AN/VRC-12
Radio Sets

The AN/VRC-12 and AN/VRC-43 through VRC-49 is a series of combat-proven vehicular radio sets which lend themselves particularly well to applications of tactical deployment and specific operational missions because of their ability to be assembled into various configurations and of being installed on most types of military vehicles; including heavy armor. The equipment provides 920 VHF/FM voice channels in the 30-76 MHz range. It consists of three major units: Receiver-Transmitter RT-246A/VRC with a channel-presetting capability (10 pushbuttons), Manual Receiver-Transmitter RT-524A/VRC with built-in loudspeaker, and Auxiliary Receiver R-442A/VRC.

Shock mountings are supplied as standard items for vehicular installation. The AS-1729/VRC step-tuned whip antenna is automatically matched to the operating frequency by either of the transceiver units; a simple, relatively inexpensive antenna is used with the auxiliary receiver. Optional control boxes and an interphone amplifier are supplied if operation of the radio set is to be extended to crew members in heavy armored vehicles or crew-served weapons. Audio accessories, such as headsets, handsets, microphones and loudspeakers may be chosen from a wide variety of standard items available. In tanks, a headset-microphone combination (MK-1697) built into a DH-132 or DH-133 series of helmets are more commonly used. Separate brochures are available for Audio Accessories, Control Ancillaries, Vehicular Mountings and Antenna AS-1729/VRC.

In addition to the conventional noise-operated squelch, an advanced tone-operated squelch (150 Hz) is provided in this series, thus eliminating "false alarms" or undesired audio output from the receiver when net stations are not called. The tone squelch also ensures reliable retransmission when two receiver-transmitter are used as an automatic relay station in high-density communication centers where off-frequency signals often cause false triggering of the retransmission setup.

As a result of long-standing field experience, much thought and effort have been invested in upgrading the equipment to standards beyond those set by the original designers.

MAJOR CHARACTERISTICS

CHARACTERISTIC		AN/VRC-							
		12	43	44	45	46	47	48	49
No. Channels	Transmit	1	1	1	2	1	1	1	2
	Receive	2	1	3	2	1	2	3	2
Channel Selection	Preset	x		x	x				
	Manual					x	x	x	x
	Remote	x	x	x	x				
Retransmission					x				x

MAJOR COMPONENT UNITS

Name	Designation	U.S. F S N	Quantity used in AN/VRC-(FSN: 5820-223-) 12 7412)	43 7415)	44 7417)	45 7418)	46 7433)	47 7434)	48 7435)	49 7437)
Receiver-Transmitter (automatic)	RT-246A/VRC	5820-892-0623	1	1	1	2				
Receiver-Transmitter (manual)	RT-524A/VRC	5820-892-0622					1	1	1	2
Receiver (auxiliary)	R-442A/VRC	5820-892-0624	1		2			1	2	
Antenna (for receiver-transmitter)	AS-1729/VRC*	5985-985-9024	1	1	1	2	1	1	1	2
Antenna Base (for auziliary receiver)	**	-		1		2		1	2	
Mast Section (for auxiliary receiver)	MS-116A	5820-199-8831		1		2		1	2	
Mast Section (for auxiliary receiver)	MSA-117A	5820-199-8843	1		2			1	2	
Mast Section (for receiver-transmitter)	MS-118A	5820-199-8841		1		2		1	2	
Mounting (for auxiliary receiver)	MT-1029/VRC	5820-893-1323	1	1	1	2	1	1	1	2
Mounting (for auxiliary receiver)	MT-1898/VRC	5820-893-1324	1		2			1	2	
Cable Assembly, electrical, power 10'	CX-4720/VRC	5995-823-2726	1	1	1	1	1	1	1	1
Cable Assembly, electrical, power 2'6"	CX-4721/VRC	5995-823-2725	1		1	1		1	1	1
Cable Assembly, electrical, power 1'6"	CX-4721/VRC	5995-823-2887			1				1	
Retransmission Control (crew)	C-2299/VRC	5820-892-3340				1				1
Bag	CW-206/GR	5820-497-9644	1		1			1	1	
Technical Manual	TM-11-5820-401-12		1	1	1	1	1	1	1	1

* Consists of : Matching Unit-Base MX-6707/VRC, Antenna Element AS-1730/VRC, Antenna Element AT-1095/VRC.

** Consists of: Mast Base AB-558/GR or AB-15/GR, Adapter UG-273/U.

SPECIFICATIONS:

GENERAL

Frequency:	30.00 to 75.95 MHz.
Channel spacing:	50 KHz.
Number of Channels:	920.
Frequency Stability:	Crystal controlled, + 3.5 kHz of nominal frequency.
Mode of Operation:	Voice frequency modulated (FM).
Audio Passband:	500 to 3000 Hertz.
X-Mode:	Provided.
Squelch:	Noice or 150 Hz tone operation.
Temperature Range:	-40°C to +65°C (-40°F to +14°F).
Operating Voltage:	22 to 30 Vdc.
Size (less mounting):	R-442: 6"H x 5"W x 13"D. (15.2 cm x 12.7 cm x 33 cm). RT-524: 6"H x 15"W x 13"D. (15.2 cm x 38.1 cm x 33 cm). RT-246: 6"H x 15"W x 13"D. (15.2 cm x 38.1 cm x 33 cm).
Weight (less mounting):	R-442: 18.5 lbs (8.4 kg). RT-524: 58 lbs (26.3 kg). RT-246: 61 lbs (27.7 kg).

TRANSMITTER

Power Output:	35 W minimum @ 25.5 Vdc (high power); 0.5-10 W @ 30.0 ovde (low power).

TRANSMITTER (con't)

Frequency Deviation:	8.0 ± 2 kHz nominal; can deviate to 20 kHz.
Speech Compression:	Less than 3 dB change inoutput from 14 db c hange in input from nominal audio input of 1.4 mV into 150 Ohms.
Spurious Response:	At least 85 dB down within 30.00 to 75.95 MHz range (except at harmonics of IF).
Harmonic Distortion:	Less than 10% through transmitter and receiver @ 8.0 kHz deviation over audio passband.
Power Requirement:	10.0A @ 25.5 VDC.

RECEIVER

(applicable to R-442A/VRC and receiver sections of RT-246A/VRC and RT-524A/VRC)

Sensitivity:	0.5 µV for 10 dB (S+N+D)/(N+D) for 8.0 kHz deviation.
Circuit:	Superheterodyne single conversion.
Image Rejection:	Greater than 85 dB.
IF Bandwidth:	32 kHz minimum @ 6 dB. 85 kHz maximum @ 60 dB.
Squelch:	150-Hz tone-operated or noice-operated, with RF signal having 10 dB (S+N+D)/(N+D) ratio.
Limiting:	Less than 1 dB change in audio output for RF input from 1 µV to 100,000 µV.
Distortion:	Less than 8% from 500 to 3000 Hertz.
Audio Output:	500 mW into 600-Ohm speaker 150 mW into 600-Ohm headphone.
Volume ControL:	Adjustable from less than 0.25 mW to 1.0 W maximum.
Power Requirement:	0.75 A @ 26.5 Vdc.

associated industries

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