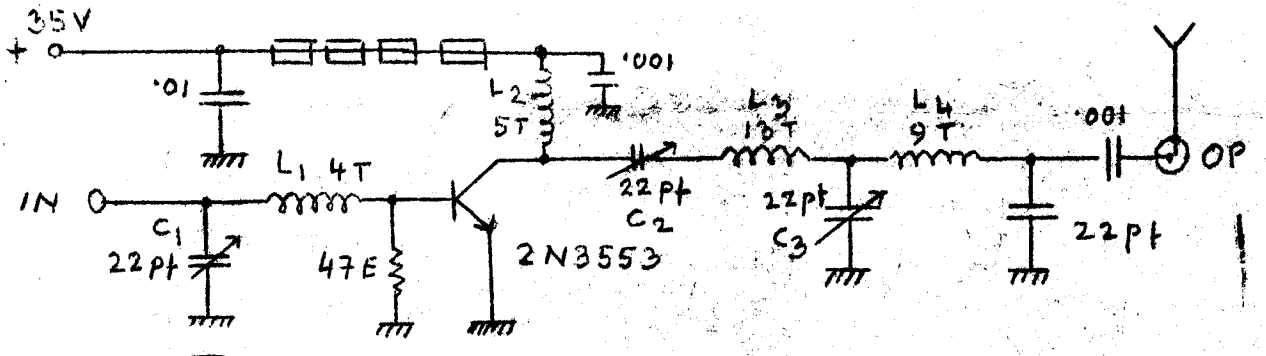
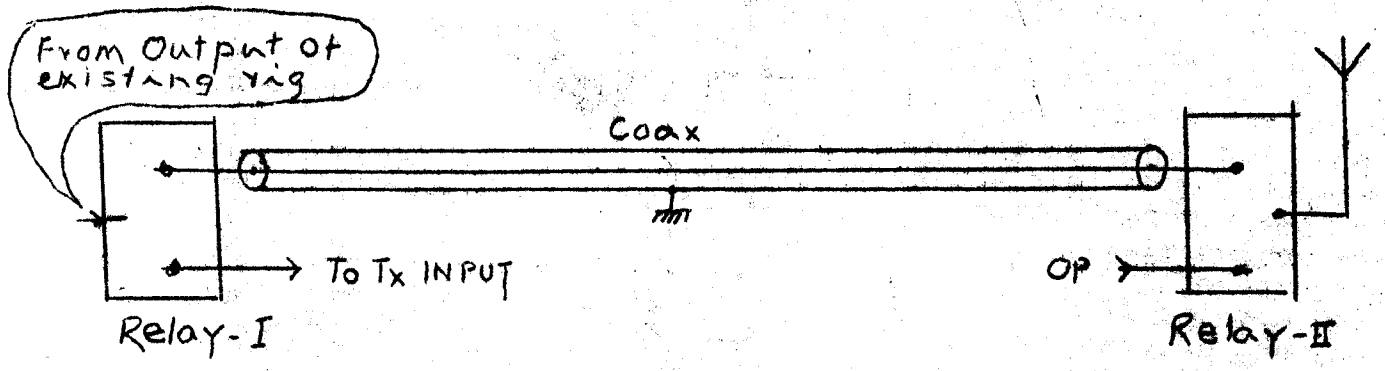
ADD-ON

POWER AMPLIFIER FOR YOUR 2M. RIG.

BY AVINASH MISSRA VU2EM.



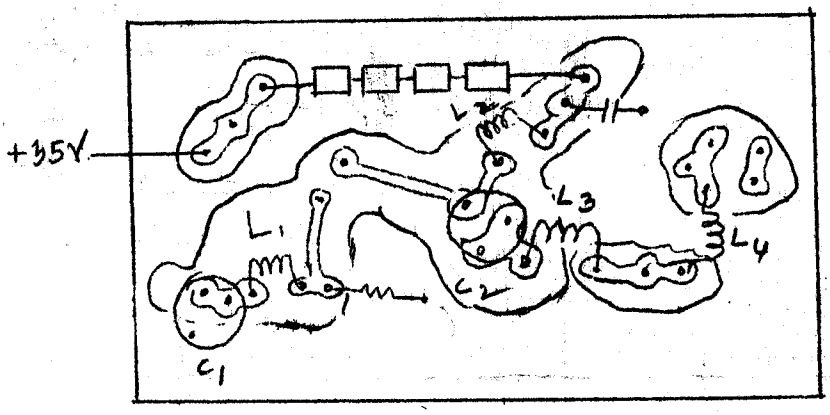


Coils : 22 SWG enamelled Copper 1/8" ϕ close Wound.

Capacitors :- 63 Volts or above.

Ferrite Beads :- 4 Nos. 4 mm. ϕ x 6 mm. Lg.

Trimmers :- 22 pf. Philips.



For those of us who are using the home - brew 2-M transreceiver which has an output of 1 watt (approx.), the power output can now be increased three fold in a simple Low Cost way.

Power output transistor in the VHF range are quite expensive - any thing above Rs.1000/- a piece. Further these are also not readily available due to being imported. Moreover the possibility of a burning out would certainly hot encourage one to try his/her skill at it - at least not me !

So I thought of having another look at our good old 2 N 3553. It is manufactured in our country by SMC and costs around Rs.55/- in retail. The " TOWERS MANUAL " provided the following information :-

V_{CB} (MAX) =65V, V_{CE} (MAX) =40V, VEB (MAX) =4V,

1_C (MAK) =1A, T_J = 200 °C, P_{TOT} = 7 WC.

HFE BIAS = 250 m A.

Manufacturer : OBS (i.e, obsolete - no current manufacturer known).

The P_{TOT} was quite appealing. Even if I could achieve 50% of the declared P_{TOT} at 60 °C which works out at 5 - 6 watts which with 60% efficiency for class 'C' would be about 3 watts.

Armed with above data and a pair of 2 N 3553 S and a basic class 'C' amplifier circuit a PCB was acted for above pattern. Since the output impedence of the basic rig is between 50 - 75 ohms, impedence conversion was required before the drive could be applied, hence this had to be provided for in the base circuit, various turns combinations were tried and what worked best are the values given. The transistor requires a good heat sink. I made use of 2" x 1½" of ¼" thick aluminium plate. I would have been happier if the thickness was ½". Increasing the dimensions does not help as the heat sink itself tends to rediate and isolation is difficult to achieve with this sort of a package. Since the heat sink blocks out a lot of space, trimmers are mounted on the foil side to provide access for tuning.

Initially a voltage of 12 to 15 V. should be applied to the Collector and the output trimmers be tuned for maximum output. A 5 Watt 0.47 ohms Carbon resistor be used as dummy load.

Increase the collector voltage in 2 or 3 Steps by changing the taps of your power supply transformer secondary, peak tuning all the way through and monitor your heat sink as well. Finally tune at 35 Volts. The Collector supply heed not be regulated. But the variation from <u>no load</u> to <u>load</u> shall not fall below 2 Volts.

Stacking of 2m. antennas :-