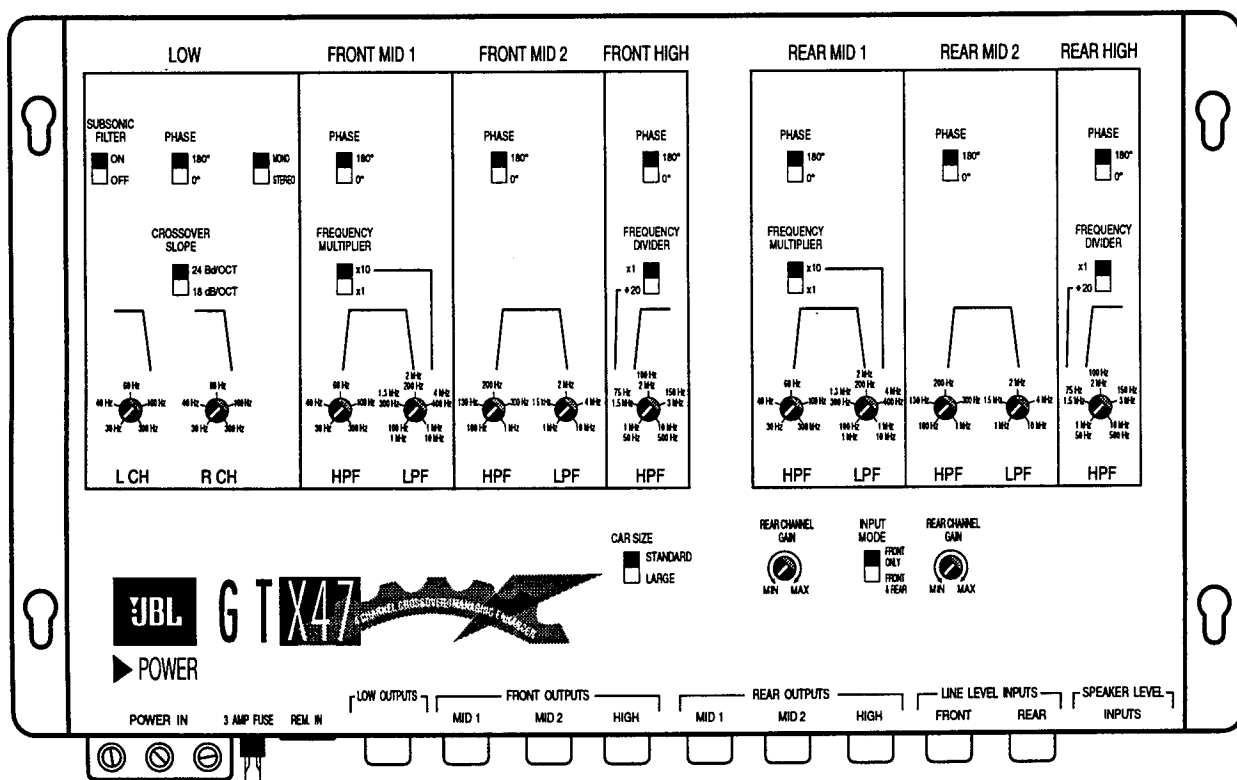


GTX47

ACTIVE DIVIDING NETWORK

TECHNICAL MANUAL



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

H A Harman International Company

Part No.: GTX47SM Rev A

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GTX47 Specifications

Number of Outputs:	7 (fully configurable)		
Possible System Configurations:	FRONT: 1, 2 or 3-way REAR: 1, 2 or 3-way SUBWOOFER		
Crossover Section Frequencies:	LOW: (SUBWOOFER) Low-Pass 30 - 300Hz	High-Pass Filter:	30Hz - 300Hz
	FRONT AND REAR MID 1:	Low-Pass Filter	(x1 mode): 100Hz - 1kHz (x10 mode): 1kHz - 10kHz
	FRONT AND REAR MID 2:	High-Pass Filter	100 - 1kHz
	FRONT AND REAR HIGH:	Low-Pass Filter	1k - 10kHz
		High-Pass Filter	(x1 mode): 1kHz - 10kHz (÷20 mode): 50Hz - 500Hz
Output Level Control Range:	0dB to -20dB		
Overall Frequency Response:	10Hz to 50kHz (+0dB, -1dB)		
Signal-to-Noise Ratio:	100dBA		
Input Sensitivity (for 500mV output, Gain Control CW):	500mV		
Maximum Line Level Input:	4V RMS		
Line Level Input Impedance:	10kΩ MIN		
Output Impedance:	1kΩ MAX		
Speaker Level Input Impedance:	15Ω		
Maximum Speaker Level Input:	7V RMS		
Filter Type:	Subwoofer: Selectable (18dB or 24dB per octave) All others: (12dB per octave Butterworth)		
Size: Main Chassis: (inches. W x L x H).	11-7/8" x 7-1/8" x 1-5/8" (300mm x 180mm x 41mm)		
Size: Remote Unit: (inches. W x L x H).	2.56" x 3.3" x 1.18" (65mm x 84mm x 30mm)		
Weight Main Chassis:	3 lbs. 14 oz. (1.76kg)		
Weight Remote Unit:	8.5 oz. (240g)		
Fuse:	3 Amp ATC		

JBL subscribes to a policy of continuous product improvement. As a result, some design elements and specifications may be changed without notice during the life of the product.

Features

- Variable frequency crossover combined with unique "Virtual Center" image enhancement circuitry.
- Trunk-mount design with dash-mount remote control.
- Separate Front and Rear inputs.
- Configurable to 2, 3 or 4-way operation with independent front and rear channel adjustments.
- Continuously adjustable crossover frequencies independently adjustable for each band.
- Constant-bass (non-fading) Subwoofer output.
- "Phase" switches on each output allow easy polarity reversal to assure optimum band-to-band transitions.
- Stereo/Mono Subwoofer output selection.
- 12 dB per octave crossover slopes on all bands.
- Selectable 18 dB or 24 dB slope Subwoofer filter.
- "Virtual Center" image enhancement circuit stabilizes the center image for the driver and recovers rear channel ambiance.
- Remote control provides adjustment for effects level and bypass modes.
- Small car/large car image optimizer switch.
- Gold-plated connectors eliminate contact oxidation and assure reliable trouble-free connections.

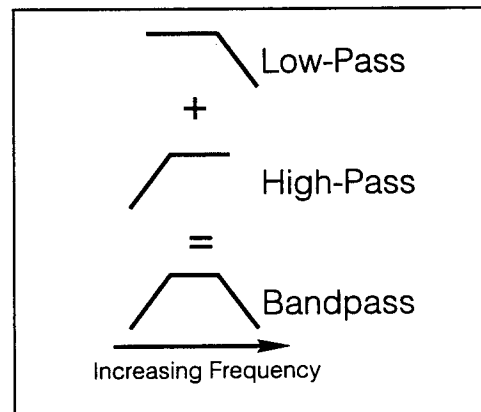
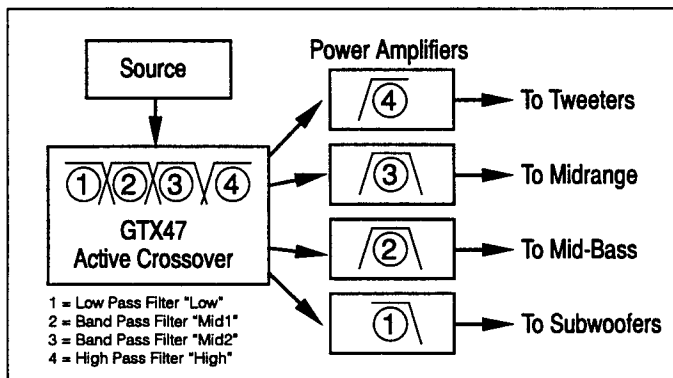
Theory of Operation

Why Crossover Networks are Needed

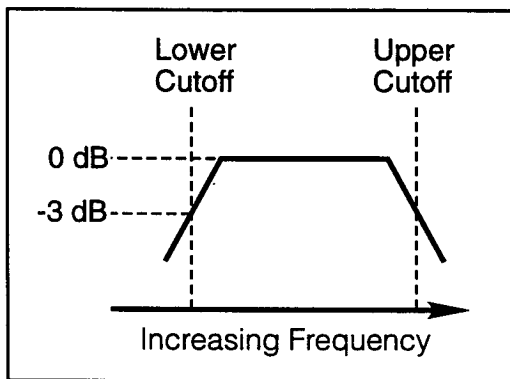
If a single speaker could be made to cover the entire frequency range with smooth response, low distortion, and high output, and be small enough to fit in a car, we would not need crossover networks of any type. Unfortunately, no one has yet developed the "perfect" speaker that has all of these ideal characteristics. As a result, multiple drivers, each specialized for a band a frequencies, are generally used to cover the audible frequency range. The crossover network's job is to divide the full-spectrum music signal into the narrow bands required by each specialized speaker driver. A 2-way speaker separates the frequency spectrum into 2-bands typically handled by a woofer and tweeter which reproduce the lows and highs respectively. 3-way systems add a midrange driver, and 4-way systems commonly add either a Midbass driver or super-tweeter. The GTX47 has the unique flexibility to adapt to any system from 2 to 4-way designs, both front and rear, and with independent adjustment for each band.

Understanding the Terminology

There are three basic types of crossover circuits used in the GTX47: High-Pass, Low-Pass, and Band-Pass. As its name implies, a Low-Pass crossover allows low frequencies to pass through, and blocks higher ones. In the GTX47, a Low-Pass crossover is commonly used for the Subwoofer, and is labeled "LOW". A High-Pass crossover allows high frequencies to pass through and blocks the lows. In the GTX47, two high-pass sections are included, labeled "FRONT HIGH" and "REAR HIGH". By proper use of the frequency controls, these may be used to feed either a front or rear satellite speaker or the tweeters in a 3 or 4-way system. The remaining sections, "FRONT and REAR MIN 1 and MIN 2", are Band-Pass crossovers, where both the highs and lows are blocked, and the band in the middle is allowed to pass through. These are typically used for Midrange or Midbass speakers. The crossover circuits of the GTX47 may be used in a variety of combinations to create 2, 3 or 4-way designs independently for front and rear systems.



The rate at which the crossover attenuates the out-of-band signals is called the slope. In the GTX47, the slope of all of the Band-Pass and High-Pass sections is 12dB per octave. This means that the output of the signal will be attenuated by 12dB for each octave away from the Cutoff Frequency. As in all crossovers, there is still signal which reaches the speaker outside of the frequencies passed by the crossover, but this signal is increasingly attenuated the further away it is from the desired band. The slope of the subwoofer ("LOW") section in the GTX47 may be chosen as 18 or 24 dB per octave. The sharper 24 dB per octave slope is helpful to reduce the amount of Midrange energy produced by the subwoofer, improving system imaging.



The Cutoff Frequency for each band is the point at which the response is 3 dB down from the signal level. On the GTX47, the Cutoff Frequency of each High-Pass and Low Pass is adjustable. Each Band-Pass has adjustments for both the upper and lower Cutoff Frequencies which define the band.

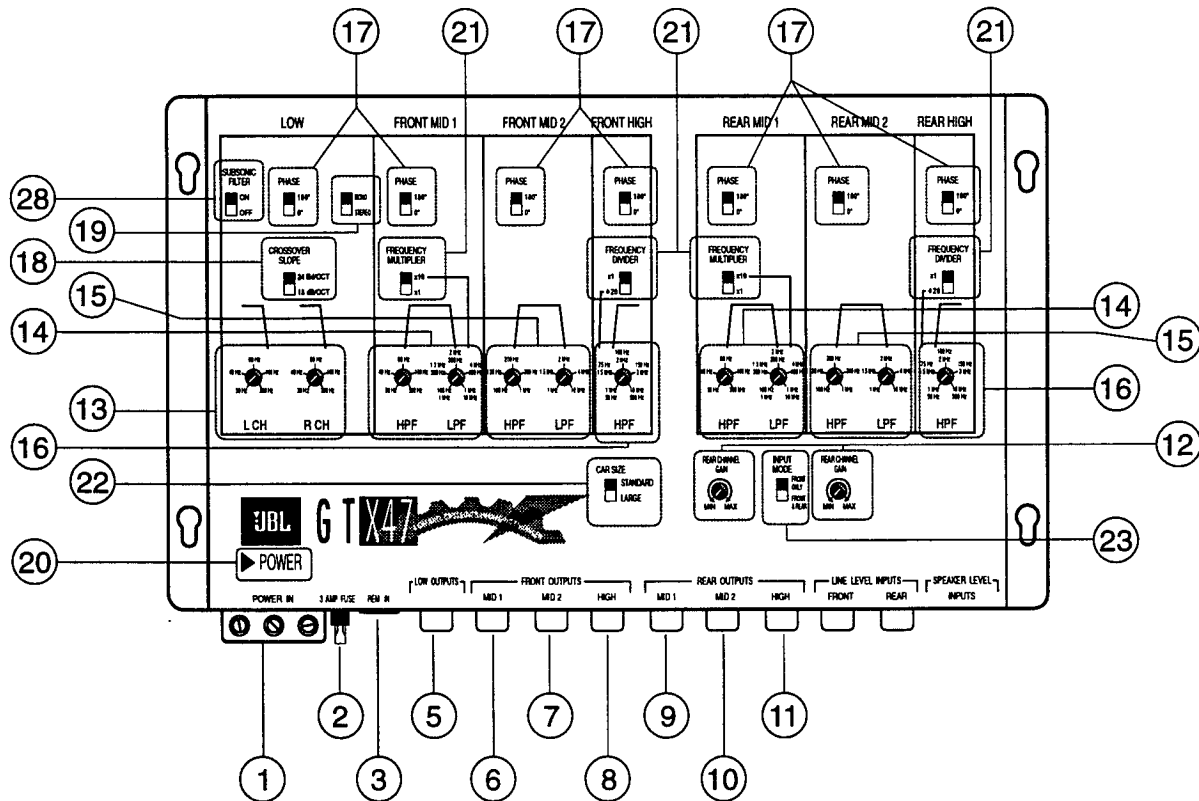
Virtual Center Image Enhancer

Many methods have been tried to recreate the image and spaciousness of a live performance in the confines of a car interior. Multichannel surround sound, DSP, installing a center channel speaker, sophisticated phase and amplitude manipulation, and other approaches can help add to the realism of reproduced sound when applied properly. When misapplied, the results can be disastrous. Until the JBL Virtual Center circuitry was developed, the most successful techniques were expensive as with DSP, or often required difficult installation, as with center channel speakers.

JBL's breakthrough "Virtual Center" circuitry is the result of the understanding of how the human ear responds to timing, frequency, and amplitude cues to determine the apparent direction of a sound source. Virtual Center circuitry manipulates the analog signal in real time to provide each of the driver's ears with the signal they would receive if the driver was seated in the center of the vehicle. This provides a stable centered image to the driver much like that obtained with a dedicated center-channel loudspeaker.

To restore the spaciousness that is generally lost in the small confines of a car interior, the rear channels utilize the differential-mode ambiance recovery system to restore the ambiance information present in all conventional stereo recordings. Unlike DSP, the JBL circuitry does not add synthetic reverb, but recovers real information that is masked in conventional systems. As a result, the overall effect from the Virtual Center circuitry of the GTX47 is incredibly realistic yet simple to adjust and use. Best of all, the "Virtual Center" and ambiance recovery circuits do not require specially encoded recordings and work with virtually all conventional stereo tapes, discs, and broadcasts.

GTX47 Controls, Connectors and Switches

**1. Power Connectors:**

Connect to Battery, Ground and Remote-On signals.

- The Battery terminal should be connected directly to the battery. Do not connect this terminal to the vehicle's electrical system wiring (such as dome-light circuit, etc.). Add a 3-Amp inline fuse (not included) to protect against shorting of the power wire.
- The Ground terminal connection should be made to a clean, bare metal part of the vehicle's chassis (an already installed screw, if possible). Scrape off paint or corrosion from the grounding point.
- The Remote-On terminal should be connected to the remote turn-on wire or power antenna output from the head unit. This will allow the GTX47 to turn on and off simultaneously with the head unit.

2. Fuse:

The fuse protects the units from damage. If the unit's remote-on light does not turn on, check this fuse. If the fuse has blown, replace it with a new one of the same value (do not use larger value fuses). If the fuse blows again, there is a problem with the wiring and/or the unit itself. Your JBL dealer can identify and correct the problem.

3. Remote Control Connector:

Plug the remote control cable into this receptacle.

4. High and Low Level Input Connectors:

When using a head unit with separate front and rear 4-channel preamp-level outputs, connect the front and rear head unit outputs to the front and rear line level inputs respectively. The input selector switch (23) should be in the

"Front & Rear" Position. If using a head unit with just 2-channel preamp output, connect the head-unit to the "Front" line level inputs and switch the input mode switch to "Front Only". If using a head unit which only has speaker level outputs, connect the head unit outputs to the speaker level inputs with the supplied adapter cable. Set the input mode selector to "Front" for a 2-channel head unit and "Front and Rear" for 4-channel units. If you are using a bi-level head unit which has 2-channels of line level and 2-channels of speaker level, both the 2-channels of line level input and 2-channels of speaker level input may be used. In this case, the input mode selector should be set to the "Front & Rear" position.

5. "Low" Output Connectors:

Connect to the subwoofer amplifier input terminals.

6. Front Mid 1 Output Connectors:

Connect to the amplifier used to drive front channel Midrange or Midbass loudspeakers in 3 or 4-way systems.

7. Front Mid 2 Output Connectors:

Connect to the amplifier used to drive Midrange speakers in 3 or 4-way systems.

NOTE: Either Mid 1 or Mid 2 may be used for Midrange driver in 3-way systems depending on the crossover frequency desired.

8. Front High Output Connectors:

Connect to the amplifier used for the front tweeter in 3 or 4-way systems or the front satellite speakers in 2-way systems.

9. Rear Mid 1 Output Connectors:

Connect to the amplifier used to drive rear channel Midrange or Midbass loudspeakers in 3 or 4-way systems.

10. Rear Mid 2 Output Connectors:

Connect to the amplifier used to drive rear Midrange speakers in 3 or 4-way systems.

NOTE: Either Mid 1 or Mid 2 may be used for the Midrange driver in 3-way systems depending on the crossover frequency desired.

11. Rear High Output Connectors:

Connect to the amplifier used for the rear tweeters in 3 or 4-way systems or to the rear satellite speakers in 2-way systems.

12. Front and Rear Channel Gain Controls:

Use these controls to set the input sensitivity level of the GTX47 to the optimal level for connection to the amplifiers.

13. Right and Left Low Output Frequency Adjustment Controls:

Use these controls to set the upper cutoff frequencies for the Low output.

14. Front and Rear Mid 1 Cutoff Frequency Adjustments:

These controls set the upper and lower cutoff frequencies of the Mid 1 band-pass filters. Use the control labeled HPF to set the low frequency limit and the control labeled LPF to set the upper frequency limit.

15. Front and Rear Mid 2 Cutoff Frequency Adjustments:

These controls set the upper and lower cutoff frequencies of the Mid 2 band-pass filters. Use the control labeled HPF to set the low frequency limit and the control labeled LPF to set the upper frequency limit.

16. Front and Rear High Frequency Adjustment Controls:

Use these controls to set the lower cutoff frequency of the Front and Rear High outputs.

17. Phase Switches:

These switches reverse the polarity of the speakers connected to their respective outputs. Start by setting these switches to 0 to keep all of the outputs "in-phase". If an RTA shows a deep dip in response at any of the crossover frequencies, try reversing the polarity of one of the drivers at this crossover. If the dip is reduced or eliminated, leave the phase switch in this position. Check each band and leave the phase switches in the position which gives the smoothest response.

18. "Low" Crossover Slope:

Use this switch to set the "Low" output crossover slope to either 18 or 24dB per octave.

19. Subwoofer Output Stereo/Mono Switch:

Selects Stereo or Mono output for the sub-bass frequencies. The Mono mode allows the use of one subwoofer along with a single channel amplifier. It should also be used when two or more subwoofers are mounted in common enclosure or baffle board. The Stereo mode can provide better separation when independent and isolated enclosures are used for each subwoofer.

20. Remote-On Indicator:

An LED gives visual confirmation of whether or not the unit is in operation. It is also useful for system trouble-shooting.

21. Crossover Frequency Multiplier Switches:

These switches can change the range of crossover frequencies. The alternate multiplied frequency adjustment ranges are listed above the variable controls.

NOTE: The High crossover replaces the frequency multiplier with a frequency divider to be used in 2-way or some 3-way systems.

22. Car Size Optimizer Switch:

Use this switch to optimize the virtual center image position on the built in Imaging Enhancer Processor.

23. Input Mode Switch:

Set this switch to "Front Only" when using the GTX47 with a head unit that has only one set of outputs. This causes the front and rear crossover sections to be driven by the front input signal. Set this switch to Front and Rear when using the GTX47 with a head unit that has two sets of outputs.

24. Remote Bypass/On Indicator:

This indicator is on when the Imaging Processor is engaged and off when the Imaging Enhancer is bypassed.

25. Driver/All Optimizer Indicator:

This indicator is on when the Imaging Enhancer is in "Driver" optimization mode and off when the Imaging Enhancer is in the "All" passenger mode.

26. Front Ambience and On/Bypass Control Switch:

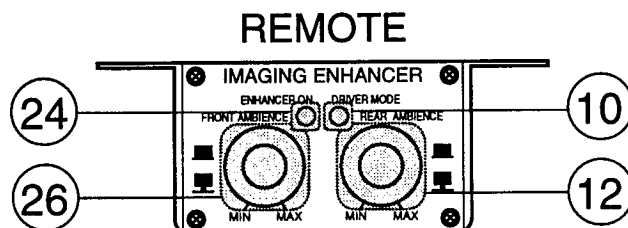
Rotating this control adjusts the amount of ambience and front staging width produced by the Imaging Enhancer. Pulling the knob places the Imaging Enhancer in "Bypass" mode. Pushing in the knob places the Imaging Enhancer in "On" mode.

27. Rear Ambience and Driver/All Optimizer Control:

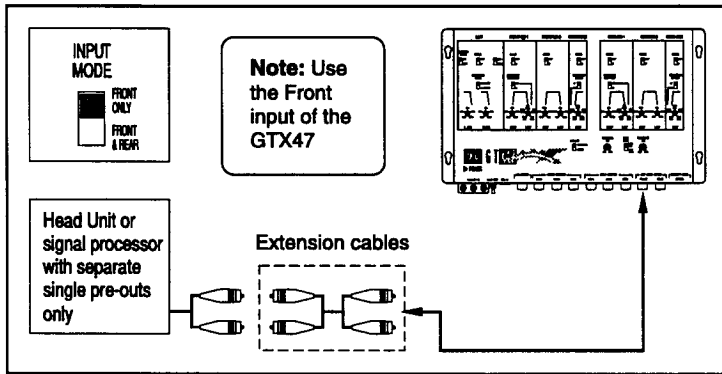
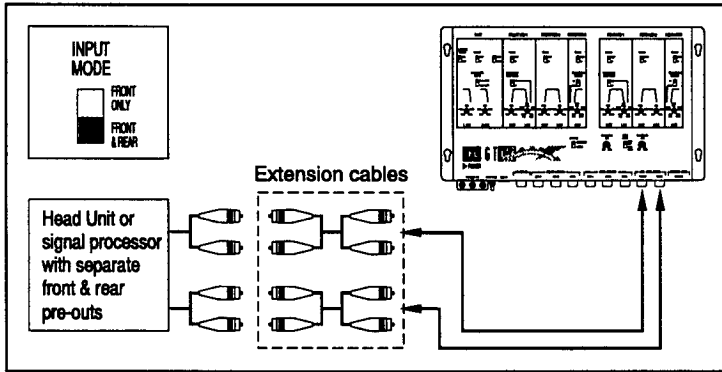
Rotating this knob controls the amount of rear fill ambience and the "room size" of the acoustic environment when used in a system with rear speakers. Pulling the knob out places the Imaging Enhancer in "All" passengers optimization mode. Pushing the knob in places the unit in "Driver" optimization mode. Best results at the driver's position will be achieved with the control in the "Driver" setting.

28. Subsonic Filter Switch:

Engages a 15Hz High Pass subsonic filter.



Wiring Set-up



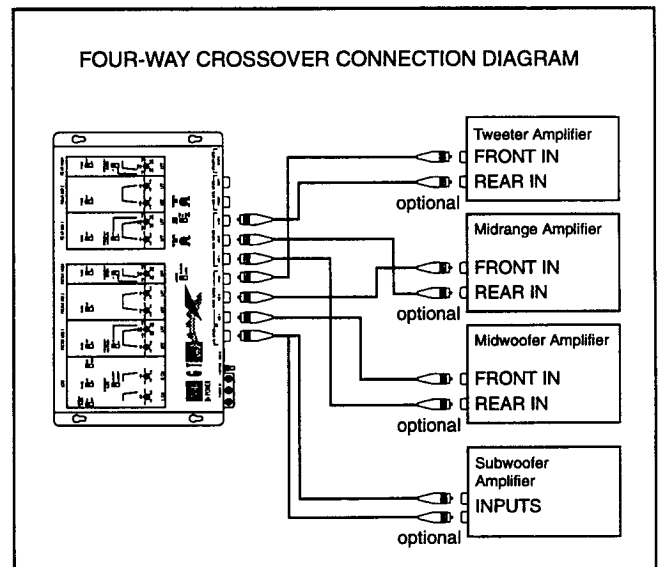
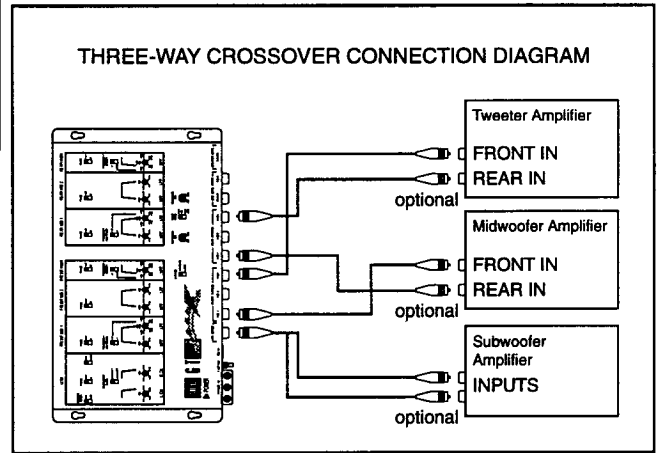
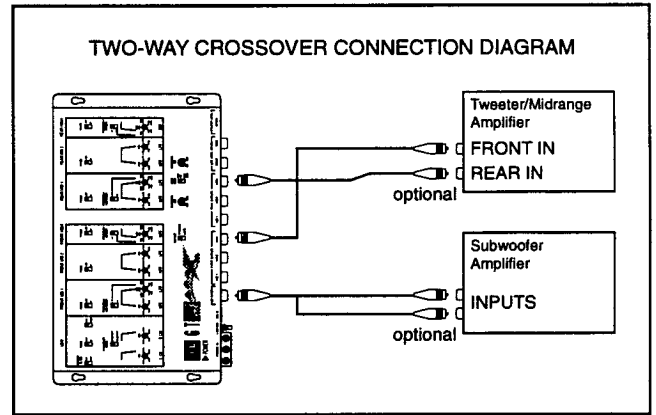
SPEAKER LEVEL INPUT CONNECTIONS

- | | |
|---------------|--------------|
| Left Front + | White |
| Left Front - | White/Black |
| Right Front + | Gray |
| Right Front - | Gray/Black |
| Left Rear + | Green |
| Left Rear - | Green/Black |
| Right Rear + | Purple |
| Right Rear - | Purple/Black |

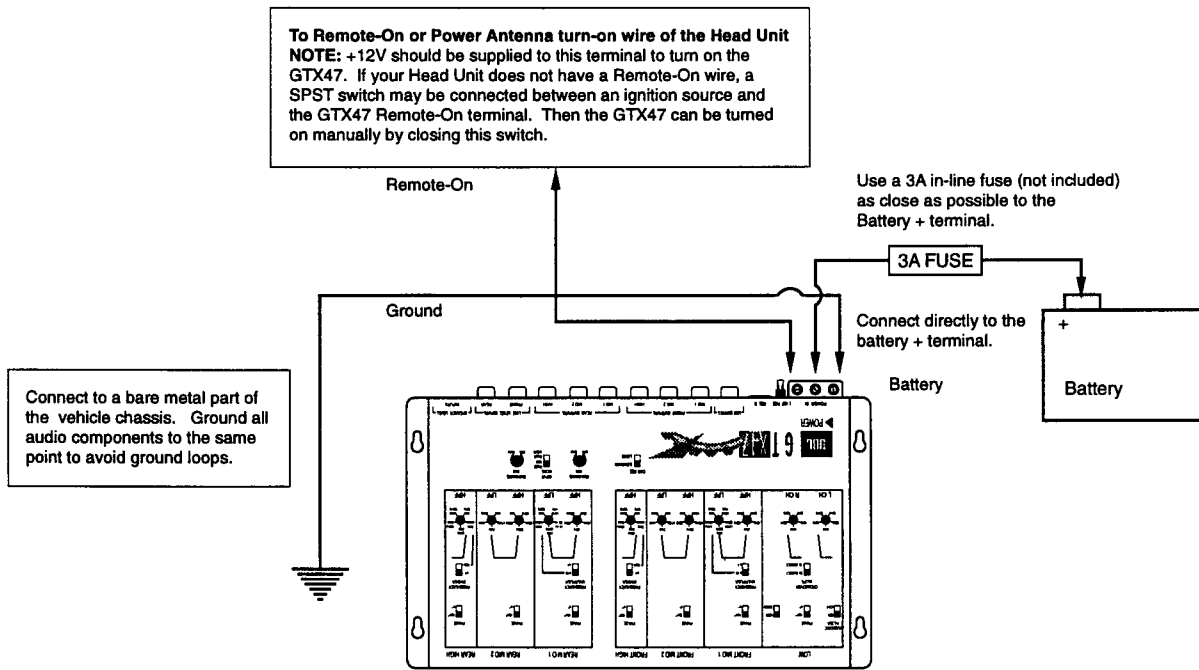
Refer to "Power Connections Diagram and System Configurations Diagrams" for more information.

IMPORTANT NOTE FOR RIGHT HAND DRIVE CARS:

For countries which have right hand drive cars all input and output connections to the GTX47 should be reversed. Connect the left output of your CD/Cassette to the right input of the GTX47 and the right output of the GTX47 to the left inputs of the amplifier. Connect the right outputs of the GTX47 to the left inputs of the amplifier. Connect the left outputs of the GTX47 to the right inputs of the amplifier. (see page 7)



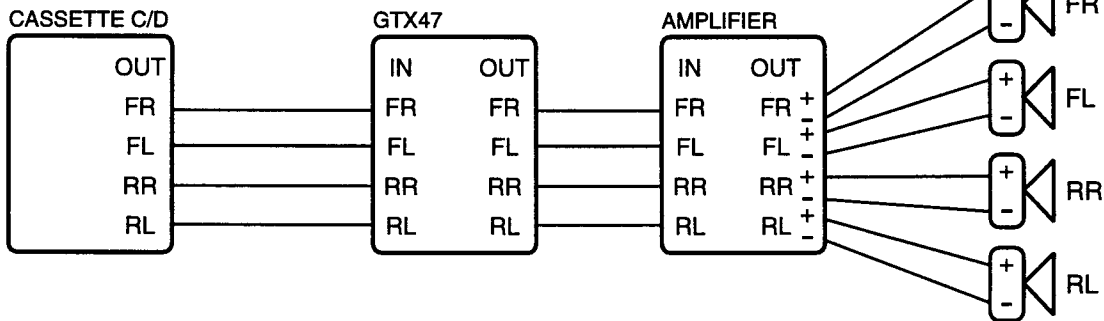
Wiring and Set-Up



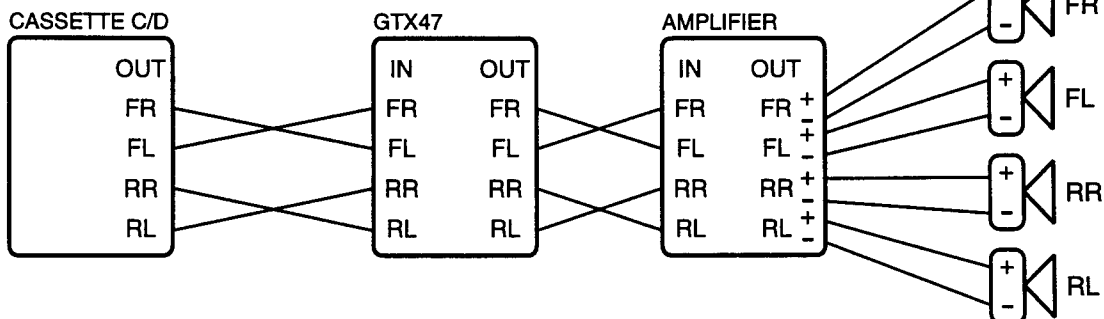
System Configurations

Typical GTX47 system configurations are shown below.

LEFT HAND DRIVE CAR (Connection shown for one speaker type only. Repeat similar connection for other speakers).

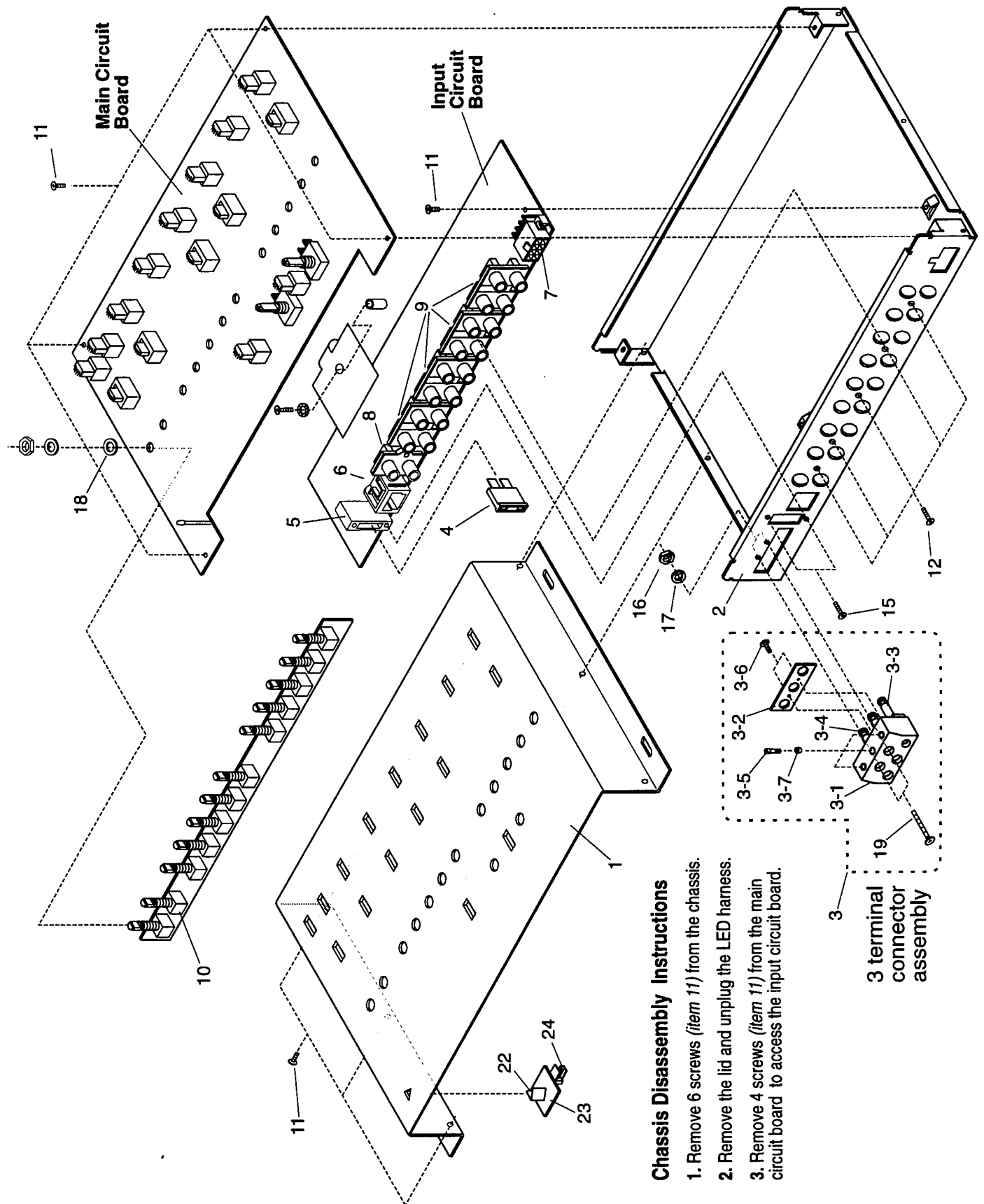


RIGHT HAND DRIVE CAR (Connection shown for one speaker type only. Repeat similar connection for other speakers).



Note: Right hand driver cars must reverse right and left inputs and outputs for proper functioning of the Imaging Enhancer.

Mechanical Exploded View



Chassis Disassembly Instructions

1. Remove 6 screws (item 11) from the chassis.
2. Remove the lid and unplug the LED harness.
3. Remove 4 screws (item 11) from the main circuit board to access the input circuit board.

3 terminal connector assembly

Mechanical Parts List

Ref. Number	Part Number	Description	Qty.
GTX47 UNIT MECHANICAL PARTS			
Printed Circuit Board			
		GTX47-(3+4) PCB FR4 2SIDE	1
Harness			
	1-51-248	AWG#28 UL2854 SHIELD WIRE SV2.5-5H TO SV2.5-4H 200mm BLACK	1
Chassis			
1	5-01-129	2268-1 TOP COVER	1
2	5-01-130	2268-2 BOTTOM COVER	1
Terminal			
	3-61-025B	3 TERMINAL CONNECTOR ASSEMBLY	1
3-1	3-61-025	*2033B-5 TERMINAL HOLDER 3P	1
3-2	3-06-016	*2033-6 WIRE CONNECTOR BRACKET	1
3-3	5-01-119	*2031B-7G BRASS WIRE CONN. G/P	1
3-4	5-01-118	*2018-7G BRASS WIRE CONN. G/P	2
3-5	1-33-260	*M3x9 G/P BM-(BRASS W.C.)	3
3-6	1-33-251	*2x6 PT BZ-W.C.BKT	2
3-7		*VINYL TUBE 3x1.5L	3
Fuse			
4	1-29-111	GM FUSE 3A	1
5	1-29-130	GM FUSE HOLDER 1800F1	1
6	1-43-015	MODULAR JACK AP-90-6-6U	1
Connector			
7	1-58-004	8POLE #5569-08AI MOLEX CONNECTOR	1
RCA Jacks			
8	1-26-006	2RCA JACK HSP-202V-03 GOLD	1
9	1-44-407	4RCA JACK HSP-204V-03 GOLD	4
Potentiometer			
10	VR3, through VR14	1-26-034 TOCOS TRIMPOT TP96000 20KBx4	12
Screws and Washers			
11	1-33-251	M3X0.5X5 (2.6)BM NI	12
12	1-33-401	3X8 NI BT	5
13	1-35-379	MSP 3X16 TIN	2
14	1-33-464	M3x0.5x16 PM NI	1
15	1-34-269	2.6x8 BT NI	2
16	1-37-030	M3 NUT	2

17	1-37-230	M3 SPRING WASHER ZNC	2
18	1-37-501	FIBRE WASHER 12x7x0.3mm	12
19	5-01-166	2268-3 SHIELD PLATE	1
	1-40-067	2268-3A SHIELD PLATE PAPER	1
20	5-01-165	BRASS TUBE 4.8xM3x10mm	1
21	1-37-330	M3 TEETN WASHER ZNC	1
LEDs			
22	1-25-011	TRIANGLE LED RED 5X4 SIL-2233D	1
23	9-01-031	LED PCB GTE422 2267-3	1

Ref. Number	Part Number	Description	Qty.
Connector			
24	1-58-008	WAFER 2PIN S11-2W	1

Ref. Number	Part Number	Description	Qty.
-------------	-------------	-------------	------

REMOTE CONTROL BOX

Resistors			
R 66,67	1-18-315	1/4W+-5% PS 1.5K OHM	2
R 65	1-18-410	1/4W+-5% PS 10K OHM	1

Panels			
25	5-01-086	2288-3 VR TOP COVER	1
26	5-01-087	2288-4 VR BOTTOM COVER	1

Jack			
27	1-45-015	MODULAR JACK AP-90-6-6U	1

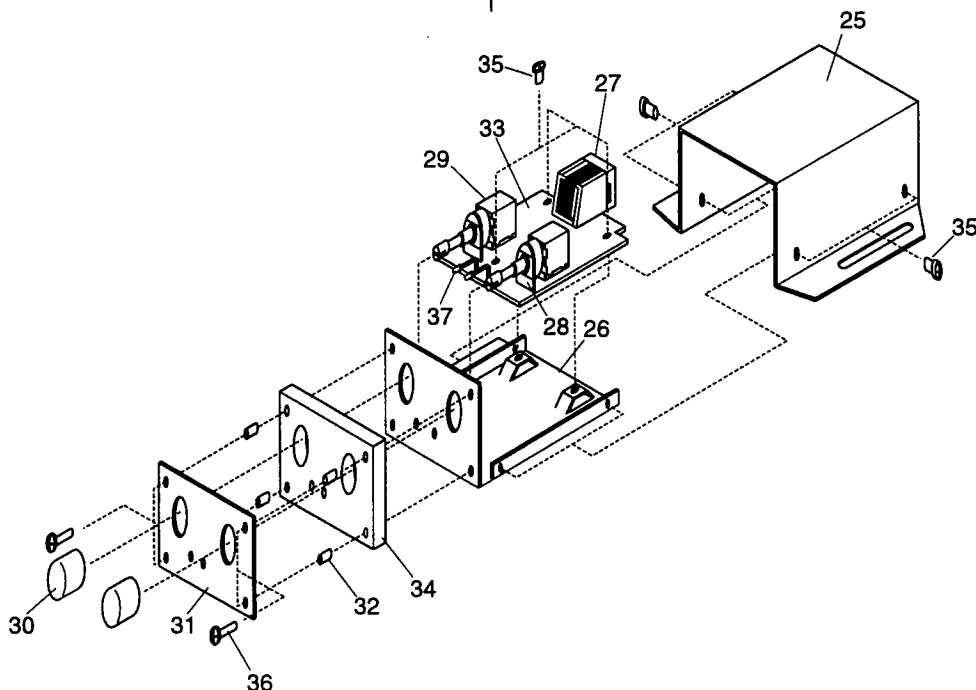
Potentiometers			
28	1-26-098	V16L4(7x6.5)(PH2D)S(SL123-3) 20KC-15A10K (18TEETH) NOBLE	1
29	1-26-093	V16L4(7x6.5)(PH2D)S(SL123-4) 20KC-15A10K (18TEETH) NOBLE	1

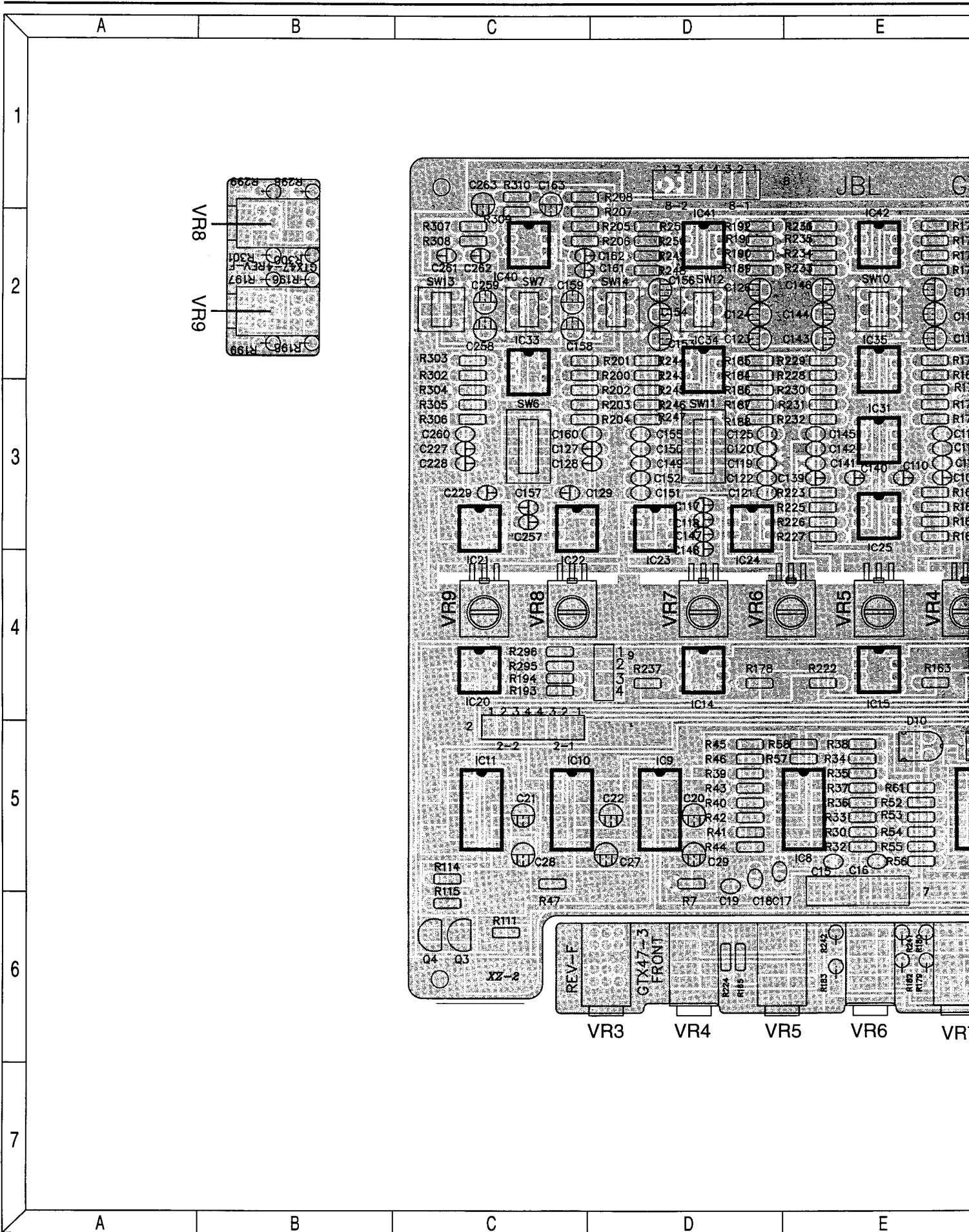
Knob			
30	3-64-003	2111-3 FADER KNOB	2
31	5-01-083	2288-5 PANEL PLATE	1
32	5-01-091	BRASS TUBE 5x3x6mm	4

Printed Circuit Board			
33	9-01-034	VR PCB GTP4-2	1

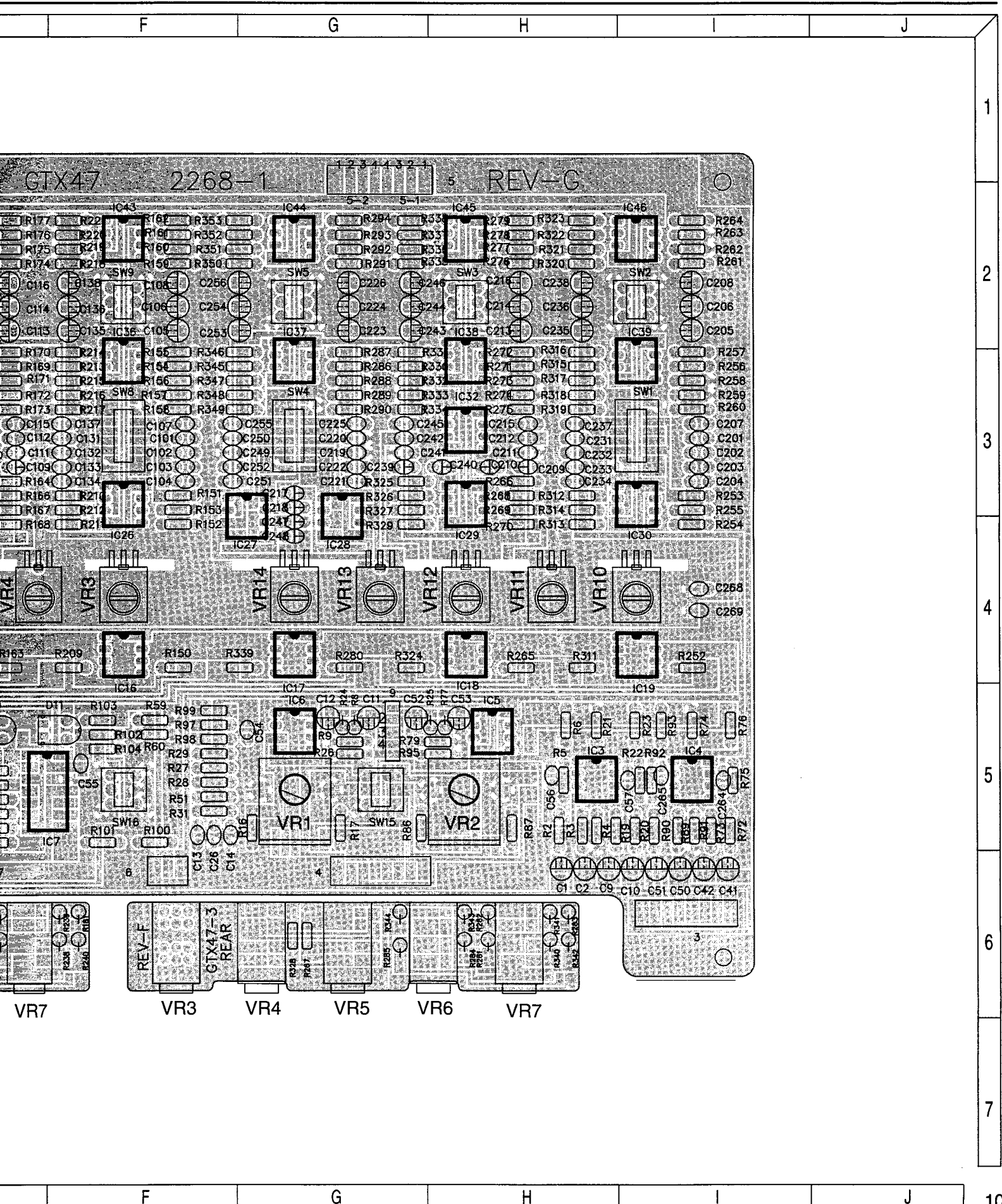
Screw and Washer			
34	1-42-108	2285-5A RUBBER RAD 55x32x6mm	1
35	1-33-254	M3x0.5x4 PM BZ	7
36	1-33-415	M3x0.5x10 BZ PM	4

LED			
37	1-25-010	D=3mm GREEN SIL-3144D	2

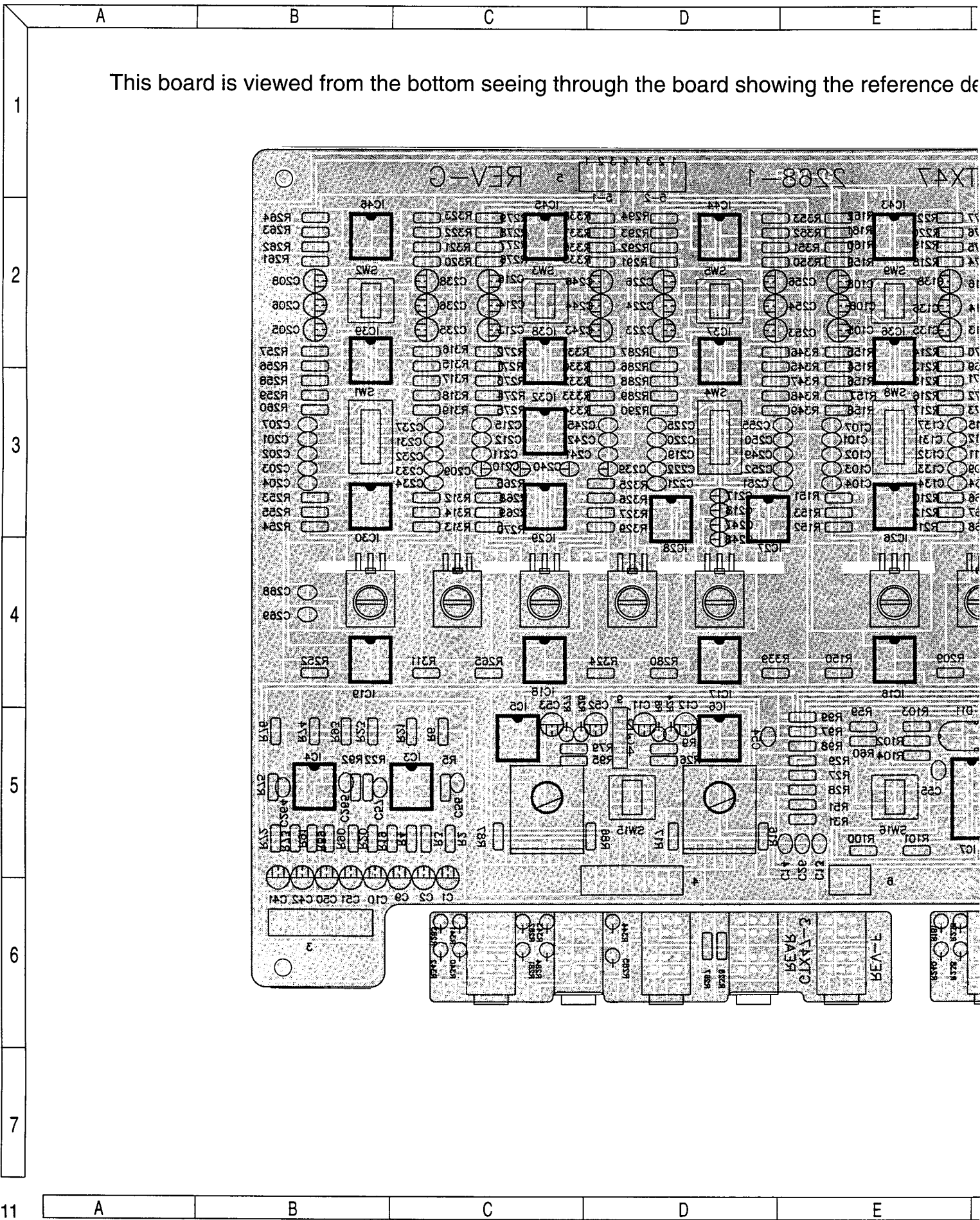




Board (Top Component Side)

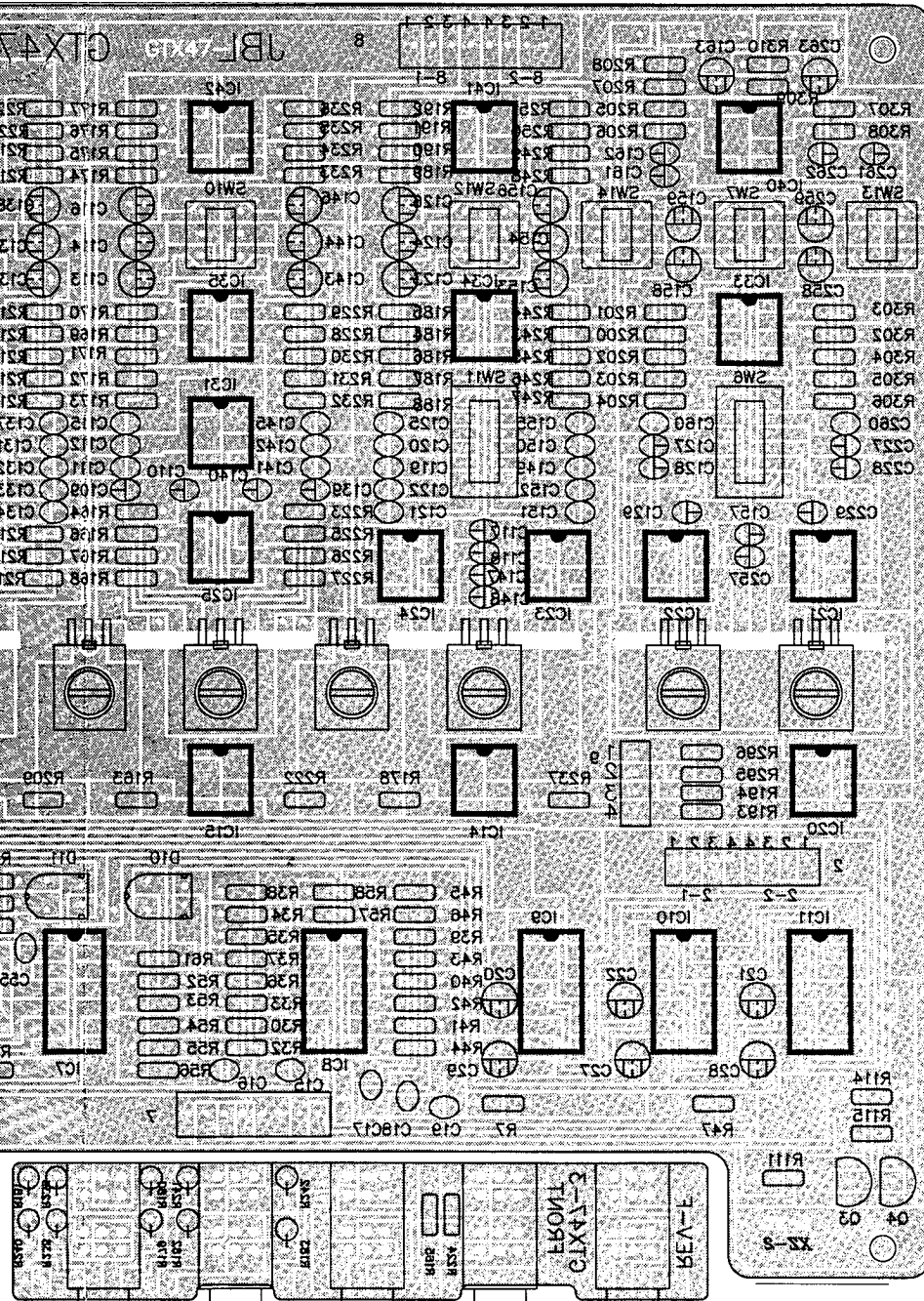


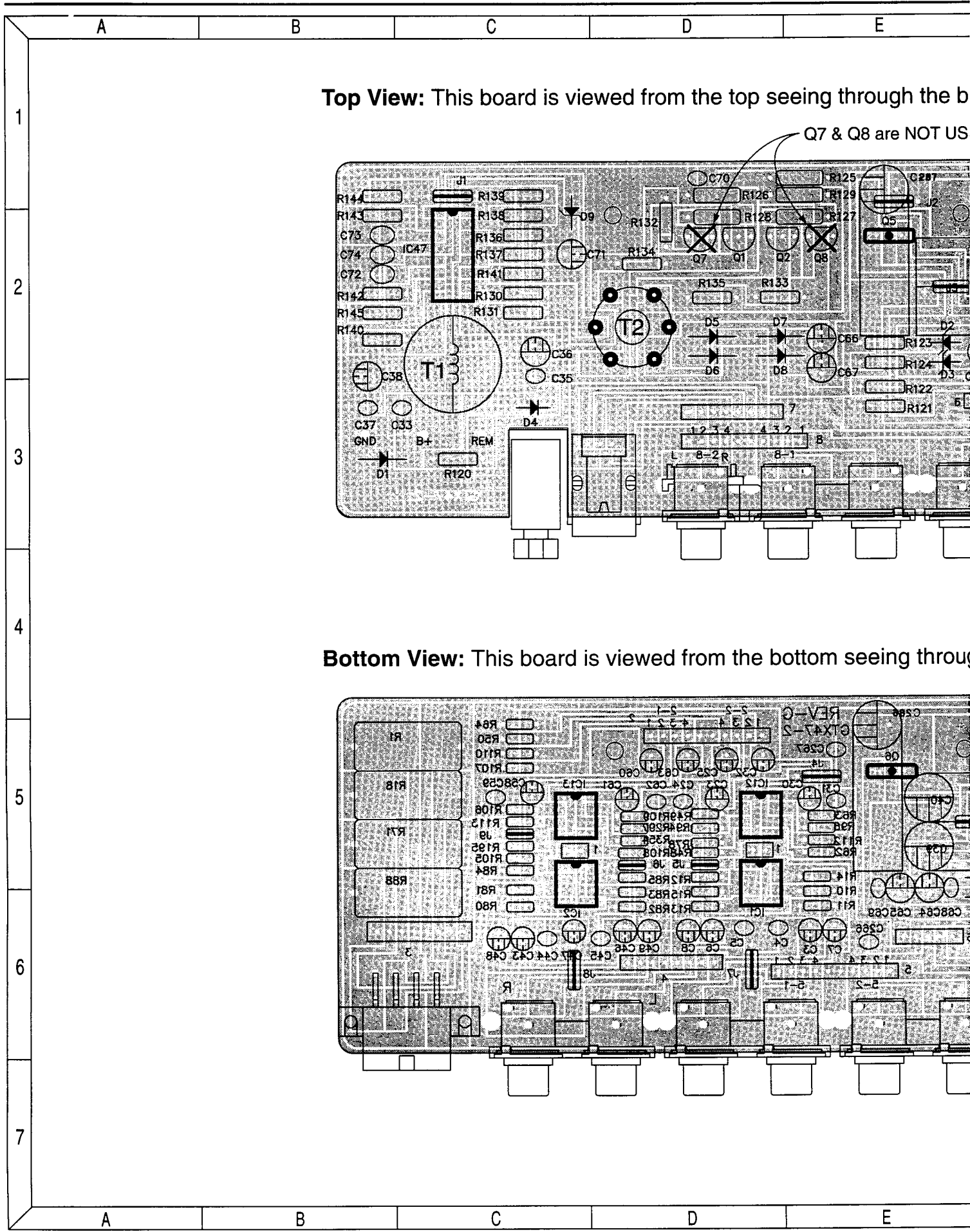
This board is viewed from the bottom seeing through the board showing the reference designations



Print Board (Bottom Side)

Reference designators and components

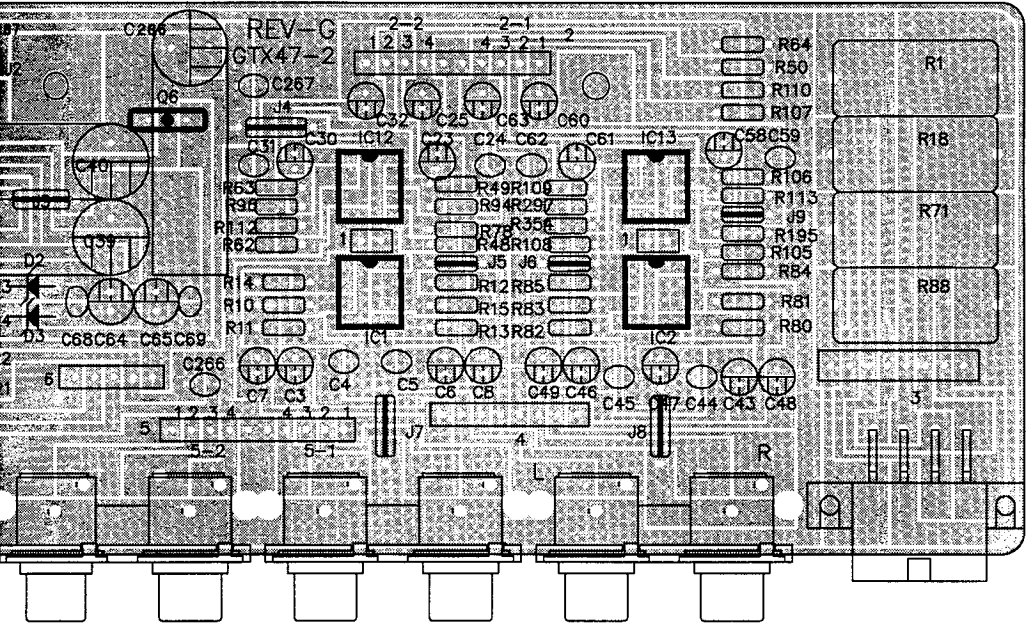




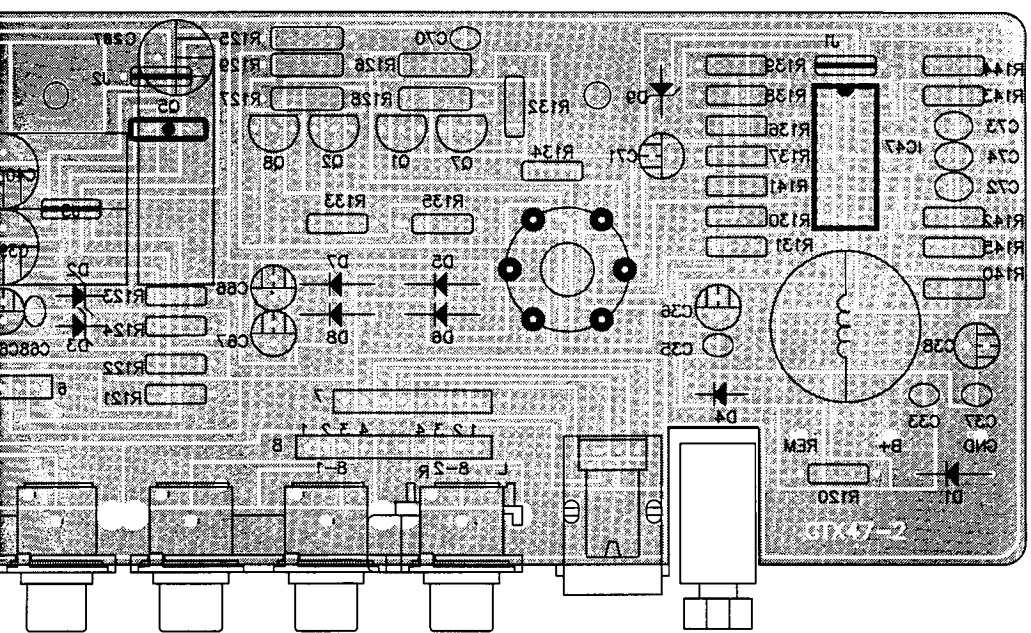
Top (Top and Bottom Side)

the board showing the trace layers.

NOT USED



through the board showing the reference designators and components.



Bottom (Top and Bottom Side)

1

2

3

4

5

6

7

12

Electrical Parts List

Ref. Number	Part Number	Description	Qty.	Ref. Number	Part Number	Description	Qty.
MAIN PRINTED CIRCUIT BOARD							
Optocoupler							
D 10, 11	1-03-301	OPHTO COUPLER NSL-32H-001	2				
Transistors							
Q 3, 4	1-07-003	9014C	2				
Integrated Circuits							
IC 9, 10, 11	1-09-305	NEC D4066BC	3				
IC 3, 4, 5, 6, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35, 36, 37, 38, 39	1-09-406	LF353 NS	30				
IC 7, 8	1-09-408	LF347N	2				
IC 40, 41, 42, 43, 44, 45	461-09-421	BA4560	7				
Mylar Capacitors							
C 101, 103, 112, 122, 131, 133, 142, 152, 201, 203, 212, 222, 231, 233, 242, 252	1-11201RH	100V+-10% 0.01UF MINI	16				
C 55	1-11415RH	100V+-10% 0.0015UF MINI	1				
C 54	1-11315RH	100V+-10% 0.015UF MINI	1				
C 119, 149, 219, 249	1-11347RH	100V+-10% 0.047UF MINI	4				
C 14, 26, 111, 120, 141, 150, 211, 220, 241, 250	1-11447RH	100V+-10% 0.0047UF MINI	10				
Electrolytic Capacitors							
C 161, 162, 261, 262	1-13010PH	50V+-10% 1UF MINI 4x7.5	4				
C 1, 2, 9, 10, 41, 42, 50, 51, 105, 106, 108, 113, 114, 116, 123, 124, 126, 135, 136, 138, 143, 144, 146, 153, 154, 156, 158, 159, 163, 205, 206, 208, 213, 214, 216, 223, 224, 226, 235, 236, 238, 243, 244, 246, 253, 254, 256, 258, 259, 263	1-13110LH	16V+-10% 10UF MINI 4x7.5	50				
C 109, 110, 128, 139, 140, 209, 210, 228, 239, 240	1-13412PH	50V+-10% 0.12UF 4x7.5	10				
C 157, 257	1-13418PH	50V+-10% 0.18UF 4x7.5	2				
C 102, 104, 132, 134, 202, 204, 232, 234	1-13422PH	50V+-10% 0.22UF 4x7.5	8				
C 117, 118, 129, 147, 148, 217, 218, 229, 247, 248	1-13433PH	50V+-10% 0.33UF 4x7.5	10				
C 127, 227	1-13468PH	50V+-10% 0.68UF 4x7.5	2				
C 11, 12, 52, 53	1-13147LI	16V+-20% 47UF 5x7.5	4				
Monolithic Capacitors							
C 15, 16, 17, 18, 121, 151, 221, 251, 268, 269, 271	1-14091PI	50V+-20% 0.1UF 104KHB	11				
Ceramic Capacitors							
C 19	1-16033PH	50V+-10% 33PF	1				
C 56, 57, 264, 265	1-16047PH	50V+-10% 47PF	4				
C 107, 115, 125, 137, 145, 155, 160, 207, 215,	1-16110PH	50V+-10% 100PF	14				
				225, 237, 245, 255, 260			
				C 13	1-16133PH	50V+-10% 330PF	1
PRINTED CIRCUIT BOARD 1 (MAIN)							
					9-01-049	GTX47-1 PCB	1
Potentiometers							
				VR1, VR2	1-26-107	RK14K12H 50KAx2 L=15MM	2
				R102, 52	1-26-324	TRIMMER POT. 2LEGS VER.50K OHM	2
Switches							
				SW 1, 4, 6, 8, 11	1-27-013	SS-42D01 G6 4P2T	5
				SW 2, 3, 5, 7, 9, 10, 12, 13, 14, 15, 16	1-27-023	SS-22F05 G8 2P2T	11
Resistors							
				R 162, 177, 192, 208, 221, 236, 251, 264, 279, 294, 310, 323, 338, 353	1-30-210	1/8W+-1% METAL FILM 100 OHM	14
				R 9, 26, 79, 95	1-30-268	1/8W+-1% METAL FILM 680 OHM	4
				R 16, 17, 86, 87, 150, 151, 159, 163, 164, 174, 178, 189, 209, 210, 218, 222, 223, 233, 237, 248, 252, 253, 261, 265, 266, 276, 280, 291, 311, 312, 320, 324, 325, 335, 339, 350	1-30-310	1/8W+-1% METAL FILM 1K OHM	36
				R 103, 152, 167, 168, 211, 226, 227, 254, 269, 270, 313, 327, 329	1-30-322	1/8W+-1% METAL FILM 2.2K OHM	13
				R 54	1-30-343	1/8W+-1% METAL FILM 4.3K OHM	1
				R 53, 101	1-30-341	1/8W+-1% METAL FILM 4.7K OHM	2
				R 33, 34, 39, 40	1-30-339	1/8W+-1% METAL FILM 3.9K OHM	4
				R 6, 23, 32, 56, 76, 93, 154, 155, 157, 160, 161, 169, 170, 172, 175, 176, 184, 185, 187, 190, 191, 200, 201, 202, 203, 204, 207, 213, 214, 216, 219, 220, 228, 229, 231, 234, 235, 243, 244, 246, 249, 250, 256, 257, 259, 262, 263, 271, 272, 274, 277, 278, 286, 287, 289, 292, 293, 302, 303, 304, 305, 306, 309, 315, 316, 318, 321, 322, 330, 331, 333, 336, 337, 345, 346, 348, 351, 352	1-30-410	1/8W+-1% METAL FILM 10K OHM	78
				R 205, 307	1-30-411	1/8W+-1% METAL FILM 11K OHM	2
				R 156, 158, 171, 173, 186, 188, 230, 232, 215, 217, 245, 247, 258, 260, 273, 275, 288, 290, 317, 319, 332, 334, 347, 349	1-30-412	1/8W+-1% METAL FILM 12K OHM	24
				R 104	1-30-415	1/8W+-1% METAL FILM 15K OHM	1
				R 153, 166, 212, 225, 255, 268, 314, 326	1-30-418	1/8W+-1% METAL FILM 18K OHM	8
				R 206, 308	1-30-422	1/8W+-1% METAL FILM 22K OHM	2
				R 30, 55	1-30-430	1/8W+-1% METAL FILM 30K OHM	2
				R 37, 38	1-30-443	1/8W+-1% METAL FILM 43K OHM	2
				R 4, 5, 21, 22, 74, 75, 91,	921-30-432	1/8W+-1% METAL FILM 33.2K OHM	8

ACTIVE DIVIDING NETWORK

Ref. Number	Part Number	Description	Qty.
R 193, 194, 295, 296	1-30-456	1/8W+-1% METAL FILM 56K OHM	4
R 7	1-30-462	1/8W+-1% METAL FILM 62K OHM	1
R 2, 3, 19, 20, 35, 36, 41, 42, 43, 44, 46, 61, 72, 73, 89, 90, 97, 98, 99, 100, 111, 114, 115	1-30-510	1/8W+-1% METAL FILM 100K OHM	23
R 28	1-30-515	1/8W+-1% METAL FILM 150K OHM	1
R 27, 29	1-30-522	1/8W+-1% METAL FILM 220K OHM	2
R 31, 51, 59, 60	1-30-547	1/8W+-1% METAL FILM 470K OHM	4
R 45	1-30-551	1/8W+-1% METAL FILM 510K OHM	1
R 57, 58	1-30-710	1/8W+-1% METAL FILM 10M OHM	2
R 8, 24, 25, 77	1-30-262	1/8W+-1% METAL FILM 620 OHM PF4	

Connectors

1-58-001	WAFER 8PIN S11-8W	6
1-58-010	WAFER 3PIN S11-3W	1

INPUT CIRCUIT BOARD**Transformer**

T1	0.6x170T 1.2MH T80-26	1
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Choke

T2	1-01-206 XJ42106 #1240 P=0.8MM 16Tx2 S=0.6MM 13Tx2	1
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Diodes

D 1	1-05-001 1N4001	1
D 4	1-05-009 1N4148	1
D 5, 6, 7, 8	1-05-022 FR152	4

Zener Diodes

D 9	1-06-005 1/2W+-5% 15V	1
D 2, 3	1-06-004 1/2W+-5% 9.1V	2

Transistors

Q 1, 2	1-07-003 9013H "SAMSUNG"	2
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Integrated Circuits

IC 1, 2, 12, 13	1-09-406 LF353 NS	4
IC 47	1-09-418 TL594CN TI	1

Mylar Capacitors

C 24, 31, 33, 35, 59, 62, 73	1-10201RH 100V+-10% 0.01UF	7
C 74	1-10447RH 100V+-10% 0.0047UF	1
C 272, 278, 279, 285	1-11201RH 100V+-10% 0.01UF MINI	4
C 273, 274, 275, 276, 277, 280, 281, 282, 283, 284	1-11333RH 100V+-10% 0.033UF MINI	10
C 72	1-11412RH 100V+-10% 0.0012UF MINI	1

Electrolytic Capacitors

C 39, 40	1-12247LI 16V+-20% 470UF 8x14	2
C 286, 287	1-12310NI 35V+-20% 1000UF 10x30	2
C 36	1-13010PH 50V+-10% 1UF MINI 4x7.5	1
C 71	1-13133LI 16V+-20% 33UF MINI 5x7.5	1
C 38, 66, 67	1-13210LI 16V+-20% 100UF MINI 6x7.5	3
C 3, 6, 7, 8, 23, 25, 30, 32, 43, 46, 47, 48, 49, 58, 60, 61, 63, 64, 65	1-13110LH 16V+-10% 10UF MINI 4x7.5	19

Monolythic Capacitors

C 37, 68, 69, 70, 266, 267	1-14091PI 50V+-20% 0.1UF HB	6
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Ref. Number	Part Number	Description	Qty.
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Ceramic Capacitors

C 270	1-16133PH 50V+-10% 330PF	1
C 4, 5, 44, 45	1-16147PH 50V+-10% 470PF	4

Resistors

R 49, 63, 106, 109	1-17-210 1\8W+-5% PS 100 OHM	4
R 10, 13, 80, 83	1-17-310 1\8W+-5% PS 1K OHM	4
R 48, 62, 105, 108	1-17-347 1\8W+-5% PS 4.7K OHM	4
R 14, 15, 78, 84, 85, 94, 96, 112, 113, 195, 297, 354	1-17-410 1\8W+-5% PS 10K OHM	12
R 11, 12, 81, 82	1-17-450 1\8W+-5% PS 51K OHM	4
R 50, 64, 107, 110	1-17-510 1\8W+-5% PS 100K OHM	4
R 120	1-18-110 1\4W+-5% PS 10 OHM	1
R 128	1-18-222 1\4W+-5% PS 220 OHM	1
R 140, 141	1-18-233 1\4W+-5% PS 330 OHM	2
R 123, 124, 137	1-18-310 1\4W+-5% PS 1K OHM	3
R 121, 122, 134, 135	1-18-322 1\4W+-5% PS 2.2K OHM	4
R 139	1-18-347 1\4W+-5% PS 4.7K OHM	1
R 142	1-18-351 1\4W+-5% PS 5.1K OHM	1
R 145	1-18-410 1\4W+-5% PS 10K OHM	1
R 144	1-18-412 1\4W+-5% PS 12K OHM	1
R 138	1-18-415 1\4W+-5% PS 15K OHM	1
R 136	1-18-422 1\4W+-5% PS 22K OHM	1
R 143	1-18-447 1\4W+-5% PS 47K OHM	1
R 126, 127	1-20-010 1W+-5% PS 1 OHM	2
R 125	1-20-210 1W+-5% PS 100 OHM	1
R 1, 18, 71, 88	1-23-115 5W+-5% PS 15 OHM	4

PRINTED CIRCUIT BOARD 2 (INPUT)

9-01-050	GTX47-2 PCB	1
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Wire

1-51-246	17/0.193x2mm SINGLE WIRE RED 70mm (5+5)W/FUSE T'NAL	1
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MECHANICAL PARTS**Transistors**

Q6	1-08-103 TIP41C	1
Q5	1-08-104 TIP42C	1

Mica Insulator

1-32-002	MICA FOR TRA. TO-220	2
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Harness

1-51-253	AWG#26 w/T HOUSING SV2.5-5H TO SV11-3H+SV11-2H P03 RED L= 80mmx1 P03 BLUE L= 80mmx1 P03 BLACK L= 80mmx1 P02 RED & BLUE L=160mmx1	1
1-51-254	AWG#28 UL2854 SHIELD WIRE SV2.5-10H TO S11-8H 250mm BLACK	3

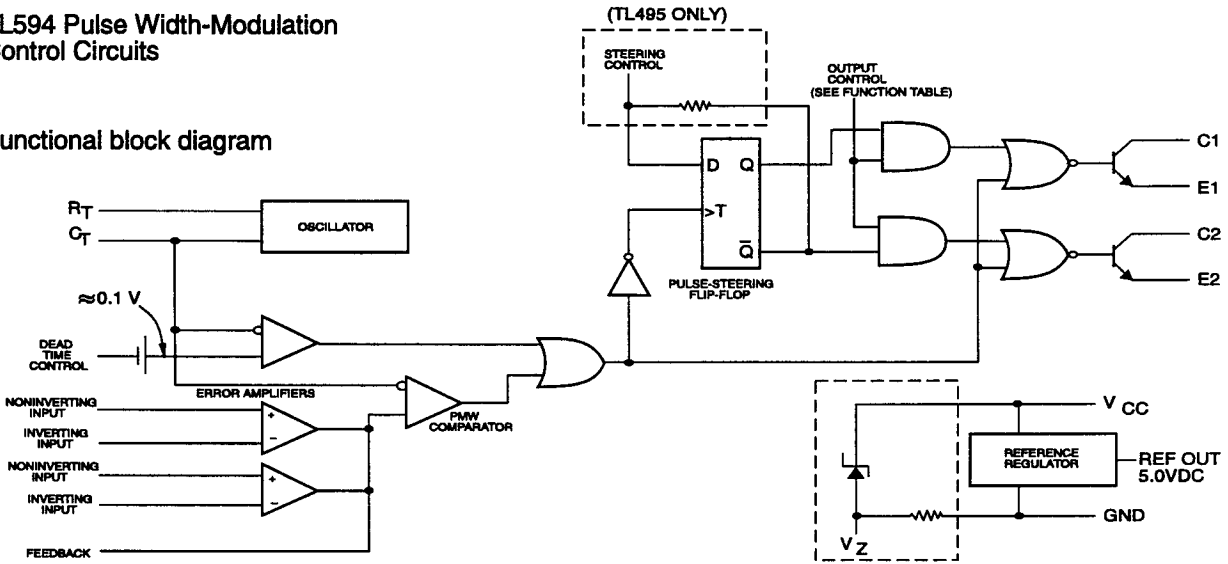
Resistors

R 179, 238, 281, 340	1-30-310 1/8W+-1% METAL FILM 1K OHM	4
R 165, 180, 182, 183, 196, 197, 198, 199, 224, 239, 241, 242, 267, 282, 284, 285, 298, 299, 300, 301, 328, 341, 343, 344	1-30-322 1/8W+-1% METAL FILM 2.2K OHM	24
R 181, 240, 283, 342	1-30-415 1/8W+-1% METAL FILM 15K OHM	4

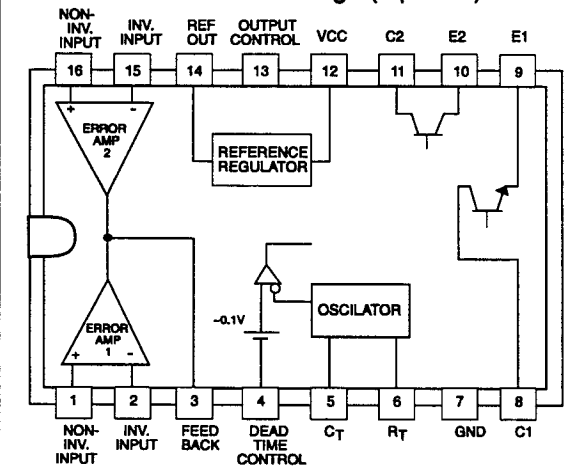
Integrated Circuit Layout and Voltages

TL594 Pulse Width-Modulation Control Circuits

functional block diagram

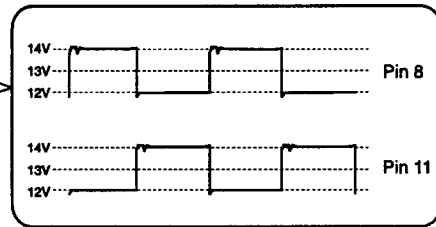


TL594 Dual In-Line Package (top view)

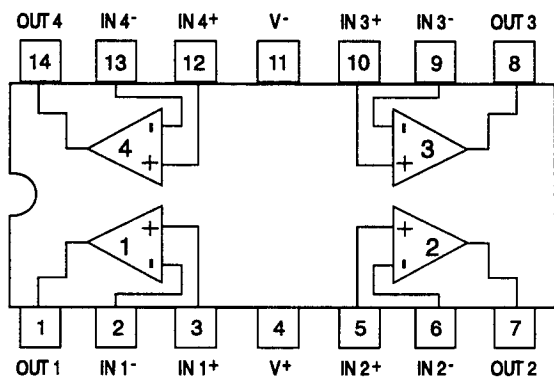


I C: 47 (TL 594)

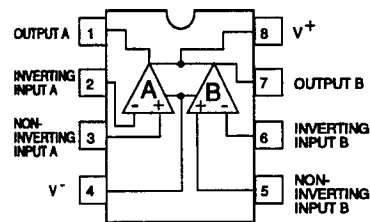
PIN	VOLTAGE
8	13.6 V DC
11	13.6 V DC
12	13.5 V DC



LM347 Connection Diagram (top view)



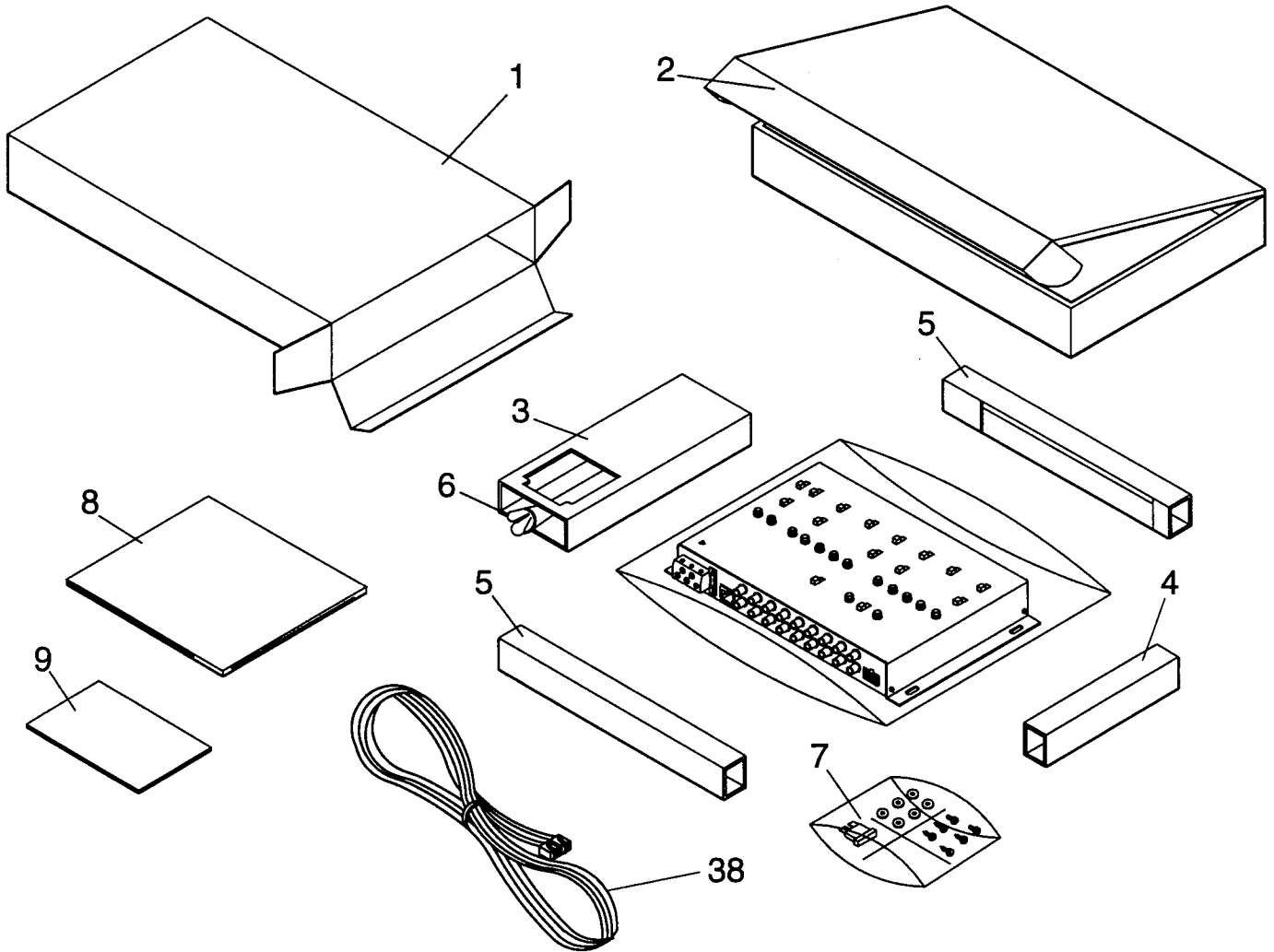
LF353, 4560 top view



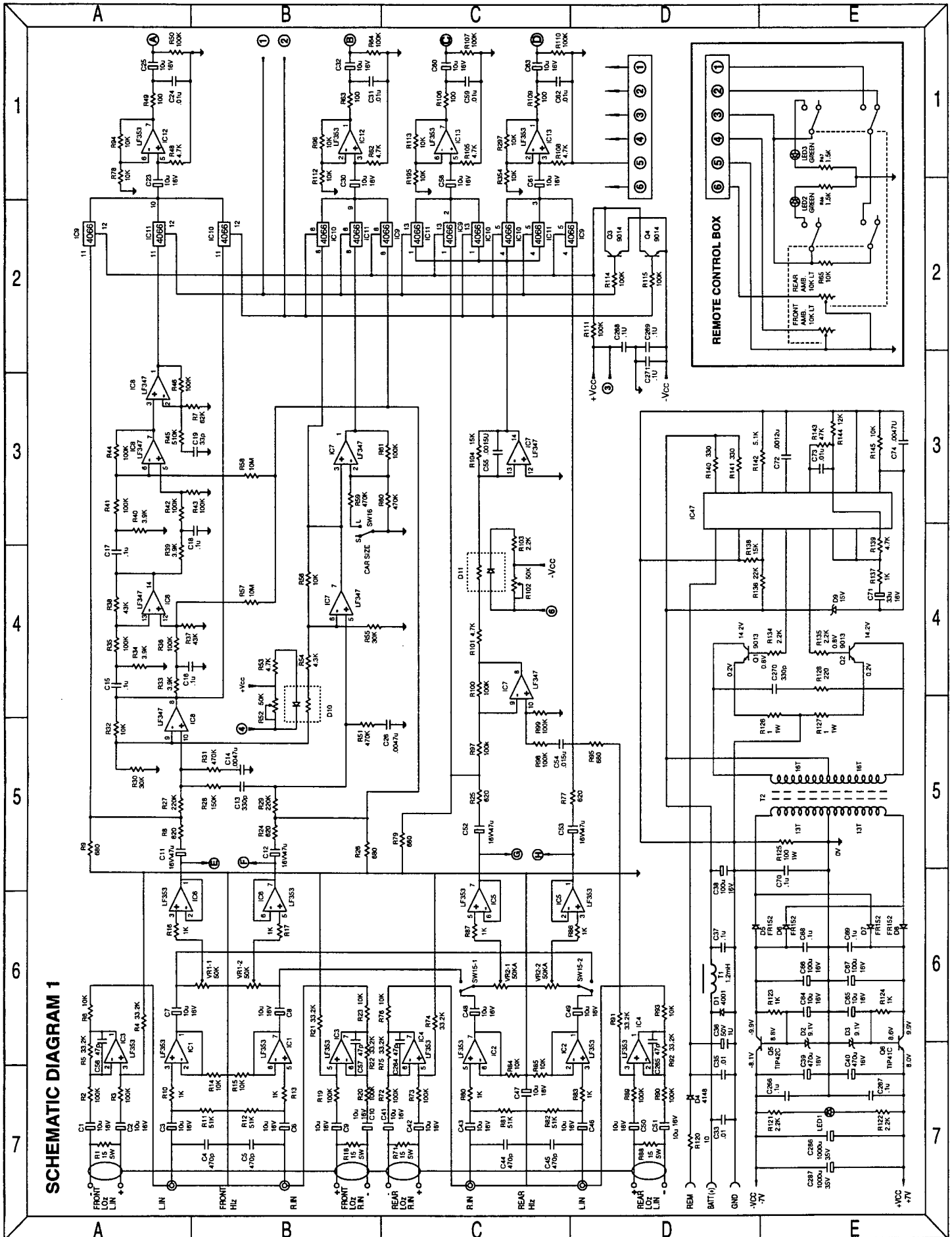
Ref. Number	Part Number	Description	Qty.
PACKAGING AND ACCESSORIES			
1	2268-P4	GIFT BOX GTX47 2268-P4	1
2	2267-P1	INNER BOX 2267-P1	1
3	2267-P2	INNER PAD 2267-P2	1
4	2267-P3	INNER PAD 2267-P3	1
5	2267-P5	INNER PAD 2267-P5	1
Speaker Input Harness			
6	1-50-047	8POLE MOLEX CONNECTOR PLUG 1 5557-08R HOUSING #3901-01-2080 12x0.19x22c w/5556Tx8PCS OTHEREND 15mm STRIP W/SLEEVE VIO / VIO+BLK L=330MM GRY / GRY+BLK L=330MM GRN / GRN+BLK L=330MM WHI / WHI+BLK L=330MM	

Ref. Number	Part Number	Description	Qty.
7	1-36-432	4x25 PA BZ	2
	1-37-140	M4 FLAT WASHER BZ	2
	1-37-240	M4 SPRING WASHER BZ	2
		POLYBAG	1
	1-29-111	GM FUSE LAMP 3A	1
	1-36-432	4X25 PA BZ	6
8	1-37-140	M4 FLAT WS BZ	6
	2268-1	MANUAL	1
9	2268-2	WARRANTY CARD JBL	1
38	1-51-117	20 foot phone cord with 6 pin connector	1

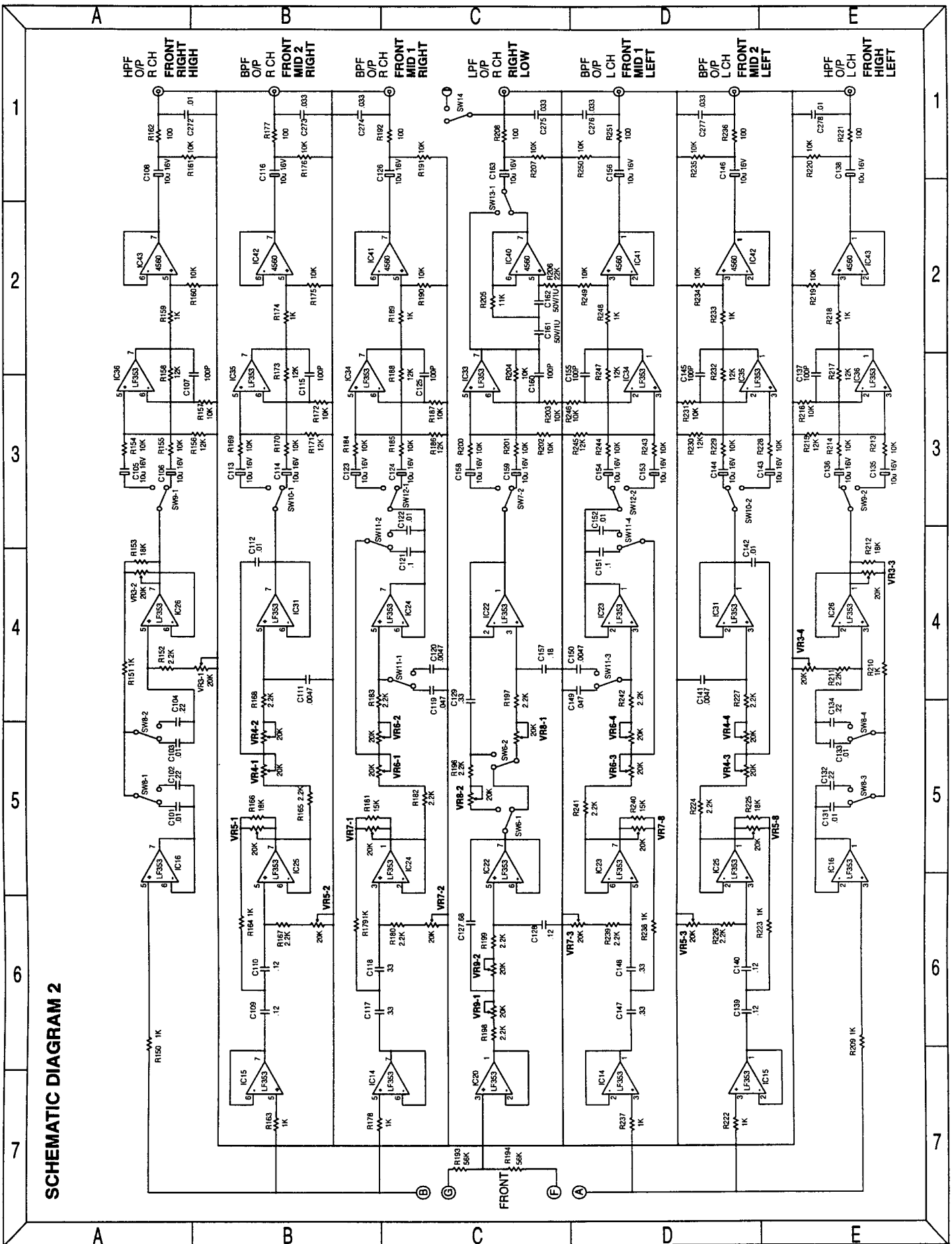
Packaging Exploded View



SCHEMATIC DIAGRAM 1



SCHEMATIC DIAGRAM 2



SCHEMATIC DIAGRAM 3

