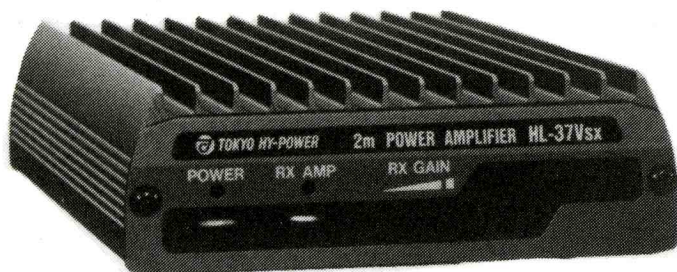


INSTRUCTION MANUAL

144MHz Band Power Amplifier

Model HL-37Vsx



Tokyo Hy-Power Labs., Inc.

HL-37Vsx is a compact power amplifier designed for 144MHz band FM/SSB hand-held and portable transceiver operation with a built-in RX preamp using a low noise FET. HL-37Vsx enables you to enjoy a comfortable DX QSO expanding the communication range limit of your hand-held radio.

FEATURES

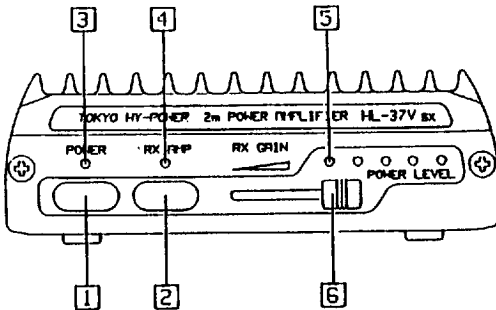
- 1) Surface-mounted type chip parts are partly employed. Also, coils at the RX amp. are surface mounted. This results in a higher reliability and more ruggedness in construction. In addition, a modern external design incorporating roundness has been adopted.
- 2) Combined with a hand-held transceiver, it boosts up to 30W output from 2 to 3W input, for example. (RF driving input between 0.5W and 5W is accepted.)
- 3) A low spurious signal emission with an effective output low pass filter.
- 4) With a built-in RX preamp, a noisy and weak signal can be received more clearly. The range of the RX gain is from -20dB up to +18dB.
- 5) With LED power level indicator on front panel, you can know an approximate output power level.
- 6) FM/SSB mode select switch is located inside the unit. The change-over from TX to RX is made with some delay of approx. 1 second at "SSB" so that the relay does not chatter.

SPECIFICATIONS

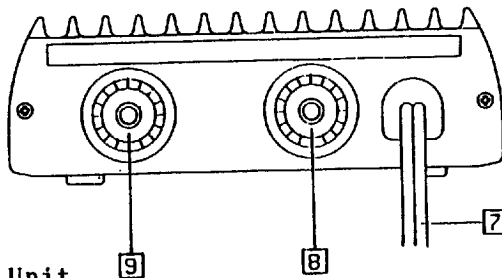
Frequency Band	:	144MHz band
Mode	:	FM/SSB/CW
Power Supply	:	13.8VDC (negative ground)
Power Consumption	:	5A max.
Output Power	:	32W(20-35W)
RF Input Power	:	5W(0.5W-5W)
Spurious Level	:	less than -60dB
Input/Output Impedance:	:	50Ω (M-type or SO-239 Connectors)
RX Preamp Gain	:	-20dB ~ +18dB (variable)
Accessory Circuit	:	-Variable Gain Low Noise RX Preamp. -LED Power Level Indicator. -Reverse DC Power Polarity Protection. -Mode Select.
Semiconductors Used	:	1 x RF Power Transistor 1 x IC 5 x Transistors 1 x FET 15 x Diodes 7 x LEDs
Accessories	:	Mounting Bracket Fuse (5A) Instruction Manual
Weight	:	approx. 550grams (approx. 1.2 pounds)
Dimension	:	105 (W) x 34 (H) x 143.5 (D) mm (4.1" x 1.3" x 5.6")

EXPLANATION OF FEATURES

Front Panel



Rear Panel



Inside of Unit

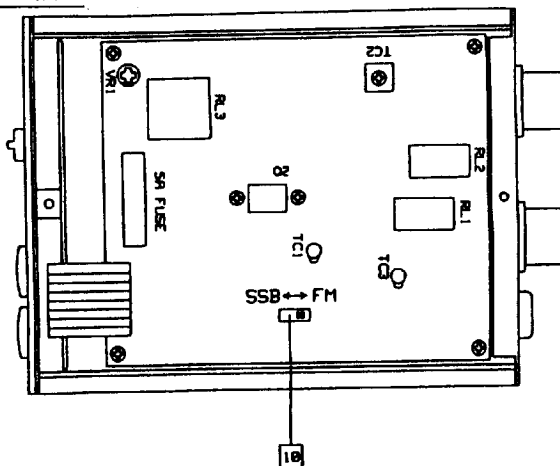


FIG. 1

- 1 Power Switch:
DC power switch for TX power amp unit.
- 2 RX Preamp Switch:
You can operate RX preamp independently.
- 3 POWER (LED):
Lights when TX power amp is ON.
- 4 RX AMP (LED):
Lights when RX preamp is ON.
- 5 Power Level (Output Power Level Indicator):
Indicates output power level with 5 LEDs.
With all of them lighting, it indicates an
output power of over 30W.
- 6 RX GAIN (RX Preamp Gain Control Lever):
Gain can be manually and variably changed from
+14dB max. to -20dB. It works as an attenuator
between 0dB and -20dB. RX Preamp is effective
when the receiving signal is weak.
- 7 DC 13.8V Power Lead:
Connect to the battery for 12V or stabilized DC
power supply. Red for positive and black for
negative. (Fuse on protection line is mounted
on PCB.
- 8 TX (Input Connector):
Connect the cable from the antenna connector of
the transceiver.
- 9 ANT (Output Connector):
Connect the cable from the antenna.
- 10 Mode Select Switch:
As shipped, HL-37Vsx is adjusted for FM
operation. If you need to operate SSB, then set
the switch to the SSB position in referring to
the sketch on the preceding page.

Installation

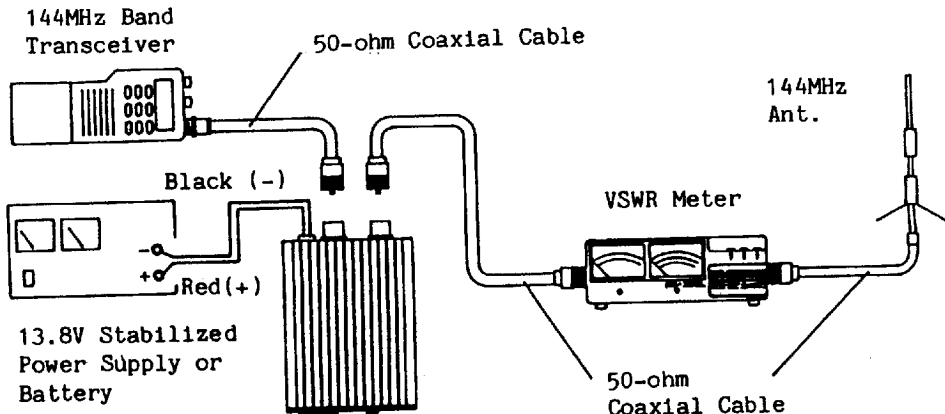


FIG. 2

PREPARATION FOR OPERATION

1. In case a rubber antenna has been put on the transceiver, remove it at first.
2. Prepare two male connectors for coaxial jumper cable between ANT connector of the transceiver and TX connector of HL-37Vsx.
In case the ANT connector of the transceiver is of a BNC type, the connector combination for jumper cable is MP-BNCP. (Optional cable BM-69 is available.)
3. Connect cables according to FIG. 2.

CAUTION

Be careful of the following subjects which may possibly become a cause of a trouble.

1. During transmission, the heat sink may reach a high temperature. Set the amp in a well-ventilated place. Don't put any objects on the top of the amp.
2. In the same way, do not operate the amp in any places where it becomes exposed to the direct rays of the sun, or nearby a heater, etc.
3. Be sure to check the "matching" or VSWR of the antenna before operation. At first, measure VSWR value as well as output power of the transceiver using the settings in referring to FIG.2. If the VSWR value is too high, adjust your antenna to obtain a proper "matching". Try to obtain VSWR of less than 1.3, or desirably as low as 1.0.
4. Do not connect a whip antenna to ANT connector on the rear panel of the amp directly using M-BNC adaptor connector. This will emit a strong output signal nearby the amp, and the amp or transceiver may get an oscillation trouble, etc.
5. Do not try to drive over the rated input level (5W max.).

6. Be careful that DC power voltage be kept no higher than the rated voltage of 13.8VDC (12-14V). If you erroneously connect to 24VDC (battery for large vehicles) or AC supply line such as of 110/117VAC, the amp may be killed easily.
7. In case that AC-to-DC converter (power supply) is used at home, some DC power supplies produce abnormally high output voltage due to high frequency RF intrusion. Use a DC power supply fully protected against this RF intrusion.
8. In case you install mobile mounting bracket to the amp, use the supplied M4 bolts. If you use a longer one, the top of the screw touches internal parts of the unit.

*Be careful of the following subjects which may be very dangerous:

- a) During transmission, if you touch the antenna directly, you will receive an electric shock and get burnt due to high frequency output power energy.
- b) If you connect the polarity of DC power leads reversely to the battery, the leads may be burnt as the battery is of low internal impedance.

OPERATION

As shipped from factory, HL-37Vsx is adjusted for FM operation. If you need to operate SSB, then please refer to FIG.1 and set Mode Select Switch to the SSB position.

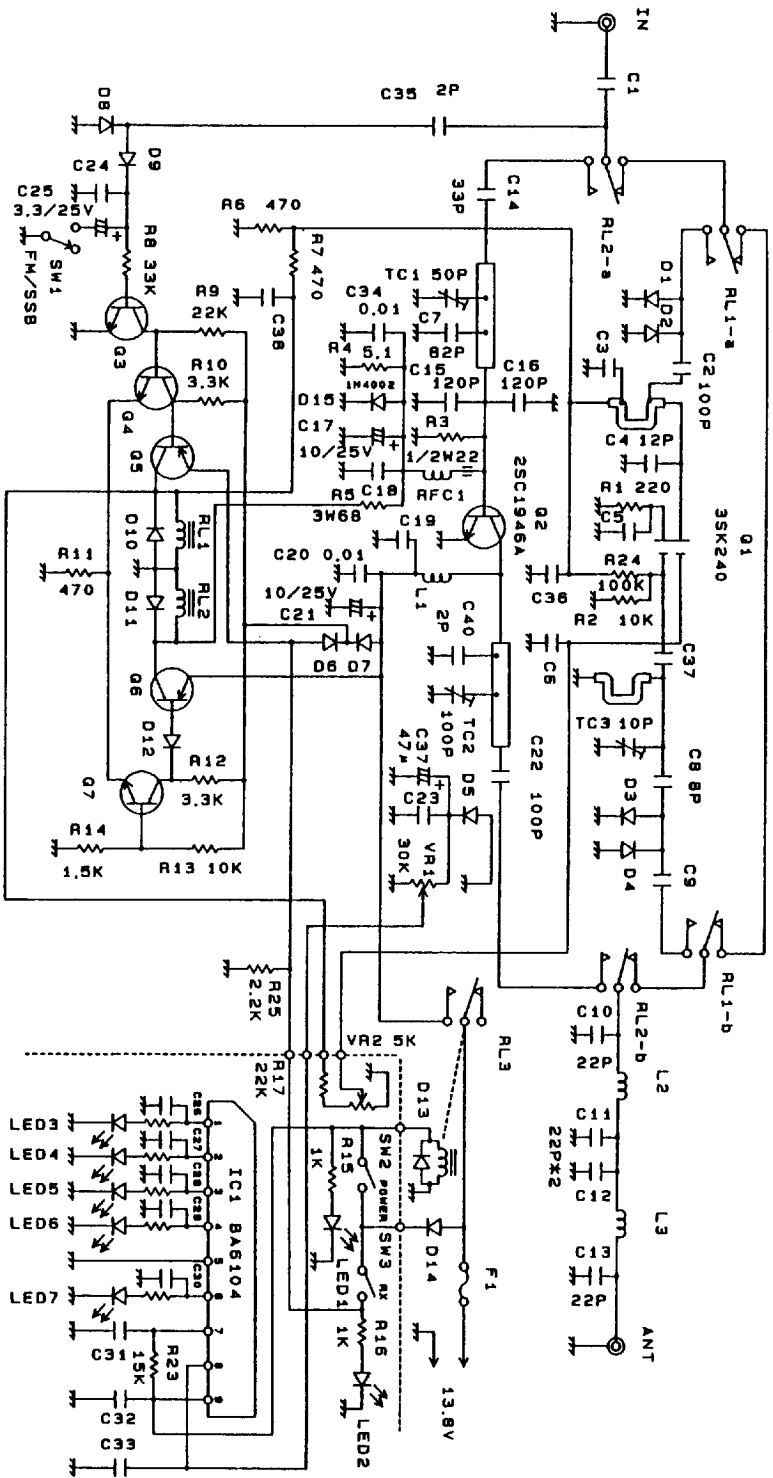
1. Be sure to check the installation according to FIG. 2, again.
2. At first, keep 1 Power Switch and 2 RX Preamp Switch OFF, and set 6 RX GAIN Control Lever to the right.
3. Turn the power switch of the transceiver ON. At receiving state, signals to and from the antenna bypass the internal part of the amp. Then, you can hear received signals from the transceiver.
4. Turn 1 Power Switch of the amp ON.
5. Upon turning the transceiver to "transmit", HL-37Vsx will be made into "transmitting power amplification" state, and high power signal is emitted from the antenna. At the same time, 5 Power Level Indicator lights. The number of LEDs lighted is related to the output power level.
6. Be sure to check VSWR value at "transmitting" state. Sometimes VSWR value can be varied as a result of increasing drive power level. In case VSWR becomes too high, adjust the antenna to obtain an optimum "matching" according to "CAUTION-3" on Page 6.

7. In case the receiving signals are weak, noisy and hard to read, turn [2] RX Preamp Switch ON. You can hear signals more clearly. Due to the nature of FM signal, in case the received signal has already reached a certain level and is very comprehensible, the readability cannot always be improved, even by turning RX Preamp Switch ON. Besides, you can control the RX gain as you like by sliding [6] RX GAIN Control Lever.

Max. on the right and min. on the left.

8. In case you operate with the transceiver only, just turn [1] Power Switch and [2] RX Preamp Switch OFF. The signal to and from the transceiver bypasses the internal part of the amp.

Then, if you need to operate RX preamp only, just Turn [2] RX Preamp Switch ON.



- Q3,4,7 2SC2712Y
- Q5 2SA1162Y
- Q6 2SA1298Y
- D1-4,8,9 1SS226
- D5-7,10-13 1SS196

All capacitors are 1000PF unless otherwise noted.

HL-37V SX CIRCUIT DIAGRAM

R18-22 1K X5