

DEPARTMENT OF THE ARMY TECHNICAL MANUAL

ORGANIZATIONAL MAINTENANCE MANUAL

COUPLER ANTENNA

CU-1658/A AND CU-1669/GRC



HEADQUARTERS, DEPARTMENT OF THE ARMY

NOVEMBER 1970

WARNING

DANGEROUS VOLTAGES are used in the operation of this equipment. **DEATH ON CONTACT** may result if safety precautions are not observed. Electrical potentials up to 400 volts dc exist in the receiver-transmitter to which the antenna coupler is connected when the radio set is energized. Do not make contact with exposed wires or connectors when the equipment is energized.

WARNING

Operator and maintenance personnel should be familiar with the requirements of TB SIG 291 before attempting installation or operation of the equipment covered in this manual. Failure to follow the requirements of TB SIG 291 could result in injury or **DEATH**.

WARNING

The metal case handle of the antenna coupler in the extended carry or pull-out position is close to the output terminal. A short circuit is possible through the case whenever the antenna lead-in wire is connected to the output terminal and the handle is not in the down position.

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TECHNICAL MANUAL }
 No. 11-5985-326-20 }

HEADQUARTERS
 DEPARTMENT OF THE ARMY
 WASHINGTON, D.C., 17 November 1970

Organizational Maintenance Manual
COUPLER, ANTENNA CU-1658/A and CU-1669/GRC

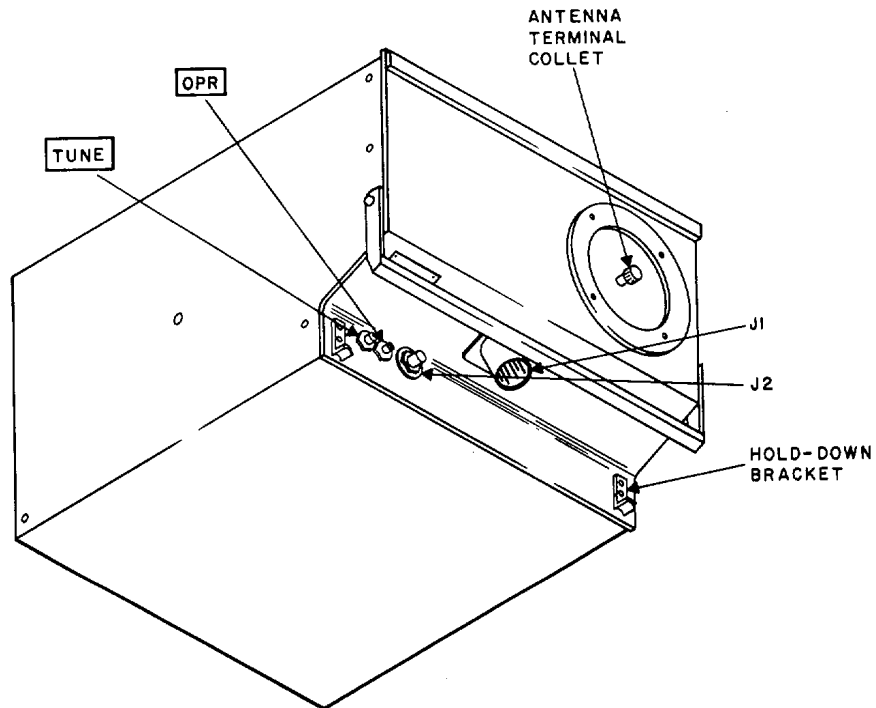
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*This manual supersedes so much of TM 11-5821-271-15, 6 March 1967; including all changes as pertains to organizational maintenance procedures.

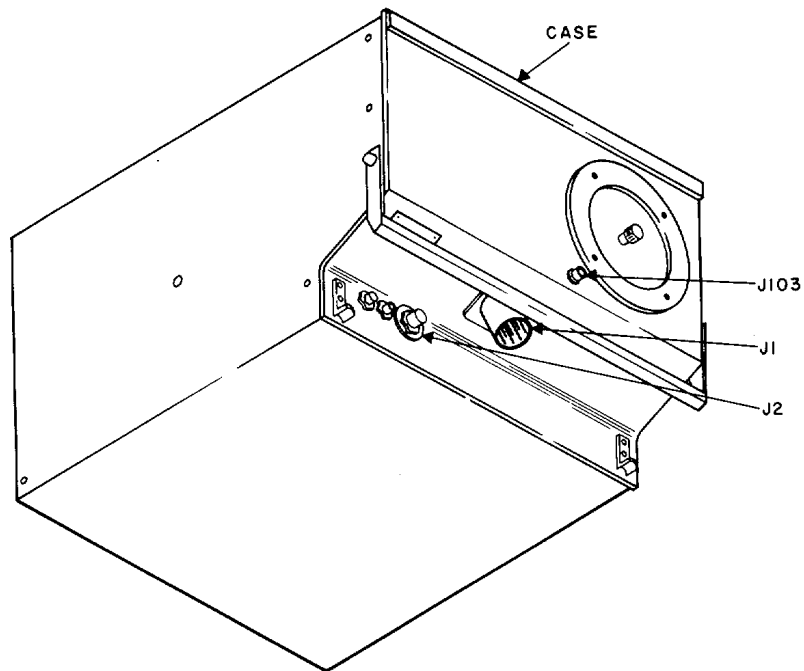
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A. COUPLER, ANTENNA CU-1658/A



B. COUPLER, ANTENNA CU-1669/GRC

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Figure 1-1. Couplers, Antenna CU-1658/A and CU-1669/GRC, less mounting.

CHAPTER 1
INTRODUCTION

Section I. GENERAL

1-1. Scope

a. This manual describes Couplers, Antenna CU-1658/A and CU-1669/GRC (fig. 1-1) and covers its installation, operation, and maintenance. It includes operation under usual conditions, cleaning and inspection of the equipment, and replacement of parts available to second echelon maintenance.

b. The maintenance allocation chart (MAC) is in appendix B.

1-2. Indexes of Publications

a. *DA Pam 310-4.* Refer to the latest issue of DA Pam 310-4 to determine whether there are new editions, changes, or additional publications pertaining to this equipment.

b. *DA Pam 310-7.* Refer to DA Pam 310-7 to determine whether there are modification work orders (MWO's) pertaining to the equipment. DA Pam 310-7 lists all authorized Department of the Army modification work orders, identifying the type, model, series, and Federal stock number of the item to be modified; number, date, and classification of the MWO; category of maintenance authorized to perform the modification; and the man-hours required to apply the modification to each

item.

1-3. Forms and Records

a. *Reports of Maintenance and Unsatisfactory Equipment.* Use equipment forms and records in accordance with instructions given in TM 38750.

b. *Report of Packaging and Handling Deficiencies.* Fill out and forward DD Form 6 (Report of Packaging and Handling Deficiencies) as prescribed in AR 700-58 (Army), NAVSUP Publication 378 (Navy), AFR 71-4 (Air Force), and MCO P4610-5 (Marine Corps).

c. *Discrepancy in Shipment Report (DISREP) (SF 361).* Fill out and forward Discrepancy in shipment Report (DISREP) (SF 361) as prescribed in AR 55-38 (Army), NAVSUP Publication 459 (Navy), AFM 75-34 (Air Force) and MCO P4610.19 (Marine Corps).

d. *Reporting of Equipment Manual Improvements.* Reporting of errors, omissions, and recommendations for improving this manual by the individual user is encouraged. Report should be submitted on DA Form 2028 (Recommended Changes to Publications) and forwarded direct to Commanding General, U.S. Army Electronics Command, ATTN: AMSEL-ME-NMP-EM, Fort Monmouth, N.J. 07703.

Section II. DESCRIPTION AND DATA

1-4. Use of Term Hertz

The National Bureau of Standards has officially adopted the term Hertz (abbreviated Hz) for cycles per second (abbreviated cps). The table below provides the

common equivalents. The term Hertz is used throughout this manual except where equipment markings or decals reflect the old term.

Unit/ quantity	Old term	Old abbr	New term	New abbr
Frequency	Cycles per second.....	cps	Hertz	Hz
10 ⁻³ cycle per second	Millicycles per second	mc	Millihertz	mHz
10 ³ cycles per second.....	Kilocycles per second	Kc	Kilohertz	kHz
10 ⁶ cycles per second.....	Megacycles per second....	Mc	Megahertz	MHz
10 ⁹ cycles per second	Gigacycles per second.....	Gc	Gigahertz	GHz

1-5. Purpose and Use

a. *Purpose.* The purpose of Couplers, Antenna CU-1658,/A and CU-1669i/GRC is to electrically match the impedance of a whip antenna (25 feet or longer) or a long wire antenna (25 to 100 feet) with a 50-ohm coaxial transmitter output line.

b. *Use.* Couplers, Antenna CU-1658/A and CU-1669,/GRC are high frequency (hf) antenna couplers covering the frequency range of 2.000 to 29.999 MHz. They are automatically tuned in 3 seconds when a new frequency is selected, using any high frequency radio set such as Receiver-Transmitter, Radio RT-698,/ARC-102. Coupler, Antenna CU-1658/A is employed for airborne use; Coupler, Antenna CU-1669,/GRC is employed for ground use. The antenna couplers will match a whip antenna of 25 feet or longer, or a long wire antenna between 25 and 100 feet. Antennas shorter than 25 feet may also be matched with the aid of external loading coils.

1-6. Technical Characteristics

Frequency range 2.000 to 29.999 MHz
 Power requirements 115 volts ac (vac), single phase, 400 Hz.
 Power consumption..... 130 watts maximum during tuning; 20 watts during operate.
 Duty cycle Continuous
 Rated input radio-frequency (rf) power..... 630 watts peak envelope power (pep); 200 watts average.
 Tuning time..... 3.0 seconds, typical 5.0 seconds, maximum
 Tuning accuracy..... 1.3 to 1 voltage standing-wave ratio (vswr) maximum for all operating conditions when tune power is greater than 70 watts.
 Receiver-transmitter compatibility..... Completely compatible with Receiver-Transmitter, Radio RT-648/ ARC-94; Receiver-Transmitter, Radio RT-698/ARC-102; and Receiver-Transmitter, Radio RT-311/ARC-38.

Ambient temperature:

Operating..... -55 degrees C (-67 degrees F) to 71 degrees C (159.8 degrees F).
 Nonoperating 62 degrees C (-79.6 degrees F) to 85 degrees C (185 degrees F).
 Altitude..... 0 to 30,000 ft (9,100 meters) operating.
 Shock..... 15 G, 11-millisecond duration.
 Vibration 5 to 500 Hz, MIL-E-5400F (curve IV with vibration isolators and curve II nonoperating).

1-7. Components and Dimensions

(fig. 1-2)

a. *Components.* Couplers, Antenna CU-1658/A and CU-1669/GRC.
 b. *Dimensions.* Refer to figure 1-2.

1-8. Nomenclature and Common Names

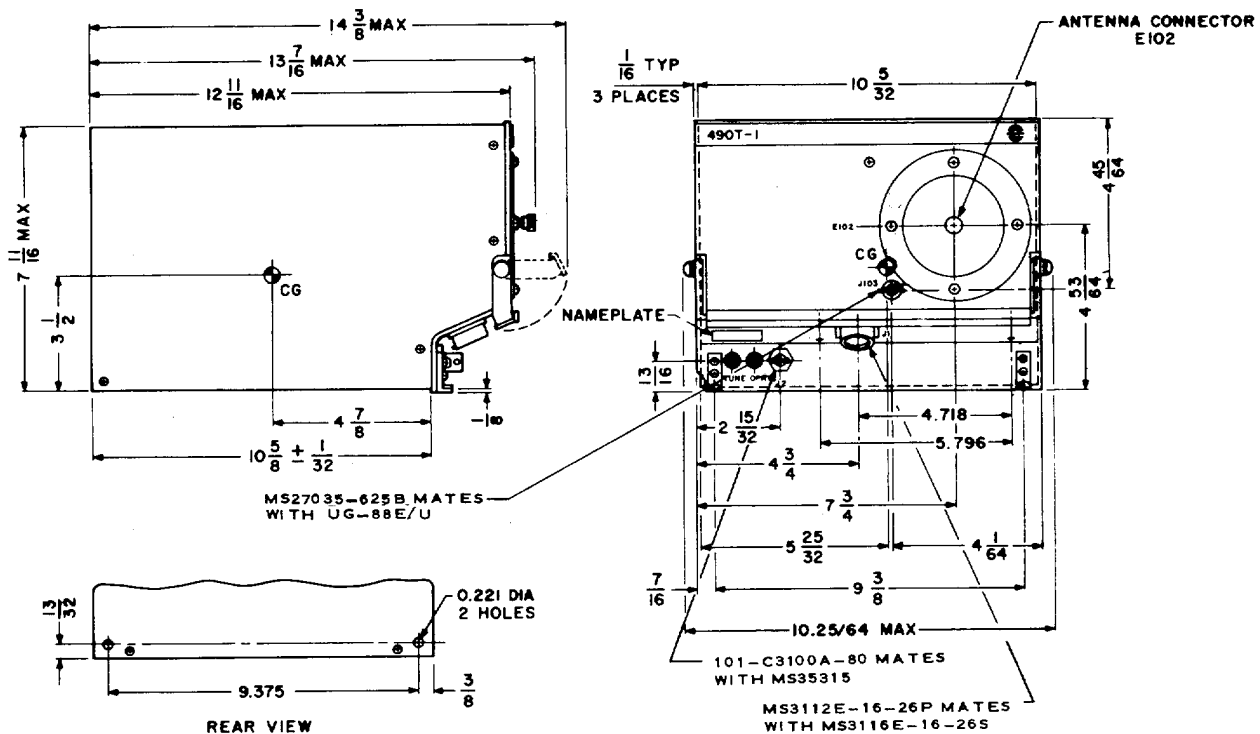
A list of nomenclature assignments for Couplers, Antenna CU-1658/A and CU-1669/GRC and additional equipment required is provided below.

A common name used throughout this manual is indicated after each item.

<i>Official nomenclature</i>	<i>Common name</i>
Coupler, Antenna CU-1658/A	Antenna coupler
Coupler, Antenna CU-1669/GRC	Antenna coupler
Mounting MT-3772/A	Mount
Electrical Dummy Load DA-487/U	Dummy Load

1-9. Description of Equipment

The antenna coupler is contained inside a nonpressurized, semiportable, dust-proof type case. This configuration combines rigidity with radio-frequency isolation. Refer to figure 1-1 for physical configuration. No operating controls are located on the antenna coupler. Two indicator lamps, TUNE and OPR, are located on the front panel. Connector receptacles J1 and J2 are also located on the front panel. J1 is the power source connection, and J2 provides for connection between the receiver-transmitter antenna terminal and the antenna coupler. An antenna terminal is located on the upper part of the front panel.



NOTE:

1. EQUIPMENT WEIGHT: 19.7 LB CU-1669/ GRC 19.4 LB CU-1658/A
2. TUNE LIGHT - AMBER
OPR LIGHT - GREEN
3. CONNECTOR MS27035-625B APPEARS ONLY ON CU-1669/ GRC

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Figure 1-2. Couplers, Antenna CU-1658/A and CU-1669/GRC, outline and mounting dimensions.

Only the CU-1669/GRC has an additional jack (J103) located just beneath the antenna terminal. This jack is utilized with Radio Set AN/GRC-158 (TM 11-5820-672-12).

1-10. Additional Equipment Required

The following equipment is not supplied with nor is it a part of Couplers, Antenna CU-1658/A or CU-1669/GRC. However, the equipment is needed for use with the coupler during operation and installation.

Equipment	Purpose	Applicable publication
Mounting MT-3772/A.	Secures antenna couplers to aircraft bulkhead and protects antenna couplers from vibration and shock.	None.
Loading coils	Used to match antennas shorter than 25 feet	None.

1-11. Differences in Models

The only external difference between Couplers, Antenna CU-1658/A and CU-1669/GRC is that J103 is located on the front panel of the CU-1669/GRC (fig. 1-1). Except for a transmit-receive relay and a receiver ground relay which are included in the CU-1669/GRC, the internal circuits of the two antenna couplers are identical.

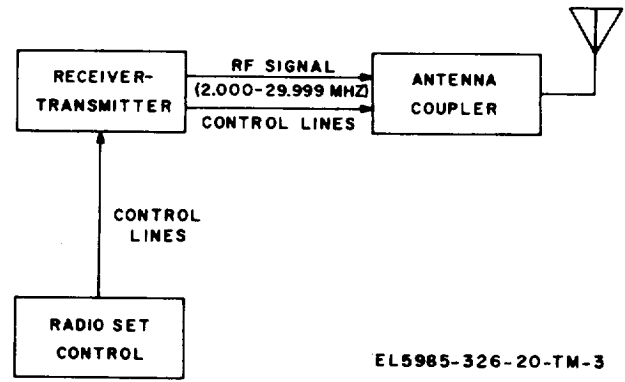
1-12. System Application (fig. 1-3)

a. A basic hf communication system consists of a receiver-transmitter, a radio set control, an antenna, and an antenna coupler. This system provides voice communication between aircraft and ground communication stations.

b. When the receiver-transmitter transmits, it sends information to the antenna coupler in the form of voltage and current data. This data is used to initiate automatic tuning of the antenna coupler to match the antenna impedance with the receiver-transmitter impedance.

Thus, a more powerful signal is radiated from the antenna.

c. Transmitted RF signals are sampled by the antenna coupler. The antenna coupler contains sensing circuits that compare the samples with voltage and current data to produce error information. The error information activates control circuits located in the antenna coupler. The control circuits position tuning elements in such a manner as to match the impedance of the receiver-transmitter with the impedance of the antenna. This results in more efficient radio set operation.



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Figure 1-3. Basic hf communications system, block diagram.

CHAPTER 2
INSTALLATION

WARNING

During installation of this equipment confirm to all safety requirements set forth in TB SIG 291. Injury or DEATH could result from failure to comply with safe practices.

2-1. General

Since the antenna coupler is normally installed in an aircraft by the manufacturer of the aircraft or during a higher level retrofit program, limited installation is provided in this chapter.

2-2. Siting

Mounting MT-3772/A (not part of the antenna coupler) is normally installed in the electronics bay of the aircraft. The antenna coupler is installed in the mount. The minimum space requirements for the antenna coupler is illustrated in figure 1-2. This illustration is furnished primarily for planning purposes. When used, consideration should be given to the space required for the cabling from the antenna coupler to the aircraft antenna. Also, the space required from the antenna coupler to the receiver-transmitter must be considered. Provisions for adequate space to perform operating procedures and for removing the antenna coupler from its mount when necessary are further considerations.

2-3. Checking Unpacked Equipment

a. Check the equipment against the packing slip to insure that all items have been supplied and that they are in good condition. Report any damage or discrepancies as indicated in paragraph 1-3. Shortage of a minor assembly or part that does not affect proper function or securing of the equipment should not prevent installation or use of the equipment.

b. If any of the equipment has been used or reconditioned, see whether it has been changed by a modification work order (MWO). If an equipment has been modified, the MWO number will appear on the front panel near the nomenclature plate. If modified, see that any operational instruction changes resulting from the modification have been entered in the equipment manual.

NOTE

Current MWO's applicable to standard equipment are listed in DA Pam 310-7.

2-4. Interconnection Procedures

a. *General.* Figures 6-1 through 6-9 depict typical interconnections necessary for radio set operation. Refer to the notes on figures 6-1 through 6-9 for aircraft cabling information. Refer to TM 55-1500-323-25 for aircraft wiring procedures and practices.

b. *Mating Connectors.* Mating connector types are given below.

<i>Equipment</i>	<i>Connector</i>	<i>Type</i>
Receiver-transmitters.	J40	DPE-60-33S
	J4	UG-21D/U
	J3	UG-536A/U
Radio set control.	J1	MS3106A-28-15S or PT06A-20-39S/SR
	J1	MS3116E-16-26S
Antenna coupler.	J2	MS3531S
	J103 (CU-1669/GRC only)	UG-88E/U

c. *Power requirements.* The primary input power requirements are-

<i>Equipment</i>	<i>Power requirements</i>
Receiver-Transmitter, Radio RT-648/ ARC-94.	115 vac (line to neutral), 3 phase 400 Hz: Phase 1-J40-1 (fused-5 amp) Phase 2-J40-2 (fused-5 amp) Phase 3-J40-3 (fused-5 amp)
Receiver-Transmitter, Radio RT-698/ ARC-102.	27.5 vdc (fused-40 amp)

**2-5. Receiver-Transmitter, Radio RT-648/
ARC-94 Installation**

The chart below lists the different configurations in which Receiver-Transmitter, Radio RT-648, ARC-94, Control, Radio Set C-3940 /ARC-94, Control, Radio Set C-4626/ ARC-102, and the antenna couplers may be interconnected. Refer to the referenced figure for cabling diagrams.

<i>Radio set control</i>	<i>Antenna coupler</i>	<i>Fig. No.</i>
C-4626/ARC-102.....	CU-1669/GRC	6-1
C-4626/ ARC-102.....	CU-1658,/A.....	6-2
C-3940/ ARC-94.....	CU-1669/'GRC.....	6-3
C-3940/ARC-94 (dual system)	CU-1669/GRC	6-4
C-3940/ARC-94.....	CU-1658/A.....	6-5

**2-6. Receiver-Transmitter, Radio RT-698/
ARC-102 Installation**

The chart below lists the different configurations in which Receiver-Transmitter, Radio RT-698/ ARC-102, Control, Radio Set C-3940/ARC-94, Control, Radio Set C-4626/ARC-102, and the antenna couplers may be interconnected. Refer to the referenced figure for cabling diagrams.

<i>Radio set control</i>	<i>Antenna coupler</i>	<i>Fig. No.</i>
C-4626/ARC-102.....	CU-1669/GRC	6-6
C-4626/ARC-102.....	CU-1658/A.....	6-7
C-3940/ARC-94.....	CU-1669/GRC	6-8
C-3940/ARC-94.....	- CU-1658/A.....	6-9

CHAPTER 3

OPERATION

WARNING

Before operating this equipment, make certain all requirements of TB SIG 291 are met. Injury or DEATH could result from improper or careless operation.

Section I. OPERATING CONTROLS AND INDICATORS

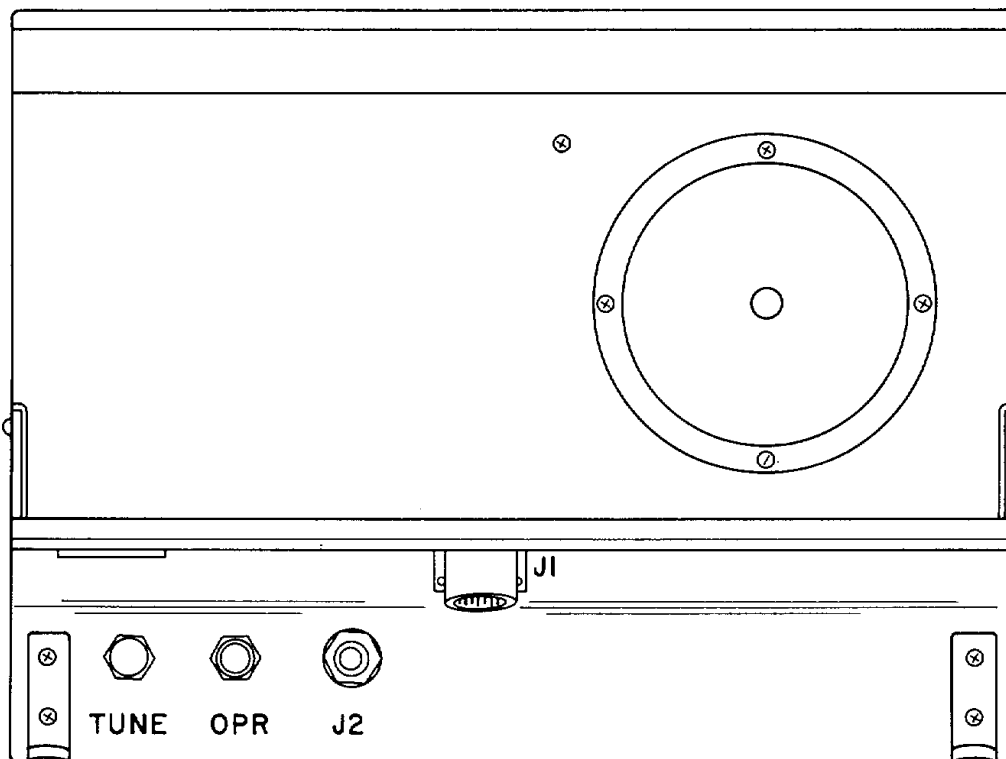
3-1. Controls

No operating controls are located on the antenna coupler. Operation of the antenna coupler is initiated by the receiver-transmitter control circuits.

3-2. Indicators
(fig. 3-1)

<i>Indicator</i>	<i>Function</i>
TUNE lamp (amber).....	The TUNE lamp is lighted when tuning is in progress. If the TUNE lamp does not light, the antenna coupler is not receiving RF power.

<i>Indicator</i>	<i>Function</i>
OPR lamp (green).....	The OPR lamp is lighted to indicate the antenna coupler is in the operate condition (no longer tuning) and the voltage standing-wave ratio (vswr) is below 1.3 to 1.



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Figure 3-1. Couplers, Antenna CU-1658/A and CU-1669/GRC, indicators.

Section II. OPERATION UNDER USUAL CONDITIONS**3-3. General**

If the aircraft engines are operated during radio operation, the pilot or an authorized crew member must start and operate the engines. If the aircraft engines are not operated, use an auxiliary power source to prevent excessive drain on the aircraft battery. Refer to the aircraft technical manuals for connections and power requirements and for setting of communications power controls.

3-4. Starting Procedures

- a. Set the aircraft primary power ON-OFF switch to ON.
- b. Close the aircraft 27.5-volt dc circuit breaker.
- c. Turn on the radio set. (Refer to the operator

manual of the radio installed for correct turn-on procedure.)

- d. Tune the radio set to the frequency of a local station. While the radio set is tuning, the TUNE lamp on the antenna coupler should light. When the radio set stops tuning, the TUNE lamp should go out and the OPR lamp on the antenna coupler should light.

3-5. Stopping Procedures

- a. Turn off the radio set. (Refer to the operator manual of the radio installed for correct shutdown procedure.)
- b. Open the aircraft 27.5-volt dc circuit breaker.
- c. Set the aircraft primary power ON-OFF switch to OFF.

CHAPTER 4

ORGANIZATIONAL MAINTENANCE

NOTE

The pilot or copilot does not perform preventive or organizational maintenance.

Section I. GENERAL

4-1. Scope of Maintenance

The maintenance duties assigned to the organizational maintenance repairman are listed below together with references to paragraphs covering the specific maintenance functions. The tools and materials required are listed in paragraph 4-2.

- a. Intermediate preventive maintenance checks and services (para 4-4).
- b. Cleaning (para 4-6).
- c. Periodic preventive maintenance checks and services (para 4-8).
- d. Preservation (para 4-7).

4-2. Tools, Test Equipment, and Materials Required

- a. Multimeter AN/URM-105.
- b. Toolkit, Electronic Equipment TK-105/G.
- c. Cleaning compound, FSN 7930-395-9542.
- d. Brush, MIL-G-7241.
- e. Sandpaper, No. 000.
- f. Cloth, lint free.

Section II. PREVENTIVE MAINTENANCE**4-3. General**

Preventive maintenance is the systematic care, servicing, and inspection of equipment to prevent the occurrence of trouble, to reduce out-of-service time, and to maintain equipment serviceability.

- a. *Systematic Care.* The procedures given in paragraphs 4-4 through 4-9 cover routine systematic care and cleaning essential to proper upkeep and operation of the equipment.

b. Preventive Maintenance Checks and Services.

The preventive maintenance checks and services charts (paras 4-5 and 4-9) outline the functions to be performed at specific intervals. These checks and services are to maintain the antenna coupler in a serviceable condition. The charts list what to check, how to check, and the normal conditions. The Reference column lists the paragraphs or applicable technical manuals that contain supplementary information. If the defect cannot be remedied at the organizational maintenance level, higher category of maintenance is required. Records and reports of these checks must be made in accordance with TM 38-750.

4-4. Intermediate Preventive Maintenance Checks and Services

Perform the maintenance functions indicated in the intermediate preventive maintenance checks and services chart (para 4-5) once each intermediate interval. An intermediate interval is defined as approximately 25 flying hours for the CU-1658/A and once each calendar week for the CU-1669/GRC. The intermediate preventive maintenance checks and services should be performed on the CU-1658/A concurrently with the intermediate preventive maintenance checks and services scheduled on the aircraft in which the equipment is installed. Adjustments of the maintenance interval must be made to compensate for any unusual operating conditions. Equipment maintained in a standby (ready for immediate operation) condition must have intermediate maintenance performed at least once every 30 days. Equipment in limited storage (requires service before operation) does not require intermediate maintenance.

4-5. Intermediate Preventive Maintenance Checks and Services Chart

Seq No.	Item	Procedure	Reference
1	Exterior surfaces	a Clean the antenna coupler..... b Inspect exposed metal surface for rust, corrosion, and bare spots.	a Paragraph 4-6. b Paragraph 4-7.
2	Cables and connectors	Check all cables for evidence of chaffing, cracking, or Cuts Refer to higher category of maintenance for replacement Check all electrical connectors for dents, cracks, or improper mating Check cables for continuity using Multimeter AN/URM-15 Replace defective cables.	TM 11-6625-203-12.
3	Antenna system	a Check to see that the antenna is mated securely to..... the antenna coupler Tighten if necessary. b Check to see that the antenna coupler is mounted securely. c Check the antenna and antenna coupler for physical damage. d Clean the antenna system	a None. b None. c None. d Paragraph 4-6.

4-6. Cleaning

All exterior surfaces of the equipment should be free of dirt, grease, and fungus. Perform the following procedures as specified in the preventive maintenance checks and services charts.

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

WARNING

Cleaning compound is flammable and its fumes are toxic. Do not use near a flame; provide adequate ventilation.

- b. Remove grease, fungus, and ground-in dirt from the exterior surfaces with a clean cloth dampened (not wet) with cleaning compound. Wipe dry with a clean, dry, lint free cloth.

4-7. Preservation

Remove dust 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 the applicable cleaning and refinishing practices specified in TB 746-10 and TM 9-

213.

4-8. Periodic Preventive Maintenance Checks and Services

Perform the maintenance functions in the periodic preventive maintenance checks and services chart (para 4-9) once each periodic interval in addition to the intermediate preventive checks and services. Records of periodic preventive maintenance will be prepared in accordance with the requirements of TM 38-750. In the case of the CU-1658/A, the periodic preventive maintenance inspection should be scheduled concurrently with the periodic preventive maintenance service schedule of the aircraft in which the equipment is installed to reduce out-of-service time. Refer to the applicable aircraft technical manual for the hours between service periods. In the case of the CU-1669/GRC, the periodic preventive maintenance inspection should be conducted at least once each 30 calendar days. Equipment with a deficiency that cannot be remedied at the organizational category should be deadlined in accordance with TAM 38-750.

4-9. Periodic Preventive Maintenance Checks and Services Chart

Seq No.	Item	Procedure	Reference
1	Completeness	Verify that the antenna coupler is complete	Fig. 1-1
2	Publications.....	Check to see that all pertinent publications are available. Technical manuals must be complete and in useable condition with all applicable changes posted.	DA Pam 310-4
3	Modification work orders	Check to see that all URGENT MWO's have been applied to the equipment and that all NORMAL MWO's have been scheduled.	DA Pam 310-7

Seq No.	Item	Procedure	Reference
4	Antenna coupler -	Remove the antenna coupler from the mount and check for dirt and corrosion.	Para 4-12
5	Antenna coupler	Clean the antenna coupler	Para 4-6
6	Antenna coupler	Inspect the electrical connectors on the antenna coupler for signs of obvious physical damage.	None

Section III. ORGANIZATIONAL TROUBLESHOOTING

4-10. General

a. The troubleshooting and repair work that can be performed at the organizational maintenance level (operators and unit repairmen) is necessarily limited in scope by the tools, test equipment, and replaceable parts issued. The maintenance allocation chart (MAC) limits organizational troubleshooting to the replacement of defective antenna couplers as a whole. The organizational maintenance category is not authorized to troubleshoot the internal circuitry of the antenna coupler. Accordingly, organizational troubleshooting is based on the performance of the equipment and logical fault analysis in determining the cause of trouble.

b. The primary objective in organizational troubleshooting is to trace the trouble to one of the major components of the communication system while it is installed in the aircraft. The major components are: the receiver-transmitter, the radio set control, the antenna, and the antenna coupler. The troubleshooting

chart in paragraph 4-11 provides a direct go no-go basis on which the operator or unit repairman can determine if the antenna coupler is the cause of trouble. Defective major components discovered during organizational troubleshooting will be replaced by known operable components and the defective component sent to higher category of maintenance for repair.

4-11. Troubleshooting

a. *Use of Troubleshooting Chart.* The troubleshooting chart will help locate trouble in the equipment. The chart supplements the equipment performance check list for the receiver-transmitter being used (refer to applicable technical manual), the maintenance checks and services chart (para 4-9), and the start-stop procedures (paras 3-4 and 3-5).

Item No.	Symptom	Probable Cause	Corrective Action
1	Antenna coupler tuning elements cannot be heard moving into home position when receiver-transmitter is tuned to different channels.	a No primary power..... b Defective antenna coupler	a Check primary power. b Substitute with another antenna coupler.
2	Antenna coupler TUNE (amber) lamp does not light during tuning. antenna coupler.	a Defective indicator lamp	a Replace lamp.
3	Antenna coupler TUNE (amber) and OPR (green) lamps both remain illuminated after radio set is tuned.	b Defective antenna coupler	b Substitute with another antenna coupler.
4	Antenna coupler OPR (green) lamp does not light When timing cycle is complete. antenna coupler.	Defective antenna coupler	Substitute with another antenna coupler.
5	Receiver noisy Transmitter meters indicate transmitter operating normally Signal not radiated	a Defective indicator lamp	a Replace lamp.
6	No receiver-transmitter output	b Defective antenna coupler	b Substitute with another
7	Receiver operates, transmitter does not.....	a Antenna disconnected	a Check antenna connections
8	Transmitter operates, receiver does not	b Antenna coupler disconnected.....	b Check antenna coupler connections.
9	Transmitter operates, receiver produces noise	Defective power source	Check power source.
		Defective transmitter	Replace receiver-transmitter.
		Defective receiver.....	Replace receiver-transmitter.
		a Antenna disconnected	a Check antenna connections.
		b Antenna coupler disconnected.....	b Check antenna coupler connections.

Item No.	Symptom	Probable Cause	Corrective Action
10	During two-way communication with a local station, transmitter signal is weak and unreadable Tuning is inaccurate.	c Defective antenna coupler - Defective antenna coupler .- Reception is not clear.	c Substitute another antenna coupler. Substitute another antenna coupler.

Section IV. REMOVAL AND REPLACEMENT

WARNING

Always disconnect prime power prior to removing any components.

4-12. Antenna Coupler Removal

- a. Disconnect the cable connectors from J1, J2, and J103 (if applicable) from the antenna coupler.
- b. Disconnect the antenna wire from the terminal collet on the front of the antenna coupler.
- c. Loosen the holddown clamps that secure the antenna coupler to Mounting MIT-3772/A.
- d. Pull the antenna coupler forward until the locating pins on the back of Mounting MT3772/ A are out of the holes in the antenna coupler's case.

4-13. Antenna Coupler Replacement

- a. Position the antenna coupler in Mounting MIT-3772,/A.
- b. Tighten the holddown clamps that secure the

antenna coupler to Mounting MT-3772/A.

- c. Connect the antenna wire to the terminal collet on the front of the antenna coupler.
- d. Connect cable connectors to J1, J2, and J103 (if applicable) on the antenna coupler.

4-14. Indicator Lamp Removal

- a. Remove the lens cover from the applicable indicator lamp assembly.
- b. Disengage and remove lamp from the assembly.

4-15. Indicator Lamp Replacement

- a. Insert lamp and engage in lamp assembly.
- b. Replace the lens cover on the indicator lamp assembly.

CHAPTER 5

SHIPMENT, LIMITED STORAGE, AND DEMOLITION TO
PREVENT ENEMY USE**5-1. Shipment**

a. Disassembly. The antenna coupler is not disassembled for shipment. Remove the antenna coupler from its installation as described in paragraph 4-12.

b. Repackaging. Repackaging of equipment for shipment and storage normally will be performed at a packaging facility or by a repackaging team. Should emergency packaging be required, select the material from those listed in SB 38-100. Package the equipment in accordance with the original packaging, so far as possible, with the available materials.

5-2. Limited Storage

Before the antenna coupler is placed in storage, current maintenance services should be completed, shortcomings and deficiencies should be corrected, and all modification work orders (MWO's) should be applied. Perform inspections, maintenance services, cleaning, and preservation in accordance with the instructions given in chapter 4 and in TM 740-90-1.

5-3. Authority for Demolition

Demolition of the equipment will be accomplished only upon order of the commander. Use the procedures outlined in paragraph 5-4 to prevent further use of the equipment.

5-4. Methods of Destruction

When installed in an aircraft, the associated aircraft technical manual should establish priority and method of destruction for the antenna coupler. Use one or a combination of any of the following methods to destroy the equipment and spare parts:

a. Smash. Smash the controls, transistors, coils, switches, capacitors, and transformers; use sledges, axes, handaxes, pickaxes, hammers, or crowbars.

b. Cut. Cut interunit cabling and break connector pins and contacts.

WARNING

Be extremely careful in the use of explosives and incendiary devices. These items should not be used unless extreme urgency demands their use.

c. Burn. Burn cables, technical manuals, and wiring. Use gasoline, kerosene, oil, flamethrowers, or incendiary grenades.

d. Bend. Bend panels and chassis.

e. Explode. If explosives are necessary, use grenades or TNT.

f. Dispose. Bury or scatter the destroyed parts in slit trenches, foxholes, or throw them into streams.

CHAPTER 6

ILLUSTRATIONS

6-1. General

This chapter contains illustrations for the use of organizational maintenance personnel.

6-2. List of Illustrations

Following is a list of illustrations contained in this chapter.

Figure 6-1. Receiver-Transmitter, Radio RT-648/ARC-94, Control, Radio Set C-4626/ARC-102, and Coupler, Antenna CU-1669/GRC, cabling diagram.

Figure 6-2. Receiver-Transmitter, Radio RT-648/ARC-94, Control, Radio Set C-4626/ARC-102, and Coupler, Antenna CU-1658/A, cabling diagram.

Figure 6-3. Receiver-Transmitter, Radio RT-648/ARC-94, Control, Radio Set C-3940/ARC-94, and Coupler, Antenna CU-1669/GRC, cabling diagram.

Figure 6-4. Receiver-Transmitter, Radio RT-648/ARC-94, Control, Radio Set C-3940/ARC-94, and Coupler, Antenna CU-1669/GRC, cabling diagram (dual system).

Figure 6-5. Receiver-Transmitter, Radio RT-648/ARC-94, Control, Radio Set C-3940/ARC-94, and Coupler, Antenna CU-1658/A, cabling diagram.

Figure 6-6. Receiver-Transmitter, Radio RT-698/ARC-102, Control, Radio Set C-4626/ARC-102, and Coupler, Antenna CU-1669/GRC, cabling diagram.

Figure 6-7. Receiver-Transmitter, Radio RT-698/ARC-102, Control, Radio Set C-4626/ARC-102 and Coupler, Antenna CU-1658/A, cabling diagram.

Figure 6-8. Receiver-Transmitter, Radio RT-698/ARC-102, Control, Radio Set C-3940/ARC-94, and Coupler, Antenna CU-1669/GRC, cabling diagram.

Figure 6-9. Receiver-Transmitter, Radio RT-698/ARC-102, Control, Radio Set C-3940/ARC-94, and Coupler, Antenna CU-1658/A, cabling diagram.

APPENDIX A

REFERENCES

Following is a list of publications available to the organizational repairman of Couplers, Antenna CU-1658/A and CU-1669/GRC.

DA Pam 310-4	Index of Technical Manuals, Technical Bulletins, Supply Manuals, (Types 7, 8, and 9), Supply Bulletins, Lubrication Orders, and Modification Work Orders.
DA Pam 310-7	Military Publications: Index of Modification Work Orders.
SB 38-100	Preservation, Packaging and Packing Materials, Supplies and Equipment used by the Army.
TB SIG 291	Safety Measures to be Observed When Installing and Using Whip Antennas , Field Type Masts, Towers, Antennas, and Metal Poles that are used with Communications, Radar, and Direction Finder Equipment.
TB 746-10	Field Instructions for Painting and Preserving Electronics Command Equipment.
TM 9-213	Painting Instructions for Field Use.
TM 55-1500-323-25	Installation Practices for Aircraft Electric and Electronic Wiring.
TM 11-5820-672-12	Organizational Maintenance Manual: Radio Set AN/GRC-158.
TM 11-5821-248-12	Organizational Maintenance Manual: Radio Set AN/ARC-102.
TM 11-6625-203-12	Organizational Maintenance Manual: Multimeter AN/URM-105.
TM 38-750	The Army Maintenance Management System (TAMMS).
TM 740-90-1	Administrative Storage of Equipment.

APPENDIX B

MAINTENANCE ALLOCATION

Section I. INTRODUCTION

B-1. General

This appendix provides a summary of the maintenance operations covered in the equipment literature for coupler, antenna CU-1658/A and CU-1669/GRC. It authorizes categories of maintenance for specific maintenance functions on repairable items and components and the tools and equipment required to perform each function. This appendix may be used as an aid in planning maintenance operations.

B-2. Explanation of Format for Maintenance Allocation Chart

- a. Group Number. Not used.
- b. *Component Assembly Nomenclature.* This column lists the item names of component units, assemblies, subassemblies, and modules on which maintenance is authorized.
- c. *Maintenance Function.* This column indicates the maintenance category at which performance of the specific maintenance function is authorized. Authorization to perform a function at any category also includes authorization to perform that function at higher categories. The codes used represent the various maintenance categories as follows:

<i>Code</i>	<i>Maintenance category</i>
C.....	Operator/crew
O.....	Organizational maintenance

- F..... , Direct support maintenance
- H..... General support maintenance
- D..... Depot maintenance

d. *Tools and Equipment.* The numbers appearing in this column refer to specific tools and equipment which are identified by these numbers in section III.

e. *Remarks.* Self-explanatory.

B-3. Explanation of Format for Tool and Test Equipment Requirements

The columns in the tool and test equipment requirements chart are as follows:

- a. *Tools and Equipment.* The numbers in this column coincide with the numbers used in the tools and equipment column of the MAC. The numbers indicate the applicable tool for the maintenance function.
- b. *Maintenance Category.* The codes in this column indicate the maintenance category normally allocated the facility.
- c. *Nomenclature.* This column lists tools, test and maintenance equipment required to perform the maintenance functions.
- d. *Federal Stock Number.* This column lists the Federal stock number.
- e. *Tool Number.* Not used.

SECTION II. MAINTENANCE ALLOCATION CHART																
(1) GROUP NUMBER	(2) FUNCTIONAL GROUP COMPONENT ASSEMBLY	(3) MAINTENANCE FUNCTIONS											(4) TOOLS AND EQUIPMENT	(5) REMARKS		
		INSPECT	TEST	SERVICE	ADJUST	ALIGN	CALIBRATE	INSTALL	REPLACE	REPAIR	OVERHAUL	REBUILD				
1 REPLACEMENT	COUPLER, ANTENNA CU-1658/A; COUPLER, ANTENNA CU-1669/GRC	O	O	O					O	O				1 & 2	EQUIPMENT OPERATION TEST AND REPAIR LIMITED TO OF LAMPS AND LENSES, REPLACE & REPAIR INDICATED BY COMPONENT BREAKDOWN. OVERHAUL AND REBUILD AS NECESSARY.	
		F	F	F					F	F				3 thru 11		
						H	H						D	D		3 thru 13
		F	F	F					F	H			D	D		3 thru 11 3 thru 11
		F	F	F					F	H			D	D		3 thru 11 3 thru 11
1A	ANTENNA COUPLET CONTROL A2	F	F	F					F					3 thru 11 3 thru 11		
1B	ELECTRONIC CONTROL AMPLIFIER A3	F	F	F					F	H				3 thru 11 3 thru 11		
1C	VARIABLE RF STEEPING COIL A4	F	F	F					F					3 thru 11		
1D	VARIABLE RF COIL (SERIES VARICOIL) A5	F	F	F	F				H	H			H	3 thru 13		
						H	H	H	D	D			D	3 thru 11		

SECTION II. MAINTENANCE ALLOCATION CHART																	
(1) GROUP NUMBER	(2) FUNCTIONAL GROUP COMPONENT ASSEMBLY	(3) MAINTENANCE FUNCTIONS											(4) TOOLS AND EQUIPMENT	(5) REMARKS			
		INSPECT	TEST	SERVICE	ADJUST	ALIGN	CALIBRATE	INSTALL	REPLACE	REPAIR	OVERHAUL	REBUILD					
1F	VARIABLE RF COIL (SHUNT VARICOIL) A6	F	F	F		H	H			F					3 thru 11 3 thru. 13		
1F	VARIABLE RF SHUNT CAPACITOR ASSEMBLY A7	F	F	F		H	H			F			D	D	3 thru 3 thru 13		
1G	LOADING-PHASING DISCRIMINATOR A8	F	F	F						F			D	D	3 thru 11 3 thru 11		
1H	VARIABLE RF SERIES CAPACITOR ASSEMBLY A9	F	F	F			H	H		F				D	3 thru 11 3 thru 13		
1I	ELECTRICAL EQUIPMENT CHASSIS COMPONENTS	F	F	F						F	F				3 thru 11	MECHANICAL	ARE AND
2	MOUNTING MT-3772/A	O		O						O		H			1 & 2 3&7		

TOOLS AND TEST EQUIPMENT REQUIREMENTS				
TOOLS AND EQUIPMENT	MAINTENANCE CATEGORY	NOMENCLATURE	FEDERAL STOCK NUMBER	TOOL NUMBER
1	O	TOOL KIT, ELECTRONIC EQUIPMENT TK-101/G	5180-064-5178	
2	O	MULTIMETER AN/URM- 105	6625-581-2036	
3	F	TOOL KIT, ELECTRONIC EQUIPMENT TK-105/a	5180-610-8177	
4	F	RADIO SET AN/ARC-102	5821-050-8255	
5	F	ELECTRICAL DU[4Y LOAD DA-487/U		
6	F	OSCILLOSCOPE AN/US-140(*)	6625-066-2525	
7	F	MULTIMETER TS-352(*)/U	6625-242-5023	
8	F	TEST HARNESS, RADIO SET AN/ URM -157	6625-766-4685	
9	F	TEST SET AN/URM-109	6625-627-8592	
10	F	R.F. WATTMETER AN/URM-120	6625-813-8430	
11	F	ALUMINUM PLATE	9535-815-2213	
12	H	Q METER TS-617/U	6625-538-7702	
13	H	TESTER, SPRING RE-SILANCY 0-100 GRAMS	6635-545-8500	

By Order of the Secretary of the Army:

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General, United States Army,
Chief of Staff.

Official:

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The Adjutant General.

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CNGB (1)	LBAD (14)
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USACDC (2)	Sig Sec GENDEP (5)
USACDC Agcy (1)	Sig Dep (10)
USAMC (1)	SigFLDMS (2)
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LOGCOMDS (5)	MAAG (1)
USAMICOM (4)	USARMIS (1)
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USASTRATCOM (4)	Units org under fol TOE:
USAESC (70)	(2 cys each)
MDW (1)	11-15
Armies (2)	11-16
Corps (2)	11-17
1st Cav Div (3)	11-97
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USASESS (10)	11-117
USAADS (2)	11-158
USAFAS (2)	11-215
USAARMS (2)	11-216
USAIS (2)	11-217
USAES (2)	11-218
USAINTS (3)	11-225
WRAMC (1)	11-226
USACDCEC (10)	11-227
Instl (2) except	11-500(AA-AC)
Fort Gordon (10)	29-124
Fort Huachuca (10)	29-136
WSMR (3)	
Fort Carson (25)	

NG: None.

USAR: None.

For explanation of abbreviations used, see AR 310-50.

*** U.S. GOVERNMENT PRINTING OFFICE: 1970-431-137/257**

1. Connect to optional remote antenna coupler tune indicators. Connect lights between +28 vdc (J1-R) and switched grounds (J1-B, -C, and -J). During antenna coupler tuning, the J1-J is grounded. During operate, the J1-C is grounded. During fault, J1-B, -C, and -J are grounded.
2. Connections external to the hf system.
3. Pins 53 and 37 may be employed as balanced input from the interphone amplifier. In this case, the wire on pin 54 should not be connected. If an unbalanced carbon mike input is desired, the wires to pins 53 and 37 should not be connected.
4. When the unbalanced carbon mike input is used, the mike return circuit should be connected to pin 18 on the ARC-19. It is recommended that no grounds external to the ARC-94 chassis be placed on this line.
5. Total resistance of powerlines to and from power supply must not exceed 0.15 ohm. Number 20 AWG shall be minimum wire size used.
6. Total resistance of these powerlines to and from power supply must not exceed 0.10 ohm. Number 18 AWG shall be minimum wire size used.
7. Provide good RF ground circuit to aircraft bulkhead. Use a flexible solid copper or aluminum strap.
8. If bench operation without an antenna coupler is desired, pins 5 and 56 on the ARC-94 must be connected together to complete the key interlock circuit. Do not connect pins 5 or 56 to an external dc power source.
9. A terminal strip provided in the PP-3702/ARC-102 can be used for tiepoints.
10. Twisted.
11. Shielded pair.

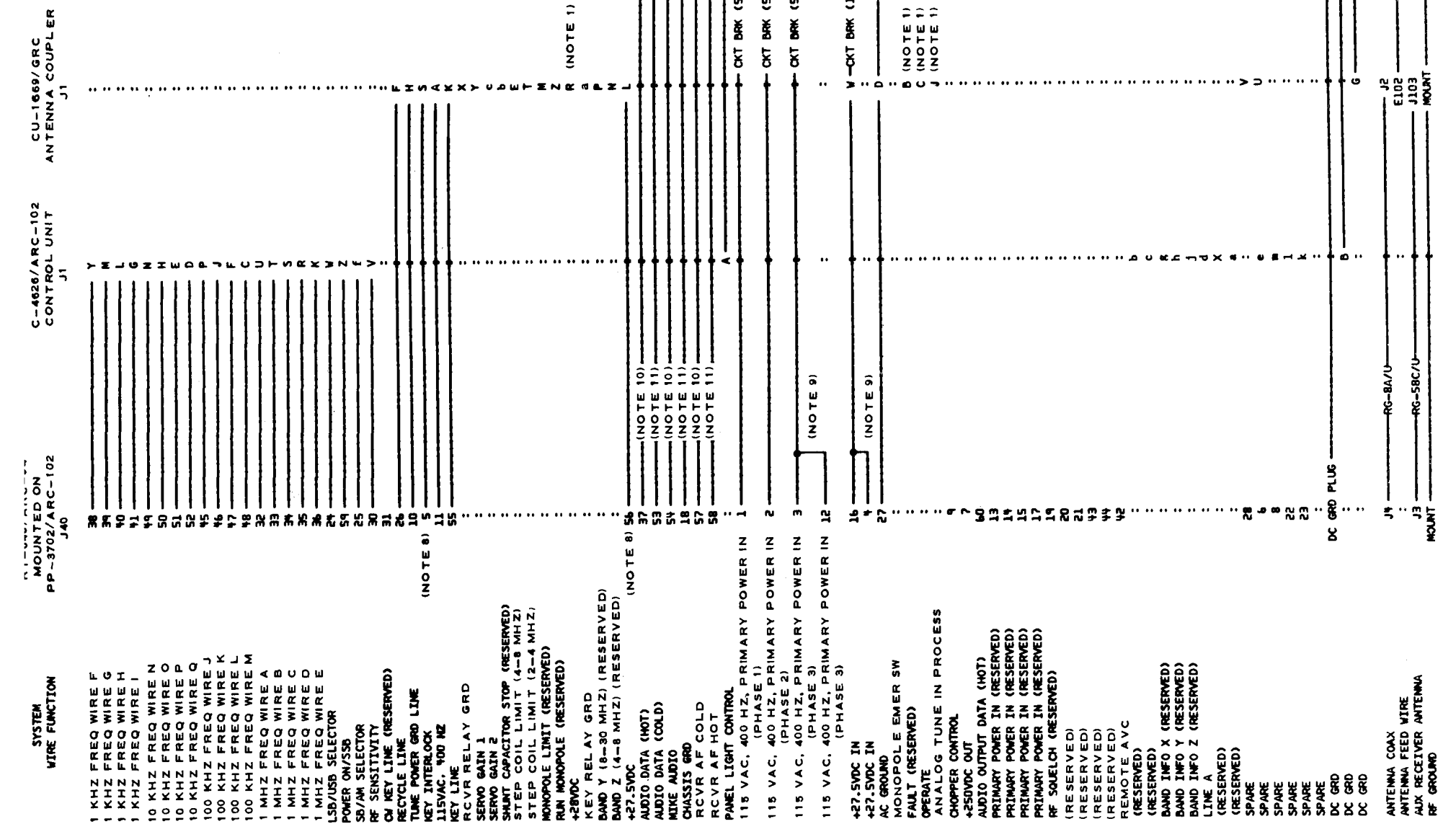


Figure 6-1. Receiver-Transmitter, Radio RT-648/ARC-94, Control, Radio Set C-4626/ARC-102, and Coupler, Antenna CU-1669/GRC, cabling diagram.

1. Connect to optional remote antenna coupler tune indicators. Connect lights between +28 vdc (J1-R) and switched grounds (J1-B, -C, and -J). During antenna coupler tuning, the J1-J is grounded. During operate, the J1-C is grounded. During fault, J1-B, -C, and -J are grounded.
2. Connections external to the hf system.
3. Pins 53 and 37 may be employed as balanced input from the interphone amplifier. In this case, the wire on pin 54 should not be connected. If an unbalanced carbon mike input is desired, the wires to pins 53 and 37 should not be connected.
4. When the unbalanced carbon mike input is used, the mike return circuit should be connected to pin 18 on the ARC-19. It is recommended that no grounds external to the ARC-94 chassis be placed on this line.

5. Total resistance of powerlines to and from power supply must not exceed 0.15 ohm. Number 20 AWG shall be minimum wire size used.
6. Total resistance of these powerlines to and from power supply must not exceed 0.10 ohm. Number 18 AWG shall be minimum wire size used.
7. Provide good RF ground circuit to aircraft bulkhead. Use a flexible solid copper or aluminum strap.
8. If bench operation without an antenna coupler is desired, pins 5 and 56 on the ARC-94 must be connected together to complete the key interlock circuit. Do not connect pins 5 or 56 to an external dc power source.
9. A terminal strip provided in the PP-3702/ARC-102 can be used for tiepoints.
10. Twisted.
11. Shielded pair.

NOTES

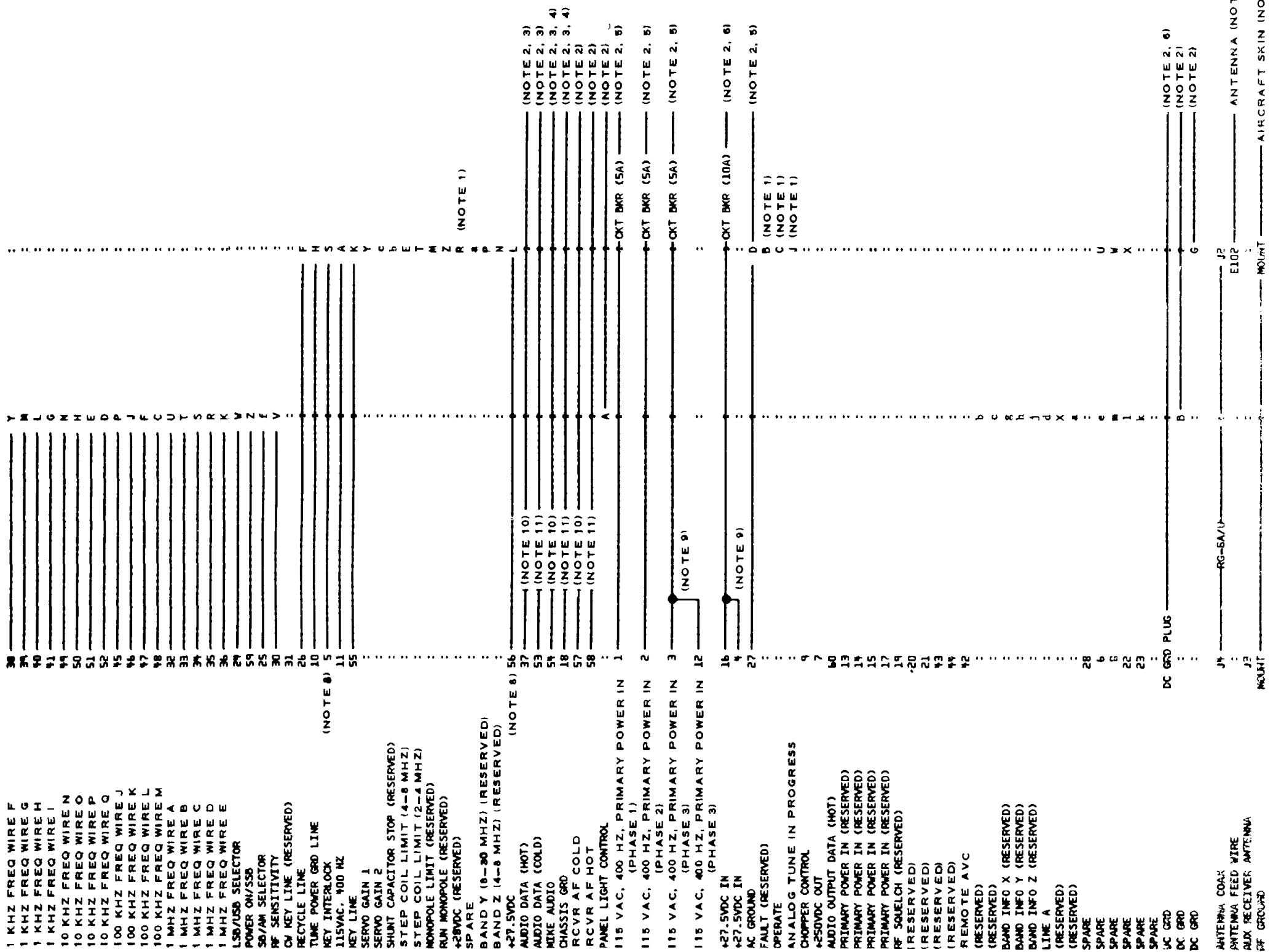


Figure 6-2. Receiver-Transmitter, Radio RT-648/ARC-94, Control, Radio Set C-4626/ARC-102, and Coupler, Antenna CU-1658/A, cabling diagram.

1. Connect to optional remote antenna coupler tune indicators. Connect lights between +28 vdc (J1-R) and switched grounds (J1-B, -C, and -J). During antenna coupler tuning, the J1-C is grounded. During fault, J1-B, -C, and -J are grounded.
2. Connections external to the hf system.
3. Pins 53 and 37 may be employed as balanced input from the interphone amplifier. In this case, the wire on pin 54 should not be connected. If an unbalanced carbon mike input is desired, the wires to pins 53 and 37 should not be connected.
4. When the unbalanced carbon mike input is used, the mike return circuit should be connected to pin 18 on the ARC-19. It is recommended that no grounds external to the ARC-94 chassis be placed on this line.
5. Total resistance of powerlines to and from power supply must not exceed 0.15 ohm. Number 20 AWG shall be minimum wire size used.
6. Total resistance of these powerlines to and from power supply must not exceed 0.10 ohm. Number 18 AWG shall be minimum wire size used.
7. Provide good RF ground circuit to aircraft bulkhead. Use a flexible solid copper or aluminum strap.
8. If bench operation without an antenna coupler is desired, pins 5 and 56 on the ARC-94 must be connected together to complete the key interlock circuit. Do not connect pins 5 or 56 to an external dc power source.
9. A terminal strip provided in the PP-3702/ARC-102 can be used for tiepoints.
10. Twisted.
11. Shielded pair.

NOTES

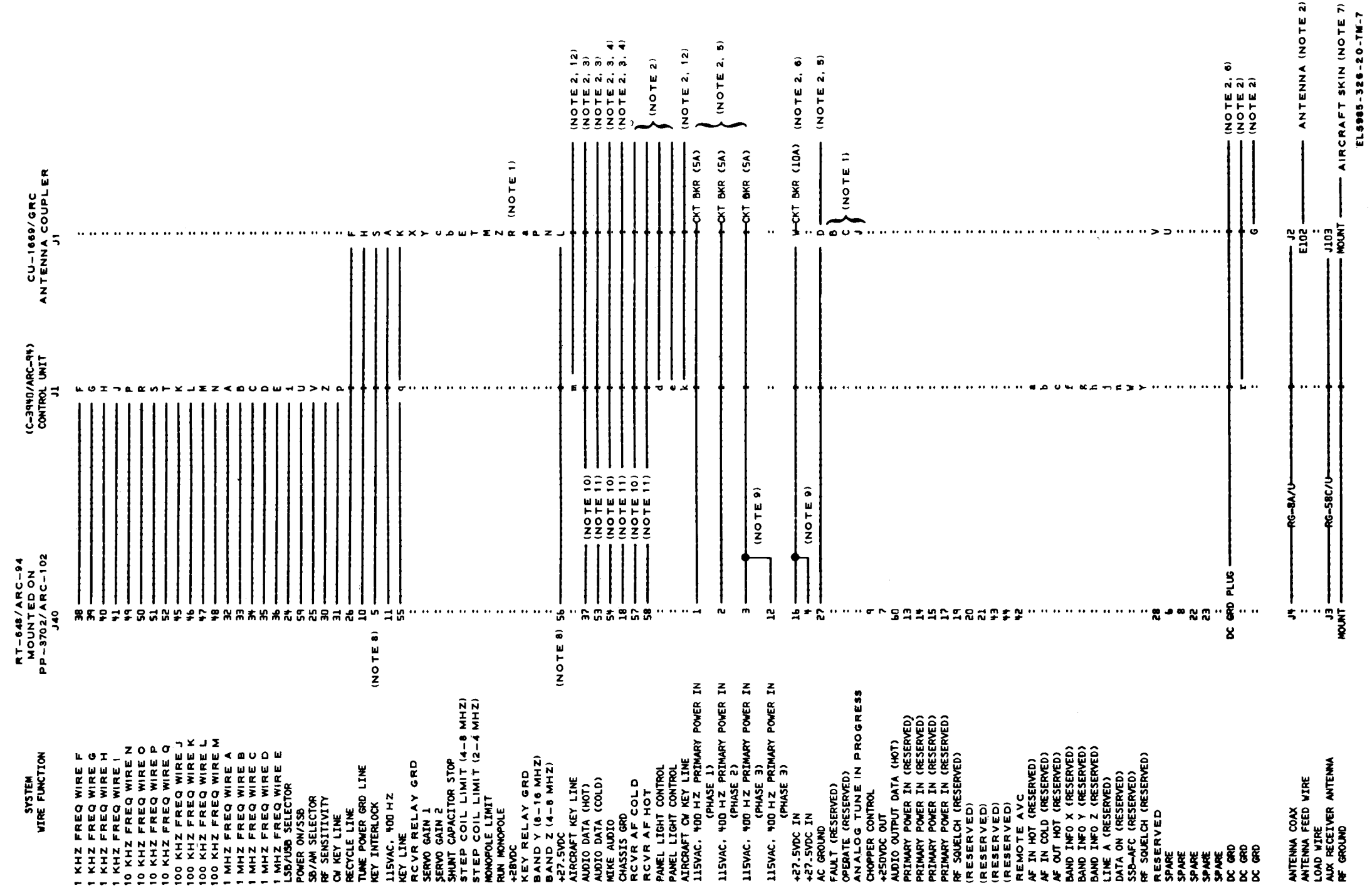


Figure 6-3. Receiver-Transmitter, Radio RT-648/ARC-94, Control, Radio Set C-39406/ARC-94, and Coupler, Antenna CU-1669/GRC, cabling diagram.

1. Connect to optional remote antenna coupler tune indicators. Connect lights between +28 vdc (J1-R) and switched grounds (J1-B, -C, and -J). During antenna coupler tuning, the J1-J is grounded. During operate, the J1-C is grounded. During fault, J1-B, -C, and -J are grounded.
2. Connections external to the hf system.
3. Pins 53 and 37 may be employed as balanced input from the interphone amplifier. In this case, the wire on pin 54 should not be connected. If an unbalanced carbon mike input is desired, the wires to pins 53 and 37 should not be connected.
4. When the unbalanced carbon mike input is used, the mike return circuit should be connected to pin 18 on the ARC-19. It is recommended that no grounds external to the ARC-94 chassis be placed on this line.
5. Total resistance of powerlines to and from power supply must not exceed 0.15 ohm. Number 20 AWG shall be minimum wire size used.

6. Total resistance of these powerlines to and from power supply must not exceed 0.10 ohm. Number 18 AWG shall be minimum wire size used.
7. Provide good RF ground circuit to aircraft bulkhead. Use a flexible solid copper or aluminum strap.
8. If bench operation without an antenna coupler is desired, pins 5 and 56 on the ARC-94 must be connected together to complete the key interlock circuit. Do not connect pins 5 or 56 to an external dc power source.
9. A terminal strip provided in the PP-3702/ARC-102 can be used for tiepoints.
10. Twisted.
11. Shielded pair.
12. If a separate cw key line is not provided in the aircraft, C--3940/ARC-94 pins k and m must be jumpered together by aircraft wiring for cw operation

NOTES

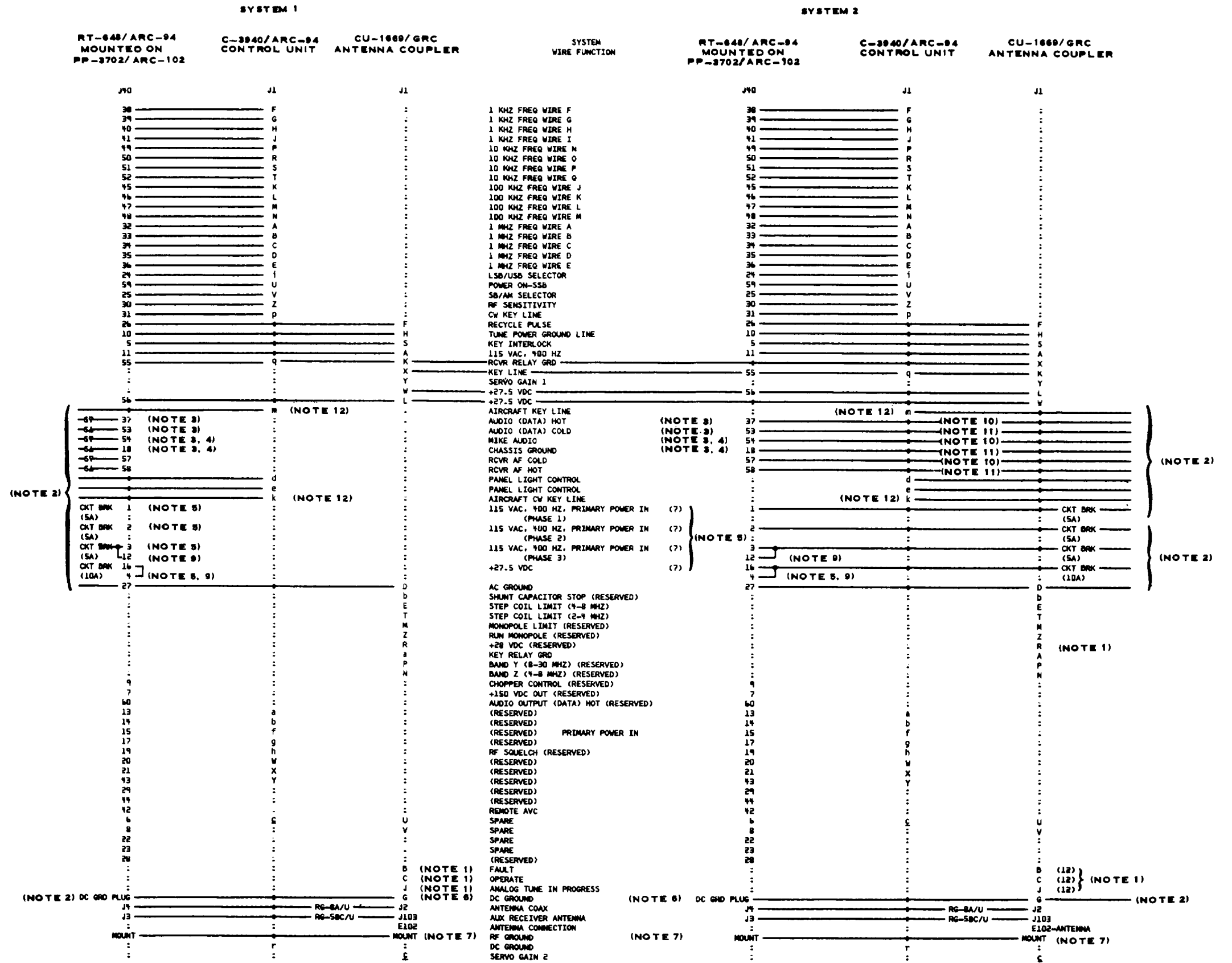


Figure 6-4. Receiver-Transmitter, Radio RT-648/ARC-94, Control, Radio Set C-3940/ARC-94, and Coupler, Antenna CU-1669/GRC, (dual system) cabling diagram.

1. Connect to optional remote antenna coupler tune indicators. Connect lights between +28 vdc (J1-R) and switched grounds (J1-B, -C, and -J). During antenna coupler tuning, the J1-J is grounded. During operate, the J1-C is grounded. During fault, J1-B, -C, and -J are grounded.
2. Connections external to the hf system.
3. Pins 53 and 37 may be employed as balanced input from the interphone amplifier. In this case, the wire on pin 54 should not be connected. If an unbalanced carbon mike input is desired, the wires to pins 53 and 37 should not be connected.
4. When the unbalanced carbon mike input is used, the mike return circuit should be connected to pin 18 on the ARC-94. It is recommended that no grounds external to the ARC-94 chassis be placed on this line.
5. Total resistance of powerlines to and from power supply must not exceed 0.15 ohm. Number 20 AWG shall be minimum wire size used.

6. Total resistance of these powerlines to and from power supply must not exceed 0.10 ohm. Number 18 AWG shall be minimum wire size used.
7. Provide good RF ground circuit to aircraft bulkhead. Use a flexible solid copper or aluminum strap.
8. If bench operation without an antenna coupler is desired, pins 5 and 56 on the ARC-94 must be connected together to complete the key interlock circuit. Do not connect pins 5 or 56 to an external dc power source.
9. A terminal strip provided in the PP-3702/ARC-102 can be used for tiepoints.
10. Twisted.
11. Shielded pair.
12. If a separate cw key line is not provided in the aircraft, C-3940/ARC-94 pins k and m must be jumpered together by aircraft wiring for cw operation

NOTES

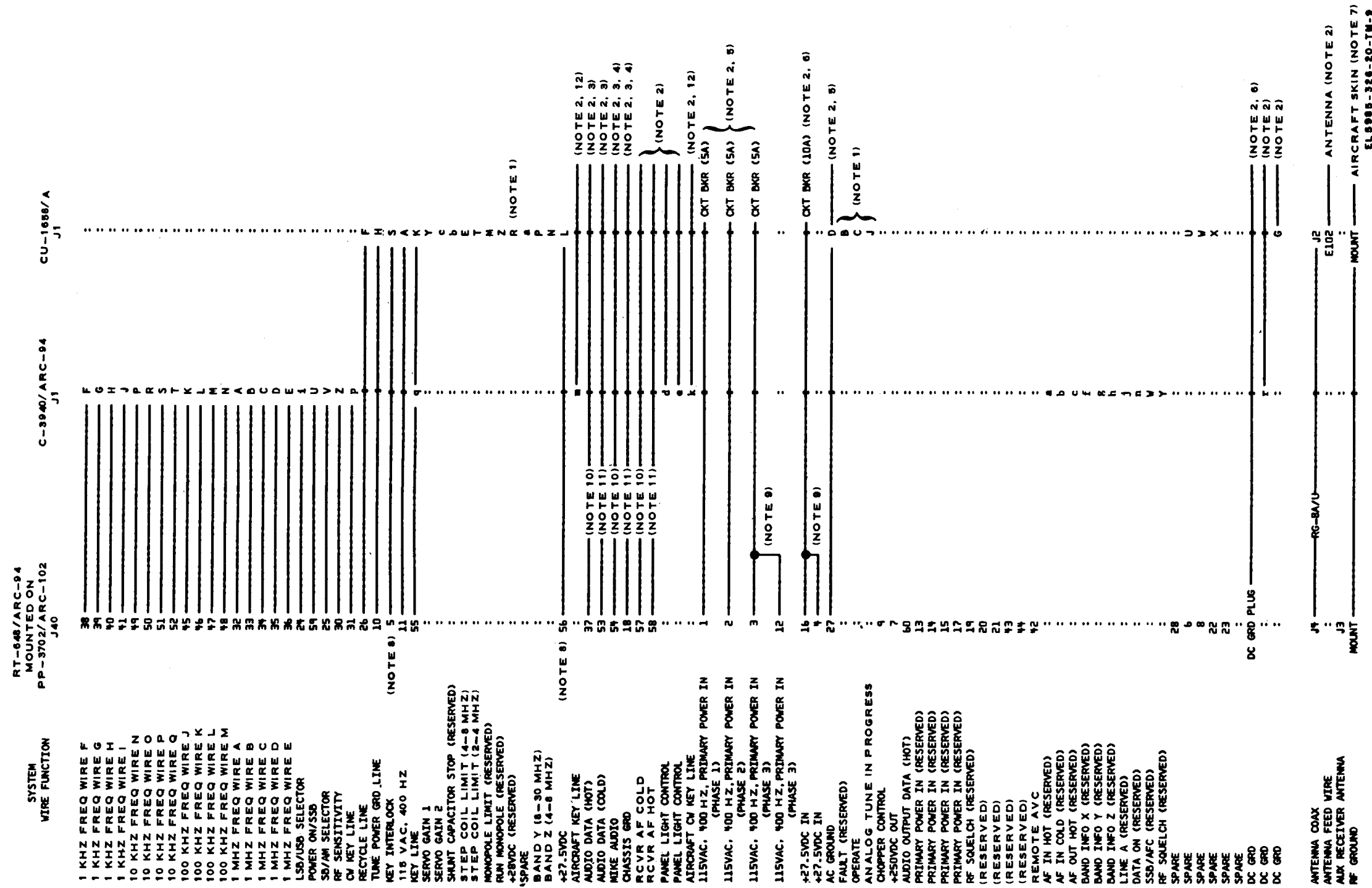


Figure 6-5. Receiver-Transmitter, Radio RT-648/ARC-94, Control, Radio Set C-3940/ARC-94, and Coupler, Antenna CU-1658/ A, cabling diagram.

1. Connect to optional remote antenna coupler tune indicators. Connect lights between +28 vdc (J1-R) and switched grounds (J1-B, -C, and -J). During antenna coupler tuning, the J1-J is grounded. During operate, the J1-C is grounded. During fault, J1-B, -C, and -J are grounded.
2. Connections external to the hf system.
3. Pins 53 and 37 may be employed as balanced input from the interphone amplifier. In this case, the wire on pin 54 should not be connected. If an unbalanced carbon mike input is desired, the wires to pins 53 and 37 should not be connected.
4. When the unbalanced carbon mike input is used, the mike return circuit should be connected to pin 18 on the ARC-19. It is recommended that no grounds external to the ARC-94 chassis be placed on this line.
5. Total resistance of powerlines to and from power supply must not exceed 0.15 ohm. Number 20 AWG shall be minimum wire size used.
6. Total resistance of these powerlines to and from power supply must not exceed 0.10 ohm. Number 18 AWG shall be minimum wire size used.
7. Provide good RF ground circuit to aircraft bulkhead. Use a flexible solid copper or aluminum strap.
8. If bench operation without an antenna coupler is desired, pins 5 and 56 on the ARC-94 must be connected together to complete the key interlock circuit. Do not connect pins 5 or 56 to an external dc power source.
9. A terminal strip provided in the PP-3702/ARC-102 can be used for tiepoints.
10. Twisted.
11. Shielded pair.

NOTES

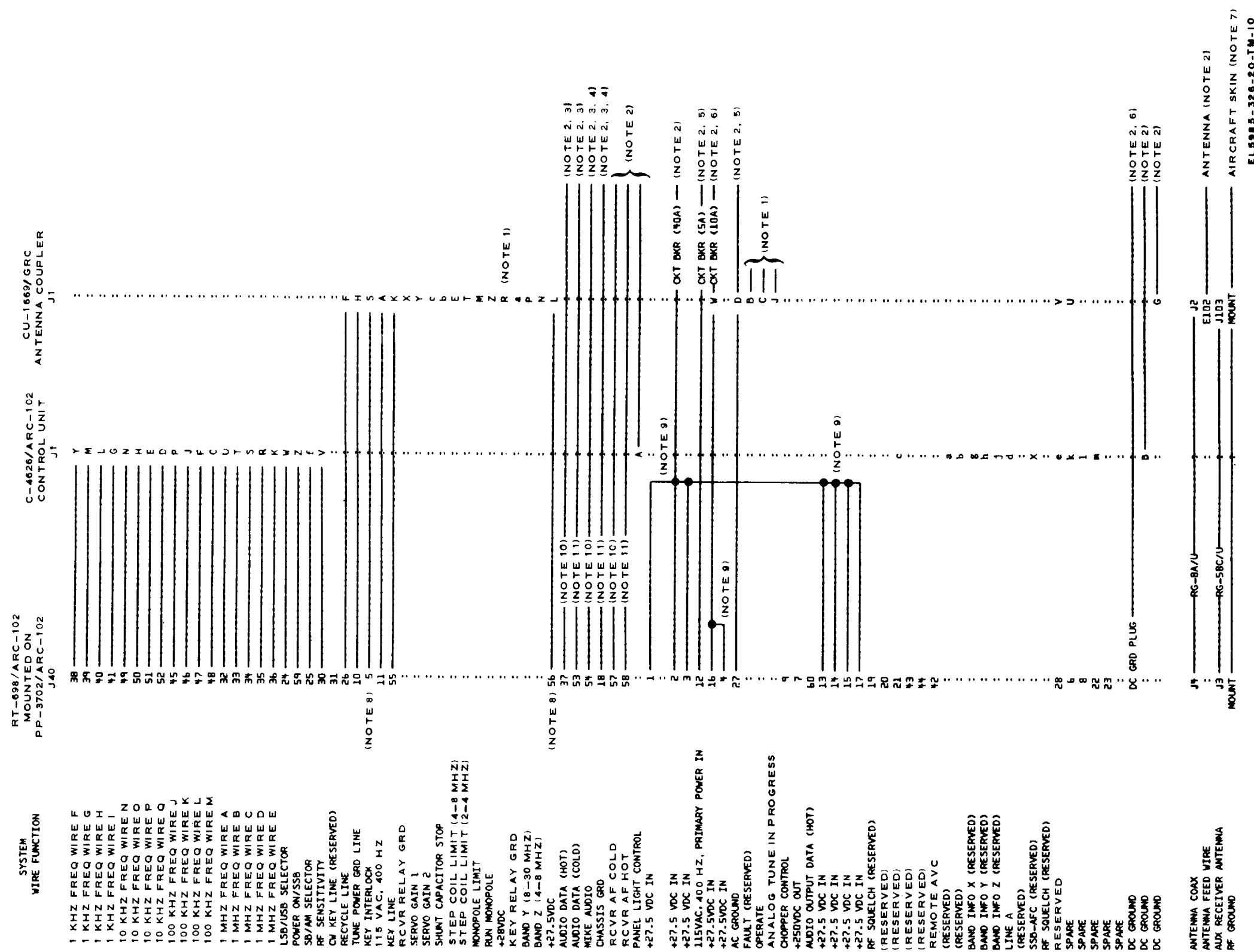


Figure 6-6. Receiver-Transmitter, Radio RT-698/ARC-102, Control, Radio Set C-46266/ARC-102, and Coupler, Antenna CU-1669/GRC, cabling diagram.

1. Connect to optional remote antenna coupler tune indicators. Connect lights between +28 vdc (J1-R) and switched grounds (J1-B, -C, and -J). During antenna coupler tuning, the J1-J is grounded. During operate, the J1-C is grounded. During fault, J1-B, -C, and -J are grounded.
2. Connections external to the hf system.
3. Pins 53 and 37 may be employed as balanced input from the interphone amplifier. In this case, the wire on pin 54 should not be connected. If an unbalanced carbon mike input is desired, the wires to pins 53 and 37 should not be connected.
4. When the unbalanced carbon mike input is used, the mike return circuit should be connected to pin 18 on the ARC-19. It is recommended that no grounds external to the ARC-94 chassis be placed on this line.
5. Total resistance of powerlines to and from power supply must not exceed 0.15 ohm. Number 20 AWG shall be minimum wire size used.

6. Total resistance of these powerlines to and from power supply must not exceed 0.10 ohm. Number 18 AWG shall be minimum wire size used.
7. Provide good RF ground circuit to aircraft bulkhead. Use a flexible solid copper or aluminum strap.
8. If bench operation without an antenna coupler is desired, pins 5 and 56 on the ARC-94 must be connected together to complete the key interlock circuit. Do not connect pins 5 or 56 to an external dc power source.
9. A terminal strip provided in the PP-3702/ARC-102 can be used for tiepoints.
10. Twisted.
11. Shielded pair.
12. If a separate cw key line is not provided in the aircraft, C--3940/ARC-94 pins k and m must be jumpered together by aircraft wiring for cw operation.
13. Total resistance of power lines to and from 27.5-volt dc power source must not exceed 0.015 ohm Number 8 AWG shall be the minimum wire size used

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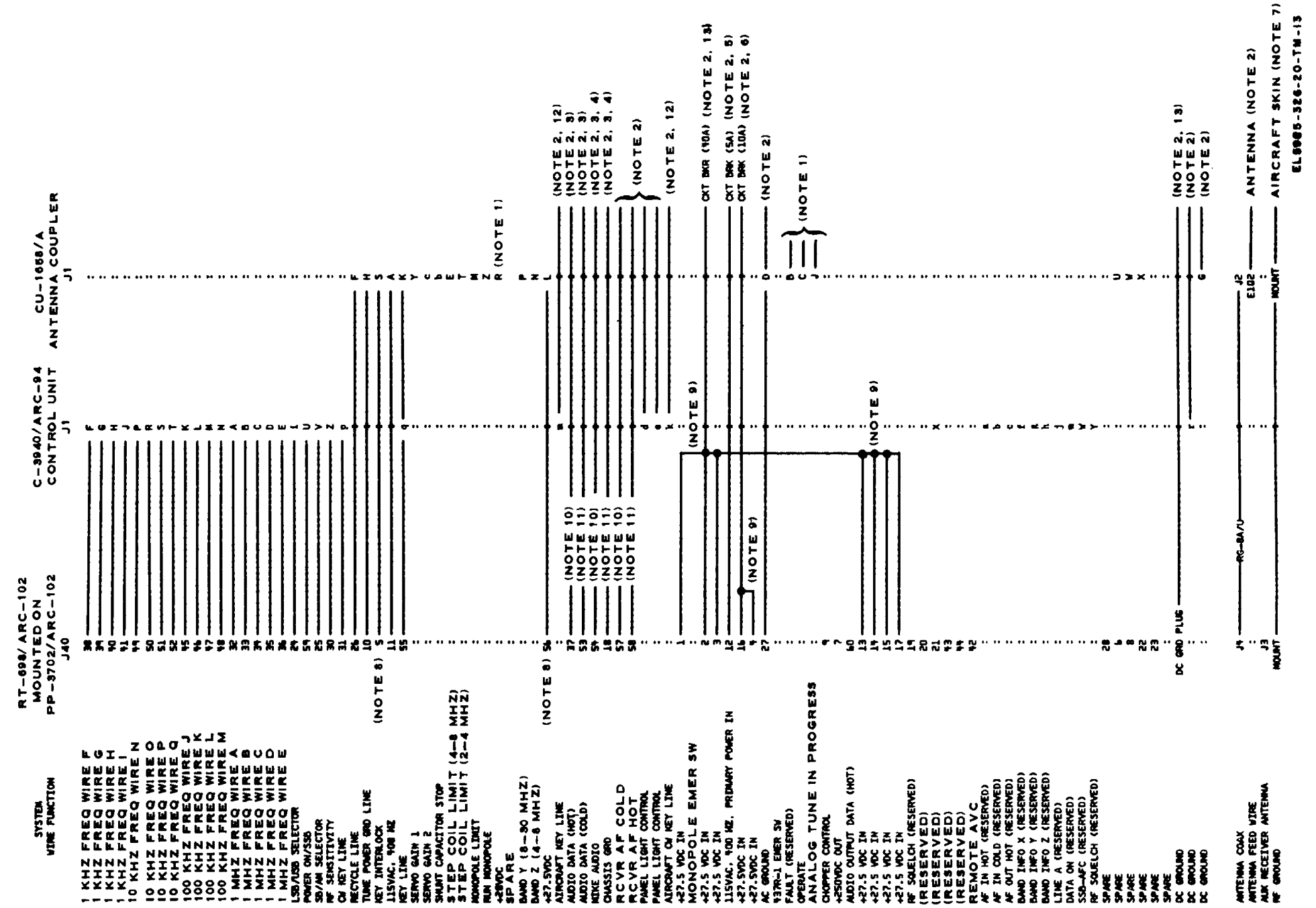


Figure 6-7. Receiver-Transmitter, Radio RT-698/ARC-102, Control, Radio Set C-46360/ARC-102, and Coupler, Antenna CU-1658/A, cabling diagram.

1. Connect to optional remote antenna coupler tune indicators. Connect lights between +28 vdc (J1-R) and switched grounds (J1-B, -C, and -J). During antenna coupler tuning, the J1-J is grounded. During operate, the J1-C is grounded. During fault, J1-B, -C, and -J are grounded.
2. Connections external to the hf system.
3. Pins 53 and 37 may be employed as balanced input from the interphone amplifier. In this case, the wire on pin 54 should not be connected. If an unbalanced carbon mike input is desired, the wires to pins 53 and 37 should not be connected.
4. When the unbalanced carbon mike input is used, the mike return circuit should be connected to pin 18 on the ARC-19. It is recommended that no grounds external to the ARC-94 chassis be placed on this line.
5. Total resistance of powerlines to and from power supply must not exceed 0.15 ohm. Number 20 AWG shall be minimum wire size used.
6. Total resistance of these powerlines to and from power supply must not exceed 0.10 ohm. Number 18 AWG shall be minimum wire size used.

7. Provide good RF ground circuit to aircraft bulkhead. Use a flexible solid copper or aluminum strap.
8. If bench operation without an antenna coupler is desired, pins 5 and 56 on the ARC-94 must be connected together to complete the key interlock circuit. Do not connect pins 5 or 56 to an external dc power source.
9. A terminal strip provided in the PP-3702/ARC-102 can be used for tiepoints.
10. Twisted.
11. Shielded pair.
12. If a separate cw key line is not provided in the aircraft, C--3940/ARC-94 pins k and m must be jumpered together by aircraft wiring for cw operation
13. Total resistance of power lines to and from 27.5-volt dc power source must not exceed 0.015 ohm Number 8 AWG shall be the minimum wire size used
14. When the PP-3702/ARC-102 is used with the ARC/102, the 115-volt ac. 400-Hz, primary power is supplied by the 488A-2 static inverter.

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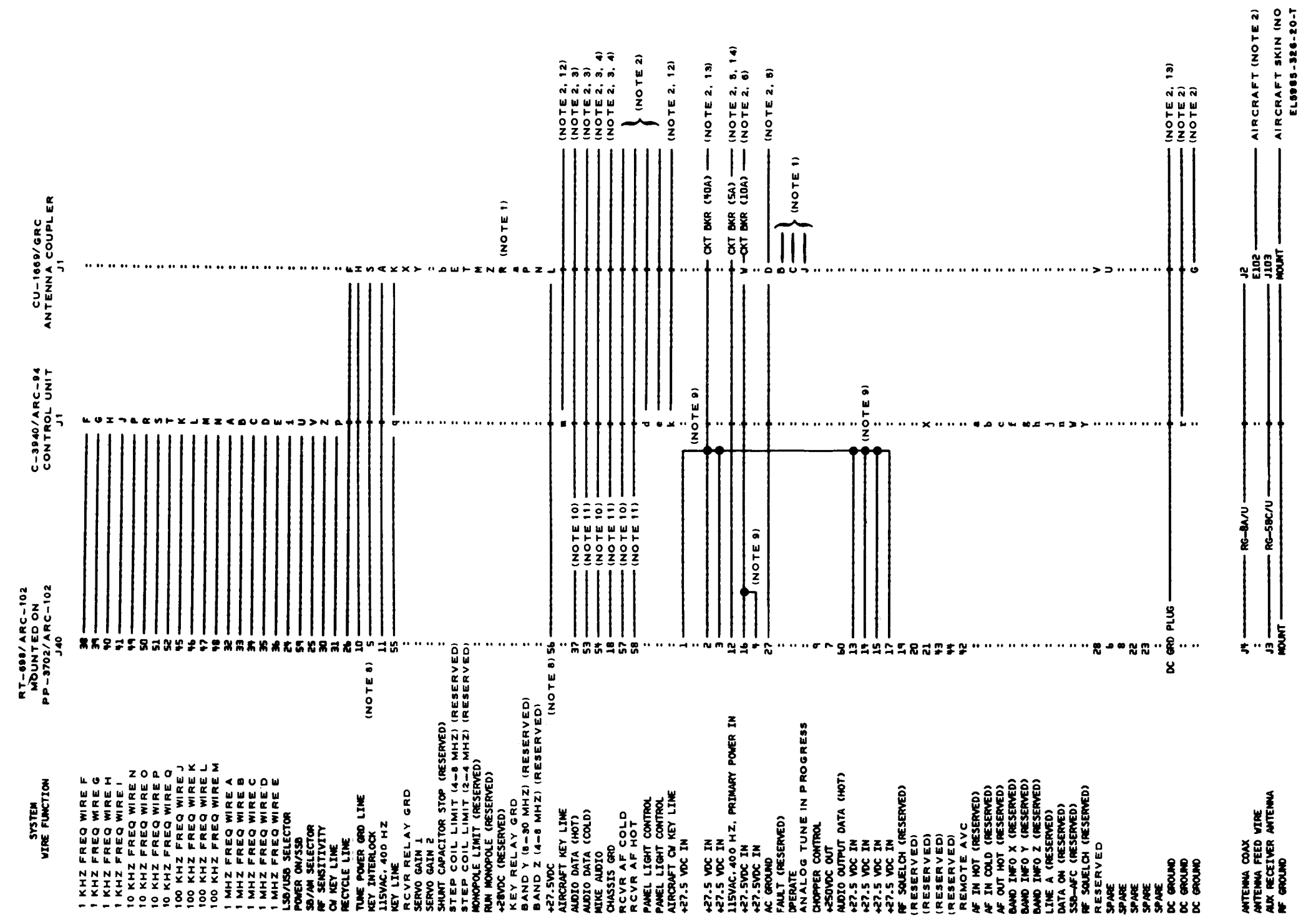


Figure 6-8. Receiver-Transmitter, Radio RT-698/ARC-102, Control, Radio Set C-3940/ARC-94, and Coupler, Antenna CU-1669/ GRC, cabling diagram.

1. Connect to optional remote antenna coupler tune indicators. Connect lights between +28 vdc (J1-R) and switched grounds (J1-B, -C, and -J). During antenna coupler tuning, the J1-J is grounded. During operate, the J1-C is grounded. During fault, J1-B, -C, and -J are grounded.
2. Connections external to the hf system.
3. Pins 53 and 37 may be employed as balanced input from the interphone amplifier. In this case, the wire on pin 54 should not be connected. If an unbalanced carbon mike input is desired, the wires to pins 53 and 37 should not be connected.
4. When the unbalanced carbon mike input is used, the mike return circuit should be connected to pin 18 on the ARC-19. It is recommended that no grounds external to the ARC-94 chassis be placed on this line.
5. Total resistance of powerlines to and from power supply must not exceed 0.15 ohm. Number 20 AWG shall be minimum wire size used.

6. Total resistance of these powerlines to and from power supply must not exceed 0.10 ohm. Number 18 AWG shall be minimum wire size used.
7. Provide good RF ground circuit to aircraft bulkhead. Use a flexible solid copper or aluminum strap.
8. If bench operation without an antenna coupler is desired, pins 5 and 56 on the ARC-94 must be connected together to complete the key interlock circuit. Do not connect pins 5 or 56 to an external dc power source.
9. A terminal strip provided in the PP-3702/ARC-102 can be used for tiepoints.
10. Twisted.
11. Shielded pair.
12. If a separate cw key line is not provided in the aircraft, C--3940/ARC-94 pins k and m must be jumpered together by aircraft wiring for cw operation
13. Total resistance of power lines to and from 27.5-volt dc power source must not exceed 0.015 ohm Number 8 AWG shall be the minimum wire size used

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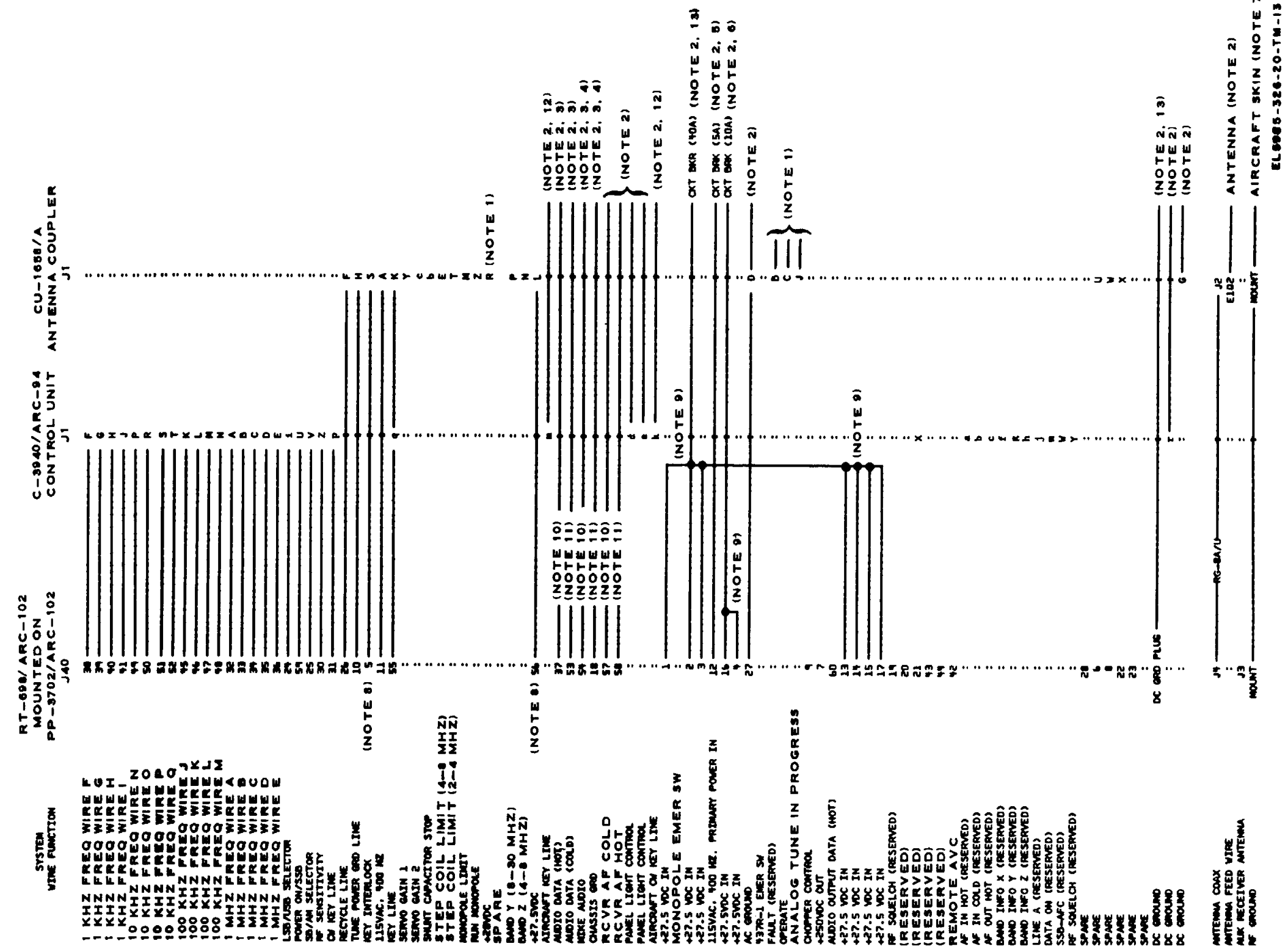


Figure 6-9. Receiver-Transmitter, Radio RT-698/ARC-102, Control, Radio Set C-3940/ARC-94, and Coupler, Antenna CU-1658/ A, cabling diagram.

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