AlliedSignal

ELECTRONIC AND AVIONICS SYSTEMS

INSTALLATION MANUAL

BENDIX/KING®

KX 125

COMMUNICATION TRANSCEIVER
NAVIGATION RECEIVER

MANUAL NUMBER 006-00655-0001
REVISION 1 JANUARY, 1994

SECTION III

OPERATION

3.1 GENERAL

All controls required to operate the KX 125 are located on the unit front panel. (See Figure 3-1)

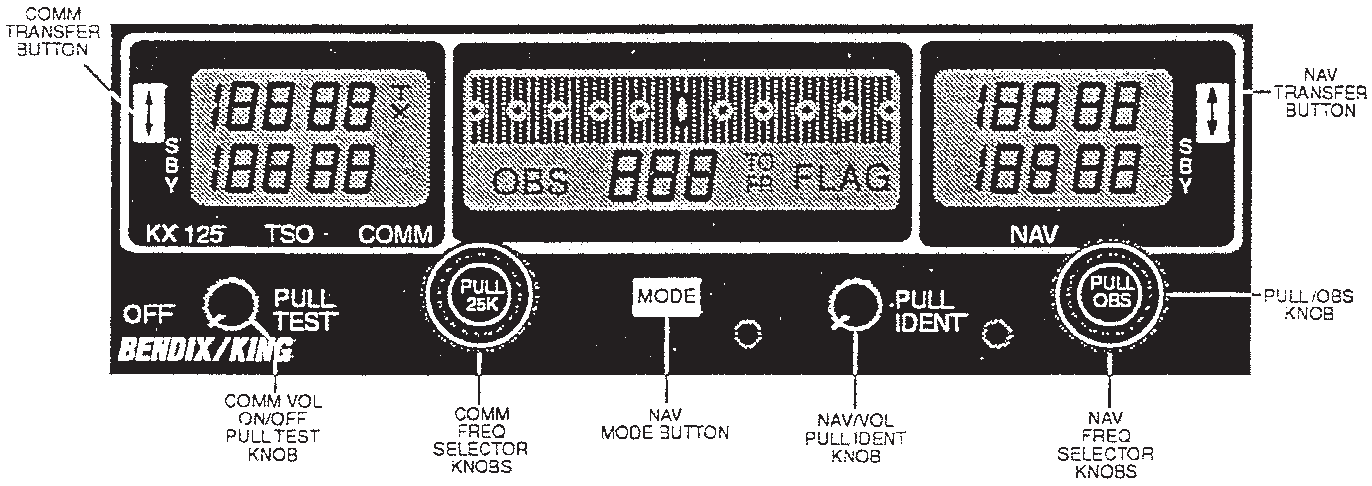

FIGURE 3-1 FRONT PANEL DISPLAY/CONTROLS

3.2 DETAILED OPERATING MODES

3.3 TURN ON

To turn on the radio, rotate the COMM Volume (VOL) knob clockwise from the OFF position. When power is activated, the COMM FREQ and NAV FREQ windows will display the frequencies stored in the non-volatile memory before power down. If on power up, the active NAV USE frequency is a VOR frequency, the NAV INFO window will display the CDI deviation bars, "OBS" annunciator, three digit OBS setting stored in non-volatile memory prior to power down and "TO" or "FR" annunciator. A "FLAG" annunciator will also be displayed if no valid or an invalid navigation signal is received and the "TO"/"FR" annunciators will be turned off. Note that if the "OBS" annunciator is flashing, the inner NAV FREQ selector knob is in the out position. If on power up, the active NAV USE frequency is a localizer frequency, the NAV INFO window will display the CDI bars and "LOC" annunciator. The "FLAG" annunciator will also be turned on if no valid or an invalid navigation signal is received. A more detailed description of all the operational modes of the KX 125 will be given below.

CAUTION

THE KX 125 SHOULD BE TURNED ON ONLY AFTER ENGINE STARTUP. THIS IS A SIMPLE PRECAUTION WHICH HELPS PROTECT THE SOLID STATE CIRCUITRY AND EXTENDS THE OPERATING LIFE OF YOUR AVIONICS EQUIPMENT.

3.3.1 DIM SELECT

The KX 125 panel lighting may be powered up from either a 14VDC or 28VDC lighting bus supply. To enable the KX 125 panel lighting to track a 14VDC lighting bus, leave DIM SELECT (P100 pin B) open. To track a 28VDC lighting bus, tie DIM SELECT to ground.

3.4 COMM TRANSCEIVER

Pull the COMM VOL knob out and adjust for a desired listening level. Push the COMM VOL knob back in to actuate the automatic squelch.

3.4

The top frequency displayed in the COMM FREQ window is the active COMM USE frequency and the COMM standby (SBY) frequency is displayed below it. A "TX" annunciator will come on next to the COMM USE frequency to indicate the TRANSMIT mode of operation. Select the desired operating frequency in the COMM SBY display by rotating the increment/decrement knobs of the COM FREQ selector either clockwise or counter-clockwise. A clockwise rotation will increment the previous frequency while a counter-clockwise rotation will decrement the previous frequency. The outer (larger) knob will change the MHz portion of the standby display. At one band-edge (118 or 136 MHz for -0101/-0201 or 139 MHz for -0302/-0402) the following 1 MHz change will wrap around to the other band-edge. The inner (smaller) knob will change the kHz portion of the standby display. It will change in steps of 50kHz when the knob is pushed in, and 25kHz when the knob is pulled out. The wrap around at band-edge is also utilized when incrementing or decrementing the kHz portion of the standby display.

To tune the radio to the desired COMM operating frequency, the desired COMM frequency must be entered into the COMM SBY display and then the COMM TRANSFER button must be pushed momentarily. This will trade the contents of the COMM USE and COMM SBY display. The COMM transceiver is always tuned to the frequency appearing in the COMM USE display. It is therefore possible to have two different frequencies stored in the COMM USE and COMM SBY displays and to change back and forth between them at the simple push of the COMM TRANSFER button. During the TRANSMIT mode of operation, a "TX" annunciator will appear next to the COMM USE frequency display, signifying that the transceiver is in the transmit mode of operation. The KX 125 is designed to allow a continuous TRANSMIT duration of 1/2 minute. If the transceiver is keyed for more than 1/2 minute, the KX 125 will automatically stop transmitting and the COMM FREQ window display will be flashing. On release of the mic key, the flashing will stop and operation will return to normal. This feature is designed to detect a "stuck" mic key and prevent it from over-stressing the transmitter which may reduce the reliability of the transceiver.

There is a COMM active entry mode whereby, the COMM USE frequency can be changed directly by the COMM FREQ selector knobs. To activate the COMM active entry mode, press and hold the COMM TRANSFER button for 2 seconds or more. The COMM STBY frequency will blank and the last COMM USE frequency displayed can be changed directly by the COMM FREQ selector knobs. In the COMM active entry mode, the COMM transceiver is also always tuned to the frequency appearing in the COMM USE display. To exit the COMM active entry mode, momentarily press the COMM TRANSFER button. The previous COMM SBY frequency will be re-displayed.

A non-volatile memory stores the COMM USE and COMM SBY frequencies on power down. When the unit is turned on again, the COMM USE and SBY windows will display the same COMM USE and SBY frequencies that were displayed before power down. If the KX 125 is in the COMM active entry mode during power down, it will power up back in the COMM active entry mode.

3.4.1 COMM REMOTE TRANSFER

The COMM REMOTE TRANSFER button operates identical to the front panel COMM TRANSFER button with the exception that holding the COMM REMOTE TRANSFER button for 2 seconds or more will not place the KX 125 into the COMM active entry mode.

3.5 NAV RECEIVER

The top frequency displayed in the NAV FREQ window is the active NAV USE frequency and the standby (SBY) frequency is displayed below it. The NAV receiver frequency channeling is the same as the COMM transceiver. The NAV FREQ increment/decrement knobs are located on the right hand side of the front panel. Note that the smaller knob must be pushed in to allow NAV frequency channelling. The larger knob operates in 1 MHz steps and increments/decrements the NAV STBY frequency display. The smaller knob operates in 50kHz steps. The NAV receiver lower and upper frequency limits are 108.00 MHz and 117.95 MHz. Exceeding the upper limit of frequency band would automatically return to the lower limit and vice versa. Flipping of the NAV USE and SBY frequencies is achieved by momentarily pressing the NAV TRANSFER button. There is also a NAV active entry mode whereby, the NAV USE frequency can be changed directly by the NAV FREQ selector knobs. To activate the NAV active entry mode, press and hold the NAV TRANSFER button for 2 seconds or more. The NAV SBY frequency will blank and the last NAV USE frequency displayed can be changed directly by the NAV FREQ selector knobs. The NAV receiver is always tuned to the NAV USE frequency displayed. To exit the NAV active entry mode, momentarily press the NAV TRANSFER button. The previous NAV SBY frequency will be re-displayed.

The NAV audio volume can be adjusted with the NAV VOL knob. Pulling the NAV VOL knob out will allow both voice and morse code identification (IDENT) of the tuned NAV station to be heard. When the NAV VOL knob is pushed in, the IDENT tone is attenuated.

3.5.1 NAV REMOTE TRANSFER

The NAV REMOTE TRANSFER button operates identical to the front panel NAV TRANSFER button with the exception that holding the NAV REMOTE TRANSFER button for 2 seconds or more will not place the KX 125 into the COMM active entry mode.

3.5.2 NAV MODES

There are 3 NAV modes available with the KX 125: CDI, Bearing and Radial. The CDI mode works on both VOR and localizer frequencies. The remaining modes work only with VOR frequencies. On power up, the KX 125 will go into the default CDI mode. Momentarily pressing the NAV MODE button will step switch the KX 125 NAV modes in the following sequence: Bearing, Radial, back to CDI and so on. A description of each of the 3 NAV modes is given below.

3.5.2.1 NAV CDI MODE - VOR OPERATION

Tune the KX 125 NAV USE frequency to a desired VOR frequency. Bring the KX 125 into the CDI (Course Deviation Indicator) mode by depressing the NAV MODE button several times as necessary. The NAV INFO window will display an "OBS" annunciator, a previous three digit OBS bearing, an appropriate "TO" or "FR" (from) annunciator and the deviation bars. Refer to Figure 3-2 for an example of a NAV INFO window display showing reception of a valid VOR signal.

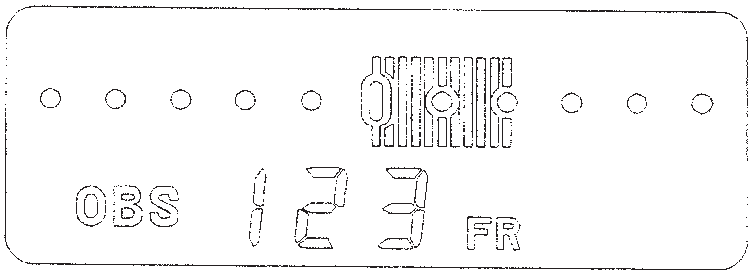

FIGURE 3-2 KX 125 NAV INFO WINDOW DISPLAY IN CDI MODE WITH A VALID VOR SIGNAL

In this example, the previous OBS setting is 123 degrees and the received VOR signal is 119 degrees FROM the VOR station. Thus the selected OBS of 123 degrees is + 4 degrees off the received 119 degrees FROM. The course deviation is indicated by the lighting up of the deviation bars as shown. Each deviation bar represents 0.4 degree and each reference dot represents 2 degrees. The KX 125 CDI display limit is ±10 degrees of course deviation. If an invalid VOR signal is received, a "FLAG" annunciator and all the deviation bars will be displayed and the "TO" or "FR" annunciator will be turned off. Refer to Figure 3-3.

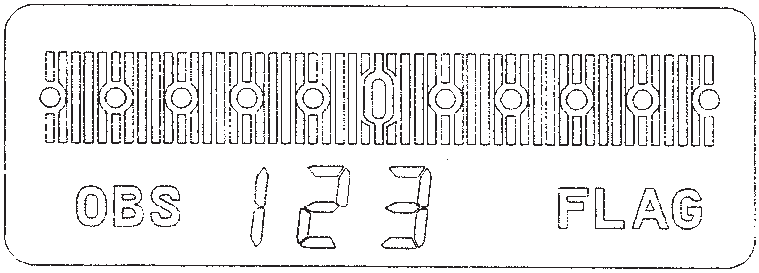

FIGURE 3-3 KX 125 NAV INFO WINDOW DISPLAY IN CDI MODE WITH AN INVALID VOR SIGNAL

The OBS setting can be changed by pulling out and rotating the inner NAV FREQ selector knob. When the inner NAV FREQ selector knob is pulled out, the "OBS" annunciator will be flashing and changing of the NAV frequency will be disabled, allowing only the OBS setting to be changed.

3.5.2.2 NAV CDI MODE - LOCALIZER OPERATION

Tune the KX 125 NAV USE frequency to a desired localizer frequency. The NAV INFO window will display "LOC" and the CDI display will be activated. If a valid localizer signal is received at 5 degrees to the right of the centerline, 13 deviation bars in the CDI will be turned on. Refer to Figure 3-4. If the valid localizer signal is received along the centerline, the CDI display will be centered with only the reference dots turned on.

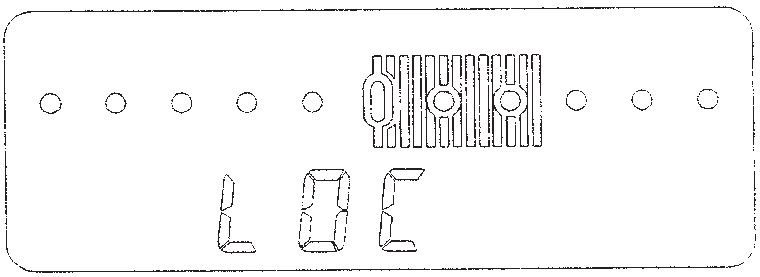

FIGURE 3-4 KX 125 NAV INFO WINDOW DISPLAY IN CDI MODE WITH A VALID LOCALIZER SIGNAL

If an invalid localizer signal is received, the KX 125 will show flag status by turning on the "FLAG" annunciator and displaying all the CDI deviation bars in the NAV INFO window. Refer to Figure 3-5.

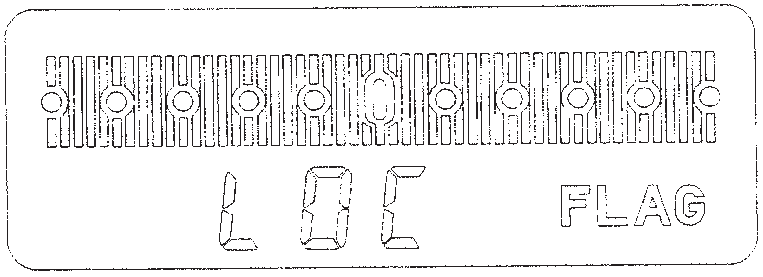

FIGURE 3-5 KX 125 NAV INFO WINDOW DISPLAY IN CDI MODE WITH AN INVALID LOCALIZER SIGNAL

3.5.2.3 NAV BEARING MODE

Tune the KX 125 to a desired VOR station. Bring the KX 125 into the Bearing mode by depressing the NAV MODE button several times as needed until the NAV INFO window shows only a three digit display with a "TO" annunciator. In the Bearing mode, the KX 125 will always display the received VOR signal in TO format. Refer to Figure 3-6 for an example where the received VOR signal is actually 119 degrees FROM but is being displayed as 299 degrees TO by the KX 125 in the Bearing mode.

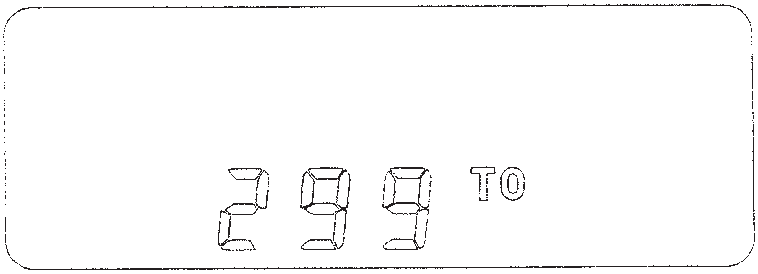

FIGURE 3-6 KX 125 NAV INFO WINDOW DISPLAY IN BEARING MODE WITH A VALID VOR SIGNAL

If an invalid VOR signal is received while the KX 125 is in the Bearing mode, the NAV INFO window will display the "FLAG" annunciator and three horizontal dashes. Refer to Figure 3-7 for an example.

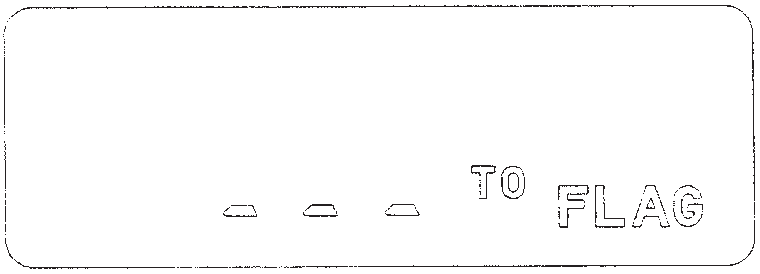

FIGURE 3-7 KX 125 NAV INFO WINDOW DISPLAY IN BEARING MODE WITH AN INVALID VOR SIGNAL

3.5.2.4 NAV RADIAL MODE

Tune the KX 125 to a desired VOR station. Bring the KX 125 into the Radial mode by depressing the NAV MODE button several times as needed until the NAV INFO window shows only a three digit display with a "FR" annunciator. In the Radial mode, the KX 125 will always display the received VOR signal in FROM format. Refer to Figure 3-8 for an example where the received VOR signal is 119 degrees FROM as displayed by the KX 125 in Radial mode.

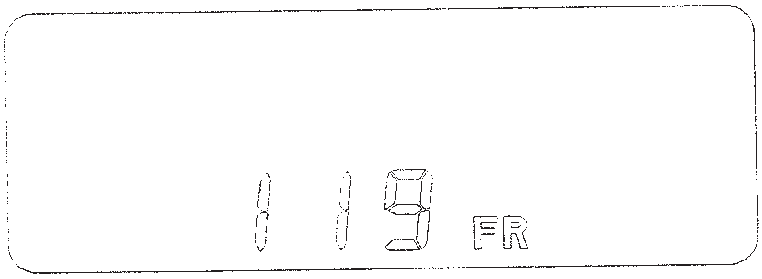

FIGURE 3-8 KX 125 NAV INFO WINDOW DISPLAY IN RADIAL MODE WITH A VALID VOR SIGNAL

If an invalid VOR signal is received, the KX 125 in Radial mode will show flag status similar to Figure 3-7 except that "FR" will be displayed instead of "TO".

3.5.3 NAV AUTO-TO FUNCTION

There is a NAV AUTO-TO function (VOR operation only) which when activated will automatically bring the KX 125 into the CDI mode, center the CDI display and replace the OBS setting with the received VOR signal bearing in TO format at that instant. To activate the AUTO-TO function, regardless of what mode the KX 125 is in, press and hold the NAV MODE button for 2 seconds or more. Refer to Figure 3-9 for an example of NAV INFO display immediately after the Auto-To function has been activated when the received VOR signal is 119 degrees FROM (same as 299 degrees TO).

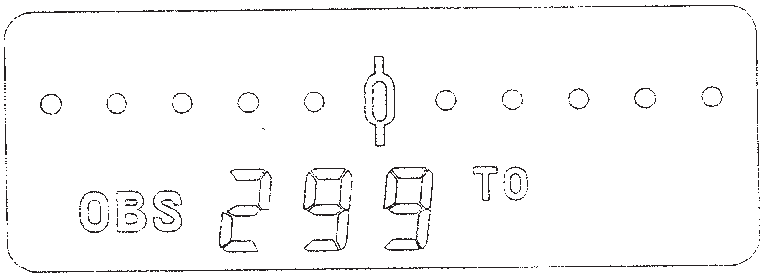

FIGURE 3-9 KX 125 NAV INFO WINDOW DISPLAY AFTER AUTO-TO FUNCTION HAS BEEN ACTIVATED

After the AUTO-TO function has been selected, any change in received VOR signal bearing will be displayed by the appropriate number of deviation bars been turned on.

3.6 DEFAULT POWER UP STATE

If the KX 125 is powered up with either the COMM TRANSFER or NAV TRANSFER button depressed, it will default into the COMM active entry mode and the NAV active entry mode. Both the COMM USE and SBY frequency will be set to 120.00 MHz and both the NAV USE and SBY frequency will be set to 110.00 MHZ.