

Pilot's Guide Gold Crown

Gold Crown Avionics



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This Pilot's Guide compiles the operation sections from Bendix/King Gold Crown Installation manuals.

The major sections of this Pilot's Guide are arranged by unit type with the subsections being individual units.

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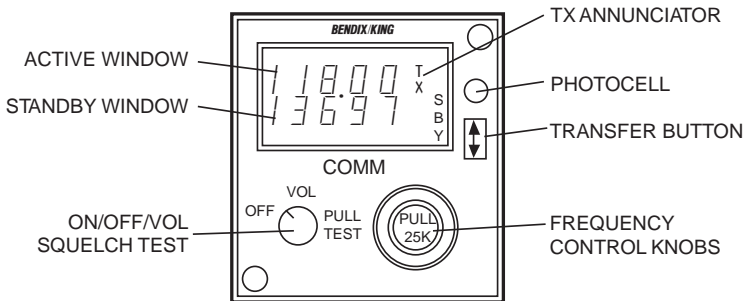
VHF Comm

KFS 598 Operating Procedures

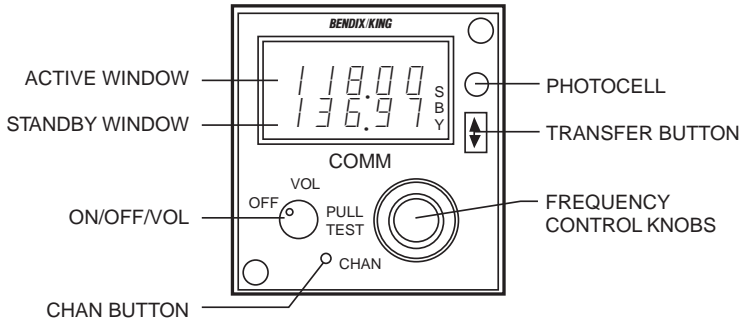
Rotate the VOL control knob clockwise from the OFF position. To override the automatic squelch pull the VOL knob out and rotate the VOL control for desired listening level on the noise being produced by the receiver. Push the VOL knob back in to activate the automatic squelch.

Select the desired operating frequency in the Standby display by rotating the Frequency Control knobs either clockwise or counterclockwise. A clockwise rotation will increase the frequency while a counterclockwise rotation will decrease the frequency. The larger tuning knob will increase or decrease the MHz portion of the display in 1 MHz steps. At band edge

(118 MHz on the low end and either 136 or 151 MHz on the high end) the next 1 MHz step will cause the display to wrap around to the opposite band edge. The smaller tuning knob will increase or decrease the KHz portion of the display in 50 KHz steps with the knob pushed in or in 25 KHz steps with the knob pulled out. Rollover to the opposite band edge occurs at 000 and 975 KHz. While in the Standby Entry mode, the transceiver remains tuned to the frequency displayed in the Active window at all times. To transfer the Standby Frequency to the active, press the Transfer Button. During the transmit operation, a TX annunciation will light just right of the active display, signifying that the transceiver is in the Transmit mode of operation.



KFS 598 Comm Control Functions



KFS 598A Control Functions

KFS 598A Operating Procedures

Rotate the VOL control knob clockwise from the OFF position. A momentary unsquelched state will occur. To override the automatic squelch state, push the PUSH TST knob. To return to the squelched state push the PUSH TST knob once again.

When the mic is keyed, the TX annunciator will light just right of the active display. If the mike key is held down for more than 1-1/2 minutes, the key line to the KTR 908 will be disabled. The total display will then flash as long as the mic key is depressed.

Frequency Mode:

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 tuning knobs, and then transferring the selected frequency into the Active window by pressing the Transfer button. The larger tuning knob will increase or decrease the MHz portion of the display in 1 MHz steps. At band edge (118 MHz on the low end and either 136 or 151 MHz on the high end) the next 1 MHz step will cause the display to wrap around to the opposite band edge. The smaller tuning knob will increase or decrease the KHz portion of the display in 50 KHz steps with the knob pushed in or in 25 KHz steps with the knob pulled out. Rollover to the opposite band edge occurs at 000 and 975 KHz. While in the Standby Entry mode, the transceiver remains tuned to the frequency displayed in the Active window at all times. During the transmit operation, a TX annunciation will light just right of the active display, signifying that the transceiver is in the Transmit mode of operation.

Civil Operation

Active Entry

The Active Entry mode is entered 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 Frequency Control 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.

Channel Mode

A. Momentarily pressing the CHAN button while in Frequency mode 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 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 tuning knob changes the channel number and corresponding frequency. The channels will only increase and decrease to channels that have been programmed. If there has been no activity for five seconds the unit will return to Frequency mode and the channel frequency is placed in the Standby window. Pressing the CHAN button before the 5 second delay is completed will return the unit to Frequency mode and the status of Frequency mode prior to entering Channel mode remains the same.

B. When 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 the Transfer button or allowing the unit to time out will bring it back to Standby Entry.

Program Mode

A. Program mode is selected by pressing and holding the CHAN button for longer than two seconds. The unit tunes the KTR 908 to 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 and turning either tuning knob changes the Channel number. When the Channel number is flashing, 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 secured mode prevents the pilot from changing the programmed channels. This is accomplished by a strap in the aircraft wiring.

The tuning knobs then work as in Frequency mode, except between rollover points 118.XX to 136.XX and 136.XX to 118.XX, or 118.XX to 151.XX and 151.XX to 118.XX for extended frequency range, dashes are displayed to unprogram the channel. When frequency is flashing, pressing the Transfer button will cause the frequency to stop flashing and the Channel number to flash allowing the next channel to be programmed.

B. If no 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 frequencies from what they were prior to entering Program mode.

Remote Transfer

Operates identically as front panel Transfer button with the exception that holding the Remote Transfer button for two seconds does not place unit in Active Entry.

Military Operation

Channel Mode

The Channel Mode operates the same as in civil operation except the Channel Mode does not time out and return to the Frequency Mode.

Program Mode

The Program Mode operates the same as in civil operation.

Default Mode

Turning the units on while holding the Transfer button down will bring the unit on in Active Entry and load 120.00MHz as the Active frequency. This will aid the pilot in blind tuning the radio in the case of display failure.

Remote Transfer

Operates identically as front panel Transfer button with the exception that holding the Remote Transfer button for two seconds does not place unit in Active Entry.

Remote Channel

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

NAV/VOR/ILS

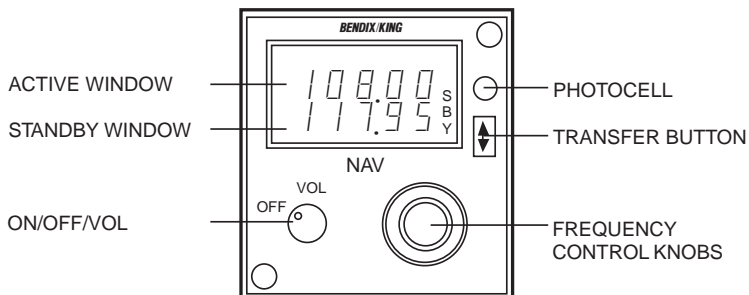
KFS 564

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.

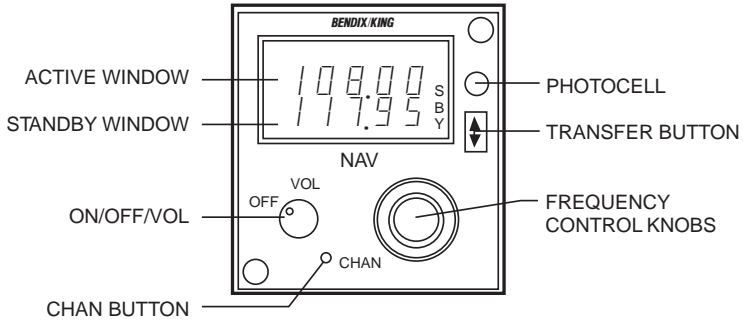
Frequency selection is accomplished with the Frequency Control knobs. Clockwise rotation will increase the frequency and counterclockwise rotation will decrease the frequency. The larger knob will change the MHz portion of the display. At band edge (108 or 117MHz) the next 1MHz step will cause the display 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 Frequency Control 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 Frequency Control 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.



KFS 564 Control Functions



KFS 564A Control Functions

KFS 564A

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.

Frequency Mode:

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 Frequency Select knobs, and then transferring the selected frequency into the Active window by pressing the Transfer button. The larger control knob will increase or decrease the MHz portion of the display in 1MHz steps with rollover at each band edge (108 or 117MHz). The smaller

Frequency Control 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.

Active Entry

The Active Entry mode is entered 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 Frequency Control 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.

Civil Operation

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 Frequency Control knob will increase or decrease the Channel number. The unit will only increase or decrease 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.

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 Frequency Control 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 Frequency Control 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 allowing the next channel to be programmed.

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 reentering the Frequency mode the Active and Standby frequencies displayed will be the last frequencies displayed prior to entering the Program mode.

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.

Military Operation

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.

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 Frequency Control knobs. 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 Frequency Control 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.

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. This will aid the pilot in blind tuning the unit in case of a display failure.

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.

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.

Navigation Indicator

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.

VOR/LOC Deviation Indicator

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

Glideslope Deviation Indicator

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

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

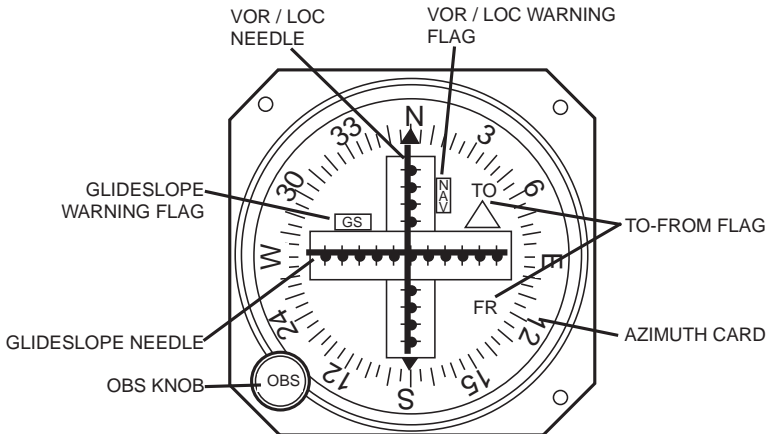
the semicircle centered about the reciprocal of the selected course. If the station direction is within 90 degrees of the selected course radial, the FROM flag will be visible.

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.

Glideslope Warning Flag

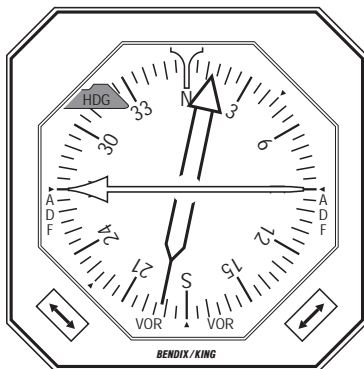
The Glideslope warning flag is fully visible when the glideslope signal is unreliable or when a malfunction has occurred in the glideslope receiver. The flag is out of view when the signal is reliable and the glideslope receiver is functioning properly.



Navigation Indicator

Radio Magnetic Indicator (RMI)

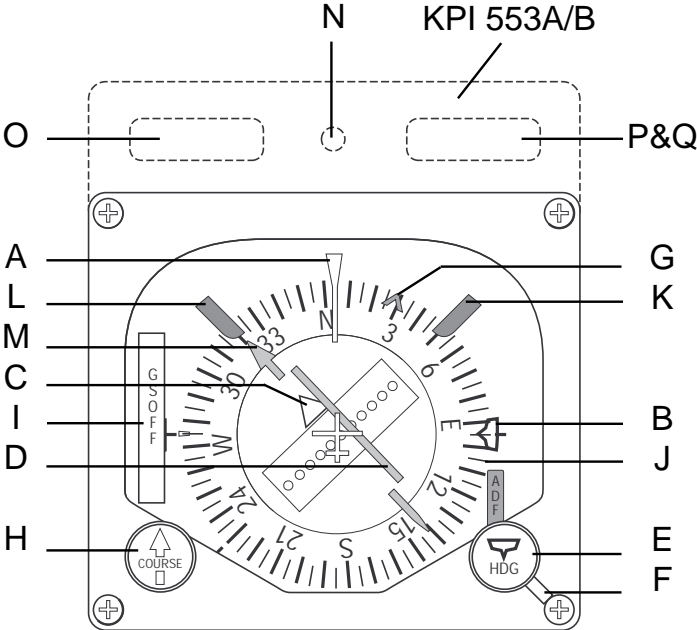
The VOR needle on the RMI continuously indicates the magnetic heading to the station referenced to the RMI compass card.



Radio Magnetic Indicator (RMI)

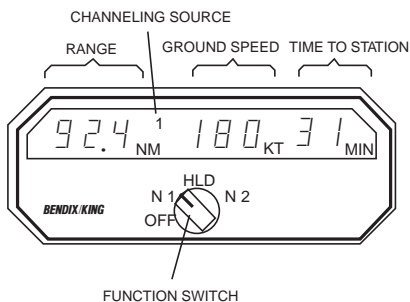
KPI 552B and KPI 553A/B Indicator

The following controls and indicators are on the KPI 552B and KPI 553A/B.

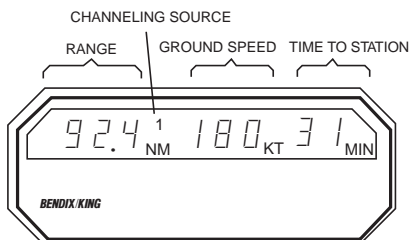


- A. Lubber Line**
Fixed reference mark for compass card. Represents nose of aircraft.
- B. Heading Bug (Orange)**
Indicates Selected Heading.
- C. TO-FROM Indicator**
Indicates whether the course pointer is showing the magnetic bearing TO or FROM the station.
- D. Lateral Deviation Indicator**
Indicates flight on selected VOR radial, localizer beam or RNAV track with respect to aircraft location. Scale is 1 dot equals typically $\pm 5^\circ$ of localizer deviation, $\pm 2^\circ$ of VOR deviation, ± 1 mile or RNAV Enroute deviation, and $\pm .25$ mile RNAV Approach deviation.
- E. Heading Select Knob**
Positions Heading Bug on Compass Card. Knob face includes a color coded symbol representing the Heading Bug.
- F. ADF/NAV Selector**
Rotating lever determines which information the ADF/NAV indicator (G) is displaying. Automatic direction finder (ADF) and radio magnetic indicator (RMI or NAV) information is supplied by aircraft avionics.
- G. ADF/NAV Indicator (Green)**
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**
Indicates glideslope beam center with respect to (from View) location. Glideslope scale is typically $\pm .35^\circ$ 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 (Red)**
In view when an erroneous directional gyro input, a power failure or a compass card servo failure occurs.
- L. NAV Warning Flag (Red)**
In view when navigational receiver output is invalid.
- M. Course Arrow (Yellow)**
Indicates Selected Course.
- N. Photoresistor (KPI 553A/B)**
Senses light for display dimming circuit.
- O. Distance Display (KPI 553A/B)**
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 (KPI 553A/B)**
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.
- Q. GS/TTG Transfer Button (KPI 553“B” only)**
Pressing the GS/TTG transfer button switches the right-hand 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 1250 ft. Below 1250 ft. the display changes to altitude as indicated by the legend.

DME/TACAN



KDI 572 Display



KDI 573/574 Display

DME KDI 572/573/574 When Used With the KDM 706/706A

The effective range of a DME depends on many factors: most important being line of sight limitations determined by the altitude of the aircraft (see [Table 1](#)), weather, the location and altitude of the ground transmitter and transmitter power output. The degree of maintenance of the KDM 706/706A DME and maintenance of the ground station also contribute to a DME's effective range capability. Usually line-of-sight limitations will prevent an aircraft on the ground from receiving and locking onto a VORTAC station.

The DME system electronically

converts elapsed time-to-distance by measuring the length of time between the transmission of a radio signal to a pre-selected VORTAC station and reception of the reply signal. This distance is then indicated in nautical miles on the DME range/ground speed/time-to-station indicator. This 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 low altitude and long range. These distances may differ considerably when in close proximity to a VORTAC facility. However, if the range is three times

the altitude or greater, this error is negligible. To obtain accurate ground speed and time-to-station, the aircraft must be on a direct course to or from the VORTAC facility.

Note: *It is recommended that the power to the DME system be turned on only after engine start-up as this procedure increases the reliability of the solid state circuitry.*

The KDI 572 Master Indicator function selector switch serves as the Power ON-OFF control for the system as well as selecting the DME channeling source N1 (NAV 1), Hold (NAV 1 or NAV 2) and N2 (NAV 2). In most typical installations, channeling of the DME is accomplished with the No. 1 and No. 2 VOR/LOC frequency selectors in the aircraft. The KDI 573 requires a external panel mounted switch to provide ON-OFF and NAV 1, HOLD, NAV 2 Switching.

The DME uses channels that are paired with VOR/LOC channels. Tuning the desired VOR/LOC frequency on the NAV frequency selector automatically pairs the proper DME channel. In a few installations, a separate DME control head is installed. It selects the VORTAC channel enabling the DME to function separately from the aircraft's NAV system.

Information on VORTAC stations can be found by checking the current aeronautical chart.

One or two frequency selector controls may be used with the KDI 572/574 Master Indicator. The KDI 572/574 also provides a Hold function. After a DME channel has been selected, the Hold function may be selected. This will uncouple the frequency selector control from the DME and allow a new navigation frequency to be selected without channeling the DME 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 DME 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.

To prevent the display of false information the KDI 572/574 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 indicator 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 indicator will display "RNV" when the displayed range, ground speed and time-to-station are derived from an area navigation system.

The KDI 572/574 Indicator displays range to the nearest nautical mile from 0 to 99.9 nautical miles and to the nearest 1 nautical mile from 100 to 389 nautical miles. Ground speed 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 KDI 573 Slave Indicator (see Figure) provides a display identical to the display on the KDI 572 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 NAV Frequency Selector provides frequency selection for the NAV receiver (including glideslope channels) as well as DME channels. The desired navigation frequency is selected by use of two controls located on the front panel. The large (inner) control is used to increase or decrease the navigation frequency in

one MHz increments from 108.00MHz to 117.00MHz. The small (outer) control is used to increase or decrease the navigation frequency in 50 KHz increments. The frequency selected is displayed in the "frequency window".

The DME system provides an audio output capability allowing the pilot to identify the DME ground station by listening to the CW tones transmitted by the ground station at 30-second intervals.

Table 1 Aircraft Altitude Versus Range Capability

AGL ALTITUDE (FEET)	LINE OF SIGHT RANGE (NAUTICAL MILES)	AGL ALTITUDE (FEET)	LINE OF SIGHT RANGE (NAUTICAL MILES)
1,000	39	25,000	195
2,000	55	30,000	213
3,000	67	35,000	230
4,000	78	40,000	246
5,000	87	45,000	261
6,000	95	50,000	275
7,000	103	60,000	301
8,000	110	70,000	325
9,000	117	80,000	348
10,000	123	90,000	369
15,000	151	100,000	389
20,000	174		

TACAN

KFS 579A and KDI 572/573/574 When Used With the KTU 709

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 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 display range to the nearest 0.1 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 an 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 channeled 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.

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 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

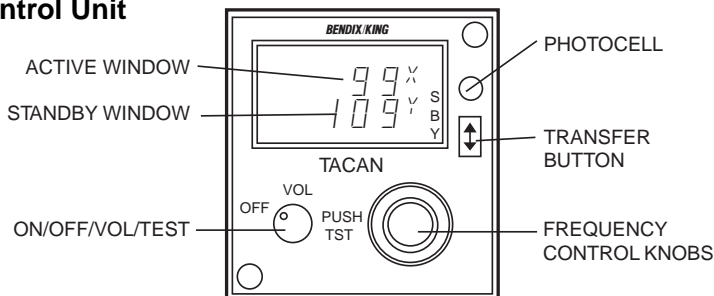
NAV system. The number of channels is limited to 200 if tuning is accomplished using a NAV control head. A TACAN control head will tune all 252 channels. This unit selects TACAN channels 1 thru 126, X or Y. To tune a VORTAC station, one must know the channel number of the corresponding VOR frequency. Refer to [Table 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 "scalloping". 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.

KFS 579A TACAN Control Unit



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

Display Modes 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 ending digit in the standby display. It also selects X or Y channel; with knob out, either X or Y channels are present and with knob in either 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.

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.

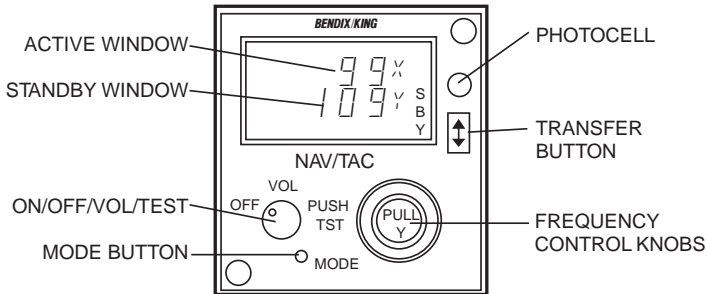
Remote Transfer (Optional Remote Installation)

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.

Control Disable

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.

KFS 579A NAV/TACAN Control Unit



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

Display Modes

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 of 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.

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.

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.

Remote Transfer (Optional Remote Installation)

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.

Control Disable

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

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. This will aid the pilot in blind tuning the radio in case of a display failure.

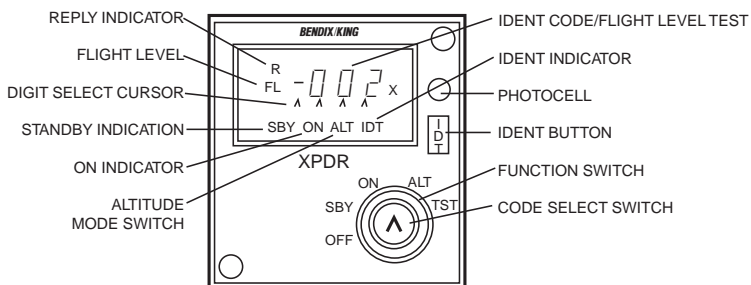
**Table 2 TACAN/DME Channel Designation
and Paired Frequencies**

VOR FREQ	TACAN CHANNELS	XMIT & RCV FREQ		VOR FREQ	TACAN CHANNELS	XMIT & RCV FREQ	
134.40	(1X)	1025	962	108.55	(22Y)	1046	1109
134.45	(1Y)	1025	1088	108.60	(23X)	1047	984
134.50	(2X)	1026	963	108.65	(23Y)	1047	1110
134.55	(2Y)	1026	1089	108.70	(24X)	1048	985
134.60	(3X)	1027	964	108.75	(24Y)	1048	1111
134.65	(3Y)	1027	1090	108.80	(25X)	1049	986
134.70	(4X)	1028	965	108.85	(25Y)	1049	1112
134.75	(4Y)	1028	1091	108.90	(26X)	1050	987
134.80	(5X)	1029	966	108.95	(26Y)	1050	1113
134.85	(5Y)	1029	1092	109.00	(27X)	1051	988
134.90	(6X)	1030	967	109.05	(27Y)	1051	1114
134.95	(6Y)	1030	1093	109.10	(28X)	1052	989
135.00	(7X)	1031	968	109.15	(28Y)	1052	1115
135.05	(7Y)	1031	1094	109.20	(29X)	1053	990
135.10	(8X)	1032	969	109.25	(29Y)	1053	1116
135.15	(8Y)	1032	1095	109.30	(30X)	1054	991
135.20	(9X)	1033	970	109.35	(30Y)	1054	1117
135.25	(9Y)	1033	1096	109.40	(31X)	1055	992
135.30	(10X)	1034	971	109.45	(31Y)	1055	1118
135.35	(10Y)	1034	1097	109.50	(32X)	1056	993
135.40	(11X)	1035	972	109.55	(32Y)	1056	1119
135.45	(11Y)	1035	1098	109.60	(33X)	1057	994
135.50	(12X)	1036	973	109.65	(33Y)	1057	1120
135.55	(12Y)	1036	1099	109.70	(34X)	1058	995
135.60	(13X)	1037	974	109.75	(34Y)	1058	1121
135.65	(13Y)	1037	1100	109.80	(35X)	1059	996
135.70	(14X)	1038	975	109.85	(35Y)	1059	1122
135.75	(14Y)	1038	1101	109.90	(36X)	1060	997
135.80	(15X)	1039	976	109.95	(36Y)	1060	1123
135.85	(15Y)	1039	1102	110.00	(37X)	1061	998
135.90	(16X)	1040	977	110.05	(37Y)	1061	1124
135.95	(16Y)	1040	1103	110.10	(38X)	1062	999
108.00	(17X)	1041	978	110.15	(38Y)	1062	1125
108.05	(17Y)	1041	1104	110.20	(39X)	1063	1000
108.10	(18X)	1042	979	110.25	(39Y)	1063	1126
108.15	(18Y)	1042	1105	110.30	(40X)	1064	1001
108.20	(19X)	1043	980	110.35	(40Y)	1064	1127
108.25	(19Y)	1043	1106	110.40	(41X)	1065	1002
108.30	(20X)	1044	981	110.45	(41Y)	1065	1128
108.35	(20Y)	1044	1107	110.50	(42X)	1066	1003
108.40	(21X)	1045	982	110.55	(42Y)	1066	1129
108.45	(21Y)	1045	1108	110.60	(43X)	1067	1004
108.50	(22X)	1046	983	110.65	(43Y)	1067	1130

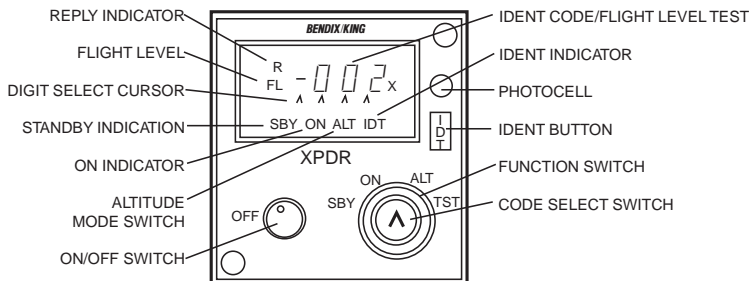
VOR FREQ	TACAN CHANNELS	XMIT & RCV FREQ		VOR FREQ	TACAN CHANNELS	XMIT & RCV FREQ	
110.70	(44X)	1068	1005	134.00	(67X)	1091	1154
110.75	(44Y)	1068	1131	134.05	(67Y)	1091	1028
110.80	(45X)	1069	1006	134.10	(68X)	1092	1155
110.85	(45Y)	1069	1132	134.15	(68Y)	1092	1029
110.90	(46X)	1070	1007	134.20	(69X)	1093	1156
110.95	(46Y)	1070	1133	134.25	(69Y)	1093	1030
111.00	(47X)	1071	1008	112.30	(70X)	1094	1157
111.05	(47Y)	1071	1134	112.35	(70Y)	1094	1031
111.10	(48X)	1072	1009	112.40	(71X)	1095	1158
111.15	(48Y)	1072	1135	112.45	(71Y)	1095	1032
111.20	(49X)	1073	1010	112.50	(72X)	1096	1159
111.25	(49Y)	1073	1136	112.55	(72Y)	1096	1033
111.30	(50X)	1074	1011	112.60	(73X)	1097	1160
111.35	(50Y)	1074	1137	112.65	(73Y)	1097	1034
111.40	(51X)	1075	1012	112.70	(74X)	1098	1161
111.45	(51Y)	1075	1138	112.75	(74Y)	1098	1035
111.50	(52X)	1076	1013	112.80	(75X)	1099	1162
111.55	(52Y)	1076	1139	112.85	(75Y)	1099	1036
111.60	(53X)	1077	1014	112.90	(76X)	1100	1163
111.65	(53Y)	1077	1140	112.95	(76Y)	1100	1037
111.70	(54X)	1078	1015	113.00	(77X)	1101	1164
111.75	(54Y)	1078	1141	113.05	(77Y)	1101	1038
111.80	(55X)	1079	1016	113.10	(78X)	1102	1165
111.85	(55Y)	1079	1142	113.15	(78Y)	1102	1039
111.90	(56X)	1080	1017	113.20	(79X)	1103	1166
111.95	(56Y)	1080	1143	113.25	(79Y)	1103	1040
112.00	(57X)	1081	1018	113.30	(80X)	1104	1167
112.05	(57Y)	1081	1144	113.35	(80Y)	1104	1041
112.10	(58X)	1082	1019	113.40	(81X)	1105	1168
112.15	(58Y)	1082	1145	113.45	(81Y)	1105	1042
112.20	(59X)	1083	1020	113.50	(82X)	1106	1169
112.25	(59Y)	1083	1146	113.55	(82Y)	1106	1043
133.30	(60X)	1084	1021	113.60	(83X)	1107	1170
133.35	(60Y)	1084	1147	113.65	(83Y)	1107	1044
133.40	(61X)	1085	1022	113.70	(84X)	1108	1171
133.45	(61Y)	1085	1148	113.75	(84Y)	1108	1045
133.50	(62X)	1086	1023	113.80	(85X)	1109	1172
133.55	(62Y)	1086	1149	113.85	(85Y)	1109	1046
133.60	(63X)	1087	1024	113.90	(86X)	1110	1173
133.65	(63Y)	1087	1150	113.95	(86Y)	1110	1047
133.70	(64X)	1088	1151	114.00	(87X)	1111	1174
133.75	(64Y)	1088	1025	114.05	(87Y)	1111	1048
133.80	(65X)	1089	1152	114.10	(88X)	1112	1175
133.85	(65Y)	1089	1026	114.15	(88Y)	1112	1049
133.90	(66X)	1090	1153	114.20	(89X)	1113	1176
133.95	(66Y)	1090	1027	114.25	(89Y)	1113	1050

VOR FREQ	TACAN CHANNELS	XMIT & RCV FREQ		VOR FREQ	TACAN CHANNELS	XMIT & RCV FREQ	
114.30	(90X)	1114	1177	116.15	(108Y)	1132	1069
114.35	(90Y)	1114	1051	116.20	(109X)	1133	1196
114.40	(91X)	1115	1178	116.25	(109Y)	1133	1070
114.45	(91Y)	1115	1052	116.30	(110X)	1134	1197
114.50	(92X)	1116	1179	116.35	(110Y)	1134	1071
114.55	(92Y)	1116	1053	116.40	(111X)	1135	1198
114.60	(93X)	1117	1180	116.45	(111Y)	1135	1072
114.65	(93Y)	1117	1054	116.50	(112X)	1136	1199
114.70	(94X)	1118	1181	116.55	(112Y)	1136	1073
114.75	(94Y)	1118	1055	116.60	(113X)	1137	1200
114.80	(95X)	1119	1182	116.65	(113Y)	1137	1074
114.85	(95Y)	1119	1056	116.70	(114X)	1138	1201
114.90	(96X)	1120	1183	116.75	(114Y)	1138	1075
114.95	(96Y)	1120	1057	116.80	(115X)	1139	1202
115.00	(97X)	1121	1184	116.85	(115Y)	1139	1076
115.05	(97Y)	1121	1058	116.90	(116X)	1140	1203
115.10	(98X)	1122	1185	116.95	(116Y)	1140	1077
115.15	(98Y)	1122	1059	117.00	(117X)	1141	1204
115.20	(99X)	1123	1186	117.05	(117Y)	1141	1078
115.25	(99Y)	1123	1060	117.10	(118X)	1142	1205
115.30	(100X)	1124	1187	117.15	(118Y)	1142	1079
115.35	(100Y)	1124	1061	117.20	(119X)	1143	1206
115.40	(101X)	1125	1188	117.25	(119Y)	1143	1080
115.45	(101Y)	1125	1062	117.30	(120X)	1144	1207
115.50	(102X)	1126	1189	117.35	(120Y)	1144	1081
115.55	(102Y)	1126	1063	117.40	(121X)	1145	1208
115.60	(103X)	1127	1190	117.45	(121Y)	1145	1082
115.65	(103Y)	1127	1064	117.50	(122X)	1146	1209
115.70	(104X)	1128	1191	117.55	(122Y)	1146	1083
115.75	(104Y)	1128	1065	117.60	(123X)	1147	1210
115.80	(105X)	1129	1192	117.65	(123Y)	1147	1084
115.85	(105Y)	1129	1066	117.70	(124X)	1148	1211
115.90	(106X)	1130	1193	117.75	(124Y)	1148	1085
115.95	(106Y)	1130	1067	117.80	(125X)	1149	1212
116.00	(107X)	1131	1194	117.85	(125Y)	1149	1086
116.05	(107Y)	1131	1068	117.90	(126X)	1150	1213
116.10	(108X)	1132	1195	117.95	(126Y)	1150	1087

ATCRBS Transponder



KFS 576 Control Unit



KFS 576A Control Unit

KFS 576/576A

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

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, 5600, 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.

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

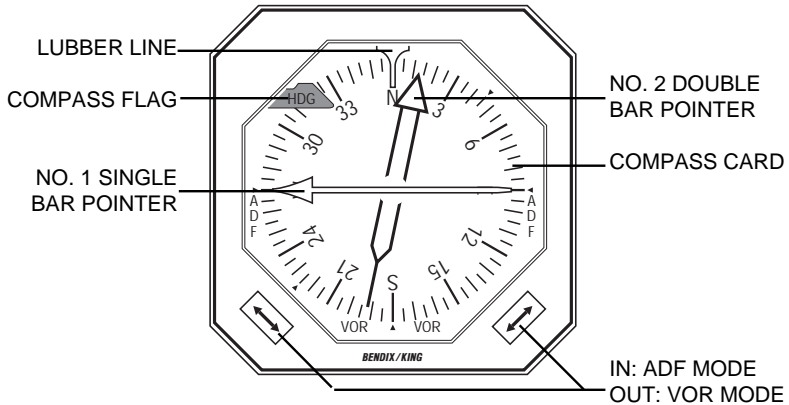
indicates a flight level of 4200 feet. If an encoder is not included in the installation, a reading of -002 hundred feet will be displayed, unless the control unit is a KFS 576 Mod 1 or a KFS 576A then dashes will appear. The transmitter is inhibited during the test function. The TST position provides 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.

RMI



KNI 582 Control Functions

KNI 582

The KNI 582 display is discussed below:

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.

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.

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.

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.

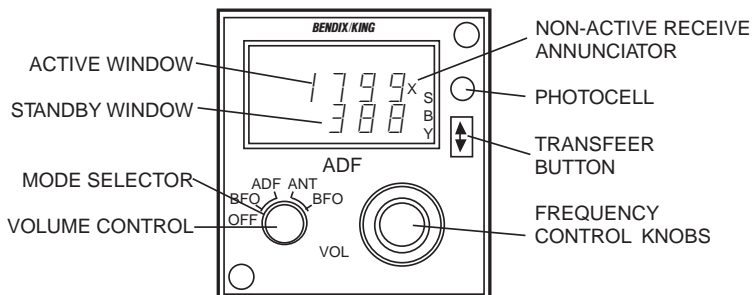
ADF

KFS 586/586A

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.



KFS 586 Control Functions

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.

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

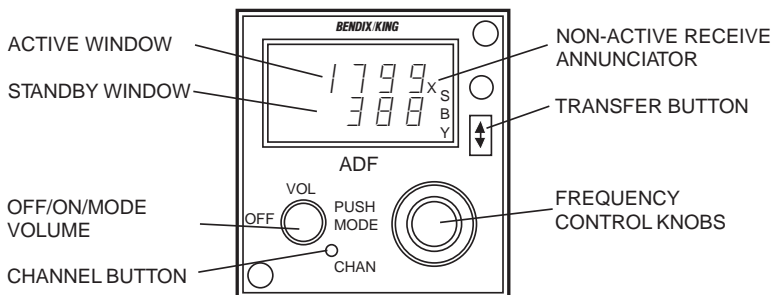
the top of the display. Holding the transfer button depressed for approximately 2 seconds causes the Standby frequency display to go out. The Active frequency may now be controlled directly by the frequency selector control. In this tuning mode, the station audio is present, permitting the operator to 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. This is to alert the pilot he has selected an out of band frequency.

D. X Character

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



KFS 586A Control Functions

KFS 586A Operation

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 Frequency Control 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 Frequency Control knobs operate as in Standby Entry, but as the Active/Chan display changes so does the tuned frequency of the radio.

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

Civil Operation

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 Frequency Control 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.

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. The channel number flashes. Either Frequency Control 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 Frequency Control knobs 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 allowing the next channel to be programmed. 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.

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.

Military Operation

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 Frequency Control 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.

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 Frequency Control 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 Frequency Control 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 rollover 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.

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. This will aid the pilot in blind tuning the radio in case of a display failure.

X Character

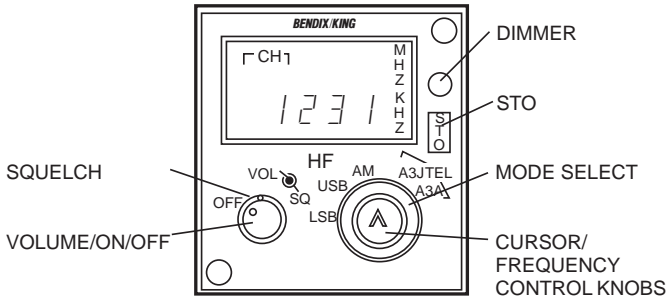
The small x to the left of the Active/Chan display turns off in the ADF and ADF/BFO modes only when the ADF is pointing.

Marine Distress Frequency Operation

A strap on the KFS 586 or 586A will allow the KDF 806 to tune the marine distress frequency, 2182 KHZ. To select 2182 KHZ, channel the KFS 586/A to any 1700 frequency and rotate the large frequency select knob one click to the right, clockwise. The KDF 806 will be tuned to 2182. To fine tune the reception, the small knob may be used to vary the frequency between 2180 and 2189.

To return to standard ADF frequencies rotate the large knob to the right, clockwise. The first click will select the 100 KHZ frequency, an invalid ADF frequency. The display will flash and continue to flash until the second rotation click and a valid frequency is tuned.

HF/SSB COMM



KFS 594 Control Functions

KFS 594

The operating controls of the KFS 594 are described as follows:

ON/OFF/Volume Control

The smaller left most knob controls the ON/OFF switch and the Volume of the received audio. Clock-wise 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/Frequency Control Knob

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.

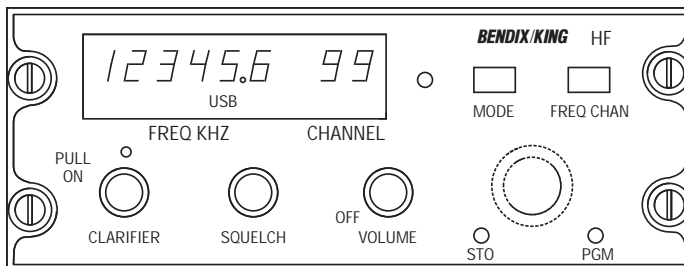
STO

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.

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.



KCU 951 Control Functions

KCU 951

The operating controls of the KCU 951 are described as follows:

ON/OFF/Volume

Applies power to the unit and controls the audio output level.

Squelch

Squelch Control provides variable squelch threshold control.

Clarifier

Clarifier Control provides up to 250Hz of local oscillator adjustment during the receive mode of operation only. This function is performed by varying the master reference oscillator frequency. Means are provided to disengage the clarifier function by pushing the adjust knob in.

Mode

The emission mode switch is a momentary pushbutton that selects LSB, AME, USB or optional A3A. Emissions mode selection is cyclic moving from left to right. This switch is active at all times except transmit. A3A is indicated by displaying the AM and USB messages simultaneously.

Freq/Chan

This switch transfers the HF System from a direct frequency operation to a channelized form of operation. The switch operates as a two position switch. The depressed position establishes the channelized form of operation.

Channel/Frequency Select

This selector consists of two concentric knobs that controls the channel and frequency digits, plus the lateral position of the cursor. These switches function as Frequency Control switches.

Channel Control

The outer knob is not functional when the **FREQ/CHAN** switch is in the **CHAN** position. The inner knob will provide channel control from 1 through 99.

Frequency Control

The outer concentric knob becomes a cursor (flashing light) control with the **FREQ/CHAN** switch in the **FREQ** position. Rotation of the outer knob in a counterclockwise direction, one step will cause the right digit to flash. The flashing digit can be increased or decreased with the inner knob with rollover to 0 or 9 or optional automatic carry or borrow to those digits more significant than the cursor digit. A clockwise rotation of the outer knob will cause the cursor (flashing digit) to move in a left to right direction. The Tens megahertz digit cannot be selected. The units digit selects frequencies from 2 to 29MHz in 1MHz steps with rollover from 2 to 29MHz and 29 to 2MHz.

Program (PGM) Switch

This switch enables channelized data to be modified. The **PGM** message will be displayed whenever this switch is depressed.

Store (STO) Switch

This switch is used to store the displayed data when programming the preset channels.

System Power Up

When power is first applied (**OFF/ON VOL CONTROL**), the frequency display is blanked and transmit is inhibited until the crystal oven is heated up and synthesizer is locked. If the **FREQ/CHAN** button is in the depressed position, the active channel will be displayed. The active channel would be the last channel used on transmit prior to system turn off. The auto coupler is switched to the "bypassed" state. The system is functioning as a receiver connected directly to the HF antenna.

The receiver frequency will appear on the display (approximately 1-3 minutes after turn on) upon synthesizer lockup and oven warm up. The time delay will depend on the temperature of the crystal oven at turn on.

Depressing the mic key button momentarily will initiate the coupler auto tune sequence. Frequency will again be blanked during the auto tune cycle, the **TX** message will also flash. Emission mode and channel number will continue to be displayed. Active frequency will reappear upon completion of the coupler tune sequence.

Channel Operation

Channel number, emission mode and active frequency will be displayed. When operating in the optional **A3A** mode the **AM** and **USB** messages are both illuminated. When transmitting in the channel mode, the transmit frequency and an added **TX** message will be displayed. Rotation of the inner control knob causes the channel number to be increased or

decreased. The coupler is switched to the bypass condition when a channel change occurs. Depressing the mic key will initiate the auto tune sequence.

The auto coupler generates a "READY" signal that inhibits the auto coupler tune sequence until a channel change occurs. The auto coupler monitors SWR during transmit. Should the SWR degrade to a ratio greater than 3.6:1, the auto coupler will start a tune cycle synchronized with the next mic key depression.

If a PA or coupler fault is detected, transmit is inhibited and the frequency digits will flash indicating the fault. Depressing the mic key or a channel change will clear the fault indication.

All 99 of the preset channels may be programmed for semi duplex simplex or receive only operation, as desired. For the case of the semi duplex channel, the coupler is bypassed in receive to avoid receiver desensitization due to narrow antenna bandwidths.

A "receive only" channel may be programmed to allow only receive mode. When a receive only channel is detected, the coupler is bypassed and transmit is inhibited.

Frequency Mode

Operation in the frequency mode is similar to channel mode except that the frequency is selected as desired rather than on a preprogrammed basis.

Frequency selection is accomplished by means of cursor/digit Frequency Control knobs. No RCV only condition applies. Only simplex operation is allowed. Transmit is therefore allowed on any 100Hz frequency increase in the 2-30MHz frequency range.

In normal operation, the frequency, emission mode and TX message when transmitting is displayed. No channel number is displayed.

When the system is transferred from channelized operation to direct frequency control, the initial frequency displayed is the last frequency used for transmit purposes when operating in the direct frequency mode. Previous emission mode is also saved and displayed.

The coupler is bypassed under the above conditions. Auto tune sequence is initiated with the mic key. Changing any digit on the frequency display will cause a coupler bypass.

The cursor control is the outer concentric knob and works in an increment/decrement fashion. Cursor position is annunciated by flashing the active digit. The cursor occupies one of six positions and moves left to right for clockwise knob rotation.

The cursor hidden position is a blank space between the least significant digit and the most significant digit. Depressing the mic key will cause the cursor to go to the hidden position.

The KCU 951 has the capability of a borrow/carry type of tuning. This type of tuning is called "rollover" and is enabled in the aircraft wiring harness. This allows ease in continuous tuning up and down the frequencies (in 100Hz steps). For example, if rollover is enabled, and two frequency digits are 89 with the cursor on the 9, one more clockwise rotation of the knob will change the digits to 90. Without rollover, the digits would revert to 80. Normally, pilots may prefer not to have rollover enabled, so that they may select each frequency digit individually without borrowing from or carrying to the next digit.

Program Operation

The program mode is accessed by depressing the PGM switch.

The program mode must be entered while in the channel configuration (only channels can be programmed). Once in the program mode, the channel number, emission mode and transmit frequency are displayed. Transmit is inhibited. The transmit frequency however, may be examined by depressing the mic key.

Note: *LSB only available where application permits.*

The following information is stored during the program operation:

- A. Receiver frequency
- B. Transmit frequency
- C. Receive only channel logic
- D. LSB, AME, USB, A3A logic

To set a receive only frequency on any given channel, perform the following:

- A. Depress the PGM switch.
- B. Select channel to be set to receive only.
- C. Set receive frequency.
- D. Select receive mode (LSB, AME, USB, A3A).
- E. Depress STO switch once.
- F. Release the PGM switch or select and program the next channel as desired.

The above procedure stores the displayed frequency, stores the displayed receive frequency and sets the receive only bit.

The "TX" message will flash after the STO actuation to indicate that the transmit frequency will be stored on the next STO actuation.

Setting a simplex channel would require the following steps:

- A. Depress the PGM switch.
- B. Select channel to be set to simplex.
- C. Set receive/transmit frequency.
- D. Select emission mode (LSB, AME, USB, A3A).
- E. Depress STO switch twice.
- F. Release the PGM switch or select and program the next channel as desired.

Setting a semi-duplex channel would require the following steps:

- A. Depress the PGM switch.
- B. Select channel to be set to semi-duplex.
- C. Set receive frequency.
- D. Select emission mode (LSB, AME, USB, A3A)
- E. Depress STO switch once.
- F. Set transmit frequency.
- G. Depress STO switch.
- H. Release the PGM switch or select and program the next channel as desired.

Marker Beacon

KA 35 When Used With the KMR 675

Marker beacon receivers are used to provide accurate fixes by informing the pilot of his passage over beacon stations located on airways and ILS approach courses. Three types of beacons are used. They are the inner marker, the outer marker and the middle marker.

The outer, middle and inner markers are used in conjunction with the radio instrument landing systems. The outer marker is normally positioned on the front localizer course near the point where the glideslope approach path intersects the minimum inbound altitude after the procedure turn. Distance from the airport will vary from 4 to 7 miles. Radio frequency from the marker is projected vertically in an elliptical cone shaped pattern. The marker signal is modulated at 400Hz and is keyed to emit dashes at a rate of two per second.

When passing the outer marker the blue light will flash "on/off" at a two per second rate and the pilot will hear a series of low tone dashes.

The middle marker is normally located on the front localizer course about 3200 feet from the approach end of the ILS runway. The radiated pattern is similar in shape and power to the outer marker. The middle marker signal is modulated with 1300Hz and the modulation is keyed to identify by alternate dots and dashes. When the KMR 675 equipped aircraft passes the middle

marker the pilot hears a medium pitched tone in a series of dots and dashes and the amber light flashes synchronously with the tones.

The inner marker is located close to the end of the runway. The beacon transmitter and antenna project a vertical cone shaped pattern of radio frequency energy. The radio frequency output of the transmitter is modulated with an audio tone of 3000Hz. An aircraft equipped with the KMR 675 will receive a 3000Hz tone in headphone or speaker and the white lamp will be on while over the station. The inner marker is used to indicate a point approximately 1500 feet from the runway and if on proper glide path the altitude above the runway should be approximately 100 feet. The inner marker is used for Cat. II ILS approaches.

The optional Hi-Lo Switch in the KMR 675 provides sensitivity switching control. Many marker receivers provide only a "low sensitivity" position. The effect of the high sensitivity position is to greatly enlarge the size of the cone shaped "area of indication" above the station. An aircraft flying at high altitude or slightly off course may fail to receive the signal when in the low sensitivity position. It is suggested that the KMR 675 marker sensitivity switch first be placed in high sensitivity position until aural and/or lamp indication is received. The control switch may be turned to low sensitivity to reduce the duration of the indication and to obtain a more accurate reading of passage since the signal appears to build and

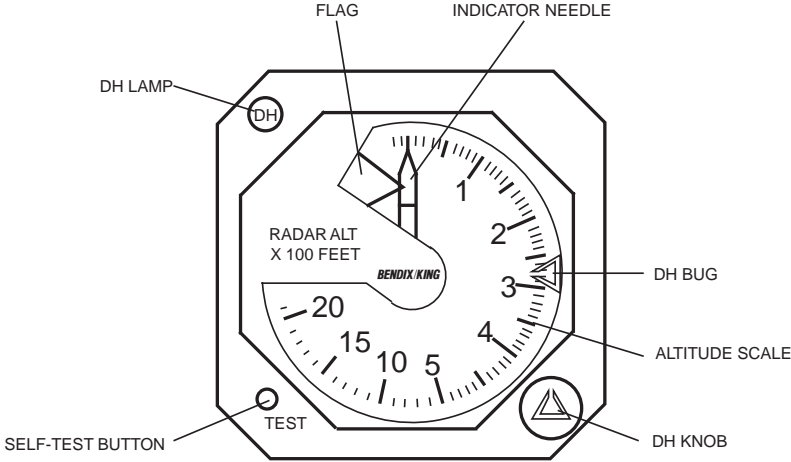
fade faster on low sensitivity. The marker audio may now be turned off to obtain the exact time of center passage from the light only, since the imminence of station passage has already been indicated. This suggestion is especially appropriate if the pilot is involved in radio communication with approach control or tower at that moment.

The Test Function of the KMR 675 performs a functional check of the panel mounted marker lamps as well as the tone amplifiers, lamp circuitry and audio circuitry of the remote receiver. To initiate the test function, place the sensitivity/test switch in the

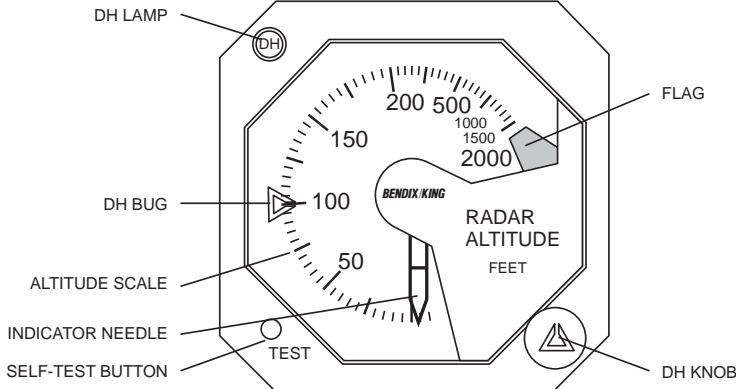
test position. All marker lamps should be illuminated and an 800Hz audio tone should be present. Placing the sensitivity/test switch in either Hi or Lo sensitivity should end the test function. If the sensitivity/ test switch remains in test position for longer than two or three seconds, the test function will automatically end.

The automatic dimming feature of the KMR 675 senses the amount of ambient light in the aircraft and adjusts the brightness of the marker panel lamps. In high ambient light conditions (direct sunlight) the marker panel lamps will be much brighter than in low ambient light conditions.

Radar Altimeter



KNI 415 Control Functions



KNI 416 Control Functions

KNI 415/416

The KNI 415 and KNI 416 Radar Altimeter Indicators 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) bug. 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.

Normal Operation

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, \pm 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, \pm 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.

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.

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.

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 the following section: Emergency Operation.

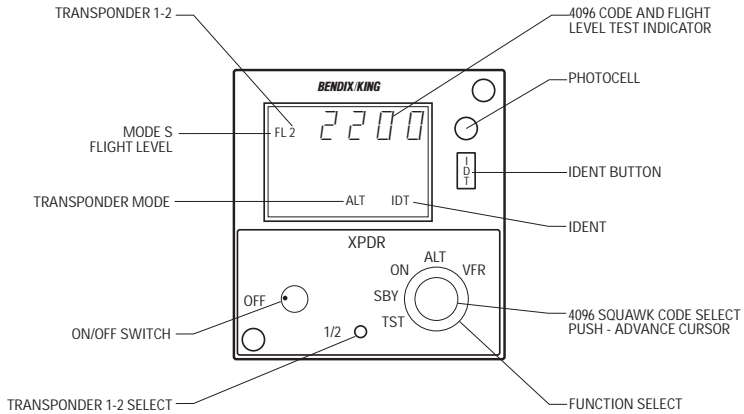
During the actual approach, the Radar Altimeter System provides altitude and altitude trip information to the flight control system. When the decision height is reached, the DH lamp lights to alert the pilot that a decision is to be made. The DH lamp may then be turned off by pressing the lamp in.

Emergency Operation

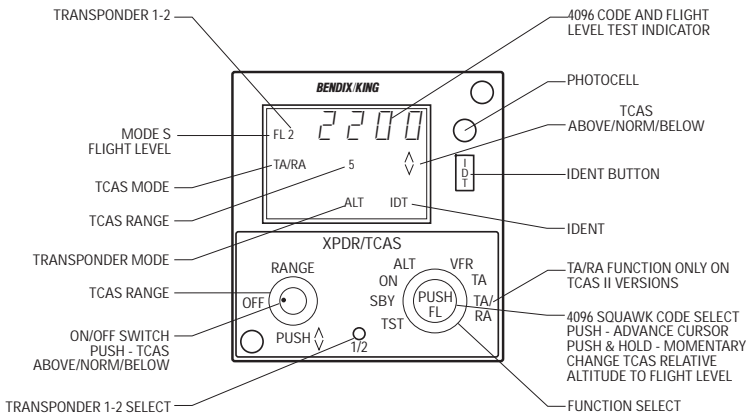
Self Test Errors

- A. If the altimeter does not indicate 50 ± 5 feet when initiating self test, disregard 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 announced.

Mode S Transponder



KFS 578A CONTROL UNIT - MODE S ONLY



KFS 578A CONTROL UNIT - MODE S/TCAS

KFS 578A

An aircraft equipped with a MST 67A Transponder may be located in range and azimuth by a ground ATRBS radar site. The transponder upon receiving Mode A or Mode C interrogation, 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. Mode S transponders transmit random replies called squitter which include the unique Mode S address strapped in the installation harness. The ATC Mode S ground station receives this Mode S reply and

can selectively interrogate one specific Mode S address.

The KFS 578A Control Unit, supplies serial data and control signals for the MST 67A Transponder. An optional feature allows the use of dual MST 67A Transponders individually selected by one KFS 578A Control Unit. The KFS 578A is equipped with an ARINC 429 serial data bus. The KFS 578A 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 ON/OFF Selector knob of a KFS 578A clockwise from the OFF position. The selected code may then be entered as follows: Momentarily pressing the FL/Cursor knob steps the cursor (indicated by the flashing digit) to the right one digit at a time. Rotating the FL/Cursor knob CW or CCW changes the numerical value of the selected digit as desired. Rotating the Function knob to the VFR position for approximately 3 seconds causes the code to automatically change to the pre programmed VFR code(usually 1200). The selected code should be in accordance with the instructions for IFR flight or rules applicable to transponder utilization for VFR flight. The VFR code can be programmed to be any code by the following technique:

- A. Place the function selector to VFR.
- B. Select the VFR code as required.
- C. Push the Ident(IDT) button. or Wait 3 seconds. or Rotate the Function switch to the desired mode.

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 or 7700 selected on the control*

unit. Code 7700 is selected for emergencies, 7600 is selected for radio failure, and 7500 for hijack. Code 0000 is reserved.

The MST 67A 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 Ident Button when depressed momentarily, and then released, holds the IDENT reply for approximately 18 ± 2 seconds to assure the proper reply within at least one radar sweep. During which time the IDT 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 Mode A, Mode C and Mode S 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, Mode C or Mode S interrogation transmitting flight level information if an altitude encoder is a part of the installation.

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 578A to cause the

display to respond with maximum brilliance if needed or to follow the panel lighting dimmer bus.

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 all segments of the display to light for 2 seconds then the squawk code display will display flight level (altitude) information for 4 seconds, then return to Standby ("SBY") mode. 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, dashes will be displayed in the squawk code display. The transmitter is inhibited during the test function.

In a dual system 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. While in External Standby the KFS 578A provides only two modes with the function switch, counter-clockwise for flight level information and clockwise for the standby aircraft identification code.

Note: *The flight level readout is not corrected for atmospheric pressure changes.*

The KFS 578A may be included in a Traffic Alert and Collision Avoidance System (TCAS I or II). In this case the KFS 578A will also control the TCAS functions.

When the Traffic Advisory ("TA") Mode is selected "TA" will be annunciated on the control unit display. This mode will place the TCAS in the Traffic Advisory only (no Resolution Advisory) mode. The selected Mode S transponder will remain in the "ALT" mode while the control unit annunciates "TA".

Note: *The KFS 578A does not display TCAS information.*

Rotating the Function Switch clockwise from "TA" mode will cause "TA/RA" to be annunciated on the control unit's display. The TCAS II will be switched to the "TA/RA" mode. The selected Mode S transponder will remain in the "ALT" mode while the control unit annunciates "TA/RA".

Note: *On non TCAS versions, "TA" and "TA/RA" are only annunciated in the "TST" mode when all segments of the display are annunciated.*

The TCAS Flight Level is not related to the transponder function of the same name. The TCAS Flight Level function causes the TCAS indicator to change displayed altitude from Relative Altitude (intruder to own aircraft) to absolute altitude. The TCAS Flight Level is initiated by pressing and holding (greater than 3 seconds) the FL/Cursor Switch. The TCAS Flight Level function will time out from absolute altitude to relative altitude after 15 seconds. The TCAS Flight Level function is defined by the TCAS unit. (no TCAS Flight Level is displayed on the KFS 578A)

The TCAS Range Switch is used to control the range (in nautical miles) that traffic is displayed on the TCAS indicator. The TCAS Range Switch is not a hard switch but a continuous rotary switch. Turning the

TCAS Range Switch in the clockwise direction increments through the TCAS ranges and conversely counterclockwise rotation of the TCAS Range Switch decrements through the TCAS ranges. The TCAS range does not roll over when the range is at its minimum or maximum (i. e. stops at "15"). The TCAS ranges are "3", "5", "10", "15", "20" and "40", and are annunciated on the display.

Above/Norm/Below tells the TCAS to display traffic Above(8700 feet above & 2700 feet below), Below (2700 feet above & 8700 feet below) or Normal (2700 feet above & below). The TCAS Above/Norm/Below selection is sequenced through by pressing the ON/OFF Switch. The TCAS Above/Norm/Below selection is annunciated on the display as " ~ " for Above and " ~ " for Below. If both the up and down arrows are displayed the mode is Norm.

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

The KFS 578A has a display adjust feature which allows for display balancing with other gas discharge

displays. To utilize this mode first place the unit in the "TST" mode by rotating the function select knob counterclockwise, then press and hold the "IDT" button for three seconds. An "A" followed by a number between 1 and 8 is displayed. Rotate the FL/CURSORS knob to change the number which also adjusts the response time for the automatic display brightness adjust to react to changes in ambient light levels. Push the FL/CURSORS knob to display a "b" followed by a number between 0 and 64. Change this number and the display brightness by rotating the FL/CURSORS knob. This adjustment is typically made at initial installation for balancing with other gas discharge displays in the cockpit. Push the FL/CURSORS knob again to display a "C" plus a number between 0 and 255. This number and the display brightness can also be changed by rotating the FL/CURSORS knob. This adjustment is typically made after initial installation for fine adjustment of the display brightness. Press the "IDT" button to exit the display adjust mode.

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