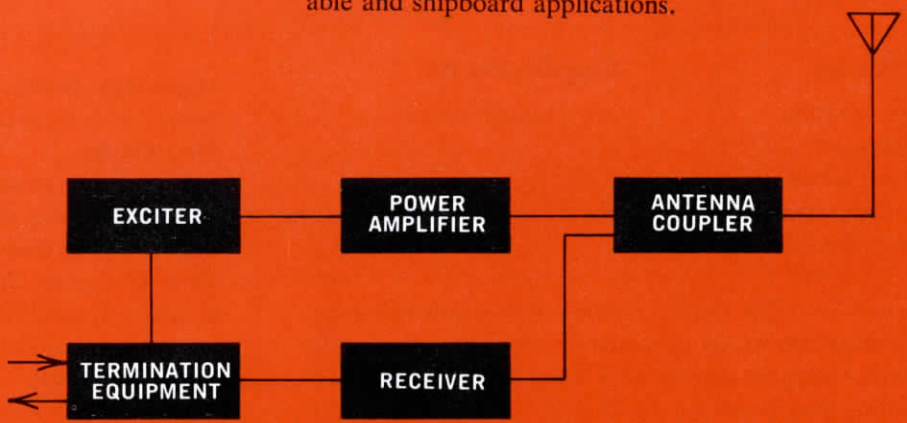
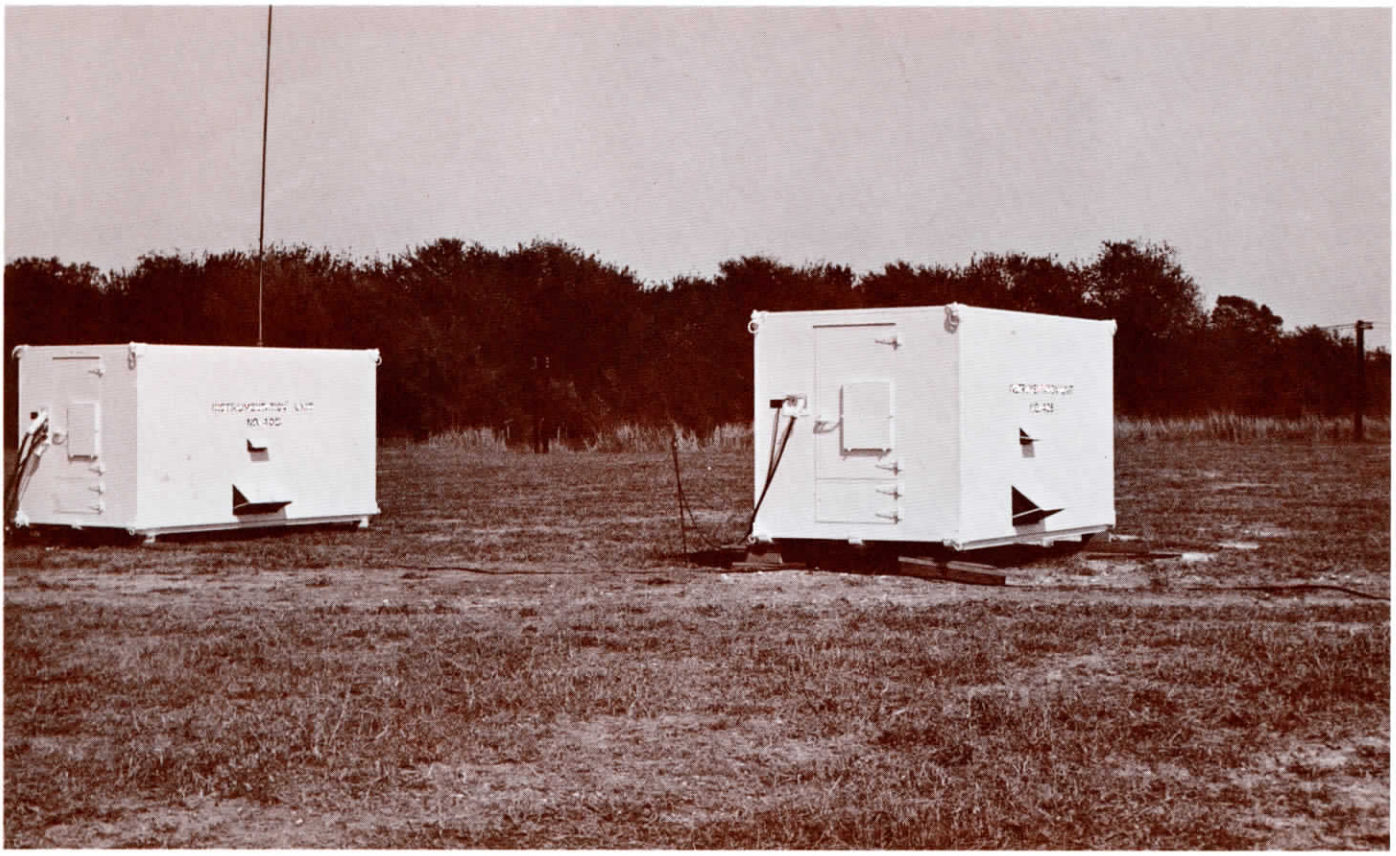
Communication Systems

Collins HF communication systems represent the latest design concepts in single sideband communication equipment. These concepts have resulted from a continuing SSB development program at Collins which has helped revolutionize communication methods in the HF spectrum in the decades since World War II. Specialized systems are available for both voice and data transmission in airborne, vehicular, transportable and shipboard applications.



ANNA-1 Air Transportable HF Communication System



Features	Applications
High Mobility	*Air Transportable*
Lightweight	
Self-contained	
One-Man Operation	
Two Independent Systems	

The ANNA-1 HF Communication System provides either simplex or full duplex operation on two independent radio circuits, which are automatically tuned in 0.1 kc channel increments throughout the 2.0-29.9999 mc frequency range. Transmit power output is 1 kw PEP or average. Choice of modes includes upper sideband, lower sideband, independent sidebands or AM, together with voice frequency telegraph facilities.

An RF patch panel permits a choice of antennas for either system. The selection includes a semidirectional, horizontally-polarized log-periodic for short to medium range, point-to-point communication and a vertically-polarized, omnidirectional monopole with low angle radiation for ship-to-shore and ground-to-air communication. A 32 ft. whip can be installed on the shelter to provide an operational radio circuit within minutes after the equipment is moved on site. Receiver bandpass filters allow transmit-receive frequency separation as low as 10%.

REMOTE AREA OPERATION

Lightweight shelters used in the system can be easily transported by cargo aircraft, as well as railroad, ship or rubber-tired vehicles.

Each terminal contains all necessary equipment, including antennas, primary power generator and maintenance facilities, to quickly establish voice and teletypewriter communication for support of government or commercial operations in remote geographical locations. Air conditioning and heating maintain shelter temperatures at reasonable levels for efficient operation.

Separate operator consoles for radio and audio facility control functions are located directly behind the TTY machines to enable one operator to have complete station control.

SYSTEM CONFIGURATION

The terminal is housed in three major subsystems — a communication shelter, an electronic maintenance shelter and a power generator. The communication shelter houses the operator console and all facilities for two integral, full duplex, HF SSB radio terminals including RTTY message capabilities. The electronic maintenance shelter provides storage space and work area for adjustment and repair of subsystems at remotely located sites.

The modified military type S-141A/G shelters have 3″ protective skid rails, square inside corners, and are equipped with

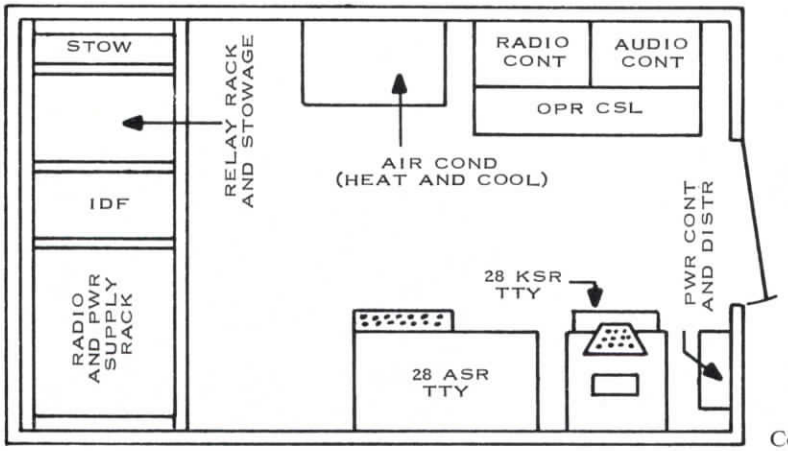
 Available only on a production contract.

roof access steps. Separate air conditioning and heating units are included in each shelter. The system is capable of withstanding low level shock and vibration encountered by railroad, cargo aircraft, ship and rubber-tired vehicles employed in transport. A type III military transporter can be used for transport over highways and unimproved terrain.

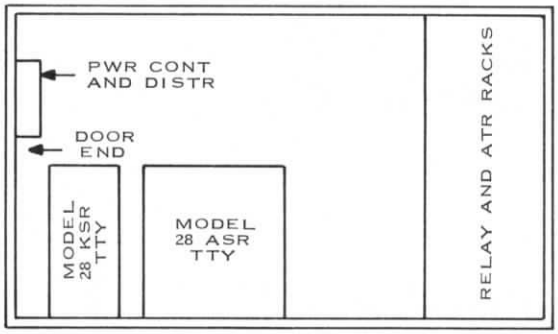
Power for the terminal is supplied by a 30 kw diesel generator. Its output is 120 v or 208 v, 60 cps, 3 phase, 4-wire with 5% voltage and frequency regulation. A fuel tank with sufficient capacity for eight hours of operation is supplied.

SIMPLIFIED MAINTENANCE

Modular electronic equipment, together with circuit card techniques, is used where applicable to facilitate maintenance and spare parts logistics. All interunit wiring terminates at a distribution frame, providing flexibility in interconnection of components and readily accessible test points.



Communication Shelter Floor Plan



Communication Shelter Left Wall Layout

Specifications

GENERAL

FREQUENCY RANGE: 2.0-29.9999 mc.

TUNING INCREMENTS: 0.1 kc steps.

FREQUENCY STABILITY: 1 part in 10^8 per day.

TUNING: Completely automatic.

CONTROL: Local operator.

POWER OUTPUT: 1 kw PEP or average.

MODE OF OPERATION: Duplex or simplex (patch selectable).

RECEIVE FREQUENCY SEPARATION: 10% from transmitter frequency.

CHANNELIZATION: Two independent 3 kc channels.

TRANSMISSION MODES: USB and AM, normal operation. LSB and ISB, simple patching.

AUDIO TERMINATIONS: 0 db level, 600 ohms.

CHANNELIZATION: Channel A — 1 db P/P ripple, +350 to +3040 cps; −60 db points, −75 and +3300 cps. Channel B — 1 db P/P ripple, −350 to −3040 cps; −60 db points, +75 and −3300 cps.

TTY FACILITIES: Includes frequency shift keyers and converters, dc loop control and TTY patching panel.

ANTENNAS: Type 437C-3A, vertically-polarized omnidirectional. Type 637E-1, horizontally-polarized log-periodic, and a 32 ft. whip antenna.

PRIMARY POWER: 208 v, 60 cps, 3 phase, wye connected. Peak power requirement is approximately 22 kw. Diesel driven generator normally furnished as part of system.

	Size			*Weight*
	W	*H*	*D*	
*Maintenance shelter	81″ 205.74 cm	83″ 210.82 cm	142″ 360.68 cm	3895 lbs. 1766.77 kg
*Communication shelter	81″ 205.74 cm	83″ 210.82 cm	142″ 360.68 cm	5295 lbs. 2401.81 kg
Diesel generator	60″ 152.4 cm	78″ 198.12 cm	96″ 241.3 cm	3925 lbs. 1780.38 kg
437C-3A tower skid	54″ 137.16 cm	60″ 152.4 cm	126″ 320.04 cm	1670 lbs. 757.51 kg

*With antenna stowed.

Basic Units

714Y-2 Frequency Control, p. 90
789R-1 IF Translator, p. 88-90
789T-1 IF Translator, p. 88-90
618Z-4 RF Translator, p. 87
635T-2 Receiver Bandpass Filter, p. 111, 112
548L-4 1 KW Power Amplifier, p. 37
180R-6/309A-2E Antenna Coupler and Control, p. 102, 103

AN/MRC-95 Vehicular HF Communication System

Features

Automatic Tuning
Simplified Operation
Modular Construction
Remote Operation
Application Versatility

Applications

Mobile
Airlift Capability

The AN/MRC-95 is an automatically tuned HF communication system installed in a 4 x 4 ¼-ton M151 military vehicle. Frequency range is 2.0-29.999 mc in 1 kc increments with a transmit power output of 400 watts PEP in either upper sideband or lower sideband and 100 watts in AM with reinserted carrier, CW or frequency shift keying. The AN/MRC-95 provides optimum tactical communication whether moving or in fixed locations. Automatic tuning permits operation by nontechnical personnel. A temperature compensated standard assures instant on-frequency operation.

EQUIPMENT CONFIGURATIONS

The basic transceiver is the proven Collins 618T-3, housed with associated power supply and frequency shift keyer in a compact aluminum case, which is drip-proof during operation and watertight in the transport condition. The local-remote control, antenna coupler, load coil, and auxiliary speaker are of watertight construction. Rugged packaging ideally suits the AN/MRC-95 communication system for airlift and airdrop operations.

The rugged Fiberglas antenna employs four sections for mo-

 Available only on a production contract.

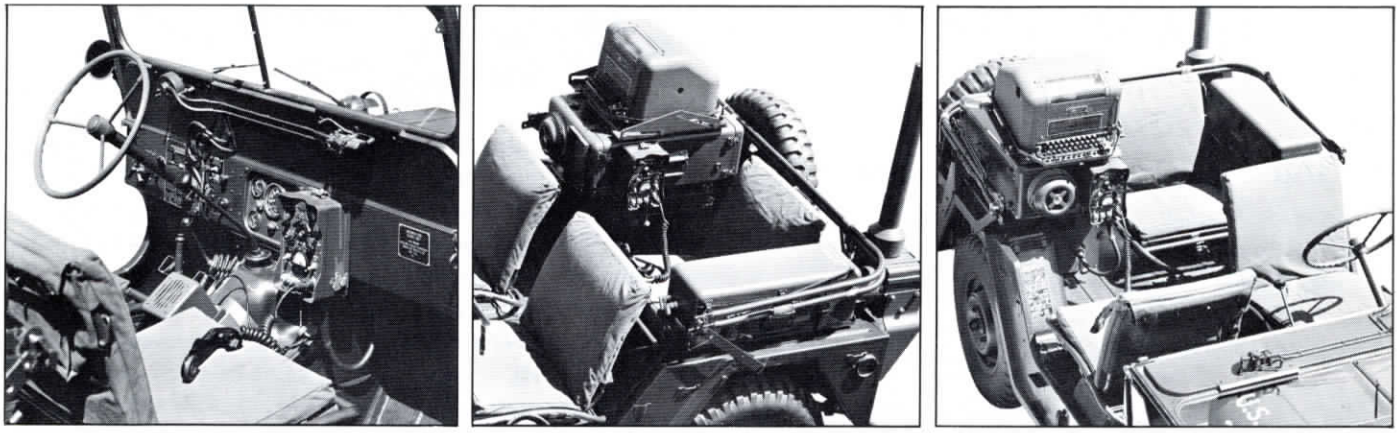
bile operation and eight sections for stationary use. A connector located on the side of the load coil also permits the use of a dipole antenna.

A choice of three control box positions in the vehicles allows the control box to be used from the rear seat, front of transceiver case or instrument panel. The control box can be used with an appropriate interconnecting cable at distances up to 100 ft. from vehicle.

Phone patch extends system versatility for use with wire circuits. Remote control over long distances can be achieved by the use of the AN/GRA-6 or similar type equipment.

MOBILE POWER SYSTEM

The electrical generating system will supply more than 200% of the capacity required for the communication system, making it independent of the vehicle battery. An emergency switch permits operation from the vehicle battery. Sufficient excess power is available for operation of an auxiliary UHF or VHF communication system. A voltmeter/tachometer assures correct engine speeds and generating capacity under all conditions. System protective devices include an oil pressure interlock with manual override.



Flexibility of control unit location permits installation on the vehicle instrument panel or on the transceiver.

Specifications

FREQUENCY RANGE: 2.0-29.999 mc.

POWER OUTPUT: SSB — 400 watts PEP; AM — 100 watts; CW, FSK — 100 watts.

NUMBER OF CHANNELS: 28,000 spaced 1 kc.

FREQUENCY SELECTION: 4 knobs with digital indicators.

TUNING METHOD: Automatic, servo controlled, including antenna coupler.

CHANNEL CHANGE TIME: 15 seconds nominal.

OPERATING MODES: USB, LSB, AM, CW and FSK.

FREQUENCY STABILITY: 0.8 part in 10^6 per month.

SEMIREMOTE CAPABILITY: Complete control of radio by remote control box up to 100 ft. with appropriate cable.

REMOTE CAPABILITY: Control over 2-wire line with AN/GRA-6 or equivalent. (Push-to-talk and audio functions.)

TELEPRINTER OPERATION: 850 cps shift. 400 cps primary power for teleprinter available at transceiver case.

ANTENNA REQUIRED: 16 ft. or 32 ft. whip, or 45-90 ft. wire.

AUDIO CHARACTERISTICS: Input — 100 ohm carbon microphone. Output — 300 ohms.

PHONE PATCH REQUIREMENTS: 600 ohm phone line, operator controlled, not voice operated.

MICROPHONE: Differential carbon, Electro-Voice 205KK or equivalent.

KEY: Standard military types.

HANDSET: Military type H33F/PT or equivalent.

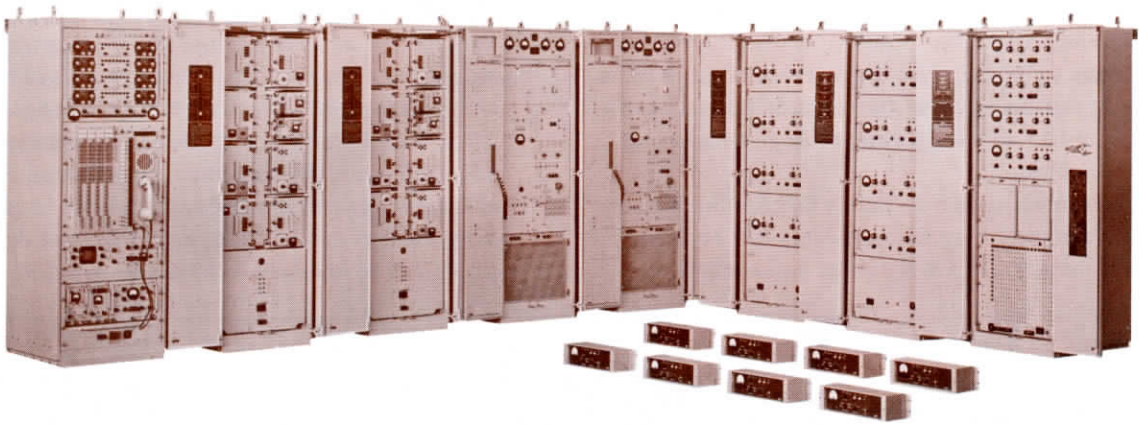
INPUT POWER: 27.5 v dc, 53 amps peak during tuning; 31 amps SSB voice transmit, 14 amps receive.

SIZE AND WEIGHT:

	Size			*Weight*
	W	*H*	*D*	
Transceiver case	19½" 49.53 cm	12¾" 32.39 cm	30" 76.2 cm	140 lbs. 63.53 kg
Coupler case	9" 22.86 cm	9" 22.86 cm	27" 68.58 cm	50 lbs. 22.68 kg
Control box	6" 15.24 cm	9" 22.86 cm	3.5" 8.89 cm	7.5 lbs. 3.4 kg
Speaker	7½" 19.05 cm	7" 17.78 cm	4¾" 12.07 cm	3.5 lbs. 1.59 kg
Load Coil	9" 22.86 cm	9" 22.86 cm	7⅜" 18.73 cm	22 lbs. 9.98 kg

GFE EQUIPMENT: M151 vehicle and 100 amp generating system. H33F/PT Handset; TT4 Teletypewriter.

AN/SRC-16 Shipboard HF Communication System



Features	Applications
Automatic Tuning	*Shipboard*
Simultaneous Channels	*Fixed Station*
Mode Choice	
Data Transmission	
Simplified Maintenance	

The AN/SRC-16 is a high capacity, long range HF communication system which provides four independent transmit and four independent receive channels. The system includes two 5 kw linear amplifiers which can be switched into any two transmit channels in lieu of the 500 watt amplifiers normally used.

Frequency coverage is in 1 kc tuning increments over the 2.0-29.999 mc range. Operating mode choice includes AM, CW, MCW, FSK, SSB, ISB and data communication on each channel. The channel frequency of each transmitter and receiver is phase locked to a primary frequency standard assuring high signal stability.

CIRCUIT FEATURES

Linear power amplifiers, high performance filters and low distortion circuitry meet all complex data transmission and reception performance requirements. Compatible AM is transmitted using the upper sideband and a reinserted carrier. Pi network output circuitry assures efficient antenna loading. The converter for FSK-CW mode reception includes an oscilloscope to monitor test tones and to facilitate BFO adjustment on FSK reception.

RF LEVEL CONTROL

A variable attenuator, using transistor circuitry, provides automatic control of radiated or received power levels. The RF signal between the transmitter and RF amplifier can be attenuated up to 120 db. Normally, it is automatically controlled by direct current pulses. It can be switched to the receiver input to manually attenuate the RF signal level.

ANTENNA SWITCHING

The AN/SRC-16 employs 12 automatic antenna couplers with terminations for three or more antennas. In a typical installation, eight couplers are associated with the 2-6 mc antenna, two couplers with the 5-15 mc antenna and two with the 10-30 mc antenna. Other arrangements are optionally available to meet individual system requirements. An RF switching matrix located in the HF coupler cabinet connects individual channel equipment to the proper antenna couplers. The couplers permit duplex operation on all channels by isolating transmit and receive circuitry, as well as maintaining the correct antenna impedance match. External equipments, such as the AN/URC-32, AN/WRT-2, AN/SRT-14 and AN/SRT-15, can also be connected to the antenna matrix through auxiliary input jacks.

INPUT PATCHING

A communication patching switchboard permits connecting remote input audio lines to any of the radio channels. Interlocked pushbutton selectors prevent improper operation, and visual or aural signals indicate equipment status. Voice compression and noise squelching facilitate voice communications. Redundant power supplies prevent central control failure in the event of a single power supply malfunction.

SYSTEM TEST FACILITIES

An integral multipurpose test set simplifies system maintenance tests. A two-tone signal can be applied to either transmitted sideband for distortion measurements and check of performance quality. A sidetone containing the signal is sampled at the T/R relay, coupled to the receiver input, demodulated and passed to a distortion measuring circuit which analyzes the hum level at 400 cps and 800 cps, third order distortion products and the second harmonic of the F1 tone. Frequency lock is tested by transmitting one of two tones on both LSB and USB in a closed loop throughout the system.

UNITIZED CONSTRUCTION

The entire system is housed in eight separate equipment cabinets. Maintenance and installation are simplified through the use of modular construction. Individual units are mounted on slide cabinet drawers and all electrical connections are made through mating connectors wherever possible. Addi-

 Available only on a production contract.

tionally, the system can be easily expanded as traffic increases by adding units and cabinets.

Completely automatic tuning allows the control cabinet to be located up to 900 feet from the other seven cabinets of the installation. It contains facilities for switching of remote input stations, system fault alarm, digital frequency selection, standby-operate control, manual variable RF level attenuation, audio level metering, RF output metering, signal monitoring, with controls and indicators for all modes.

COOLING

Each cabinet is water cooled by a closed-cycle cooling system. The inlet of the centrifugal blower is attached to a water cooled heat exchanger and supplies air to a plenum located at the rear or center of the cabinet. This plenum supplies cooling air to all the units in the cabinet through openings in the rear or bottom of the units. When a unit is withdrawn from the cabinet, the plenum opening is closed by a sliding valve.

Specifications

NUMBER OF CHANNELS: 4 transmit and receive channels, each capable of independent, simultaneous operation.

FREQUENCY RANGE: 2.0-29.999 mc in 1 kc increments.

FREQUENCY STABILITY: 1 part in 10^8 per 30 days (with internal frequency standard).

MODE OF OPERATION: Radio frequency simplex or duplex.

TYPE OF SIGNALS: Single sideband, reduced carrier; two independent sidebands, reduced carrier; composite transmission; CW telegraphy; frequency shift telegraphy; single sideband with carrier in transmit function; double sideband with carrier in receive function.

WEIGHT AND VOLUME:

	Est. Wt. Crated	*Est. Wt. Uncrated*	*Est. Vol. Crated*
Cabinet 1	1255 lbs. 569.27 kg	855 lbs. 387.83 kg	35 cu. ft. 0.99 cu. meter
Cabinets 2 & 3, each	1540 lbs. 698.54 kg	995 lbs. 451.33 kg	35 cu. ft. 0.99 cu. meter
Cabinets 4 & 5, each	1610 lbs. 730.3 kg	1110 lbs. 503.5 kg	35 cu. ft. 0.99 cu. meter
Cabinet 7	1720 lbs. 780.19 kg	1320 lbs. 598.75 kg	35 cu. ft. 0.99 cu. meter
Cabinets 6 & 8, each	1610 lbs. 730.3 kg	1056 lbs. 479.0 kg	35 cu. ft. 0.99 cu. meter
Antenna coupler control	20 lbs. 9.07 kg	12 lbs. 5.44 kg	1.2 cu. ft. 0.034 cu. meter

DECK SPACE REQUIRED: 38 sq. ft. (3.53 sq. meters).

COOLING WATER REQUIRED: 49.6 gpm at 35° C maximum.

POWER SOURCE: 440 v, 400 cycle, 3 phase, delta connected — 27.4 kw at 0.9 pf; 115 v, 400 cycles, 3 phase, delta connected — 11 kw.

ANTENNAS REQUIRED: 3 broadband, nominal 50 ohm impedance; VSWR no greater than 4:1.

AUDIO INPUT: 600 ohms balanced.

AUDIO OUTPUT: 600 ohms balanced.

TRANSMITTER CHARACTERISTICS

POWER OUTPUT: Low power — 500 watts PEP with two or more tones; average power output of 250 watts continuous. High power (2.0-5.999 mc only with CU-1169/SRC-16 antenna coupler) — 5.0 kw PEP with two or more tones; average power output of 2.5 kw continuous.

OUTPUT IMPEDANCE: For antennas having frequency ranges from 2.0-5.999 mc, 6.0-14.999 mc and 10.0-29.999 mc.

CARRIER SUPPRESSION: 45 db below PEP output.

HARMONIC SUPPRESSION: 50 db below PEP output.

SPURIOUS SUPPRESSION: 50 db below PEP output.

DISTORTION: 35 db below PEP at rated power (third order distortion as measured by two-tone test).

OPPOSITE SIDEBAND REJECTION: 50 db below the level of a single tone.

PHASE STABILITY: Not more than 2.38° of phase shift in a 22 millisecond period.

BANDWIDTH: 300-3050 cps for each sideband (1½ db points).

INPUT LINES: Ten 600 ohm balanced lines; 0-60 ma teleprinter loop; key and microphone.

RECEIVER CHARACTERISTICS

PHASE STABILITY: Not more than 2.38° of phase shift in a 22 millisecond period.

BANDWIDTH: 300-3050 cps for each sideband (1½ db points).

NOISE FIGURE: 17 db or better.

DISTORTION: Any intermodulation product or distortion 35 db or more below either tone from a two-tone test signal.

IF AND IMAGE REJECTION: —80 db or more below 25 mc; —65 db or more above 25 mc.

AGC CHARACTERISTICS: Will maintain output level within +3 db for inputs of 10 uv rms to 1 v rms. Approximately 6-12 millisecond attack time and normal decay time of 0.5-1.0 second. AGC delayed on command.

OUTPUT LINES: 18 600 ohm balanced lines; speaker and handset.

SENSITIVITY: Better than 1 uv for a 10 db S+N/N ratio.

FREQUENCY STANDARD CHARACTERISTICS

OUTPUT FREQUENCY: 100 kc and 1 mc.

OUTPUT VOLTAGE: 1 v.

STABILITY: Aging rate — less than 1 part in 10^8 per 30 days. Temperature variation — less than ± 4 parts in 10^{11} per degree C (0.000004 cps at 100 kc).

RESET ACCURACY: Better than ± 5 parts in 10^{11}.

FREQUENCY CHANGE WITH SHOCK: Less than 1 part in 10^8.

HARMONIC DISTORTION: 40 db below rated output.

SPURIOUS OUTPUTS: 60 db below rated output.

ANTENNA COUPLER CHARACTERISTICS

FREQUENCY RANGE: CU-1169/SRC-16 — 2.0-5.999 mc. CU-1170/SRC-16 — 6.0-29.999 mc.

INPUT IMPEDANCE: 50 ohms nominal.

ANTENNA VSWR (tuning range): 4:1 (50 ohms) maximum.

RF INPUT POWER: CU-1169/SRC-16 — 6000 watts PEP, 3000 watts average continuous, maximum. CU-1170/SRC-16 — 1200 watts PEP, 600 watts average continuous, maximum. Both units require 100 watts average forward power for automatic antenna tuning and constant surveillance.

EFFICIENCY: 60% minimum.

ISOLATION, INPUT TO OUTPUT: 45 db minimum with channel frequencies separated 15% or more.

ISOLATION BETWEEN INPUTS: 45 db minimum with channel frequencies separated 15% or more.

PRIMARY INPUT VOLTAGE: 115 v $\pm 10\%$, 400 cps, 3 phase, delta or wye.

PRIMARY INPUT POWER: 100 watts maximum.

TYPE OF SERVICE: Continuous, unattended, remote.

AN/SRC-23 Shipboard HF Communication System

The AN/SRC-23 is a single channel communication system using components of the AN/SRC-16 system. It offers exceptionally high frequency stability for long range surface-to-surface and surface-to-air communication in data, AM, FSK, CW and SSB modes. Tuning is completely automatic on 28,000 channels in the 2.0-29.999 mc range. Detailed information on a system to specific requirements is available upon request.

Available only on a production contract.

AN/TRC-115 Transportable HF Communication System

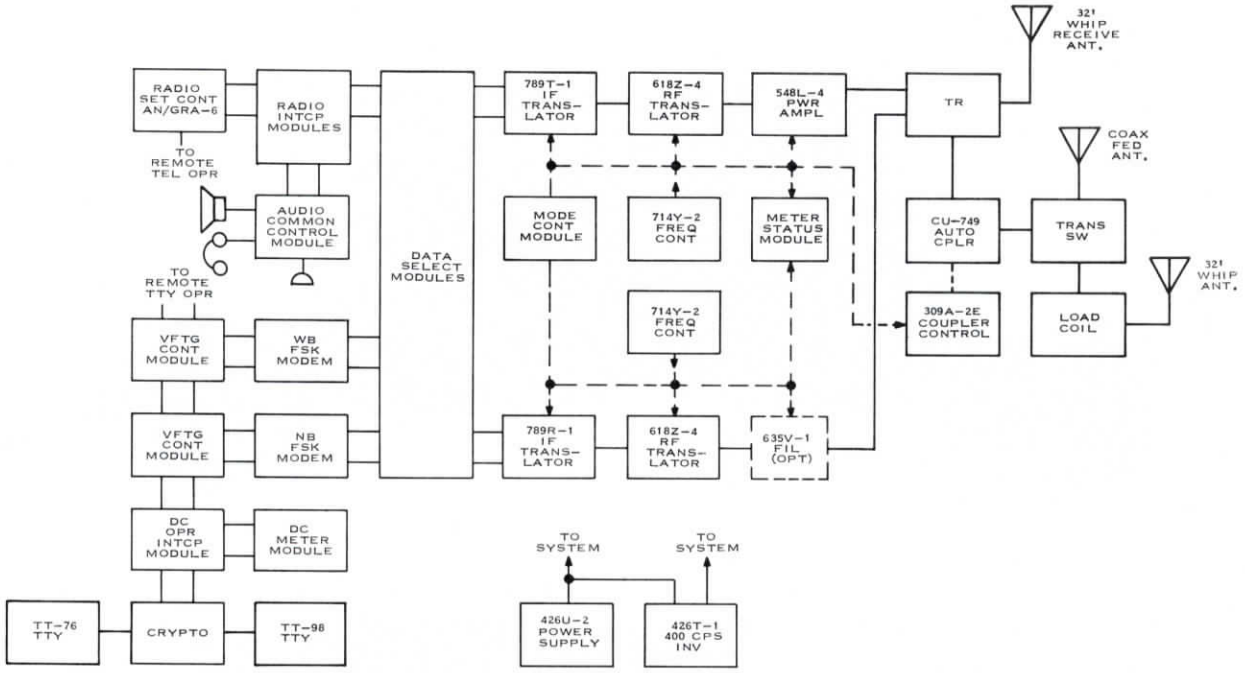
Features	Applications
Automatic Tuning	*Transportable*
Single Shelter	*Communication Center*
One-Man Operation	

The AN/TRC-115 employs one 1 kw transmitter using single sideband techniques and one receiver with one voice channel and one teletypewriter channel capable of being transmitted and received simultaneously. The systems cover the 2.0-29.9999 mc frequency range in 280,000 channel increments with direct reading frequency control and fully automatic tuning, including the antenna circuits. Function switches permit selection of AM, upper sideband, or lower or independent sideband modes for either simplex or duplex operation. All equipment necessary to place the system in full operation is housed in one compact shelter that is transportable by fixed-wing aircraft, helicopter or truck. The AN/TRC-115 consists of components of the Collins Universal Radio Group in an S-144( )/G shelter. It can be set up and operated by one man.

In duplex operation, two RF channel frequencies are required. Both an 85 cycle shift and an 850 cycle shift teletypewriter keyer-converter unit are included to provide the AN/TRC-115 with teletypewriter transmission capabilities.

The AN/TRC-115 contains the necessary units to control, switch and operate remote telephone line, remote teletypewriter, and the local operator's equipment. The unit consists of a communication control console, one radio receiver, one radio transmitter, two radio set controls, one antenna coupler and coupler control, and a telegraph terminal group.

Functional Circuits



Specifications

SHELTER: S-144()/G.

TRANSMITTER POWER: 1 kw PEP or average.

FREQUENCY RANGE: 2.0-29.9999 mc in 0.1 kc steps.

MODES OF OPERATION: USB (3 kc), LSB (3 kc), ISB (each sideband 3 kc), and compatible AM.

INFORMATION TYPES: Voice and/or voice frequency TTY.

MODE OF OPERATION: Full or half duplex.

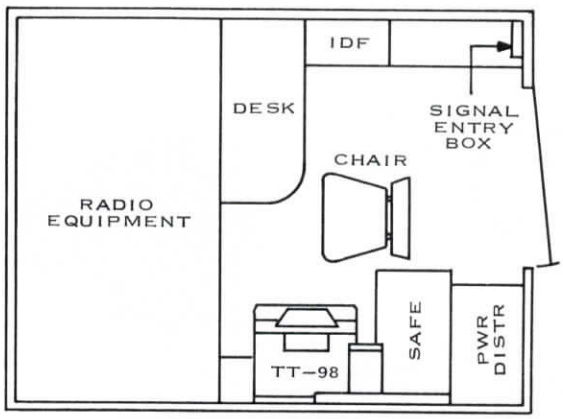
CARRIER SUPPRESSION: Normal SSB operation is for carrier to be fully suppressed (—50 db); optional reduced carrier operation with three levels of suppression.

AFC: Optional.

IMAGE REJECTION: Below 20 mc, at least 80 db; above 20 mc, at least 60 db.

FREQUENCY STABILITY: One part in 10^8 per day.

RMS STABILITY FACTOR: Does not exceed one part in 10^8 in any 10-minute period.



AN/TRC-115 Floor Plan

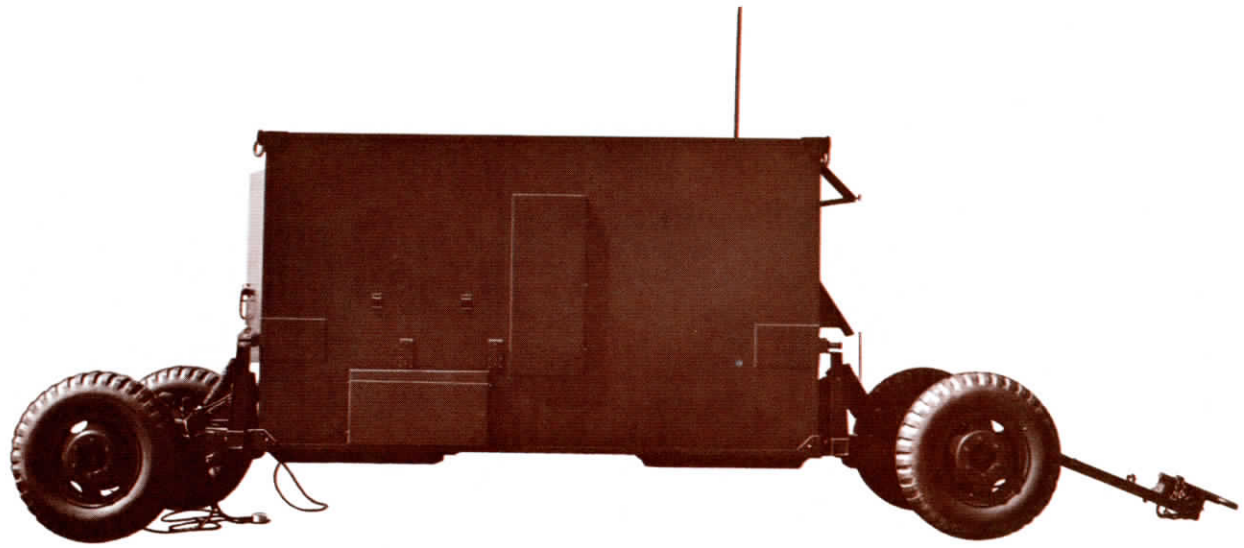
TRANSMITTER DISTORTION PRODUCTS: Third and higher order distortion suppressed at least 40 db; harmonic emission suppressed at least 35 db, referenced with PEP level.

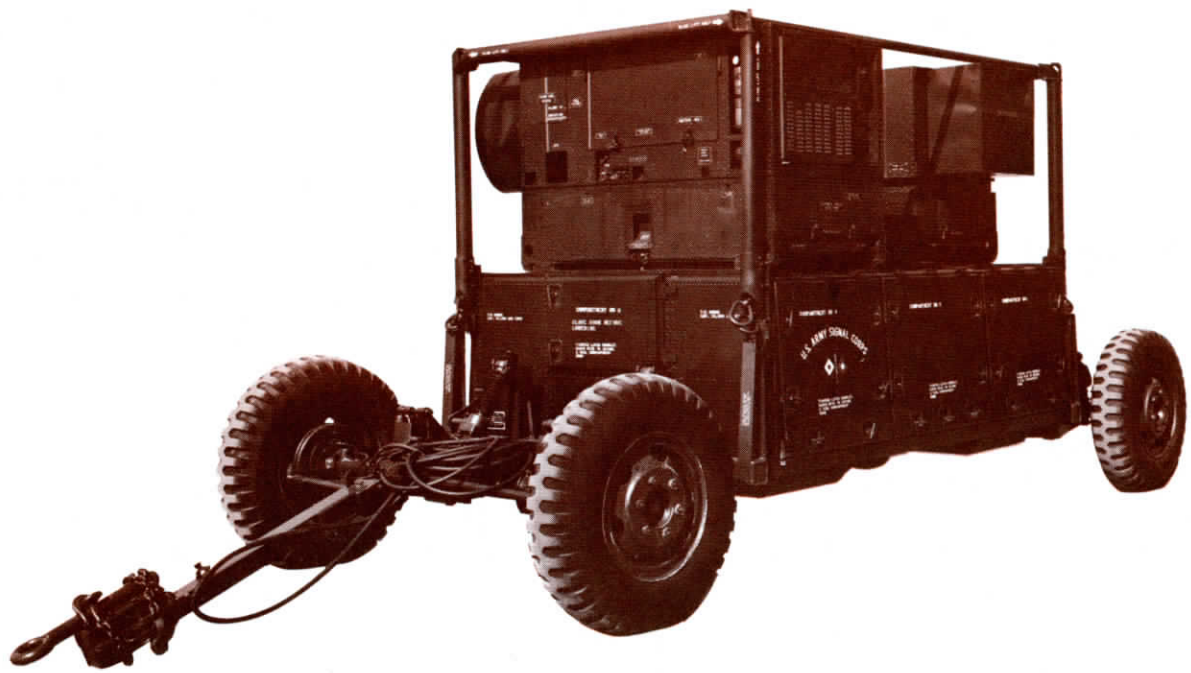
ANTENNAS: Transmit — 32 ft. whip, shelter mounted. Duplex Receive — 32 ft. whip, field mounted. A dipole or any 50 ohm impedance antenna can also be used.

Basic Units

789R-1 IF Translator, p. 88-90
789T-1 IF Translator, p. 88-90
618Z-4 RF Translator, p. 87
548L-4 1 KW Power Amplifier, p. 37
635V-1 Bandpass Filter, p. 112
714Y-2 Frequency Control, p. 90
700B-2 Teletypewriter Converter, p. 122, 123
426U-2 Power Supply, p. 86

AN/TSC-38 Transportable HF Communication Central





Features

Automatic Tuning
Remote Operation
Rapid Set Up

Applications

Highway Towing
Aircraft Transport

The AN/TSC-38 is a transportable HF station with radio channels covering the 2.0-29.9999 mc frequency range in 0.1 kc channel increments. Digital tuning simplifies operation and assures optimum equipment performance. The systems can be completely tuned to a new operating frequency in a maximum of 30 seconds facilitating tactical communication. The primary HF radio system is full duplex with a 10 kw PEP or average transmitter and two space diversity receivers to handle four independent sideband circuits in a nominal 12 kc bandwidth. A secondary full duplex system includes a 1 kw PEP or average transmitter and a receiver with four independent sidebands.

Either system is capable of reception at frequencies within 10% of the transmitter operating frequencies. System can be operated in a completely suppressed carrier SSB mode, or AFC and carrier re-insertion at three preset levels can be used if desired. A 20-line automatic switchboard is included in the system. Manually initiated ringdown signaling is available on the radio circuits.

 Available only on a production contract.

MINIMUM SET UP TIME

The self-contained HF facility is housed in two mobile units which can be transported by single C-130B, C-133, C-124, or two C-119 aircraft; or towed by a prime mover over highways, unimproved roads or cross country terrain. The equipment is operational only minutes after arrival on site.

The AN/TSC-38 operates from either a 120 v or 208 v, 50-60 cps or 400 cps, 3 phase, wye connected power source with no manual switching. The equipment will tolerate line voltage and frequency with up to $\pm 10\%$ variation.

Power for the complete system is provided by a primary and a backup 65 kw, 400 cps turbine generator set. Batteries furnish power for immediate touch-down and emergency operation of the secondary radio system and its associated terminal equipment.

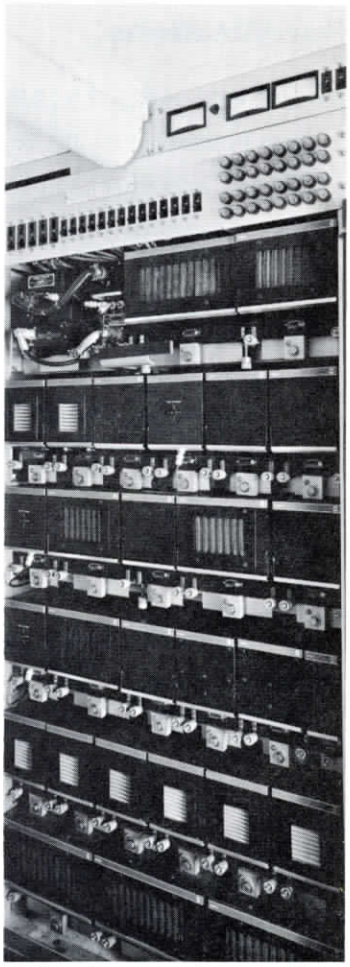
REMOTE OPERATION

The following radio system functions can be controlled from a remote location — primary power control, sideband selection, frequency changing, ten preset conditions, operational mode and push-to-talk operation, carrier reinsertion and AFC selection.

EQUIPMENT CONFIGURATION

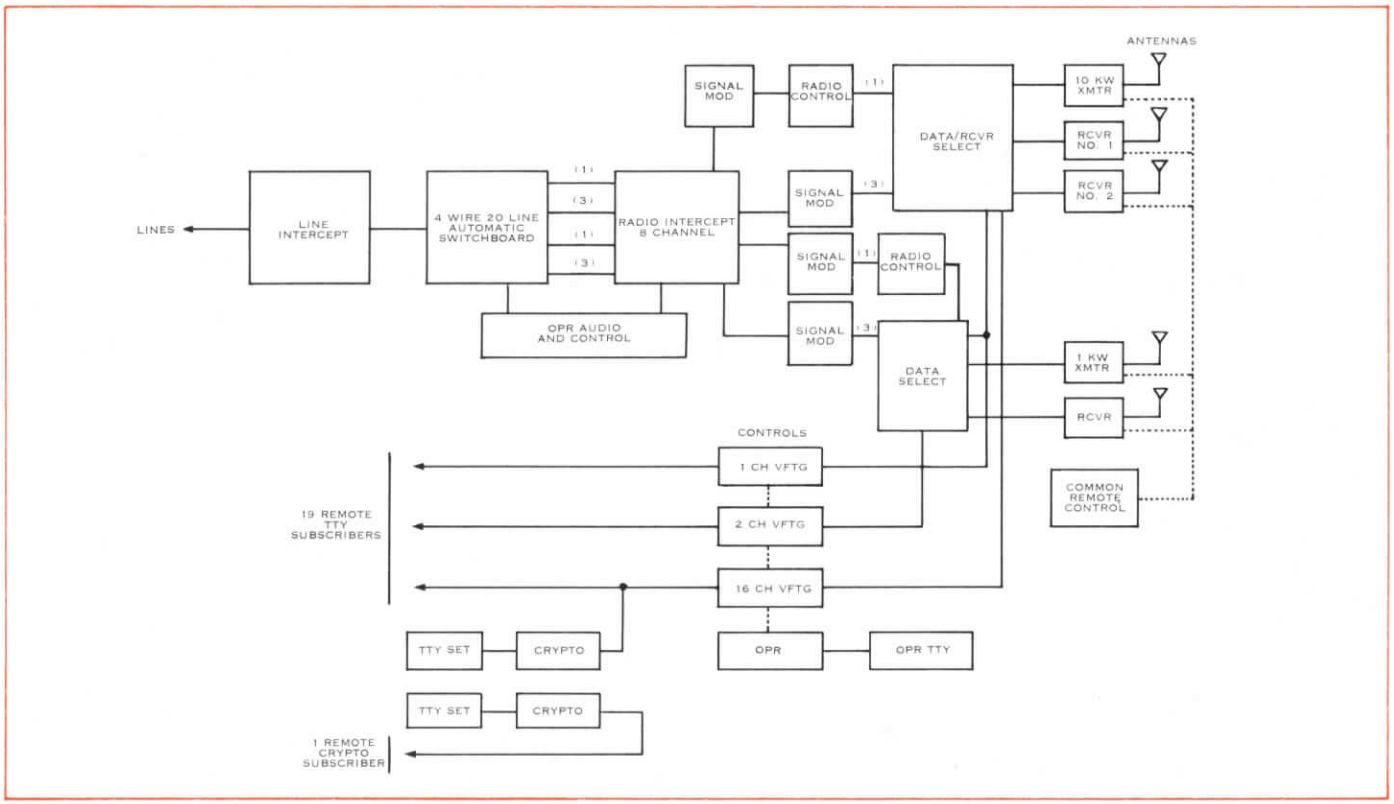
The system is a completely transportable configuration consisting of two mobile units: an air conditioned S-141 shelter and undercarriage which houses all electronic equipment; and an undercarriage and pallet with installed primary power engine generator and compartments for transportation of antennas, outside plant equipment and spare parts.

10 KW Power Amplifier



All equipment easily accessible

Functional Circuits



Specifications

FREQUENCY RANGE: 2.0-29.9999 mc.

TUNING INCREMENTS: 0.1 kc steps.

FREQUENCY STABILITY: 1 part in 10^8 per day.

TUNING: Completely automatic.

CONTROL: Local switch select, FSK dial-pulse select, and remote FSK dial-pulse select over a 2- or 4-wire telephone line.

EXTERNAL SUBSCRIBERS: Twelve 2- or 4-wire (switch selectable).

(1) 2- or 4-wire FSK dial, FSK push-to-talk (3 maximum).
(2) 2- or 4-wire dc dial common battery; maximum loop resistance, 500 ohms (12 maximum).
(3) 2- or 4-wire common battery manual; maximum loop resistance, 500 ohms (12 maximum).
(4) 2- or 4-wire local battery ringdown subscribers (6 maximum).
(5) 2- or 4-wire switchboard trunks (12 maximum).

TELEPHONE SWITCHING: Switchboard; 4-wire, dc dial, 20-line, 10-link, single-register 28 v dc loop operation. Attendant; single DSA (Dial Service Assistance) position.

VOICE FREQUENCY TELEGRAPHY GROUP (PRIMARY)

CHANNELS: Sixteen 4-wire, full duplex circuits.

CHANNEL FREQUENCY: 425-2975 cps.

FREQUENCY SHIFT: ±42.5 cps.

MODE OF OPERATION: Normal space diversity, switch-selectable to 8-channel space/frequency diversity on an individual channel basis.

VOICE FREQUENCY TELEGRAPHY GROUP (SECONDARY)

CHANNELS: Two 4-wire circuits.

CHANNEL FREQUENCY: Any two between 425 and 2975 cps.

FREQUENCY SHIFT: ±42.5 cps.

MODE OF OPERATION: Normal nondiversity, switch-selectable to 1-channel frequency diversity.

VOICE FREQUENCY TELEGRAPHY GROUP (WIDEBAND)

CHANNEL: One 4-wire full duplex nondiversity.

CHANNEL FREQUENCY: 2000 cps channel center frequency ±425 cps shift.

CRYPTOGRAPHY

Space and cabling are provided for two full duplex on-line terminals.

LOCAL TELETYPEWRITER

Two page-printer/keyboards; one typing reperforator, one transmitter distributor equipment, and one combination reperforator/keyboard/transmit distributor.

EXTERNAL SUBSCRIBERS

Twenty 4-wire lines; 20 or 60 ma neutral or 30 ma polar.

PRIMARY RADIO-FULL DUPLEX

TRANSMITTER POWER OUTPUT: 10 kw PEP/average.

RECEIVERS: Two (space diversity).

MODE OF OPERATION: Switch selection; full duplex or simplex.

FREQUENCY SEPARATION: 10% from transmitted frequency.

CHANNELIZATION: Four independent 3 kc channels in a 12 kc assignment.

ANTENNA REQUIREMENTS: 1 each 10 kw transmit antenna displaying 50 ohms with a VSWR of less than 3:1 from 2.5-30.0 mc and 2:1 from 2.0-2.5 mc. 2 each, receive antennas for space diversity reception.

SECONDARY RADIO-FULL DUPLEX

TRANSMIT POWER OUTPUT: 1 kw PEP/average.

CHANNELIZATION: One receiver with four 3 kc ISB channels.

MODE OF OPERATION: Switch selection; full duplex or simplex.

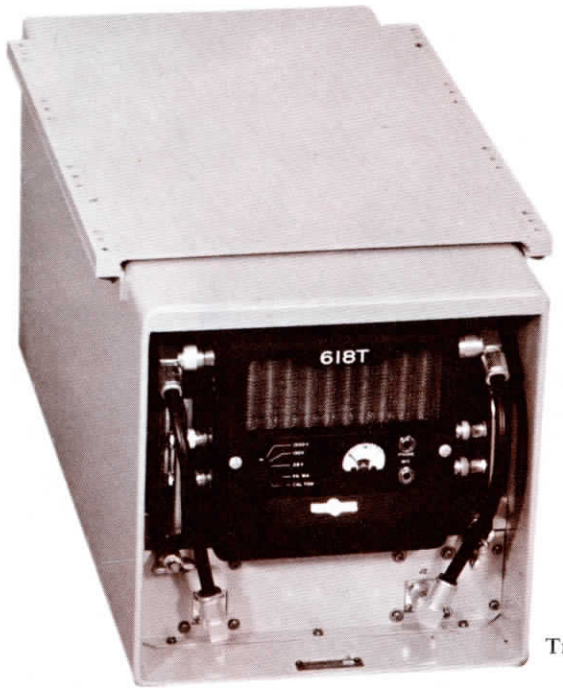
ANTENNA REQUIREMENTS: 1 transmit and 1 receive antenna displaying 50 ohms with 3:1 VSWR or 32 ft. whip.

ANTENNAS SUPPLIED: Two 32 ft. whip antennas (within shelter). Two receive sloping vee antennas (1 kw). One 10 kw transmit sloping vee antenna.

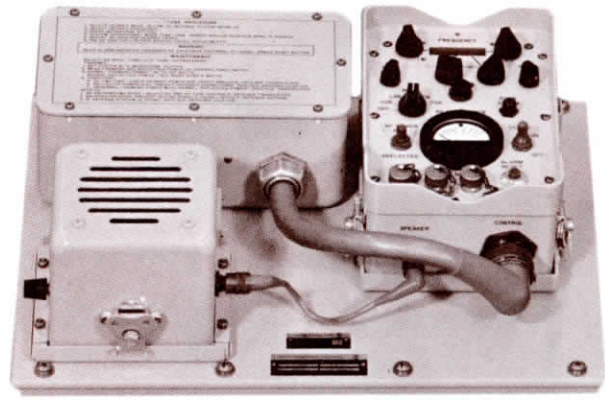
Basic Units

Power Amplifiers, p. 34-37
789R-1 IF Translator, p. 88-90
789T-1 IF Translator, p. 88-90
618Z-4 RF Translator, p. 87
635V-1 Harmonic Filter, p. 112
426U-2 Power Supply, p. 86

HF-105, -106, -107, -108, -109 HF Shipboard Systems



Transceiver Case



Command Center Control Group

Features	Applications
Automatic Tuning	*Small Boat*
Command-Center Operation	*Landing Craft*
Optional Power Sources	*Shipboard*
Easy Installation	
Simplified Maintenance	

The Collins HF-105, HF-106, HF-107, HF-108 and HF-109 are multiple purpose, single sideband radio systems which operate from different primary power sources to meet a variety of application requirements.

The systems are automatically tuned and cover the 2.0-29.999 mc frequency range in 28,000 channel increments. Transmit power output is 400 watts in either upper or lower sideband and 100 watts in AM with reinserted carrier, CW or optional FSK.

The systems offer optimum tactical communication range for small boats, landing craft and ships.

COMMAND-CENTER OPERATION

The ship's commanding officer is offered a new concept in rapid communication, since the desired channel frequency can be selected directly from a control unit in the command center in much the same manner as an aircraft radio is operated. Tuning is completely automatic. Channel change time is less than 30 seconds nominal. Complete operation of the equipment requires no technical background.

RAPID INSTALLATION

The systems can be quickly installed by ship's personnel using only common skills, such as welding and cable wiring. A routine installation requires only about 16 hours.

Equipment packaging in four basic units — transceiver, command control group, antenna coupler group and power supply group — makes installation adaptable to various types of ships. The five HF communication systems are identical except for primary input power requirements.

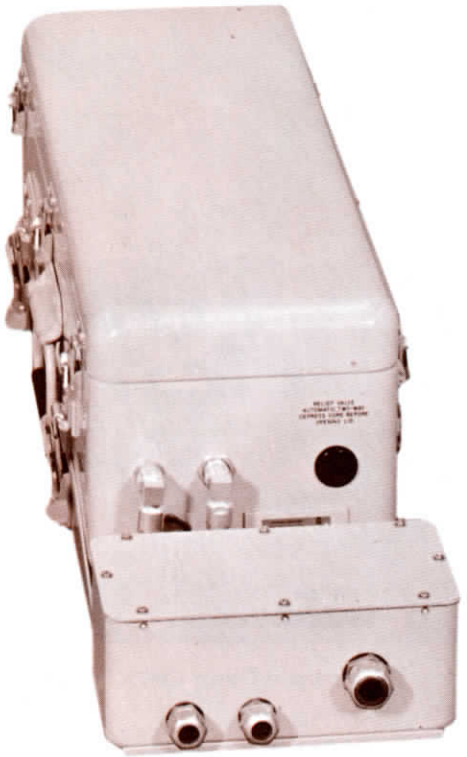
The basic transceiver is the proven 618T housed in a type 1, drip-proof, wrap-around case. Capability of remotely located control unit and antenna coupler facilitates optimum installation.

The watertight control group may be located up to 350 ft. from the transceiver. In addition to all operating controls, it includes an RF wattmeter to monitor over-all functioning of the system during operation.

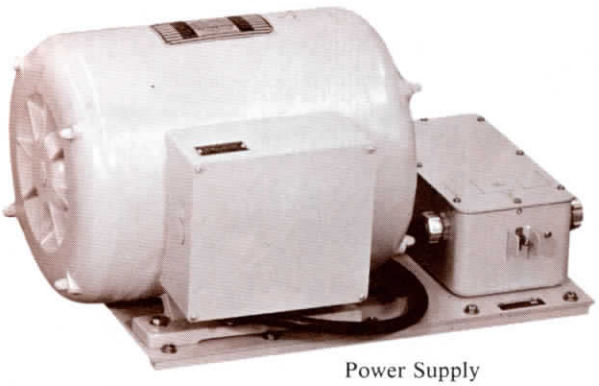
Flexibility in antenna location is made possible by a separate antenna coupler which can be located up to 100 ft. from the transceiver case.

EASE OF MAINTENANCE

The location of an equipment malfunction can be quickly isolated by ship's personnel using a simplified procedure which is outlined on a permanently attached plate located near the control unit. Corrective maintenance is initiated by substitution of one of the three easily replaced major system units. This feature makes it especially suitable for small ships which have limited space and equipment for trouble shooting.



Antenna Coupler



Power Supply

Specifications

FREQUENCY RANGE: 2.0-29.999 mc.

NUMBER OF FREQUENCY CHANNELS: 28,000 spaced 1 kc.

FREQUENCY SELECTION: 4 control knobs with indicators.

CHANNEL CHANGE TIME: Less than 15 seconds nominal, including antenna coupler.

OPERATING MODES: USB, LSB, AM, CW and optional FSK.

FREQUENCY STABILITY: 0.8 part in 10^6 per month.

WARM-UP TIME: 30 seconds.

TELETYPEWRITER OPERATION: 850 cps shift with optionally available 700B-2 Teletypewriter Converter.

ANTENNA REQUIRED: 16 ft. or 32 ft. whip, or 45-90 ft. wire.

AUDIO CHARACTERISTICS: Input — 100 ohms carbon microphone. Output — 300 ohms.

MICROPHONE: Standard military differential carbon type.

KEY: Standard military types.

INPUT SOURCE:

System	Power Source
HF-105	27.5 v dc.
HF-106	220 v or 120 v, 50 or 60 cps, 1 phase.
HF-107	440 v or 220 v, 60 cps, 3 phase.
HF-108	208 v, 400 cps, 3 phase, 4-wire.
HF-109	440 v, 220 v or 120 v, 400 cps, 3 phase.

SIZE AND WEIGHT:

	Size			*Weight*
	W	*H*	*D*	
Transceiver and mount	12″ 30.48 cm	12″ 30.48 cm	25½″ 64.77 cm	102 lbs. 46.27 kg
Antenna coupler and mount	9½″ 24.13 cm	10″ 25.4 cm	36½″ 92.71 cm	70 lbs. 31.75 kg
Control group	18½″ 46.99 cm	14″ 35.56 cm	5″ 12.7 cm	26 lbs. 11.79 kg
Power supply group	Differs with type of system.			

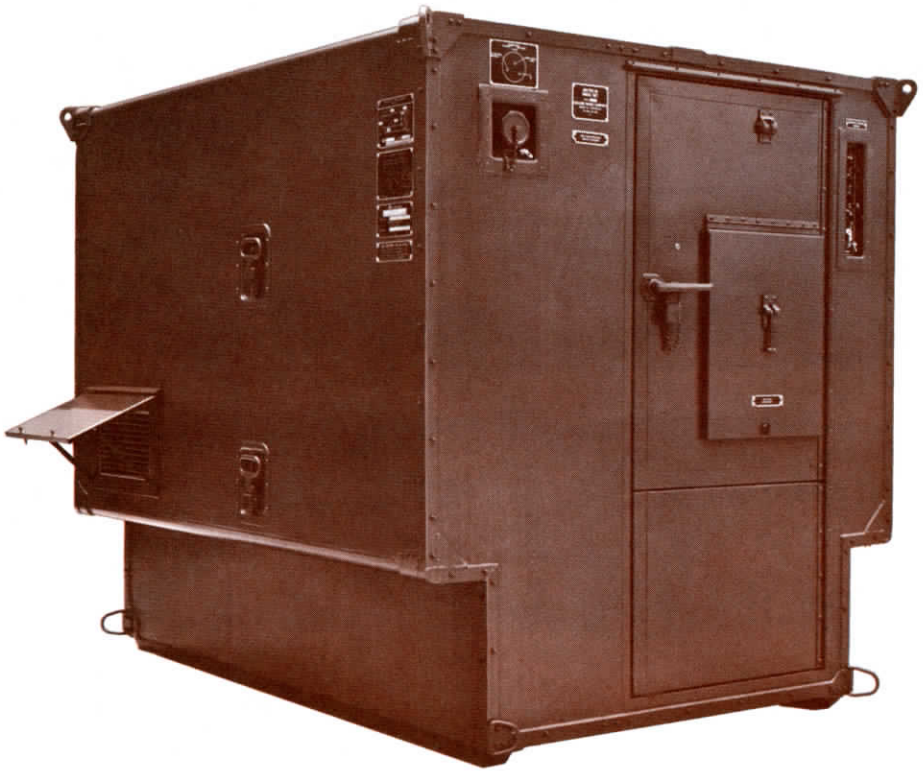
Basic Units

618T Transceiver, p. 44, 45
490B-1 Automatic Antenna Coupler, p. 108

Related Equipment

700B-2 Teletypewriter Converter, p. 122, 123

TCS-110-1 Transportable HF Communication Terminal



Features

Automatic Tuning
Single Shelter
One-Man Operation

Applications

Transportable
Communication Center

TCS-110-1 is a compact, lightweight HF terminal housed in a single S-144/G size shelter. It includes all facilities to control, switch and operate five remote telephone and teletypewriter lines together with the local operator's audio and teletypewriter circuits.

The basic HF radio equipment, Collins' Universal Radio Group, provides four independent 3 kc wide multiplexed channels in a 12 kc frequency allocation. It is automatically tuned throughout the 2.0-29.9999 mc frequency range in 0.1 kc channel increments. Choice of operating modes includes 4 channel multiplex (A-1, A-2, B-1, B-2) in independent sideband, upper sideband, lower sideband, CW, teletypewriter and compatible AM.

In duplex operation, the receiver can be operated with only 10% frequency separation from the transmitter. The transmit antenna is mounted on top of the shelter to minimize transmission line length, which reduces undesired radiation and loss. The receiving antenna is located at ground level a short distance from the terminal.

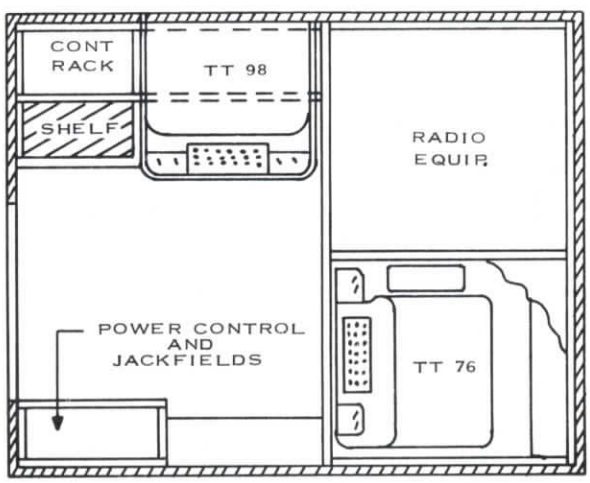
In addition to local control, the system can be operated by FSK dial pulses over a conventional 2- or 4-wire telephone line. Terminal equipment for crytographic units enables compatibility with existing systems.

RAPID SET UP

All equipment required to place the communication terminal in service is housed in the shelter. It can be transported by fixed-wing aircraft, helicopter or truck, and set up for operation by one man.

EQUIPMENT CONFIGURATION

The interior of the shelter is arranged to make maximum use of available space, while providing for easy maintenance and complete removal or replacement of individual equipment, if the need arises. The power control center provides immediate access to the lighting and equipment power switch



TCS-110-1 Floor Plan

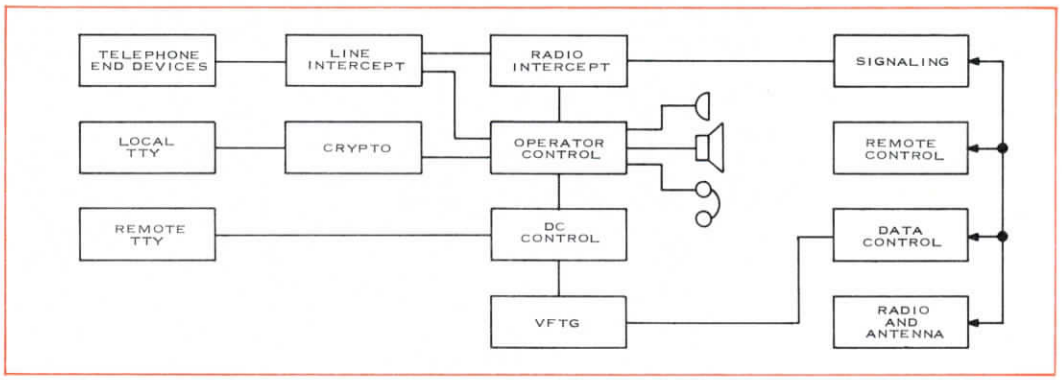
Available only on a production contract.

from the shelter entrance and the normal operating position. The operating console has function controls carefully grouped to facilitate operation with minimum effort. All status displays are located at eye level. The equipment is arranged to preclude blind spots and sharp protrusions to insure maximum efficiency and personnel safety.

ADVERSE ENVIRONMENTS

The equipment shelter is designed to operate over a wide range of environmental conditions, including temperatures of −40° C to +50° C (−52° C to +54.4° C nonoperating), 100% relative humidity at 35° C and 10,000 ft. pressure (50,000 ft. nonoperating). It will operate satisfactorily under sand, dust, salt and fungus environments as normally encountered in desert, seacoast and tropical areas. Shock and vibration, as encountered during aircraft transport, railroad humping, 18-inch drops and Munson road tests, can be tolerated by the TCS-110-1 system.

Functional Circuits



Specifications

GENERAL

FREQUENCY RANGE: 2.0-29.9999 mc; 0.1 kc steps.

FREQUENCY STABILITY: 1 part in 10^8 per day.

TUNING: Automatic.

CONTROL: Local switch select, FSK dial-pulse select, and remote FSK dial-pulse select over a 2- or 4-wire telephone line.

EXTERNAL SUBSCRIBERS: Five 2- or 4-wire.

(1) 2- or 4-wire FSK dial FSK PTT (4 maximum).
(2) 2- or 4-wire dc dial common battery; maximum loop resistance, 500 ohms (1 maximum).
(3) 2- or 4-wire common battery manual; maximum loop resistance, 500 ohms (1 maximum).
(4) 2- or 4-wire local battery-type ringdown subscribers (1 maximum).
(5) 2- or 4-wire switchboard trunks (4 maximum).

TELEPHONE SWITCHING: Switchboard; 4-wire.

DUPLEX RADIO

POWER OUTPUT: 1 kw PEP/average.

RECEIVERS: One.

MODE OF OPERATION: Switch selection; full duplex or simplex.

FREQUENCY SEPARATION: 10% from transmitted frequency.

CHANNELIZATION: Four independent 3 kc channels in a 12 kc frequency assignment.

ANTENNAS: Two 32 ft. Fiberglas whips.

VOICE FREQUENCY TELEGRAPH PRIMARY

CHANNELS: Eight 4-wire, full duplex circuits.

CHANNEL FREQUENCY: 425-2975 cps.

FREQUENCY SHIFT: ±42.5 cps.

MODE OF OPERATION: Normal 8 channel nondiversity, switch-selectable to four channel frequency diversity on an individual channel basis.

CRYPTOGRAPHY

Space and cabling are provided within the shelter for one full duplex on-line terminal.

LOCAL TELETYPEWRITER

TWO PAGE PRINTER/KEYBOARD: One TT-76/FG keyboard, typing reperforator, transmitter distributor, and one TT-98/FG page printer/keyboard.

EXTERNAL SUBSCRIBERS

Eight 4-wire lines; 60 ma neutral.

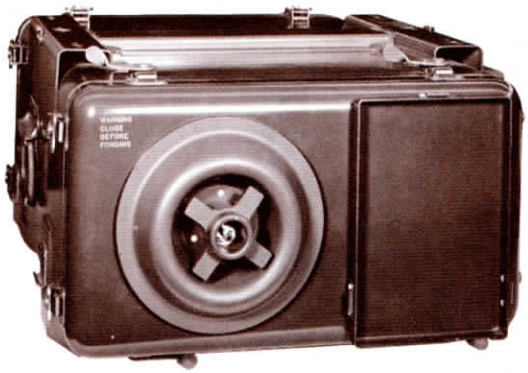
POWER SOURCE: 120 v ac, single phase; or 208 v, 3 phase, 50-60 cps or 400 cps.

SIZE: S-144/G Shelter — 62″ W, 66″ H, 78″ D (157.48 cm W, 167.64 cm H, 198.12 cm D), maximum.

Basic Units

789R-1 IF Translator, p. 88-90
789T-1 IF Translator, p. 88-90
618Z-4 RF Translator, p. 87
548L-4 1 KW Power Amplifier, p. 37
426U-2 Power Supply, p. 86
635T-2 Receiver Bandpass Filter, p. 111, 112
313 Series Control, p. 83-85

VC-102 HF Communication System



Transceiver

Antenna Coupler

Speaker

Control Box

Features	Applications
Automatic Tuning	*Mobile*
Remote Operation	*Transportable*
Phone Patch	*Shipboard*
Teletypewriter Capability	*Fixed Station*
Modular Construction	

The VC-102, a multiple purpose single sideband radio system, provides optimum tactical area communication whether used in mobile or fixed installations. The 2.0-29.999 mc frequency range is covered in 28,000 1 kc increments. Transmit power output is 400 watts PEP in either upper sideband or lower sideband and 100 watts in AM with reinserted carrier, CW or FSK. Automatic tuning permits operation by unskilled personnel and assures on-frequency operation.

SYSTEM APPLICATION

The VC-102, using modular construction, is ideally suited for vehicular, transportable, shipboard and fixed HF station installations.

All operating controls are located on a compact local-remote unit, which can be used with an appropriate cable at distances up to 100 ft. from the transceiver case. Remote control over long distances can be achieved by the use of the AN/GRA-6 or similar type equipment.

A telephone patch circuit extends system versatility for use with wire line circuits. This function is under direct supervision of the operator.

Teletypewriter A nonsynchronous FSK unit is supplied for teletypewriter speeds up to 100 words per minute. The frequency shift keyer uses solid state components, built-in loop supply and an electronic keyer. It is housed in the main equipment case.

Antenna Choice The rugged Fiberglas antenna employs four sections for mobile operation and eight sections for stationary use. A separate antenna coupler allows the antenna to be located up to 100 ft. from the transceiver case.

BASIC EQUIPMENT

The basic transceiver is the proven Collins 618T-3, housed with a power supply and optional 700B-2 FSK unit in a compact aluminum case which is drip-proof during operation and watertight in transport. The local-remote control, antenna coupler, auxiliary speaker and auxiliary load coil are of watertight construction.

Modular construction, together with plug-in major assemblies, reduces maintenance and parts problems. The extensive use of transistor circuits provides increased reliability and reduction of power consumption and weight.

Accessories

INSTALLATION KITS

Installation kits are available for the M38A-1 and M151 military vehicles which include all mounting brackets and interconnecting cables for the transceiver and antenna coupler cases and remote-local control box, together with the whip antenna assembly. Mounting bases are supplied with quick disconnect receptacles to facilitate removal of the equipment cases for inspection or maintenance.

The Fiberglas antenna consists of four sections for a 16 ft. whip and four extension sections for 32 ft. heights. It is complete with canvas stowage bag.

FIXED STATION ANTENNA

A Fiberglas antenna kit for shipboard or fixed station installation includes a feed-through type base section for bulkhead mounting and one or more extension sections.

76F-1 SPEAKER/AMPLIFIER

The optional speaker unit, similar to LS-166, is mounted in a watertight case with a self-contained transistor audio am-

plifier. A gain control is provided on the side of the enclosure.

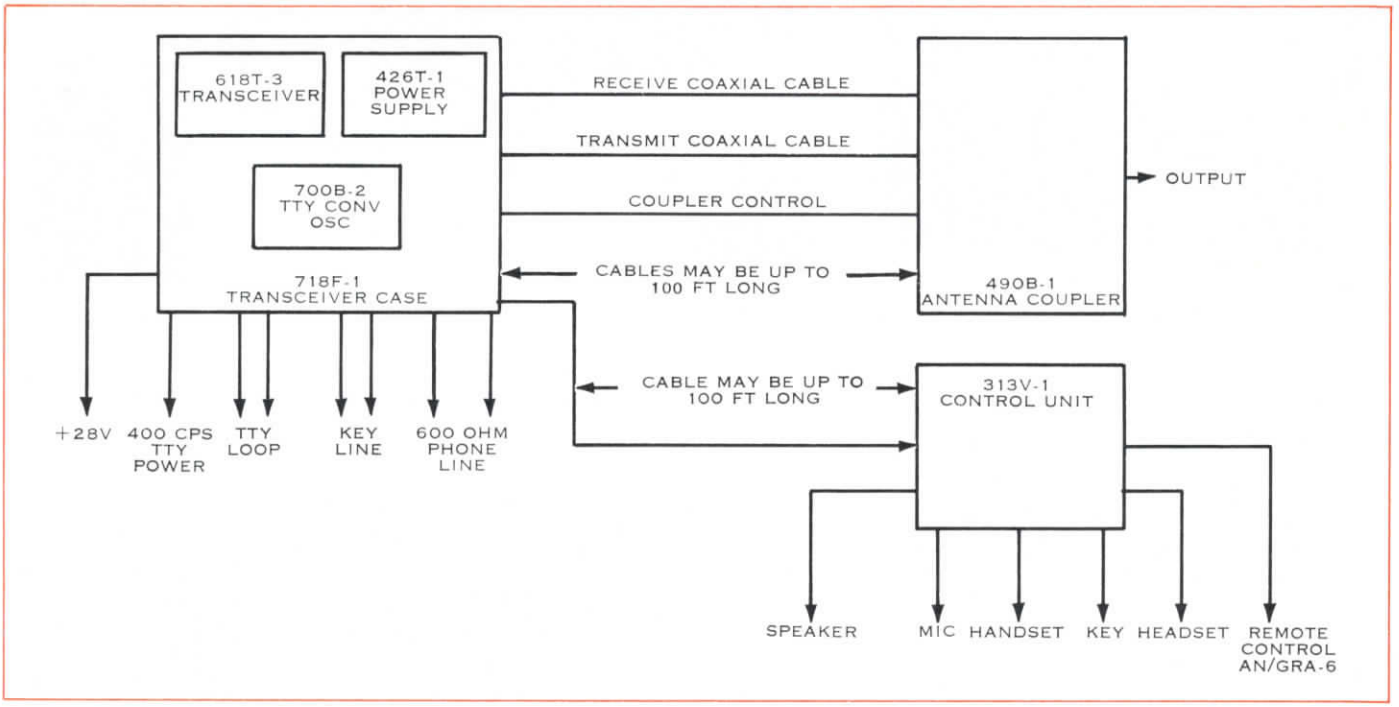
690D-1 LOAD COIL

The optional load coil unit is used to electrically lengthen a 16 ft. whip antenna in the 2-30 mc range. It is mounted in a watertight case which also provides the antenna mount. A coax fitting UG-680/U type N is provided on the side of the case for connecting a dipole antenna.

CABLES

Optional cables 100 ft. long are available for the control and antenna coupler.

Functional Circuits



Specifications

FREQUENCY RANGE: 2.0-29.999 mc.

NUMBER OF FREQUENCY CHANNELS: 28,000 spaced 1 kc.

FREQUENCY SELECTION: 4 knobs with digital indicators.

TUNING METHOD: Automatic, servo-controlled, including antenna coupler.

CHANNEL CHANGE TIME: 15 seconds nominal, including antenna coupler.

OPERATING MODES: USB, LSB, AM, CW and FSK.

FREQUENCY STABILITY: 0.8 part in 10^6 per month.

SEMIREMOTE CAPABILITY: Complete control with appropriate cable up to 100 ft.

REMOTE CAPABILITY: Control over 2-wire line with AN/GRA-6 or equivalent. (Push-to-talk and audio control only, 2 miles.)

ANTENNA REQUIRED: 16 ft. or 32 ft. whip, or 45-90 ft. wire.

PHONE PATCH REQUIREMENTS: 600 ohm phone line operator controlled, not voice operated.

MICROPHONE: Differential carbon, Electro-Voice 205KK or equivalent.

KEY: Standard military type.

HANDSET: Military type H33F/PT or equivalent.

POWER INPUT: 27.5 v dc, 53 amps peak during tuning; 37 amps nominal SSB voice transmit; 14 amps receive.

GFE EQUIPMENT: AN/GRA-6 remote control, if used.

SIZE AND WEIGHT:

	Size			*Weight*
	W	*H*	*D*	
Transceiver case	19½″ 49.5 cm	12¾″ 32.4 cm	30″ 76.2 cm	140 lbs. 63.5 kg
Coupler case	9 5/16″ 23.65 cm	9″ 22.8 cm	27″ 68.6 cm	50 lbs. 22.7 kg
Control box	6″ 15.2 cm	9″ 22.8 cm	3.5″ 8.9 cm	7.5 lbs. 3.4 kg
Speaker	7½″ 19.0 cm	7″ 17.8 cm	4¾″ 12.1 cm	3.5 lbs. 1.6 kg

Basic Unit

618T-3 Transceiver, p. 44, 45

Related Equipment

700B-2 Teletypewriter Converter, p. 122, 123

VC-104 Vehicular HF-UHF Communication System

Features

Automatic Tuning
HF-UHF Communication
Phone Patch
Remote Operation
Modular Construction

Applications

Mobile
Airlift Capability

The VC-104, installed in a 4 x 4 ¼-ton M38A-1 military vehicle, provides optimum tactical mobile communication in the 2.0-29.999 mc and 225.0-399.9 mc frequency ranges.

In the HF range, 1 kc channel increments are provided with 400 watts PEP level output in either upper sideband, or lower sideband and 100 watt output level in AM with reinserted carrier, CW or FSK.

The UHF range is covered in 100 kc increments with 20 watts AM output power.

Automatic digital tuning reduces required operator proficiency and precludes the possibility of equipment damage because of operator error. A separate UHF single frequency receiver is included to monitor the guard channel.

Available only on a production contract.

EQUIPMENT CONFIGURATION

The basic communication equipment, a Collins VC-102 system for HF SSB, compatible AM, CW and FSK, and a Collins 718M-1, which includes an AN/ARC-52X for UHF voice, are housed in compact aluminum cases. The cases are drip-proof during operation and watertight in the transport condition. The M38A-1 vehicle is equipped with a standard military 100 amp, 27.5 v electrical system.

The primary power system includes a voltmeter/tachometer to assure correct engine speeds and generating capacity under all conditions. Both the HF and UHF systems can be operated while the vehicle is in motion.

Carrying racks are included for transporting AN/PRC-25, AN/PRC-41 and AN/PRC-47 pack sets. The VC-104 is well-suited for airlift and airdrop operations because of small size, reduced weight and ruggedness.

A phone patch circuit extends system versatility for use with wire line facilities. This function is under direct supervision of the operator.

Controls are centrally located. The HF control unit may be quickly detached for semi-remote operation.

CONTROLS

All HF operating function controls are located on a compact local-remote unit which can be quickly detached from the transceiver case. The VC-104 can be used with an appropriate cable at distances up to 100 ft. from the vehicle. Remote control over greater distances can be accomplished by the use of the AN/GRA-6 or similar equipment.

In addition to manual selection of the 1750 channels, 19 of the most commonly used UHF frequencies can be preset, allowing rapid channel selection. The AN/GRA-6 will also control the 718M-1 UHF Transceiver.

OPTIONAL FSK

One hundred word per minute FSK capability can be added to the HF system by the use of a Collins 700B-2 Teletypewriter Converter.

ANTENNA CHOICE

Remote location of the HF antenna is made possible by a separate antenna coupler which can be positioned up to 100 ft. from the vehicle. A connector located on the HF whip mounting base permits the use of a dipole antenna. A discone UHF antenna mounts directly on the vehicle.

Specifications

HF SYSTEM CHARACTERISTICS

POWER OUTPUT: SSB — 400 watts PEP; AM — 100 watts; CW, FSK —100 watts.

FREQUENCY RANGE: 2.0-29.999 mc; 1 kc channel increments.

FREQUENCY STABILITY: 0.8 part in 10^6 per month.

ANTENNA: Whip, adjustable in sections 16-32 ft. Long wire, 45-90 ft., or dipole antenna can be used.

PHONE PATCH: 600 ohm line.

POWER INPUT: 27.5 v dc; 53 amps peak during tuning; 37 amps nominal SSB voice transmit; 14 amps receive.

WEIGHT: 200 lbs. (90.72 kg).

UHF SYSTEM CHARACTERISTICS

POWER OUTPUT: 20 watts.

FREQUENCY RANGE: 225.0-399.9 mc; 100 kc increments.

FREQUENCY STABILITY: ±10 kc.

PRESET CHANNELS: 19, including guard channel.

ANTENNA: AS-390 with 4 each 4 ft. mast sections.

POWER INPUT: 27.5 v dc; 16 amps tuning; 14 amps transmit; 9 amps receive.

WEIGHT: 125 lbs. (56.70 kg).

GFE EQUIPMENT: M38A-1 vehicle and 100 amp generating system. AN/GRA-6 remote control, if used.

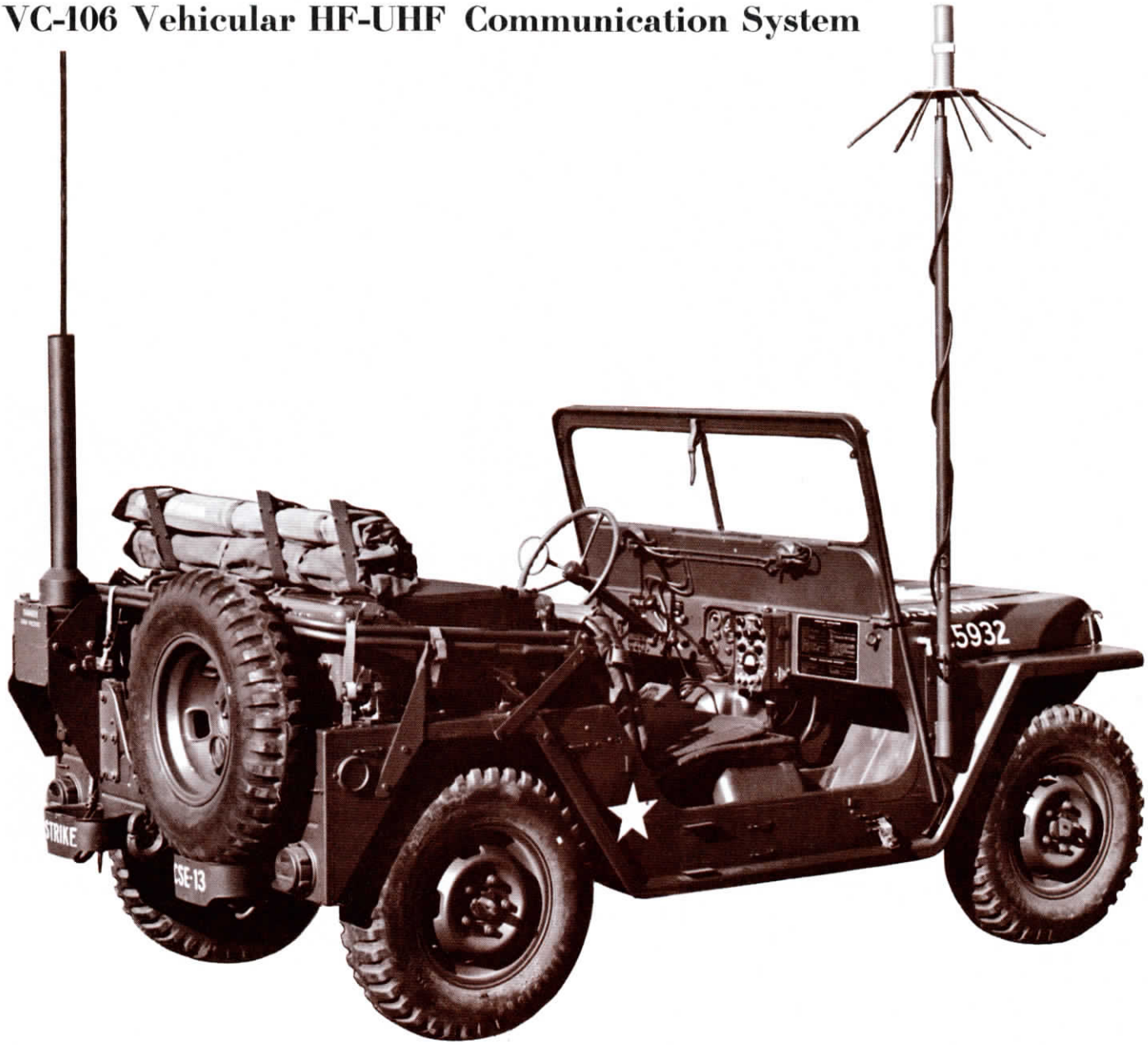
Basic Unit

VC-102 HF Communication System, p. 75, 76

Related Equipment

700B-2 Teletypewriter Converter, p. 122, 123

VC-106 Vehicular HF-UHF Communication System



Features

Automatic Tuning
HF-UHF Communication
Phone Patch
Remote Operation
Modular Construction

Applications

Mobile
Airlift Capability

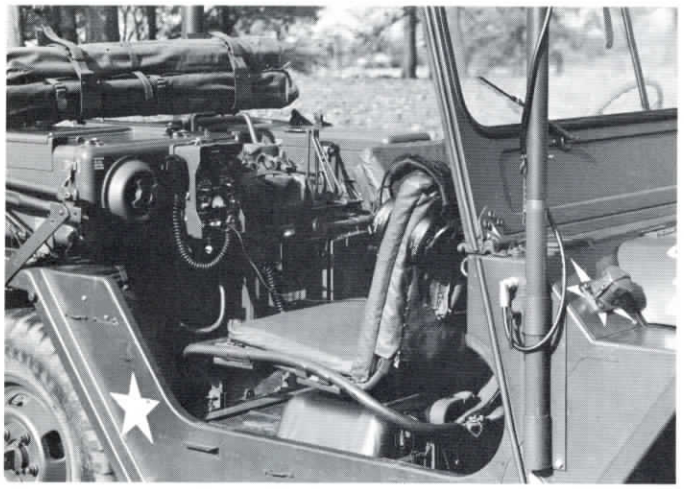
Collins VC-106 is an HF-UHF vehicular communication system installed in a 4 x 4 ¼-ton M151 vehicle. It offers optimum tactical area communication with automatic tuning in the 2.0-29.999 mc and 225.0-399.9 mc frequency ranges, In the HF range, 1 kc channel increments are provided with 400 watts peak envelope power output level in either upper sideband or lower sideband and 100 watt output level in AM with reinserted carrier, CW or frequency shift keying.

The UHF range is covered in 100 kc increments with 20 watts AM output power. In addition to manual selection of the 1750 channels, 19 of the most commonly used UHF frequencies can be preset, allowing rapid channel selection. A separate UHF single frequency receiver is included to monitor the guard channel.

BASIC EQUIPMENT

Both systems can be operated while the vehicle is in motion. The basic equipment includes a Collins VC-102 system for HF SSB, compatible AM, CW and FSK and a Collins 718M-1 which uses an AN/ARC-52X for UHF voice. The systems are housed in waterproof cases which are attached to the vehicle by quick disconnect clamps allowing removal for operation as a fixed station.

Available only on a production contract.



Controls are centrally located.

The M151 vehicle is equipped with a standard military 100 amp, 27.5 v electrical system. The primary power system includes a voltmeter/tachometer to assure correct engine speeds and generating capacity under all conditions. The size, weight and ruggedness of the VC-106 system ideally suit it to airlift and airdrop operations.

CONTROLS

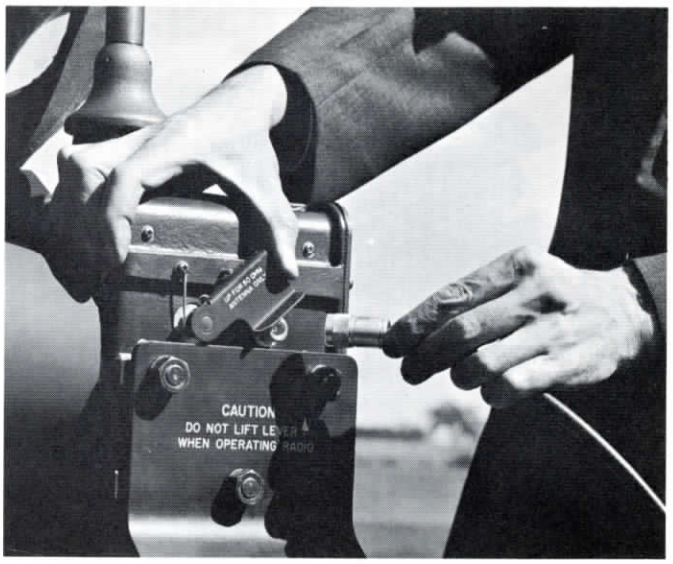
The HF operating controls are located on a compact, local-remote unit, which can be quickly detached from the transceiver case. The unit can be used with an appropriate cable at distances up to 100 ft. from the vehicle. Remote control over greater distances can be accomplished by the use of the AN/GRA-6 or similar equipment.

A phone patch circuit extends the versatility of the HF system by permitting connection with wire line telephone facilities. This function is under direct supervision of the operator. UHF radio can also be controlled by the AN/GRA-6.

Optional FSK One hundred word per minute FSK capability can be added to the HF system by the use of Collins 700B-2 Keyer-Converter.

ANTENNA CHOICE

Remote location of the HF system antenna is made possible by a separate antenna coupler which can be positioned up to 100 ft. from the vehicle. A connector located at the mounting base of the HF whip antenna also permits the use of either a long wire or dipole antenna. A discone UHF antenna mounts directly on the vehicle.



Dipole antenna connector automatically disconnects whip.

Specifications

HF SYSTEM CHARACTERISTICS

POWER OUTPUT: SSB — 400 watts PEP; AM — 100 watts; CW, FSK — 100 watts.

FREQUENCY RANGE: 2.0-29.999 mc; 1 kc channel increments.

FREQUENCY STABILITY: 0.8 part in 10^6 per month.

ANTENNA: Whip, adjustable in sections 16-32 ft. Long wire 45-90 ft. or dipole antenna can be used.

PHONE PATCH: 600 ohm line.

POWER INPUT: 27.5 v dc, 53 amps peak during tuning; 37 amps nominal SSB voice transmit; 14 amps receive.

WEIGHT: 200 lbs. (90.27 kg).

UHF SYSTEM CHARACTERISTICS

POWER OUTPUT: 20 watts.

FREQUENCY RANGE: 225.0-399.9 mc; 100 kc increments.

FREQUENCY STABILITY: ±10 kc.

PRESET CHANNELS: 19, including guard channel.

ANTENNA: AS-390 with four each four foot mast sections.

POWER INPUT: 27.5 v dc; 16 amps tuning; 14 amps transmit; 9 amps receive.

WEIGHT: 125 lbs. (56.70 kg).

GFE EQUIPMENT: M151 vehicle and 100 amp generating system. AN/GRA-6 remote control, if used.

Basic Unit

VC-102 HF Communication System, p. 75, 76

Related Equipment

700B-2 Teletypewriter Converter, p. 122, 123