

**Installation Section
for
DME-451/450C/450
Distance Measuring Equipment**



section II

installation

2.1 UNPACKING AND INSPECTING EQUIPMENT

Unpack the equipment carefully and make a visual inspection of the unit for possible damage. All claims for damage should be filed with the transportation company involved. If claims for damage are to be filed, save the original shipping carton and materials. If no defect can be detected, replace packing materials in the shipping container and save for future uses such as storage or reshipment.

2.2 PREINSTALLATION CHECK

The practice of testing each unit prior to installation in the aircraft ensures the installer that the unit will perform satisfactorily after the installation is complete. Installing a "known good" box will also reduce time spent in isolating problems in an installation that is not yielding optimum performance.

If preinstallation testing is desired, perform the minimum performance test procedures contained in paragraph 5.5.2 of the maintenance section of this instruction book.

2.3 CABLING

DME-451/450C/450 system interconnect wiring diagrams are shown in figures 2-1 through 2-4. Refer to the appropriate illustration when preparing the aircraft wiring harness.

Figures 2-5 through 2-9 illustrate system mating connectors for each unit and list functions assigned to each connector pin. S-TEC part numbers and vendor part numbers are listed for each connector on the applicable equipment outline and mounting dimensions illustrations.

2.3.1 Wiring Precautions

During preparation of the interconnect wiring cables, observe the following precautions:

- a. Bond and shield all parts of the aircraft electrical system, such as generator and ignition systems.

- b. Keep the interconnect cables away from heavy-current circuits, other pulse-transmitting equipment, and potential sources of interference.
- c. Leave slack in cable to allow for movement due to vibration.
- d. After installation of the cables in the aircraft and before installation of the equipment, a check should be made to ensure that aircraft power is applied only to the pins specified.

2.3.2 ANT-451 Antenna Cabling

- a. The coaxial cable interconnecting the TCR-451 Transceiver with the ANT-451 Antenna must not constitute more than 3 dB of attenuation. Table 2-1 provides some commonly used coaxial cable types and lists the maximum allowable length for each. Any type of 50-ohm coax may be used, provided the 3-dB limit is not exceeded.
- b. Figure 2-10 illustrates the method of preparing and installing the bayonet-type BNC connectors used at both the TCR-451 Transceiver and ANT-451 Antenna. Careful preparation and installation of these BNC connectors is necessary to ensure optimum system performance.

2.3.3 IND-450/451 Indicator and TCR-451 Transceiver

Remove and install mating connector crimp type contacts in accordance with steps a and b. Table 2-2 lists

Table 2-1. Coax Types and Recommended Lengths.

COAX TYPE NUMBER	RECOMMENDED MAXIMUM LENGTH
RG-122/U	3.2 m (10.5 ft)
RG-142B/U	10 m (33 ft)
RG-178B/U	3 m (10 ft)
RG-223/U	7.6 m (25 ft)

Table 2-2. Special Tools Required for Installation.

DESCRIPTION	MANUFACTURER AND TYPE	S-TEC PART NUMBER
Crimping tool	Cannon, CCT-D*C-1	371-0382-010
Insertion/extraction tool	Cannon, CIET-20HDB	371-8445-010

special tools required to prepare the contacts; figure 2-11 illustrates the use of these special tools.

- a. The connecting wire must be crimped in the contact so that the crimped portion of the contact can enter the connector shell and provide a positive lock of the contact in the shell. Use the crimping tool listed in table 2-2 and crimp each interconnect wire in a contact. Insert contact in the proper connector shell hole and press until locked. To ensure contact is locked securely, pull back lightly on wire.
- b. To remove a contact, use the extraction tool to unlock the contact and pull the contact out of the connector shell from the rear.

2.4 INSTALLATION PROCEDURES

The following installation procedures must be performed as described to ensure proper operation and performance. Any deviation from these instructions may result in reduced performance and/or damage to the equipment.

Warning

In the interest of personal safety, it is recommended that the aircraft battery master switch be turned off to disconnect power to the equipment mount before any electronic equipment is removed from or installed in the aircraft.

2.4.1 ANT-451 Antenna

Placement of the DME antenna should be carefully planned and installation instructions followed closely to ensure optimum performance of the system.

Random placement of the DME antenna may result in aircraft shielding causing dead spots in normal

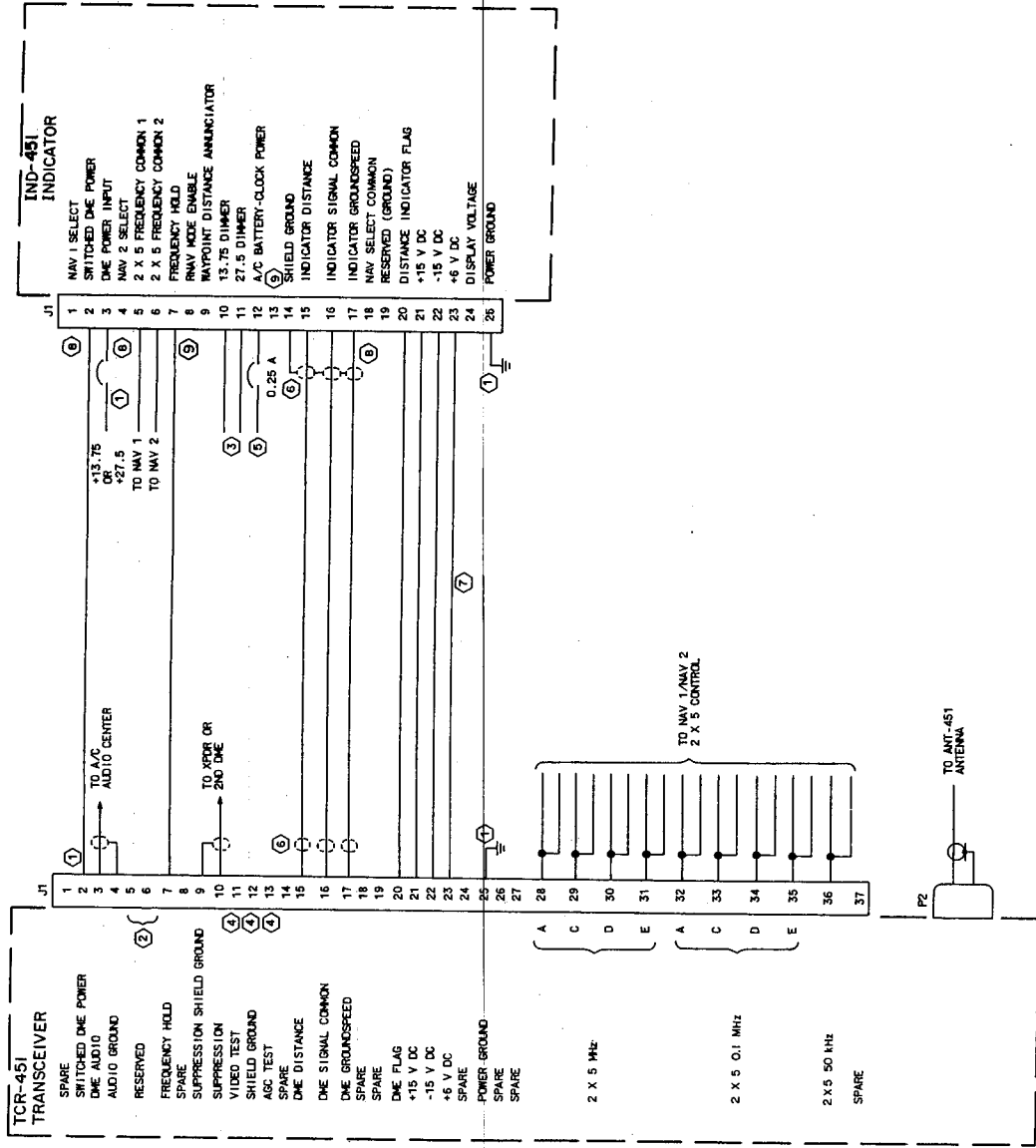
flight attitudes. Using a nonrecommended coaxial cable type, exceeding the maximum recommended cable length for a given type, or allowing excessively sharp bends in the cable, will increase transmission line attenuation resulting in attenuation of the transmitted reply, and thereby reduce the effective range. Therefore, instructions given in steps a through g should be carefully followed:

- a. Select a mounting area well removed from projections such as propellers, landing gear, and engines.
- b. Mount antenna on the bottom surface so that antenna will be vertical in normal flight attitudes. The surface to which the antenna is attached should be a flat plane having the largest possible area.
- c. Ensure good electrical bonding between antenna body and aircraft skin.

Caution

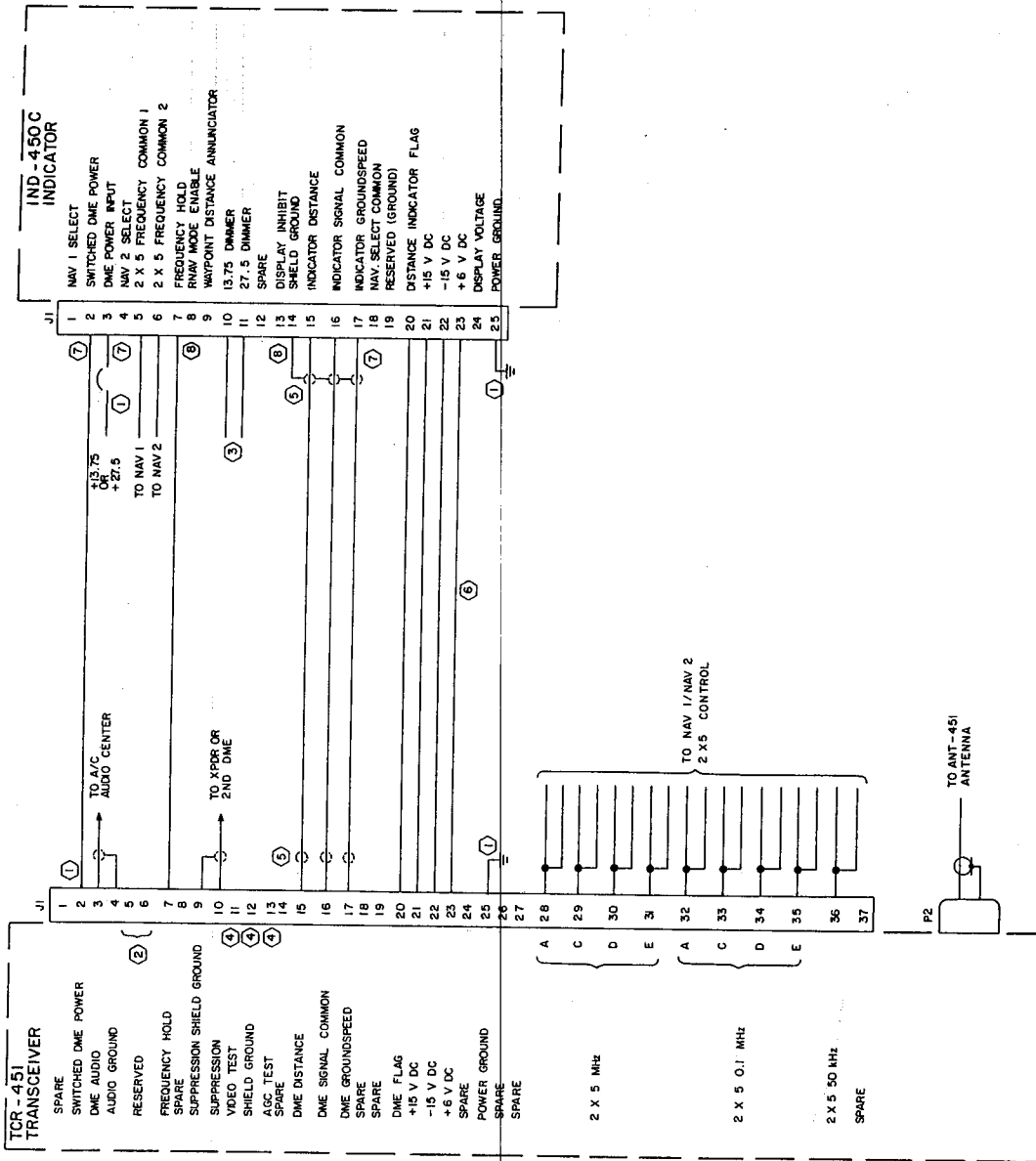
To prevent receiver front end damage, it is important that adequate isolation be provided between two DME antennas or a DME antenna and a transponder antenna. It is possible, with the use of DME Y-channels, for one DME to transmit directly on the receiver frequency of a second DME as well as on the receiver frequency of the transponder. A transponder can also transmit directly on the receiver frequency of the DME. Minimum isolation of 40 dB between L-band systems is suggested (this includes antenna isolation plus cable losses). A separation of 1.2 m (4 ft) between L-band antennas on a common ground plane provides about 32 dB of isolation. The isolation increases 6 dB each time the separation is doubled; that is, 38 dB for 2.4 m (8 ft), 44 dB for 4.9 m (16 ft), etc.

- d. In addition to the preceding caution, it is also recommended that maximum separation be observed between the ADF antenna (sense antenna if integral antenna is not installed) and the ANT-451 Antenna.
- e. Refer to figure 2-12 for the ANT-451 Antenna outline and mounting dimensions, and drill the required mounting holes as indicated.
- f. Position the antenna in the mounting holes after all burrs have been removed, and secure in position using the mounting hardware provided in the ANT-451 installation kit, S-TEC part number 628-5131-001.



NOTES:

- ① FOR 13.75 V OPERATION USE 5 A BREAKER. FOR 27.5 V OPERATION USE 3 A BREAKER. WIRES CARRYING 13.75/27.5 V (INCLUDING POWER LARBER) MUST BE 22 AWG OR LARGER; ALL OTHERS MUST BE 24 AWG OR LARGER.
- ② RESERVED FOR OPTIONAL DISTANCE GATE CIRCUIT. IF INSTALLED, USE SHIELDED PAIR, AND CONNECT CENTER CONDUCTOR TO J1-5; SHIELD TO J1-6.
- ③ FOR 13.75 V OPERATION GROUND P1-11; FOR 27.5 V OPERATION LEAVE P1-10 OPEN.
- ④ P1-11, 12, AND 13 ARE FOR TESTING PURPOSES ONLY.
- ⑤ CONNECT DIRECTLY TO BATTERY CIRCUIT (14 V OR 28 V) IN ACCORDANCE WITH FAA ADVISORY CIRCULAR AC-20-54 OR SUCCEEDING DOCUMENT.
- ⑥ GROUND SHIELDS AT INDICATOR ONLY.
- ⑦ +6 VDC INTERCONNECT WIRE MUST BE 20 AWG.
- ⑧ IND-451 INDICATORS WITH SERVICE BULLETIN NO. 1 REQUIRE A JUMPER ON THE AIRCRAFT MATING PLUG FOR USE WITH A JUMPER ON THE INDICATOR. THIS JUMPER IS USED FOR R-NAV OPERATION; WIRE JUMPER FROM PIN 18 TO PIN 1, IF NO. 2 NAV RECEIVER IS USED, WIRE JUMPER FROM PIN 18 TO PIN 4.
- ⑨ IND-451 WITHOUT SB 4: PIN 13 IS 32 KHZ TEST.
IND-451 WITH SB 4: PIN 13 IS RNAV SELECT WARN.
IND-451 WITH SB 4 AND WITHOUT RNAV SHOULD CONNECT PIN 13 TO PIN 8.
IND-451 WITH SB 4 AND WITH RNAV SHOULD LEAVE PIN 13 OPEN.
IND-451 WITHOUT SB 4 SHOULD LEAVE PIN 13 OPEN.



NOTES:

- ① FOR 13.75 V OPERATION USE 5 A BREAKER FOR 27.5 V OPERATION USE 3 A BREAKER. WIRES CARRYING 13.75/27.5 V (INCLUDING POWER GROUND) MUST BE 22 AWG OR LARGER. ALL OTHERS MUST BE 24 AWG OR LARGER.
- ② RESERVED FOR OPTIONAL DISTANCE GATE CIRCUIT. IF INSTALLED, USE SHIELDED PAIR, AND CONNECT CENTER CONDUCTOR TO J1-5, SHIELD TO J1-6.
- ③ FOR 13.75 V OPERATION GROUND P1-1; FOR 27.5 V OPERATION LEAVE P1-10 OPEN.
- ④ P1-11,12, AND 13 ARE FOR TESTING PURPOSES ONLY.
- ⑤ GROUND SHIELDS AT INDICATOR ONLY.
- ⑥ +6 VDC INTERCONNECT WIRE MUST BE 20 AWG.
- ⑦ IND-450C INDICATORS REQUIRE A JUMPER ON THE AIRCRAFT MATING PLUG. FOR USE WITH R-NAV EQUIPMENTS, IF NO.1 NAV RECEIVER IS USED, FOR R-NAV EQUIPMENTS FROM JUMPER FROM PIN B TO PIN 1, IF NO.2 NAV RECEIVER IS USED, WIRE JUMPER FROM PIN B TO PIN 4.
- ⑧ FOR INSTALLATIONS WITHOUT R-NAV EQUIPMENTS, CONNECT PIN 13 TO PIN 8, OTHERWISE LEAVE OPEN.

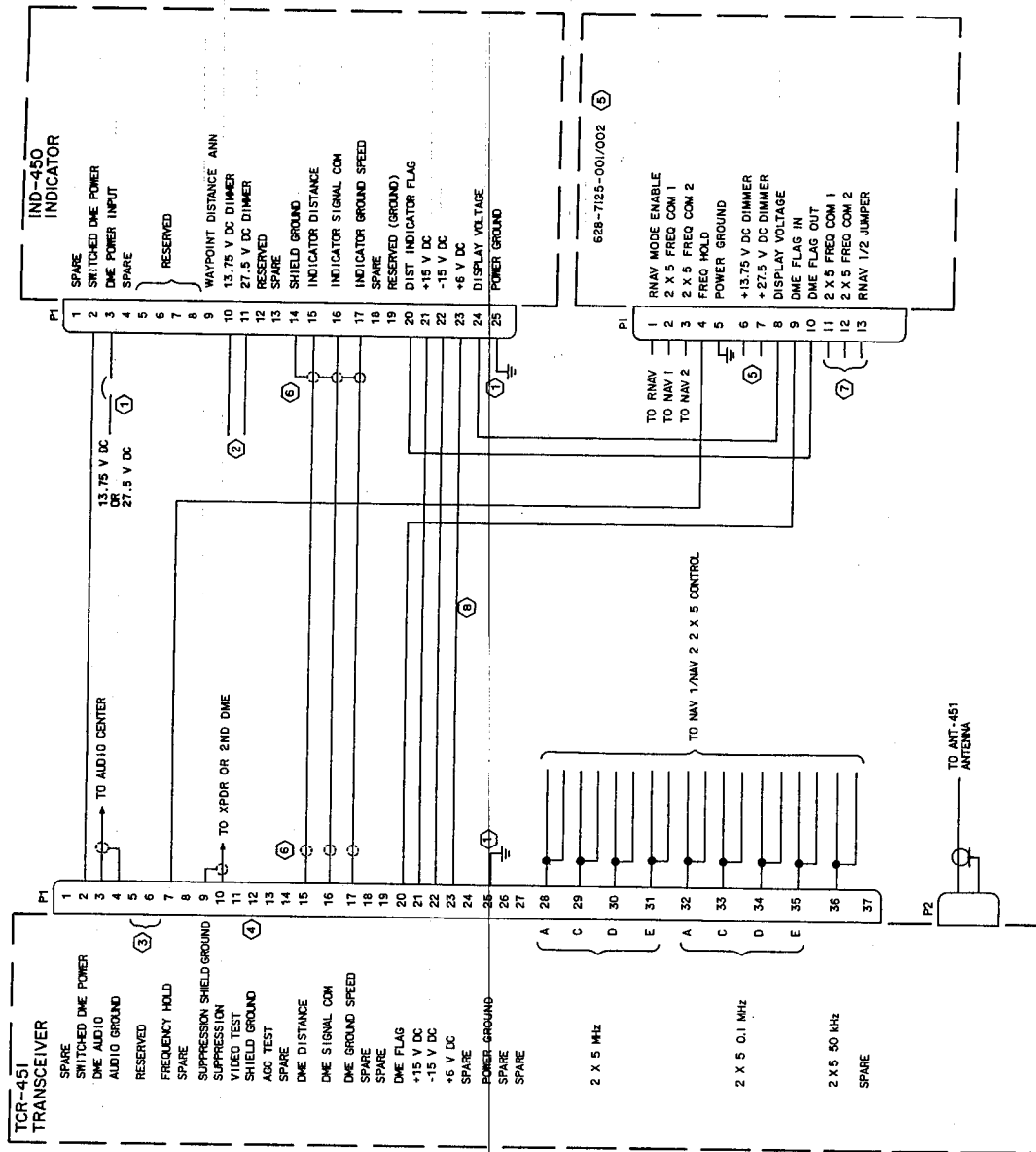
628 - 8278

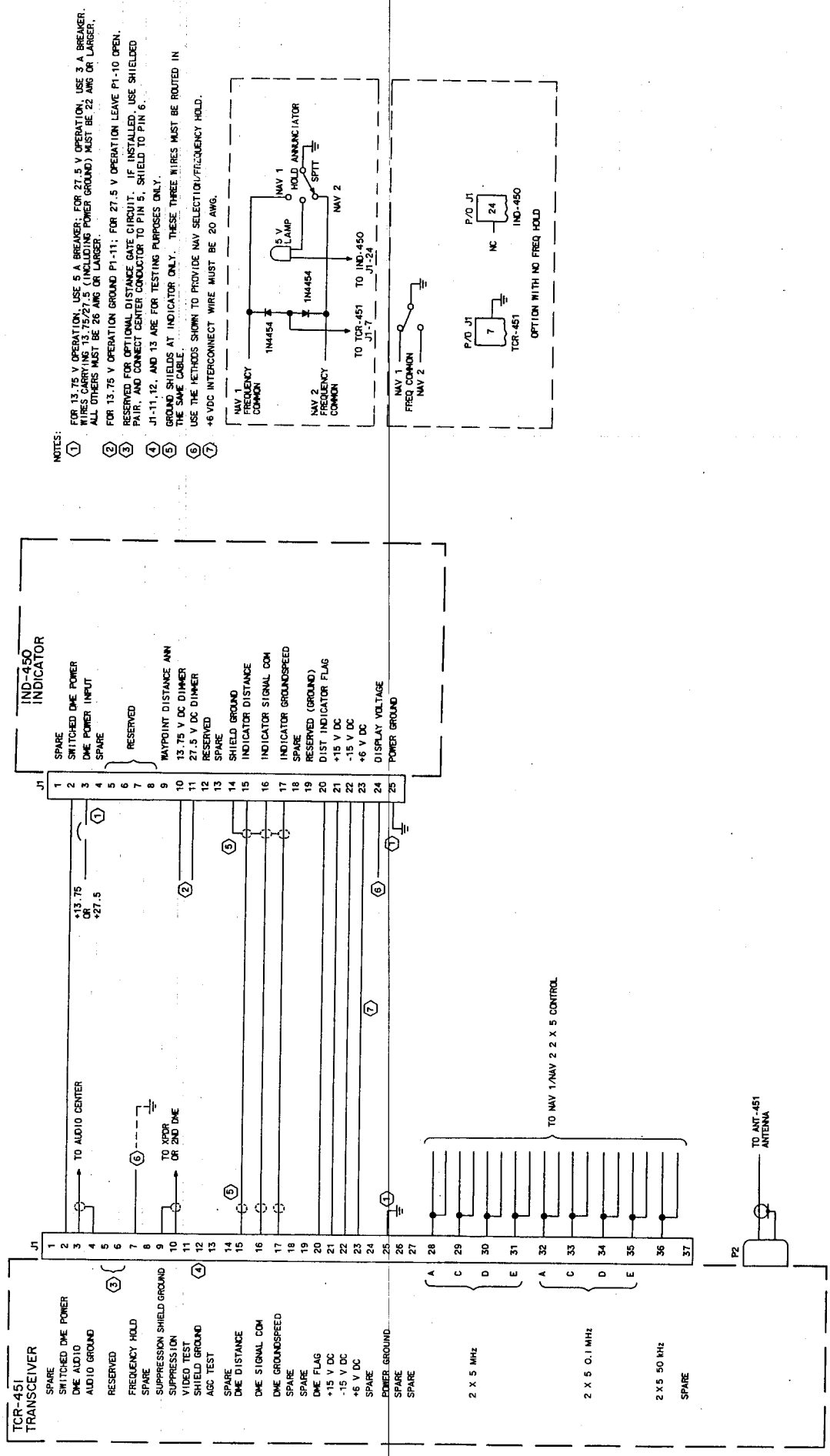
Interconnect Wiring Diagram
Using IND-450C Indicator
Figure 2-2

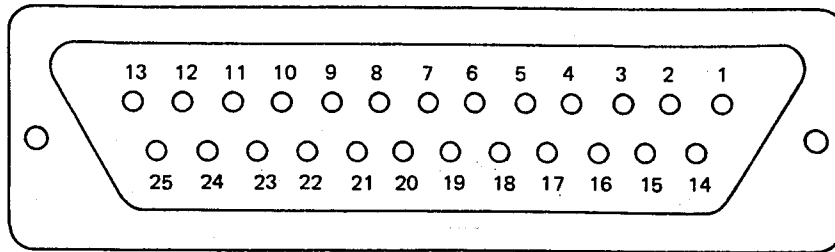
Revised 2 August 1984

2-5/2-6

- NOTES:
- ① FOR 13.75 V OPERATION, USE 5 A BREAKER. FOR 27.5 V OPERATION, USE 3 A BREAKER. WIRES CARRYING 13.75/27.5 (INCLUDING POWER GROUND) MUST BE 22 AWG OR LARGER.
 - ② FOR 13.75 V OPERATION GROUND P1-11; FOR 27.5 V OPERATION LEAVE P1-10 OPEN. RESERVED FOR OPTIONAL DISTANCE GATE CIRCUIT. IF INSTALLED, USE SHIELDED PAIR, AND CONNECT CENTER CONDUCTOR TO PIN 5, SHIELD TO PIN 6.
 - ③ P1-11, 12, AND 13 ARE FOR TESTING PURPOSES ONLY.
 - ④ FOR 13.75 V OPERATION USE NAV SYSTEM MODE CONTROL 628-7125-001 AND CONNECT PIN 6 TO AIRCRAFT LIGHTING BUS. FOR 27.5 V OPERATION, USE 628-7125-002 AND CONNECT PIN 7 TO LIGHTING BUS.
 - ⑤ GROUND SHIELDS AT INDICATOR ONLY. THESE THREE WIRES MUST BE ROUTED IN THE SAME CABLE.
 - ⑥ IF NAV 1 IS COUPLED TO RNAV, JUMPER PIN 13 TO PIN 11; IF NAV 2 IS COUPLED TO RNAV, JUMPER PIN 13 TO PIN 12.
 - ⑦ +6 VDC INTERCONNECT WIRE MUST BE 20AWG.







MATING CONNECTOR
(VIEWED FROM MATING SIDE)

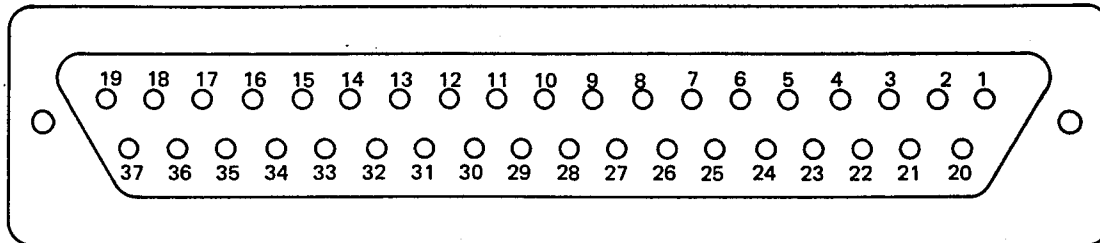
① 1 NAV 1 SELECT	② 13 DISPLAY INHIBIT
2 SWITCHED DME POWER	14 SHIELD GROUND
① 3 DME POWER INPUT	15 INDICATOR DISTANCE
4 NAV 2 SELECT	16 INDICATOR SIGNAL COMMON
5 2 X 5 FREQUENCY COMMON 1	① 17 INDICATOR GROUND SPEED
6 2 X 5 FREQUENCY COMMON 2	18 NAV SELECT COMMON
7 FREQUENCY HOLD	19 SHIELD GROUND
8 RNAV MODE ENABLE	20 DISTANCE INDICATOR FLAG
9 WAYPOINT DISTANCE ANNUN	21 + 15 V DC
10 13.75 DIMMER	22 - 15 V DC
11 27.5 DIMMER	23 + 6 V DC
12 AIRCRAFT BATTERY- CLOCK POWER	24 RESERVED
	25 POWER GROUND

① PINS 1, 4, AND 18 WERE SPARES PRIOR TO SB1.

② PIN 13 WAS 32 kHz TEST PRIOR TO SB4.

628-6893

IND-451 Indicator, Mating Connector Pin Assignments
Figure 2-5

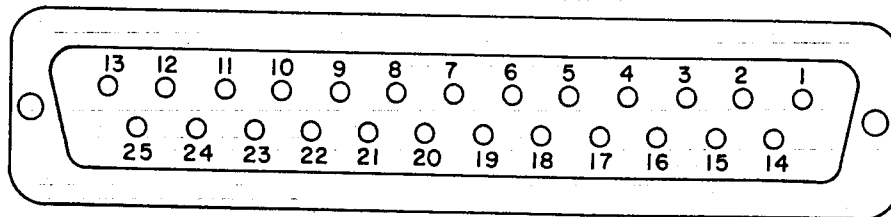


MATING CONNECTOR
(VIEWED FROM WIRING SIDE)

1 SPARE	19 SPARE
2 SWITCHED DME POWER	20 DME FLAG
3 DME AUDIO	21 +15 V DC
4 AUDIO GROUND	22 -15V DC
5 RESERVED (DISTANCE GATE)	23 +6 V DC
6 RESERVED (SHIELD GROUND)	24 SPARE
7 FREQUENCY HOLD	25 POWER GROUND
8 SPARE	26 SPARE
9 SUPPRESSION SHIELD GROUND	27 SPARE
10 SUPPRESSION	28 A MHz 2X5
11 RESERVED (VIDEO TEST)	29 C MHz 2X5
12 RESERVED (SHIELD GROUND)	30 D MHz 2X5
13 RESERVED (AGC TEST)	31 E MHz 2X5
14 SPARE	32 A kHz 2X5
15 DME DISTANCE	33 C kHz 2X5
16 DME SIGNAL COMMON	34 D kHz 2X5
17 DME GROUND SPEED	35 E kHz 2X5
18 SPARE	36 50 kHz 2X5
	37 SPARE

628-6894

TCR-451 Transceiver, Mating Connector Pin Assignments
Figure 2-6

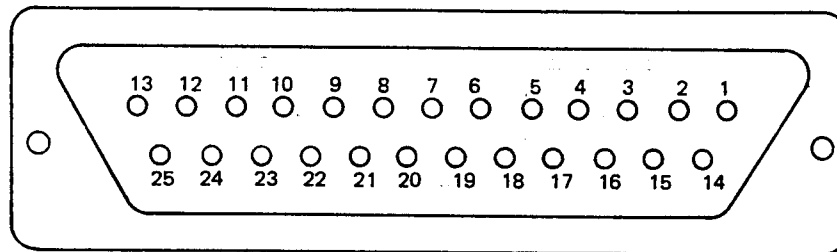


MATING CONNECTOR
(VIEWED FROM MATING SIDE)

- | | | | |
|----|-------------------------------|----|-------------------------|
| 1 | NAV 1 SELECT | 16 | INDICATOR SIGNAL COMMON |
| 2 | SWITCHED DME POWER | 17 | INDICATOR GROUND SPEED |
| 3 | DME POWER INPUT | 18 | NAV SELECT COMMON |
| 4 | NAV 2 SELECT | 19 | RESERVED (GROUND) |
| 5 | 2 X 5 FREQUENCY COMMON 1 | 20 | DISTANCE INDICATOR FLAG |
| 6 | 2 X 5 FREQUENCY COMMON 2 | 21 | +15 V D C |
| 7 | FREQUENCY HOLD | 22 | -15 V D C |
| 8 | RNAV MODE ENABLE | 23 | +6 V DC |
| 9 | WAYPOINT DISTANCE ANNUNCIATOR | 24 | DISPLAY VOLTAGE |
| 10 | 13.75 V DIMMER | 25 | POWER GROUND |
| 11 | 27.5 V DIMMER | | |
| 12 | SPARE | | |
| 13 | DISPLAY INHIBIT | | |
| 14 | SHIELD GROUND | | |
| 15 | INDICATOR DISTANCE | | |

628-8277

IND-450C Indicator, Mating Connector Pin Assignments
Figure 2-7

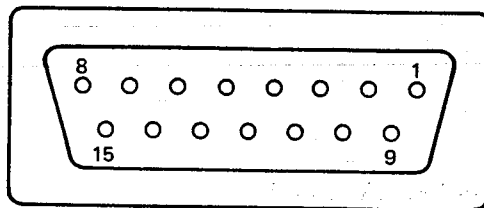


MATING CONNECTOR
(VIEWED FROM WIRING SIDE)

1	SPARE	13	SPARE
2	SWITCHED DME POWER	14	SHIELD GROUND
3	DME POWER INPUT	15	INDICATOR DISTANCE
4	SPARE	16	INDICATOR SIGNAL COMMON
5	RESERVED	17	INDICATOR-GROUNDSPEED
6	RESERVED	18	SPARE
7	RESERVED	19	SHIELD GROUND
8	RESERVED	20	DISTANCE INDICATOR FLAG
9	WAYPOINT DISTANCE	21	+15 V DC
	ANNUNCIATOR	22	-15 V DC
10	13.75 V DC DIMMER	23	+6 V DC
11	27.5 V DC DIMMER	24	RESERVED
12	RESERVED	25	POWER GROUND

628-6892

IND-450 Indicator, Mating Connector Pin Assignments
Figure 2-8

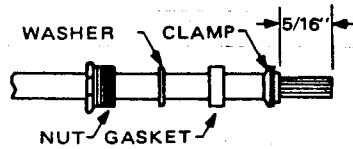


NAV SYSTEM MODE CONTROL
MATING CONNECTOR
(VIEWED FROM WIRING SIDE)

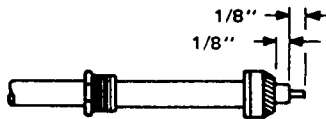
- 1 RNAV MODE ENABLE
- 2 2 x 5 FREQ COM 1
- 3 2 x 5 FREQ COM 2
- 4 FREQ HOLD
- 5 POWER GROUND
- 6 13.75 V DIMMER
- 7 27.5 V DIMMER
- 8 DISPLAY VOLTAGE
- 9 DME FLAG IN
- 10 DME FLAG OUT
- 11 2 x 5 FREQ COM 1
- 12 2 x 5 FREQ COM 2
- 13 RNAV 1/2 JUMPER
- 14 NOT USED
- 15 NOT USED

628-7260

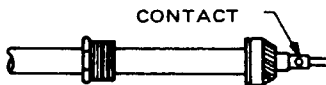
*NAV System Mode Control, Mating Connector Pin Assignments
Figure 2-9*



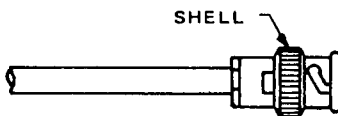
TRIM CABLE INSULATION AND SLIDE PARTS ON CABLE AS SHOWN. COMB OUT BRAID



FOLD BRAID OVER CLAMP WITHOUT CROSSING STRANDS & TRIM OFF EXCESS AS SHOWN. CUT DIELECTRIC AND CENTER CONDUCTOR TO LENGTH AND TIN CENTER CONDUCTOR.



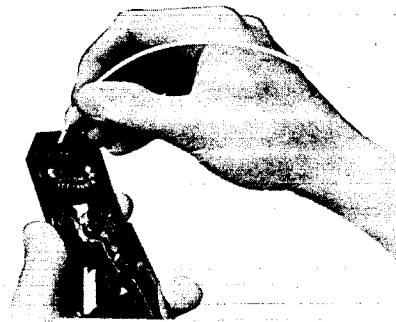
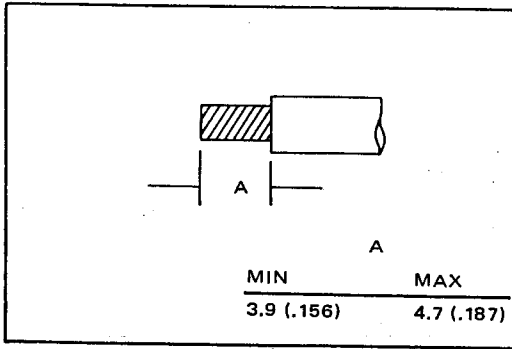
SLIDE CONTACT OVER CONDUCTOR UNTIL FLUSH AGAINST DIELECTRIC & SOLDER. DO NOT HEAT EXCESSIVELY. THIS WILL CAUSE THE DIELECTRIC TO SWELL THEREBY PREVENTING PROPER FITTING IN THE CONNECTOR SHELL.



SLIDE THE CABLE ASSY INTO THE SHELL AND TIGHTEN THE NUT SECURELY.

628-6049
TP4-4315-011

BNC Installation
Figure 2-10



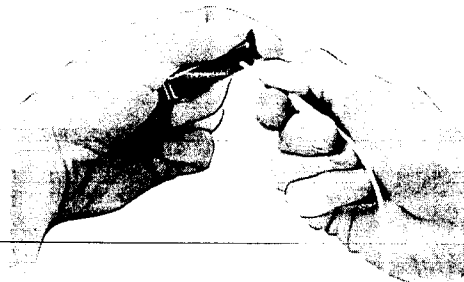
WIRE STRIPPING

1. CUT WIRES TO LENGTH. STRIP INSULATION PER ABOVE ILLUSTRATION. CHECK FOR BROKEN OR FRAYED WIRES.

CONTACT CRIMPING

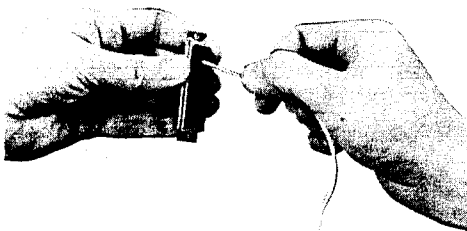
2. INSERT CONTACT AND WIRE INTO PROPER CRIMPING TOOL (AND LOCATOR, IF REQUIRED) CRIMP CONTACT TO WIRE. INSPECT CRIMP.

NOTE: DIMENSIONS ARE IN MM (IN.).

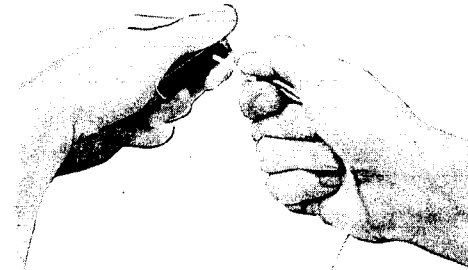


CONTACT INSERTION

3. CENTER WIRED CONTACT IN GROOVE OF INSERTION TOOL, WITH TOOL TIP BUTTING CONTACT SHOULDER. INSERT CONTACT INTO CAVITY UNTIL A POSITIVE STOP IS FELT. INSPECT INSERTION.



4. TO BE SURE CONTACT IS LOCKED SECURELY, PULL BACK LIGHTLY ON WIRE. REPEAT FOR BALANCE OF CONTACTS, WORKING ROW BY ROW ACROSS THE INSULATOR.

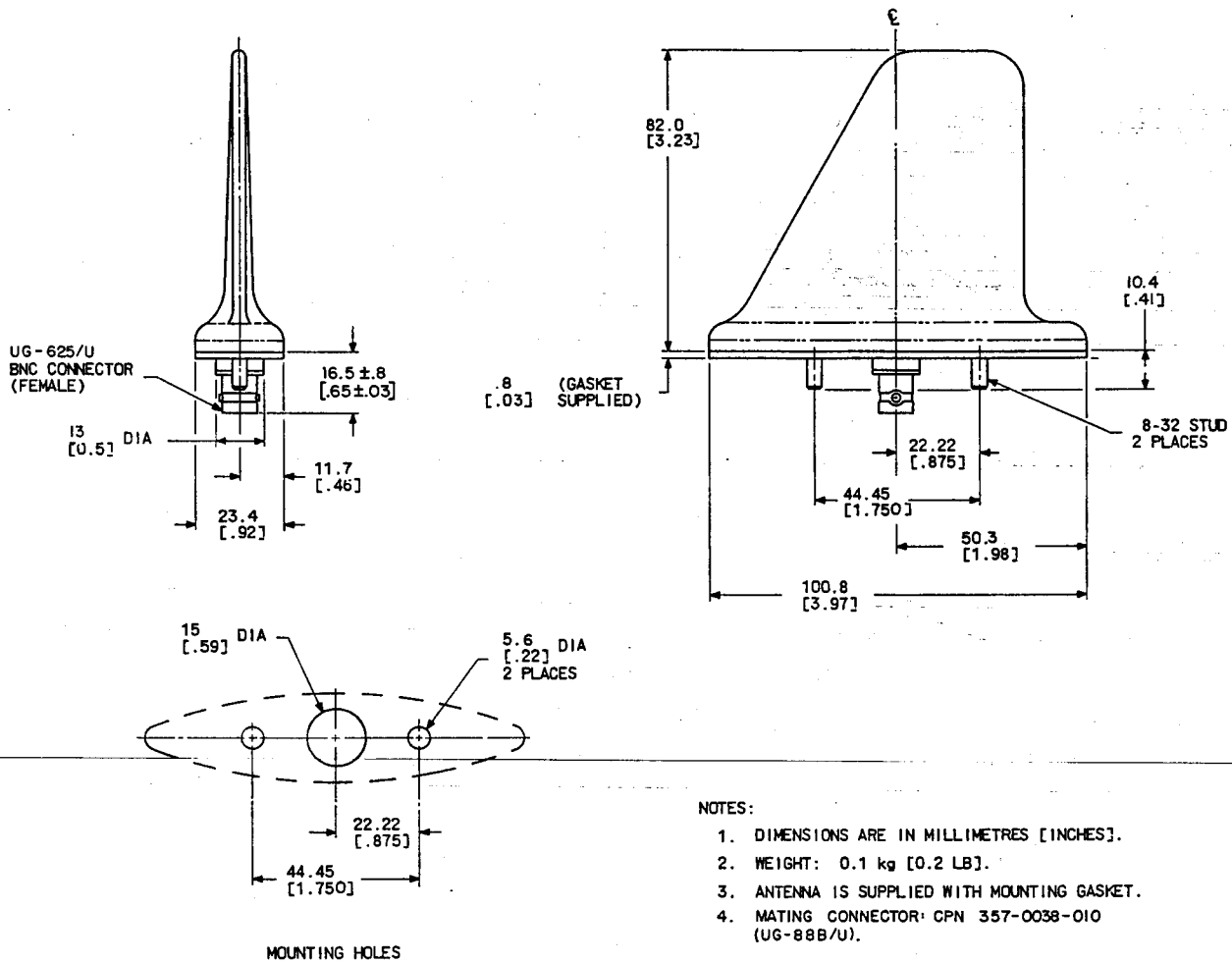


CONTACT EXTRACTION

5. PLACE WIRE INTO EXTRACTION TOOL TIP. INSERT TOOL TIP INTO CONTACT CAVITY UNTIL TIP BOTTOMS AGAINST CONTACT SHOULDER, RELEASING TINES. HOLD WIRE AGAINST TOOL WITH FINGER AND REMOVE TOOL AND CONTACT. REPEAT FOR BALANCE OF CONTACTS.

628-5699-001

Use of Crimping and Insertion/Extraction Tools
Figure 2-11



NOTES:

1. DIMENSIONS ARE IN MILLIMETRES [INCHES].
2. WEIGHT: 0.1 kg [0.2 LB].
3. ANTENNA IS SUPPLIED WITH MOUNTING GASKET.
4. MATING CONNECTOR: CPN 357-0038-010 (UG-88B/U).

628-6887

ANT-451 Antenna, Outline and Mounting Dimensions
Figure 2-12

g. Install standard BNC connector, provided with the installation kit, on antenna cable as shown in figure 2-10. Connect cable mating connector to antenna. Any bends in the coaxial cable should have at least 76-mm (3-in) radius.

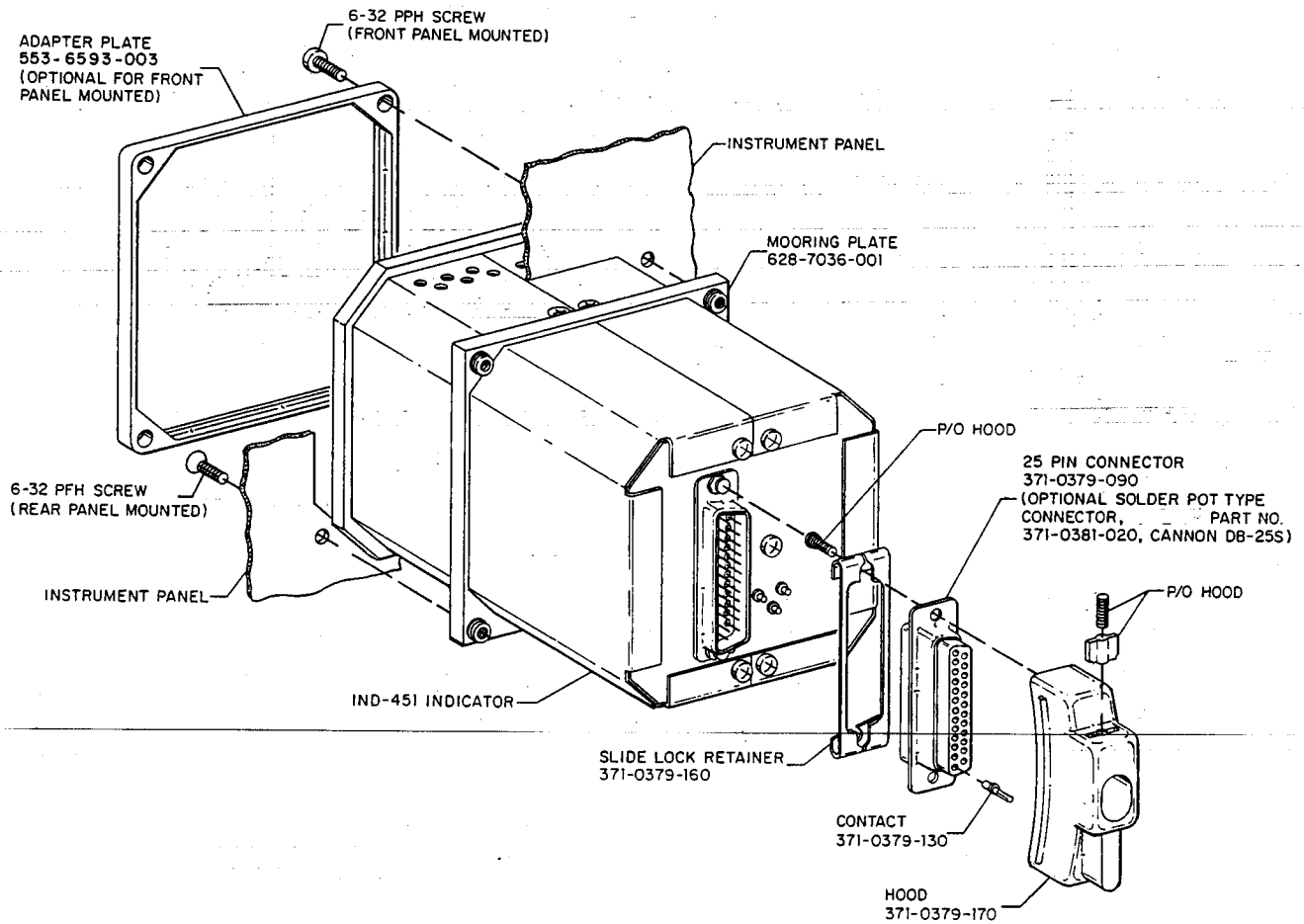
2.4.2 IND-451 Indicator

Note

Although cooling air is not required for operation of the IND-451 Indicator,

reliability will be increased when installation includes this feature.

- a. Installation kit **S-TEC Part Number** 628-6841-001, supplied with the IND-451 Indicator, is required for installation (refer to figure 2-13).
- b. The installation kit supplied with the IND-451 Indicator contains a mooring plate that must be used to attach the IND-451 to the instrument panel. If behind-the-panel installation is to be made, only the mooring plate and four #6-32 screws are required for attachment. However, if front panel installation is desired, an optional adapter plate,



628-7164

IND-451 Indicator, Installation Kit (CPN 628-6402-001)
Figure 2-13

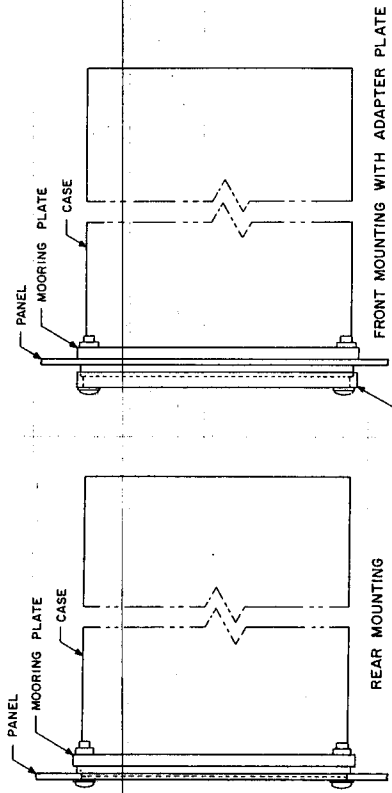
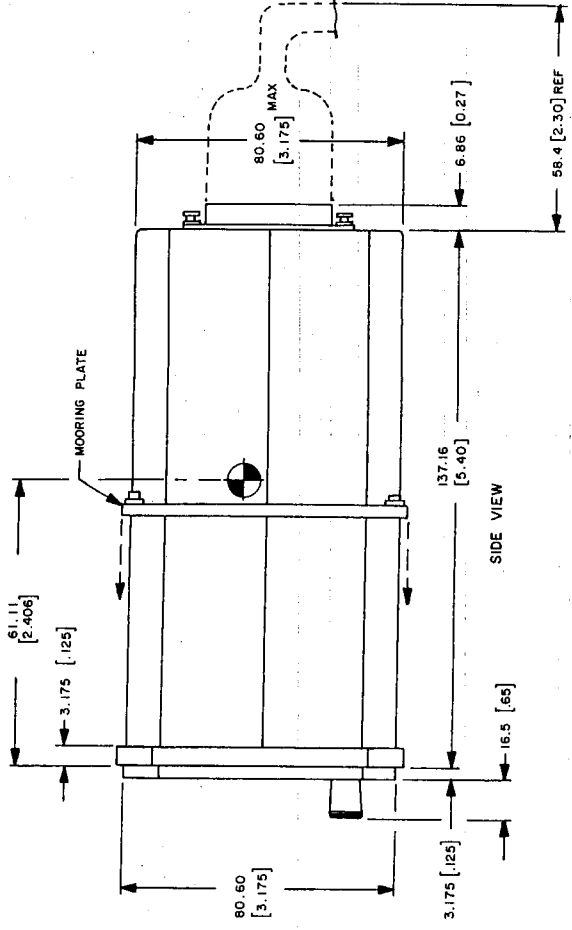
S-TEC Part Number 553-6593-003, must be used. Regardless of mounting method selected, the instrument panel cutout will be the same.

Select a mounting position that is convenient for pilot view and control, and make the instrument panel cutout using dimensions included in figure 2-14.

c. If behind-the-panel mounting is desired, slide the mooring plate over the indicator from the rear and

butt against the bezel. Position the IND-451 in place from behind the panel and secure using four #6-32 screws.

d. If installation from the front of the panel is desired, slide the IND-451 into position through the panel cutout. From behind the panel, slide the mooring plate over the IND-451 case and continue forward until tight against instrument panel. Position the optional adapter plate on front of the indicator (overlaps instrument panel) and secure in place using four #6-32 screws.

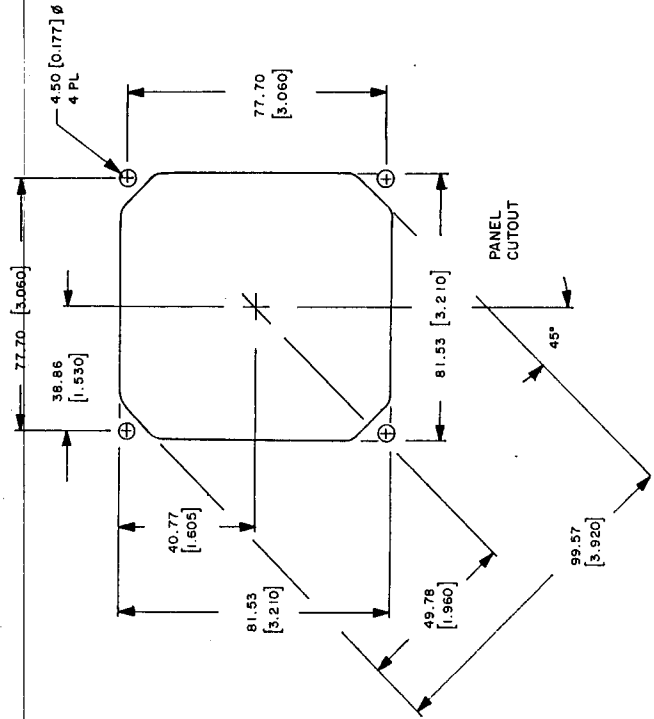
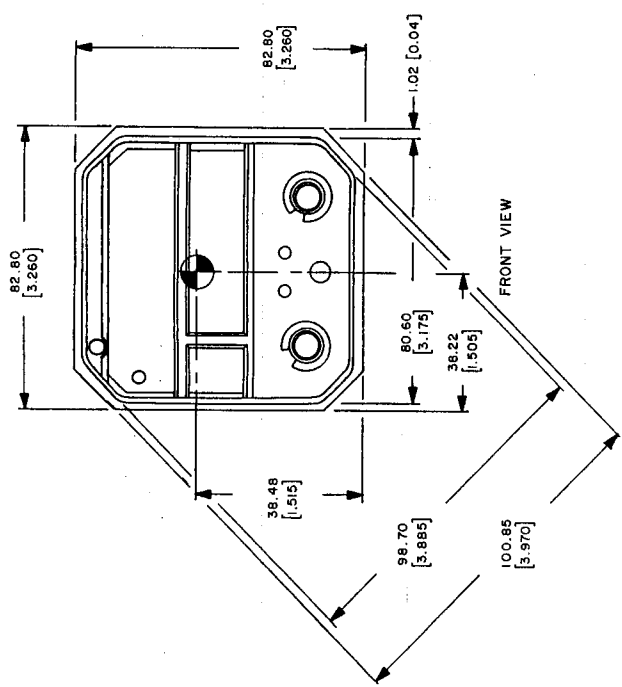


ADAPTER PLATE (553-6593-003)

NOTES:

- ① DIMENSIONS ARE IN mm [IN].
- ② WEIGHT: .41 kg [.9 LB].
- ③ IND-451 CONNECTOR CHART.

UNIT CONNECTOR	S-TEC PART NUMBER	CANNON PART NUMBER
CONNECTOR BLOCK	371-0379-010	DBC-25P-FO
CONTACTS	371-0379-100	D110238-34
MATING CONNECTOR		
CONNECTOR BLOCK	371-0379-090	DBC-25S-FO
CONTACTS	371-0379-130	D110238-35
SOLDER POT CONNECTOR (OPTIONAL)	371-0381-020	DB-25S



2.4.3 IND-450C Indicator

Note

Although cooling air is not required for operation of the IND-450C Indicator, reliability will be increased when the installation includes this feature.

- a. Installation kit Collins part number 628-9277-001, supplied with the IND-450C Indicator, is required for installation (refer to figure 2-15.)

Note

Installation kit 628-9277-001 does not come with contacts or connector. These must be supplied when installing the IND-450C.

- b. The installation kit supplied with the IND-450C Indicator contains a mooring plate that must be used to attach the IND-450C to the instrument panel. If behind-the-panel installation is to be made, only the mooring plate and four #6-32 screws are required for attachment. However, if front panel installation is desired, an optional adapter plate **S-TEC** part number 553-6593-003, must be used. Regardless of mounting method selected, the instrument panel cutout will be the same. Select a mounting position that is convenient for pilot view and control, and make the instrument panel cutout using dimensions included in figure 2-16.
- c. If behind-the-panel mounting is desired, slide the mooring plate over the indicator from the rear and butt against the bezel. Position the IND-450C in place from behind the panel and secure using four #6-32 screws.
- d. If installation from the front of the panel is desired, slide the IND-450C into position through the panel cutout. From behind the panel, slide the mooring plate over the IND-450C case and continue forward until tight against instrument panel. Position the optional adapter plate on front of the indicator (overlaps instrument panel) and secure in place using four #6-32 screws.

2.4.4 TCR-451 Transceiver

- a. Installation kit **S-TEC** part number 628-6463-001, supplied with the TCR-451, is required for installation (refer to figure 2-17).

Note

Although cooling air is not required for normal operation of the TCR-451, ample space around the radio and/or cooling air will increase reliability by aiding in heat dissipation. This practice pertains to all avionics equipment as well as to the TCR-451 Transceiver.

- b. Select any convenient mounting location that allows horizontal mounting of the TCR-451, provides at least 25.4 mm (1.0 in) air space above the transceiver, and allows for cable access and relief. Using the dimensions supplied in figure 2-18, drill the four holes required for tray attachment.
- c. Deburr all holes and attach the tray to the airframe using four #8-32 panhead screws. Use external shakeproof lockwashers to provide good grounding to the airframe.
- d. Place the TCR-451 in its tray so that the transceiver rear panel lip engages the back lip of the tray. Using a Phillips screwdriver, tighten the two screw-actuated retainers over the front lip of the transceiver.

2.4.5 IND-450 Indicator

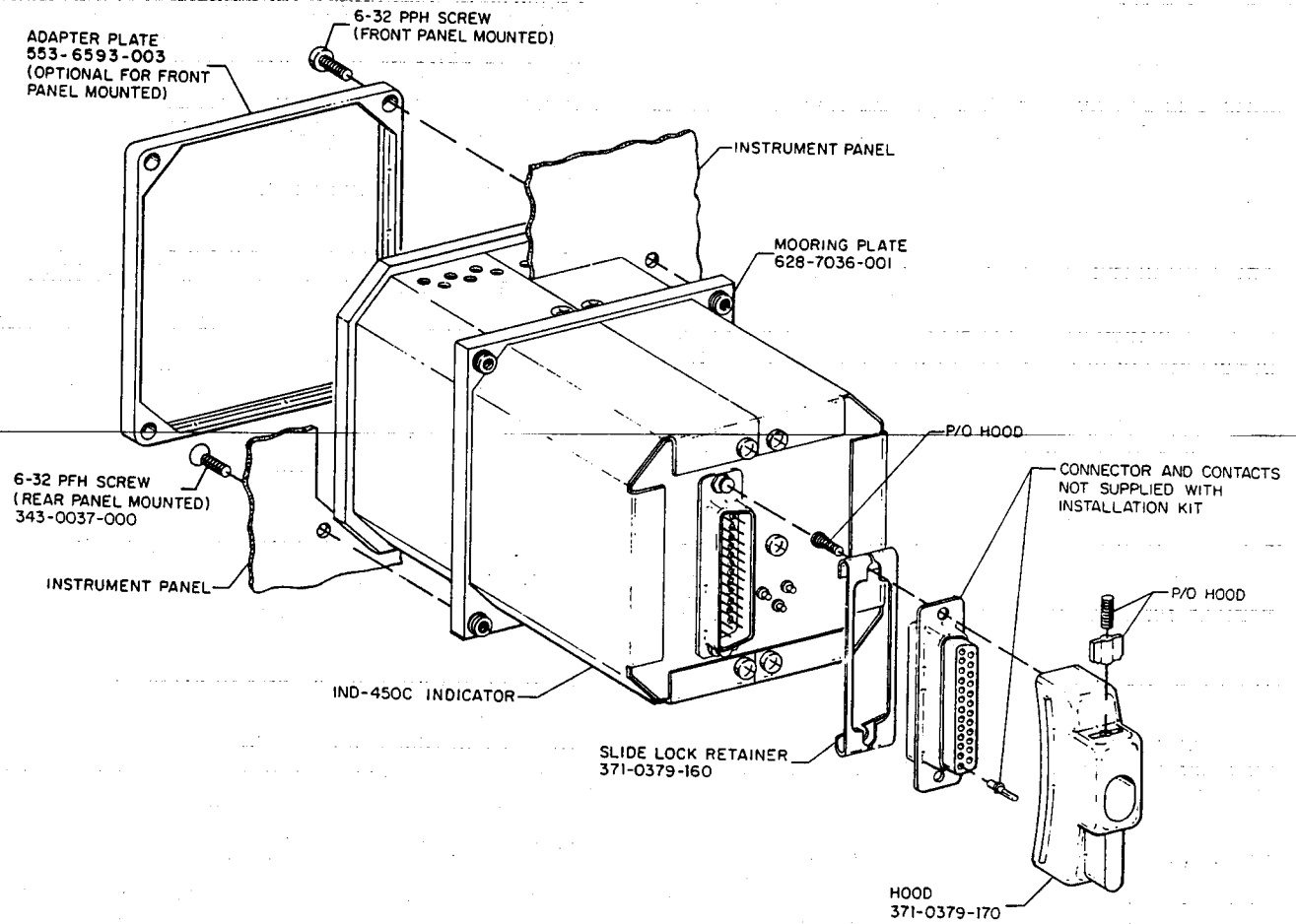
Note

Although cooling air is not required for operation of the IND-450 Indicator, reliability will be increased when installation includes this feature.

- a. Installation kit **S-TEC** part number 628-6402-001, supplied with the IND-450 Indicator, is required for installation (refer to figure 2-19).
- b. The IND-450 is rigidly mounted to the aircraft instrument panel. Using the panel cutout dimensions of figure 2-20, make the cutout and drill the four holes required for mounting.
- c. Insert the IND-450 into the cutout hole from behind the panel and secure in place using the four #4-40 screws provided in the installation kit. Mounting-screw length is not critical.

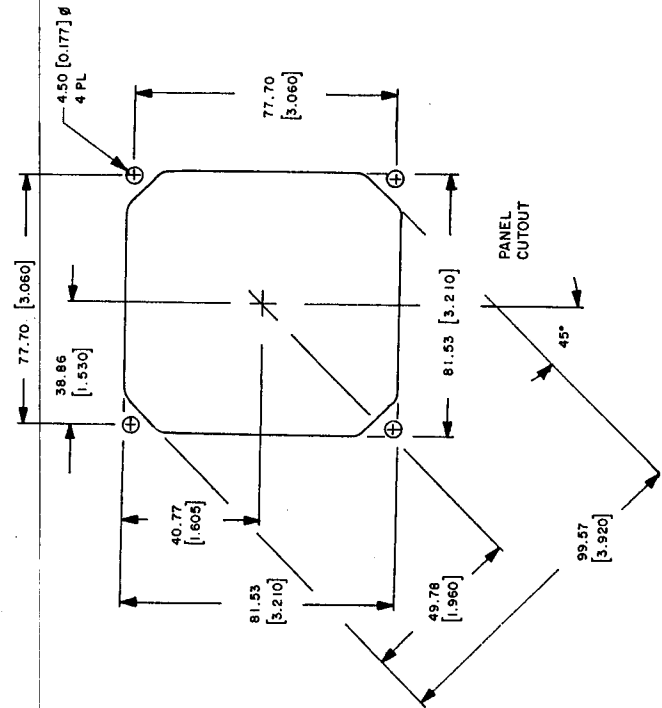
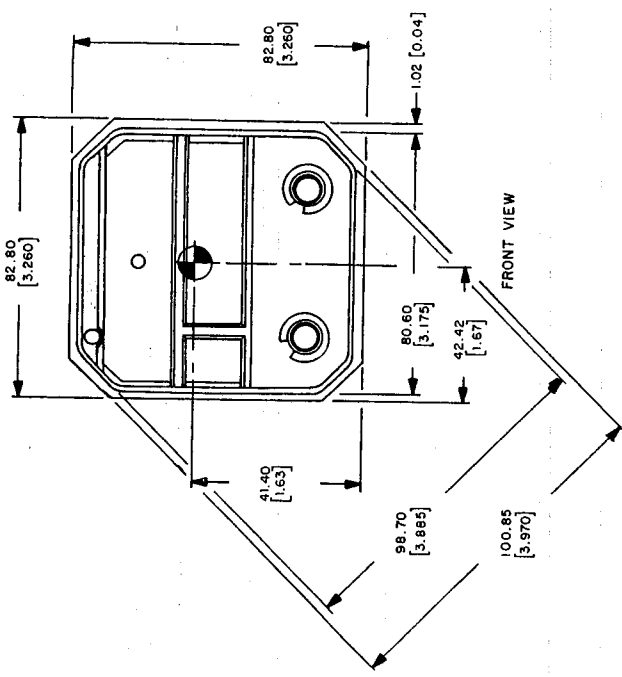
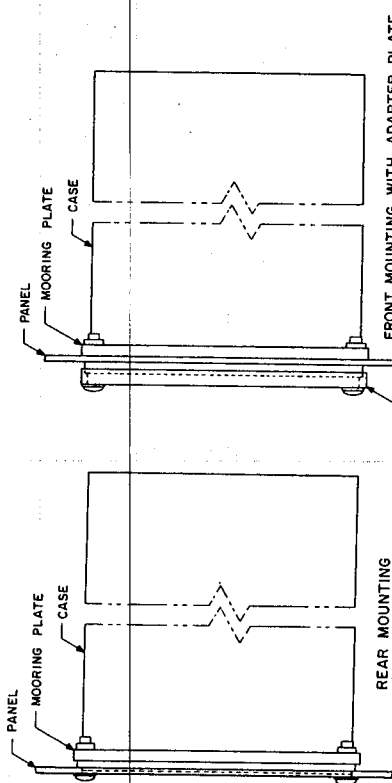
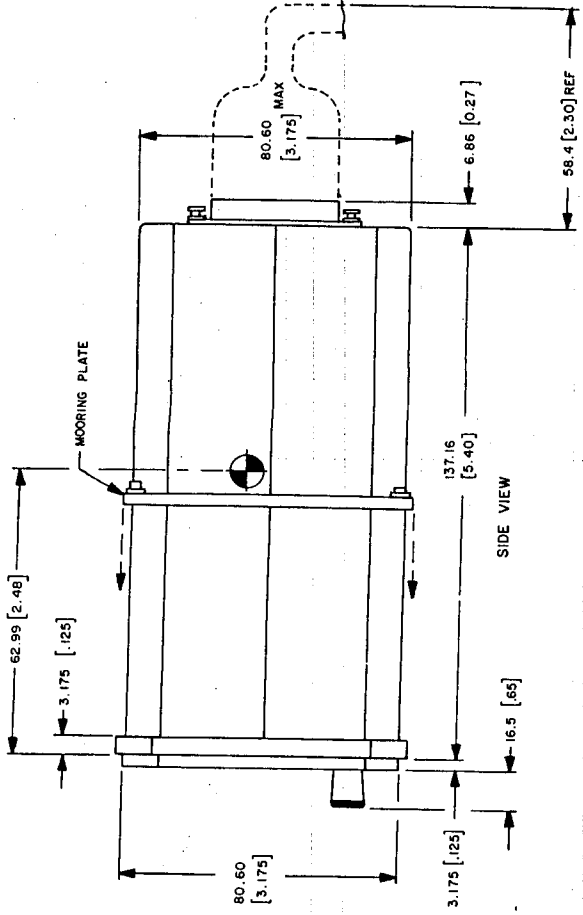
2.4.6 NAV System Mode Control 628-7125-001, -002

- a. Since the NAV system mode control provides annunciation of the selected position, special attention must be given to the mounting location. Select a spot that will always be in the pilot's immediate field of view and is easily accessible for changing switch positions.



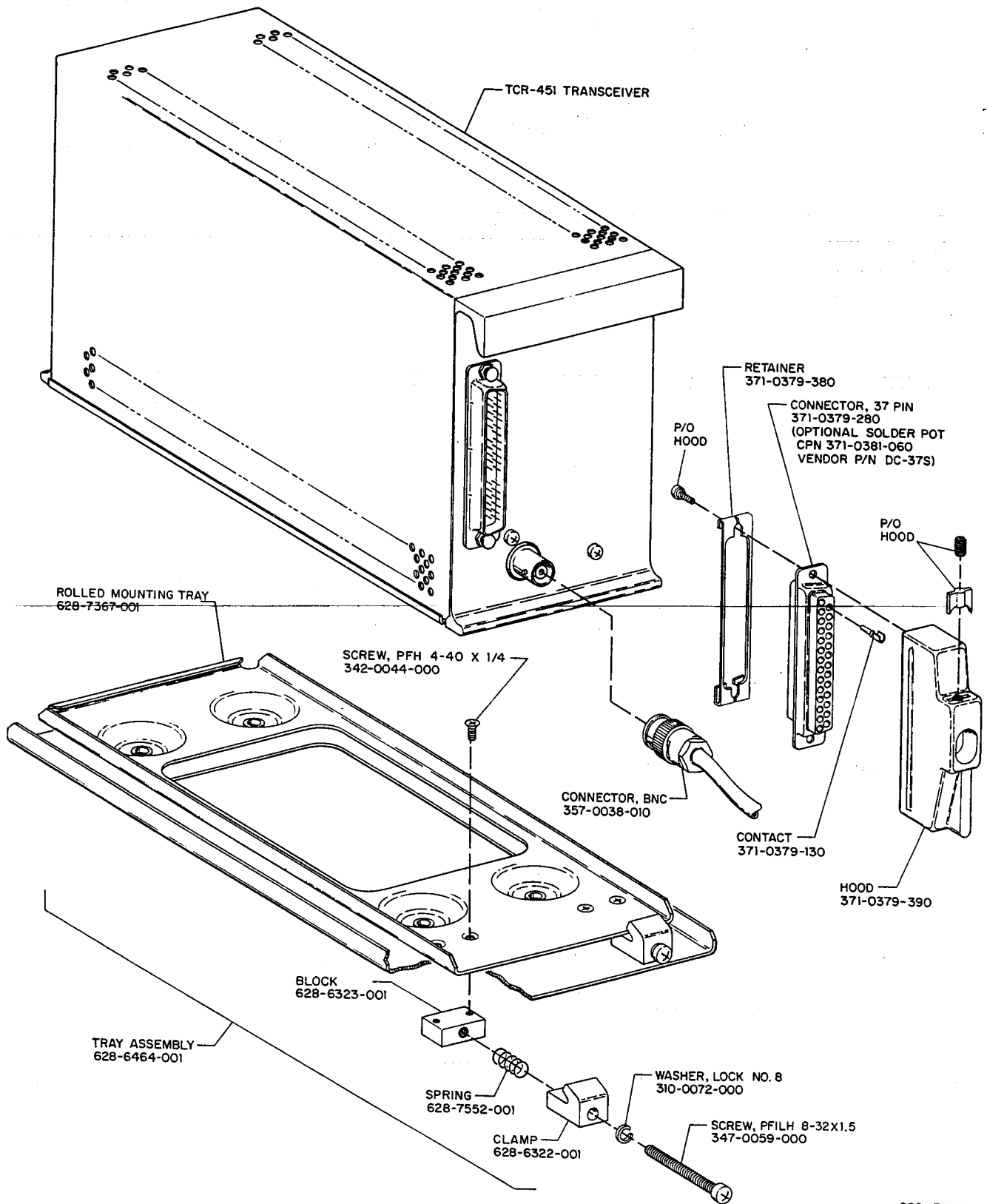
628-8283

IND-450C Indicator, Installation Kit (CPN 628-9277-001)
Figure 2-15



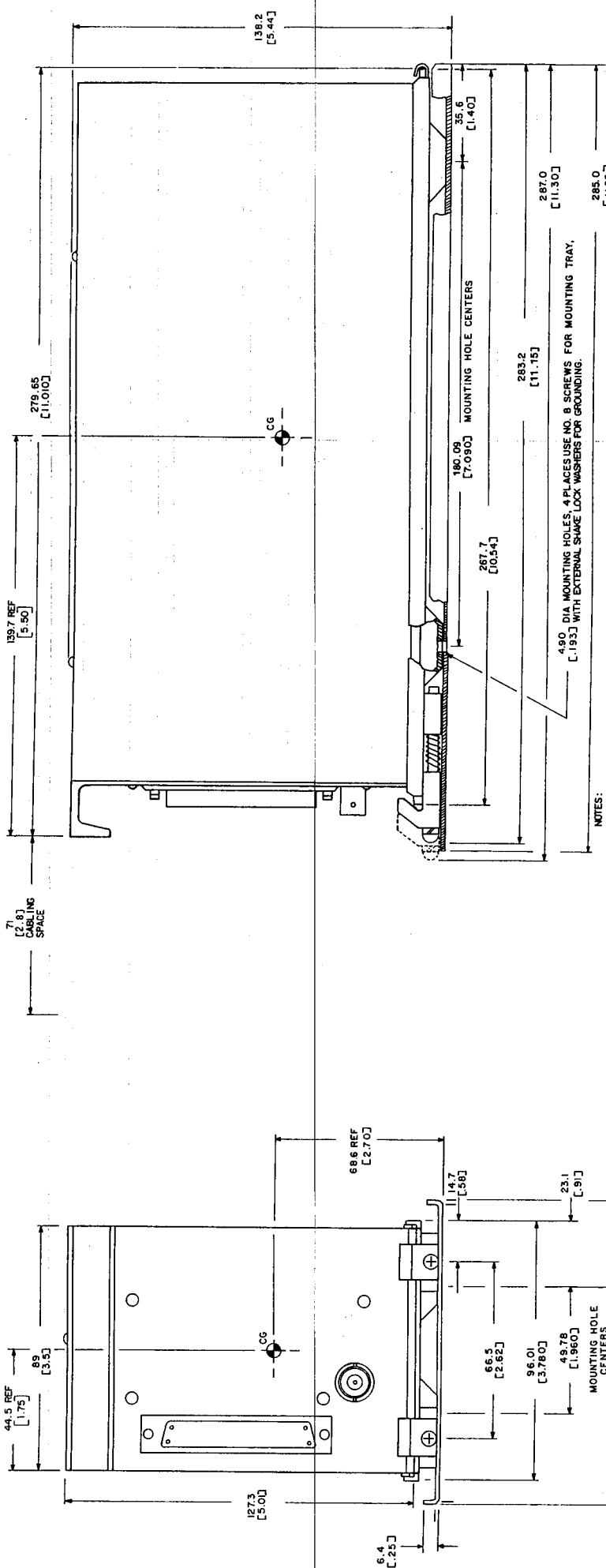
NOTES:
 ① DIMENSIONS ARE IN mm [IN].
 ② WEIGHT: .363 kg [.8 LB].
 ③ IND-450C CONNECTOR CHART.

UNIT CONNECTOR	SYEC PART NUMBER	CANNON PART NUMBER
CONNECTOR BLOCK	371-0379-010	DBC-25P-FO
CONTACTS	371-0379-10C	D10238-34
MATING CONNECTOR		
CONNECTOR BLOCK	371-0379-090	DBC-25S-FO
CONTACTS	371-0379-130	D10238-35
SOLDER POT CONNECTOR (OPTIONAL)	371-0381-020	DB-25S



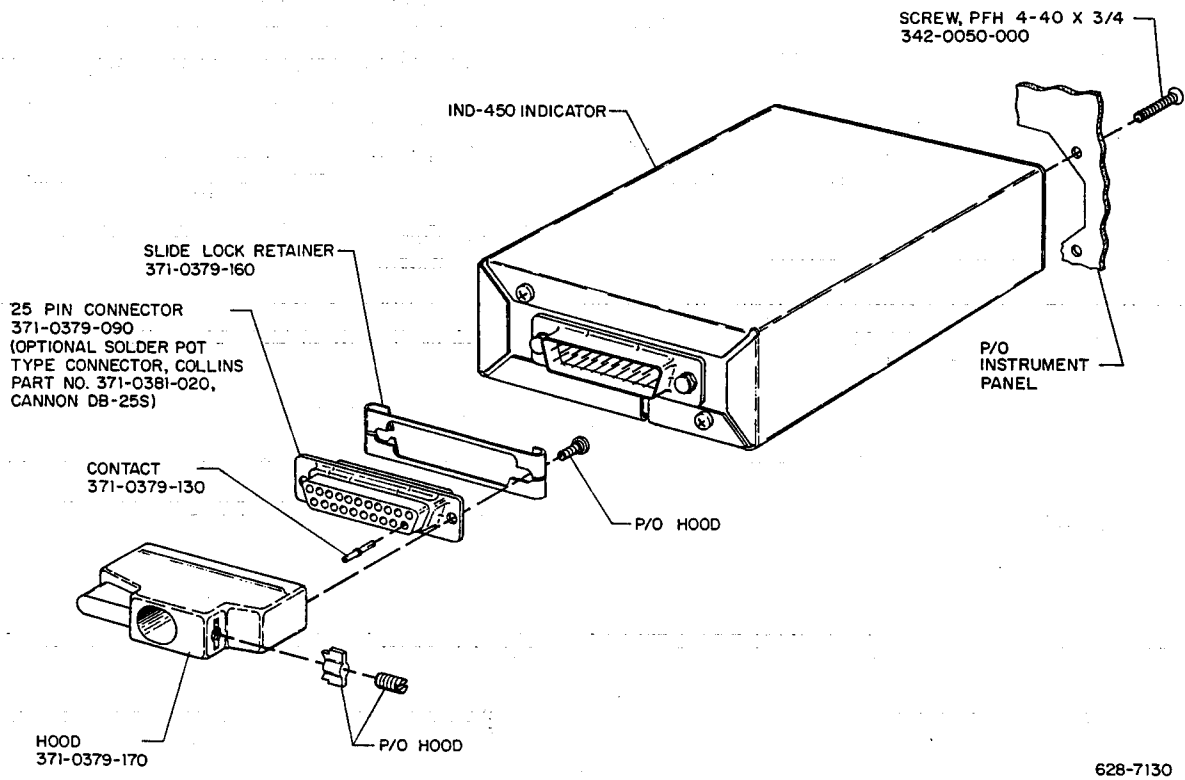
628-7324

TCR-451 Transceiver, Installation Kit
Figure 2-17



NOTES:
 1. UNLESS OTHERWISE SPECIFIED, DIMENSIONS ARE IN MILLIMETRES [INCHES].
 2. WEIGHT: APPROXIMATELY 2.6 ± 0.1 KG [5.7 ± 0.2 LB] INSTALLED.

MATING CONNECTOR		UNIT CONNECTOR	
TYPE	S-TEC PART NO.	TYPE	S-TEC PART NO.
RF	357-0338-010	RF	357-0339-010
CONTACTS	371-0379-130	CONTACTS	371-0379-100
CONNECTOR BLOCK	371-0379-280	CONNECTOR BLOCK	371-0379-270
SOLDER POT CONNECTOR (OPTL)	371-0381-060	DC-375-F0	DC-375-F0
		DC-375	DC-375



628-7130

IND-450 Indicator, Installation Kit (CPN 628-6402-001)
Figure 2-19

- b. After a suitable position has been selected, make the panel cutout per dimensions supplied in figure 2-21.
- c. Secure the panel in place using the two #4-40 screws provided in the installation kit.
- d. All connector parts required for installation are supplied with the NAV system mode control. These parts are itemized in table 2-3.

2.4.7 Hold Annunciator 262-1459-010 (Required when interconnect shown in figure 2-4 is installed.)

- a. Installation of a hold annunciator requires that the hold annunciator be in the pilot's unobstructed

Table 2-3. NAV System Mode Control, Connector Parts.

DESCRIPTION	QTY	S-TEC PART NUMBER	VENDOR PART NUMBER
15-pin connector receptacle	1	371-0379-240	DAC-15S-FO
Contacts	8	371-0379-130	D110238-35
Hood	1	371-0379-260	DA51210-1
Retainer	1	371-0379-250	DA51220-1
Screw	2	342-0048-000	(4-40 X 1/2 falthead)

Optional solder pot type connector CPN 371-0381-050/DA-15S.

field of view at all times; select a mounting position that fits this requirement. Since the hold annunciator is extremely compact, a mounting position near the top center of the panel is ideal.

- b. After a suitable position has been selected, drill the mounting hole per the dimensions supplied in figure 2-22.
- c. Use the mounting hardware provided to secure the annunciator in place.

2.5 POSTINSTALLATION CHECK

The following postinstallation checks are to be performed with the DME-451/450C/450 system installed in the aircraft. Checks should be made using the aircraft power supply.

2.5.1 DME-451 System (With IND-451 Indicator)

- a. Apply power to the system by turning the NAV system mode control to 1. Observe display digit 1 directly above the control.
- b. Turn on navigation receiver number 1 and select a different frequency at or near the center frequency of the band (approximately 113 MHz).
- c. Using a calibrated DME ramp tester, check to ensure that indicated distance on top display of IND-451 agrees with that set on the ramp tester. A DME flag is indicated by dashes across the display.
- d. Turn on navigation receiver number 2 and select a frequency near the center of the band. Select 2 on the IND-451 NAV system mode control and repeat step c.
- e. Select TTS and GS on the display selector control and observe dashes in the bottom display.
- f. Select ET and reset display to zero by pressing white button as many times as required. Once reset, press the white button once and observe bottom display begins counting up in seconds into minutes and seconds. Press white button again and note display is frozen. Clear display (reset) by pressing button one final time.

Note

Initial application of power to the GMT clock (power is continually applied to the clock once the system is installed in the aircraft) will result in dashes across the display. The dashes will remain until either the F- or S-contacts are pressed.

- g. Position display selector to GMT. Using a pencil, set the clock to the correct Greenwich mean time using the recessed contacts labeled F and S. Pressing the F-contact advances the hours display at a 1-Hz rate; pressing the S-button advances the

minutes display at a 1-Hz rate. If necessary, refer to table 2-4 to ensure the clock is correctly set.

- h. Set automatic dimming by placing your finger over the photocell; note that display becomes dimmer. Match display intensity in darkness with other radios, using the adjustment behind the front panel access hole located below and slightly to the left of the photocell.

2.5.2 DME-450 System (With IND-450 Indicator)

- a. Apply power to the system by positioning the left-hand switch to ON. Allow 30 seconds for warmup and stabilization. Position the mode selector switch to NM.
- b. Turn on the navigation receiver used to tune the DME, and select a frequency at or near the center of the navigation band (approximately 113 MHz).
- c. Using a calibrated DME ramp tester, check to ensure that indicated distance on the IND-450 agrees with that set on the ramp tester. A DME flag is indicated by dashes on the indicator display.
- d. Check the automatic dimming feature by placing your finger over the photocell. Note that the display becomes dimmer. Match the display intensity in darkness to other radios, using the adjustment behind the access hole located in the lower right-hand corner.
- e. If possible, a flight test using a station in the immediate area should be used to check all functions of the DME-451 system.

2.5.3 DME-450C System (With IND-450C Indicator)

- a. Apply power to the system by turning the NAV system mode control to 1.
- b. Turn on navigation receiver number 1 and select a frequency at or near the center of the band (approximately 113 MHz).
- c. Using a calibrated DME ramp tester, check that the indicated distance on the IND-450C agrees with that set on the ramp tester. A DME flag is indicated by dashes on the display.
- d. Turn on navigation receiver number 2 and select a frequency at or near the center of the bank (approximately 113 MHz). Select 2 on the IND-450C NAV system mode control and repeat step c.
- e. Check the automatic dimming feature by placing your finger over the photocell. Note that the display becomes dimmer. Match the display intensity in darkness to other radios, using the adjustment behind the access hole located in the top center of the indicator.
- f. If possible, a flight test using a station in the immediate area should be used to check all functions of the DME-451 system.