Service Manual

Model

FD-4

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 SOLT, 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, explode view, PCB assembly, parts list and circuit diagrams are given in this manual to assist the service technician in maintaining the Model FD-4.

* The following accessories are supplied with FD-4 as the standard accessories.

Owner's manual	: 8288414100 (for export model)
	: 8288415000 (for domestic model)

* Following is the packing material for the Model FD-4.

Carton, inner, FD-4	: 8228716000
Packing, side, L, FD-4	: 8228440000
Packing, side, R, FD-4	: 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
Standard	SCSI-2 or better
Sampling Frequency	32 kHz, 44.1 kHz
Quantization	12-bit nonlinear, 16-bit linear
Emphasis	Not available
Recording Time (mono track min.)	
Fs: 32 kHz	About 33 min. / 100 MB (up to 24 hours) at maximum
Fs: 44.1 kHz	About 18 min. / 100 MB (up to 24 hours) at maximum
Number of Tracks	
NORMAL / MASTERING MODE 1	6 (4 + 2 additional tracks)
MASTERING MODE 2	4
Number of simultaneous recording tracks	2
Number of simultaneous playback tracks	4
Number of tracks to be pasted at a time	6
Recording Format	FDMS-3
Recording Mode	NORMAL MODE (Fs: 32 kHz, 4 + 2 tracks, default) MASTERING MODE 1 (Fs: 44.1 kHz, 4 + 2 tracks) MASTERING MODE 2 (Fs: 44.1 kHz, 4 tracks)

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
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)
DATA OUT	
Connector	Square shape optical
Format	IEC consumer optical standard IEC 958 Part 3

ELECTRICAL (continued)

SCSI DATA input / output

Connector	D-SUB 25-pin
Protocol	SCSI-2, unbalanced transfer method
Transfer type	Asynchronous
Number of device to be connected	1

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	Adjust MONITOR knob for -10 dBV output at MONITOR OUTPUT. (MON SEL: ST+MON, MON)
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 ~ 4) → 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 ~ 4) → MONITOR	-10 dBV ± 1 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 ~ 4) → MONITOR	20 ~ 20 kHz +1, -3 dB (INPUT: -50 dBV) 20 ~ 20 kHz +1, -2 dB (INPUT: -10 dBV)
INPUT (1 ~ 4) → 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)

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

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	80 dB or more	82 dB or more
	+2 dBV	AUX SEND	+2 dBV	92 dB or more	94 dB or more
INPUT Σ4	-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	73 dB or more	75 dB or more
	+2 dBV	MONITOR	+2 dBV	85 dB or more	87 dB or more
Residual Noise	VR MIN	PHONES			-75 dBV or less

ELECTRICAL (continued)

Distortion

INPUT		OUTPUT		S / N	
	LEVEL		LEVEL	UNWTD.	AWTD.
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 $_{p\text{-}p}$ or less

Other switching -50 dBV $_{p\text{-}p}$ 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

Fs: 44.1 kHz 20 ~ 20 kHz +1, -2 dB

Fs: 32 kHz 20 ~ 14.5 kHz +1, -2 dB

Full Scale Output Level (Ref: -12dB) +2 dBV ± 1 dB (Fs: 32 kHz / 44.1 kHz)

Dynamic Range 88 dB or more (Fs: 32 kHz / 44.1 kHz)

Total Harmonic Distortion

Fs: 44.1 kHz 0.02 % or less

Fs: 32 kHz 0.08 % or less

Channel Separation 80 dB or more / 1 kHz at max. recording level (Fs: 32 kHz / 44.1 kHz)

S / N 88 dB or more (A-WTD., Fs: 32 kHz / 44.1 kHz)

Power Consumption

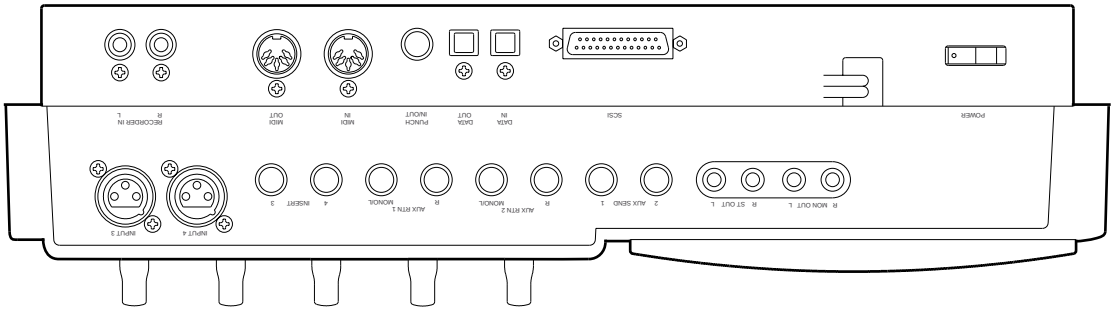
JPN 13 W +5, -20 %

Others 15 W +5, -20 %

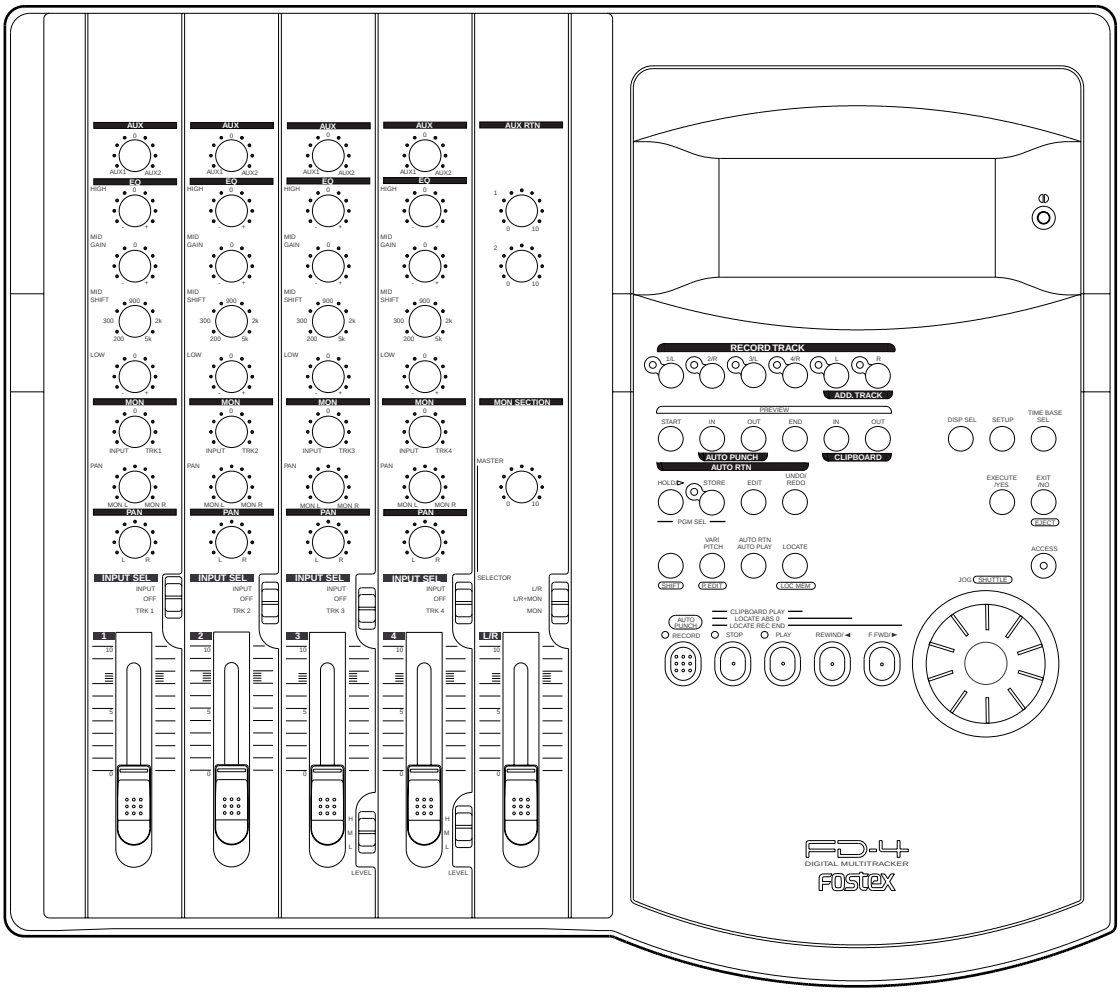
Specifications and appearance are subject to change without notice for product improvement.

2. CONTROLS, INDICATORS & CONNECTORS

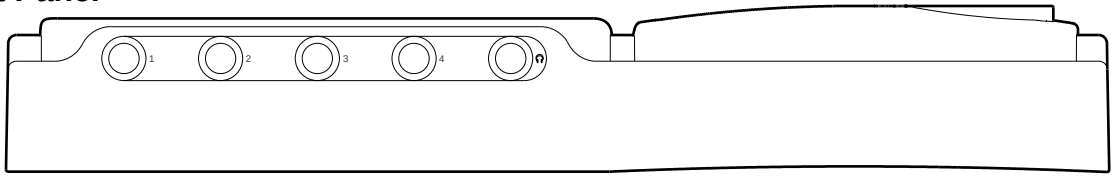
Rear Panel



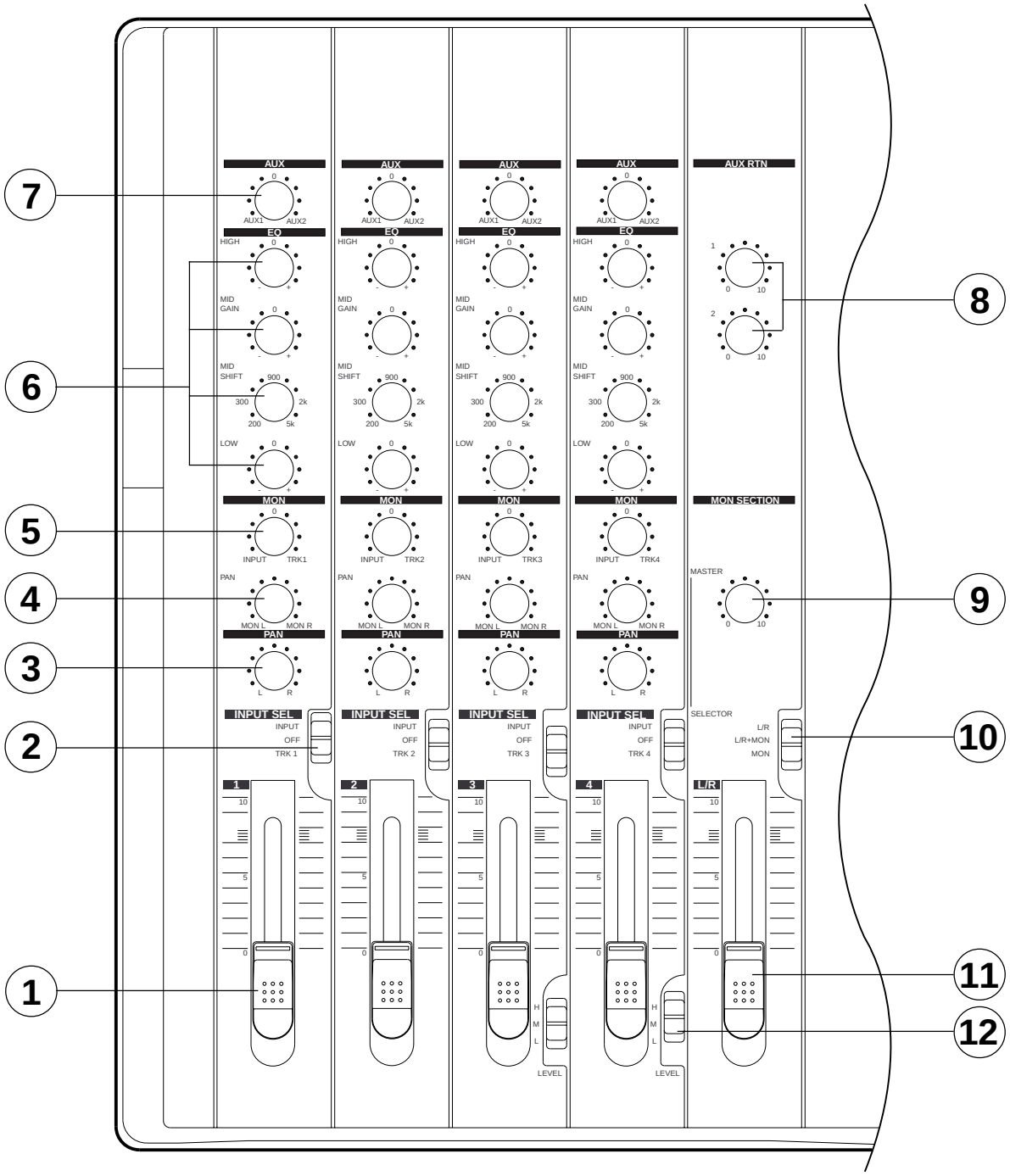
Control Panel



Front Panel

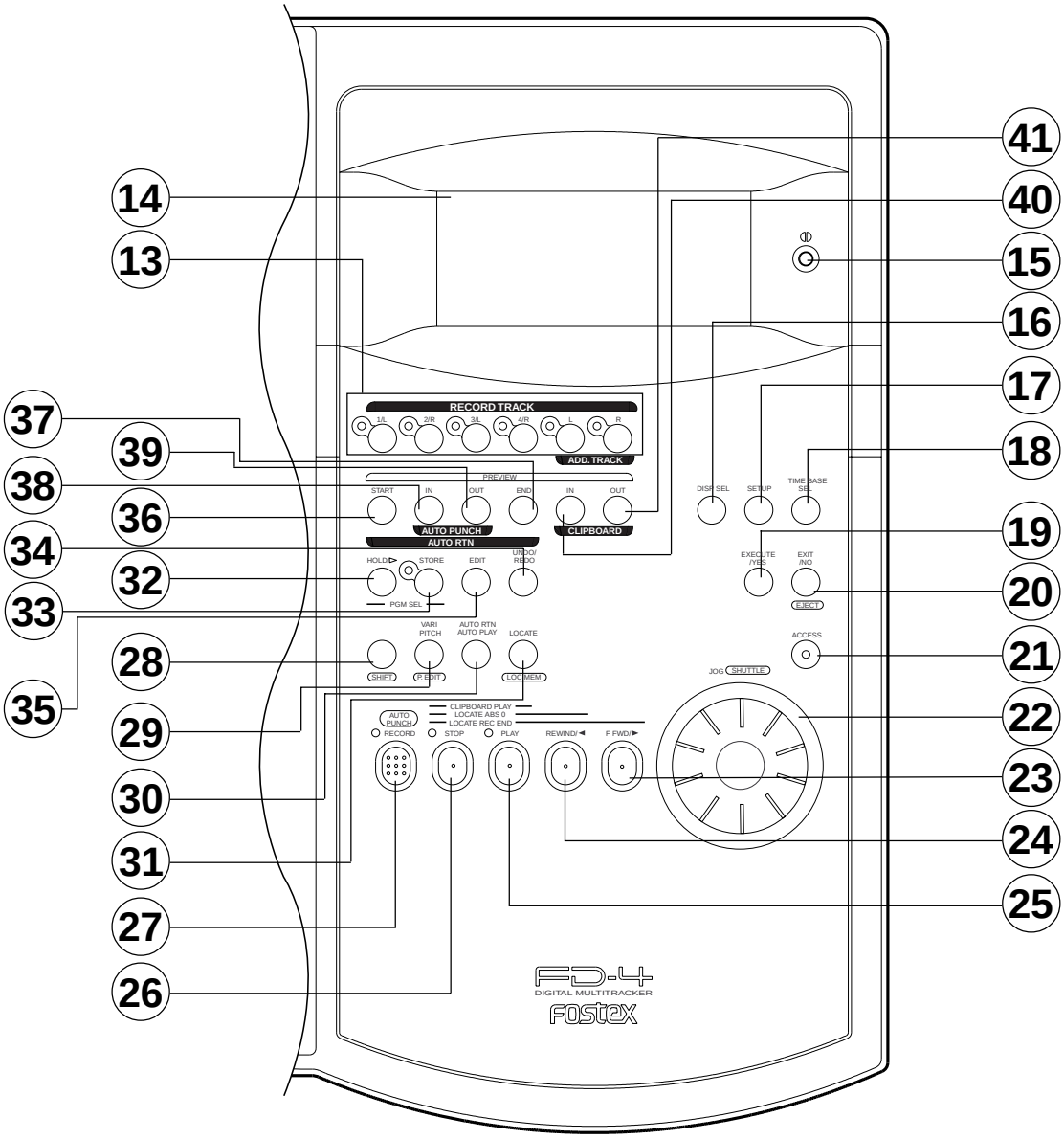


Control Panel (Mixer Section)



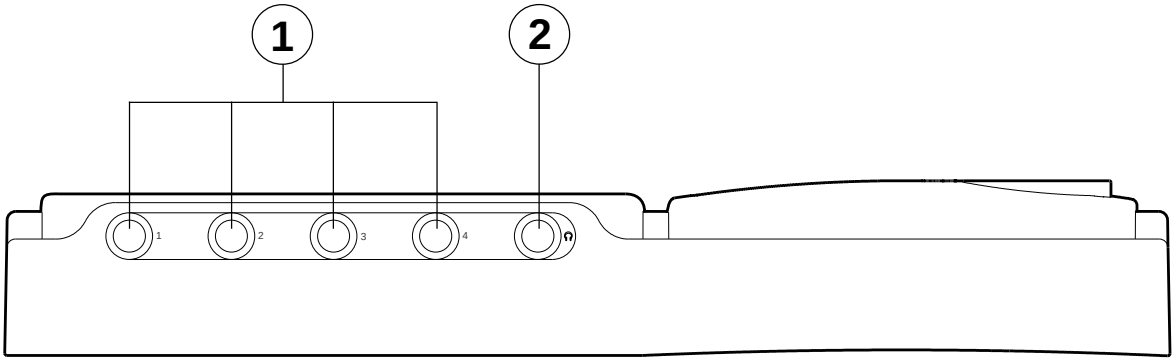
1. Input faders [1-4]
2. Input select switches [INPUT SEL (INPUT/OFF/TRK)]
3. Panpot knobs [PAN (L/R)]
4. Monitor panpot knobs [PAN (MON L/MON R)]
5. Monitor level control knob [MON (INPUT/TRK)]
6. Equalizer control knobs [EQ (HIGH/MID/LOW)]
7. AUX send knobs [AUX (AUX 1/AUX 2)]
8. AUX return knobs [AUX 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)



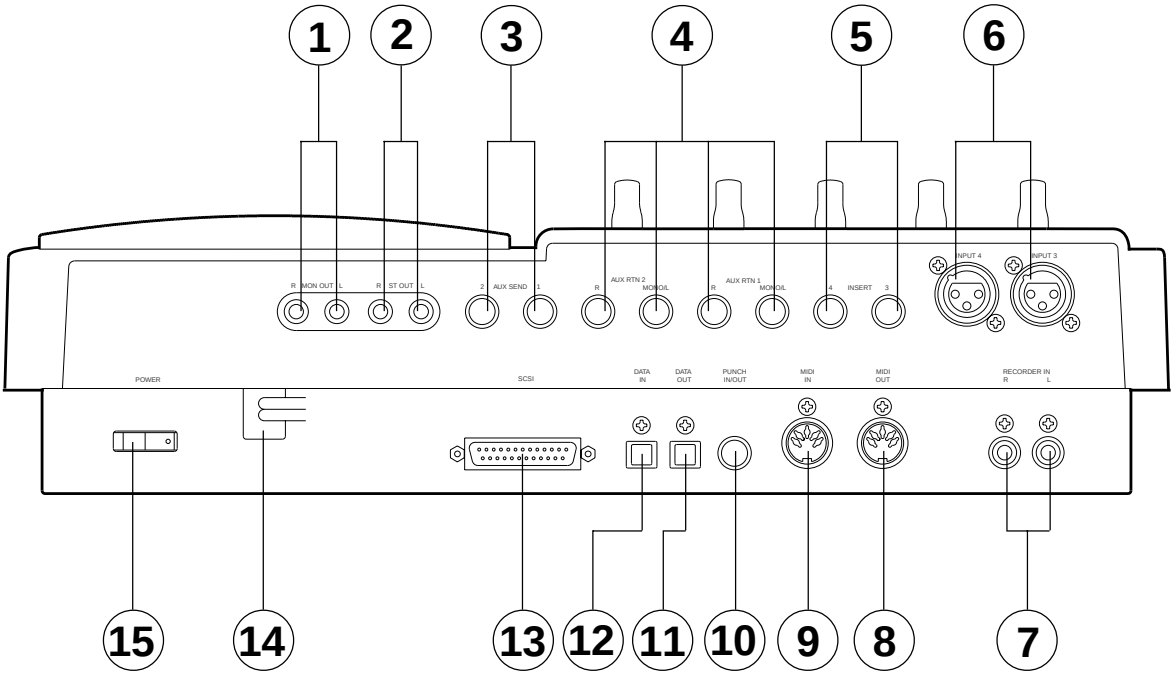
13. Record track select keys [RECORD TRACK (1/L, 2/R, 3/L, 4/R, L, R)]
14. LCD
15. Contrast adjustment knob
16. Display indication select key
17. Setup key [SETUP]
18. Time Base select key
19. Execute/Yes key [EXECUTE/YES]
20. Exit/No key [EXIT/NO/(EJECT)]
21. Access LED [ACCESS]
22. JOG dial [JOG/(SHUTTLE)]
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)]

Front Panel



1. Input jacks [1, 2, 3, 4] (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 3, 4 [INSERT 3, 4] (TRS Phone)
6. Balanced input connectors 3, 4 [INPUT 3, 4] (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. Power cable
15. Power switch [POWER]

3. SOFTWARE UPDATE

The FD-4 software can be updated through SCSI port. This means that unscrewing and opening up the FD-4 top panel is not necessary to change the EPROMs on the MAIN PCB assy. 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-4 updated software.

1. Updated software in a removable media (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

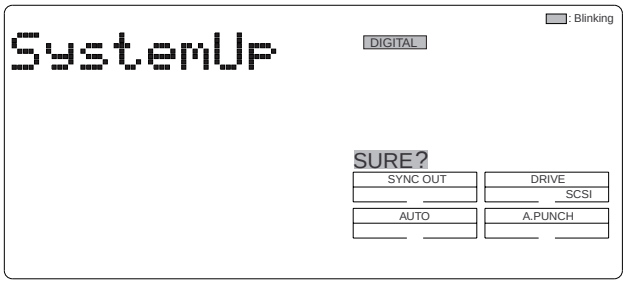
The following tools/equipment are required to update the FD-4 software.

1. IBM PC 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-4 (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 SCSI board.
2. Insert the diskette to the removable type SCSI drive and format it by the computer (IBM PC format).
3. Copy the updated software file to the removable type SCSI drive (diskette).
4. Reconnect the removable type SCSI drive to the FD-4 SCSI port.
5. In order to boot up the FD-4 system software, insert the diskette formatted by the FD-4.
6. Eject the diskette by pressing the EXIT/NO key while holding down the SHIFT key.
7. Insert the diskette with updated software file. The FD-4 LCD display shows “No Disk”, “Initial..”, “name of drive (e.g. ZIP 100)” and “FD4MOT” in order and comes to a standstill at the display below.



8. Pressing the EXECUTE/YES key would update the software. The display shows “Loading!”, “Writing!” and “Initial..” in order and automatically returns to the above condition again. This indicates that updating the software is completed.
9. Eject the diskette with updated software file and insert the diskette formatted by the FD-4.
10. Check the software version by the Service Mode. (For details, please refer to the section “4-2. Software/CPU version”.)

CAUTION:

1. The diskette in which the updated software file is copied must be formatted by IBM PC computer, not by Macintosh.
2. If something wrong happens while updating the software (e.g. A blackout occurred while updating the software.), the FD-4 might not be able to boot up the system software inside the Flash ROM. In this case, please refer to the section “4-8. Flash ROM” (page 17).

4. SERVICE MODE

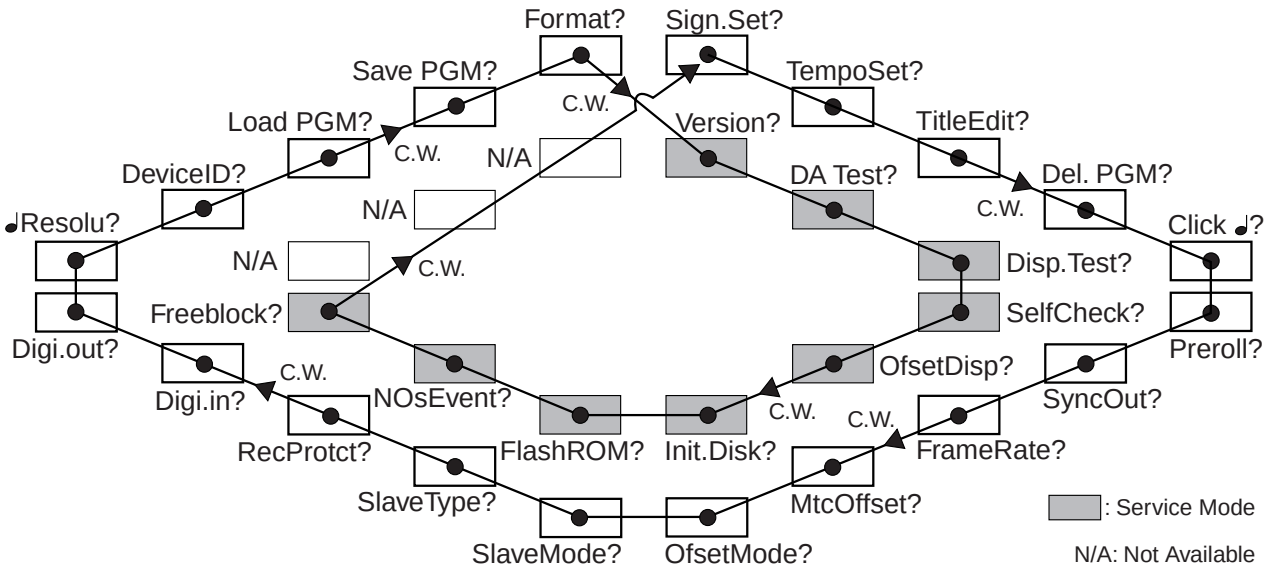
There are various optional modes available in the FD-4 Service Mode. Please utilize them when servicing the unit.

4-1. Putting FD-4 into Service Mode

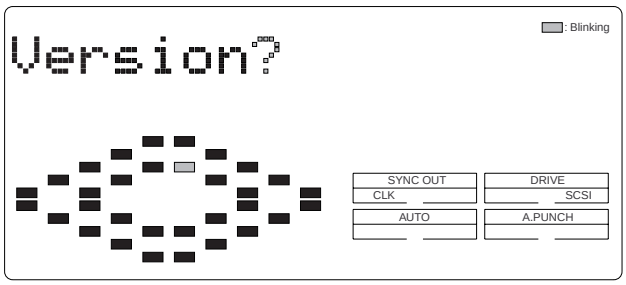
The way of putting the FD-4 into Service Mode is as follow.

1) Connect a SCSI device, insert the diskette formatted by the FD-4 and turn it on.
2) Turn on the power of FD-4.
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.

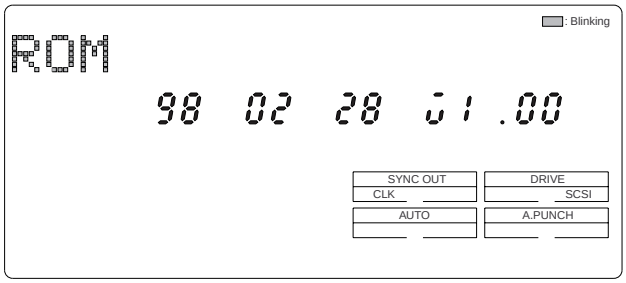


4-2. Flash ROM/CPU version



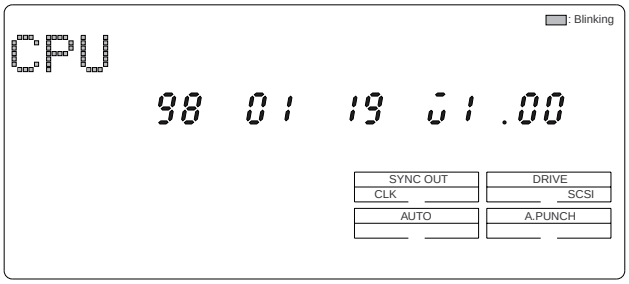
This mode is used to check the Flash ROM and CPU versions currently installed in the unit.

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



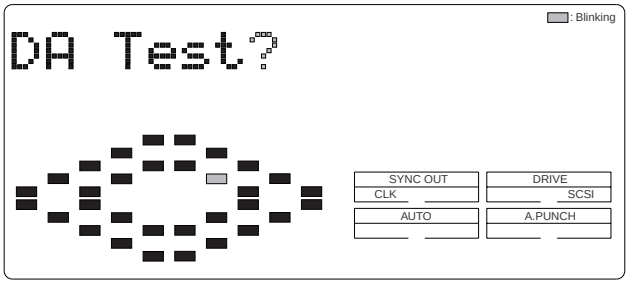
The example on the left indicates that the Flash ROM version is V1.00 and its programming date is February 28, 1998.

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



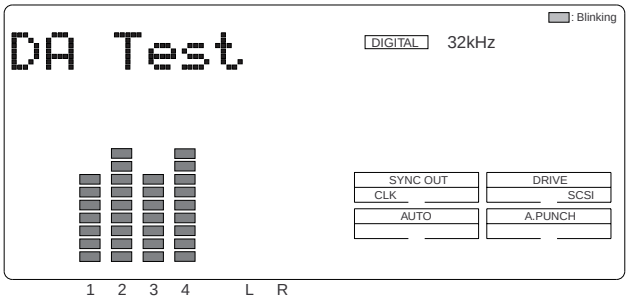
The example on the left indicates that the CPU version is V1.00 and its programming date is January 19, 1998.

4-3. DA Test



This mode test the signal flow from the DATA INPUT jack to the D/A converter. A S/P DIF digital signal whose sampling frequency is the same as the one when formatting the diskette (MASTERING MODE 1, 2: 44.1kHz, NORMAL MODE: 32kHz) must be input to the DATA INPUT jack.

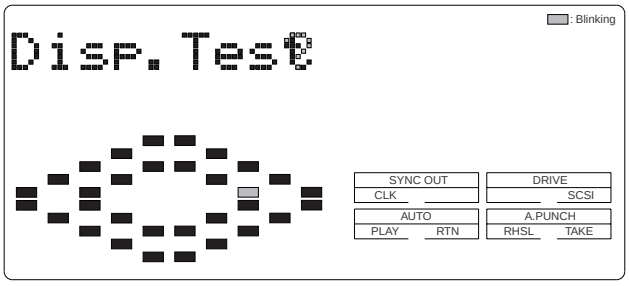
To execute this test, press the EXECUTE/YES key while "?" is blinking.



If the FD-4 is in a normal condition, "32kHz or 44.1kHz" and "DIGITAL" will be lit solid. The odd (1 and 3) and even (2 and 4) channels indicate the L and R input level of S/P DIF digital signal fed to the DATA INPUT jack respectively.

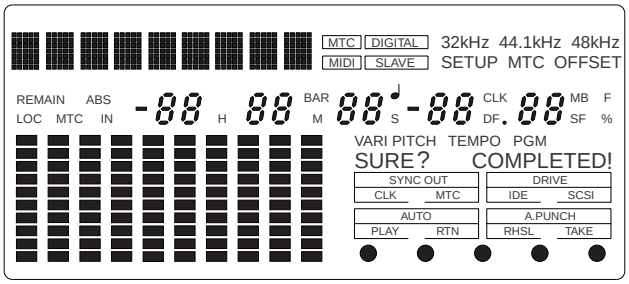
If the FD-4 is not in a normal condition, "32kHz or 44.1kHz" and "DIGITAL" will blink and the bargraph meter will not indicate any input level.

4-4. Display/Button Test



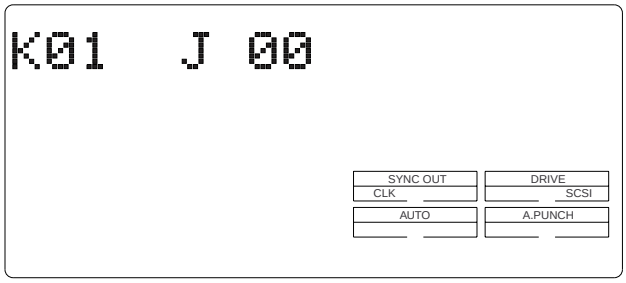
This mode tests if all the segments on the LCD display and the LEDs on the FD-4 top panel are correctly working or not.

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



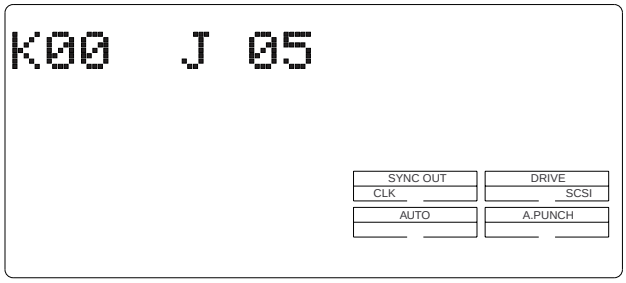
If the FD-4 is in a normal condition, all the segments on the LCD display will lit solid and the LEDs on the top panel will start blinking.

If the FD-4 is not in a normal condition, the 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. (“K” stands for the Key and “J” the Jog dial.)



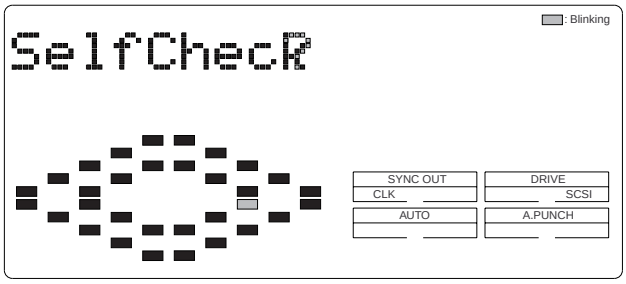
The display on the left indicates that the jog dial is turned C.W.

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 020” or “J-19” is displayed respectively.

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

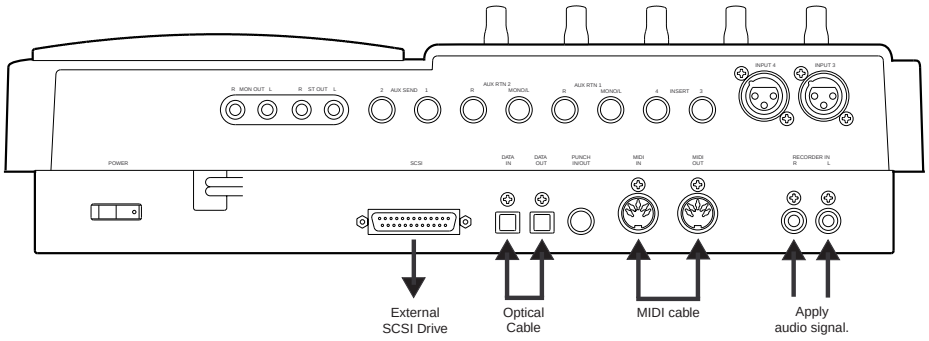
4-5. Self Check

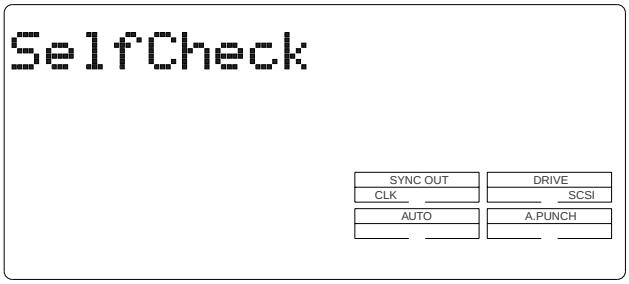


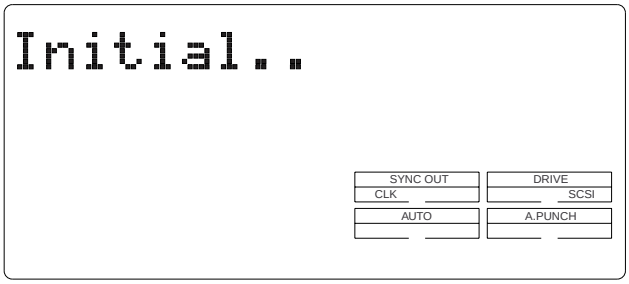
This mode automatically tests the following points in order.

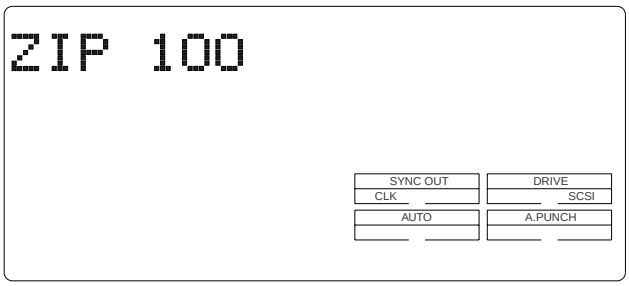
- SCSI bus
- ATA bus
- MIDI in/out circuit
- S/P DIF digital signal (44.1kHz)
- 32kHz digital signal
- Vari-pitch circuit
- A/D and D/A circuit (Input Monitor)

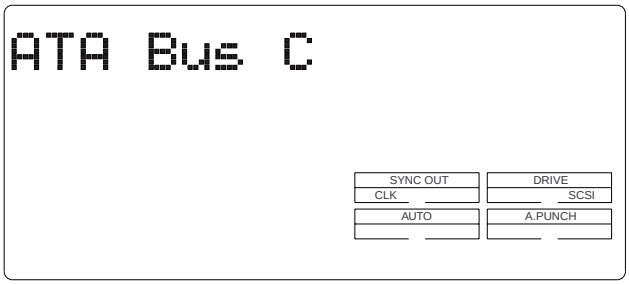
<Cable Connection in “Self Check” Mode>

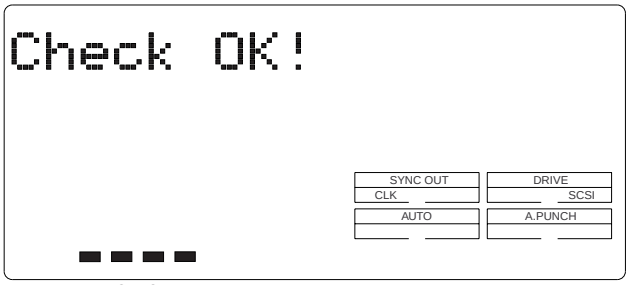












To start the Self Check mode, press the EXECUTE/YES key when “?” is blinking (condition indicated in the previous page).

As shown in the left, “SelfCheck”, “Initial..”, name of connected SCSI drive (The example in the left shows that the ZIP drive is connected to the FD-4 SCSI port.) and “ATA Bus C (Check)” appear on the FD-4 LCD display in order.

Since a 2.5" internal E-IDE hard disk drive is not installed in the FD-4, the Self Check mode comes to a standstill at “ATA Bus Check” test.

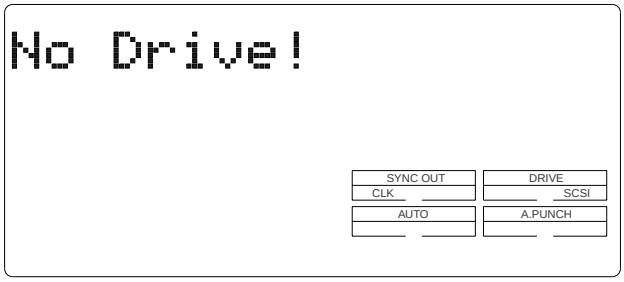
In order to continue the Self Check mode, press the EXECUTE/YES key.

If the FD-4 is in a good shape, “Check OK!” will be displayed and the FD-4 is automatically put into Input Monitor mode with all the RECORD TRACK LEDs and RECORD LED flashing after checking the points mentioned in the previous page. In this condition, if a signal is applied to the FD-4 RECORDER IN (L, R) jacks, its level can be monitored on the bargraph level meter.

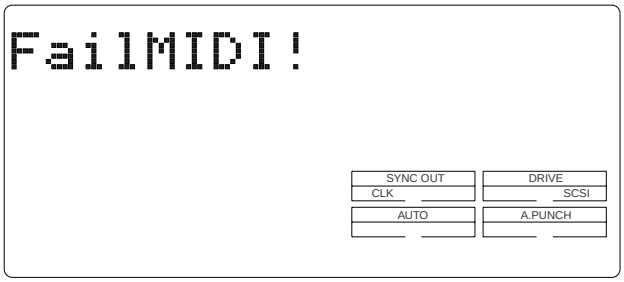
To quit the Self Check mode, press the EXIT/NO key when “Check OK!” is displayed.

The followings are examples of error message when the FD-4 is not working properly.

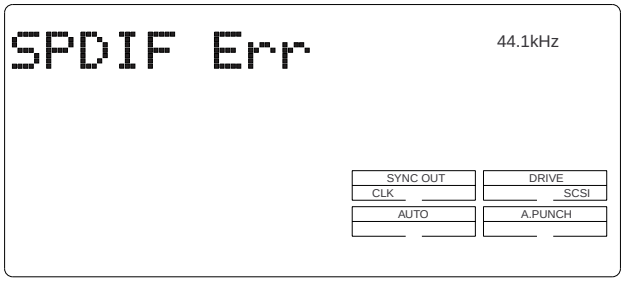
• SCSI function



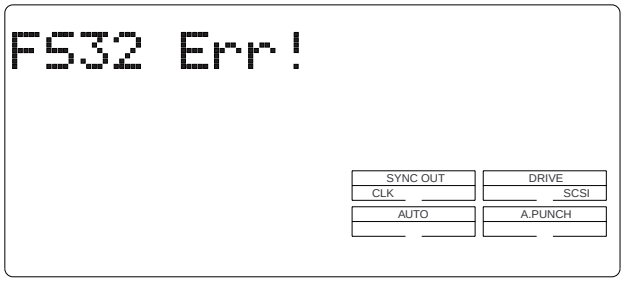
• MIDI function



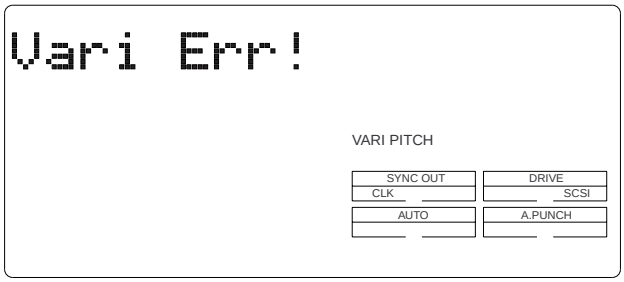
• Digital Signal in/out (Fs: 44.1kHz)



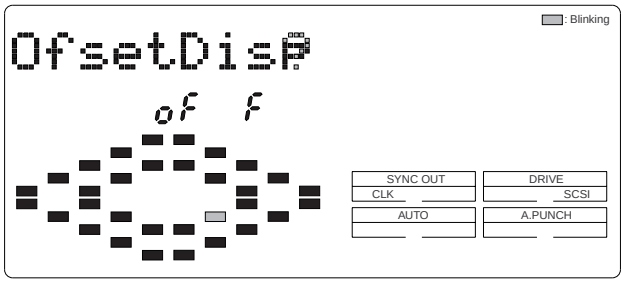
• Digital Signal in/out (Fs: 32kHz)

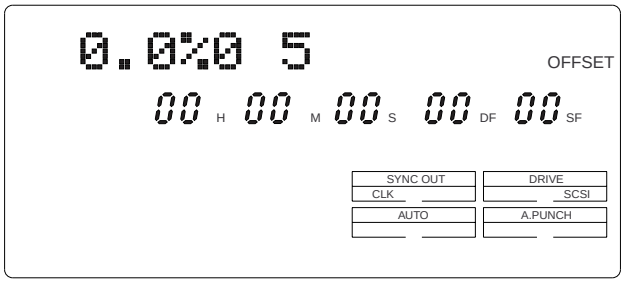


• Vari-pitch function



4-6. Offset Display





This mode determines if the offset value against a master machine should be displayed or not when the FD-4 is working as a slave machine.

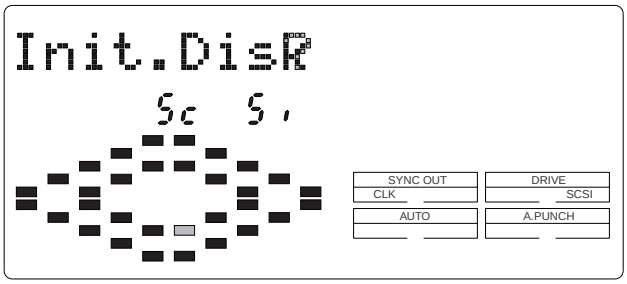
If you would like to turn ON the offset display, press the EXECUTE/YES key while "?" is blinking. (The default setting is "off".) Then, turn the jog dial C.W and press the EXECUTE/YES key.

In order to display the offset value, select the "MTC" by the TIME BASE key 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 when the FD-4 is working as a slave machine and is synchronizing with a master machine. This is caused by a difference of internal clock between both machines but there is nothing wrong with it.
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

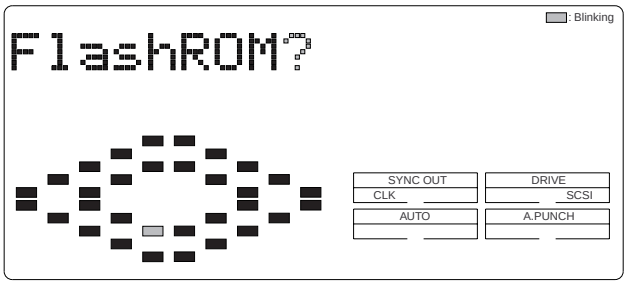


This mode initializes an external SCSI device connected to the SCSI port or a 2.5" internal E-IDE hard disk drive. The disk drive currently connected can be initialized.

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 selected disk drive.

This mode puts the disk back to the condition originally formatted and is equal to “Quick Format”.

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-4 software inside the Flash ROM can be updated through SCSI port. However, if something wrong happens when updating the software (e.g. A blackout occurred while updating the software.), the FD-4 might not be able to boot up the system software inside the Flash ROM.

In this case, the following procedures must be taken.

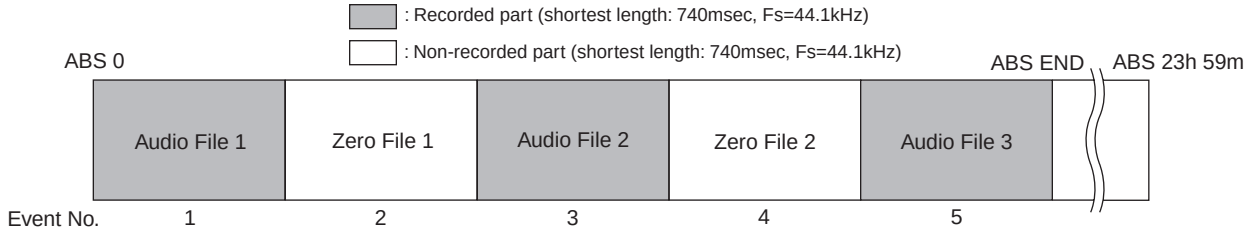
1. Turn the switch S1 on the MAIN PCB assy to “EPROM” side.
2. Mount and solder the EPROM sockets to “U31” and “U32” on the MAIN PCB assy.
3. Plug the EPROMs into the sockets.
4. Turn on the power of FD-4.

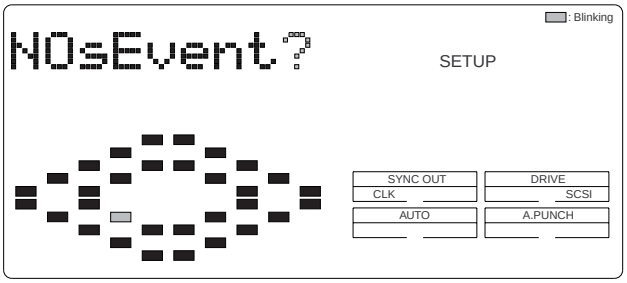
In this condition, the FD-4 is booted up using the system software inside the EPROMs. The next procedures to take are as follows.

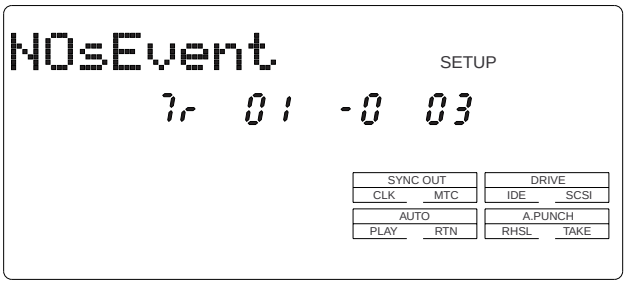
1. Put the FD-4 into the Service Mode, select “FlashROM” and press EXECUTE/YES key. (“SURE?” is blinking.)
2. Press the EXECUTE/YES key one more time to copy the system software from EPROMs to Flash ROM.
3. Turn the switch S1 to “FLMEM” side.
4. In order to confirm that the FD-4 is booted up using the 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.

4-9. Event Number

Individual Audio Files are continuously recorded in each track of program on the FD-4. However, the FD-4 disk management system allows to create a “no signal recorded” section between Audio Files. This “no signal recorded” section is handled as “Zero File”. As shown in the diagram below, Audio Files and Zero Files will be alternately recorded on the FD-4 and each Audio File and Zero File are counted as individual “Event”. Thus, the number of events on a certain track is calculated by summing up these Audio Files and Zero Files. Each track can accommodate up to 512 events but the FD-4 will not newly record events when the number of events reach 508.







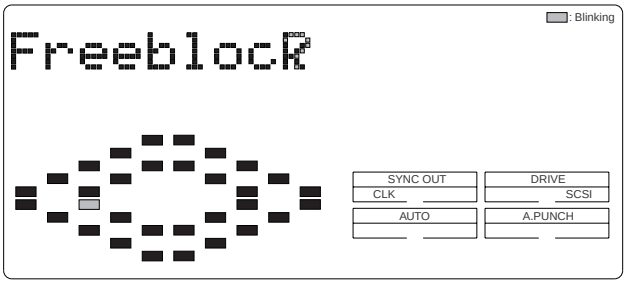
This Service Mode allows to check the Event Number recorded on each track in one program on the FD-4.

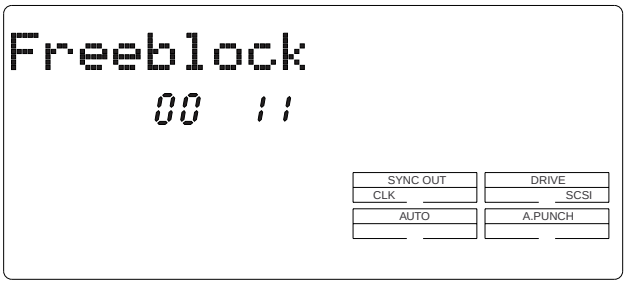
In order to check, press the EXECUTE/YES key while "?" is blinking.

The example in the left indicates that there are 3 events created on track 1. By turning the jog dial C.W., you can check the event number on track 2, 3, 4...

CAUTION:
If a long recording and/or many editing is committed, the Event Number increases. If the Event Number is getting closer to its maximum limit (508), please save/load the data to/from an external DAT recorder or SCSI device. During save/load procedures, Audio Files can be optimized and as a result, the Event Number decreases.

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-4.

If the Free Block indicates a large number even after formatting the diskette and no signal is recorded, the diskette can be judged to be in a bad condition.

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-4 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-4 ERROR CODE LIST	
ERROR CODE	**DESCRIPTION**
1	Audio File address breaks into System File.
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

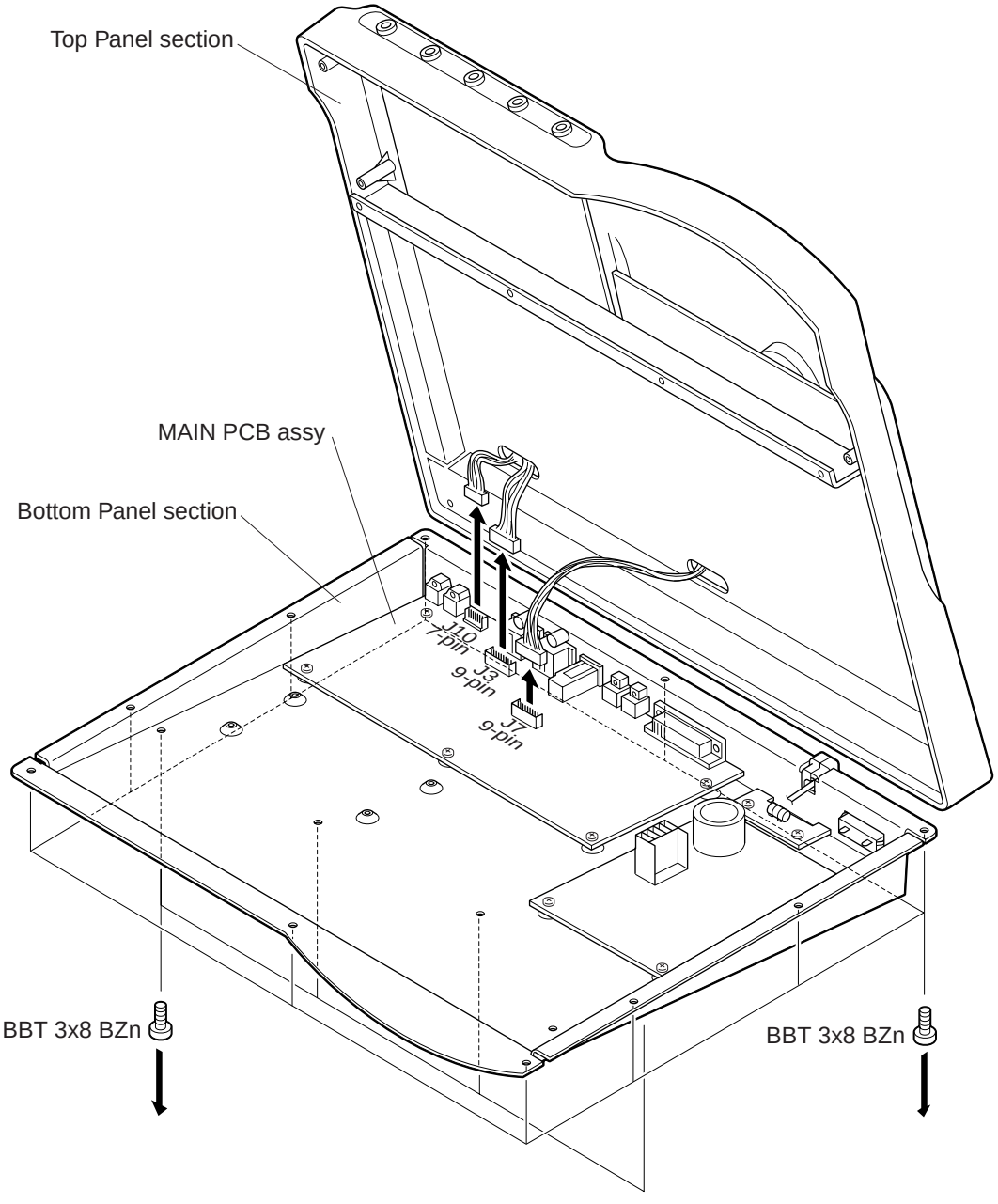
The Model 9045 and a 2.5" E-IDE hard disk drive installing procedures are explained below.

● Model 9045 Contents

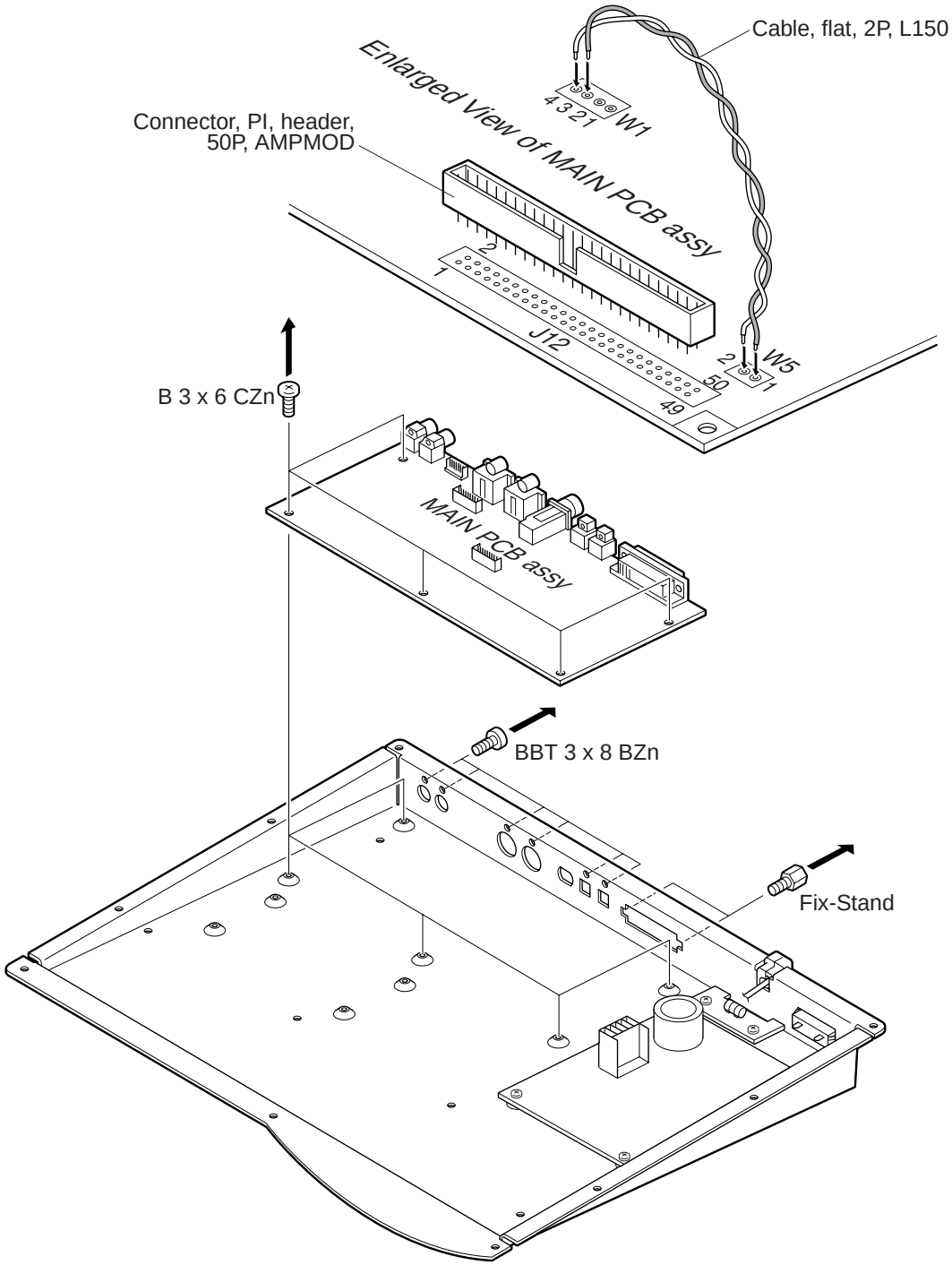
- Bracket, HD, FD-4 (P/N: 8221234000) x 2
- Connector, PI, header, 50P, AMPMOD (P/N: 8245314000) x 1
- Cable, flat, 2P, L150 (P/N: 8276292015) x 1
- Cable assy, flat, 50P, P1.0, AMPMOD, L150 (P/N: 8277465015) x 1
- 14 x screws (P 3 x 4 CZn)

● Installing Procedures

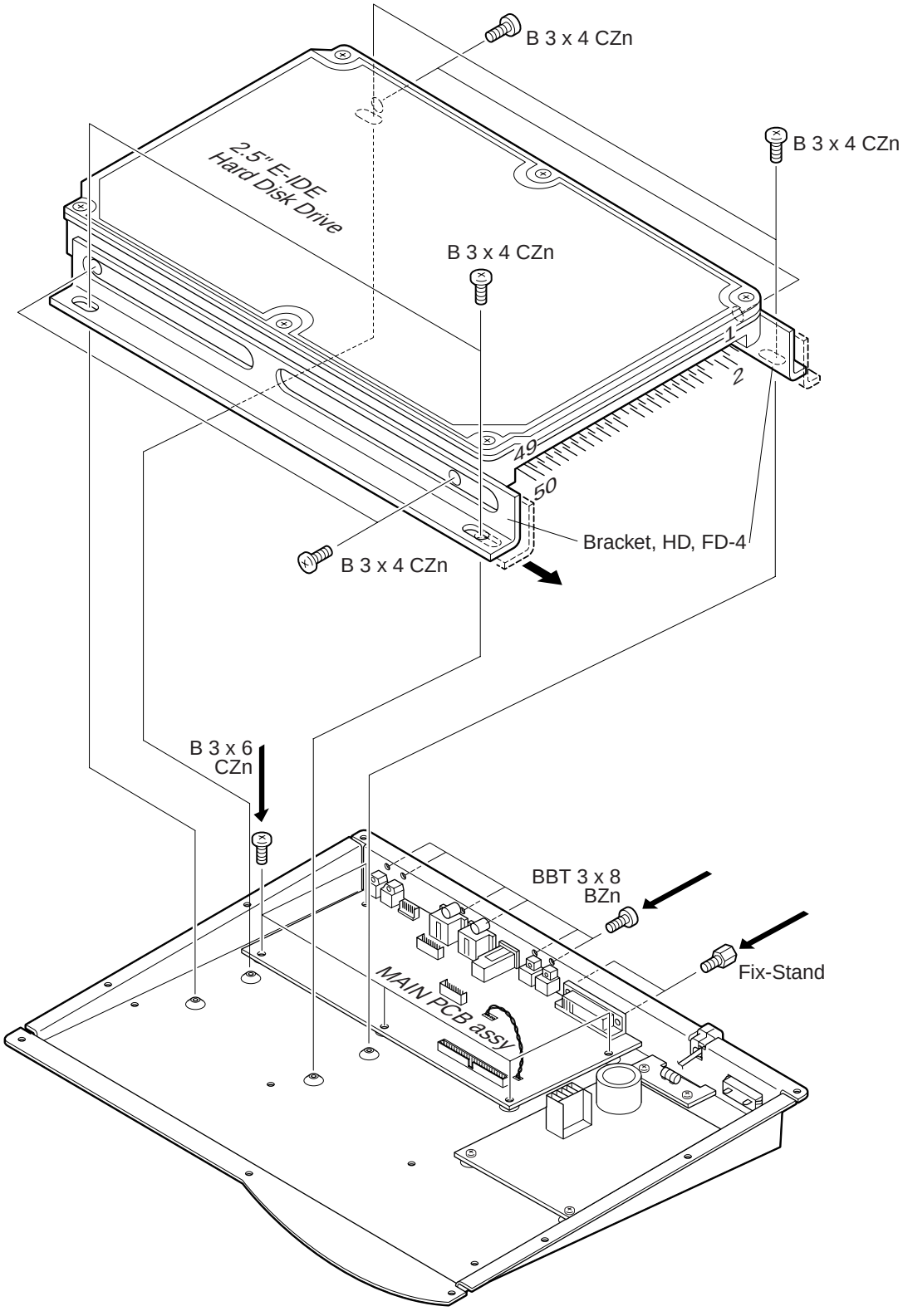
1) Loosen 14 x screws (BBT 3 x 8 BZn) which fix the FD-4 Top Panel section to the Bottom Panel section.
2) Remove the following cables from the connectors on the MAIN PCB assy.
    - 9-pin cable to the J3 (coming from MIXER A PCB assy)
    - 9-pin cable to the J7 (coming from DISPLAY PCB assy)
    - 7-pin cable to the J10 (coming from MIXER A PCB assy)



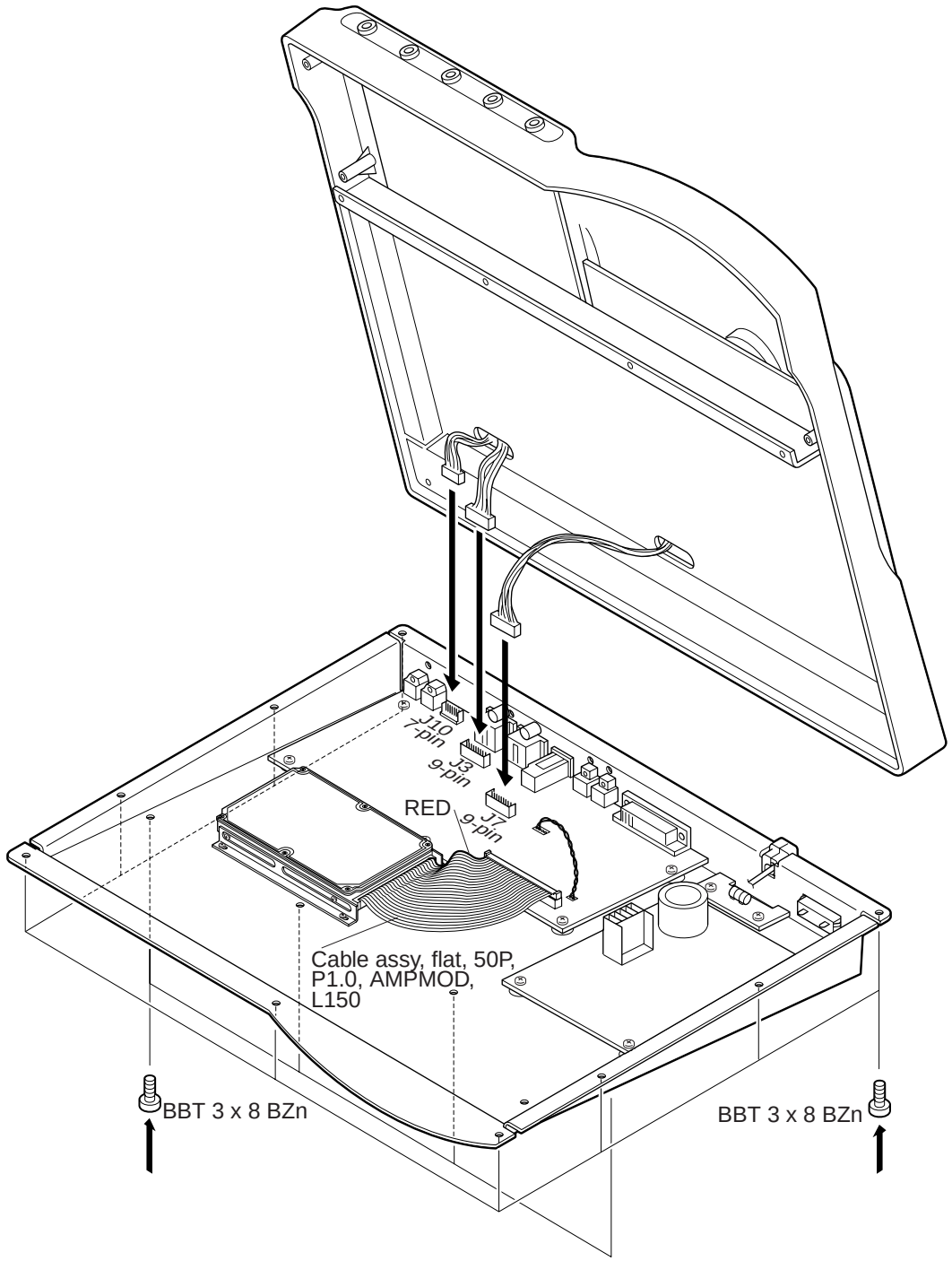
3) Remove the MAIN PCB assy by loosening the following screws.
    - 5 x screws (B 3 x 6 CZn) fixing the PCB assy from top
    - 6 x screws (BBT 3x8 BZn) fixing the PCB from rear
    - 2 x Fix-Stand fixing the D-SUB 25-pin connector
4) Mount and solder the 50-pin connector and 2-pin cable. (Before soldering, you might need to remove the soldering by a solder remover.)



5) Put back the MAIN PCB assy to the Bottom Panel section by tightening the following screws.
   - 5 x screws (B 3 x 6 CZn) fixing the PCB assy from top
   - 6 x screws (BBT 3x8 BZn) fixing the PCB from rear
   - 2 x Fix-Stand fixing the D-SUB 25-pin connector
6) Using 4 x screws (P 3 x 4 CZn), fix the HD Bracket to a 2.5" E-IDE hard disk drive.
7) Using 4 x screws (P 3 x 4 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. When connecting, in order to connect pins straight, do not twist or turn the cable. (Pin-1 of J12 (RED) must go to Pin-1 of HDD connectors.)
9) Connect the following cables from the connectors on the MAIN PCB assy.
    - 9-pin cable to the J3 (coming from MIXER A PCB assy)
    - 9-pin cable to the J7 (coming from DISPLAY PCB assy)
    - 7-pin cable to the J10 (coming from MIXER A PCB assy)
10) Tighten 14 x screws (BBT 3 x 8 BZn) which fix the FD-4 Top Panel section to the Bottom Panel section.

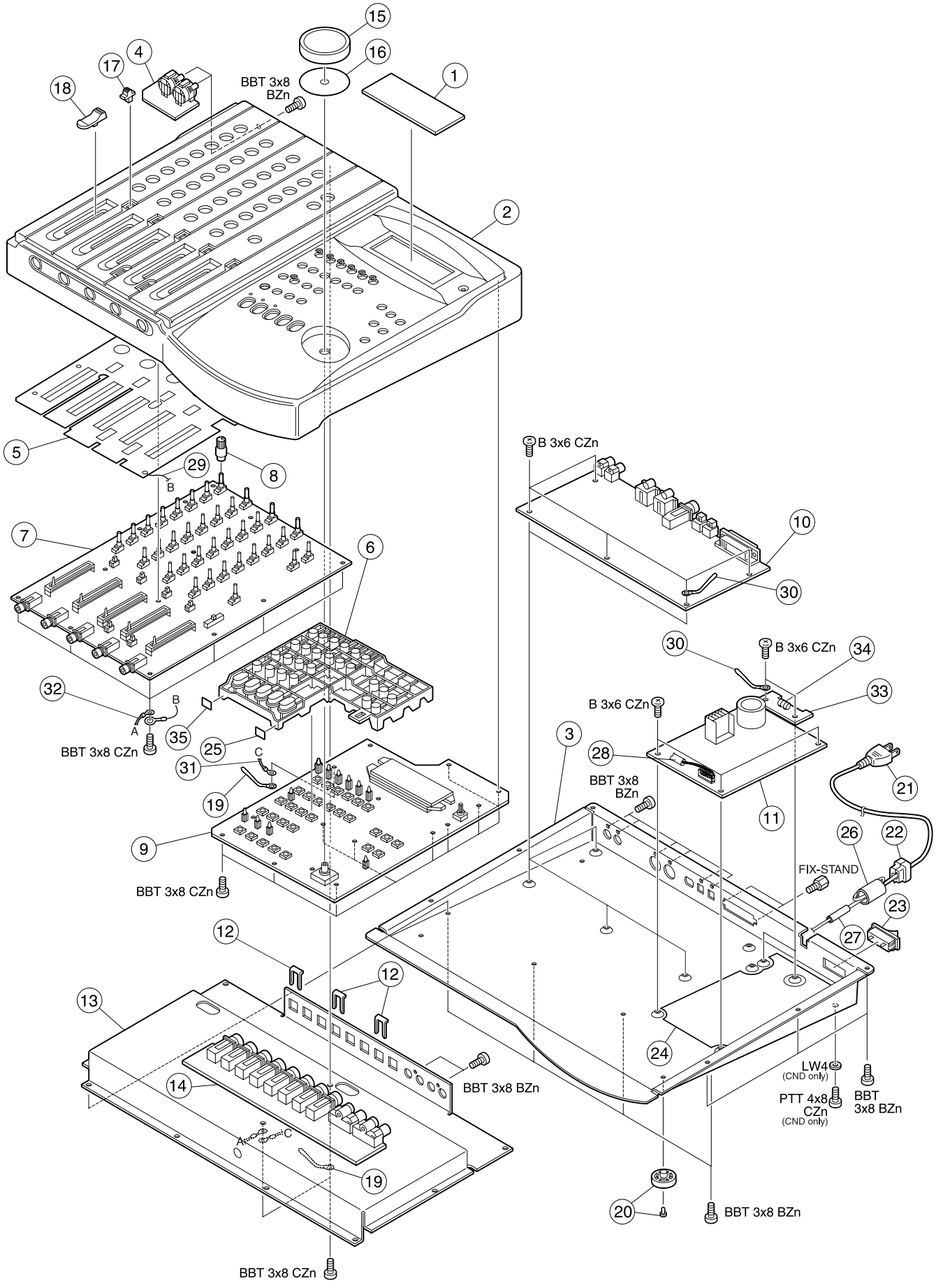


7. EXPLODED VIEW, PCB ASSEMBLY AND PARTS LIST

● FD-4 OVERALL EXPLODED VIEW & PARTS LIST

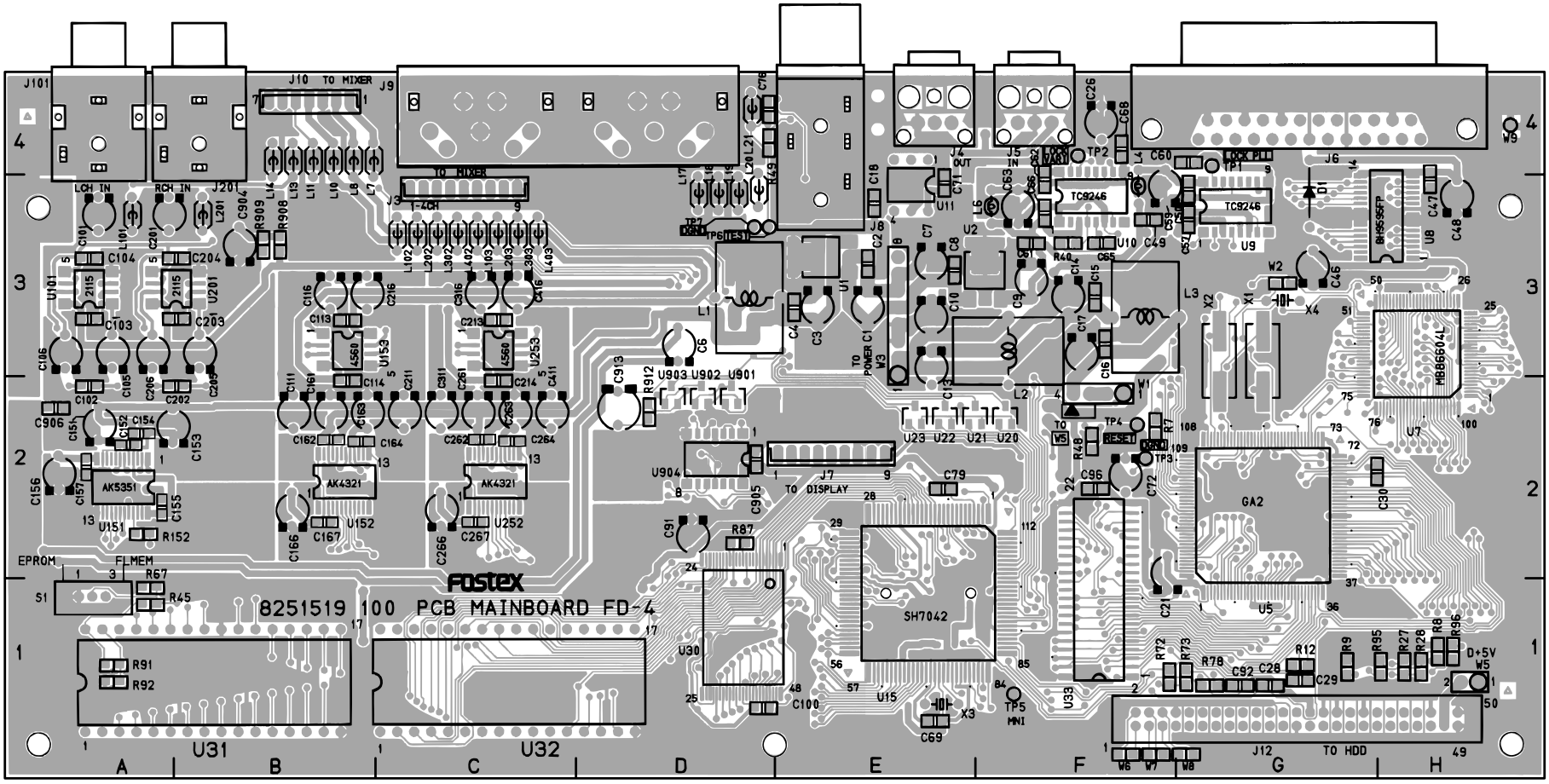
Ref. No.	Part No.	Description
1	8212 6100 00	Window, LCD, FD-4
2	8212 6090 00	Panel, top, FD-4
3	8221 2290 00	Panel, bottom, FD-4
4	8274 1240 00	PCB assy, XLR, FD-4
5	8216 6641 00	Shield, mixer, FD-4
6	8226 2370 00	Button assy, control, FD-4
7	8274 1220 00	PCB assy, Mixer A, FD-4
8	8226 2230 01	Knob, volume, C
9	8274 1360 00	PCB assy, Display, FD-4
10	8274 1370 00	PCB assy, Main, FD-4
⚠ 11	8274 1380 00	PCB assy, Power, FD-4
12	8204 0820 00	Plate, mounting, B
13	8221 2270 00	Bracket, jack, FD-4
14	8274 1230 00	PCB assy, Jack, FD-4
15	8226 2380 00	Knob, jog, FD-4
16	8216 6670 00	Sheet, jog, FD-4
17	8226 1601 03	Knob, slide, N4.5
18	8226 2390 01	Knob, fader, N4.5
19	8207 0005 00	Cord, holder
20	8207 0120 00	Foot, FF-822
⚠ 21	8276 8351 00	Cord, power, CSA, non integral, USA/CND
	8276 0030 00	Cord, power, JPN
	8276 0060 00	Cord, power, EUR
	8276 8790 00	Cord, power, BS, 2C, PHE-8, UK
22	8207 0084 00	Bushing, 2271 (Except CND)
	8207 0084 01	Bushing, 3P31, CND
23	8253 4620 01	SW, P, Power, SDDJF1-A-2
24	8216 6650 00	Sheet, isolation, power, FD-4
25	8216 6361 00	Cushion, battery, PD-4/FD-4
26	8242 2340 13	Filter, EMI, ferrite, core, HF70RH16x28x10
27	8276 9140 06	Tube, UL, black, L60
28	8276 8720 14	Tube, UL, clear, 16, L140
29	8276 3750 09	Cable assy, earth lug, D3, L90
30	8207 0117 01	Cord holder, CS-1
31	8277 3530 15	Cable assy, earth lug, D3-D3, #20, L150
32	8277 3530 20	Cable assy, earth lug, D3-D3, #20, L200
⚠ 33	8274 1390 00	PCB assy, AC In, FD-4
⚠ 34	8239 0007 08	Fuse, 20, TDLY, 0.8A, 250V
35	8216 6361 01	Cushion, button, FD-4

● FD-4 OVERALL EXPLODED VIEW

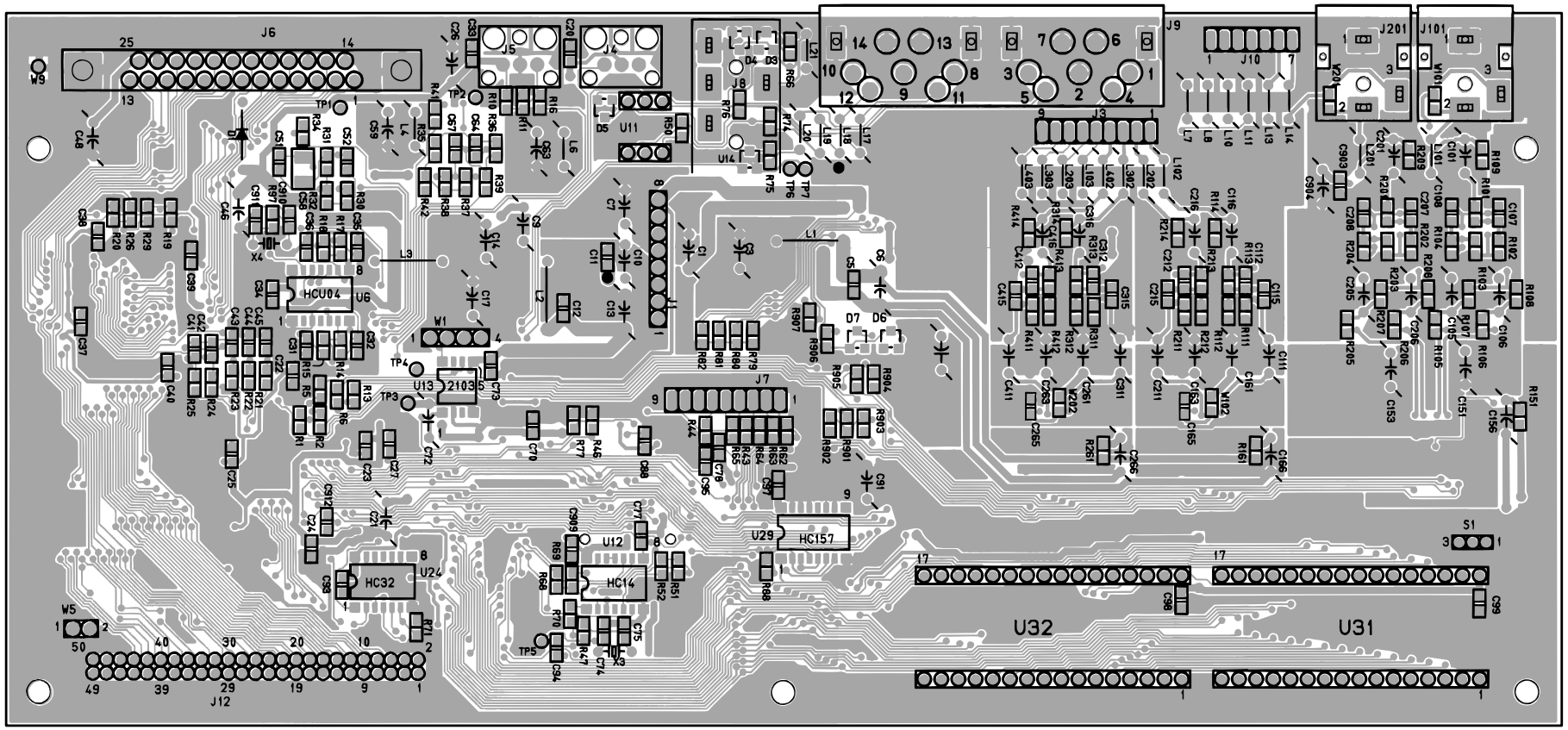


● FD-4 PCB PATTERN DRAWING

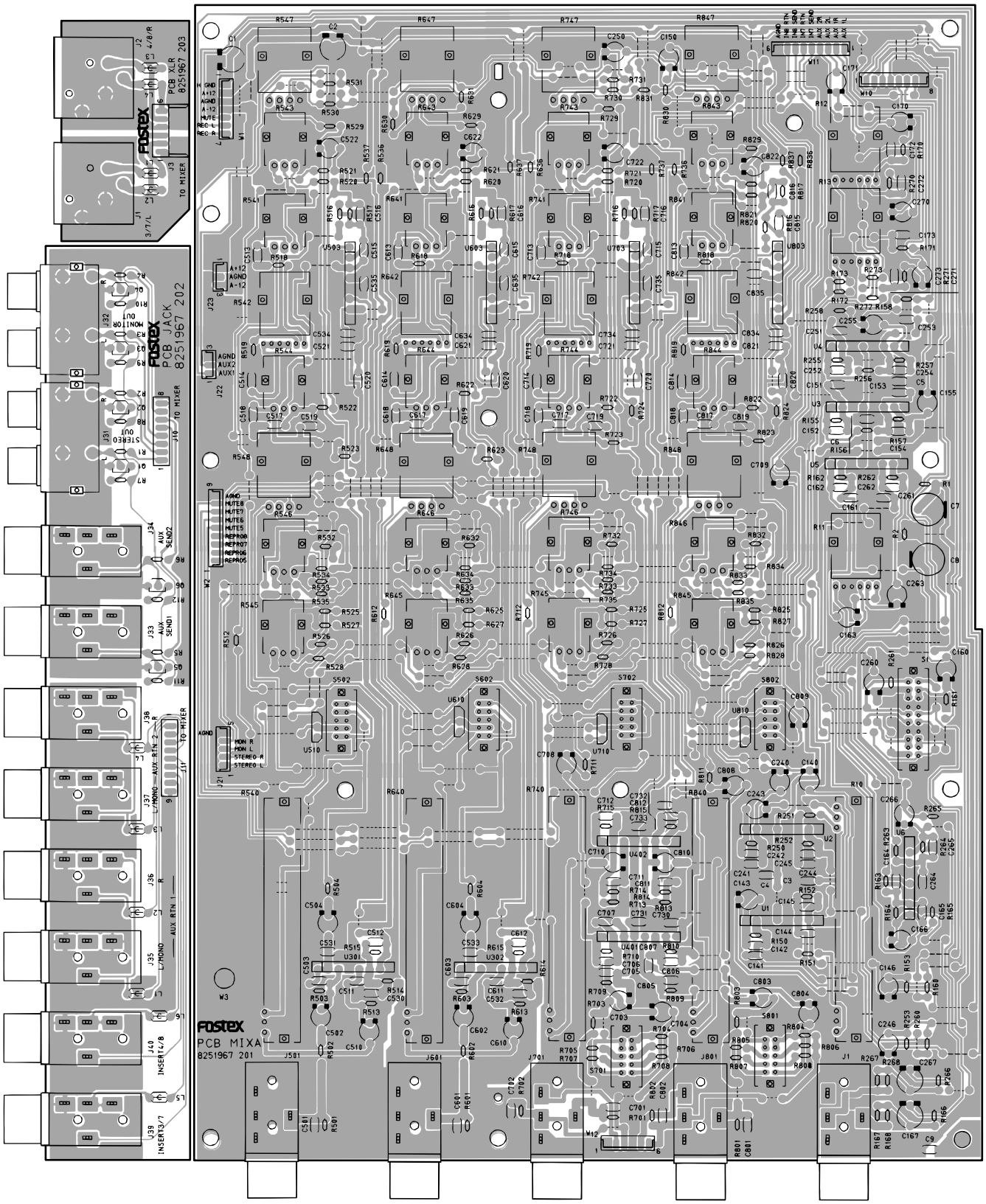
• Parts Side of MAIN PCB assy



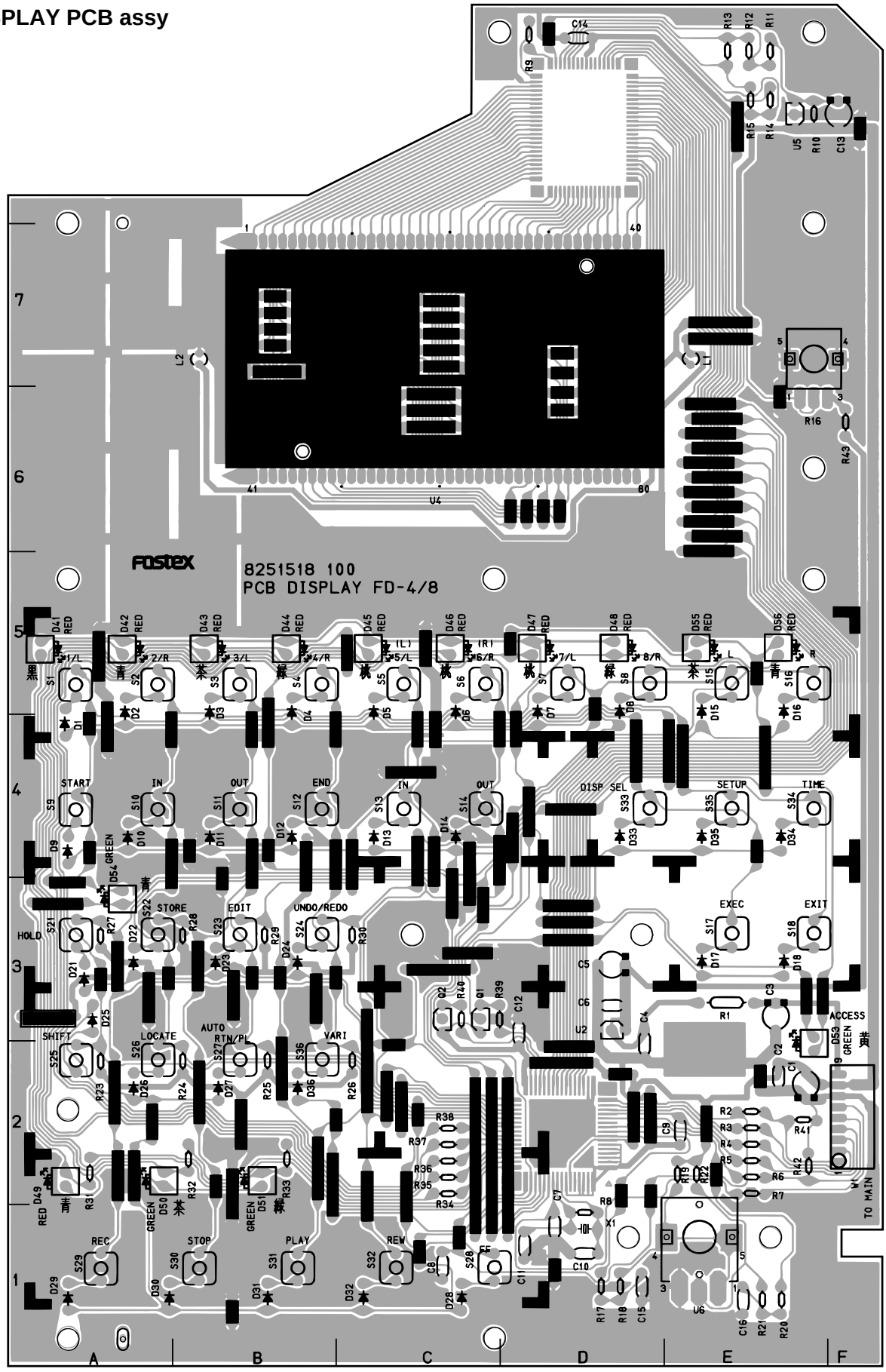
• **Foil Side of MAIN PCB assy**



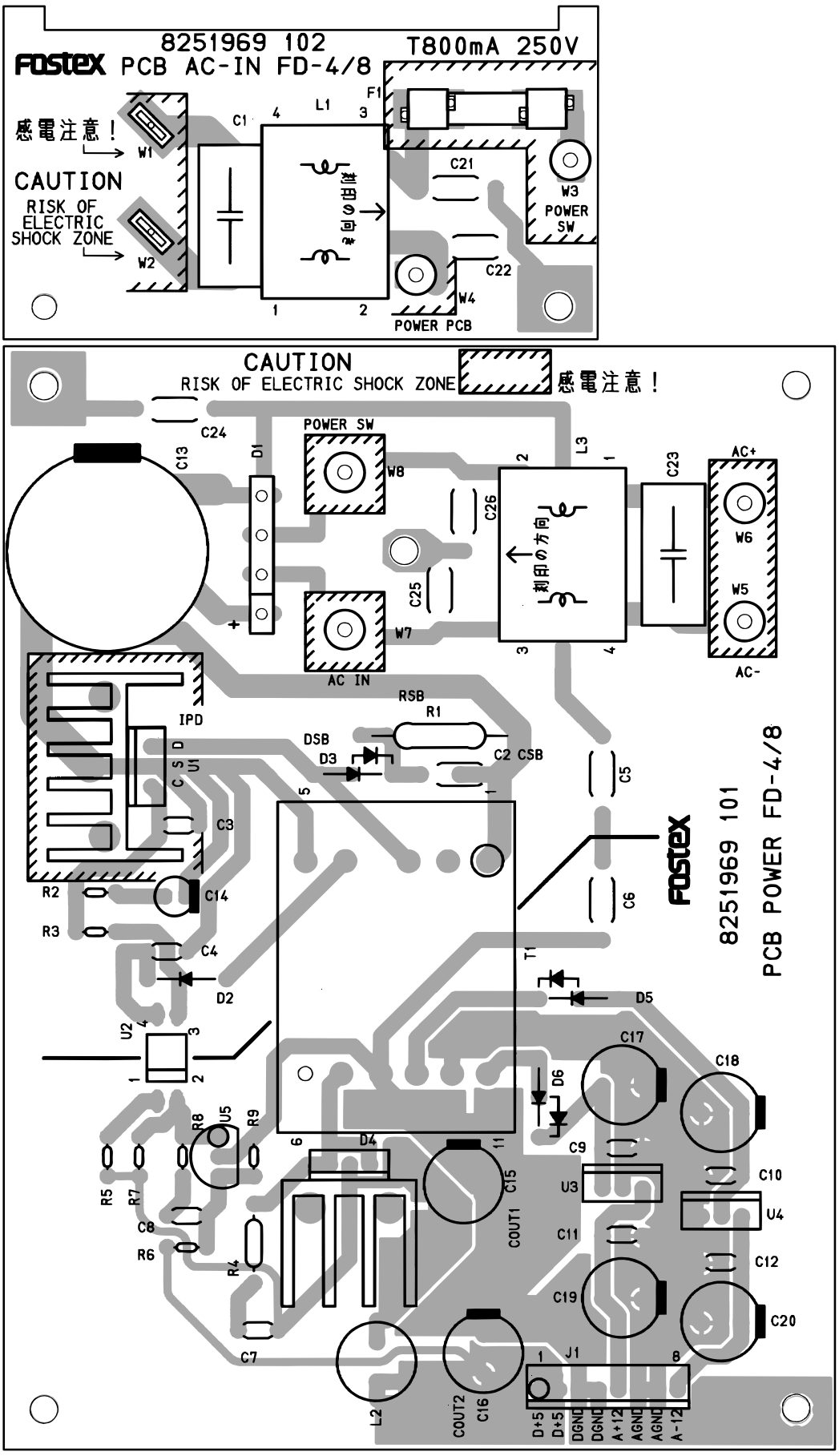
• MIXER A, JACK and XLR PCB assys



• **DISPLAY PCB assy**



• POWER and AC IN PCB assys



● FD-4 Parts List

• MAIN PCB assy

Ref. No.	Part No.	Description
	8274 1370 00	PCB Assy, Main, FD-4
B001	8251 5191 00	Plain PCB, Main, FD-4

ICs

Ref. No.	Part No.	Description
U001, 002	8236 5403 01	ST, analog, regulator, NJM78M05DLA
U003, 004		N/A
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, term, 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 01	QFP, digital, CPU, main, FD-4, 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		N/A
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, 252	8236 5408 00	ST, digital, DA, AK4321
U352, 452		N/A
U153, 253	8236 7207 00	ST, analog, NJM4560M
U353, 453		N/A
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, 002	8230 5001 01	ST, carbon, 1/10W, 100Ω, 5%
R003, 004		N/A
R005~007	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	8230 5000 00	ST, carbon, 1/10W, 0Ω, 5%
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 5001 04	ST, carbon, 1/10W, 100kΩ, 5%
R037, 038	8230 5007 51	ST, carbon, 1/10W, 750Ω, 5%
R039	8230 5002 03	ST, carbon, 1/10W, 20kΩ, 5%
R040	8230 5001 22	ST, carbon, 1/10W, 1.2kΩ, 5%
R041	8230 5005 61	ST, carbon, 1/10W, 560Ω, 5%
R042	8230 5001 22	ST, carbon, 1/10W, 1.2kΩ, 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%

RESISTORs

Ref. No.	Part No.	Description
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%
R079~082	8230 5001 03	ST, carbon, 1/10W, 10kΩ, 5%
R083~086		N/A
R087	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%
R097	8230 5001 05	ST, carbon, 1/10W, 1MΩ, 5%
R098, 099		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%
R111~411	8230 5001 03	ST, carbon, 1/10W, 10kΩ, 5%
R511~811		N/A
R112~412	8230 5001 03	ST, carbon, 1/10W, 10kΩ, 5%
R512~812		N/A
R113~413	8230 5002 72	ST, carbon, 1/10W, 2.7kΩ, 5%
R513~813		N/A
R114~414	8230 5001 04	ST, carbon, 1/10W, 100kΩ, 5%
R514~814		N/A
R161, 261	8230 5001 00	ST, carbon, 1/10W, 10Ω, 5%
R361, 461		N/A
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, CC20F
C003	8232 1431 06	VT, ALU, 16V, 10µF, 20%, SME-VB
C004	8233 5021 04	ST, CER, 50V, 0.1µF, +80, CC20F
C005~007		N/A
C008	8233 5021 04	ST, CER, 50V, 0.1µF, +80, CC20F
C009, 010	8232 1431 06	VT, ALU, 16V, 10µF, 20%, SME-VB
C011	8233 5021 04	ST, CER, 50V, 0.1µF, +80, 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, CC20F
C016, 017		N/A
C018	8233 5021 04	ST, CER, 50V, 0.1µF, +80, CC20F
C019		N/A
C020	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	8233 5002 20	ST, CER, 50V, 22pF, 5%, CC20SL
C037~040	8233 5041 03	ST, CER, 25V, 0.01µF, 10%, CC20R

Ref. No.	Part No.	Description
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, 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
C053~056		N/A
C057	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, 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 5002 21	ST, CER, 50V, 220pF, 5%, CC20SL
C065	8233 5044 73	ST, CER, 25V, 0.047µF, 10%, CC20R
C066	8233 5041 03	ST, CER, 25V, 0.01µF, 10%, CC20R
C067	8233 5001 21	ST, CER, 50V, 120pF, 5%, CC20SL
C068~070	8233 5021 04	ST, CER, 50V, 0.1µF, +80, 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
C079~087		N/A
C088	8233 5021 04	ST, CER, 50V, 0.1µF, +80, 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
C096~100	8233 5041 03	ST, CER, 25V, 0.01µF, 10%, CC20R
C101~104		N/A
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, 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
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	8276 0020 02	Wire, jumper, IPS-1041-2, F5
C106, 206	8276 0020 02	Wire, jumper, IPS-1041-2, F5
C107, 207		N/A
C108, 208		N/A
C111~411	8232 1431 06	VT, ALU, 16V, 10µF, 20%, SME-VB
C511~811		N/A
C112~412	8233 5006 81	ST, CER, 50V, 680pF, 5%, CC20SL
C512~812		N/A
C113, 213	8233 5041 03	ST, CER, 25V, 0.01µF, 10%, CC20R
C313, 413		N/A
C114, 214	8233 5041 03	ST, CER, 25V, 0.01µF, 10%, CC20R

Ref. No.	Part No.	Description
C314, 414		N/A
C115~815		N/A
C116~416	8232 1434 76	VT, ALU, 16V, 47µF, 20%, SME-VB
C516~816		N/A
C161~461		N/A
C162, 262	8233 5041 03	ST, CER, 25V, 0.01µF, 10%, CC20R
C362, 462		N/A
C163, 263	8232 1434 76	VT, ALU, 16V, 47µF, 20%, SME-VB
C363, 463		N/A
C164, 264	8233 5041 03	ST, CER, 25V, 0.01µF, 10%, CC20R
C364, 464		N/A
C165, 265		N/A
C166, 266	8232 1431 06	VT, ALU, 16V, 10µF, 20%, SME-VB
C366, 466		N/A
C167, 267	8233 5041 03	ST, CER, 25V, 0.01µF, 10%, CC20R
C367, 467		N/A
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, 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	8245 1580 11	Connector, PI, socket, IC, 32P
E1402		N/A
J001, 002		N/A
J003	8245 1711 09	Connector, PI, jack, 8283, 9P, WHT
J004	8245 3170 00	Connector, opt., TX178
J005	8245 3180 00	Connector, opt., RX178
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, 012		N/A
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, 008	8242 1860 13	Filter, T, EMI, LFW7B-M3R2T
L009		N/A
L010, 011	8242 1860 13	Filter, T, EMI, LFW7B-M3R2T
L012		N/A
L013, 014	8242 1860 13	Filter, T, EMI, LFW7B-M3R2T
L015, 016		N/A
L017~021	8242 1860 13	Filter, T, EMI, LFW7B-M3R2T
L022		N/A
L101~201	8242 1860 13	Filter, T, EMI, LFW7B-M3R2T
L102~402	8242 1860 13	Filter, T, EMI, LFW7B-M3R2T
L502~802		N/A
L103~403	8242 1860 13	Filter, T, EMI, LFW7B-M3R2T
L503~803		N/A
S001	8253 4570 02	Switch, slide, 1-2, non-shortening, SSSS91
X001	8256 1700 01	Resonator, ST, XTL, 22.579 MHZ, FUP-FBB3AFUJICOM
X002	8256 1700 03	Resonator, ST, XTL, 16.384MHz, FUP-FBB3A
X003	8256 1790 01	Resonator, PT, CER, 7.000MHz, F5, EFOEN
X004		N/A

Ref. No.	Part No.	Description
Y3301	8216 5950 00	Shield, RCA
Y3302		N/A
W001, 002		N/A
W003	8276 7320 30	Cable assy, 8P, 8263WHT-5395, #22, L300
W004~008		N/A
W101, 201		N/A
W102, 202	8230 5000 00	Resistor, ST, carbon, 1/10W, 0Ω, 5%

• MIXER A PCB assy

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

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
U302	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%

Ref. No.	Part No.	Description
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, +80, YF
C007, 008	8232 1432 27	VT, ALU, 16V, 220µF, 20%, SME-VB
C009	8232 8181 04	VT, CER, 25V, 0.1µF, +80, 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
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, YF
C531, 731	8232 8181 04	VT, CER, 25V, 0.1µF, +80, YF
C532, 732	8232 8181 04	VT, CER, 25V, 0.1µF, +80, YF
C533, 733	8232 8181 04	VT, CER, 25V, 0.1µF, +80, YF
C534~834	8232 8181 04	VT, CER, 25V, 0.1µF, +80, YF

Ref. No.	Part No.	Description
C535~835	8232 8181 04	VT, CER, 25V, 0.1µF, +80, 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

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 1712 03	Connector, PI, jack, 8283, 3P, RED
J501~801	8245 2980 00	Connector, PL, jack, phone, LGR4609-7000
S001	8253 6550 16	SW, 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, WHTMT/F-MT/BS, L200
W002	8276 7790 30	Cable assy, 9P, WHTMT/F-MT/BS, L300
W010	8276 7780 20	Cable assy, 8P, WHTMT/F-MT/BS, L200
W011	8276 7790 20	Cable assy, 9P, WHTMT/F-MT/BS, L200
W012	8277 4530 40	Cable assy, shiled 2C, 6P, WHT8283-9073, L400

• JACK PCB assy

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

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		N/A
E101		Wire, jumper, F5
E102		Wire, jumper, F7.5
E103		Wire, jumper, F10
E104		Wire, jumper, F12.5

• XLR PCB assy

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

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 1360 00	PCB Assy, Display, FD-4
B001	8251 5181 00	Plain PCB, Display, FD-4

ICs

Ref. No.	Part No.	Description
U001	8236 0835 01	QFP, digital, CPU, FD4-display
U002		N/A
U003	8236 0836 00	QFP, digital, LCD driver, HD44780U
U004	8256 1760 00	Module, display, LCD, FD-4
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
D007, 008		N/A
D009~014	8234 5007 00	HT, 1SS136
D015, 016		N/A
D017, 018	8234 5007 00	HT, 1SS136
D019, 020		N/A
D021~036	8234 5007 00	HT, 1SS136
D037~040		N/A
D041~046	8234 0100 00	Opt., V, LED, ORG, GL-2HD6
D047, 048		N/A
D049	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, 056		N/A

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%
R031~036	8230 1381 11	HT, carbon, 1/4W, 110Ω, 5%
R037, 038		N/A
R039, 040	8230 1381 02	HT, carbon, 1/4W, 1kΩ, 5%
R041~043	8230 1388 23	HT, carbon, 1/4W, 82kΩ, 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, YF
C003	8232 1451 06	VT, ALU, 35V, 10µF, 20%, SME-VB
C004	8232 8181 04	VT, CER, 25V, 0.1µF, +80, 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, YF
C013		N/A
C014	8232 8181 04	VT, CER, 25V, 0.1µF, +80, YF
C015, 016	8232 8031 03	VT, CER, 50V, 0.01µF, +80, 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
S001~006	8253 1350 02	SW, PT, tact, SOR-112HS
S007, 008		N/A
S009~014	8253 1350 02	SW, PT, tact, SOR-112HS
S015, 016		N/A
S017, 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 55	Cable assy, 9P, WHTMT/F-MT/BS, L550
W002		N/A

Ref. No.	Part No.	Description
W003		N/A
X001	8256 1340 03	Resonator, PF, CER, 8.00MHz, F5, EFOEN
Y1001	8207 0100 10	Spacer, LED, 10
Y1002	8207 0100 11	Spacer, LED, 11
Y1003	8207 0100 13	Spacer, LED, 13
Y1004	8207 0100 14	Spacer, LED, 14
Y1005		N/A
Y1006	8212 6110 00	Plate, reflect, LCD, FD-4
Y1007	8207 0100 09	Spacer, LED, 9
Y1008	8207 0100 12	Spacer, LED, 12

• POWER PCB assy

Ref. No.	Part No.	Description
	8274 1380 00	PCB Assy, Power Supply, FD-4
B001	8251 9691 01	Plain PCB, Power Supply, FD-4

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		N/A
C002	8232 3491 03	VT, PES, 630V, 0.01µF, 10%, ECQ-EKF
C003	8232 8011 00	VT, CER, 50V, 10pF, 5%, SL
C004	8232 8181 04	VT, CER, 25V, 0.1µF, +80, 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, YF
C009~012	8232 8031 03	VT, CER, 50V, 0.01µF, +80, 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
C023~026		N/A

MISCELLANEOUS

Ref. No.	Part No.	Description
J001	8245 0530 08	Connector, PI, jack, 8263, 8P, WHT
L001		N/A
L002	8242 2501 03	Coil, PVT, 10µH, 2A, ELC
L003	8242 2491 93	Filter, line, 19mH, 0.5A, ELF15N005
T001	8242 2480 00	Transformer, sw power, 27SF11, FD-4
W001~006		N/A
W007	8277 4711 10	Cable assy, 250RECEP-SIN1.8, BRN, L100
W008		N/A
Y501		N/A
Y502	8207 0015 00	Heat sink, 16PB16, L25, B
Y503		Screw, P3 x 6, CZn

• AC IN PCB assy

Ref. No.	Part No.	Description
	8274 1390 00	PCB Assy, AC In, FD-4
B101	8251 9691 02	Plain PCB, AC In, FD-4

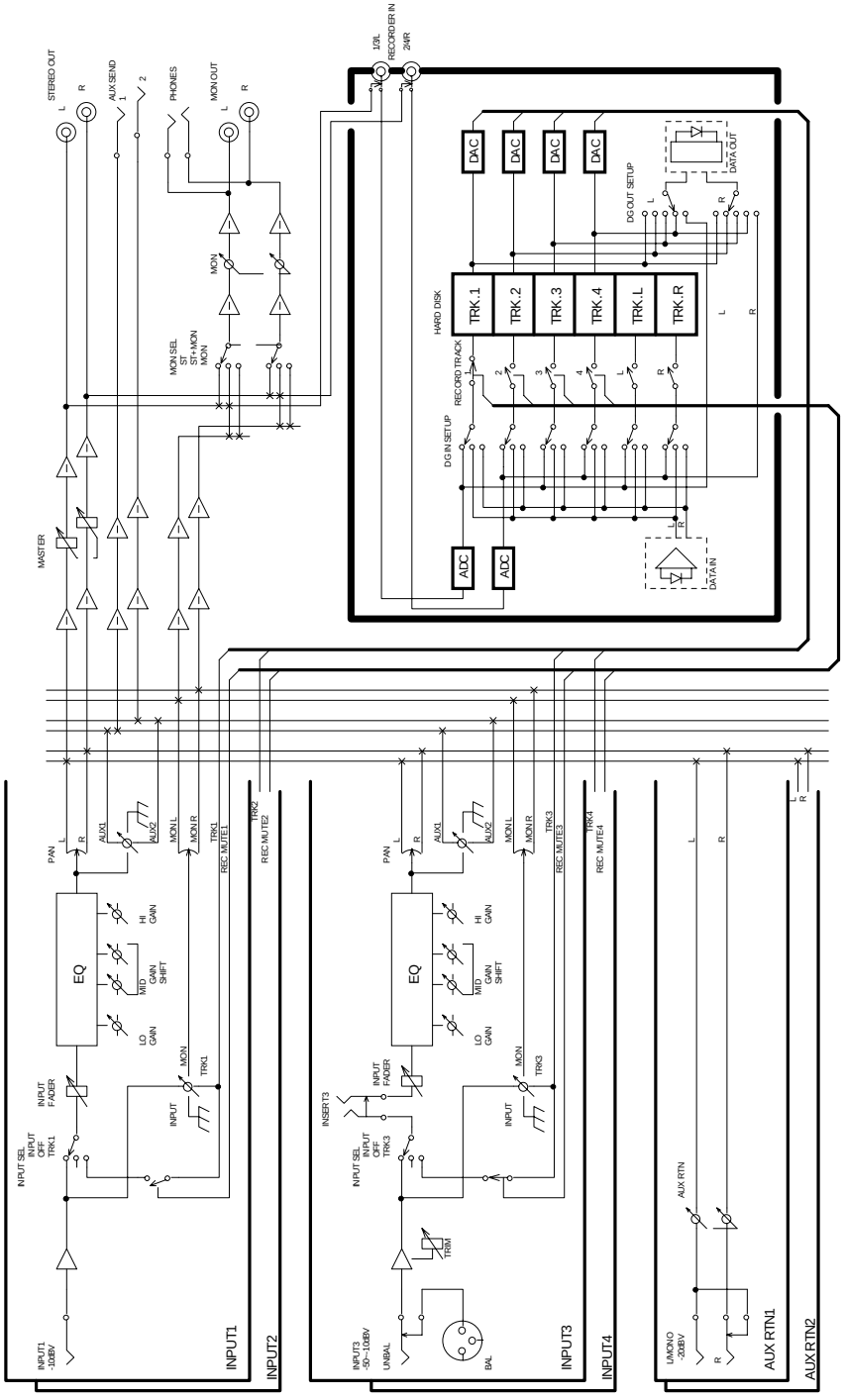
Ref. No.	Part No.	Description
C001	8232 3521 04	Capacitor, V, PES, 250VAC, 0.1µF, 20%, ECQ-UMV
C021, 022	8232 3542 22	Capacitor, V, CER, 250V, 0.0022µF, 20%, ECK-ZNS
E101	8239 0002 00	Holder, PI, fuse, S-N5057
L001	8242 2491 02	Filter, line, 1mH, 2.2A, ELF15N022
W001, 002	8245 5430 00	Terminal, IPS-5007
W003	8277 4711 10	Cable assy, 250RECEP-SIN1.8, BRN, L100
W004	8277 4722 10	Cable assy, 1P, SIN1.8-SIN1.8, WHT, L100

● Abbreviation

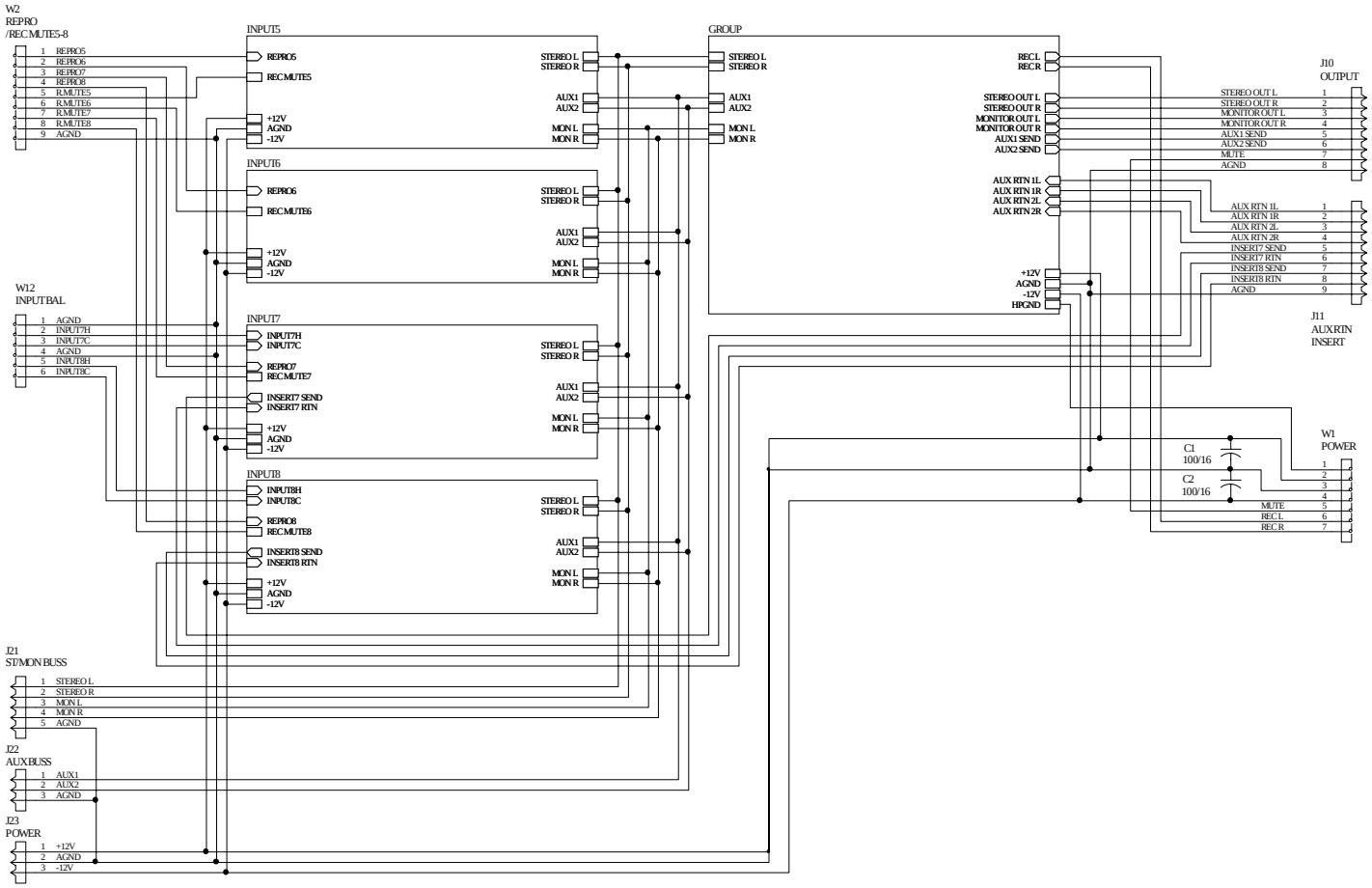
T: Taping device
F: Forming device
P: Penetrate mount
V: Vertical mount
H: Horizontal mount
I: I form
L: L form
QFP: Quad Flat Package
SOP: Small Outline Package
SIP: Single In-line Package
SOJ: Small Outline with J leads
220: TO-220 type

8. CIRCUIT DIAGRAMS

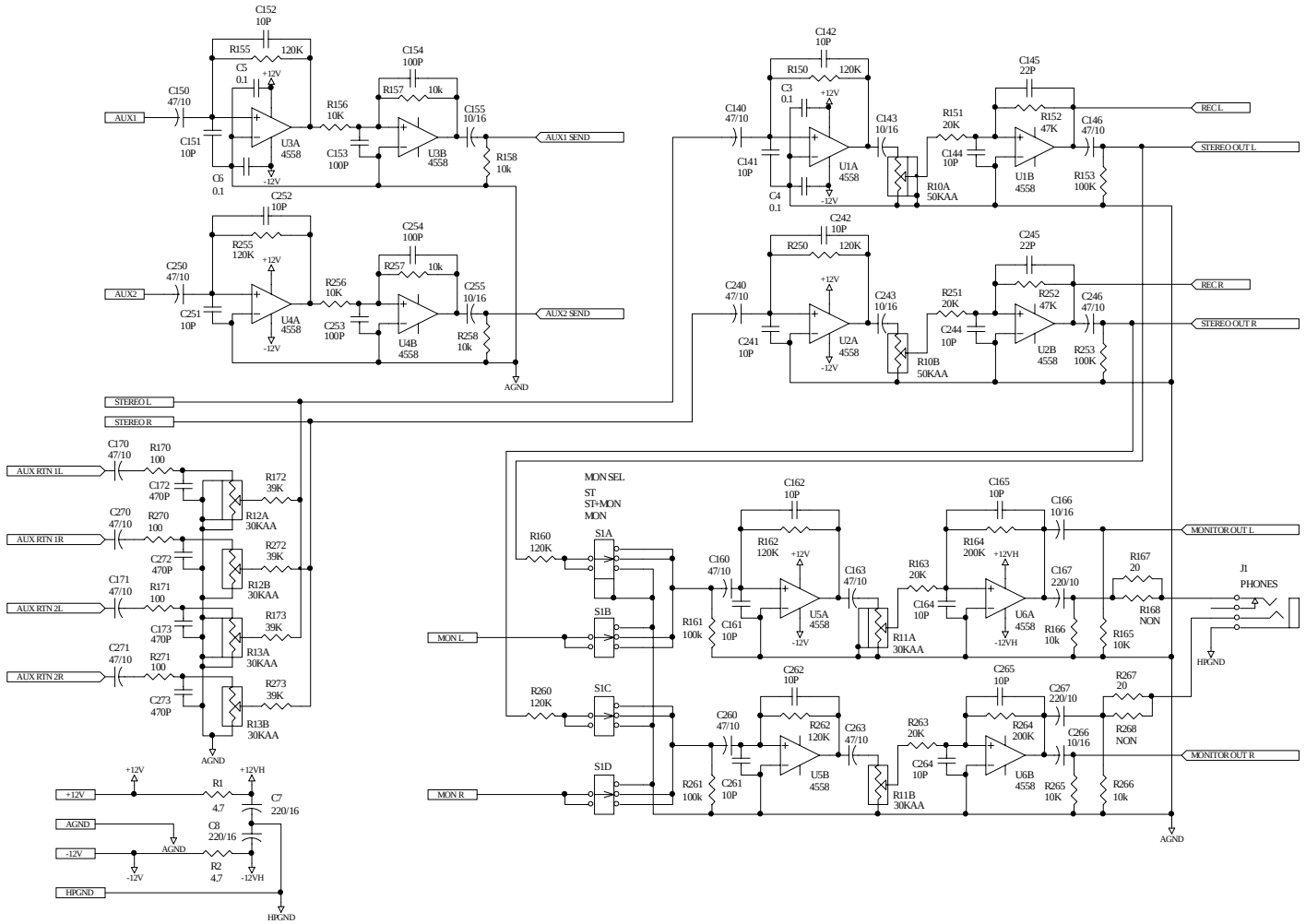
● BLOCK DIAGRAM



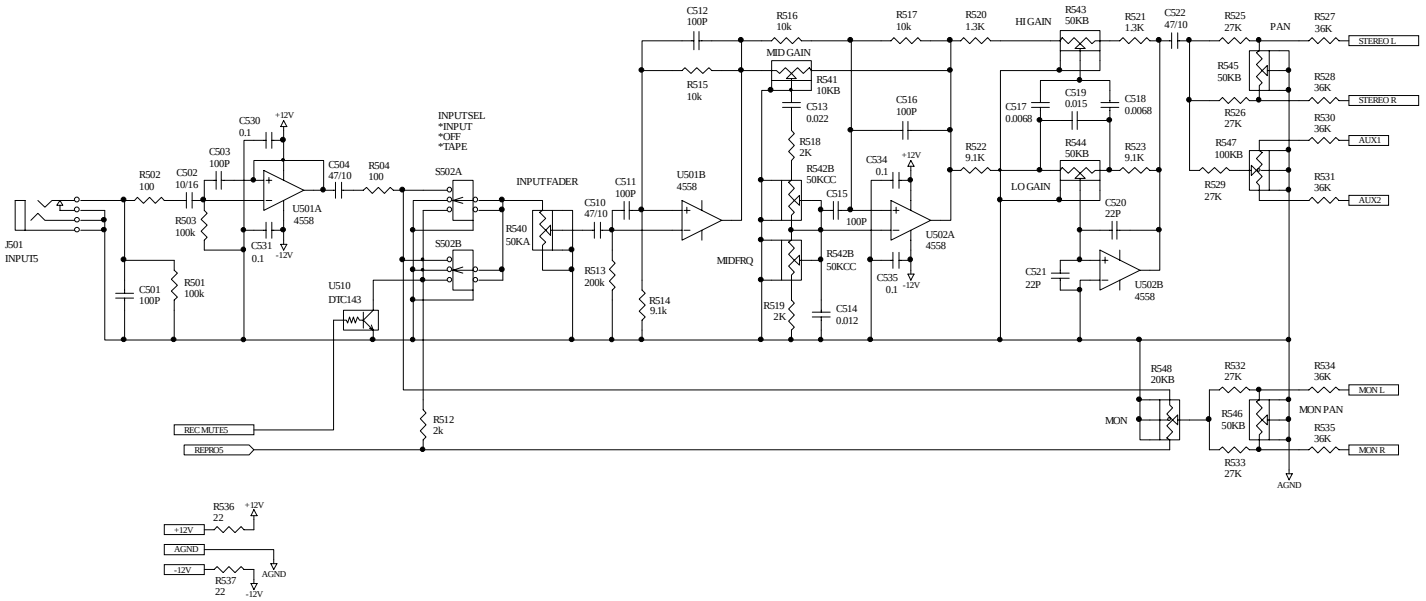
● MIXER A (1/6)


W2
REPRO
/REC MUTE5-8
1 REPRO5
2 REPRO6
3 REPRO7
4 REPRO8
5 RMUTE5
6 RMUTE6
7 RMUTE7
8 RMUTE8
9 AGND
INPUT5
REPRO5
REC MUTE5
+12V
AGND
-12V
STEREO L
STEREO R
AUX1
AUX2
MON L
MON R
INPUT6
REPRO6
REC MUTE6
+12V
AGND
-12V
STEREO L
STEREO R
AUX1
AUX2
MON L
MON R
W12
INPUT BAL
1 AGND
2 INPUT7H
3 INPUT7C
4 AGND
5 INPUT8H
6 INPUT8C
INPUT7
INPUT7H
INPUT7C
REPRO7
REC MUTE7
INSERT7 SEND
INSERT7 RTN
+12V
AGND
-12V
STEREO L
STEREO R
AUX1
AUX2
MON L
MON R
INPUT8
INPUT8H
INPUT8C
REPRO8
REC MUTE8
INSERT8 SEND
INSERT8 RTN
+12V
AGND
-12V
STEREO L
STEREO R
AUX1
AUX2
MON L
MON R
GROUP
STEREO L
STEREO R
AUX1
AUX2
MON L
MON R
REC L
REC R
STEREO OUT L
STEREO OUT R
MONITOR OUT L
MONITOR OUT R
AUX1 SEND
AUX2 SEND
AUX RTN 1L
AUX RTN 1R
AUX RTN 2L
AUX RTN 2R
+12V
AGND
-12V
HPGND
J10
OUTPUT
STEREO OUT L 1
STEREO OUT R 2
MONITOR OUT L 3
MONITOR OUT R 4
AUX1 SEND 5
AUX2 SEND 6
MUTE 7
AGND 8
AUX RTN 1L 1
AUX RTN 1R 2
AUX RTN 2L 3
AUX RTN 2R 4
INSERT7 SEND 5
INSERT7 RTN 6
INSERT8 SEND 7
INSERT8 RTN 8
AGND 9
J11
AUX RTN
INSERT
W1
POWER
1
2
3
4
MUTE 5
REC L 6
REC R 7
C1
100/16
C2
100/16
J21
ST/MON BUSS
1 STEREO L
2 STEREO R
3 MON L
4 MON R
5 AGND
J22
AUX BUSS
1 AUX1
2 AUX2
3 AGND
J23
POWER
1 +12V
2 AGND
3 -12V

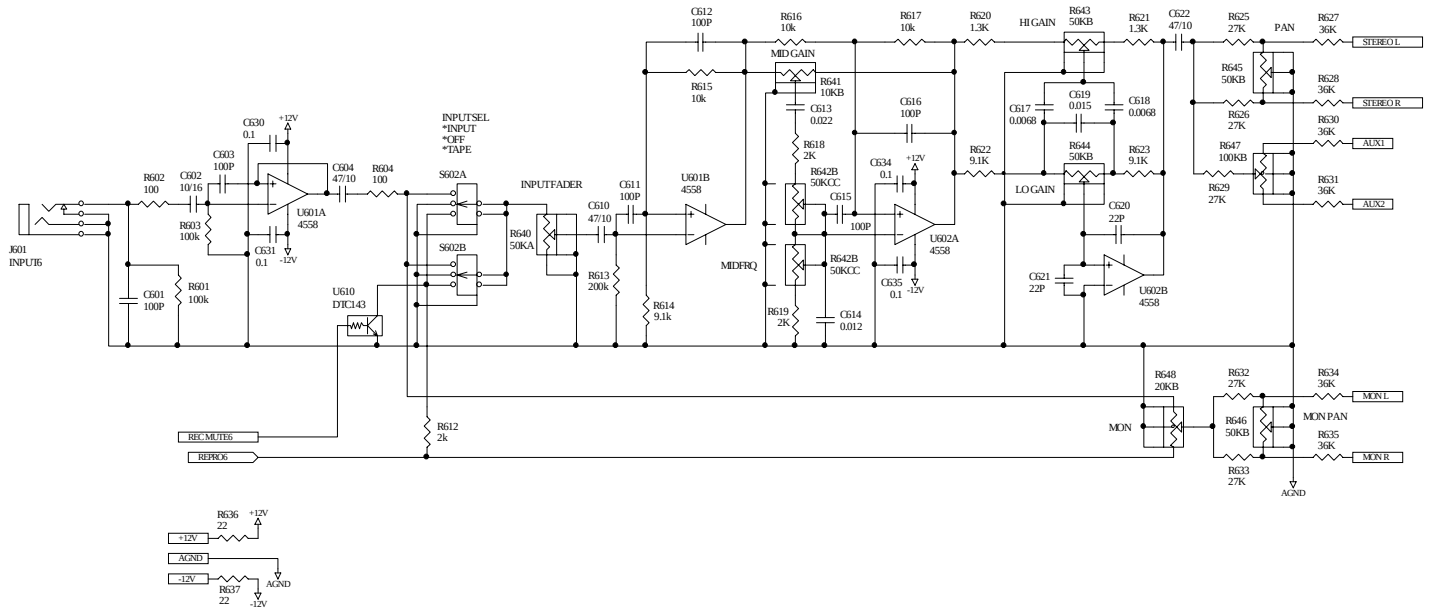
● MIXER A (2/6)


C152 10P
R155 120K
C5 0.1
+12V
C150 47/10
AUX1
C151 10P
U3A 4558
R156 10K
C154 100P
R157 10k
C153 100P
U3B 4558
C155 10/16
AUX1 SEND
R158 10k
C6 0.1
-12V
C252 10P
R255 120K
C250 47/10
AUX2
C251 10P
U4A 4558
R256 10K
C254 100P
R257 10k
C253 100P
U4B 4558
C255 10/16
AUX2 SEND
R258 10k
AGND
C142 10P
R150 120K
C3 0.1
C140 47/10
C141 10P
U1A 4558
C143 10/16
R151 20K
C145 22P
R152 47K
C144 10P
U1B 4558
C146 47/10
REC L
STEREO OUT L
R153 100K
C4 0.1
R10A 50KAA
C242 10P
R250 120K
C240 47/10
C241 10P
U2A 4558
C243 10/16
R251 20K
C245 22P
R252 47K
C244 10P
U2B 4558
C246 47/10
REC R
STEREO OUT R
R253 100K
R10B 50KAA
STEREO L
STEREO R
C170 47/10
R170 100
AUX RTN 1L
C172 470P
R172 39K
R12A 30KAA
C270 47/10
R270 100
AUX RTN 1R
C272 470P
R272 39K
R12B 30KAA
C171 47/10
R171 100
AUX RTN 2L
C173 470P
R173 39K
R13A 30KAA
C271 47/10
R271 100
AUX RTN 2R
C273 470P
R273 39K
R13B 30KAA
AGND
MON SEL
ST
ST+MON
MON
R160 120K
S1A
S1B
MON L
C162 10P
R162 120K
C160 47/10
R161 100k
C161 10P
U5A 4558
C163 47/10
C165 10P
C166 10/16
R164 200K
R163 20K
C164 10P
U6A 4558
C167 220/10
MONITOR OUT L
R167 20
R168 NON
J1
PHONES
R166 10k
R165 10K
HPGND
R11A 30KAA
R260 120K
S1C
S1D
MON R
C262 10P
R262 120K
C260 47/10
R261 100k
C261 10P
U5B 4558
C263 47/10
C265 10P
C267 220/10
R264 200K
R263 20K
C264 10P
U6B 4558
C266 10/16
MONITOR OUT R
R267 20
R268 NON
R265 10K
R266 10k
R11B 30KAA
AGND
+12V
+12VH
R1 4.7
C7 220/16
AGND
C8 220/16
-12V
R2 4.7
-12VH
HPGND

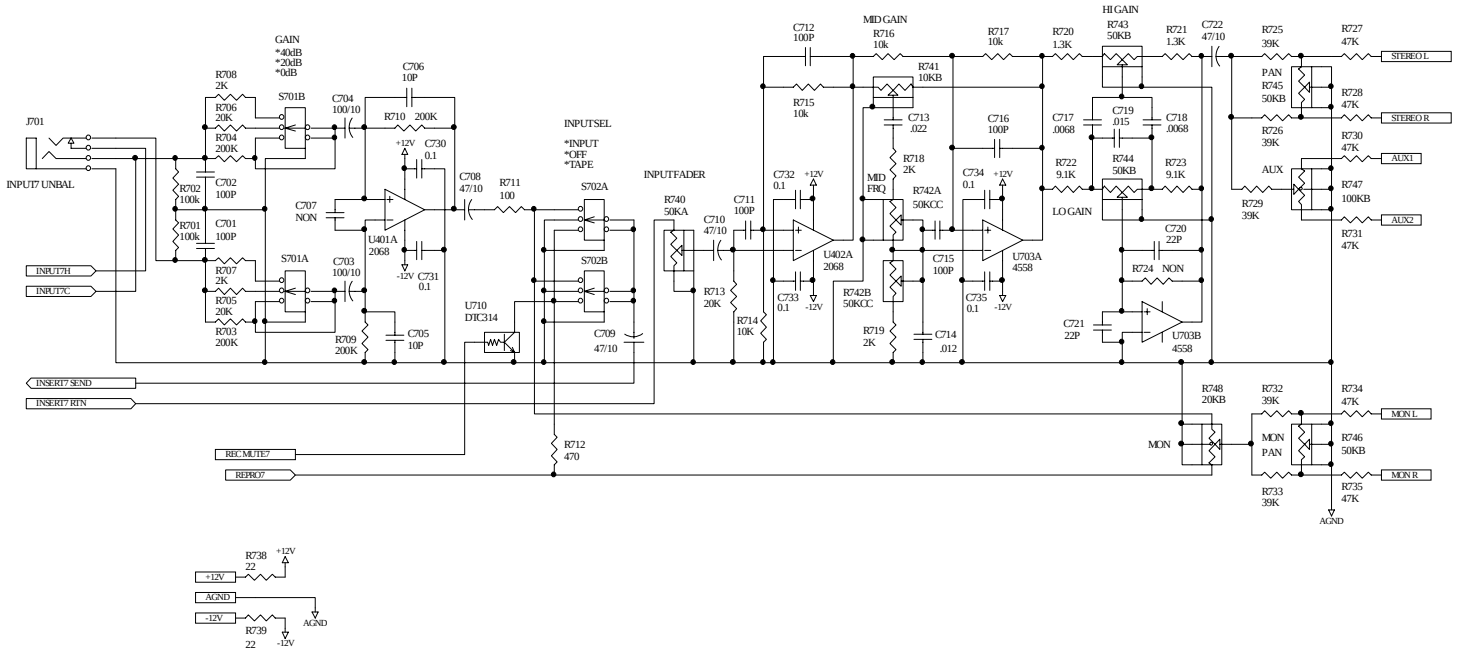
● MIXER A (3/6)


J501
INPUT5
R502 100
C502 10/16
C503 100P
C530 0.1
+12V
C504 47/10
R504 100
U501A 4558
R503 100k
C531 0.1
-12V
C501 100P
R501 100k
INPUTSEL
*INPUT
*OFF
*TAPE
S502A
S502B
INPUTFADER
R540 50KA
C510 47/10
C511 100P
U501B 4558
R513 200k
R514 9.1k
U510 DTC143
R512 2k
REC MUTE5
REPRO5
C512 100P
R516 10k
MID GAIN
R541 10KB
C513 0.022
R518 2K
R542B 50KCC
R519 2K
C514 0.012
MIDFRQ
R515 10k
C516 100P
C515 100P
C534 0.1
C535 0.1
U502A 4558
R517 10k
R520 1.3K
R522 9.1K
R523 9.1K
HI GAIN
LO GAIN
R543 50KB
R544 50KB
C517 0.0068
C519 0.015
C518 0.0068
C520 22P
C521 22P
U502B 4558
R521 1.3K
C522 47/10
R525 27K
PAN
R527 36K
STEREO L
R545 50KB
R528 36K
STEREO R
R526 27K
R530 36K
AUX1
R547 100KB
R529 27K
R531 36K
AUX2
R548 20KB
MON
R532 27K
R534 36K
MON L
MON PAN
R546 50KB
R535 36K
MON R
R533 27K
AGND
R536 22
+12V
AGND
-12V
RS37 22
-12V
AGND

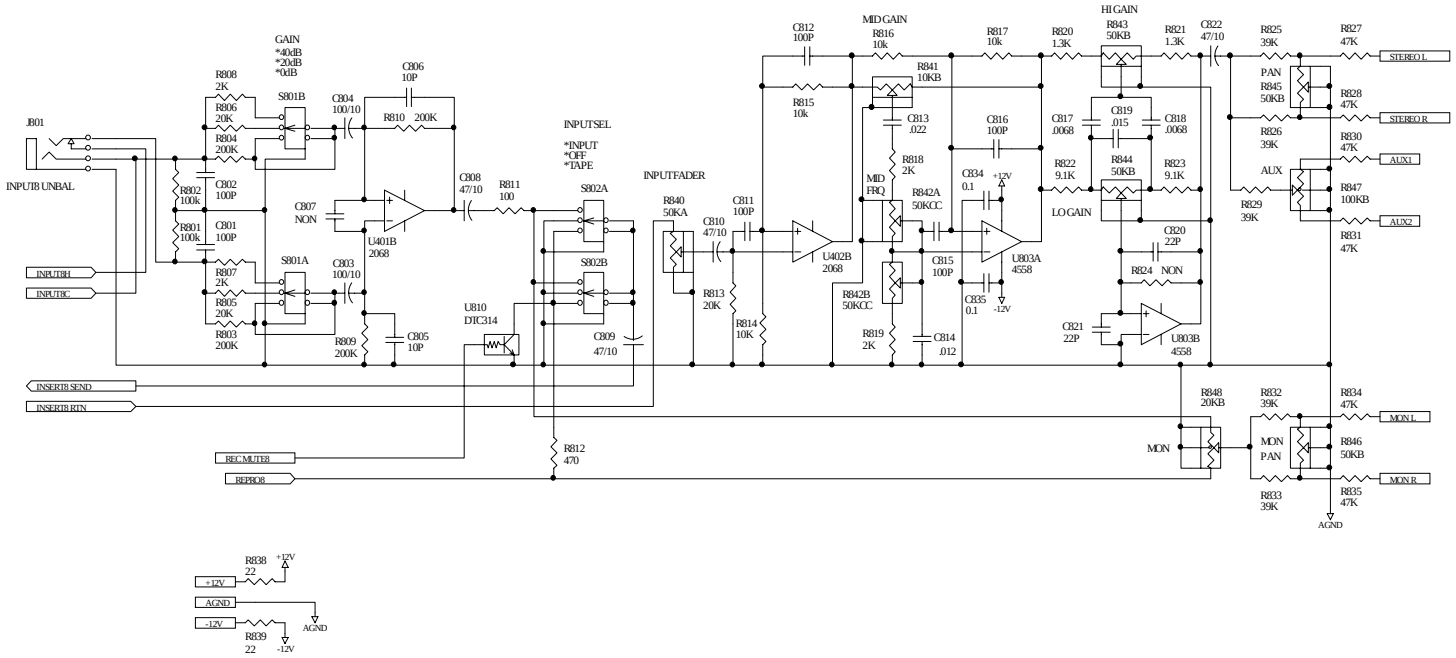
● MIXER A (4/6)


J601
INPUT6
R602
100
C602
10/16
C603
100P
C630
0.1
+12V
U601A
4558
C631
0.1
-12V
C604
47/10
R604
100
R603
100k
C601
100P
R601
100k
INPUTSEL
*INPUT
*OFF
*TAPE
S602A
S602B
U610
DTC143
INPUTFADER
R640
50KA
C610
47/10
C611
100P
R613
200k
R614
9.1k
U601B
4558
C612
100P
R615
10k
R616
10k
R617
10k
MID GAIN
R641
10KB
C613
0.022
R618
2K
R642B
50KCC
MIDFRQ
R642B
50KCC
R619
2K
C614
0.012
C615
100P
C616
100P
C634
0.1
+12V
C635
0.1
-12V
U602A
4558
R620
1.3K
HI GAIN
R643
50KB
R622
9.1K
LO GAIN
R644
50KB
R621
1.3K
R623
9.1K
C617
0.0068
C619
0.015
C618
0.0068
C620
22P
C621
22P
U602B
4558
C622
47/10
R625
27K
PAN
R627
36K
STEREO L
R645
50KB
R628
36K
STEREO R
R626
27K
R630
36K
AUX1
R647
100KB
R629
27K
R631
36K
AUX2
R648
20KB
MON
R632
27K
R634
36K
MON L
MON PAN
R646
50KB
R635
36K
MON R
R633
27K
AGND
REC MUTE6
REPRO6
R612
2k
R636
22
+12V
AGND
-12V
R637
22
AGND
-12V

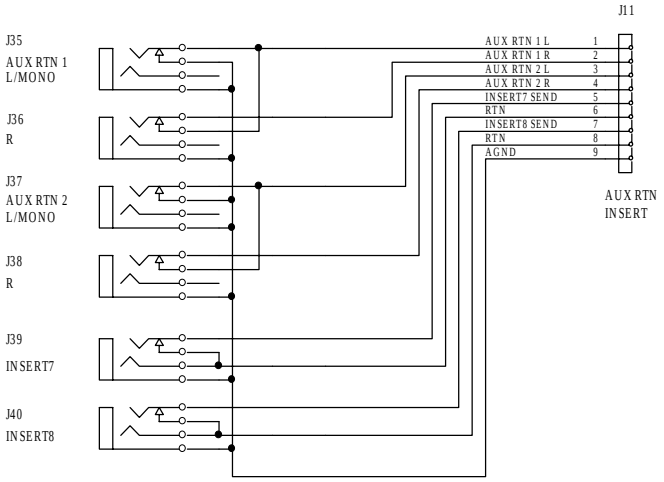
● MIXER A (5/6)

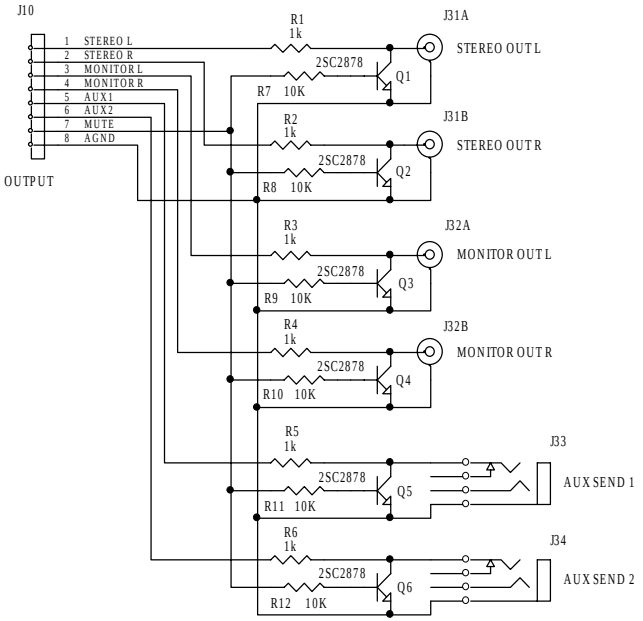

J701
INPUT7 UNBAL
INPUT7H
INPUT7C
GAIN
*40dB
*20dB
*0dB
S701B
S701A
R708 2K
R706 20K
R704 200K
R702 100k
R701 100k
R707 2K
R705 20K
R703 200K
C702 100P
C701 100P
C704 100/10
C703 100/10
C706 10P
R710 200K
+12V
C730 0.1
-12V
C731 0.1
C707 NON
U401A 2068
C708 47/10
R711 100
C705 10P
R709 200K
U710 DTC314
INPUTSEL
*INPUT
*OFF
*TAPE
S702A
S702B
C709 47/10
INPUTFADER
R740 50KA
C710 47/10
C711 100P
R713 20K
R714 10K
C712 100P
R715 10k
C732 0.1
C733 0.1
U402A 2068
MID GAIN
R716 10k
R741 10KB
R718 2K
MID FRQ
R742B 50KCC
R719 2K
C713 .022
R742A 50KCC
C714 .012
C715 100P
C716 100P
C734 0.1
C735 0.1
U703A 4558
R717 10k
R720 1.3K
R721 1.3K
C722 47/10
HI GAIN
R743 50KB
C717 .0068
C719 .015
C718 .0068
R722 9.1K
R744 50KB
R723 9.1K
LO GAIN
C720 22P
R724 NON
C721 22P
U703B 4558
R725 39K
R727 47K
STEREO L
PAN
R745 50KB
R728 47K
STEREO R
R726 39K
R730 47K
AUX1
AUX
R747 100KB
R729 39K
AUX2
R731 47K
INSERT7 SEND
INSERT7 RTN
REC MUTE7
REPRO7
R712 470
R748 20KB
MON
R732 39K
R734 47K
MON L
MON PAN
R746 50KB
R733 39K
R735 47K
MON R
AGND
R738 22
+12V
AGND
-12V
R739 22
AGND

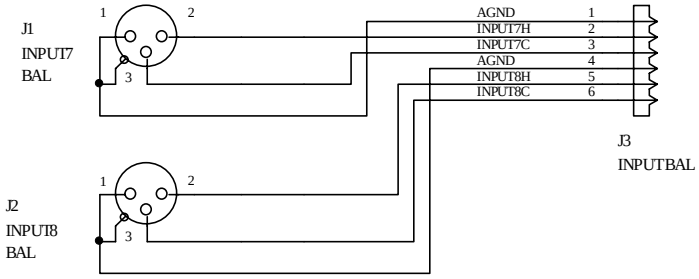
● MIXER A (6/6)


J801
INPUTB UNBAL
INPUTBH
INPUTBC
GAIN
*40dB
*20dB
*0dB
S801B
S801A
R808 2K
R806 20K
R804 200K
R802 100k
R801 100k
R807 2K
R805 20K
R803 200K
C802 100P
C801 100P
C804 100/10
C803 100/10
C806 10P
R810 200K
C807 NON
U401B 2068
C808 47/10
R811 100
C805 10P
R809 200K
U810 DTC314
INPUTSEL
*INPUT
*OFF
*TAPE
S802A
S802B
C809 47/10
R812 470
INPUTFADER
R840 50KA
C810 47/10
C811 100P
R813 20K
R814 10K
U402B 2068
C812 100P
R815 10k
MID GAIN
R816 10k
R841 10KB
C813 .022
R818 2K
MID FRQ
R842A 50KCC
R842B 50KCC
R819 2K
C814 .012
C815 100P
C816 100P
R817 10k
C834 0.1
+12V
C835 0.1
-12V
U803A 4558
HI GAIN
R843 50KB
R820 1.3K
R821 1.3K
C822 47/10
C817 .0068
C819 .015
C818 .0068
R822 9.1K
R844 50KB
R823 9.1K
LO GAIN
C820 22P
R824 NON
C821 22P
U803B 4558
R825 39K
R827 47K
PAN
R845 50KB
R828 47K
R826 39K
R830 47K
AUX
R847 100KB
R829 39K
R831 47K
STEREO L
STEREO R
AUX1
AUX2
R848 20KB
MON
R832 39K
R834 47K
MON PAN
R846 50KB
R833 39K
R835 47K
MON L
MON R
AGND
INSERTB SEND
INSERTB RTN
REC MUTER
REPRO8
R838 22
R839 22
+12V
AGND
-12V

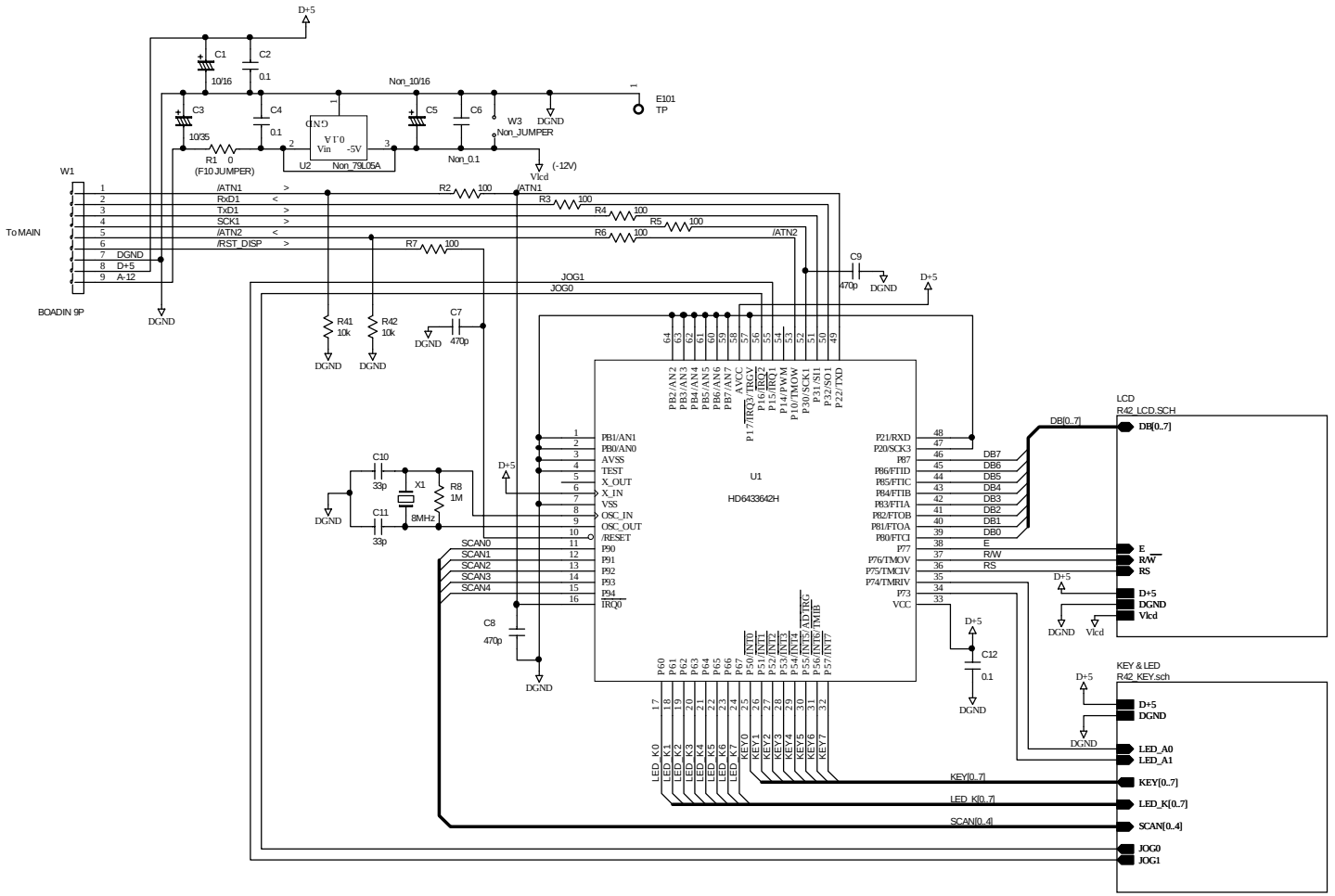
● ANALOG I/O & XLR



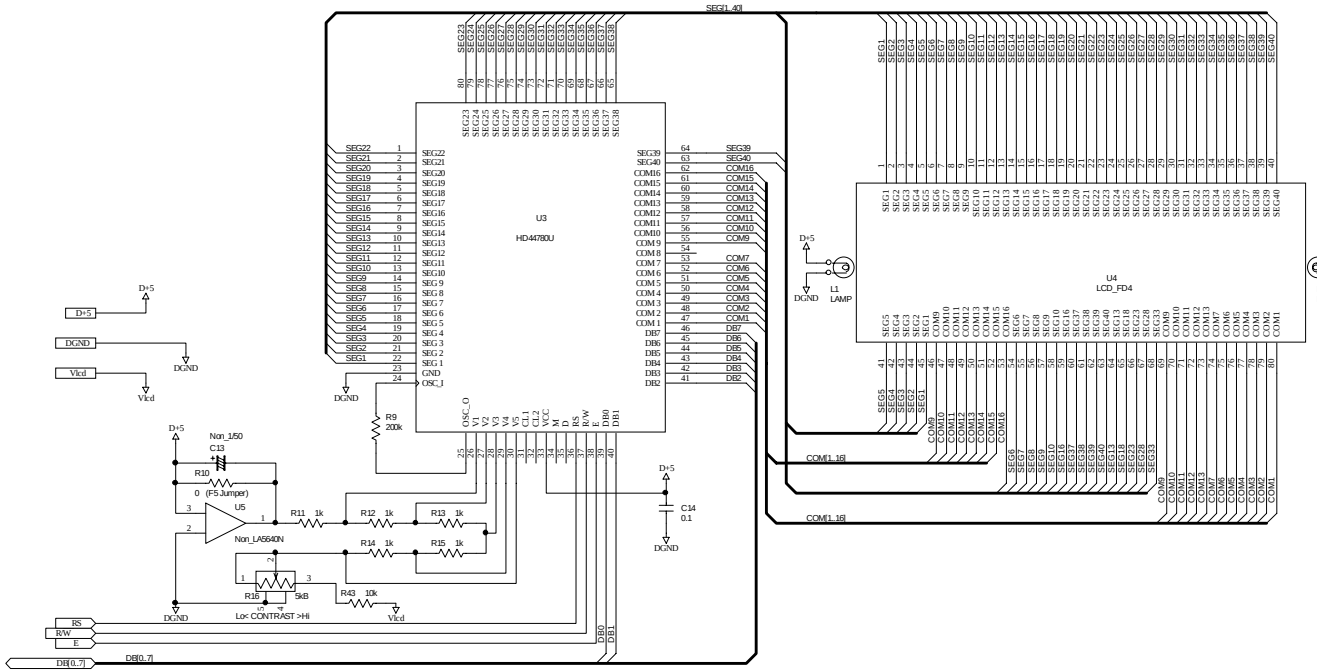




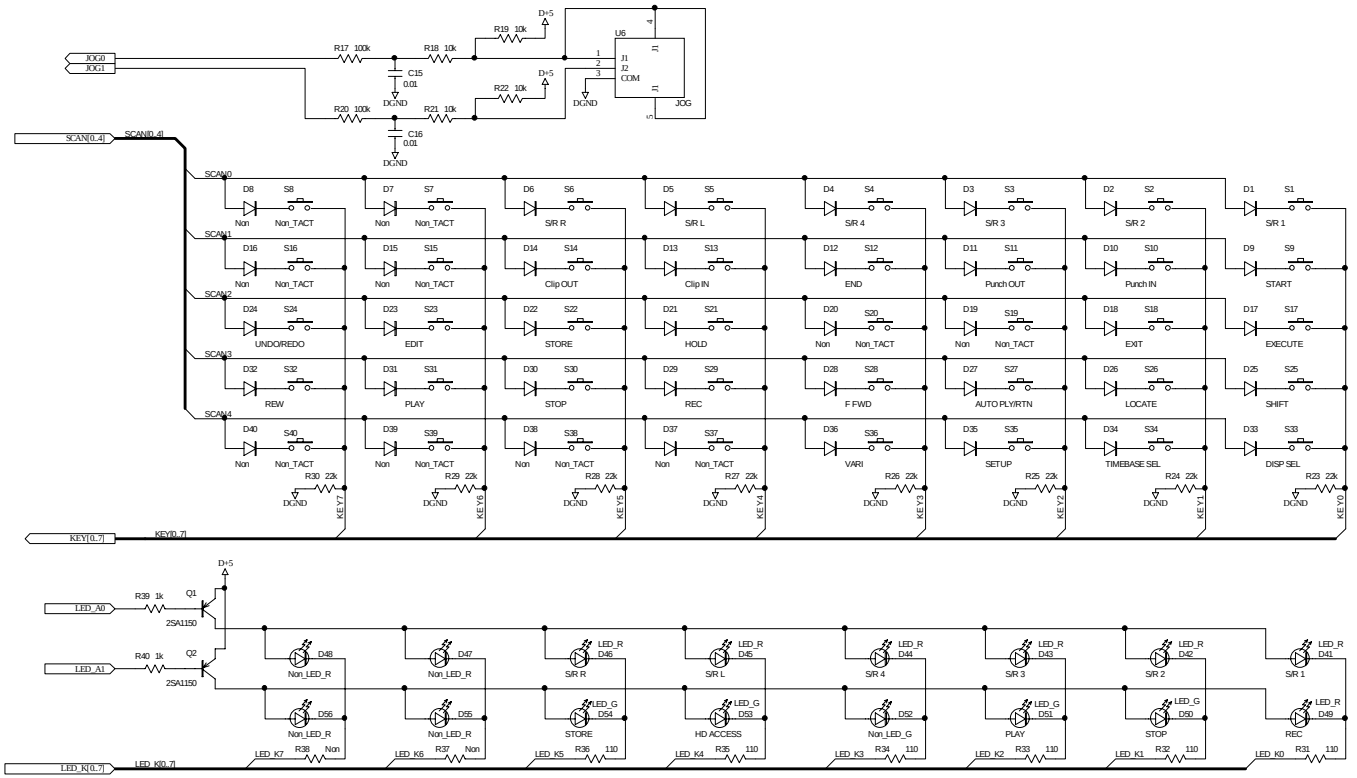
● DISPLAY, ROOT (1/3)

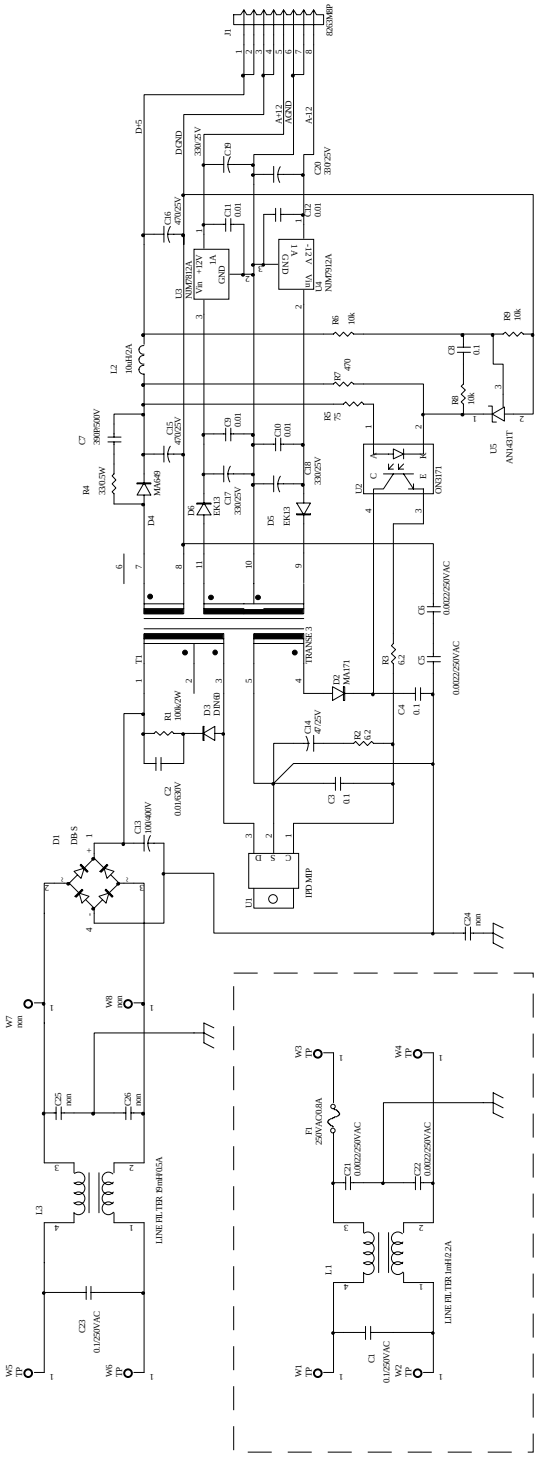


● DISPLAY, LCD (2/3)

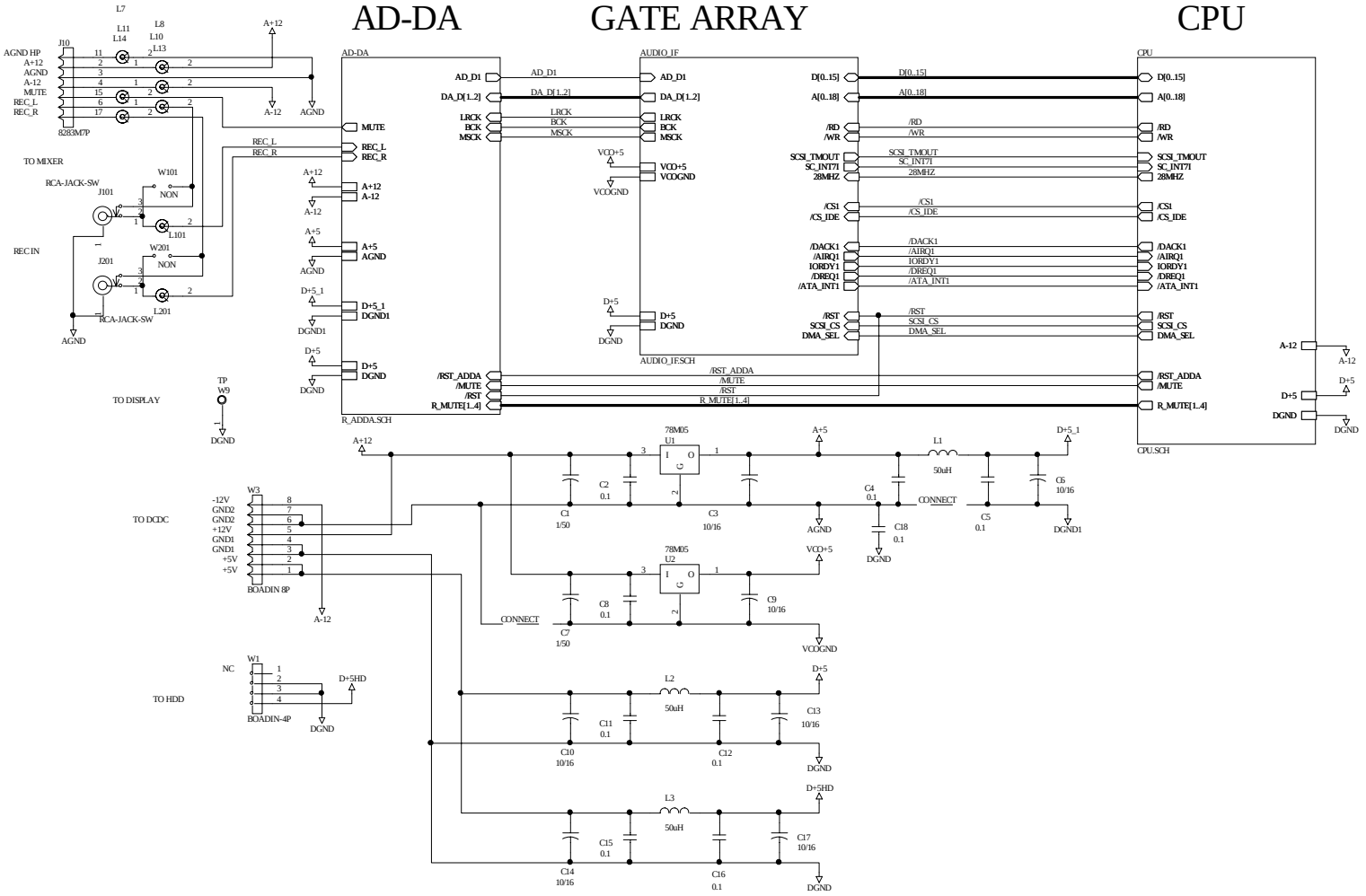


● DISPLAY, KEY & LED (3/3)

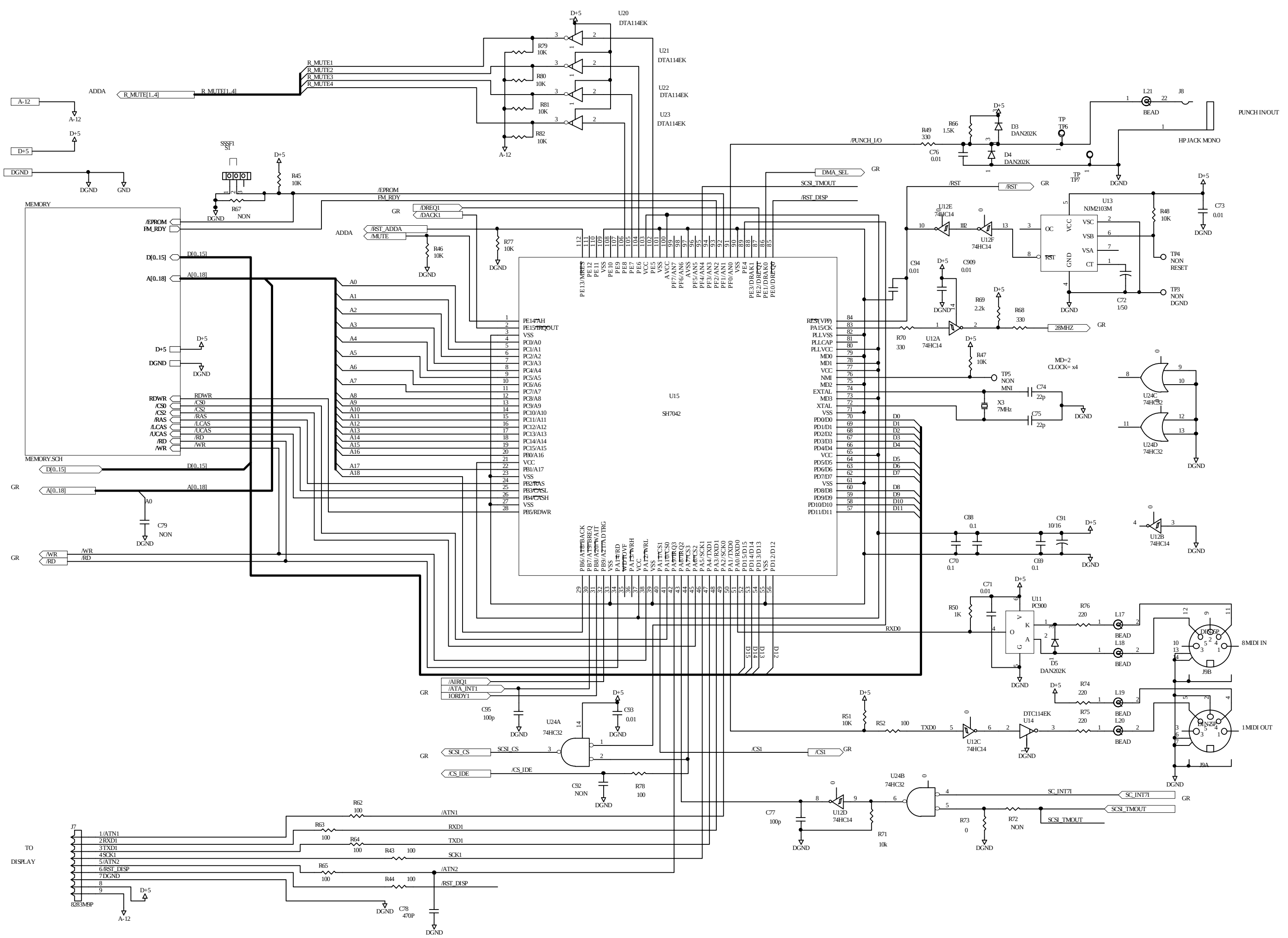




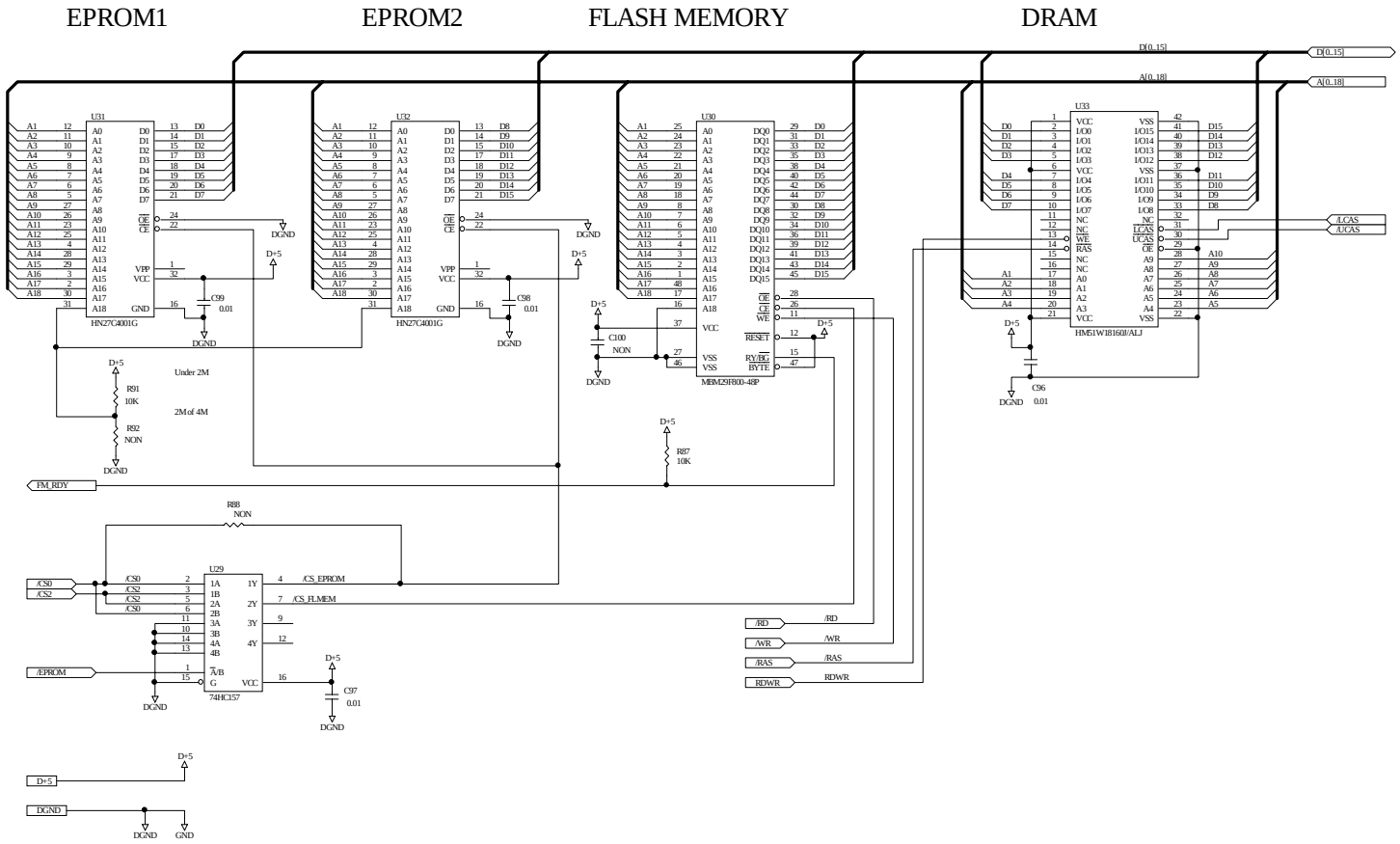
● MAIN, ROOT (1/9)


AD-DA
GATE ARRAY
CPU
AD-DA
AUDIO_IF
CPU
R_ADDA.SCH
AUDIO_IF.SCH
CPU.SCH
TO MIXER
TO DISPLAY
TO DCDC
TO HDD
RCA-JACK-SW
8283M7P
BOADIN 8P
BOADIN-4P
78M05
CONNECT
AGND
DGND
VCOGND
A+12
A-12
A+5
D+5
D+5_1
DGND1
D+5HD
MUTE
REC_L
REC_R
AD_D1
DA_D[1..2]
LRCK
BCK
MSCK
VCO+5
D[0..15]
A[0..18]
/RD
/WR
SCSI_TMOUT
SC_INT7I
28MHZ
/CS1
/CS_IDE
/DACK1
/AIRQ1
IORDY1
/DREQ1
/ATA_INT1
/RST
SCSI_CS
DMA_SEL
/RST_ADDA
/MUTE
R_MUTE[1..4]

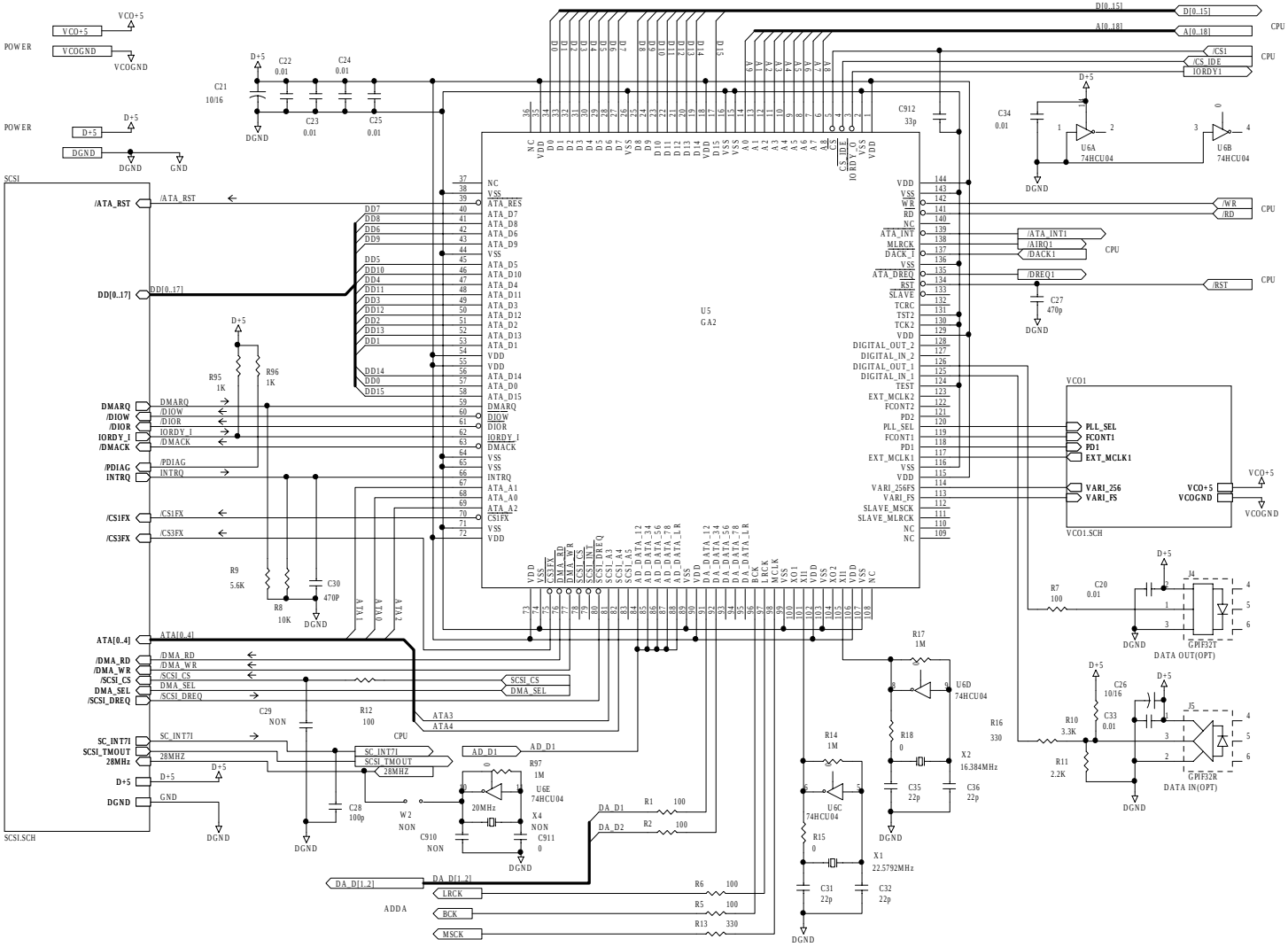
● MAIN, CPU (2/9)


MEMORY
MEMORY.SCH
U15
SH7042
PUNCH IN/OUT
HP JACK MONO
MIDI IN
MIDI OUT
TO
DISPLAY

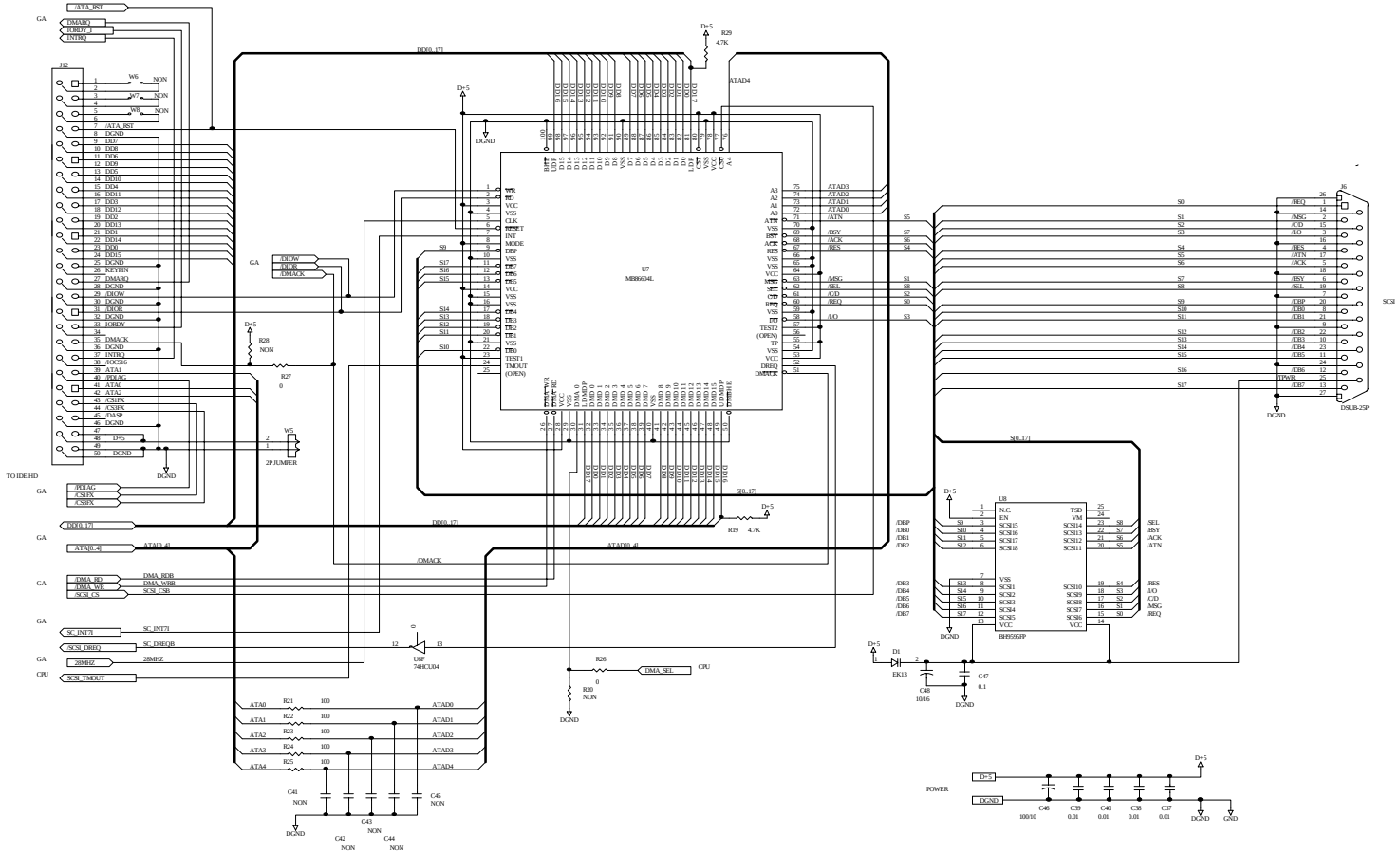
● MAIN, MEMORY (3/9)



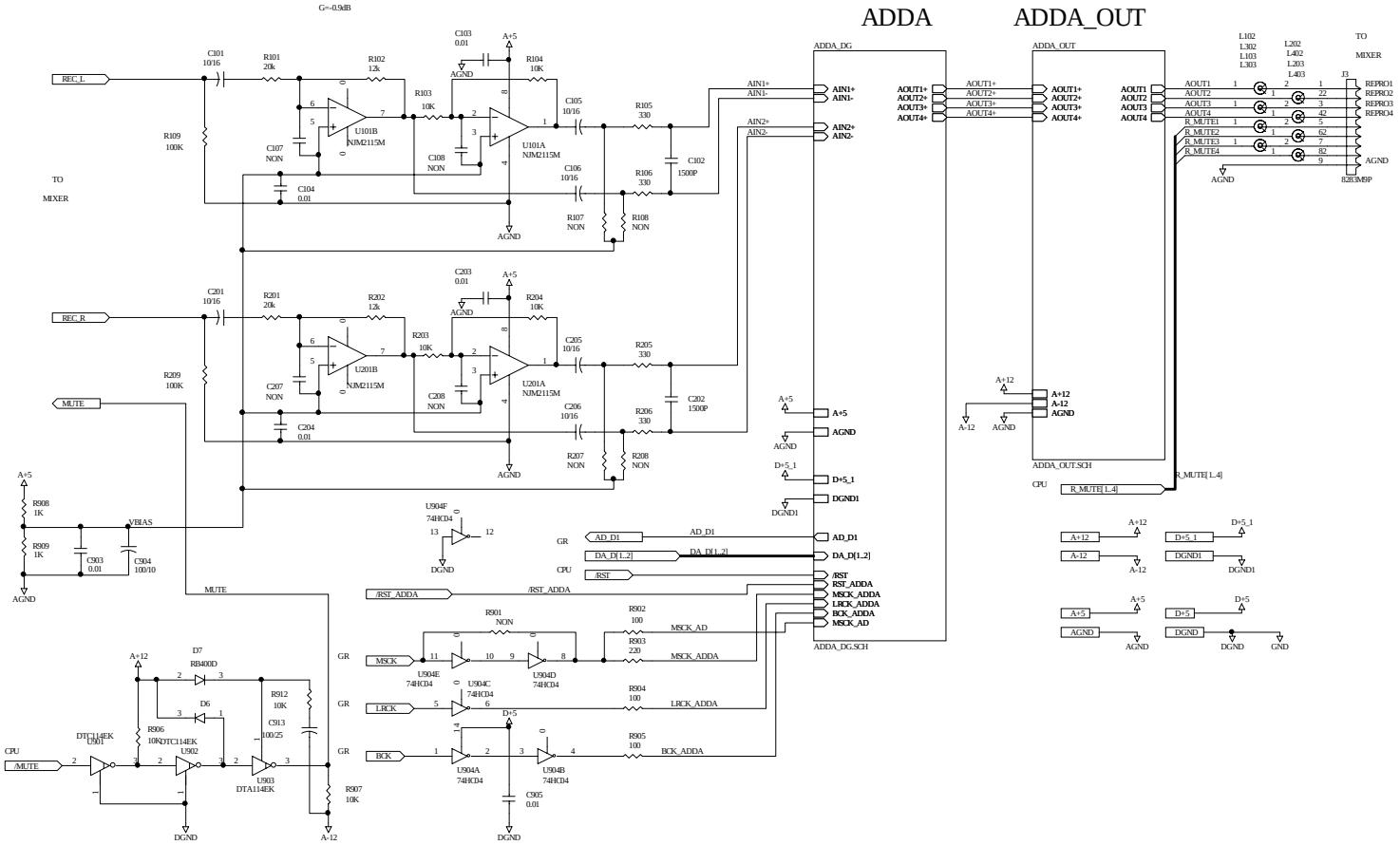
● MAIN, AUDIO IF (4/9)



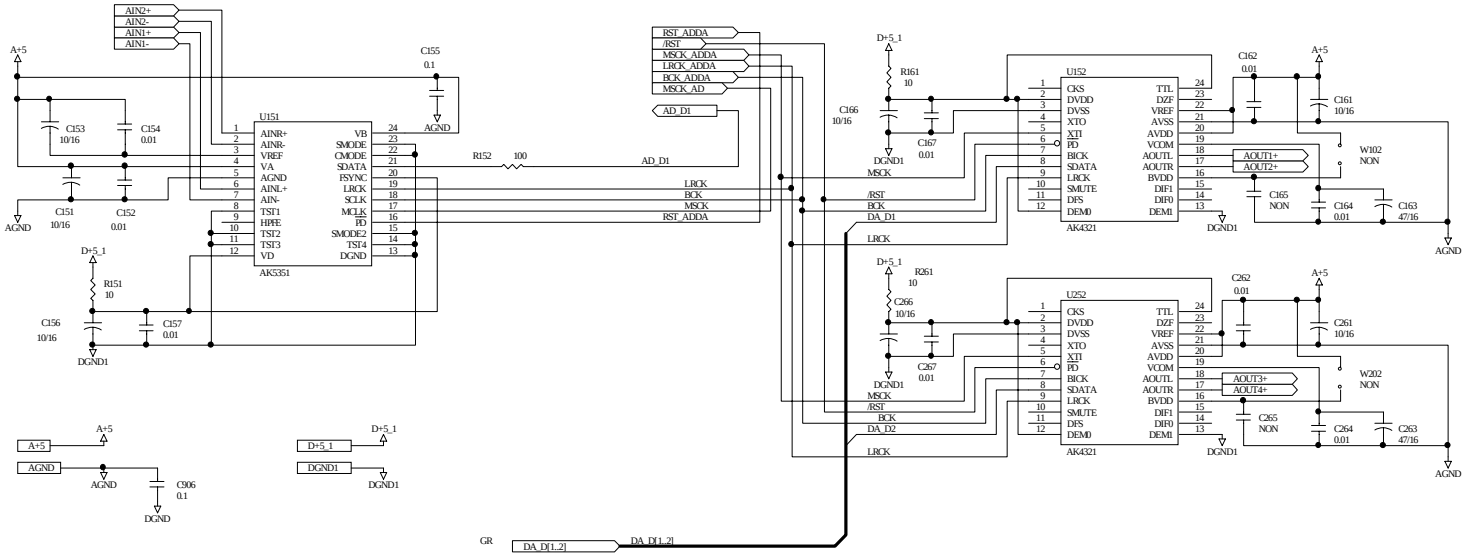
● MAIN, SCSI (5/9)



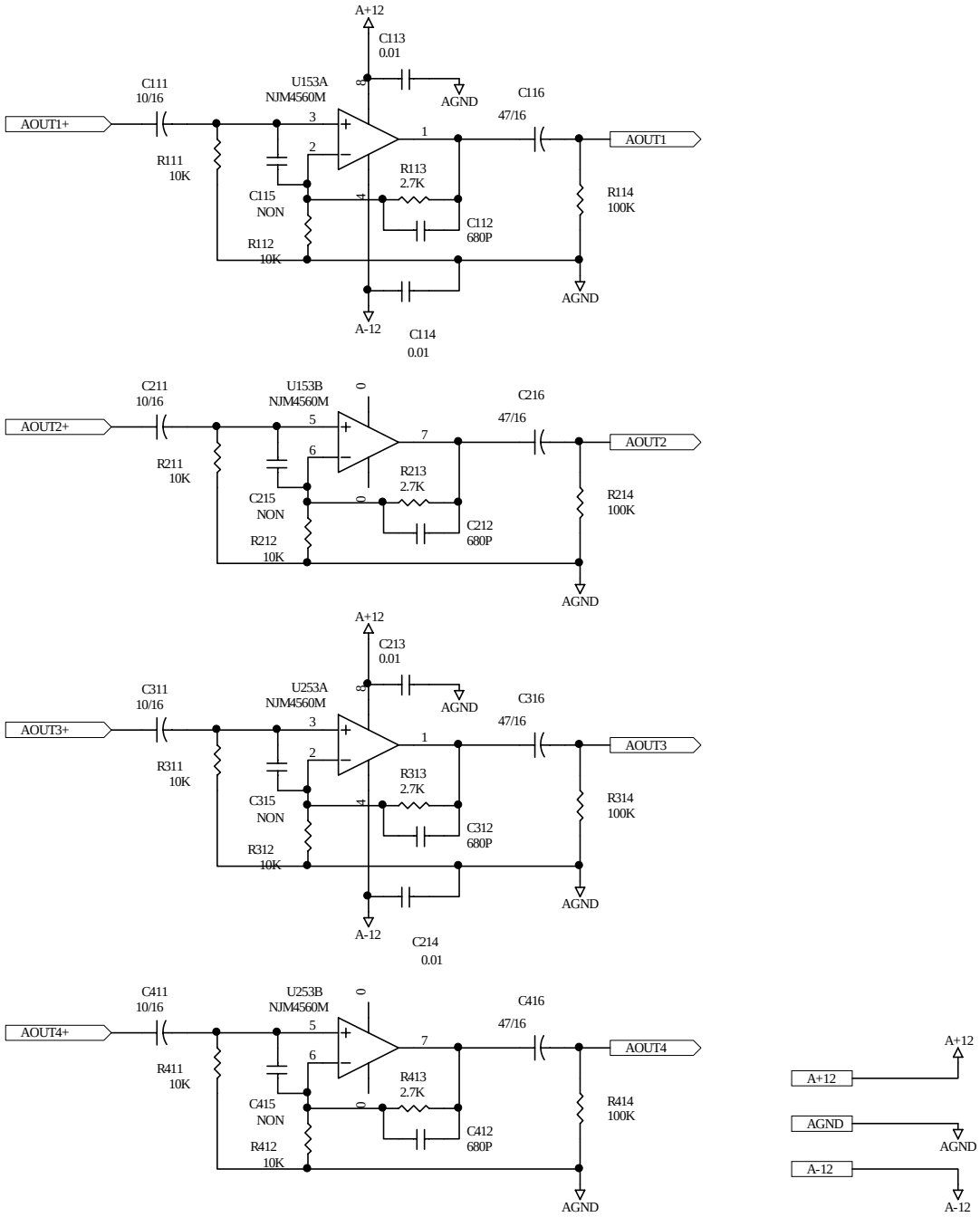
● MAIN, ADDA - ROOT (6/9)



● MAIN, ADDA - DG (7/9)

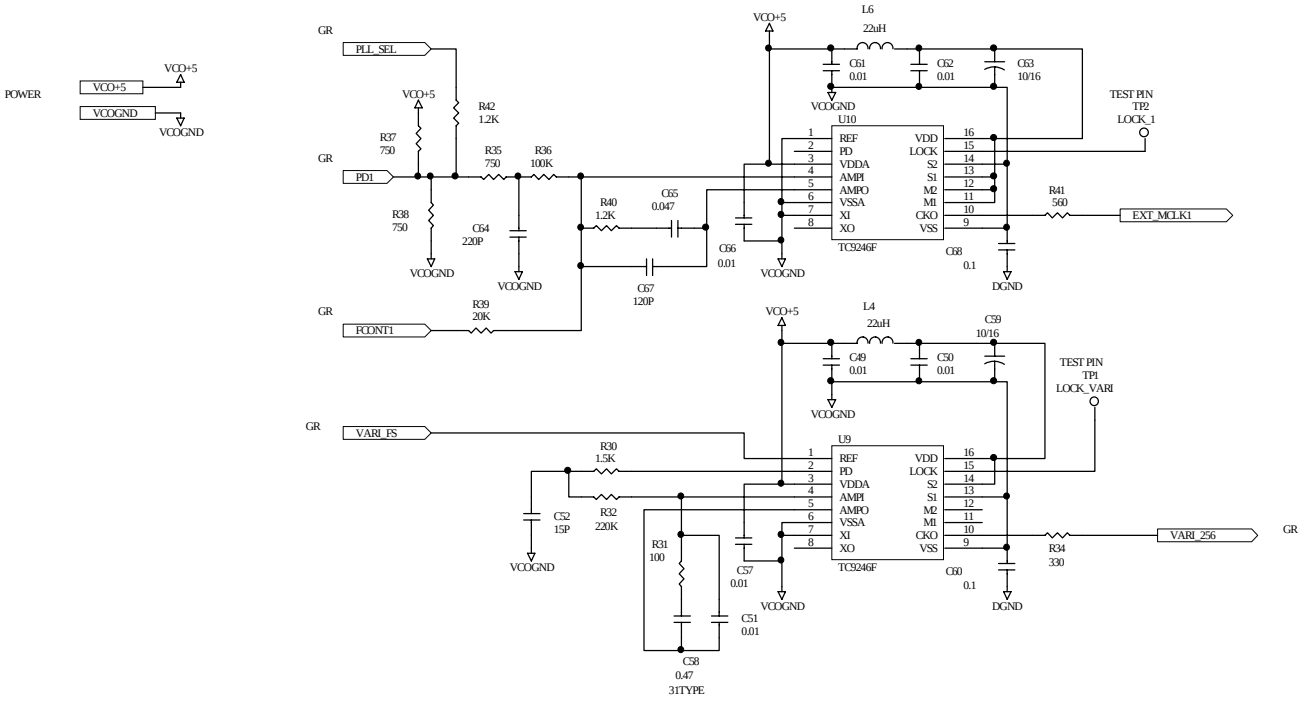


● MAIN, ADDA - OUT (8/9)



● MAIN, VCO (9/9)

VCO1



FOSTEX

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