



**KX 170B/KX 175B
NAVIGATION RECEIVER/
COMMUNICATIONS TRANSCEIVER**

**INSTALLATION MANUAL
006-0085-01**

REV. 1 JANUARY, 1976

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**MAINTENANCE/OVERHAUL
MANUAL**

**KX 170B/KX 175B
NAV/COMM
TRANSCEIVER**



KING RADIO CORPORATION®

400 NORTH ROGERS ROAD

OLATHE, KANSAS, U.S.A.

1870

1871

1872

KING
KX 170B/KX 175B
NAVIGATION RECEIVER/
COMMUNICATIONS TRANSCEIVER

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KX 170B/KX 175B
NAVIGATION RECEIVER/COMMUNICATIONS TRANSCEIVER

HISTORY OF REVISIONS

Rev. 1, January, 1976

<u>Page</u>	<u>Reason for Change</u>
Front Page	Rev. No. change and Warranty deleted
1-9	Part Number changes
2-1	Paragraph 2.3(b) changed
2-4A	Antenna Cable Assembly added
2-8A	Drawing of cooling diffuser added
2-8B	Installation drawing of Ram Air Kit added
2-9	Interconnect updated
2-13	Interconnect updated
2-17	Interconnect updated
2-19	Interconnect updated



KX 170B/KX 175B
NAVIGATION RECEIVER/
COMMUNICATIONS TRANSCEIVER

The information in this maintenance manual does not profess to include all the details of design, production, or variations of the equipment, or to cover all the possible contingencies which may arise during operation, installation, or maintenance. Should special problems arise or further information be desired, please contact the KING Customer Service Department.



KX 170B/KX 175B
NAVIGATION RECEIVER/
COMMUNICATION TRANSCEIVER



FIGURE 1 KX 170B/KX 175B
(Dwg. No. 696-6123-00)


KING
KX 170B/KX 175B
NAVIGATION RECEIVER/
COMMUNICATIONS TRANSCEIVER

SECTION I
GENERAL INFORMATION

1.1 INTRODUCTION

This manual contains information relative to the physical, mechanical and electrical characteristics of the King Radio Corporation Silver Crown KX 170B/KX 175B, and interconnect information for various NAV/COMM system options.

1.2 PURPOSE OF EQUIPMENT

The King KX 170B / KX 175B NAV/COMM combines in a single panel mounted unit a 720 channel VHF COMM Transceiver and an independent 200 channel VHF NAV receiver. The NAV Receiver supplies VOR/LOC information to navigational converters and provides frequency selection for remote mounted Distance Measuring Equipment and Glideslope Receivers.

1.3 DESIGN FEATURES

1.3.1 KX 170B/KX 175B

A. Controls

1. On-Off switches are independent of volume control settings allowing the volume to remain at desired levels.
2. Separate NAV and COMM ON-OFF switches (KX 175B NAV and COMM are electrically independent).
3. Automatic squelch eliminates pilot responsibility for continuously monitoring squelch adjustments. Squelch threshold automatically adjusts to open on readable signals. Test position opens squelch to test COMM receiver sensitivity and to listen to extremely weak signals.
4. Ident-Voice switch filters station ident from receiver audio.
5. Frequency selector mechanism features human engineered concentric airline type drum readout, and blue-white. Glideslope and DME switching is provided.

B. Electronics

1. Varactor diode tuned filters eliminate use of mechanical tuning shafts and mechanisms.
2. Balanced mixers for superior intermodulation, cross modulation, and L. O. radiation performance provide true 1 + 1 operation.
3. Transistorized transmitter provides 5 watts minimum output power and long term reliability superior to tube designs.
4. The digital frequency synthesizers utilize state of the art integrated circuits to replace all but 6 crystals (KX 170B) and 7 crystals (KX 175B), providing improved mean time between failure.


KX 170B/KX 175B
**NAVIGATION RECEIVER/
 COMMUNICATIONS TRANSCEIVER**

5. Crystal filter selectivity both NAV and COMM.
6. Carrier to noise squelch with carrier squelch back up functionally described above.
7. Tight AGC (typically 0.5db from 10 μ v to 20,000 μ v) minimizes audio level variations.

C. Construction

1. Modular construction for ease of maintenance.
2. Rack mounted, removable from the front panel.
3. Anti-theft locking mechanism. (Optional)
4. Provisions for identifying radios as COMM 1, NAV 1 and COMM 2, NAV 2 in dual installations.

1.4 POWER REQUIREMENTS

The KX 170B/KX 175B requires 13.75 volts for proper operation. Aircraft having electrical power plants producing 27.5 volts require the installation of a voltage converter. The KA 39 Voltage Converter, designed to separately convert NAV and COMM 27.5 volts to 13.75 volts, may be conveniently remote mounted in the aircraft.

1.5 TECHNICAL CHARACTERISTICS

KX 170B TRANSCEIVER	
SPECIFICATION	CHARACTERISTIC
GENERAL	
MOUNTING:	Panel mounted, no shock mounting required.
SIZE KX 170B NAV/COMM	6.312 X 2.600 X 14.15 inches w/connectors. (16.03 X 6.60 X 35.94 centimeters.)
WEIGHT: KX 170B NAV/COMM	7.0 lbs excluding external connectors and harness. (3.18Kg)
POWER REQUIREMENTS: COMM Receive COMM Transmit (Tone) NAV Receiver Lamps Max Total Current	13.75V (or 27.5V with KA 39) 0.70 amps 4.5 amps (2.8 amps unmodulated) 0.52 amps 0.16 amps (13.75Vdc), 0.08 amps (27.5Vdc) 5.1 amps (Transmit tone mod, NAV Rec. Lamps)


KX 170B/KX 175B
NAVIGATION RECEIVER /
COMMUNICATIONS TRANSCEIVER
KX 170B TRANSCEIVER

SPECIFICATION	CHARACTERISTIC
COMM TRANSCEIVER	
CRYSTAL CONTROLLED:	720 channels
FREQUENCY RANGE:	118.000 to 135.975MHz with 25kHz spacing
FREQUENCY STABILITY:	±0.003%
TRANSMITTER	
VHF POWER OUTPUT:	5 watts minimum, 50 ohm load
MODULATION:	85% modulation capability with 90% limiting provided
MICROPHONE:	Dynamic mike containing transistorized pre-amp or carbon (must provide at least 120 mVRMS into 500Ω load.)
SIDETONE:	Adjustable up to 4mw into 500 ohm headphones
DUTY CYCLE:	1 minute on, 4 minutes off (20%)
RECEIVER	
SENSITIVITY:	1.5μv (soft) will provide a 6db minimum signal plus noise to noise ratio (1kHz, 30% mod)
SELECTIVITY:	Typical 6db at ±8kHz, 60db at ±35kHz
SPURIOUS RESPONSES:	Down at least 60db
SQUELCH:	Automatic squelch (carrier to noise) with manual disable and carrier squelch override.
AGC CHARACTERISTICS:	From 10μv to 20,000μv audio output will not vary more than 3db.
NAV RECEIVER	
CRYSTAL CONTROLLED:	200 channels.
FREQUENCY RANGE:	108.00 to 117.95MHz with 50kHz spacing.
SENSITIVITY: Navigation	1.5μv (soft) will provide a half-flag indication 1.0μv (soft) will provide a 6db $\frac{\text{signal} + \text{noise}}{\text{noise}}$ ratio.


KX 170B/KX 175B
 NAVIGATION RECEIVER/
 COMMUNICATIONS TRANSCEIVER
KX 170B TRANSCEIVER

SPECIFICATION	CHARACTERISTIC																																																																																																																																				
SELECTIVITY:	Typical 6db at $\pm 19\text{kHz}$ 50db at $\pm 50\text{kHz}$																																																																																																																																				
SPURIOUS RESPONSES:	Down at least 60db																																																																																																																																				
IDENT FILTER:	Tone rejection, 15db, minimum																																																																																																																																				
AGC CHARACTERISTICS:	From $10\mu\text{v}$ to $20,000\mu\text{v}$ audio output will not vary more than 3db.																																																																																																																																				
NAV RECEIVER ACCURACY:	Two sigma limit, $\pm 1.5^\circ$																																																																																																																																				
NAV OUTPUT:	With LOC adjusted for 0.35Vrms , $\text{VOR} = 0.5\text{Vrms}$ (typical) into $20\text{K}\Omega$ or greater load impedance.																																																																																																																																				
DME CHANNELING:																																																																																																																																					
<table style="margin-left: auto; margin-right: auto;"> <thead> <tr> <th></th> <th>M_0</th> <th>M_1</th> <th>M_2</th> <th>M_3</th> <th></th> <th>K_0</th> <th>K_1</th> <th>K_2</th> <th>K_3</th> <th></th> <th></th> </tr> </thead> <tbody> <tr> <td>108</td> <td>-</td> <td>-</td> <td>0</td> <td>-</td> <td>.0X</td> <td>0</td> <td>0</td> <td>-</td> <td>-</td> <td>.X0</td> <td>-</td> </tr> <tr> <td>109</td> <td>-</td> <td>-</td> <td>-</td> <td>0</td> <td>.1X</td> <td>0</td> <td>0</td> <td>0</td> <td>-</td> <td>.X5</td> <td>0</td> </tr> <tr> <td>110</td> <td>0</td> <td>-</td> <td>-</td> <td>-</td> <td>.2X</td> <td>0</td> <td>0</td> <td>0</td> <td>0</td> <td></td> <td></td> </tr> <tr> <td>111</td> <td>0</td> <td>0</td> <td>-</td> <td>-</td> <td>.3X</td> <td>-</td> <td>0</td> <td>0</td> <td>0</td> <td></td> <td></td> </tr> <tr> <td>112</td> <td>0</td> <td>0</td> <td>0</td> <td>-</td> <td>.4X</td> <td>-</td> <td>-</td> <td>0</td> <td>0</td> <td></td> <td></td> </tr> <tr> <td>113</td> <td>-</td> <td>0</td> <td>0</td> <td>0</td> <td>.5X</td> <td>0</td> <td>-</td> <td>-</td> <td>0</td> <td></td> <td></td> </tr> <tr> <td>114</td> <td>0</td> <td>-</td> <td>0</td> <td>0</td> <td>.6X</td> <td>-</td> <td>0</td> <td>-</td> <td>-</td> <td></td> <td></td> </tr> <tr> <td>115</td> <td>-</td> <td>0</td> <td>-</td> <td>0</td> <td>.7X</td> <td>-</td> <td>-</td> <td>0</td> <td>-</td> <td></td> <td></td> </tr> <tr> <td>116</td> <td>0</td> <td>-</td> <td>0</td> <td>-</td> <td>.8X</td> <td>-</td> <td>-</td> <td>-</td> <td>0</td> <td></td> <td></td> </tr> <tr> <td>117</td> <td>0</td> <td>0</td> <td>-</td> <td>0</td> <td>.9X</td> <td>0</td> <td>-</td> <td>-</td> <td>-</td> <td></td> <td></td> </tr> </tbody> </table>		M_0	M_1	M_2	M_3		K_0	K_1	K_2	K_3			108	-	-	0	-	.0X	0	0	-	-	.X0	-	109	-	-	-	0	.1X	0	0	0	-	.X5	0	110	0	-	-	-	.2X	0	0	0	0			111	0	0	-	-	.3X	-	0	0	0			112	0	0	0	-	.4X	-	-	0	0			113	-	0	0	0	.5X	0	-	-	0			114	0	-	0	0	.6X	-	0	-	-			115	-	0	-	0	.7X	-	-	0	-			116	0	-	0	-	.8X	-	-	-	0			117	0	0	-	0	.9X	0	-	-	-			
	M_0	M_1	M_2	M_3		K_0	K_1	K_2	K_3																																																																																																																												
108	-	-	0	-	.0X	0	0	-	-	.X0	-																																																																																																																										
109	-	-	-	0	.1X	0	0	0	-	.X5	0																																																																																																																										
110	0	-	-	-	.2X	0	0	0	0																																																																																																																												
111	0	0	-	-	.3X	-	0	0	0																																																																																																																												
112	0	0	0	-	.4X	-	-	0	0																																																																																																																												
113	-	0	0	0	.5X	0	-	-	0																																																																																																																												
114	0	-	0	0	.6X	-	0	-	-																																																																																																																												
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NOTE: (-) = OPEN, (0) = DME COMMON.																																																																																																																																					
ILS ENERGIZE:	The ILS energize wire is connected to the ILS common wire when the MHz selector is in either the 108, 109, 110, or 111 position <u>AND SIMULTANEOUSLY</u> the kHz selector is in either the 0.10, 0.15, 0.30, 0.35, 0.50, 0.55, 0.70, 0.75, 0.90 or 0.95 position.																																																																																																																																				


KX 170B/KX 175B
 NAVIGATION RECEIVER/
 COMMUNICATIONS TRANSCEIVER

SPECIFICATION	CHARACTERISTIC
GLIDESLOPE CHANNELING:	
GS GS GS GS 108 109 110 111	GS GS GS GS GS 0.1 0.3 0.5 0.7 0.9
108 0 - - -	.0X - - - -
109 - 0 - -	.1X 1 - - -
110 - - 0 -	.2X - - - -
111 - - - 0	.3X - 1 - -
112 - - - -	.4X - - - -
113 - - - -	.5X - - 1 -
114 - - - -	.6X - - - -
115 - - - -	.7X - - - 1
116 - - - -	.8X - - - -
117 - - - -	.9X - - - 1
<p>NOTE: (0) = ILS common, (-) = open, (1) = either KN 73 A+ (KN 73 Installations) or KX 170B/KX 175B A+ with 1KΩ source resistance (KI 211C/KI 212/KI 213/KI 214 installations).</p>	
<div style="border: 1px solid black; padding: 2px; display: inline-block;">AUDIO</div>	
AUXILIARY AUDIO INPUTS:	Two (2) 500 ohms with 30db isolation between any two.
INTERCOM INPUT:	One (1) Intercom Microphone Input. (Microphone must provide at least 120m Vrms into 500Ω load).
FREQUENCY RESPONSES:	Within 6db from 350Hz to 2500Hz.
HEADPHONE OUTPUT:	50mw into 500 ohm
SPEAKER OUTPUT:	4.5Vrms into auxiliary input produces 5 watts audio output.
KX 175B TRANSCEIVER	
TSO COMPLIANCE:	
COMM Transmit	C37b (DO-110, Class II)
COMM Receive	C38b (DO-109)
VOR	C40a (DO-114)
LOC	C36c (DO-131, Class C)
Environmental	DAPBAAXXXXXX
MOUNTING:	Panel mounted, no shock mounting required.
SIZE:	6.312 × 2.600 × 14.15 inches w/connectors. (16.03 × 6.60 × 35.94 centimeters)
WEIGHT:	7.0 lbs excluding external connectors and harness. (3.18Kg)


KING
 KX 170B/KX 175B
 NAVIGATION RECEIVER/
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 KX 175B TRANSCEIVER

SPECIFICATION	CHARACTERISTIC
POWER REQUIREMENTS: COMM Receive COMM Transmit (Tone) NAV Receive Lamps Max. total current	13.75V (or 27.5V with KA 39) 0.70 amps 4.5 amps (2.8 amps unmodulated) 0.52 amps 0.16 amps (13.75Vdc), 0.08 amps (27.5Vdc) 5.1 amps (Transmit tone mod, NAV Rec, Lamps)
CRYSTAL CONTROLLED:	720 channels
FREQUENCY RANGE:	118.000 to 135.975MHz with 25kHz spacing
FREQUENCY STABILITY:	±0.003%
TRANSMITTER	
VHF POWER OUTPUT:	5 watts minimum, 50 ohm load
MODULATION:	85% modulation capability with 90% limiting, less than 15% distortion at 80% mod.
MICROPHONE:	Carbon or dynamic mike containing transistorized pre-amp (must provide at least 120mvrms into 500Ω load).
SIDETONE:	Adjustable up to 4mw into 500 ohm headphones
DUTY CYCLE:	1 minute on, 4 minutes off (20%)
RECEIVER	
SENSITIVITY:	1.5μv (soft) will provide a 6db minimum signal plus noise to noise ratio
SELECTIVITY:	Typical 6db at ±8kHz, 60db at ±20kHz
SPURIOUS RESPONSES:	Down at least 60db
SQUELCH:	Automatic squelch (carrier to noise) with manual disable and carrier squelch override.
AGC CHARACTERISTICS:	From 10μv to 20,000μv audio output will not vary more than 3db.
NAV RECEIVER	
CRYSTAL CONTROLLED:	200 channels
FREQUENCY RANGE:	108.00 to 117.95MHz with 50kHz spacing.

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<table border="0" style="width: 100%;"> <tr> <td></td> <td style="text-align: center;">GS</td> <td style="text-align: center;">GS</td> <td style="text-align: center;">GS</td> <td style="text-align: center;">GS</td> <td></td> <td style="text-align: center;">GS</td> <td style="text-align: center;">GS</td> <td style="text-align: center;">GS</td> <td style="text-align: center;">GS</td> <td style="text-align: center;">GS</td> <td></td> </tr> <tr> <td></td> <td style="text-align: center;">108</td> <td style="text-align: center;">109</td> <td style="text-align: center;">110</td> <td style="text-align: center;">111</td> <td></td> <td style="text-align: center;">0, 1</td> <td style="text-align: center;">0, 3</td> <td style="text-align: center;">0, 5</td> <td style="text-align: center;">0, 7</td> <td style="text-align: center;">0, 9</td> <td style="text-align: center;">GS</td> </tr> <tr> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td style="text-align: center;">50kHz</td> </tr> </table>		GS	GS	GS	GS		GS	GS	GS	GS	GS			108	109	110	111		0, 1	0, 3	0, 5	0, 7	0, 9	GS												50kHz	
	GS	GS	GS	GS		GS	GS	GS	GS	GS																											
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108	0	-	-	-	.0X	-	-	-	-	-	.X0	-																									
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110	-	-	0	-	.2X	-	-	-	-	-																											
111	-	-	-	0	.3X	-	1	-	-	-																											
112	-	-	-	-	.4X	-	-	-	-	-																											
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116	-	-	-	-	.8X	-	-	-	-	-																											
117	-	-	-	-	.9X	-	-	-	-	1																											
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KA 39 VOLTAGE CONVERTER																																					
SIZE:	3.500 × 2.000 × 5.500 inches (8.889 × 5.18 × 13.87 centimeters)																																				
WEIGHT:	1.1 lbs. excluding harness (.5Kg)																																				
POWER:	<table border="0" style="width: 100%;"> <tr> <td></td> <td style="text-align: center;">A</td> <td style="text-align: center;">B</td> </tr> <tr> <td>Input Volts</td> <td style="text-align: center;">27.5vdc</td> <td style="text-align: center;">27.5vdc</td> </tr> <tr> <td>Output Volts</td> <td style="text-align: center;">13.75vdc (nominal)</td> <td style="text-align: center;">13.75vdc (nominal)</td> </tr> <tr> <td>Input Current continuous</td> <td></td> <td></td> </tr> <tr> <td>Input Current 40% duty.</td> <td></td> <td style="text-align: center;">-----</td> </tr> <tr> <td>Output Current continuous</td> <td style="text-align: center;">1.5A</td> <td style="text-align: center;">0.75A</td> </tr> <tr> <td>Output Current 40% duty</td> <td style="text-align: center;">5.0A</td> <td style="text-align: center;">-----</td> </tr> </table>		A	B	Input Volts	27.5vdc	27.5vdc	Output Volts	13.75vdc (nominal)	13.75vdc (nominal)	Input Current continuous			Input Current 40% duty.		-----	Output Current continuous	1.5A	0.75A	Output Current 40% duty	5.0A	-----															
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Output Current continuous	1.5A	0.75A																																			
Output Current 40% duty	5.0A	-----																																			

KING
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1.6 UNITS AND ACCESSORIES SUPPLIED

- A. King KX 170B NAV/COMM (069-1020-00)
- B. King KX 175B NAV/COMM (069-1019-00)
- C. King KX 170B/KX 175B Installation Kit (~~050-1142-00~~) includes:

030-0101-00	Connector, Antenna (TED 9-30-4)	2
030-1019-00	Clamp, Cable Hall	2
030-2101-04	Connector, 42 pin (Amphenol 26-190-42)	1
047-1743-01	Plate, Connector Mounting	1
047-1851-00	Cover, Connector Mounting Plate	1
057-1214-00	Decal, COMM 1	1
057-1214-01	Decal, COMM 2	1
057-1214-02	Decal, NAV 1	1
057-1214-03	Decal, NAV 2	1
088-0136-01	Filter, Red Lamp	2
089-2188-22	E4 ESNA Nut	2
089-5523-05	Screw, #4-40 X 5/16 Fil HP	4
089-5903-05	Screw, #4-40 X 5/16 PHP	2
089-5907-05	Screw, #6-32 X 5/16 PHP	2
089-6008-04	Screw, #4-40 X 1/4 FHP	4
089-8025-30	Flat Washer	2
089-8094-30	Flat Washer	2
090-0019-07	Ring, Retainer	2

1.7 ACCESSORIES REQUIRED, BUT NOT SUPPLIED

- A. Communication and navigation antenna and cables.
- B. Headphones and speaker:
 - 1. Headphones: Low impedance types, 300 to 1,000 ohms.
 - 2. Speaker: Voice coil impedance 3 to 6 ohms nominal.
- C. KA 39 Voltage Converter, 27.5V to 13.75V (required in 27.5V installation only).
- D. Microphone: Low impedance carbon, or dynamic with transistor preamp, such as King KA 14.
- E. VOR/LOC converter and indicator. Various King Options include:
 - 1. KI 201C VOR Indicator (VOR/LOC only)
 - 2. KI 214 ILS Indicator (VOR/LOC Glideslope 40 Channel)
 - 3. (a) KN 77 VOR/LOC Converter, with KNI 520 Navigation Indicator
 - (b) KN 77 VOR/LOC Converter, with KPI 550A Pictorial Navigation System

KING
KX 170B/KX 175B
NAVIGATION RECEIVER/
COMMUNICATIONS TRANSCEIVER

4. (a) KN 73 Glideslope Receiver - KN 77 VOR/LOC Converter with KNI 520 Navigation Indicator
- (b) KN 73 Glideslope Receiver - KN 77 VOR/LOC Converter with KPI 550 Pictorial Navigation System

5. (a) KN 74 Area Navigation Computer with KI 213 CDI and Glideslope Receiver.
- (b) KN 74 Area Navigation Computer with KN73 Glideslope Receiver and KPI 550A Pictorial Navigation System.

1.8 LICENSE REQUIREMENTS

The Federal Communications Commission requires that the operator of the transmitter of this equipment holds a Restricted Radio Telephone Operator Permit, or higher class license. A permit may be obtained by a U. S. citizen from the nearest field office of the FCC; no examination is required.

This equipment has been type accepted by the FCC and entered on their list of type accepted equipments as King KX 170B/KX 175B and must be identified as King KX 170B or King KX 175B.

-CAUTION-

The VHF transmitter in this equipment is guaranteed to meet Federal Communications Commission approval only when King crystals are used.

Use of other than King crystals is considered an unauthorized modification.


KX 170B/KX 175B
NAVIGATION RECEIVER /
COMMUNICATIONS TRANSCEIVER

SECTION II
INSTALLATION

2.1 GENERAL

This section contains suggestions and factors to consider before installing the KX 170B/KX 175B NAV/COMM unit and KA 39 Voltage Converter (27.5V installations only). Close adherence to these suggestions will assure a more satisfactory performance from the equipment.

2.2 UNPACKING AND INSPECTING EQUIPMENT

Exercise extreme care when unpacking each unit. Make a visual inspection of each 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. When all equipment is removed, place in the shipping container all packing materials for use in unit storage or reshipment. The KX 170B/KX 175B installation will conform to standards designated by the customer, installing agency and existing conditions as to unit location and type of installation.

2.3 KX 170B/KX 175B INSTALLATION

Listed below are factors and suggestions to consider before installing your KX 170B/KX 175B system. Close adherence to these suggestions will assure more satisfactory performance from your equipment.

- (a) The KX 170B/KX 175B is mounted rigid in the aircraft panel. Mark and cut the mounting hole as shown in Figure 2-5. The purpose of the "behind aircraft panel mount cutout is to allow a margin of error in cutout size and prevent the mounting tray front edge from being visible. The mounting tray bottom lip should extend through the mounting hole flush with the instrument panel to insure proper plug pin engagement.
- (b) Avoid mounting close to any high external heat source. Forced air cooling should be supplied for 3 or more radios in a stack.
- (c) Remember to allow adequate space for installation of cables and connectors.
- (d) Secure the mounting rack to instrument panel per Figure 2-5. The rear mounting bosses should be attached to the airframe by means of support brackets.
- (e) Slide the KX 170B/KX 175B into the rack and secure by turning the locking screw on the front panel.

- CAUTION -

Do not force locking tab screw.

- (f) An antitheft mechanism is available for the KX 170B/KX 175B (KPN 050-1326-00 short locking bar, 050-1326-01, long locking bar). This kit may be installed at the customer's option to provide a means of locking the radio to the instrument panel with a padlock located on the lower rear corner of the mounting tray.

Installation consists of riveting the bracket to the mounting tray as shown in Figure 2-5. After the radio installation is complete, the locking bar may be inserted and a small padlock affixed to deter theft.


KX 170B/KX 175B
**NAVIGATION RECEIVER/
COMMUNICATIONS TRANSCEIVER**

- (g) The installing agency will supply and fabricate all external cables. The plugs required are supplied by King Radio.

2.4 KA 39 INSTALLATION

(For use in 27.5 volt installations only)

- (a) Select the KA 39 location considering good thermal conductivity to the airframe, convenient cable routing, and separation from other heat sources. The KA 39 should be mounted no closer to the KX 170B/KX 175B than is necessary to good thermal isolation.
- (b) Refer to Figure 2-4 for the KA 39 mounting dimensions.
- (c) Secure the KA 39 firmly in place.
- (d) The installing agency will supply and fabricate external cables.

2.5 ANTENNA INSTALLATION

- (a) Conventional 50 ohm horizontally polarized NAV and vertically polarized COMM antennas are required with the KX 170B/KX 175B. Vertical bent whip antennas are not recommended. Wideband COMM antennas provide efficient operation over the COMM band. Antennas should be installed per manufacturers recommendations. Additional recommendations are as follows:

COMM ANTENNA

1. Mount antenna on flat metal surface or install a ground plane at least 18 inches square.
2. The antenna should be well removed from any projections and the engine(s) and propeller.
3. NAV and COMM Antennas must be well separated to minimize COMM interference to NAV while transmitting, (Minimum recommended separation is 30db).

NAV ANTENNA

1. The location should be well removed from other antenna, projections and engine(s). It should have a clear line of sight area if possible.
 2. The antenna MUST BE mounted symmetrically with the centerline of the aircraft.
 3. Avoid running other coaxial cables and wires with the NAV antenna cable.
- (b) The antenna connectors on the KX 170B/KX 175B unit are identified on the rear die casting.

KING
KX 170B/KX 175B
NAVIGATION RECEIVER/
COMMUNICATIONS TRANSCEIVER

—NOTE—

With the KX 170B/KX 175B viewed from the rear, the NAV antenna connector is on the right and the COMM antenna connector is on the left. This means that the NAV frequency selector and NAV antenna are on opposite sides of the radio. The COMM frequency selector and COMM antenna connector are also on opposite sides of the radio.

—CAUTION—

Review the above information carefully. Interchanged antenna connections will cause erroneous NAV operation and in some installations could introduce 7 watts of transmitter power into a NAV receiver causing damage to that unit.

- (c) Refer to Figure 2-3 for a dual omni antenna installation if two navigation receivers are used. VOR antenna duplexers normally cause a 6db signal loss.
- (d) Refer to Figure 2-2 for the COMM and NAV antenna cable connector assembly. Solder tack the snap on shield to the connector base at two points to insure that a good electrical ground is made.

2.6 CABLING

- (a) The length and routing of the external cables must be carefully studied and planned prior to installation. Avoid sharp bends and placing cables too near the aircraft control cables.
- (b) Fabricate the external cables in accordance with the installation drawing that fulfills the system requirement.

—NOTE—

Use good quality stranded wire that will not support a flame and with at least 600 volt insulation. It is recommended that the mike audio line be in a shielded-twisted pair.

- (c) Since other radio and navigation equipment will possibly utilize the same speaker circuits for muting, speaker selection and microphone switching must be devised by the installing agency. The KX 170B/KX 175B does not shunt the speaker line of other equipment when the off-on-test switch is turned "off".

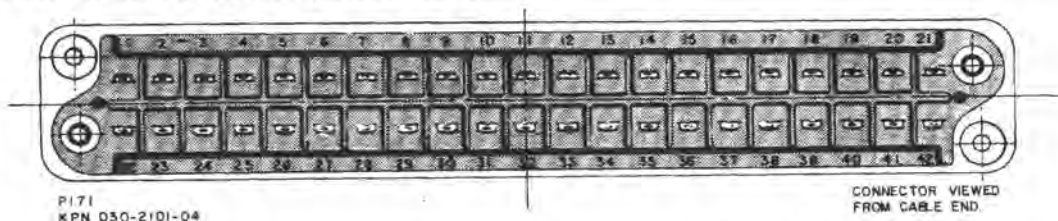


FIGURE 2-1 KX 170B/KX 175B CONNECTOR PIN LOCATIONS
(DWG. NO. 696-6002-00 R-1)

KING
KX 170B/KX 175B
NAVIGATION RECEIVER /
COMMUNICATIONS TRANSCEIVER



Trim coax cable outer insulation as shown.



Fold braid back over outer cover of coax.
Do not cross strands.



Solder center conductor to center pin of
connector. Make sure front end of braid
(Point of fold) is even with bottom of connector
(Shown by arrows)



Slide connector cap, with clearance hole in
position to clear dielectric, on to connector
until it snaps in place.

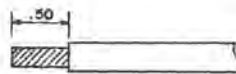


Push braid forward and flatten against connector
cap and solder.
Solder tac connector cap to connector in at least
two places to insure good electrical contact.

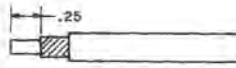
FIGURE 2-2 ANTENNA CABLE ASSEMBLY
(DWG. NO. 696-6003-00)


KX 170B/KX 175B
NAVIGATION RECEIVER/COMMUNICATIONS TRANSCEIVER

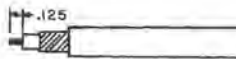
CONNECTOR ASSEMBLY INSTRUCTIONS
 DOCUMENT 008-1058-00, OCT, 1972



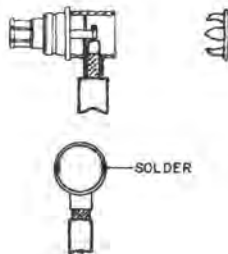
Trim coax outer insulation as shown.



Trim braid but not center conductor or insulation back 0.25".

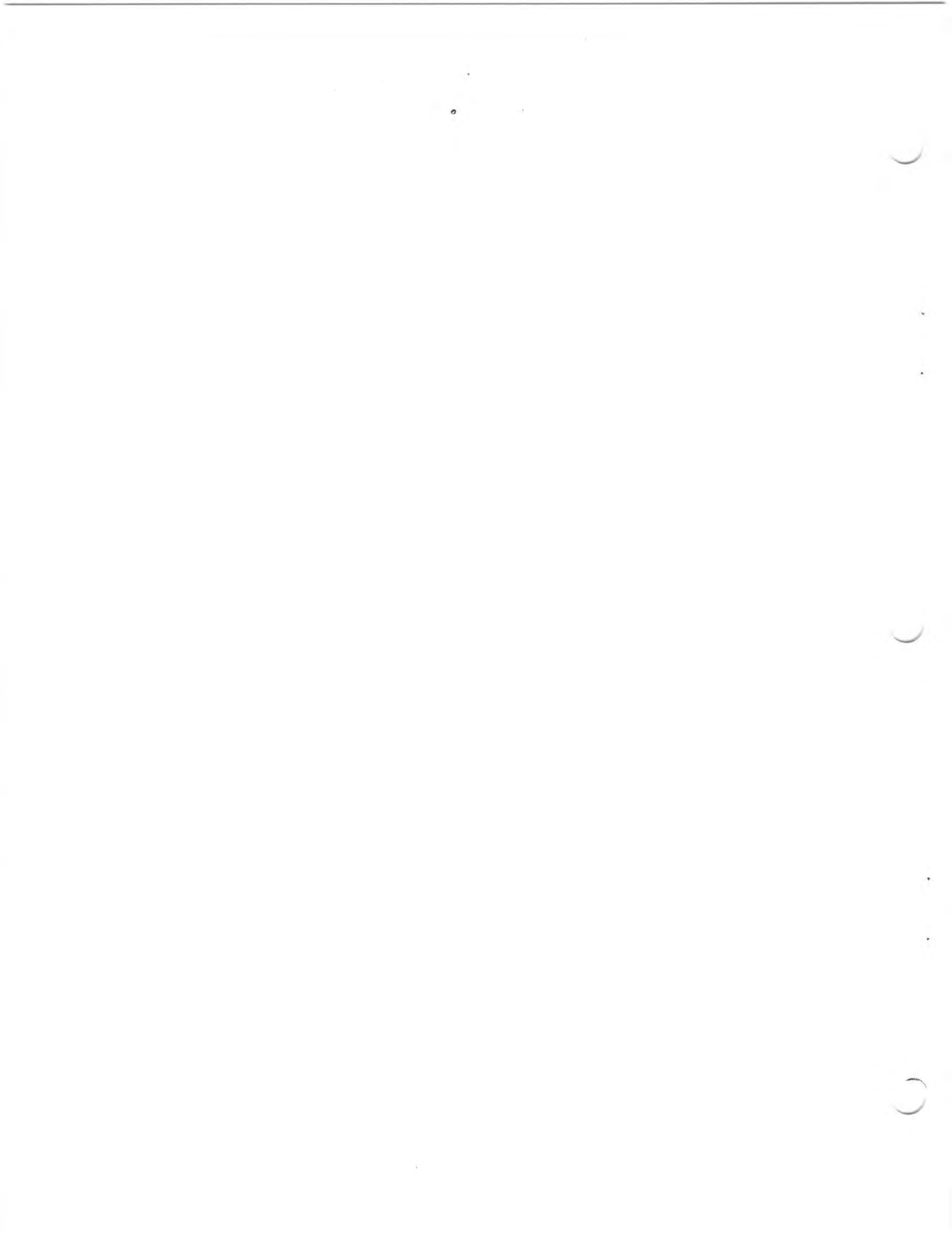


Strip insulation back 0.125".



Insert cable through side wall of connector and solder center conductor to center pin of connector. Heat the outside of the connector sleeve and at the same time apply solder between braid and sleeve. Continue to apply heat until the solder flows. Insert connector cap into end of fitting and tack solder in 2 places.

FIGURE 2-2A ANTENNA CABLE ASSEMBLY




KING
KX 170B/KX 175B
NAVIGATION RECEIVER/
COMMUNICATIONS TRANSCEIVER

SECTION III
OPERATION

3.1 GENERAL

All controls required to operate the KX 170B/KX 175B are located on the unit front panel.

3.2 KX170B/KX 175B NAV/COMM CONTROLS

3.2.1 COMM ON-OFF TEST CONTROL

The ON-OFF-TEST control is located directly above the COMM channel selector. Power is supplied to the COMM when this control is either in the ON or TEST position. The TEST position is used to defeat the COMM automatic squelch for both test purposes and listening to extremely weak signals.

3.2.2 COMM VOLUME CONTROL

The Volume (VOL) control, located on the lower left side of the KX 170B/KX 175B is used to adjust the transceiver audio volume. The KX 170B/KX 175B system power ON/OFF switch is independent of this control, allowing the COMM volume to remain at a desired preset level.

3.2.3 COMM FREQUENCY SELECTOR

The two concentric knobs under the COMM frequency window are used to dial COMM frequencies. The larger knob selects MHz and the smaller knob selects kHz. The transceiver is inoperable in the two unused MHz positions between 118MHz and 135MHz. Clockwise rotation selects higher frequencies. The dial mechanism has no stops, permitting continuous rotation.

3.2.4 NAV OFF-VOICE-IDENT CONTROL

The OFF-VOICE-IDENT control is located directly above the NAV channel selector. Power is supplied to the NAV when this control is either in VOICE or IDENT position. NAV operation is independent of COMM. With the switch on IDENT, the ground station voice and identification tone are coupled to the aircraft speaker and/or headphone circuitry. With the switch on VOICE the identification tone is eliminated, permitting the pilot to monitor the VOR ground station for voice transmissions without receiving the VOR ident tone.

3.2.5 NAV VOLUME CONTROL

The navigation receiver volume (VOL) control, on the right side of the KX 170B/KX 175B is used to control the level of the audio and/or identification tone output from the navigation receiver. This control is also independent of the system power switch allowing the NAV volume to remain at a desired preset level.

3.2.6 NAV FREQUENCY SELECTOR CONTROLS

The two concentric knobs under the NAV frequency window are used to dial NAV frequencies. The larger knob selects MHz and the smaller knob kHz. Clockwise rotation selects higher frequencies. Remote DME, Glideslope, and ILS channeling are also performed by this control.

KING
KX 170B/KX 175B
NAVIGATION RECEIVER/
COMMUNICATIONS TRANSCEIVER

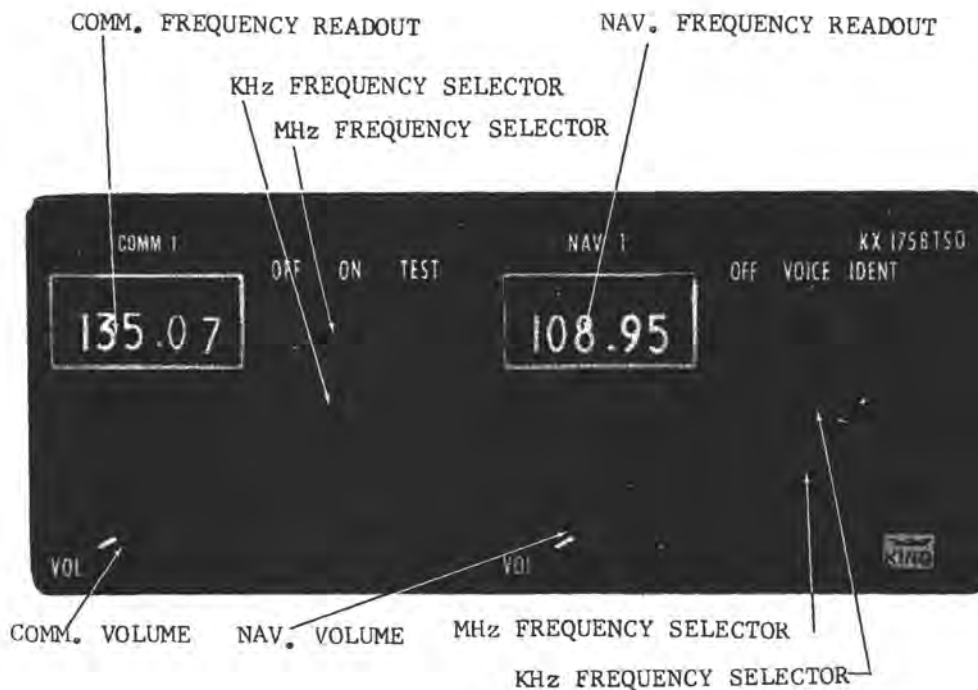


FIGURE 3-1 KX 170B/175B CONTROL FUNCTIONS

3.3 POST-INSTALLATION CHECKOUT

An operational performance flight test is recommended after the installation is completed to insure satisfactory performance of the equipment in its normal environment.

To check the communications transceiver, maintain an appropriate altitude and contact a ground station facility at a range of at least fifty nautical miles. Contact a ground station close in. Place the squelch knob in the test position and listen for any unusual electrical noise which would reduce the COMM receiver sensitivity by increasing the squelch threshold. If possible, verify the communications capability on both the HIGH and LOW ends of the VHF COMM band.

To check the VOR/ILS System select a VOR frequency within a forty nautical mile range. Listen to the VOR audio and insure that no electrical interference such as magneto noise is present. Check the tone identifier filter operation. Fly inbound or outbound on a selected VOR radial and check for proper LEFT-RIGHT and TO-FROM indications. Check the VOR accuracy.

—NOTE—

At low altitudes VOR ground station
scalloping may be present.

Flight test the ILS operation by flying a simulated ILS approach. Check localizer LEFT-RIGHT deflection and, if applicable, glideslope deflection. Check the localizer accuracy in relation to the ILS runway. Check the glideslope accuracy in relation to the published ILS approach altitude.

KING
KA 47
DME CODE CONVERTER

SECTION IV
KA 47

4.1 GENERAL

The purpose of the King KA 47 is to convert the King KN 65 shift code obtained from the King KX 170A/175/KX 170B/KX 175B to the standard ARINC 2 out of 5 DME code used in the King KDM 700A. It is designed to be mounted next to the remote mounted DME equipment, and pin A from J301 should be grounded at the same point as the DME ground. The power requirement is either 13.75VDC or 27.5VDC at 225 ma.

Standard digital troubleshooting techniques may be used in troubleshooting the King KA 47.


KING
 KA 47
 DME CODE CONVERTER

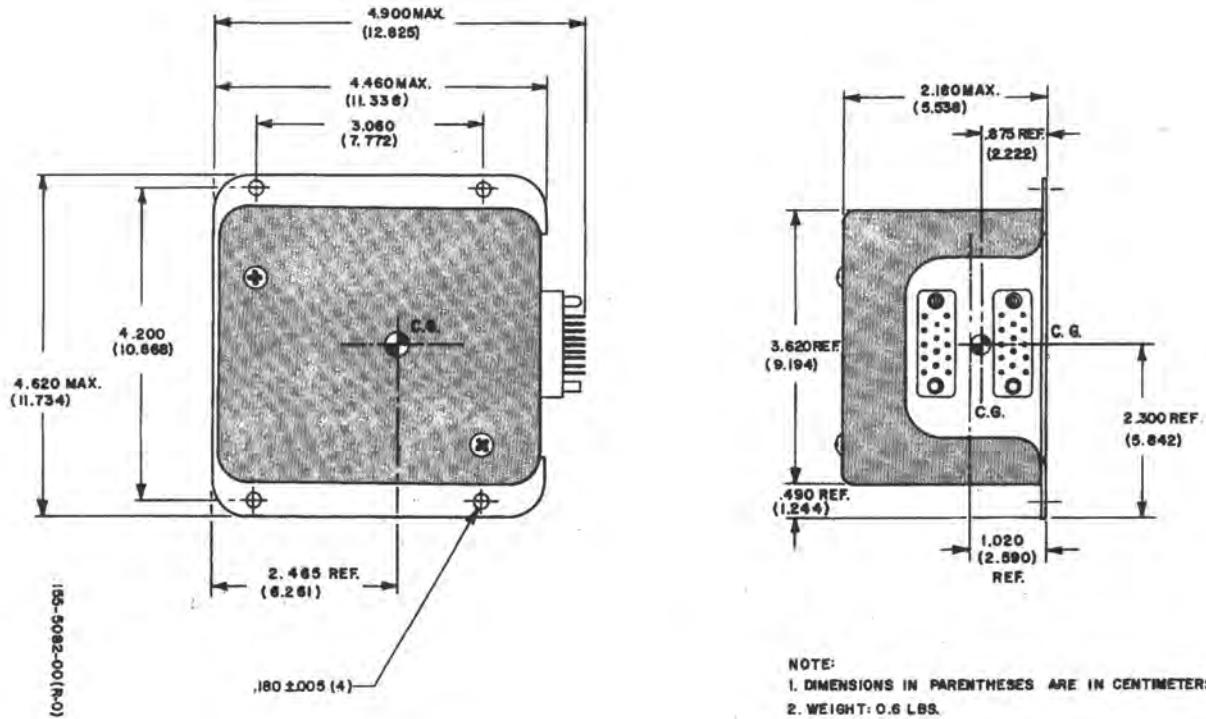


FIGURE 4-1 OUTLINE AND MOUNTING DIAGRAM
 (DWG. NO. 155-5082-00 R-0)


KX 170B/KX 175B
 NAVIGATION RECEIVER /
 COMMUNICATIONS TRANSCEIVER

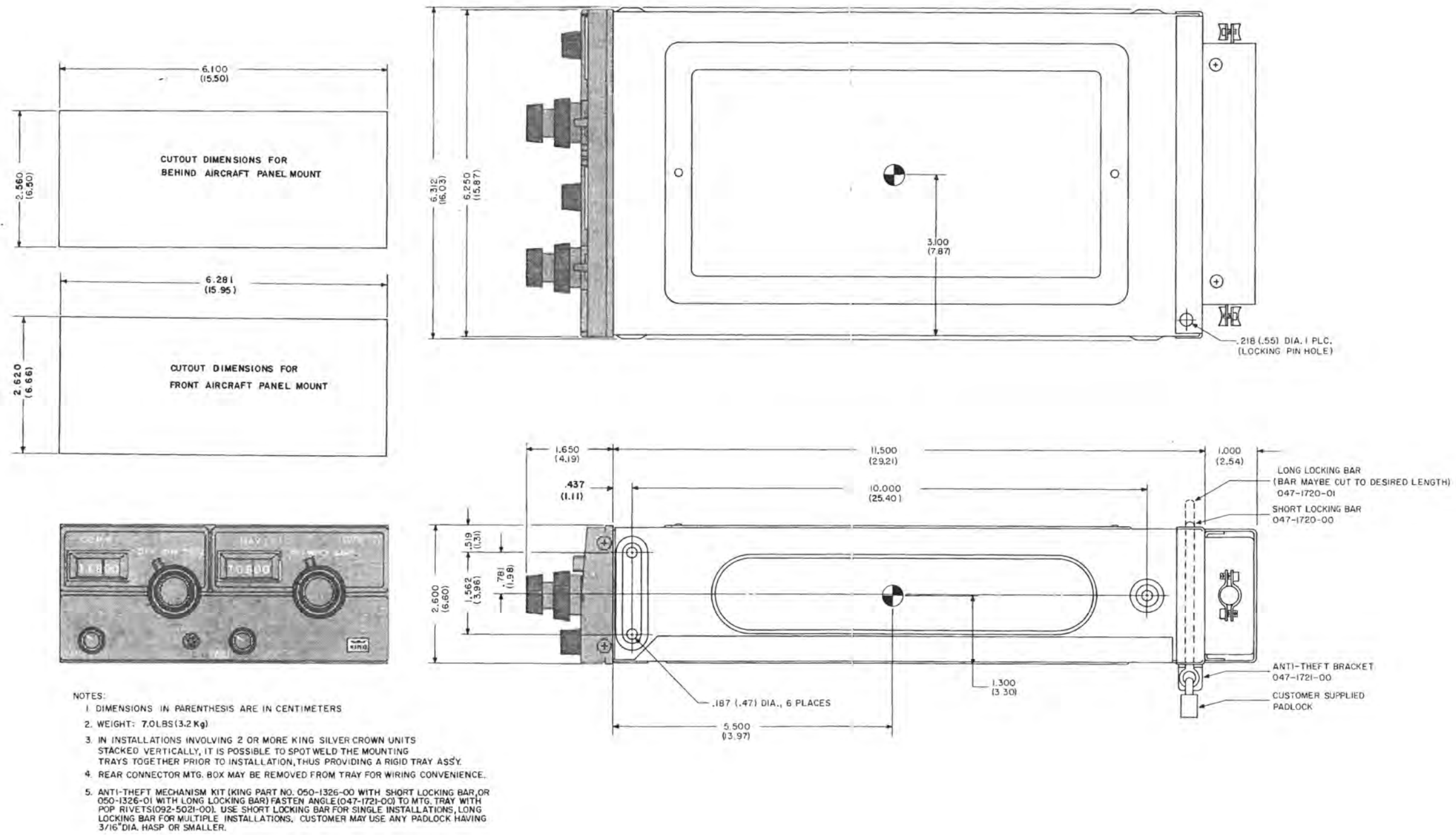


FIGURE 2-5 KX 170 B/175B OUTLINE AND MOUNTING DRAWING
(DWG. NO. 155-5106-00 R-0)

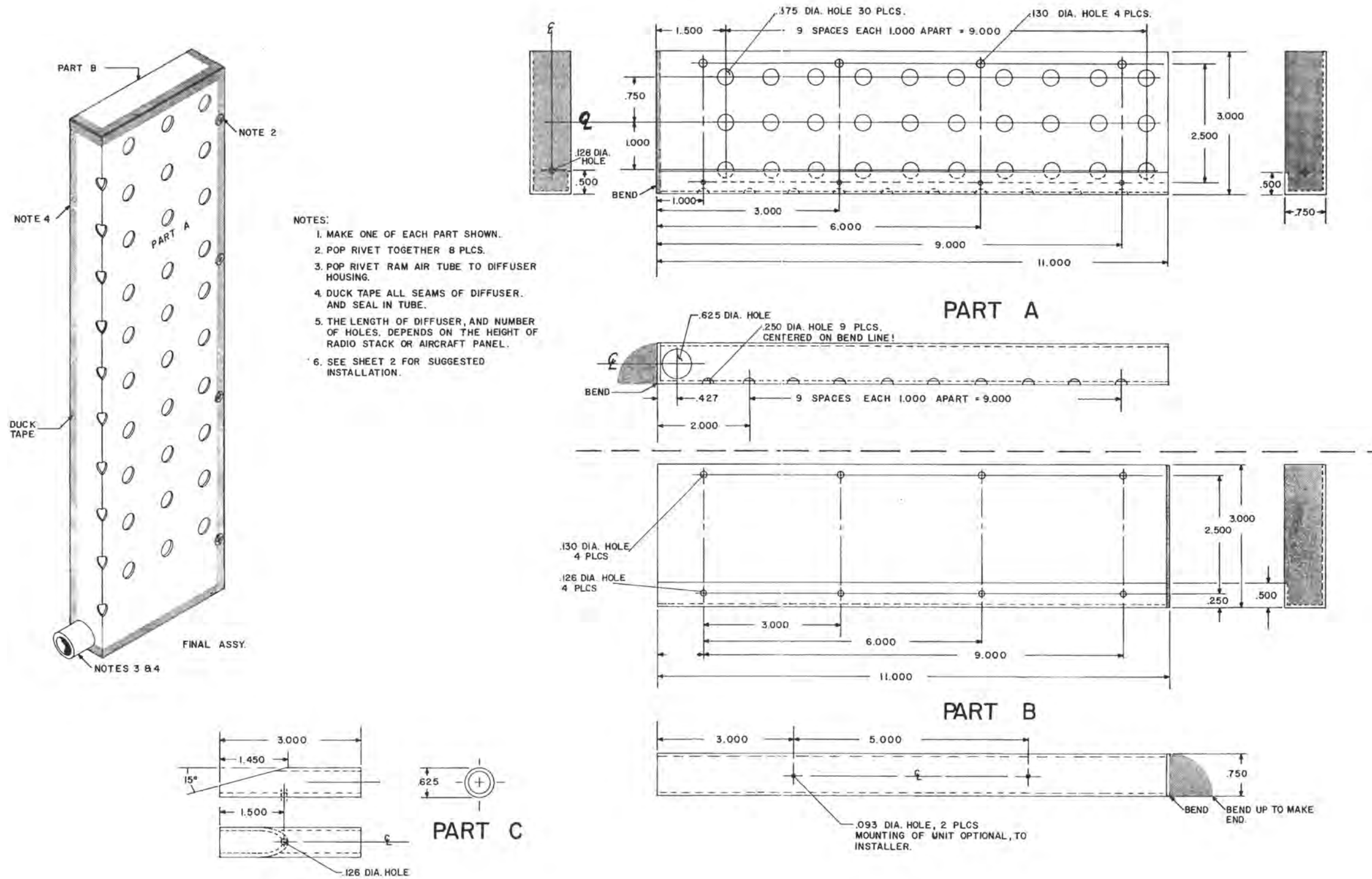
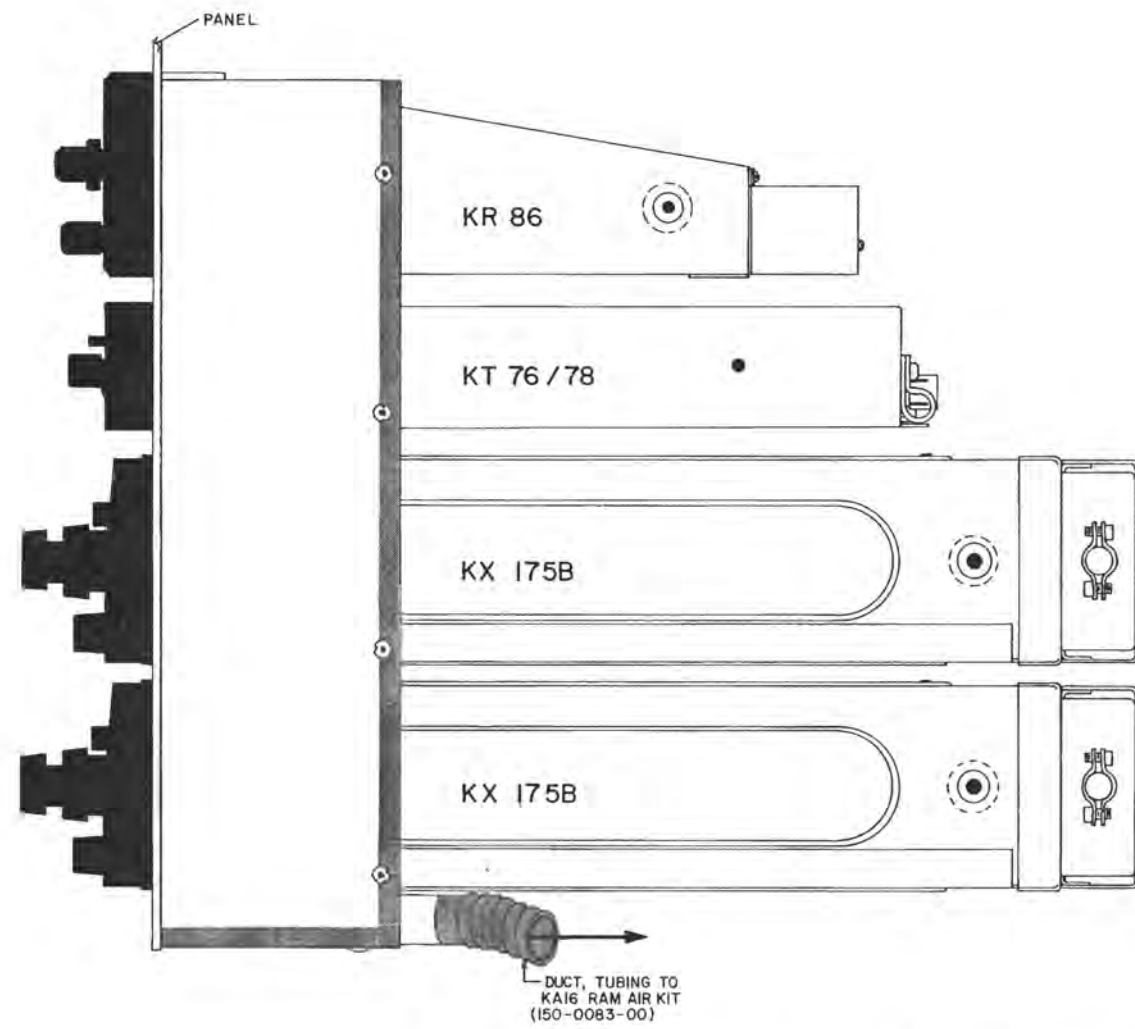


FIGURE 2-5A COOLING DIFFUSER FOR RADIO STACKS



TYPICAL INSTALLATION
KA16-KPN(071-4001-00) AND DIFFUSER STACK

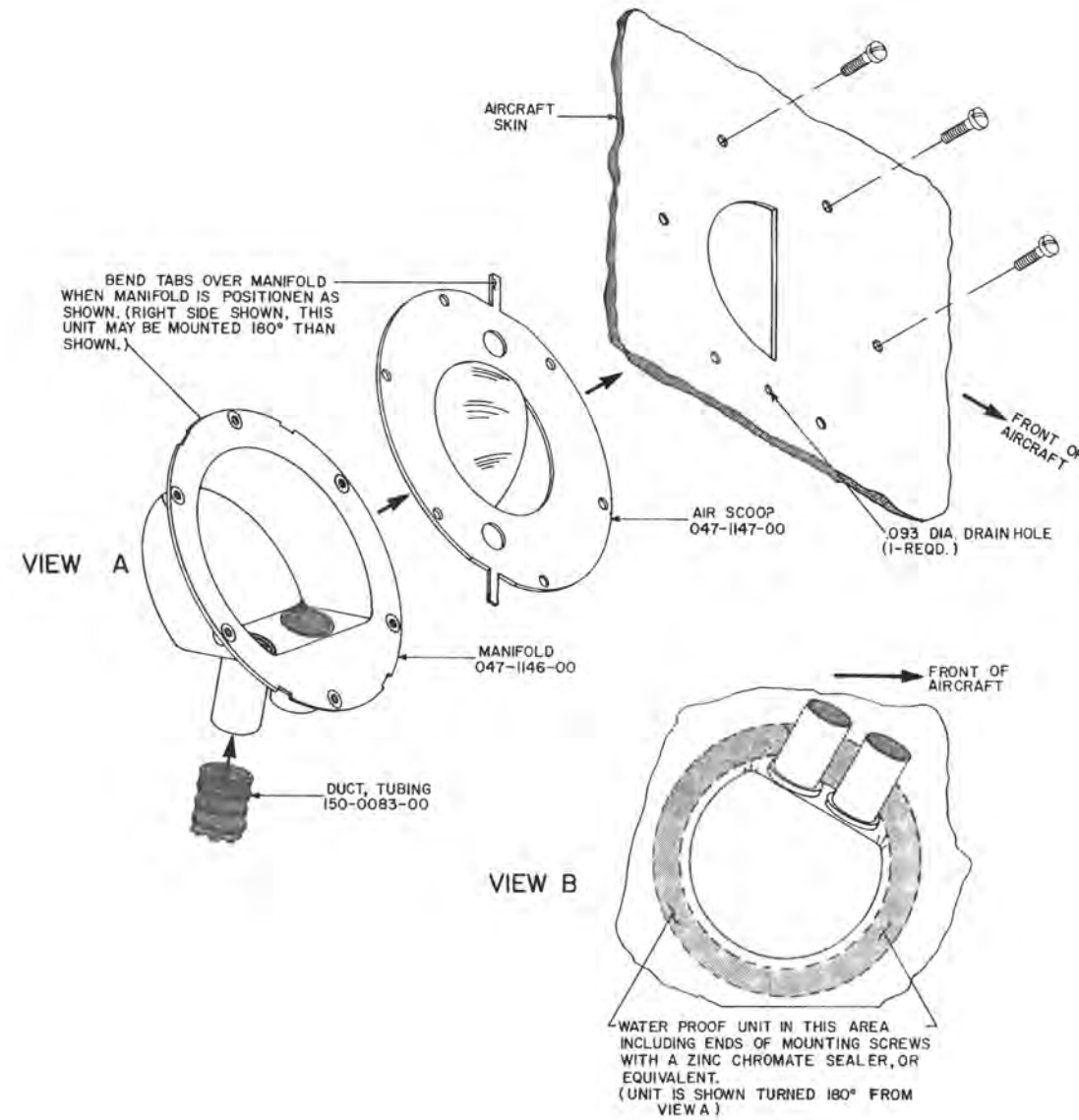
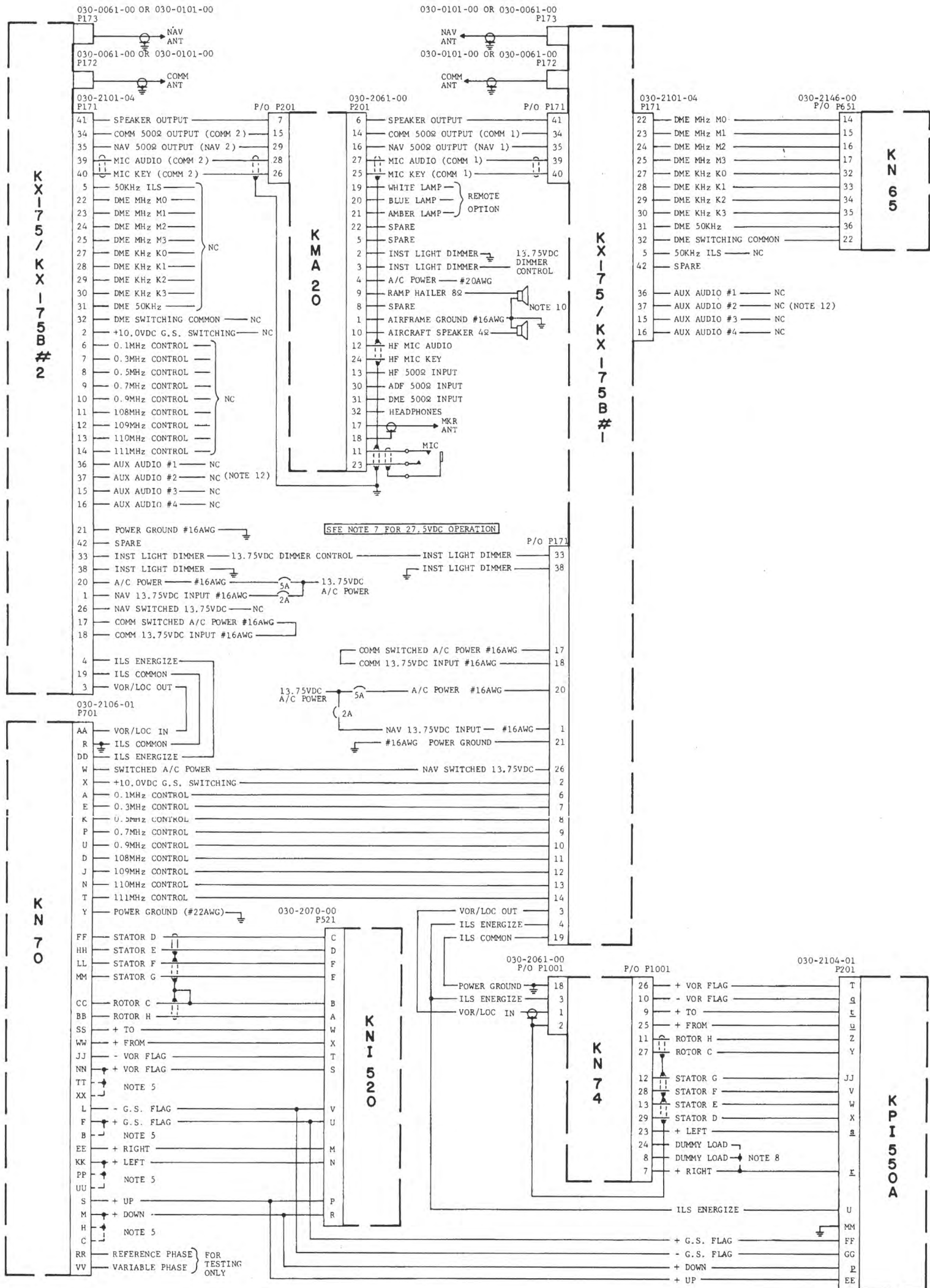


FIGURE 2-5B KR 16 RAM AIR KIT AND DIFFUSER INSTALLATION

FIGURE 2-6 TSO/D SILVER CROWN SYSTEM INTERCONNECT
(DWG. NO. 155-1088-00 R-6)

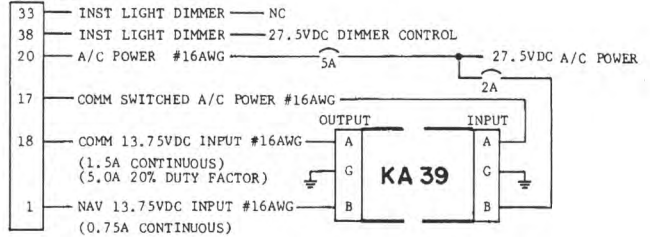


NOTES:

- UNLESS NOTED, ALL WIRES #24AWG MINIMUM.
- ALL ANTENNA COAX IS RG58A/U.
- UNLESS OTHERWISE SPECIFIED, ALL SYSTEM GROUNDS ARE AIRFRAME GROUNDS.
- THE KA47 MAY BE USED TO CONVERT KX175/KX175B DME SWITCHING OUTPUT TO CHANNEL 2 OUT OF 50CODE DME'S.
- KN70 JUMPER PINS AS INDICATED FOR REQUIRED NUMBER OF EXTERNAL LOADS.

EXTERNAL LOADS	GLIDESLOPE		VOR/LOC	
	DEV	FLAG	DEV	FLAG
ONE	M	F	KK	NN
	H	B	PP	TT
	C		UU	XX
TWO	M	NONE	KK	NN
	H		PP	TT
THREE	NONE		NONE	NONE

7. 27.5VDC OPERATION
KX175/KX175B
P/O P171



KING
 KX 170B/KX 175B
 NAVIGATION RECEIVER/
 COMMUNICATIONS TRANSCIEVER

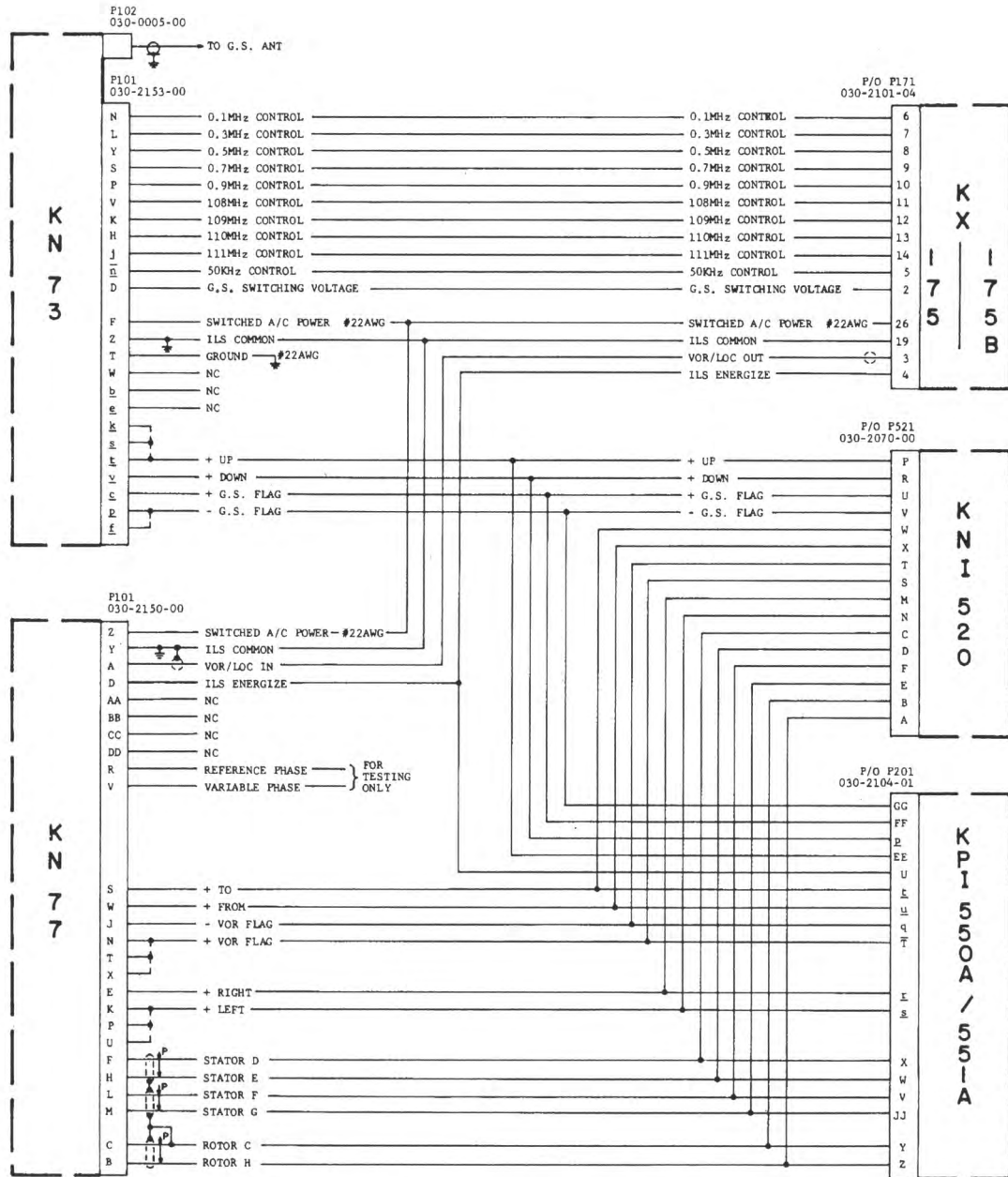


FIGURE 2-7 KN 73/KN 77 INTERCONNECT
 (DWG. NO. 155-1117-00 R-3)

NOTES:

1. UNLESS NOTED, ALL WIRES TO BE #26AWG MINIMUM.
2. UNLESS NOTED, ALL SYSTEM GROUNDS ARE AIRFRAME GROUNDS.
3. JUMPER KN 77 PINS AS INDICATED FOR REQUIRED NUMBER OF EXTERNAL LOADS.

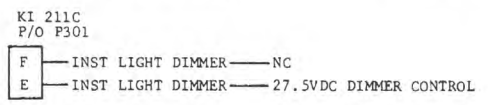
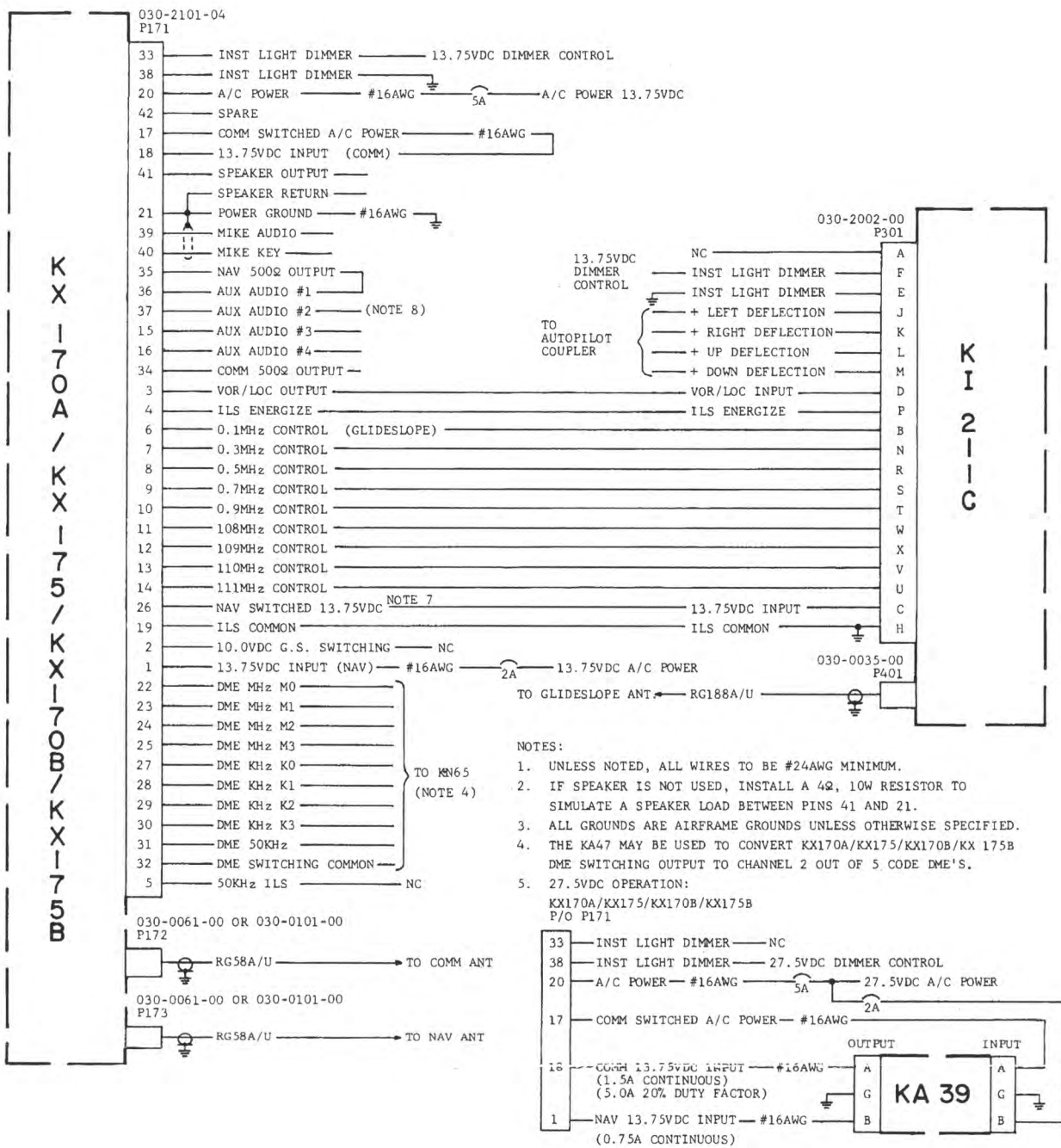
NUMBER OF EXTERNAL LOADS	VOR/LOC	
	DEV	FLAG
1	KPU	NTX
2	KP	NT
3	NONE	NONE

4. JUMPER KN 73 PINS AS INDICATED FOR REQUIRED NUMBER OF EXTERNAL LOADS.

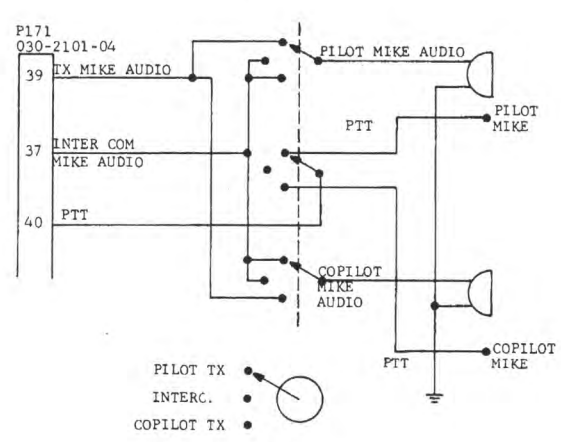
NUMBER OF EXTERNAL LOADS	GLIDESLOPE	
	DEV	FLAG
1	SKS	EP
2	SK	NONE
3	NONE	NONE

5. RESOLVER PINS SHOWN CONNECTED TO BOTH KN1 520 AND KPI 550A ARE FOR REFERENCE ONLY. IN ACTUAL INSTALLATION ONLY ONE RESOLVER WILL BE WIRED TO KN 77.

KING
 KX 170A/KX 175
 NAVIGATION RECEIVER/
 COMMUNICATIONS TRANSCIEVER



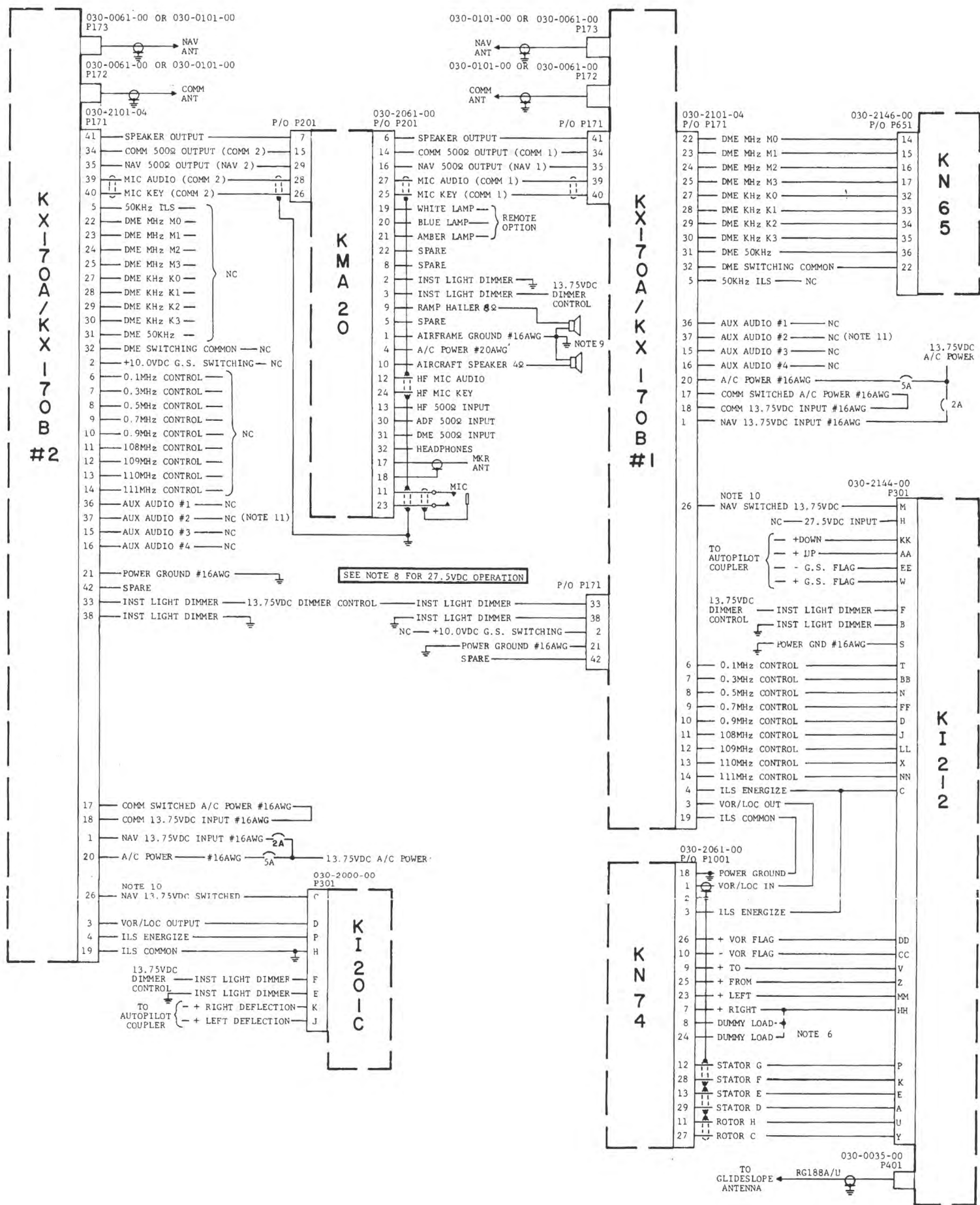
- POWER BUSS CIRCUIT BREAKERS ARE TO BE MOUNTED IN THE AIRCRAFT BREAKER PANEL OR INSTRUMENT PANEL SUCH THAT THEY WILL BE ACCESSIBLE IN FLIGHT AND SAFE FROM PHYSICAL DAMAGE.
- EXTERNAL SWITCHING CAPABILITY:
 COMM PIN 17 NONE
 NAV PIN 26 300ma
- AUX. AUDIO #2 (PIN 37) IS INTERCOM MIC INPUT ON KX170B/KX175B AND KY195B ONLY. ONE POSSIBLE INTERCONNECT IS SHOWN BELOW.



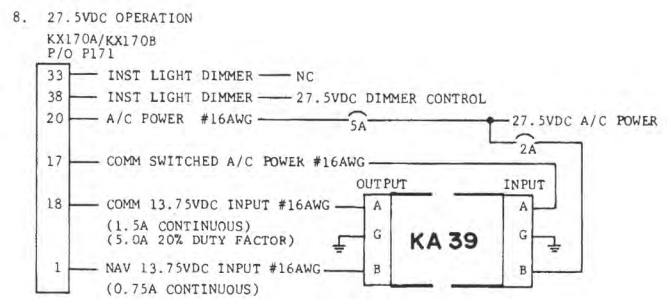
Rev. 1, January, 1976

FIGURE 2-8 KX 170B/175B INTERCONNECT
 (DWG. NO. 155-1089-00 R-5)

FIGURE 2-9 NON-TSO'D SILVER CROWN SYSTEM INTERCONNECT
(DWG. NO. 155-1090-00 R-8)



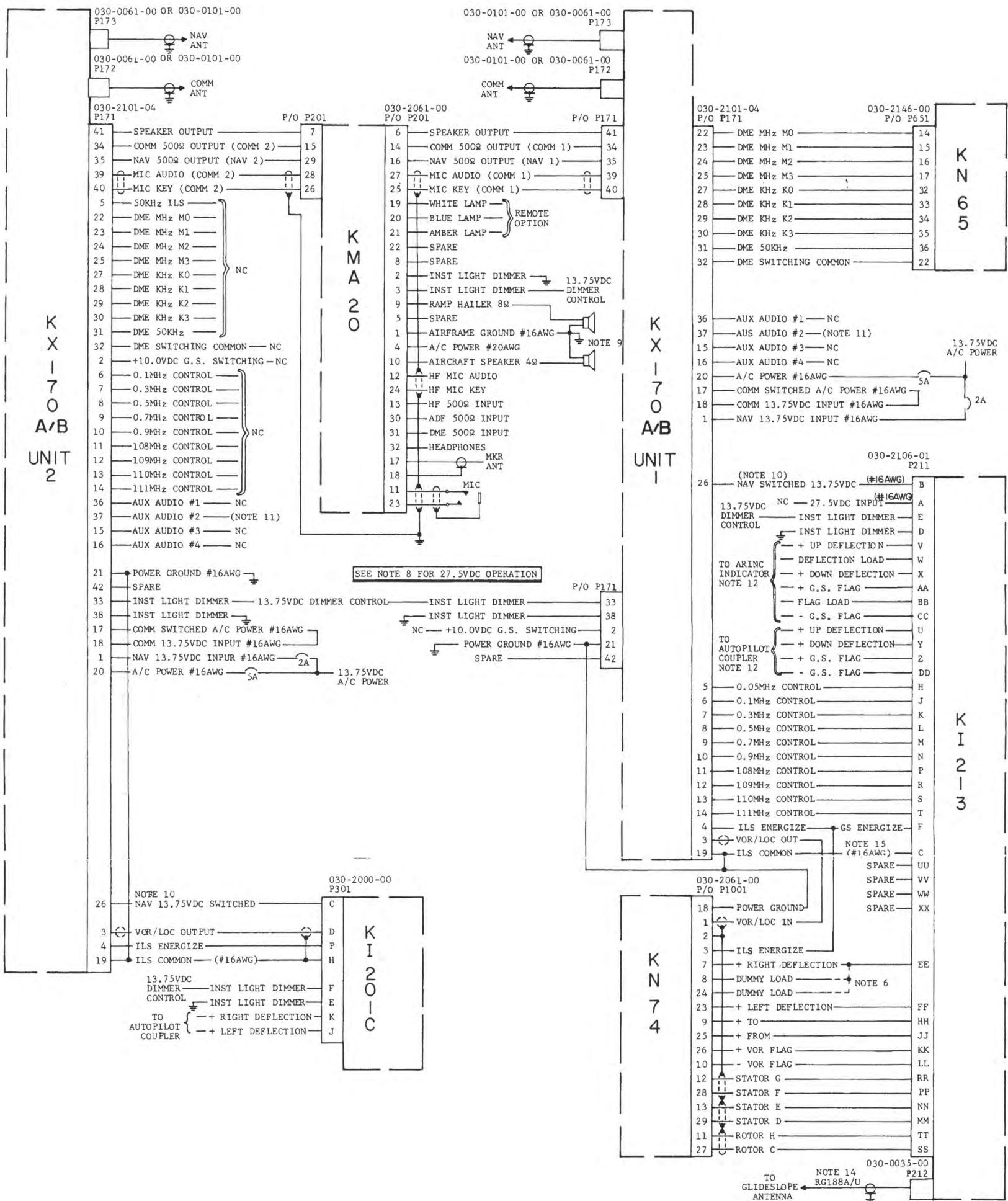
- NOTES:
- UNLESS NOTED, ALL WIRES #24AWG MINIMUM.
 - UNLESS NOTED, ALL ANTENNA COAX IS RG58A/U.
 - UNLESS SPECIFIED, ALL SYSTEM GROUNDS ARE AIRFRAME GROUNDS.
 - THE KA47 MAY BE USED TO CONVERT KX170A/KX170B DME SWITCHING OUTPUT TO CHANNEL 2 OUT OF 5 CODE DME'S.
 - POWER BUSS CIRCUIT BREAKERS ARE TO BE MOUNTED IN THE AIRCRAFT BREAKER PANEL OR INSTRUMENT PANEL SUCH THAT THEY WILL BE ACCESSIBLE IN FLIGHT AND SAFE FROM PHYSICAL DAMAGE.
 - KN74: FOR ONE INDICATOR JUMPER PINS 7, 8, AND 24.
FOR TWO INDICATORS JUMPER PINS 7 AND 8.
FOR THREE INDICATORS NO JUMPER REQUIRED.
 - KN65 DME INDICATOR (KI265) NOT SHOWN.
 - RAMP HAILER AND AIRCRAFT SPEAKER RETURN LEADS SHOULD BE CONNECTED TO PIN 1 AT KMA20.
 - EXTERNAL SWITCHING CAPABILITY: COMM - PIN 17 - NONE
NAV - PIN 26 - 300MA
 - AUXILIARY AUDIO #2 IS INTERCOM MIC INPUT ON KX170B.



- KMA20
P/O P201
- 2 — INST LIGHT DIMMER — 27.5VDC DIMMER CONTROL
 - 3 — INST LIGHT DIMMER — NC
- KI212
P/O P301
- B — INST LIGHT DIMMER — 27.5VDC DIMMER CONTROL
 - F — INST LIGHT DIMMER — NC
- KI21C
P/O P301
- F — INST LIGHT DIMMER — NC
 - E — INST LIGHT DIMMER — 27.5VDC DIMMER CONTROL



FIGURE 2-10 NOT TSO'S DUAL SILVER CROWN SYSTEM INTERCONNECT DIAGRAM
(DWG. NO. 155-1128-00 R-5)

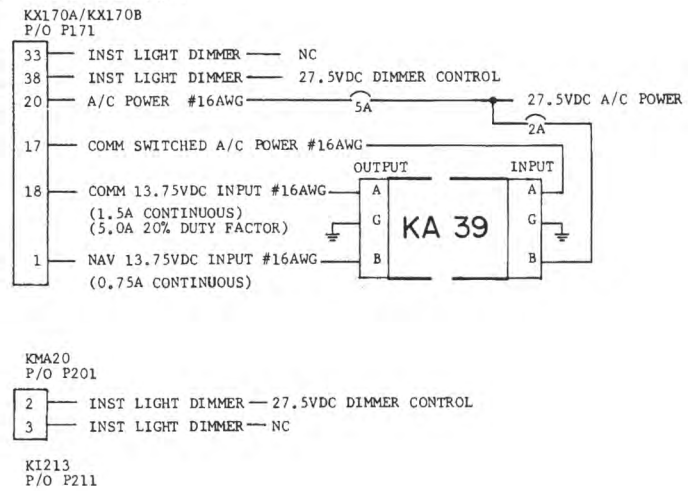


NOTES:

1. UNLESS NOTED; ALL WIRES #24AWG MINIMUM.
2. UNLESS NOTED; ALL ANTENNA COAX IS RG58A/U.
3. UNLESS SPECIFIED; ALL SYSTEM GROUNDS ARE AIRFRAME GROUNDS.
4. THE KA47 MAY BE USED TO CONVERT KX170A/KX170B DME SWITCHING OUTPUTS TO CHANNEL THE KDM.700/A/705 DME'S.
5. POWER BUSS CIRCUIT BREAKERS ARE TO BE MOUNTED IN THE AIRCRAFT BREAKER PANEL OR INSTRUMENT PANEL SUCH THAT THEY WILL BE ACCESSIBLE IN FLIGHT AND SAFE FROM PHYSICAL DAMAGE.
6. KN74: FOR ONE INDICATOR JUMPER PINS 7, 8, AND 24.
FOR TWO INDICATORS JUMPER PINS 7 AND 8.
FOR THREE INDICATORS NO JUMPERS ARE REQUIRED.
7. KN65 DME INDICATOR (KI265) NOT SHOWN.
9. RAMP HAILER AND AIRCRAFT SPEAKER RETURN LEADS SHOULD BE CONNECTED TO PIN 1 AT KMA20.
10. EXTERNAL SWITCHING CAPABILITY: COMM - PIN 17 - NONE
NAV - PIN 26 - 300ma
11. AUX AUDIO #2 IS INTERCOM MIC INPUT ON KX170B.
12. THE KI213 HAS THE FOLLOWING EXTERNAL INDICATOR DRIVING CAPABILITY;

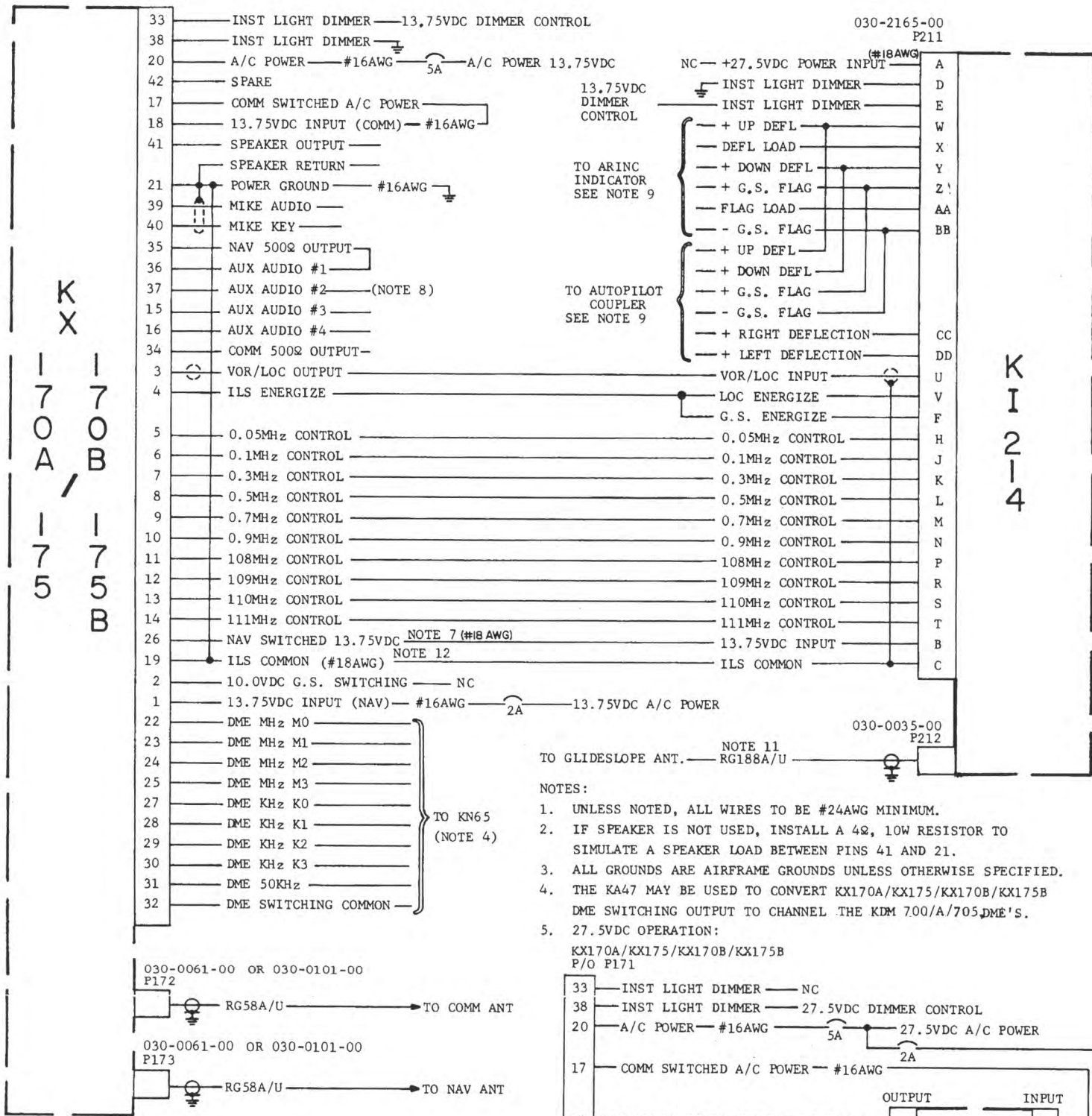
INDICATORS	VOR		GLIDESLOPE	
	FLAG	DEFLECTION	FLAG	DEFLECTION
ARINC	NONF	NONE	ONE	ONE

8. 27.5VDC OPERATION:



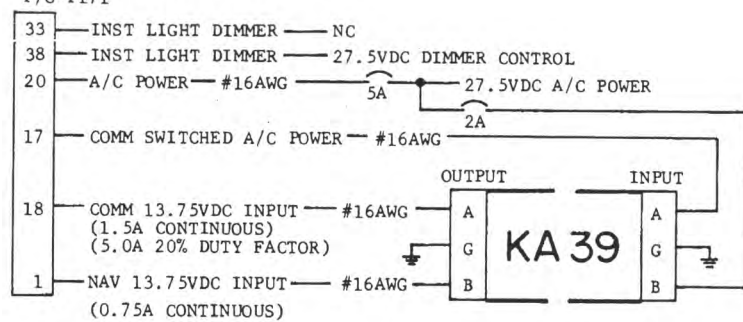
030-2101-04
P171

030-2165-00
P211

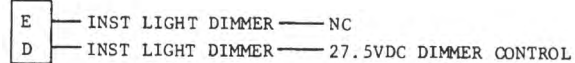


NOTES:

1. UNLESS NOTED, ALL WIRES TO BE #24AWG MINIMUM.
2. IF SPEAKER IS NOT USED, INSTALL A 4Ω, 10W RESISTOR TO SIMULATE A SPEAKER LOAD BETWEEN PINS 41 AND 21.
3. ALL GROUNDS ARE AIRFRAME GROUNDS UNLESS OTHERWISE SPECIFIED.
4. THE KA47 MAY BE USED TO CONVERT KX170A/KX175/KX170B/KX175B DME SWITCHING OUTPUT TO CHANNEL THE KDM 700/A/705 DME'S.
5. 27.5VDC OPERATION:
KX170A/KX175/KX170B/KX175B
P/O P171



KI214
P/O P211



6. POWER BUSS CIRCUIT BREAKERS ARE TO BE MOUNTED IN THE AIRCRAFT BREAKER PANEL OR INSTRUMENT PANEL SUCH THAT THEY WILL BE ACCESSIBLE IN FLIGHT AND SAFE FROM PHYSICAL DAMAGE.
7. EXTERNAL SWITCHING CAPABILITY:
COMM PIN 17 NONE
NAV PIN 26 300ma
8. AUX AUDIO #2 IS INTERCOM MIC INPUT ON KX170B AND KX175B.
9. THE KI214 HAS THE FOLLOWING EXTERNAL INDICATOR DRIVING CAPABILITY:

INDICATORS	VOR		GLIDESLOPE	
	FLAG	DEFLECTION	FLAG	DEFLECTION
ARINC	NONE	NONE	ONE JUMPER PINS Z & AA IF NOT USED	ONE JUMPER PINS W & X IF NOT USED
AUTOPILOT (HI Z)	NONE	ONE	ONE	ONE

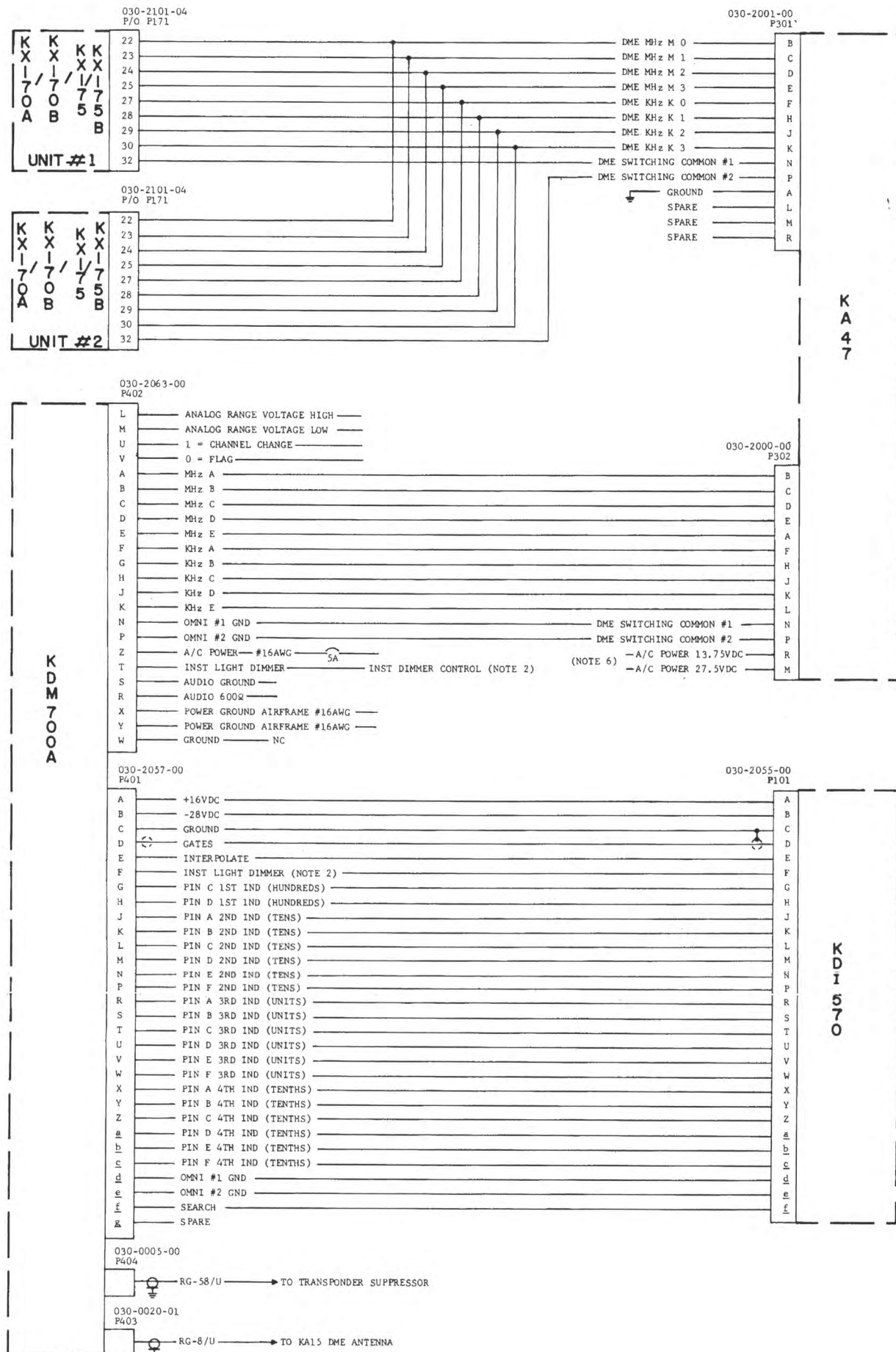
10. KI214 GLIDESLOPE AND LOCALIZER CAN BE ENERGIZED SIMULTANEOUSLY AS SHOWN OR ENERGIZED INDEPENDENTLY.
11. GLIDESLOPE ANTENNA (KA 22 OR EQUIVALENT) MUST HAVE AIRFRAME GROUND.
12. ROUTE ILS COMMON AND POWER GROUND AWAY FROM COMM TRANSMITTER COAXIAL CABLES AND MAKE AIRFRAME GROUND NEAREST KX 170A/175/170B/175B. IF KA 39 IS USED, ROUTE OUTPUT PIN G WITH ILS COMMON AND POWER GROUND.

FIGURE 2-11 KX 170A/175/170B/175B/KI 214 INTERCONNECT DIAGRAM

(DWG. NO. 155-1129-00 R-4)

Rev. 1, January, 1976





- NOTES:
- UNLESS NOTED, ALL WIRES TO BE #24AWG MINIMUM.
 - INST LIGHT DIMMER CONTROL CAN RUN FROM PIN F OF KDI570 TO AIRCRAFT LIGHT DIMMER CONTROL.
 - PARTIAL INTERCONNECT OF KX170A/KX175/KX170B/KX175B SHOWN. REFER TO KX170A/KX175B INSTALLATION MANUAL (006-0057-XX), OR KX170B/KX175B INSTALLATION MANUAL (006-0085-XX) FOR COMPLETE INTERCONNECT INFORMATION.
 - IF CABLING BETWEEN KDM700A AND KDI570 IS TO BE LONGER THAN 5 FEET, AND IS IN CLOSE PROXIMITY TO OTHER EQUIPMENT OR CABLES, IT IS RECOMMENDED THAT IT BE LACED OR SLEEVED SEPARATELY AND NOT INTERWOVEN WITH OTHER WIRING.
 - KA47 SHOULD BE MOUNTED ADJACENT TO THE DME AND THE GROUND WIRE OF THE KA47 SHOULD BE GROUNDED AT THE SAME POINT AS THE DME GROUND.
 - FOR 27.5VDC INSTALLATION, CONNECT PIN Z OF P402 (KDM700A) TO PIN M OF P302 (KA47). FOR 13.75VDC INSTALLATION, CONNECT PIN Z TO PIN R OF P302.
 - UNLESS NOTED, ALL SYSTEM GROUNDS ARE AIRFRAME GROUNDS.
 - POWER BUSS CIRCUIT BREAKERS ARE TO BE MOUNTED IN THE AIRCRAFT BREAKER PANEL OR INSTRUMENT PANEL SUCH THAT THEY WILL BE ACCESSIBLE IN FLIGHT AND SAFE FROM PHYSICAL DAMAGE.

FIGURE 4-2 KA 47 INTERCONNECT DIAGRAM
 (DWG. NO. 155-1102-00 R-2)