MARK LEVINSON
No331
REPAIR MANUAL

This procedure will allow a qualified Mark Levinson dealer to repair a No331 power amplifier. Please read and understand all instructions outlined in this procedure before attempting any repair. If a question should arise, please contact the MADRIGAL AUDIO LABS. TECHNICAL SERVICE DEPARTMENT for assistance (PHONE) 203-346-0896 or (FAX) 203-346-1540.

TOOLS REQUIRED

5/64" hexdriver
3/32" hexdriver
1/8" hexdriver
5/32" hexdriver
7/64" hexdriver
1/16" hexdriver
1/2" wrench
12mm wrench
small slotted screwdriver
#1 phillips screwdriver
#2 phillips screwdriver
3/16" slotted screwdriver
DC voltage meter
trimpot adjustment tool

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APPENDIX

ASSEMBLY PRINTS ARE PROVIDED IN THE SERVICE PACK.

CAUTION! Hazardous voltages available inside unit. Before proceeding, remove AC cable from AC outlet.

CAUTION! Static sensitive parts and subassemblies inside unit. Observe proper grounding procedures before continuing.

CAUTION! Handle metalwork with care to avoid scrtching outer surfaces.

NOTE! When removing an assembly, put the hardware (screws, washers, nuts) in a small plastic bag and keep it with the assembly to ease assembly after repair.

REMOVING THE TOP COVER, TRANSISTOR COVERS, AND COVER SIDEBAR

REFER TO PRINT #942189

1. Using a 3/32" hexdriver, remove 2 screws(17) which secure the top cover(16). To remove the top cover, carefully slide it back towards the rear of the unit.

2. Using a 5/64" hexdriver, remove 4 screws(13) which secure the transistor covers(12) to the heatsinks. Carefully separate the transistor covers from the heatsinks and set them aside.

3. Using a 3/32" hexdriver, remove 4 screws(9) that secure the cover side bar(8) to the heatsinks. Carefully remove the cover side bar from the heatsink by lifting it up.

REMOVING A VOLTAGE GAIN PCB (VG)

REFER TO PRINT #942189

1. Using a 3/32" hexdriver, remove 2 screws(17) which secure the top cover(16). To remove the top cover, carefully slide it back towards the rear of the unit.

2. Using a 5/64" hexdriver, remove 4 screws(13) which secure the transistor covers(12) to the heatsinks. Carefully separate the transistor covers from the heatsinks and set them aside.

3. Using a 3/32" hexdriver, remove 4 screws(9) that secure the cover side bar(8) to the heatsinks. Carefully remove the cover side bar from the heatsink by lifting it up.

REFER TO PRINT #942188

4. Using a small bladed screwdriver, unlock the XLR connector from its sleeve (see diagram 1). Using a #1 phillips screwdriver, remove the XLR shell from the chassis. Using a 1/2" wrench, remove the RCA connector nut and set it and the black shoulder washer aside.

5. Using a #2 phillips screwdriver, remove 5 screws(16) and lockwashers(17) that secure the VG PCB(13) to the chassis(1). **Be sure that the lockwashers or screws do not drop into the unit.** Carefully lift the front of the VG PCB up unplugging it from the channel assy(2), then lift the VG PCB out of the unit.

REMOVING A CHANNEL ASSEMBLY

REFER TO PRINT # 942189

1. Using a 3/32" hexdriver, remove 2 screws(17) which secure the top cover(16). To remove the top cover, carefully slide it back towards the rear of the unit.

2. Using a 5/64" hexdriver, remove 4 screws(13) which secure the transistor covers(12) to the heatsinks. Carefully separate the transistor covers from the heatsinks and set them aside.

3. Using a 3/32" hexdriver, remove 4 screws(9) that secure the cover side bar(8) to the heatsinks. Carefully remove the cover side bar from the heatsink by lifting it up.

REFER TO PRINT # 942188

4. Using a small bladed screwdriver, unlock the XLR connector from its sleeve (see diagram 1). Using a #1 phillips screwdriver, remove the XLR shell from the chassis. Using a 1/2" wrench, remove the RCA connector nut and set it and the black shoulder washer aside.

5. Using a #2 phillips screwdriver, remove 5 screws(16) and lockwashers(17) that secure the VG PCB(13 or 14) to the chassis(1). **Be sure that the lockwashers or screws do not drop into the unit.** Carefully lift the front of the VG PCB up unplugging it from the channel assy(2), then lift the VG PCB out of the unit and set it aside.

6. Lay down a towel or soft cloth and carefully tip the unit up onto the channel opposite to the one that is being remove.

REFER TO PRINT # 942189

7. Using a 5/64" hexdriver, remove 12 screws(4) that secures the bottom cover(3) to the unit. Remove cover and set it aside.

10. **BEFORE PROCEEDING, DISCHARGE THE 4 LARGE BLUE CAPACITORS IN THE FOLLOWING MANNER!** Using a 25watt resistor with the MINIMUM value of 10 ohms, discharge each capacitor to the ground bars.

REFER TO PRINT # 942188

11. Using a 1/8" hexdriver, remove 2 screws(33) which secures the bottom of the faceplate(28) to the chassis(1). While holding the faceplate in place and using a 5/32" hexdriver, remove 2 screws(31) and lockwashers(32) which secures the top of the faceplate to the chassis. Carefully remove the faceplate out of the void in between the right and left channel assy(2). Disconnect the ribbon cable from the on/off pcb in the faceplate. Set faceplate and hardware aside.

12. Using a bladed screwdriver, remove 2 screws and 2 pair of lockwashers which secure the power supply bars to the large blue capacitors. Next, remove the screw(11) and lockwashers(12) from the output bar.

13. Carefully lay the unit down, be sure that is on a soft towel.

14. Using a 3/32" hexdriver, remove 5 screws [3 in the front(8) and 2 in the rear(7)] which secures the channel assy(2) to the chassis(1). Set hardware aside. To remove channel gently pull it out towards the side of the unit until it disconnects from the VSMB PCB and the power supply bars clear the capacitors.

15. Carefully tilt the channel down and lay it flat on a soft towel.

16. Using a bladed screwdriver, remove 4 screws and lockwashers which secure the remaining wires onto the channel.

17. Install the previously removed wires onto the new channel in the following manner, RED-P1, BLUE-P2, BLACK-P3, WHITE-P5.

18. Tilt the channel up and line up connector P12 on the audio channel with the corresponding connector on the VSMB PCB. Next line up the front and rear mounting holes in the channel assy with the chassis holes and secure with 5 previously removed screws[3 black screws-front(8), 2 stainless screws-rear(7)].

19. Tilt the unit up on the opposite channel heatsink, and secure the output bar to the channel, and the power supply bars and cables to the large blue capacitors.

20. Replace the front plate by first connecting the ribbon cable to the ON/OFF PCB in the front panel. (the ribbon cable can only be connected one way) Then secure to the chassis with 4 previously removed screws(31,32,33).

21. Replace the bottom plate and feet and carefully tip unit back down onto its feet.

22. Install the VG PCB by first sliding the XLR connector in to the sleeve in the chassis. Then connect to the channel assy and secure with 5 screws and lockwashers. Lock the XLR connector into its sleeve and secure the RCA connector with the RCA nut and shoulder washer.

23. Reverse steps 1 to install the sidebar, transistor covers and the top plate.

REPLACING A POWER SUPPLY CAPACITOR

REFER TO PRINT # 942189

1. Using a 3/32" hexdriver, remove 2 screws(17) which secure the top cover(16). To remove the top cover, carefully slide it back towards the rear of the unit.

2. Using a 5/64" hexdriver, remove 4 screws(13) which secure the transistor covers(12) to the heatsinks. Carefully separate the transistor covers from the heatsinks and set them aside.

3. Using a 3/32" hexdriver, remove 4 screws(9) that secure the cover side bar(8) to the heatsinks. Carefully remove the cover side bar from the heatsink by lifting it up.

REFER TO PRINT # 942188

4. Using a small bladed screwdriver, unlock the XLR connector from its sleeve (see diagram 1). Using a #1 phillips screwdriver, remove the XLR shell from the chassis. Using a 1/2" wrench, remove the RCA connector nut and set it and the black shoulder washer aside.

5. Using a #2 phillips screwdriver, remove 5 screws(16) and lockwashers(17) that secure the VG PCB(13 or 14) to the chassis(1). **Be sure that the lockwashers or screws do not drop into the unit.** Carefully lift the front of the VG PCB up unplugging it from the channel assy(2), then lift the VG PCB out of the unit and set it aside.

6. Lay down a towel or soft cloth and carefully tip the unit up onto the channel opposite to the one that is being remove.

REFER TO PRINT # 942189

7. Using a 5/64" hexdriver, remove 12 screws(4) that secures the bottom cover(3) to the unit. Remove cover and set it aside.

8. **BEFORE PROCEEDING, DISCHARGE THE 4 LARGE BLUE CAPACITORS IN THE FOLLOWING MANNER!** Using a 25watt resistor with the MINIMUM value of 10 ohms, discharge each capacitor to the ground bars.

REFER TO PRINT # 942188

9. Using a 1/8" hexdriver, remove 2 screws(33) which secures the bottom of the faceplate to the chassis. While holding the faceplate in place and using a 5/32" hexdriver, remove 2 screws(31) and lockwashers(32) which secures the top of the faceplate(28) to the chassis(1). Carefully remove the faceplate out of the void in between the right and left channel assy(2). Disconnect the ribbon cable from the on/off pcb in the faceplate. Set faceplate and hardware aside.

10. Using a bladed screwdriver, remove 2 screws and 2 pair of lockwashers which secure the power supply bars to the large blue capacitors. Next, remove the screw(11) and lockwashers(12) that secures the output bar to the channel assy(2).

11. Carefully lay the unit down, be sure that is on a soft towel.

12. Using a 3/32" hexdriver, remove 5 screws [3 in the front(8) and 2 in the rear(7)] which secures the channel assy(2) to the chassis(1). Set hardware aside. To remove channel gently pull it out towards the side of the unit until it disconnects from the VSMB PCB and the power supply bars clear the capacitors.

13. Carefully tilt the channel down and lay it flat on a soft towel.

14. Using a bladed screwdriver, remove 4 screws and lockwashers which secure the remaining wires onto the channel. Set the channel aside.

15. Careful tilt the unit back up on the opposite channel.

REFER TO PRINT # 942186

16. Using a 7/64" hexdriver, loosen the capacitor clamp(15) that secures the power supply capacitor(13 or 14) in place. Then using a bladed screwdriver remove the screw that secures the capacitor to the ground bar.

17. To remove the capacitor, carefully slide it up towards the top of the unit until it is out of the capacitor clamp.

18. Install the new capacitor, secure it to the ground bar and then secure it in place with the capacitor clamp. Tip the unit back down for audio channel installation.

19. Install the previously removed wires onto the audio channel in the following manner, RED-P1, BLUE-P2, BLACK-P3, WHITE-P5.

REFER TO PRINT #942188

20. Tilt the channel up and line up connector P12 on the audio channel with the corresponding connector on the VSMB PCB. Next line up the front and rear mounting holes in the audio channel with the chassis holes and secure with 5 previously removed screws[3 black screws-front(8), 2 stainless screws-rear(7)].

21. Tilt the unit up on the opposite channel heatsink, and secure the output bar to the channel, and the power supply bars and cables to the large blue capacitors.

22. Replace the front plate(28) by first connecting the ribbon cable to the ON/OFF PCB in the front panel. (the ribbon cable can only be connected one way) Then secure to the chassis with 4 previously removed screws and lockwashers (31,32,33).

23. Replace the bottom plate and feet and carefully tip unit back down onto its feet.

24. Install the VG PCB(9 and 10) by first sliding the XLR connector in to the sleeve in the chassis. Then connect to the channel assy(2) and secure with 5 screws(16) and lockwashers(17). Lock the XLR connector into its sleeve and secure the RCA connector with the RCA nut and shoulder washer.

25. Reverse step 1 to install the sidebar, transistor covers and the top plate.

REPLACING A SPEAKER TERMINAL

REFER TO PRINT # 942189

1. Using a 3/32" hexdriver, remove 2 screws(17) which secure the top cover(16). To remove the top cover, carefully slide it back towards the rear of the unit.

2. Using a 5/64" hexdriver, remove 4 screws(13) which secure the transistor covers(12) to the heatsinks. Carefully separate the transistor covers from the heatsinks and set them aside.

3. Using a 3/32" hexdriver, remove 4 screws(9) that secure the cover side bar(8) to the heatsinks. Carefully remove the cover side bar from the heatsink by lifting it up.

REFER TO PRINT # 942188

4. Using a small bladed screwdriver, unlock the XLR connector from its sleeve (see diagram 1). Using a #1 phillips screwdriver, remove the XLR shell from the chassis. Using a 1/2" wrench, remove the RCA connector nut and set it and the black shoulder washer aside.

5. Using a #2 phillips screwdriver, remove 5 screws(16) and lockwashers(17) that secure the VG PCB(13 and 14) to the chassis(1). **Be sure that the lockwashers or screws do not drop into the unit.** Carefully lift the front of the VG PCB up unplugging it from the channel assy(2), then lift the VG PCB out of the unit and set it aside.

6. Lay down a towel or soft cloth and carefully tip the unit up onto the channel opposite to the one that is being removed.

REFER TO PRINT # 942189

7. Using a 5/64" hexdriver, remove 12 screws(4) that secures the bottom cover(3) to the unit. Remove cover and set it aside.

8. **BEFORE PROCEEDING, DISCHARGE THE 4 LARGE BLUE CAPACITORS IN THE FOLLOWING MANNER!** Using a 25watt resistor with the MINIMUM value of 10 ohms, discharge each capacitor to the ground bars.

REFER TO PRINT # 942188

9. Using a 1/8" hexdriver, remove 2 screws(33) which secures the bottom of the faceplate(28) to the chassis(1). While holding the faceplate in place and using a 5/32" hexdriver, remove 2 screws(31) and lockwashers(32) which secures the top of the faceplate to the chassis. Carefully remove the faceplate out of the void in between the right and left heatsink. Disconnect the ribbon cable from the on/off pcb in the faceplate. Set faceplate and hardware aside.

10. Using a bladed screwdriver, remove 2 screws and 2 pair of lockwashers which secure the power supply bars to the large blue capacitors. Next, remove the screw(11) and lockwashers(12) that secures the output bar to the channel assy(2). Repeat this step for the opposite channel assy.

11. Carefully lay the unit down, be sure that is on a soft towel. Place two 1 1/2 blocks under the false front panel and the rear panel to ease channel removal.

12. Using a 3/32" hexdriver, and while holding the channel assy in place, remove 5 screws [3 in the front(8) and 2 in the rear(7)] which secures the channel assy(2) to the chassis(1). Set hardware aside. To remove channel gently pull it out towards the side of the unit until it disconnects from the VSMB PCB and the power supply bars clear the capacitors.

13. Using a bladed screwdriver, remove 4 screws and lockwashers which secure the remaining wires onto the channel. Set the channel aside.

14. Repeat steps 13 and 14 for the opposite channel.

15. Tuck the ribbon cable into the false front panel and tilt the unit up onto the false front panel.

REFER TO PRINT #942186

16. Using a 3/32" hexdriver, remove 5 Screws (28) that secures the rear panel (27) to the tunnel (1).

17. Using a bladed screwdriver, remove 3 screws(33) and lockwashers(34) that secures three AC connector wires to the VSMB daughter board (22).

REFER TO PRINT # 942185

18. Using a 12mm open end wrench, loosen and remove the nuts and lockwashers which secures the bottom black speaker terminals (5) to the ground bars(7,8).

19. To separate the rear panel from the tunnel, first lift up on the bottom corners of the rear panel to disengage the speaker terminal posts from the ground bars. A bit of force may be necessary to accomplish this. **DO NOT PRY WITH TOOL!!!** Second, grasp the output bars (9,10) and gently pull them out towards the side of the unit so that they clear the VSMB PCB. Finally, slide the rear panel towards the top of the unit until it clears.

20. Remove the nuts and lockwashers that secure the right output bar (10) and(or) the left output bar (9) to the speaker terminals. Remove output tie straps (6) from the speaker terminals. Remove the faulty terminal(s) and install new terminal. TORQUE INNER NUT TO 75 ft/lbs AND THE OUTER NUT TO 45 ft/lbs.

21. Reinstall the output tie straps (6) and the output bars (9 and (or) 10) to the speaker terminals and tighten.

REFER TO PRINT #942186

22. To install the rear panel assy(27) to the tunnel(1), slide it down towards the bottom of the unit while pulling the output bars out and around the VSMB PCB (18).Lift the bottom corners of the rear panel assy to engage the bottom black speaker terminals with the ground bars and secure with 2 nuts and lockwashers. Attach the rear panel assy to the tunnel with 5 screws.

23. Secure the AC connector wires to the VSMB daughter PCB(22) in the following manner.

    AC conn - green wire to GND, Black wire to "L", blue wire to "N"

24. Tilt the unit down and prop the front and the rear of the unit up with 4 1 1/2" blocks.

REFER TO PRINT #942188

25. Lay the right and left channel assys down flat beside the chassis on soft towels. Connect the power supply and ground cables to the channel as follows RED-P1, BLUE-P2, BLACK-P3, WHITE-P5.

REFER TO PRINT #942154

26. Carefully tilt the channel assy up and line up connector P12 on the audio channel with the corresponding connector on the VSMB PCB. Secure it to the false front panel and the rear panel with 5 screws [2 stainless (8) in the rear panel 3 black (7) in the front]. Repeat step for the other channel.

27. Carefully tilt the unit up on one channel assy and secure the output bar to the left and right channel assys with 2 screws(11) and lockwashers(12). Secure the channel power supply bars to the large blue capacitors with 4 screws and lockwashers.

28. Replace the front plate(28) by first connecting the ribbon cable to the ON/OFF PCB in the front panel. (the ribbon cable can only be connected one way) Then secure to the chassis(1) with 4 previously removed screws and lockwashers(31,32,33).

29. Replace the bottom plate and feet and carefully tip unit back down onto its feet.

30. Install the VG PCB(13 and 14) by first sliding the XLR connector in to the sleeve in the chassis. Then connect to the channel assy(2) and secure with 5 screws(12) and lockwashers(13). Lock the XLR connector into its sleeve and secure the RCA connector with the RCA nut and shoulder washer.

31. Reverse steps 1 to install the sidebar, transistor covers and the top plate.

REPLACING A FUSE

1. Lay down a towel or soft cloth and carefully tip the unit up onto its side.

REFER TO PRINT # 942189

2. Using a 5/64" hexdriver, remove 12 screws(4) that secures the bottom cover(3) to the unit. Remove cover and set it aside.

REFER TO PRINT #9421586

3. Locate fuses on the VSMB DAUGHTER PCB(22). Replace the bad fuse with the value specified in the chart on the VSMB DAUGHTER PCB.

4. Reverse steps 1 to 3 to install bottom plate and feet.

REPLACING THE VOLTAGE\SYSTEM MONITOR DAUGHTER BOARD (VSMB DAUGHTER PCB)

1. Lay down a towel or soft cloth and carefully tip the unit up onto its side.

REFER TO PRINT # 942189

2. Using a 5/64" hexdriver, remove 12 screws(4) that secures the bottom cover(3) to the unit. Remove cover and set it aside.

REFER TO PRINT #942186

3. Locate VSMB DAUGHTER PCB(22) and remove connections P300,P301,P302,P315,P316, and P324.

4. Using a #2 phillips screwdriver, remove screws(23) and lockwashers(24) that secure the VSMB DAUGHTER PCB to the tunnel(1).

5. Replace VSMB DAUGHTER PCB to the tunnel by reversing steps 1 to 5. Make wire connections as follows;

   AC conn - green wire to P301, Black wire to P300, blue wire to P302
   From ground bars to P315,P316
   8 pin connector from SMB transformer(8) to P324 (keyed connection)

6. Remove voltage module from faulty VSMB DAUGHTER PCB and install it onto the new VSMB DAUGHTER PCB. (keyed connection)

REPLACING THE VOLTAGE/SYSTEM MONITOR BOARD (VSMB PCB)

REFER TO PRINT # 942189

1. Using a 3/32" hexdriver, remove 2 screws(17) which secure the top cover(16). To remove the top cover, carefully slide it back towards the rear of the unit.

2. Using a 5/64" hexdriver, remove 4 screws(13) which secure the transistor covers(12) to the heatsinks. Carefully separate the transistor covers from the heatsinks and set them aside.

3. Using a 3/32" hexdriver, remove 4 screws(9) that secure the cover side bar(8) to the heatsinks. Carefully remove the cover side bar from the heatsink by lifting it up.

REFER TO PRINT # 942188

4. Using a small bladed screwdriver, unlock the XLR connector from its sleeve (see diagram 1). Using a #1 phillips screwdriver, remove the XLR shell from the chassis. Using a 1/2" wrench, remove the RCA connector nut and set it and the black shoulder washer aside.

5. Using a #2 phillips screwdriver, remove 5 screws(16) and lockwashers(17) that secure the VG PCB(13 and 14) to the chassis(1). **Be sure that the lockwashers or screws do not drop into the unit.** Carefully lift the front of the VG PCB up unplugging it from the channel assy(2), then lift the VG PCB out of the unit and set it aside.

6. Lay down a towel or soft cloth and carefully tip the unit up onto the channel opposite to the one that is being removed.

REFER TO PRINT # 942189

7. Using a 5/64" hexdriver, remove 12 screws(4) that secures the bottom cover(3) to the unit. Remove cover and set it aside.

8. **BEFORE PROCEEDING, DISCHARGE THE 4 LARGE BLUE CAPACITORS IN THE FOLLOWING MANNER!** Using a 25watt resistor with the MINIMUM value of 10 ohms, discharge each capacitor to the ground bars.

REFER TO PRINT # 942154

9. Using a 1/16" hexdriver, remove 2 screws(33) which secures the bottom of the faceplate(28) to the chassis(1). While holding the faceplate in place and using a 5/32" hexdriver, remove 2 screws(31) and lockwashers(32) which secures the top of the faceplate to the chassis. Carefully remove the faceplate out of the void in between the right and left heatsink. Disconnect the ribbon cable from the on/off pcb in the faceplate. Set faceplate and hardware aside.

10. Using a bladed screwdriver, remove 2 screws and 2 pair of lockwashers which secure the power supply bars to the large blue capacitors. Next, remove the screw(11) and lockwashers(12) that secures the output bar to the channel assy(2). Repeat this step for the opposite channel assy.

11. Carefully lay the unit down, be sure that is on a soft towel. Place two 1 1/2 blocks under the false front panel and the rear panel to ease channel removal.

12. Using a 3/32" hexdriver, and while holding the channel assy in place, remove 5 screws [3 in the front(8) and 2 in the rear(7)] which secures the channel assy(2) to the chassis(1). Set hardware aside. To remove channel gently pull it out towards the side of the unit until it disconnects from the VSMB PCB and the power supply bars clear the capacitors.

13. Using a bladed screwdriver, remove 4 screws and lockwashers which secure the remaining wires onto the channel. Set the channel aside.

14. Repeat steps 13 and 14 for the opposite channel.

15. Turn unit over.

REFER TO PRINT #942186

16. Locate VSMB DAUGHTER PCB(22) and remove connections P300,P301,P302,P315,P316, and P324.

17. Using a #2 phillips screwdriver, remove screws(24) and lockwashers(25) that secure the VSMB DAUGHTER PCB to the tunnel(1). Set the board aside.

REFER TO DIAGRAM 2

18. Disconnect wires from VSMB PCB and untwist specified wire bundles.

REFER TO DIAGRAM 3

19. Remove hardware which secures the ground bars to the capacitors and remove ground bars. Set hardware and ground bars aside.

REFER TO PRINT #942186

20. Using a #2 phillips screwdriver, remove 8 screws (20) and lockwashers(21) which secures the VSMB PCB(18) to the tunnel(1). Lift the VSMB PCB out of the tunnel until the transformer connections are accessable. Disconnect the secondary plugs remove the screws and lockwashers that secure the primary terminals the VSMB PCB. Lift the PCB out of the tunnel

REFER TO DIAGRAM 4 AND PRINT #942186

21. Connect the transformer primarys to the VSMB PCB as shown in diagram 4. Connect the secondary plugs to the VSMB PCB. Install the VSMB PCB into the tunnel and secure with 8 screws and lockwashers.

REFER TO DIAGRAM 5

22. Secure the ground bars to the capacitors. Refer to the chart and connect the wires to the VSMB PCB.

REFER TO PRINT #942186

23. Replace VSMB DAUGHTER PCB(22) to the tunnel(1) and secure with screws(23) and lockwashers(24). Make wire connections as follows;

AC conn - green wire to P301, Black wire to P300, blue wire to P302
From ground bars to P315,P316
8 pin connector from SMB transformer(8) to P324 (keyed connection)

24. Turn the unit over and prop the front and the rear of the unit up with 4 1 1/2" blocks.

REFER TO PRINT #942188

25. Lay the right and left channel assys down flat beside the chassis on soft towels. Connect the power supply and ground cables to the channel as follows RED-P1, BLUE-P2, BLACK-P3, WHITE-P5.

REFER TO PRINT #942188

26. Carefully tilt the channel assy up and line up connector P12 on the audio channel with the corresponding connector on the VSMB PCB. Secure it to the false front panel and the rear panel with 5 screws [2 stainless (8) in the rear panel 3 black (7) in the front]. Repeat step for the other channel.

27. Carefully tilt the unit up on one channel assy and secure the output bar to the left and right channel assys with 2 screws(11) and lockwashers(12). Secure the channel power supply bars to the large blue capacitors with 4 screws and lockwashers.

28. Replace the front plate(28) by first connecting the ribbon cable to the ON/OFF PCB in the front panel. (the ribbon cable can only be connected one way) Then secure to the chassis(1) with 4 previously removed screws and lockwashers(31,32,33).

29. Replace the bottom plate and feet and carefully tip unit back down onto its feet.

30. Install the VG PCB(13 and 14) by first sliding the XLR connector in to the sleeve in the chassis. Then connect to the channel assy(2) and secure with 5 screws(16) and lockwashers(17). Lock the XLR connector into its sleeve and secure the RCA connector with the RCA nut and shoulder washer.

31. Reverse steps 1 to install the sidebar, transistor covers and the top plate.

REPLACING A POWER TRANSFORMER

REFER TO PRINT # 942189

1. Using a 3/32" hexdriver, remove 2 screws(17) which secure the top cover(16). To remove the top cover, carefully slide it back towards the rear of the unit.

2. Using a 5/64" hexdriver, remove 4 screws(13) which secure the transistor covers(12) to the heatsinks. Carefully separate the transistor covers from the heatsinks and set them aside.

3. Using a 3/32" hexdriver, remove 4 screws(9) that secure the cover side bar(8) to the heatsinks. Carefully remove the cover side bar from the heatsink by lifting it up.

REFER TO PRINT # 942188

4. Using a small bladed screwdriver, unlock the XLR connector from its sleeve (see diagram 1). Using a #1 phillips screwdriver, remove the XLR shell from the chassis. Using a 1/2" wrench, remove the RCA connector nut and set it and the black shoulder washer aside.

5. Using a #2 phillips screwdriver, remove 5 screws(16) and lockwashers(17) that secure the VG PCB(13 and 14) to the chassis(1). **Be sure that the lockwashers or screws do not drop into the unit.** Carefully lift the front of the VG PCB up unplugging it from the channel assy(2), then lift the VG PCB out of the unit and set it aside.

6. Lay down a towel or soft cloth and carefully tip the unit up onto the channel opposite to the one that is being removed.

REFER TO PRINT # 942189

7. Using a 5/64" hexdriver, remove 12 screws(4) that secures the bottom cover(3) to the unit. Remove cover and set it aside.

8. **BEFORE PROCEEDING, DISCHARGE THE 4 LARGE BLUE CAPACITORS IN THE FOLLOWING MANNER!** Using a 25watt resistor with the MINIMUM value of 10 ohms, discharge each capacitor to the ground bars.

REFER TO PRINT # 942188

9. Using a 1/16" hexdriver, remove 2 screws(33) which secures the bottom of the faceplate(28) to the chassis(1). While holding the faceplate in place and using a 5/32" hexdriver, remove 2 screws(31) and lockwashers(32) which secures the top of the faceplate to the chassis. Carefully remove the faceplate out of the void in between the right and left heatsink. Disconnect the ribbon cable from the on/off pcb in the faceplate. Set faceplate and hardware aside.

10. Using a bladed screwdriver, remove 2 screws and 2 pair of lockwashers which secure the power supply bars to the large blue capacitors. Next, remove the screw(11) and lockwashers(12) that secures the output bar to the channel assy(2). Repeat this step for the opposite channel assy.

11. Carefully lay the unit down, be sure that is on a soft towel. Place two 1 1/2 blocks under the false front panel and the rear panel to ease channel removal.

12. Using a 3/32" hexdriver, and while holding the channel assy in place, remove 5 screws [3 in the front(8) and 2 in the rear(7)] which secures the channel assy(2) to the chassis(1). Set hardware aside. To remove channel gently pull it out towards the side of the unit until it disconnects from the VSMB PCB and the power supply bars clear the capacitors.

13. Using a bladed screwdriver, remove 4 screws and lockwashers which secure the remaining wires onto the channel. Set the channel aside.

14. Repeat steps 13 and 14 for the opposite channel.

15. Turn unit over.

REFER TO PRINT #942186

16. Locate VSMB DAUGHTER PCB(22) and remove connections P300,P301,P302,P315,P316, and P324.

17. Using a #2 phillips screwdriver, remove 4 screws(23) and lockwashers(24) that secure the VSMB DAUGHTER PCB to the tunnel(1). Set the board aside.

REFER TO DIAGRAM 2

18. Disconnect wires from VSMB PCB and untwist specified wire bundles.

REFER TO DIAGRAM 3

19. Remove hardware which secures the ground bars to the capacitors and remove ground bars. Set hardware and ground bars aside.

REFER TO PRINT #942186

20. Using a #2 phillips screwdriver, remove 8 screws (20) and lockwashers(21) which secures the VSMB PCB(18) to the tunnel(1). Lift the VSMB PCB out of the tunnel until the transformer connections are accessable. Disconnect the secondary plugs remove the screws and lockwashers that secure the primary terminals the VSMB PCB. Lift the PCB out of the tunnel

REFER TO DIAGRAM 4 AND PRINT #942186

21. Remove bolts(3) and lockwashers(4) that secures the transformer(2) to the tunnel(1). Slide the transformer out of the tunnel. Install new transformer by reversing this step.

22. Connect the transformer primarys to the VSMB PCB as shown in diagram 4. Connect the secondary plugs to the VSMB PCB. Install the VSMB PCB into the tunnel and secure with 8 screws and lockwashers.

REFER TO DIAGRAM 5

23. Secure the ground bars to the capacitors. Refer to the chart and connect the wires to the VSMB PCB.

REFER TO PRINT #942186

24. Replace VSMB DAUGHTER PCB(22) to the tunnel(1) and secure with screws(23) and lockwashers(24). Make wire connections as follows;

    AC conn - green wire to P301, Black wire to P300, blue wire to P302
    From ground bars to P315,P316
    8 pin connector from SMB transformer(8) to P324 (keyed connection)

25. Turn the unit over and prop the front and the rear of the unit up with 4 1 1/2" blocks.

REFER TO PRINT #942188

26. Lay the right and left channel assys down flat beside the chassis on soft towels. Connect the power supply and ground cables to the channel as follows RED-P1, BLUE-P2, BLACK-P3, WHITE-P5.

REFER TO PRINT #942188

27. Carefully tilt the channel assy up and line up connector P12 on the audio channel with the corresponding connector on the VSMB PCB. Secure it to the false front panel and the rear panel with 5 screws [2 stainless (8) in the rear panel 3 black (7) in the front]. Repeat step for the other channel.

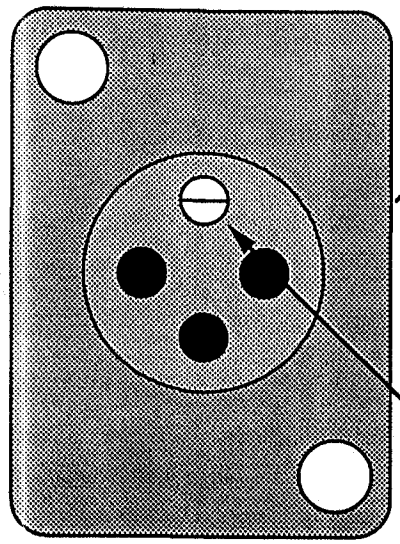
28. Carefully tilt the unit up on one channel assy and secure the output bar to the left and right channel assys with 2 screws(11) and lockwashers(12). Secure the channel power supply bars to the large blue capacitors with 4 screws and lockwashers.

29. Replace the front plate(28) by first connecting the ribbon cable to the ON/OFF PCB in the front panel. (the ribbon cable can only be connected one way) Then secure to the chassis(1) with 4 previously removed screws and lockwashers(31,32,33).

30. Replace the bottom plate and feet and carefully tip unit back down onto its feet.

31. Install the VG PCB(13 and 14) by first sliding the XLR connector in to the sleeve in the chassis. Then connect to the channel assy(2) and secure with 5 screws(16) and lockwashers(17). Lock the XLR connector into its sleeve and secure the RCA connector with the RCA nut and shoulder washer.

32. Reverse steps 1 to install the sidebar, transistor covers and the top plate.



XLR CONNECTOR LOCATED IN THE REAR OF THE UNIT.

UNLOCK BY TURNING COUNTERCLOCKWISE 1/3rd OF A TURN USING THE SMALL BLADED SCREWDRIVER

DIAGRAM 1

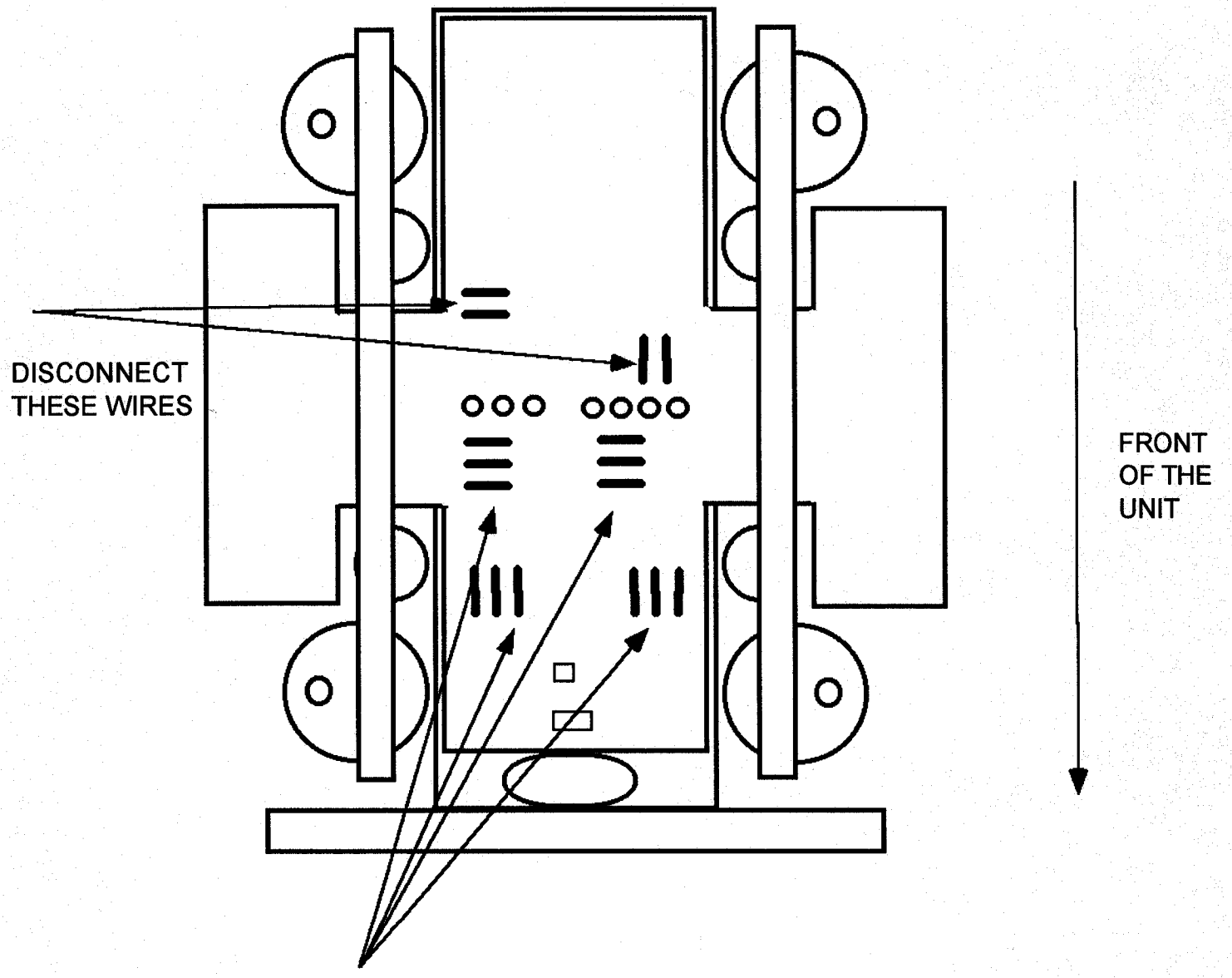

DISCONNECT
THESE WIRES
FRONT
OF THE
UNIT
DISCONNECT AND
UNTWIST THESE
WIRES

DIAGRAM 2

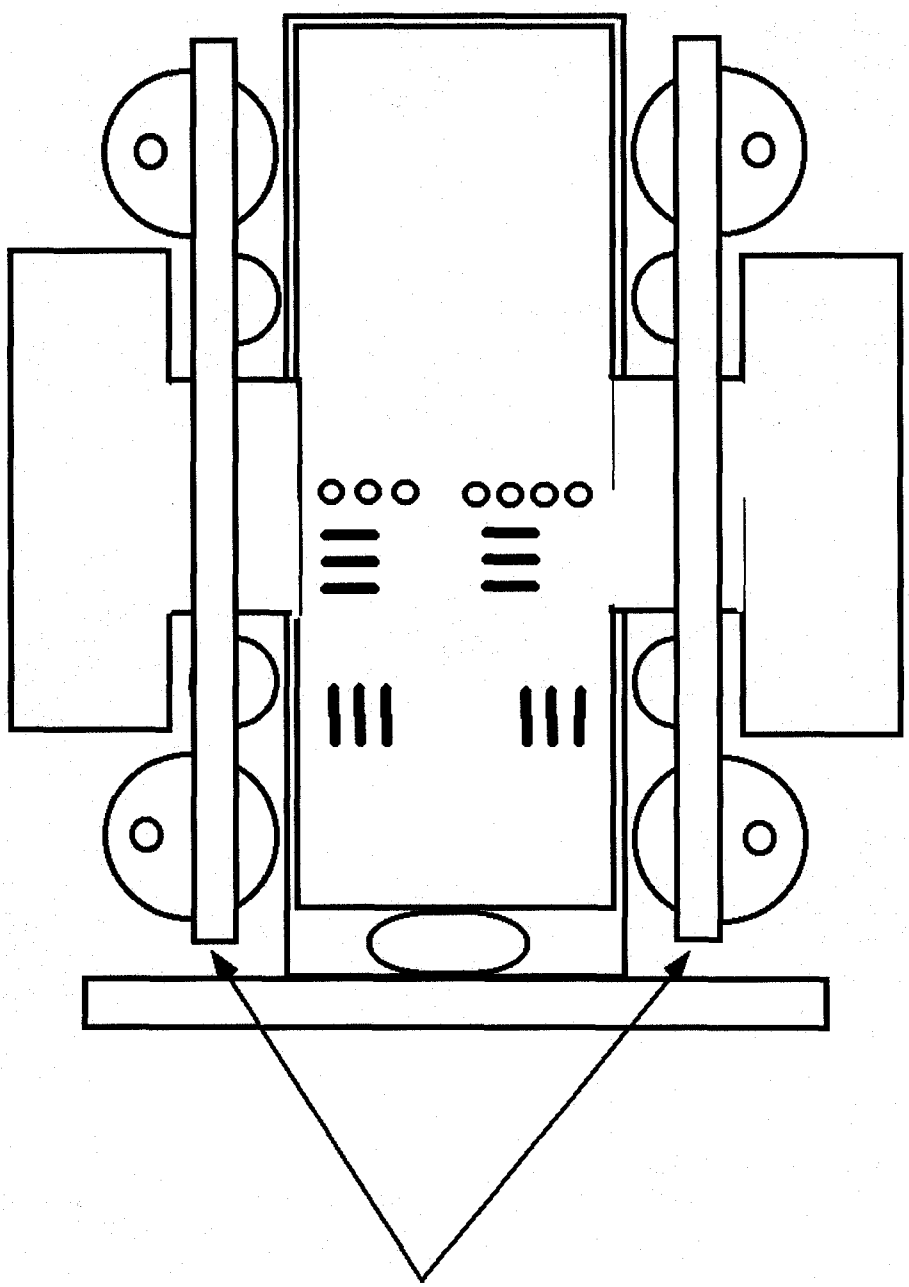
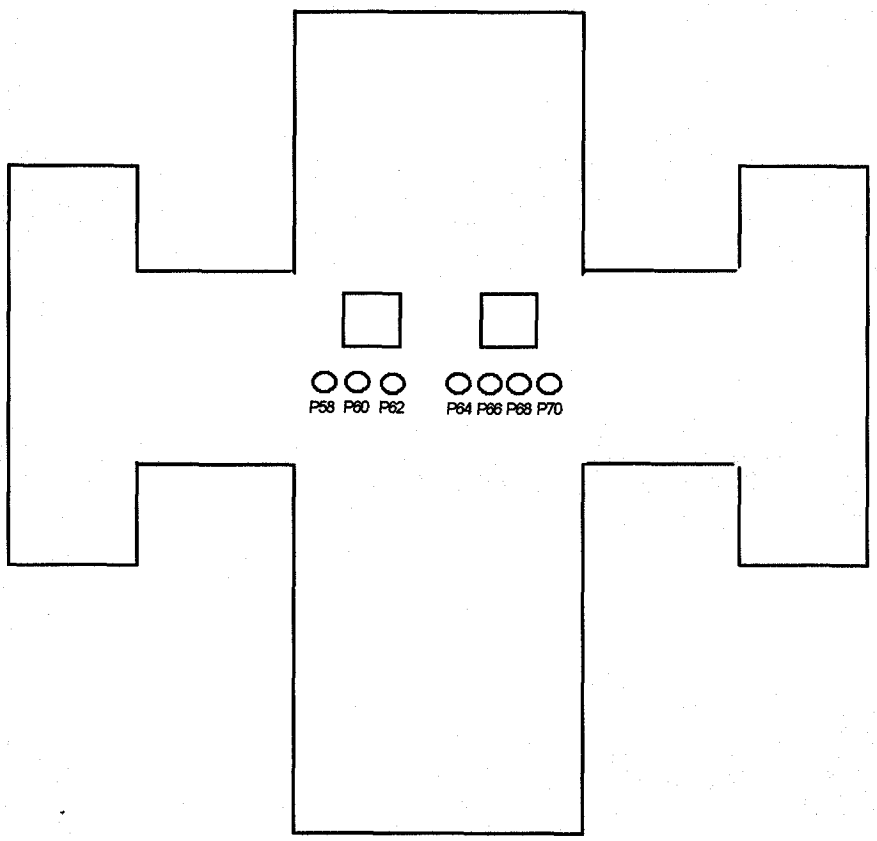


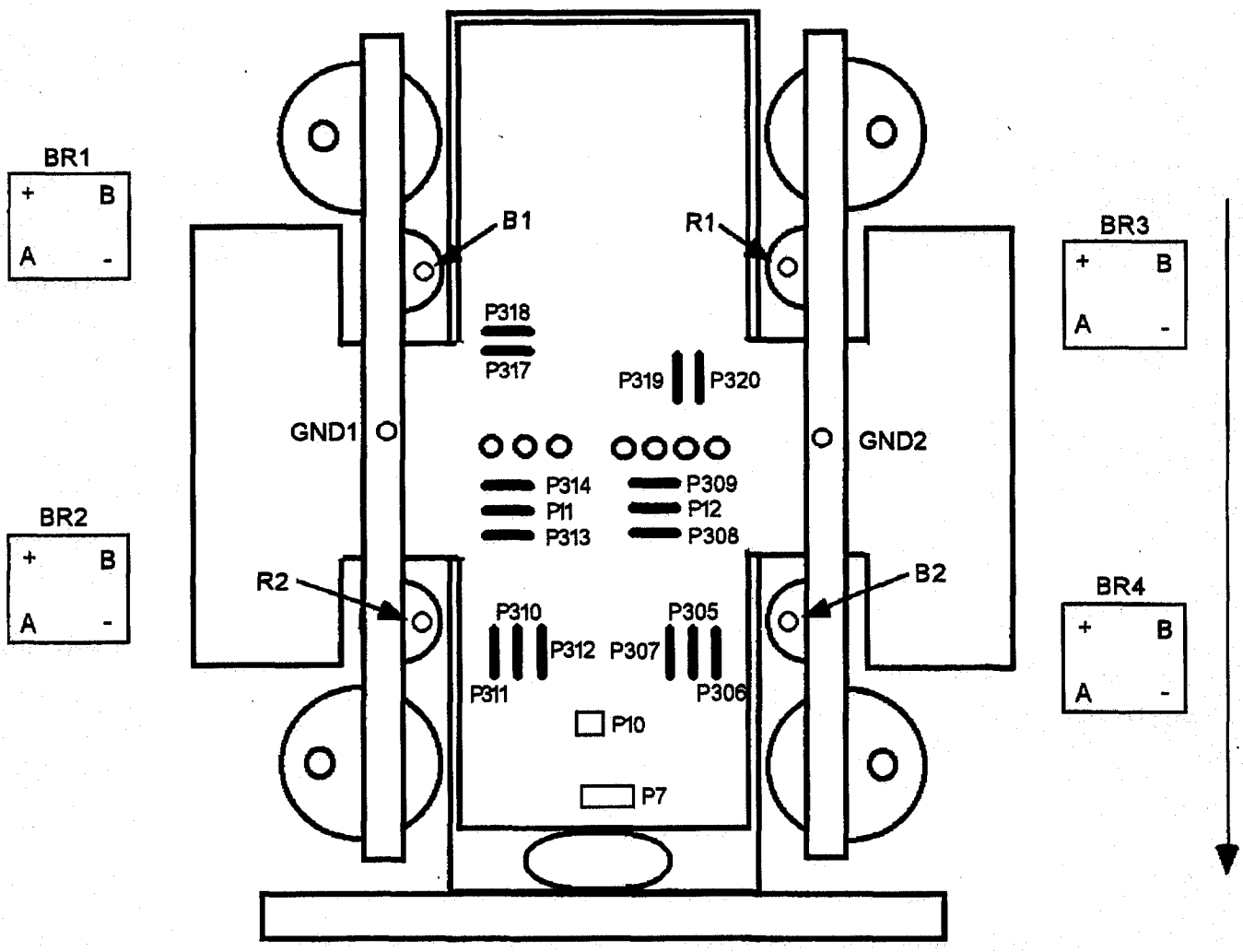
DIAGRAM 3



P58= WHITE
P60= GREEN
P62= BLACK

P64= ORANGE
P66= GRAY
P68= PURPLE
P70= BROWN

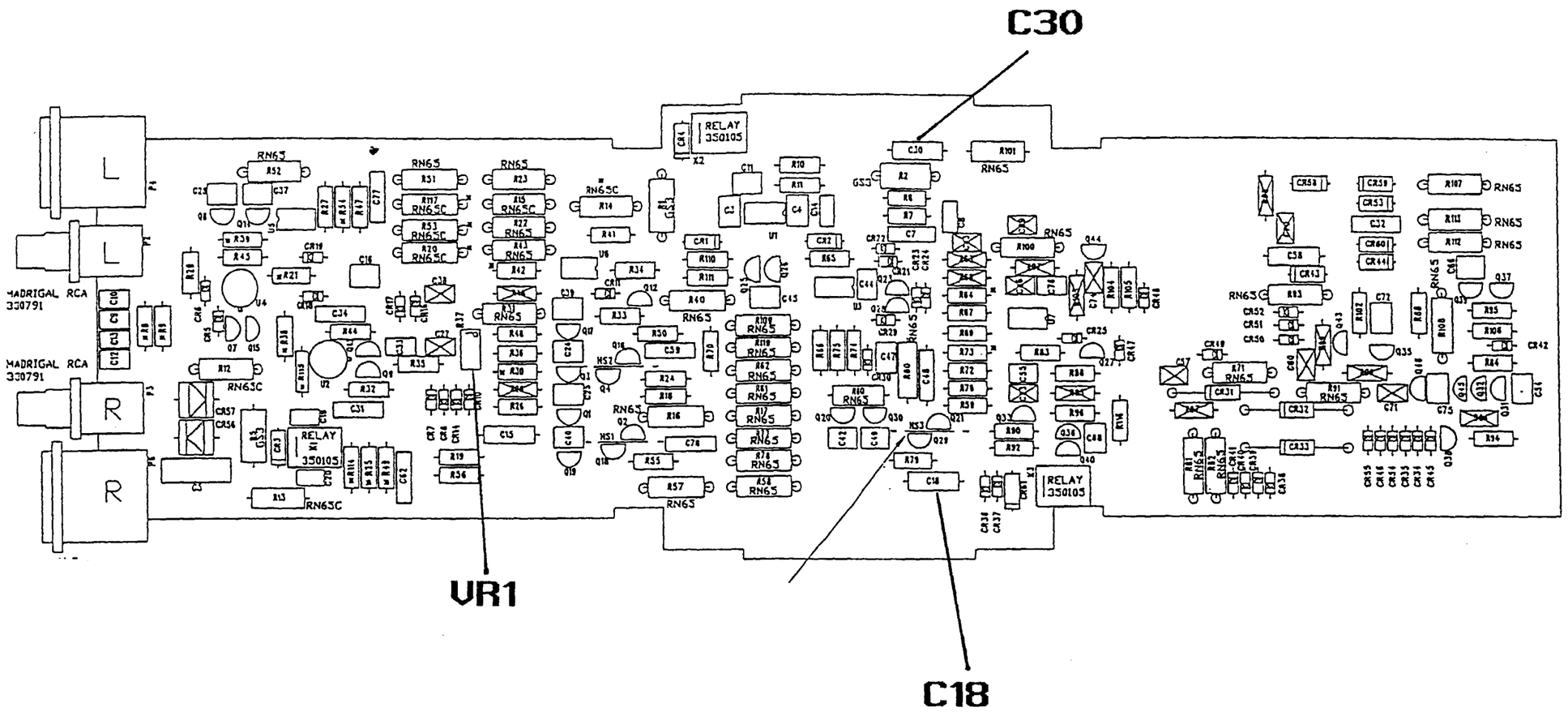
DIAGRAM 4



CONNECT FROM	TO	WIRE COLOR
B1	P312	BLACK
R1	P305	RED
R2	P310	RED
B2	P307	BLACK
P311	GND1	GREEN
P306	GND2	GREEN
P11	GND1	GREEN
P12	GND2	GREEN
P317	BR1 B	GREEN
P318	BR1 A	BLACK
P319	BR3 B	GREEN
P320	BR3 A	BLACK
P308	BR4 A	GREEN
P309	BR4 B	GREEN
P313	BR2 A	GREEN
P314	BR2 B	GREEN

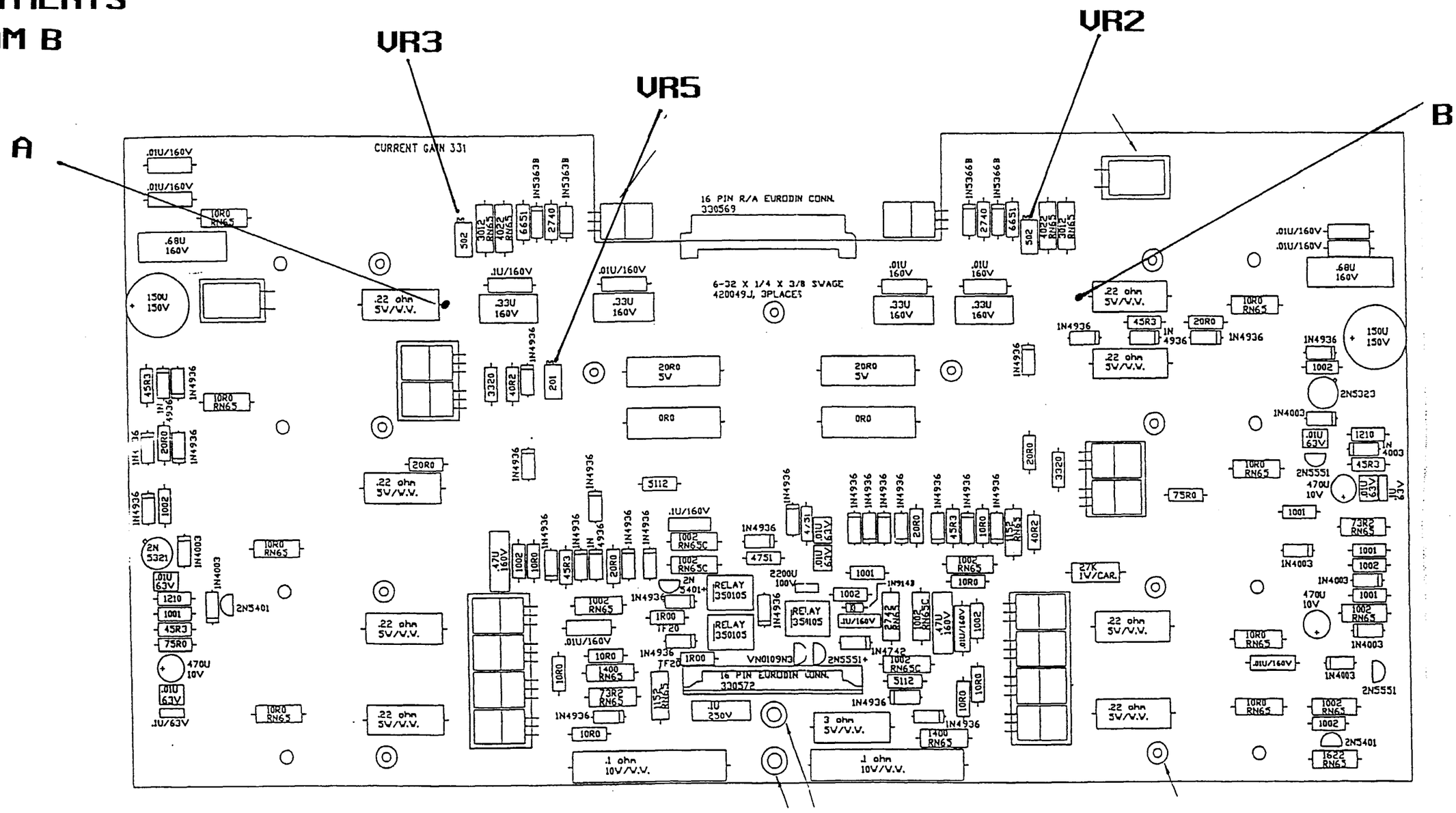
DIAGRAM 5

ADJUSTMENTS
DIAGRAM A



DC OFFSET ADJUSTMENT (after 2 hour warm up)
Using DC voltage meter, measure across the (+) and
(-) output terminals, and adjust VR1 for > 10mV.

ADJUSTMENTS
DIAGRAM B



REGULATOR ADJUSTMENT (after 2 hour warm up)
Using a DC voltage meter, measure across capacitor C30 on DIAGRAM A and adjust VR3 on DIAGRAM B for 85.2V. Then measure across capacitor C18 on DIAGRAM A and adjust VR6 on DIAGRAM B for 82.5V.

OUTPUT BIAS ADJUSTMENT (after 2 hour warm up)
Using a DC voltage meter, measure from point A to point B and adjust VR4 for 45mV.

These measurements are the same for the 333 and the 332.

Output bias 34 mV measured from point A to point B. It is adjustable via R71(on the CG board).

DCO < 10mV adjustable via R 37 on the voltage gain board.

Regulators plus and minus 115 volts. Plus regs (point D on the VG board)are adjusted via R110 on the CG board. Minus regs (point C on the VG board) are adjustable via R153 on the CG board.

Shunt current for the plus regulator can be measured from point E (on the CG board) to the plus reg (point D on the VG board). It should be adjusted via R130 (on the CG board) to 2.1 Volts.

Shunt current for the minus regulator can be measured from point F (on the CG board) to the plus reg (point C on the VG board). It should be adjusted via R173 (on the CG board) to 2.1 Volts.

These measurements should be made on a unit that has been in the ON position for at least 2 hours.