GTH400
6/5/4/3 CHANNEL
AUTOMOTIVE POWER AMPLIFIER
TECHNICAL MANUAL

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H A Harman International Company

Part No.: GTH400SM Rev A

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GTH400 Specifications

	Nominal Value	Test Limits
Continuous Power Output (20Hz - 20kHz, 14.4V Battery Voltage, 80 kHz Filter)	35W x 4 + 70W x 2 (4 ohms, 0.05% THD)	35W x 4 + 70W x 2 (4 ohms, <0.2%)
	50W x 4 + 100W x 2 (2 ohms, 0.08% THD)	50W x 4 + 100W x 2 (2 ohms, <0.3%)
	100W x 2 (Bridged 4 ohms, 0.08% THD) + 70W x 2 (4 ohms, 0.05% THD)	100W x 2 (Bridged 4 ohms, <0.3% THD) + 70W x 2 (4 ohms, <0.2% THD)
	100W x 2 (Bridged 4 ohms, 0.08% THD) + 200W x 1 (Bridged 4 ohms, 0.08% THD)	100W x 2 (Bridged 4 ohms, <0.2% THD) + 200W x 1 (Bridged 4 ohms, <0.3% THD)
Signal to Noise Ratio (A-wtd)	>100 dBA	>90 dBA
Frequency Response	10Hz - 50kHz (+0, -1dB)	20Hz - 20kHz (+0, -2dB)
	20Hz - 20kHz (+0, -0.1dB)	
Line Level Input Sensitivity (for rated power)	100mV - 4V RMS	50 to 200mV at min position
		3 to 5 V at max position
Line Level Input Impedance	10k Ohms	not tested
Speaker Level Input Impedance	15 Ohms or 100k Ohms (Selectable By Internal Jumpers)	not tested
Speaker Level Input Sensitivity (For Rated Power)	200mV - 8V RMS	100 to 400mV at min position 6 to 10 V at max position
Bass Boost	+4dB at 40Hz	+4dB at 40Hz +/-1.5dB
Built in Electronic Crossover Frequency and Slope	80 Hz, 18dB per Octave Low-Pass Filter (selectable by crossover resistor chips)	3 dB down at 80 Hz (+/-2 dB)
	80 Hz, 18dB per Octave High-Pass Filter (selectable by crossover resistor chips)	
Damping Factor	>200	not applicable
Power Requirement	11 to 16V DC Negative Ground	not applicable
Fuse Size	30 Amp ATC Type Fuse (2 per amplifier)	not applicable

	Nominal Value	Test Limits
Size (L x W x H)	15-1/4" x 11-1/4" x 2" (387mm x 286mm x 51mm)	not applicable
Weight	13 lbs. 4 oz. (6 kg)	
Speaker Input Mating Connector	Molex Mini-Fit Jr. # 39-01-2040 Metal Pins: 39-00-0038	not applicable
Minimum Speaker Impedance		
Single Ended, non-bridged	2 ohms	not applicable
Bridged	4 ohms	

Test Conditions and Notes

- 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. The imaging enhancer should be set to "Bypass" mode.
- 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, and the imgaging enhancer should be set to "Bypass" mode.
- 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.

Features

- 6. 5, 4 or 3-Channel Operation.
- Complete System with Amplifier, Crossovers and Image Enhancer in One Chassis.
- Simultaneous Stereo + Mono Operation.
- 3 Built-In Independent 18dB/Octave Frequency Selectable High-Pass and Low-Pass Crossovers.
- 3 Pairs of Preamp Outputs with independent Frequency Selectable High-Pass and Low-Pass Crossovers.
- No Current Limiting.
- Dual Oversized Floating Rail MOSFET Switch-Mode Power Supplies Independently Powered Satellite and Subwoofer Channels.
- "Common Sense" 2-way Turn-on
- Switchable Bass Boost
- "Virtual Center" Image Enhancement Circuit Both Stabilizes the Center Image for the Driver and Recovers rear Channel Ambience.
- Remote Control Provides Adjustment for Effects Level and Bypass Modes.
- Small Car/Large Car Image Optimizer Switch.
- Switchable Constant-Bass (Non-Fading) Subwoofer Output.
- 2, 4 or 6-Channel Input Capability.
- Stealth Remote Silent Turn-On Circuitry with Power-On Indicator
- Balanced Speaker Level Inputs.
- 3 Continuously Adjustable Gain Controls.
- Capable of Single-Ended Operation Into 2-Ohm Loads.
- Fully Complementary, Direct-Coupled, Discrete Power Amplifier Circuitry.
- Gold Plated RCA Input Connectors.
- Gold Plated Power and Speaker Connectors.
- Third Order, (18dB per Octave) Capacitive/Inductive Power-Supply Filtering.
- Independent Input Mode Switching for Each Group of Channels.
- Made in USA

Controls and Connectors

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 7) 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" directions for more information.

5., 6., 7., 8., Power Connector - Connection for power wires. See "Wiring" directions for information on proper connections.

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.

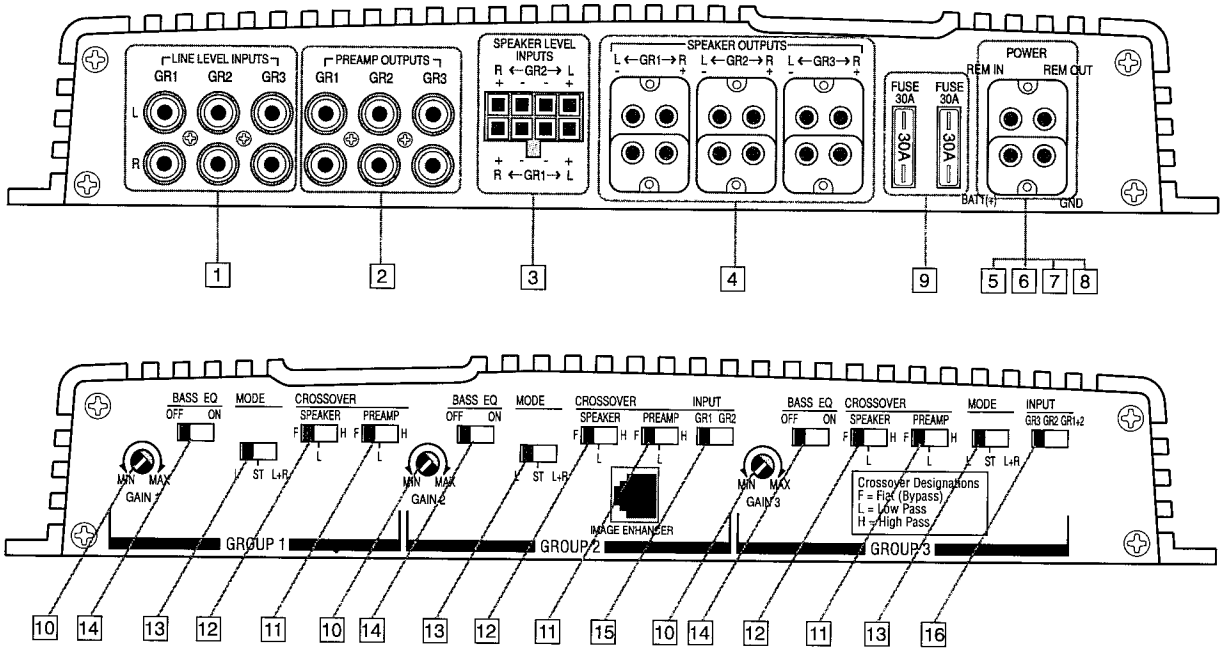
13. Mode Switches - These switches are used to set the input mode for both preamp and speaker-level inputs (to drive speaker output groups). Set the switch to Stereo for normal operation on the group using individual left and right inputs. Set this switch to L to drive both the left and right outputs 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.

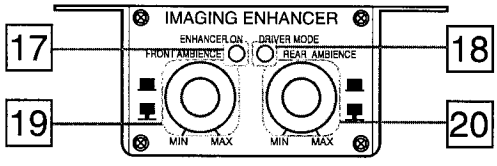
14. Bass EQ Switch - These switches activate a built-in Bass Boost circuit used to increase low-bass output on the selected speaker output group. These switches do not effect the preamp outputs.

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.

16. Group 3 Input Switch - This switch is used to select which inputs will drive Group 3 of the amplifier. Put the switch in position "GR 3" to allow Group 3 to be driven by the Group 3 inputs. Put the switch in the "GR 2" position to drive Group 3 with the Group 2 inputs. Put this switch in the "GR 1+2" position to drive Group 3 with the sum of Group 1 and 2 for a non-fading subwoofer output on Group 3.

17. Remote Bypass/On Indicator - This indicator is on when the imaging Enhancer is engaged and off when the imaging Enhancer is bypassed.





18. Driver/All Optimizer Indicator - This indicator is on when the Virtual Center Channel circuitry is in "Driver" optimization mode and off when it is in the "All" passenger mode. Note: The enhancer on indicator must be on before driver's mode can be enabled.

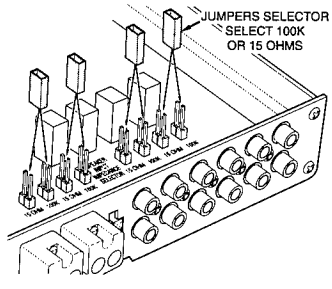
19. Front Ambience Control and On/Bypass Switch - Rotating this control adjusts the amount of ambience and front staging width produced by the Imaging Enhancer. Pulling the knob places the Imaging Enhancer in "Bypass" mode. Pushing in the knob places the Imaging Enhancer in "On" mode.

20. Rear Ambience and Driver/All Optimizer Control - Rotating this knob controls the amount of rear-fill ambience and the "room size" of the acoustic environment when used in a system with rear speakers. Pulling the knob out places the Imaging Enhancer in "All" passengers optimization mode. Pushing the knob in places the unit in "Driver" optimization mode. Best results at the driver's position will be achieved with the control in the "Driver" setting. Note: the front ambience control must be pushed in (Enhancer On) to enable the rear ambience effect.

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 GTH400 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 previous 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. (See step 1, page 16 to remove bottom cover).

Crossover Frequency Adjustments

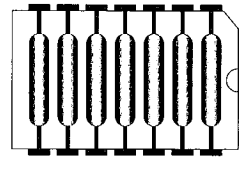
The GTH400 amplifiers include built-in frequency selectable crossovers. One crossover is connected in series with the amplifier circuitry and the other crossover is connected to the preamp level output jacks. These crossovers can be set in either the F (full bandwidth operation), L (subwoofer operation), or H (satellite operation). More details on the use of these crossovers are given in the "Add-On and upgrade Steps" section.

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:

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

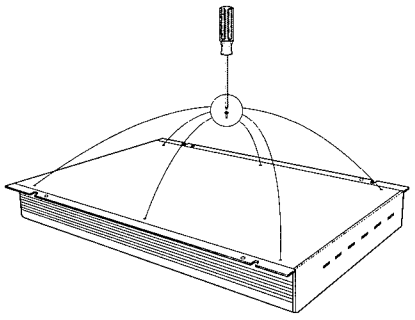
- Use the following equation if you have a resistor pack of a known value, and want to find its crossover frequency:

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

- 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.

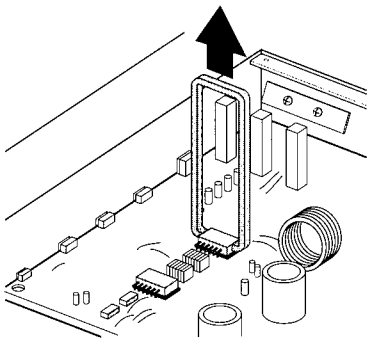
To change the crossover frequency change the resistor network as follows:

1. Remove the screws from the bottom panel as shown below.



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. For further information on how to use the speaker output and preamp output crossovers for system building see the "Typical Applications" and "Add-On and Upgrade Steps" sections.

5.3 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.

Remote Chassis Installation

The wired remote of the GTH400 can be installed either in dash or under dash.

Under-Dash Remote Installation

1. Set the GTH400 remote in the installation location and mark two mounting screw hole locations.

2. Set the GTH400 remote aside and drill two pilot holes using a 1/6"-(1mm) bit. Be careful not to drill into any of the car's components.

3. Secure the spacer and faceplate (with the control labeling) to the front of the remote control panel using the four smaller screws included.

4. Push the two adjustment knobs onto the metal shafts.

5. Set the GTH400 remote back in place and secure it using two sheet metal screws. Continue to Step 6 in the "In-Dash Installation" section.

In-Dash Remote Installation

1. Choose a location for the in-dash installation and use the template at the back of this manual to mark hole locations as shown on the template.

2. Drill the holes indicated on the template.

3. Install the remote behind the panel with the holes just drilled. Position the remote so the two knobs feed through panel and the LEDs are in alignment with the holes drilled.

4. Place the face plate (with the control labeling) over the two shafts and secure it in place with the 4 screws provided.

5. Push the two adjustment knobs onto the metal shafts.

6. Connect one end of the GTH400 remote control wire (included) to the connector on the back of the remote control box.

7. Run the wire back to the GTH400 main chassis and plug the remote control wire into the "Remote In" connector on the main chassis. Note: a standard 6-pin telephone extension cord may be used if more wire is needed for remote control connection. These extension cords can be purchased at many electronics or hardware stores.

Theory of Operation

The JBL GTH400 incorporates an analog signal processor which is designed to recreate a realistic sound stage and center image without the need for adding a tough to install center channel speaker. This virtual center image is created through a JBL proprietary technology (patent pending). The GTH400 also includes the capability to extract ambient information from the recordings which can help to recreate the live feel in music. The circuitry is composed of four sections, the virtual center image circuitry, the rear ambience recovery circuitry, and the switching circuitry.

The virtual center image circuitry manipulates the amplitude and phase (time delay) of the front left and right channels when in the driver mode. IC1:D and IC1:C form a network which alters the phase and frequency response of the left speaker output to compensate for the fact that the person seated in the driver seat is closer and more off axis to the left speaker than the right speaker. This circuitry combines with the gain circuitry on the right channel located in IC2:B to create the virtual center image circuitry.

The front ambience recovery is created by cross coupling circuitry located in IC1:A and IC1:B and the associated circuitry. The amount of ambience recovery that is mixed back in with the modified (driver mode) or unmodified (all mode) stereo signal is controlled by the optocoupler and the voltage at pin 4 on the remote control knob. Ambience recovery is on in both the "All" and "Driver" modes.

The rear ambience recovery circuitry is a pure L-R surround circuit. IC3:A in combination with optocoupler D2 control the output level of the level of the left and right rear channels. The level is determined by the voltage on pin 6 of the remote connector which varies according to the setting on the rear ambience control knob.

Mode and bypass switching on the GTH400 Imaging Enhancer is accomplished through the use of 4066 CMOS switches (IC4, IC5 and IC6) which are controlled by switch positions on the wired remote.

Imaging Matrix for the GTH400 Amplifier

This circuit is patented and any duplication of the circuit is in violation of U.S. patent laws.

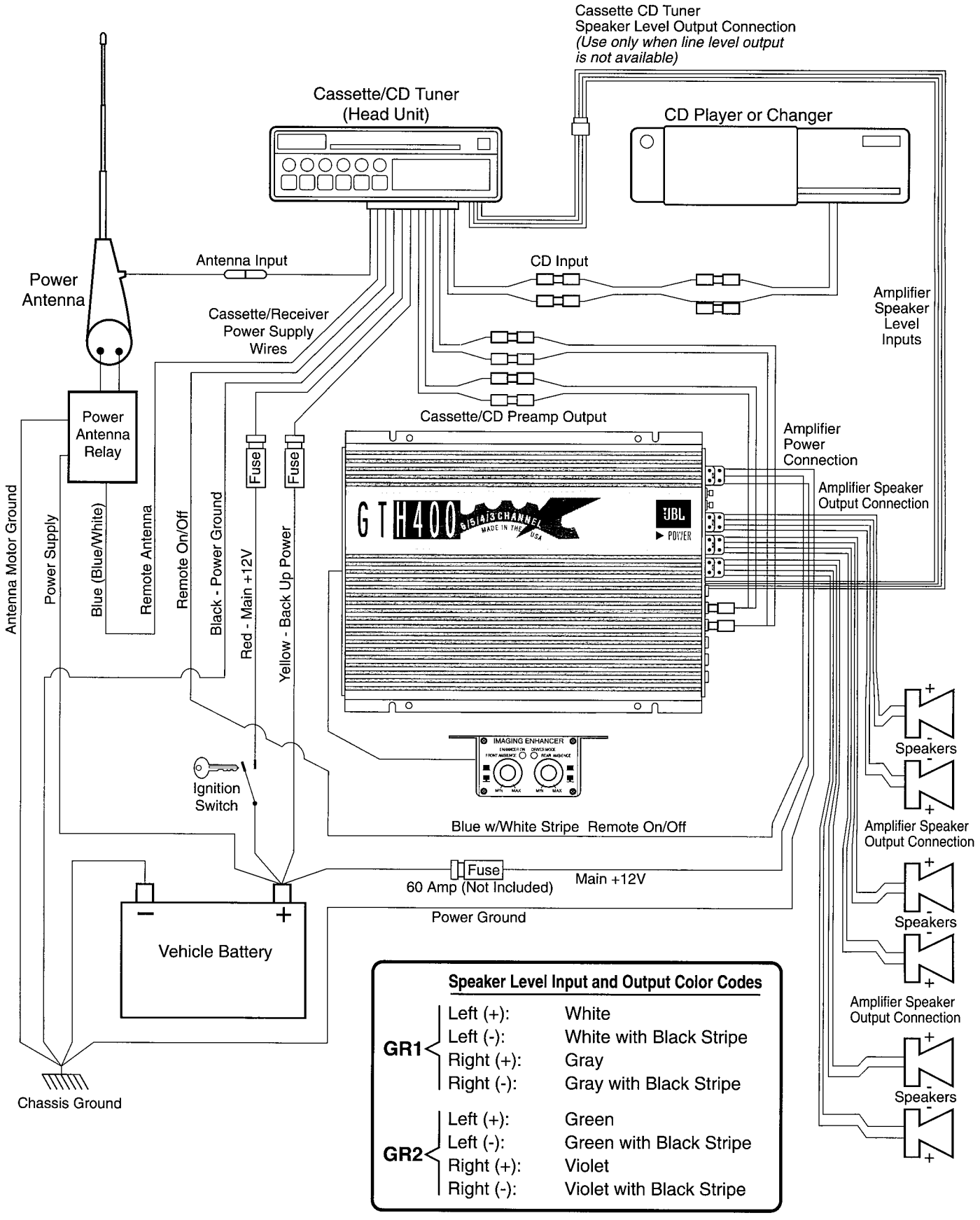
Test Conditions

1. Levels in dBr. Speaker Output @ 1W out, (R_L = 4 ohms) = 0dB reference, (0dBr).
2. One channel driven.
3. All Pots in Center Position.
4. All Switches in Stereo Mode. **Note**: Group 2 Input switch is set to GR2.
5. All Filters Flat.
6. Test indicates crosstalk and does not account for Phase shift. Use AP I-OPHASE.TST to check phase vs. amplitude.
7. Sine Wave Input: V_{in} = 100mv f = 1khz
8. Adjust gain pots to obtain 1W/4Ω output.

	Front Input Driven: Group 1 Left				Front Input Driven: Group 1 Right			(Front Right)
	Enhancer OFF	**Enhancer ON**	**Drivers Mode ON**		**Enhancer OFF**	**Enhancer ON**	**Drivers Mode ON (Small Car)**	**Drivers Mode ON (Large Car)**
Set Front Ambience Pot CCW □3dBr	L = 0dBr R = -62dBr	L = +0.3dBr R = -10.3dBr	L = +1dBr R = -9.5dBr	Set Front Ambience Pot CCW □3dBr	L = -63dBr R = 0dBr	L = -10.4dBr R = +0.6dBr	L = -9.3dBr R = +2.2dBr	L = -9.3dBr R = +3.5dBr
Set Front Ambience Pot CW □1dBr	L = 0dBr R = -62dBr	L = +4.8dBr R = -0.55dBr	L = +5.5dBr R = +1dBr	Set Front Ambience Pot CW □1dBr	L = -63dBr R = 0dBr	L = 0dBr R = +5.2dBr	L = +0.8dBr R = +6.8dBr	L = +0.8dBr R = +8.3dBr

	Rear Input Driven: Group 2 Left				Rear Input Driven: Group 2 Right		
Set Rear Ambience Pot CCW □3dBr	L = 0dBr R = -51dBr	L = -12dBr R = -12dBr	L = -12dBr R = -12dBr	Set Rear Ambience Pot CCW □3dBr	L = -53dBr R = 0dBr	L = -12dBr R = -12dBr	L = -12dBr R = -12dBr
Set Rear Ambience Pot CW □1dBr	L = 0dBr R = -51dBr	L = +5.5dBr R = +5.5dBr	L = +5.5dBr R = +5.5dBr	Set Rear Ambience Pot CW □1dBr	L = -53dBr R = 0dBr	L = +5.5dBr R = +5.5dBr	L = +5.5dBr R = +5.5dBr

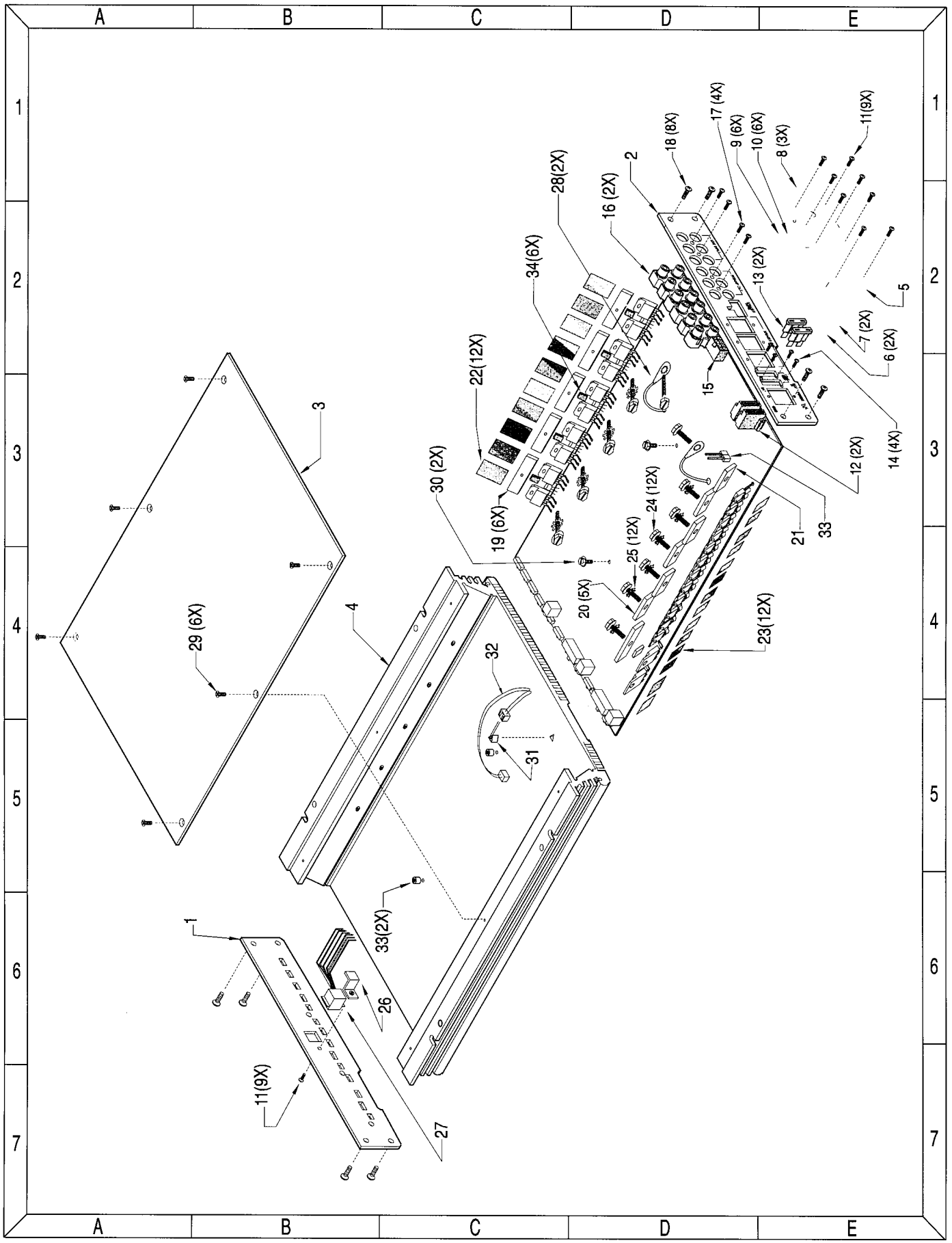
Typical System Configuration



Speaker Level Input and Output Color Codes

GR1	Left (+):	White
	Left (-):	White with Black Stripe
	Right (+):	Gray
	Right (-):	Gray with Black Stripe
GR2	Left (+):	Green
	Left (-):	Green with Black Stripe
	Right (+):	Violet
	Right (-):	Violet with Black Stripe

Mechanical Exploded View

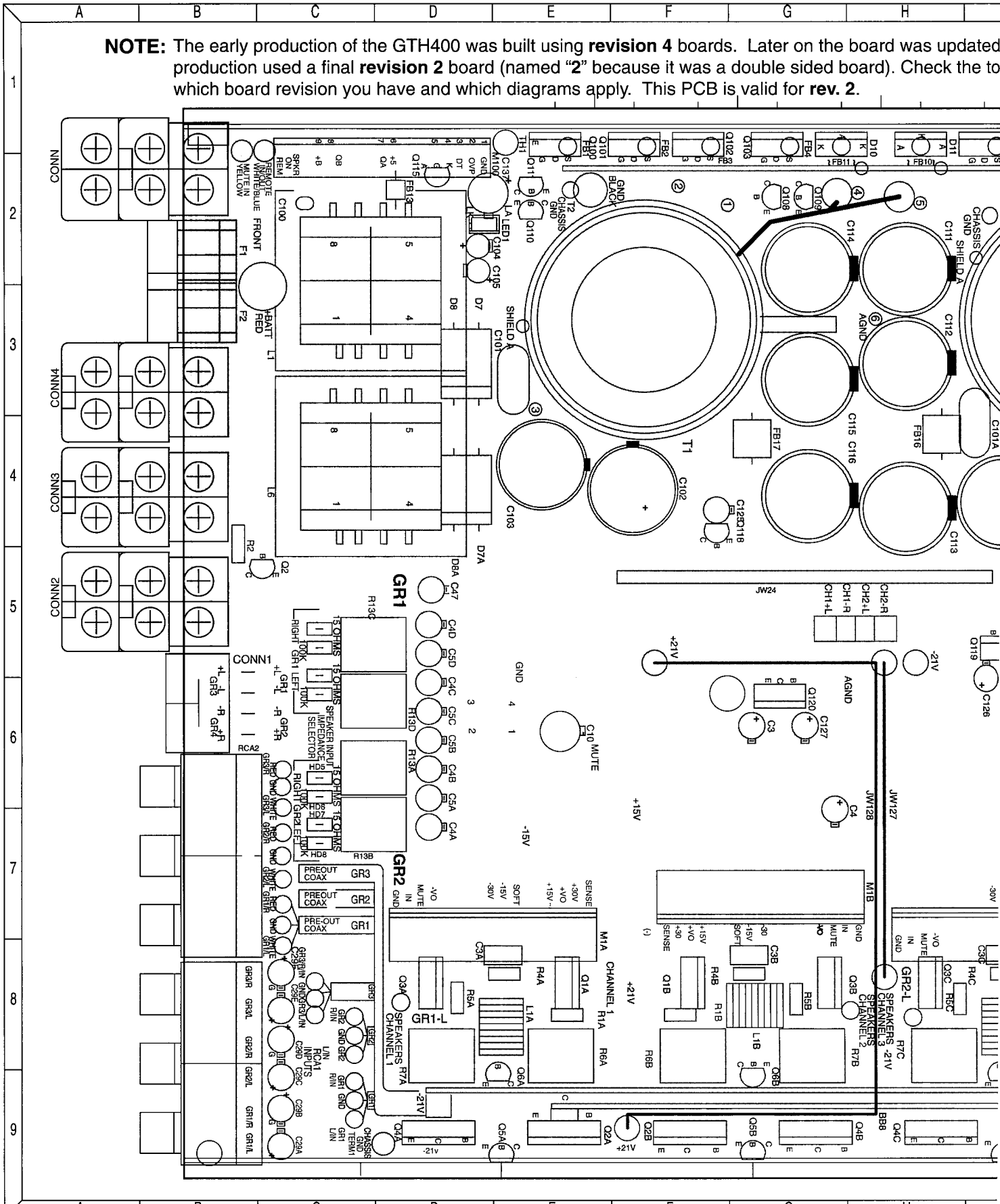


GTH400 Mechanical Parts

Reference Number	Description	Part Number	Quantity
1	FRONT BRACKET FOR GTH400	BR1194	1
2	REAR BRACKET FOR GTH400	BR1192	6
3	BOTTOM PLATE FOR GTH400	BR1193	1
4	HEAT SINK FOR GTH400 14"LENGTH 11" WIDTH	HS1078	1
5	POWER CONNECTOR, 4 POS, 8 AWG 2X-TOP, 2X-BOTTOM	CO1264	1
6	PWR LOWER TERMINAL, LOWER POWER ALUMINUM BAR, AWG 8, GOLD PLATED MATES WITH SUNLAND P/N CO1264 (use screws SC1202. (2) inside to PCB, (2) outside	BR1289	2
7	PWR UPPER TERMINAL, UPPER POWER ALUMINUM BAR, AWG 16, GOLD PLATED. MATES WITH SUNLAND P/N CO1264 (use screws SC1203. (2) inside to PCB, (2) outside	BR1288	2
8	SPEAKER OUTPUT CONNECTOR 2-CH 4 POSITIONS	CO1259	3
9	SPK LOWER TERMINAL, LOWER SPEAKER ALUMINUM BAR, AWG 16, GOLD PLATED. MATES WITH SUNLAND P/N CO1259 (use screws SC1200, (6) inside to PCB, (6) outside	BR1284	6
10	SPK UPPER TERMINAL, UPPER SPEAKER ALUMINUM BAR, AWG 16, GOLD PLATED. MATES WITH SUNLAND P/N CO1259 (use screws SC1200, (6) inside to PCB, use screws SC1201, (6) outside	BR1285	6
11	SC 4-40x 7/16 TAPT-THR, PAN PHI HEAD, NICKEL FSH	SC1090	9
12	FUSE HOLDER	FH1001	1
13	FUSE	FS1059	1
14	SC 1-42x 5/16 TAPPING-THR, PAN PHI HEAD, POINT B , NICKEL FSH	SC1197	4
15	HEADER MOLEX	CO1270	15
16	RCA CONNECTORS	CO1273	2
17	SC M3x1.25x10 PLAS-THR, PAN PHI HEAD, NICKEL FSH	SC1189	4
18	SC 6-32x 1/2 TAPT-THR, PAN PHI HEAD, NICKEL FSH	SC1187	8
19	ALUMINUM BAR 4.8x12.7x40mm	BR1187	6
20	ALUMINUM BAR 4.8x12.7x25.4 MM.	BR1240	5
21	ALUMINUM BAR 4.8x12.7x35.0mm.	BR1250	1
22	SIL PAD INSULATOR TO-220 WITH ADHESIVE 0.750" x 0.500"	SP1072	12
23	SIL PAD INSULATOR TO-3P WITH ADHESIVE 1.000" x 0.750"	SP1073	12
24	SC 6-32x 3/4 CUTT-THR, HEX WASHER HEAD, POINT F, ZINC F	SC1192	12
25	WASHER EXTERNAL TOOTH FOR #6 SCREW ZINC FINISH	WA1049	12
26	CLAMP FOR PHONE JACK	BR1249	1
27	PHONE CONNECTOR	CO1284	2
28	GROUND HARNESS	UA0007	2
29	SC 4-40x 1/4 TAPT-THR, FLAT PHI HEAD, ZINC FSH	SC1188	6
30	SC 6-32x 3/8 TAPTITE, HEX WASHER HEAD, ZINC FSH	SC1194	2
31	LED RED DIFUSED (TRIANGLE SHAPE)	LE1029	1
32	LED HARNESS FOR GTH400	XX1212	1
33	SPACER 1/4" ROUND 3/16"LENGHT ALUMINUM	ST1018	2
34	SILICONE FOAM WITH ACRYLIC PRESSURE SENSITIVE ADHESIVE 3/8"Lx1/4"W,GRAY,(3/16"T)	SP1020	6
	SC 6-32x 1/4 HEX SOCKET SET SCREW,FLAT POINT,ALLOY STEEL, GOLD FLASH. SPK LOWER (6) INSIDE SPK (12)	SC1200	18
	SC 6-32x 3/8 HEX SOCKET SET SCREW,FLAT POINT,ALLOY STEEL, GOLD FLASH. SPK UPPER (6)	SC1201	6
	SC 8-32x 1/4 HEX SOCKET SET SCREW, FLAT POINT,ALLOY STEEL, GOLD FLASH. PWR LOWER INSIDE/OUTSIDE	SC1202	4
	SC 5/16-18 X 3/8 HEX SOCKET SET SCREW, FLAT POINT, ALLOY STEEL, GOLD FLASH (UPPER POWER IN/OUT)	SC1203	4
	SILICONE SPONGE WITH ACYRILC PRESSURE SENSITIVE ADHESIVE 1"L x 1/2"W x 1/8"T ORANGE	SP1076	10
	SILICONE GREASE #340 DOW	MS1004	0.25OZ

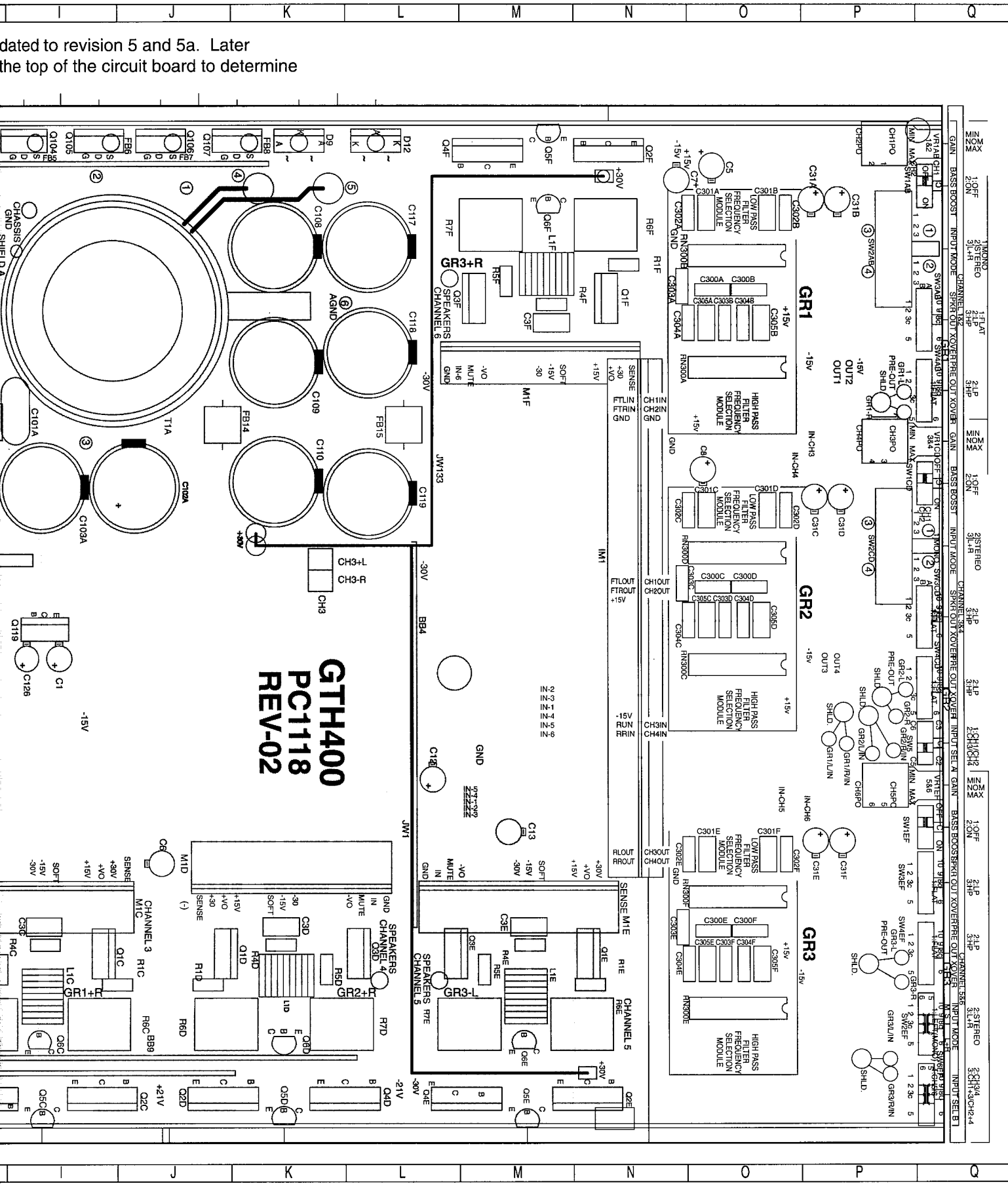
GTH400 PCB Rev 2 *Double Sided Board* (T

NOTE: The early production of the GTH400 was built using **revision 4** boards. Later on the board was updated production used a final **revision 2** board (named "**2**" because it was a double sided board). Check the to which board revision you have and which diagrams apply. This PCB is valid for **rev. 2**.



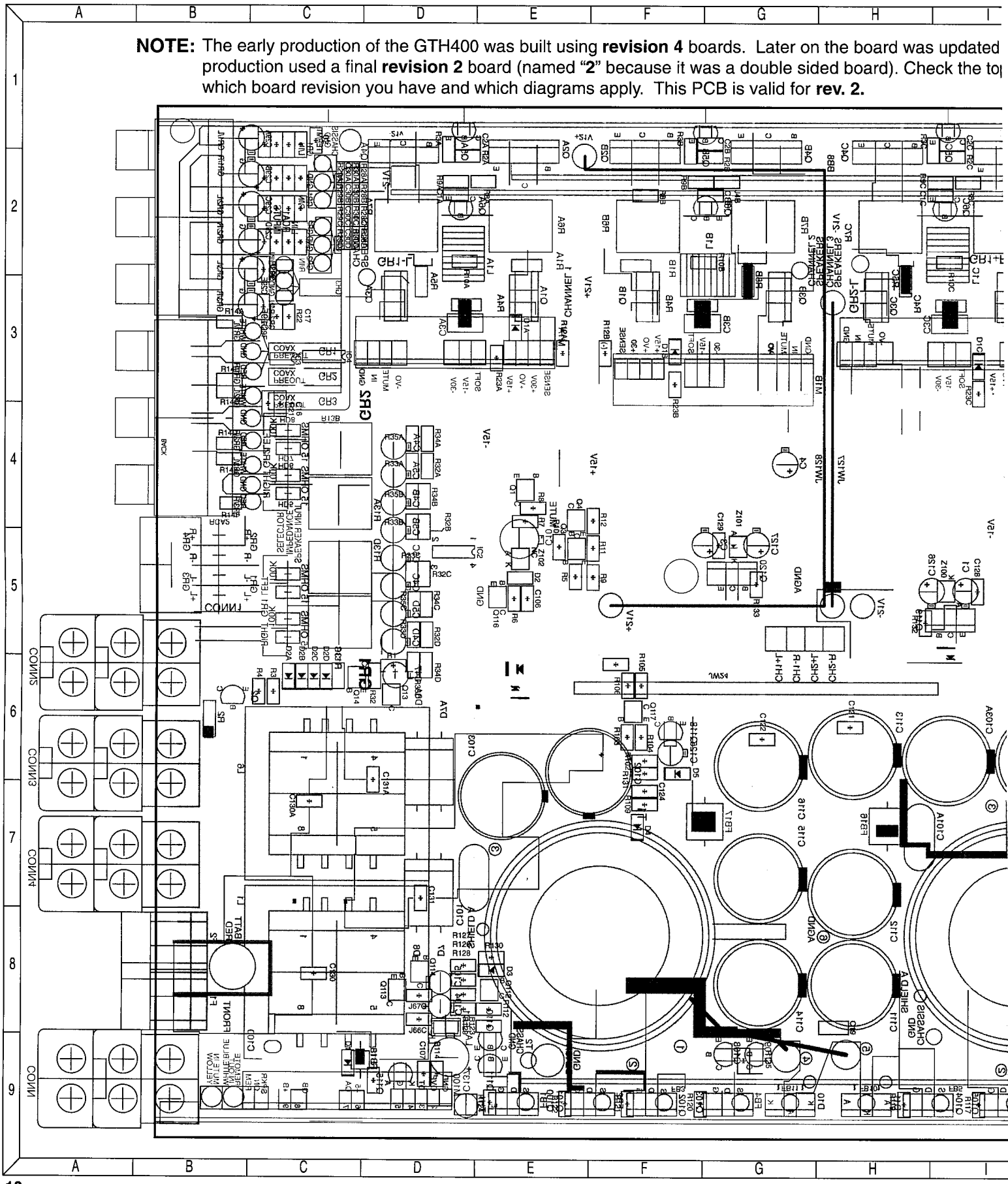
rd (Top Side viewing traces through the board)

dated to revision 5 and 5a. Later
the top of the circuit board to determine



GTH400 PCB Rev 2 *Double Sided Boa*

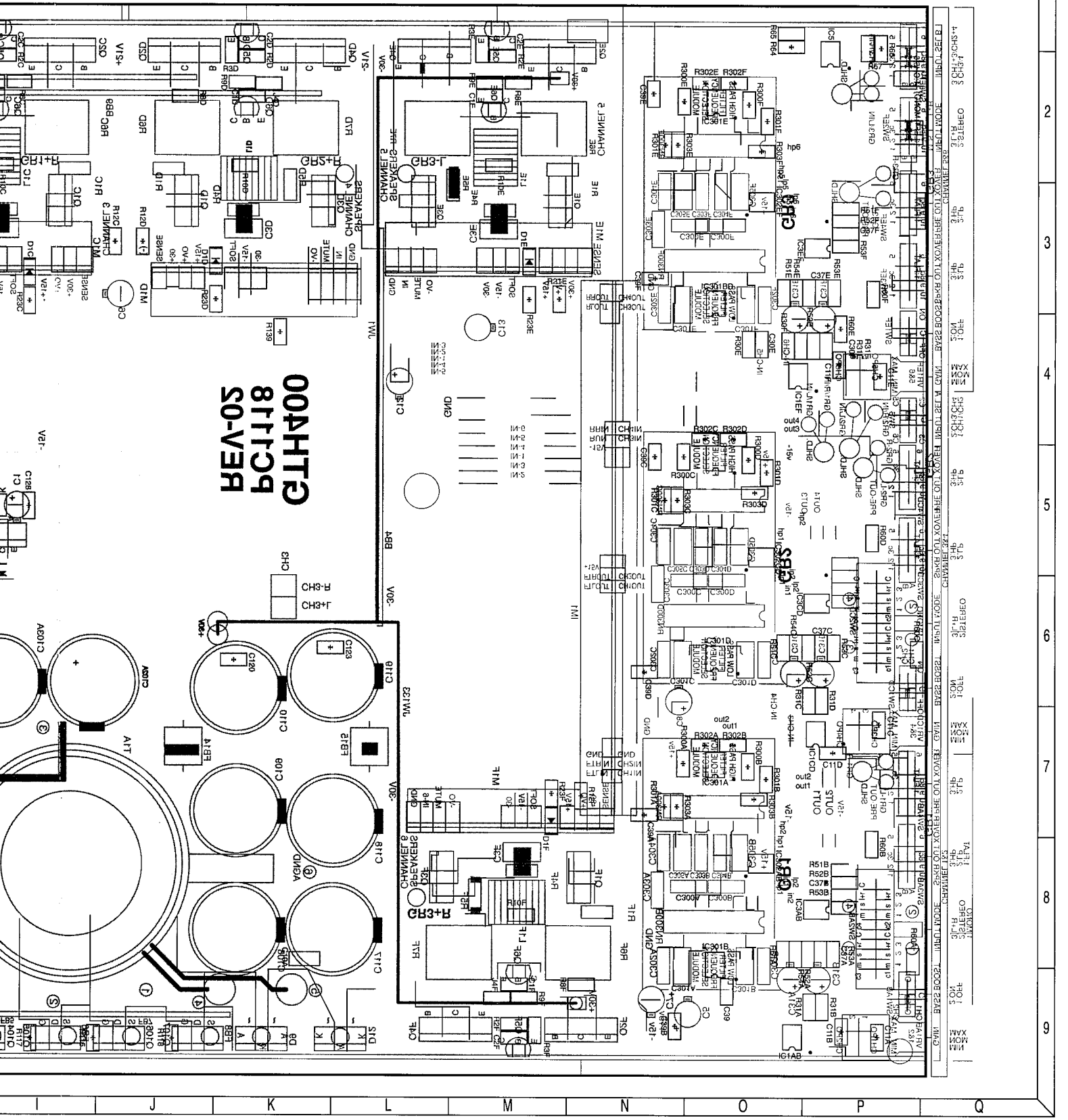
NOTE: The early production of the GTH400 was built using **revision 4** boards. Later on the board was updated
production used a final **revision 2** board (named "**2**" because it was a double sided board). Check the to
which board revision you have and which diagrams apply. This PCB is valid for **rev. 2.**



d Board **(Bottom Side)** Viewed from the bottom

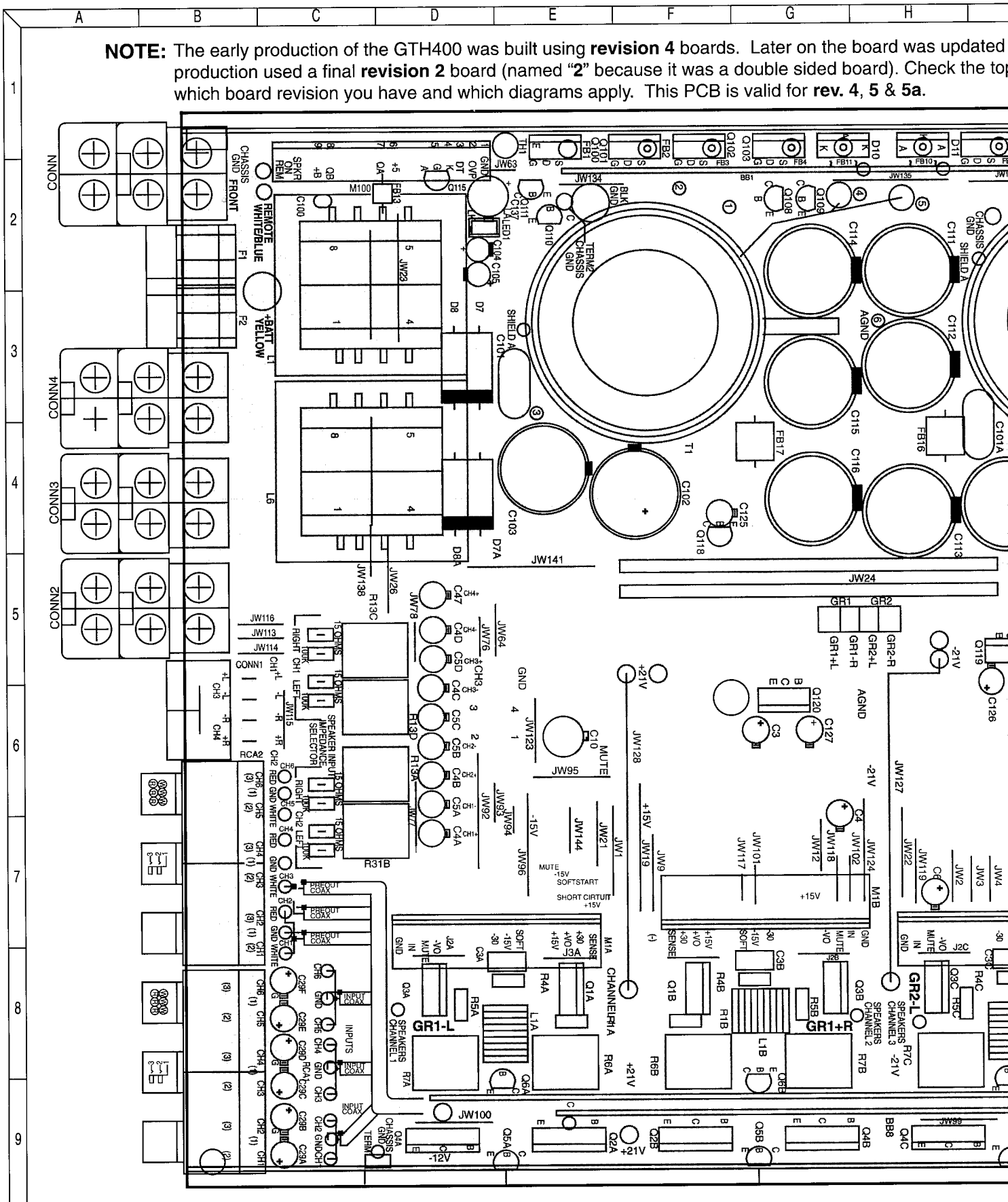
pdated to revision 5 and 5a. Later
k the top of the circuit board to determine

NOTE: The Items in This Orange color are the top Silk Screen as seen through the board.



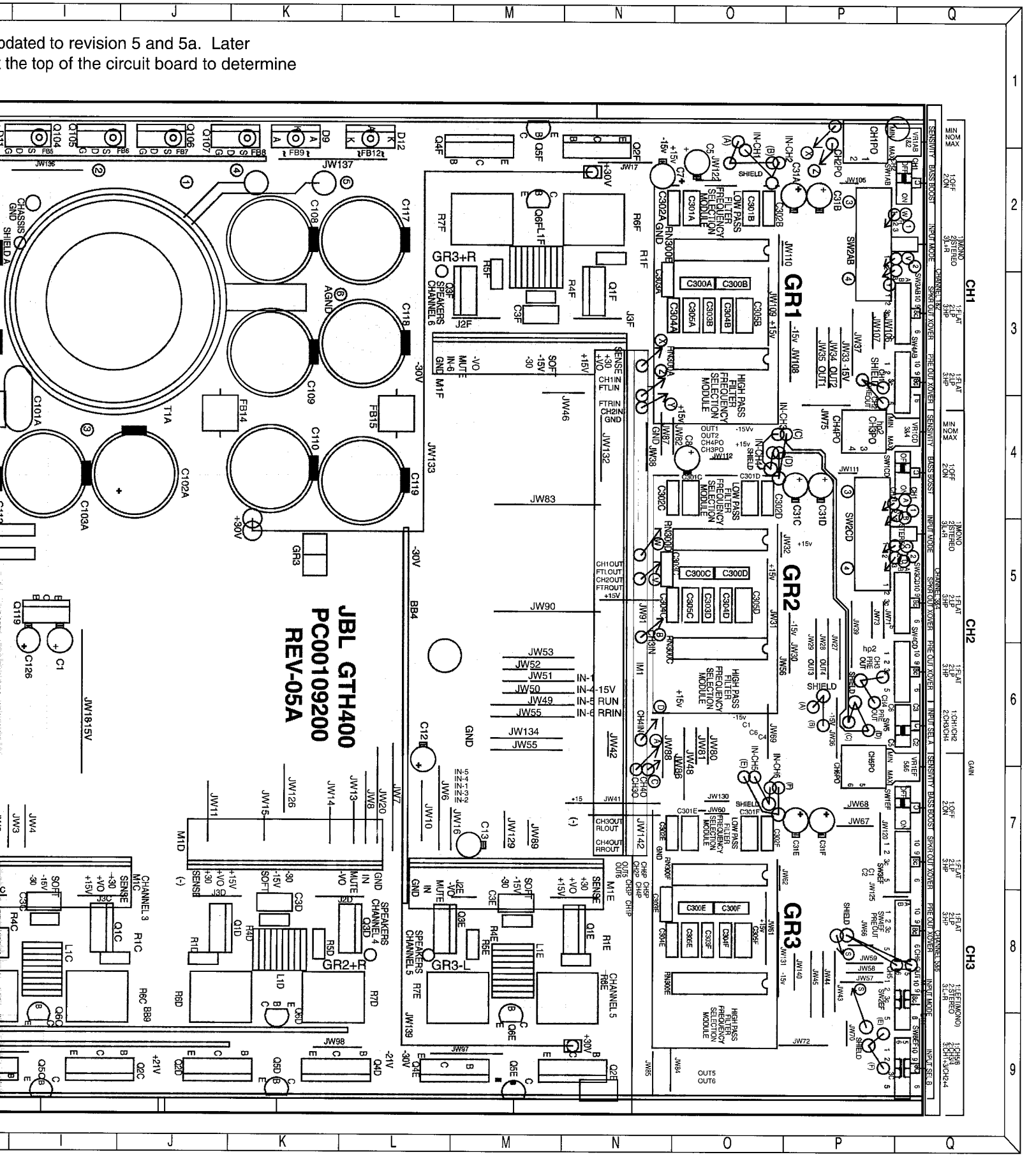
GTH400 PCB's Rev 5a (Top Side

NOTE: The early production of the GTH400 was built using **revision 4** boards. Later on the board was updated production used a final **revision 2** board (named "**2**" because it was a double sided board). Check the top which board revision you have and which diagrams apply. This PCB is valid for **rev. 4**, **5** & **5a**.

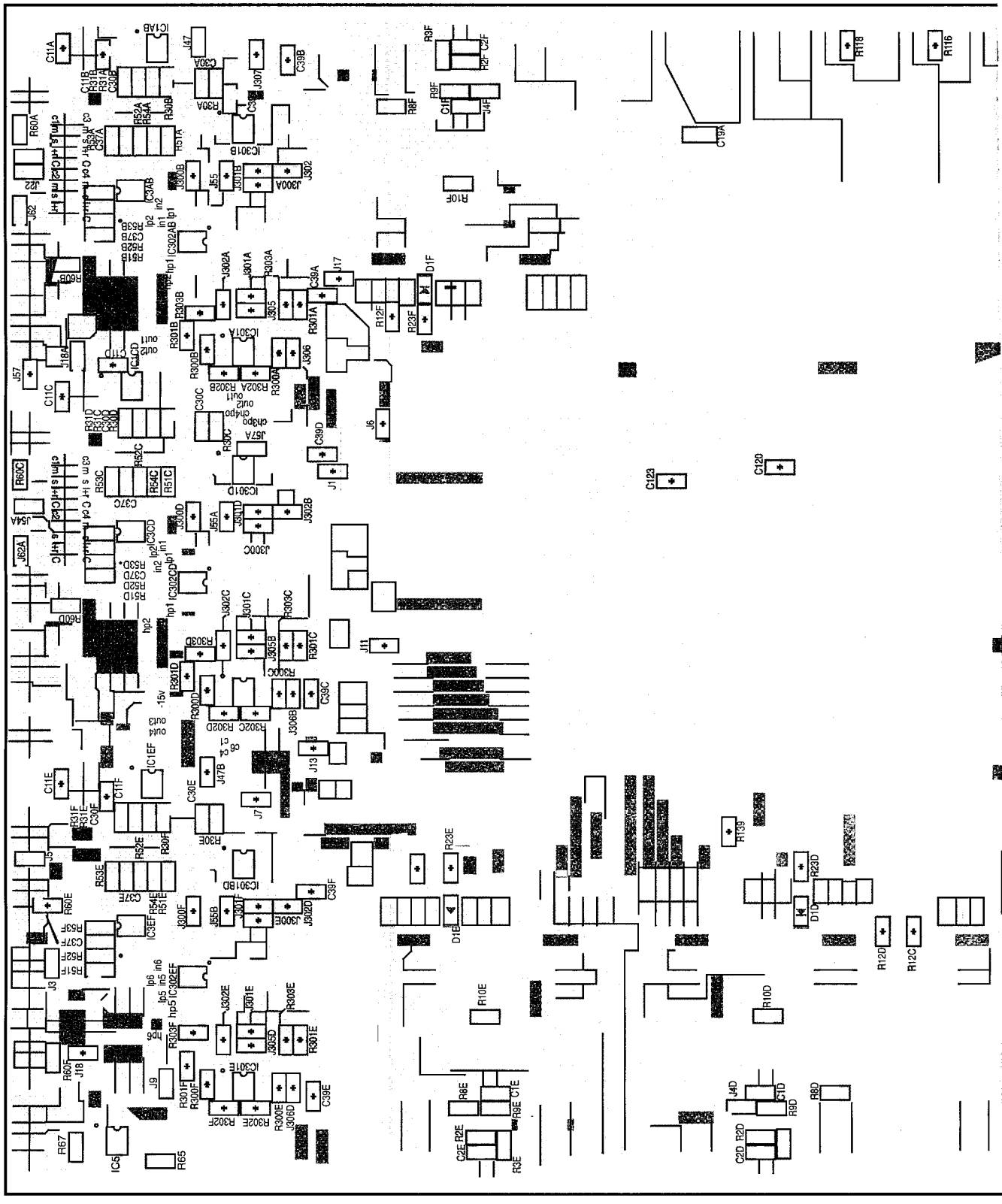


Side viewing traces through the board)

odated to revision 5 and 5a. Later
the top of the circuit board to determine



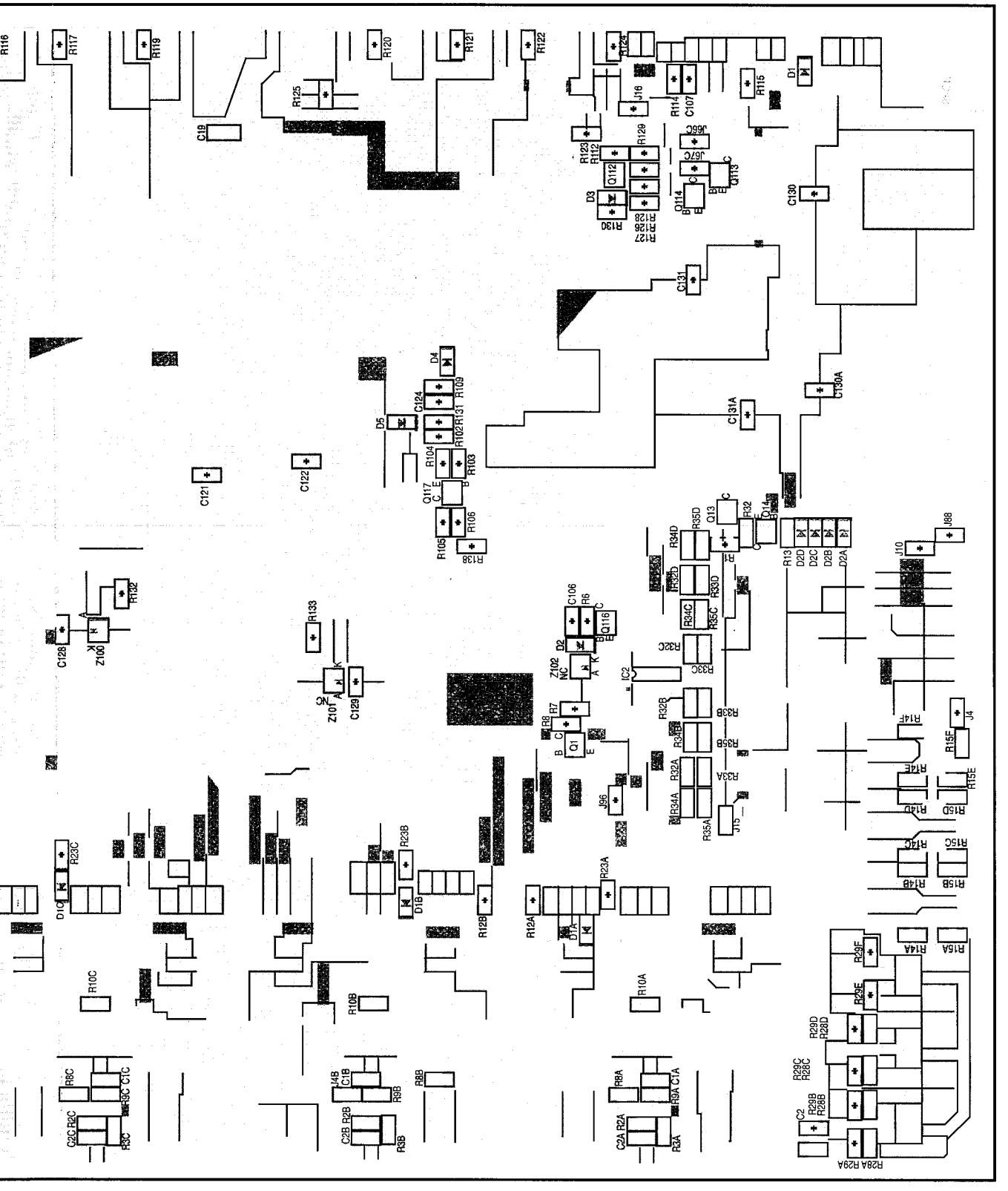
NOTE: The early production of the GTH400 was built using **revision 4** boards. Later on the board was updated production used a final **revision 2** board (named "**2**" because it was a double sided board). Check the to which board revision you have and which diagrams apply. This PCB is valid for **rev. 4**, **5** & **5a**.



Bottom Side) Viewed from the bottom

I	J	K	L	M	N	O	P	Q

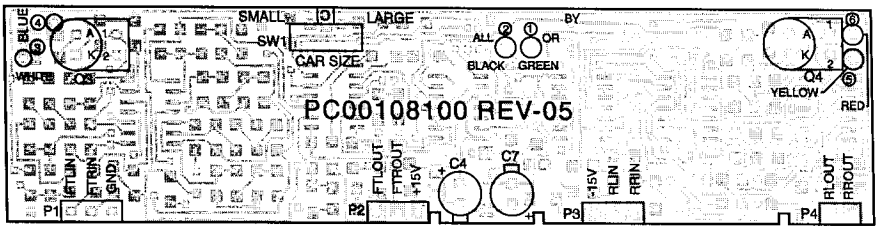
odated to revision 5 and 5a. Later
the top of the circuit board to determine



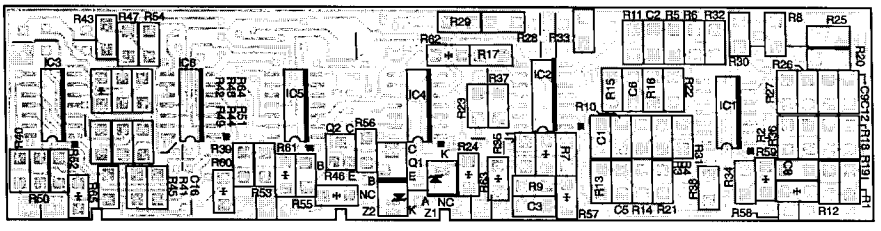
I	J	K	L	M	N	O	P	Q

Small PCB's

Imaging Enhancer PCB (Double Sided)

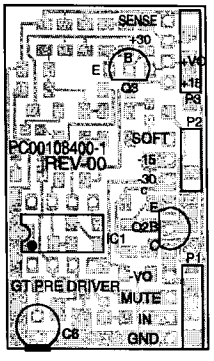


Top Side viewing traces through the PCB

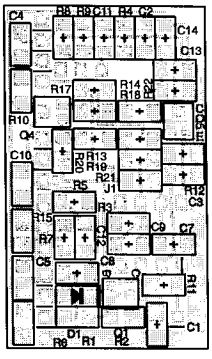


Bottom Side

GT Pre-Amp Driver PCB (Single Sided)

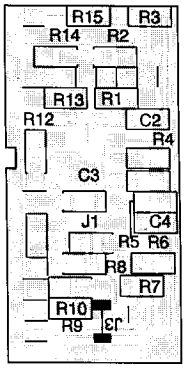


Top Side viewing traces through the PCB

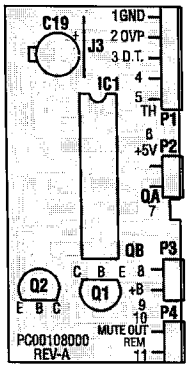


Bottom View

PWM PCB Module (Single Sided)



Top Side viewing traces through the PCB



Bottom View

GTH400 Electrical Parts List

Reference Number	Description	Part Number	Quantitiy
BB8, BB9	BUS BAR 7"+5"	BR1247	1
BB4	BUS BAR 3"	BR1248	1
BB1	BUS BAR 5.33" LENGTH	BR1265	1
FB1 - FB13	FERRITE BEAD	CC1028	1
HD1 - HD8	PIN HEADER STRAIGHT 2-POSITION 0.100" SPACING	CO1258	8
CONN1	RIGHT ANGLE HEADER, 8 CIRCUITS DUAL ROW, MOUNTING PEGS, TIN PLATED TERMINALS, 94V-2	CO1270	1
RCA1, RCA2	CONNECTOR RCA JACK 6-POSITION PC MOUNT RIGHT ANGLE, GOLD PL. RED-TOP WHITE-BOTTOM	CO1273	2
RN300A, 300B, 300C, 300D, 300E, 300F	CONNECTOR IC SOCKET 14-PIN	CO1277	6
LED1	CONNECTOR HEADER STRAIGHT 2-POSITION	CO1284	1
HD2, 4, 6, 8	CONNECTOR JUMPER 0.1" 2-POS.	CO1285	4
F1, 2	FUSE HOLDER RIGHT ANGLE PC MOUNT (FOR AUTO FUSE	FH1001	2
F1, 2	FUSE AUTO 30A/32 V	FS1059	2
D9-D12, TH1, Q100-Q107,	SLEEVING SHRINK TUBI. 3/64" 105 °C BLACK PVC	IM1143	0.477FT
RN1, 2, 3, 4, 5,	LABEL FOR CROSSOVER NETWORK	LB1231	6
1M1	MODULE IMAGE PROCESSOR	MA0006	1
M1A, 1B, 1C, 1D	MODULE AUDIO DRIVER	MA0011	4
M1E, M1F	MODULE AUDIO DRIVE CH5,6	MA0024	2
	T/R PIN-1 ON FEED HOLE SIDE *(JRC NJM5532M-TE3)		
	NYLON, SELF LOCKING CABLE TIE 3" LENGTH, 0.1" WIDTH, 0.625" DIA. NATURAL COLOR	MS1065	4
	PC BOARD MAIN GTH400 118.15 SQ.IN. CEM-1 1-SIDED	PC1092	1

Capacitors

C101, 101A	CAP. POLY FIL 1.00 µF ±10% 50V RADIAL T/R LS=5.0 mm	CP1126	2
C301A, 301B, 301C, 301D, 301E, 301F, 305A, 305B, 305C, 305E, C305D, C305F	CAP. POLY FIL 0.22 µF 5% 63V 85 DEG C T/R RADIAL METALLIZED LS=5mm	CP1177	12
C304A, 304B, 304C, 304D, 304E, 304F	CAP. POLY FIL 0.022µF 5% 63V 85 DEG C T/R RADIAL LEAD METALLIZED LS=5mm	CP1178	6
C1, 3, 4, 5, 6, 7, 8, 12, 13, 125, 126, 127.	CAP. ALUM EL. 22.00 µF ±20% 25V 5X11 RADIAL AMMOPACK F=2.5mm LS=2.5mm	CP1352	12
C102, 102A, 103, 103A, 111, 112, 113, 114, 115, 116	CAP. ALUM EL. 2200.00µF ±20% 25V 105°C RADIAL LEAD	CP1355	10
C137	CAP. ALUM EL. 100.00 µF ±20% 16V 85°C A/P RADIAL LEAD 6.3 X 7 T/R LS=2.0mm F=2.5mm	CP1411	1
C4A, 4B, 4C, 4D, 5A, 5B, 5C, 5D, 47, 104, 105,	CAP. ALUM EL. 2.20 µF ±20% 50V 85°C A/P RADIAL LEAD 4 X 7 T/R LS= 1.5mm, F=2.5mm	CP1415	11
C1A-1F, 2A-AF, 2, 9, 39, 106, 107, 120-124, 128-131, 130A, 131A, 39A-39F	CAP. CERAMIC 0.10 µF ±20% 50V Z5U T/R 1206 PKG.	CP1426	34
C100,	CAP. POLY FIL 0.10 µF ± 5% 63V 85°C T/R RADIAL LEAD METALLIZED LS=5mm	CP1495	1
C30A, 30B, 30C, 30D, 30E, 30F	CAP. CERAMIC 100.00 pF ±10% 50V X7R T/R 1206	CP1496	6
C108, 109, 110, 117, 118, 119	CAP. ALUM EL. 1800.00 µF ±20% 35V V 105°C T/R RADIAL LEAD I RIPPLE MIN=2A, 18X25, BULK	CP1525	6
C302A, 302B, 302C, 302D, 302E, 302F	CAP. POLY FIL 0.015µF ±5% 63V 85°C T/R RADIAL LEAD METALLIZED LS=5mm	CP1534	6
C300A - 300F, C303A - 303F	CAP. POLY FIL 0.082µF ±5% 63V 85°C T/R RADIAL LEAD METALLIZED LS=5mm	CP1535	12
C3A, 3B, 3C, 3D, 3E, 3F	CAP. POLY FIL 0.047µF ± 5% 63V V 85°C T/R RADIAL LEAD F=5.0 mm	CP1539	6
C11A - C11F	CAP. CERAMIC 10.00 pF ± 5%	CP1542	6
C19, 19A	CAP. CERAMIC 0.10 µF ±20% 100V Z5U T/R 1210 PKG.	CP1552	2
C10	CAP. ALUM EL. 330.00 µF ±20% 16V 85°C T/R RADIAL LEAD 8mmx11.5mm, F=5mm	CP1562	1
C31A, 31B, 31C, 31D, 31E, 31F, 29A, C29F, 29B, 29C, 29D, 29E	CAP. ALUM EL. 22.00 µF ±20% 10 V 85°C T/R RADIAL LEAD	CP1565	12
C37A, B, C, D, E, F.	CAP.F/CHIP CER. 0.047 µF ±10% 50V X7R T/R SMD1206	CP1566	6

Diodes

D7, 7A, 8, 8A	RECTIFIER DIODE 3A/200V MAX, 100V MIN, T/R AXIAL TAPE SPACE= 52.4mm *(GI 1N5401), (TAITRON 1N5401)	DI1005	4
D9, 10	DUAL RECTIFIER 100V 16A COMMON CATHODE *(G.I. FEP16BT/CT), (D.I. SF162C)	DI1053	2
D11, 12	DUAL RECTIFIER 100V 16A COMMON ANODE *(G.I. FEN16BT/CT), (D.I. SF162A)	DI1054	2
D1, 1A, 1B, 1C, 1D,1E, 1F, 2, 2A, 2B, 2C, 2D, 3, 4, 5	DI,RECTIF SWCH 80V/15mA MELF OR LL-34 PKG. T/R CATHODE ON HOLE SIDE 2500 PCS/REEL (SMD) *(SANYO LFBO1-CTI), (ROHM RLS4148-TE11)	DI1132	15
Z100, 101	DI,ZENER 15V/200mW/ 5% CP OR SOT-23 PKG. T/R 1-PIN SIDE ON FEED HOLE SIDE (SMD) *(SANYO DZD15-TB), (KEC Z02W15-RTR)	DI1150	2
Z102	DI,ZENER 16V/200mW/ 5% CP or SOT-23 PKG. T/R 1-PIN SIDE ON FEED HOLE SIDE (SMD) *(SANYO DZD16-TB), (KEC Z02W16-RTR)	DI1167	1

Reference Number	Description	Part Number	Quantitiy
Intergrated Circuits			
IC3AB, IC3CD, 3EF, 5, 301C, 301D, 301A, 301B, 301F, 302CD, 302EF	IC DUAL LOW-NOISE JFET-INPUT OP-AMP. 0° TO 70°C, SMD SO-8 OR DMP-8 PKG. TAPE & REEL PIN-1 SIDE ON FEED HOLE SIDE	IC1041	13
IC2	IC QUAD LOW NOISE J-FET-INPUT OP-AMP, 0°C to 70°C, SMD, S0-14 OR DMP-14 PKG. T/R PIN-1 SIDE ON FEED HOLE SIDE *(T.I. TL074CDR), (SGS-THOMSON TL074CDT)	IC1162	1
IC1AB, IC1CD, IC1EF	IC HIGH PERFORMANCE DUAL LOW-NOISE OP-AMP SMD DMP-8 PKG	IC1175	3
Resistors			
VR1AB, VR1CD, VR1EF	RES.POT.100.00 KΩ DUAL GANG DETENT AT CENTER-15K,A TAPER, SHAFT LENGHT=8mm DIA.=3mm SLOT STYLE,BUSHING=6mm; WITHOUT TAP	RS1227	3
R4A, 4B, 4C, 4D	RES. C/F 68.00 Ω 5% 1/4W T/R OR AMMOPACK.	RS1385	4
R29A, 29B, 29C, 29D, 29E, 29F, 106, 114, 126, 129, R132, 133	RES. F/CHIP 1.00 KΩ 5% 1/8W T/R 1206 PKG.	RS1700	2
R1, R6, 8, R8E, 8F, 23A, 23B, 23C, 23D, 23E, 23F, 32, 64-67, 104, 105, R130, 138,	RES. F/CHIP 10.00 KΩ 5% 1/8W T/R 1206 PKG	RS1701	20
R7, 13, 103, 112	RES. F/CHIP 100.00 KΩ 5% 1/8W T/R 1206 PKG.	RS1702	4
R14A, 14B, 14C, 14D, 14E, 14F, 31A, 31B, 31C, 31D, 31E, R31F, 109, 131	RES. F/CHIP 2.20 KΩ 5% 1/8W T/R 1206 PKG.	RS1703	14
R28A, 28B, 28C, 28D, 30A, 30B, 30C, 30D, 30E, 30F, 51A	RES. F/CHIP 22.00 KΩ 5% 1/8W T/R 1206 PKG	.RS1704	11
R51B, 51C, 51D, 51E, 51F, 300A, R300E, 300F 300B, 300C, 300D,	RES. F/CHIP 22.00 KΩ 5% 1/8W T/R 1206 PKG.	RS1704	11
R102, 115, 9A, 9B, 9C, 9D, 9E, 9F, R8A, 8B, 8C, 8D	RES. F/CHIP 4.70 KΩ 5% 1/8W T/R 1206 PKG	RS1705	12
R139, 301A, 301B, 301C, 301D, R12A - 12F, 301E,301F	RES. F/CHIP 47.00 KΩ 5% 1/8W T/R 1206 PKG.	RS1706	13
R52A, 52B, 52C, 52D, 52E, 52F, 53A, R53F, 54A, 53B, 53C, 53D, 53E, 54C, 54E	RES. F/CHIP 43.00 KΩ 5% 1/8W T/R 1206 PKG.	RS1712	15
R303A, 303B, 303C, 303D, 303E, 303F	RES. F/CHIP 56.00 KW 5% 1/8W T/R 1206 PKG.	RS1713	6

Reference Number	Description	Part Number	Quantitiy
R123, 125	RES. F/CHIP 470.00 Ω 5% 1/8W T/R 1206 PKG.	RS1722	2
R302A, 302B, 302C, 302D, 302E, 302F	RES. F/CHIP 27.00 KΩ 5% 1/8W T/R 1206 PKG	.RS1726	6
R127, 128	RES. F/CHIP 270.00 KΩ 5% 1/8W T/R 1206 PKG.	RS1730	2
R15A, 15B, 15C, 15D, 15E, 15F	RES. F/CHIP 330.00 Ω 5% 1/8W T/R 1206 PKG.	RS1731	6
J1-10, 15-18, 18A, 4B, 4D, 4F, 22, 47, 96, 47B, 54A 55,55A, 55B, 57, 57A, 62, 62A, 66C, 67C, 88, 302	RES. F/CHIP 0.00 W 5% 1/8W 1206 T/R	RS1779	34
J300A, 300B, 300 300D, 300E, 300F, 301A, 301B, 301C, 301D, 301E, 301F, 302A, 302B, 302C, 302D, 302E	RES. F/CHIP 0.00 Ω 5% 1/8W 1206 T/R	RS1779	17
J305B, 305D, 306, 306B, 306D, 307, 305	RES. F/CHIP 0.00 Ω 5% 1/8W 1206 T/R	RS1779	7
R60A, 60B, 60C, 60D, 60E, 60F	RES. F/CHIP 200.00 Ω 5% 1/8W T/R 1206	RS1830	6
R2A, 2B, 2C, 2D, 2E, 2F	RES. F/CHIP 7.50 KΩ 5% 1/8W T/R 1206	RS1831	6
R6A, 6B, 6C, 6D, 6E, 6F, 7A, 7B, 7C, 7D, 7E, 7F	RES. WIRE WO. 0.10 Ω 5% 5.0W RADIAL LS=5mm	RS1868	12
R13A, 13B, 13C 13D	RES.WIRE WO. 15.00 5 % 5.0W WELDED CONSTRUCTION, RADIAL LS=0.200 BULK	RS1869	4
R32A, 32B, 32C, 32D, 33A, 33B, 33C, R34D, 35A, 33D, 34A, 34B, 34C, 35B, 35C, 35D	RES. F/CHIP 51.00 KΩ 5% 1/8W T/R 1206	RS1872	16
R3A, 3B, 3C, 3E, 3D, 3F.	RES. F/CHIP 4.30 KΩ 5% 1/8W T/R 1206	RS1877	6
R10A, 10B, 10C, 10D, 10E, 10F	RES. F/CHIP 10.00 Ω 5% 1/8W T/R 1206	RS1878	6
RN300A, 300B, 300C, 300D, 300E, 300F	RESISTOR NETWORK 7-ISOLATED 33 KOHM RESISTORS 2% DIP-14 SPECIAL MARKING	RS1900	6
R4E, 4F	RES. C/F 33.00 Ω 5% 1/4W T/R OR AMMOPACK.	RS1902	2
R116 - 122, 124	RES. F/CHIP 47.00 Ω 5% 1/8W T/R 1206	RS1903	8
R1A, 1B, 1C, 1D R5A, 5B, 5C, 5D, 1E, 1F, 5E, 5F	RES. C/F 5.10 Ω 5% 1/4W T/R AXIAL OR AMMOPACK.	RS1916	12
Switches			
SW1AB, 1CD, 1EF, 5	NON SHORTING HORIZONTAL MICRO-SLIDE SWITCH, 2P2T, 3.5mm MTG. HEIGHT, 2.5mm TERMINAL LENGTH *(PANASONIC ESD11H220)	SW1011	4

Reference Number	Description	Part Number	Quantitiy
3AB, 4AB, 3CD, 4CD SW3EF, 2EF, 4EF, 6EF	NON SHORTING HORIZONTAL MICRO-SLIDE SWITCH, 2P3T, 3.5mm MTG. HEIGHT, 2.5mm TERMINAL LENGTH. *(PANASONIC ESD-11H230)	SW1013	8
SW2AB, SW2CD	NON SHORTING HORIZONTAL SLIDE SWITCH 4P3T FRAME TYPE	SW1059	2
Transistors			
TH1	NTC THERMISTOR 10K OHM @ 25°C RADIAL *(FENWAL 142-103LAG-RB1), (BETATHERM 10.K3A2)	TH1006	1
Q108, 110	PNP SIGN 40V/600mA TO-92 T/R GENERAL PURPOSE LS=5.0mm *(MOTOROLA MPS2907ARLRA), (NATIONAL PN2907ARA)	TR1010	2
Q2A, 2B, 2C, 2D	NPN TRANSISTOR 15A 70V *(SGS TIP3055), (MOSPEC TIP3055)	TR1041	4
Q4A, 4B, 4C, 4D	PNP TRANSISTOR 15A 70V *(SGS TIP2955), (MOSPEC TIP2955)	TR1048	4
Q2E, 2F	TRANSISTOR NPN, 100V, 25A, HFE MIN=10 (15A,4V), TO-218 PKG POWER TRANSISTOR *(SGS TIP35C), (MOSPEC TIP35C)	TR1057	2
Q4E, 4F	TRANSISTOR PNP 100 V, 25A, HFE MIN=10 (15 A 4 V), TO-218 PKG. POWER TRANSISTOR *(SGS TIP36C), (MOSPEC TIP36C)	TR1061	2
Q5A, 5B, 5C, 5D, 5E, 5F, 109, 111, 118	NPN SIGN 40V/600mA TO-92 T/R 1W *(MOTOROLA MPS2222ARLRA), (NATIONAL PN2222ARA)	TR1063	9
Q112, 113, 114	NPN AF 30V/ 150mA CP OR SMT 200 ≤ B≤ 400 T/R 2-PIN SIDE ON FEED HOLE SIDE (SMD) *(SANYO 2SC4639-6-TA), (ROHM 2SC2412K-T147Q/R)	TR1108	3
Q116, 117	PNP AF 30V/150mA CP OR SOT-23 OR SMT 200 ≤ B ≤ 400 2PIN SIDE ON FEED HOLE SD(SMD) *(SANYO 2SA1781-6-TA), (PHILIPS BC858B)	TR1125	2
Q1, 13, 14	NPN SWCH 50V/100mA 10K/— CP OR SMT T/R 2-PIN SIDE ON FEED HOLE SIDE (SMD) *(SANYO 2SC3859-TA), (ROHM DTC114TK-T147)	TR1131	3
Q100, 101, 102, 103, 104, 105, 106, 107	FET POWR 60V/35A/0.028 OHM TO-220 PKG. *(I.R. IRFZ44), (MOTOROLA IRFZ44)	TR1157	8
Q6A, 6B, 6C, 6D, 6E, 6F	NPN SIGN 160V/60mA/ 625mW TO-92 T/R *(MOTOROLA 2N5551RLRA), (NATIONAL 2N5551RA{TR})	TR1167	6
Q1A, 1B, 1C, 1D, 1E, 1F, 120	NPN POWR 100V/ 3A/ 40W TO-220 *(SGS TIP31C), (SAMSUNG TIP31C)	TR1183	7
Q3A, 3B, 3C, 3D, 3E, 3F, 119	PNP POWR 100V/ 3A/ 40W TO-220 *(SGS TIP32C), (SAMSUNG TIP32C)	TR1184	7
Q115	SCR TO 92 PACKAGE T/R *(MOTOROLA MCR22-2 RLRA), (MOTOROLA MCR22-2)	TY1000	1

Reference Number	Description	Part Number	Quantitiy
Inductor Magnetics			
L1A, L1B, L1C, L1D, L1E, L1F 00-MI1100,	INDUCTOR AIR CORE 0.38uH ASSY.	UA0087	6
L1, L6 00-MI1095	COMMON MODE INDUCTOR	UA0089	2
CH2-CH1 IN CH2-CH1 OUT	COAXIAL CABLE ASSEMBLY 18.25"	UA0094	2
CH6-CH5 OUT	COAXIAL CABLE ASSEMBLY 14.5"	UA0095	1
T1	POWER TRANSFORMER FOR GTH400 ASSY.	UA0098	1
T1A	POWER TRANSFORMER GTH400 ASSY.	UA0100	1
Miscellaneous			
CH4-CH3 IN CH4-CH3 OUT	COAXIAL CABLE ASSY. 16.4"	UA0104	2
CH6-CH5 IN	COAXIAL CABLE ASSEMBLY 13.25"	UA0106	1
L2, L3, L4, L5	FERRITE BEAD ASSEMBLY	UA0160	4
JW1-23, 26-125, 127-133, 138, 140, 2A, 2B, 2C, 2D, 2E, 2F, 3A, 3B, 3C, 3D, 3E, 3F, JW126	WIRE AWG22, SOLID, ELECTROLYTIC, SOFT DRAWN AND ANNEALED TIN-PLATED COPPER.	WI1553	24.5
C, B, Y	WIRE #22 SOLID UL VW-1 BLUE PVC INSULATED, UL1007.	WI1560	1FT.
A, V, Z	WIRE #22 SOLID UL VW-1 RED PVC INSULATED, UL1007	WI1563	1FT.
D, W, X	WIRE #22 SOLID UL VW-1 WHITE PVC INSULATED, UL1007	WI1564	1FT.
	WIRE #18 7x26 UL1015 BLUE THERMOPLASTIC INSULATION, TINNED, COPPER STRANDED 105°	WI1574	0.66FT.
JW134, 135, 136, 137, 139, 141, CH5+30, CH6+30	WIRE #16 SOLID UL1007 GREEN	WI1623	1.35FT.
SPEAKERS CH1, 2, 3, 4, 5, 6	WIRE #18 16x30 , DUAL, CLEAR 300V 60°C , 1 COND. TINNED, 1 COND. BARE	WI1624	4.275FT.
	WIRE #16 26x30, DUAL, CLEAR 300V °C , 1 COND. TINNED, 1 COND. BARE	WI1625	2.708FT.
JW24, 25	WIRE #14,NO-INSULATED,SOLID, TINNED.	WI1626	0.6FT.
POWER (+)	WIRE #8 19/21 WHITE, RED OR YELLOW, TEM. RATING: +125°C	WI1634	0.25FT.
WI1635	WIRE #8 19/21 BLACK TEM. RATING +125°C	POWER (-)	0.42FT.
CHASSIS GND	HARNESS GROUND (X 2)	XX1198	2
XX1212	LED HARNESS FOR GTH400	DS1	1

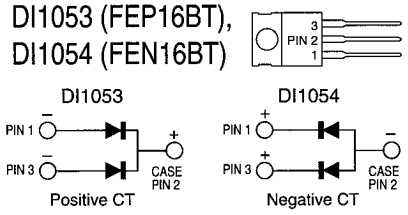
* Manufacturer and Manufacturer's Part Number

PWM MODULE (MA0007)

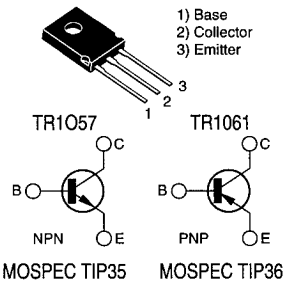
REFERENCE DESIGNATOR	DESCRIPTION	PART NUMBER	QNTY.
Capacitors			
C1	CAP. CERAMIC 2700.00 pF ±10% 100V X7R T/R 1206 PKG.	CP1434	1
C2, 3, 4	CAP. CERAMIC 0.10 µF ±20% 50V Z5U T/R 1206 PKG	CP1426	3
C19	CAP. ALUM EL. 22 µF ±20% 10V 85°C A/P RADIAL LEAD 5 X 11 T/R LS=2.0mm, F=2.5mm	CP1565	1
Integrated Circuits			
IC1	PWN CONTROL MODULE 16 PIN DIP	IC1002	1
Resistors			
R1	RES. F/CHIP 10.00 Ω 5% 1/8W T/R 1206	RS1878	1
R2	RES. F/CHIP 1.00 KΩ 5% 1/8W T/R 1206 PKG.	RS1700	1
R3	RES. F/CHIP 510.00 Ω 5% 1/8W T/R 1206 PKG.	RS1733	1
R4	RES. F/CHIP 6.80 KΩ 5% 1/8W T/R 1206 PKG.	RS1724	1
R5	RES. F/CHIP 100.00 KΩ 5% 1/8W T/R 1206 PKG.	RS1702	1
R6	RES. F/CHIP 4.70 KΩ 5% 1/8W T/R 1206 PKG.	RS1705	1
R7	RES. F/CHIP 12.00 KΩ 5% 1/8W 1206 T/R	RS1783	1
R8	RES. F/CHIP 2.20 KΩ 5% 1/8W T/R 1206 PKG.	RS1703	1
R9, 11	RES. F/CHIP 10.00 KΩ 5% 1/8W T/R 1206 PKG.	RS1701	2
R10	RES. F/CHIP 680.00 Ω 5% 1/8W T/R 1206 PKG.	RS1709	1
R12, 13	RES. F/CHIP 27.00 Ω 5% 1/8W T/R 1206	RS1826	2
R14	RES. F/CHIP 220.00 Ω 5% 1/8W T/R 1206 PKG.	RS1711	1
R15	RES. F/CHIP 4.30 KΩ 5% 1/8W T/R 1206	RS1877	1
J1	RES. F/CHIP 0.0 Ω 5% 1/8W 1206 T/R	RS1779	1
Transistors			
Q1	PNP SIGN 40V/600mA TO-92 T/R GENERAL PURPOSE LS=5.0mm	TR1010	1
Q2	NPN SIGN 40V/600mA TO-92 T/R 1W	TR1063	1
Miscellaneous			
P1	CONNECTOR SINGLE ROW HEADER RIGHT ANGLE 5-PIN 0.1" CENTERS TIN PLATED OR BETTER.	CO1249	1
P2, 3, 4	CONNECTOR SINGLE ROW HEADER RIGHT ANGLE 2-PIN 0.1" CENTERS TIN PLATED OR BETTER	CO1267	3
	BLANK PC BOARD FOR PWM MODULE 1.4576 SQ.IN. CEM-1 1-SIDED	PC1080	1
J3	WIRE #22 BARE SOLID TIN ELECTROLYTIC,SOFT DRAWN AND TIN-PLATED COPPER.	WI1553	0.042 FT

IC Voltage Diagrams

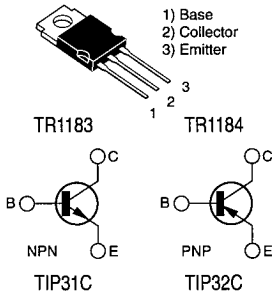
DI1053 (FEP16BT), DI1054 (FEN16BT)



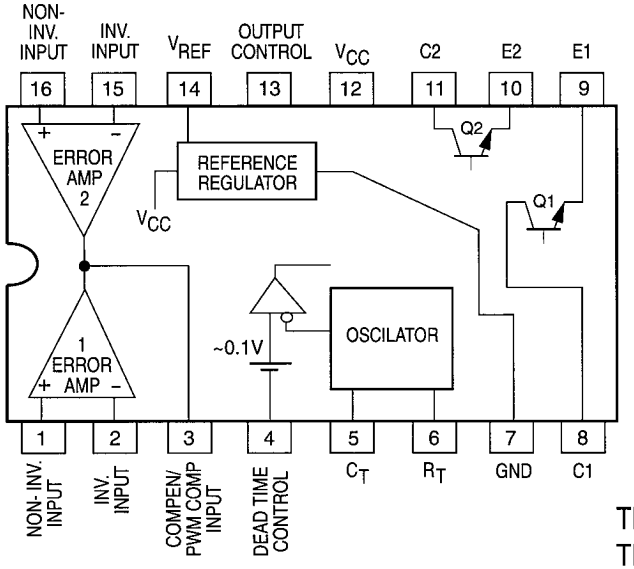
TR1057 & TR1061



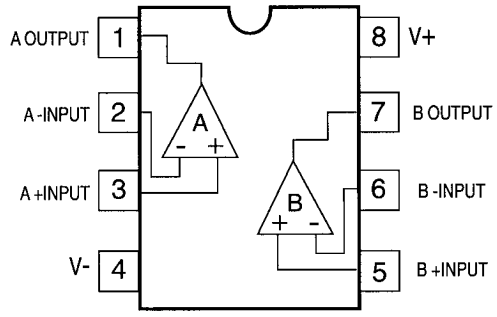
TR1183 & TR1184



IC1002 (TL494) PWM IC



IC1175 (NJM5532), IC1041 (TL072)



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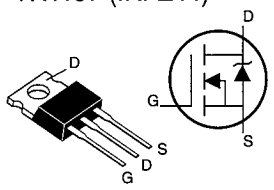
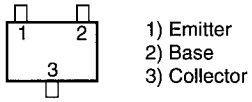
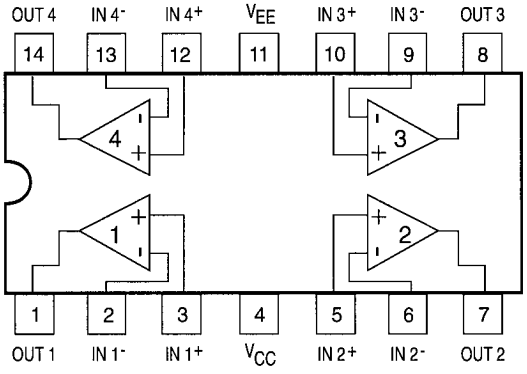


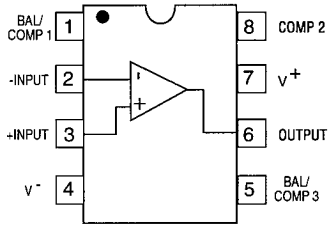
TR1131 (25C3859), TR1108 (25C4639), TR1125 (25H1781)



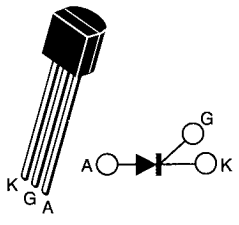
IC1162 (TL074)



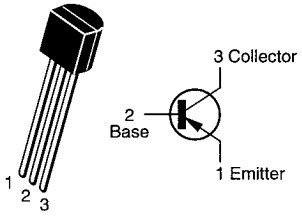
IC1040 (LM318)



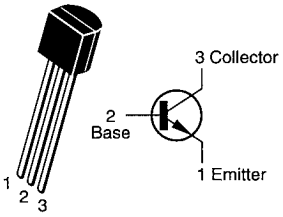
TY1000 (MCR22)



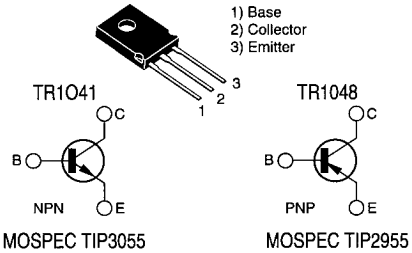
TR1010 (MPS2907), TR1166 (2N5401)



TR1002 (2N3904), TR1063 (MPS2222A), TR1167 (2N5551)



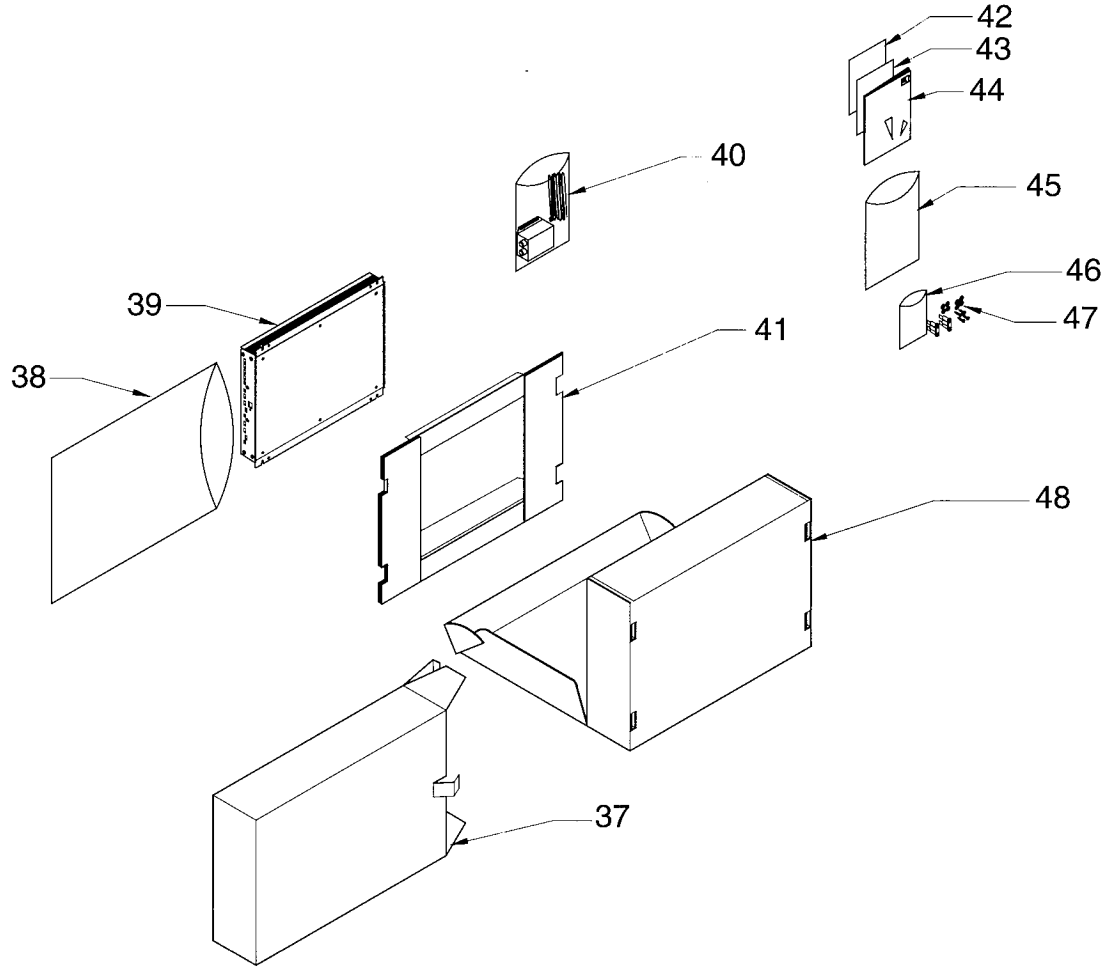
TR1041 & TR1048



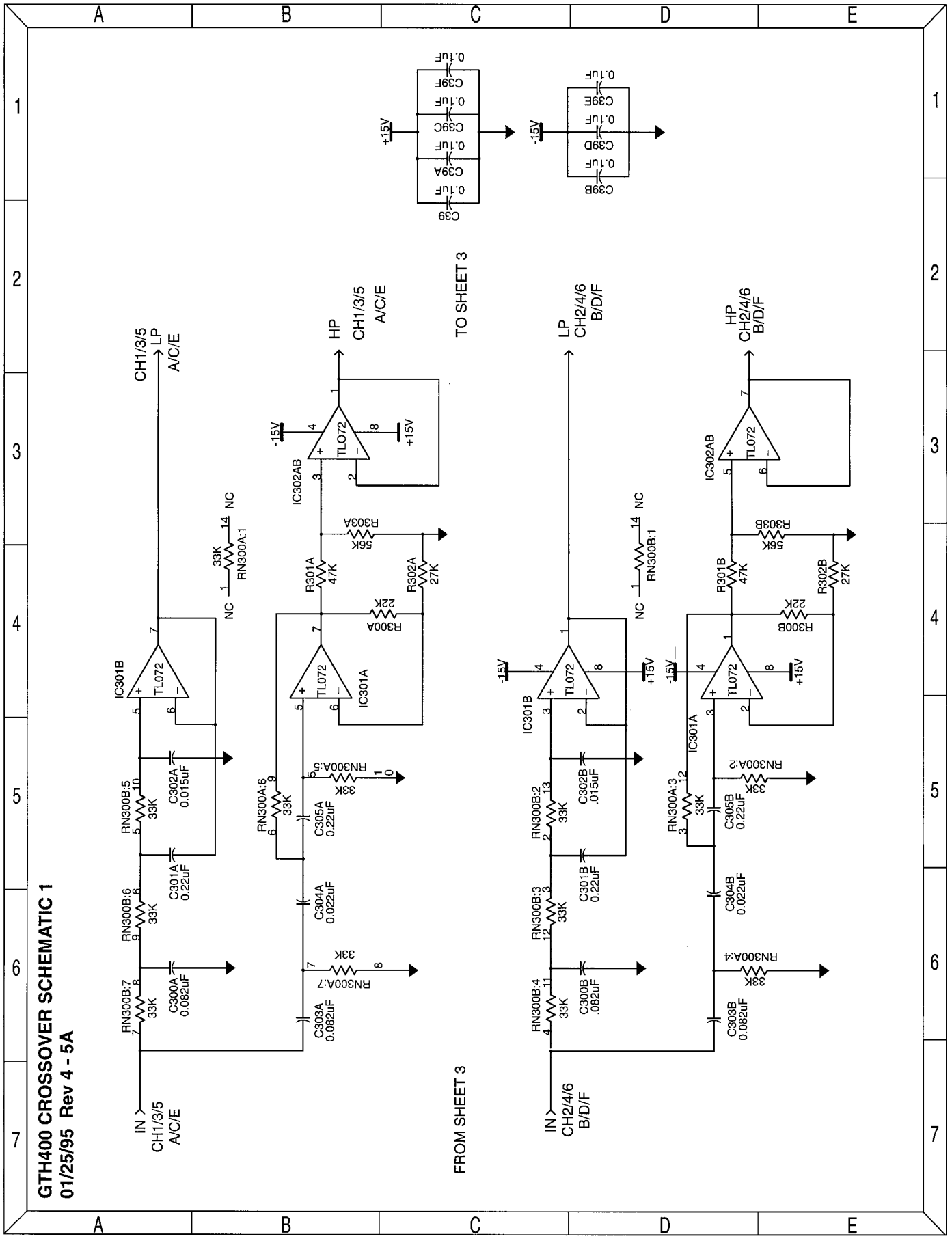
NOTE: Parts in parenthesis are manufacturer's numbers see parts lists for full list of possible manufacturer's part numbers.

GTH400 Package Parts List

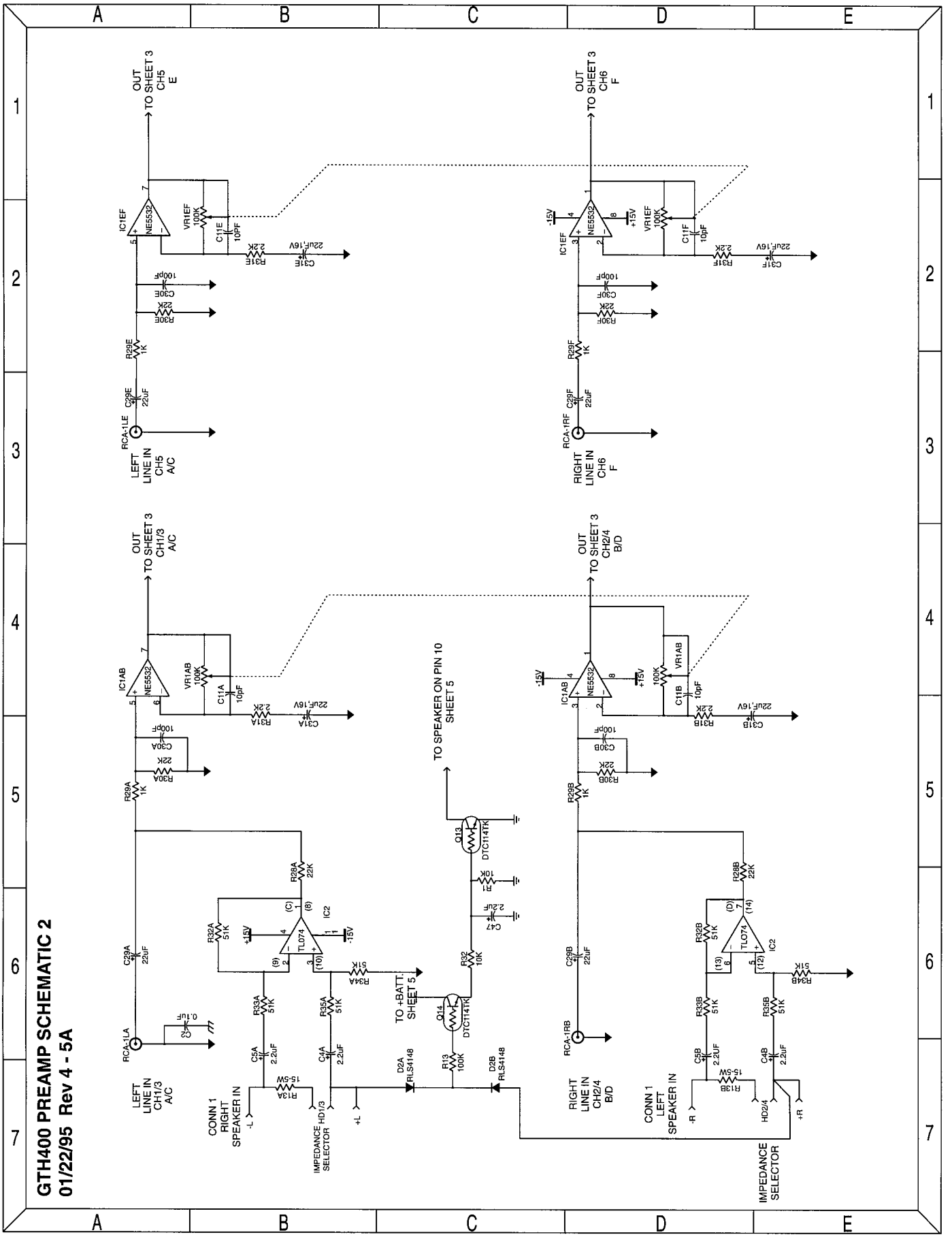
Reference Number	Description	Part Number	Quantitiy
37	BEAUTY BOX FOR JBL GTH400	PM1218	1
38	PLASTIC BAG 14" x 20"x 0.0015"	PM1224	1
39	GTH400 UNIT	A00009	1
40	REMOTE CONTROL FOR GTH400 WITH PHONE WIRE 20 FT.	XX1211	1
41	INTERNAL FILLER FOR JBL GTH400	PM1212	1
42	DECLARATION OF CONFORMITY GTH400	SH1076	1
43	WARRANTY SHEET/CONSUMER SURVEY CARD	SH1005	1
44	OWNER's MANUAL FOR GTH400	SH1071	1
45	PLASTIC BAG 9"LX12"WX0.0015"T WITH RECYCLABLE LOGO,BAG FOR OWNERS MANUAL	PM1029	1
46	PLASTIC BAG FOR ACCESSORIES 4"L X 4"W X 0.0015"T WITH RECYCLABLE LOGO	PM1221	1
47	FUSE AUTO 30A/32 V	FS1059	2
47	SC #8 x 7/8 THREAD FORMING TAPPING,PHI HEAD, POINT AB, NICKEL FINISH.	SC1208	6
47	WASHER HELICAL SPRING LOCK #8 NICKEL FINISH	WA1075	6
47	0.375 OD x 0.180 OD x 0.060 Tk PLAIN WASHER, NYLON 66, FLAME RETARDANT, TR:85C-95C,CLEAR.	WA1077	6
48	CARTON BOX FOR JBL GTH400	PM1211	1
LABELS	SERIAL NUMBER BAR CODE LABEL	LB1223,	3
	FOR GT SERIES AMPLIFIERS		
	LABEL MODEL NUMBER FOR GTH400	LB1249	1
	CE LABEL, 3/4 X 1/2" PAPER WITH ADHESIVE.	LB1250	1
	3/4" ROUND, WHITE, PAPER BOND MATERIAL WITH ADHESIVE	LB1255	1
	MASTER CARTON FOR GTH400 AND	PM1228	0.5
	SPEAKER HARNESS 8-WIRE 2-ROWS	XX1208	1
	1/16 SHORT ARM HEX KEY FOR #6 SET SCREW	XX1240	1
	.050 SHORT ARM HEX KEY FOR #4 SET SCREW	XX1241	1
	5/64 SHORT ARM HEX KEY FOR #8 SET SCREW	XX1242	1



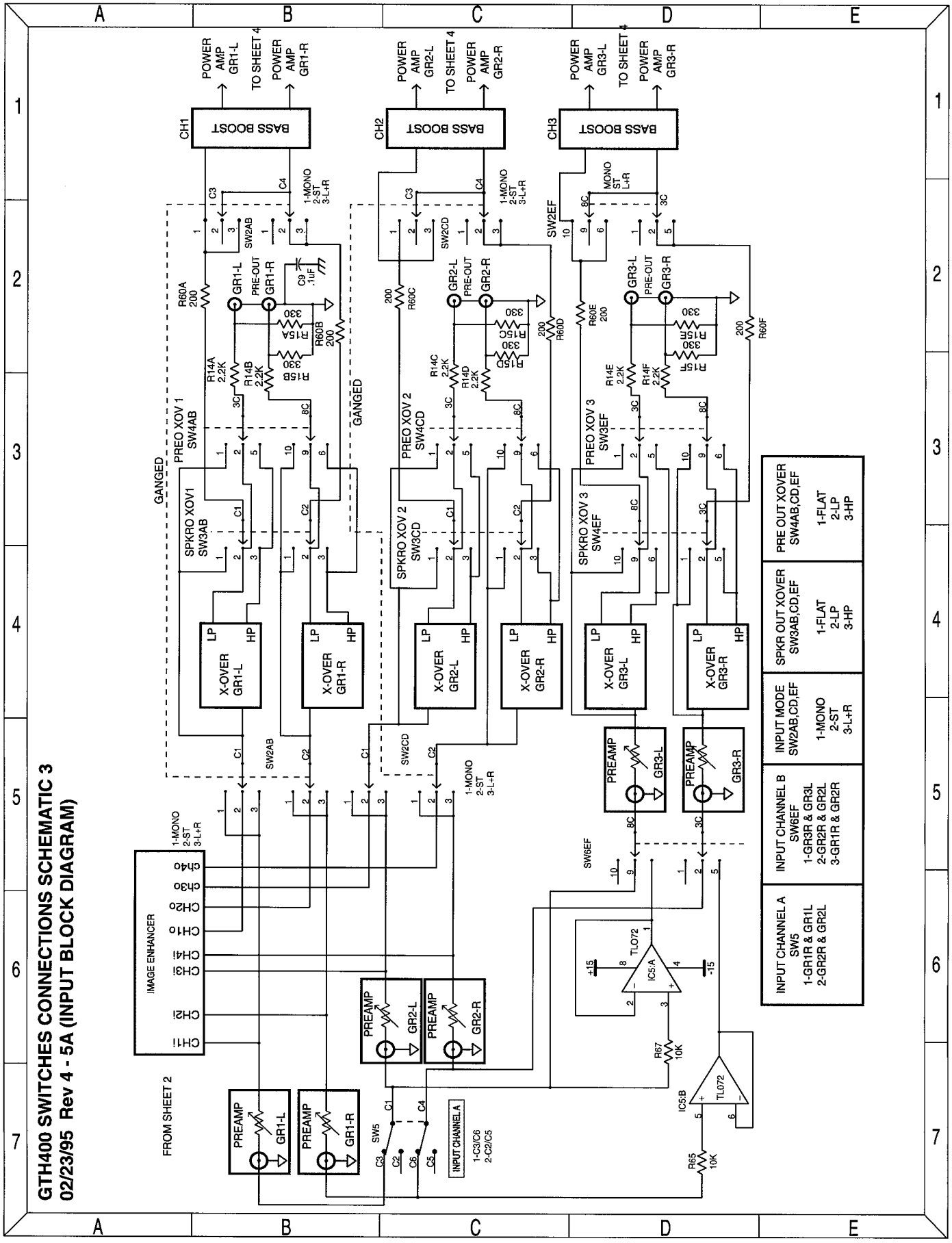
GTH400 Schematic Diagram 1 (Rev 4-5a)



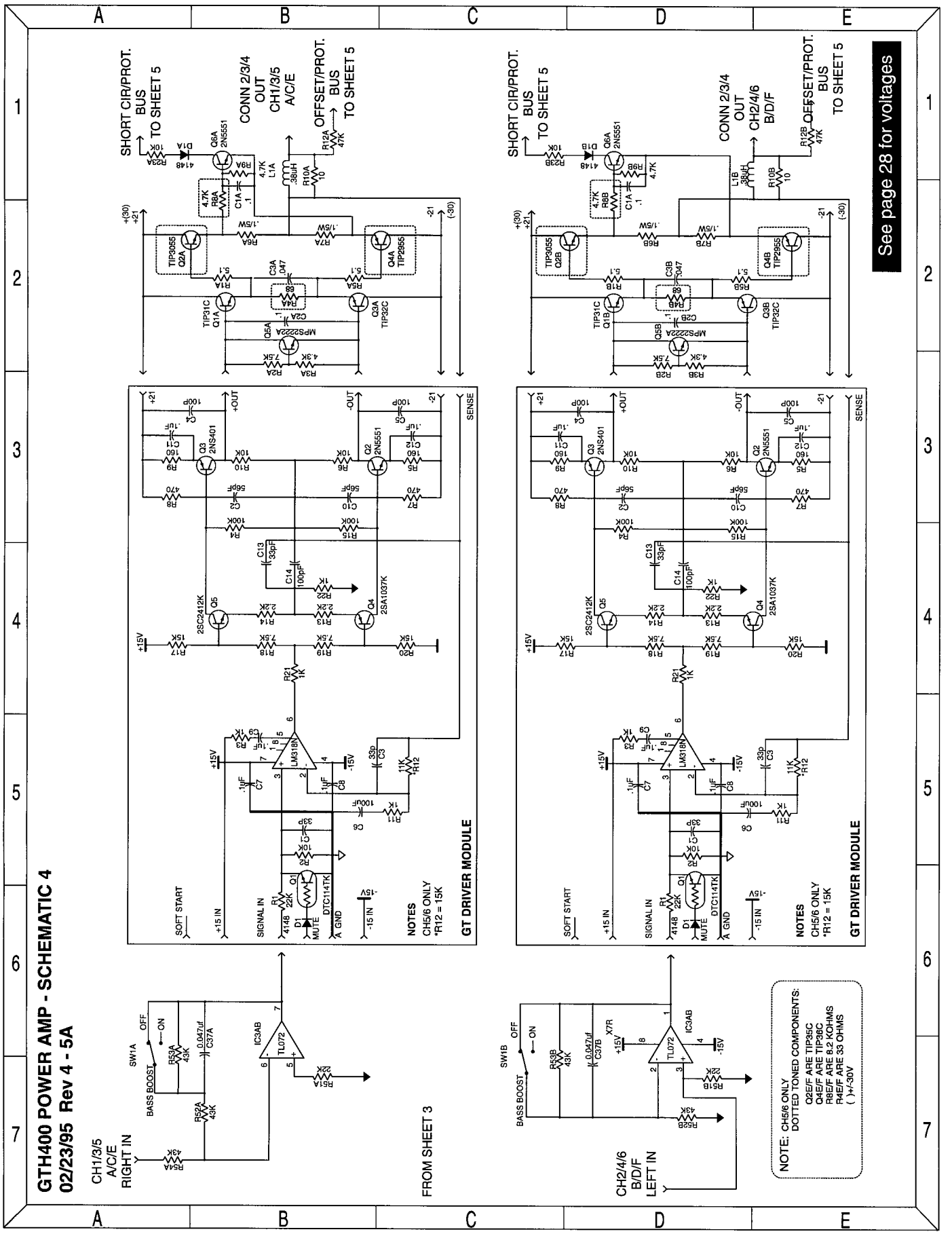
GTH400 Schematic Diagram 2 (Rev 4-5a)



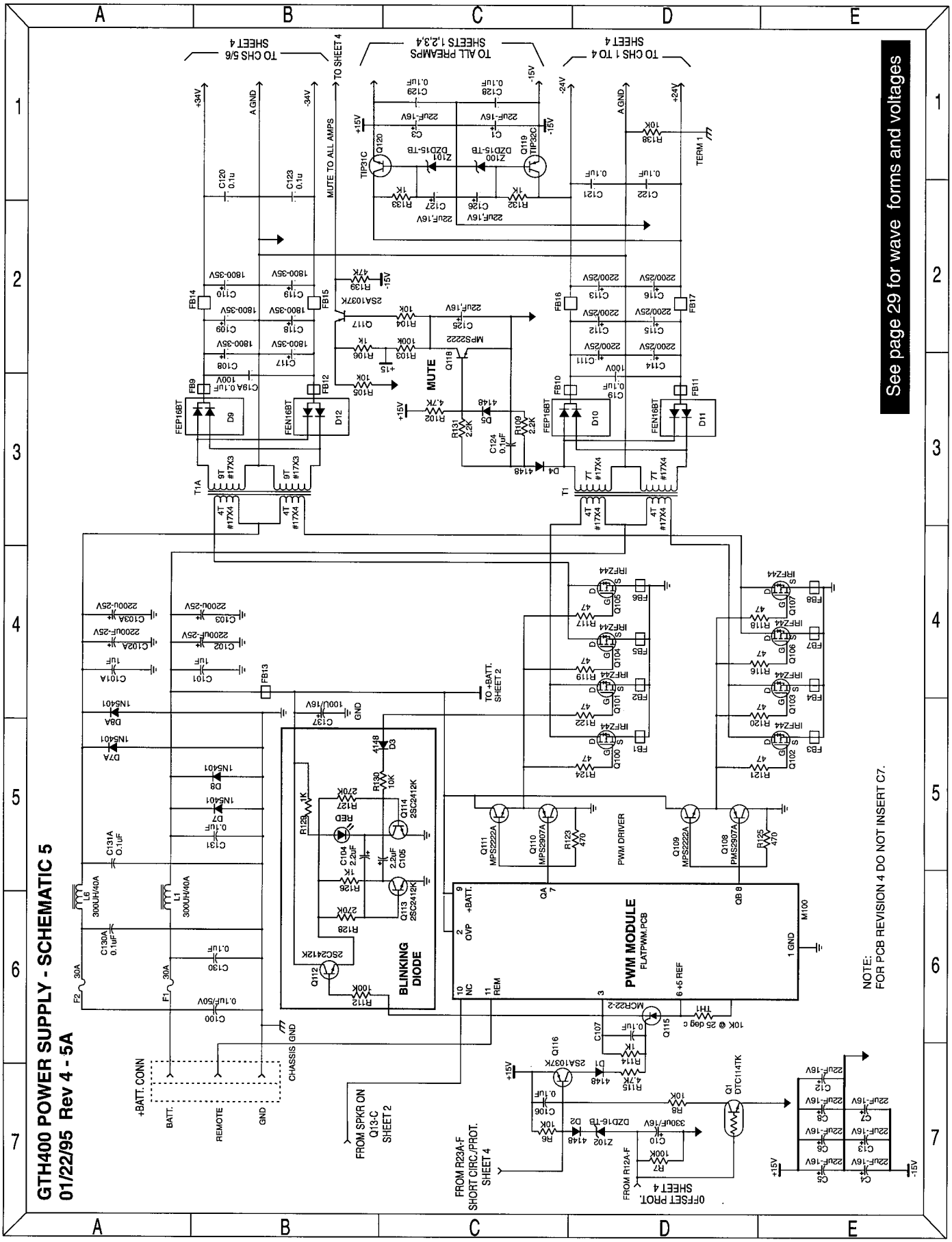
GTH400 Schematic Diagram 3 (Rev 4-5a)



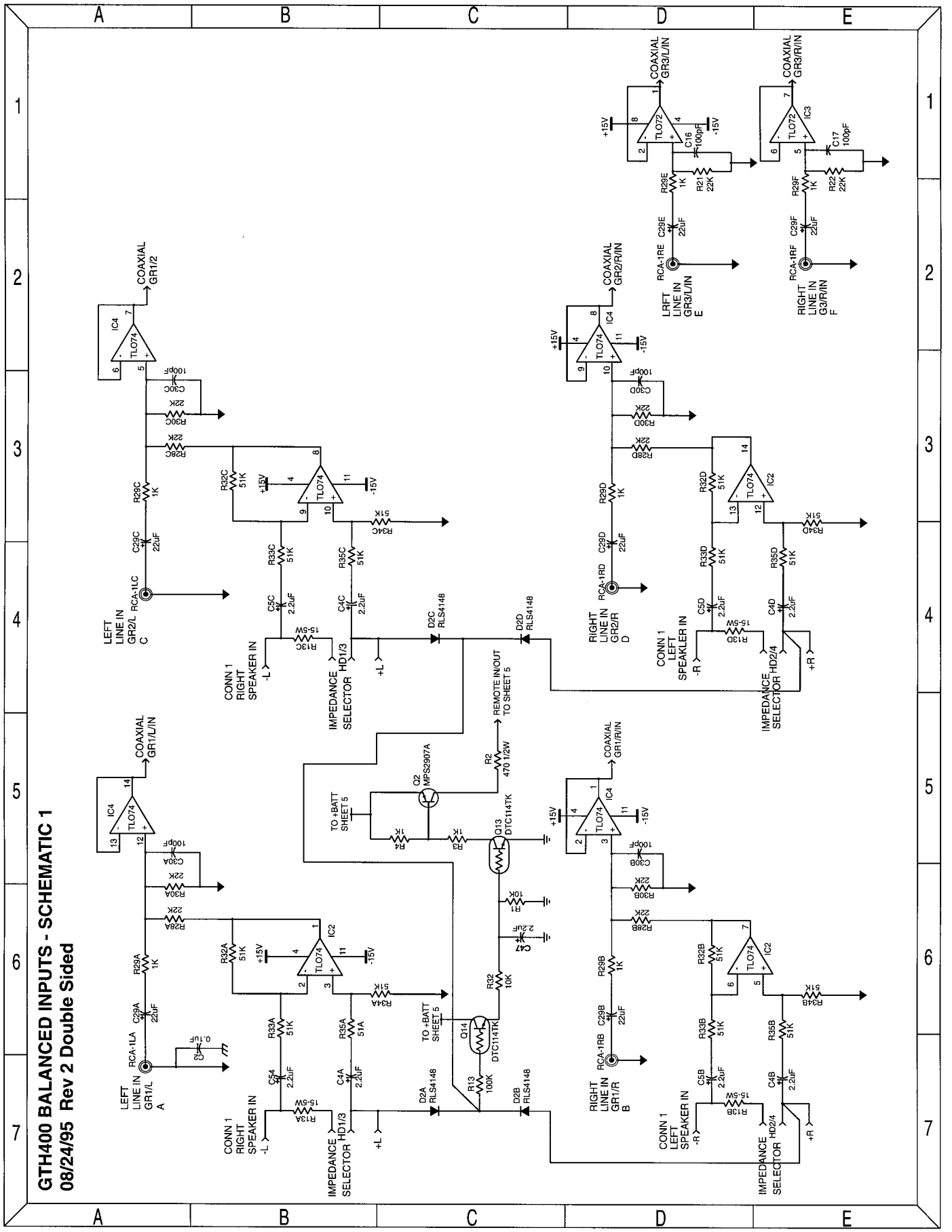
GTH400 Schematic Diagram 4 (Rev 4-5a)



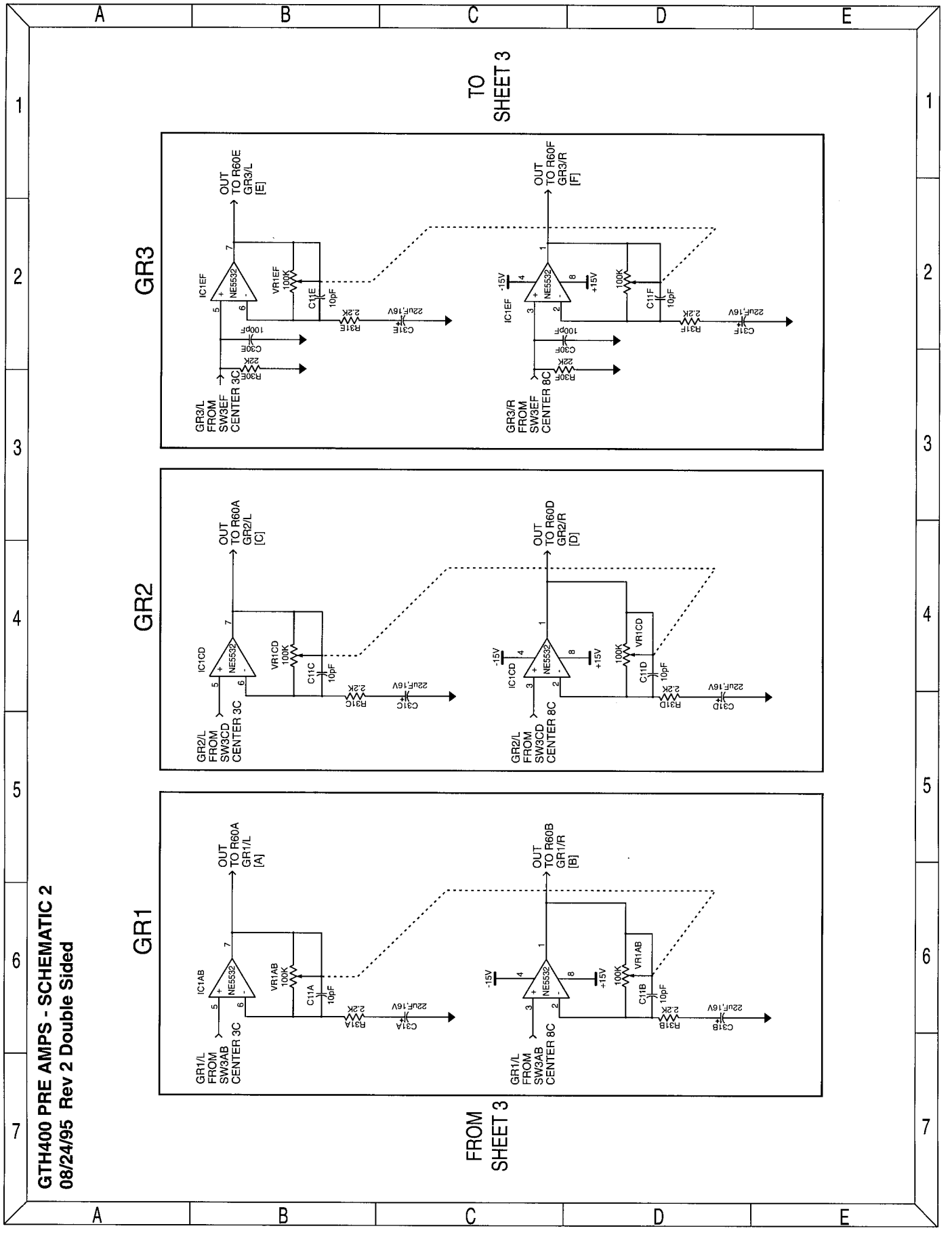
GTH400 Schematic Diagram 5 (Rev 4-5a)



GTH400 Schematic Diagram1 (Rev 2 Double Sided)

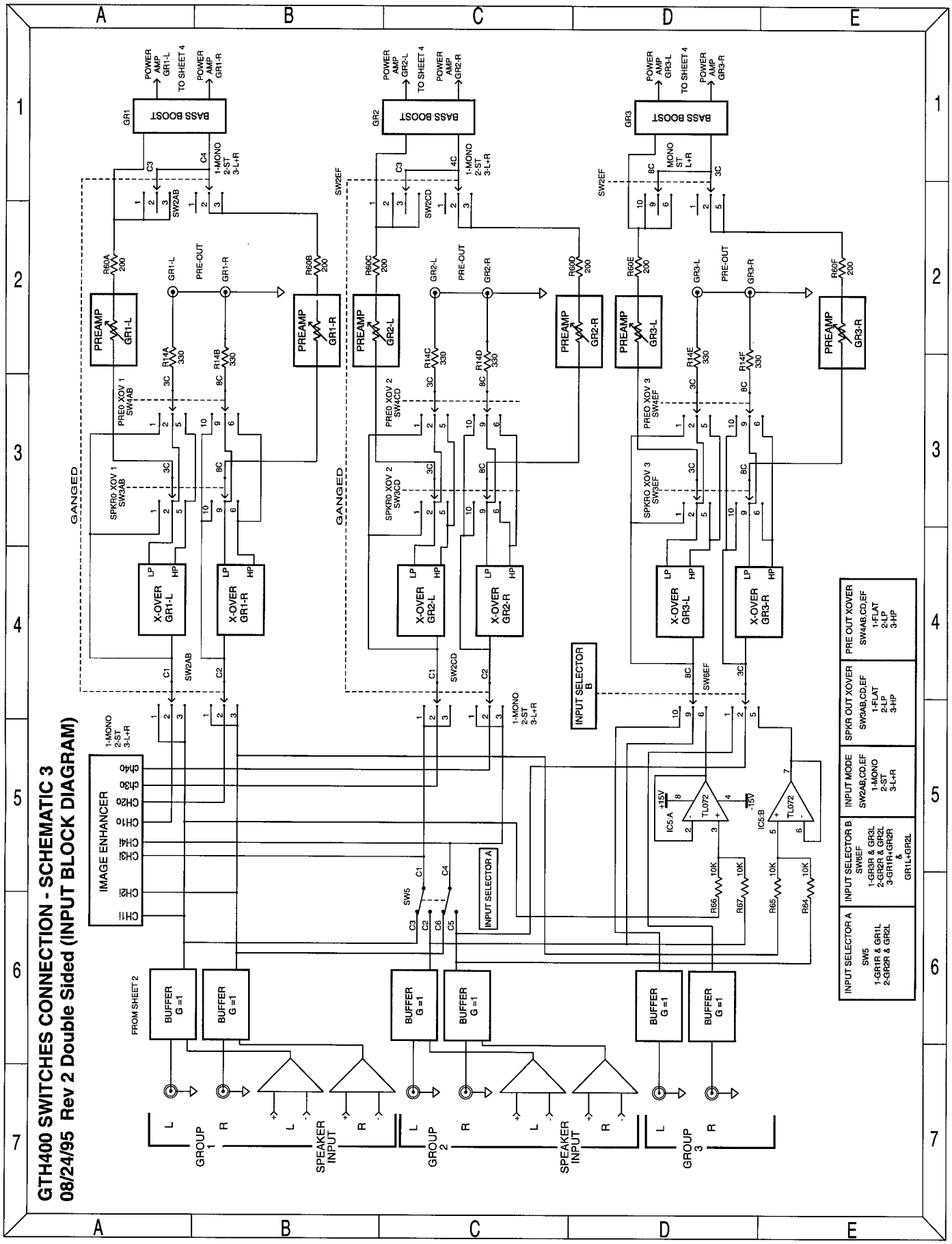


GTH400 Schematic Diagram 2 (Rev 2 Double Sided)

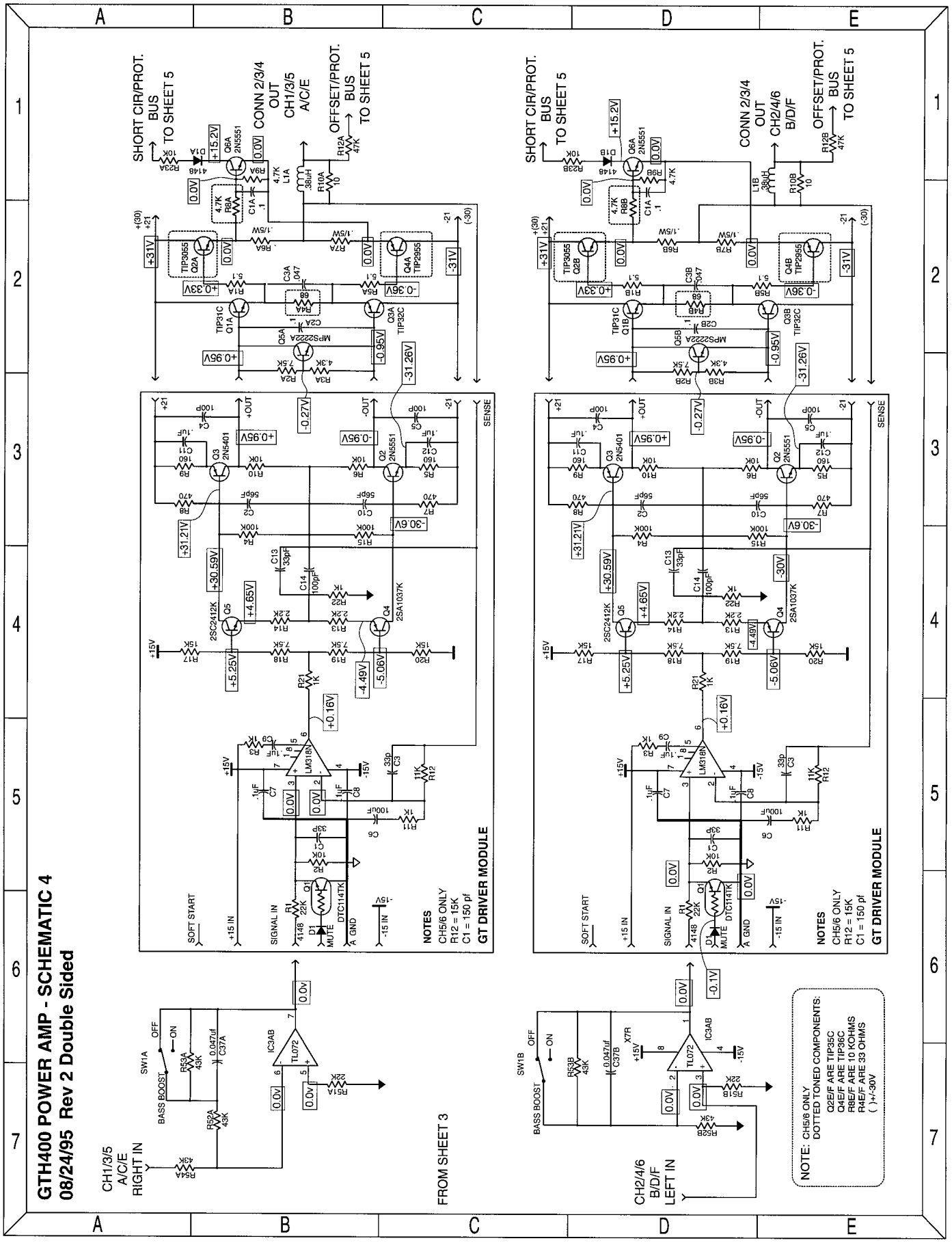


GTH400 PRE AMPS - SCHEMATIC 2
08/24/95 Rev 2 Double Sided

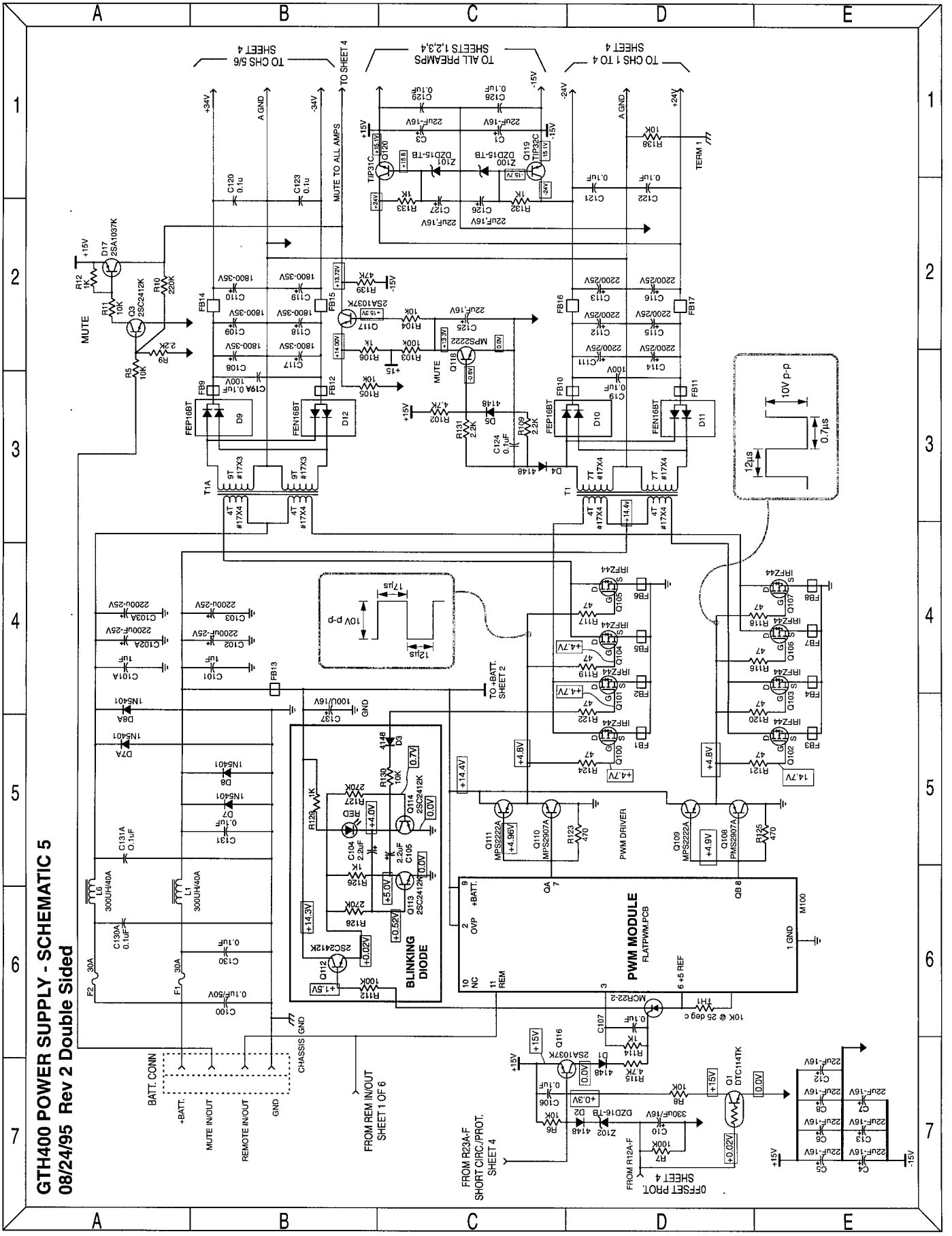
GTH400 Schematic Diagram 3 (Rev 2 Double Sided)



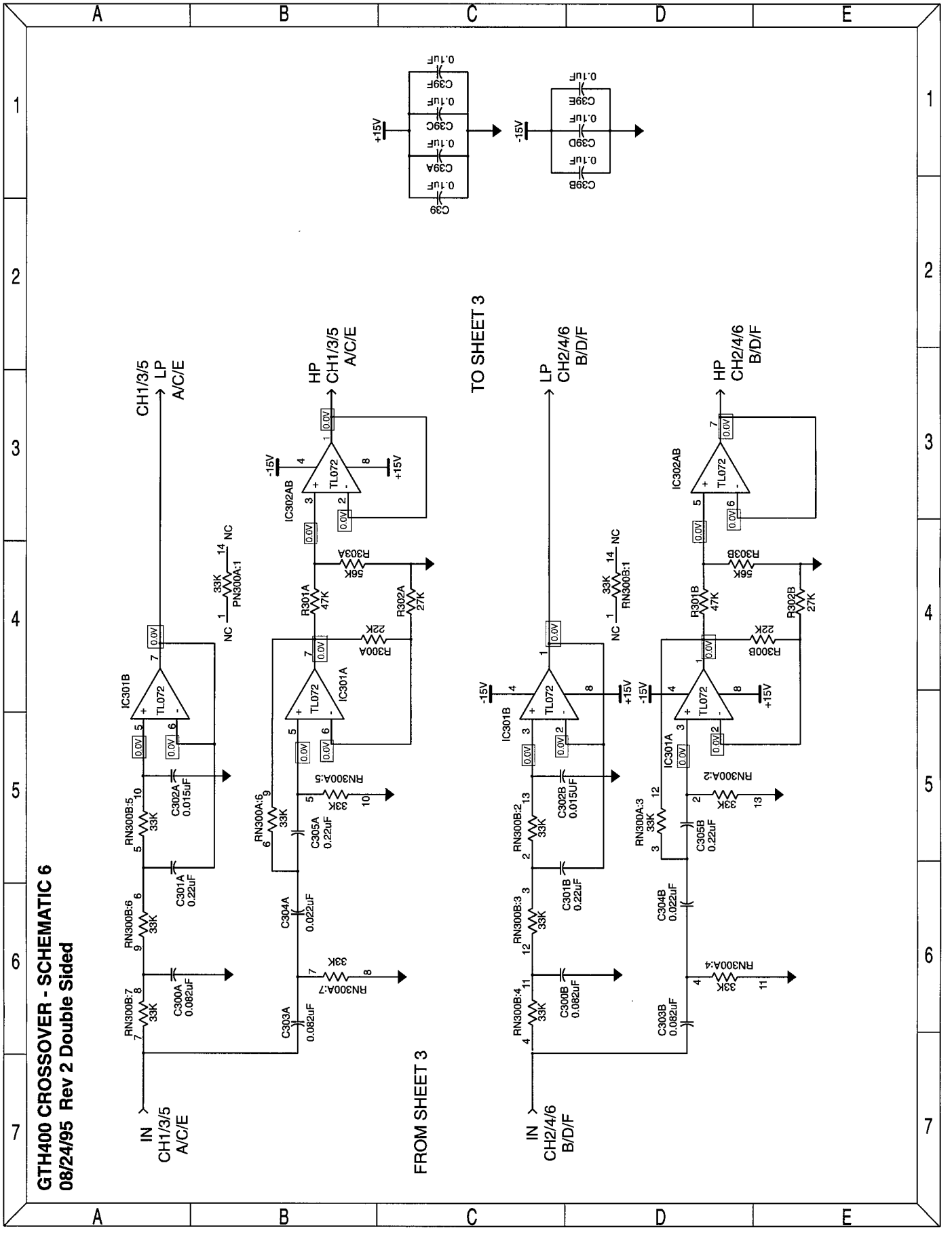
GTH400 Schematic Diagram 4 (Rev 2 Double Sided)



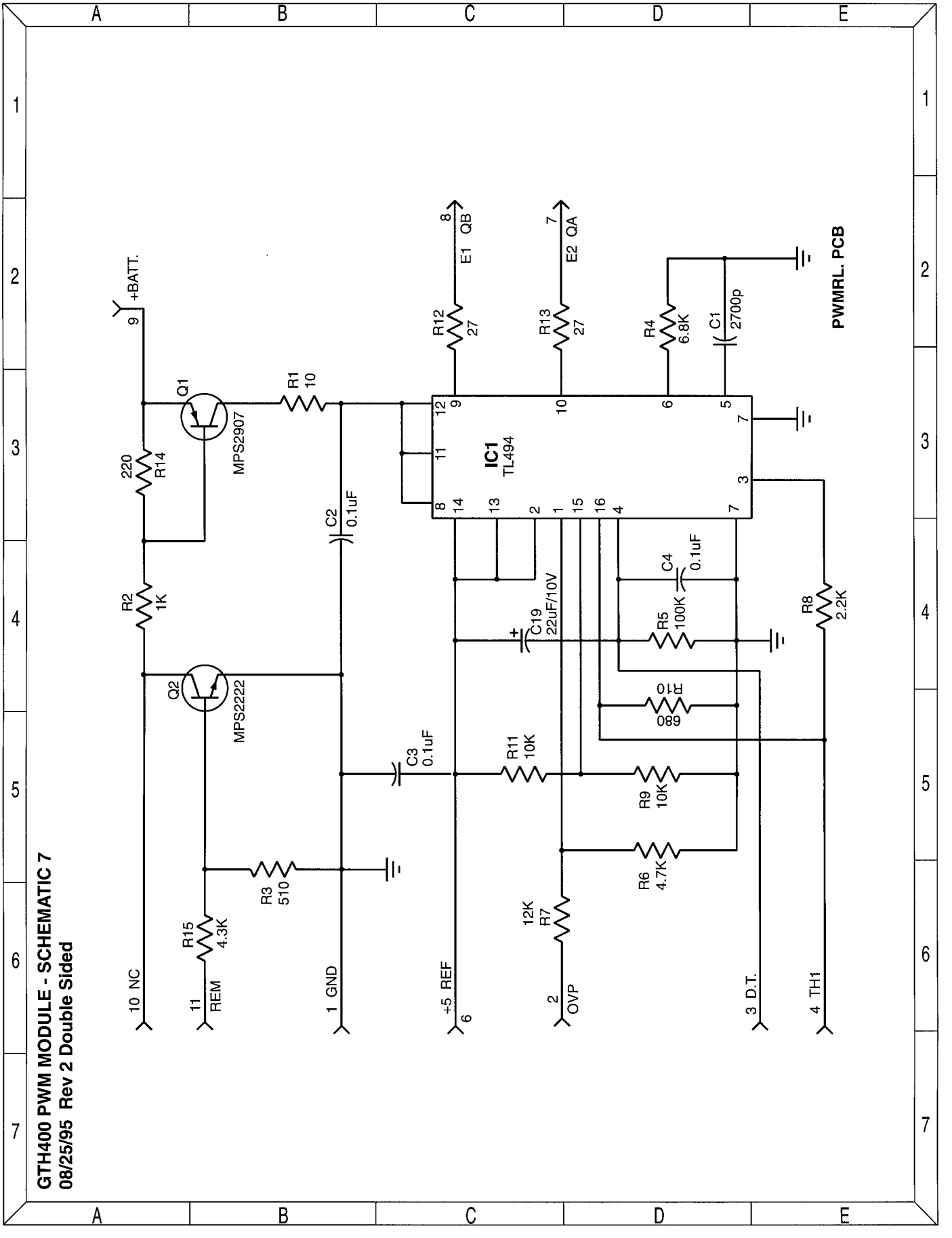
GTH400 Schematic Diagram 5 (Rev 2 Double Sided)



GTH400 Schematic Diagram 6 (Rev 2 Double Sided)



GTH400 Schematic Diagram 7 (Rev 2 Double Sided)



GTH400 Schematic Diagram 8 (Rev 2 Double Sided)