

Honeywell

INSTALLATION MANUAL

BENDIX/KING[®]

KN 62/62A/64

***DISTANCE MEASURING
EQUIPMENT***

MANUAL NUMBER 006-00144-0007

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WARNING

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SECTION I GENERAL INFORMATION

1.1 INTRODUCTION

This manual contains information relative to the physical, mechanical, and electrical characteristics and installation procedures for the KN 62/62A/64 DME. The KN 64 has lower output power than the KN 62/62A. The KN 64 is not TSO'ed.

1.2 EQUIPMENT DESCRIPTION

The KN 62/62A/64 is a panel mounted, 200 channel DME employing the latest state of the art solid-state transmitter and large scale integrated circuit (LSI) technology. All tuning is done electronically using a single crystal, digital, frequency synthesizer. The unit has a gas discharge display that simultaneously indicates range, speed, and time-to-station or range and frequency. An automatic dimming circuit adjusts the brightness of the display to compensate for changes in ambient light level.

Range, speed, and time-to-station are measured digitally, using two LSI's. Two other LSI circuits are employed in the digital frequency synthesizer and display circuitry.

The KN 62/62A/64 can be channeled internally using its own frequency selection knobs or externally from any of the common NAV receiver codes.

The KN 62/62A/64 is an extremely compact DME requiring only 1.3 inches of panel height. It can be operated with any DC input from 11 to 33 volts. Power consumption is only 15 watts at any input voltage; thus, forced air cooling is **not** required.

1.3 TECHNICAL CHARACTERISTICS

SPECIFICATION	CHARACTERISTIC
TSO COMPLIANCE (KN 62A only):	F.A.A. TSO C66a
KA 60 Antenna:	FAA TSO C66a and TSO C74c
KA 61 Antenna:	FAA TSO C66c, C74c, C112, C118, C147
RTCA DO-160 Environmental Categories	
KN 62A:	/A1B1/A/PKS/XXXXXXZBBBA
KA 60:	/D2/A/JY/XXXXXXXXXXXX
RTCA DO-160D Environmental Categories	
KA 61:	[D2X]ACB[SCMYL, RG]XRFXX-SXXXXXXXX[XXXX][2A]AX
CHANNELS:	200 channels
ELECTRICAL:	A. All solid state transmitter B. Electronically tuned by single crystal, digital, frequency synthesizer C. Range, speed, and time-to-station measured digitally, using large scale integrated circuits

SPECIFICATION	CHARACTERISTIC
	D. Gas discharge display
OUTPUT POWER:	50 watts peak, pulsed power minimum (35 watts, KN 64) 100 watts nominal (50 watts, KN 64)
MAXIMUM DISPLAY RANGE:*	389 nautical miles
PANEL HEIGHT:	1.3 inches (3.30 cm) maximum
ACQUISITION SENSITIVITY:	-82dBm minimum, -87dBm nominal (-78dBm minimum, -87dBm nominal, KN 64)

NOTE

*THE MAXIMUM RANGE AT WHICH THE DME WILL LOCK UP IS DETERMINED BY ALTITUDE AND GROUND STATION OUTPUT POWER AND SENSITIVITY.

SPECIFICATION	CHARACTERISTIC
RANGE ACCURACY:*	$\pm .1$ NAUTICAL MILES OR $\pm .14\%$, WHICHEVER IS GREATER, FROM 0 TO 99.9 NAUTICAL MILES ± 1 NAUTICAL MILE FROM 100 TO 389 NAUTICAL MILES
GROUND SPEED ACCURACY:	± 1 KNOT OR $\pm 1\%$, WHICHEVER IS GREATER FROM 0 TO 999 KNOTS
TIME-TO-STATION ACCURACY:	± 1 MINUTE FROM 0 TO 99 MINUTES
SEARCH TIME:	1.0 second nominal
MEMORY TIME:	11 to 15 seconds
AUDIO OUTPUT (IDENT):	Level adjustable up to 15mW INTO 600 OHM LOAD, nominally set for 2mW
MAXIMUM ALTITUDE:	50,000 feet
KN 62/62A/64 OVERALL DIMENSIONS (including mounting rack and connectors)	
LENGTH	12.258 INCHES (31.135 cm)
WIDTH:	6.312 inches (16.032 cm)
HEIGHT:	1.300 inches (3.302 cm)
WEIGHT:	2.6 LBS (1.18 KG) nominal

POWER REQUIREMENTS: 11-33VDC at 15 watts

066-1068-04 AND 066-1088-01 ONLY

BACKLIGHTING: NOMINAL 14VDC AT 2 WATTS

NOMINAL 28VDC AT 2 WATTS

CHANNELING SOURCES:

- a. Internal
- b. External control head providing shifted BCD code such as KFS 560B.
- c. External control head providing ARINC 2 x 5 code such as KX 170 and KFS 560B.
- d. External control head providing slip code such as KX 170A, KX 170B, KX 175A, and KX 175B.

1.3.1 DME CHANNEL SOURCES

The KN 62/62A/64 can be channeled by the internal channeling tuning knobs or it may be channeled by an external source. The KN 62/62A/64 will accept external channeling in the form of Shifted BCD, ARINC 2X5, or Bendix/King Slip code. The tuning logic for each of the three types of channeling is given in tables 1-1, 1-2, and 1-3.

TABLE 1-1 SHIFTED BCD DME CHANNELING CODES

Frequency Mhz	M8	M4	M2	M1	.X Mhz	K80 0	K40 0	K20 0	K10 0	.XX Mhz	K50
108	0	0	0	0	.0X	0	0	0	0	.X0	1
109	0	0	0	1	.1X	0	0	0	1	.X5	0
110	0	0	1	0	.2X	0	0	1	0		
111	0	0	1	1	.3X	0	0	1	1		
112	0	1	0	0	.4X	0	1	0	0		
113	0	1	0	1	.5X	0	1	0	1		
114	0	1	1	0	.6X	0	1	1	0		
115	0	1	1	1	.7X	0	1	1	1		
116	1	0	0	0	.8X	1	0	0	0		
117	1	0	0	1	.9X	1	0	0	1		

0 = Connected to Remote Control Common
 1 = Open

TABLE 1-2 2 x 5 DME CHANNELING CODES

Frequency Mhz	MA	ME	MC	MD	X Mhz	KA	KE	KC	KD	.XX Mhz	K5 0
108	0	1	1	0	.0X	1	0	1	1	.X0	1
109	0	0	1	1	.1X	0	1	1	1	.X5	0
110	1	0	1	1	.2X	0	1	0	1		
111	0	1	1	1	.3X	1	1	0	1		
112	0	1	0	1	.4X	1	1	1	0		
113	1	1	0	1	.5X	1	1	0	0		
114	1	1	1	0	.6X	1	0	0	1		
115	1	1	0	0	.7X	1	0	1	0		
116	1	0	0	1	.8X	0	1	1	0		
117	1	0	1	0	.9X	0	0	1	1		

0 = Connected to Remote Control Common
 1 = Open

TABLE 1-3 SLIP CODE DME CHANNELING CODES

Frequency Mhz	M0	M1	M2	M3	.X Mhz	K0	K1	K2	K3	.XX Mhz	K50
108	1	1	0	1	.0X	0	0	1	1	.X0	1
109	1	1	1	0	.1X	0	0	0	1	.X5	0
110	0	1	1	1	.2X	0	0	0	0		
111	0	0	1	1	.3X	1	0	0	0		
112	0	0	0	1	.4X	1	1	0	0		
113	1	0	0	0	.5X	0	1	1	0		
114	0	1	0	0	.6X	1	0	1	1		
115	1	0	1	0	.7X	1	1	0	1		
116	0	1	0	1	.8X	1	1	1	0		
117	0	0	1	0	.9X	0	1	1	1		

0 = Connected to Remote Control Common
 1 = Open

1.3.2 UNIT RESONANT FREQUENCIES

The following critical frequencies are mechanical resonance of the unit under test that have peak acceleration amplitude greater than twice the input acceleration amplitude. There were no observed changes in performance of the unit under test.

x	Y	Z
215 Hz to 262 Hz	104 Hz to 163 Hz	205 Hz to 433 Hz
456 Hz to 680 Hz	246 Hz to 439 Hz	467 Hz to 478 Hz
1807 Hz to 1875 Hz		
1975 Hz to 1933 Hz		

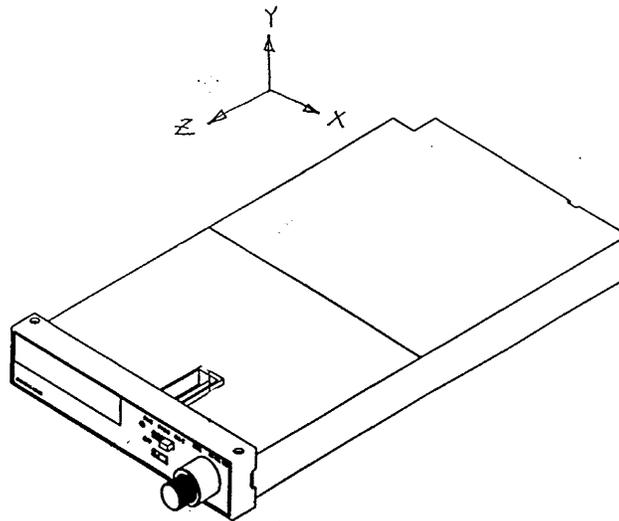


Figure 1-1 KN 62/62A/64 CRITICAL FREQUENCIES

1.4 UNITS AND ACCESSORIES

1.4.1 KN 62 DME

The KN 62 is available in only one version under P/N 066-1064-00.

1.4.2 KN 62A DME

The KN 62A is available in two versions, P/N 066-1068-01 and P/N 066-1068-04.

1.4.3 KN 64 DME

The KN 64 is available in two versions, P/N 066-1088-00 and 066-1088-01.

1.4.4

KN 62/62A/64 INSTALLATION KIT

The KN 62/62A/64 installation kit, P/N 050-01611-XXXX is available in two versions. The -0000 and the -0001. The contents of the kit are listed below:

TABLE 1-4 KN 62/62A/64 INSTALLATION KIT

PART NUMBER 050-01611-xxxx	DESCRIPTION	-0000 Rev. AA	-0001 Rev. AC
030-00005-0000	CONNECTOR, BNC UG 88C/U	1	0
030-00101-0002	PANEL MOUNT PLUG	1	1
030-01094-0053	CONNECTOR	1	1
030-01107-0022	CONNECTOR TERM 22T	1	1
089-02051-0024	NUT SPEED U 6-32	4	4
089-02353-0001	NUT CLIP 6-32	4	4
089-05903-0007	SCREW, PHP 4-40X7/16	2	2
089-06012-0008	Screw, FHP 6-32X1/2	4	4
089-08003-0034	WASHER, SPLIT LOCK #4	2	2
089-08168-0002	WASHER WAVE	1	1
089-08252-0030	WASHER	2	2
090-00019-0007	RING RETAINER .438	1	1

1.5 LICENSE REQUIREMENTS

NONE

SECTION II INSTALLATION

2.1 GENERAL INFORMATION

This section contains information relative to the installation and wiring of the KN 62/62A/64 DME. A close adherence to methods and procedures discussed herein is required.

2.1.1 KN 62A ONLY

The conditions and tests required for TSO approval of this article are minimum performance standards. It is the responsibility of those desiring to install this article either on or within a specific type or class of aircraft to determine that the aircraft installation conditions are within TSO standards. The article may be installed only if further evaluation by the applicant documents an acceptable installation and is approved by the Administrator.

2.1.2 KN 62 AND KN 64

The conditions and tests performed on this article are minimum performance standards. It is the responsibility of those desiring to install this article either on or within a specific type or class of aircraft to determine that the aircraft installation conditions are within these performance standards. The article may be installed only if further evaluation by the applicant documents an acceptable installation and is approved by the Administrator.

2.2 UNPACKING AND INSPECTING EQUIPMENT

Exercise extreme care when unpacking the equipment. Make a visual inspection of the unit for evidence of damage incurred during shipment. If a claim for damage is to be made, save the shipping container to substantiate the claim. The claim should be promptly filed with the transportation company. It would be advisable to retain the container and packaging material after all equipment has been removed in the event that equipment storage or reshipment should become necessary.

2.3 EQUIPMENT INSTALLATION

2.3.1 AVIONICS COOLING REQUIREMENTS FOR PANEL MOUNTED EQUIPMENT

The greatest single contributor to increased reliability of all modern day avionics is to limit the maximum operating temperature of the individual units. While modern day individual circuit designs consume much less electrical energy, the watts per cubic inch dissipated within avionics units remains much the same due to high density packaging techniques utilized. Consequently, the importance of providing avionics stack cooling is still with us.

While each individual unit may not require forced air cooling, the combined heat load of several units operating in a typical avionics stack will significantly degrade the reliability of the avionics if provisions for stack cooling are not incorporated in the initial installation. Recommendations on stack cooling are contained in Bendix/King Installation Bulletin #55 and #143 revised. Failure to provide stack cooling will certainly lead to increased avionics maintenance costs and may void the Honeywell warranty.

2.3.2 KN 62/62A/64 INSTALLATION (FIGURES 2-1 THROUGH 2-18)

- A. Plan a location on the aircraft panel that is clearly visible and within easy access of the pilot.
- B. Avoid mounting the KN 62/62A/64 close to heater vents or other high heat sources.
- C. Compass safe distance is 8 inches for worst case deflection of one degree.
- D. Install the mounting rack in the aircraft using 6-32 x 1/2 flat head phillips screws (P/N 089-06012-0008) and 6-32 clip nuts (P/N 089-02353-0001). The screws are inserted from the inside through the holes in the sides of the mounting rack.
- E. Connect the harness wires to the connector pins and insert the connector pins into the rear of the Molex connector. See [Section 2.3.3](#) and Figures [2-1](#) and [2-2](#).
- F. Mount the Molex connector on the two hex spacers at the rear of the mounting rack. Use two 4-40 x 7/16 pan head, phillips screws (P/N 089-05903-0007) and two #4 split lock washers (P/N 089-08003-0034). Orient the connector so the polarizer key is closer to the side next to the antenna connector.
- G. Connect the antenna cable to the antenna connector ([Figure 2-3](#)).
- H. Install the antenna connector in the mounting rack from the outside as shown in Figures [2-14](#), [2-15](#). Secure connector in place with three washers and a retaining ring as shown in the figure.
- I. Install the KN 62/62A/64 into the mounting rack and secure by turning the hold down adjustment screw (accessible through a hole in the front panel) clockwise with an allen hex wrench until it is locked in place ([Figure 2-13](#)).
- J. The audio output of the KN 62/62A/64 is set for approximately 2mW into 600 ohms at the factory. If a different level is desired, readjust the audio level adjustment, accessible through the top cover ([Figure 2-13](#)).
- K. For 066-1068-04 and 066-1088-01 units with backlit Nomenclature refer to interconnect drawings for interconnect to lighting buss.
- L. When operating dual KN 62/62A/64's, the respective DME's will interfere with each other when the NAV frequencies differ by 5.3 MHz (for example, 108.00 MHz and 113.3 MHz). This interference results in premature flags or loss of "lock-on". Should this occur, one of the KN 62/62A/64's should be either turned off or tuned to a different NAV frequency so that the 5.3 MHz difference is eliminated.

2.3.3 MOLEX CONNECTOR ASSEMBLY (FIGURE 2-1)

- A. Solderless Contact Terminal Assembly using Molex Crimper
Refer to instructions in [Section 2.3.3](#).
- B. Solderless Contact Terminal Assembly using Pliers
 1. Strip each wire 5/32" for contact terminal (P/N 030-01107-0030). (The last two digits of the contact terminal part number indicate the number of terminals furnished).
 2. Tin the exposed conductor.
 3. Using needle nose pliers, fold over each conductor tab in turn, onto the exposed conductor. When both tabs have been folded, firmly press the tabs against the conductor.
 4. Repeat step 3 for insulator tabs.
 5. Apply a small amount of solder (using minimum heat) to the conductor/tab connection to assure a good electromechanical joint.
- C. Contact Insertion into Molex Connector Housing
 1. After the contact terminals have been installed on the wiring harness, the contact terminals can be inserted into the proper location in the connector housing (P/N 030-01094-0053). The terminal cannot be inserted upside down. Be sure to push the terminal all the way in, until a click can be felt or heard.
 2. The self-locking feature can be tested by gently pulling on the wire.
- D. Extraction of Contact from Molex Connector
 1. Slip the flat narrow blade of a Molex contact ejector tool, HT-1884 (P/N 047-05009-0001) under the contact on the mating side of the connector. By turning the connector upside down one can see the blade slide into the stop.
 2. When the ejector is slid into place, the locking key of the contact is raised, allowing the contact to be removed by pulling moderately on the lead.
 3. Neither the contact nor position is damaged by removing a contact; however, the contact should be checked visually before reinstalling in connector, to be certain that retaining tab "A" extends as shown (see [Figure 2-1](#)) for retention in connector.

2.3.4 DME ANTENNA INSTALLATION

2.3.4.1 General

- a. The antenna should be well removed from any projections, the engine(s), and propeller(s). It should also be well removed from landing gear doors, access doors, or other openings which will break the ground plane for the antenna.
- b. The antenna should be mounted on a bottom surface of the aircraft and in a vertical position when the aircraft is in level flight.
- c. Avoid running other cables or wires near the antenna cable.
- d. Avoid mounting the antenna within three (3) feet of the ADF sense antenna or any COMM

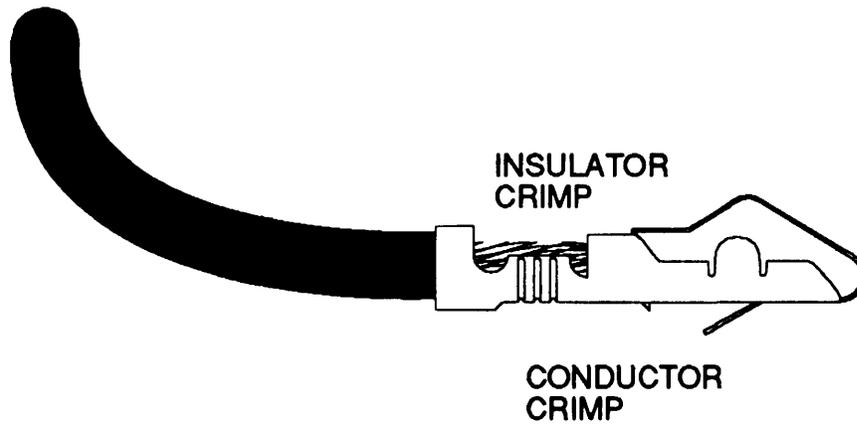
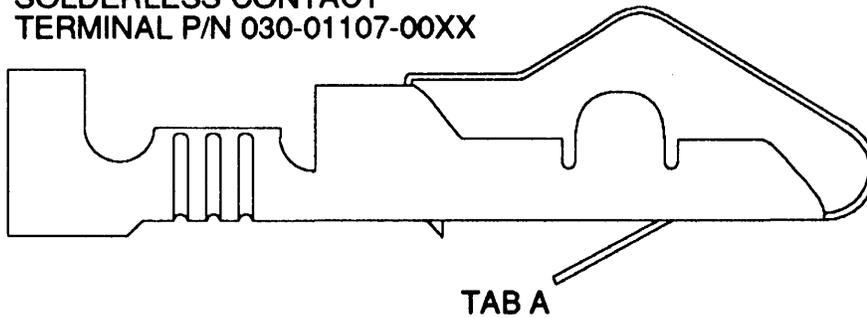
antenna and six (6) feet from a transponder antenna.

- e. Where practical, plan the antenna location to keep cable lengths as short as possible, and avoid sharp bends in the cable to minimize the VSWR.
- f. To prevent RF interference, the antenna must be physically mounted a minimum distance of three feet from the KN 62/62A/64.
- g. A back-up plate should be used for added strength on thin-skinned aircraft.
- h. The antenna should be kept clean. If left dirty (oil covered) the range of the DME may be affected.
- i. On pressurized aircraft, the antenna should be sealed using RTV (P/N 016-01082-0000) around the connector and mounting hardware.
- j. All antennas should be sealed around the outside for moisture protection.

2.3.4.2 KA 60/61 Installation (Refer to Figure 2-16 and 2-17)

- a. Peel the backing off the antenna template and apply template to the aircraft at the desired mounting location.
- b. Drill or cut the proper size holes for mounting the antenna, then remove the template.
- c. Using the antenna as a stencil, draw a line around the base of the antenna that will come into contact with the aircraft. Then carefully scrape off the paint within the stenciled area. Lightly sand the bare metal with fine sandpaper to insure removal of all paint and protective coatings.
- d. Sand the inside area of the aircraft where the backing plate will be located to remove the chromate or other protective finish.
- e. Apply Alumiprep No. 33 (P/N 016-01127-0000) following the directions on the container to cleanse the metal of any residue.
- f. Apply Alodine No. 1001 (P/N 016-01128-0000) following the directions on the container.
- g. Rivet the backing plate (P/N 047-04570-0000) into place, if required.
- h. Mount the antenna using #8 star washers (P/N 089-08017-0037) and 8-32 nuts (P/N 089-02148-0032) included with the antenna.
- i. RGU 400 or equivalent coaxial cable is normally used on installations having a cable run of ten feet or less. For cable runs from ten to twenty feet, use RG 142B/U cable (P/N 024-00002-0000).
- j. Inspect coaxial cable connector for proper center contact, then fasten it securely to the antenna.

SOLDERLESS CONTACT
TERMINAL P/N 030-01107-00XX



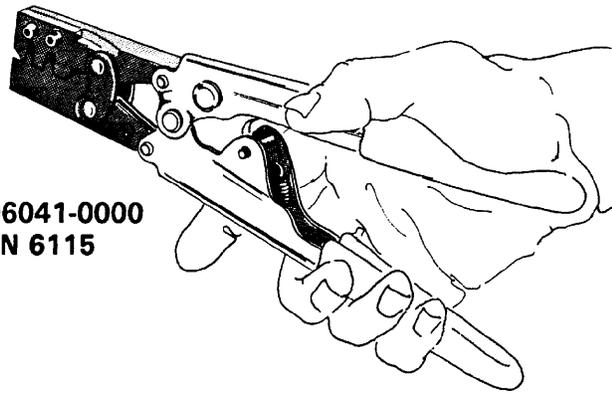
TERMINAL EXTRACTION
TOOL P/N 047-05099-0001
MOLEX P/N HT-1884



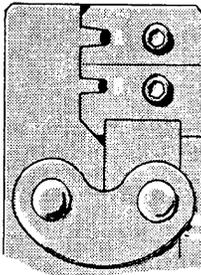
FIGURE 2-1 MOLEX TERMINALS AND TOOLS
(Sheet 1 of 3)

Holding the hand crimpers as shown, release the crimper's ratchet pawl and open by squeezing tightly on the handles, and then releasing pressure.

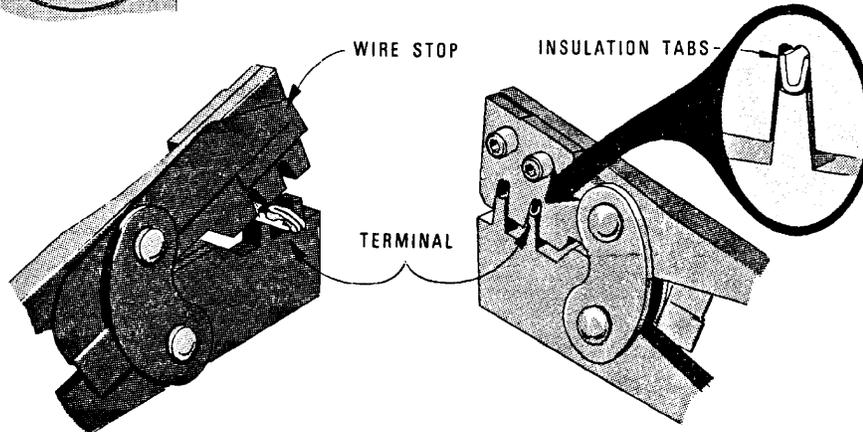
HAND CRIMPER
P/N 071-06041-0000
MOLEX P/N 6115



Close crimpers until ratchet begins to engage. Then insert terminal into jaws from the back side. (See the following; Figure 2-1). For 24 to 30 AWG wire, it will be necessary to start the crimp in jaw A and then complete in jaw B.



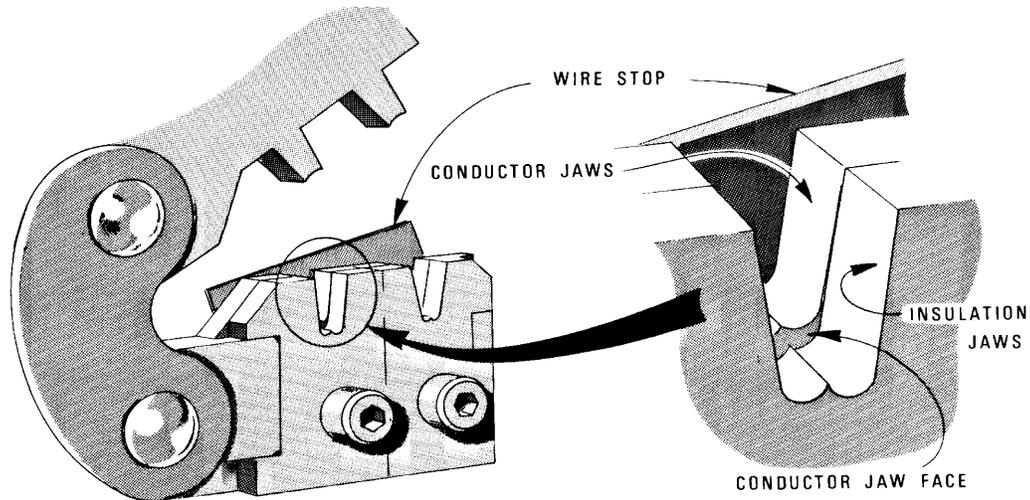
JAW	TERMINAL	WIRE SIZE	INSULATION RANGE
A	030-01107-0030	18 to 24 AWG	.110 TO .055
B	030-01107-0030	24 to 30 AWG	.055 to .030



Terminal is in the correct position when insulation tabs are flush with outside face of crimp jaws.

FIGURE 2-1 MOLEX TERMINALS AND TOOLS
(Sheet 2 of 3)

Once the terminal is in the correct position, close the jaws gently until the terminal is held loosely in place. Push the wire stop down so that it rests snugly behind the contact portion of the terminal. Strip off 1/8 inch of the wire insulation and insert the wire through the insulation tabs into the conductor tabs until the insulation hits the conductor jaw face or until the conductor touches the wire stop.



Squeeze the handles until the crimp jaws close and the ratchet releases. Straighten the terminal if necessary, then release the plier grips and remove the crimped terminal.

CRIMPING PRESSURE ADJUSTMENT

If too much or too little pressure is needed to release the crimper's ratchet pawl at the end of the crimp stroke, the ratchet can be easily adjusted. A spanner wrench provided with the tool can be used to loosen the lock nut, and rotate the keyed stud clockwise for increased pressure and counter-clockwise for decreased pressure. Once the desired pressure has been set, the lock nut must be tightened again. Newer models may have a screwdriver adjustment.

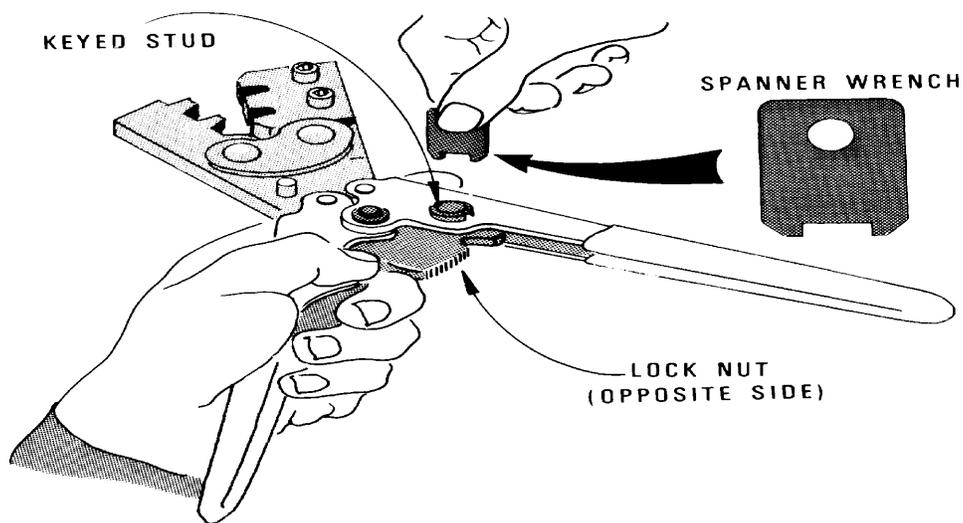


FIGURE 2-1 MOLEX TERMINALS AND TOOLS
(Sheet 3 of 3)

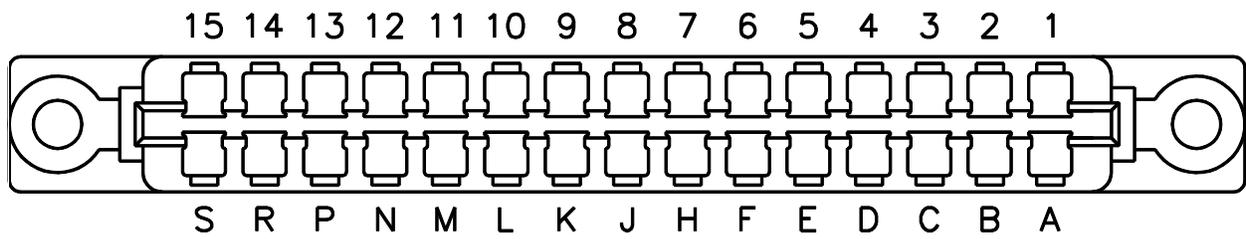
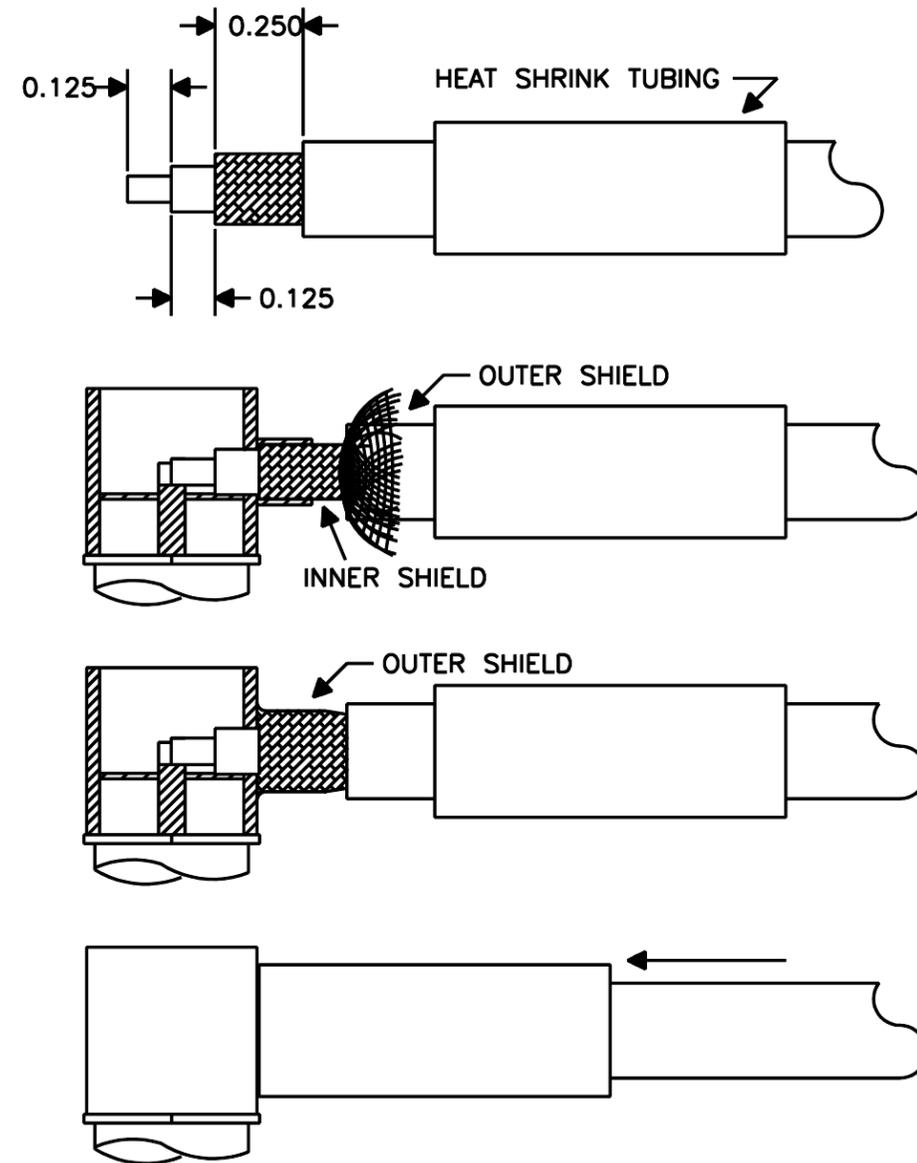
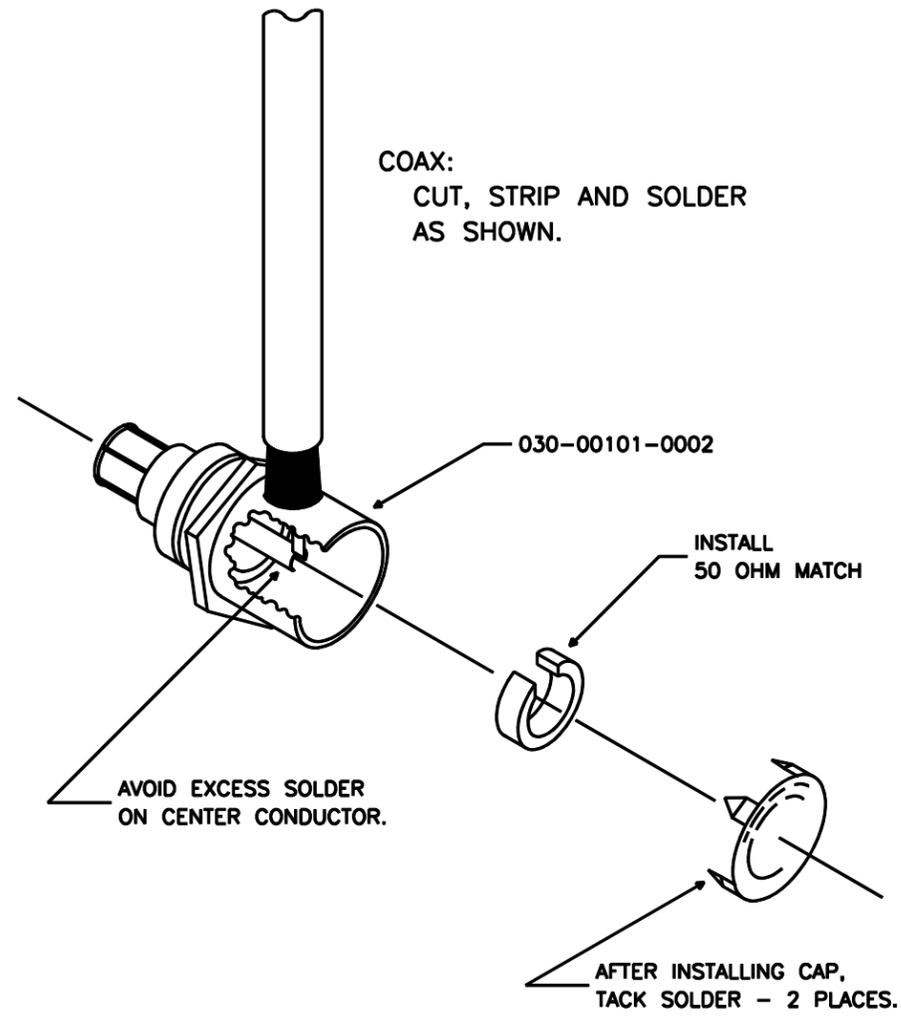


FIGURE 2-2 KN 62/62A/64 PIN FUNCTION

TABLE 2-1 KN 62/62A/64 PIN FUNCTION LIST

A	-----	!	AUDIO LOW
B	-----	!	AUDIO HI
C	-----		DME COMMON
D	-----	!	SLIP CODE SELECT
E	-----		+14vdc LIGHT DIMMER
F	-----		+28vdc LIGHT DIMMER SELECT
H	<-- -----		K400/KE/K1 DME CHANNEL LINE
J	-----	!	2X5 CODE SELECT
K	-----	!	10 BIT FREQUENCY
L	<-- -----	!	RNAV/CHAN REQ
M	-----		BCD CODE SELECT
N	<-- -----		DME REQUEST
P	-----		RESERVED
R	<-- -----		ALTITUDE REQUEST
S	-----		GROUND
1	-----		A/C GROUND
2	-----		A/C POWER
3	-----		A/C POWER
4	<-- -----		K200/KC/K2 CHANNEL LINE
5	<-- -----		K50/K50/K50 CHANNEL LINE
6	<-- -----		K100/KD/K3 CHANNEL LINE
7	<-- -----		K800/KA/K0 CHANNEL LINE
8	<-- -----		M1/MD/D3 CHANNEL LINE
9	<-- -----		M2/MC/M2 CHANNEL LINE
10	-----		NO CONNECTION
11	<-- -----		M4/ME/M1 CHANNEL LINE
12	<-- -----		M8/MA/M0 CHANNEL LINE
13	<-- -----		DATA BUS
14	<-- -----		CLOCK BUS
15	-----		A/C GROUND
	IN		OUT

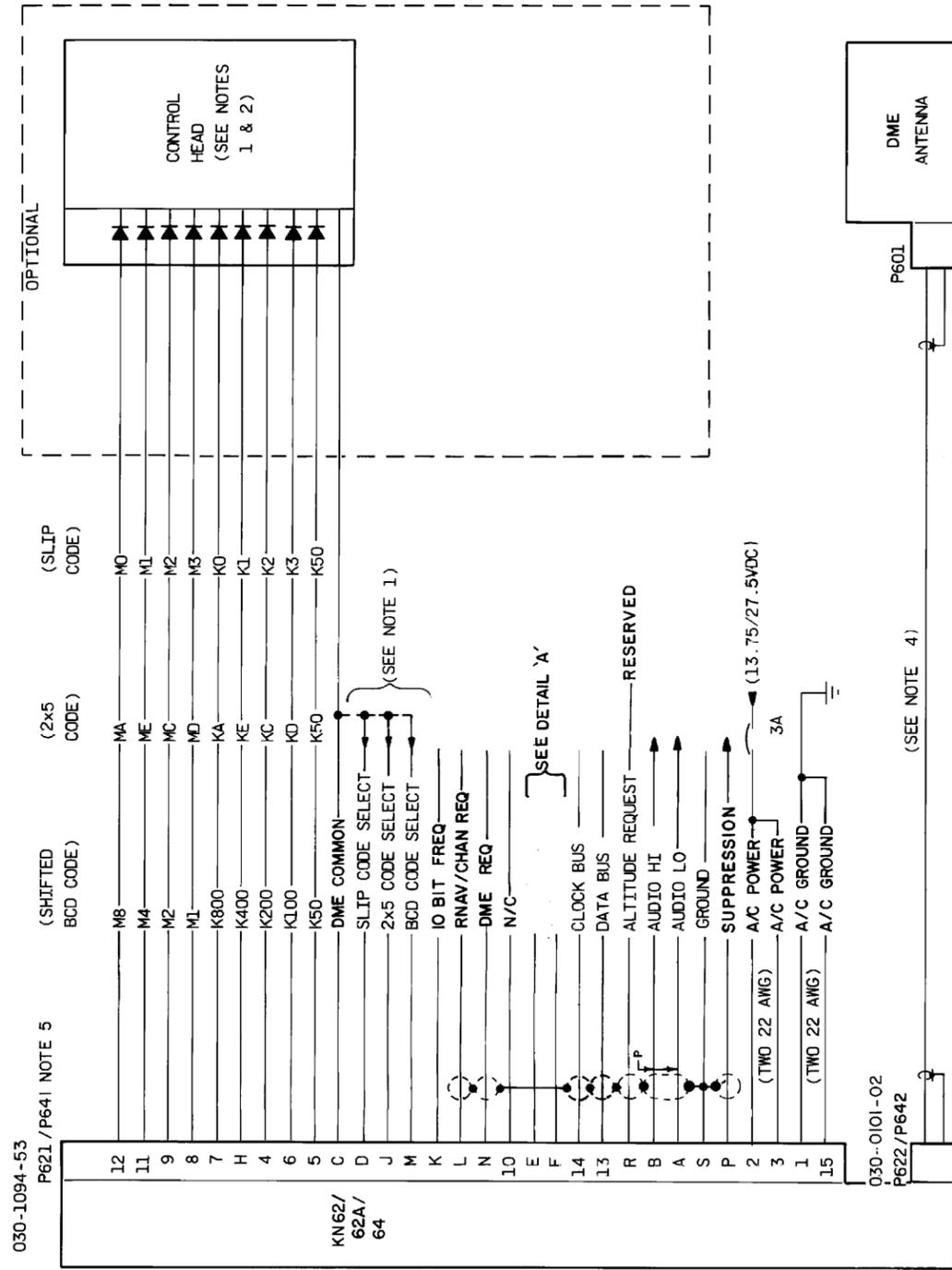


1. STRIP RGU-400 AND PLACE 1" HEAT SHRINK TUBING (P/N 150-00025-0010) OVER COAX.
2. SOLDER CENTER CONTACT AND SOLDER INNER SHIELD INSIDE. SEE NOTE 1.
3. SOLDER OUTER SHIELD OUTSIDE. SEE NOTE 1.
4. SLIDE HEAT SHRINK TUBING FORWARD (FLUSH WITH CONNECTOR) AND ADD HEAT TO SHRINK THE TUBING.

NOTES:

1. WHEN SOLDERING, AVOID APPLYING EXCESS HEAT TO CONNECTOR BODY, HEAT SINK SPRING CONTACTS, AND CENTER CONDUCTOR INSULATOR.

FIGURE 2-3 ANTENNA CABLE ASSEMBLY
(P/N 030-00101-0002, R-9)



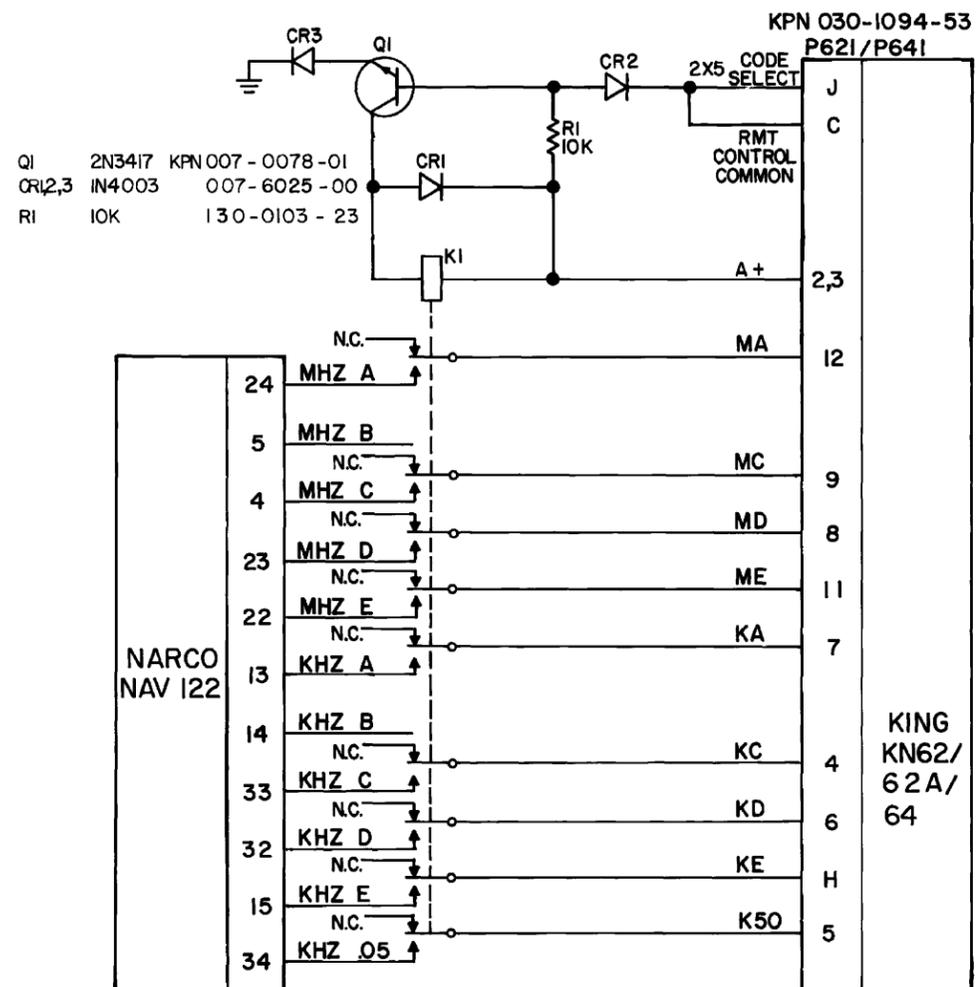
- NOTES:
1. THE CONTROL HEAD MAY PROVIDE SHIFTED BCD CODE, 2x5 CODE, OR SLIP CODE. THE CODE SELECT LINE (P621/P641-D, J, OR M) CORRESPONDING TO THE CODE USED MUST BE CONNECTED TO THE REMOTE CONTROL COMMON LINE. THE OTHER TWO CODE SELECT LINES SHOULD REMAIN UNCONNECTED.
 2. THE CONTROL HEAD MUST CONTAIN INTERNAL ISOLATION DIODES ON EACH FREQUENCY CONTROL LINE. IF IT DOES NOT, THESE DIODES MUST BE ADDED IN SERIES WITH EACH CONTROL LINE AS SHOWN. 1N4154 DIODES (KPN 007-6016-00) MAY BE USED.
 3. A+ IN AND POWER GROUND WIRES SHOULD BE 22 AWG MINIMUM. ALL OTHER WIRES SHOULD BE 24 AWG MINIMUM. INSTALL SHIELDED WIRES WHERE INDICATED AND GROUND WHERE INDICATED.
 4. RGU400 SHOULD BE USED TO CONNECT THE ANTENNA TO THE DME UP TO A MAXIMUM LENGTH OF TEN FEET. FOR CABLE RUNS EXCEEDING TEN FEET, REFER TO THE ANTENNA INSTALLATION INSTRUCTIONS.
 5. P621/P622 DENOTES THE KN62/62A, WHILE P641/P642 DENOTES THE KN64.



155-01296-0000 R8

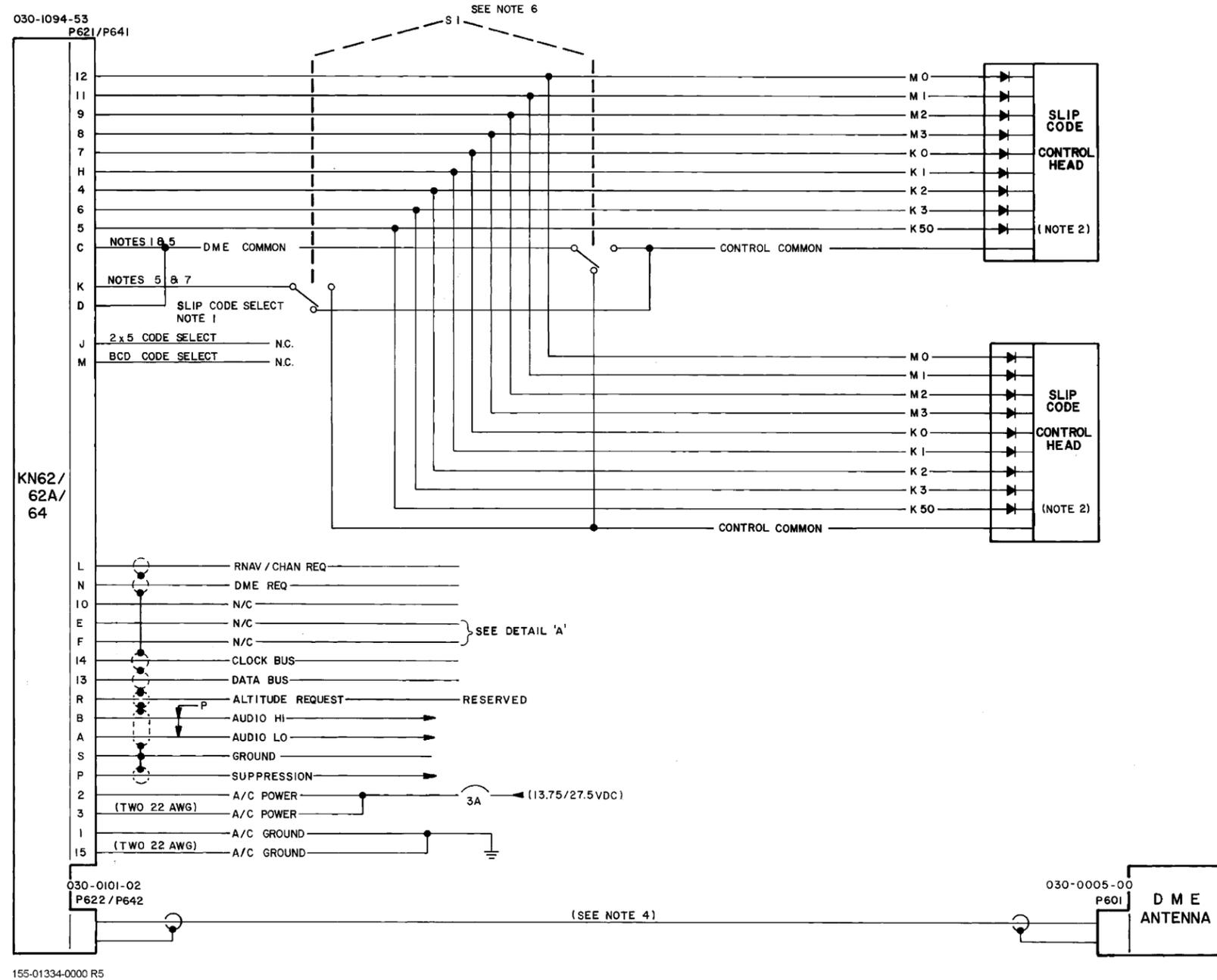
DETAIL 'A'
FOR UNITS WITH
BACKLIGHTING ONLY

FIGURE 2-4 KN 62/62A/64 INTERCONNECT
(Dwg. No. 155-01296-0000, R-8)



- NOTE:
1. KN 62/62A/64 VIEWED WITH INTERNAL CHANNELING SELECTED.
 2. THE RELAY IS A NORMALLY CLOSED CONTACT RELAY AND IS VIEWED IN AN ENERGIZED CONDITION.
 KPN 032-0051-00 (14VDC)
 KPN 032-0051-01 (28VDC)
 3. DELETED
 4. P621 DENOTES THE KN62/62A, WHILE P641 DENOTES THE KN64.

FIGURE 2-5 KN 62A/64 TO NARCO NAV 122 INTERCONNECT
 (Dwg. No. 155-01339-0000, R-5)



- NOTES:
1. THE CONTROL HEAD MAY PROVIDE SHIFTED BCD CODE, 2 x 5 CODE, OR SLIP CODE. THE CODE SELECT LINE (P621/P641-D, J, OR M) CORRESPONDING TO THE CODE USED MUST BE CONNECTED TO THE DME COMMON LINE. THE OTHER TWO CODE SELECT LINES SHOULD REMAIN UNCONNECTED.
 2. THE CONTROL HEAD MUST CONTAIN INTERNAL ISOLATION DIODES ON EACH FREQUENCY CONTROL LINE. IF IT DOES NOT, THESE DIODES MUST BE ADDED IN SERIES WITH EACH CONTROL LINE AS SHOWN. 1N4154 DIODES (KPN 007-6016-00) MAY BE USED.
 3. A+ IN AND POWER GROUND WIRES SHOULD BE 22AWG MINIMUM. ALL OTHER WIRES SHOULD BE 24AWG MINIMUM. INSTALL SHIELDED WIRES WHERE INDICATED AND GROUND WHERE INDICATED.
 4. RGU-400 SHOULD BE USED TO CONNECT THE ANTENNA TO THE DME UP TO A MAXIMUM LENGTH OF TEN FEET. FOR CABLE RUNS EXCEEDING TEN FEET, REFER TO THE ANTENNA INSTALLATION INSTRUCTIONS.
 5. KN 62 MUST HAVE MOD 2 STAMPED OR MODIFIED PER SERVICE BULLETIN KN-62-2 IF SERIAL NO. IS BELOW 2526.
 6. S1 MUST BE DPDT AND IS USED FOR REMOTE NAV 1, REMOTE NAV 2 SWITCHING.
 7. PIN K WAS PREVIOUSLY RESERVED AND IS NOW USED AS A PULL-UP FOR CONTROL COMMON OF REMOTE CONTROL HEAD NOT IN USE.
 8. CODE PROGRAMMING LINES MUST BE TIED TO CONTROL COMMON AT THE CONTROL HEAD WHEN USING TWO REMOTE HEADS OF DIFFERENT CODE TYPES OR MIS-CHANNELING WILL OCCUR.
 9. P621/P622 DENOTES THE KN62/62A, WHILE P641/P642 DENOTES THE KN64.

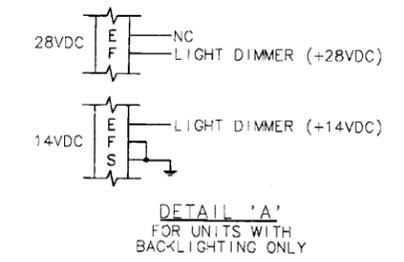
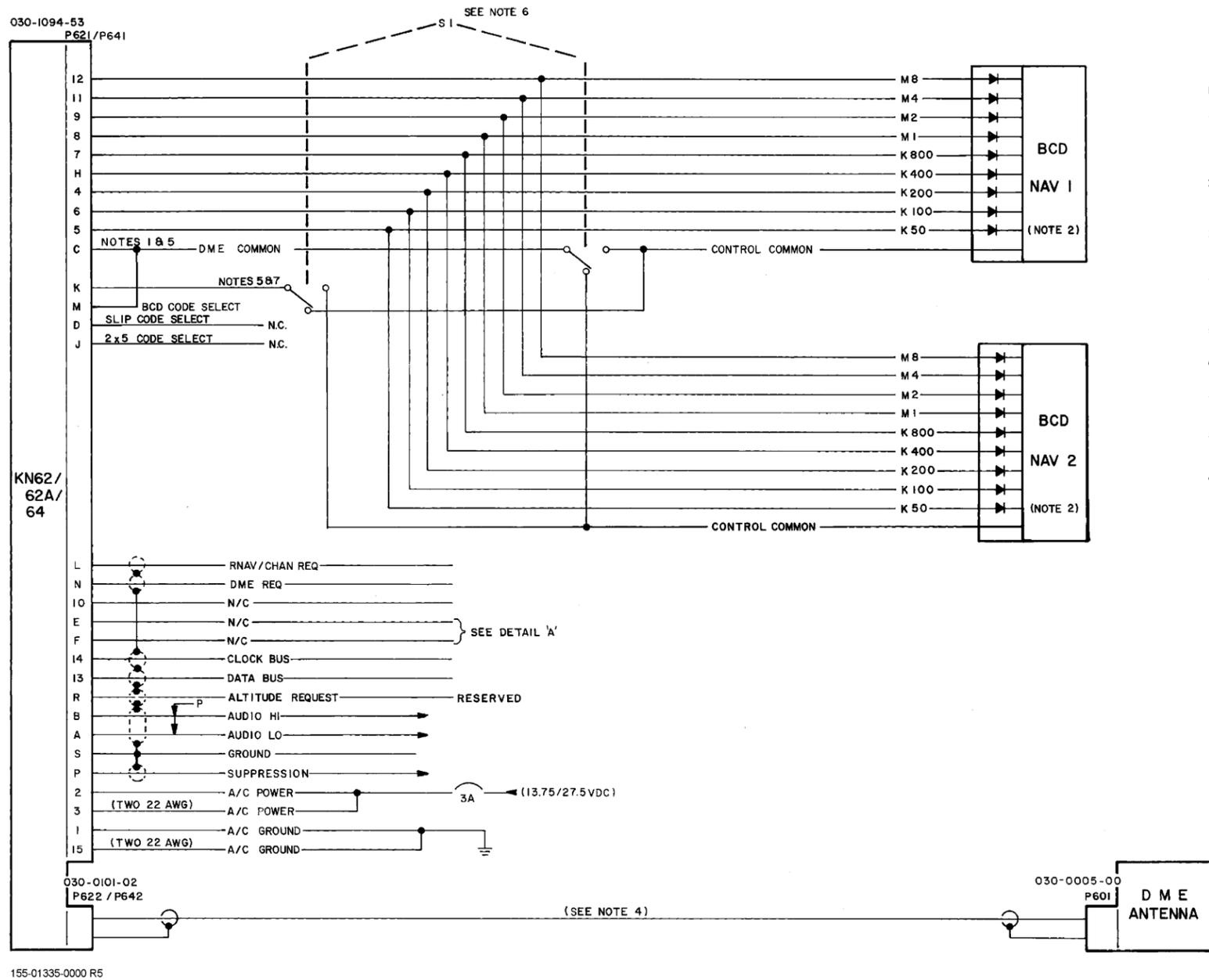
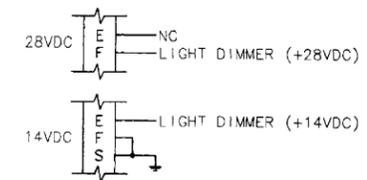


FIGURE 2-6 DUAL SLIP CODE CONTROL UNIT INTERCONNECT
(Dwg. No. 155-01334-0000, R-5)



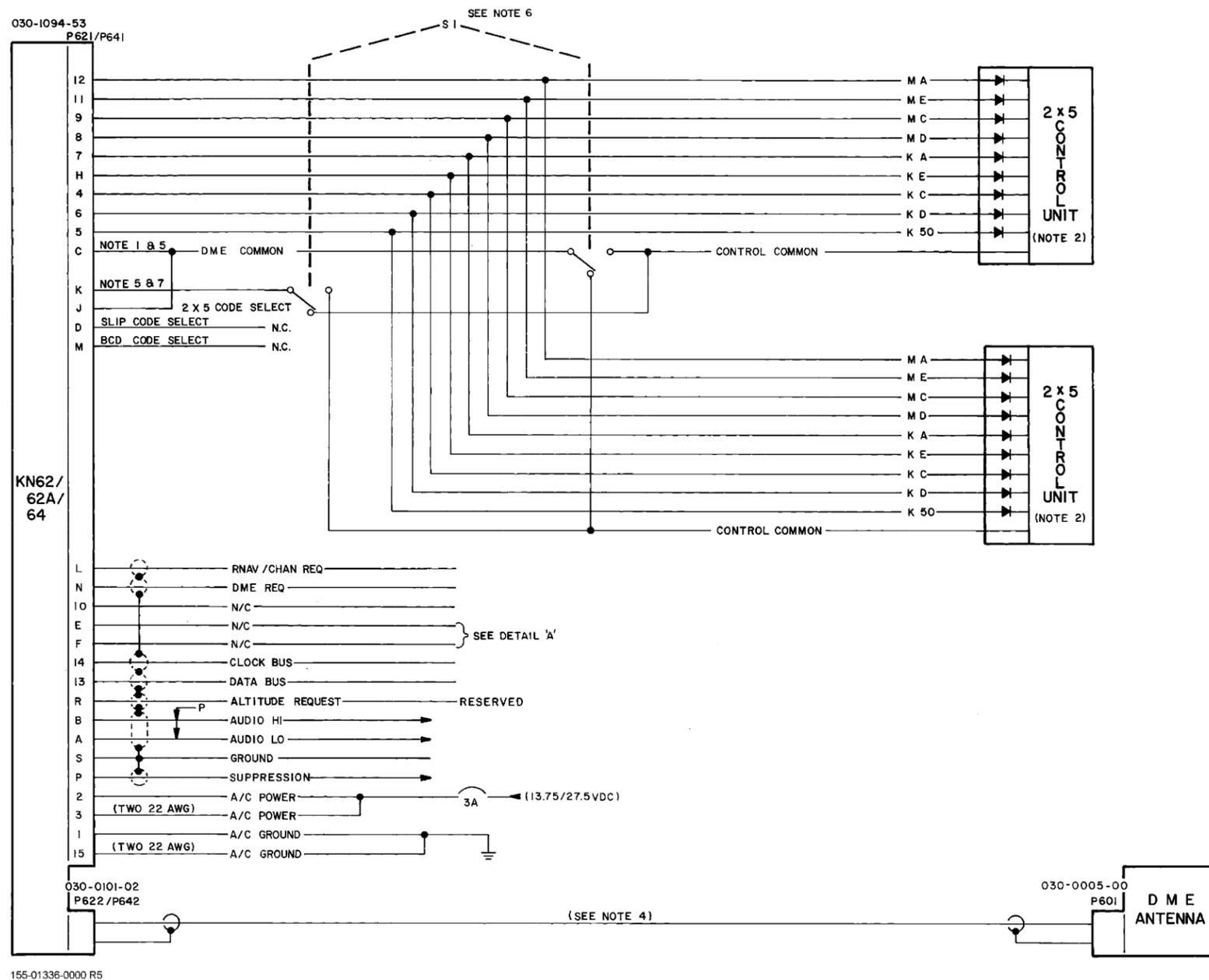
NOTES:

1. THE CONTROL HEAD MAY PROVIDE SHIFTED BCD CODE, 2 x 5 CODE, OR SLIP CODE. THE CODE SELECT LINE (P621/P641-D, J, OR M) CORRESPONDING TO THE CODE USED MUST BE CONNECTED TO THE DME COMMON LINE. THE OTHER TWO CODE SELECT LINES SHOULD REMAIN UNCONNECTED.
2. THE CONTROL HEAD MUST CONTAIN INTERNAL ISOLATION DIODES ON EACH FREQUENCY CONTROL LINE. IF IT DOES NOT, THESE DIODES MUST BE ADDED IN SERIES WITH EACH CONTROL LINE AS SHOWN. 1N4154 DIODES (KPN 007-6016-00) MAY BE USED.
3. A+ IN AND POWER GROUND WIRES SHOULD BE 22AWG MINIMUM. ALL OTHER WIRES SHOULD BE 24AWG MINIMUM. INSTALL SHIELDED WIRES WHERE INDICATED AND GROUND WHERE INDICATED.
4. RGU 400 SHOULD BE USED TO CONNECT THE ANTENNA TO THE DME UP TO A MAXIMUM LENGTH OF TEN FEET. FOR CABLE RUNS EXCEEDING TEN FEET, REFER TO THE ANTENNA INSTALLATION INSTRUCTIONS.
5. KN 62 MUST HAVE MOD 2 STAMPED OR MODIFIED PER SERVICE BULLETIN KN-62-2 IF SERIAL NO. IS BELOW 2526.
6. S1 MUST BE DPDT AND IS USED FOR REMOTE NAV 1, REMOTE NAV 2 SWITCHING.
7. PIN K WAS PREVIOUSLY RESERVED AND IS NOW USED AS A PULL-UP FOR CONTROL COMMON OF REMOTE CONTROL HEAD NOT IN USE.
8. CODE PROGRAMMING LINES MUST BE TIED TO CONTROL COMMON AT THE CONTROL HEAD WHEN USING TWO REMOTE HEADS OF DIFFERENT CODE TYPES OR MIS-CHANNELING WILL OCCUR.
9. P621/P622 DENOTES THE KN62/62A, WHILE P641/P642 DENOTES THE KN64.



DETAIL 'A'
FOR UNITS WITH
BACKLIGHTING ONLY

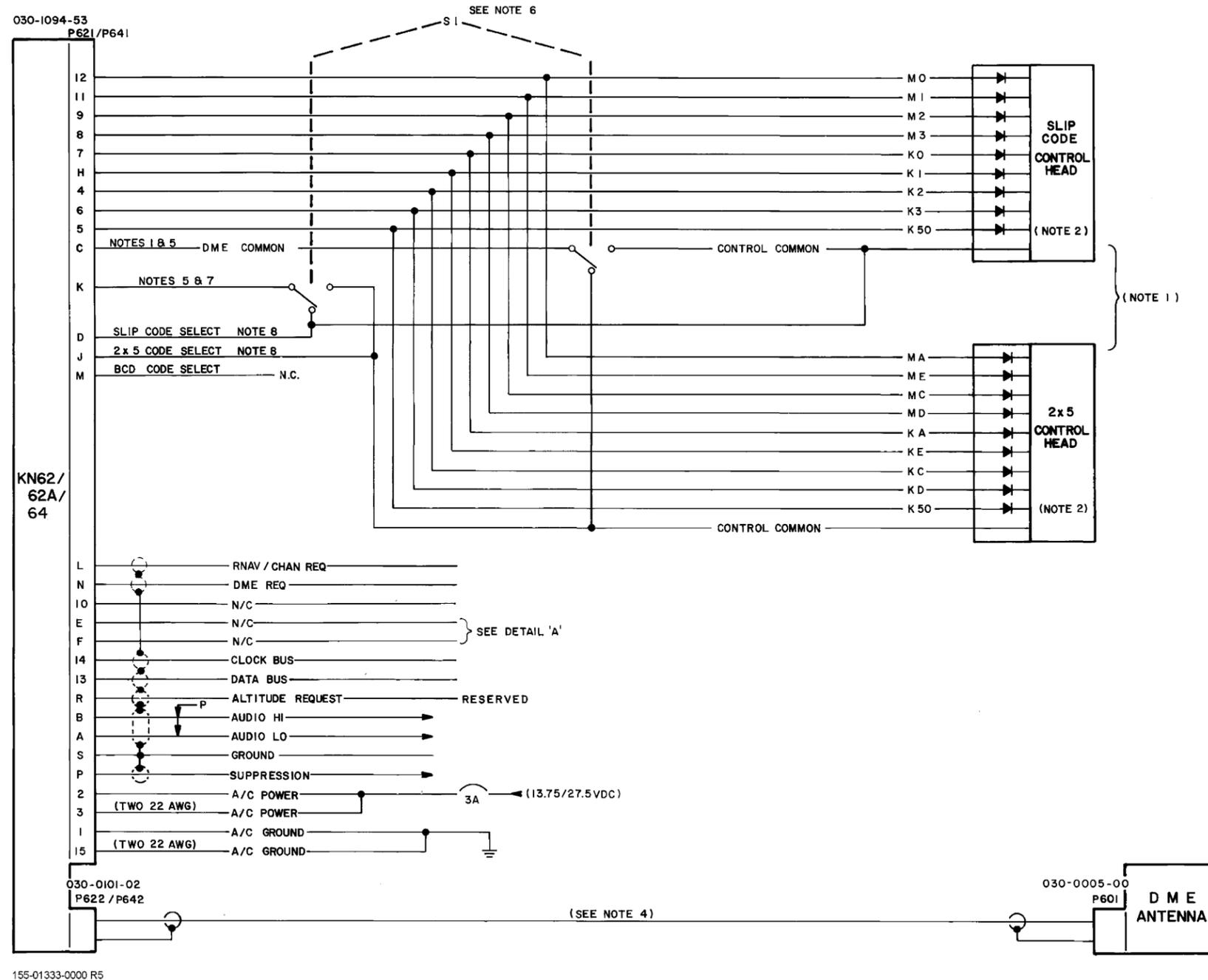
FIGURE 2-7 DUAL BCD CONTROL UNIT INTERCONNECT
(Dwg. No. 155-01335-0000, R-5)



NOTES:

1. THE CONTROL HEAD MAY PROVIDE SHIFTED BCD CODE, 2 x 5 CODE, OR SLIP CODE. THE CODE SELECT LINE (P621/P641-D, J, OR M) CORRESPONDING TO THE CODE USED MUST BE CONNECTED TO THE DME COMMON LINE. THE OTHER TWO CODE SELECT LINES SHOULD REMAIN UNCONNECTED.
2. THE CONTROL HEAD MUST CONTAIN INTERNAL ISOLATION DIODES ON EACH FREQUENCY CONTROL LINE. IF IT DOES NOT, THESE DIODES MUST BE ADDED IN SERIES WITH EACH CONTROL LINE AS SHOWN. 1N4154 DIODES (KPN 007-6016-00) MAY BE USED.
3. A+ IN AND POWER GROUND WIRES SHOULD BE 22AWG MINIMUM. ALL OTHER WIRES SHOULD BE 24AWG MINIMUM. INSTALL SHIELDED WIRES WHERE INDICATED AND GROUND WHERE INDICATED.
4. RGU 400 SHOULD BE USED TO CONNECT THE ANTENNA TO THE DME UP TO A MAXIMUM LENGTH OF TEN FEET. FOR CABLE RUNS EXCEEDING TEN FEET, REFER TO THE ANTENNA INSTALLATION INSTRUCTIONS.
5. KN 62 MUST HAVE MOD 2 STAMPED OR MODIFIED PER SERVICE BULLETIN KN-62-2 IF SERIAL NO. IS BELOW 2526.
6. S1 MUST BE DPDT AND IS USED FOR REMOTE NAV 1, REMOTE NAV 2 SWITCHING.
7. PIN K WAS PREVIOUSLY RESERVED AND IS NOW USED AS A PULL-UP FOR CONTROL COMMON OF REMOTE CONTROL HEAD NOT IN USE.
8. CODE PROGRAMMING LINES MUST BE TIED TO CONTROL COMMON AT THE CONTROL HEAD WHEN USING TWO REMOTE HEADS OF DIFFERENT CODE TYPES OR MIS-CHANNELING WILL OCCUR.
9. P621/P622 DENOTES THE KN62/62A, WHILE P641/P642 DENOTES THE KN64.

FIGURE 2-8 DUAL 2 x 5 CONTROL UNIT INTERCONNECT
(Dwg. No. 155-01336-0000, R-5)



- NOTES:
1. THE CONTROL HEAD MAY PROVIDE SHIFTED BCD CODE, 2 x 5 CODE, OR SLIP CODE. THE CODE SELECT LINE (P621/P641-D, J, OR M) CORRESPONDING TO THE CODE USED MUST BE CONNECTED TO THE REMOTE COMMON LINE.
 2. THE CONTROL HEAD MUST CONTAIN INTERNAL ISOLATION DIODES ON EACH FREQUENCY CONTROL LINE. IF IT DOES NOT, THESE DIODES MUST BE ADDED IN SERIES WITH EACH CONTROL LINE AS SHOWN. 1N4154 DIODES (KPN 007-6016-00) MAY BE USED.
 3. A+ IN AND POWER GROUND WIRES SHOULD BE 22AWG MINIMUM. ALL OTHER WIRES SHOULD BE 24AWG MINIMUM. INSTALL SHIELDED WIRES WHERE INDICATED AND GROUND WHERE INDICATED.
 4. RGU40Q SHOULD BE USED TO CONNECT THE ANTENNA TO THE DME UP TO A MAXIMUM LENGTH OF TEN FEET. FOR CABLE RUNS EXCEEDING TEN FEET, REFER TO THE ANTENNA INSTALLATION INSTRUCTIONS.
 5. KN 62 MUST HAVE MOD 2 STAMPED OR MODIFIED PER SERVICE BULLETIN KN-62-2 IF SERIAL NO. IS BELOW 2526.
 6. S1 MUST BE DPDT AND IS USED FOR REMOTE NAV 1, REMOTE NAV 2 SWITCHING.
 7. PIN K WAS PREVIOUSLY RESERVED AND IS NOW USED AS A PULL-UP FOR CONTROL COMMON OF REMOTE CONTROL HEAD NOT IN USE.
 8. CODE SELECT LINES MUST BE TIED TO CONTROL COMMON AT THE CONTROL HEAD WHEN USING TWO REMOTE HEADS OF DIFFERENT CODE TYPES OR MIS-CHANNELING WILL OCCUR.
 9. P621/P622 DENOTES THE KN62/62A, WHILE P641/P642 DENOTES THE KN64.

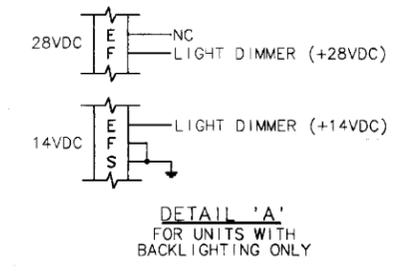
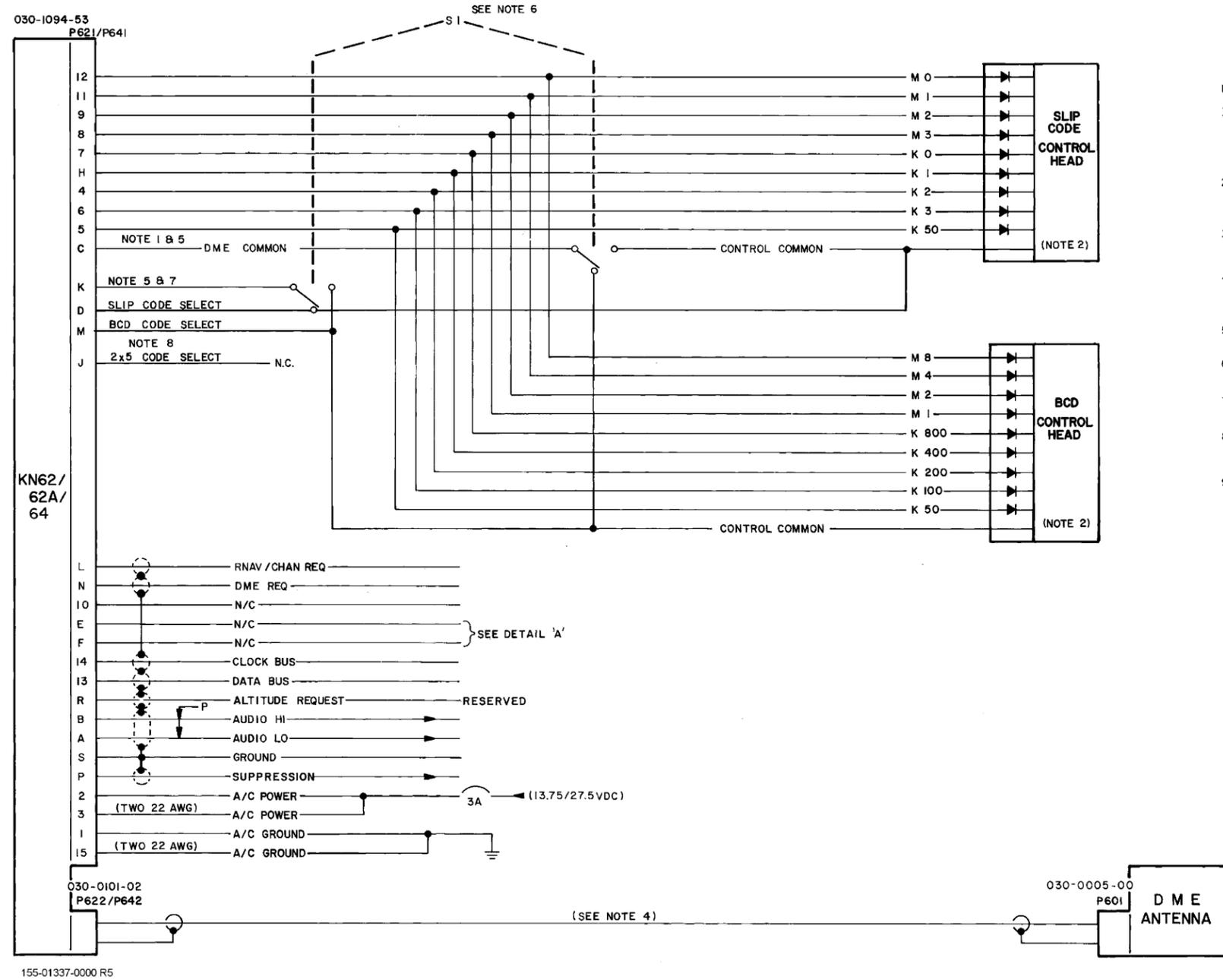


FIGURE 2-9 SLIP CODE AND 2 x 5 CONTROL UNIT INTERCONNECT
(Dwg. No. 155-01333-0000, R-5)



- NOTES:
1. THE CONTROL HEAD MAY PROVIDE SHIFTED BCD CODE, 2 x 5 CODE, OR SLIP CODE. THE CODE SELECT LINE (P621/P641-D, J, OR M) CORRESPONDING TO THE CODE USED MUST BE CONNECTED TO THE REMOTE COMMON LINE.
 2. THE CONTROL HEAD MUST CONTAIN INTERNAL ISOLATION DIODES ON EACH FREQUENCY CONTROL LINE. IF IT DOES NOT, THESE DIODES MUST BE ADDED IN SERIES WITH EACH CONTROL LINE AS SHOWN. 1N4154 DIODES (KPN 007-6016-00) MAY BE USED.
 3. A+ IN AND POWER GROUND WIRES SHOULD BE 22AWG MINIMUM. ALL OTHER WIRES SHOULD BE 24AWG MINIMUM. INSTALL SHIELDED WIRES WHERE INDICATED AND GROUND WHERE INDICATED.
 4. RGU-400 SHOULD BE USED TO CONNECT THE ANTENNA TO THE DME UP TO A MAXIMUM LENGTH OF TEN FEET. FOR CABLE RUNS EXCEEDING TEN FEET, REFER TO THE ANTENNA INSTALLATION INSTRUCTIONS.
 5. KN 62 MUST HAVE MOD 2 STAMPED OR MODIFIED PER SERVICE BULLETIN KN-62-2 IF SERIAL NO. IS BELOW 2526.
 6. S1 MUST BE DPDT AND IS USED FOR REMOTE NAV 1, REMOTE NAV 2 SWITCHING.
 7. PIN K WAS PREVIOUSLY RESERVED AND IS NOW USED AS A PULL-UP FOR CONTROL COMMON OF REMOTE CONTROL HEAD NOT IN USE.
 8. CODE SELECT LINES MUST BE TIED TO CONTROL COMMON AT THE CONTROL HEAD WHEN USING TWO REMOTE HEADS OF DIFFERENT CODE TYPES OR MIS-CHANNELING WILL OCCUR.
 9. P621/P622 DENOTES THE KN62/62A, WHILE P641/P642 DENOTES THE KN64.

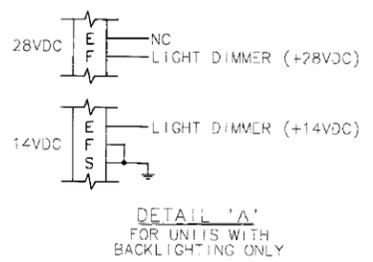
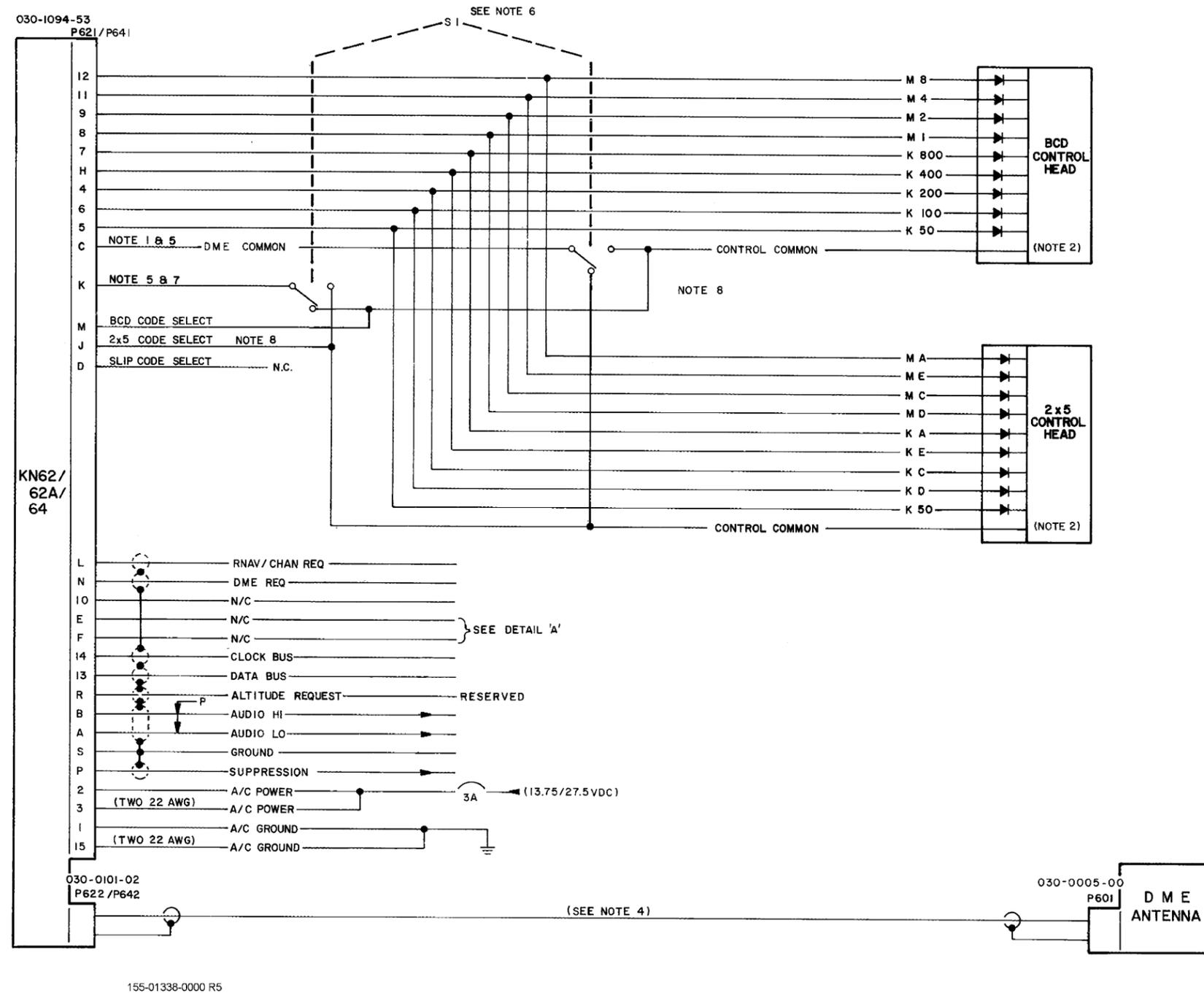


FIGURE 2-10 SLIP CODE AND BCD CONTROL UNIT INTERCONNECT (Dwg. No. 155-01337-0000, R-5)



- NOTES:
1. THE CONTROL HEAD MAY PROVIDE SHIFTED BCD CODE 2 x 5 CODE, OR SLIP CODE. THE CODE SELECT LINE (P621/P641-D, J, OR M) CORRESPONDING TO THE CODE USED MUST BE CONNECTED TO THE REMOTE COMMON LINE.
 2. THE CONTROL HEAD MUST CONTAIN INTERNAL ISOLATION DIODES ON EACH FREQUENCY CONTROL LINE. IF IT DOES NOT, THESE DIODES MUST BE ADDED IN SERIES WITH EACH CONTROL LINE AS SHOWN. 1N4164 DIODES (KPN 007-6016-00) MAY BE USED.
 3. A+ IN AND POWER GROUND WIRES SHOULD BE 22AWG MINIMUM. ALL OTHER WIRES SHOULD BE 24AWG MINIMUM. INSTALL SHIELDED WIRES WHERE INDICATED AND GROUND WHERE INDICATED.
 4. RGU 400 SHOULD BE USED TO CONNECT THE ANTENNA TO THE DME UP TO A MAXIMUM LENGTH OF TEN FEET. FOR CABLE RUNS EXCEEDING TEN FEET, REFER TO THE ANTENNA INSTALLATION INSTRUCTIONS.
 5. KN 62 MUST HAVE MOD 2 STAMPED OR MODIFIED PER SERVICE BULLETIN KN-62-2 IF SERIAL NO. IS BELOW 2526.
 6. S1 MUST BE DPDT AND IS USED FOR REMOTE NAV 1, REMOTE NAV 2 SWITCHING.
 7. PIN K WAS PREVIOUSLY RESERVED AND IS NOW USED AS A PULL-UP FOR CONTROL COMMON OF REMOTE CONTROL HEAD NOT IN USE.
 8. CODE SELECT LINES MUST BE TIED TO CONTROL COMMON AT THE CONTROL HEAD WHEN USING TWO REMOTE HEADS OF DIFFERENT CODE TYPES OR MIS-CHANNELING WILL OCCUR.
 9. P621/P622 DENOTES THE KN62/62A, WHILE P641/P642 DENOTES THE KN64.

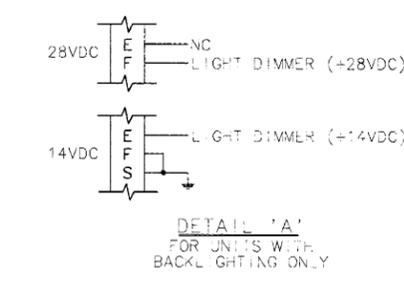
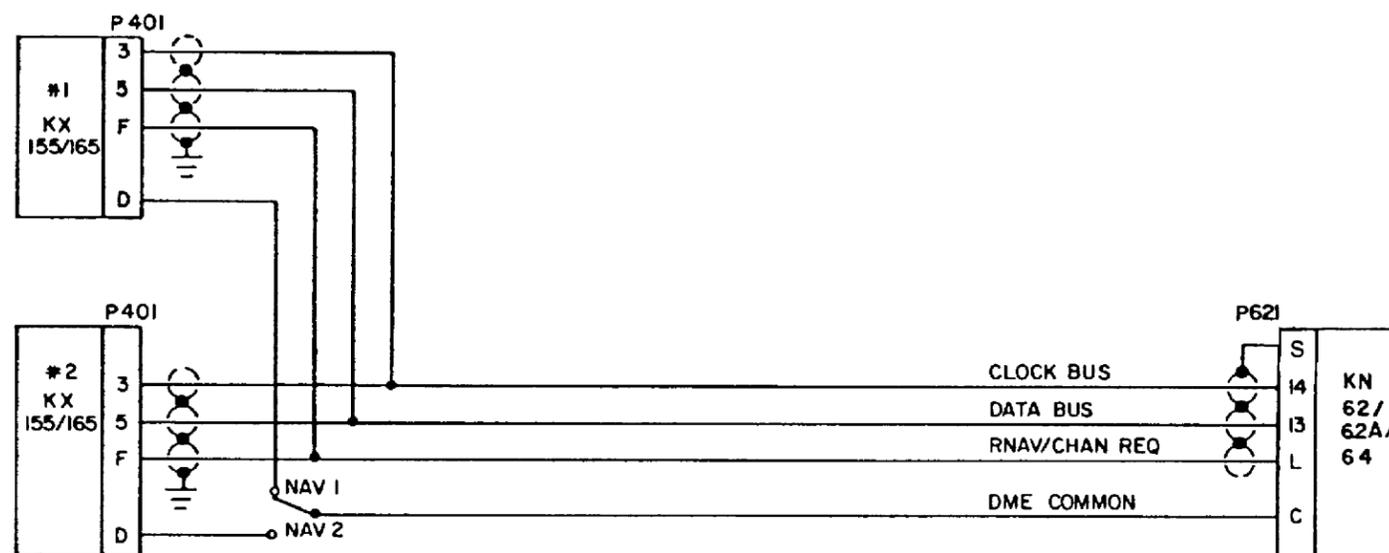


FIGURE 2-11 2 x 5 AND BCD CONTROL UNIT INTERCONNECT
(Dwg. No. 155-01338-0000, R-5)



NOTE:

WHEN CHANNELING A KN62/62A/64 FROM TWO KX 155/165'S, THE CLOCK BUS DATA BUS AND RNAV/CHAN REQ CAN BE PARALLELED. WITH ALL CODE SELECT LINES OPEN THE KN62/62A CHANNELS SERIALY. THE SWITCHING IS PERFORMED BY SWITCHING THE DME COMMON, AS DONE WITH PARALLEL CHANNELING SOURCES. ONLY THE KX 155/165 WITH THE DME COMMON PULLED LOW WILL RESPOND ON THE DATA BUS TO A CHANNEL REQUEST.

FIGURE 2-12 NAV 1 - NAV 2 CHANNELING OF A KN 62/62A/64 FROM TWO KX 155/165'S
(Dwg. No. 696-3423-00, R-0)

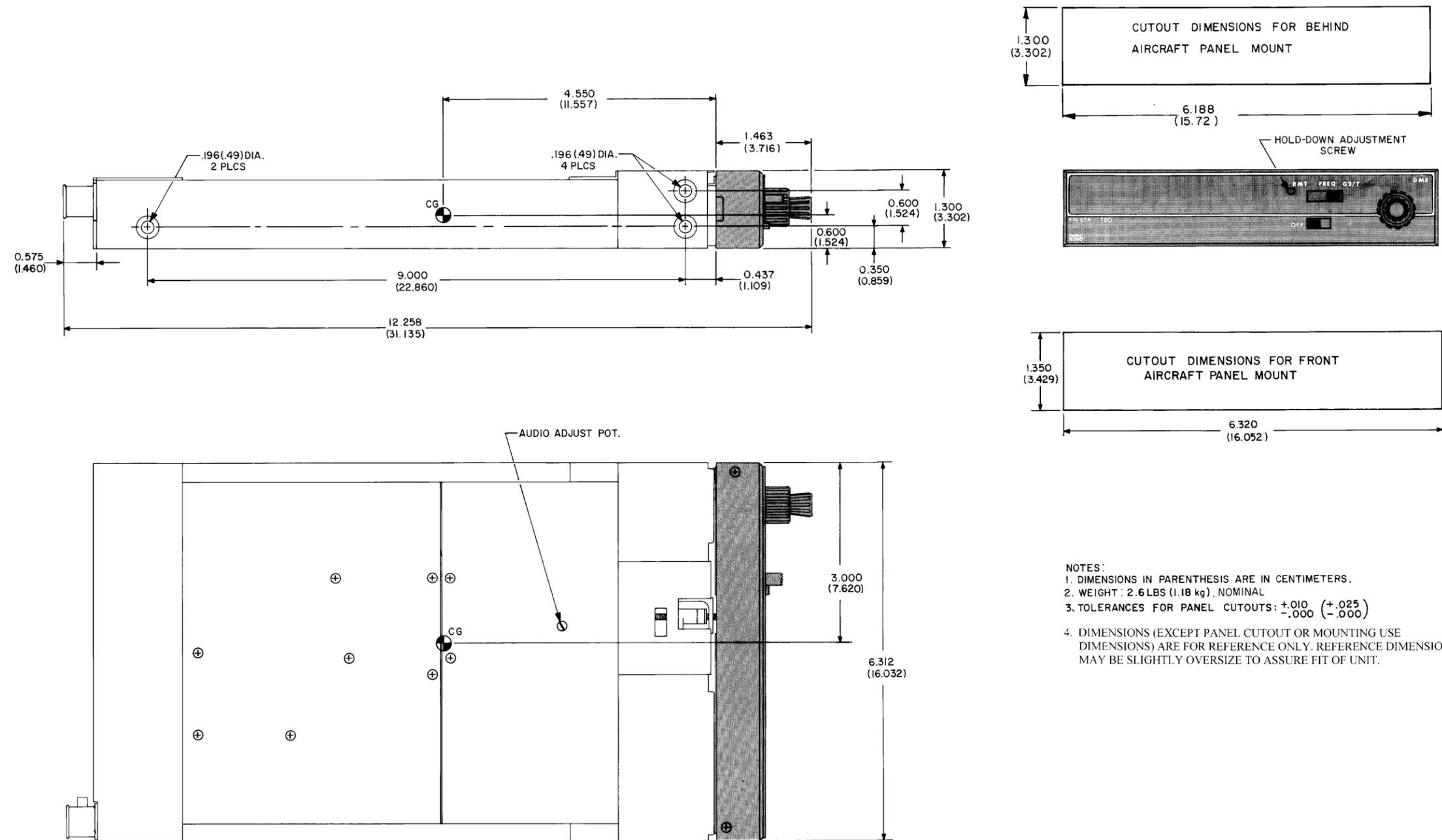
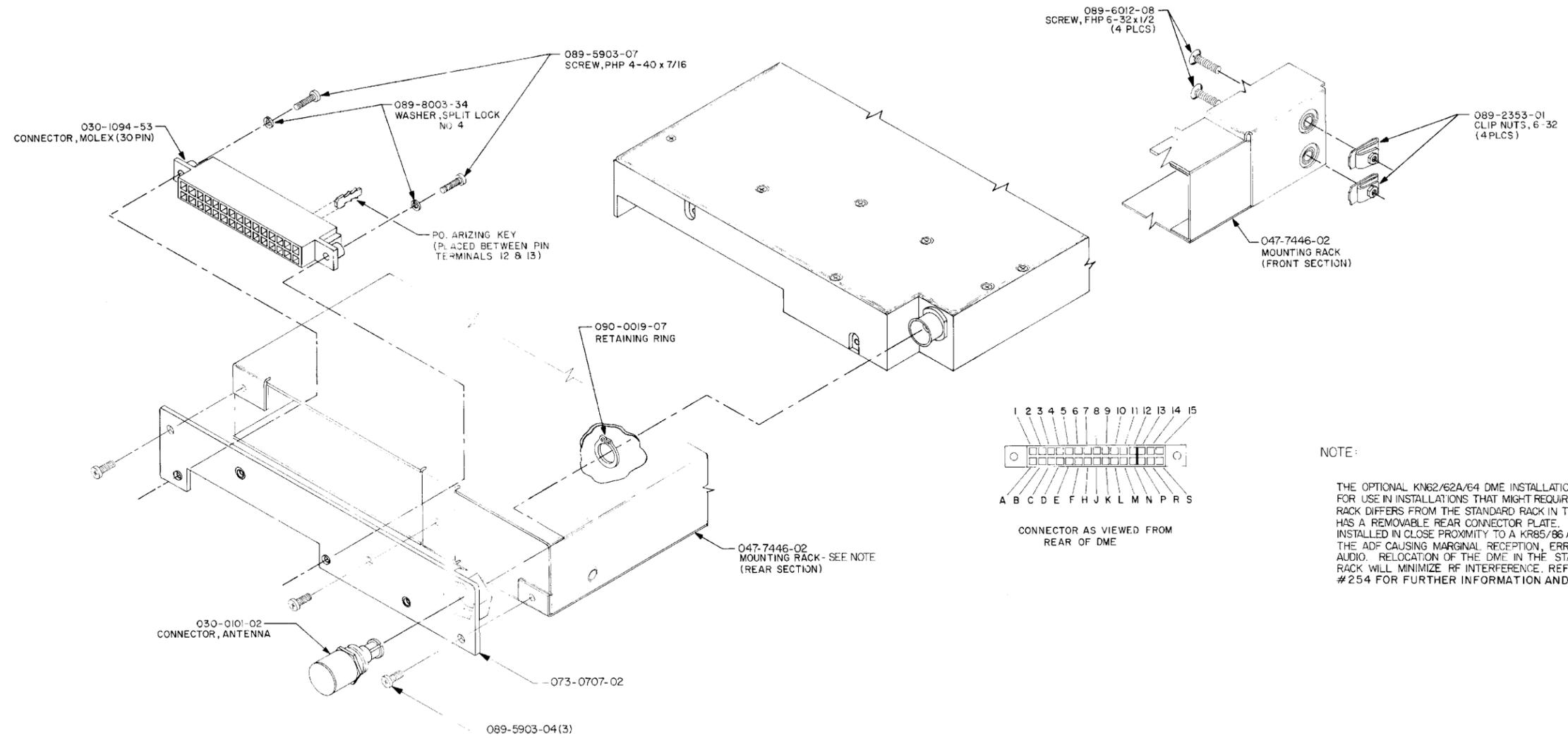


FIGURE 2-13 KN 62/62A/64 OUTLINE AND MOUNTING DRAWING
(Dwg. No. 155-05280-0000, R-AA)



NOTE:

THE OPTIONAL KN62/62A/64 DME INSTALLATION RACK WITH HARDWARE IS DESIGNED FOR USE IN INSTALLATIONS THAT MIGHT REQUIRE ADDITIONAL RFI SHIELDING. THIS RACK DIFFERS FROM THE STANDARD RACK IN THAT IT IS COMPLETELY ENCLOSED AND HAS A REMOVABLE REAR CONNECTOR PLATE. IN SOME INSTANCES IF A DME IS INSTALLED IN CLOSE PROXIMITY TO A KR85/86 ADF, DME RFI CAN BE PICKED UP BY THE ADF CAUSING MARGINAL RECEPTION, ERRATIC NEEDLE POINTING OR A NOISY AUDIO. RELOCATION OF THE DME IN THE STACK OR THE USE OF THIS OPTIONAL RACK WILL MINIMIZE RFI INTERFERENCE. REFER TO INSTALLATION BULLETIN #254 FOR FURTHER INFORMATION AND INSTRUCTIONS.

FIGURE 2-14 KN 62/62A/64 INSTALLATION DRAWING
(Dwg. No. 155-05281-0000, R-4)

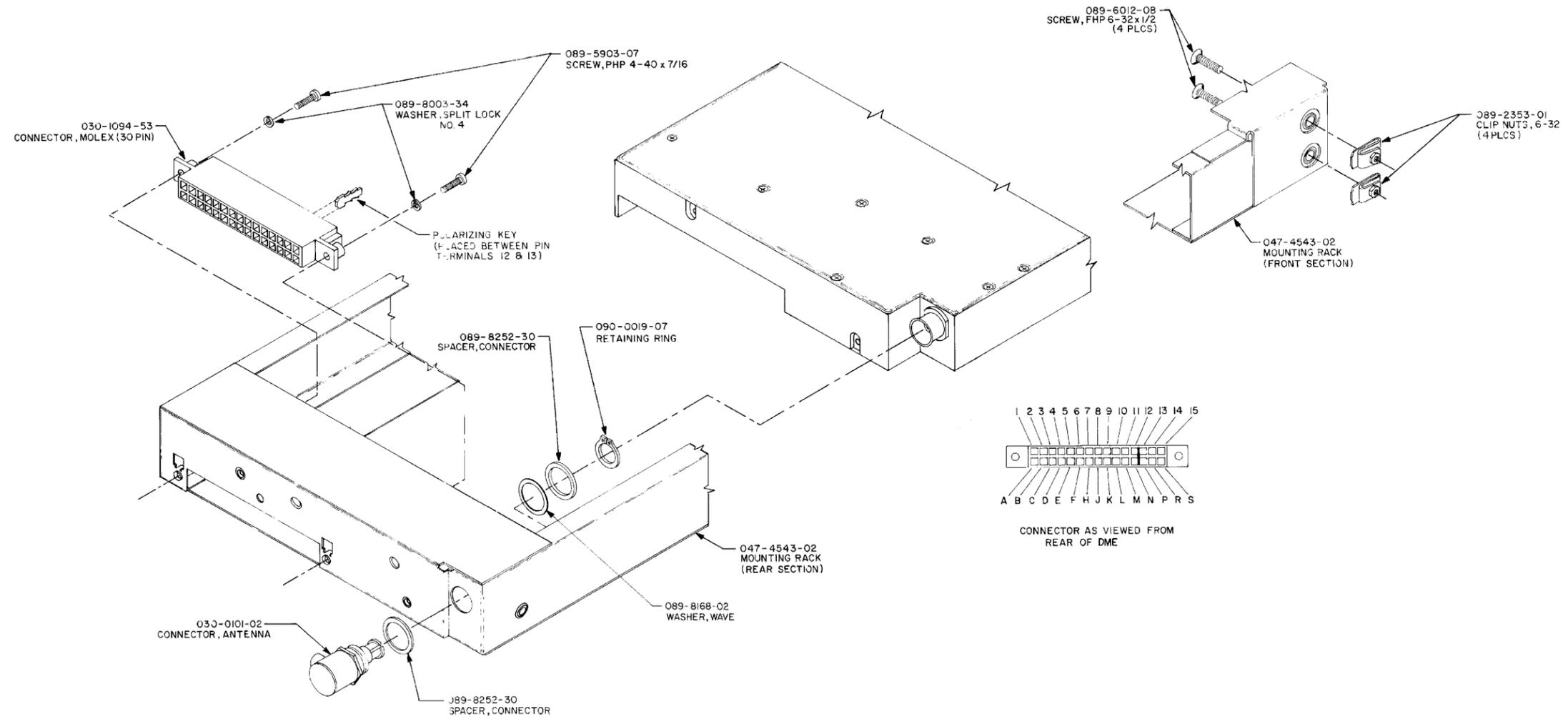
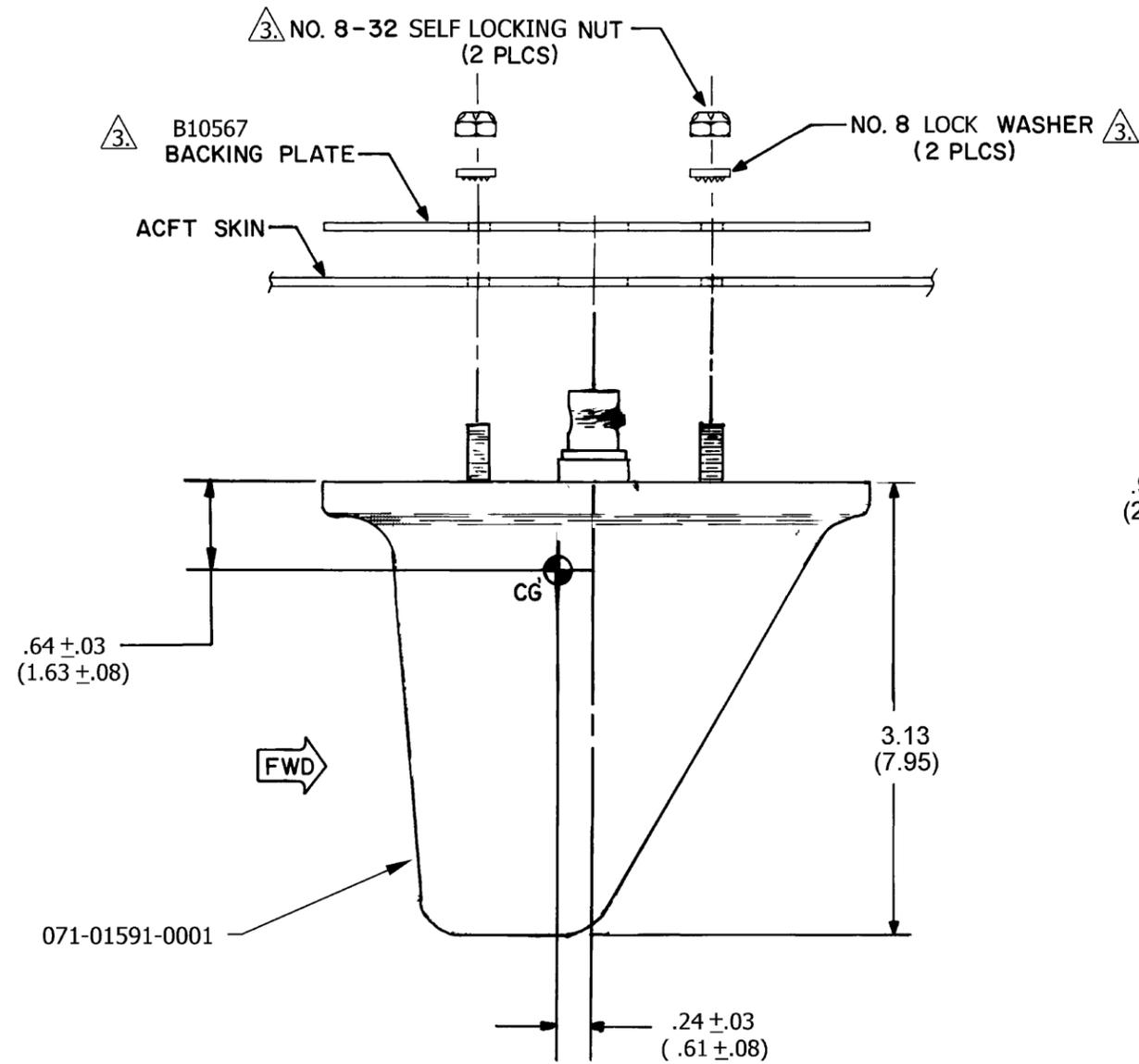
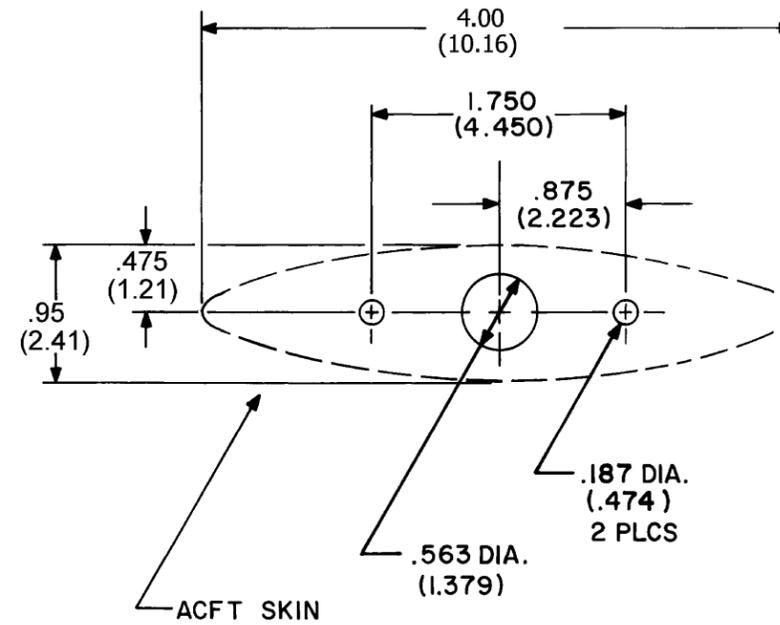


FIGURE 2-15 KN 62/62A/64 INSTALLATION DRAWING
(Dwg. No. 155-05281-0001, R-1)



MOUNTING HOLE CUTOUT DIAGRAM



NOTES:

1. DIMENSIONS IN PARENTHESES () ARE IN CENTIMETERS.
2. WEIGHT: .20 LB. (.090 Kg) NOMINAL WITH BACKING PLATE, WASHERS, AND 8-32 NUT.
3. ITEMS SUPPLIED WITH PART 071-01591-0001.

FIGURE 2-16 KA 60 ANTENNA INSTALLATION DRAWING
(Dwg. No. 155-05289-0000, R-AB)

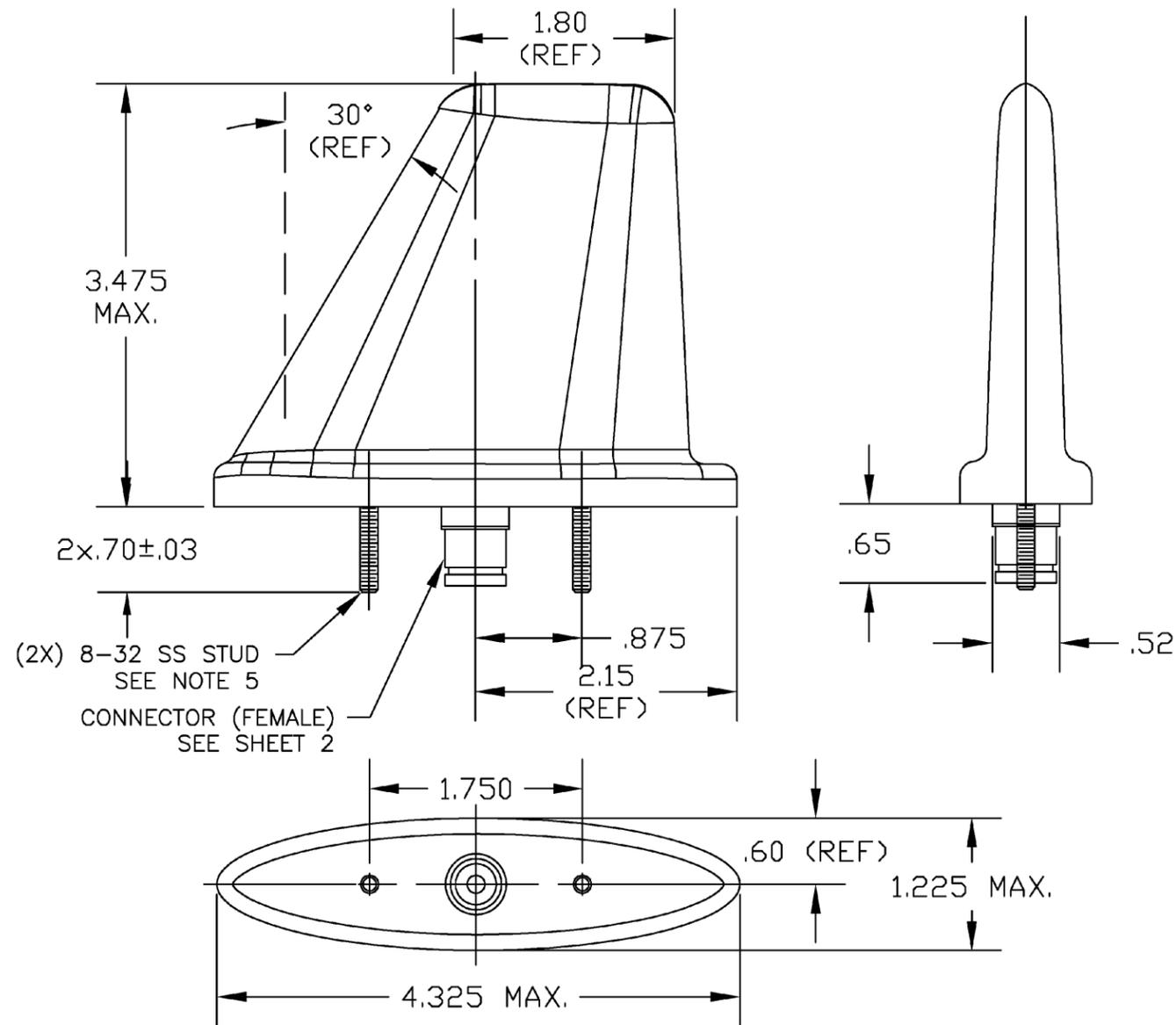


Figure 2-17 KA 61 Installation Drawing
(Page 1 of 2)

1. RF Performance Characteristics:

- Frequency: 960 to 1220 MHz.
- VSWR: 1.5:1 Max @ 960 to 1220 MHz.
1.3:1 Max @ 1025 to 1150 MHz.
- Polarization: Vertical
- Radiation Pattern: Equivalent of $\lambda/4$ Stub
- RF Power: 500 Watts pulse power @ 55,000 FT altitude
(30uS pulse width, PRF 125 pulses per second)
- Lightning Protection: DC grounded (< 50mW from RF pin to base plate)

2. Weight: 0.40 LBS (MAX)

3. Construction: Molded radome filled with an EPOXY resin fill and painted with white enamel.

4. Color: White Semi-gloss per FED STD 17925

5. Mounting Studs: 8-32 Studs must withstand 9 in-lb (min) torque

6. Rated Air Speed: 350 Knot EAS with 15 Degrees side slip

7. TSO Categories: C66c, C74c, C112, C118, C147

8. DO160D ENV CAT: [D2X]ACB[SCMYL,RG]XRFXXSXXXXXXXX[XXXX][2A]AX

9. Item 2: Material: Aluminum sheet, #2024-T3, .040" THK

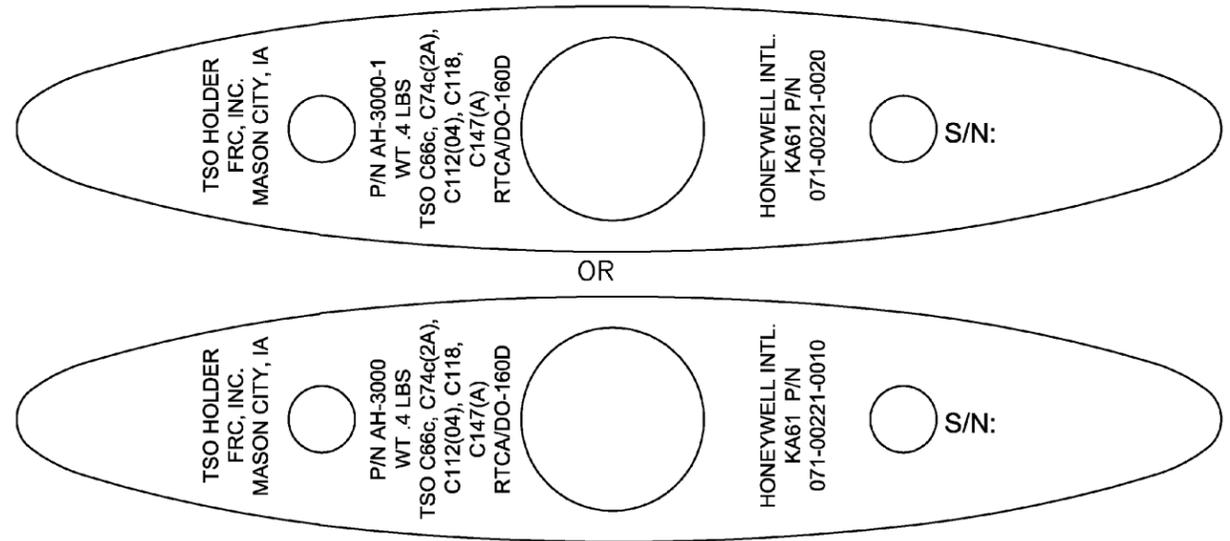
Finish: Clear Iridite, Mil-C-5541

Marking: Vendor Part No. to be stamped approximately as shown.

10. Item 3: Material: #60 White paper coated with removable adhesive and paper liner, or equivalent.

Marking: Vendor part number identification located approximately as shown.

11. Dimensions, Item 1, Antenna:



Product List:

Each antenna assembly shall include the following items:

Qty	Item No.	FRC P/N	Description
1	1	071-00221-0010	BNC L-Band Antenna
1	1	071-00221-0020	TNC L-Band Antenna
1	2	AH-3000-030	Backing Plate
1	3	AH-3000-040	Installation Template
2	4	8-32	Self Locking Cadmium Plated Carbon Hex Nut
1	5	Install-AH-3000	Installation Instructions (not shown)

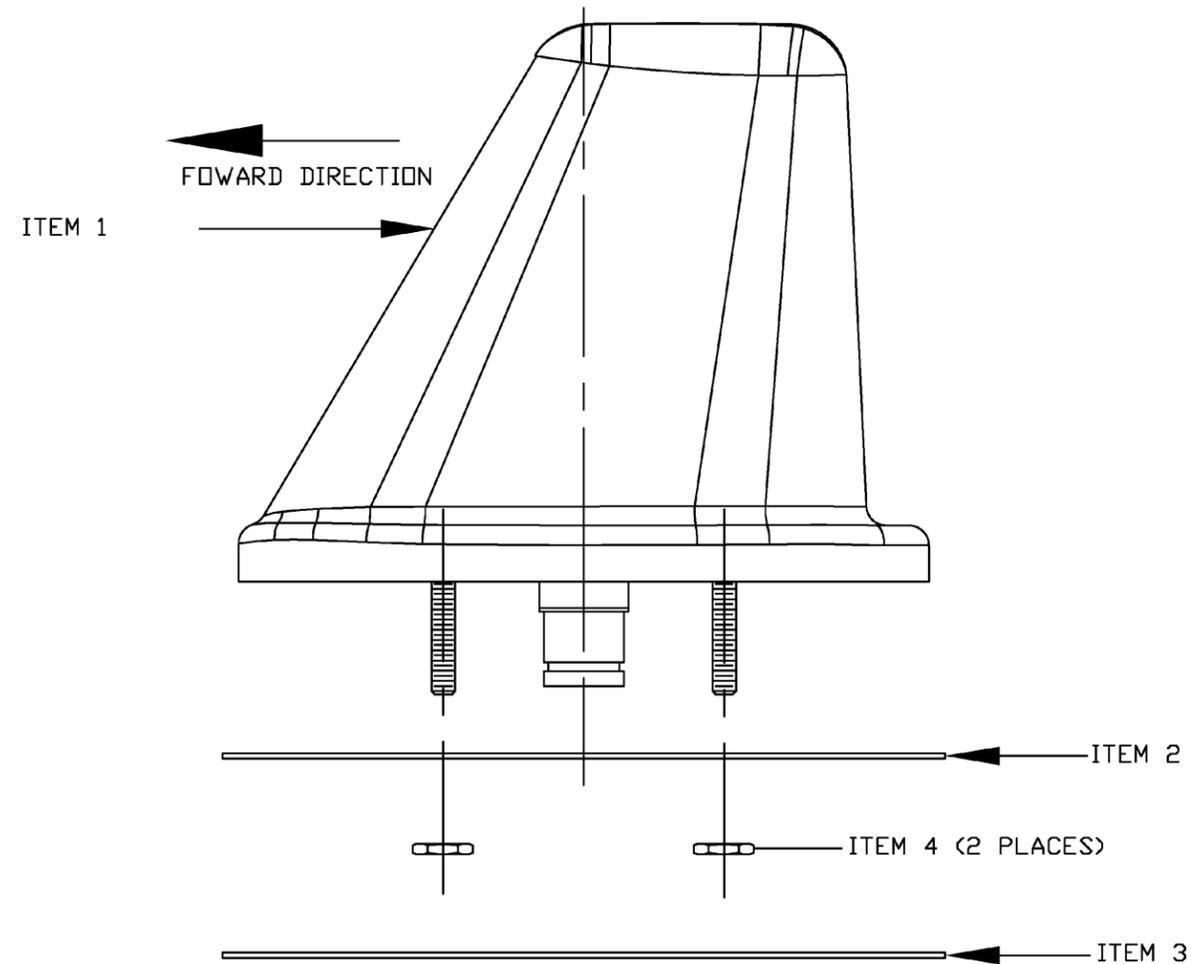
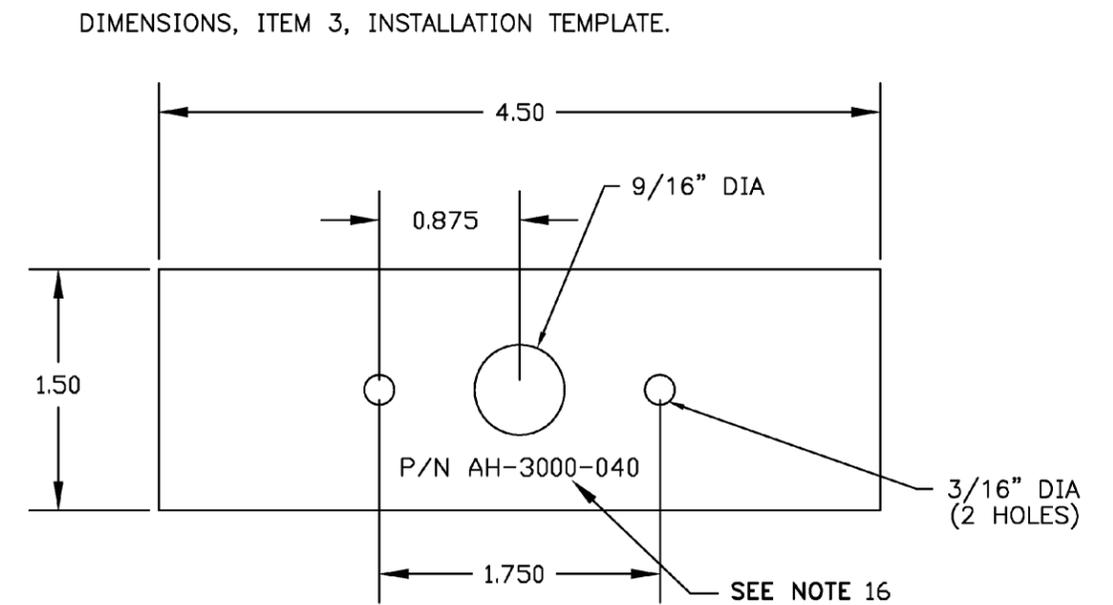
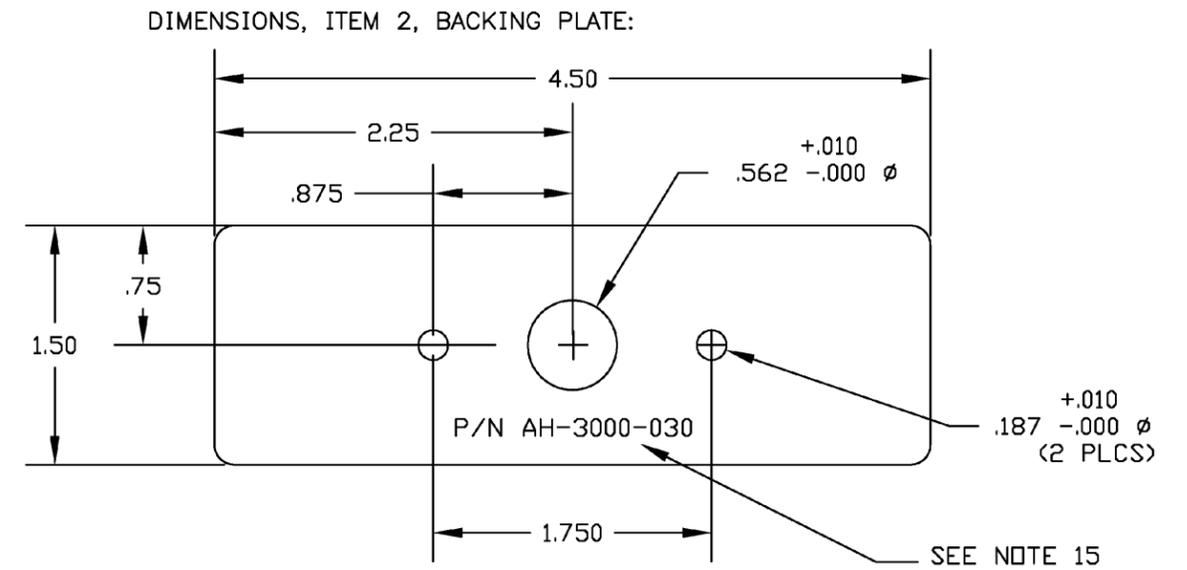


Figure 2-17 KA 61 Installation Drawing
(Page 2 of 2)



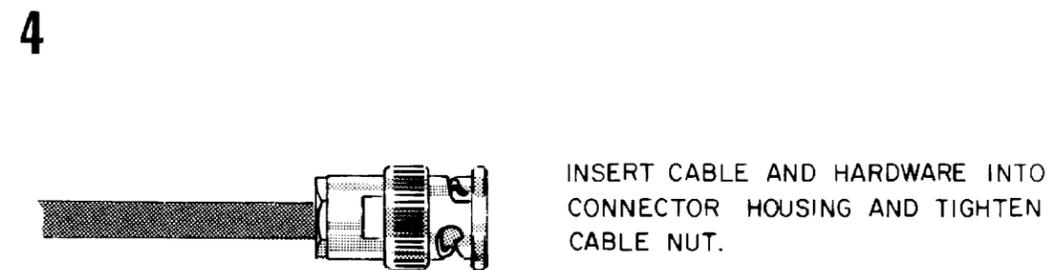
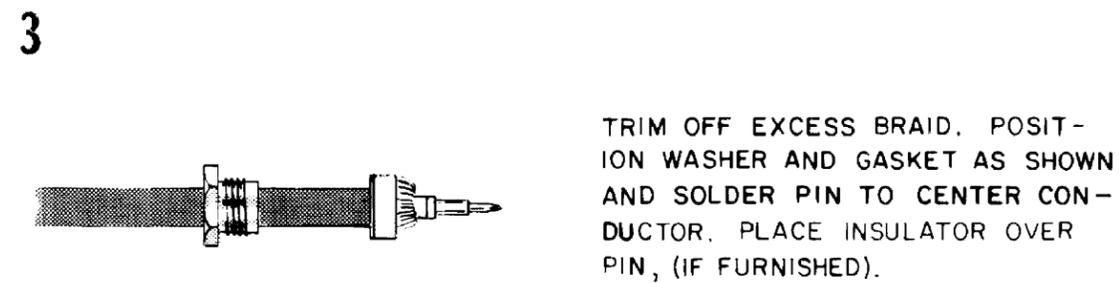
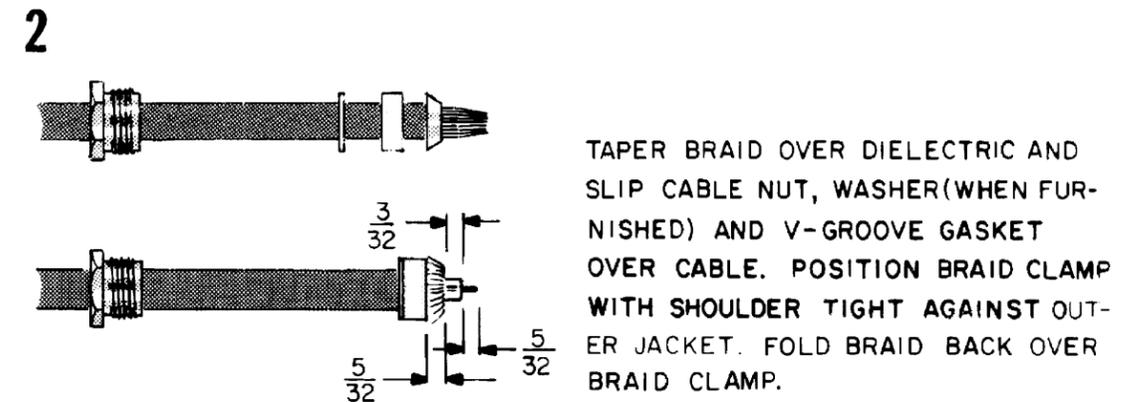
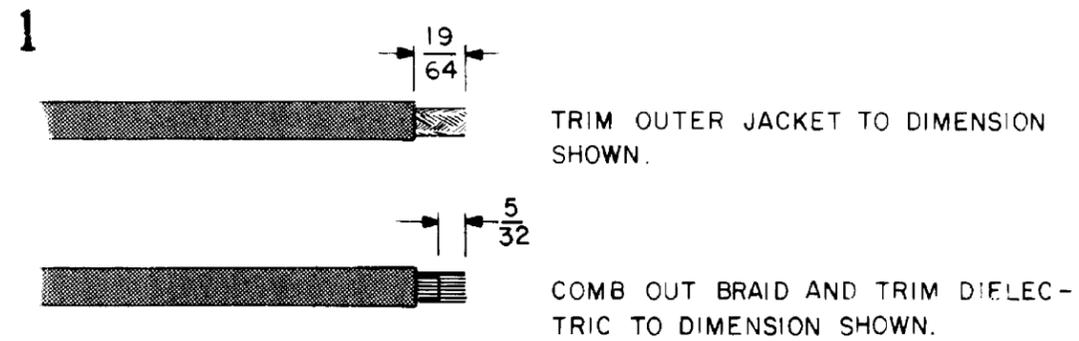


FIGURE 2-18 030-00005-0000 CONNECTOR ASSEMBLY
(Dwg. No. 155-05267-0000, R-0)

SECTION III OPERATION

3.1 GENERAL

It is recommended that power to the KN 62/62A/64 be turned on only after engine start-up, as this procedure increases the reliability of the solid state circuitry.

The KN 62/62A/64 front panel controls consist of an ON-OFF switch, a function switch, and frequency selection knobs (**Figure 3-1**). The function switch determines both the information displayed and the channeling source for the KN 62/62A/64. In Remote (RMT) mode, the KN 62/62A/64 is channeled from an external control head, and the display shows range, speed, and time-to-station. In Frequency (FREQ) mode, the KN 62/62A/64 is channeled from its own frequency selection knobs, and the display shows range and frequency. In Ground Speed/Time-to-Station (GS/T) mode, the KN 62/62A/64 holds the last internally selected frequency and displays range, speed, and time-to-station.

The frequency hold feature in GS/T mode is necessary to prevent accidental rechanneling of the DME when frequency is not being displayed. To prevent the unit from displaying false information, the KN 62/62A/64 will display dashes and stay in "search" whenever power is turned on or momentarily interrupted in GS/T mode. Normal operation is re-established by switching to FREQ or RMT mode.

When the KN 62/62A/64 is locked to a ground station, range is displayed 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. 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 indicates 99 minutes for any computed time-to-station greater than 99 minutes. When the KN 62/62A/64 is in search mode, dashes are displayed instead of range, speed, and time-to-station. An automatic dimming circuit adjusts the brightness of the display to compensate for changes in ambient light level. The dimming is controlled by a photocell mounted behind the front panel to the left of the display. Backlighting of nomenclature on 066-1068-04 and 066-1088-01 is connected and controlled directly by aircraft dimming bus.

The audio output of the KN 62/62A/64 can be set as high as 15 milliwatts into 600 ohms using the audio level adjustment accessible through the top cover. It is set for approximately 2mW output at the factory. It is desirable to use the audio to identify the DME ground stations being received.

The effective range of the KN 62/62A/64 DME depends on many factors; most important being the altitude of the aircraft. When the aircraft is on the ground, the KN 62/62A/64 usually will not receive DME stations due to line-of-sight signal limitations. Other contributing factors to the DME's effective range are the location and altitude of the ground transmitter, transmitter power output, and the degree of maintenance of the ground facility. The distance measured by the KN 62/62A/64 is slant-range distance (measured on a slant from aircraft to ground station) and should not be confused with actual ground distance. The difference between ground distance and slant-range distance is smallest at low altitude and long range. These distances may differ considerably when in close proximity to a VOR/DME facility. However, if the range is three times the altitude or greater, this error is negligible. In order to obtain accurate ground speed and time-to-station, the aircraft must be tracking directly to or from the station.

When operating dual KN 62/62A/64's, the respective DME's will interfere with each other when the NAV frequencies differ by 5.3MHz (for example, 108.00MHz and 113.3MHz). This interference results in premature flags or loss of "Lock-On". Should this occur, one of the KN 62/62A/64's should be either turned off or tuned to a different NAV frequency so that the 5.3MHz difference is eliminated.

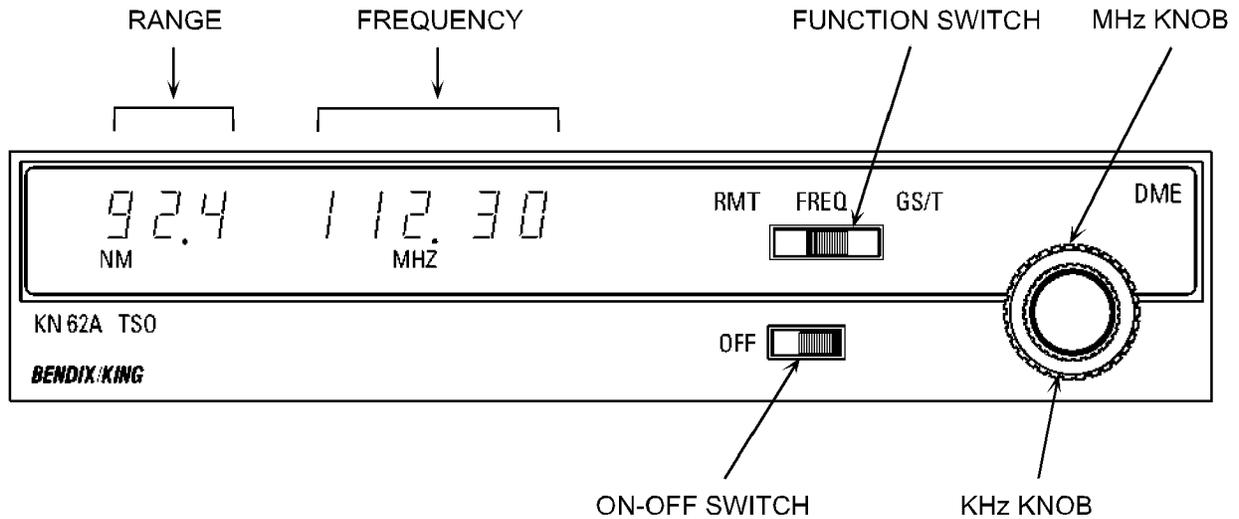


FIGURE 3-1 KN 62/62A/64 frequency mode

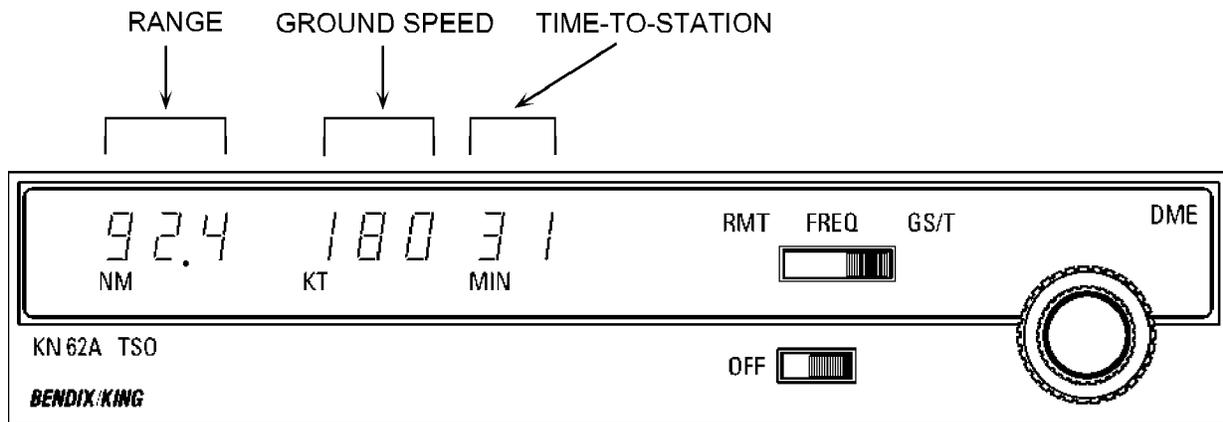


FIGURE 3-2 KN 62/62A/64 ground speed/time-to-station mode

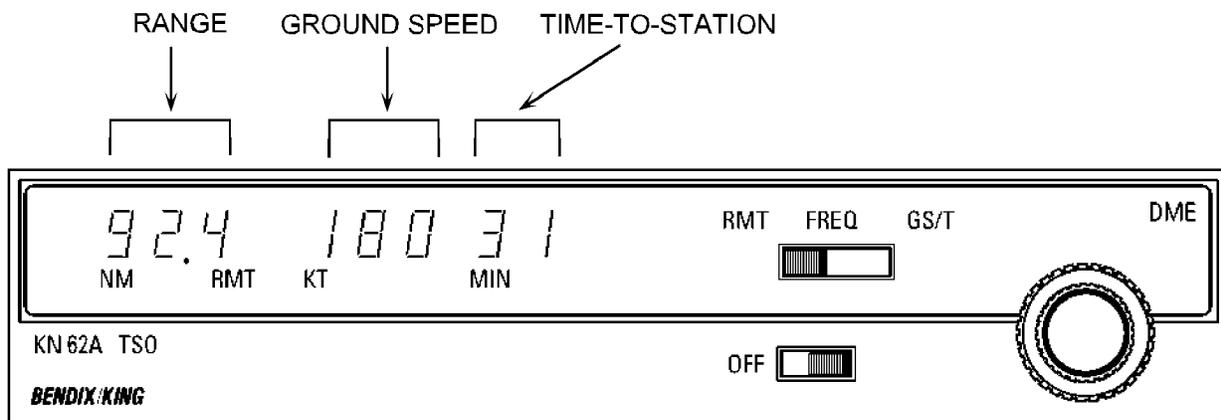


FIGURE 3-3 KN 62/62A/64 remote mode

