

**ENSTROM F-28F/280FX OPERATOR'S MANUAL
AND
FAA APPROVED
ROTORCRAFT FLIGHT MANUAL
SUPPLEMENT
BENDIX/KING KX 165A NAV/COM SYSTEM**

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REPORT NO. 28-AC-056

HELICOPTER SERIAL NO. _____

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**THIS SUPPLEMENT MUST BE CARRIED IN THE
HELICOPTER AT ALL TIMES IF EQUIPPED WITH THE
BENDIX/KING KX 165A NAV/COM INSTALLATION.
CHAPTERS 1, 2, 3, AND 4 ARE FAA APPROVED.**

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FEDERAL AVIATION ADMINISTRATION

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ROTORCRAFT FLIGHT MANUAL SUPPLEMENT
BENDIX/KING KX 165A NAV/COM

TABLE OF CONTENTS

<u>CHAPTER</u>	<u>DESCRIPTION</u>	<u>PAGE</u>
	Supplement Cover Page	
	Log of Revisions	i
	Table of Contents	iii
	List of Figures	iv
	List of Tables	iv
	List of Effective Pages	v
	INTRODUCTION	INTRO-1
CHAPTER 1	OPERATING LIMITATIONS	1-1
	Purpose	1-1
	General.....	1-1
	Operational Limits	1-1
CHAPTER 2	NORMAL PROCEDURES	2-1
	General.....	2-1
CHAPTER 3	EMERGENCY PROCEDURES	3-1
	Electrical System Failure.....	3-1
	Stuck Mic	3-1
CHAPTER 4	PERFORMANCE DATA	4-1
	General.....	4-1
CHAPTER 5	RESERVED.....	5-1
CHAPTER 6	WEIGHT/BALANCE AND LOADING.....	6-1
	General.....	6-1
CHAPTER 7	SYSTEM DESCRIPTION AND OPERATION.....	7-1
	System Description	7-1
	General Operation.....	7-2
	COMM Transceiver	7-2
	NAV Transceiver	7-4
	Fault Detection	7-7
	Display Brightness.....	7-7
	Pilot Configuration.....	7-8

**ROTORCRAFT FLIGHT MANUAL SUPPLEMENT
BENDIX/KING KX 165A NAV/COM**

TABLE OF CONTENTS

<u>CHAPTER</u>	<u>DESCRIPTION</u>	<u>PAGE</u>
CHAPTER 7	SYSTEM DESCRIPTION AND OPERATION	
	Blind Tuning	7-8

LIST OF FIGURES

<u>FIGURE NO.</u>	<u>DESCRIPTION</u>	<u>PAGE</u>
7-1	KX 165A System Interface	7-1
7-2	KX 165A Display	7-2
7-3	Active VOR Frequency/CDI Format	7-5
7-4	Active LOC Frequency/CDI Format.....	7-5
7-5	VOR Flag Display/CDI Format	7-5
7-6	Bearing TO Function	7-6
7-7	Bearing TO Flag Display	7-6
7-8	Radial FROM Function	7-6
7-9	Radial FROM Flag Display	7-6

LIST OF TABLES

<u>TABLE NO.</u>	<u>DESCRIPTION</u>	<u>PAGE</u>
Intro-1	List of Abbreviations.....	INTRO-1

LIST OF EFFECTIVE PAGES

<u>PAGE</u>	<u>DATE</u>	<u>PAGE</u>	<u>DATE</u>
i	Jan 9/14		
ii	Jan 9/14		
iii	Jan 9/14		
iv	Jan 9/14		
v	Jan 9/14		
vi	Jan 9/14		
INTRO-1	Jan 9/14		
INTRO-2	Jan 9/14		
1-1	Jan 9/14		
1-2	Jan 9/14		
2-1	Jan 9/14		
2-2	Jan 9/14		
3-1	Jan 9/14		
3-2	Jan 9/14		
4-1	Jan 9/14		
4-2	Jan 9/14		
6-1	Jan 9/14		
6-2	Jan 9/14		
7-1	Jan 9/14		
7-2	Jan 9/14		
7-3	Jan 9/14		
7-4	Jan 9/14		
7-5	Jan 9/14		
7-6	Jan 9/14		
7-7	Jan 9/14		
7-8	Jan 9/14		

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INTRODUCTION

Intro-1. General

This supplement contains the operating instructions, procedures, and limitations for the Bendix/King KX 165A NAV/COM system. The supplement is divided into two basic parts, the FAA approved RFM Supplement and Supplemental Data provided by the Enstrom Helicopter Corporation (Enstrom). Chapters 1, 2, 3, and 4 make up the FAA approved RFM Supplement. It is required by Federal Regulations that this supplement be carried in the helicopter at all times if the Bendix/King KX 165A NAV/COM unit is installed.

For additional information regarding the supplement format and text emphasis or definitions, refer to the Basic Flight Manual. Abbreviations noted in this supplement are listed in Table Intro-1.

Intro-1. List of Abbreviations

CB	Circuit Breaker
CCW	Counter Clockwise
CDI	Course Deviation Indicator
COM	Communication
COMM	Communication
CW	Clockwise
ET	Elapsed Time
GS	Glideslope
ICS	Intercom System
kHz	Kilohertz
LOC	Localizer
MHz	Megahertz
MIC	Microphone
NAV	Navigation
OBS	Omni Bearing Selector
RFM	Rotorcraft Flight Manual
VHF	Very High Frequency
VOR	VHF Omni-Directional Range
VOX	Voice Activated

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CHAPTER 1. OPERATING LIMITATIONS

1-1. Purpose

This chapter includes operating limitations and restrictions that must be observed during ground and flight operations.

1-2. General

The operating limitations set forth in this chapter are the direct results of design analysis and flight tests. Compliance with these limitations will allow the pilot to derive maximum utility from the helicopter.

1-3. Operational Limits

This RFM supplement is intended for use with the KX 165A NAV/COM system.

An aircraft radio station license may be required with the KX 165A for transmitting.

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CHAPTER 2. NORMAL PROCEDURES

2-1. General

Refer to the basic RFM.

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CHAPTER 3. EMERGENCY PROCEDURES

3-1. Electrical System Failure

Refer to the basic RFM.

3-2. Stuck MIC

If the microphone is keyed for longer than 33 seconds, the transmitter stops transmitting and the active COMM frequency flashes to alert the pilot of the stuck microphone condition.

NOTE

In an emergency situation, if the flashing alert remains after you have stopped keying the microphone, turn the power off and then back on. You will then get another 33 second time-out period to transmit.

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CHAPTER 4. PERFORMANCE DATA

4-1. General

Refer to the basic RFM.

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CHAPTER 6. WEIGHT/BALANCE AND LOADING

6-1. General

This installation is included in the basic aircraft weight. Refer to the basic RFM.

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CHAPTER 7. SYSTEM DESCRIPTION AND OPERATION

7-1. System Description

The KX 165A NAV/COM unit is a VHF Communications/Navigation Transceiver which provides the following functions.

1. Two-way voice communication within the frequency range of 118.00 MHz to 136.975 MHz (760 channels) in 25 kHz increments or 118.00 MHz to 136.9917 MHz (2280 channels) in 8.33 kHz increments.
2. Reception of navigation (VOR/LOC) and glideslope signals within the frequency ranges of 108.00 MHz to 117.95 MHz in 50 kHz increments (200 channels) and 329.15 MHz to 335.00 MHz in 150 kHz increments (40 channels) respectively.

The KX 165A provides output to a VOR/LOC/GS indicator and to either a VOX ICS or an audio panel. The system interface is shown in Figure 7-1.

Power to the KX 165A unit is provided via the **COM/NAV** circuit breaker (CB) (7½ Amp) located on the left side of the center pedestal.

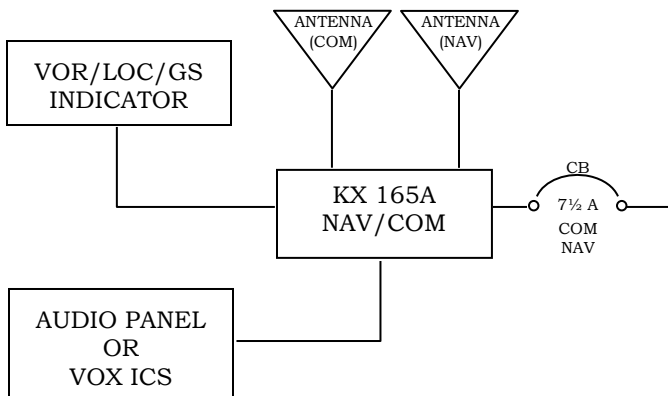


Figure 7-1. KX 165A System Interface

7-2. General Operation

The KX 165A display and controls are shown in Figure 7-2.

1. Rotate the On/Off COMM Volume knob clockwise from the OFF position. Pull the volume knob out and adjust for desired listening level. Push the **VOL** knob back in to actuate the automatic squelch.
2. The KX 165A internal memory stores the frequencies that were displayed before power down.

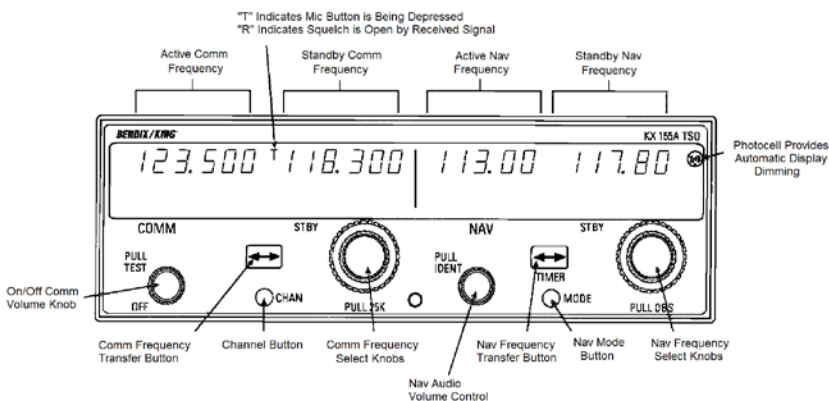


Figure 7-2. KX 165A Display (8.33 kHz Version)

7-3. COMM Transceiver

The left portion of the digital display is allocated for COMM active and COMM standby frequencies with a "T" between to indicate transmit and an "R" to indicate receive mode of operation. The transceiver is always tuned to the frequency appearing in the active display.

1. Select the desired operating frequency in the standby display by rotating the **COMM** Frequency Select knobs either clockwise (increment) or counter-clockwise (decrement). The outer knob changes the MHz portion and the inner knob changes the kHz portion of the standby display.

NOTE

COMM radios with 25 kHz spacing display the frequency to two decimal places. COMM radios with 8.33 kHz spacing display the frequency to three decimal places.

- a. 25 kHz version: The standby display frequency will change in increments of 50 kHz when the inner knob is pushed in and 25 kHz when the knob is pulled out.
 - b. 8.33 kHz version: The standby display frequency will change in increments of 25 kHz when the inner knob is pushed in and both 8.33 kHz and 25 kHz when the knob is pulled out.
2. Push the **COMM** frequency transfer [↔] button to transfer the standby frequency to the active frequency.
 3. The operating frequency can also be entered by accessing the active entry mode.
 - a. Push and hold the COMM frequency transfer [↔] button for 2 or more seconds. The desired frequency can be directly entered into the display.
 - b. Push the COMM frequency transfer [↔] button again to return to the active/standby display.
 4. The KX 165A is capable of storing 32 pre-set channels.
 - a. Press the **CHAN** button for 2 or more seconds to enter the channel program mode. A “PG” will display and the channel number will flash.
 - b. Rotate the **COMM** kHz (inner) knob to select the channel.
 - c. Push the COMM frequency transfer [↔] button (the standby frequency will flash) and rotate the **COMM** frequency knobs to enter the frequency.
 - d. If dashes (displayed when rotating the outer knob between 136 MHz and 118 MHz) are entered instead of a frequency, the corresponding channel is skipped in channel selection mode.

7-4 ENSTROM F-28F/280FX RFM SUPPLEMENT

- e. Press the COMM frequency transfer [↔] button and follow the same procedure to program additional channels.
 - f. Exit the program mode by momentarily pushing the **CHAN** button. If there is no button or knob activity for 20 seconds while in channel program mode, the unit will exit channel program mode.
5. To select a frequency from a programmed channel:
 - a. Momentarily push the **CHAN** button.
 - b. Rotate the **COMM** frequency knobs to select the desired channel.
 6. Depress the MIC KEY button to activate the transmit mode.
 - a. If the microphone is keyed for longer than 33 seconds, the transmitter stops transmitting and the active COMM frequency flashes to alert the pilot of the stuck microphone condition.

7-4. Nav Transceiver

The right portion of the display is allocated to NAV receiver information and the NAV increment/decrement knobs are located on the right hand side of the front panel.

1. Select the desired operating frequency in the standby display by rotating the **NAV** Frequency Select knobs either clockwise (increment) or counter-clockwise (decrement). The outer knob changes the MHz portion (1 MHz) of the standby display. The inner knob changes the kHz portion (50 kHz) of the standby display.
2. The operating frequency can also be entered by accessing the ACTIVE entry mode.
 - a. Push and hold the NAV frequency transfer [↔] button for 2 or more seconds. The desired frequency can be directly entered into the display.
 - b. Push the NAV frequency transfer [↔] button again to return to the active/standby display.

3. Press the **MODE** button to cycle through CDI, BEARING, RADIAL, and TIMER modes.
4. In CDI, BEARING, and RADIAL modes, the increment/decrement knob (pushed in) channels the active frequency. Depressing the NAV frequency transfer [↔] button places the active frequency in blind storage and displays the standby frequency in the active window display.
5. CDI Mode:
 - a. Set the desired OBS course by pulling out the inner **NAV** frequency knob and turning it.
 - b. “OBS” flashes on the display while the knob is pulled out. The CDI is displayed on the line below the frequency/OBS (Figure 7-3).
 - c. When the active window is tuned to a localizer frequency, the standby frequency area is replaced by “LOC” (Figure 7-4).
 - d. The display will “FLAG” if the received signal for the active localizer frequency is too weak (Figure 7-5).

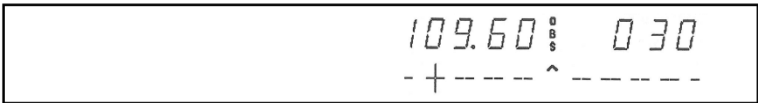


Figure 7-3. Active VOR Frequency/CDI Format

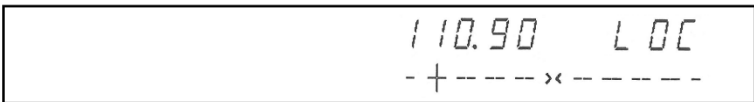


Figure 7-4. Active LOC Frequency/CDI Format

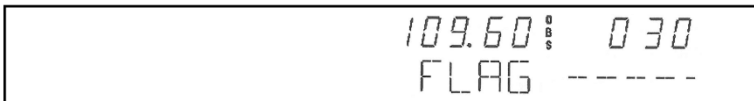
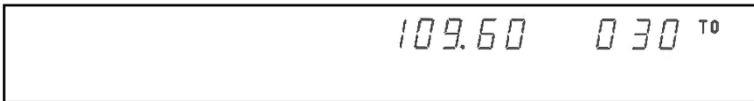
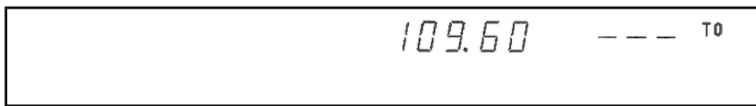


Figure 7-5. VOR Flag Display/CDI Format

7-6 ENSTROM F-28F/280FX RFM SUPPLEMENT

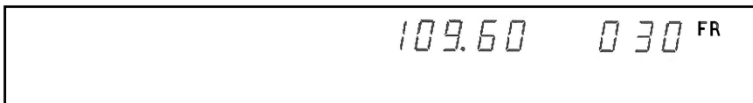
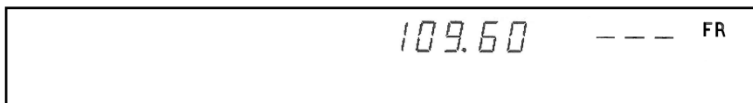
6. BEARING Mode:

- a. The right hand window of the NAV display shows "TO", signifying the bearing to the station (Figure 7-6).
- b. The display "---" appears if the received signal is too weak (Figure 7-7).

**Figure 7-6. Bearing TO Function****Figure 7-7. Bearing TO Flag Display**

7. RADIAL Mode:

- a. The right hand window of the NAV display shows "FR", signifying the bearing from the station (Figure 7-8).
- b. The display "---" appears if the received signal is too weak (Figure 7-9).

**Figure 7-8. Radial FROM Function****Figure 7-9. Radial FROM Flag Display**

8. TIMER Mode:

- a. When the unit is in **TIMER** mode and turned on, the elapsed timer begins counting upward from zero.
- b. The timer can be stopped and reset to zero by pushing the NAV frequency transfer button [↔] for 2 seconds or more causing the ET on the display to flash.
- c. In this state, the timer can be set as a countdown timer or the elapsed timer can be restarted.
 - 1) Rotate the **NAV** increment/decrement knobs to set the desired time. The outer knob selects minutes. The inner knob selects ten second intervals if the knob is “in” or selects individual seconds if the knob is “out”.
 - 2) Push the NAV frequency transfer button [↔] to start the timer.
 - 3) After the countdown timer reaches zero, the counter will begin to count upwards indefinitely while flashing for the first 15 seconds.
- d. The elapsed timer can also be reset to zero and started again by pushing the NAV frequency transfer [↔] button.

7-5. Fault Detection

If a fault is detected during normal operation, the radio will come up in the fault display mode at the next power-up. A fault does not indicate a radio malfunction. Simply rotate one of the frequency selector knobs or press any button (except the **NAV MODE** button) to return the radio to normal operation. (Press the **NAV MODE** button to page through the fault display listing.)

7-6. Display Brightness

Light intensity of the KX 165A display is automatically controlled by a photocell in the top right corner of the front panel.

7-7. Pilot Configuration

Pilot configuration parameters or other additional operation instructions may be found in Bendix/King Silver Crown Plus™ Avionics Systems Pilot's Guide.

7-8. Blind Tuning

In the unlikely event the display fails, operate the unit in the Direct Tune Mode by doing the following:

1. Turn off the KX 165A unit.
2. Turn on the KX 165A unit while pressing either the **COMM** or **NAV** frequency transfer [↔] button.
 - a. 120.00 MHz (120.000 MHz in the 8.33 kHz version) will be the active COMM frequency and 110.00 MHz will be the active NAV frequency.
3. Example (8.33 kHz Version): Set COMM frequency to 122.8 MHz; set NAV frequency to 109.6 MHz.
 - a. Turn on the KX 165A unit while pressing either the **COMM** or **NAV** frequency transfer [↔] button.
 - b. Turn outer **COMM** frequency select knob CW two increments (120.000 MHz to 122.000 MHz). Turn inner **COMM** frequency select knob CCW eight decrements (.000 MHz to .800 MHz).
 - c. Turn outer **NAV** frequency select knob CCW one increment (110.00 MHz to 109.00 MHz). Turn inner **NAV** frequency select knob CCW eight decrements (.00 MHz to .60 MHz).