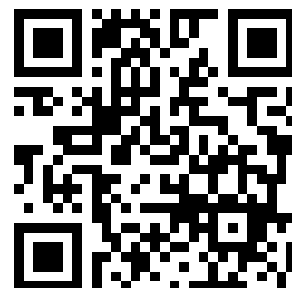

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OPERATOR'S MANUAL RADIO RECEIVING SETS AN/ARN-30A, AN/ARN-30B AND AN/ARN-30C

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HEADQUARTERS, DEPARTMENT OF THE ARMY

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HEADQUARTERS,
DEPARTMENT OF THE ARMY
WASHINGTON 25, D.C., 27 May 1959.

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[AG 41244 (12 May 59)]

By Order of *Wilber M. Brucker*, Secretary of the Army:

MAXWELL D. TAYLOR,
General, United States Army,
Chief of Staff.

Official:

R. V. LEE,
Major General, United States Army,
The Adjutant General.

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OS Maj Comd (5)	AMS (1)		11-507 (2)
OS Base Comd (5)			

NG: State AG (3).

USAR: None.

For explanation of abbreviations used, see AR 820-50.

*This manual supersedes so much TM 11-530A, 8 October 1957, including C 1, 20 November 1957, as pertain to first echelon.

TECHNICAL MANUAL

Operator's Manual

RADIO RECEIVING SETS AN/ARN-30A, AN/ARN-30B, AND AN/ARN-30C

TM 11-5826-207-10

CHANGES No. 1

HEADQUARTERS,
DEPARTMENT OF THE ARMY
WASHINGTON 25, D. C., 3 January 1963

TM 11-5826-207-10, 27 May 1959, is changed as follows:

Page 37. Add section V after section IV.

Section V. EQUIPMENT SERVICEABILITY CRITERIA

5-1. Purpose

The procedures described in paragraphs 5-3 through 5-6 will be used to evaluate equipment serviceability. This section does not affect the requirements in other portions of the manual pertaining to periodic preventive maintenance service on the equipment.

5-2. Scope

The instructions in this section apply to all organizations of the Army and will be performed by first or second echelon maintenance personnel. Evaluation of each assigned equipment installed in aircraft will be made periodically in accordance with these instructions; the frequency of the evaluation will be directed by appropriate commands. This equipment serviceability criteria will be used to evaluate the AN/ARN-30A, AN/ARN-30B, or AN/ARN-30C when installed in an aircraft. The procedures apply to these equipment only and do not evaluate or qualify the remaining portions of the aircraft electronic configuration.

5-3. Categories of Equipment Serviceability

Equipment will be rated as either *GO* (Combat Ready) or *NO-GO* (not Combat Ready).

a. The *GO* condition is subdivided into two categories: *GREEN* and *AMBER*.

- (1) *GREEN*—*completely combat ready*.
 - (a) Equipment passes all applicable tests in this section.
 - (b) All running spares and accessories are on hand at the using organization.

- (2) *AMBER*—*conditionally combat ready*.

Equipment passes all applicable tests in this section. As soon as the complete prescribed load of running spares and accessories are on hand at using organization, the category *AMBER* changes to *GREEN*.

b. The *NO-GO* classification is defined as category *RED*. Category *RED* is in effect when:

- (1) Equipment fails one or more of the applicable tests in this section even though all running spares and tools and accessories are on hand at the using organization.
- (2) One or more *URGENT* modification work orders (MWO) have not been applied.

5-4. Inspection and Maintenance Worksheet

a. Equipment Inspection and Maintenance Worksheet, DA Form 2404, will be used to record results of the equipment serviceability evaluation as follows:

- (1) Complete blocks 1, 2, 3, and 5.
- (2) Enter *ESE* (equipment serviceability evaluation) in block 6.
- (3) Enter the publication number and publication date in block 7.
- (4) Enter the item number of each test in column *a* and the symbol *P* (for Pass) or *F* (for Fail) as applicable in column *b*.
- (5) Record the data of each evaluation before the last entry in column *b*.

(6) After performing the evaluation, the evaluator will sign DA Form 2404 above column *b*. Supervisor will sign after the last entry in column *b*.

b. Lines may be drawn vertically in columns *c* and *d* to record subsequent evaluations. If columns *c* and *d* are used for recording subsequent evaluations, the date of evaluation will be recorded and the DA Form 2404 will be signed by the evaluator and his supervisor.

5-5. Test Conditions

a. Select an omnidirectional radio transmitting station (vor station) which has sufficient signal strength and whose signals are known to be reliable for reception. Note the location and frequency of this station (from the aeronautical chart used during flight). If the airfield has a runway localizer transmitter, note the frequency of this transmitter.

b. Place the aircraft in a location that is clear of obstructions that would prevent reception of the vor and localizer signals.

c. Position all aircraft switches and circuit breakers that control the application of 28 volts dc to the AN/ARN-30A, AN/ARN-30B, or AN/ARN-30C to off. Refer to the technical manuals covering the applicable aircraft for the names and locations of these switches and circuit breakers.

d. Connect an auxiliary power unit to the aircraft to furnish 28-volt dc power. Refer to the technical manuals covering the applicable aircraft for the procedure of connecting the auxiliary power unit.

e. Rotate the OFF switch on Radio Set Control C-984/ARN-30 or C-1254/ARN-30 fully counterclockwise.

f. Turn on the aircraft interphone system and set the NAV switch on the aircraft interphone control panel to its on position. (Check to see that the interphone system is set for monitoring the audio signals received by the AN/ARN-30A, AN/ARN-30B, or AN/ARN-30C.)

g. Set the OMNI-VAR LOC switch on Radio Set Control C-984/ARN-30 or C-1254/ARN-30 to OMNI.

h. Throughout the test (par. 5-6), monitor audio signals received by the AN/ARN-30A, AN/ARN-30B, or AN/ARN-30C in the interphone system headset.

5-6. Test Items

After making sure that all of the test conditions in paragraph 5-5 are complied with, perform all of the following test item checks. Omit items 8 and 9 if the airfield does not have an instrument landing system, including a runway localizer transmitter.

Item	Action	Result
1. Aircraft power switches and circuit breakers that control the application of primary power to the AN/ARN-30A, AN/ARN-30B, or AN/ARN-30C.	Place in on position -----	Panel markings on Radio Set Control C-984/ARN-30 or C-1254/ARN-30 glow. <i>Note.</i> Radio Set Control C-984/ARN-30 requires an ultraviolet instrument panel illuminating light which causes the fluorescent panel markings on this control to glow.
2. OFF switch on Radio Set Control C-984/ARN-30 or C-1254/ARN-30.	Rotate clockwise; allow sufficient time for the equipment to warm up and then adjust for comfortable volume level.	Receiver noise is heard in the headset.
3. Tuning crank on Radio Set Control C-984/ARN-30 or C-1254/ARN-30.	Rotate clockwise or counterclockwise until the number on the MC dial that is the same as the selected vor station frequency is below the reference mark on the control panel.	The call signs for the selected vor station are heard in the headset. The OFF vertical flag on Indicator ID-48/ARN or Course Indicator ID-453/ARN-30 drops out of sight and the vertical pointer deflects to the left or right. The TO-FROM meter on Course Indicator ID-322/ARN-30 or ID-453/ARN-30 indicates either TO or FROM.

Item	Action	Result
4. Course selector knob on Course Indicator ID-322/ARN-30 or ID-453/ARN-30.	Rotate until the course pointer indicates the known direction the aircraft is located from the vor station (vor radial). Note the course pointer indication.	Vertical pointer was deflected completely to the left or right (item 3) and returns to the center as the course pointer approaches the vor radial direction. The TO-FROM meter indicates TO.
5. Course selector knob on Course Indicator ID-322/ARN-30 or ID-453/ARN-30.	Rotate clockwise until the vertical pointer on Indicator ID-48/ARN or Course Indicator ID-453/ARN-30 is deflected to its complete left position. Note the course pointer indication.	The course pointer should be between 9° and 11° clockwise from the position in item 4.
6. Course selector knob on Course Indicator ID-322/ARN-30 or ID-453/ARN-30.	Rotate counterclockwise until the vertical pointer on Indicator ID-48/ARN or Course Indicator ID-453/ARN-30 is deflected to its complete right position. Note the course pointer indication.	The course pointer should be between 9° and 11° counterclockwise from the position in item 4.
7. Course selector knob on Course Indicator ID-322/ARN-30 or ID-453/ARN-30.	Rotate until course pointer is 180° from the position in item 4 (reciprocal heading).	The vertical pointer on Indicator ID-48/ARN or Course Indicator ID-453/ARN-30 should be centered, and the TO-FROM meter should indicate FROM.
8. Tuning crank on Radio Set Control C-984/ARN-30 or C-1254/ARN-30. <i>Note.</i> Omit items 8 and 9 if the airfield does not have a runway localizer transmitter.	Rotate clockwise or counterclockwise until the number on the MC dial that is the same as the frequency of the airfield runway localizer transmitter is below the reference mark on the control panel.	The audio tone and the call sign of the runway localizer transmitter should be heard in the headset. The vertical OFF flag on Indicator ID-48/ARN or Indicator Course ID-453/ARN-30 appears.
9. OMNI-VAR LOC switch on Radio Set Control C-984/ARN-30 or C-1254/ARN-30.	Place at VAR LOC -----	The OFF vertical flag on Indicator ID-48/ARN or Course Indicator ID-453/ARN-30 drops out of sight. The vertical pointer will deflect to the right if the aircraft is located within the runway localizer <i>left</i> sector. The vertical pointer will deflect to the left if the aircraft is located within the runway localizer <i>right</i> sector. The left and right sectors include the area on the left and right sides of the runway as viewed by facing the runway from the approach end.
10. OFF switch on Radio Set Control C-984/ARN-30 or C-1254/ARN-30.	Rotate completely counterclockwise to OFF.	OFF vertical flag on Indicator ID-48/ARN-30 or Course Indicator ID-453/ARN-30 appears and vertical pointer returns to center position. Audio in headset dies out.
11. Aircraft power switches and circuit breakers that were turned on in item 1.	Place in off positions -----	Panel markings on Radio Set Control C-1254/ARN-30 stop glowing. Ultraviolet light for Radio Set Control C-984/ARN-30 goes out.

5-7. Stopping Procedure

a. Turn off the NAV switch on the aircraft interphone control panel and turn off the aircraft interphone system.

b. Disconnect the aircraft auxiliary power unit. Refer to the applicable aircraft technical manual for procedures covering the disconnecting of the auxiliary power unit from the aircraft.

By Order of the Secretary of the Army:

Official:

J. C. LAMBERT,
Major General, United States Army,
The Adjutant General.

EARLE G. WHEELER,
General, United States Army,
Chief of Staff.

Distribution:

Active Army and NG: To be distributed in accordance with DA Form 12-31 requirements for first echelon or Operator's and Crew Member's Maintenance Instructions for all Fixed and Rotor Wing Aircraft.

USAR: None.

TECHNICAL MANUAL

Operator's Manual

RADIO RECEIVING SETS AN/ARN-30A, AN/ARN-30B, AND AN/ARN-30C

TM 11-5826-207-10 }
CHANGES No. 2 }

HEADQUARTERS,
DEPARTMENT OF THE ARMY
WASHINGTON 25, D.C., 12 April 1963

TM 11-5826-207-10, 27 May 1959, is changed as follows:

Notes. The parenthetical reference to previous changes (example: "page 1 of C 1") indicates that pertinent material was published in that changes.

Page 1. Add paragraphs 1-2.1 and 1-2.2 after 1-2.

ords in accordance with instructions in TM 38-750.

1-2.1. Index of Publications

Refer to the latest issue of DA Pam 810-4 to determine whether there are new editions, changes, or additional publications pertaining to your equipment. DA Pam 810-4 is an index of current technical manuals, technical bulletins, supply bulletins, lubrication orders, and modification work orders that are available through publications supply channels. The index lists the individual parts (-10, -20, -35P, etc.) and the latest changes to and revisions of each equipment publication.

b. Report of Damaged or Improper Shipment. Fill out and forward DD Form 6 (Report of Damaged or Improper Shipment) as prescribed in AR 700-58 (Army), NAVSANDA Publications 378 (Navy), and AFR 71-4 (Air Force).

1-2.2. Forms and Records

a. Reports of Maintenance and Unsatisfactory Equipment. Use equipment forms and rec-

c. Comments on Manual. Forward all comments on this publication direct to: Commanding Officer, U.S. Army Electronics Materiel Support Agency, ATTN: SELMS-MP, Fort Monmouth, N.J. (DA Form 1598 (Record of Comments on Publications), DA Form 2496 (Disposition Form), or letter may be used.)

Page 37, section V (page 1 of C 1). Add section VI after section V.

Section VI. MAINTENANCE INSTRUCTIONS

6.1. Scope of Maintenance

Notes. The pilot will not perform preventive or corrective maintenance.

The maintenance duties assigned to the aircraft crew chief are listed below together with a reference to the paragraphs covering the specific maintenance function. The duties include

instructions for performing preventive maintenance and corrective maintenance and do not require tools or materials other than those allocated at second echelon (par. 6-2)

a. Daily preventive maintenance checks and services (par. 6-4).

b. Cleaning (par. 6-5).

6-2. Tools and Materials Required

The tools and materials required to perform the maintenance duties assigned to the crew chief are—

- a. Tool Kit, Radio Repair TK-115/G.
- b. Fine sandpaper, No. 000.
- c. Clean, dry, lint-free cloth.
- d. Soft bristle brush.
- e. Cleaning compound (Federal stock No. 7980-395-9542).

6-3. Preventive Maintenance

Preventive maintenance is the systematic care, servicing, and inspection of equipment to prevent the occurrence of trouble, to reduce downtime, and to assure that the equipment is serviceable.

a. *Systematic Care.* The procedures given in paragraphs 6-4, 6-5, and 6-6 cover routine systematic care and cleaning essential to proper upkeep and operation of equipment.

b. *Preventive Maintenance Checks and Services.* The preventive maintenance checks and services chart (par. 6-5) outlines functions to be performed daily. These checks and services are designed to maintain Army equipment in a combat serviceable condition; that is, in good

general (physical) condition and in good operating condition. To assist the crew chief in maintaining combat serviceability, the chart indicates what to check, how to check, and what the normal conditions are; the *references* column lists the paragraphs and manuals that contain detailed repair or replacement procedures. If the defect cannot be remedied by the aircraft crew chief, higher echelon maintenance is required. Records and reports of these checks and services must be made in accordance with TM 38-750.

6-4. Daily Preventive Maintenance Checks and Services

Daily preventive maintenance checks and services of the AN/ARN-30A, AN/ARN-30B, and AN/ARN-30C (radio set) are required when the equipment is part of an aircraft installation. Paragraph 6-5 specifies checks and services that must be accomplished daily and under the special conditions listed below:

- a. Following the last flight of each day or preceding the next day's flight.
- b. When the equipment is replaced after removal for any reason.
- c. At least once each week if the equipment is maintained in a *standby* condition.

6-5. Daily Preventive Maintenance Checks and Services Chart

Notes. The operational checks must be made using a local VHF omnidirectional range (VOR), visual-aural range (VAR), and runway localizer station (LOC) of known reliable strength. Place the aircraft in a location that is free of obstructions, such as high power lines and large buildings.

Sequence No.	Item	Procedure	References
1	Radio set components-----	Check for completeness and proper installation. Replace any missing units.	Applicable aircraft technical manual.
2	Cleanliness -----	Check the components of the radio set for dirt and moisture. Remove dirt, moisture, rust, and corrosion.	Par. 6-6.
3	Connectors -----	Check connectors for security. Hand-tighten loose connectors.	
4	Knobs, dials, switches, and panel lamps.	While making the operating checks (items 5 through 10), observe that the mechanical action of each knob, dial, and switch is smooth and free of external or internal binding. Check the panel lamps on the C-1254/ARN-30 for security.	Applicable aircraft technical manual.
5	Aircraft power-----	Energize aircraft switches and circuit breakers so that power is applied to the radio set.	Applicable aircraft technical manual.

Sequence No.	Item	Procedure	References
6	Radio set receiver operation	Turn the control unit OFF switch clockwise (direction of arrow). See that receiver noise is heard over the aircraft audio system. Check that C-1254/ARN-30 panel lamps light.	Table 2-1.
7	Control Unit. Course Indicator ID-322/ARN-30 and Indicator ID-48/ARN-30 or Course Indicator ID-453/ARN-30.	Set the control unit OMNI-VAR LOC switch to OMNI, tune to frequency of the local VOR station. The tuning dial frequency corresponds to transmitting station frequency (identified by station call sign). The ID-48/ARN-30 or ID-453/ARN-30 vertical pointer FLAG alarm is out of sight and the vertical pointer deflects to the left or right. The ID-322/ARN-30 or ID-453/ARN-30 TO-FROM meter indicates TO or FROM. <i>Note.</i> In some installations, Course Indicator ID-453/ARN-30 is used in place of both Indicator ID-48/ARN-30 and Course Indicator ID-322/ARN-30.	Higher echelon repair required.
8	ID-453/ARN-30 or ID-48/ARN-30 and ID-322/ARN-30.	a. Rotate the course selector knob of the ID-322/ARN-30 or ID-453/ARN-30 until the ID-453/ARN-30 or ID-48/ARN-30 vertical pointer centers. The vertical pointer flag alarm is out of sight and TO-FROM meter indicates TO or FROM. b. Rotate the course selector knob to the reciprocal of the heading obtained in a above. The vertical pointer flag alarm is out of sight and the vertical pointer centers. The TO-FROM meter indication is opposite to that of a above.	a. Higher echelon repair required. b. Higher echelon repair required.
9	Control Unit and ID-48/ARN-30 or ID-453/ARN-30.	Set the control unit OMNI-VAR LOC switch to VAR LOC and tune to the frequency of the local VAR station or the runway localizer transmitter. The tuning dial frequency corresponds to the frequency of the transmitting station (identified by station call sign). The ID-48/ARN-30 or ID-453/ARN-30 vertical pointer deflects to the left or right, depending on the aircraft location, and the vertical pointer flag alarm is out of sight. <i>Note.</i> The horizontal pointer and flag alarm of the ID-48/ARN-30 or ID-453/ARN-30 will not give an indication. They are used in conjunction with a glide slope receiver, not part of the radio set.	Higher echelon repair required.
10	Control Unit -----	Turn the OFF switch counterclockwise (against the direction of arrow) to OFF.	Table 2-1.
11	Aircraft power-----	Deenergize aircraft switches and circuit breakers to remove power from radio set and aircraft.	Applicable aircraft technical manual.

6-6. Cleaning

Inspect the components of the radio set for cleanliness. The surfaces should be clean and free of dirt, grease, corrosion, and fungus.

Perform the following procedures as specified in the maintenance checks and services chart.

- a. Remove dirt and loose dust with a clean soft cloth.

Warning: Cleaning compound is flammable and its fumes are toxic. Provide adequate ventilation. *Do not use near a flame.*

b. Remove grease, fungus, and ground-in dirt from the surfaces of the components; use a cloth dampened (not wet) with cleaning compound.

c. Remove dust or dirt from the connectors with a brush.

Caution: Do not press on the glass faces of the ID-453/ARN-30 or the ID-48/ARN-30 and ID-322/ARN-30 when cleaning; the meters may become damaged.

d. Clean the meters, controls, and dials; use a soft clean cloth. If dirt is difficult to remove dampen the cloth with water; mild soap may be used for more effective cleaning.

e. Remove rust and corrosion from metal surfaces by lightly sanding them with fine sandpaper. Brush two thin coats of paint on the bare metal to protect it from further corrosion. Refer to applicable cleaning and refinishing practices specified in TM 9-213.

Add the appendix after section VI.

APPENDIX

REFERENCES

The following is a list of applicable references.

DA Pam 310-4	Index of Technical Manuals, Technical Bulletins, Supply Bulletins, Lubrication Orders, and Modification Work Orders.
TM 9-213	Painting Instructions for Field Use.
TM 11-530	Installation Practices for Aircraft Electric and Electronic Wiring.
TM 11-5826-207-12P	Operator and Organizational Maintenance Repair Parts and Special Tools Lists and Maintenance Allocation Chart; Receiving Set, Radio AN/ARN-30, -30A, -30B, -30C.
TM 11-6625-203-12	Operation and Organizational Maintenance: Multimeter AN/URM-105, including Multimeter ME-77/U.
TM 38-750	The Army Equipment Records System and Procedures.

By Order of the Secretary of the Army:

Official:

J. C. LAMBERT,
Major General, United States Army,
The Adjutant General.

EARLE G. WHEELER,
General, United States Army,
Chief of Staff.

Distribution:

To be distributed in accordance with DA Form 12-31 requirements for operator and crew maintenance instructions for all fixed and rotor wing aircraft.

TABLE OF CONTENTS

<i>Section</i>	<i>Page</i>
I GENERAL DESCRIPTION	1
1-1. Purpose of Handbook	1
1-3. Purpose of Equipment	1
1-5. Equipment Supplied	1
1-7. Equipment Required But Not Supplied	3
1-9. Description of Components	3
1-26. General Principles of Operation	11
1-30. Power Requirements	11
1-32. Operating Limitations	11
1-35. Comparison of VHF Navigation Facilities	11
1-37. Comparison of Radio Receiving Set AN/ARN-30, AN/ARN-30A, AN/ARN-30B, and AN/ARN-30C	14
II OPERATING PROCEDURES	19
2-1. Operating Controls	19
2-3. Operation Prior to Take-off	21
2-5. Airborne Operation of VOR Facilities	23
2-16. Airborne Operation of VAR Facilities	27
2-24. Simultaneous Voice and Navigation Signal Reception	32
III OPERATING CHECKS AND ADJUSTMENTS	35
3-1. Preflight Operating Checks and Adjustments	35
3-3. Airborne Operating Checks and Adjustments	35
IV EMERGENCY OPERATION	37

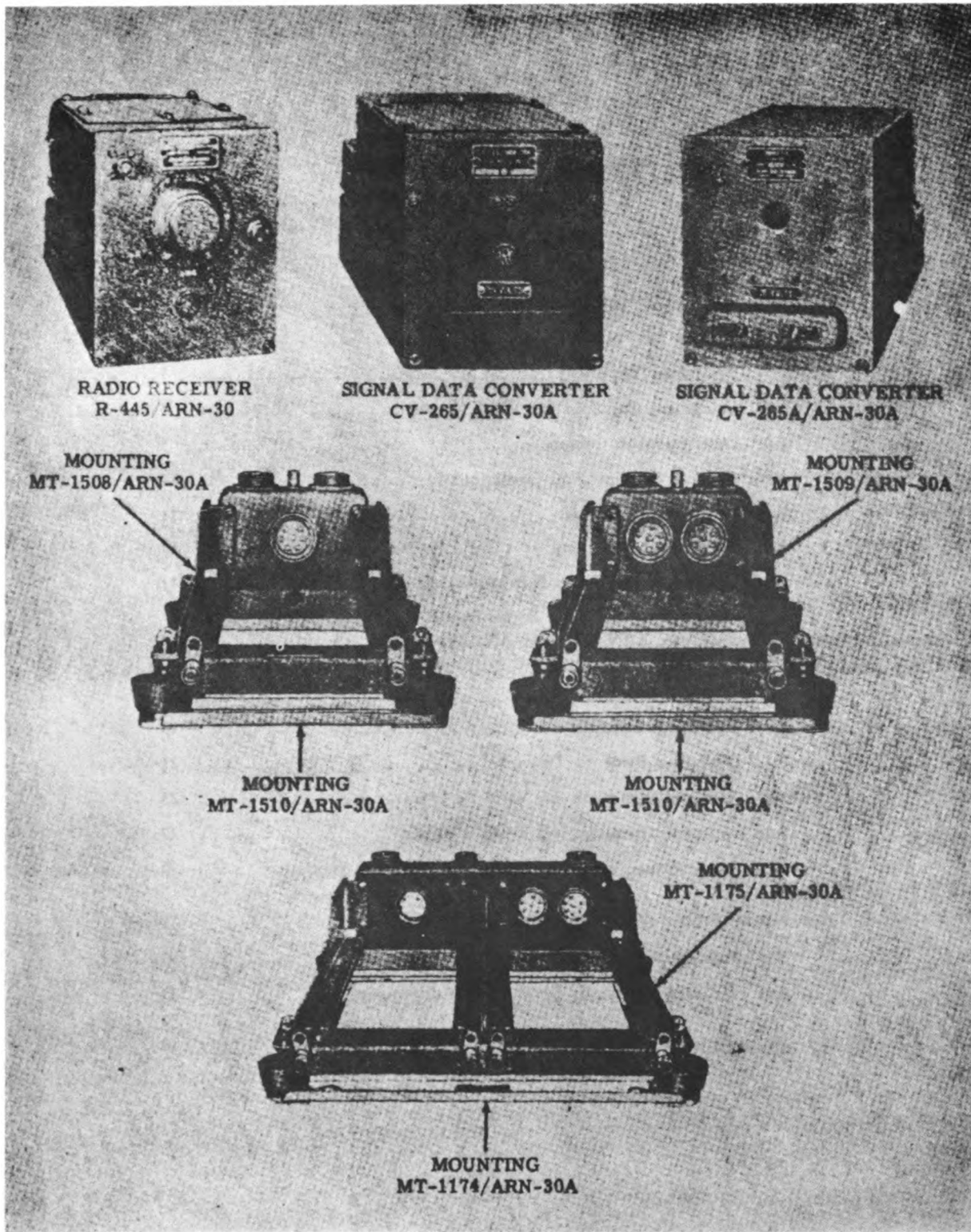


Figure 1-1. Radio Receiving Set AN/ARN-30A, AN/ARN-30B, and AN/ARN-30C (Sheet 1 of 2)

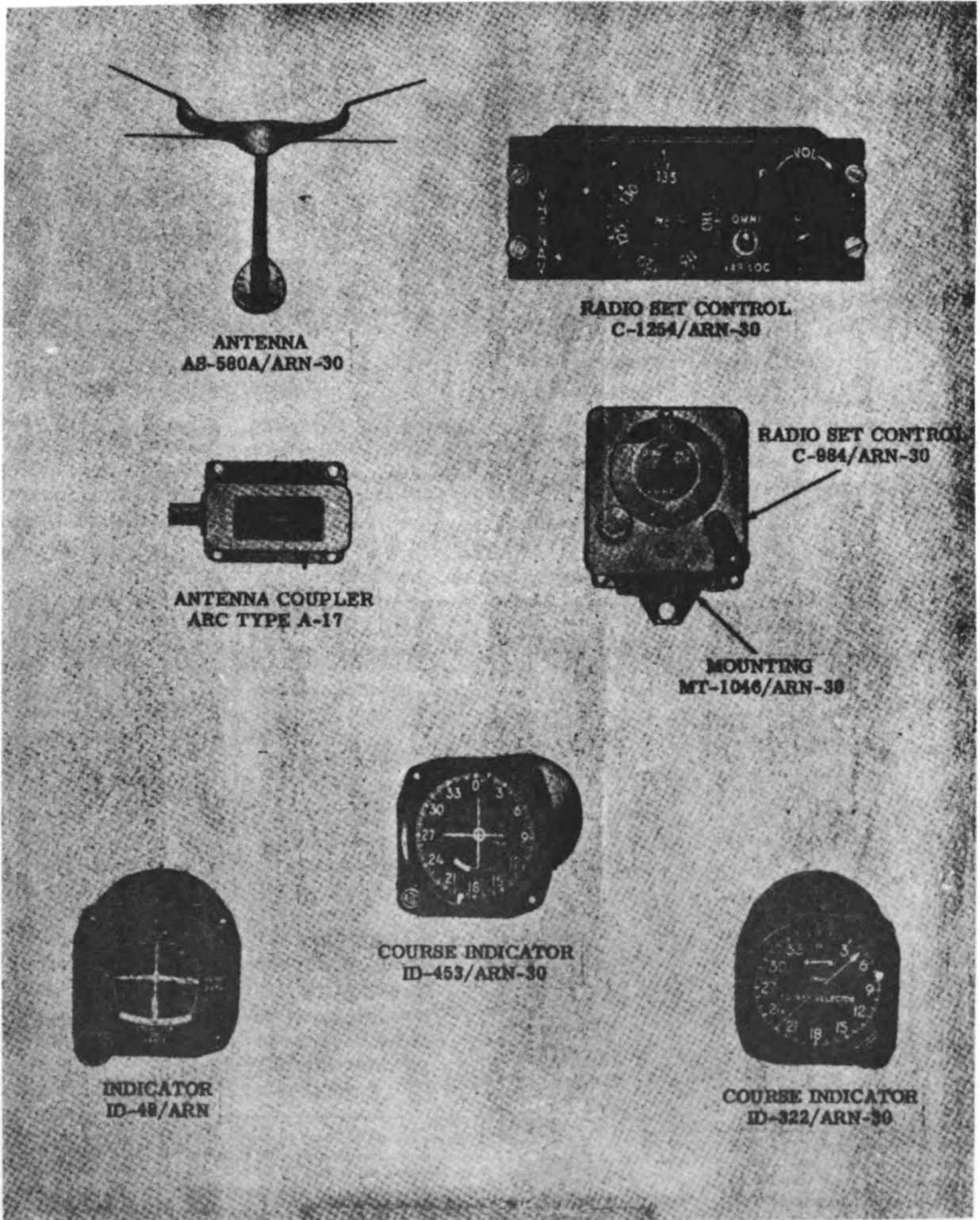


Figure 1-1. Radio Receiving Set AN/ARN-30A, AN/ARN-30B, and AN/ARN-30C (Sheet 2 of 2)

SECTION I

GENERAL DESCRIPTION

1-1. PURPOSE OF HANDBOOK.

1-2. This handbook provides instructions for the operation of Radio Receiving Set AN/ARN-30A, AN/ARN-30B, and AN/ARN-30C. All statements in this handbook apply to all sets except when referenced to one or more specific sets.

1-3. PURPOSE OF EQUIPMENT.

1-4. Radio Receiving Set AN/ARN-30A, AN/ARN-30B, and AN/ARN-30C (each hereinafter referred to as the set), are airborne radio receiving sets with a frequency range of 108 to 135 megacycles designed to receive the following vhf radio airways facilities:

Vhf omnidirectional range (VOR); visual-aural range (VAR); 90/150 cps runway localizer (LOC); voice reception on the complete band of frequencies covered within the range of 108 to 135 megacycles, simultaneously with the available navigation facilities, if desired.

1-5. EQUIPMENT SUPPLIED.

1-6. The major units, mechanical linkage and interconnecting parts supplied as part of the sets are shown in figures 1-1 and 1-2. The quantity of major units supplied with each set are listed in table 1-1. See table 1-2 for the quantity of interconnecting parts supplied. For a comparison listing of major units for each set, refer to table 1-3.

TABLE 1-1. MAJOR UNITS SUPPLIED

Short Form Name	Type Designation	Quantity Per Installation		
		AN/ARN-30A	AN/ARN-30B	AN/ARN-30C
Antenna	AS-580A/ARN-30	1	1	1
Antenna Coupler	A-17 ¹	1	1	1
Control Unit	C-984/ARN-30 ²	1	1	1
Control Unit	C-1254/ARN-30 ²	1	1	1
Converter	CV-265/ARN-30A	1	—	—
Converter	CV-265A/ARN-30A	—	1	1
Course Indicator	ID-322/ARN-30	1	1	—
Course Indicator	ID-453/ARN-30	—	—	1
Dynamotor	DY-86/ARN-30	1	1	1
Indicator	ID-48/ARN	1	1	—
Mounting	MT-1046/ARN-30	1	1	1
Mounting	MT-1174/ARN-30A ³	1	1	1
Mounting	MT-1175/ARN-30A ³	1	1	1
Mounting	MT-1508/ARN-30A ⁴	1	1	1
Mounting	MT-1509/ARN-30A ⁴	1	1	1
Mounting	MT-1510/ARN-30A ⁴	1	1	1
Receiver	R-445/ARN-30	1	1	1

¹ Antenna AS-580A/ARN-30 is normally supplied for use on all aircraft except jet aircraft. In jet aircraft, Antenna Coupler ARC Type A-17 is installed inside canopy with two 1/8-inch diameter rods (not supplied), each about 26 inches long, forming the dipole. The antenna coupler may also be used to match a dipole antenna mounted on the vertical fin, to a standard 50-ohm coaxial cable.

² Radio Set Control C-984/ARN-30, with Mounting MT-1046/ARN-30, and Radio Set Control C-1254/ARN-30 are interchangeable functionally but not physically.

³ Mounting MT-1174/ARN-30A and Mounting MT-1175/ARN-30A are supplied for a one-rack installation when the receiver and converter are mounted on a common rack.

⁴ Mounting MT-1508/ARN-30A, Mounting MT-1509/ARN-30A, and Mounting MT-1510/ARN-30A are supplied for a two-rack installation when the receiver and converter are mounted on individual racks.

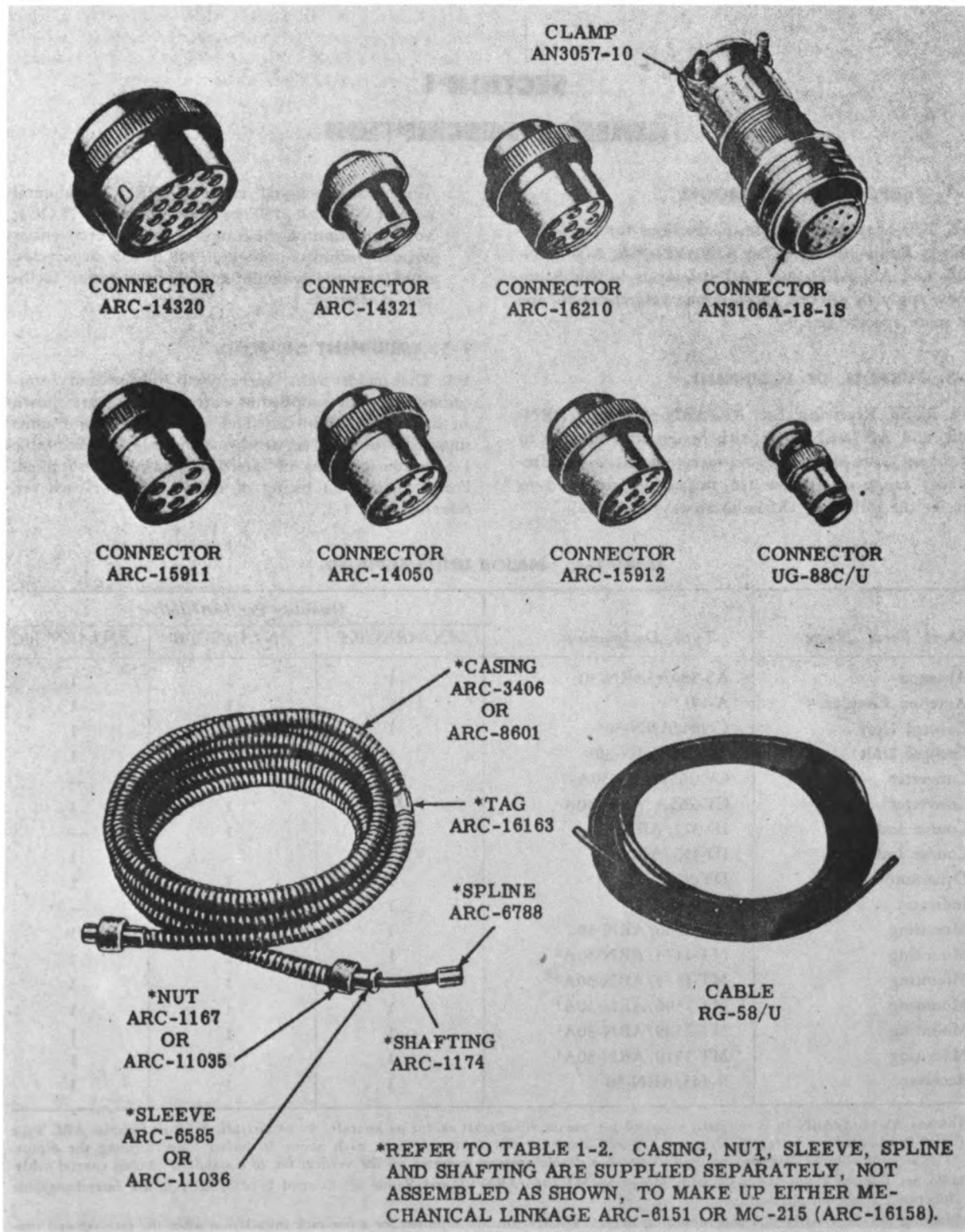


Figure 1-2. Radio Receiving Set AN/ARN-30A, AN/ARN-30B and AN/ARN-30C, Interconnecting Parts

1-7. EQUIPMENT REQUIRED BUT NOT SUPPLIED.

1-8. The required equipment not supplied consists of sufficient AN16 and AN20 bulk wire to fabricate the required wiring harness. The length of wire is determined by the set used, and by the location of the units in the aircraft in which the units are installed. All connectors for the wiring harness and all parts for the mechanical linkage, listed in table 1-2, are supplied, as well as connectors and coaxial conductors for the r-f cables.

1-9. DESCRIPTION OF COMPONENTS.

1-10. ANTENNA AS-580A/ARN-30. (See figure 1-3.) Antenna AS-580A/ARN-30 functions as the receiving antenna for the set. The antenna is a "ramshorn" V-type incorporating two broad-band antennas. The forward dipole antenna is used for glide-slope signal reception, if such equipment is installed in the aircraft. The angular rear dipole antenna is used for the reception of VOR, VAR, and localizer signals in conjunction with the other units of the set. Both antennas terminate

in individual UG-291/U connectors located in the antenna base. The dipoles are set in a rubber block, which in turn is fastened to an aluminum pedestal support. Antenna AS-580A/ARN-30 is designed for mounting on the fuselage of the aircraft.

1-11. RADIO RECEIVER R-445/ARN-30. (See figure 1-4.) Radio Receiver R-445/ARN-30 is a nine-tube superheterodyne receiver capable of being tuned to any amplitude-modulated signal with a frequency range between 108 and 135 megacycles. The receiver provides aural output for headset operation, as well as a navigation signal which is used to feed the converter. The receiver contains no local tuning controls but is designed to be tuned remotely by Radio Set Control C-984/ARN-30 or Radio Set Control C-1254/ARN-30. The antenna input connector, a threaded sleeve for connecting the mechanical linkage to the tuning-capacitor drive-gear, and an auxiliary-equipment output connector are located on the front panel of the receiver. The auxiliary connector, normally covered by a screw-on cap, is used for connecting the receiver high-voltage supply to a VHF

TABLE 1-2. INTERCONNECTING PARTS SUPPLIED

Short Form Name	Type Designation	Quantity Per Installation					
		AN/ARN-30A		AN/ARN-30B		AN/ARN-30C	
		One-Rack	Two-Rack	One-Rack	Two-Rack	One-Rack	Two-Rack
Cable	RG-58/U	AR	AR	AR	AR	AR	AR
Clamp	AN3057-10	1	1	1	1	—	—
Connector, coaxial	UG-88C/U	2	4	2	4	2	4
Connector, plug	ARC-14050	2	2	2	2	2	2
Connector, plug	AN3106A-18-1S	1	1	1	1	—	—
Connector, plug	ARC-14320	—	—	—	—	1	1
Connector, plug	ARC-14321	1	—	1	—	1	—
Connector, plug	ARC-15911	1	1	1	1	—	1
Connector, plug	ARC-15912	—	1	—	1	1	1
Connector, plug	ARC-16210	—	1	—	1	—	1
Shafting	ARC-1174 ^{1, 2}	AR	AR	AR	AR	AR	AR
Nut	ARC-1167 ¹ or ARC-11035 ²	2	2	2	2	2	2
Casing	ARC-3406 ¹ or ARC-8601 ²	AR	AR	AR	AR	AR	AR
Sleeve	ARC-6585 ¹ or ARC-11036 ²	2	2	2	2	2	2
Spline	ARC-6788 ^{1, 2}	2	2	2	2	2	2
Tag	ARC-16163 ²	1	1	1	1	1	1

¹These items, when assembled, make up Mechanical Linkage ARC-6151.

²These items, when assembled, make up Mechanical Linkage MC-215(ARC-16158).

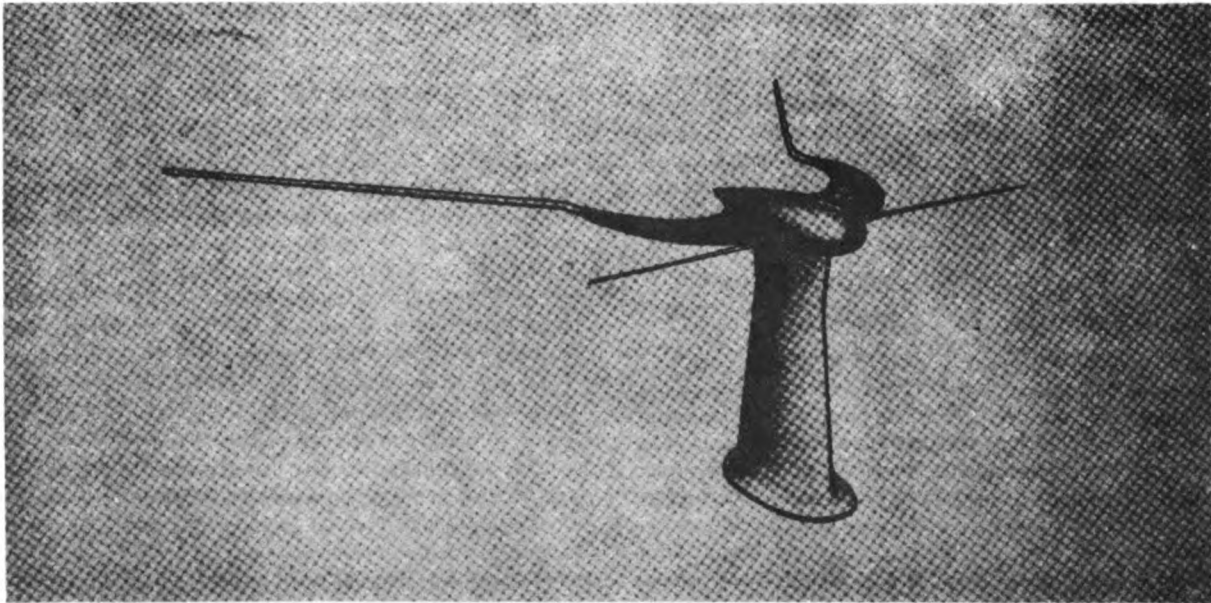


Figure 1-3. Antenna AS-580A/ARN-30

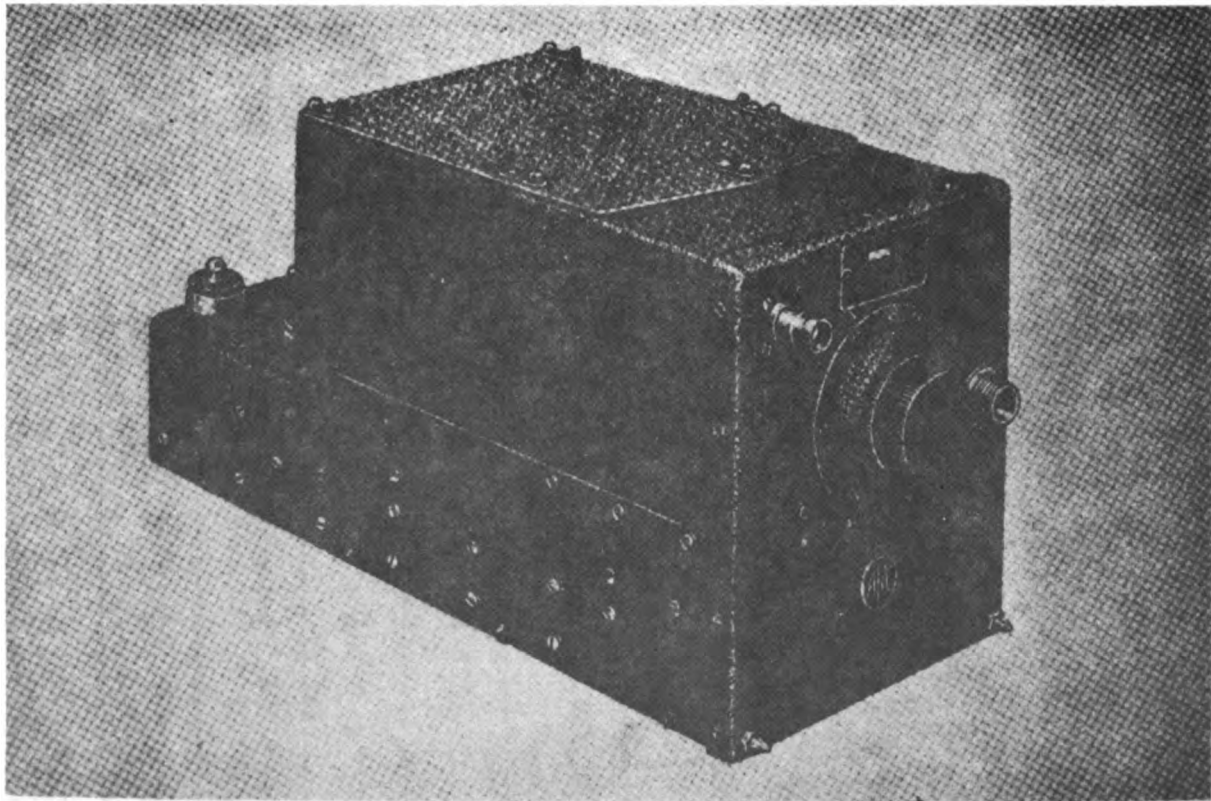


Figure 1-4. Radio Receiver R-445/ARN-30

transmitter, such as Radio Transmitter T-366A/ARC or T-363A/ARC, or to a 75-mc marker beacon receiver such as the ARC Type R-20A Marker Beacon Receiver, if such equipment is included in the aircraft. A wired plug, located behind the screw-on cap, is connected to the auxiliary connector in order to complete the receiver high-voltage output.

CAUTION

The wired plug must be left in place to ensure operation of the set unless a vhf transmitter or marker beacon receiver is connected.

Four vibration mounts and an input connector for Dynamotor DY-86/ARN-30 are located at the rear of the receiver chassis. Output connectors are installed on the rear end of the receiver chassis and plug into the mating connectors on the receiver mounting. A snap-slide-attached cover on top of the receiver chassis permits easy access to all electron tubes and alignment adjustment points.

1-12. SIGNAL DATA CONVERTER CV-265/ARN-30A AND CV-265A/ARN-30A. Signal Data Converter CV-265/ARN-30A (figure 1-5) and CV-265A/ARN-30A (figure 1-6) are five-tube units designed to accept the VOR, VAR, and localizer information delivered by the receiver and convert it to a form which is presented visually by the instrumentation provided. The converters contain no operating or tuning controls. Input and output connectors are located on the rear end of the chassis and mate with connectors on Mounting MT-1175/ARN-30A when the receiver and converter are commonly mounted, or on Mounting MT-1509/ARN-30A when the converter is mounted separately from the receiver. All electron tubes are accessible when the top cover is removed. Three alignment adjustment controls are located on front of the converter behind a screw-attached cover on the CV-265/ARN-30A and behind a snapslide attached cover on the CV-265A/ARN-30A; *however, these controls are not required for any operating procedure and must not be tampered with.*

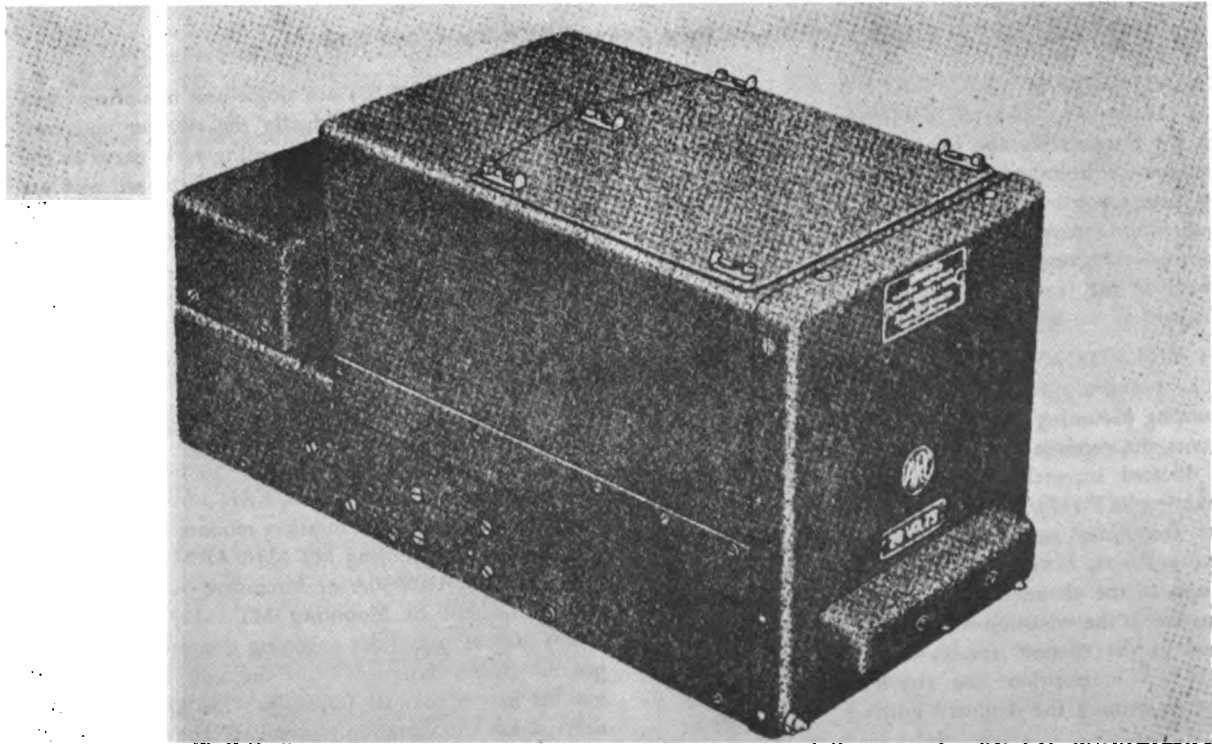


Figure 1-5. Signal Data Converter CV-265/ARN-30A

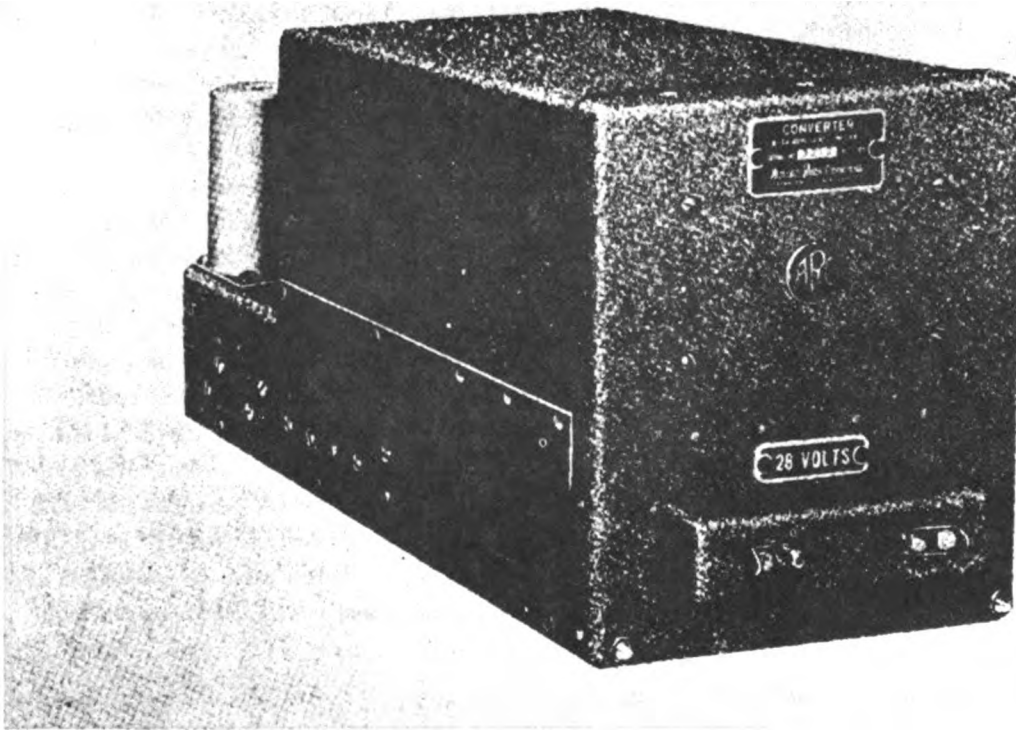


Figure 1-6. Signal Data Converter CV-265A/ARN-30A

1-13. MOUNTING MT-1175/ARN-30A. (See figure 1-7.) Mounting MT-1175/ARN-30A is the mounting rack for the receiver and converter when mounted for a one-rack installation and serves as a terminal junction box for all units of the set. These units are mounted in separate stalls, secured by means of nut-and-link arrangements which engage the tapered studs located on the front of the units. All connectors are contained in an enclosure located at the rear.

1-14. MOUNTING MT-1174/ARN-30A. (See figure 1-8.) Mounting MT-1174/ARN-30A is provided for mounting Mounting MT-1175/ARN-30A, which in turn mounts the receiver and converter. Vibration mounts are located in each corner of MT-1174/ARN-30A. Mounting MT-1175/ARN-30A is secured by means of four snapslides engaging the grooved studs. Two ground straps, fastened from the two rear vibration mounts to the channel frame, provide ground connections across the vibration mounts. Eight holes are provided in the channel frames for securing MT-1174/ARN-30A in position; the attaching hardware parts serve to ground the mounted units.

1-15. MOUNTING MT-1508/ARN-30A AND MOUNTING MT-1509/ARN-30A. Mounting MT-1508/ARN-30A (figure 1-9) and Mounting MT-1509/

ARN-30A (figure 1-10) are single-unit mounting racks designed to mount individually the receiver and converter, respectively. These mounting racks serve as the terminal junction box for all units of the set, and are used where space limitations prevent mounting both the receiver and converter in Mounting MT-1175/ARN-30A. The connectors are located in an enclosure at the rear of each mounting rack. Each mounting rack contains two nut-and-link arrangements which engage two conical studs located on the front of the receiver and converter.

1-16. MOUNTING MT-1510/ARN-30A. (See figure 1-11.) Mounting MT-1510/ARN-30A is provided for mounting Mounting MT-1508/ARN-30A or Mounting MT-1509/ARN-30A. Vibration mounts are located in each corner of Mounting MT-1510/ARN-30A. Mounting MT-1508/ARN-30A or Mounting MT-1509/ARN-30A is secured to Mounting MT-1510/ARN-30A by means of four snapslides engaging grooved studs. Two ground straps, fastened from the two rear vibration mounts to the channel frame, provide ground connections across the vibration mounts. Eight holes are provided in the channel frames for securing MT-1510/ARN-30A in position. The attaching hardware parts serve to ground the mounted units.

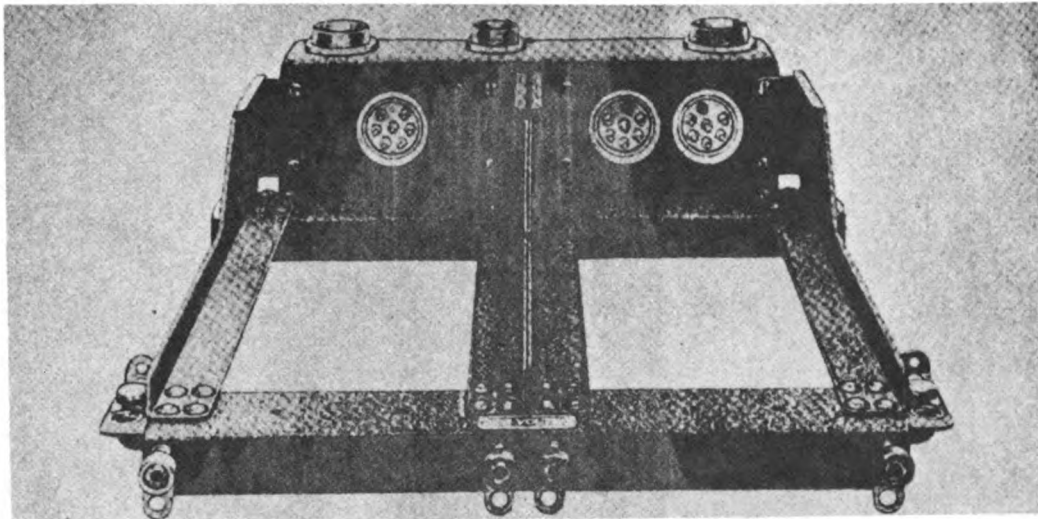


Figure 1-7. Mounting MT-1175/ARN-30A

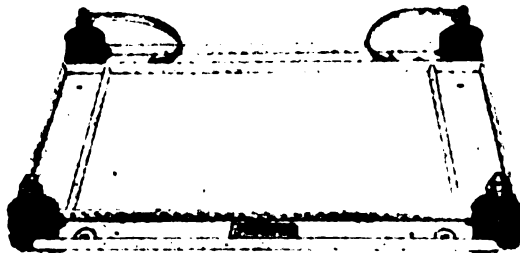


Figure 1-8. Mounting MT-1174/ARN-30A

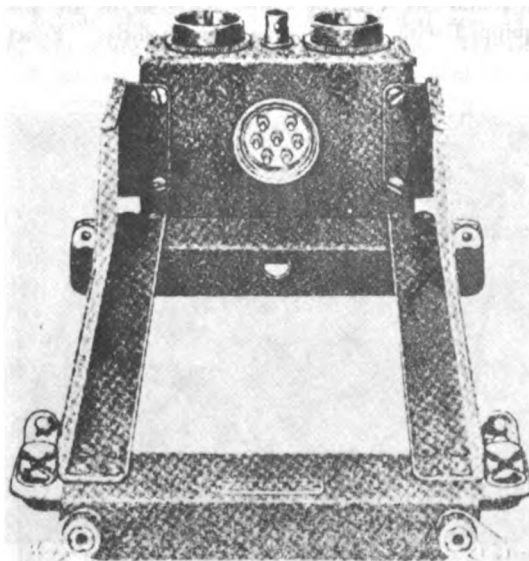


Figure 1-9. Mounting MT-1508/ARN-30A

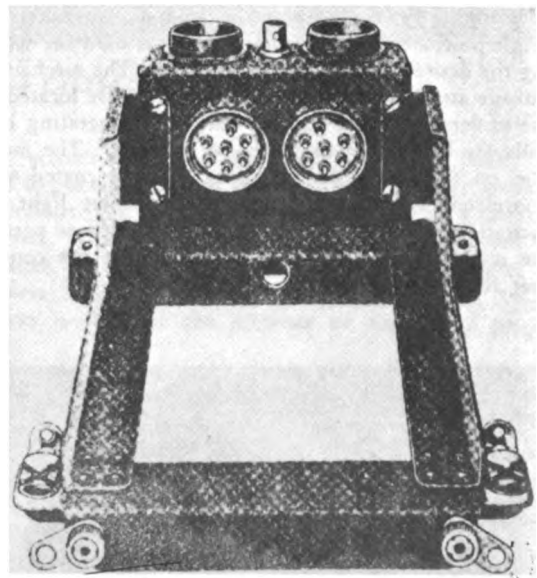


Figure 1-10. Mounting MT-1509/ARN-30A

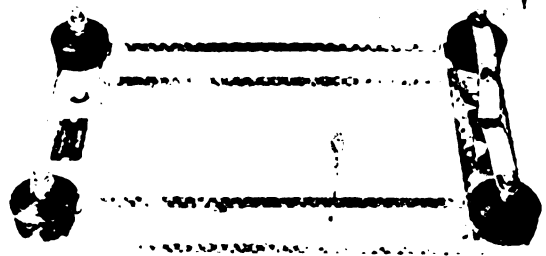


Figure 1-11. Mounting MT-1510/ARN-30A

1-17. DYNAMOTOR DY-86/ARN-30. (See figure 1-12.) Dynamotor DY-86/ARN-30 is a completely enclosed unit used to furnish high voltage to the receiver and converter. The dynamotor plugs into a mating connector at the rear of the receiver chassis and is secured to four vibration mounts on the receiver chassis by snapslides located on the base of the dynamotor.

1-18. RADIO SET CONTROL C-984/ARN-30. (See figure 1-13.) Radio Set Control C-984/ARN-30 is used in aircraft where only bulkhead or panel mounting facilities are provided. The control is interchangeable with Radio Set Control C-1254/ARN-30 (paragraph 1-20). The C-984/ARN-30 provides remote power control for the set, remote tuning control of the receiver, volume level control of the equipment audio output, and switch control for selecting VOR or VAR and localizer signals. Power control is accomplished by means of an off-on rotary switch combined with a variable resistor which is used for controlling the volume level of the received signal. Remote control tuning of the receiver is provided by the interconnection of mechanical linkage between the receiver and the control unit. Internally, the mechanical linkage is geared to a tuning crank and a frequency-indicating dial. A single-pole, single-throw rotary switch is used for selecting the desired type of signal reception. The mechanical linkage attachment point and a connector are located on the underside of the control unit. All operating controls are located on the front of the unit. The markings on the frequency indicating dial are coated with fluorescent paint which requires ultraviolet light for excitation at night. A snapslide is included as part of the rear cover plate, and is used to secure the control unit to its mounting.

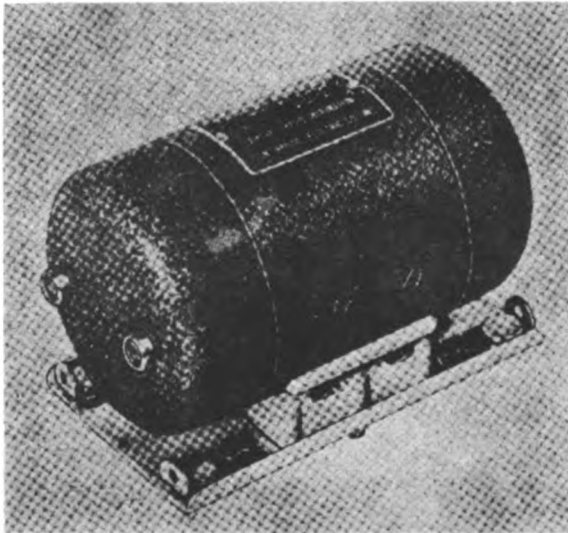


Figure 1-12. Dynamotor DY-86/ARN-30

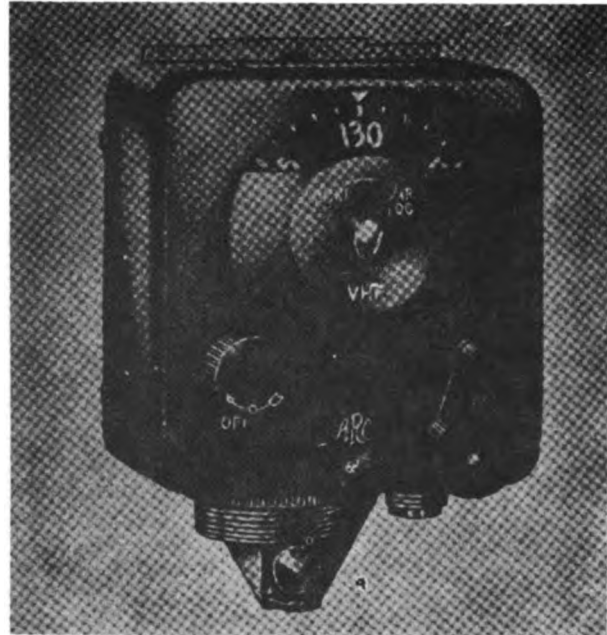


Figure 1-13. Radio Set Control C-984/ARN-30

1-19. MOUNTING MT-1046/ARN-30. (See figure 1-14.) Mounting MT-1046/ARN-30 is a plate-type mounting provided for Radio Set Control C-984/ARN-30. A disc-type spring is riveted to the plate for mounting tension. Four holes are provided for attaching the mounting.

1-20. RADIO SET CONTROL C-1254/ARN-30. (See figure 1-15.) Radio Set Control C-1254/ARN-30 is an edge-lighted plastic console control unit used instead of Radio Set Control C-984/ARN-30 in all aircraft equipped with console mounting facilities. Function-

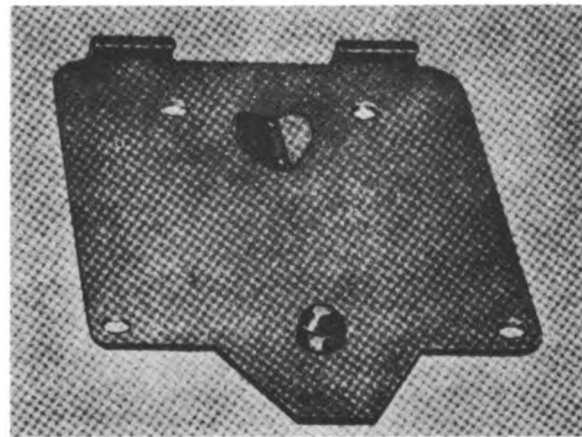


Figure 1-14. Mounting MT-1046/ARN-30

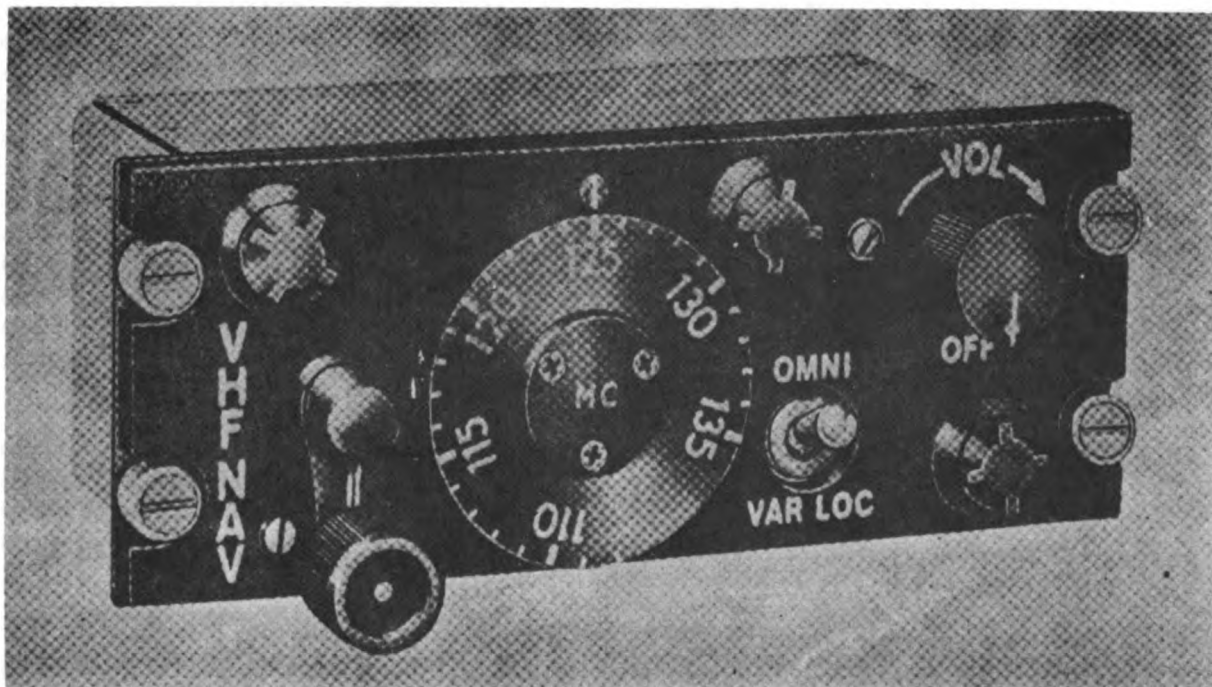


Figure 1-15. Radio Set Control C-1254/ARN-30

ally, it provides the same facilities as Radio Set Control C-984/ARN-30, which is described in paragraph 1-18. Edge-lighting illumination is provided by three 28-volt mid-gate flange-base lamps installed in red-filter light assemblies located on the front panel. The light is transmitted through a plastic panel having an overall dull, black finish, except for the index lines and control designations, which are translucent white, and the areas behind the frequency indicating dial and VOL knob, which are clear, sandblasted sections. The control of primary power, the volume adjustment of the received signal, and the remote control tuning of the receiver are effected in the same manner as in the Radio Set Control C-984/ARN-30. The selection of VOR or VAR and localizer signals is by means of a single-pole, single-throw toggle switch. The electrical connector and the point of attachment of the mechanical linkage are located on the rear of the unit, while all operating controls are located on the front panel.

1-21. INDICATOR ID-48/ARN. (See figure 1-16.) Indicator ID-48/ARN is designed for panel mounting. This indicator is a special type of microammeter, having two pointers, which visually indicate the VOR, VAR, or localizer information received from the converter. The LOCALIZER or RANGE pointer is pivoted at the top and moves left or right. The GLIDE PATH pointer is pivoted at the left of the dial and moves up and down. The latter pointer is used in conjunction with a glide-path receiver, when such equipment is installed in the aircraft. The instrument is marked with blue and yellow

low sectors for flying the visual courses of VAR. A red flag-alarm warning is associated with each pointer to indicate the relative operating strength of a received signal. The flag alarm associated with the vertical pointer, in conjunction with the TO-FROM meter of Course Indicator ID-322/ARN-30 (paragraph 1-22), serves to indicate the presence or absence of proper

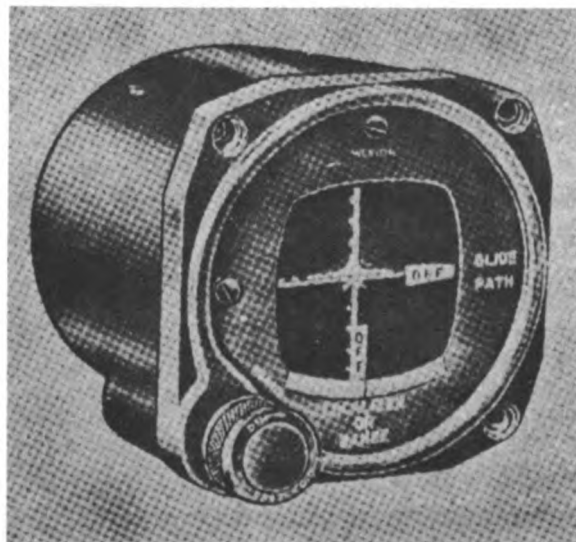


Figure 1-16. Indicator ID-48/ARN

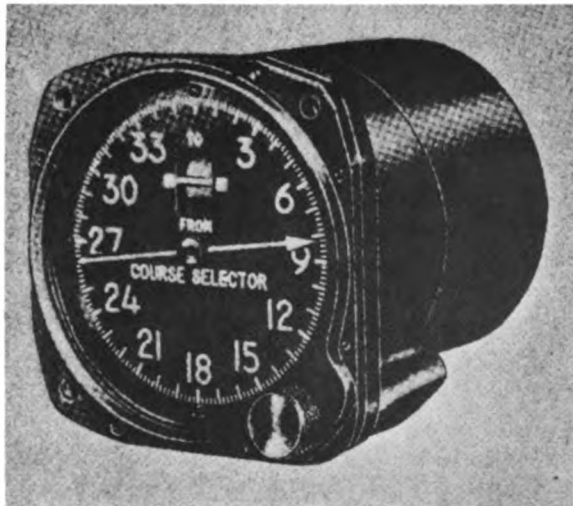


Figure 1-17. Course Indicator ID-322/ARN-30



Figure 1-18. Course Indicator ID-453/ARN-30

output signals from the converter. A marker beacon lamp assembly located in the lower left corner of the instrument case is used with marker beacon receiving equipment, when such equipment is installed in the aircraft.

1-22. COURSE INDICATOR ID-322/ARN-30. (See figure 1-17.) Course Indicator ID-322/ARN-30 is designed for panel mounting. This indicator is a combined COURSE SELECTOR and TO-FROM indicating instrument. The COURSE SELECTOR, through adjustment of the control knob and observation of the vertical pointer of Indicator ID-48/ARN, permits the selection of any desired track to or from a VOR station. The COURSE SELECTOR dial is graduated in a compass scale of 360 degrees. The TO-FROM meter is a zero-center d-c instrument which provides the sense information required to resolve any ambiguity in the reading of the COURSE SELECTOR. The TO-FROM meter will show TO when the indicated bearing on the COURSE SELECTOR is the magnetic bearing *to* the station. The meter will show FROM when the indicated bearing on the COURSE SELECTOR is the magnetic bearing *from* the station. When reading the TO-FROM meter, the vertical pointer of the ID-48/ARN should be approximately centered. When the TO-FROM meter pointer-bar is in the neutral position, that is, within or touching the area marked off by the two white blocks, it may be that the pointer is passing through the neutral position on the way from one indication to the other; or the received signal may be too weak to be reliable; or the received signal may not be a proper signal.

1-23. COURSE INDICATOR ID-453/ARN-30. (See figure 1-18.) Course Indicator ID-453/ARN-30 is a combined cross-pointer meter and course selector TO-

FROM instrument. Functionally, it combines the purposes of Indicator ID-48/ARN and Course Indicator ID-322/ARN-30 in a single instrument. The cross-pointer meter section of Course Indicator ID-453/ARN-30 is a special type of microammeter containing two pointer mechanisms, and two flag-alarm mechanisms for indicating the operating or non-operating condition of the pointer mechanisms. The vertical pointer visually indicates the VOR, VAR, or localizer information received from the converter. The vertical pointer is pivoted at the top and moves left or right to supply a visual indication of the lateral position of the aircraft with respect to the on-course signal of the omni or localizer beam. The horizontal pointer is pivoted at the left and moves up and down. The horizontal pointer is used in conjunction with a glide-path receiver (when such equipment is installed in the aircraft) to show the relationship between the aircraft line of descent and the glide slope. Fluorescent blue and yellow sectors are included for flying the visual courses of VAR. A red flag-alarm warning is associated with each pointer to indicate the relative operating strength of a received signal. The flag alarm associated with the vertical pointer, in conjunction with the TO-FROM meter, serves to indicate the presence or absence of proper output signals from the converter. The course selector dial is graduated in a compass scale of 360 degrees. An arrowhead is used for the true-course indicator and a ball as the reciprocal indicator on the indicator scale. The TO-FROM meter is a zero center d-c instrument which provides the sense information required to resolve any ambiguity in the reading of the course indicator scale.

1-24. ANTENNA COUPLER ARC TYPE A-17. Antenna AS-580A/ARN-30 is normally supplied for use on all aircraft except jet aircraft. In jet aircraft, Antenna Coupler ARC Type A-17 is installed inside canopy with two 1/8-inch diameter rods (not supplied), each about 26 inches long, forming the dipole. The antenna coupler may also be used to match a dipole antenna mounted on the vertical fin, to a standard 50-ohm coaxial cable. This antenna is coupled to the set through the antenna coupler which furnishes the loading. Instructions for installing the antenna coupler are supplied with the unit.

1-25. INTERCONNECTING PARTS. The interconnecting parts supplied with the set (table 1-2) include all the necessary items, except the individual wires, required to fabricate the cable assemblies and mechanical linkage used for interconnecting the equipment units.

1-26. GENERAL PRINCIPLES OF OPERATION.

1-27. Primary power (28-volts dc) for a one-rack installation (figure 1-19) is brought in through Mounting MT-1175/ARN-30A to the control unit. Relay K301 in the mounting is energized and distributes the low voltage to the receiver and converter. Also, the low voltage is applied through the receiver to the dynamotor which generates the high-voltage operating potential. The high voltage is distributed to the receiver circuits and through the mounting to the converter. DC for the panel lamps of Radio Set Control C-1254/ARN-30 is applied through a separate lead from the aircraft 28-volt supply. In a two-rack installation (figure 1-20), primary power is brought into the receiver rack Mounting MT-1508/ARN-30A and then to the control unit. With the closing of the primary power circuit, relay K1801 in the receiver mounting is energized and distributes the low voltage. The two installations function in the same manner, except that the two-rack installation requires harness and r-f cable connections between the receiver and converter racks for the flow of operating voltages and intelligence.

1-28. The signal picked up by the antenna is fed by coaxial cable to the input circuits of the receiver with the receiver tuned to an incoming signal by the control unit. The type of signal reception is selected by the OMNI-VAR LOC switch on the control unit. In the VAR LOC position, a low-voltage circuit is closed, actuating two relays, K201 and K202, in the converter. The closing of the relays connects the high-voltage circuit and the navigation portion of the VAR or localizer

signal to the VAR and localizer circuits of the converter where the signal is converted for visual presentation on the ID-48/ARN or ID-453/ARN-30. With the OMNI-VAR LOC switch in the OMNI position, the relays are unenergized, and the high-voltage and navigation portion of the VOR signal are fed through the normally closed contacts of the relays to the omni circuits of the converter. Here, the signal is converted into visual track information for presentation on Indicator ID-48/ARN and Course Indicator ID-453/ARN-30. If the OMNI-VAR LOC switch is set incorrectly for the type of signal being received, the vertical pointer flag-alarm on the indicator or course indicator will show. In either position of the selector switch, the audio portion of the VOR, VAR, or localizer signal is connected through Mounting MT-1175/ARN-30A (for one-rack installations) and through Mounting MT-1508/ARN-30A (for two-rack installations) to the control unit where its level may be adjusted by the volume control, and the output made available at a lead brought out from the connector. This lead is connected to a suitable monitoring point within the aircraft. A provision is also made to permit use of a tuning meter if desired.

1-29. Intercabling between components of a one-rack installation is shown in figure 1-21. (See figure 1-22 for intercabling between components of a two-rack installation.)

1-30. POWER REQUIREMENTS.

1-31. All sets require a primary power source of approximately 2.9 amperes at 28 volts dc.

1-32. OPERATING LIMITATIONS.

1-33. DISTANCE RANGE. The distance range of the equipment is dependent on the altitude of the aircraft and the surrounding terrain. In general, the distance range may be determined by the formula $D \approx 1.2 \sqrt{H}$

$$\begin{aligned} D &= \text{Approximate distance in miles} \\ H &= \text{Height in feet.} \end{aligned}$$

For example, the approximate distance range at 10,000 feet above normal terrain would be 120 miles. The range of a VOR station usually exceeds this "horizon distance" by 10 to 20 per cent.

1-34. TEMPERATURE AND ALTITUDE LIMITS. The sets are designed to operate satisfactorily at any altitude up to 50,000 feet, and at temperatures ranging from -55°C (-67°F) to $+55^{\circ}\text{C}$ ($+131^{\circ}\text{F}$).

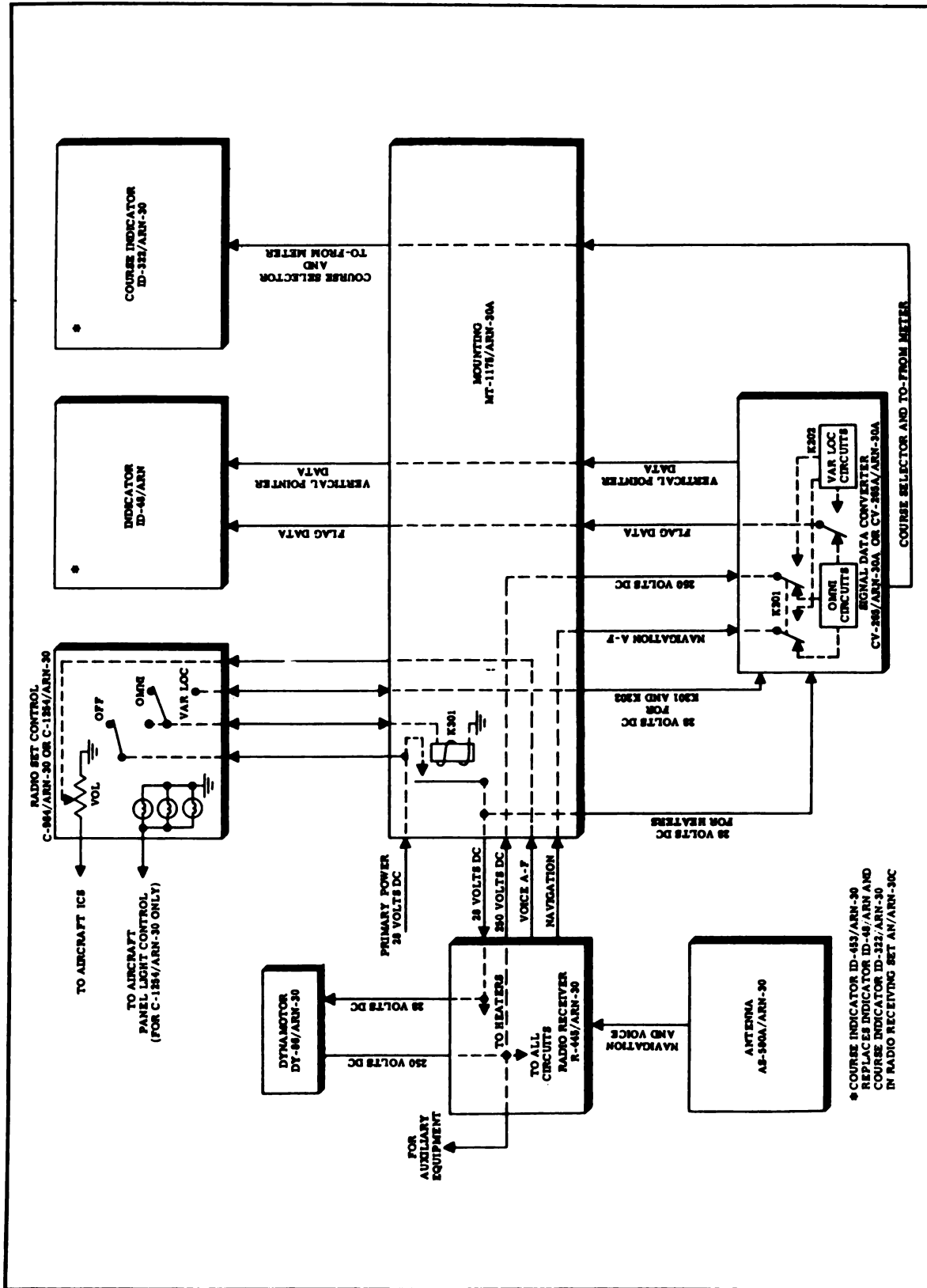
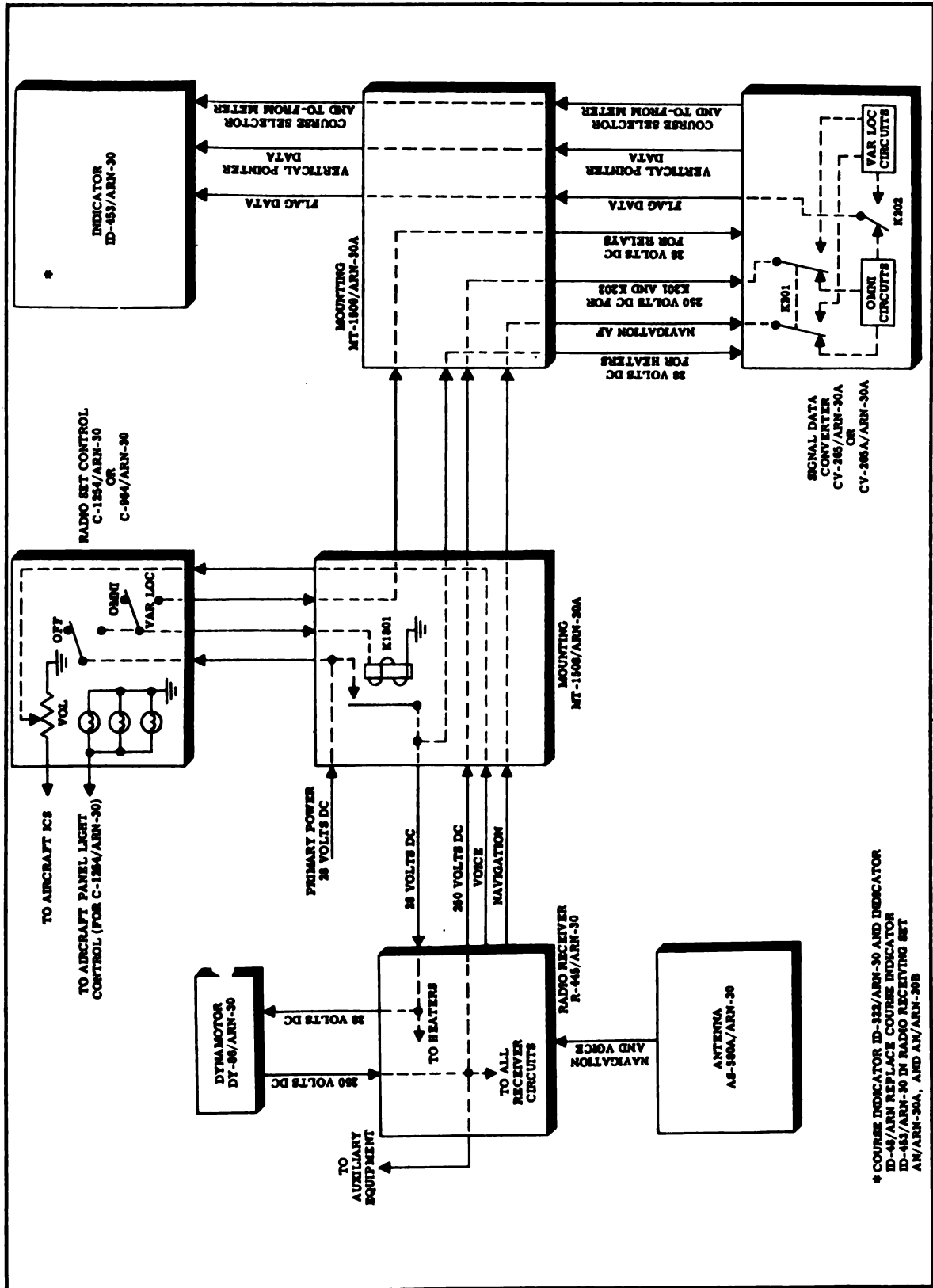


Figure 1-19. One-Reck Installation, Block Diagram



* COURSE INDICATOR ID-322/ARN-30 AND INDICATOR ID-48/ARN-30 REPLACE COURSE INDICATOR ID-455/ARN-30 IN RADIO RECEIVING SET AN/ARN-30A, AND AN/ARN-30B

Figure 1-20. Two-Rack Installation, Block Diagram

1-35. COMPARISON OF VHF NAVIGATION FACILITIES.

1-36. Table 1-3 is a comparison of the identifying characteristics of the vhf navigation facilities which can be received and interpreted by the set.

1-37. COMPARISON OF RADIO RECEIVING SET AN/ARN-30, AN/ARN-30A, AN/ARN-30B AND AN/ARN-30C.

Note

The following information is provided for reference purposes only. This handbook does *not* cover Radio Receiving Set AN/ARN-30. Refer to AN 16-45-131 (Operation Instructions), AN 16-45-132 (Maintenance Instructions), and AN 16-45-133 (Illustrated Parts Breakdown) for information on AN/ARN-30.

1-38. Radio Receiving Set AN/ARN-30, manufactured by Aircraft Radio Corp., Boonton, N. J., is commercially identified by the manufacturer as Navigation-Communication Receiver Type 15C. Radio Receiving Set AN/ARN-30A, AN/ARN-30B, and AN/ARN-30C, also manufactured by Aircraft Radio Corp., are commercially identified as Navigation-Communication Receiver Type 15D; however, reference to all sets or units thereof in this handbook are by AN nomenclature only. The units of AN/ARN-30 carry commercial-designation nameplates. The units of AN/ARN-30A, AN/ARN-30B, and AN/ARN-30C carry AN nomenclature nameplates. Because of the functional similarity of all the sets, and the interchangeability of some of the major units, a comparison of the units of each set is given in table 1-4. Interconnecting parts supplied with each set are not considered in this table.

TABLE 1-3. CHARACTERISTICS OF VHF NAVIGATION FACILITIES

<i>Characteristics</i>	<i>VOR</i>	<i>VAR</i>	<i>Localizer</i>
Frequency	108-118 mc	108-110 mc	108-112 mc
Identification (3 letter)	Continuous or Voice	Standard interval	Continuous or Voice
Aural Track	No	A-N and On-course	No
Visual Track	Yes	Yes	Yes
Voice	Replaces identification when used	Simultaneous	Replaces identification when used

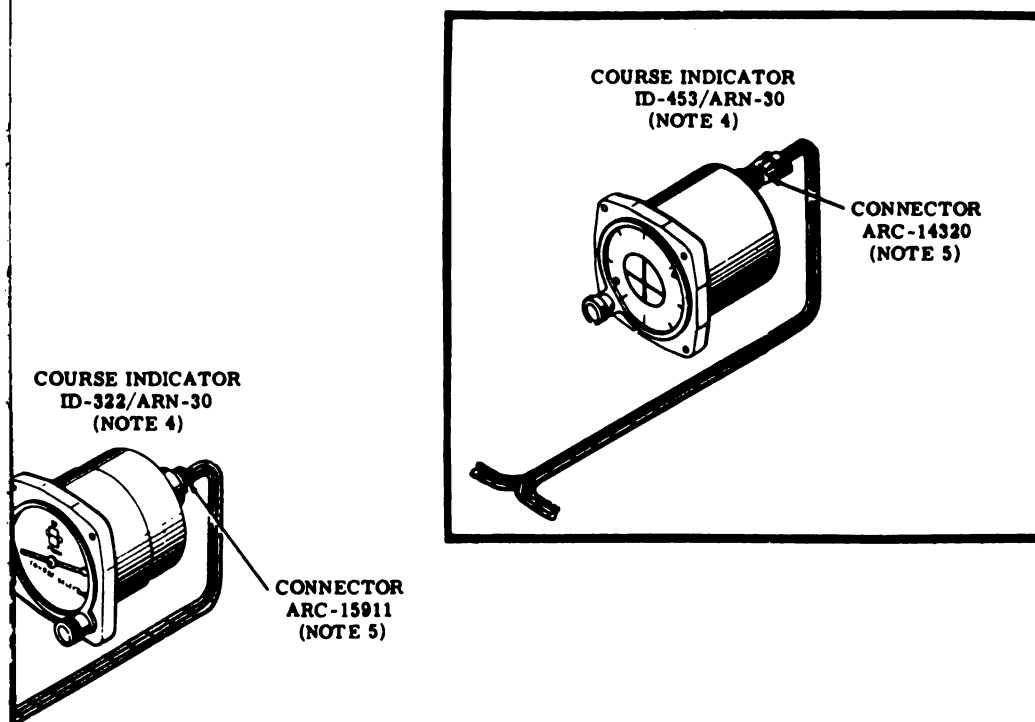
TABLE 1-4. COMPARISON OF RADIO RECEIVING SET AN/ARN-30, AN/ARN-30A, AN/ARN-30B, AN/ARN-30C, AND AN/ARN-30C

RADIO RECEIVING SET AN/ARN-30		RADIO RECEIVING SET AN/ARN-30A		RADIO RECEIVING SET AN/ARN-30B		RADIO RECEIVING SET AN/ARN-30C		INTER- CHANGE- ABLE	
AN Nomen- clature	ARC Type Designation	AN Nomen- clature	ARC Type Designation	AN Nomen- clature	ARC Type Designation	AN Nomen- clature	ARC Type Designation		
Antenna AS-580/ARN-30 or Antenna AS-580A/ARN-30	Antenna ARC Type A-13A or Antenna ARC Type A-13B	Antenna AS-580A/ARN-30	Antenna ARC Type A-13B	Antenna AS-580A/ARN-30	Antenna ARC Type A-13B	Antenna AS-580A/ARN-30	Antenna ARC Type A-13B	Yes	
Radio Receiver R-445/ARN-30	Radio Receiver ARC Type R-13B	Radio Receiver R-445/ARN-30	Radio Receiver ARC Type R-13B	Radio Receiver R-445/ARN-30	Radio Receiver ARC Type R-13B	Radio Receiver R-445/ARN-30	Radio Receiver ARC Type R-13B	Yes	
Signal Data Converter CV-217/ARN-30	Converter ARC Type B-10A	Signal Data Converter CV-265/ARN-30A	Converter ARC Type B-13	Signal Data Converter CV-265A/ARN-30A	Converter ARC Type B-13A	Signal Data Converter CV-265A/ARN-30A	Converter ARC Type B-13A	No	
Mounting MT-1047/ARN-30	Rack ARC Type E-13B	Mounting MT-1175/ARN-30A	Rack ARC Type E-14	Mounting MT-1175/ARN-30A	Rack ARC Type E-14	Mounting MT-1175/ARN-30A	Rack ARC Type E-14	No	
Mounting MT-1044/ARN-30	Mounting ARC Type M-22	Mounting MT-1174/ARN-30A	Mounting ARC Type M-10	Mounting MT-1174/ARN-30A	Mounting ARC Type M-10	Mounting MT-1174/ARN-30A	Mounting ARC Type M-10	No	
Filter-Amplifier AM-609/ARN-30	Filter-Amplifier ARC Type F-10A	No comparative component; however function included in Signal Data Converter CV-265/ARN-30A and CV-265A/ARN-30A							—
Mounting MT-1045/ARN-30	Mounting ARC Type M-21	Not Required							—
Dynamotor DY-86/ARN-30	Dynamotor ARC Type D-10A	Dynamotor DY-86/ARN-30	Dynamotor ARC Type D-10A	Dynamotor DY-86/ARN-30	Dynamotor ARC Type D-10A	Dynamotor DY-86/ARN-30	Dynamotor ARC Type D-10A	Yes	

TABLE 1-4. COMPARISON OF RADIO RECEIVING SET AN/ARN-30, AN/ARN-30A, AN/ARN-30B, AN/ARN-30C, AND AN/ARN-30C (Cont)

RADIO RECEIVING SET AN/ARN-30		RADIO RECEIVING SET AN/ARN-30A		RADIO RECEIVING SET AN/ARN-30B		RADIO RECEIVING SET AN/ARN-30C		INTER-CHANGE-ABLE
AN Nomenclature	ARC Type Designation	AN Nomenclature	ARC Type Designation	AN Nomenclature	ARC Type Designation	AN Nomenclature	ARC Type Designation	
Radio Set Control C-984/ARN-30	Control Unit ARC Type C-22A	Radio Set Control C-984/ARN-30 or *Radio Set Control C-1254/ARN-30	Control Unit ARC Type C-22A or *Control Unit ARC Type C-1254	Radio Set Control C-1254/ARN-30	Control Unit ARC Type C-1254	Radio Set Control C-1254/ARN-30	Control Unit ARC Type C-1254	See Note 2, Table 1-1.
Mounting MT-1046/ARN-30	Mounting ARC Type M-18	Mounting MT-1046/ARN-30	Mounting ARC Type M-18	Mounting MT-1046/ARN-30	Mounting ARC Type M-18	Mounting MT-1046/ARN-30	Mounting ARC Type M-18	Yes
Indicator ID-48/ARN	Cross-Pointer Meter ARC-13310	Indicator ID-48/ARN	Cross-Pointer Meter ARC-13310	Indicator ID-48/ARN	Cross-Pointer Meter ARC-13310	Not Required		Yes
Course Indicator ID-322/ARN-30	Course Selector/To-From Meter ARC-15463	Course Indicator ID-322/ARN-30	Course Selector/To-From Meter ARC-15463	Course Indicator ID-322/ARN-30	Course Selector/To-From Meter ARC-15463	Not Required		—
—	—	—	—	—	—	Course Indicator ID-453/ARN-30	Indicator ARC Type IN-10	Yes
—	—	Mounting MT-1508/ARN-30A	Rack ARC Type E-15	Mounting MT-1508/ARN-30A	Rack ARC Type E-15	Mounting MT-1508/ARN-30A	Rack ARC Type E-15	—
—	—	Mounting MT-1509/ARN-30A	Rack ARC Type E-16	Mounting MT-1509/ARN-30A	Rack ARC Type E-16	Mounting MT-1509/ARN-30A	Rack ARC Type E-16	—
—	—	Mounting MT-1510/ARN-30A	Mounting ARC Type M-25	Mounting MT-1510/ARN-30A	Mounting ARC Type M-25	Mounting MT-1510/ARN-30A	Mounting ARC Type M-25	—

* Radio Set Control C-1254/ARN-30 replaces Radio Set Control C-984/ARN-30 electrically but not physically. Radio Set Control C-984/ARN-30 requires Mounting MT-1046/ARN-30.

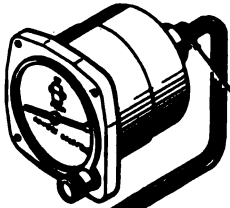


NOTES:

1. TO ACCOMPLISH PROPER GROUNDING OF THE SYSTEM, CLEAN AIRCRAFT SURFACE TO WHICH MOUNTING MT-1174/ARN-30A IS ATTACHED (8 POINTS).
2. MECHANICAL LINKAGE ASSEMBLED FROM SHAFTING ARC-1174; CASING ARC-3406 OR ARC-8601; SPLINE ARC-6788; SLEEVE ARC-6585 OR ARC-11036; AND NUT ARC-1167 OR ARC-11035.
3. RADIO SET CONTROL C-1254/ARN-30 CAN BE USED IN PLACE OF RADIO SET CONTROL C-984/ARN-30. IN SUCH CASES, CABLE AND MECHANICAL LINKAGE CONNECTIONS ARE MADE AT REAR OF UNIT, AND ADDITIONAL WIRE FOR PANEL LIGHT CONTROL IS REQUIRED.
4. COURSE INDICATOR ID-453, ARN-30 CAN BE USED IN PLACE OF INDICATOR ID-48, ARN AND COURSE INDICATOR ID-322/ARN-30 IN A ONE-RACK INSTALLATION.
5. ONE CONNECTOR ARC-14320 IS REQUIRED IN PLACE OF CONNECTOR AN3106A-18-1S AND CLAMP AN3057-10, AND CONNECTOR ARC-15911 WHEN COURSE INDICATOR ID-453/ARN-30 IS USED.

Figure 1-21. One-Rack Installation, Intercabling Diagram

**COURSE INDICATOR
ID-322/ARN-30
(NOTE 4)**



**CONNECTOR
ARC-15911
(NOTE 5)**

**PROPER GROUNDING OF THE SYSTEM,
SURFACE TO WHICH MOUNTING
IS ATTACHED AT MOUNTING HOLES.
KAGE ASSEMBLED FROM SHAFTING ARC-1174;
OR ARC-8601; SPLINE ARC-6788;
OR ARC-11036; AND NUT ARC-1167**

**COL C-1254/ARN-30 CAN BE USED
IO SET CONTROL C-984/ARN-30.
ABLE AND MECHANICAL LINKAGE
E MADE AT REAR OF UNIT, AND
: FOR PANEL LIGHT CONTROL IS REQUIRED.
ARN AND COURSE INDICATOR
N BE USED IN PLACE OF
R ID-453/ARN-30 IN A
LLATION.**

**-15911, AND AN3106A-18-18
57-10 REPLACE CONNECTOR
BOTH COURSE INDICATOR
D INDICATOR ID-48/ARN**

SECTION II

OPERATING PROCEDURES

2-1. OPERATING CONTROLS.

2-2. All controls necessary for operation are located on Radio Set Control C-984/ARN-30 (figure 2-1), or Radio Set Control C-1254/ARN-30 (figure 2-2), and Course Indicator ID-322/ARN-30 (figure 2-3) or Course Indicator ID-453/ARN-30 (figure 2-5). Though no operating controls are located on Indicator ID-48/ARN (figure 2-4), visual indications of this instrument together with the indications observed on the COURSE SELECTOR and TO-FROM meter of Course Indicator ID-322/ARN-30 are essential for the proper use and operation of Radio Receiving Set AN/ARN-30A and AN/ARN-30B. Table 2-1 identifies the controls, and their functions, provided for operation of the set in use.

Note

In the illustrations applying to the operating instructions, only Course Indicator ID-453/ARN-30 will be shown for indicator representations. Since the indication display of Course Indicator ID-453/ARN-30 is the equivalent of both Indicator ID-48/ARN and Course Indicator ID-322/ARN-30, all instructions and illustrations will apply to both groups of indicators.

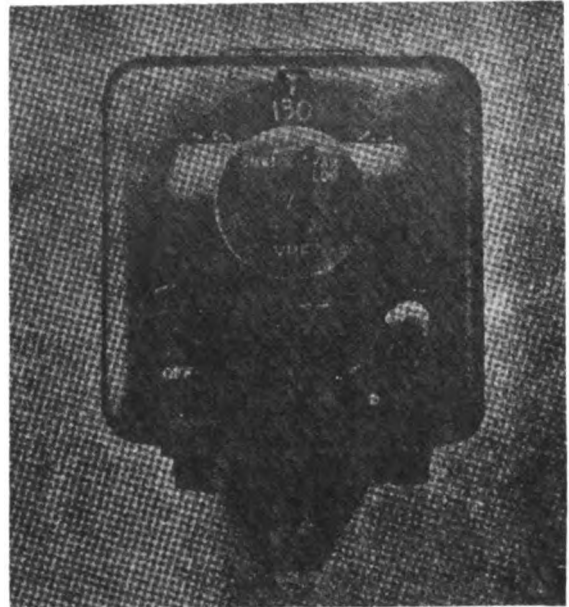


Figure 2-1. Radio Set Control C-984/ARN-30

TABLE 2-1. OPERATING CONTROLS

<i>Component</i>	<i>Control Designation</i>	<i>Function</i>
Radio Set Control C-984/ARN-30 or Radio Set Control C-1254/ARN-30	OFF	Combination on-off switch and volume control. Controls application of power to the set, rotation clockwise (direction of arrow) turning power on. Further clockwise rotation increases the audio level of Radio Receiver R-445/ARN-30.
	OMNI-VAR LOC	Function selector switch. In OMNI position, the equipment provides track information, as chosen by the operator, when tuned to the selected VOR ground station. In VAR LOC position, the equipment is set up for operation with either VAR or localizer signals.
	Tuning Crank (No panel marking)	Through the interconnection of mechanical linkage, remotely tunes the receiver.
Course Indicator ID-322/ARN-30 or Course Indicator ID-453/ARN-30	Course Selector Knob (No panel marking)	Permits selection or determination of the magnetic bearing of the aircraft from the VOR station being received.

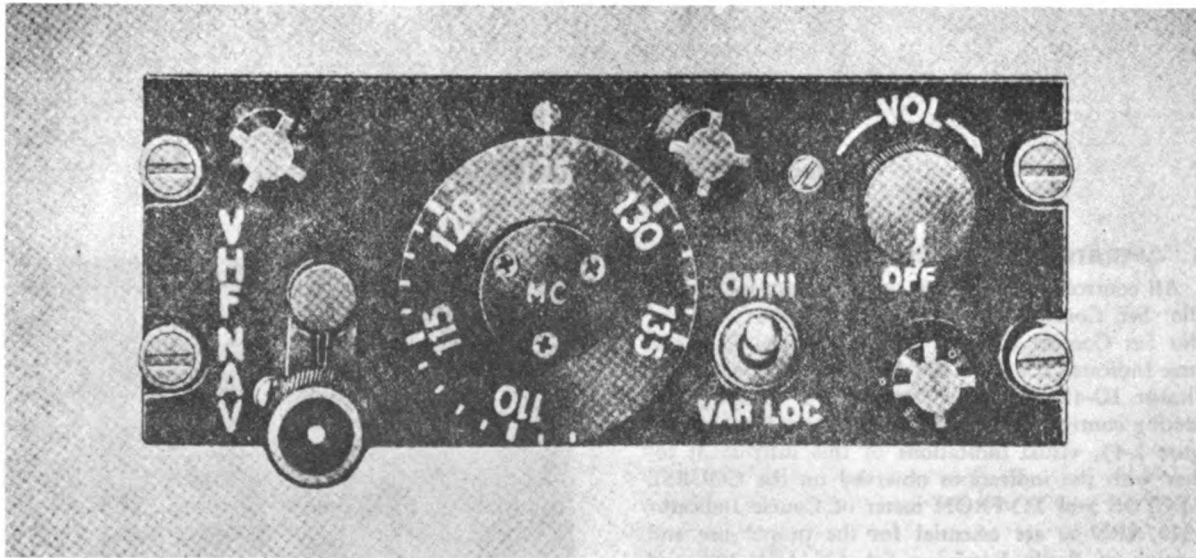


Figure 2-2. Radio Set Control C-1254/ARN-30

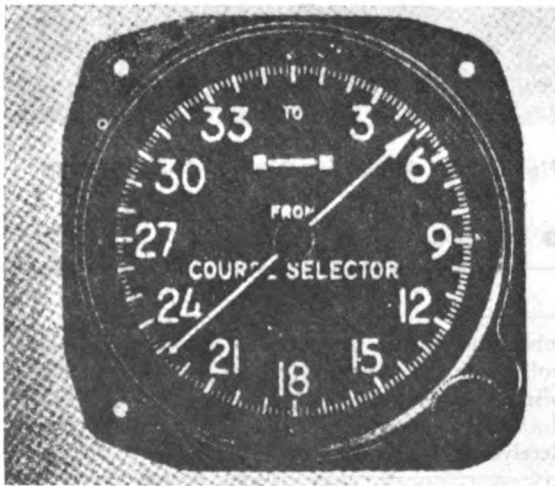


Figure 2-3. Course Indicator ID-322/ARN-30

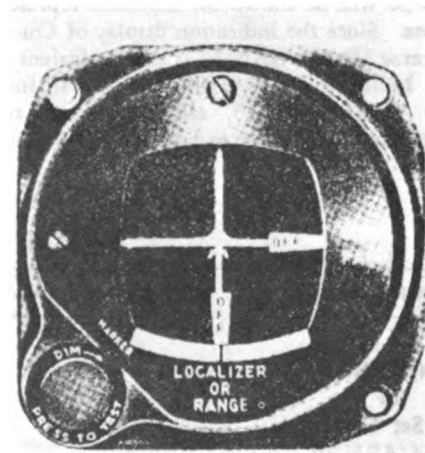


Figure 2-4. Indicator ID-48/ARN

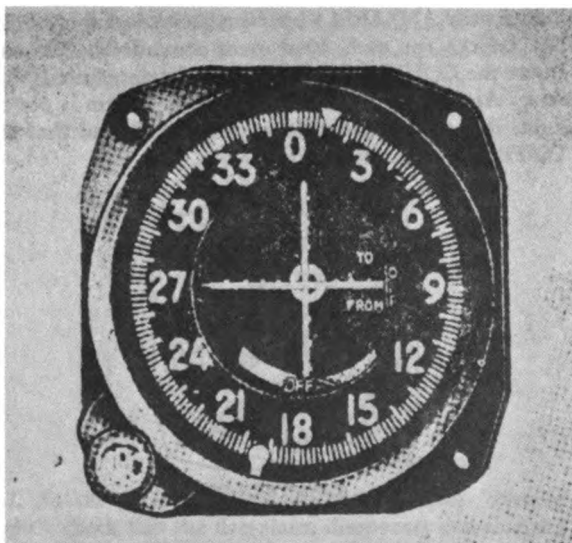
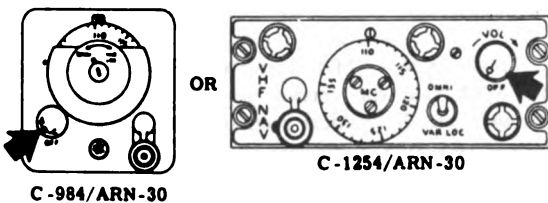


Figure 2-5. Course Indicator ID-453/ARN-30

2-3. OPERATION PRIOR TO TAKE-OFF.

2-4. A preflight operation check should be made using Radio Test Set AN/ARM-5, or equivalent, as a signal source. The use of actual VOR, VAR, or localizer signals for this purpose is not advisable, since unsatisfactory and erroneous indications may be obtained. Proceed as follows:

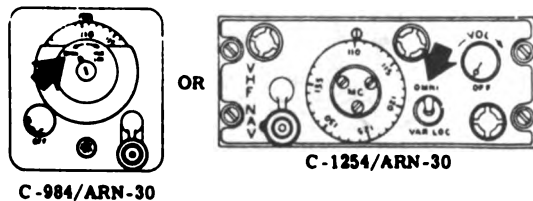
a. Turn the OFF switch on. Allow the equipment to warm up for approximately three minutes. For Radio Set Control C-1254/ARN-30 only, adjust the aircraft panel light control as required.



C-984/ARN-30

C-1254/ARN-30

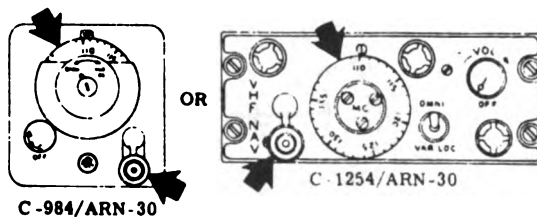
b. Set OMNI-VAR LOC switch to OMNI position.



C-984/ARN-30

C-1254/ARN-30

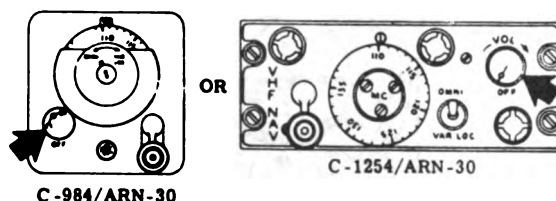
c. Rotate tuning crank and tune the receiver to test signal frequency from Radio Test Set AN/ARM-5. Compare the control unit frequency dial reading with frequency being transmitted.



C-984/ARN-30

C-1254/ARN-30

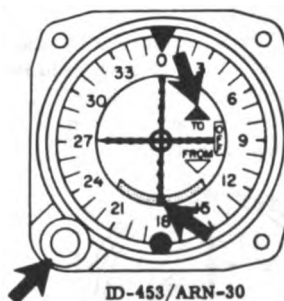
d. Adjust the OFF control for a suitable audio level to permit reception of both the navigation and voice test signals from the AN/ARM-5.



C-984/ARN-30

C-1254/ARN-30

e. When the AN/ARM-5 operator announces, for example, "Zero degrees TO", set the COURSE SELECTOR to the zero-degree position by means of the COURSE SELECTOR knob. Observe Indicator ID-48/ARN or Course Indicator ID-453/ARN (depending on set in use) and check that the flag-alarm (the red flag marked OFF) is out of sight, and that the vertical pointer is centered. On Course Indicator ID-322/ARN-30 or Course Indicator ID-453/ARN-30, check that the bar pointer of the TO-FROM meter indicates TO and is out of the unreliable-signal zone marked off by the white blocks.



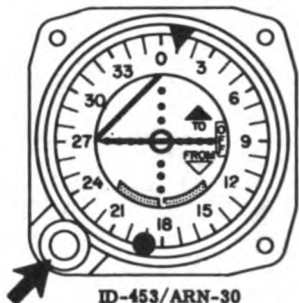
ID-453/ARN-30

f. Observing Indicator ID-48/ARN or Course Indicator ID-453/ARN-30, rotate the COURSE SELECTOR knob in a clockwise direction to permit the indicator vertical pointer to swing full left (pointer over the farthest left-hand dot), and note the COURSE SELECTOR reading. Then rotate the COURSE SELECTOR knob in a counterclockwise direction to permit the vertical pointer to swing full right (pointer over the

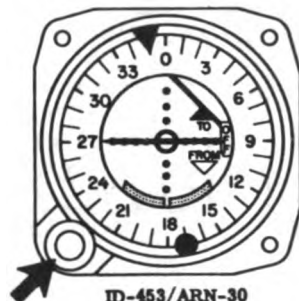
Section II
Paragraph 2-4

AN 16-30ARN30-1

farthest right-hand dot), and note the COURSE SELECTOR reading. The difference between the two readings should be 18 to 23 degrees.



ID-453/ARN-30

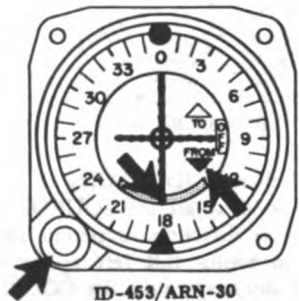


ID-453/ARN-30

Note

Always make the course sensitivity check with the TO-FROM meter in the TO position to satisfy the requirements of step f. If the check is made with the TO-FROM meter in the FROM position, opposite indications will result.

g. Adjust the COURSE SELECTOR knob for a 180-degree reciprocal indication on the COURSE SELECTOR of the AN/ARM-5 "angle TO" track of step e. Note that the TO-FROM meter now indicates FROM. Also notice that on Indicator ID-48/ARN, or Course Indicator ID-453/ARN-30, the flag-alarm is out of sight and the vertical pointer is centered.



ID-453/ARN-30

h. As the AN/ARM-5 operator announces the "angle TO" tracks for each 60 degrees around the compass, adjust the COURSE SELECTOR to the announced position. At each point, check that the flag-alarm is out of sight, that the vertical pointer is centered, and that the TO-FROM meter indicates TO.

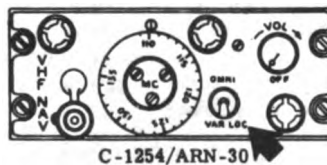


ID-453/ARN-30

i. Set the OMNI-VAR LOC switch to the VAR LOC position.

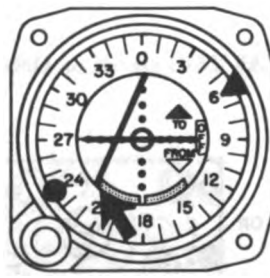


C-984/ARN-30



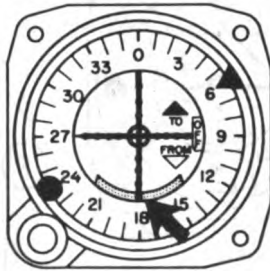
C-1254/ARN-30

j. As the AN/ARM-5 operator announces "Needle left", check that the vertical-pointer flag-alarm disappears and that the vertical pointer swings left, near the outer edge of the colored arc.



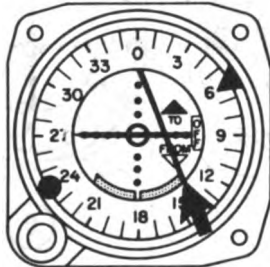
ID-453/ARN-30

k. As the AN/ARM-5 operator announces "Needle center", check that the flag-alarm disappears and the vertical pointer centers.



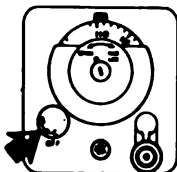
ID-453/ARN-30

l. As the AN/ARM-5 operator announces "Needle right", check that the flag-alarm disappears and that the vertical pointer swings right, near the outer edge of the colored arc.

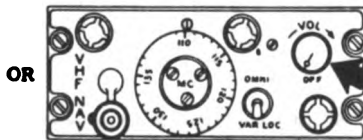


ID-453/ARN-30

m. During the test signal transmission, check the operation of the volume control, and also the quality and available audio level of voice transmission.



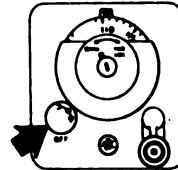
C-984/ARN-30



C-1254/ARN-30

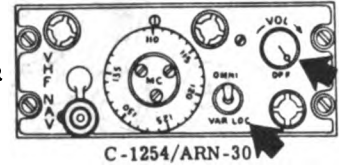


n. With the volume control set full clockwise, strike the receiver and converter sharply with the palm of the hand. There should be negligible microphonic noise, and no signal interruption or appreciable noise resulting from such blows. Repeat this test with the OMNI-VAR LOC switch in the OMNI position.

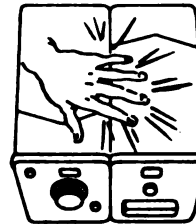


C-984/ARN-30

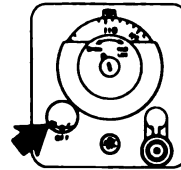
OR



C-1254/ARN-30

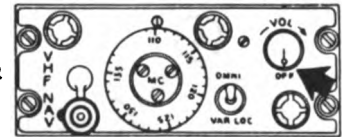


o. Turn the OFF control full counterclockwise to disconnect all power to the equipment.



C-984/ARN-30

OR



C-1254/ARN-30

2-5. AIRBORNE OPERATION OF VOR FACILITIES.
2-6. TYPICAL USES OF VOR. The following navigation procedures are typical of those which may be flown using VOR facilities.

Determination of aircraft bearing from a VOR station (paragraph 2-8).

Flying a desired track to or from a VOR station (paragraph 2-9).

Flying to an objective using two VOR stations (figure 2-7).

Approximate ground speed check using two VOR stations (figure 2-8).

Intersecting a localizer using a VOR station (figure 2-9).

Procedures for let-downs (paragraph 2-13).

2-7. PRINCIPLES OF FLYING VOR. Figure 2-6 illustrates and notes the basic operating principles of flying a VOR. In this illustration, the TO-FROM meter vertical-pointer indications are shown for several aircraft locations with respect to a selected VOR station and a course indicator COURSE SELECTOR setting of 270 degrees.

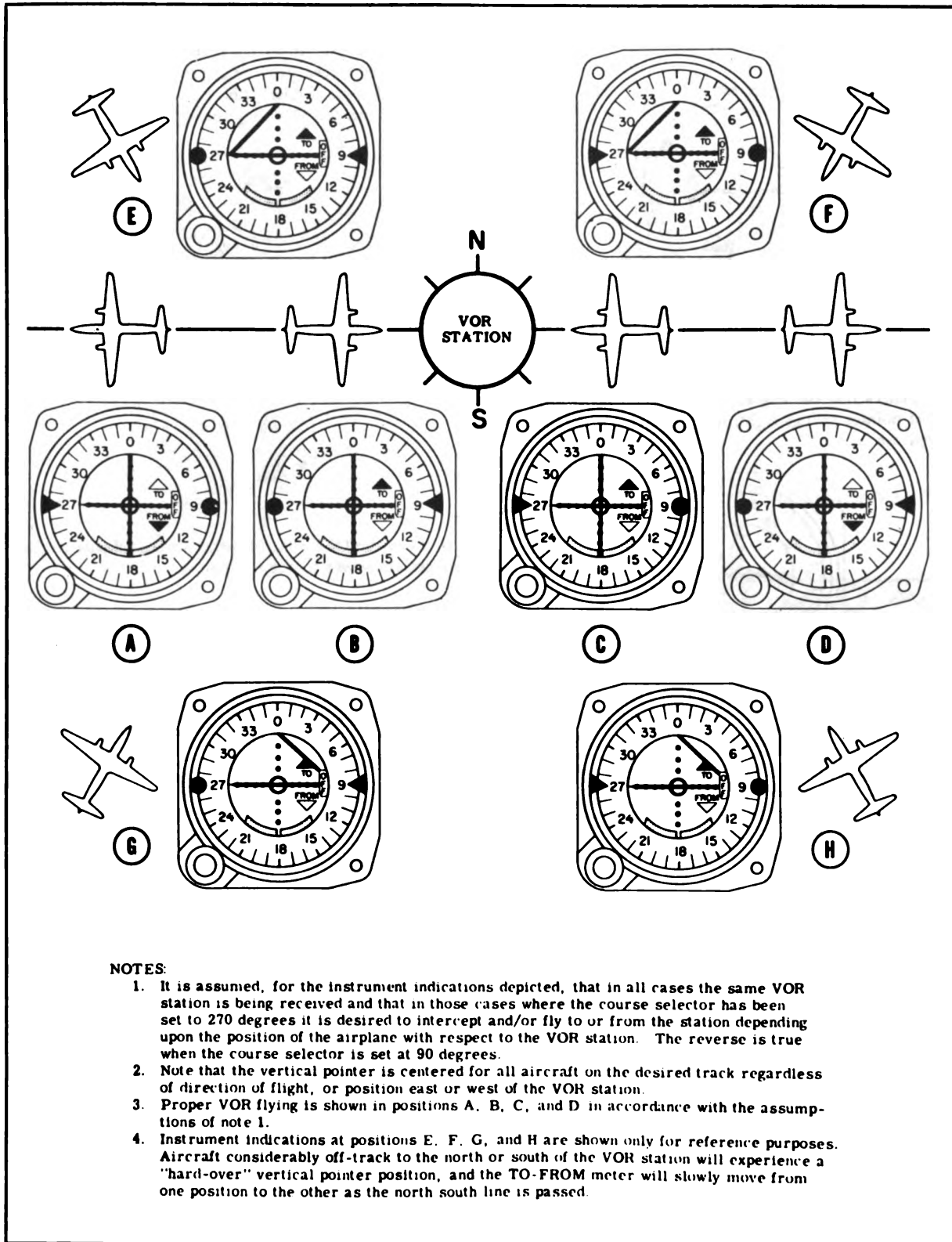
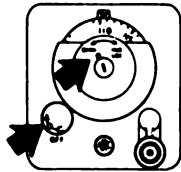


Figure 2-6. Instrument Indications During VOR Flight

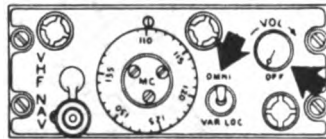
2-8. DETERMINATION OF AIRCRAFT BEARING RELATIVE TO A VOR STATION. To determine the bearing of an aircraft to a VOR station, proceed as follows:

a. Turn the OFF switch on. Turn the OMNI-VAR LOC switch to OMNI. Allow the equipment to warm up.



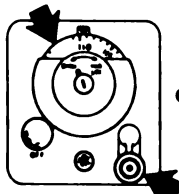
C-984/ARN-30

OR



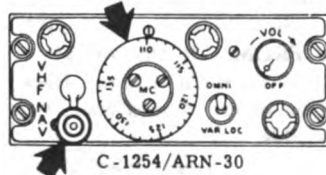
C-1254/ARN-30

b. Tune in the desired VOR station and identify. Make certain that the vertical-pointer flag-alarm is out of sight.

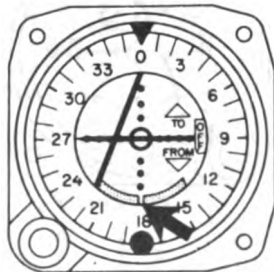


C-984/ARN-30

OR



C-1254/ARN-30



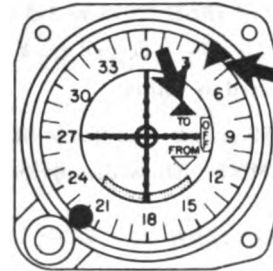
ID-453/ARN-30

c. Rotate the COURSE SELECTOR knob until the vertical pointer is centered. Check that the TO-FROM meter pointer is out of the neutral area.



ID-453/ARN-30

d. Read the COURSE SELECTOR bearing and note whether it is TO or FROM the station as indicated by the TO-FROM meter. This is the bearing of the aircraft relative to the VOR station.

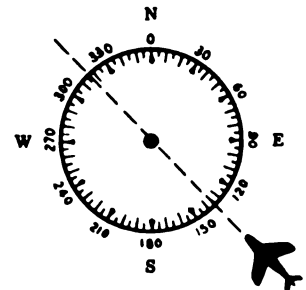
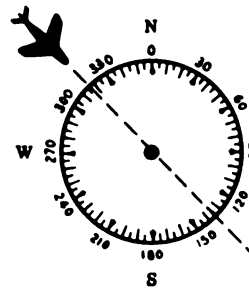


ID-453/ARN-30

e. The general location of the aircraft with respect to the VOR station may be determined as follows: If Course Indicator ID-322/ARN-30 or Course Indicator ID-453/ARN-30 shows "135 TO", the aircraft is north-west of the station; if the bearing is "135 FROM", the aircraft is southeast of the station.

COURSE INDICATOR BEARING "135 TO" (SEE NOTE)

COURSE INDICATOR BEARING "135 FROM" (SEE NOTE)



NOTE: SINCE VOR SUPPLIES ONLY POSITIONAL INFORMATION THE COURSE INDICATOR DOES NOT INDICATE THE HEADING OR DIRECTION OF THE AIRCRAFT. REFER TO FIGURE 2-6

f. To fly the aircraft *to* or *from* the station: Turn the airplane so that its heading is in general agreement with the information obtained in step e., and "fly the needle". When the needle is centered, it may be noticed that there is a difference of several degrees between the course indicator bearing and the magnetic heading of the compass. This is usually due to the crab angle, caused by a cross wind, required to make good the desired track. By "flying the needle", however, the aircraft will fly a straight line to or from the VOR station, and the wind drift is automatically compensated for.

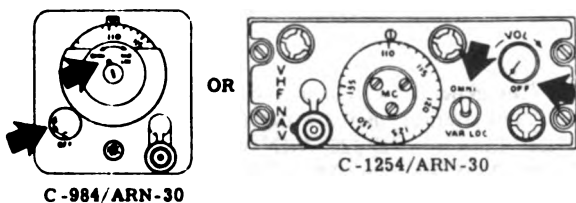
Section II
Paragraphs 2-8 to 2-9

AN 16-30ARN30-1

g. To position the aircraft, tune in a second VOR station, and plot its bearing against the bearing of the first VOR station.

2-9. FLYING A DESIRED TRACK TO OR FROM A VOR STATION. To fly a desired track *to* or *from* a VOR station, proceed as follows:

a. Turn the OFF switch on. Turn the OMNI-VAR LOC switch to OMNI. Allow the equipment to warm up.

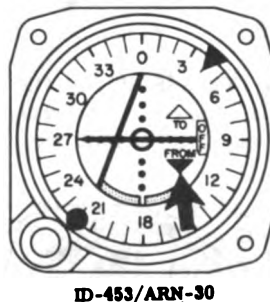
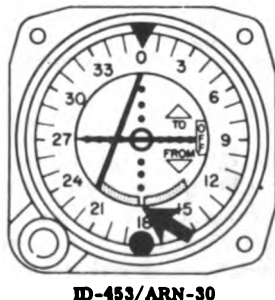
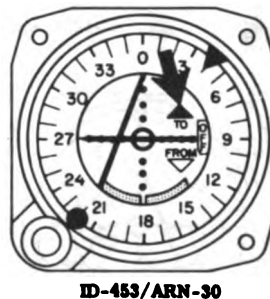
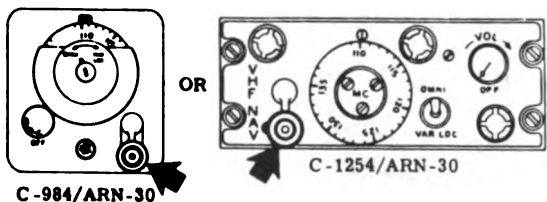


it is desired to make good to the station. Check that the TO-FROM meter is indicating TO or FROM.



d. Note the position of the vertical pointer and the course indicator TO-FROM meter. If the track chosen is TO the VOR station and the aircraft is less than about 70 degrees from the selected track, the TO-FROM meter will indicate TO. If the track chosen is FROM the station and the aircraft is less than about 70 degrees from the selected track, the TO-FROM meter will indicate FROM. If the aircraft is in the vicinity of 90 degrees from the selected track, the TO-FROM meter will be in the neutral zone, that is, no indication will be visible.

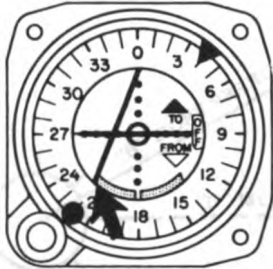
b. Tune in the desired VOR station and identify. Make certain that the vertical-pointer flag-alarm is out of sight.



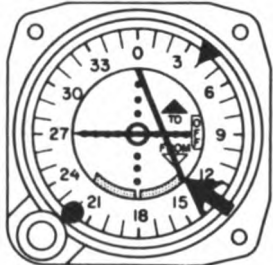
c. Rotate the COURSE SELECTOR knob so that the large arrowhead on Course Indicator ID-322/ARN-30 or the triangular shaped end of the pointer on Course Indicator ID-453/ARN-30 points to the magnetic track

e. Check the bearing shown on the course indicator with the compass heading; they should be in general agreement. If they are, observe the position of the vertical pointer. To position the aircraft on the desired course, "steer into the needle," that is, if the pointer is left of center, steer left until the needle centers, or if it is right of center, steer right until the needle centers. When the needle is centered the aircraft is on the

selected track. When "flying the needle" do not attempt to keep the needle directly in the center. Rather, fly the general trend of the needle to prevent over-correction. If the compass heading and the course indicator bearing are about 180 degrees apart, it indicates that the aircraft is heading in an opposite direction to the desired course. An attempt to "steer into the needle" under this condition will cause the needle to move still farther left or right. To correct the situation, make a 180-degree turn and then "fly the needle".



ID-453/ARN-30



ID-453/ARN-30



ID-453/ARN-30

CAUTION

Always remember that VOR supplies only positional information. Direction or heading information must still be obtained from the compass. The rule of "steer into the needle" is only applicable if the course indicator bearing and the compass heading are kept in general agreement; and in agreement with the course it is desired to make good.

2-10. FLYING TO AN OBJECTIVE, USING TWO VOR STATIONS. The procedure for flying to an

objective using two VOR stations is outlined and illustrated in figure 2-7.

2-11. GROUND SPEED CHECK, USING TWO VOR STATIONS. An approximate ground speed check may be made by using two VOR stations. The procedure is outlined and illustrated in figure 2-8.

2-12. INTERSECTING LOCALIZER PATH, USING A VOR STATION. The procedure for intersecting a localizer path using a VOR station is outlined and illustrated in figure 2-9.

2-13. INDICATIONS OF ARRIVAL OVER VOR STATION.

2-14. Upon arrival over a VOR station, the indicating instruments and aural signal are affected as follows:

- a. The aural signal suddenly increases in strength and may become distorted.
- b. The vertical pointer on the indicator swings abruptly from side to side.
- c. The vertical-pointer flag-alarm may appear and disappear in rapid succession.
- d. The TO-FROM meter of the course indicator becomes erratic, showing TO, then FROM, etc., finally steadying into the FROM position, indicating that the aircraft has passed beyond the VOR station.

2-15. PROCEDURE FOR LET-DOWNS. Let-downs may be made where authorized, in accordance with published information, using VOR. The required procedure is outlined in paragraph 2-9.

2-16. AIRBORNE OPERATION OF VAR FACILITIES.

2-17. TYPICAL USES OF VAR. The following navigation procedures are typical of those which may be flown using VAR facilities:

Flying visual courses (paragraph 2-17).

Flying aural courses (paragraph 2-17).

Position determination through fixes or quadrants (paragraph 2-17).

Let-downs, "front-course" runway approach (paragraph 2-19).

Let-downs, "back-course" runway approach (paragraph 2-20).

2-18. PRINCIPLES OF FLYING VAR. Figure 2-10 illustrates the visual and aural indications which might be observed during a VAR flight, under the conditions specified therein.

2-19. FLYING VISUAL AND AURAL COURSES: POSITION DETERMINATION. To determine the position of an aircraft, or to fly an on-course heading through the use of the VAR stations, proceed as follows:

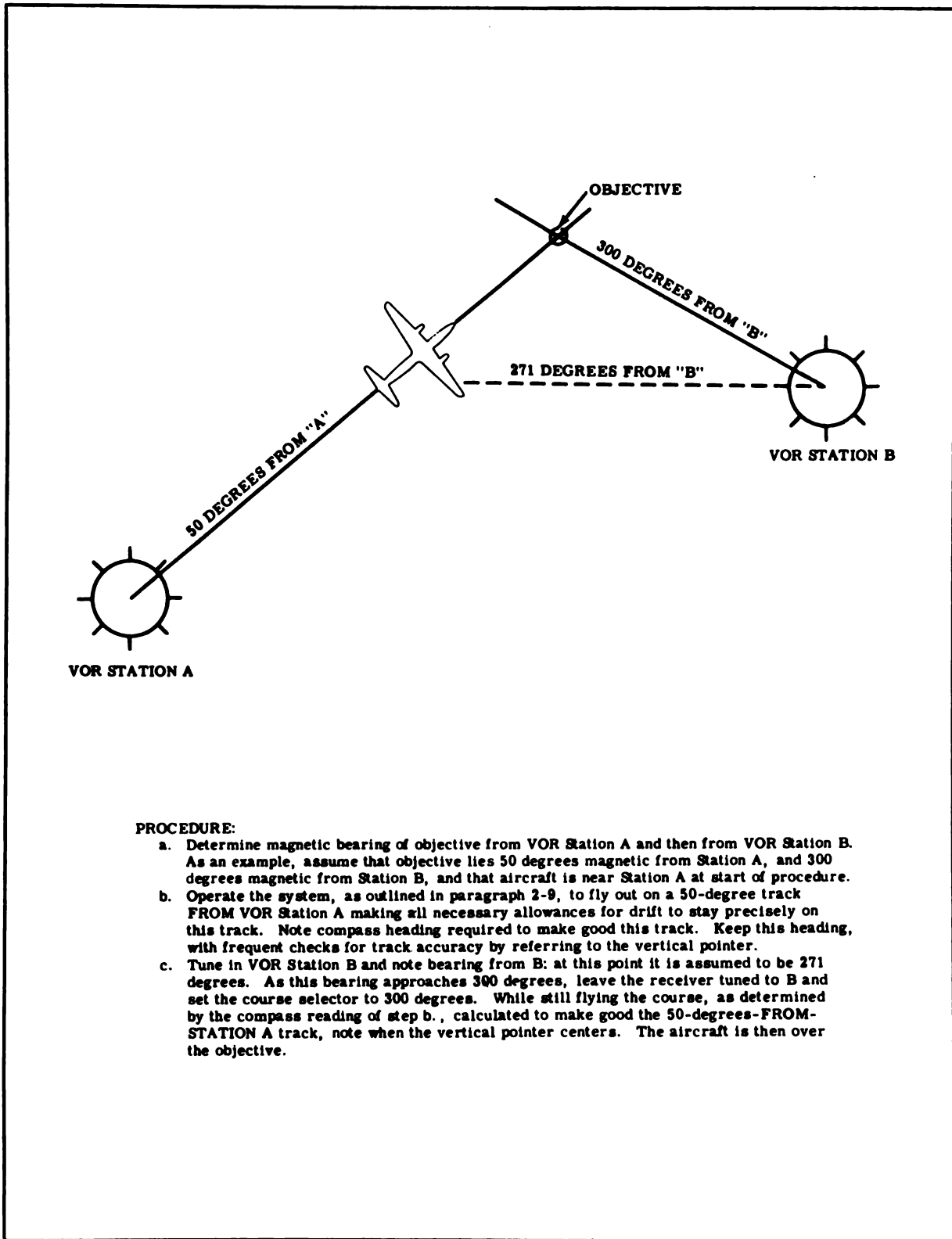


Figure 2-7. Flying to an Objective Using Two VOR Stations

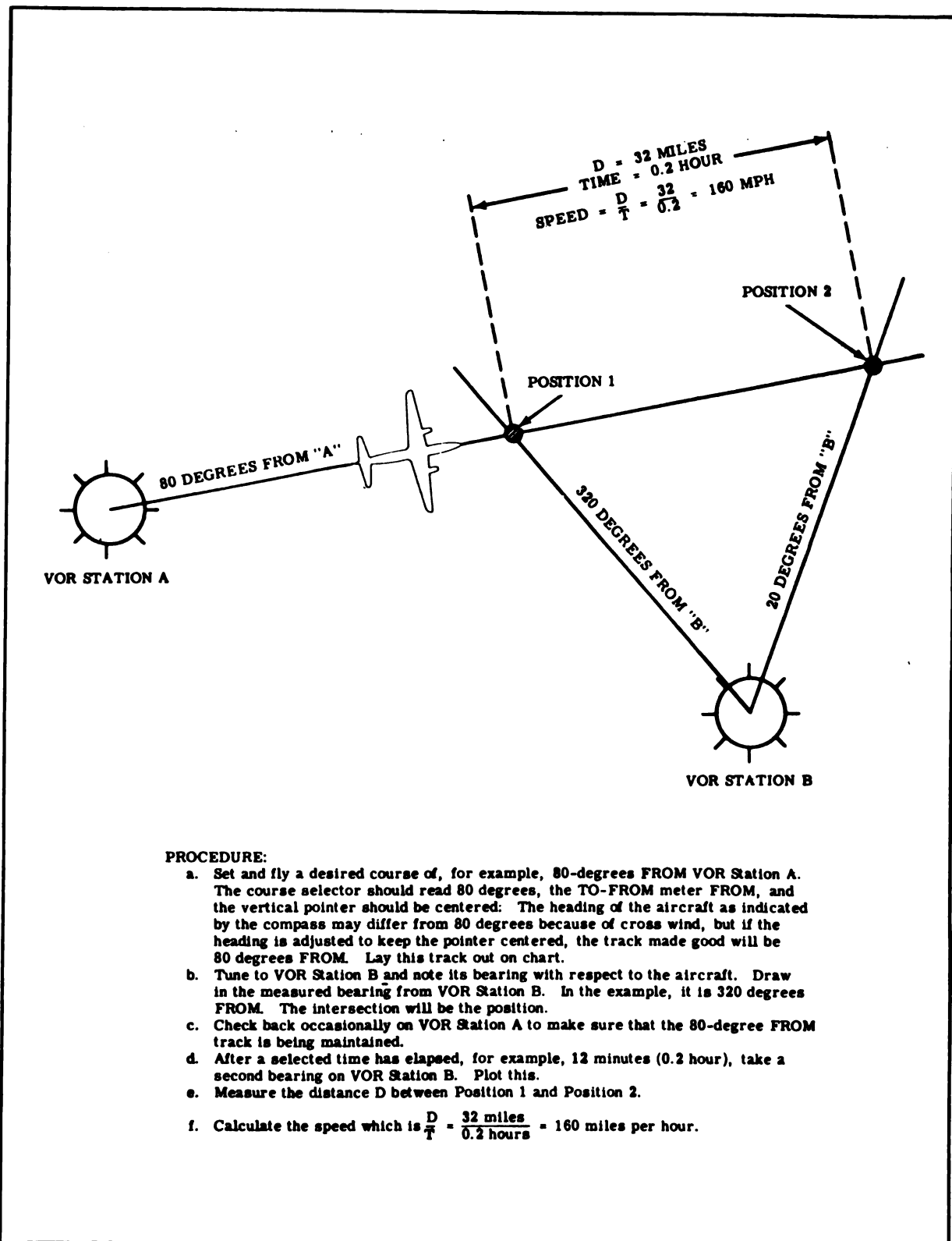


Figure 2-8. Approximate Ground Speed Check Using Two VOR Stations

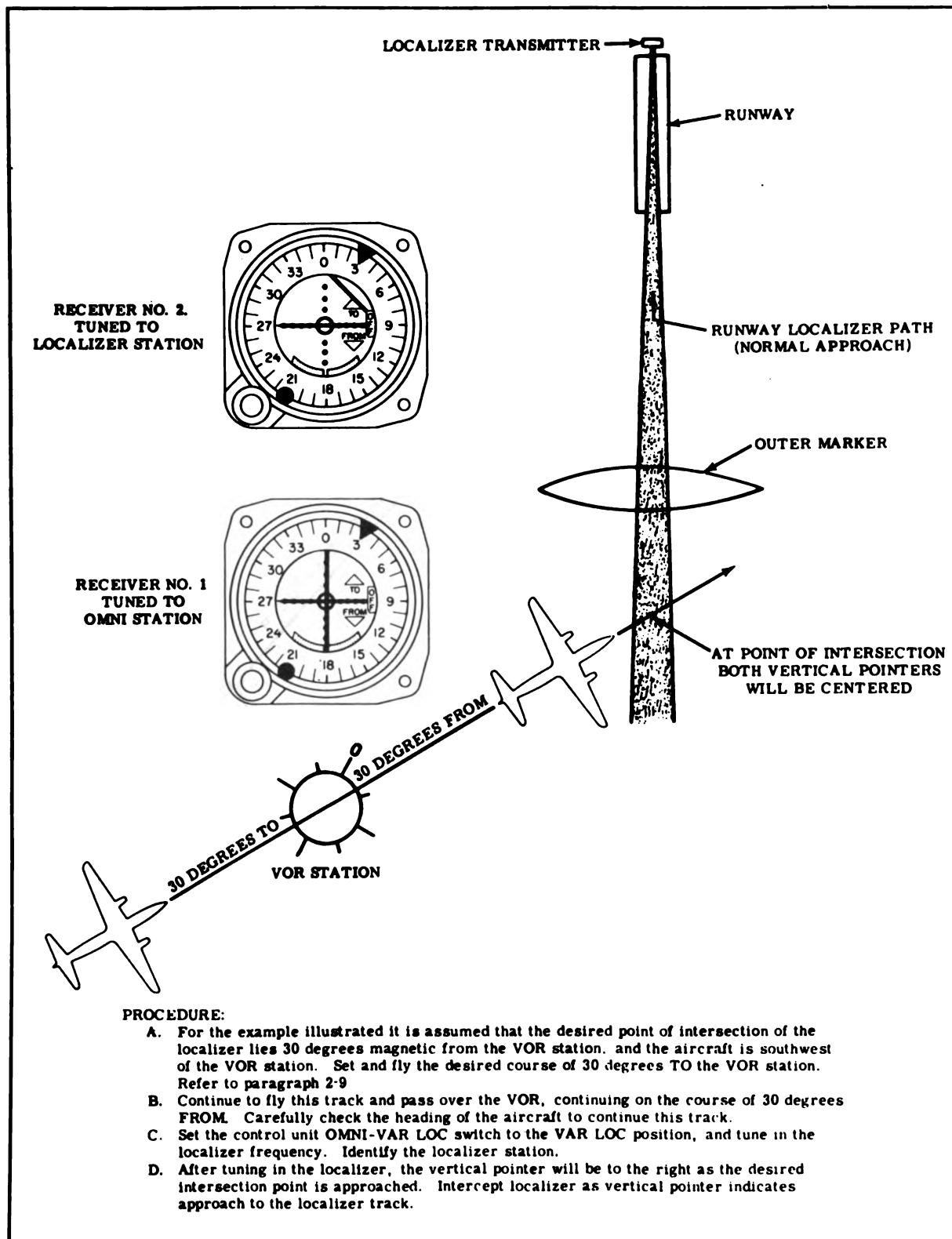


Figure 2-9. Intersection of Localizer Using a VOR Station

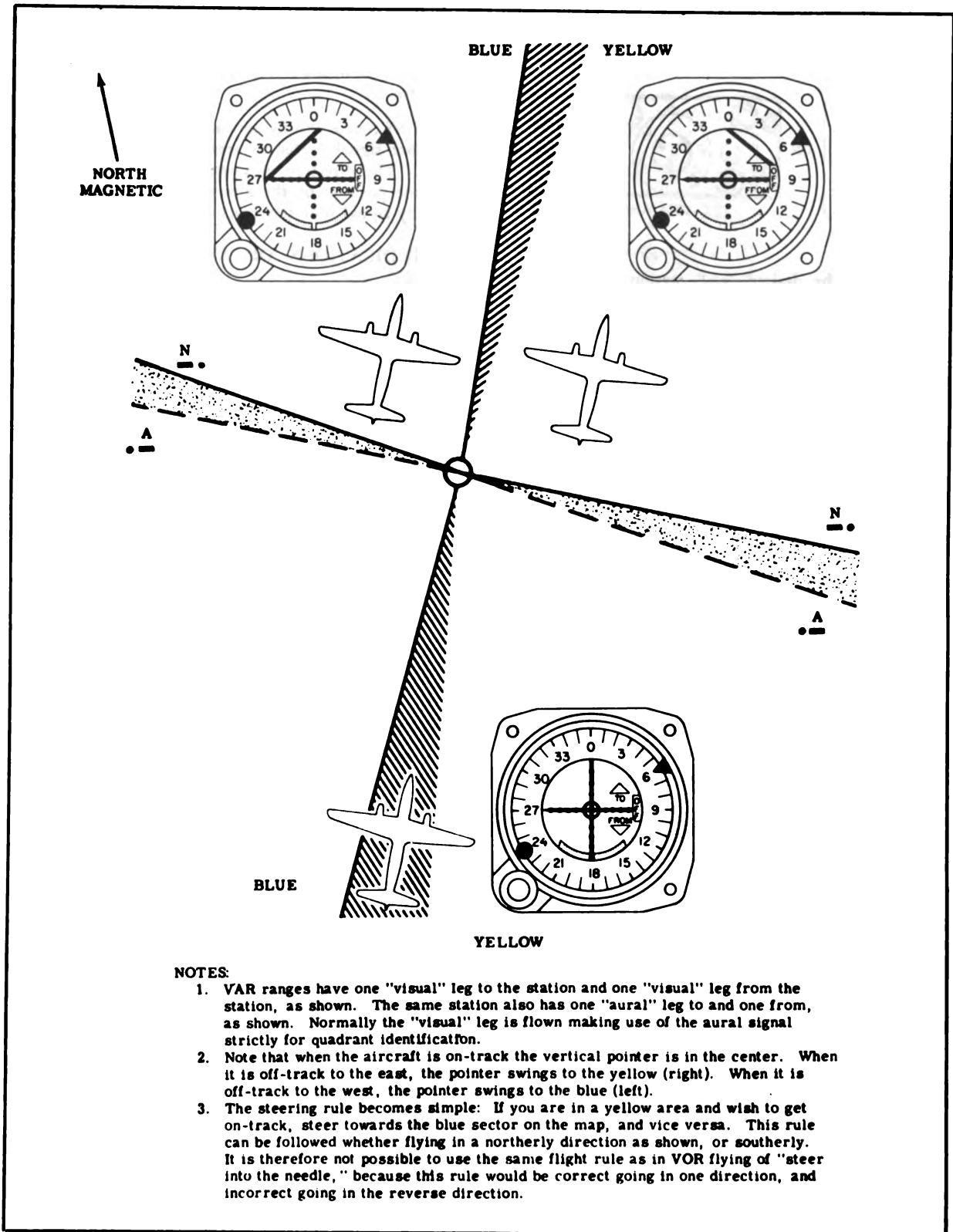
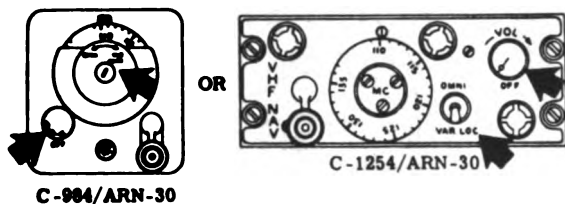


Figure 2-10. Visual and Aural Indications During VAR Flight

Section II
Paragraphs 2-19 to 2-25

AN 16-30ARN30-1

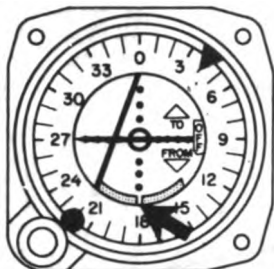
a. Turn the OFF switch on. Turn the OMNI-VAR LOC switch to the VAR LOC position. Allow the equipment to warm up.



C-904/ARN-30

C-1254/ARN-30

b. Tune in the desired VAR station and identify. Check that the vertical-pointer flag-alarm is out of sight.



ID-453/ARN-30

c. Note whether the vertical pointer is in the blue or yellow sector; also, whether the audio signal is an "A" or "N". Refer to area map and determine quadrant for aircraft position.



ID-453/ARN-30

d. If off course and flying the visual course, fly toward the other color sector on the map. The direction of steering will depend on the quadrant position of the aircraft. (See figure 2-10.) A centered needle indicates on-course.

e. If off course and flying the aural course, fly toward the other signal (refer to area map) to get back on course. The direction of steering will depend on the quadrant position of the aircraft. (See figure 2-10.) A steady signal indicates on-course.

2-20. INDICATIONS OF ARRIVAL OVER VAR STATION.

2-21. Upon arrival over a VAR station, the audio and visual courses are affected as follows:

a. If flying the visual course, the "A" signal will change to "N", or vice versa.

b. If flying the audio course, the vertical pointer will swing from the blue sector to the yellow sector, or vice versa.

2-22. LET-DOWN "FRONT-COURSE" RUNWAY APPROACH. The procedure for a let-down using localizer frequencies when approaching the runway in the normal sense, is outlined and illustrated in figure 2-11.

2-23. LET - DOWN "BACK - COURSE" RUNWAY APPROACH. If the approach to the airport follows a localizer "back-course" closely, follow the procedure described in figure 2-12.

2-24. SIMULTANEOUS VOICE AND NAVIGATION SIGNAL RECEPTION.

2-25. To receive voice and navigation signals, simultaneously, tune the receiver to the desired station, increase the volume level by turning the OFF control in a clockwise direction. The position of the OMNI-VAR LOC switch has no effect. The adjustment of the OFF control affects only the audio level; the navigation circuits are unaffected.

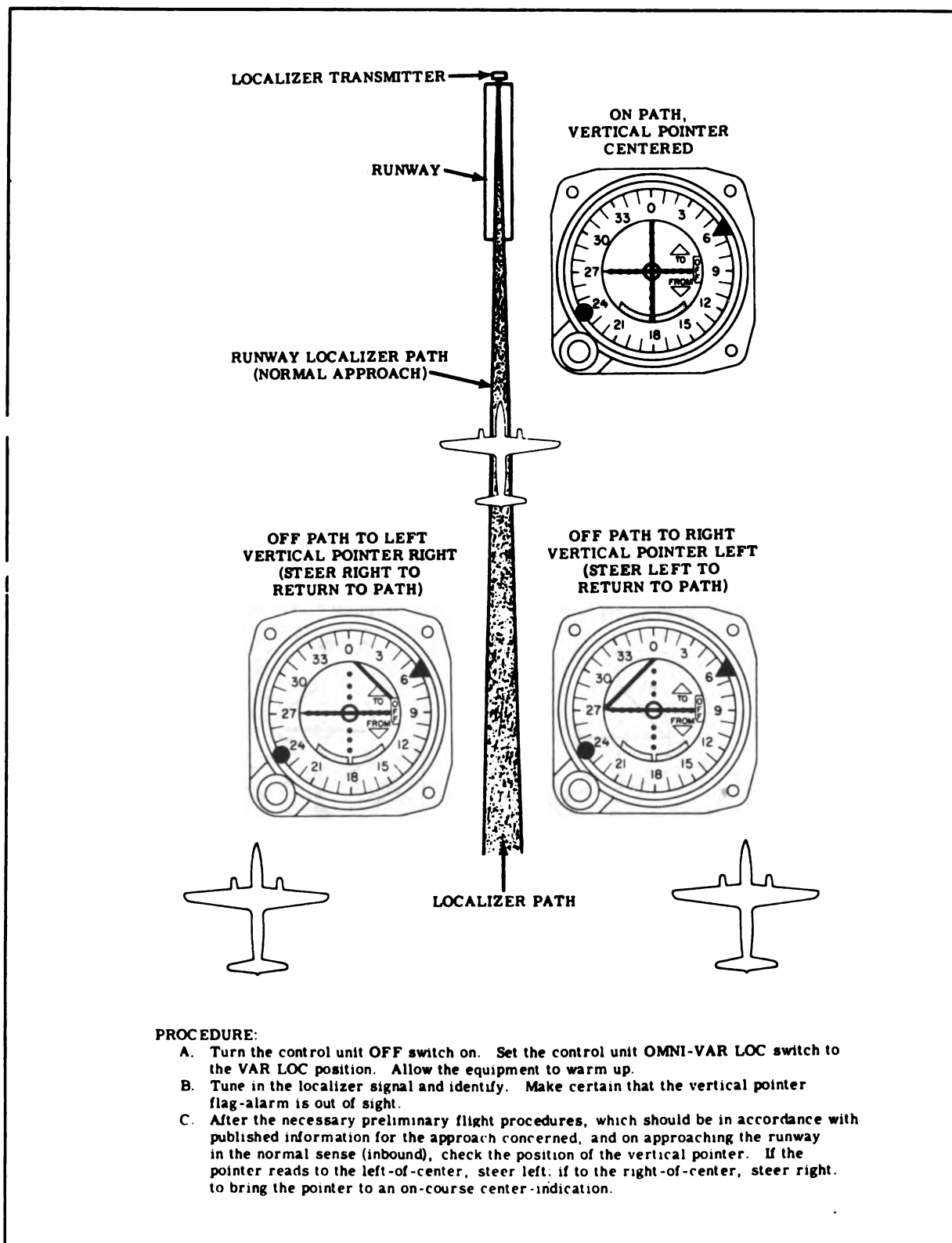


Figure 2-11. Localizer Instrument Indications, "Front-Course" Runway Approach

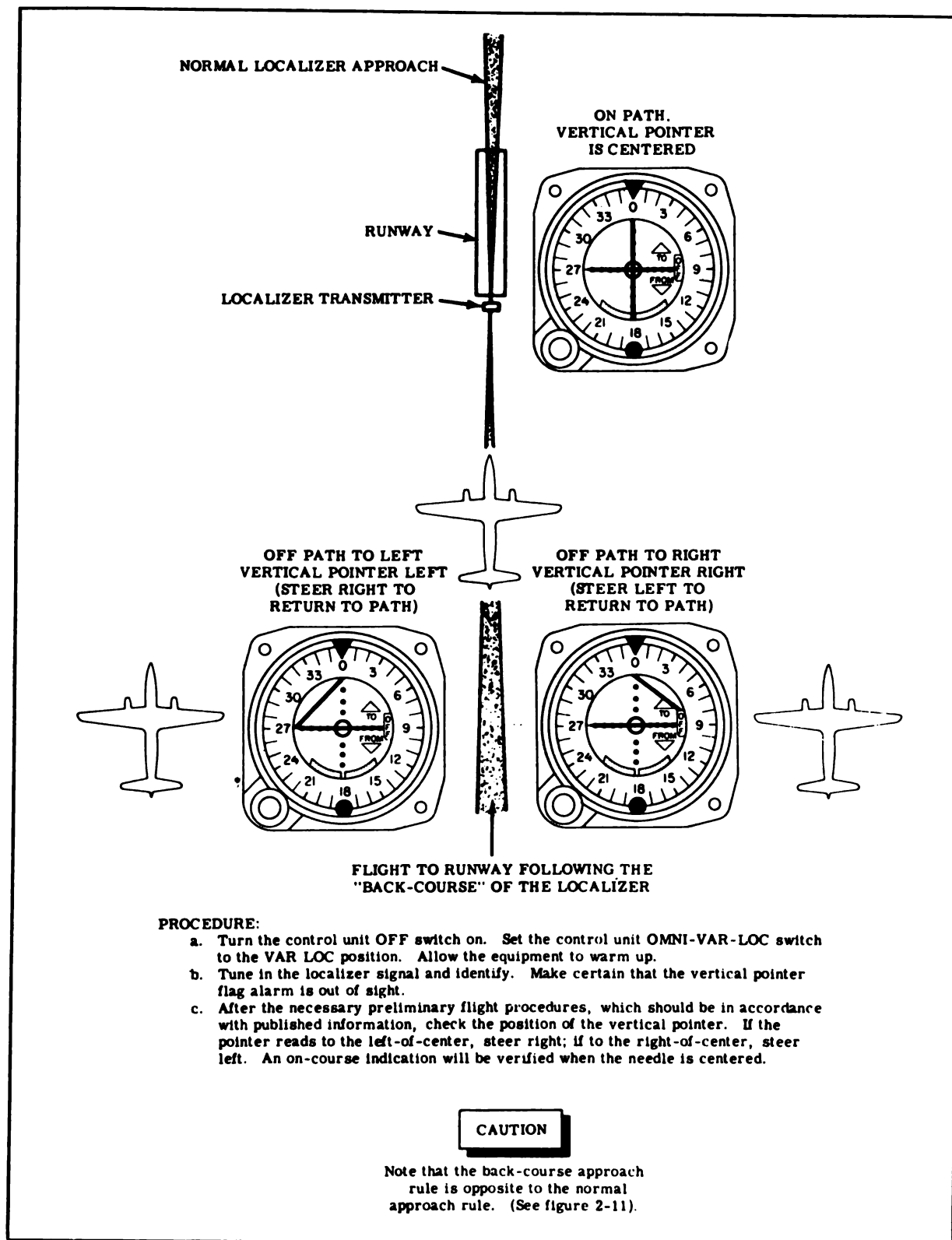


Figure 2-12. Localizer Instrument Indications, "Back-Course" Runway Approach

SECTION III

OPERATING CHECKS AND ADJUSTMENTS

3-1. PREFLIGHT OPERATING CHECKS AND ADJUSTMENTS.

3-2. Preflight operating checks and adjustments are outlined in paragraph 2-4.

3-3. AIRBORNE OPERATING CHECKS AND ADJUSTMENTS.

3-4. The checks and adjustments listed in table 3-1 are applicable to all operational procedures and should be made by the operator during airborne operation.

TABLE 3-1. AIRBORNE OPERATING CHECKS AND ADJUSTMENTS

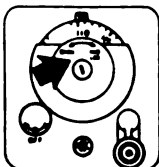
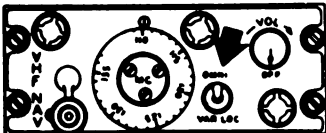
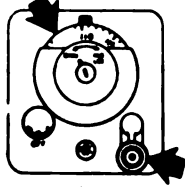
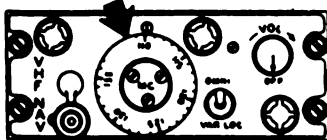
<i>What to Check or Adjust</i>	<i>How to Check or Adjust</i>	<i>Precautions</i>
<p style="text-align: center;">OMNI-VAR LOC switch</p>  <p style="text-align: center;">C-984/ARN-30 OR</p>  <p style="text-align: center;">C-1254/ARN-30</p>	<p>Visually check position of OMNI-VAR LOC switch</p>	<p>Position will depend on navigation facility in use. If VOR signals are to be received, the switch must be in the OMNI position. If VAR or localizer signals are to be received, the switch must be in the VAR LOC position. (The flag-alarm will remain in sight if the switch is in the wrong position.)</p>
<p style="text-align: center;">Tuning dial</p>  <p style="text-align: center;">C-984/ARN-30 OR</p>  <p style="text-align: center;">C-1254/ARN-30</p>	<p>Tune the receiver accurately. Check the dial indication on the control unit against the station's listed frequency.</p>	<p>Inaccurate tuning may cause weak or unreliable signal reception.</p>

TABLE 3-1. AIRBORNE OPERATING CHECKS AND ADJUSTMENTS (Cont)


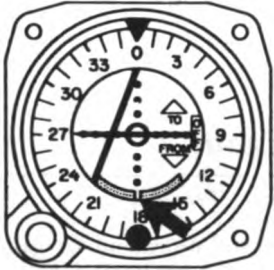

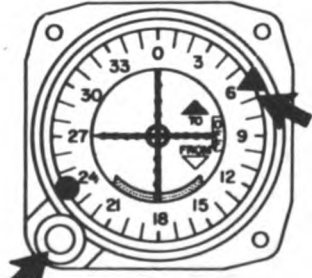
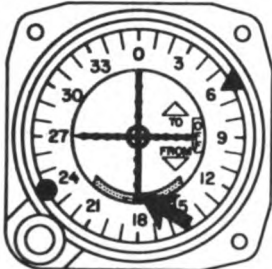
What to Check or Adjust	How to Check or Adjust	Precautions
<p>Station identity</p> 	<p>Identify the station positively before proceeding.</p>	
<p>Flag-alarm</p>  <p>ID-453/ARN-30</p>	<p>Visually check that the flag-alarm drops down out of sight during operation on any facility.</p>	<p>An exposed flag-alarm over the vertical pointer indicates unreliable information due to improper tuning, or wrong OMNI-VAR LOC switch position, or defective ground or airborne equipment.</p>
<p>TO-FROM meter</p>  <p>ID-453/ARN-30</p>	<p>Visually check that bar-pointer is out of neutral area VOR operation.</p>	<p>A neutral area reading is an indication of an unreliable signal. The signal may be too weak, or some part of it may be missing either from the ground or in the airborne equipment. Track information may still be useful when the meter is in this zone, but it should be double-checked. The TO-FROM meter will indicate TO only if the aircraft is less than about 70 degrees from the selected course, or FROM only if it is more than about 110 degrees.</p>
<p>Course indicator bearing</p>  <p>ID-453/ARN-30</p>	<p>Adjust the COURSE SELECTOR to the desired course, or in the case where the aircraft position is being determined, adjust the COURSE SELECTOR until the vertical pointer is centered.</p>	<p>The course indicator indicates a magnetic bearing which is completely independent of the heading of the aircraft. Do not confuse the course indicator reading with the aircraft magnetic compass reading. It is practically impossible to check the omni track against a directional gyro, ADF, or other heading device because VOR lays down a track and does not provide heading information.</p>

TABLE 3-1. AIRBORNE OPERATING CHECKS AND ADJUSTMENTS (Cont)

<i>What to Check or Adjust</i>	<i>How to Check or Adjust</i>	<i>Precautions</i>
<p data-bbox="211 306 467 333">Vertical pointer position</p>  <p data-bbox="283 671 424 692">ID-463/ARN-30</p>	<p data-bbox="592 306 978 389">Visually check that the vertical pointer is kept centered, indicating that the aircraft is "on track."</p>	<p data-bbox="1020 306 1381 609">During flight, do not attempt to keep the needle "dead" center; rather, fly the general trend of the needle. Sudden variations may occur occasionally when the aircraft is directly over high peaks or bodies of water; this is due to "terrain effect." Sudden changes may also be due to maintenance work being performed on the ground equipment.</p>

SECTION IV

EMERGENCY OPERATION

Note

Except for the possible substitution of the use of VOR facilities for VAR or localizer signals (or vice versa) to complete a desired navigation maneuver, there are no emergency methods of operation in case of circuit failure during flight. However, if the voice portion of the receiver is operable, it may be possible to use GCA facilities.



