



**communications**

**OPERATING and SERVICE  
INSTRUCTIONS**

**HT-33B**

**the hallicrafters co.**  
MANUFACTURERS OF ELECTRONIC EQUIPMENT, CHICAGO 24, U. S. A.



Figure 1. Hallicrafters Model HT-33B Linear Amplifier

## SECTION I

### GENERAL

#### 1-1. GENERAL DESCRIPTION

The Hallicrafters Model HT-33B is a compact linear amplifier employing a Penta-Lab PL-172 pentode type tube having 1000 watts plate dissipation. The HT-33B is designed as the ideal companion unit for The Hallicrafters HT-32, HT-37, or FPM-200, and may be used with any 100 watt exciter without the need of an external pad or matching network.

The circuit employs a single PL-172, operating class AB1. The input circuit is designed for either 50 or 75 ohm matching and requires no grid tuning or neutralization at any time. The power supply is self-contained and uses two 3B28 tubes connected in a full wave rectifier circuit having excellent regulation. Screen voltage is controlled by six OA2 regulator tubes. A variable bias supply with front panel control is included to maintain proper idling plate current. Provision has been made to apply cut off bias by proper connections to an octal plug on the rear of the chassis. 115 VAC

is also available at this plug for switching operations.

Overload protection is provided by a 5 ampere fuse (F1) which protects the filament, bias, and blower circuits, a 1/16 ampere fuse (F2) which protects the PL-172 tube screengrid, and a 22 ampere circuit breaker, which, in addition to being the high voltage ON-OFF switch, protects the high voltage supply.

An interlock safety switch removes the primary voltage from the plate supply transformer when the cabinet cover is opened. (Do not attempt to defeat its purpose, as lethal voltages are present.)

#### 1-2. T.V.I. (TELEVISION INTERFERENCE) SUPPRESSION

Every consideration has been given to possible local TVI. problems in the design of the HT-33B. Circuitry has been used that discourages harmonic generation. A low pass filter has been

ERRATA SHEET

MODEL HT-33B

In figure 9 on page 10 of the Operating and Service Instructions Manual for this model, the tube type for V1 should be changed to a type PL172.

Form Number 094-902830  
pack with Operating and  
Service Instructions Manual  
094-902444

## GENERAL SPECIFICATIONS

Dimensions, Overall . . . . .	20" W x 10 1/2" H x 17" D.
Dimensions, Front Panel . . . . .	Standard Rack Mtg. 8 3/4" H x 19" W.
Mode of Operation . . . . .	AB1 linear power amplifier.
Power Requirement . . . . .	2350 watts at 117 VAC, 50/60 cycles.
Input Impedance . . . . .	50 - 75 Ohms.
Output Impedance . . . . .	40 - 80 Ohms.
Plate Power Input SSB . . . . .	1000 watts average
Plate Power Input AM . . . . .	1000 watts average
Plate Power Input CW . . . . .	1000 watts average
Power Output SSB @ 1 KW Input . . . . .	* 800 watts PEP Two Tone Test
Drive Power SSB (200 MA Idling Plate Current) . . . . .	60 - 70 watts PEP
Drive Power AM (200 MA Idling Plate Current) . . . . .	15 - 18 watts
Drive Power CW (200 MA Idling Plate Current) . . . . .	60 - 70 watts
Weight, Net . . . . .	114 pounds
Weight, Shipping . . . . .	120.5 pounds

\* Slightly less on high frequency bands.

included in series with the AC power leads. The enclosed metal cabinet greatly aids in shielding. A ground lug has been provided at the rear of the chassis for an external ground connection. It is recommended that all station components be bonded together with heavy copper wire or strap and connected to an earth ground. Ground leads, which are equal to 1/4 wave length at your favorite operating frequencies, should be avoided.

### 1-3. ADDITIONAL FEATURES

Many additional features have been included

for reliability and ease of operation. All important circuits are metered and easily read on illuminated meters. In addition to grid current, screen current, cathode current, and plate voltage ranges, an RF output volt meter is included for easier tuning. In this position (keeping in mind the maximum current ratings for the tube as given later), both PLATE TUNING and PLATE LOADING controls are adjusted for maximum deflection on the voltmeter. A red light on the front panel indicates that the high voltage supply is on. All band switching is accomplished by a single selector knob.

## SECTION II INSTALLATION

### 2-1. UNPACKING

Check all shipping tags and labels for further instructions before removing or destroying them. All tubes are shipped in separate cartons to prevent damage to the tubes and sockets.

Remove the PL-172 tube from the carton and be sure the small metal cooling flag is firmly attached to the short center pin at the tube base. The tube must be oriented so that the large cathode pin is in line with the large hole in the socket. Lower the tube into the chimney carefully, rotating the tube slightly back and forth until the tube pins engage in the socket holes. DO NOT FORCE. As the tube engages the socket, press down lightly until firmly seated in the socket. After the tube is

installed, loosen the screw at the point where the parasitic choke is connected to the coupling capacitor. Swing the parasitic choke and anode connector around to the proper position and snap the anode connector on the plate of the PL-172 tube. Tighten the screw at the point where the parasitic choke connects to the coupling capacitor FIRMLY, WITHOUT FORCE. (See Figure 3 for exact location.) Install the six OA2 regulator tubes. Install the two 3B28 rectifier tubes and connect rectifier plate caps.

### 2-2. LOCATION

It is very important that the HT-33B be placed in such a manner that complete air circulation will be available on all sides, top and bottom.

The air intake for the fan is at the bottom of the cabinet and air space must be maintained. The HT-33B must rest on cabinet feet at all times. Under no circumstances should any object be placed on top of this unit.

### 2-3. POWER REQUIREMENTS

The HT-33B is designed for 117V, 50/60 cycle AC operation. The source should be capable of supplying 2350 watts with good regulation at the specified line voltage if maximum capabilities of this unit are to be realized.

### 2-4. RACK MOUNTING

The HT-33B may be rack mounted if desired. In order to accomplish this, the unit must first be removed from its cabinet by following the procedure given below:

1. Remove the perforated bottom panel from the cabinet.
2. Remove the short AC fan cord from its receptacle.
3. Remove the three screws which hold the fan support bracket to the chassis.
4. Remove the fan assembly from the unit.
5. Remove the three chassis mounting screws at the bottom rear of the cabinet.
6. Remove the top and bottom screws each side of the front panel (Four screws only).

7. Open the cabinet cover to disengage the interlock switch. (BE SURE ALL CABLES ARE DISCONNECTED FROM CHASSIS.)
8. Slide the chassis out from the front of the cabinet.
9. The fan must be replaced in its original position after the unit is installed in the rack. Never operate the unit without using the fan.

Slots for mounting screws are at the edges of the front panel. They are spaced to permit mounting screws in a standard 19 inch rack.

### NOTE

A chassis support shelf should be used in the rack. Never support the weight of the HT-33B from the front panel.

The HT-33B should never be placed directly above another unit that radiates heat, as the fan blows this warm air through the tube and its cooling capabilities will be impaired. Also, the area above the chassis should be left vacant to allow warm air to be freely exhausted.

### 2-5. BIAS AND ANTENNA RELAY CONNECTIONS

It is recommended that coaxial type antenna changeover relays be used with the HT-33B.

It is also recommended that cut off bias be used in all modes of operation. (See figures 4, 5, and 6 for antenna relay connections.)

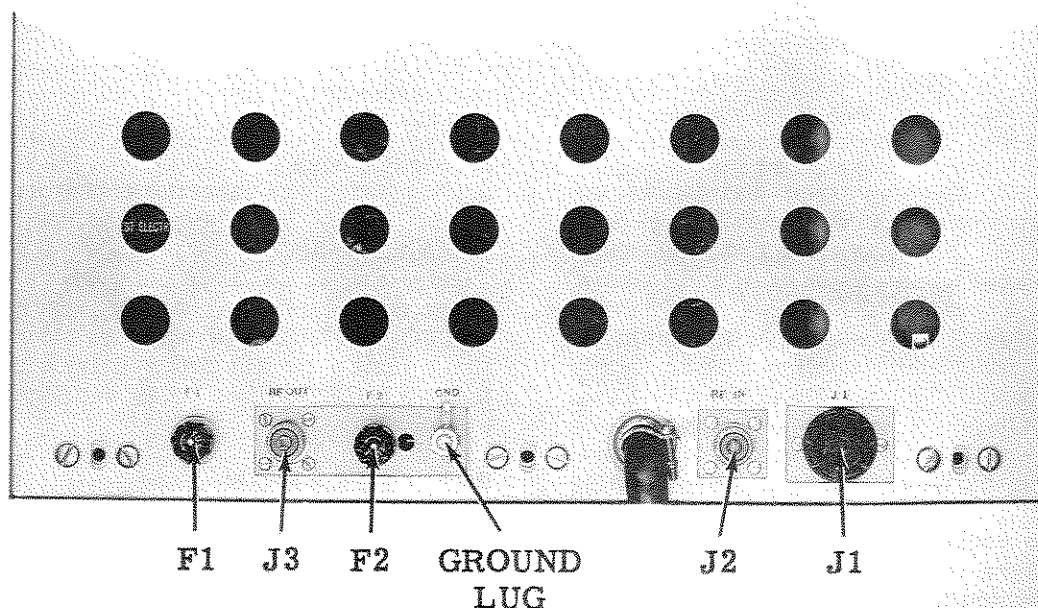


Figure 2. Rear View of Chassis

## NOTE

The bias control relay may be connected in parallel with a 117V AC antenna changeover relay.

The HT-33B is shipped with a jumper between pins 3 and 4, and another jumper between pins 1 and 8 in the plug at the rear of chassis, marked J1. This allows the HT-33B bias relay to close when the FILAMENT switch is turned ON. If either jumper is removed, the bias relay will remain open and cut-off bias will be applied to the PL-172 tube.

AC voltage (117V, not to exceed 50 watts) is available at pins 3 and 8 of this plug (J1) when the FILAMENT switch is turned ON.

Another AC circuit is available (117V, not to exceed 50 watts) when the HIGH VOLTAGE switch is turned ON.

## 2-6. RF INPUT AND OUTPUT CONNECTIONS

**A. RF INPUT** - The input connector (J2), located at the rear of the chassis, will mate with a

type PL-259 coaxial connector (Amphenol type 83-1SP) (not supplied). Excitation from the exciter unit should be applied through this connector. The input is designed for 50 to 75 ohms and any reasonable length of RG-58/U cable will suffice.

## CAUTION

Care must be used in applying excitation. See tuning instructions in Section IV.

**B. RF OUTPUT** - The output connector (J3), located at the rear of the chassis, will mate with a type PL-259 coaxial connector (Amphenol type 83-SP) (not supplied). Use only RG-8/U coaxial cable in the feed line. Although the output impedance is variable, it is strongly recommended that the load be 50 ohms with the lowest possible VSWR. Never attempt to feed an antenna of unknown characteristics, as serious damage to the HT-33B may result. For further information on this subject, consult the A. R. R. L. handbook.

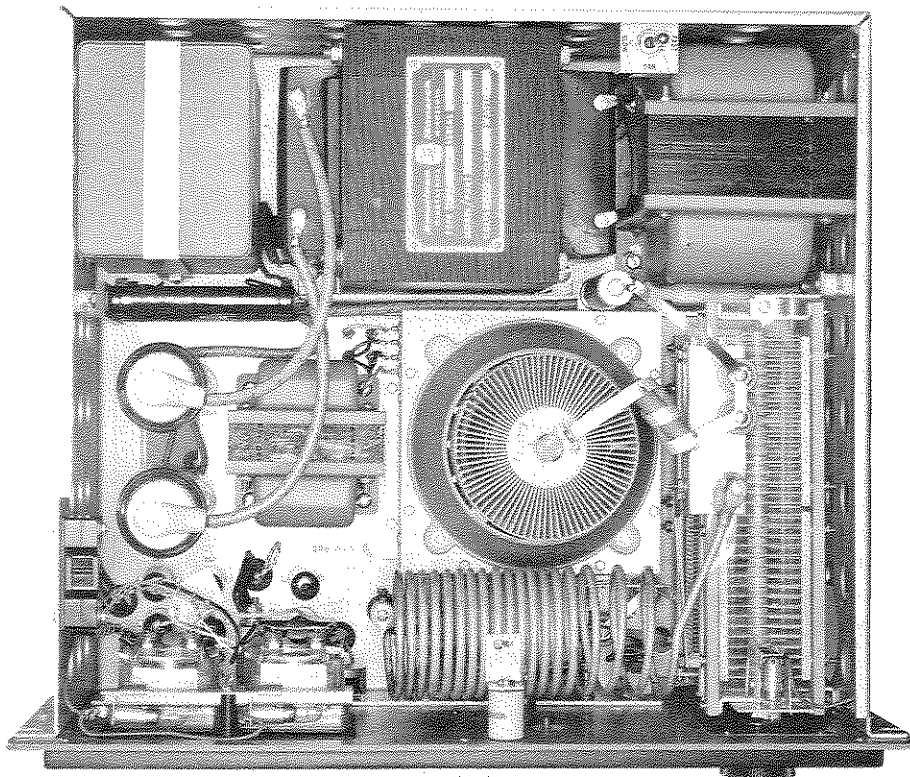
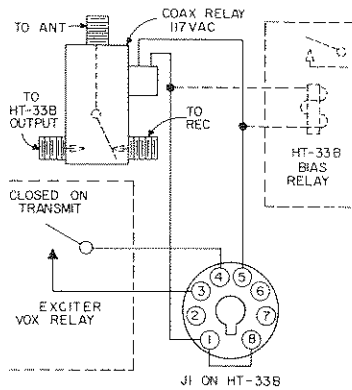
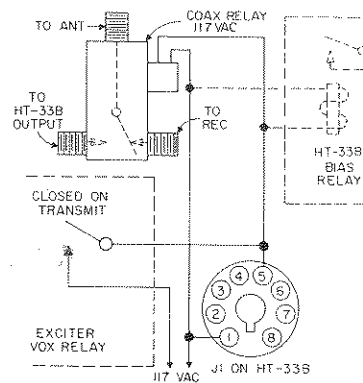


Figure 3. Top View of Chassis



**Figure 4. Antenna and Bias Switching Circuit**

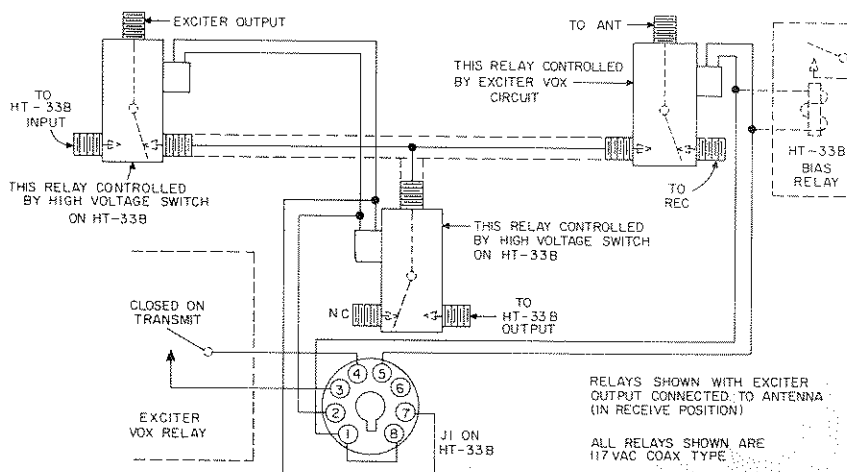
Suggested antenna and bias switching circuits where 117V AC is supplied by the HT-33B. (Note. - Contacts in exciter relay must have no internal connections.) (for use with exciters such as HT-32)



**Figure 5. Antenna and Bias Switching Circuit**

Suggested antenna and bias switching circuits where 117V AC is supplied externally.

NOTE: Both plug jumpers must be removed.



**Figure 6. Automatic Switching from Exciter to Final Amplifier.**

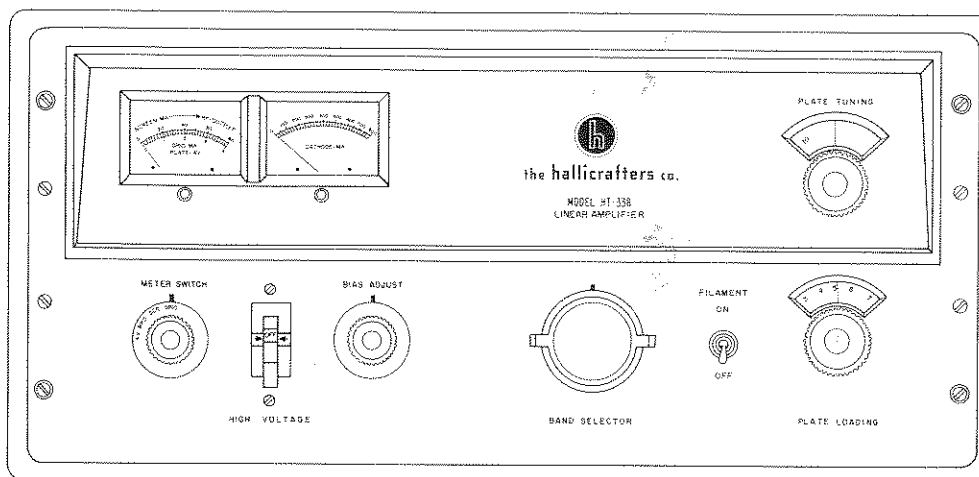
Suggested antenna and bias switching circuit where 117V AC is supplied by the HT-33B. Antenna switching from the HT-33B to the exciter will be automatic when the High Voltage switch is turned OFF. (For use with exciters such as the HT-32).

OPTIONAL BIAS SWITCHING. - Provision has also been made for external bias switching which eliminates the use of the bias relay in the HT-33B. To accomplish this, one jumper should be removed from J1. This will disable the bias relay and cause cut-off bias to appear on the PL-172. To key the bias on the HT-33B, a spare set of contacts must be available on the exciter Vox relay or on the antenna change-over relay. Connect one lead from pin No. 6 (J1) to one relay contact. The other relay contact should be connected to the HT-33B ground terminal.

Note: The relay contacts used must be open in standby and closed in transmit.

## SECTION III

### FUNCTION OF OPERATING CONTROLS



*Figure 7. Front Panel Controls*

NAME OF CONTROL	TYPE	DESCRIPTION
FILAMENT	Toggle	Connected in series with power line. Used to energize all filaments, bias supply, and fan, or to disable entire unit.
HIGH VOLTAGE	Circuit Breaker (22 Amp.)	Used to energize primary of high voltage transformer and turn on red indicator light. Also protects high voltage supply.
METER SWITCH	Rotary (4 position)	Connects the meter to read grid current, screen current, RF output voltage, and plate voltage.
BIAS ADJUST	Potentiometer	Used to adjust the cathode current to the correct operating point.
BAND SELECTOR	Rotary Switch (5 position)	Selects proper plate tank coil tap. Shorts out unused portion of coil. Switches in additional loading capacity on 40 and 80 meters. Switches in additional stator section of Plate Tuning Capacitor on 40 and 80 meters.
PLATE TUNING	* Variable Capacitor	Resonates plate circuit to operating frequency. (Never attempt to use the HT-33B as a frequency multiplier.) Note: One section used on 10, 15, and 20 meters, both sections used on 40 and 80 meters.
PLATE LOADING	* Variable Capacitor	Used to adjust output impedance to match antenna load impedance. (40 - 80 Ohms.)

\* Note: 0 on dial indicates maximum capacity and 10 indicates minimum capacity.



## SECTION IV

### OPERATING PROCEDURE

#### 4-1. GENERAL

In all cases, both the PLATE TUNING and PLATE LOADING controls are adjusted for maximum RF output as indicated on the RF output voltmeter. Never control power input by the loading adjustment alone. Power input should always be a direct function of the applied excitation. All tuning adjustments must be made at the desired maximum peak input level.

It is strongly recommended that a monitor scope be used if best results are to be obtained on DSB (AM) and SSB. Meter readings alone cannot give an accurate indication of proper adjustment and operation.

Although a 1/4 second meter is used, as prescribed by the FCC, a meter cannot follow voice peaks and, of course, cannot indicate true power input under voice conditions. Many factors influence the indicated power input, such as the degree of damping in the meter, individual voice characteristics, microphone frequency response characteristics, response characteristics of the exciter, etc. Under conditions of voice operation, it is not unusual to realize output peaks in excess of 1 KW even though the cathode current, as indicated on the meter, does not reach 390 MA (1 KW average input).

Before attempting to operate the HT-33B, the following items should be checked:

1. All station components should be bonded together and to an earth or water pipe ground.
2. The HT-33B output jack (J3) should be connected to the antenna transmission line through a coaxial type antenna change-over relay. (Never operate without antenna load.)
3. The HT-33B input jack (J2) should be connected to exciter output.
4. The HT-33B bias relay should be connected to exciter VOX circuit.
5. Check fan speed switch (See par. 6-8).

#### 4-2. TUNING PROCEDURE

The following steps apply to all modes of operation.

1. Set FILAMENT SWITCH to OFF.
2. Set HIGH VOLTAGE switch to OFF.
3. Set BAND SELECTOR to desired band.
4. Plug the HT-33B line cord plug into a receptacle capable of delivering 2350 watts at 117V, 50/60 cycles.
5. Set FILAMENT SWITCH to ON. Three to four minutes for filament warm up is sufficient.

- Never leave filament power on unless the blower fan is operating.

- Never apply High Voltage unless filament power has been applied for at least three minutes.

- Before applying power to the HT-33B, a check should be made to make certain that relay circuitry is functioning properly.

#### NOTE

The cathode current indicated on the meter will be the combined plate, screen, and control grid current. To determine the plate current, it will be necessary to subtract the combined total of the screen current reading plus the control grid current reading from the cathode current.

#### 4-3. CW OPERATION

1. Set the BIAS ADJUST control to the maximum counterclockwise position.
2. Assuming that filament voltage has been applied for the required time, place the HIGH VOLTAGE switch in the ON position.
3. It is permissible and desirable to use high bias (low idling current) consistent with driver capability for CW operation. Therefore, the idling current may be adjusted to any point between minimum and 200 MA for CW operation.
4. Apply enough CW excitation from exciter to increase cathode current to approximately 250 MA.

5. Set METER SWITCH to RFO and adjust PLATE TUNING and PLATE LOADING for maximum upward deflection on the meter.
6. Increase excitation until the cathode current reads approximately 300 MA.
7. Repeat step 5 of this procedure.
8. Increase excitation and adjust the PLATE TUNING and PLATE LOADING controls until plate current is approximately 370 MA at maximum RF output. One kilowatt DC input will be obtained when the plate voltage multiplied by the plate current equals 1000. For an example:  $2700V \times 370 MA = 999 \text{ watts}$ , or  $999W \div 2700V = 370 MA$ .

Note that screen current and grid current have been subtracted at this point.

#### 4-4. SSB OPERATION

1. Set BIAS ADJUST for 200 MA cathode current indication (without excitation). See par. 6-3.
2. Place exciter in CW position and increase excitation to the HT-33B until the cathode current reads approximately 250 MA.
3. Set METER SWITCH to RFO and adjust both the PLATE TUNING and PLATE LOADING controls for maximum upward deflection on the meter.
4. Increase excitation until the cathode current is approximately 300 MA.
5. Repeat step 3 of this procedure.
6. Increase excitation and adjust the PLATE TUNING and PLATE LOADING

controls until plate current reads approximately 550 MA. Always tune for maximum RF output.

#### NOTE

A slight buzzing sound may occur as the power is increased beyond one kilowatt. This is caused by the circuit breaker's operation near the critical point in its trip range.

7. Switch the exciter to SSB and increase the audio gain gradually while talking into the microphone. The drive level should be set just below the point where grid current occurs on the loudest voice peaks. As mentioned previously, the cathode current on voice peaks is dependent on several factors and may vary from approximately 250 - 390 MA.

It should be remembered that the above instructions are of a general nature and are to be used only as a guide. To realize the maximum capabilities of the HT-33B on SSB or DSB, an oscilloscope should be used for the final adjustments.

#### 4-5. DSB WITH CARRIER (AM)

1. Perform steps 1 through 6 of the SSB tuning procedure. See par. 4-4.
2. Remove CW excitation and place the exciter in the AM position.
3. Gradually increase AM output from the exciter until the HT-33B cathode current is 390 MA. With the exciter in MOX position, the cathode current will change very little with or without modulation. It is recommended that "voice control" be used for AM as well as SSB.

## SECTION V SERVICE DATA

### 5-1. WARNING-HIGH VOLTAGE

DC voltage in excess of 2700 volts is present in this equipment.

Do not attempt to measure voltages with hand held test leads or to service this unit with the high voltage supply on. In addition to the danger of serious injury or death from the high voltage supply, serious radio frequency burns can be caused by

coming in contact with, or close proximity to, the plate and output circuits.

An AC interlock switch is installed on the cover for your protection. Do not attempt to defeat its purpose. Also, a bleeder circuit is provided to discharge the high voltage filter capacitor. However, we strongly recommend the use of a grounding rod to short the high voltage circuit to the chassis before any servicing is attempted.

USE EXTREME CAUTION WHEN WORKING WITH THIS EQUIPMENT

### 5-2. CLEANING

Dust may collect inside equipment that is power cooled, depending upon the dust content of the air being circulated. Also, the 2700V circuitry tends to attract dust particles. The circuitry should be kept clean, as accumulation of dust in the high voltage or RF areas may cause arcing and, consequently, damage. This applies to both the top side and underside of the chassis. Both PLATE TUNING and PLATE LOADING capacitors should be cleaned frequently to prevent arcing between plates.

#### CAUTION

Do not nick or bend capacitor plates.

The preferred method of cleaning is by use of a vacuum cleaner while dusting with a clean flexible bristle brush. Be sure to remove and clean the fan and the area around the PL-172 tube socket.

Never use solvents for cleaning.

### 5-3. LUBRICATION

Both upper and lower fan bearings should be lubricated with one or two drops of SAE No. 30 oil once a year.

### 5-4. CHASSIS REMOVAL

See RACK MOUNTING, par. 2-4.

### 5-5. SERVICE OR OPERATION QUESTIONS

For further information regarding operation or servicing of any Hallicrafters equipment, contact your Hallicrafters dealer. The Hallicrafters Company maintains an extensive system of Authorized Service Centers where any required service will be performed promptly and efficiently at a nominal charge. All Hallicrafters Authorized Service Centers display the sign shown below. For the location of the one nearest you, consult your dealer or telephone directory. Make no service shipments to the factory, as The Hallicrafters Company will not accept responsibility for unauthorized shipments.

The Hallicrafters Company reserves the privilege of making revisions in current production of equipment and assumes no obligation to incorporate such revisions in earlier models.

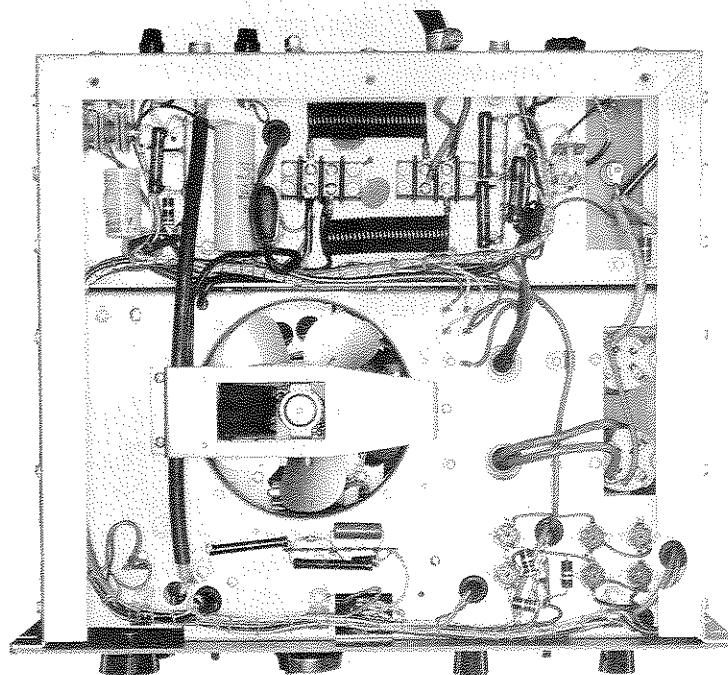


Figure 8. Bottom View of Chassis

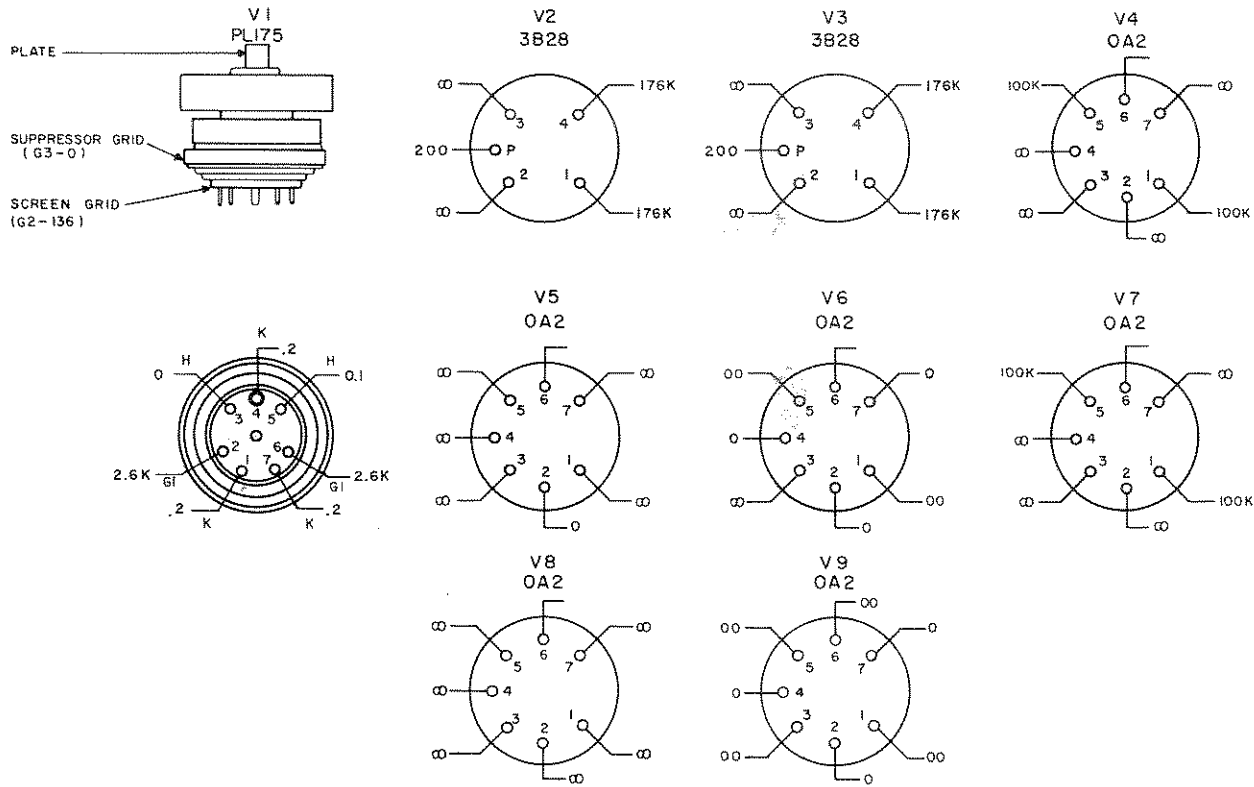


Figure 9. Resistance Chart

## SECTION VI SUPPLEMENTARY DATA

### 6-1. NEUTRALIZATION

No neutralization is necessary at any time. A low impedance input circuit, in conjunction with excellent shielding and by-passing, assures complete stability at all times.

### 6-2. GRID CURRENT

The HT-33B is designed for Class AB1 operation and is intended to operate without grid current at one kilowatt DC input in all modes of operation.

The grid current meter makes an excellent "flat top" indicator. Assuming that the plate circuit has been loaded as specified, the exciter audio gain control should be advanced to the point where grid current starts to flow on the loudest voice peaks and then retarded to the point where grid current is no longer indicated.

It should be noted that grid current up to 4 MA is permissible and will not harm the PL-172; however, distortion products will be excessive if grid current is indicated in SSB or DSB operation.

### NOTE

To prevent excessive grid dissipation, excitation should always be removed from the HT-33B before the HIGH VOLTAGE switch is set to OFF

### 6-3. IDLING CURRENT

The idling current (cathode current without excitation) for all modes of operation should be set at 200 MA.

This is accomplished by rotating the BIAS ADJUST control as necessary to establish the correct operating point (see 4-3 CW Operation.)

### 6-4. PLATE CURRENT

The indicated plate current on the 1/4 second meter will be approximately 370 MA for 1 KW plate input.

The plate current for 1 KW input (legal limit for amateur use) will be approximately 370 MA when the indicated cathode current is 390 MA.

The maximum cathode current that may be drawn will be 550 MA, and then, only during brief tune-up periods.

### 6-5. SCREEN CURRENT

The screen current will be approximately 20 MA at 1 KW input, SSB voice peaks. Under key down CW conditions, the screen current will be 25 MA at 1 KW input. The screen grid current should never exceed 50 MA.

### 6-6. PLATE VOLTAGE

The plate voltage should be approximately 2700 volts with 117V AC line voltage at 1 KW CW input.

### 6-7. RF OUTPUT VOLTMETER (RFO)

This voltmeter is connected across the output coax and indicates maximum output voltage across the coax. It is not calibrated, and is to be used as a tuning indicator (always tune for maximum upward deflection for a given power input). As this is not a peak reading meter, voice peaks

will deflect meter approximately 1/3 the equivalent CW output.

### 6-8. TUBE COOLING (PL-172)

It is important that the cooling flag be installed on the short center pin at the base of the PL-172 tube. The flag is of the friction fit or self retaining type and need not be cemented or soldered. Should the PL-172 tube ever be replaced, the cooling flag should be transferred to the new tube.

The cooling fan in the HT-33B has provision for two speed operation. Under all normal operating conditions, adequate cooling for the PL-172 tube will be obtained with the fan in the "SLOW" position. Under extreme conditions of varying temperatures, and/or for prolonged periods of continuous key down input with full carrier, the fan switch should be placed in the "FAST" position.

The FAN switch is located on the chassis wrap-around between the plate transformer and the filter choke. Lifting the cabinet top cover provides access to it.

## SERVICE PARTS LIST

Schematic Symbol	Description	Hallicrafters Part Number	Schematic Symbol	Description	Hallicrafters Part Number
CAPACITORS			CAPACITORS (cont)		
C1	.001 mfd., 5KV., 20% Cer. Disc.	047-200556	C27	60 mfd., 450V., Electrolytic	048-100417
C2, 3, 5, 6, 9, 10, 12, 13	1500 mmf., 500V., Cer. Feed-Thru	047-100602	C29	.002 mfd., 6000V., 20% Cer. Disc.	047-101085
C4, 7, 8, 28	.01 mfd., 500V., 20% Cer. Disc.	047-100354	RESISTORS		
C11, C21	.005 mfd., 500V., 20% Cer. Disc.	047-100442	R1, 2, 3,	225 ohm, 20%, 10W	023-000335
C14, C15	.001 mfd., 3KV., 20% Cer. Disc.	047-100397	R4	47 ohm, 1W ) Part of L4)	-----
C16A, B	Variable Capacitor, PLATE TUNING	048-000497	R5	50 ohm, 5%, 10W, W.W (Part of L5)	024-101247
C17	200 mmf., 1KV., 10% Cer. H. V.	047-201192	R6	47K ohm, 1%, 2W	452-003473
C18, C19	500 mmf., 5KV., Cer. H. V.	047-201084	R7	2200 ohm, 1%, 2W	452-003222
C20	Variable Capacitor, PLATE LOADING	048-100498	R8	4700 ohm, 10%, 2W	451-652472
C22	0.1 mfd., 200V, Paper	499-014104	R9	470 ohm, 5%, 2W	451-651471
C23, 24	.01 mfd., 1600V.	047-200752	R10	1.5 megohm, 1%, 2W	452-003155
C25	10 mfd., 3KV., 10% Paper	046-100889	R11	2 megohm, 1%, 2W	452-003205
C26	16 mfd., 450V., Electrolytic	045-100418	R12, 13, 14, 15	10K ohm, 50W, W.W.	024-101232
			R16, 17	470 ohm, 10%, 2W	451-652471
			R18	100K ohm, 10%, 2W	451-652104
			R19	10K ohm, 10%, 10W	453-002103
			R20	2250 ohm, 10W, W.W	024-001358
			R21	1350 ohm, 4W; Variable, BIAS ADJUST	0251101734
			R22	2500 ohm, 10W, W.W	024-101235

## SERVICE PARTS LIST CON'T

Schematic Symbol	Description	Hallicrafters Part Number	Schematic Symbol	Description	Hallicrafters Part Number
RESISTORS (cont)			JACKS, PLUGS AND SOCKETS (cont)		
R23	47 ohm, 10%, 2W	451-352470		Socket, Tube (V1)	006-200835
R24	60 ohm, 10W (Part of M2)	024-101292		Socket, Tube (V2, 3)	006-100316
R25	80 MA Shunt (Part of M2)	-----		Socket, Tube (V4, 5, 6, 7)	006-100645
R26	60 ohm, 5%, 10W	024-101292		Socket, Pilot Light (LM1, 2, 3, 4)	086-000539
R27	15 ohm, 10%, 10W	453-062150		Socket, Pilot Light (With Jewel) (LM5)	086-200448
COILS AND TRANSFORMERS			KNOB AND KNOB SKIRTS ASSEMBLIES		
L1, 2	Choke, AC Line	053-200512		Knob, BAND SELECTOR	015-101430
L3	Choke, Filter	056-200337		Knob, PLATE TUNING and PLATE LOADING	015-101415
L4	Choke, Parasitic Grid (Inc. R4)	053-100421		Knob, METER SWITCH	015-001567
L5	Choke, Parasitic Plate Assy. (Inc. R5)	041-250388		Knob, BIAS ADJUST	015-101421
L6	Choke, RF; 2.5 UH	053-200335	TUBES, LAMPS, RECTIFIERS AND DIODES		
L7	Choke, RF Plate	053-000624	V1	PL-172; Power Amplifier	090-201295
L8	Coil, Tank	051-402603	V2, 3	3B28; H. V. Rectifiers	090-900414
L9	Choke, RF Safety	053-200444	V4, 5, 6, 7, 8, 9	OA2; Voltage Regulators	090-900001
T1	Transformer, Rectifier Filament and Bias	052-300684	LM1, 2, 3, 4	Pilot Light	039-100004
T2	Transformer, Rectifier Plate	052-400685	LM5	Pilot Light (117V)	039-200002
SWITCHES			CR1, 2, 3, 4	Rectifier, Selenium (65 MA)	027-100243
SW1	Switch, Rotary; Meter	060-002271	CR5	Diode, 1N34A	112-100028
SW2	Switch, Toggle, DPST; FILAMENT	060-200908	MISCELLANEOUS CHASSIS PARTS		
SW3	Switch, AC Interlock HIGH VOLTAGE	060-200450		Barrier Strip	088-101959
SW4	Switch, Circuit Breaker	060-102096		Blade, Fan	041-350576
SW5A, B	Switch, Rotary; BAND SELECTOR	060-302093		Bracket, Meter Mtg.	067-204619
SW6	Switch, Toggle, SPST; FAN	060-100138-02		Bracket, Motor Mtg.	067-206544
JACKS, PLUGS AND SOCKETS				Cabinet	066-402251
J1	Socket, Octal; Antenna Relay	006-200296		Chimney	008-205294
	Plug, Octal	035-100003-01		Connector Hood	010-200055
J2, 3	Connector, Coaxial	010-100056	F1	Cover, Cabinet Top	066-401487
J4	AC Receptacle (Fan)	010-200015	F2	Feet, Rubber Mtg.	016-100029
P1	Line Cord and Plug; Fan	087-204833		Fuse (5 Amp, 250V)	039-100460
P2	Line Cord and Plug; AC Cap, Rectifier Plate	087-204978		Fuse (1/16 Amp)	039-100504
	Cap, PL-172 Plate (Part of L5)	076-100191		Fuse Holder	006-200837
		-----	M1	Meter, Cathode Current	082-000490
			M2	Meter, Motor, Fan	082-000491
				Motor, Fan	020-200218
				Panel, Front	068-400899
			K1	Relay, Bias	021-200433

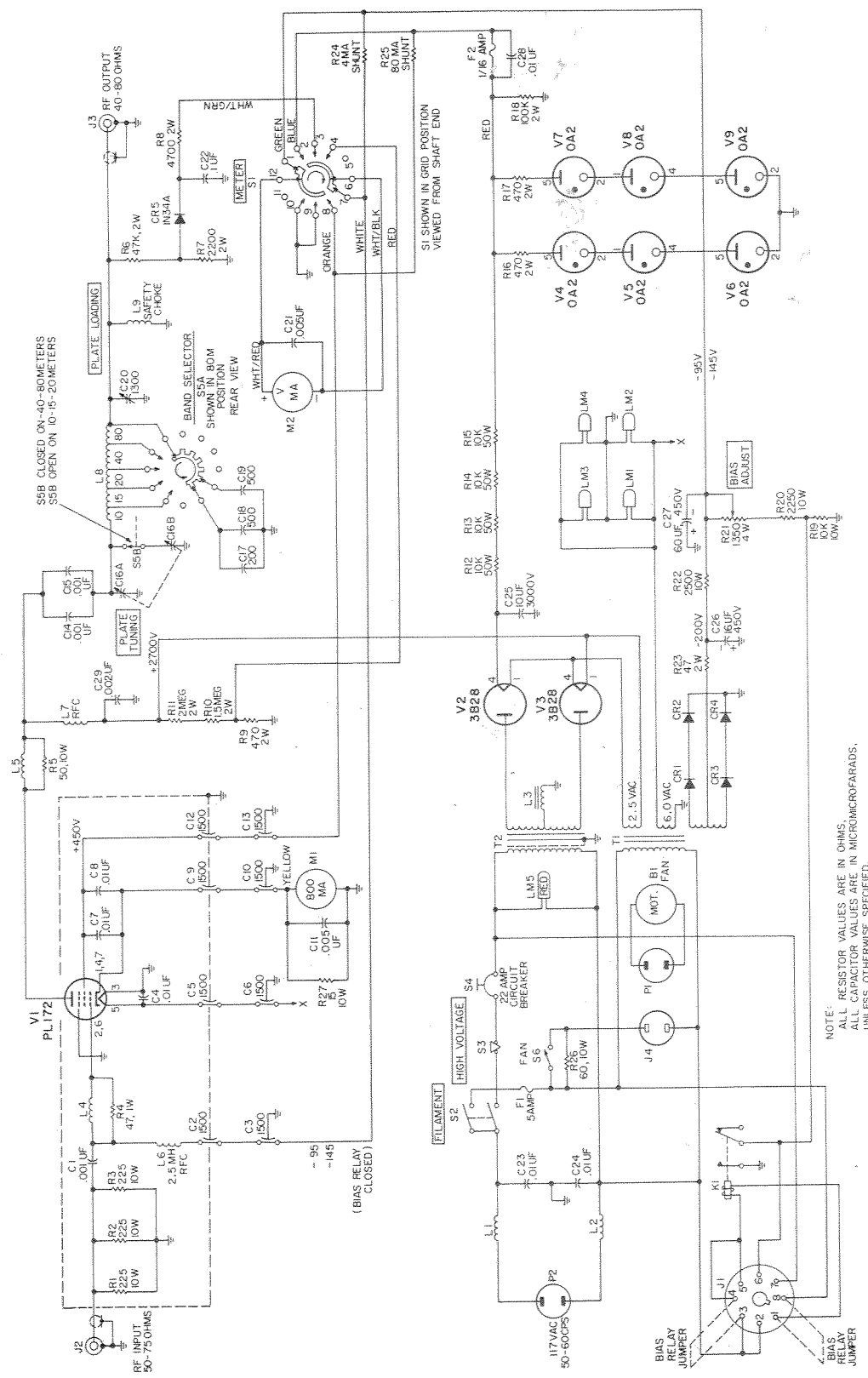


Figure 10. Schematic Drawing for HT-33B Linear Amplifier