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## GENERAL DESCRIPTION OF GLOVE KING WRL400 EXCITER

The exciter section consists of a 7C5 hot cathode Xtal oscillator capacity coupled to a 2E26 buffer doubler. The oscillator stage being rich in harmonics allows the use of 40 & 80M Xtals for complete amatour band coverage from 10 to 80 meters. Voltage regulation is used in the oscillator stage and to the screen of the buffer stage thus insuring maximum stability at all times. A keying jack in the oscillator cathode circuit, allows one to work break in CW and since the buffer stage has fixed bias on it at all times the removal of the excitation will cause the plate current to drop to zero or to a safe value. The switch on the front panel marked 10 & 20M, 40&80M serves the purpose of shorting out the cathode choke in the oscillator. This action enables the oscillator to work straight thru and removes the possibility of ones tuning to a harmonic accidentally.

## FINAL

The final sections consists of the new, easy to drive, V70D's. They are connected in a conventional push pul circuit and are biased to operate at maximum efficiency from 10 to 160 Meters. The fixed bias supply incorporated supplies the necessary bias and insures complete cut-off of final plate current with the removal of excitation. Neutralization of the final is not critical but it must be balanced at all times. Using a lamp loop consisting of a two turn loop of wire about  $2\frac{1}{2}$ " in dia. to which has been attached a #49 bulb and a insulated alignment screw-driver the neutralizing procedure is as follows:

Remove the B lead from the feed thru on the final chassis.

Turn on the Exciter and tune it up on the 10M band.

Next obtain rated grid current for the finals (32MA) according to the tuning procedure.

Turn off the Exciter and tighten the plates on both neut. cond. until they touch then back each off approximately 5 turns.

Turn on the exciter, hold the lamp loop near the final tank coil and tune the PA Plate control for maximum brilliancy of the bulb.

With the insulated screwdriver, rotate each movable plate of the neut. cond. down a turn at a time until the bulb dims down.

Re-tune the PA grid and PA Plate and again adjust the neut. cond. until the bulb goes clear out. Always keep the spacings between the plates equal or you will find that the final plate current will not dip down to 50MA as is required with no load. Once the final has been neutralized properly on 10M it will remain the same for the other bands.

### MODULATOR

The modulator tube complement is as follows: A 6SJ7 speech into a 6N7 inverter into a pair of triode connected push pull 6F6's into a pair of 5514's push pull class B modulators. A pair of 866 Jr's. supply approx. 850V at 250 MA to the modulators and a 5Y3 supplies all necessary speech and driver voltages, approx 400 V @ 150 MA.

The 6F6 drivers have been connected as triodes in order to obtain the utmost speech quality with the least amount of distortion and supply more than enough drive to operate the modulators to full output which is in the vicinity of 150 watts.

A shorting relay across the secondary of the modulation transformer serves the purpose of automatically keeping the secondary shorted when the modulator is not in use thus providing a safety factor when operating CW. The mod. plate switch in conjunction with the transmit switch controls this relay.

### POWER SUPPLY

The main power supply consists of two separate supplies. One supplies 1350V. at 300MA to both the final tubes, the other supplies 500V at 200MA to the Exciter section. A high, low switch has been incorporated in the high voltage supply to enable the operator to tune up the final without the danger of burning up the meter or ruining the tubes. This switch places a resistor in series with the 110 Volt primary of the high voltage transformer thus reducing the voltage to such an extent that the final can draw a maximum of only .100MA. The switching arrangement is such that the Exciter switch can be operated independently of the Transmit switch but is closed automatically when the Transmit switch is turned on. In this way the complete transmitter can be turned on and off with the Transmit switch only. A Terminal strip at the rear of the chassis provides 110V. AC when the Transmit switch is turned on. This strip is marked Ant. Rly, and can be used to energize an Antenna changeover relay or for receiver disabling.

The two mounting posts next to the final coil are for mounting a jack base. If 160M operation is contemplated, the base will have to be mounted on the two posts and the padder condenser plugs into it. The Final coil for 160M has attached to it two clip leads which should be connected to the leads on the jack base.

## TUNING PROCEDURE FOR WRL GLOBE KING

1. Check all tubes to see if they are plugged in well and none are broken due to shipment.
2. Install a good ground to the transmitter case. A #10 wire is recommended and it should be as short and direct as possible.
3. Insert the proper xtal, osc coil and buffer coil in their respective sockets (refer to the Coil and Xtal chart).
4. With all switches off, plug the line cord into a 110V receptacle.
5. Turn on the Filament switches and allow tubes to heat for at least one minute.
6. Set the switch marked 10-20M and 40-80M to the appropriate position.
7. Set the osc-buffer meter switch to Osc. Set the Osc switch at the rear of the chassis to Osc. "in". Plug a key in the key jack and close it.
8. Turn on the Exciter switch and tune the Osc plate control for minimum dip on the meter. (approx. 10MA). Open the key.
9. Set the meter switch to Duffer, close key, and tune the buffer plate control for minimum dip also. (28MA on 10M, less on lower frequencies)
10. Turn off the Exciter switch and plug the Final grid coil in its socket. Leave the key closed.
11. Again turn on the Exciter switch and with the P.A. Grid PA Plate meter switch set to PA Grid, tune the PA Grid control for maximum current on the meter. If the grid current exceeds or is less than 45 MA, adjust the link of the F. Grid coil until this current is obtained. You will note that the Buffer plate current rises when the F. Grid is tuned. This is due to normal loading of the Buffer but do not exceed 70MA plate current.
12. Turn off the Exciter switch. It is well worth mentioning here that when tuning up the Exciter, a dependable wave-meter is essential to insure your being in the proper band.
13. Insert the final plate coil in its socket and move the swinging link out of the coil.
14. Set the switch marked High and low B to Low B and turn on the Exciter switch.
15. Turn on the Transmit switch tune the PA plate control for minimum dip on the meter, it should dip to 20 MA on 10M, less on lower frequencies.
16. Turn off the Excitor and Transmit switches.
17. Attach the antenna feeders to the two feed thru's on the cabinet.
18. Turn on Transmit switch only and swing the final link into its coil while carefully tuning the PA plate control until a load of approximately 60MA is obtained.
19. Set the Hi Lo B switch to Hi B plus and adjust the final link and PA tuning until the recommended load of 300MA is obtained.
20. Switch the final meter switch back to PA Grid and adjust it until the required 40MA grid current is obtained. The final load shouldn't exceed 325MA or be less than 275MA and the final grid current shouldn't exceed 45 MA or be less than 35MA for normal operation.

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You can now go on the air with CW by simply operating the key which is still in the key jack.

For Phone operation, turn on the Filament switch of the modulator allowing one minute warm-up and remove the key from key jack.

A Xtal mic or a high impedance dynamic mic is connected to the Mic Jack and the gain control set to #6 for full modulation. Turn on the plate switch and leave it on. The complete transmitter is now turned on and off with the Transmit switch and only it need be used. With normal speech in the Mic, the gain control should be re-set so that the modulation meter needle swings up to 250MA for good high quality modulation.

#### COIL AND XTAL CHART

BAND	XTAL	OSC	BUFFER	F.GRID	F.PLATE
10M	7000 to 7425KC	20MEL	10MEL	10JVL	10TVL
20M	7000 to 7200KC	20MEL	20MEL	20JVL	20TVL
40M	7000 to 7300KC	40MEL	40MEL	40JVL	40TVL
80M	3500 to 4000KC	80MEL-Pad	80MEL	80JVL-Pad	80TVL

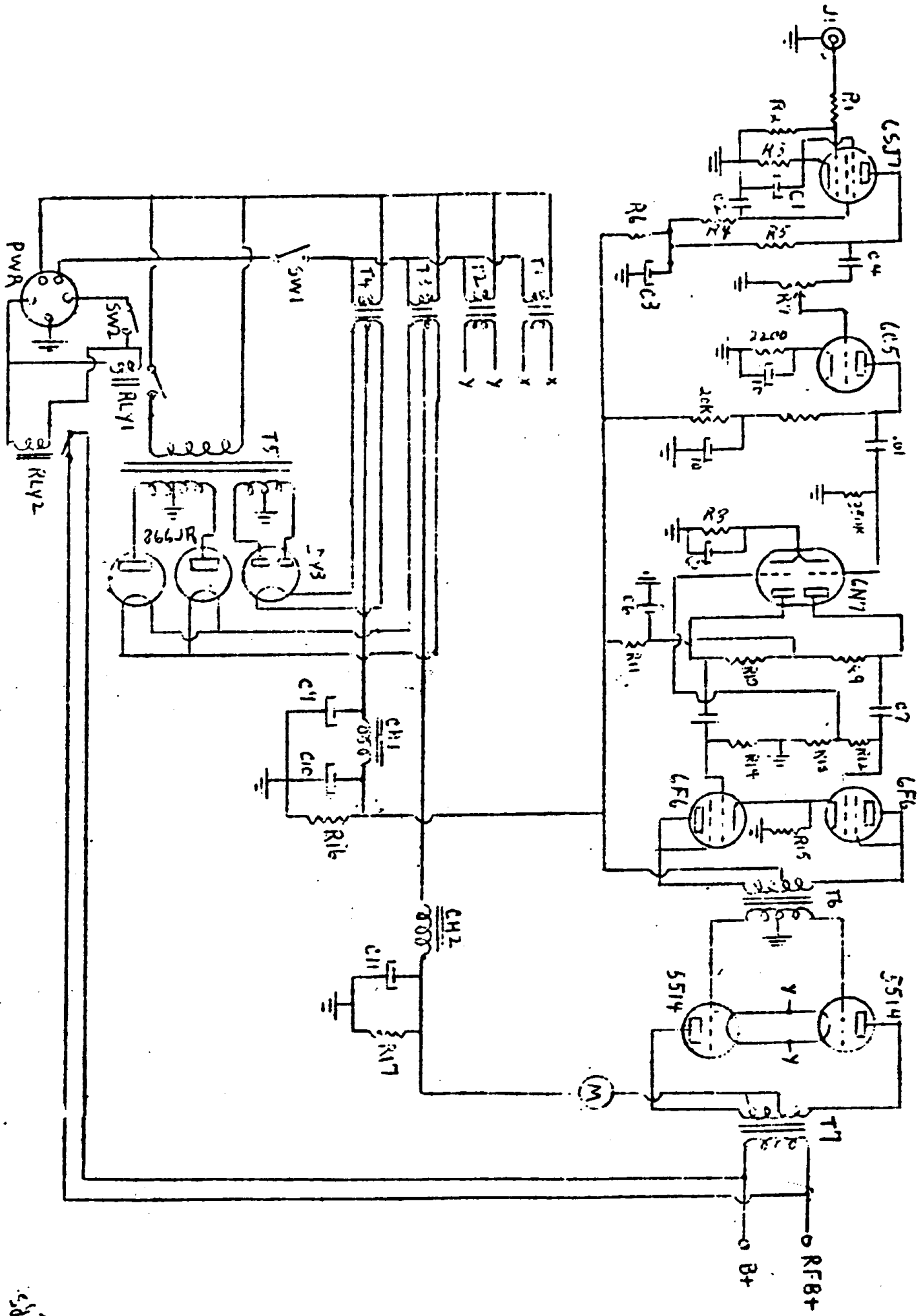
For 160M operation a 30MFD air padder and a special set of coils is required.

For VFO operation the following is recommended:

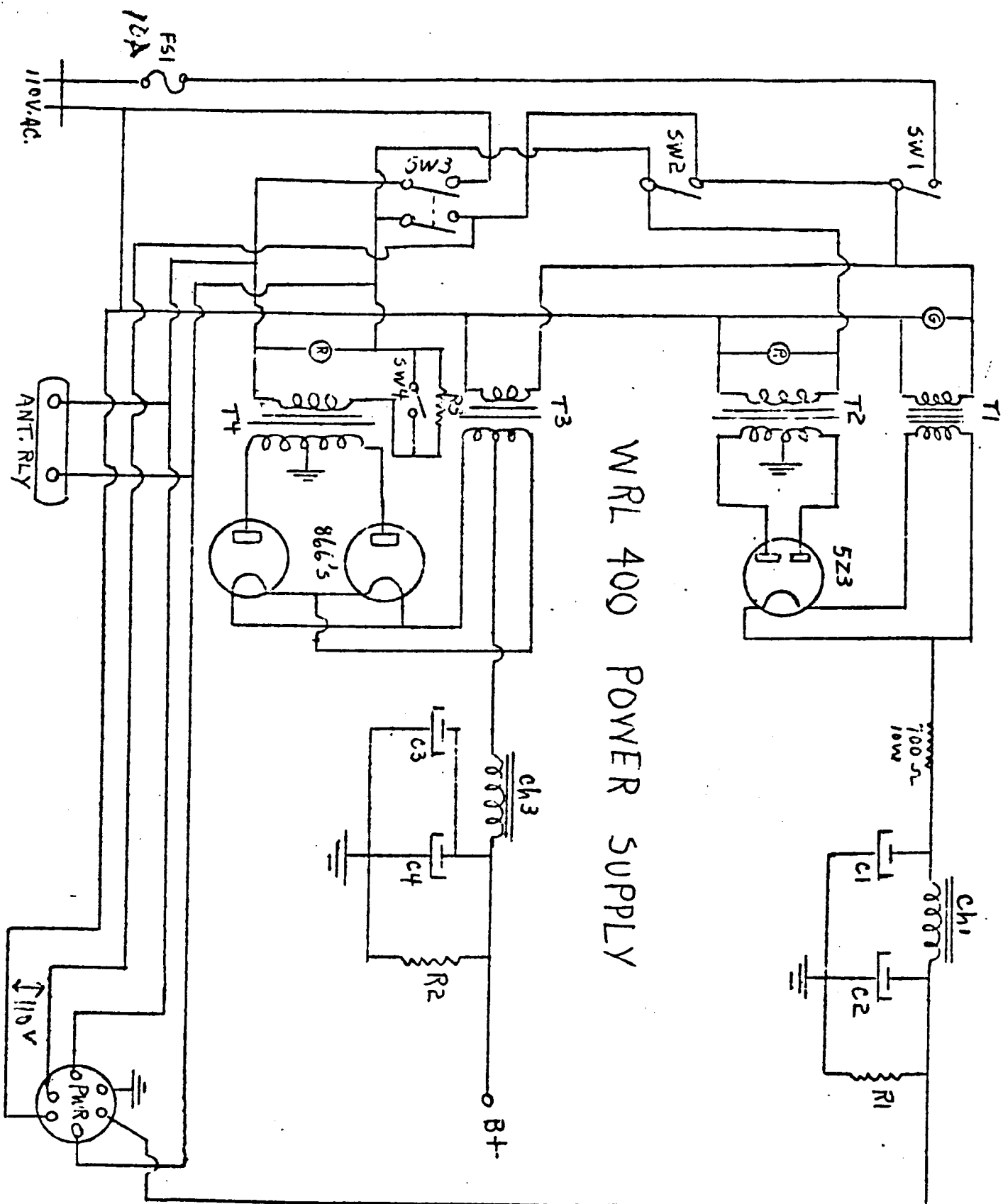
For 10 to 20M operation a 40M VFO is required, the output of which is fed into the Xtal socket thru a 15 mmf condenser. The black dot on the Xtal socket indicates the grid side and to this grid the 15 mmf condenser should be attached. The tune up procedure is the same as if a Xtal were being used. A 20M VFO may be used for 10 and 20M operation by feeding its output in the jack marked VFO and setting the OSC switch to "Out" position. For 40M operation a 40M VFO is fed into the socket marked VFO at the rear of the Exciter chassis. The switch above the VFO socket should be set to osc out for VFO operation and to osc in for Xtal operation. The same applies for 80M operation except that an 80M VFO is used. In this manner the VFO output is link coupled to the osc plate coil and the osc plate tuning control should be resonated with the VFO for maximum efficiency.



WRL 400A MODULATOR



507-6-51



5/8/81

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## RF Section Parts List

R1-100k- $\frac{1}{2}$ w	C1-100 mmf-300V
R2-320-2w	C2,3,5,,9-.002 mf-500V
R3-100k-1w	C4,11-70 mmf.variable tuning
R4,9,10-10 ohms 1w	C7-15 mmf-500V
R5-3K-40W	C8-.001 mf-500V
R6-15K-1w	C10-.002 mf-2500V
R7-10K-1w	C12,13,14-12 mf-250V
R8-7K-10w	C15-Dual 70mmf variable tuning.
R11-2500-20W	C16-.002 mf-5000V
R12-1000-1w	NC-2,NC 853 condensers
R13-560-1w	C17-Dual 100 mmf variable tuning
R14-10 ohms 2w	M1-0-150 MA Meter
T1-6.3V-3A. fil xfrmr	M2-0-400 MA Meter
T2-6.3V-1A Bias xfrmr	SR-200MA Selenium rectifier
T3-7.5V-12A Fil xfrmr	RFC 1,2,3-2.5 MH-50 MA
SW1-SPDT Regeneration Sw.	RFC4-2.5 MH-125 MA
SW2-DPDT Exciter meter Sw.	RFC5-1 MH-500 MA
SW3-Special ceramic final meter Sw.	
SW4-SPST Osc. Disabling Sw.	

## Modulator Parts List

R1-100k- $\frac{1}{2}$ w	T7-Mod. xfrmr. 7K to 4K ohms
R2-2 Megs- $\frac{1}{2}$ w	T5-Dual plate xfrmr
R3-2200- $\frac{1}{2}$ w	850V-300 MA
R4-1 Meg- $\frac{1}{2}$ w	400V-150 MA
R5,14-220K- $\frac{1}{2}$ w	Rly1-110V relay SPST normally open
R6,11,13-20K- $\frac{1}{2}$ w	Rly2-110V relay SPST normally closed.
R7- $\frac{1}{2}$ meg Volume control	Ch 1-10H-150 MA
R8-1500- $\frac{1}{2}$ w	Ch 2-10H-300 MA
R9,10-150K- $\frac{1}{2}$ w	M-0-300 MA Meter
R12-200K- $\frac{1}{2}$ w	C1,5-10 mf-50V
R15-700-10w	C2-.1 mf-400V
R16-50K-20W	C3,6-8 mf-450 Can..
R17-50K-75W	C4,7,8,--.01 mf-600V
T1-7.5V-8A fil xfrmr	C9,10-8mf-450V can
T2-6.3V-3A fil xfrmr	C11- Two 4 mf 1000V cond.
T3-2.5V-5A fil xfrmr	SW1-DPST on off Sw.
T4-5V-3A fil xfrmr	SW2-DPST plate Sw.
T6-3.1 driver xfrmr	J1-closed ckt mic jack

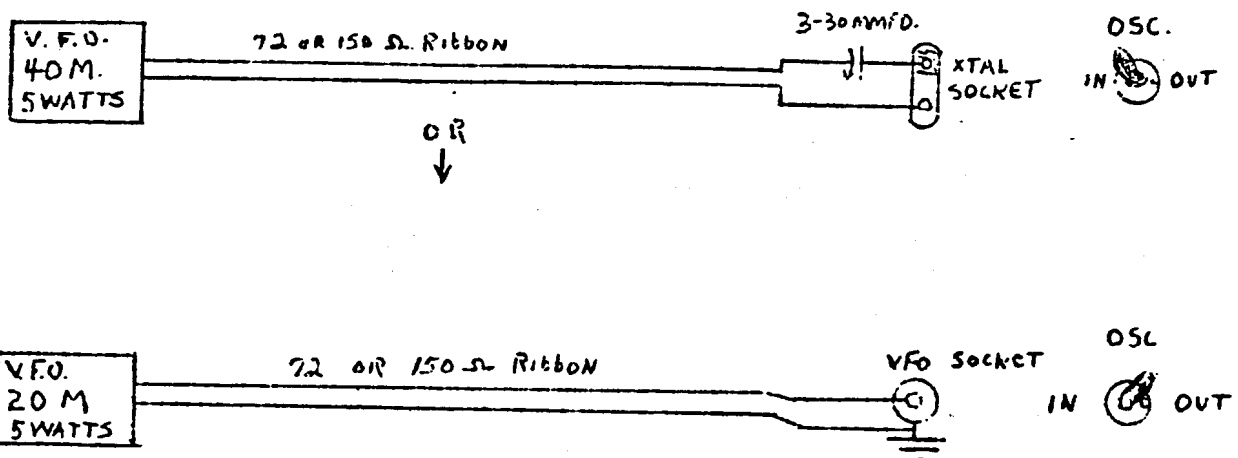
## Power Supply Parts List

Pilot lights-3,, S6 bulbs	R1-50K-20w
T1-5V.3A fil xfrmr	R2-50K-75W
T2-500-0-500MA Plate xfrmr	R3-100 ohms-50W
T3-2.5V 10A 10A fil xfrmr	FSL-10A fuse
T4-1400V-300 MA Plate xfrmr	SW1-DPST fil Sw.
Ch3-10H-300MA Choke	SW2-DPST-Exciter Sw.
Ch1-10H-150MA Chokes..	SW3-DPST-Transmit Sw.
C1,2-10 mf 600V cond	SW4-DPST-10A 10A 10A

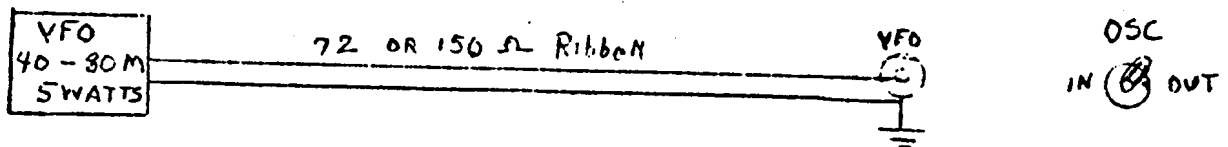


## METHODS OF FEEDING A VFO INTO TRANSMITTER

## 10 AND 20 OPERATION



## 40 OR 80M OPERATION



When working into VFO SOCKET, TUNE THE OSC TANK TO RESONANCE WITH VFO OUTPUT AS DETERMINED WITH AN RF INDICATOR HELD NEAR OSC TANK COIL.

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