When one or more 6L6 tubes are replaced it may be found that the B+ output voltage will not go down to zero when the output control is turned to minimum output. This is caused by the varying grid characteristics between 6L6's and is most likely to occur in the Model 500bb. The output may be adjusted back to zero by adjusting the potentiometer (located on teh top of or directly behind the extension projecting from inside of the front panel atop the variable transformer) until the output drops to zero.

PRINCIPLE OF OPERATION

The operation of this unit can best be understood by referring to the schematic drawing included with this manual.

The full wave rectifier circuit for the high voltage supply consists of a variable transformer (T3), a plate transformer (T2), rectifier tubes V1 and assiciated filter circuit (choke L1 in the 500BB and 600B and resistor R32 in the 560BB and capacitors C1). This is basically a choke input filter. C10 in the 500BB and 600B serves to minimize spikes originating in the rectifiers.

The series or passing tube circuit consists of a number of 6L6's (V2) connected in parallel. Triode connections are used in the 500BB and 560BB while a pentode connection is employed in the 600B. This model also uses a half wave rectifier circuit consisting of rectifiers (S1), capacitor (C12), and choke (L3) to provide the screen voltage.

The 300 volt reference circuit consists of a power transformer (T1), a full wave rectifier tube (V3), and the associated LC and RC filter networks (L2, C2, C3, R6, R7, and R8). R6, R7 and R8 are also used to obtain the proper voltage to operate the two reference tubes (V4 and V5).

Tubes V6 and V7 and the associated resistors and capacitors form the control circuit for the ghih voltage supply. the 150 volt bias supply is taken from a potentiometer (R27) which shunts one of the VR tubes (V4).

The 6.3 VAC center tapped filament supply is unregulated and is supplied directly from the input through one winding of the filament transformer (T4).

To portray one phase of regulation on the high voltage supply, assume that there is an increase in the output voltage due to a decrease in load current. To restore the output to its original value will require an increase in the voltage drop across the passing tubes. this is accumplished as follows:

The increase in output voltage will appear across the sensing nwtwork consisting of R19, R20, R21, R22, and R23 which are connected across the output and the -300 volt reference supply.

Part of this volatage increase will appear at grid (pin #4) of V7, which is connected to the sensing network, causing the grid to become ~~negative~~ positive. As a result there will be an increase in the plate current in this section of V7 causing an increased voltage drop to appear across the cathode resistor R16, Since grid 1 of V7 is held negative by the VR tubes V4 and V5 (in the 600B, V8 has good long-time stability characteristics,and acts the reference tube thereby increasing the stability of that circuit), the change in volatage across the cathode resistor R16 will make the grid more negative with respect to its cathode. This in turn will decrease the plate current of this ~~sirt~~ portion of V7 and decrease the drop across the plate resistor R17.

Since R17 is connected to the grid of V6 this grid will then become less negative and casue the plate current of V6 to be increased. The resultant increased drop in plate resistor R12 , R12 is connected between the grid and cathode of the series tubes and thus determines the grid voltage of these tubes. Increasing the voltage drop across R12 will therefore make the passing tube grids more negative with respect to the cathodes causing a higher voltage drop to appear across these tubes. This increased drop will be of the required amount necessary to restore the output to its originalvoltage setting. This entire wequence of events, of course, occurs almost instantaneously.

MAINTENANCE

During normal life this instrument requires no maintenance other than the care afforded similar electronic equipment. Tubes should be replaced at the end of their specified life in accordance with the policies established for this particular application.

TUBE COMPLEMENT

500BB	560BB	600B
(7) 6L6	(4) 6L6	(7) 6L6
(2) OD3	(2) OD3	(2) OD3
(2) 5R4	(1) 5R4	(3) 5R4
(1) 6SL7GT	(1) 6SL7GT	(1) 6SL7GT
(1) 6BQ6GT	(1) 6BQ6GT	(1) 6BQ6GT
(1) 5Y3	(1) 5Y3	(1) 5Y3
		(1) 5651

SPARE PARTS

All components in this instrument are of a good commercial grade and can be expected to give a reasonably long period of tro uble free service. As the age of your instrument increases, however, some components are likely to deteriorate; therefore, we suggest that you contact our Service Department for a list of the spare parts that should be kept on hand.

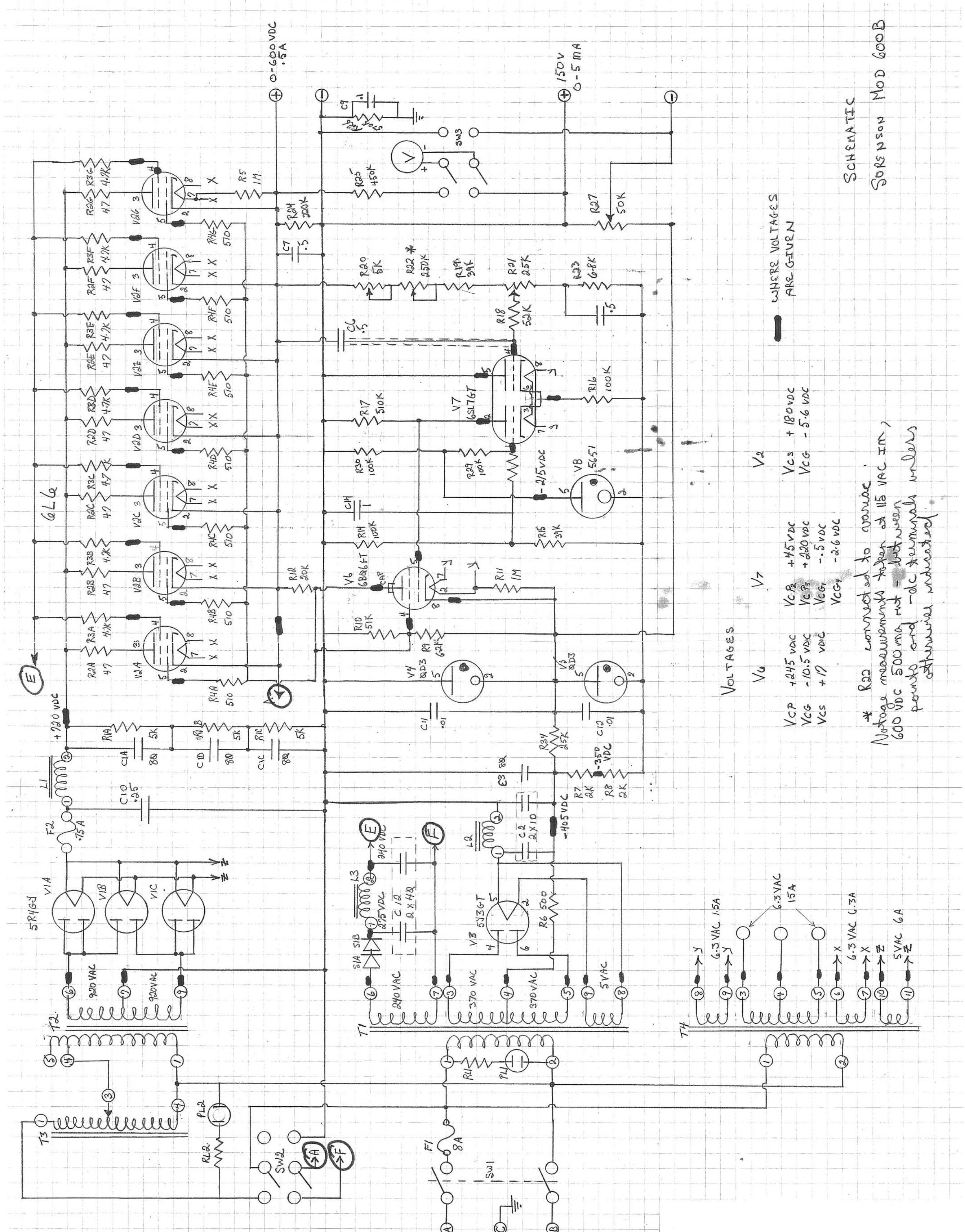
In the event it becomes necessary to replace any part we strongly urge the replacement be of the same value as the original. Substitute parts shold not be used unless we advise you that the substitute value will not impair the performance of your instrument.

CAUTION: DANGEROUS VOLTAGES EXIST IN THIS INSTRUMENT. PLEASE OBSERVE APPROPRIATE PRECAUTIONS.

TROUBLE SHOOTING

Typical circuit voltages are indicated on the schematic. All voltage measurements should be taken with a 1000 ohm/volt voltmeter. Grid voltages should be measured with an electronic type voltmeter.

Most difficulties with these instruments will result from defective tubes. In some cases the tube reponsible for the difficulty will appear to be good when tested on a tube checker. We believe the most effective time saving procedure in the event of trouble is to replace each tube with one known to be good.



Scan and schematic courtesy of Alfred Raaphorst