Service Manual

Model

FD-8

DIGITAL MULTITRACKER

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 lightening 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.

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 changed 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.

TABLE OF CONTENTS

NOTES

* Service mode, error code list, exploded view, PCB assembly, parts list and circuit diagrams are given in this manual to assist the service technician in maintaining the Model FD-8.

* The following accessories are supplied with FD-8 as the standard accessories.

Owner's manual	: 8288419100 (for export model)
	: 8288420000 (for domestic model)
Quick manual	: 8288423100 (for export model)
	: 8288424000 (for domestic model)

* Following is the packing material for the Model FD-8.

Carton, inner, FD-8	: 8228719000
Packing, side, L, FD-4/8	: 8228440000
Packing, side, R, FD-4/8	: 8228441000

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

RECORD & REPRODUCE

Recording Medium	External fixed / removable hard disk drive
	Internal 2.5” E-IDE hard disk drive (option)
Standard	SCSI-2 or better
Sampling Frequency	44.1 kHz
Quantization	16-bit linear
Emphasis	Not available
Compression / Expansion Method	A.D.A.C. (Advanced Digital Audio Acoustic Coding)
Recording Time (mono track min.)	
MASTERING mode	About 18 min. / 100 MB at maximum
NORMAL mode	About 72 min. / 100 MB at maximum
	Recording time will be limited up to 24 hours.
Number of Tracks	24 tracks (8 + 16 additional tracks)
Number of recording tracks	2 (8 when ADAT digital signal is input to DATA IN port)
Number of simultaneous recording tracks	Depending on characteristics of recording medium
Number of simultaneous playback tracks	8
Recording Format	FDMS-3
Recording Mode	NORMAL mode (A.D.A.C., 8 + 16 tracks, default)
	MASTERING mode (linear recording, 8 + 16 tracks)
	BACKUP mode (for data archiving)

ELECTRICAL (0 dBV = 1 V)

• MIXER SECTION

Reference Input Level	
MIC	-50, -30 dBV
Impedance	20 kΩ or more
LINE	-10 dBV
Impedance	20 kΩ or more
RECORDER IN	-10 dBV
Impedance	20 kΩ or more
AUX RTN	-20 dBV
Impedance	8 kΩ or more
DATA IN	
Connector	Square shape optical
Format	IEC consumer optical standard IEC 958 Part 3
	ALESIS Proprietary Multi Channel Optical Digital Interface
Reference Output Level	
STEREO	-10 dBV
Load impedance	10 kΩ or more
AUX SEND	-10 dBV
Load Impedance	10 kΩ or more
MONITOR	-10 dBV
Load impedance	10 kΩ or more
HEADPHONE	20 mW at maximum (Load: 16 Ω)
	50 mW at maximum (Load: 50 Ω)

ELECTRICAL (continued)

DATA OUT

Connector	Square shape optical
Format	IEC consumer optical standard IEC 958 Part 3 ALESIS Proprietary Multi Channel Optical Digital Interface

SCSI DATA input / output

Connector	D-SUB 25-pin
Protocol	SCSI-2, unbalanced transfer method
Transfer type	Asynchronous
Number of device to be connected	2
SCSI ID: 0 ~ 5	Recording / reproducing
SCSI ID: 6	Data backup

Fader / Knob Position at Reference Input / Output

MASTER fader	At 8 ~ 9 position (AUX RTN : -20 dBV / 1 kHz, AUX RTN VR: MAX. Adjust master fader for -10 dBV output at STEREO OUT.)
MONITOR knob	At 2 ~ 5 position (AUX RTN : -20 dBV / 1 kHz, MON SEL: ST+MON, ST. Adjust MONITOR knob for -10 dBV output at MONITOR OUTPUT.)
INPUT fader	At 7 ~ 8 position (INPUT: -10 dBV / 1 kHz, EQ GAIN: 0, PAN: L (R). Adjust input fader for -10 dBV output at STEREO OUT.)

Output Level

INPUT (1 ~ 8) → AUX SEND	-10 dBV +0, -2 dB (INPUT: -10 dBV / 1 kHz, EQ GAIN: 0, PAN: L (R), AUX1, 2 VR: CH MAX, input fader: at 7 ~ 8 position.)
INPUT (1 ~ 8) → MONITOR	-10 dBV +1, -2 dB (INPUT: -10 dBV / 1 kHz, EQ GAIN: 0, PAN: L (R), MON VR: MON MAX, MON PAN: L (R), input fader: at 7 ~ 8 position.)

Frequency Response

INPUT (1 ~ 8) → MONITOR	20 ~ 20 kHz +1, -3 dB (INPUT: -50 dBV) 20 ~ 20 kHz +1, -2 dB (INPUT: -10 dBV)
INPUT (1 ~ 8) → AUX SEND	20 ~ 20 kHz +1, -2 dB (INPUT: -10 dBV)
AUX RTN → MONITOR OUT	20 ~ 20 kHz +1, -2 dB (AUX RTN: -20 dBV)
AUX RTN → PHONES	80 ~ 20 kHz +1, -2 dB (AUX RTN: -20 dBV, at 20 mW / 16 Ω output)

EQ Characteristics

High (12 kHz) & Low (80 Hz)	+15 dB ± 3 dB at “+15” position -15 dB ± 3 dB at “-15” position
Mid (200 Hz ~ 5 kHz)	+15 dB ± 3 dB at “+15” position -15 dB ± 3 dB at “-15” position

ELECTRICAL (continued)

S / N

INPUT		OUTPUT		S / N	
	LEVEL		LEVEL	UNWTD.	AWTD.
INPUT	-50 dBV	AUX SEND	-10 dBV	66 dB or more	68 dB or more
	-38 dBV	AUX SEND	+2 dBV	78 dB or more	80 dB or more
	-10 dBV	AUX SEND	-10 dBV	77 dB or more	79 dB or more
	+2 dBV	AUX SEND	+2 dBV	89 dB or more	91 dB or more
INPUT Σ8	-50 dBV	MONITOR	-10 dBV	63 dB or more	65 dB or more
	-38 dBV	MONITOR	+2 dBV	75 dB or more	77 dB or more
	-10 dBV	MONITOR	-10 dBV	70 dB or more	72 dB or more
	+2 dBV	MONITOR	+2 dBV	82 dB or more	84 dB or more
Residual Noise	VR: MIN	PHONES			-75 dBV or less

Distortion

INPUT		OUTPUT		FREQ. RANGE	DISTORTION
	LEVEL		LEVEL		
INPUT	-40 dBV	MONITOR	0 dBV	100 ~ 10 kHz	0.05 % or less
	0 dBV	MONITOR	0 dBV	100 ~ 10 kHz	0.05 % or less
	0 dBV	AUX SEND	0 dBV	100 ~ 10 kHz	0.05 % or less
AUX RTN	-10 dBV	MONITOR	0 dBV	100 ~ 10 kHz	0.05 % or less
	-10 dBV	PHONES	20 mW	1 kHz	0.10 % or less

Crosstalk 60 dB or more / 1 kHz

Click Noise

Power on / off -20 dBV p-p or less

Other switching -50 dBV p-p or less

MIDI Controlling Operation check should be executed using the test mode with connecting the MIDI IN and OUT terminal.

• RECORDER SECTION

Frequency Response 20 ~ 20 kHz +1, -2 dB

Full Scale Output Level (Ref: -12 dB) +2 dBV ± 1 dB

Dynamic Range 88 dB or more

Total Harmonic Distortion 0.02 % or less (1 kHz, +2 dBV)

Channel Separation 80 dB or more (1 kHz, max. recording level)

S / N 88 dB or more (A-WTD.)

Power Consumption

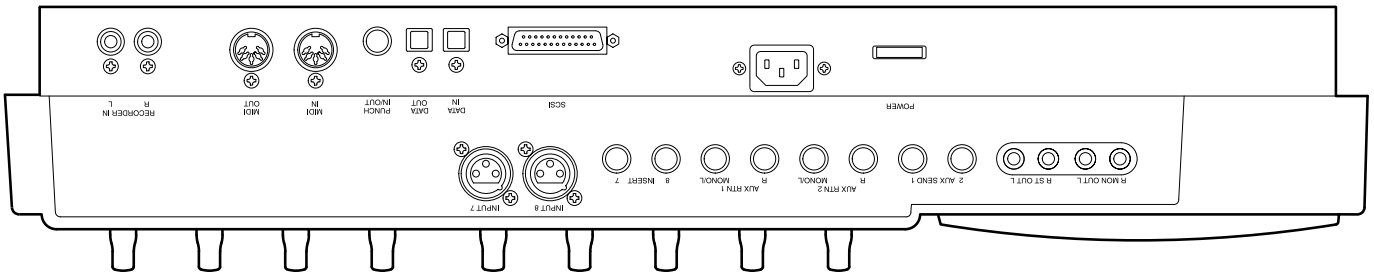
JPN 15 W

Others 17 W

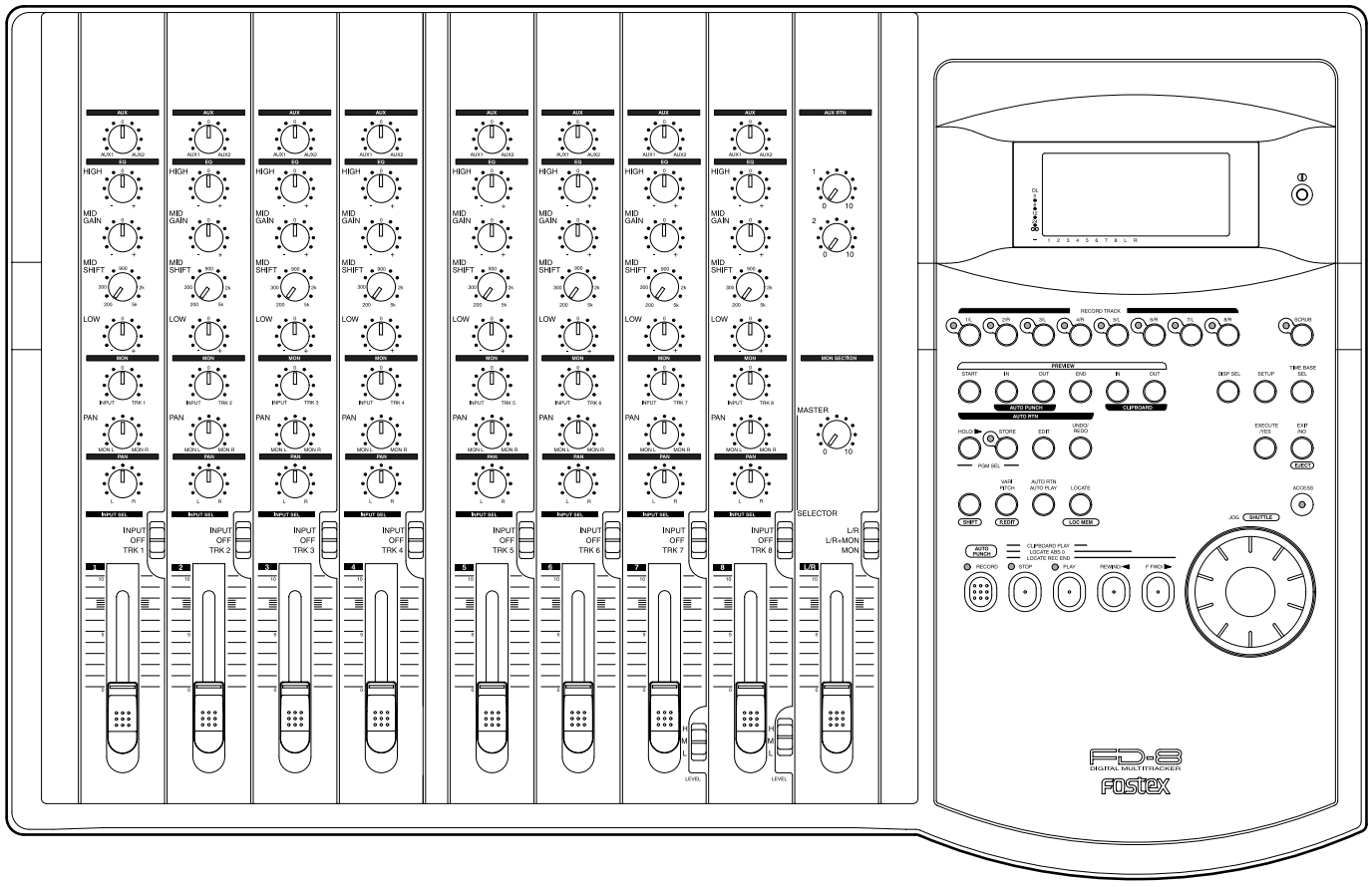
Specifications and appearance are subject to change without notice for product improvement.

2. CONTROLS, INDICATORS & CONNECTORS

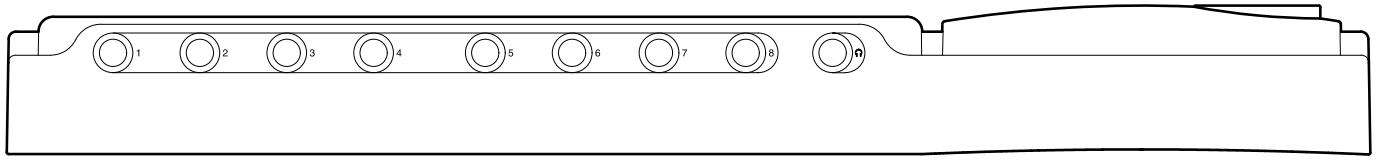
Rear Panel



Control Panel

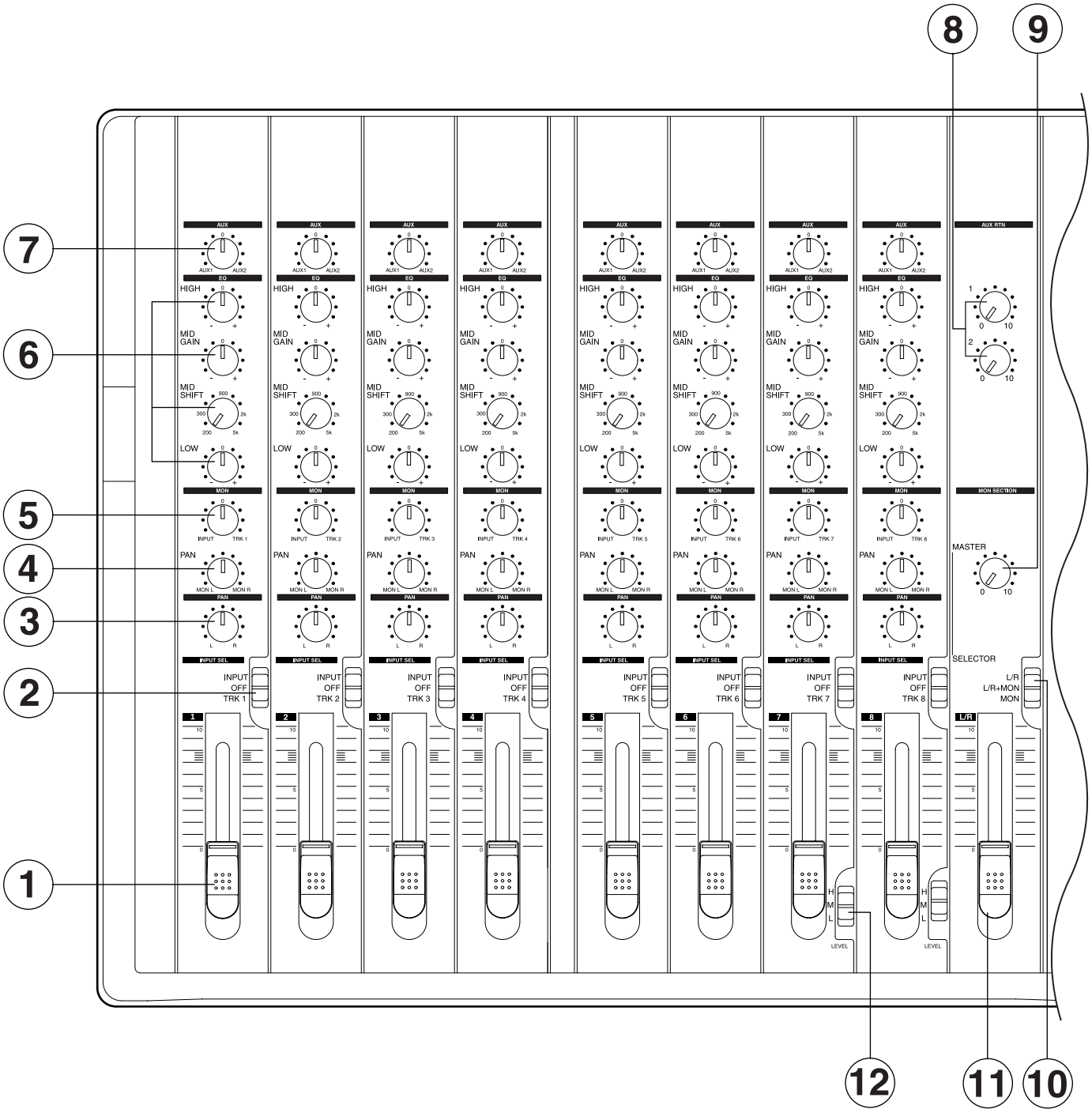


Front Panel



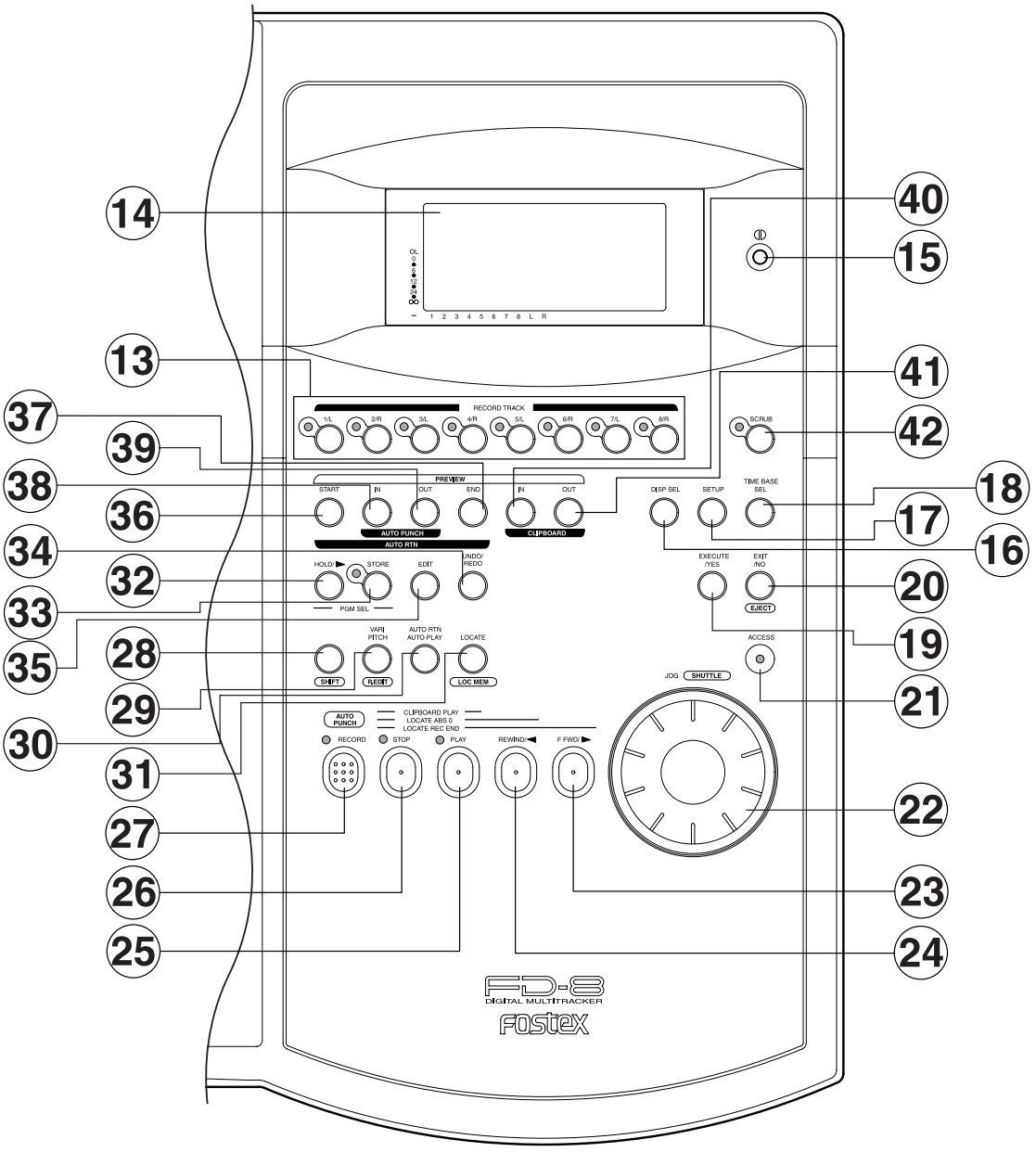
Control Panel (Mixer Section)

1. Input faders [1-8]
2. Input select switches [INPUT SEL (INPUT/OFF/TRK)]
3. Panpot knobs [PAN (L/R)]
4. Monitor panpot knobs [PAN (MON L/MON R)]
5. Monitor level control knob [MON (INPUT/TRK)]
6. Equalizer control knobs [EQ (HIGH/MID GAIN & SHIFT/LOW)]
7. AUX send knobs [AUX (AUX 1/AUX 2)]
8. AUX return knobs [AUX RTN (1, 2)]
9. Monitor master knob [MONITOR SECTION (MASTER)]
10. Monitor select switch [SELECTOR (L/R, L/R+MON, MON)]
11. Master fader [L/R]
12. Input level switches [LEVEL (H/M/L)]



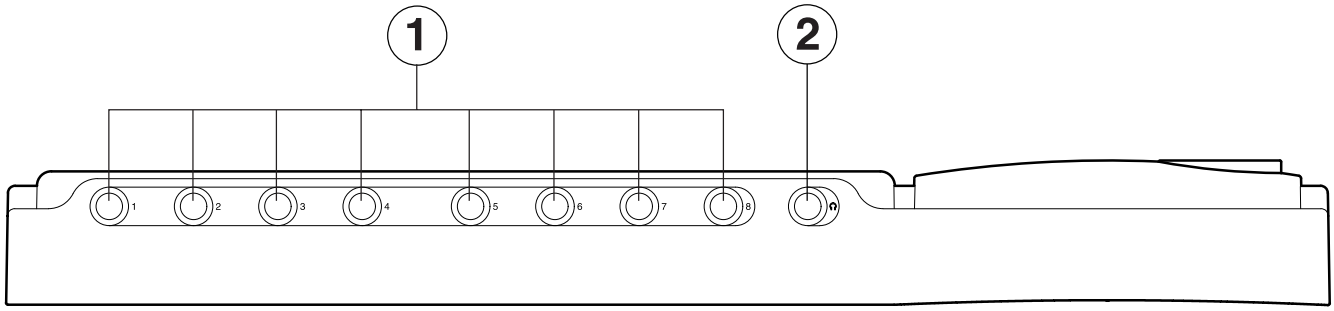
Control Panel (Recorder Section)

13. Record track select keys [RECORD TRACK (1/L, 2/R, 3/L, 4/R, 5/L, 6/R, 7/L, 8/R)]
14. LCD
15. Contrast adjustment knob
16. Display indication select key [DISP SEL]
17. Setup key [SETUP]
18. Time Base select key [TIME BASE SEL]
19. Execute/Yes key [EXECUTE/YES]
20. Exit/No key [EXIT/NO/(EJECT)]
21. Access LED [ACCESS]
22. JOG dial [JOG/(SHUTTLE)]
23. Fast forward button [F FWD/ ▶]
24. Rewind button [REWIND/ ◀]
25. Play button [PLAY]
26. Stop button [STOP]
27. Record button [RECORD/(AUTO PUNCH)]
28. Shift key [(SHIFT)]
29. Vari Pitch key [VARI PITCH/(P.EDIT)]
30. Auto Return/Auto Play mode on/off key [AUTO RTN/AUTO PLAY]
31. Locate key [LOCATE/(LOC MEM)]
32. Hold/ ▶ key [HOLD/ ▶]
33. Store key [STORE]
34. Undo/Redo key [UNDO/REDO]
35. Edit key [EDIT]
36. Auto Return Start key [AUTO RTN START/(PREVIEW)]
37. Auto Return End key [AUTO RTN END/(PREVIEW)]
38. Auto Punch In key [AUTO PUNCH IN/(PREVIEW)]
39. Auto Punch Out key [AUTO PUNCH OUT/(PREVIEW)]
40. Clipboard In key [CLIPBOARD IN/(PREVIEW)]
41. Clipboard Out key [CLIPBOARD OUT/(PREVIEW)]
42. Scrub key [SCRUB]



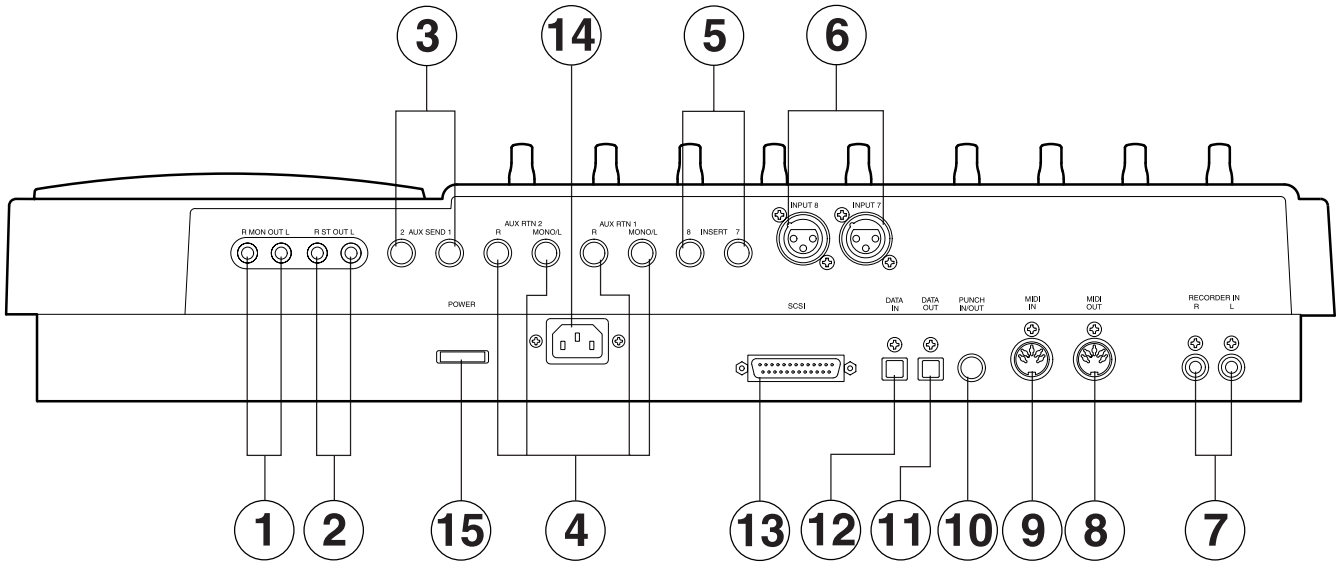
Front Panel

1. Input jacks [1, 2, 3, 4, 5, 6, 7, 8] (Phone)
2. Headphone jack [PHONES] (TRS Phone)



Rear Panel

1. Monitor Out jacks [MON OUT L, R] (RCA pin)
2. Stereo Out jacks [ST. OUT L, R] (RCA pin)
3. AUX Send jacks 1, 2 [AUX SEND 1, 2] (Phone)
4. AUX Return jacks 1, 2 [AUX RTN 1, 2] (Phone)
5. Insert jacks 7, 8 [INSERT 7, 8] (TRS Phone)
6. Balanced input connectors 7, 8 [INPUT 7, 8] (Balanced XLR)
7. Recorder in jacks L, R [RECORDER IN L, R] (RCA pin)
8. MIDI OUT jack [MIDI OUT] (DIN 5-pin)
9. MIDI IN jack [MIDI IN] (DIN 5-pin)
10. Punch in/out jack [PUNCH IN/OUT] (Phone)
11. Data output jack [DATA OUT] (OPTICAL)
12. Data input jack [DATA IN] (OPTICAL)
13. SCSI connector [SCSI] (D-SUB 25-pin)
14. AC IN connector
15. Power switch [POWER]



3. SOFTWARE UPDATE

Same as the FD-4, the FD-8 software can be updated through the SCSI port. This means that unscrewing and opening up the FD-8 top panel is not necessary to change the EPROMs. Please refer to the following explanation for correct software updating procedures.

3-1. Method of Sending Software from Fostex Japan

There are two ways of sending the FD-8 updated software.

1. Updated software in a removable medium (e.g. floppy disk, zip disk, etc.) to be sent via airmail
2. Updated software as an attachment file to be sent via E-mail

3-2. Required Tools

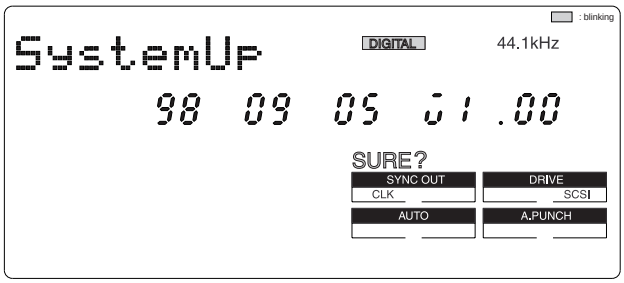
The following tools/equipment are required to update the FD-8 software.

1. IBM PC/AT compatible computer with SCSI board
2. Removable type SCSI drive
3. Cable between the removable type SCSI drive and the SCSI board
4. Cable between the removable type SCSI drive and the FD-8 (D-SUB 25-pin)

3-3. Software Updating Procedures

Presuming that the updated software is correctly sent and is copied into your computer.

1. Connect the removable type SCSI drive to the IBM PC/AT compatible computer SCSI port.
2. Insert the diskette to the removable type SCSI drive and format it by the computer on which Windows 95/98 is running.
3. Copy the updated software file to the removable type SCSI drive (diskette).
4. Set the removable type SCSI drive ID to 0 ~ 5 and connect to the FD-8 SCSI port.
5. Insert the diskette with updated software file. The FD-8 LCD display shows “No Disk”, “Initial..”, “name of drive (e.g. ZIP 100)” and “FD8MOT” in order and comes to a standstill at the display below. Memorize the displayed ROM version and date before updating the software.



6. Pressing the EXECUTE/YES key would start updating the software. The display shows “Loading!”, “Writing!” and “Initial..” in order and automatically returns to the above condition again. Check the displayed ROM version and date if the software is correctly updated by comparing to the ones displayed in the above procedure 7.
7. Eject the diskette with updated software file by the press of STOP or EXIT/NO key and insert the diskette formatted by the FD-8.
8. Confirm the software version by the Service Mode. For details, please refer to the section “4-2. Flash ROM/CPU version”.

CAUTION:

1. The diskette in which the updated software file is copied must be formatted by IBM PC/AT computer, not by Macintosh.
2. If something wrong happens while updating the software (e.g. A blackout occurred while updating the software.), the FD-8 might not be able to boot up the system software inside the Flash ROM. In such a case, please refer to the section “4-8. Flash ROM” (page 17).
3. The SCSI ID to be connected to the FD-8 must be selected to 0 ~ 5. The SCSI ID “6” is used for backing up purpose exclusively. The SCSI ID “7” cannot be used by technical reasons.

4. SERVICE MODE

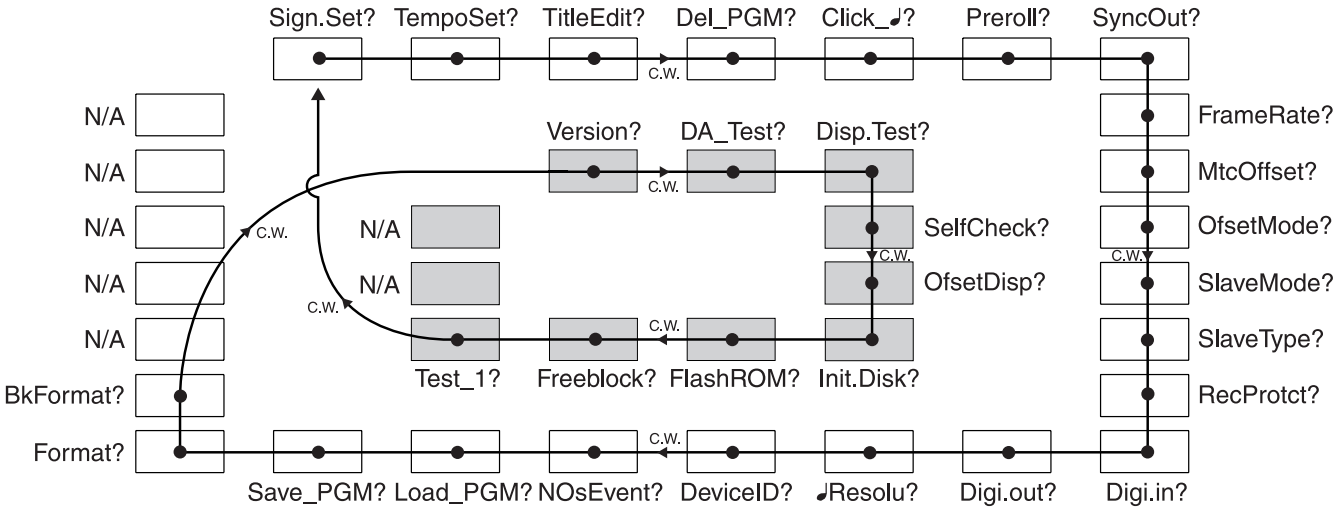
There are various optional modes available in the FD-8 Service Mode. Please utilize them when servicing the unit.

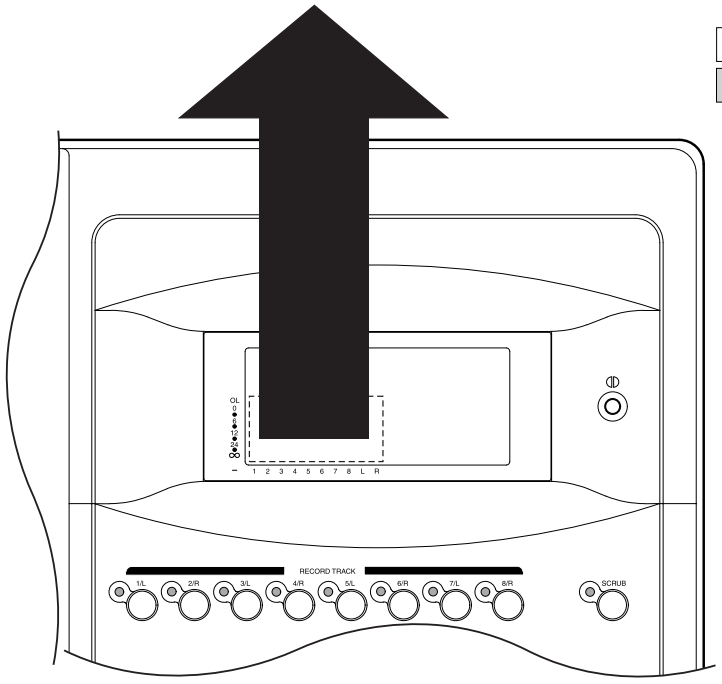
4-1. Putting FD-8 into Service Mode

The way of putting the FD-8 into Service Mode is as follow.

1) Connect a SCSI device, insert the diskette formatted by the FD-8 and turn the power of SCSI device on.
2) After confirming that the access LED on the SCSI device is lit and then goes out, turn on the power of FD-8.
3) While holding down the STOP button and SHIFT key, press the SETUP key.

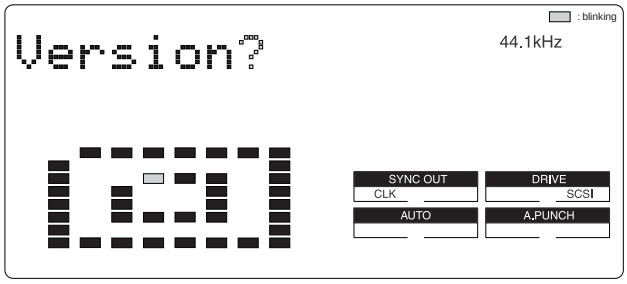
As shown below, by rotating the jog dial C.W. or C.C.W., various optional modes will be displayed in addition to the general SETUP menus. In order to select a certain optional mode, press the EXECUTE/YES key while its menu is displayed.





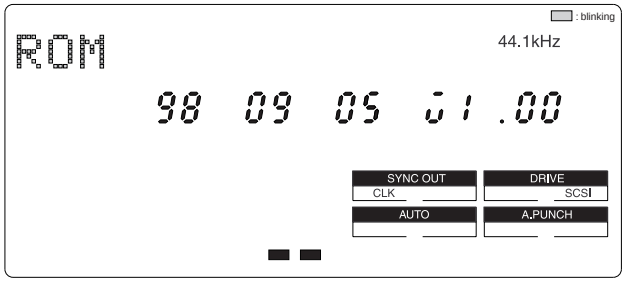
FD-8 LCD Display Section

4-2. Flash ROM & CPU version



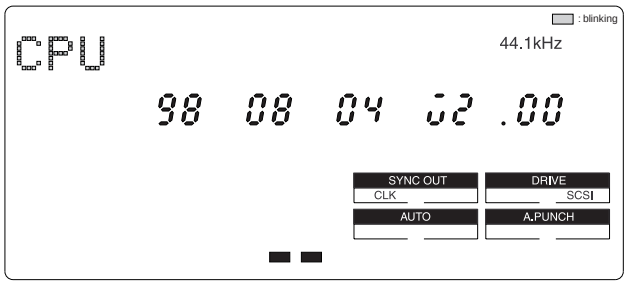
This mode is used to check the Flash ROM and CPU versions currently installed in the unit.

In order to check the version number, press the “EXECUTE/ YES” key while “?” is blinking as shown in the left.



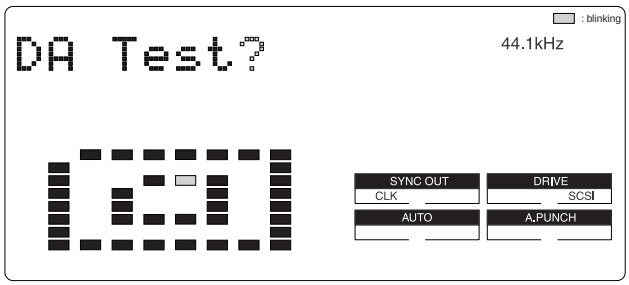
The example on the left indicates that the Flash ROM version is V1.00 and its programming date is September 5, 1998.

In this condition, by turning the jog dial C.W. or C.C. W., the CPU version can be checked.



The example on the left indicates that the CPU version is V2.00 and its programming date is August 4, 1998.

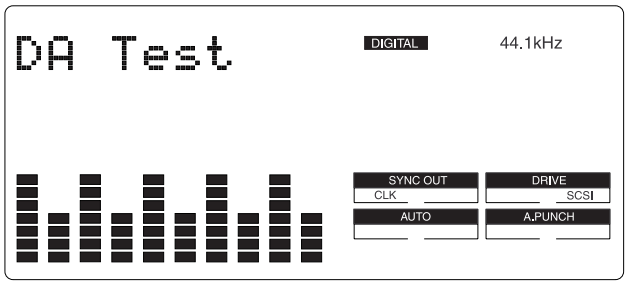
4-3. DA Test



This mode tests the signal flow from the DATA INPUT jack to the D/A converter. A S/P DIF digital signal (Fs: 44.1kHz) must be input to the DATA INPUT jack to execute this test.

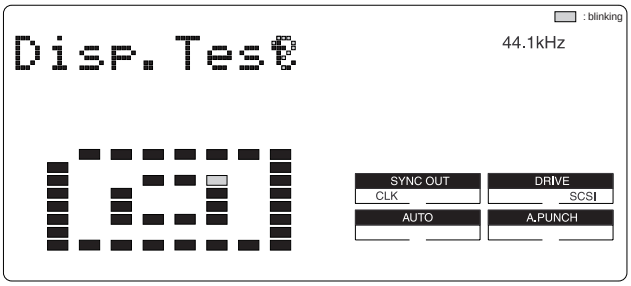
Then, press the EXECUTE/YES key while “?” is blinking.

If the FD-8 is in a normal condition, “44.1kHz” and “DIGITAL” will be lit solid. The odd (1, 3, 5, 7 and L) and even (2, 4, 6, 8 and R) channels indicate the left and right input level of S/P DIF digital signal fed to the DATA INPUT jack respectively.



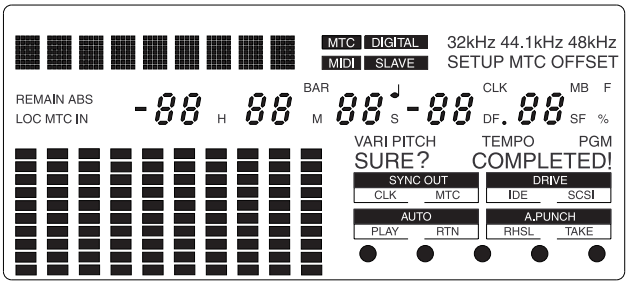
If the FD-8 is not in a normal condition, “DIGITAL” will blink and the bargraph meter will not indicate any level.

4-4. Display/Button Test



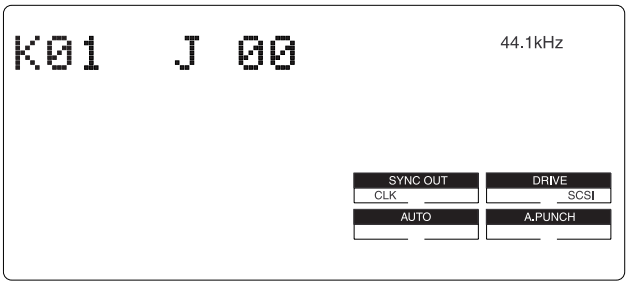
This mode tests if all the segments on the LCD display, LEDs and buttons (switches) on the FD-8 top panel are correctly working or not.

To execute this test, press the EXECUTE/YES key while "?" is blinking.



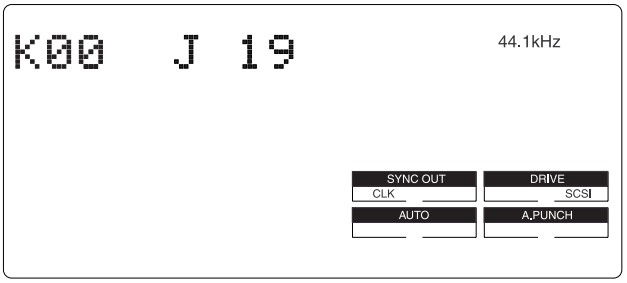
If the FD-8 is in a normal condition, all the segments on the LCD display will be lit solid and all the LEDs on the top panel will start blinking.

If the FD-8 is not in a normal condition, faulty segments on the LCD display and/or LEDs on the top panel will remain unlit.



In this condition, if the EXECUTE/YES key is pressed one more time, the Button Test can be executed.

The Button Test checks if each key/button and jog dial are working properly or not. The display on the left indicates that the RECORD button is pressed and held down. ("K" stands for the Key and "J" the Jog dial.)



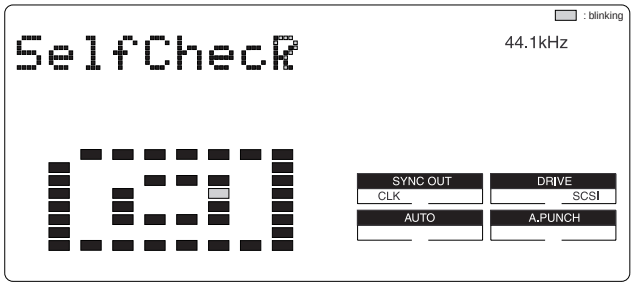
The display on the left indicates the condition when the jog dial is turned C.W.

The table below shows the relationship between the key/button/jog dial and the corresponding numbers appear on the LCD display.

In order to quit the Button Test, turn the jog dial C.W. or C.C.W. further after "J_20" or "J-19" is displayed respectively.

Key/Button/Jog Dial	No.	Key/Button/Jog Dial	No.	Key/Button/Jog Dial	No.
RECORD	K01	UNDO/REDO	K13	RECORD TRACK 1/L	K25
STOP	K02	EXECUTE/YES	K14	RECORD TRACK 2/R	K26
PLAY	K03	EXIT/NO/(EJECT)	K15	RECORD TRACK 3/L	K27
REWIND/◀	K04	AUTO RTN START	K16	RECORD TRACK 4/R	K28
F FWD/▶	K05	AUTO PUNCH IN	K17	RECORD TRACK 5/L	K29
(SHIFT)	K06	AUTO PUNCH OUT	K18	RECORD TRACK 6/R	K30
VARI PITCH/(P.EDIT)	K07	AUTO RTN END	K19	RECORD TRACK 7/L	K31
AUTO RTN/PLAY	K08	CLIPBOARD IN	K20	RECORD TRACK 8/R	K32
LOCATE/(LOC MEM)	K09	CLIPBOARD OUT	K21	SCRUB	K34
HOLD/▶	K10	DISP SEL	K22	JOG DIAL (C.W.)	J 00 ~ 20
STORE	K11	SETUP	K23	JOG DIAL (C.C.W.)	J -00 ~ -19
EDIT	K12	TIME BASE SEL	K24		

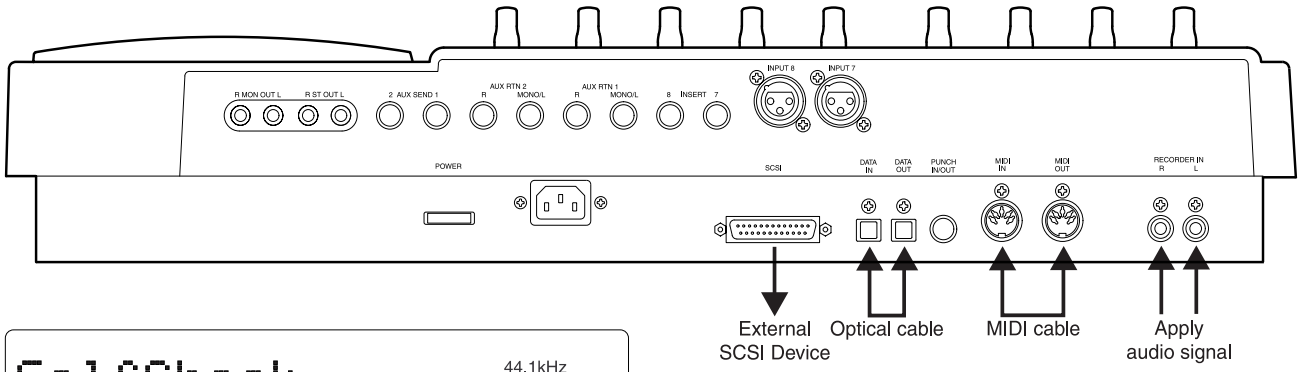
4-5. Self Check

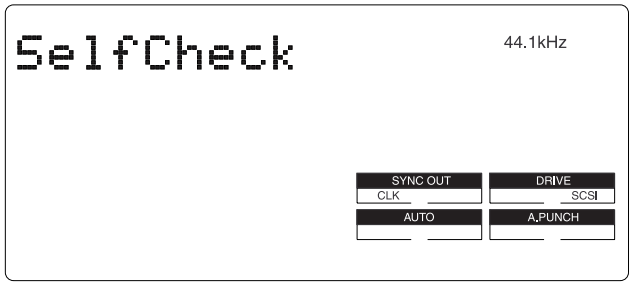


This mode automatically tests the following points in order.

- SCSI bus
- ATA (E-IDE) bus
- MIDI in/out circuit
- S/P DIF digital signal (44.1kHz)
- Vari-pitch circuit
- A/D and D/A circuit (Input Monitor)

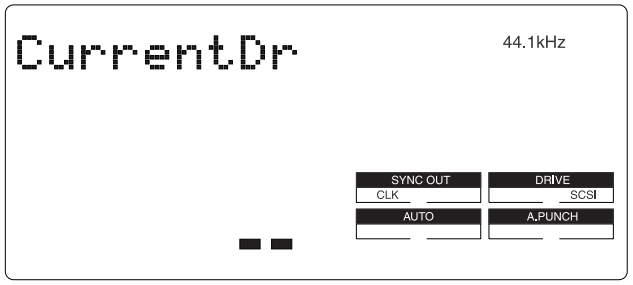
<Cable Connection in “Self Check” Mode>





CAUTION: In order not to form a MIDI signal loop, connect the MIDI cable after putting the FD-8 into the Service Mode.

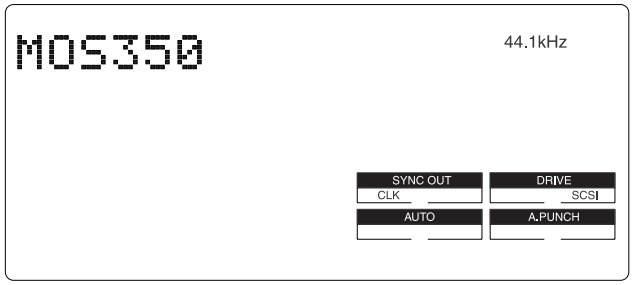
To start the Self Check mode, press the EXECUTE/YES key when “?” is blinking.

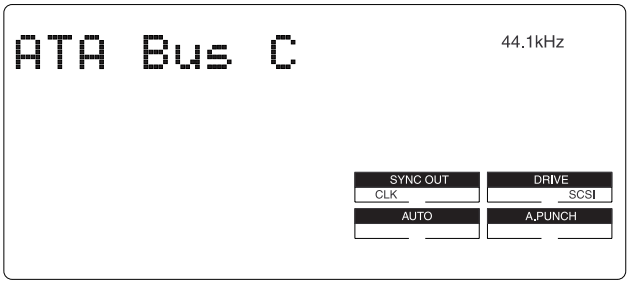


As shown in the left, “SelfCheck”, “CurrentDr”, name of connected SCSI drive (The example on the left shows that the Magneto Optical drive MOS350 is connected to the FD-8 SCSI port.) and “ATA Bus C (check)” appear on the FD-8 LCD display in order.

If a 2.5" internal E-IDE hard disk drive is not installed in the FD-8, the Self Check mode comes to a standstill at “ATA Bus C (check)” test.

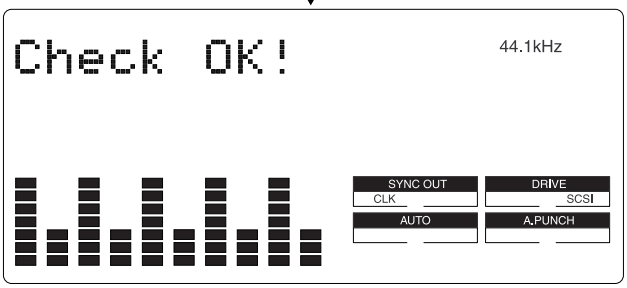
In order to continue the Self Check mode, press the EXECUTE/YES key again.





Continue to next page

From previous page

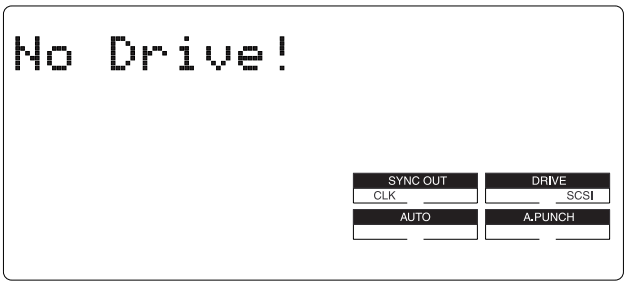


If the FD-8 is in a good condition, “Check OK!” will be displayed and the FD-8 is automatically put into Input Monitor mode with all the RECORD TRACK LEDs and RECORD LED flashing. In this condition, if a signal is applied to the FD-8 RECORDER IN (L, R) jacks, its level can be monitored on the bargraph level meter.

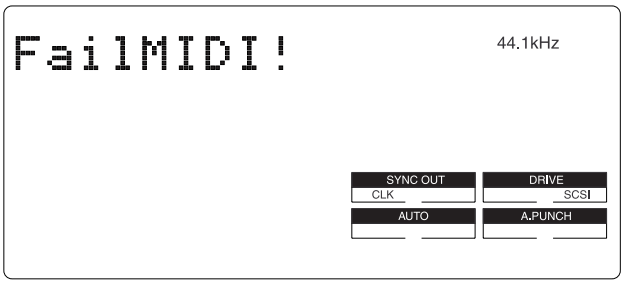
To quit the Self Check mode, press the EXIT/NO key when “Check OK!” is displayed.

The followings are examples of error message when the FD-8 is not working properly.

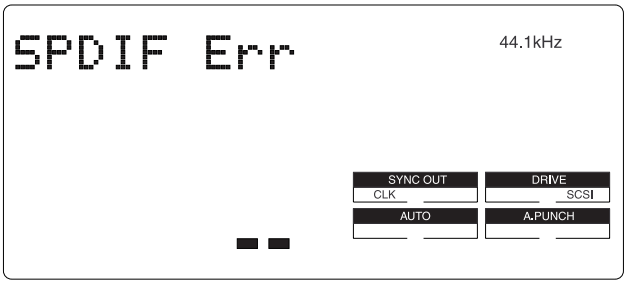
• SCSI function



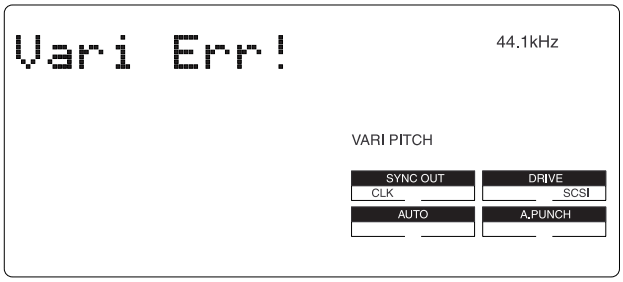
• MIDI function



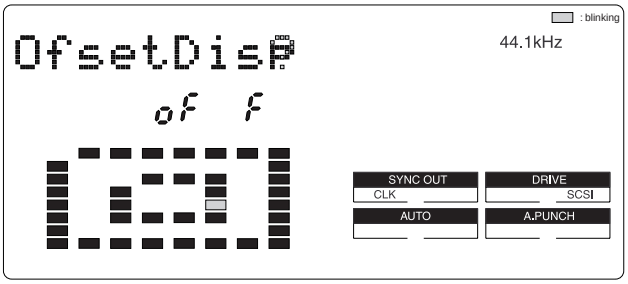
• Digital Signal in/out (Fs: 44.1kHz)

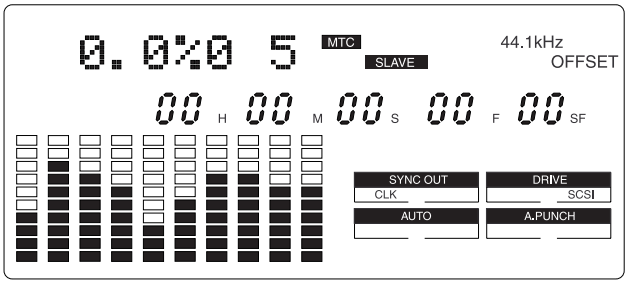


• Vari-pitch function



4-6. Offset Display





This mode determines if the offset value against a master machine should be displayed or not when the FD-8 is working as a slave machine.

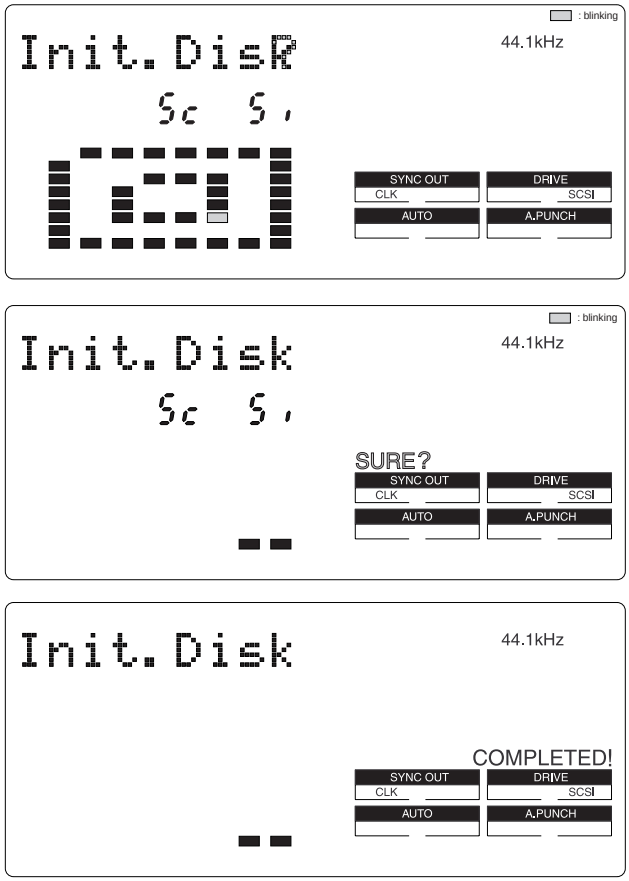
If you would like to turn ON the offset display, press the EXECUTE/YES key while “?” is blinking. (The default setting is “off”.) Then, turn the jog dial C.W. to change the display to “ON” and press the EXECUTE/YES key.

In order to display the offset value, select the “MTC” time base and the “REMAINING TIME” as DISP SEL key.

CAUTION:

1. There might be a case that the percentage display does not indicate “0.0%” exactly. This is caused by the difference of internal clock between master and slave machines, which is running independently.
2. The two-digit numbers displayed in the right of percentage display (“05” in the left example) is only for software programming purpose.

4-7. Initializing Disk



This mode initializes an external SCSI device connected to the SCSI port or a 2.5" E-IDE hard disk drive internally installed. The disk drive currently connected can be initialized.

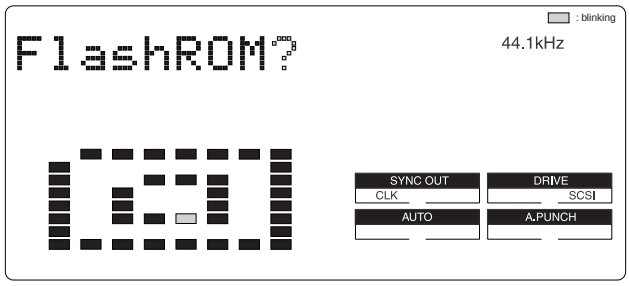
CAUTION:

1. If both the external SCSI drive and the internal 2.5” E-IDE hard disk drive are connected at the same time, the SCSI drive is given priority over the 2.5” E-IDE hard disk drive and is recognized by the FD-8.
2. Up to 2 x SCSI drives can be connected to the FD-8. One is for recording / reproducing (SCSI ID: 0 ~ 5) and the other for exclusive backing up (SCSI ID: 6). Initializing is possible on the SCSI drive (ID: 0 ~ 5) used for recording / reproducing only.

After pressing the EXECUTE/YES key, “SURE?” will start blinking in the LCD display. In this condition, pressing the EXECUTE/YES key one more time would initialize the recognized disk drive.

This mode puts the disk back to the condition originally formatted.

4-8. Flash ROM



This mode is used when copying the system software from EPROMs to Flash ROM.

As mentioned in the section “SOFTWARE UPDATE”, the FD-8 software inside the Flash ROM can be updated through the SCSI port. However, if something wrong happens when updating the software (e.g. A blackout occurred while updating the software.), the FD-8 might not be able to boot up by the system software inside the Flash ROM.

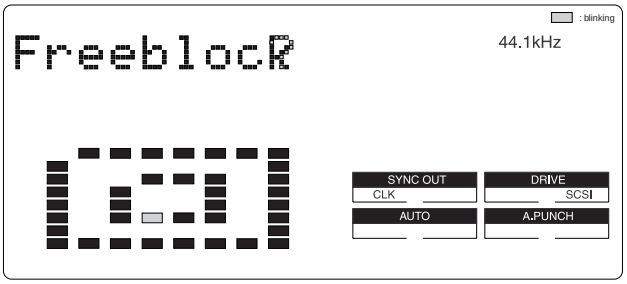
In this case, the following procedures must be taken.

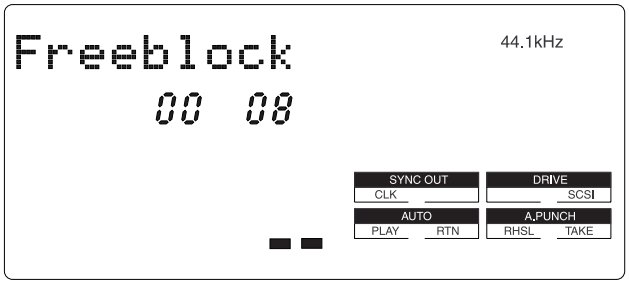
1. Turn the switch S1 on the MAIN PCB assy to “EPROM” side.
2. Mount and solder the EPROM sockets to “U31” and “U32” on the MAIN PCB assy.
3. Plug the EPROMs into the sockets.
4. Turn on the power of FD-8.

In this condition, the FD-8 is booted up using the system software inside the EPROMs. The next procedures to take are as follows.

1. Put the FD-8 into the Service Mode, select “FlashROM” and press EXECUTE/YES key. (“SURE?” is blinking.)
2. Press the EXECUTE/YES key one more time to copy the system software from EPROMs to Flash ROM.
3. Turn the switch S1 to “FLMEM” side.
4. In order to confirm that the FD-8 is booted up using the system software inside the Flash ROM, turn off the power, disconnect the EPROMs and turn the power back on again.
5. After the confirmation, update the system software inside the Flash ROM through SCSI port again.

4-10. Free Block Check

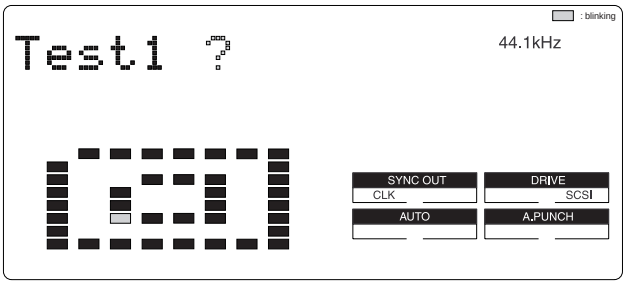




This mode is used to check the condition of the diskette inserted into an external SCSI drive connected to the FD-8 or the internal E-IDE hard disk drive. (As mentioned before, the SCSI drive has a priority unless the SCSI ID is set to "6".)

If the Free Block indicates a large number even after formatting and no signal is recorded or recorded signals are frequently skipped, the diskette / hard disk drive can be judged to be in a bad condition.

4-11. Test 1



This Service Mode is exclusively designed for software programming purpose. There is nothing to do with servicing / repairing the FD-8.

5. ERROR CODE LIST

The chart below indicates the error code number and corresponding description. Since the error code list is basically designed for our engineers to improve the software, the description is quite technical. If you find the FD-8 with one of the error codes displayed, we encourage you to update the software first. In case updating the software does not solve the problem, we would like you to inform us about details.

FD-8 ERROR CODE LIST

ERROR CODE	DESCRIPTION
1	The FD-8 tries to access the address which does not exist.
3	SCSI drive does not boot up correctly when in SCSI access operation.
9	When saving system region sector, its address is registered in Free_block File during Free block File checking procedure.
10	Link_pointer which links Audio File indicates smaller address (out of region) than Link_File address region in RAM.
11	Link_pointer indicates larger address (out of region) than Link_File address region in RAM.
12	“Pointer_addre” calculation of Link_Pointer is not correct.
14	Link_Pointer during recording/reproducing indicates smaller address (out of region) than actual Link_File address region.
15	Link_Pointer during recording/reproducing indicates larger address (out of region) than actual Link_File address region.
16	“Pointer_addre” calculation of Link_Pointer during recording/reproducing is not correct.
20	src_cash_load: Improper access of link address occurred while PASTE editing.
21	bak_cash_load: Program link during PASTE/MOVE editing is incorrect.
22	bak_cash_load: Imcompatibility problem occurred on program link during PASTE/MOVE editing.
30	Error when executing MOVE editing. Improper Link Pointer. Error in “bak_cash_load” function.
31	Error when executing MOVE editing. Improper Link Pointer. Error in “bak_cash_load” function.
32	Error when executing MOVE editing. Improper Link Pointer. Error in “bak_cash_load” function.
35	Backup_Save:Error occurred when saving data to SCSI device.
36	Backup_Load: Error occurred when loading data from SCSI device.
38	Displayed in Test Mode only. SCSI device cannot be recognized during initial test.
40	dis_cah_load: Improper access occurred when recording/reproducing.
41	dis_cah_load: Improper access occurred when recording/reproducing.
42	dis_cah_load: Improper access occurred when recording/reproducing.
45	get_non_des_block: Remaining disk capacity is insufficient.
52	non_des_cash_save_sub: Improper access occurred when recording/reproducing.
60	remake_free_block: There was improper access to program management region.
61	remake_free_block: There was improper access to program management region.
62	remake_free_block: Number of manageable events exceeds limit.
63	remake_free_block: There was improper access to program management region.
64	remake_free_block: There is an overlapping section in program management region.
96	There was improper access to program management region.
97	There was improper access to program management region when saving System File.
99	There was improper access when fading in/out.

6. INSTALLING 2.5" INTERNAL HARD DISK DRIVE

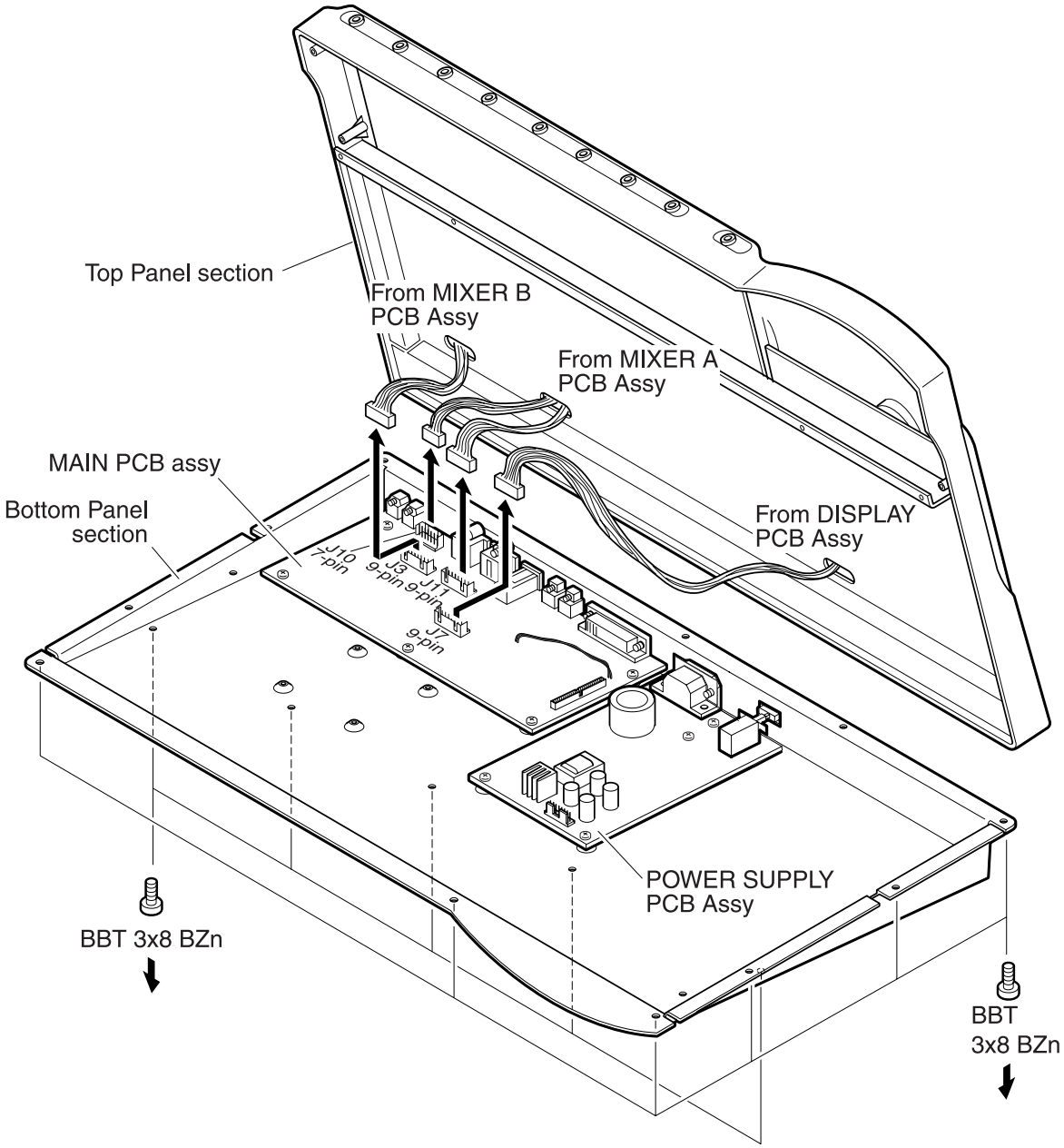
The Model 9045 and a 2.5" E-IDE hard disk drive installing procedures are explained below.

● Model 9045 Contents

- Bracket, HD, FD-4/8 (P/N: 8221234000) x 2
- Connector, PI, header, 50P, P2.0, A3E-50PA (P/N: 8245314000) x 1
- Cable, flat, 2P, L150 (P/N: 8276292015) x 1
- Cable assy, flat, 50P, P1.0, L180 (P/N: 8277465018) x 1
- 8 x screws (P 3 x 5 CZn)

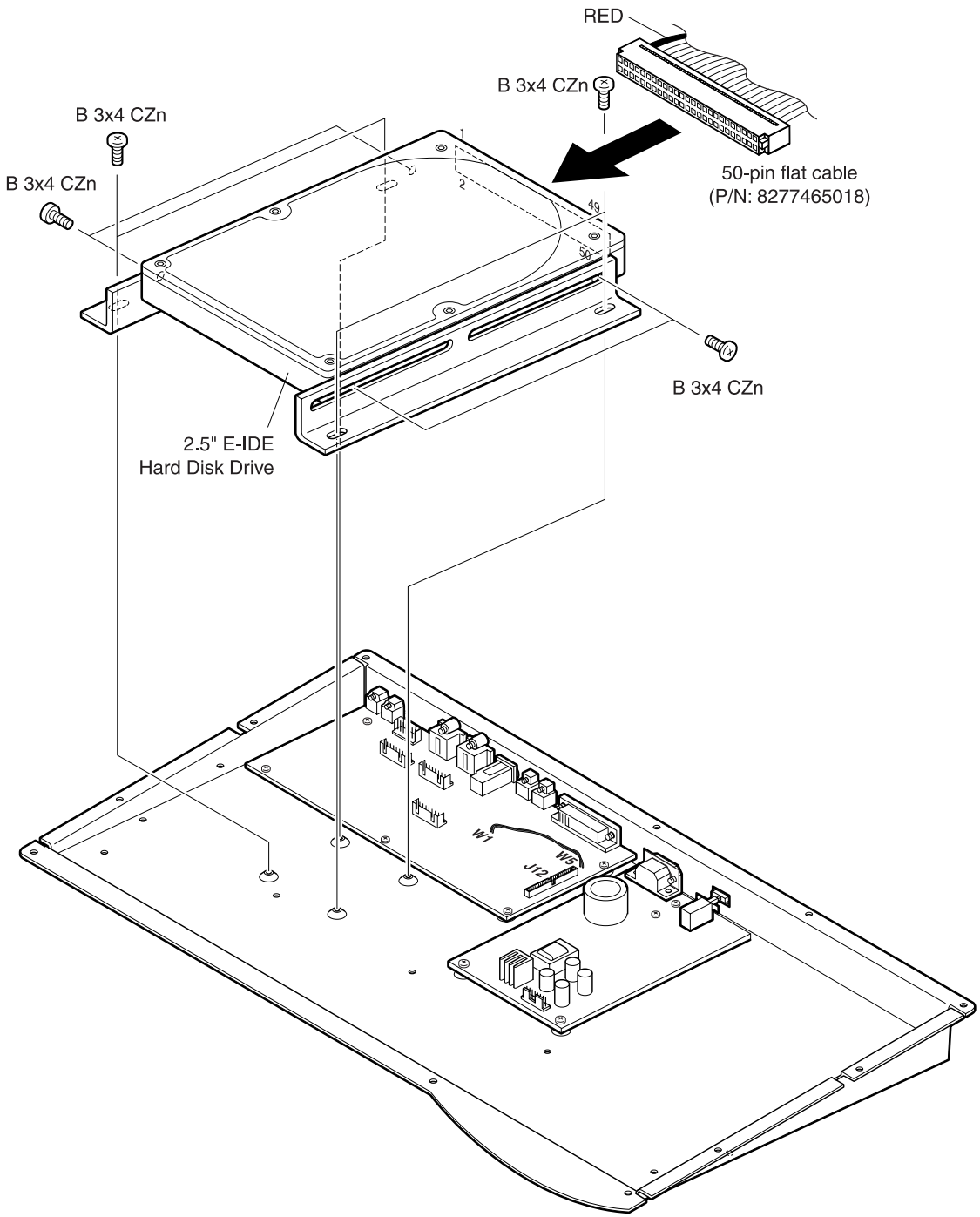
● Installing Procedures

1) Loosen 17 x screws (BBT 3 x 8 BZn) fixing the FD-8 Top Panel section to the Bottom Panel section.
2) Remove the following cables from the connectors on the MAIN PCB assy.
    - 7-pin cable to the J10 (from MIXER A PCB assy)
    - 9-pin cable to the J11 (from MIXER A PCB assy)
    - 9-pin cable to the J3 (from MIXER B PCB assy)
    - 9-pin cable to the J7 (from DISPLAY PCB assy)

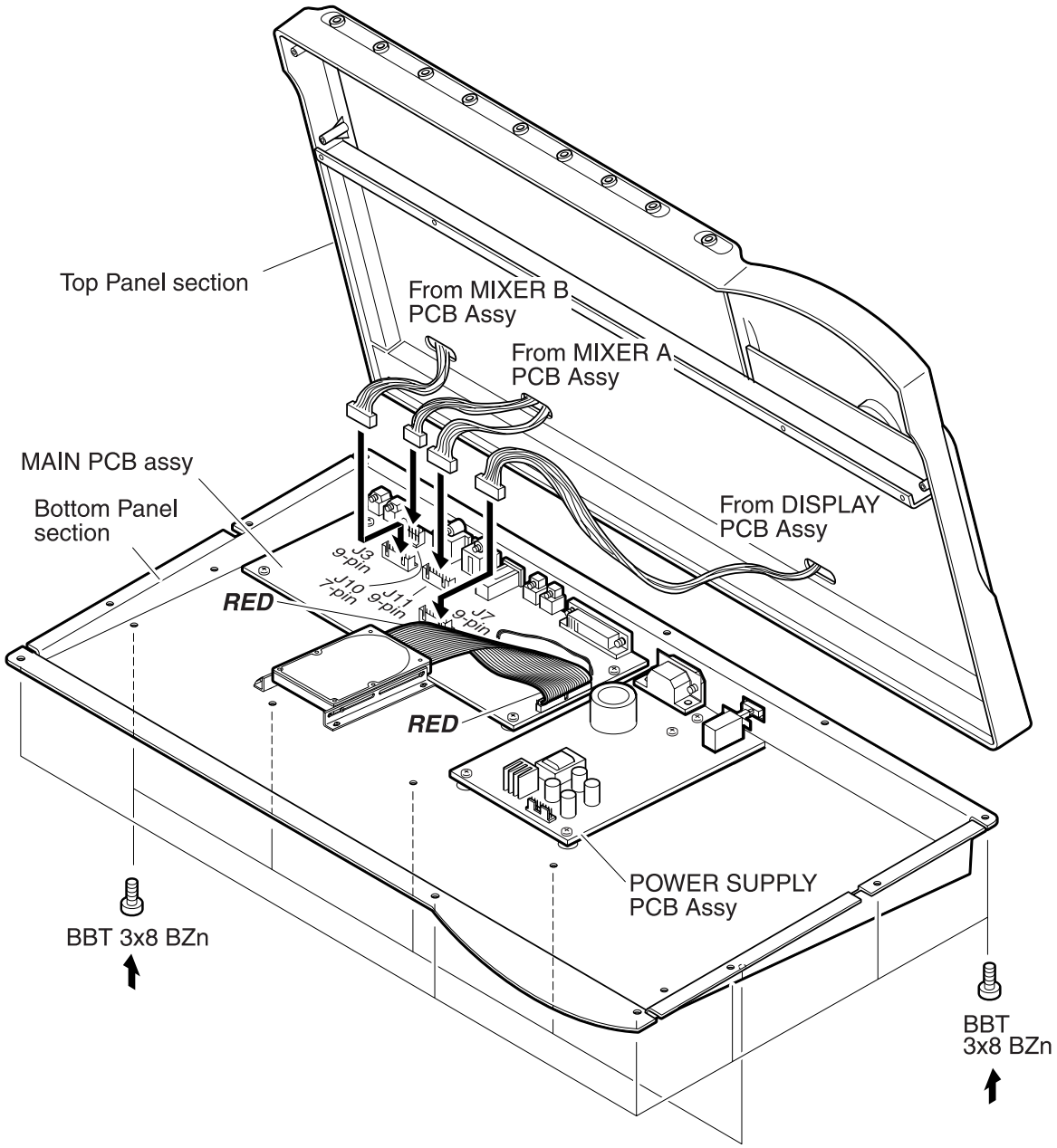


NOTE: Not like the FD-4 MAIN PCB assy, the E-IDE 50-pin connector J12 and 2-pin cable between W1 and W5 have already been mounted and soldered. So, it is not necessary to remove the FD-8 MAIN PCB assy when installing a 2.5” E-IDE hard disk drive.

3) Using 4 x screws (P 3 x 5 CZn), fix the HD Bracket to a 2.5" E-IDE hard disk drive.
4) Using 4 x screws (P 3 x 5 CZn), fix the 2.5" E-IDE hard disk drive/HD bracket to the Bottom Panel section. (During the above procedures 6) and 7), adjust the tightening position of screws to the HDD and to the bottom panel so that screws are not bothered from each other.)



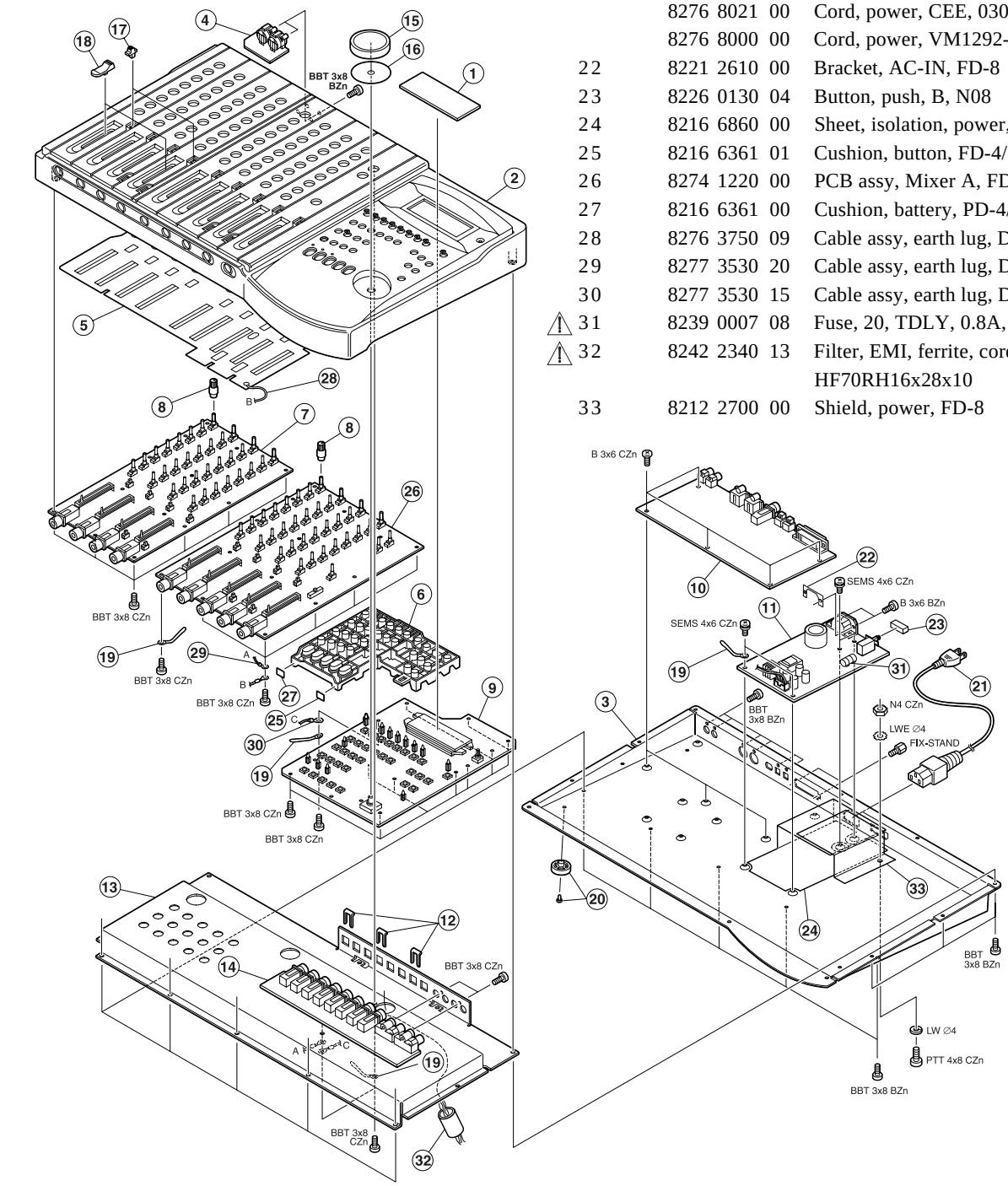
8) Connect the 50-pin flat cable between J12 of MAIN PCB assy and the HDD connectors. In order to connect pins straight, twist the cable as shown below. (Pin-1 of J12 (RED) must go to Pin-1 (RED) of HDD connectors.)
9) Connect the following cables from the connectors on the MAIN PCB assy.
    - 7-pin cable to the J10 (from MIXER A PCB assy)
    - 9-pin cable to the J11 (from MIXER A PCB assy)
    - 9-pin cable to the J3 (from MIXER B PCB assy)
    - 9-pin cable to the J7 (from DISPLAY PCB assy)
10) Tighten 17 x screws (BBT 3 x 8 BZn) fixing the FD-8 Top Panel section to the Bottom Panel section.



7. EXPLODED VIEW, PCB ASSEMBLY AND PARTS LIST

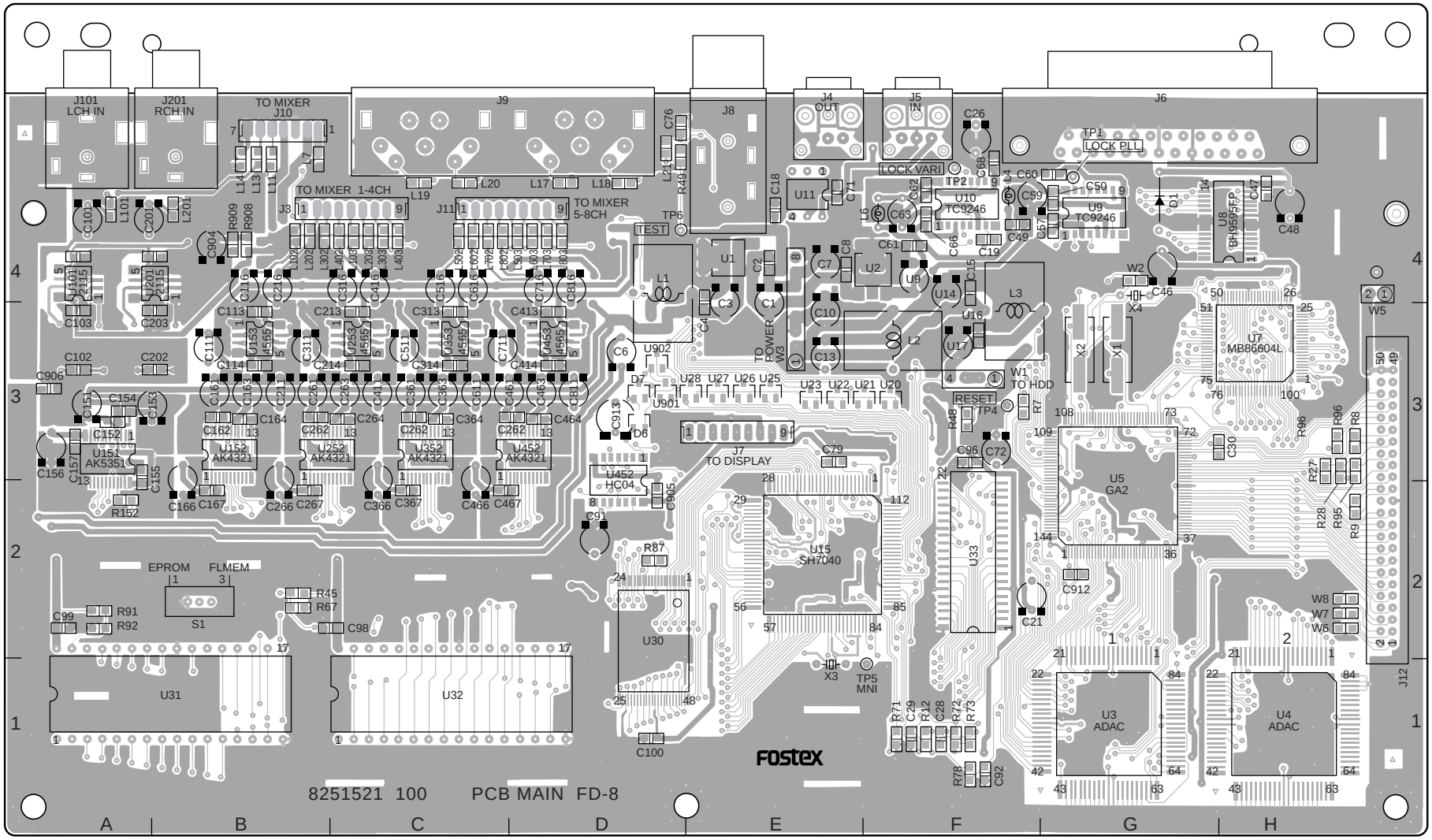
● FD-8 OVERALL EXPLODED VIEW

Ref. No.	Part No.	Description
1	8212 6501 00	Window, LCD, FD-8
2	8212 6490 00	Panel, top, FD-8
3	8221 2581 00	Panel, bottom, FD-8
4	8274 1240 00	PCB assy, XLR, FD-4/8
5	8216 6841 00	Shield, mixer, FD-8
6	8226 2370 00	Button assy, control, FD-4/8
7	8274 1260 00	PCB assy, Mixer B, FD-8
8	8226 2230 01	Knob, volume, C
9	8274 1560 00	PCB assy, Display, FD-8
10	8274 1570 00	PCB assy, Main, FD-8
⚠ 11	8274 1580 00	PCB assy, Power, FD-8
12	8204 0820 00	Plate, mounting, B
13	8221 2571 00	Bracket, jack, FD-8
14	8274 1230 00	PCB assy, Jack, FD-4/8
15	8226 2380 00	Knob, jog, FD-4/8
16	8216 6670 00	Sheet, jog, FD-4/8
17	8226 1601 03	Knob, slide, N4.5
18	8226 2390 01	Knob, fader, N4.5
19	8207 0117 01	Holder, cord, CS-1
20	8207 0120 00	Foot, FF-822
⚠ 21	8276 8010 00	Cord, power, UL/CSA, VM0033-0089, USA/CND
	8276 8021 00	Cord, power, CEE, 0309B-0310B, EUR
	8276 8000 00	Cord, power, VM1292-1298, DM
22	8221 2610 00	Bracket, AC-IN, FD-8
23	8226 0130 04	Button, push, B, N08
24	8216 6860 00	Sheet, isolation, power, FD-8
25	8216 6361 01	Cushion, button, FD-4/8
26	8274 1220 00	PCB assy, Mixer A, FD-4/8
27	8216 6361 00	Cushion, battery, PD-4/FD-8
28	8276 3750 09	Cable assy, earth lug, D3, L90
29	8277 3530 20	Cable assy, earth lug, D3-D3, #20, L200
30	8277 3530 15	Cable assy, earth lug, D3-D3, #20, L150
⚠ 31	8239 0007 08	Fuse, 20, TDLY, 0.8A, 250V
⚠ 32	8242 2340 13	Filter, EMI, ferrite, core, HF70RH16x28x10
33	8212 2700 00	Shield, power, FD-8

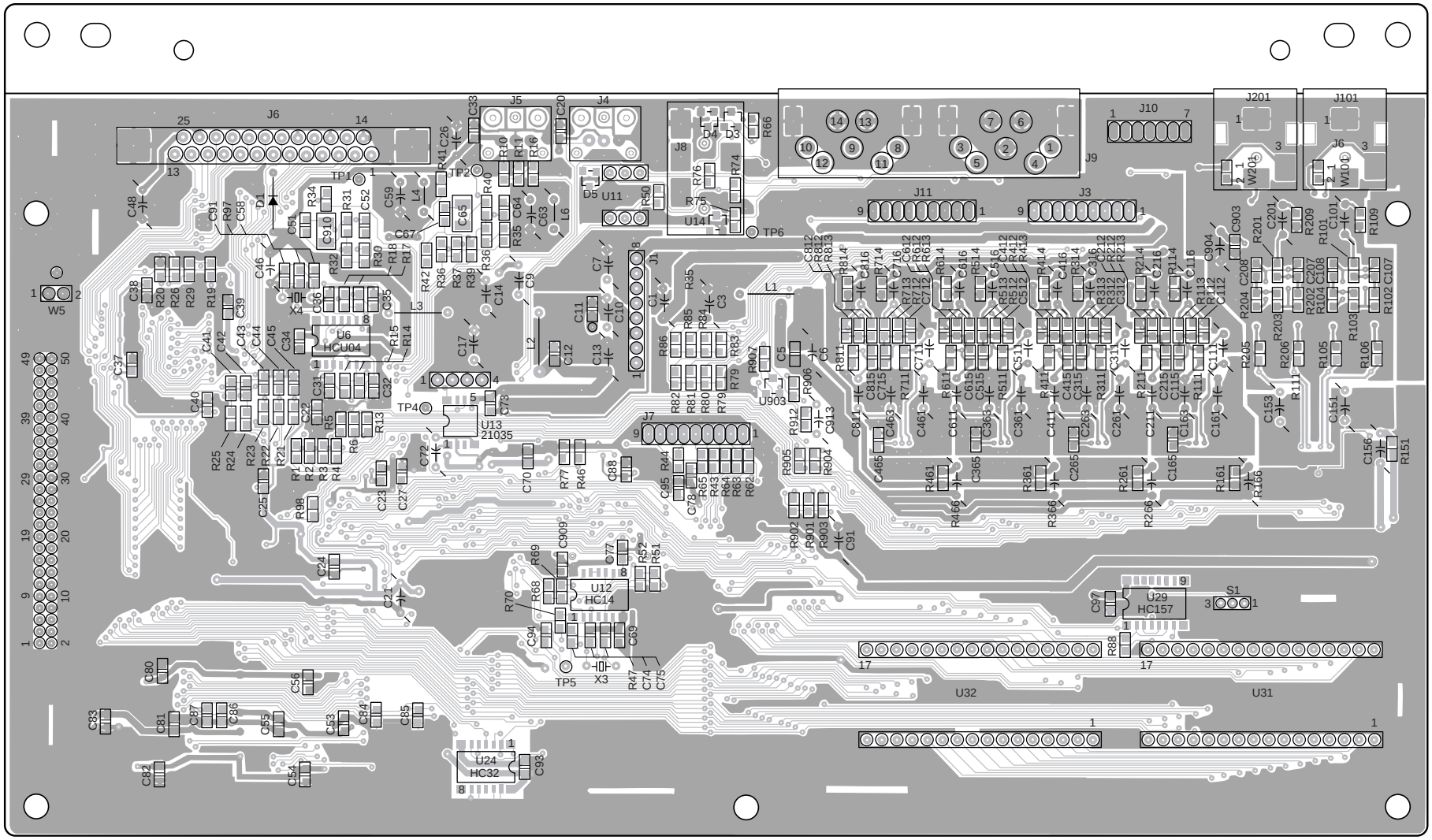


● FD-8 PCB PATTERN DRAWING

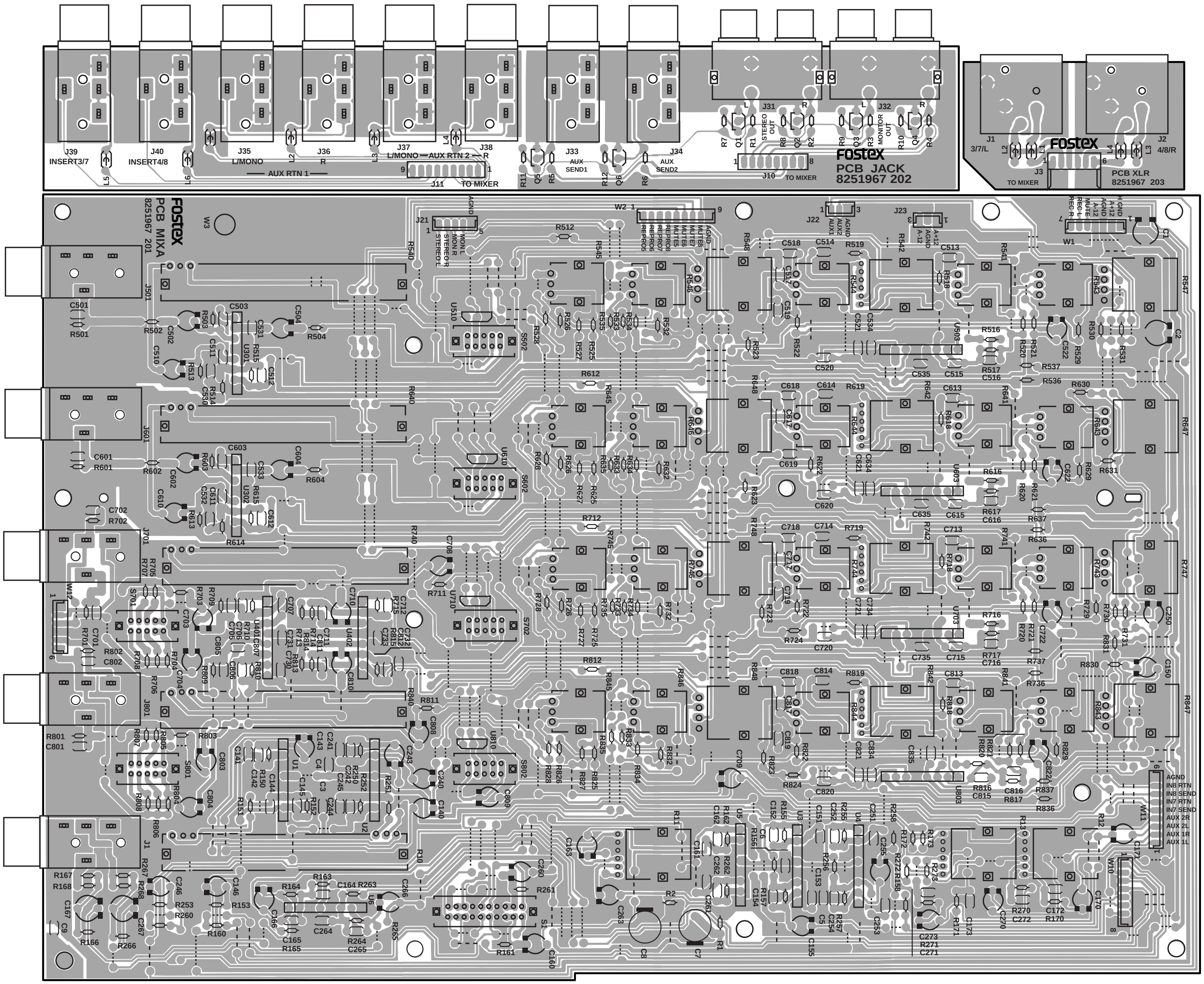
• Parts Side of MAIN PCB assy



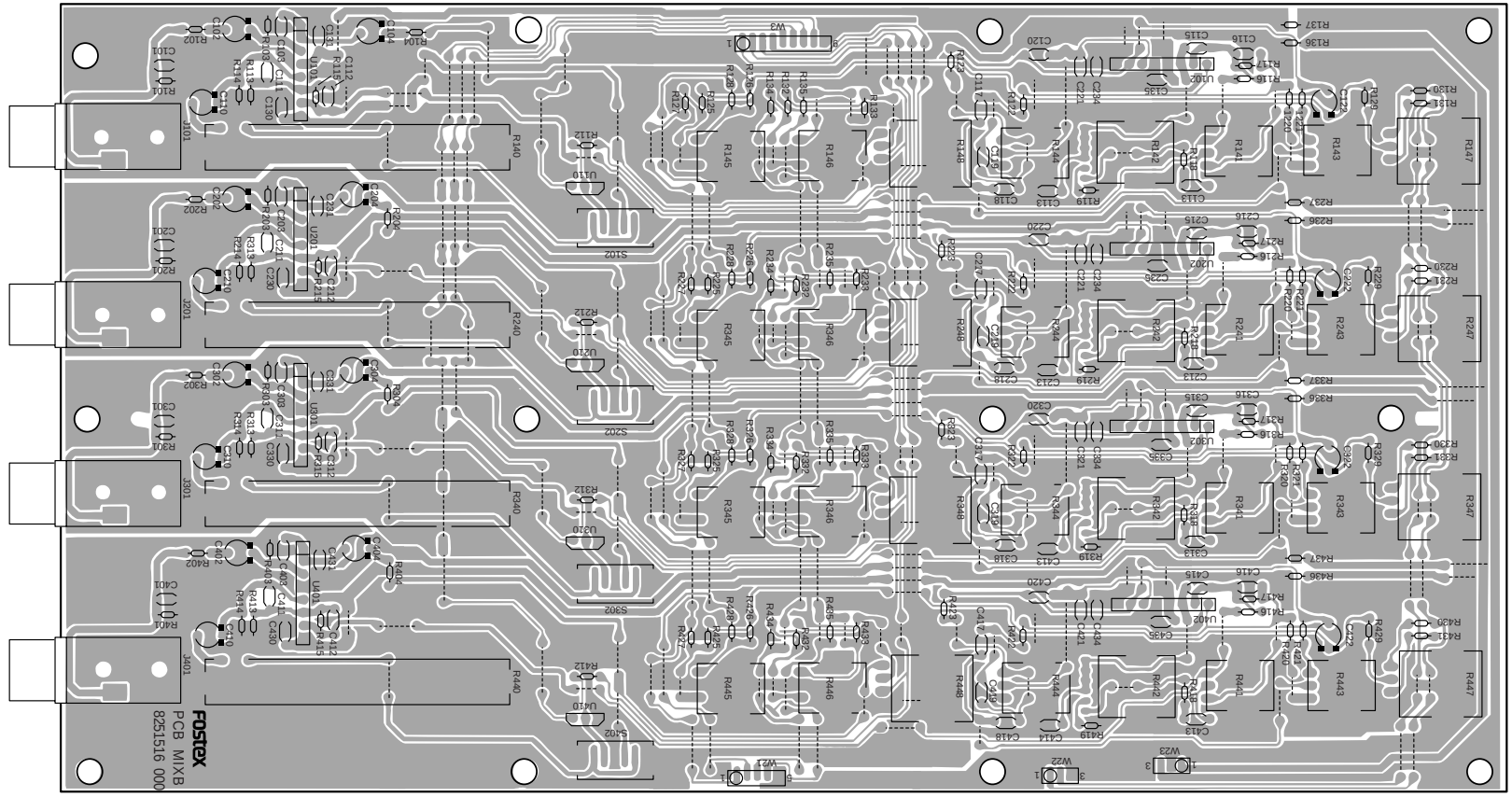
• **Foil Side of MAIN PCB assy**



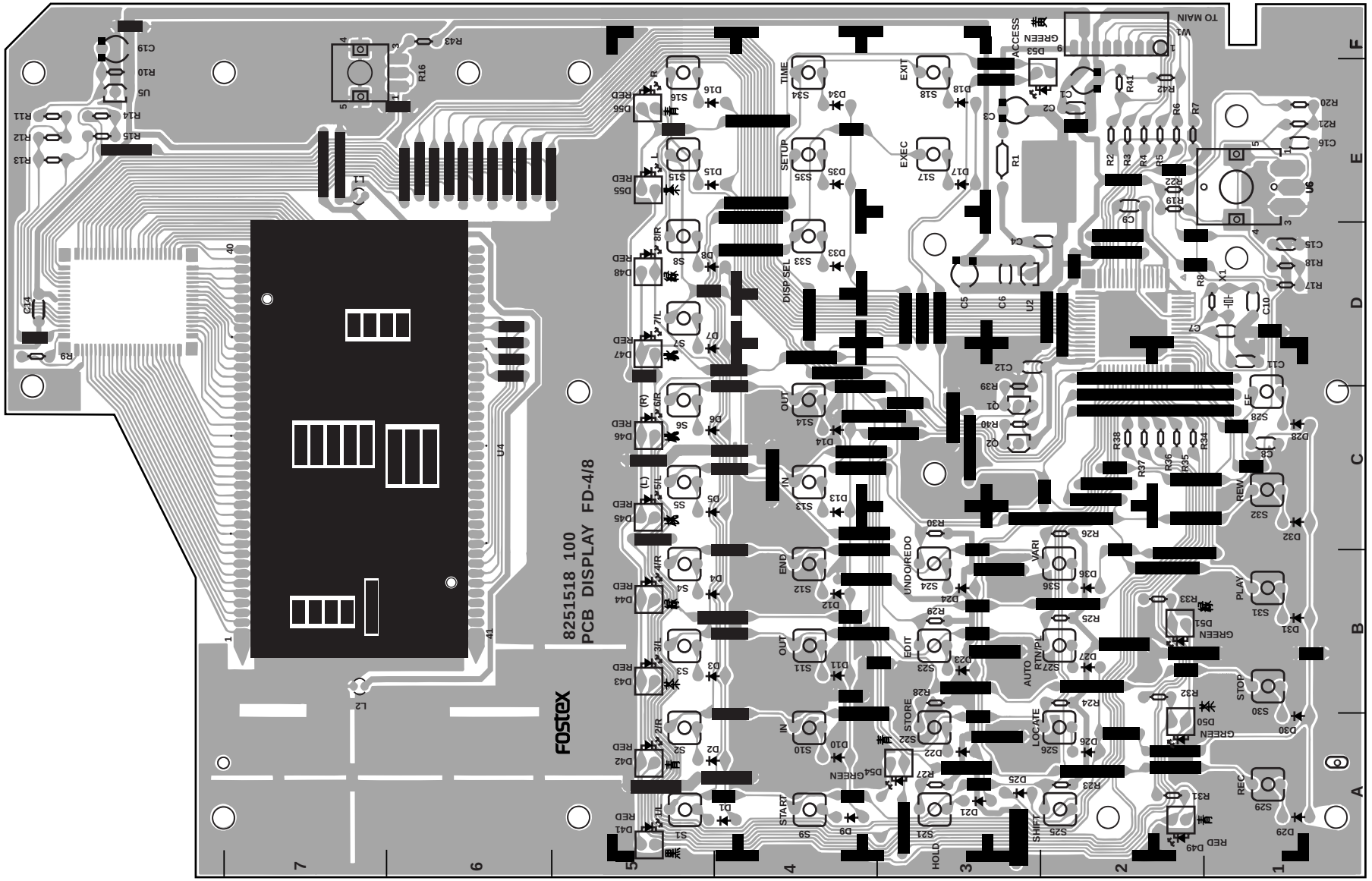
• MIXER A, JACK and XLR PCB assys



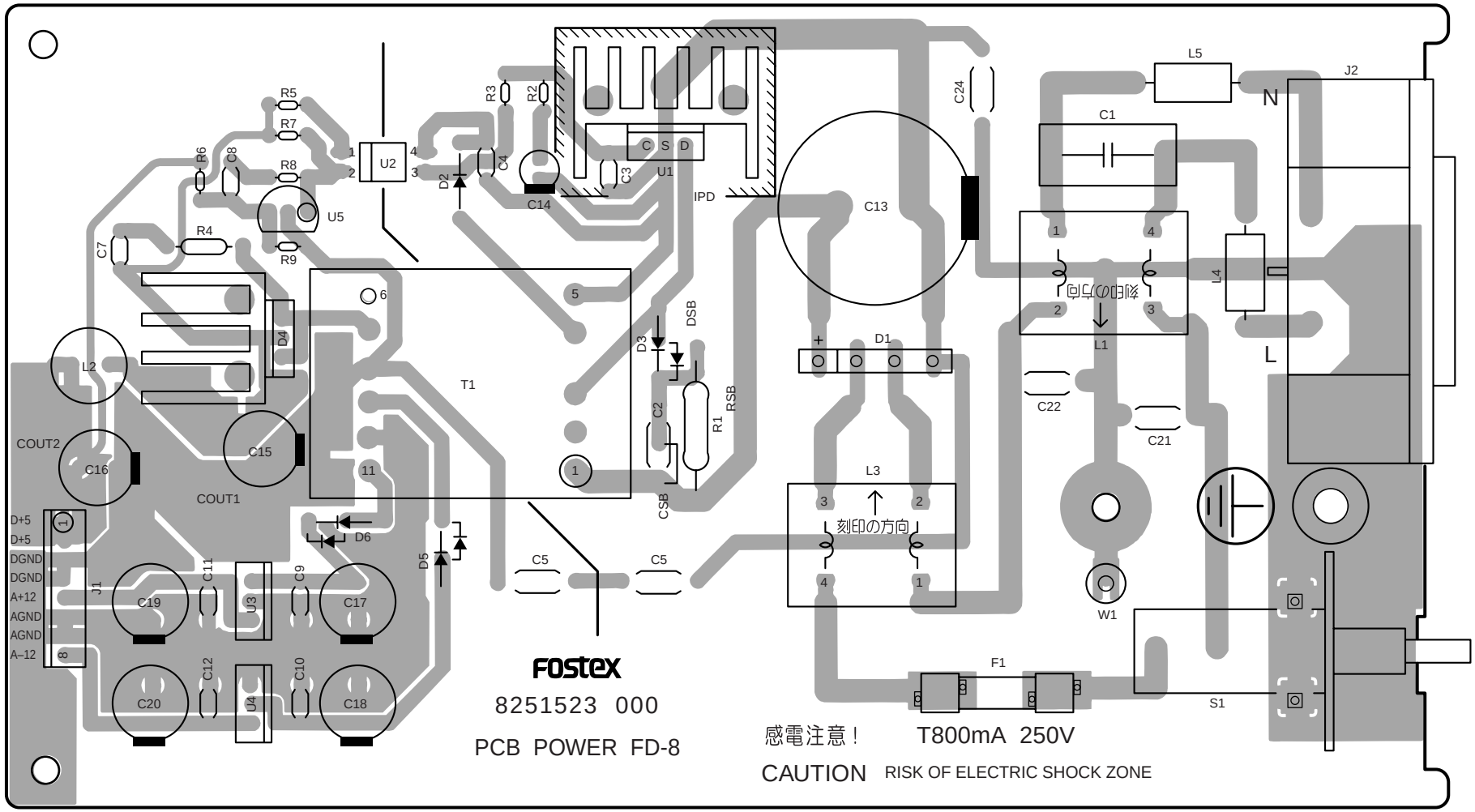
• **MIXER B PCB assy**



• DISPLAY PCB assy



• **POWER PCB assy**



● FD-8 Parts List

• MAIN PCB assy

Ref. No.	Part No.	Description
	8274 1570 00	PCB Assy, Main, FD-8
B001	8251 5211 00	Plain PCB, Main, FD-8

ICs

Ref. No.	Part No.	Description
U001, 002	8236 5403 01	ST, analog, regulator, NJM78M05DLA
U003, 004	8236 0843 00	QFP, digital, gate array, A.D.A.C.
U005	8236 0818 00	QFP, digital, gate array, ASPI
U006	8236 5610 04	ST, digital, 74HCU04
U007	8236 0828 00	QFP, digital, SCSI, M86604L
U008	8236 0829 00	SOP, digital, SCSI, terminate, BH9595FP-Y
U009, 010	8236 5034 00	ST, digital, VCO, TC9246F
U011	8234 0199 00	Opt., photo coupler, PC900
U012	8236 5600 14	ST, digital, 74HC14
U013	8236 5025 00	ST, analog, reset, NJM2103M
U014	8236 5701 01	ST, digital, driver, DTC114EK
U015	8236 0838 02	QFP, digital, CPU, main, FD-8, mask, SH7042, F28
U016~019		N/A
U020~023	8236 5704 01	ST, digital, driver, DTA114EK
U024	8236 5600 32	ST, digital, 74HC32
U025~028	8236 5704 01	ST, digital, driver, DTA114EK
U029	8236 5601 57	ST, digital, 74HC157
U030	8236 0840 11	TSOP, digital, Flash ROM, M29F400T90, SGS
U031, 032		N/A
U033	8236 0831 00	SOJ, digital, DRAM, HM5118160AJ-7
U034, 035		N/A
U101, 201	8236 5050 11	ST, analog, op amp, NJM2115M (TEI)
U151	8236 5407 00	ST, digital, AD, AK5351
U152~452	8236 5053 00	ST, digital, DA, AK4320
U153~453	8236 5412 00	ST, analog, NJM4565M
U901, 902	8236 5701 01	ST, digital, driver, DTC114EK
U903	8236 5704 01	ST, digital, driver, DTA114EK
U904	8236 5600 04	ST, digital, 74HC04

DIODEs

Ref. No.	Part No.	Description
D001	8234 1050 00	VF, SCHOTTKY, EK13
D002		N/A
D003~006	8234 5028 00	ST, DAN202K
D007	8234 7506 00	ST, RB400D

RESISTORs

Ref. No.	Part No.	Description
R001~007	8230 5001 01	ST, carbon, 1/10W, 100Ω, 5%
R008	8230 5001 03	ST, carbon, 1/10W, 10kΩ, 5%
R009	8230 5005 62	ST, carbon, 1/10W, 5.6kΩ, 5%
R010	8230 5003 32	ST, carbon, 1/10W, 3.3kΩ, 5%
R011	8230 5002 22	ST, carbon, 1/10W, 2.2kΩ, 5%
R012	8230 5001 01	ST, carbon, 1/10W, 100Ω, 5%
R013	8230 5003 31	ST, carbon, 1/10W, 330Ω, 5%
R014	8230 5001 05	ST, carbon, 1/10W, 1MΩ, 5%
R015	8230 5000 00	ST, carbon, 1/10W, 0Ω, 5%
R016	8230 5003 31	ST, carbon, 1/10W, 330Ω, 5%
R017	8230 5001 05	ST, carbon, 1/10W, 1MΩ, 5%
R018		N/A
R019	8230 5004 72	ST, carbon, 1/10W, 4.7kΩ, 5%
R020		N/A
R021~25	8230 5001 01	ST, carbon, 1/10W, 100Ω, 5%
R026, 027	8230 5000 00	ST, carbon, 1/10W, 0Ω, 5%
R028		N/A
R029	8230 5004 72	ST, carbon, 1/10W, 4.7kΩ, 5%
R030	8230 5001 52	ST, carbon, 1/10W, 1.5kΩ, 5%
R031	8230 5001 01	ST, carbon, 1/10W, 100Ω, 5%
R032	8230 5002 24	ST, carbon, 1/10W, 220kΩ, 5%
R033		N/A
R034	8230 5003 31	ST, carbon, 1/10W, 330Ω, 5%
R035	8230 5007 51	ST, carbon, 1/10W, 750Ω, 5%
R036	8230 5008 22	ST, carbon, 1/10W, 8.2kΩ, 5%
R037		N/A
R038	8230 5003 31	ST, carbon, 1/10W, 330Ω, 5%
R039	8230 5001 03	ST, carbon, 1/10W, 10kΩ, 5%
R040	8230 5001 01	ST, carbon, 1/10W, 100Ω, 5%
R041	8230 5005 61	ST, carbon, 1/10W, 560Ω, 5%
R042	8230 5002 23	ST, carbon, 1/10W, 22kΩ, 5%
R043, 044	8230 5001 01	ST, carbon, 1/10W, 100Ω, 5%
R045~048	8230 5001 03	ST, carbon, 1/10W, 10kΩ, 5%
R049	8230 5003 31	ST, carbon, 1/10W, 330Ω, 5%
R050	8230 5001 02	ST, carbon, 1/10W, 1kΩ, 5%
R051	8230 5001 03	ST, carbon, 1/10W, 10kΩ, 5%
R052	8230 5001 01	ST, carbon, 1/10W, 100Ω, 5%
R053, 054		N/A
R061		N/A
R062~065	8230 5001 01	ST, carbon, 1/10W, 100Ω, 5%
R066	8230 5001 52	ST, carbon, 1/10W, 1.5kΩ, 5%
R067		N/A
R068	8230 5003 31	ST, carbon, 1/10W, 330Ω, 5%
R069	8230 5002 22	ST, carbon, 1/10W, 2.2kΩ, 5%
R070	8230 5003 31	ST, carbon, 1/10W, 330Ω, 5%
R071	8230 5001 03	ST, carbon, 1/10W, 10kΩ, 5%
R072		N/A
R073	8230 5000 00	ST, carbon, 1/10W, 0Ω, 5%
R074~076	8230 5002 21	ST, carbon, 1/10W, 220Ω, 5%
R077	8230 5001 03	ST, carbon, 1/10W, 10kΩ, 5%
R078	8230 5001 01	ST, carbon, 1/10W, 100Ω, 5%
R079~087	8230 5001 03	ST, carbon, 1/10W, 10kΩ, 5%
R088~090		N/A
R091	8230 5001 03	ST, carbon, 1/10W, 10kΩ, 5%
R092~094		N/A
R095, 096	8230 5001 02	ST, carbon, 1/10W, 1kΩ, 5%

Ref. No.	Part No.	Description
R097	8230 5001 05	ST, carbon, 1/10W, 1MΩ, 5%
R098	8230 5001 01	ST, carbon, 1/10W, 100Ω, 5%
R099		N/A
R151	8230 5001 00	ST, carbon, 1/10W, 10Ω, 5%
R152	8230 5001 01	ST, carbon, 1/10W, 100Ω, 5%
R101, 201	8230 5002 03	ST, carbon, 1/10W, 20kΩ, 5%
R102, 202	8230 5001 23	ST, carbon, 1/10W, 12kΩ, 5%
R103, 203	8230 5001 03	ST, carbon, 1/10W, 10kΩ, 5%
R104, 204	8230 5001 03	ST, carbon, 1/10W, 10kΩ, 5%
R105, 205	8230 5003 31	ST, carbon, 1/10W, 330Ω, 5%
R106, 206	8230 5003 31	ST, carbon, 1/10W, 330Ω, 5%
R107, 207		N/A
R108, 208		N/A
R109, 209	8230 5001 04	ST, carbon, 1/10W, 100kΩ, 5%
R111~811	8230 5001 03	ST, carbon, 1/10W, 10kΩ, 5%
R112~812	8230 5001 03	ST, carbon, 1/10W, 10kΩ, 5%
R113~813	8230 5002 72	ST, carbon, 1/10W, 2.7kΩ, 5%
R114~814	8230 5001 04	ST, carbon, 1/10W, 100kΩ, 5%
R161~461	8230 5001 00	ST, carbon, 1/10W, 10Ω, 5%
R901		N/A
R902	8230 5001 01	ST, carbon, 1/10W, 100Ω, 5%
R903	8230 5002 21	ST, carbon, 1/10W, 220Ω, 5%
R904, 905	8230 5001 01	ST, carbon, 1/10W, 100Ω, 5%
R906, 907	8230 5001 03	ST, carbon, 1/10W, 10kΩ, 5%
R908, 909	8230 5001 02	ST, carbon, 1/10W, 1kΩ, 5%
R910, 911		N/A
R912	8230 5001 03	ST, carbon, 1/10W, 10kΩ, 5%
R913		N/A

CAPACITORs

ALU = Electrolytic type

CER = Ceramic type

Ref. No.	Part No.	Description
C001		N/A
C002	8233 5021 04	ST, CER, 50V, 0.1µF, +80-20%, CC20F
C003	8232 1431 06	VT, ALU, 16V, 10µF, 20%, SME-VB
C004	8233 5021 04	ST, CER, 50V, 0.1µF, +80-20%, CC20F
C005~007		N/A
C008	8233 5021 04	ST, CER, 50V, 0.1µF, +80-20%, CC20F
C009, 010	8232 1431 06	VT, ALU, 16V, 10µF, 20%, SME-VB
C011	8233 5021 04	ST, CER, 50V, 0.1µF, +80-20%, CC20F
C012, 013		N/A
C014	8232 1431 06	VT, ALU, 16V, 10µF, 20%, SME-VB
C015	8233 5021 04	ST, CER, 50V, 0.1µF, +80-20%, CC20F
C016, 017		N/A
C018	8233 5021 04	ST, CER, 50V, 0.1µF, +80-20%, CC20F
C019, 020	8233 5041 03	ST, CER, 25V, 0.01µF, 10%, CC20R
C021	8232 1431 06	VT, ALU, 16V, 10µF, 20%, SME-VB
C022~025	8233 5041 03	ST, CER, 25V, 0.01µF, 10%, CC20R
C026	8232 1431 06	VT, ALU, 16V, 10µF, 20%, SME-VB
C027	8233 5004 71	ST, CER, 50V, 470pF, 5%, CC20SL
C028	8233 5001 01	ST, CER, 50V, 100pF, 5%, CC20SL
C029		N/A
C030	8233 5004 71	ST, CER, 50V, 470pF, 5%, CC20SL
C031, 032	8233 5002 20	ST, CER, 50V, 22pF, 5%, CC20SL
C033, 034	8233 5041 03	ST, CER, 25V, 0.01µF, 10%, CC20R
C035, 036		N/A
C037~040	8233 5041 03	ST, CER, 25V, 0.01µF, 10%, CC20R
C041~045		N/A
C046	8232 1431 06	VT, ALU, 16V, 10µF, 20%, SME-VB
C047	8233 5021 04	ST, CER, 50V, 0.1µF, +80-20%, CC20F
C048	8232 1431 06	VT, ALU, 16V, 10µF, 20%, SME-VB
C049~051	8233 5041 03	ST, CER, 25V, 0.01µF, 10%, CC20R
C052	8233 5001 50	ST, CER, 50V, 15pF, 5%, CC20SL
C053~057	8233 5041 03	ST, CER, 25V, 0.01µF, 10%, CC20R
C058	8233 5094 74	ST, CER, 25V, 0.47µF, 20%, KC30E
C059	8232 1431 06	VT, ALU, 16V, 10µF, 20%, SME-VB
C060	8233 5021 04	ST, CER, 50V, 0.1µF, +80-20%, CC20F
C061, 062	8233 5041 03	ST, CER, 25V, 0.01µF, 10%, CC20R
C063	8232 1431 06	VT, ALU, 16V, 10µF, 20%, SME-VB
C064	8233 5001 50	ST, CER, 50V, 15pF, 5%, CC20SL
C065	8233 5094 74	ST, CER, 25V, 0.47µF, 20%, KC30F
C066, 067	8233 5041 03	ST, CER, 25V, 0.01µF, 10%, CC20R
C068~070	8233 5021 04	ST, CER, 50V, 0.1µF, +80-20%, CC20F
C071	8233 5041 03	ST, CER, 25V, 0.01µF, 10%, CC20R
C072	8232 1461 05	VT, ALU, 50V, 1µF, 20%, SME-VB
C073	8233 5041 03	ST, CER, 25V, 0.01µF, 10%, CC20R
C074, 075	8233 5003 30	ST, CER, 50V, 33pF, 5%, CC20SL
C076	8233 5041 03	ST, CER, 25V, 0.01µF, 10%, CC20R
C077	8233 5001 01	ST, CER, 50V, 100pF, 5%, CC20SL
C078	8233 5004 71	ST, CER, 50V, 470pF, 5%, CC20SL
C079		N/A
C080~083	8233 5041 03	ST, CER, 25V, 0.01µF, 10%, CC20R
C084~087		N/A
C088	8233 5021 04	ST, CER, 50V, 0.1µF, +80-20%, CC20F
C089, 090		N/A
C091	8232 1431 06	VT, ALU, 16V, 10µF, 20%, SME-VB
C092		N/A
C093, 094	8233 5041 03	ST, CER, 25V, 0.01µF, 10%, CC20R
C095	8233 5001 01	ST, CER, 50V, 100pF, 5%, CC20SL
C096~097	8233 5041 03	ST, CER, 25V, 0.01µF, 10%, CC20R
C098, 099		N/A
C100	8233 5041 03	ST, CER, 25V, 0.01µF, 10%, CC20R
C101, 201	8232 1431 06	VT, ALU, 16V, 10µF, 20%, SME-VB
C102, 202	8233 5001 52	ST, CER, 50V, 0.0015µF, 5%, CC20R
C103, 203	8233 5041 03	ST, CER, 25V, 0.01µF, 10%, CC20R
C104, 204	8233 5041 03	ST, CER, 25V, 0.01µF, 10%, CC20R
C105, 205		N/A
C106, 206		N/A
C107, 207		N/A
C108, 208		N/A
C111~811	8232 1431 06	VT, ALU, 16V, 10µF, 20%, SME-VB
C112~812	8233 5006 81	ST, CER, 50V, 680pF, 5%, CC20SL
C113~413	8233 5041 03	ST, CER, 25V, 0.01µF, 10%, CC20R
C114~414	8233 5041 03	ST, CER, 25V, 0.01µF, 10%, CC20R
C115~815		N/A

Ref. No.	Part No.	Description
C116~816	8232 1434 76	VT, ALU, 16V, 47µF, 20%, SME-VB
C151		N/A
C152	8233 5041 03	ST, CER, 25V, 0.01µF, 10%, CC20R
C153	8232 1431 06	VT, ALU, 16V, 10µF, 20%, SME-VB
C154	8233 5041 03	ST, CER, 25V, 0.01µF, 10%, CC20R
C155	8233 5021 04	ST, CER, 50V, 0.1µF, +80-20%, CC20F
C156	8232 1431 06	VT, ALU, 16V, 10µF, 20%, SME-VB
C157	8233 5041 03	ST, CER, 25V, 0.01µF, 10%, CC20R
C158, 159		N/A
C161~461		N/A
C162~462	8233 5041 03	ST, CER, 25V, 0.01µF, 10%, CC20R
C163~463	8232 1434 76	VT, ALU, 16V, 47µF, 20%, SME-VB
C164~464	8233 5041 03	ST, CER, 25V, 0.01µF, 10%, CC20R
C165~465		N/A
C166~466	8232 1431 06	VT, ALU, 16V, 10µF, 20%, SME-VB
C167~467	8233 5041 03	ST, CER, 25V, 0.01µF, 10%, CC20R
C901, 902		N/A
C903	8233 5041 03	ST, CER, 25V, 0.01µF, 10%, CC20R
C904	8232 1431 06	VT, ALU, 16V, 10µF, 20%, SME-VB
C905	8233 5041 03	ST, CER, 25V, 0.01µF, 10%, CC20R
C906	8233 5021 04	ST, CER, 50V, 0.1µF, +80-20%, CC20F
C907, 908		N/A
C909	8233 5041 03	ST, CER, 25V, 0.01µF, 10%, CC20R
C910		N/A
C911	8230 5000 00	Resistor, ST, carbon, 1/10W, 0Ω, 5%
C912	8233 5003 30	ST, CER, 50V, 33pF, 5%, CC20SL
C913	8232 1441 07	VT, ALU, 25V, 100µF, 20%, SME-VB

MISCELLANEOUS

Ref. No.	Part No.	Description
E1401		N/A
E1402		N/A
J001, 002		N/A
J003	8245 1714 09	Connector, PI, jack, 8283, 9P, YEL
J004	8245 5520 00	Connector, opt., GPIF32T
J005	8245 5530 00	Connector, opt., GPIF32R
J006	8245 3120 05	Connector, PL, jack, D-SUB, 25P, 70057-025, EMIFIL
J007	8245 1711 09	Connector, PI, jack, 8283, 9P, WHT
J008	8245 2980 00	Connector, PL, jack, phone, LGR4609-7000
J009	8245 4200 00	Connector, jack, DIN5P, YKF51-5053
J010	8245 1711 07	Connector, PI, jack, 8283, 7P, WHT
J011	8245 1711 09	Connector, PI, jack, 8283, 9P, WHT
J012	8245 3140 00	Connector, PI, header, 50P, PITCH2.0
J101, 201	8245 2850 00	Connector, PL, jack, RCA, 1P, YKB11-0923, W/S
L001~003	8276 9130 00	Wire, jumper, isolation, 1/4 type
L004	8242 1962 23	Coil, PVT, 22µH, LF5.0S
L005		N/A
L006	8242 1962 23	Coil, PVT, 22µH, LF5.0S
L007	8242 5011 21	Filter, ST, EMI, 120, 25%, MMZ2012S
L008~010		N/A
L011	8242 5011 21	Filter, ST, EMI, 120, 25%, MMZ2012S
L012		N/A
L013, 014	8242 5011 21	Filter, ST, EMI, 120, 25%, MMZ2012S
L015, 016		N/A
L017~021	8242 5011 21	Filter, ST, EMI, 120, 25%, MMZ2012S
L022		N/A
L101, 201	8242 5011 21	Filter, ST, EMI, 120, 25%, MMZ2012S
L102~802	8242 5011 21	Filter, ST, EMI, 120, 25%, MMZ2012S
L103~803	8242 5011 21	Filter, ST, EMI, 120, 25%, MMZ2012S
S001		N/A
X001	8256 1700 01	Resonator, ST, XTL, 22.579MHZ, FUP-FBB3AFUJICOM
X002		N/A
X003	8256 1790 01	Resonator, PT, CER, 7.000MHz, F5, EFOEN
X004		N/A
Y3301	8216 5950 00	Shield, RCA
Y3302	8216 6680 00	Shield, phone, FD-4/8
W001, 002		N/A
W003	8276 7320 30	Cable assy, 8P, 8263WHT-5395, #22, L300
W004		N/A
W005	8276 2920 15	Cable, flat, 2P, L150
W006~008		N/A
W101, 201		N/A
W102~402		N/A

• MIXER A PCB assy

Ref. No.	Part No.	Description
	8274 1220 00	PCB Assy, Mixer A, FD-4/8
B001	8251 9672 01	Plain PCB, Mixer A, FD-4/8

ICs

Ref. No.	Part No.	Description
U001, 002	8236 0366 00	SIP, analog, NJM2068LD
U003, 004	8236 0342 02	SIP, analog, NJM4558L
U005	8236 0366 00	SIP, analog, NJM2068LD
U006	8236 0352 03	SIP, analog, NJM4556AL
U301	8236 0342 02	SIP, analog, NJM4558L
U401	8236 0366 00	SIP, analog, NJM2068LD
U302, 402	8236 0342 02	SIP, analog, NJM4558L
U503~803	8236 0342 02	SIP, analog, NJM4558L
U510~810	8236 0781 07	PT, digital, driver, DTC143TS

RESISTORs

Ref. No.	Part No.	Description
R001, 002	8230 1504 79	VT, carbon, 1/2W, 4.7Ω, 5%
R010	8240 2540 00	Pot, PI, SL45, 50kΩAA, NS-4502GVP, L20
R011~013	8240 2530 00	Pot, PI, RT12, 30kΩAA, EVJY00, L20
R150, 250	8230 1388 23	HT, carbon, 1/4W, 82kΩ, 5%
R151, 251	8230 1382 03	HT, carbon, 1/4W, 20kΩ, 5%
R152, 252	8230 1384 73	HT, carbon, 1/4W, 47kΩ, 5%
R153, 253	8230 1381 04	HT, carbon, 1/4W, 100kΩ, 5%
R155, 255	8230 1388 23	HT, carbon, 1/4W, 82kΩ, 5%
R156, 256	8230 1381 03	HT, carbon, 1/4W, 10kΩ, 5%
R157, 257	8230 1381 03	HT, carbon, 1/4W, 10kΩ, 5%
R158, 258	8230 1381 03	HT, carbon, 1/4W, 10kΩ, 5%
R160, 260	8230 1388 23	HT, carbon, 1/4W, 82kΩ, 5%
R161, 261	8230 1381 04	HT, carbon, 1/4W, 100kΩ, 5%
R162, 262	8230 1388 23	HT, carbon, 1/4W, 82kΩ, 5%
R163, 263	8230 1382 03	HT, carbon, 1/4W, 20kΩ, 5%
R164, 264	8230 1382 04	HT, carbon, 1/4W, 200kΩ, 5%
R165, 265	8230 1381 03	HT, carbon, 1/4W, 10kΩ, 5%
R166, 266	8230 1381 03	HT, carbon, 1/4W, 10kΩ, 5%
R167, 267	8230 1382 00	HT, carbon, 1/4W, 20Ω, 5%
R168, 268		N/A
R170, 270	8230 1381 01	HT, carbon, 1/4W, 100Ω, 5%
R171, 271	8230 1381 01	HT, carbon, 1/4W, 100Ω, 5%
R172, 272	8230 1382 73	HT, carbon, 1/4W, 27kΩ, 5%
R173, 273	8230 1382 73	HT, carbon, 1/4W, 27kΩ, 5%
R501, 601	8230 1381 04	HT, carbon, 1/4W, 100kΩ, 5%
R502, 602	8230 1381 01	HT, carbon, 1/4W, 100Ω, 5%
R503, 603	8230 1381 04	HT, carbon, 1/4W, 100kΩ, 5%
R504, 604	8230 1381 01	HT, carbon, 1/4W, 100Ω, 5%
R701, 801	8230 1381 04	HT, carbon, 1/4W, 100kΩ, 5%
R702, 802	8230 1381 04	HT, carbon, 1/4W, 100kΩ, 5%
R703, 803	8230 1382 04	HT, carbon, 1/4W, 200kΩ, 5%
R704, 804	8230 1382 04	HT, carbon, 1/4W, 200kΩ, 5%
R705, 805	8230 1382 03	HT, carbon, 1/4W, 20kΩ, 5%
R706, 806	8230 1382 03	HT, carbon, 1/4W, 20kΩ, 5%
R707, 807	8230 1382 02	HT, carbon, 1/4W, 2kΩ, 5%
R708, 808	8230 1382 02	HT, carbon, 1/4W, 2kΩ, 5%
R709, 809	8230 1382 04	HT, carbon, 1/4W, 200kΩ, 5%
R710, 810	8230 1382 04	HT, carbon, 1/4W, 200kΩ, 5%
R711, 811	8230 1381 01	HT, carbon, 1/4W, 100Ω, 5%
R512~812	8230 1382 02	HT, carbon, 1/4W, 2kΩ, 5%
R513~813	8230 1382 04	HT, carbon, 1/4W, 200kΩ, 5%
R514~814	8230 1389 12	HT, carbon, 1/4W, 9.1kΩ, 5%
R515~815	8230 1381 03	HT, carbon, 1/4W, 10kΩ, 5%
R516~816	8230 1381 03	HT, carbon, 1/4W, 10kΩ, 5%
R517~817	8230 1381 03	HT, carbon, 1/4W, 10kΩ, 5%
R518~818	8230 1382 02	HT, carbon, 1/4W, 2kΩ, 5%
R519~819	8230 1382 02	HT, carbon, 1/4W, 2kΩ, 5%
R520~820	8230 1381 32	HT, carbon, 1/4W, 1.3kΩ, 5%
R521~821	8230 1381 32	HT, carbon, 1/4W, 1.3kΩ, 5%
R522~822	8230 1389 12	HT, carbon, 1/4W, 9.1kΩ, 5%
R523~823	8230 1389 12	HT, carbon, 1/4W, 9.1kΩ, 5%
R524~824		N/A
R525~825	8230 1382 73	HT, carbon, 1/4W, 27kΩ, 5%
R526~826	8230 1382 73	HT, carbon, 1/4W, 27kΩ, 5%
R527~827	8230 1383 63	HT, carbon, 1/4W, 36kΩ, 5%
R528~828	8230 1383 63	HT, carbon, 1/4W, 36kΩ, 5%
R529~829	8230 1382 73	HT, carbon, 1/4W, 27kΩ, 5%
R530~830	8230 1383 63	HT, carbon, 1/4W, 36kΩ, 5%
R531~831	8230 1383 63	HT, carbon, 1/4W, 36kΩ, 5%
R532~832	8230 1382 73	HT, carbon, 1/4W, 27kΩ, 5%
R533~833	8230 1382 73	HT, carbon, 1/4W, 27kΩ, 5%
R534~834	8230 1383 63	HT, carbon, 1/4W, 36kΩ, 5%
R535~835	8230 1383 63	HT, carbon, 1/4W, 36kΩ, 5%
R536~836	8230 1382 20	HT, carbon, 1/4W, 22Ω, 5%
R537~837	8230 1382 20	HT, carbon, 1/4W, 22Ω, 5%
R540~840	8240 2500 00	Pot., PI, SL45, 50kΩA, NS-4502VP, L20
R541~841	8240 2680 00	Pot., PI, RT09, 10kΩB, CC, EVUF3A, L20
R542~842	8240 2700 00	Pot., PI, RT12, 50kΩCC, EVJY00, L20
R543~843	8240 2510 00	Pot., PI, RT09, 50kΩB, CC, EVUF3A, L20
R544~844	8240 2510 00	Pot., PI, RT09, 50kΩB, CC, EVUF3A, L20
R545~845	8240 2510 00	Pot., PI, RT09, 50kΩB, CC, EVUF3A, L20
R546~846	8240 2510 00	Pot., PI, RT09, 50kΩB, CC, EVUF3A, L20
R547~847	8240 2490 00	Pot., PI, RT12, 100kΩB, CC CT, EVJ02J, L20
R548~848	8240 2830 00	Pot., PI, RT12, 20kΩB, CC CT, EVJ02J, L20

CAPACITORs

ALU = Electrolytic type
CER = Ceramic type
PES = Mylar type

Ref. No.	Part No.	Description
C001, 002	8232 1431 07	VT, ALU, 16V, 100µF, 20%, SME-VB
C003~006	8232 8181 04	VT, CER, 25V, 0.1µF, 20%, YF
C007, 008	8232 1432 27	VT, ALU, 16V, 220µF, 20%, SME-VB
C009	8232 8181 04	VT, CER, 25V, 0.1µF, 20%, YF
C140, 240	8232 1424 76	VT, ALU, 10V, 47µF, 20%, SME-VB
C141, 241	8232 8011 00	VT, CER, 50V, 10pF, 5%, SL
C142, 242	8232 8011 00	VT, CER, 50V, 10pF, 5%, SL
C143, 243	8232 1431 06	VT, ALU, 16V, 10µF, 20%, SME-VB
C144, 244	8232 8011 00	VT, CER, 50V, 10pF, 5%, SL
C145, 245	8232 8012 20	VT, CER, 50V, 22pF, 5%, SL
C146, 246	8232 1424 76	VT, ALU, 10V, 47µF, 20%, SME-VB
C150, 250	8232 1424 76	VT, ALU, 10V, 47µF, 20%, SME-VB
C151, 251	8232 8011 00	VT, CER, 50V, 10pF, 5%, SL
C152, 252	8232 8011 00	VT, CER, 50V, 10pF, 5%, SL
C153, 253	8232 8011 01	VT, CER, 50V, 100pF, 5%, SL
C154, 254	8232 8011 01	VT, CER, 50V, 100pF, 5%, SL
C155, 255	8232 1431 06	VT, ALU, 16V, 10µF, 20%, SME-VB
C160, 260	8232 1424 76	VT, ALU, 10V, 47µF, 20%, SME-VB

Ref. No.	Part No.	Description
C161, 261	8232 8011 00	VT, CER, 50V, 10pF, 5%, SL
C162, 262	8232 8011 00	VT, CER, 50V, 10pF, 5%, SL
C163, 263	8232 1424 76	VT, ALU, 10V, 47µF, 20%, SME-VB
C164, 264	8232 8011 00	VT, CER, 50V, 10pF, 5%, SL
C165, 265	8232 8011 00	VT, CER, 50V, 10pF, 5%, SL
C166, 266	8232 1431 06	VT, ALU, 16V, 10µF, 20%, SME-VB
C167, 267	8232 1422 27	VT, ALU, 10V, 220µF, 20%, SME-VB
C170, 270	8232 1424 76	VT, ALU, 10V, 47µF, 20%, SME-VB
C171, 271	8232 1424 76	VT, ALU, 10V, 47µF, 20%, SME-VB
C172, 272	8232 8014 71	VT, CER, 50V, 470pF, 5%, SL
C172, 273	8232 8014 71	VT, CER, 50V, 470pF, 5%, SL
C501, 601	8232 8011 01	VT, CER, 50V, 100pF, 5%, SL
C502, 602	8232 1431 06	VT, ALU, 16V, 10µF, 20%, SME-VB
C503, 603	8232 8011 01	VT, CER, 50V, 100pF, 5%, SL
C504, 604	8232 1424 76	VT, ALU, 10V, 47µF, 20%, SME-VB
C510~810	8232 1424 76	VT, ALU, 10V, 47µF, 20%, SME-VB
C511~811	8232 8011 01	VT, CER, 50V, 100pF, 5%, SL
C512~812	8232 8011 01	VT, CER, 50V, 100pF, 5%, SL
C513~813	8232 9012 23	VT, PES, 50V, 0.022µF, 5%, AMZ
C514~814	8232 9011 03	VT, PES, 50V, 0.01µF, 5%, AMZ
C515~815	8232 8011 01	VT, CER, 50V, 100pF, 5%, SL
C516~816	8232 8011 01	VT, CER, 50V, 100pF, 5%, SL
C517~817	8232 9016 82	VT, PES, 50V, 0.0068µF, 5%, AMZ
C518~818	8232 9016 82	VT, PES, 50V, 0.0068µF, 5%, AMZ
C519~819	8232 9011 53	VT, PES, 50V, 0.015µF, 5%, AMZ
C520~820	8232 8012 20	VT, CER, 50V, 22pF, 5%, SL
C521~821	8232 8012 20	VT, CER, 50V, 22pF, 5%, SL
C522~822	8232 1424 76	VT, ALU, 10V, 47µF, 20%, SME-VB
C530, 730	8232 8181 04	VT, CER, 25V, 0.1µF, +80-20%, YF
C531, 731	8232 8181 04	VT, CER, 25V, 0.1µF, +80-20%, YF
C532, 732	8232 8181 04	VT, CER, 25V, 0.1µF, +80-20%, YF
C533, 733	8232 8181 04	VT, CER, 25V, 0.1µF, +80-20%, YF
C534~834	8232 8181 04	VT, CER, 25V, 0.1µF, +80-20%, YF
C535~835	8232 8181 04	VT, CER, 25V, 0.1µF, +80-20%, YF
C701, 801	8232 8011 01	VT, CER, 50V, 100pF, 5%, SL
C702, 802	8232 8011 01	VT, CER, 50V, 100pF, 5%, SL
C703, 803	8232 1421 07	VT, ALU, 10V, 100µF, 20%, SME-VB
C704, 804	8232 1421 07	VT, ALU, 10V, 100µF, 20%, SME-VB
C705, 805	8232 8011 00	VT, CER, 50V, 10pF, 5%, SL
C706, 806	8232 8011 00	VT, CER, 50V, 10pF, 5%, SL
C707, 807		N/A
C708, 808	8232 1424 76	VT, ALU, 10V, 47µF, 20%, SME-VB
C709, 809	8232 1424 76	VT, ALU, 10V, 47µF, 20%, SME-VB

MISCELLANEOUS

Ref. No.	Part No.	Description
E601		Wire, jumper, F5
E602		Wire, jumper, F10
E603		Wire, jumper, F15
J001	8245 2980 00	Connector, PL, jack, phone, LGR4609-7000
J021	8245 1711 05	Connector, PI, jack, 8283, 5P, WHT
J022	8245 1711 03	Connector, PI, jack, 8283, 3P, WHT
J023	8245 1711 03	Connector, PI, jack, 8283, 3P, WHT
J501~801	8245 2980 00	Connector, PL, jack, phone, LGR4609-7000
S001	8253 6550 16	Switch, PI, slide, 4-3, non-shortening, SSSF0, L09
S701, 801	8253 6550 13	Switch, PI, slide, 2-3, non-shortening, SSSF0, L09
S502~802	8253 6550 13	Switch, PI, slide, 2-3, non-shortening, SSSF0, L09
W001	8276 7770 20	Cable assy, 7P, WHT MT/F-MT/BS, L200
W002	8276 7790 30	Cable assy, 9P, WHT MT/F-MT/BS, L300
W010	8276 7780 20	Cable assy, 8P, WHT MT/F-MT/BS, L200
W011	8276 7790 20	Cable assy, 9P, WHT MT/F-MT/BS, L200
W012	8277 4530 40	Cable assy, shield 2C, 6P, WHT8283-9073, L400

• MIXER B PCB assy

Ref. No.	Part No.	Description
	8274 1260 00	PCB Assy, Mixer B, FD-8
B001	8251 5160 00	Plain PCB, Mixer B, FD-8

ICs

Ref. No.	Part No.	Description
U101~401	8236 0342 02	SIP, analog, NJM4558L
U102~402	8236 0342 02	SIP, analog, NJM4558L
U110~410	8236 0781 07	PT, digital, driver, DTC143TS

RESISTORs

Ref. No.	Part No.	Description
R101~401	8230 1381 04	HT, carbon, 1/4W, 100kΩ, 5%
R102~402	8230 1381 01	HT, carbon, 1/4W, 100Ω, 5%
R103~403	8230 1381 04	HT, carbon, 1/4W, 100kΩ, 5%
R104~404	8230 1381 01	HT, carbon, 1/4W, 100Ω, 5%
R112~412	8230 1382 02	HT, carbon, 1/4W, 2kΩ, 5%
R113~413	8230 1382 04	HT, carbon, 1/4W, 200kΩ, 5%
R114~414	8230 1389 12	HT, carbon, 1/4W, 9.1kΩ, 5%
R115~415	8230 1381 03	HT, carbon, 1/4W, 10kΩ, 5%
R116~416	8230 1381 03	HT, carbon, 1/4W, 10kΩ, 5%
R117~417	8230 1381 03	HT, carbon, 1/4W, 10kΩ, 5%
R118~418	8230 1382 02	HT, carbon, 1/4W, 2kΩ, 5%
R119~419	8230 1382 02	HT, carbon, 1/4W, 2kΩ, 5%
R120~420	8230 1381 32	HT, carbon, 1/4W, 1.3kΩ, 5%
R121~421	8230 1381 32	HT, carbon, 1/4W, 1.3kΩ, 5%
R122~422	8230 1389 12	HT, carbon, 1/4W, 9.1kΩ, 5%
R123~423	8230 1389 12	HT, carbon, 1/4W, 9.1kΩ, 5%
R124~424		N/A
R125~425	8230 1382 73	HT, carbon, 1/4W, 27kΩ, 5%
R126~426	8230 1382 73	HT, carbon, 1/4W, 27kΩ, 5%
R127~427	8230 1383 63	HT, carbon, 1/4W, 36kΩ, 5%
R128~428	8230 1383 63	HT, carbon, 1/4W, 36kΩ, 5%

Ref. No.	Part No.	Description
R129~429	8230 1382 73	HT, carbon, 1/4W, 27kΩ, 5%
R130~430	8230 1383 63	HT, carbon, 1/4W, 36kΩ, 5%
R131~431	8230 1383 63	HT, carbon, 1/4W, 36kΩ, 5%
R132~432	8230 1382 73	HT, carbon, 1/4W, 27kΩ, 5%
R133~433	8230 1382 73	HT, carbon, 1/4W, 27kΩ, 5%
R134~434	8230 1383 63	HT, carbon, 1/4W, 36kΩ, 5%
R135~435	8230 1383 63	HT, carbon, 1/4W, 36kΩ, 5%
R136~436	8230 1382 20	HT, carbon, 1/4W, 22Ω, 5%
R137~437	8230 1382 20	HT, carbon, 1/4W, 22Ω, 5%
R140~440	8240 2500 00	Pot., PI, SL45, 50kΩA, NS-4502VP, L20
R141~441	8240 2680 00	Pot., PI, RT09, 10kΩB, CC, EVUF3A, L20
R142~442	8240 2700 00	Pot., PI, RT12, 50kΩCC, EVJY00, L20
R143~443	8240 2510 00	Pot., PI, RT09, 50kΩB, CC, EVUF3A, L20
R144~444	8240 2510 00	Pot., PI, RT09, 50kΩB, CC, EVUF3A, L20
R145~445	8240 2510 00	Pot., PI, RT09, 50kΩB, CC, EVUF3A, L20
R146~446	8240 2510 00	Pot., PI, RT09, 50kΩB, CC, EVUF3A, L20
R147~447	8240 2490 00	Pot., PI, RT12, 100kΩB, CC CT, EVJ02J, L20
R148~448	8240 2830 00	Pot., PI, RT12, 20kΩB, CC CT, EVJ02J, L20

CAPACITORs

ALU = Electrolytic type
CER = Ceramic type
PES = Mylar type

Ref. No.	Part No.	Description
C101~401	8232 8011 01	VT, CER, 50V, 100pF, 5%, SL
C102~402	8232 1431 06	VT, ALU, 16V, 10µF, 20%, SME-VB
C103~403	8232 8011 01	VT, CER, 50V, 100pF, 5%, SL
C104~404	8232 1424 76	VT, ALU, 10V, 47µF, 20%, SME-VB
C110~410	8232 1424 76	VT, ALU, 10V, 47µF, 20%, SME-VB
C111~411	8232 8011 01	VT, CER, 50V, 100pF, 5%, SL
C112~412	8232 8011 01	VT, CER, 50V, 100pF, 5%, SL
C113~413	8232 9012 23	VT, PES, 50V, 0.022µF, 5%, AMZ
C114~414	8232 9011 03	VT, PES, 50V, 0.01µF, 5%, AMZ
C115~415	8232 8011 01	VT, CER, 50V, 100pF, 5%, SL
C116~416	8232 8011 01	VT, CER, 50V, 100pF, 5%, SL
C117~417	8232 9016 82	VT, PES, 50V, 0.0068µF, 5%, AMZ
C118~418	8232 9016 82	VT, PES, 50V, 0.0068µF, 5%, AMZ
C119~419	8232 9011 53	VT, PES, 50V, 0.015µF, 5%, AMZ
C120~420	8232 8012 20	VT, CER, 50V, 22pF, 5%, SL
C121~421	8232 8012 20	VT, CER, 50V, 22pF, 5%, SL
C122~422	8232 1424 76	VT, ALU, 10V, 47µF, 20%, SME-VB
C130~430	8232 8181 04	VT, CER, 25V, 0.1µF, +80-20%, YF
C131~431	8232 8181 04	VT, CER, 25V, 0.1µF, +80-20%, YF
C134~434	8232 8181 04	VT, CER, 25V, 0.1µF, +80-20%, YF
C135~435	8232 8181 04	VT, CER, 25V, 0.1µF, +80-20%, YF

MISCELLANEOUS

Ref. No.	Part No.	Description
E601		Wire, jumper, F5
E602		Wire, jumper, F10
E603		Wire, jumper, F15
J101~401	8245 2980 00	Connector, PL, jack, phone, LGR4609-7000
S102~402	8253 6550 13	Switch, PI, slide, 2-3, non-shortening, SSSF0, L09
W021	8276 7750 10	Cable assy, 5P, WHT8283-9073, L100
W022	8276 7730 10	Cable assy, 3P, WHT8283-9073, L100
W023	8276 7730 10	Cable assy, 3P, WHT8283-9073, L100

• JACK PCB assy

Ref. No.	Part No.	Description
	8274 1230 00	PCB Assy, JACK, FD-4/8
B001	8251 9672 02	Plain PCB, JACK, FD-4/8

Ref. No.	Part No.	Description
Q001~006	8234 1434 03	Transistor, VT, NPN, 2SC2878A/B
R001~006	8230 1381 02	Resistor, HT, carbon, 1/4W, 1kΩ, 5%
R007~012	8230 1381 03	Resistor, HT, carbon, 1/4W, 10kΩ, 5%
J010	8245 1711 08	Connector, PI, jack, 8P, 8283, WHT
J011	8245 1711 09	Connector, PI, jack, 9P, 8283, WHT
J031, 032	8245 2620 01	Connector, PL, jack, RCA, 2P, BLK
J033~040	8245 2980 00	Connector, PL, jack, phone, LGR4609-7000
L001~006		Wire, jumper, F5
E101		Wire, jumper, F5
E102		Wire, jumper, F7.5
E103		Wire, jumper, F10

• XLR PCB assy

Ref. No.	Part No.	Description
	8274 1240 00	PCB Assy, XLR, FD-4/8
B001	8251 9672 03	Plain PCB, XLR, FD-4/8

Ref. No.	Part No.	Description
J001, 002	8245 2680 03	Connector, PL, XLR 31, 3P, NC3FAH20
J003	8245 1721 06	Connector, PL, jack, 8283, 6P, WHT

• DISPLAY PCB assy

Ref. No.	Part No.	Description
	8274 1560 00	PCB Assy, Display, FD-8
B001	8251 5181 00	Plain PCB, Display, FD-8

ICs

Ref. No.	Part No.	Description
U001	8236 0835 01	QFP, digital, CPU, FD4/8-display
U002		N/A
U003	8236 0836 00	QFP, digital, LCD driver, HD44780U
U004	8256 1760 00	Module, display, LCD, FD-4/8
U005		N/A
U006	8256 1770 00	Module, jog, SIM-026MT

TRANSISTORs

Ref. No.	Part No.	Description
Q001, 002	8234 1008 02	VT, PNP, 2SA1150Y

DIODEs

Ref. No.	Part No.	Description
D001~008	8234 5007 00	HT, 1SS136
D009~014	8234 5007 00	HT, 1SS136
D015		N/A
D016~018	8234 5007 00	HT, 1SS136
D019, 020		N/A
D021~036	8234 5007 00	HT, 1SS136
D037~040		N/A
D041~049	8234 0100 00	Opt., V, LED, ORG, GL-2HD6
D050, 051	8234 0191 00	Opt., V, LED, GRN, GL-2EG6
D052		N/A
D053, 054	8234 0191 00	Opt., V, LED, GRN, GL-2EG6
D055		N/A
D056	8234 0191 00	Opt., V, LED, GRN, GL-2EG6

RESISTORs

Ref. No.	Part No.	Description
R001		Wire, jumper, F10
R002~007	8230 1381 01	HT, carbon, 1/4W, 100Ω, 5%
R008	8230 1381 05	HT, carbon, 1/4W, 1MΩ, 5%
R009	8230 1382 04	HT, carbon, 1/4W, 200kΩ, 5%
R010		Wire, jumper, F5
R011~015	8230 1381 02	HT, carbon, 1/4W, 1kΩ, 5%
R016	8240 1510 04	Pot., PI, RT09, 5kΩB, L20, ∅4 knob, RK09K113
R017	8230 1381 04	HT, carbon, 1/4W, 100kΩ, 5%
R018, 019	8230 1381 03	HT, carbon, 1/4W, 10kΩ, 5%
R020	8230 1381 04	HT, carbon, 1/4W, 100kΩ, 5%
R021, 022	8230 1381 03	HT, carbon, 1/4W, 10kΩ, 5%
R023~030	8230 1382 23	HT, carbon, 1/4W, 22kΩ, 5%
R031~038	8230 1381 11	HT, carbon, 1/4W, 110Ω, 5%
R039, 040	8230 1381 02	HT, carbon, 1/4W, 1kΩ, 5%
R041~043	8230 1381 03	HT, carbon, 1/4W, 10kΩ, 5%

CAPACITORs

ALU = Electrolytic type
CER = Ceramic type

Ref. No.	Part No.	Description
C001	8232 1431 06	VT, ALU, 16V, 10µF, 20%, SME-VB
C002	8232 8181 04	VT, CER, 25V, 0.1µF, +80-20%, YF
C003	8232 1451 06	VT, ALU, 35V, 10µF, 20%, SME-VB
C004	8232 8181 04	VT, CER, 25V, 0.1µF, +80-20%, YF
C005, 006		N/A
C007~009	8232 8014 71	VT, CER, 50V, 470pF, 5%, SL
C010, 011	8232 8063 30	VT, CER, 50V, 33pF, 5%, NPO
C012	8232 8181 04	VT, CER, 25V, 0.1µF, +80-20%, YF
C013		N/A
C014	8232 8181 04	VT, CER, 25V, 0.1µF, +80-20%, YF
C015, 016	8232 8031 03	VT, CER, 50V, 0.01µF, +80-20%, YF

MISCELLANEOUS

Ref. No.	Part No.	Description
E101		N/A
E501		Wire, jumper, F5
E502		Wire, jumper, F7.5
E503		Wire, jumper, F10
E504		Wire, jumper, F12.5
E505		Wire, jumper, F20
E506		Wire, jumper, F30
L001, 002	8239 1160 00	Lamp, 5V, 75mA
S001~014	8253 1350 02	SW, PT, tact, SOR-112HS
S015		N/A
S016~018	8253 1350 02	SW, PT, tact, SOR-112HS
S019, 020		N/A
S021~036	8253 1350 02	SW, PT, tact, SOR-112HS
S037~040		N/A
W001	8276 7790 65	Cable assy, 9P, WHTMT/F-MT/BS, L650
W002, 003		N/A
X001	8256 1340 03	Resonator, PF, CER, 8.00MHz, F5, EFOEN
Y1001	8207 0100 09	Spacer, LED, 9
Y1002	8207 0100 10	Spacer, LED, 10
Y1003	8207 0100 11	Spacer, LED, 11
Y1004	8207 0100 12	Spacer, LED, 12
Y1005	8207 0100 13	Spacer, LED, 13
Y1006	8207 0100 14	Spacer, LED, 14
Y1007	8212 6110 00	Plate, reflect, LCD, FD-4/8

• POWER PCB assy

Ref. No.	Part No.	Description
	8274 1580 00	PCB Assy, Power Supply, FD-8
B101	8251 5230 00	Plain PCB, Power Supply, FD-8

ICs

Ref. No.	Part No.	Description
U001	8236 5410 03	V, analog, power, MIP163
U002	8234 1081 00	Opt., H, photo coupler, ON3171
U003	8236 0321 05	220, analog, regulator, 7812FA
U004	8236 0348 05	220, analog, regulator, NJM7912FA
U005	8236 5409 00	VT, analog, regulator, AN1431T

DIODEs

Ref. No.	Part No.	Description
D001	8234 1077 00	Stack, 600VAC, 1.5A, D2SBA60
D002	8234 1079 00	HT, 80V, 0.2A, MA171
D003	8234 1078 00	HT, 600V, 1.0A, D1N60
D004	8234 1080 00	V, 200V, 5.0A, MA649
D005, 006	8234 1084 00	VT, SCHOTTKY, EK03W

RESISTORs

Ref. No.	Part No.	Description
R001	8230 1251 04	H, metal, 2W, 100kΩ, 5%, RSS
R002, 003	8230 1386 29	HT, carbon, 1/4W, 6.2Ω, 5%
R004	8230 1243 30	HT, metal, 1/2W, 33Ω, 5%, RSS
R005	8230 1387 50	HT, carbon, 1/4W, 75Ω, 5%
R006	8230 1381 03	HT, carbon, 1/4W, 10kΩ, 5%
R007	8230 1384 71	HT, carbon, 1/4W, 470Ω, 5%
R008, 009	8230 1381 03	HT, carbon, 1/4W, 10kΩ, 5%

CAPACITORs

ALU = Electrolytic type
CER = Ceramic type
PES = Mylar type

Ref. No.	Part No.	Description
C001	8232 3521 04	V, CER, 250V AC, 0.1µF, 20%, ECQ-UMZ
C002	8232 3491 03	VT, PES, 630V, 0.01µF, 10%, ECQ-EKF
C003	8232 8011 00	VT, CER, 50V, 10pF, ±5pF, SL
C004	8232 8181 04	VT, CER, 25V, 0.1µF, +80-20%, YF
C005, 006	8232 3542 22	VT, CER, 250V, 0.0022µF, 20%, ECK-ZNS
C007	8232 3533 91	VT, CER, 500V, 390pF, 10%, ECK-ZHT
C008	8232 8181 04	VT, CER, 25V, 0.1µF, +80-20%, YF
C009~012	8232 8031 03	VT, CER, 50V, 0.01µF, +80-20%, YF
C013	8232 3241 07	VT, ALU, 400V, 100µF, 20%, SMH-VNSN, D25.4
C014	8232 0964 76	V, ALU, 25V, 47µF, 20%, SME-VB
C015, 016	8232 3584 77	VT, ALU, 25V, 470µF, , 20%, LXV, D10
C017~020	8232 3583 37	VT, ALU, 25V, 330µF, , 20%, LXV, D10
C021, 022	8232 3542 22	V, CER, 250V, 0.0022µF, 20%, ECK-ZNS
C023~026		N/A

MISCELLANEOUS

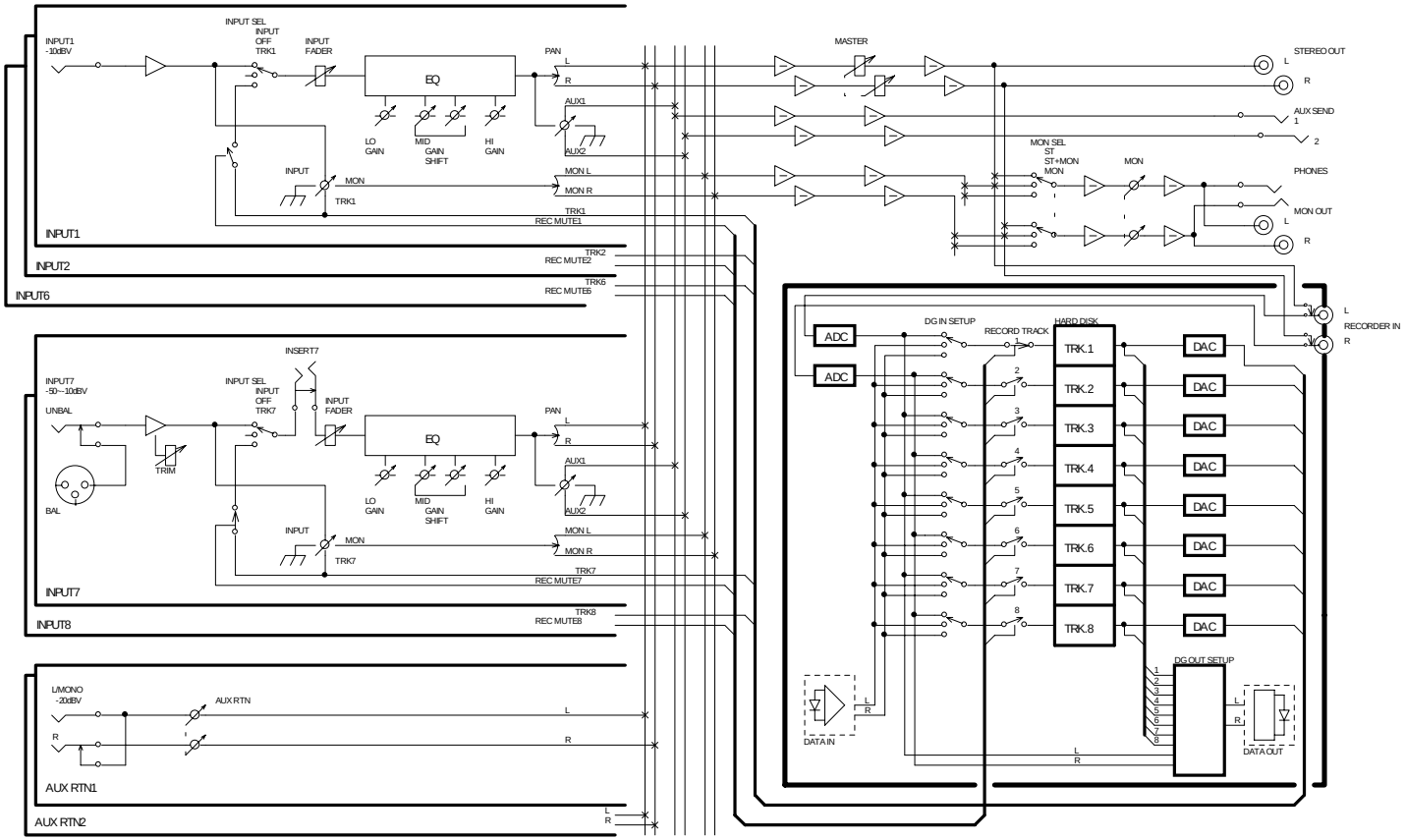
Ref. No.	Part No.	Description
E301	8239 0002 00	Holder, PI, fuse, S-N5057
J001	8245 0530 08	Connector, PI, jack, 8263, 8P, WHT
J002	8245 3210 00	Connector, PL, jack, AC-inlet, 3P, AP-320V
L001	8242 2491 02	Filter, line, 1mH, 2.2A, ELF15N022
L002	8242 2501 03	Coil, PVT, 10µH, 2A, ELC
L003	8242 2491 93	Filter, line, 19mH, 0.5A, ELF15N005
L004, 005	8242 1340 01	Filter, EMI, 6 hole
S001	8253 4610 02	Switch, push, power, SDDLB1-B1-F2
T001	8242 2480 00	Transformer, sw power, 27SF11, FD-4/8
W001~008		N/A
Y501		N/A
Y502	8207 0015 00	Heat sink, 16PB16, L25, B
Y503		Screw, P3 x 6, CZn

● Abbreviation

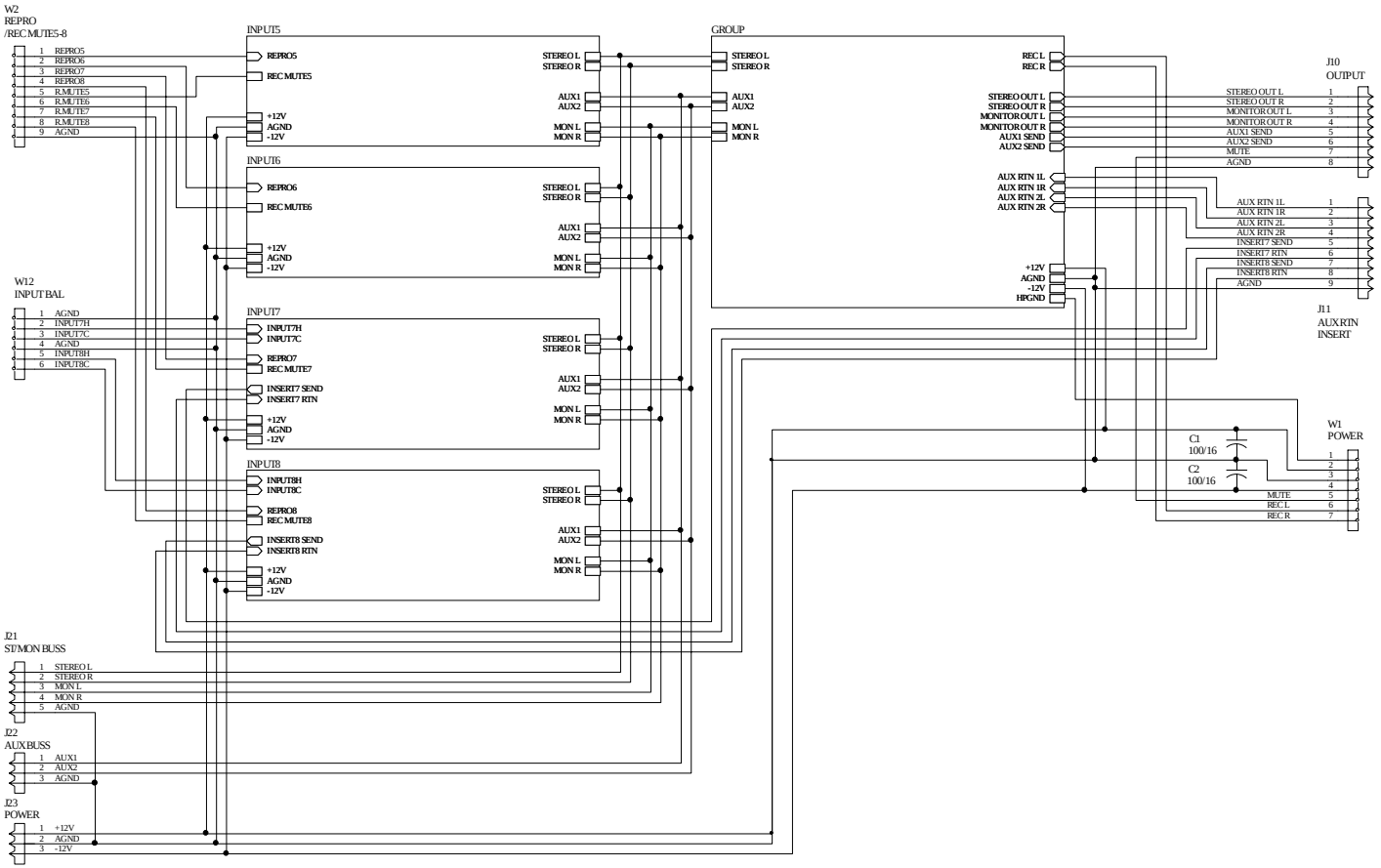
S: Surface mount
T: Taping device
F: Forming device
P: Penetrate mount
V: Vertical mount
H: Horizontal mount
I: I form
L: L form
QFP: Quad Flat Package
SOP: Small Outline Package
SIP: Single In-line Package
SOJ: Small Outline with J leads
220: TO-220 type

8. CIRCUIT DIAGRAMS

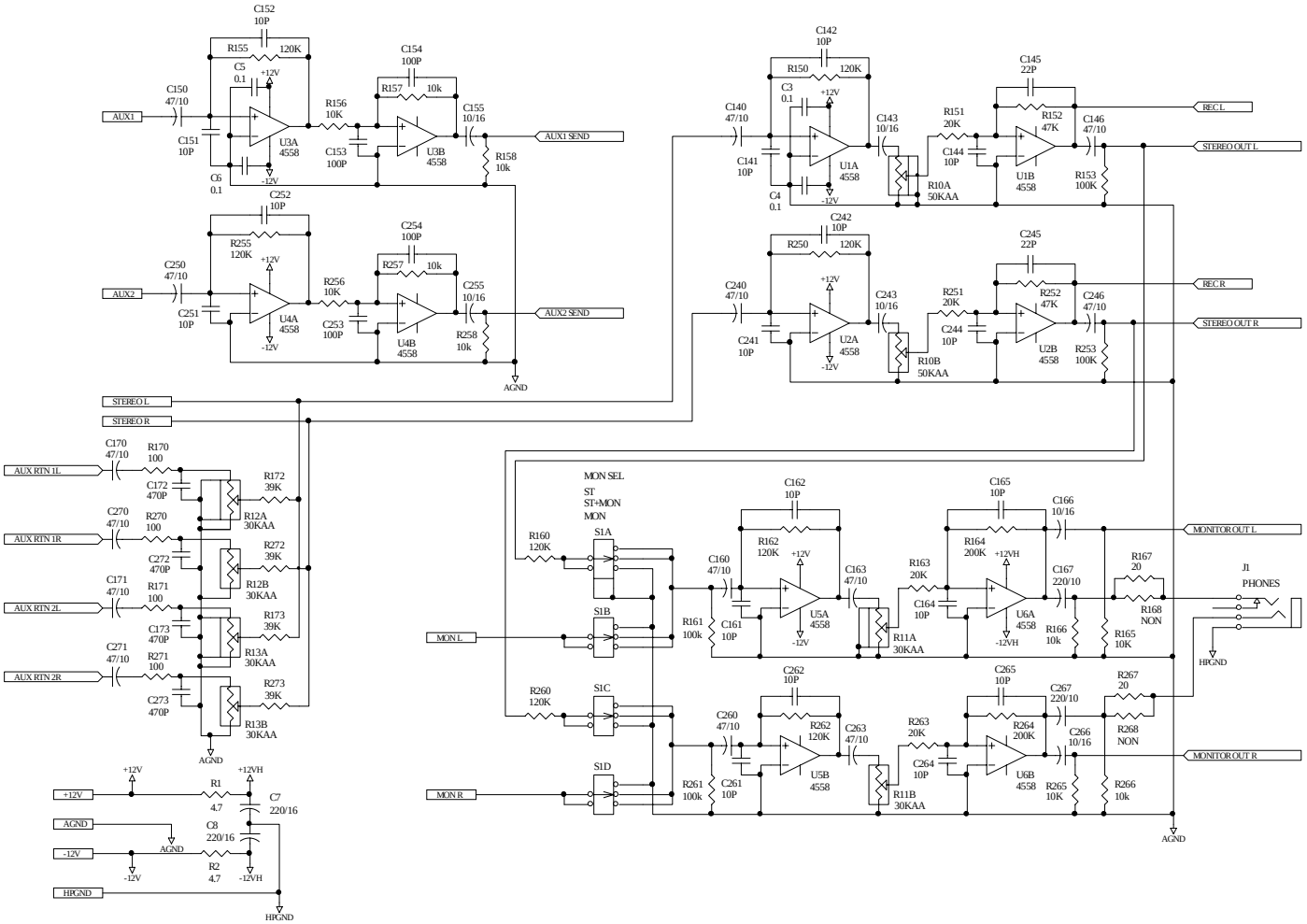
● BLOCK DIAGRAM



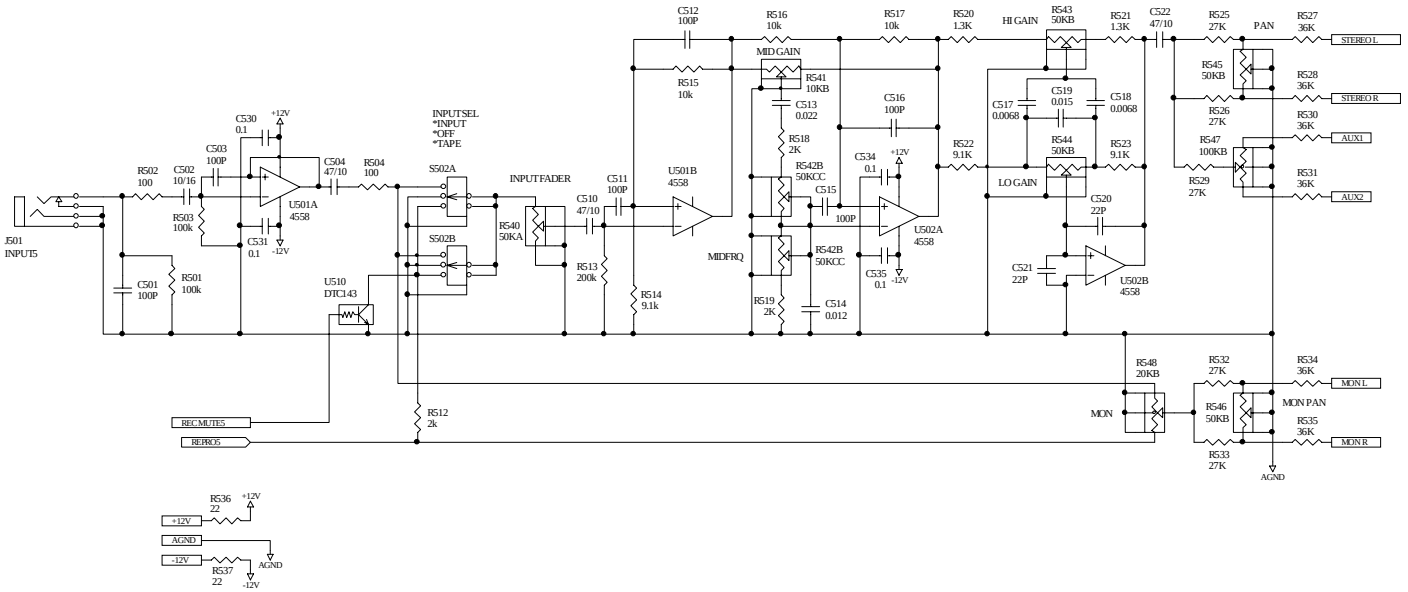
● MIXER A, INPUT 5 ~ 8 CONNECTION (1/6)



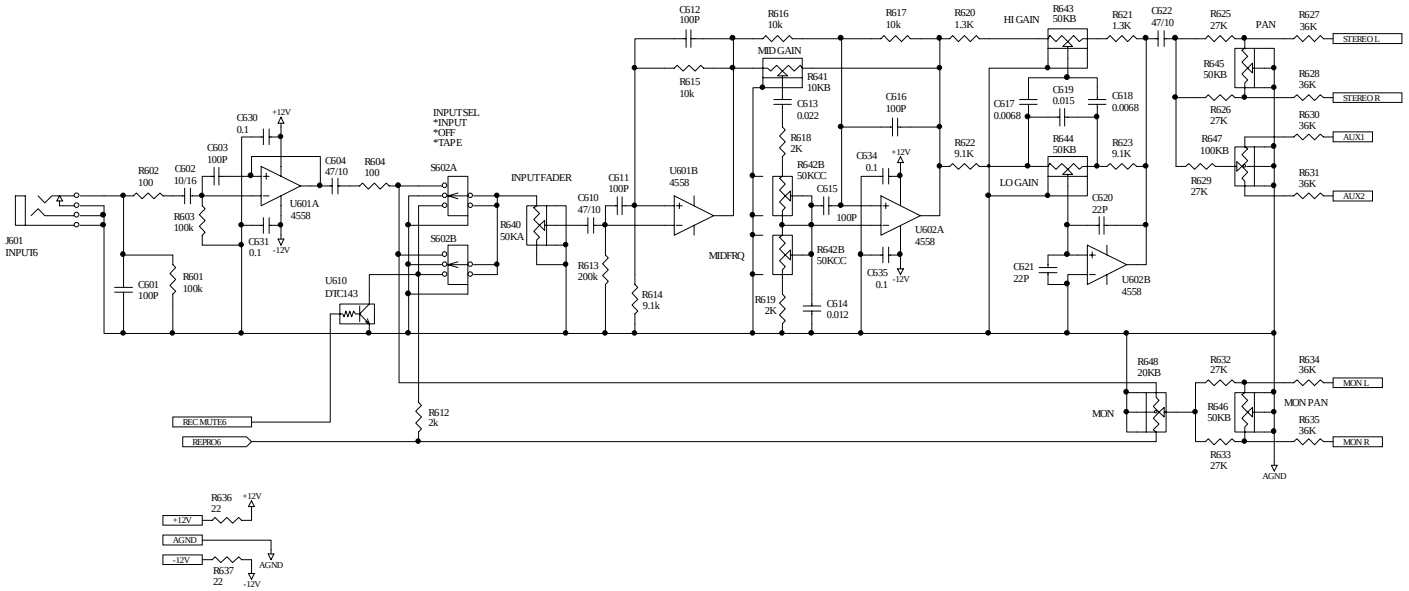
● MIXER A, MASTER (2/6)



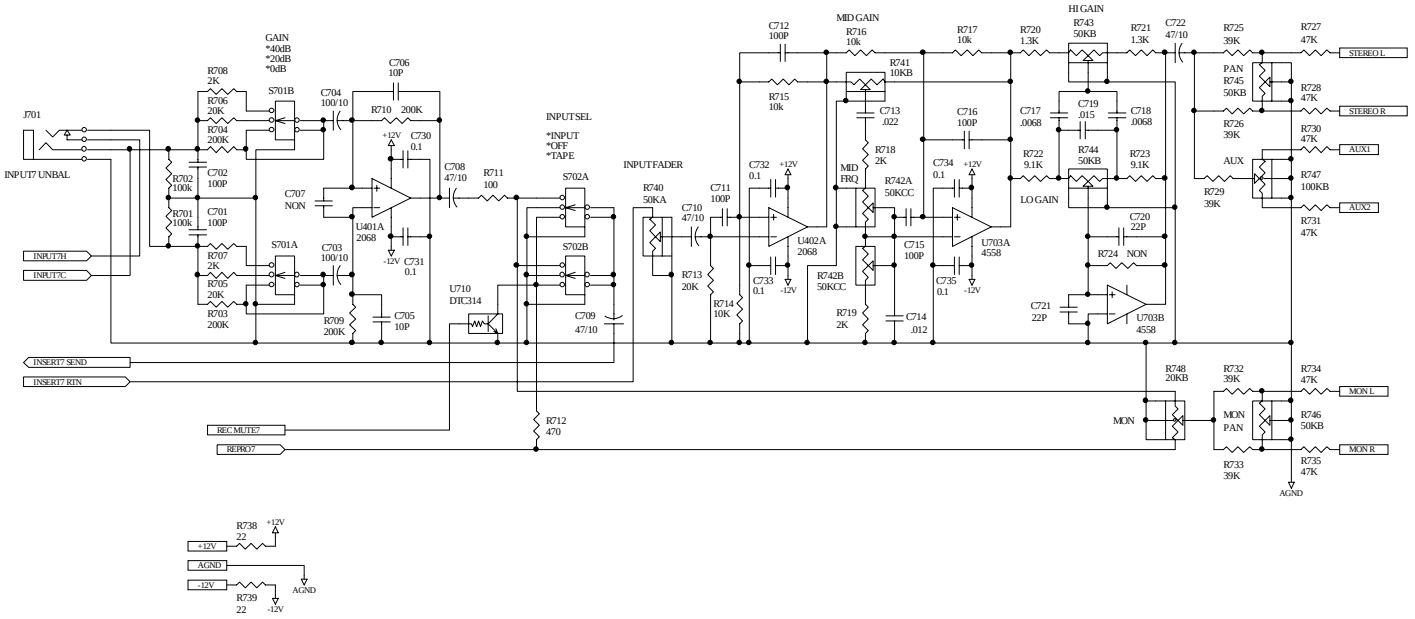
● MIXER A, INPUT 5 (3/6)



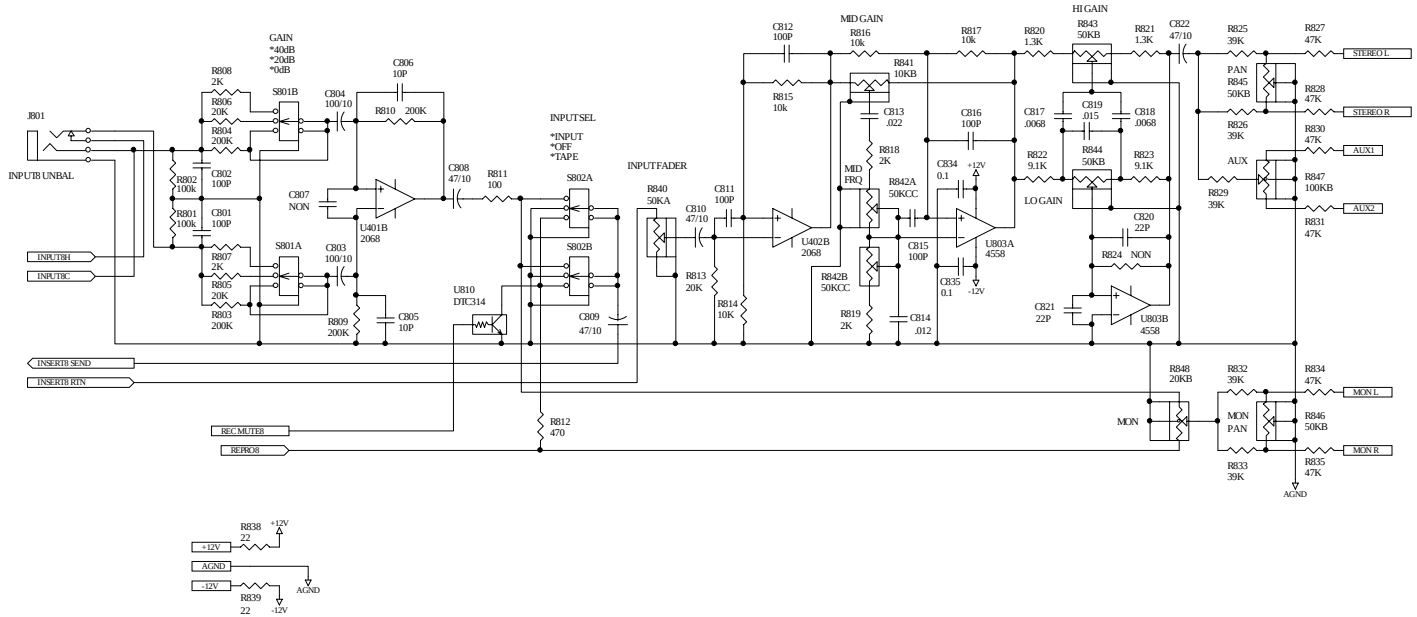
● MIXER A, INPUT 6 (4/6)



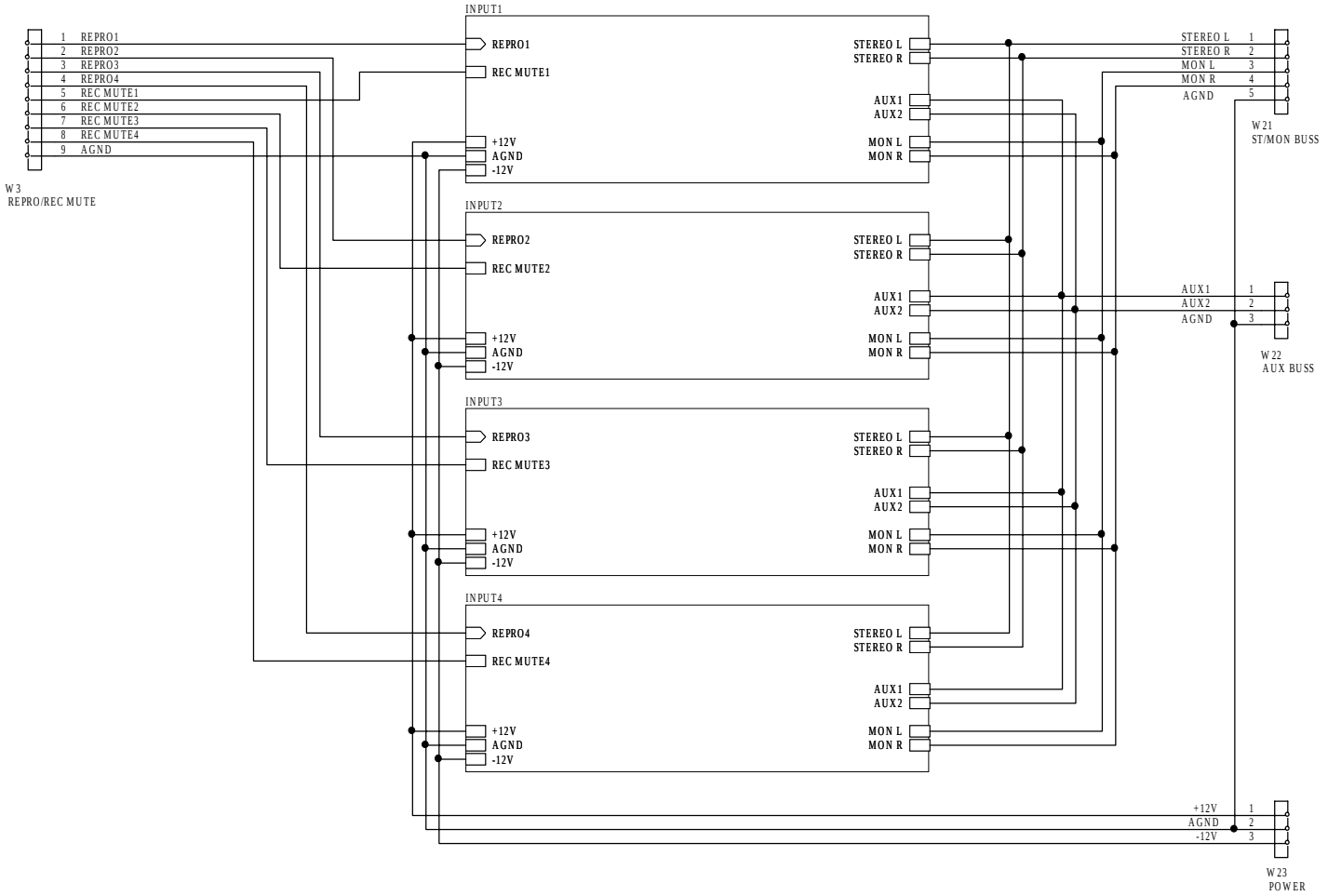
● MIXER A, INPUT 7 (5/6)



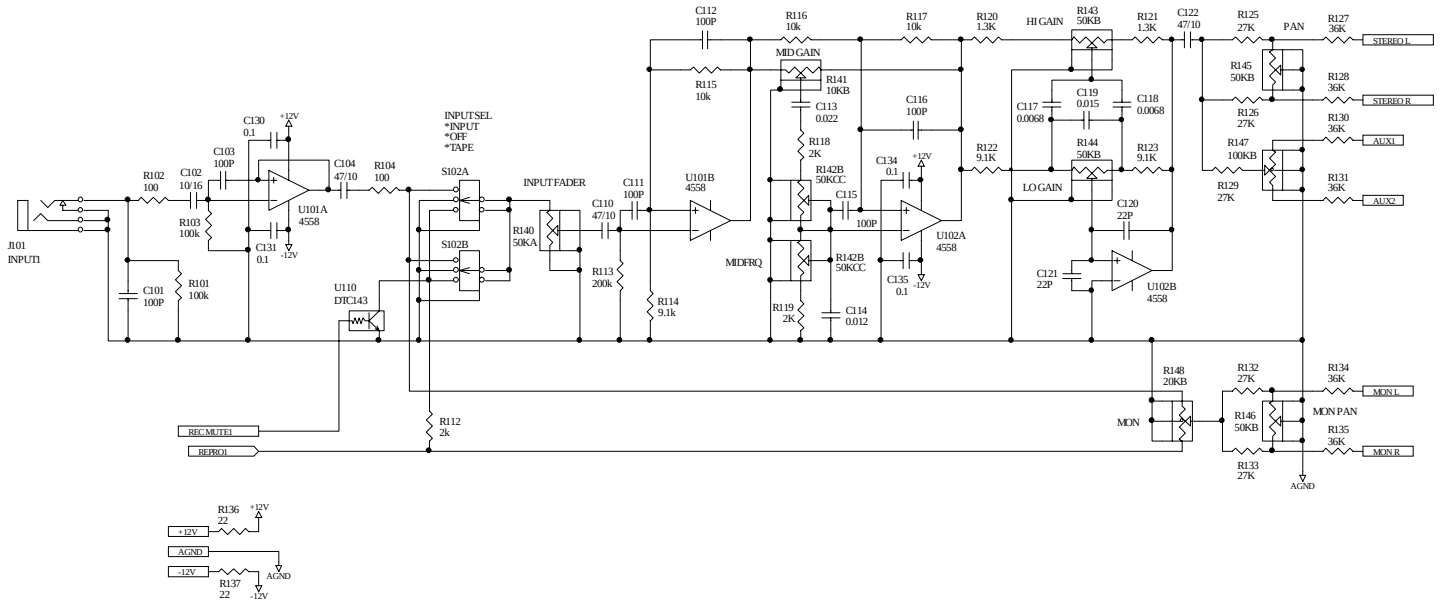
● MIXER A, INPUT 8 (6/6)



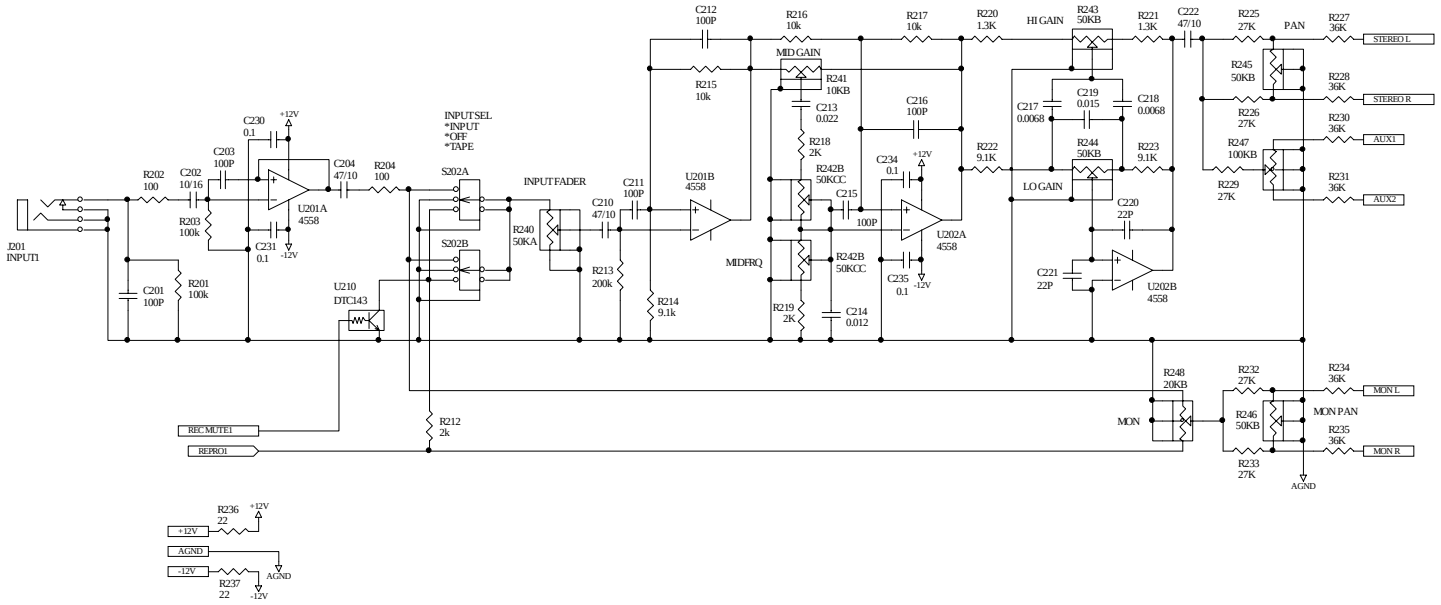
● MIXER B, INPUT 1 ~ 4 CONNECTION (1/5)



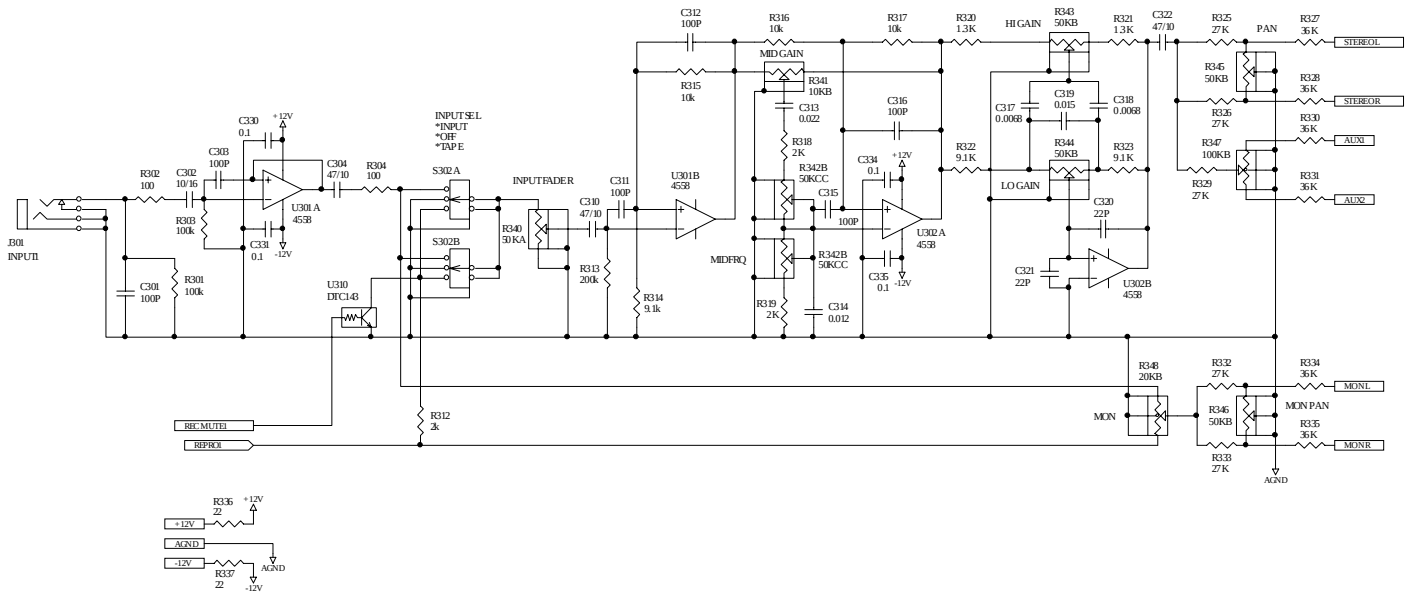
● MIXER B, INPUT 1 (2/5)



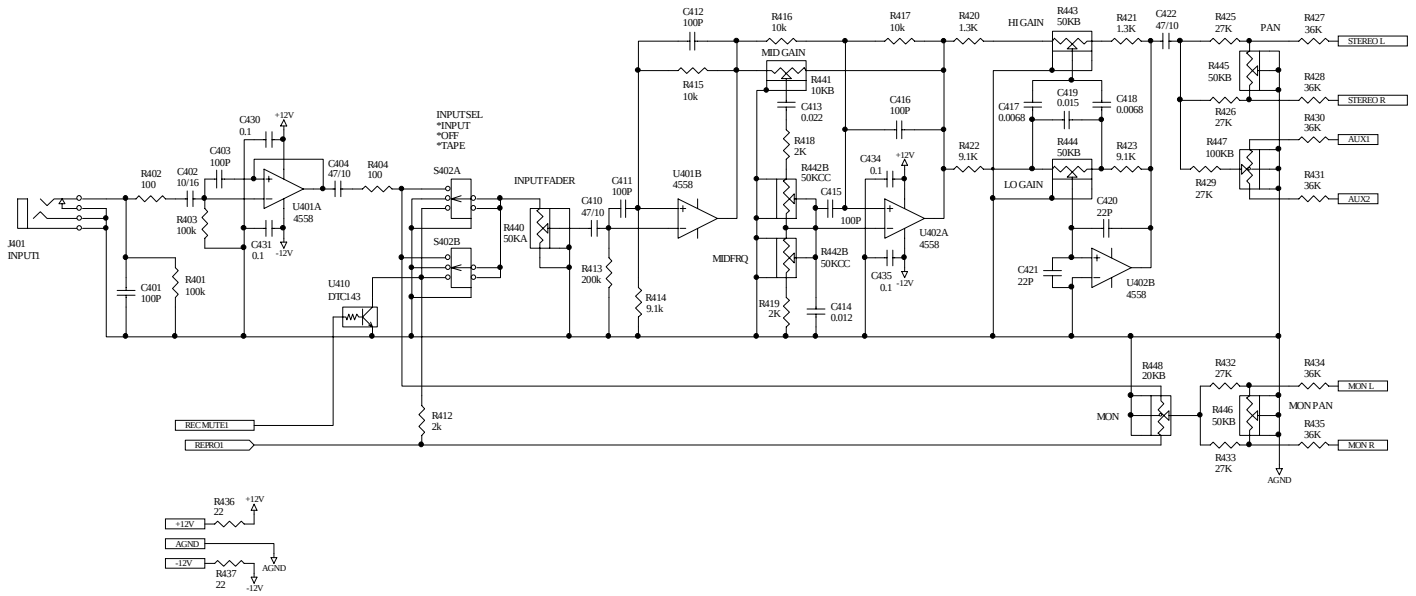
● MIXER B, INPUT 2 (3/5)



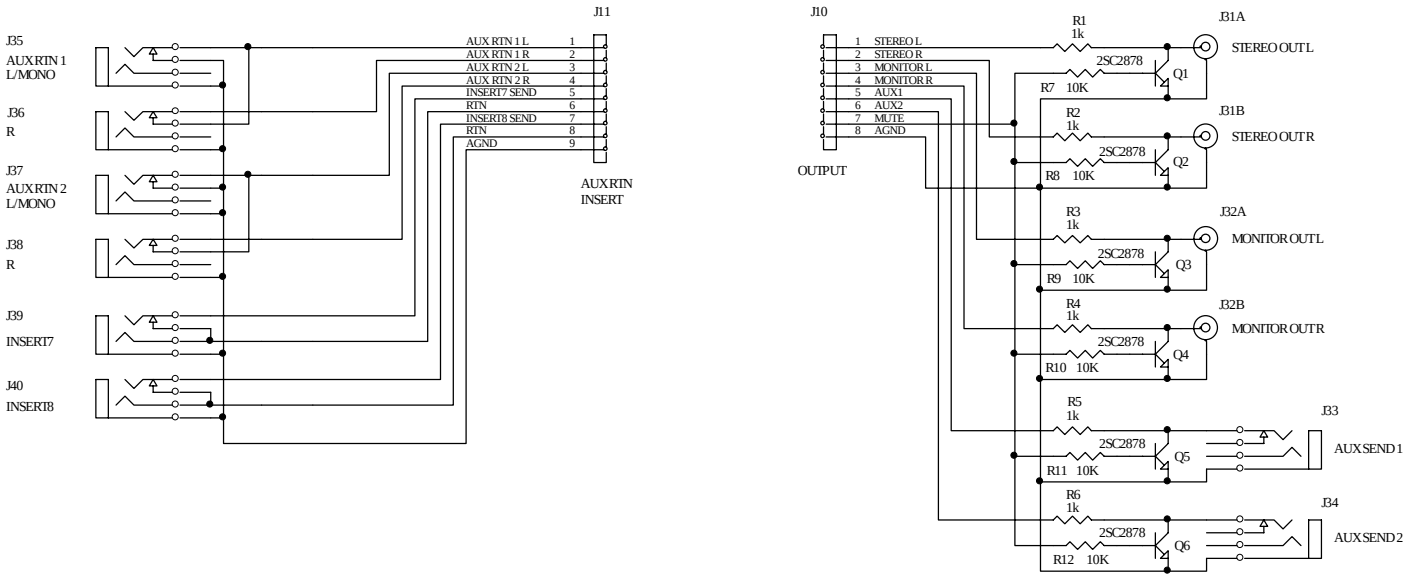
● MIXER B, INPUT 3 (4/5)

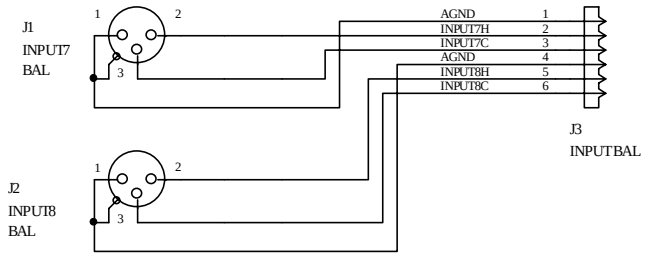


● MIXER B, INPUT 4 (5/5)

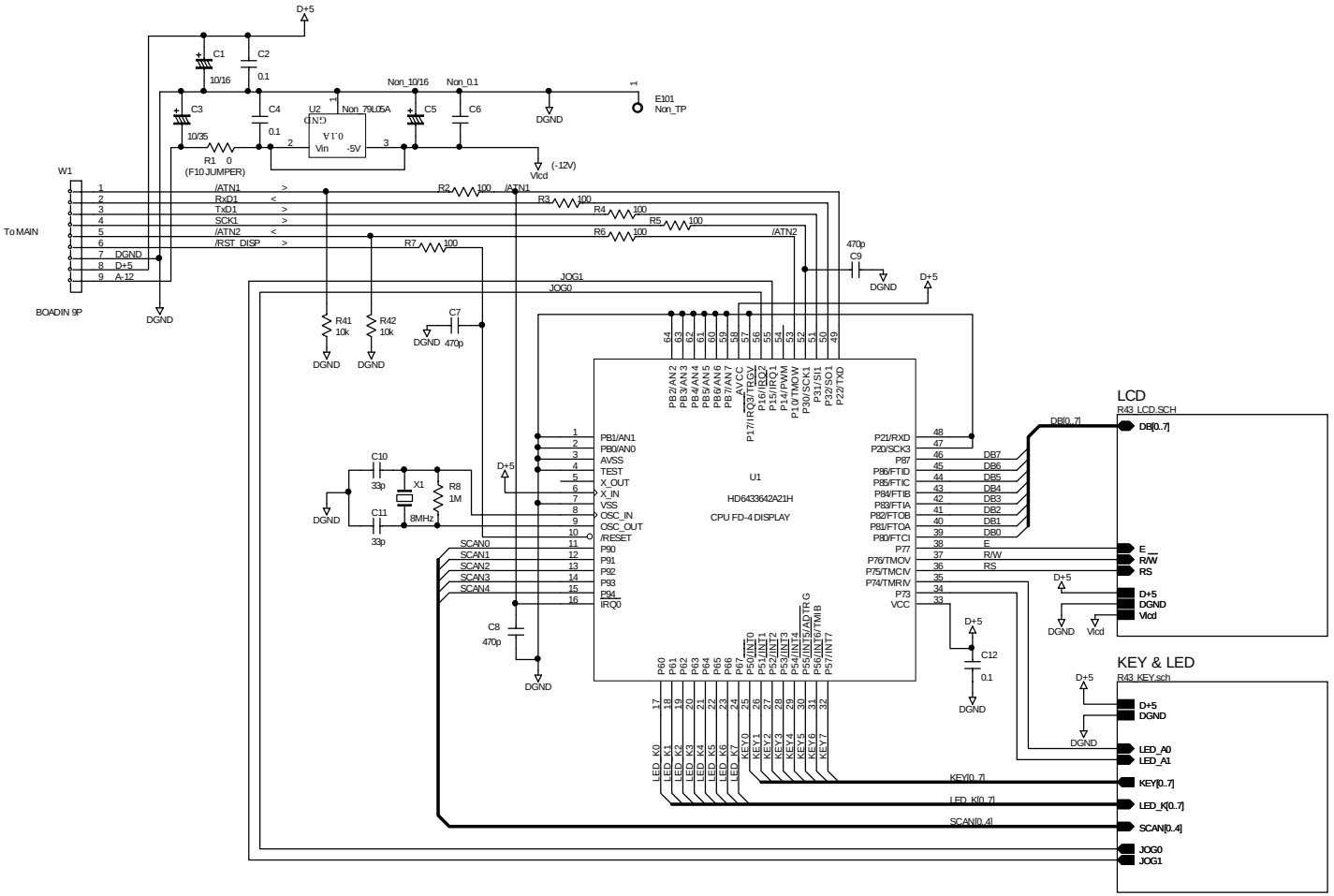


● ANALOG I/O & XLR

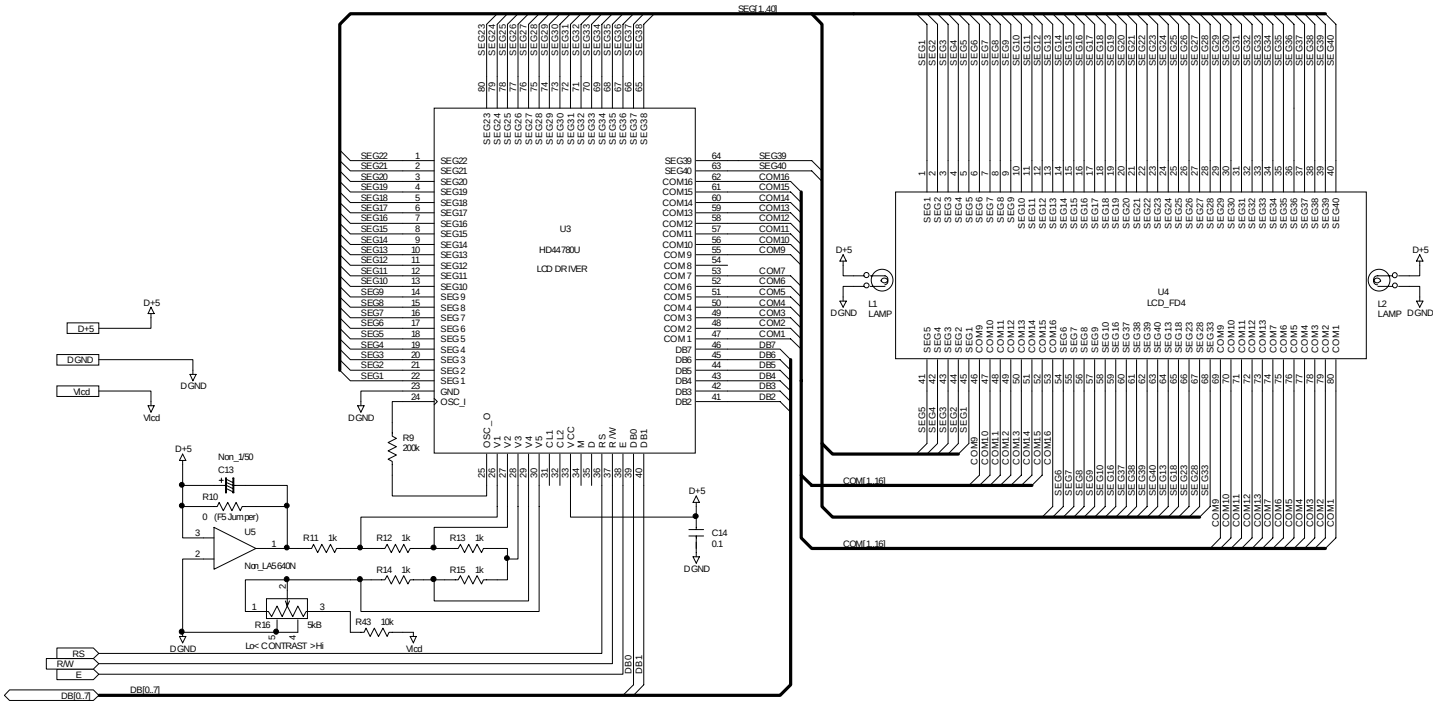




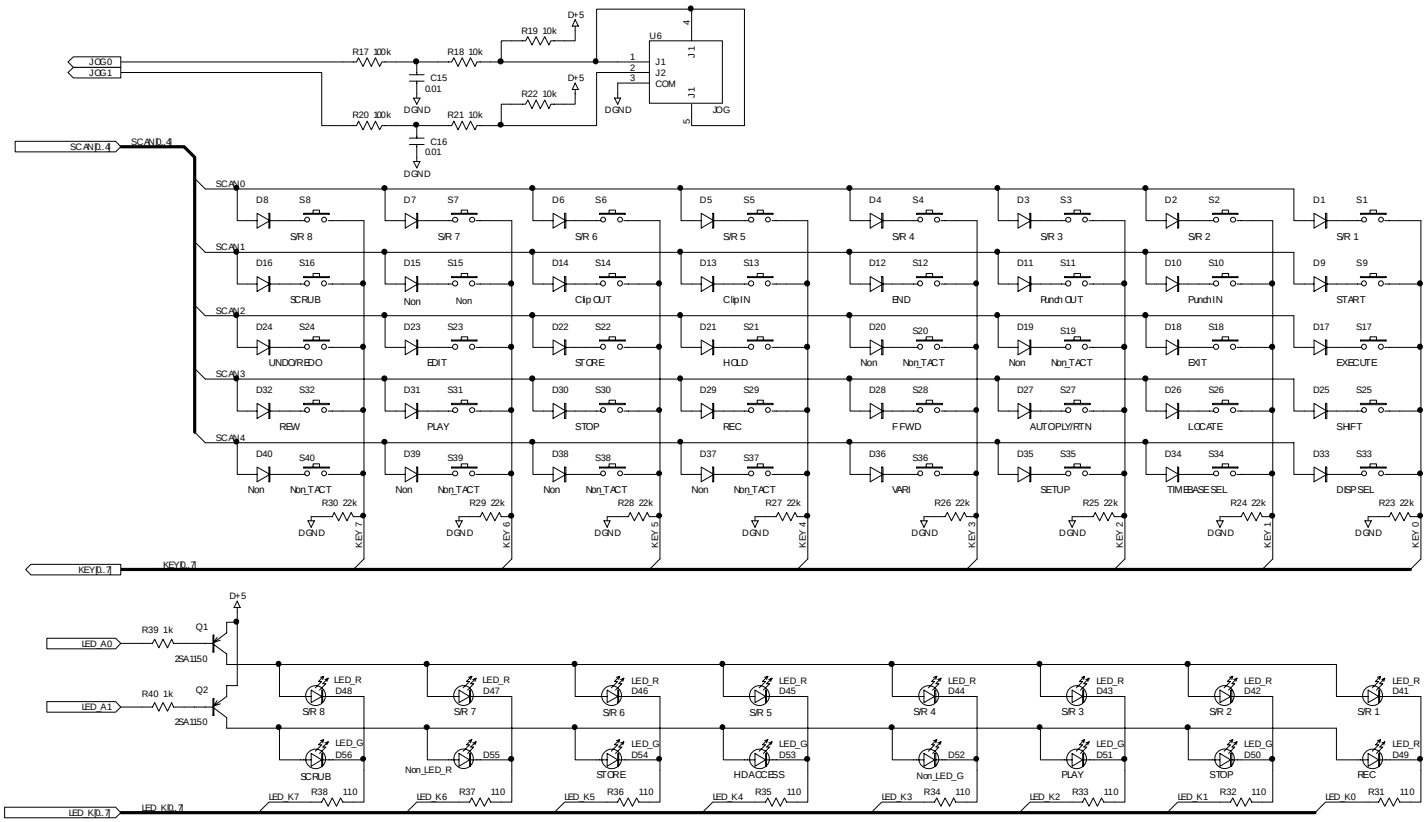
● DISPLAY, ROOT (1/3)



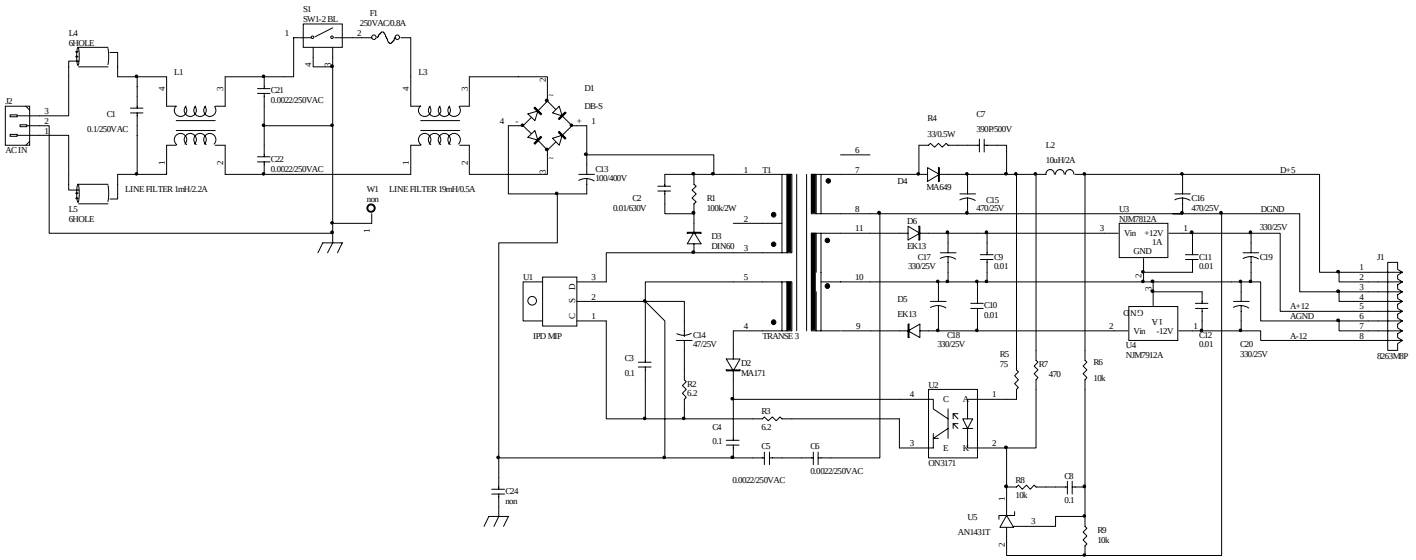
● DISPLAY, LCD (2/3)



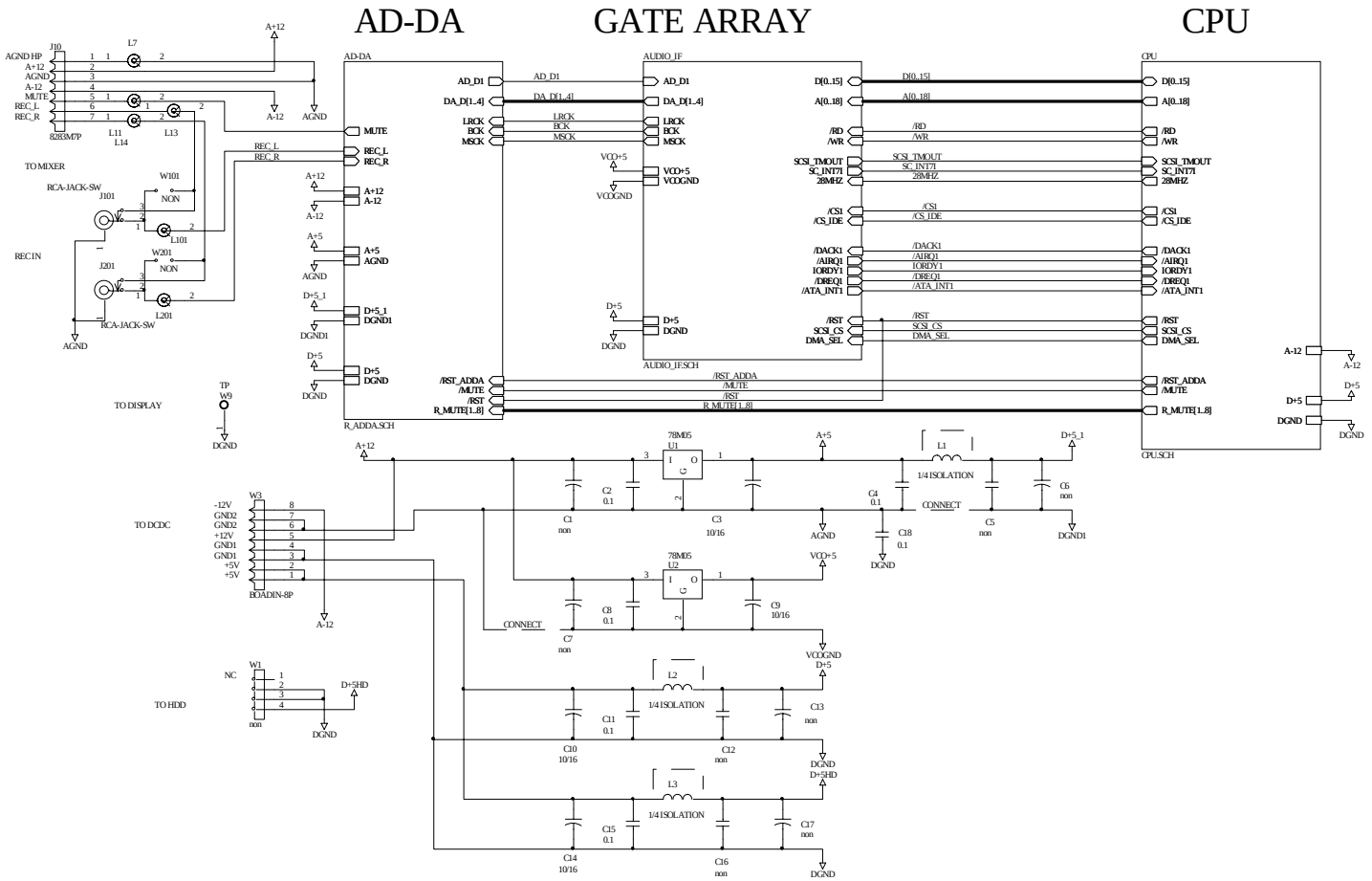
● DISPLAY, KEY & LED (3/3)



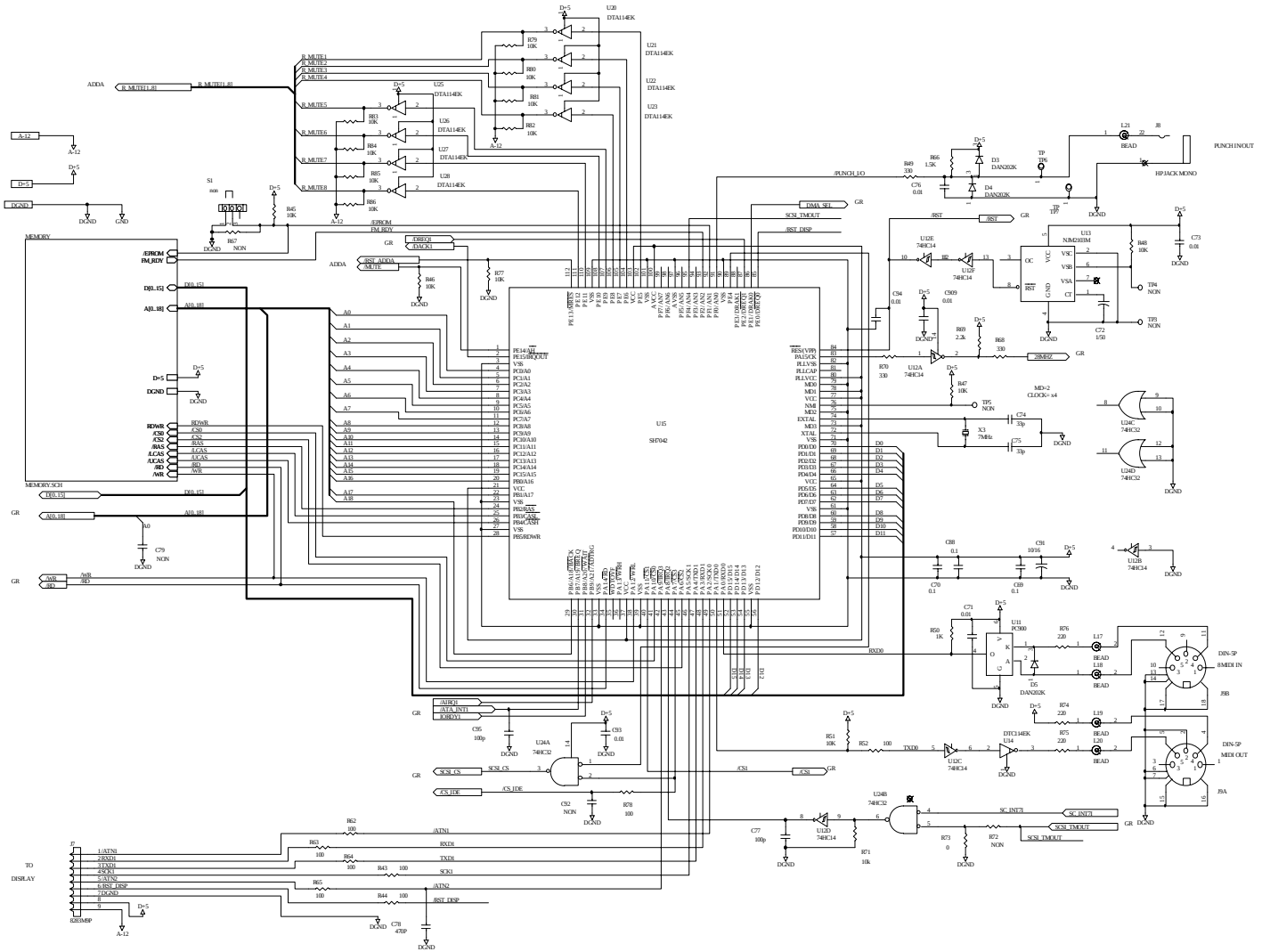
● POWER


S1
SW1-2 BL
F1
250VAC/0.8A
L4
6HOLE
L1
L3
J2
AC IN
C1
0.1/250VAC
C21
0.0022/250VAC
C22
0.0022/250VAC
LINE FILTER 1mH/2.2A
LINE FILTER 19mH/0.5A
L5
6HOLE
W1
D1
DB-S
C13
100/400V
C2
0.01/630V
R1
100k/2W
D3
DIN60
T1
TRANSF.3
U1
IPD MIP
C14
47/25V
C3
0.1
D2
MA171
R2
6.2
R3
6.2
C4
0.1
C5
C6
0.0022/250VAC
C24
non
R4
33/0.5W
C7
390P/500V
D4
MA649
L2
10uH/2A
C15
470/25V
D6
EK13
C17
330/25V
C9
0.01
D5
EK13
C10
0.01
C18
330/25V
U2
ON3171
R5
75
R7
470
R6
10k
R8
10k
C8
0.1
U5
AN1431T
R9
10k
U3
NJM7812A
Vin +12V
1A
GND
C16
470/25V
C11
0.01
C19
330/25V
DGND
D+5
U4
NJM7912A
GND
V I
Vin -12V
C12
0.01
C20
330/25V
A+12
AGND
A-12
J1
8263MBP

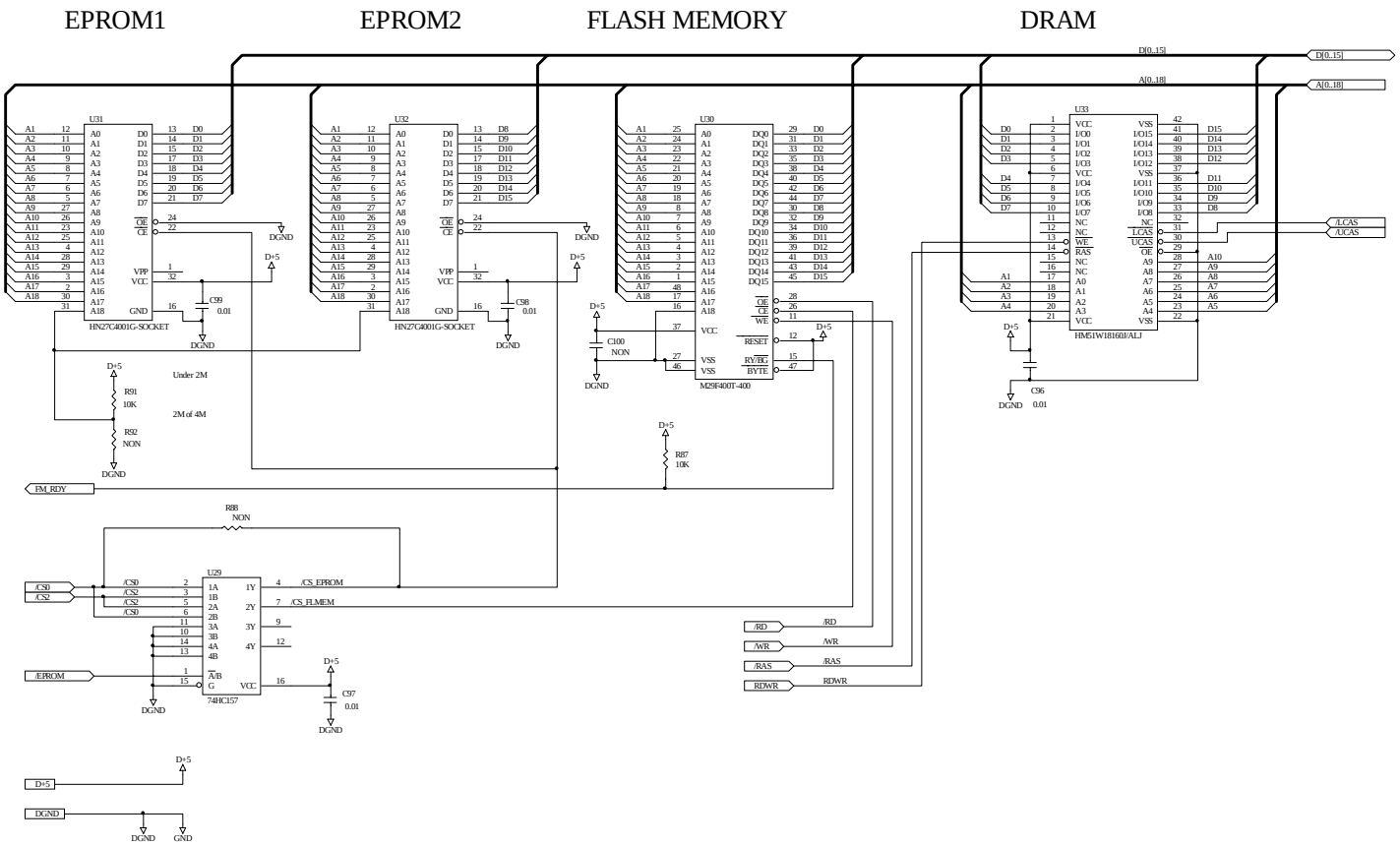
● MAIN, ROOT (1/10)



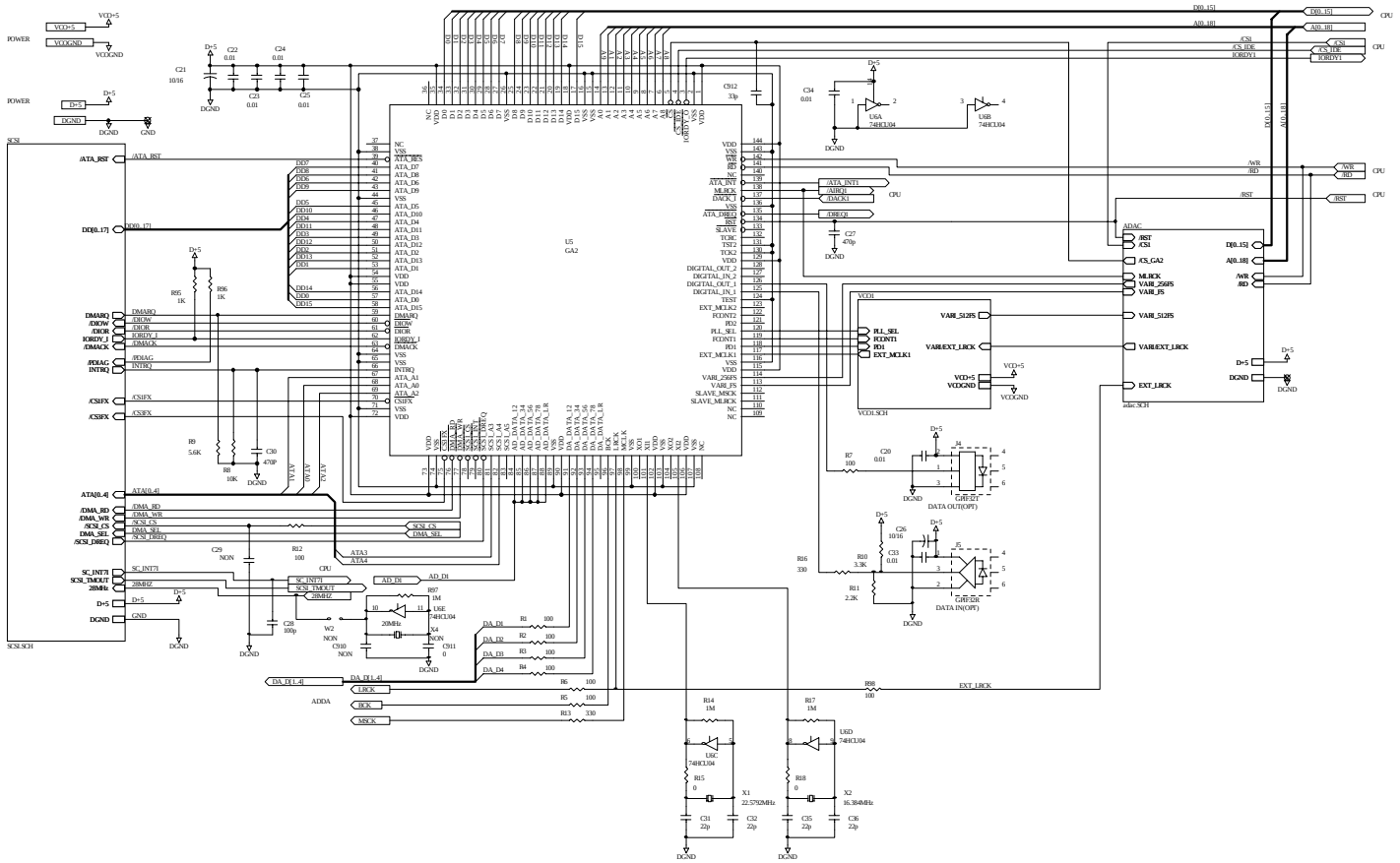
● MAIN, CPU (2/10)



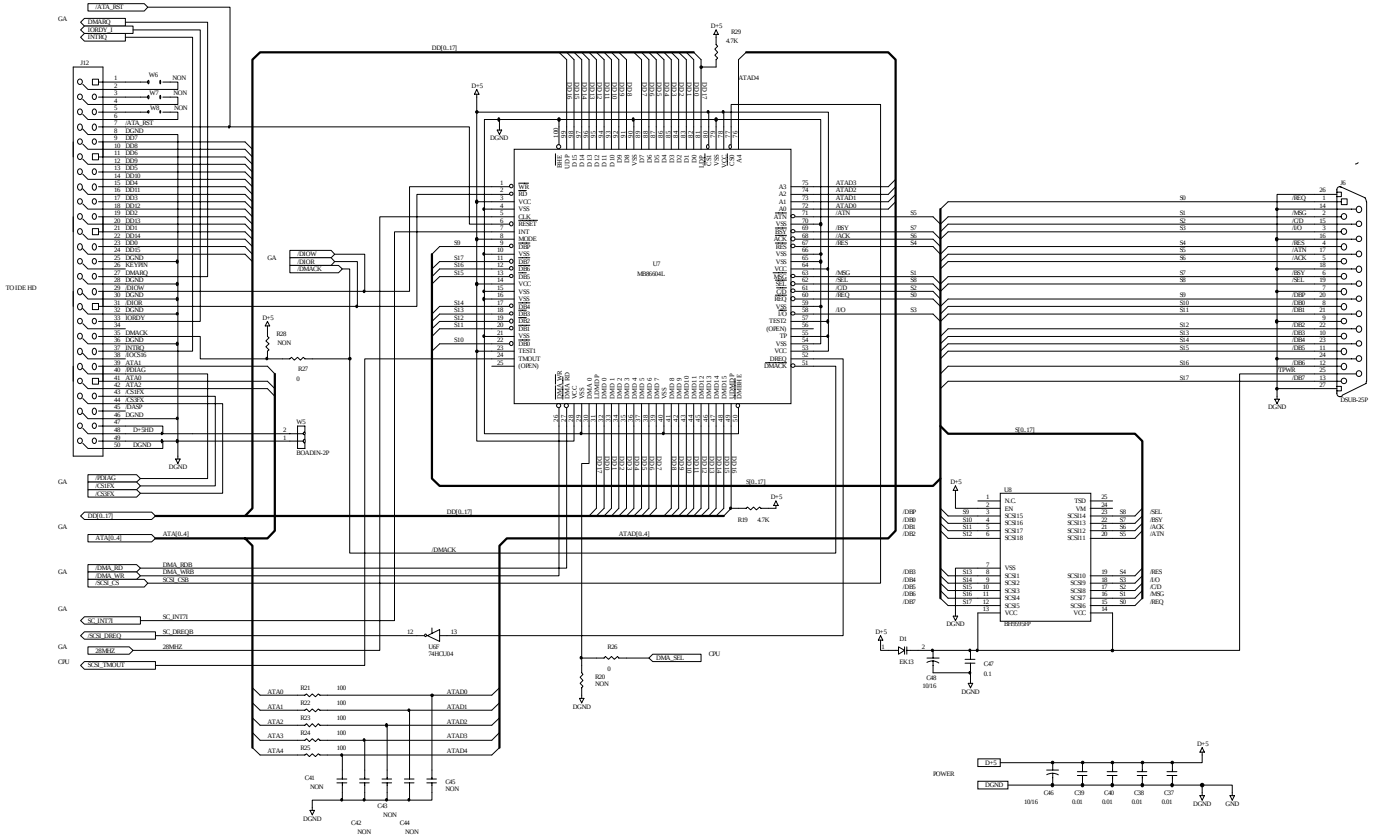
● MAIN, MEMORY (3/10)



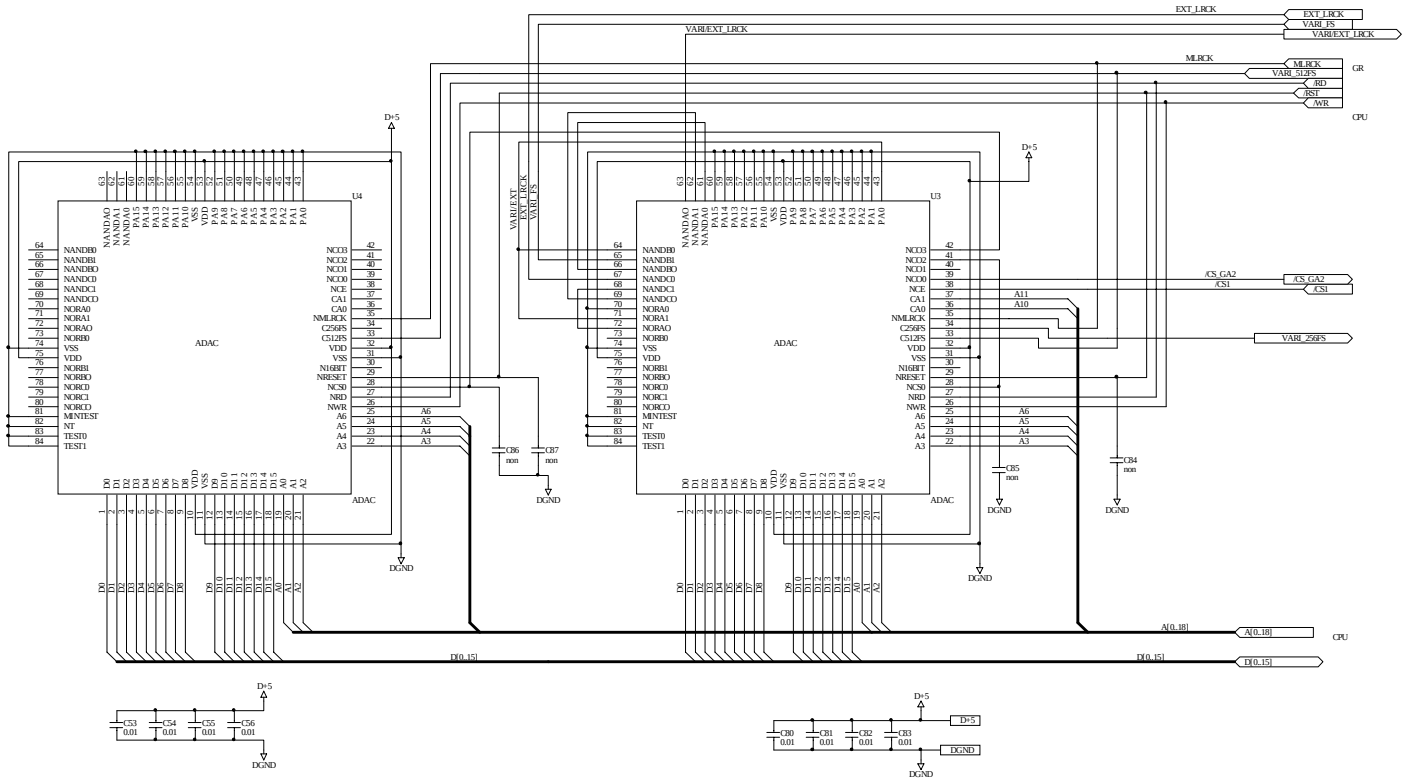
MAIN, GATE ARRAY (4/10)



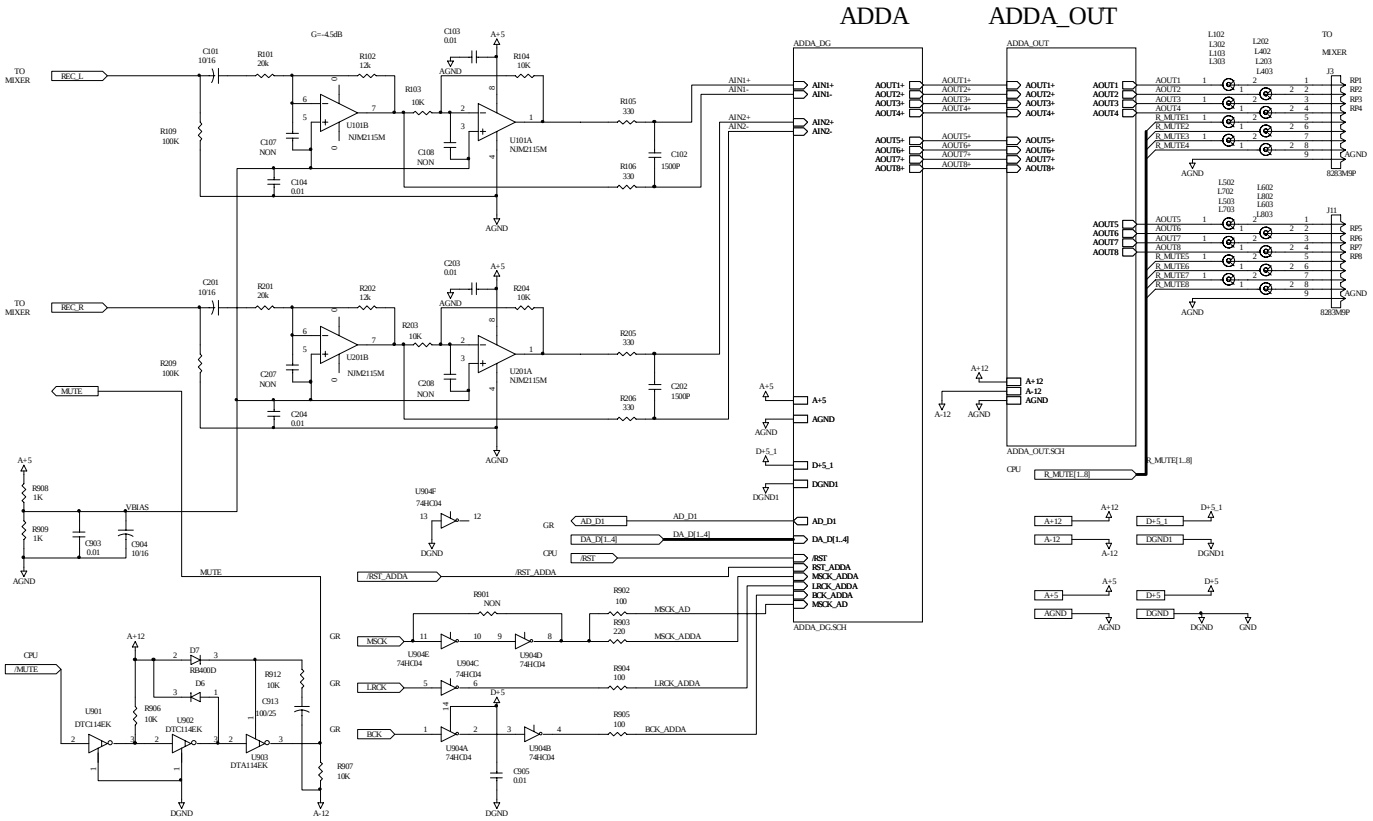
● MAIN, SCSI I/F (5/10)



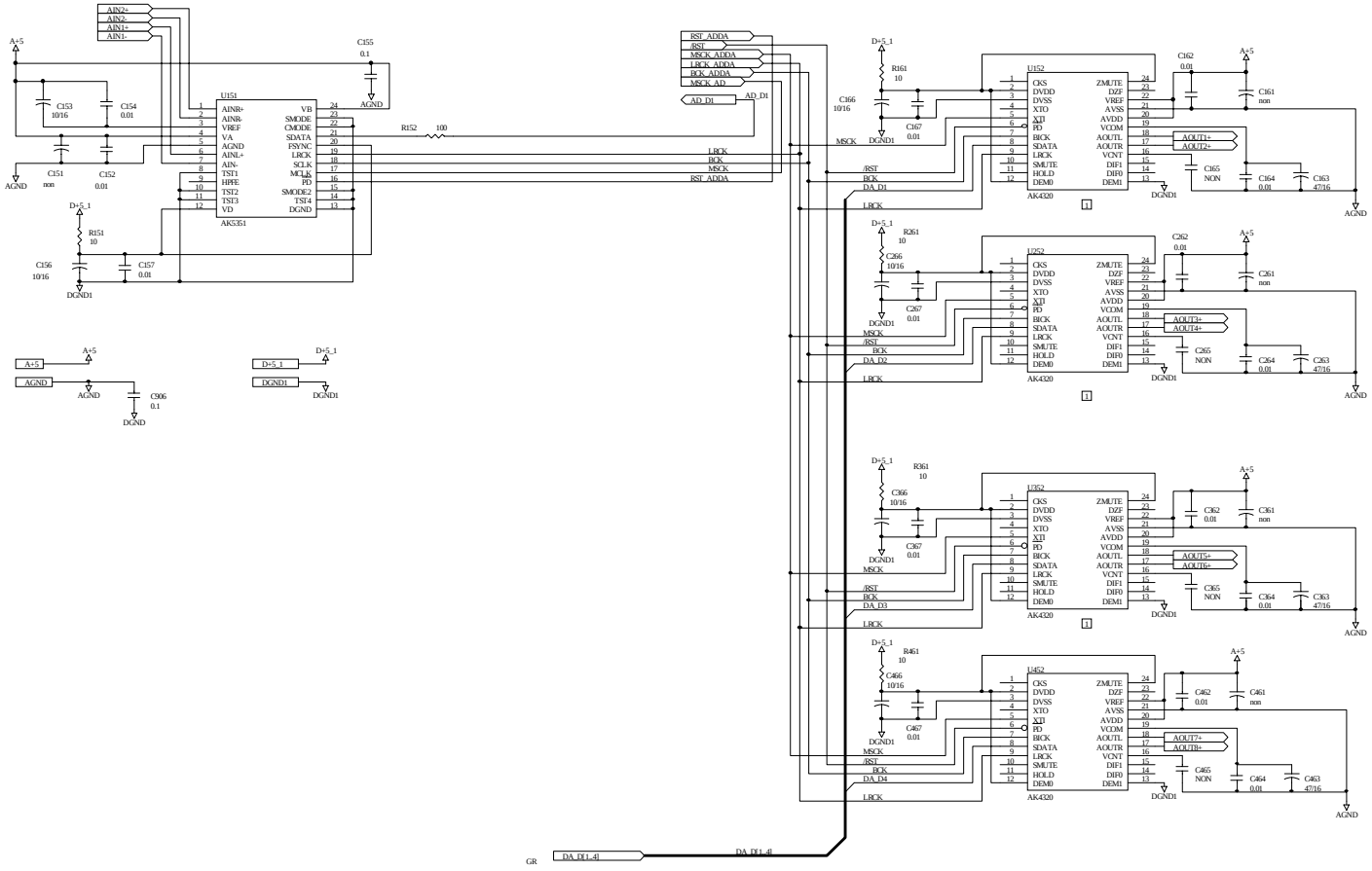
● MAIN, ADAC (6/10)



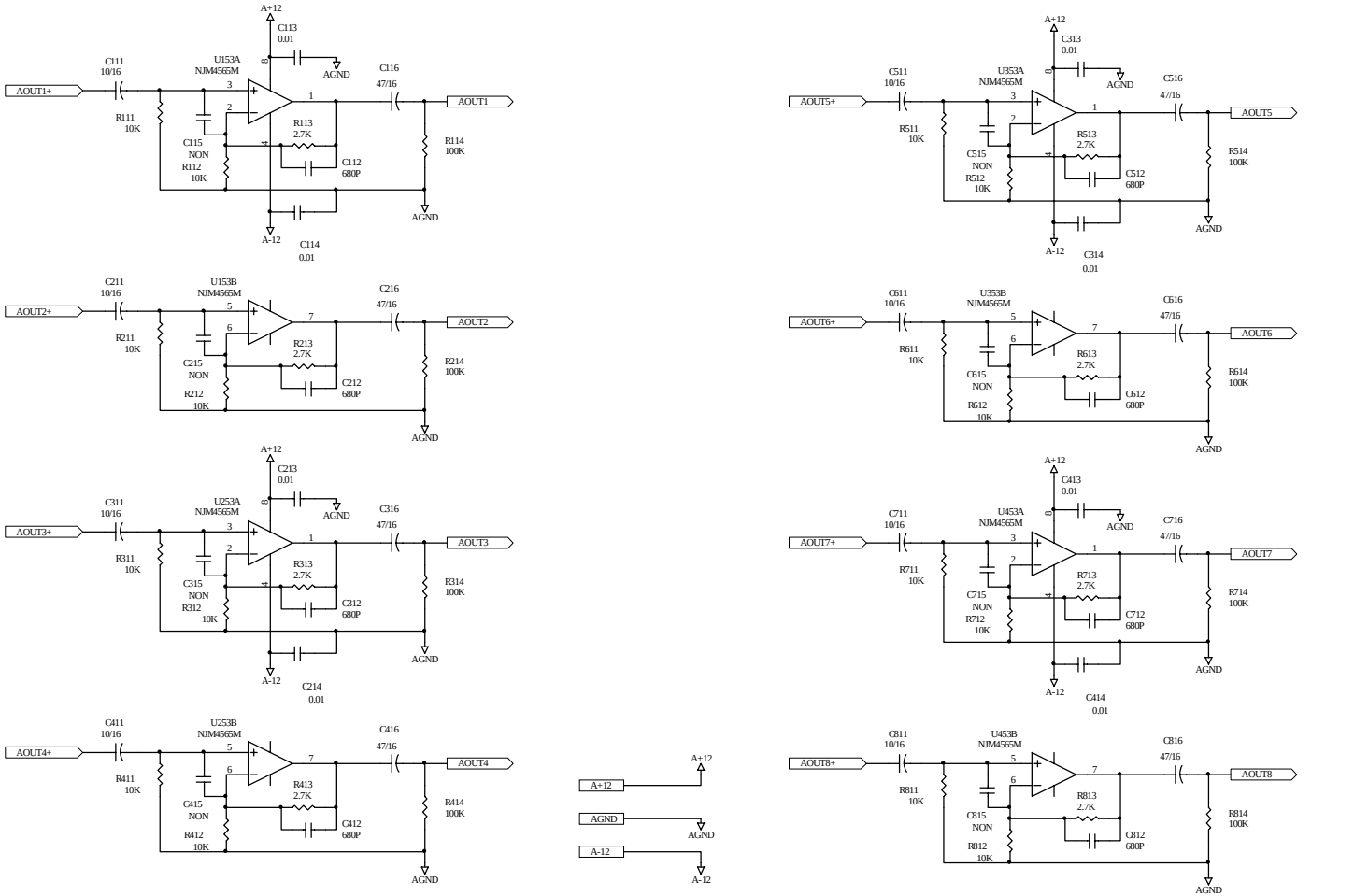
● MAIN, ROOT, ADDA (7/10)



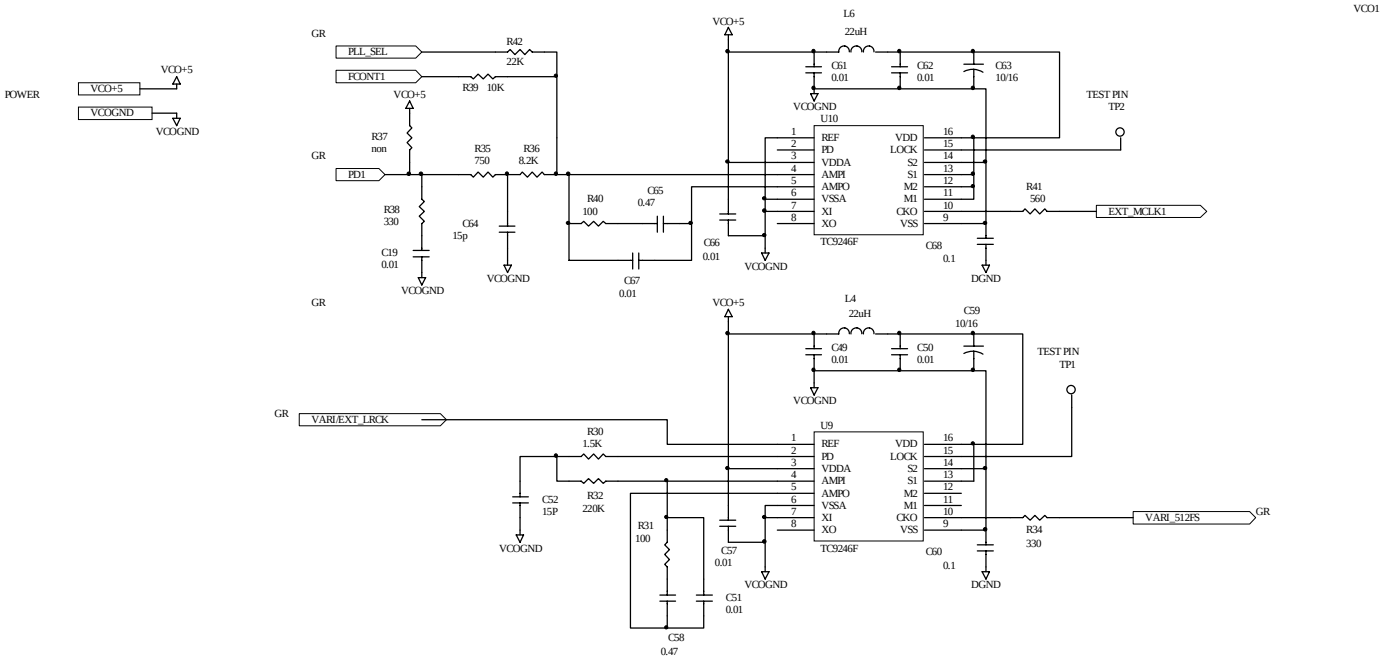
● MAIN, AD-DA (8/10)



● MAIN, ANALOG OUT (9/10)



● MAIN, VCO1 (10/10)



< NOTE >

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