PILOT'S OPERATING HANDBOOK

SECTION 9

SUPPLEMENT 48

"HONEYWELL" KLN 94 GPS (B-RNAV) NAVIGATION SYSTEM INTERFACED WITH ELECTROMECHANICAL INSTRUMENTS

OPTIONAL EQUIPMENT No. OPT10 34-301

This supplement includes only the general, limitations, emergency procedures, normal procedures and performance in addition to those of SOCATA TB airplane in its standard version.

This Supplement includes information to be furnished to the pilot as required by the certification conditions.

D.G.A.C.Approval :

Le Directeur des Etudes et de l'Exploitation de l'Aviation Civile

B. PINON

Date : 23 MAR 2001

"Ce supplément est une traduction en langue anglaise du Supplément Français correspondant approuvé par la D.G.A.C."

THIS DOCUMENT MUST BE EMBODIED IN SECTION 9 OF THE PILOT'S OPERATING HANDBOOK AND BE PERMANENTLY KEPT IN THE AIRPLANE EQUIPPED WITH THE OPTION "HONEYWELL" KLN 94 GPS (B-RNAV) NAVIGATION SYSTEM INTERFACED WITH ELECTROMECHANICAL INSTRUMENTS

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Grégory POMMIER

Date : 11 JUIL 2001

DIRECTION GÉNÉRALE DE L'AVIATION CIVILE
SERVICE DE LA NAVIGATION AÉRONAUTIQUE ET DU CONTRÔLE TECHNIQUE

"HONEYWELL" KLN 94 GPS (B-RNAV) NAVIGATION SYSTEM INTERFACED WITH ELECTROMECHANICAL INSTRUMENTS

LIST OF AMENDMENTS

Edition 0 of January 31, 2001

Revision 1 of May 15, 2001

Pages	Description
9.48B	List of effective pages
9.48C	List of amendments
9.48.9	Modification of the paragraph "Autopilot coupled operation"
9.48.10	Classifying mistake for the option (O becomes A)
9.48.9	Minor modifications (terminology, text moving or presentation)

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SUPPLEMENT

"HONEYWELL" KLN 94 GPS (B-RNAV) NAVIGATION SYSTEM INTERFACED WITH ELECTROMECHANICAL INSTRUMENTS

TABLE OF CONTENTS

"HONEYWELL" KLN 94 GPS (B-RNAV)
NAVIGATION SYSTEM INTERFACED WITH
ELECTROMECHANICAL INSTRUMENTS

SECTION 1

GENERAL

This supplement is intended to inform the pilot about the equipment limitations, description and operations necessary to the operation when the TB airplane is equipped with the option ""HONEYWELL" KLN 94 GPS (B-RNAV) NAVIGATION SYSTEM INTERFACED WITH ELECTROMECHANICAL INSTRUMENTS".

Approved utilization types :

- IFR in continental and Terminal Enroute areas as additional source,
- B-RNAV.

Certification rules :

- AMJ 20X2 Section 4,
- AC 20-138.

The generalities hereafter supplement those of the standard airplane described in Section 1 "General" of the basic Pilot's Operating Handbook, when the TB airplane is equipped with the option ""HONEYWELL" KLN 94 GPS (B-RNAV) NAVIGATION SYSTEM INTERFACED WITH ELECTROMECHANICAL INSTRUMENTS".

This supplement does not constitute an operational utilization authorization.

The GPS is an automatic tridimensional (latitude, longitude, altitude) location and navigation means using information provided by satellites (the KLN 94 system is able to track up to 8 satellites at a time). It also uses data recorded in a data base. The data base is housed in a Navdata card to be inserted in the front face and is updated every 28 days by replacing the card.

Each data base contains information about airports, communication frequencies, VORs, NDBs, Intersections, SIDs, STARs, instrument approaches, flight service stations ...

There is also room for up to 500 user defined waypoints and 25 different flight plans.

SECTION 2

LIMITATIONS

2.1 - General

The limitations hereafter supplement those of the standard airplane described in Section 2 "Limitations" of the basic Pilot's Operating Handbook, when the TB airplane is equipped with the option ""HONEYWELL" KLN 94 GPS (B-RNAV) NAVIGATION SYSTEM INTERFACED WITH ELECTROMECHANICAL INSTRUMENTS".

"HONEYWELL" KLN 94 Pilot's Guide, P/N 006-18207-000 Revision 0 dated 09/00 or any applicable following edition, shall be readily available to the pilot, each time the GPS navigation system is used.

The system must utilize the ORS 01 software version or a more recent one.

Data base updating must be verified before each flight.

The navigation sources required for the anticipated flight shall be serviceable and allow an immediate crossed check on available ground aids or shall allow to return to primary navigation sources in case of GPS navigation loss.

Use of GPS as a navigation source is **PROHIBITED**, unless the pilot verifies the currency of the data base and the coordinates of each selected waypoint.

For every navigation into areas reserved for B-RNAV, the pilot must be provided with a predicted availability of RAIM on the route, if the constellation disposes of less than 23 satellites.

The check of navigation system information consistency must be regularly performed during the flight :

- when reaching each waypoint or before reaching the position report point of the ATC,
- before leaving a published route and then every 15 minutes during this type of operation (function "Direct To").

The check of position information consistency may be performed by comparing this position with the one determined by the primary radionavigation sources.

2.2 - SID/STAR

The use of SIDs and STARs stored in GPS data base is **PROHIBITED**.

The use of user waypoints on SID/STAR is **PROHIBITED**.

2.3 - Instrument approach (Non precision approach)

Use of the GPS is **PROHIBITED**.

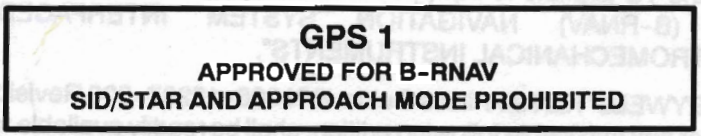

Figure 9.48.1 - GPS limitation placard

"HONEYWELL" KLN 94 GPS (B-RNAV)
NAVIGATION SYSTEM INTERFACED WITH
ELECTROMECHANICAL INSTRUMENTS

SECTION 3

EMERGENCY PROCEDURES

The emergency procedures hereafter supplement those of the standard airplane described in Section 3 "Emergency procedures" of the basic Pilot's Operating Handbook, when the TB airplane is equipped with the option ""HONEYWELL" KLN 94 GPS (B-RNAV) NAVIGATION SYSTEM INTERFACED WITH ELECTROMECHANICAL INSTRUMENTS".

HSI NAV FLAG

Return to remaining operational navigation equipment.

"NAV1/GPS1" push-button **NAV1**

"MSG" ANNUNCIATOR ILLUMINATION

1 - "MSG" push-button of GPS ..... **PRESS**

Check the message.

"Bad Satellite Geometry", Nav Super Flag Failure", "RAIM position error", "RAIM not available", "Searching the sky" or "No GPS Receiver Data" :

Return to VOR or ADF navigation source and to remaining operational navigation equipment.

"NAV1/GPS1" push-button **NAV1**

"HONEYWELL" KLN 94 GPS (B-RNAV)
NAVIGATION SYSTEM INTERFACED WITH
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"MSG" ANNUNCIATOR ILLUMINATION (Cont'd)

*If the message mentions an error of course deviation (**"Adj Nav CRS to XXX"** or **"GPS course is xxx°"**) :*

- OBS set to DTK value
  Return to VOR or ADF navigation source and to remaining operational navigation equipment.
  "NAV1/GPS1" push-button **NAV1**
- OBS not set to DTK value
  Set the OBS to the value of DTK. Check the correct interception of the segment, if the AP interface is used.

WHEN IN B-RNAV VERIFY THE IFR PROCEDURE APPLICABLE TO EACH ONE OF THESE NEW SITUATIONS WITH THE AIR TRAFFIC CONTROL :

- **OUT OF B-RNAV AREA : IT IS PROHIBITED TO ENTER THE B-RNAV AREA.**
- **IN B-RNAV AREA : INFORM THE AIR TRAFFIC CONTROL TO INDICATE THE LOSS OF B-RNAV CAPABILITY.**

When the system integrity is restored, the return to GPS mode must be accompanied by the validation of the followed and desired track concordance by using primary sources of navigation.

"HONEYWELL" KLN 94 GPS (B-RNAV)
NAVIGATION SYSTEM INTERFACED WITH
ELECTROMECHANICAL INSTRUMENTS

SECTION 4

NORMAL PROCEDURES

The normal procedures hereafter supplement those of the standard airplane described in Section 4 "Normal procedures" of the basic Pilot's Operating Handbook, when the TB airplane is equipped with the option ""HONEYWELL" KLN 94 GPS (B-RNAV) NAVIGATION SYSTEM INTERFACED WITH ELECTROMECHANICAL INSTRUMENTS".

Normal operating procedures of the GPS recommended by the manufacturer are outlined in the "HONEYWELL" KLN 94 Pilot's Guide at the latest revision and Memory Jogger at the latest revision.

However, it is important to precise the following points for the GPS use on TB :

SET UP CONDITIONS

- Verify if the data base is current. Verify data on the self test page.
- Verify that altitude data is valid for the GPS prior to flight.
- In case of B-RNAV use :

  During the preflight planning phase, the availability of GPS integrity (RAIM) shall be confirmed for the intended flight (route and time).

  B-RNAV flight dispatch shall not be made in the event of a continuous loss of RAIM for more than 5 minutes predicted in any part of the intended flight.

  With 23 or more satellites available, the predicted availability of RAIM is valid for 7 days.

  When less than 23 satellites are available, the predicted availability of RAIM shall be confirmed short before each flight.

"HONEYWELL" KLN 94 GPS (B-RNAV)
NAVIGATION SYSTEM INTERFACED WITH
ELECTROMECHANICAL INSTRUMENTS

SYSTEM ANNUNCIATORS / SWITCHES / CONTROLS

"NAV1/GPS1" push-button

This push-button may be used to select data to be displayed on the pilot's HSI ; the NAV data come either from NAV1 navigation receiver or from the GPS1.

When pressed once, the push-button illuminates **"NAV1"** (green), pressed one more time illuminates **"GPS1"** (blue).

"MSG" message annunciator (amber)

CAUTION

"MSG" ANNUNCIATOR MAY BE PERMANENTLY ILLUMINATED IF THERE EXISTS A PERMANENT MESSAGE. WHEN A NEW MESSAGE APPEARS, "MSG" ANNUNCIATOR JUST FLASHES

"MSG" message annunciator will flash to alert the pilot of a situation that requires his attention. Press the **"MSG" push-button** located on the GPS to view the message (Appendix B of "HONEYWELL" KLN 94 Pilot's Guide contains a list of all the messages likely to appear on the "Message" page and their meanings).

"WPT" Waypoint annunciator (amber)

This annunciator flashes approximately 20 seconds before warning "NEXT DTK".

"APR" annunciator is not used.

"TERM" annunciator is not used.

"GPS" mode

When using the "GPS" mode, GPS navigation data (course deviation, TO/FROM) are presented on the HSI.

When crossing a waypoint, the track resetting on the following navigation leg must be hand-performed on the HSI.

Autopilot coupled operation

The GPS may be coupled with the autopilot via the HSI, which receives the information relative to the navigation source (VOR1 or GPS) selected by the "NAV1/GPS1" push-button.

When AP is engaged on the mode controller, the autopilot is then coupled with the HSI and uses displayed information (track and course deviation).

Autopilot with flight director

Engaging the "NAV" mode on the autopilot mode controller will activate the FD on the ADI. The FD uses selected course and left/right steering information displayed on the HSI.

GPS use in Terminal area

The CDI full scale must be set by hand to ± 1 Nm.

"HONEYWELL" KLN 94 GPS (B-RNAV)
NAVIGATION SYSTEM INTERFACED WITH
ELECTROMECHANICAL INSTRUMENTS

SECTION 5

PERFORMANCE

The installation and the operation of the "HONEYWELL" KLN 94 GPS (B-RNAV) NAVIGATION SYSTEM INTERFACED WITH ELECTROMECHANICAL INSTRUMENTS do not change the basic performance of the airplane described in Section 5 "Performance" of the basic Pilot's Operating Handbook.

SECTION 6

WEIGHT AND BALANCE

Information hereafter supplement the one given for the standard airplane in Section 6 "Weight and balance" of the basic Pilot's Operating Handbook.

A or O	OPTIONAL EQUIPMENT	EQUIPMENT SUPPLIER	WEIGHT per unit lb (kg)	ARM in. (m)
	34 - NAVIGATION			
A	GPS (B-RNAV) KLN 94 interfaced with electromechanical instruments (OPT10 34301A)	HONEYWELL	5.952 (2.700)	25.98 (0.66)

"HONEYWELL" KLN 94 GPS (B-RNAV)
NAVIGATION SYSTEM INTERFACED WITH
ELECTROMECHANICAL INSTRUMENTS

SECTION 7

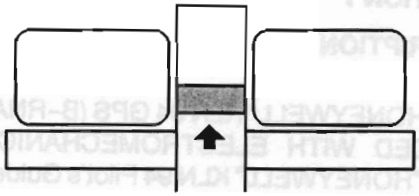
DESCRIPTION

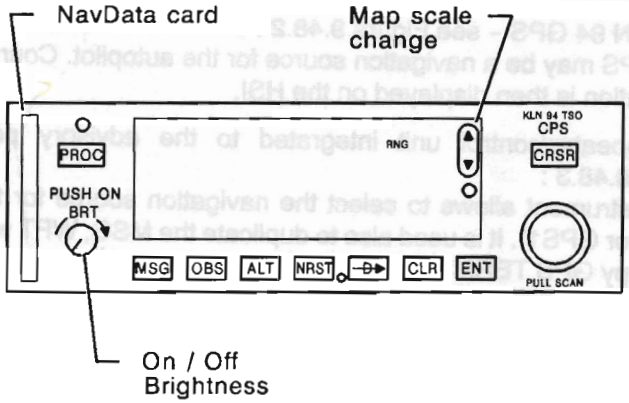
Normal operating procedures of the "HONEYWELL" KLN 94 GPS (B-RNAV) NAVIGATION SYSTEM INTERFACED WITH ELECTROMECHANICAL INSTRUMENTS are described in the "HONEYWELL" KLN 94 Pilot's Guide at the latest revision.

GPS system consists of :

- one KLN 94 GPS - see Figure 9.48.2 :
  This GPS may be a navigation source for the autopilot. Course deviation information is then displayed on the HSI.
- one repeater/control unit integrated to the advisory panel - see Figure 9.48.3 :
  This instrument allows to select the navigation source for the autopilot (NAV1 or GPS1). It is used also to duplicate the MSG, WPT warnings and to recopy GPS TERM and APR data.

"HONEYWELL" KLN 94 GPS (B-RNAV) NAVIGATION SYSTEM INTERFACED WITH *ELECTROMECHANICAL INSTRUMENTS*





MSG - Message viewing

OBS - OBS/Leg mode selection

ALT - Altitude functions

NRST - Nearest VOR, NDB, Airports, interceptions, User defined waypoints

"Direct TO"

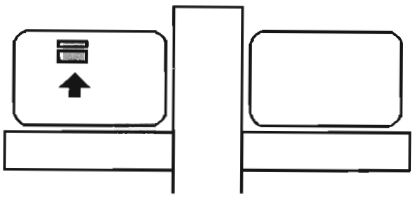
PROC - Procedure

CLR - Clear

ENT - Enter

I4345100AAAUTY8200

Figure 9.48.2 - "HONEYWELL" KLN 94 GPS SYSTEM



GPS 1
APPROVED FOR B-RNAV
SID/STAR AND APPROACH MODE PROHIBITED

NAV1	MSG	TERM
GPS1	WPT	APR

NAV1
GPS1

- NAV1/GPS1 push-button

Annunciators :

- NAV1 : NAV1 navigation source
- GPS1 : GPS1 navigation source
- MSG, WPT : Repeater of GPS, MSG, WPT warnings
- TERM, APR : Repeater of TERM, APR data (not used)

I4345100AAAUTY8001

Figure 9.48.3 - Repeater/control unit and GPS placard