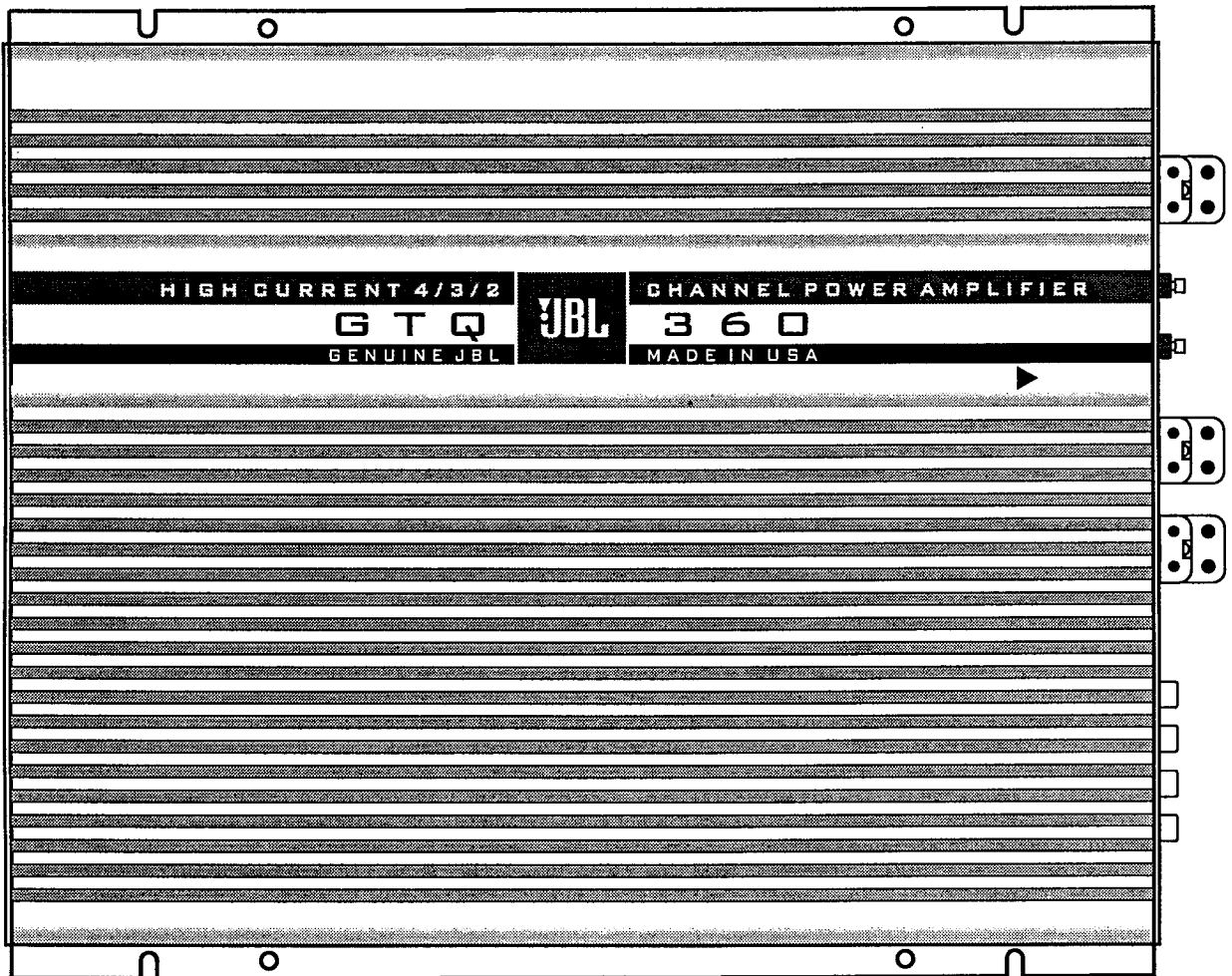


# GTQ360



4/3/2 CHANNEL  
AUTOMOTIVE  
POWER AMPLIFIER

## TECHNICAL MANUAL



2<sup>nd</sup> PROOF  
3-17-98

JBL Consumer Products Inc.  
250 Crossways Park Drive  
Woodbury, N.Y. 11797  
1-800-336-4JBL in the USA

H A Harman International Company

Part No.: 1112-GTQ360 Rev A

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**SPECIFICATIONS**

|                                       |  |
|---------------------------------------|--|
| Number of Channels . . . . .          | 4, 3, 2                                      |
| 4 Ohms Stereo . . . . .               | 60W x 4                                      |
| 2 Ohms Stereo . . . . .               | 120W x 4                                     |
| 4 Ohms Bridged . . . . .              | 180W x 2                                     |
| T.H.D. @ 4 Ohms rated power . . . . . | 0.05%  |
| Frequency Response . . . . .          | 10Hz - 40kHz (+0, -1db)                      |
| Signal to Noise Ratio . . . . .       | 100dBA                                       |
| Slew Rate . . . . .                   | 10V/us                                       |
| Channel Separation (dB) . . . . .     | >65dB  |
| Damping Factor . . . . .              | >200   |
| Crossover Slope . . . . .             | 18dB   |
| Fuse Size . . . . .                   | 30Amp 32Volt ATC Type Fuse (2 per amplifier) |
| <b>External Dimensions (Inches)</b>   |  |
| Length . . . . .                      | 17-5/8"                                      |
| Width . . . . .                       | 10"  |
| Depth. . . . .                        | 2"   |
| <b>External Dimensions (mms)</b>      |  |
| Length . . . . .                      | 447 mm                                       |
| Width . . . . .                       | 245 mm                                       |
| Depth. . . . .                        | 51 mm  |
| Weight . . . . .                      | 13.5lbs (6.1kg)                              |

JBL continually strives to improve its products. New materials, production methods and design refinements are introduced into existing models without notice as a routine expression of our design philosophy. For this reason, GTQ Series Multichannel Automotive Amplifiers may differ in some respect from their published specifications and descriptions, but will always equal or exceed the original specifications unless otherwise stated.

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## Features

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- 4, 3 or 2-Channel Operation.
- Simultaneous Stereo + Mono Operation.
- Advanced MOSFET Oversized Floating Rail Power Supply (2 in the GTQ360).
- Discrete Darlingon Output Array.
- High Current Low Impedance Design.
- Universal Interface™
- Common-Sense Turn-On (no remote wire needed when using Universal Interface).
- Full Programmable 18dB per Octave Crossover (Low-Pass, High-Pass, Thru Pass).
- Preamp Output for System Building.
- Crossovers on Preamp Outputs for the ultimate system building.
- Multiple Head unit Ready.
- Switchable Bass Boost.
- Remote out for turning on all the gear in the trunk.
- JBL's Proprietary Gold Plated Input and Output Connectors.
- Continuously Adjustable gain Controls.
- Bridgeable.
- Switchable Hi-Level Input Sensitivity.

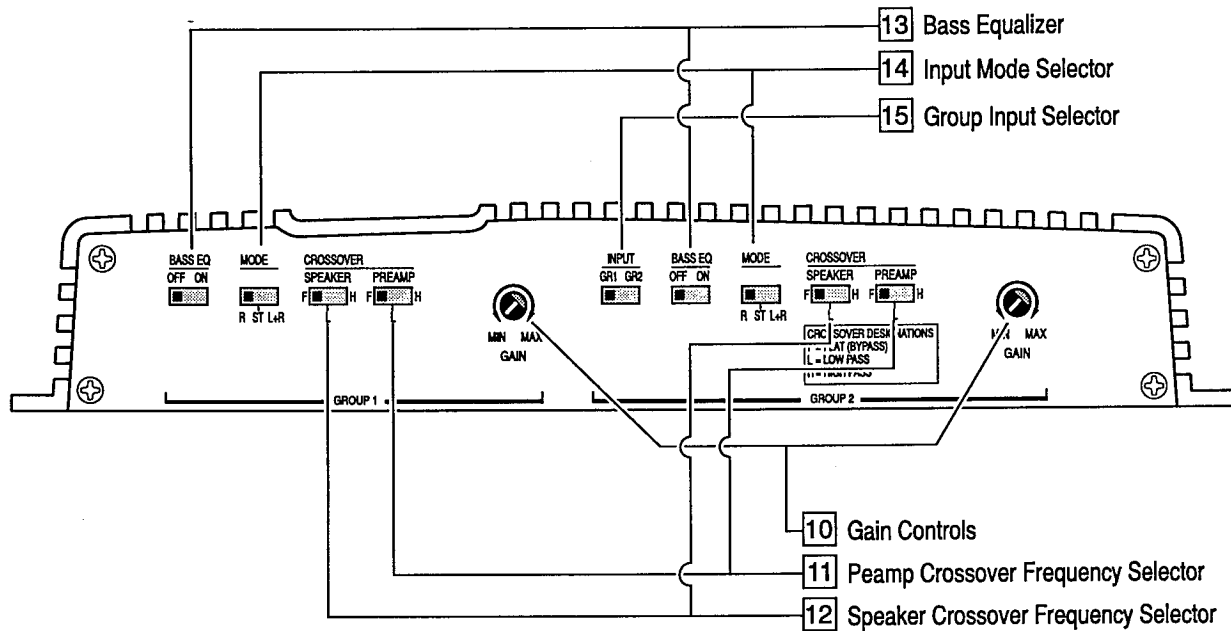
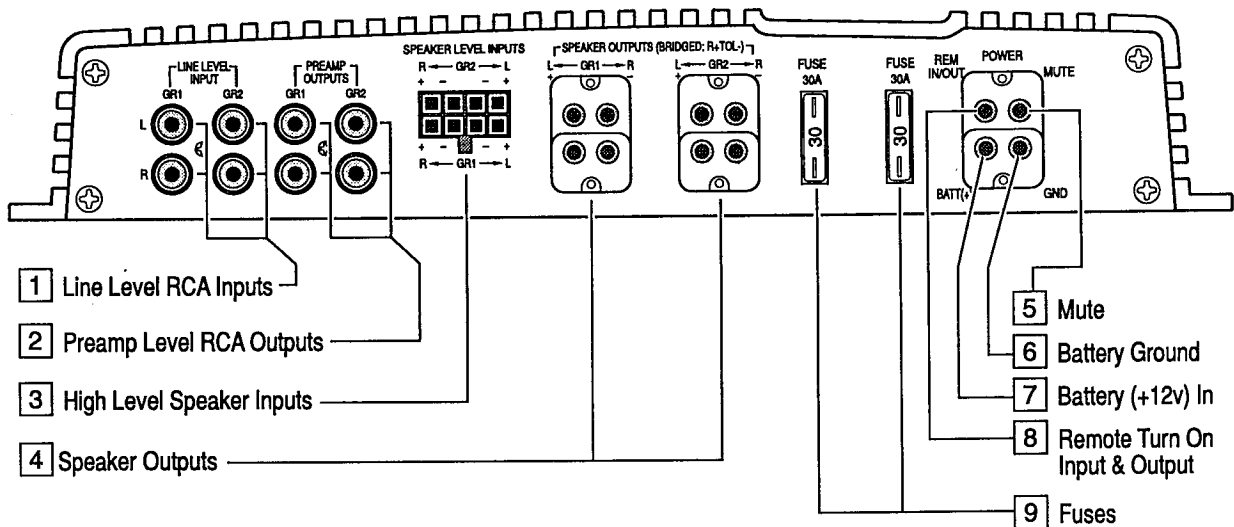
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## Test Conditions and Notes

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- Power testing is completed using 4 Ohm, 250 Watt resistors (such as the Dale RH-250 250W, 4 ohm, 1% resistor).
- The distortion meter, scopes, and any other test equipment used to test the amplifier should be ground isolated to prevent ground loop noise problems.
- In some situations, it may be necessary to connect the ground of the distortion meter to the RCA ground terminal on the amplifier in order to prevent ground noise problems and obtain the correct THD measurements.
- Signal to Noise ratio is measured versus the rated power into 4 ohms using an A weighted meter with the gain control set to the minimum position.
- Frequency response measurements can be taken at 1 watt or rated power. Reference levels should be established at 1 kHz with all crossovers in the "flat" or "off" position.
- Crossover frequency measurements should be taken at 1 watt output for the speaker outputs and 0.5 V output on the preamp outputs. The specification is taken relative to the 40 Hz output on the Low Pass filter and relative to the 1 kHz output on the high pass filter. Right and Left channel reference levels should be reestablished for each measurement.

### Controls and Connections



### Controls and Connections

**1. Preamp-Level Input Connector** - Use these connectors for line (preamp) level inputs to the amplifier.

**2. Preamp-Level Output Connector** - Use these outputs to send the signal to additional amplifiers.

**3. Speaker-Level Input Connector** - Use this connector for speaker level input signals. A wire harness is supplied for use with this connector. See "Typical System Configuration" section (page 6) for wiring instructions. This input also includes JBL's Common Sense input circuitry which turns the amplifier on as soon as the high powered head unit connected to this input is turned on.

**4. Speaker Output Connector** - Connect speaker wiring to these connectors. See wiring instructions on Page 6 for more information.

**5. Mute** - Accepts Standard Noise Gate Input (+5 to +12 volts) to silence the Amp during no music conditions.

**6., 7., 8., Power Connector** - Connection for power wires. See wiring instructions on Page 6 for more information.

**9. Fuses** - Two 30 Amp ATC type fuses.

**10. Gain Controls** - Use these controls to adjust the gain of the amplifier channel group.

**11. Preamp Crossover Switches** - These switches control the built-in crossovers that are directed to the preamp-output connectors. Set the switch to F (flat) for

full band operation for that group. Set the switch to L (low) to activate the low-pass filter on the preamp output group for subwoofer use, or to use in conjunction with a high-pass filtered input signal to create a bandpass crossover for a midrange or midbass driver. Set the switch to H (high) to activate the high-pass filter for use with external amplifiers driving satellite speakers or tweeters from the preamp output group.

**12. Speaker Crossover Switches** - These switches control the built-in crossovers that are connected to each group's power amplifier circuitry. Set the switch to F (flat) for full band operation on a group. Set this switch to L (low) to activate the low pass filter on the selected amplifier for subwoofer use in conjunction with a high-pass filtered input signal to create a bandpass crossover (for a midrange or midbass driver). Set the switch to H (high) to activate the high-pass filter for use with satellite speakers or tweeters on an amplifier group.

**13. Bass EQ Switch** - These switches activate a built-in Bass Boost circuit used to increase low-bass output on the selected speaker output group. These switches do not effect the preamp outputs.

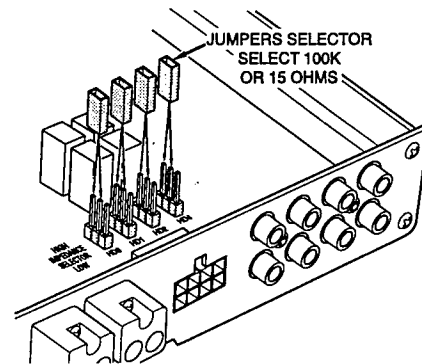
**14. Mode Switches** - These switches are used to set the input mode for both preamp and speaker-level inputs (to drive speaker output groups). Set the switch to Stereo for normal operation on the group using individual left and right inputs. Set this switch to L to drive both the left and right outputs with only a single input on the left jack. Set the switch to "L+R" to sum the left and right inputs for a mono output on the group. These switches do not affect the preamp outputs. **Note:** L+R and L settings bypass the imaging enhancer.

**15. Group 2 Input Switch** - This switch is used to select which inputs will drive Group 2 of the amplifier. Put the switch in position "GR 1" to allow Group 2 to be driven by the Group 1 inputs. Put the switch in the "GR 2" position to drive Group 2 with the Group 2 inputs.

**Power Indicator LED (on amp chassis top)** - LED steadily illuminates for normal operation. LED blinks when protection circuitry is engaged, and during power-up.

### Speaker-Level Input Impedance Adjustments

The speaker level inputs of the GTQ360 come factory set with 100k ohm input impedance. This will provide the lowest distortion operation from the speaker outputs of most modern head units by reducing the power the amplifier in the head unit must deliver to practically nothing. The resulting signal will practically be as free from noise and distortion as a preamp-level connection. On some older, or lower-priced head units, this load will not facilitate proper fader operation. To allow for this, we have provided the ability to change the input impedance of the speaker-level inputs to 15 ohms.



This is accomplished by moving the jumpers shown on the above diagram. This input is also capable of directly accepting signals, when in the 100k ohm setting, from many Balanced Line Drivers such as those sometimes used in competition vehicles. For best results, a Balanced Line Driver capable of at least 4V nominal output should be used.

If the head unit has 4 channels of built-in amplification and/or an electronic fader control, you should leave the jumpers in the factory set position.

If the head unit has 2 channels of amplification, With a speaker-level fader, the jumpers should be set to the 15-ohm position. This will always be a rotary-type control, not one controlled by electronic pushbuttons.

If you are not certain of the type of fader control your unit has, measure the resistance across one set of speaker outputs with an ohmmeter (with the head-unit off). Adjust the fader control through its entire adjustment range. If there is a change in the resistance as the control is adjusted, set the jumpers to the 15ohm position.

### Crossover Frequency Adjustments

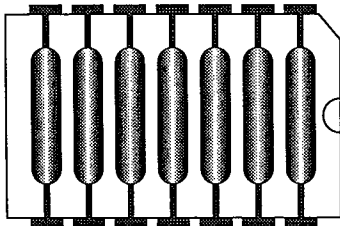
The GTQ360 amplifiers include built-in frequency selectable crossovers. One crossover is connected in series with the amplifier circuitry and the other crossover is connected to the preamp level output jacks. These crossovers can be set in either the F (full bandwidth operation), L (subwoofer operation), or H (satellite operation).

The crossover frequencies are set by chips inside the amplifier. These chips are simply a set of resistors, connected across the pins and molded into a single package. The crossover frequencies may be changed to any value desired by changing the resistor network. JBL has chips available in the popular values listed in the table below. If none of these suit your system, you may purchase compatible resistor networks from a local electronics store, or you may build your own custom values from discrete resistors mounted on a 14-pin DIP Header using the instructions which follow.

| Frequency | Resistor Value | JBL Part Number |
|-----------|----------------|-----------------|
| 50Hz      | 47K Ω          | 1-23-750        |
| 80Hz      | 33KΩ           | 1-23-817        |
| 120Hz     | 22K Ω          | 1-23-820        |
| 200Hz     | 12K Ω          | 1-23-821        |
| 250Hz     | 10K Ω          | 1-23-810        |
| 375Hz     | 6.8K Ω         | 1-23-822        |
| 500Hz     | 4.7K Ω         | 1-23-815        |
| 650Hz     | 3.9K Ω         | 1-23-823        |
| 2.5Hz     | 1K Ω           | 1-23-824        |
| 5kHz      | 470 Ω          | 1-23-816        |

### Custom Chip Construction

Regardless of whether you build or buy it, the necessary resistor network has the following configuration:



- Each resistor in the package has the same value.
- If you know the crossover frequency you want, you can calculate the resistor value necessary by solving the following equation:

$$\text{Resistor Value in Ohms} = \frac{2,500,000}{\text{Frequency in Hz}}$$

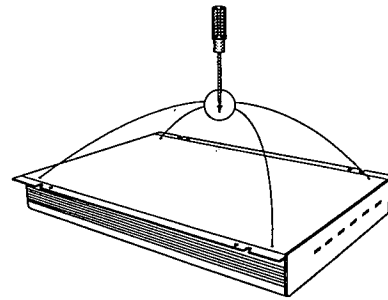
Use the following equation if you have a resistor pack of a known value, and want to find its crossover frequency:

To build chips from discrete resistors, solder the resistors to a standard 14-pin "DIP Header" according to the diagram. If a DIP Header is not available, you may bend the leads of 1/4-watt resistors 90 degrees, trim them to 1/8"-length, and insert them directly into the chip sockets.

To change the crossover frequency change the resistor network as follows:

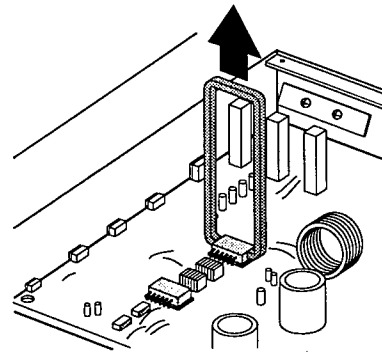
$$\text{Frequency in Hz} = \frac{2,500,000}{\text{Resistor Value in Ohms}}$$

1. Remove the screws from the bottom panel as shown in the following illustration.



2. Select which resistor module, high pass or low pass, that you wish to change.

3. A chip puller, which can be obtained from any electronics store, is recommended to remove the resistor chip. Pull the resistor chip from the socket as shown in the following figure.



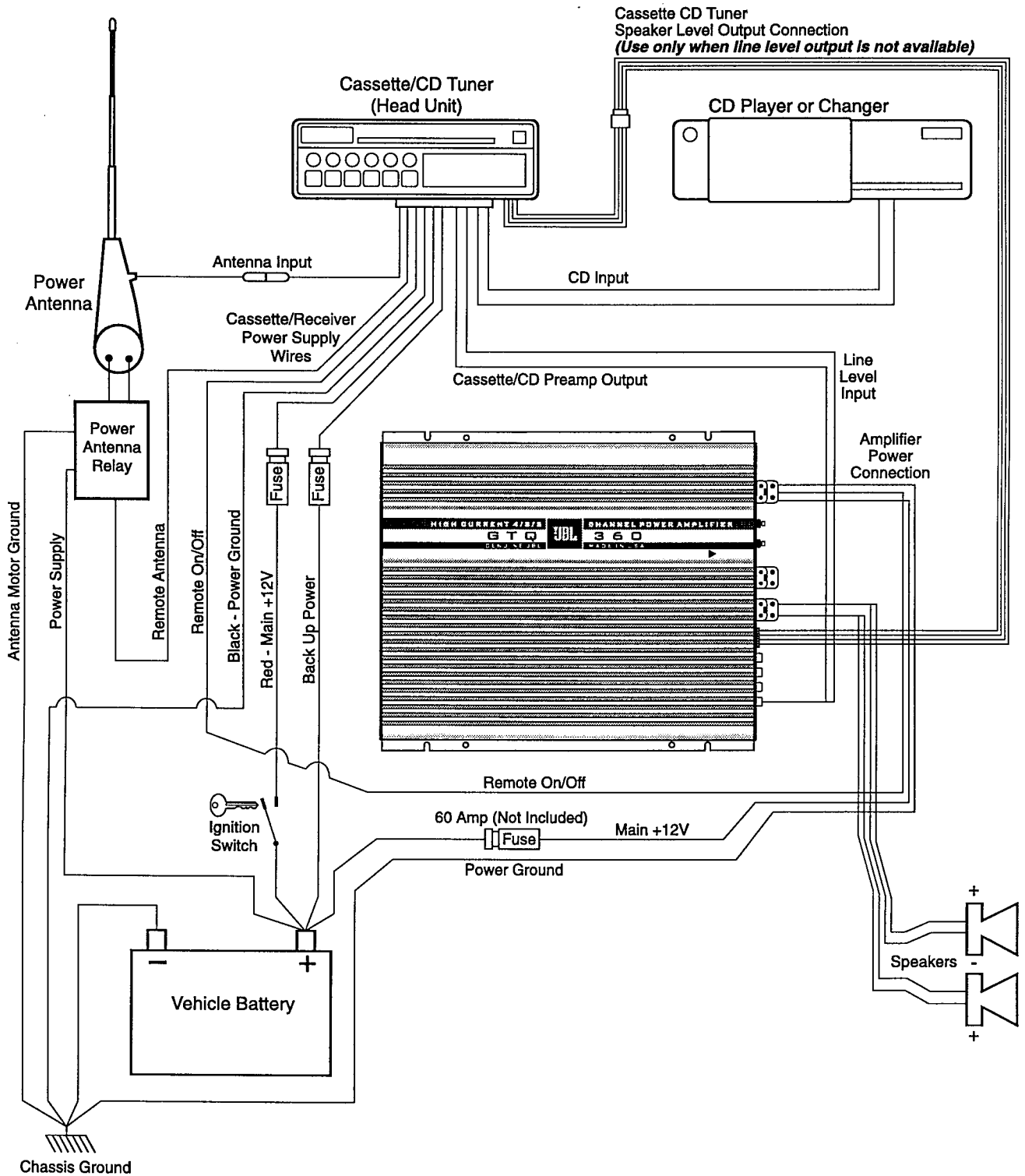
4. Place the new module in the socket making sure all pins are lined up with the socket holes. Press the module firmly into the socket.

5. Replace the bottom lid.

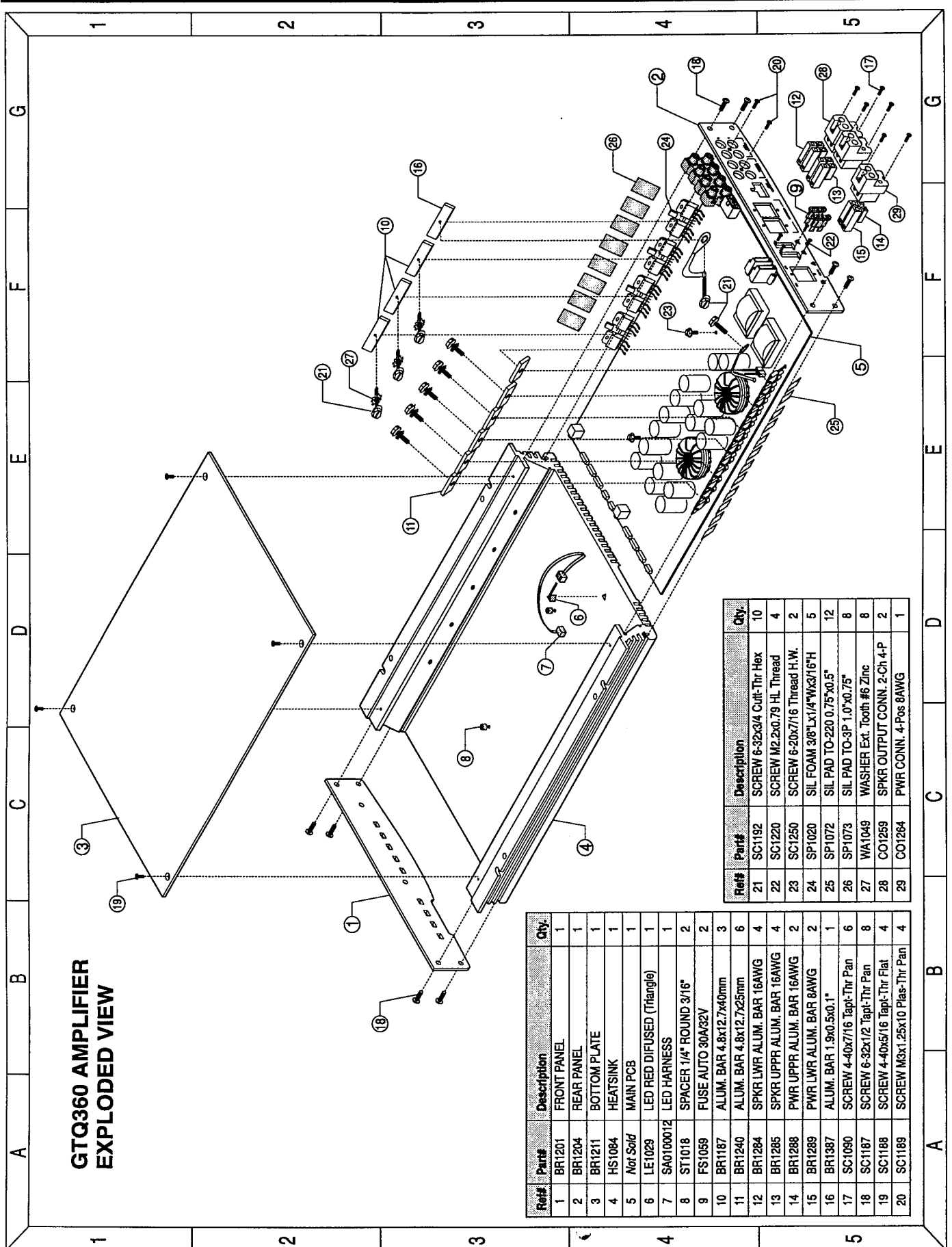
### Mounting Positions

Place the amplifier in the installation location. Use a pen or pencil to mark the mounting screw hole locations. Set the amplifier aside and drill the holes for the mounting screws. (Note: If the surface you are mounting the amp to is covered with carpeting or upholstery, cut a small "x" in the material at each screw hole location before drilling the holes. This will help prevent tearing or stretching of the material and carpet fibers from being pulled out.) Set the amplifier in position and align the holes on its side with the holes previously drilled. Put washers on the sheet metal screws provided and drive them into the mounting panel. Tighten the screws evenly until the unit is solidly mounted.

# Typical System Configuration



GTQ360 Mechanical Exploded View



GTQ360 AMPLIFIER  
EXPLODED VIEW

| Part# | Description                           | Qty. |
|-------|---------------------------------------|------|
| 1     | FRONT PANEL                           | 1    |
| 2     | REAR PANEL                            | 1    |
| 3     | BOTTOM PLATE                          | 1    |
| 4     | HEATSINK                              | 1    |
| 5     | Not Sold                              | 1    |
| 6     | LED RED DIFUSED (Triangle)            | 1    |
| 7     | SAO100012                             | 1    |
| 8     | SPACER 1/4" ROUND 3/16"               | 2    |
| 9     | FUSE AUTO 30A/32V                     | 2    |
| 10    | ALUM. BAR 4.8x12.7x40mm               | 3    |
| 11    | ALUM. BAR 4.8x12.7x25mm               | 6    |
| 12    | SPKR LWR ALUM. BAR 16AWG              | 4    |
| 13    | SPKR UPRR ALUM. BAR 16AWG             | 4    |
| 14    | PWR UPRR ALUM. BAR 16AWG              | 2    |
| 15    | PWR LWR ALUM. BAR 8AWG                | 2    |
| 16    | BR1367 ALUM. BAR 1.9x0.5x0.1"         | 1    |
| 17    | SC1090 SCREW 4-40x7/16 Tap-T Thr Pan  | 6    |
| 18    | SC1187 SCREW 6-32x1/2 Tap-T Thr Pan   | 8    |
| 19    | SC1188 SCREW 4-40x5/16 Tap-T Thr Flat | 4    |
| 20    | SC1189 SCREW M6x1.25x10 Plase-Thr Pan | 4    |
| 21    | SC1192 SCREW 6-32x3/4 Out- Thr Hex    | 10   |
| 22    | SC1220 SCREW M2.2x0.79 HL Thread      | 4    |
| 23    | SC1250 SCREW 6-20x7/16 Thread H.W.    | 2    |
| 24    | SP1020 SIL FOAM 3/8"Lx1/4"Wx3/16"H    | 5    |
| 25    | SP1072 SIL PAD TO-220 0.75"x0.5"      | 12   |
| 26    | SP1073 SIL PAD TO-3P 1.0"x0.75"       | 8    |
| 27    | WA1049 WASHER Ext. Tooth #6 Zinc      | 8    |
| 28    | CO1259 SPKR OUTPUT CONN. 2-Ch 4-P     | 2    |
| 29    | CO1284 PWR CONN. 4-Pos 8AWG           | 1    |



## GTQ360 Parts List

| REF. NO.  | PART NO. | DESCRIPTION                      | QTY | REF. NO.  | PART NO. | DESCRIPTION                       | QTY |
|---|----------|----------------------------------|-----|---|----------|-----------------------------------|-----|
| <b>Main PCB, Preamp, Crossover, Power Supply and Power Amplifier</b>  |          |                                  |     | C11, 11G, 15, 15G, 24, 24G, 28, 28G                 | CP1177   | POLY FILM 0.22 $\mu$ F 5% 63V     | 8   |
|   |          |                                  |     | C12, 12G, 25, 25G                                   | CP1573   | POLY FILM 0.012 $\mu$ F 5% 63V    | 4   |
|   |          |                                  |     | C14, 14G, 27, 27G                                   | CP1178   | POLY FILM 22nF 5% 63V             | 4   |
|   |          |                                  |     | C19, 19A  | CP1552   | SMD 0.1 $\mu$ F 20% 100V Z5U      | 2   |
|   |          |                                  |     | C29, 29G, 32, 32B                                   | CP1445   | SMD 47nF 10% 100V x7r             | 4   |
|   |          |                                  |     | C76, 76G, 99, 99G                                   | CP1542   | SMD 10pF 5% 50V NPO               | 4   |
|   |          |                                  |     | C97, 97G, 98, 98G                                   | CP1496   | SMD 100pF 10% 50V x7r             | 4   |
|   |          |                                  |     | C101, 101A  | CP1126   | POLY FILM 1 $\mu$ F 19% 50V       | 2   |
|   |          |                                  |     | C102, 102A, 103, 103A                               | CP1355   | ALUM. ELECT. 2200 $\mu$ F 20% 25  | 4   |
|   |          |                                  |     | C108-119  | CP1624   | ALUM. ELECT. 2200 $\mu$ F 20% 35V | 12  |
|   |          |                                  |     | C137  | CP1411   | ALUM. ELECT. 100 $\mu$ F 20% 16V  | 1   |
| <b>Transistors</b>  |          |                                  |     | <b>Diodes</b>                                       |          |                                   |     |
| Q1, 13, 14  | TR1131   | SMD XSTR NPN DTC114TK            | 3   | D1, 1A, 1B, 1C, 1D, 2, 2A, 2B, 2C, 2D, 3, 4B, 5     | DI1132   | SMD SWCH 1N4148                   | 13  |
| Q1A, 1B, 1C, 1D, 120  | TR1183   | NPN PWR XSTR TIP31C T            | 5   | D7, 7A, 8, 8A                                       | DI1005   | 1N5401 3A/200V                    | 4   |
| Q2  | TR1135   | PNP XSTR RXT2907A SOT-89         | 1   | D9, 10  | DI1053   | RECT. DUAL FEP16BT 16A            | 2   |
| Q2A, 2B, 2C, 2D   | TR1255   | NPN PWR XSTR TIP35C TO-2         | 4   | D11, 12   | DI1054   | RECT. DUAL FEN16BT 16A            | 2   |
| Q3, 5, 112, 113, 114  | TR1108   | SMD XSTR NPN 2SC2412K CP         | 5   | D13, 14, 15, 16                                     | DI1010   | UF44002 RECT. 1A/100V A PI        | 4   |
| Q3A, 3B, 3C, 3D, 119  | TR1184   | PNP PWR XSTR TIP32C T            | 5   | Q115  | TY1000   | SCR T092 MCR22-2 T/R              | 1   |
| Q4, 6, 116  | TR1125   | SMD XSTR PNP 2SA1037K CP         | 3   | Z1, 2   | DI1150   | SMD ZENER 15V 5% CP PKG           | 2   |
| Q4A, 4B 4C, 4D  | TR1256   | PNP PWR XSTR TIP36C TO-2         | 4   | Z3  | DI1167   | SMD ZENER 16V 5% CP PKG           | 1   |
| Q5A, 5B, 5C, 5D, 109, 110   | TR1063   | NPN XSTR MPS2222A TO-92 T        | 6   | <b>Integrated Circuits</b>                          |          |                                   |     |
| Q6A, 6B, 6C, 6D   | TR1209   | SMD XSTR 2SC3906K SOT23/SM       | 4   | IC2   | IC1162   | TL074 QUAD OP-AMP, SMD            | 1   |
| Q100-107  | TR1157   | FET PWR IRFZ44                   | 8   | IC2A, 2G  | IC1175   | NE5532 DUAL L                     | 2   |
| Q111, 108   | TR1010   | PNP XSTR MPS2907A TO-92 T        | 2   | IC3, 3G, 4, 4G, 5, 5B, 8, 8G, 9, 9G                 | IC1041   | TL072 DUAL OP-AMP                 | 10  |
| <b>Capacitors</b>   |          |                                  |     | <b>Resistors</b>                                    |          |                                   |     |
| C1, 1A, 1B, 1C, 1D, 2A, 2B, 2C, 2D, 3E, 3G, 4E, 4G, 9, 16, 16G, 17, 17G, 18, 19, 21, 22, 30, 30G, 31, 31G, 37, 38, 39, 40, 92, 121, 122, 130A, 131A | CP1426   | SMD 0.1 $\mu$ F 20% 50V Z5U      | 35  | J1, 1A, 1G, 2, 2E, 2G, 3                            | RS1779   | SMD ZERO $\Omega$ JUMPER 12 PI    | 7   |
| C1E, 1G, 3, 4, 5, 5G, 6, 19E, 19G, 20, 20G, 33, 34, 35, 36  | CP1352   | ALUM. ELECT. 22 $\mu$ F 20% 25V  | 15  | R1A, 1B, 1C, 1D, 5A, 5B, 5C, 5D                     | RS1916   | C/F 5.1 $\Omega$ 5% 1/4W T/ P     | 8   |
| C2  | CP1427   | SMD 10nF 20% 50V Z5U             | 1   | R1E, 1G, 3, 4, 9, 10, 19, 19G, 24, 43, 98, 126, 129 | RS1700   | SMD 1K $\Omega$ 5% 1/8W 12 P      | 13  |
| C3A, 3B, 3C, 3D   | CP1539   | POLY FILM 0.047 $\mu$ P 5% 63V   | 4   |   |          |                                   |     |
| C4A, 4B, 5C, 5D, 47, 104, 105   | CP1415   | ALUM. ELECT. 2.2 $\mu$ F 20% 50V |     |   |          |                                   |     |
| C7, 8   | CP1547   | ALUM. ELECT. 100 $\mu$ F 20% 35V | 2   |   |          |                                   |     |
| C10   | CP1562   | ALUM. ELECT. 330 $\mu$ F 20% 16V | 1   |   |          |                                   |     |
| C10A, 10G, 13, 13G, 23, 23G, 26, 26G  | CP1535   | POLY FILM 0.082 $\mu$ F 5% 63V   | 8   |   |          |                                   |     |

| REF. NO.   | PART NO. | DESCRIPTION             | QTY | REF. NO.                                | PART NO.  | DESCRIPTION                            | QTY  |
|--|----------|-------------------------|-----|---|-----------|--|------|
| R2   | RS1539   | C/F 470Ω 5% 1/2W T/ P   | 1   | R56, 56G, 57, 57G, 147, 147G, 148, 148G | RS1968    | SMD 2.2MΩ 5% 1/8W 12 P                 | 8    |
| R2A, 2B, 2C, 2D  | RS1831   | SMD 7.5KΩ 5% 1/8W T/ P  | 4   | R116-122, 124                           | RS1717    | SMD 100Ω 5% 1/8W 12 PI                 | 8    |
| R3A, 3B, 3C, 3D  | RS1877   | SMD 4.3KΩ 5% 1/8W 12 P  | 4   | R123, 125                               | RS1722    | SMD 470Ω 5% 1/8W 12 P                  | 2    |
| R4A, 4B, 4C, 4D  | RS1902   | C/F 33Ω 5% 1/4W T/R P   | 4   | R127, 128                               | RS1730    | SMD 270KΩ 5% 1/8W 12P                  | 2    |
| R4E, 4G, 21, 40G, 21G, 11, 11G, 28, 28G, 28B, 28C, 28D, 28E, 36, 36G, 40                   | RS1704   | SMD 22KΩ 5% 1/8W 120 PI | 16  | VR1, VR1G                               | RS1227    | POT. 100KΩ DUAL CTR. DET               | 2    |
| R5, 5G, 18, 22, 22G, 26  | RS1703   | SMD 2.2KΩ 5% 1/8W 12 PI | 7   | <b>Miscellaneous</b>                    |           |  |      |
| R6, 8, 8A, 8B, 8C, 8D, 17, 17G, 20, 23, 23A, 23B, 23C, 23D, 32, 32E, 32G, 42, 44, 130, 138 | RS1701   | SMD 10KΩ 5% 1/8W 120 PI | 21  | BB1                                     | BR1265    | BUS BAR 5.33"                          | 1    |
| R6A, 6B, 6C, 6D, 7A, 7B, 7C, 7D  | RS1868   | W/W 0.1Ω 5% 5W RAD      | 8   | CONN1                                   | CO1270    | HDR. RIGHT ANGLE 8-POS 2-RR            | 1    |
| R7, 13, 41, 112, 1   | RS1702   | SMD 100KΩ 5% 1/8W 12 PI | 5   | F1, 2                                   | FS1059    | FUSE AUTO 30A/32V                      | 2    |
| R9A, 9B, 9C, 9D, 33, 115   | RS1705   | SMD 4.7KΩ 5% 1/8W 12 PI | 6   | F1, 2                                   | FH1001    | FUSE HOLDER RIGHT ANGLE                | 2    |
| R10A, 10B, 10C, 10D  | RS1878   | SMD 10W 5% 1/8W 120P    | 4   | FB1-9, 13, 17, 18                       | CC1028    | FERRITE BEAD                           | 14   |
| R12, 12G, 29, 29G  | RS1726   | SMD 270KΩ 5% 1/8W 120 P | 4   | L1, 6                                   | SA0100021 | INPUT INDUCTOR 300uH                   | 2    |
| R13A, 13B, 13C, 13D  | RS1869   | W/W 15Ω 5% 5W RAD       | 4   | L1A, 1B, 1C, 1D                         | SA0000012 | AIR CORE INDUCTOR 0.38uH               | 4    |
| R14, 14G, 31, 31G  | RS1713   | SMD 56KΩ 5% 1/8W 120 P  | 4   | LED1                                    | CO1304    | HEADER STRAIGHT 2-POS 0.1"             | 1    |
| R14A, 14B, 14C, 14D  | RS1731   | SMD 330Ω 5% 1/8W 12P    | 4   | RCA1, 2                                 | CO1271    | RCA JACK QUAD, GOLD                    | 2    |
| R15, 15G, 16, 16G  | RS1830   | SMD 200Ω 5% 1/8W 12 P   | 4   | RN1, 1G, 2, 2G                          | CO1277    | CONNECTOR IC SOCKET 14 -PIN            | 4    |
| R25  | RS1891   | SMD 220KΩ 5% 1/8W 12 P  | 1   | RN1, 1G, 2, 2G                          | LB1231    | LABEL CROSSOVER NETWORK 80             | 4    |
| R32A, 32B, 32C, 32D, 33A, 33B, 33C, 33D, 34A, 34B, 34C, 34D, 35A, 35B, 35C, 35D            | RS1872   | SMD 51KΩ 5% 1/8W 120 P  | 16  | SW3, 3B, 1, 1G, 2, 2G                   | SW1013    | SWITCH 2P3T HORIZONTAL                 | 6    |
| R34, 34G, 35, 35G, 37, 37B, 38, 38G, 39, 39B   | RS1712   | SMD 43KΩ 5% 1/8W 120 P  | 10  | SW4, 4B, 5                              | SW1011    | SWITCH 2P2T HORIZONTAL                 | 3    |
|  |          |                         |     | T1                                      | SA0110421 | POWER TRANSFORMER GTQ360               | 1    |
|  |          |                         |     | T1A                                     | SA0110431 | POWER TRANSFORMER GTQ360               | 1    |
|  |          |                         |     | TH1                                     | SA0114321 | THERMISTOR ASSEMBLY                    | 1    |
|  |          |                         |     |   | IM1138    | SLEEVING SHRINK PVC 3/32               | 1.5' |
|  |          |                         |     |   | TH1006    | NTC THERMISTOR 10KΩ @25                | 1    |
|  |          |                         |     |   | WI1557    | WIRE 26AW 7x34 UL1007 BLACK            | 27'  |
|  |          |                         |     |   | MS1004    | SILICONE GREASE #340 DOW (NOT STOCKED) |      |

**GT DRIVER (4 Modules)**

AMOUNTS LISTED ARE FOR EACH MODULE

**Capacitors**

|                  |        |                               |   |
|------------------|--------|-------------------------------|---|
| C1, 4, 5, 14     | CP1496 | SMD 100pF 10% 50V X7R P       | 4 |
| C2, 10           | CP1557 | SMD 56pF 5% 50V NPO 12 P      | 2 |
| C3, 13           | CP1475 | SMD 33pF 5% 50V NPO 12 P      | 2 |
| C6               | CP1411 | ALUM. ELECT. 100μF 20% 16V PI | 1 |
| C7, 8, 9, 11, 12 | CP1426 | SMD 0.1μF 20% 50V Z5U PI      | 5 |

| REF. NO.                   | PART NO. | DESCRIPTION                       | QTY | REF. NO.                   | PART NO. | DESCRIPTION  | QTY |
|----------------------------|----------|-----------------------------------|-----|----------------------------|----------|--|-----|
| <b>Diodes</b>              |          |                                   |     | <b>Integrated Circuits</b> |          |  |     |
| D1                         | DI1132   | SMD SWCH 1N4148 T PI              | 1   | IC1                        | IC1002   | PWN CONT. MODULE 16 PIN DIP                            | 1   |
| <b>Integrated Circuits</b> |          |                                   |     | <b>Resistors</b>           |          |  |     |
| IC1                        | IC1040   | HIGH PERF. NJM318<br>OP AMP DIP-8 | 1   | R1                         | RS1878   | RES. F/CHIP 10.00 $\Omega$ 5%<br>1/8W T/R 1206         | 1   |
| <b>Resistors</b>           |          |                                   |     | R2                         | RS1700   | RES. F/CHIP 1.00 K $\Omega$ 5%<br>1/8W T/R 1206 PKG.   | 1   |
| J1                         | RS1779   | SMD ZERO $\Omega$ JUMPER 120 PI   | 1   | R3                         | RS1733   | RES. F/CHIP 510.00 $\Omega$ 5%<br>1/8W T/R 1206 PKG.   | 1   |
| R1                         | RS1806   | SMD 18K $\Omega$ 5% 1/8W 120 PI   | 1   | R4                         | RS1724   | RES. F/CHIP 6.80 K $\Omega$ 5%<br>1/8W T/R 1206 PKG.   | 1   |
| R2, 6, 10,<br>12           | RS1701   | SMD 10K $\Omega$ 5% 1/8W 120 P    | 4   | R5                         | RS1702   | RES. F/CHIP 100.00 K $\Omega$ 5%<br>1/8W T/R 1206 PKG. | 1   |
| R3, 11, 21,<br>22          | RS1700   | SMD 1K $\Omega$ 5% 1/8W 12 P      | 4   | R6                         | RS170    | RES. F/CHIP 4.70 K $\Omega$ 5%<br>1/8W T/R 1206 PKG.   | 1   |
| R4, 15                     | RS1702   | SMD 100K $\Omega$ 5% 1/8W 120 PI  | 2   | R7                         | RS1783   | RES. F/CHIP 12.00 K $\Omega$ 5%<br>1/8W 1206 T/R       | 1   |
| R5, 9                      | RS1829   | SMD 160 $\Omega$ 5% 1/8W 120 P    | 2   | R8                         | RS1703   | RES. F/CHIP 2.20 K $\Omega$ 5%<br>1/8W T/R 1206 PKG.   | 1   |
| R7, 8                      | RE1722   | SMD 470 $\Omega$ 5% 1/8W 120 P    | 2   | R9, 11                     | RS1701   | RES. F/CHIP 10.00 K $\Omega$ 5%<br>1/8W T/R 1206 PKG.  | 2   |
| R13, 14                    | RS1703   | SMD 2.2K $\Omega$ 5% 1/8 W 120 PI | 2   | R10                        | RS1709   | RES. F/CHIP 680.00 $\Omega$ 5%<br>1/8W T/R 1206 PKG.   | 1   |
| R17, 20                    | RS1725   | SMD 15K $\Omega$ 5% 1/8W 120 P    | 2   | R12, 13                    | RS1826   | RES. F/CHIP 27.00 $\Omega$ 5%<br>1/8W T/R 1206         | 2   |
| R18, 19                    | RS1831   | SMD 7.5K $\Omega$ 5% 1/8W T/ P    | 2   | R14                        | RS1711   | RES. F/CHIP 220.00 $\Omega$ 5%<br>1/8W T/R 1206 PKG.   | 1   |
| RN1, 1G, 2,<br>2G          | RS1900   | RES. NETWORK 7-33K $\Omega$ DIP   | 4   | R15                        | RS1877   | RES. F/CHIP 4.30 K $\Omega$ 5%<br>1/8W T/R 1206        | 1   |
| <b>Transistors</b>         |          |                                   |     | J1                         | RS1779   | RES. F/CHIP 0.0 $\Omega$ 5%<br>1/8W 1206 T/R           | 1   |
| Q1                         | TR1131   | SMD XSTR NPN DTC114TK 10K         | 1   | <b>Transistors</b>         |          |  |     |
| Q2                         | TR1167   | NPN XSTR 2N5551 TO-92             | 1   | Q1                         | TR1010   | PNP SIGN RXT2907A TO-92 T/R                            | 1   |
| Q3                         | TR1166   | PNP XSTR 2N5401 TO-92             | 1   | Q2                         | TR1063   | NPN SIGN RXT2222A TO-92                                | 1   |
| Q4                         | TR1125   | SMD XSTR PNP 2SA1037K CP          | 1   | <b>Miscellaneous</b>       |          |  |     |
| Q5                         | TR1108   | SMD XSTR NPN 2SC2412K CP          | 1   | P1, P3                     | CO1280   | HEADER RIGHT ANGLE 4-POS                               | 2   |
| <b>Miscellaneous</b>       |          |                                   |     | P2                         | CO1279   | HEADER RIGHT ANGLE 3-POS                               | 1   |
| REF. NO.                   | PART NO. | DESCRIPTION                       | QTY |                            |          |  |     |

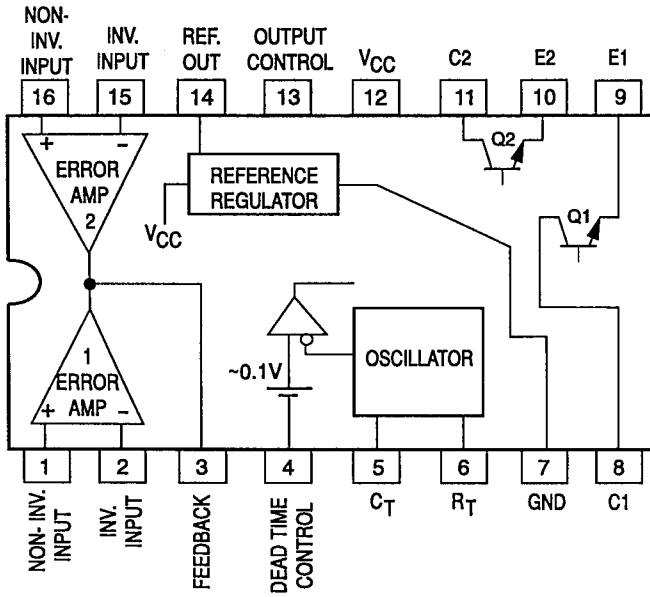
## PWM MODULE

### Capacitors

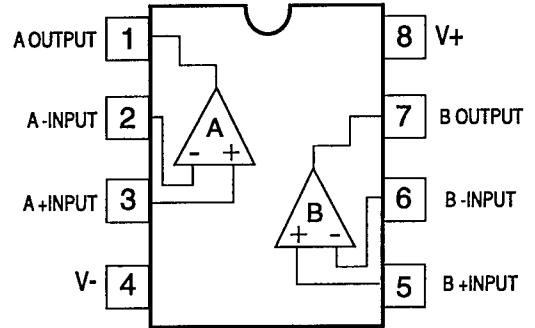
|          |        |  |   |
|----------|--------|--|---|
| C1       | CP1434 | CAP. CERAMIC 2700.00 pF $\pm$ 10%<br>100V  | 1 |
| C2, 3, 4 | CP1426 | CAP. CERAMIC 0.10 $\mu$ F $\pm$ 20%<br>50V | 3 |
| C19      | CP1565 | CAP. ALUM EL. 22 $\mu$ F $\pm$ 20%<br>10V  | 1 |

Integrated Circuit Diagrams

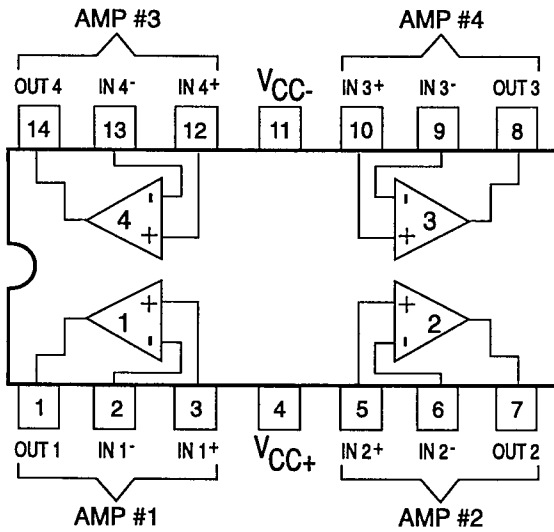
IC1002 (TL494) PWM IC



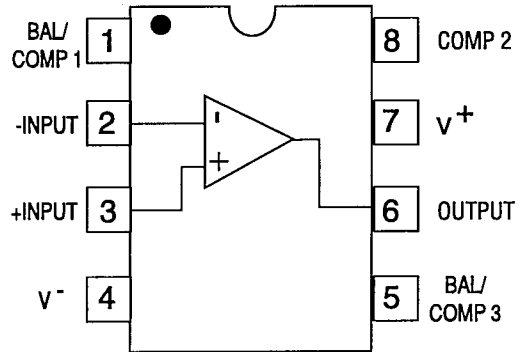
IC1175 (NJM5532), IC1041 (TL072) DUAL OP-AMP



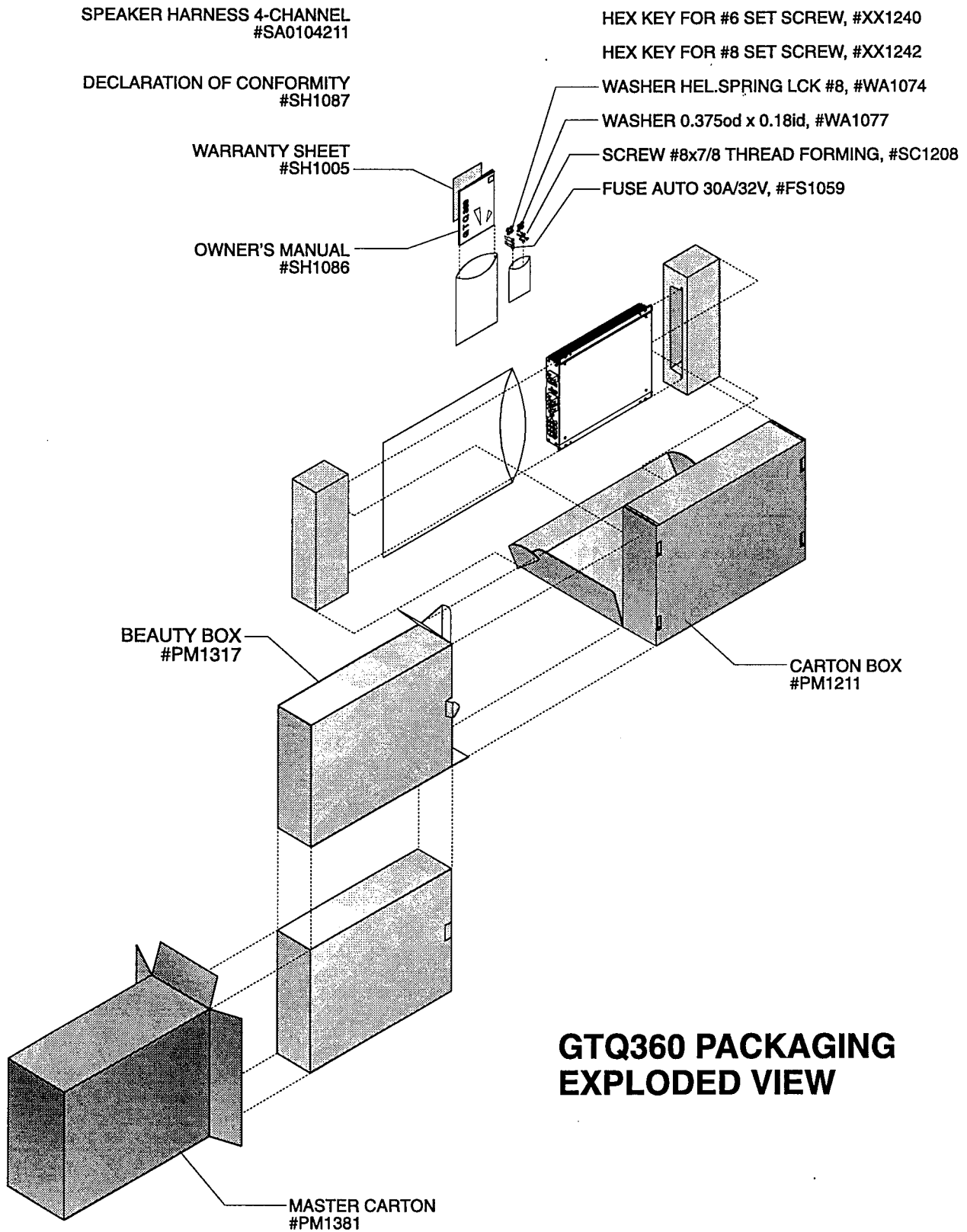
IC1162 & IC1052 (TL074) QUAD OP-AMP



IC1040 (NJM318) OP-AMP

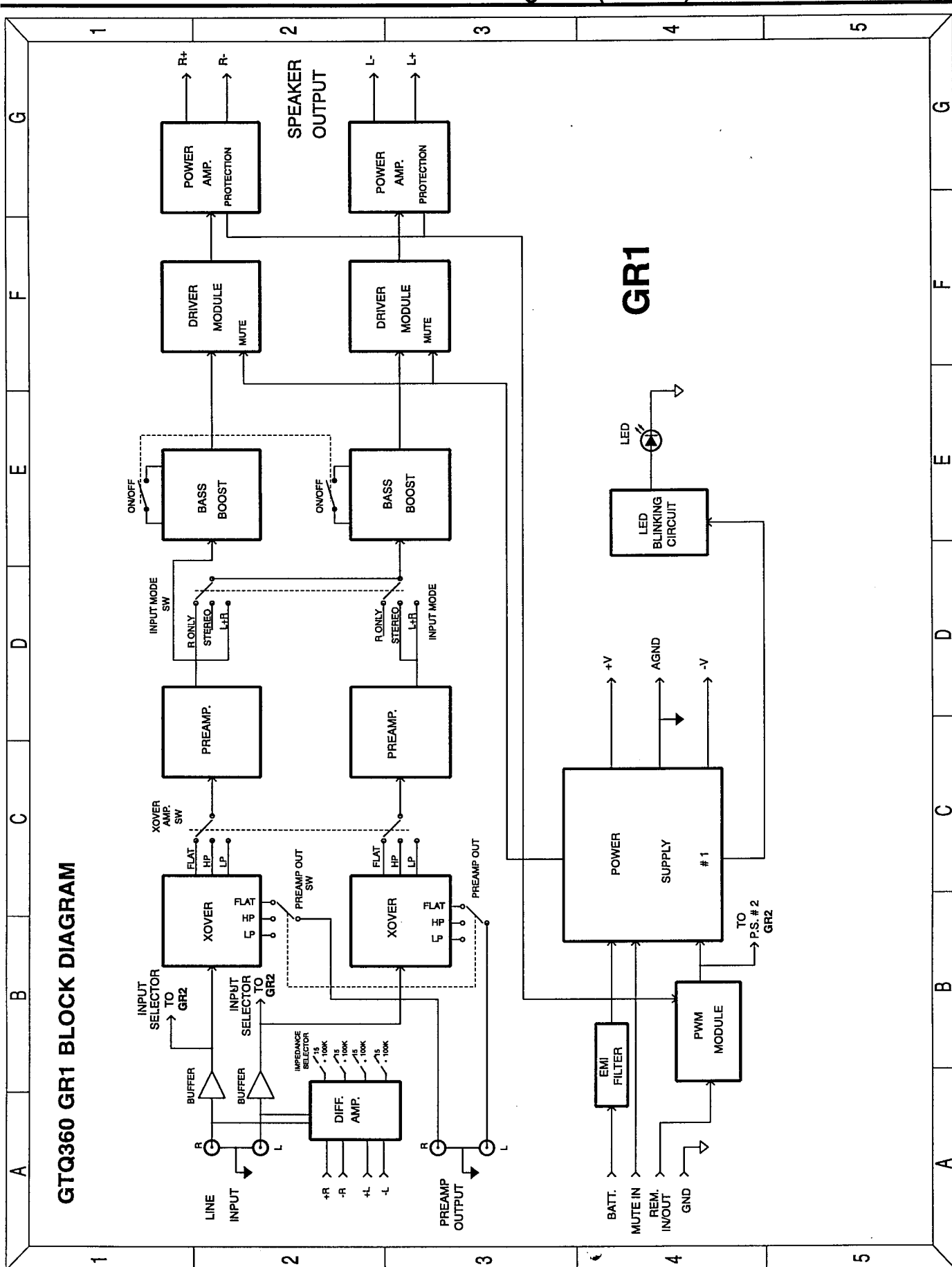


Packaging Exploded View

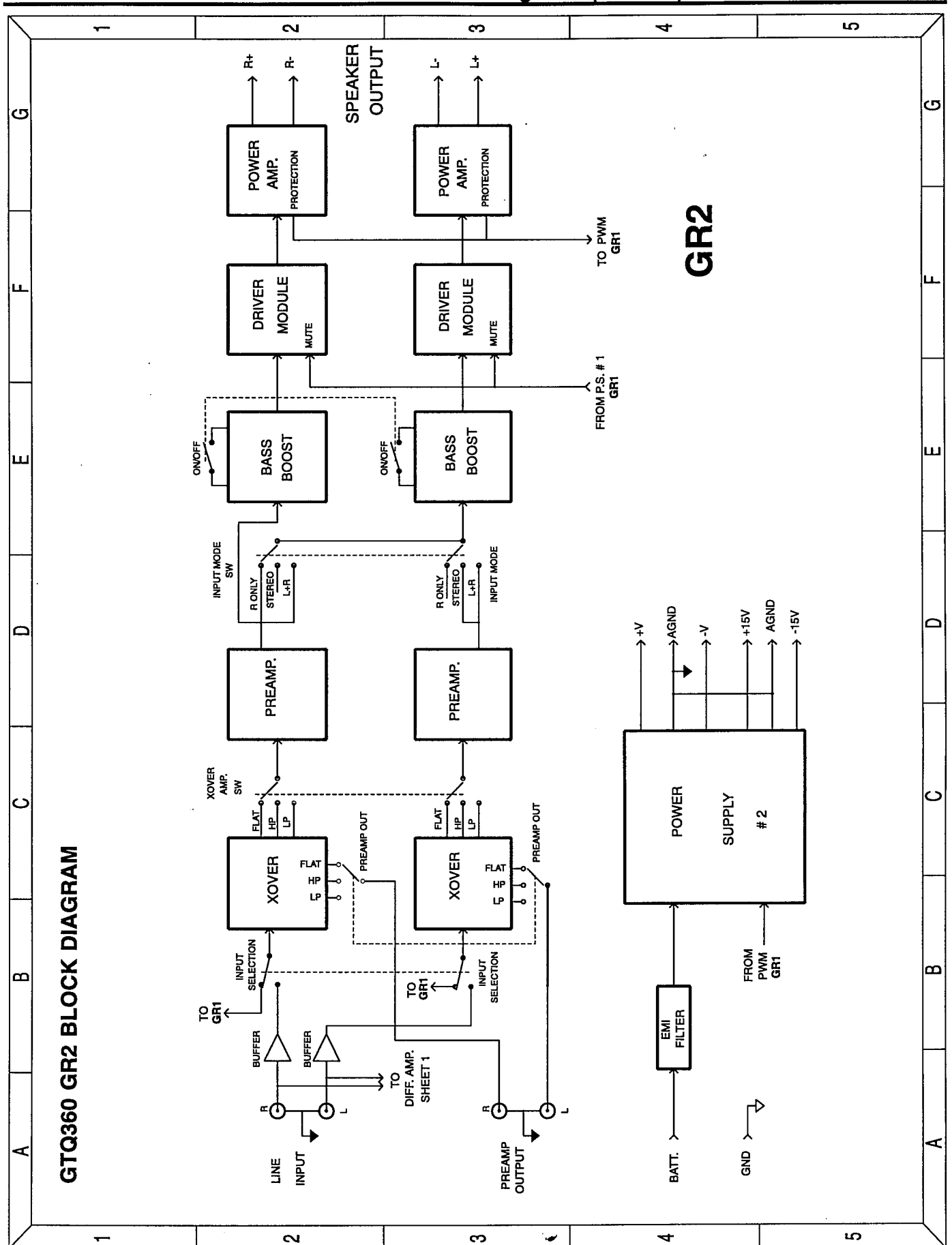


GTQ360 PACKAGING  
EXPLODED VIEW

GTQ360 GR1 Block Diagram (sheet 1)



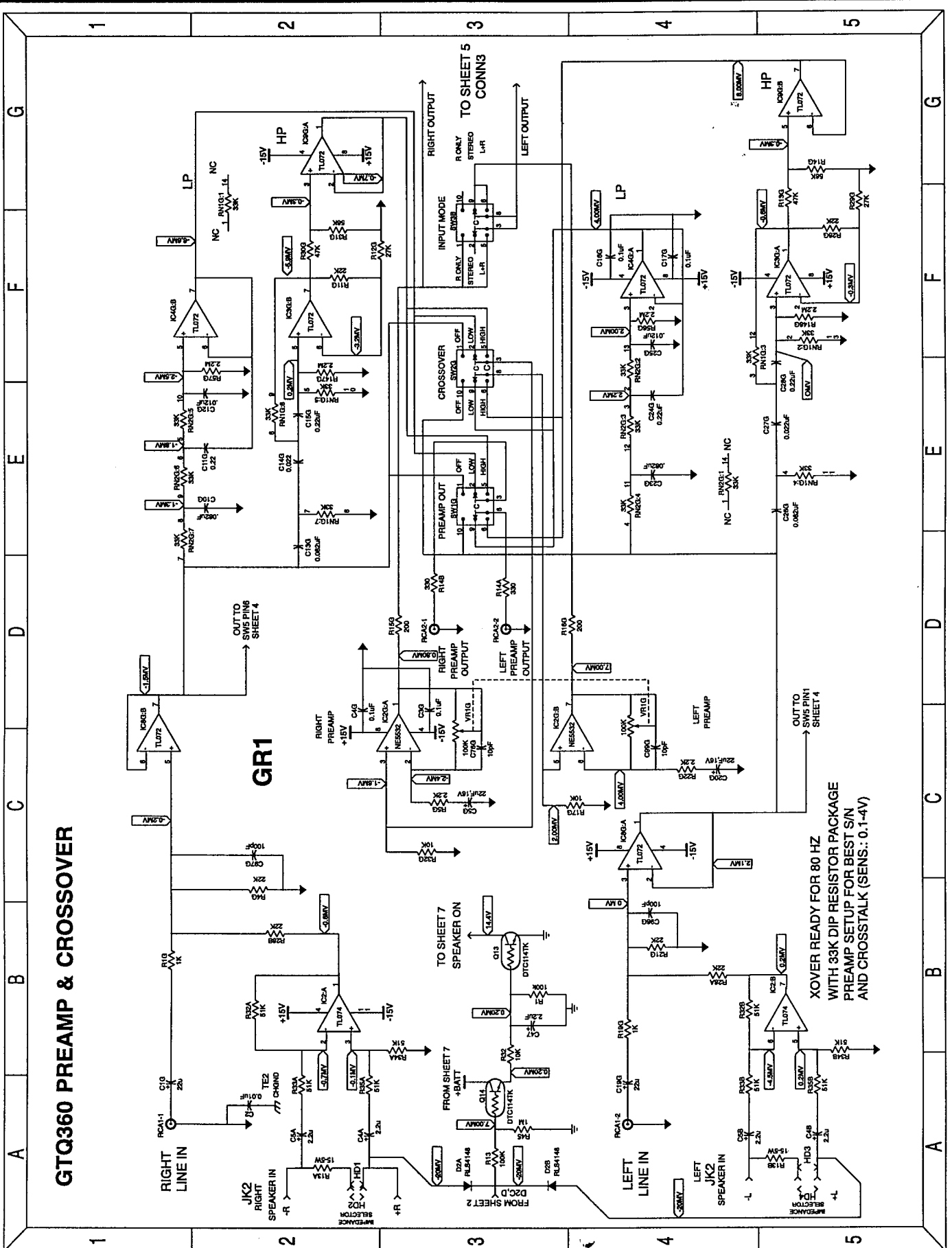
GTQ360 GR2 Block Diagram (sheet 2)



GTQ360 GR2 BLOCK DIAGRAM

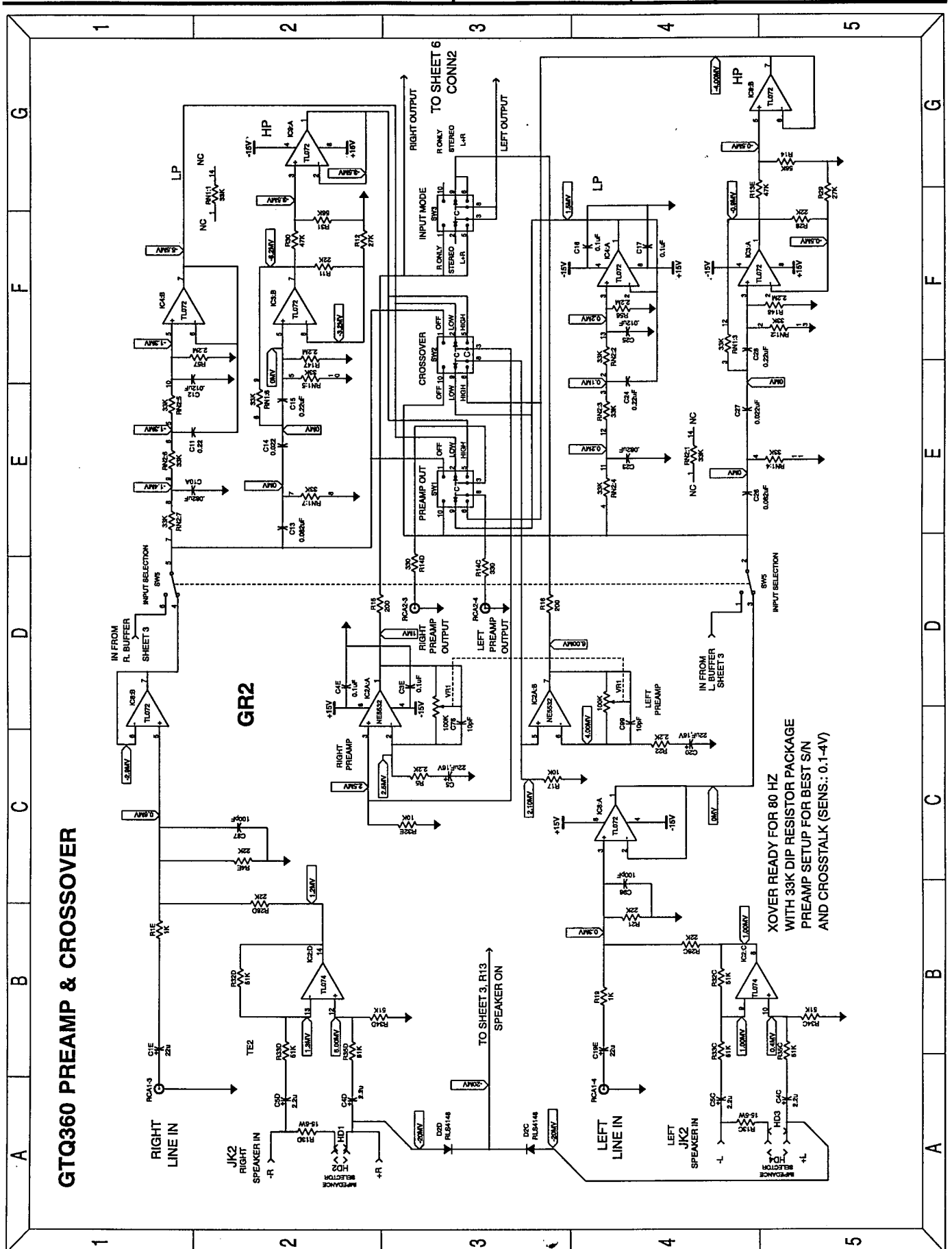
GR2

GTQ360 GR1 Preamp & Crossover (sheet 3)

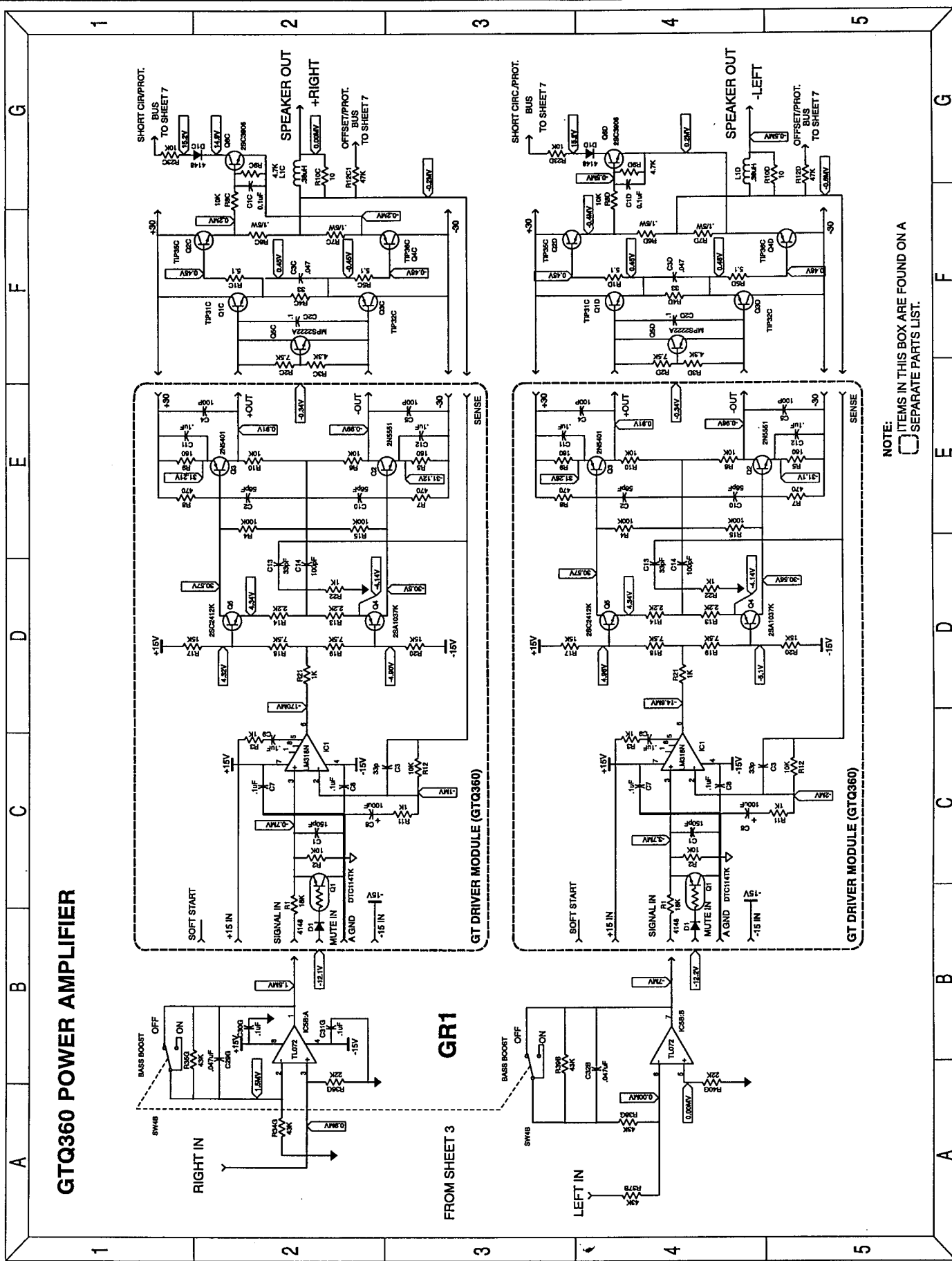




GTQ360 GR2 Preamp & Crossover (sheet 4)

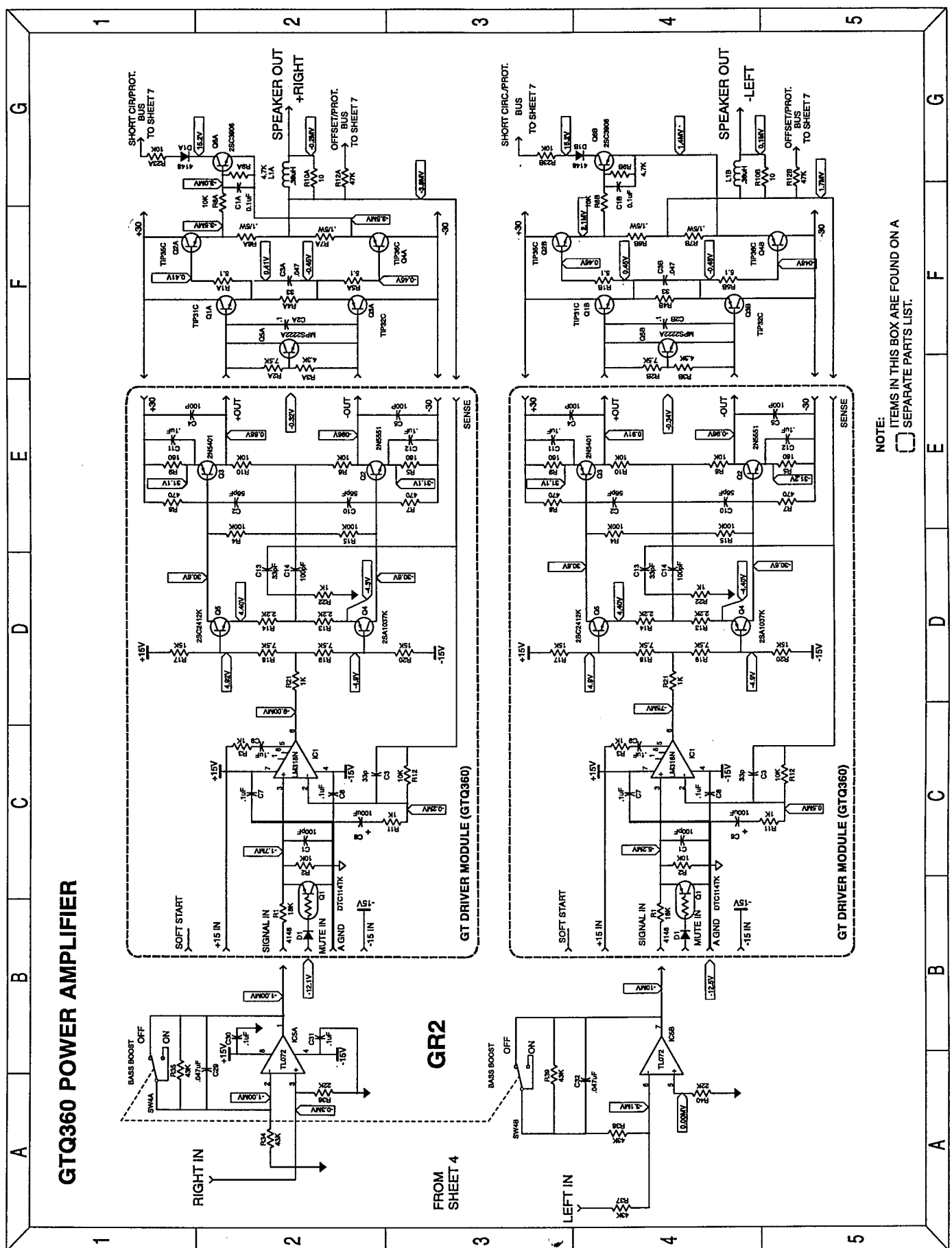


GTQ360 GR1 Power Amplifier (sheet 5)

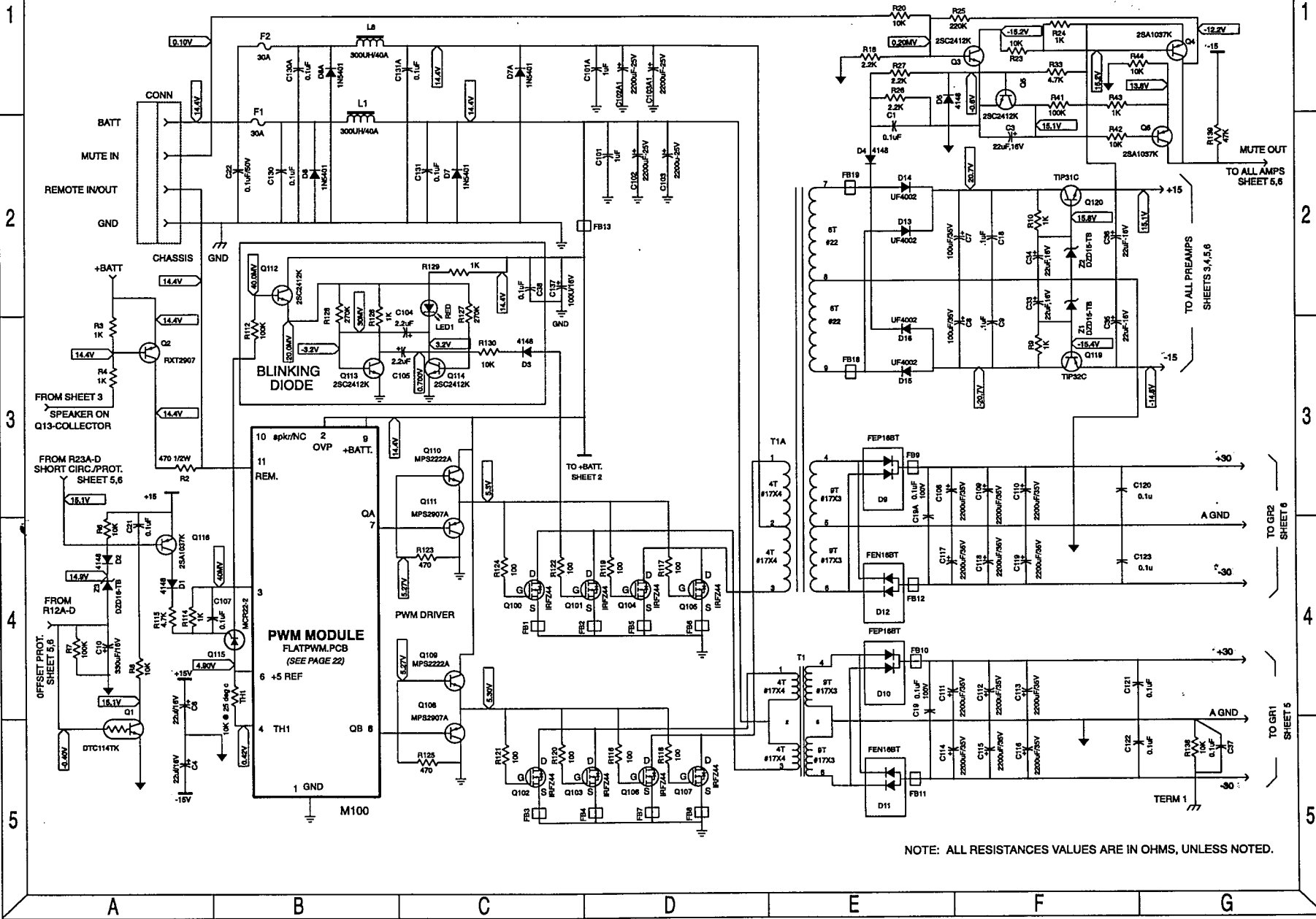


NOTE:  
 □ ITEMS IN THIS BOX ARE FOUND ON A SEPARATE PARTS LIST.

GTQ360 GR2 Power Amplifier (sheet 6)

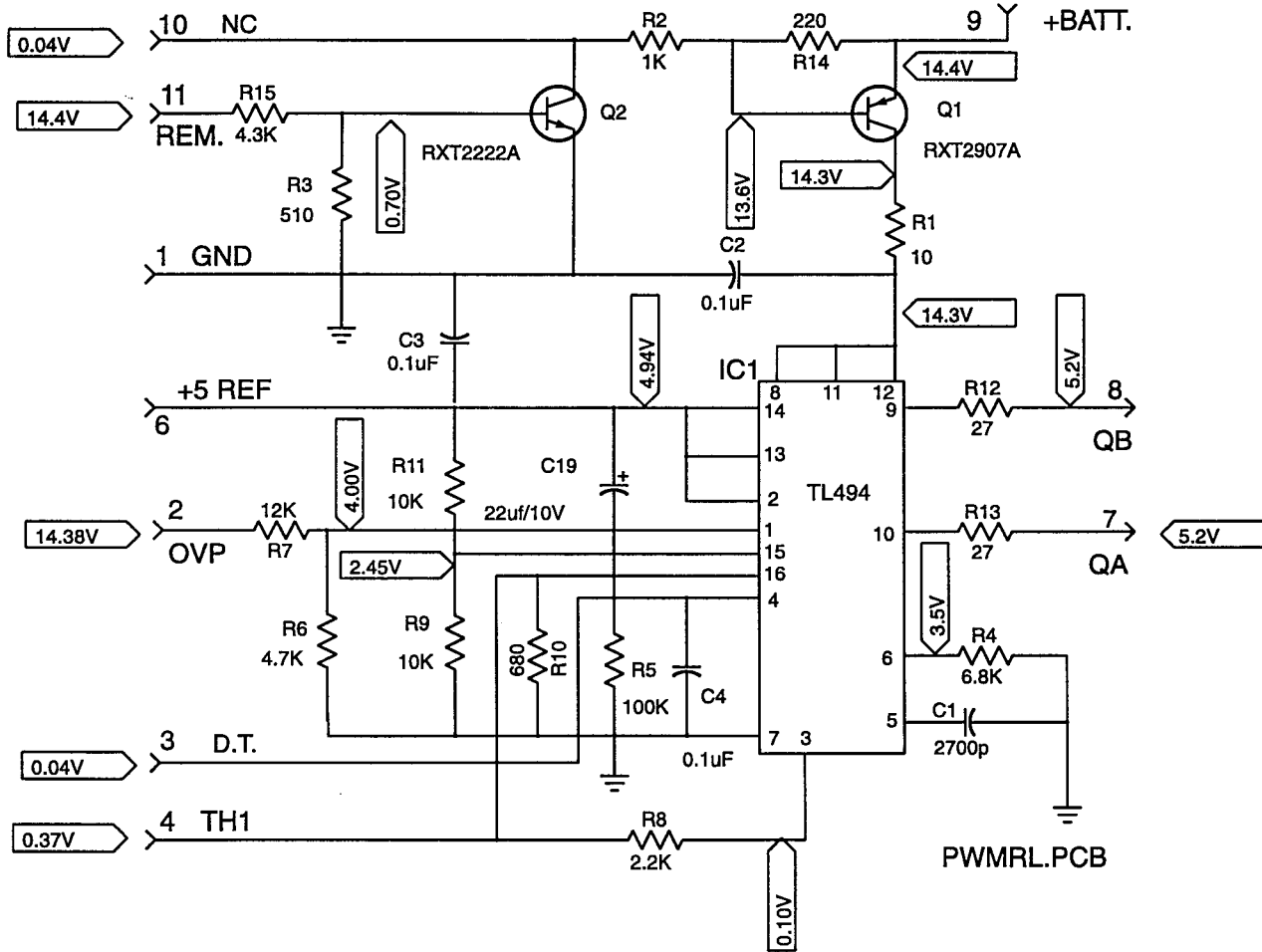


# GTQ360 POWER SUPPLY

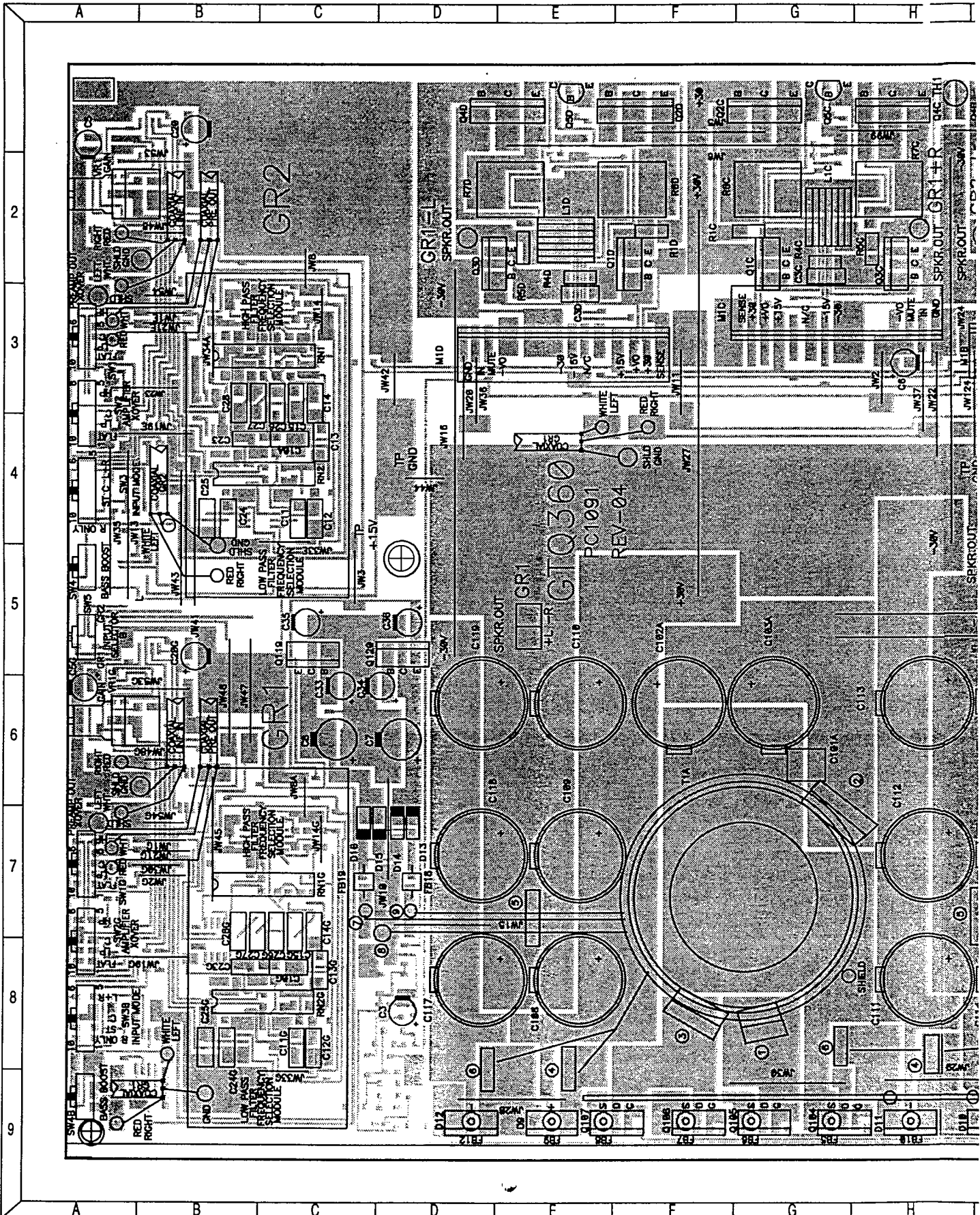


NOTE: ALL RESISTANCES VALUES ARE IN OHMS, UNLESS NOTED.

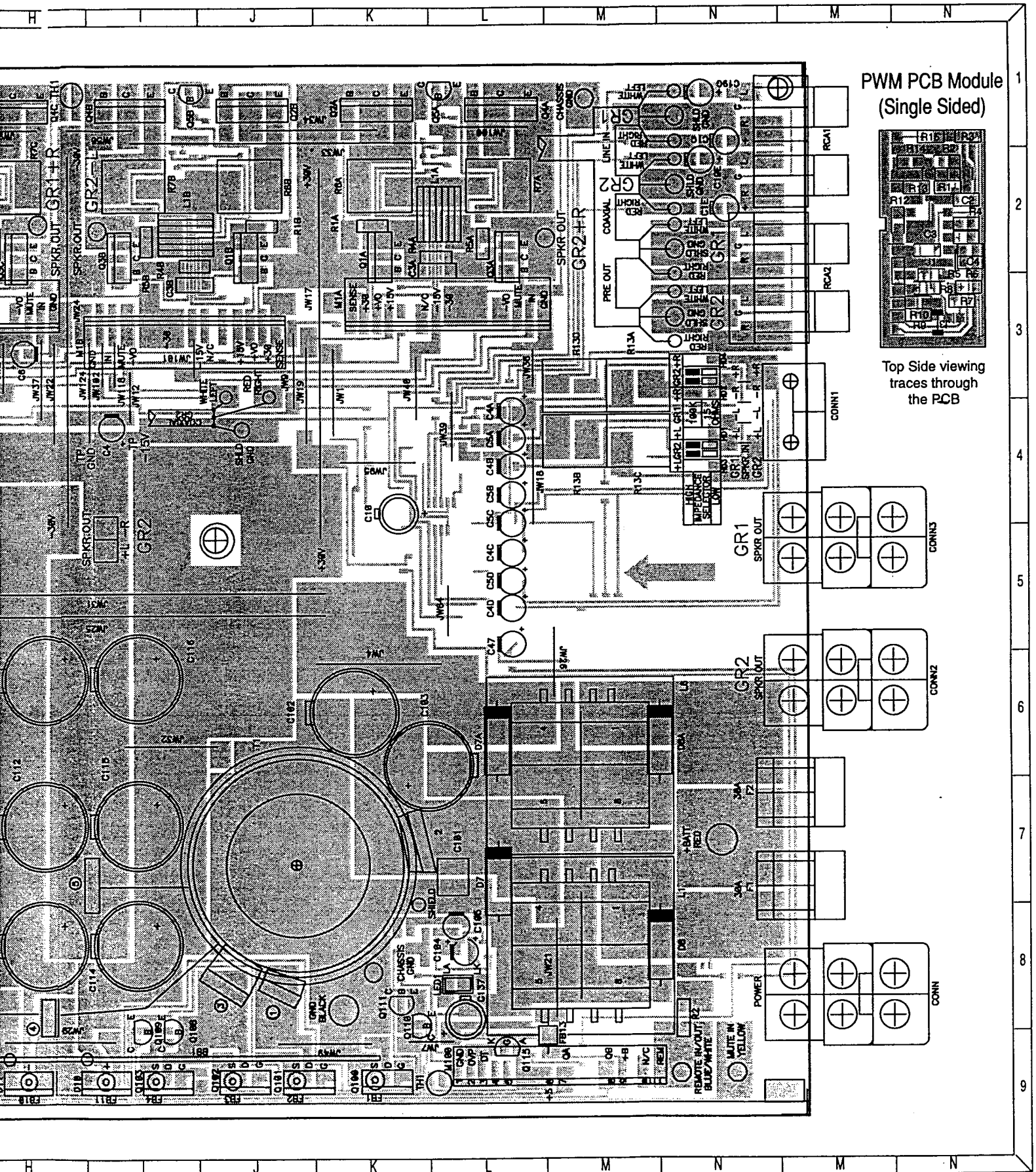
# GTQ360 PWM MODULE



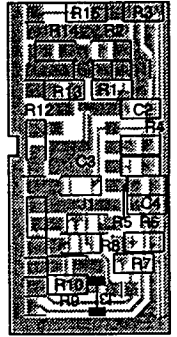
THE PWM MODULE IS FOUND ON A SEPARATE PARTS LIST.



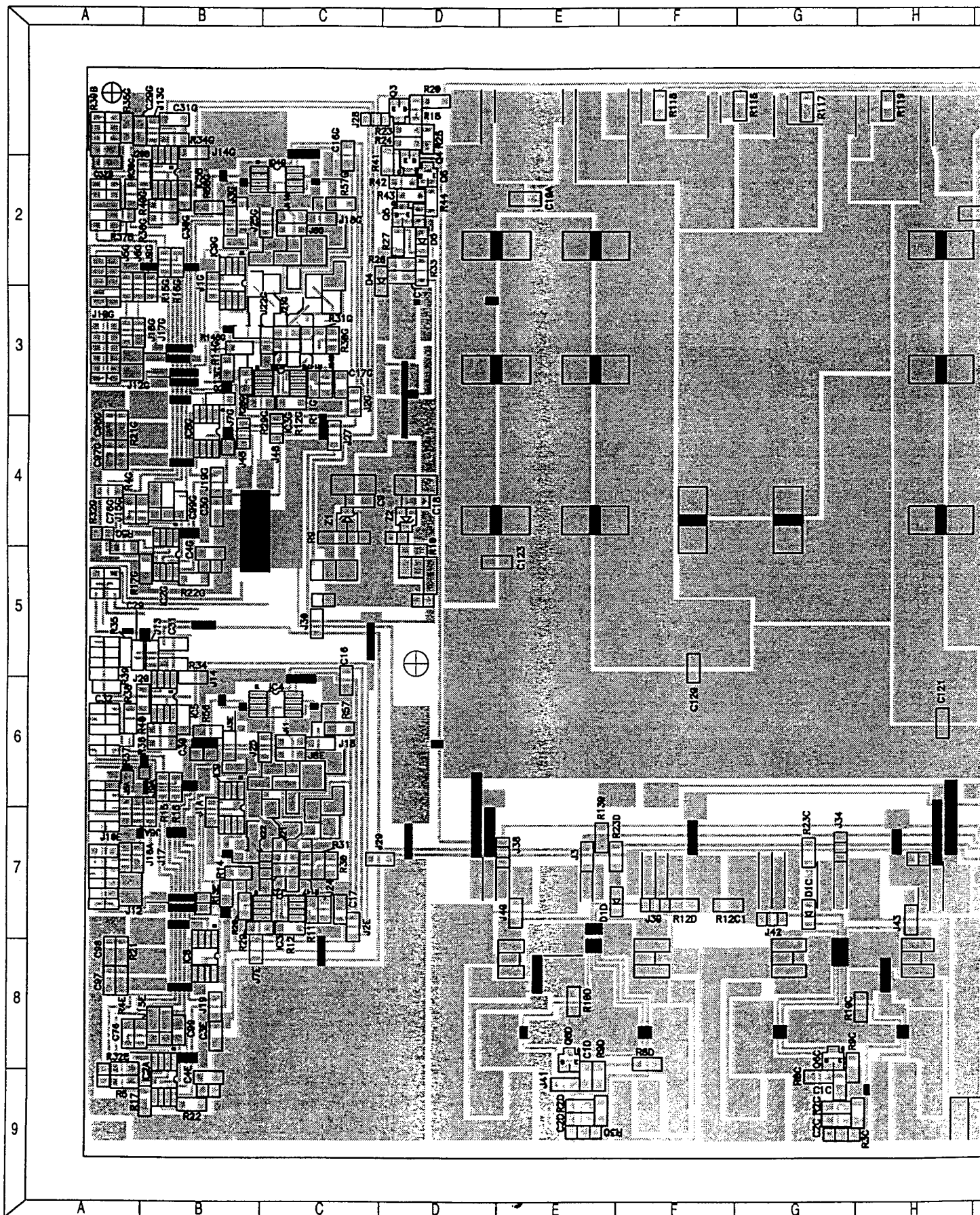
ED CIRCUIT BOARD (TOP VIEW)



PWM PCB Module (Single Sided)

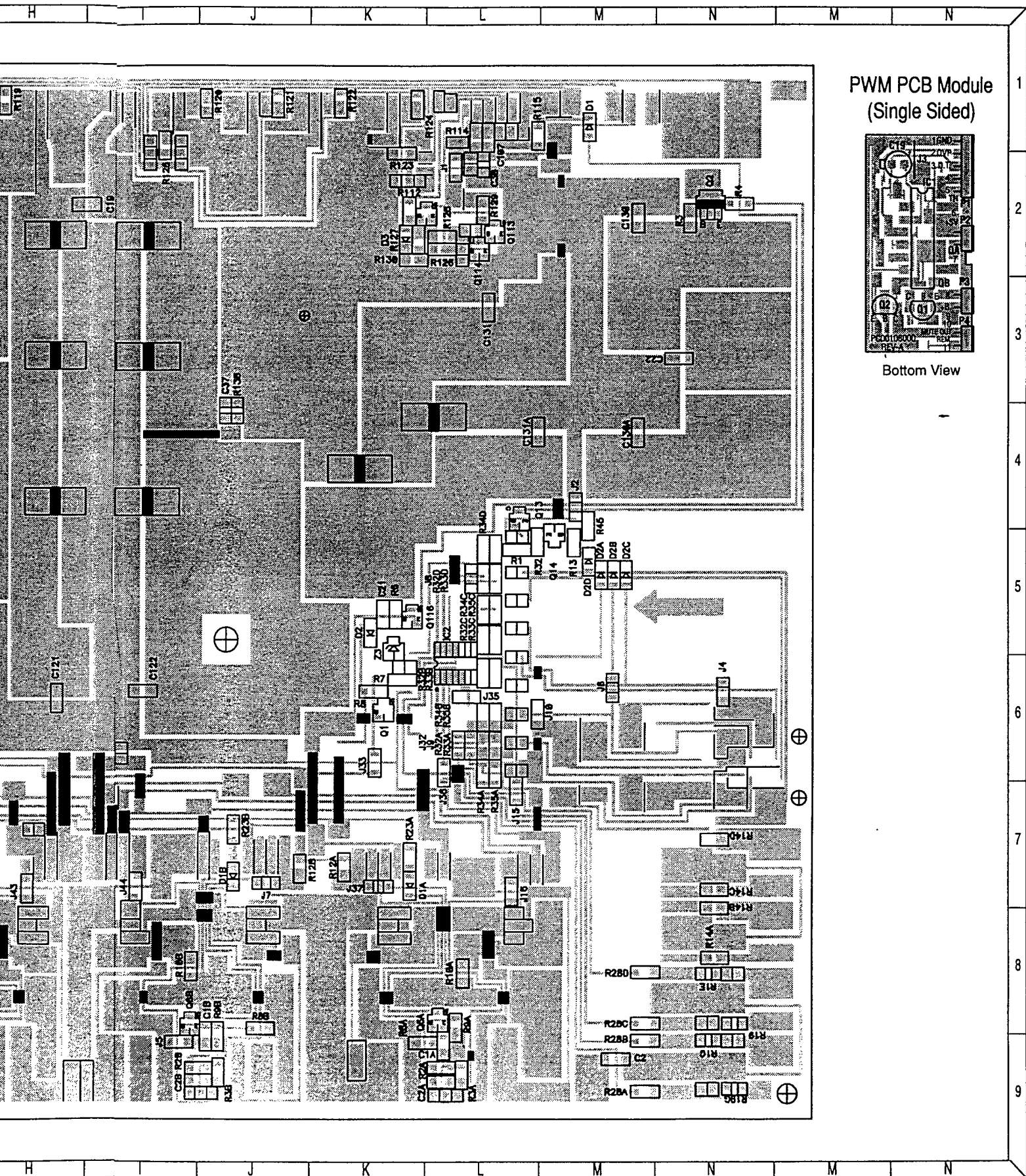


Top Side viewing traces through the PCB

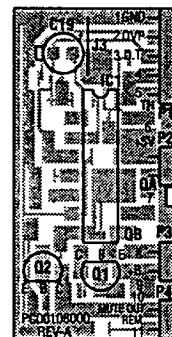




# D CIRCUIT BOARD (BOTTOM VIEW)



PWM PCB Module  
(Single Sided)



Bottom View