

T.O. 31R2-2URC121-1

TECHNICAL MANUAL

**OPERATION, MAINTENANCE,
AND INSTALLATION INSTRUCTIONS
WITH ILLUSTRATED PARTS BREAKDOWN
AND THEORY**

For On-Equipment Location

**TRANSPORTABLE GROUND STATION
AN/URC-121 (V)-1, P/N10197-0100**

Harris Corporation, RF Communications Group
FO4606-82-D-0079

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SAFETY SUMMARY

The following are general safety precautions that are not related to any specific procedures and therefore do not appear elsewhere in this publication. These are recommended precautions that personnel must understand and apply during many phases of operation and maintenance.

KEEP AWAY FROM LIVE CIRCUITS

Operating personnel must at all times observe all safety regulations. Do not replace components or make adjustments inside the equipment with the high voltage supply turned on. Under certain conditions, dangerous potentials may exist when the power control is in the off position, due to charges retained by capacitors. To avoid casualties, always remove power and discharge circuits to ground before touching any circuit components.

DO NOT SERVICE OR ADJUST ALONE

Under no circumstances should any person reach into or enter the enclosure for the purpose of servicing or adjusting the equipment except in the presence of someone who is capable of rendering aid.

RESUSCITATION

Personnel working with or near high voltages should be familiar with modern methods of resuscitation. Cardiopulmonary resuscitation procedures are outlined in T.O. 31-1-141-1, and annual refresher training requirements are outlined in AFOSH STD 127-50.

The following warnings appear in the text in this volume, and are repeated here for emphasis.

WARNING

Voltages dangerous to life exist in this radio equipment. Before removing any covers, disconnect the primary power.

WARNING

Before pulling the 100 Watt Transceiver or the 500 Watt Linear Power Amplifier out on its slides, make sure that you have the support rods fully extended and locked in front of the case (see figure 1-2). Otherwise, the case may tip over, causing damage to the equipment and possible injury.

HANDLING OF ELECTROSTATIC DISCHARGE SENSITIVE DEVICES (ESDS)

Electrostatic discharge sensitive devices (ESDS) must be handled with certain precautions that must be followed to minimize the effect of static build-up. Consult T.O. 00-25-234, DOD Std-1686, and DOD HDBK 263.

GLOSSARY

A	Ampere(s)
A/D	Analog-to-Digital (Converter)
AFSK	Audio Frequency Shift Keying; a baseband modulation scheme in which two audio frequencies are used to represent binary coded data; the frequency is shifted to one frequency to represent a 1 (mark) and to the other to represent a 0 (space).
AGC	Automatic gain control
ALE	Address latch enable
AM	Amplitude modulation; a modulation scheme in which the carrier is made to vary in amplitude in accordance with the modulating signal.
AME	Amplitude modulation equivalent
ANTIVOX	Prevents false VOX operation; see VOX
BFO	Beat Frequency Oscillator, used in SSB detection circuits
BIT	Built-in Test
BIU	Bus interface unit
BW	Bandwidth
CPU	Central processing unit
CREV	Converter reverse
CW	Continuous wave; a wave that does not vary in amplitude or frequency and is turned on and off to carry intelligence, e.g., Morse Code
D/A	Digital-to-Analog (Converter)
dB	Decibel(s)
dBm	Decibel(s) relative to one milliwatt
EMI	Electromagnetic interference
EPROM	Erasable programmable read-only memory
EU	Execution unit
HF	High frequency; a radio frequency band extending from about 3 MHz to 30 MHz; in this manual, HF includes 1.6 to 30 MHz.
HV	High voltage
IF	Intermediate frequency
IM	Intermodulation (distortion)
I/O	Input/Output
KREV	Keyer reverse
LCD	Liquid crystal display
LED	Light emitting diode
LPA	Linear power amplifier
LSB	Lower sideband; a modulation scheme in which the intelligence is carried on the first sideband below the carrier frequency; see SSB
MIC	Microphone
mA	Milliamperes(s)
mV	Millivolt(s)
NBSV	Narrow band secure voice
PEP	Peak envelope power
PPC	Peak power control
PWB	Printed wiring board
RAM	Random access memory
rms	Root mean square
RTC	Real time clock
RX	Receive
S TONE	Sidetone
SSB	Single sideband; a modulation scheme in which the intelligence is carried by one of the carrier sidebands, the other side band and the carrier center frequency being suppressed

GLOSSARY (Cont.)

TGC	Transmitter gain control
TX	Transmit
μ A	Microampere(s)
μ P	Microprocessor
USB	Upper sideband; a modulation scheme in which the intelligence is carried on the first sideband above the carrier frequency; see SSB
μ V	Microvolt(s)
Vac	Volts, alternating current
VCO	Voltage controlled oscillator
Vdc	Volts, direct current
VOX	Voice operated transmission
VSWR	Voltage standing wave ratio; the ratio of the maximum to the minimum voltage of a standing wave on a radio frequency transmission line
W	Watt(s)

INTRODUCTION

The purpose of this manual is to provide all information necessary for the installation, operation, and maintenance of Transportable Ground Station AN/URC-121(V)-1, manufactured by the RF Communications Group of Harris Corporation, Rochester, New York. The manual is divided into eight chapters. The contents of each chapter are briefly described in the following paragraphs.

Chapter 1 provides a general description and a list of capabilities and limitations of Transportable Ground Station, AN/URC-121(V)-1. A list of companion equipment references are included along with the components that form the AN/URC-121(V)-1.

Chapter 2 provides the information necessary for planning and carrying out installation of Transportable Ground Station, AN/URC-121(V)-1. A dimensional outline drawing is provided to show dimensions and other information required for proper installation.

Chapter 3 provides instructions for preparing

Transportable Ground Station, AN/URC-121(V)-1 for use, including the initial application of power and checkout. Instructions for repacking the equipment for reshipment are also included in Chapter 3.

Chapter 4 provides operating instructions for Transportable Ground Station, AN/URC-121(V)-1.

Chapter 5 discusses the theory of operation for Transportable Ground Station, AN/URC-121(V)-1.

Chapter 6 describes the maintenance procedures for Transportable Ground Station, AN/URC-121(V)-1.

Chapter 7 contains the Illustrated Parts Breakdown (IPB).

Chapter 8 contains all foldout (FO) drawings. The diagrams are numbered FO-1, FO-2, etc. They are printed on sheets with page-size blank aprons to permit viewing the diagram with the rest of the book closed or opened to another page.

APPLICABLE SPECIFICATIONS

The following specifications, standards, and publications were used in the preparation of this manual.

SPECIFICATION	NAME
MIL-M-38798B, para. 3.4	Combined Operation and Maintenance Instructions Manual (Equipment)
MIL-M-38807, Amend. 4	Preparation of Illustrated Parts Breakdown
MIL-M-38790 and MIL-M-38784A	General Requirements for Preparation of Technical Manuals

APPLICABLE STANDARDS

STANDARD	NAME
MIL-STD-12 IEEE-200-75	Abbreviations for use on Drawings and in Technical Type Publications.
MIL-STD-15-1A IEEE-315-75	Graphic Symbols for Electrical Components.
MIL-STD-17-1	Mechanical Symbols.
MIL-STD-806	Graphic Symbols for Logic Diagrams.

APPLICABLE PUBLICATIONS

PUBLICATION	NAME
DOD 5200.20	Distribution Statements on Technical Documents.
USAS Y14.15-1966	Electrical and Electronic Diagrams.
USAS Y32.16-1968	Electrical and Electronic Reference Designations.
T.O. 31-1-141 (Series)	Technical Manual-Basic Electronic Technology and Testing Practices

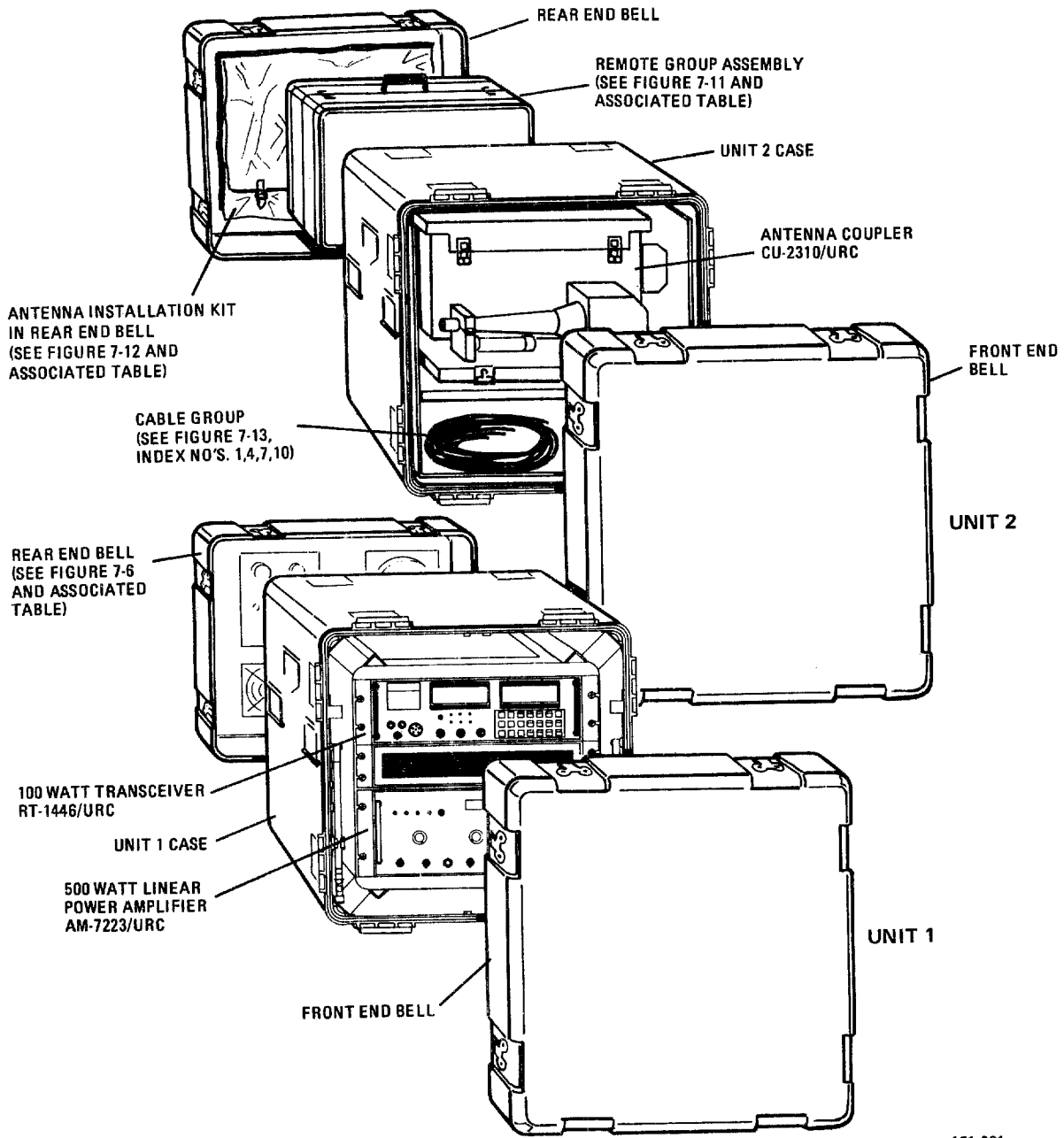


Figure 1-1. Transportable Ground Station, AN/URC-121(V)-1

CHAPTER 1

GENERAL INFORMATION

1-1. GENERAL DESCRIPTION. The AN/URC-121(V)-1 Transportable Ground Station provides a rapidly deployable voice (AME or SSB), CW, or data communications system for use in the 1.600,00 to 29.999,99 MHz high frequency band. Communication may be made with any ground/air/ground stations equipped with HF equipment. The Transportable Ground Station produces a radio frequency (RF) output of 500 watts peak envelope power (PEP) or 250 watts average (AVG) power into an antenna having a characteristic load impedance of 50 ohms, unbalanced. If the antenna does not exhibit a constant 50 ohm load over the frequency range of operation, the accessory Antenna Coupler CU-2310/URC will effect an impedance match. The Transportable Ground Station is operated from the Remote Control Unit (RCU) C-11329/URC. Figure 2-1 shows a typical station.

1-2. DESCRIPTION. The AN/URC-121(V)-1 Transportable Ground Station consists of Transceiver RT-1446/URC and 500 Watt Linear Power Amplifier AM-7223/URC mounted in one environmentally protected case (hereafter referred to as Unit 1); and Antenna Coupler CU-2310/URC, interconnecting cables, and Remote Control Unit C-11329/URC in a carrying case, in a second environmentally protected case (hereafter referred to as Unit 2). The Remote Control Unit is in its own carrying case for ease of removing it from Unit 2 and carrying it to the remote location when the system is set up for operation. Two six foot cable stubs are provided. One cable stub is connected to the end bell of Unit 1 and one to the system power switch box on the Remote Control Unit. The Remote Control Unit is compatible with EIA Standard RS-422 up to 1000 ft.

1-2 RECEIVER-TRANSMITTER RT-1446/URC. Receiver-Transmitter RT-1446/URC, hereafter known as the 100 Watt Transceiver, provides USB, LSB, AME, CW, and DATA modes of transmission and reception. The 100 Watt Transceiver operates from a +13.6 Vdc power source. The included power supply is used to convert standard 115/230 Vac power line inputs into the required +13.6 Vdc output required by the 100 Watt

Transceiver. The power supply will also convert a +28 Vdc input to produce the required +13.6 Vdc output.

1-4. RADIO FREQUENCY AMPLIFIER AM-7223/URC. Radio Frequency Amplifier AM-7223/URC, hereafter known as the 500 Watt LPA, is a microprocessor-controlled power amplifier that amplifies the selected HF input signal from the 100 Watt Transceiver in the frequency range of 1.600,00 to 29.999,99 MHz. The output level delivered by the 500 Watt LPA is 500 watts PEP (peak envelope power) with multiple tone signals, or 250 watts average power with lock-keyed CW or a continuous single tone input signal. The 500 Watt LPA tunes automatically in response to frequency data from the 100 Watt Transceiver and to its own internally generated fine tuning (servo) signals. Automatic tuning is typically accomplished in 5 seconds or less.

1-5. ANTENNA COUPLER CU-2310/URC. 100/500 Watt Antenna Coupler CU-2310/URC, hereafter known as the Antenna Coupler, automatically matches the output impedance of Unit 1 to a whip or long wire antenna over the frequency range of 1.600,00 to 29.999,99 MHz. Operation, including network tuning and monitoring, is fully automatic. Tuning time is typically less than five seconds.

1-6. REMOTE CONTROL UNIT C-11329/URC. Remote Control Unit C-11329/URC, hereafter known as the Remote Control Unit, provides remote control capability for the 100 Watt Transceiver identical to that available at the front panel keyboard of the 100 Watt Transceiver. In remote control operation, the 100 Watt Transceiver is controlled using the front panel keypad on the Remote Control Unit. The operator can make frequency, channel, and mode selections from the keypad, and may also adjust analog controls on the Remote Control Unit front panel to set the audio and RF gain levels, the audio squelch level, and the audio input level of the 100 Watt Transceiver. The Remote Control Unit can access and program the 100 Watt Transceiver memory, which can store up to 100 channels of frequencies and operating modes. Equipment status,

selected frequency, mode selections, and BIT test results (for the Remote Control Unit as well as for the rest of the system) are displayed on front panel LCD displays. The interface between the Remote Control Unit and the 100 Watt Transceiver is EIA Standard RS-422. This is a hard-wired system and control distances are limited by the characteristics of the interconnecting cable path, up to 1000 ft. For remote operation, the Remote Control Interface PWB Assembly, A1A19, must be installed in the 100 Watt Transceiver.

1-7. SYSTEM POWER REQUIREMENTS.

Power is supplied by an internal power selection that

automatically operates from 115/230 Vac or 28 Vdc and provides power to the system.

1-8. LEADING PARTICULARS. Table 1-1 lists the leading particulars of the AN/URC-121(V)-1 Transportable Ground Station. For complete leading particulars on each individual equipment, refer to the applicable technical manual listed in table 1-5, Related Publications.

1-9. CAPABILITIES AND LIMITATIONS.

Table 1-2 lists the functional and operational capabilities of the Transportable Ground Station.

Table 1-1. Leading Particulars

Item	Characteristic or Value
Dimensions for each Unit case: Height Width Depth Total Volume Weight Power Requirements (For Unit 1) (For Remote Control Unit)	24.87 inches 25.32 inches 35.00 inches (over end bells) 12.15 cubic feet per case 247 pounds (112 kilograms) for Unit 1 225 pounds (102 kilograms) for Unit 2 Ac Power 115 Vac or 230 Vac, +10% Single Phase 50 - 400 Hz 2400 watts peak power 1700 watts average power Dc Power 28 Vdc 750 watts maximum peak power 340 watts average power Ac Power 115 Vac or 230 Vac, + 10% selectable Single Phase 50 - 400 Hz 36 watts (maximum) DC Power: 28 Vdc, 2 amps

Table 1-1. Leading Particulars (Cont.)

Item	Characteristic or Value
Mounting	Units 1 and 2 may be set directly on the ground or on an adequate support.
Operating Environment	Unit 1: Temperature: -30 to +50 degrees C Relative Humidity: 95% (non-condensing) Antenna Coupler: Temperature: -30 to +65 degrees C Waterproof (sealed) for use in an exposed environment up to 95% relative humidity
Storage Environment	Temperature: -35 to +70 degrees C Relative humidity: 95% Waterproof (sealed) for exposed transportation
Operating Altitude	10,000 feet above mean-sea-level (MSL)
Transport Altitude	40,000 feet above mean-sea-level (MSL)
Shock/Dust/Rain	MIL-STD-810C

Table 1-2. Capabilities and Limitations

Description of Characteristic	
Frequency Range	1.600,00 to 29.999,99 MHz. Antenna Coupler tunes 15 to 35 ft. (4.52 to 10.67 m) whip antenna or 75 to 150 ft. (22.86 to 45.72 m) long wire antenna.
Frequency Tuning	10 Hz increments.
Tuning	Continuous and automatic.
Remote Capability	Antenna Coupler may be located up to 100 ft. (45.7 m) from Unit 1. Remote Control Unit C-11329/URC may be located up to 1000 ft. from Unit 1.
Modes of Operation	USB, LSB, AME, CW

Table 1-2. Capabilities and Limitations (Cont.)

Description of Characteristic	
Readout/Display	FREQUENCY, CHANNEL, BFO, MODE, AGC, LPA, VOX, AUDIO, POWER, VSWR, BIT, SIGNAL STRENGTH
Transportability/ Set-up time	Unit 1 can be positioned in the desired location by two persons. Antenna coupler can be removed from the Unit 2 case by one person and set up with a whip or long wire antenna with the aid of a second person. The Remote Control Unit can be removed from the back of the Unit 2 case, carried to the desired location and cabled to the Unit 1 end bell by one person. Typically, less than one hour is required to install the Transportable Ground Station.

Table 1-3. Equipment and Accessories Supplied

Qty	Item	Description/Use
1	Unit 1 Assembly, XCVR/LPA	Contains 100 Watt Transceiver (RT-1446/URC) and 500 Watt Linear Power Amplifier (AM-7223/URC)
1	Unit 2 Assembly, ANT CPLR/RCU	Contains a 100/500 Watt Antenna Coupler (CU-2310/URC), a Remote Control Unit (C-11329/URC), a base plate containing a whip antenna mount, all necessary interconnecting cables, a microphone, and antenna installation hardware
1	Ancillary Kit	Contains the Unit 1 ac power.cord, an extra ac power connector, and an extra bushing

Table 1-4. Equipment Required But Not Supplied

Qty	Item	Description/Use
1	Antenna, either long wire or whip	Used for reception and transmission of radio signals
1	Long wire adapter	Required if a long wire antenna is used-- screws into the whip antenna base mounted to the antenna coupler base plate
As req	407L hermaphroditic cables	Used to connect the Remote Control Unit to the Unit 1 case for distances greater than those possible with the 6 ft. cable stubs provided.
As req	Ground rods	Used to ground Unit 1 case, antenna coupler base plate, and Remote Control Unit
1	DC power cable, constructed	Required if a dc power source is used of 4 or 8 gauge wire with an MS25488-25 mating connector

Table 1-5. Related Publications

Title	Publication Number
Transportable Ground Station, AN/URC-121(V)-1 System Manual Work Cards (Overall System)	T.O. 31R2-2URC121-1 31R2-2URC-126WC-1
Receiver-Transmitter, Radio, RT-1446/URC On-equipment Manual Depot Manual Work Cards	T.O. 31R2-2URC-81 T.O. 31R2-2URC-83 31R2-2URC-86WC-1
Amplifier, Radio Frequency, AM-7223/URC On-equipment Manual Depot Manual Work Cards	T.O. 31R2-2URC-101 T.O. 31R2-2URC-103 31R2-2URC-106WC-1
100/500 Watt Antenna Coupler, CU-2310/URC On-equipment Manual Depot Manual Work Cards	T.O. 31R2-2URC-111 T.O. 31R2-2URC-113 31R2-2URC-116WC-1
Remote Control Unit, C-11329/URC On-equipment Manual Depot Manual Work Cards	T.O. 31R2-2URC-91 T.O. 31R2-2URC-93 31R2-2URC-96WC-1

CHAPTER 2

INSTALLATION

2-1. INTRODUCTION. This chapter provides information for site selection, installation and shipping of equipment. Section I, Installation Planning, describes the site requirements of the equipment.

Section II, Installation, describes the installation requirements, sequence, and cabling procedure. A fully deployed system is shown in Figure 2-1.

Section I. INSTALLATION PLANNING

2-2. GENERAL. The 100 Watt Transceiver and 500 Watt Linear Power Amplifier (LPA) are mounted in an environmentally protected case, as shown in Figure 2-2, which may be used for both shipment and operation of the equipment. The Antenna Coupler, interconnecting cables, and Remote Control Unit are transported in a second environmentally protected case, as shown in Figure 2-2.

a. When the unit is received, carefully inspect the case and equipment for damage, signs of rough handling, or signs that the case or equipment may have been tampered with. If any of these conditions are present, carefully note and report them to the proper authority (refer to T.O. OO-35D-54).

b. Set up the station at a convenient site location as described in 2-4. of this manual.

2-3. PREPARATION FOR INSTALLATION. Preparation for installation includes site selection, and operator/equipment environmental considerations. Each of these topics is discussed below.

2-4. SITE CONSIDERATION. A number of factors should be considered, from security to operational requirements. It is the responsibility of the user to determine which has precedence. Each of the following items should be considered in site selection.

a. Power requirements identified in Table 1-1 of this manual should be observed.

b. Loading. Be sure the selected space has adequate strength to support the weight of the case

and equipment, which is given in Table 1-1 of this manual.

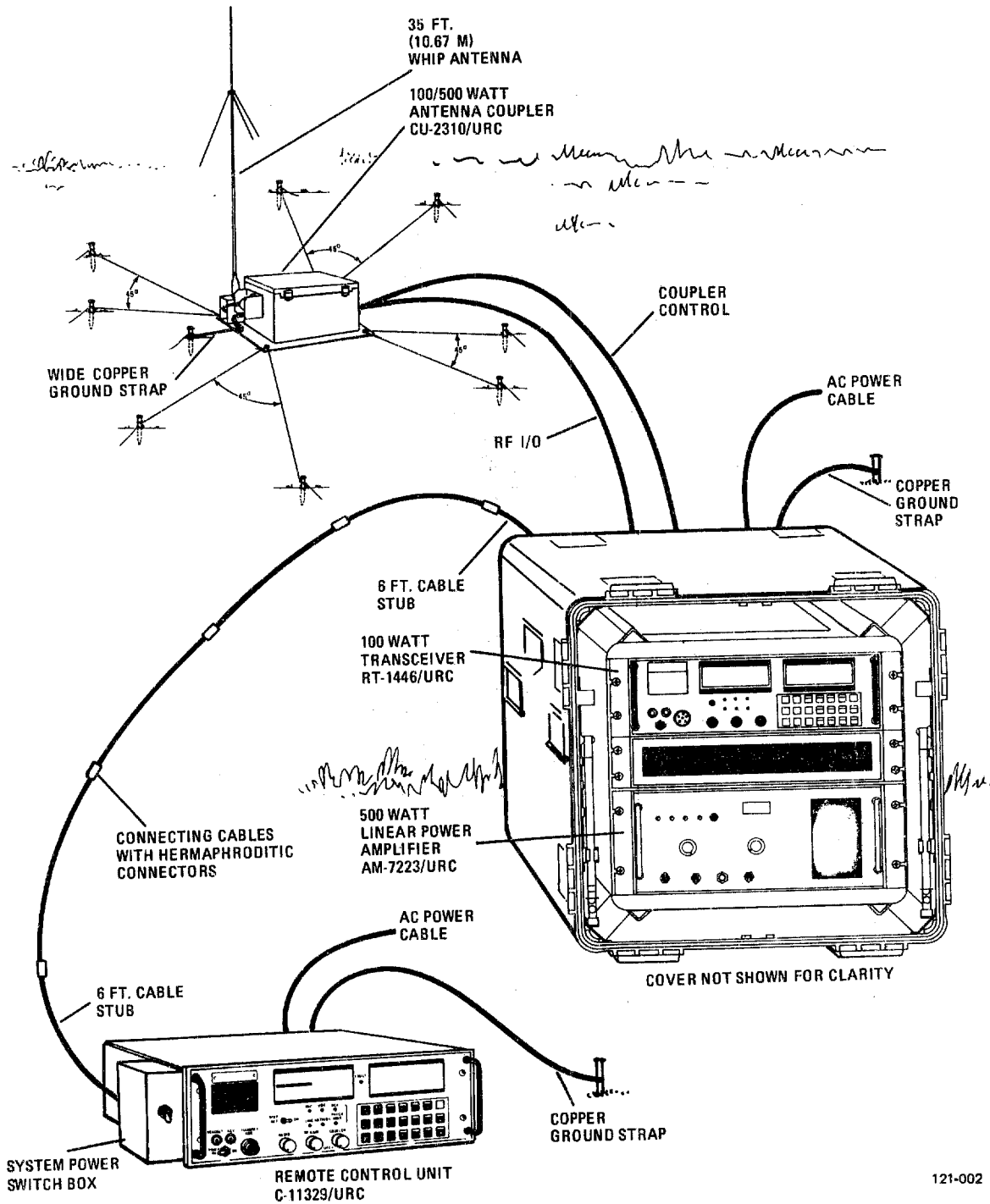
c. Accessibility. Consider the space required to access the equipment for servicing, operating, maintenance, room to maneuver, ventilation, etc.

d. Antenna System. Location of Unit 1 should take into account the resulting antenna cable length and positioning of any antenna patch equipment. Avoid long antenna cable runs. When the Antenna Coupler is employed, be sure the maximum length of the coupler control cable does not exceed 100 feet. For whip antennas, allow space for the antenna counterpoise.

e. System Ground. Make sure that the system is properly grounded for safety (e.g. lightning hazard) and for proper operation of the antenna system. Refer to T.O. 31-10-24. A good ground is 15 ohms or less.

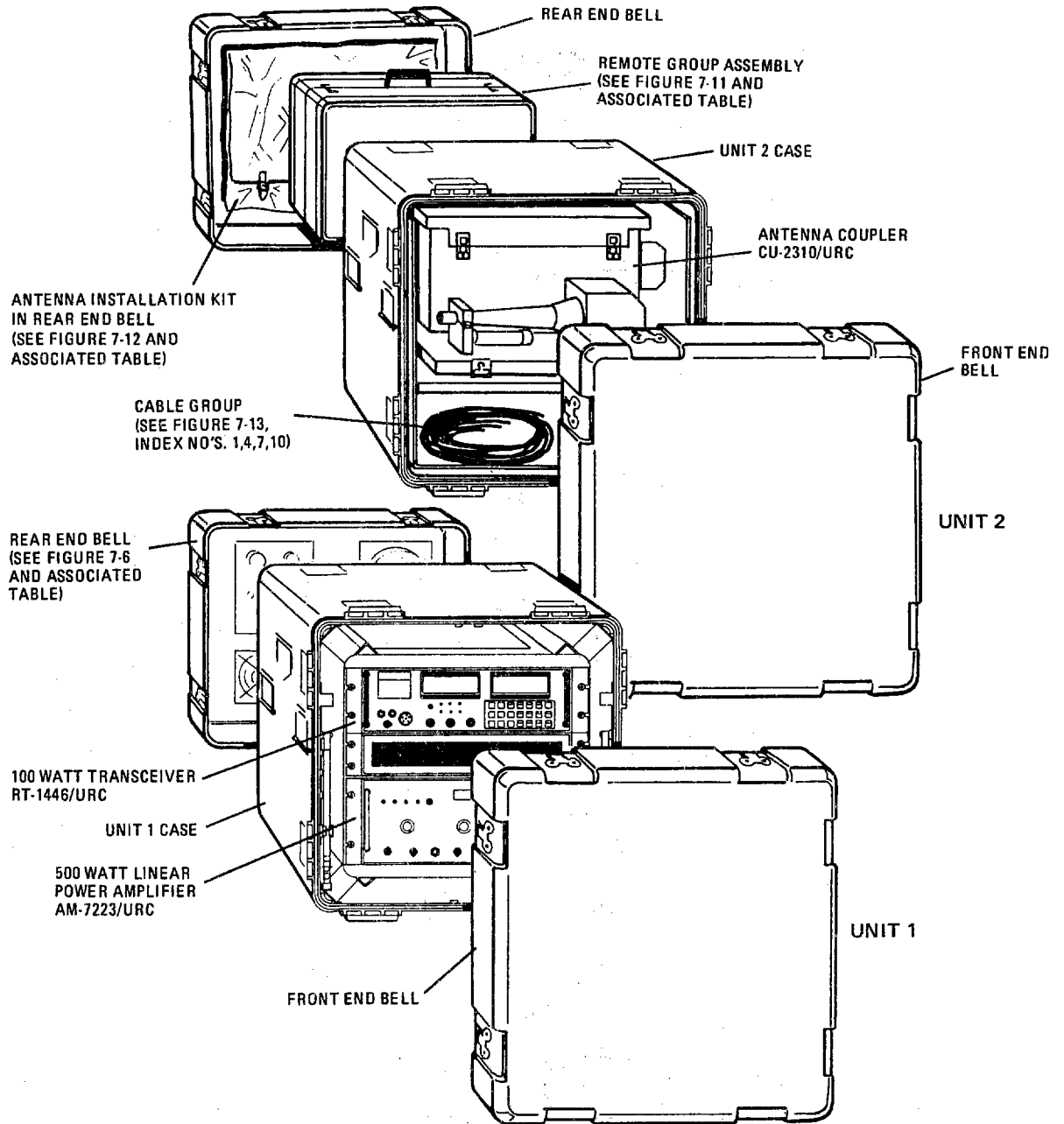
f. Environment. The Unit 1 case and cable connections to the rear end bell are weathertight; however, if front end bell is removed to operate the equipment, the controls and front of the equipment should be in a sheltered environment. When the front end bell is in place, while operating the system from the Remote Control Unit, the case need not be in a sheltered environment. The Remote Control Unit should be operated in a sheltered environment. The Antenna Coupler will operate normally over an ambient temperature range of -30 to +65 degrees C. and need not be in a sheltered environment.

g. Shielding. The operator and equipment should be shielded from close proximity effects of the antenna. Control cables to the Antenna Coupler



121-002

Figure 2-1. Transportable Ground Station, AN/URC-121(V)-1



121-001

Figure 2-2. Transportable Ground Station, AN/URC-121(V)-1

should be well shielded and control lines should not run parallel to the antenna or ground strap.

h. Interaction. The possibility of interaction between the Antenna Coupler and other electronic equipment in the vicinity does exist. Avoid this possibility whenever possible by installing the Antenna Coupler in a location well away from other equipment. Consider the effect that the 100 Watt Transceiver and 500 watt LPA will have on surrounding equipment and, conversely, what effect surrounding equipment will have on the 100 Watt Transceiver. For example, the presence of nearby high power transmitters can cause in-band spurious signals. Always consider the effect that surrounding equipment may have when selecting a location for the Remote Control Unit.

i. Heat dissipation. Make sure that the intake and exhaust ports in the rear end bell are open and free of obstructions when operating the equipment.

j. Typical Antenna Coupler Installation for Whip Antennas. A typical fixed whip antenna installation is shown in figure 2-3.

k. Typical Antenna Coupler Installation for long-wire antennas. When using 75 to 100 foot (22.86 to 45.72m) long-wire type antennas, it is advisable to mount the Antenna Coupler as close to the antenna base as possible. Assemble the long wire adapter on the Antenna Coupler and connect the input wire from the antenna to the adapter. A typical long-wire antenna installation is shown in figure 2-4.

Section II. INSTALLATION PROCEDURE

2-5. INSTALLATION MANPOWER AND MANHOUR REQUIREMENTS.

a. Manpower Requirements. Unit 1 requires two individuals to lift and position the unit in its operational location. The Antenna Coupler may be removed from the Unit 2 case and carried to its location and set up by one individual. The Remote Control Unit may be removed from the Unit 2 case and carried to its location by one individual.

b. Manhour Requirements. Most installations can be completed in less than one manhour. This figure is based on locating the Unit 1 case so that supplied cables are adequate for the installation. It includes the time necessary to install a standard whip antenna and to locate the Remote Control Unit.

2-6. INSTALLATION SEQUENCE. The sequence of installation can be described in discrete steps as listed below.

a. Positioning. Be sure Unit 1 case and Remote Control Unit are properly supported and secured and the Remote Control Unit is located for convenient operation. The Remote Control Unit should be operated in a sheltered environment; however, Unit 1 may be located in a more exposed environment, as long as it is not more severe than the requirements listed in Table 1-1.

b. Remove the Antenna Coupler from the Unit 2 case and conveniently locate it for use with the

antenna to be used. (See Figures 2-3 and 2-4 for typical whip and long-wire antenna installations.)

c. Remove the five cables from the bottom section of the Unit 2 case.

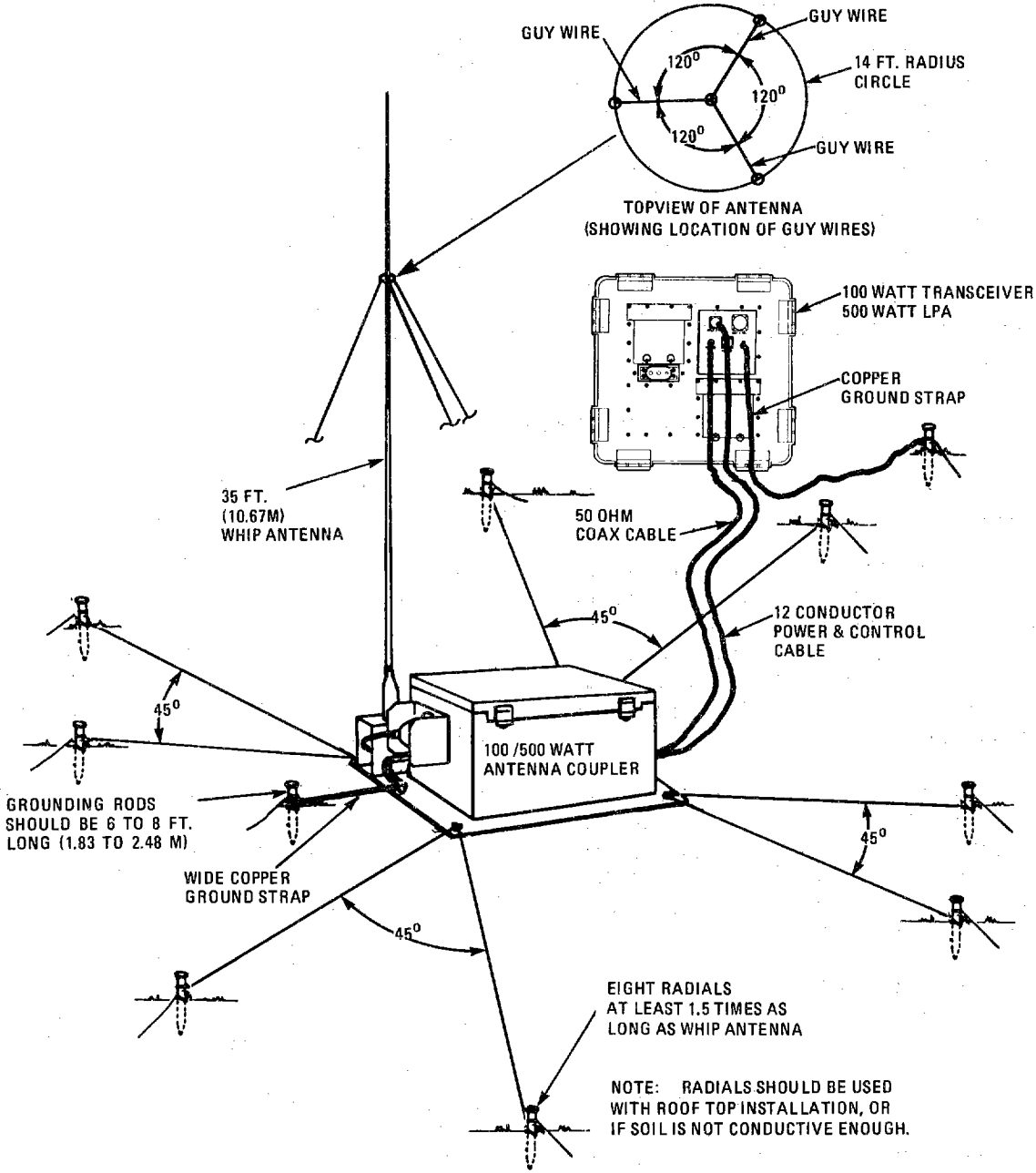
d. Connect the two 100 foot cables to J1 and J3 on the rear end bell of the Unit 1 case (see Figure 2-1). Connect the other ends of these two cables to the proper connectors on the Antenna Coupler.

e. Connect the ac power cable to J4 on the rear end bell of the Unit 1 case (See Figure 2-1) and the other end to the ac power supply. NOTE: If dc power is to be used, a dc power cable, specified in Table 1-4 of this manual, is required.

CAUTION

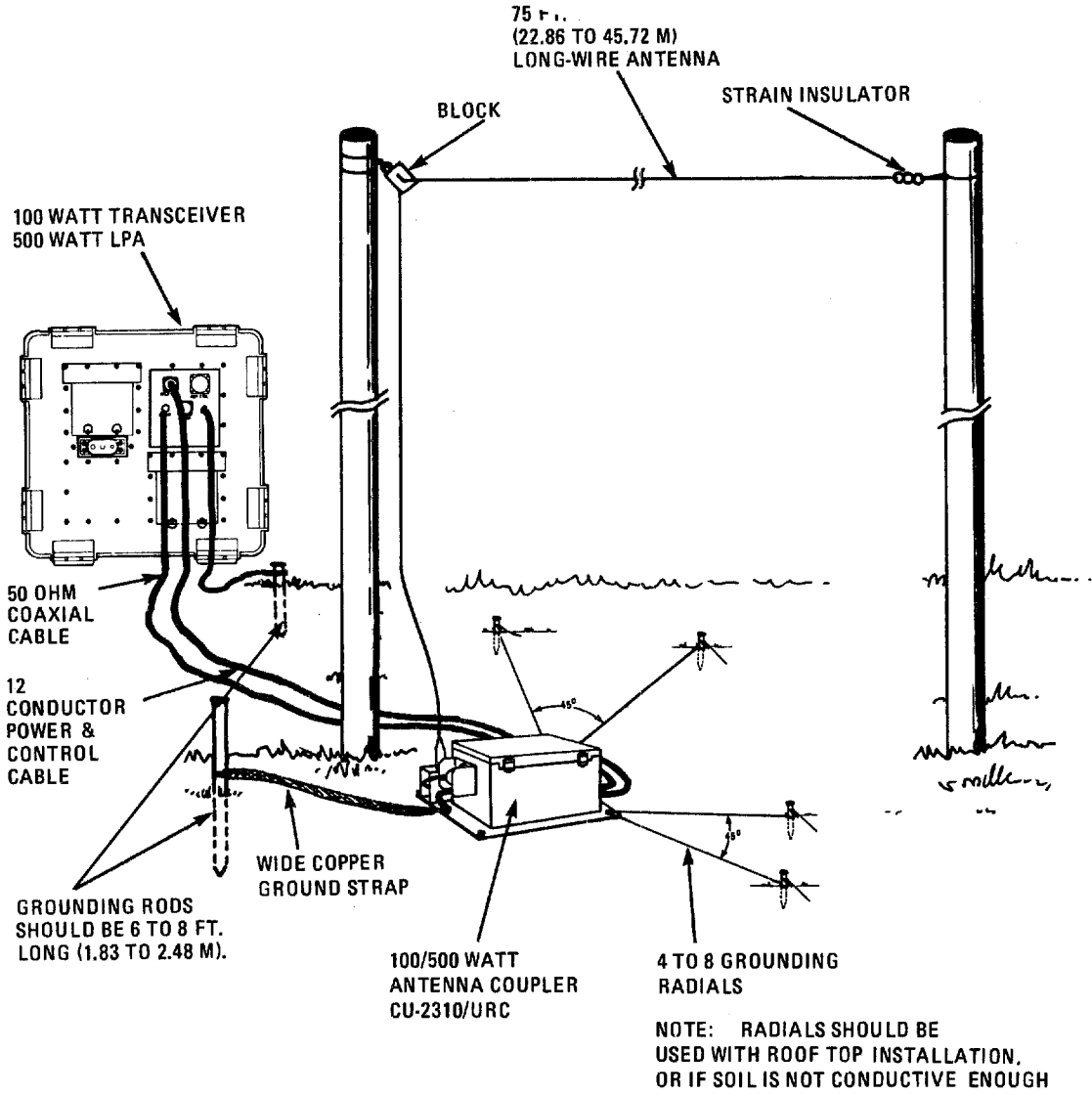
Before applying power, the 100 Watt Transceiver, 500 Watt LPA, and Remote Control Unit should be configured for the applied primary voltage, as specified in their respective manuals (these are listed in section f, j, and k of this manual). Also, the 115/230 Vac selector switch (A1A1S1 on the Interface PWB Assy inside the rear end bell of the Unit 1 Assy) should be set to match the applied line voltage.

f. Connect one of the six foot cable stubs to J1 on the system power switch box on the Remote Control Unit. Connect the other six foot cable stub to J2 on the rear end bell of the Unit 1 case. A patch cable or cables of



121-003

Figure 2-3. Typical Whip Antenna Installation



121-004

Figure 2-4. Typical Long Wire Antenna Installation

the type 407L (as shown in table of items required but not supplied) will be required to go between the two cable stubs.

(1) Refer to 100 Watt Transceiver Manual T.O. 31R2-2URC-81 for information to open unit and perform a check on Power Supply Strapping, Telephone Patch Strapping, CW Sideband Selection, and Sideband Selection, and that the Remote Control PWB is in place.

(2) The Baud Rate Select Switch and the Remote Interface Select Switch are set for EIA Standard RS-422 operation and 9600 baud in both the Remote Control Unit and 100 Watt Transceiver. The switches are located on the Remote Control Interface PWB Assembly, in the 100 Watt Transceiver, and on the Audio/Microprocessor PWB Assembly, in the Remote Control Unit. (Refer to Section 6-10 of 100 Watt Transceiver Manual T.O. 31R2-2URC-81 and Section 6-10 of Remote Control Unit Manual T.O. 31R2-2URC-91).

(3) 2 Wire/4 Wire PATCH Select Switch and 2 Wire/4 Wire LINE Select Switch settings on the Audio Interface PWB Assembly, mounted in the 100 Watt Transceiver, are set for 2 Wire operation and must match the settings for the corresponding switches on the Audio Interface PWB Assembly mounted in the Remote Control Unit. (Refer to Section 6-27 of 100 Watt Transceiver Manual T.O. 31R2-2URC-81 and

Section 6-12 of Remote Control Unit Manual T.O. 31R2-2URC-91.)

j. Configuration for the 500 Watt LPA.

(1) Refer to section 2-9 of 500 Watt LPA Manual T.O. 31R2-2URC-101 for information to open unit and set Primary Voltage Switch Settings.

k. Configuration Strapping for the Remote Control Unit.

(1) Refer to Remote Control Unit Manual T.O. 31R2-2URC-91 for Site Considerations, Equipment Strapping and Power Supply Strapping.

l. Configuration for The 100/500 Watt Antenna Coupler.

(1) No special strapping is required for the 100/500 Watt Antenna Coupler, since it receives its power from the 100 Watt Transceiver; however, a check of the operation of the Antenna Coupler should be made. Refer to Chapter 3 of 100/500 Watt Antenna Coupler Manual T.O. 31R2-2URC-111.

m. Power for the Remote Control Control Unit, described in Remote Control Manual T.O. 31R2-2URC-91, should be applied with the ac power cable furnished in the Remote Control Unit carrying case.

CHAPTER 3

PREPARATION FOR USE AND RESHIPMENT

3-1. INTRODUCTION. This chapter provides information for preparation for use of the equipment and preparation for reshipment. Section I, Preparation For Use, describes the initial control settings for the equipment and sequence of applying power to the equipment. Section II, Preparation For Reshipment, describes the disassembly and packaging for reshipment.


WARNING

Dangerous voltages exist in this radio equipment. Before removing any cover, disconnect primary power.

Section I. PREPARATION FOR USE

3-2. INITIAL CONTROL SETTINGS. This section details the initial control settings prior to the application of power.

a. 100 Watt Transceiver. It is assumed that the 100 Watt Transceiver is correctly connected and configured as described in Chapter 2 of this manual. Note that all controls are on the front panel of the 100 Watt Transceiver. Initial settings of these controls should be as listed in Table 3-1 of 100 Watt Transceiver Manual T.O. 31R2-2URC-81, except that the POWER switch should be in the ON position.

b. 500 Watt LPA. It is assumed that the 500 Watt LPA is correctly connected and configured as described in Chapter 2 of this manual. Note that all controls, except the circuit breakers, are on the front panel of the 500 Watt LPA. Initial settings of these controls should be as listed in Table 3-2 of 500 Watt

LPA manual T.O. 31R2-2URC-101, except that the POWER switch should be in the ON position.

c. 100/500 Watt Antenna Coupler. The 100/500 Watt Antenna Coupler does not have any external controls. All control of the 100/500 Watt Antenna Coupler is effected from the front panel of the associated 100 Watt Transceiver or from the front panel of an associated Remote Control Unit.

d. Remote Control Unit. It is assumed that the Remote Control Unit is correctly connected and configured to be compatible with the 100 Watt Transceiver, as described in Chapter 2 of this manual. Note that all controls are on the front panel of the Remote Control Unit, except the SYSTEM PWR switch, which is located on a box on the side of the Remote Control Unit. Initial settings of the controls are listed in Table 3-1.

Table 3-1. Initial Control Settings for Remote Control Unit

Control	Initial Setting
1. Power (POWER)	Select OFF Position
2. Speaker (SPKR)	Select ON Position
3. Squelch (SQUELCH)	Select OFF (fully counterclockwise into detent position)
4. Audio (AUDIO)	Select minimum gain (fully counterclockwise position)
5. RF Gain (RF GAIN)	Select maximum gain (fully clockwise position)
6. SYSTEM PWR	Select OFF Position (On box on side of Remote Control Unit)

NOTE

If the system does not power up as described in the following paragraphs, refer to the troubleshooting flowchart, figure 6-1.

3-3. INITIAL POWER APPLICATION AND CHECKOUT.

With the individual equipment controls set to the initial positions described above and with the equipment deployed and connected as described in chapter 2, install and secure the end bells on the Unit 1 case. Then do the following:

- a. Open and latch the two vent doors on the rear end bell.
- b. Place the SYSTEM PWR switch (mounted to the box on the side of the Remote Control Unit) in the ON position. This applies power to the Unit 1 case.
- c. Set the POWER switch on the front panel of the Remote Control Unit to the ON position. The LCD display should light up, indicating channel, mode, frequency, etc. Also, the word "REMOTE" should be displayed.

NOTE

The word "REMOTE" indicates that a communication link has been established between

the Remote Control Unit and the 100 Watt Transceiver (in the Unit 1 case). If the word "REMOTE" does not appear, the Transceiver is probably not set for remote operation. To select remote operation, press [2ND], [REMOTE] on the Transceiver front panel.

If the message "LCU OFF" is displayed continuously, check to see whether the POWER switch on the 100 Watt Transceiver (in the Unit 1 case) is set to the ON position. If it is, check for a problem in the interconnecting cables.

- d. Press [2ND], [AMP PWR] on the Remote Control Unit's front panel. This turns on the 500 Watt LPA. (NOTE: If a dc primary power source is used, the 500 Watt LPA is bypassed.) The "AMP:STBY" indicator should come on, with the "STBY" part blinking for 3 minutes until the LPA warms up. If this indicator fails to come on, check to make sure that the POWER switch on the LPA front panel is set to ON. If the "LPA MAN" indicator comes on in addition to the "AMP:STBY" indicator, this means that the AUTO/MANUAL BAND switch on the LPA front panel is set to one of the manual bands. This switch must be set to the AUTO position.

- e. If all indications on the Remote Control Unit's front panel are normal, the system should be ready for use.

Section II. PREPARATION FOR RESHIPMENT

3-4. PREPARATION FOR RESHIPMENT.

After the Transportable Ground Station has been operated by the Remote Control Unit, turn off power. Disconnect cables between the Remote Control Unit and Unit 1. Disconnect cables between 100/500 Watt Antenna Coupler and Unit 1.

a. Unit 1. Close air intake and air exhaust ports in back end bell of Unit 1. Replace protective covers on connectors.

b. 100/500 Watt Antenna Coupler. Disconnect antenna from 100/500 Watt Antenna Coupler. Replace protective covers on connectors. Disconnect ground strap. Fasten 100/500 Watt Antenna Coupler (on its mounting plate) securely in

place in the Unit 2 transportable case.

c. Remote Control Unit. Replace Remote Control Unit and its ac power cable in its own transporting case. Place it in the back of Unit 2 transportable case, and fasten it securely in place with the straps provided.

d. Replace the two cable stubs used for connecting the Remote Control Unit, the two cables used for connecting the Antenna Coupler, and the ac power cable from the 100 Watt Transceiver in the bottom of Unit 2 transportable case.

e. Replace front and back end bells on Unit 2.

CHAPTER 4**OPERATION**

4-1. INTRODUCTION. The Transportable Ground Station is comprised of four standard equipments mounted in two weatherproof cases. They are the 100 Watt Transceiver RT-1446/URC, 500 Watt Linear Power Amplifier (LPA) AM-7223/URC, 100/500 Watt Antenna Coupler CU-2310/URC, and Remote Control Unit C-11329/URC. Discussion of each unit follows.

4-2. 100 WATT TRANSCEIVER. Operation of the 100 Watt Transceiver is covered in detail in Chapter 4 of 100 Watt Transceiver Manual T.O. 31R2-2URC-81.

a. Emergency Operation. Under certain emergency conditions, the 100 Watt Transceiver may still be able to function either at full performance or reduced performance. Refer to Section 4-35 of T.O. 31R2-2URC-81 for emergency operation information.

4-3. 500 WATT LINEAR POWER AMPLIFIER. Operation of the 500 Watt LPA, when used with the 100 Watt Transceiver, is covered in detail in the 500 Watt LPA Manual T.O. 31R2-2URC-101.

a. Emergency Operation. Failure of the 500 Watt LPA will cause it to go into a bypass mode. This allows the 100 Watt Transceiver to operate in its normal mode, without amplification to the 500 watt mode.

4-4. 100/500 WATT ANTENNA COUPLER. The 100/500 Watt Antenna Coupler has no external operating controls or indicators. Its operation is automatically performed upon initiation of control signals from the associated 100 Watt Transceiver. For additional information on the 100/500 Watt Antenna Coupler, refer to T.O. 31R2-2URC-111.

a. Emergency Operation. If the 100/500 Watt Antenna Coupler has failed, the 100 Watt Transceiver is connected directly to the antenna and will indicate a BYPASS readout. This means that the antenna coupler has failed to tune. In antenna coupler bypass, much of the power will be reflected, due to impedance mismatch, and the 100 Watt Transceiver or 500 Watt LPA will reduce its output power level for equipment self protection. See Chapter 4 of 100/500 Antenna Coupler Manual T.O. 31R2-2URC-111 and Chapters 4 and 6 of 100 Watt Transceiver Manual T.O. 31R2-2URC-81 for additional operating and testing information.

4-5. REMOTE CONTROL UNIT. Information about operating controls for the Remote Control Unit can be found in Chapter 4 of Remote Control Unit Manual T.O. 31R2-2URC-91.

a. Emergency Operation. Under certain emergency conditions, the Remote Control Unit may still be able to function either at full performance or reduced performance. Refer to Section 4-32 of T.O. 31R2-2URC-91 for emergency operation information.

CHAPTER 5

THEORY OF OPERATION

5-1. INTRODUCTION. The AN/URC-121(V)-1 Transportable Ground Station consists of two transportable, environmentally protected cases, designated Unit 1 and Unit 2. The Unit 1 case contains a 100 Watt Transceiver (RT- 1446/URC) and a 500 Watt LPA (Linear Power Amplifier, AM-7223/URC). The Unit 2 case contains a 100/500 Watt Antenna Coupler (CU-2310/URC) and a Remote Control Unit (C-11329/URC). These cases also contain the necessary interconnecting cables and power distribution/control circuitry for the equipments inside. Since the theory of operation for each of these four equipments is contained in its corresponding on-equipment manual, this chapter will discuss only the circuitry which is external to these equipments; i.e., the interconnecting cables, the components on the rear end bell for the Unit 1 case, and the switch box mounted on the side of the Remote Control Unit. Figure 5-1 shows how the components of the system are connected together.

5-2. POWER-ON SEQUENCE. Before reading the following two paragraphs, you should familiarize yourself with these components:

A1K1, A1K2 These are the two large power distribution relays mounted on the Interface Assy. The Interface Assy consists of an aluminum plate fastened to the inside of the rear end bell of the Unit 1 case which contains most of the power distribution and control circuitry for the system. A1K1 is the dc power distribution relay, and A1K2 is the ac power distribution relay.

A1A1K1, A1A1K2 These are the two small power control relays on the Interface PWB Assy (A1A1), a circuit board mounted to the Interface Assy (A1).

System Power Switch This is a toggle switch mounted to the Remote Power Switch Assembly on the side of the Remote Control Unit. This switch allows power to be

distributed to the equipments in Unit 1 and to the antenna coupler.

A1A1S1 This is the ac power selector switch. It is mounted on the Interface PWB Assy and has two positions: 115 V and 230 V. The switch setting should match the ac line voltage applied to the system.

Interlock Switches A1S1, A1S2 These switches are mounted on the Interface Assy. They close when the air exhaust and air intake doors on the back of the Unit 1 case are latched in the open position.

A1A1CR1, A1A1CR2 These are the rectifier diodes at the output of A1A1T1.

A1A1CR3, A1A1CR4 These diodes isolate the on-board dc power supply from the external dc source voltage, but at the same time allow either voltage to be routed to the system power switch and to the contacts of power control relay A1A1K2.

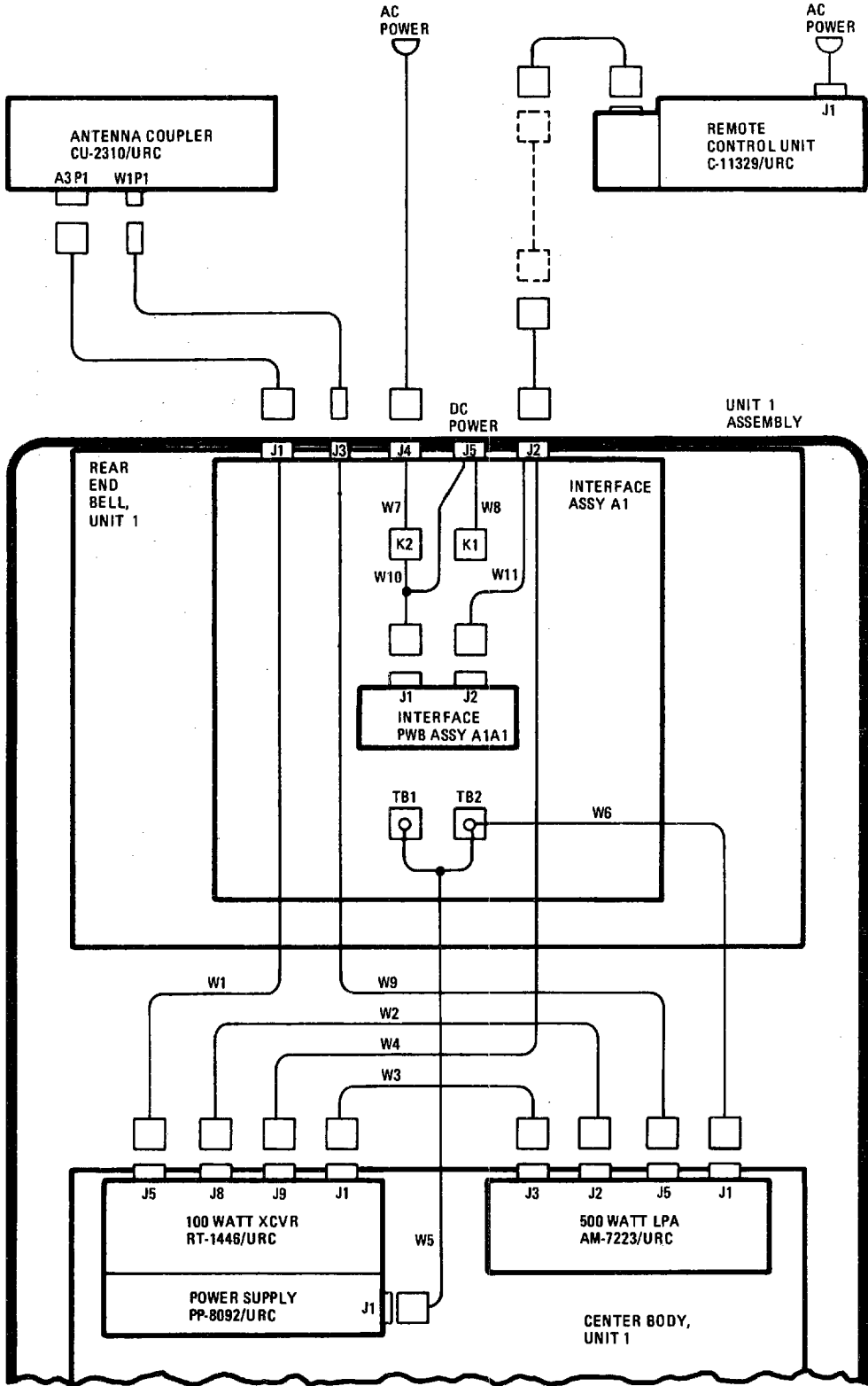
A1A1C1 This is the filter capacitor at the output of A1A1CR1 and A1A1CR2.

A1TB1, A1TB2 These are the two terminal strips at the output of the power distribution relays, and they are mounted on the Interface Assy. A1TB1 (dc) has ten terminals; A1TB2 (ac) has four terminals.

A1B1 This is the fan motor, which is mounted on the Interface Assy.

Refer to figure FO-3 during the following discussions.

a. AC Power-On Sequence. When the ac power cord is connected between J4 at the back of the Unit 1 case and an ac power source, ac voltage is applied



121-005

Figure 5-1. Interconnection Diagram for the AN/URC-121(V)-1 Transportable Ground Station

to the contacts of power distribution relay A1K2 and also to the primary of transformer A1A1T1. Depending on the position of ac selector switch A1A1S1, this voltage appears at either terminals 1, 2 and 3, 4 of A1A1T1 (for 115 Vac) or terminals 1 and 4 (for 230 Vac). The secondary of A1A1T1 is connected to a full-wave rectifier consisting of A1A1CR1 and A1A1CR2. The output of the rectifier is filtered by A1A1C1. This voltage is applied to the anode of A1A1CR3 and also across the coil of power control relay A1A1K1, which causes A1A1K1 to energize. (NOTE: When power control relay A1A1K1 energizes, power distribution relay A1K1 is prevented from energizing, because the path for its coil is opened by the contacts of power control relay A1A1K1. In other words, if an ac source and a dc source were simultaneously connected to the system, the ac source would override the dc source.) From A1A1CR3, this voltage is routed through connector A1A1P7/J2 on the Interface PWB Assy to the system power-on switch, which is mounted in a box on the side of the Remote Control Unit. If this switch is closed, and if the two air door interlock switches A1S1 and A1S2 are closed, the dc voltage from A1A1CR3 energizes fan motor A1B1 and power control relay A1A1K2. With the contacts of power control relays A1A1K1 and A1A1K2 closed, dc voltage is applied to the coil of ac power distribution relay A1K2. This energizes A1K2 and allows ac voltage to be distributed to A1TB2. From A1TB2, the ac voltage is applied to power plugs P4 and P5, which connect to the Transceiver and LPA, respectively. If the power switches on the individual equipments are all in the on position, the system should begin to

power up. (NOTE: The system power switch mounted on the side of the Remote Control Unit does not control the power for the Remote Control Unit. The Remote Control Unit has its own power cord and can be turned on or off only by the power switch on its front panel.)

b. DC Power-On Sequence. When a dc power cord is connected between J5 at the back of the Unit 1 case and a dc power source (+28 Vdc nominal), the dc voltage is applied to the contacts of power distribution relay A1K1 and to the anode of A1A1CR4 through connector A1A1P6/J1. From A1A1CR4, this voltage is routed through connector A1A1P7/J2 on the Interface PWB Assy to the system power-on switch, which is mounted to a box on the side of the Remote Control Unit. If this switch is closed, and if the two air door interlock switches A1S1 and A1S2 are closed, the dc voltage from A1A1CR4 energizes fan motor A1B1 and power control relay A1K2. With the contacts of A1K2 closed, dc voltage is applied through A1A1P7/J2 to the coil of the dc power distribution relay A1K1. This energizes A1K1 and allows dc voltage to be distributed to A1TB1. From A1TB1, the dc voltage is applied to power plug P4, which connects to the Transceiver. If the power switches on the individual equipments are all in the on position, the system should begin to power up. (NOTE: When the system is connected to a dc power source, only the 100 Watt Transceiver is powered up. The 500 Watt LPA does not receive dc power and is therefore bypassed, allowing the rf signal to go directly from the 100 Watt Transceiver to the antenna coupler.)

CHAPTER 6

MAINTENANCE

WARNING

Voltages dangerous to life exist in this radio equipment. Before removing any covers, disconnect the primary power.

6-1. INTRODUCTION. For maintenance purposes, the AN/URC-121(V)-1 Transportable Ground Station may be divided into two sections. The first section consists of the equipments mounted inside the cases. The second section consists of the cases themselves and all the interconnecting cables, including the system power switch assembly, which is mounted to the side of the Remote Control Unit (but readily detachable). This division makes the AN/URC-121(V)-1 easy to troubleshoot and repair. If there is a problem in one of the individual equipments, it can be quickly isolated by running the system BIT test (BIT is an acronym for Built-In Test). For information on BIT, see the technical manual for the 100 Watt Transceiver. If there is a problem in the cases or the interconnecting cables, it will most likely result in a failure of the system to power up. If the system does power up, but there is a problem in one of the cables between the equipments, then the system BIT test should assist you in identifying the faulty cable. The following diagnostic procedures, therefore, are limited to the situation in which the system fails to power up, thereby preventing you from running the system BIT test.

6-2. POWER-ON SYSTEM DIAGNOSTICS. Before doing any troubleshooting, refer to chapter 5, Theory of Operation, for a detailed account of the power-on sequence for the AN/URC-121(V)-1. Then use the Power-On Fault Isolation Chart, figure 6-1, to isolate the cause of the problem.

6-3. REMOVAL/REPLACEMENT PROCEDURES. To gain access to the equipments, components, and cables inside the cases, turn the twist-lock fasteners counterclockwise and remove the end bells. The 100/500 Watt Antenna Coupler and the Remote Control Unit are normally deployed

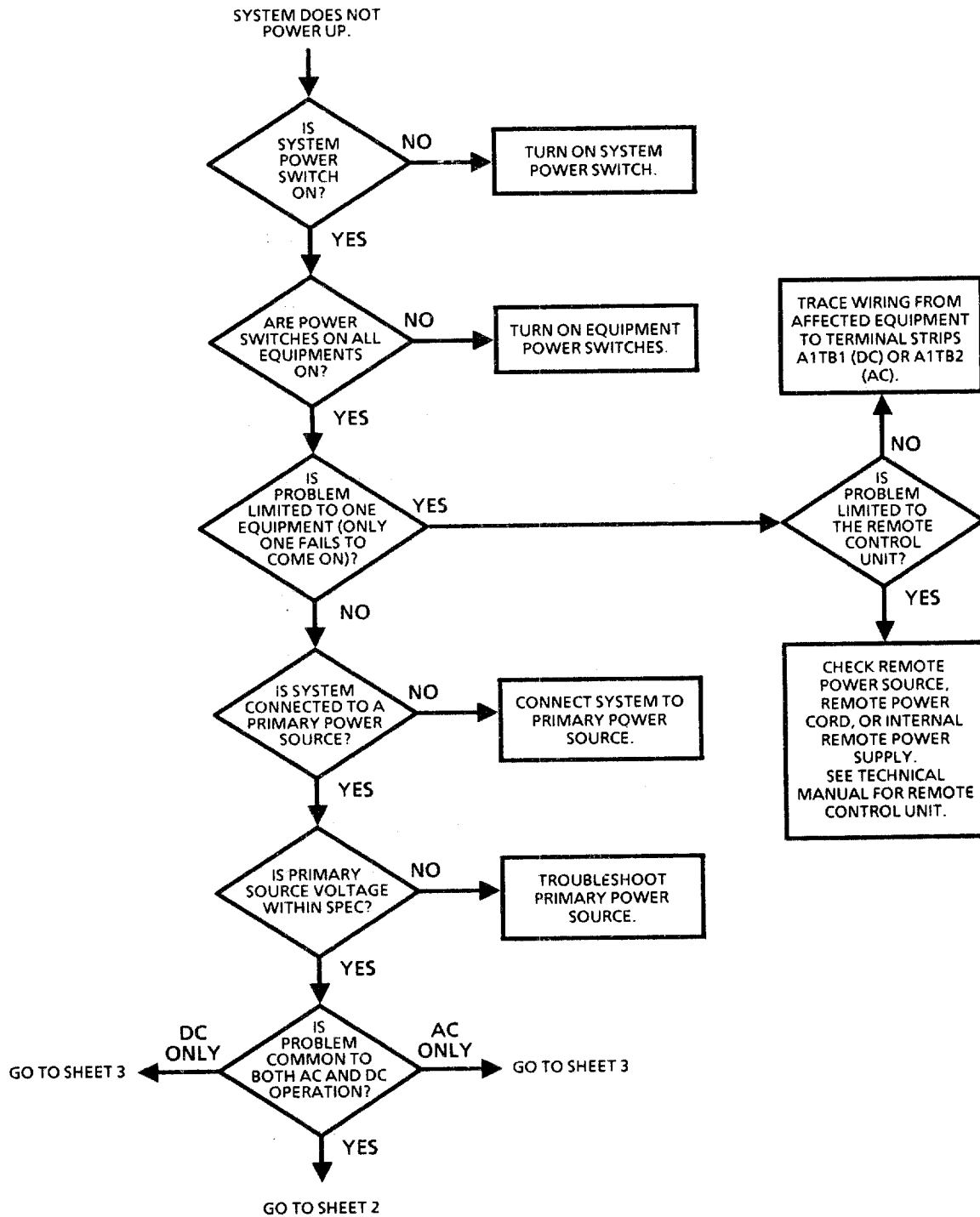
outside the cases, so they will be serviced in this condition. The 100 Watt Transceiver and the 500 Watt Linear Power Amplifier, however, may be serviced while they are inside the cases. To gain access to these equipments, you must first remove the facing screws from their retaining brackets. The 100 Watt Transceiver and its power supply must be pulled out as a unit. Therefore, you must remove the four facing screws from the power supply's retaining brackets, as well as the four facing screws from the 100 Watt Transceiver's retaining brackets.

WARNING

Before pulling the 100 Watt Transceiver or the 500 Watt Linear Power Amplifier out on its slides, make sure that you have the support rods fully extended and locked in front of the case (see figure 6-2). Otherwise, the case may tip over, causing damage to the equipment and possible injury.

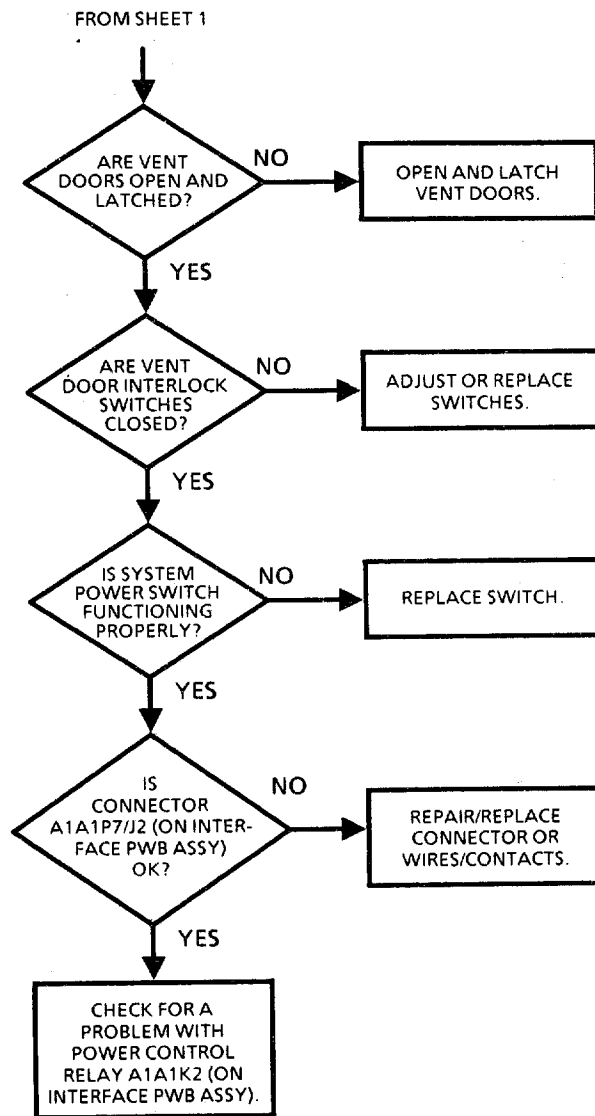
The slides will automatically lock when the equipment is pulled out to the limit of its travel. The equipment may now be serviced from this position. To push the equipment back into its case, you must first press the buttons in the slides on either side of the equipment. If you need to remove the equipment completely from the case, use the following procedure:

- (1) Disconnect any cables from the back of the 100 Watt Transceiver and 500 Watt LPA.
- (2) Slide the 100 Watt Transceiver forward until it reaches the stops on the drawer slides.



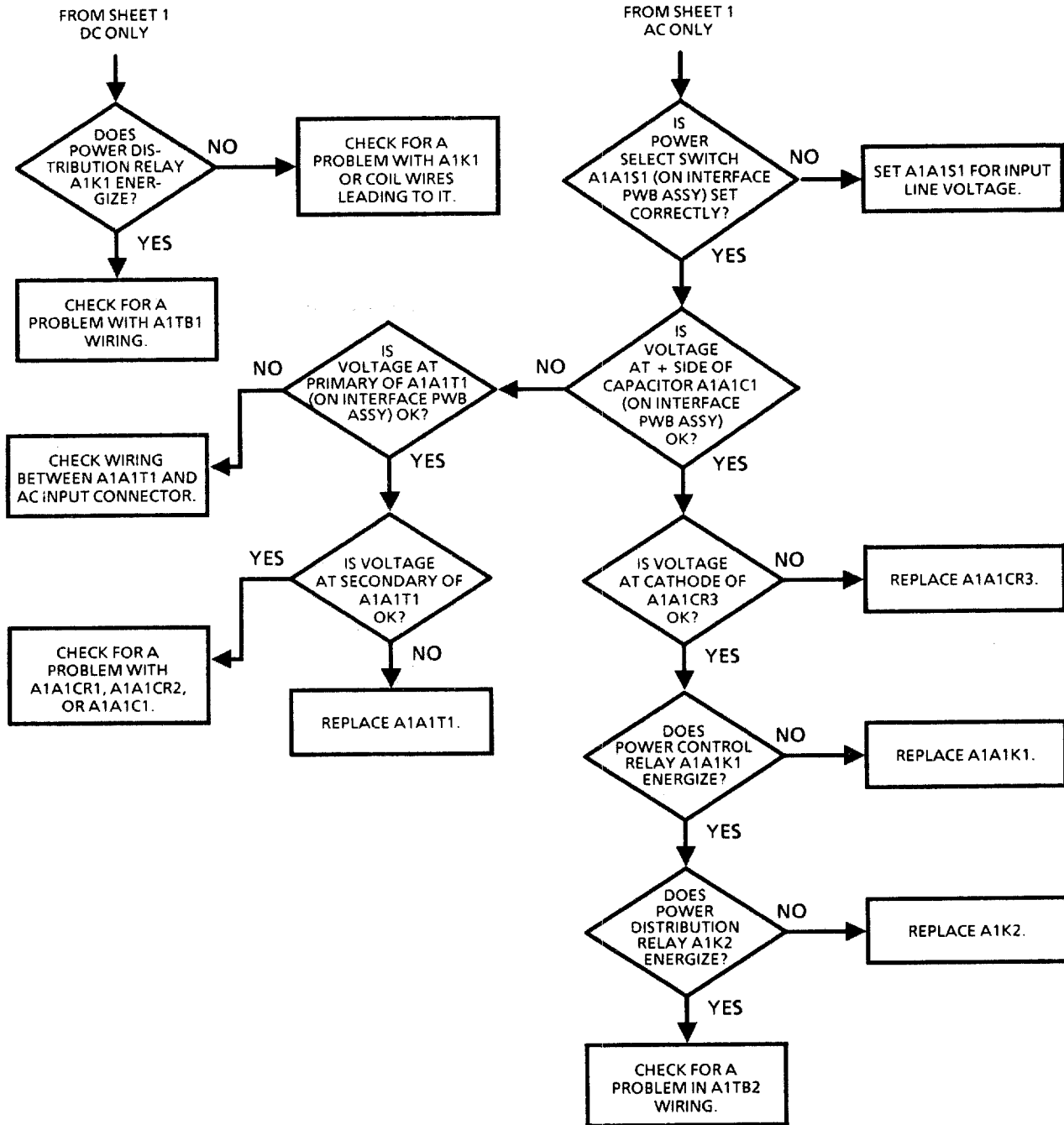
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Figure 6-1. Power-on Fault Isolation Chart (Sheet 1 of 3)



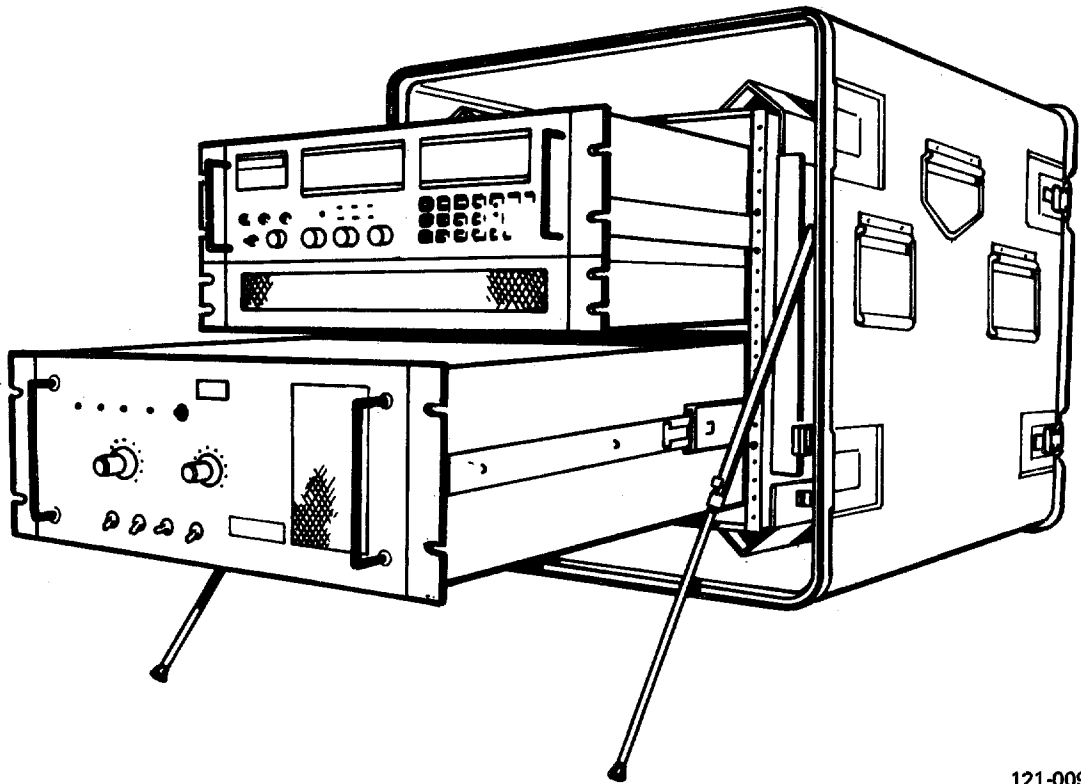
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Figure 6-1. Power-on Fault Isolation Chart (Sheet 2 of 3)



* 121-008

Figure 6-1. Power-on Fault Isolation Chart (Sheet 3 of 3)



121-009

Figure 6-2. Unit 1 Case, Equipment Extended

T.O. 31R2-2URC121-1

- (3) Depress the stops near the back end of the slides through the opening in the slides.
- (4) Carefully continue to slide the 100 Watt Transceiver forward and support it while removing it from the case.
- (5) Remove the 500 Watt LPA in the same manner.
- (6) If you are going to replace these equipments with new ones, remove the slides and the slide mounting brackets from the old equipments and mount them to the new equipments.

Tool List

Screwdrivers:

3/16-inch flat blade (4 inches long)
No. 1 Phillips
No. 2 Phillips
Phillips right-angle, ratchet (optional)

Wrenches:

6-inch adjustable
0.050-inch Allen

Nut Drivers:

3/16, 9/16, 1/4, 5/16 (optional)

Needle Nose Pliers (optional)

6-4. PREVENTIVE MAINTENANCE PROCEDURES. Clean the two air filters on the Unit 1 rear end bell every 14 days of 24-hour continuous equipment operation or sooner if the filters are noticeably soiled. Use soap and water; dry thoroughly before replacing. Preventive maintenance procedures for the individual equipments inside the cases may be found in chapter 6 of the individual equipment manuals.

6-5. ALIGNMENT PROCEDURES. There are no alignment procedures for the cases, interconnecting cables, and components external to the equipments inside the cases. Alignment procedures for the individual equipments may be found in chapter 6 of the individual equipment manuals.

CHAPTER 7

ILLUSTRATED PARTS BREAKDOWN

Section I. INTRODUCTION

7-1. PURPOSE. This chapter lists, illustrates, and describes the assemblies and detail parts for the AN/URC-121(V)-1 Transportable Ground Station. Its purpose is for the identification, requisitioning, and issuance of parts.

7-2. SCOPE. All the major assemblies and detail parts for the AN/URC-121(V)-1 Transportable Ground Station are listed in this chapter. In general, the assemblies and parts installed at the time the AN/URC-121(V)-1 Transportable Ground Station was manufactured are listed and identified. When an assembly or part (including vendor items), which is different from the original, was installed during the manufacture of later items, series, or blocks, all assemblies and parts are listed (and "Usable-On" coded). However, when the original assembly or part does not have continued application (no spares of the original were procured or such spares are no longer authorized for replacement), only the preferred assembly or part is listed. Also, when an assembly or part was installed during modification, and the original does not have continued application, only the preferred item is listed. Interchangeable and substitute assemblies and parts, subsequently authorized by the Government, are not listed in this chapter; such items are identified by information available through the Interchangeable and Substitute (I & S) Data Systems. Refer to T.O. 00-25-184. When a standard size part can be replaced with an oversize

or undersize part, the latter parts, showing sizes, are also listed. Repair Parts Kits and Quick Change Units are listed when they are available for replacement.

7-3. CHAPTER ORGANIZATION. This chapter is divided into two sections. Section I, INTRODUCTION, explains the purpose, scope, and organization of the chapter. Section II, MAINTENANCE PARTS LIST, consists of illustrations, in which the assemblies and detail parts of the AN/URC-121(V)-1 Transportable Ground Station are identified by numbers (called index numbers), followed by a list which contains parts numbers, descriptions, and other relevant data for the items identified on the illustrations.

7-4. SOURCE, MAINTENANCE, AND RECOVERABILITY (SMR) CODES. This chapter contains Air Force Peculiar In-Being Source and Repair Codes only. Definitions of these SMR codes, as well as detailed coding criteria and transposition matrices for each coding method may be obtained from T.O. 00-25-195.

7-5. FEDERAL SUPPLY CODES FOR MANUFACTURERS (FSCM). The codes used in this chapter are as follows. The first list is in numerical order by FSCM; the second is in alphabetical order by manufacturer name.

T.O. 31R2-2URC121-1

FSCM	NAME AND ADDRESS	FSCM	NAME AND ADDRESS
00287	CEM Company Incorporated	70983	Belden Corporation 2000 South Batavia Avenue Geneva, Illinois 60134
00779	Amp Incorporated 2800 Fulling Mill P.O. Box 3508 Harrisburg, Pennsylvania 17105	71468	TT Cannon Electric Division of ITT Corporati 10550 Talbert Avenue P.O. Box 8040 Fountain Valley, California 9270
02660	Bunker-Ramo Eltra Corporation Amphenol Division 2801 South 25th Avenue Broadview, Illinois 60153	74199	Quam Nichols Company 218 East Marquette Road Chicago, Illinois 60637
05236	Jonathan Manufacturing Company 1101 South Acacia Avenue Fullerton, California 92631	77342	AMF Incorporated Potter and Brumfield Division 200 Richland Creek Drive Princeton, Indiana 47671
06540	Mite Corporation Amatom Electronic Hardware Division 446 Blake Street New Haven, Connecticut 06515	77820	Bendix Elect. Comp. Division Sherman Avenue Sidney, New York 13838
06915	Richco Plastic Company 5825 North Tripp Avenue Chicago, Illinois	78553	Tinnerman Products Incorporate Cleveland, Ohio
08779	Signal Transformer Company Incorporated 500 Broadview Avenue Inwood, New York 11696	79061	Vaco Products 1510 Skokie Boulevard Northbrook, Illinois 60062
09353	C and K Components Incorporated 15 Riverdale Avenue Newton, Massachusetts 02158	81860	Barry Division of Barry Wright Co 700 Pleasant Watertown, Massachusetts 021
14304	Harris Corporation RF Communications Group 1680 University Avenue Rochester, New York 14610	82877	Rotron Incorporated Custom Division 7 Hasbrouck Lane Woodstock, New York 12498
25330	General Connector Corporation Subsidiary of the Union Corporation 80 Bridge Street Newton, Massachusetts 02158	83315	Hubbell Corporation 407 East Hawly Mundelein, Illinois 60060
27264	Molex 2222 Wellington Ct. Lisle, Illinois 60532	83330	Kulka Smith Incorporated A North American Phillips Comp 1913 Atlantic Avenue Manasquan, New Jersey 08736
51249	Heyman Company Waukesha, Wisconsin	86797	Rogan Corporation 3455 Woodhead Drive Northbrook, Illinois 60062

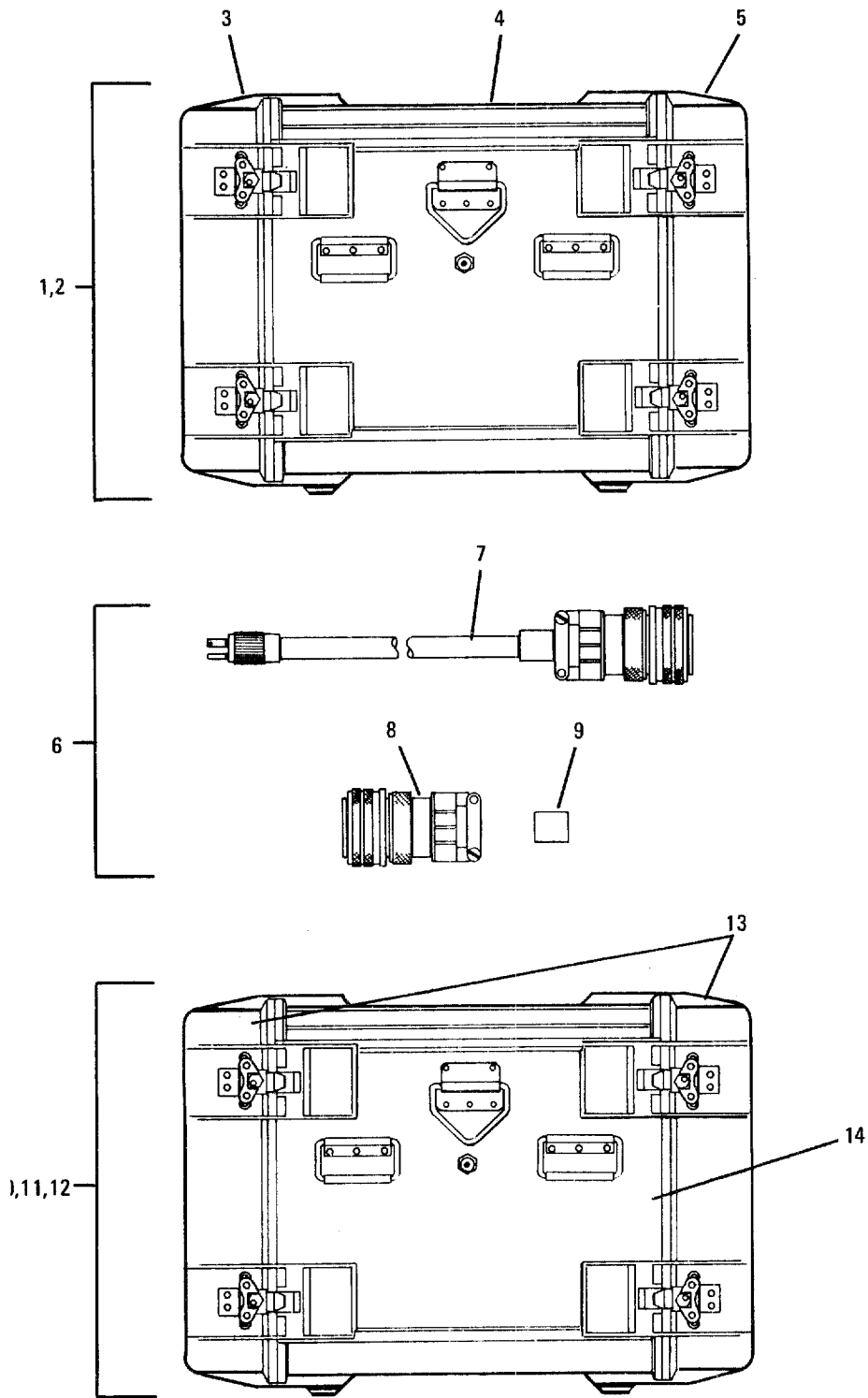
FSCM	NAME AND ADDRESS	FSCM	NAME AND ADDRESS
86928	Seastrom Manufacturing Company Incorporated 701 Sonora Avenue Glendale, California 91201	95146	Alco Elect. Products Incorporated 1551 Osgood Street North Andover, Massachusetts 01845
91662	Elco A G & W Company Huntington Industries Port Huntington, Pennsylvania 16652	96906	Military Specification Code
92194	Alpha Wire Company 711 Ligerwood Avenue Elizabeth, New Jersey 07207	98003	Nielson Hardware Corporation 770 Wethersfield Avenue P.O. Box 568 Hartford, Connecticut 06141
		99392	Mepco/Electra Incorporated Roxboro Division 265 Industrial Drive P.O. Box 1223 Roxboro, North Carolina 27573

NAME AND ADDRESS	FSCM	NAME AND ADDRESS	FSCM
Alco Elect. Products Incorporated 551 Osgood Street North Andover, Massachusetts 01845	95146	Bunker-Ramo Eltra Corporation Amphenol Division 2801 South 25th Avenue Broadview, Illinois 60153	02660
Alpha Wire Company 711 Ligerwood Avenue Elizabeth, New Jersey 07207	92194	C and K Components Incorporated 15 Riverdale Avenue Newton, Massachusetts 02158	09353
AMF Incorporated Potter and Brumfield Division 200 Richland Creek Drive Princeton, Indiana 47671	77342	CEM Company Incorporated	00287
Amp Incorporated 2800 Fulling Mill P.O. Box 3508 Harrisburg, Pennsylvania 17105	00779	Elco A G & W Company Huntington Industries Park Huntington, Pennsylvania 16652	91662
Barry Division of Barry Wright Corporation 700 Pleasant Watertown, Massachusetts 02172	81860	General Connector Corporation Subsidiary of the Union Corporation 80 Bridge Street Newton, Massachusetts 02158	25330
Belden Corporation 2000 South Batavia Avenue Geneva, Illinois 60134	70983	Harris Corporation RF Communications Group 1680 University Avenue Rochester, New York 14610	14304
Bendix Electronic Components Division Sherman Avenue Sidney, New York 13838	77820	Heyman Company Waukesha, Wisconsin	51249

T.O. 31R2-2URC121-1

NAME AND ADDRESS	FSCM	NAME AND ADDRESS	FSCM
Hubbell Corporation 407 East Hawly Mundelein, Illinois 60060	83315	Quam Nichols Company 218 East Marquette Road Chicago, Illinois 60637	74199
ITT Cannon Electric Division of ITT Corporation 10550 Talbert Avenue P.O. Box 8040 Fountain Valley, California 92708	71468	Richco Plastic Company 5825 North Tripp Avenue Chicago, Illinois	06915
Jonathan Manufacturing Company 1101 South Acacia Avenue Fullerton, California 92631	05236	Rogan Corporation 3455 Woodhead Drive Northbrook, Illinois 60062	86797
Kulka Smith Incorporated A North American Phillips Company 1913 Atlantic Avenue Manasquan, New Jersey 08736	83330	Rotron Incorporated Custom Division 7 Hasbrouck Lane Woodstock, New York 12498	82877
Mepco/Electra Incorporated Roxboro Division 265 Industrial Drive P.O. Box 1223 Roxboro, North Carolina 27573	99392	Seastrom Manufacturing Company Incorporated 701 Sonora Avenue Glendale, California 91201	86928
Mite Corporation Amatom Electronic Hardware Division 446 Blake Street New Haven, Connecticut 06515	06540	Signal Transformer Company Incorporated 500 Broadview Avenue Inwood, New York 11696	08779
Molex 2222 Wellington Ct. Lisle, Illinois 60532	27264	Tinnerman Products Incorporated Cleveland, Ohio	78553
Nielson Hardware Corporation 770 Wethersfield Avenue P.O. Box 568 Hartford, Connecticut 06141	98003	Vaco Products 1510 Skokie Boulevard Northbrook, Illinois 60062	79061

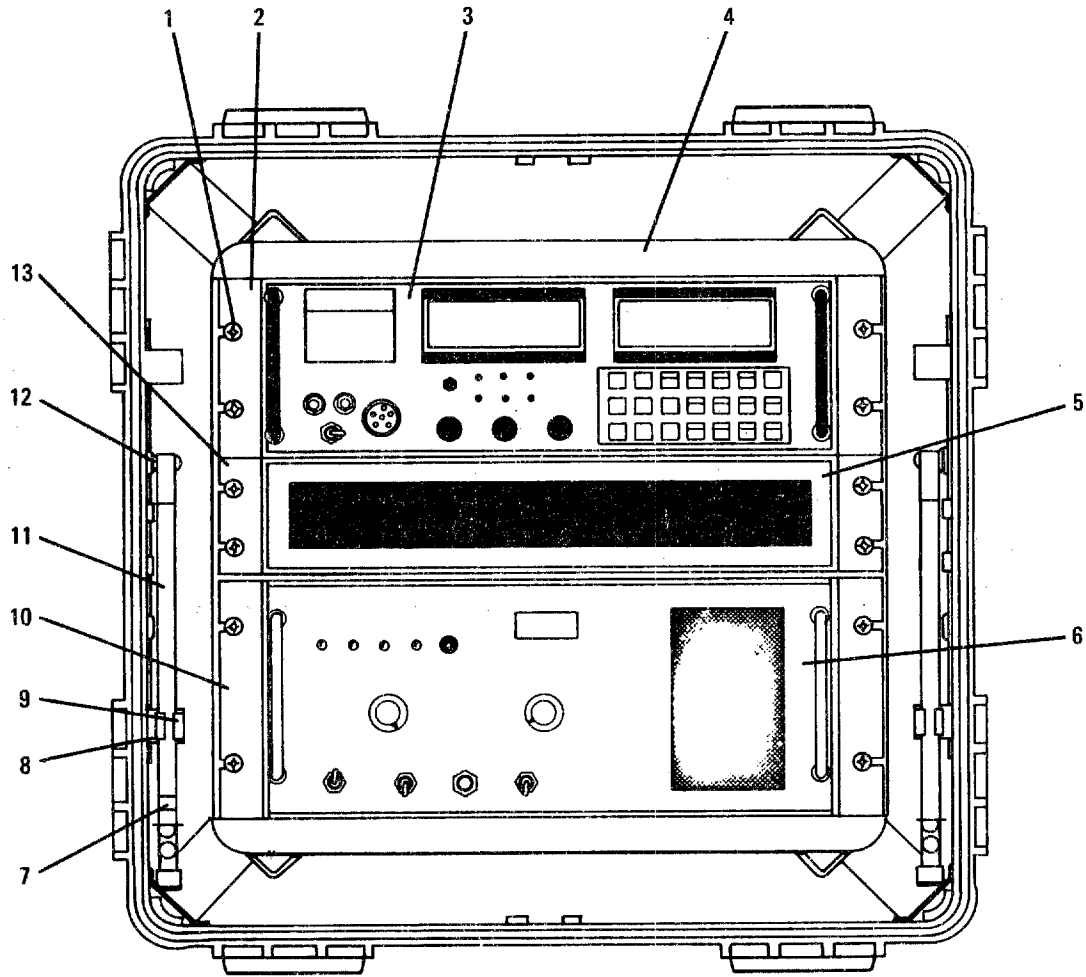
Section II. MAINTENANCE PARTS LIST



121-010

Figure 7-1. Transportable Ground Station, AN/URC-121(V)-1

FIG. & INDEX NO.	PART NO.	FSCM	DESCRIPTION 1 2 3 4 5 6 7	UNITS PER ASSY	USABLE ON CODE	SMR CODE
1 -	10197-0100	14304	TRANSPORTABLE GROUND STATION			PEODD
1	10197-2000	14304	. UNIT 1 ASSY (COMPLETE)	1		PEODD
2	10197-2090	14304	. . UNIT 1 CASE (W/O EQUIPMT)	1		XB
3	10197-2099-1	14304	. . . END BELL, FRONT	1		XB
4	10197-2099-2	14304	. . . CENTER BODY	1		XB
5	10197-2400	14304	. . . END BELL ASSY, REAR	1		XB
6	10197-0110	14304	. ANCILLARY KIT	1		XB
7	10197-2116	14304	. . CABLE ASSY, AC POWER	1		XB
8	MS3106F20-15S	96906	. . CONNECTOR	1		PAOZZ
9	MS3420-12A	96906	. . BUSHING	1		XB
10	10197-4000	14304	. UNIT 2 ASSY (COMPLETE)	1		PEODD
11	10197-4090	14304	. . UNIT 2 CASE (W/O EQUIPMT)	1		XB
12	10197-4099	14304	. . . UNIT 2 CASE (W/O HDWRE)	1		XB
13	10197-4099-1	14304 END BELL	2		XB
14	10197-4099-2	14304 CENTER BODY	1		XB



121-011

Figure 7-2. Unit 1 Assy, Front View