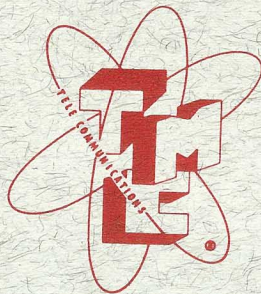


INSTRUCTION BOOK
for
**SINGLE SIDEBAND
ADAPTER
MODEL GSB-1**



THE TECHNICAL MATERIEL CORPORATION

Mamaroneck, New York

Ottawa, Ontario

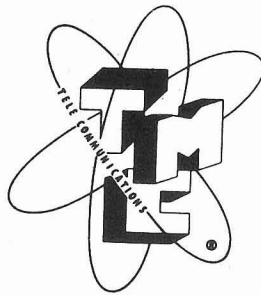
PRICE \$1.25

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SECTION I

GENERAL DESCRIPTION

1. DESCRIPTION

The TMC Model GSB, Single Sideband Adapter is a precision built unit, housed in an attractive metal cabinet to match the TMC Model GPR-90 Communication Receiver. Cable and connectors are provided with each GSB to permit shielded connection between the IF Output of the GPR-90 and the IF Input of the GSB.

The GSB is a filter type adapter designed for use with receivers having a 455 Kc IF. It permits simple and accurate tuning of single sideband signals and greatly facilitates the reception of AM and CW signals.

The 455 Kc receiver output is first amplified and then converted to the region of 17 Kc by means of the 1st Oscillator and 1st Mixer. At this lower frequency the entire shortskirt selectivity is obtained. A tuning control tunes the incoming signal for proper relation to the band-pass filter which, with a bandwidth of 2.5 Kc at the 6 db. point and a skirt width at the 50 db. point of 3.5 Kc, permits sharp rejection of unwanted signals. A product

detector follows the band-pass filter and provides carrier reinsertion for demodulation of Single Sideband, Exalted Carrier and CW signals to the best advantage. A low pass filter, with a cut-off at 5 Kc and high attenuation at 17 Kc, follows the product detector and eliminates all unwanted signals. Added protection of the first mixer against overload is provided by the use of a separate AVC system. Fast or slow, AVC is provided by a switch on the front panel. This AVC system controls the signal beyond that provided by the receiver. A built-in audio amplifier eliminates the necessity of using the receiver's audio system. Further, by paralleling the audio outputs of the GSB and the receiver, one speaker may be used for the receiver or GSB outputs by simply manipulating the audio gain controls on each unit.

An UPPER/LOWER SIDEBAND switch permits the selection of either sideband. In the reception of AM signals, the use of this switch permits selection of the sideband on which unwanted signals are least objectionable. With the AM/SSB switch in the SSB position, it is possible to re-



Figure 1-1. Front View, Model GSB-1.

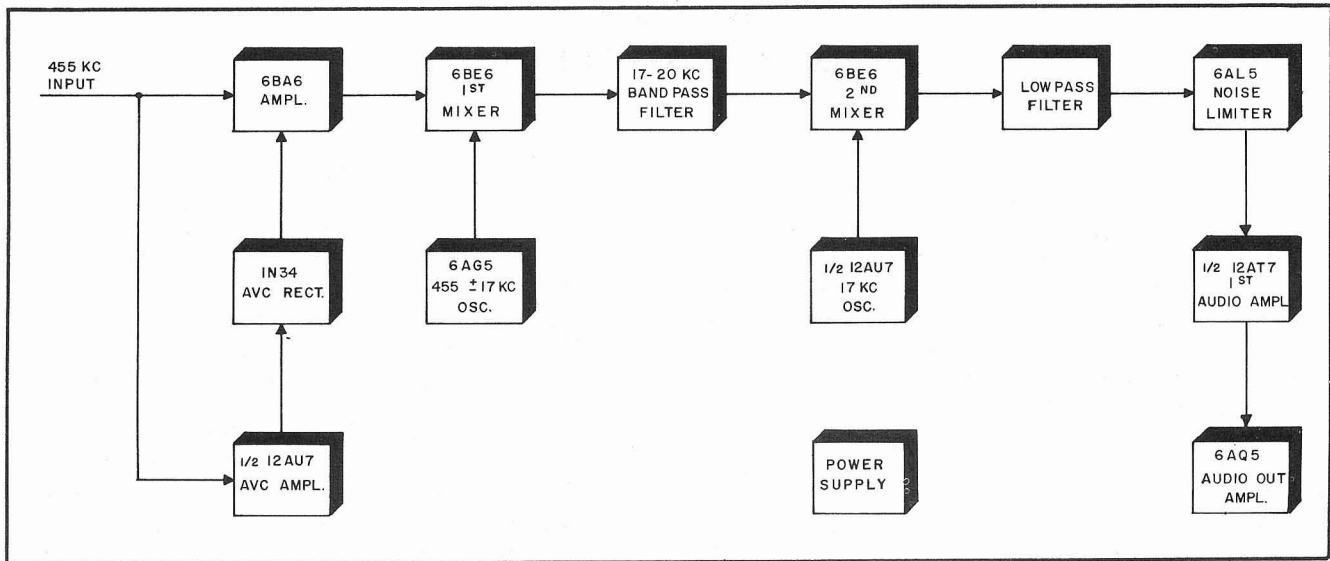


Figure 1-2. Block Diagram, Model GSB-1.

ceive AM signals with exalted carrier induced by carrier reinsertion produced in the GSB circuitry.

A noise limiter is also provided which clips both positive and negative peaks and is placed in or out of the circuitry by means of an ON-OFF switch on the front panel.

The only requirement for using the GSB, with any other receiver having 455 Kc IF, is that a shielded connection be brought out from the plate of the last IF tube for connection to the IF input of the GSB.

2. FRONT PANEL CONTROLS

- A. Power ON/OFF Switch
- B. Bandsread
- C. Upper-Lower Sideband Selector Switch
- D. SSB-AM Selector Switch
- E. AVC ON/OFF Switch
- F. AVC FAST/SLOW Switch
- G. Noise Limiter ON/OFF Switch

3. TECHNICAL SPECIFICATIONS

FREQUENCY RANGE:
452-458 Kc.

TYPE OF RECEPTION:
AM, SSB (upper or lower), CW.

IF INPUT VOLTAGE RANGE:
0.1-10 volts (rms).

INPUT IMPEDANCE:
High from IF.

AUDIO OUTPUT:

At output jack (before audio amplifier) 0.3 volts (rms) for 0.3 volts (rms) input.

Impedance to match audio grid.

At terminals (after audio amplifier) 1 watt.

Impedance-

- Loudspeaker-6, 8, 16 ohms
- Line- 600 ohms
- Headset- High or Low

AVC CHARACTERISTICS:

With 40 db change in input, output remains constant within 9 db.

INPUT POWER:

115 volts, 50/60 cycles, 55 watts.

SIZE:

12'' wide x 10'' high x 15'' deep.

SHIPPING DATA:

WEIGHT

| NET | GROSS |
|---------|----------|
| 27 lbs. | 31 lbs.* |
| | 57 lbs. |

DIMENSIONS

- *Carton- 14'' wide x 13-1/2'' high x 17'' deep.
- Export- 15'' wide x 16'' high x 20'' deep.

COMPONENTS AND CONSTRUCTION:

Equipment manufactured in accordance with JAN specifications wherever practicable.

SECTION II INSTALLATION

1. UNPACKING

Carefully unpack the GSB and check any instructions which may be accompanying the instrument. The equipment should be checked for any damage that may have occurred during shipment or storage.

2. INSTALLATION

The Model GSB, although originally designed for use with the Model GPR-90 receiver, (which already provides proper terminals) may be used with any receiver which will provide .3 volts (rms) R.F. input at approximately 455 Kc. For connec-

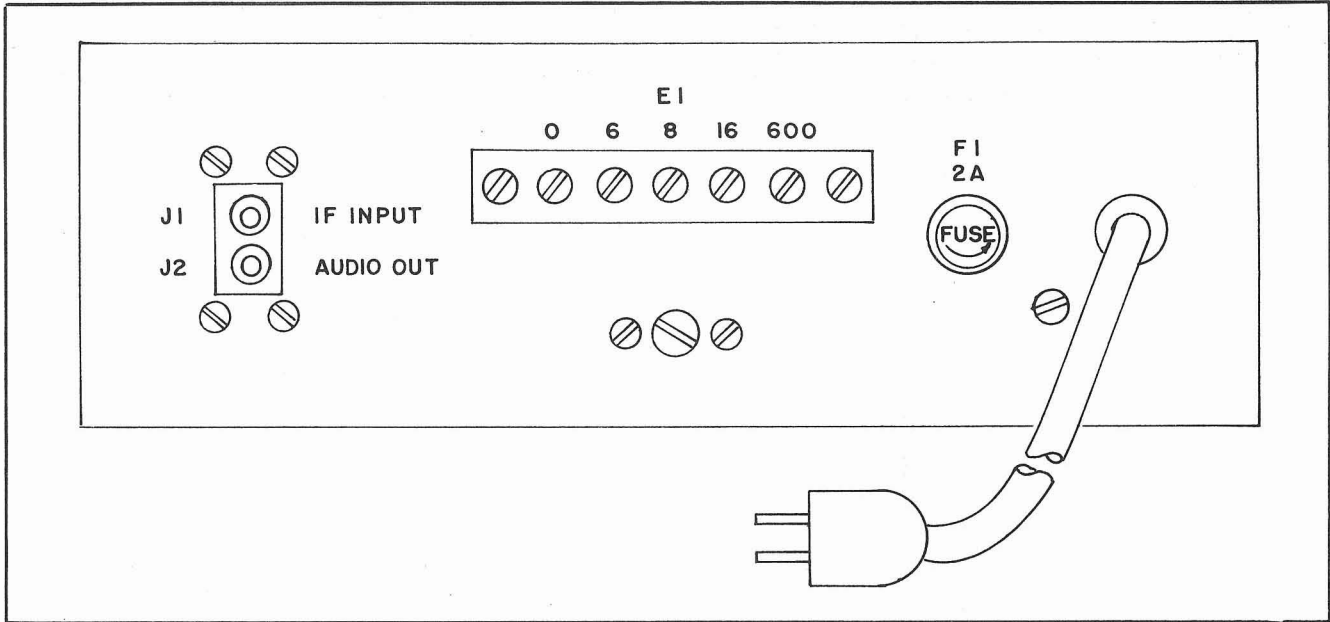


Figure 2-1. Rear View, Outside of Chassis, Model GSB-1.

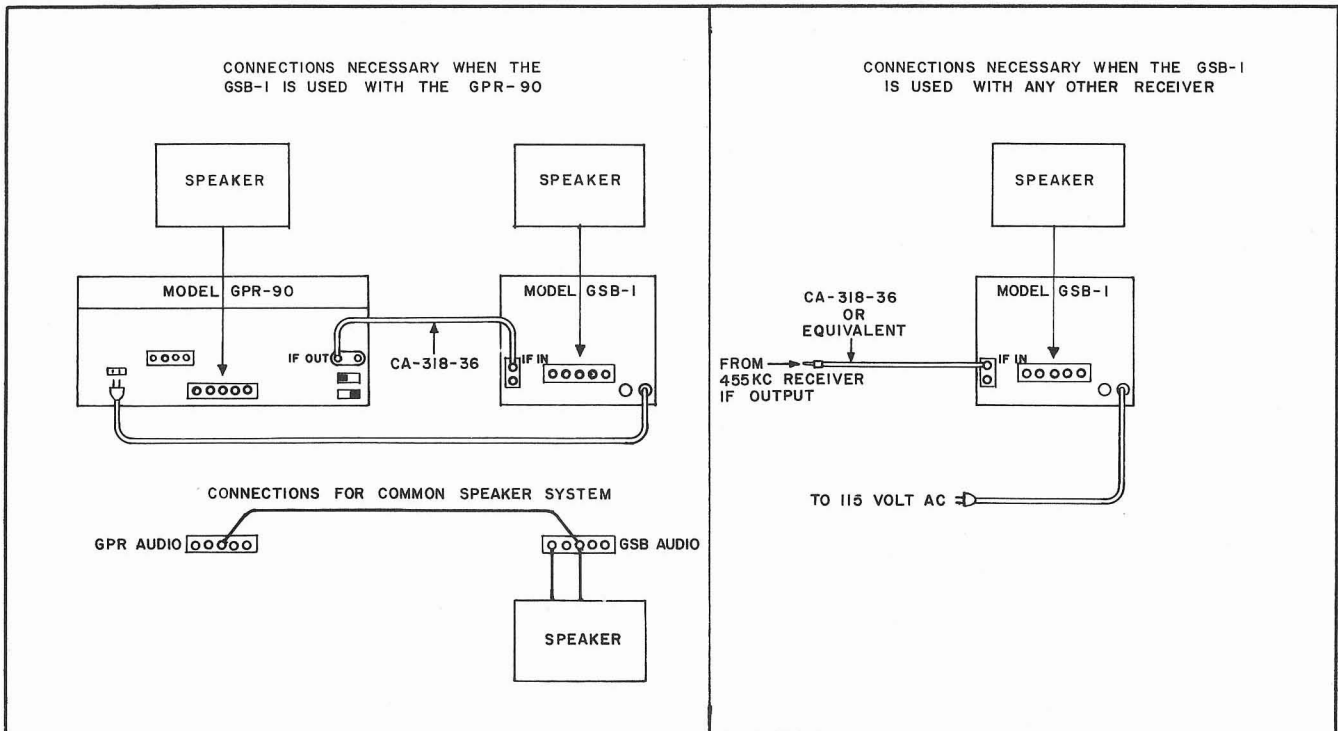


Figure 2-2. Connection to Receiver

tion to the GPR-90 receiver, refer to Figure 2-2. If there is no external provision for this connection on your receiver, it will be necessary to bring a lead out through a 10 mmfd coupling capacitor from the plate of the final I. F. stage. The use of RG-58/U low loss coaxial cable of short length, is recommended. This cable and fittings are inclosed with each unit.

The Audio Output of the Adapter is available for loudspeakers, line or headphones. Connect a loudspeaker to the proper terminals on the rear apron of the GSB. Use of a headset on the Adapter opens the loudspeaker circuit.

If desired, the output of both the GSB and re-

ceiver may be used with a single loudspeaker or headset. Connect a single lead from an Audio Output terminal on the receiver to a terminal with nearly the same impedance on the GSB. The shield of the I. F. connecting co-axial cable is the circuit ground return. The output impedance at the terminals has now been halved. Therefore, to match the loudspeaker correctly it must be connected to the next higher impedance terminal on the GSB. Inserting the headset in the GSB jack disconnects the loudspeaker as before and still permits output from both the adapter and receiver. The output of either the adapter, receiver, or both will be controlled by the proper manipulation of both Audio Gain Controls.

SECTION III OPERATION

1. DESCRIPTION OF CONTROLS

- a. Audio Gain - Power/off control; Clockwise rotation of this control first applies power to the GSB. Further rotation controls the audio output.
- b. Sideband - Upper/Lower control. This switch places the 1st oscillator in the correct position to permit either the upper or lower sideband to pass through bandpass filter.
- c. The Band Spread control varies the 1st oscillator over a limited range from the mid-frequencies of 438 and 472 Kcs. This permits a fine adjustment of the incoming signal to the bandpass filter and to the 17 Kc 2nd oscillator.
- d. The AM/SSB Switch turns on the 17 Kc 2nd oscillator in the SSB position. This oscillator is used for carrier reinsertion for SSB, exalted carrier or BFO for CW.
- e. The AVC ON/OFF Switch provides overload protection for the first mixer by controlling the gain of the first I. F. amplifier.
- f. The AVC Fast/Slow Switch provides two time constants. Fast for SSB and AM signals, slow for CW signals.
- g. Noise limiter clips both positive and negative noise peaks.

2. TUNING PROCEDURE

A. SINGLE SIDEBAND SIGNALS.

1. CONTROL POSITIONS:

| | |
|----------------------|---|
| SSB-AM Switch | SSB |
| BAND SPREAD | ON ZERO |
| SSB Switch | Either UPPER or LOWER, depending on which reception is desired. |
| AVC ON/OFF | ON |
| AVC SLOW/FAST | SLOW for voice |
| NOISE LIMITER Switch | OFF until necessary |

Tune the receiver for maximum momentary deflection on the S meter. This assures that the signal is centered in the receiver I. F. pass band. Tune the Band Spread knob on the Adapter very slowly for maximum intelligibility of the received signal. If the signal sounds garbled regardless of the Band Spread position, switch to the opposite sideband. For best AVC action, the R.F. gain of the receiver should be fully advanced. However, if reception is extremely noisy, the R. F. gain setting should be reduced.

B. AM SIGNALS.

CONTROL POSITIONS:

| | |
|----------------------|---------------------|
| SSB-AM | AM |
| BAND SPREAD | ON ZERO |
| SSB Switch | Upper or Lower |
| AVC ON/OFF | ON |
| AVC SLOW/FAST | FAST for voice |
| NOISE LIMITER Switch | OFF until necessary |

Tune the receiver for maximum deflection on the S meter. Turn the Band Spread knob on the Adapter very slowly for maximum intelligibility of the signal. Correct demodulation will occur when the carrier and one sideband are placed in the filter bandpass. If interference appears on the signal, switching sidebands will eliminate its effects. Returning the Band Spread control will again be required to bring the other Sideband and carrier back into the filter pass-band.

C. EXALTED CARRIER AM

1. CONTROL POSITION:

same as for SSB

2. The reception of H. F. AM signals may be accompanied by selective fading. The random fading of the carrier and its sidebands will produce considerable distortion. This can be eliminated by the demodulation of the signal with a locally generated carrier. This is accomplished in the GSB with the AM/SSB switch on SSB. Tune the Band Spread control to obtain a zero beat with the carrier. If interference is found, switching sidebands will eliminate it. No retuning of the Band Spread control is necessary.

D. CW SIGNALS.

Slow Switch on Slow.

1. CONTROL POSITIONS

Same as for SSB except AVC Fast/

2. CW may be received very simply with the GSB by simply tuning the Band Spread knob to obtain the desired audio tone.

SECTION IV ALIGNMENT

1. 17 Kc OSCILLATOR

With the AM/SSB switch on SSB the frequency of the 17 Kc second oscillator may be determined at the plate of the second mixer V5. Use of a frequency meter or E put counter will give direct readings of frequency while a lissajou pattern method using an accurate audio generator and oscilloscope will give an indirect method of measurement. Adjust C-24 until 17,000 cycles is obtained.

2. 472 Kc OSCILLATOR

Set the Sideband Switch in the UPPER position. Set the Band Spread dial at Zero. Con-

nect some frequency measuring device to the plate of V4 and adjust the slug in T1 until a frequency of 472 Kc is obtained.

3. 438 Kc OSCILLATOR

Set the Sideband Switch in the lower position. Follow the same procedure as for the 472 Kc Oscillator, but in this case C16 should be adjusted. An air test will tell if the upper and lower frequencies are correct. Tune in an AM signal with the AM/SSB Switch on SSB. Tune as for Exalted Carrier in the upper sideband position. When a zero beat is obtained switch to lower sideband. No change of zero beat should occur. If so re-adjust C16.

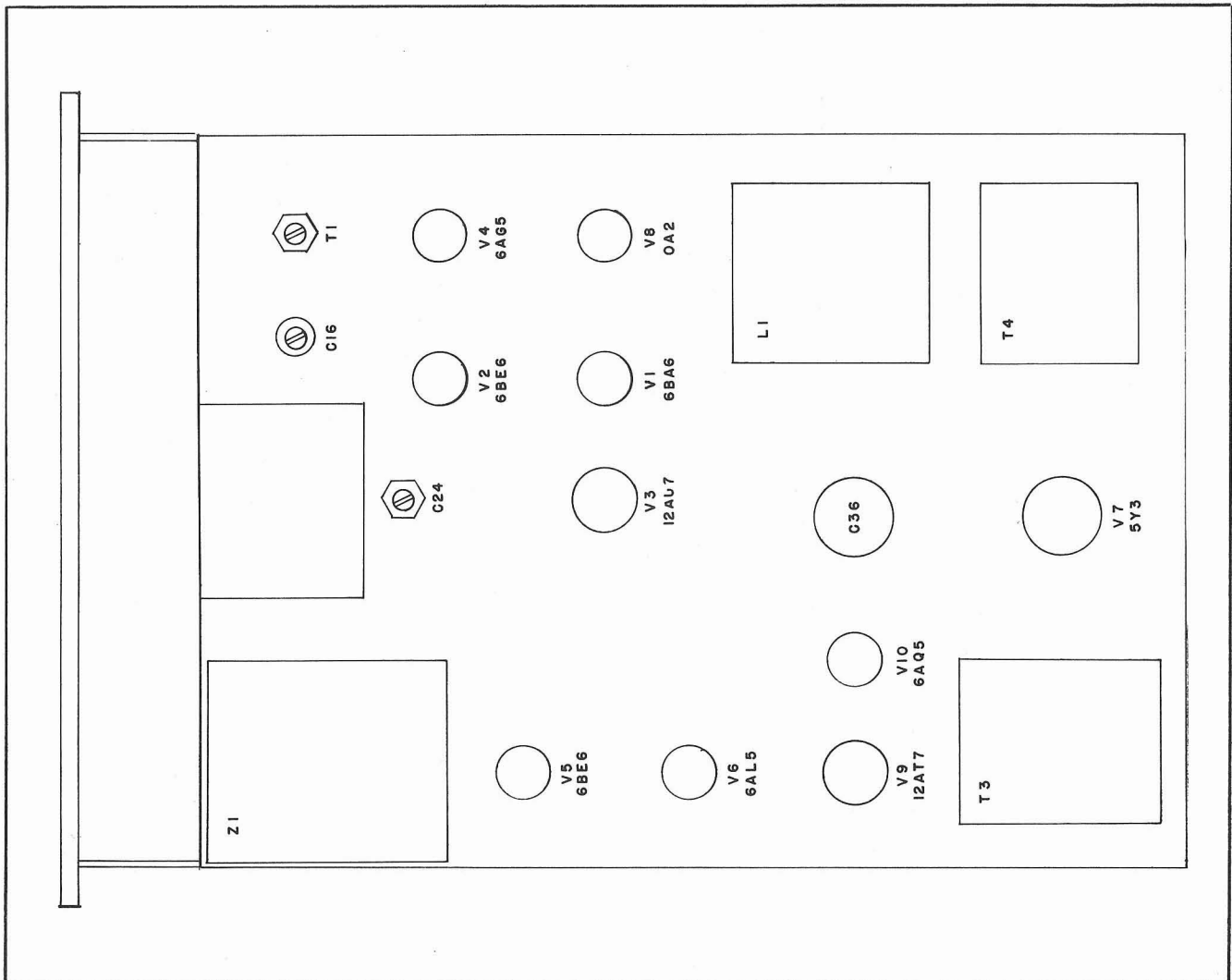


Figure 4-1. Top View, Outside of Chassis, Model GSB-1.

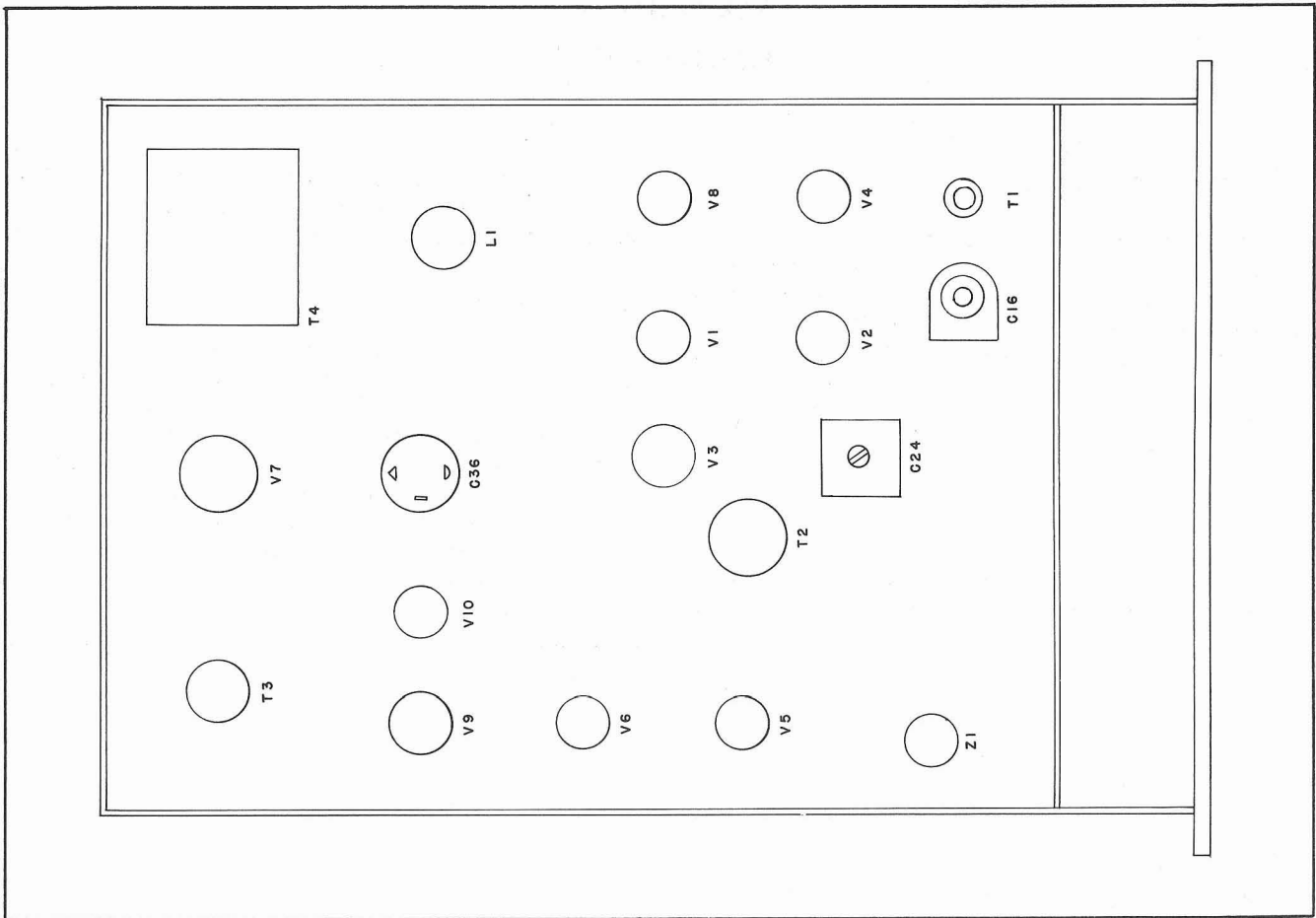


Figure 4-2. Bottom View, Inside of Chassis, Model GSB-1.

NOTE When no frequency calibration equipment is available, the GSB may be aligned to the receiver. The GSB Adapter has been aligned for use with a receiver with a 455 Kc I.F. If the receiver you are using is slightly different, but within range of 452-458 Kc, it may be aligned as follows:

Set the Band Spread dial at zero, the

Upper-lower sideband switch to Upper, the AM-SSB Switch to SSB. Tune in an AM signal on the receiver for maximum S meter deflection. Adjust the slug, in T1 for zero beat which then will give maximum intelligibility. Switch to lower sideband and adjust C16 for zero beat and maximum intelligibility. The GSB is now properly aligned.

SECTION V DATA

TABLE 5-1. TUBE VOLTAGES AND RESISTANCES

| TUBE | TYPE | FUNCTION | SOCKET PIN NUMBERS | | | | | | | | |
|------|-------|------------------------|--------------------|------|------|------|------|-----|-----|-----|------|
| | | | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 |
| V1 | 6BA6 | IF AMPL | -0.5 | 1.7 | 3.3* | 3.3* | 200 | 100 | 1.7 | | |
| V2 | 6BE6 | 1 ST MIXER | -10 | 2.2 | 3.3* | 3.3* | 200 | 50 | 0 | | |
| V3 | 12AU7 | AVC AMPL— 17 KC OSC | 140 | -24 | 0 | 3.3* | 3.3* | 120 | 0 | 3.5 | 3.3* |
| V4 | 6AG5 | 1 ST OSC | -12 | 0 | 3.3* | 3.3* | 115 | 90 | 0 | | |
| V5 | 6BE6 | 2 ND MIXER | -18 | 0.6 | 3.3* | 3.3* | 170 | 85 | 0 | | |
| V6 | 6AL5 | NOISE LIMITER | -0.1 | -0.1 | 3.3* | 3.3* | 3.5 | | -1 | | |
| V7 | 5Y3 | RECTIFIER | NC | 260 | NC | -5 | NC | -5 | NC | 260 | |
| V8 | 0A2 | REGULATOR | 150 | NC | NC | 0 | NC | NC | NC | | |
| V9 | 12AT7 | 1 ST AUDIO | NC | NC | NC | 3.3* | 3.3* | 100 | 0 | 0.8 | 3.3* |
| V10 | 6AQ5 | AUDIO OUTPUT | 0 | 10 | 3.3* | 3.3* | 200 | 200 | NC | | |

*=AC VOLTAGES

NC=NO CONNECTION

| TUBE | TYPE | FUNCTION | SOCKET PIN NUMBERS | | | | | | | | |
|------|-------|------------------------|--------------------|------|----|-----|------|------|------|------|---|
| | | | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 |
| V1 | 6BA6 | IF AMPL | 3M | 220 | 90 | 90 | 100K | 100K | 220 | | |
| V2 | 6BE6 | 1 ST MIXER | 22K | 220 | 90 | 90 | 100K | 100K | 470K | | |
| V3 | 12AU7 | AVC AMPL— 17 KC OSC | 100K | 100K | 1 | 90 | 90 | 100K | 470K | 680 | |
| V4 | 6AG5 | 1 ST OSC | 100K | 0.5 | 90 | 90 | 100K | 100K | 0.5 | | |
| V5 | 6BE6 | 2 ND MIXER | 47K | 120 | 90 | 90 | 100K | 100K | 15K | | |
| V6 | 6AL5 | NOISE LIMITER | 200K | 200K | 90 | 90 | 2.2M | NC | 2.2M | | |
| V7 | 5Y3 | RECTIFIER | NC | 100K | NC | 130 | NC | 130 | NC | 100K | |
| V8 | 0A2 | REGULATOR | 300K | NC | NC | 0 | NC | NC | NC | | |
| V9 | 12AT7 | 1 ST AUDIO | NC | NC | NC | 90 | 90 | 100K | 1M | 220 | |
| V10 | 6AQ5 | AUDIO OUTPUT | 470K | 300 | 90 | 90 | 100K | 100K | NC | | |

CONDITIONS:

1. LINE—115 VOLTS, 60 CPS.
2. AF GAIN CONTROL FULL CW.
3. AM/SSB SWITCH—SSB.
4. UPPER/LOWER SIDEBAND SWITCH—UPPER.
5. BANDSPREAD—ZERO.
6. AVC ON/OFF SWITCH—ON.
7. ALL MEASUREMENTS TAKEN WITH RESPECT TO GROUND USING A HEWLETT-PACKARD MODEL 410B VTVM OR EQUIVALENT.

K= THOUSAND
M= MILLION

PARTS LIST

SINGLE SIDEBAND ADAPTER, MODEL GSB-1

| SYM. | DESCRIPTION | FUNCTION | TMC PART NO. |
|------|--|--------------------------------------|-----------------|
| C1 | CAPACITOR, fixed: ceramic; 120 mmfd., ± 24 mmfd.; 500 wvdc; disc type. | IF Input Coupling Cap., V1 | CC-101-4 |
| C2 | CAPACITOR, fixed: ceramic; .01 mfd., $+80\%$ - 20% , 500 wvdc; disc type. | Screen Bypass Cap., V1 | CC-100-16 |
| C3 | CAPACITOR, fixed: ceramic; 120 mmfd.; ± 24 mmfd.; 500 wvdc; disc type. Same as C1. | Coupling Cap., V1 | CC-101-4 |
| C4 | CAPACITOR, fixed: ceramic; 120 mmfd.; ± 24 mmfd.; 500 wvdc; disc type. Same as C1. | IF Input Coupling Cap., V3A | CC-101-4 |
| C5 | CAPACITOR, fixed: ceramic; .01 mfd., $+80\%$ - 20% , 500 wvdc; disc type. Same as C2. | Cathode Bypass Cap., V3A | CC-100-16 |
| C6 | CAPACITOR, fixed: ceramic; .01 mfd., $+80\%$ - 20% , 500 wvdc; disc type. Same as C2. | Coupling Cap., V3A | CC-100-16 |
| C7 | CAPACITOR, fixed: ceramic; .001 mfd., ± 200 mmfd., 500 wvdc; disc type. | AVC Filter Cap., V3A | CC-100-9 |
| C8 | CAPACITOR, fixed: paper; .05 mfd., $+40\%$ - 20% , 400 wvdc; plastic tubular case. | AVC Filter Cap., V3A | CN-100-3 |
| C9 | CAPACITOR, fixed: ceramic; .001 mfd., ± 200 mmfd., 500 wvdc; disc type. Same as C7. | Audio Coupling Cap., V19 | CC-100-9 |
| C10 | CAPACITOR, fixed: ceramic; .01 mfd., $+80\%$ - 20% , 500 wvdc; disc type. Same as C2. | Cathode Bias Cap., V2 | CC-100-16 |
| C11 | CAPACITOR, fixed: ceramic; .01 mfd., $+80\%$ - 20% , 500 wvdc; disc type. Same as C2. | Audio Output Coupling Cap., J2 | CC-100-16 |
| C12 | CAPACITOR, fixed: ceramic; .01 mfd., $+80\%$ - 20% , 500 wvdc; disc type. Same as C2. | Screen Bypass Cap., V2 | CC-100-16 |
| C13 | CAPACITOR, fixed: ceramic; .01 mfd., $+80\%$ - 20% , 500 wvdc; disc type. Same as C2. | Decoupling Cap., V4 | CC-100-16 |
| C14 | CAPACITOR, fixed: mica; 150 mmfd., $\pm 5\%$, char. D; 500 wvdc. | Osc. Inj. Cap., V4 | CM20D151J |

| SYM. | DESCRIPTION | FUNCTION | TMC PART NO. |
|------|--|--------------------------------|--------------|
| C15 | CAPACITOR, variable: air dielectric; one section, seven plates; 6.5 to 50 mmfd; round shaft, 19/32 in. lg., char. S. | Bandsread Tuning Cap. | CB118SRX050 |
| C16 | CAPACITOR, variable: ceramic; 7-45 mmfd., char. C; 500 wvdc. | 438 Kc. Osc. Tank Trimmer, V4 | CV11C450 |
| C17 | CAPACITOR, fixed: mica; 1300 mmfd., ±2%; char. E; 500 wvdc. | p/o First Osc. Tank, V4 | CM20E132G |
| C18 | CAPACITOR, fixed: mica; 200 mmfd., ±2%; char. E; 500 wvdc. | p/o 438 Kc. Osc. Tank, V4 | CM20E201G |
| C19 | CAPACITOR, fixed: mica; 1000 mmfd., ±5%; char. E; 500 wvdc. | Osc. Grid Coupling | CM20E102J |
| C20 | CAPACITOR, fixed: ceramic; .01 mfd., +80%-20%, 500 wvdc; disc type. Same as C2. | Screen Bypass Cap., V4 | CC-100-16 |
| C21 | CAPACITOR, fixed: mica; 1000 mmfd., ±5%; char. E; 500 wvdc. Same as C19. | 17 Kc. Osc. Inj. Cap. | CM20E102J |
| C22 | CAPACITOR, fixed: mica; 560 mmfd., ±5%; char. B; 500 wvdc. | p/o Low Pass Filter | CM20B561J |
| C23 | CAPACITOR, fixed: mica; 1500 mmfd., ±2%; char. E; 500 wvdc. | p/o 17 Kc Osc. Tank | CM20E152G |
| C24 | CAPACITOR, variable: mica; 100 to 550 mmfd., 4 plates; 500 wvdc. | 17 Kc. Osc. Tank Trimmer | CV-100-304 |
| C25 | CAPACITOR, fixed: mica; 1000 mmfd., ±5%; char. E; 500 wvdc. Same as C19. | Osc. Grid Coupling Cap. | CM20E102J |
| C26 | CAPACITOR, fixed: ceramic; .01 mfd., +80%-20%; 500 wvdc; disc type. Same as C2. | Plate Bypass Cap., V3B | CC-100-16 |
| C27 | CAPACITOR, fixed: ceramic; .01 mfd., +80%-20%, 500 wvdc; disc type. Same as C2. | Cathode Bypass Cap., V5 | CC-100-16 |
| C28 | CAPACITOR, fixed: ceramic; .01 mfd., +80%-20%, 500 wvdc; disc type. Same as C2. | Screen Bypass Cap., V5 | CC-100-16 |
| C29 | CAPACITOR, fixed: ceramic; .01 mfd., +80%-20%, 500 wvdc; disc type. Same as C2. | Second Mixer Coupling Cap., V5 | CC-100-16 |
| C30 | CAPACITOR, fixed: mica; 560 mmfd., ±5%; char. B; 500 wvdc. Same as C22 | p/o Low Pass Filter, V5 | CM20B561J |
| C31 | CAPACITOR, fixed: mica; 560 mmfd., ±5%; char. B; 500 wvdc. Same as C22. | p/o Low Pass Filter, V5 | CM20B561J |

| SYM. | DESCRIPTION | FUNCTION | TMC PART NO. |
|----------------|--|--------------------------------|----------------|
| C32 | CAPACITOR, fixed: ceramic; .001 mfd., ± 200 mmfd., 500 wvdc; disc type. Same as C7. | Filter Cap., V6 | CC-100-9 |
| C33 | CAPACITOR, fixed: ceramic; .001 mfd., ± 200 mmfd., 500 wvdc; disc type. Same as C7. | Filter Cap., V6 | CC-100-9 |
| C34A, B | CAPACITOR, fixed: ceramic; two section; .01 mfd. G.M.V. 500 wvdc; disc type. | AC Line Bypass Cap. | CC-100-23 |
| C35 | CAPACITOR, fixed: ceramic; .01 mfd., $+80\%$ - 20% , 500 wvdc; disc type. Same as C2. | Audio Bypass Cap., Input, V10. | CC-100-16 |
| C36A, B,C,D | CAPACITOR, fixed: electrolytic; quad. unit 10/30/15/30 mmfd.; 450 wvdc. | P.S. Filter Cap. | CE-104-1 |
| CR1 | CRYSTAL UNIT, rectifying: germanium. | AVC Rect. | 1N34 |
| E1 | TERMINAL STRIP: feed-thru; five 6-32 binder head machine screws with solder lugs; phenolic body. | Output Terminals, T3 | TM-116-5 |
| F1 | FUSE, cartridge: 2 amp. | Power Fuse | FU-100-2 |
| I1 | LAMP, incandescent: miniature; 6-8 volts, 250 ma. DC; T-3-1/4 frost bulb; bayonet base. | Power Indicator | BI-101-44 (AF) |
| J1,2 | CONNECTOR, receptacle: electrical; female; dual contact; phono type. | IF Input & Audio Output Jack | JJ-144 |
| J3 | JACK, telephone: five contacts; six solder lug terminals; normally closed. | Phone Jack | JJ-132 |
| L1 | REACTOR, filter: 11.4 henries, 125 ma. max. current, DC. res. approx. 250 ohms; insulated for 2500 volts, RMS. | P.S. Filter | TF-158 |
| R1 | RESISTOR, fixed: composition; 220 ohms, $\pm 10\%$; 1/2 watt. | Cathode Res., V1 | RC20GF221K |
| R2 | RESISTOR, fixed: composition; 1,000 ohms, $\pm 10\%$; 2 watts. | Plate Load Res., V1 | RC42GF102K |
| R3 | RESISTOR, fixed: composition; 1 megohm, $\pm 10\%$; 1/2 watt. | T.C. Res., AVC Rect. | RC20GF105K |
| R4 | RESISTOR, fixed: composition; 68,000 ohms, $\pm 10\%$; 1 watt. | Screen Grid Res., V1 | RC30GF683K |
| R5 | RESISTOR, fixed: composition; 470,000 ohms, $\pm 10\%$; 1/2 watt. | Grid Res., V1 | RC20GF474K |

| SYM. | DESCRIPTION | FUNCTION | TMC PART NO. |
|------|---|-------------------------|--------------|
| R6 | RESISTOR, fixed: composition; 22,000 ohms, $\pm 10\%$; 1 watt. | Plate Load Res., V3A | RC30GF223K |
| R7 | RESISTOR, fixed: composition; 470,000 ohms, $\pm 10\%$; 1/2 watt. Same as R5. | Grid Res., V3A | RC20GF474K |
| R8 | RESISTOR, fixed: composition; 680 ohms, $\pm 10\%$; 1/2 watt. | Cath. Bias Res., V3A | RC20GF681K |
| R9 | RESISTOR, fixed: composition; 150,000 ohms, $\pm 10\%$; 1/2 watt. | Input Res., AVC Rect. | RC20GF154K |
| R10 | RESISTOR, fixed: composition; 1.5 megohm, $\pm 10\%$; 1/2 watt. | Load Res., AVC Rect. | RC20GF155K |
| R11 | RESISTOR, fixed: composition; 10 megohm, $\pm 10\%$; 1/2 watt. | T.C. Res., AVC Rect. | RC20GF106K |
| R12 | RESISTOR, fixed: composition; 470,000 ohms, $\pm 10\%$; 1/2 watt. Same as R5. | Signal Grid Res., V2 | RC20GF474K |
| R13 | RESISTOR, fixed: composition; 22,000 ohms, $\pm 10\%$; 1/2 watt. | Osc. Inj. Grid Res., V2 | RC20GF223K |
| R14 | RESISTOR, fixed: composition; 220 ohms, $\pm 10\%$; 1/2 watt. Same as R1. | Cath. Bias Res., V2 | RC20GF221K |
| R15 | RESISTOR, fixed: composition; 47,000 ohms, $\pm 10\%$; 1/2 watt. | Plate Load Res., V2 | RC20GF473K |
| R16 | RESISTOR, fixed: composition; 22,000 ohms, $\pm 10\%$; 2 watts. | Screen Grid Res., V2 | RC42GF223K |
| R17 | RESISTOR, fixed: composition; 22,000 ohms, $\pm 10\%$; 1/2 watt. Same as R13. | Plate Load Res., V4 | RC20GF223K |
| R18 | RESISTOR, fixed: composition; 22 ohms, $\pm 10\%$; 1/2 watt. | Grid Limiting Res., V4 | RC20GF220K |
| R19 | RESISTOR, fixed: composition; 100,000 ohms, $\pm 10\%$; 1/2 watt. | Grid Res., V4 | RC20GF104K |
| R20 | RESISTOR, fixed: composition; 68,000 ohms, $\pm 10\%$; 1/2 watt. | Screen Grid Res., V4 | RC20GF683K |
| R21 | RESISTOR, fixed: composition; 15,000 ohms, $\pm 10\%$; 1/2 watt. | Grid Res., V5 | RC20GF153K |
| R22 | RESISTOR, fixed: composition; 47,000 ohms, $\pm 10\%$; 1/2 watt. Same as R15. | Grid Res., V5 | RC20GF473K |
| R23 | RESISTOR, fixed: composition; 120 ohms, $\pm 10\%$; 1/2 watt. | Cath. Bias Res., V5 | RC20GF121K |
| R24 | RESISTOR, fixed: composition; 100,000 ohms, $\pm 10\%$; 1/2 watt. Same as R19. | Plate Load Res., V5 | RC20GF104K |

| SYM. | DESCRIPTION | FUNCTION | TMC PART NO. |
|------|---|----------------------------------|-----------------|
| R25 | RESISTOR, fixed: composition; 47,000 ohms, $\pm 10\%$; 2 watts. | Screen Res., V5 | RC42GF473K |
| R26 | RESISTOR, fixed: composition; 100,000 ohms, $\pm 10\%$; 1/2 watt. Same as R19. | Low Pass Filter Load Res. | RC20GF104K |
| R27 | RESISTOR, fixed: composition; 2.2 megohms, $\pm 10\%$; 1/2 watt. | Noise Limiter Filter Res., V6 | RC20GF225K |
| R28 | RESISTOR, fixed: composition; 220,000 ohms, $\pm 10\%$; 1/2 watt. | Noise Limiter Filter Res., V6 | RC20GF224K |
| R29 | RESISTOR, fixed: composition; 2.2 megohms, $\pm 10\%$; 1/2 watt. Same as R27. | Noise Limiter Filter Res., V6 | RC20GF225K |
| R30 | RESISTOR, fixed: composition; 100,000 ohms, $\pm 10\%$; 1/2 watt. Same as R19. | Grid Res., V3B | RC20GF104K |
| R31 | RESISTOR, fixed: composition; 2,200 ohms, $\pm 10\%$; 1/2 watt. | Plate Decoupling Res., V3B | RC20GF222K |
| R32 | RESISTOR, fixed: wire wound; 6,000 ohms, $\pm 5\%$; 5 watts. | Current Limiting Res., V8 | RW-107-48 |
| R33 | RESISTOR, variable: composition; 1 megohm, $\pm 20\%$; 2 watts; W/ ON-OFF switch; 7/8 in. long, round shaft. | Audio Gain V9 | RV4BTRD105D |
| R34 | RESISTOR, fixed: composition; 33,000 ohms, $\pm 10\%$; 2 watts. | Plate Load Res., V9 | RC42GF333K |
| R35 | RESISTOR, fixed: composition; 47,000 ohms, $\pm 10\%$; 1/2 watt. Same as R15. | p/o Low Pass Filter, V5 | RC20GF473K |
| R36 | RESISTOR, fixed: composition; 220 ohms, $\pm 10\%$; 1/2 watt. Same as R1. | Cath. Res., V9 | RC20GF221K |
| R37 | RESISTOR, fixed: composition; 470,000 ohms, $\pm 10\%$; 1/2 watt. Same as R5. | Grid Res., V10 | RC20GF474K |
| R38 | RESISTOR, fixed: composition; 300 ohms, $\pm 10\%$; 2 watts. | Cath. Bias Res., V10 | RC42GF301K |
| R39 | RESISTOR, fixed: wire wound; 1000 ohms, $\pm 5\%$; 5 watts. | Plate Decoupling Res., V10 | RW-107-34 |
| R40 | RESISTOR, fixed: composition; 560 ohms, $\pm 10\%$; 2 watts. | Imp. Matching Res., J3 | RC42GF561K |
| R41 | RESISTOR, fixed: composition; 5600 ohms, $\pm 10\%$; 1/2 watt. | Grid Voltage Divider, V5 | RC20GF562K |
| R42 | RESISTOR, fixed: composition; 180 ohms, $\pm 10\%$; 2 watts. | Filament Balance Res. | RC42GF181K |
| R43 | RESISTOR, fixed: composition; 180 ohms, $\pm 10\%$; 2 watts. Same as R42. | Filament Balance Res. | RC42GF181K |

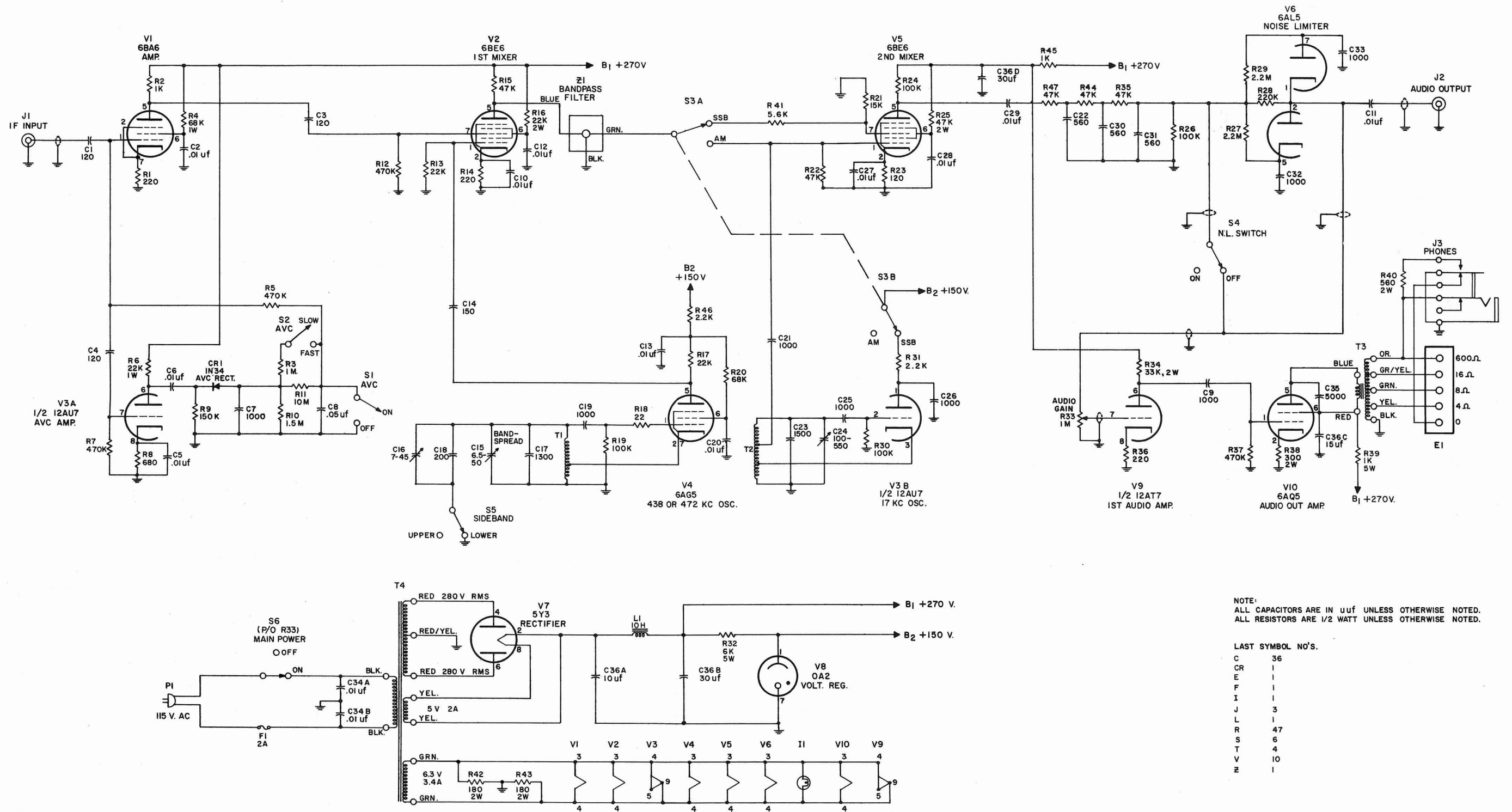
| SYM. | DESCRIPTION | FUNCTION | TMC PART NO. |
|-----------|--|-----------------------------|--------------|
| R44 | RESISTOR, fixed: composition; 47,000 ohms, $\pm 10\%$; 1/2 watt. Same as R15. | p/o Low Pass Filter, V5 | RC20GF473K |
| R45 | RESISTOR, fixed: composition; 1000 ohms, $\pm 10\%$; 1/2 watt. Same as R2. | Plate Decoupling Res., V5 | RC20GF102K |
| R46 | RESISTOR, fixed: composition; 2200 ohms, $\pm 10\%$; 1/2 watt. Same as R31. | Plate Decoupling Res., V4 | RC20GF222K |
| R47 | RESISTOR, fixed: composition; 47,000 ohms, $\pm 10\%$; 1/2 watt. Same as R15. | p/o Low Pass Filter, V5 | RC20GF473K |
| S1 | SWITCH, toggle: SPST; 3 amps at 250 v., 6 amps at 125 v.; bat type toggle. | AVC ON/OFF Switch | ST-103-1-62 |
| S2 | SWITCH, toggle: SPST; 3 amps at 250 v., 6 amps at 125 v., bat type toggle. Same as S1. | AVC FAST/SLOW Switch | ST-103-1-62 |
| S3 A,B | SWITCH, rotary: one section; three positions, two pole; phenolic insulation; contacts and wipers silver plated; 1/4 in. dia. shaft, flatted; 2-7/8 in. long. | AM-SSB Switch | SW-198 |
| S4 | SWITCH, toggle: SPST; 3 amps at 250 v., 6 amps at 125 v.; bat type toggle. Same as S1. | Noise Limiter | ST-103-1-62 |
| S5 | SWITCH, rotary: one section; two positions; one pole; phenolic insulation; contacts and wipers silver plated; 1/4 in. dia. shaft, flatted; 2-7/8 in. long. | Sideband Switch | SW-197 |
| S6 | SWITCH, ON-OFF: part of R33. | Power ON-OFF Switch | P/O R33 |
| T1 | TRANSFORMER, RF: 438 Kc and 472 Kc; 78 microhenries, ± 6 microhenries; $Q=80$ or greater; tapped at 29 microhenries, ± 2 microhenries, DC res. approx. 2 ohms. | 1st Osc. Tank Transformer | A-1413 |
| T2 | TRANSFORMER, AF: 17 Kc; 43.5 millihenries, ± 1 millihenry; $Q=20$ or greater tapped at 100 and 250 turns; DC res. approx. 10 ohms. | 17 Kc Osc. Tank Transformer | A-1382 |
| T3 | TRANSFORMER, AF: output; primary, 5000 ohms, 55 ma. DC current; secondary, 600 ohms, tapped at 16 ohms, 8 ohms, and 4 ohms; 4 audio watts max. output; insulated for 1000 volts. | Output Transformer | TF-159 |

| SYM. | DESCRIPTION | FUNCTION | TMC PART NO. |
|-----------|---|-----------------------|--------------|
| T4 | TRANSFORMER, power and filament: primary, 105/125 volts, 50/60 cps, single phase, three secondary windings; sec. #1, 5 volts, 2.0 amps; sec. #2, 280-0-280 volts, 90 ma; sec. #3, 6.3 volts, 3.4 amps; all windings insulated for 1000 volts. | Power Transformer | TF-168 |
| V1 | TUBE, electron: remote cut off RF pentode; 7 pin miniature. | IF Amplifier | 6BA6 |
| V2 | TUBE, electron: heptode converter; 7 pin miniature. | First Mixer | 6BE6 |
| V3 A,B | TUBE, electron: medium mu duo triode; 9 pin miniature. | AVC Amp. & 17 Kc Osc. | 12AU7 |
| V4 | TUBE, electron: sharp cut off RF pentode; 7 pin miniature. | 438 or 472 Kc Osc. | 6AG5 |
| V5 | TUBE, electron: heptode converter; 7 pin miniature. Same as V2. | Second Mixer | 6BE6 |
| V6 | TUBE, electron: duo diode; 7 pin miniature. | Noise Limiter | 6AL5 |
| V7 | TUBE, electron: full-wave rectifier; octal socket. | Rectifier | 5Y3 |
| V8 | TUBE, electron: voltage regulator; 7 pin miniature. | Voltage Regulator | OA2 |
| V9 | TUBE, electron: duo triode; 9 pin miniature. | First Audio Amp. | 12AT7 |
| V10 | TUBE, electron: beam power amplifier; 7 pin miniature. | Audio Output Amp. | 6AQ5 |
| W1 | CABLE ASSEMBLY: power; consists of moulded non-polarized, two contact, male plug and six feet of 18/2SJ rubber covered cable; opposite end stripped. | Power Cable | CA-102-2 |
| W2 | CABLE ASSEMBLY: GSB-1 to GRP-90 interconnect; consists of two plugs, PL-147-2, and 36 in. of cable, RG-58A/U. | Interconnect Cable | CA-318-36 |
| XF1 | HOLDER, fuse: extractor post type for single AGC type fuse; stationary end terminal. | Socket for F1 | FH-100-2 |
| XI1 | SOCKET, bracket: for miniature bayonet base T3-1/4 bulb; right angle, down turned. | Socket for I1 | TS-109 |
| XV1 | SOCKET, tube: 7 pin miniature. | Socket for V1 | TS-102-P01 |

| SYM. | DESCRIPTION | FUNCTION | TMC PART NO. |
|------|--|-----------------|-----------------|
| XV2 | SOCKET, tube: 7 pin miniature. Same as XV1. | Socket for V2 | TS-102-P01 |
| XV3 | SOCKET, tube: 9 pin miniature. | Socket for V3. | TS-103-P01 |
| XV4 | SOCKET, tube: 7 pin miniature. Same as XV1. | Socket for V4 | TS-102-P01 |
| XV5 | SOCKET, tube: 7 pin miniature. Same as XV1. | Socket for V5 | TS-102-P01 |
| XV6 | SOCKET, tube: 7 pin miniature. Same as XV1. | Socket for V6 | TS-102-P01 |
| XV7 | SOCKET, tube: octal; ceramic. | Socket for V7 | TS-101-P01 |
| XV8 | SOCKET, tube: 7 pin miniature. Same as XV1. | Socket for V8 | TS-102-P01 |
| XV9 | SOCKET, tube: 9 pin miniature. Same as XV3. | Socket for V9 | TS-103-P01 |
| XV10 | SOCKET, tube: 7 pin miniature. Same as XV1. | Socket for V10 | TS-102-P01 |
| Z1 | FILTER, bandpass: output flat within 6 db from 17.3 Kc to 19.8 Kc; less than 3 db insertion loss at 18.6 Kc; input-output nominal impedance 20,000 ohms, steel case. | Bandpass Filter | FX-151 |

NOTES

NOTES



NOTE:
 ALL CAPACITORS ARE IN uuf UNLESS OTHERWISE NOTED.
 ALL RESISTORS ARE 1/2 WATT UNLESS OTHERWISE NOTED.

LAST SYMBOL NO'S.

| | |
|----|----|
| C | 36 |
| CR | 1 |
| E | 1 |
| F | 1 |
| I | 1 |
| J | 3 |
| L | 1 |
| R | 47 |
| S | 6 |
| T | 4 |
| V | 10 |
| Z | 1 |

Figure 5-1. Schematic Diagram, Model GSB-1

