

# HARRIS RF-350 SERIES HF RADIO GROUP

## 100/500/1000 Watt • 1.6 to 30 MHz

The RF-350 Series HF Radio product line provides high-performance, long-range communications capability. It is designed to provide reliable, easily maintained, HF voice and data communications for fixed plant, transportable, shelter, and mobile stations. The transceiver, configured with a 500 watt or 1000 watt linear power amplifier, fulfills a wide range of communications requirements.

The RF-350 is a microprocessor-controlled transceiver, conservatively rated at 100 watts PEP and Average. The solid-state power amplifier assures continuous full-output power during keydown operation. All operating and metering functions of the transceiver are fully remote controllable over two- or four-wire phone lines. Additionally, the built-in phone patch and internally mounted AFSK option provide full communication flexibility.

The exceptionally rugged, industrial/military design and construction of the RF-350 system guarantees continuous high performance and reliability under demanding field conditions. Automatic diagnostic BITE provides board-level fault isolation for the entire system.

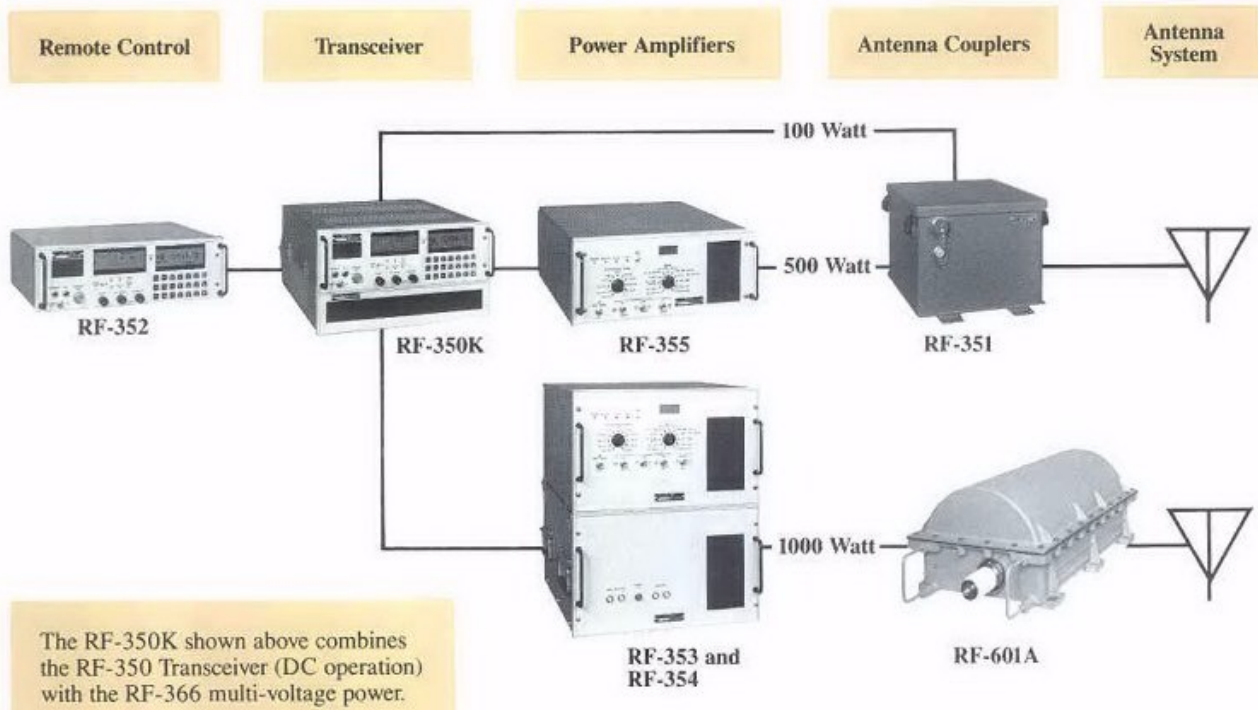
The RF-350 system is tuned by simply selecting a frequency (or preset channel) and keying. All other tuning functions, including linear power amplifier and antenna tuning, are performed automatically.



RF-350-05T

The versatility of the RF-350 Series allows for cost-effective, high-performance system integration. Systems providing 100, 500, and 1000 watt power output can be configured to meet a variety of demanding user requirements.

## RF-350 High Performance HF Transceiver Group



# RF-350 Series HF Transceiver Group



## RF-350 Transceiver

- 100 watts PEP/Average
- 1.6 to 30 MHz
- Microprocessor controlled
- Digital fine tuning
- 10 Hz synthesized steps
- Field programmable channelization
- All solid state
- Built-in optional FSK modem
- Built-in phone patch
- LCD display
- BFO
- Automatic tuning
- Modular construction
- Automatic diagnostic BITE
- RS-232C/422 computer control/interface



## RF-355 500 Watt Linear Power Amplifier

- Only 7 inches high
- 500 watt PEP/250 watt Average
- 110/220 VAC and optional 28 VDC
- Serial data interface control
- Continuous tuning, fully automatic
- Rack/stack mount
- Microprocessor BITE and control
- Rugged construction
- Manual tuning backup
- Fully protected into any load



## RF-353/354 1 kW Linear Power Amplifier

- 1 kW PEP/Average
- Serial data interface control
- Continuous tuning, fully automatic
- Rack/stack mount
- Microprocessor BITE and control
- Rugged construction
- Manual tuning backup
- Fully protected into any load



## RF-351 100/500 Watt Coupler

- 1.6 to 30 MHz
- 500 watt rating
- Fully automatic
- Matches 15- to 35-foot whips and 75- to 150-foot long wires
- Automatic long-wire adapter
- High VSWR protection



## RF-352 Remote Control

- Provides full control and monitoring of transceiver
- Remote BITE of entire system
- 9600 baud RS-232C/422 control interface allows control up to 1 mile
- Built-in 300 baud FSK modem for control over phone lines for unlimited separation
- Built-in phone patch

# AN/URC-121(V)

## SERIES

TRANSPORTABLE  
HF TRANSCEIVER SYSTEM



 HARRIS

# AN/URC-121(V) SERIES

**The AN/URC-121(V) Transportable HF System provides high-performance, long-range communications capability. It is designed to provide reliable, easily maintained, HF voice and data communications for transportable and mobile operation. The transceiver, configured with a 500-watt or 1000-watt linear power amplifier and remote control, fulfills a wide range of communications requirements.**

## System Features

- 100/500/1000 watts output power
- 1.6 to 30 MHz
- Microprocessor controlled
- Digital fine tuning
- 10 Hz synthesized steps
- 99 field programmable channels

The AN/URC-121(V) Transportable HF System is based on the RT-1446/URC, a microprocessor-controlled

transceiver, conservatively rated at 100 watts PEP and Average output power. The solid-state power amplifier assures continuous full-output power during keydown operation. All operating and metering functions of the transceiver are fully remote controllable over phone lines or computer interfaces. Additionally, the built-in phone patch and internally-mounted AFSK option provide communication flexibility. The unit is compatible with standard DOD secure communications devices, including ANDVT.

The exceptionally rugged design and construction of this system guarantee continuous high performance and reliability under demanding field conditions. Automatic diagnostic BITE provides board-level fault isolation for the entire system.

The AN/URC-121(V) Transportable HF Transceiver System is tuned by simply selecting a frequency (or preset channel) and keying. All other functions, including linear power amplifier and antenna tuning, are performed automatically.

## Upgrade All Your Long Range HF Radio Communications with a Product Line of Nomenclatured Equipment

The versatile AN/URC-121(V) HF System has been selected by the United States Department of Defense for a wide range of transportable applications, for large scale replacement of existing systems, as well as new communications requirements. It is electronically and mechanically designed to be compatible with existing networks and anticipated adaptive operating schemes to provide reliable, supportable, high-performance communications into the 21st century.

Operation of any system configuration is straightforward. Frequency, mode, and other operating characteristics can be operator selected or can be preset on up to 99 field-programmable channels. Tuning is as easy as selecting a frequency or channel and keying. All other tuning functions are automatic. An individual can become a qualified operator in a matter of minutes. System self-test and automatic diagnostic BITE make it simple to identify and locate problems in the field. Modular construction puts you back on the air when seconds count.

Operation and maintenance manuals, data, documentation, provisioning, and training packages provide all required levels of support from the field to the depot.



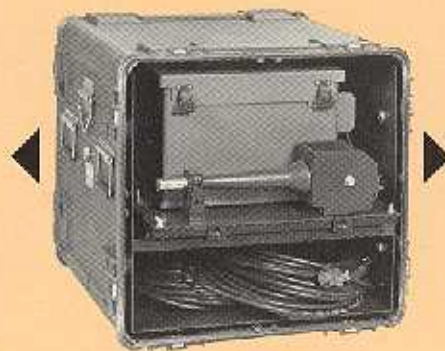
### Typical Application Features

- Demonstrated AFSK interface with Transportable Record Communications Terminal (TRCT).
- Demonstrated high-speed data transmission and reception up to 2400 bps (with RF-3466 High-Speed Data Modem and ANDVT).
- Adaptive HF with channel evaluation and selective call using RF-7110 AUTOLINK® Adaptive Controller.
- Built-in phone patch and VOX for operation to/from telephone lines.
- Interfaces with various record message devices such as AN/UGC-74, AN/UGC-129, and AN/UGC-141.
- Operates with various digital message entry devices (DMED) to provide burst communications capability.
- Demonstrated interface with COMSEC equipment such as Parkhill KY65/KY75 and Advanced Narrow-Band Digital Voice Terminal (ANDVT) CV-3591.

### AN/URC-121(V) System Configurations



The basic Transportable Ground System is designed for applications requiring a pre-wired, pre-configured system. The system is fully operational by removing the front and rear end bells.



The AN/URC-121(V) Antenna Coupler/Remote Control Deployment option provides storage for the antenna coupler, control and RF cables, and accessory remote control (when required).



The Adaptive Transportable Ground System provides full adaptive HF operation by incorporating the RF-7110-04 Adaptive Controller. This transportable AUTOLINK® system provides automatic link establishment, link quality analysis (LQA), and automated channel selection.



The Transportable Open Field option provides the versatility required for a fully-protected, open field system. The case housing the R/T and 500 Watt Power Amplifier is designed to environmentally protect the system when exposed to the elements. The second case contains the remote control, antenna coupler, coupler control, and RF cables, as well as interface cables for use with standard 407L cables provided by the government.



## Specifications for the AN/URC-121(V) Transportable HF Transceiver System

### RT-1446/URC 100 Watt HF Transceiver

#### General

Frequency Range ..... 1.6 to 30 MHz (10 Hz synthesized steps).  
 Power Output ..... 100 watt PEP/Average.  
 Channels ..... 99 front panel programmable channels.  
 Frequency Stability ..... 0.3 parts in 10<sup>6</sup>.  
 Power Input ..... 110/220 VAC ± 10% at 50 to 400 Hz, +28 VDC or +12 VDC.

#### RF Input/Output

Impedance ..... 50 ohms nominal unbalanced, capable of driving a 2:1 VSWR load.

Temperature ..... -30° to +50° C.

Tuning Time ..... Less than 10 msec.

Display ..... LCD.

#### Built-in Test

Diagnostics ..... Fault isolation to LRU/front-panel alphanumeric indication.

Emission Modes ..... A3J (single sideband, upper or lower); A3H (compatible AM); A2J (CW); AF5K.

Size ..... 8.75 H x 16.75 W x 20.0 D inches (22.2 H x 42.5 W x 50.8 cm).

Weight ..... 85 lbs. (38.6 kg).

Mounting ..... Rack, stack, or tactical case.

#### Transmitter

Power Output ..... SSB (A3J) 100 watt PEP/Average; compatible AM (A3H) 25 watt carrier nominal; CW (A2J) 100 watt PEP.

Overload Protection ..... Power amplifier is fully protected from mismatch, including an open or shorted antenna.

#### Carrier Suppression

(A3J Mode) ..... At least 50 dB below PEP output.

#### Intermodulation

Distortion ..... 33 dB below PEP.

#### Undesired Sideband

Suppression ..... 50 dB at 1 kHz.

Harmonic Suppression ..... 2nd 40 dB, 3rd 55 dB, 50-400 MHz 70 dB below PEP.

Audio Input ..... Either carbon or dynamic microphone; in addition, a 600 ohm input is provided.

Residual Noise Level ..... 50 dB below PEP.

#### Receiver

Sensitivity ..... SSB: 0.5  $\mu$ v for 10 dB SINAD.  
 AM: 3  $\mu$ v for 10 dB SINAD.

Audio Output ..... 4 watts to internal speaker.

Selectivity ..... SSB: nominally 350-3050 Hz at 3 dB.

Image and IF Rejection ..... Greater than 80 dB.

AGC Characteristics ..... Attack time: SSB 30 msec. max.  
 Release time: selectable 3 ± 1 sec.  
 200 ± 100 msec., 30 msec. max.

#### Intermodulation

Distortion ..... In-band third order: -50 dB or better for two equal -36 dBm signals falling within SSB filter.  
 Out-of-band third order: -60 dB or better for two equal 0 dBm signals falling at  $f_0$  ± 100 kHz and  $f_0$  ± 200 kHz.

Overload Protection ..... Receiver protected for input to 100 VRMS.

Spurious Responses ..... -80 dB.

\*FSK Modem Interface ..... MIL-STD-188-114 (low level).

\*Center Frequency and Shift ..... 2805 ± 42.5 Hz.  
 2000 ± 85 Hz.  
 2000 ± 425 Hz.

\*With optional AFSK module.

\*—AUTOLINK is a registered trademark of Harris Corp.

### AM-7223/URC 500 Watt HF Linear Power Amplifier and AM-7224/URC 1 kW Linear Power Amplifier with PP-7913/URC Power Supply

Frequency Range ..... 1.6 to 30 MHz.  
 RF Output Power ..... AM-7223/URC: 500 watt PEP and 250 watt Average.  
 AM-7224/URC with PP-7913/URC: 1000 watt PEP and Average.

Channel Change Time ..... 5 seconds nominal.

#### RF Drive Power

Required ..... 65 watts for full power output.

Output Impedance ..... 50 ohms.

Working VSWR ..... 2:1 self-protecting for any load.

#### Intermodulation

Distortion ..... Third order more than 33 dB down.

Harmonic Output ..... More than 40 dB down.

Input Power ..... AM-7223/URC: 110/220 VAC ± 10% at 50 to 400 Hz or +28 VDC.

AM-7224/URC with PP-7913/URC: 110/220 VAC ± 10% at 50 to 400 Hz.

Metering ..... Output power, grid current, plate current, and plate voltage.

Operating Temperature ..... -30 to +50° C.

Cooling ..... Forced air from internal blower.

Size ..... AM-7223/URC:

7.0 H x 16.75 W x 20.0 D inches (17.8 H x 42.5 W x 50.8 D cm).

AM-7224/URC:

10.5 H x 16.75 W x 20.0 D inches (26.7 H x 42.5 W x 50.8 D cm).

PP-7913/URC:

10.5 H x 16.75 W x 20.0 D inches (26.7 H x 42.5 W x 50.8 D cm).

Weight ..... AM-7223/URC: 77 lbs. (35.0 kg)

AM-7224/URC: 40 lbs. (18.1 kg)

PP-7913/URC: 135 lbs. (61.2 kg)

Mounting ..... Rack or stack.

### C-11329/URC Remote Control Unit

Functions ..... The remote control provides full control and monitoring of the transceiver.

Display ..... LCD.

Receive Frequency ..... Controllable in 10 Hz steps, from 1.6 to 30 MHz.

Transmit Frequency ..... Controllable in 10 Hz steps, from 1.6 to 30 MHz.

Distance ..... 1 mile using RS-232C/422 on field wire; unlimited over V1 grade phone lines.

Temperature Range ..... -30° to +50° C.

Size ..... 5.25 H x 16.75 W x 12.5 D inches (13.3 H x 42.5 W x 31.8 D cm).

Weight ..... 20 lbs. (9.1 kg).

### CU-2310/URC 100/500 Watt HF Antenna Coupler

Input Impedance ..... 50 ohms (maximum VSWR 1.5:1)

Frequency Range ..... 1.6 to 30 MHz (into a 15- to 35-foot whip or a 75- to 150-foot long wire antenna).

Power Level ..... 500 watt PEP/250 watt Average, continuous duty.

Size ..... 11.0 H x 16.0 W x 18.0 D inches (27.9 H x 40.6 W x 45.7 D cm).

Weight ..... 25 lbs. (11.3 kg).

Case Construction ..... Waterproof (sealed) for exposed mounting.

Operating Power ..... Derived from associated RT-1446/URC HF Transceiver.

Because Harris engineers are continually striving to improve all aspects of our equipment, published specifications are subject to change without notice.



**HARRIS CORPORATION** RF COMMUNICATIONS GROUP  
 1680 University Avenue Rochester, New York 14610 U.S.A.  
 Tel: 716-244-5830 Cable: RFCOM, Rochester, N.Y. TELEX: 978464