
Service Manual

Model
VM04

4ch Digital Mixer with DSP Effects

Fostex[®]

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Fostex[®]

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.

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.

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.

"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.
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.



8. BLOCK DIAGRAMS

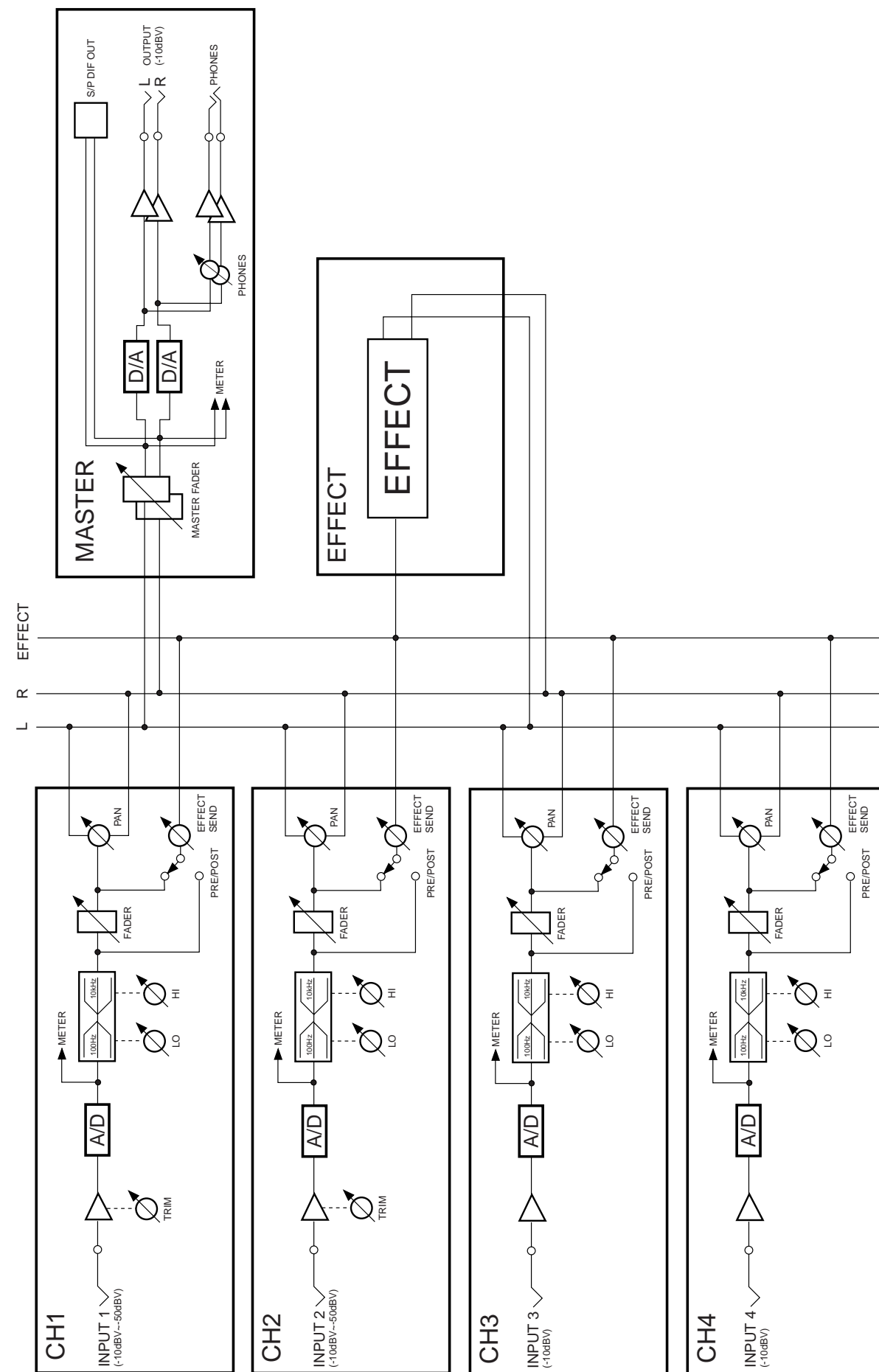
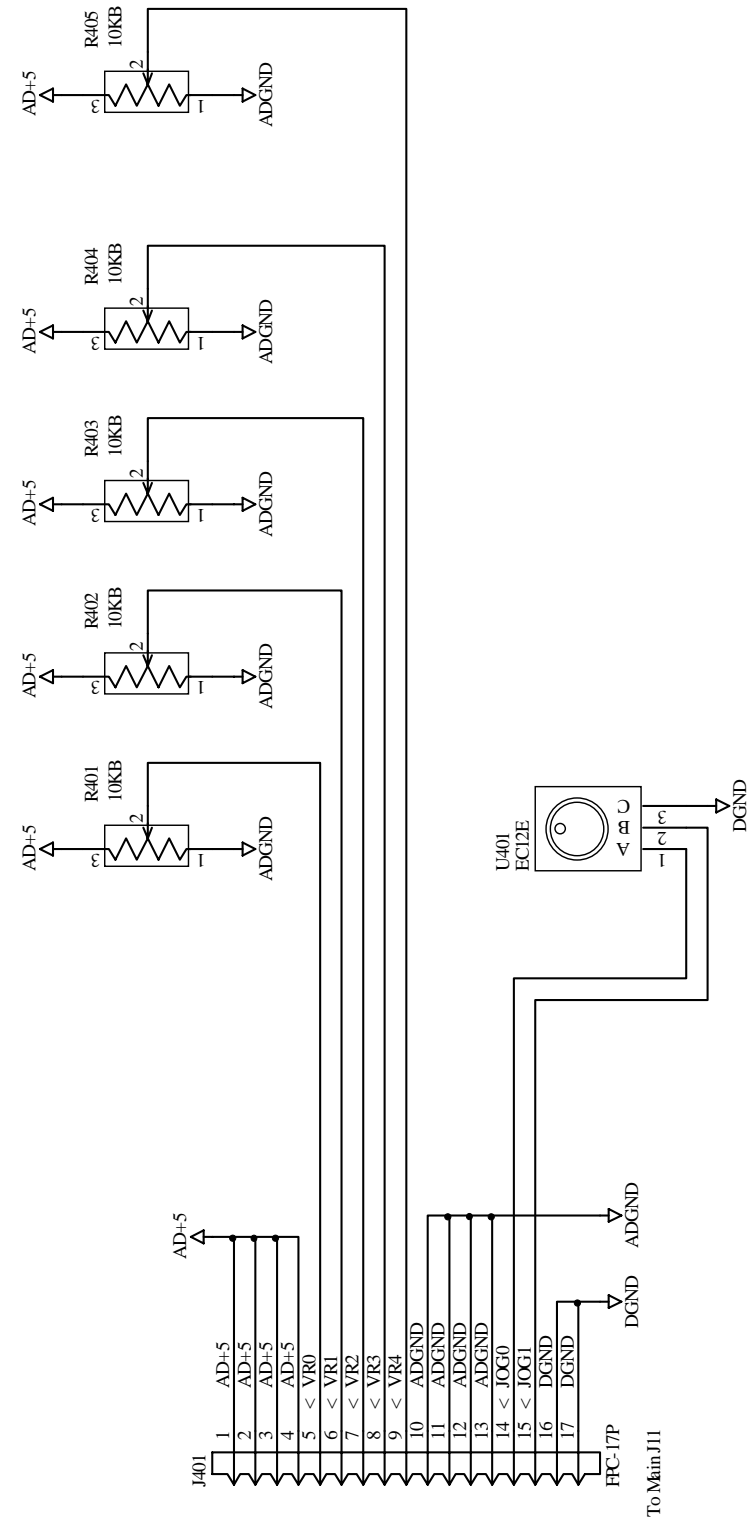


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NOTES

* 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.

1. SPECIFICATIONS

DEFINITION (Specification Unit : 0 dBV = 1 Vrms)

NORMAL FADER POSITION

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

MIXER SECTION

INPUT 1, 2

Input Level	-50dBV ~ -10dBV
Input Impedance	20kΩ or more
Connector	Ø6 mm Phone Jack/Unbalanced

INPUT 3, 4

Input Level	-10dBV
Input Impedance	20kΩ or more
Connector	Ø6 mm Phone Jack/Unbalanced

OUTPUT (L, R)

Output Level	-10dBV
Load Impedance	10kΩ or more
Connector	Ø6 mm Phone Jack/Unbalanced

PHONES OUT

Output Level	20 mW MAX (16Ω load)
Load Impedance	16Ω or more
Connector	Ø6 mm Stereo Phone Jack

EQUALIZER

HI (Shelving Type)	±18dB or more (-10dBV / 10 kHz)
LO (Shelving Type)	±18dB or more (-10dBV / 100 Hz)

FREQUENCY RESPONSE

Input (-10dBV) → Stereo Out (-10dBV)	+1, -2dB (20Hz ~ 20kHz)
Input (-50dBV) → Stereo Out (-10dBV)	+1, -3dB (20Hz ~ 20kHz)
Input (-10dBV) → Phones Out (20mW/16Ω)	+1, -3dB (20Hz ~ 20kHz)

S/N (with DAT envelope filter)

Input (+2dBV) → Stereo Out (+2dBV)	86dB or more (IHF-A)
Input (-38dBV) → Stereo Out (+2dBV)	66dB or more (IHF-A)
Input Σ4 (+2dBV) → Stereo Out (+2dBV)	81dB or more (IHF-A)
Phones Out Phones Out Residual Noise	66dB or more (IHF-A)

DISTORTION (with DAT envelope filter)

Input (+2dBV) → Stereo Out (0dBV)	0.1% or less (100Hz ~ 10kHz)
Input (-40dBV) → Stereo Out (0dBV)	0.1% or less (100Hz ~ 10kHz)
Input (0dBV) → Phones Out (20mW/16Ω)	1.0% or less (1kHz)

CROSSTALK

SHOCK NOISE	60dB or more (1kHz)
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LEVEL INDICATION

Type	LCD Bargraph Meter
Number of Indicated Levels	11 dots (-48, -30, -24, -18, -12, -9, -6, -3, -1, 0, OL)
Reference Level (-10dBV) Indication	-12dB

DIGITAL SECTION

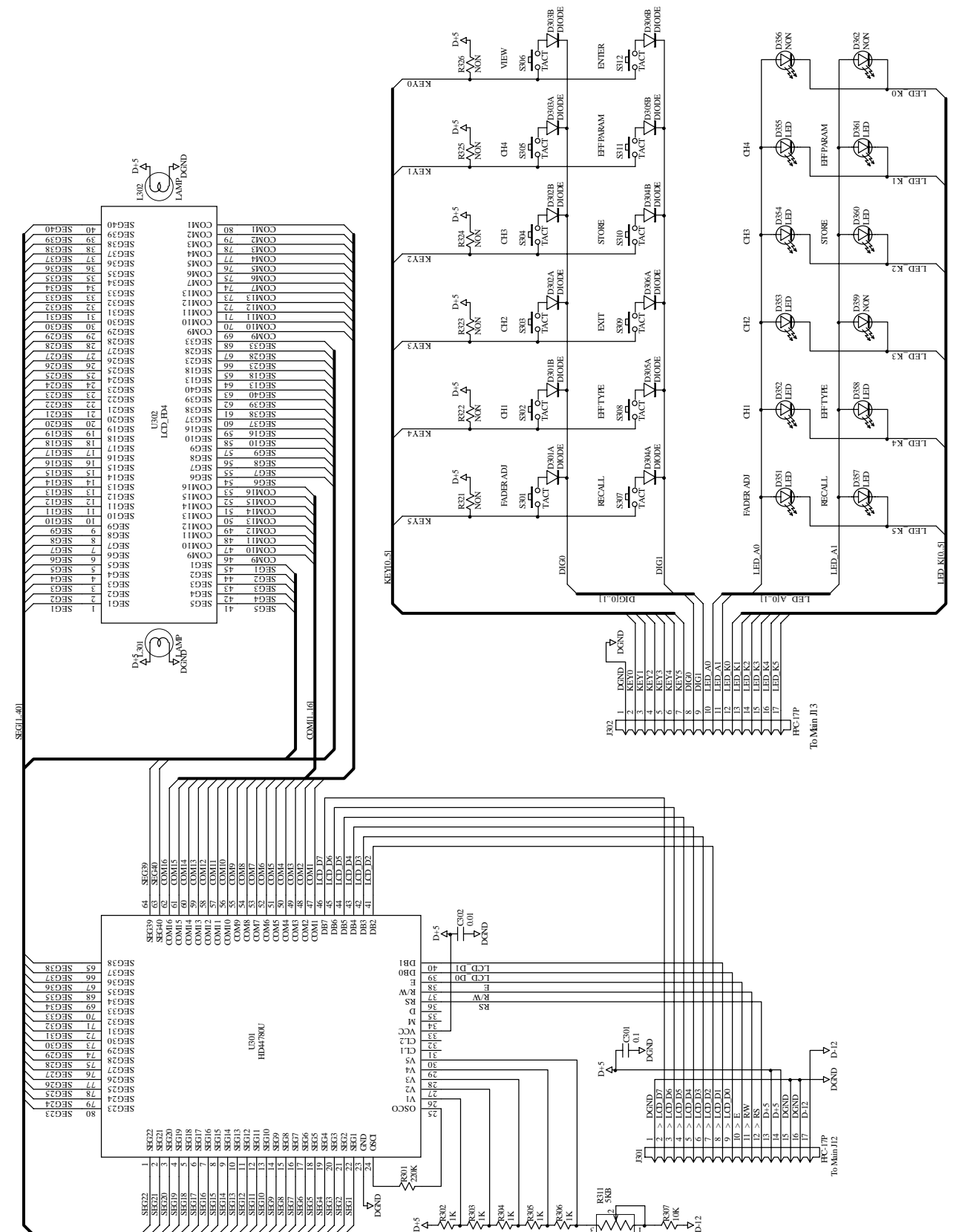
SAMPLING FREQUENCY	44.1kHz
QUANTIZATION	16 bit linear
A/D CONVERTER	20bit, 64 times Over Sampling Enhanced Dual Bit, Delta-Sigma
D/A CONVERTER	20bit 128-time, Over Sampling, Delta-Sigma
S/P DIF OUT	
Format	IEC 60958 (S/P DIF)
Connector	Optical

GENERAL

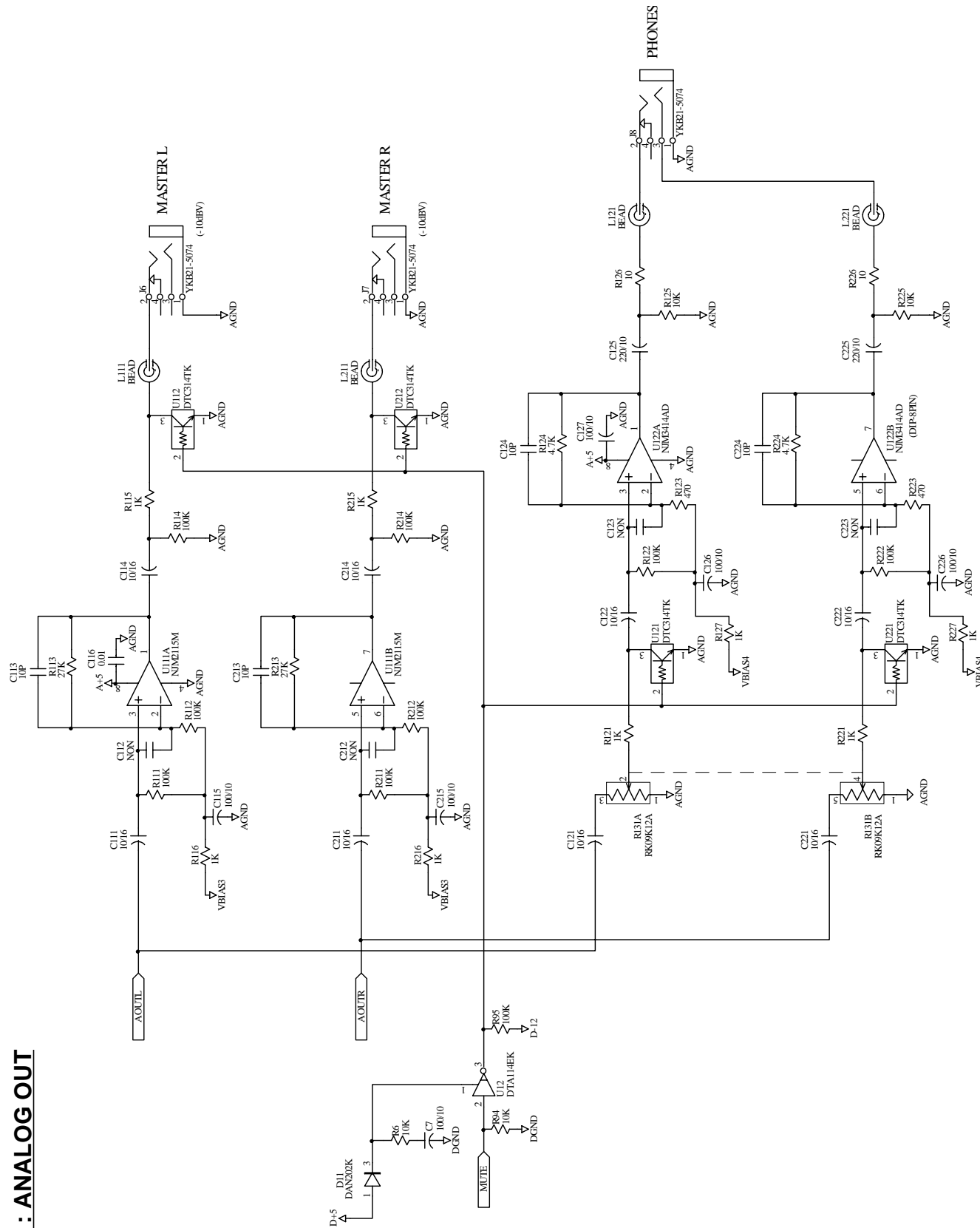
DC IN AD-9B, DC9V, 650 mA (the Center Positive)	
DIMENSIONS	254 (W) × 186 (D) × 50 (H) mm
WEIGHT	Approx. 1.1 kg
POWER SUPPLY	
USA/CND	120VAC, 60Hz
EUR/UK	230VAC, 50/60Hz
JPN 100VAC, 50/60Hz	

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

DISPLAY PCB

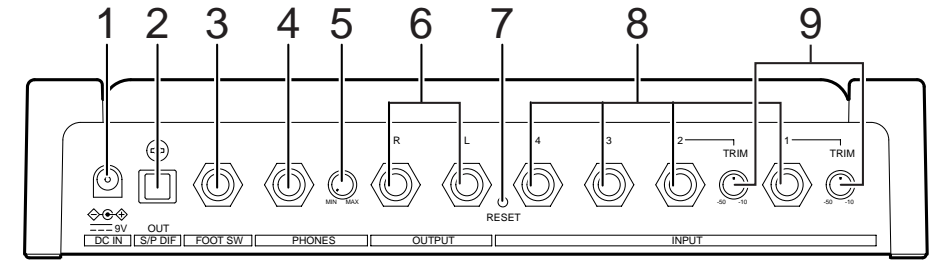


MAIN PCB : ANALOG OUT



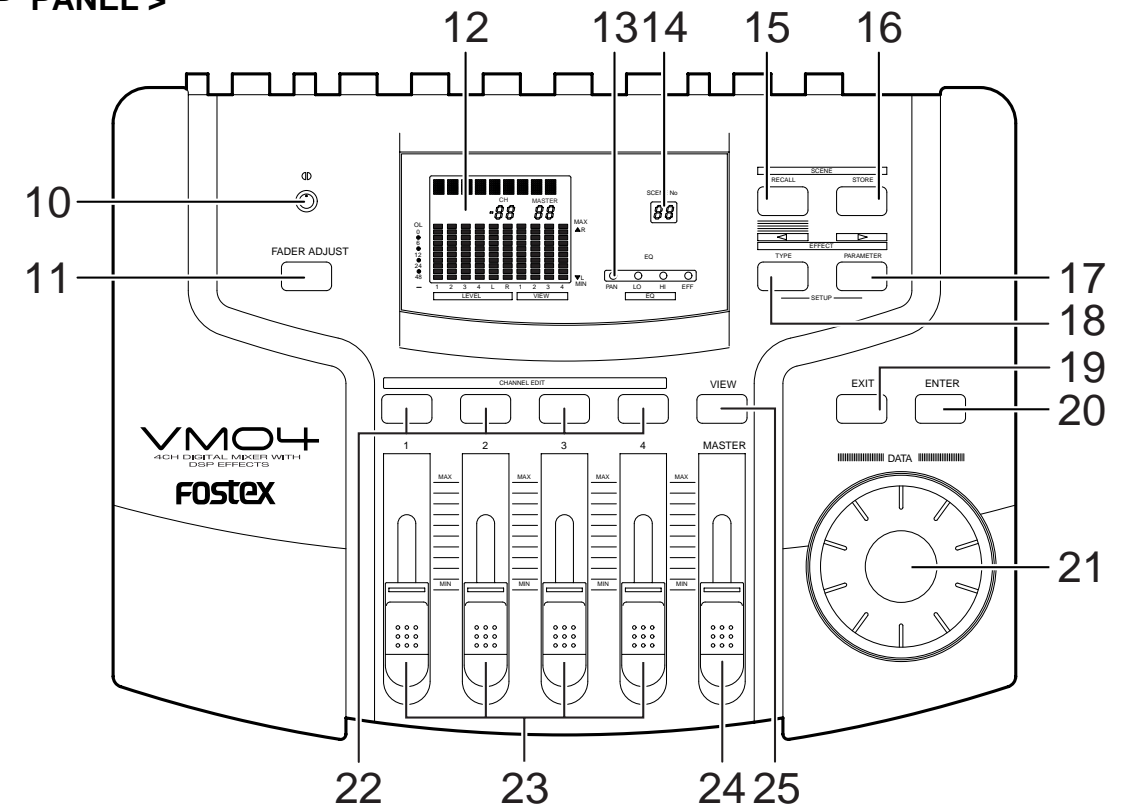
2. CONTROLS, INDICATORS AND CONNECTORS

< 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 >

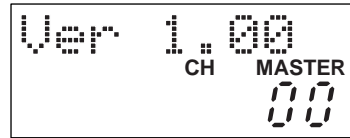


- 10. Contrast control knob
- 11. FADER ADJUST key
- 12. LCD display
- 13. View status indicator
- 14. SCENE Number display
- 15. SCENE RECALL key
- 16. SCENE STORE key
- 17. EFFECT PARAMETER key
- 18. EFFECT TYPE key
- 19. EXIT key
- 20. ENTER key
- 21. DATA encoder
- 22. CHANNEL EDIT key
- 23. Input faders
- 24. MASTER fader
- 25. VIEW key

3. SERVICE MODE

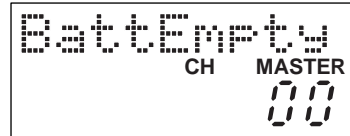
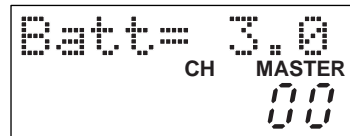
3-1 Software Version Check

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.



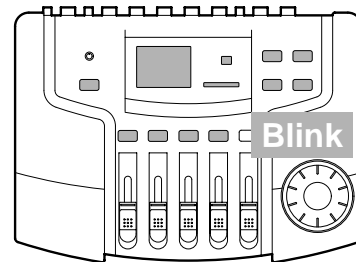
3-2 Battery Check

- 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

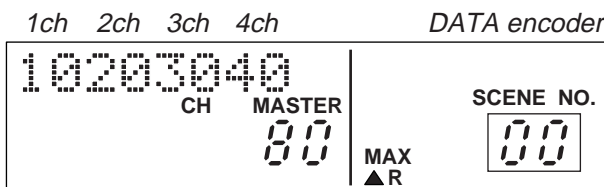
- While holding down the EXIT key and ENTER key together, press the VIEW key.
- All the LEDs and LCD segments are supposed to start blinking. Check if they are correctly blinking or not.
- Press the ENTER key would change the blinking pattern.
- If the key other than the ENTER key is pressed, the VM04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



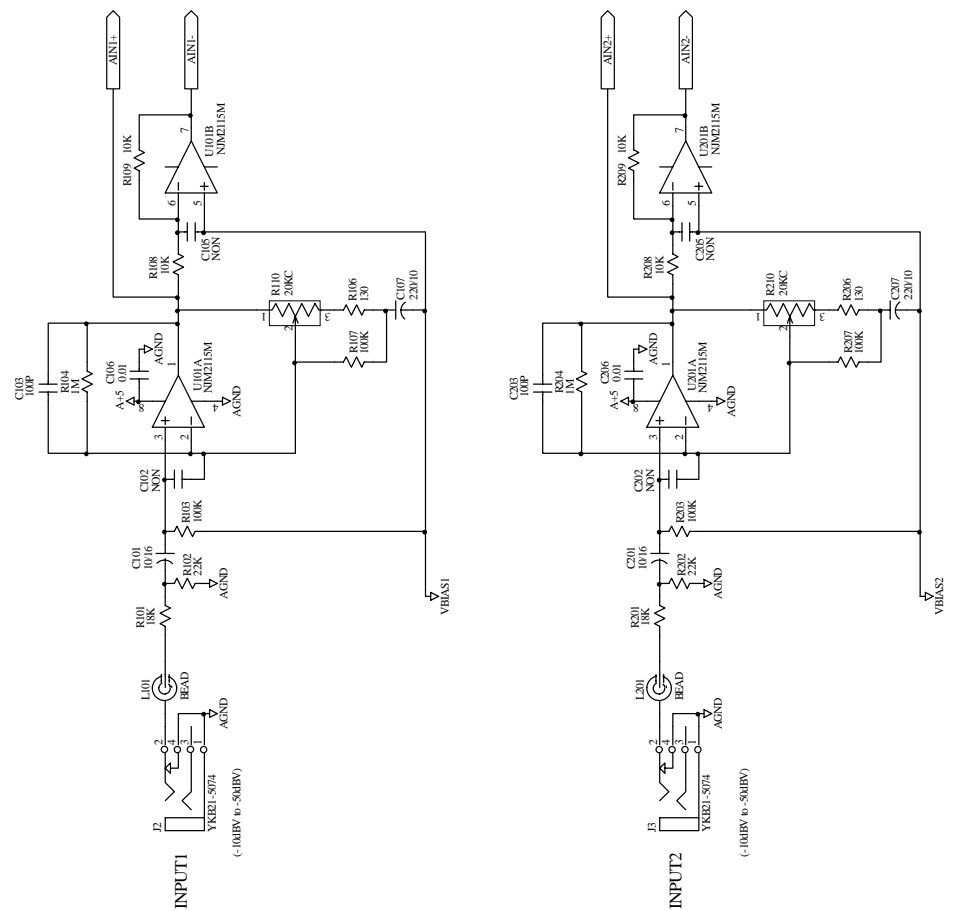
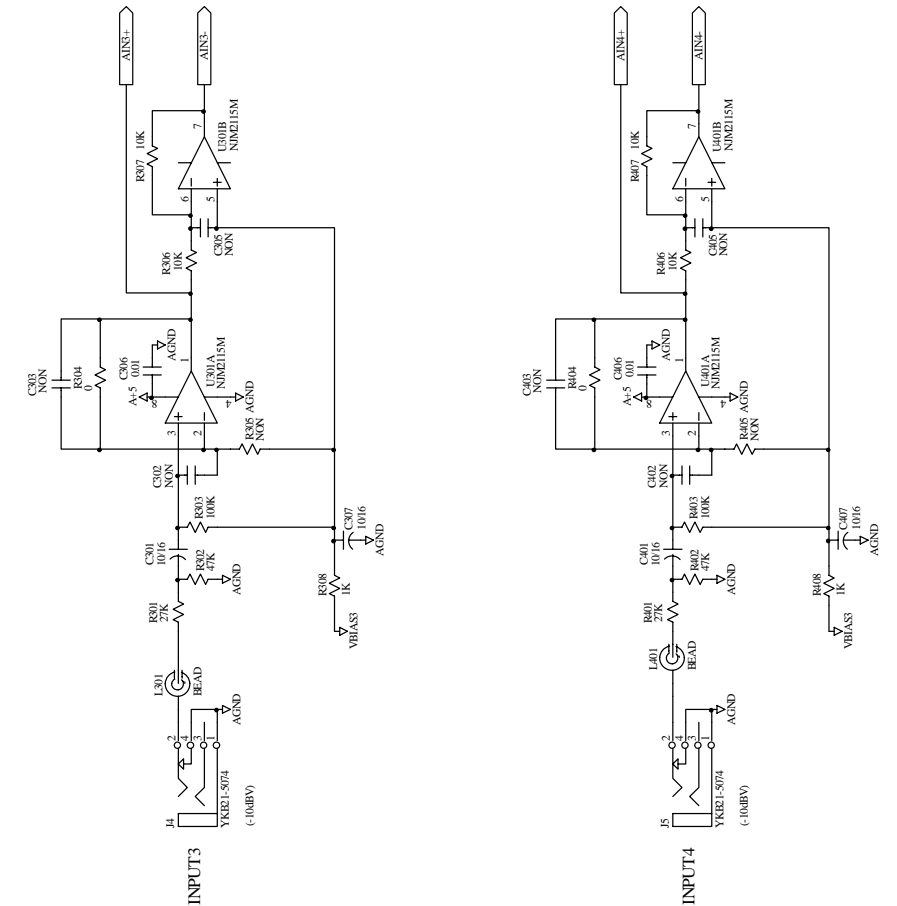
3-5 Test Scene RECALL

- 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

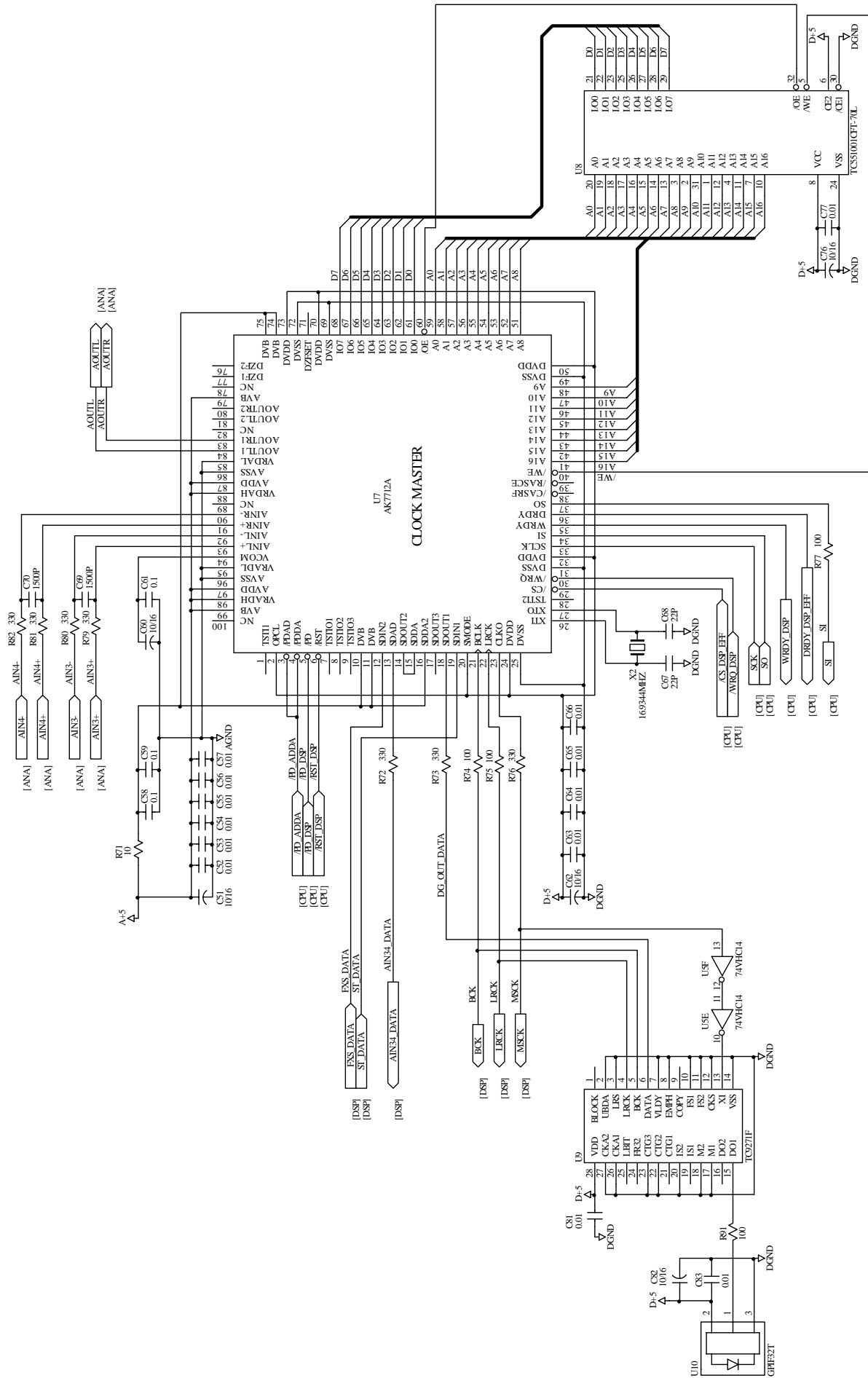
- TEST 1 Line Check 1~4 Output Level / Frequency Response
- TEST2 Line Check 1, 2 Output Level(Trim) / Frequency Response / Distortion / S/N(INPUT : Short)
- TEST 3 Line Check 3, 4 Output Level / Frequency Response / Distortion / S/N(INPUT : Short)
- TEST 4 Line Check 1~4 S/N(Σ4, INPUT : Short)
- TEST 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

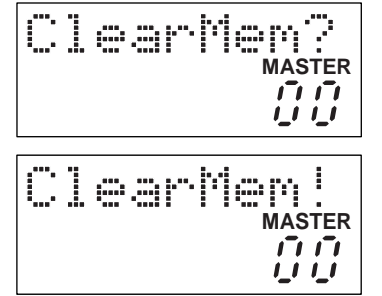
MAIN PCB : DSP (EFFECT)



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.

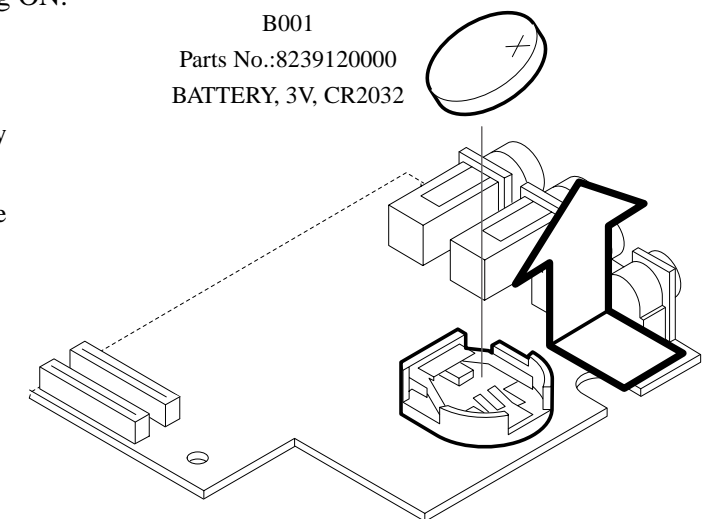
INPUT Fader		PAN	
MASTER	Fader	Left	Right
EFFECT	Send	Value	Gain (dB)
Value	Gain (dB)	Value	Gain (dB)
00	-∞	L10	0.0
01	-72.0	L9	-0.1
05	-55.0	L8	-0.25
10	-42.5	L7	-0.4
15	-35.0	L6	-0.7
20	-28.75	L5	-1.0
25	-23.0	L4	-1.4
30	-18.0	L3	-1.8
35	-15.5	L2	-2.2
40	-13.0	L1	-2.6
45	-10.5	C	-3.0
50	-8.5	R1	-4.2
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

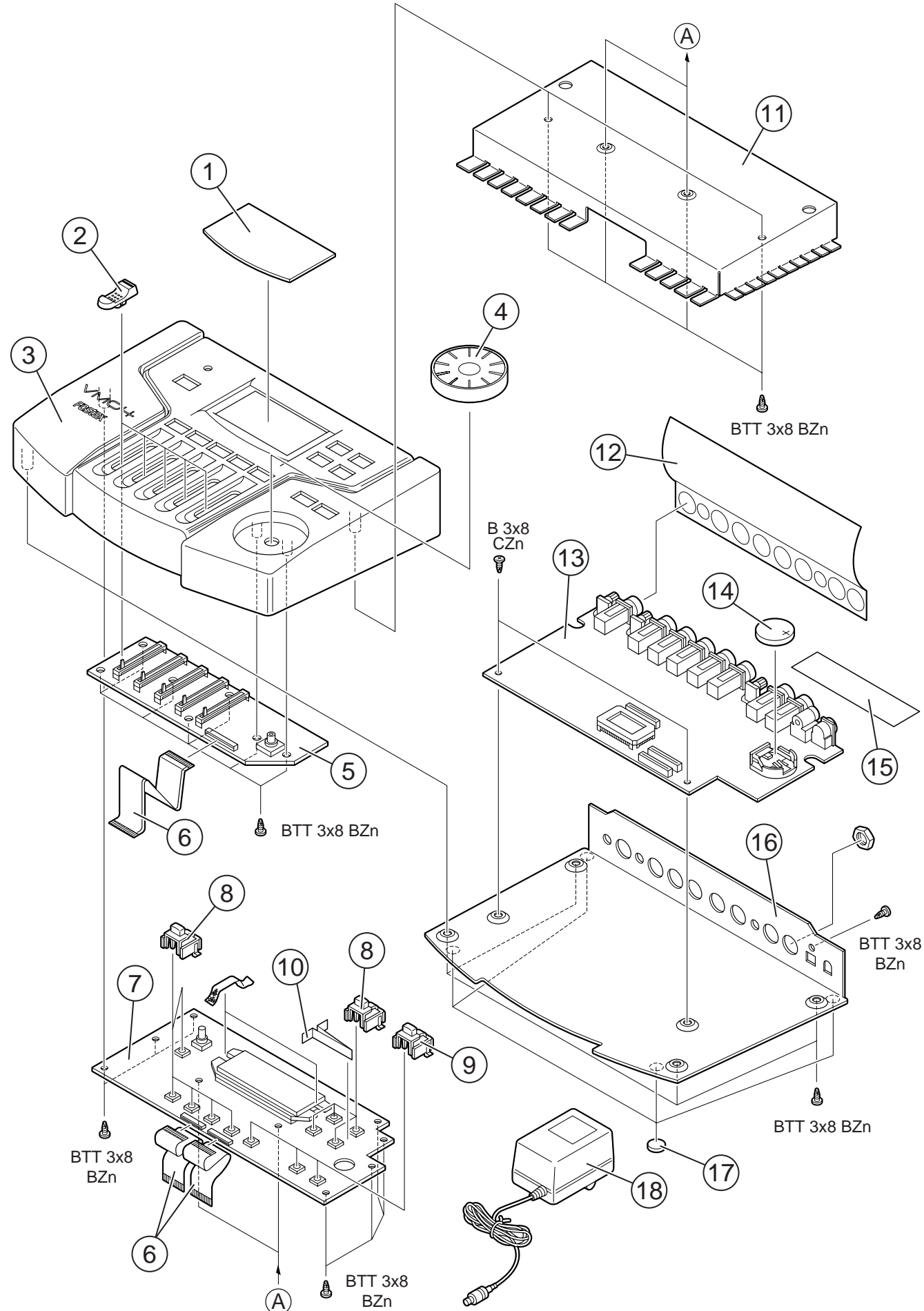
If the voltage of the inside memory backup battery falls below 2.2V, the message “BattEmpty” will appear when powering ON.

CAUTION

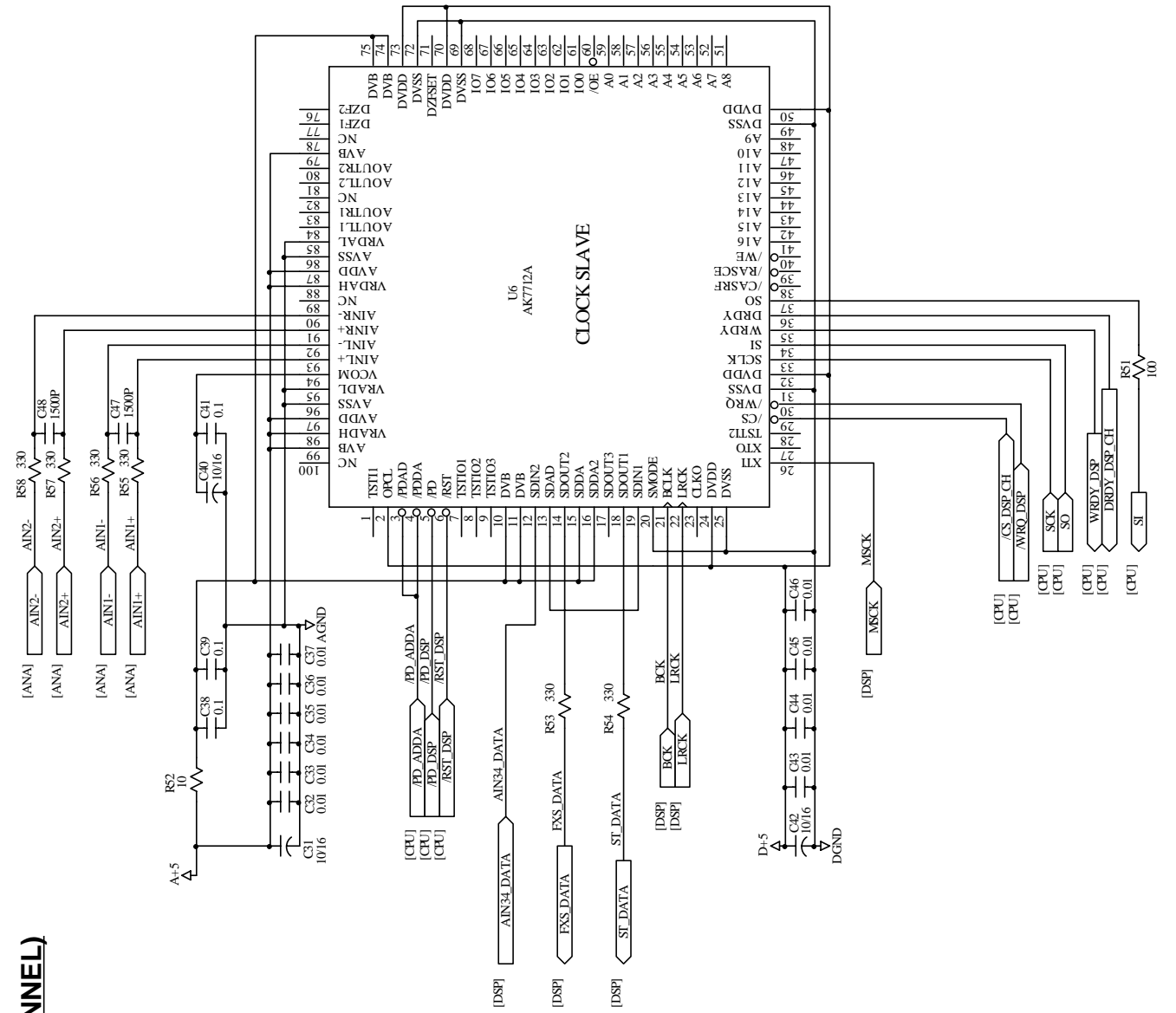
- Replacing the battery with the new one would basically initialize the backup data.
- In order to retain the backup data, please replace the battery while powering on.



4. EXPLODED VIEW

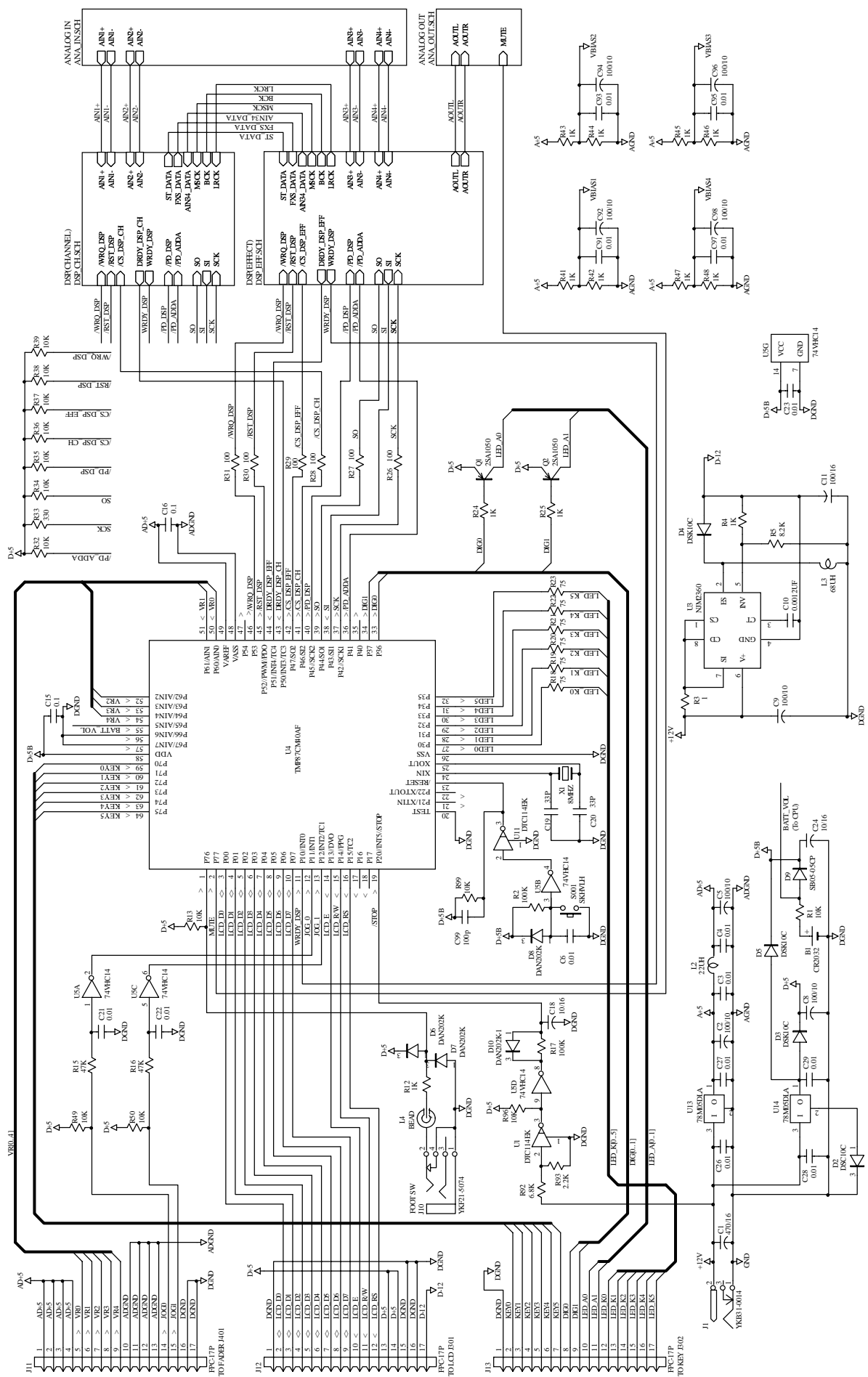


MAIN PCB : DSP (CHANNEL)



7. CIRCUIT DIAGRAMS

MAIN PCB : CPU



5. PARTS LIST

EXPLODED VIEW		
No.	Part No.	Description
1	8212653000	WINDOW, LCD, VM04
2	8226239001	KNOB, FADER, N4.5
3	8212652100	PANEL, TOP, VM04
4	8226238000	KNOB, JOG, FD-4
5	8274167000	PCB ASSY, FADER, VM04
6	8276839615	CABLE, FLAT, FFC, 17P, L150
7	8274166000	PCB ASSY, DISPLAY, VM04
8	8226246001	BUTTON, 7X13, LED
9	8226246002	BUTTON, 7X13, N4.5
10	8216695000	SHEET, LED, VM04
11	8221266000	SHIELD, MAIN, VM04
12	8216694000	SHIELD, EMI, VM04
13	8274165000	PCB ASSY, MAIN, VM04
14	8239120000	BATTERY, 3V, CR2032
15	8216699000	SHEET, BATTERY, VM04
16	8221265100	PANEL, BOTTOM, VM04
17	8260561000	Foot, Assy
18	8270818003	AC adaptor, AD-9B, USA/CND
	8270818006	AC adaptor, AD-9B, EUR
	8270818007	AC adaptor, AD-9B, UK
	8270818010	AC adaptor, AD-9B, JPN

Ref.No.	Part No.	Description
U001	8236570101	IC, ST, DG, DRIVER, DTC114EK
U003	8236541300	IC, ST, AN, DC-DC, NJM2360AM
U004	8236085201	IC, QFP, DG, CPU, VM04
U005	8236545014	IC, ST, TSSOP, 74VHC14
U006, 007	8236084900	IC, QFP, DG, DSP, AK7712A
U008	8236084600	IC, TSOP, SRAM, TC551001CFT-70L
U009	8236504900	IC, ST, DG, DIGITAL OUT, TC9271F
U010	8245317000	CONN, OPT, TOTX178
U011	8236570101	IC, ST, DG, DRIVER, DTC114EK
U012	8236570401	IC, ST, DG, DRIVER, DTA114EK
U013, 014	8236540301	IC, ST, REGULATOR, NJM78M05DLA
U101-401	8236505011	IC, ST, AN, OPAMP, NJM2115M(TEI)
U111	8236505011	IC, ST, AN, OPAMP, NJM2115M(TEI)
U112, 212	8236570201	IC, ST, DG, DRIVER, DTC314TK
U121, 221	8236570201	IC, ST, DG, DRIVER, DTC314TK
U122	8236037500	IC, DIP, AN, NJM3414AD

Ref.No.	Part No.	Description
Q001, 002	8234100802	TR, VT, PNP, 2SA1150Y

Ref.No.	Part No.	Description
D002-004	8234019612	D, VT, DSK10C-ET1
D005	8234019612	D, VT, DSK10C-ET1
D006, 007	8234502800	D, ST, DAN202K
D008	8234502800	D, ST, DAN202K
D009	8234502100	D, ST, SCHOTTKY, SB05-05CP
D010	8234502800	D, ST, DAN202K
D011	8234502800	D, ST, DAN202K

Ref.No.	Part No.	Description
R001	8230500103	ST, CARBON, 1/10W, 10K, 5%
R002	8230500104	ST, CARBON, 1/10W, 100K, 5%
R003	8230500109	ST, CARBON, 1/10W, 1, 5%
R004	8230500102	ST, CARBON, 1/10W, 1K, 5%
R005	8230500822	ST, CARBON, 1/10W, 8.2K, 5%
R006	8230500103	ST, CARBON, 1/10W, 10K, 5%
R012	8230500102	ST, CARBON, 1/10W, 1K, 5%
R013	8230500103	ST, CARBON, 1/10W, 10K, 5%
R015, 016	8230500473	ST, CARBON, 1/10W, 47K, 5%
R017	8230500104	ST, CARBON, 1/10W, 100K, 5%
R018-023	8230500750	ST, CARBON, 1/10W, 75, 5%
R024, 025	8230500102	ST, CARBON, 1/10W, 1K, 5%
R026-031	8230500101	ST, CARBON, 1/10W, 100, 5%
R032	8230500103	ST, CARBON, 1/10W, 10K, 5%

RESISTORS		
Ref.No.	Part No.	Description
R033	8230500331	ST, CARBON, 1/10W, 330, 5%
R034-039	8230500103	ST, CARBON, 1/10W, 10K, 5%
R041-046	8230500102	ST, CARBON, 1/10W, 1K, 5%
R047, 048	8230500103	ST, CARBON, 1/10W, 10K, 5%
R049, 050	8230500103	ST, CARBON, 1/10W, 10K, 5%
R051	8230500101	ST, CARBON, 1/10W, 100, 5%
R052	8230500100	ST, CARBON, 1/10W, 10, 5%
R053, 054	8230500331	ST, CARBON, 1/10W, 330, 5%
R055-058	8230500331	ST, CARBON, 1/10W, 330, 5%
R071	8230500100	ST, CARBON, 1/10W, 10, 5%
R072, 073	8230500331	ST, CARBON, 1/10W, 330, 5%
R074, 075	8230500101	ST, CARBON, 1/10W, 100, 5%
R076	8230500331	ST, CARBON, 1/10W, 330, 5%
R077	8230500101	ST, CARBON, 1/10W, 100, 5%
R079-082	8230500331	ST, CARBON, 1/10W, 330, 5%
R090	8230500103	ST, CARBON, 1/10W, 10K, 5%
R091	8230500101	ST, CARBON, 1/10W, 100, 5%
R092	8230500103	ST, CARBON, 1/10W, 10K, 5%
R093	8230500222	ST, CARBON, 1/10W, 2.2K, 5%
R094	8230500103	ST, CARBON, 1/10W, 10K, 5%
R095	8230500104	ST, CARBON, 1/10W, 100K, 5%
R096	8230500103	ST, CARBON, 1/10W, 10K, 5%
R101, 201	8230500183	ST, CARBON, 1/10W, 18K, 5%
R102, 202	8230500223	ST, CARBON, 1/10W, 22K, 5%
R103, 203	8230500104	ST, CARBON, 1/10W, 100K, 5%
R104, 204	8230500105	ST, CARBON, 1/10W, 1M, 5%
R106, 206	8230500131	ST, CARBON, 1/10W, 130, 5%
R107, 207	8230500104	ST, CARBON, 1/10W, 100K, 5%
R108, 208	8230500103	ST, CARBON, 1/10W, 10K, 5%
R109, 209	8230500103	ST, CARBON, 1/10W, 10K, 5%
R110, 210	8240154010	POT, PL, RT9, 20KC, RK09K111
R111, 211	8230500104	ST, CARBON, 1/10W, 100K, 5%
R112, 212	8230500104	ST, CARBON, 1/10W, 100K, 5%
R113, 213	8230500273	ST, CARBON, 1/10W, 27K, 5%
R114, 214	8230500104	ST, CARBON, 1/10W, 100K, 5%
R115, 215	8230500102	ST, CARBON, 1/10W, 1K, 5%
R116, 216	8230500102	ST, CARBON, 1/10W, 1K, 5%
R121, 221	8230500102	ST, CARBON, 1/10W, 1K, 5%
R122, 222	8230500104	ST, CARBON, 1/10W, 100K, 5%
R123, 223	8230500471	ST, CARBON, 1/10W, 470, 5%
R124, 224	8230500472	ST, CARBON, 1/10W, 4.7K, 5%
R125, 225	8230500103	ST, CARBON, 1/10W, 10K, 5%
R126, 226	8230500100	ST, CARBON, 1/10W, 10, 5%
R127, 227	8230500102	ST, CARBON, 1/10W, 1K, 5%
R131	8240168003	POT, PI, RT 9, 50KAA, RK09K12A
R301, 401	8230500273	ST, CARBON, 1/10W, 27K, 5%
R302, 402	8230500473	ST, CARBON, 1/10W, 47K, 5%
R303, 403	8230500104	ST, CARBON, 1/10W, 100K, 5%
R304, 404	8230500000	ST, CARBON, 1/10W, 0, 5%
R306, 406	8230500103	ST, CARBON, 1/10W, 10K, 5%
R307, 407	8230500103	ST, CARBON, 1/10W, 10K, 5%
R308, 408	8230500102	ST, CARBON, 1/10W, 1K, 5%

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, 10µF, 20%
C010	8233500122	ST, CER, 50V, 0.0012µF, 10%
C011	8232143107	VT, ALU, 16V, 10µF, 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

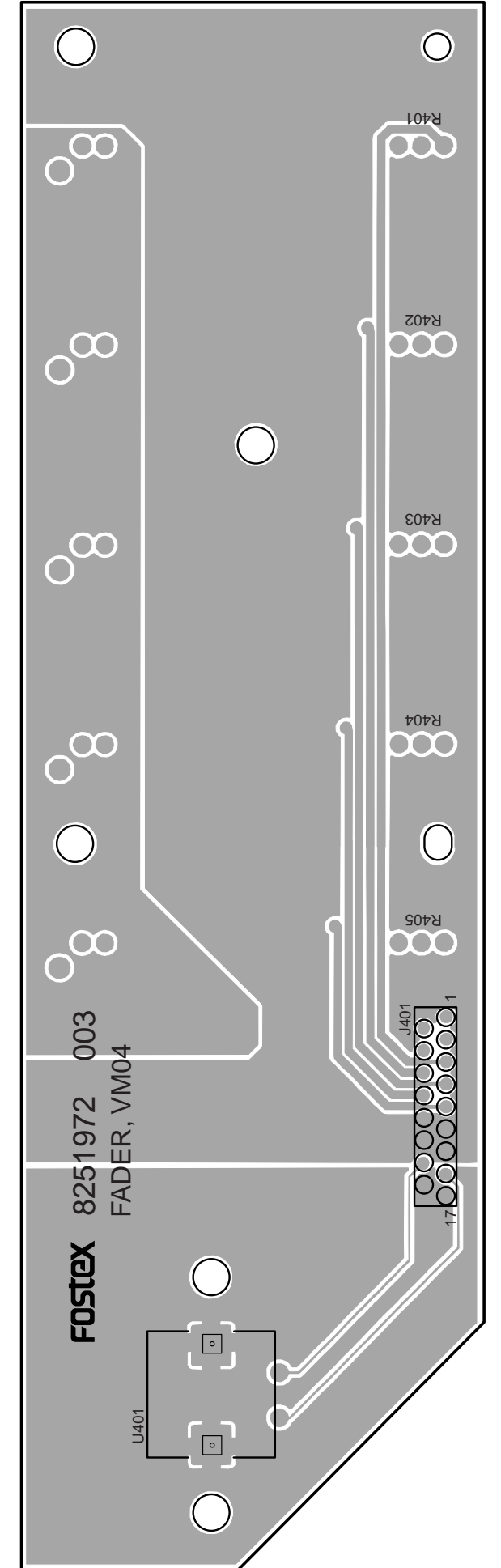
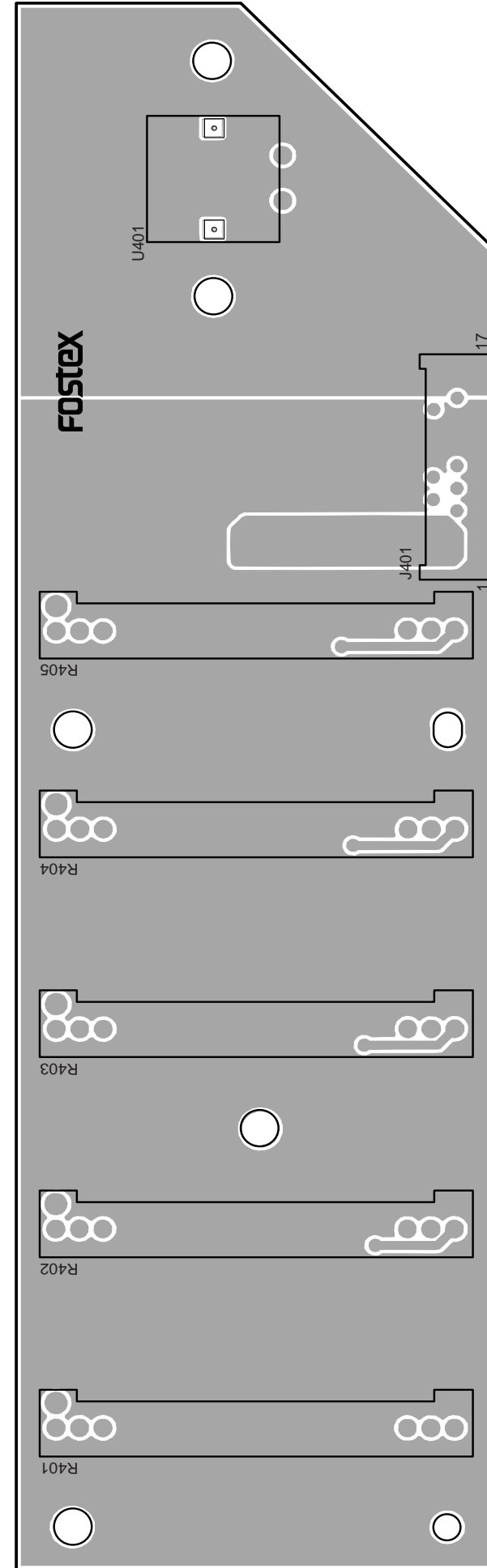
Ref.No.	PartNo.	Description
U401	8253466000	SW, PI, ENCODER, EC12E

RESISTOR

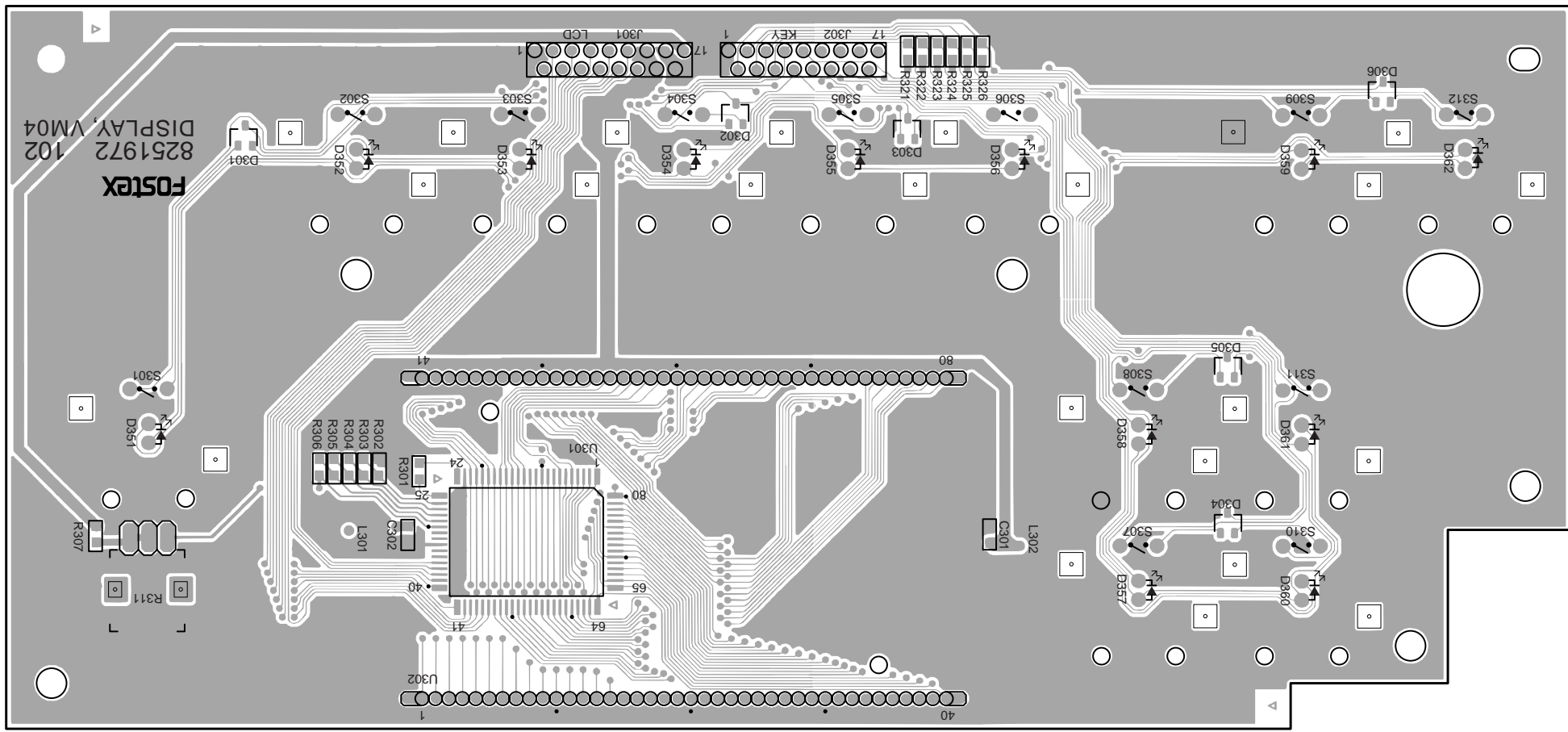
Ref.No.	PartNo.	Description
R401~405	8240274005	POT, PI, SL30, 10KB, RS30H11

MISCELLANEOUS

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

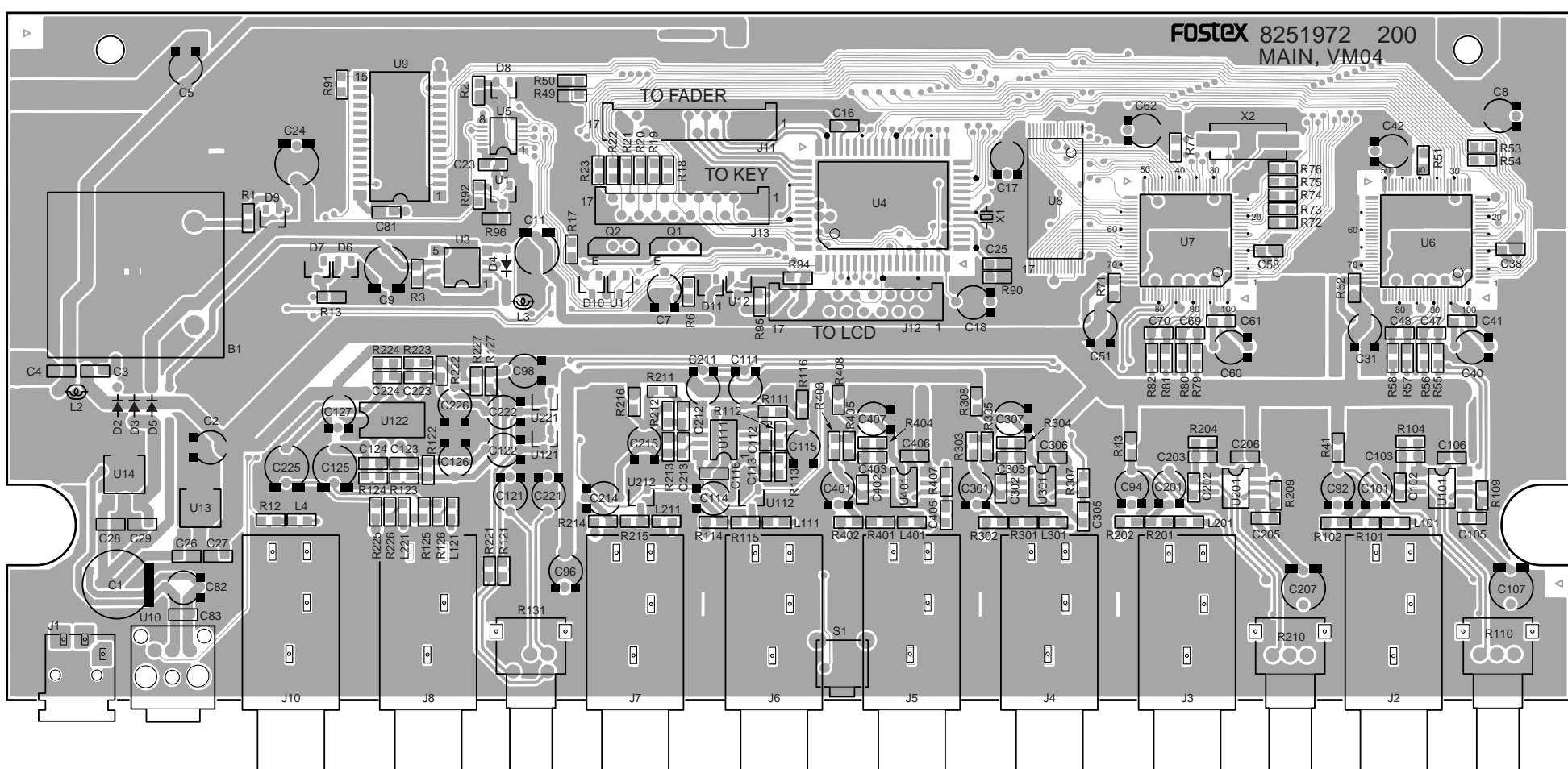


DISPLAY PCB : FOIL SIDE

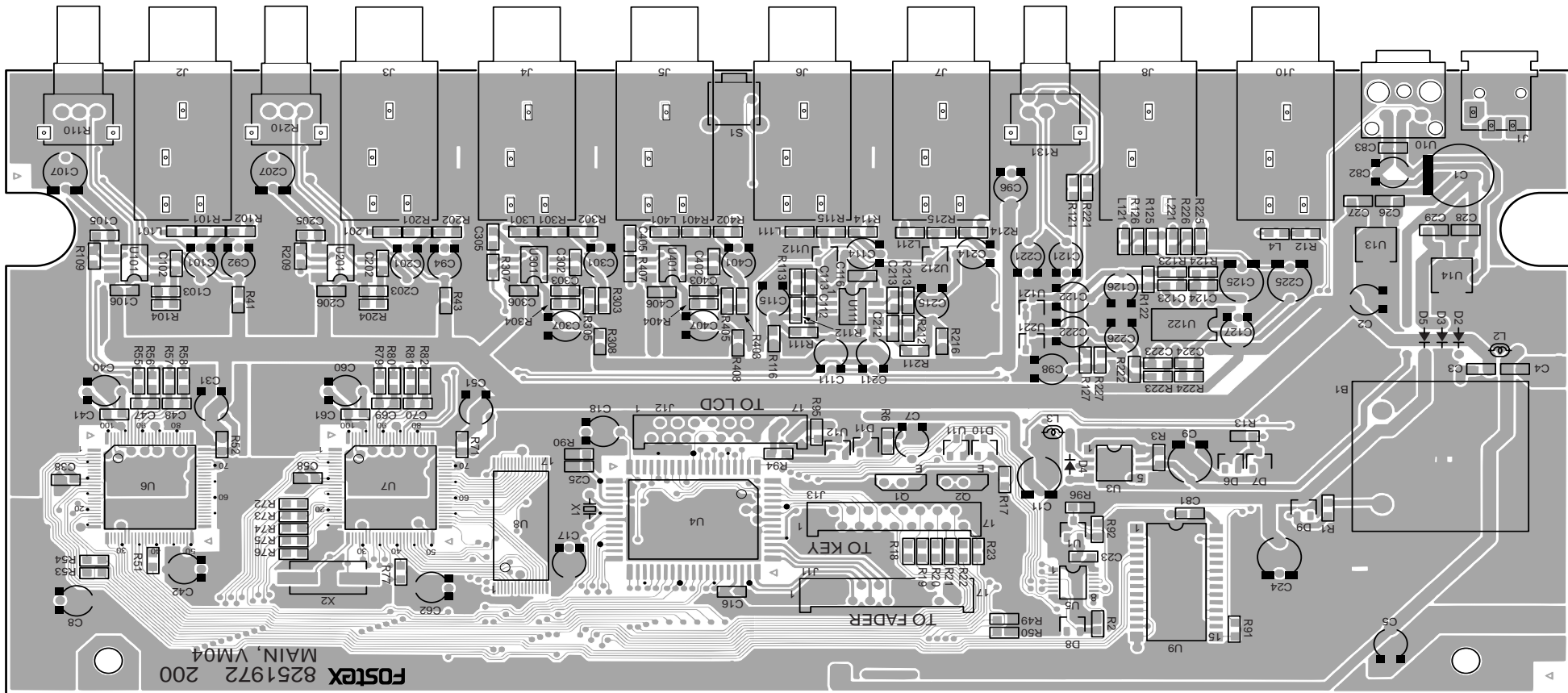


6. PCB PATTERN DRAWING

MAIN PCB : PARTS SIDE



MAIN PCB : FOIL SIDE



DISPLAY PCB : PARTS SIDE

