AN 08-30ARN5-2

HANDBOOK OF OPERATING INSTRUCTIONS

for

RADIO RECEIVING EQUIPMENTS AN/ARN-5 and AN/ARN-5A

RESTRICTED

(For Official Use Only)

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LIST OF REVISED PAGES ISSUED

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LIST OF ILLUSTRATIONS

Destruction of Abandoned Materiel in the Combat Zone

In case it should become necessary to prevent the capture of this equipment and when ordered to do so, DESTROY IT SO THAT NO PART OF IT CAN BE SALVAGED, RECOGNIZED, OR USED BY THE ENEMY. BURN ALL PAPERS AND BOOKS.

Means:-

1. Explosives, when provided.
2. Hammers, axes, sledges, machetes, or whatever heavy object is readily available.
3. Burning by means of incendiaries such as gasoline, oil, paper, or wood.
4. Grenades and shots from available arms.
5. Burying all debris or disposing of it in streams or other bodies of water, where possible and when time permits.

Procedure:-

1. Obliterate all identifying marks. Destroy nameplates and circuit labels.
2. Demolish all panels, castings, switch- and instrument-boards.
3. Destroy all controls, switches, relays, connections, and meters.
4. Rip out all wiring and cut interconnections of electrical equipment. Smash gas, oil, and water-cooling systems in gas-engine generators, etc.
5. Smash every electrical or mechanical part, whether rotating, moving, or fixed.
6. Break up all operating instruments such as keys, phones, microphones, etc.
7. Destroy all classes of carrying cases, straps, containers, etc.
8. Bury or scatter all debris.

DESTROY EVERYTHING!

★

Unsatisfactory Report

For U. S. Army Air Force Personnel:-

In the event of malfunctioning, unsatisfactory design, or unsatisfactory installation of any of the component units of this equipment, or if the material contained in this book is considered inadequate or erroneous, an Unsatisfactory Report, AAF Form No. 54, or a report in similar form, shall be submitted in accordance with the provisions of Army Air Force Regulation No. 15-54, listing:

1. Station and organization.
2. Nameplate data (type number or complete nomenclature if nameplate is not attached to the equipment).
3. Date and nature of failure.
4. Airplane model and serial number.
5. Remedy used or proposed to prevent recurrence.
6. Handbook errors or inadequacies, if applicable.

For U. S. Navy Personnel:-

Report of failure of any part of this equipment during its guaranteed life shall be made on form N. Aer. 4112, "Report of Unsatisfactory or Defective Material," or a report in similar form, and forwarded in accordance with the latest instructions of the Bureau of Aeronautics. In addition to other distribution required, one copy shall be furnished to the Inspector of Naval Materiel (location to be specified) and the Bureau of Ships. Such reports of failure shall include:

1. Reporting activity.
2. Nameplate data.
3. Date placed in service.
4. Part which failed.
5. Nature and cause of failure.
6. Replacement needed (yes—no).
7. Remedy used or proposed to prevent recurrence.

For British Personnel:-

Form 1022 procedure shall be used when reporting failure of radio equipment.

SPECIAL NOTICE

A limited number of single-channel Radio Receivers R-47/ARN-5 are in the field. Their operation is similar to that of Radio Receiver R-57/ARN-5 when the latter is operating on any one channel.

SECTION I
GENERAL DESCRIPTION

1. GENERAL.

a. Radio Receiving Equipment AN/ARN-5 or AN/ARN-5A is airborne equipment designed to give vertical guidance to a pilot during aircraft landing operations. This equipment is part of a navigational system which provides both lateral and vertical guidance, lateral guidance being supplied by Radio Receiving Equipment RC-103-A.

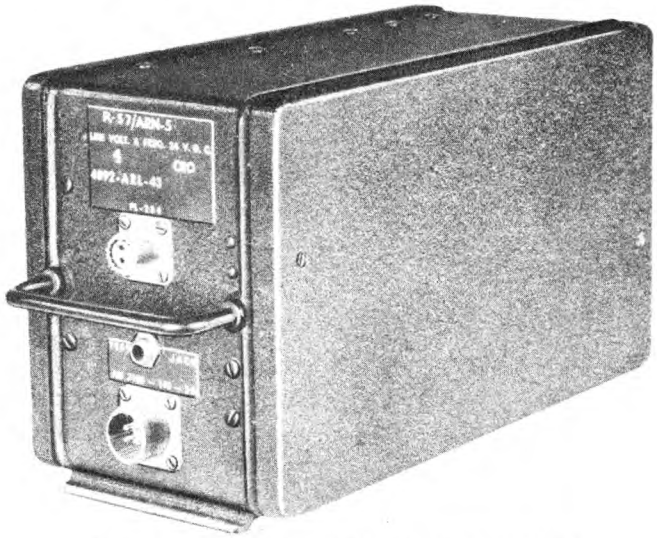


Figure 1-1. Radio Receiver R-57/ARN-5

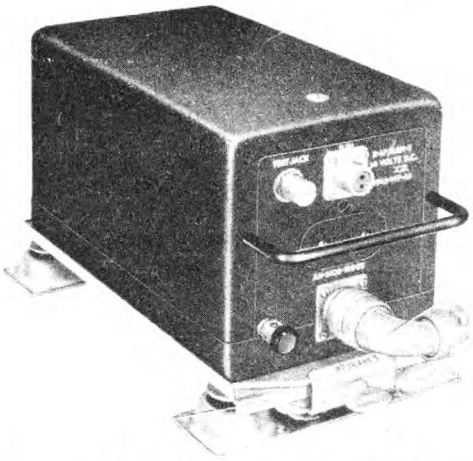


Figure 1-2. Radio Receiver R-47/ARN-5

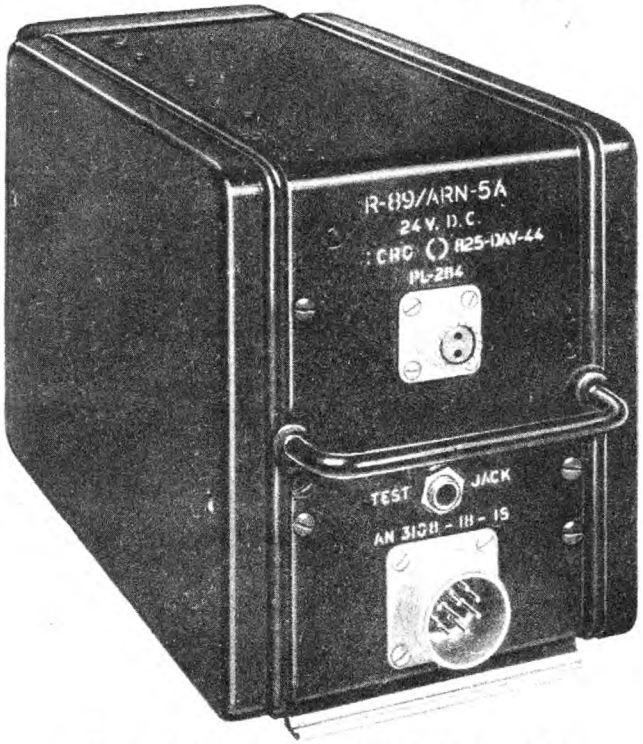


Figure 1-3. Radio Receiver R-89/ARN-5A

b. The major assembly of Radio Receiving Equipment AN/ARN-5 is Radio Receiver R-57/ARN-5. The major assembly of Radio Receiving Equipment AN/ARN-5A is Radio Receiver R-89/ARN-5A. Either ultra-high frequency "glide-path" receiver is used to pick up signals from an associated glide-path transmitter located adjacent to the landing strip or runway. One or two cross-pointer indicators provide visual indication to the pilot of the position of the aircraft with relation to the glide path.

c. Radio Receiver R-57/ARN-5 is designed to operate at any one of three frequencies: 332.6, 333.8, or 335.0 megacycles.* The operating frequency is changed by changing the crystal. The two crystals not in use

* Radio Receiver R-47/ARN-5 is a super-regenerative single-channel glide-path receiver capable of being tuned to any frequency in the range 330 to 340 megacycles. Operation of this receiver in a region where transmitters using several frequencies are employed is not recommended because of the lack of adjacent channel selectivity in the receiver.

are stored in the receiver. The received r-f carrier is amplitude modulated at 90 and 150 cycles per second. Radio Receiver R-89/ARN-5A operates on the same three frequencies. The operating frequency is changed by means of the selector switch on Radio Control Box BC-732-A. On the control box the channels are marked "U", "V", "W","X", "Y", and "Z". These correspond to channels GX, GY, GZ, GX, GY, and GZ, respectively, of Radio Receiver R-89/ARN-5A. The frequencies for each position on the control box are:

Switch Position	*Frequency in Megacycles*	*Designated in Radio Receiver R-89/ARN-5A as:*
"U"	332.6	GX
"V"	333.8	GY
"W"	335.0	GZ
"X"	332.6	GX
"Y"	333.8	GY
"Z"	335.0	GZ

d. The radio receiving equipment operates from a 24- to 28-volt d-c power source. No dynamotor is used and no other source of power is required. The negative side of the two-wire primary power supply is grounded. The total current drain of Radio Receiver R-57/ARN-5 is approximately 1.35 amperes.† The total current drain of Radio Receiver R-89/ARN-5A is approximately 1.7 amperes.

† The current drain of Radio Receiver R-47/ARN-5 is approximately 1.1 amperes.

2. EQUIPMENT SUPPLIED.

The following table lists equipment supplied with Radio Receiving Equipment AN/ARN-5 or AN/ARN-5A.

Quantity		*Name of Unit*	*Overall Dimensions (inches)*	*Weight (pounds)*
AN/ARN-5	AN/ARN-5A			
1	1	Antenna Assembly AS-61/ARN-5 or Antenna System AS-27/ARN-5*	20 x 6-½ x 10 20 x 23 x 10	2.5 3.5
1	1	Resistor RS-125†		
1	1	Adapter AN3057-10	1-5/64 x 15/16 diameter	0.03
1	1	Mounting MT-28/ARN-5	1-½ x 6 x 11	1.3
1	1	Capacitor (Drawing No. SC-D-2246)		
1	1	Plug PL-275‡		
2	2	Plug PL-284§		
	1	Plug AN3108-18-1S or Plug AN3106-18-1S		
10 feet	10 feet	Radio Frequency Cable RG-22/U or Cable WC-551-B		
1	1	Adapter PL-293		
1		Radio Receiver R-57/ARN-5 includes 3 Crystal Units FT-243, tubes, and Adapter U-19/ARN‖	5-¼ x 6-½ x 12-⅛	11.0
	1	Radio Receiver R-89/ARN-5A	5-½ x 6-½ x 14	12.5

3. EQUIPMENT REQUIRED BUT NOT SUPPLIED.

The following table lists equipment required for operation but not supplied with the radio receiving equipment.

Quantity	*Name of Unit*	*Required Characteristics*
2	Plug PL-P257 or Plug PL-190	Four No. 20 contacts; Army-Navy part number AN3106-14s-2S; for Radio Receiver R-57/ARN-7
as required	Cable, Aircraft Low Tension, per Spec. AN-J-C-48	
1 or 2	Indicator I-101-C or I-101-D	Special meter with two needles normally crossed at right angles at center of meter face; contains two 150-0-150-microampere movements; resistance of each movement 1000 ohms

Quantity	*Name of Unit*	*Required Characteristics*
1	Connector Panel	Terminal strip for attaching and interconnecting cables used in airborne instrument landing system, supplied as part of aircraft by manufacturer
1	Mounting FT-292-A	Mounting plate for Radio Control Box BC-732-A
1	Radio Control Box BC-732-A	Box containing power "ON-OFF" switch for all components of Radio Receiving Equipments RC-103-A and AN/ARN-5 and "ON-OFF" and selector switches for Radio Receiving Equipment AN/ARN-5A; 14-contact pin-type receptacle and snapslide fastener on base for fastening to Mounting FT-292-A; also contains frequency selection switch, volume control, and monitoring jack for Radio Receiving Equipment RC-103-A
1	Headset with Plug PL-255	

* Antenna Assembly AS-27/ARN-5 is issued only when the installation plan of the aircraft requires that Radio Receiving Equipments AN/ARN-5 or AN/ARN-5A and RC-103-A use the same antenna.
† When two Indicators (I-101-C or I-101-D) are used, omit Resistor RS-125.
‡ Used only in pressurized-cabin installations.
§ In pressurized-cabin installations, or other special installations, Radio Frequency Cable RG-22/U or Cable WC-551-B may have to be cut and interconnected through Plug PL-275. In such installations, two additional Plugs PL-284 must be used.
‖ Since most aircraft will have installation that includes a 10-prong plug for connection to the receiver, Radio Receiver R-57/ARN-5 is equipped with Adapter U-19/ARN.

SECTION II
INSTALLATION AND ADJUSTMENT

1. INSTALLATION.

a. GENERAL.—Since Radio Receiver R-57/ARN-5 or R-89/ARN-5A require no adjustment in flight other than changing crystals, locate it at any convenient place in the aircraft.

(1) The interconnecting wires and antenna transmission line should be as short as possible.

(2) Carefully bond and shield the aircraft engine, ignition system, generator, and accessories to prevent electrical interference with signal reception.

b. MOUNTING MT-28/ARN-5.

(See fig. 2-1.)

(1) Permanently attach Mounting MT-28/ARN-5 for Radio Receiver R-57/ARN-5 or R-89/ARN-5A to a flat, rigid surface in the aircraft, so that the receiver will be mounted base down in a horizontal position during level flight.

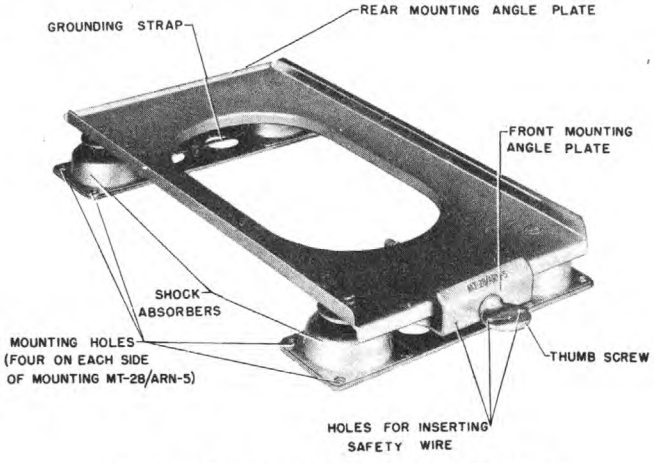


Figure 2-1. Mounting MT-28/ARN-5

(2) Allow sufficient clearance on the top and all sides of the receiver for maximum travel allowed by the shock absorbers, and to permit ready removal and installation of the receiver and associated cords and plugs. "TEST JACK", marked on the front panel of the receiver, should be readily accessible. See figures 6-1 and 6-2 for installation dimensions and required clearances.

c. RADIO RECEIVER R-57/ARN-5 or R-89/ARN-5A.

(1) Install Radio Receiver R-57/ARN-5 or R-89/ARN-5A on Mounting MT-28/ARN-5 by sliding the protruding metal flange at the back and bottom of the receiver into the lip at the rear of the mounting.

(2) Fasten the receiver on the mounting by tightening the thumbscrew on the front of the mounting. The thumbscrew should be hand tightened only and should not be forced. Use no tools.

(3) The angle plate on the front of the mounting holds the receiver on the mounting. It has a small hole for the use of safety wire, while the thumbscrew has two similar holes. When the receiver has been satisfactorily mounted and the thumbscrew on the mounting tightened, insert a piece of safety wire through the provided holes and wind the ends of the wire tightly together. This prevents accidental loosening of the thumbscrew.

d. CONNECTOR PANEL.

(1) Locate the terminal strip for attaching and interconnecting the cables used in the airborne instrument landing system in a convenient place in the aircraft so that the 10-ampere primary power fuse may be easily replaced.

(2) Locate the terminal strip so that the total length of the power conductors may be made as short as possible. This is to prevent excessive voltage drop between the primary power source and the equipment.

(3) Mount the 1250-mfd. condenser near the terminal strip and connect it electrically across the indicator. (See figs. 6-3 and 6-4.) Purpose of the condenser is to dampen the fluctuations of the needle of Indicator I-101.

e. CABLES.

(See figs. 6-3 and 6-4.)

(1) Radio Frequency Cable RG-22/U or Cable WC-551-B has Plug PL-284 on each end. Insert the plug into two-contact pin-type Socket SO-264 on the front panel of the receiver. No polarity need to be observed, and either end of the cable may be used.

(2) For Radio Receiver R-89/ARN-5A, insert Plug AN3108-18-1S (on one end of the receiver-to-terminal strip cable) to the 10-contact pin-type Socket AN3102-18-1P. This plug may be inserted into the receptacle on the receiver panel in only one way. In connecting the cable to the terminal strip, make certain that the polarity of the power leads is correct. For proper connection data, see figure 6-4.

Note

Most installations in aircraft are wired for Radio Receiver R-89/ARN-5A which uses a 10-prong Connector AN3108-18-1S. When Radio Receiver R-57/ARN-5 is to be installed, Adapter U-19/ARN is required between the receiver socket and the cable connector.

(3) For Radio Receiver R-57/ARN-5 insert Plug AN3108-18-1S (on one end of the receiver-to-terminal strip cable) through Adapter U-19/ARN to the four-contact pin-type socket marked "AN3102-14S-2P" on the receiver.

Note

In installations where a four-wire cable and Plug AN3108-14S-2S are used, Plug AN3108-14S-2S will plug directly into Radio Receiver R-57/ARN-5.

This adapter or plug may be inserted into the receptacle on the receiver panel in only one way. In connecting the cable to the terminal strip make certain that the polarity of the power leads is correct. For proper connection data see figure 6-3.

(4) Lash or clamp the wires at frequent intervals to structural members of the aircraft along their entire length.

(5) The wire from the terminal strip to the battery should go directly to the battery terminals.

(a) If this is not practical, and power must be drawn from a power bus, take it from a bus on the load side of the battery rather than from one on the charging side. Electrical noise and large voltage fluctuations, which might impair satisfactory operation of the equipment, exist in the charging circuit.

(b) The conductors in the primary power-source wire (terminal strip to battery) should be of sufficient size to carry a minimum of 5 amperes. When both receivers are operating, the total drop in voltage should not exceed 1 volt from the 24-volt primary power source to the receptacle on the radio receiver.

CAUTION

Observe polarity when connecting the power cable to the battery terminals.

f. ANTENNA AND TRANSMISSION LINE.

(1) Radio Receiver R-57/ARN-5 or R-89/ARN-5A is designed to operate from a short, straight dipole antenna and a balanced transmission line. Either Antenna Assembly AS-61/ARN-5 or Antenna System AS-27/ARN-5 may be used.

Figure 2-2. Antenna Assembly AS-61/ARN-5— Top Angle View

(a) Antenna Assembly AS-61/ARN-5 is a dipole antenna for use with Radio Receiver R-57/ARN-5 or R-89/ARN-5A; it has one transmission-cable plug (Socket SO-264) in the base of the antenna mount.

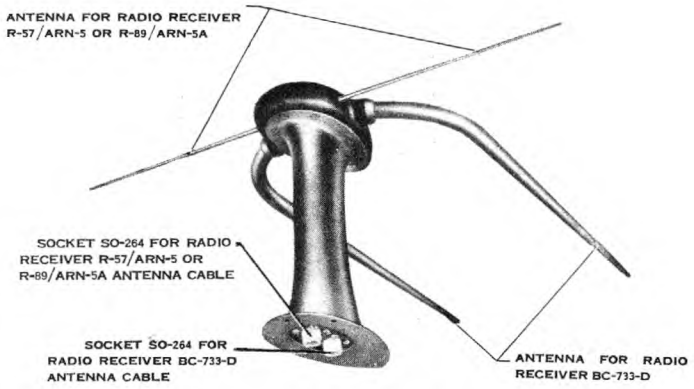


Figure 2-3. Antenna System AS-27/ARN-5— Bottom Angle View

(b) Antenna System AS-27/ARN-5 has, in addition to the straight dipole antenna for Radio Receiver R-57/ARN-5 or R-89/ARN-5A, a folded parallel dipole antenna for use with Radio Receiver BC-733-D (part of Radio Receiving Equipment RC-103-A). It also has two transmission-cable Sockets SO-264 in the base of the antenna mount.

(2) Locate the antenna as far forward on the aircraft as possible. The best location varies with the type of aircraft, and no specific instructions can be given which would apply to all types of installations.

g. RADIO CONTROL BOX BC-732-A. — Radio Control Box BC-732-A contains the power "ON-OFF" switch for Radio Receiving Equipment AN/ARN-5 and the power "ON-OFF" and selector switches for Radio Receiving Equipment AN/ARN-5A. Locate the box so that the controls can be conveniently reached by the pilot and copilot. Allow sufficient clearances for easy installation and removal of the control box and its associated cable and plugs.

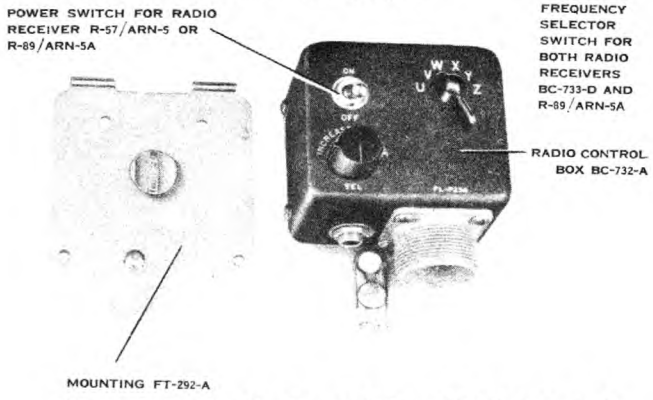


Figure 2-4. Radio Control Box BC-732-A and Mounting FT-292-A

b. INDICATORS.

(1) If two indicators are used, locate them so that they may be easily and properly observed by the pilot and copilot. They may be mounted in instrument brackets attached to the aircraft or in the instrument panel.

(2) If only one indicator is used, two 1000-ohm, ½-watt resistors must be added to the meter circuit at the meter terminals in the junction box, one resistor for each section of the dual meter.

(3) See figure 6-1 for installation data on these resistors. In all cases, allow sufficient clearance for the installation and removal of each instrument, cable, and plug.

2. ADJUSTMENT.

a. GENERAL.—The tuning, balance, and sensitivity adjustment controls located inside Radio Receiver R-57/ARN-5 or R-89/ARN-5A should not be changed except by qualified trained personnel at properly equipped repair depots. These are primarily manufacturing adjustments, and no readjustment should be required unless repairs are made on the receiver.

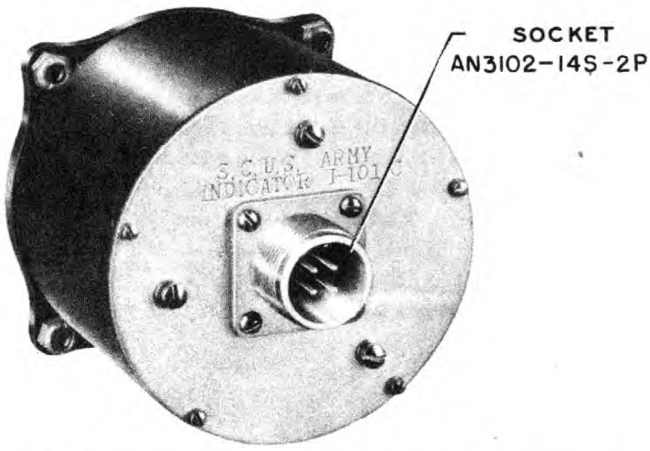


Figure 2-5. Indicator I-101-C—Rear Angle View

b. AFTER-INSTALLATION TEST.

(1) GENERAL.—Test Oscillator TS-170/ARN is a battery-operated portable test oscillator which provides a crystal controlled 332.6-, 333.8-, or 335-megacycle signal which may be modulated from an internal source with either 90 or 150 cycles per second. This test set provides either a radiated signal or a cable transmitted signal to the receiver.

(2) SENSITIVITY TEST.

(a) Remove the aircraft transmission line from the receiver and replace it with the test set transmission line.

(b) Set the "ON-OFF" switches on the test oscillator and on Radio Control Box BC-732-A to "ON".

(c) Set the test oscillator to the channel corresponding to the crystal in use in Radio Receiver R-57/ARN-5; or, if Radio Receiver R-89/ARN-5A is used, to the channel corresponding to the position of the frequency selector switch on Radio Control Box BC-732-A.

(d) Set the modulation switch of the test set to 90 cycles, and the attenuator control to position of maximum attenuation.

(e) Slowly increase the input signal to the receiver by manipulation of the attenuator control on the test set until the horizontal pointer of the pilot's localizer glide-path indicator is at the center position. The position of the attenuator control is an indication of the sensitivity of the receiver.

(f) In order to indicate minimum allowable sensitivity of the receiver, the pointer of the attenuator should not be past the place indicated as the position for minimum sensitivity when the oscillator is directly connected to the receiver. Turn the test oscillator and radio control box off.

(3) OVERALL TEST.

(a) For an overall test of the receiving equipment, remove the test oscillator transmission line and replace it with the aircraft antenna transmission line.

(b) Place the test oscillator approximately 20 feet from the glide-path receiving antenna on the aircraft.

(c) Extend the test oscillator antenna to full length, and make certain that there are no obstructions between the aircraft and oscillator antennas.

(d) Set the "ON-OFF" switches on the test oscillator and on Radio Control Box BC-732-A to "ON".

(e) Turn the modulation switch on the test oscillator to 90 cycles. A downward deflection of the horizontal pointer of the pilot's glide-path localizer indicator should result.

(f) Turn the test oscillator and radio control box off.

(g) Repeat the procedure for the other two frequencies.

SECTION III
OPERATION

1. CHANGING OPERATING FREQUENCY IN RADIO RECEIVER R-57/ARN-5.

a. Determine the frequency at which operation is desired (332.6, 333.8 or 335 megacycles).

b. Remove the cover on the right-hand side by means of the two screws in the cover. It will be necessary to remove the receiver from the mounting. (Refer to sec. II, par. 1*c*.) Note the frequency of the operating crystal mounted in the receiver. This crystal determines the receiver frequency as follows:

Crystal Frequency (kilocycles)	*Receiver Frequency (megacycles)*
6497.9	332.6
6522.9	333.8
6547.9	335.0

c. If the correct crystal is not installed, select the desired one from those stored in the cover.

d. To change the crystal, remove the tool from the cover and loosen the clamp which holds the crystal in the operating position. Insert the tool under the crystal and remove by lifting. Replace with the desired crystal and tighten the clamp.

e. Replace the unused crystal in the cover and insert the tool in the proper position to hold spare crystals in place.

f. Replace the cover.

2. CHANGING OPERATING FREQUENCY IN RADIO RECEIVER R-89/ARN-5A.

By means of the selector switch located on Radio Control Box BC-732-A, select the frequency at which operation is desired. Frequencies for each position of the selector switch are:

Switch Position	*Frequency in Megacycles*	*Designated in Radio Receiver R-89/ARN-5A as:*
"U"	332.6	GX
"V"	333.8	GY
"W"	335.0	GZ
"X"	332.6	GX
"Y"	333.8	GY
"Z"	335.0	GZ

3. OPERATING PROCEDURE.

a. Turn the "ON-OFF" switch on Radio Control Box BC-732-A to the "ON" position.

b. Observe course indications on Indicator I-101-C or I-101-D.

(1) The horizontal needle on each indicator is actuated by Radio Receiver R-57/ARN-5 or R-89/ARN-5A and provides vertical guidance during landing operations.

(2) The vertical needle is for use with Radio Receiver BC-733-D for lateral guidance during instrument landing operations.

(3) The glide path is an imaginary beam created by the combined operation of the vertical and lateral guidance transmitters, which runs from the landing spot on the field, at a specified angle, up into the air as far as the radiated signals will reach. When the aircraft is headed toward the runway during a landing operation, the action of the horizontal needle is directional, that is, when the needle is above center, the aircraft must be flown up to regain the center of the glide path and vice versa.

4. INDICATIONS OF FALSE OPERATION.

a. If the associated transmitting equipment fails to send out signals or if a failure of the receiver occurs, the automatic alarm circuit in the receiver will cause the horizontal needle to deflect up and remain up, regardless of the aircraft position.

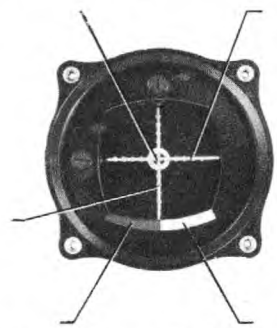


Figure 3-1. Indicator I-101-C—Front View

b. If the power supply to the receiver fails, the horizontal needle will remain in the center of the meter face regardless of the aircraft position.

5. GLIDE PATH.

a. Figure 3-2 shows the glide path which radiates from the glide-path transmitter located on the ground adjacent to the landing strip.

b. Also shown in figure 3-2 are the indicator's horizontal needle positions and the significance of these positions to the pilot. It is evident that the aircraft's heading should follow the direction indicated by the needle.

c. The glide path may be used if necessary as a directional beam. At any given distance the altitude at which the glide path may be picked up is dependent upon the angle at which the glide path is being radiated from the transmitter. Distance-altitude data for given glide angles are shown in table II, section V. Altitude in the table is expressed in feet above the landing field, and should not be confused with sea-level or terrain altitude.

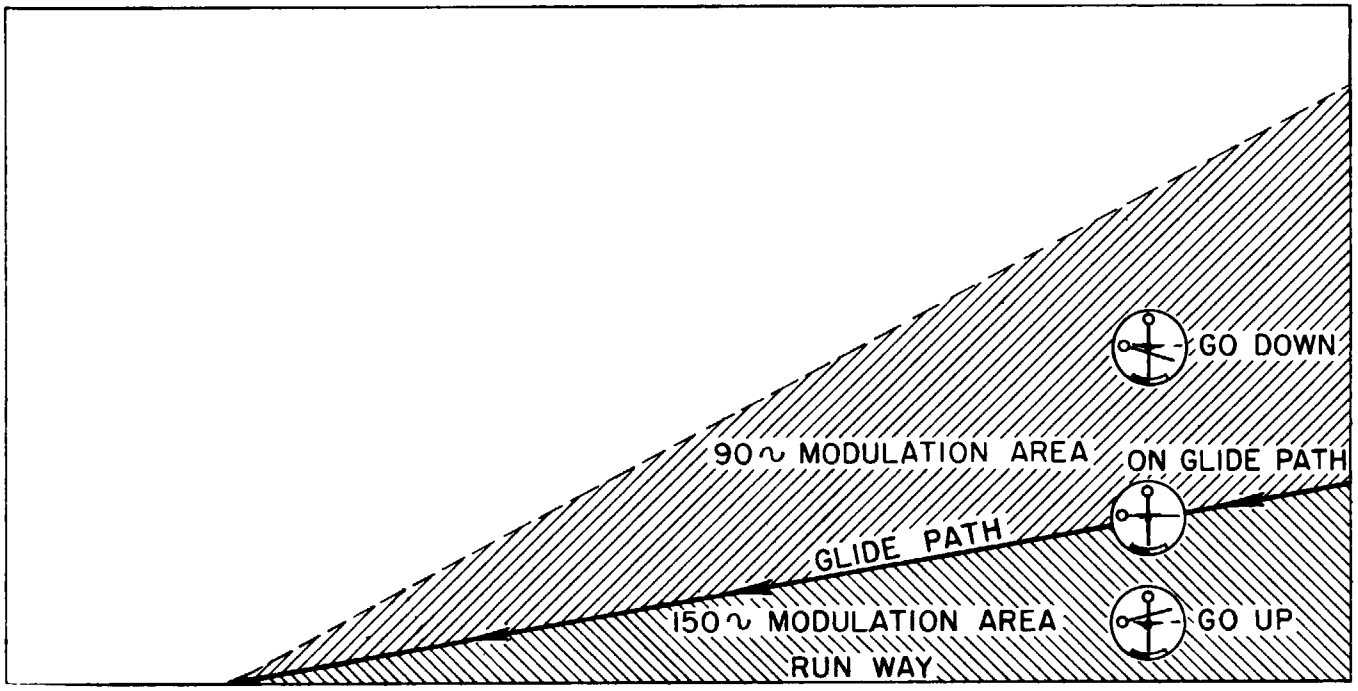


Figure 3-2. Glide-Path Chart

SECTION IV
EMERGENCY OPERATION AND REPAIR

CAUTION

Do not attempt to make any adjustments of any controls in Radio Receiver R-57/ARN-5 or R-89/ARN-5A. These adjustments are critical and must be made only by trained maintenance personnel with adequate test equipment.

1. LOCATING TROUBLE DURING FLIGHT.

a. Be sure the "ON-OFF" switch on Radio Control Box BC-732-A is in the "ON" position.

CAUTION

Remove the headset during actual operation.

b. Check all plugs for tightness. Check the cables and junction box for visible short circuits and loose connections.

SECTION V
SUPPLEMENTARY DATA

TABLE 5-1. BRITISH-AMERICAN EQUIVALENT TERMS

American Term	*British Equivalent*
Antenna	Aerial
Battery	Storage battery or accumulator
Generator	Generator or dynamo
Ground	Ground or earth
Heading	Course
Jack	Socket
(to) Land	(to) Land or alight
Radio	Wireless
Safety wire	Safety wire or lock wire
Tube	Valve

TABLE 5-2. ALTITUDE ABOVE LANDING FIELD FOR VARIOUS GLIDE ANGLES AND DISTANCES FROM THE LANDING FIELD

Glide Angle	*Air Distance in Miles from Point of Contact on Landing Field*																	
	1320′	2640′	3960′	5280′	2	3	4	5	6	7	8	9	10	11	12	13	14	15
	Altitude above Landing Field in Feet																	
2°	46	92	138	184	369	553	737	921	1106	1290	1474	1658	1843	2027	2211	2396	2580	2764
2° 30′	57	115	172	230	461	691	921	1152	1382	1612	1842	2073	2303	2533	2764	2994	3224	3455
3°	69	138	207	276	553	829	1105	1382	1658	1934	2211	2487	2764	3040	3316	3593	3869	4145
3° 30′	80	161	241	322	644	966	1288	1610	1932	2255	2577	2899	3221	3543	3865	4187	4509	4831
4°	92	184	276	368	737	1105	1473	1842	2210	2578	2947	3315	3683	4052	4420	4788	5157	5525
4° 30′	103	207	310	414	829	1243	1657	2071	2486	2900	3314	3728	4143	4557	4971	5385	5800	6214
5°	115	230	345	460	920	1381	1841	2301	2761	3221	3682	4142	4602	5062	5522	5983	6443	6903
5° 30′	126.5	253	380	506	1012	1518	2024	2530	3036	3543	4049	4555	5061	5567	6073	6579	7085	7591
6°	138	275	414	552	1104	1656	2208	2760	3311	3863	4415	4967	5519	6071	6623	7175	7727	8279

TABLE 5-3. RATE OF DESCENT FOR VARIOUS AIR SPEEDS AND GLIDE ANGLES

Air Speed in Miles Per Hour	*Glide Angle*								
	2°	2° 30′	3°	3° 30′	4°	4° 30′	5°	5° 30′	6°
	Rate of Descent in Feet per Minute								
50	154	192	230	268	307	345	384	422	460
60	184	230	276	322	369	415	460	506	552
70	215	269	322	376	430	484	537	589	644
80	246	307	368	429	491	553	614	674	736
90	276	345	414	483	553	622	691	759	828
100	307	384	460	537	614	691	767	843	920
120	368	460	552	644	737	830	921	1012	1104
140	430	536	644	752	860	967	1074	1180	1287
160	491	613	736	858	982	1105	1227	1350	1470
180	553	691	827	966	1106	1243	1381	1517	1655
200	614	767	920	1074	1228	1381	1535	1686	1839

SECTION VI
DRAWINGS

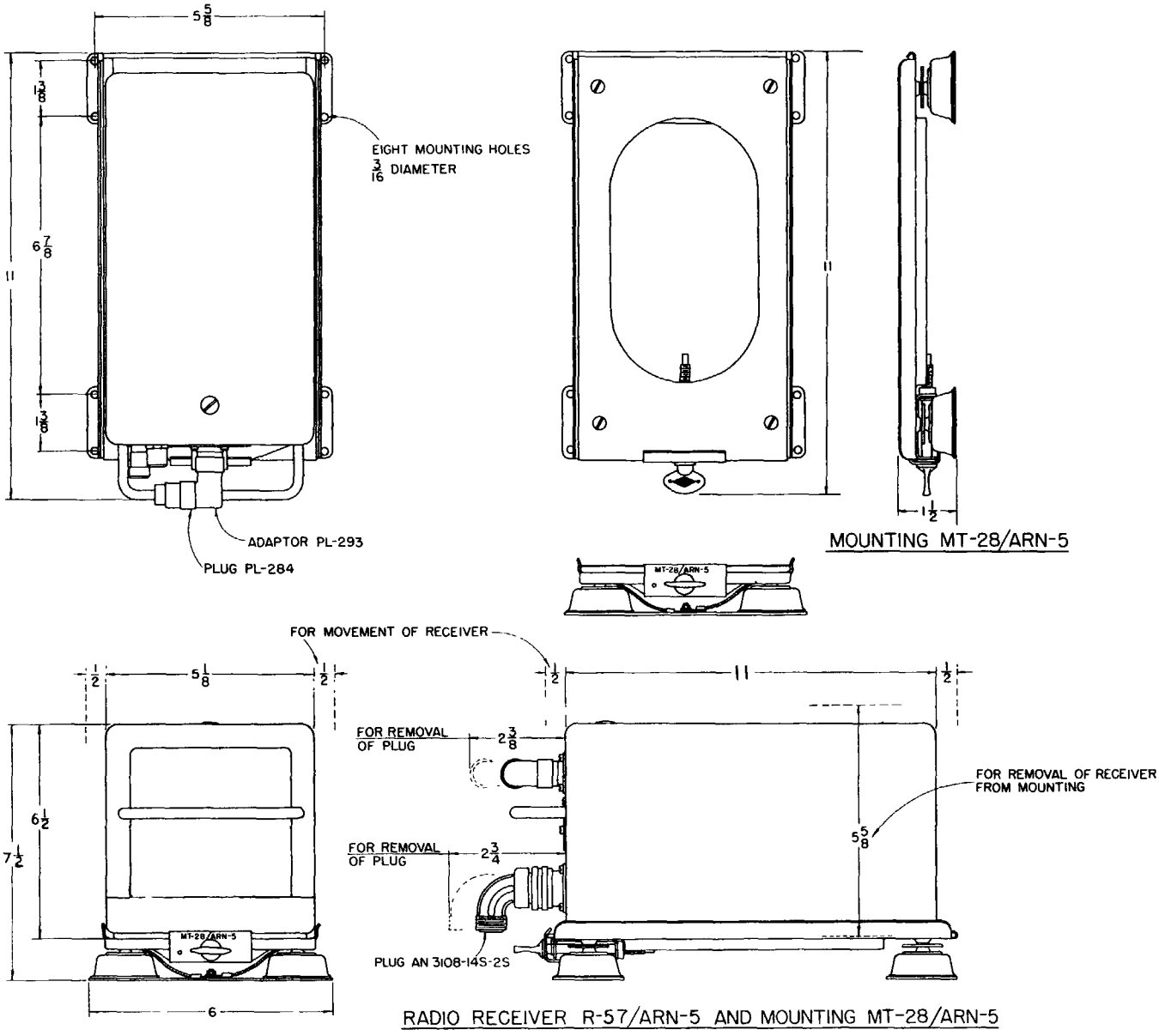


Figure 6-1. Radio Receiving Equipment AN/ARN-5—Outline Dimensional Drawing

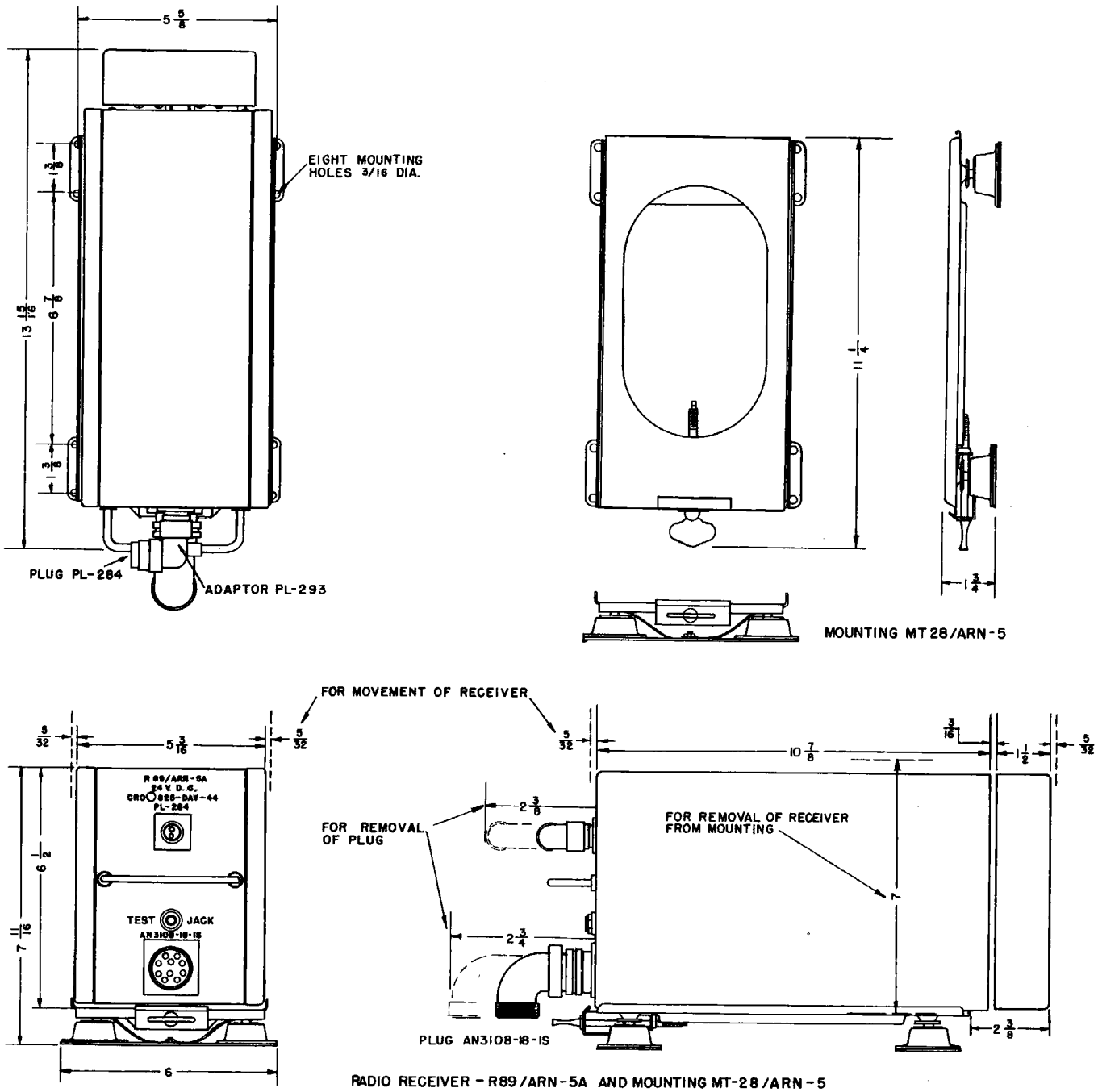


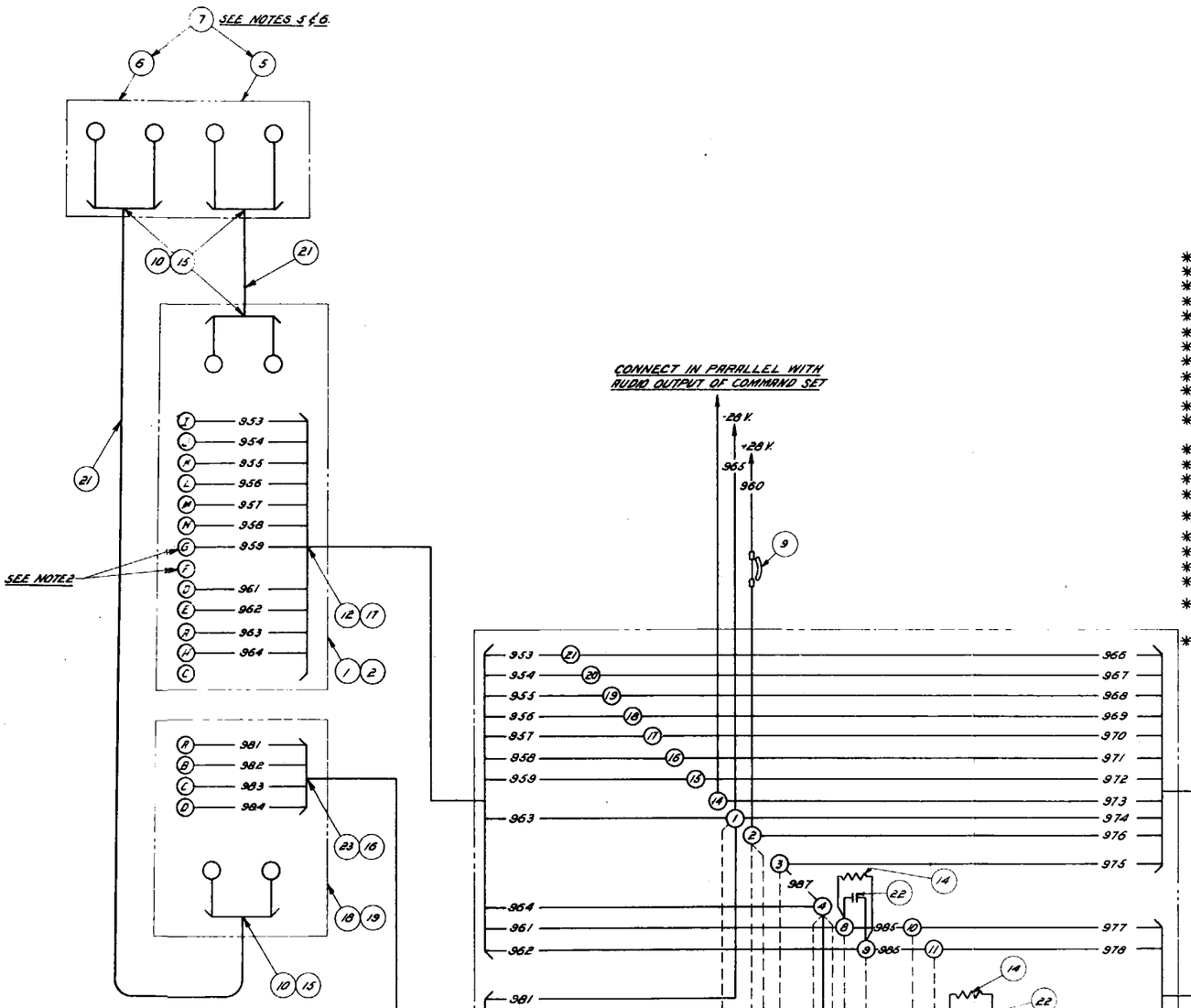
Figure 6-2. Radio Receiving Equipment AN/ARN-5A—Outline Dimensional Drawing

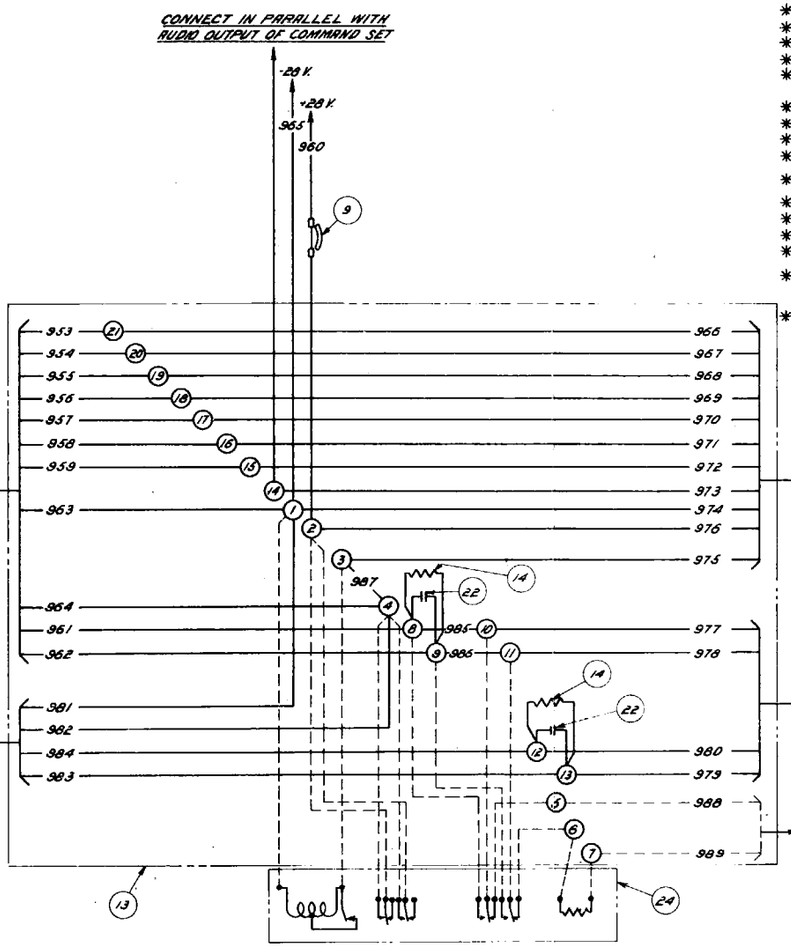
RESTRICTED
AN 08-30ARN5-2

WIRE TABLE

ALL WIRES TO BE AIRCRAFT CABLE PER SPEC. AN-J-C-48, UNLESS OTHERWISE SPECIFIED.
+ INDICATES WIRE TO BE INDIVIDUALLY SHIELDED PER SPEC. 95-27273.
Ⓢ INDICATES WIRE WHOSE VOLTAGE DROP MUST NOT EXCEED LIMITS OF SPEC. 95-32310.

REF. NOTES	WIRE NO.	MAXIMUM OPERATING VOLTAGE	MAX. ALLOWABLE RESISTANCE IN OHMS (1°C)	MINIMUM CABLE SIZE PERMITTED	REF. NOTE	WIRE NO.	MAXIMUM OPERATING VOLTAGE	MAX. ALLOWABLE RESISTANCE IN OHMS (1°C)	MINIMUM CABLE SIZE PERMITTED
	953	15	ONE	AN 20		972	100	ONE	AN 20
	954	15	ONE	AN 20		973	100	ONE	AN 20
	955	15	ONE	AN 20		974	0	.25	AN 18
	956	15	ONE	AN 20		975	30	.25	AN 18
	957	15	ONE	AN 20		976	30	.25	AN 18
	958	15	ONE	AN 20		977	30	ONE	AN 20
2	959	100	ONE	AN 20		978	30	ONE	AN 20
	960	30	.25	AN 18		979	1	ONE	AN 20
	961	1	1½	AN 20		980	1	ONE	AN 20
	962	1	1½	AN 20		981	0	.25	AN 18
	963	0	.25	AN 18		982	30	.25	AN 18
	964	30	.25	AN 18		983	1	1½	AN 20
	965	30	.25	AN 18		984	1	1½	AN 20
	966	15	ONE	AN 20	10	985	1	ONE	AN 20
	967	15	ONE	AN 20	10	986	1	ONE	AN 20
	968	15	ONE	AN 20	10	987	30	.25	AN 18
	969	15	ONE	AN 20	10	988	30	ONE	AN 20
	970	15	ONE	AN 20	10	989	30	ONE	AN 20
	971	15	ONE	AN 20					

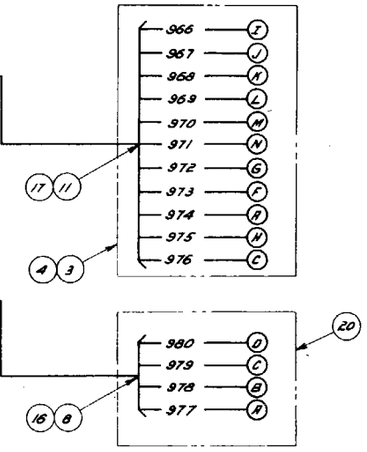




COMPONENT TABLE

ITEM	QUAN. REQD.	EQUIPMENT NOMENCLATURE: DESCRIPTION	EQUIPMENT NOMENCLATURE: TYPE NO.	SPEC. OR INSTALLATION DRAWING
* 1	1	RADIO RECEIVER	BC-733-D	H43G8688
* 2	1	MOUNTING	FT-283-A	H43G8688
* 3	1	RADIO CONTROL BOX	BC-732-A	H43G8688
* 4	1	MOUNTING	FT-282-A	H43G8688
* 5	1	ANTENNA (SEE NOTE 6)	AN-100 OR AN-100-A	H43G9161
* 6	1	ANTENNA (SEE NOTE 6)	RS-61/ARN-5	
* 7	1	ANTENNA (SEE NOTES 5 & 6)	RS-27/ARN-5	H44D2528
* 8	1	PLUG (PL-P257)	AN 3106-145-23	
* 9	1	CIRCUIT BREAKER	10 AMP	
* 10	4	PLUG	PL-284	H43G11747
* 11	1	PLUG (PL-P256)	AN3106-20-15	
* 12	1	PLUG (PL-Q234)	AN3108-20-15	
13		CONNECTOR PANEL	CONTRACTOR FURNISHED	
* 14	2 (NOTE 9)	RESISTOR (1000 Ω, ½ W.)	SEE NOTE 3	
* 15	4	ADAPTER	PL-293	H43G8688
* 16	2	ADAPTER (CABLE CLAMP H-286)	AN 3057-6	
* 17	2	ADAPTER (CABLE CLAMP H-293)	AN 3057-12	
* 18	1	RADIO RECEIVER OR RADIO RECEIVER	R-47/ARN-5 OR R-51/ARN-5	H44D2661
* 19	1	MOUNTING	MT-28-( )/ARN-5	H44D2661
* 20	1 (NOTE 9)	INDICATOR (PILOT'S)	I-101-C OR I-100-D	H43G8699
* 21	2	CABLE (TRANSMISSION LINE)	RG-22/U OR VIC-551	
* 22	2	CAPACITORS	SEE NOTE 7	
* 23	1	PLUG OR PLUG (PL-P257)	AN3108-145-28 OR AN 3106-145-28	
24		P.D.I. JUNCTION BOX		
* 25		DYNAMOTOR	DM-53-A OR DM-53-A2	

* INDICATES GOVERNMENT FURNISHED EQUIPMENT.



NOTES:

9 LOADING UNITS (ITEM (14)) ARE NOT REQUIRED WHEN A SECOND INDICATOR IS INSTALLED. WHEN A SECOND INDICATOR IS INSTALLED IT WILL BE WIRED IN PARALLEL WITH INDICATOR ITEM (20) INDICATOR ID-48/ARN MAY BE USED IN PLACE OF ITEM (20)

8 ITEM (13) TO BE TYPE NRS-17-R8, AS MADE BY NORTHERN INDUSTRIAL CHEMICAL CO., OR EQUAL.

7 ITEM (22), SIGNAL CORPS STOCK NO. 30KB1250, SHALL BE MOUNTED TO AIRPLANE STRUCTURE BY CONTRACTOR FURNISHED CLIPS, TYPE AN-742-22, OR EQUAL.

6 ITEM (7) IS A COMBINATION ANTENNA WHICH INCORPORATES THE FUNCTIONS OF ITEM (5) & ITEM (6). WHEN ITEM (7) IS INSTALLED, ITEM (5) & ITEM (6) ARE NOT REQUIRED.

5 EARLY PRODUCTION TYPES MARKED RS-27/ARN-4 ARE SATISFACTORY FOR USE. ALL LATER MODELS ARE CORRECTLY MARKED RS-27/ARN-5.

4 WIRES CONNECTED TO TERMINALS 1, 2, 3, 4, 8, 9, 10, 11, 12, 13 & 14 TO CONNECT TO A TERMINAL STRIP IN ALL CASES. ALL OTHER WIRING MAY CONNECT DIRECTLY TO ITEM (3) & ITEM (1). SEE NOTE 10.

3 ITEM (14) RESISTOR TYPE RS-125, SIGNAL CORPS STOCK NO. 32452S.

2 FOR 300 OHM OUTPUT, CONNECT WIRE 959 TO TERMINAL "F" IN PLUG AN3108-20-15 (ITEM (12)).

1 ALL TERMINAL STRIPS REQUIRED IN THE INSTALLATION OF THE WIRING SHALL BE OF SUITABLE INSULATING MATERIAL, AND WITH TERMINAL SPACING, TO PREVENT VOLTAGE BREAKDOWN.

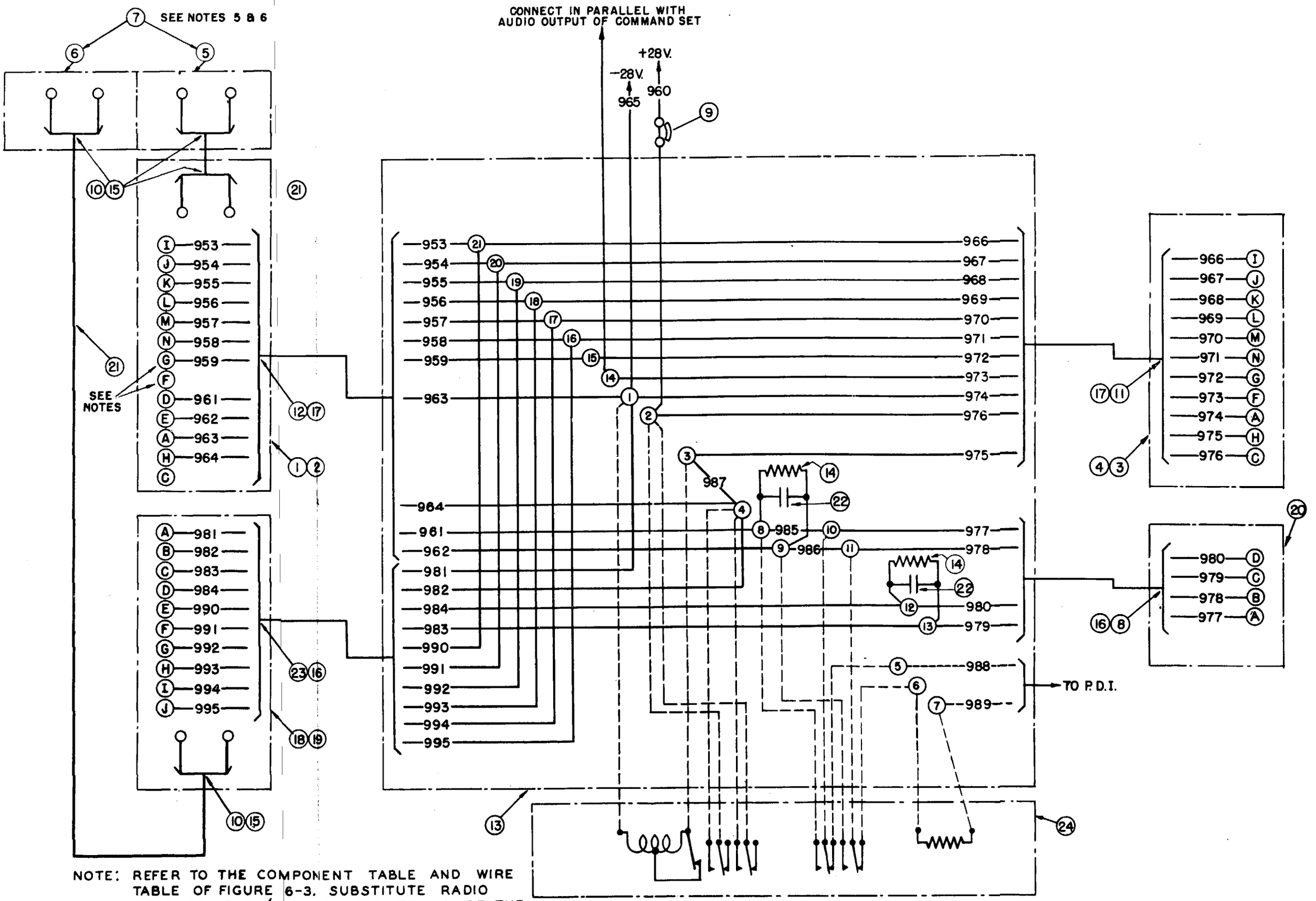
10 WHEN P.D.I. EQUIPMENT IS INSTALLED, TERMINALS 1 TO 14 INCLUSIVE ARE REQUIRED AND SHALL BE WIRED AS SHOWN BY DOTTED LINES TO CORRESPONDING TERMINALS IN P.D.I. JUNCTION BOX. WIRES NO. 985, 986, & 987 ARE NOT REQUIRED. TERMINALS 5, 6, & 7 & WIRES NO. 988 & 989 ARE REQUIRED FOR P.D.I. EQUIPMENT ONLY.

POWER REQUIREMENTS	
RC-103-A	62.4 WATTS
RN/ARN-5	34.0 WATTS
TOTAL	96.4 WATTS

TO BE IDENTIFIED ON ALL DRAWINGS AS WIRING DIAGRAM FOR RADIO SETS AN/ARN-5, RC-103-A & P.D.I. JUNCTION BOX.

Figure 6-3. Radio Receiving Equipments AN/ARN-5 and R-103-A—Cording Diagram

RESTRICTED
AN 08-30ARN5-2



NOTE: REFER TO THE COMPONENT TABLE AND WIRE TABLE OF FIGURE 6-3. SUBSTITUTE RADIO RECEIVER R-89/ARN-5A FOR ITEM 18 OF THE COMPONENT TABLE.

Figure 6-4. Radio Receiving Equipments AN/ARN-5A and RC-103-A—Cording Diagram