G175H RECEIVER

(PART NO. G175H00000-1)

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G175H RECEIVER

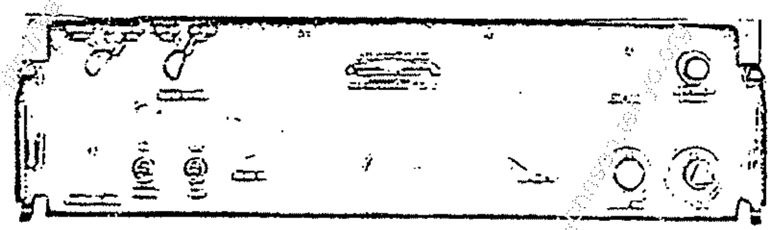
G175 SERIES VHF RECEIVERS

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.

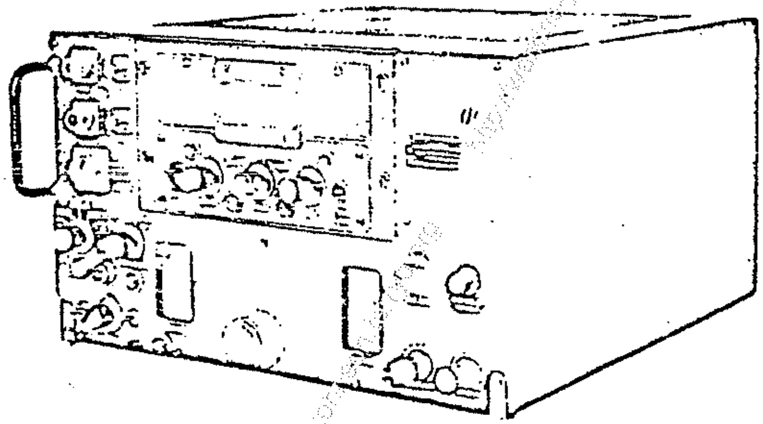
Two generations of equipment are represented in the G175 series. The parent G175 and the A, D, D(1), and H models (Types I and II), employ vacuum tube design. A separate power supply is required. The tuning bands for these models are 30 mc to 60 mc and 60 mc to 260 mc, operated by a single tuning control 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



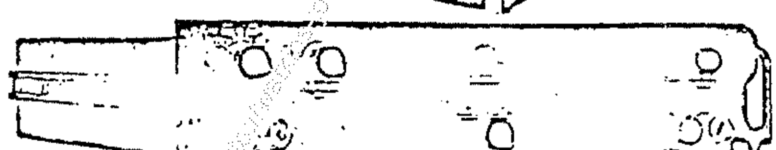
TYPE I

G175A



TYPE II

G175F



TYPE III

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1-300-188

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.	8	8	7	7	7	7	8	8	7	8
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/A②	50 min	50 min	50 min	50 min	10 min	10 min	50 min	10 min
	Impedance-ohms	50	N/A②	50	50	50	50	50	50	50	50
	Frequency-mc	21.4	N/A②	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 ①	X						X	X		X
	250 VDC ①	X						X	X		X

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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.

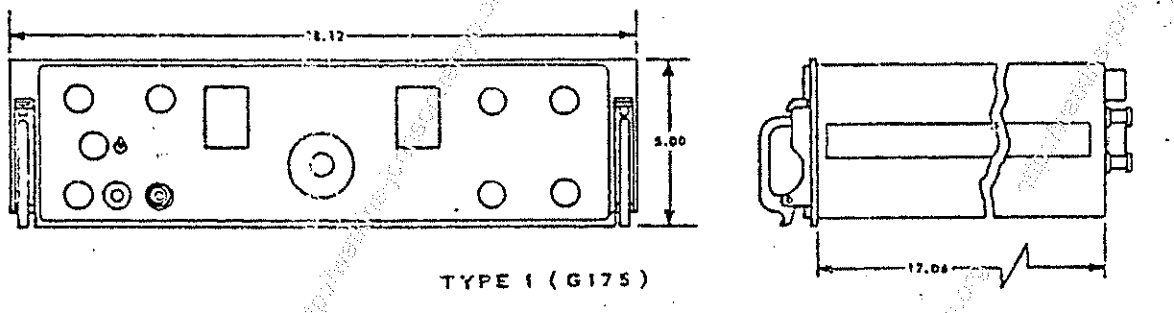
② AM sensitivity is measured at the video output with an RF signal modulated 50% by a 1 kc tone.

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.

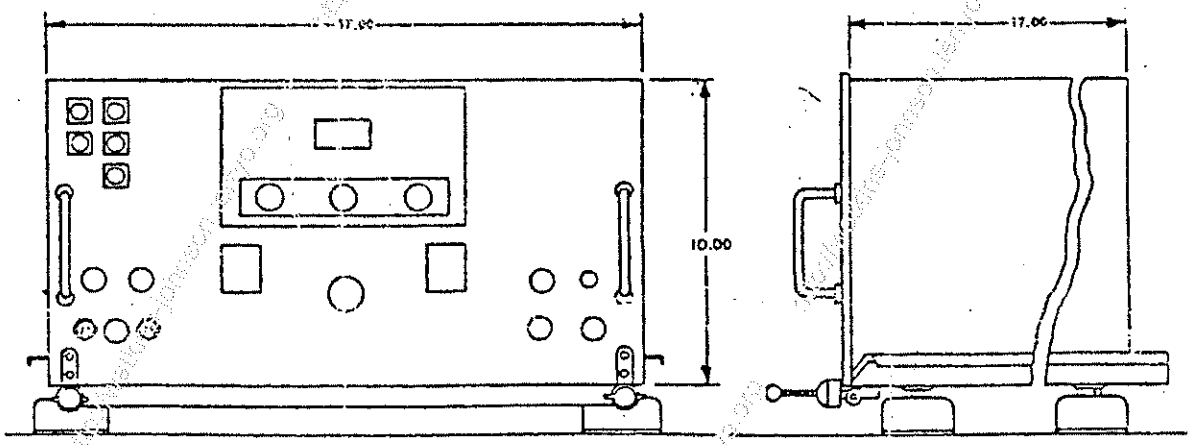
④ The SDU is an integral part of the G175A.

⑤ Power supplied by a G227 power supply.

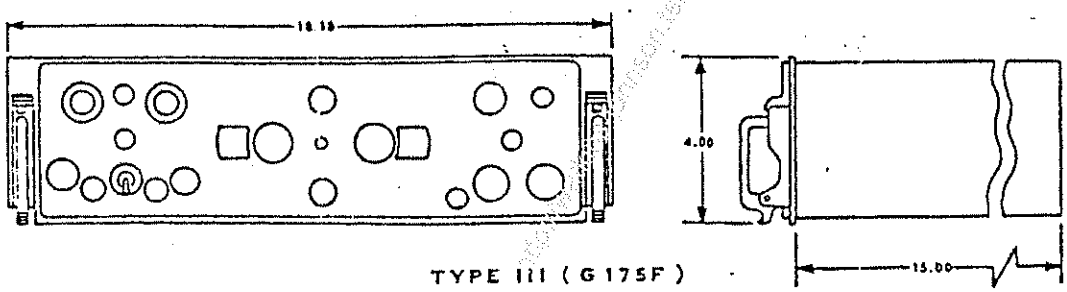
⑥ Case size only, not including front panel and handles.



TYPE I (G175)



TYPE II (G175A)



TYPE III (G175F)

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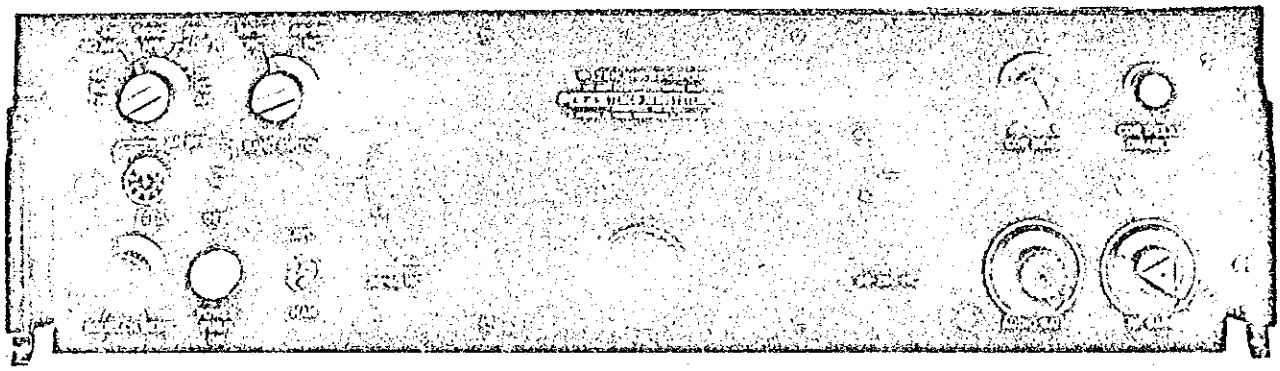
G175H RECEIVER



G175H DIODE AND ELECTRON TUBE COMPLEMENT

SYMBOL	TYPE	FUNCTION
CR-101	IN457	AGC DELAY
CR-102	IN458	COR
CR-401	IN34A	SQUELCH/COR CONTROL, 300-KC BANDWIDTH
CR-402	IN34A	SQUELCH/COR CONTROL, 20-KC BANDWIDTH
V-101	12AU7A	VIDEO AMPLIFIER; COR AMPLIFIER
V-102	12AU7A	VIDEO AMPLIFIER
V-103	12AU7A	SQUELCH AMPLIFIER; AUDIO AMPLIFIER
V-104	12AU7A	AUDIO AMPLIFIER
V-105	12AU7A	COR AMPLIFIER
V-201	6280	1st R-F AMPLIFIER, HIGH-BAND TUNER
V-202	6J4	2nd R-F AMPLIFIER, HIGH-BAND TUNER
V-203	6AK5	MIXER, HIGH-BAND TUNER
V-204	6AF4A	OSCILLATOR, HIGH-BAND TUNER
V-301	6AK5	1st R-F AMPLIFIER, LOW-BAND TUNER
V-302	6AK5	2nd R-F AMPLIFIER, LOW-BAND TUNER
V-303	6AK5	MIXER, LOW-BAND TUNER
V-304	6AF4A	OSCILLATOR, LOW-BAND TUNER
V-401	6DC6	1st I-F AMPLIFIER, 300-KC BANDWIDTH
V-402	6DC6	2nd I-F AMPLIFIER, 300-KC BANDWIDTH
V-403	6CB6	3rd I-F AMPLIFIER, AM; 1st LIMITER; FM, (300-KC BANDWIDTH)
V-404	6AK5	DETECTOR, AM; 2nd LIMITER FM, (300-KC BANDWIDTH)
V-405	6AL5	DISCRIMINATOR, 300-KC BANDWIDTH
V-406	6AU6	22.4-MC OSCILLATOR, 20-KC BANDWIDTH
V-407	6BA6	21.4-MC I-F AMPLIFIER, 20-KC BANDWIDTH
V-408	6AK5	MIXER, 20-KC BANDWIDTH
V-409	6BA6	1-MC I-F AMPLIFIER, 20-KC BANDWIDTH
V-410	6AL5	DETECTOR/AVC, 20-KC BANDWIDTH

Table 1-1

SECTION II
INSTALLATION

2-1. GENERAL, UNPACKING AND INSPECTION

The G175H Receiver has been thoroughly inspected and factory adjusted for optimum performance prior to shipment. A thorough inspection for possible damage should be performed upon receipt of the equipment.

2-2. PREPARATION FOR USE AND RESHIPMENT

The receiver is shipped ready for installation with COR dropout period set at a nominal 5 seconds. If desired, the length of dropout period may be adjusted for operator convenience or unusual operating conditions. The procedure for COR dropout period adjustment is outlined in paragraph 5-20.

No preparation is necessary to make the receiver ready for reshipment. The equipment is shipped with the internal components in place.

2-3. UNIT INSTALLATION

The G175H Receiver is designed for rack mounting. Mounting information, center of gravity, and overall dimensions are shown in figure 2-1. To install, slide the receiver into suitable slide tracks until the stops are engaged. Depress the pushbutton located at top of each locking handle and rotate handle outward. Engage hook-shaped lower portion of handle into fork fitting and return to locked (pushed in) position.

SECTION IV
THEORY OF OPERATION

4-1 OPERATION

The C175H Receiver, functionally depicted by the block diagram in figure 4-1, is an AM-FM superheterodyne receiver, tunable from 30 to 260 mc in two bands, 30 to 60 and 60 to 260 mc. The G175H also features three operator-selectable i-f bandwidths of 300 kc, 40 kc, and 20 kc (the 20-kc i f bandwidth is available for AM operation only). A simple internal modification on the 40-kc bandwidth i-f section increases its bandwidth to 75 kc.

4-2. POWER DISTRIBUTION AND CONTROL

Power is distributed to the receiver by the G227 Power Supply. Operating voltages provided are 250-volt dc, 150-volt dc, and 117-volt ac, 60 cps. Panel lighting circuit is supplied 28-volt dc. The power supply is energized when the POWER switch on the receiver panel is set to ON. Power is switched in the receiver by the BAND SWITCH and mode-band width, selection switches as necessary according to the mode of operation.

4-3. G175H10000 AM BFO ASSEMBLY

The G175H10000 AM BFO (beat frequency oscillator) Assembly, as shown in figure 7-3 adds BFO capability for AM operation. The 10000 assembly has a fundamental center frequency of 21.4 mc and operates in the AM mode only. AM BFO ON-OFF switch S0091, mounted on the receiver front panel, is used to apply regulated +150-volt d c to the 10000 assembly through C1002. Helical potentiometer R0091 (AM BFO FREQ), also mounted on the receiver front panel, is connected to the 10000 assembly through C1001, C1003, and C1004 and is used to vary the oscillator frequency up to a maximum of ±12.0 kc from the 21.4-mc center frequency. Capacitor C1005 of the 10000 assembly is connected to ground through the AM positions of the receiver mode switch S102. The oscillator output is applied through J1001 to the receiver i-f strip. Crystal Y1101 is cut for oscillation at 21.435 mc. The fixed and variable capacitance of the tank circuit provides a center crystal operating frequency of 21.4 mc. The frequency adjust potentiometer of the receiver front panel varies the voltage applied to variactors CR1101 and CR1102. Varying the voltage applied to CR1101 and CR1102 varies the capacitance of the tank circuit. The capacitance of the tank circuit varies sufficiently to change the crystal operating frequency ±12.0 kc. Potentiometer R1101 adjusts the operating voltage of the frequency adjust potentiometer for the low frequency. Tank circuit L1102 and C1104 forms a decoupling circuit for the oscillator output to keep oscillations out of the receiver mode switch. C1108 and R1108 form a suppression network to keep the oscillator output from appearing on the +150-volt d-c supply line. The beat frequency oscillator output is applied through J1001 to J0091 of the receiver i-f strip.

4-4. R-F TUNER SECTIONS

Each of the G175H tuners has an antenna input to which r-f signals are supplied. The tuners are identical at the block diagram level and therefore only one needs to be explained. Two tuned stages of r-f amplification select and amplify the desired signal from the multitude of signals present at the antenna input and apply the resulting signal to a mixer stage. Also applied to the mixer is an oscillator output of a frequency 21.4-mc higher than the tuned signal. These two signals are mixed to produce the 21.4-mc i-f signal. The local oscillator output may be monitored by an external measuring device to determine the receiver carrier frequency (Carrier frequency = measured frequency -21.4-mc.)

The 21.4-mc i-f signal is applied to all i-f sections simultaneously as well as being routed externally to a spectrum display unit. These i-f sections will be explained, one at a time, as each differs from the other in some manner.

4-5. LOCAL OSCILLATOR OUTPUT CONTROL CIRCUIT

The G175 local oscillators were modified in forming the G175H receiver by the addition of K0091, L0091, C0091, C0092, C0093, and R0092. The addition of these components provides a sufficient output to J-103 through the entire receiver frequency range. Coaxial relay K0091 provides selection of the 60- to 260-mc oscillator consisting of triode XV-204 and associated circuitry or the 30- to 60-mc oscillator consisting of triode XV-304 and associated circuiting for monitoring at J-103. Relay K0091 is energized with band switch S-103 in the 30- to 60- mc position, applying oscillator XV304 output

to J-103. The addition of L0091 to the cathode circuit of XV-304 provides an amplitude adjustment of the oscillator output. Moving L0091 toward the cathode of XV-304 increases the output amplitude. L0091 is adjusted to provide a 60- to 100-millivolt output amplitude throughout the 30- to 60-mc band. The addition of R0092 in the XV-204 oscillator circuit provides proper output amplitude control. The value of R0092 may be changed to correct the oscillator output amplitude. The oscillator output amplitude should be greater than 60 millivolts throughout the 60- to 260-mc tuning range but never greater than 100 millivolts in the 60- to 150-mc range.

4-6. 20-KC BANDWIDTH I-F SECTION

The 20-kc bandwidth i-f section may be used for the detection of AM signals only. When this i-f section is used, the 21.4-mc signal passes through a single stage of amplification and is mixed with the output of a crystal-controlled 22.4-mc oscillator. This produces a 1-mc i-f signal which also undergoes a stage of amplification. The 1-mc i-f stage serves the dual purpose of amplification and producing the desired 20-kc bandpass. The output of the 1-mc i-f amplifier is applied to the AM detector which provides outputs of the demodulated intelligence and the rectifier carrier AVC. The intelligence is applied to successive stages of video and audio amplification. The AVC voltage from the AM detector section is applied to the two i-f amplifiers by placing the AVC-MAN switch to AVC. This gives the standard automatic volume (or gain) control. Strong carrier signals produce relatively large negative AVC voltages which reduce the i-f amplifier gains, compensating for the large initial carrier strength. Weak carrier signals produce relatively small negative AVC voltages. Consequently, the i-f amplifiers operate at or near their maximum possible gains, necessary for detection of these weaker signals.

If the AVC-MAN switch is placed in the MAN position, the RF GAIN control setting determines i-f amplifier gain. I-f amplifier gain in this case is constant and does not adjust with variations in received carrier strength as when the AVC-MAN switch is in the AVC position.

4-7. EXTERNAL RELAY CONTROL SWITCH

The G175H Receiver provides a switch to control an external unit by dial position of the G175H. Switch S0093 is a cam-operated limit switch. The cam is attached to the 30- to 60-mc dial shaft, and the 30- to 60-mc dial shaft is connected by gears to the 60- to 260-mc dial shaft. The cam is fixed on the dial so that the switch is held closed when the receiver is tuned above 93.5-mc (±1.5-mc) and the switch is open when the receiver is tuned below 86.5-mc (±1.5-mc). When the switch is closed, the relay control line connects the associated external unit control to ground.

4-8. VIDEO, AUDIO, SQUELCH, AND COR SECTIONS

The amplitudes of video and audio signals are determined by the GAIN control setting. Both the squelch and COR (carrier operated relay) sections are controlled by the AVC (automatic volume control voltage).

In the absence of a detected carrier wave, the squelch section provides a disabling signal to the audio section. The annoying hiss and pop of an atmospheric noise and other forms of static do not reach the operator, providing more comfortable operating circumstances. When the AVC voltage goes negative (detector receives relatively strong i-f signal due to r-f reception) by an amount determined by the SQUELCH SENS control setting, the disabling signal is removed and the audio section can operate normally.

The COR section operates in a similar manner to detect carrier reception. The COR SENS control determines the AVC voltage magnitude necessary to operate the COR section actuating the relay. A set of relay contacts is provided for carrier control of desired auxiliary equipment. Activation of the COR section is indicated by the lighted condition of the COR lamp. The COR section does not immediately deactivate after carrier reception terminates, but waits for a length of time determined by the COR delay adjust control setting. Depressing the COR DELAY DISABLE (this control also houses the COR light) will promptly deactivate the COR circuit. The video amplifier, audio amplifier, squelch and COR sections just described are common to all three i-f sections and will not be explained any further at this level.

4-9. 300-KC BANDWIDTH I-F SECTION

When the 300-kc bandwidth i-f section is used, either an AM or FM detection mode is available. In the 300-KC FM mode, the 21.4-mc i-f signal from the tuner being used is applied through two i-f amplifier stages and two limiter stages to the discriminator. The discriminator detects the frequency modulation and passes the intelligence on to the video amplifier section. The two 21.4-mc i-f amplifiers give the required signal gain, while the two limiter stages function to remove undesirable

amplitude modulation. In addition, the second limiter generates a bias AVC voltage necessary for the squelch and COR section and for AVC action. It should be noted that in the 300 KC FM mode the position of the AVC-MAN switch has no effect upon operation. The bias voltage is always returned to the i-f amplifiers for AVC action.

When operating the 300-KC bandwidth i-f section in the AM mode, the FM first limiter becomes an AM i-f amplifier and the FM second limiter becomes an AM detector. The discriminator stage is not used. The 21.4-mc i-f signal from the tuner in use is passed through the three 21.4-mc i-f amplifiers to the detector stage where it is demodulated. The intelligence is applied to the video amplifier and AVC voltage to the squelch and COR sections in the 300 KC AM mode. The AVC-MAN switch may be used in either position as in the 20-KC AM mode of operation.

4-10. 40-KC BANDWIDTH I-F SECTION

In the 40-KC AM mode, the 21.4-mc signal from the tuner being used is passed through a stage of amplification and mixed with the output of a crystal-controlled 18.9-mc oscillator. The resulting 2.5-mc i-f signal is passed through a coupling network to another stage of amplification. The coupling network is a quick-change item, two of which are supplied. Changing the i-f strip bandwidth is simply a matter of changing networks. Networks supplied provide either 40-kc or 75-kc bandwidth.

The 2.5-mc i-f amplifier is the last stage of amplification before detection. The detector produces intelligence and AVC outputs which are used as previously described. The FM detector is not used. Note that the AVC-MAN switch has no effect when using the 40-kc bandwidth i-f strip.

AVC action is always employed whether AM or FM detection is used.

When FM detection is employed, the 2.5-mc i-f amplifier becomes the first limiter, while the AM detector becomes the second limiter. A bias voltage is supplied by the second limiter while the modulating intelligence is detected and supplies AVC to the video amplifier.

4-11. DETAILED RECEIVER THEORY

The following discussions are at a schematic diagram level. The G175H schematic is illustrated in figure 7-1. Supplemental simplified schematics will be presented at appropriate places for the explanation of the more difficult sections. A thorough knowledge of signal flow sequence as illustrated in the block diagram of figure 4-1 should be mastered before reading further.

4-12. 30 TO 60-MC TUNER

The 30- to 60-mc tuner of the G175H consists of two stages of r-f amplification, a local oscillator, and a mixer. The antenna input is rear-panel mounted and offers an input impedance of approximately 50 ohms. The 30- to 60-mc tuner is disabled when operation between 60 and 260 mc is chosen. This is done by removing power from the plate and screen grid of the r-f amplifiers, from the screen of the mixer, and from the plate of the oscillator. Bandswitch S-103 performs this function and also energizes the edge lamps of the operated tuner and disables the lamps of the tuner not used.

4-13. FIRST R-F AMPLIFIER

The first r-f amplifier, V-301, uses a type 6AK5 pentode in a conventional voltage-amplifier configuration. The grid tank circuit is tuned inductively by coil L-301A, part of a four-gang arrangement used to tune, in unison, three other L-C circuits of the tuner. Mechanically, the inductance of coil L-301A is varied by a driven contact which tracks along the form of a wire helix. The plate load circuit is coupled through capacitors C-310 and C-324 to the grid of the second r-f amplifier, V-302. The plate load circuit includes adjustable inductor coil L-301B, ganged with the other tuned circuits.

4-14. SECOND R-F AMPLIFIER

The second r-f amplifier, V-302, is almost identical to the first in operation and further improves the noise figure of the receiver.

4-15. MIXER

The low-band mixer, V-303, employs a type 6AK5 sharp-cutoff pentode tube. The output from the second r-f amplifier and the output of local oscillator, V-304, are combined at the input grid of V-303. A small self-bias is developed at the grid which minimizes the effect of any variation in oscillator signal level. A decoupled test point, TP-301, taken from a tap between grid resistors R-312 and R-313, provides a convenient means for observing the response of the 30- to 60-mc r-f tuner during alignment. The output of the tuner is connected through receptacles J-302 and J-401 to the amplifiers in the i-f strips.

4-16. LOCAL OSCILLATOR

The low-band local oscillator, V-304, employs a high frequency type 6AF4A triode tube in a grounded-plate Colpitts circuit. The output of the local oscillator is at a frequency 21.4-mc higher than that of

the received signal. The tank circuit is tuned by varying the inductance of coil L-301D (which is ganged with the tunable inductors of the r-f amplifiers and the mixer). The signal at the oscillator cathode is connected to the BNC-type output receptacle (J-103) mounted on the rear panel of the receiver. The oscillator frequency can be measured at this connector to determine the frequency of a received signal. (Carrier Frequency = measured frequency -21.4-mc.) The output from the grid circuit of the oscillator is coupled through capacitor C-325 to mixer V-303.

4-17. 60- TO 260-MC TUNER

The 60- to 260-mc tuner consists of two stages of r-f amplification; a local oscillator, and a mixer. The higher frequencies handled by this tuner require the use of an input tube specifically designed for high efficiency in terms of r-f losses and for low-noise operation. When the receiver is operated between 30 and 60 mc, all d-c power is removed (except plate voltage for the mixer, V-203) from the 60- to 260-mc tuner section by switch S-103.

4-18. FIRST R-F AMPLIFIER

The first r-f amplifier, V-201, is a type 6280 planar triode used in a grounded-grid, broadband configuration. In general, the broadbanding is made possible by the very low input resistance to the stage and the low cathode-to-ground capacity. Broadbanding is further achieved by carefully tailoring the length of the cables between receptacles J-102 and J-201. The self-bias developed by cathode current is reduced to the proper operating level by applying a positive potential to the grid from a divider connected across the regulated 150-volt d-c supply. The result is to stabilize the type 6280 tube. The 6.3-volt a-c filament of V-201 is operated at 5.9-volt ac from the 12.6-volt a-c filament transformer through a 5.1-ohm ballast resistor. This measure produces a self-regulating effect which extends tube life. In order to extend tube life further and to keep the noise figure low, cooling is obtained from blower B-101. The motor of the blower is plugged into the chassis through a six-pin plug with a jumper between pins E and F so that plate voltage is removed from V-201 when the motor is disconnected. V-201 is also protected by time-delay relay, K-201, which applies plate voltage to the tube after a two-minute filament warmup. A convenient means for measuring plate current is provided by test point TP-201 at the junction of series resistors R-201 and R-202 in the cathode circuit. By reading the potential between test point TP-201 and ground, the plate current can be computed (voltage x 10 = current in milliamperes). The plate circuit is a modified pi network which couples and matches the high-impedance plate circuit to the low input impedance of the second r-f amplifier, V-202. The effect of cathode-to-filament capacity is minimized by the use of broadband chokes, L-202 and L-203, which keep the filament considerably above r-f ground.

4-19. SECOND R-F AMPLIFIER

The second r-f amplifier, V-202, employs a type 6J4 tube in a broadband, grounded-grid circuit. The output from the first r-f amplifier is coupled across inductor L206 to the cathode of the second r-f amplifier. A capacitive-T network consisting of C-217, C-219, and C-222 is used in the plate circuit to provide control over the interstage bandwidth and to achieve the desired degree of selectivity. Capacitors C-217 and C-222 are adjustable. This tuned circuit approaches parallel resonance at 55 mc, increasing the coupling at the low end and providing a more uniform coupling over the range between 60 and 260 mc. The characteristic dip in the over-coupled stage is "filled in" by the effect of the single-tuned, high-Q plate circuit of the first r-f amplifier tube. The response of the two r-f amplifier stages is essentially flat over the band when viewed at the input of the mixer stage. Capacitor C220 and inductor L-208 form a low-frequency compensation network. (The purpose of dual capacitor C-261 is explained in paragraph 4-20 below.) The output from the second r-f amplifier is coupled through a double-tuned, over-coupled bandpass filter and capacitor C-223 to the grid of mixer V-203.

4-20. LOCAL OSCILLATOR

The local oscillator, V-204, utilizes a high transconductance type 6AF4A tube in a modified Colpitts configuration. The local oscillator is tuned from 81.4-to 281.4-mc by coil L-205D. It always generates a signal 21.4-mc higher in frequency than the tuned r-f input. Trimmer capacitor C-229 is adjusted during alignment to effect proper tracking of the tuner. Frequency stability of the oscillator is attained by loose coupling to a high-Q tank. In order to preclude the possibility of oscillator energy leaking back through the tuner to the antenna, neutralization is included at the plate of second r-f amplifier V-202. The voltage at the top of coil L-210 is 180° out of phase with that at the grid of oscillator V-204. This voltage is fed through dual capacitor C-261 to the output circuitry of second r-f amplifier V-202. The feedback voltage phase and amplitude is approximately that of the oscillator signal which leaks back from the grid of mixer V-203. Cancellation takes place and the possibility of oscillator radiation is considerably reduced. The frequency of this oscillator can also be measured at J-103. The oscillator signal is coupled to J-103 using resistor R-0092 and capacitor C-0092.

4-21. MIXER

The mixer, V-203, is conventional and uses a type 6AK5 tube with the second r-f amplifier output and the oscillator output introduced together at the input grid of the tube. The mixer is applied to receptacle J-202 and routed on to the i-f amplifier strips. Decoupled test point TP-202, from a tap on the mixer grid resistors, provides a convenient means for observing the response of the r-f circuits.

4-22. 20-KC I-F AMPLIFIER AND AM DETECTOR

The i-f amplifier strip consisting of tubes V-406 through V-410 has an overall bandwidth of 20-kc and includes a type 6AL5 tube which functions as an AM detector and AVC source. This strip is energized when switch S-102 is in the 20-KC AM position by placing plate and screen potentials on crystal oscillator V-406, isolation amplifier V-407, and 1-mc i-f amplifier V-409. At the same time, the 300-kc and 40-kc bandwidth i-f amplifiers are disabled by switch S-102 by the removal of certain operating potentials. The detected output is applied to the audio amplifier through switch S-102D (shown in figure 7-1 in the 40 KC FM position).

4-23. 21.4-MC AMPLIFIER

The output from the tuner in operation is fed to the 20-kc bandwidth i-f amplifier at either receptacle J-401 or J-403. The tuned circuit consisting of capacitor C-404 and coil L-416, plus the capacity associated with the cabling and connectors is resonant at 21.4-mc. This circuit is coupled to the input grid of 21.4-mc amplifier V-407 through capacitors C-408, C-410, and C-414. The grid circuit of V-407 includes a tank consisting of capacitor C-411 and coil L-417, plus the input capacity of the tube, which is also resonant at 21.4-mc. (Note that these tuned circuits are common to both the 20-kc and 300-kc bandwidth i-f amplifier strips.) The 21.4-mc amplifier uses a type 6BA6 tube in a conventional voltage type arrangement and is plate-loaded by transformer T-409 in parallel with capacitor C-423 which are resonant at 21.4 mc. The plate output of amplifier V-407 is returned to the 250-volt d-c supply through mode bandwidth selector switch S-102E. V-407 is disabled when this switch is in any position other than 20-KC AM.

4-24. 22.4-MC CRYSTAL OSCILLATOR

In order to properly use realistic Q-figures in tuned circuits to achieve the 20-kc bandpass, the 21.4-mc i-f signal from the tuner is converted to a 1-mc intermediate frequency by mixing with the output from 22.4-mc crystal oscillator V-406. This oscillator is conventional and somewhat resembles a tuned-grid, tuned-plate configuration because of the resonant circuit comprised of capacitor C-402 and coil L-401. This circuit holds the cathode far above a-c ground at the frequency of the crystal in the grid circuit. (Note that leakage to the antenna from this oscillator and undesirable radiation is prevented by 21.4-mc amplifier V-407.) The output signal of oscillator V-406 is capacitively coupled to the input grid of the mixer. The plate of V-406 is also returned to the 250-volt d-c supply through mode-bandwidth selector switch S-102E and is disconnected when this switch is in a position other than 20-KC AM.

4-25. 1-MC MIXER

Mixer V-408 is a type 6AK5 tube in a conventional circuit and is plate-loaded by a parallel combination of capacitor C-444 and coil L-412 which is resonant at 1 mc. The output of the mixer is a-c coupled to the 1-mc i-f amplifier.

4-26. 1-MC I-F AMPLIFIER

The output from the plate of the mixer is capacitively coupled to the input grid of 1-mc i-f amplifier V-409, a type 6BA6 tube. The tank in the grid circuit of this amplifier consists of capacitor C-454 and coil L-413 and is resonant at 1 mc. In the plate circuit of V-409 is another double-tuned, capacitively-coupled tank circuit, consisting of transformers T-413 and T-414, that is also resonant at 1 mc.

4-27. AM DETECTOR AND AVC

The output from the 1-mc amplifier is detected in one of the diodes of AM detector/AVC V-410, a type 6AL5 tube. The output of the diode is applied through resistors R-442, R-467, and capacitor C-475, to switch S-102D, and finally to the video amplifier (assuming that mode-bandwidth selector switch S-102 is in the 20-KC AM position). Diodes CR-401 and CR-402 are part of the squelch and carrier-operated-relay circuits which are discussed in paragraphs 4-42 and 4-49 below. The other diode of V-410 operates as a rectifier to develop AVC voltage. With front-panel AVC-MAN control in the AVC position, AVC voltage is applied directly to the grids of remote-cutoff type 6BA6 tubes in the 21.4-mc and 1-mc i-f amplifiers (V-407 and V-409). The cathodes of V-407 and V-409 are returned to ground through resistors R-409 and R-425, respectively, and AVC-MAN switch S-104. When switch S-104 is placed in the MAN position, the AVC output voltage from pin 2 of V-410 is grounded, thus eliminating AVC action.

In addition, the cathodes of the amplifiers are returned to the junction of a voltage divider consisting of resistor R-132 and front-panel RF GAIN control R-133. On one extreme of R-133 setting, the cathode resistors are grounded to provide maximum gain. On the other extreme of R-133 setting the cathode resistors are returned to +7.5-volt dc which biases the tubes to cutoff enabling the i-f strip gain to be reduced by approximately 40 db. Note that the AVC voltage is delayed by the positive potential at pin 5 of V-410 from a divider consisting of resistors R-431 and R-439 (in series across the regulated 150-volt d-c supply). This effectively cuts off the plate of V-410 until r-f amplitude exceeds the potential at pin 5.

4-28. 40-KC BANDWIDTH I-F AMPLIFIER, AM DETECTOR, AND FM DISCRIMINATOR

When switch S-102 is placed in either the 40 KC AM or 40 KC FM position, both the 20-kc and 300-kc bandwidth i-f strips are disabled by removal of certain operating potentials. At the same time switch S-102G applies the +150-volt dc regulated to the 40-kc bandwidth i-f strip, activating it.

4-29. 21.4-MC I-F AMPLIFIER

The first stage of the i-f strip is a cascade circuit using two type 6CW4 Nuvistor triodes. The characteristic impedance of the 21.4-mc signal applied to the strip is 50 ohms. It is therefore necessary to use wideband transformer T-601 to step up this low impedance to a higher value more suitable for low-noise operation of V-601. Fixed bias is used on V-602 to increase the dynamic range of the stage. Inductor L-602 is the plate load of the stage. Capacitor C-605 applies a small amount of r-f signal back to the grid of V-601 for neutralization purposes. This neutralization is not required for stability, but must be employed to obtain a wide range of AVC control.

4-30. 18.9-MC OSCILLATOR

A type 6CW4, V-604, is used as a crystal-controlled, grounded-plate Colpitts oscillator. The oscillator output, taken from the grid of V-604 is applied to the mixer stage (V-603) grid through capacitors C-606 and C-607.

4-31. MIXER

The tetrode Nuvistor type 7587, is used as a mixer. The 21.4-mc signal from V-602 and the 18.9-mc oscillator output are mixed in this stage to produce an i-f of 2.5 mc. Double-tuned coupling is used between the mixer and the next stage. The type of capacitive coupling network between the two tuned circuits; L-604, C-614, and L-605, C-261; determines the overall bandwidth of the i-f strip. Bandwidths of either 40 kc or 75 kc are available by the simple expedient of changing coupling networks. In order to make the changeable boards noncritical, only a portion of the complete network is mounted on the strips. In the case of the 75-kc bandwidth condition, the external circuit consists only of a jumper wire, the actual coupling being determined by capacitors C-615 and C-620 mounted internally. For the 40-kc bandwidth, capacitor C-617 is placed in series with C-615 and C-620, reducing the coupling. Two additional capacitors, C-616 and C-618, are connected across the input and output terminals of the board to maintain peak response at 2.5 mc.

4-32. 2.5-MC I-F AMPLIFIER, AM; FIRST LIMITER, FM

The 2.5-mc stage immediately following the mixer serves as a linear i-f amplifier for the reception of AM signals and as a first limiter when receiving FM signals. During AM reception resistor R-614 is open-circuited at switch S-102A, and the +150-volt d-c line is connected to pin 2 of V-605 through R-616, giving a high screen grid voltage. This provides the linear operation required. During FM reception, resistor R-614 is connected to ground through switch S-102A. Resistors R614 and R616 now form a voltage divider, lowering V-605 screen voltage, causing this stage to act as a limiter. When used as a limiter, V-605 developes a negative voltage at pin 4 which can be used for AVC purposes. This connection of the i-f strip is not used in the G175H Receiver.

4-33. DETECTOR, AM; SECOND LIMITER, FM

This stage also serves two functions. For AM reception, detection is provided by control grid to cathode signal rectification. For FM signal reception, limiting action takes place due to a large signal on the control grid which is rectified and used to bias the tube toward cutoff. A sharp cutoff characteristic is obtained by operation at greatly reduced plate and screen grid voltages. The outputs taken from the grid of V-606 are: COR and squelch, through isolating diode CR-603; AVC voltage for both AM and FM operation; and the AM audio output. Because of diode CR-603, the COR and squelch outputs are connected directly to these circuits. The AVC output from resistor R-624 is routed to S-102C where, in either 40 KC position, it is applied directly back to the AVC input at resistor R-601. The AM audio output is routed to switch S-102D where, in the 40 KC AM position, it is applied to the first video amplifier V-101A.

4-34. DISCRIMINATOR

The FM detector used is a conventional Foster-Seeley discriminator type except that the center tap usually found on the secondary of the transformer is replaced by a capacitor divider (C-634 - C-635). This provides better balance and is independent of coil characteristics or tuning slug position. Crystal diodes CR-601 and CR-602 are used for rectification. The FM output is routed to switch S-102D where, in the 40 KC FM position, it is applied to the first video amplifier V-101A.

4-35. 300-KC BANDWIDTH I-F AMPLIFIER, AM DETECTOR, AND FM DISCRIMINATOR

When mode selector switch S-102 is placed to either 300 KC FM or 300 KC AM, both the 20-kc bandwidth and 40-kc bandwidth i-f strips are disabled by removal of certain operating voltages. The 300-kc bandwidth amplifier can operate as an i-f amplifier and AM detector or an i-f amplifier, limiter and discriminator, the changeover being accomplished by switching circuit voltage at switch S-102.

4-36. FIRST I-F AMPLIFIER

The output from the tuner in use is connected to the 300-kc i-f amplifier at either receptacle J-401 or J-403. Transformers T-401 and T-402 are resonated at 21.4 mc (the intermediate frequency) by capacitors C-404 and C-411 and the capacity associated with the interconnecting cabling. The input is a-c coupled through capacitors C-408 and C-410 to the grid of the first i-f amplifier V-401, a high gain type 6DC6 tube. The plate and screen grid of V-401 are returned to B+ through switch S-102E and are disconnected when this switch is not in a 300 KC position. Note also that the cathode is returned to approximately 14-volt dc (at the junction of a voltage divider consisting of resistors R-135 and R-137). This cathode bias prevents signal rectification at the input grid.

4-37. SECOND I-F AMPLIFIER

The operation of the second i-f amplifier is the same as that of the first.

4-38. THIRD I-F AMPLIFIER OR FIRST LIMITER

With the mode-bandwidth selector switch in the 300 KC AM position, V-403, a type 6CB6 tube, operates as a third i-f amplifier in a fashion similar to that of the first and second. A test point, TP-403, is brought out from a divider in the grid circuit for alignment purposes. With switch S-102 in the 300 KC FM position, however, the screen potential of V-403 is lowered considerably by the dividing action of resistor R-433 which is returned to ground through relay K-102. In this event, positive clipping takes place, since the tube current saturates quickly when the input grid is driven above the operating point. Negative clipping occurs because of the sharp cutoff characteristic of the 6CB6. Transformer T-407 is tightly coupled and both the primary and secondary are loaded resistively to achieve a bandwidth of 2 mc.

4-39. AM DETECTOR OR SECOND LIMITER

The output from V-403 is connected to AM detector/second limiter V-404, a type 6AK5 tube. With the mode-bandwidth selector switch in the 300 KC FM position, the cathode (grounded) and grid act as a diode detector with the output of V-404 appearing at the junction of capacitors C-472 and C-475. The output is then routed to the contacts of switch S-102D. When switch S-102 is in the 300 KC AM position, the AM signal is routed to the input video amplifier. Note that any AM signal leakage through the tube V-404 and FM discriminator V-405 is open-circuited at switch S-102. When switch S-102 is in the 300 KC FM position, however, the AM path to the video amplifier is interrupted at switch S-102. AM detector/second limiter V-404 then acts as a second limiter due to the low screen voltage and the sharp cutoff characteristic of the tube (as explained above for the case of the first limiter).

4-40. DISCRIMINATOR

The discriminator employs a type 6AL5 tube in a conventional phase-sensitive circuit. The output is applied to the video amplifier through switch S-102.

4-41. AVC-MAN AND RF GAIN CONTROLS

When mode-bandwidth selector switch S-102, is in the 300 KC AM position and the AVC-MAN switch, S-104, is in the AVC position, AVC voltage is taken from the detected audio output at the grid of V-404. This AVC voltage is filtered and fed back through switch S-102C and isolating resistors R-405 and R-418 to the input grids of V-401 and V-402, respectively. This AVC action is delayed by 0.5 volt by the divider action of the forward resistance of diode CR-101 and 20-megohm resistor R-134 which are tied in series across the 150-volt d-c supply and ground. Manual gain operation is made available by front-panel RF GAIN control R-133 when AVC-MAN switch S-104 is placed in the MAN position. In this case the AVC bus is at ground, at switch S-104, and the cathodes of V-401 and V-402 are returned to

ground through the RF GAIN control R-133. Thus, minimum gain is available when the control is turned fully counterclockwise so that the voltage at the cathodes is approximately +7.5 volts, established by the dividing action of resistors R-132 and R-133 across the 250-volt d-c supply. With switch S-102 in the 300-KC FM position, AVC voltage is derived from rectifying action which takes place at the grid of first limiter V-403. This AVC voltage is filtered and applied through switch S-102C and isolating resistors R-405 and R-415 to tubes V-401 and V-402. As in the AM case, AVC action is delayed by 0.5 volt. Note that on the FM case, RF GAIN control R-133 is made inoperable by the short to ground through sections A and C of switch S-102. Manual (volume) control is not necessary or desirable in FM operation since the limiters must be saturated.

4-42. VIDEO AND AUDIO AMPLIFIERS AND SQUELCH

The video and audio section consists of tubes V-101 through V-104, type 12AU7A dual triodes, and provides a 22 K video output from cathode follower V-102 and an audio output from 600-ohm transformer T-101. A squelch circuit is included which quiets the receiver in the absence of a carrier.

4-43. INPUT AMPLIFIER

The input stage to the video amplifier (V-101) employs one-half of a type 12AU7A tube in a conventional ground-cathode, plate-loaded circuit. The grid circuit includes a high frequency compensation network consisting of resistor R-101 and capacitor C-101.

4-44. CATHODE FOLLOWER

The output from the input amplifier drives a type 12AU7A cathode follower (V-102) from AUDIO GAIN potentiometer R-106. The two triode sections of V-102 are wired in parallel in order to achieve a low-impedance video output which is connected to receptacle J-104. A second output from V-102 is taken from a tap in the total cathode resistance which is connected through capacitor C-104 to the first audio amplifier, V-103B.

4-45. AUDIO AMPLIFIER

This audio amplifier utilizes one-half of a type 12AU7A tube and is gated by biasing the grid strongly negative in the absence of a carrier, providing a squelch effect. (See paragraph 4-46 below.) In all other respects the stage is conventional.

4-46. SQUELCH AMPLIFIER

The audio amplifier (V-103B) is controlled by a squelch circuit, V-103A, one-half of a type 12AU7A tube which in turn can be made inoperable by a bias derived from the AVC circuit. (See figure 4-2.) In the 20-KC AM case, the output from the AM detector (V-410) is rectified negatively by diode CR-402 and capacitor C-105 to furnish a signal to the squelch amplifier. The cathode of the first audio amplifier (V103B) is returned to its grid through resistors R-110 and R-111 in series, with the junction tied to the 150-volt d-c line. In the presence of a carrier, the negative potential from the AVC bus applied to the grid of squelch amplifier V-103B is sufficient to cut the tube off. The drop across resistor R-111 is zero so that the only bias on the grid of the first audio amplifier V-103B is attributable to that across resistor R-110 and the stage functions as a conventional voltage amplifier. In the absence of a carrier, however, squelch amplifier V-103A conducts and the drop across resistor R-111 is then added to that across resistor R-110 (from the viewpoint of the grid). This causes a bias of sufficient amplitude to cut off audio amplifier V-103B. With switch S-102 in the 300-KC AM position, the detected output from the AM detector (V-404) is sampled through CR-401 and applied to the grid of squelch amplifier V-103A. Operation is otherwise as described above for the 20-KC AM case. With switch S-102 in the 300 KC FM position, sufficient grid rectification takes place at pin 1 of the second limiter V-404 to operate the squelch circuit as described for the 300-kc AM case. For either the 40-KC AM or 40-KC FM modes, squelch operating

SQUELCH CIRCUIT SCHEMATIC

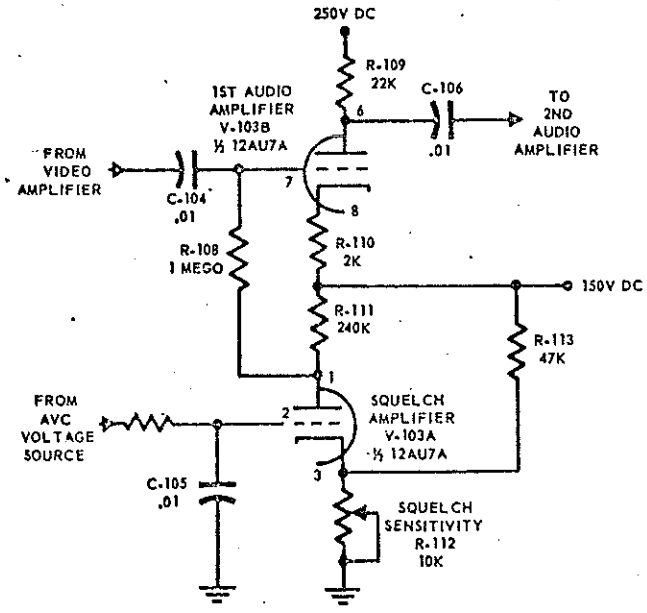


Figure 4-2

voltage is supplied from the squelch and COR output of the 40-kc bandwidth i-f strip as previously described. For any of the three modes of operation, squelch threshold is adjusted by front-panel SQUELCH SENS control R-112 which varies the bias and operating point of the squelch amplifier.

4-47. SECOND AUDIO AMPLIFIER

The audio output from the first audio amplifier is applied to the second audio amplifier, V-104A, a conventional voltage amplifier.

4-48. OUTPUT AMPLIFIER

The second audio amplifier drives the grid circuit of the third audio output amplifier (V-104B) which is plate-loaded by the primary of output transformer T-101. The 600 and 150-ohm secondary of the transformer is connected to audio output receptacle J-108.

4-49. CARRIER OPERATED RELAY (COR)

Provision is made in the receiver for signaling the absence or presence of a carrier with a panel-mounted lamp. The same circuit also provides relay contacts to indicate the absence or presence of a carrier to auxiliary equipment. (See figure 4-3.)

The signaling voltage is derived from the same source which excites the squelch amplifier. In the presence of a carrier, a negative d-c potential appears on the grid of the first COR amplifier (V-101B) of sufficient amplitude to cut the tube off. Under this circumstance, the plate is fixed at approximately 160-volt d c by the bleeding action between the 250-volt d-c and 150-volt d-c supplies through resistors R-136 and R-120. The plate of V-101B and the grid of the second COR amplifier (V-105A) are directly coupled (through isolating resistor R-123). The cathode of V-105A is returned through resistor R-125 to the 150-volt d-c supply. Then, with V-101B cut off, the grid of V-105A is more positive than its cathode and the tube conducts. In the COR relay amplifier (V-105B), the bleeder action between the 250-volt d-c supply and the 150-volt d-c supply through parallel resistors R-128 and R-129 in series with resistor R-126 causes a cathode bias of approximately 5 volts. The positive potential at the cathode of V-105A charges capacitor C-108 through the small forward resistance of diode CR-102. Since capacitor C-108 is between the grid of V-105B and ground, plate current rises and relay K-101 (in the plate circuit) is energized. A double-pole, double-throw set of relay contacts is provided to auxiliary equipment at receptacle J-107. If the carrier disappears, the negative bias is not present at the grid of V-101B and the tube is in a state of conduction so that the plate potential is considerably below 150 volts. In effect, this condition makes the grid of

COR CIRCUIT SCHEMATIC

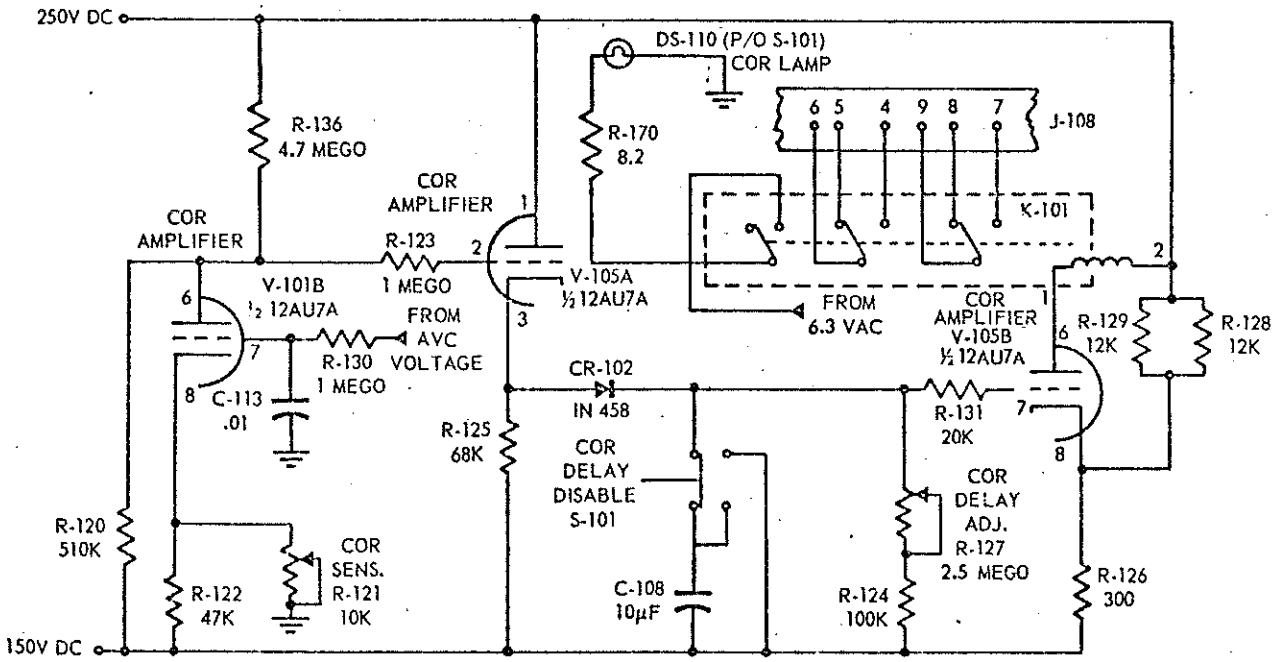


Figure 4-3

V-105A more negative than its cathode (which is returned to the 150-volt d-c supply) and the tube is cut off. Capacitor C-108 charges through resistors R-127 and R-124, the grid potential of V-101B falls below that of its cathode, and the plate current falls below the sensitivity of the relay. Then, the relay is deenergized and the ground line to the auxiliary equipment is interrupted. The sensitivity of the COR circuit may be adjusted by means of COR SENS front-panel control R-121. R-121 is a variable resistor in the cathode of the first COR amplifier (V-101B) which varies the operating point of the tube. The operation of the COR relay amplifier (V-105B) may be adjusted so that, with the loss of the carrier, the tube cuts off in three seconds on one extreme or continues conducting for 13 seconds on the other. This feature is made possible by varying the total resistance in the discharge path of capacitor C-108 with COR DELAY control R-127. This variable resistor is mounted on the rear apron of the receiver chassis. In addition, the current can be disabled by depressing spring-loaded, front-panel COR DELAY DISABLE switch S-101. This switch is an integral part of lamp DS-110, which removes capacitor C-108 from the grid circuit of the COR relay amplifier V-105B, discharging it at the same time.

SECTION V
MAINTENANCE

5-1. GENERAL

This section contains inspection, repair, and alignment information necessary for the proper maintenance of the G175H Receiver. Additional useful information for troubleshooting purposes will be the G175H block diagram in Section IV, and the G175H schematic diagram in Section VII, and the parts location illustrations in Section VI. Listed below is the power and equipment necessary for the performance of the maintenance procedures. If maintenance procedures are to be performed on the G175H at a location remote from its installation, it must be accompanied by its associated G227 Power Supply.

Voltages required is 28-volt dc, 115-volt 60-cps ac, and 150-volt dc.

The required test equipment for performance of the following maintenance procedures is listed in table 5-1.

5-2. PREVENTIVE MAINTENANCE

Preventive maintenance is accomplished through the performance of regularly scheduled inspections; including daily, 100-hour, and 1000-hour inspections.

CAUTION

When cleaning the receiver, be sure that the cooling blower is thoroughly cleaned. If the blower port becomes clogged, the 6280 tube will be damaged by excessive heat.

5-3. DAILY INSPECTION

Inspect for loose mounting; frayed, crimped, or corroded cables; and cracked connectors. Check the power pilot lamp. Make sure air passages are free of obstructions.

5-4. 100-HOUR INSPECTION

Remove dust covers and clean interior of receiver with clean dry compressed air.

Note

The V-201 electron tube should be replaced after 500 hours of operation.

NECESSARY TEST EQUIPMENT

PREFERRED TYPE	SUITABLE ALTERNATE
G196 OSCILLOSCOPE (WITH CA PLUG-IN)	TEKTRONIX TYPE 545 OR EQUIVALENT
TELONIC SM-2000 SWEEP GENERATOR (WITH SH-1 L2 AND L4 HEADS)	TS452CU RADIO TEST SET
G266 SIGNAL GENERATOR	ANUSM16 SIGNAL GENERATOR
G268 SIGNAL GENERATOR	ANURM25F SIGNAL GENERATOR
G200 VTVM	HEWLETT PACKARD 410B OR EQUIVALENT
G295 VTVM	ME30AU VOLTMETER
G199 TUBE CHECKER	TV2AU TEST SET, ELECTRON TUBE OR EQUIVALENT
G151A FREQUENCY METER	ANURM32 FREQUENCY METER
50-OHM DUMMY LOAD (3) MICROLAB TA5MB	EQUIVALENT
BNC "TEE" CONNECTOR (2) UG274U	EQUIVALENT
6-DB POWER DIVIDER MICROLAB DA4TB	EQUIVALENT
HEWLETT PACKARD 524C FREQUENCY COUNTER	EQUIVALENT
HEWLETT PACKARD 525A FREQUENCY CONVERTER	EQUIVALENT
BOONTON 91D R-F VOLTMETER	EQUIVALENT

Table 5-1

5-5. 1000-HOUR INSPECTION

In addition to the daily and 100-hour inspections, remove and check all vacuum tubes with a tube tester; replace low quality items. Perform the receiver sensitivity check outlined in paragraph 5-6.

5-6. G175H SENSITIVITY CHECK

a. Energize the receiver and the G266 Signal Generator and allow a 30-minute warmup before performing the remainder of the procedure.

b. Disconnect the cable to J-101 and connect the G266 in its place.

c. Connect the VTVM to the audio output connector J-108, pins 1 and 2.

d. Set the G266 to approximately 45 mc with 50%, 1000 cps amplitude modulation.

e. Set the G175H BAND SWITCH to 30-60 MC, the mode-bandwidth selector to 300 KC AM, the AVC-MAN switch to MAN, and the RF GAIN and AUDIO GAIN controls maximum clockwise.

f. Carefully tune the receiver to the output of the G266. Keep the G266 output low enough to avoid receiver saturation.

g. Set the G266 output to 2 microvolts as indicated by generator attenuator dial. Record audio output level in DBM.

h. Remove modulation from G266. Record audio output level. The difference in level (steps g and h) should be 10 dbm minimum.

i. Disconnect the G266 from J-101 and reconnect to J-102. Set to approximately 160 mc with 50%, 1000 cps amplitude modulation.

j. Repeat steps e through h, except set the G175H BAND SWITCH to 60-260 MC in step e.

k. Repeat steps e through h, except in step e place the mode-bandwidth selector in 40 KC AM position.

l. Repeat steps e through h, except in step e place the mode-bandwidth selector in 20 KC AM and in step h the difference in levels obtained (in steps g and h) should be 16 db minimum.

5-7. CORRECTIVE MAINTENANCE

The following information pertains to a malfunctioning G175H. Before troubleshooting the G175H it should be well established that the receiver has an internal fault and the malfunction is not due to an external input.

5-8. TROUBLESHOOTING PROCEDURES

By far the greatest percentage of difficulties are caused by failure of replaceable parts, particularly tubes. Proper functioning of such parts in the G175H should be assured either by test or replacement with known good items before further troubleshooting is undertaken.

a. Initial Setup -- Connect the receiver to the G227 Power Supply and set the POWER switch to ON. Before working on the equipment, allow a 30-minute warmup.

b. Procedure -- Because of the many possible modes of reception, troubles in the G175H can be quickly isolated to a particular section such as a tuner or i-f strip. Some stages such as the audio, video, squelch and COR (carrier operated relay) circuits are common to all modes of operation. If the tuners are detecting in a normal fashion, as indicated by the associated specturm display unit (SDU), and none of the reception modes are producing desired audio, video, or COR results, the difficulty will most likely be found in these common circuits. When a trouble has been narrowed to a particular section, subassembly, or stage, voltage and resistance measurements (see table 5-3), along with direct observation, will usually give an indication of the faulty components. Finally, it is recommended that, even though realignment is not necessary, maintenance personnel familiarize themselves with these procedures because it may be of value in work other than complete alignment. Section VI illustrations may be used to locate the various sections, subassemblies, and detailed parts of the G175H.

WARNING

This unit employs voltages which are dangerous to life. Extreme caution should be exercised during troubleshooting and alignment when contact with these voltages is most likely.

5-9. ALIGNMENT PROCEDURES

The following instructions are divided into nine procedures. These include mechanical and electrical adjustments for both tuners, and alignment of the three i-f strips. Also included is the procedure for converting the 40-kc bandwidth i-f strip to 75-kc bandwidth operation and vice versa. One other adjustment, the COR delay potentiometer R-127, is simply set to the desired amount of delay between termination of carrier reception and COR circuit deactivation.

When performing alignment procedures, the following general instructions should be kept in mind and followed when the case applies.

In order to minimize the effects of frequency response of the detectors (including their decoupling networks) used for visual alignment, the sweep generator width should be no greater than that required to produce a suitable oscilloscope pattern.

A post-detection type of marker adder is used in the SM 2000 Sweep Generator. Its use is recommended to prevent possible marker interference to the response curve. However, if such a marker adder is not available, the marker generator output may be introduced by connection of one or two turns of insulated wire wrapped around the sweep generator lead near the point of connection to the

G175H RECEIVER TROUBLESHOOTING CHART

SYMPTOM	PROBABLE CAUSE	REMEDY
RECEIVER FAILS TO OPERATE.	a. RECEIVER POWER SWITCH OFF b. NO INPUT POWER	a. TURN POWER SWITCH ON. b. CHECK THE VARIOUS VOLTAGES AT J107.
WITH POWER APPLIED TO RECEIVER, THERE IS NO SIGNAL FROM EITHER TUNER AT THE SDU OUTPUT.	TROUBLE IN THE B+ VOLTAGE SUPPLY	CHECK THE B+ VOLTAGE CIRCUIT, PARTICULARLY BANDSWITCH S-103.
30-60 MC TUNER OPERATES, BUT 60-260 MC TUNER IS INOPERATIVE.	DEFECTIVE COMPONENT IN 60-260 MC TUNER	ATTEMPT TO CORRECT TROUBLE BY TUBE SUBSTITUTION. IF TROUBLE PERSISTS, PROCEED AS FOLLOWS: CHECK THE OUTPUT OF OSCILLATOR V-204. CHECK THE INPUTS AND OUTPUTS OF V-201, V-202, AND V-203. IF V-201 IS DEFECTIVE, CHECK THE B+ DELAY RELAY K-201 AND BLOWER B-101 FOR PROPER OPERATION. NOTE: BEFORE REPLACING V-201, MEASURE (WITH A VTVM) THE VOLTAGE BETWEEN TEST POINT TP-201 AND CHASSIS. THIS IS THE VOLTAGE DROP ACROSS R-202 (100 OHMS). THE VOLTAGES SHOULD BE BETWEEN 2 AND 3 VOLTS. IF THE VOLTAGE IS ABOVE OR BELOW THESE LIMITS, THE TUBE SHOULD BE REPLACED.
60-260 MC TUNER OPERATES, BUT 30-60 MC TUNER IS INOPERATIVE.	DEFECTIVE COMPONENT IN 30-60 MC TUNER	ATTEMPT TO CORRECT TROUBLE BY TUBE SUBSTITUTION. IF TROUBLE PERSISTS, PROCEED AS FOLLOWS: CHECK THE OUTPUT OF OSCILLATOR V-304. CHECK THE INPUTS AND OUTPUTS OF V-301, V-302, AND V-303 TO ISOLATE THE DEFECTIVE STAGE. MAKE REPAIRS AND/OR REPLACE COMPONENTS AS NECESSARY.
RECEIVER OPERATES IN 300-KC AND 40-KC MODES BUT DOES NOT OPERATE IN 20-KC MODE.	DEFECTIVE 20-KC BANDWIDTH I-F STRIP	ATTEMPT TO CORRECT TROUBLE BY TUBE SUBSTITUTION. IF TROUBLE PERSISTS PROCEED AS FOLLOWS: STARTING AT TP-402, TRACE THE SIGNAL PATH THROUGH THE 20-KC BANDWIDTH I-F STRIP. CHECK THE OUTPUTS AND INPUTS OF V-410, V-409, V-408, AND V-407. CHECK THE OUTPUT OF OSCILLATOR V-406. MAKE REPAIRS AND/OR REPLACE COMPONENTS AS NECESSARY.
RECEIVER OPERATES IN 40-KC AND 20-KC MODES BUT DOES NOT OPERATE IN 300-KC MODES.	DEFECTIVE 300-KC BANDWIDTH I-F STRIP	ATTEMPT TO CORRECT TROUBLE BY TUBE SUBSTITUTION. IF TROUBLE PERSISTS, PROCEED AS FOLLOWS: STARTING AT TP-401, TRACE THE SIGNAL PATH THROUGH THE 300-KC BANDWIDTH I-F STRIP. CHECK THE OUTPUTS AND INPUTS OF V-404, V-403, V-402, AND V-401 TO ISOLATE THE DEFECTIVE STAGE. MAKE REPAIRS AND/OR REPLACE COMPONENTS AS NECESSARY.
RECEIVER OPERATES IN 300-KC AND 20-KC MODES BUT DOES NOT OPERATE IN 40-KC MODES.	DEFECTIVE 40-KC BANDWIDTH I-F STRIP	ATTEMPT TO CORRECT TROUBLE BY TUBE SUBSTITUTION. IF TROUBLE PERSISTS, PROCEED AS FOLLOWS: STARTING AT THE AM DETECTOR V-606, TRACE THE SIGNAL PATH THROUGH THE 40-KC BANDWIDTH I-F STRIP. CHECK THE OUTPUTS AND INPUTS OF V-606, V-605, V-603, V-602, AND THE OUTPUT OF OSCILLATOR V-604. MAKE REPAIRS AND/OR REPLACE COMPONENTS AS NECESSARY.
RECEIVER OPERATES IN AM MODES AND IN 40-KC FM BUT DOES NOT OPERATE IN 300-KC FM.	DEFECTIVE DISCRIMINATOR IN 300-KC BANDWIDTH I-F STRIP	TRY TUBE SUBSTITUTION. CHECK ELECTRICAL VALUES OF COMPONENTS. MAKE NECESSARY REPLACEMENTS.
RECEIVER OPERATES IN AM MODES AND IN 300-KC FM MODE BUT DOES NOT OPERATE IN 40-KC FM MODES.	DEFECTIVE DISCRIMINATOR IN 40-KC BANDWIDTH I-F STRIP	CHECK DIODES CR-601 AND CR-602. CHECK ELECTRICAL VALUES OF COMPONENTS. MAKE NECESSARY REPLACEMENTS.

Table 5-2. (Sheet 1 of 2)

G175H RECEIVER TROUBLESHOOTING CHART (CONT)

SYMPTOM	PROBABLE CAUSE	REMEDY
COR LAMP LIGHTS WHEN A CARRIER IS RECEIVED, BUT THE RECEIVER REMAINS SQUELCHED. VIDEO OUTPUT IS NORMAL.	a. SQUELCH SENS CONTROL NOT ADJUSTED PROPERLY b. DEFECTIVE COMPONENT IN SQUELCH CIRCUIT	a. ADJUST SQUELCH SENS CONTROL. b. TRY TUBE SUBSTITUTION. CHECK ELECTRICAL VALUES OF COMPONENTS. MAKE NECESSARY REPLACEMENTS.
CARRIER OPERATES SQUELCH CIRCUIT BUT COR LAMP DOES NOT LIGHT.	a. COR SENS CONTROL NOT ADJUSTED PROPERLY b. DEFECTIVE TUBE OR RELAY IN COR	a. ADJUST COR SENS CONTROL. b. TRY TUBE SUBSTITUTION. CHECK OPERATION OF RELAY. MAKE NECESSARY REPLACEMENTS.
VIDEO OUTPUT IS PRESENT BUT THERE IS NO AUDIO OUTPUT.	DEFECTIVE COMPONENT IN AUDIO AMPLIFIER SECTION	TRY TUBE SUBSTITUTION. CHECK ELECTRICAL VALUES OF COMPONENTS. MAKE NECESSARY REPLACEMENTS.
NEITHER VIDEO NOR AUDIO OUTPUT IS PRESENT.	DEFECTIVE COMPONENT IN VIDEO AMPLIFIER SECTION	TRY TUBE SUBSTITUTION. CHECK ELECTRICAL VALUES OF COMPONENTS. MAKE NECESSARY REPLACEMENTS.
G186 SCREEN LIGHTS AND MARKER INJECTS, NO R-F INDICATIONS GIVEN, G175H AUDIO, VIDEO, AND COR SECTIONS INOPERATIVE.	G175H TUNER-DEFECTIVE	TRY OTHER BAND. G175H SHOULD OPERATE NORMALLY. REPLACE INOPERATIVE TUNER TUBES AND/OR REPAIR TUNER DEFECTS.
G175H AUDIO, VIDEO, COR SECTIONS, OR ANY COMBINATION OF SAME INOPERATIVE. G186 OPERATES NORMALLY.	a. G175H I-F SECTION DEFECTIVE b. G175H AUDIO, VIDEO, COR SECTIONS, OR COMBINATIONS OF SAME DEFECTIVE	a. USE MODE-BANDWIDTH SELECTOR TO ISOLATE DEFECTIVE I-F SECTION. REPLACE INOPERATIVE TUBES AND/OR REPAIR I-F SECTION DEFECTS. b. REPLACE INOPERATIVE TUBES AND/OR REPAIR DETECTED DEFECTS IN THE AUDIO, VIDEO, OR COR SECTIONS.

Table 5-2. (Sheet 2 of 2)

circuit under test. When coupling the marker generator to the sweep output, care should be taken to ensure that the marker does not interfere with the response curve.

A low-capacity shielded cable, such as RG62U coaxial cable, should be used for connection to the oscilloscope. Cable capacity plus oscilloscope input capacity should be held to a maximum of 100 pf. The oscilloscope should be used in the d-c position on the vertical amplifier preamplifier.

The alignment procedures should be followed carefully and performed in the order given. The G175H and all test equipment must be allowed 30 minutes warmup time to stabilize their operation.

5-10. I-F STRIP BANDWIDTH ALTERATION

The 40-kc bandwidth i-f strip is easily converted to produce either of two bandwidths, 40 kc or 75 kc. This is done by changing printed circuit network boards. Two plainly marked boards are supplied; one producing 40-kc bandwidth, and one producing 75-kc bandwidth. Proceed as follows:

a. Visually inspect the markings on the coupling network board mounted on top of one of the transformer shields of the 40-kc bandwidth i-f strip. If the board for the undesired bandwidth is being used, remove the three screws retaining it. Store the board in a safe place.

b. Place the board producing the desired bandwidth, marked side up with the mounting holes properly oriented, on top of the transformer shield. Secure, using the three screws previously removed.

5-11. 300-KC BANDWIDTH I-F AMPLIFIER ALIGNMENT

a. Adjust the G175H controls as follows:

SQUELCH SENS	Maximum CCW
AUDIO GAIN	Maximum CCW
MAN-AVC	MAN
RF GAIN	Maximum CCW
COR SENS	Maximum CCW
BAND SWITCH	60-260 MC
Mode-Bandwidth Selector	300 KC FM

TUBE SOCKET VOLTAGE CHART

TUBE		NOTE REFERENCE	PIN NUMBER											PLATE CAP	SCREEN THREAD
SCHEMATIC DESIGNATION	TYPE NUMBER		1	2	3	4	5	6	7	8	9	10	12		
V-101	12AU7A		94	-0.75	3.75	0	0	150	-1.65	28	6.3*	–	–	–	–
V-102	12AU7A		230	88	145	0	0	230	88	145	6.3*	–	–	–	–
V-103	12AU7A		33.5	-1.6	0	0	0	195	32	150	6.3*	–	–	–	–
V-104	12AU7A		84	0	0	0	0	225	0	8.6	6.3*	–	–	–	–
V-105	12AU7A		230	150	163	0	0	185	157	155	6.3*	–	–	–	–
V-201	6280	1.	6.5*	–	7.5	0	–	–	–	–	–	–	–	175	7
V-202	6J4	1.	0	0	0	6.3*	0	0	120	–	–	–	–	–	–
V-203	6AK5	1.	-1	0	6.3*	0	150	44	0	–	–	–	–	–	–
V-204	6AF4A	1.	47	2.0	0	6.3*	2.1	2	47	–	–	–	–	–	–
V-301	6AK5	2.	0	1.3	6.3*	0	170	110	1.3	–	–	–	–	–	–
V-302	6AK5	2.	0	1.3	6.3*	0	170	105	1.3	–	–	–	–	–	–
V-303	6AK5	2.	-1.5	0	6.3*	0	150	60	0	–	–	–	–	–	–
V-304	6AF4A	2.	80	-10	6.3*	0	0	-10	65	–	–	–	–	–	–
V-401	6DC6	3.	0.25	1	6.3*	0	220	65	0	–	–	–	–	–	–
V-402	6DC6	3.	0.3	0	6.3*	0	225	54	0	–	–	–	–	–	–
V-403	6CB6	3.	-0.2	0	6.3*	0	125	34	0	–	–	–	–	–	–
V-404	6AK5	3.	-1.25	0	6.3*	0	24	60	0	–	–	–	–	–	–
V-405	6AL5	3.	-1	-5	0	6.3*	0	NC	-6.6	–	–	–	–	–	–
V-406	6AU6	4.	-7	0	0	6.3*	230	95	0	–	–	–	–	–	–
V-407	6BA6	4.	-0.5	0	0	6.3*	225	53	0.5	–	–	–	–	–	–
V-408	6AK5	4.	-0.65	0	6.3*	0	150	52	0	–	–	–	–	–	–
V-409	6BA6	4.	-0.6	0	0	6.3*	220	56	0.7	–	–	–	–	–	–
V-410	6AL5	4.	0	-0.25	0	6.3*	20	0	-0.65	–	–	–	–	–	–
V-601	6CW4	5.	–	68	–	-0.3	–	–	–	0.3	–	0	6.3*	–	–
V-602	6CW4	5.	–	125	–	64	–	–	–	68	–	0	6.3*	–	–
V-603	7587	5. & 7.	–	10	–	-6	–	–	–	0	–	0	6.3*	125	–
V-604	6CW4	5. & 7.	–	55	–	-7	–	–	–	0	–	0	6.3*		–
V-605	7587	5.	–	22	–	-0.3	–	–	–	-0.3	–	0	6.3*	145	–
V-605		6.	–	10	–	-0.3	–	–	–	-0.3	–	0	6.3*	148	–
V-606	7587	5.	–	15	–	-0.3	–	–	–	0	–	6.3*	0	22	–

NOTES:

1. Band Switch to 60-260 MC.
2. Band Switch to 30-60 MC.
3. Mode-Bandwidth Selector to 300-KC FM.
4. Mode-Bandwidth Selector to 20 KC AM.
5. Mode-Bandwidth Selector to 40 KC AM.
6. Mode-Bandwidth Selector to 40 KC FM.
7. Measurement at pin 4 using 1-megohm resistor in series with probe.
8. These measurements made with a high B+ voltage of +230. This value will vary with G 227 Power Supply load and line voltage variations.
9. * Denotes a-c voltage.

Table 5-3

I-F STRIP ALIGNMENT SETUP

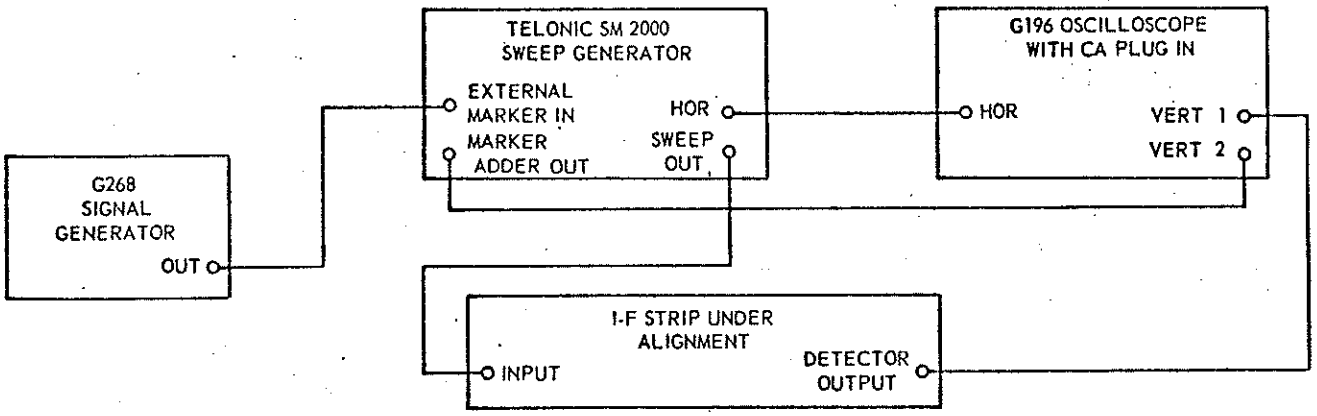


Figure 5-1

b. Set 60-260 MC dial to lowest frequency.

c. Remove local oscillator and second i-f amplifier tubes (V-204 and V-402).

d. Connect the G196 Oscilloscope to test point TP-401. Remove I-F strip bottom cover.

e. Connect the sweep generator (with L-4 plug-in installed) to pin 1 of V-403. Adjust for a response curve on the G196 CRT.

f. Adjust the G268 Signal Generator to 21.4 mc, using the G151A Frequency Meter, and couple to external marker input of the sweep generator. Periodically check this adjustment throughout the remainder of the procedure.

g. Adjust transformer T-407 for a symmetrical response centered about the 21.4-mc marker pip.

h. Remove the first limiter tube (V-403).

i. Reconnect the sweep generator to pin 1 of V-404. Do not disturb the frequency setting.

j. Reconnect the G196 to pin 1 of V-405.

k. Adjust transformer T-408 for a symmetrical S-shaped discriminator curve centered about the 21.4-mc marker. Peak separation should be 750 kc (±30 kc).

l. Replace V-402 and V-403. Remove the first i-f amplifier tube, V-401.

m. Reconnect the G196 to TP-403.

n. Reconnect the sweep generator to pin 1 of V-402. Do not change the frequency settings of sweep generator.

o. Set the sweep generator output amplitude to where the peak deflection on the G196 CRT corresponds to 0.25 volt.

p. Adjust transformer T-405 and T-406 for a symmetrical response curve centered about the 21.4-mc marker. Response curve shape should be flat-topped or slightly double-peaked.

q. Replace V-401.

r. Disconnect cables at receptacles J-202 and J-302 (on r-f chassis).

s. Solder a 10-ohm resistor between pin 1 of V-401 and ground (at tube socket mounting strap nut).

t. Solder 200-ohm resistor to pin 1 of V-401.

u. Connect the sweep generator between 200-ohm resistor and ground (at tube socket mounting strap nut). Do not change the frequency settings of the sweep generator or the G268 Signal Generator.

v. Set output amplitude of sweep generator so that peak deflection on the G196 is 0.25 volt.

w. Adjust transformers T-403 and T-404 for summetrical response curve centered around the 21.4-mc marker. The shape of the response curve should be flat-topped or slightly double-peaked.

x. Remove the 10- and 200-ohm resistors.

y. Reconnect cables to receptacles J-202 and J-302.

z. Install i-f bottom cover and tighten all mounting screws.

aa. Connect the sweep generator between test point TP-202 (on r-f chassis) and ground (on a trimmer-capacitor stud).

ab. Set output amplitude of the sweep generator so that peak deflection on the G196 is 0.25 volt.

ac. Adjust transformers T-401 and T-402 for symmetrical response curve centered around the 21.4-mc marker. The response curve should be very flat-topped.

ad. Place mode-bandwidth selector in 300 KC AM position and AVC-MAN switch in MAN. Connect G196 scope to junction of K-102, C-101, and R-101. Adjust RF GAIN control and output of sweep generator for a low level response curve as displayed on G196 scope.

ae. Adjust T-401 through T-407 for a symmetrical response curve centered around the 21.4-mc marker and 300 kc wide at the 3-db points.

af. Place mode-bandwidth selector to 300 KC FM. Adjust T-408 for a symmetrical S-shaped discriminator curve centered about the 21.4-mc marker.

LOCAL OSCILLATOR ADJUSTMENT

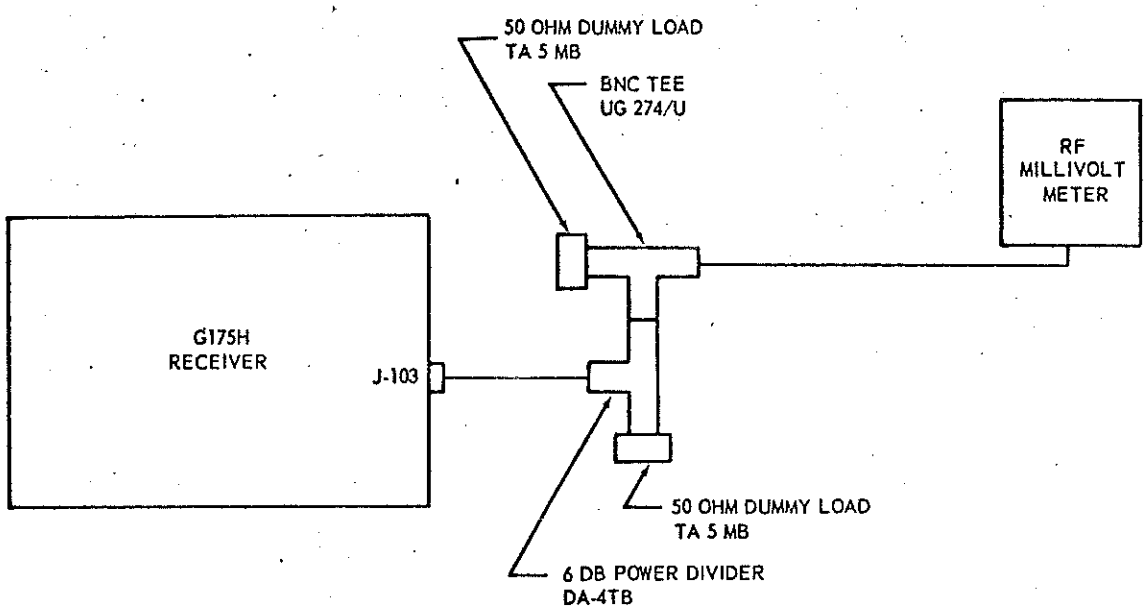


Figure 5-2

5-12. 40-KC BANDWIDTH I-F AMPLIFIER ALIGNMENT

If this i-f amplifier is not drastically out of alignment, steps d through g may be omitted and only the remainder of the procedure performed. This procedure must be performed with the i-f strip set for 40-kc bandwidth operation. If, after the alignment is performed, it is decided to change the i-f strip bandwidth to 75 kc, a realignment is not necessary as alignment is maintained when the coupling boards are interchanged. The i-f strip must be disassembled from the main chassis and P-602 removed during alignment. Set the mode-bandwidth selector to 40 KC FM before preceeding.

a. Using the G200 VTVM, connect a 1-megohm resistor in series with the probe and measure the voltage at pin 4 of V-604. This voltage should be -6-volt dc to -8-volt dc. This step checks for satisfactory operation of the 18.9-mc crystal oscillator. It is still possible for oscillator frequency to deviate enough from 18.9-mc to adversely affect alignment.

b. Set the mode-bandwidth selector to 40 KC AM.

c. Connect the G200 VTVM to resistor R-624. Make this connection to the junction of R-624 and wire, leaving the i-f strip subassembly.

d. Set the G268 Signal Generator to 2.5 mc, using the G151A Frequency Meter, and connect to pin 4 of V-605. Keep the G268 output level from producing a reading in excess of -10-volt dc on the G200.

e. Adjust L-606 for maximum negative voltage. Do not let output level of G268 cause a G200 reading in excess of -10-volt dc.

f. Reconnect the G268 to pin 4 of V-603. Do not disturb the frequency settings of this unit.

g. Adjust L-604 and L-605 for maximum negative voltage on G200. Do not let a G268 output level produce a G200 reading in excess of -10-volt dc.

h. Set the G268 Signal Generator to 21.4 mc, using the G151A Frequency Meter, and connect to J-601.

i. Adjust L-606, L-605, L-604, and L-602, respectively, for a maximum negative voltage reading on the G200. Do not allow a great enough G268 output level to cause the G200 to indicate in excess of -10-volt dc.

j. Repeat step i until no further improvement in gain is noted.

k. Disconnect the G268 from J-601. Connect the sweep generator to J-601. Couple the G268 Signal Generator to external marker input of sweep generator.

l. Disconnect G200 VTVM and connect G196 Oscilloscope to the junction of C-101, R-101, and K-102.

m. Adjust the sweep generator to produce a low level response curve on the G196 Oscilloscope.

n. Adjust L-604 and L-605, and if necessary, L-606 and L-602, for a flat-topped response symmetrical about the 21.4-mc marker and 40 kc wide at the 3-db points. Readjust sweep generator output as necessary to keep trace amplitude within 8-volt peak-to-peak limits.

o. Set the mode-bandwidth selector to 40 KC FM.

p. Connect the G196 to the junction of C-636 and CR-602.

q. Connect the sweep generator (using L-2 plug-in head) to pin 4 of V-605. Adjust for S response curve on G196 CRT.

r. Set the G268 to 2.5 mc, using the G151A, and couple to external marker input of sweep generator.

s. Adjust L-608 and L-609 until discriminator S-shaped response curve has equal amplitude positive and negative peaks, approximately 150-kc bandwidth peak-to-peak, and zero amplitude at the 2.5-mc marker. Be sure the marker coupling is not upsetting response shape. Readjust sweep generator setup as necessary to keep G196 trace amplitude to less than 20-volts peak-to-peak.

t. Fasten 40-kc strip to receiver. Connect P-602 to J-602. Place mode-switch bandwidth selector in 40 KC AM position.

P-602 to J-602. Place mode-switch bandwidth selector in 40 KC AM position. Connect the G196 Oscilloscope to the junction of C101, R101, and K102.

u. Connect the SM 2000 Sweep Generator to TP-202. Set G268 to 21.4 mc using the G151A and couple to the external marker input of the sweep generator. Slight adjustment of T-601, L-602, L-604, L-605, and L-606 may be required to obtain a response curve symmetrical about the 21.4-mc marker and 40 kc wide at the 3-db points.

v. Place the mode-bandwidth selector to 40 KC FM. The S-shaped response curve, as displayed on the G196 scope, should have a zero amplitude at the 21.4-mc marker with equal negative and positive peaks. Slight adjustment of L-608 and L-609 may be required.

5-13. 20-KC BANDWIDTH I-F AMPLIFIER ALIGNMENT

Proceed as follows:

a. Set mode-bandwidth selector to 20 KC AM. Remove 20-kc i-f bottom cover and place AVC-MAN switch in MAN position.

b. Connect sweep generator between pin 1 of V-407 and ground (on tube socket mounting strap nut).

c. Connect the G196 Oscilloscope to junction of resistors R-413 and R-414.

d. Set the G268 Signal Generator to 21.4-mc, using the G151A Frequency Meter, and couple to external marker input of the sweep generator.

e. Adjust the sweep generator output and RF GAIN control for a low level response curve on the G196.

f. Adjust transformers T-409 and T-410 for maximum gain centered about the 21.4-mc marker. The 22.4-mc pip (generated by the second local oscillator, V-406) must appear on the high frequency side of the response curve. This pip may be identified by removing V-406 and confirming that it disappears.

g. Connect the G268 to pin 1 of V-407 and adjust transformers T-411, T-412, T-413, and T-414 for maximum indication on the G200 VTVM connected between junction of resistor R-440, capacitor C-481 and ground.

h. Replace 20-kc i-f bottom cover. Set the G268 to 21.4 mc and connect to external marker input of sweep generator. Connect the sweep generator to TP-202 (on the r-f chassis).

i. Connect the G196 to the junction of C-101, R-101 and K-102.

j. Adjust output of sweep generator and RF GAIN control for a low level response curve on the G196.

k. Adjust T-409 through T-414 for a symmetrical response curve centered about the 21.4-mc marker and 20 kc wide at the 3-db points.

5-14. 30- TO 60-MC LOCAL OSCILLATOR ADJUSTMENT

Unless the 30- to 60-mc tuner is being aligned, the only adjustment in the 30- to 60-mc oscillator concerns tuning dial accuracy (paragraph 5-18). If, however, after replacing V-304, a discrepancy is noted during the 1000-hour sensitivity check, the procedure below should be used to correct it. All bottom covers should be in place when the procedure is performed.

a. Set the G268 Signal Generator to 30 mc and connect to J-101.

b. Connect the G200 VTVM to TP-403.

c. Place mode-bandwidth selector to 300 KC FM, and tune the G175H to the G268 output as indicated by the G200 negative deflection.

d. Adjust C-331 for G200 maximum negative voltage reading. Rock the G175H tuning dial during this adjustment. Readjust G268 output level as necessary to keep G200 maximum reading less than -2-volt dc.

The following procedure is to be performed when the J-103 output is of insufficient amplitude throughout the 30- to 60-mc range, and when triode tube V-304 replacement fails to correct the signal amplitude.

e. Connect the r-f voltmeter to the G175H as shown in figure 5-2.

f. Rotate the BAND SWITCH on the G175H front panel to the 30-60 MC position.

g. Press the POWER switch on the G175H front panel to the ON position. The white light in switch illuminates, (allow 30-minute warm-up time).

h. Rotate the frequency dial throughout the 30- to 60-mc range while monitoring the r-f voltmeter for a minimum signal of 60 millivolts and a maximum signal of 100 millivolts. Change the position of L-0091 on L-308 to maintain this output amplitude.

i. Pull out the power switch of the G175H. The white light in the power switch should extinguish. Remove the r-f voltmeter and interconnecting cables installed in steps a and e.

5-15. 60- TO 260-MC LOCAL OSCILLATOR ADJUSTMENT

Unless the 60- to 260-mc tuner is being aligned, the only adjustment in the 60- to 260-mc oscillator concerns the tuning dial accuracy (paragraph 5-18). If, however, after replacing V-204, a discrepancy is noted during the 1000-hour sensitivity check, the procedure below should be used to correct it. All bottom covers should be in place when the procedure is performed.

a. Press the POWER switch on the G175H front panel to the ON position. The white light in the power switch should illuminate.

b. Set the G266 Signal Generator to 60 mc, using the G151A Frequency Meter, and connect to J-102.

c. Connect the G200 VTVM to TP-403.

d. Place mode-bandwidth selector to 300 KC FM, and tune the G175H to the G266 output as indicated by the G200 negative deflection.

e. Adjust C229 for G200 maximum negative voltage reading. Rock the G175H tuning dial during this adjustment. Readjust G268 output level as necessary to keep G200 maximum reading less than -2-volt dc.

The following procedure is to be performed when the J-103 output is of sufficient amplitude throughout 60- to 260-mc band and triode vacuum tube V-204 has been replaced failing to correct the signal amplitude.

f. Connect the r-f voltmeter to the G175H as shown in figure 5-2.

g. Rotate the BAND SWITCH on the G175H front panel to the 60-260 MC position.

h. Rotate the frequency dial throughout the 60- to 260-mc range while monitoring the r-f voltmeter for minimum signal amplitude of 60 millivolts and a maximum signal of 100 millivolts from 60 to 150 mc. The signal amplitude is controlled by the value of resistor R-0092. Replacing R-0092 with a smaller resistance will increase the signal amplitude and replacing R-0092 with a large resistance will decrease the output signal amplitude. Replace R-0092 as required.

i. Pull out the POWER switch of the G175H. Remove the r-f voltmeter and interconnecting cables installed in steps a and e.

5-16. 30- TO 60-MC TUNER ALIGNMENT

Before the procedure outlined below is attempted, ensure that the tuning dial reads accurately. Tuning dial adjustment is covered in paragraph 5-18. Set up test equipment as shown in figure 5-3 to level sweep output.

a. Set mode-bandwidth selector to 300 KC AM position and AVC-MAN switch to AVC position.

b. Set BAND SWITCH to 30-60 MC position. The bottom covers must be in place when the following adjustments are made. Press the POWER switch to the ON position.

c. Attach the G196 Oscilloscope to r-f test point TP-301.

d. Apply sweep generator output to antenna terminal J-101 and connect G200 VTVM to TP-401.

e. Set the G266 Signal Generator to 30 mc, using the G151A Frequency Meter, and couple to J-101.

f. Set receiver dial to 30 mc.

g. Carefully adjust dial to read maximum negative AGC voltage as indicated by the G200. The G266 output amplitude should be set so that the AGC voltage is not more than -15 volts to avoid overloading the i-f section.

h. Set sweep generator to 30 mc and observe response curve on the G196. The G266 marker pip should be seen at the peak of the response curve or no more than 10% down from the peak.

i. Repeat steps e through h at 60 mc.

j. Rock G175H tuning dial for maximum AGC voltage. The G266 marker pip should be seen at the peak of response curve or no more than 10% down from the peak.

k. If necessary, adjust capacitors C-304, C-314, and C-322 until the above conditions are satisfied.

l. Check response at points between 30 and 60 mc to ensure that marker amplitude decreases no more than 25 percent of the peak response. It may be necessary to readjust C-304, C-314, and C-322 slightly to achieve the desired accuracy in tracking.

5-17. 60- TO 260-MC TUNER ALIGNMENT

The r-f circuits of the 60- to 260-mc tuner are wideband compared with the i-f selectivity and are designed around the highly stable Mallory S-4 Inductuner. The end inductuners are also very stable and should never require realignment. If such should become necessary, however, the procedure outlined below is to be followed.

a. Disconnect capacitor C-248 from inductuner lug and solder to BNC-type test connector.

b. Connect sweep generator with 50-ohm source impedance to BNC test jack. An accurate 50-ohm

SWEEP GENERATOR OUTPUT LEVELING SETUP

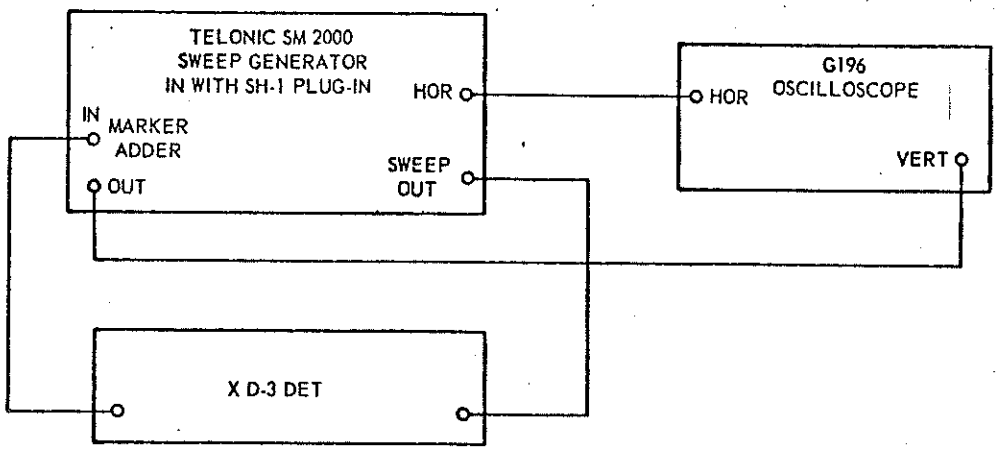


Figure 5-3

source can be achieved by using a 6- or 10-db resistive pad between the sweep generator and the input.

c. Connect the G196 Oscilloscope to front-end test point TP-202.

d. Set the G266 Signal Generator to 70 mc, using the G151A Frequency Meter, and couple to external marker input of sweep generator.

e. Set the G175H dial to 70 mc.

f. Adjust capacitors C-217 and C-222 for double-tuned, symmetrical response centered around the 70-mc marker. Make sure the G266 coupling is not affecting response shape.

g. Adjust capacitor C-220 for 15% dip in response.

h. Repeat step f above.

i. Set the G175H dial, sweep generator, and G266, using the G151A, to 250 mc and bend end inductors L-207 and L-209 to produce symmetrical response curve centered around the 250-mc marker. Make sure the G266 coupling is not affecting response shape.

j. Disconnect capacitor C-248 from BNC test connector and resolder to inductuner.

k. Connect sweep generator to antenna receptacle J-102.

l. Set the G175H dial; sweep generator and G266, using the G151A, to 70 mc.

m. Adjust capacitor C-243 for symmetrical response around the 70-mc marker.

n. Set G175H dial, sweep generator, and G266, using the G151A, to 250 mc and move position of capacitor C-244 along end portion of end inductor L-204 to produce symmetrical round-nose response around the 250-mc marker.

5-18. MECHANICAL ADJUSTMENTS OF THE TUNING DIAL

Proceed as follows:

a. Loosen all screws in couplings of both inductuners and slide apart large inductuner coupling.

b. Rotate 60-260 MC tuning knob to clockwise stop.

c. The 60-260 MC dial should indicate 262 mc; if not, perform procedure listed in steps d and e below.

d. Loosen set screws of spur gear on knob shaft and rotate gear train until 262 mc is indicated.

e. Tighten spur gear set screws.

f. Rotate 30-260 MC tuning knob to counterclockwise stop.

g. The 30-60 MC tuning dial should indicate 29 mc; if not, continue with procedure listed below in step h. The collar on the rear of the stop mechanism must be readjusted. It is necessary to partially remove the larger tuner chassis to reach one of the two set screws securing the collar.

h. Loosen both set screws, rotate dial by means of tuning knob until 29 mc is indicated.

i. Push collar against traveling member of stop and tighten screws. Check both stops before securing chassis.

j. With gear train firmly against clockwise stop, loosen tuning shaft spur gear set screws and rotate gear train to last mark on 60-260 MC dial.

k. Turn large inductuner to its clockwise stop and couple to gear train.

l. With spur gear still loose, rotate gear train completely counterclockwise so that dial reads 28 mc.

m. Rotate small inductuner to counterclockwise stop and couple gear train.

n. Rotate entire assembly until 262 mc is indicated on 60-260 MC dial.

o. Check that spur gear on knob shaft is against front plate of gear train.

p. Tighten all set screws.

5-19. G175H11000 AM BFO ADJUSTMENTS

In addition to performing the alignment procedures on the G175H Receiver, it may be necessary to perform the following adjustments which have been performed at the factory. Prior to performing the following procedures, replace the defective circuit tube or transistor and determine if the correct output is obtained. The AM BFO adjustment is to be performed if the AM BFO FREQ front panel control fails to provide proper frequency variations of the beat frequency oscillator assembly.

a. Gain access to the junction of capacitors C-1105, C-1106, and C-1107. Attach the frequency counter input probe to this point.

b. Press the POWER switch of the G175H front panel to the ON position. The white light in the power switch should illuminate.

c. Place the AM BFO ON-OFF toggle switch on the G175H front panel to the ON position. Rotate the mode-bandwidth selector to the 300 KC AM position.

d. Rotate the AM BFO FREQ control of the G175H front panel fully counterclockwise.

e. Rotate screwdriver-adjust potentiometer R-1101 to obtain a 21.385-mc (±5 kc) reading as displayed by the frequency counter.

f. Pull out on the POWER switch of the G175H front panel. The white light should extinguish. Remove the frequency counter input probe from the beat frequency oscillator assembly.

g. Secure mountings removed in step a.

5-20. CARRIER-OPERATED RELAY DROPOUT PERIOD SELECTION

The carrier-operated relay dropout period is set by the adjustment of COR delay potentiometer R127 and provides dropout delays from 3- to 10-seconds. A nominal 5-second delay is selected at the factory. Should this period require changing, (due to unusual operating conditions or for operator convenience), proceed as follows:

a. Set up equipment for test as shown in figure 5-4 and apply power.

COR RELAY DROPOUT TEST SETUP

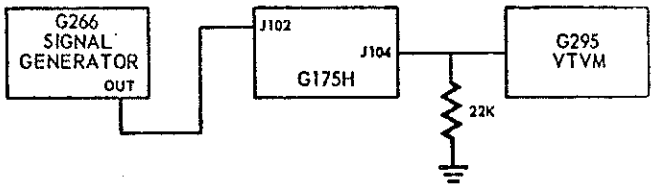


Figure 5-4.

b. Set the receiver controls as follows: AVC MAN switch to AVC; bandwidth to 300KC AM; and BAND SWITCH to 60-260 MC. Tune receiver to 260 MC.

c. With COR DELAY DISABLE button depressed and no signal present, rotate COR SENS control clockwise until the indicator lamp lights. Then rotate COR SENS control counterclockwise until the indicator lamp extinguishes. This sets the final sensitivity level for COR actuation during weak r-f carrier presence.

d. Tune G266 Signal Generator to 260 mc.

Note

Input signal to receiver must be at least 5 microvolts to achieve satisfactory results.

e. After the signal has been applied for 30 seconds, quickly tune receiver off signal and note time required to extinguish COR lamp.

f. Adjust R127 for greater (cw) or less (ccw) time delay. Repeat procedure until desired delay is achieved. Disconnect test equipment.

SECTION VI
ILLUSTRATED PARTS BREAKDOWN

INTRODUCTION

PURPOSE AND FORMAT

This Illustrated Parts Breakdown lists and describes the component parts of the Model G175H Receiver to assist in the requisitioning, storage, and identification of spare parts. Four major parts comprise this section: (1) Introduction, (2) Group Assembly Parts Breakdown, (3) Numerical Index, and (4) Reference Designation Index.

SUMMARY OF CONTENTS

INTRODUCTION

Included in the Introduction are: (1) Purpose and Format, (2) Summary of Contents, (3) How To Use, and (4) List of Manufacturers' Codes and Addresses.

GROUP ASSEMBLY PARTS BREAKDOWN

The Group Assembly Parts Breakdown contains illustrations and parts lists of installations, assemblies, and detailed parts. The illustrations and text are arranged according to function and/or next assembly. When it is necessary to show a subassembly in detail, and it is not possible to do so in the same illustration as its major assembly, it is referenced to another illustration in which the subassembly is exploded in as much detail as necessary and its component parts listed in the accompanying text.

The nomenclature of each part, the units per assembly, and the "usable on" code, if any, is listed to the right of the part number in the text. Next assembly sequence is determined by indenture position; that is, a part listed one column to the right of the position of the part above it is a component of that assembly or installation. The first indenture line in the text is used for the text title and is not used to show part relationship. Attaching parts are shown directly below in the same indenture column as the parts they attach.

When a vendor part is listed, the manufacturer's code is given in the nomenclature along with any other information thought necessary or helpful. Alternate vendors are given when available. The manufacturer's name and address may be found from the code symbol by consulting that part of Introduction entitled "List of Manufacturers' Codes and Addresses." The codes are in accordance with Federal Supply Code for Manufacturers, cataloging handbook H4-1.

The column entitled "Usable on Code" is not utilized in this publication.

The number of parts given under the column entitled "Units per Assembly" constitute that number required to make up a single assembly.

Left- and right-hand parts are listed separately. Component parts of left- and right-hand parts are identified in the nomenclature. When a left- or right-hand assembly has both left- and right-hand parts as components, the nomenclature will show the assembly to which each belongs.

NUMERICAL INDEX

Each part appearing in the group assembly parts list is listed by part name (such as commercial hardware, which bears no number) or part number, without exception, in the "Numerical Index." The "Numerical Index" is compiled in accordance with the numerical part number filing system described below. The part number numerical arrangement starts with commercial items listed alphabetically by noun for parts without numbers. For parts with numbers, arrangement starts in the left-hand column and continues from left to right, one column at a time, until part number numerical arrangement is determined. The order of precedence in part number numerical arrangement is as follows:

(1) Space (blank column)
(2) Dash (-)
(3) Letters A thru Z
(4) Numerals 0 thru 9

All part numbers are listed with the figure and index number of each appearance.

The column entitled "Stock Number" is not utilized in this publication.

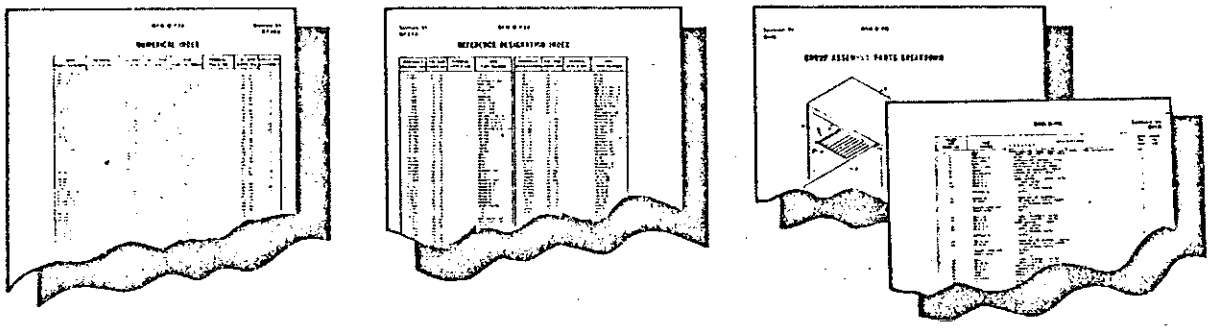
REFERENCE DESIGNATION INDEX

The Reference Designation Index includes all components of electronic equipment having reference designators.

The Reference Designation Index is divided into four columns consisting of the following: (1) REFERENCE DESIGNATION -- Reference designators listed in alphanumerical order; (2) FIG AND INDEX NO. -- Used to locate the corresponding part in the Group Assembly Parts Breakdown; (3) STOCK NUMBER -- This column is not used in this publication; and (4) MFR PART NUMBER -- The part number assigned by the manufacturer of the part.

HOW TO USE

KNOWN ⇩	MFR PART NO.	REFERENCE DESIGNATION NO. (COMPONENT NUMBERS ON SCHEMATICS) ⇩
WANT TO KNOW ⇩	SEQUENCE OF ASSEMBLY	MFR PART NO., DESCRIPTION, AND WHERE PART IS PHYSICALLY INSTALLED ⇩
SOLUTION ⇩	IN NUMERICAL INDEX FIND MFR PART NO. SEQUENCE OF ASSEMBLY MAY BE FOUND ON INDICATED FIGURE AND INDEX NO. IN GROUP ASSEMBLY PARTS BREAKDOWN.	IN REFERENCE DESIGNATION INDEX FIND REFERENCE DESIGNATION NUMBER. FIND MFR PART NO., DESCRIPTION, AND WHERE PART IS PHYSICALLY INSTALLED ON INDICATED FIGURE AND INDEX NO. IN GROUP ASSEMBLY PARTS BREAKDOWN.



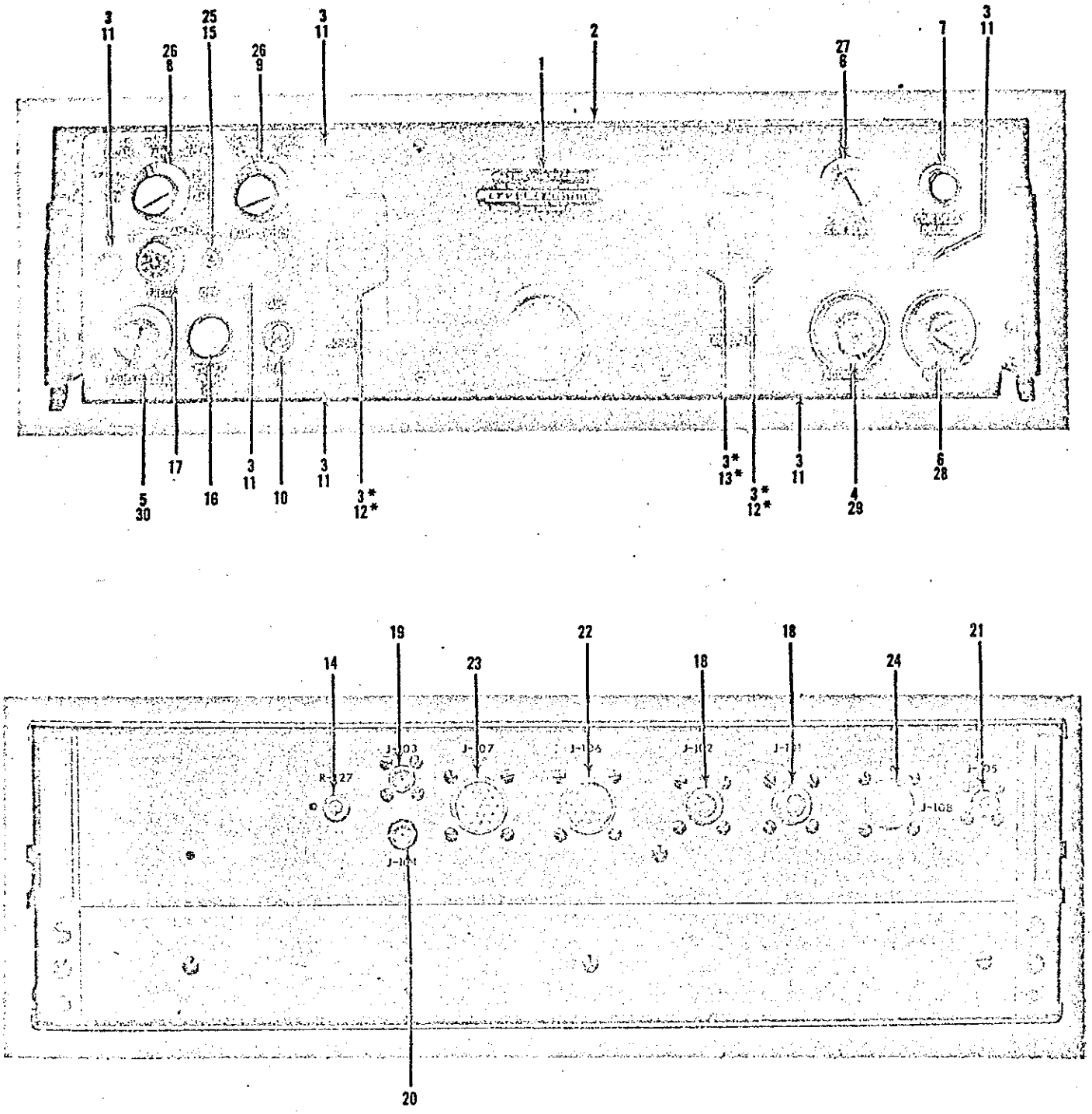
LIST OF MANUFACTURERS' CODES AND ADDRESSES

CODE	NAME AND ADDRESS
00656	Aerovox Corp. New Bedford, Massachusetts
01121	Allen Bradley Co. Milwaukee, Wisconsin
03877	Transitron Electronics Corp. Wakefield, Massachusetts
04062	Elmenco Products Co. New York, New York

CODE	NAME AND ADDRESS
04217	Essex Wire Corp. Anaheim, California
05395	LTV Temco Aerosystems Div. Greenville, Texas
05402	Controls Co. of America Schiller Park, Illinois
09922	Burndy Corp. Norwalk Connecticut

LIST OF MANUFACTURERS'S CODES AND ADDRESSES (CONT)

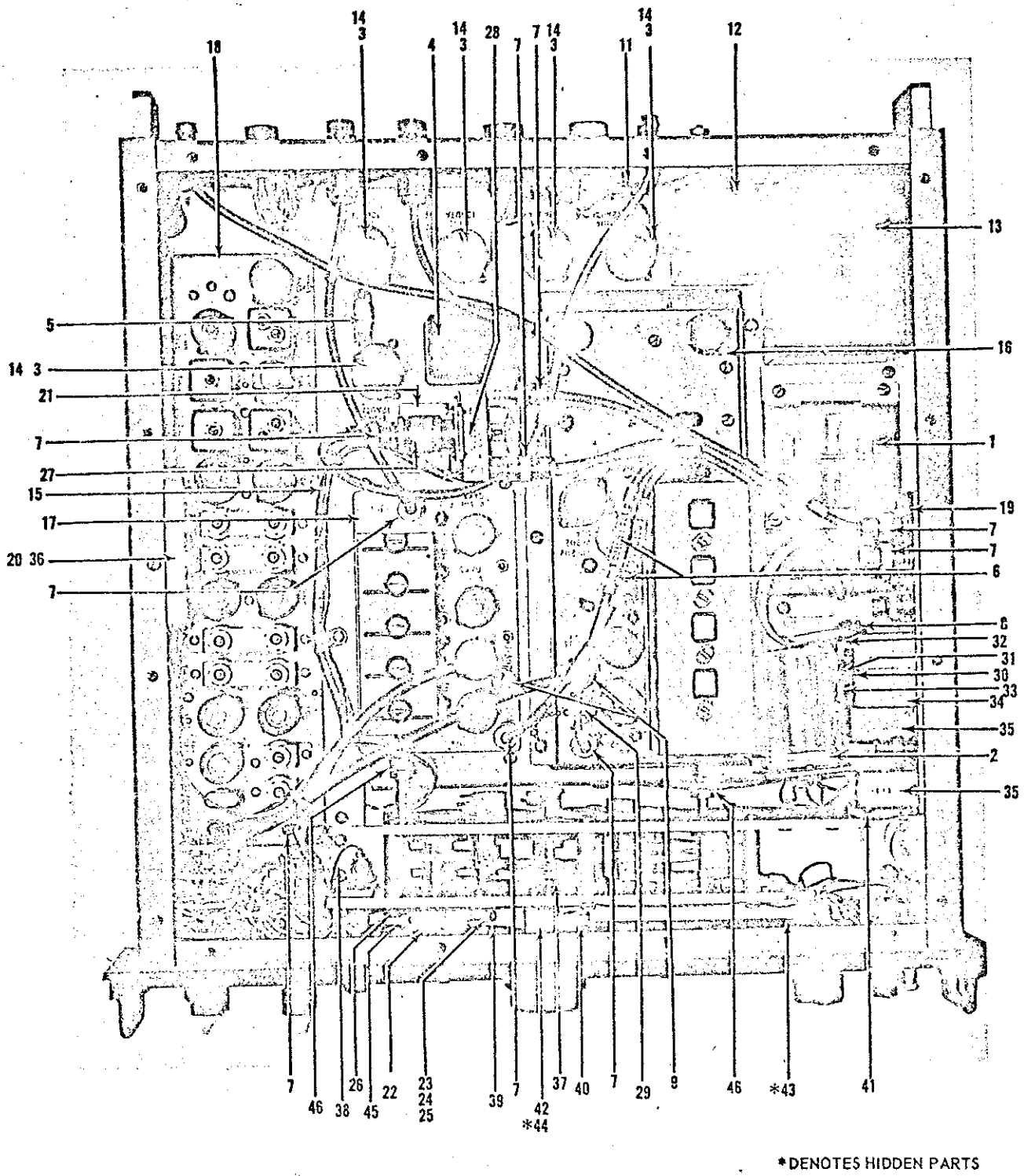
CODE	NAME AND ADDRESS
11139	Deutsch Co., The Banning, California
13812	Dialco Electric Corp. Brooklyn, New York
14632	Communication Electronics, Inc. Bethesda, Maryland
28520	Heyman Mfg. Co. Kenilworth, New Jersey
31254	Iron Fireman Mfg. Co. Cleveland, Ohio
37942	Mallory, P. R., Co., Inc. Indianapolis, Indiana
40228	Micro Switch Corp. Freeport, Illinois
49956	Raytheon Co. Lexington, Mass.
70331	Alpha Wire Corp. New York, New York
71279	Cambridge Thermionic Corp. Cambridge, Massachusetts
71286	Camloc Fastener Corp. Paramus, New Jersey
71450	Chicago Telephone Supply Corp. Elkhart, Indiana
71590	Centralab, Inc. Milwaukee, Wisconsin
71785	Cinch Mfg. Corp. Chicago, Illinois
72653	General Cement, Division of Textron Inc. Rockford, Illinois
72982	Erie Technological Products, Inc. Erie, Pennsylvania
73690	Elco Resistor Co. New York, New York
74306	Piezo Crystal Co. Carlisle, Pennsylvania
74868	Industrial Products, Inc. Danbury, Connecticut
74970	Johnson, E. F. Co., Inc. Waseca, Minnesota
77342	Potter and Brumfield Princeton, Indiana
80183	Sprague Electric Company North Adams, Massachusetts
80294	Bourns, Inc. Riverside, California
80702	Wahlgren Electrical Mfg. Co. Pasadena, California
81073	Grayhill, Inc. Legrange, Illinois
81312	Winchester Electronics Co., Inc. Norwalk, Conneticut
81640	Hetherington, Inc. Folcraft, Pennsylvania
82376	Astron Corp. East Newark, New Jersey
83330	Smith, Herman H., Inc. Brooklyn, New York
84171	Arco Electronics, Inc. New York, New York
86684	Radio Corporation of America Harrison, New Jersey
91637	Dale Electronics, Inc. Columbus, Nebraska
93289	Air Marine Motors, Inc. Amityville, Long Island, New York
94197	Curtis-Wright Corp. Electronics Division Carlstadt, New Jersey
94375	Automatic Metal Products Corp. Brooklyn, New York
99687	Raytheon Mfg. Co., Equipment Division Newton, Massachusetts
99789	Vitro Electronics (42542) Silver Springs, Maryland
99848	Wilco Corp. Indianapolis, Indiana



*DENOTES HIDDEN PARTS

Figure 6-1. Model G175H Receiver, Front And Rear Views

FIGURE AND INDEX NO.	PART NUMBER	1 2 3 4 5 6 7 DESCRIPTION	UNITS PER ASSY	USABLE ON CODE
1	G175H00000-1	MODEL G175H RECEIVER, FRONT AND REAR VIEWS	REF	
-1	G175H00001-1	• NAMEPLATE -05395-	1	
-2	G175H01000-1	• EDGELIGHT PLATE, ASSEMBLY OF -05395-	1	
-3	327	• LAMP, 28 VDC -13812-	9	
-4	CA 1041 AB	• RESISTOR, VARIABLE, 0.1 MEG, 2W, 10%, -44655-	1	
-5	JA1N104P103VA	• RESISTOR, VARIABLE COMP, 10 K, 10%, 2 W -01121-	1	
-6	65-10KP0RM20PCT	• RESISTOR, VARIABLE COMP, 10 K, 20%, 1/2 W, PLAIN SHAFT, • • STANDARD TAPER, BUSHING LENGTH 3/8 IN., SHAFT LENGTH 15/16 IN. -71450-	2	
-7	A3234W	• SWITCH, PUSH BUTTON SNAP -05402-	1	
-8	24005-3	• SWITCH, ROTARY, 5 POLES, 3 POSITION, WITH 5/8 IN. SHAFT -81073-	1	
-9	24804-2	• SWITCH, ROTARY -81073-	1	
-10	523	• SWITCH, TOGGLE, DPST -83330-		
-11	TT61A87	• LAMPHOLDER -13812-	6	
-12	107-1930-975	• LAMPHOLDER -13812-	2	
-13	8-1930XP24	• LAMPHOLDER -13812-	1	
-14	RV5LAXSB255B	• RESISTOR, VARIABLE COMP, 2.5 MEG, 20%, 1/2 W -71450-	1	
-15	6AT2	• SWITCH -40228-	1	
-16	A324	• SWITCH, 6 VOLT LAMP -81640-	1	
-17	3600S1-103	• POTENTIOMETER, 10 K -80294-	1	
-18	UG1052U	• CONNECTOR, RECEPTACLE, TYPE N	2	
-19	UG291AU	• CONNECTOR, RECEPTACLE, TYPE BNC	1	
-20	UG1094U	• CONNECTOR, RECEPTACLE, TYPE BNC	1	
-21	UG291U	• CONNECTOR, RECEPTACLE, TYPE BNC	1	
-22	DS00-19P	• CONNECTOR, RECEPTACLE, 19 PIN DEUTSCH TYPE -11139-	1	
-23	DS00-19S	• CONNECTOR, RECEPTACLE, 19 PIN DEUTSCH TYPE -11139-	1	
-24	DS00-122P	• CONNECTOR, RECEPTACLE, 12 PIN DEUTSCH TYPE -11139-	1	
-25	G175H00951-1	• PLATE -05395- -ATTACHING PARTS-	1	
	256X3-8FH5SP	• SCREW	2	
	2 LOCK	• WASHER, LOCK	2	
	256X28	• NUT	2	
		••••*••••		
-26	70-3-2G3	.KNOB, DIMMER, BLACK, DIAL SKIRTED WITH POINTER ARROW AND WHITE TACTILE CAP, FOR 1/4 IN. SHAFT -49956-	2	
-27	70-3-1G	.KNOB, PLAIN, BLACK, DIAL SKIRTED WITH POINTER ARROW, FOR 1/8 IN. SHAFT -49956-	1	
-28	70-3-1G1	.KNOB, INTENSITY, BLACK, DIAL SKIRTED WITH POINTER ARROW AND BLUE TACTILE CAP, FOR 1/8 IN. SHAFT -49956-	1	
-29	70-3-2G4	.KNOB, GAIN, BLACK, DIAL SKIRTED WITH POINTER ARROW AND RED TACTILE CAP, FOR 1/4 IN. SHAFT -49956-	1	
-30	70-3-2G	.KNOB, PLAIN, BLACK, DIAL SKIRTED WITH POINTER ARROW, FOR 1/4 IN. SHAFT -49956-	1	



*DENOTES HIDDEN PARTS

Figure 6-2. Model G175H Receiver, Top View

FIGURE AND INDEX NO.	PART NUMBER	DESCRIPTION 1 2 3 4 5 6 7	UNITS PER ASSY	USABLE ON CODE
2	G175H00000-1	MODEL G175H RECEIVER, TOP VIEW	REF	
-1	A1321-50	• BLOWER, CENTRIFUGAL, 50-60 CPS, 115 V -00656-	1	
-2	TVL3561-7	• CAPACITOR, ELECTROLYTIC, 60-30-30 UF, 3 -250-250 VDC -80183-	1	
-3	191P35W933	• SHIELD, ELECTRON TUBE, 9 PIN MEDIUM -73690-	5	
-4	TS4519-1	• RELAY, 10 K COIL -77342-	1	
-5	R685-4D10K	• RELAY -31254-	1	
-6	G175H00100-1	• CABLE ASSEMBLY -05395-	2	
-7	UG88U	• • CONNECTOR	9	
-8	M7PLSH19C	• CONNECTOR, PLUG, 7 PIN	1	
-9	UG260U	• CONNECTOR, PLUG, TYPE BNC	2	
-10	DELETED			
-11	EB1055	• RESISTOR, FIXED COMP, 1 MEG, 5%, 1/2 W -01121-	1	
-12	B31-575	• TRANSFORMER, AUDIO -99789-	1	
-13	B31-539	• TRANSFORMER, FILAMENT -99789-	1	
-14	12AU7A	• ELECTRON TUBE	5	
-15	2002-3	• CABLE ASSEMBLY, RG58U -80058-	1	
-16		• LOW BAND TUNER -SEE FIGURE 6-5 FOR DETAIL- -99789- -99789-	1	
-17		• HIGH BAND TUNER -SEE FIGURE 6-4 FOR DETAIL- -99789-	1	
-18		• I-F STRIP -SEE FIGURE 6-6 FOR DETAIL- -99789-	1	
-19	FM75-100	• 40 KC I-F STRIP -SEE FIGURE 6-7 FOR DETAIL- -99789-	1	
-20	G175H10000-1	• BFO ASSEMBLY -SEE FIGURE 6-8 FOR DETAIL -05395-	1	
-21	G175H00952-1	• BRACKET -05395-	1	
		-ATTACHING PARTS-		
	440X1-4BHSSP	• SCREW, MACHINE	6	
	4 LOCK	• WASHER, LOCK	6	
		••••*••••		
-22	G175D00951-1	• CAM -05395-	1	
		-ATTACHING PARTS-		
	440X1-8HSCPSSP	• SCREW, HEX SOCKET, SET	2	
		••••*••••		
-23	1SX1T	• SWITCH -40228-	1	
		-ATTACHING PARTS-		
	256X11-16BHSSP	• SCREW, MACHINE	2	
	2 LOCK	• WASHER, LOCK	2	
	256X2B	• NUT	2	
		••••*••••		
-24	JX25	• ACTUATOR -04228-	1	
-25	G175D00952-1	• SPACER -05395-	1	
-26	7462	• GROUND LUG -77653-	1	
-27	UG201AU	• ADAPTER	1	
		-ATTACHING PARTS-		
	632X3-8BHSSP	• SCREW, MACHINE	2	
	6 LOCK	• WASHER, LOCK	2	
		••••*••••		
-28	94CSA1-2-126	• SWITCH, RELAY, 6 V COIL -94375-	1	
-29	CW123AU	• CAP, BNC	1	
-30	1079	• COUPLING NETWORK FOR 40 KC OPERATION -80058-	1	
-30	1155	• COUPLING NETWORK FOR 75 KC OPERATION -SEE SCHEMATIC- -80058-	1	
-31	DM10-100J	• CAPACITOR, SILVER MICA, 10 UUF, 5%, 500V -84171-	1	
-32	301C0J339C	• CAPACITOR, CERAMIC TUBULAR, 3.3 UUF, PORM .25 UUF, 600 V -72982-	1	
-33	301C0H479C	• CAPACITOR, CERAMIC TUBULAR, 4.7 UUF, PORM .25 UUF, 600 V -72982-	1	
-34	1081	• SHIELD CAN, ALUMINUM -80058-	1	
-35	1091	• SHIELD CAN, ALUMINUM -80058-	2	
-36	G175H10010-1	• COVER -05395-	1	
		-ATTACHING PARTS-		
	440X3-4BHSSP	• SCREW, MACHINE	1	
	4 LOCK	• WASHER, LOCK	1	
		••••*••••		
-37	AD50-836	• GEAR TRAIN ASSEMBLY -SEE FIGURE 6-10 FOR DETAIL- -99789-	1	
-38	AA25-612	• MOUNTING PLATE ASSEMBLY -99789-	1	
-39	A25-620-1	• DIAL ASSEMBLY -99789-	1	
-40	A25-620-2	• DIAL ASSEMBLY -99789-	1	
-41	A24-741	• BRACKET -99789-	1	
-42	A25-077	• BLOCK, MOUNTING -99789-	1	
-43	A24-846	• INDICATOR -99789-	1	
-44	A24-748-1	• SLEEVE -99789-	1	
-45	AB32-160	• MASK ASSEMBLY -99789-	1	
-46	3010-863-2308	.COUPLING, BELLOWS TYPE	2	

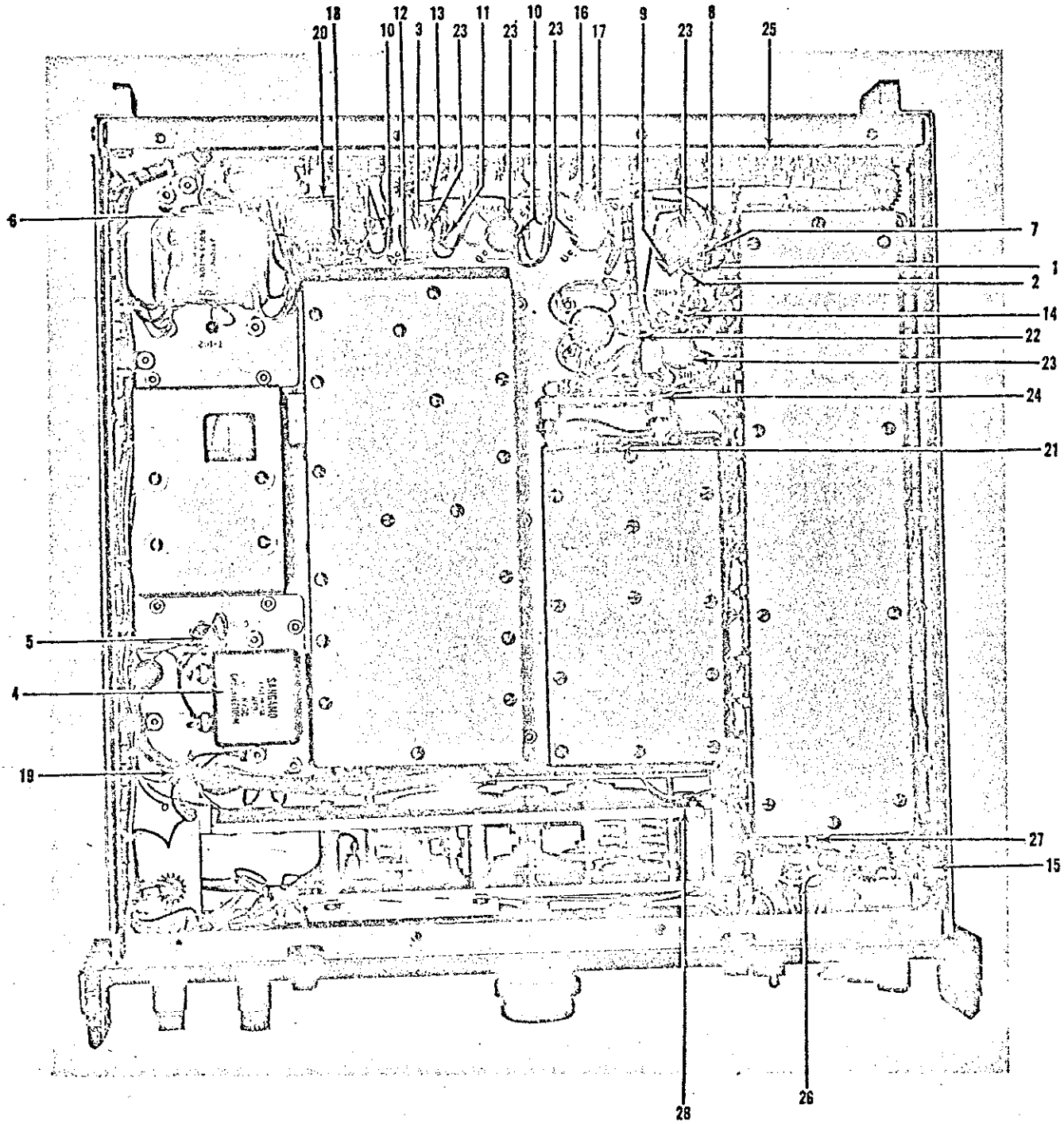


Figure 6-3. Model G175H Receiver, Bottom View

FIGURE AND INDEX NO.	PART NUMBER	1 2 3 4 5 6 7 DESCRIPTION	UNITS PER ASSY	USABLE ON CODE
3	G175H00000-1	MODEL G175H RECEIVER, BOTTOM VIEW	REF	
-1	CM15E240J	• CAPACITOR, MICA, 24 UUF, 5%, 500 V -04062-	1	
-2	CM15E301J	• CAPACITOR, MICA, 300 UUF, 5%, 500 V -04062-	1	
-3	MA811	• CAPACITOR, CERAMIC DISC, .01 UF, GMV, 5 0 V -72982-	1	
-4	CP53B1EE105H	• CAPACITOR, PAPER, 1 UF, 20%, 400 V	1	
-5	M7SLRN	• CONNECTOR, RECEPTACLE -81312-	1	
-6	1-5-10M	• CAPACITOR, METALIZED PAPER, 10 UF, 20%, 150 V -82376-	1	
-7	EB1041	• RESISTOR, FIXED COMP, 100 K, 10%, 1/2 W -80294-	1	
-8	EB2245	• RESISTOR, FIXED COMP, 220 K, 5%, 1/2 W -80294-	1	
-9	EB4731	• RESISTOR, FIXED COMP, 3.3 K, 5%, 1/2 W -80294-	1	
-10	EB1055	• RESISTOR, FIXED COMP, 1 MEG, 5%, 1/2 W -80294-	2	
-11	EB2455	• RESISTOR, FIXED COMP, 240 K, 5%, 1/2 W -80294-	1	
-12	EB1035	• RESISTOR, FIXED COMP, 10 K, 5%, 1/2 W -80294-	1	
-13	EB1025	• RESISTOR, FIXED COMP, 1 K, 5%, 1/2 W -80294-	1	
-14	HB1335	• RESISTOR, FIXED COMP, 13 K, 5%, 2 W, -80294-	1	
-15	810-2-5K1	• RESISTOR, 2500 OHMS, 1%, 10 W -91637-	1	
-16	RC20GF105J	• RESISTOR, 1 MEG, 5%, 1/2 W	1	
-17	RC20GF221J	• RESISTOR, 220 OHMS, 5%, 1/2 W	1	
-18	RC32GF472J	• RESISTOR, 4.7 K, 5%, 1 W	1	
-19		• RESISTOR, .475 OHM -99789-	1	
-20	RC20GF153J	• RESISTOR, 15 K, 5%, 1/2 W	1	
-21	RC42GF103J	• RESISTOR, 10 K, 5%, 2 W	1	
-22	GB82G5	• RESISTOR, 8.2 OHMS, 5%, 1 W -80294-	1	
-23	TS103P01	• SOCKET, ELECTRON TUBE, 9 PIN MINIATURE -73690-	5	
-24	53-412	• TERMINAL BOARD ASSEMBLY -SEE FIGURE 6-9 FOR DETAIL -99789-	1	
-25	53-413	• TERMINAL BOARD ASSEMBLY -SEE FIGURE 6-9 FOR DETAIL -99789-	1	
-26	G175H00100-2	• CABLE ASSEMBLY -05395-	1	
-27	P50-200	• • CONNECTOR -80702-	2	
-28	HP2N	• CLAMP -09922-	1	

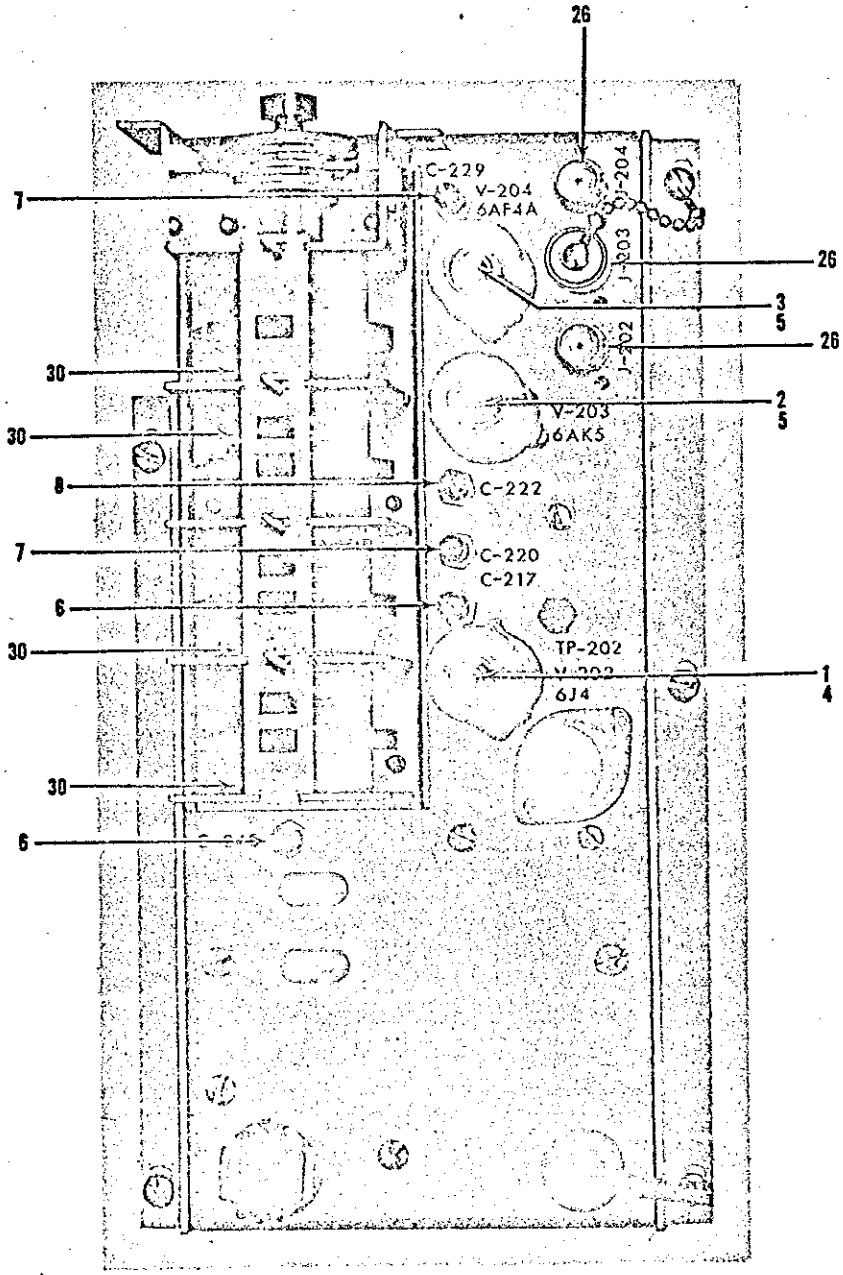
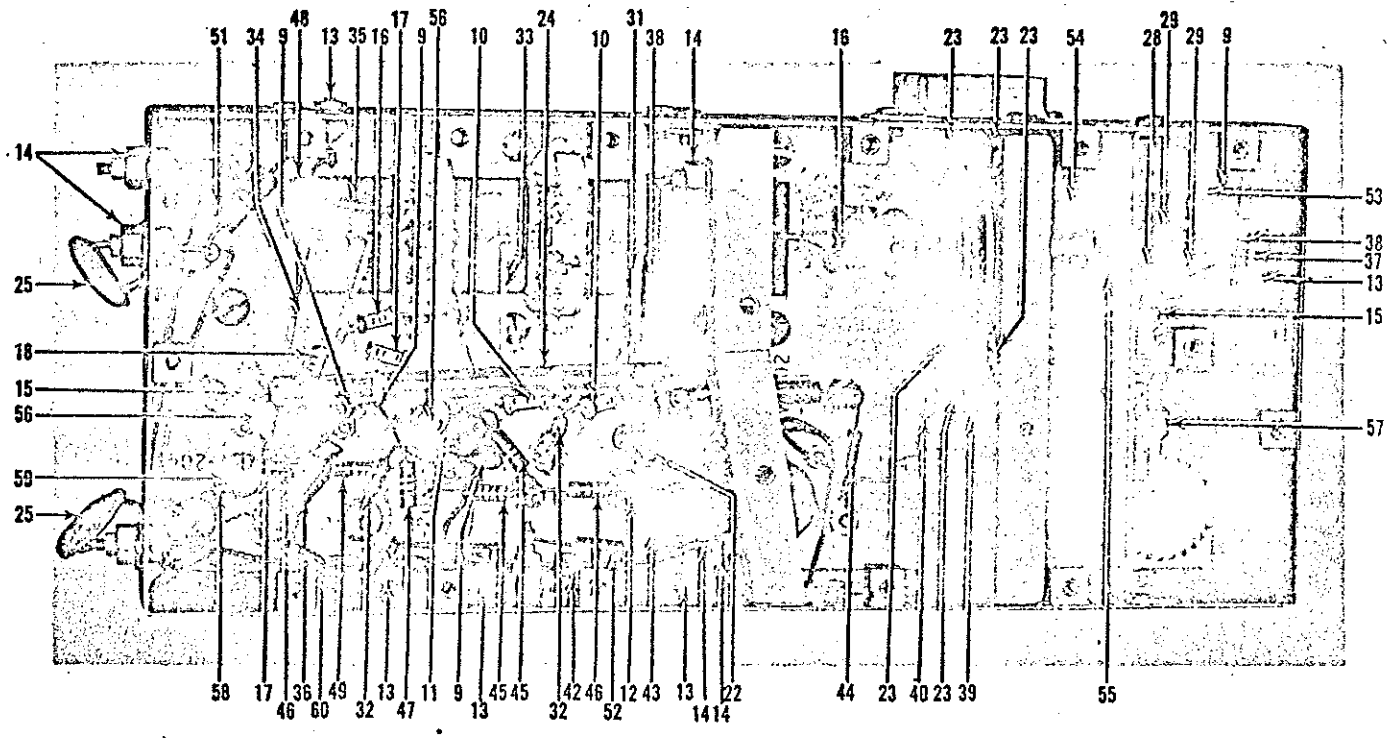
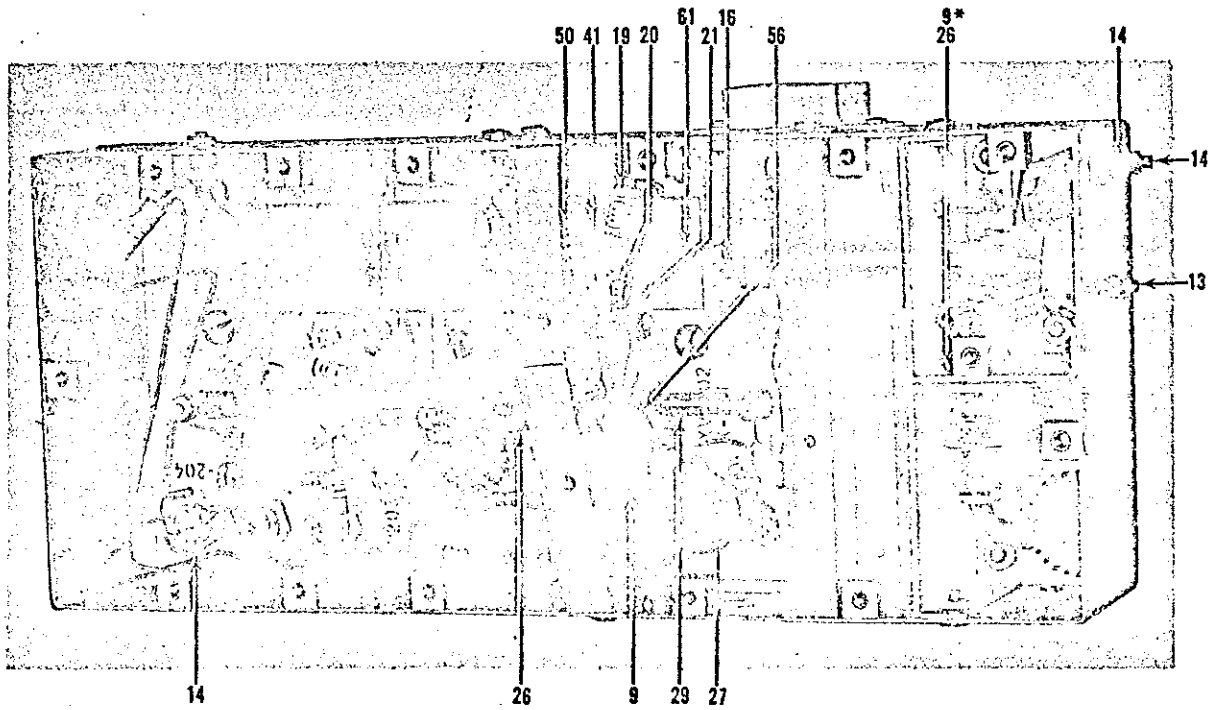


Figure 6-4. High Band Tuner (Sheet 1of 2)





*DENOTES HIDDEN PART

Figure 6-4. High Band Tuner (Sheet 2 of 2)

FIGURE AND INDEX NO.	PART NUMBER	1 2 3 4 5 6 7 DESCRIPTION	UNITS PER ASSY	USABLE ON CODE
		HIGH BAND TUNER -SEE FIGURE 6-2 FOR NEXT HIGHER ASSEMBLY-	REF	
-1	6J4	• ELECTRON TUBE	1	
-2	6AK5	• ELECTRON TUBE	1	
-3	6AF4A	• ELECTRON TUBE	1	
-4	120P35W930	• SHIELD, ELECTRON TUBE, 7 PIN, MEDIUM -73690-	1	
-5	121P35W929	• SHIELD, ELECTRON TUBE, 7 PIN, SHORT -73690-	2	
-6	829-3	• CAPACITOR, CERAMIC TRIMMER, .5-3 UUF, 5 V -71590-	2	
-7	829-6	• CAPACITOR, CERAMIC TRIMMER, 1.0-6.0 UUF, 500 V -71590-	2	
-8	829-4	• CAPACITOR, CERAMIC TRIMMER, 1.0-4.0 UUF, 500 V -71590-	1	
-9	40C214	• CAPACITOR, CERAMIC DISC, .001 UF, GMV, 1000 V -80183-	6	
-10	301C0K209C	• CAPACITOR, CERAMIC, 2.0 UUF, PORM .25 UUF, 500 V, -72982-	2	
-11	301C0H100K	• CAPACITOR, CERAMIC, 10 UUF, 10%, 500 V -72982-	1	
-12	514C11A	• CAPACITOR, CERAMIC FEEDTHRU, 47 UUF, 20%, 500 V -80183-	1	
-13	507C2	• CAPACITOR, CERAMIC STANDOFF, .001 UF, GMV, 500 V -80183-	5	
-14	514C1	• CAPACITOR, CERAMIC FEEDTHRU, .001 UF, GMV, 500 V -80183-	9	
-15	301C0H829D	• CAPACITOR, CERAMIC, 8.2 UUF, PORM 0.5 UUF, 500 V -72982-	2	
-16	301C0H689D	• CAPACITOR, CERAMIC, 6.8 UUF, PORM 0.5 UUF, 500 V -72982-	2	
-17	301C0K508B	• CAPACITOR, CERAMIC, 0.5 UUF, PORM 0.1 UUF, 500 V -72982-	2	
-18	301C0J339C	• CAPACITOR, CERAMIC, 3.3 UUF, .25 UUF, 5 0 V -72982-	1	
-19	301C0G330K	• CAPACITOR, CERAMIC, 33 UUF, 10%, 500 V -72982-	1	
-20	301C0G220K	• CAPACITOR, CERAMIC, 22 UUF, 10%, 500 V -72982-	1	
-21	D6-102	• CAPACITOR, CERAMIC, .001 UUF, 20%, 600 V -71590-	1	
-22	GP2-331	• CAPACITOR, CERAMIC, 500 UUF, 10%, 500 V -72982-	1	
-23	370FA	• CAPACITOR, CERAMIC, 200 UUF, 2%, 200 V -72982-	5	
-24	A17-729	• CAPACITOR, SPECIAL -99789-	1	
-25	HA811	• CAPACITOR, CERAMIC DISC, .01 UF, GMV, 5 V -72982-	2	
-26	UG694U	• CONNECTOR, RECEPTACLE, TYPE BNC	5	
-27	6-3-90DF	• RELAY, TIME DELAY, SPST 6 VAC -94197-	1	
-28	207-11	• CHOKE, COIL RF, 1.5 UH -99848-	1	
-29	A14-735	• CHOKE, COIL RF, 14 UH -99789-	3	
-30	8304	• INDUCTOR, VARIABLE, 4 SECTION SPIRAL MODIFIED PER NEMS-CLARKE B32-140 -37942-	4	
-31	A17-727	• INDUCTOR, ADJUSTABLE -99789-	1	
-32	A14-737	• INDUCTOR, COUPLING, 1.67 UF -99789-	2	
-33	A14-749-1	• INDUCTOR, ADJUSTABLE -99789-	1	
-34	A17-728	• INDUCTOR, FIXED -99789-	1	
-35	A14-806	• INDUCTOR, PADDING, 1.15 UH -99789-	1	
-36		• CHOKE, LOOP, NO. 22 BUS WIRE -	1	
-37	EB1615	• RESISTOR, FIXED COMP, 160 OHMS, 5%, 1/2 W -01121-	1	
-38	EB1015	• RESISTOR, FIXED COMP, 100 OHMS, 5%, 1/2 W -01121-	2	
-39	EB8225	• RESISTOR, FIXED COMP, 8.2 K, 5%, 1/2 W -01121-	1	
-40	EB5135	• RESISTOR, FIXED COMP, 51 K, 5%, 1/2 W -01121-	1	
-41	HB1525	• RESISTOR, FIXED COMP, 1.5 K, 5%, 2 W -01121-	1	
-42	GB5625	• RESISTOR, FIXED COMP, 5.6 K, 5%, 1/2 W -01121-	1	
-43	EB6225	• RESISTOR, FIXED COMP, 6.2 K, 5%, 1/2 W -01121-	1	
-44	EB1215	• RESISTOR, FIXED COMP, 120 OHMS, 5%, 1/2 W -01121-	1	
-45	EB4745	• RESISTOR, FIXED COMP, 470 K, 5%, 1/2 W -01121-	2	
-46	EB2731	• RESISTOR, FIXED COMP, 27 K, 10%, 1/2 W -01121-	1	
-47	EB1541	• RESISTOR, FIXED COMP, 150 K, 10%, 1/2 W -01121-	1	
-48	HB8221	• RESISTOR, FIXED COMP, 8.2 K, 10%, 2 W -01121-	1	
-49	EB2211	• RESISTOR, FIXED COMP, 220 OHMS, 10%, 1/2 W -01121-	1	
-50	GB5115	• RESISTOR, FIXED COMP, 510 OHMS, 5%, 1 W -01121-	1	
-51	GB1025	• RESISTOR, FIXED COMP, 1 K, 5%, 1 W -01121-	1	
-52	EB1545	• RESISTOR, FIXED COMP, 150 K, 5%, 1/2 W	1	
-53	RH25	• RESISTOR, WIREWOUND, 5.1 OHMS, 3%, 25 W -91637-	1	
-54	6280	• ELECTRON TUBE	1	
-55	14F14078	• SOCKET, ELECTRON TUBE -71785-	1	
-56	TS102P01	• SOCKET, ELECTRON TUBE, 7 PIN MINIATURE -73690-	3	
-57	UG88U	• CONNECTOR, PLUG, TYPE BNC	1	
-58	RC07GF220J	• RESISTOR, 22 OHMS, 5%, 1/4 W	1	
-59	DM15-010M	• CAPACITOR, 1 UUF, 20% -84171-	1	
-60	DM15-050K	• CAPACITOR, 5 UUF, 10% -84171-	1	
-61		• INDUCTOR	1	

FIGURE AND INDEX NO.	PART NUMBER	1 2 3 4 5 6 7 DESCRIPTION	UNITS PER ASSY	USABLE ON CODE

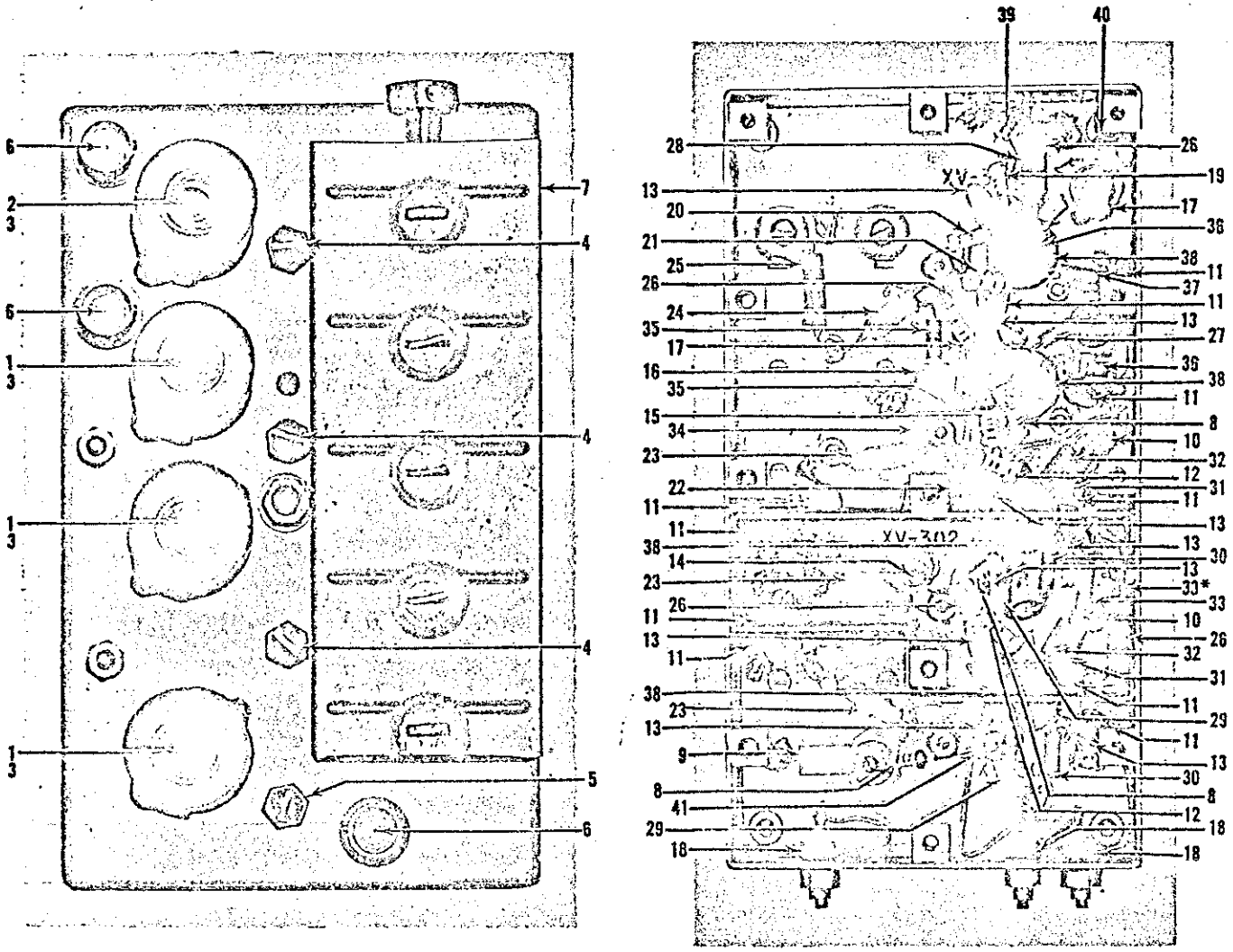


Figure 6-5. Low Band Tuner

FIGURE AND INDEX NO.	PART NUMBER	1 2 3 4 5 6 7 DESCRIPTION	UNITS PER ASSY	USABLE ON CODE
5		LOW BAND TUNER -SEE FIGURE 6-2 FOR NEXT HIGHER ASSEMBLY-	REF	
-1	6AK5	• ELECTRON TUBE	3	
-2	6AF4A	• ELECTRON TUBE	1	
-3	121P35W929	• SHIELD, ELECTRON TUBE, 7 PIN, SHORT -73690-	4	
-4	829-7	• CAPACITOR, CERAMIC TRIMMER, 1-7.5 UUF, 500 V -71590-	3	
-5	829-10	• CAPACITOR, CERAMIC TRIMMER, 1.5-10 UUF, 500 V -71590-	1	
-6	UG694U	• CONNECTOR, RECEPTACLE, TYPE BNC	3	
-7	HLT162	• INDUCTOR, TUNER, 30-65 MCS -37942-	1	
-8	301C0G120K	• CAPACITOR, CERAMIC, 12 UUF, 10% -72982-	3	
-9	CM15E620J	• CAPACITOR, MICA, 62 UUF, 5%, 500 V -04062-	1	
-10	507C2	• CAPACITOR, CERAMIC STANDOFF, .001 UF, GMV, 500 V -80183-	2	
-11	40C214	• CAPACITOR, CERAMIC DISC, .001 UF, GMV, 1000 V -80183-	10	
-12	301C0H569C	• CAPACITOR, CERAMIC, 5.6 UUF, PORM .25 UUF, 500 V -72982-	2	
-13	20C8	• CAPACITOR, CERAMIC, .0047 UF, GMV, 500 V -80183-	8	
-14	301C0G180K	• CAPACITOR, CERAMIC, 18 UUF, 10%, 500 V -72982-	1	
-15	301C0G240K	• CAPACITOR, CERAMIC, 24 UUF, 10%, 500 V -72982-	1	
-16	CM15E151J	• CAPACITOR, MICA, 150 UUF, 5%, 500 V -04062-	1	
-17	301C0K508B	• CAPACITOR, CERAMIC, .5 UUF, PORM 0.1 UUF, 500 V -72982-	2	
-18	514C1	• CAPACITOR, CERAMIC FEEDTHRU, .001 UF, GMV, 500 V -80183-	3	
-19	301C0H100K	• CAPACITOR, CERAMIC, 10 UUF, 10%, 500 V -72982-	1	
-20	301C0H479C	• CAPACITOR, CERAMIC, 4.7 UUF, PORM .25 UUF -72982-	1	
-21	301C0H689D	• CAPACITOR, CERAMIC, 6.8 UUF, PORM 0.5 UUF, 500 V -72982-	1	
-22	514C11A	• CAPACITOR, CERAMIC, FEEDTHRU, 47 UUF, 20%, 500 V -80183-	1	
-23	A23-868	• INDUCTOR, COIL RF, .158 UH -99789-	3	
-24	A23-870	• INDUCTOR, COIL RF, .235 UH -99789-	1	
-25	A23-871	• INDUCTOR, COIL RF, 1.23 UH -99789-	1	
-26		• CHOKE, LOOP, NO. 22 BUS WIRE -99789-	4	
-27	A14-737	• INDUCTOR, COUPLING, 1.67 UH -99789-	1	
-28		• COUPLING, LOOP, NO. 22 WIRE BUS -99789-	1	
-29	EB2245	• RESISTOR, FIXED COMP, 220 K, 5%, 1/2 W -01121-	2	
-30	EB1515	• RESISTOR, FIXED COMP, 150 OHMS, 5%, 1/2 W -01121-	2	
-31	EB5635	• RESISTOR, FIXED COMP, 56 K, 5%, 1/2 W -01121-	2	
-32	EB9125	• RESISTOR, FIXED COMP, 9.1 K, 5%, 1/2 W -01121-	2	
-33	EB1025	• RESISTOR, FIXED COMP, 1 K, 5%, 1/2 W -01121-	2	
-34	EB2735	• RESISTOR, FIXED COMP, 27 K, 5%, 1/2 W -01121-	1	
-35	EB4745	• RESISTOR, FIXED COMP, 470 K, 5%, 1/2 W -01121-	2	
-36	EB1045	• RESISTOR, FIXED COMP, 100 K, 5%, 1/2 W -01121-	2	
-37	EB8225	• RESISTOR, FIXED COMP, 8.2 K, 5%, 1/2 W -01121-	1	
-38	TS102P01	• SOCKET, ELECTRON TUBE, 7 PIN MINIATURE -73690-	4	
-39		• INDUCTOR, SOLDEREX WIRE -05395-	1	
-40	DM15-560J	• CAPACITOR, 56 UUF, 5% -84171-	1	
-41	NP0 T47UUF	• CAPACITOR, 47 UUF, 500 VDC 10% -72982-	1	

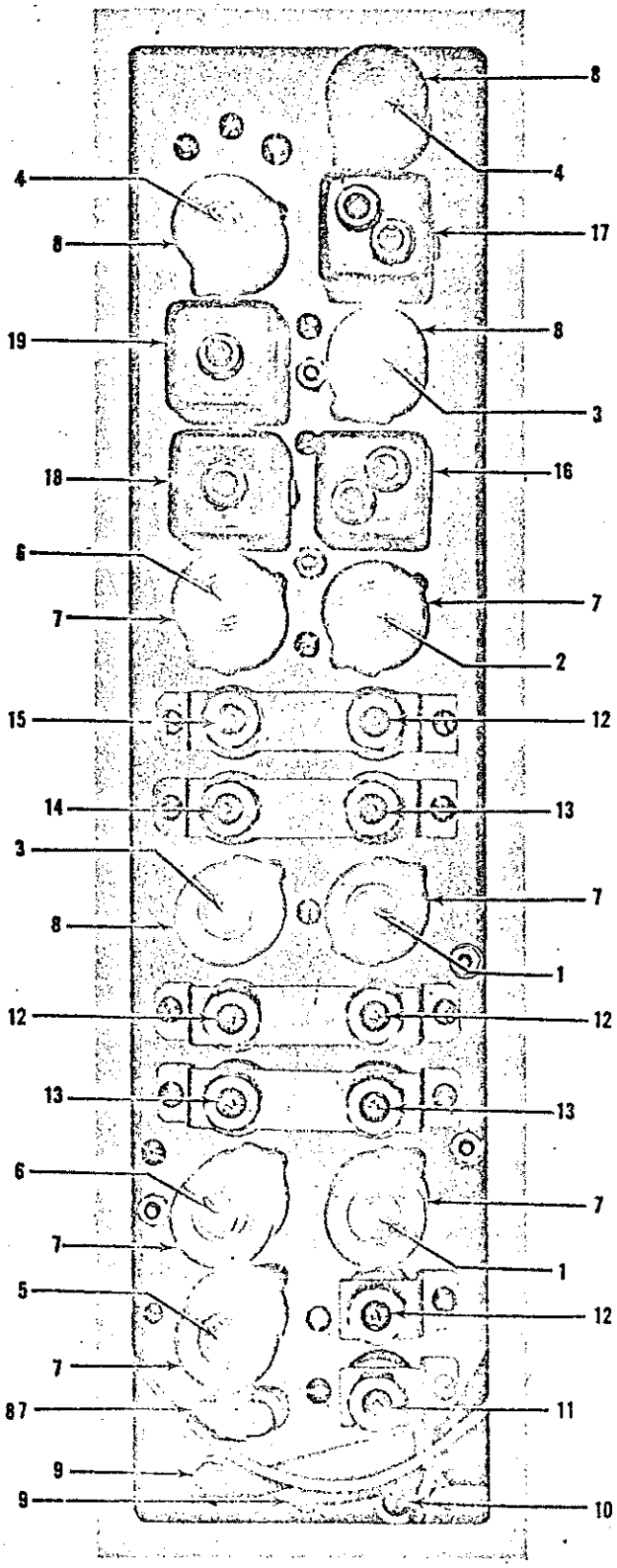


Figure 6-6. I-F Strip (Sheet 1of 2)

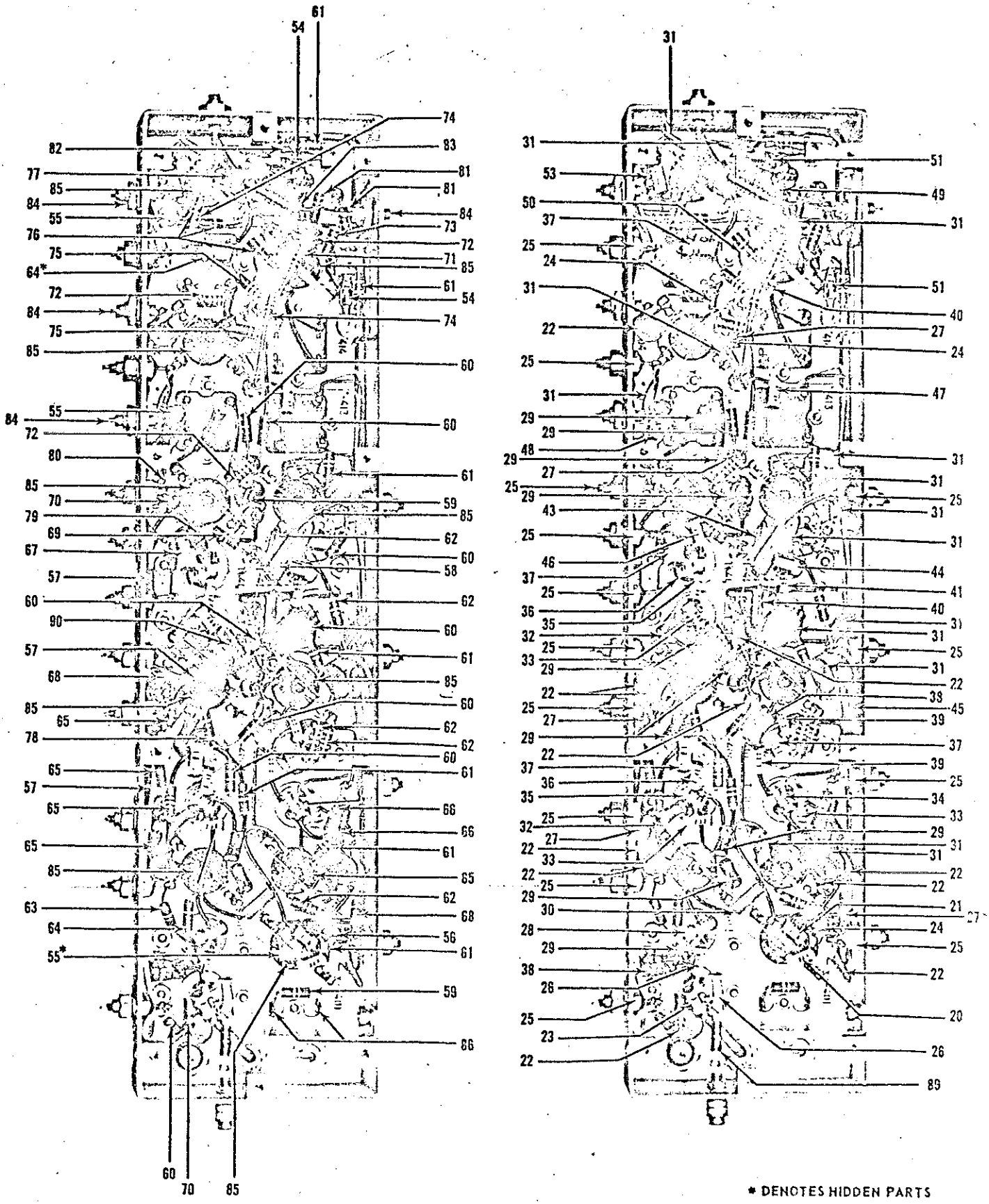
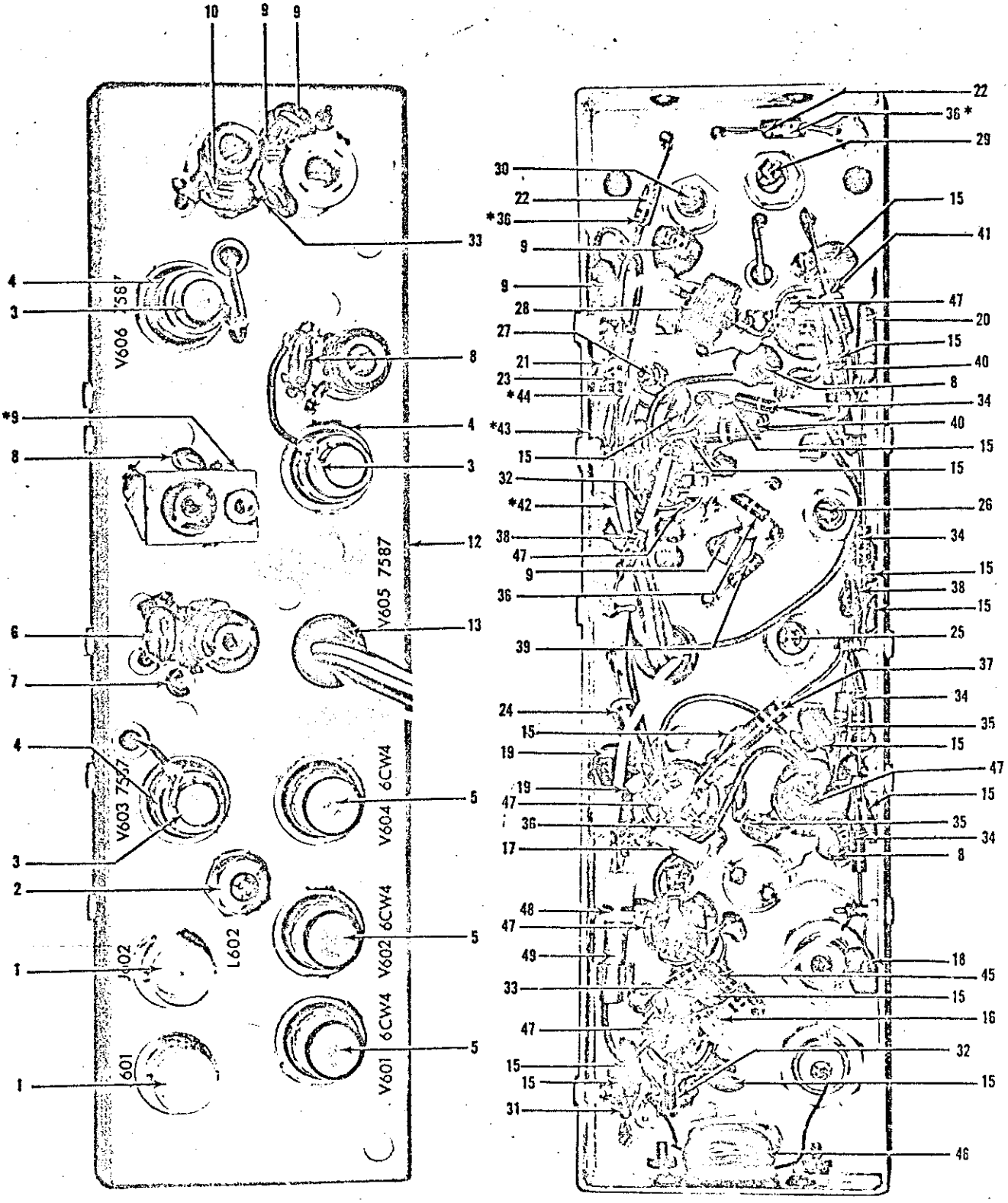


Figure 6-6. I-F Strip (Sheet 2 of 2)

FIGURE AND INDEX NO.	PART NUMBER	1 2 3 4 5 6 7 DESCRIPTION	UNITS PER ASSY	USABLE ON CODE
6		1-F STRIP -SEE FIGURE 6-2 FOR NEXT HIGHER ASSEMBLY-	REF	V
-1	6DC6	• ELECTRON TUBE	2	V
-2	6CB6	• ELECTRON TUBE	1	V
-3	6AK5	• ELECTRON TUBE	2	V
-4	6AL5	• ELECTRON TUBE	2	V
-5	6AU6	• ELECTRON TUBE	1	V
-6	6BA6	• ELECTRON TUBE	2	V
-7	120P35930	• SHIELD, ELECTRON TUBE, 7 PIN MEDIUM -73690-	6	V
-8	121P35929	• SHIELD, ELECTRON TUBE, 7 PIN SHORT -73690-	4	V
-9	MX1530UP1C	• CONNECTOR, RECEPTACLE, SEALING PLUGS NYLON DEUTSCH CP-140-1AT*	2	V
-10	UG694U	• CONNECTOR, RECEPTACLE, TYPE BNC	1	V
-11	AB31-678	• TRANSFORMER ASSEMBLY -99789-	1	V
-12		• TRANSFORMER ASSEMBLY -99789-	4	V
-13		• TRANSFORMER ASSEMBLY -99789-	3	V
-14	AB31-760	• TRANSFORMER ASSEMBLY -99789-	1	V
-15	AB31-761	• TRANSFORMER ASSEMBLY -99789-	1	V
-16	AB14-799	• TRANSFORMER ASSEMBLY -99789-	1	V
-17	AB14-976	• TRANSFORMER ASSEMBLY -99789-	1	V
-18	AB15-102	• TRANSFORMER ASSEMBLY -99789-	1	V
-19	AB15-104	• TRANSFORMER ASSEMBLY -99789-	1	V
-20	301C0H100K	• CAPACITOR, CERAMIC, 10 UUF, 10%, 500 V -72982-	1	V
-21	301C0H829D	• CAPACITOR, CERAMIC, 8.2 UUF, PORM 0.5 UUF, 500 V -72982-	1	V
-22	20C8	• CAPACITOR, CERAMIC, .0047 UF, GMV, 500 V -80183-	11	V
-23	301C0H479C	• CAPACITOR, CERAMIC, 4.7 UUF, PORM .25 UUF -72982-	1	V
-24	40C214	• CAPACITOR, CERAMIC DISC, .001 UF, GMV, 1000 V -80183-	3	V
-25	514C1	• CAPACITOR, CERAMIC FEEDTHRU, .001 UF, GMV, 500 V -80183-	14	V
-26	301C0J229B	• CAPACITOR, CERAMIC, 2.2 UUF, PORM 0.1 UUF, 500 V -72982-	2	V
-27	507C2	• CAPACITOR, CERAMIC STANDOFF, .001 UF, GMV, 500 V -80183-	5	V
-28	315S2H330J	• CAPACITOR, CERAMIC, 33 UUF, 5%, 500 V -72982-	1	V
-29	GP2-331-470	• CAPACITOR, CERAMIC, 470 UUF, 10%, 500 V -72982-	9	V
-30	CM150030M	• CAPACITOR, MICA 3 UUF, 0.5 UUF, 500 V -04062-	1	V
-31	MA811	• CAPACITOR, CERAMIC DISC, .01 UF, GMV, 5 0 V -72982-	13	V
-32	GP2-331-390	• CAPACITOR, CERAMIC, 390 UUF, 10%, 500 V -72982-	2	V
-33	301C0G120K	• CAPACITOR, CERAMIC, 12 UUF, 10%, 500 V -72982-	3	V
-34	TCZR68	• CAPACITOR, CERAMIC, .68 UUF, PORM .25 UUF, 1000 V -71590-	1	V
-35	301C0K159C	• CAPACITOR, CERAMIC, 1.5 UUF, PORM .25 UUF, 1000 V -72982-	2	V
-36	301C0K129C	• CAPACITOR, CERAMIC, 1.2 UUF, PORM .25 UUF, 500 V -72982-	2	V
-37	302B1G390J	• CAPACITOR, CERAMIC, 39 UUF, 5%, 500 V -72982-	4	V
-38	CM15E221J	• CAPACITOR, MICA, 220 UUF, 5%, 500 V -04062-	2	V
-39	301C0K508B	• CAPACITOR, CERAMIC, 0.5 UUF, PORM 0.1 UUF -72982-	2	V
-40	CM15E101J	• CAPACITOR, MICA, 100 UUF, 5%, 500 V -04062-	2	V
-41	NP0A5-1UUF	• CAPACITOR, CERAMIC, 5.1 UUF, PORM .25 UUF, 500 V -72982-	1	V
-42	DELETED			V
-43	CM15E910J	• CAPACITOR, MICA, 91 UUF, 5%, 500 V -04062-	1	V
-44	301C0J399C	• CAPACITOR, CERAMIC, 3.9 UUF, PORM .25 UUF -72982-	1	V
-45	BPD-03	• CAPACITOR, CERAMIC DISC, .03 UF, GMV, 1 V -00656-	1	V
-46	301C0J220K	• CAPACITOR, CERAMIC, 22 UUF, 10% -72982-	1	V
-47	301C0K209B	• CAPACITOR, CERAMIC, 2 UUF, PORM 0.1 UUF, 500 V -72982-	1	V
-48	CM15E330J	• CAPACITOR, MICA, 33 UUF, 5%, 500 V -04062-	1	V
-49	P123ZGP	• CAPACITOR, METALIZED PAPER, .033 UF, 20%, 400 V -00656-	1	V
-50	CM15100J	• CAPACITOR, MICA, 10 UUF, 5%, 500 V -04062-	1	V
-51	CM15E391J	• CAPACITOR, MICA, 390 UUF, 5%, 500 V -04062-	1	V
-52	CM15E510J	• CAPACITOR, MICA, 51 UUF, 5%, 500 V -04062-	1	V
-53	CM15E270J	• CAPACITOR, MICA, 27 UUF, 5%, 500 V -04062-	1	V
-54	1N3A	• SEMICONDUCTOR, DEVICE DIODE GERMANIUM	2	V
-55	A14-804	• INDUCTOR, CATHODE, 28 UH -99789-	2	V
-56	A15-059	• INDUCTOR, CHOKE RF, 8 UH -99789-	1	V
-57		• CHOKE, LOOP, NO. 22 BUS WIRE -99789-	3	V
-58	A15-056	• INDUCTOR, CHOKE RF, 24 UH -99789-	1	V
-59	EB2231	• RESISTOR, FIXED COMP, 22 K, 10%, 1/2 W -01121-	2	V
-60	EB1021	• RESISTOR, FIXED COMP, 1 K, 10%, 1/2 W -01121-	8	V
-61	EB1241	• RESISTOR, FIXED COMP, 120 K, 10%, 1/2 W -01121-	7	V
-62	EB4741	• RESISTOR, FIXED COMP, 470 K, 10%, 1/2 W -01121-	5	V
-63	EB2241	• RESISTOR, FIXED COMP, 220 K, 10%, 1/2 W -01121-	2	V
-64	EB1035	• RESISTOR, FIXED COMP, 10 K, 5%, 1/2 W -01121-	2	V
-65	EB8205	• RESISTOR, FIXED COMP, 82 OHMS, 5%, 1/2 W -01121-	4	V
-66	EB1015	• RESISTOR, FIXED COMP, 100 OHMS, 5%, 1/2 W -01121-	2	V
-67	EB8241	• RESISTOR, FIXED COMP, 820 K, 10%, 1/2 W -01121-	1	V
-68	EB1031	• RESISTOR, FIXED COMP, 10 K, 10%, 1/2 W -01121-	2	V
-69	EB1041	• RESISTOR, FIXED COMP, 100 K, 10%, 1/2 W -01121-	1	V
-70	EB5105	• RESISTOR, FIXED COMP, 51 OHMS, 5%, 1/2 W -01121-	2	V
-71	EB2735	• RESISTOR, FIXED COMP, 27 K, 5%, 1/2 W -01121-	1	V
-72	EB4731	• RESISTOR, FIXED COMP, 47 K, 10%, 1/2 W -01121-	3	V
-73	EB4725	• RESISTOR, FIXED COMP, 4.7 K, 5%, 1/2 W -01121-	1	V
-74	EB1551	• RESISTOR, FIXED COMP, 1.5 MEG, 10%, 1/2 W -01121-	2	V
-75	EB3335	• RESISTOR, FIXED COMP, 33 K, 5%, 1/2 W -01121-	2	V
-76	EB1045	• RESISTOR, FIXED COMP, 100 K, 5%, 1/2 W -01121-	2	V
-77	GB4705	• RESISTOR, FIXED COMP, 4.7 OHMS, 5%, 1 W -01121-	1	V
-78	EB2035	• RESISTOR, FIXED COMP, 20 K, 5%, 1/2 W -01121-	1	V
-79	EB3035	• RESISTOR, FIXED COMP, 30 K, 5%, 1/2 W -01121-	1	V
-80	EB3341	• RESISTOR, FIXED COMP, 330 K, 10%, 1/2 W -01121-	1	V
-81	EB2435	• RESISTOR, FIXED COMP, 24 K, 5%, 1/2 W -01121-	2	V
-82	EB5035	• RESISTOR, FIXED COMP, 50 K, 5%, 1/2 W -01121-	1	V
-83	EB4735	• RESISTOR, FIXED COMP, 47 K, 5%, 1/2 W -01121-	1	V
-84	1433	• TEST POINT -88245-	4	V
-85	TS102P01	• SOCKET, ELECTRON TUBE, 7 PIN MINIATURE -73690-	10	V
-86	126-105-2	• SOCKET, CRYSTAL -74970-	1	V
-87	MS91388	• CRYSTAL, 22.4 MC, CR33U	1	V
-88	R50-100	• CONNECTOR -08310-	1	V

FIGURE AND INDEX NO.	PART NUMBER	1 2 3 4 5 6 7 DESCRIPTION	UNITS PER ASSY	USABLE ON CODE
6 -89	RC20GF752J	• RESISTOR, 7.5 K, 5%, 1/2 W	1	V
-90	EB1545	• RESISTOR, FIXED COMP, 150 K, 5%, 1/2 W -01121-	1	V

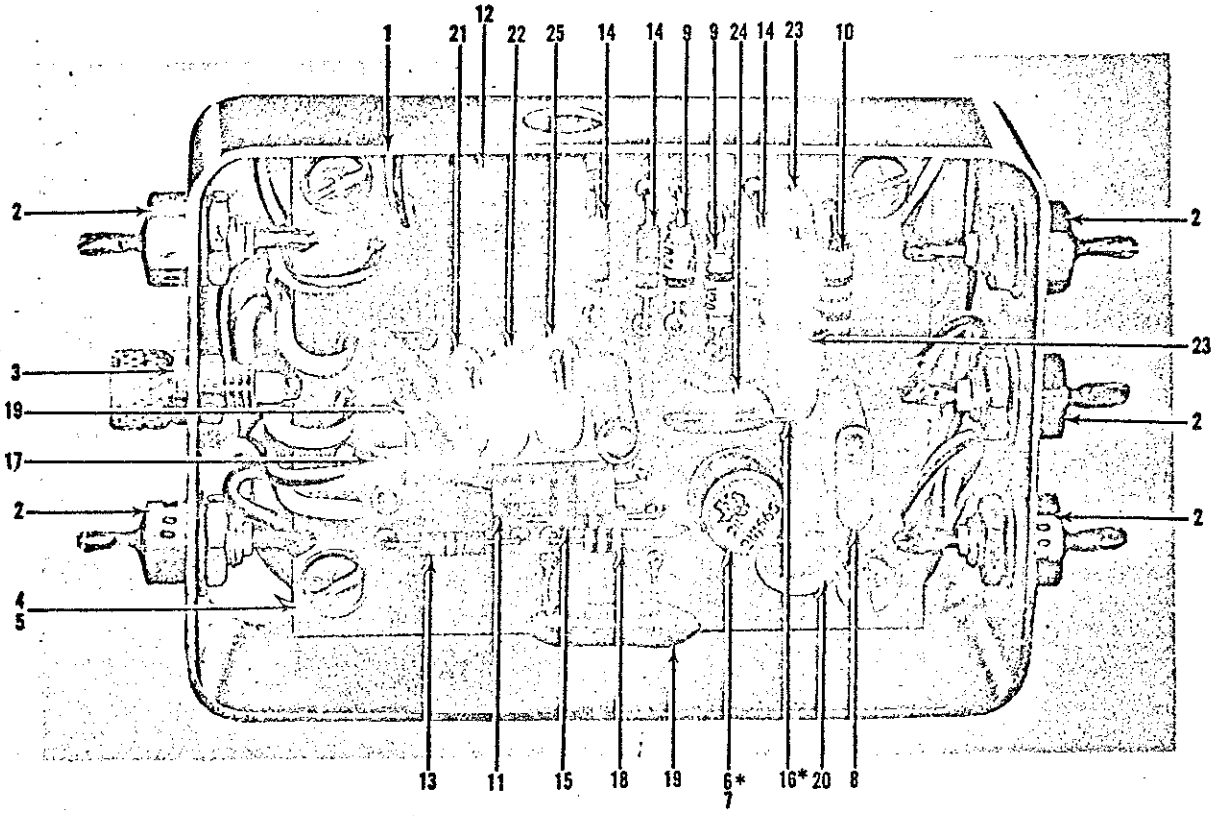


* DENOTES HIDDEN PARTS

Figure 6-7. 40KC IF Strip

FIGURE AND INDEX NO.	PART NUMBER	1 2 3 4 5 6 7 DESCRIPTION	UNITS PER ASSY	USABLE ON CODE
7		40 KC I-F STRIP -SEE FIGURE 6-2 FOR NEXT HIGHER ASSEMBLY-	REF	V
-1	UG1094U	• CONNECTOR, BNC	2	V
-2	1095	• COIL -80058-	1	V
-3	6010	• PLATE CLIP -71785-	3	V
-4	7587	• TUBE -86684-	3	V
-5	6CW4	• TUBE -86684-	3	V
-6	DM10-470J	• CAPACITOR, SILVER MICA, 47 UUF, 5%, 500 V -84171-	1	V
-7	301C0H689C	• CAPACITOR, CERAMIC TUBULAR, 6.8 UUF, PORM .25 UUF, 600 V -72982-	1	V V
-8	DM10-100J	• CAPACITOR, SILVER MICA, 10 UUF, 5%, 500 V -84171-	4	V
-9	DM10-101J	• CAPACITOR, SILVER MICA, 100 UUF, 5%, 500 V -84171-	6	V
-10	DM10-820J	• CAPACITOR, SILVER MICA, 82 UUF, 5%, 500 V -84171-	1	V
-11	DM10-330J	• CAPACITOR, SILVER MICA, 33 UUF, 5%, 500 V -84171-	1	V
-12	3014	• CHASSIS, BRASS, SILVER PLATED -80058-	1	V
-13	SB375-4	• GROMMET, PLASTIC -28520-	1	V
-14	5R3-1	• RECEPTACLE -71286-	2	V
-15	40C272	• CAPACITOR, CERAMIC DISC, 0.001 UF, 20%, 500 V -80183-	14	V
-16	301C0K508C	• CAPACITOR, CERAMIC TUBULAR, 0.5 UUF, PORM .25 UUF, 600 V -72982-	1	V V
-17	301C0J229C	• CAPACITOR, CERAMIC TUBULAR, 2.2 UUF, PORM .25 UUF, 600 V -72982-	1	V V
-18	DM10-201J	• CAPACITOR, SILVER MICA, 200 UUF, 5%, 500 V -84171-	1	V
-19	DM10-220J	• CAPACITOR, SILVER MICA, 22 UUF, 5%, 500 V -84171-	2	V
-20	29C262	• CAPACITOR, CERAMIC DISC, 0.0047 UF, 20%, 500 V -80183-	1	V
-21	29C986	• CAPACITOR, CERAMIC DISC, 0.01 UF, 20%, 500 V -80183-	1	V
-22	1N99	• DIODE, GERMANIUM -03877-	2	V
-23	1N34A	• DIODE, GERMANIUM -03877-	1	V
-24	1096	• COIL, 10 UH -80058-	1	V
-25	1034-1	• COIL, VARIABLE, 61 TO 122 UH -80058-	1	V
-26	1034-2	• COIL, VARIABLE, 28 TO 63 UH -80058-	1	V
-27	2060-8	• COIL, VARIABLE, 120 TO 243 UH -71450-	1	V
-28	11000-15	• COIL, 1 MH -99848-	1	V
-29	2060-6	• COIL, VARIABLE, 28 TO 63 UH -71450-	1	V
-30	1041	• COIL, VARIABLE, 61 TO 122 UH -80058-	1	V
-31	CB2241	• RESISTOR, FIXED COMP, 220 K, 10%, 1/4 W -01121-	1	V
-32	CB5605	• RESISTOR, FIXED COMP, 56 OHMS, 5%, 1/4 W -01121-	2	V
-33	CB4735	• RESISTOR, FIXED COMP, 47 K, 5%, 1/4 W -01121-	1	V
-34	CB1021	• RESISTOR, FIXED COMP, 1 K, 10%, 1/4 W -01121-	4	V
-35	CB1051	• RESISTOR, FIXED COMP, 1 MEG, 10%, 1/4 W -01121-	2	V
-36	CB4045	• RESISTOR, FIXED COMP, 100 K, 5%, 1/4 W -01121-	4	V
-37	EB4735	• RESISTOR, FIXED COMP, 47 K, 5%, 1/2 W -01121-	1	V
-38	CB1035	• RESISTOR, FIXED COMP, 10 K, 5%, 1/4 W -01121-	2	V
-39	CB8241	• RESISTOR, FIXED COMP, 820 K, 10%, 1/4 W -01121-	1	V
-40	EB1045	• RESISTOR, FIXED COMP, 100 K, 5%, 1/2 W -01121-	2	V
-41	EB8235	• RESISTOR, FIXED COMP, 82 K, 5%, 1/2 W -01121-	1	V
-42	CB1235	• RESISTOR, FIXED COMP, 12 K, 5%, 1/4 W -01121-	1	V
-43	CB3635	• RESISTOR, FIXED COMP, 36 K, 5%, 1/4 W -01121-	1	V
-44	CB3341	• RESISTOR, FIXED COMP, 330 K, 10%, 1/4 W -01121-	1	V
-45	CB1001	• RESISTOR, FIXED COMP, 10 OHMS, 10%, 1/4 W -01121-	1	V
-46	1092	• TRANSFORMER, MATCHING -80058-	1	V
-47	133-65-10-001	• TUBE SOCKET -71785-	6	V
-48	8004-1G1	• CLIP, CRYSTAL -91506-	1	V
-49	4202	• CRYSTAL, QUARTZ, 18,900 KC -74306-	1	V

6-21



*DENOTES HIDDEN PARTS

Figure 6-8. Beat Frequency Oscillator Assembly, 21.435 MC

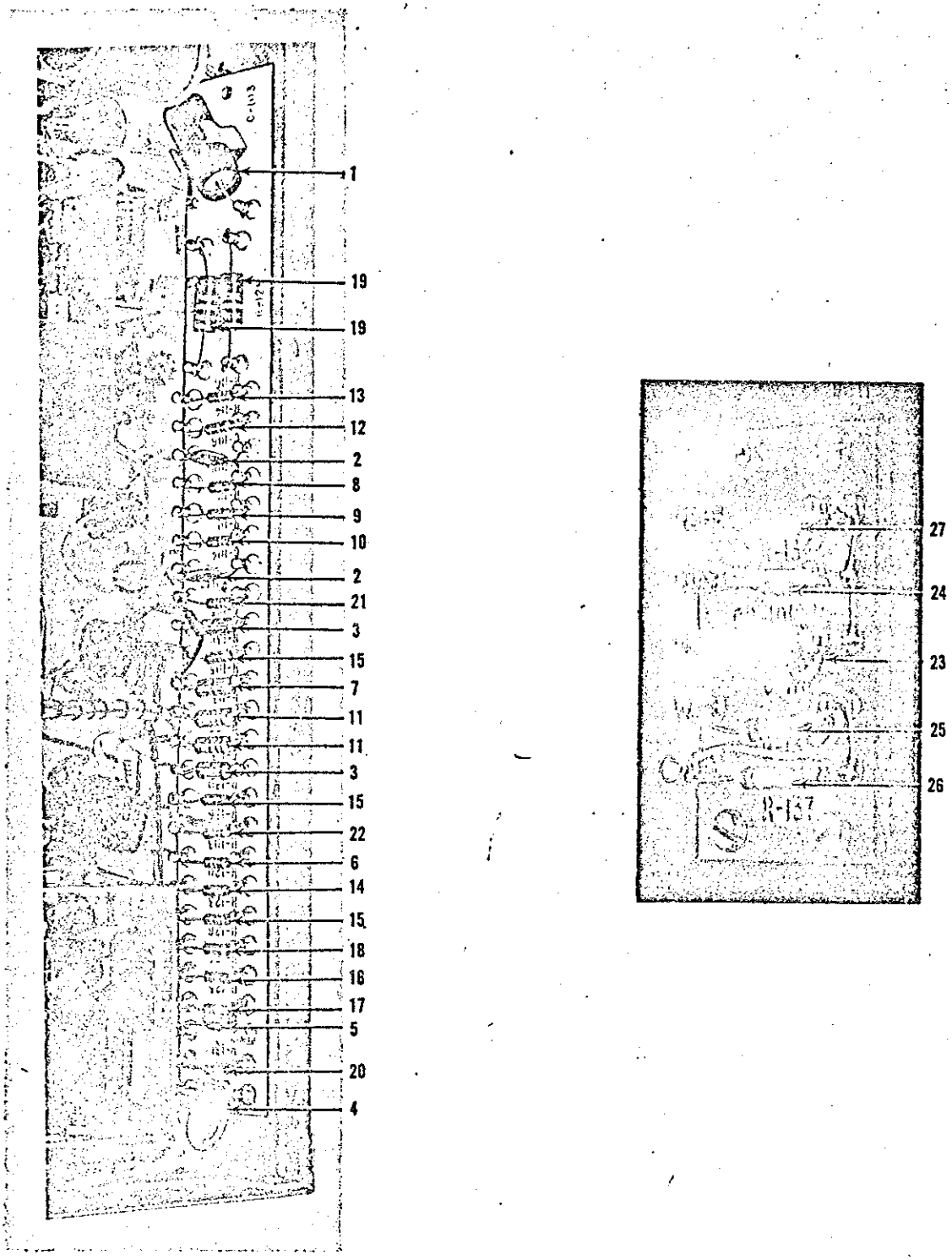


Figure 6-9. Terminal Board Assembly

FIGURE AND INDEX NO.	PART NUMBER	1 2 3 4 5 6 7 DESCRIPTION	UNITS PER ASSY	USABLE ON CODE
9	53-413	TERMINAL BOARD ASSEMBLY -SEE FIGURE 6-3 FOR NEXT HIGHER ASSEMBLY	REF	V
-1	P123ZGP	• CAPACITOR, METALIZED PAPER, 1.0 UF, 20%, 200 V -00656-	1	V
-2	HA811	• CAPACITOR, CERAMIC DISC, .01 UF, GMV, 5 V -72982-	2	V
-3	P123ZGP	• CAPACITOR, METALIZED PAPER, .1 UF, 20%, 200 V -00656-	2	V
-4		• CAPACITOR, .01 UUF, 1000 V, CRL	1	V
-5	1N458	• SEMICONDUCTOR, DEVICE DIODE SILICON	1	V
-6	EB4731	• RESISTOR, FIXED COMP, 47 K, 10%, 1/2 W -01121-	1	V
-7	GB1031	• RESISTOR, FIXED COMP, 10 K, 10%, 1 W -01121-	1	V
-8	EB2231	• RESISTOR, FIXED COMP, 22 K, 10%, 1/2 W -01121-	1	V
-9	EB2025	• RESISTOR, FIXED COMP, 2 K, 5%, 1/2 W -01121-	1	V
-10	EB2445	• RESISTOR, FIXED COMP, 240 K, 5%, 1/2 W -01121-	1	V
-11	GB4735	• RESISTOR, FIXED COMP, 47 K, 5%, 1 W -01121-	2	V
-12	EB4745	• RESISTOR, FIXED COMP, 470 K, 5%, 1/2 W -01121-	1	V
-13	EB2245	• RESISTOR, FIXED COMP, 220 K, 5%, 1/2 W -01121-	1	V
-14	EB5145	• RESISTOR, FIXED COMP, 510 K, 5%, 1/2 W -01121-	1	V
-15	EB1055	• RESISTOR, FIXED COMP, 1 MEG, 5%, 1/2 W -01121-	3	V
-16	EB1041	• RESISTOR, FIXED COMP, 100 K, 10%, 1/2 W -01121-	1	V
-17	EB6835	• RESISTOR, FIXED COMP, 68 K, 5%, 1/2 W -01121-	1	V
-18	EB3015	• RESISTOR, FIXED COMP, 300 OHMS, 5%, 1/2 W -01121-	1	V
-19	HB1235	• RESISTOR, FIXED COMP, 12 K, 5%, 2 W -01121-	2	V
-20	EB2035	• RESISTOR, FIXED COMP, 20 K, 5%, 1/2 W -01121-	1	V
-21	EB3341	• RESISTOR, FIXED COMP, 330 K, 10%, 1/2 W -01121-	1	V
-22	EB4755	• RESISTOR, FIXED COMP, 4.7 MEG, 5%, 1/2 W -01121-	1	V
	53-412	TERMINAL BOARD ASSEMBLY -SEE FIGURE 6-3 FOR NEXT HIGHER ASSEMBLY	REF	V
-23	P123ZGP	• CAPACITOR, METALIZED PAPER, .1 UF, 20%, 200 V -00656-	1	V
-24	1N457	• SEMICONDUCTOR, DEVICE DIODE SILICON	1	V
-25	EB2445	• RESISTOR, FIXED COMP, 240 K, 5%, 1/2 W -01121-	1	V
-26	EB2435	• RESISTOR, FIXED COMP, 24 K, 5%, 1/2 W -01121-	1	V
-27	EB2065	• RESISTOR, FIXED COMP, 20 MEGOHM, 5%, 1/2 W -01121-	1	V

FIGURE AND INDEX NO.	PART NUMBER	1 2 3 4 5 6 7 DESCRIPTION	UNITS PER ASSY	USABLE ON CODE
10	AD50-836	GEAR TRAIN ASSEMBLY -SEE FIGURE 6-2 FOR NEXT HIGHER ASSEMBLY-	REF	V
-1	AC41-046	• GEAR BOX ASSEMBLY -99789-	1	V
-2	DELETED			V
-3	AA25-611	• MOUNTING BLOCK ASSEMBLY -99789-	1	V
-4	AA24-755-8	• STOP ASSEMBLY -99789-	4	V
-5	AA24-752	• PINION SHAFT ASSEMBLY -99789-	1	V
-6	AA25-602	• GEAR ASSEMBLY -99789-	3	V
-7	AA25-649	• GEAR ASSEMBLY -99789-	4	V
-8	AA25-601	• GEAR ASSEMBLY -99789-	2	V
-9	DELETED			V
-10	DELETED			V
-11	DELETED			V
-12	DELETED			V
-13	DELETED			V
-14	DELETED			V
-15	A24-749	• SHAFT TUNING -99789-	1	V
-16	B32-601-02	• SHAFT, GEAR TRAIN -99789-	2	V
-17	B32-601-09	• SHAFT, GEAR TRAIN -99789-	3	V
-18	B32-601-12	• SHAFT, GEAR TRAIN -99789-	1	V
-19	B32-601-15	• SHAFT, GEAR TRAIN -99789-	1	V
-20	B32-601-13	• SHAFT, GEAR TRAIN -99789-	1	V
-21	B32-601-11	• SHAFT, GEAR TRAIN -99789-	1	V
-22	B32-601-20	• SHAFT, GEAR TRAIN -99789-	1	V
-23	A24-760-1	• SPACER -99789-	10	V
-24	A25-645	• SPACER -99789-	6	V
-25	B32-108-24	• SPUR GEAR -99789-	6	V
-26	A24-699	• GEAR, 92T, 48P -99789-	1	V
-27	B32-108-64	• SPUR GEAR -99789-	1	V
-28	B32-108-36	• SPUR GEAR -99789-	1	V
-29	B32-108-21	• SPUR GEAR -99789-	1	V
-30	B32-108-52	• SPUR GEAR -99789-	2	V
-31	B32-108-84	• SPUR GEAR -99789-	1	V
-32	A25-595	• SPUR GEAR -99789-	1	V
-33	A25-643-02	• SPACER -99789-	1	V
-34	A25-643-01	• SPACER -99789-	1	V
-35	A25-644	• SPACER -99789-	1	V
-36	A25-259-3	• SPACER -99789-	1	V

NUMERICAL INDEX

PART NUMBER	STOCK NUMBER	FIGURE & INDEX NO.	UNITS PER ASSEMBLY
AA24-752		1 -5	1
AA24-755-8		10 -4	4
AA25-601		10 -8	2
AA25-602		10 -6	3
AA25-611		10 -3	1
AA25-612		2 -38	1
AA25-649		10 -7	4
AB14-799		6 -16	1
AB14-976		6 -17	1
AB15-102		6 -18	1
AB15-104		6 -19	1
AB31-678		6 -11	1
AB31-760		6 -14	1
AB31-761		6 -15	1
AB32-160		2 -45	1
AC41-046		10 -1	1
AD50-836		2 -37	1
		10 -	REF
A10044		8 -6	1
A1321-50		2 -1	1
A14-735		4 -29	3
A14-737		4 -32	2
		5 -27	1
A14-749-1		4 -33	1
A14-804		6 -55	2
A14-806		4 -35	1
A15-056		6 -58	1
A15-059		6 -56	1
A17-727		4 -31	1
A17-728		4 -34	1
A17-729		4 -24	1
A23-868		5 -23	3
A23-870		5 -24	1
A23-871		5 -25	1
A24-699		10 -26	1
A24-741		2 -41	1
A24-748-1		2 -44	1
A24-749		10 -15	1
A24-760-1		10 -23	10
A24-846		2 -43	1
A25-077		2 -42	1
A25-259-3		10 -36	1
A25-595		10 -32	1
A25-620-1		2 -39	1
A25-620-2		2 -40	1
A25-643-01		10 -34	1
A25-643-02		10 -33	1
A25-644		10 -35	1
A25-645		10 -24	6
A3234W		1 -7	1
A324		1 -16	1
BPD-03		6 -45	1
B10-2-5K1		3 -15	1
B31-539		2 -13	1
B31-575		2 -12	1
B32-108-21		10 -29	1
B32-108-24		10 -25	6
B32-108-36		10 -28	1
B32-108-52		10 -30	2
B32-108-64		10 -27	1
B32-108-84		10 -31	1
B32-601-02		10 -16	2
B32-601-09		10 -17	3
B32-601-11		10 -21	1
B32-601-12		10 -18	1
B32-601-13		10 -20	1
B32-601-15		10 -19	1
B32-601-20		10 -22	1
CA 1041		1 -4	1
CB1001		7 -45	1
CB1021		7 -34	4
CB1035		7 -38	2
CB1051		7 -35	2
CB1235		7 -42	1
CB2241		7 -31	1
CB3341		7 -44	1
CB3635		7 -43	1
CB4045		7 -36	4
CB4735		7 -33	1
CB5605		7 -32	2
CB8241		7 -39	1
CM15E101J		6 -40	2
CM15E151J		5 -16	1
CM15E221J		6 -38	2
CM15E240J		5 -1	1
CM15E270J		6 -53	1
CM15E301J		3 -2	1
CM15E330J		6 -48	1
CM15E391J		6 -51	1
CM15E510J		6 -52	1
CM15E620J		5 -9	1
CM15E910J		6 -43	1
CM150030M		6 -30	1
CM15100J		6 -50	1
CP53B1EE105M		3 -4	1
CW123AU		2 -29	1
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		10 -9	
		10 -10	
		10 -11	
		10 -12	
		10 -13	
		10 -14	
DM10-100J		2 -31	1
		7 -8	4
		7 -9	6
DM10-101J		7 -18	1
DM10-201J		7 -19	2
DM10-220J		7 -11	1
DM10-330J		7 -6	1
DM10-470J		7 -10	1
DM10-820J		4 -59	1
DM15-010M		8 -21	1
		4 -60	1
DM15-050K		8 -22	1
DM15-430J		8 -25	1
DM15-471J		8 -23	2
DM15-500J		5 -40	1
DM15-560J		8 -24	1
DM15-680J		1 -24	1
DS00-122P		1 -22	1
DS00-19P		1 -23	1
DS00-19S		4 -21	1
D6-102		4 -38	2
EB1015		6 -66	2
		6 -60	8
EB1021		3 -13	1
EB1025		5 -33	2
		6 -68	2
EB1031		3 -12	1
EB1035		6 -64	2
		3 -7	1
EB1041		6 -69	1
		9 -16	1
		5 -36	2
EB1045		6 -76	2
		7 -40	2
		2 -11	1
EB1055		3 -10	2
		9 -15	3
		4 -44	1
EB1215		6 -61	7
EB1241		5 -30	2
EB1515		4 -47	1
EB1541		4 -52	1
EB1545		6 -90	1
		6 -74	2
EB1551		4 -37	1
EB1615		9 -9	1
EB2025		6 -78	1
EB2035		9 -20	1
		9 -27	1
EB2065		4 -49	1
EB2211		6 -59	2
EB2231		9 -8	1
		6 -63	2
EB2241		3 -8	1
EB2245		5 -29	2
		9 -13	1
		6 -81	2
EB2435		9 -26	1
		9 -10	1
EB2445		9 -25	1
		3 -11	1
EB2455		4 -46	1
EB2731		5 -34	1
EB2735		6 -71	1
		9 -18	1
EB3015		6 -79	1
EB3035		6 -75	2
EB3335		6 -80	1
EB3341		9 -21	1
		6 -73	1
EB4725		3 -9	1
EB4731		6 -72	3

PART NUMBER	STOCK NUMBER	FIGURE & INDEX NO.	UNITS PER ASSEMBLY
EB4731		9 -6	1
EB4735		6 -83	1
		7 -37	1
EB4741		6 -62	5
EB4745		4 -45	2
		5 -35	2
		9 -12	1
EB4755		9 -22	1
EB5035		6 -82	1
EB5105		6 -70	2
EB5135		4 -40	1
EB5145		9 -14	1
EB5635		5 -31	2
EB6225		4 -43	1
EB6835		9 -17	1
EB8205		6 -65	4
EB8225		4 -39	1
		5 -37	1
EB8235		7 -41	1
EB8241		6 -67	1
EB9125		5 -32	2
FB2B		8 -2	5
FM75-100		2 -19	1
GB1025		4 -51	1
GB1031		9 -7	1
GB4705		6 -77	1
GB4735		9 -11	2
GB5115		4 -50	1
GB5625		4 -42	1
GB82G5		3 -22	1
GP2-331		4 -22	1
GP2-331-390		6 -32	2
GP2-331-470		6 -29	9
G000051-1		8 -7	1
G175D00951-1		2 -22	1
G175D00952-1		2 -25	1
G175H00000-1		1 -	REF
		2 -	REF
		3 -	REF
G175H00001-1		1 -1	1
G175H00100-1		2 -6	2
G175H00100-2		3 -26	1
G175H00951-1		1 -25	1
G175H00952-1		2 -21	1
G175H01000-1		1 -2	1
G175H10000-1		2 -20	1
		8 -	REF
G175H10010-1		2 -36	1
G175H10020-1		8 -1	1
G175H11000-1		8 -4	1
G175H11200-1		8 -5	1
HA811		3 -3	1
		4 -25	2
		6 -31	13
		9 -2	2
HB1235		9 -19	2
HB1335		3 -14	1
HB1525		4 -41	1
HB8221		4 -48	1
HLT162		5 -7	1
HP2N		3 -28	1
JA1N104P103VA		1 -5	1
JX25		2 -24	1
MS91388		6 -87	1
MX1530UP1C		6 -9	2
M6351		8 -	5
M6377		8 -	5
M7PLSH19C		2 -8	1
M7SLRN		3 -5	1
NP0A5-1UUF		6 -41	1
P1232GP		6 -49	1
		9 -1	1
		9 -3	2
		9 -23	1
P50-200		3 -27	2
RC07GF134J		8 -15	1
RC07GF220J		4 -58	1
RC07GF394J		8 -18	1
RC07GF473J		8 -14	3
RC07GF474J		8 -16	1
RC07GF683J		8 -13	1
RC20GF105J		3 -16	1
RC20GF153J		3 -20	1
RC20GF184J		8 -17	1
RC20GF221J		3 -17	1
RC20GF752J		6 -89	1
RC32GF472J		3 -18	1
RC42GF103J		3 -21	1

PART NUMBER	STOCK NUMBER	FIGURE & INDEX NO.	UNITS PER ASSEMBLY
RH25		4 -53	1
RV5LAXSB255B		1 -14	1
R50-100		6 -88	1
		8 -3	1
R685-4D10K		2 -5	1
SB375-4		7 -13	1
TCZR68		6 -34	1
TS102P01		4 -56	3
		5 -38	4
		6 -85	10
TS103P01		3 -23	5
TS4519-1		2 -4	1
TT61A87		1 -11	6
TVL3561-7		2 -2	1
UG1052U		1 -18	2
UG1094U		7 -1	2
		1 -20	1
UG201AU		2 -27	1
UG260U		2 -9	2
UG291AU		1 -19	1
UG291U		1 -21	1
UG694U		4 -26	5
		5 -6	3
		6 -10	1
UG88U		2 -7	9
		4 -57	1
V20		8 -9	2
1-5-10M		3 -6	1
1N3A		6 -54	2
1N34A		7 -23	1
1N457		9 -24	1
1N458		9 -5	1
1N99		7 -22	2
1SX1T		2 -23	1
1034-1		7 -25	1
1034-2		7 -26	1
1041		7 -30	1
107-1930-975		1 -12	2
1079		2 -30	1
1081		2 -34	1
1091		2 -35	2
1092		7 -46	1
1095		7 -2	1
1096		7 -24	1
11000-15		7 -28	1
1155		2 -30	1
12AU7A		2 -14	5
120P35W930		4 -4	1
120P35930		6 -7	6
121P35W929		4 -5	2
		5 -3	4
121P35929		6 -8	4
126-105-2		6 -86	1
133-65-10-001		7 -47	6
14F14078		4 -55	1
1433		6 -84	4
1537-20		8 -10	1
191P35W933		2 -3	5
2 LOCK		1 -	2
2 LOCK		2 -	2
20C8		5 -13	8
		6 -22	11
2002-3		2 -15	1
2060-6		7 -29	1
2060-8		7 -27	1
207-11		4 -28	1
2083127		8 -8	1
24005-3		1 -8	1
24804-2		1 -9	1
2500-24		8 -11	1
256X11-168HSSP		2 -	2
256X28		1 -	2
		2 -	2
256X3-8FHSSP		1 -	2
29C262		7 -20	1
29C9B6		7 -21	1
301C0G120K		5 -8	3
		6 -33	3
301C0G180K		5 -14	1
301C0G220K		4 -20	1
301C0G240K		5 -15	1
301C0G330K		4 -19	1
301C0H100K		4 -11	1
		5 -19	1
		6 -20	1
301C0H479C		2 -33	1
		5 -20	1
		6 -23	1

PART NUMBER	STOCK NUMBER	FIGURE & INDEX NO.	UNITS PER ASSEMBLY
301C0H569C		5 -12	2
301C0H689C		7 -7	1
301C0H689D		4 -16	2
		5 -21	1
301C0H829D		4 -15	2
		6 -21	1
301C0J220K		6 -46	1
301C0J229B		6 -26	2
301C0J229C		7 -17	1
301C0J339C		2 -32	1
		4 -18	1
301C0J399C		6 -44	1
301C0K129C		6 -36	2
301C0K159C		6 -35	2
301C0K209B		6 -47	1
301C0K209C		4 -10	2
301C0K508B		4 -17	2
		5 -17	2
		6 -39	2
301C0K508C		7 -16	1
3010-863-2308		2 -46	2
3014		7 -12	1
302B1G390J		6 -37	4
315S2H330J		6 -28	1
3250P1-202		8 -12	1
327		1 -3	9
3600S1-103		1 -17	1
370FA		4 -23	5
4 LOCK		8 -	4
4 LOCK		2 -	6
		2 -	1
40C214		4 - 9	6
		5 -11	10
		6 -24	3
40C272		7 -15	14
4202		7 -49	1
440X1-4BHSSP		2 -	6
		8 -	4
440X1-8HSCPSSP		2 -	2
440X3-4BHSSP		2 -	1
5GAD10		8 -20	1
5HKS10		8 -19	2
5R3-1		7 -14	2
507C2		4 -13	5
		5 -10	2
		6 -27	5
514C1		4 -14	9
		5 -18	3
		6 -25	14
514C11A		4 -12	1
		5 -22	1
523		1 -10	
53-412		3 -24	1
		9 -	REF
53-413		3 -25	1
		9 -	REF
6 LOCK		2 -	2
6-3-90DF		4 -27	1
6AF4A		4 -3	1
		5 -2	1
6AK5		4 -2	1
		5 -1	3
		6 -3	2
6AL5		6 -4	2
6AT2		1 -15	1
6AU6		6 -5	1
6BA6		6 -6	2
6CB6		6 -2	1
6CW4		7 -5	3
6DC6		6 -1	2
6J4		4 -1	1
6010		7 -3	3
6280		4 -54	1
632X3-8BHSSP		2 -	2
65-10KP0RH20PCT		1 -6	2
70-3-1G		1 -27	1
70-3-1G1		1 -28	1
70-3-2G		1 -30	1
70-3-2G3		1 -26	2
70-3-2G4		1 -29	1
7462		2 -26	1
7587		7 -4	3
8-1930XP24		1 -13	1
8004-1G1		7 -48	1
829-10		5 -5	1
829-3		4 -6	2
829-4		4 -8	1
829-6		4 -7	2
829-7		5 -4	3
8304		4 -30	4
94CSA1-2-126		2 -28	1

REFERENCE DESIGNATION INDEX

REFERENCE DESIGNATION	FIG. AND INDEX NO.	STOCK NUMBER	MFR PART NUMBER
B101	2 -1		A1321-50
CR101	9 -24		1N457
CR102	9 -5		1N458
CR1101	8 -9		V20
CR1102	8 -9		V20
CR401	6 -54		1N34A
CR402	6 -54		1N34A
CR601	7 -22		1N99
CR602	7 -22		1N99
CR603	7 -23		1N34A
C0091	5 -40		DM15-560J
C0092	4 -59		DM15-010M
C0093	4 -60		DM15-050K
C1001	8 -2		FB2B
C1002	8 -2		FB2B
C1003	8 -2		FB2B
C1004	8 -2		FB2B
C1005	8 -2		FB2B
C101	3 -1		CM15E240J
C102	3 -2		CM15E301J
C103	9 -1		P123ZGP
C104	9 -2		HA811
C105	9 -3		P123ZGP
C106	9 -2		HA811
C107	3 -3		HA811
C108	3 -6		1-5-10M
C109	3 -4		CP53B1EE105M
C110	9 -23		P123ZGP
C1101	8 -23		DM15-500J
C1102	8 -23		DM15-500J
C1103	8 -24		DM15-680J
C1104	8 -20		5GAD10
C1105	8 -22		DM15-430J
C1106	8 -25		DM15-471J
C1107	8 -21		DM15-010M
C1108	8 -19		5HKS10
C1109	8 -19		5HKS10
C113	9 -3		P123ZGP
C130	9 -4		5HKS10
C131	2 -2		TVL3561-7
C217	4 -6		829-3
C218	4 -9		40C214
C219	4 -10		301C0K209C
C220	4 -7		829-6
C221	4 -10		301C0K209C
C222	4 -8		829-4
C223	4 -11		301C0H100K
C224	4 -12		514C11A
C225	4 -9		40C214
C226	4 -9		40C214
C227	4 -13		507C2
C228	4 -14		514C1
C229	4 -7		829-6
C230	4 -15		301C0H829D
C231	4 -16		301C0H689D
C232	4 -13		507C2
C233	4 -17		301C0K508B
C234	4 -18		301C0J339C
C235	4 -9		40C214
C236	4 -14		514C1
C237	4 -17		301C0K508B
C238	4 -14		514C1
C239	4 -9		40C214
C240	4 -13		507C2
C241	4 -14		514C1
C242	4 -14		514C1
C243	4 -6		829-3
C244	4 -16		301C0H689D
C245	4 -14		514C1
C246	4 -19		301C0G330K
C247	4 -20		301C0G220K
C248	4 -21		D6-102
C249	4 -13		507C2
C250	4 -13		507C2
C251	4 -22		GP2-331
C252	4 -23		370FA
C253	4 -23		370FA
C254	4 -23		370FA
C255	4 -23		370FA
C256	4 -23		370FA
C257	4 -14		514C1
C258	4 -14		514C1
C259	4 -15		301C0H829D
C261A,B	4 -24		A17-729
C262	4 -9		40C214
C263	4 -14		514C1
C264	4 -25		HA811
C265	4 -25		HA811
C301	5 -8		301C0G120K
C302	5 -9		CM15E620J
C304	5 -5		829-10
C307	5 -10		507C2
C309	5 -11		40C214
C310	5 -12		301C0H569C
C311	5 -13		20C8
C312	5 -13		20C8
C313	5 -14		301C0G180K
C314	5 -4		829-7
C316	5 -11		40C214
C317	5 -13		20C8
C318	5 -10		507C2
C319	5 -12		301C0H569C
C320	5 -15		301C0G240K
C321	5 -16		CM15E151J
C322	5 -4		829-7
C323	5 -8		301C0G120K
C324	5 -8		301C0G120K
C325	5 -17		301C0K508B
C326	5 -11		40C214
C327	5 -18		514C1
C328	5 -18		514C1
C329	5 -18		514C1
C331	5 -4		829-7
C332	5 -11		40C214
C333	5 -19		301C0H100K
C334	5 -20		301C0H479C
C335	5 -21		301C0H689D
C336	5 -17		301C0K508B
C338	5 -13		20C8
C339	5 -13		20C8
C340	5 -13		20C8
C341	5 -13		20C8
C342	5 -11		40C214
C343	5 -13		20C8
C344	5 -22		514C11A
C345	5 -11		40C214
C346	5 -11		40C214
C347	5 -11		40C214
C348	5 -11		40C214
C349	5 -11		40C214
C401	6 -20		301C0H100K
C402	6 -21		301C0H829D
C403	6 -22		20C8
C404	6 -23		301C0H479C
C405	6 -24		40C214
C406	6 -25		514C1
C407	6 -22		20C8
C408	6 -26		301C0J229B
C409	6 -27		507C2
C410	6 -26		301C0J229B
C411	6 -28		315S2H330J
C412	6 -29		GP2-331-470
C413	6 -22		20C8
C414	6 -30		CM150030M
C415	6 -27		507C2
C416	6 -31		HA811
C417	6 -31		HA811
C418	6 -29		GP2-331-470
C419	6 -31		HA811
C420	6 -32		GP2-331-390
C421	6 -29		GP2-331-470
C422	6 -22		20C8
C423	6 -33		301C0G120K
C424	6 -22		20C8
C425	6 -33		301C0G120K
C426	6 -34		TCZR68
C427	6 -35		301C0K159C
C428	6 -36		301C0K129C
C429	6 -37		302B1G390J
C430	6 -38		CM15E221J
C431	6 -37		302B1G390J
C432	6 -29		GP2-331-470
C433	6 -25		514C1
C434	6 -25		514C1
C435	6 -27		507C2
C436	6 -39		301C0K508B
C437	6 -39		301C0K508B
C438	6 -22		20C8
C439	6 -29		GP2-331-470
C440	6 -25		514C1
C441	6 -32		GP2-331-390
C442	6 -29		GP2-331-470
C443	6 -31		HA811
C444	6 -40		CM15E101J
C445	6 -31		HA811
C446	6 -41		NP0A5-1UUF

REFERENCE DESIGNATION	FIG. AND INDEX NO.	STOCK NUMBER	MFR PART NUMBER
C447	6 -35		301C0K159C
C448	6 -33		301C0G120K
C449	6 -25		514C1
C450	6 -25		514C1
C451	6 -37		302B1G390J
C452	6 -36		301C0K129C
C453	6 -31		HA811
C454	6 -43		CM15E910J
C455	6 -44		301C0J399C
C456	6 -45		BPD03
C457	6 -46		301C0J220K
C458	6 -25		514C1
C459	6 -25		514C1
C460	6 -22		20C8
C461	6 -31		HA811
C463	6 -31		HA811
C464	6 -47		301C0K209B
C465	6 -29		GP2-331-470
C466	6 -25		514C1
C467	6 -27		507C2
C468	6 -29		GP2-331-470
C469	6 -29		GP2-331-470
C471	6 -48		CM15E330J
C472	6 -49		P123ZGP
C473	6 -25		514C1
C474	6 -50		CM15E100J
C475	6 -31		HA811
C476	6 -31		HA811
C477	6 -51		CM15E391J
C478	6 -52		CM15E510J
C479	6 -40		CM15E101J
C480	6 -25		514C1
C481	6 -31		HA811
C482	6 -22		20C8
C483	6 -24		40C214
C485	6 -24		40C214
C487	6 -27		507C2
C488	6 -37		302B1G390J
C489	6 -22		20C8
C490	6 -31		HA811
C491	6 -25		514C1
C492	6 -25		514C1
C493	6 -53		CM15E270J
C494	6 -25		514C1
C495	6 -38		CM15E221J
C496	6 -22		20C8
C497	6 -22		20C8
C498	6 -31		HA811
C499	6 -31		HA811
C601	7 -15		40C272
C602	7 -15		40C272
C603	7 -15		40C272
C604	7 -15		40C272
C605	7 -16		301C0K508C
C606	7 -17		301C0J229C
C607	7 -8		DM10-100J
C608	7 -18		DM10-201J
C609	7 -15		40C272
C610	7 -19		DM10-220J
C611	7 -19		DM10-220J
C612	7 -15		40C272
C613	7 -15		40C272
C614	7 -6		DM10-470J
C615	7 -7		301C0H689C
C616	2 -32		301C0J339C
C617	2 -31		DM10-100J
C618	2 -33		301C0H479C
C619	7 -15		40C272
C620	7 -8		DM10-100J
C621	7 -9		DM10-101J
C622	7 -9		DM10-101J
C623	7 -15		40C272
C624	7 -15		40C272
C625	7 -15		40C272
C626	7 -8		DM10-100J
C627	7 -15		40C272
C628	7 -8		DM10-100J
C629	7 -9		DM10-101J
C630	7 -15		40C272
C631	7 -15		40C272
C632	7 -10		DM10-820J
C633	7 -11		DM10-330J
C634	7 -9		DM10-101J
C635	7 -9		DM10-101J
C636	7 -9		DM10-101J
C637	7 -20		29C262
C638	7 -21		29C986
DS101	1 -3		327
DS102	1 -3		327
DS103	1 -3		327
DS104	1 -3		327
DS105	1 -3		327
DS106	1 -3		327
DS107	1 -3		327
DS108	1 -3		327
DS109	1 -3		327
J0091	6 -88		R50-100
J1001	8 -3		R50-100
J101	1 -18		UG1052U
J102	1 -18		UG1052U
J103	1 -19		UG291AU
J104	1 -20		UG1094U
J105	1 -21		UG291U
J106	1 -22		DS00-19P
J107	1 -23		DS00-19S
J108	1 -24		DS00-12P
J110	3 -5		M7SLRN
J201	4 -26		UG694U
J202	4 -26		UG694U
J203	4 -26		UG694U
J204	4 -26		UG694U
J301	5 -6		UG694U
J302	5 -6		UG694U
J303	5 -6		UG694U
J401	6 -9		MX1530UP1C
J402	6 -10		UG694U
J403	6 -9		MX1530-U1PC
J601	7 -1		UG1094U
J602	7 -1		UG1094U
K0091	2 -28		94CSA1-2-126
K101	2 -4		TS4519-1
K102	2 -5		R685-4D10K
K201	4 -27		6-3-90DF
L0091	5 -39		
L1101	8 -10		1537-20
L1102	8 -11		2500-24
L201	4 -28		207-11
L202	4 -29		A14-735
L203	4 -29		A14-735
L204	4 -61		
L205A	4 -30		8304
L205B	4 -30		8304
L205C	4 -30		8304
L205D	4 -30		8304
L206	4 -29		A14-735
L207	4 -31		A17-727
L208	4 -32		A14-737
L209	4 -33		A14-749-1
L210	4 -34		A17-728
L211	4 -35		A14-806
L212	4 -32		A14-737
L213	4 -36		
L301	5 -7		HLT162
L302	5 -23		A23-868
L303	5 -23		A23-868
L304	5 -23		A23-868
L305	5 -24		A23-870
L306	5 -25		A23-871
L307	5 -26		IN
L308	5 -26		IN
L309	5 -27		A14-737
L310	5 -26		IN
L311	5 -26		IN
L312	5 -28		IN
L401	6 -55		A14-804
L402	6 -56		A15-059
L405	6 -57		
L406	6 -55		A14-804
L407	6 -55		A14-804
L408	6 -57		
L409	6 -57		
L426	6 -58		A15-056
L602	7 -2		1095
L603	7 -24		1096
L604	7 -25		1034-1
L605	7 -26		1034-2
L606	7 -27		2060-8
L607	7 -28		11000-15
L608	7 -29		2060-6
L609	7 -30		1041
P110	2 -8		M7PLSH19C
P201	4 -57		UG88U
P202	2 -9		UG260U
P204	2 -7		UG88U
P301	2 -7		UG88U
P302	2 -9		UG260U

REFERENCE DESIGNATION	FIG. AND INDEX NO.	STOCK NUMBER	MFR PART NUMBER
P303	2 -7		UG88U
P402	2 -7		UG88U
P601	2 -7		UG88U
P602	2 -7		UG88U
Q1101	8 -7		GD00051-1
R0091	1 -17		3600S1-103
R0092	4 -58		RC07GF220J
R0093	6 -89		RC20GF752J
R101	3 -7		EB1041
R102	3 -8		EB2245
R103	9 -6		EB4731
R104	3 -9		EB4731
R105	9 -7		GB1031
R106	1 -4		CA 1041
R108	3 -10		EB1055
R109	9 -8		EB2231
R110	9 -9		EB2025
R1101	8 -12		3250P1-202
R1102	8 -14		RC07GF473J
R1103	8 -14		RC07GF473J
R1104	8 -14		RC07GF473J
R1105	8 -16		RC07GF474J
R1106	8 -15		RC07GF134J
R1107	8 -13		RC07GF683J
R1108	8 -18		RC07GF394J
R1109	8 -17		RC20GF184J
R111	9 -10		EB2445
R112	1 -5		JA1N104P103VA
R113	9 -11		GB4735
R114	9 -12		EB4745
R115	3 -11		EB2455
R116	9 -13		EB2245
R117	3 -12		EB1035
R118	3 -10		EB1055
R119	3 -13		EB1025
R120	9 -14		EB5145
R121	1 -6		65-10KPORM20PCT
R122	9 -11		GB4735
R123	9 -15		EB1055
R124	9 -16		EB1041
R125	9 -17		EB6835
R126	9 -18		EB3015
R127	1 -14		RV5LAXSB255B
R128	9 -19		HB1235
R129	9 -19		HB1235
R130	9 -15		EB1055
R131	9 -20		EB2035
R132	9 -21		EB3341
R133	1 -6		65-10KPORM20PCT
R135	9 -25		EB2445
R136	9 -22		EB4755
R137	9 -26		EB2435
R138	9 -15		EB1055
R139	2 -11		EB1055
R140	3 -14		HB1335
R145	3 -15		B10-2-5K1
R160	3 -16		RC20GF105J
R161	3 -17		RC20GF221J
R162	3 -18		RC32GF472J
R163	3 -19		
R164	3 -20		RC20GF153J
R165	3 -21		RC42GF103J
R170	3 -22		GB82G5
R201	4 -37		EB1615
R202	4 -38		EB1015
R203	4 -39		EB8225
R204	4 -40		EB5135
R205	4 -41		HB1525
R206	4 -42		GB5625
R207	4 -43		EB6225
R208	4 -44		EB1215
R209	4 -45		EB4745
R210	4 -45		EB4745
R211	4 -46		EB2731
R212	4 -47		EB1541
R213	4 -48		HB8221
R214	4 -46		EB2731
R215	4 -49		EB2211
R216	4 -38		EB1015
R217	4 -50		GB5115
R218	4 -51		GB1025
R219	4 -52		EB1545
R220	4 -53		RH25
R301	5 -29		EB2245
R302	5 -30		EB1515
R303	5 -31		EB5635
R304	5 -32		EB9125
R305	5 -33		EB1025
R306	5 -29		EB2245
R307	5 -30		EB1515
R308	5 -31		EB5635
R309	5 -33		EB1025
R310	5 -32		EB9125
R311	5 -34		EB2735
R312	5 -35		EB4745
R313	5 -35		EB4745
R314	5 -36		EB1045
R316	5 -36		EB1045
R317	5 -37		EB8225
R401	6 -59		EB2231
R402	6 -60		EB1021
R403	6 -61		EB1241
R404	6 -62		EB4741
R405	6 -63		EB2241
R406	6 -64		EB1035
R407	6 -65		EB8205
R408	6 -65		EB8205
R409	6 -66		EB1015
R410	6 -61		EB1241
R411	6 -61		EB1241
R412	6 -60		EB1021
R413	6 -62		EB4741
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R422	6 -60		EB1021
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R425	6 -66		EB1015
R426	6 -67		EB8241
R427	6 -68		EB1031
R428	6 -69		EB1041
R429	6 -70		EB5105
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R434	6 -72		EB4731
R436	6 -60		EB1021
R439	6 -73		EB4725
R440	6 -74		EB1551
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R442	6 -72		EB4731
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R445	6 -75		EB3335
R446	6 -72		EB4731
R448	6 -76		EB1045
R449	6 -64		EB1035
R451	6 -76		EB1045
R452	6 -77		GB4705
R457	6 -60		EB1021
R458	6 -60		EB1021
R459	6 -68		EB1031
R460	6 -70		EB5105
R461	6 -62		EB4741
R462	6 -78		EB2035
R463	6 -79		EB3035
R464	6 -60		EB1021
R465	6 -80		EB3341
R466	6 -81		EB2435
R467	6 -82		EB5035
R468	6 -83		EB4735
R469	6 -81		EB2435
R601	7 -31		CB2241
R602	7 -32		CB5605
R603	7 -33		CB4735
R604	7 -34		CB1021
R605	7 -35		CB1051
R606	7 -34		CB1021
R607	7 -36		CB1045
R608	7 -37		EB4735
R609	7 -35		CB1051
R610	7 -38		CB1035
R611	7 -36		CB1045
R612	7 -39		CB8241
R613	7 -32		CB5605
R614	7 -38		CB1035
R615	7 -34		CB1021
R616	7 -40		EB1045
R617	7 -34		CB1021
R618	7 -40		EB1045
R619	7 -41		EB8235

REFERENCE DESIGNATION	FIG. AND INDEX NO.	STOCK NUMBER	MFR PART NUMBER
R620	7 -36		CB1045
R621	7 -36		CB1045
R622	7 -42		CB1235
R623	7 -43		CB3635
R624	7 -44		CB3341
R625	7 -45		CB1001
S0091	1 -15		6AT2
S0092	1 -16		A324
S0093	2 -23		1SX1T
S102	1 -8		24005-3
S103	1 -9		24804-2
S104	1 -10		523
S105	1 -7		A3234W
TP401	6 -84		1433
TP402	6 -84		1433
T101	2 -12		B31-575
T102	2 -13		B31-539
T401	6 -11		AB31-678
T402	6 -12		
T403	6 -13		
T404	6 -12		
T405	6 -13		
T406	6 -12		
T407	6 -16		AB14-799
T408	6 -17		AB14-976
T409	6 -13		
T410	6 -12		
T411	6 -14		AB31-760
T412	6 -15		AB31-761
T413	6 -18		AB15-102
T414	6 -19		AB15-104
T601	7 -46		1092
V101	2 -14		12AU7A
V102	2 -14		12AU7A
V103	2 -14		12AU7A
V104	2 -14		12AU7A
V105	2 -14		12AU7A
V201	4 -54		6280
V202	4 -1		6J4
V203	4 -2		6AK5
V204	4 -3		6AF4A
V301	5 -1		6AK5
V302	5 -1		6AK5
V303	5 -1		6AK5
V304	5 -2		6AF4A
V401	6 -1		6DC6
V402	6 -1		6DC6
V403	6 -2		6CB6
V404	6 -3		6AK5
V405	6 -4		6AL5
V406	6 -5		6AU6
V407	6 -6		6BA6
V408	6 -3		6AK5
V409	6 -6		6BA6
V410	6 -4		6AL5
V601	7 -5		6CW4
V602	7 -5		6CW4
V603	7 -4		7587
V604	7 -5		6CW4
V605	7 -4		7587
V606	7 -4		7587
W601	2 -15		2002-3
XDS101	1 -11		TT61A87
XDS102	1 -11		TT61A87
XDS103	1 -11		TT61A87
XDS104	1 -11		TT61A87
XDS105	1 -11		TT61A87
XDS106	1 -11		TT61A87
XDS107	1 -12		107-1930-975
XDS108	1 -12		107-1930-975
XDS109	1 -13		8-1930XP24
XV101	3 -23		TS103P01
XV102	3 -23		TS103P01
XV103	3 -23		TS103P01
XV104	3 -23		TS103P01
XV105	3 -23		TS103P01
XV201	4 -55		14F14078
XV202	4 -56		TS102P01
XV203	4 -56		TS102P01
XV204	4 -56		TS102P01
XV301	5 -38		TS102P01
XV302	5 -38		TS102P01
XV303	5 -38		TS102PJ1
XV304	5 -38		TS102P01
XV401	6 -85		TS102P01
XV402	6 -85		TS102P01
XV403	6 -85		TS102P01
XV404	6 -85		TS102P01
XV405	6 -85		TS102P01
XV406	6 -85		TS102P01
XV407	6 -85		TS102P01
XV408	6 -85		TS102P01
XV409	6 -85		TS102P01
XV410	6 -85		TS102P01
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XV602	7 -47		133-65-10-001
XV603	7 -47		133-65-10-001
XV604	7 -47		133-65-10-001
XV605	7 -47		133-65-10-001
XV606	7 -47		133-65-10-001
XY401	6 -86		126-105-2
Y1101	8 -8		2083127
Y401	6 -87		MS91388
Z601	2 -30		1079
Z602	2 -30		1155

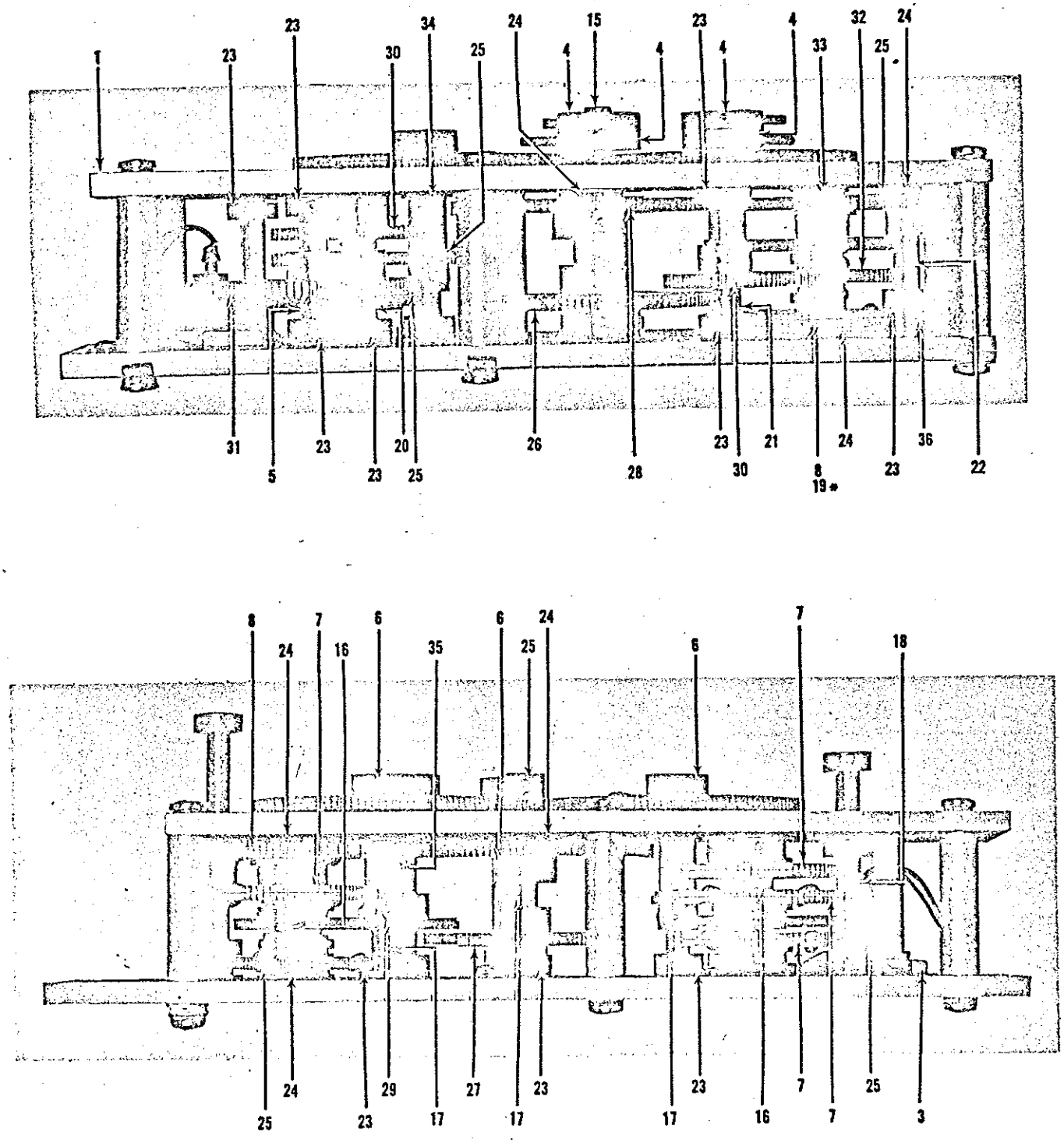

Figure 6-10. Gear Train Assembly

SECTION VII
SCHEMATICS