



**SONIC FRONTIERS**

I N C O R P O R A T E D

760 PACIFIC ROAD, UNIT #19 • OAKVILLE, ONTARIO, CANADA L6L 6M5 • TEL (416) 847-3245 • FAX (416) 847-5471

## **Service Information**

for the

# **SFS-50 and SFM-75 MKII**

# **Tube Amplifiers**

As both the SFS-50 and SFM-75 MKII amplifiers are essentially identical, the following service information is applicable to both products unless specified otherwise.

**Caution: THESE AMPLIFIERS OPERATE WITH VOLTAGES OF 575 VOLTS V D.C.!!!**

Lethal voltages exist in all vacuum tube amplifiers and the SFS-50 and SFM-75 MKII amps operate with approximately 575V D.C. on the plates of the output tubes and approximately 320V D.C. on the screens. Either of these voltages is high enough to be fatal to a careless person. If you are not experienced and qualified in working with these high voltages, then refer any and all internal servicing work to an experienced technician! These high voltages may exist in the circuit even after the power has been turned off and disconnected for an hour or more.

September 1991

# TROUBLESHOOTING

1. Problems in either the SFS-50 or SFM-75 MKII amps are most likely to be related to output tube failure. A blown A.C. line fuse usually indicates an output tube has either "run away" and drawn excess plate current or shorted out and done the same thing. If replacing the tube fails to restore proper operation (ie: that tube cannot be biased) then check the associated 5R0 (5 ohm) 1 watt cathode resistor - it is probably open circuit. The only other possible problem would be the screen voltage rising up to the level of the plate voltage, which indicates an internal short between the plate and screen grids of a tube. If this is suspected, then resistance measurements should be taken between pins 3 and 4 of each output tube. Any reading less than 100K ohms indicates a faulty tube.

If at any time the amplifier cannot be biased to the proper operating point ( "50" on the bias meter or 250 mv. across the 5R0 cathode resistor with the bias selector switch in the "OFF" position), then a faulty MPSA44 is likely (silk screened "Q3" on the circuit board of the SFM-75 MKII and SFS-50 amps).

Also check the 1K, 5 watt screen power supply resistor (silk screened "R28" on both amps) for continuity - replace if necessary. Check also the 1K, 5 watt resistor (R36), on the SFS-50.

2. Check all solder joints at tube sockets, circuit board/wiring connections and individual board mounted components.

3. Waveform distortion on a sine wave output is usually the result of a faulty 2N4400 ("Q2" on the SFM-75 MKII, or "Q2" or "LQ2" on the SFS-50). Check these on an ohmmeter and replace if faulty. Also check the associated R20, LR20 (4.75K ohms) and R21, LR21 (100R) for proper value; replace if out of tolerance.

4. If all the operating voltages appear to be correct but no signal can be heard, check both 6DJ8 tubes (by replacement). Also check the input grid resistor (R18, LR18) for continuity. Replace if out of tolerance by more than 3%.

5. If the regulated screen voltage rises to 370 - 390 volts (instead of the proper 315V +/- 10V.) then the LF35IN (IC2) should be replaced. Check also TIP50 (Q4) for proper operation.

6. An output sine wave that is abnormally low in magnitude is most likely caused by a shorted feedback capacitor, "CF" (SFM-75 MKII and SFS-50). Lift one lead off the board to verify. If the problem is corrected then replace it with a 68pf. 160V. (or greater) POLYPROPYLENE capacitor.

7. Be sure to check the circuits for any signs of overheated resistors. If any problems still remain, then continuity tests on resistors and wiring runs are suggested.

# OPERATING VOLTAGES

## *SFM-75 MKII MONO AMPLIFIER*

### Output Tube Sockets (referenced to chassis ground)

1. pin #3 = 575V. D.C. (+/- 20V.)
2. pin #4 = 315V. D.C. (+/- 10V.)
3. pin #5 = -35V. D.C. (+/- 3V.)
4. pin #8 = 0.250V (250mv. with proper bias on tubes)
5. A.C. volts measured between pins #2 & #7 = 6.3V. D.C. (+/- 0.5V.)

### Circuit Board

1. Output of plate regulator: measured at junction of R10, R11 = 420V.D.C. (+/- 10V.)
  2. Output of plate regulator: measured at input ends of C5, C6 = 210V.D.C. (+/- 15V.)
  3. D.C. volts measured at positive (+) end of C13 = 400V.D.C. (+/- 15V.)
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## *SFS-50 STEREO AMPLIFIER*

### Output Tube Sockets (referenced to chassis ground)

1. pin #3 = 565V. D.C. (+/- 20V.)
2. pin #4 = 315V. D.C. (+/- 10V.)
3. pin #5 = -35V. D.C. (+/- 3V.)
4. pin #8 = 0.250V (250mv. with proper bias on tubes)
5. A.C. volts measured between pins #2 & #7 = 6.3V. D.C. (+/- 0.5V.)

### Circuit Board

1. Output of plate regulator: measured at junction of R10, R11, LR10, LR11 = 420V.D.C. (+/- 10V.)
2. A.C. volts measured at input ends of C5, C6, LC5, LC6 = 210V.D.C. (+/- 15V.)
3. D.C. volts measured at positive (+) end of C13 = 385V.D.C. (+/- 15V.)
4. D.C. volts measured at positive (+) end of C18 = 390V.D.C. (+/- 15V.)

## **SERVICE UPDATE #1**

**RE: *SFS-50 STEREO AMPLIFIER***

Earlier shipments of the SFS-50 used a 2N4400 transistor at position "Q3" on the circuit board (as part of the screen regulator). A few samples of these devices have failed in the field; as a result we are now using an MPSA44 device as a replacement in production, with 100% reliability in the field. If an SFS-50 suddenly cannot be biased properly on all four output tubes, then the failure of "Q3" is the likely cause.

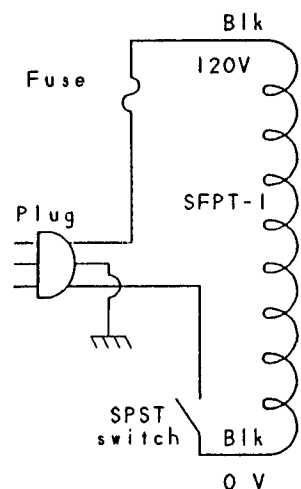
# **SFS-50 STEREO AMPLIFIER**

*SCHEMATIC DIAGRAMS*

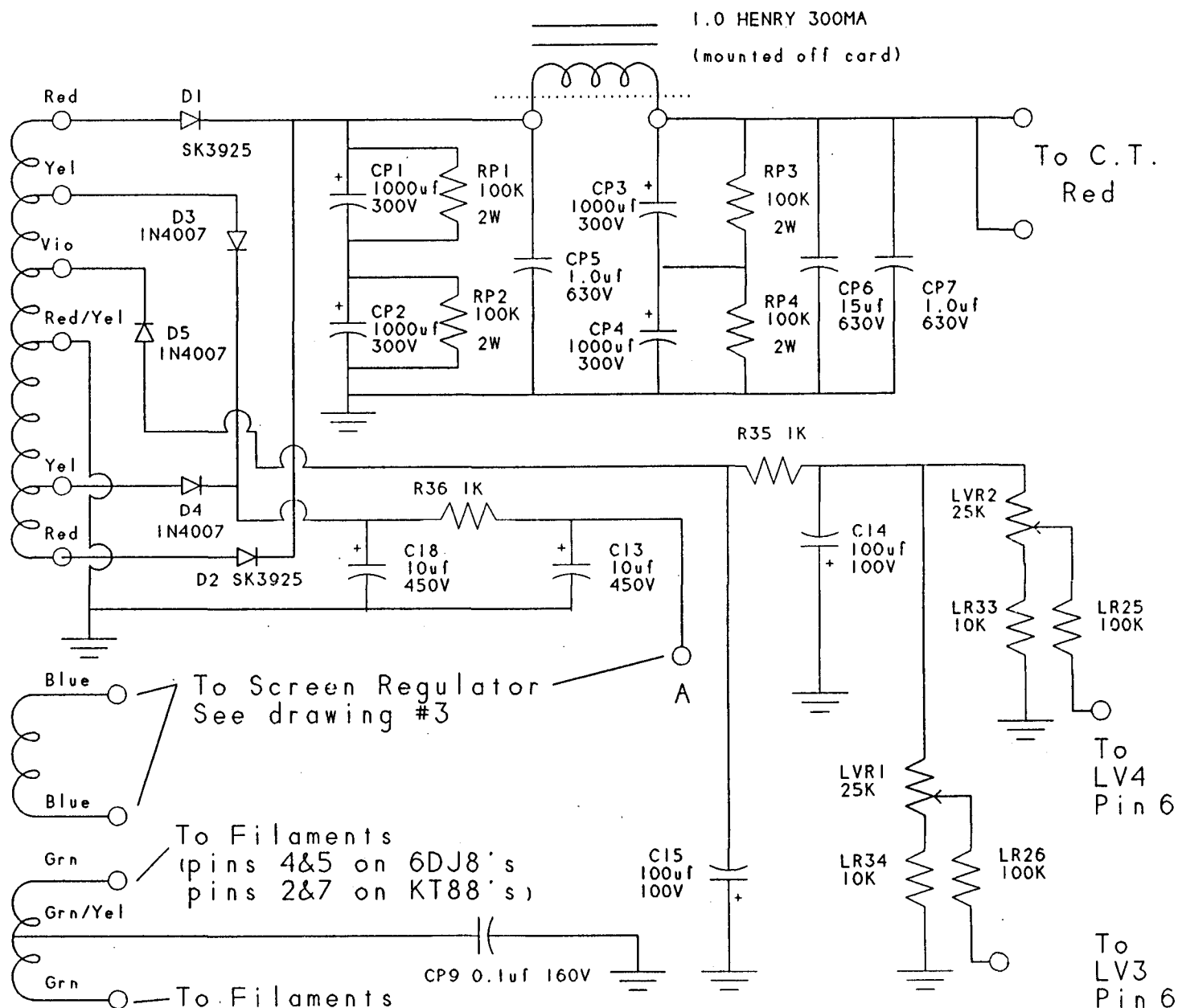
DRAWING  
#1

# SFS-50 MAIN POWER SUPPLY

Fuse Rating	
Voltage	AC Type
100-120	4 amp Slo-blo
200-240	2 amp Slo-blo



See Drawing  
#2 for  
International  
Primary  
Connections



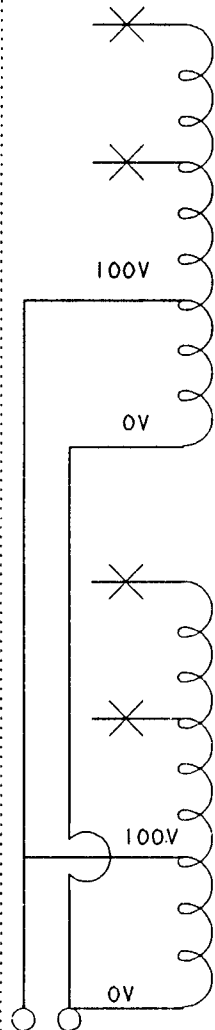
DRAWING  
#2

# INTERNATIONAL POWER TRANSFORMER A.C. PRIMARY WINDINGS for SFPT-1 INT(SFS-50) & SFPT-2 INT(SFM-75)

WIRE  
COLOURS

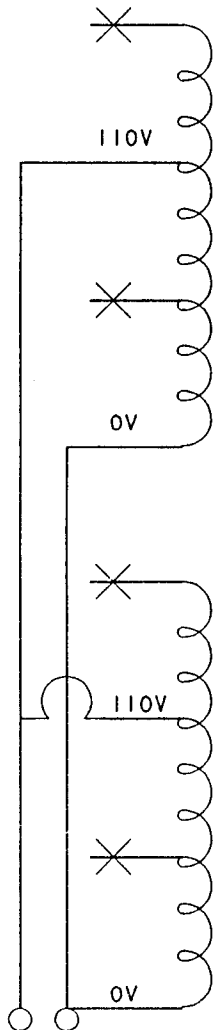
120V  
white  
110V  
blk/wht  
100V  
blk/yel  
0V  
black  
120V  
orange  
110V  
blk/blu  
100V  
brn/yel  
0V  
brown

100 V



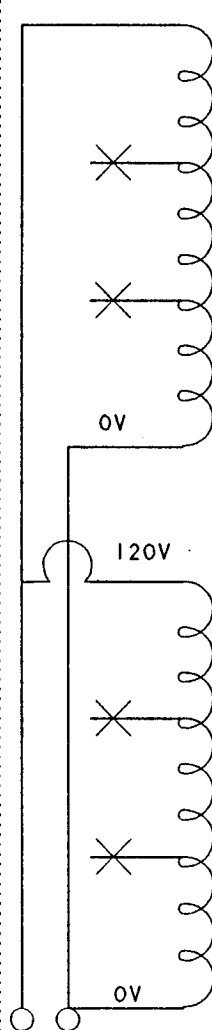
100V AC

110V



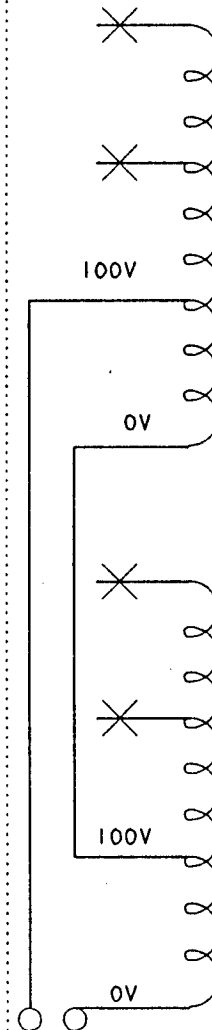
110V AC

120V



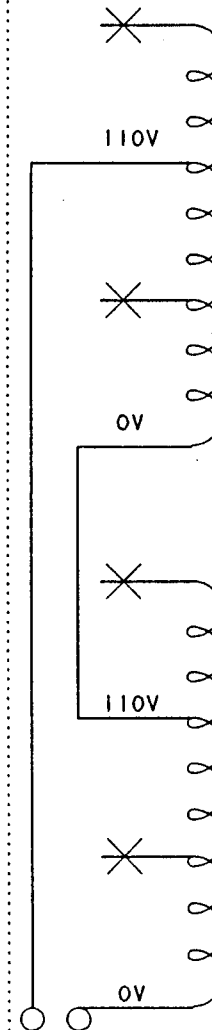
120V AC

200V



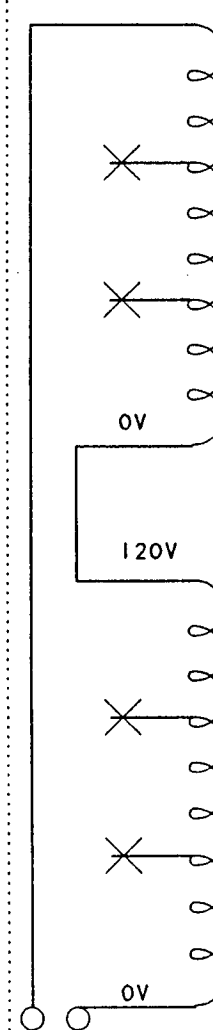
200V AC

220V



220V AC

240V

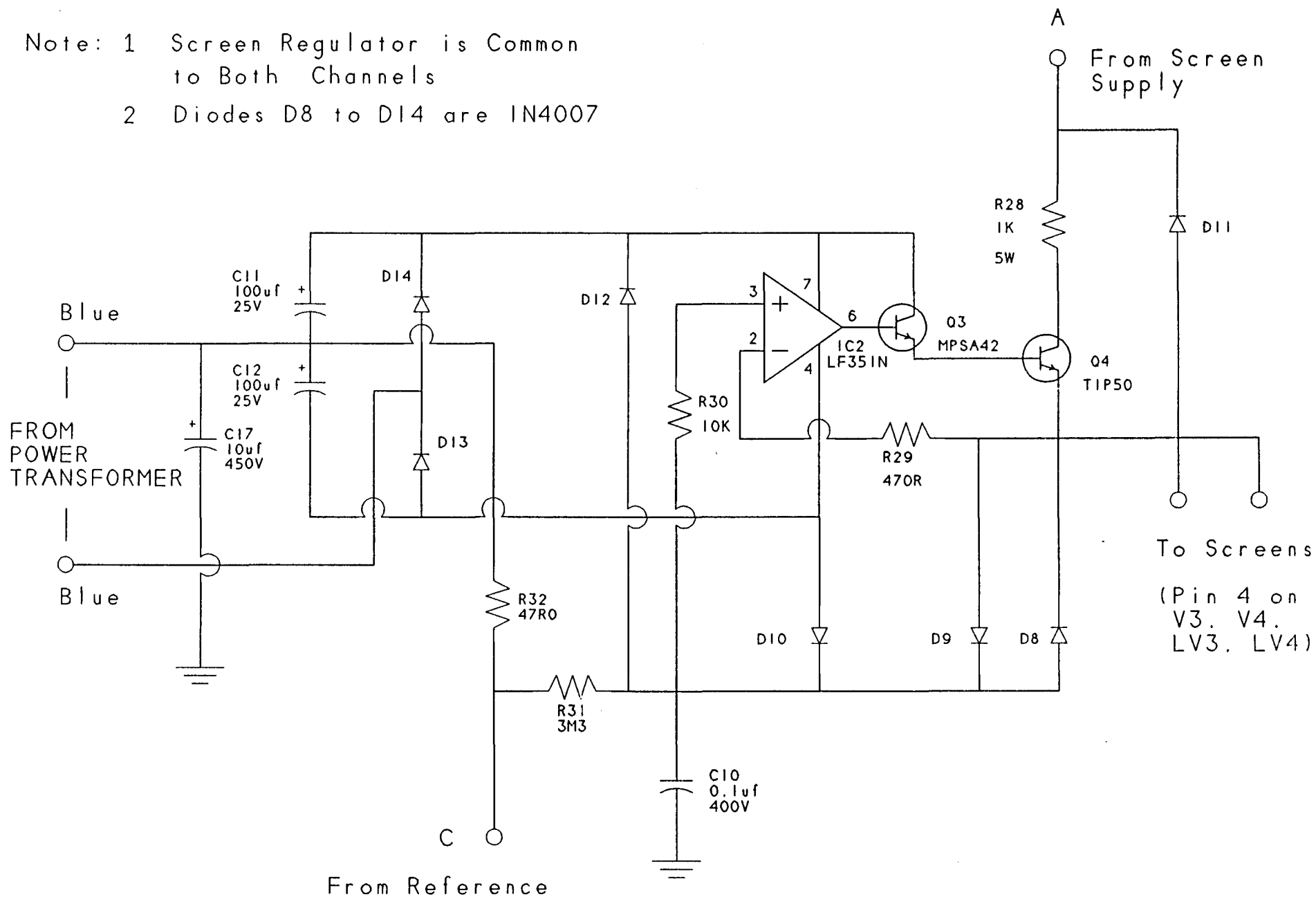


240V AC

DRAWING  
#3

# SFS-50 Screen Regulator

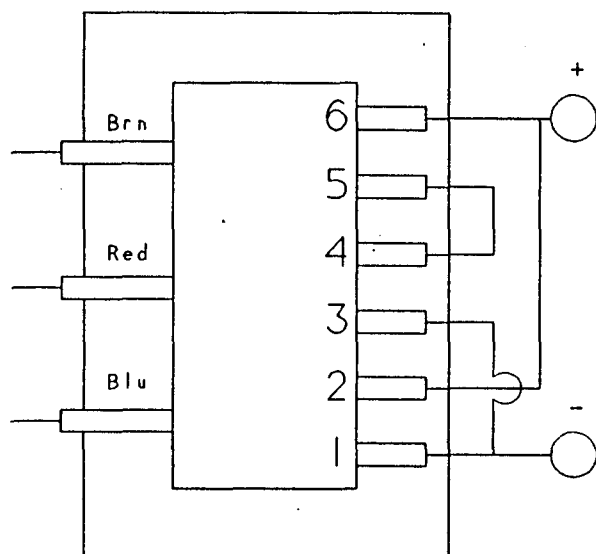
- Note: 1 Screen Regulator is Common  
to Both Channels
- 2 Diodes D8 to D14 are 1N4007





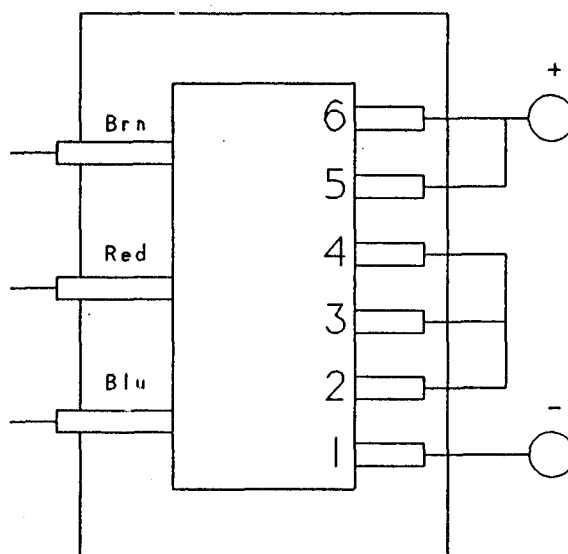
# OUTPUT TRANSFORMER SECONDARY WINDING OPTIONS FOR PART NUMBER SFOT-1

3.5 OHM CONNECTION



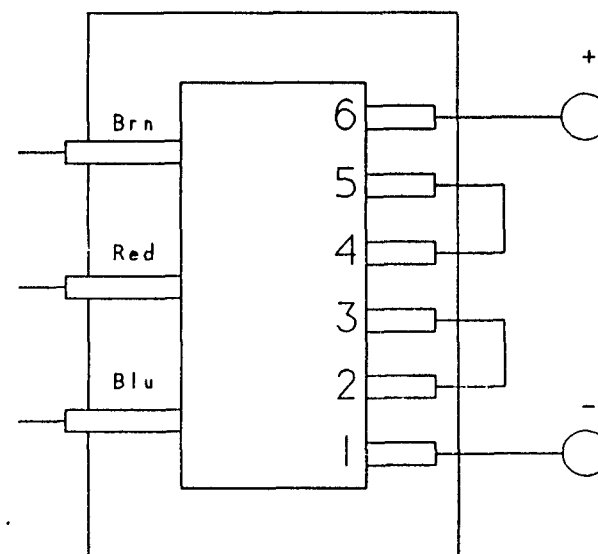
16AWG Wire Length	Connect Pin # to Pin #
1 inch	4 -- 5
1 - 3/4 inch	1 -- 3
3 inch	2 -- 6

8.0 OHM CONNECTION



16AWG Wire Length	Connect Pin # to Pin #
1 inch	2 -- 3
1 inch	3 -- 4
1 inch	5 -- 6

14.5 OHM CONNECTION



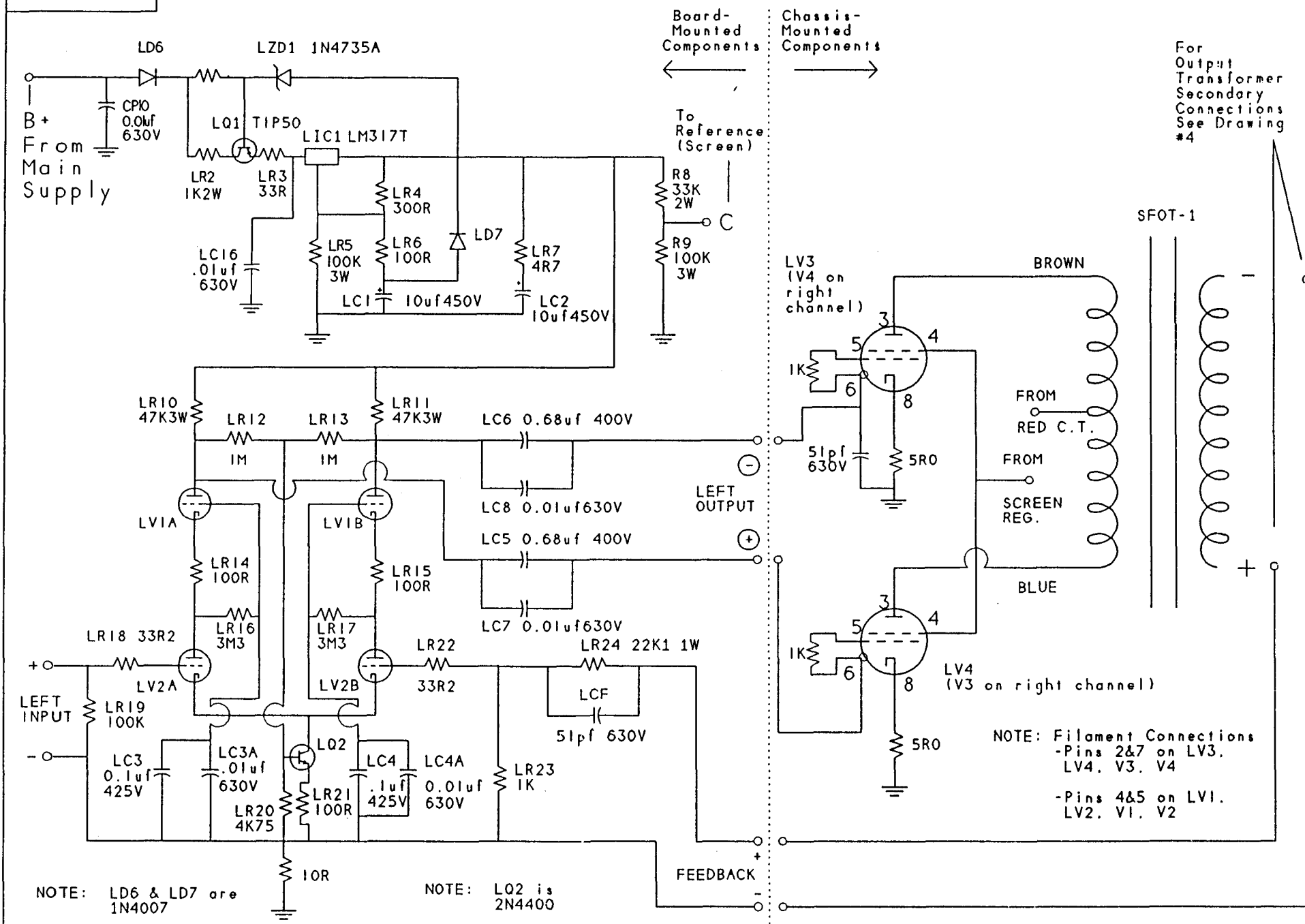
16AWG Wire Length	Connect Pin # to Pin #
1 inch	2 -- 3
1 inch	4 -- 5

5  
100

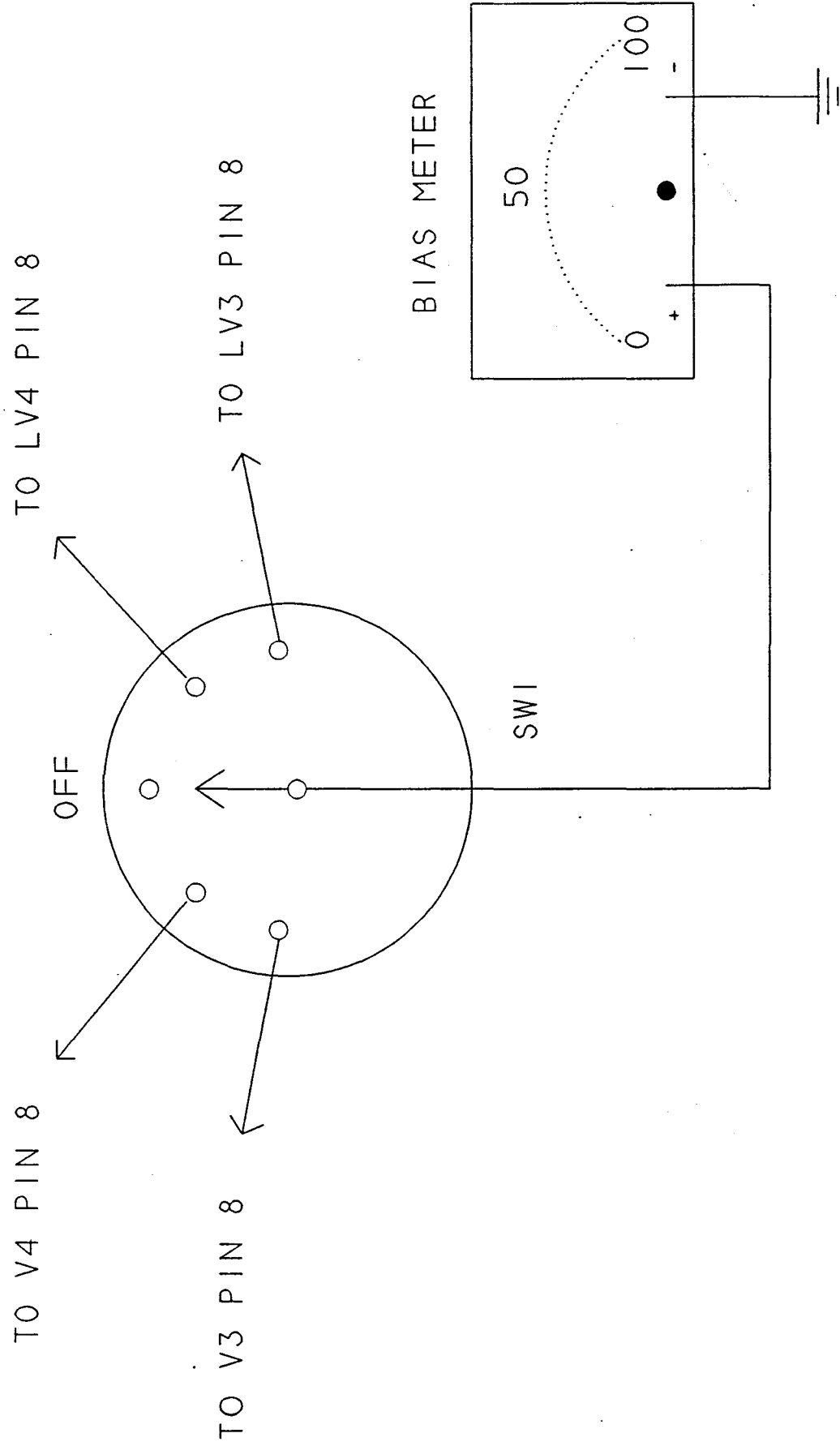
DRAWING  
#5

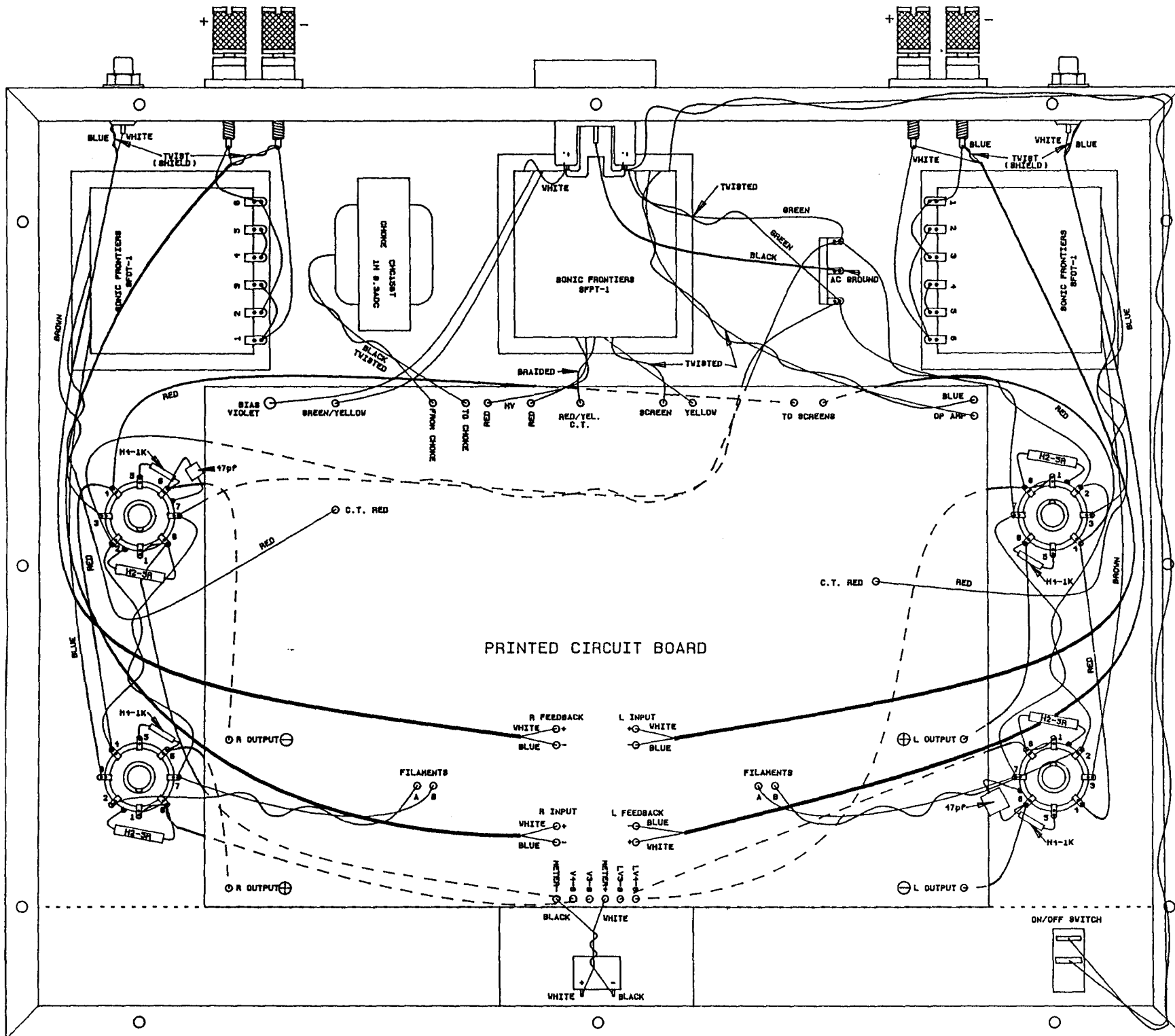
# SFS-50 AMPLIFIER/REGULATOR

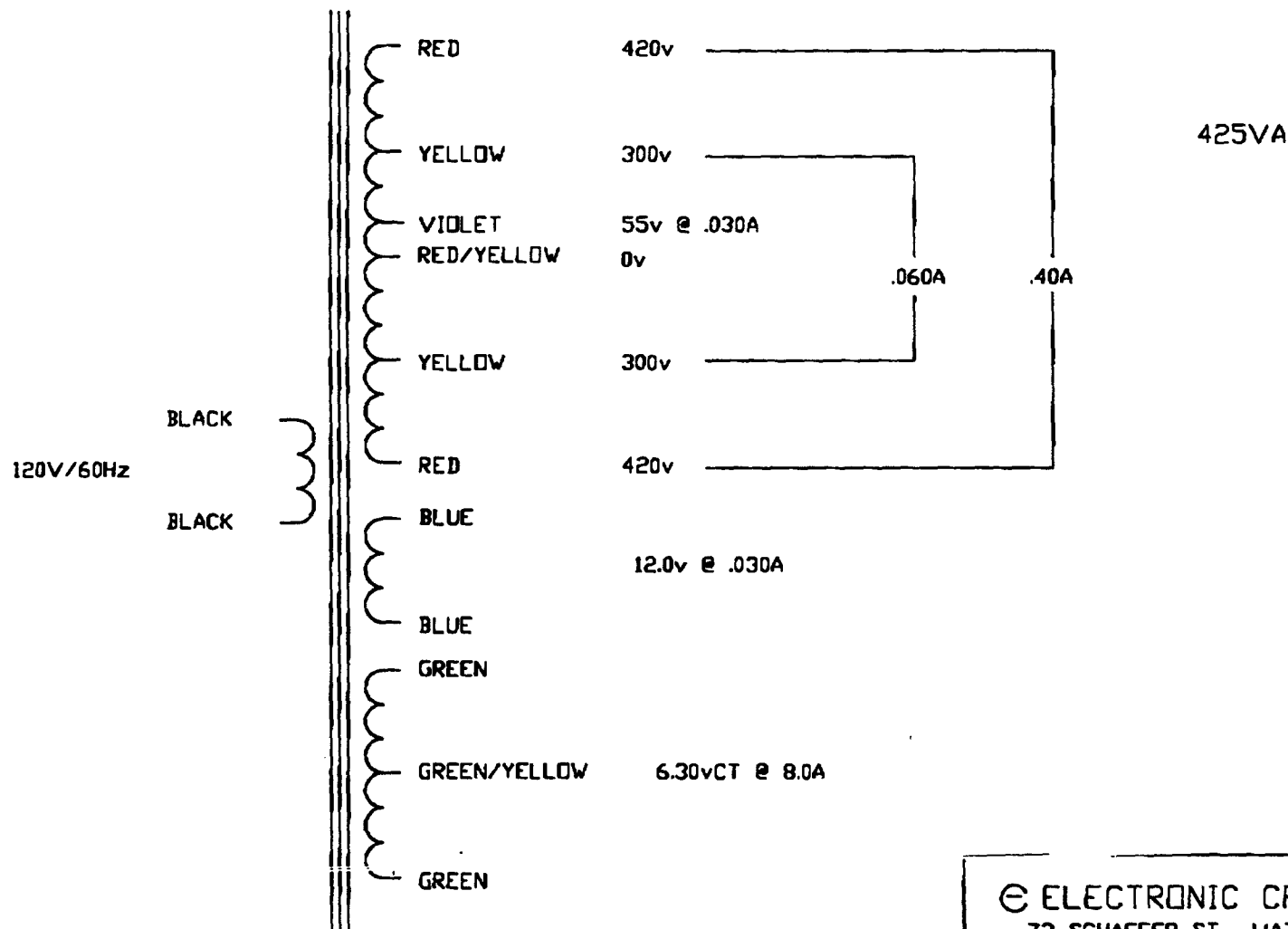
(Left Channel Shown)



# SFS-50 BIASING CIRCUIT







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73 SCHAEFER ST. WATERLOO, ONTARIO

SCALE: NTS		DRAWN: GG
DATE: MAY 8/01	DRAWING NO: 90244SCH	REV: 3
MATERIAL:	TOLERANCE:	
TITLE: 90244 POWER XFMR ( SFPT-1 )		