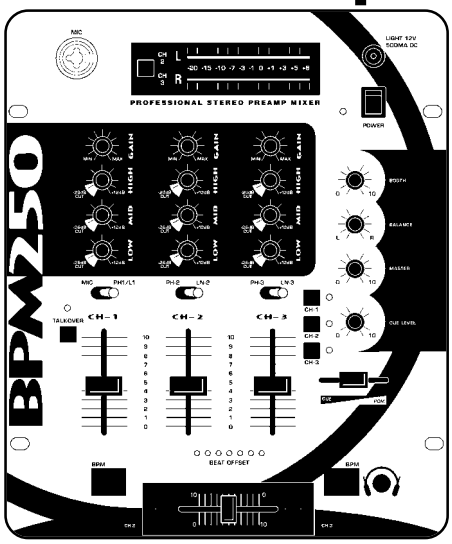
SERVICE MANUAL

BPM-250

Stereo Preamp Mixer



CONTENT'S:

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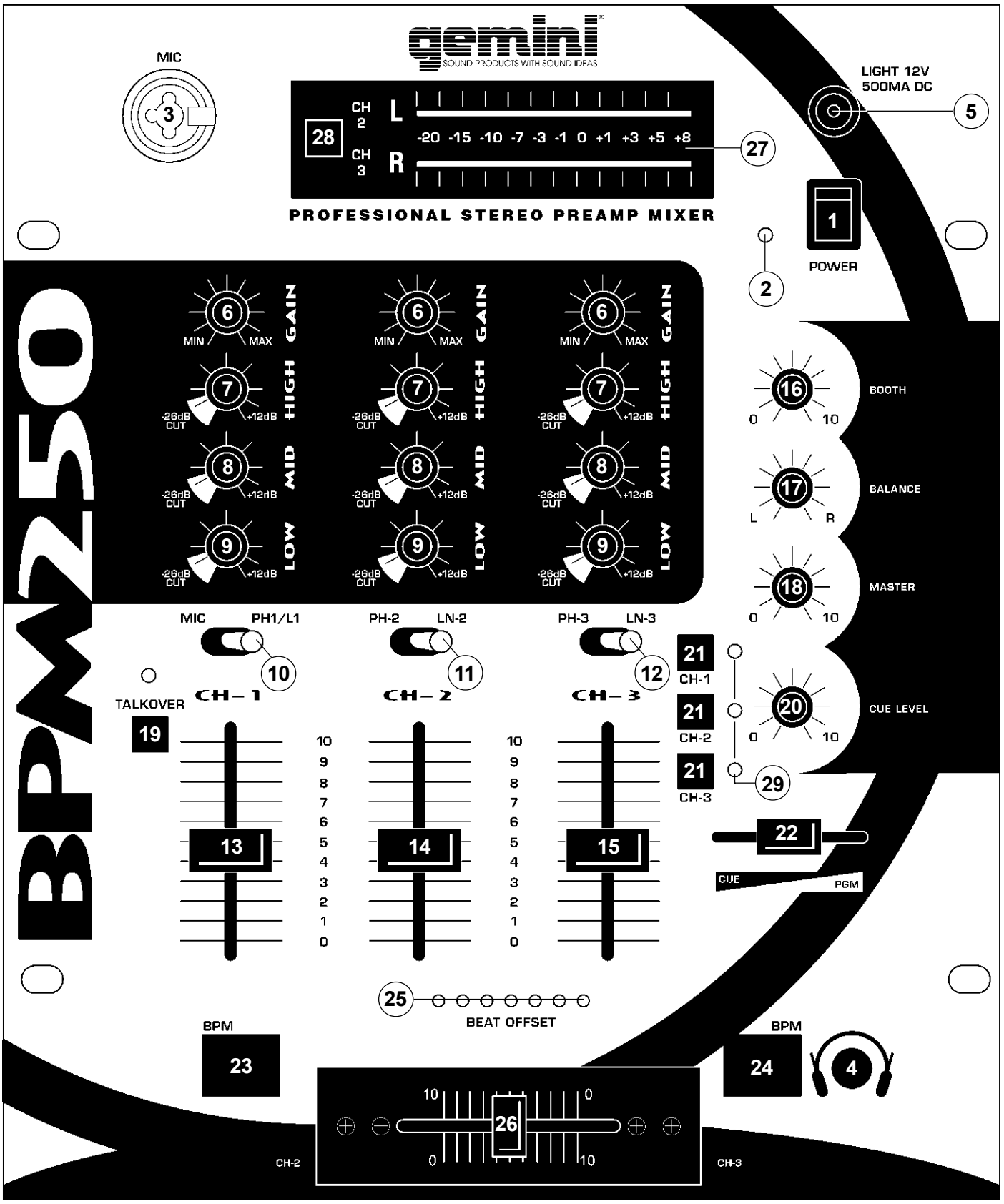
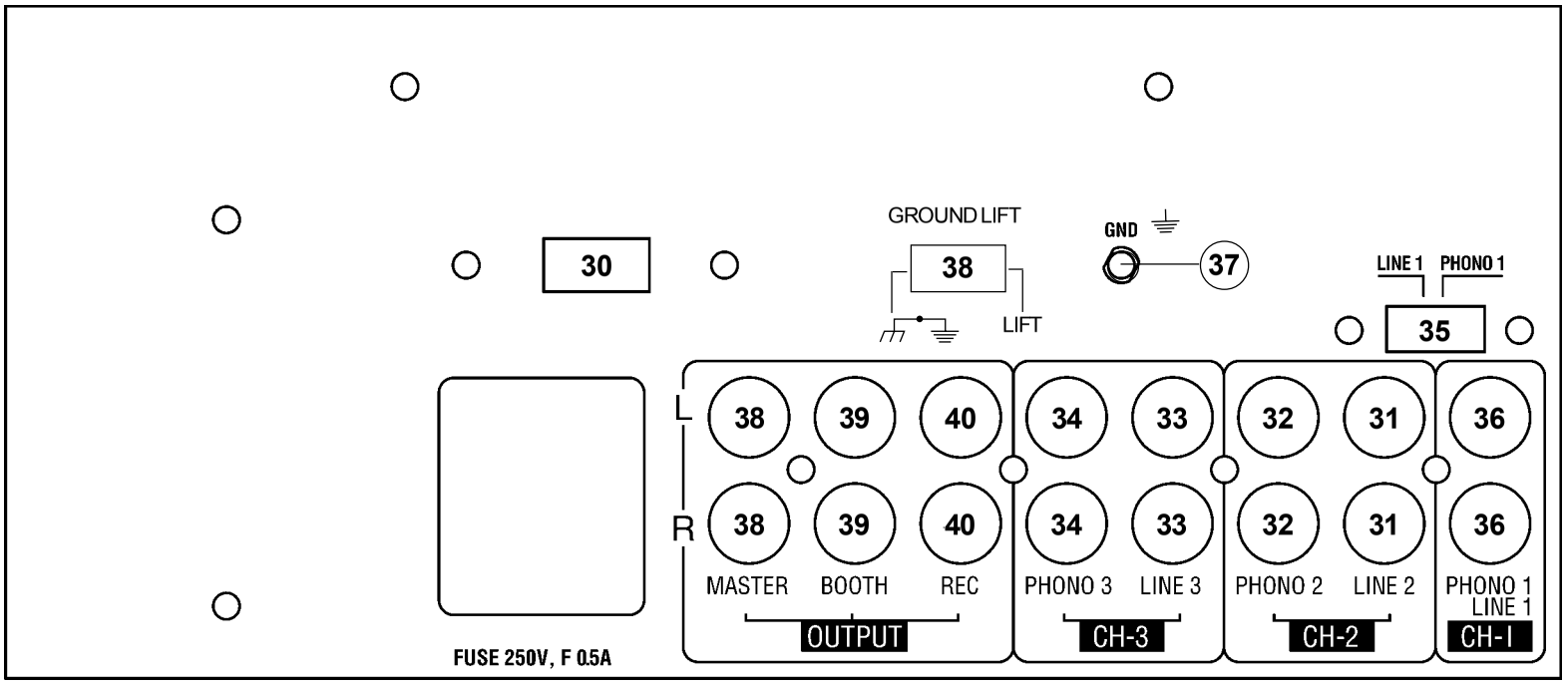

gemini
SOUND PRODUCTS WITH SOUND IDEAS
MIC
3
28
CH 2
CH 3
L
R
-20 -15 -10 -7 -3 -1 0 +1 +3 +5 +8
27
LIGHT 12V
500MA DC
5
PROFESSIONAL STEREO PREAMP MIXER
1
POWER
2
BPM250
6
MIN
MAX
GAIN
7
-26dB CUT
+12dB
HIGH
8
MID
9
LOW
16
BOOTH
0
10
17
BALANCE
L
R
18
MASTER
MIC
PH1/L1
PH-2
LN-2
PH-3
LN-3
10
11
12
CH-1
CH-2
CH-3
TALKOVER
19
21
CH-1
CH-2
CH-3
20
CUE LEVEL
29
22
CUE
PGM
13
14
15
10
9
8
7
6
5
4
3
2
1
0
25
BEAT OFFSET
BPM
23
BPM
24
4
26
CH-2
CH-3


30
GROUND LIFT
38
LIFT
GND
37
LINE 1
PHONO 1
35
L
R
38
39
40
34
33
32
31
36
MASTER
BOOTH
REC
PHONO 3
LINE 3
PHONO 2
LINE 2
PHONO 1
LINE 1
OUTPUT
CH-3
CH-2
CH-I
FUSE 250V, F 0.5A

Connections

1. Before plugging in the power cord, make sure that the **VOLTAGE SELECTOR (30)** switch is set to the correct voltage.

NOTE: This product is double insulated and not intended to be grounded.

2. Make sure that the **POWER (1)** switch is in the off position. The **POWER LED (2)** will be off.
3. The BPM-250 is supplied with 3 sets of output jacks. The **MASTER OUTPUT (38)** jacks are used to connect to your main amplifier. The **OUTPUT REC (40)** jacks can be used to connect the mixer to the record input of your recorder enabling you to record your mix. The **OUTPUT BOOTH (39)** jacks allow you to hook up an additional amplifier.
4. The **DJ MIC (3)** input (found on the front panel) accepts a 1/4" or XLR connector and accepts only unbalanced microphones.
5. On the rear panel are 2 stereo **PHONO (32, 34)** inputs, 2 stereo **LINE (31, 33)** inputs and 1 stereo **PHONO/LINE (36)** input. The **PHONO/LINE (35)** switch enables you to set the **(36)** input to Phono or Line. The phono inputs will accept only turntables with a magnetic cartridge. A **GROUND (37)** screw for you to ground your turntables is located on the rear panel. The stereo line inputs will accept any line level input such as a CD player, a cassette player, etc.
6. Headphones can be plugged into the front panel mounted **HEADPHONE (4)** jack.
7. The BPM-250 comes with a front panel **BNC LIGHT (5)** jack. This jack is for use with a gooseneck light like the Gemini GNL-700.

Using the Ground Lift Switch

Depending on your system configuration, sometimes applying the ground will create a quieter signal path. Sometimes lifting the ground can eliminate ground loops and hum to create a quieter signal path.

1. With the mixer on, listen to the system in idle mode (no signal present) with the ground applied (the **GROUND LIFT SWITCH (38)** in the left position).
2. **Then turn the power off before moving the GROUND LIFT SWITCH (38)**. Lift the ground by moving the **GROUND LIFT SWITCH** to the right, turn the power back on and listen to determine which position will provide a signal devoid of background noise and hum. Keep the **GROUND LIFT SWITCH** in the ground position if the noise level remains the same in either position.

CAUTION: DO NOT TERMINATE THE AC GROUND ON THE POWER MIXER IN ANY WAY. TERMINATION OF THE AC GROUND CAN BE HAZARDOUS.

Operation

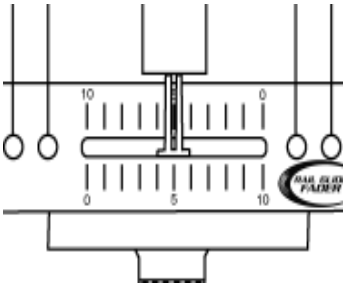
1. POWER ON: Once you have made all the equipment connections to your mixer, press the **POWER SWITCH (1)**. The power will turn on and the **POWER LED (2)** will glow RED.
2. CHANNEL 1: The **GAIN (6)**, **HIGH (7)**, **MID (8)**, and **LOW (9)**, controls allows you to fully adjust the selected source. Switch # **(10)** allows you to select either the **DJ MIC (3)** or the **PHONO/LINE (36)** input. The **CHANNEL (13)** slide controls the output level of this channel.
3. MAIN CHANNEL SECTION: To assign an input source to a channel, first set the **PHONO/LINE (11,12)** switches to their appropriate positions. To make the proper adjustments to your music, set the **GAIN (6), HIGH (7)**, **MID (8)** and **LOW (9)** controls and position the **CHANNEL (14, 15)** slide.

NOTE: There is Low, Mid and High equalization for each channel with an extremely wide range of adjustment giving you a smoother mix.

SUGGESTION: You can use the Cut Features on each channel to remove Low, Mid and/or High to create special effects.

4. CROSSFADER SECTION: The **CROSSFADER (26)** allows the mixing of one source into another. The left side of the **CROSSFADER (26)** is channel 2 and the right side is channel 3. The **CROSSFADER (26)** in your unit is removable and if the need arises can be easily replaced. Crossfader units are available in three varieties. Part # RF-45 (which is identical to the crossfader supplied with the mixer) has a 45 mm travel from side to side. Part # RF-30 is available with a 30 mm travel distance. Also available is the PSF-45 with a special curve designed for scratch mixing. Just purchase one of these crossfader units from your Gemini dealer and follow these instructions:

   1. Unscrew the outside FADER PLATE SCREWS (B). Do not touch the INSIDE SCREWS (C).
   2. Carefully lift the fader and unplug the CABLE (D).
   3. Plug the new fader into the cable and place it back in the mixer.
   4. Screw the fader to the mixer.



5. BPM DISPLAY: There are **BPM DISPLAYS (23, 24)** for Channel 2 and Channel 3. They update approximately every beat and digitally display the Beats Per Minute allowing you to match the beats visually. **BPM DISPLAY (23)** reflects the Beats Per Minute of Channel 2, and **BPM DISPLAY (24)** reflects the Beats Per Minute of Channel 3.

NOTE: A [- -] reading will appear on the BPM DISPLAY if the track has unclear beats. The [- -] reading will also appear if there is no signal present.

6. The **BEAT OFFSET INDICATORS (25)** light when the tracks of Channel 2 and Channel 3 are within 11 BPMs of each other and display how aligned the beats for Channel 2 and Channel 3 are. When the RED LEDs light, the beats are not aligned. When the YELLOW LEDs light, the beats are almost aligned. When the GREEN LED lights, the beats are aligned perfectly.

NOTE: If the diffence between the two channel's beats exceed 11 BPM, the BEAT OFFSET INDICATORS will not light.

SUGGESTION: You can use the BPM DISPLAYS to determine which tracks have similar or the same Beats Per Minute. When mixing two tracks with similar Beats Per Minute, you can use one source's pitch control to align the Beats Per Minute with the other source's BPM. The BPM DISPLAYS and the BEAT OFFSET INDICATORS update every beat and will reflect the change in BPM and indicate when the beats are aligned.

NOTE: Beat mixing is a skill that requires practice. Not every track has a strong beat, and beat mixing works best with tracks with clear and strong beats.

7. OUTPUT CONTROL SECTION: The level of the **MASTER OUT (38)** is controlled by the **MASTER (18)** control. The **BALANCE (17)** control will allow the Amp Out signal to be balanced between the left and right speakers. The **BOOTH (16)** control adjusts the level of the **BOOTH OUTPUT (39).** HINT: The booth OUTPUT is used by some DJs to run monitor speakers in their DJ booth. You can also use it as a second ZONE or AMP output.

NOTE: The RECORD OUT (40) has no level control. The level is set by the channel slides and the gain controls of the selected channel. The tonal qualities are set by the bass, treble and mid controls of that same channel.

8. TALKOVER SECTION: The purpose of the talkover section is to allow the program playing to be muted so that the mic can be heard above the music. When the **TALKOVER (19)** button is pushed, the **TALKOVER INDICATOR** will glow and the volume of all sources except the Mic or whatever is connected to the **PHONO/LINE (36)** input are reduced by -16 dB.

9. CUE SECTION: By connecting a set of headphones to the **HEADPHONE (4)** jack, you can monitor any or all of the channels. Select the correct **CUE (21)** button or buttons and their respective **CUE LED (29)** indicators will glow. Use the **CUE LEVEL (20)** control to adjust the headphone volume without effecting the overall mix. By sliding the **CUE PGM PAN (22)** control to the left you will be able to monitor the assigned cue signal. Sliding to the right will monitor the PGM (program) output.

10. DISPLAY: The peak hold, dual function **DISPLAY (27)** indicates either the **MASTER (38)** output left and right levels or the channel 2 and channel 3 levels. You can choose the option you want by pressing the **DISPLAY (28)** button.

NOTE: When the DISPLAY (27) is in the channel 2/ channel 3 display mode, by adjusting the individual channel gain and tone controls, you can increase or decrease the signal to match the other channel's signal. The channel slides and crossfader have no effect on the display readings.

Specifications

INPUTS:

DJ Mic.....1.5mV 2Kohm unbalanced

Phono.....3mV 47Kohm

Line.....150 mV 27Kohm

OUTPUTS:

Amp/Booth.....0 dB 775mV 400ohm

Max.....24V Peak to Peak

Rec.....225mV 5Kohm

GENERAL:

Low.....+ 12/-26dB

Mid.....+ 12/-26dB

High.....+ 12/-26dB

Gain (Mic).....0 to -40dB

Gain (Chnls 1-3).....0 to -20dB

Frequency Response.....20Hz - 20KHz +/- 2dB

Distortion.....0.02%

S/N Ratio.....better than 80dB

Talkover Attenuation.....-16dB

Headphone Impedance.....16ohm

Power Source.....115/230V 50/60Hz 15W

Dimensions.....254mm x 305mm x 112mm

10" x 12" x 4 7/16"

Weight.....6.5 lbs (3 Kg)

Parts Lists

Cabinet Parts and Packing

Item #	Description	Part #
1	PANEL CONTROL	002-194A
2	BRACKET VR	021-758B
3	PANEL REAR	021-969B
4	COVER BOTTOM	032-019
5	HOLDER X-FADER	022-360
6	SWING LEVEL (LONG)	023-674
7	KNOB PUSH (SMALL)	002-531
8	BUSHING FOR KNOB (SMALL)	002-532
9	KNOB SLIDE (BIG)	002-713
10	KNOB SLIDE (SMALL)	002-714
11	KNOB ROTARY (B)	003-131
12	KNOB INLAY (BLACK); BOOTH,BAL,MASTER,CUE	148-236
13	KNOB INLAY (RED); GAIN	148-238
14	KNOB INLAY (GRAY); HIGH,MID,LOW	148-239
15	VR INLAY	003-970
16	PLATE LED	003-362
17	PLATE DISPLAY (SMALL)	003-372
18	HOLDER LED	003-989A
19	HOLDER BUSHING LED	003-993
20	HOLDER LED 3f (17mm)	003-969
21	HOLDER LED 3f (7mm)	003-711
22	PROTECTOR PLATE FOR 115/230V SWITCH	022-305
23	PAD FOOT	049-206
24	GND SCREW	146-710
25	VR DUST PROOF CLOTH (SMALL)	159-167
26	VR DUST PROOF CLOTH	159-171
27	SWING DUST PROOF CLOTH	159-216
28	BNC DUST PROOF CLOTH	159-201
29	PCB SUPPORT	047-468
30	SCREEN	046-024
31	SPACER	003-548
32	EVA PAD	003-510
33	SNAP RIVET	003-612
34	DRYER	190-062
35	PAN-HEAD MACHINE SCREW; PMS 2X4(B)	102-007
36	PAN-HEAD MACHINE SCREW; PMS 2.6X4(B)	102-025
37	BAND-HEAD TAPPING SCREW/TW-E; BTB-3/TW-3 3X6(AB)	121-003A
38	BAND-HEAD TAPPING SCREW; BTS-3 3X5(AB)	111-051A
39	BAND-HEAD TAPPING SCREW; BTS-3 3X6(AB)	111-046A
40	BAND-HEAD TAPPING SCREW; BTS-3 3X10(AB)	111-044A
41	BAND-HEAD TAPPING SCREW/TWIN SCREW; BTS-2 3X8(AB) TWIN	110-172A
42	FLAT-HEAD TAPPING SCREW; FTS-3 3X6(AB)	111-043A
43	FLAT-HEAD TAPPING SCREW; FTS-3 3X12(AB)	111-049A
44	NUT/WASHER 3mm	131-081
45	BAND-HEAD MACHINE SCREW; BMS 3X2X4	107-015

Printed Circuit Boards

Item #	Description	Part #
1	PRINTED CIRCUIT BOARD PC626-1; IN/OUT	162-823
2	PRINTED CIRCUIT BOARD BPM250-2; (94V0 203.5×241.5mm)	162-975
3	PRINTED CIRCUIT BOARD BPM250-5; LINE/PHONO	162-978
4	PRINTED CIRCUIT BOARD BPM250-7; BIT	162-979
5	PRINTED CIRCUIT BOARD BPM250-8; BIT DISPLAY (CEM-1 41×166mm)	162-980

Parts Lists - PCB1 Input/Output

ICs

Item #	Designators	Description	Part #
1	A21, A51, A119	INTEGRATED CIRCUIT NJM4558L	074-104

Transistors

Item #	Designators	Description	Part #
1	A80, A84, A96, A76	TRANSISTOR 2SC2878	076-095
2	A21, A51, A119	TRANSISTOR 2SA1048 (2SA1317)	076-104

Electrical Parts

Item #	Designators	Description	Part #
1	A104, A105	SILICON DIODE 1N4148	079-003
2	A1, A2, A3, A4	4P RCA JACK	161-105

Parts Lists - PCB2 Main

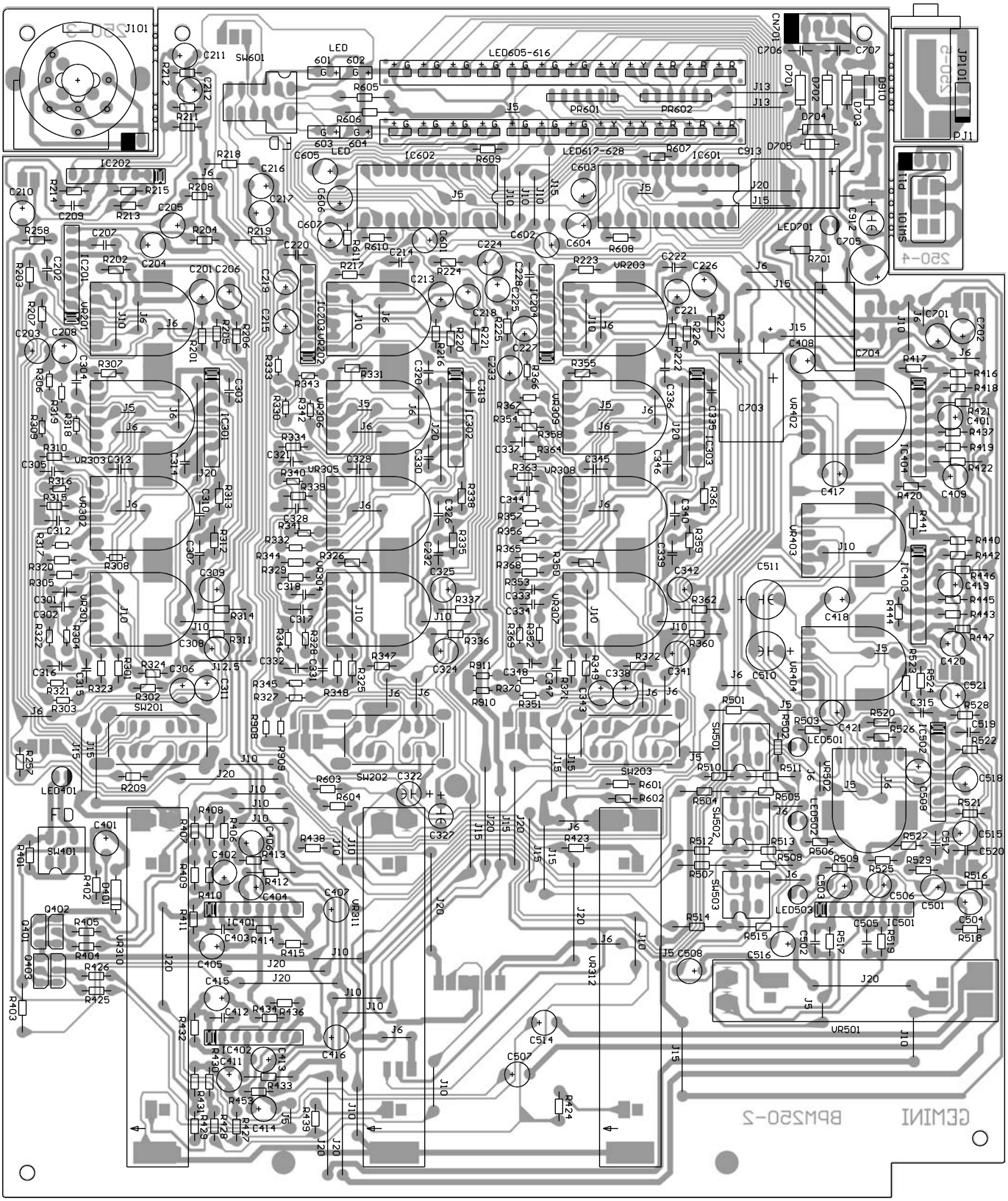
ICs

Item #	Designators	Description	Part #
1	IC201-204, IC301-303, IC401-404, IC501	INTEGRATED CIRCUIT NJM4558L	074-104
2	IC502	INTEGRATED CIRCUIT NJM4556L	074-113
3	IC601-602	INTEGRATED CIRCUIT LB1412	074-111

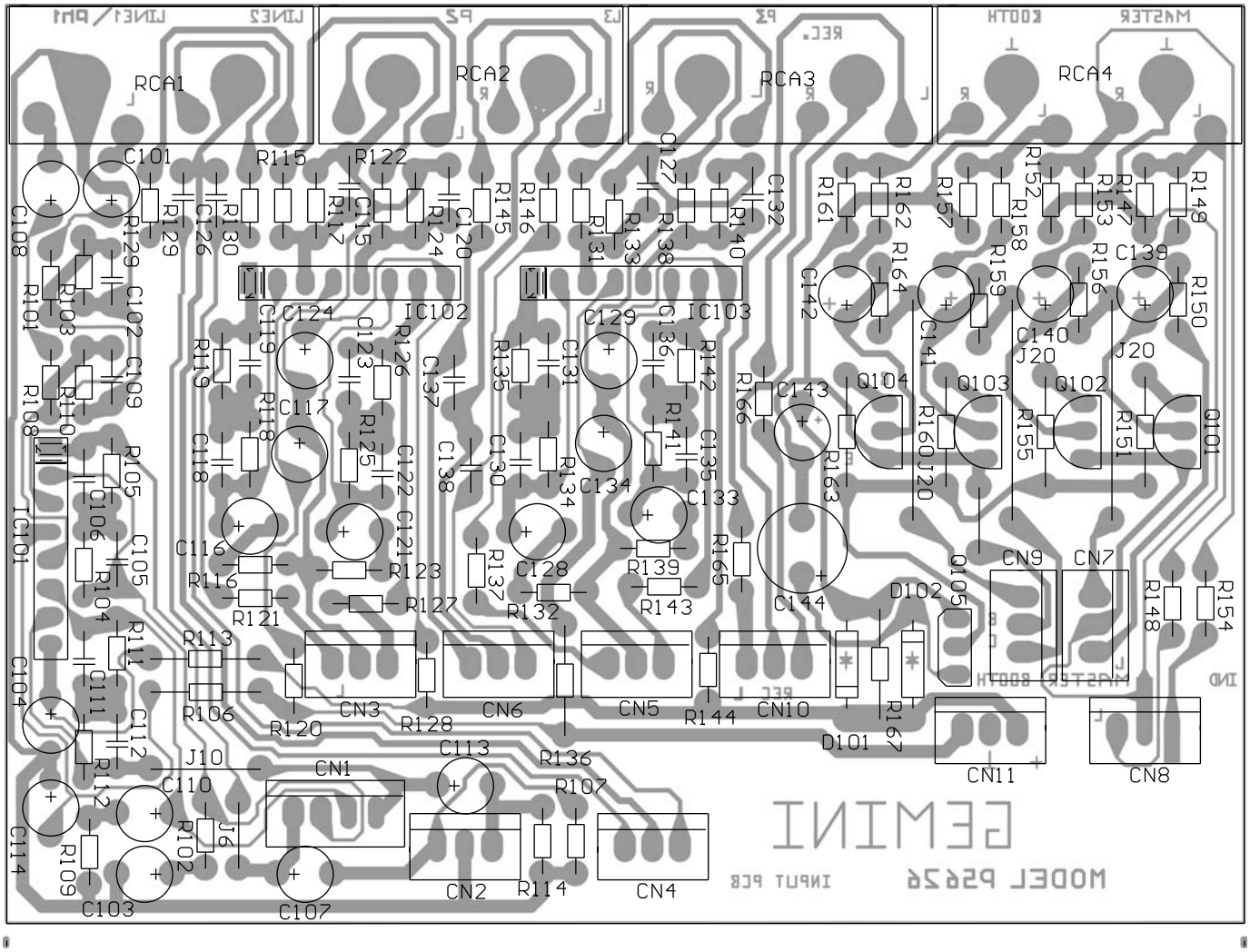
Electrical Parts

Item #	Designators	Description	Part #
1	Q301, Q401, Q501, Q601	TRANSISTOR DTC114TS	076-094
2	D902	ZENER DIODE 1/2 W 10V	079-025
3	SW102, SW302, SW502	LEVER SWITCH 4P2C	082-019
4	SW401	PUSH SWITCH 2P2C L=12.5	083-069
5	SW601	PUSH SWITCH 4P2C L=12.5	083-097
6	SW501-503	3KEY PUSH SWITCH 2P2C L=12.5 P=15mm	083-076
7	SW101	SLIDE SWITCH	081-004
8	VR310-312	SLIDE VR 45mm L=20 10KA×2	072-091
9	VR501	SLIDE VR 30mm L=15 10KB×2	072-097
10	VR201-203	ROTARY VR 16f L=20 50KB×2	071-103
11	VR402, VR404 VR502	ROTARY VR 16f L=20 50KA×2	071-084
12	VR403	ROTARY VR 16f L=20 20KMN×2 C.C	071-136
13	VR301-303	ROTARY VR 16f L=20 50KE×2 C.C	071-145
14	PJ1	PHONE JACK 6.3f	092-078
15	J101	PHONE JACK 6.3f+ XLR	092-090
16	Red 3.15	LIGHT EMITTING DIODE (RED) 3.15f	080-091
17	Green 5x5	LIGHT EMITTING DIODE (GREEN) 5×5	080-090
18	Green 2.5x6.5	LIGHT EMITTING DIODE (GREEN) 2.5×5	080-077
19	Yellow 2.5x6.5	LIGHT EMITTING DIODE (YELLOW) 2.5×5	080-076
20	Red 2.5x6.5	LIGHT EMITTING DIODE (RED) 2.5×5	080-075

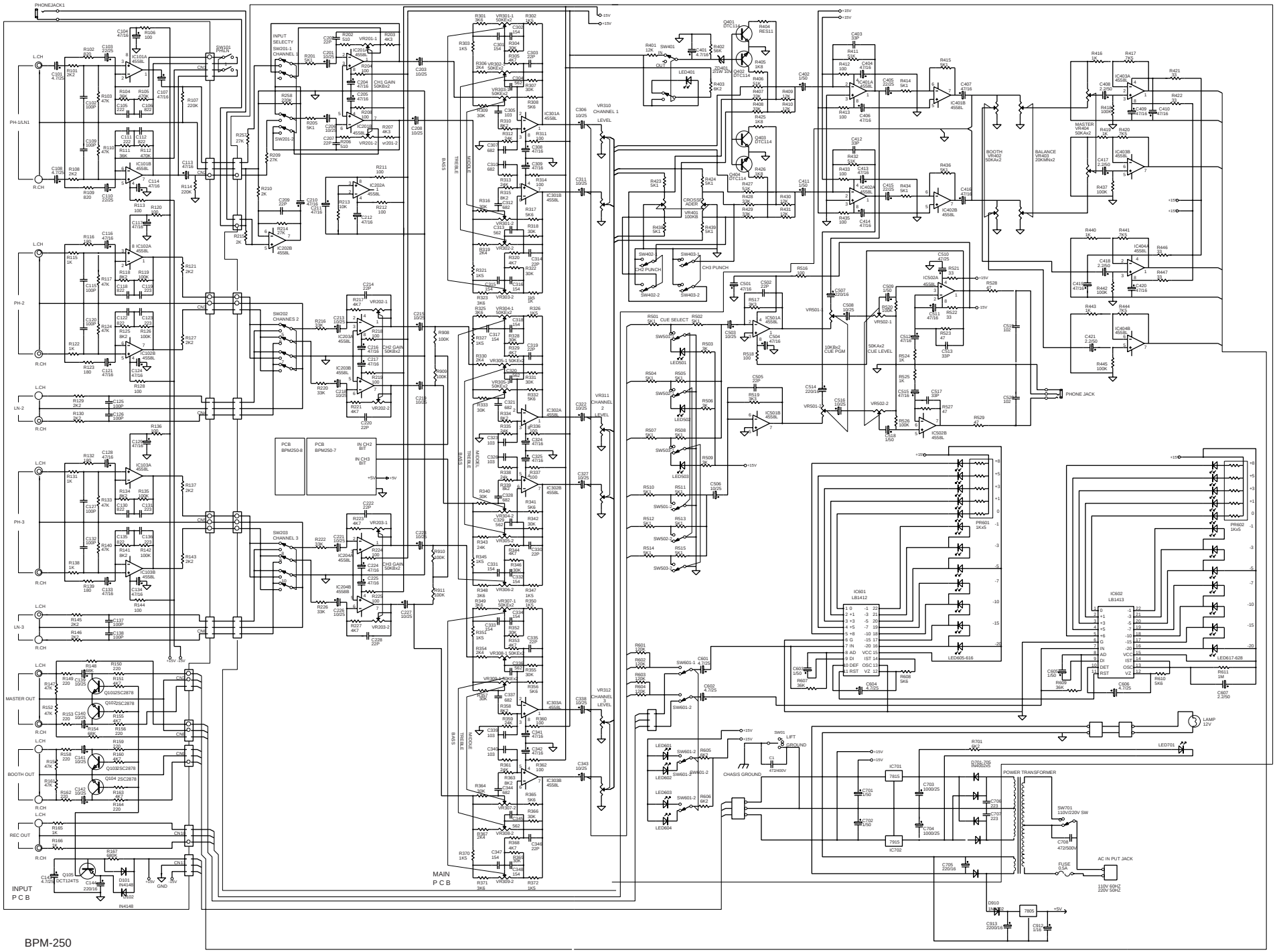
PCB2 - Main



PCB1 - Input/Output



Schematic


PHONEJACK1
PH-1/LN1
PH-2
LN-2
PH-3
LN-3
MASTER OUT
BOOTH OUT
REC OUT
INPUT P C B
MAIN P C B
BPM-250
SW101 PHLN
SW201-1 CHANNEL 1
SW201-2
SW202 CHANNES 2
SW203 CHANNEL 3
CH1 GAIN 50KBx2
CH2 GAIN 50KBx2
CH3 GAIN 50KBx2
PCB BPM250-8
PCB BPM250-7
IN CH2 BIT
IN CH3 BIT
VR310 CHANNEL 1 LEVEL
VR311 CHANNEL 2 LEVEL
VR312 CHANNEL 3 LEVEL
SW401
LED401
SW402
SW402-2
SW403
SW403-2
CH2 PUNCH
CH3 PUNCH
CROSSFADER
VR401 100KB
SW501 CUE SELECT
LED501
LED502
LED503
10KBx2 CUE PGM
50KAx2 CUE LEVEL
PHONE JACK
BOOTH VR402 50KAx2
BALANCE VR403 20KMNx2
MASTER VR404 50KAx2
IC601 LB1412
IC602 LB1413
LED605-616
LED617-628
LAMP 12V
LED701
SW701 110V/220V SW
FUSE 0.5A
AC IN PUT JACK
110V 60HZ 220V 50HZ
POWER TRANSFORMER
CHASSIS GROUND
GROUND
LIFT
BASS
TREBLE
MIDDLE