Chapter 4 Single-Channel Radios

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4-1
Section I. Frequency Modulated Radio Sets

AN/PRC-25
Radio Set

NSN: 5820-00-857-0759

Reference: TM 11-5820-398-12

General Information

The AN/PRC-25 is a short-range, manpack, portable frequency modulated (FM) transceiver that provides two-way voice communication. The RT-505 and RT-505A transceiver radios are similar components. Both case modules are identical; however, the internal module circuits of the RT-505A are micro-modularized. The modules of the two radios are physically and electrically interchangeable. The RT-505 and the RT-505A are part of the AN/PRC-25. They can be used as part of vehicular Radio Sets AN/VRC-53 and AN/GRC-125.

Technical Characteristics

Frequency Range ................................. Low band, 30.00 to 52.95 MHz; High band, 53.00 to 75.95 MHz
Power Output .................................. 1.1 to 2.0 W
Power Source ................................. Batteries, dry BA-4386/U and BA-398/U
Distance Range ................................ 5 to 8 km (3 to 5 mi)
Antenna ........................................ AT-892 semirigid tape,
........................................ AT-271A multisection whip,
........................................ RC-292 ground plane,
........................................ OE-254
Type of Service ................................. 30 K0F3E
Weight .......................................... 10.7 kg (23.5 lb) with battery
Limitation ........................................ Nonsecure operation
AN/PRC-25
Radio Set
FM 24-24

AN/PRC-77
Radio Set

NSN: 5820-00-930-3724
Reference: TM 11-5820-667-12

General Information

The AN/PRC-77 is a manpack, portable FM transceiver used to provide short-range, two-way radiotelephone voice communication. It can provide secure voice (X-mode) transmission with the TSEC/KY-57. The radio consists of RT-841/PRC-77 transceiver and minor components. The RT-841 also is used as part of Radio Sets AN/VRC-64 and AN/GRC-160.

Technical Characteristics

Frequency Range ....................................................... Low band, 30.00 to 52.95 MHz; High band, 53.00 to 75.95 MHz
Planning Range ...................................................... 8 km (5 mi)
Power Output ......................................................... 0 to 4.0 W
Power Source ......................................................... BA-4386/U, BA-398/U or BA55984
Antenna ................................................................. AT-892/PRL-24, at 271A/PRC multisection whip or doublet
Type of Service .................................................... 30K0F3E
Weight ................................................................. 10.7 kg (23.5 lb)
AN/VRC-12 Series
Radio Sets

NSN: 5820-00-223-7412
Reference: TM 11-5820-401-10-1
TM 11-5820-401-10-2

General Information

The radio sets in the AN/VRC-12 series are short-range, vehicular, aircraft, and fixed-station mounted units. They provide FM radiotelephone communication and can be used with speech security or digital data equipment TSEC/KY-8, or TSEC/KY-57 by connection through the X-mode facility of the radio sets. Transceivers RT-246 and RT-524 and Receiver R-442 make up the major components of the AN/VRC-12 series radio configuration. The RT-246 has 10 automatic presets and remote select/power capability. The RT-524 is equipped with a built-in loudspeaker.

Technical Characteristics

- Frequency Range: 30.00 to 52.95 (A-Band); 53.00 to 75.95 (B-Band)
- Planning Range: 8 to 41 km (5 to 25.5 mi)
- Power Input: Low power: 0.5 to 8 W, 25 V DC operating power; 0.5 to 10 W, 30 V DC operating power; High power: 35 W minimum, 25 V DC operating power
- Power Output: Low, 8W; high, 35 W
- Power Source: Vehicular power or Power Supply PP-2953 and Power Supply PP-665
- NRI Operation: Using AN/GSA-7, AN/GRA-39, or C-6709/G Antenna -- AT-912 or AS-1729, 3.05 m (10 ft) vehicular whip; OE-254/GRC or fixed RC-292 for installation; and AB-15 or AB-558, 3.35 m (11 ft) whip is used with R-442/VRC
- Tuning: Detent
- Squelch: 150 Hz tone and noise
- Type of Service: 30K0F3E
- Weight: 25.5 kg (56 lb), RT-246; 23 kg (51 lb), RT-524; 8.2 kg (18 lb), R-442
AN/VRC-12 Series
Radio Sets

AN/VRC-12

AN/VRC-43

AN/VRC-44
AN/VRC-12 Series Radio Sets (Cont.)

AN/VRC-45

AN/VRC-46

AN/VRC-47
AN/VRC-12 Series
Radio Sets (Cont.)

AN/VRC-48

AN/VRC-49

<table>
<thead>
<tr>
<th>NOMEN</th>
<th>RT-246</th>
<th>R-442</th>
<th>RT-524</th>
<th>C-2299</th>
<th>AT-912 OR AS-1729</th>
<th>AB-15 OR AB-558 WITH ANTENNA ELEMENTS</th>
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*When Radio Sets AN/VRC-45 and AN/VRC-49 are equipped with VINSON installation kits, the C-2299 is replaced by the C-10374/VRC.
AN/VRC-53, AN/VRC-64, AN/GRC-125, and AN/GRC-160 Radio Sets

NSN:
- 5820-00-223-7467 (AN/VRC-53)
- 5820-00-223-7475 (AN/VRC-64)
- 5820-00-223-7411 (AN/GRC-125)
- 5820-00-223-7473 (AN/GRC-160)

Reference TM 11-5820-498-12

General Information

The AN/VRC-53 and the AN/VRC-64 are vehicular mounted. The AN/GRC-125 and the AN/GRC-160 can be used for vehicular and manpack operations. Both variations of the radio sets provide short range, two way, FM radiotelephone communication between vehicles and crew served weapons (tanks, armored personnel carriers). The radio sets are compatible with other FM radio sets in 30.00 to 75.95 MHz range.

Technical Characteristics

Frequency Range. Low band, 30.00 to 52.95 MHz; High band, 53.00 to 75.95 MHz
Power Output. 1 to 3 W
Power Source. Batteries, dry BA-4386/U and BA-5598/U
Distance Range. 5 to 8 km (3 to 5 mi)
Antenna. Vehicular-mounted AS-1729/VRC, manpacked AT-892 semirigid tape, AT-271A multisection whip
Vehicular Operation. 24 V DC
Type of Service. 30 K0F3E
Weight. 15.5 kg (33.5 lb)
AN/VRC-53 and AN/VRC-64
Radio Sets
Single-Channel Ground and Airborne Radio Systems (SINCGARS) is a family of VHF-FM radio sets designed to meet the Army’s tactical communications requirements under the new Army operations doctrine. SINCGARS is replacing the AN/PRC-77 and the AN/VRC-12 series radio sets. It is designed for simple, quick operation using a 16-element keypad for push-button tuning. SINCGARS is capable of short-range or long-range operation for voice, frequency shift-keying (FSK), or digital data communications. It can be used for single-channel operation or in a jam-resistant, frequency hopping mode which can be changed as needed. SINCGARS has a built-in self test with visual and audio read back. Major components and equipment configurations are shown in the chart on the following page.

**Technical Characteristics**

- **Frequency Range**: 30 to 88 MHz
- **Number of Channels**: 2,320 (spaced every 25 kHz) includes eight channels that can be preset for single-channel operation or eight that can be preset for frequency hopping operation
- **Power Input**: 12 V DC, manpack; 28 V DC, vehicular/aircraft
- **Power Output**: 5 W, and up to 50 W with power amplifier
- **Antenna**: See the following chart
# SINCgars Radio Sets

## Table: SINCgars Components

<table>
<thead>
<tr>
<th>Version</th>
<th>Nomenclature</th>
<th>Function</th>
<th>Components</th>
<th>Replaces</th>
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<td>AN/PRC-119</td>
<td>Manpack</td>
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<td>AN/PRC-25, AN/PRC-77</td>
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<td>AN/VRC-53, AN/VRC-64</td>
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<td>AN/VRC-88</td>
<td>Vehicle, Short Range/</td>
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<td>AN/GRC-125, AN/GRC-160</td>
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<td></td>
<td>Dismount</td>
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<td>AN/VRC-89</td>
<td>Vehicle, Long Range/</td>
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<td>AN/VRC-12, AN/VRC-47</td>
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<td>Vehicle, Short Range</td>
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</tr>
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<td>(V5)</td>
<td>AN/VRC-90</td>
<td>Vehicle, Long Range</td>
<td>1 1 1 1</td>
<td>AN/VRC-43, AN/VRC-46</td>
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<td>(V6)</td>
<td>AN/VRC-91</td>
<td>Vehicle, Long Range/</td>
<td>2 1 2 1 1 1</td>
<td>AN/VRC-46 and AN/GRC-160</td>
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<td>Vehicle, Short Range/</td>
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<td>Dismount</td>
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<td>(V7)</td>
<td>AN/VRC-92</td>
<td>Dual/Vehicle, Long Range</td>
<td>2 1 2 2</td>
<td>AN/VRC-45, AN/VRC-49</td>
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</tbody>
</table>

Ancillary Items:
- Receiver-Transmitter RT-1439(P)/VRC
- Data Adapter MX-10506( )/VRC
- Electronic Counter-Countermeasure Module C-11290( )/VRC
- Intervehicular Remote Control Unit C-11291( )/VRC
Section II. Amplitude Modulated Radio Sets

AN/GRC-106 and AN/GRC-106A Radio Sets

NSN: 5820-00-402-2263 (AN/GRC-106)
      5820-00-223-7548 (AN/GRC-106A)

Reference: TM 11-5820-520-10

General Information

The AN/GRC-106 is an HF-single sideband (SSB) radio set used primarily as a mobile link in a communications network. It also may be used in fixed and semifixed applications, and it has an AM mode to make it compatible with standard AM radio sets. The AN/GRC-106 is now being used as the basic radio set with all of the newer SSB radio teletypewriter (RATT) configurations. The AN/GRC-106 and AN/GRC-106A are identical except that the AN/GRC-106 uses an RT-662/GRC, and the AN/GRC-106A uses an RT-834/GRC. The KY-99 is compatible with the AN/GRC-106 for secure operation.

Technical Characteristics

Frequency Range ......................................... 2.0 to 29.999 MHz (AN/GRC-106);
                                  2.0 to 29.9999 (AN/GRC-106A)
Planning Range ......................... Ground wave, 80 km (50 mi) (frequency depends on
                                  antenna and terrain); sky wave, 160 to 2,400 km
                                  (100 to 1,491 mi)
Number of Channels .................. RT-662: 28,000, spaced every 1 kHz;
                                  RT-834: 280,000, spaced every 100 Hz
Power Input .................................................. 27 V DC
Power Source ................................. Vehicle power system; to operate from 115 V AC,
                                  Power Supply PP-4763A must be used to provide
                                  the required 27 V DC
Power Output .................. 3K00R3E, 3K00J3E: 400 W PEP 1K10A1A,
                                  100HA1A: 200 W
Antenna ........................................ 4.57 m (15 ft) whip or doublet AN/GRA-50 Tuning,
                                  Digital receiver also has a ± 600 Hz vernier
Squelch ................................. Noise
Security Device .......................... TSEC/KY-65
Type of Service .................. 3K00J3E, 3K00R3E, 1K0013A1A, 1K10A1A
Weight ........................................... 58.1 kg (128 lb)
AN/GRC-106 and AN/GRC-106A Radio Sets

RT-662/GRC

RT-834/GRC

AM-3349/GRC 106
AN/GRC-109
Radio Set

NSN: 5820-00-892-0881
Reference: TM 11-5820-474-14

General Information

The AN/GRC-109 is a compact, portable high frequency (HF) radio set used for continuous wave (CW) communications under a wide range of climatic conditions. Transmissions can be made using the built-in hand key, an external hand key, or an external, high-speed automatic keyer such as Coder-Burst Transmission Group AN/GRA-71. Two power supplies and a voltage regulator permit operation from a variety of power sources. Current tactical speech security equipment is not compatible with the AN/GRC-109; therefore, secure voice is not a mode of operation.

Technical Characteristics

<table>
<thead>
<tr>
<th>Characteristic</th>
<th>Specification</th>
</tr>
</thead>
<tbody>
<tr>
<td>Frequency Range</td>
<td>Transmit, 3 to 22 MHz; receive, 3 to 24 MHz</td>
</tr>
<tr>
<td>Planning Range</td>
<td>121 km (75mi)</td>
</tr>
<tr>
<td>Number of Channels</td>
<td>24, crystal controlled</td>
</tr>
<tr>
<td>Power Input</td>
<td>75 to 260 V AC, 40 to 400 Hz or 6 V DC</td>
</tr>
<tr>
<td>Power Source</td>
<td>Any appropriate AC power source, generator DC G-43/G, 6 V DC wet or dry battery</td>
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<tr>
<td>Power Output</td>
<td>10 to 15 W</td>
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<td>Antenna</td>
<td>Inverted-L, length depending on the frequency</td>
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<tr>
<td>Tuning</td>
<td>Transmitter, crystal controlled; receiver, crystal controlled or continuous</td>
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<tr>
<td>Squelch</td>
<td>None</td>
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<td>Type of Service</td>
<td>Transmit, 100HA1A</td>
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<tr>
<td>Weight</td>
<td>25.2 kg (55.5 lb)</td>
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</table>
AN/GRC-109
Radio Set

PP-2684/GRC-109 POWER SUPPLY

PP-2685/GRC-109 POWER SUPPLY

T-784/GRC-109 RADIO TRANSmitter

R-1004/GRC-109 RADIO RECEIVER
**AN/GRC-193**

**High Frequency Radio Set**

**NSN:** 5820-01-133-4195

**Reference:** 11-5820-924-12

**General Information**

The AN/GRC-193 is a medium/high-power vehicular configuration of the Improved High Frequency Radio (IHFR) system. It will satisfy those mission requirements which need an HF radio capability greater than the low power/IHFR system. The high-power vehicular/airborne adaptive configuration consists of a basic receiver-transmitter with required coupling device, amplifier, and other ancillary devices for CW voice or teletype operation; near vertical incidence sky wave (NVIS) antenna, whip antenna, data I/O device, and external power sources. The radio will have the capability of selectable power (100 W, 400 W). Normal operation will be below 400 W. The AN/GRC-193 uses the KY-99 for securing voice traffic and the TSEC/KG-84 for securing data traffic. The antenna may be remoted up to 61 m (200 ft) from the radio set, using the antenna siting bit which is part of the basic configuration.

**Technical Characteristics**

- **Frequency Range:** 2 to 29.999 MHz, 100 Hz channel separation
- **Planning Range:** 2,500 miles (4,023.3 km)
- **Number of Channels:** 280,000
- **Power Input:** 115 V AC, 50 to 60 Hz, 24 V DC and 26.5 V DC, vehicular
- **Power Output:** Selectable power, 100 W, 400 W
- **Antenna:** AT-1011, 4.88 m (16 ft) whip, doublet, long-wire, AN/GRA-50, AS-2259 NVIS
- **Tuning:** Automatic digitally controlled remote
- **Remote Operation:** Up to 2 km (1.2 mi) using AN/GRA-39
AN/GRC-193
High Frequency Radio Set

AN-GRC-193A

AN-GRC-193B
AN/GRC-213
High Frequency Radio Set

NSN: 5820-01-128-3935
Reference: TM-11-5820-923-12

General Information

The AN/GRC-213 is a low-power manpack/vehicular configuration of the IHFR system. It provides a much needed, reliable, full HF coverage capability of 2 to 29,999 MHz to tactical commanders. It has a requirement to pass secure, command and control information over medium to long distances and over varying degrees of terrain features which would normally preclude the use of very high frequency (VHF)/FM combat net radios (CNR). Use of broadband or NVIS antennas enhances the communication capability of IHFR. The AN/GRC-213 consists of AN/PRC-104A (complete), audio amplifier and power conditioner, antenna switch (for use with long-wire antennas), and vehicular mounting tray to allow its installation in Army combat vehicles (tracked and wheeled). It gives the commander a complete low-power communications system.

Technical Characteristics

- Frequency Range: 2 to 29.999 MHz
- Number of Channels: 280,000 spaced at 100 Hz
- Power Input: Battery or 20 to 32 V DC power supply
- Power Output: 20 W
- Antenna: Whip AN/GRA-50, AS-2259
- Tuning: Automatic antenna tuning
- Modes of Operation: Voice, data, CW, LSB, USB
- Weight: 13.6 kg (30 lb)
- Secure Device: KY-99, future COMSEC
AN/GRC-213
High Frequency Radio Set
General Information

The AN/PRC-41 is a lightweight, portable VHF/ultra high frequency (UHF)-AM receiver-transmitter which permits manpack, fixed-station, or vehicular operation. The AN/PRC-41 and AN/PRC-41A are identical except that the AN/PRC-41A can provide secure voice (X-mode) operation when used in conjunction with Speech Security Equipment TSEC/KY-38. The X-mode operation is possible due to circuitry modifications made on the AN/PRC-41A model. The Special Cable CX-10831 is required to connect the TSEC/KY-38 to the AN/PRC-41A. The AN/PRC-41 uses RT-695, and the AN/PRC-41A uses RT-695A.

Technical Characteristics

Frequency Range .............................................. 225.0 to 399.9 MHz
Planning Range ............................................. LOS
Number of Channels ........................................ 1,750, spaced every 100 kHz
Power Input .................................................. 24 V DC
Power Source .............................................. Portable BA-451/U, vehicle power system, aircraft power system, any AC power source (PP-3700/PRC-41 is required to convert the AC voltage to 24 V DC) power
Power Output ............................................... 3W
Antenna ......................................................... AS-1404 or AS-1405
Tuning ......................................................... Detent, crystal controlled
Squelch ......................................................... Carrier
Type of Service .............................................. AN/PRC-41, 6K00A3E AN/PRC-41A, 80K0A3E (secure or nonsecure)
Weight ......................................................... 20 kg (44.6 lb)
Security Device .............................................. TSEC/KY-38
AN/PRC-41 and AN/PRC-41A Radio Sets
The AN/PRC-47 is an HF-SSB radio set which provides CW and upper sideband (USB) voice communications. It also provides FSK communication when operated with an FSK converter. The AN/PRC-47 may be used in portable, vehicular, or fixed-station applications, Current tactical speech security equipment is not compatible with the AN/PRC-47; therefore, secure voice is not a mode of operation.

**Technical Characteristics**

- **Frequency Range**: 2.0 to 11.999 MHz
- **Planning Range**: Refer to short and intermediate distance ground wave and sky wave propagation charts (FM 11-486-6)
- **Number of Channels**: 10,000, spaced every 1 kHz
- **Power Input**: 24 V DC, 26.5 V DC or 115 V AC, 400 Hz
- **Power Source**: BB-451/U, vehicle power system, any appropriate AC power source
- **Power Output**: High, 100 W PEP; low, 20 W PEP
- **Antenna**: AS-1320/PRC-47, whip; AS-1321/PRC-47, long-wire vehicular whip
- **Tuning**: Digital
- **Type of Service**: 3K00J3E, 1K00A1A
- **Weight**: 86.3 kg (190 lb)
AN/PRC-47
Radio Set

AS-1329/PRC-47
ANTENNA

RT-671/PRC-47
RECEIVER-TRANSMITTER
RADIO

CX-8395/PRC-47
CABLE ASSEMBLY,
POWER ELECTRICAL

MX-4430/PRC-47
ADAPTER,
BATTERY
TERMINAL

H-33G/PT
HANDSET

BB-451/U
BATTERY
STORAGE

4-25
AN/PRC-74
Radio Set

NSN:
5820-00-912-3991 (AN/PRC-74)
5820-00-926-7282 (AN/PRC-74A)
5820-00-935-0030 (AN/PRC-74B)
5820-00-177-1641 (AN/PRC-74C)

Reference:
TM 11-5820-590-12
TM 11-5820-590-12-1

General Information

The AN/PRC-74 is a low-power, transistorized, SSB radio set used for voice and CW communications. It is designed primarily as a manpack set in areas where direct line of sight (LOS) communications are not possible. Except for the difference in the frequency range of the AN/PRC-74B and AN/PRC-74C, all models are essentially the same. Current tactical speech security equipment is not compatible with the AN/PRC-74; therefore, secure voice is not a mode of operation. Coder-Burst Transmission Group AN/GRA-71 can be used with all lettered models.

Technical Characteristics

Frequency Range ................. 2.0 to 11.999 MHz (AN/PRC-74 and AN/PRC-74A); 2.0 to 17.999 MHz (AN/PRC-74B and AN/PRC-74C)
Planning Range ................. 40 km (25 mi) ground wave; refer to sky wave propagation chart to determine medium range, FM 11-486-6
Number of Channels ............... 10,000 spaced every 1 kHz (AN/PRC-74 and AN/PRC-74A); 16,000 spaced every 1 kHz (AN/PRC-74B and AN/PRC-74C)
Power Input ....................... 10.5 to 17 V DC, 12 to 31 V DC or 110/220 V AC
Power Source ...................... Battery (BA-30, 70 each or BB-418/U, 10 each); vehicle power system (requires PP-4514/PRC-74); any appropriate AC power source (requires use of PP-4514/PRC-74)
Power Output ...................... 15 W PEP
Antenna ......................... AS-1887/PRC-74, slanted wire and dipole
Tuning ........................... Detent
Type of service .................... -3 K00J3E, 100HA1A
Weight ............................ 18.8 kg (41.5 lb) with dry Battery BA-4386/U, two each; 13.4 kg (29.5 lb) with wet Battery BB-418/U, 10 each; 22.7 kg (50 lb) with PP-4514/PRC-74
AN/PRC-74
Radio Set
**AN/PRC-104A**

**High Frequency Radio Set**

**NSN:** 5820-01-141-7953

**Reference:** TM 11-5820-919-12

**General Information**

The AN/PRC-104A is a low-power vehicular configuration of the IHFR system. It provides a much needed, reliable, full HF coverage capability of 2 to 29.999 MHz to tactical commanders. It has a requirement to pass secure, command and control information over medium to long distances and over varying degrees of terrain features which would normally preclude the use of VHF/FM CNR. Use of broadband or NVIS antennas enhance the communication capability of IHFR. The AN/PRC-104A consists of a receiver-transmitter with up to 20 watts of power, the associated accessories (microphone, antenna, battery, backpack), and the appropriate secure device. The AN/PRC-104A has a frequency range of 2 to 29.9999 MHz in 100 Hz steps yielding 280,000 channels and operates in the USB, lower sideband (LSB), and CW modes. It provides the tactical commander with a complete low-power communications system.

**Technical Characteristics**

<table>
<thead>
<tr>
<th>Characteristic</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Frequency Range</td>
<td>2 to 29.999 MHz</td>
</tr>
<tr>
<td>Number of Channels</td>
<td>280,000 spaced at 100 Hz</td>
</tr>
<tr>
<td>Power Input</td>
<td>Battery or 20 to 32 V DC power supply</td>
</tr>
<tr>
<td>Power Output</td>
<td>20 W</td>
</tr>
<tr>
<td>Antenna</td>
<td>AN/GRA-50, AS-2259 NVIS</td>
</tr>
<tr>
<td>Tuning</td>
<td>Automatic antenna tuning</td>
</tr>
<tr>
<td>Mode of Operation</td>
<td>Voice, Data, CW, LSB, USB</td>
</tr>
<tr>
<td>Weight</td>
<td>6.36 kg (14 lb)</td>
</tr>
<tr>
<td>Secure Device</td>
<td>KY-99</td>
</tr>
</tbody>
</table>
AN/PRC-104A
High Frequency Radio Set
AN/PRC-112
Multi-Transmission Transceiver

* This radio is an over-the-counter commercial purchase obtained by the US Army.

NSN: 5820-01-279-5450

Reference: TM 11-5820-1037-13NP

General Information

The AN/PRC-112 is a technologically advanced, multi-transmission transceiver weighing only 28 ounces and can fit in the palm of your hand. The radio acts as a transponder, supplying ranging and personnel identification information. It also performs beacon and air-to-ground voice functions. Combined with an interrogator equipped avionics system, a user location can be accurately determined in range and bearing, out to 100 nm.

Technical Characteristics

Frequency Range .................................................. 121.5 MHz
225 MHz to 299.975 MHz

Available Channels ............................................. 3000 in 25 kHz steps

Frequency Stability ............................................. +/-5 ppm

Modulation Modes ............................................ AM voice AM swept-tone beacon
Transpond mode: BPSK/OOK

Operating Modes .............................................. Voice: any channel
Swept-tone beacon: 121.5 MHz and 243 MHz
DME transpond: any UHF channel

Weight ......................................................... 28 ounces or 0.79 kg with battery
AN/PRC-112
Multi-Transmission Transceiver
AN/PRC-112A(C)
Multi-Transmission Radio with Embedded
Communications Security

* This radio is an over-the-counter commercial purchase obtained by the US Army.

NSN: 5820-01-280-2117

Reference: Not available

General Information

The AN/PRC-112A(C) provides full voice encryption using Motorola’s field proven INDICTOR module. Designed for covert and hostile environment operations, the AN/PRC-112A(C) provides interoperability with key COMSEC devices including the Sunburst II Processor (AN/CSZ-1A) and VINSON (KY-57). Slightly larger than the standard AN/PRC-112, the AN/PRC-112A(C) will slip easily into uniform pockets, rucksacks and other transport compartments. The AN/PRC-112A(C) is an NSA endorsed, Type I secure voice, ground-to-air communications radio. A mode control switch selects between two key variables for secure voice, a zeroize-key function and a clear “plain text” voice mode. This radio will automatically receive and process clear “plain text” voice transmissions even when configured in a secure voice mode. The built-in transponder beacon supplies ranging and personnel identification information via the airborne AN/ARS-6 interrogator system.

Technical Characteristics

Frequency Range .................................................. 121.5 MHz
225 to 299,975 MHZ
Available Frequencies ................................. 3000 in 25 kHz steps
Frequency Stability ........................................... +/-5 ppm
Modulation Modes ............................... Secure--AM, 16 kb/s CVSD AM voice
AM swept-tone beacon
Transponder-BPSK/OOK
Operation Modes ........................ Secure voice--2 selectable key variables
Key variable zeroize switch Voice: clear
Sweep-tone beacon: 121.5 MHz and 243 MHz
DME transpond: any UHF channel
Weight ....................................................... 36.5 ounces or 1.0 kg (with battery)
AN/PRC-112A(C)
Multi-Transmission Radio with Embedded Communications Security
**General Information**

The AN/TRC-133A is a transportable, tactical HF, nonsecure SSB radio terminal set mounted in an S-280A type shelter. The shelter contains five radio positions which can be connected to separate doublet antennas provided as part of the radio terminal. Positions 1 and 2 can be operated with separated 15-foot whip antennas, which are used when the radio terminal set is needed for mobile operation and powered from the 28-volt DC vehicular electrical system. In addition, Radio Frequency Amplifier AM-3979/FRC-93 is provided to allow any one of the five positions to transmit on increased output power to extend the operating range of the position so selected. Current tactical speech security equipment is not compatible with the AN/TRC-133A; therefore, secure voice is not a mode of operation.

**Technical Characteristics**

<table>
<thead>
<tr>
<th>Type of Service</th>
<th>3K00J3E (selectable USB or LSB), 100HA1A, 1K10A1A</th>
</tr>
</thead>
<tbody>
<tr>
<td>Frequency Range</td>
<td>3.4 to 5.0 MHz and 6.5 to 30 MHz Planning Range</td>
</tr>
<tr>
<td>MHz Planning Range</td>
<td>Ground wave, 80 km (50 mi); sky wave, see intermediate sky wave propagation chart</td>
</tr>
<tr>
<td>Number of Channels</td>
<td>130, crystal controlled</td>
</tr>
<tr>
<td>Power Input</td>
<td>110 V AC, 60 MHz, single phase and 28 V DC (max) for mobile mode</td>
</tr>
<tr>
<td>Power Source</td>
<td>10 kW, Power Supply PU-619</td>
</tr>
<tr>
<td>Power Output</td>
<td>RT-718, 100 W PEP; RT-718 with AM-3979, 1,000 W PEP</td>
</tr>
<tr>
<td>Antenna</td>
<td>Quarter-wave whip or doublet antenna</td>
</tr>
<tr>
<td>Tuning</td>
<td>Continuous in 200 kHz bands using CK-31</td>
</tr>
<tr>
<td>Weight</td>
<td>2,272.2 kg (5,000 lb)</td>
</tr>
<tr>
<td>Limitation</td>
<td>Nonsecure operation</td>
</tr>
</tbody>
</table>
AN/TRQ-35(V)
Tactical Frequency Sounding System

General Information

The AN/TRQ-35(V) is an ionospheric sounding system that produces easy to understand ionospheric propagation statistics on a real-time basis. The system is used to minimize outages related to unpredictable changes of ionospheric characteristics and conditions. It is intended to improve frequency management and assignments of frequencies for HF communications systems, result in more effective and efficient use of the HF spectrum, and produce more reliable HF communications with improved grade of service. The AN/TRQ-35(V) system consists of the following stand-alone components.

Major Components

1 Receiver R-2081/TRQ-35(V)
1 Transmitter T-1373/TRQ-35(V)
1 Spectrum Monitor R-2093/TRQ-35(V)

Technical Characteristics

<table>
<thead>
<tr>
<th>Characteristic</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Frequency Range</td>
<td>2 to 30 MHz</td>
</tr>
<tr>
<td></td>
<td>or 2 to 16 MHz coverage after selection</td>
</tr>
<tr>
<td>Number of Channels</td>
<td>9,333</td>
</tr>
<tr>
<td>Channel Spacing</td>
<td>3.0 kHz</td>
</tr>
<tr>
<td>Power Input</td>
<td>115/230 V AC ± 10%, 47 to 440 Hz</td>
</tr>
<tr>
<td>Transmitted Power</td>
<td>0.2 W and 2 W from diplexer,</td>
</tr>
<tr>
<td></td>
<td>± 3 dB selectable by front panel switch;</td>
</tr>
<tr>
<td></td>
<td>10 W and 100 W nondiplexed output power,</td>
</tr>
<tr>
<td></td>
<td>± 3 dB</td>
</tr>
<tr>
<td>Weight</td>
<td>Transmitter 113.4 kg (250 lb) in case,</td>
</tr>
<tr>
<td></td>
<td>Receiver 79.4 kg (175 lb) in case,</td>
</tr>
<tr>
<td></td>
<td>Spectrum Monitor 79.4 kg (175 lb) in case</td>
</tr>
</tbody>
</table>

4-36
AN/TRQ-35(V)
Tactical Frequency Sounding System

R-2081/TRQ-35(V)

R-2093/TRQ-35(V)

T-1373/TRQ-35(V)
AN/VRC-24A and AN/TRC-68A Radio Sets

NSN: 5820-00-223-7413 (AN/VRC-24A)
      5820-00-892-3723 (AN/TRC-68A)

Reference: TM 11-5820-222-10

General Information

The AN/VRC-24A and the AN/TRC-68A are VHF/UHF-AM radio sets used for communications with aircraft in close support of ground operations. The AN/VRC-24A is designed for vehicular installation, and the AN/TRC-68A is designed for fixed installation. These radio sets will provide secure voice (X-mode) service when used in conjunction with Speech Security Equipment TSEC/KY-99.

Technical Characteristics

Frequency Range ........................................... 225.0 to 399.9 MHz
Planning Range ........................................... Approximately 50 km (31 mi)
with aircraft at 305 m (1,000 ft)
Number of Channels .................................... 1,750 with a channel every 100 kHz
Power Input ............................................... 24 V DC or 115/230 V AC, 50 to 60 Hz
Power Source ............................................. Vehicle power system, any appropriate AC power source
Power Output ............................................. 16 W
Antenna ..................................................... AN/VRC-24A, AT-803/VR (center-fed, broadband
vertical dipole) AN/TRC-68A, AT-197/GR (discone with two radiator assemblages)
Tuning ....................................................... Detent
Squelch ..................................................... Noise or carrier
Type of Service ......................................... 6K00A3E or 30K0A3E, X-mode operation
Weight ..................................................... AN/VRC-24A, 28.1 kg (62 lb),
                                              AN/TRC-68A, 70.4 kg (155 lb)
AN/VRC-24A and AN/TRC-68A
Radio Sets
Section III. Auxiliary Radio Equipment

AB-903/G
Mast

NSN 5985-00-933-2197
Reference: TM 11-5985-263-15

General Information

The AB-903/G is a cable-driven, lightweight, telescopic mast assembly. A crank handle attached to the winch assembly is used to raise or lower the mast. The mast raises antennas, such as Antenna AS-1729/VRC used for the AN/VRC-122 radio series, 30 feet above ground level. The mast may be setup on the ground or mounted on vehicles.

Technical Characteristics

Height Extended .............................................................. 8.9 m (29 ft, 3 in)
Number of Tubular Segments ............................................. 6
Weight ................................................................. 18.16 kg (40lb)
AB-903/G
Mast

- COUNTERPOISE ADAPTER ASSEMBLY
- UPPER GUY RING
- LOWER GUY RING
- WINCH ASSEMBLY
- BASE PLATE
- BASE CAP (UNDER MAST)
AN/GRA-6
Receiver-Transmitter Control Group

NSN: 5820-00-644-4554

Reference: TM 11-5820-489-34

General Information

The AN/GRA-6 provides local and remote control facilities for various push-to-talk radio sets. The control group has the means for controlling and operating a radio set using one or two transceiver amplifiers of the push-to-talk type from a position approximately 3.2 km (2 mi) away. The control group provides local control of the radio set through a continuous DC circuit. It provides two-way telephone communication and ringing between the remote and local control operators.

Technical Characteristics

Frequency Range .................................................. 300 to 3500 HZ
Planning Range .................................................. 3.2 km (2 mi), using WD-1/TT
Power Input ....................................................... 6 V DC and 45V DC
Power Source ..................................................... Battery BA-414/U (one each) and BA-30 (four each)
Type of Service .................................................. 30K0F3E
Weight ............................................................. 7.9 kg (17.5 lb)
AN/GRA-6
Receiver-Transmitter Control Group
AN/GRA-39, AN/GRA-39A, and AN/GRA-39B
Radio Set Control Groups

NSN: 5820-00-889-3860 (AN/GRA-39)
      5820-00-082-3998 (AN/GRA-39A)
      5820-00-949-9909 (AN/GRA-39B)

Reference: TM 11-5820-477-12

General Information

The AN/GRA-39 is a transistorized, battery-operated remote control system. It enables an operator to transmit and receive voice communication through a radio set from a distance up to 3.2 km (2 mi). A push-to-talk circuit permits the radio in the system to be operated by a local battery switchboard and the telephones connected to a local battery switchboard which permits NRI. The difference in models is the displayed call lamp, located on the front panel; the AN/GRA-39 model does not have this feature.

Technical Characteristics

- Frequency Range: 300 to 3500 Hz
- Planning Range: 3.2 km (2 mi) using WD-1/TT
- Power Input: 6.6 to 9.0 V DC
- Power Source: Battery BA-30, six each for C-2328 and C-2329
- Type of Service: 30K0F3E
- Weight: 9.6 kg (21.25 lb)
AN/GRA-39, AN/GRA-39A, and AN/GRA-39B
Radio Set Control Groups

C 2329

C-2328

REMOTE OPERATION

LINE BINDING POSTS C 2328 AN/GRA-39B
LINE BINDING POSTS C-2329 RT-524
RADIO CONNECTOR MIKE CONNECTOR

4-45
The AN/GRA-50 is a doublet antenna assembly designed to increase the communications distance of HF radio sets when in fixed or semifixed installation. The AN/GRA-50 can be used with any HF radio set that has the proper frequency range and a transmitter output power of less than 500 W and an output impedance of approximately 50 ohms.

**Technical Characteristics**

Frequency Range ........................................ 1.5 to 30 MHz  
Antenna Type ........................................... Half-wave doublet  
Weight ...................................................... 5.3 kg (11.75 lb)
AN/GRA-71
Coder-Burst Transmission Group

NSN: 5820-00-056-6856

Reference: TM 11-5835-224-12

General Information

The AN/GRA-71 is composed of an electromechanical Morse-code generator that enables an operator to record messages (in Morse-code characters) on magnetic recording tape. It has a keyer device to convert the tape-recorded Morse-code characters into equivalent electrical impulses for keying an associated transmitter and a keyer adapter device that contains the electronic circuitry for supplying power to the keyer unit and adapting its output to the transmitter.

Technical Characteristics

<table>
<thead>
<tr>
<th>Characteristic</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Power Input</td>
<td>Spring motor drive Keyer KY-468 and 6.3 V AC from transmitter to MX-4498</td>
</tr>
<tr>
<td>Power Output</td>
<td>Electrical signals for keying transmitter for 300 wpm</td>
</tr>
<tr>
<td>Weight</td>
<td>4.3 kg (9.5 lb)</td>
</tr>
</tbody>
</table>
General Information

The AN/GSA-7 is a small, lightweight, electronic switching device used to integrate FM radio equipment with local, push-to-talk, telephone circuits NRI. It permits the AN/GSA-7 operator to key the transmitter, and it automatically converts a 20-Hz telephone ringing signal to a 1600-Hz radio ringing signal and vice versa.

Technical Characteristics

Frequency Range ................................................................. 300 to 3500Hz
Planning Range ................................................................. 16 km (10 mi), using WD-1/T
Power Input ................................................................. 22 to 30 V DC or 115/230 V AC, 50 to 400 Hz
Power Source ................................................................. Vehicle power or AC power source
Type of Service ................................................................. 30K0F3E
Weight ................................................................. 12.5 kg (27.5 lb)
AN/GSA-7
Radio Set Control
AT-784/PRC
Loop Antenna

NSN: 5820-00-086-7651
Reference: TM 11-5985-284-15

General Information

The AT-784/PRC is a direction finder device which is used in conjunction with FM Radio Sets AN/PRC-77, AN/VRC-12 series, or their equivalents. It enables the operator to determine the direction of a transmitted radio signal. The AT-784/PRC is used for reception only.

Technical Characteristics

Frequency Range ........................................ 30 to 76 MHz covered in five bands
Planning Range ........................................... Depends on radio set used
Weight ................................................................. 1.1 kg (2.5 lb)
AT-784/PRC
Loop Antenna

AT-1082/PRC ANTENNA

CW-922/GRC
CAP, ELECTRICAL
RG-558/U
UG-88E/U

CG-3344/PRC
CABLE ASSEMBLY RADIO
FREQUENCY (5FT)

UG-89C/U
RG-55/U
UG-88E/U

CW-445/PRC
BAG, COTTON DUCK

CG-3344/PRC
CABLE ASSEMBLY RADIO
FREQUENCY (5FT)
AT-984A/G
Long-Wire Antenna

NSN: 5820-00-926-0201

Reference: TM 11-5820-398-12

General Information

The AT-984A/G is a multiple-wavelength long-wire antenna. It is used to extend the normal transmission and reception range of radio sets equipped with Receiver-Transmitters RT-505/PRC-25 and RT-841/PRC-77.

Technical Characteristics

Frequency Range: .......................................................... 30 to 76 MHz
Planning Range: ........................................... 19 km (12 mi), long-wire to whip antenna;
                                           28 km (17 mi), long-wire to long-wire antenna
Weight: ............................................................ 4.5 kg (10 lb)
C-6709/G
Control, Radio Set

NSN: 5820-00-930-3597

Reference: TM 11-5820-615-12

General Information

The C-6709/G is a single channel, solid-state NRI. The operator at the C-6709/G receives requests either from the radio link or the switchboard and establishes the interconnection. The C-6709/G can be used with automatic switchboards such as the AN/TTC-41(V), enabling a DTMF telephone subscriber to key and unkey the radio using the key sender on the telephone.

Technical Characteristics

Frequency Range ........................................... 300 to 7000 Hz
Planning Range ............................................ 4 km (2.5 mi)
Power Input .................................................. 22 to 30V DC
Power Source ............................................... Vehicle power
Type of Service ............................................. 30K0F3E
KY-90
Secure Digital Net Radio Interface Unit

NSN: 5895-01-166-3931
Reference: TB 11-5820-890-10-7

General Information

The secure digital net radio interface unit (SDNRIU) will permit calls between single-channel radios and telephone subscribers using either existing or programmed equipment. The SDNRIU is a replacement for the AN/GSA-7 presently used as an NRI unit.

Technical Characteristics

Components ........................................... Half-duplex to full-duplex converters
signaling equipment with COMSEC

Weight ................................................. 40 lb (18 kg)
Mounting ............................................ Shelter and Vehicle
OE-254() / GRC
Antenna Group

NSN: 5985-01-063-1574

Reference: TM 11-5985-357-13

General Information

The OE-254 is a general purpose, stationary, broadband, omnidirectional antenna used to extend the range of tactical FM radio sets. Under normal field conditions, the antenna will be mast mounted. Once installed, the OE-254 does not have to be taken down for adjustment when a new frequency band is assigned to the radio net.

Technical Characteristics

Frequency Range ................................................................. 30 to 88MHz
Planning Range ............................................................... 57.9 km (36 mi), average terrain;
                                                                 48.3 km (30 mi), difficult terrain
RF Power Capability ......................................................... 35 W nominal
Antenna Erection Time (one person) .................................... 15 minutes
Height Erected ................................................................. 12.8 m (42 ft)
Input Impedance to Radio .................................................. 50 ohms
Weight ................................................................. 20.4 kg (45 lb)
OE-254(/) GRC
Antenna Group

MAST SECTION A8-24
MAST SECTION MS117A
MAST SECTION MS116A

ANTENNA ASSY
AS-3166/GRC

41 FT 9 IN
(12.7 M)

33 FT 8 IN
(10.3 M)

MAST ASSEMBLY
AB-1244(/) GRC

CABLE ASSY, RF
CG-1889A/U 80 FT
(24 M)

CONNECTOR
ADAPTER
UG-349B/U

25 FT MAX
(7.5 M)
OE-303  
Half-Rhombic Very High Frequency Antenna

NSN: 5985-01-152-5845

Reference: TM 11-5985-370-12

General Information

The OE-303 is a high gain, lightweight, directional antenna that can operate over the frequency range of 30 to 88 MHz without having to be physically tuned by the operator. The antenna and all the ancillary equipment (guys, stakes, tools, mast sections, compass) are contained in two carrying bags for manpack or vehicular transportation. The antenna is oriented in the direction of desired transmission by using a compass and the appropriate map sheet as required. The Mast Assembly AB-1244 is the primary antenna support structure used with the Half-Rhombic VHF Antenna OE-303. Connections to the antenna and radio sets are made with connectors and cables provided with the antenna.

Technical Characteristics

Frequency Range ........................................... 30 to 88 MHz
Antenna Erection Time (two people) ......................... 20 minutes
Height Erected ............................................. 9.1 m (30ft)
Weight ......................................................... 20.4 kg (45 lb)
OE-303
Half-Rhombic Very High Frequency Antenna

DIRECTION OF DESIRED TRANSCEIVER STATION

NOTE: MATCHING TRANSFORMER CASE ACTS AS INSULATOR.
**RC-292**

**Antenna Equipment**

NSN: 5985-00-497-8554

Reference: TM 11-5820-348-15

**General Information**

The RC-292 is a general purpose, stationary, ground-plane antenna used to increase the transmission/reception range of tactical FM radio sets. The radiating and ground plane elements must be adjusted to the proper length for a particular operating frequency.

**Technical Characteristics**

- Frequency Range: 20 to 76 MHz
- Planning Range: Approximately twice the planning range of a radio set using a quarter-wave whip antenna
- Height Erected: 11.28 to 12.56 m (37 to 41.2 ft)
- Weight: Approximately 19.5 kg (43 lb)
RC-292
Antenna Equipment

![Antenna Diagram]

**EQUIPMENT CONFIGURATIONS**
**ANTENNA RC-292**

<table>
<thead>
<tr>
<th>Operating Frequency (MHz)</th>
<th>Antenna Sections Required</th>
<th>Type of Antenna Sections Used</th>
<th>Ground Plane Sections Required</th>
<th>Type of Ground Plane Sections</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>AB-21/GR</td>
<td>AB-22/GR</td>
<td>AB-23/GR</td>
</tr>
<tr>
<td>20.27.9</td>
<td>6</td>
<td>3</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>27.9-38.9</td>
<td>4</td>
<td>1</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>38.9-54.4</td>
<td>3</td>
<td>0</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>54.4-75.95</td>
<td>2</td>
<td>0</td>
<td>1</td>
<td>0</td>
</tr>
</tbody>
</table>