
Service Manual

Model
VM04

4ch Digital Mixer with DSP Effects

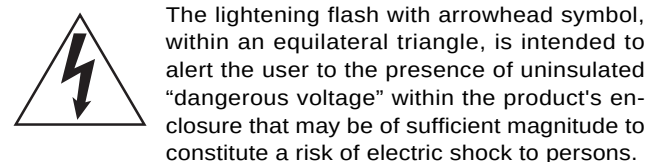
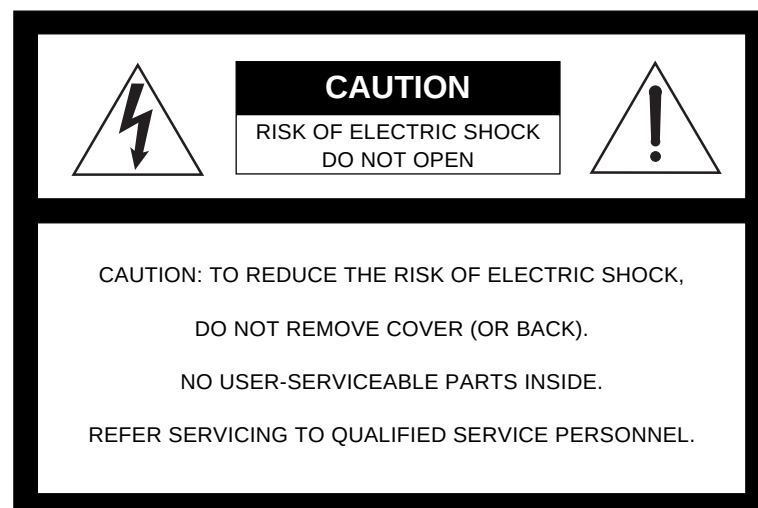
Fostex®

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FOSTEX CORPORATION OF AMERICA 15431 Blackburn Ave., Norwalk, CA 90650, U.S.A.

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Fostex®



“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.

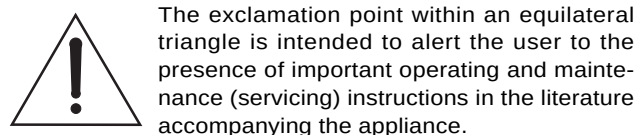
7. Wall or Ceiling Mounting - The appliance should be mounted to a wall or ceiling only as recommended by the manufacturer.
8. Ventilation - The appliance should be situated so that its location or position does not interfere with its proper ventilation. For example, the appliance should not be situated 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.

CAUTION:

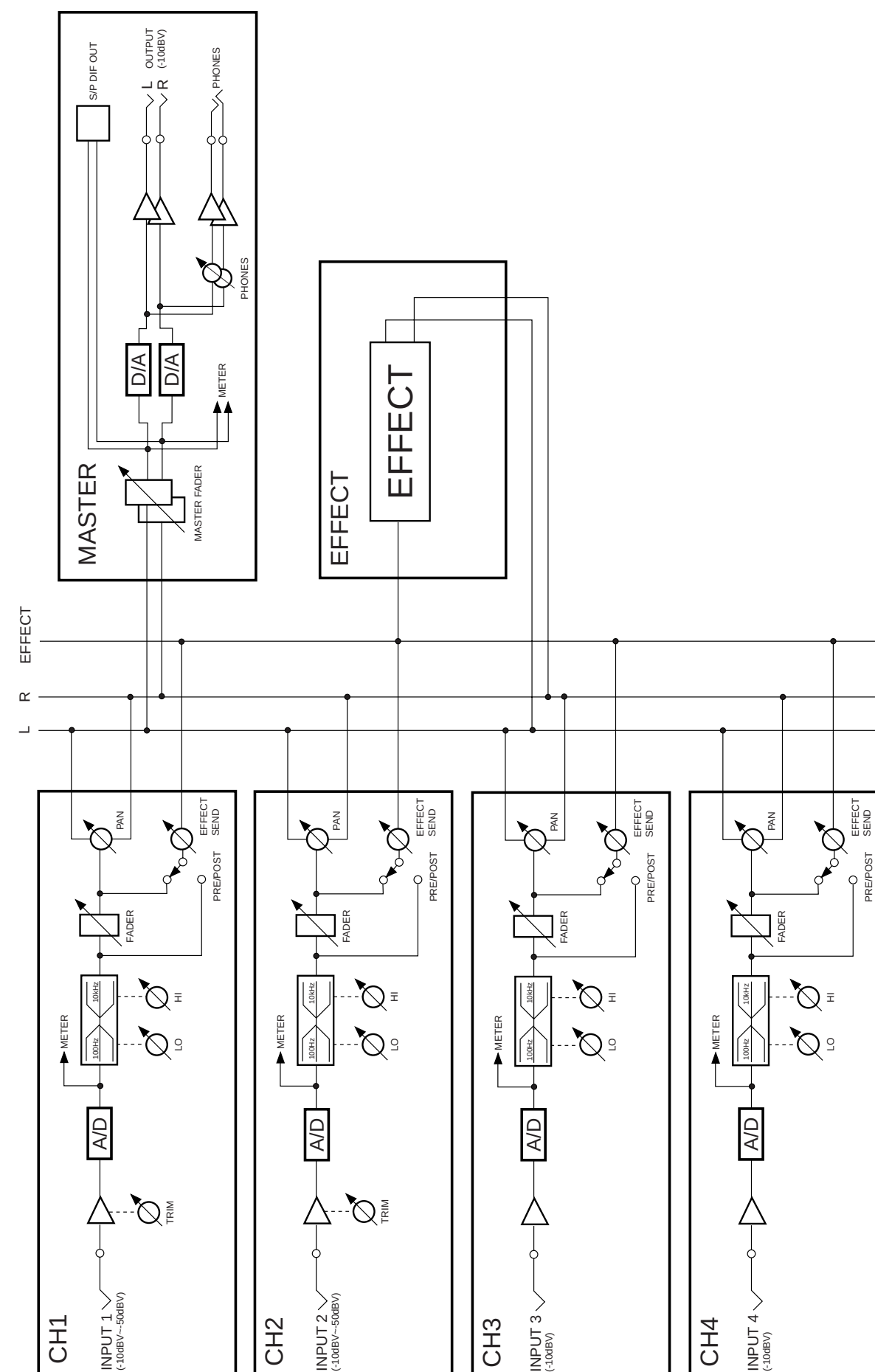
TO PREVENT ELECTRIC SHOCK, MATCH
WIDE BLADE OF PLUG TO WIDE SLOT,
FULLY INSERT.

ATTENTION:

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



8. BLOCK DIAGRAMS



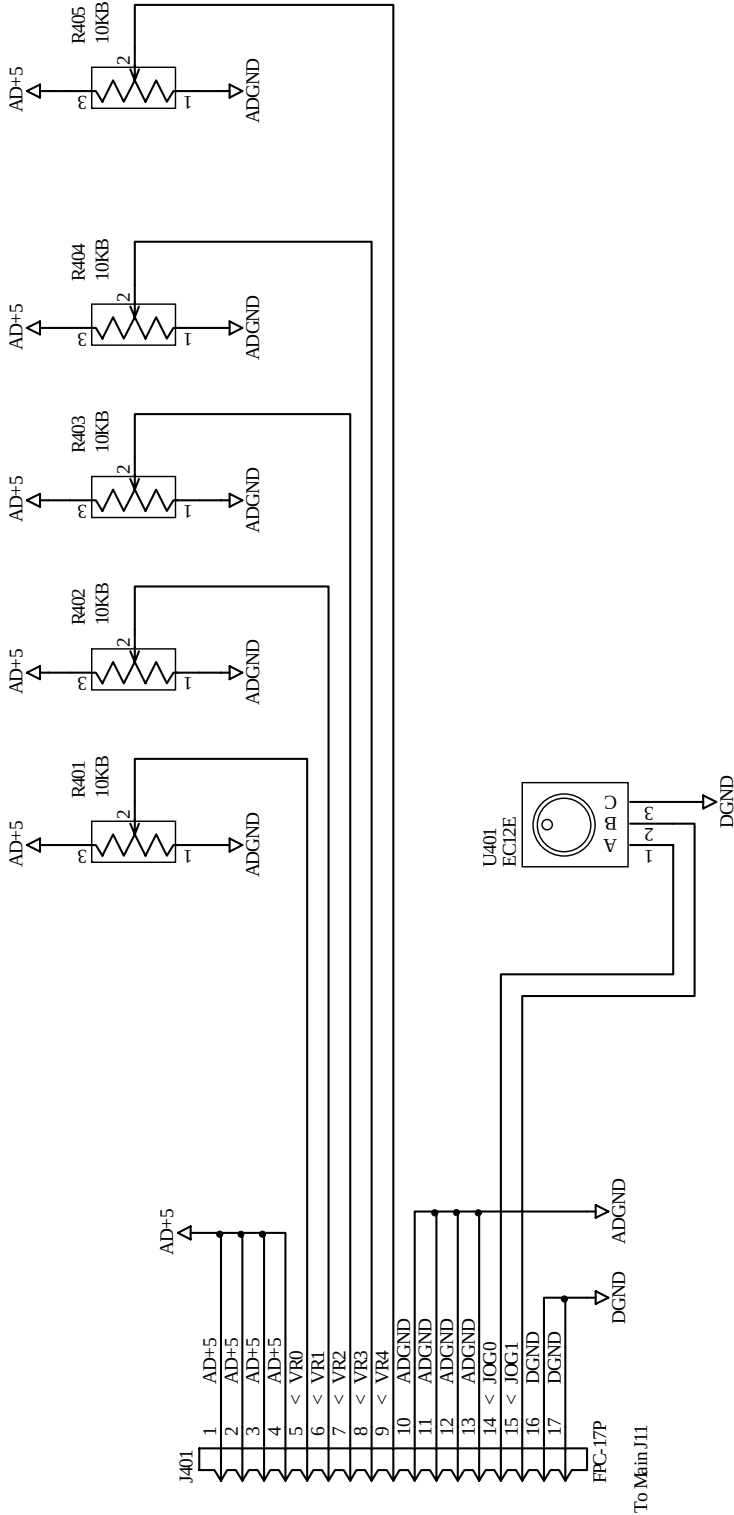


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NOTES

- * Parts List and circuit diagrams are given in this manual to assist the service technician in maintaining the Model VM04
- * The following accessories are supplied with VM04 as the standard accessories.

Owner's manual	: 8288440000
⚠ AC adaptor AD-9B	: 8270818003 (for USA/CND)
	: 8270818006 (for EUR)
	: 8270818007 (for UK)
	: 8270818010 (for JPN)
- * Following is the packing material for the Model VM04.

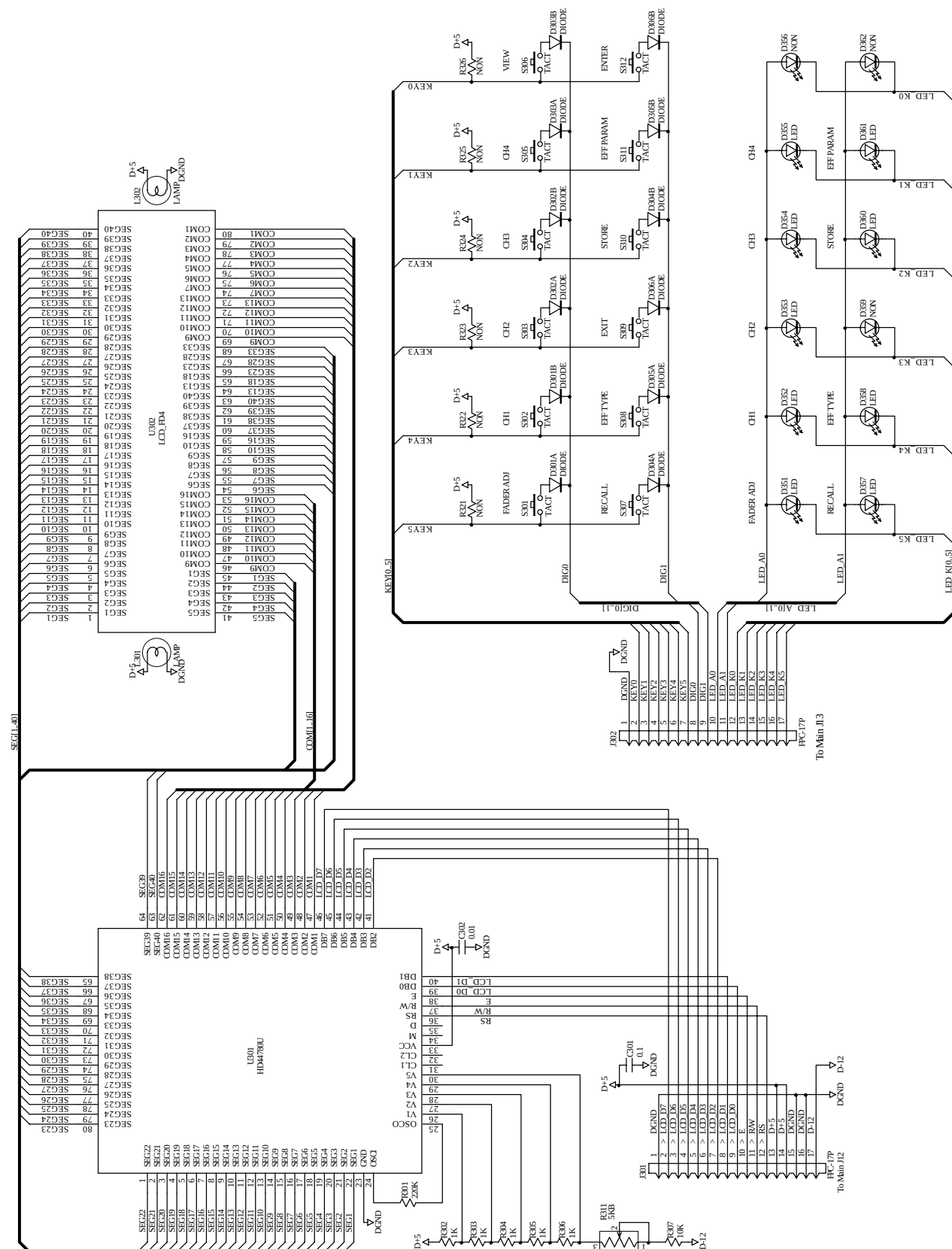
PACK, SIDE, L, VM04	: 8228446000
PACK, SIDE, R, VM04	: 8228447000
CARTON, INNER, VM04	: 8228722000
CARTON, OUTER, VM04	: 8228901000

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.

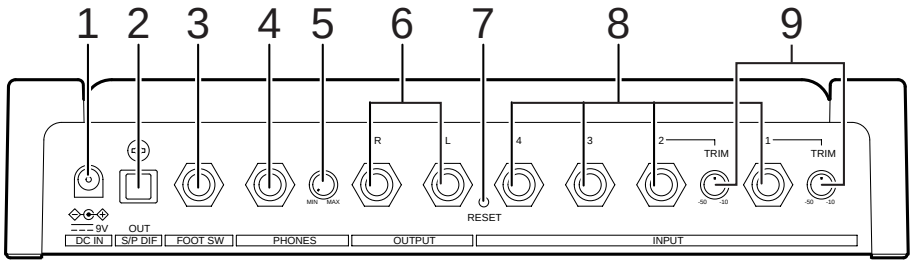
Master fader	80 position (Master Fader display)
Input fader	80 position (Channel Fader display)
Effect Send	00 position

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



2. CONTROLS, INDICATORS AND CONNECTORS

< REAR PANEL >



1. DC INLET connector [the Center Positive]

2. S/P DIF optical output connector [Optical]

3. FOOT SW (unlatched) jack [Ø6 mm Phone]

4. Headphone jack [Ø6 mm Stereo Phone]

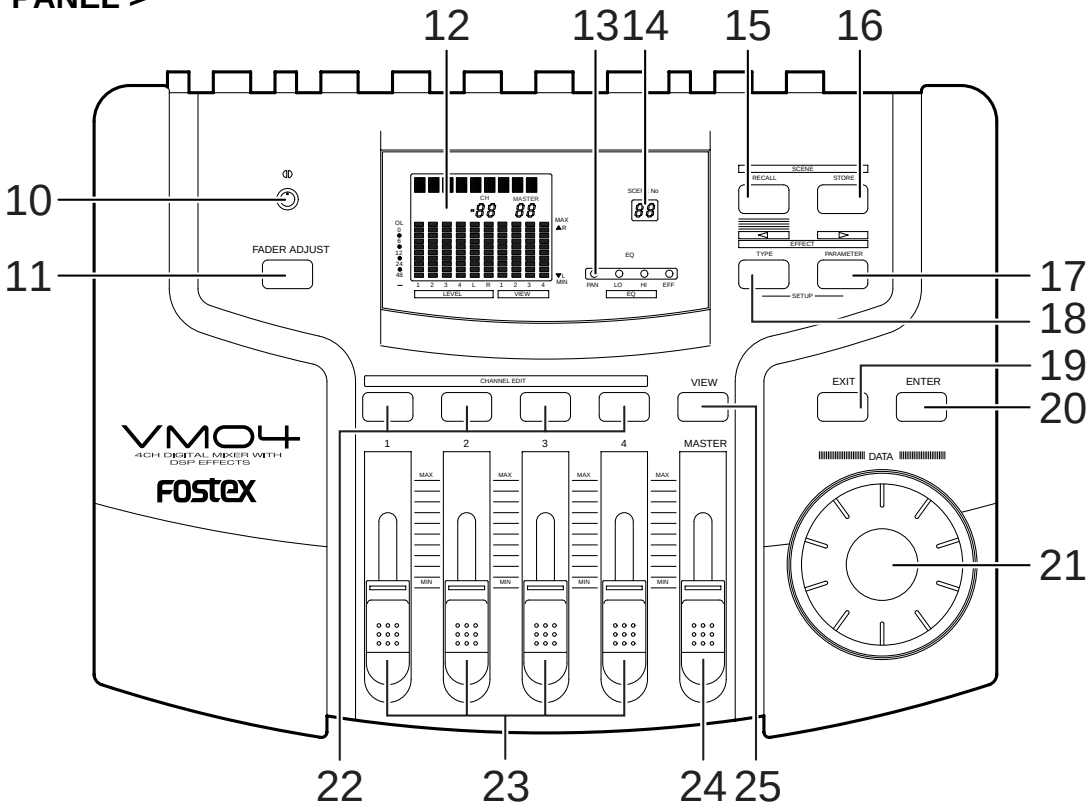
5. Headphone volume control knob
6. Stereo OUTPUT L/R jacks [Ø6 mm Phone]

7. RESET switch

8. INPUT jacks [Ø6 mm Phone]

9. TRIM knobs

< TOP PANEL >



10. Contrast control knob

11. FADER ADJUST key

12. LCD display

13. View status indicator

14. SCENE Number display

15. SCENE RECALL key

16. SCENE STORE key

17. EFFECT PARAMETER key
18. EFFECT TYPE key

19. EXIT key

20. ENTER key

21. DATA encoder

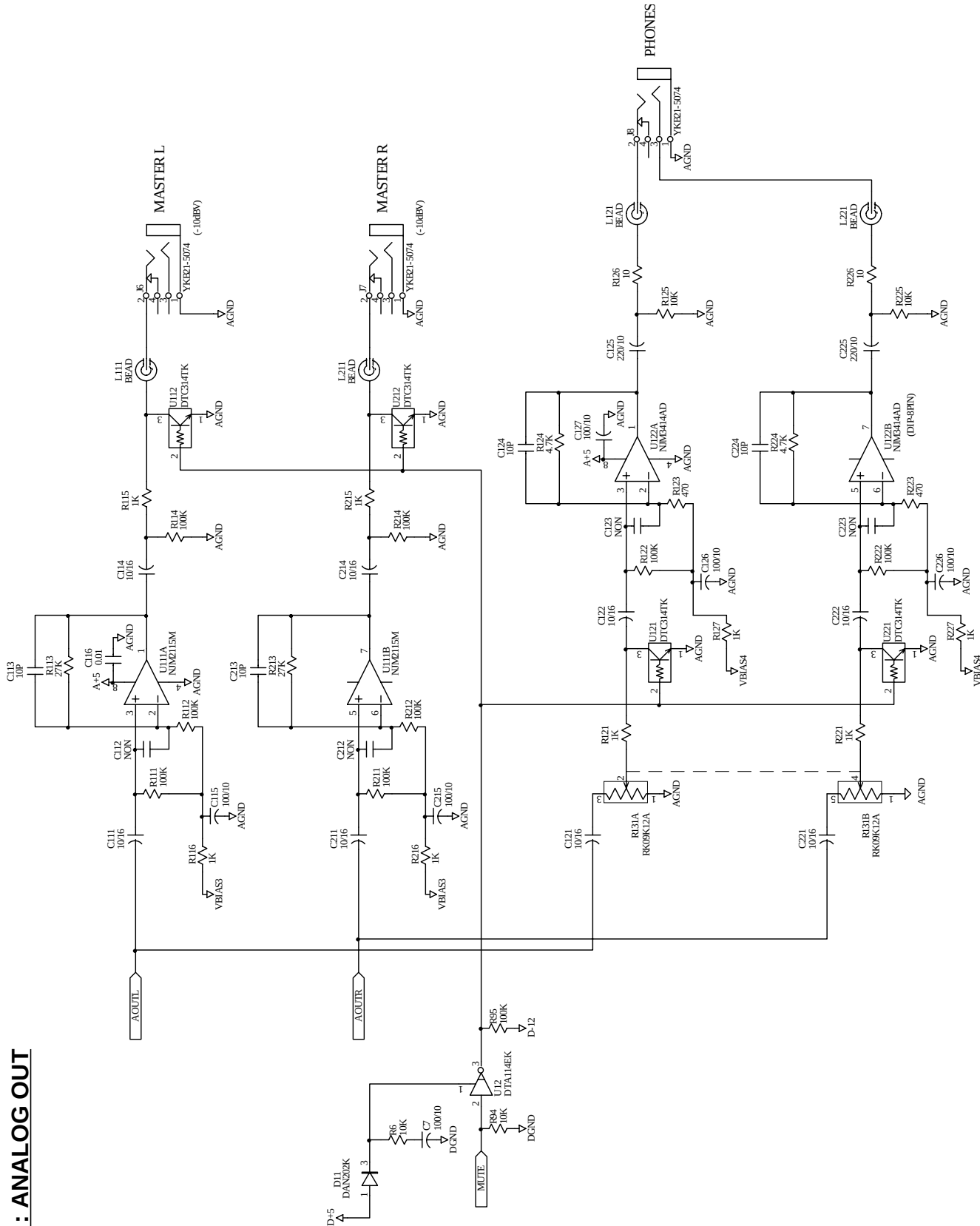
22. CHANNEL EDIT key

23. Input faders

24. MASTER fader

25. VIEW key

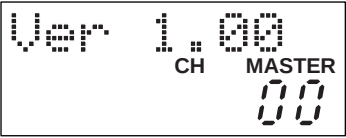
MAIN PCB : ANALOG OUT



3. SERVICE MODE

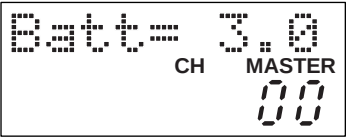
3-1 Software Version Check

While holding down the EXIT key and ENTER key together, press the EFFECT TYPE key.
The LCD Display will show the Software Version of the VM04 for a second, and then return to the Normal Mix mode.



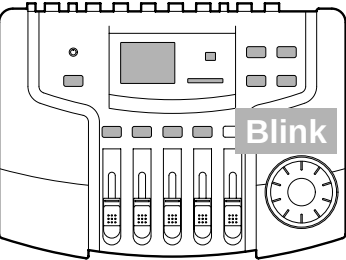
3-2 Battery Check

- While holding down the EXIT key and ENTER key together, press the EFFECT PARAMETER key.
- The LCD Display will show the voltage of the memory backup battery inside the VM04 for a second, and then return to the Normal Mix mode.
 - If the voltage falls below 2.2V, the message “BattEmpty” will appear when powering ON.
 - If the message “BattEmpty” is displayed, please replace the battery with the new one. For exchanging procedure, please refer to the page 7.



3-3 Display Check

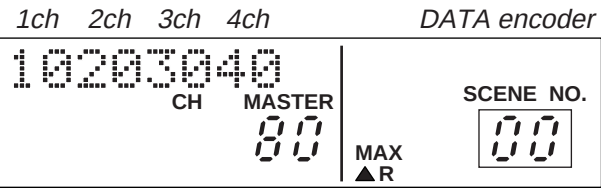
- While holding down the EXIT key and ENTER key together, press the VIEW key.
- All the LEDs and LCD segments are supposed to start blinking. Check if they are correctly blinking or not.
 - Press the ENTER key would change the blinking pattern.
 - If the key other than the ENTER key is pressed, the VM04 returns to Normal Mix mode display.



3-4 Fader Check

While holding down the EXIT key and ENTER key together, press the FADER ADJUST key.

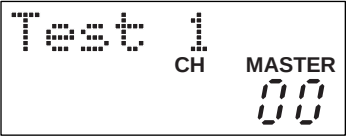
- Confirm that each channel parameter value correctly appears on the Character Display.
- Confirm that the SCENE NO. Display value would vary when rotating the DATA encoder.
- If any key is pressed, the VM04 returns to Normal Mix mode display.



3-5 Test Scene RECALL

While holding down the EXIT key and ENTER key together, press the SCENE RECALL key

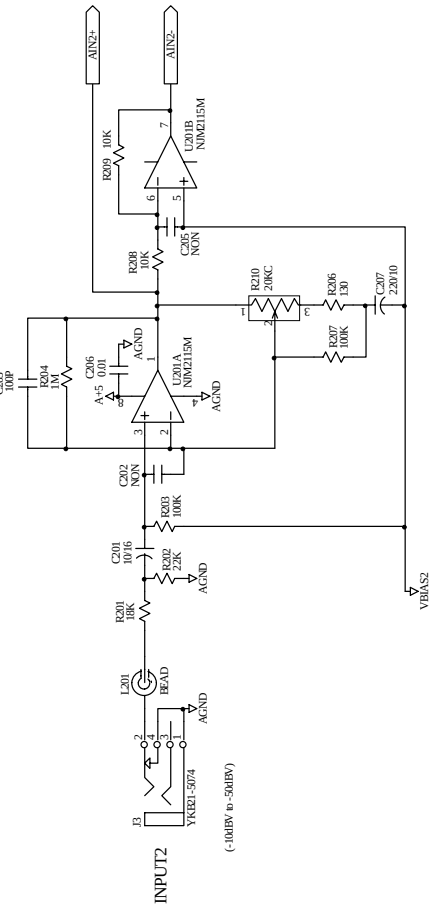
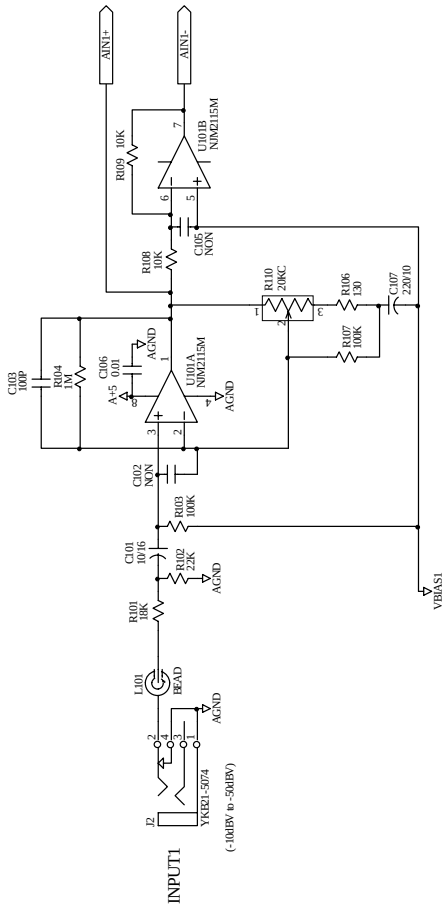
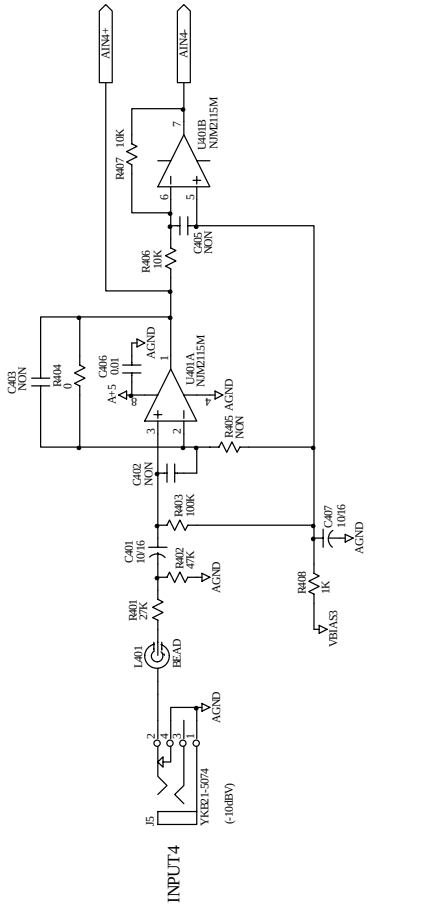
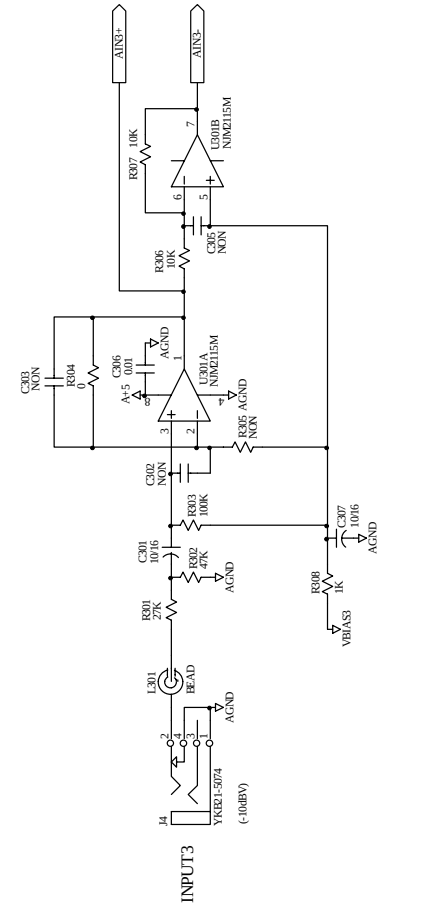
- There are five Test Scenes (Test 1 ~ Test 5).
- Pressing the ENTER key would step forward the Test Scene.
- Pressing the key other than the ENTER key would return the VM04 to the Normal Mix mode display.
- Each Test Scene is set up as shown in the table below.



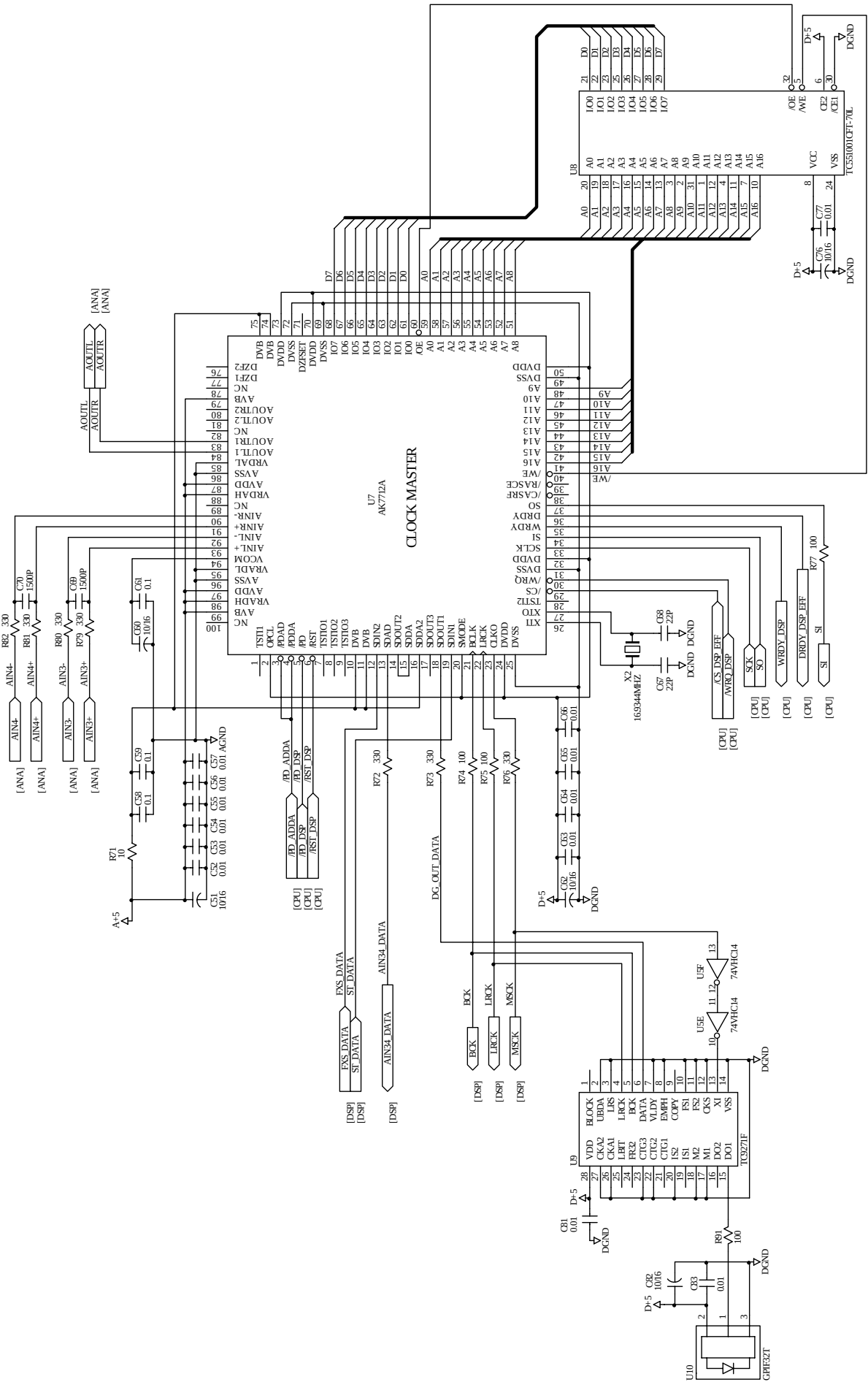
	CH 1		CH 2		CH 3		CH 4		Master	Eff Send 1~4 ch	Pre/Post	Effect
	Level	PAN	Level	PAN	Level	PAN	Level	PAN				
TEST 1	80	L	80	R	80	L	80	R	80	00	POST	-
TEST 2	80	L	80	R	00	C	00	C	80	00	POST	-
TEST 3	00	C	00	C	80	L	80	R	80	00	POST	-
TEST 4	80	L	80	L	80	L	80	L	80	00	POST	-
TEST 5	00	C	00	C	00	C	00	C	80	80	PRE	Delay

- TEST 1 Line Check 1~4 Output Level / Frequency Response
- TEST2 Line Check 1, 2 Output Level(Trim) / Frequency Response / Distortion / S/N(INPUT : Short)
- TEST 3 Line Check 3, 4 Output Level / Frequency Response / Distortion / S/N(INPUT : Short)
- TEST 4 Line Check 1~4 S/N(Σ4, INPUT : Short)
- TEST 5 Effect Check 1~4 Only the effect signal (1 Time Delay) is output.

CAUTION: While in the condition that the Test Scene is recalled, please do not turn off the power. Otherwise, correct Scene No. cannot be recalled.



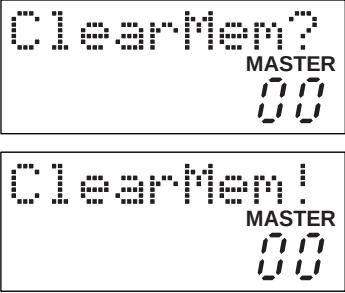
MAIN PCB : ANALOG IN



3-6 Memory Clear

While holding down the **EXIT** key and **ENTER** key together, press the **SCENE STORE** key

- Pressing the **ENTER** key would clear the memory and the message “ClearMem!” appear. All the setup will be initialized.
- Pressing the key other than **ENTER** returns to the Normal Mix mode display (The Scene No. 00 is displayed.) and the memory will not be initialized.
- Pressing the **RESET SW** would also clear the memory and the message “ClearMem!” appear.



Gain Table

The value appears in the LCD display corresponds to the gain in dB as shown below.

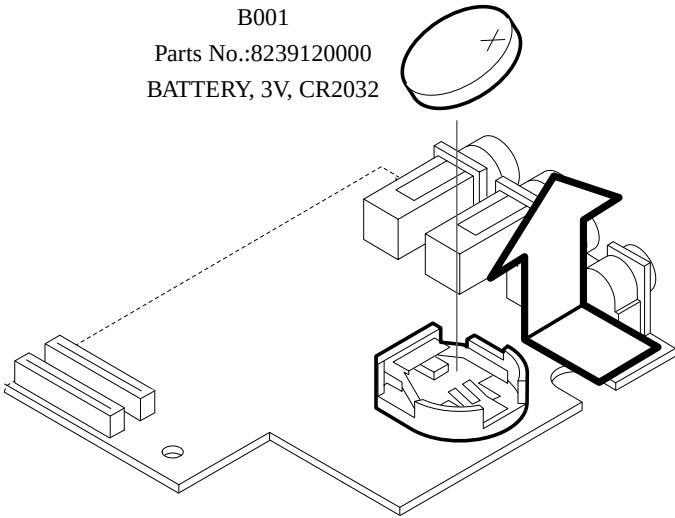
INPUT Fader		PAN	
MASTER	Fader	Gain (dB)	
EFFECT	Send	Value	Right
Value	Gain (dB)	Left	Right
00	-∞	L10	0.0
01	-72.0	L9	-0.1
05	-55.0	L8	-0.25
10	-42.5	L7	-0.4
15	-35.0	L6	-0.7
20	-28.75	L5	-1.0
25	-23.0	L4	-1.4
30	-18.0	L3	-1.8
35	-15.5	L2	-2.2
40	-13.0	L1	-2.6
45	-10.5	C	-3.0
50	-8.5	R1	-4.2
55	-7.0	R2	-5.5
60	-5.5	R3	-7.1
65	-4.0	R4	-9.0
70	-2.5	R5	-11.3
75	-1.25	R6	-14.1
80	0	R7	-17.6
85	+1.5	R8	-23.5
90	+3.0	R9	-32.0
95	+4.67	R10	-∞
99	+6.0		0.0

REPLACING THE BATTERY

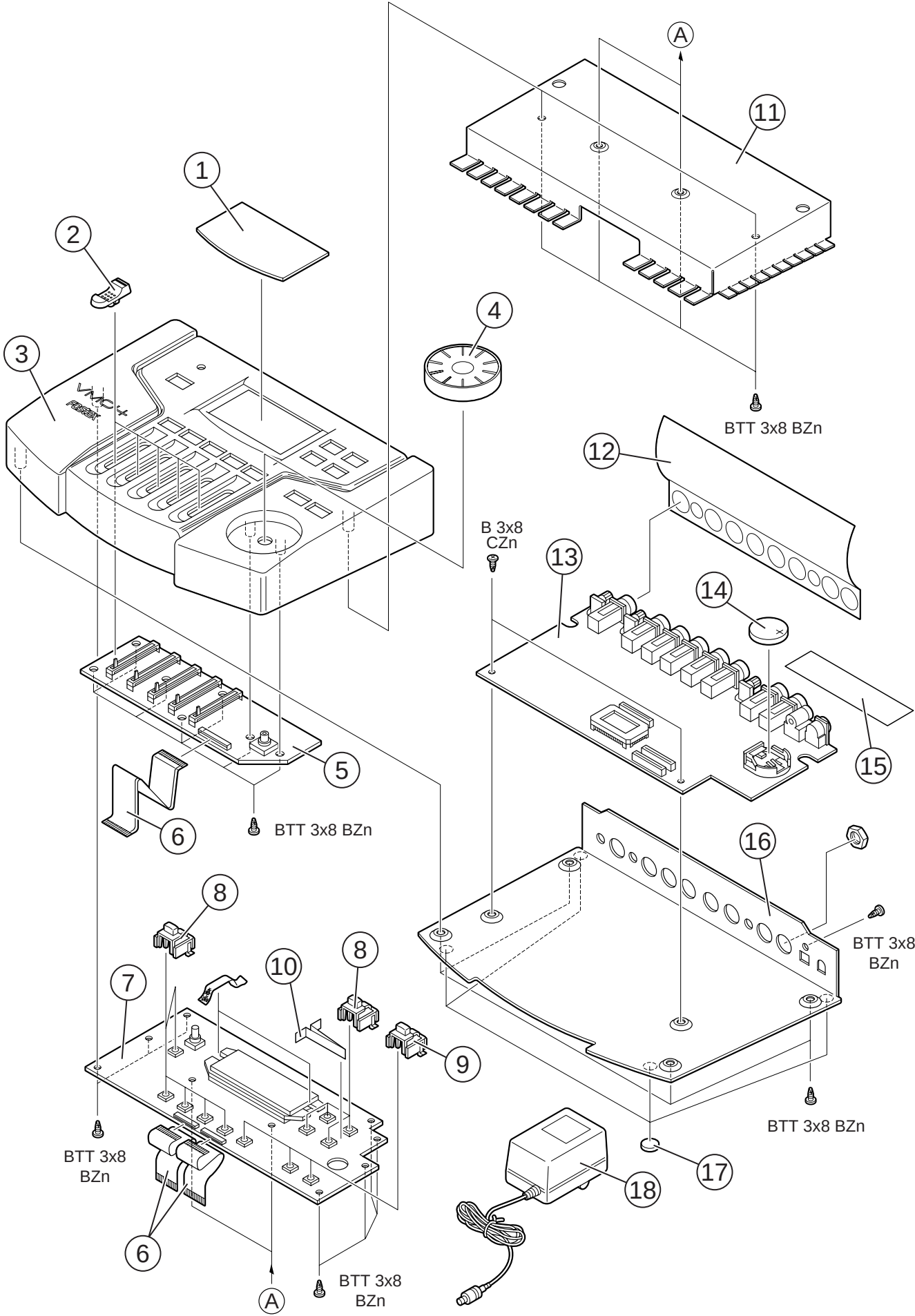
If the voltage of the inside memory backup battery falls below 2.2V, the message “BattEmpty” will appear when powering ON.

CAUTION

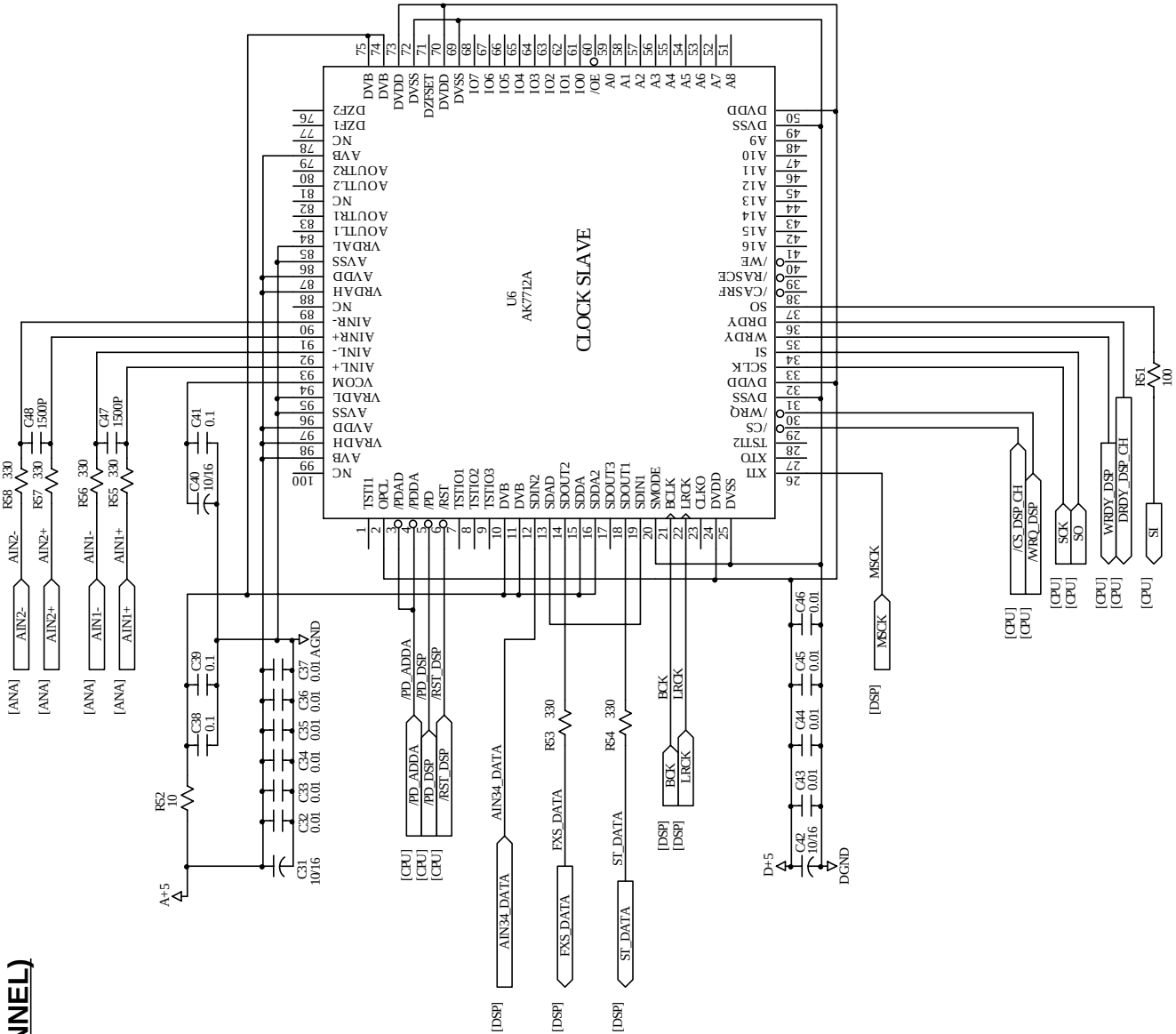
- Replacing the battery with the new one would basically initialize the backup data.
- In order to retain the backup data, please replace the battery while powering on.



4. EXPLODED VIEW



MAIN PCB : DSP (CHANNEL)



5. PARTS LIST



8274165000 PCB ASSY,MAIN,VM04

TRANSISTOR

DIODEs

RESISTORS

RESISTORS

CAPACITORs

Ref.No.	Part No.	Description
C001	8232143477	VT, ALU, 16V, 470μF, 20%
C002	8232142107	VT, ALU, 10V, 100μF, 20%
C003, 004	8233504103	ST, CER, 25V, 0.01μF, 10%
C005	8232142107	VT, ALU, 10V, 100μF, 20%
C006	8233504103	ST, CER, 25V, 0.01μF, 10%
C007	8232142107	VT, ALU, 10V, 100μF, 20%
C008	8232142107	VT, ALU, 10V, 100μF, 20%
C009	8232143107	VT, ALU, 16V, 100μF, 20%
C010	8233500122	ST, CER, 50V, 0.0012μF, 10%
C011	8232143107	VT, ALU, 16V, 100μF, 20%
C015	8233502104	ST, CER, 50V, 0.1μF, +80
C016	8233502104	ST, CER, 50V, 0.1μF, +80
C018	8232143106	VT, ALU, 16V, 10μF, 20%
C019, 020	8233500330	SAP, ST, CER, 50V, 33pF, 5%
C021, 022	8233504103	ST, CER, 25V, 0.01μF, 10%
C023	8233504103	ST, CER, 25V, 0.01μF, 10%
C024	8232143106	VT, ALU, 16V, 10μF, 20%
C025	8233500101	ST, CER, 50V, 100pF, 5%

CAPACITORS

ALU = Electrolytic
CER = Ceramic type

Ref.No.	Part No.	Description
C026~029	8233504103	ST, CER, 25V, 0.01µF, 10%
C031	8232143106	VT, ALU, 16V, 10µF, 20%
C032~037	8233504103	ST, CER, 25V, 0.01µF, 10%
C038, 039	8233502104	ST, CER, 50V, 0.1µF, +80
C040	8232143106	VT, ALU, 16V, 10µF, 20%
C041	8233502104	ST, CER, 50V, 0.1µF, +80
C042	8232143106	VT, ALU, 16V, 10µF, 20%
C043~046	8233504103	ST, CER, 25V, 0.01µF, 10%
C047, 048	8233500152	ST, CER, 50V, 0.0015µF, 5%
C051	8232143106	VT, ALU, 16V, 10µF, 20%
C052~057	8233504103	ST, CER, 25V, 0.01µF, 10%
C058, 059	8233502104	ST, CER, 50V, 0.1µF, +80
C060	8232143106	VT, ALU, 16V, 10µF, 20%
C061	8233502104	ST, CER, 50V, 0.1µF, +80
C062	8232143106	VT, ALU, 16V, 10µF, 20%
C063~066	8233504103	ST, CER, 25V, 0.01µF, 10%
C067, 068	8233500220	ST, CER, 50V, 22pF, 5%
C069, 070	8233500152	ST, CER, 50V, 0.0015µF, 5%
C076	8232143106	VT, ALU, 16V, 10µF, 20%
C077	8233504103	ST, CER, 25V, 0.01µF, 10%
C081	8233504103	ST, CER, 25V, 0.01µF, 10%
C082	8232143106	VT, ALU, 16V, 10µF, 20%
C083	8233504103	ST, CER, 25V, 0.01µF, 10%
C091	8233504103	ST, CER, 25V, 0.01µF, 10%
C092	8232142107	VT, ALU, 10V, 100µF, 20%
C093	8233504103	ST, CER, 25V, 0.01µF, 10%
C094	8232142107	VT, ALU, 10V, 100µF, 20%
C095	8233504103	ST, CER, 25V, 0.01µF, 10%
C096	8232142107	VT, ALU, 10V, 100µF, 20%
C097	8233504103	ST, CER, 25V, 0.01µF, 10%
C098	8232142107	VT, ALU, 10V, 100µF, 20%
C101, 201	8232143106	VT, ALU, 16V, 10µF, 20%
C103, 203	8233500101	ST, CER, 50V, 100pF, 5%
C106, 206	8233504103	ST, CER, 25V, 0.01µF, 10%
C107, 207	8232142227	VT, ALU, 10V, 220µF, 20%
C111, 211	8232143106	VT, ALU, 16V, 10µF, 20%
C113, 213	8233500100	ST, CER, 50V, 10PF, 5%
C114, 214	8232143106	VT, ALU, 16V, 10µF, 20%
C115, 215	8232142107	VT, ALU, 10V, 100µF, 20%
C116	8233504103	ST, CER, 25V, 0.01µF, 10%
C121, 221	8232143106	VT, ALU, 16V, 10µF, 20%
C122, 222	8232143106	VT, ALU, 16V, 10µF, 20%
C124, 224	8233500100	ST, CER, 50V, 10pF, 5%
C125, 225	8232142227	VT, ALU, 10V, 220µF, 20%
C126, 226	8232142107	VT, ALU, 10V, 100µF, 20%
C127	8232142107	VT, ALU, 10V, 100µF, 20%
C301, 401	8232143106	VT, ALU, 16V, 10µF, 20%
C306, 406	8233504103	ST, CER, 25V, 0.01µF, 10%
C307, 407	8232143106	VT, ALU, 16V, 10µF, 20%

MISCELLANEOUS

Ref.No.	Part No.	Description
B001	8239121000	HOLDER, BATTERY, BCR20H4
E801	8239120000	BATTERY, 3V, CR2032
J001	8245544000	CONN, DC INLET, YKB31-0014
J002~005	8245339004	CONN, JACK, PHONE, YKB21-5074
J006, 007	8245339004	CONN, JACK, PHONE, YKB21-5074
J008	8245339004	CONN, JACK, PHONE, YKB21-5074
J010	8245339004	CONN, JACK, PHONE, YKB21-5074
J011	8245272017	CONN, PI, JACK, FPC 17P
J012	8245272017	CONN, PI, JACK, FPC 17P
J013	8245272017	CONN, PI, JACK, FPC 17P
L002	8242196223	COIL., PVT, 22µH, 5%, LF5.0S
L003	8242214031	COIL, PVT, 68µH, 5%, ELES
L004	8242501121	FILTER, EMI, 120, 25%, MMZ2012S
L101~401	8242501121	FILTER, EMI, 120, 25%, MMZ2012S
L111, 211	8242501121	FILTER, EMI, 120, 25%, MMZ2012S
L121, 221	8242501121	FILTER, EMI, 120, 25%, MMZ2012S
S001	8253469000	SW, PLT, TACT, SKHVLH
X001	8256134003	RESONATOR, PF, CER, 8.00MHZ
X002	8256170004	RESONATOR, ST, XTL, 16.9344MHZ
Y1501	8245340000	NUT, PHONEJACK
	8251972201	Plain PCB, MAIN, VM04

8274165000 PCB ASSY, DISPLAY, VM04

ICs

Ref.No.	Part No.	Description
U301	8236083600	IC, QFP, DG, LCD DRIVER, HD44780
U302	8256176000	MODULE, DISPLAY, LCD, FD-4

DIODES

Ref.No.	Part No.	Description
D301~306	8234502800	D, ST, DAN202K
D351	8234504001	OPT, VT, LED, RED, LT3D31W
D352	8234504003	OPT, VT, LED, YLW, LT3H31W
D353	8234504003	OPT, VT, LED, YLW, LT3H31W
D354	8234504003	OPT, VT, LED, YLW, LT3H31W
D355	8234504003	OPT, VT, LED, YLW, LT3H31W
D357	8234504004	OPT, VT, LED, GRN, LT3E31W
D358	8234504003	OPT, VT, LED, YLW, LT3H31W
D360	8234504001	OPT, VT, LED, RED, LT3D31W
D361	8234504003	OPT, VT, LED, YLW, LT3H31W

RESISTORS

Ref.No.	Part No.	Description
R301	8230500224	ST, CARBON, 1/10W, 220K, 5%
R302~306	8230500102	ST, CARBON, 1/10W, 1K, 5%
R307	8230500752	ST, CARBON, 1/10W, 7.5K, 5%
R311	8240151004	POT, PI, RT9, 5KB, L20, RK09K113
R321~326	8230500103	ST, CARBON, 1/10W, 10K, 5%

CAPACITORS

CER = Ceramic type

Ref.No.	Part No.	Description
C301	8233502104	ST, CER, 50V, 0.1µF, +80
C302	8233504103	ST, CER, 25V, 0.01µF, 10%

MISCELLANEOUS

Ref.No.	Part No.	Description
J301, 302	8245272117	CONN, PL, JACK, FPC, 17P
L301, 302	8239116000	LAMP, 5V, 75MA
S301~312	8253135002	SW, PT, TACT, SOR-112HS
Y301	8212611000	PLATE, REFLECT, LCD, FD-4
	8251972102	Plain PCB, DISPLAY, VM04

8274167000 PCB ASSY, FADER, VM04

IC

Ref.No.	PartNo.	Description
U401	8253466000	SW, PI, ENCODER, EC12E

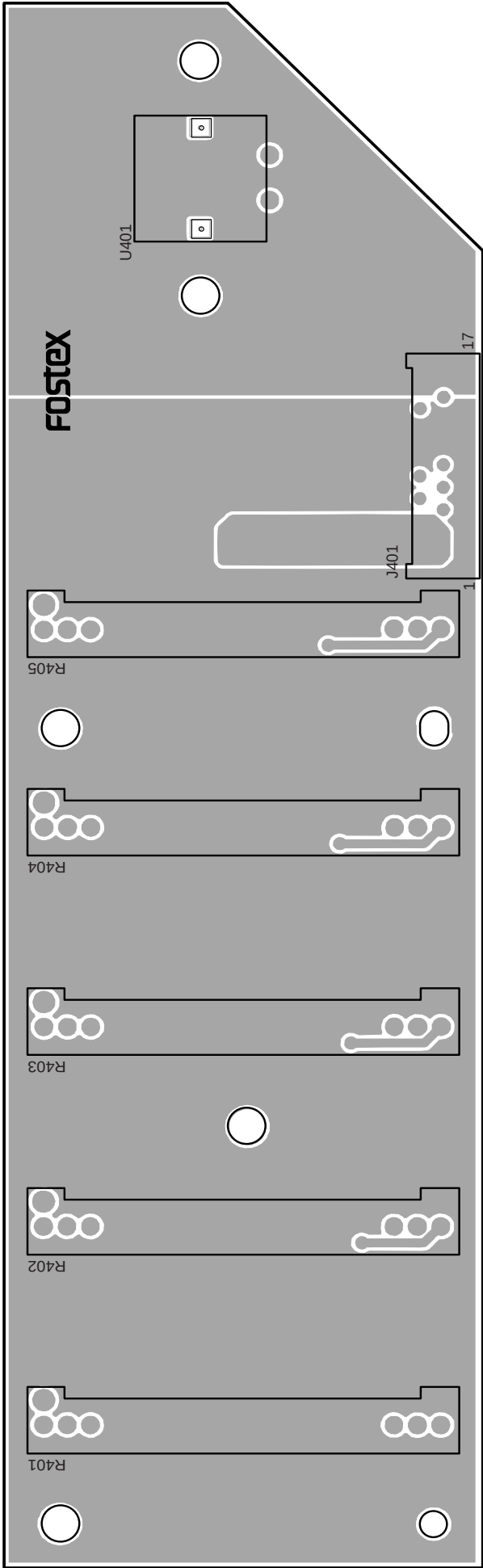
RESISTOR

Ref.No.	PartNo.	Description
R401~405	8240274005	POT, PI, SL30, 10KB, RS30H111

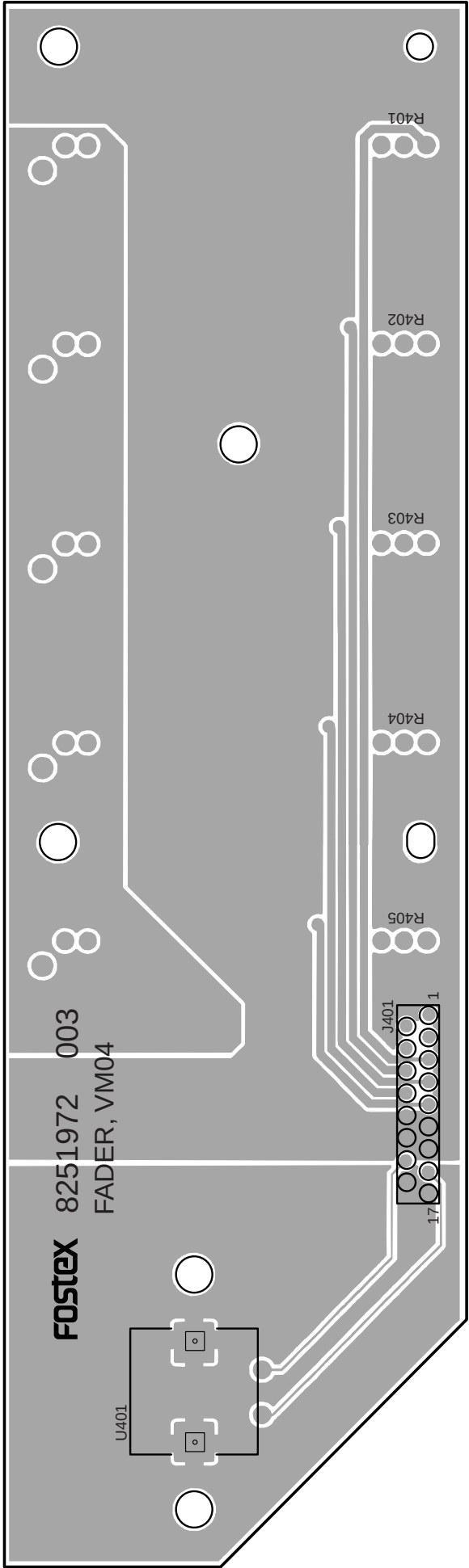
MISCELLANEOUS

Ref.No.	PartNo.	Description
J401	8245272117	CONN, PL, JACK, FPC, 17P
	8251972003	Plain PCB, FADER, VM04

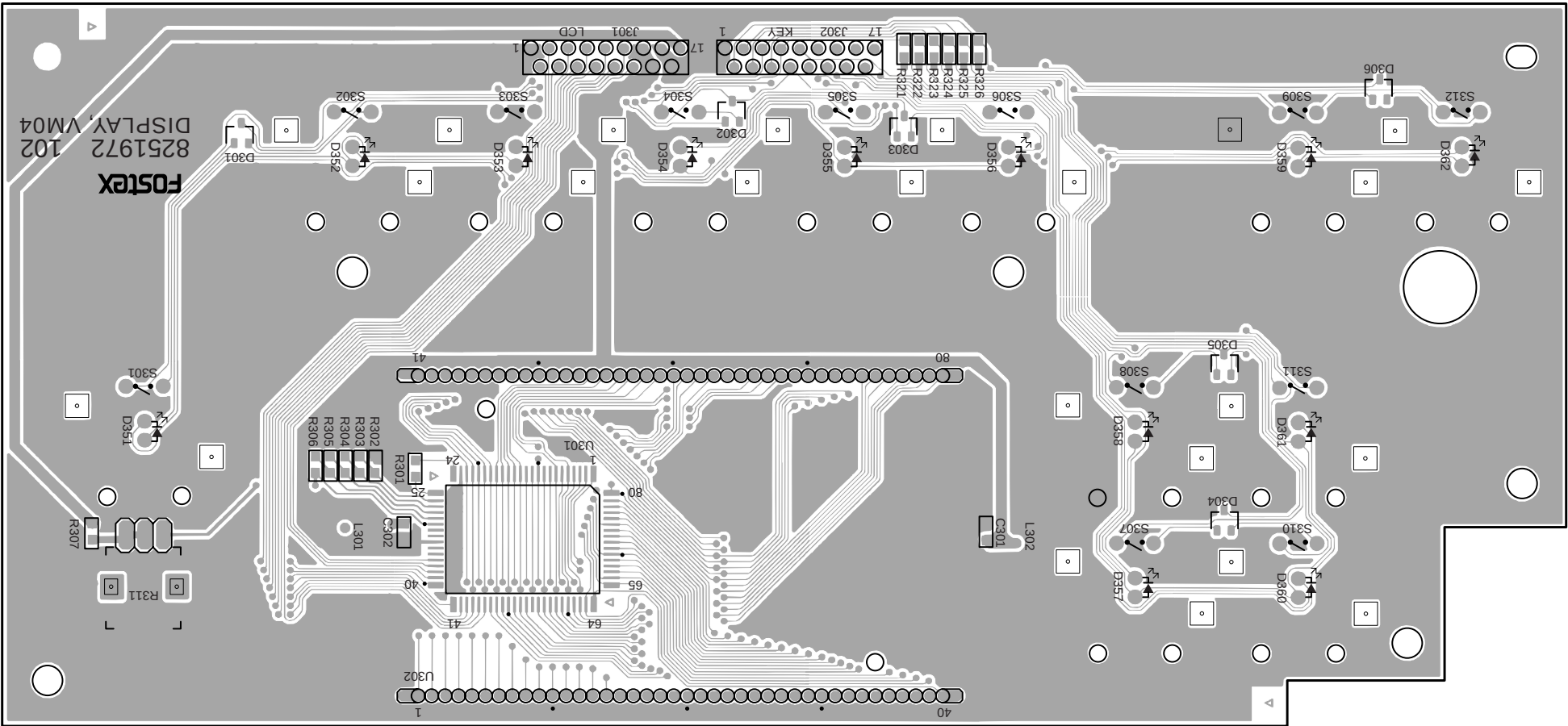
FADER PCB : PARTS SIDE



FADER PCB : FOIL SIDE

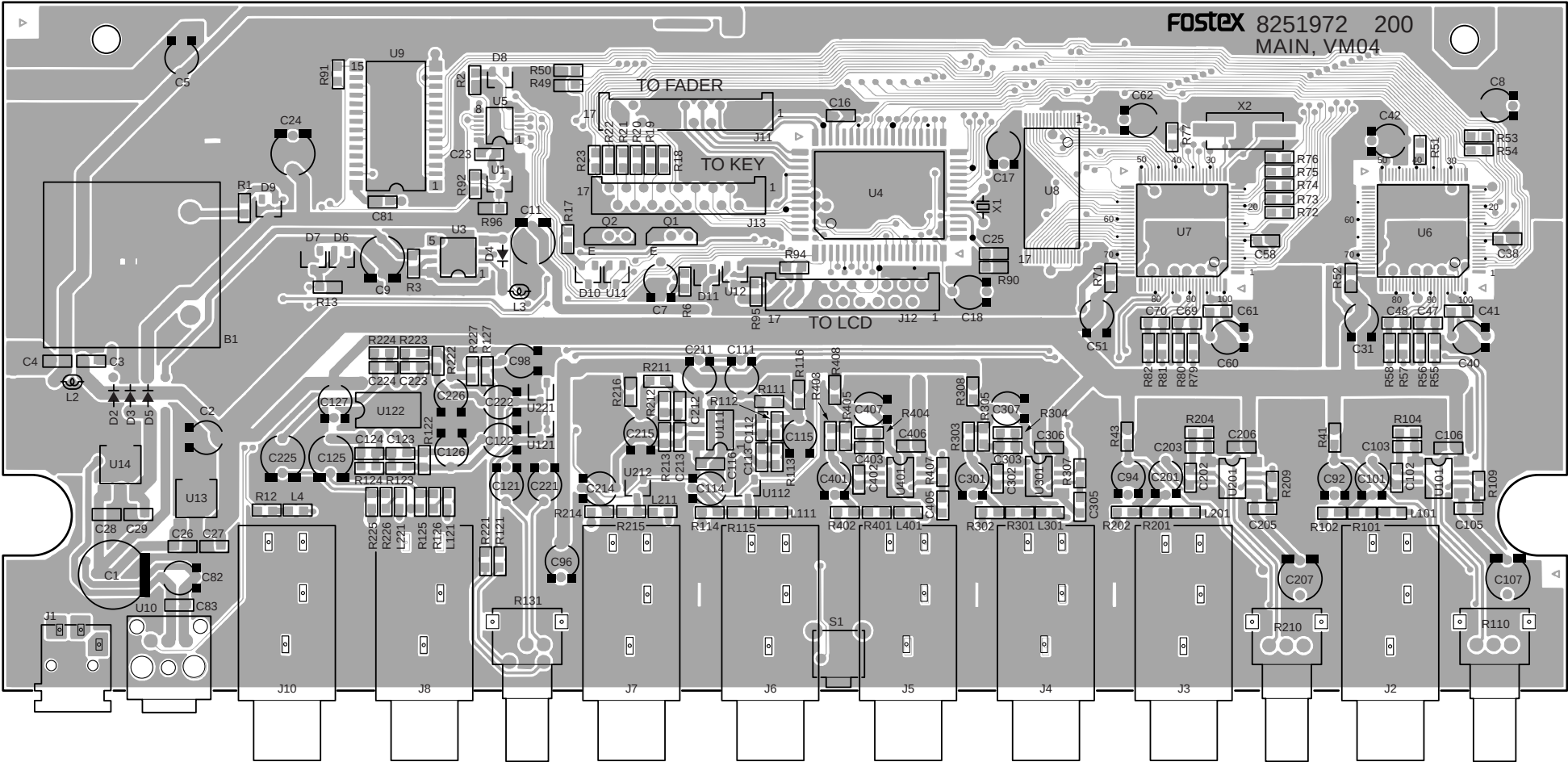


DISPLAY PCB : FOIL SIDE

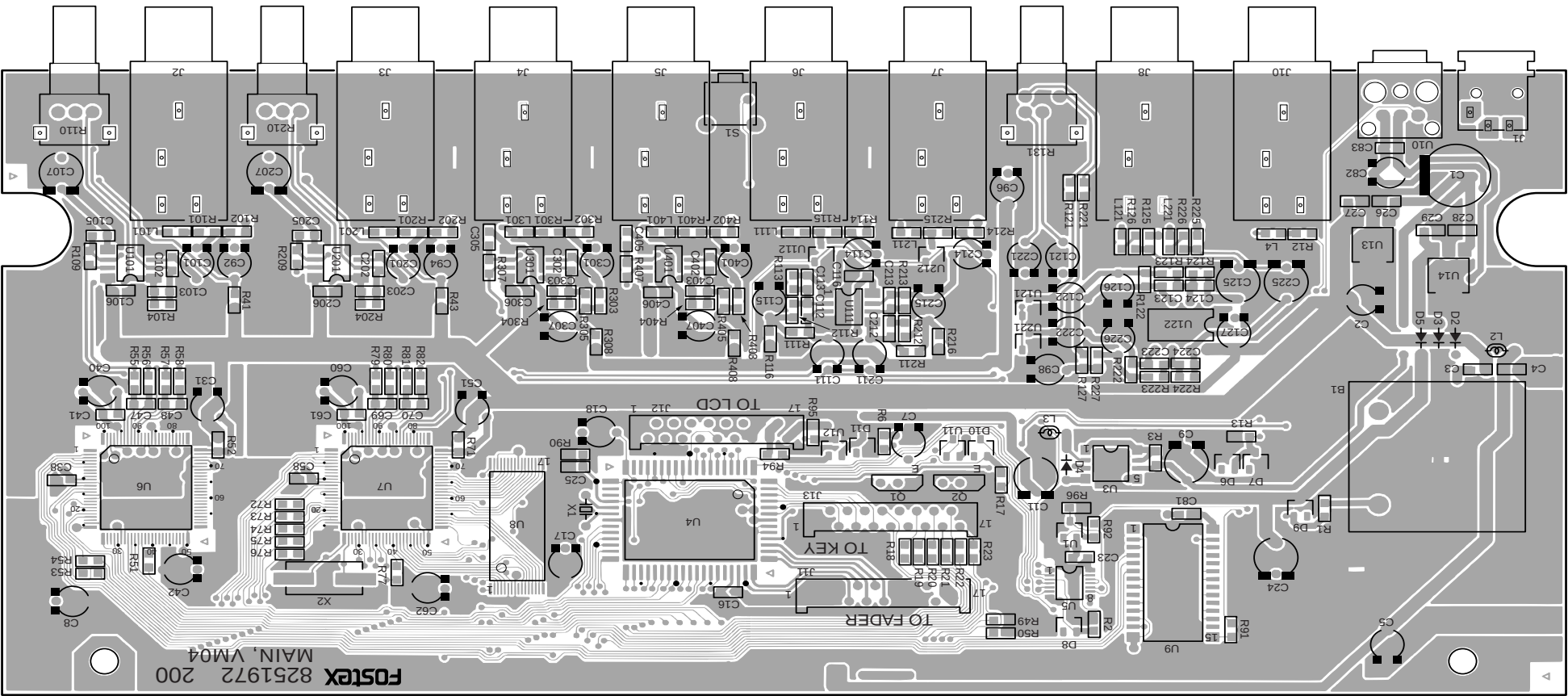


6. PCB PATTERN DRAWING

MAIN PCB : PARTS SIDE



MAIN PCB : FOIL SIDE



DISPLAY PCB : PARTS SIDE

