KING®

KX 145/KI 205
NAVIGATION RECEIVER/ COMMUNICATIONS TRANSCEIVER

INSTALLATION MANUAL
006-0110-02

REV. 2, JULY, 1977

TABLE OF CONTENTS

SECTION I
GENERAL INFORMATION

SECTION II
INSTALLATION

SECTION III
OPERATION

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 145/KI 205, and interconnect information for various NAV/COMM system options.

1.2 DESCRIPTION OF EQUIPMENT

The King KX 145 NAV/COMM Transceiver combines in a single panel mounted unit,a 720 channel crystal controlled communications transceiver with dual independent frequency selectors and a shared 200 channel crystal controlled navigation receiver with associated VOR/LOC converter circuitry.

The COMM frequency selector covers the band from 118.000 to 135.975MHz in 25KHz steps and the NAV/COMM frequency selector covers the band from 108.000 to 127.950MHz in 50KHz steps.

The King KI 205 VOR/LOC Indicator is designed to operate with the KX 145 to provide OMNI (VOR) or Localizer (LOC) visual information. The KX 145 VHF Navigational Receiver receives and converts the OMNI or Localizer information to DC signals which drive the Left-Right needle and the To-From Flag indicator of the KI 205.

1.3 TECHNICAL CHARACTERISTICS

SPECIFICATION	CHARACTERISTIC
APPLICABLE DOCUMENT:	Minimum Operational Characteristics (MOC) RTCA Documents DO-139 and DO-149
SIZE:	
KX 145 (including mounting rack)	
Length:	11.3 inches (28.7 cm)
Width:	6.31 inches (16.0 cm)
Height:	2.66 inches (6.75 cm)
KI 205	
Length:	5.1 inches (12.95 cm)
Width:	3.25 inches (8.28 cm)
Height:	3.25 inches (8.28 cm)
WEIGHT:	
KX 145 (including mounting rack)	3.1 lbs (1.41 kg)
KI 205	0.7 lbs (.32 kg)
MOUNTING:	Panel
POWER REQUIREMENTS:	13.75VDC (27.5VDC with KA 39)
NAV/COMM Receive	1.20AMP
Transmit (Tone)	1.70AMP
Lamps	.44AMP
COMM TRANSCEIVER	
CRYSTAL CONTROLLED:	720 channels
FREQUENCY RANGE:	
COMM Head	118.000 to 135.975MHz with 25KHz spacing
NAV/COMM Head	118.000 to 127.950MHz with 50KHz spacing
FREQUENCY STABILITY:	±0.003%

SPECIFICATION	CHARACTERISTIC	
KA 39 VOLTAGE CONVERTER		
SIZE:	3.500 x 2.000 x 5.500 inches (8.889 x 5.18 x 13.87 centimeters)	
WEIGHT:	1.1 lbs excluding harness (.5 kg)	
POWER:	A	B
Input Voltage	27.5VDC	27.5VDC
Output Voltage	13.75VDC (nominal)	13.75VDC (nominal)
Output Current (continuous)	1.5AMP	0.75AMP
Output Current (40% duty)	5.0AMP	----

1.4 UNITS AND ACCESSORIES SUPPLIED

1.4.1 GENERAL

A. King KX 145 NAV/COMM Transceiver with Mounting Rack

B. King KI 205 VOR/LOC Indicator

C. King KX 145/KI 205 Installation Kit (KPN 050-1403-00) includes:

PART NUMBER	DESCRIPTION		QUANTITY
008-0001-01	Lug, Ground		5
030-1045-15	Connector, 15 Pin	Molex 09-01-2151	1
030-1045-22	Connector, 22 Pin	Molex 09-01-2221	1
030-1046-37	Connector, Contact	Molex 1917-G	1
030-2227-05	Connector, 12 Pin	Burndy SMS12P-1	1
030-2227-09	Hood, Connector	Burndy SMS12N-1	1
030-2227-17	Pin, Male	Burndy SM20M-6TK6	12
035-1013-02	Shipping Bag, Plastic		1
089-2076-30	Nut, 4-40		6
089-5115-12	Scr, FHP 6-32 x 3/4		3
089-5903-05	Scr, 4-40 PHP x 5/16		3
089-5903-08	Scr, 4-40 PHP x 1/2		3
089-8003-34	Washer, Split Lock #4		4
089-8025-30	Washer, Flat #4		5
091-0031-01	Clamp, Nylon Cable		1
091-0072-02	Clamp, Nylon Cable		2

SECTION II
INSTALLATION

2.1 GENERAL

This section contains suggestions and factors to consider before installing the KX 145/KI 205 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. The claim should be promptly filed with the transportation company. When all equipment is removed, place in the shipping container all packing materials and save for use in storage or reshipment.

2.3 KX 145/KI 205 INSTALLATION

The KX 145/KI 205 installation will conform to standards designated by the customer, installing agency, and existing conditions as to the unit location and type of installaiton. However, the following suggestions should be considered before installing your KX 145/KI 205. Close adherence to these suggestions will assure a more satisfactory performance from the equipment. The installing agency will supply and fabricate all external cables. The connectors required are supplied by King Radio.

NOTE

Use good quality stranded wire with at least 600 volt insulation that will not support a flame.

2.3.1 KX 145 INSTALLATION

A. The KX 145 is mounted rigidly in the aircraft panel.

NOTE

Allow adequate space for installation of cables and connectors. Avoid sharp bends and placing the cables too near the aircraft control cables.

B. Refer to Figure 2-7 for the KX 145 mounting dimensions.

C. Avoid mounting close to any high external heat source.

D. The mounting rack must be mounted behind the aircraft's instrument panel in such a way that it is flush with the back side of the panel and that the lip on the bottom of the rack extends through the panel cutout. The rear mounting bosses should be attached to the airframe by means of support brackets. See Figure 2-7.

E. Slide the KX 145 straight back into its rack in such a way that the bottom lip of the mounting rack fits into the front panel of the unit and the front panel fits flush against the instrument panel. This will ensure a positive connection between connector J501 on the Receiver/Transmitter Board and P501, Transmitter Coax Assembly, mounted on the rear of the rack.

Caution should be taken to see that the pin on the rack mounted J501 does line up with the opening in the J501 connector as J501 can be bent backwards. This will cause the connector to ground the RF output and open Q507. While the KX 145 should be slid smoothly and firmly into its rack, if any great amount of resistance is felt, it should be removed and the J501 connector inspected. Secure the KX 145 in its rack by turning the locking screw (3-32" Hex) on the front panel.

Antenna isolation between antennae mounted in opposite geometric planes is dependent on the amount of vertical component from the horizontal navigation antenna and the amount of horizontal component from the vertical communication antenna. Practical values are from 10dB to 30dB.

The only practical method of checking isolation is by radiating a signal from one antenna and receiving the signal on a second antenna. For example, a KX 170 with 5 watts of output power is at +37dBm. A received signal of +7dBm or less measured on the second antenna would be satisfactory. As a matter of information, 7 watts of output power is at +38.5dBm and 10 watts if +40dBm.

Conventional 50 ohm horizontally polarized NAV and vertically polarized COMM antennas are required with the KX 145/KI 205. Vertical bent whip antennas may be used, but degradation of range may be experienced at the higher frequencies. Wideband COMM antennas provide efficient operation over the COMM band. Antennas should be installed per manufacturer's recommendations. Additional recommendations are as follows:

A. COMM (Transmit) Antenna

1. Mount antenna on flat metal surface or install a ground plane at least 18 inches square. Mounting surface must be free of paint and oil to provide a good bonding surface.

2. The antenna should be well removed from any projections and the engine(s) and propeller(s).

3. NAV and COMM antennas must be well separated. (Minimum recommended separation is 30dB).

4. Route the COMM antenna coax cable away from the KI 205 SIN/COS potentiometer shielded cables.

5. A check of antenna VSWR should be made to insure it is less than 3.0 to 1.

NOTE

The COMM antenna is used for transmitter operation only. The NAV antenna is used for both NAV and COMM receiver operation.

B. NAV (Receive) Antenna

1. The location should be well removed from other antennas, 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.

4. Remove paint or oil from the antenna mounting surface.

CAUTION

PERFORM A VSWR CHECK ON THE COMPLETED INSTALLATION. THE VSWR MUST NOT EXCEED 3.0 : 1 MAXIMUM AT EITHER END OF THE COMMUNICATION FREQUENCY RANGE.

2.3.5 CABLE HARNESS AND CONNECTOR ASSEMBLY

2.3.5.1 KX 145 Connectors

The KX 145 uses a special connector that mates directly with the printed circuit boards inside the unit. Assembly of the connector is as follows:

a. Contact Terminal Assembly using Molex Crimper (Figure 2-1)

(1) Strip each wire 5/32" for contact terminal KPN 030-1046-XX. (The last two digits of the contact terminal part number indicate the number of terminals required).

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 off 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 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

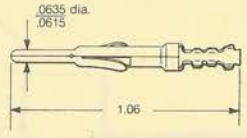
At low altitudes VOR ground station scalloping may be present.

Flight test the LOC operation by flying a simulated LOC approach. Check localizer LEFT-RIGHT deflection. Check the localizer accuracy in relation to the ILS runway.

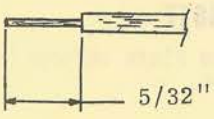
BURNDY HYTOOL M8ND
(ratchet controlled)

RX 20-25 Extraction Tool

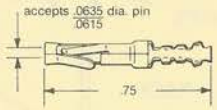
Fixed outer sleeve depresses contact locking spring. With tool still in contact hole, use hand to pull out contact.



Burndy Pin SM20M-6TK6

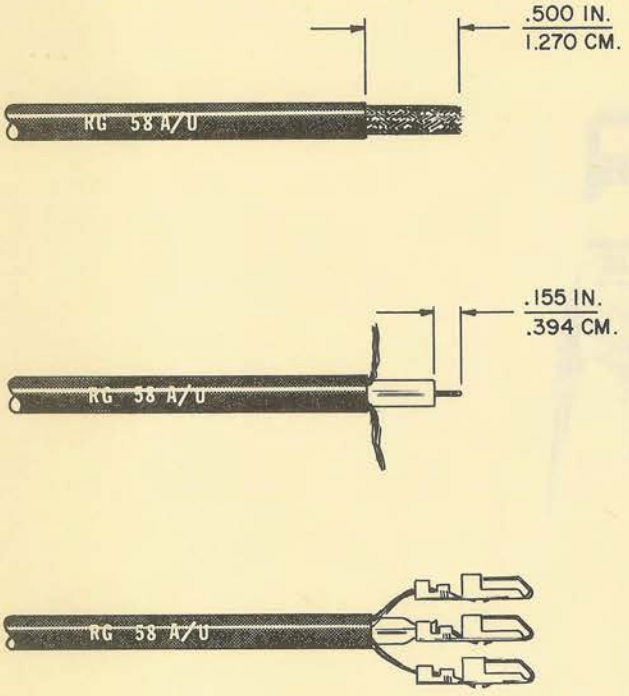


Suggested Wire Strip Length



Burndy Socket SC20M-6TK6

FIGURE 2-2 CRIMPING TOOL

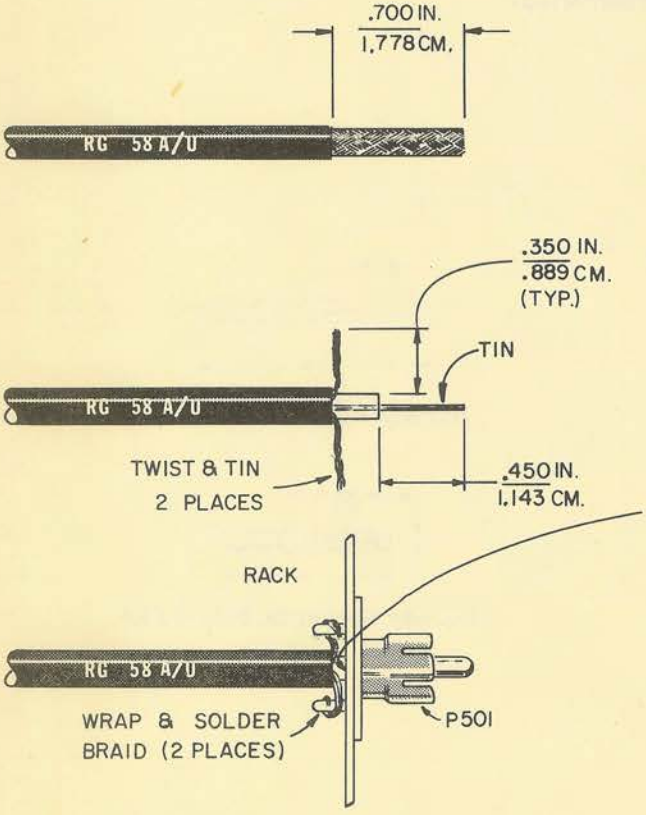


Trim coax cable outer insulation as shown.

Separate braid into two equal parts and fold out to sides of coax. Shorten center conductor .100 inch and strip as shown.

Install Molex contact terminals 1917-G as shown.

FIGURE 2-3 RECEIVER COAX ASSEMBLY



Trim coax cable outer insulation as shown.

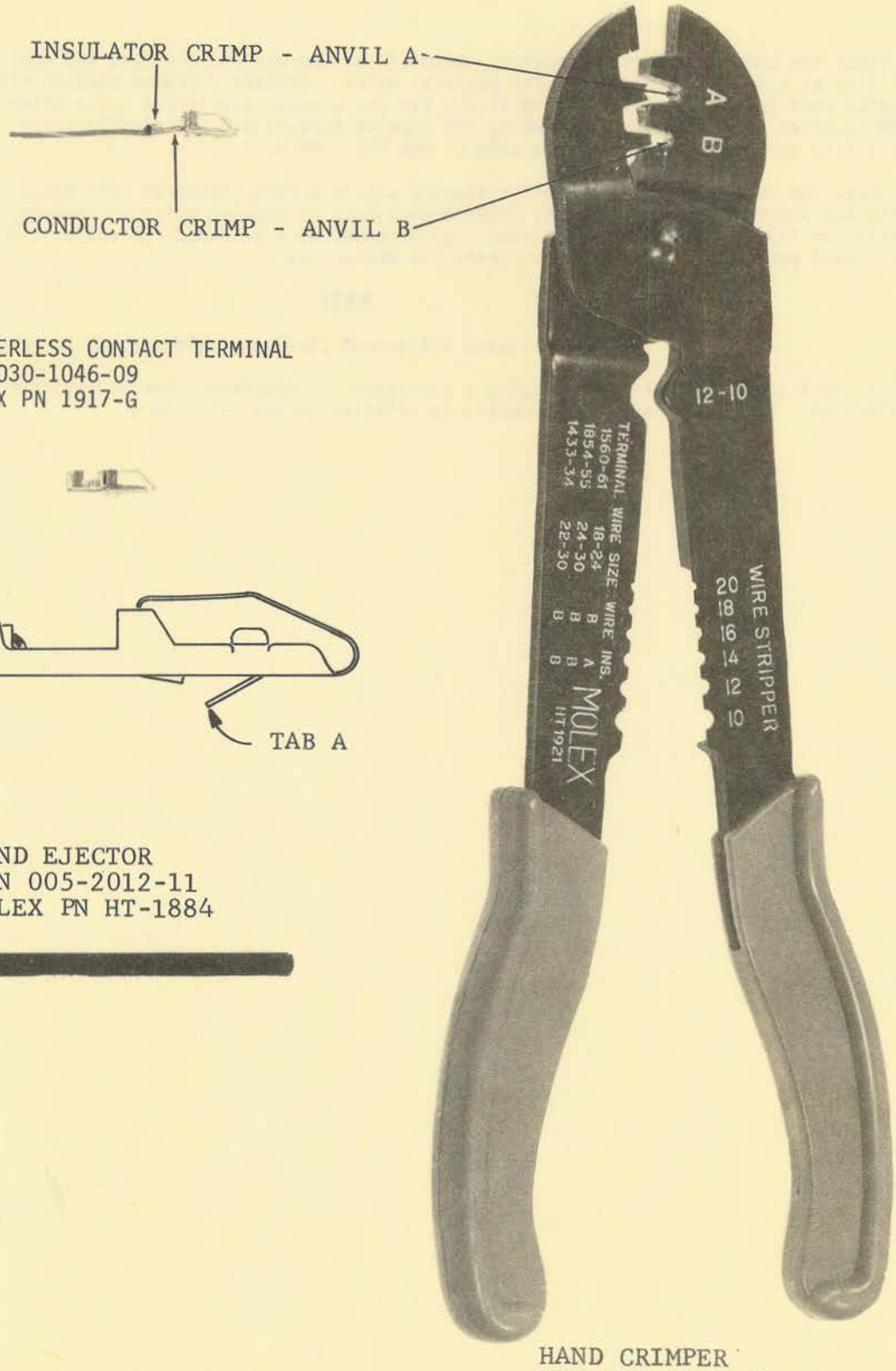
Separate braid into two equal parts and fold out to sides of coax. Strip center conductor and trim braid as shown.

NOTE

Solder connector to plate before inserting coax into connector.

Solder center conductor. Do not get solder on outside of center pin.

FIGURE 2-4 TRANSMITTER COAX ASSEMBLY



SOLDERLESS CONTACT TERMINAL
KPN 030-1046-09
MOLEX PN 1917-G

TAB A

HAND EJECTOR
KPN 005-2012-11
MOLEX PN HT-1884

HAND CRIMPER
KPN 005-2012-10
MOLEX PN HT-1921

FIGURE 2-1 CRIMPING TOOL
(Dwg. No. 696-2151-00, R-0)

(2) Open the Molex Hand Crimper HT 1921 with the engraved side toward the operator. Place the conductor tab section of a contact terminal on Anvil B with the contact portion facing away from the operator. Close the crimper slightly until the contact tabs touch the female jaw.

(3) Insert the stripped conductor until the insulation is even with the side of the crimper facing the operator. Crimp the conductor tabs by squeezing the handles together until the jaws are fully closed or a sufficient crimp is obtained.

(4) Move the lead to Anvil A. Place the insulating tab section on Anvil A. Crimp again until the jaws are fully closed or a sufficient crimp is obtained.

b. Contact Terminal Assembly using Pliers

(1) Strip each wire 5/31" for contact terminal KPN 030-1046-XX (the last two digits of the contact terminal part number indicate the number of terminals required).

(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 the insulator tabs.

(5) Apply a drop 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 desired location in the connector housing. The terminal cannot be inserted upside down. Be sure to push the terminal all the way in, until a click can be felt, heard, or seen (by turning the translucent housing over).

(2) The self locking feature can be tested by moderately 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, 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 or 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.

2.3.5.2 KI 205 Connector

The KI 205 connector assembly and disassembly is similar to the KX 145 connector (Paragraph 2.3.5.1) except a Burndy crimping tool and extraction tool (Figure 2-2) is used. Refer to Figure 2-6 for cable termination and precautionary note.

2.4 POST INSTALLATION CHECK

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

2.3.1.1 Dual COMM Radio Installations

There are several system installation options available for dual communication systems without the use of isolation amplifiers. These can be made at little additional cost and without degrading either the system's reliability or audio quality. However, under no circumstances is the paralleling of audio amplifiers to a common speaker an acceptable installation option. This would only shorten the life of the audio amplifier, cause distortion in the audio and possible transmitter modulation problems.

One solution for this problem is the addition of several toggle switches which will make use of the transceiver's speaker amplifier. Figure 2-13 illustrates this configuration. Switches S1 through S5 allow for the selection of either the headphones or the speaker for individual audio outputs. Switch 6 selects the speaker amplifier, which will be used in the event of a transceiver failure. Switch 7 selects the microphone input to the desired transceiver. One disadvantage of this scheme occurs when the KX 170 speaker amplifier is selected becuase the COMM audio is hard-wired inside the KX 170 and COMM audio will be present in the speaker.

Other options would be to use dual primary matching transformers, matching T-impedance pad or dual speakers. The disadvantages of these systems are that they will suffer a loss in total volume available proportionate to the efficiency of the transformers or the T-impedance pad. For example, with a dual primary matching transformer, such as a STANCOR TA12 (20 ohms C.T. primary, 8 ohms secondary, 10 watts), the audio loss will be approximately 20 percent. A 3dB T-impedance for 4 ohms will be approximately 1 ohm for the two series resistors and 6 ohms for the shunt resistor. One half of the total audio power will be lost in the bridge.

2.3.2 KI 205 INSTALLATION

A. Carefully select the KI 205 panel location for unobstructed vision, minimum parallax and adequate clearance for the instrument case and installation of cables and connectors.

B. Refer to Figure 2-8 for the KI 205 mounting dimensions.

C. A standard 3 1/8" instrument hole is required.

D. Avoid running the interconnect harness between the KI 205 and KX 145 too close to the KX 145 transmitter antenna coax cable or any other transmitter antenna coax cable.

2.3.3 KA 39 INSTALLATION

A. Select the KA 39 location considering good thermal conductivity to the airframe, convenient cable routing, proximity to the KX 145/KI 205 and separation from other heat sources.

B. Refer to Figure 2-9 for the KA 39 mounting dimensions.

C. Secure the KA 39 firmly in place.

2.3.4 ANTENNA INSTALLATION

For completely satisfactory operation, the antenna isolation between a communication transmitter antenna and a navigation receiver antenna, as well as between dual communication antennae, should be 30dB. In other words, two antenna in the same geometric plane on the aircraft's VHF band must be spaced 312 inches apart in order to achieve 30dB isolation. 156 inches gives only 24.5dB, 78 inches gives only 18.5dB and 39 inches gives only 12.5dB of isolation. Two VHF whips mounted in tandem would have practical values of isolation higher than these figures as the rack of the antenna moves the antenna from the same exact plane. VHF antennas mounted on top and bottom have approximately 30dB isolation plus the added advantage of a much better radiation pattern from the bottom antenna.

1.5 ACCESSORIES REQUIRED, BUT NOT SUPPLIED

1.5.1 GENERAL

A. Communication and Navigation Antennas 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.

E. Tools: (For Cable Termination)

1. KX 145

a. Hand Crimper - KPN 005-2012-10 (Molex PN HT-1921)

b. Hand Ejector - KPN 005-2012-11 (Molex PN HT-1884)

2. KI 205

a. Hand Crimper - Burndy Hytool M8ND with die set N2ORT-29

b. Extraction Tool- RX-20-25 (KPN 005-2012-12)

1.6 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 145 and must be identified as King KX 145.

CAUTION

THE VHF TRANSMITTER IN THIS EQUIPMENT IS GUARANTEED TO MEET FEDERAL COMMUNICATIONS COMMISSION APPROVAL ONLY WHEN A KING CRYSTAL IS USED.

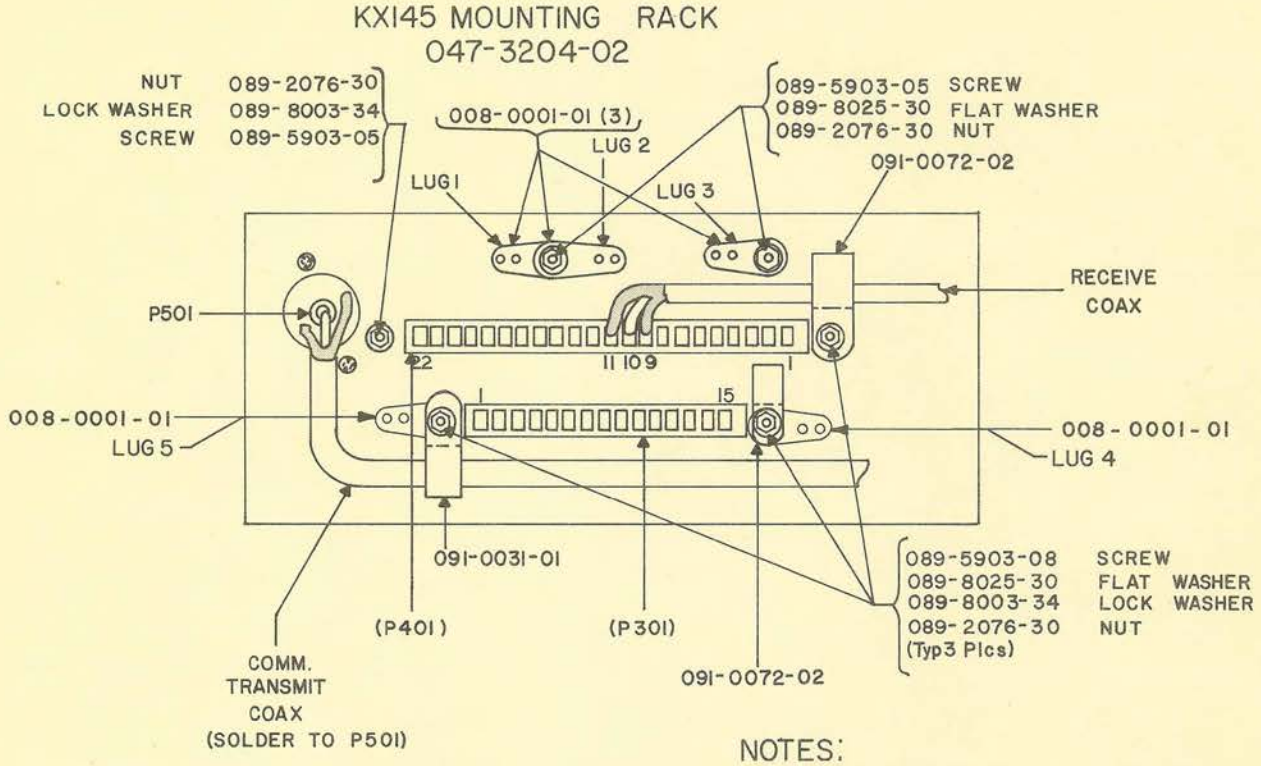
USE OF OTHER THAN A KING CRYSTAL IS CONSIDERED AN UNAUTHORIZED MODIFICATION.

SPECIFICATION	CHARACTERISTIC
TRANSMITTER	
VHF POWER OUTPUT:	2.0 watts minimum, 50 ohm load
MODULATION:	75% modulation capability with 98% limiting provided
MICROPHONE:	Dynamic mike containing transistorized preamp or carbon (must provide at least 250mvRMS into 150 ohm load)
SIDETONE:	Adjustable up to 10mw into 500 ohm headphones
DUTY CYCLE:	1 minute on, 4 minutes off (20%)
RECEIVER	
SENSITIVITY:	1.5uv (soft) will provide a 6dB minimum signal plus noise to noise ratio (1KHz, 30% mod)
SELECTIVITY:	Typical 6dB at ±14KHz, 25dB at ±25KHz
SPURIOUS RESPONSES:	Down at least 60dB. Image 50dB typical.
SQUELCH:	Manual (Front panel controlled)
AGC CHARACTERISTICS:	From 12.5uv to 10,000uv (soft) audio output will not vary more than 3dB.
NAV RECEIVER	
CRYSTAL CONTROLLED:	200 channels
FREQUENCY RANGE:	108.000 to 117.950MHz with 50KHz spacing
SENSITIVITY: Navigation	1.5uv (soft) will provide a half-flag indication
SELECTIVITY:	Typical 6dB at 14KHz, 25dB at ±25KHz
SPURIOUS RESPONSES:	Down at least 60dB. Image 50dB typical.
IDENT FILTER:	Tone rejection, 15dB, minimum
AGC CHARACTERISTICS:	From 25uv to 10,000uv (soft) audio output will not vary more than 3dB.
BEARING ACCURACY:	$\pm 1.5^{o}$ nominal, $\pm 3.0^{o}$ maximum
AUDIO	
AUXILIARY AUDIO INPUTS:	Three 500 ohm inputs with 15dB isolation between any two.
INTERCOM INPUTS:	One Intercom Microphone Input. (Microphone must provide at least 250mv into 150 ohm load).
FREQUENCY RESPONSES:	Within 6dB from 350Hz to 2500Hz
HEADPHONE OUTPUT:	10mw into 500 ohms
SPEAKER OUTPUT:	5.0mw into auxiliary input (50 ohm) produces 3 watts audio output

TABLE OF CONTENTS

LIST OF ILLUSTRATIONS

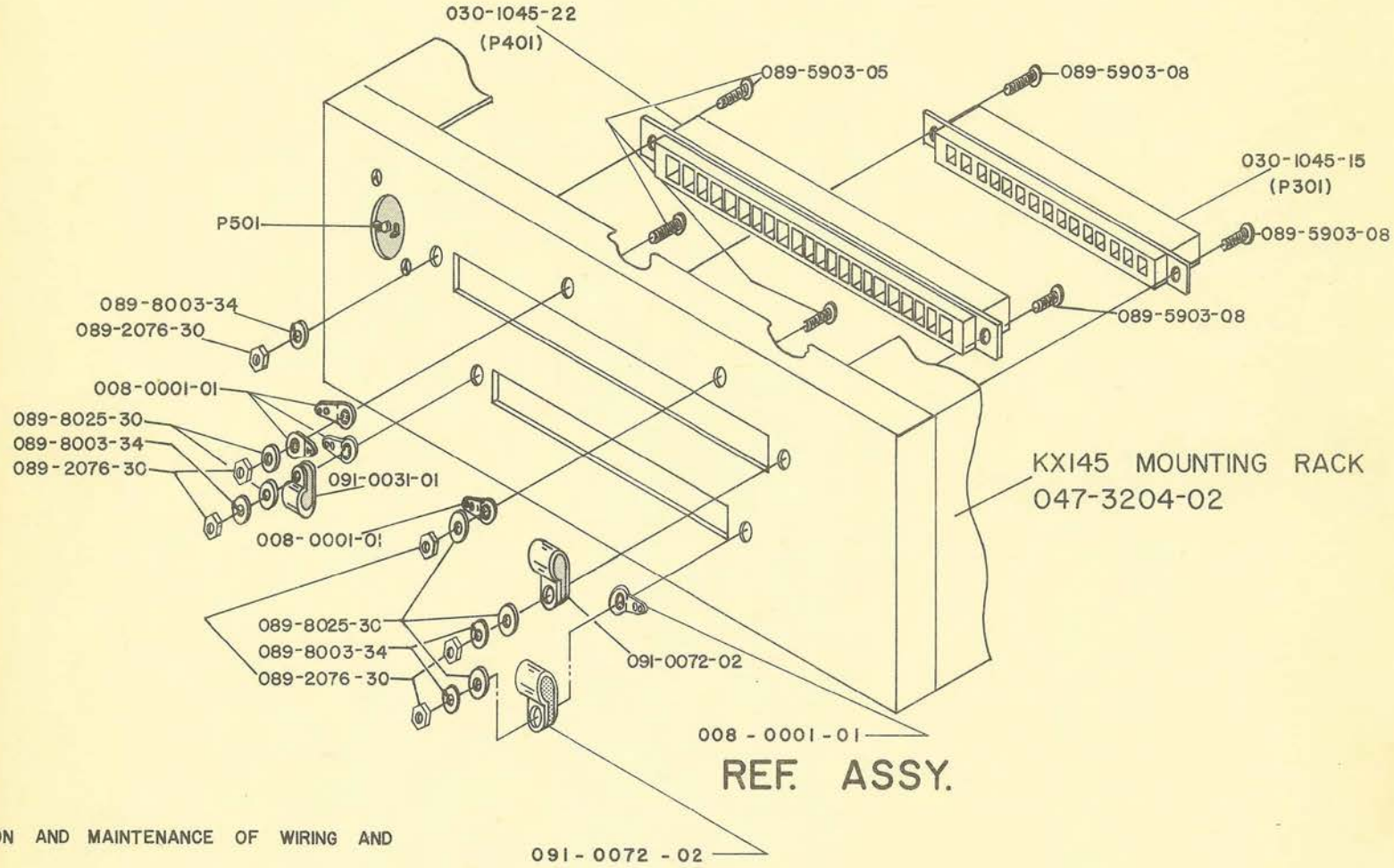
KING RADIO CORPORATION.
PRINTING DEPARTMENT
OLATHE, KANSAS 66062



NOTES:

1. THE FOLLOWING TOOLS ARE REQUIRED FOR CONSTRUC CABLE HARNESS FOR CONN. P301 AND P401.
   HAND CRIMPING TOOL - MOLEX HT-1921
   TERMINAL EXTRACTOR TOOL - MOLEX HT-1884

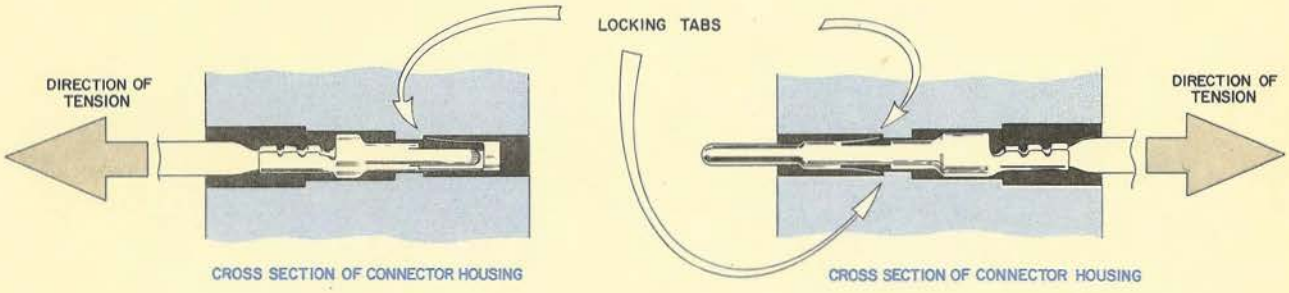
FIGURE 2-5 MOUNTING RACK HARDWARE ASSEMBLY
(Dwg. No. 155-5200-00, R-1)

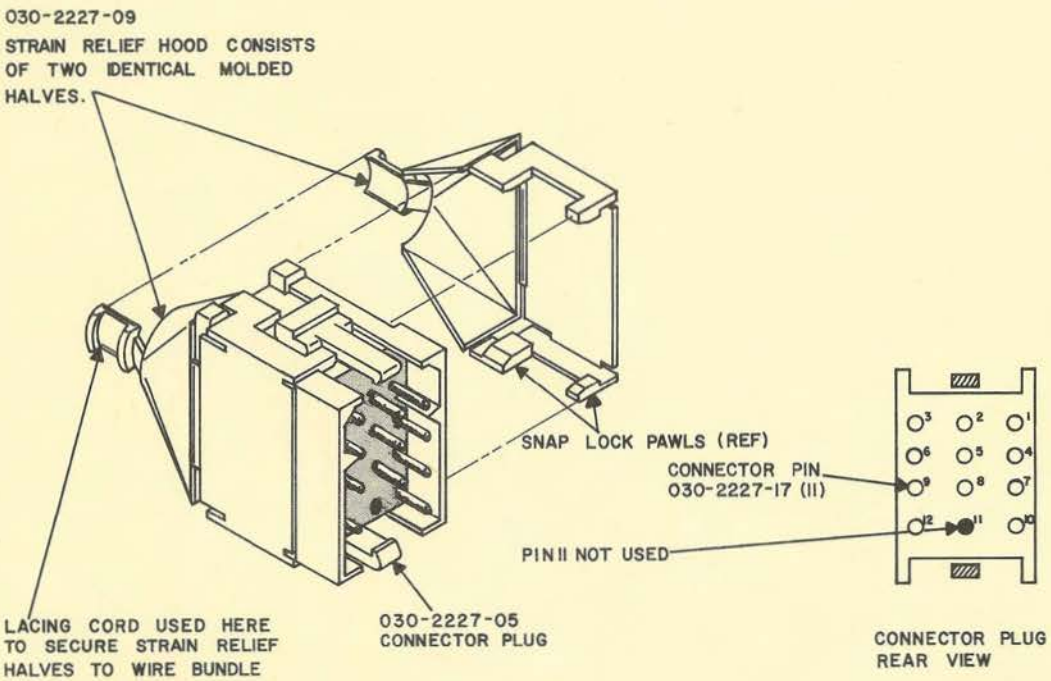


TION AND MAINTENANCE OF WIRING AND

NOTE

To ensure that proper terminal contact is made, place a slight amount of tension on each individual wire of the Burndy plug and jack. Any socket which is loose in the connector housing should be extracted and the locking tab bent to insure proper mating with the connector housing.





NOTE:

THE FOLLOWING TOOLS ARE REQUIRED FOR CONSTRUCTION AND MAINTENANCE OF WIRING AND CABLE HARNESS FOR THE KI205 CONNECTOR:

HAND CRIMPING TOOL - BURNDY HYTOOL M8ND WITH DIE SET N20RT-29

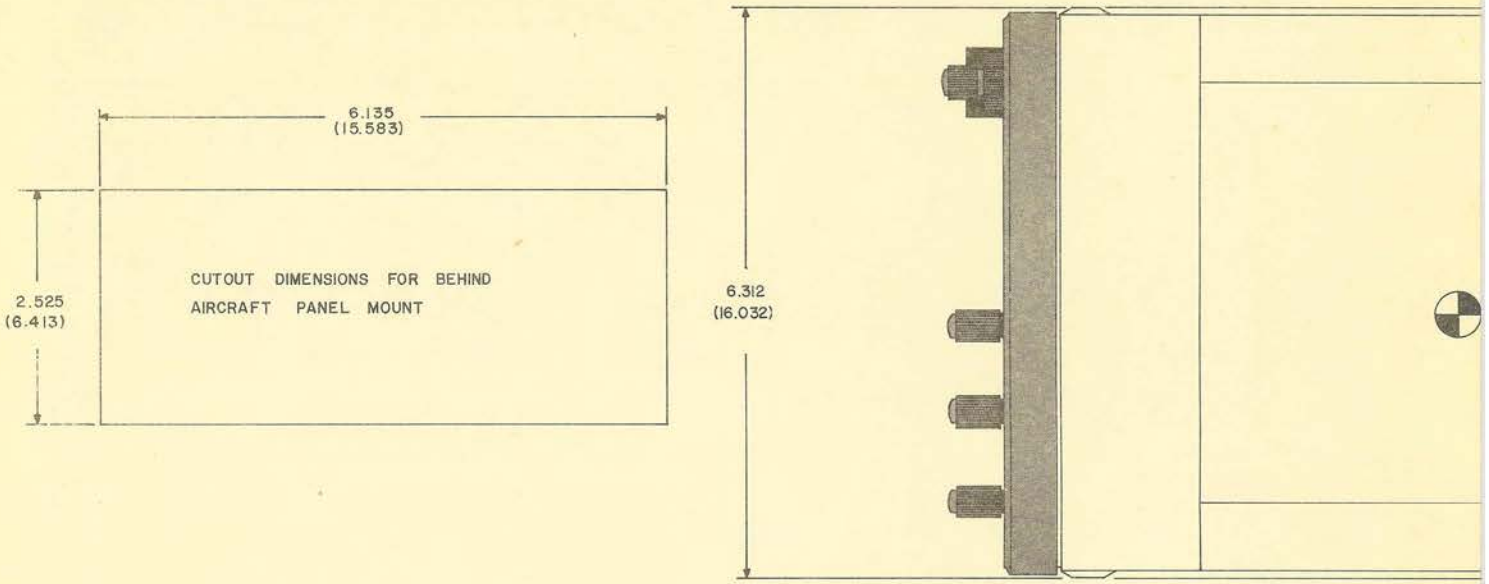
TERMINAL EXTRACTOR TOOL - BURNDY RX20-25

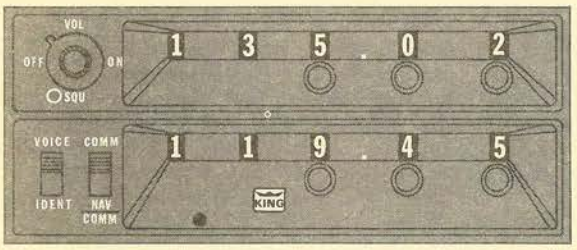
EXTRACTOR TOOL HANDLE - BURNDY RX20-4P3

OR

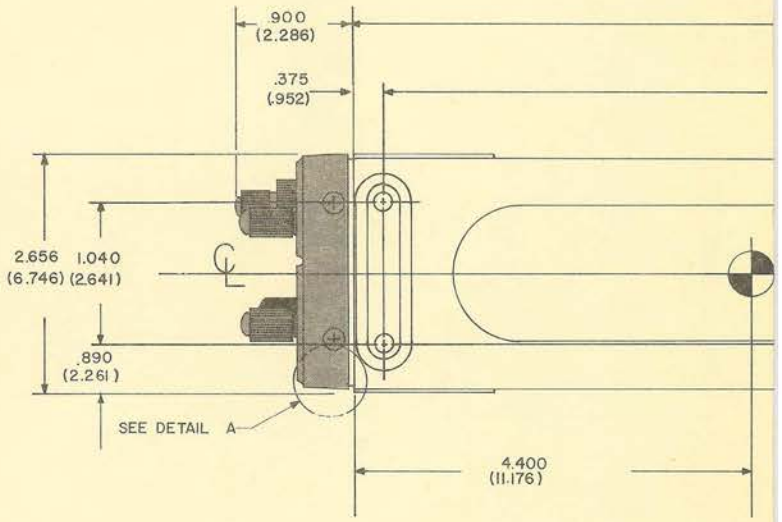
SPRING LOADED RX16DH EXTRACTION TOOL

FIGURE 2-6 KI 205 CONNECTOR ASSEMBLY
(Dwg. No. 696-2902-00, R-0)
(Dwg. No. 155-5201-00, R-1)





NOTES:
1. DIMENSIONS IN PARENTHESIS ARE IN CENTIMETERS
2. WEIGHT: 3.1 LBS. (1.407 Kg)



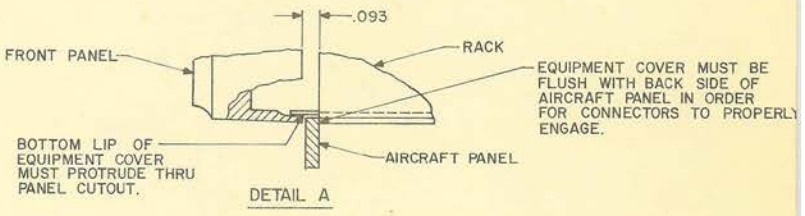
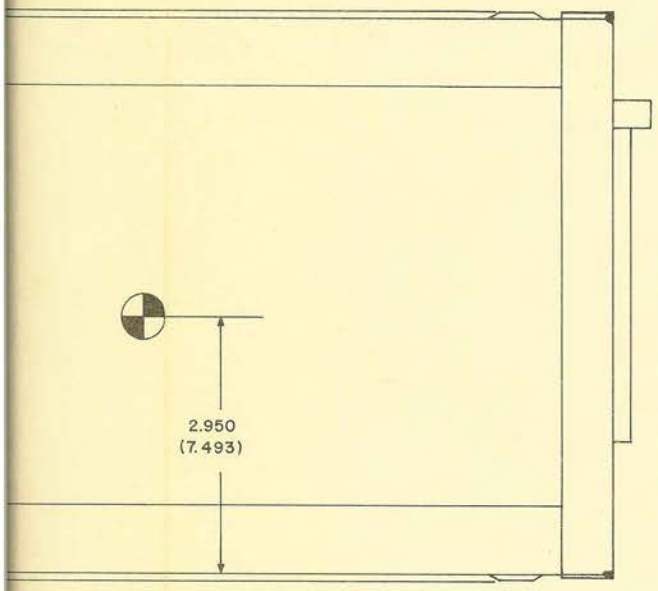
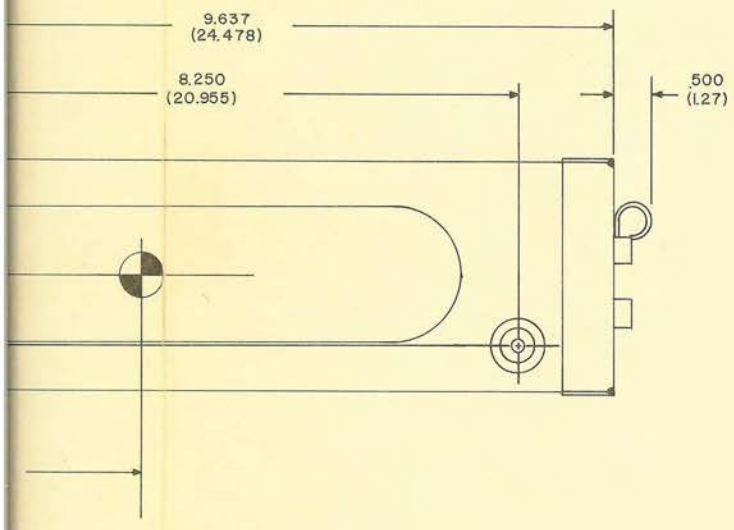


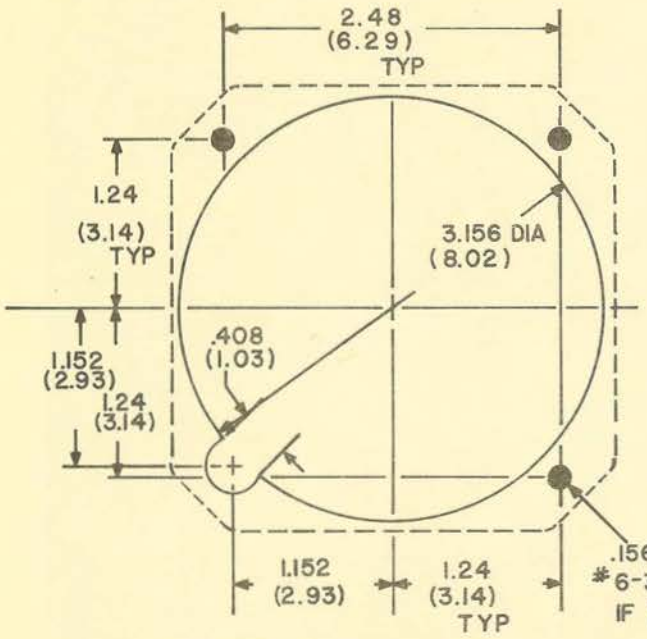
FIGURE 2-7 KX 145 OUTLINE AND MOUNTING DRAWING
(Dwg. No. 155-5199-00, R-1)



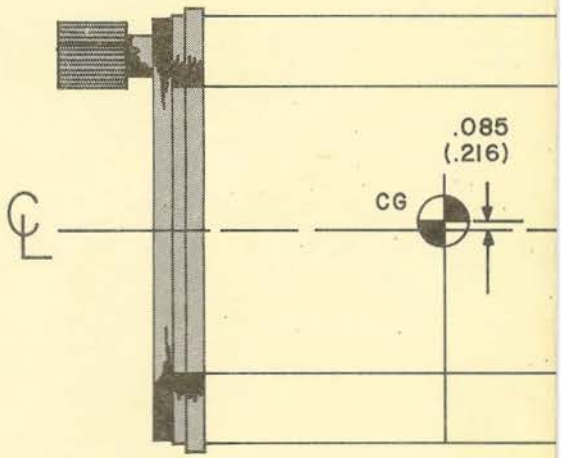


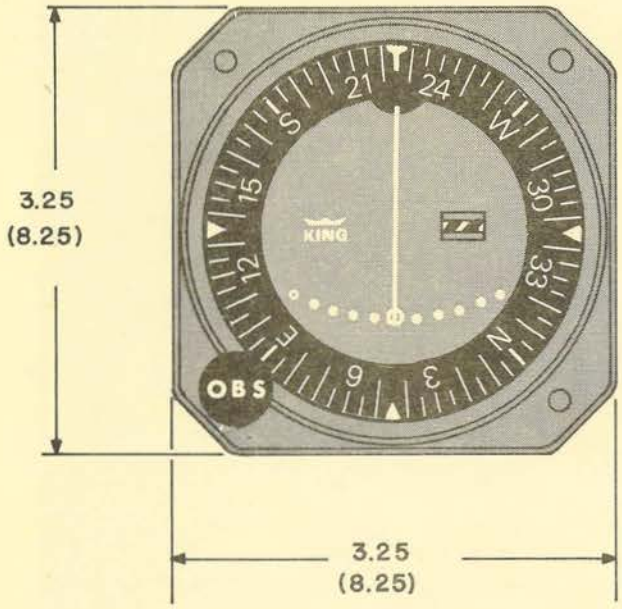
COVER MUST BE
BACK SIDE OF
ANEL IN ORDER
CTORS TO PROPERLY

KI205
VOR/LOC-OBS INDICATOR



CUTOUT DIMENSION FOR
PANEL MOUNTING (SEE NOTE 4)





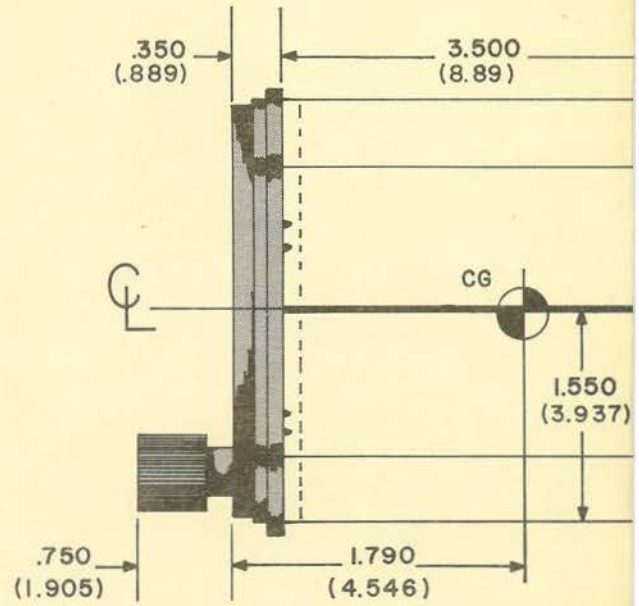
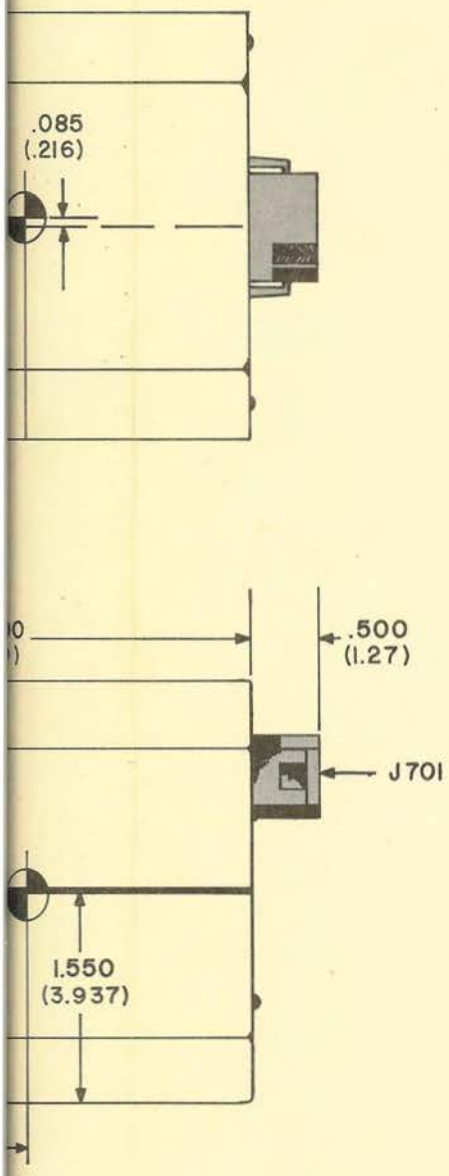
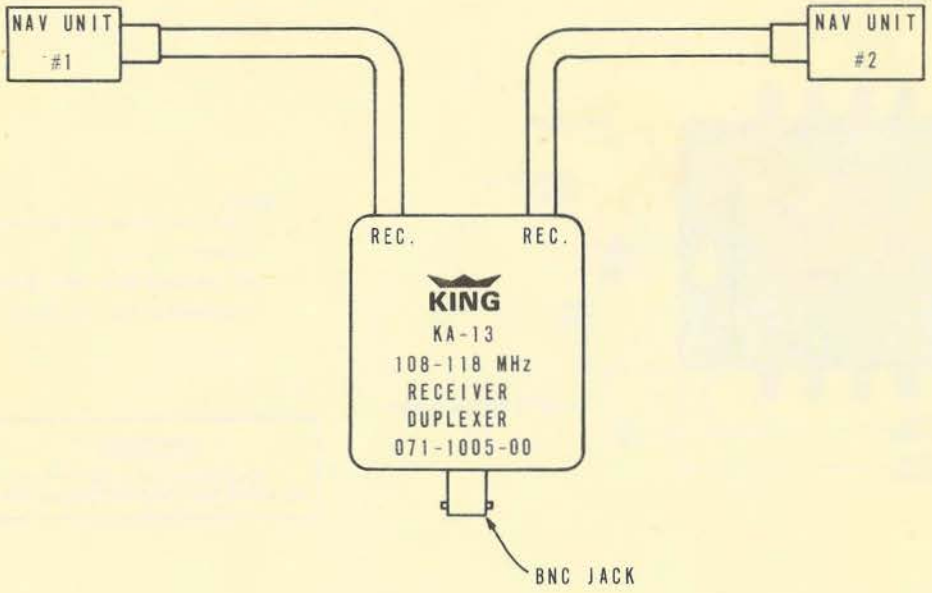


FIGURE 2-8 KI 205 INSTALLATION DRAWING
(Dwg. No. 155-5198-00, R-1)

NOTES:

1. DIMENSIONS IN ( ) ARE IN CENTIMETERS.
2. J701 IS A 12 PIN CONNECTOR.
3. WEIGHT : 0.7 LBS. (.3175)
4. THIS UNIT MAY BE FRONT OR REAR MOUNTED IN A STANDARD 3" A.T.I. OPENING. TO REAR MOUNT UNIT USE A STANDARD MOORING PLATE (KPN 073-0044-01.) TO FRONT MOUNT UNIT USE A STANDARD BLACK ADAPTOR PLATE (KPN 073-0045-00) WITH A STANDARD MOORING PLATE (KPN 073-0044-01).
5. USE GREENLEE PUNCH - (KPN 071-6038-00) USE TEMPLATE - (KPN 071-6039-00)





17 IN. IS ¼ WAVELENGTH OF COAX CORRECTED FOR POLYETHYLENE DIELECTRIC

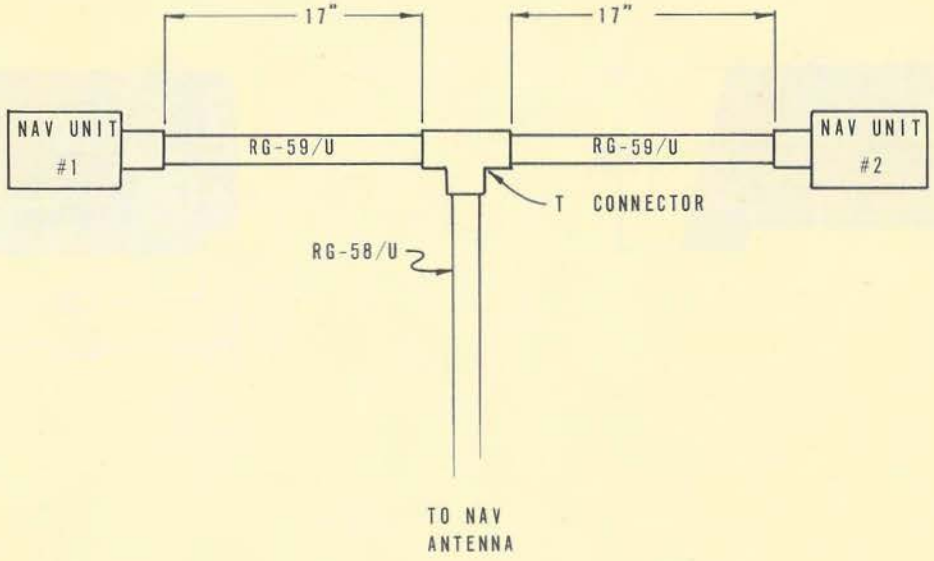
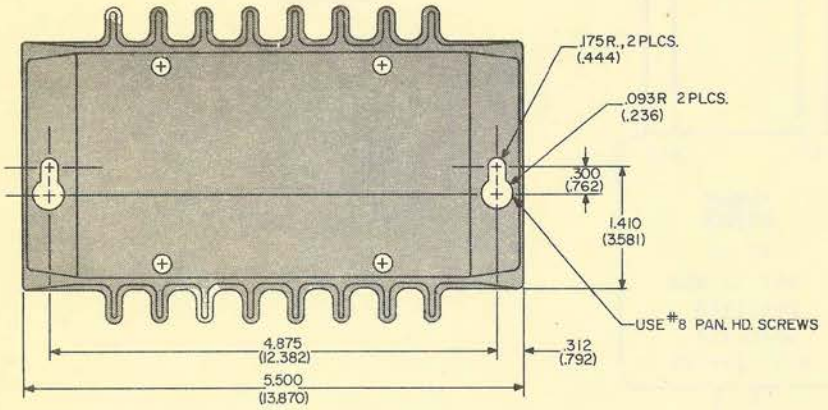


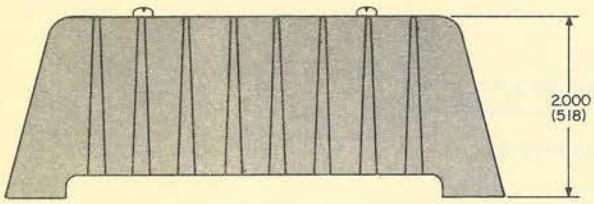
FIGURE 2-10 DUAL OMNI ANTENNA INSTALLATION



NOTES:
1. ALL DIMENSIONS IN PARENTHESIS ARE IN CENTIMETERS.
2. WEIGHT: 1.1 lbs
3. TERMINALS WILL TAKE 16 TO 22 AWG WIRE.
4. TERMINALS ARE #5-40 X 1/4 BD. HD. SCREWS.

WARNING

DO NOT MOUNT IN CLOSE PROXIMITY
TO HEATER DUCT OR OTHER SOURCES OF HEAT



155-5076-00 (R-)

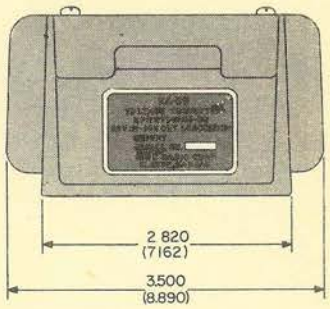
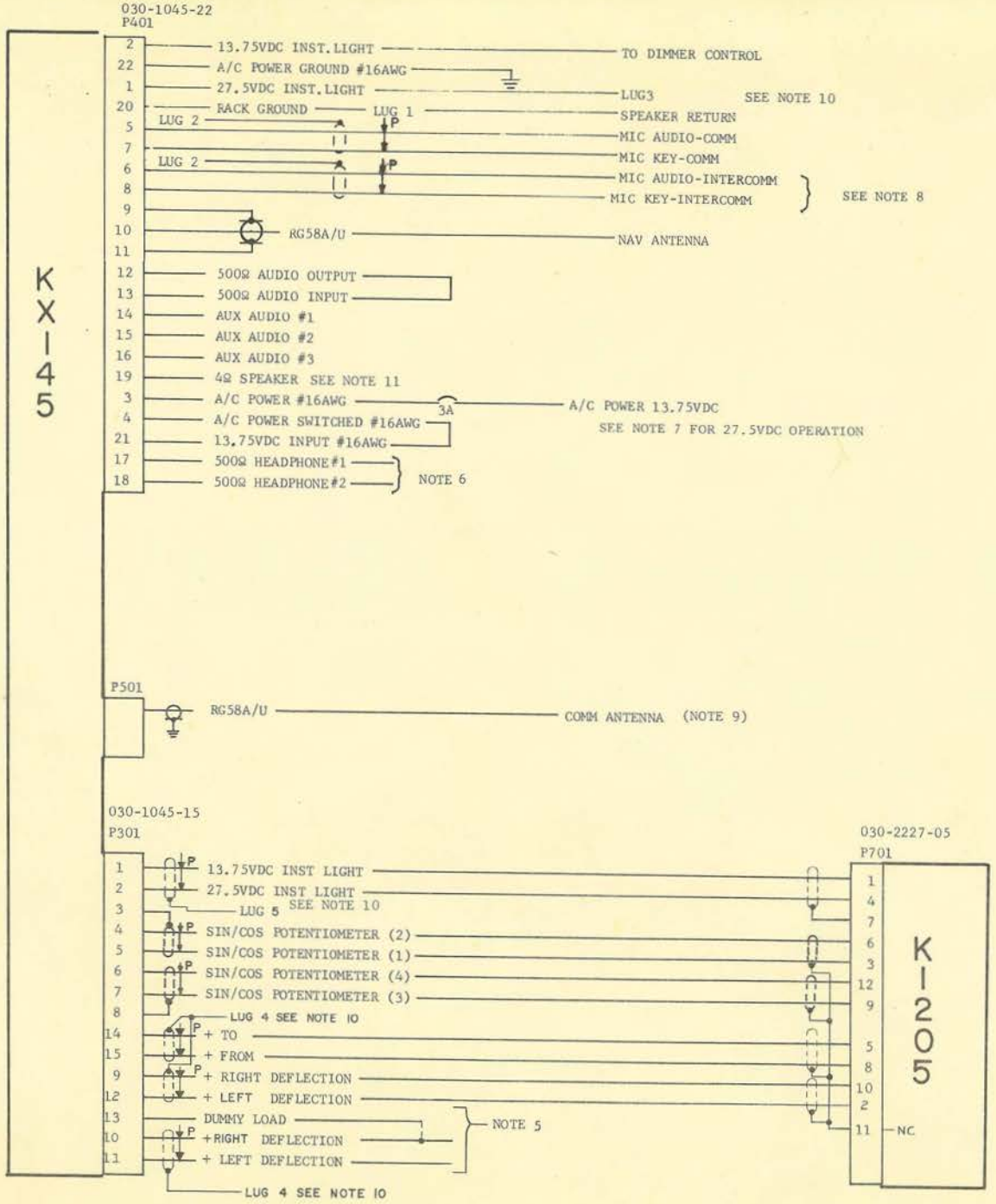


FIGURE 2-9 KA 39 VOLTAGE CONVERTER OUTLINE AND MOUNTING DRAWING
(Dwg. No. 155-5076-00, R-0)



NOTE 1. UNLESS NOTED, ALL WIRES TO BE #24AWG MINIMUM.

2. IF SPEAKER IS NOT USED, INSTALL A 4Ω 10W. RESISTOR

NOTE 7. 27.5VDC OPERATION
KX145

FIGURE 2-11 KX 145/KI 205 INTERCONNECT
(Dwg. No. 155-1195-00, R-6)

11 + LEFT DEFLECTION

LUG 4 SEE NOTE 10

NOTE 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 PIN 19 AND LUG 1

3. ALL GROUNDS ARE AIRFRAME GROUNDS UNLESS OTHERWISE SPECIFIED.

4. 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 PHYICAL DAMAGE.

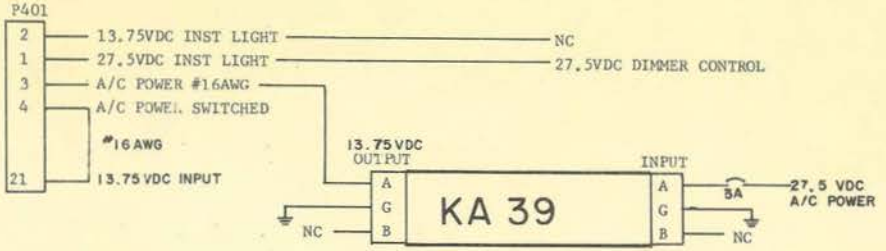
5. THE KX145 HAS THE FOLLOWING EXTERNAL LOAD DRIVING CAPABILITY:

	VOR	
INDICATORS	FLAG	DEFLECTION
ARINC	NONE	ONE. JUMPER PINS 10 & 13 IF NOT USED
AUTOPILOT (HIZ)	NONE	ONE. JUMPER PINS 10 & 13

6. HEADPHONE RETURN GROUNDED AT AIRFRAME. THE TWO HEADPHONE OUTPUTS ARE TIED TOGETHER INTERNALLY, AND ARE PROVIDED TO FACILITATE DUAL HEADSET INSTALLATION.

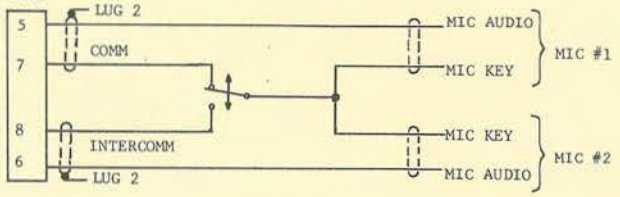
NOTE 7. 27.5VDC OPERATION

KX145
030-1045-22
P401



NOTE 8. IF INTERCOMM CAPABILITY IS REQUIRED, AN EXTERNAL SPDT TOGGLE SWITCH IS REQUIRED

030-1045-22
P401



NOTE 9 ROUTE ALL COMM ANTENNA COAX CABLES AWAY FROM KI205 SHIELDED WIRES.

NOTE 10. LUGS 1-5 REFER TO GROUND LUGS ON REAR OF KX145 MOUNTING RACK.

NOTE 11. DO NOT PARALLEL THE KX145 4Ω SPEAKER AUDIO OUTPUT WITH ANY OTHER SPEAKER OUTPUT.

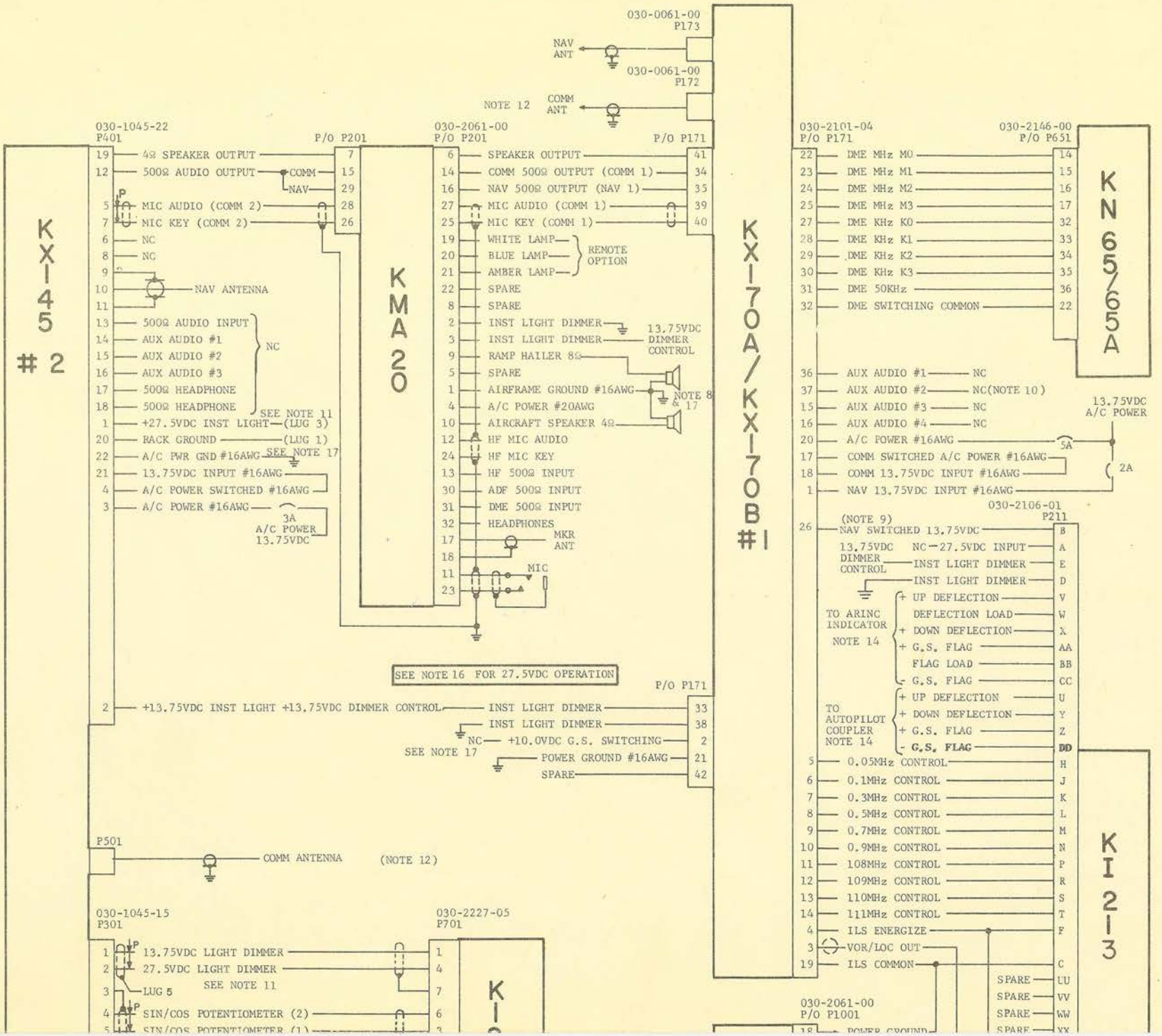
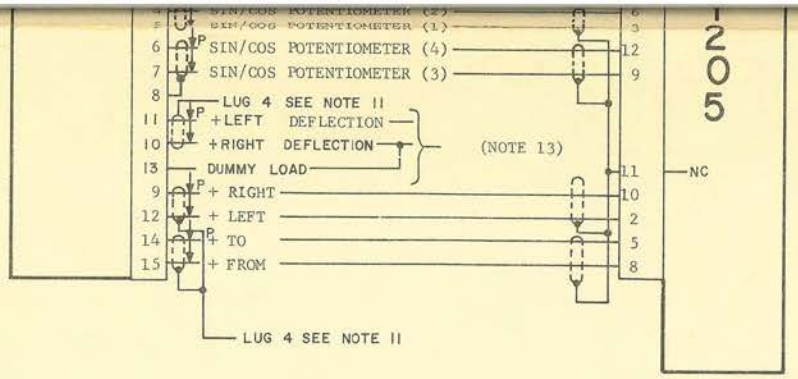
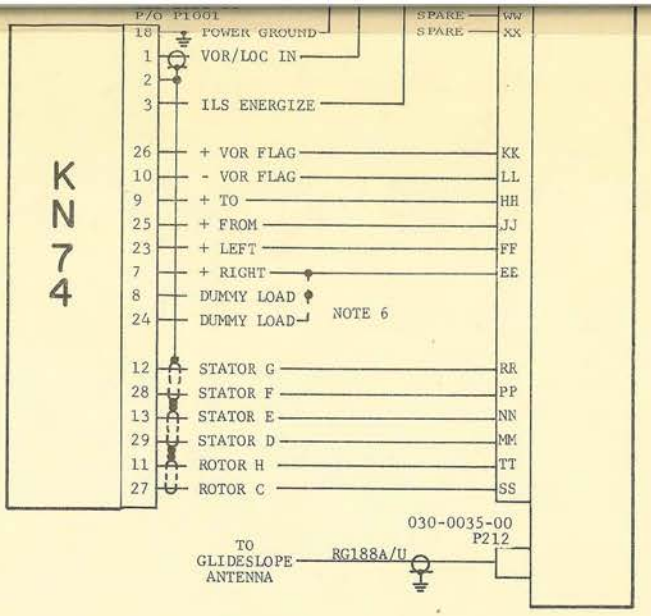


FIGURE 2-12 NON-TSO'D SILVER CROWN SYSTEM INTERCONNECT
(Dwg. No. 155-1194-00, R-4)





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 OUTPUT TO CHANNEL 2 OUT OF 5 CODE DME'S
5. POWER BUS 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 JUMPER REQUIRED
7. KN65 DME INDICATOR (KI 265) NOT SHOWN.
8. RAMP HAILER AND AIRCRAFT SPEAKER RETURN LEADS SHOULD BE CONNECTED TO PIN 1 AT KMA20.
9. EXTERNAL SWITCHING CAPABILITY: COMM - PIN - NONE
   NAV - PIN 26 - 300MA
10. AUXILIARY AUDIO #2 IS INTERCOM MIC INPUT ON KX170B
11. LUGS 1-5, REFER TO GROUND LUGS ON REAR OF KX145 MOUNTING RACK.
12. ROUTE ALL COMM ANTENNA COAX CABLES AWAY FROM KI 205 SHIELDED WIRES.
13. THE KX145 HAS THE FOLLOWING EXTERNAL LOAD DRIVING CAPABILITY.

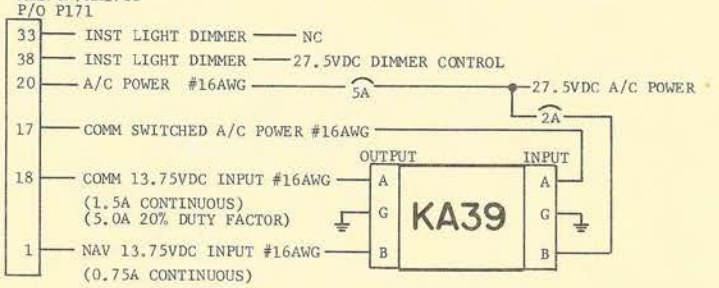
INDICATORS	VOR	
	FLAG	DEFLECTION
ARINC	NONE	ONE. JUMPER PINS 10&13, IF NOT USED
AUTOPILOT HIZ	NONE	ONE. JUMPER PINS 10&13

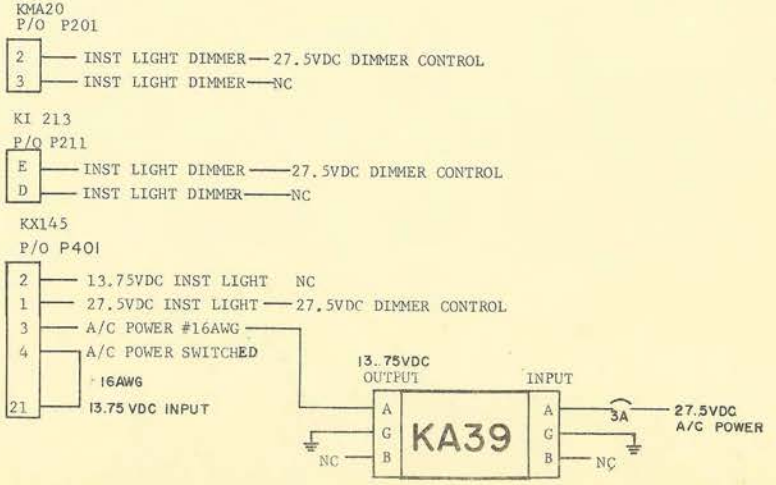
14. THE KI213 HAS THE FOLLOWING EXTERNAL INDICATOR DRIVING CAPABILITY:

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

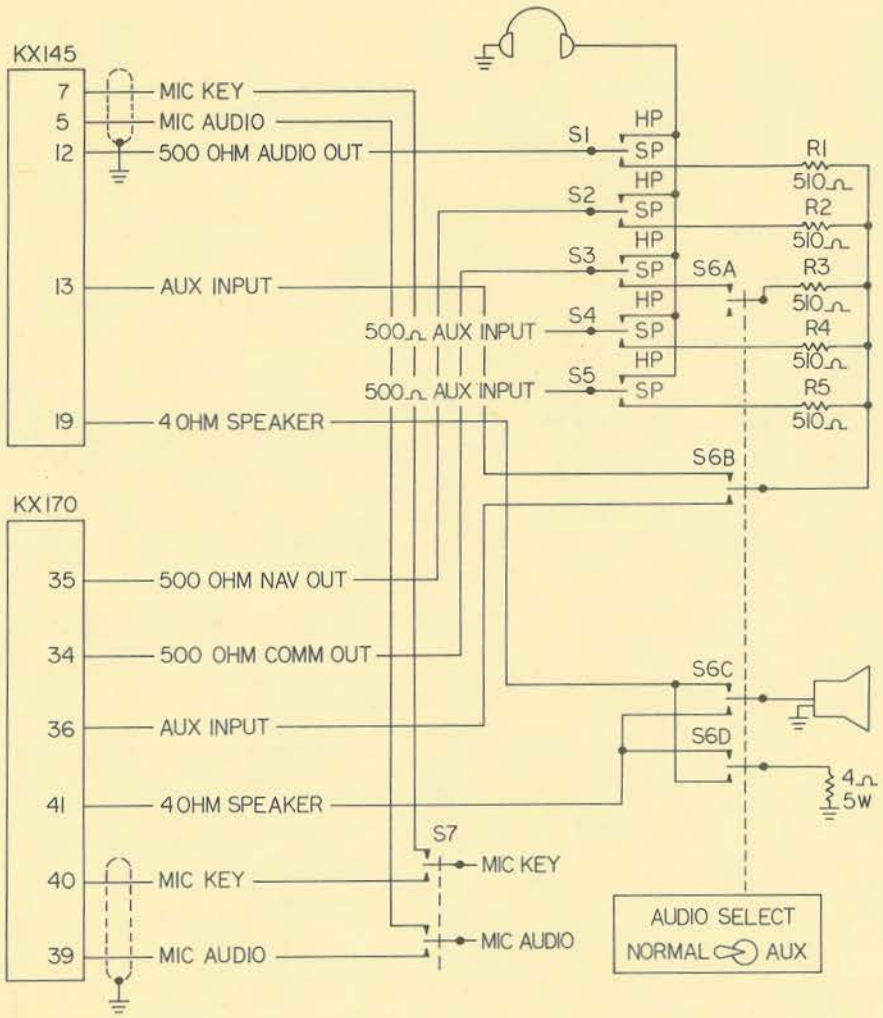
15. COMPLETE INTERCONNECT INFORMATION FOR KN65 & KN74 MAY BE FOUND IN THE RESPECTIVE INSTALLATION MANUALS.

16. 27.5VDC OPERATION





17. POWER GROUND FROM KX145, KMA20, & KX170A/B MUST BE GROUNDED AT THE SAME POINT ON AIRFRAME.



NOTES:

1. S1 through S5 are SPDT switches labeled Headphones or Speaker.
2. S6 is a panel mounted 4PDT switch labeled as shown. If either transceiver is removed for repair, the remaining transceiver will provide speaker audio.
3. The S6A contact is necessary when using the KX 170 speaker amp as the COMM audio is internally wired. KX 170 speaker audio will always be present.

FIGURE 2-13 DUAL COMM SYSTEM INTERCONNECT WITHOUT ISOLATION AMPLIFIER

SECTION III
OPERATION

3.1 KX 145/KI 205 OPERATING PROCEDURE

3.1.1 TRANSCEIVER OPERATION

Normal transceiver operation is acheived whenever a COMM frequency is displayed either on the COMM frequency selector or the NAV/COMM frequency selector. The COMM-NAV/COMM switch selects which frequency selector is activated.

If the NAV/COMM frequency selector is activated, and a NAV frequency is selected, the transmitted frequency will automatically transfer to the selected frequency indicated by the COMM frequency selector when the mic is keyed. When the key is released, the receive mode will revert back to the NAV/COMM frequency selector. This type operation is used when communicating with Flight Service Stations.

NOTE

The transmitter and receiver will be inoperative if 116.000 through 117.975MHz is selected by the COMM frequency selector.

3.1.2 NAV VOR OPERATION

VOR operation is automatically activated whenever the COMM-NAV/COMM switch is in the NAV/COMM position and a VOR frequency is selected.

The receiver volume level can then be adjusted to positively identify the station or listen to FSS reports.

To intercept a selected VOR radial (from the station) and fly outbound, turn the OBS control to set the desired radial under the top indicator index. Maneuver the aircraft to fly the selected radial magnetic heading plus a 45° intercept angle which will provide a sufficient intercept angle. The intercept angle should be reduced as the deviation needle approaches an on course condition (center) to prevent excessive course bracketing.

To determine the bearing and fly "to" a selected VOR station, turn the OBS control until the "To-From" indicator indicates "To" and the deviation needle is centered. Read the "to" bearing under the top indicator index and maneuver the aircraft to approximately fly the magnetic course "to" the station. If the deviation needle moves to the right, the aircraft course must be adjusted 5 or 10 degrees to the right. Similarly, if the deviation needle goes to the left, the aircraft course must be adjusted to the left. Maintaining a centered deviation needle will provide automatic course compensation for wind drift.

While flying a selected VOR course often times it can be noted that the deviation needle moves erratically about the center or moves a few degrees to one side and eventually returns to center. This action is referred to as VOR scalloping or course bends. Scalloping is generally caused by irregularities in terrain and metal objects located near the VOR station. Scalloping is more noticeable at lower altitudes and in any case should be ignored.

Aircraft position can be easily determined by consecutively selecting two VOR stations and determining the "from" radial. By projecting appropriate radial lines from the VOR station the aircraft location may be identified as the intersection of the two radial lines.

3.1.3 NAV LOCALIZER OPERATION

Localizer circuits are automatically energized when the COMM-NAV/COMM switch is in the NAV/COMM position and an ILS frequency is selected. By adjusting the receiver volume level the localizer station can be identified and in some cases ATIS information received. The indicator will display a "To" indicating the signal is reliable.

Maneuver the aircraft to fly an on course centered needle. While flying a front course approach or out bound on the back course approach, magnetic heading corrections are made toward the needle deflection. Similarly, while flying the back course approach or outbound on the front course approach, corrections are made away from the needle deflection.

The localizer course width is narrow compared to VOR course width and requires much smaller course corrections to center the deviation needle. When intercepting the localizer course the aircraft turn into the localizer course should be started when the needle moves off the meter stop.

A helpful quick reference reminder of the localizer course is to set the course on the OMNI bearing readout.

3.2 KX 145/KI 205 CONTROL FUNCTIONS

All controls required to operate the KX 145/KI 205 are located on the unit front panels. It is recommended that the ON-OFF switch be in the "OFF" position when the aircraft engine is started.

3.2.1 KX 145 CONTROLS

A. ON-OFF Volume Control

The ON-OFF Volume control is the inner concentric knob located in the upper left corner of the KX 145. Power is applied to the unit when this control is turned clockwise out of the detented "OFF" position. This control also adjusts the volume when it is in the "ON" position.

B. Squelch (SQ) Control

The Squelch Control is the outer concentric knob on the ON-OFF-Volume control. This control adjusts to squelch the audio at the desired level and is fully unsquelched in the maximum clockwise position.

C. Voice-Ident Switch

The Voice-Ident switch is located in the lower left corner of the KX 145. With the switch in the Ident position the ground station voice and identification tone are coupled to the aircraft speaker and/or headphone circuitry. With the switch on in the voice position, the identification tone is eliminated, permitting the pilot to monitor the VOR ground station for voice transmissions without receiving the VOR identification tone.

D. COMM Frequency Selector

The three upper knobs to the right side of the KX 145 are the COMM frequency selector. The left hand knob selects MHz, the center knob selects 0.1MHz and the right hand knob selects 0.025MHz channels. This selector tunes the COMM band from 118.000 to 135.975MHz in 25KHz steps. The frequency selector also dials 116.000 through 117.975MHz but the transceiver is inoperative in these positions.

E. NAV/COMM Frequency Selector

The three knobs under the COMM frequency selector are the NAV/COMM frequency selector. The left hand knob selects MHz, the center knob selects 0.1MHz and the right hand knobs selects 0.05MHz. This selector tunes the NAV band from 108.000 to 117.950MHz and the COMM band from 118.000 to 127.950MHz in 50KHz steps.

F. COMM-NAV/COMM Switch

The COMM-NAV/COMM switch, located to the right of the Voice-Ident switch, selects either the COMM (upper) frequency selector or the NAV/COMM (lower) frequency selector.

3.2.2 KI 205 CONTROLS AND FUNCTION

A. OMNI Bearing Selector

The OMNI Bearing Selector (OBS), located on the KI 205, is used to rotate the azimuth card on which the desired course is selected.

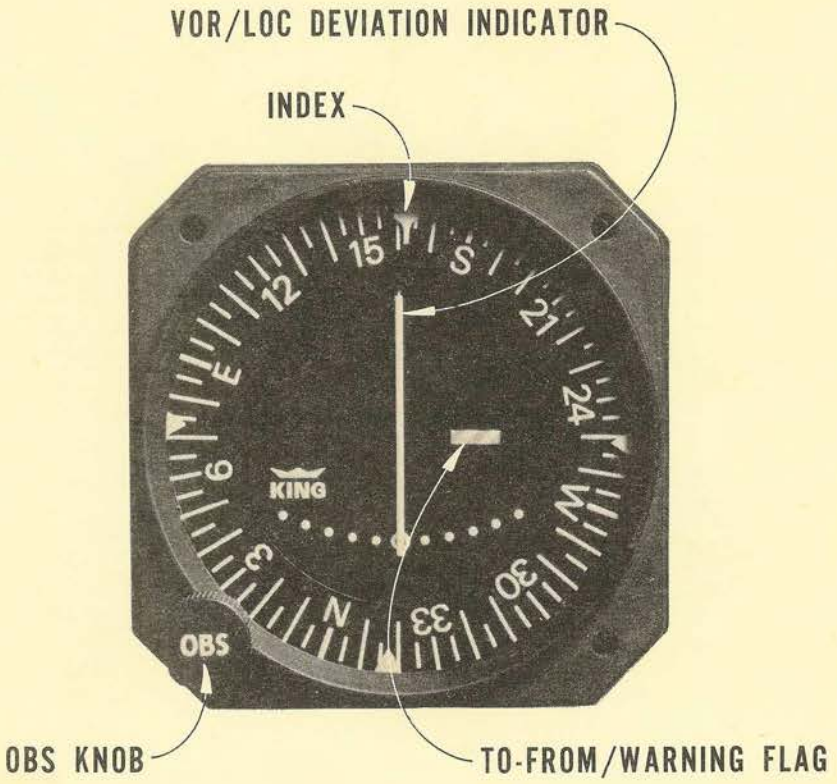
B. VOR/LOC Deviation Indicator

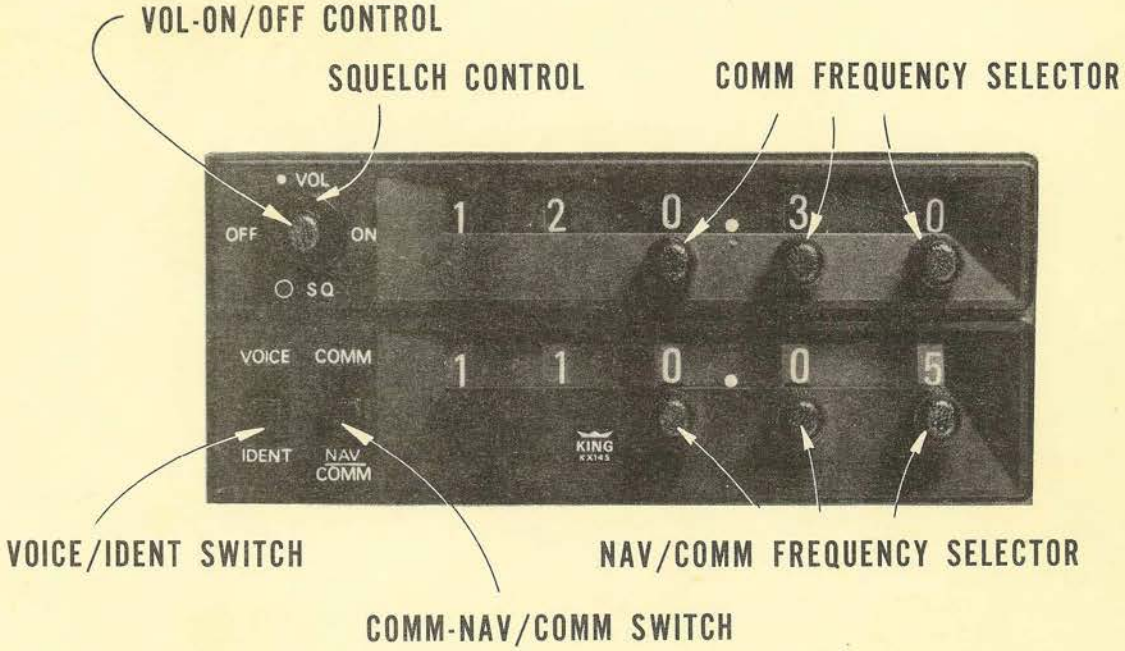
The VOR/LOC deviation needle indicates the direction and amount of deviation from the selected VOR course or localizer path. The angular deviation is toward the proper flight path in normal operation.

C. VOR/LOC Warning Indicator

The VOR/LOC Warning Flag is fully visible when the VOR or LOC signal is unreliable. The VOR TO/FROM indication shows the direction "To" or "From" the VOR station. In localizer mode, a "To" indication is presented.

FIGURE 3-1 KX 145/KI 205 CONTROL FUNCTIONS


VOR/LOC DEVIATION INDICATOR
INDEX
KING
OBS
OBS KNOB
TO-FROM/WARNING FLAG


VOL-ON/OFF CONTROL
SQUELCH CONTROL
COMM FREQUENCY SELECTOR
VOL
OFF
ON
SQ
VOICE
COMM
IDENT
NAV
COMM
KING
VOICE/IDENT SWITCH
NAV/COMM FREQUENCY SELECTOR
COMM-NAV/COMM SWITCH