TECH NOTES

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TECH NOTE # TN 04-2	**ISSUE DATE:**	Oct 2004
	ISSUED BY:	Mike Ulrich
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PRODUCT(S) AFFECTED:

SWR LA12 and LA15 Bass Amplifiers; all voltages.

SYMPTOMS:

Power Amp Bias misadjustment and/or incorrect heatsinking of V_{BE} Multiplier transistor Q2 which can lead to catastrophic failure on the Power Amp PCB assembly.

CONDITION:

Over biasing the Power Amp causes the current at the Output emitter resistors to reach levels between 625mA to 1.25A. Also, some cases show the V_{BE} multiplier transistor Q2 is not properly attached to the heatsink. The above two conditions can contribute to thermal runaway occurring on the Power Amp. This will lead to the catastrophic failure by either R6 or R9 igniting when the unit is at idle (unit powered ON with no instrument input). This proceeds to destroying the PCB assembly.

PARTS REQUIRED:

None

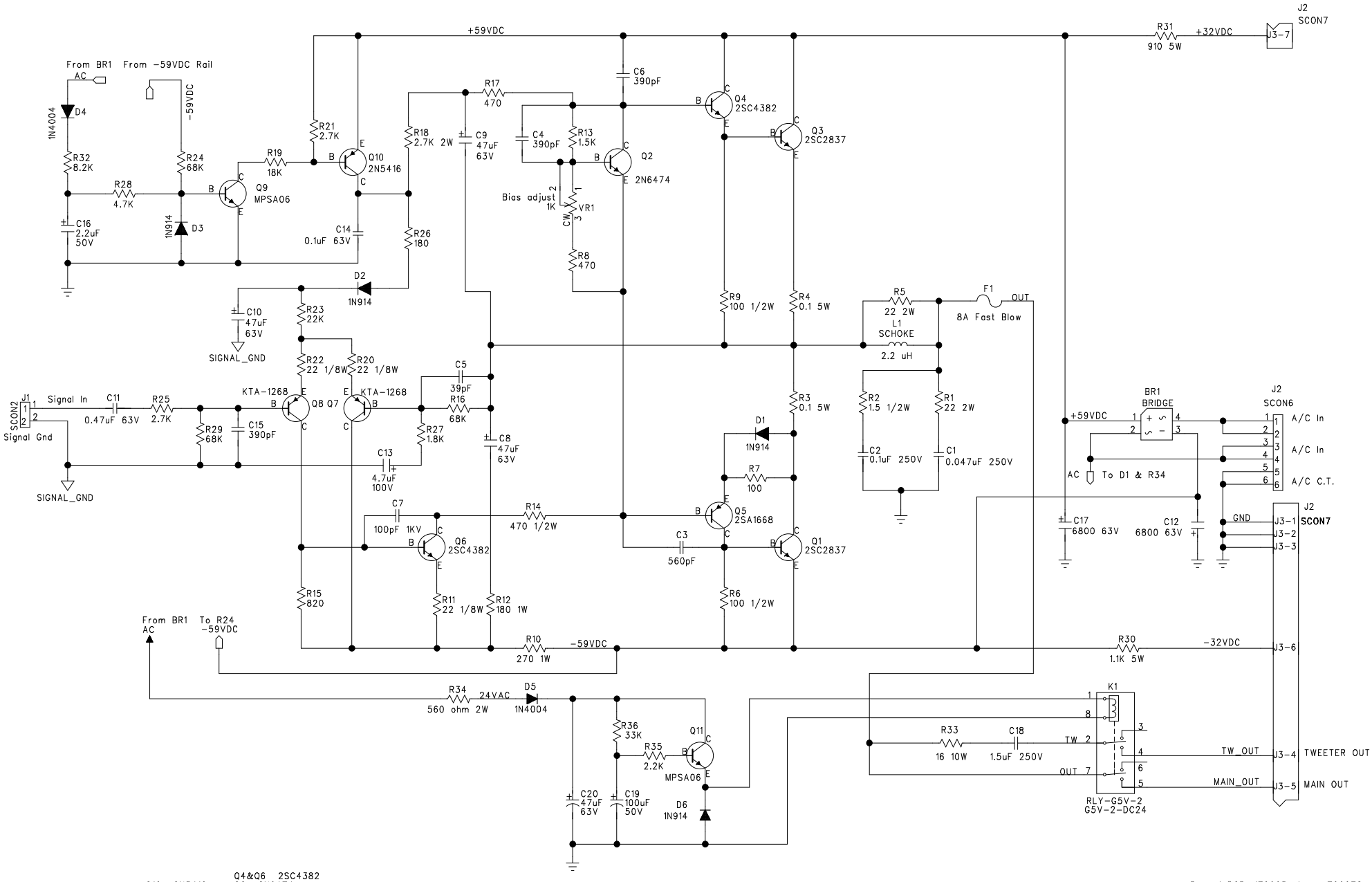
REQUIRED ACTION:

Take the following corrective actions (reference attached schematic and PCB assembly drawings):

1. Remove chassis from cabinet by removing 10 mounting screws. Lift the chassis out the rear of the cabinet. Disconnect the speaker wiring from cabinet by removing the cable clamp from the inside of the cabinet. Disconnect the speaker wiring from the tweeter and main speaker, noting wire color and polarity connections to the speakers.
2. Verify that Q1, Q2 and Q3 are properly attached to the heatsink.
3. Perform the bias re-adjustment with the following equipment: Signal generator, Oscilloscope, Volt meter, Two-Ohm load:
    a. Set the signal generator output for 60mv at 1 KHz.
    b. Connect a 2 ohm load to the main speaker wiring. White wire is (+), Green wire is (-).
    c. Turn the unit ON. Run input signal through “Mix In” jack. Monitor the signal on an oscilloscope at .2 Volts/Div, .2ms Time/Div, 1x probe.
    d. Adjust the trim pot, VR1, such that the signal should have a prominent crossover notch at about zero crossing.
    e. Adjust the bias trim pot just pass the point where the crossover notch disappears.
    f. Attach the Volt Meter leads across both emitter resistors R3 and R4, so that one lead is attached to emitter of Q3 and the other lead is attached to the collector of Q1.
    g. Remove the 2 ohm load (so that the power amp is looking at an open load) and observe the Volt Meter reading. Adjust the trim pot to read approximately 4mV. This will set the bias current to 20mA in the output string. You may notice the voltage reading increasing/decreasing while the amplifier is idling. This is normal for this amplifier configuration.
4. It may be necessary to reset the limiter circuit located on the Pre Amp PCB assembly. Change generator to 160mV, 100 Hz signal. Change load to 8 ohms. Plug into “Input” jack with tone controls set flat (12:00) and master volume at 100%.
5. To set the limiter, adjust the limiter trim pot (R44 on Pre Amp PCB) until you get the following at the speaker output:
    a. LA 15 = 16.5VAC
    b. LA 12 = 15VAC
6. Turn OFF unit and disconnect test equipment.
7. Re-connect speaker wiring to speaker and tweeter. Re-attach speaker clamp to inside of the cabinet. Install chassis to cabinet.

WARRANTY CLAIM INSTRUCTIONS:

The above corrective action should be performed on any LA12 or LA15 currently under their applicable warranty period which falls within the serial number range IA04A thru IA04K. For proper labor reimbursement please indicate the Tech Note Number **TN 04-2** in the Special Authorization Box (Box #12) on the FMIC Warranty Claim Form. Labor reimbursement = 1/2 hour (U.S. and Canada only).



Q10 2N5416
Q4&Q6 2SC4382
Q2 2N6474
Q5 2SA1668
Q1&Q3 2SC2837
Q7&Q8 KTA-1268
Q9&Q11 MPSA06

E B C — TO-39 Bottom View
BCE 1 2 3 — TO-220
BCE 1 2 3 — MT-100
ECB 1 2 3 — TO-92
EBC 1 2 3 — TO-92
All Others Front View

NOTES (Unless otherwise specified):
1. All resistance expressed in ohms, 1/4 watt, 5%

Changes apply to both the LA12 and LA15 assemblies

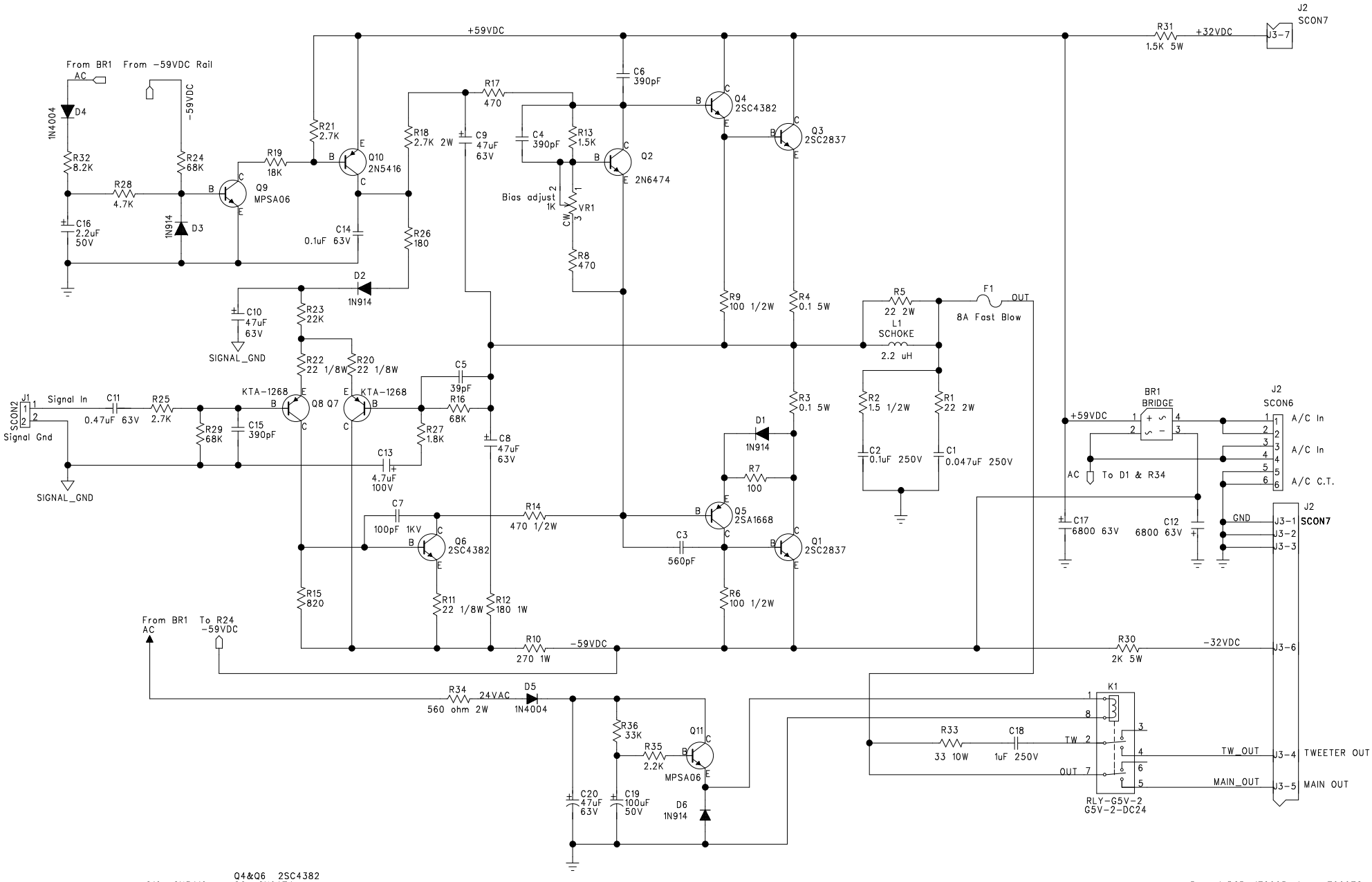
Rev x1 PCB: 170065; Assy: 700078

SWR Sound Corp.

LA12 Power Amp Board
W/power-on delay relay

January 2003 Revision x1 Page 1 of 1

Last updated: 30 April 2003



NOTES (Unless otherwise specified):

1. All resistance expressed in ohms, 1/4 watt, 5%

Changes apply to both the LA12 and LA15 assemblies

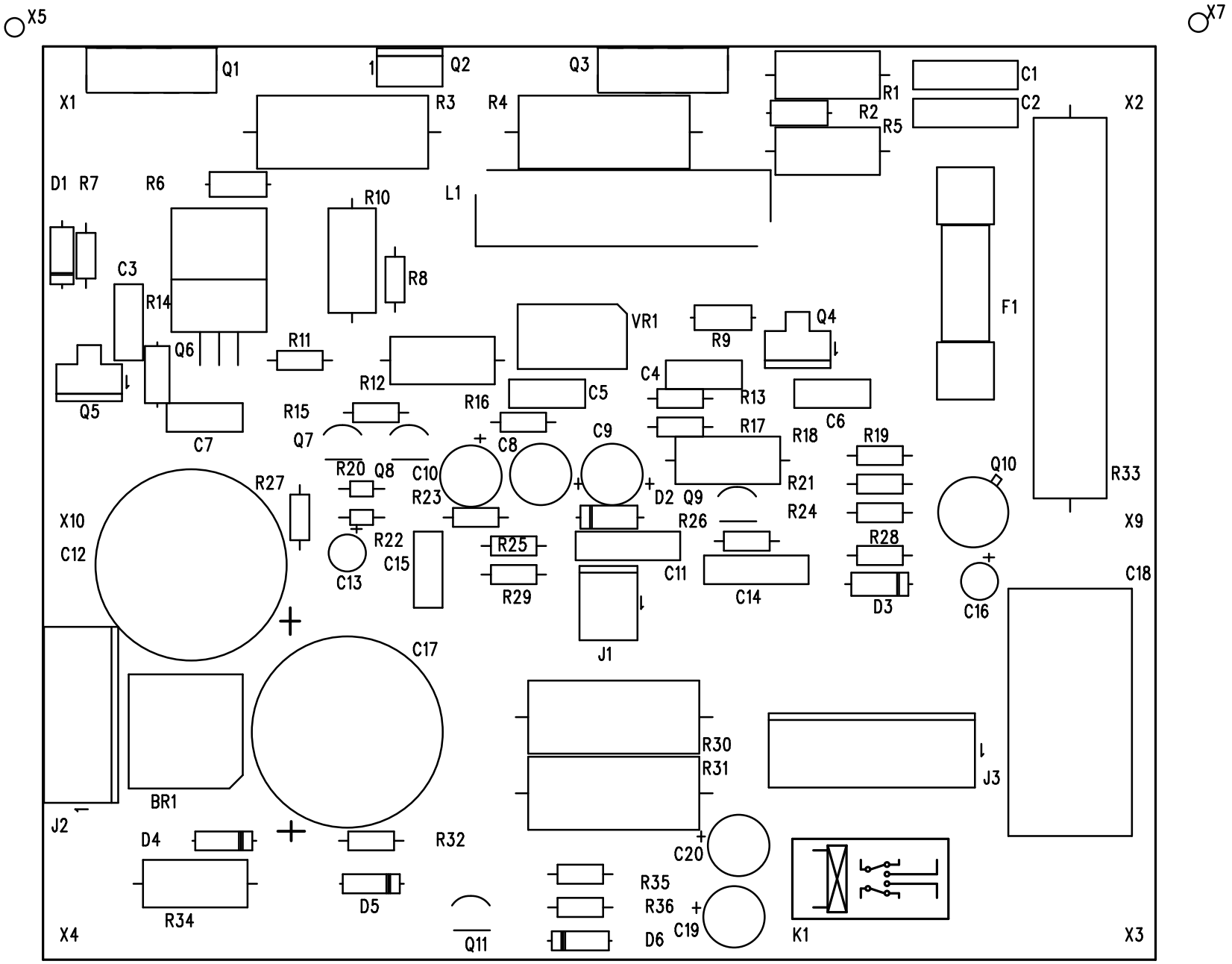
Rev x1 PCB: 170065; Assy: 700078

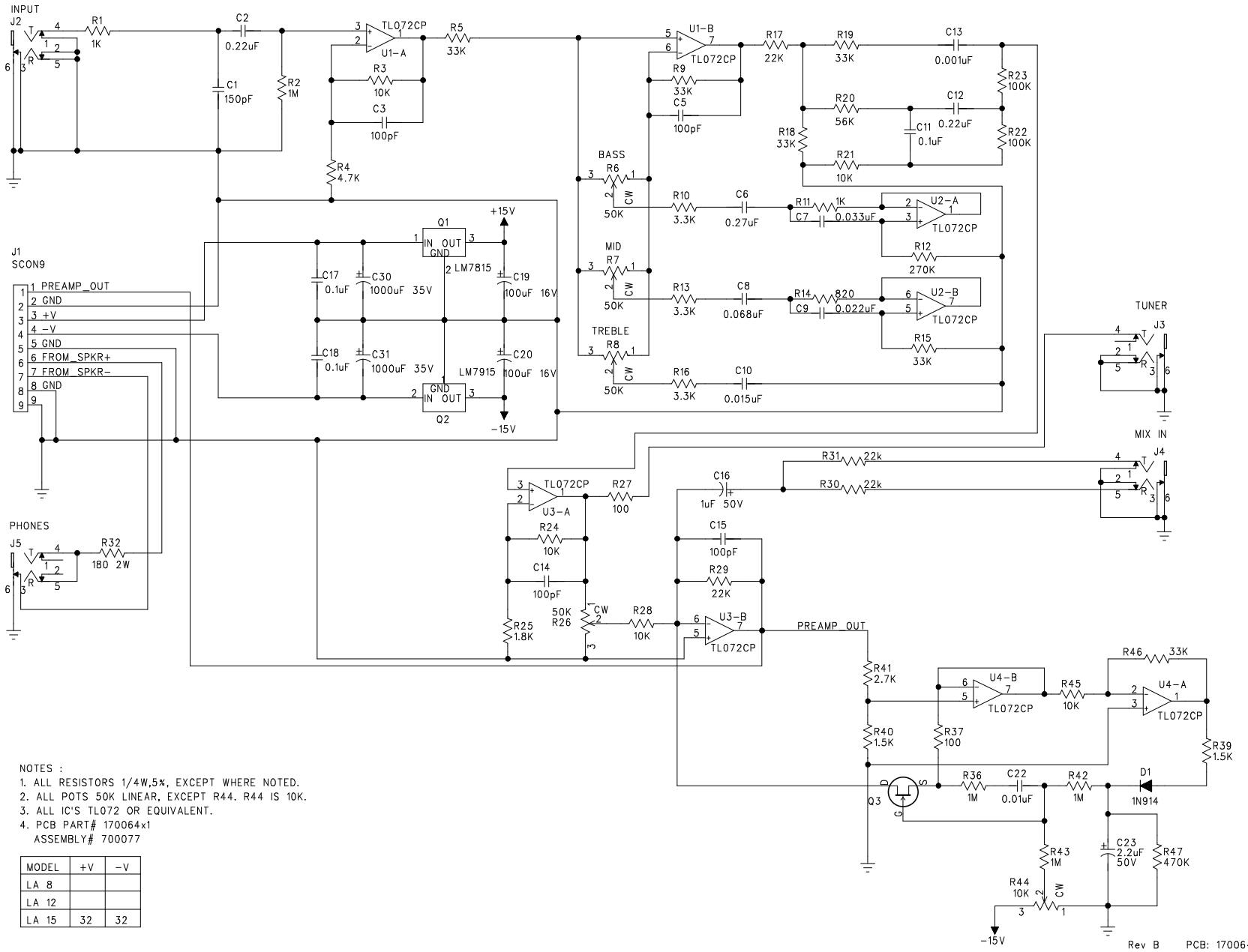
SWR Sound Corp.

LA15 Power Amp Board
W/power-on delay relay

January 2003 Revision x1 Page 1 of 1

Last updated: 30 April 2003


X5
X7
Q1
Q2
Q3
R1
C1
C2
X1
R3
R4
R2
R5
X2
D1
R7
R6
L1
R10
R8
C3
R14
VR1
R9
Q4
F1
Q6
R11
R12
C4
R13
C5
C6
Q5
R15
R16
C7
Q7
C8
C9
R17
R18
R19
R20
Q8
C10
R23
D2
Q9
R21
R24
Q10
R33
X10
R27
R26
R22
R25
R28
X9
C12
C13
C15
C11
C14
D3
C16
C18
J1
C17
R30
R31
J3
BR1
J2
D4
R32
C20
R35
R36
R34
D5
C19
K1
X4
Q11
D6
X3
X6
Layer One – Routing



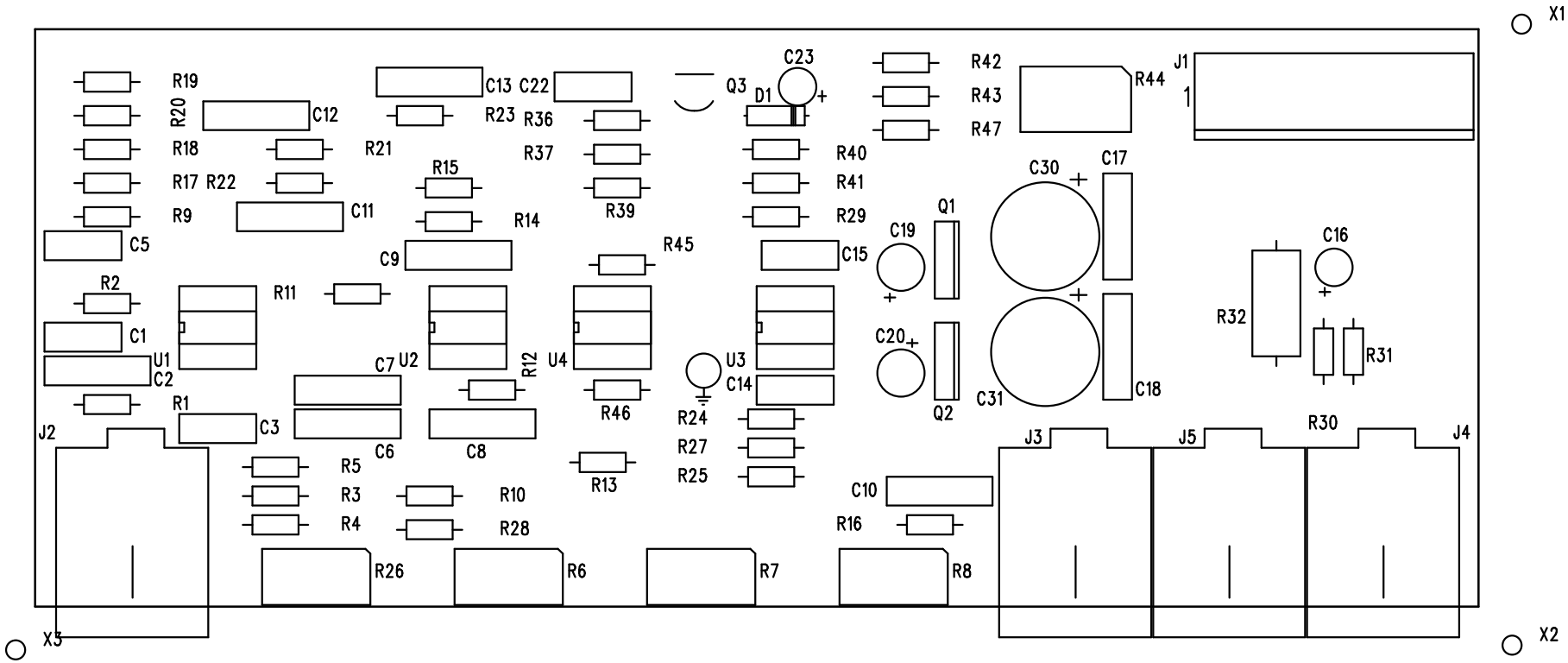
NOTES :
1. ALL RESISTORS 1/4W,5%, EXCEPT WHERE NOTED.
2. ALL POTS 50K LINEAR, EXCEPT R44. R44 IS 10K.
3. ALL IC'S TL072 OR EQUIVALENT.
4. PCB PART# 170064x1
   ASSEMBLY# 700077

MODEL	+V	-V
LA 8		
LA 12		
LA 15	32	32

Rev B PCB: 170064; Assy: 700077

SWR Sound Corporation

Title:	LA Series Pre-Amp W/Limiter	Rev: B
Date:	12 Nov. 2003 GMx	
Last update:		Sheet: 1 of 1



Layer One – Routing