

HOMEBREW AMATEUR EQUIPMENT :

7 Watt QRP AM/CW Transmitter

Collected from the Amateur Magazine 'QSP'  
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The whole set up consists of a 7 MHz VFO with buffer, an RF Power amplifier section consisting of 3 transistors and its power supply, a TBA 810 Modulator with a single transistor Pre-amplifier and its power supply .

FIG 1 : Variable Frequency Oscillator :

The VFO consists of 2 FETs ( BEL BFW 10 ) . The first FET in the Oscillator with the fundamental frequency of 7 MHz . The second stage is a Class-A Buffer. The VFO draws 4 mA from a 6 Volt battery

The container is a slightly large Eliminator box . An ordinary 'L' Board can be used to assemble the circuit .

The Oscillator uses a Colpitts's Configuration . The voltage - feedback for sustaining oscillation is getting from the capacitor divider, network . These oscillations are coupled to the Buffer gate through a 10 pF Capacitor .

The buffer is operating as Class-A . The necessary reverse bias at the gate is developed across the source of buffer . The - amplified signal from the buffer is coupled to the power Amplifier section through a 100 pF capacitor .

Remarks : The capacitor should be Low Loss Type ; So 'STYROFLEX'

is preferred rather than Tubular Ceramic . Otherwise the oscillator may refuse to oscillate.

IF THE OSCILLATOR REFUSE TO OSCILLATE USE AN RFC INSTEAD OF THE 1 K2 RESISTOR IN THE SOURCE OF 'OSCILLATOR' . To make this RFC , wind 150 turns of SWG 36 enamelled wire on a 100 K ( or any other high Value) 1/2 Watt resistor and solder the ends to the resistor leads . Also you can try increasing the supply voltage to 9 Volt. The 'Oscillator Coil' should away from the metal enclosure .

Fig 2: RF Power Amplifier and its Power supply :

The Radio Frequency Power Amplifier consists of three(3) stages :  
(1) The Pre-Amplifier , (2) The Driver , and the (3) final stage ;  
These consist of BC148B in Class A mood , an SK 100 in Class and the final a BD 139 in Class C respectively .

- The pre-amplifier is an R-C Coupled one while the driver collector-load is an RFC damped with 1 K resistor in order to suppress unwanted Self-Oscillation . The base of BD 139 is directly coupled to the collector of SK 100 . The Tank Coil is placed in the collector of BD139. THE TAPPING ON THE coil ARE CRITICAL . The Antenna Connector is an ordinary Mike -connector , so two 0.1 mFd. capacitor are used for isolating the DC. from the mike-connector .

The power amplifier pwr. supply is a full wave centre tapped one. The power transistor is with a 24-0-24 V, @ 1 Amp. secondary . Since the load current is only around 200 mAmp. , the rectified voltage will be much higher than the rated voltage . The voltage drop across the winding will be in significant . So the output voltage from the power - supply will be around 35 Volts . A bridge rectifier circuit is not-  
p-recommended because it causes hum in the signal .

Fig. 3 : The Modulator Section :

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The modulator is a TBA 810 IC Audio Amplifier with a single transistor Pre-Amplifier. The TBA is operating on 11 VDC supply from an eliminator and is using standard circuitry . The audio pre-amp. is a CIL 464 transistor . The 0.01 mFd. capacitor from the base of CIL464- to the ground is an RF bypass capacitor . The RF may induce in the pre-amp. while transmitting . Lower values can be used for this purpose . a 100 ohm  $1/2$  watt resistor is connected accross the output of the modulator . When the Tx ( Transmitter) is in AM position this 100 Ohm will come in series with the emitter of the SK100 .

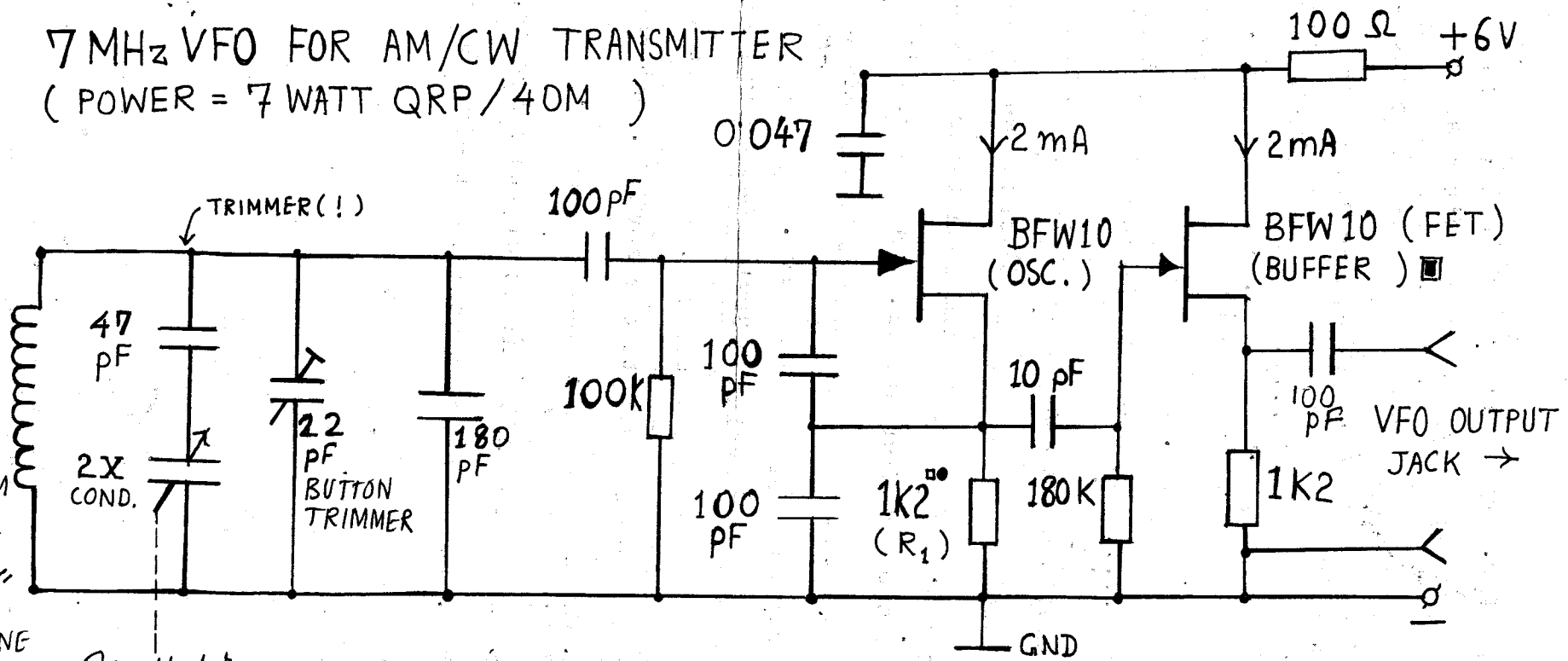
The modulator power supply is a half-wave rectifier . The Condenser Mike shown in fig 3 is having three connections but two connections Mike can also be used equelly well .

Use an external Voltage stabilizer ( from your TV set ! ) in the RF power supply section .

FIG 1

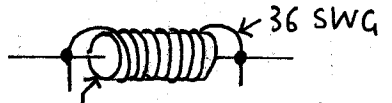
# 7 MHz VFO FOR AM/CW TRANSMITTER (POWER = 7 WATT QRP/40M)

- OUTER DIA: 1.7CM
- LENGTH OF COIL: 1CM
- TURNS: 11
- SWG: 24
- INNER DIA: 1/2"
- FORMER: POLYSTRENE PIPE

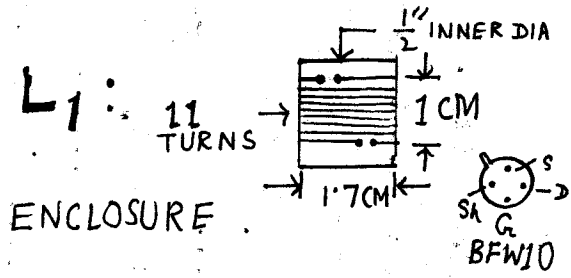


Oscillator section of 2x gaus

- ALL CAPACITORS STYRO FLEX (BUT NOT TUBULAR CERAMIC) FOR LOWER LOSS.
- IF NOT OSCILLATING, USE 'RFC' INSTEAD OF 1K2 (R<sub>1</sub>)
- RFC<sub>R<sub>1</sub></sub> DATA: 150 TURNS / SWG 36 ENAMELLED WIRE ON A 100K RESISTOR 1/2 W AS SHOWN →



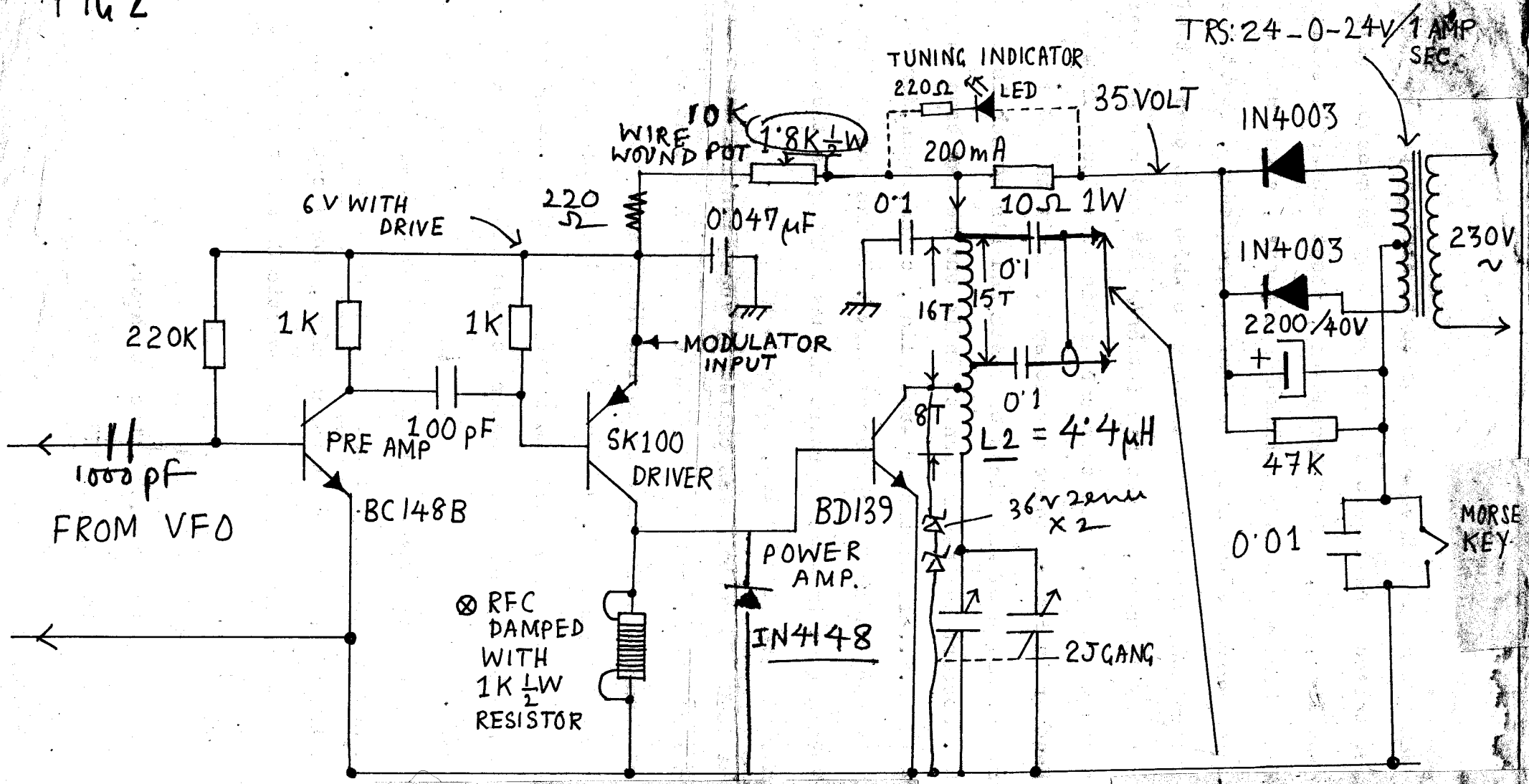
- OR INCREASE POWER FROM +6V TO +9V.
- KEEP THE OSCILLATOR AWAY FROM METAL ENCLOSURE.



- 1. BUFFER AMPLIFIER IS TO ISOLATE OSCILLATOR FROM THE FOLLOWING CIRCUITS (OR ANTENNA)
- 2. TO INCREASE POWER WITHOUT CHANGING FREQUENCY

FIG 2

# 7 WATTS RF AMP. SECTION

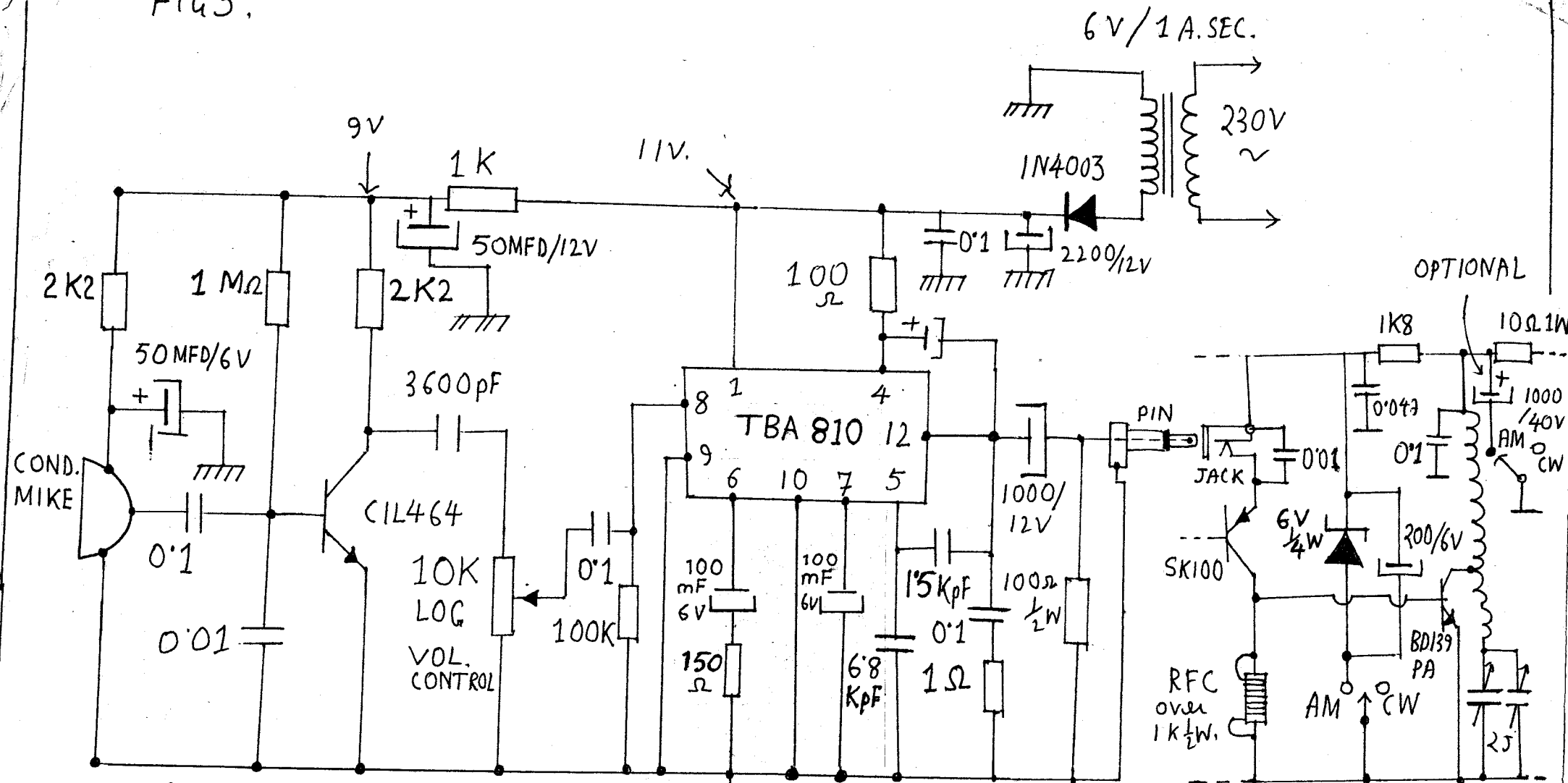


⊗ RFC : 150 TURNS / 36 SWG ON 1 KΩ  
 L2 : 24 TURNS / 24 SWG ON 3 CM / DIA 1.7 CM FORMER (PVC)

TO DIPOLE THROUGH 75 Ω COAX.

collected from "QSP"

FIG 3.



AF PRE AMPLIFIER

MODULATOR

DRIVER & FINAL STAGES MODIFIED FOR AM

- ① NEVER CONNECT MODULATOR & TX GND TOGETHER (TO PREVENT SHORT)
- ② ADJ. 10K LOG FOR MINIMUM DISTORTION.