combat
PRO **EN**

HF-6000

MULTI-ADAPTIVE HF RADIO SYSTEM

TADIRAN
COMMUNICATIONS
sure and secure

combat
PROVEN

HF-6000

The advanced multi-adaptive COMSEC/ECCM function HF radio system that moves you up to highly reliable HF operations

- The lightest system on the market.
- Digital squelch eliminates false alarms and misdetections.
- Selective calling - addressing transmission to any individual or group network members.
- Operator-selectable AutoCall and optional ALE as per MIL-STD-188-141B.
- Optional COMSEC, VOCODER (digital voice), ECCM, Adaptable High Rate Data Transmission, Dual Frequency, FLASH, Adaptive Power Control and GPS.
- State-of-the-art innovative MMI.
- Compatible with HF-2000 system.

The HF-6000 radio system does away with the traditional problems that have plagued HF communications in the field. Compatible with HF-2000 systems, the HF-6000 packs new capabilities into a lightweight unit designed for the highly mobile battlefield.

The HF-6000's performance-enhancing features include Digital Squelch, AutoCall, Selective Calling and a range of powerful options which make the HF-6000 adaptable to every arena: Vocoder (digital voice), COMSEC, full-band frequency hopping, adaptive high-rate modem, dual frequency, adaptive RF power output, FLASH, GPS and built-in mini data terminal.

Real-time selection of the best channel frequency is supported by operator-selectable AutoCall, based on Tadiran Communications' proprietary Automatic Link Establishment (ALE) protocol, as well as per MIL-STD-188-141B ALE. The operator is always on top of the situation, using the large menu-driven LCD graphic display which presents a wide variety of radio status information and visual alerts. The HF-6000's features are fully compatible and operable with the HF-2000 radio system's capabilities.

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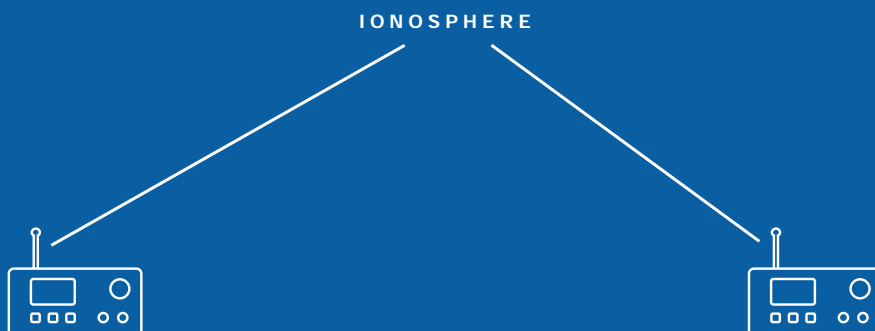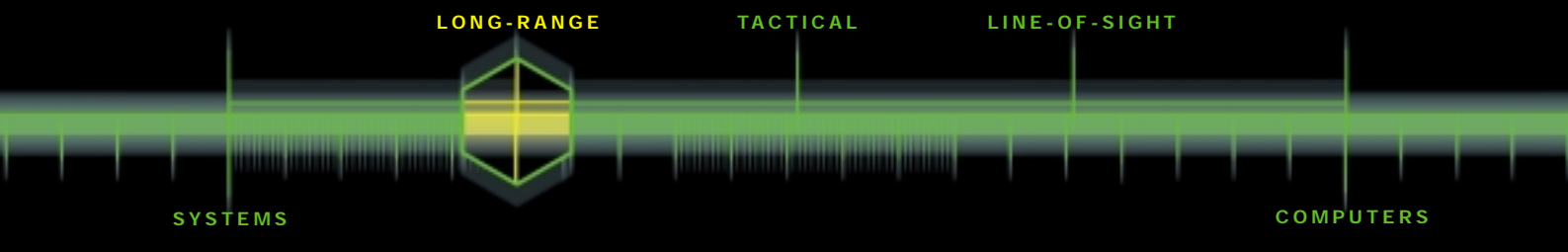
CAPABILITIES

Automatic Link Establishment (ALE): Real-time Frequency management ALE ensures reliable communications under rapidly changing propagation conditions by continuously evaluating the frequency set. The optimal requency is selected automatically, and the link is quickly established. The HF-6000 family provides both MIL-STD-188-141B ALE (optional) for interoperability with other MIL-STD-188-141B stations, as well as AutoCall (standard),a Tadiran Communications-developed function delivering faster and more reliable link establishment. AutoCall is recommended when greater tactical efficiency, responsiveness and operational ease are critical.

Digital Squelch: The digital Active Squelch mutes the annoying noise traditionally associated with HF communications. As a result, the HF-6000 family not only eliminates false alarms and misdetections, but also supports connection to vehicular intercom systems and to HF-VHF relay stations.

Selective Calling: This feature allows the operator to address a message to selected members of the network. The message can be addressed to an individual member, a group, or the entire network. Selective Calling is applicable in CLEAR, Frequency Hopping, COMSEC and Frequency Management modes.

Data Communications (optional): A built-in high rate modem supports flexible and reliable data transmissions. A high probability of error-free data transfer, even under harsh communication conditions, is assured by modem optimization and the use of power error detection techniques and correction codes. The modem utilizes several wave forms, including: Single tone, 39 tone and Programmable FSK, compatible with MIL-STD-188-110A, STANAG-4285 and MFSK. The modem operates at a data rate from 50 b/s to 4800 b/s. The received message is displayed on the radio front panel (mini terminal).

COMSEC - Communication Security (optional): The built-in COMSEC ensures Secure Voice, Data and Burst communications. Voice communications are scrambled in the frequency, time and phase domains, eliminating residual intelligibility or digital encryption when the radio includes high rate Modem and Vocoder. Data and Burst communications are digitally encrypted via the internal MFSK Modem, achieving a very high level of security.

ECCM - Frequency Hopping (optional): The advanced circuitry featured by the HF-6000 family enables frequency hopping over the entire frequency band, supporting full selection of suitable propagating frequencies (adaptive frequency hopping) and more reliable and successful operations in densely jammed environments. The HF-6000 employs automatic synchronization to eliminate the need for vulnerable master stations. It delivers immediate operational readiness without any cumbersome, time-consuming synchronization processes. The HF-6000 ensures a very high probability of synchronization even under severe jamming conditions. HF-6000 ECCM is applicable with the system's Voice, Data and Burst communications.

Vocoder (optional): The Vocoder is based on the Mixed Excitation Linear Prediction (MELP) coder, which is the new 2400 bps US Federal Standard for DOD. The Vocoder operates at two rates: 1200 and 2400 b/s. Featuring speech compression methods tailored to the HF channel conditions, Forward Error Correction (FEC) and Frame Synchronization, the built-in Vocoder provides improved Intelligibility, Voice Quality, Reconizability and Communicability in comparison with traditional LPC-10 Vocoders.

Dual Frequency (optional): The Dual Frequency capability supports reception and transmission on different frequencies. Reliable communications can be established when the same channel frequency cannot be used by stations because of poor link quality.

FLASH - Burst (optional): Pre-programmed FLASH messages are easily edited via the radio keyboard. After editing, the messages are rapidly transmitted via the internal modem to the designated net station. FLASH Messages are transmitted at below voice intelligibility conditions, supported by a power error correction code. An acknowledge signal is returned upon successful message reception. A built-in data terminal capability enables the display of messages on the radio's front panel display.

Adaptive Capabilities:

    Adaptive high rate modem (optional): This feature uses adaptive methods for matching the data transmission rate and modem type to the quality of the HF link. This results in a considerable increase in the effective data throughput for a typical HF link.

    Adaptive Power Control (optional): Adaptive Power Control (APC) enables output power to be automatically adapted to communication conditions, assuring the lowest transmit power level and the lowest power consumption for the most reliable communication. The APC operates at PRC- 6020 in Autocall Voice Communication.

PRC-6020 VRC-6100 VRC-6020 VRC-6200

SYSTEM COMPONENTS

Description	Configuration	PRC-6020 20W Manpack	VRC-6020 20W Vehicular	VRC-6100 100W Vehicular	VRC-6200 125W Vehicular	GRC-6400 400W Base Station	GRC-6600 1000W Base Station
Receiver-transmitter RT-6001		1	1	1	-	1	1
Receiver-transmitter RT-6201		-	-	-	1	-	-
Antenna whip, 9 ft, AT-1741R		1	-	-	-	-	-
Carrying harness, ST-6020		1	-	-	-	-	-
Handset, H-250/U		1	1	1	1	1	1
Antenna whip, 15 ft, AT-1715		-	1	1	1	-	-
Broadband dipole/semi delta antenna		-	1[1]	1[1]	1[1]	1	1
Vehicular adapter VA-6100		-	-	1	-	-	-
Mounting base MT-6010		-	1	-	-	-	-
100W power amplifier, AM-2102		-	-	1	-	-	-
400W power amplifier, AM-6401		-	-	-	-	1	-
1000W power amplifier, AM-6601		-	-	-	-	-	1
Interface unit, IU-6000		-	-	1	-	1	1
Mounting base, MT-2122		-	-	1	-	-	-
Mounting base, MT-1029		-	-	-	1	-	-
Mounting base, MT-6400		-	-	-	-	1	1
100W antenna coupler, CP-2103		-	-	1	1	-	-
Mounting base for CP, MT-2123		-	-	1	1	-	-
125W antenna coupler, CP-6200		-	-	-	1	-	-
Mounting base for CP, MT-6200		-	-	-	1	-	-
12/24 DC adapter, AD-1228		-	1	-	-	-	-
AC/DC power supply, PS-2400M		-	1[1]	1[1]	1[1]	-	-
AC/DC power supply, PS-1200		-	-	-	-	1	1
Interconnecting cables (RF, power & control)		-	1	1	1	1	1
Loudspeaker, LS-108M		1[2]	-	-	-	1	1
Loud speaker, LS-454/U		-	-	1	1	-	-

Notes: 1. Optional item required for base station configurations.   2. Optional item

CONFIGURATIONS

PRC-6020- 20 watt manpack radio set. Built around an RT-6001 receiver transmitter, the PRC-6020 feature advanced miniaturization technologies, resulting in significant weight and size reductions. An integrated unit comprising the RT-6001 receiver transmitter and antenna coupler weighs only 3.9 kgs.

VRC-6020- 20 watt vehicular/fixed station radio set. Built around the RT 6001, the VRC-6020 provides all the performance features of the PRC-6020. The VRC-6020 is available with a vehicle mounting. The power supply is fed from the vehicle's 12/24 VDC battery.

VRC-6100- 100 watt vehicular/fixed station radio set. Built around the RT 6001, the VRC-6100 provides all the performance features of the PRC-6020. The VRC-6100 is comprised of a power amplifier, and vehicular adapter fixed on a special mounting with shock absorbers. A very fast-tuning 100W antenna coupler is available for all antenna types to support AutoCall/ALE and frequency hopping modes. With the exception of the RT-6001, the VRC 6100's components are shared by the previous generation HF-2000/VRC-2100, making system upgrading a highly affordable option.

VRC-6200- 100 watt vehicular/fixed station radio set. The VRC-6200 is the cost-effective vehicular configuration of the HF 6000. The main unit of the VRC-6200, the RT-6201, contains a Receiver-Transmitter, 125W Power Amplifier and Power Supply units housed in one box. Since the RT-6201 Receiver-Transmitter unit is based on the same modules as the RT-6001, it provides all the performance features of VRC-6100 and maintains logistic commonality. Furthermore, the VRC-6200 provides a high level of spectral purity, and enables the implementation of optional PRE- SELECTOR to improve collocation and optional GPS. The RT- 6201 is mounted onto the vehicle using the MT-1029 mounting (common to VRC-12 VHF system) and provides interconnection for an external intercom system, such as the VIC-1.

GRC-6400/GRC-6600

GRC-6400- 400 watt fixed station radio set.

GRC-6600- 1000 watt fixed station radio set. Both configurations are built around the RT-6001, delivering all the performance features of the PRC-6020.

TECHNICAL SPECIFICATIONS

General

Frequency Range:	1.5000 to 29.9999 MHz
Channels:	2,850,000 at 10 Hz spacing
Modes of Operation:	
• CLEAR:*	Fixed frequency, Dual Frequency, AutoCall and MIL-STD-ALE
• COMSEC (SEC):1	Fixed Frequency, Dual Frequency, AutoCall and MIL-STD-ALE
• ECCM:	Frequency Hopping
Type of traffic:	Voice-Analog and Digital (option), Data, Burst, CW
Modulation:	USB, LSB, AM*
Preset:	100 channel parameters
	10 COMSEC keys
	10 ECCM hopset tables
	10 ALE tables*
	up to 180 AutoCall groups
Frequency Stability:	±1 ppm
Built-In-Test (BIT):	On-line and operator initiated
Power Sources:	
• PRC-6020:	12V nominal, NiCad & Lithium batteries
• VRC-6020:	12/24 VDC nominal, MIL-STD-1275AT
• VRC-6100/VRC-6200:	24 VDC nominal, MIL-STD-1275AT
• GRC-6400/GRC-6600:	110/220 VAC
Environmental conditions:	Per MIL-STD-810 D/E
• Operating temperature:	-40°C to +65°C
• Humidity:	95% at 25°
• Immersion:!	1 meter for 2 hours
EMC/EMI:	MIL-STD-461/2

Physical Characteristics

• Dimensions: (HxWxD)Q	PRC-6020: 85 x 224 x 250 mm
	VRC-6020: 150 x 240 x 340 mm
	VRC-6100: 256 x 442 x 390 mm
	VRC-6200: 178 x 394 x 343 mm
	GRC-6400: 1,078 x 625 x 800 mm
	GRC-6600: 1,393 x 625 x 800 mm
• Weight:	PRC-6020: 3.9 kg
	VRC-6020: 9.5 kg
	VRC-6100: 33 kg
	VRC-6200: 20 kg

Receiver

Sensitivity	
• PRC-6020/VRC-6020:	-113 dBm (10dB SINAD)
• VRC-6100/VRC-6200:	-107 dBm (10dB SINAD)
• GRC-6400/VRC-6600:	-107 dBm (10dB SINAD)
Image Rejection:	-80 dB
IF Rejection:	-80 dB
Audio Outputs:	10 mW/600 Ω (earphone)
	200 mW/50 Ω (portable loudspeaker)
	1 W/600 Ω (vehicular loudspeaker)
Squelch:	Active: digitally-coded

Transmitter

Power Output:	
• PRC-6020/VRC-6020:	5W/10W/20W/Adaptive*
• VRC-6100/VRC-6200:	20W/50W/100W
• GRC-6400:	100W/200W/400W
• GRC-6600:	200W/500W/1000W
Harmonics:	45 dB below single tone
Special Feature:	Adaptive RF Power Control (AutoCall voice)
Antenna Tuning:	Fast & Automatic

Selective calling**

Type:	Digital FSK Coding
Addresses:	27 individual, 3 nets, All

Digital squelch**

Type:	Digital FSK Coding
False Alarms:	Less than one per hour

AutoCall-Automatic Link Establishment (ALE)**

Frequency Groups:	up to 180
Frequency Group Length:	10
Link Establishment Time:	< 4.5 seconds for 1st frequency

MIL-STD-188-141B ALE (optional)**

Frequency Tables:	10
Frequency Table Length:	Up to 100
Self Addresses:	20
Other Addresses:	100
ALE Nets:	20
Special Features:	LQA Exchange Function, AMD, DTM Interoperable with Digital Squelch

Data Communication (optional)**

Built-in Modem Types:	MIL-STD-188-110A: Single Tone, 39-Tone, PFSK, STANAG 4285, MFSK
Data Rates:	From 50 to 4800 b/s
Modes of Operation:	Fixed Frequency, dual Frequency, MIL-STD ALE/AutoCall, Frequency Hopping (MFSK only)
Special Features:/	Adaptive Modem (type & rate) Message Displayed on the radio front panel (mini terminal)

FLASH - built-in data terminal (optional)**

Data Type:	Up to 100 preformatted messages 3 digits, up to 900 coded messages
Data Entry:1	Via radio keyboard, data loader, and personal computer
Special Features:6	Storage of last 16 messages; (up to 90 characters each) Message acknowledgement Message Displayed on the radio front panel

ECCM - Frequency Hopping (optional)**

Communication Type:	Voice, Data, FLASH, Digital CW
Technique:	Full band frequency hopping and sub-band frequency hopping
Hop Rate:#	More than 15 hops/second
Hopset Length:%	Up to 150 frequencies
Synchronization:	Fast & automatic; no need for periodic resynchronization or master station

VOCODER (optional)

Rates:	2400, 1200 b/s
Encryption:	Digital Encryption
Modem Type:	Single Tone
Special Features:	Clear Override: Secure Alert; Automatic rate adaptation; Selective Calling; Resynchronization; Late Entry; Pre-Vocoder Speech Enhancement; Analog voice override

COMSEC (optional)**

Voice:1	Scrambler, time, phase & frequency domain Digital encryption (with optional Vocoder & Modem)
Data, FLASH, CW:$	Digital encryption
Special Feature:.	Clear Override, Secure Alert

* Optional capability   ** Compatibility with HF-2000 Radio system

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