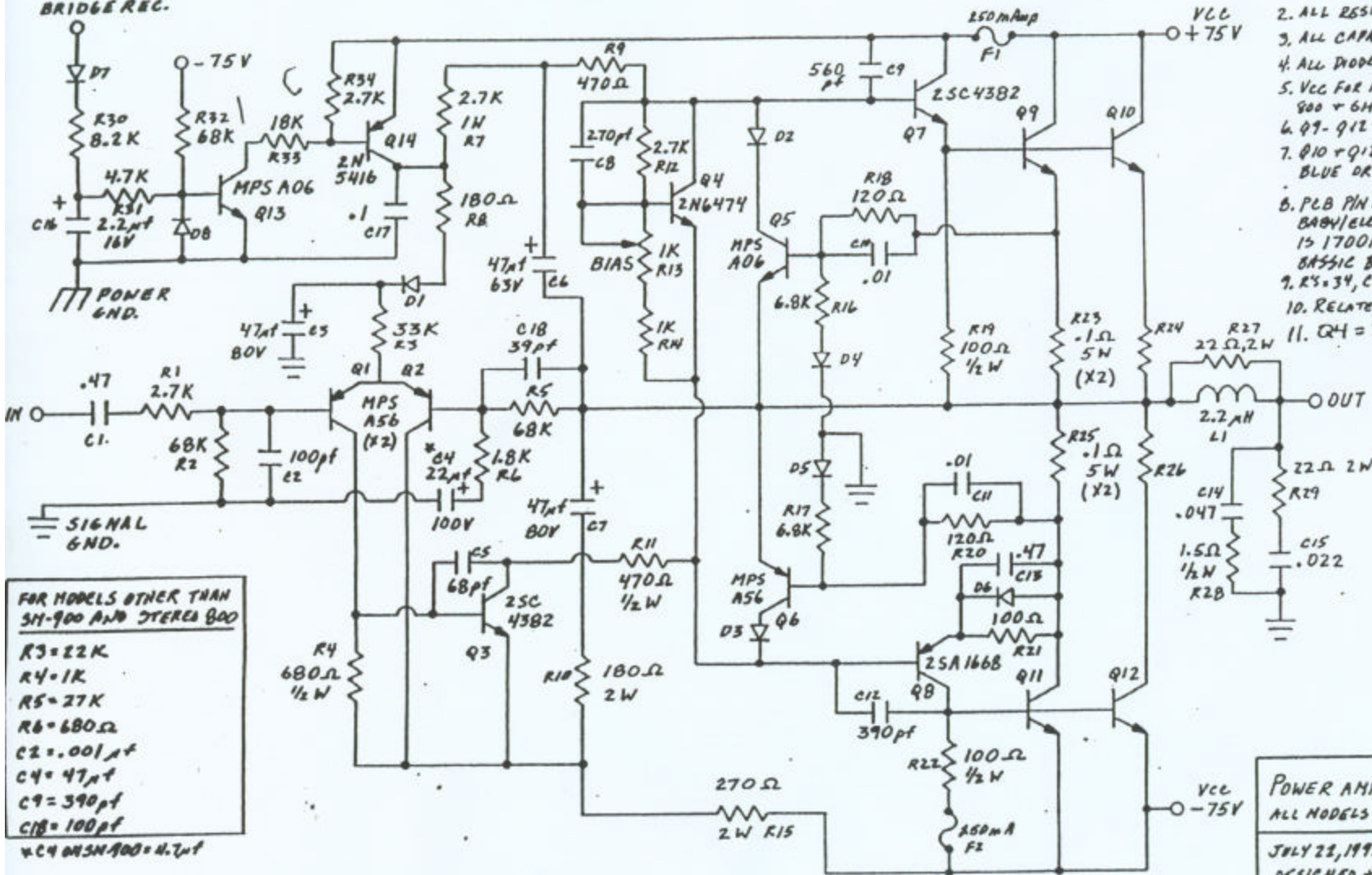


A/C TERMINAL
BRIDGE REC.



FOR MODELS OTHER THAN
5M-900 AND STEREO 800

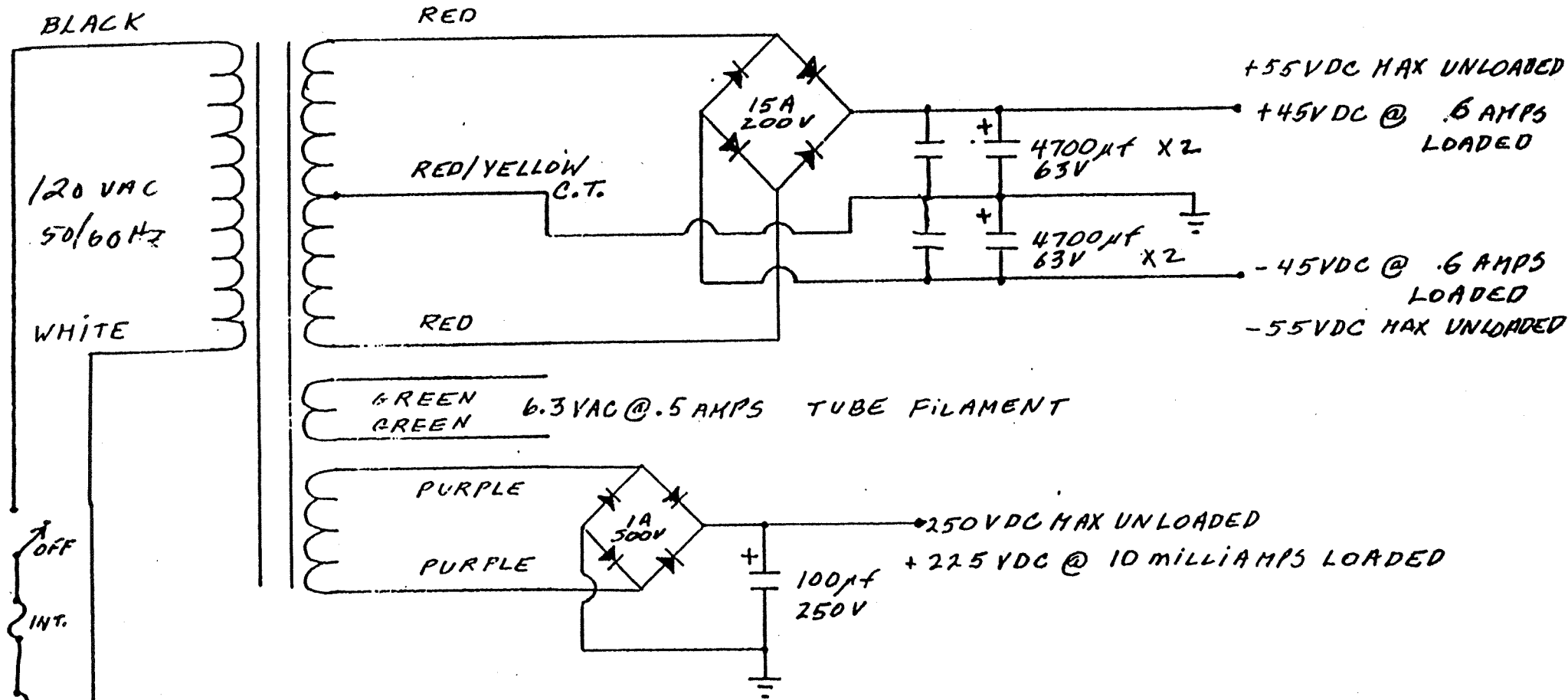
R3 = 22K
R4 = 1K
R5 = 27K
R6 = 680Ω
C2 = .001μf
C4 = 47μf
C9 = 390pf
C18 = 100pf
*C4 ON 5M-900 = 4.7μf

- NOTES: UNLESS OTHERWISE SPECIFIED.
1. SEE TABLE FOR ALTERNATE R + C VALUES FOR OTHER MODELS. VALUES SHOWN ARE FOR STEREO 800, 5M-900.
 2. ALL RESISTORS IN OHMS, 4W, 5%.
 3. ALL CAPACITORS IN MICRO-FARAD.
 4. ALL DIODES IN 4004.
 5. VCC FOR MODELS OTHER THAN STEREO 800 + 6M-900 = ± 60VDC
 6. Q7 - Q12 = 2SC 3264 (SANKEN ONLY)
 7. Q10 + Q12 NOT ON BABY/ELECTRIC BLUE OR BASSIC BLACK
 8. PCB PIN FOR ALL MODELS EXCEPT BABY/ELECTRIC BLUE + BASSIC BLACK IS 170010. BABY BLUE - 17008B. BASSIC BLACK - 170013.
 9. R5 = 34, C5 = 18, D2 = 8, Q4 = 14, L1, F1 + 2
 10. RELATED DIB'S 1002, 1003
 11. Q4 = 2SC 3834 after 1/25/98

POWER AMP SCHEMATIC 1011
ALL MODELS BUILT AFTER JUNE, 1992

JULY 22, 1992
DESIGNED + DWN. BY: S. W. RABG
SWR ENG., INC. 818-774-3356

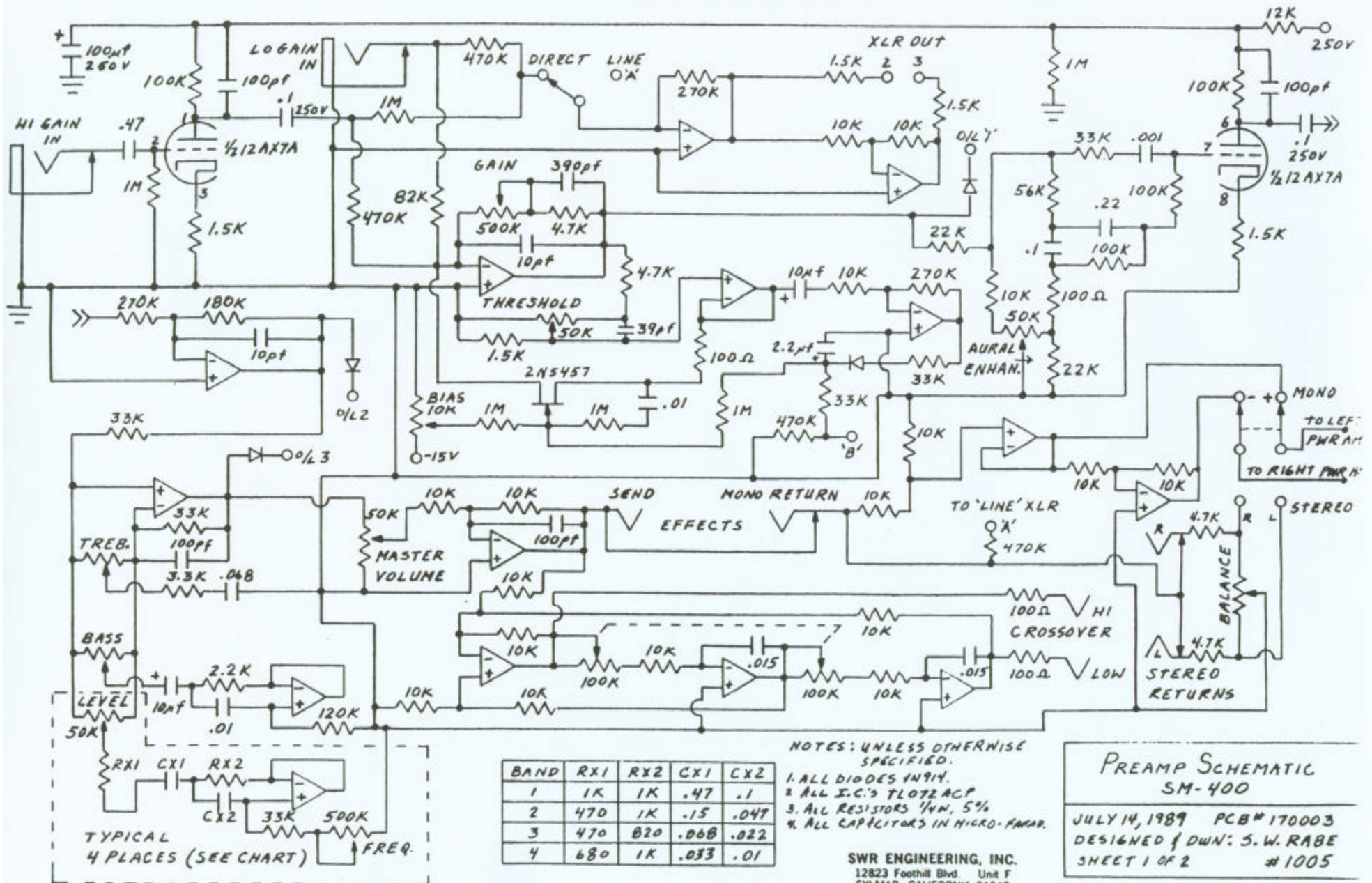
Power Supply SM-400



NOTES

1. FIGURE FOR 40% DUTY CYCLE
2. ONE DIMENSION OF Y-FORMER (LENGTH, WIDTH OR HEIGHT) HAS TO BE LESS THAN 3.10 INCHES
3. ALL LEADS 6" LENGTH
4. MUST WITHSTAND 1500V HYPOT TEST
5. DESIGN TO U.L. SPECIFICATIONS

STEVE RABE 6-10-85
818-768-4960

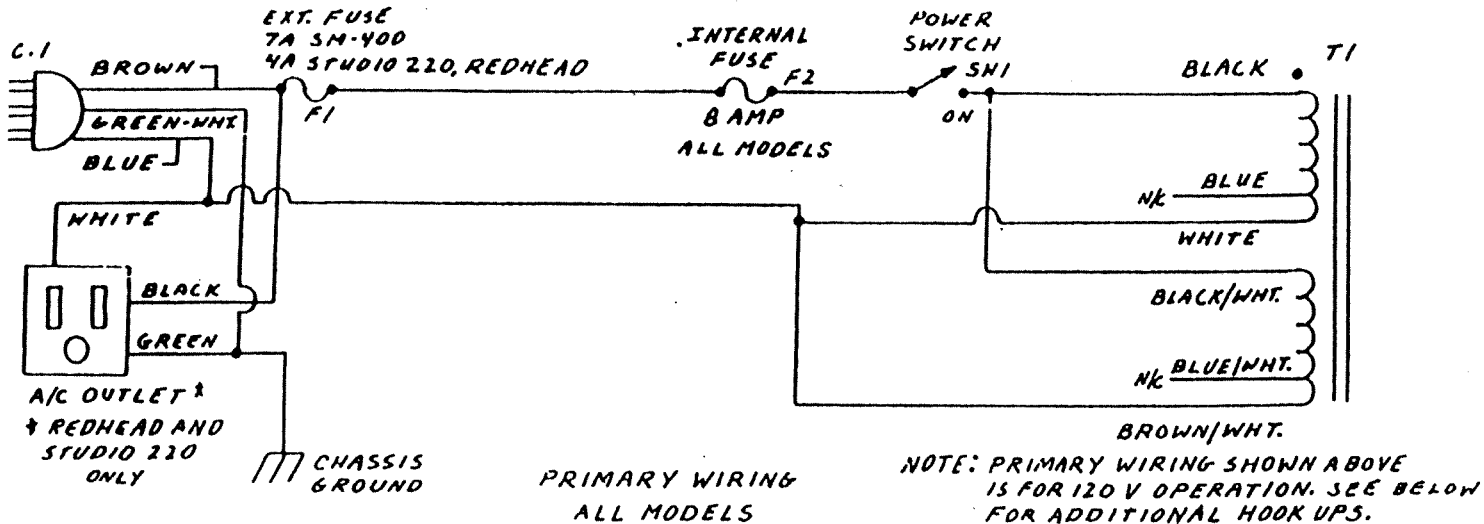


NOTES: UNLESS OTHERWISE SPECIFIED.
 1. ALL DIODES IN 914.
 2. ALL I.C.'S TLO2ACP
 3. ALL RESISTORS 1/4W, 5%
 4. ALL CAPACITORS IN MICRO-FARAD.

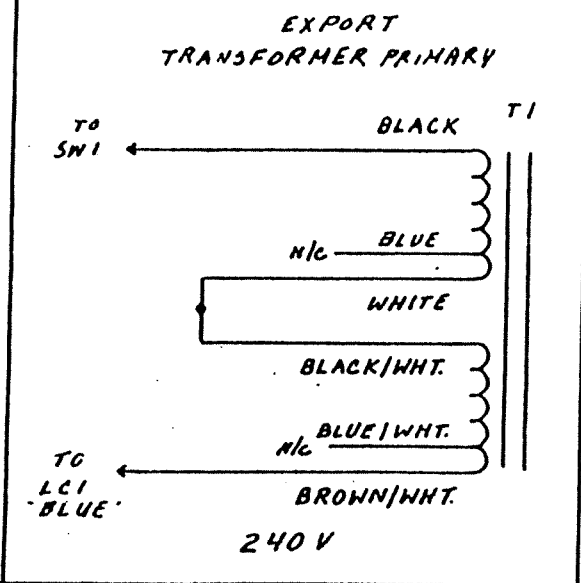
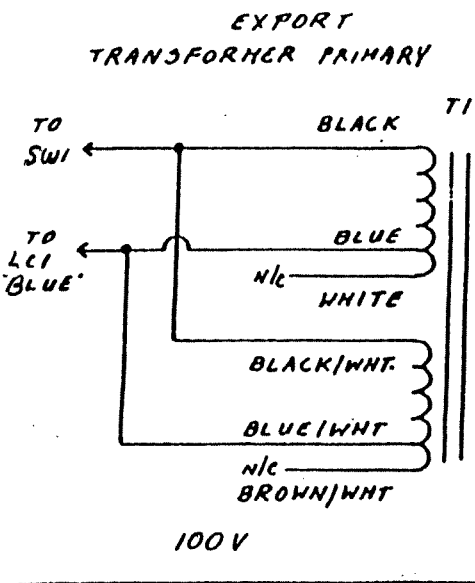
BAND	RX1	RX2	CX1	CX2
1	1K	1K	.47	.1
2	470	1K	.15	.047
3	470	820	.068	.022
4	680	1K	.033	.01

PREAMP SCHEMATIC
 SM-400
 JULY 14, 1989 PCB# 170003
 DESIGNED & DWN: S.W. RABE
 SHEET 1 OF 2 #1005

SWR ENGINEERING, INC.
 12823 Foothill Blvd. Unit F
 SYLMAR, CALIFORNIA 91342



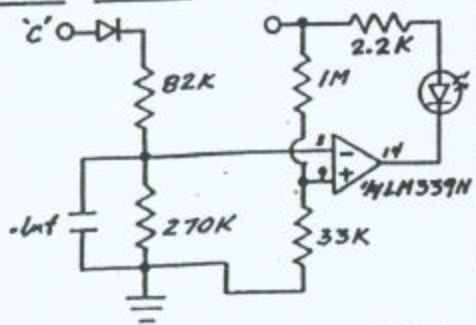
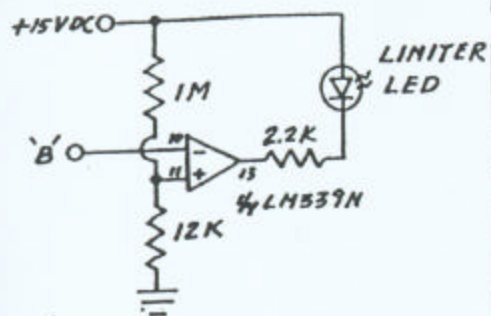
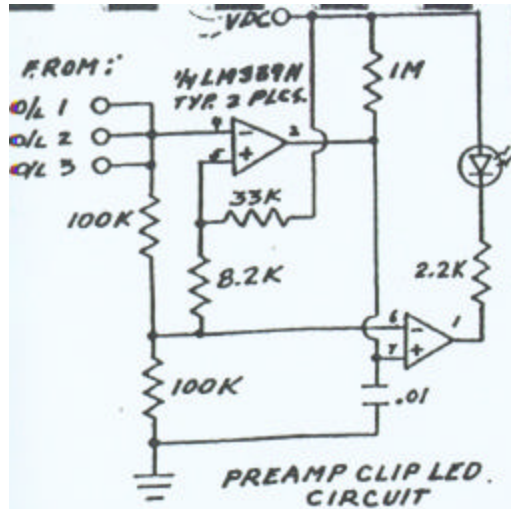
- NOTES:
1. 'N/C' = NO CONNECTION
 2. 'WHT' = WHITE
 3. F1 FUSES ARE 3AG, SLO-BLO
 4. F2 FUSES ARE 3AG, FAST-BLO, PIGTAIL.
 5. ALL PRIMARY WIRE UL TYPE 1015 OR 1007, 18 GA.
 6. PIN FOR STUDIO 220 TRANSFORMER = 560001A. SM-400/REDHEAD = PIN 560003A. BABY/ELECTRIC BLUE = 560005 GRAND PRIX PREAMP = 560006



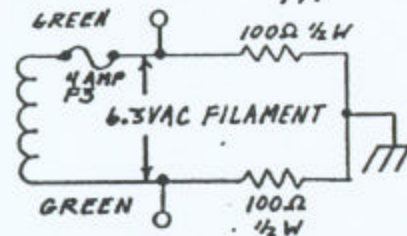
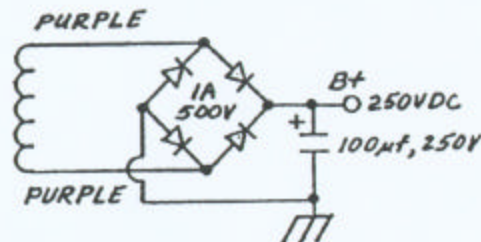
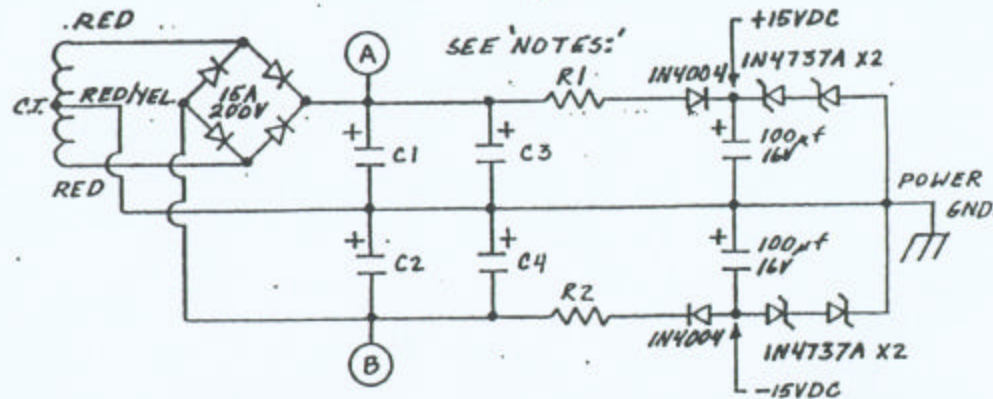
SWR ENGINEERING, INC.
12823 Foothill Blvd., Unit F
SYLMAR, CA 91342

SCHMATIC
PRIMARY WIRING
DOMESTIC + EXPORT
ALL MODELS

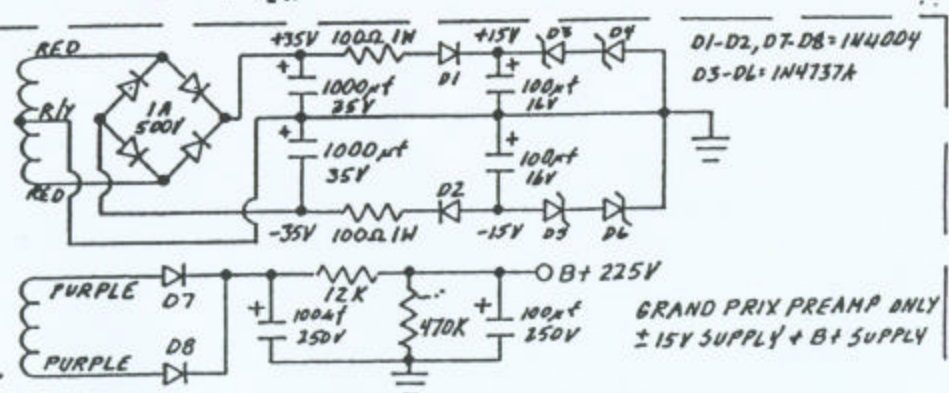
FEB. 22, 1990 DNM S.W.R.
NO. 1001 REV. C



NOTE: NOT ON SM-400 OR 6-T.P.



POWER SUPPLY CIRCUIT
TRANSFORMER SECONDARY WIRING
REF.:
STUDIO 220 PCB# 170001
SM-400 PCB# 170003, 170004
BABY/ELECTRIC BLUE PCB# 170008
STEREO 800/SM-900 # 170011
BASSIC BLACK PCB# 170013



NOTES:

- POINT 'A' = +DCV, POINT 'B' = -DCV
- 6-T. PREAMP = ±35V
- STUDIO 220, SM-400, REDHEAD, BABY/ELECTRIC BLUE = ±60V
- STEREO 800, SM-900 = ±75V
- C1 THRU C4 VALUES
- 6-T. PREAMP C1, C2 = 1000µf, 35V
- STUDIO 220, BABY/ELECTRIC BLUE C1, C2 = 470µf, 63V C3, C4 = N/A
- SM-400, REDHEAD C1-C4 = 470µf, 63V
- STEREO 800, SM-900 C1-C4 = 6800µf, 80V
- BASSIC BLACK C1, C2 = 470µf, 63V
- R1 AND R2 VALUES
- 6-T. PREAMP = 100Ω, 1W
- STUDIO 220, SM-400 = 660Ω, 5W
- REDHEAD, BABY/ELECTRIC BLUE, BASSIC BLACK = 820Ω, 3W
- STEREO 800 = 1.1K, 5W
- SM-900 = 550Ω, 10W

SWR ENGINEERING, INC.
12823 Foothill Blvd. Unit F
SYLMAR, CALIFORNIA 91342

SCHEMATIC

- SECONDARY WIRING
- PREAMP/POWER CLIP CIRC.
- ALL MODELS

REV. C NO. 1002
DRAWN: S.W. RABE FEB. 6, 1991

BIAS PROCEDURE SM-400/SM-900/ST-800

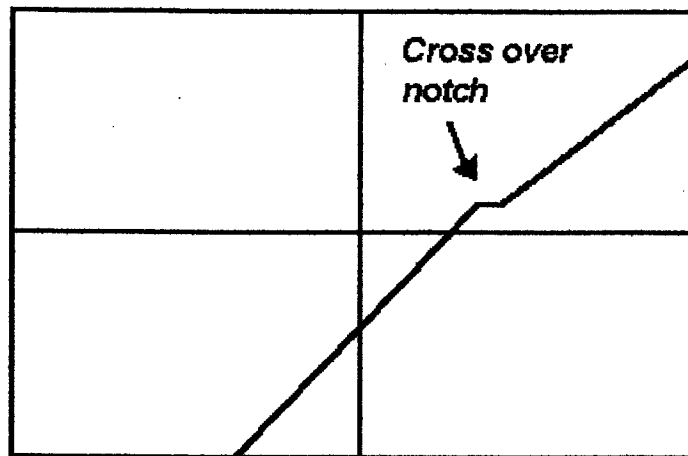
Equipment required:

**Sinewave generator
2 ohm, 250 watt load
AC millivolt meter
Oscilloscope**

- 1. Lower signal generator output to minimum, set frequency to 1KHz and insert into "mono" effects return jack (unbalanced line in for Stereo 800).**
- 2. Set Power Amp Assign Switch on back panel to "Stereo" position (up). Plug 2 ohm dummy load in channel to be tested.**
- 3. Raise Master Volumes on SM-900 and ST-800 to full clockwise. Set Effects Blend control on SM-900 to "wet" (full clockwise). Set Balance control on SM-400 to mid-position.**
- 4. Adjust bias trim pots to full counter-clockwise position.**
- 5. Turn on/off switch to "on" position. Connect unit to autotransformer (variac) and raise AC line level to 115 volts.**
- 6. Position ground reference on oscilloscope just above center line of screen.**
- 7. Raise signal generator level so that 2 volts RMS appears at the speaker output.**
- 8. Monitor signal on scope with the following settings:
Load: 2 ohms
Scope: Sweep Time: 50us Volts/Div: 0.2V
Signal Generator: Freq. 1KHz**

9. The signal should have a prominent crossover notch at about zero crossing. Refer to diagram below.

Figure 1.



10. Adjust bias trimpot of amp being tested just past the point the crossover notch disappears. DO NOT OVER ADJUST as this will set the idle current too high and the power amp will overheat

11. Repeat procedure for other side.

SM-400 TEST PROCEDURE

1. CHECK FOR FOREIGN OBJECTS (CLIPPED LEADS, ETC.) IN UNIT. TURN UPSIDE DOWN AND GENTLY SHAKE TO REMOVE.
2. INSTALL 8 AMP FAST BLO FUSES IN SPEAKER FUSEHOLDERS AND 7 AMP FUSE IN LINE FUSEHOLDER (4 AMP FUSE FOR 220/240 VOLT UNITS). INSTALL 12AX7A TUBE IN TUBE SOCKET.
3. CHECK UNIT FOR UNSOLDERED WIRES, BACKWARD FILTER CAPACITORS, AND OBVIOUS WORKMANSHIP ERRORS.
4. SET STEREO/MONO SWITCH IN STEREO POSITION ON BACK PANEL. PLUG 2 OHM DUMMY LOAD IN RIGHT SPEAKER OUT JACK AND SIGNAL GENERATOR IN RIGHT STEREO EFFECTS RETURN JACK. SET BALANCE CONTROL ON FRONT PANEL TO LEFT (FULL COUNTER CLOCKWISE).
5. PLUG UNIT INTO VARIAC (VARIAC SHOULD BE A 0 VOLTS. TURN ON/OFF SWITCH TO ON POSITION.
6. HOOK UP VOLTMETER TO MONITOR +/- VOLT IC SUPPLY.
7. LOAD- 2 OHMS
SCOPE: SWEEP- 50 μ S VOLTS/DIV- .2
SOUNDTECH: INPUT LEVEL- 3V FREQ.= 1KHZ ATTEN.= -20db
8. SET BOTH BIAS TRIMPOTS TO FULL COUNTER-CLOCKWISE POSITION.
9. SLOWLY BRING UP VARIAC WHILE MONITORING WATTMETER, A/C VOLTAGE AND 15V IC SUPPLY. IF ALL OK, BRING VARIAC UP TO 100V A/C.
10. RAISE BALANCE CONTROL TO 2 VOLTS OUT @ 1KHZ. AND SET BIAS ON RIGHT POWER AMP. LOWER VOLUME AND CHECK FOR DC OFFSET.
11. CHANGE DUMMY LOAD TO LEFT SIDE, ROTATE BALANCE CONTROL TO FULL CLOCKWISE AND CHANGE SIGNAL INPUT TO LEFT EFFECTS RETURN JACK. REPEAT BIAS ADJUST AND DC OFFSET FOR LEFT SIDE.
12. RAISE A/C VOLTAGE TO 120 VOLTS A/C.
INSERT SIGNAL TO HI GAIN INPUT JACK. WITH GAIN FULL CHECK FOR PRE CLIP LED TO LIGHT. CHANGE FREQUENCY TO 100 HZ. CHECK FOR PREAMP CLIP LED TO GO OUT. MAKE SURE ALL TONE CONTROLS ARE SET FLAT, LIMITER, ENHANCER, MASTER VOL. OFF, BALANCE MID-POSITION
13. LOAD= 4 OHMS
SCOPE: SWEEP= 2mS VOLTS/DIV.= 20V
SOUNDTECH: INPUT LEVEL=100V
14. RAISE MASTER VOLUME AND CHECK FOR POWER OUT UNDER CLIPPING OF LEFT POWER AMP (200 WATTS MIN.). CHECK BALANCE CONTROL FOR PROPER OPERATION. CHECK FOR LOOSE CONNECTIONS.
15. LOWER MASTER VOLUME, PUT DUMMY LOAD IN RIGHT SPEAKER OUT AND REPEAT STEP 14 FOR RIGHT POWER AMP, ETC.
16. LOWER MASTER VOLUME, REMOVE DUMMY LOAD AND ATTACH BANANA JACK ATTACHMENT AND INSERT IN MONO OUT. SWITCH STEREO/MONO TO MONO POSITION.
17. RAISE MASTER VOLUME AND CHECK FOR POWER OUT @ 4 OHMS.-350W
18. LOWER MASTER VOLUME, CHANGE LOAD TO 8 OHMS AND CHECK POWER OUT. 400 WATTS. CHECK FOR LOOSE CONNECTIONS.

SM-400 TEST PROCEDURE

19. TURN MASTER VOLUME DOWN TO ABOUT 10V RMS. MAKE SURE GAIN CONTROL IS FULL AND CHECK PREAMP CLIP LED BY BOOSTING ENHANCER, THEN BASS CONTROL AND FINALLY SECOND EQ BAND. LED SHOULD LIGHT AS PREAMP CLIPPING IS REACHED. TURN VOLUME OFF.
20. RE-SET FOLLOWING CONTROLS
SCOPE: VOLTS/DIV. = 5V SWEEP = 2ms (SHOULD ALREADY BE 2ms)
SOUNDTECH: INPUT LEVEL = 3V OUTPUT ATTEN. = -50
21. RAISE MASTER VOLUME TO 0 DB READING ON SOUNDTECH. TURN LIMITER CONTROL FULL CLOCKWISE. ADJUST LIMITER BIAS CONTROL SO THAT OUTPUT DECREASES TO -1.5 dB. MAKE SURE GAIN AND LIMITER CONTROLS ARE FULL CLOCKWISE.
22. RAISE INPUT LEVEL ON SOUNDTECH TO 10V SCALE AND RAISE OUTPUT ATTENUATOR TO -40dB. OBSERVE OUTPUT LEVEL AND CHECK FOR LIMITING EFFECT. OUTPUT SHOULD CHANGE ABOUT 3dB. MAKE SURE LIMITER LED IS LIT. CHECK FOR LOOSE CONNECTIONS IN LIMITER CIRCUIT. TURN LIMITER CONTROL OFF WHILE LEAVING ALL OTHER CONTROLS IN CURRENT POSITION. INPUT LEVEL ON SOUNDTECH SHOULD BE READING 0 dB ON 10V SCALE.

TONE CONTROL AND EQ SECTIONS

23. LOWER GAIN CONTROL TO REDUCE OUTPUT -8dB. LOWER MASTER VOLUME UNTIL -16dB IS ACHIEVED. CHANGE FREQUENCY FROM 100 HZ TO 40 HZ. CHECK FOR INCREASE IN GAIN OF ABOUT 4-6 dB. RE-ADJUST MASTER VOLUME TO -16 dB.
24. TURN AURAL ENHANCER FULL CLOCKWISE. OUTPUT SHOULD INCREASE +6 dB. RETURN TO FULL OFF. TURN BASS CONTROL (FROM MID-POSITION) FULL CLOCKWISE, THEN FULL COUNTER-CLOCKWISE. OUTPUT SHOULD CHANGE + AND - 15dB. CHECK FOR LOOSE CONNECTIONS AND RETURN TO MID-POSITION.
25. MAKE SURE ALL FREQUENCY KNOBS IN EQ SECTION ARE FULL COUNTER-CLOCKWISE AND LEVEL CONTROLS ARE IN MID-POSITION.
26. BOOST LEVEL CONTROL ON FIRST EQ BAND TO MAX. ROTATE FREQUENCY KNOB BELOW UNTIL OUTPUT PEAKS. CHECK FOR A CUT AND BOOST OF APPROXIMATELY 15 dB. RETURN LEVEL CONTROL TO MID-POSITION.
27. CHANGE FREQUENCY ON SOUNDTECH TO 80 HZ. CHECK FOR A CUT AND BOOST OF 15 dB BY USING LEVEL CONTROL ON SECOND BAND OF EQ. RETURN TO MID-POSITION. RAISE LEVEL CONTROL OF FIRST BAND TO FULL. ROTATE FREQUENCY CONTROL OF FIRST BAND FULL CLOCKWISE AND THEN BACK TO PEAK POINT. CHECK CUT AND BOOST OF FIRST BAND AND FOR LOOSE CONNECTIONS. RETURN LEVEL CONTROL TO MID POSITION AND FREQUENCY CONTROL FULL COUNTER-CLOCKWISE.
28. CHANGE FREQUENCY ON SOUNDTECH TO 200 HZ. ADJUST MASTER TO -16 dB. CHANGE SWEEP ON SCOPE TO 1 ms.
29. ROTATE AURAL ENHANCER TO FULL CLOCKWISE POSITION. OUTPUT SHOULD INCREASE +3 dB AND THEN DROP -6 dB (FROM ORIGINAL -16 dB POSITION ON SOUNDTECH. RETURN ENHANCER TO FULL COUNTER CLOCKWISE POSITION.

V
Held
& off
x 20 dB

30. CHECK FOR A BOOST AND CUT OF 15 dB @ 200 HZ BY USING LEVEL CONTROL ON THIRD BAND OF EQ. CHECK FOR LOOSE CONNECTIONS IN BOOST POSITION. RETURN LEVEL CONTROL TO MID-POSITION. CHECK BOOST AND CUT @ 200 HZ ON SECOND EQ BAND BY RAISING LEVEL CONTROL TO MAX. AND ROTATING FREQUENCY CONTROL TO OUTPUT PEAK POINT. CHECK FOR LOOSE CONNECTIONS AND RETURN LEVEL AND FREQUENCY CONTROLS TO NORMAL POSITIONS.
31. CHANGE FREQUENCY ON SOUNDTECH TO 400 HZ. CHANGE SWEEP ON SCOPE TO .5 ms. RE-ADJUST MASTER VOLUME FOR -16 dB OUT. CHECK CUT AND BOOSTS @ 400 HZ ON FOURTH AND THIRD EQ BANDS RESPECTIVELY AS YOU DID FOR 200 HZ, ETC.
32. CHANGE FREQUENCY ON SOUNDTECH TO 1.6K HZ. ADJUST MASTER VOLUME FOR -16 dB OUTPUT. CHECK FOR CUT AND BOOST ON FOURTH EQ BAND BY ROTATING FREQUENCY CONTROL FULL CLOCKWISE. RETURN LEVEL AND FREQUENCY CONTROLS TO NORMAL POSITIONS.
33. CHECK FOR CUT AND BOOST OF 15 dB @ 1.6K HZ USING TREBLE CONTROL.
34. CHANGE FREQUENCY ON SOUNDTECH TO 500 HZ. TURN GAIN CONTROL FULL CLOCKWISE. TURN MASTER VOLUME UP UNTIL 0 dB READING IS OBTAINED ON 10 V SCALE ON THE SOUNDTECH. MAKE SURE CROSSOVER FREQUENCY CONTROL IS AT FULL COUNTER-CLOCKWISE POSITION.
35. INSTALL PATCH CORD FROM "HI" OUT JACK ON CROSSOVER TO MONO EFFECTS RETURN ON BACK PANEL. OUTPUT WILL DROP ABOUT 1/2 dB.
36. ROTATE CROSSOVER CONTROL TO FULL CLOCKWISE POSITION. OUTPUT SHOULD DROP TO -14 dB. CHECK FOR LOOSE CONNECTIONS.
37. REMOVE PATCH CORD FROM "HI" OUT JACK TO "LOW" OUT JACK. OUTPUT SHOULD GO BACK UP TO ABOUT -1 dB. TURN CROSSOVER CONTROL BACK TO FULL COUNTER-CLOCKWISE POSITION. OUTPUT SHOULD DROP TO ABOUT -25 dB. REMOVE PATCH CORD ENTIRELY. OUTPUT SHOULD GO BACK UP TO 0 dB READING.
38. INSTALL XLR CONNECTOR TO BALANCED OUT JACK. CHANGE VOLTS/DIV ON SCOPE TO .2. CHECK FOR OUTPUT ON BOTH + AND - LEADS AND IN BOTH LINE AND DIRECT MODES. REMOVE XLR CONNECTOR.
39. CHANGE VOLTS/DIV. ON SCOPE BACK TO 5V. REMOVE INPUT SIGNAL AND INSTALL IN "LOW" GAIN JACK. CHECK FOR A DROP IN OUTPUT LEVEL OF -14 dB. REPLACE INPUT SIGNAL TO "HI" GAIN JACK. CHECK AGAIN FOR OVERALL LOOSE CONNECTIONS. REMOVE INPUT SIGNAL.
40. CHECK NOISE LEVELS: SET INPUT LEVEL TO 30 mV ON SOUNDTECH. TOTAL NOISE, MASTER AND GAIN CONTROLS FULL = (20 MILLIVOLTS. TOTAL NOISE WITH MASTER AND GAIN FULL COUNTER-CLOCKWISE = (2 MILLIVOLTS.
41. SWITCH STEREO/MONO SWITCH TO STEREO AND CHECK NOISE IN LEFT AND RIGHT CHANNELS WITH MASTER DOWN. NOISE SHOULD BE LESS THAN 1.5 MILLIVOLTS.
42. TURN INPUT LEVEL ON SOUNDTECH TO 3V POSITION. TURN UNIT OFF AND OBSERVE TURN OFF TRANSIENT SPIKE. SHOULD BE LESS THAN 1V.

END OF TEST

ON 220 check Pwr-Amp clip
 & E.Q. switch