

A 20 WATT LINEAR FOR 2M

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The circuit described here is of a basic VHF Power Amplifier suitable for 2M (144-146 MHz) the output power of which can vary from 3 Watts to 25 Watts depending upon the selection of the transistor and the input power. The most cost effective design is to use two 2N3553 transistors having same hfe. It can give about 4-5 Watts of output with a Vcc of 12-15 Volts.

MECHANICAL CONSTRUCTION

The main amplifier section is made on a 3" X 5" single sided copper PCB. The copper PCB is connected to (-)ve of supply and considered to be ground of the system. Connections to the ground are directly soldered to the copper PCB and the floating points are constructed by mounting a 1cm X 1cm copper PCB on the main PCB with the help of an adhesive. In case high power transistors are used, a separate Heat Sink is required of size 3" X 5" X 0.8" and is to be placed under the main PCB. One 4mm(ϕ) hole is to be made on the Heat Sink and one 10mm(ϕ) hole is to be made on the PCB. The transistor should be carefully fitted so that the inner metallic portion of the transistor is in contact with the Heat Sink. Adequate Heat Sink compound should be used to prevent thermal shut down. Now the transistor is to be bolted to the Heat Sink from the bottom.

ELECTRICAL CONNECTIONS

Emitters are to be soldered on the PCB. Base and Collectors are to be isolated with the help of 10mm X 8mm copper PCB placed as

"Islands" on the main PCB. Other four similar islands are to be formed as shown in the component layout diagram. C1 to C6 are "Mica Compression" type capacitors of value 0-80pf. All coils are made out of 14 S.W.G. wires and coil diameter is 1/4 inch. L1 is a 1" straight wire, L2 = 3turns and L3 = 5turns.

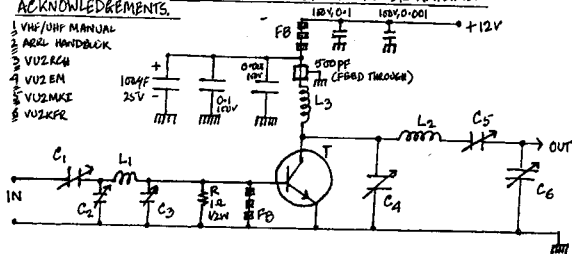
TUNE UP

One dummy load made out of 10 nos, 2 Watt carbon resistors of 470 Ω value and an RF Probe is to be connected at the output. C1 should be in open condition and C5 and C6 in almost closed condition. All other capacitors will be 70-90% closed. C2, C3 and C4 should be carefully adjusted to increase the output. Then C1 is to be gradually closed to increase input as well as output power. With an input of 1 Watt, BLY87A will give an output of 6-8 Watts. Another stage of BLW31 Cascode with the first stage gives an output of about 20-25 Watts.

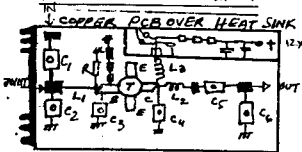
CIRCUIT DIAGRAM OF VHF POWER AMPLIFIER

ACKNOWLEDGEMENTS.

- 1 VHF/UHF MANUAL
- 2 ARRL HANDBOOK
- 3 VU2RCH
- 4 VU2BN
- 5 VU2MKE
- 6 VU2KFR



COMPONENT LAYOUT DIAGRAM



TRANSISTOR DATA :-

SL	TR	PIN	POUT	COST(Rs)
1	2N 3553	2W	3-5W	60p
2	2N 3553	2W / 3W	4W / 6W	120p
3	BLY 87A	1W / 2W	5W / 8W	600p
4	BLY 89A	5W / 8W	15W / 25W	1200p
5	BLW 31	8W / 15W	25W / 40W	950p

SPECIFICATIONS

C1-C6 : 0-80 PF mica compression type

L1 : 1", 14 S.W.G. wire, $\phi = 1/4"$

L2 : 3 turns, 14 S.W.G. wire, $\phi = 1/4"$

L3 : 5 turns, 14 S.W.G. wire, $\phi = 1/4"$