

BENDIX/KING
KPI 552B/553B
PICTORIAL NAVIGATION INDICATOR

SECTION III
OPERATION

3.1 UNIT CONTROLS AND INDICATORS

The following controls and indicators are on the KPI 552B/553B (Ref. Figure 3-1, 3-2, or 3-3)

- | | |
|--|---|
| (A) Lubber Line | Fixed reference mark for compass card. Represents nose of aircraft. |
| (B) Heading Bug | Indicates Selected Heading. |
| (C) TO-FROM Indicator | Indicates whether the course pointer is showing the magnetic bearing TO or FROM the station. |
| (D) Lateral Deviation Indicator | Indicates flight on selected VOR radial, localizer beam or RNAV track with respect to aircraft location. Scale is 1 dot equals $\pm .5^\circ$ of localizer deviation, $\pm 2^\circ$ of VOR deviation, ± 1 mile of RNAV Enroute deviation, and $\pm .25$ mile RNAV Approach deviation. |
| (E) ADF/NAV Selector | Rotating lever which determines information which the ADF/NAV indicator (G) is displaying. Automatic direction finder (ADF) and radio magnetic indicator (RMI or NAV) information is supplied by aircraft avionics. |
| (F) Heading Select Knob | Positions Heading Bug on Compass Card. Knob face includes a color coded symbol representing the Heading Bug. |
| (G) ADF/NAV Indicator | Indicates bearing of ADF or NAV signal. |
| (H) Course Select Knob | Positions course selector on compass card. Knob face includes a color coded symbol representing the Course Arrow. |
| (I) Glideslope Deviation Indicator
(Hidden from View) | Indicates glideslope beam center with respect to aircraft location. Glideslope scale is $\pm .35^\circ$ per dot. A black glideslope warning flag covers this area when the glideslope signal is invalid. |
| (J) Compass Card | Indicates aircraft magnetic heading with reference to Lubber Line. |
| (K) Compass Warning Flag | In view when an erroneous directional gyro input, a power failure or a compass card servo failure occurs. |
| (L) NAV Warning Flag | In view when navigational receiver output is invalid. |
| (M) Course Arrow | Indicates Selected Course. |
| (N) Photoresistor | Senses ambient light for display dimming circuit. |
| (O) Distance Display | The left-hand portion of the display shows distance (NM) to the VOR or waypoint, as determined by the function switch. |
| (P) Groundspeed, Time-To-Go, or
Altitude | The right-hand portion of the display shows Groundspeed, Time-To-Go, or Altitude as indicated by the illumination of the KT, H:M or FT legends. |

**BENDIX/KING
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PICTORIAL NAVIGATION INDICATOR**

(R) GS/TTG Transfer Button

Pressing the GS/TTG transfer button switches the righthand display from the GS display to the TTG display, or from TTG to GS depending on what is currently in use. This information is only displayed above 1250ft. Below 1250ft the display changes to altitude as indicated by the legend.

(S) WAYPOINT Annunciator

Indicates bearing of WAYPOINT

(T) CROSSTRACK Annunciator

Indicates bearing of CROSSTRACK

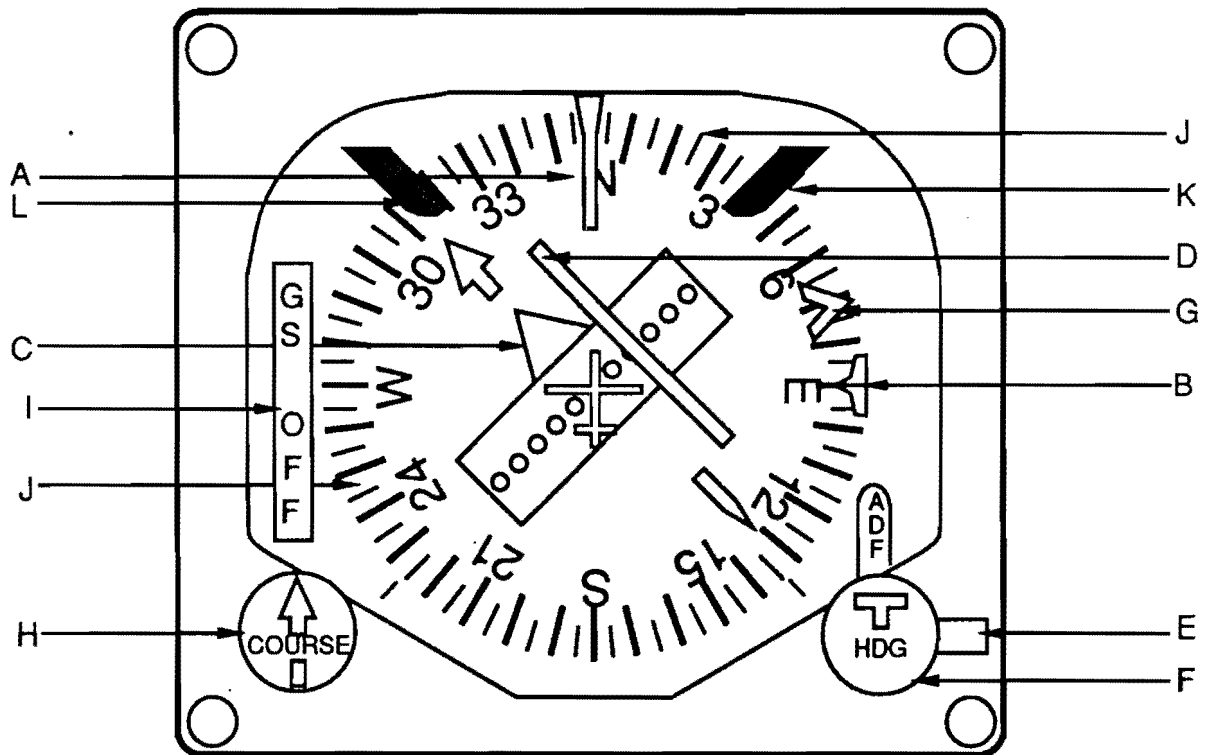


FIGURE 3-1 KPI 552B



BENDIX/KING
KPI 552B/553B
PICTORIAL NAVIGATION INDICATOR

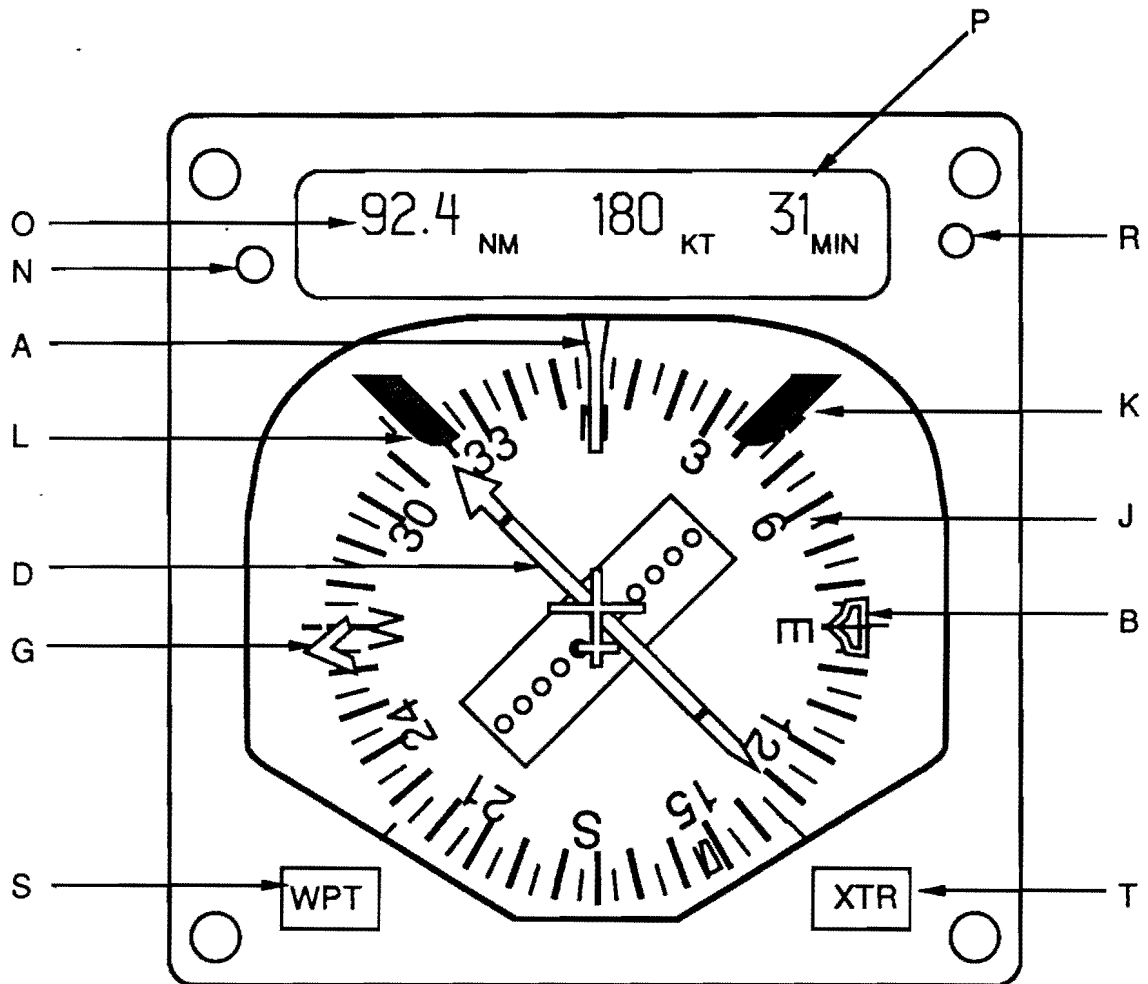


FIGURE 3-3 KPI 553B-09

KING
KNI 582
RADIO MAGNETIC INDICATOR

SECTION III OPERATION

3.1 GENERAL

The KNI 582 display is discussed below:

A. Compass Card/Lubber Line:

This rotating card repeats gyro stabilized magnetic compass information. Aircraft heading is read from the compass card under the orange lubber line.

B. Compass Flag:

This flag comes into view whenever the compass system determines that the heading is invalid or the indicated heading has an error of 5° or more.

C. Pointers:

The arrow of either pointer indicates the magnetic heading to a VOR station/area navigation waypoint or an ADF station depending on the position of the front panel switches associated with the pointer.

3.2 NORMAL OPERATION

The KNI 582 RMI repeats magnetic heading information from a directional gyro system. Aircraft heading is read under the lubber line of the KNI 582.

When an ADF receiver is tuned to a station and the appropriate pointer placed in the ADF mode, the arrow of the pointer indicates the magnetic heading to the ADF station. Thus, if the pilot desires to fly toward the station, he merely turns his aircraft to the magnetic heading indicated by the pointer.

When a VOR receiver is tuned to a VOR station and the appropriate pointer placed in the VOR mode, the arrow of the pointer indicates the magnetic heading to the VOR station. If the KNI 582 is used in an area navigation system, the VOR pointer indicates magnetic heading to the waypoint. Should a localizer frequency be selected or the VOR receiver indicates a flagged condition, the VOR pointer is parked 90° to the right of the lubber line.

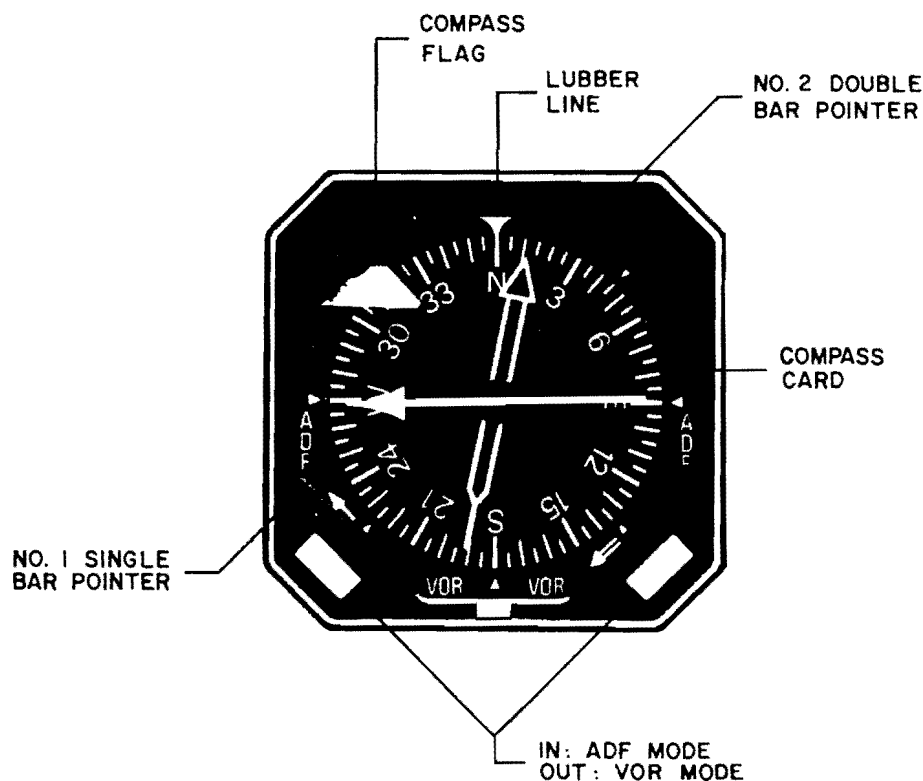


FIGURE 3-1 KNI 582 CONTROL FUNCTIONS

KING
KNR 634/KNR 634A/KFS 564/KFS 564A
NAV/ILS/MARKER BEACON RECEIVER SYSTEM

SECTION III
OPERATION

3.1 KFS 564 OPERATION

Rotate the VOL control clockwise from the OFF position to turn the system on. Clockwise rotation beyond the OFF position will increase the NAV audio volume. Counterclockwise rotation will decrease the audio volume.

Frequency selection is accomplished with the INC/DEC knobs. Clockwise rotation will increment the frequency and counterclockwise rotation will decrement the frequency. The larger knob will change the MHz portion of the display. At one band edge (108 or 117MHz) the next 1MHz step will cause the display to wrap around to the opposite band edge. The smaller knob will change the KHz portion of the display and will wrap around at the band edges (00 and 95) in the same manner.

With the smaller INC/DEC knob pushed in, frequency selection is accomplished by entering a frequency into the Standby display and then transferring that frequency into the Active window by pressing the Transfer button. Frequency selection may be accomplished directly in the Active window by pulling the smaller INC/DEC knob out, waiting until the Standby display shows dashes (---), and then entering the desired frequency. The receiver will remain tuned to the frequency displayed in the Active window at all times.

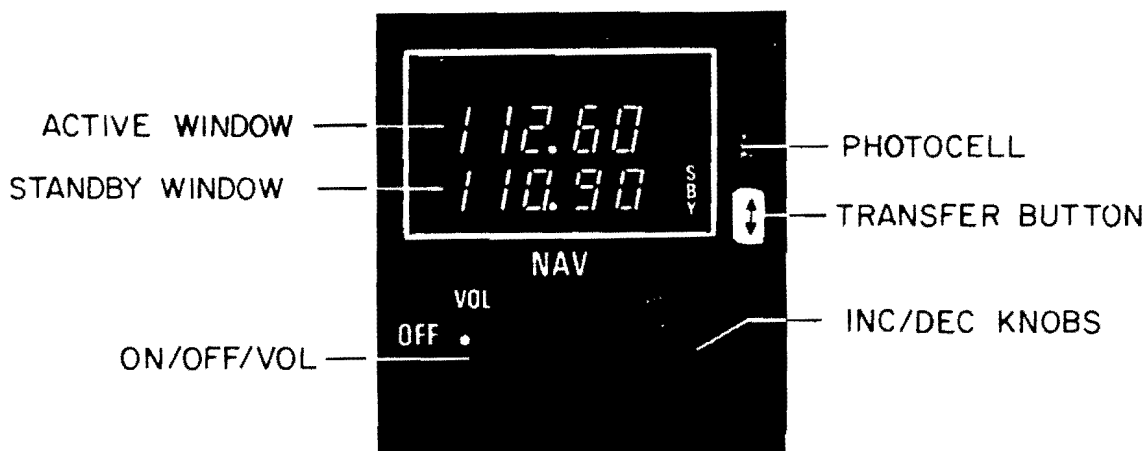


FIGURE 3-1 KFS 564 CONTROL FUNCTIONS

KING
KNR 634/KNR 634A/KFS 564/KFS 564A
NAV/ILS/MARKER BEACON RECEIVER SYSTEM

3.2 KFS 564A OPERATION

3.2.1 ON/OFF AND VOL CONTROL

Rotate the VOL control clockwise from the OFF position to turn the system on. Clockwise rotation beyond the OFF position will increase the NAV audio volume. Counterclockwise rotation will decrease the audio volume.

3.2.2 FREQUENCY MODE

3.2.2.1 Standby Entry

Frequency selection is accomplished in the Standby Entry mode by changing the frequency displayed in the Standby window of the display with the INC/DEC knobs, and then transferring the selected frequency into the Active window by pressing the Transfer button. The larger INC/DEC knob will increment or decrement the MHz portion of the display in 1MHz steps with rollover at each band edge (108 or 117MHz). The smaller INC/DEC knob will increment or decrement the KHz portion of the display in 50KHz steps. Rollover to the opposite band edge occurs at 00 or 95. While in the Standby Entry mode, the receiver remains tuned to the frequency displayed in the Active window at all times.

3.2.2.2 Active Entry

The Active Entry mode is entered from the Standby Entry mode by pressing and holding the Transfer button for more than 2 seconds. The frequency displayed in the Active window may then be changed with the INC/DEC knobs in the same manner as described above. The receiver will be tuned to the frequency displayed in the Active window at all times.

Momentarily pressing the Transfer button will return the control unit to the Standby Entry mode. The Standby frequency displayed prior to entering the Active Entry mode remains unchanged.

3.2.3 CIVIL OPERATION (J5642-7 OPEN)

3.2.3.1 Channel Mode

Momentarily pressing the CHAN button while in the Frequency mode will place the unit in the Channel mode. The receiver will remain tuned to the last Active frequency displayed before entering the Channel mode. The last Channel number used will be displayed, unless no channels have been programmed, in which case the unit defaults to Channel 1 and dashes are displayed in the Standby window.

Turning either INC/DEC knob will increment or decrement the Channel number. The unit will only increment or decrement to channels that have been programmed. The frequency associated with each Channel number will be displayed in the Standby window. If there is no knob activity for 5 seconds the unit will return to the Frequency mode and the Channel frequency will be displayed in the Standby window. Pressing the CHAN button will return the unit to the Frequency mode and the status of the Frequency mode prior to entering the Channel mode will remain the same.

When in the Channel mode, pressing the Transfer button will return the unit to the Frequency mode. The Channel frequency will become the new Active frequency and the last frequency used will be the new Standby frequency. If the unit was in the Active Entry mode prior to entering the Channel mode, pressing the Transfer button or allowing the unit to time out will bring the unit back to the Standby Entry mode.

3.2.3.2 Program Mode

The Program mode is entered by pressing and holding the CHAN button for more than 2 seconds. The receiver remains tuned to the last Active frequency displayed before entering the Program mode and the last Channel number used will be displayed. The Channel number will be flashing and may be changed with the INC/DEC knobs. Pressing the Transfer button will cause the Channel number to stop flashing and cause the frequency to flash (unless the channel is Program Secured). The frequency may then be changed with the INC/DEC knobs in the same manner as described above with the exception that the first step past any band edge will cause dashes to be displayed. Any Channel with dashes displayed will be unprogrammed. Pressing the Transfer button will cause the frequency displayed to stop flashing and the Channel number will flash.

The unit will revert to the Frequency mode if no knob activity takes place for 20 seconds. The unit may also be returned to the Frequency mode from the Program mode by momentarily pressing the CHAN button. On re-entering the Frequency mode the Active and Standby frequencies displayed will be the last frequencies displayed prior to entering the Program mode.

KING
KNR 634/KNR 634A/KFS 564/KFS 564A
NAV/ILS/MARKER BEACON RECEIVER SYSTEM

3.2.4 MILITARY OPERATION (J5642-7 GROUNDED)

3.2.4.1 Channel Mode

Momentarily pressing the CHAN button while in the Frequency mode places the unit in the Channel mode. The last channel used will be the Channel number displayed. The receiver will be tuned to the frequency displayed in the Standby window. If no channels are programmed into the unit, the unit will display "CH 1" and dashes in the Standby display for 5 seconds and will tune the receiver to the last Active frequency. The unit will only channel to channel numbers with a frequency programmed into them.

NOTE

Channel mode does not time out as in civil operation.

Momentarily pressing the CHAN button will return the unit to the Frequency mode and the status will remain as it was prior to entering the Channel mode. Holding the Transfer button depressed for more than 2 seconds while in the Channel mode will cause the unit to enter the Active Tune mode.

3.2.4.2 Program Mode

Pressing and holding the CHAN button for longer than 2 seconds will cause the unit to enter the Program mode. The last channel in use will be displayed and will be flashing. The receiver will be tuned to the last Active frequency. While flashing, the Channel number may be changed with the INC/DEC switches. Pressing the Transfer button will cause the Channel number to stop flashing and the frequency in the Standby window will flash. The frequency may then be changed with the INC/DEC knobs in the manner described above. The first step past either band edge will cause dashes to be displayed in the Standby window. Any Channel with dashes entered will be unprogrammed. An unprogrammed Channel will display dashes in the Standby window when recalled, in which case the receiver will be tuned to the last valid Active frequency.

Pressing the CHAN button will return the unit to the mode in use prior to entering the Program mode. The receiver will be tuned to the frequency displayed in the Active window if it returns to the Frequency mode or will be tuned to the frequency displayed in the Standby window if it returns to the Channel mode.

3.2.5 DEFAULT MODE

Turning the unit on while holding the Transfer button down will bring the unit on in the Active Entry mode and display 110.00 as the Active frequency.

3.2.6 REMOTE TRANSFER

Operates identically to the front panel Transfer button with the exception that holding the Remote Transfer button for 2 seconds does not cause the unit to enter the Active Entry mode.

3.2.7 REMOTE CHANNEL

Pressing the Remote Channel button will cause the system to enter the Channel mode of operation and will increment the channel from the previous channel number used.

KING
KNR 634/KNR 634A/KFS 564/KFS 564A
NAV/ILS/MARKER BEACON RECEIVER SYSTEM

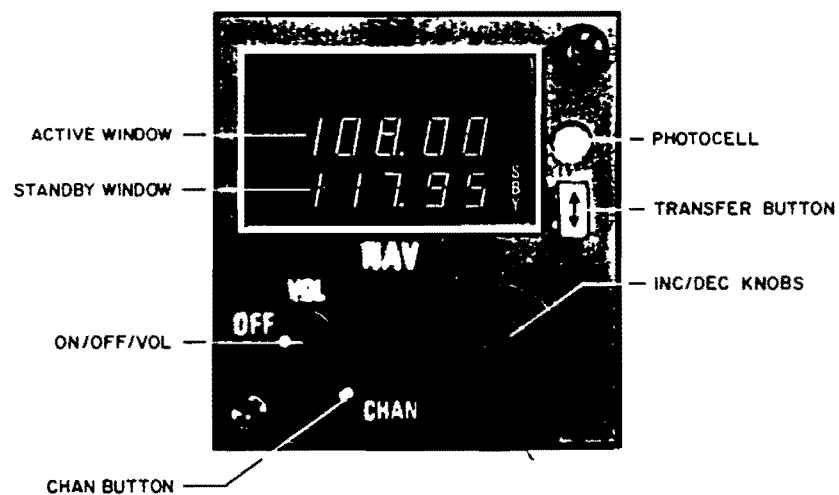


FIGURE 3-2 KFS 564A CONTROL FUNCTIONS

KING
KNR 634/KNR 634A/KFS 564/KFS 564A
NAV/ILS/MARKER BEACON RECEIVER SYSTEM

3.3 NAVIGATION INDICATOR

3.3.1 OMNI-BEARING SELECTOR (OBS)

The omni-bearing selector is used to select the desired course. The VOR radial selected serves as a reference for all VOR indications.

3.3.2 VOR/LOC DEVIATION INDICATOR

The VOR/LOC deviation needle indicates the direction and amount of deviation from the selected VOR radial or localizer path.

3.3.3 GLIDESLOPE DEVIATION INDICATOR

The Glideslope deviation needle indicates the direction and amount of deviation from the glidepath.

3.3.4 TO/FROM INDICATOR

The TO/FROM flag indicates whether the direction to the VOR station is within the semicircle centered about the direction selected on the omni-bearing selector or within the semicircle centered about the reciprocal of the selected course. If the station direction is with 90 degrees of the selected course radial, the FROM flag will be visible.

3.3.5 VOR/LOC WARNING FLAG

The VOR/LOC warning flag is fully visible when the VOR or LOC signals are unreliable or when a malfunction has occurred in the NAV receiver. The flag is out of view when the signal is reliable and the system is operating properly.

3.3.6 GLIDESLOPE WARNING FLAG

The Glideslope warning flag is fully visible when the glideslope signal is unreliable or when a malfunction has occurred in the glideslope receiver. The flag is out of view when the signal is reliable and the glideslope receiver is functioning properly.

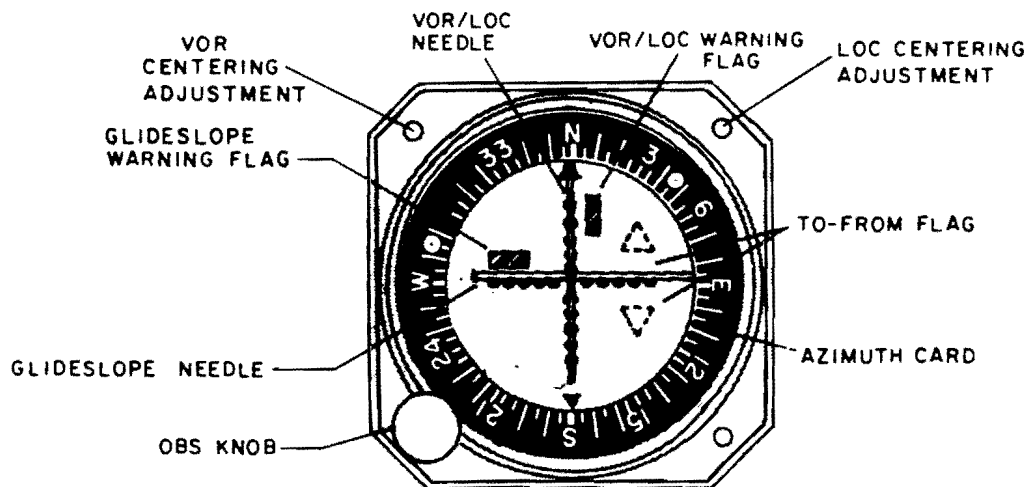


FIGURE 3-3 NAVIGATION INDICATOR

3.4 RADIO MAGNETIC INDICATOR (RMI)

The VOR needle on the RMI continuously indicates the magnetic heading to the station referenced to the RMI compass card.

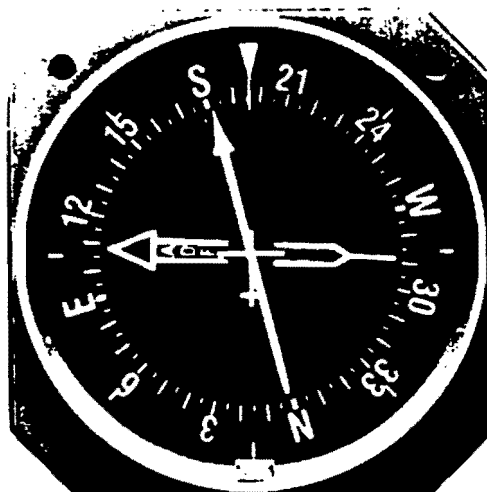


FIGURE 3-4 RADIO MAGNETIC INDICATOR (RMI)

KING
KDF 806/KFS 586/KFS 586A
AUTOMATIC DIRECTION FINDER

SECTION III OPERATION

3.1 OPERATING PROCEDURE

It is recommended that the KDF 806 unit be turned off when the aircraft engine is started in order to prevent possible voltage transient damage to the radio. The unit is turned off by placing the function switch in the OFF position. The KFS 586A turns the unit off by rotating the ON/OFF/VOL knob fully counterclockwise. The volume control adjusts the audio output for a comfortable listening level.

NOTE

IN THE ADF MODE, THE AUDIO MUTING FEATURE OF THE KDF 806 CAUSES THE AUDIO OUTPUT TO BE MUTED UNLESS THE RECEIVER IS LOCKED ONTO A VALID STATION. THIS REDUCES INTERSTATION NOISE AND AIDS THE PILOT IN IDENTIFYING NAVIGABLE STATIONS.

3.1.1 KFS 586 OPERATION

The KDF 806 Automatic Direction Finder has two operational modes. With the mode switch in the ADF position, the unit is placed into the ADF mode and the loop antenna is enabled. The indicator needle will point to the relative bearing of the selected station. To tell if there is a sufficient signal for navigational purposes, the pilot can place the KDF 806 back into the ANT mode, parking the indicator needle at 90°. When the unit is then switched to the ADF mode, the needle should slew to the station bearing in a positive manner, without excessive sluggishness, wavering, or reversals.

In the ANT mode, the loop antenna is disabled and the unit acts as a receiver, allowing audio reception through the speaker or headphones. The indicator needle remains parked at the 90° relative position. This mode provides slightly clearer audio reception, and is used for station identification. In various parts of the world, some stations use an interrupted carrier for identification purposes. A Beat Frequency Oscillator (BFO) function is provided to permit these stations to be more easily identified. Placing the function switch in either of the BFO positions causes a 1000Hz tone to be heard whenever there is a radio carrier signal present at the selected frequency.

3.1.2 FREQUENCY CONTROL

A. Standby Entry

The Standby frequency is read on the bottom of the display. It may be tuned by turning the frequency selector control. Standby frequency tuning does not affect the Active frequency. Depressing the Transfer button causes the Standby frequency to appear in the Active, or upper frequency location. To tune Standby frequency:

1. Tune frequency of station desired.
2. Push Transfer button

This method permits the pilot to tune to the desired frequency without the accompanying noise of tuning through other stations.

B. Active Entry

The Active frequency is read on the top of the display. Holding the transfer button depressed for approximately 2 seconds causes the Standby frequency display to go out. The Active frequency may now be controlled directly by the frequency selector control. In this tuning mode, the station audio is present, permitting the operator to hunt for a station by listening to the audio while tuning. The large outer knob of the frequency selector control selects the 100's KHz from 1 to 17, with roll over from 17 to 1, and roll under from 1 to 17. The small inner knob selects 10's KHz when pushed in and 1's KHz when pulled out. The 10's KHz and 1's KHz rolls over from 9 to 0 and rolls under from 0 to 9.

C. Display Flash

Any time the frequency displayed is below 190, the display flashes.

KING
KDF 806/KFS 586/KFS 586A
AUTOMATIC DIRECTION FINDER

D. X Character

The small X to the right of the top frequency turns off in the ADF and ADF/BFO modes only when the ADF is pointing.



FIGURE 3-1 KFS 586 CONTROL FUNCTIONS

3.1.3 KFS 586A OPERATION

The operating modes of the KDF 806 are controlled by depressing the Mode button of the KFS 586A. A description of the ADF receiver modes is found in Para 3.1.1.

3.1.3.1 Frequency Mode

a. Standby Entry

Two frequencies are displayed; one in the Active display and the other in the Standby display. Select desired frequency in Standby display by rotating the increment/decrement knobs either clockwise or counterclockwise. The larger knob will change the 100KHz portion of the Standby (SBY) display. When changing the frequency past either end of specified frequency range the display will roll over to the other end of the frequency range. The small knob will change KHz portion of the Standby display. It steps in increments of 10KHz when the knob is pushed in and 1KHz when the knob is pulled out.

To tune the ADF receiver to the desired frequency, the desired frequency must first be entered into the Standby display, and then the Transfer button must be pushed for less than 2 seconds. This will trade the frequency of the Active/Chan and Standby display. While in Frequency Mode, the ADF Receiver is always tuned to the frequency in the Active display.

b. Active Entry

The Active Entry mode is entered by pushing the Transfer button for longer than 2 seconds. The increment/decrement knobs operate as in Standby Entry, but as the Active/Chan display changes so does the tuned frequency of the radio.

KING
KDF 806/KFS 586/KFS 586A
AUTOMATIC DIRECTION FINDER

Momentarily pushing the Transfer button returns the control head to Standby Entry. The Standby frequency prior to Active Entry mode remains unchanged.

3.1.4 CIVIL OPERATION

3.1.4.1 Channel Mode

- a. Momentarily pressing the CHAN button while in one of the Frequency modes temporarily puts the unit in Channel mode. The unit remains tuned to the last Active frequency displayed before entering Channel mode. The last used channel number is displayed in the Active/Chan window and the associated frequency in the Standby display (unless no channels have been programmed, in which case the unit defaults to channel 1 and dashes are displayed in the SBY display). Turning either Increment/Decrement knob will change the channel number and its corresponding frequency. The channels will only increment and decrement to channels that have been programmed.

Pressing the CHAN button will return the unit to Frequency mode and the status of Frequency mode prior to entering Channel mode remains the same. If there has been no activity for 5 seconds the unit will return to Frequency mode and the channel frequency remains in the Standby display.

- b. If in Channel mode, pressing the Transfer button will return the unit to Frequency mode. The Channel frequency will become the new Active frequency and the last Active frequency will become the new Standby frequency. If the unit was in Active Entry mode prior to entering Channel mode, pressing Transfer button or allowing the unit to time out will bring it back to Standby Entry.
- c. The On/Off/Volume and Mode control operate as in Frequency Mode.

3.1.4.2 Program Mode

- a. Program mode is selected by pressing and holding the CHAN button for longer than 2 seconds. The unit remains tuned to the last Active frequency displayed before entering Program mode and the last used channel number is displayed when Program mode is entered. The channel number flashes. Either Increment/Decrement knob changes the channel number. Any channel, 1 thru 9, may be programmed. When the channel number is flashing, pressing the Transfer button will cause the channel number to stop flashing and cause the frequency to flash. The Increment/Decrement knobs then work as in Frequency mode. When frequency is flashing, pressing the Transfer button will cause the frequency to stop flashing and the channel number to flash. An unprogrammed channel displays dashes.
- b. In frequency rollover or rollunder, dashes will be displayed before rolling to the highest or lowest frequency respectively. Leaving the dashes in the display unprograms the channel when leaving Program mode.
- c. If no knob activity has occurred for 20 seconds the unit returns to Frequency mode. The unit can also be returned to Frequency mode from Program mode by pressing the CHAN button. Returning to Frequency mode will not change the Active or Standby frequency from what it was prior to entering Program mode.
- d. The On/Off/Volume and Mode controls operate as in Frequency mode.

3.1.4.3 Default Mode

Turning the unit on while holding the Transfer button down will bring the unit on in Active Entry and load 800KHz as the Active frequency.

KING
KDF 806/KFS 586/KFS 586A
AUTOMATIC DIRECTION FINDER

3.1.5 MILITARY OPERATION

3.1.5.1 Channel Mode

- A. Momentarily pressing the CHAN button while in Frequency mode puts the unit in Channel mode. The last channel used is the channel number displayed. The unit tunes the ADF receiver to the frequency in the Standby display provided that it is a valid frequency. Otherwise it will tune the KDF 806 to the last Active frequency. If no channels are programmed the unit will display for 3 seconds; "CH 1" and dashes in the Standby window. Turning either Increment/ Decrement knob changes the channel number and corresponding channel frequency. The unit will only channel to channel numbers with a valid frequency programmed. If the frequency is below 190Khz, the ADF receiver does not operate and the frequency flashes.

Holding Transfer Button for 2 seconds selects Active Entry.

NOTE

CHANNEL MODE DOES NOT TIME OUT AS IN CIVIL OPERATION.

- b. Momentarily pressing the CHAN button will return the unit to frequency mode and the status remains what it was prior to entering Channel mode. The KDF 806 will be tuned to the frequency in the Active display.
- c. The On/Off/Volume and Mode controls operate as in Frequency mode.

3.1.5.2 Program Mode

- a. Pressing and holding the CHAN button for longer than 2 seconds brings the unit into Program mode. The last used channel number is displayed and flashes. The ADF receiver remains tuned to the last Active frequency. When the channel number is flashing, the Increment/ Decrement knobs change the channel number. An unprogrammed channel displays dashes in the Standby window, in which case the receiver tunes the last valid Active frequency.
- b. Pressing the Transfer button causes the channel number to stop flashing and the frequency to flash. The Increment/Decrement knobs then operate as in Frequency mode. Pressing the Transfer button again causes the the Channel number to flash and the frequency to stop flashing.
- c. In frequency rollover or rollunder dashes will be displayed before rolling to the lowest or highest frequency respectively. Leaving the dashes in the display unprograms the channel when leaving Program mode.
- d. The unit returns to the mode and frequency which were in use prior to entering Program mode by momentarily pressing the CHAN button or if no activity has occurred for 20 seconds. The ADF receiver will be tuned to the frequency in the Active/Chan display if the prior mode was Frequency mode or the frequency in the Standby window if the prior mode was Channel mode.
- e. The On/Off/Volume and Mode controls operate as in Frequency mode.

3.1.5.3 Default Mode

Turning the unit on while holding the Transfer button down will bring the unit on in Active Entry and load 800KHz as the Active frequency.

3.1.6 X Character

The small x to the left of the Active/Chan display turns off in the ADF and ADF/BFO modes only when the ADF is pointing.

KING
KDF 806/KFS 586/KFS 586A
AUTOMATIC DIRECTION FINDER

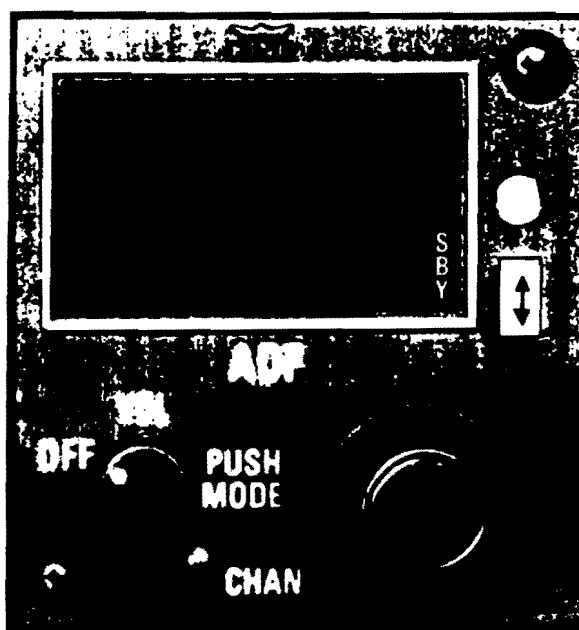


FIGURE 3-2 KFS 586A CONTROL FUNCTIONS

KING
KFS 594
CONTROL UNIT

SECTION III OPERATION

3.1 GENERAL

The KFS 594 functions are as follows:

ON/OFF/Volume Control-

The smaller left most knob controls the ON/OFF switch and the Volume of the received audio. Clockwise motion of the switch increases volume and turns the unit on.

Squelch-

The large left most knob selects the threshold of the received signal above which the audio shall be enabled. Turn the knob clockwise to reduce this threshold.

Mode-

The larger right most knob controls the emission modes of the radio. When LSB, USB or AM is selected, the radio is set to the corresponding mode, and the control head displays a directly selectable frequency on one of nineteen user programmable channels. When A3J is selected, the radio goes to the corresponding mode, and the control head displays an ITU channel.

Cursor/INC/DEC-

When pushed in the smaller right most knob moves the cursor (a flashing digit) from left to right, and when rotated, serves to increment or decrement the digit selected by the cursor.

STO-

The STO button performs three functions. First, when in the channel mode and not in program mode (program mode is annunciated by a flashing dash in the space adjacent to the channel number), pressing STO causes the head to display the letters "TX" and the transmit frequency, while the receiver monitors the transmit frequency. This allows the user to listen for signals on the transmit frequency of a duplex channel. Second, if STO is pushed while the microphone is keyed, a 1000Hz tone will be transmitted. This is used to break the squelch of some stations. Third, pressing the STO while in program mode enters the selected frequency into the channel to be programmed.

3.2 PROGRAMMING

The nineteen user channels are programmed as follows:

1. Select the channel to be programmed.
2. Step the cursor to the frequency digits, and change them to the desired receiver frequency. Changing the displayed frequency of a programmable channel will automatically place the control head in program mode, as shown by the flashing dash adjacent to the channel number.
3. Press STO. When the radio accepts the program of the receive frequency, the flashing "TX" letters will appear in the upper right of the display and the cursor will move to the 10/1MHz digits.
4. Change the displayed frequency to the desired transmit frequency.
5. Press STO. When the transmit frequency is accepted, the letters "TX" will disappear as will the cursor.

KING
KFS 594
CONTROL UNIT

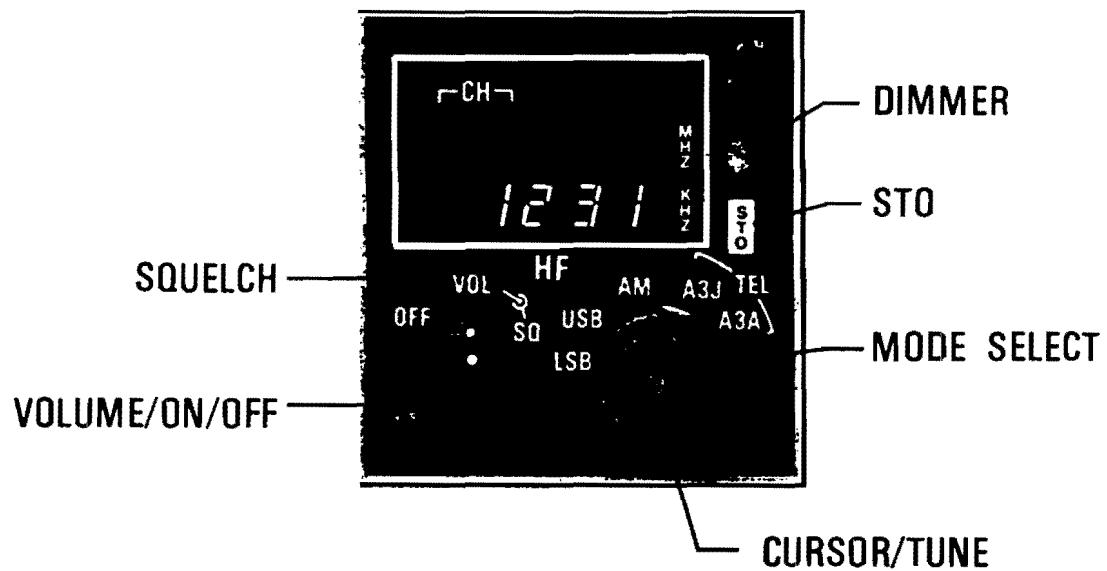


FIGURE 3-1 CONTROL FUNCTIONS

KING
KXP 756/KFS 576/A
TRANSPONDER

SECTION III OPERATION

3.1 SYSTEM OPERATION

An aircraft equipped with a KXP 756 Transponder may be located in range and azimuth by a ground ATCRBS radar site. The transponder upon receiving Mode A, Mode B or Mode C interrogations, transmits coded returns that identify the aircraft by code number and/or report the altitude at which the aircraft is operating when an altimeter encoder is included as part of the system.

KXP 756 Transponder operation with the KFS 576/576A Control Unit (See Figure 3-1 for KFS 576/576A Control Unit functions).

CAUTION

AS WITH ALL AVIONICS THE TRANSPONDER SHOULD BE TURNED OFF WHILE STARTING AIRCRAFT ENGINE(S).

The KFS 576/576A Control Unit, supplies serial data and control signals for the KXP 756 Transponder. An optional feature allows the use of dual KXP 756 Transponders individually selected by one KFS 576/576A Control Unit. The KFS 576A is equipped with a King Radio 429 serial data bus and can be integrated into a frequency management system. The KFS 576A may also be used in the tandem mode (two units controlling one R/T with each control unit displaying the same readout).

The selected transponder is turned on by rotating the Function Selector knob of a KFS 576 from the OFF position to the SBY position or in the case of a KFS 576A, turning the OFF switch clockwise to the ON position. The KFS 576A will always be in the standby mode when it is initially turned on. The selected code may then be entered as follows: Momentarily pressing the Code Selector knob steps the cursor (located under the first digit of the displayed code) to the right one digit at a time. Rotating the knob CW or CCW changes the numerical value of the selected digit as desired. Holding the code selector knob pressed in for approximately 3 seconds causes the code to automatically change to 1200. The selected code should be in accordance with the instructions for IFR flight or rules applicable to transponder utilization for VFR flight. On Mod 1 KFS 576 units and all KFS 576A's, the VFR code can be programmed to be any code (usually 1200) by the following technique.

- A. Place the function selector to STBY.
- B. Select the VFR code as required.
- C. Push the IDT and the CURSOR buttons simultaneously. The new code is now programmed into memory and will appear whenever the cursor is pushed and held for approximately 3 seconds.

To eliminate the possibility of dialing through restricted reply codes, the transmitted reply does not change for a few seconds after the new code is selected completely.

CAUTION

NEVER ACTIVATE THE TRANSPONDER WITH CODES 0000, 7500, 7600, 7700 SELECTED ON THE CONTROL UNIT. CODE 7700 IS SELECTED FOR EMERGENCIES, 7600 FOR RADIO FAILURE, AND 7500 FOR HIJACK. CODE 0000 IS RESERVED.

The KXP 756 incorporates a solid state transmitter, no warm up time is required. Therefore, any time that the Function Selector knob is in the ON or ALT position, the transponder becomes an active part of the beacon system. It is undesirable from the Air Traffic Control system viewpoint to be operating out of standby while on the ground except during the self-test mode.

The function mode as determined by the position of the Function Selector knob will be displayed in the lower section of the display area. The reply indicator is an R located in the upper left of the display area and during normal transponder operation the R will be visible as an indication of a transmitted reply. An interrogation will normally be processed with each sweep of search radar which will normally be 10-15 second intervals. The R may light within the interval from a second or third interrogator.

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KXP 756/KFS 576/A
TRANSPONDER

The Ident Button when depressed momentarily, and then released, holds the IDENT reply for approximately 25 seconds to assure the proper reply within at least one radar sweep. During which time the IDT (ident) nomenclature will be displayed. The IDENT feature is used at the request of the traffic controller. An external ident feature provides for a remote mounted push button switch to also activate the Ident reply.

When the Function Selector knob is in the ON position, the transponder replies to both Mode A and Mode C interrogations but without flight level information. With the Function Selector knob in the ALT position, the transponder automatically selects the proper reply to either a Mode A or Mode C interrogation transmitting flight level information if an altitude encoder is a part of the installation. An optional switch permits the transponder to reply Mode B interrogations which are used in place of Mode A interrogations in some areas outside of the U.S.

An automatic dimming function adjusts the brightness of the displayed data and nomenclature to compensate for changes in the ambient light level. A provision is made in the KFS 576A to cause the display to respond with maximum brilliance if needed, by an external switch.

The test position of the Function Selector knob provides for a preflight or airborne check of transponder operation. This check will be independent of any ground interrogation. Switching the Function Selector knob to the Test position should cause the R (reply indicator) to flash or illuminate continuously. If an altitude encoder is a part of the installation, the flight level input to the transponder and the letters FL will also be displayed. The flight level readout is displayed in 100 foot increments, thus a readout of 005 indicates 500 feet, or a readout of 042 indicates a flight level of 4200 feet. If an encoder is not included in the installation, a reading of -002 hundred feet will be displayed, unless the control unit is a KFS 576 Mod 1 or a KFS 576A then dashes will appear. The transmitter is inhibited during the test function. The TST position provides a momentary test function in the KFS 576A and after 3 seconds the unit will revert to the "ALT" mode.

In a dual system with KFS 576 Mod 1 or KFS 576A control unit, the external standby function may be used. If the system is configured in this manner, the active transponder will function as normal. The inactive (external standby) transponder will not transmit regardless of the position of the function switch. In any functioning mode except test, display will show the reply code of the standby unit. The letters SBY will indicate that the unit is in standby mode. The unit that is in external standby will show the flight level when the function switch is placed in the test position and the letters FL will illuminate. The KFS 576A provides only two modes with the function switch, clockwise for flight level information and counterclockwise for the standby aircraft identification code. Note, the flight level readout is not corrected for atmospheric pressure changes.

A maintenance check of the transponder system and/or altitude encoder should be performed if the system fails the self-test function.

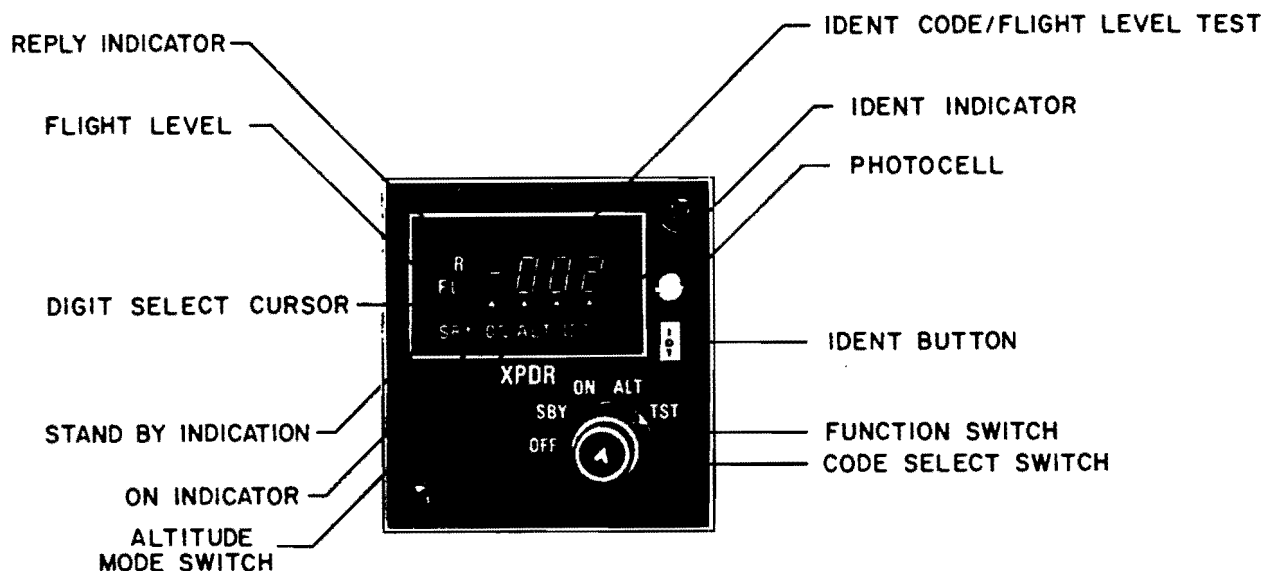


FIGURE 3-1 KFS 576 CONTROL UNIT

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KXP 756/KFS 576/A
TRANSPONDER

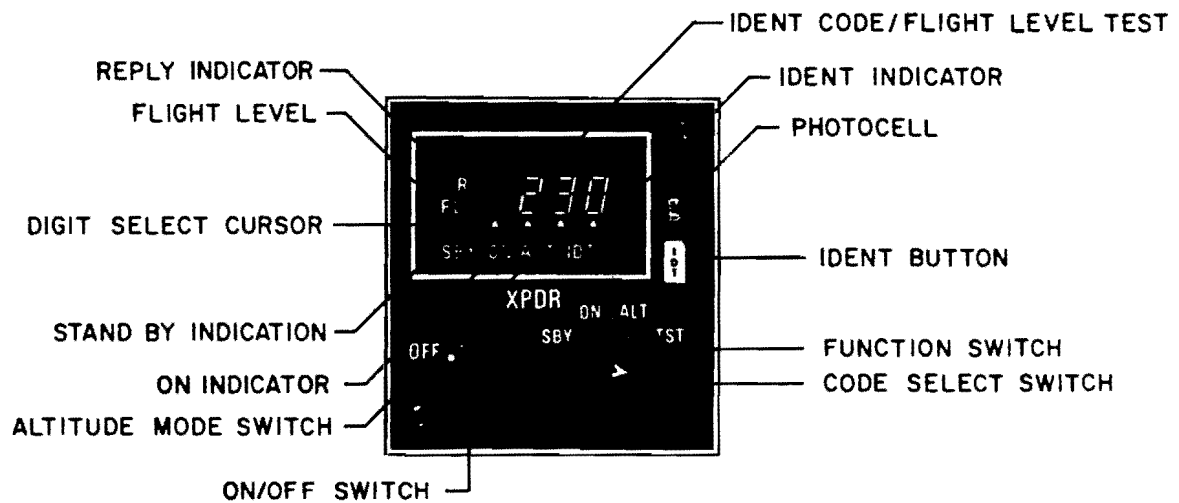


FIGURE 3-2 KFS 576A CONTROL UNIT

SECTION III OPERATION

3.1 SYSTEM OPERATION

The KTU 709 TACAN system is a polar coordinate UHF navigation system that provides relative bearing and slant-range distance information with respect to a selected TACAN or VORTAC ground station. The effective range of the TACAN is limited to the line-of-sight. Actual operating range depends on the altitude of the aircraft, weather, type of terrain, location and altitude of the ground transmitter and transmitter power. Usually line-of-sight limitations will prevent an aircraft on the ground from receiving and locking on to a TACAN or VORTAC ground station. Typical operating distance versus altitude is shown in Table 3-1.

The range measurement portion of the KTU 709 TACAN system electronically converts elapsed time-to-distance by measuring the length of time between the transmission of a radio signal to a pre-selected TACAN or VORTAC station and reception of the reply signal. This distance is then indicated in nautical miles on the range/groundspeed/time-to-station indicator. The distance is measured on a slant from the aircraft to the ground and is commonly referred to as slant-range distance. Slant-range distance should not be confused with actual ground distance. The difference between slant-range distance and ground distance is smallest at a low altitude and long range. These distances may differ considerably when in close proximity to a TACAN or VORTAC ground station. However, if the range is three times the altitude or greater, the error is negligible. To obtain accurate ground speed and time-to-station, the aircraft must be on a direct course to or from a TACAN or VORTAC ground station.

NOTE

It is recommended that the power to the KTU 709 TACAN system be turned on only after engine start-up as this procedure increases the reliability of the solid state circuitry.

The KDI 572/573/574 indicators (See Figures 3-1 and 3-2) display range to the nearest .1 nautical mile from 0 to 99.9 nautical miles and to the nearest 1 nautical mile from 100 to 389 nautical miles. Groundspeed is displayed to the nearest knot from 0 to 999 knots. Time-to-station is displayed to the nearest minute from 0 to 99 minutes, the display also will indicate 99 minutes for any computed time-to-station greater than 99 minutes. The indicators will display "RNV" when the displayed range, groundspeed and time-to-station are derived from an area navigation system. The indicators will display "dashes" while in search or if power is turned on or momentarily interrupted while in the frequency Hold mode, indicating loss of the DME holding frequency. Normal operation is re-established by placing the KDI 572/574 function switch in the N1 (NAV 1) or N2 (NAV 2) position. A "1" (one) is displayed when N1 or a "2" (two) is displayed when N2 has been selected as the channeling source. In the Hold mode either a "1H" or "H2" is displayed to indicate the channeling source being held.

The KDI 573 Slave Indicator provides a display identical to the display on the KDI 572/574 Master Indicator. An automatic dimming function is designed into both indicators to adjust the brightness of the display to compensate for changes in the ambient light level.

The KDI 572 Master Indicator function selector switch serves as the Power ON-OFF control for the system as well as selecting the TACAN channeling source N1 (NAV 1), Hold (NAV 1 or NAV 2) and N2 (NAV 2). The KDI 574 requires a external panel mounted switch to provide ON-OFF and NAV 1, HOLD, NAV 2 Switching.

In hold (H1 or H2) The KDI 572/574 will uncouple the frequency selector control from the TACAN and allow a new navigation frequency to be selected without channeling the KTU 709, until the N1 (NAV 1) or N2 (NAV 2) function is again selected on the KDI 572/574. This feature may be used to advantage during an approach where both NAV receivers are tuned to the ILS frequency. If there is no corresponding DME channel on the ILS frequency, the TACAN may be channelled to a nearby VORTAC station before the approach is begun and then placed in Hold position where it will remain giving useful distance information up to the time of loss of signal.

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TACAN UNIT

The KTU 709 TACAN will not output TACAN bearing composite when its designated tuning source (either NAV 1 or NAV 2) is deselected or when a frequency HOLD is attempted (either NAV 1 or NAV 2). This feature provides better pilot management of the TACAN derived steering signal when dual tuning sources (and dual HOLD sources) exist.

A typical installation may have the TACAN tuning source designated as the NAV 1 control head whereby the pilot associates this tuning source with the number one navigational display system. Pilot selection of NAV 2 to tune the TACAN will now remove the TACAN derived steering information from the number one NAV display. This action allows only the steering information obtained from the number one tuning source to be displayed on the number one NAV display. Pilot selection of NAV 1 HOLD will also remove the steering information from the NAV 1 steering display. This action prevents the operator from associating a retuned-during-HOLD frequency on the NAV 1 tuning head with the tune-before-HOLD steering information displayed had that steering information been presented.

The TACAN may use channels that are paired with VOR/LOC channels. Tuning the desired VOR/LOC frequency on the NAV frequency selector automatically pairs the proper TACAN channel. Table 3-2 shows VOR frequency to TACAN channel and frequency conversion. In certain installations, a separate TACAN control head is installed. It selects the TACAN or VORTAC channel enabling the unit to function separately from the aircraft's NAV system. The number of channels is limited to 200 if tuning is accomplished using a NAV control head. A TACAN control head will tune all 252 channels. This unit selects TACAN channels 1 thru 126, X or Y. To tune a VORTAC station, one must know the channel number of the corresponding VOR frequency. Refer to Table 3-2.

Information on TACAN and VORTAC ground stations may be found in the current aeronautical chart.

Bearing information may be displayed on the KI 203 or KI 229 indicator. The KTU 709 provides a TACAN derived composite output which can directly drive most VOR indicators. Because it operates at microwave frequencies, the KTU 709's TACAN bearing signal is less subject to erratic behavior such as VOR "scallopings". It is also less affected by helicopter rotor modulation and is less prone to reflected signal distortions than VOR.

The KTU 709 provides echo monitoring and protection. It also features self-test modes for both bearing and range. Self-test modes may be used to checkout the system prior to installation or as an in-flight test to verify the system is functioning properly. The KTU 709 TACAN system provides an audio capability allowing the pilot to identify the TACAN or VORTAC ground station by listening to the ID tones transmitted by the ground station at 30-second intervals.

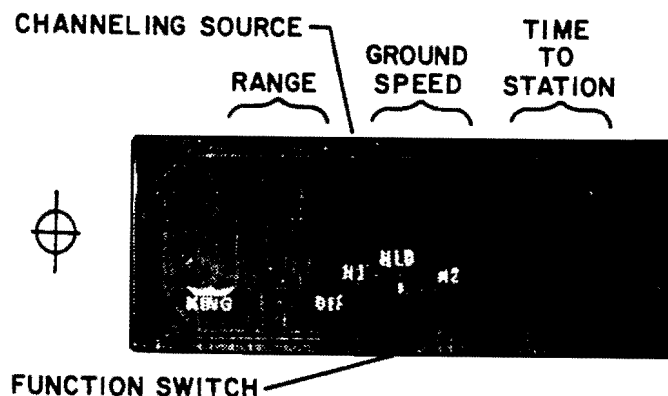


FIGURE 3-1 KDI 572 INDICATOR

KING
KTU 709/KFS 579A
TACAN UNIT

3.2 OPERATING PROCEDURES FOR THE KFS 579A TACAN CONTROL UNIT

See Figure 3-3.

Rotate the "VOL" control knob clockwise from the "OFF" position. The display will light.

3.2.1 DISPLAY MODES

3.2.1.1 Standby Entry

Two Tacan channels are displayed; one in the Active display and the other in the Standby display. Select desired channel in standby display by rotating the tuning knobs either clockwise or counterclockwise. The larger knob will change the 10's and 100's digits of the standby display. When changing display past either end of specified frequency range the display will roll over to the other end of the frequency range. The small knob will change the unit's digit of the standby display. It also selects X or Y channel; with knob out, X & Y channels are present and with knob in X or Y channels are present. Depending on which was displayed prior to pushing the small knob in.

Channels 0 and 127 thru 129 X or Y are displayed but are not valid Tacan channels and will flash to indicate their invalidity. The Tacan receiver will tune to the invalid frequency.

To tune the receiver to the desired channel the desired channel must first be entered into the Standby display, and then the Transfer button must be pushed for less than 2 seconds. This will trade the channel of the Active and Standby window. The Tacan receiver is always tuned to the channel in the Active window.

3.2.1.2 Active Entry

The Active Entry mode is entered by pushing the Transfer button for longer than 2 seconds. The tuning knobs operate as in Standby Entry, but as the active channel display changes so does the tuned frequency of the Tacan receiver. The standby entry will be blanked.

Momentarily pushing the Transfer button causes the standby entry to reappear and the Standby channel prior to Active Entry mode remains unchanged.

3.2.2 REMOTE TRANSFER (OPTIONAL REMOTE INSTALLATION) (J5791-P1)

Operates identically as front panel Transfer button. Grounding indicated pin actuates transfer, however, holding the pin at ground for more than 2 seconds will not change the mode of the unit to Active Entry.

3.2.3 CONTROL DISABLE (J5791-P8)

By grounding Pin 8, the front panel and remote controls are made nonfunctional. The transceiver is tuned to the frequency in use prior to disabling.

3.3 OPERATING PROCEDURES FOR THE KFS 579A NAV/TACAN CONTROL UNIT

Rotate the "VOL" control knob clockwise from the "OFF" position. The display will light.

3.3.1 DISPLAY MODES

3.3.1.1 Standby Entry

Two TACAN channels, two NAV frequencies, or a mixed combination of NAV frequency and TACAN channel are displayed; one in the Active display and the other in the Standby display. The mode of the standby display is changed from TACAN channel to the NAV frequency or NAV frequency to TACAN channel by momentarily depressing the MODE button. Select the desired TACAN channel or NAV frequency in the Standby display by rotating the tuning knobs either clockwise or counterclockwise. The larger knob will change the 10's and 100's digits to a TACAN channel or the MHz digit of a NAV frequency if that mode is selected. When changing the display past the end of the frequency range (0 to 129 X or Y or 108.XX to 117.XX) the display will rollover to the other end of the frequency range. The small knob will change the units digit for TACAN channels of increments or decrement in increments of 50KHz for NAV frequencies. Rollovers exist for the small knob between 0 and 9 X or Y for TACAN channels and 0 and .95MHz for NAV frequencies. The small knob also selects X or Y channels; with knob out, X & Y channels are selected and with the knob in X or Y channels are selected depending on which was displayed prior to pushing the small knob in. The KHz tuning in NAV mode is not affected by the "PULL Y" option.

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KTU 709/KFS 579A
TACAN UNIT

To tune the receiver to the desired channel or frequency, the desired channel or frequency must first be entered into the Standby display, and then the Transfer button must be pushed for less than 2 seconds. This will exchange the Active and Standby displays. When the displays are mixed combination of NAV frequency and TACAN channel, the act of transferring a NAV frequency to the Active display will open a line on the KNR 634 allowing bearing information to come from the NAV Receiver. The act of transferring a TACAN channel to the Active display will ground the same line on the KNR 634 allowing bearing information to come from the KTU 709.

3.3.1.2 Active Entry

The Active Entry mode is entered by pushing the Transfer button for longer than 2 seconds. The increment/decrement knobs operated as in Standby Entry, however, the Standby display is blanked out and only the Active display as well as the remote unit is changed by the increment/decrement knobs.

Momentarily pushing the Transfer button returns the control unit to Standby Entry mode. The Standby frequency or TACAN channel prior to Active Entry mode remains unchanged.

3.3.1.3 REMOTE TRANSFER (OPTIONAL REMOTE INSTALLATION) (J5791-P1)

Grounding the Remote Transfer line on the rear connector will exchange the Active and Standby displays, however, holding the pin at ground for more than 2 seconds will not change the mode of the control unit to Active Entry.

3.3.1.4 CONTROL DISABLE (J5792-P8)

By grounding pin 8, the front panel and remote controls are made inoperative.

3.3.1.5 DEFAULT MODE

Depressing the Transfer button or grounding Remote Transfer while turning the control unit on will put the unit in Active Entry mode with a frequency of 110.00MHz or a TACAN channel of 37X. Momentarily depressing the Transfer button will change the mode of the control unit to Standby Entry with 110.00MHz or 37X depending on the mode of the Standby display.

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KTU 709/KFS 579A
TACAN UNIT

CHANNELING SOURCE
RANGE GROUND SPEED TIME
TO STATION

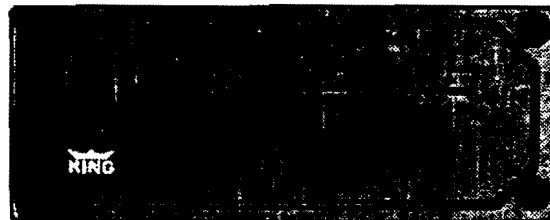


FIGURE 3-2 KDI 573/574 INDICATORS

KING
KTU 709/KFS 579A
TACAN UNIT

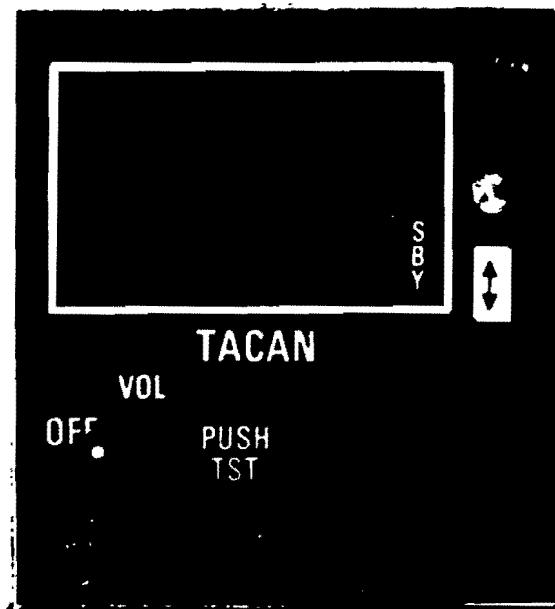


FIGURE 3-3 TACAN CONTROL UNIT

KING
KTU 709/KFS 579A
TACAN UNIT

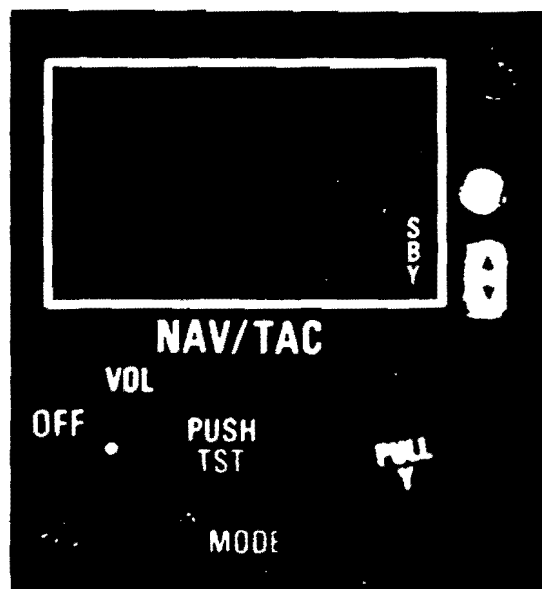


FIGURE 3-4 NAV/TACAN CONTROL UNIT

KING
KTU 709/KFS 579A
TACAN UNIT

<u>AGL ALTITUDE (feet)</u>	<u>LINE OF SIGHT RANGE (nautical miles)</u>
1000	39
2000	55
3000	67
4000	78
5000	87
6000	95
7000	103
8000	110
9000	117
10,000	123
15,000	151
20,000	174
25,000	195
30,000	213
35,000	230
40,000	246
45,000	261
50,000	275
60,000	301
70,000	325
80,000	348
90,000	369
100,000	389

TABLE 3-1 TYPICAL OPERATING DISTANCE VS. ALTITUDE

KING
KTU 709/KFS 579A
TACAN UNIT

VOR FREQUENCIES	(TACAN) CHANNELS	TRANSMIT AND RECEIVE FREQUENCIES		VOR FREQUENCIES	(TACAN) CHANNELS	TRANSMIT AND RECEIVE FREQUENCIES	
	(1X)	1025	962		(15Y)	1039	1102
	(1Y)	1025	1088		(16X)	1040	977
	(2X)	1026	963		(16Y)	1040	1103
	(2Y)	1026	1089	108.00	(17X)	1041	978
	(3X)	1027	964	108.05	(17Y)	1041	1104
	(3Y)	1027	1090	*108.10	(18X)	1042	979
	(4X)	1028	965	*108.15	(18Y)	1042	1105
	(4Y)	1028	1091	108.20	(19X)	1043	980
	(5X)	1029	966	108.25	(19Y)	1043	1106
	(5Y)	1029	1092	*108.30	(20X)	1044	981
	(6X)	1030	967	*108.35	(20Y)	1044	1107
	(6Y)	1030	1093	108.40	(21X)	1045	982
	(7X)	1031	968	108.45	(21Y)	1045	1108
	(7Y)	1031	1094	*108.50	(22X)	1046	983
	(8X)	1032	969	*108.55	(22Y)	1046	1109
	(8Y)	1032	1095	108.60	(23X)	1047	984
	(9X)	1033	970	108.65	(23Y)	1047	1110
	(9Y)	1033	1096	*108.70	(24X)	1048	985
	(10X)	1034	971	*108.75	(24Y)	1048	1111
	(10Y)	1034	1097	108.80	(25X)	1049	986
	(11X)	1035	972	108.85	(25Y)	1049	1112
	(11Y)	1035	1098	*108.90	(26X)	1050	987
	(12X)	1036	973	*108.95	(26Y)	1050	1113
	(12Y)	1036	1099	109.00	(27X)	1051	988
	(13X)	1037	974	109.05	(27Y)	1051	1114
	(13Y)	1037	1100	*109.10	(28X)	1052	989
	(14X)	1038	975	*109.15	(28Y)	1052	1115
	(14Y)	1038	1101	109.20	(29X)	1053	990
	(15X)	1039	976	109.25	(29Y)	1053	1116

TABLE 3-2 TACAN/DME CHANNEL DESIGNATION AND PAIRED FREQUENCIES
(Sheet 1 to 5)

KING
KTU 709/KFS 579A
TACAN UNIT

VOR FREQUENCIES	(TACAN) CHANNELS	TRANSMIT AND RECEIVE FREQUENCIES		VOR FREQUENCIES	(TACAN) CHANNELS	TRANSMIT AND RECEIVE FREQUENCIES	
*109.30	(30X)	1054	991	*110.75	(44Y)	1068	1131
*109.35	(30Y)	1054	1117	110.80	(45X)	1069	1006
109.40	(31X)	1055	992	110.85	(45Y)	1069	1132
109.45	(31Y)	1055	1118	*110.90	(46X)	1070	1007
*109.50	(32X)	1056	993	*110.95	(46Y)	1070	1133
*109.55	(32Y)	1056	1119	111.00	(47X)	1071	1008
109.60	(33X)	1057	994	111.05	(47Y)	1071	1134
109.65	(33Y)	1057	1120	*111.10	(48X)	1072	1009
*109.70	(34X)	1058	995	*111.15	(48Y)	1072	1135
*109.75	(34Y)	1058	1121	111.20	(49X)	1073	1010
109.80	(35X)	1059	996	111.25	(49Y)	1073	1136
109.85	(35Y)	1059	1122	*111.30	(50X)	1074	1011
*109.90	(36X)	1060	997	*111.35	(50Y)	1074	1137
*109.95	(36Y)	1060	1123	111.40	(51X)	1075	1012
110.00	(37X)	1061	998	111.45	(51Y)	1075	1138
110.05	(37Y)	1061	1124	*111.50	(52X)	1076	1013
*110.10	(38X)	1062	999	*111.55	(52Y)	1076	1139
*110.15	(38Y)	1062	1125	111.60	(53X)	1077	1014
110.20	(39X)	1063	1000	111.65	(53Y)	1077	1140
110.25	(39Y)	1063	1126	*111.70	(54X)	1078	1015
*110.30	(40X)	1064	1001	*111.75	(54Y)	1078	1141
*110.35	(40Y)	1064	1127	111.80	(55X)	1079	1016
110.40	(41X)	1065	1002	111.85	(55Y)	1079	1142
110.45	(41Y)	1065	1128	*111.90	(56X)	1080	1017
*110.50	(42X)	1066	1003	*111.95	(56Y)	1080	1143
*110.55	(42Y)	1066	1129	112.00	(57X)	1081	1018
110.60	(43X)	1067	1004	112.05	(57Y)	1081	1144
110.65	(43Y)	1067	1130	112.10	(58X)	1082	1019
*110.70	(44X)	1068	1005	112.15	(58Y)	1082	1145

TABLE 3-2 TACAN/DME CHANNEL DESIGNATION AND PAIRED FREQUENCIES
(Sheet 2 to 5)

KING
KTU 709/KFS 579A
TACAN UNIT

VOR FREQUENCIES	(TACAN) CHANNELS	TRANSMIT AND RECEIVE FREQUENCIES		VOR FREQUENCIES	(TACAN) CHANNELS	TRANSMIT AND RECEIVE FREQUENCIES	
112.20	(59X)	1083	1020	112.65	(73Y)	1097	1160
112.25	(59Y)	1083	1146	112.70	(74X)	1098	1035
	(60X)	1084	1021	112.75	(74Y)	1098	1161
	(60Y)	1084	1147	112.80	(75X)	1099	1036
	(61X)	1085	1022	112.85	(75Y)	1099	1162
	(61Y)	1085	1148	112.90	(76X)	1100	1037
	(62X)	1086	1023	112.95	(76Y)	1100	1163
	(62Y)	1086	1149	113.00	(77X)	1101	1038
	(63X)	1087	1024	113.05	(77Y)	1101	1164
	(63Y)	1087	1150	113.10	(78X)	1102	1039
	(64X)	1088	1025	113.15	(78Y)	1102	1165
	(64Y)	1088	1151	113.20	(79X)	1103	1040
	(65X)	1089	1026	113.25	(79Y)	1103	1166
	(65Y)	1089	1152	113.30	(80X)	1104	1041
	(66X)	1090	1027	113.35	(80Y)	1104	1167
	(66Y)	1090	1153	113.40	(81X)	1105	1042
	(67X)	1091	1028	113.45	(81Y)	1105	1168
	(67Y)	1091	1154	113.50	(82X)	1106	1043
	(68X)	1092	1029	113.55	(82Y)	1106	1169
	(68Y)	1092	1155	113.60	(83X)	1107	1044
	(69X)	1093	1030	113.65	(83Y)	1107	1170
	(69Y)	1093	1156	113.70	(84X)	1108	1045
112.30	(70X)	1094	1031	113.75	(84Y)	1108	1171
112.35	(70Y)	1094	1157	113.80	(85X)	1109	1046
112.40	(71X)	1095	1032	113.85	(85Y)	1109	1172
112.45	(71Y)	1095	1158	113.90	(86X)	1110	1047
112.50	(72X)	1096	1033	113.95	(86Y)	1110	1173
112.55	(72Y)	1096	1159	114.00	(87X)	1111	1048
112.60	(73X)	1097	1034	114.05	(87Y)	1111	1174

TABLE 3-2 TACAN/DME CHANNEL DESIGNATION AND PAIRED FREQUENCIES
(Sheet 3 to 5)

KING
KTU 709/KFS 579A
TACAN UNIT

VOR FREQUENCIES	(TACAN) CHANNELS	TRANSMIT AND RECEIVE FREQUENCIES		VOR FREQUENCIES	(TACAN) CHANNELS	TRANSMIT AND RECEIVE FREQUENCIES	
114.10	(88X)	1112	1049	115.55	(102Y)	1126	1189
114.15	(88Y)	1112	1175	115.60	(103X)	1127	1064
114.20	(89X)	1113	1050	115.65	(103Y)	1127	1190
114.25	(89Y)	1113	1176	115.70	(104X)	1128	1065
114.30	(90X)	1114	1051	115.75	(104Y)	1128	1191
114.35	(90Y)	1114	1177	115.80	(105X)	1129	1066
114.40	(91X)	1115	1052	115.85	(105Y)	1129	1192
114.45	(91Y)	1115	1178	115.90	(106X)	1130	1067
114.50	(92X)	1116	1053	115.95	(106Y)	1130	1193
114.55	(92Y)	1116	1179	116.00	(107X)	1131	1068
114.60	(93X)	1117	1054	116.05	(107Y)	1131	1194
114.65	(93Y)	1117	1180	116.10	(108X)	1132	1069
114.70	(94X)	1118	1055	116.15	(108Y)	1132	1195
114.75	(94Y)	1118	1181	116.20	(109X)	1133	1070
114.80	(95X)	1119	1056	116.25	(109Y)	1133	1196
114.85	(95Y)	1119	1182	116.30	(110X)	1134	1071
114.90	(96X)	1120	1057	116.35	(110Y)	1134	1197
114.95	(96Y)	1120	1183	116.40	(111X)	1135	1072
115.00	(97X)	1121	1058	116.45	(111Y)	1135	1198
115.05	(97Y)	1121	1184	116.50	(112X)	1136	1073
115.10	(98X)	1122	1059	116.55	(112Y)	1136	1199
115.15	(98Y)	1122	1185	116.60	(113X)	1137	1074
115.20	(99X)	1123	1060	116.65	(113Y)	1137	1200
115.25	(99Y)	1123	1186	116.70	(114X)	1138	1075
115.30	(100X)	1124	1061	116.75	(114Y)	1138	1201
115.35	(100Y)	1124	1187	116.80	(115X)	1139	1076
115.40	(101X)	1125	1062	116.85	(115Y)	1139	1202
115.45	(101Y)	1125	1188	116.90	(116X)	1140	1077
115.50	(102X)	1126	1063	116.95	(116Y)	1140	1203

TABLE 3-2 TACAN/DME CHANNEL DESIGNATION AND PAIRED FREQUENCIES
(Sheet 4 to 5)

KING
KTU 709/KFS 579A
TACAN UNIT

VOR FREQUENCIES	(TACAN) CHANNELS	TRANSMIT AND RECEIVE FREQUENCIES	
117.00	(117X)	1141	1078
117.05	(117Y)	1141	1204
117.10	(118X)	1142	1079
117.15	(118Y)	1142	1205
117.20	(119X)	1143	1080
117.25	(119Y)	1143	1206
117.30	(120X)	1144	1081
117.35	(120Y)	1144	1207
117.40	(121X)	1145	1082
117.45	(121Y)	1145	1208
117.50	(122X)	1146	1083
117.55	(122Y)	1146	1209
117.60	(123X)	1147	1084
117.65	(123Y)	1147	1210
117.70	(124X)	1148	1085
117.75	(124Y)	1148	1211
117.80	(125X)	1149	1086
117.85	(125Y)	1149	1212
117.90	(126X)	1150	1087
117.95	(126Y)	1150	1213

TABLE 3-2 TACAN/DME CHANNEL DESIGNATION AND PAIRED FREQUENCIES
(Sheet 5 to 5)

KING
KDI 573B
NAVIGATION INDICATOR

SECTION III OPERATION

3.1 GENERAL

The KDI 573B has a pushbutton in the center of the unit, which when pressed will cycle the righthand display between Groundspeed and Time-to-Station.

The KDI 573B is a remote mounted digital indicator which is functionally equivalent to the KPI 553B PNI digital display section. The KDI 573B receives data in ARINC 429 format.

The unit displays distance to VORTAC or waypoint on the left-hand portion of the display, indicated by the legend NM. Range is indicated to the nearest tenth of a nautical mile from 0 to 999.9 nautical miles and to the nearest nautical mile from 1000 to 7999 nautical miles.

Groundspeed is shown on the right-hand portion of the display, indicated by the legend KT. It is indicated to the nearest knot from 0 to 999 knots.

Time-to-station is displayed on the right-hand portion of the display, indicated by the legend H:M. It is displayed to the nearest minute from 0 to 9 hours and 59 minutes.

Radar altitude is shown as dashed lines on the right-hand display between 1250 to 1000 feet and numerically to the nearest 10 feet from 990 to 0 feet. The appearance of the letters FT indicate radar altitude information is being displayed.

Readout brightness is automatically controlled with respect to cockpit ambient lighting by a photocell located to the left of the digital readout.

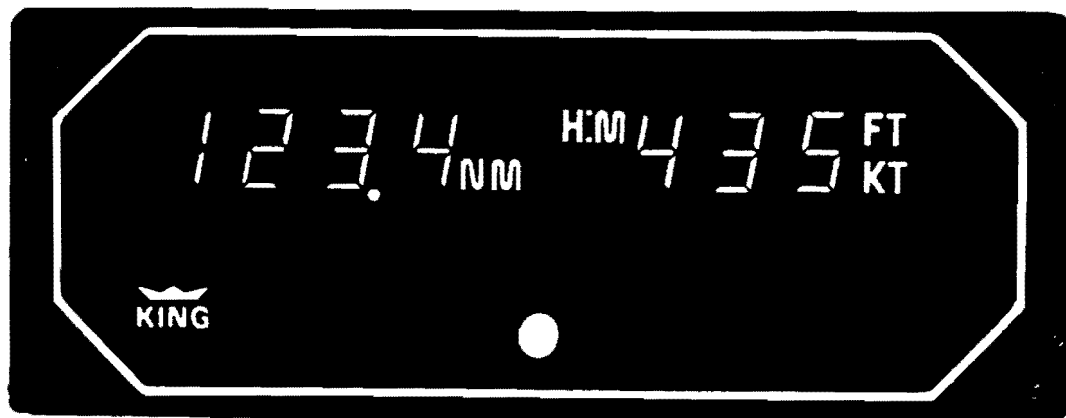


FIGURE 3-1 KDI 573B Remote Indicator

BENDIX
RDS 84
WEATHER RADAR SYSTEM

SECTION III OPERATION

3.1 GENERAL

This section describes the controls and displays of the RDS-84 Radar System when the system uses a IN-842A Color Radar Indicator. A more through explanation of the operation and controls of the RDS-84 can be found in the RDS-84 pilots guide King P/N 006-8533-00. If the sensor is installed with an EFS-10 system and it utilizes the display units of the EFS-10 system, operation of the radar sensor with the CP-113H or the CP-123F can be found in the EFS-10 pilots guide King P/N 006-8536-00.

3.2 OPERATION

3.2.1 OPERATING CONTROLS AND DISPLAY FEATURES

All controls used to operate the RDS-84 Weather Radar System are contained on the radar indicator. These controls and the display features are identified in Figure 3-1 and described in this paragraph.

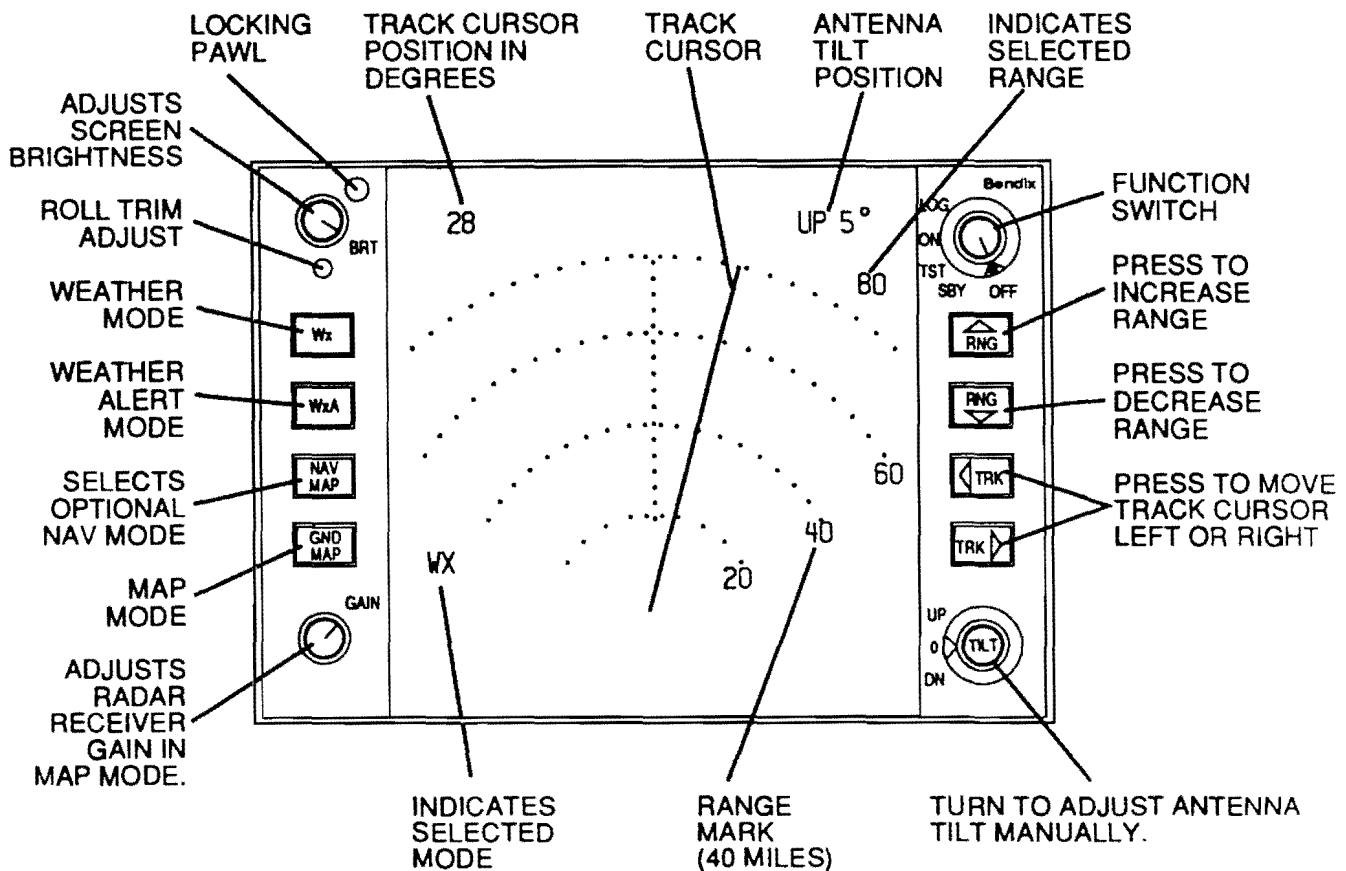


FIGURE 3-1 OPERATING CONTROLS AND DISPLAYS, IN-842A COLOR RADAR INDICATOR

BENDIX
RDS 84
WEATHER RADAR SYSTEM

CONTROL/DISPLAY	FUNCTION
BRT control	Adjusts brightness of the display for varying cockpit light conditions.
Wx pushbutton	Selects the weather mode (Wx) when pressed. "Wx" appears in display.
WxA pushbutton	Selects weather alert mode (WxA) when pressed. Magenta area flashes. WxA appears in the display.
MAP pushbutton	Selects ground mapping mode (MAP) when pressed. MAP appears in the display. Magenta color is not used in the MAP mode.
Function selector	1. OFF position removes primary power from the system. 2. SBY (standby) position places system in the standby condition during warm-up period and when the system is not in use. The word STBY is displayed in lower left corner. NAV mode may be selected while in standby. 3. TST (test) position selects test function to determine operability of the system. A test pattern is displayed. No transmission exists in the TST condition. 4. ON position selects the condition for normal operation. Radar transmission exists in the ON position. The Wx mode and 80 mile range are automatically selected when turned on. 5. LOG position selects flight log information when optional NAV equipment is connected via IU-2023() Remote Computer Unit, GC 360A, or GC 381A. If optional equipment is not connected, NO LOG will appear in display.
NAV pushbutton (push-on/push-off)	Operational only when a Remote Computer Unit is connected with operational NAV equipment. When actuated, NAV information is superimposed over the MODE selected (Wx, WxA, or MAP). NAV mode may also be selected when indicator is in standby. If the selected mode is pressed off, a NAV only display occurs. If a Remote Computer Unit and a NAV system is not connected, the words "NO NAV" will be displayed in the lower left corner.
TRACK  pushbutton	When pressed, a yellow track cursor line appears and moves to the left (in one degree steps) while the pushbutton is held depressed. The track cursor stops when the pushbutton is released, and remains for about 10 to 15 seconds, then disappears unless the pushbutton is pressed again. The differential heading will be indicated in yellow numerals in the upper left corner of the display, and disappears simultaneously with the track cursor.
TRACK  pushbutton	When pressed, the yellow track cursor appears and moves to the right while held depressed. Operation is as explained above.

BENDIX
RDS 84
WEATHER RADAR SYSTEM

CONTROL/DISPLAY



RANGE increase
pushbutton

FUNCTION

Clears the display and advances the indicator to the next higher range each time the pushbutton is pressed (eg: 20 to 40, 40 to 80, ect.), until 320 mile range is reached. The range selected is displayed in the upper right corner on the last range mark, and the distance to each of the other range mark circles is displayed along the right edge of the circles (arcs).

NOTE

System has 1000 mile range capability when in NAV mode and an IU-2023B, GC 360A, or GC 381A is in the system. Weather information will not be available.



RANGE decrease
pushbutton

Clears the display and places the indicator in the next lower range each time the pushbutton is pressed (eg: 40 to 20), until minimum range is reached.

GAIN control

Varies the radar receiver gain when in the MAP mode. Gain and STC are preset in TEST function and in the Wx and WxA modes.

3.2.2 OPERATING PROCEDURES

3.2.2.1 General

There are several system functions that the operator can perform or select by using the controls on the indicator. The basic operation procedures are described in the following paragraphs.

Some of the control functions are unique to the color radar indicators. Operation of GAIN and TILT controls is similar to the controls on other airborne radar systems. In the Wx, WxA, and TEST modes, the gain is preset to obtain a calibrated (magenta display) function at a predetermined storm-cell level. In the MAP mode, the GAIN control setting is an operator function and is important in obtaining a definitive picture during varying topographic conditions.

Operation of the TILT control is covered in pilots' manuals for all radar systems. This control is important. Improper use can allow a potentially dangerous storm to remain undetected. For additional information, refer to Bendix publication ACS-927, Airborne Weather Radar Antenna Stabilization Criteria.

Momentary pushbutton controls are used on the indicator. The momentary switches return when the pushbutton is released. By function, the pushbutton types are as follows:

Pushbutton Control Function	Type
Wx (Weather)	Momentary
WxA (Weather Alert)	Momentary
MAP	Momentary
NAV	Momentary
TRACK	Momentary
RANGE	Momentary

3.2.2.2 Turn on Procedure

- A. Turn the function switch from the OFF to the TST position. After seven to eight seconds, a test pattern should appear on the indicator display.

BENDIX
RDS 84
WEATHER RADAR SYSTEM

- B. Check the indicator display. The test pattern displayed is for the test mode, 80-mile range, and contains all the alphanumerical information for mode, range, and range marks. The word "TEST" appears in the lower left corner.
- C. Adjust BRT controls for desired screen brightness. Observe test pattern illustrated in Figure 3-2.
- D. When safe conditions exist (see operating precautions in previous paragraph), place function switch in the ON position to activate the radar system. The indicator display automatically appears in the Wx mode.

3.2.2.3 Primary Mode Selection (Wx, WxA, MAP)

- A. Observe the existing mode indicated in the display (see Figure 3-3)

NOTE

When the indicator is first turned ON, the Wx mode is displayed.

- B. To change the existing mode to one of the other primary modes, press the new mode pushbutton.

3.2.2.4 Optional NAV and FLT LOG Displays

- A. If an optional navigation (NAV) system is connected via the applicable IU-2023(), GC 360A, or GC 381A then turn the function switch to the LOG position to display the flight log programmed into the NAV system. This overrides any other previously selected mode. Turn the switch back to the ON position to restore previous display.
- B. Push-on the NAV pushbutton to display the programmed waypoints with course data, as programmed into the NAV system. If other modes are also selected, the NAV display is superimposed on them. The word "NAV" appears in the lower left corner. To obtain a NAV-only display, press the Wx (or other mode) button. To restore the superimposed display, press the mode button again.
- C. If an optional NAV system is not connected to the Indicator, the LOG position has no affect on the display, but the words "NO LOG" will appear in the lower left corner. When the NAV button is push-on, the words "NO NAV" appear in the lower left corner of the display.

NOTE

The radar transmitter is not disabled in the NAV or LOG mode when a remote computer unit is not connected.

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RDS 84
WEATHER RADAR SYSTEM

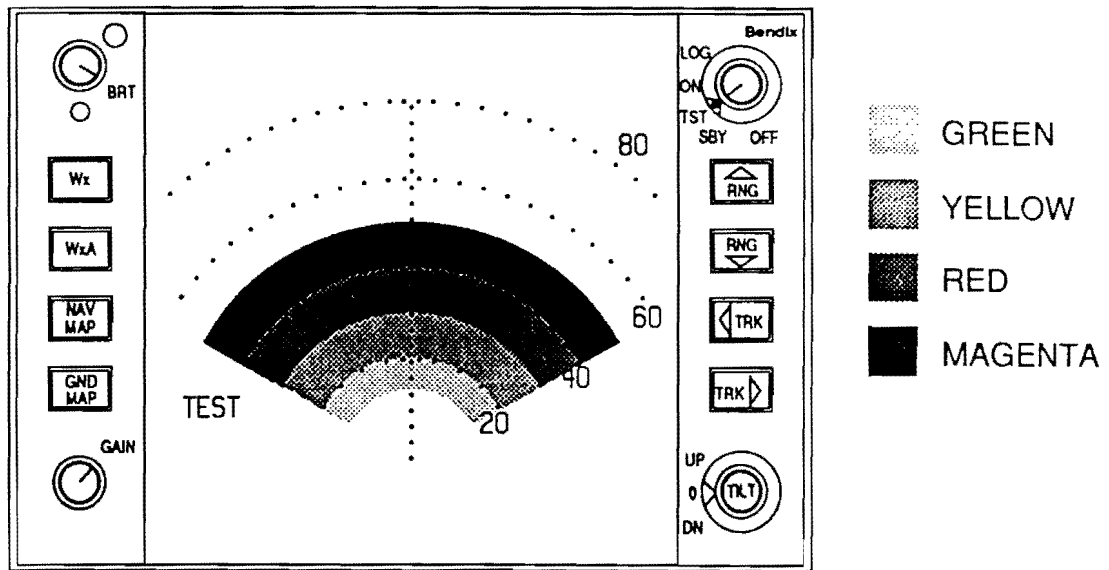


FIGURE 3-2 TYPICAL TEST PATTERN DISPLAY

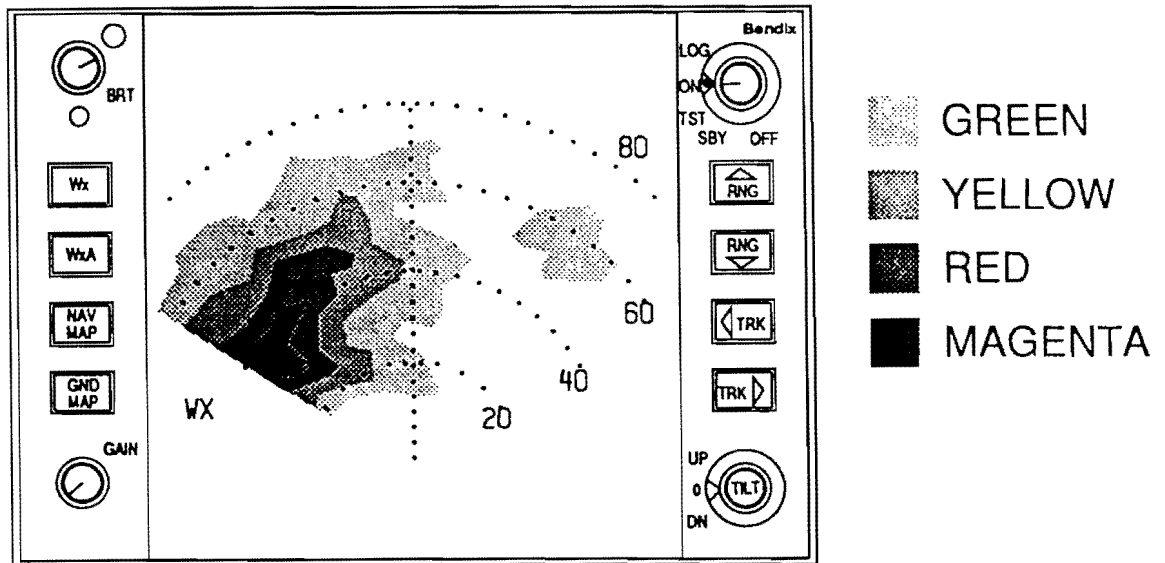


FIGURE 3-3 TYPICAL WEATHER DISPLAY

BENDIX
RDS 84
WEATHER RADAR SYSTEM

3.2.2.5 Range Selection

- A. Momentarily press the  RANGE pushbutton to increase the maximum range displayed by one increment, (e.g., 20 to 40).

NOTE

Display erases completely and rewrites on the newly selected range.

- B. Observe that the range selected is shown in the upper right corner of the display and along the last range mark.
- C. Observe that the distance to each of the other three range marks is shown at the right side of each concentric range circle.
- D. To decrease the maximum range displayed, momentarily press the  RANGE button.
- E. Repeat step A or D as necessary to obtain the desired range.

3.2.2.6 Track Cursor Operation

- A. Press and hold either of the TRACK pushbuttons ( or ).
- B. Observe the display. A yellow track cursor appears and moves slowly across the screen, either to the left () or to the right (), depending upon which pushbutton is pressed.
- C. When the track cursor reaches the desired position, release the button. The track cursor stops moving and the position (in degrees away from the aircraft heading) is displayed in yellow numbers. The track cursor disappears from the display in 10 to 20 seconds.

NOTE

The track cursor will appear at zero degrees azimuth the next time a TRACK pushbutton is pressed.

NOTE

When the optional IU-2023(), GC 360A, or GC 381A NAV input is connected to the indicator, the track line angle displayed on the indicator will be the true or magnetic heading of the track cursor in degrees, depending upon the NAV system. Also, the word "TRK HDG" will appear in the upper left corner of the screen. If NAV is not engaged, and the track pushbutton is depressed, the track line angle displayed on the screen will be the differential heading.

3.2.2.7 Test Pattern Selection

- A. Initially, turn function switch from OFF to TST position.
- B. Check the indicator display. The test pattern appears 7 or 8 seconds after the indicator function switch was rotated from the OFF position to the TST position. The exact point of test pattern termination or range duration of each color is shown in Figure 3-2. The presence of four distinct colors, in the proper order, is important.
- C. If indicator function switch is already in the ON position, move to the TST position and observe that the test pattern reflects the range selected before the function switch was moved; e.g., if range was set for 160 miles, the test pattern will extend only to about 50 miles on the 160-mile range. Set the range to 80 miles for the best test pattern presentation.

3.2.2.8 Turn-off Procedure (on the ground)

The RDS-841A Radar Sensor will tilt the antenna down, for increased radar receiver protection, when the indicator is switched to SBY and OFF position. Always turn the indicator function switch to SBY or OFF before disengaging the avionics master switch in the aircraft. The system will power-down in about 5 seconds after switched to the OFF position, to allow time for the antenna to move to the down position.

BENDIX
GC 360A
RADAR GRAPHICS COMPUTER

SECTION III
OPERATION

3.1 GENERAL

The following statement is displayed in all modes except Standby (SBY) when the unit is first turned on.

THE NAVIGATION DATA
PRESENTED ON THIS SCREEN
IS NOT TO BE USED
FOR PRIMARY NAVIGATION.
CONTENTS OF THE CHECKLISTS
ARE THE RESPONSIBILITY OF
THE USER/INSTALLER.

VERSION A X.X B X.X

The statement will automatically disappear after 20 seconds or can be made to disappear more quickly by pressing the CANCEL button.

The mode of the GC 360A is selected with a rotary switch in the center of the front panel.

3.2 EMERGENCY (EMER) MODE

The GC 360A displays checklists of emergency procedures for the aircraft in Emergency (EMER) mode. The Emergency Index contains the titles of the emergency checklists. The ↑ (Up), ↓ (Down), and PAGE buttons are used to select a particular checklist title. The selected checklist title is shown in yellow while the others are shown in magenta.

Pressing the ✓ (Check) button causes the selected checklist title and data to be displayed. While in the checklist, the ✓ button is used to check off items. The checklist title is displayed in white, checked off items are shown in green, unchecked items are magenta, and the item presently being examined is in yellow.

The ↑ (Up), ↓ (Down), and PAGE buttons may be used to bypass items without checking them off or return to items previously bypassed. The PAGE button may be used to view consecutive pages within a checklist. When the last item in a list is checked off, the display automatically returns to any items previously bypassed. When all items have been checked off, the display returns to the Index with the next checklist title selected. An "END OF LIST" statement follows the last title in an index and the last item in a checklist. The user may return to the Index prior to checking off all items by pressing the IDX (Index) button.

3.3 CHECKLIST (✓ LST) MODE

Checklists of normal procedures for the aircraft are displayed in Checklist (✓ LST) mode. This mode is functionally identical to the Emergency (EMER) mode.

3.4 STANDBY (SBY) MODE

The GC 360A will display "NO NAV" on the radar screen in the Standby (SBY) mode. No navigation data will be displayed by the graphics computer in this mode.

3.5 NAVIGATION (NAV 1)

When interfaced with a KNS 660 the GC 360A will display the position of each waypoint listed in the active flight plan and any navaid or airport when selected on the KNS 660, that are in the field of view. The active waypoint will be indicated by a white label (1-25) with the other NAV 1 waypoints shown with a cyan label. A line showing the selected course is drawn through the active waypoint and is referenced to NAV 1 as a solid white line. All other data and graphics referenced to NAV 1 are shown in cyan.

BENDIX
GC 360A
RADAR GRAPHICS COMPUTER

Selected course, active waypoint name, bearing, and distance to the active waypoint for NAV 1 is shown in the corner of the screen from top to bottom. The displayed information will be replaced by dashes if it is invalid or flagged.

Cross Track data will be displayed below the active NAV data when the received data is valid. Each mark right or left of center equals 1NM for enroute mode and 0.25NM for approach mode. A solid bar across the full scale will be displayed if the received data is invalid.

The aircraft heading is shown in the upper left corner of the radar screen. This information will also be replaced by dashes when invalid.

An arrow (OFF SCREEN POINTER) referenced to NAV 1 is shown above the NAV data. This pointer indicates the approximate direction of the active waypoint in relation to the aircraft when ever it is located off the screen. The arrow disappears when the active waypoint is on the screen.

Nav aids selected by the KNS 660 can be displayed on screen when in range by pressing the REF ↑ (Up) button or the REF ↓ (Down) button. Activation of this mode is indicated by a green R. Three levels of nav aids may be selected, high level, low level, and terminal level and are indicated by one, two, or three dots at the left side of the R. Nav aids and their identifiers when shown are green also.

Pressing the REF ↑ (Up) button when no nav aids are displayed, will cause high, low and terminal levels of nav aids selected by the KNS 660 and within viewing range to appear on the screen in green. Successively pressing the REF ↑ button again will remove each level of nav aid, beginning with the terminal level, followed by the low level and the high level. Pressing the REF ↓ (Down) button when no nav aids are displayed, will cause high level nav aids to be displayed on the screen. Successively pressing the REF ↓ button will cause the additional display of low level and terminal level nav aids and then cause all nav aids to be removed from the screen.

Waypoint identifiers are displayed by pressing the NAME (IDX) button and appear below each symbol. Pressing the NAME button a second time will remove the identifiers. Identifiers associated with each waypoint are displayed in cyan for NAV 1 and yellow for NAV 2.

The selected digital course readout and the course line can be displayed by pressing the ✓ (Check) button and may be removed by pressing the ✓ button a second time.

Moving the Joystick causes a cursor to appear which may be moved to any location on the active screen. When the cursor is on the screen, the latitude and longitude position of the cursor are displayed opposite the selected NAV when the indicator is in stand-by with a single NAV selected. If the indicator is in a weather mode, the cursor location will replace the NAV data. Pressing the ✓ (Check) button while the cursor is on the screen causes the position on the screen to become a fixed position referenced to the ground and the position data is transferred to the KNS 660 where it may be approved as a new waypoint or deleted from memory. The cursor may be removed from the screen before the ✓ button is pressed, sending information to the KNS 660 by pressing the Cancel button. After the ✓ button has been pressed the cursor is under the control of the KNS 660 and must be inserted or deleted by the KNS 660.

If the radar indicator is in a weather or map mode, the waypoints, nav aids and airport symbols will be superimposed on the weather. If the indicator is in Standby (STBY), the symbols are shown without weather.

3.6 NAVIGATION (NAV 2)

The GC 360A accepts data from a dual NAV installation. The second NAV may be another KNS 660 or a KNR 634A/KDM 706A combination. By selecting NAV 2 on the GC 360A, only information related to the second navigation system will be displayed. Navigation data and symbols for NAV 2 will be displayed in yellow. The compass heading, track line operation and data, and nav aids are common to both NAV 1 and NAV 2. Activating the Joystick function will cause the cursor to appear on the screen and the latitude and longitude position of the cursor will appear opposite the navigation information referenced to NAV 2 while the indicator is in stand-by. When the indicator is in a weather mode the cursor location will replace the NAV data on screen.

When a KNS 660 is used for the second navigation system the operation and presentation will be the same as NAV 1 with the following exceptions: (1) The active waypoint number will be in white but will have a yellow waypoint symbol and (2) the selected course line will be a dashed line instead of a solid line.

When using a KNR 634A/KDM 706A combination for NAV 2 the VOR frequency, radial to, and the distance from the VOR is shown in yellow. When a VOR is displayed on the screen, it will be a yellow VOR symbol with a white number "1" next to it. The selected course line is a dashed white line.

BENDIX
GC 360A
RADAR GRAPHICS COMPUTER

3.7 NAVIGATION (BOTH)

To display NAV 1 and NAV 2 information simultaneously, select the BOTH position on the GC 360A and the Standby mode on the radar Indicator. Navigation Information will be displayed from both systems in a similar manner as they are displayed for a single NAV display with the following exceptions:

When activating the Joystick function, the cursor will be referenced to NAV 1 and display its related data in the NAV 1 position. The Joystick may be referenced to NAV 2 by pressing the IDX (Index) button once. The data related to the Joystick will now be displayed in the NAV 2 position. Pressing the Index button again will return the reference to NAV 1.

3.8 CIRCLE MODE

A 360° Circle mode may be activated by pressing the 360° button with the radar indicator in Standby or weather mode. Functional operation in this mode is the same as in the standard display mode. The range information is displayed in the upper right corner and represents the outer ring. The inside ring represents half the displayed distance. The Off Screen Pointer is replaced by an "RMI BUG" placed on the outer ring in the direction of the active waypoint and color coded to each navigation system. The position of the aircraft is indicated by the green airplane symbol in the center of the screen.

Wind speed and head wind/tail wind speed component may be selected for display by using the WIND button while in circle mode. The first press of the WIND button will display the wind speed at the right center of the screen as a green "WS" with the wind speed below it. A green block on the circle mode display perimeter indicates the direction the wind is coming from. The second press of the WIND button changes from wind speed to indicate a head wind or tail wind speed component. This is shown with a "HW" for head wind and a "TW" for tail wind. A third press of the WIND button removes the wind information. If invalid data is presented the wind speed will be dashed.

3.9 KA 68 AND KA 68A POCKET TERMINALS

A KA 68 or KA 68A Pocket Terminal is used to program Normal and Emergency checklist information into the GC 360A. The pocket terminal plugs into a jack on the front of the radar graphics unit.

The title of a checklist is programmed into the appropriate index by selecting the desired mode on the GC 360A (EMER, or ✓ LST) and pressing the IDX (Index) button, if necessary, to enter the index. If the index already contains some titles, the ↑ (Up) and ↓ (Down) buttons on the GC 360A are used to determine the location of the title to be added. If the number of index titles exceeds one page, the following pages may be selected by using the Page button rather than cycling through the index with the ↑ or ↓ buttons. The last page of each index is indicated by an "END OF LIST" statement.

NOTE

The following characters cannot be written into the GC 360A even though they are shown on the Pocket Terminal keyboard [] \

The title is entered by pressing the appropriate keys on the pocket terminal. The title may consist of any combination of 27 alphanumeric characters, spaces or punctuation (1 line). Any of the shaded functions are obtained by pressing the shift key prior to pressing the key with the desired function. For example to enter a period, press and release the shift key and then press the key labeled with a period. As the title is entered, a white cursor block appears to the right of the last character entered, indicating the location where the next character will be inserted. When the title is complete, it must be terminated by a carriage return to make the cursor disappear. Type only the title of the checklist to be entered into memory. Checklist data should be entered into memory only after selecting the title with the ✓ (Check) button.

NOTE

The KA 68 requires a shift before either a carriage return (CR) or a space. With the KA 68A, a carriage return or a space require only a single key stroke.

Error correction is accomplished with the delete function, "SHIFT - DEL" on the pocket terminal. While in insert mode (cursor on the screen), pressing "SHIFT - DEL" will delete individual characters. Once an item has been terminated with a carriage return (no cursor on the screen), "SHIFT - DELETE" will delete the entire selected item (shown in yellow).

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GC 360A
RADAR GRAPHICS COMPUTER

In order to program the contents of a checklist into memory, the desired title must first be selected in either the Emergency or Checklist Index using the ↑ (Up), ↓ (Down), and PAGE buttons on the GC 360A. Once the desired checklist has been selected, press the ✓ (Check) button to display the checklist. If the checklist already contains some items, the ↑, ↓ and PAGE buttons on the GC 360A are used to determine the location of the item to be added. The new item will be inserted after the selected item shown in yellow. If no item is shown in yellow the new item will be added at the beginning of the checklist. The last page of each checklist is indicated by an "END OF LIST" statement.

An item in the checklist is entered into memory by pressing the appropriate keys on the pocket terminal. A checklist item may consist of any combination of alphanumeric characters, spaces, or punctuation up to a length of 13 lines (390 characters). If a single item is longer than one line, do not use the carriage return to move from one line to the next. Use spaces as necessary to complete the line and move the cursor to the beginning of the following line. The carriage return should be used only at the end of the entire item to make the cursor disappear.

NOTE

Most items will only be a few lines long. If you have a single item such as a list that exceeds 13 lines, line 13 MUST be ended with a carriage return.

Certain special functions can be obtained on the pocket terminal by pressing the Control key prior to pressing X, C, or I. Control - X ERASES EVERYTHING (all checklists) stored in nonvolatile memory in the GC 360A. Information cannot be recovered once it has been erased. After pressing Control - X the message "ERASE ENTIRE MEMORY YES / NO" appears on the radar screen, if Y-E-S is entered, the radar graphics unit will carry out the command. If N-O or any other key is pressed the erase command is aborted. Control - C on the pocket terminal duplicates the function of the ✓ (Check) button on the GC 360A. Control - I on the pocket terminal duplicates the function of the IDX (Index) button on the GC 360A.

CAUTION

CONTROL-X ERASES THE ENTIRE CONTENTS OF THE GC 361A NON-VOLATILE MEMORY. THAT IS, ALL ROUTES AND CHECKLESTS ARE TOTALLY ELIMINATED AND CANNOT BE RECOVERED ONCE THEY HAVE BEEN ERASED. TO GUARD AGAINST ACCIDENTAL ERASURE, A VERIFICATION MESSAGE APPEARS ON THE SCREEN AFTER CONTROL-X HAS BEEN ENTERED: "ERASE ENTIRE MEMORY YES / NO." IF Y-E-S IS THEN ENTERED, THE MEMORY WILL BE ERASED. IF N-O OR ANY OTHER KEY IS PRESSED, THE ERASE COMMAND WILL BE ABORTED.

BENDIX
GC 360A
RADAR GRAPHICS COMPUTER

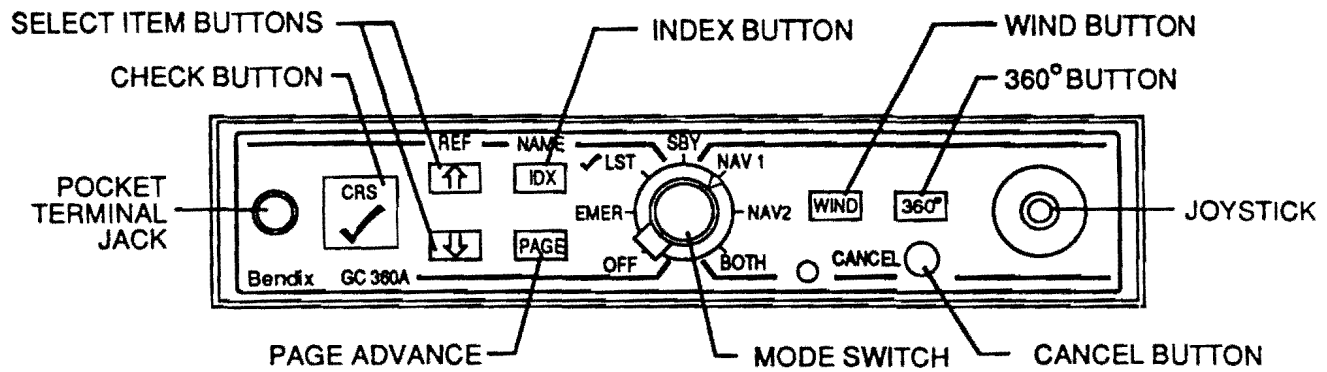


FIGURE 3-1 GC 360A RADAR GRAPHICS UNIT

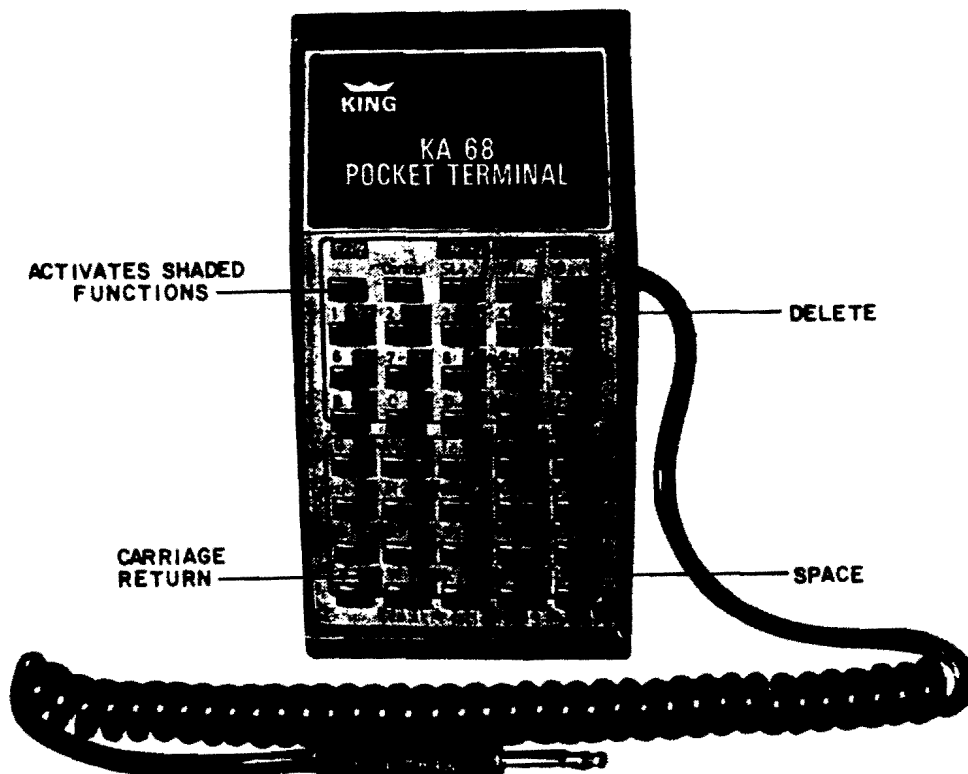


FIGURE 3-2 KA 68 POCKET TERMINAL

BENDIX
GC 360A
RADAR GRAPHICS COMPUTER

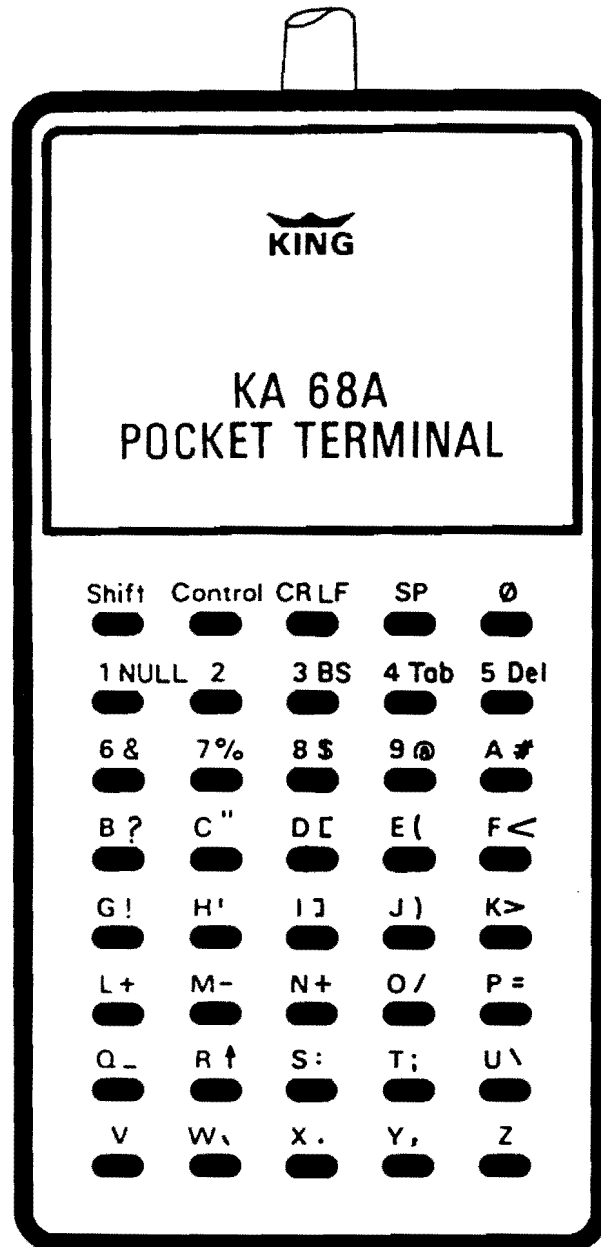


FIGURE 3-3 KA 68A POCKET TERMINAL

BENDIX
GC 360A
RADAR GRAPHICS COMPUTER

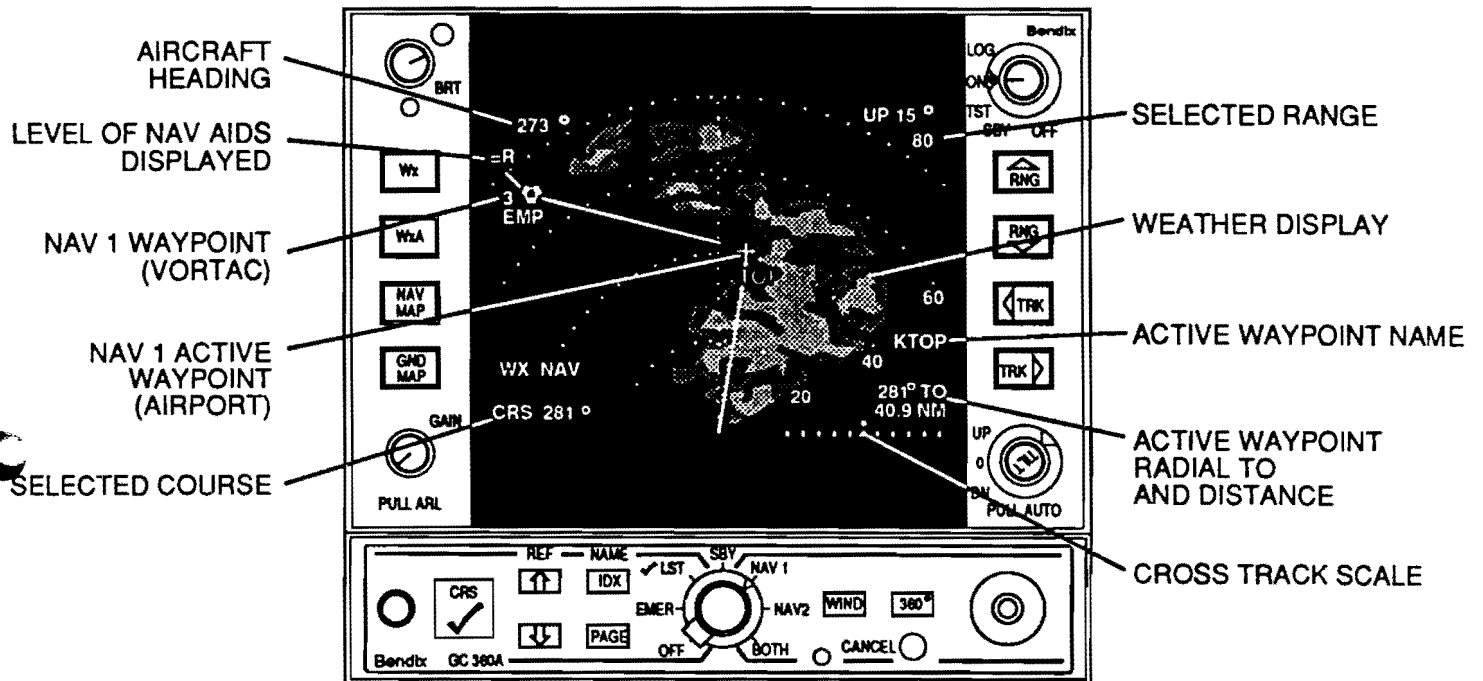


FIGURE 3-4 NORMAL MODE NAV 1 ONLY

BENDIX
GC 360A
RADAR GRAPHICS COMPUTER

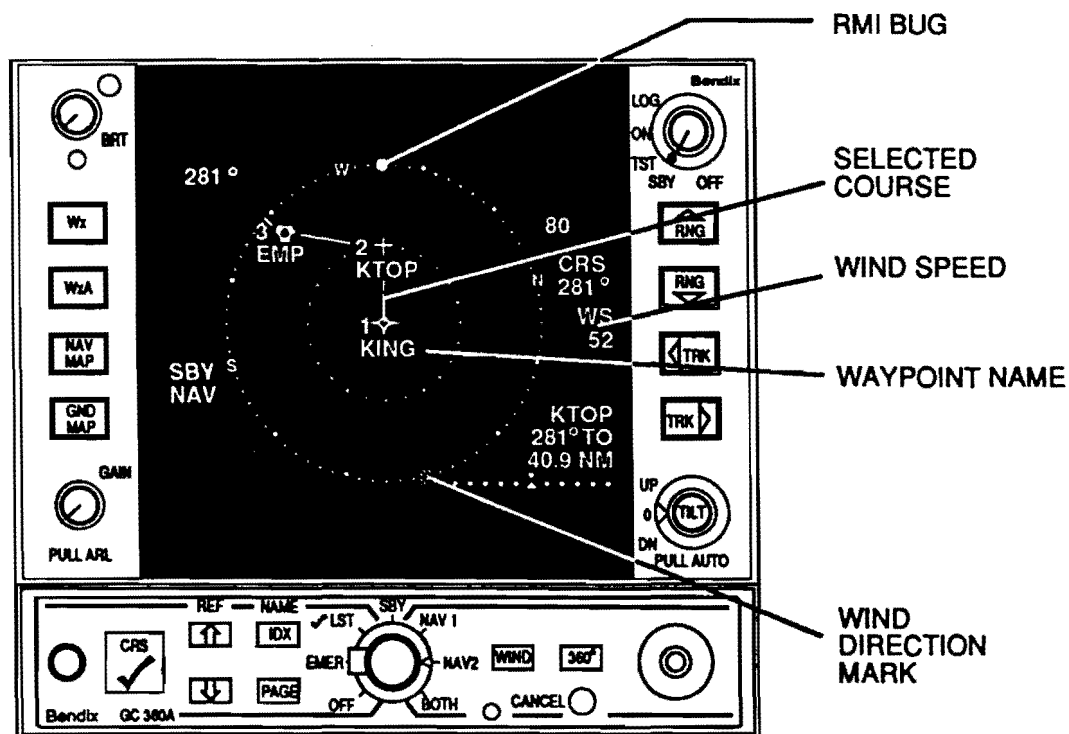


FIGURE 3-5 360° (CIRCLE) MODE BOTH NAV'S

BENDIX
GC 360A
RADAR GRAPHICS COMPUTER

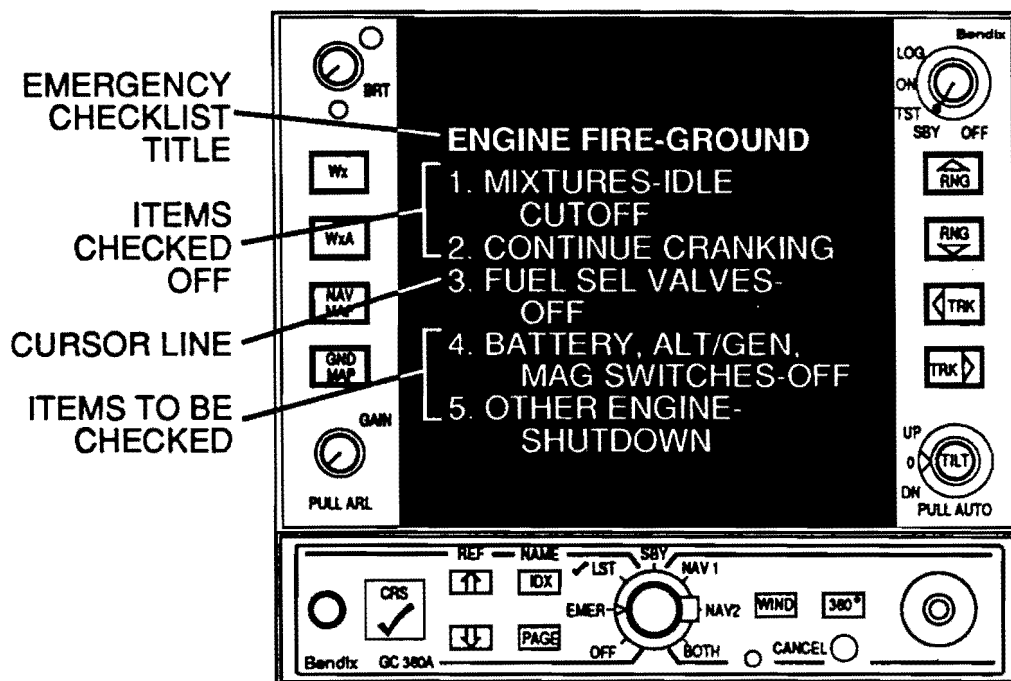


FIGURE 3-6 EMERGENCY CHECKLIST MODE

APPENDIX A
RTCA/DO-160A
ENVIRONMENTAL QUALIFICATION FORM

APPENDIX A
RTCA/DO-160A
ENVIRONMENTAL QUALIFICATION FORM

NOMENCLATURE: GC 360A RADAR GRAPHICS COMPUTER
PART NUMBER: 071-1313-00/03
TSO NUMBER: TSO-C105
MANUFACTURER'S SPECIFICATION: MPS 004-0574-00
MANUFACTURER: KING RADIO CORPORATION
ADDRESS: 400 N. ROGERS ROAD
OLATHE, KS 66062
USA

CONDITIONS	PARAGRAPH	CONDUCTED TESTS	
TEMPERATURE AND ALTITUDE	4.0	CATEGORIES	A2D1
TEMPERATURE VARIATION	5.0	CATEGORY	B
HUMIDITY	6.0	CATEGORY	A
SHOCK	7.0	PARAGRAPHS	7.1 AND 7.2
VIBRATION	8.0	CATEGORIES	KPS
EXPLOSION	9.0	CATEGORY	X
WATERPROOFNESS	10.0	CATEGORY	X
FLUIDS SUSCEPTIBILITY	11.0	CATEGORY	X
SAND AND DUST	12.0	CATEGORY	X
FUNGUS	13.0	CATEGORY	X
SALT SPRAY	14.0	CATEGORY	S
MAGNETIC EFFECT	15.0	CLASS	A
POWER INPUT	16.0	CATEGORY	B
VOLTAGE SPIKE CONDUCTED	17.0	CATEGORIES	AB
AUDIO FREQUENCY CONDUCTED SUSCEPTIBILITY	18.0	CATEGORY	B
INDUCED SIGNAL SUSCEPTIBILITY	19.0	CATEGORY	A
RADIO FREQUENCY SUSCEPTIBILITY	20.0	CATEGORY	A
RADIO FREQUENCY EMISSION	21.0	CATEGORY	A

KING
KRA 405
RADAR ALTIMETER SYSTEM

SECTION III
OPERATION

3.1 GENERAL

The KNI 415 and KNI 416 Radar Altimeter Indicators are shown in Figures 3-1 and 3-2 and are discussed below.

Altitude Scale:	The KNI 415 scale gives accurate altitude indications from -20 to +2000 feet. From -20 to 500 feet each mark on the scale represents 10 feet. From 500 to 2000 feet, each mark represents 100 feet. The KNI 416 scale gives accurate altitude indications from -10 to +2000 feet. From -10 to 200 feet each mark represents 5 feet, from 200 to 500 feet each mark represents 20 feet, and from 500 to 2000 feet each mark represents 100 feet.
Indicator Needle:	The AGL altitude in feet is displayed beneath this needle. Needle will be clockwise behind mask when above 2000 feet.
Flag:	Indicates invalid altitude information is being displayed or self test button is depressed.
Self Test Button:	This button is used to test the Radar Altimeter R/T and indicator. When the button is depressed, the flag will come into view and 50 ± 5 feet will be displayed.
DH Knob:	This knob controls the DH (Decision Height) but. By turning it clockwise, the DH bug will increase in altitude; counterclockwise, the bug will decrease in altitude.
DH Bug:	Indicates altitude during an approach at which the DH lamp will light.
DH Lamp:	This lamp lights when the Decision Height is reached. The lamp can be turned off by pushing the lamp in. The lamp can be turned off by pushing the lamp in. The lamp can be turned on again, when below the decision height, by depressing the lamp a second time. Once turned off, the DH lamp will be automatically armed upon climb out as the aircraft passes through the DH altitude. Pressing the self-test button will also turn on the DH lamp if the DH bug is set above 50 feet.

3.2 NORMAL OPERATION

3.2.1 PREFLIGHT

- A. Turn on primary aircraft power.
- B. Adjust the DH knob on the KNI 415/416 Radar Altimeter Indicator to set the DH but to 25 feet.
- C. Depress the TEST button. The indicated altitude should be 50 ± 5 feet and the flag should come into view. The DH lamp should be out.
- D. With the TEST button depressed, slowly increase the DH bug until the DH lamp lights. The bug should be 50 ± 5 feet. The lamp should be lit at all altitudes above 50 feet.
- E. Release the TEST switch. The warning flag should move out of view and the Indicated altitude should be 0 feet, nominal.

KING
KRA 405
RADAR ALTIMETER SYSTEM

3.2.2 TAXI

When taxiing to and from the ramp, the DH light is sometimes annoying. The light may be turned off by simply pressing the DH lamp. Once off, the lamp may be turned on again by pressing the DH lamp or pressing the TEST button, if the DH bug is set above 50 feet. Climbing past the decision height (indicated by the DH bug) arms the DH lamp so during the approach the lamp will light upon reaching the decision height.

3.2.3 IN FLIGHT OPERATION

At normal cruise altitudes above 2000 feet, the indicator pointer is behind the mask and the warning flag is hidden from view above 2,500 feet. A Flight Control System (FCS) warn is applied to the auto pilot or flight director system indicating that usable information is not available.

3.2.4 APPROACH

When the approach plates are reviewed prior to beginning the actual approach, the pilot should set the DH but to the decision height altitude, and check altimeter operation as follows:

- A. Depress the SELF TEST button and hold:
 - 1. 50 ± 5 feet should be indicated.
 - 2. The flag should come into view.
 - 3. The DH lamp should light (if the DH setting is above 50 feet).
- B. Verify that the pointer comes on scale at 2000 feet AGL by using the barometric altitude as a reference.
- C. If altimeter does not operate as specified above, refer to Emergency Operation, Paragraph 3.3.

During the actual approach, the Radar Altimeter System provides altitude and altitude trip information to the flight control system. When the decision height is reached, the DH lamp lights to alert the pilot that a decision is to be made. The DH lamp may then be turned off by pressing the lamp in.

3.3 EMERGENCY OPERATION

3.3.1 SELF TEST ERRORS

- A. If the altimeter does not indicate 50 ± 5 feet when initiating self test, disregard to radar altimeter system.
- B. Should the flag not come into view but the indicated altitude is correct, the altimeter system may be used. Keep in mind that subsequent failures will not be indicated by the flag.
- C. Failure of the DH lamp to light during self test means the pilot must watch the indicator closely since the decision height will not be annunciated.

KING
KRA 405
RADAR ALTIMETER SYSTEM

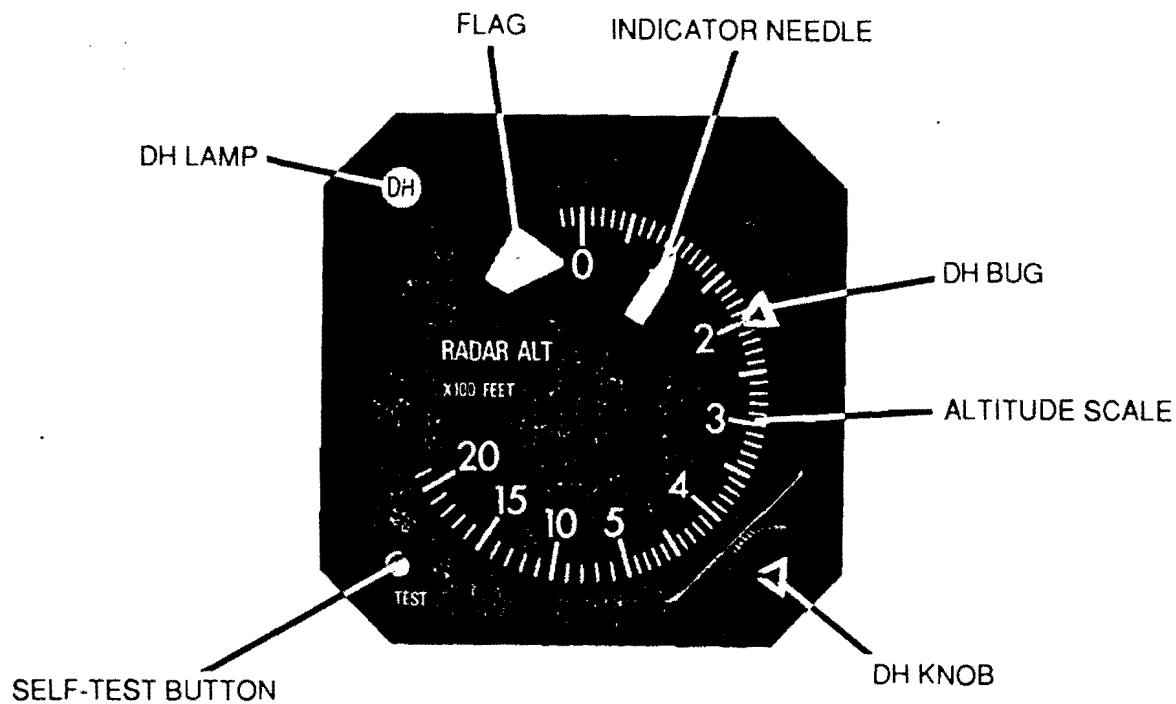


FIGURE 3-1 KNI 415 CONTROL FUNCTIONS
(Dwg No 696-6206-00)

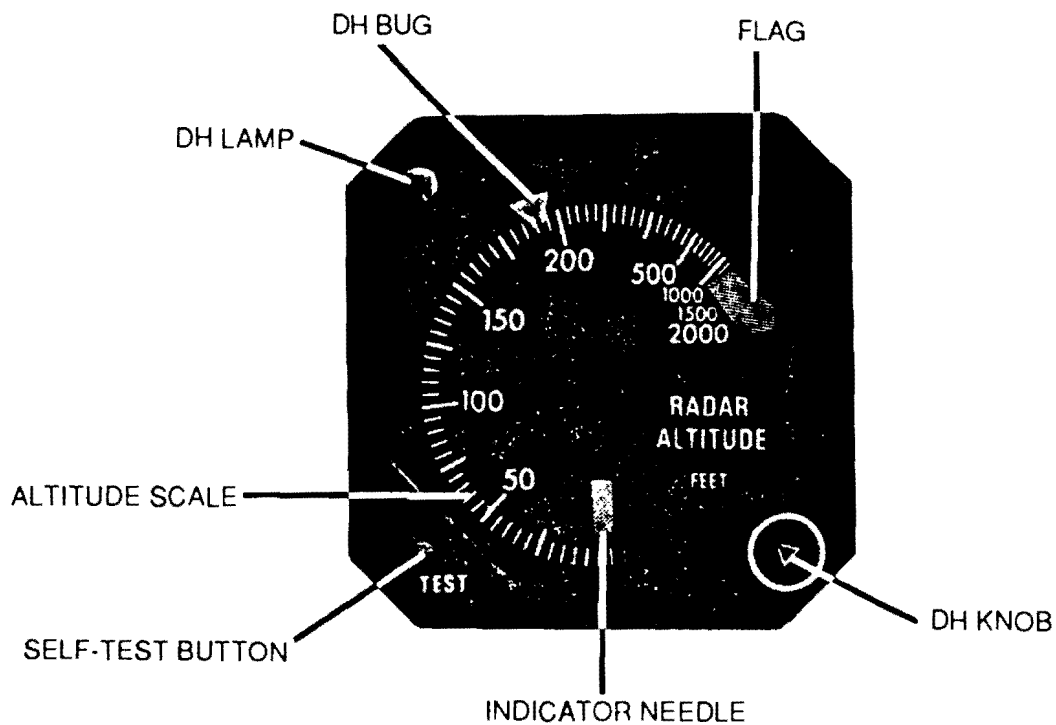


FIGURE 3-2 KNI 416 CONTROL FUNCTIONS
(Dwg No 696-6206-00)

KING
KCS 305
SLAVED GYROCOMPASS SYSTEM

SECTION III OPERATION

3.1 PREFLIGHT CHECKOUT

A quick check of the basic gyro compass system may be performed as follows:

Prior to application of power to the KCS 305 System, verify that the gyroscope has been off for at least ten minutes in order to assure that the spin motor is at rest. Next, place the system in the "Free Gyro" mode by setting the "Slave In" pushbutton on the KA 51A to the "out" position or by placing the KA 51B "Slave/Free" toggle switch to the "Free" position.

Upon application of power, the COMPASS FLAG in the pilot's heading indicator should remain in view for nearly 30 seconds. Retraction of the flag indicates that the gyro is coming up to speed.

Manual compass card positioning may be checked by depressing the two Heading Drive pushbuttttons located on the KA 51A or by toggling the clockwise and counterclockwise switches on the KA 51B. Note that the COMPASS FLAG appears during manual slaving.

In order to ckeckout the automatic slaving mode, manually set the COMPASS card to a reading 90 degrees removed from true aircraft heading. Next, place the system in the slaved mode and observe that the compass card rotates to within 2 degrees of local magnetic heading. Within 1-1/2 minutes on a KSG 105, KPN 060-0013-00, 20 seconds on a KSG 105, KPN 060-0013-01, or 70 seconds on a KSG 105-01 with Mod 4, the compass flag will retract, and automatic slaving will continue at the slow rate of 2.5 degrees/minute.

The slaving meter on the KA 51A/51B indicates the instantaneous error between the compass card presentation and the signal from the flux valve. At middle-north latitudes, one division on the meter scale corresponds to approximately 2 degrees of error. Meter indications are valid only during steady, level aircraft attitudes.

3.2 INFIGHT CHECKOUT

Achieve a steady level flight attitude and depress the "Slave-In" switch on the KA 51A or place the "Slave/Free" toggle switch on the KA 51B to the "Free" position. The COMPASS FLAG will appear for 1-1/2 minutes on a KSG 105, KPN 060-0013-00, less than 20 seconds on a KSG 105, KPN 060-0013-01, or less than 70 seconds on a KSG 105-01 with Mod 4, during which time the automatic fast slaving feature will cause the COMPASS card to align with true magnetic heading. When the COMPASS FLAG retracts, the system will be in the normal slaving mode. Departures from level flight may now be made without affecting the accuracy of the compass readings.

The slaving meter on the KA 51A/51B indicates the instantaneous error between the compass card presentation and the signal from the flux value. At middle-north latitudes, one division on the meter scale corresponds to approximately 2 degrees error. Meter indications are valid only during steady level flight conditions.

Normally, any heading errors which develop in the gyro are corrected automatically at a rate of 2.5 degrees/minute. This mode is selected by the "Slave-In" switch on the KA 51A or the "Slave/Free" switch on the KA 51B.

Decoupling of the flux valve by retracting the "Slave-In" switch on the KA 51A or placing the KA 51B to the "Free" mode, allows the pilot to manually synchronize the heading card to the reference of his choice at the manual slave rate of 10 degrees/sec. Long term drift of the gyro must be taken into account under this condition.

Generally, this system is left in the "Slave" mode at all times. During aircraft power-up the compass system will initiate the automatic fast slave cycle for 1-1/2 minutes on a KSG 105, KPN 060-0013-00, less than 20 seconds on a KSG 105, KPN 060-0013-01, or less than 70 seconds on a KSG 105-01 with Mod 4, and then revert to the normal slave rate. If the "Slave" switch should be cycled, or if gyro power is momentarily disrupted, the automatic fast slave cycle will be re-engaged.