

***Illustrated Parts List  
and  
Maintenance Instructions***

FOR

NAV/COMM TRANSCEIVER INSTALLATION  
Part No. 369H90071 Basic, 369H90071-503,  
369H90071-507 and 369H90071-509

USED ON HUGHES 500D (MODEL 369D) HELICOPTERS



**Hughes Helicopters** division of summa corporation / culver city, california

—

# TABLE OF CONTENTS

Section	Page	Section	Page
FOREWORD . . . . .	F-1	2 MAINTENANCE INSTRUCTIONS (CONTINUED)	
F-1. Purpose and Content of this Manual . . . . .	F-1	2-3. Description of KY 195B VHF COMM Transceiver . . . . .	2-3
F-2. Applicability . . . . .	F-1	2-4. Description of KI 201C VOR Indicator . . . . .	2-3
F-3. Compatibility of Combined Optional Equipment . . . . .	F-1	2-5. Description of KA 39 Voltage Converter . . . . .	2-3
F-4. Organization of Contents . . .	F-1	2-6. Description of VC 20-30 Coupler . . . . .	2-3
F-5. Use of this Manual . . . . .	F-1	2-7. Reference Data . . . . .	2-3
F-6. Related Publications . . . . .	F-1	2-8. Troubleshooting . . . . .	2-4
F-7. Literature Changes and Revisions . . . . .	F-1	2-9. Operational Check . . . . .	2-4
1 ILLUSTRATED PARTS LIST . . . . .	1-1	2-10. Alignment . . . . .	2-4
1-1. Scope and Contents . . . . .	1-1	2-11. Inspection . . . . .	2-4
1-2. Group Assembly Parts List . . . . .	1-1	2-12. Replacement of NAV/COM-COMM Transceiver . . . . .	2-4
1-3. Illustrations . . . . .	1-1	2-13. Replacement of VOR Indicator . . . . .	2-4
2 MAINTENANCE INSTRUCTIONS . .	2-1	2-14. Replacement of KA 39 Voltage Converter . . . . .	2-4
2-1. General Information . . . . .	2-1	2-15. Replacement of VC 20-30 Antenna Coupler . . . . .	2-6
2-2. Description of KX 170A/B and KX 175B NAV/COM Transceiver . . . . .	2-3		



## FOREWORD

**F-1. PURPOSE AND CONTENT OF THIS MANUAL.** This manual supplements information contained in HMI - Vol 1 and 369D - IPC, and instructions for maintenance of the KX 170A/B, KX 175B and KY 195B transceiver installation. This manual also contains parts lists for procuring replacement parts for the KX 170A/B, KX 175B and KY 195B transceiver equipment.

**F-2. APPLICABILITY.** The KX 170A/B, KX 175B and KY 195B transceivers are applicable for use on any Hughes 500D (Model 369D) helicopter.

**F-3. COMPATIBILITY OF COMBINED OPTIONAL EQUIPMENT.** For compatibility information on which optional equipment may or may not be used in combination at the same time, refer to Section 21, HMI - Vol 1.

**F-4. ORGANIZATION OF CONTENTS.** The contents of this manual are grouped into sections as outlined in the Table of Contents. Each section

is organized to provide comprehensive coverage of entire systems, major equipment groupings, and major components that are similar or associated. Procedures for each of these are presented in sequence as defined in Section 1, HMI - Vol 1.

**F-5. USE OF THIS MANUAL.** This manual is for use by operators of the 369D helicopter equipped with a KX 170A/B, KX 175B or KY 195B transceiver. Although this manual is a separate publication, it should be kept with HMI - Vol 1, HMI - Vol 2, 369D - IPC and other handbooks listed in Section 1, HMI - Vol 1 that form the primary information file for the helicopter.

**F-6. RELATED PUBLICATIONS.** Reference is made to applicable portions of HMI - Vol 1 and 369D - IPC as required to accomplish instructions contained herein.

**F-7. LITERATURE CHANGES AND REVISIONS.** Changes and revisions to contents of this manual are made as defined in Section 1, HMI - Vol 1.



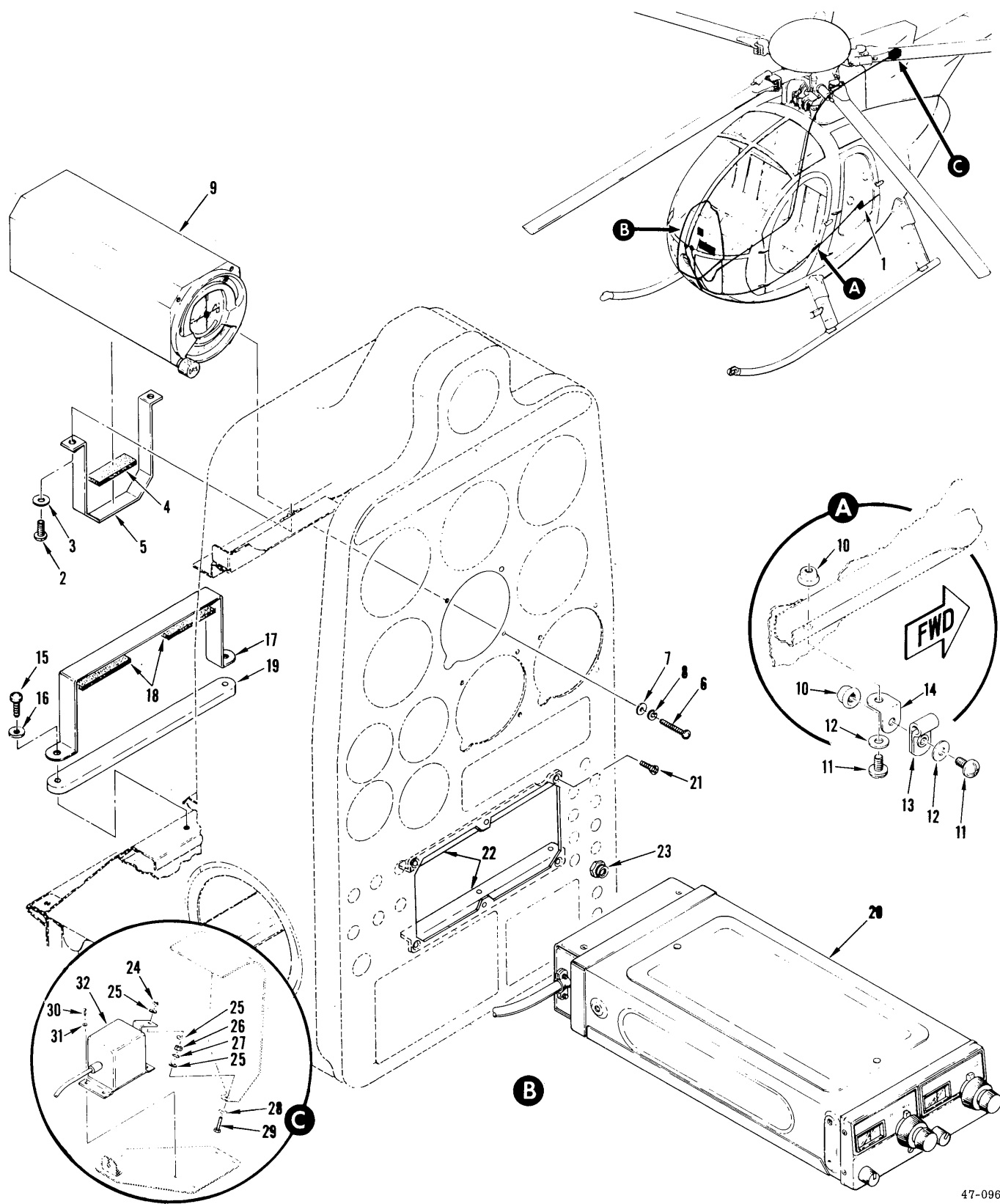
## SECTION I ILLUSTRATED PARTS LIST

1-1. SCOPE AND CONTENTS. This illustrated parts list provides, by means of text (parts lists) and companion illustrations, a complete parts definition of the 369H90071 Transceiver (KX 170A/B, KX 175B and KY 195B) installation, manufactured by Hughes Helicopters, Culver City, California.

NOTE: The illustrated parts list is organized and presented in the same manner as the 369D Series Illustrated Parts List (369D - IPC). (For information on use, refer to the 369D - IPC.)

1-2. GROUP ASSEMBLY PARTS LIST. The parts lists furnish information for procuring replacement parts for the transceiver installation and shall not be used for any other purpose.

1-3. ILLUSTRATIONS. Illustrations are provided for each group assembly parts list. Each illustration is exploded to the extent necessary to show parts relationship for the complete transceiver installation.

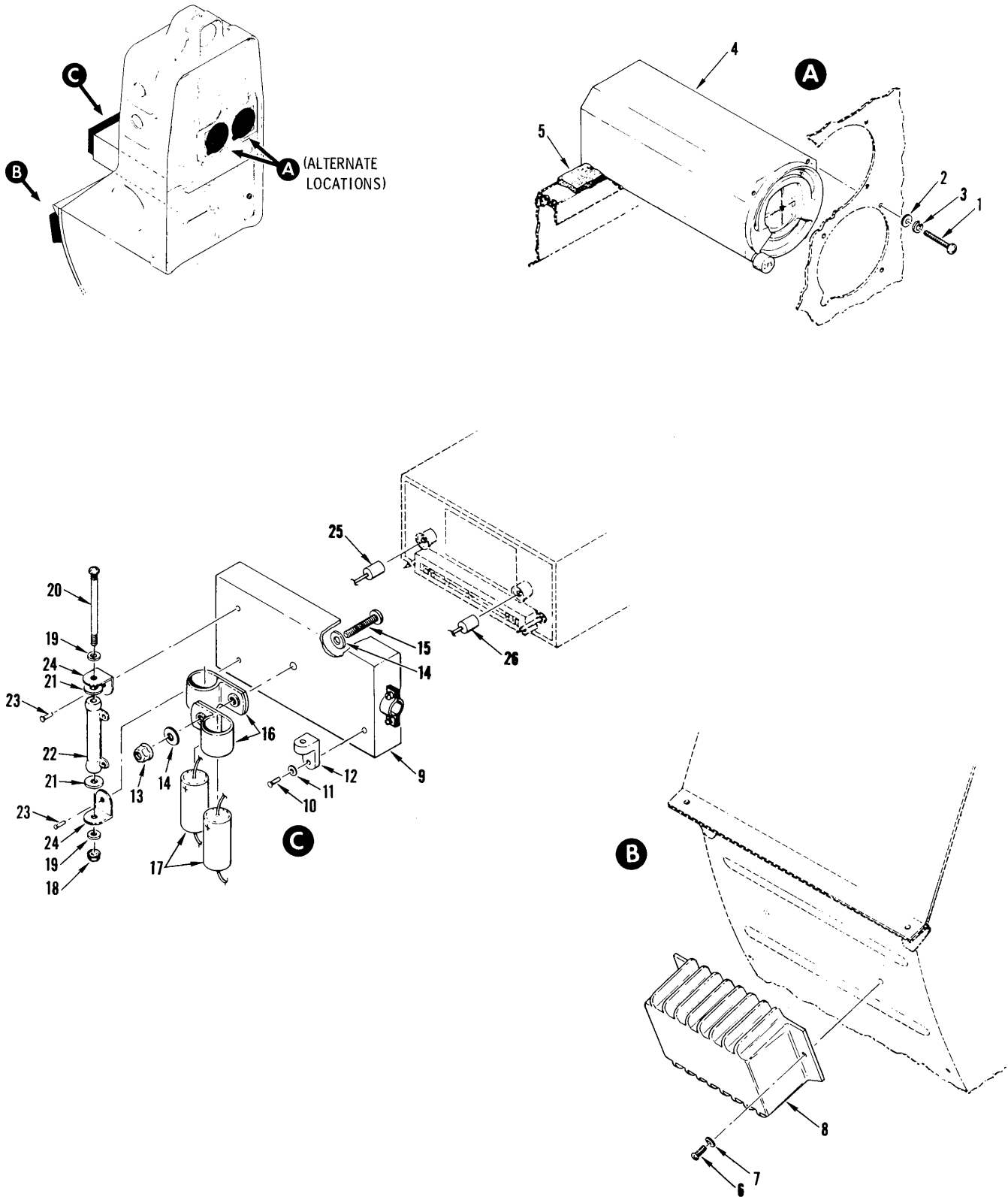


47-096

Figure 1-1. KX 170A/B, KX 175B, and KY 195B King transceiver and coupler installation



FIG. & INDEX NO.	PART NO.	DESCRIPTION	UNITS PER ASSY
1-1-	369H90071	KX170A/B OR KX175/B TRANSCEIVER SYSTEM . . . . .	1
	369H90071-507	INSTL EQPT (See figure 1-2 for further bkdn) KY195/B TRANSCEIVER INSTL EQPT (See figure 1-2 . . . for further bkdn)	1
	369H90071-503	. KX170A/B OR KX175/B TRANSCEIVER SYSTEM . . . . . PROVISIONS (Part of 369H90071) (See figure 1-2 for further bkdn)	1
	369H90071-509	. KY195/B TRANSCEIVER SYSTEM PROVISIONS . . . . . (Part of 369H90071-507) (See figure 1-2 for further bkdn)	1
-1	369H90146-507	. . ANTENNA ASSY (See figure 1-3 for bkdn) . . . . .	1
-2	MS51958-61	. . SCREW . . . . .	2
-3	AN960D10L	. . WASHER . . . . .	2
-4	369H90071-13	. . STRIP . . . . .	AR
-5	369H90071-7	. . CLAMP . . . . .	1
-6	MS51957-33	. . SCREW . . . . .	3
-7	AN960XC6L	. . WASHER . . . . .	3
-8	MS35338-136	. . WASHER . . . . .	3
-9	KI201C	. . INDICATOR (Part of 369H90071) (See figure 1-2 . . . for alternate locations)	1
-10	NAS21043-3	. . NUT (Part of 369H90071-503) . . . . .	2
-11	NAS623-3-2	. . SCREW (Part of 369H90071-503) . . . . .	2
-12	AN960D10L	. . WASHER (Part of 369H90071-503) . . . . .	2
-13	MS25281-3	. . CLAMP (Part of 369H90071-503) . . . . .	1
-14	AN743-12	. . CLIP (Part of 369H90071-503) . . . . .	1
-15	NAS623-3-5	. . SCREW . . . . .	2
-16	AN960D10L	. . WASHER . . . . .	2
-17	369H90071-5	. . CLAMP . . . . .	1
-18	369H90071-13	. . STRIP . . . . .	AR
-19	369H90071-27	. . FILLER . . . . .	1
-20	KX170A/B OR KX175/B KY195/B	. . NAV/COM TRANSCEIVER SYSTEM (Part of 369H90071) . . . . . . . COMM TRANSCEIVER SYSTEM (Part of . . . . . 369H90071-507)	1 1
-21	AN507-8R6	. . SCREW . . . . .	8
-22	369H90071-41	. . SUPPORT . . . . .	2
-23	2TC13-7.5	. . CIRCUIT BREAKER . . . . .	1
-24	MS21043-3	. . NUT . . . . .	1
-25	AN960D10L	. . WASHER . . . . .	3
-26	AN315-3R	. . NUT . . . . .	1
-27	MS35338-138	. . WASHER . . . . .	1
-28	AN960D10	. . WASHER . . . . .	1
-29	NAS603-9	. . SCREW . . . . .	1
-30	NAS601-6	. . SCREW . . . . .	4
-31	AN960XC6L	. . WASHER . . . . .	4
-32	VO-20-30	. . COUPLER . . . . .	1



47-097

Figure 1-2. KX 170A/B, KX 175B and KY 195B King transceiver system - converter, indicator and wire harness installation

FIG. & INDEX NO.	PART NO.	DESCRIPTION	UNITS PER ASSY
1-2-	369H90071	KX170A/B OR KX175/B TRANSCEIVER SYSTEM . . . . .	REF
	369H90071-507	INSTL EQPT (Cont)	
	369H90071-503	KY195/B TRANSCEIVER SYSTEM INSTL EQPT (Cont) . . .	REF
	369H90071-503	. KX170A/B OR KX175/B TRANSCEIVER SYSTEM . . . . .	REF
	369H90071-509	PROVISIONS (Part of 369H90071)	
	369H90071-509	. KY195/B TRANSCEIVER SYSTEM PROVISIONS . . . . .	REF
	369H90071-509	(Cont) (Part of 369H90071-507)	
-1	MS1957-33	. . SCREW (Part of 369H90071-503) . . . . .	3
-2	AN960XC6L	. . WASHER (Part of 369H90071-503) . . . . .	3
-3	MS35338-136	. . WASHER (Part of 369H90071-503) . . . . .	3
-4	KI201C	. . INDICATOR (Part of 369H90071-503) . . . . .	2
	369H90071-13	(Alternate locations)	
-5	369H90071-13	. . STRIP . . . . .	AR
-6	NAS623-2-2	. . SCREW . . . . .	2
-7	AN960D8L	. . WASHER . . . . .	2
-8	KA39	. . VOLTAGE CONVERTER . . . . .	1
-9	369H90071-23	. . WIRE HARNESS ASSY . . . . .	1
-10	MS20470A4	. . RIVET . . . . .	1
-11	AN960PD6	. . WASHER . . . . .	1
-12	SSC2S	. . TY-WRAP . . . . .	1
-13	MS21042-08	. . NUT . . . . .	1
-14	AN960PD8L	. . WASHER . . . . .	2
-15	MS51957-47	. . SCREW . . . . .	1
-16	MS25281-10	. . CLAMP . . . . .	2
-17	097-0057-33	. . CAPACITOR . . . . .	2
-18	MS21043-06	. . NUT . . . . .	1
-19	AN960XC6L	. . WASHER . . . . .	2
-20	NAS601-36	. . SCREW . . . . .	1
-21	5607-16	. . WASHER . . . . .	2
-22	1707	. . RESISTOR . . . . .	1
-23	MS20470AD3	. . RIVET . . . . .	2
-24	369H90071-9	. . CLIP . . . . .	2
-25	369H90071-19	. . CABLE ASSY (COMM) (Part of 369H90071-503) . . . . .	1
-26	369H90071-21	. . CABLE ASSY (NAV) (Part of 369H90071-503) . . . . .	1

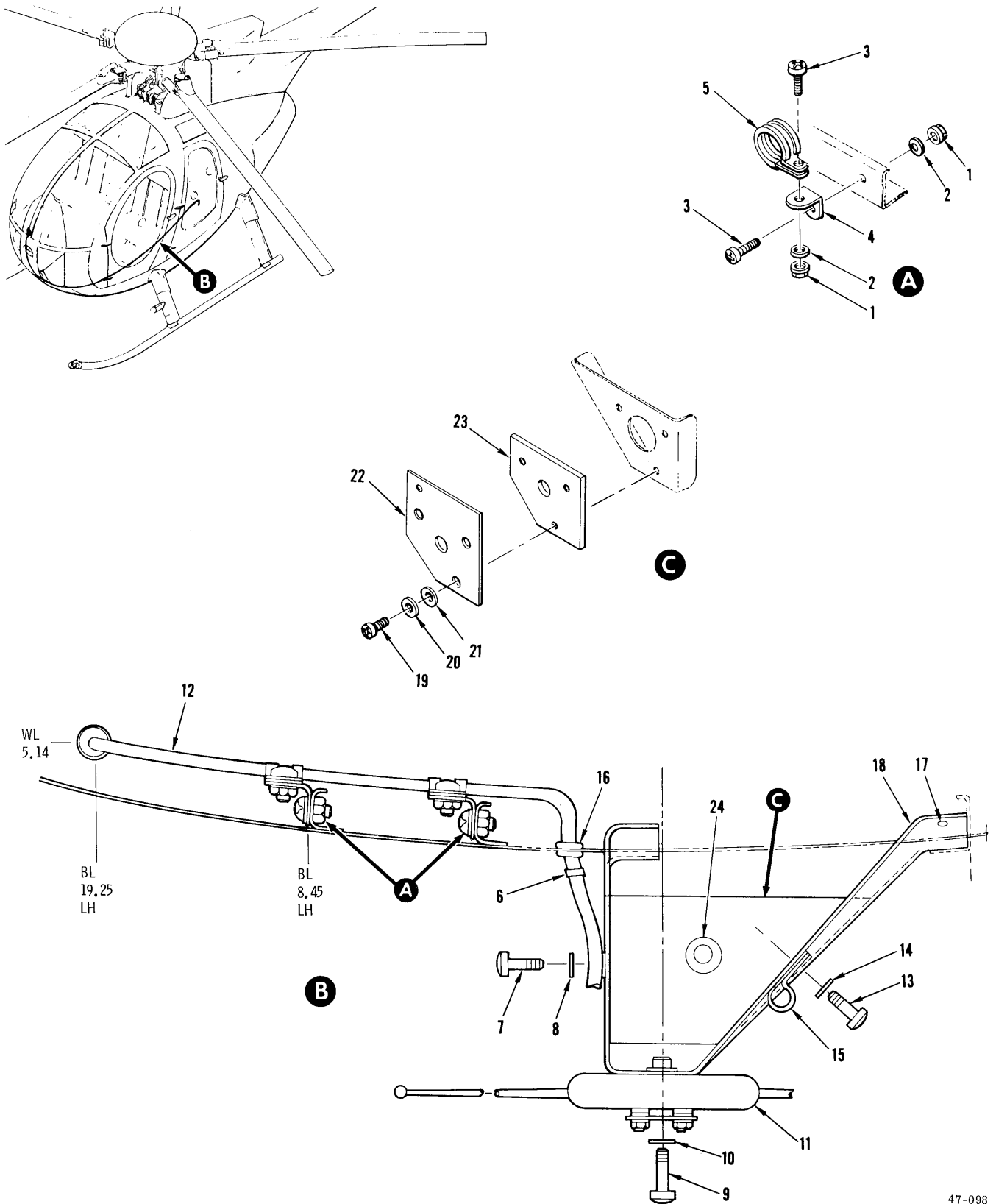


Figure 1-3. ADF/VHF-NAV antenna

FIG. & INDEX NO.	PART NO.	DESCRIPTION	UNITS PER ASSY
1-3-	369H90146-507	ADF/VHF NAV ANTENNA INSTL (See figure 1-4 . . . . . for further bkdn)	1
	369H90146-501	. ANTENNA INSTL . . . . .	1
-1	MS21042-3	. . NUT . . . . .	4
-2	AN960PD10L	. . WASHER . . . . .	4
-3	NAS603-7P	. . SCREW . . . . .	4
-4	369H90146-13	. . CLIP . . . . .	2
-5	MS21919DF4	. . CLAMP . . . . .	2
-6	MS17821-1	. . STRAP . . . . .	1
-7	NAS623-3-2	. . SCREW . . . . .	1
-8	AN960PD10L	. . WASHER . . . . .	1
-9	NAS623-3-10	. . SCREW . . . . .	2
-10	AN960PD10L	. . WASHER . . . . .	2
-11	VRP-37	. . ANTENNA . . . . .	1
-12	4	. . VARGLAS SILICONE SLEEVING . . . . .	AR
-13	NAS623-3-2	. . SCREW . . . . .	1
-14	AN960PD10L	. . WASHER . . . . .	1
-15	MS21919DF4	. . CLAMP . . . . .	1
-16	NAS557-4A	. . GROMMET . . . . .	1
-17	MS20470AD4	. . RIVET . . . . .	5
-18	369H90146-15	. . BRACKET ASSY . . . . .	1
-19	NAS623-2-3	. . . SCREW . . . . .	3
-20	NAS620C8L	. . . WASHER . . . . .	3
-21	5607-18	. . . WASHER . . . . .	3
-22	369H90146-21	. . . PLATE . . . . .	1
-23	369H90146-23	. . . INSULATOR . . . . .	1
-24	NAS1368N-3A	. . . GROMMET . . . . .	1

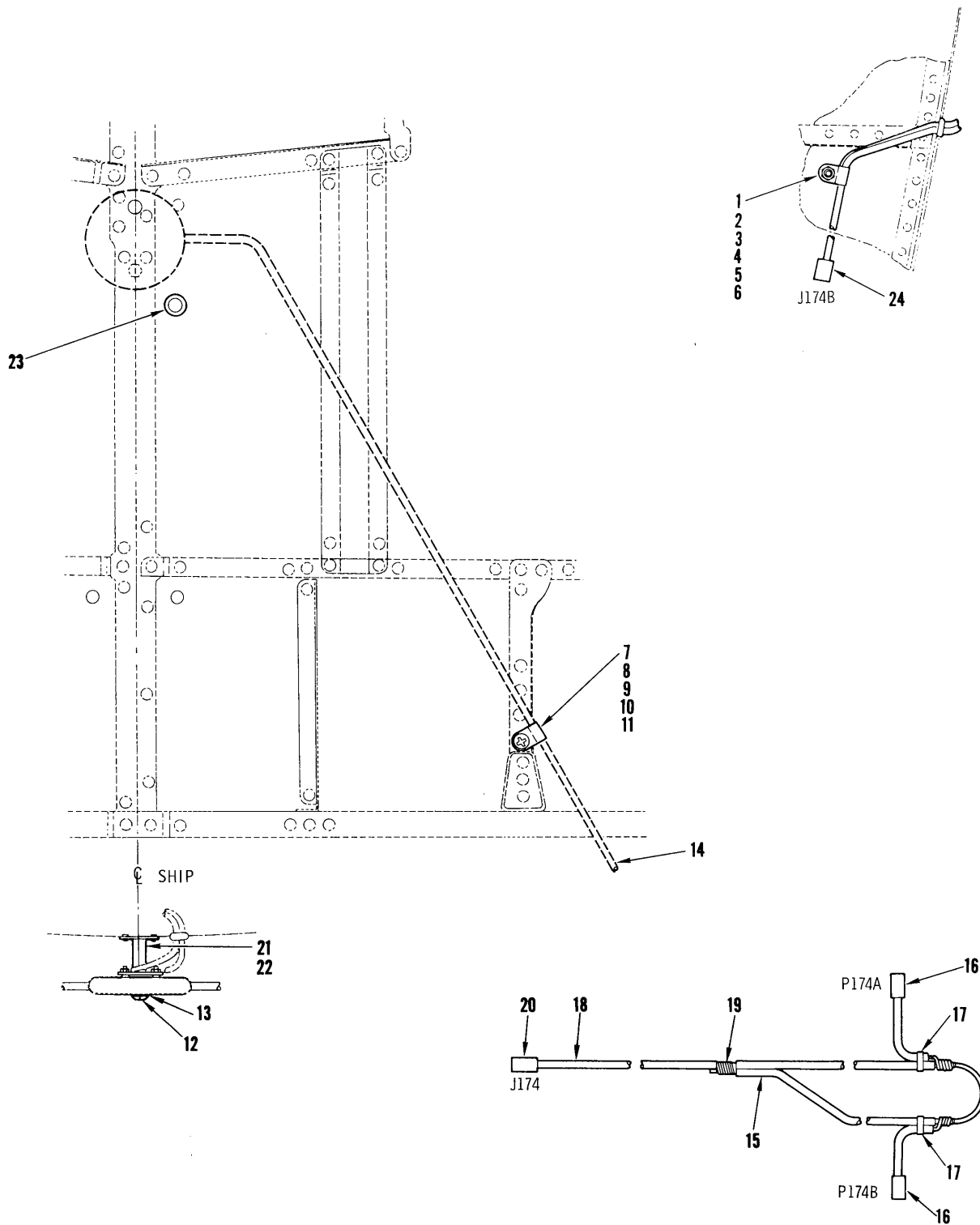


Figure 1-4. ADF/VHF-NAV antenna installation - extended landing gear

FIG. & INDEX NO.	PART NO.	DESCRIPTION	UNITS PER ASSY
1-4-	369H90146-507 369H90146-31	ADF/VHF NAV ANTENNA INSTL (Cont) . . . . . . ANTENNA INSTL . . . . . (Following items used only on helicopters with extended landing gear installed)	REF 1
-1	MS25082-C3	. . NUT . . . . .	1
-2	AN960D10L	. . WASHER . . . . .	4
-3	MS35338-138	. . WASHER . . . . .	1
-4	MS21042-3	. . NUT . . . . .	1
-5	NAS1096-3-8	. . BOLT . . . . .	1
-6	MS25281-F3	. . CLAMP . . . . .	1
-7	NAS623-3-3	. . SCREW . . . . .	2
-8	AN960PD10L	. . WASHER . . . . .	2
-9	MS25281-F2	. . CLAMP . . . . .	2
-10	MS20470B3	. . RIVET . . . . .	4
-11	SO-107	. . STANDOFF . . . . .	2
-12	NAS623-3-7	. . SCREW . . . . .	2
-13	AN960PD10L	. . WASHER . . . . .	2
-14	VRP-37	. . ANTENNA . . . . .	1
-15	369H90146-27	. . WIRE HARNESS . . . . .	1
-16	UG88/U	. . . CONNECTOR . . . . .	2
-17	17	. . . LACING . . . . .	AR
-18	RG58/U	. . . COAX CABLE . . . . .	AR
-19	172ALY	. . . COPPER WIRE . . . . .	AR
-20	UG89/U	. . . CONNECTOR . . . . .	1
-21	MS20470AD3	. . RIVET . . . . .	2
-22	WSI-4-10	. . SPACER . . . . .	2
-23	MS35489-11S	. . GROMMET . . . . .	1
-24	UG89/U	. . CONNECTOR . . . . .	1





## SECTION II MAINTENANCE INSTRUCTIONS

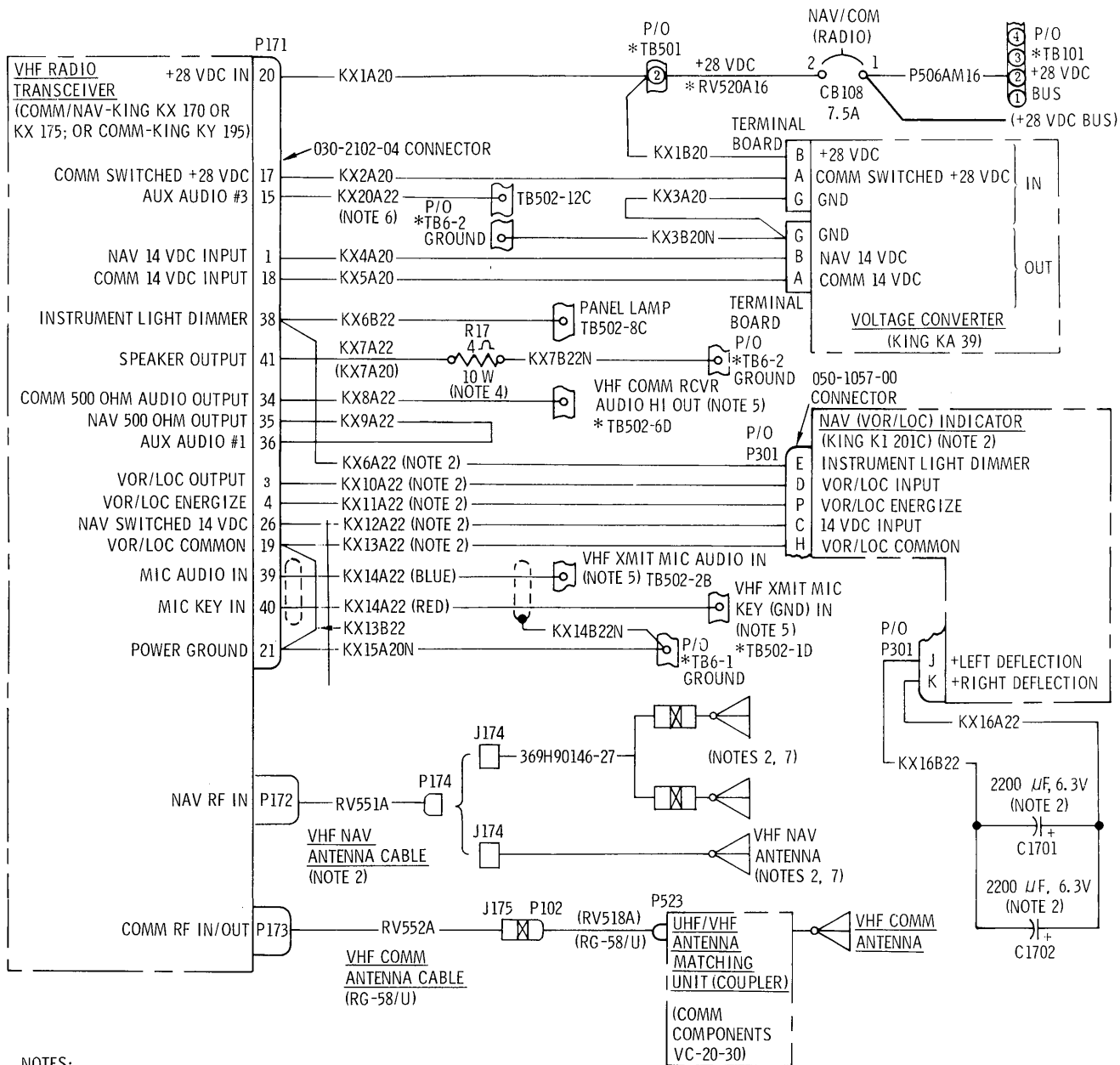
2-1. **GENERAL INFORMATION.** The KX 170A/B or KX 175B NAV/COM transceiver installation provides for two-way voice communication between aircraft and with ground stations. The transceiver also receives Very-High-Frequency Omnidirectional Radio Range and Localizer (VOR/LOC) for navigation information conversion and display. The KY 195 COMM transceiver installation provides for radio communications only. Major components of each system are listed in table 2-1 and described in following paragraphs. The KA 39 voltage converter receives +28 vdc from the helicopter +28 vdc bus, through the NAV/COM 7.5-ampere circuit breaker on the instrument panel, and converts it to +14 vdc at approximately 4.5 amperes power in the transceiver and KI 201 indicator. Figure 2-1 provides

a wiring diagram for the NAV/COM-COMM installation. The maintenance information in this section pertains to a system already installed in a helicopter. For maintenance information on the transceiver, indicator, voltage, converter, and indicator beyond the scope of this manual, refer to the manufacturer's publications (table 2-2, HMI - Vol 1).

**NOTE:** The KX 170 and KX 175 vhf NAV/COM installations are essentially identical, except for differences in vhf transceivers. Suffix letters for manufacturer's model number may vary (example: KX 170A or KX 170B). For difference information, refer to paragraph 2-2. An integrated interphone communication system (ICS) must also be

Table 2-1. Major NAV/COM components

Component	System		
	KX 170A/B	KX 175B	KY 195B
Transceiver	KX 170A/B	KX 175B	KY 195B
Indicator	KI 201C	KI 201C	Not used
Voltage Converter	KA 39	KA 39	KA 39
Antenna Coupler	VC 20-30	VC 20-30	VC 20-30
NAV/COM Antenna	VRP 37	VRP 37	Not used
NAV/COM Antenna (used with extended landing gear)	Uses two VRP 37 antennas	Uses two VRP 37 antennas	Not used
COMM Antenna	369A3014-53	369A3014-53	369A3014-53
Antenna Cable Assy	369H90146-27	369H90146-27	Not used
NAV Cable Assy	369H90071-21	369H90071-21	Not used
COM (COMM) Cable Assy	369H90071-19	369H90071-19	369H90071-19
Wire Harness	369H90071-23	369H90071-23	369H90071-23



NOTES:

1. ASTERISK (\*) INDICATES PART OF HELICOPTER BASIC ELECTRICAL SYSTEM.
2. USED ONLY WITH KING KX 170 OR KX175. WHEN KING KX 195 IS INSTALLED, VHF NAV ANTENNA IS NOT INSTALLED AND VHF NAV ANTENNA CABLE AND CONNECTOR P301 ARE STOWED.
3. ALL WIRING, EXCEPT WIRE NO. P506AM16 AND ANTENNA CABLES, IS PART OF VHF COM/NAV WIRING HARNESS ASSEMBLY.
4. TERMINATION IMPEDANCE USED IN PLACE OF SPEAKER.
5. FOR WIRING INTERCONNECTION INFORMATION, REFER TO INFORMATION ON INTERPHONE SYSTEM AND RADIO CONTROL EQUIPMENT IN THIS OPTION GROUP.
6. PART OF N<sub>1</sub>/N<sub>R</sub> EPO WARNING SYSTEM, TO ELIMINATE POSSIBILITY OF INTERFERENCE BETWEEN THAT SYSTEM AND RADIO/ICS SYSTEM.
7. ADDITIONAL VRP-37 ANTENNA AND 369H90146-27 HARNESS ASSEMBLY USED ON HELICOPTERS WITH EXTENDED LANDING GEAR.

Figure 2-1. KX 170A/B, KX 175B NAV/COM and KY 195B COMM installations - wiring diagram

installed in a helicopter for use of the vhf NAV/COM installation. The associated audio components (interphone control unit or intercom adapter, headset connectors, headset-microphones, interconnection wiring, etc) are required for reception and transmission of vhf COMM and reception of vhf NAV signals.

**2-2. DESCRIPTION OF KX 170A/B AND KX 175B NAV/COM TRANSCEIVER.** The KX 170A/B and KX 175B vhf NAV/COM transceivers contain, each in a single panel-mounted unit, a vhf navigation (NAV) receiver and a vhf communications (COM) transceiver. The receiver and transceiver operate independently, using amplitude-modulated signals. The frequency range of the NAV receiver is from 108.00 MHz to 117.95 MHz, tunable in 200 crystal-controlled channels with 50-kHz spacing. The NAV receiver receives incoming signals from the vhf NAV antenna and supplies VOR/LOC navigation information to KI 201 indicator for visual display. The frequency range of the COM transceiver is from 118.00 MHz to 135.95 MHz, tunable in 360 crystal-controlled channels with 50 kHz spacing. The COM transceiver transmits and receives on the same frequency, using the uhf/vhf antenna. Output power of the transistorized transceiver is 5 watts minimum into a 50-ohm load. The unit operates on +14 vdc supplied through the KA 39 voltage converter. All operating controls and indicators are on the face of the unit.

**NOTE:** The King KX 170A, KX 170B or KX 175B vhf NAV/COM transceiver may be used. The KX 170A and KX 170B vhf transceivers are basically identical, except the frequency range of 118.00 to 139.95 MHz is covered with 720 channels having 25 kHz separation for the KX 170B, and with 360 channels having 50 kHz separation for the KX 170A. The KX 175B is identical to the KX 170B, except the KX 175B also complies with specific FAA Technical Standard Order (TSO) specifications. (Refer to manufacturer's publications, table 2-2, HMI - Vol 1.) Otherwise, KX 170A/B and KX 175B vhf transceivers are directly interchangeable.

**2-3. DESCRIPTION OF KY 195B VHF COMM TRANSCEIVER.** The KY 195B vhf COMM transceiver transmits and receives amplitude-modulated voice signals in the frequency range from 118.00 MHz to 135.95 MHz. Dual, independent frequency selectors provide switch selection of either one or two previously chosen frequencies. The COMM transceiver operates on +14 vdc supplied through

the KA 39 voltage converter. All controls and indicators are on the face of the unit.

**NOTE:** Suffix letter for manufacturer's model number may vary (example: KY 195 or KY 195B). The King KY 195 or KY 195B vhf COMM transceiver may be used. The KY 195 and KY 195B are basically identical, except the frequency range of 118.00 to 135.95 MHz is covered with 720 channels having 25 kHz separation for the KY 195B, and with 360 channels having 50 kHz separation for the KY 195. Both the KY 195 and KY 195B comply with specific FAA Technical Standard Order (TSO) specifications. (Refer to manufacturer's publications, table 2-2, HMI - Vol 1.) Otherwise, KY 195 and KY 195B vhf COMM transceivers are directly interchangeable. An integrated interphone system and radio control equipment must also be installed. The associated audio components (interphone control unit or intercom adapter, headset connectors, headset microphones, etc) are required for reception and transmission of vhf COMM signals.

**2-4. DESCRIPTION OF KI 201C VOR INDICATOR.** The KI 201C VOR indicator operates using demodulated signals from the NAV receiver to provide visual display of VOR (omni) and LOC (localized) information. The KI 201C indicator converts this information into dc voltages which drive the LEFT-RIGHT needle and the TO-OFF-FROM flag on the face of the indicator. The Omni Bearing Selector (OBS) knob is used to manually rotate and position the coarse index card.

**2-5. DESCRIPTION OF KA 39 VOLTAGE CONVERTER.** The KA 39 voltage converter consists of dual series regulators that convert 28 vdc to 14 vdc. One regulator supplies operating power to the NAV receiver, the other supplies power to the COM (COMM) transceiver.

**2-6. DESCRIPTION OF VC 20-30 COUPLER.** The Communications Components VC 20-30 uhf/vhf antenna coupler is connected in series in the COM (COMM) antenna cable, and is used to match impedance of antenna and transceiver.

**2-7. REFERENCE DATA.** Information on helicopter systems that interface with the NAV/COM-COMM system is in HMI - Vol 1 and 369D - IPC. For information on associated optional avionics equipment used with the NAV/COM-COMM system (such as the integrated interphone communication system (ICS) and the KI 211C ILS indicator), refer to the applicable Opt Eqpt Manual for that specific equipment (Section 21, HMI - Vol 1).

2-8. **TROUBLESHOOTING.** If the NAV/COM-COMM system does not operate properly during operational check or normal use, refer to table 2-2 for aid in locating the probable trouble and for corrective action. Refer to the NAV/COM-COMM wiring diagram (fig. 2-1) for aid in troubleshooting. If troubleshooting indicates that the trouble is in the VOR indicator or the NAV/COM-COMM transceiver, refer to the manufacturer's publication (table 2-2, HMI - Vol 1) for unit troubleshooting and corrective action.

**NOTE:** The audio is reproduced by components of the integrated interphone communication system (ICS) which, in itself, may be the source of audio trouble. When audio malfunction is encountered, refer to the ICS Opt Eqpt Manual (table 21-1, HMI - Vol 1) for troubleshooting procedures for that portion of audio circuitry.

2-9. **OPERATIONAL CHECK.** The following procedure is used to verify the capability of the NAV/COM-COMM system to function correctly. The procedure should be performed anytime a malfunction is suspected, and prior to normal use after repair.

a. NAV/COM transceiver:

- (1) Maintain an appropriate altitude and contact a ground station facility at a range of at least 50 nautical miles.
- (2) Contact a nearby ground station.
- (3) Set the OFF/ON/TEST switch to TEST and listen for any unusual electrical noise that would reduce the COM receiver sensitivity by increasing the squelch threshold.
- (4) Verify communications capability at both the high and low ends of the vhf COM band.
- (5) Select a VOR frequency for a transmitter within 40 nautical miles range and listen to the VOR audio to ensure that no electrical interference is present.
- (6) Check the tone identifier filter operation.
- (7) Fly inbound or outbound on a selected VOR radial and check for proper LEFT-RIGHT and TO-FROM indications. Check VOR accuracy.

**NOTE:** At low altitudes, VOR ground station scalloping may be present.

b. COMM transceiver:

- (1) Maintain an appropriate altitude and contact a ground station facility at a range of at least 50 nautical miles.
- (2) Contact a nearby ground station.
- (3) Set the OFF/ON/TEST switch to TEST and listen for any unusual electrical noise that

would reduce the COMM receiver sensitivity by increasing the squelch threshold.

- (4) Verify communications capability at both the high and low ends of the vhf COMM band.

2-10. **ALIGNMENT.** Refer to the manufacturer's publication (table 2-2, HMI - Vol 1) for instruction for aligning the NAV/COM-COMM system.

2-11. **INSPECTION.** Inspect components of the NAV/COM-COMM system in accordance with FAA AC 43.13-1A and standard avionics maintenance practices, and the following:

- a. Inspect all components for obvious physical damage, corrosion and evidence of electrical overheating.
- b. Inspect the VOR indicator and NAV/COM-COMM transceiver for loose or missing control knobs, damaged or obscured markings, and loose or damaged connectors.
- c. Inspect the wire harness assembly and antenna cable for cuts and other damage, loose connectors or connecting hardware, and frayed insulation.

2-12. **REPLACEMENT OF NAV/COM-COMM TRANSCEIVER.**

- a. Check that all electrical power is OFF.
- b. Remove instrument panel side fairings (Section 17, HMI - Vol 1).
- c. Disconnect the electrical connector (part of wire harness assembly; 9, fig. 1-2) at rear of transceiver (20, fig. 1-1).
- d. Remove screws (15), washers (16), clamp (17), and strips (18).
- e. Carefully remove transceiver (20).
- f. Install the replacement transceiver in reverse order of removal.

2-13. **REPLACEMENT OF VOR INDICATOR.**

- a. Check that all electrical power is OFF.
- b. Remove instrument panel side fairings (Section 17, HMI - Vol 1).
- c. Remove screws (2, fig. 1-1), washers (3), clamp (5), and strips (4).
- d. Remove screws (6), washers (7, 8) and indicator (9).
- e. Install the replacement indicator in reverse order of removal.

2-14. **REPLACEMENT OF KA 39 VOLTAGE CONVERTER.**

- a. Check that all electrical power is OFF.
- b. Remove screws (6, fig. 1-2), washers (7), and voltage converter (8).
- c. Install replacement voltage converter in reverse order removal.

Table 2-2. Troubleshooting

Symptom	Probable Cause	Corrective Action
<b>KX 170A/B OR KX 175B NAV/COM TRANSCEIVER INSTALLATION</b>		
Radio and indicator inoperative	NAV/COM circuit breaker (23, fig. 1-1) not ON.	Set circuit breaker to ON.
	No dc power on helicopter main bus.	Refer to Section 19, HMI - Vol 1.
	Disconnected or damaged wire harness assembly.	Connect, repair, or replace wire harness assembly, as required.
	Defective voltage converter.	Replace voltage converter.
NAV/COM circuit breaker trips	Overload or short circuit.	Set circuit breaker to ON. If trip reoccurs, replace overloaded or shorted component.
NAV voice ok, indication erroneous	Defective indicator.	Repair or replace indicator.
	Defective NAV receiver.	Repair receiver or replace transceiver.
	Disconnected or damaged NAV antenna	Connect antenna cable or repair antenna, as required.
No NAV voice received, indication ok	Defective COM receiver.	Repair or replace transceiver.
	Disconnected NAV antenna or damaged antenna.	Connect antenna cable or repair antenna, as required.
	Damaged or defective antenna coupler.	Replace antenna coupler.
<b>KY 195B COMM TRANSCEIVER INSTALLATION</b>		
Both transmitter and receiver inoperative	NAV/COM circuit breaker (23, fig. 1-1) not ON.	Set circuit breaker to ON.
	No dc power on helicopter main bus.	Refer to Section 19, HMI - Vol 1.
	Disconnected or damaged wire harness assembly.	Connect, repair, or replace wire harness assembly, as required.
	Defective voltage converter.	Replace voltage converter.
NAV/COM circuit breaker trips	Overload or short circuit.	Set circuit breaker to ON. If trip reoccurs, replace overloaded or shorted component.
No reception of audio at any station; ICS operation ok, transmit ok	Defective COMM receiver.	Repair receiver or replace transceiver.

Table 2-2. Troubleshooting (cont)

Symptom	Probable Cause	Corrective Action
<b>KY 195B COMM TRANSCEIVER INSTALLATION (CONT)</b>		
Cannot transmit; ICS operation ok, reception ok	Defective COMM transmitter.	Repair or replace transmitter.
Cannot receive or transmit; ICS operation ok	Defective COMM transceiver.	Repair or replace transceiver.
	Disconnected or damaged COM antenna.	Connect antenna cable or repair antenna, as required.
	Damaged or defective antenna coupler.	Replace antenna coupler.

**2-15. REPLACEMENT OF VC 20-30 ANTENNA COUPLER.**

- a. Open plenum chamber access door (Section 2, HMI - Vol 1).
- b. Remove nuts (24, 26, fig. 1-1), washers (25, 27, 28), and screw (29).
- c. Remove screws (30), washers (31), and antenna coupler (32).
- d. Install replacement antenna coupler in reverse order of removal.

2-16. **ADJUSTMENT.** Refer to the manufacturer's publication (table 2-2, HMI - Vol 1) for adjustment procedures for the NAV/COM-COMM transceivers.

2-17. **REPAIR.** Refer to Section 19 of HMI - Vol 1 for electrical repair instructions. Replace damaged cable clips and other attaching hardware with new parts. When a malfunction occurs in the NAV/COM-COMM transceiver or VOR indicator, replace parts found to be defective by the troubleshooting procedures provided in the manufacturer's publication (table 2-2, HMI - Vol 1). Align the NAV/COM-COMM system, if necessary, in accordance with the manufacturer's publication.

2-18. **WIRING DIAGRAM.** See figure 2-1 for the NAV/COM-COMM system interconnection wiring diagram.