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FIGURE 2-4. EQUIPMENT INTERCONNECTIONS

A whip antenna may be used successfully for the sense antenna of the ADF-31A. The performance will generally be less satisfactory than with a wire antenna of optimum length. Do not use a whip which is less than 54 inches long.

(4) Marker Beacon Antenna.

The Marker Beacon Receiver will operate satisfactorily with any suitable marker beacon antenna. A simple single wire antenna with an off-center tap such as that suggested for the Narco Type MBT Marker Beacon Receiver may be used.

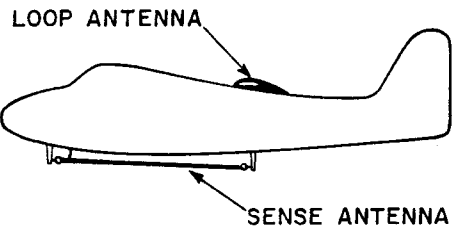
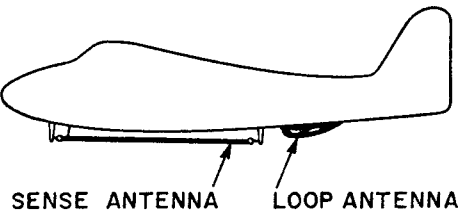
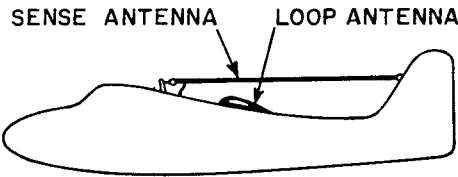
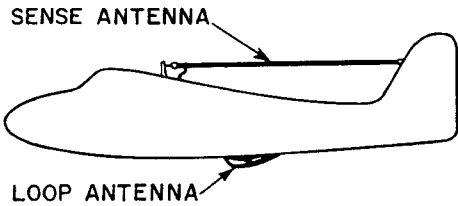
2-3. ELECTRICAL INSTALLATION.

In the electrical installation instructions given below, it is assumed that the ADF-31A has been installed as directed in paragraph 2-2. Figure 2-4 shows the interconnecting cables required for operation of the ADF-31A. The Narcomatic Sensor Assembly and the Sense Antenna may be installed on the top surface or the underside of the fuselage; refer to Figure 2-5 for the pin connections of J-302 and the position of the front panel indicator for the four different combinations of antenna locations.

A. Narcomatic Sensor Antenna Assembly (J-302)

The cable interconnecting the Narcomatic Sensor Assembly (Loop Antenna) and the ADF-31A is 20 ft. long; DO NOT CUT THE CABLE TO ANY OTHER LENGTH. Figure 2-5 shows the pin connections for the four different locations of the antennas. Connect the wires to P-302 as shown and rotate the meter if required. To rotate the meter, loosen the clamp holding the toothed wheel at the rear of the meter; then, turn by hand and secure the clamp. Refer to Figure 2-12.

In the past it was recommended that the loop antenna assembly be located forward of the trailing edge of the wing. This location has proven to be satisfactory in most aircraft; however, there may be excessive noise pickup on aircraft equipped with high current alternators. The strong magnetic field near the alternator, battery, and interconnecting cable induces alternator noise into the loop antenna assembly. Since the minimum quadrantal error is found at the above location, a compromise location must be found; this will permit receiving the weaker stations with the least amount of noise pickup and minimum quadrantal error.



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FIGURE 2-5. ANTENNA LOCATION VS CABLE CONNECTIONS

CAUTION

Do not secure the loop antenna assembly to the aircraft or cut any mounting holes until the optimum mounting location has been determined.

- (1) **Minimizing Alternator Interference**
 Alternator interference is more pronounced when the ADF is tuned to weaker stations below 300 kHz. Therefore the most simple test is to tune the receiver to a weak station within the 200 to 300 kHz range. Note the azimuth reading on the bearing indicator, start up the aircraft engine and look for a change in the bearing indication. This test should be performed with at least two different bearings, preferably near the zero and 180° points.
 The excess cable connected to the loop antenna assembly will permit moving this an-

CABLE CONNECTIONS

P-302	A	B	C	D	E	F
	BLACK	GREEN	RED	3 COND. SHIELD	COAX. SHIELD	INNER COND.

CABLE CONNECTIONS AS SUPPLIED FROM FACTORY.

P-302	A	B	C	D	E	F
	BLACK	RED	GREEN	3 COND. SHIELD	COAX. SHIELD	INNER COND.

AND ROTATE METER 180°*
 (SEE INSTALLATION SECTION)

P-302	A	B	C	D	E	F
	BLACK	GREEN	RED	3 COND. SHIELD	COAX. SHIELD	INNER COND.

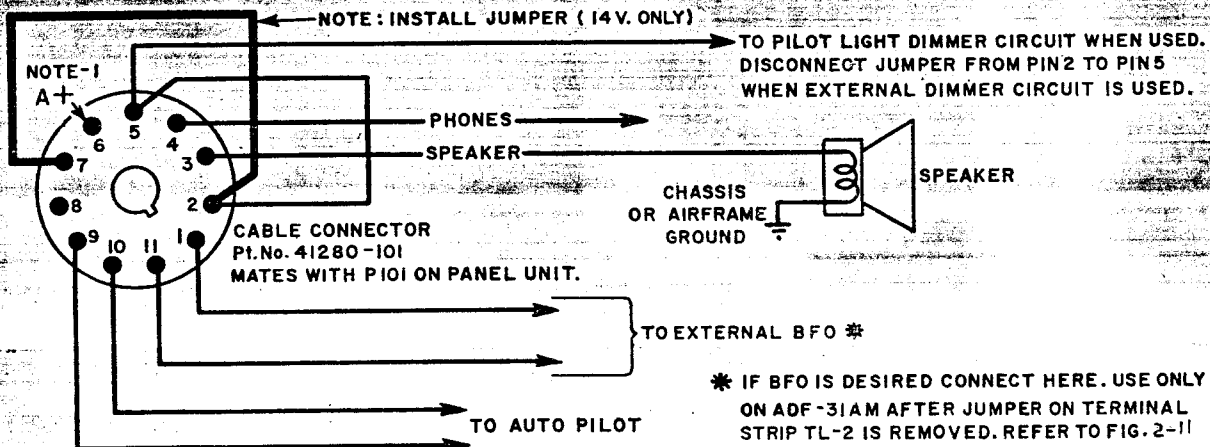
AND ROTATE METER 180°*
 (SEE INSTALLATION SECTION)

P-302	A	B	C	D	E	F
	BLACK	RED	GREEN	3 COND. SHIELD	COAX. SHIELD	INNER COND.

*Refer to Figure 12.

tenna forward of aft along the centerline of the aircraft while probing for minimum noise pickup. **DO NOT CUT HOLES FOR SECURING THE LOOP ANTENNA ASSEMBLY UNTIL THE QUADRANTAL ERROR HAS BEEN CHECKED.**

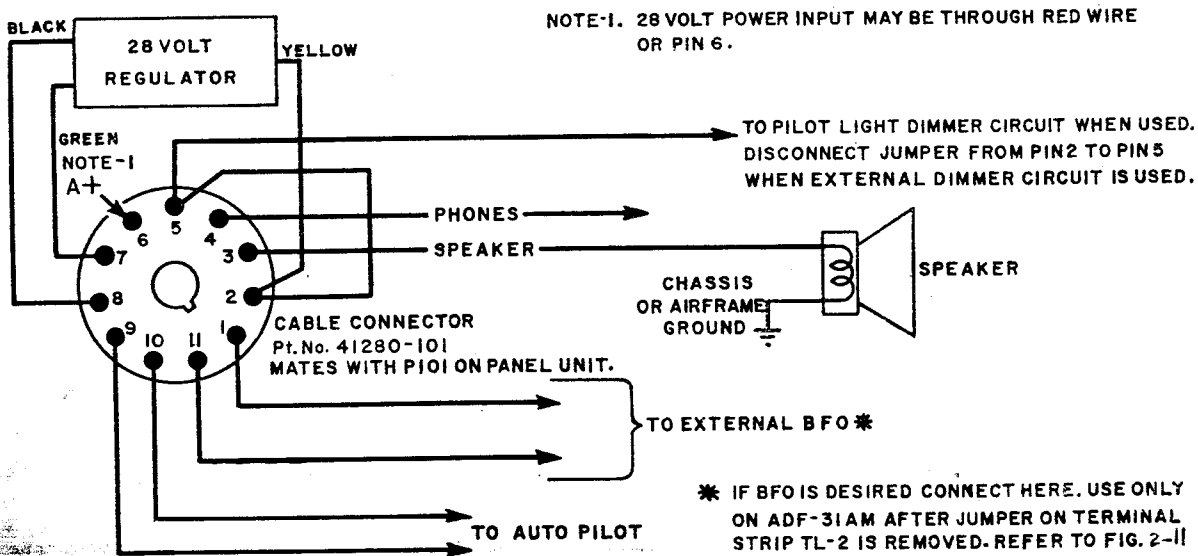
- (2) **Quadrantal Error Check**
 Quadrantal errors are most severe near the 45°, 135°, 225° and 315° bearings due to the effect of the fuselage upon the loop antenna. The cardinal points at 0°, 90°, 180°, 270° do not exhibit any additional error due to the location of the antenna.
 The ADF-31A is compensated in a screen room to an accuracy of ±3° at the cardinal points and ±4.5° at the quadrantal points. Note that, in a screen room the quadrantal points will be offset 6.5° toward the 90°-270° axis.



NOTE-1. 14 VOLT POWER INPUT MAY BE THROUGH RED WIRE OR PIN 6.

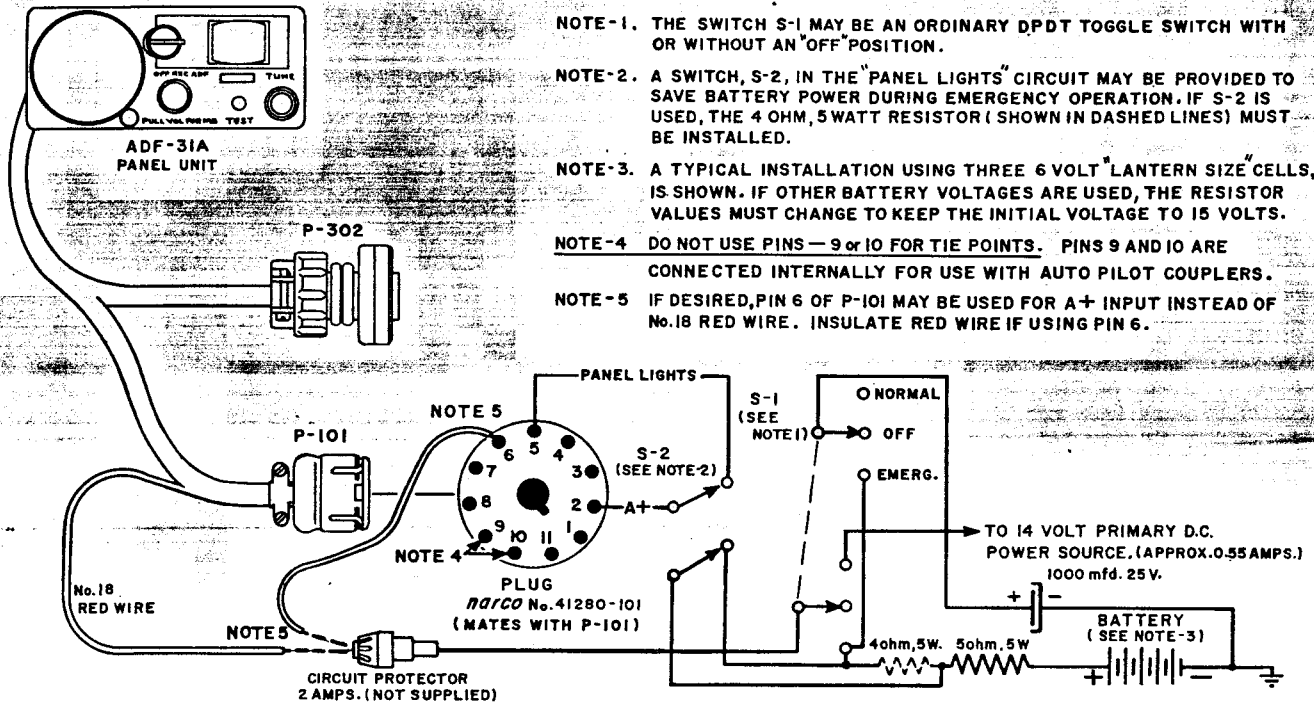
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FIGURE 2-7. ACCESSORY CABLE CONNECTIONS, 14 VOLTS



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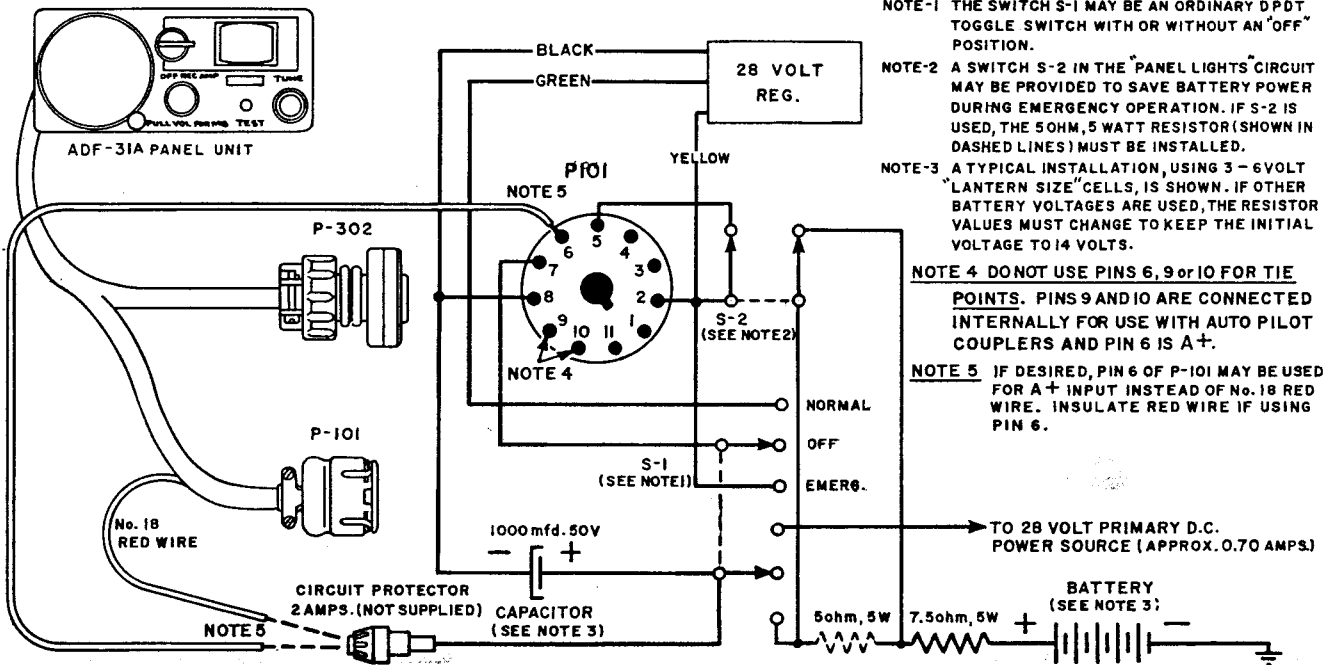
FIGURE 2-8. ACCESSORY CABLE CONNECTIONS, 28 VOLTS



- NOTE-1. THE SWITCH S-1 MAY BE AN ORDINARY DPDT TOGGLE SWITCH WITH OR WITHOUT AN "OFF" POSITION.
- NOTE-2. A SWITCH S-2, IN THE "PANEL LIGHTS" CIRCUIT MAY BE PROVIDED TO SAVE BATTERY POWER DURING EMERGENCY OPERATION. IF S-2 IS USED, THE 4 OHM, 5 WATT RESISTOR (SHOWN IN DASHED LINES) MUST BE INSTALLED.
- NOTE-3. A TYPICAL INSTALLATION USING THREE 6 VOLT "LANTERN SIZE" CELLS, IS SHOWN. IF OTHER BATTERY VOLTAGES ARE USED, THE RESISTOR VALUES MUST CHANGE TO KEEP THE INITIAL VOLTAGE TO 15 VOLTS.
- NOTE-4 DO NOT USE PINS — 9 or 10 FOR TIE POINTS. PINS 9 AND 10 ARE CONNECTED INTERNALLY FOR USE WITH AUTO PILOT COUPLERS.
- NOTE-5 IF DESIRED, PIN 6 OF P-101 MAY BE USED FOR A+ INPUT INSTEAD OF No.18 RED WIRE. INSULATE RED WIRE IF USING PIN 6.

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FIGURE 2-9. EMERGENCY BATTERY CONNECTIONS, 14 VOLTS



- NOTE-1 THE SWITCH S-1 MAY BE AN ORDINARY DPDT TOGGLE SWITCH WITH OR WITHOUT AN "OFF" POSITION.
- NOTE-2 A SWITCH S-2 IN THE "PANEL LIGHTS" CIRCUIT MAY BE PROVIDED TO SAVE BATTERY POWER DURING EMERGENCY OPERATION. IF S-2 IS USED, THE 50HM, 5 WATT RESISTOR (SHOWN IN DASHED LINES) MUST BE INSTALLED.
- NOTE-3 A TYPICAL INSTALLATION, USING 3 - 6VOLT "LANTERN SIZE" CELLS, IS SHOWN. IF OTHER BATTERY VOLTAGES ARE USED, THE RESISTOR VALUES MUST CHANGE TO KEEP THE INITIAL VOLTAGE TO 14 VOLTS.
- NOTE-4 DONOT USE PINS 6, 9 or 10 FOR TIE POINTS. PINS 9 AND 10 ARE CONNECTED INTERNALLY FOR USE WITH AUTO PILOT COUPLERS AND PIN 6 IS A+.
- NOTE 5 IF DESIRED, PIN 6 OF P-101 MAY BE USED FOR A+ INPUT INSTEAD OF No. 18 RED WIRE. INSULATE RED WIRE IF USING PIN 6.

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FIGURE 2-10. EMERGENCY BATTERY CONNECTIONS, 28 VOLTS