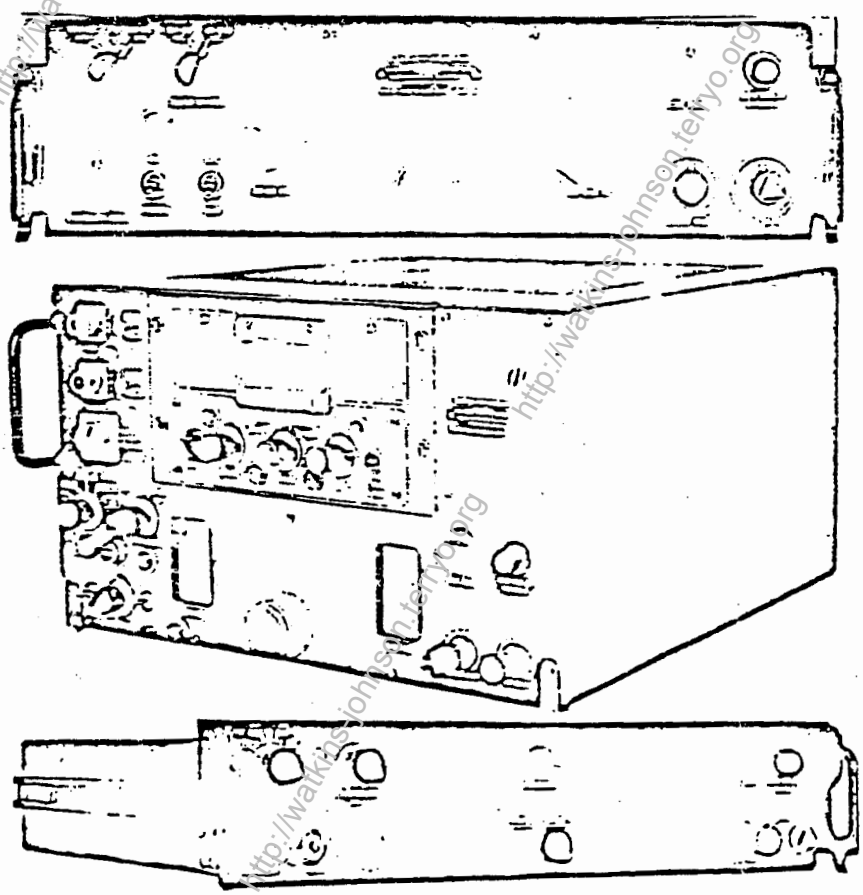
G175 SERIES VHF RECEIVERS

DESCRIPTION

The G175 series of surveillance receivers are designed for reception of AM and FM signals in two bands in the 30 mc to 260 mc range. CW capability is also available in some models. Multiple conversion superheterodyne design is provided in a compact package occupying low panel area. Flexibility of i-f bandwidth choice is offered through selection of three bandwidths by a front panel control, specific bandwidth dependent on the model. Provision for modifying one i-f bandwidth is also provided. A carrier operated relay has been incorporated for operating accessory equipment such as recorders. The 21.4 mc i-f signal is available for connection to a companion spectrum display unit for observation, and technical measurement of sidebands. Other outputs include audio, video, and local oscillator signals. AGC voltage is also brought out in some models to permit monitoring of relative signal strength. Additional features include high sensitivity, squelch circuitry and low local oscillator radiation at the antenna terminals.

Two generations of equipment are represented in the G175 series. The parent G175 and the A, D, D(1), and H models (Types I and II), employ vacuum tube design. A separate power supply is required. The tuning bands for these models are 30 mc to 60 mc and 60 mc to 260 mc, operated by a single tuning control in conjunction with a bandswitch. Available i-f bandwidths are 40 kc and 300 kc, with 20 kc also provided for AM reception only. In addition, the 40 kc bandwidth can be extended to 75 kc by a simple conversion. The A model incorporates the receiver, a spectrum display unit, and a power supply in a single package. The power supply utilizes 115 volts, 60 cps, to supply all voltages except the 28 volts d-c required for edge



G175 TYPE I

G175A TYPE II

G175F TYPE III

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lights. The D and D(1) models are similar to the parent G175 except for the incorporation of a cam operated switch connected to the tuning dial to permit use of low and high band antennas. As the dial sweeps through 90 mc, an automatic switch is made from one antenna to the other. The D(1) also includes an improvement to the local oscillator which provides a greater monitor level. The H model incorporates the D and D(1) changes and also includes variable frequency BFO circuitry for reception of CW. Controls for the BFO circuitry have also been added to the front panel and the power switch has been converted to a pushbutton type.

A second generation of receivers is represented by the B, B(1), C, C(1), and F models (Type III), which are reduced in size, weight, and power consumption by the use of modular design employing Nuvistor ceramic tubes and transistors. An integral power supply is also provided. Other improvements include higher sensitivity and ease of maintenance provided by subassembly i-f strips and modular audio, video, squelch, and COR circuitry. The tuning bands for these models are 30 mc to 90 mc and 60 mc to 260 mc, operated by twin tuning controls in conjunction with a bandswitch. Automatic switching between multiple antennas is provided by switches coupled to the tuning dials. Available i-f bandwidths are 10 kc, 40 kc, and 300 kc, except in the C and C(1) models where the 300 kc bandwidth has been increased to 3 mc and video circuit capability has been increased accordingly. In all these models, the 40 kc bandwidth can be increased to 75 kc by a simple modification. The B(1), C(1), and F models include a variable frequency BFO to provide demodulation capability for CW and simplified AM-FM selection controls. The B(1) and F models have identical capabilities, however the F model incorporates numerous circuit changes to improve overall stability and reliability.

ELECTRICAL SPECIFICATIONS

CONFIGURATION:	Model	G175	A	B	B(1)	C	C(1)	D	D(1)	F	H
	Type	I	II	III	III	III	III	I	I	III	I
INPUT FREQUENCY	Band A 30 to 60 mc	X	X					X	X		X
	Band A 30 to 90 mc			X	X	X	X			X	
	Band B 60 to 260 mc	X	X	X	X	X	X	X	X	X	X
TYPE RECEPTION	AM	X	X	X	X	X	X	X	X	X	X
	FM	X	X	X	X	X	X	X	X	X	X
	CW				X		X			X	X
INPUT IMPEDANCE	50 ohms	X	X	X	X	X	X	X	X	X	X
NOISE FIGURE	Band A - db max.	6	6	4.5	4.5	5.5	5.5	6	6	4.5	6
	Band B - db max.	6	6	7	7	7	7	6	6	7	6
LOCAL OSCILLATOR RADIATION	Band A - μv max.	5	5	15	15	15	15	5	5	15	5
	Band B - μv max.	5	5	15	15	15	15	5	5	15	5
IF REJECTION	Band A - db min.	45	45	54	54	50	50	45	45	54	45
	Band B - db min.	70	70	80	80	80	80	70	58	80	58
IMAGE REJECTION	Band A - db min.	80	80	60	60	60	80	80	80	60	80
	Band B - db min.	58	58	50	50	50	50	58	58	50	58
IF BANDWIDTHS	10 kc			X	X	X	X			X	
	20 kc (AM Only)	X	X					X	X		X
	40/75 kc	X	X	X	X	X	X	X	X	X	X
	300 kc	X	X	X	X			X	X	X	X
	3.0 mc					X	X				
AM SENSITIVITY (2)	10 kc $\mu v/\frac{S+N}{N}$			1.0/ 10 db	1.0/ 10 db	1.0/ 10 db	1.0/ 10 db			1.0/ 10 db	
	20 kc $\mu v/\frac{S+N}{N}$	2.0/ 16 db	2.0/ 16 db					2.0/ 16 db	2.0/ 16 db		2.0/ 16 db
	40/75 kc $\mu v/\frac{S+N}{N}$	2.0/ 10 db (1)	2.0/ 10 db (1)	2.0/ 10 db	2.0/ 10 db	2.0/ 10 db	2.0/ 10 db	2.0/ 10 db (1)	2.0/ 10 db (1)	2.0/ 10 db	2.0/ 10 db (1)
	300 kc $\mu v/\frac{S+N}{N}$	2.0/ 10 db	2.0/ 10 db	4.0/ 10 db	4.0/ 10 db			2.0/ 10 db	2.0/ 10 db	4.0/ 10 db	2.0/ 10 db
	3.0 mc $\mu v/\frac{S+N}{N}$					13.0/ 10 db	13.0/ 10 db				
FM SENSITIVITY (3)	10 kc $\mu v/\frac{S+N}{N}$			2.0/ 21 db	2.0/ 21 db	2.0/ 21 db	2.0/ 21 db			2.0/ 21 db	
	40/75 kc $\mu v/\frac{S+N}{N}$	4.0/ 21 db (1)	4.0/ 21 db (1)	2.0/ 21 db	2.0/ 21 db	2.0/ 21 db	2.0/ 21 db	4.0/ 21 db (1)	4.0/ 21 db (1)	2.0/ 21 db	4.0/ 21 db (1)
	300 kc $\mu v/\frac{S+N}{N}$	4.0/ 23 db	4.0/ 23 db	4.0/ 21 db	4.0/ 21 db			4.0/ 23 db	4.0/ 23 db	4.0/ 21 db	4.0/ 23 db
	3.0 mc $\mu v/\frac{S+N}{N}$					13.0/ 17 db	13.0/ 17 db				

CONFIGURATION	Model	G175	A	B	B(1)	C	C(1)	D	D(1)	F	H
	Type	I	II	III	III	III	III	I	I	III	I
VIDEO OUTPUT	Voltage - vp-p	10	10	4.25	4.25	2.0	2.0	10	10	4.25	10
	Impedance-ohms	22K	22K	1K	1K	93	93	22K	22K	1K	22K
	Frequency-cps	20 to 100K	20 to 100K	20 to 250K	20 to 250K	20 to 3000K	20 to 3000K	20 to 100K	20 to 100K	20 to 250K	20 to 100K
AUDIO OUTPUT	Voltage-volts, RMS	9.8/ 4.9	9.8/ 4.9	3.9	3.9	3.9	3.9	9.8/ 4.9	9.8/ 4.9	3.9	9.8/ 4.9
	Impedance-ohms	600/ 150	600/ 150	150	150	150	150	600/ 150	600/ 150	150	600/ 150
	Frequency-cps	150 to 12K	150 to 12K	30 to 25K	30 to 25K	30 to 25K	30 to 25K	150 to 12K	150 to 12K	30 to 25K	150 to 12K
SDU OUTPUT	Voltage-μv	10 min	N/A①	50 min	50 min	50 min	50 min	10 min	10 min	50 min	10 min
	Impedance-ohms	50	N/A①	50	50	50	50	50	50	50	50
	Frequency-mc	21.4	N/A①	21.4	21.4	21.4	21.4	21.4	21.4	21.4	21.4
L.O. OUTPUT	Voltage-mv	40 min	40 min	200 to 400	200 to 400	200 to 400	200 to 400	40 min	60 min	200 to 400	60 min
	Impedance - ohms	50	50	50	50	50	50	50	50	50	50
	Frequency - mc	51.4 to 281.4	51.4 to 281.4	51.4 to 281.4	51.4 to 281.4	51.4 to 281.4	51.4 to 281.4	51.4 to 281.4	51.4 to 281.4	51.4 to 281.4	51.4 to 281.4
CONTROL AND INDICATOR OUTPUTS	COR contacts	X	X	X	X	X	X	X	X	X	X
	HI/LO Band Select Position			X	X	X	X			X	
	AM/FM Select Position			X		X					
	Bandwidth Select			X	X	X	X			X	
	AM/FM/CW Select Position				X		X			X	
	Antenna Switch-Lo Band			X	X	X	X			X	
	Antenna Switch-Hi Band			X	X	X	X	X	X	X	X
	AGC Voltage Out			X	X	X	X			X	
	Hi-Band Tuner Position Pot			X	X	X	X			X	
BFO PITCH	Control Range, kc				±15		±15			±15	±12
OPERATOR CONTROLS	Tuning	X	X	X	X	X	X	X	X	X	X
	Fine Tuning	X	X	X	X	X	X	X	X	X	X
	Band Select	X	X	X	X	X	X	X	X	X	X
	IF Bandwidth Select			X	X	X	X			X	
	AM/FM Select			X		X					
	Bandwidth-AM/FM Select	X	X					X	X		X
	AM/FM/CW-Man/AGC				X		X			X	
	AGC-Manual Gain	X	X	X		X		X	X		X
	Power On-Off	X	X	X	X	X	X	X	X	X	X
	AM/BFO On-Off										X
	BFO Pitch				X		X			X	X
	Audio Gain	X	X					X	X		X
	Audio-Video Gain			X	X	X	X			X	
	RF Gain	X	X	X	X	X	X	X	X	X	X
	Squelch Sensitivity	X	X	X	X	X	X	X	X	X	X
	COR Sensitivity	X	X	X	X	X	X	X	X	X	X
	COR Delay/Disable	X	X	X	X	X	X	X	X	X	X
	Sweep Width		X								
	Center Frequency		X								
	Marker On-Off		X								
	SDU Gain		X								
INPUT POWER REQUIREMENTS	115v, 50 to 420 cps			X	X	X	X			X	
	115v, 60 cps	X	X					X	X		X
	28 VDC	X	X	X	X	X	X	X	X	X	X
	150 VDC ⊕	X						X	X		X
	250 VDC ⊕	X						X	X		X

CONFIGURATION	Model	G175	A	B	B(1)	C	C(1)	D	D(1)	F	H
	Type	I	II	III	III	III	III	I	I	III	I
HEAT DISSIPATION	Maximum Watts	132	203	61	61	61	61	132	132	61	132
AMBIENT TEMPERATURE	Degrees Fahrenheit			32° to 131°	32° to 131°	32° to 131°	32° to 131°		32° to 131°	32° to 131°	32° to 131°

MECHANICAL

SIZE ⑥	Height, inches	4.64	10.00	3.33	3.33	3.33	3.33	4.64	4.64	3.33	4.64
	Width, inches	17.56	17.00	17.00	17.00	17.00	17.00	17.56	17.56	17.00	17.56
	Depth, inches	17.06	17.00	15.00	15.00	15.00	15.00	17.06	17.06	15.00	17.06
CONNECTOR ARRANGEMENT	Rack & Panel	X			X		X	X	X	X	X
	Cable "Pig Tail"	X	X	X	X	X	X	X	X	X	X
WEIGHT	Pounds	32	56	23.8	23.8	23.8	23.8	32.1	32.1	23.7	32.1

NOTES

① Sensitivity in the 40/75 kc position is not specified. Values given are approximate.

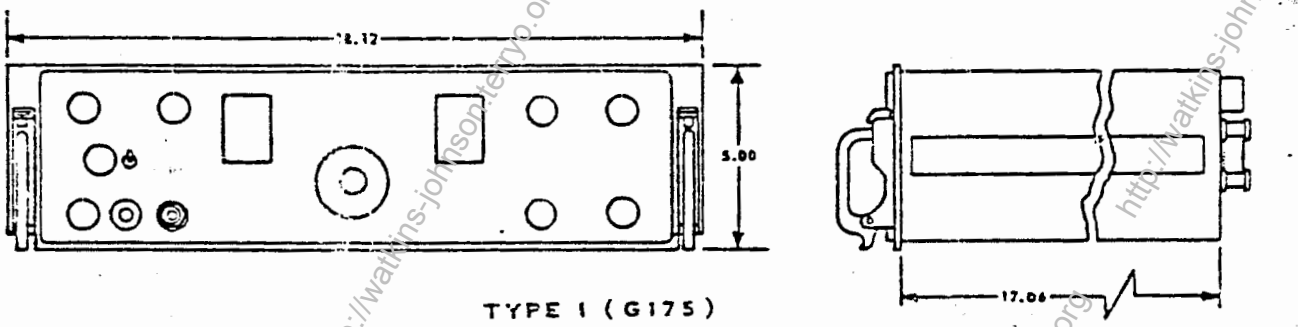
② AM sensitivity is measured at the video output with an RF signal modulated 50% by a 1 kc tone.

③ FM sensitivity is measured at the video output with an RF input signal FM modulated at a deviation equal to 1/3 the bandwidth of the receiver and a rate of 1 kc.

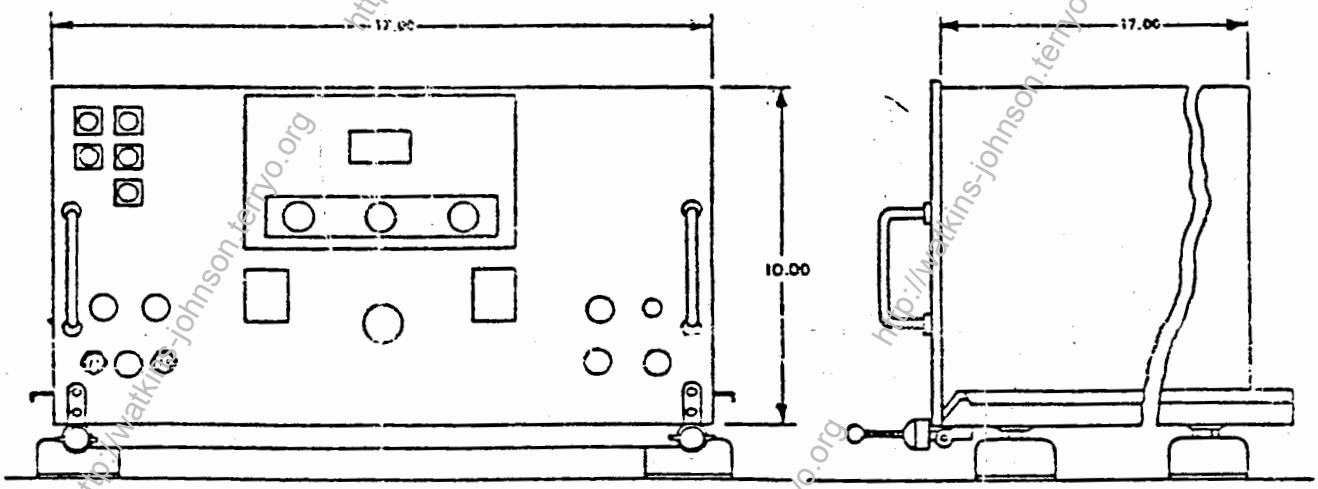
④ The SDU is an integral part of the G175A.

⑤ Power supplied by a G227 power supply.

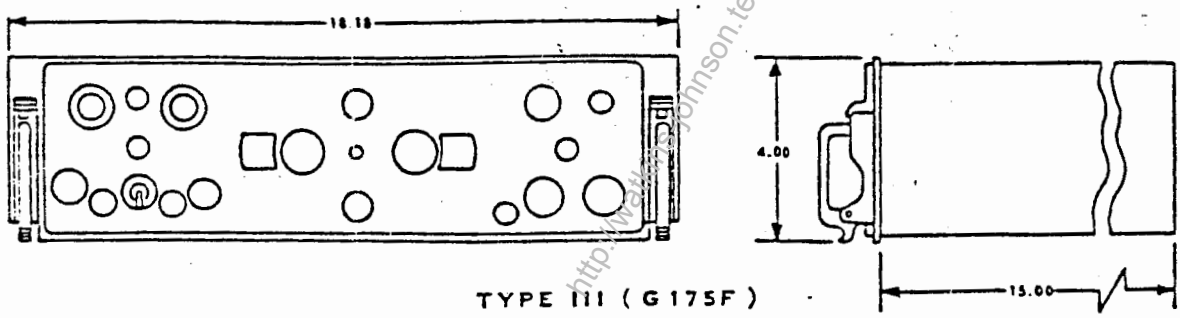
⑥ Case size only, not including front panel and handles.



TYPE I (G175)



TYPE II (G175A)



TYPE III (G175F)

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