

Honeywell

***INSTALLATION
MANUAL***

BENDIX/KING[®]

KNI 582

***RADIO MAGNETIC
INDICATOR***

*Manual Number 006-00193-0003
Revision 3, March/2007*

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**SECTION 1
GENERAL INFORMATION**

1.1 INTRODUCTION

This manual contains information relative to the physical, mechanical, and electrical characteristics of the KNI 582 Radio Magnetic Indicator. General installation instructions are also included.

1.2 EQUIPMENT DESCRIPTION

The KNI 582 Radio Magnetic Indicator (PN 066-3060-00/01/02/03/04/10/11/12/13) provides bearing information to either ADF or VOR stations by means of two pointers, each of which is read against the compass card. The type of information displayed by each needle (assuming applicable inputs are present) is determined by the corresponding front panel switch.

A servo drive compass card with a fixed lubber line displays aircraft heading information. A flag falls into view in the upper left corner of the display when the aircraft heading information being displayed is invalid.

1.3 TECHNICAL CHARACTERISTICS

SPECIFICATION	CHARACTERISTIC
TSO Compliance:	Env. Cat. RTCA DO-160A A1D1/A/SKP/XXXXXSABAAA
Temperature:	-20°C to +55°C
Altitude:	50,000 feet
Compass:	TSO C6c
ADF:	TSO C41c Class A
VOR:	TSO C40a
WEIGHT and DIMENSIONS:	See Figure 2-1 KNI 582 Outline and Mounting Drawing.

Table 1-1 - KNI 582 RMI Technical Characteristics

SPECIFICATION	CHARACTERISTIC
POWER REQUIREMENTS Primary: Lighting:	11.33VDC 0.4A maximum 26VAC 400Hz 6VA 28V at 80mA maximum 5V at 460mA maximum Note: 14V Installations may use 5V Versions with dropping resistor.
COMPASS HEADING INPUT	Operates from any slaved magnetic compass with ARINC X, Y, and Z outputs. Z grounded externally.
COMPASS VALID	Valid = +27.5VDC Invalid = 0VDC 2mA maximum
VOR/LOC COMPOSITE INPUT (-04 Version TACAN Compatible)	0.5VRMS 0° phase composite 30Hz variable AM and 30Hz reference FM on a 9960Hz carrier (ARINC Std.) (0.7VRMS maximum)
NAV SUPERFLAG (Horizontally parked needle)	Flag \leq +3.5VDC No Flag \geq +10VDC
ILS ENERGIZE (Horizontally parked needle)	ILS < +1VDC (GND) VOR = Open (+33VDC Maximum)
ADF X, Y, Z	Operates from any ADF receiver with ARINC X, Y, Z outputs. Z grounded externally. 11.8VRMS 400Hz 180° index, positive rotation reference.
OBI SIN/COS	4 wire SIN/COS 10VRMS 400Hz. 0° when SIN = 0VRMS and COS = maximum positive VRMS. Positive rotation reference with COS decreasing and SIN increasing in-phase for increasing degrees.
ADF DC SIN/COS	Common Mode: 0 to \pm 5VDC Differential: 3VDC \pm 10%
OBI DIGITAL I Electrical Characteristics A. Driver	1. Open collector referenced to ground 2. Maximum "low" voltage (with 2 receiver loads (500 Ohm) returned to 10.35 volts) = 1.0V.

Table 1-1 - KNI 582 RMI Technical Characteristics (Cont)

SPECIFICATION		CHARACTERISTIC						
B. Receiver		1. Input resistance = $1K \pm 5\%$ returned to +V 2. +V = $9.0V \pm 15\%$						
C. Interconnecting Lines		1. Maximum Shunt Capacity = 2000 pF						
II Waveform Timing								
A. Data		1. Data Rate - Approx. 1KHz 2. Negative Logic ("Low True")						
B. Clock		1. The negative going edge of the clock waveform will be greater than 10us and less than 250us from any data transistors point. 2. The minimum time that the clock spends in either the high or low state will be greater than 10us.						
C. Sync		1. The sync pulse is a negative going pulse following the data word. 2. The negative going edge of the sync pulse will be a minimum of 70us and a maximum of 350us after the negative going edge of the last clock pulse. 3. The sync pulse will be a minimum of 10us wide and a maximum of 260us wide.						
III Data Word Format		1. BCD, 0.1's, 1's, 10's, 100's 2. LSD to MSD 3. LSB to MSB 4. Maximum Word Rate = 12Hz 5. When "8" Bit of 100's is High (False) = Flag. 6. When "4" Bit of 100's is High (False) = ILS Mode.						
		100°	10°	1°	.1°			
(8) Flag	(4) ILS 2 & 1	MSB	LSB	MSB	LSB	MSB	LSB	ABC
<---- Time								

Table 1-1 - KNI 582 RMI Technical Characteristics (Cont)

1.4 UNITS AND ACCESSORIES SUPPLIED

1.4.1 KNI 582 Configurations

The KNI 582 RMI is available in the following versions:

PART NUMBER	DESCRIPTION
066-3060-00	Black Bezel, 27.5 VDC/26VAC Lights
066-3060-01	Black Bezel, 5 VDC/5VAC Lights
066-3060-02	Black Bezel, 27.5 VDC/26VAC Lights
066-3060-03	Black Bezel, 5 VDC/5VAC Lights
066-3060-04	Black Bezel, 5 VDC/5VAC Lights (TACAN Compatible)
066-3060-10	Black Bezel, 27.5 VDC/26VAC Lights
066-3060-11	Black Bezel, 5 VDC/5VAC Lights
066-3060-12	Black Bezel, 27.5 VDC/26VAC Lights
066-3060-13	Black Bezel, 5 VDC/5VAC Lights

Table 1-2 - KNI 582 RMI Configurations

1.4.2 KNI 582 RMI Installation Kit

KNI 582 RMI Installation Kit PN 050-01823-0000/0001. (solder type)

KNI 582 RMI Installation Kit PN 050-01823-0002/0003. (crimp type)

The -0000/-0002 installation kit is used for black panel mounting. The -0001/-0003 installation kit is for gray panel mounting. (See Paragraph 2.3 KNI 582 RMI INSTALLATION for installation instructions.)

PART NUMBER	DESCRIPTION	-00	-01	-02	-03
006-00540-0000	Bulletin	1	1	1	1
073-00044-0001	Mooring Plate	1	1	1	1
073-00045-0000	Black Adapter Plate	1	0	1	0
073-00045-0001	Gray Adapter Plate	0	1	0	1

Table 1-3 - KNI 582 RMI Installation Kit

PART NUMBER	DESCRIPTION	-00	-01	-02	-03
089-05115-0012	Scr. FHP 6-32 x 3/4	4	0	4	0
089-06461-0012	Scr. FHP 6-32 x 3/4	0	4	0	4
030-01157-0011	Socket Crmp 20G	0	0	49	49
030-01176-0000	HSG Conn 50S	0	0	1	1
030-01188-0000	Pin Polrzin Female	0	0	1	1
030-02350-0015	Conn Sub-Min F 50P	1	1	0	0
030-02414-0001	Hood & Lvr Mdfd	1	1	1	1

Table 1-3 - KNI 582 RMI Installation Kit (Cont)

1.5 ADDITIONAL EQUIPMENT REQUIRED, BUT NOT SUPPLIED

The following are navigation receivers, ADF receivers, and compass systems compatible with the KNI 582 RMI.

NAV RECEIVERS	ADF RECEIVERS	COMPASS
KN 53: TSO'd.	KR 85 (225 01/04) TSO'd	KCS 305 TSO'd
KNS 80: Env. DO-160, Area NAV AC 90-45A	KR 87 TSO'd	KCS 55/55A TSO'd
KNS 81: Area NAV AC 90-45A	KDF 800 TSO'd	KPI 550 TSO'd
KX 155/165: TSO'd	KDF 805 TSO'd	
KX 170B: Non-TSO'd	KDF 8000 TSO'd	
KX 175B: TSO'd		
KNR 615: TSO'd		
KNR 630: TSO'd		
KNR 634: TSO'd		
KNR 665: Area NAV AC 90-45		
KNR 665A: Area NAV AC 90-45		

Table 1-4 - Equipment Compatible with KNI 582 RMI

Crimping tools, mooring plates and power tools are referenced in individual installation manuals.

1.6 LICENSE REQUIREMENTS

None.

1.7 CONTINUED AIRWORTHINESS INSTRUCTIONS

1.7.1 Equipment

The instructions for continued airworthiness given in the TC or STC approvals for this product supplements or supersedes the instructions for continued airworthiness in this manual.

Most Honeywell products are designed and manufactured to allow "on condition maintenance". On condition maintenance is described as follows; There are no periodic service requirements necessary to maintain continued airworthiness. No maintenance is required until the equipment does not properly perform its intended function. When service is required, a complete performance test should be accomplished following any repair action. Consult the appropriate unit Maintenance/Overhaul Manual for complete performance test information.

14 CFR Part 25.1529 Instructions for Continued Airworthiness is met per the following instructions:

- A. The removal of the equipment is on the condition of failure. There is no required maintenance.

1.7.2 Wires/Coax Cables

During on-condition or regularly scheduled maintenance, inspect wires and coax cables following the guidelines listed in AC 43.13-1B Chapter 11, 12 as necessary.

SECTION 2 INSTALLATION

2.1 GENERAL

This section contains the suggestions and information to consider before installation of the KNI 582 Radio Magnetic Indicator into the aircraft. Close adherence to these suggestions will assure optimum performance from the equipment.

2.2 UNPACKING AND INSPECTING EQUIPMENT

Exercise extreme care when unpacking the equipment. Make a visual inspection of the unit for evidence of damage 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 packing material after all equipment has been removed, in the event that equipment storage or reshipment should become necessary. The KNI 582 RMI installation will conform to standards designated by the customer, installing agency and existing conditions as to unit location and type of installation.

2.3 KNI 582 RMI INSTALLATION

- A. Plan a location on the aircraft panel that is clearly visible to the pilot with the least practicable deviation from his normal position and from his line of vision when he is looking forward along the flight path.
- B. Make certain that clearance is available for the installation of the cables and connectors, and also that normal vibration does not cause the unit to bump against other equipment cases.
- C. If an instrument hole that meets the installation requirements is not available, cut a 3" ATI hole per Figure 2-1. Secure the unit with four 3/4" long 6-32 instrument screws.
- D. The KNI 582 RMI may be secured in place from front or behind the panel.

2.4 POST INSTALLATION CHECK

These are tests designed to show that the KNI 582 RMI is functioning accurately under broadly nominal conditions.

- A. Compass Card Accuracy
 - 1. With the aircraft on a known magnetic heading, this heading $\pm 2^\circ$ should be under the lubber line of KNI 582 RMI.

2. The above step should be repeated for at least one additional heading 90° from the first.

B. ADF Accuracy

1. Depending on the application, the KNI 582 RMI can be tested for either DC SIN/COS ADF or X, Y, Z, ADF by tuning in a station on the appropriate ADF.
2. In the DC SIN/COS Mode the needles should position the direction of the station $\pm 5^\circ$. Repeat for at least one more station.
3. Repeat Step 2 for X, Y, Z, ADF $\pm 5^\circ$.

C. VOR Accuracy

1. Depending on the application, the KNI 582 RMI can be tested for either OBI DIGITAL VOR, COMPOSITE VOR, or OBI SIN/COS VOR by tuning in a station on the appropriate VOR.
2. In the OBI DIGITAL VOR Mode, the single needle should point to the station $\pm 5^\circ$. Repeat for at least one more station.
3. Repeat Step 2 for COMPOSITE VOR $\pm 5^\circ$.
4. Repeat Step 2 for OBI SIN/COS VOR $\pm 5^\circ$.

D. VOR/LOC Composite Correction Adjustment

If it is necessary to make a VOR/LOC composite needle centering adjustment due to NAV receiver composite error, the KNI 582 RMI pointer can be adjusted externally using the following steps:

1. With a ramp-test NAV generator, generate an output so the NAV receiver can be tuned into a given bearing.
2. With the NAV receiver tuned to the generator frequency, insert a tuning tool into VOR/LOC composite adjustment hole (refer to Figure 2-1) and adjust R232 until the selected needle reads the same bearing the ramp generator.
3. Repeat Step 2 for verification of the adjustment for another bearing on the ramp with generator.

TEST DATA

Compass Card Accuracy

(Magnetic Heading) minus (KNI 582 RMI Indication) = Error

_____ (±2° Max.)
_____ (±2° Max.)

ADF (D.C. SIN/COS) Accuracy

(Station Heading) minus (KNI 582 RMI Indication) = Error

_____ (±5° Max.)
_____ (±5° Max.)

ADF (X, Y, and Z) Accuracy

(Station Heading) minus (KNI 582 RMI Indication) = Error

_____ (±5° Max.)
_____ (±5° Max.)

VOR (OBI DIGITAL) Accuracy

(Station Bearing) minus (KNI 582 RMI Indication) = Error

_____ (±5° Max.)
_____ (±5° Max.)

VOR (Composite) Accuracy

(Station Bearing) minus (KNI 582 RMI Indication) = Error

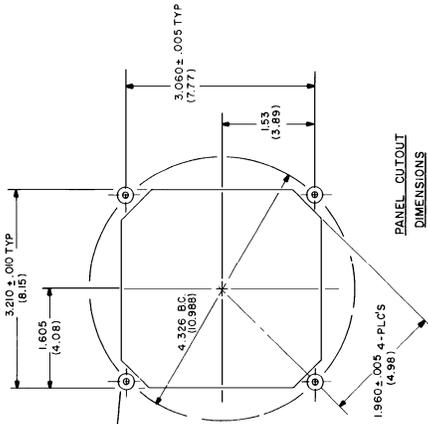
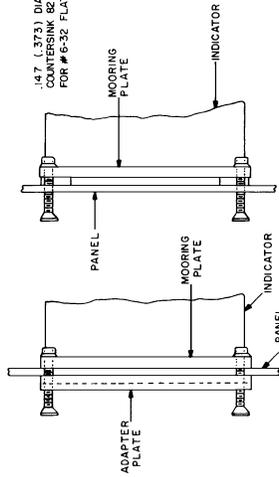
_____ (±5° Max.)
_____ (±5° Max.)

VOR (OBI SIN/COS) Accuracy

(Station Bearing) minus (KNI 582 RMI Indication) = Error

_____ (±5° Max.)
_____ (±5° Max.)

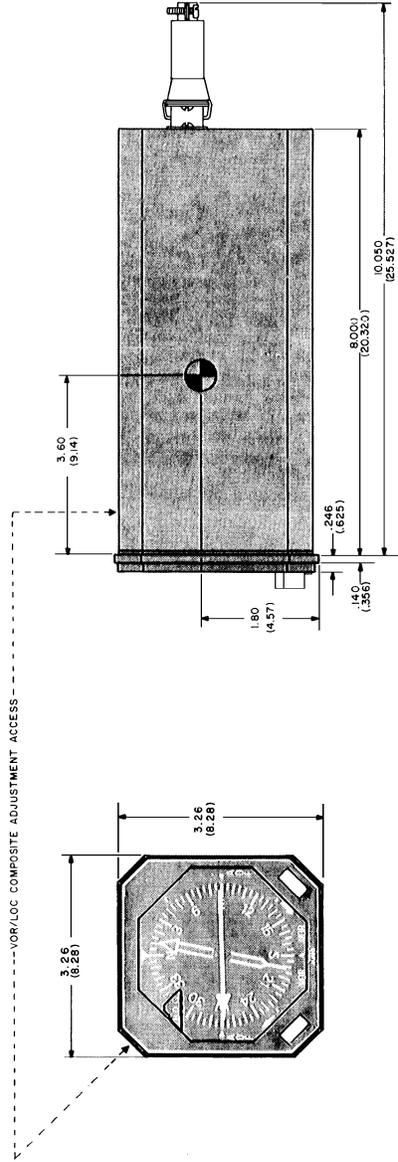
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PANEL LAYOUT
DIMENSIONS
STANDARD MOUNTINGS
PUNCH/FILE SET

PUNCH NO. 071-6042-00
FILM NO. 071-6042-00
FILE TEMPLATE NO. 071-6039-00

- NOTES:
1. DIMENSIONS IN () ARE IN CENTIMETERS
 2. WEIGHT: 3 lbs. (1.36kg)
 3. IS CENTER OF GRAVITY.



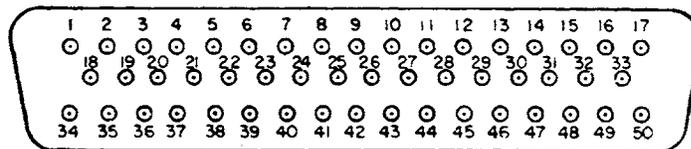
KNI582-0001

Figure 2-1 KNI 582 Outline and Mounting Drawing
(Dwg No 155-05353-0000, Rev 0)

THE FOLLOWING CHART EXPLAINS THE REAR CONNECTOR CONTROL PIN CONNECTIONS.

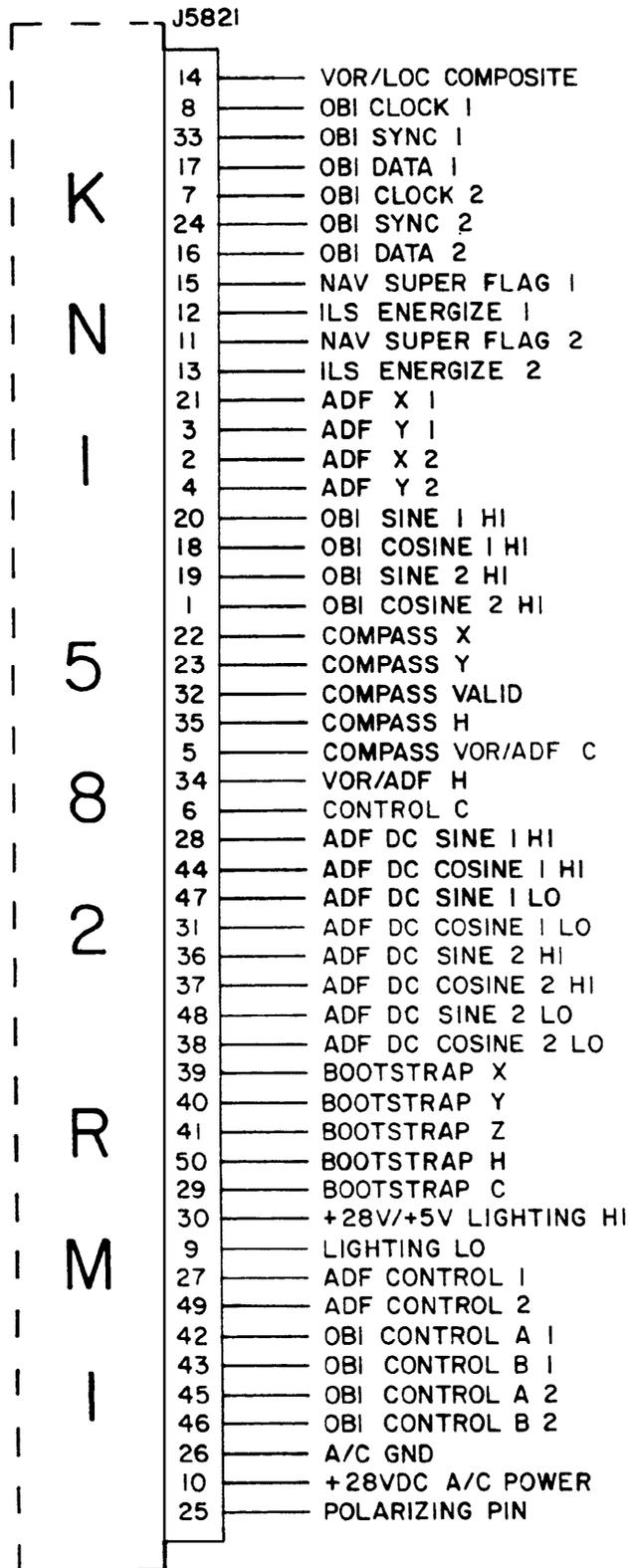
<u>VOR INPUT</u>	<u>CONTROL A</u>	<u>CONTROL B</u>
VOR/LOC Composite	CONTROL C	No Connection
OBI SIN/COS	No Connection	CONTROL C
OBI Clock, Sync, Data	No Connection	No Connection

<u>ADF INPUT</u>	<u>ADF CONTROL</u>
ADF X, Y, Z	CONTROL C
ADF DC SIN/COS	No Connection



KNI582-0002

Figure 2-2 Connector Assembly



KNI582-0003

Figure 2-3 KNI 582 Pin Functions

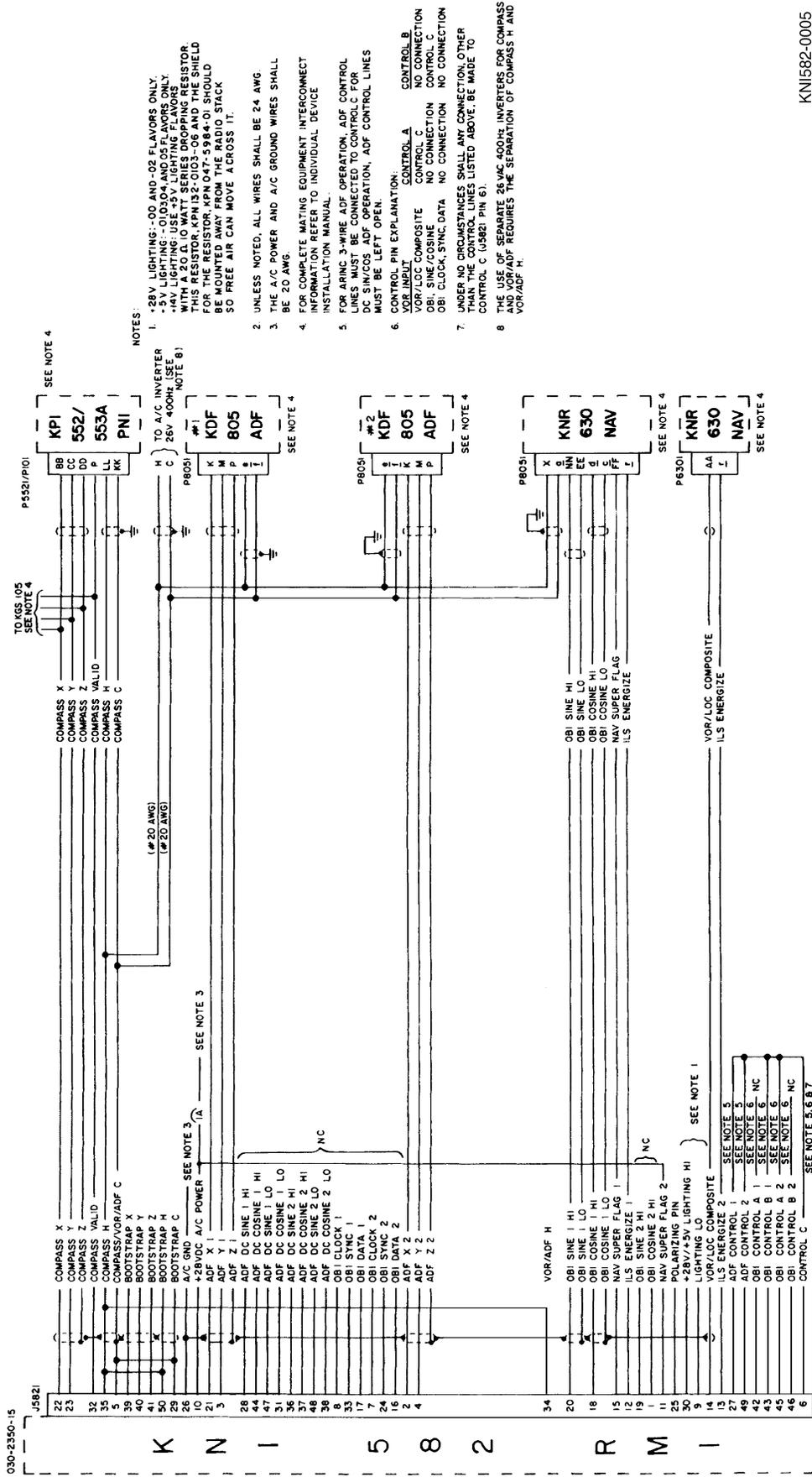
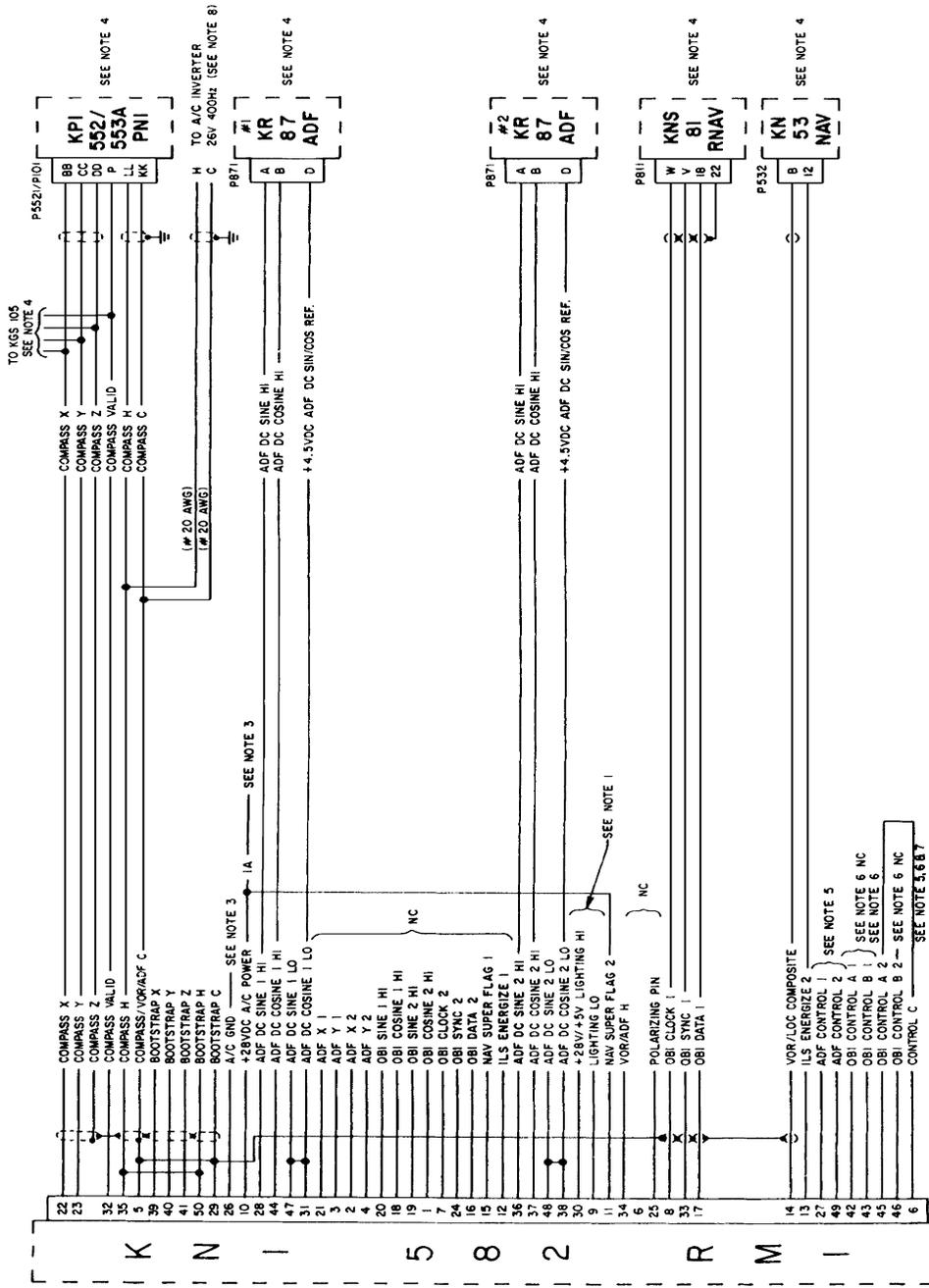


Figure 2-5 KNI 582/KDF 805/KNR 630 Interconnect (Dwg No 155-01384-0000, Rev 5)



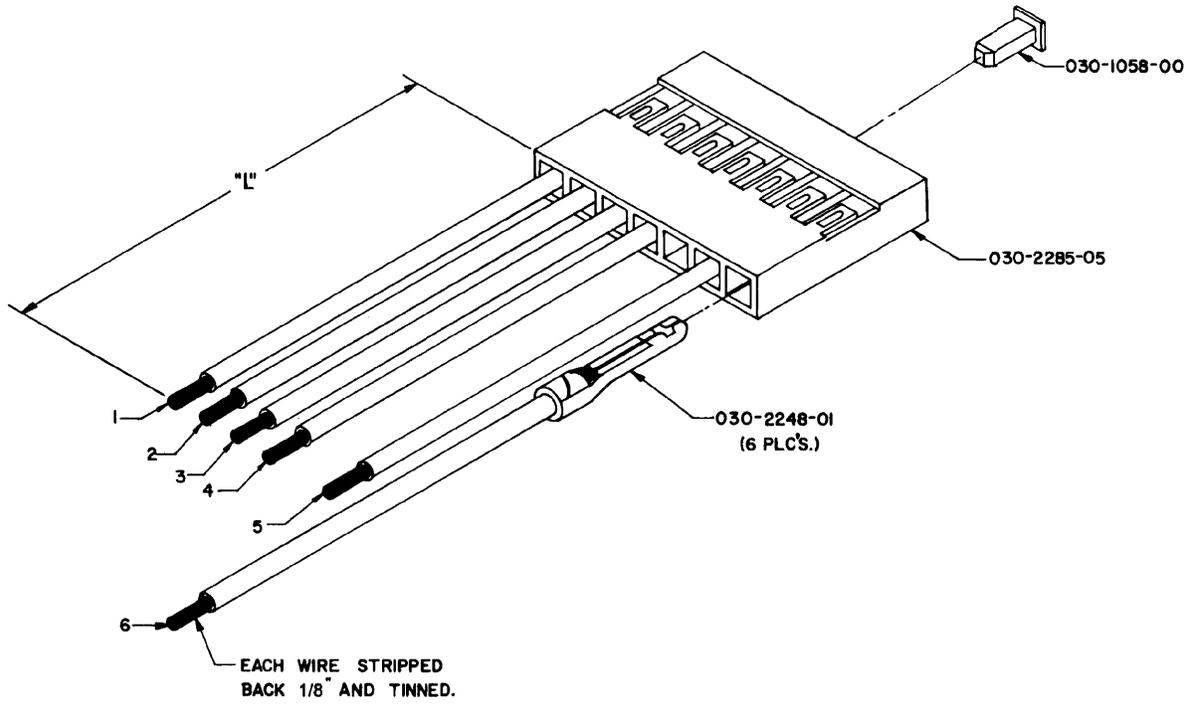
NOTES:

1. -28V LIGHTING--00 AND-02 FLAVORS ONLY.
-15V LIGHTING--01,03,04, AND 05 FLAVORS ONLY.
-14V LIGHTING--USE +5V LIGHTING FLAVORS WITH A 20.110 WATT SERIES DROPPING RESISTOR.
THIS RESISTOR KPN132-003-06 AND A SHIELD FOR THE RESISTOR, KPN 047-3984-01, MUST BE USED TO PREVENT THE RADIO STACKS SO FREE AIR CAN MOVE ACROSS IT.
2. UNLESS NOTED, ALL WIRES SHALL BE 24 AWG.
3. THE A/C POWER AND A/C GROUND WIRES SHALL BE 20 AWG.
4. FOR COMPLETE MATING EQUIPMENT INTERCONNECT INFORMATION REFER TO INDIVIDUAL DEVICE INSTALLATION MANUAL.
5. FOR ARINC 3-WIRE ADF OPERATION, ADF CONTROL LINES MUST BE CONNECTED TO CONTROL C FOR DC SINE/COSINE ADF OPERATION, ADF CONTROL LINES MUST BE LEFT OPEN.
6. CONTROL PIN EXPLANATION:

VOR INPUT	CONTROL A	CONTROL B
VOR/LOC COMPOSITE	CONTROL C	NO CONNECTION
OBI SINE/COSINE	NO CONNECTION	CONTROL C
OBI CLOCK, SYNC, DATA	NO CONNECTION	NO CONNECTION
7. UNDER NO CIRCUMSTANCES SHALL ANY CONNECTION, OTHER THAN THOSE CONTROL LINES LISTED ABOVE, BE MADE TO CONTROL C (US887, PIN 6).
8. THE USE OF SEPARATE 28 VAC 400HZ INVERTERS FOR COMPASS AND VOR/ADF REQUIRES THE SEPARATION OF COMPASS H AND VOR/ADF P.

KNI582-0006

Figure 2-6 KNI 582/KR 87/KNS 81/KN 53 Interconnect (Dwg No 155-01385-0000, Rev 4)

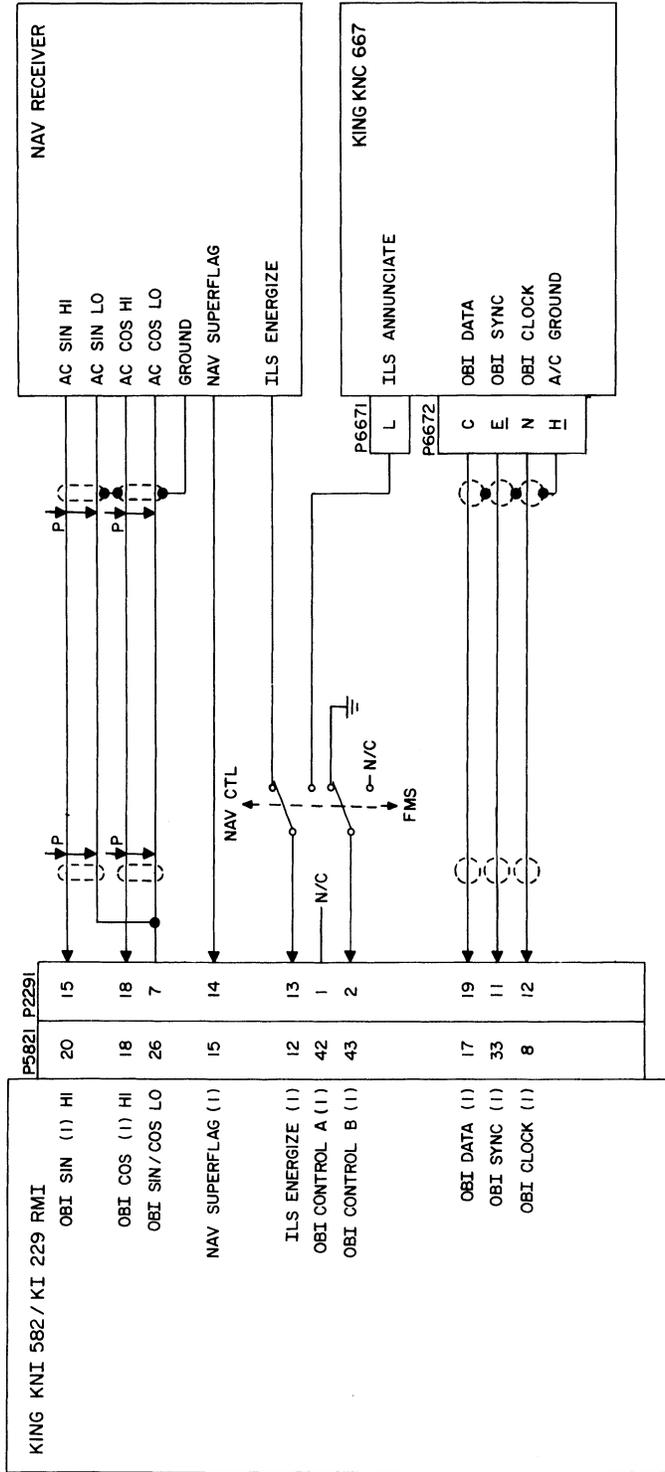


WIRE NUMBER	WIRE KPN 025-	COLOR	"L" (in)
1	0029-02	RED	8.5
2	0029-09	WHT	4.0
3	0029-06	BLU	4.0
4	0029-00	BLK	4.0
5	0029-01	BRN	4.0
6	0029-04	YEL	4.0

KNI582-0008

Figure 2-8 KNI 582 Cable Assembly
(Dwg No 155-02114-0000, R-AA)

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- NOTES:
1. LOWERCASE LETTER CONNECTOR PIN DESIGNATORS ARE SHOWN AS UNDERLINED UPPERCASE LETTERS.
 2. ALL WIRES ARE 24AWG UNLESS OTHERWISE NOTED.

KNI582-0010

Figure 2-10 KNI 582 Serial OBI Interface
(Dwg No 155-01563-0013, Rev 0)

SECTION 3 OPERATION

3.1 GENERAL

The KNI 582 RMI display is discussed below:

- A. Compass Card/Lubber Line: This rotating card repeats gyro stabilized magnetic compass information. Aircraft heading is read from the compass card under the orange lubber line.
- B. Compass Flag: This flag comes into view whenever the compass system determines that the heading is invalid or the indicated heading has an error of 5° or more.
- C. Pointers: The arrow of either pointer indicates the magnetic heading to a VOR station/area navigation waypoint of an ADF station depending on the position of the front panel switches associated with the pointer.

3.2 NORMAL OPERATION

The KNI 582 RMI repeats magnetic heading information from a directional gyro system. Aircraft heading is read under the lubber line of the KNI 582 RMI.

When an ADF receiver is tuned to a station and the appropriate pointer placed in the ADF mode, the arrow of the pointer indicates the magnetic heading to the ADF station. Thus, if the pilot desires to fly toward the station, he merely turns his aircraft to the magnetic heading indicated by the pointer.

When a VOR receiver is tuned to a VOR station and the appropriate pointer placed in the VOR mode, the arrow of the pointer indicates the magnetic heading to the VOR station. If the KNI 582 RMI is used in an area navigation system, the VOR pointer indicates magnetic heading to the waypoint. Should a localizer frequency be selected or the VOR receiver indicates a flagged condition, the VOR pointer is parked 90° to the right of the lubber line.

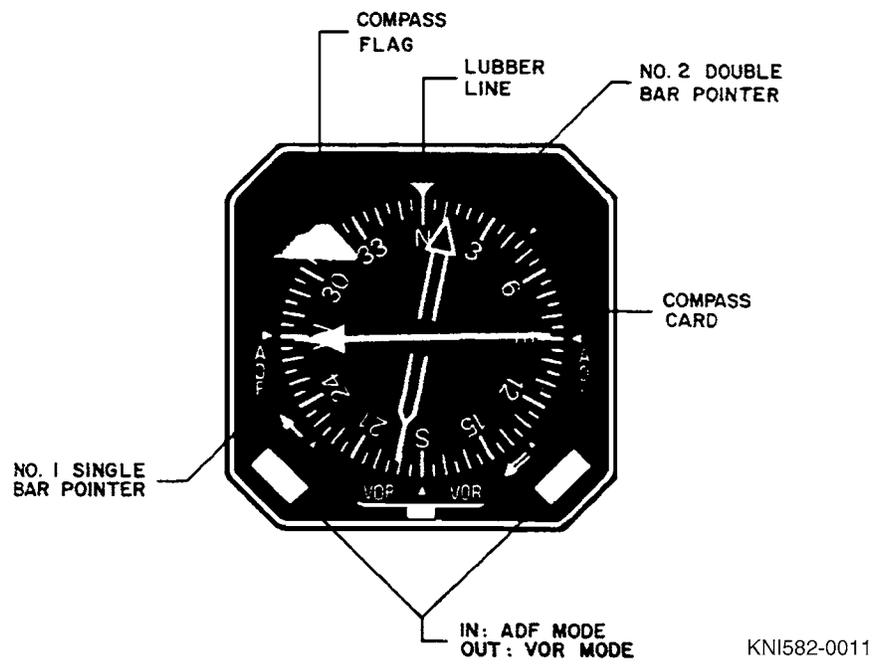


Figure 3-1 KNI 582 Control Functions

