



FriendlyPanels Gauges Pack 1

(version 2.0)

For Microsoft® FSX and FS9
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FOURTEEN GAUGES FOR YOUR FSX and FS9 AIRCRAFT



User's manual

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1. Introduction

Thank you for purchasing this Pack or just downloading this manual. Here you will find the installing instructions, description and user's instructions of some of the gauges included in this pack.

Instructions for KLN 90B, KLN 94, GNS430 and GNS 530 are in separate docs.

This pack includes FOURTEEN gauges:

- Three GPS: **BENDIX KLN 94, BENDIX KLN 90B and GARMIN GNS530** Two radios
- Two NAV – COM radios: **BENDIX KX 165A NAV1 – COM1 RADIO and NAV2 – COM2 RADIO**
- One ADF: **BENDIX KR 87 ADF**
- One DME: **BENDIX KN 62 A DME**
- Two Autopilots: **BENDIX KAP140 and BENDIX KFC225**
- Two transponders: **BENDIX KT 70 and KT 76C**
- Three audio panels: **KMA26, KMA24 and KA134**

They have been made with manuals in front. Please, read this document entirely to know what can you expect from these gauges.

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2. Requirements

This panel requires a screen resolution of 1024 x 768 or higher (1240 x 1024 recommended).

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3. Installing the gauges

Run the installation program and follow the indicated steps. Three new files will be installed in your main FS9 or FSX gauges folders: fp_gaug.s.gau, fp_gaugsx.cab and fp_snd.gau. You can combine these gauges to customize your panels in any way you want it.

The new gauges are:

In fp_gaug.s.gau:

fp_gaug.s!ADF_KR = BENDIX KR 87 ADF
p_gaug.s!APKAP140 = BENDIX KAP140 AUTOPILOT
fp_gaug.s!APKFC225 = BENDIX KFC225 AUTOPILOT
fp_gaug.s!AudKA134 = KA134 AUDIO PANEL
fp_gaug.s!AudKMA24 = KMA24 AUDIO PANEL
fp_gaug.s!AudKMA26 = KMA26 AUDIO PANEL
fp_gaug.s!DMEKN62 = BENDIX KN 62 A DME
fp_gaug.s!KX165 = BENDIX KX 165A NAV1 – COM1 RADIO
fp_gaug.s!KX165_2 = BENDIX KX 165A NAV2 – COM2 RADIO
fp_gaug.s!XPKT70 = BENDIX KT70 TRANSPONDER
fp_gaug.s!XPKT76 = BENDIX KT76 TRANSPONDER
fp_gaug.s!snd = some sounds

In fp_gaugsx.gau:

fp_gaugsx!gns530_2 = GARMIN GNS530 GPS Two radios
fp_gaugsx!kln90b = BENDIX KLN 90B GPS
fp_gaugsx!kln94 = BENDIX KLN 94 GPS

If you purchase this gauges, we suppose you know how to add them to a panel, if this is not the case, we recommend to use FS Panel Studio (www.fspanelstudio.com) and read the Chip Barber's article located here www.flightsim.com/cgi/kds?aQBfm01X=main/howto/pushback.htm .

If you want to hear the GPS buttons and switches sounds you have to install **fp_gaug.s!snd or fp_snd!snd**. Give it a small size (10x10 f.i.) and place it somewhere in the panel, it's invisible.

We took special care in minimizing strange effects when resizing the gauges but still maybe you'll need sometimes to slightly adjust the size to have a right view of some gauge.

Six examples of radio stacks has been settled by the installer: three for the Cessna 172 and three for the Beechcraft Baron 58. You will find them under the variations Rstack1, Rstack2 and Rstack3 for those planes.

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4. A couple of screenshots



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5. Gauges

This section shows, explains and describe (when necessary) the new FP gauges features included in this pack.

5.1 BENDIX KX 165A RADIO



The Bendix KX 165A Nav Com radio has four knobs and four buttons. Its display is divided in two segments. The left portion of the digital display readout is allocated for COMM ACTIVE and COMM STANDBY frequencies channels stored (this is a dummy function in this version). The right portion of the display is allocated to NAV receiver information and much more as shown below.

5.1.1 Clicking areas



1. On Off switch
2. Display Channel
- 3 and 4. Tune COM fractional frequencies
5. Ident
6. Select screen right segment mode
- 7 and 9. Tune NAV fractional frequencies
8. Centers OBI if OBS mode is active
- 10 and 11. Tune NAV integer frequencies / controls stop watches / OBS
12. Swaps NAV frequencies / controls stop watches
- 13 and 14. Tune COM integer frequencies. Change Ch stored if Ch is visible
15. Swaps COM frequencies
16. Reset Timers

5.1.2 Left segment pages

Two modes are available, though Channel mode is a dummy mode, by now.



Pushing Channel button will show channels number stored for a few seconds. The big left knob will browse through the channels stored. When Ch is not visible this knob tune COM frequencies.

5.1.3 Right segment pages

The right segment of the screen can display 9 different modes, you can browse with the MODE button.

ACTIVE / STAND BY mode



In this mode you can tune stby frequency with the right knob and swap frequencies with the transfer button

ACTIVE / CDI mode



Pushing MODE button will take you to this mode. The vertical “needle” moves side to side similar to a mechanical CDI. When the needle is centered, the aircraft is on the selected OBS course. When the active frequency is tuned to a VOR frequency, the center of the CDI scale displays the “TO” or “FROM” indicator.

The CDI needle may be automatically centered with a “TO” indication clicking on center of the knob. The CDI is displayed on the line below the frequency/OBS. When the ACTIVE frequency is tuned to a VOR frequency, the standby frequency area is replaced by a three digit OBS (Omni Bearing Selector) display. The desired OBS course can be selected with the right knob. When the ACTIVE window is tuned to a localizer frequency, the standby frequency area is replaced by “LOC”. When the received signal is too weak to ensure accuracy the display will flag.

ACTIVE / BEARING mode



Pushing MODE once more cause the NAV display to go to bearing mode of operation, the right hand window of NAV display shows the bearing TO the station.

ACTIVE / RADIAL mode



Another push of the MODE button will cause the NAV display to go from the ACTIVE/BEARING mode to the ACTIVE/RADIAL mode. The right hand window of NAV display shows the radial FROM the station.

TIMER mode



Another mode button click will cause the unit to go into the TIMER mode. When the unit is turned on the elapsed timer begins counting upwards from zero. The timer can be stopped by pushing the NAV frequency swap button or reset to zero clicking on area 16 (see above) causing the ET on the display to flash. In this state the timer can be set as a countdown timer or the elapsed timer can be restarted. If you click on swap button again the counter will restart from zero. If you use the knob in the right side countdown timer can be set to the desired time (while ET is blinking) and then pushing the NAV swap button countdown will start. The top side of the knob selects minutes, the bottom side of the knob selects seconds. After the countdown timer reaches zero, the counter will come up, whatever the mode you are in, and will begin to count upwards indefinitely while flashing for a few seconds, returning then to the mode you were before, if it was different. The Audio Alert is then sounded.

ACTIVE / GPS modes

The following GPS modes are not described in the KX 165 guide but we have considered useful to include this modes. You go into these modes pushing MODE button as well.



GPS CDI and desired track



Next waypoint distance and ident



Bearing to next waypoint distance and ident



Next waypoint ident ETE and ETA

5.2 BENDIX KR 87 ADF



The Bendix KR 87 ADF has two knobs and five buttons. It displays active and stand by frequencies and integrates two timers.

5.2.1 Clicking areas



1. ADF / ANT modes. This version displays ADF station ident.
2. BFO mode (just the letters)
3. In frequency mode transfer stand by frequency to active. Returns to frequency mode from timers modes.
4. Go into timers mode.
- 5 and 6. Controls timers modes (described below).
7. On Off
- 8, 13, 14. Decrements frequency
9. Increments fractal frequency
- 10, 11, 12. Increments frequency

5.2.2 Display modes

Frequency mode



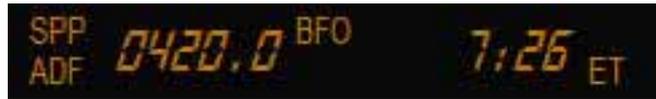
Use knob and swap button to manage this screen.

FLT timer Mode



From frequency mode push FLT/SET button once to go into this mode. This timer begins to count when you turn on the gauge and stops when you turn it off.

ET timer Mode



From frequency mode push FLT/SET button twice to go into this mode. This timer starts to count when you turn on the gauge, but you can control it. Clicking on SET/RST button once stops the timer. When it is stopped clicking again reset the timer and starts to count from zero. Clicking to the right of the button (area 7 above) will reset it to zero and ET begin to blink, you can use the knob to set a countdown (up to 59 minutes and 59 seconds), push SET/RST to start the countdown. After the countdown timer reaches zero, the counter will come up, whatever the mode you are in, and will begin to count upwards indefinitely while flashing for a few seconds, returning then to the mode you were before, if it was different. The Audio Alert is then sounded

5.3 BENDIX KN 62A DME



The Bendix KN 62A DME has one knob and two switches. The 3-position function switch determines both, the information displayed and the channeling source.

If you place the function switch on Frequency (FREQ), the unit is channeled internally with its own two concentric frequency selection knobs. You can use it to tune the VOR2 frequency in these panels. The left side displays the distance to VOR2 station.

IMPORTANT NOTE: IF THERE IS NAV2 STBY FRQUENCY AVAILABLE FOR THE AIRCRAFT IN WHICH YOU INSTALL THIS GAUGE, THEN THE KNOB WILL TUNE THIS FREQUENCY AND YOU'LL NOT SEE THE NEW NAV2 FRQ. UNTILL YOU SWAP THE NAV2 FREQUENCIES IN THE APPROPRIATE GAUGE.



If you move the function switch to the Groundspeed/Time-to-Station (GS/T) position, the unit will hold the internally selected frequency and will display distance, groundspeed and time-to-station. Acting on frequency selector will have no effect on the display, because the DME is in "Frequency Hold". This frequency hold feature in the GS/T mode prevents accidental rechanneling of the DME when the frequency is not displayed.



Finally, place the function switch in the Remote (RMT) position, and your DME will be channeled when you select your NAV frequency on the NAV receiver. When the unit locks on a ground station, it will display distance, groundspeed and time-to-station. Note that you may have two frequencies available at all times (one remotely selected on the NAV receiver and one internally selected with the unit's controls).



5.4 BENDIX KAP 140 AUTOPILOT



The Bendix KFC 225 AUTOPILOT has one knob and twelve buttons (ten for the KAP 140). Most of functions are the same in both gauges.

5.4.1 Clicking areas



1. AP on off
- 2 to 5. AP programs: Heading hold, Nav, Approach, Backcourse
6. Acquire current altitude
- 7 and 12. Decreases / increases vertical speed
- 8 and 9. Decreases / increases altitude hold (upper side 1000 fpm, lower side 100 fpm)
10. Displays current baro pressure (in Hg or MB)
11. Intercepts altitude selected (knob 10 / 11)

5.4.2 Operation

1. AUTOPILOT ENGAGE/DISENGAGE (AP) BUTTON

When pressed, engages the autopilot. The system will engage into the basic wings level (ROL) and pitch (PIT) attitude hold modes. The pitch attitude maintained will be the pitch attitude present at the moment of AP button press. When pressed again, will disengage the autopilot.

2. HEADING (HDG) MODE SELECTOR BUTTON

When pressed, will engage the Heading mode, which commands the airplane to turn to and maintain the heading selected by the heading bug on the HSI. A new heading may be selected at any time and will result in the airplane turning to the new heading. Button can also be used to toggle between HDG and ROL modes.

3. NAVIGATION (NAV) MODE SELECTOR BUTTON

When pressed, will arm the navigation mode. The mode provides automatic beam capture and tracking of VOR. NAV mode is recommended for en route navigation tracking. If pressed when NAV mode is either armed or coupled, will disengage the mode.

4. APPROACH (APR) MODE SELECTOR BUTTON

When pressed, will arm the Approach mode. This mode provides automatic beam capture and tracking of or LOC with Glideslope (GS) on an ILS. APR ARM will annunciate. If pressed when APR mode is either armed or coupled, will disengage the mode.

5. BACK COURSE APPROACH (REV) MODE SELECTOR BUTTON

When pressed, will select the back course approach mode. This mode functions similarly to the approach mode except that the autopilot response to LOC signals is reversed and glideslope is inhibited.

6. ALTITUDE HOLD (ALT) MODE SELECT BUTTON

When pressed, will engage the Altitude Hold mode. The altitude maintained is the altitude at the moment the ALT button is pressed. If pressed when ALT hold mode is engaged, will disengage the mode, defaulting to PIT mode.

7 and 12. VERTICAL SPEED (UP/DN) BUTTONS

The initial button press will bring up the commanded vertical speed in the display. Subsequent immediate button presses will increment the vertical speed command either up or down at the rate of 100 ft/min per button press.

8 and 9. ROTARY KNOB

Used to set the altitude alerter/altitude preselect reference altitude. Changes reference by 100's of feet. If the flight director is engaged, will automatically arm a preselect altitude hold capture.

10. BARO PRESSURE MODE SELECTOR BUTTON

When pressed bring up the selected baro press in the display. Once IN HG, twice MB. After a few seconds after button has been pressed the display returns to the previous mode selected.

11. ALTITUDE ARM (ARM) BUTTON

When pressed will toggle altitude arming on or off. When ALT ARM is annunciated, the automatic flight control system will capture the altitude displayed in the Altitude Alerter/Vertical Speed Display (provided the aircraft is climbing or descending to the displayed altitude). Note that the alerter functions are independent of the arming process thus providing full time alerting.

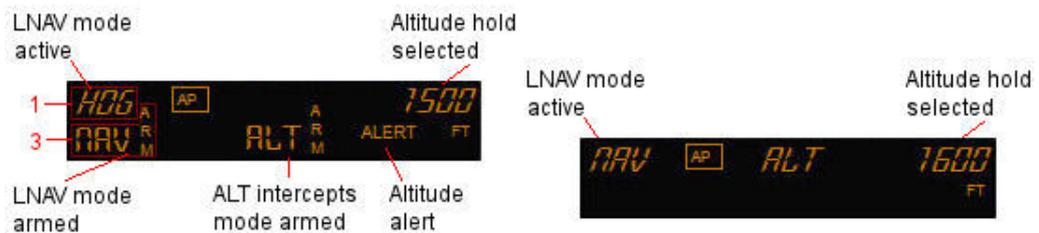
5.4.3 Display

Here follows some AP explanation screenshots.



AP active no program engaged

Segment 1 displays the LNAV mode active, while segment 3 shows the mode armed if any. Altitude alert (**ALERT**) annunciation illuminates as a solid alert in the region from 1000 to 200 feet from the selected altitude if the airplane was previously outside of this region. Flashes for a few seconds when the airplane reaches the selected altitude. An aural alert is associated with the visual alerting. This aural alert occurs 1,000 feet before a selected altitude while approaching it and 200 feet after leaving a selected altitude, and when the altitude is reached.



Segment 2 normally displays the selected altitude. The display indicates the reference vertical speed in FPM for 3 seconds after buttons UP or DN button are pressed or baro pressure if button baro was pressed.



Here below follows how the display changes in a typical sequence for an ILS approach.



Before LOC interception



LOC intercepted and GS armed



LOC and GS intercepted

5.5 BENDIX KFC 225 AUTOPILOT



The Bendix KFC 225 AUTOPILOT has one knob and twelve buttons.

5.5.1 Clicking areas



1. Yaw damper (if installed)
2. AP on off
3. Flight director (if installed)
- 4, 5, 6, 7. AP programs: Heading hold, Nav, Approach, Backcourse
8. Acquire current altitude
- 9 and 14. Decreases / increases vertical speed
- 10 and 11. Decreases / increases altitude hold
12. Displays current vertical speed
13. Intercepts altitude selected (knob 10 / 11)

5.5.2 Operation

AUTOPILOT ENGAGE/DISENGAGE (AP) BUTTON

When pressed, engages the flight director, autopilot and yaw damper (if installed). If the flight director is not already engaged, the system will engage into the basic wings level (ROL) and pitch (PIT) attitude hold modes. The pitch attitude maintained will be the pitch attitude present at the moment of AP button press. When pressed again, will disengage the autopilot.

FLIGHT DIRECTOR (FD) MODE SELECTOR BUTTON

When pressed will engage the flight director, if installed, into the basic roll (ROL) mode which functions as a wing leveler, and into the pitch attitude (PIT) hold mode, if it's not installed, it acts like AP button if AP is not active and has no effect in any other circumstances. The pitch attitude maintained will be the pitch attitude present at the moment of FD button press. When pressed again will disengage the flight director.

HEADING (HDG) MODE SELECTOR BUTTON

When pressed, will engage the Heading mode, which commands the airplane to turn to and maintain the heading selected by the heading bug on the HSI. A new heading may be selected at any time and will result in the airplane turning to the new heading. Button can also be used to toggle between HDG and ROL modes. This button will engage the flight director, if installed.

NAVIGATION (**NAV**) MODE SELECTOR BUTTON

When pressed, will arm the navigation mode. The mode provides automatic beam capture and tracking of VOR. NAV mode is recommended for en route navigation tracking. If pressed when NAV mode is either armed or coupled, will disengage the mode. This button will engage the flight director.

APPROACH (**APR**) MODE SELECTOR BUTTON

When pressed, will arm the Approach mode. This mode provides automatic beam capture and tracking of or LOC with Glideslope (GS) on an ILS. APR ARM will annunciate. If pressed when APR mode is either armed or coupled, will disengage the mode. This button will engage the flight director.

BACK COURSE APPROACH (**REV**) MODE SELECTOR BUTTON

When pressed, will select the back course approach mode. This mode functions similarly to the approach mode except that the autopilot response to LOC signals is reversed and glideslope is inhibited. This button will engage the flight director.

ALTITUDE HOLD (**ALT**) MODE SELECT BUTTON

When pressed, will engage the Altitude Hold mode. The altitude maintained is the altitude at the moment the ALT button is pressed. If pressed when ALT hold mode is engaged, will disengage the mode, defaulting to PIT mode. This button will engage the flight director.

VERTICAL SPEED (**UP/DN**) BUTTONS

The initial button press will bring up the commanded vertical speed in the display. Subsequent immediate button presses will increment the vertical speed command either up or down at the rate of 100 ft/min per button press.

ROTARY KNOB

Used to set the altitude alerter/altitude preselect reference altitude. Changes reference by 100's of feet. If the flight director is engaged, will automatically arm a preselect altitude hold capture.

VERTICAL SPEED (**VS**) MODE SELECTOR BUTTON

When pressed bring up the commanded vertical speed in the display. It doesn't capture VS in this version.

ALTITUDE ARM (**ARM**) BUTTON

When pressed will toggle altitude arming on or off. When ALT ARM is annunciated, the automatic flight control system will capture the altitude displayed in the Altitude Alerter/Vertical Speed Display (provided the aircraft is climbing or descending to the displayed altitude). Note that the alerter functions are independent of the arming process thus providing full time alerting, even when the flight director is disengaged. This button will engage the flight director.

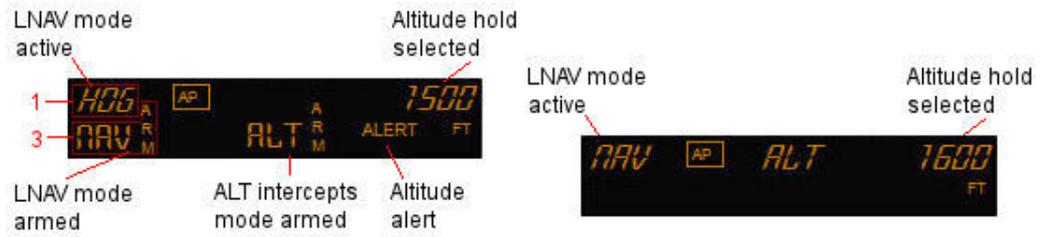
5.5.3 Display

Here follows some AP explanation screenshots.



AP active no program engaged

Segment 1 displays the LNAV mode active, while segment 3 shows the mode armed if any. altitude alert (**ALERT**) annunciation illuminates as a solid alert in the region from 1000 to 200 feet from the selected altitude if the airplane was previously outside of this region. Flashes for a few seconds when the airplane reaches the selected altitude. An aural alert is associated with the visual alerting. This aural alert occurs 1,000 feet before a selected altitude while approaching it and 200 feet after leaving a selected altitude, and when the altitude is reached.



Segment 2 normally displays the selected altitude. The display indicates the reference vertical speed in FPM for 3 seconds after the VS button or the UP or DN button is pressed.



Here below follows how the display changes in a typical sequence for an ILS approach.



Before LOC interception



LOC intercepted GS armed



LOC and GS intercepted

5.6 BENDIX KT 70 TRANSPONDER



The Bendix KT 70 Transponder has five knob and two buttons. The four little knobs are for setting xpndr code and the big one to select mode.

5.6.1 Clicking and display areas



- 1, 2, 3 and 4. ATCRBS Code Selector Knobs
- 5. VFR Button
- 6 and 7. Function Selector Knob
- 8. Ident Pushbutton

- A. Ident Push button
- B. Encoding Altimeter Altitude Window
- C. Mode Annunciation and Reply Indicator
- D. Ident Window

5.6.2 Operation

We describe below the operation of the KT 70. The display is emulated but, in FS9, the gauge always works in the same manner. What you see in the display are the screens you see in the real KT 70

IDENT Button

Marked IDT, the KT 70 Ident button is pressed when ATC requests an "Ident" or "Squawk Ident" from your aircraft. When the Ident button is pressed, the reply indicator, an "R" annunciator light will glow for approximately 18 seconds.

ID Code

The ATCRBS Transponder Identification code (squawk code) for the aircraft is displayed in the Ident Window on the right side of the display. Each of the four Transponder Code Selector Knobs selects a separate digit of the identification code.

Reply

The lighted "R" reply indicator blinks when the transponder is replying to a valid interrogation and illuminates for 18 seconds after the initiation of the Ident.

Altitude Display

The KT 70 display Flight Level Altitude, marked by the letters “FL” and a number in hundreds of feet, on the left side of the display (A). For example, the reading “FL 071” corresponds to an altitude of 7,100 feet.

VFR

Pressing the VFR Pushbutton recalls the preprogrammed VFR code, superseding whatever code was previously entered.

Function Selector Knob

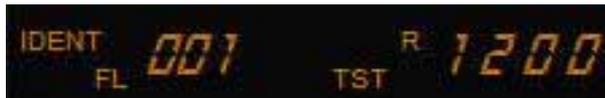
The Function Selector Knob on the right side of the KT 70 enables you to choose from among the following operating modes:

OFF - The unit is not receiving power.

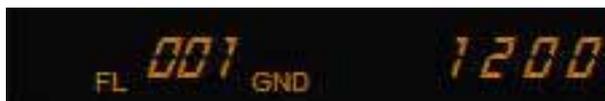
SBY (STANDBY) - In Standby the unit is energized but is inhibited from replying to any interrogation. “SBY” is shown on the display, while the altitude display is disabled.



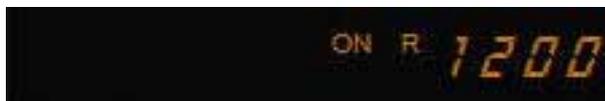
TST (TEST) - Replies are disabled in test mode, and the unit illuminates all segments of the display for at least four seconds. A series of internal tests is performed to check the KT 70/71's integrity, verifying all EEPROM data and making hardware and squitter checks.



GND (GROUND) - In the KT 70, ATCRBS (Air Traffic Control Radar Beacon System) Mode A&C interrogations are inhibited, but the KT 70 will reply to all valid Mode S interrogations, provided a Mode S status bit is set to indicate the aircraft is on the ground. In both units, the ID code is shown on the right side of the display, with altitude reported on the left side. The letters “GND” are also displayed in this mode.



ON - The KT 70 is able to reply to all valid Mode A, C and S interrogations (Mode A and C on the KT 71). However, the altitude information will not be transmitted. In the ON mode, the altitude window is left blank, the ID code is shown on the right and the “ON” annunciation is shown on the display.



ALT - In the “ALTITUDE” mode, the KT 70 replies to all valid Mode A, C and S interrogations. The ID code is displayed in the right window and altitude information (in hundreds of feet) is shown on the left.

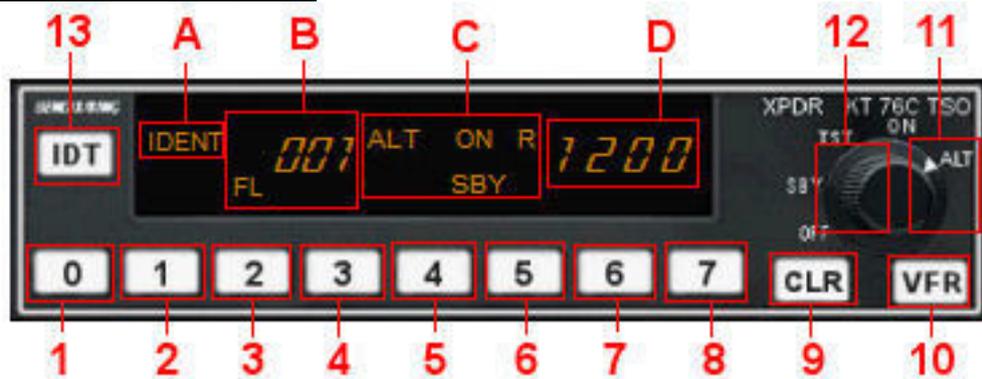


5.7 BENDIX KT 76 C TRANSPONDER



The Bendix KT 76 C Transponder has one knob and eleven buttons.

5.7.1 Clicking and display areas



1 to 8. ATRCBS Code Selector Knobs

9. Clear button

10. VFR Button

11 and 12. Function Selector Knob

13. Ident Pushbutton

A. Ident Push button

B. Encoding Altimeter Altitude Window

C. Mode Annunciation and Reply Indicator

D. Ident Window

5.7.2 Operation

The KT 76 C display and operation are the same as KT 70 described above. There's not GND function in the KT 76 C.

The code is now set by 0 – 7 buttons. First time you click one of these buttons the first code number is highlighted. Push the button number you want to place here and the next number will be highlighted, this figure can now be set with a number button and so on. CLR button allows you to get back one place and correct a number.

5.8 BENDIX KMA26, KMA24 AND KA134 AUDIO PANELS



Bendix KMA26



Bendix KMA24



Bendix KA134

6. Technical support

If you need some advice on how to adapt some gauge to a panel or have any other question, please contact FriendlyPanels at:

fpanels@friendlypanels.net

we will answer as soon as possible.

Web page:

www.friendlypanels.net