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**Service Manual**

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**Model**

**VM88**

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**8CH Digital Mixer with DSP Effects**

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**Fostex<sup>®</sup>**

**Fostex<sup>®</sup>**

FOSTEX CORPORATION 3-2-35 Musashino, Akishima, Tokyo, Japan 196-0021

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CAUTION

RISK OF ELECTRIC SHOCK  
DO NOT OPEN

CAUTION: TO REDUCE THE RISK OF ELECTRIC SHOCK,  
DO NOT REMOVE COVER (OR BACK).  
NO USER-SERVICEABLE PARTS INSIDE.  
REFER SERVICING TO QUALIFIED SERVICE PERSONNEL.

The lightning flash with arrowhead symbol, within an equilateral triangle, is intended to alert the user to the presence of uninsulated "dangerous voltage" within the product's enclosure that may be of sufficient magnitude to constitute a risk of electric shock to persons.



The exclamation point within an equilateral triangle is intended to alert the user to the presence of important operating and maintenance (servicing) instructions in the literature accompanying the appliance.

**CAUTION:**

TO PREVENT ELECTRIC SHOCK, MATCH WIDE BLADE OF PLUG TO WIDE SLOT, FULLY INSERT.

**ATTENTION:**

POUR ÉVITER LES CHOCS ÉLECTRIQUES, INTRODUIRE LA LAME LA PLUS LARGE DE LA FICHE DANS LA BORNE CORRESPONDANTE DE LA PRISE ET POUSSER JUSQU' AU FOND.

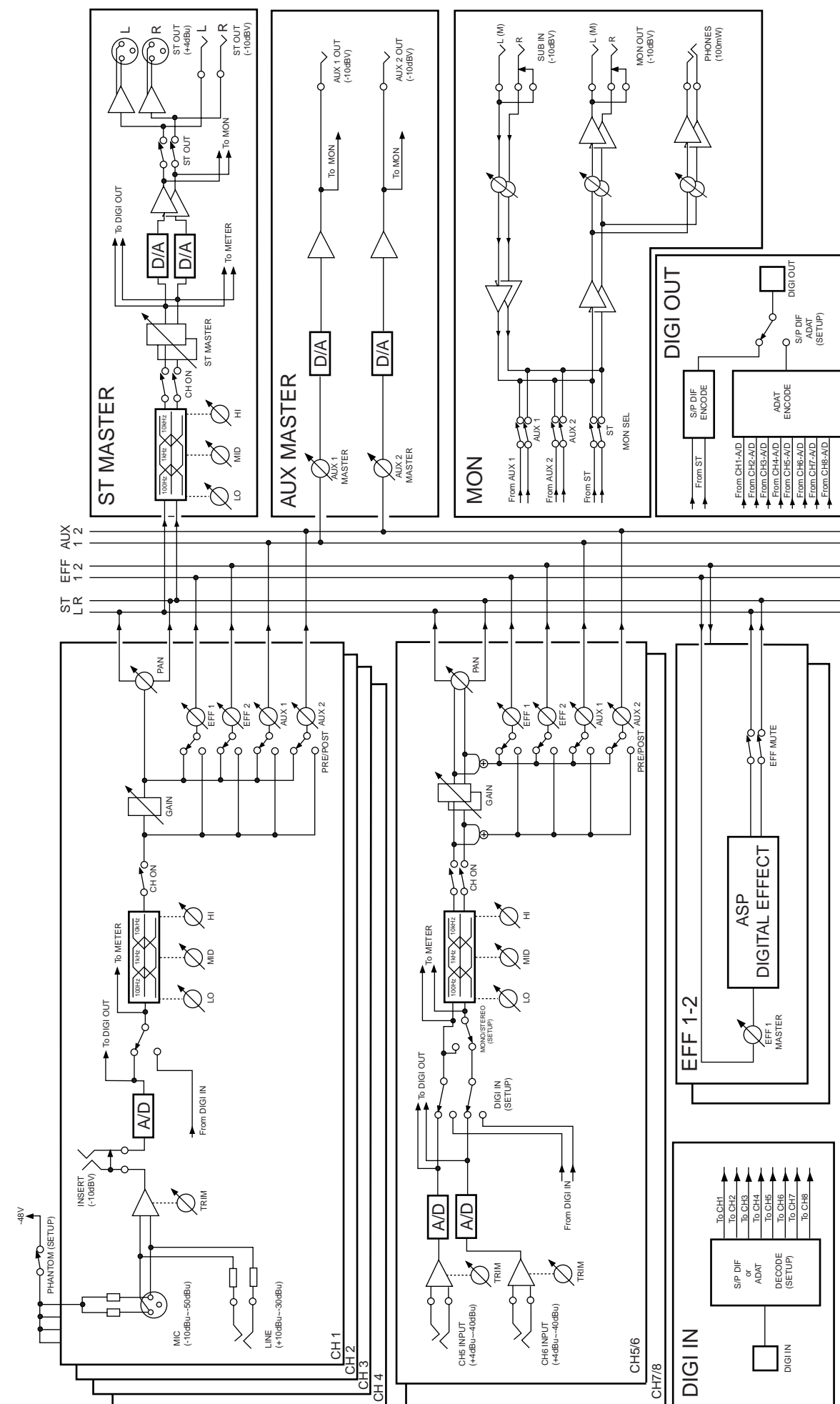
**"WARNING"**

"TO REDUCE THE RISK OF FIRE OR ELECTRIC SHOCK, DO NOT EXPOSE THIS APPLIANCE TO RAIN OR MOISTURE."

**SAFETY INSTRUCTIONS**

1. Read instructions - All the safety and operating instructions should be read before the appliance is operated.
  2. Retain instructions - The safety and operating instructions should be retained for future reference.
  3. Heed warnings - All warnings on the appliance and in the operating instructions should be adhered to.
  4. Follow instructions - All operating and use instructions should be followed.
  5. Water and Moisture - The appliance should not be used near water - for example, near a bathtub, washbowl, kitchen sink, laundry tub, in a wet basement, or near a swimming pool, and the like.
  6. Carts and Stands - The appliance should be used only with a cart or stand that is recommended by the manufacturer.
- 
- An appliance and cart combination should be moved with care. Quick stops, excessive force, and uneven surfaces may cause the appliance and cart combination to overturn.
7. Wall or Ceiling Mounting - The appliance should be mounted to a wall or ceiling only as recommended by the manufacturer.
  8. Ventilation - The appliance should be situated so that its location or position does not interfere with its proper ventilation. For example, the appliance should not be situated on a bed, sofa, rug, or similar surface that may block the ventilation openings; or, placed in a built-in installation, such as a bookcase or cabinet that may impede the flow of air through the ventilation openings.
  9. Heat - The appliance should be situated away from heat sources such as radiators, heat registers, stoves, or other appliances (including amplifiers) that produce heat.
  10. Power Sources - The appliance should be connected to a power supply only of the type described in the operating instructions or as marked on the appliance.
  11. Grounding or Polarization - The precautions that should be taken so that the grounding or polarization means of an appliance is not defeated.
  12. Power Cord Protection - Power supply cords should be routed so that they are not likely to be walked on or pinched by items placed upon or against them, paying particular attention to cords at plugs, convenience receptacles, and the point where they exit from the appliance.
  13. Cleaning - The appliance should be cleaned only as recommended by the manufacturer.
  14. Nonuse Periods - The power cord of the appliance should be unplugged from the outlet when left unused for a long period of time.
  15. Object and Liquid Entry - Care should be taken so that objects do not fall and liquids are not spilled into the enclosure through openings.
  16. Damage requiring Service - The appliance should be serviced by qualified service personnel when:
    - A. The power supply cord or the plug has been damaged; or
    - B. Objects have fallen, or liquid has been spilled into the appliance; or
    - C. The appliance has been exposed to rain; or
    - D. The appliance does not appear to operate normally or exhibits a marked change in performance; or
    - E. The appliance has been dropped, or the enclosure damaged.
  17. Servicing - The user should not attempt to service the appliance beyond that described in the operating instructions. All other servicing should be referred to qualified service personnel.

**VM88 BLOCK DIAGRAM**



● PLL, DIGITAL, MAIN, VM88

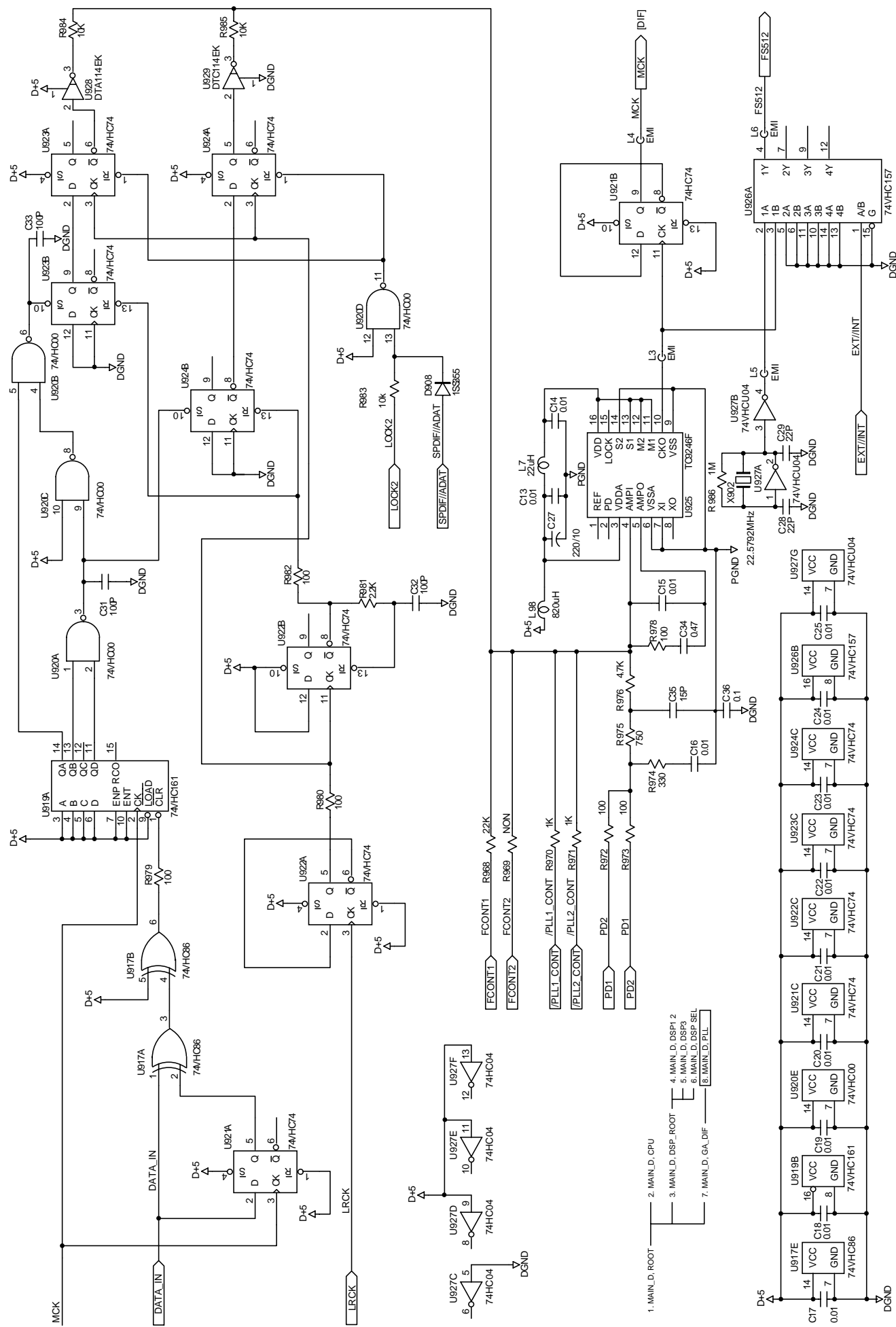


TABLE OF CONTENTS

1. SPECIFICATIONS ..... 4

2. CONTROLS, INDICATORS AND CONNECTORS ..... 6

3. SERVICE MODE ..... 7

4. EXPLODED VIEW, PCB ASSEMBLY AND PARTS LIST ..... 10

5. CIRCUIT AND BLOCK DIAGRAMS ..... 23

NOTES

\* Service mode, exploded view, PCB assembly, parts list and circuit diagrams are given in this manual to assist the service technician in maintaining the Model VM88.

\* The following accessories are supplied with VM88 as the standard accessories.

Owner's manual : 8288458000 (for export & domestic model)

\* Following is the packing material for the Model VM88.

Carton, inner, VM88 : 8228737000

Packing, side, L, VM88 : 8228465001

Packing, side, R, VM88 : 8228465002

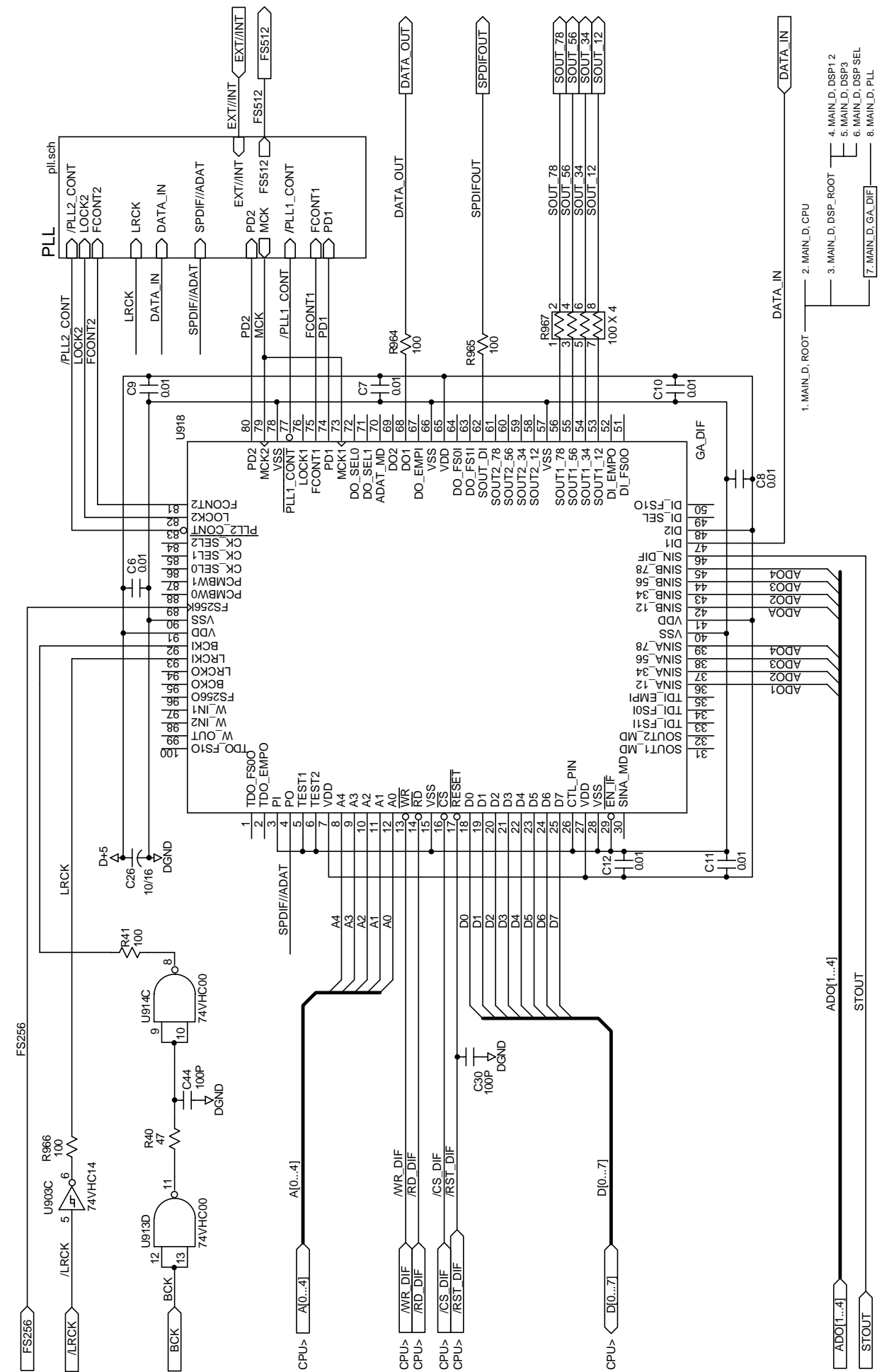
CAUTION

⚠ Parts marked with this sign are safety critical components. They must always be replaced with identical components. Refer to the Fostex Parts List and ensure exact replacement.

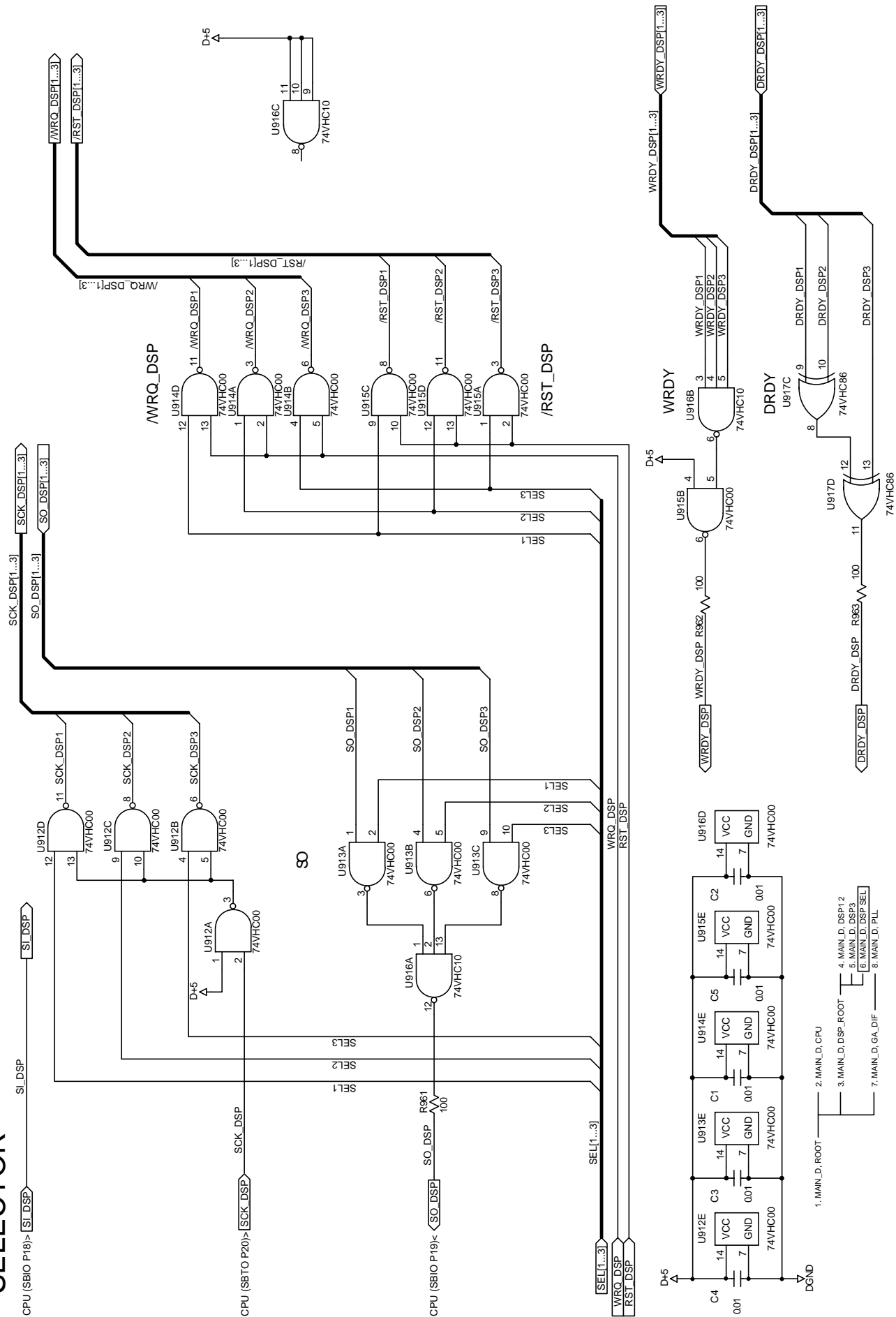
# 1. SPECIFICATIONS

<b>Specification Unit</b>	0 dBV = 1 Vr.m.s., 0 dBu = 0.775 Vr.m.s.
<b>Standard Input</b>	
<b>INPUT 1 ~ 4</b>	
<b>Connector</b>	XLR Cannon (MIC) Ø 6 mm TRS phone jack (LINE)
<b>Input level</b>	-50 dBu ~ -10 dBu (MIC) -30 dBu ~ +10 dBu (LINE)
<b>Input impedance</b>	3 kΩ or more (MIC) 10 kΩ or more (LINE)
<b>INPUT 5 - 8</b>	
<b>Connector</b>	Ø 6 mm TRS phone jack
<b>Input level</b>	-40 dBu ~ +4 dBu
<b>Input impedance</b>	10 kΩ or more
<b>INSERT 1 - 4</b>	
<b>Connector</b>	Ø 6 mm TRS phone jack
<b>Input level</b>	-10 dBV
<b>Input impedance</b>	10 kΩ or more
<b>MON IN L, R</b>	
<b>Connector</b>	Ø 6 mm TRS phone jack
<b>Input level</b>	-10 dBV
<b>Input impedance</b>	10 kΩ or more
<b>DATA IN</b>	
<b>Connector</b>	Square shape optical
<b>Format</b>	
<b>S/P DIF IN</b>	IEC consumer optical standard (IEC 958 Part 3)
<b>ADAT IN</b>	Alesis Proprietary Multichannel Optical Digital Interface
<b>Standard Output</b>	
<b>STEREO OUT L, R</b>	
<b>Connector</b>	XLR Cannon Ø 6 mm TRS phone jack
<b>Output level</b>	+4 dBu (XLR Cannon) -10 dBV (Ø 6 mm TRS phone jack)
<b>Load impedance</b>	10 kΩ or more (XLR Cannon & Ø 6 mm TRS phone jack)
<b>AUX SEND 1, 2</b>	
<b>Connector</b>	Ø 6 mm TRS phone jack
<b>Output level</b>	-10 dBV
<b>Load impedance</b>	10 kΩ or more
<b>MON OUT L, R</b>	
<b>Connector</b>	Ø 6 mm TRS phone jack
<b>Output level</b>	-10 dBV
<b>Load impedance</b>	10 kΩ or more
<b>PHONES OUT L, R</b>	
<b>Connector</b>	Ø 6 mm TRS phone jack
<b>Output level</b>	50 mW or more
<b>Load impedance</b>	32 Ω
<b>DATA OUT</b>	
<b>Connector</b>	Square shape optical
<b>Format</b>	
<b>S/P DIF OUT</b>	IEC consumer optical standard (IEC 958 Part 3)
<b>ADAT OUT</b>	Alesis Proprietary Multichannel Optical Digital Interface
<b>EQ</b>	
<b>HI</b>	10 kHz ± 18 dB (shelving type)
<b>MID</b>	1 kHz ± 18 dB (peaking type)
<b>LO</b>	100 Hz ± 18 dB (shelving type)
<b>Fader (VR) Position at Standard Input / Output</b>	
<b>Input Fader</b>	80 position
<b>INPUT 1 ~ 4 (TRS)</b>	+10 dBu, 1 kHz

## ● DIGITAL I/F, DIGITAL, MAIN, VM88




● DSP SELECT, DIGITAL, MAIN, VM88  
SELECTOR



Fader (VR) Position at Standard Input / Output (continued)

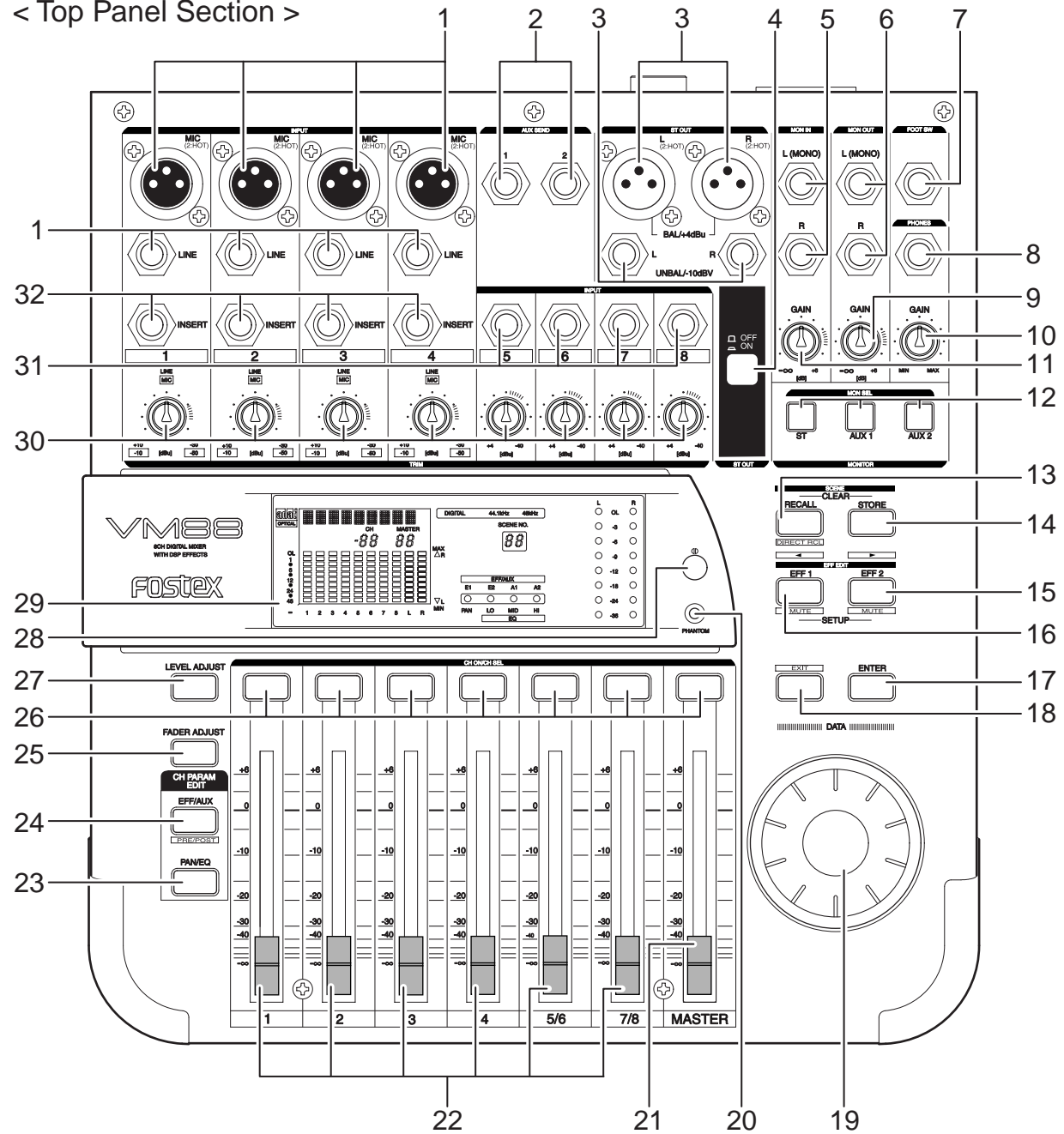
INPUT 5 ~ 8 (TRS)	+4 dBu, 1 kHz
PAN	L (R)
Master Fader	Adjust so that ST OUT level is at -10 dBV. ( ST OUT SW: ON)
INPUT 1 ~ 4 (TRS)	+10 dBu, 1 kHz
INPUT 5 ~ 8 (TRS)	+4 dBu, 1 kHz
PAN	L (R)
MON OUT VR	Adjust so that MON OUT level is at -10 dBV. (ST OUT SW: ON, MON SEL SW: ST)
INPUT 1 ~ 4 (TRS)	+10 dBu, 1 kHz
INPUT 5 ~ 8 (TRS)	+4 dBu, 1 kHz
PAN	L (R)
MON IN VR	Adjust so that MON OUT level is at -10 dBV. (ST OUT: ON, MON SEL: ST)
INPUT 1 ~ 4 (TRS)	+10 dBu, 1 kHz
INPUT 5 ~ 8 (TRS)	+4 dBu, 1 kHz
PAN	L (R)
Output Level	
INPUT 1 ~ 8 → STEREO OUT	-10 dBV ± 2 dB
INPUT 1 ~ 8 → MONITOR OUT	-10 dBV ± 2 dB
Frequency Response	
INPUT 1 ~ 8 → STEREO OUT / MONITOR OUT / AUX SEND	
INPUT 1 ~ 4	20 Hz ~ 20 kHz +1, -3 dB (LINE level)
INPUT 1 ~ 4	20 Hz ~ 20 kHz +1, -3 dB (MIC level)
INPUT 5 ~ 8	20 Hz ~ 20 kHz +1, -3 dB (LINE level)
INPUT 1 ~ 8 → PHONES OUT	
INPUT 1 ~ 4	30 Hz ~ 20 kHz +1, -3 dB (LINE level)
INPUT 1 ~ 4	30 Hz ~ 20 kHz +1, -3 dB (MIC level)
INPUT 5 ~ 8	30 Hz ~ 20 kHz +1, -3 dB (LINE level)
T.H.D. (w/ distortion filter NF3346A, 3347 or equivalent)	
INPUT 1 ~ 8 → STEREO OUT / MONITOR OUT / AUX SEND	
INPUT 1 ~ 4 (0 dBu, XLR)	0.03 % or less
INPUT 1 ~ 4 (-40 dBu, XLR)	0.05 % or less
INPUT 1 ~ 4 (+20 dBu, TRS)	0.03 % or less
INPUT 1 ~ 4 (-20 dBu, TRS)	0.05 % or less
INPUT 5 ~ 8 (+14 dBu, TRS)	0.03 % or less
INPUT 5 ~ 8 (-30 dBu, TRS)	0.05 % or less
S/N (w/ distortion filter NF3346A, 3347 or equivalent)	
INPUT 1 ~ 8 → STEREO OUT / MONITOR OUT	
INPUT 1 ~ 8 (LINE level, XLR)	90 dB or more
INPUT 1 ~ 4 (MIC level, XLR)	78 dB or more
INPUT 5 ~ 8 (MIC level, TRS)	86 dB or more
INPUT 1 ~ 8 → AUX SEND	
INPUT 1 ~ 8 (LINE level, XLR)	90 dB or more
INPUT 1 ~ 4 (MIC level, XLR)	78 dB or more
INPUT 5 ~ 8 (MIC level, TRS)	86 dB or more
Mic Gain	
INPUT 1 ~ 4	40 dB ± 3 dB
INPUT 5 ~ 8	44 dB ± 3 dB
Crosstalk	60 dB or more at 1 kHz (50 dB or more at PHONES OUT)
Click Noise	
POWER ON / OFF	-20 dB p-p or less
Other switching	-30 dB p-p or less
Shock Noise	-30 dBVp-p

Specifications and appearance are subject to change without notice for product improvement.

“Adat” and symbol  are trademarks of Alesis Corporation.

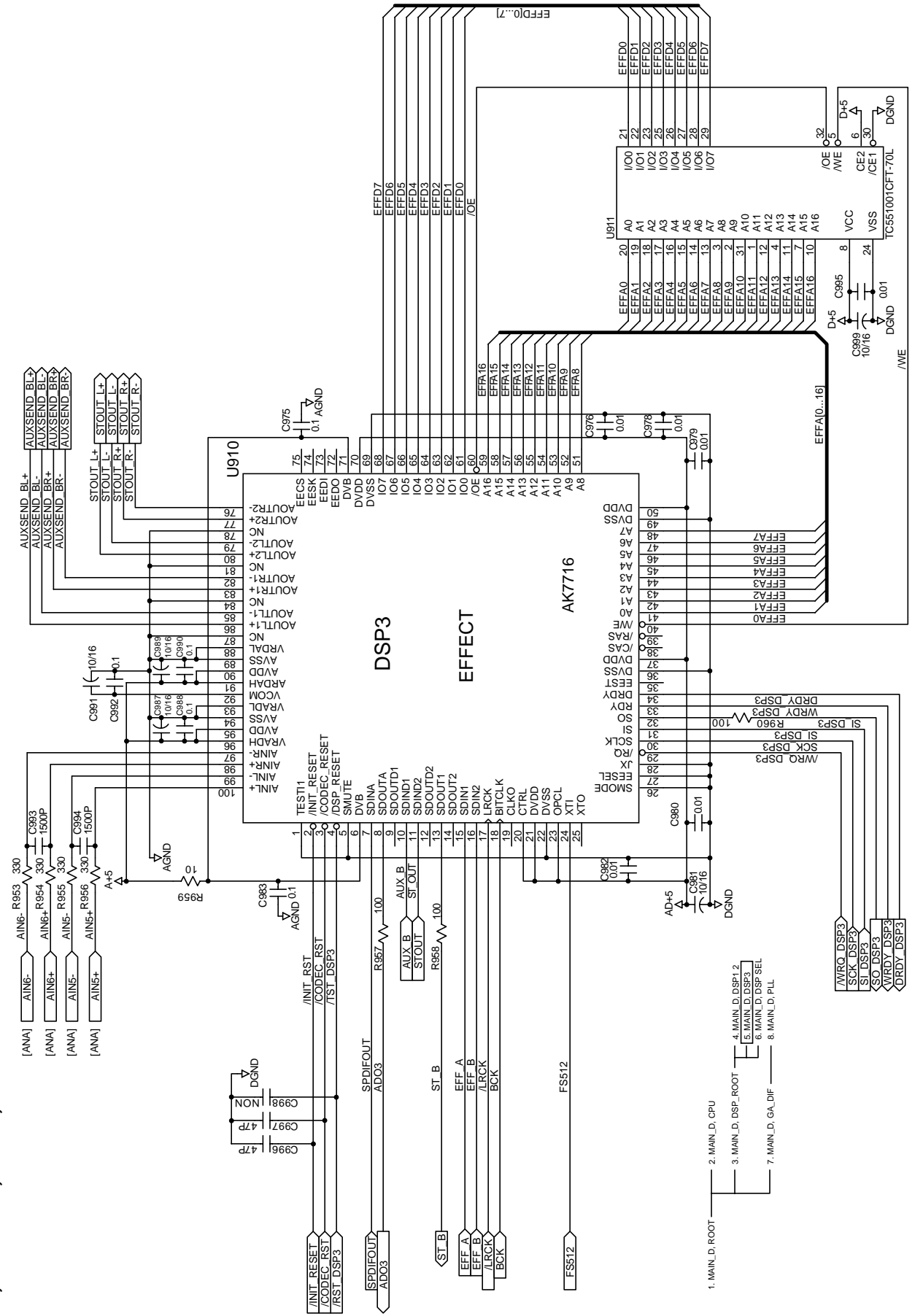
## 2. CONTROLS, INDICATORS AND CONNECTORS

< Top Panel Section >

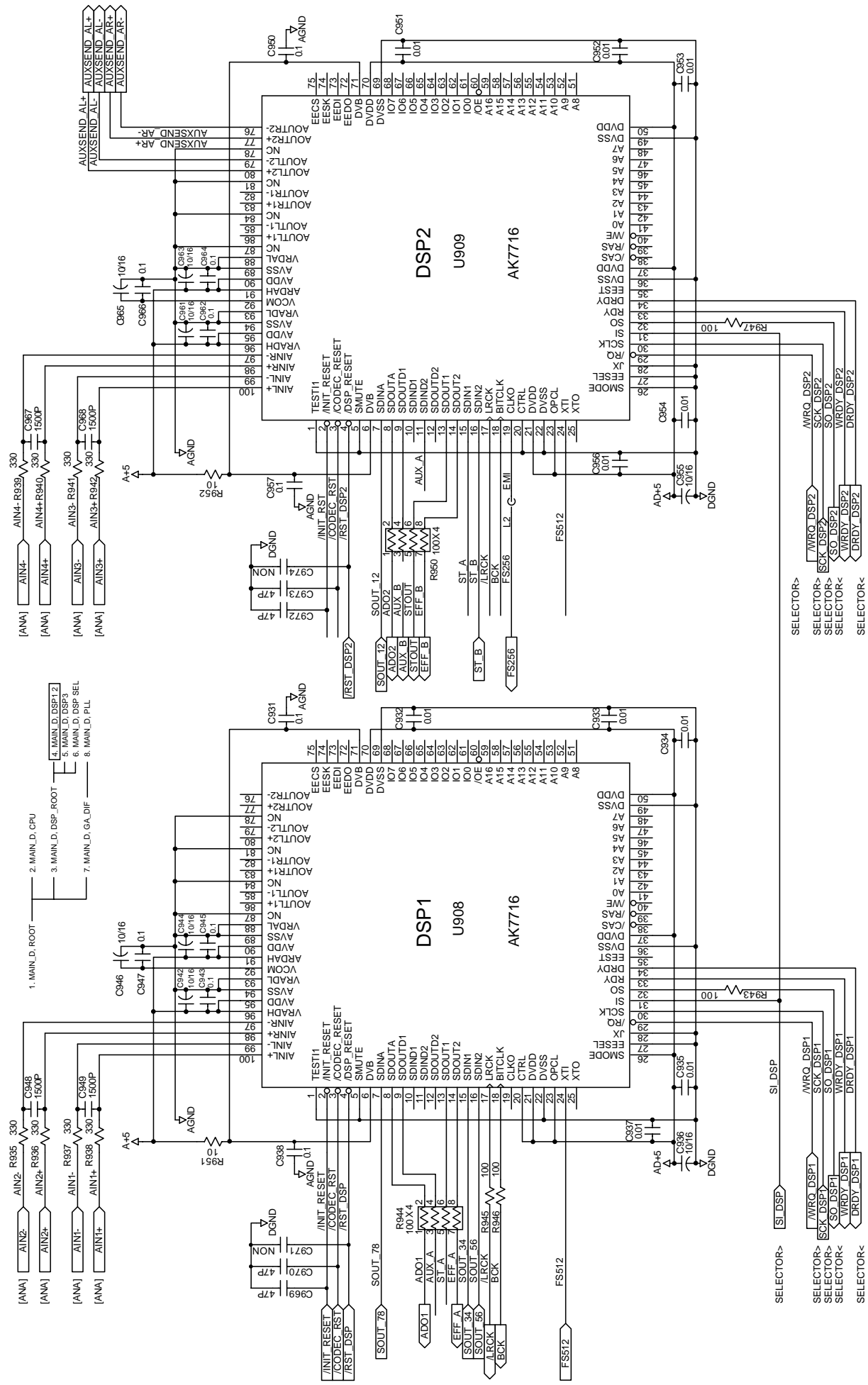


- |   |  |
|---|--|
| 1. Input connector [MIC (2: HOT) / LINE]  | 17. Enter key [ENTER]                            |
| 2. AUX send jack [AUX SEND 1, 2]  | 18. Exit key [EXIT]                              |
| 3. Stereo out connector [ST OUT L (2: HOT), R (2: HOT) BAL / +4dBu / L, R UNBAL / -10dBV] | 19. Data encoder [DATA]                          |
| 4. Stereo out ON/OFF switch [OFF / ON]  | 20. Phantom LED [PHANTOM]                        |
| 5. Monitor in jack [MON IN L (MONO), R]   | 21. Master fader [MASTER]                        |
| 6. Monitor out jack [MON OUT L (MONO), R]   | 22. Input fader [1, 2, 3, 4, 5/6, 7/8]           |
| 7. Foot switch connecting jack [FOOT SW]  | 23. PAN/EQ select key [PAN/EQ]                   |
| 8. Headphone jack [PHONES]  | 24. EFF/AUX select key [EFF/SEL]                 |
| 9. Monitor out adjusting knob [GAIN -∞ / +6 [dB]]   | 25. Fader adjust key [FADER ADJUST]              |
| 10. Headphone volume [MIN / MAX]  | 26. Channel On/Channel select key [CH ON/CH SEL] |
| 11. Monitor input adjusting knob [GAIN -∞ / +6 [dB]]                                      | 27. Level adjust key [LEVEL ADJUST]              |
| 12. Monitor select switch [ST / AUX1 / AUX2]  | 28. Contrast adjusting knob [D]                  |
| 13. Scene Recall key [SCENE RECALL / DIRECT RCL]  | 29. Display/status/meter section                 |
| 14. Scene Store key [SCENE STORE]   | 30. TRIM knob                                    |
| 15. Effect 2 key [EFF EDIT EFF1 / MUTE]   | [LINE +10/-30 [dBu] / MIC -10 / -50 [dBu]]       |
| 16. Effect 1 key [EFF EDIT EFF2 / MUTE]   | 31. Input jack 5 ~ 8 [INPUT 5, 6, 7, 8]          |
|   | 32. Insert jack 1 ~ 4 [INSERT 1, 2, 3, 4]        |

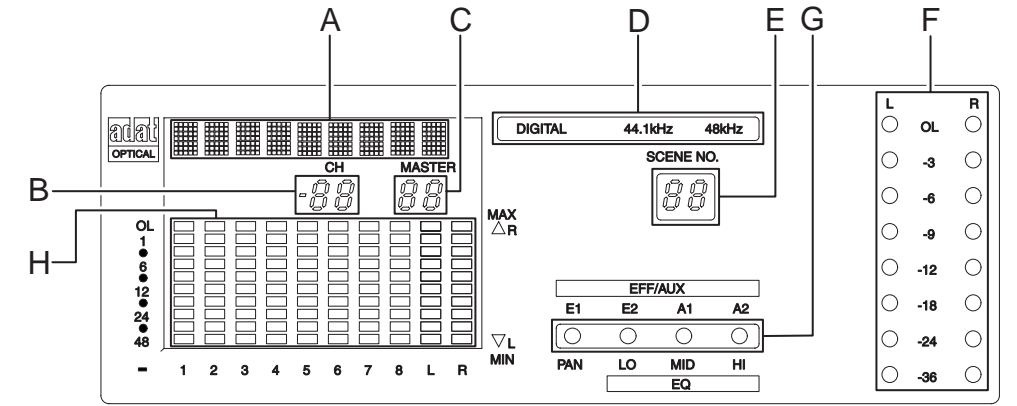
### DSP3, DIGITAL, MAIN, VM88



● DSP1 & 2, DIGITAL, MAIN, VM88

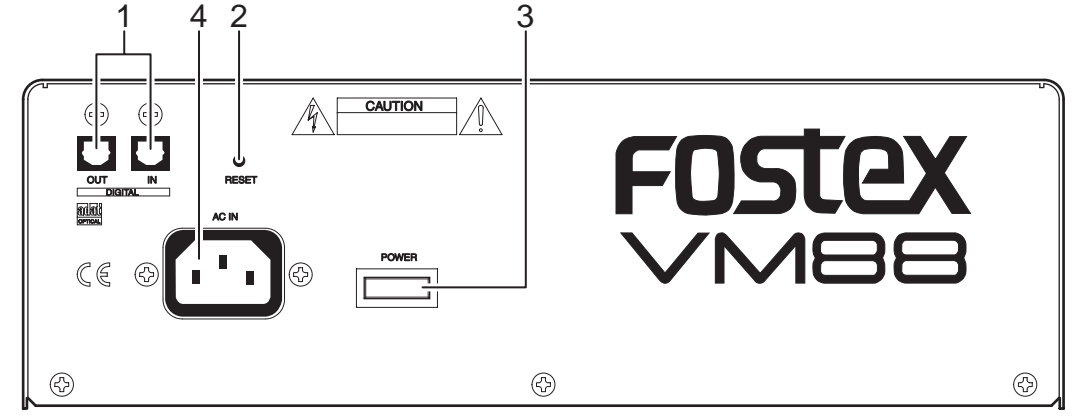


< Display/status/meter Section >



- A. Character display section
- B. CHANNEL fader display section [CH]
- C. MASTER fader display section [MASTER]
- D. Digital in status display section [DIGITAL 44.1kHz / 48kHz]
- E. Scene number display [SCENE NO.]
- F. LED level meter display section [L/R, OL, -3, -6, -9, -12, -18, -24, -∞]
- G. Status indicator [EFF/AUX: E1/E2/A1/A2, EQ: PAN/LO/MID/HIGH]
- H. LCD level meter [OL/1/6/12/24/48, 1/2/3/4/5/6/7/8/L/R, MAX/MIN, ▲R/▼L]

< Rear Panel Section >

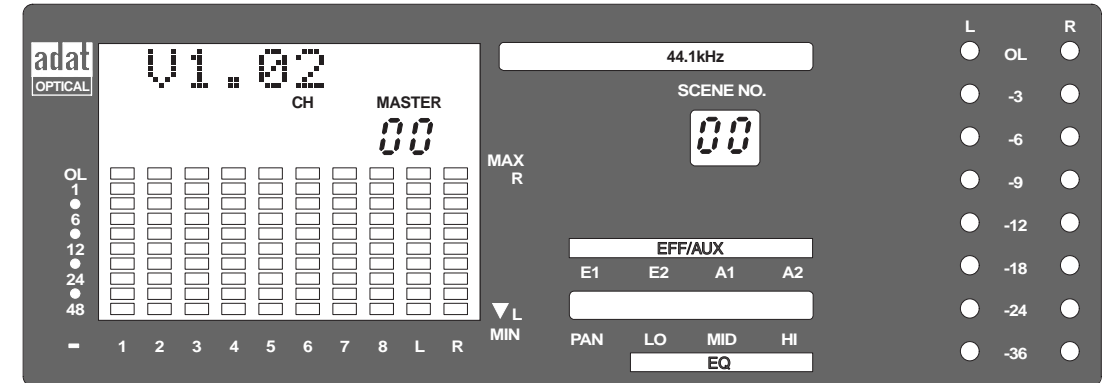


- 1. Digital in/out jack [DIGITAL IN/OUT]
- 2. RESET switch [RESET]
- 3. POWER switch [POWER]
- 4. AC IN connector [AC IN]

3. SERVICE MODE

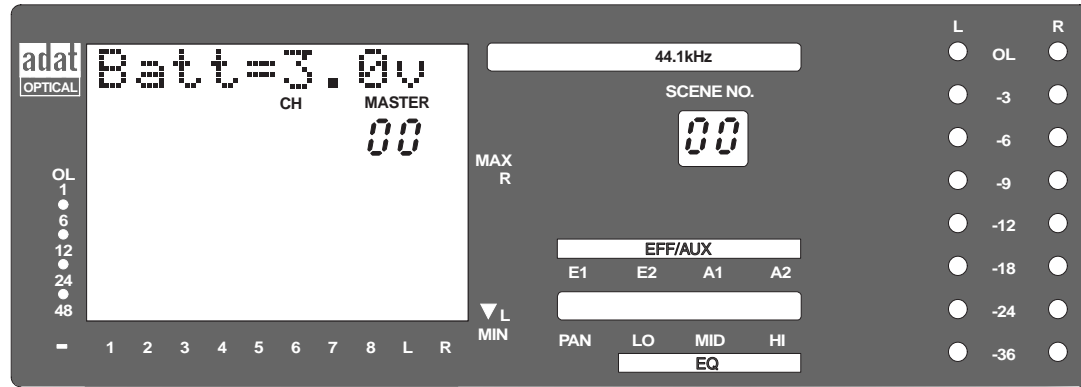
3-1. Software Version Check

While holding down both the PAN/EQ and EFF/AUX keys, press the EFF 1 key. The LCD display will show the VM08 software version for about a second, then return to the normal display mode. The example below shows that the software version is V1.02.



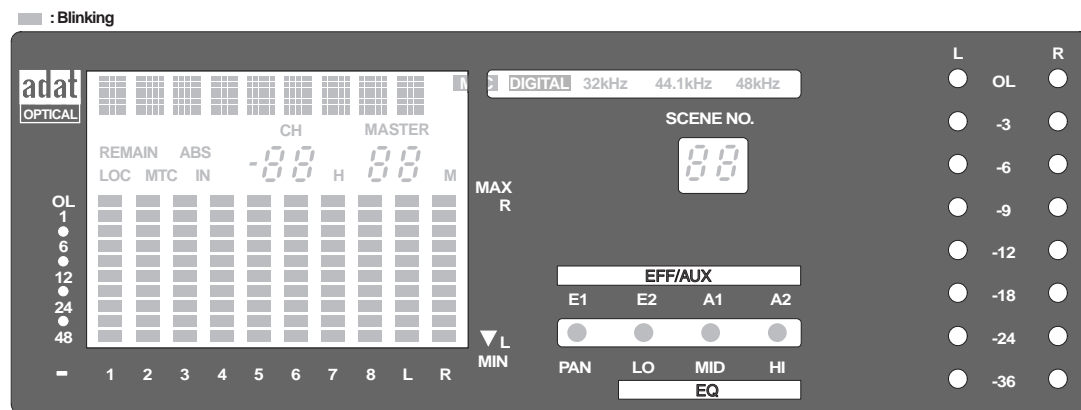
### 3-2. Battery Check

While holding down both the PAN/EQ and EFF/AUX keys, press the EFF 2 key. The LCD display will show the voltage of the memory backup battery inside the VM88 for about a second, and then return to the normal display mode. If the voltage falls below 2.2V, the message “BattEmpty” will appear with powering on. When this message appears, the battery has to be replaced with the new one.



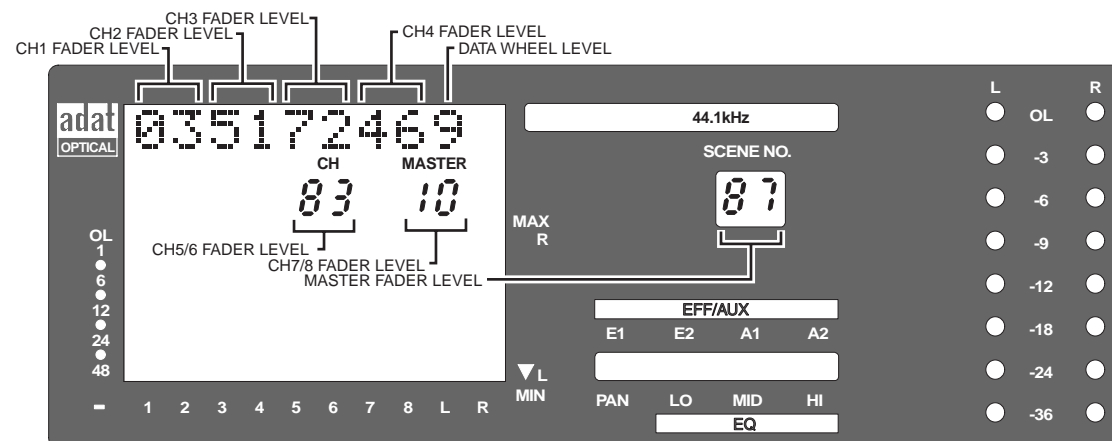
### 3-3. Display Check

While holding down both the PAN/EQ and EFF/AUX keys, press the EXIT key. The LCD segments as well as the LEVEL / FADER ADJUST, EFF/AUX, PAN/EQ, RECALL, STORE, EFF1 / 2 keys / self-illuminating switch and PHANTOM LED will start blinking. Check if they are correctly blinking. Pressing the ENTER key will change the blinking pattern. Pressing the EXIT key will put the VM88 back to the condition right after powering on.

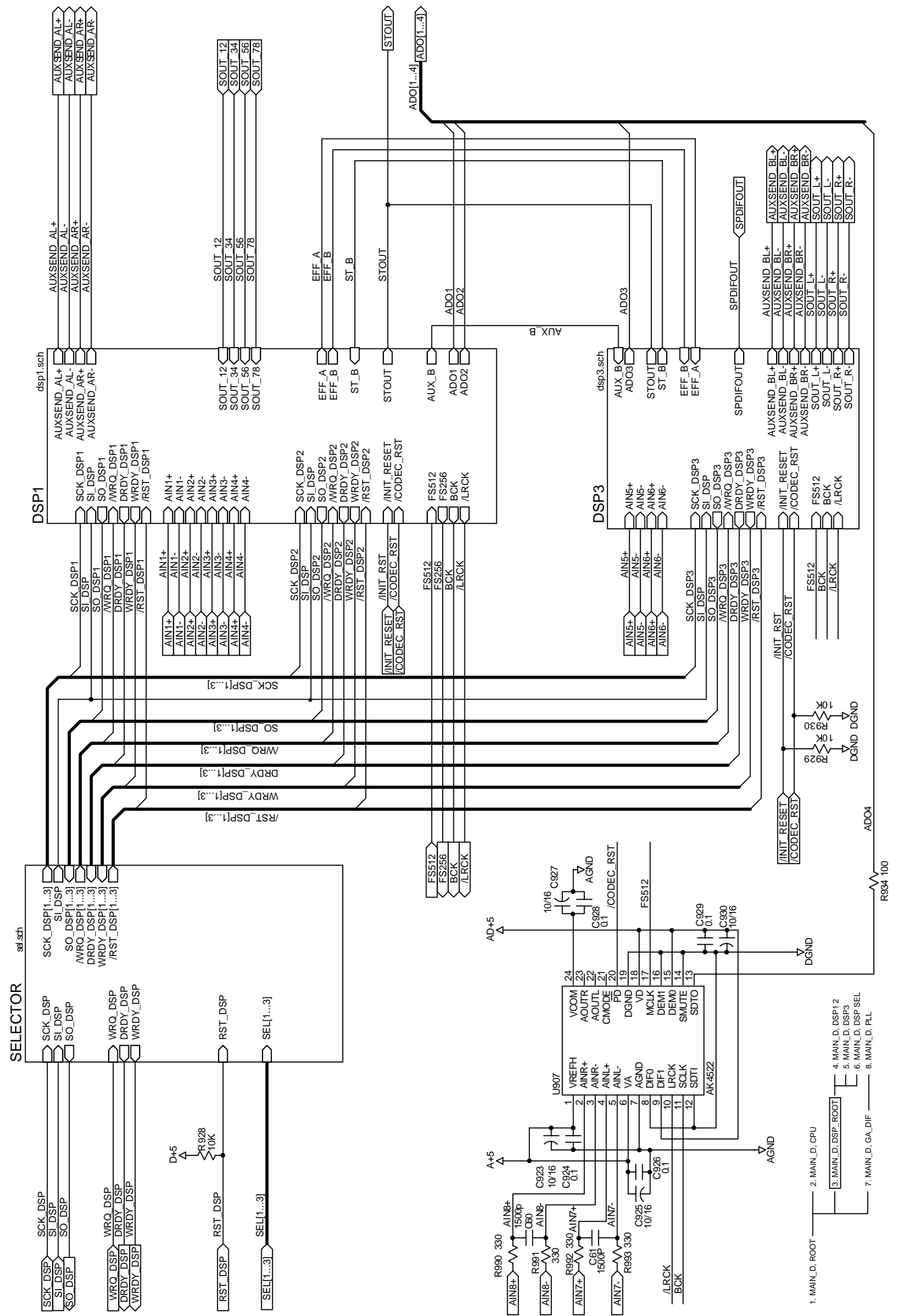


### 3-4. Fader Check

While holding down both the PAN/EQ and EFF/AUX keys, press the FADER ADJUST key. The LCD digits will indicate the current level of input, master faders and data wheel. The level of input & master faders will vary from 00 ~ 99. The data wheel level will vary from 0 ~ 9. Check if the level will vary when operating the faders and wheel. Pressing the EXIT key will put back the VM88 to the normal mode display.

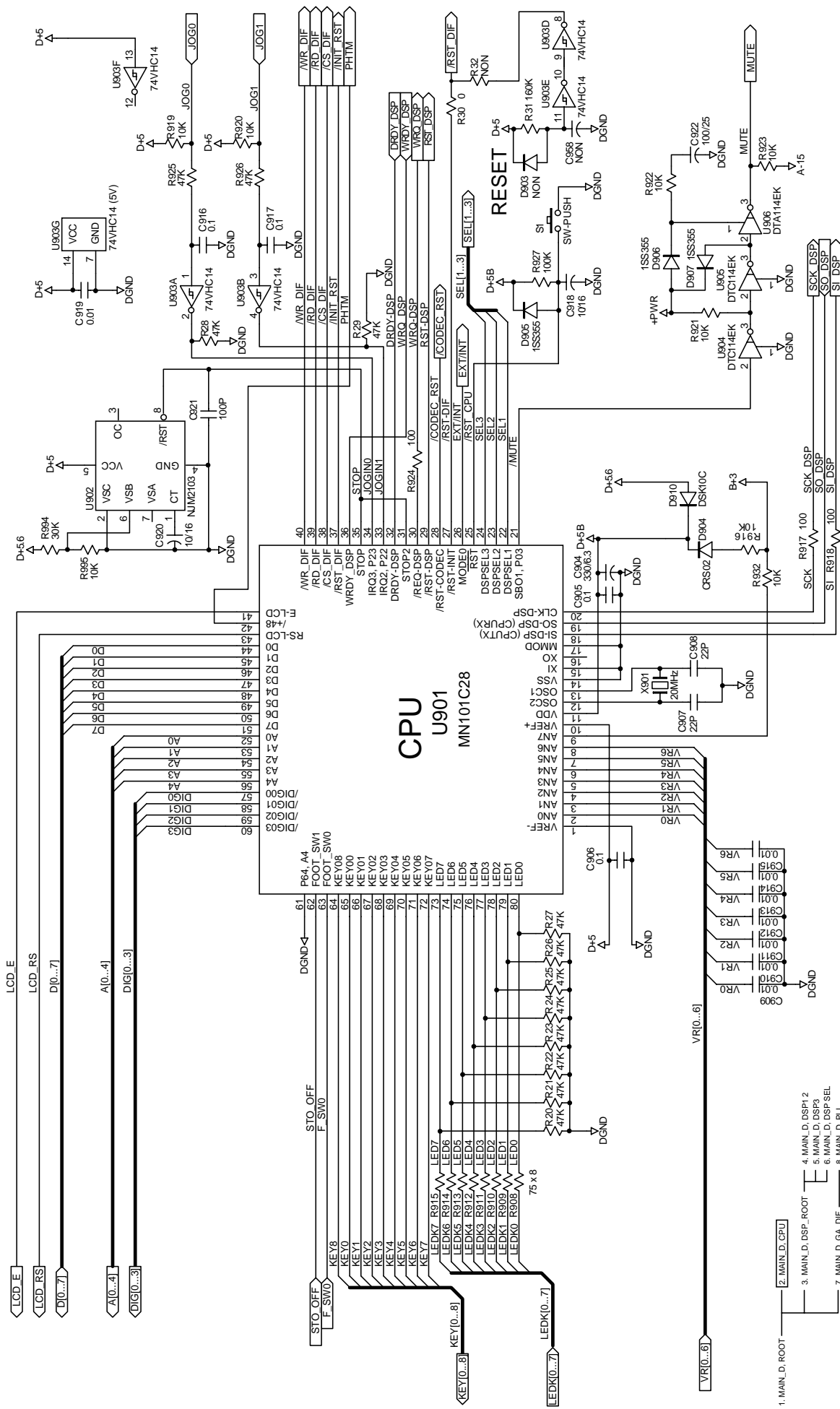


### ● ROOT, DSP, DIGITAL, MAIN, VM88



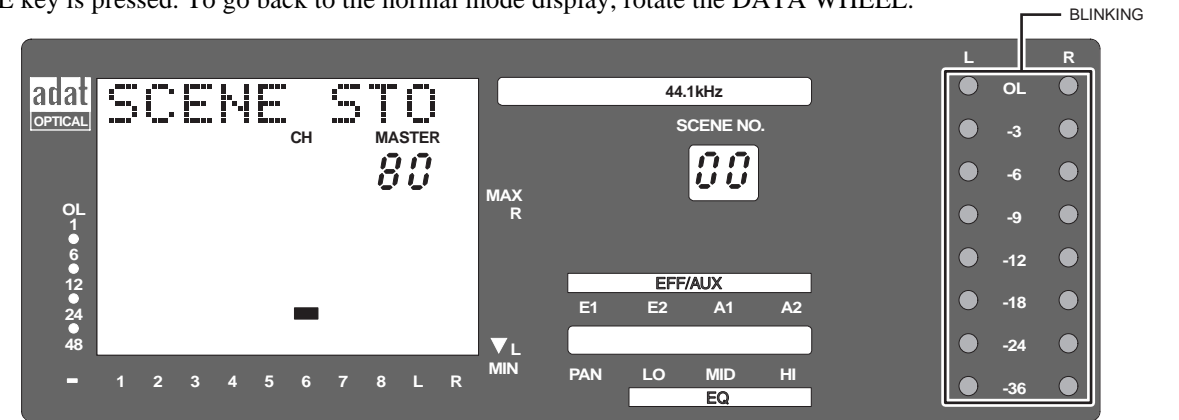


● CPU, DIGITAL, MAIN



3-5. Key Check

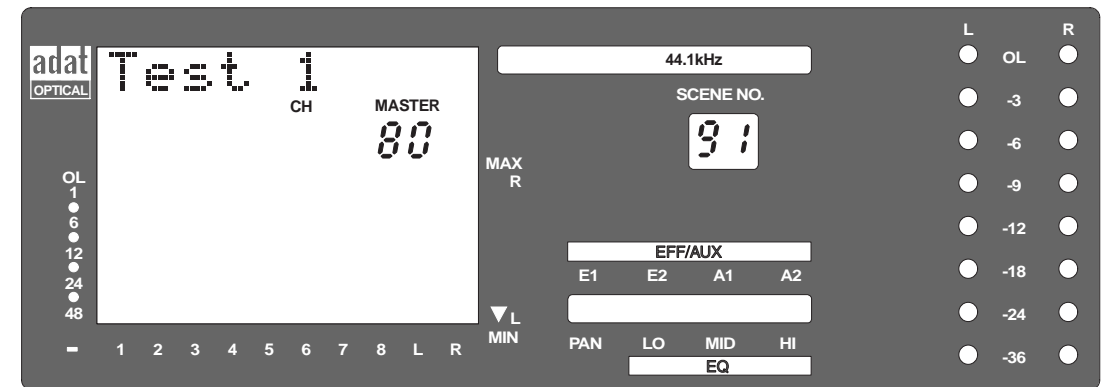
While holding down both the PAN/EQ and EFF/AUX keys, press the LEVEL ADJUST key. In this mode, the name of key will be displayed when the corresponding key is pressed. The figure below is an example when the SCENE STORE key is pressed. To go back to the normal mode display, rotate the DATA WHEEL.



**CAUTION:** If the ST OUT switch is pressed, “ST\_OUT\_ON” is always displayed on the LCD in the Key Check mode. In this condition, if other key is pressed, “\*\_NG\_\*” will appear on the LCD. In order to check the key function, release the ST switch. (The LED meter blinks when the ST switch is released.)

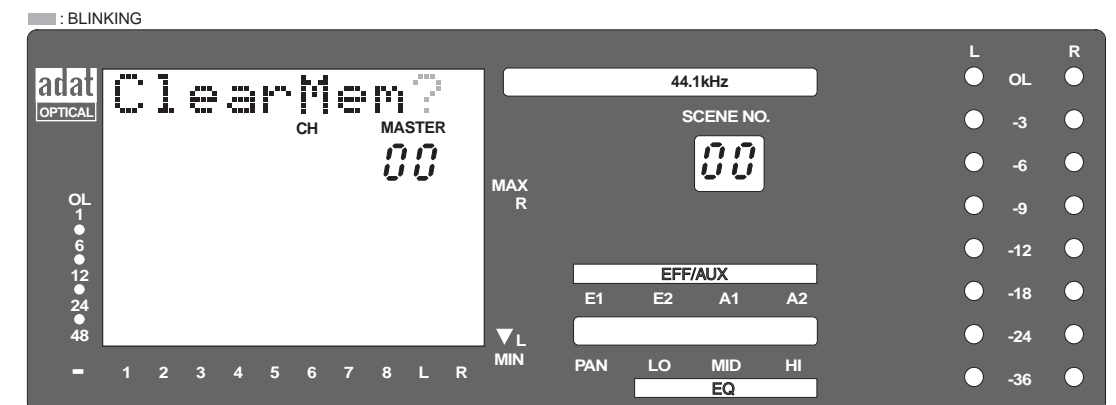
3-6. Test Scene

While holding down both the PAN/EQ and EFF/AUX keys, press the SCENE RECALL key. This mode is designed for the test executed at our manufacturer and has nothing to do with servicing the unit. In order to go back to the normal mix mode, recall the “Init. Mix: 00”.



3-7. Memory Clear

While holding down both the PAN/EQ and EFF/AUX keys, press the SCENE STORE key. In the condition that “ClearMem?” is displayed, pressing the ENTER key would initialize the memory and “ClearMem!” will appear on the LCD. Pressing the RESET switch on the rear panel would initialize the memory as well.



• Gain Table

The 2-digit value displayed in the LCD corresponds to the gain in dB as shown in the tables below.

INPUT/MASTER/EFF SEND FADER

Value	Gain (dB)
00	-∞
01	-72.00
05	-55.00
10	-42.50
15	-35.00
20	-28.75
25	-23.00
30	-18.00
35	-15.50
40	-13.00
45	-10.50
50	-8.50
55	-7.00
60	-5.50
65	-4.00
70	-2.50
75	-1.25
80	0.00
85	+1.50
90	+3.00
95	+4.67
99	+6.00

INPUT 1 ~ 4 PAN

Value	Gain (dB)	
	Left	Right
L10	0.00	-∞
L9	-0.10	-32.00
L8	-0.25	-23.50
L7	-0.40	-17.60
L6	-0.70	-14.10
L5	-1.00	-11.30
L4	-1.40	-9.00
L3	-1.80	-7.10
L2	-2.20	-5.50
L1	-2.60	-4.20
C	-3.00	-3.00
R1	-4.20	-2.60
R2	-5.50	-2.20
R3	-7.10	-1.80
R4	-9.00	-1.40
R5	-11.30	-1.00
R6	-14.10	-0.70
R7	-17.60	-0.40
R8	-23.50	-0.25
R9	-32.00	-0.10
R10	-∞	0.00

INPUT 5/6, 7/8 & MASTER BAL

Value	Gain (dB)	
	Left	Right
L10	0	-∞
L9	0	-36.0
L8	0	-26.0
L7	0	-18.0
L6	0	-12.0
L5	0	-8.0
L4	0	-5.0
L3	0	-3.0
L2	0	-1.5
L1	0	-0.5
C	0	0
R1	-0.5	0
R2	-1.5	0
R3	-3.0	0
R4	-5.0	0
R5	-8.0	0
R6	-12.0	0
R7	-18.0	0
R8	-26.0	0
R9	-36.0	0
R10	-∞	0

• Replacing Battery

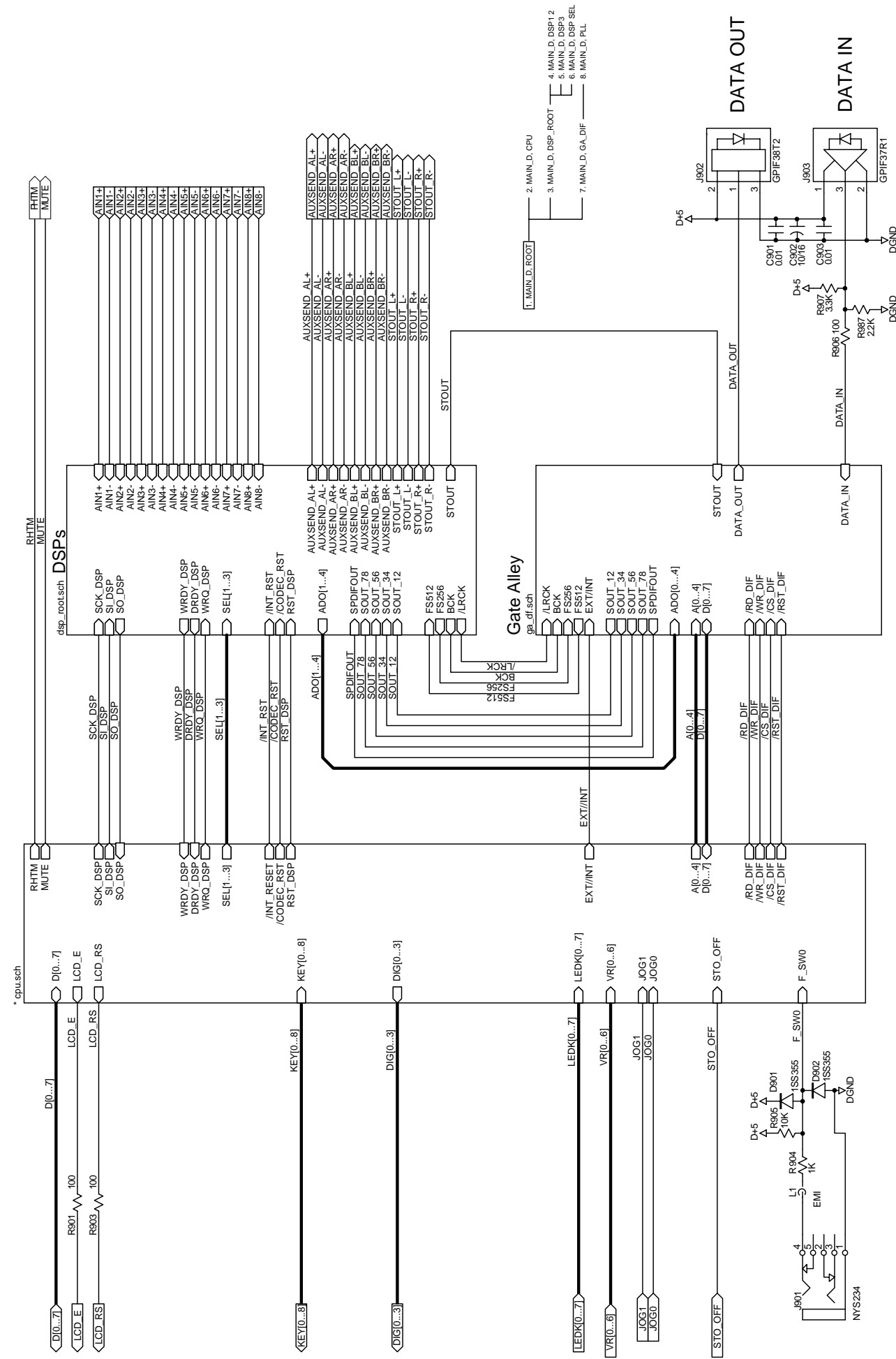
If the voltage of the internal memory backup battery falls below 2.2V, the message “BattEmpty” will appear when powering ON. In that case, the battery has to be replaced. Please understand that replacing the battery will initialize the backup data. If you would like to retain the backup data, replace the battery while the power is ON.

4. EXPLODED VIEW, PCB ASSEMBLY AND PARTS LIST

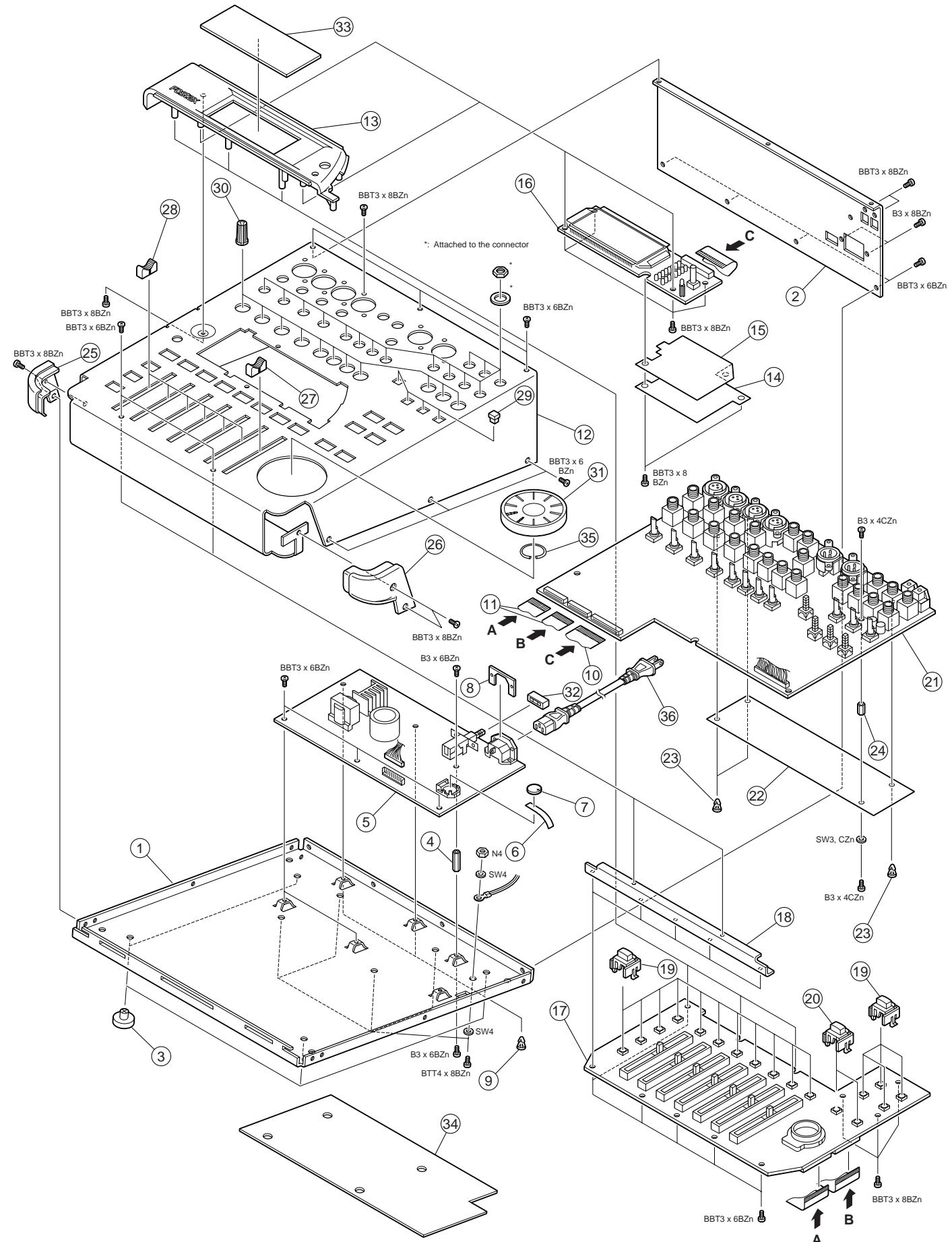
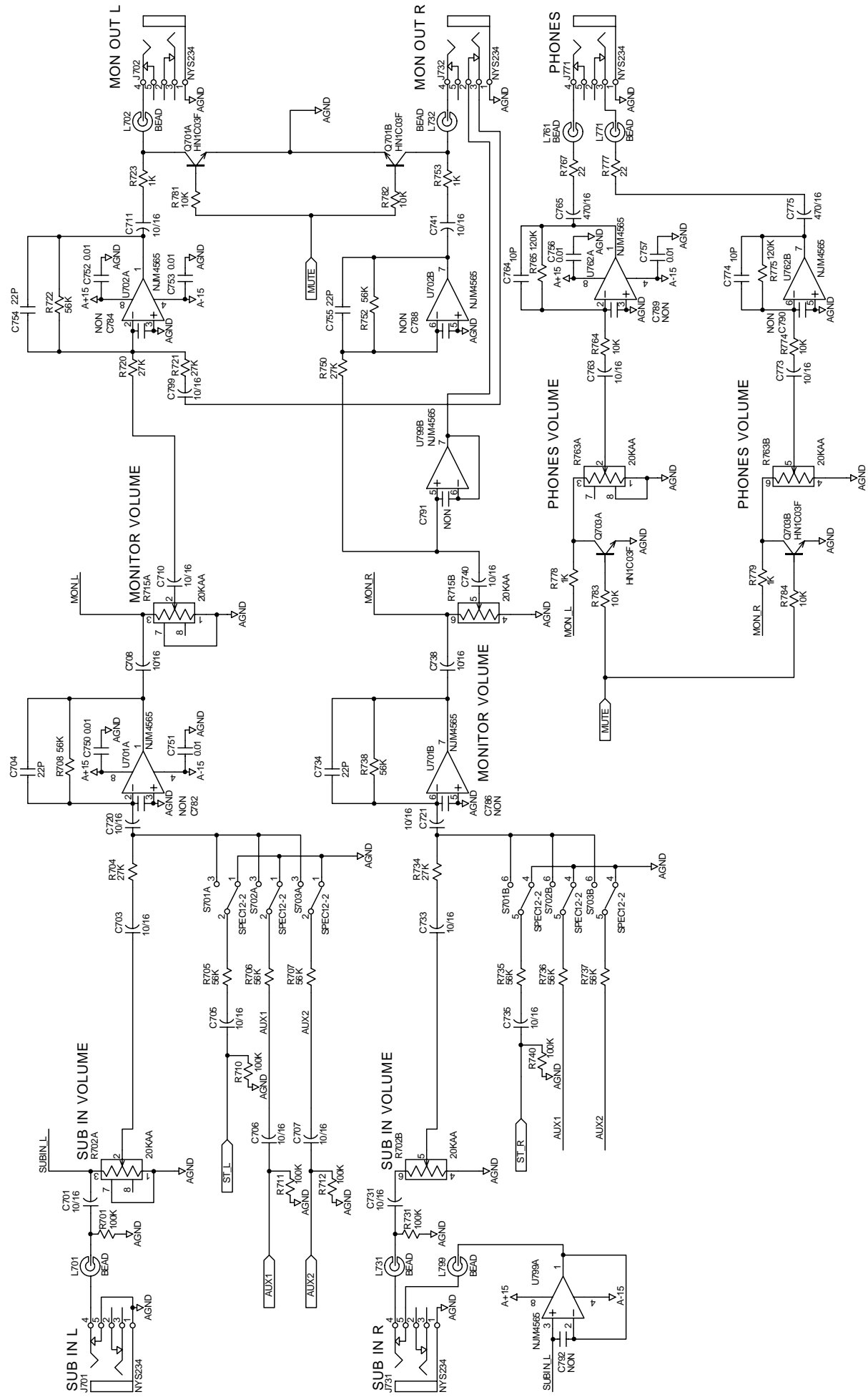
● VM88 OVERALL EXPLODED VIEW & PARTS LIST

Ref. No.	Part No.	Description	Ref. No.	Part No.	Description
1	8221 3230 00	Panel, bottom, VM88	21	8274 2760 00	PCB assy, Main, VM88
2	8221 3240 00	Panel, rear, VM88	22	8221 3260 00	Shield, power, VM88
3	8207 0120 00	Foot, FF-822	23	8207 0046 04	Spacer, PCB, 5RT
4	8204 0090 10	Spacer, M3 x 9	24	8204 0090 01	Spacer, M3 x 5
△ 5	8274 2750 00	PCB assy, Power, VM88	25	8212 6590 03	Pad, side, L, N19
6	8216 6990 00	Sheet, battery, VM04/08/88	26	8212 6590 04	Pad, side, R, N19
7	8239 1200 00	Battery, 3V, CR2032	27	8226 2490 02	Knob, fader, R
8	8221 2610 00	Bracket, AC-IN, FD-8/VM88	28	8226 2490 03	Knob, fader, N19
9	8207 0046 07	Spacer, PCB, 12RT	29	8226 2480 02	Knob, switch, N19
10	8276 8409 40	Cable, flat, FPC, 30P, L400	30	8226 1870 02	Knob, volume, W, N19
11	8276 8396 30	Cable, flat, FPC, 17P, L300	31	8226 2620 00	Knob, jog, VM88
12	8221 3220 00	Panel, top, VM88	32	8226 0130 03	Button, push, B, N
13	8212 6930 00	Panel, LCD, VM88	33	8212 6940 00	Window, LCD, VM88
14	8216 7320 01	Shield, cable, VM88	34	8216 7250 00	Sheet, bottom, VM88
15	8216 7321 02	Sheet, insulation, VM88	35	8214 3950 00	Spring, jog
16	8274 2730 00	PCB assy, Display, VM88	△ 36	8276 9170 00	Cord, power, BS, 3C, KP610-KS31A, UK
17	8274 2740 00	PCB assy, Key, VM88		8276 8010 00	Cord, power, UL/CSA, VM033-0089, USA/CND
18	8221 3250 00	Bracket, PCB, VM88		8276 8021 00	Cord, power, CEE, 031013, EUR
19	8226 2460 01	Button, 7 x 13, LED		8276 8000 00	Cord, power, DM, VM1292-1298, JPN
20	8226 2460 03	Button, 7 x 13, N19			

● ROOT, DIGITAL, MAIN

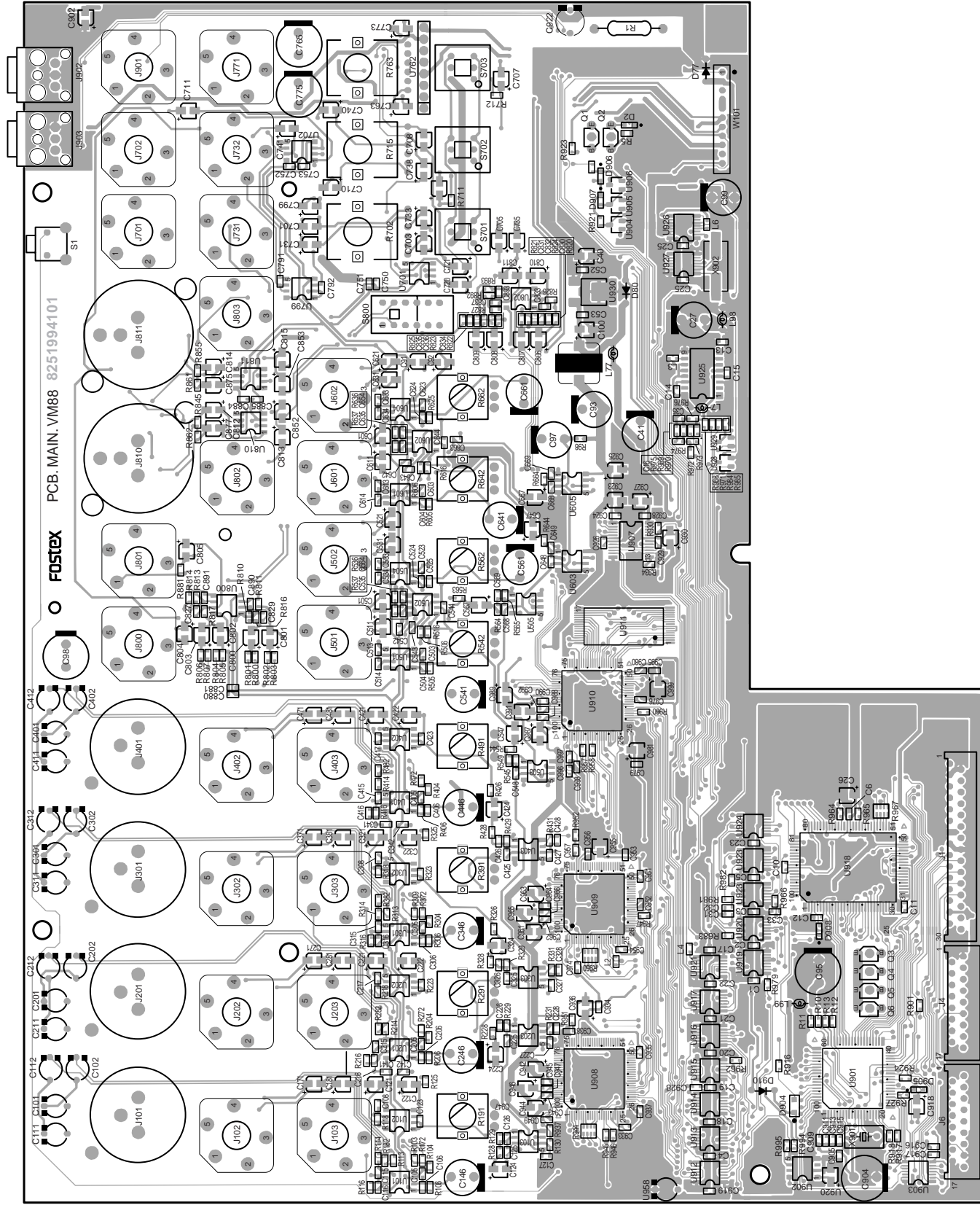


● MONITOR, ANALOG, MAIN

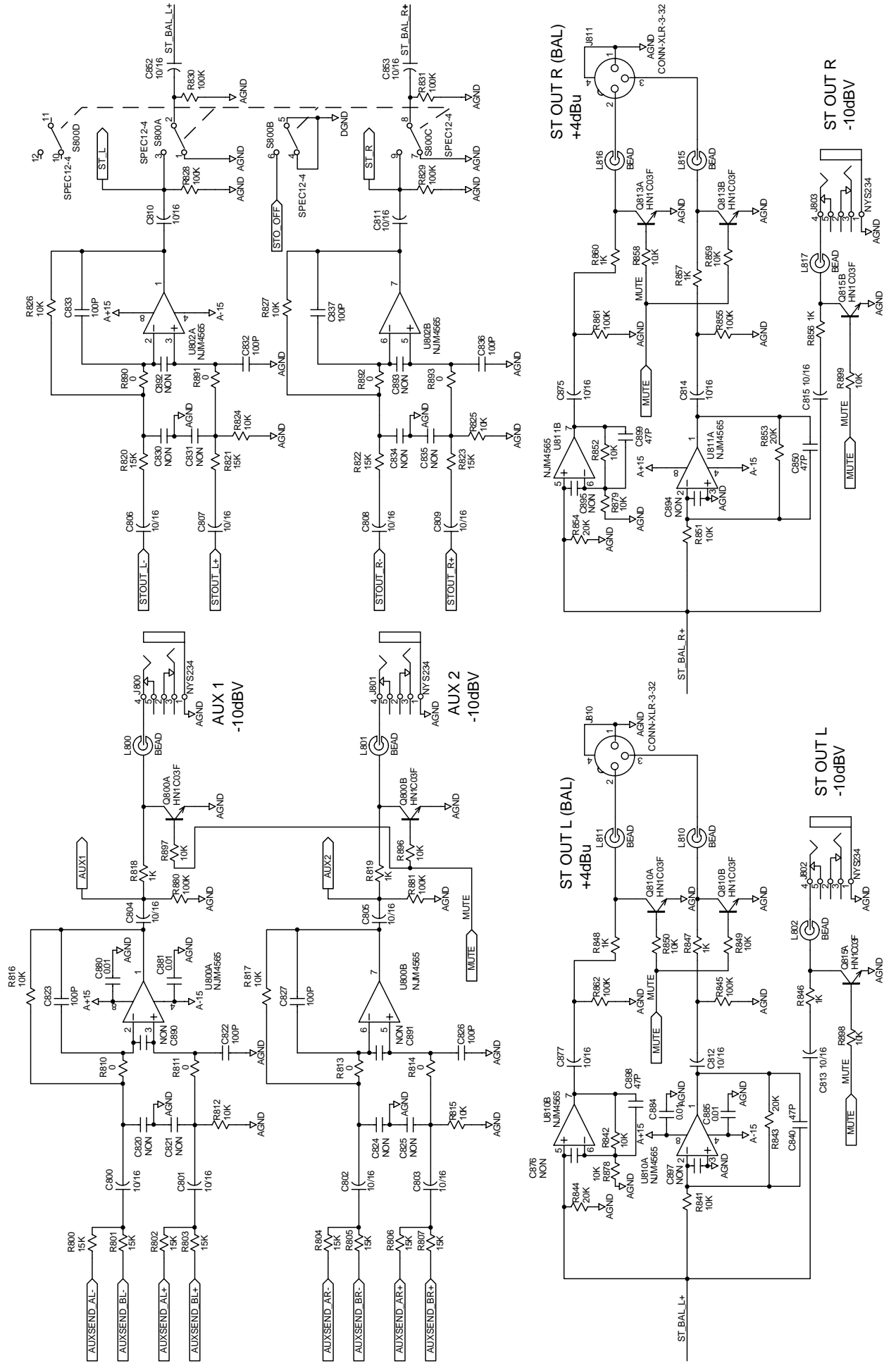


VM88 PCB ASSEMBLIES

Parts Side of MAIN PCB

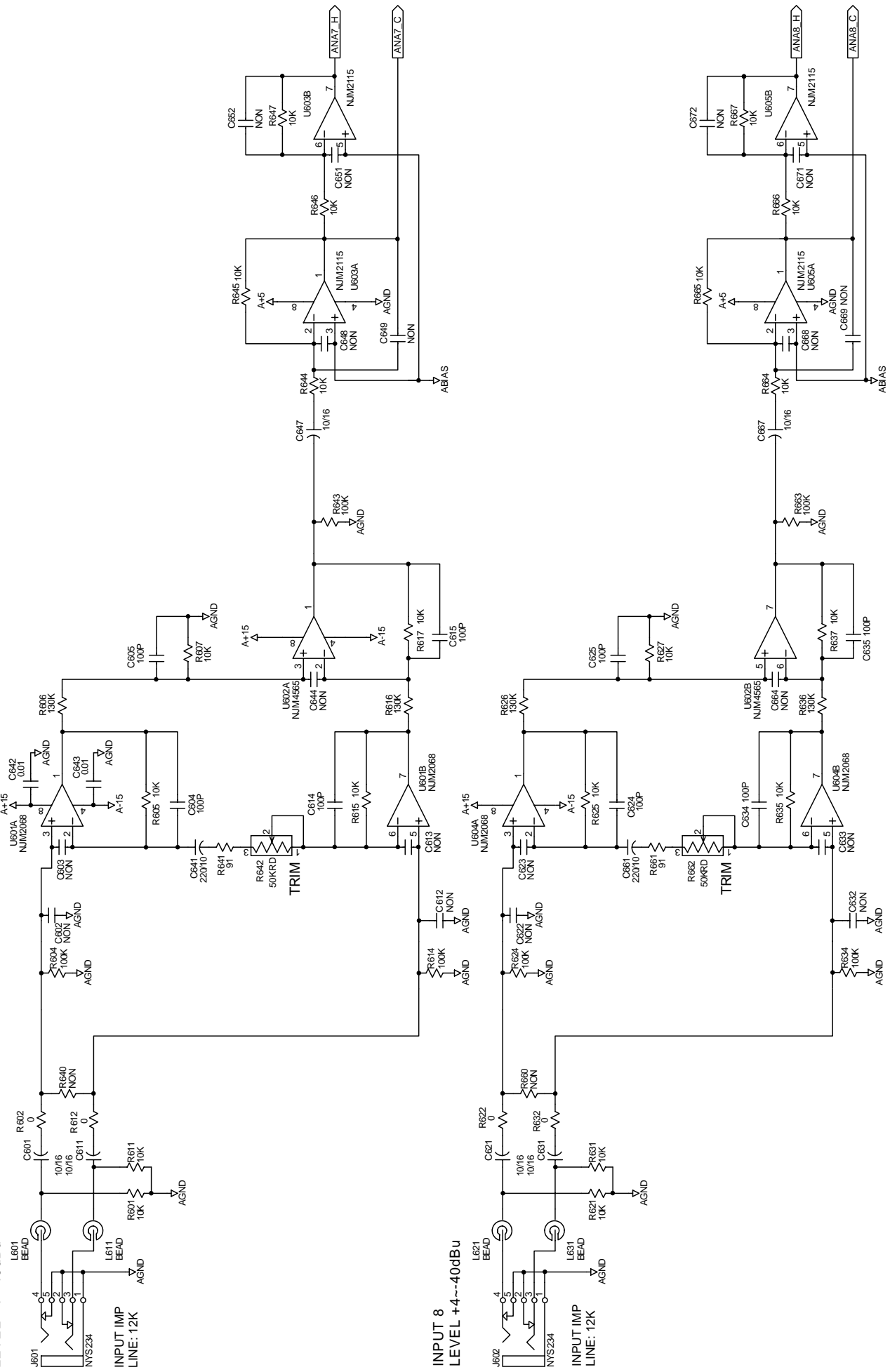


ANALOG OUT, ANALOG, MAIN

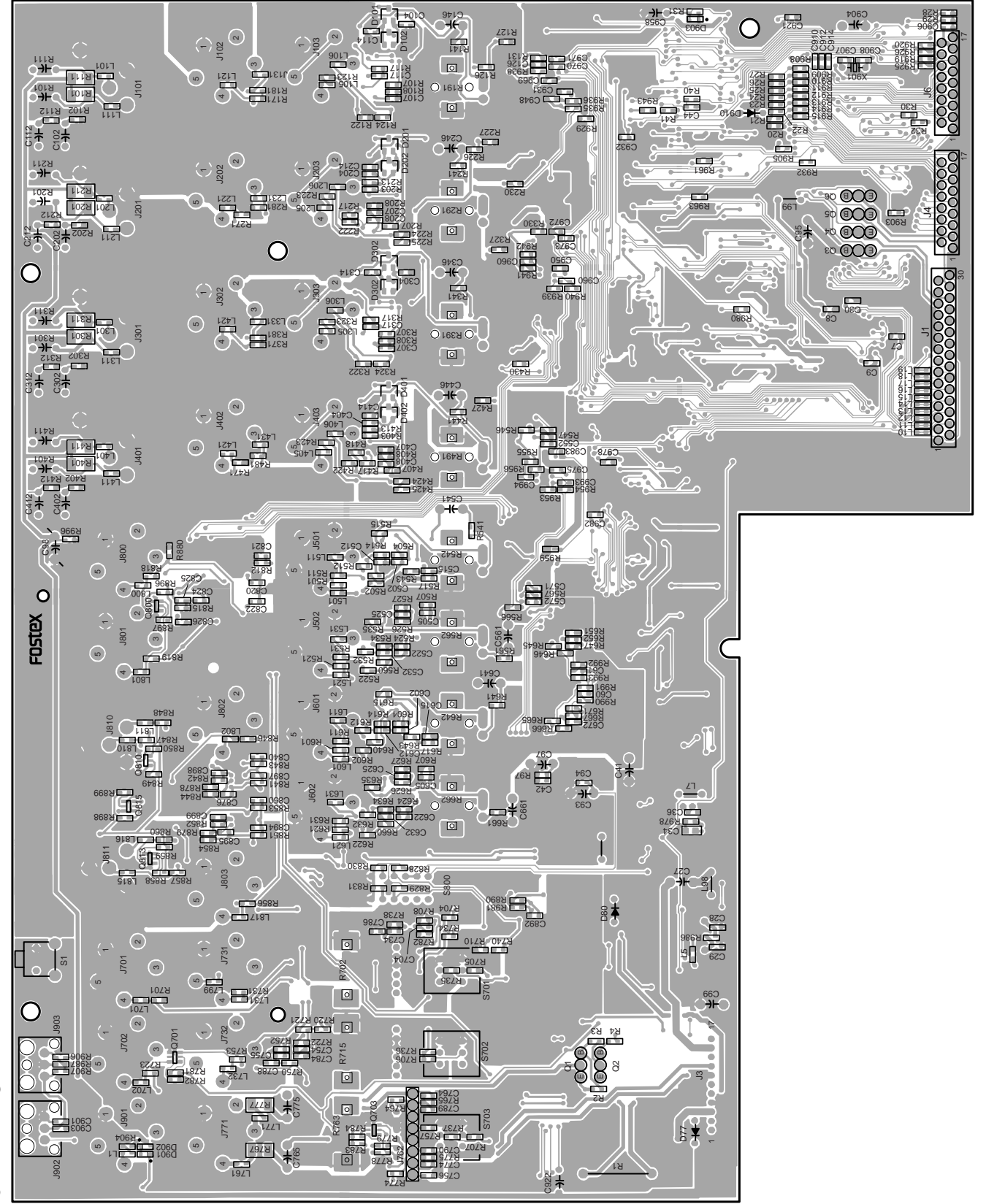


● ANALOG IN 7/8, ANALOG, MAIN

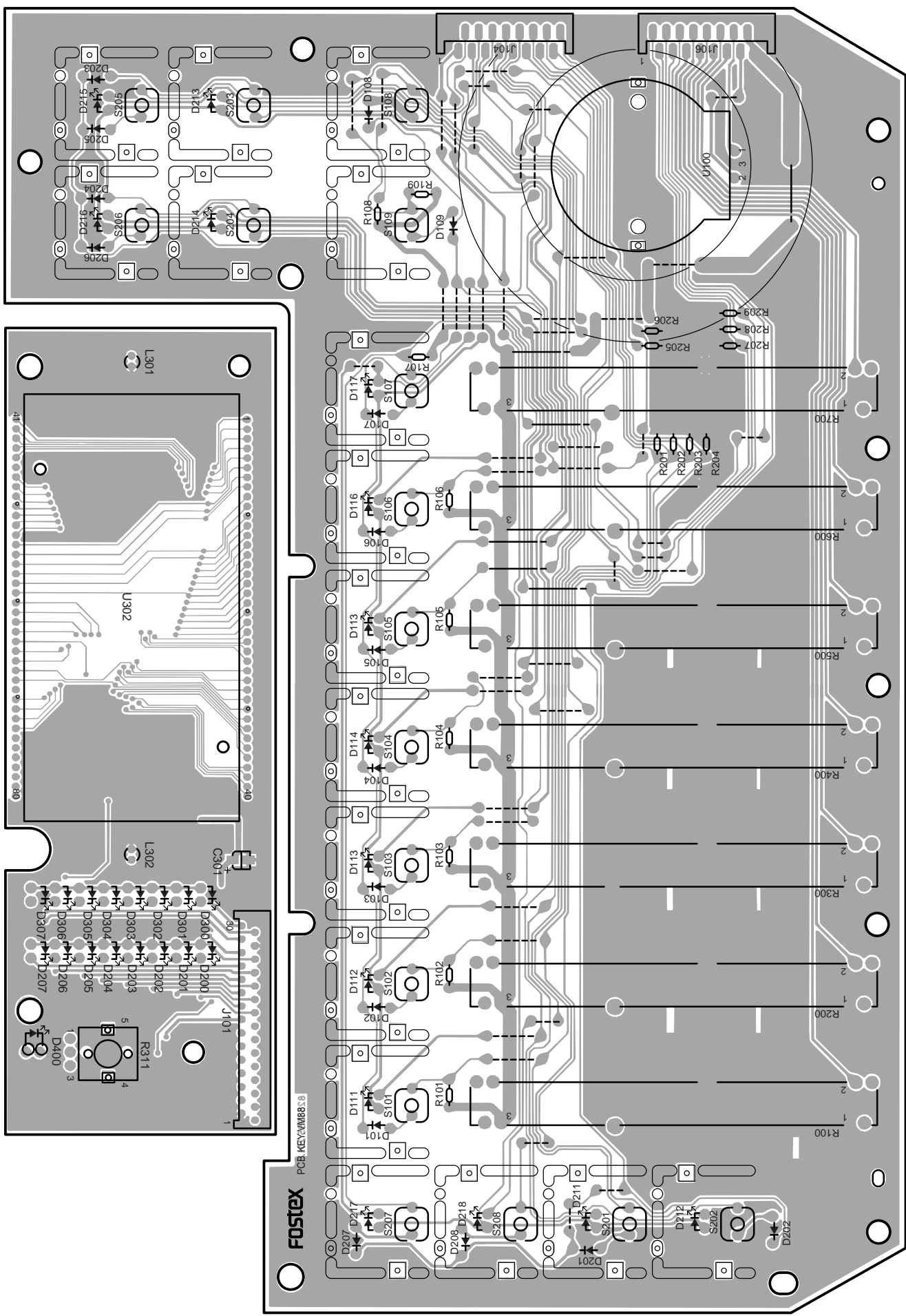
INPUT 7  
LEVEL +4--40dBu



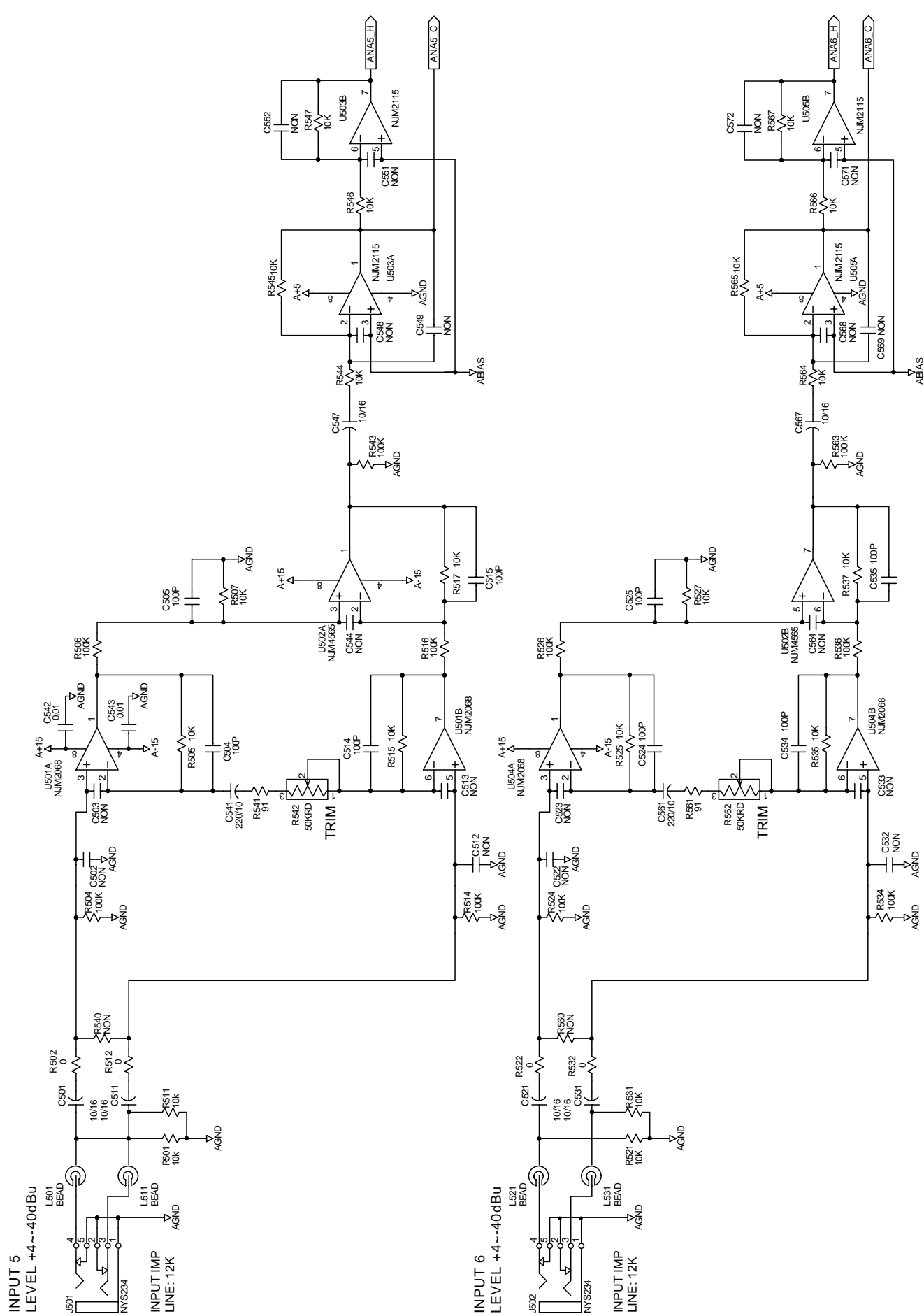
● Foil Side of MAIN PCB



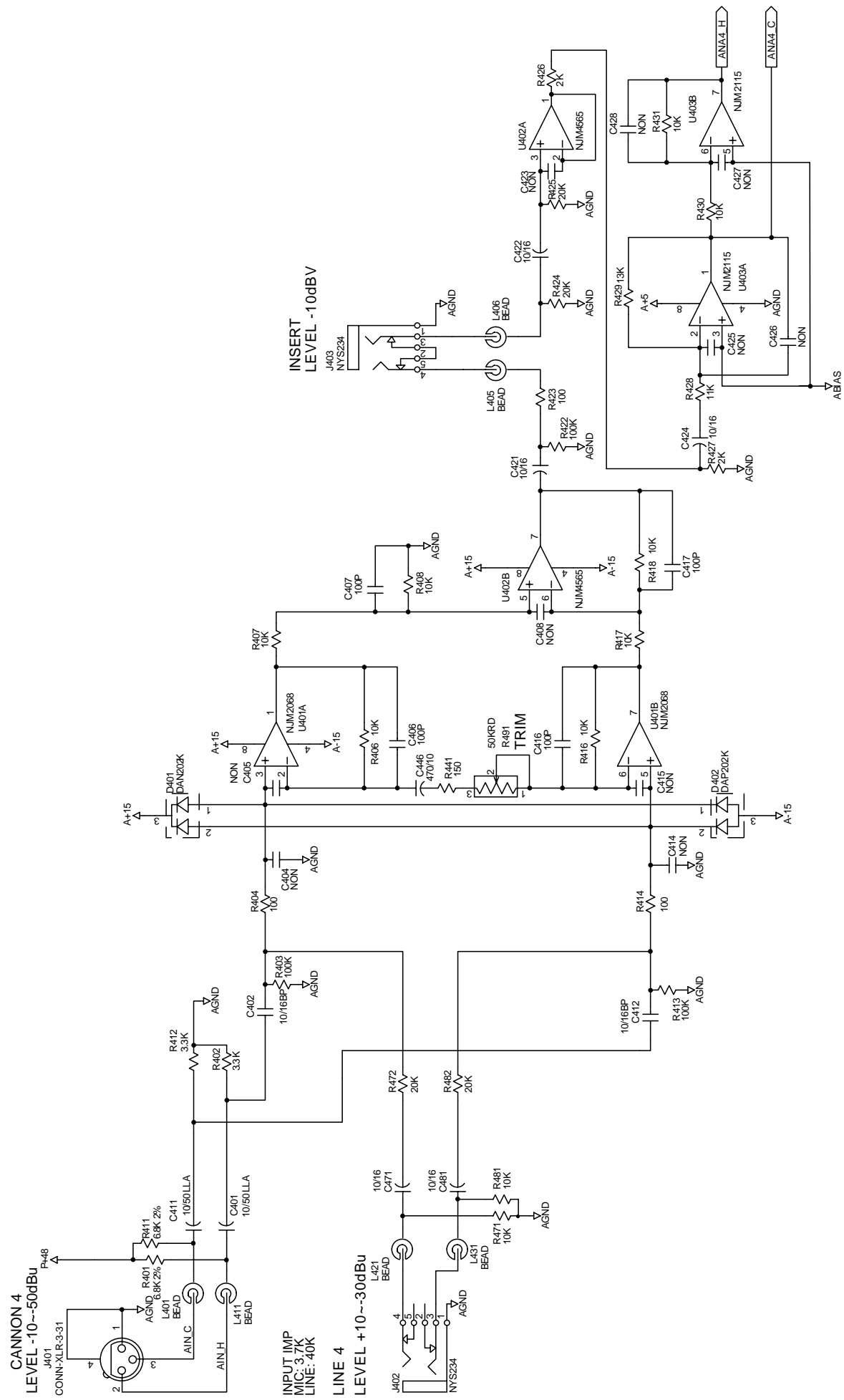
• Parts Side of KEY & DISPLAY PCB



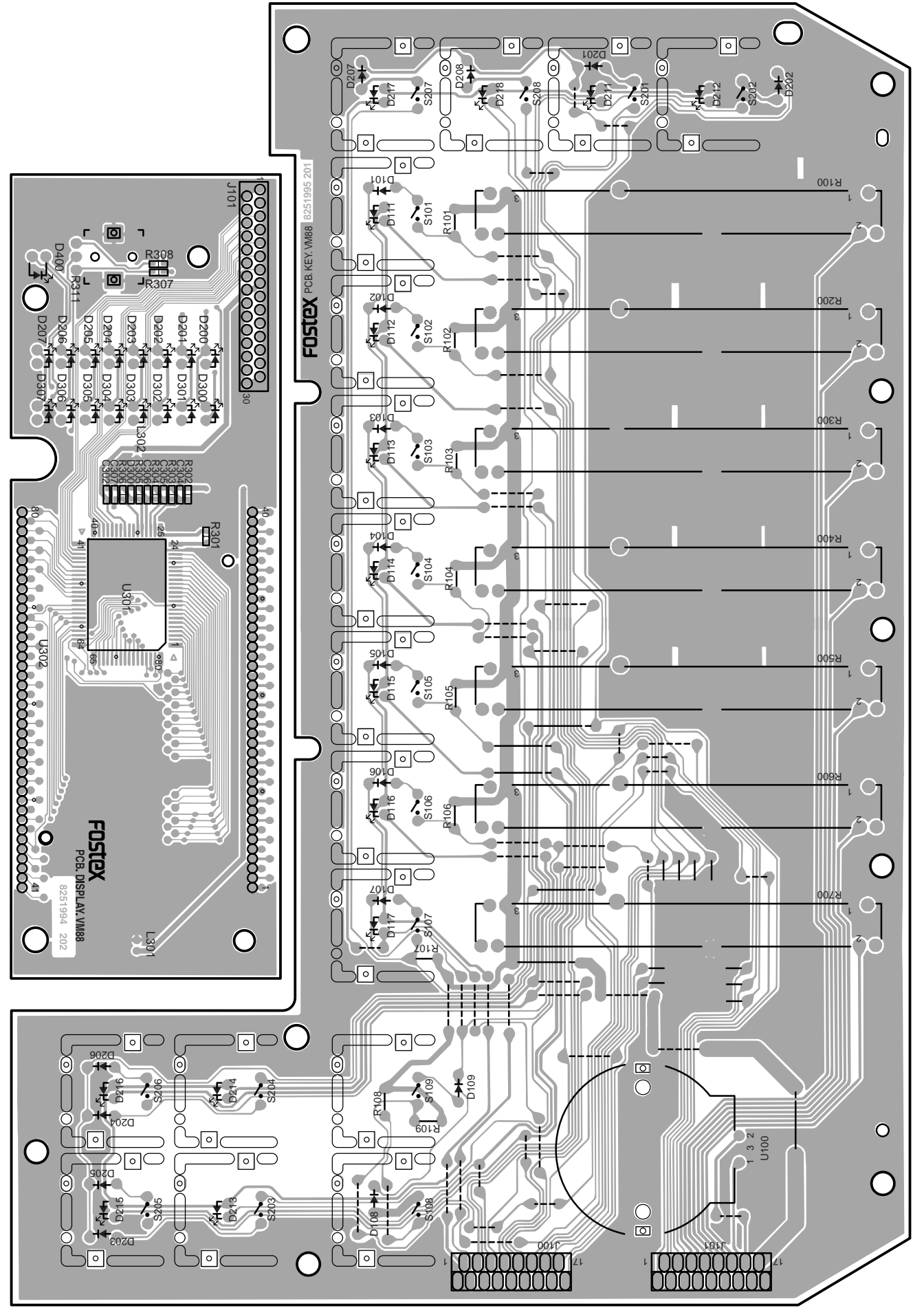
● ANALOG IN 5/6, ANALOG, MAIN



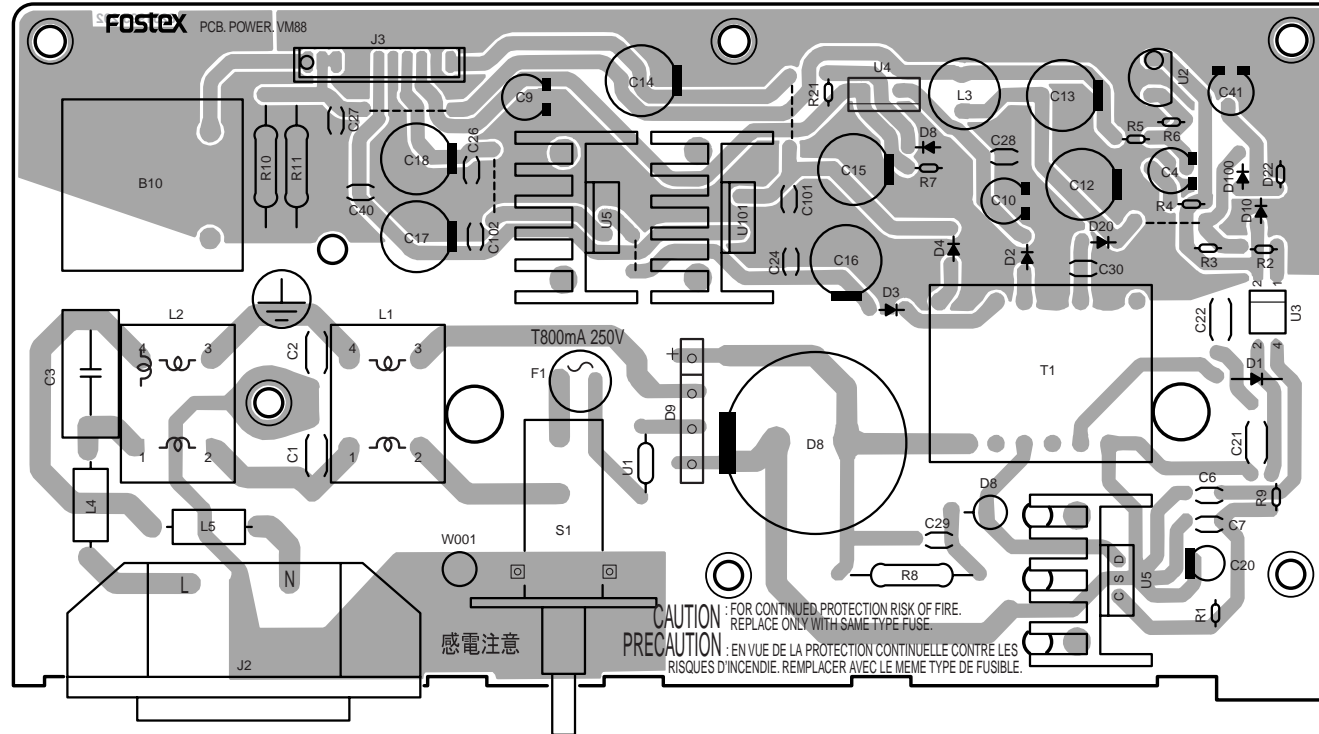
● ANALOG IN 4, ANALOG, MAIN



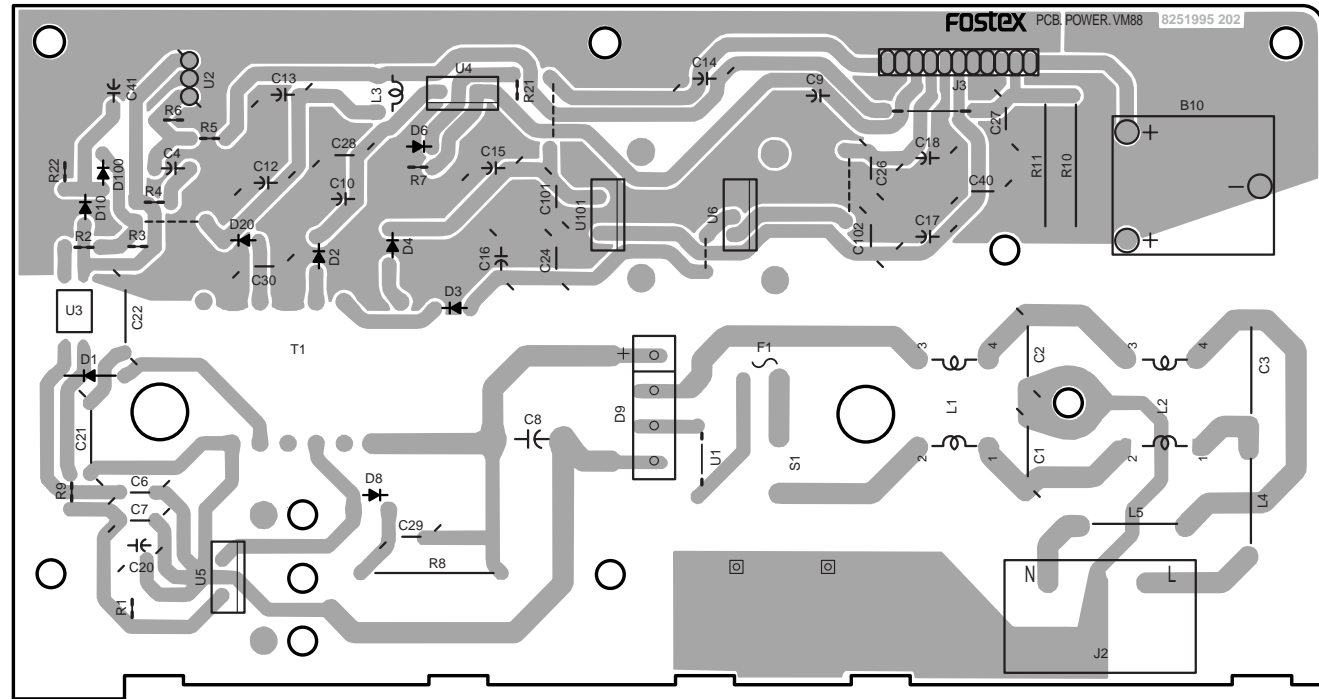
● Foil Side of KEY & DISPLAY PCB



• Parts Side of POWER PCB



• Foil Side of POWER PCB

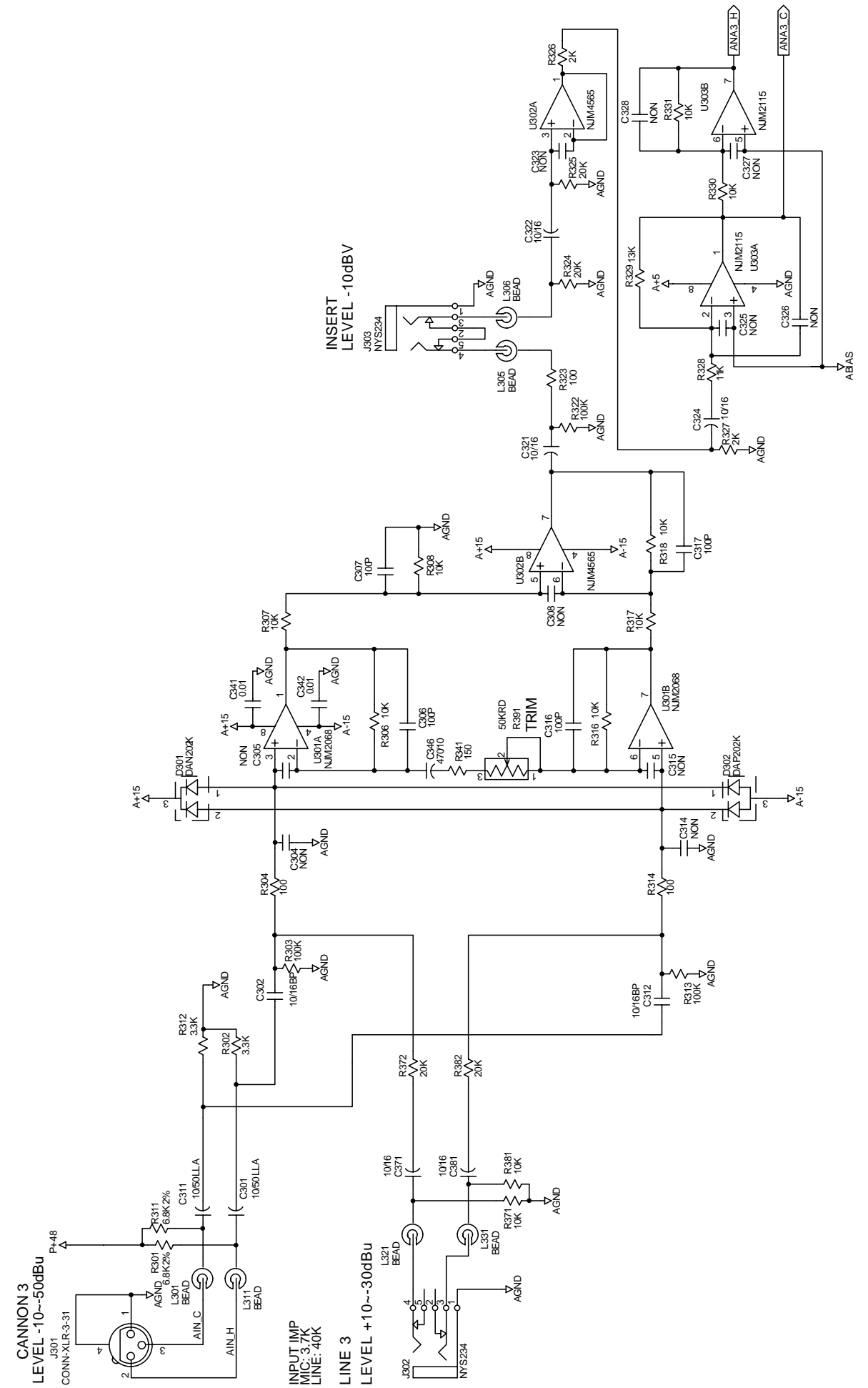


● VM88 Parts List

• Main PCB assy

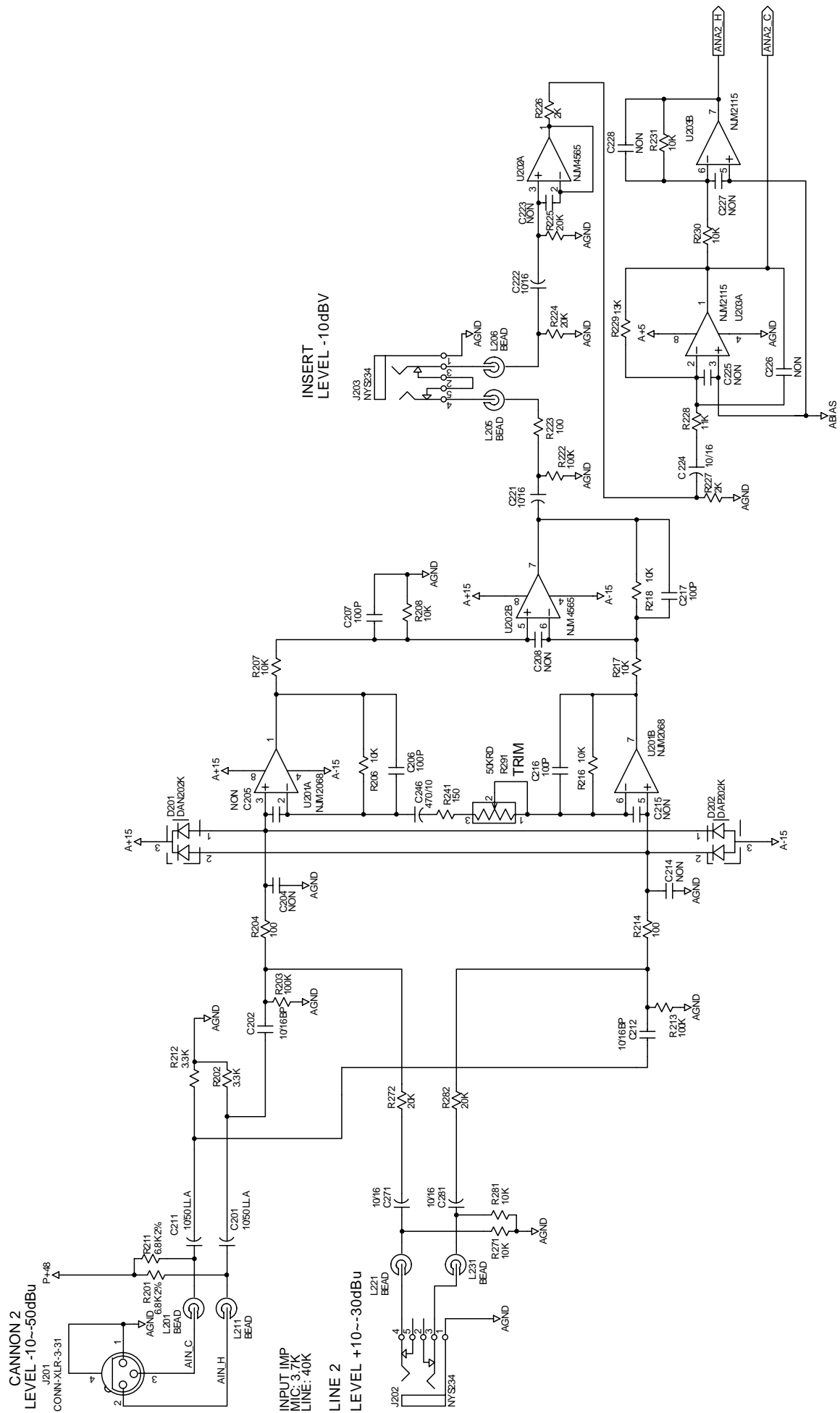
Ref. No.	Part No.	Description	ICs
	8274 2760 00	PCB Assy, Main, VM88	
	8251 9941 01	Plain PCB, Main, VM88	
Ref. No.	Part No.	Description	ICs
U101~401	8236 5405 00	ST, AN, NJM2068MD (TEI)	
U102~402	8236 5412 00	ST, AN, op amp, NJM4565M	
U103~403	8236 5050 11	ST, AN, op amp, NJM2115M (TEI)	

● ANALOG IN 3, ANALOG, MAIN





● ANALOG IN 2, ANALOG, MAIN



Ref. No.	Part No.	Description
U501, 601	8236 5405 00	ST, AN, NJM2068MD (TEI)
U502, 602	8236 5412 00	ST, AN, op amp, NJM4565M
U503, 603	8236 5050 11	ST, AN, op amp, NJM2115M (TEI)
U504, 604	8236 5405 00	ST, AN, NJM2068MD (TEI)
U505, 605	8236 5050 11	ST, AN, op amp, NJM2115M (TEI)
U701, 702	8236 5412 00	ST, AN, op amp, NJM4565M
U762	8236 0352 03	SIP, AN, op amp, NJM4556AL
U799, 800	8236 5412 00	ST, AN, op amp, NJM4565M
U802	8236 5412 00	ST, AN, op amp, NJM4565M
U810, 811	8236 5412 00	ST, AN, op amp, NJM4565M
U901	8236 0862 03	QFP, DG, CPU, VM08/88, MN101C28
U902	8236 5025 00	ST, AN, RESET, NJM2103M
U903	8236 5450 14	ST, TSSOP, 74VHC14
U904, 905	8236 5701 01	ST, DG, driver, DTC114EK
U906	8236 5704 01	ST, DG, driver, DTA114EK
U907	8236 5417 00	ST, DG, ADDA, AK4522
U908~910	8236 0861 00	QFP, DG, DSP, AK7716
U911	8236 0846 00	TSOP, DG, SRAM, TC551001CFT-70L
U912~915	8236 5450 00	ST, TSSOP, 74VHC00
U916	8236 5450 10	ST, TSSOP, 74VHC10
U917	8236 5450 86	ST, TSSOP, 74VHC86
U918	8236 0850 00	QFP, DG, gate array, DIF
U919	8236 5451 61	ST, TSSOP, 74VHC161
U920	8236 5450 00	ST, TSSOP, 74VHC00
U921~924	8236 5450 74	ST, TSSOP, 74VHC74
U925	8236 5034 00	ST, DG, VCO, TC9246F
U926	8236 5451 57	ST, TSSOP, 74VHC157
U927	8236 5459 04	ST, TSSOP, 74VHCU04
U928	8236 5704 01	ST, DG, driver, DTA114EK
U929	8236 5701 01	ST, DG, driver, DTC114EK
U930	8236 5425 01	ST, AN, regulator, TA48M05F

RESISTORS

Ref. No.	Part No.	Description
R001	8230 1111 01	H, metal, 1W, 100Ω, 5%, F15
R002	8230 5101 03	ST, carbon, 1/15W, 10kΩ, 5%
R003	8230 5105 63	ST, carbon, 1/15W, 56kΩ, 5%
R004, 005	8230 5101 02	ST, carbon, 1/15W, 1kΩ, 5%
R010~013	8230 5101 02	ST, carbon, 1/15W, 1kΩ, 5%
R020~029	8230 5104 73	ST, carbon, 1/15W, 47kΩ, 5%
R030	8230 5100 00	ST, carbon, 1/15W, 0Ω, 5%
R031	8230 5101 64	ST, carbon, 1/15W, 160kΩ, 5%
R032		N/A
R040	8230 5104 70	ST, carbon, 1/15W, 47Ω, 5%
R041	8230 5101 01	ST, carbon, 1/15W, 100Ω, 5%
R097, 098	8230 5101 02	ST, carbon, 1/15W, 1kΩ, 5%
R101~401	8230 5126 82	ST, carbon, 1/4W, 6.8kΩ, 1%
R102~402	8230 5103 32	ST, carbon, 1/15W, 3.3kΩ, 5%
R103~403	8230 5101 04	ST, carbon, 1/15W, 100kΩ, 5%
R104~404	8230 5101 01	ST, carbon, 1/15W, 100Ω, 5%
R106~406	8230 5101 03	ST, carbon, 1/15W, 10kΩ, 5%
R107~407	8230 5101 03	ST, carbon, 1/15W, 10kΩ, 5%
R108~408	8230 5101 03	ST, carbon, 1/15W, 10kΩ, 5%
R111~411	8230 5126 82	ST, carbon, 1/4W, 6.8kΩ, 1%
R112~412	8230 5103 32	ST, carbon, 1/15W, 3.3kΩ, 5%
R113~413	8230 5101 04	ST, carbon, 1/15W, 100kΩ, 5%
R114~414	8230 5101 01	ST, carbon, 1/15W, 100Ω, 5%
R116~416	8230 5101 03	ST, carbon, 1/15W, 10kΩ, 5%
R114~417	8230 5101 03	ST, carbon, 1/15W, 10kΩ, 5%
R118~418	8230 5101 03	ST, carbon, 1/15W, 10kΩ, 5%
R122~422	8230 5101 04	ST, carbon, 1/15W, 100kΩ, 5%
R123~423	8230 5101 01	ST, carbon, 1/15W, 100Ω, 5%
R124~424	8230 5102 03	ST, carbon, 1/15W, 20kΩ, 5%
R125~425	8230 5102 03	ST, carbon, 1/15W, 20kΩ, 5%
R126~426	8230 5102 02	ST, carbon, 1/15W, 2kΩ, 5%
R127~427	8230 5102 02	ST, carbon, 1/15W, 2kΩ, 5%
R128~428	8230 5101 13	ST, carbon, 1/15W, 11kΩ, 5%
R129~429	8230 5101 33	ST, carbon, 1/15W, 13kΩ, 5%
R130~430	8230 5101 03	ST, carbon, 1/15W, 10kΩ, 5%
R131~431	8230 5101 03	ST, carbon, 1/15W, 10kΩ, 5%
R141~441	8230 5101 51	ST, carbon, 1/15W, 150Ω, 5%
R171~471	8230 5101 03	ST, carbon, 1/15W, 10kΩ, 5%
R172~472	8230 5102 03	ST, carbon, 1/15W, 20kΩ, 5%
R181~481	8230 5101 03	ST, carbon, 1/15W, 10kΩ, 5%
R182~482	8230 5102 03	ST, carbon, 1/15W, 20kΩ, 5%
R191~491	8240 2930 02	Pot, PI 9, 50kΩRD, EVUF2L
R501, 601	8230 5101 03	ST, carbon, 1/15W, 10kΩ, 5%
R502, 602	8230 5100 00	ST, carbon, 1/15W, 0Ω, 5%
R504, 604	8230 5101 04	ST, carbon, 1/15W, 100kΩ, 5%
R505, 605	8230 5101 03	ST, carbon, 1/15W, 10kΩ, 5%
R506	8230 5101 04	ST, carbon, 1/15W, 100kΩ, 5%
R507, 607	8230 5101 03	ST, carbon, 1/15W, 10kΩ, 5%
R511, 611	8230 5101 03	ST, carbon, 1/15W, 10kΩ, 5%
R512, 612	8230 5100 00	ST, carbon, 1/15W, 0Ω, 5%
R514, 614	8230 5101 04	ST, carbon, 1/15W, 100kΩ, 5%
R515, 615	8230 5101 03	ST, carbon, 1/15W, 10kΩ, 5%
R516	8230 5101 04	ST, carbon, 1/15W, 100kΩ, 5%
R517, 617	8230 5101 03	ST, carbon, 1/15W, 10kΩ, 5%

TRANSISTORS

Ref. No.	Part No.	Description
Q001, 002	8234 5054 00	VT, PNP, 2SA817AY
Q003~006	8234 1008 02	VT, PNP, 2SA1150Y
Q701	8234 5057 00	ST, NPN, HNIC03F
Q703	8234 5057 00	ST, NPN, HNIC03F
Q800	8234 5057 00	ST, NPN, HNIC03F
Q810	8234 5057 00	ST, NPN, HNIC03F
Q813	8234 5057 00	ST, NPN, HNIC03F
Q815	8234 5057 00	ST, NPN, HNIC03F

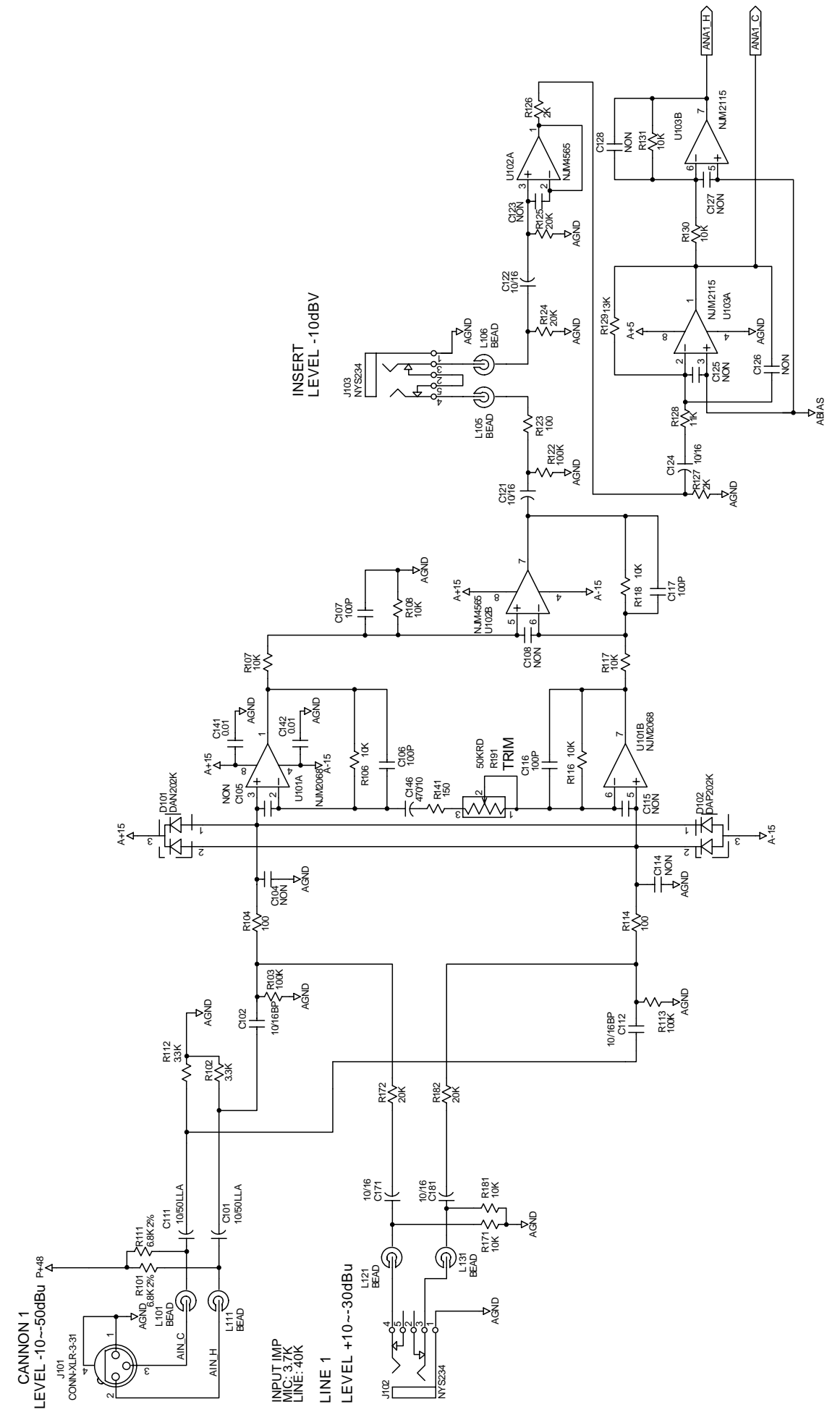
DIODEs

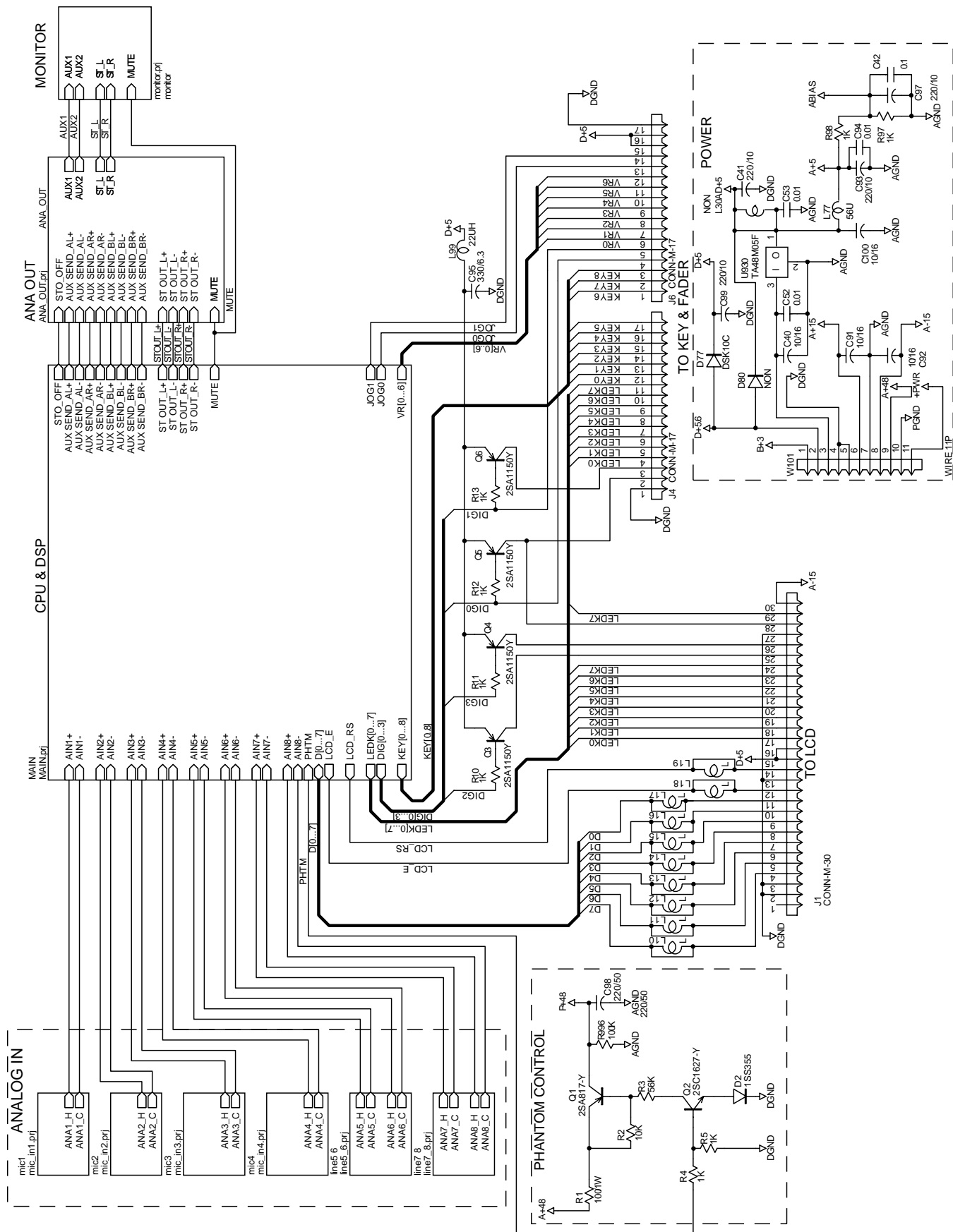
Ref. No.	Part No.	Description
D002	8234 5059 00	ST, 1SS355TE-17
D077	8234 0196 12	VT, DSK10C-ET1
D080		N/A
D101~401	8234 5028 00	ST, DAN202K
D102~402	8234 5029 00	ST, DAP202K-T146
D901, 902	8234 5059 00	D, ST, 1SS355TE-17
D903		N/A
D904	8234 5056 00	D, ST, CRS02
D905~908	8234 5059 00	D, ST, 1SS355TE-17
D910	8234 0196 12	D, VT, DSK10C-ET1

Ref. No.	Part No.	Description
R521, 621	8230 5101 03	ST, carbon, 1/15W, 10kΩ, 5%
R522, 622	8230 5100 00	ST, carbon, 1/15W, 0Ω, 5%
R524, 624	8230 5101 04	ST, carbon, 1/15W, 100kΩ, 5%
R525, 625	8230 5101 03	ST, carbon, 1/15W, 10kΩ, 5%
R526	8230 5101 04	ST, carbon, 1/15W, 100kΩ, 5%
R527, 627	8230 5101 03	ST, carbon, 1/15W, 10kΩ, 5%
R531, 631	8230 5101 03	ST, carbon, 1/15W, 10kΩ, 5%
R532, 632	8230 5100 00	ST, carbon, 1/15W, 0Ω, 5%
R534, 634	8230 5101 04	ST, carbon, 1/15W, 100kΩ, 5%
R535, 635	8230 5101 03	ST, carbon, 1/15W, 10kΩ, 5%
R536	8230 5101 04	ST, carbon, 1/15W, 100kΩ, 5%
R537, 637	8230 5101 03	ST, carbon, 1/15W, 10kΩ, 5%
R541, 641	8230 5109 10	ST, carbon, 1/15W, 91Ω, 5%
R542, 642	8240 2930 02	Pot, PI9, 50kΩRD, EVUF2L
R543, 643	8230 5101 04	ST, carbon, 1/15W, 100kΩ, 5%
R544, 644	8230 5101 03	ST, carbon, 1/15W, 10kΩ, 5%
R545, 645	8230 5101 03	ST, carbon, 1/15W, 10kΩ, 5%
R546, 646	8230 5101 03	ST, carbon, 1/15W, 10kΩ, 5%
R547, 647	8230 5101 03	ST, carbon, 1/15W, 10kΩ, 5%
R560, 660		N/A
R561, 661	8230 5109 10	ST, carbon, 1/15W, 91Ω, 5%
R562, 662	8240 2930 02	Pot, PI9, 50kΩRD, EVUF2L
R563, 663	8230 5101 04	ST, carbon, 1/15W, 100kΩ, 5%
R564, 664	8230 5101 03	ST, carbon, 1/15W, 10kΩ, 5%
R565, 665	8230 5101 03	ST, carbon, 1/15W, 10kΩ, 5%
R566, 666	8230 5101 03	ST, carbon, 1/15W, 10kΩ, 5%
R567, 667	8230 5101 03	ST, carbon, 1/15W, 10kΩ, 5%
R606	8230 5101 34	ST, carbon, 1/15W, 130kΩ, 5%
R616	8230 5101 34	ST, carbon, 1/15W, 130kΩ, 5%
R626	8230 5101 34	ST, carbon, 1/15W, 130kΩ, 5%
R636	8230 5101 34	ST, carbon, 1/15W, 130kΩ, 5%
R701	8230 5101 04	ST, carbon, 1/15W, 100kΩ, 5%
R702	8240 2940 03	Pot, PI, RT12, 20kΩAA, EVJY95
R704	8230 5102 73	ST, carbon, 1/15W, 27kΩ, 5%
R705~708	8230 5105 63	ST, carbon, 1/15W, 56kΩ, 5%
R710~712	8230 5101 04	ST, carbon, 1/15W, 100kΩ, 5%
R715	8240 2940 03	Pot, PI, RT12, 20kΩAA, EVJY95
R720, 721	8230 5102 73	ST, carbon, 1/15W, 27kΩ, 5%
R722	8230 5105 63	ST, carbon, 1/15W, 56kΩ, 5%
R723	8230 5101 02	ST, carbon, 1/15W, 1kΩ, 5%
R731	8230 5101 04	ST, carbon, 1/15W, 100kΩ, 5%
R734	8230 5102 73	ST, carbon, 1/15W, 27kΩ, 5%
R735~738	8230 5105 63	ST, carbon, 1/15W, 56kΩ, 5%
R740	8230 5101 04	ST, carbon, 1/15W, 100kΩ, 5%
R750	8230 5102 73	ST, carbon, 1/15W, 27kΩ, 5%
R752	8230 5105 63	ST, carbon, 1/15W, 56kΩ, 5%
R753	8230 5101 02	ST, carbon, 1/15W, 1kΩ, 5%
R763	8240 2940 03	Pot, PI, RT12, 20kΩAA, EVJY95
R764	8230 5101 03	ST, carbon, 1/15W, 10kΩ, 5%
R765	8230 5101 24	ST, carbon, 1/15W, 120kΩ, 5%
R767	8230 5022 20	ST, carbon, 1/4W, 22Ω, 5%
R774	8230 5101 03	ST, carbon, 1/15W, 10kΩ, 5%
R775	8230 5101 24	ST, carbon, 1/15W, 120kΩ, 5%
R777	8230 5022 20	ST, carbon, 1/4W, 22Ω, 5%
R778, 779	8230 5101 02	ST, carbon, 1/15W, 1kΩ, 5%

Ref. No.	Part No.	Description
R781~784	8230 5101 03	ST, carbon, 1/15W, 10kΩ, 5%
R800~807	8230 5101 53	ST, carbon, 1/15W, 5kΩ, 5%
R810, 811	8230 5100 00	ST, carbon, 1/15W, 0Ω, 5%
R812	8230 5101 03	ST, carbon, 1/15W, 10kΩ, 5%
R813, 814	8230 5100 00	ST, carbon, 1/15W, 0Ω, 5%
R815~817	8230 5101 03	ST, carbon, 1/15W, 10kΩ, 5%
R818, 819	8230 5101 02	ST, carbon, 1/15W, 1kΩ, 5%
R820~823	8230 5101 53	ST, carbon, 1/15W, 15kΩ, 5%
R824~827	8230 5101 03	ST, carbon, 1/15W, 15kΩ, 5%
R828~831	8230 5101 04	ST, carbon, 1/15W, 100kΩ, 5%
R841, 842	8230 5101 03	ST, carbon, 1/15W, 10kΩ, 5%
R843, 843	8230 5102 03	ST, carbon, 1/15W, 20kΩ, 5%
R845	8230 5101 04	ST, carbon, 1/15W, 100kΩ, 5%
R846~848	8230 5101 02	ST, carbon, 1/15W, 1kΩ, 5%
R849~852	8230 5101 03	ST, carbon, 1/15W, 10kΩ, 5%
R853, 854	8230 5102 03	ST, carbon, 1/15W, 20kΩ, 5%
R855	8230 5101 04	ST, carbon, 1/15W, 100kΩ, 5%
R856, 857	8230 5101 02	ST, carbon, 1/15W, 1kΩ, 5%
R858, 859	8230 5101 03	ST, carbon, 1/15W, 10kΩ, 5%
R860	8230 5101 02	ST, carbon, 1/15W, 1kΩ, 5%
R861, 862	8230 5101 04	ST, carbon, 1/15W, 100kΩ, 5%
R878, 879	8230 5101 03	ST, carbon, 1/15W, 10kΩ, 5%
R880, 881	8230 5101 04	ST, carbon, 1/15W, 100kΩ, 5%
R890~893	8230 5100 00	ST, carbon, 1/15W, 0Ω, 5%
R896~899	8230 5101 03	ST, carbon, 1/15W, 10kΩ, 5%
R901	8230 5101 01	ST, carbon, 1/15W, 100Ω, 5%
R903	8230 5101 01	ST, carbon, 1/15W, 100Ω, 5%
R904	8230 5101 02	ST, carbon, 1/15W, 1kΩ, 5%
R905	8230 5101 03	ST, carbon, 1/15W, 10kΩ, 5%
R906	8230 5101 01	ST, carbon, 1/15W, 100Ω, 5%
R907	8230 5103 32	ST, carbon, 1/15W, 3.3kΩ, 5%
R908~915	8230 5107 50	ST, carbon, 1/15W, 75Ω, 5%
R916	8230 5101 03	ST, carbon, 1/15W, 10kΩ, 5%
R917, 918	8230 5101 01	ST, carbon, 1/15W, 100Ω, 5%
R919~923	8230 5101 03	ST, carbon, 1/15W, 10kΩ, 5%
R924	8230 5101 01	ST, carbon, 1/15W, 100Ω, 5%
R925, 926	8230 5104 73	ST, carbon, 1/15W, 47kΩ, 5%
R927	8230 5101 04	ST, carbon, 1/15W, 100kΩ, 5%
R928~930	8230 5101 03	ST, carbon, 1/15W, 10kΩ, 5%
R932	8230 5101 03	ST, carbon, 1/15W, 10kΩ, 5%
R934	8230 5101 01	ST, carbon, 1/15W, 100Ω, 5%
R935~942	8230 5103 31	ST, carbon, 1/15W, 330Ω, 5%
R943	8230 5101 01	ST, carbon, 1/15W, 100Ω, 5%
R944	8230 5081 01	ST, array, 100ΩX4, 5%, CN1J4
R945~947	8230 5101 01	ST, carbon, 1/15W, 100Ω, 5%
R950	8230 5081 01	ST, array, 100ΩX4, 5%, CN1J4
R951, 952	8230 5101 00	ST, carbon, 1/15W, 10Ω, 5%
R953~956	8230 5103 31	ST, carbon, 1/15W, 330Ω, 5%
R957, 958	8230 5101 01	ST, carbon, 1/15W, 100Ω, 5%
R959	8230 5101 00	ST, carbon, 1/15W, 10Ω, 5%
R960~966	8230 5101 01	ST, carbon, 1/15W, 100Ω, 5%
R967	8230 5081 01	ST, array, 100ΩX4, 5%, CN1J4
R968	8230 5102 23	ST, carbon, 1/15W, 22kΩ, 5%
R970, 971	8230 5101 02	ST, carbon, 1/15W, 1kΩ, 5%
R972, 973	8230 5101 01	ST, carbon, 1/15W, 100Ω, 5%

● ANALOG IN 1, ANALOG, MAIN





Ref. No.	Part No.	Description	Ref. No.	Part No.	Description
R974	8230 5103 31	ST, carbon, 1/15W, 330Ω, 5%	C122~422	8233 0491 06	ST, ALU, 16V, 10μF, 20%, MV
R975	8230 5107 51	ST, carbon, 1/15W, 750Ω, 5%	C123~423		N/A
R976	8230 5105 62	ST, carbon, 1/15W, 5.6kΩ, 5%	C124~424	8233 0491 06	ST, ALU, 16V, 10μF, 20%, MV
R978~980	8230 5101 01	ST, carbon, 1/15W, 100Ω, 5%	C125~425		N/A
R981	8230 5102 22	ST, carbon, 1/15W, 2.2kΩ, 5%	C126~426		N/A
R982	8230 5101 01	ST, carbon, 1/15W, 100Ω, 5%	C127~427		N/A
R983~985	8230 5101 03	ST, carbon, 1/15W, 10kΩ, 5%	C128~428		N/A
R986	8230 5101 05	ST, carbon, 1/15W, 1MΩ, 5%	C141, 341	8233 5131 03	ST, CER, 50V, 0.01μF, 15%, CC11R
R987	8230 5102 22	ST, carbon, 1/15W, 2.2kΩ, 5%	C142, 342	8233 5131 03	ST, CER, 50V, 0.01μF, 15%, CC11R
R990~993	8230 5103 31	ST, carbon, 1/15W, 330Ω, 5%	C146~446	8232 1424 77	VT, ALU, 10V, 470μF, 20%, SME-VB
R994	8230 5103 03	ST, carbon, 1/15W, 30kΩ, 5%	C171~471	8233 0491 06	ALU, ST, 16V, 10μF, 20%, MV
R995	8230 5101 03	ST, carbon, 1/15W, 10kΩ, 5%	C181~481	8233 0491 06	ALU, ST, 16V, 10μF, 20%, MV
R996	8230 5101 04	ST, carbon, 1/15W, 100kΩ, 5%	C501, 601	8233 0491 06	ALU, ST, 16V, 10μF, 20%, MV

**CAPACITORS**

ALU = Electrolytic type  
CER = Ceramic type

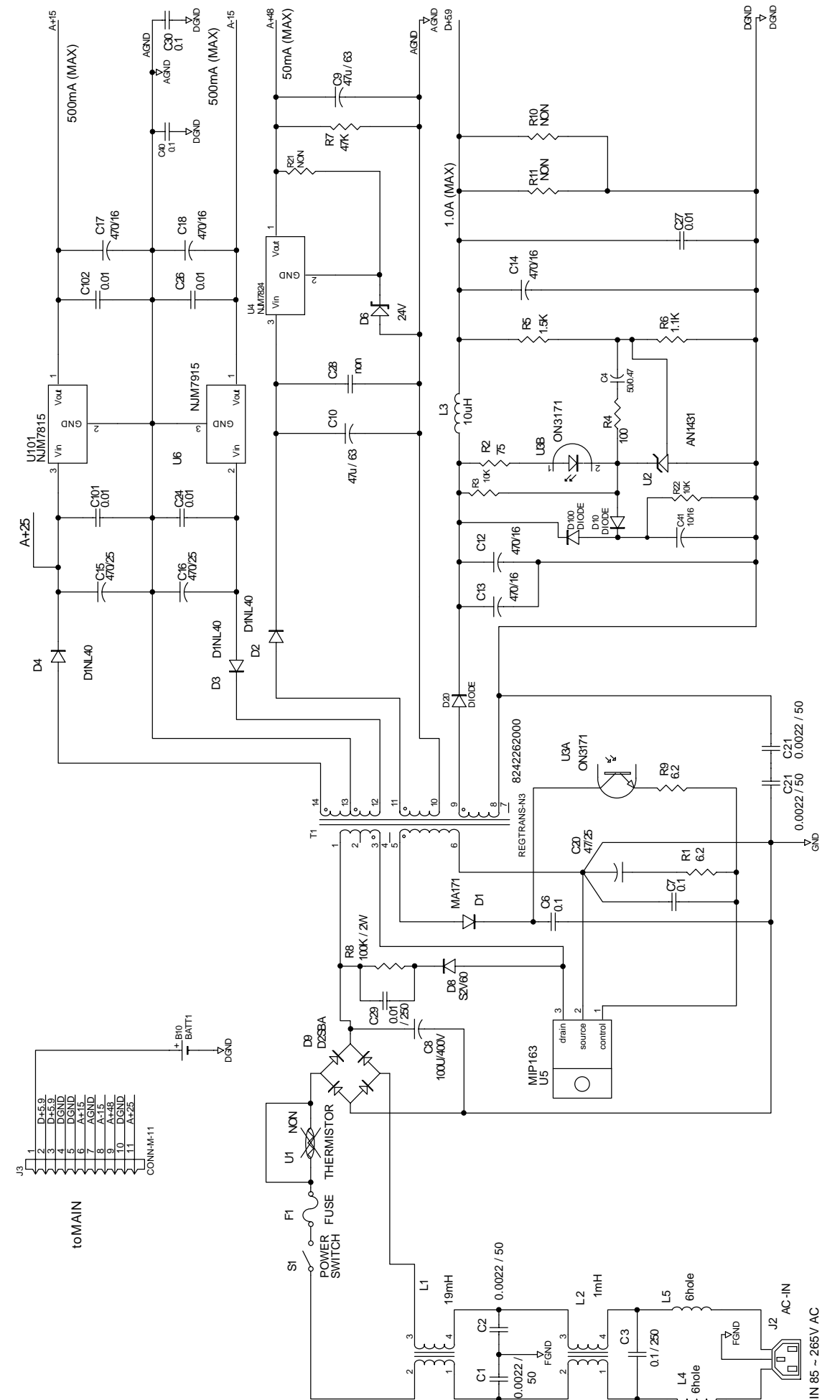
Ref. No.	Part No.	Description	Ref. No.	Part No.	Description
C001~025	8233 5131 03	ST, CER, 50V, 0.01μF, 15%, CC11R	C502, 602		N/A
C026	8233 0491 06	ST, ALU, 16V, 10μF, 20%, MV	C503, 603		N/A
C027	8232 1562 27	VT, ALU, 10V, 220μF, 20%, SRA	C504, 604	8233 5131 01	ST, CER, 50V, 100pF, 15%, CC11R
C028, 029	8233 5122 20	ST, CER, 50V, 22pF, 5%, CC11SL	C505, 605	8233 5131 01	ST, CER, 50V, 100pF, 15%, CC11R
C030~33	8233 5131 01	ST, CER, 50V, 100pF, 15%, CC11R	C511, 611	8233 0491 06	ALU, ST, 16V, 10μF, 20%, MV
C034	8233 5164 74	ST, CER, 16V, 0.47μF, 20%, KC20E	C512, 612		N/A
C035	8233 5121 50	ST, CER, 50V, 15pF, 5%, CC11SL	C513, 613		N/A
C036	8233 5151 04	ST, CER, 25V, 0.1μF, +80, CC11F	C514, 614	8233 5131 01	ST, CER, 50V, 100pF, 15%, CC11R
C040	8233 0491 06	ST, ALU, 16V, 10μF, 20%, MV	C515, 615	8233 5131 01	ST, CER, 50V, 100pF, 15%, CC11R
C041	8232 1562 27	VT, ALU, 10V, 220μF, 20%, SRA	C521, 621	8233 0491 06	ALU, ST, 16V, 10μF, 20%, MV
C042	8233 5151 04	ST, CER, 25V, 0.1μF, +80, CC11F	C522, 622		N/A
C044	8233 5131 01	ST, CER, 50V, 100pF, 15%, CC11R	C523, 623		N/A
C052, 053	8233 5131 03	ST, CER, 50V, 0.01μF, 15%, CC11R	C524, 624	8233 5131 01	ST, CER, 50V, 100pF, 15%, CC11R
C060, 061	8233 5131 52	ST, CER, 50V, 0.0015μF, 15%, CC11R	C525, 625	8233 5131 01	ST, CER, 50V, 100pF, 15%, CC11R
C091, 092	8233 0491 06	ST, ALU, 16V, 10μF, 20%, MV	C531, 631	8233 0491 06	ALU, ST, 16V, 10μF, 20%, MV
C093	8232 1562 27	VT, ALU, 10V, 220μF, 20%, SRA	C532, 632		N/A
C094	8233 5131 03	ST, CER, 50V, 0.01μF, 15%, CC11R	C533, 633		N/A
C095	8232 1413 37	VT, ALU, 6.3V, 330μF, 20%, SME-VB	C534, 634	8233 5131 01	ST, CER, 50V, 100pF, 15%, CC11R
C097	8232 1562 27	VT, ALU, 10V, 220μF, 20%, SRA	C535, 635	8233 5131 01	ST, CER, 50V, 100pF, 15%, CC11R
C098	8232 2392 27	VT, ALU, 50V, 220μF, 20%, SMG-VB	C541, 641	8232 1562 27	VT, ALU, 10V, 220μF, 20%, SRA
C099	8232 1562 27	VT, ALU, 10V, 220μF, 20%, SRA	C542, 642	8233 5131 03	ST, CER, 50V, 0.01μF, 15%, CC11R
C100	8233 0491 06	VT, ALU, ST, 16V, 10μF, 20%, MV	C543, 643	8233 5131 03	ST, CER, 50V, 0.01μF, 15%, CC11R
C101~401	8232 2961 06	VT, ALU, 50V, 10μF, 20%, LLA	C544, 644		N/A
C102~402	8232 1501 06	VT, ALU, 16V, 10μF, 20%, SME-VB-BP	C547, 647	8233 0491 06	ST, ALU, 16V, 10μF, 20%, MV
C104~404	8233 5132 21	ST, CER, 50V, 220pF, 15%, CC11R	C548, 648		N/A
C105~405		N/A	C549, 649		N/A
C106~406	8233 5131 01	ST, CER, 50V, 100pF, 15%, CC11R	C551, 651		N/A
C107~407	8233 5131 01	ST, CER, 50V, 100pF, 15%, CC11R	C552, 652		N/A
C108~408		N/A	C561, 661	8232 1562 27	VT, ALU, 10V, 220μF, 20%, SRA
C111~411	8232 2961 06	VT, ALU, 50V, 10μF, 20%, LLA	C564, 664		N/A
C112~412	8232 1501 06	VT, ALU, 16V, 10μF, 20%, SME-VB-BP	C567, 667	8233 0491 06	ST, ALU, 16V, 10μF, 20%, MV
C114~414	8233 5132 21	ST, CER, 50V, 220pF, 15%, CC11R	C568, 668		N/A
C116~416	8233 5131 01	ST, CER, 50V, 100pF, 15%, CC11R	C569, 669		N/A
C117~417	8233 5131 01	ST, CER, 50V, 100pF, 15%, CC11R	C571, 671		N/A
C121~421	8233 0491 06	ST, ALU, 16V, 10μF, 20%, MV	C572, 672		N/A
			C701	8233 0491 06	ST, ALU, 16V, 10μF, 20%, MV
			C703	8233 0491 06	ST, ALU, 16V, 10μF, 20%, MV
			C704	8233 5122 20	ST, CER, 50V, 22pF, 5%, CC11SL
			C705~708	8233 0491 06	ST, ALU, 16V, 10μF, 20%, MV
			C710, 711	8233 0491 06	ST, ALU, 16V, 10μF, 20%, MV
			C720, 721	8233 0491 06	ST, ALU, 16V, 10μF, 20%, MV
			C731	8233 0491 06	ST, ALU, 16V, 10μF, 20%, MV

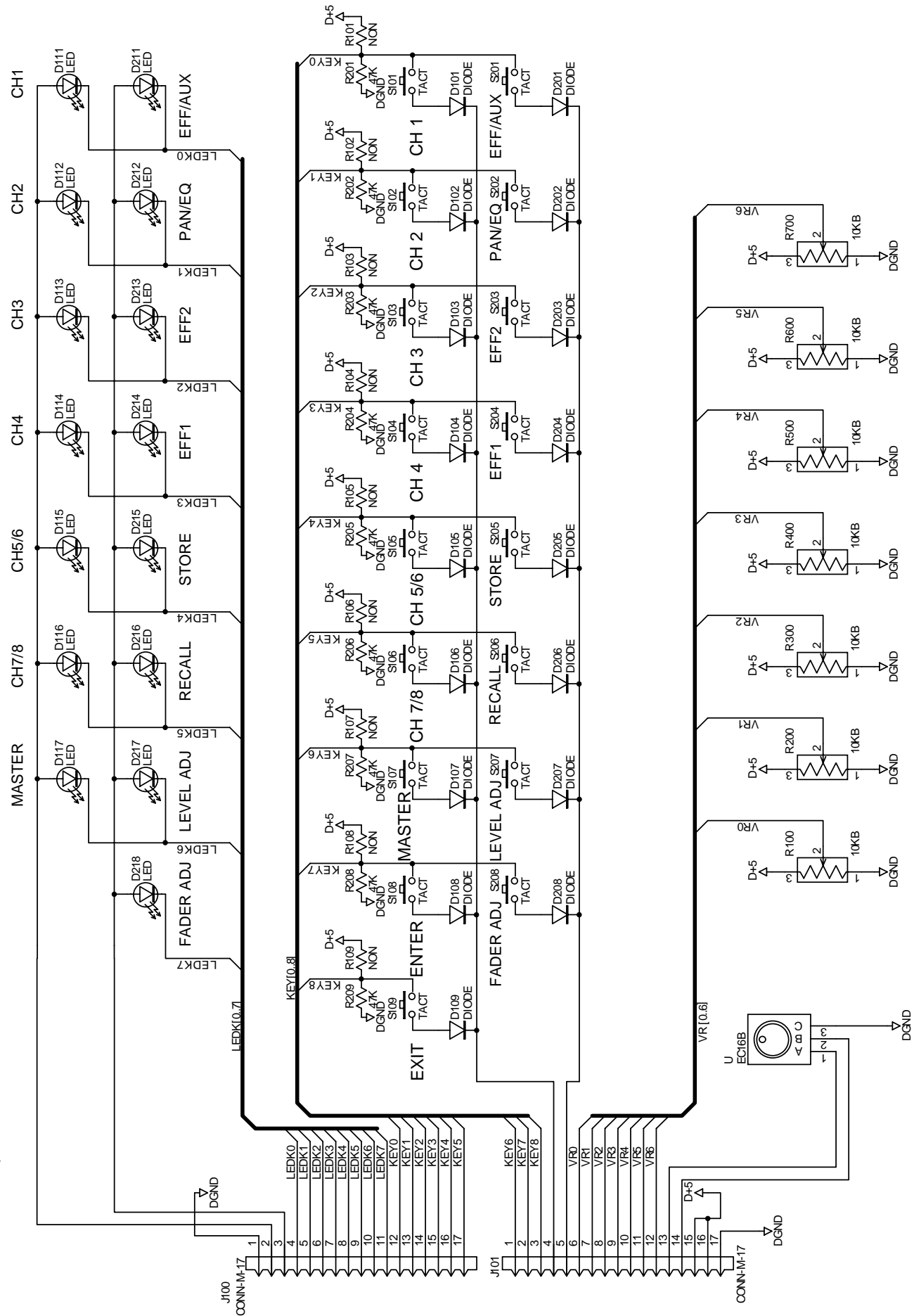
Ref. No.	Part No.	Description
C733	8233 0491 06	ST, ALU, 16V, 10µF, 20%, MV
C734	8233 5122 20	ST, CER, 50V, 22pF, 5%, CC11SL
C735	8233 0491 06	ST, ALU, 16V, 10µF, 20%, MV
C738	8233 0491 06	ST, ALU, 16V, 10µF, 20%, MV
C740, 741	8233 0491 06	ST, ALU, 16V, 10µF, 20%, MV
C750~753	8233 5131 03	ST, CER, 50V, 0.01µF, 15%, CC11R
C754, 755	8233 5122 20	ST, CER, 50V, 22pF, 5%, CC11SL
C756, 757	8233 5131 03	ST, CER, 50V, 0.01µF, 15%, CC11R
C763	8233 0491 06	ST, ALU, 16V, 10µF, 20%, MV
C764	8233 5121 00	ST, CER, 50V, 10pF, 5%, CC11SL
C765	8232 1434 77	VT, ALU, 16V, 470µF, 20%, SME-VB
C773	8233 0491 06	ST, ALU, 16V, 10µF, 20%, MV
C774	8233 5121 00	ST, CER, 50V, 10pF, 5%, CC11SL
C775	8232 1434 77	VT, ALU, 16V, 470µF, 20%, SME-VB
C782	N/A	
C784	N/A	
C786	N/A	
C788~792	N/A	
C799	8233 0491 06	ST, ALU, 16V, 10µF, 20%, MV
C800~815	8233 0491 06	ST, ALU, 16V, 10µF, 20%, MV
C820, 821	N/A	
C822, 823	8233 5131 01	ST, CER, 50V, 100pF, 15%, CC11R
C824, 825	N/A	
C826, 827	8233 5131 01	ST, CER, 50V, 100pF, 15%, CC11R
C830, 831	N/A	
C832, 833	8233 5131 01	ST, CER, 50V, 100pF, 15%, CC11R
C834, 835	N/A	
C836, 837	8233 5131 01	ST, CER, 50V, 100pF, 15%, CC11R
C840, 850	8233 5124 70	ST, CER, 50V, 47pF, 5%, CC11SL
C852, 853	8233 0491 06	ST, ALU, 16V, 10µF, 20%, MV
C875	8233 0491 06	ST, ALU, 16V, 10µF, 20%, MV
C876	N/A	
C877	8233 0491 06	ST, ALU, 16V, 10µF, 20%, MV
C880, 881	8233 5131 03	ST, CER, 50V, 0.01µF, 15%, CC11R
C884, 885	8233 5131 03	ST, CER, 50V, 0.01µF, 15%, CC11R
C898, 899	8233 5124 70	ST, CER, 50V, 47pF, 5%, CC11SL
C890~895	N/A	
C897	N/A	
C901	8233 5131 03	ST, CER, 50V, 0.01µF, 15%, CC11R
C902	8233 0491 06	ST, ALU, 16V, 10µF, 20%, MV
C903	8233 5131 03	ST, CER, 50V, 0.01µF, 15%, CC11R
C904	8232 1413 37	VT, ALU, 6.3V, 330µF, 20%, SME-VB
C905, 906	8233 5151 04	ST, CER, 25V, 0.1µF, +80, CC11F
C907, 908	8233 5122 20	ST, CER, 50V, 22pF, 5%, CC11SL
C909~915	8233 5131 03	ST, CER, 50V, 0.01µF, 15%, CC11R
C916, 917	8233 5151 04	ST, CER, 25V, 0.1µF, +80, CC11F
C918	8233 0491 06	ST, ALU, 16V, 10µF, 20%, MV
C919	8233 5131 03	ST, CER, 50V, 0.01µF, 15%, CC11R
C920	8233 0491 06	ST, ALU, 16V, 10µF, 20%, MV
C921	8233 5131 01	ST, CER, 50V, 100pF, 15%, CC11R
C922	8232 1441 07	VT, ALU, 25V, 100µF, 20%, SME-VB
C923	8233 0491 06	ST, ALU, 16V, 10µF, 20%, MV
C924	8233 5151 04	ST, CER, 25V, 0.1µF, +80, CC11F
C925	8233 0491 06	ST, ALU, 16V, 10µF, 20%, MV
C926	8233 5151 04	ST, CER, 25V, 0.1µF, +80, CC11F

Ref. No.	Part No.	Description
C927	8233 0491 06	ST, ALU, 16V, 10µF, 20%, MV
C928, 929	8233 5151 04	ST, CER, 25V, 0.1µF, +80, CC11F
C930	8233 0491 06	ST, ALU, 16V, 10µF, 20%, MV
C931	8233 5151 04	ST, CER, 25V, 0.1µF, +80, CC11F
C932~935	8233 5131 03	ST, CER, 50V, 0.01µF, 15%, CC11R
C936	8233 0491 06	ST, ALU, 16V, 10µF, 20%, MV
C937	8233 5131 03	ST, CER, 50V, 0.01µF, 15%, CC11R
C938	8233 5151 04	ST, CER, 25V, 0.1µF, +80, CC11F
C942	8233 0491 06	ST, ALU, 16V, 10µF, 20%, MV
C943	8233 5151 04	ST, CER, 25V, 0.1µF, +80, CC11F
C944	8233 0491 06	ST, ALU, 16V, 10µF, 20%, MV
C945	8233 5151 04	ST, CER, 25V, 0.1µF, +80, CC11F
C946	8233 0491 06	ST, ALU, 16V, 10µF, 20%, MV
C947	8233 5151 04	ST, CER, 25V, 0.1µF, +80, CC11F
C948, 949	8233 5131 52	ST, CER, 50V, 0.0015µF, 15%, CC11R
C950	8233 5151 04	ST, CER, 25V, 0.1µF, +80, CC11F
C951~954	8233 5131 03	ST, CER, 50V, 0.01µF, 15%, CC11R
C955	8233 0491 06	ST, ALU, 16V, 10µF, 20%, MV
C956	8233 5131 03	ST, CER, 50V, 0.01µF, 15%, CC11R
C957	8233 5151 04	ST, CER, 25V, 0.1µF, +80, CC11F
C958	N/A	
C961	8233 0491 06	ST, ALU, 16V, 10µF, 20%, MV
C962	8233 5151 04	ST, CER, 25V, 0.1µF, +80, CC11F
C963	8233 0491 06	ST, ALU, 16V, 10µF, 20%, MV
C964	8233 5151 04	ST, CER, 25V, 0.1µF, +80, CC11F
C965	8233 0491 06	ST, ALU, 16V, 10µF, 20%, MV
C966	8233 5151 04	ST, CER, 25V, 0.1µF, +80, CC11F
C967, 968	8233 5131 52	ST, CER, 50V, 0.0015µF, 15%, CC11R
C969, 970	8233 5124 70	ST, CER, 50V, 47pF, 5%, CC11SL
C971	N/A	
C972, 973	8233 5124 70	ST, CER, 50V, 47pF, 5%, CC11SL
C974	N/A	
C975	8233 5151 04	ST, CER, 25V, 0.1µF, +80, CC11F
C976	8233 5131 03	ST, CER, 50V, 0.01µF, 15%, CC11R
C978~980	8233 5131 03	ST, CER, 50V, 0.01µF, 15%, CC11R
C981	8233 0491 06	ST, ALU, 16V, 10µF, 20%, MV
C982	8233 5131 03	ST, CER, 50V, 0.01µF, 15%, CC11R
C983	8233 5151 04	ST, CER, 25V, 0.1µF, +80, CC11F
C987	8233 0491 06	ST, ALU, 16V, 10µF, 20%, MV
C988	8233 5151 04	ST, CER, 25V, 0.1µF, +80, CC11F
C989	8233 0491 06	ST, ALU, 16V, 10µF, 20%, MV
C990	8233 5151 04	ST, CER, 25V, 0.1µF, +80, CC11F
C991	8233 0491 06	ST, ALU, 16V, 10µF, 20%, MV
C992	8233 5151 04	ST, CER, 25V, 0.1µF, +80, CC11F
C993, 994	8233 5131 52	ST, CER, 50V, 0.0015µF, 15%, CC11R
C995	8233 5131 03	ST, CER, 50V, 0.01µF, 15%, CC11R
C996, 997	8233 5124 70	ST, CER, 50V, 47pF, 5%, CC11SL
C998	N/A	
C999	8233 0491 06	ST, ALU, 16V, 10µF, 20%, MV

**MISCELLANEOUS**

Ref. No.	Part No.	Description
J001	8245 2721 30	Connector, PL, jack, FPC, 30P
J004	8245 2721 17	Connector, PL, jack, FPC, 17P
J006	8245 2721 17	Connector, PL, jack, FPC, 17P





Ref. No.	Part No.	Description
J101~401	8245 2680 00	Connector, PI, jack, XLR31, 3P, NC3FAV1-0
J102~402	8245 3570 00	Connector, PI, jack, phone, NY234
J103~403	8245 3570 00	Connector, PI, jack, phone, NY234
J501~801	8245 3570 00	Connector, PI, jack, phone, NY234
J502~802	8245 3570 00	Connector, PI, jack, phone, NY234
J731, 732	8245 3570 00	Connector, PI, jack, phone, NY234
J771	8245 3570 00	Connector, PI, jack, phone, NY234
J800	8245 3570 00	Connector, PI, jack, phone, NY234
J803	8245 3570 00	Connector, PI, jack, phone, NY234
J810, 811	8245 2670 01	Connector, PI, jack, XLR32, 3P, NC3MAV
J901	8245 3570 00	Connector, PI, jack, phone, NY234
J902	8245 5520 10	Connector, opt, GPIF38T2
J903	8245 5530 10	Connector, opt, GPIF37R1
L001~006	8242 5041 21	Filter, ST, EMI, EXC3BP, 121
L007	8242 1962 23	Coil, PVT, 22μH, 5%, LF5.0S
L010~019		N/A
L030		N/A
L077	8242 5025 60	Core, ST, CDRH104, 56μH
L098	8242 2738 21	Coil, PVT, 820μH, 10%, ELEL
L099	8242 1962 23	Coil, PVT, 22μH, 5%, LF5.0S
L101~801	8242 5041 21	Filter, ST, EMI, EXC3BP, 121
L105~405	8242 5041 21	Filter, ST, EMI, EXC3BP, 121
L106~406	8242 5041 21	Filter, ST, EMI, EXC3BP, 121
L111~611	8242 5041 21	Filter, ST, EMI, EXC3BP, 121
L121~621	8242 5041 21	Filter, ST, EMI, EXC3BP, 121
L131~631	8242 5041 21	Filter, ST, EMI, EXC3BP, 121
L702, 802	8242 5041 21	Filter, ST, EMI, EXC3BP, 121
L731, 732	8242 5041 21	Filter, ST, EMI, EXC3BP, 121
L761, 771	8242 5041 21	Filter, ST, EMI, EXC3BP, 121
L799	8242 5041 21	Filter, ST, EMI, EXC3BP, 121
L800	8242 5041 21	Filter, ST, EMI, EXC3BP, 121
L810, 811	8242 5041 21	Filter, ST, EMI, EXC3BP, 121
L815~817	8242 5041 21	Filter, ST, EMI, EXC3BP, 121
S001	8253 4690 00	SW, PLT, tact, SKHVLH
S701~703	8253 4700 01	SW, push, SPEC12-2N-*W2
S800	8253 4700 02	SW, push, SPEC12-4N-*W2
W101	8277 0590 20	Cable assy, 11P, WHT, 8283-9073, L200
X901	8256 1710 01	Resonator, PT, CER, 20.00MHz, KBR
X902	8256 1700 01	Resonator, ST, XTL, 22.579MHz, FUP-FBB3A

Ref. No.	Part No.	Description
8274	2730 00	PCB Assy, Display, VM88
8251	9941 02	Plain PCB, Display, VM88

Ref. No.	Part No.	Description
U301	8236 0836 00	IC, QFP, DG, LCD driver, HD44780U
U302	8256 1760 00	Module, display, LCD, FD-4/VM88

DIODES		
Ref. No.	Part No.	Description
D200, 300	8234 5040 01	Opt, VT, LED, red, LT3D31W
D201, 301	8234 5040 03	Opt, VT, LED, ylw, LT3H31W
D202, 302	8234 5040 03	Opt, VT, LED, ylw, LT3H31W
D203, 303	8234 5040 03	Opt, VT, LED, ylw, LT3H31W
D204, 304	8234 5040 03	Opt, VT, LED, ylw, LT3H31W
D205, 305	8234 5040 04	Opt, VT, LED, grn, LT3E31W
D206, 306	8234 5040 04	Opt, VT, LED, grn, LT3E31W
D207, 307	8234 5040 04	Opt, VT, LED, grn, LT3E31W
D400	8234 1053 00	Opt, V, LED, ylw, GL3HY8

RESISTORS		
Ref. No.	Part No.	Description
R301	8230 5102 24	ST, carbon, 1/15W, 220kΩ, 5%
R302~306	8230 5101 02	ST, carbon, 1/15W, 1kΩ, 5%
R307	8230 5103 92	ST, carbon, 1/15W, 3.9kΩ, 5%
R308	8230 5106 22	ST, carbon, 1/15W, 6.2kΩ, 5%
R311	8240 2930 04	Pot, PI, RT, 9.5kΩB, EVUF2A

CAPACITORS		
ALU = Electrolytic type		
CER = Ceramic type		
Ref. No.	Part No.	Description
C301	8233 0491 06	ST, 16V, 10μF, 20%, MV
C302~307	8233 5131 03	CER, 50V, 0.01μF, 15%, CC11R

MISCELLANEOUS		
Ref. No.	Part No.	Description
J101	8245 2721 30	Connector, PL, jack, FPC, 30P
L301, 302	8239 1160 00	Lamp, 5V, 75mA
Y101	8212 6110 00	Plate, reflect, LCD, FD-4/VM88
Y102	8216 7050 00	Sheet, LCD, A, VR800/VM88
Y103	8216 7060 00	Sheet, LCD, B, VR800/VM88
Y201	8207 0100 11	Spacer, LED, 11

• Power PCB assy

Ref. No.	Part No.	Description
8274	2750 00	PCB Assy, Power, VM88
8251	9951 02	Plain PCB, Power, VM88

ICs		
Ref. No.	Part No.	Description
U001		Wire, jumper, F10
U002	8236 5409 00	VT, AN, regulator, AN1431T

Ref. No.	Part No.	Description
U003	8234 1081 00	Opt, H, photo-coupler, ON3171
U004	8236 0321 09	220, AN, regulator, NJM7824FA
U005	8236 5410 03	V, AN, power, MIP163
U006	8236 0348 06	220, AN, regulator, 7915FA
U101	8236 0321 06	220, AN, regulator, 7815FA

DIODEs		
Ref. No.	Part No.	Description
D001	8234 1079 00	HT, 80V, 0.2A, MA171
D002~004	8234 1085 00	HT, fast recovery, D1NL40
D006	8234 5039 76	HT, zener, MTZ J 24
D008	8234 5052 00	V, 600V, 1.7A, S2V60-4002
D009	8234 1077 00	STACK, 600VAC, 1.5A, D2SBA60
D010	8234 5007 00	HT, 1SS136
D020	8234 1085 00	HT, fast recovery, D1NL40
D100	8234 5007 00	HT, 1SS136

RESISTORs		
Ref. No.	Part No.	Description
R001	8230 1386 29	HT, carbon, 1/4W, 6.2Ω, 5%
R002	8230 1387 50	HT, carbon, 1/4W, 75Ω, 5%
R003	8230 1381 03	HT, carbon, 1/4W, 10kΩ, 5%
R004	8230 1381 01	HT, carbon, 1/4W, 100Ω, 5%
R005	8230 1381 52	HT, carbon, 1/4W, 1.5kΩ, 5%
R006	8230 1381 12	HT, carbon, 1/4W, 1.1kΩ, 5%
R007	8230 1384 73	HT, carbon, 1/4W, 47kΩ, 5%
R008	8230 1251 04	H, metal, 2W, 100kΩ, 5%, F20, RSS
R009	8230 1386 29	HT, carbon, 1/4W, 6.2, 5%
R022	8230 1381 03	HT, carbon, 1/4W, 10kΩ, 5%

CAPACITORs		
ALU = Electrolytic type		
CER = Ceramic type		
Ref. No.	Part No.	Description
C001, 002	8232 3542 22	VT, CER, 250V, 0.0022μF, 20%, ECK-ZNS
C003	8232 3521 04	V, PES, 250VAC, 0.1μF, 20%, ECQ-UMV
C004	8232 1464 74	VT, ALU, 50V, 0.47μF, 20%, SME-VB
C006, 007	8232 8181 04	VT, CER, 25V, 0.1μF, +80-20%, YF
C008	8232 3241 07	V, ALU, 400V, 100μF, 20%, SMH-VNSN, D2
C009, 010	8232 3824 76	VT, ALU, 63V, 47μF, 20%, LXV, D8
C012~014	8232 3574 77	VT, ALU, 16V, 470μF, 20%, LXV, D10
C015, 016	8232 3584 77	VT, ALU, 25V, 470μF, 20%, LXV, D10
C017, 018	8232 1434 77	VT, ALU, 16V, 470μF, 20%, SME, D10
C020	8232 0964 76	V, ALU, 25V, 47mF, 20%, SME
C021, 022	8232 3542 22	VT, CER, 250V, 0.0022μF, 20%, ECK-ZNS
C024	8232 8031 03	VT, CER, 50V, 0.01μF, +80-20%, YF
C026, 027	8232 8031 03	VT, CER, 50V, 0.01μF, +80-20%, YF
C028		N/A
C029	8232 3491 03	VT, PES, 630V, 0.01μF, 10%, ECQ-EKF3
C030	8232 8181 04	VT, CER, 25V, 0.1μF, +80-20%, YF
C040		N/A
C041	8232 1431 06	VT, ALU, 16V, 1μF, 20%, SME-VB
C101, 102	8232 8031 03	VT, CER, 50V, 0.01μF, +80-20%, YF

MISCELLANEOUS		
Ref. No.	Part No.	Description
B100	8239 1200 00	Battery, 3V, CR2032
△F001	8239 8010 08	Fuse, VT, semko, TLAG, 0.8A, 250V, TR5-T
J002	8245 3210 00	Connector, PL, jack, AC INLET, 3P, 0714-FR7
J003	8245 1711 11	Connector, PI, jack, 8283, 11P, WHT
L001	8242 2741 83	Filter, line, 18mH, 0.5A, ELF18D210
L002	8242 2491 02	Filter, line, 1mH, 2.2A, ELF15N022A
L003	8242 2501 03	Coil, PV, 10μH, 2A, ELC
L004, 005	8242 1340 01	Filter, EMI, 6 hole
S001	8253 4610 02	SW, P, push, power, SDDL1-B1-F2
△T001	8242 2650 00	Transformer, sw power, ER2810, 5-53-18
W001	8277 1630 15	Cable assy, earth lug, SIN1.8, L150
E101		Wire, jumper, F5
E102		Wire, jumper, F10

• Key PCB assy

Ref. No.	Part No.	Description
	8274 2740 00	PCB Assy, Key, VM88
	8251 9952 01	Plain PCB, Key, VM88

ICs		
Ref. No.	Part No.	Description
U100	8256 1870 00	Module, jog, SRGPWJ

DIODEs		
Ref. No.	Part No.	Description
D101~109	8234 5007 00	HT, 1SS136
D111~117	8234 5040 04	Opt, VT, LED, grn, LT3E31W
D201~208	8234 5007 00	HT, 1SS136
D211~214	8234 5040 03	Opt, VT, LED, ylw, LT3H31W
D215	8234 5040 01	Opt, VT, LED, red, LT3D31W
D216	8234 5040 04	Opt, VT, LED, grn, LT3E31W
D217, 218	8234 5040 01	Opt, VT, LED, red, LT3D31W

RESISTORs		
Ref. No.	Part No.	Description
R100~700	8240 2960 01	VR, slide, EWAQF, X05, 10kΩB
R101~109		N/A
R201~209	8230 1384 73	HT, carbon, 1/4W, 47kΩ, 5%

MISCELLANEOUS		
Ref. No.	Part No.	Description
J104	8245 2721 17	Connector, PL, jack, FPC, 17P, IMSA-9602S-17F
J106	8245 2721 17	Connector, PL, jack, FPC, 17P, IMSA-9602S-17F
S101~109	8253 1350 02	SW, PT, tact, SKQNA B
S201~208	8253 1350 02	SW, PT, tact, SKQNA B
E101		Wire, jumper, F5
E102		Wire, jumper, F10
E103		Wire, jumper, F12.5

4. CIRCUIT AND BLOCK DIAGRAMS

● DISPLAY, LCD, VM88

