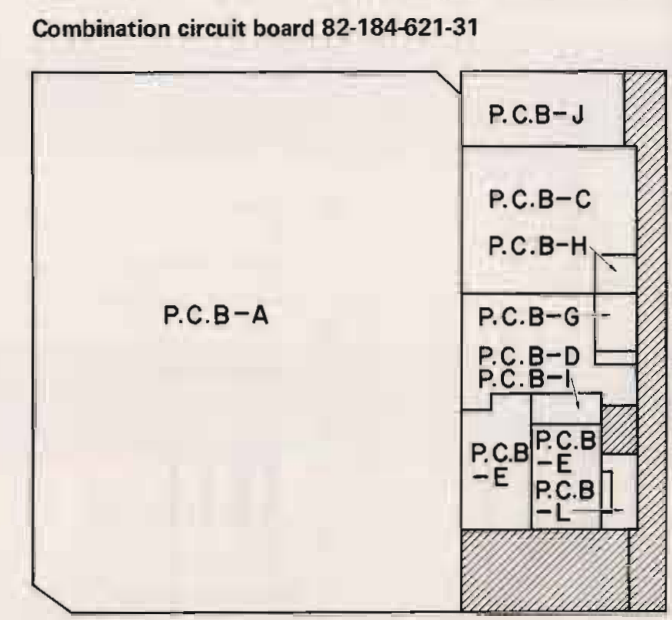


ELECTRICAL MAIN PARTS LIST

Table with columns: Symbol No., Part No., Description. Contains sections: MAIN CIRCUIT BOARD SECTION, DOLBY-NR CIRCUIT BOARD SECTION, KEY BOARD CIRCUIT BOARD SECTION, LED CIRCUIT BOARD SECTION, SWITCH CIRCUIT BOARD SECTION, VOLUME - 1 CIRCUIT BOARD SECTION, VOLUME - 2 CIRCUIT BOARD SECTION, TIMER CIRCUIT BOARD SECTION, HALL IC CIRCUIT BOARD SECTION, POWER CIRCUIT BOARD SECTION, LED MODULE CIRCUIT BOARD SECTION, RELAY CIRCUIT BOARD SECTION, MISCELLANEOUS.

Table with columns: Symbol No., Part No., Description. Contains parts for AC power cord (H, HU model only), AC power cord (E model only), AC power cord (K model only), AC power cord (G model only), Cord bushing (H, HU model only), Holder, AC power cord (E, K, G model only).

Safety component symbol. This symbol is given to important parts which serve to maintain the safety of the product, and which are made to conform to special safety specifications. Therefore, when replacing a component with this symbol, make absolutely sure that you use a designated part.



C-MOS IC handling precaution. The C-MOS IC's construction makes this part susceptible to damage by static electricity and so take sufficient care in regard to following articles. 1. Need to be put on conductive sheet... 2. To use solder iron less than 40W... 3. Do not perform a conductivity test... 4. The ICs on the electrical parts...

Circuit description

1. Outline

This is a controller with the phono-synchrone function added to the mechalogue controller (with single capstan, CUE/REV functions) used in the deck. The program size is 1k byte.

2. Block diagram of controller and peripheral circuits

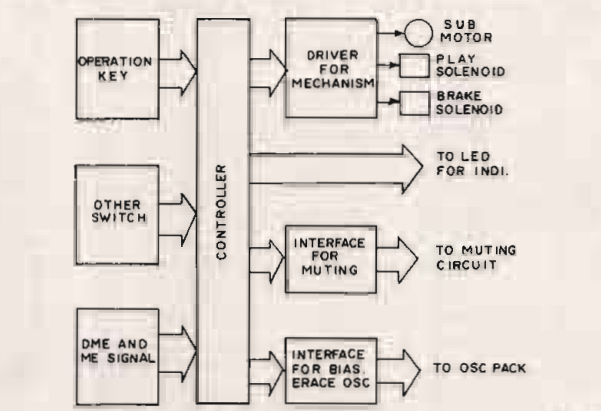


Fig. 1

3. Mecha-controller specifications

3-1. General specifications

- 3-1-1. It is same as the general controller for STOP, PLAY, REV, FF, REC, REC/PLAY, PLAY PAUSE, REC/PLAY-PAUSE.
3-1-2. CUE, REV: This is possible by double-pressing the PLAY key and FF (or REV) key.
3-1-3. ONE-REC: By pressing only the REC key in the PAUSE mode, the unit enters the REC/PLAY-PAUSE mode.
3-1-4. TIMER/REC-PLAY: Same as specified in the general specifications.
3-1-5. TIMER-PLAY: Same as specified in the general specifications.
3-1-6. AUTO-REPEAT: Same as specified in the general specifications.
3-1-7. MEMORY-STOP: Same as specified in the general specifications.
3-1-8. MEMORY-PLAY: Same as specified in the general specifications.
3-1-9. MS (music sensor): By entering the CUE or REV mode with the MS switch set to ON, only the STOP key input signal or MS signal is accepted.

3-2. Additional functions

- 3-2-1. REC-MUTE-TIMER (1): When the REC-MUTE key is pressed and released for use of MS, the unit enters the REC/PLAY-PAUSE mode after 4 sec.
3-2-2. REC-MUTE-TIMER (2): Hold the key depressed for 4 sec or more to set the unit in the no-signal mode for 4 sec or more.
3-2-3. PHONE-SYNC: When the PHONO switch is set to ON and the arm lifts in the REC/PLAY mode, the unit enters the REC/PLAY-PAUSE mode.

4. Terminal connection diagram (Top View)



Fig. 2

*Direction of the arrow shows the signal flow direction.

5. Terminal description

Table with columns: Pin No., Symbol, Description. Lists pins 1 through 35 with their respective functions and control levels (e.g., ON, LOW, HIGH).

Table with columns: Pin No., Symbol, Description. Lists pins 36 through 37 with their respective functions.

6. Basic wiring between the microprocessor and switches

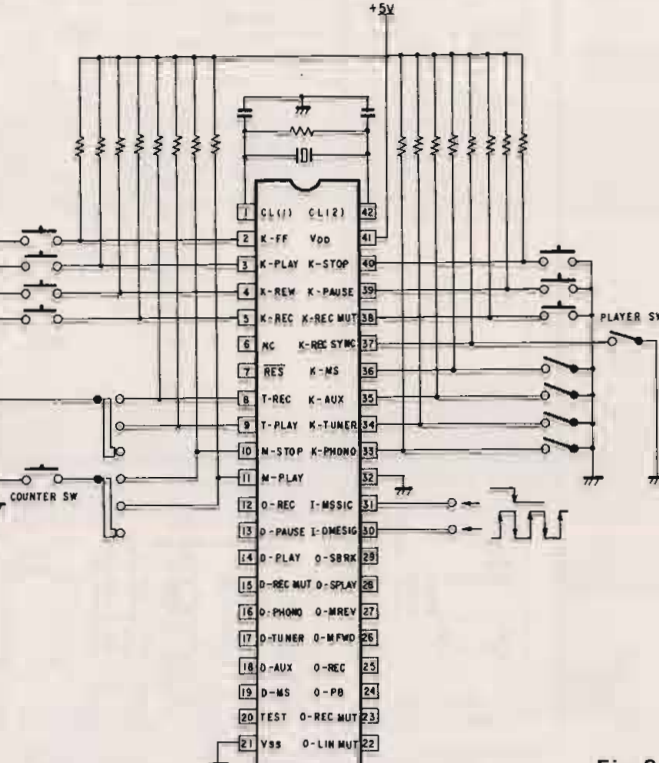


Fig. 3

Note: Terminal functions of M STOP and M PLAY are not used in this unit.

7. Microprocessor output and peripheral circuits

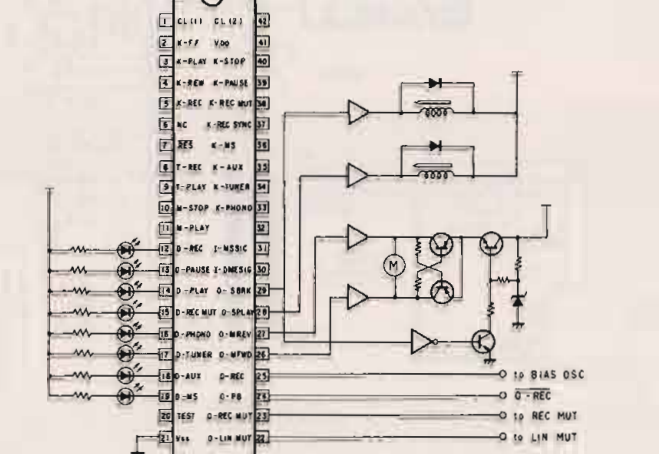
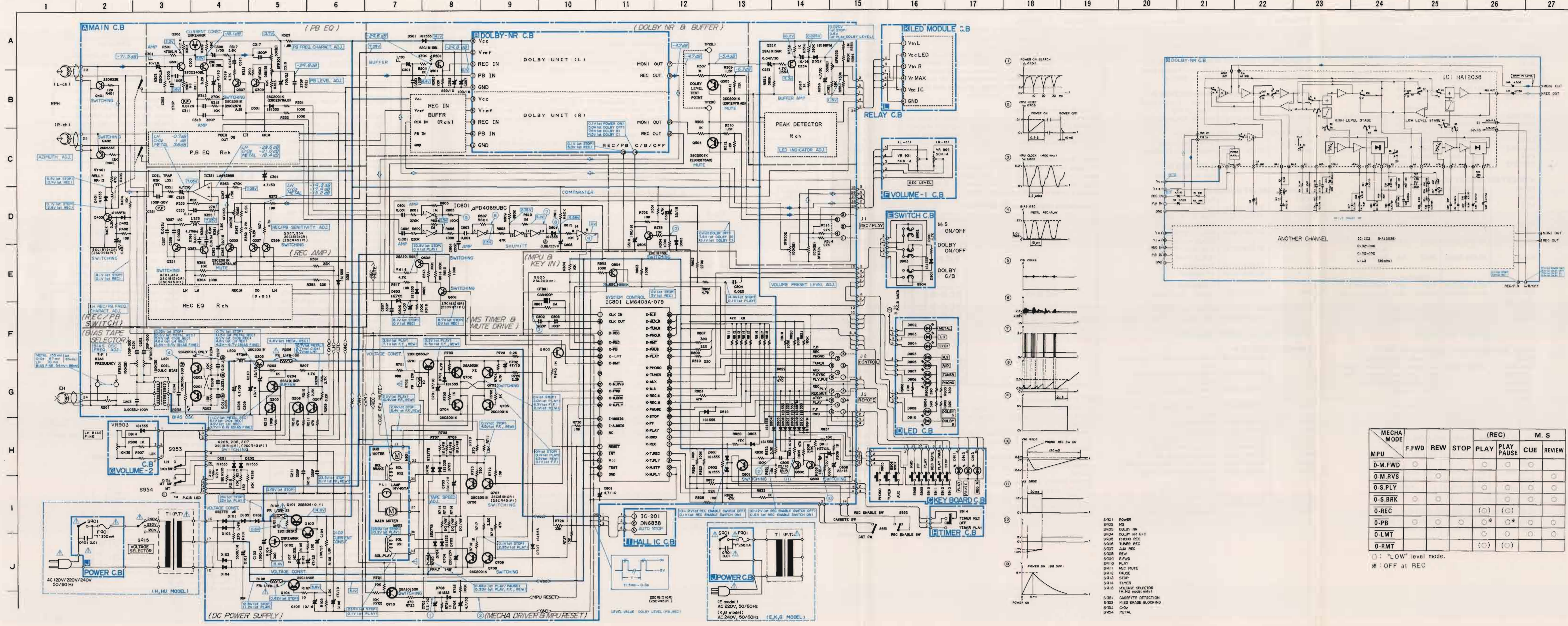
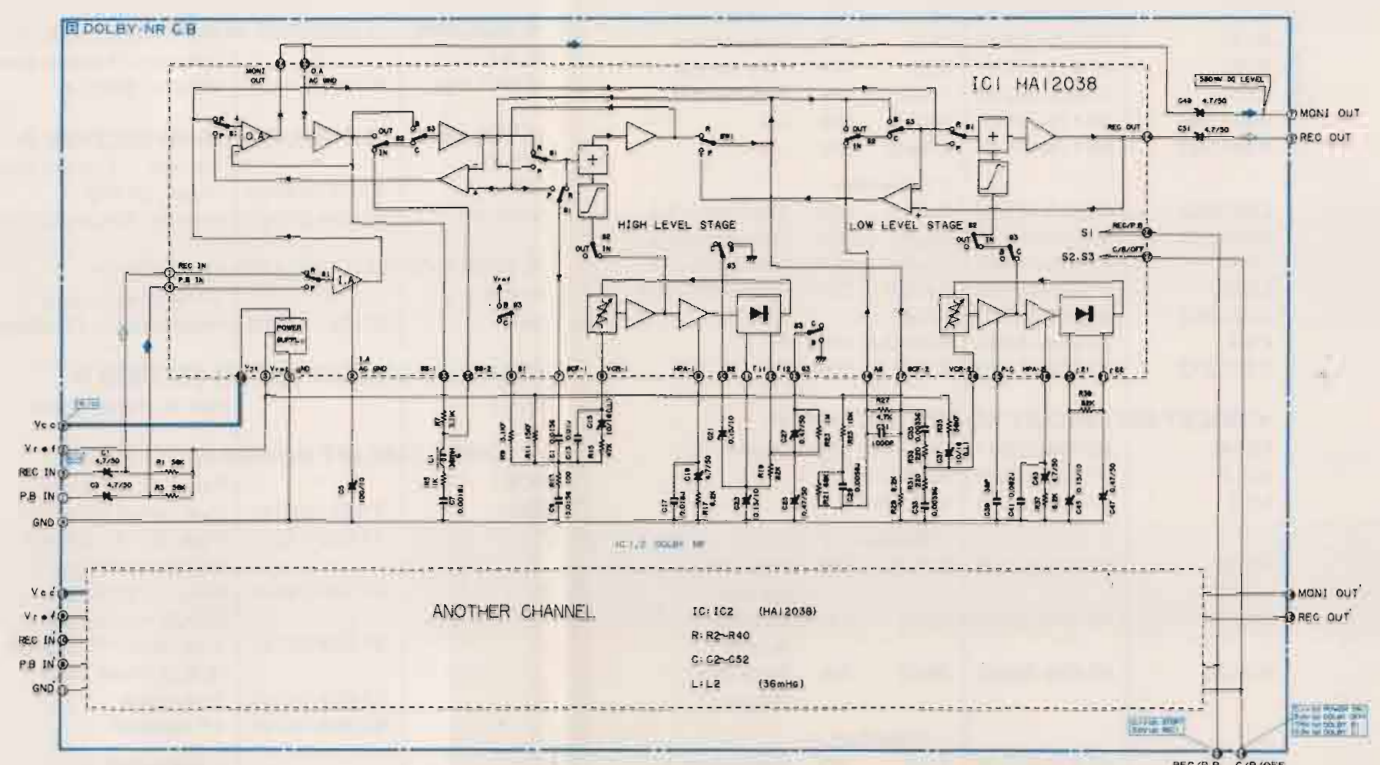
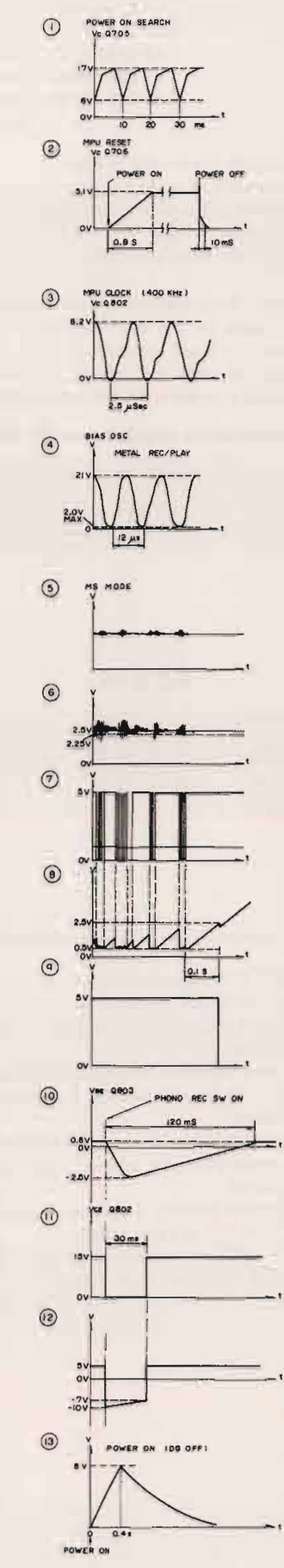


Fig. 4

SCHEMATIC DIAGRAM

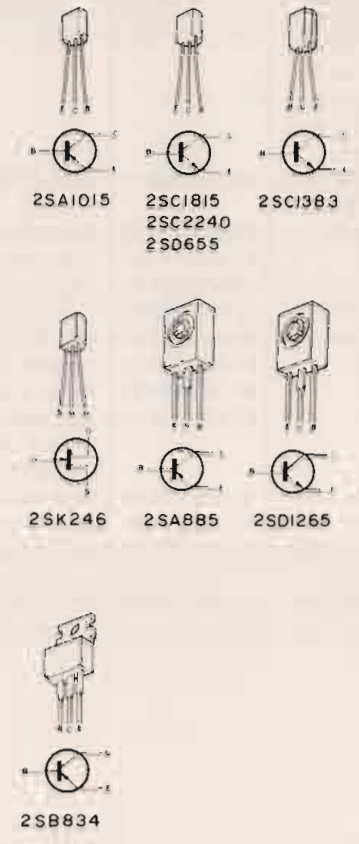


- NOTES:**
- 1) B (+) power supply
 - 2) Signal path
 - 3) Rec path
 - 4) The voltage is the reference value measured with a tester (20 k-ohms/V DC) when there are no signals. But () is with recording.
 - 5) An asterisk (*) indicates that the value was measured with a vacuum-tube voltmeter during recording.
 - 6) Resistors with no designation have a rated power of 1/8W and a tolerance of ±5%.
 - 7) Capacitors with no designation have a dielectric strength of less than 50WV.
 - 8) The only capacitor tolerance indicated are ±5% (J) and ±10% (K).
 - 9) Ceramic capacitor symbols:
 - SL: For temperature compensation (SL)
 - YY: High dielectric constant system (YY)
 - YW, YP, YZ: High dielectric constant system (YW, YP, YZ)
 - 10) Explanation of symbols:
 - M: Mylar capacitor
 - A: Aluminum solid capacitor
 - PP: Polypropylene film capacitor
 - BP: Bi-polarized capacitor
 - LL: Low-leakage capacitor
 - F: Fuse resistor
 - NF: Nonflammable resistor
 - LN: Low noise resistor
 - 11) Safety component symbol: This symbol is given to important parts which serve to maintain the safety of the product, and which are made to conform to special safety specifications. Therefore, when replacing a component with this symbol, make absolutely sure that you use a designated part.



MECHA MODE	(REC)				M. S	
	F.FWD	REW	STOP	PLAY	PLAY PAUSE	CUE REVIEW
O-M.FWD	○					
O-M.RVS						
O-S.PLY						
O-S.BRK						
O-REC				○	○	
O-PB				○*	○*	
O-LMT				○	○	
O-RMT				○	○	

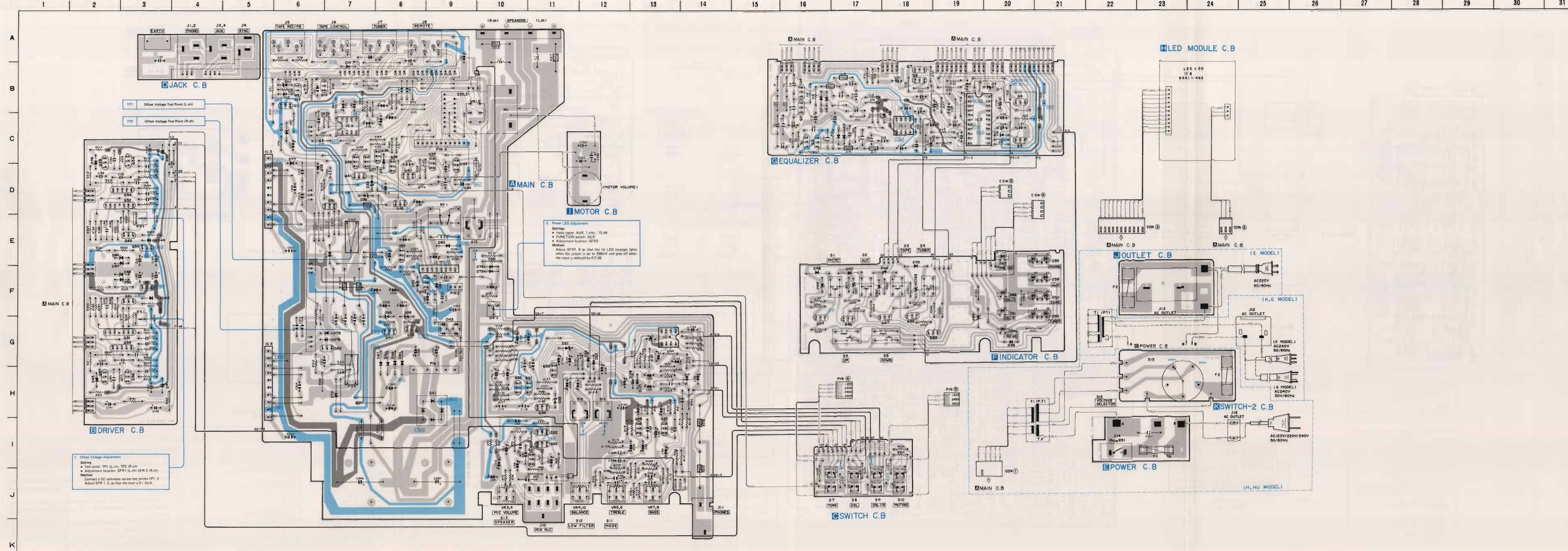
○: "LOW" level mode.
#: OFF at REC



- S901 POWER
- S902 MS
- S903 DOLBY NR
- S904 DOLBY NR B/C
- S905 PHONO REC
- S906 TUNER REC
- S907 AUX REC
- S908 REW
- S909 F.FWD
- S910 PLAY
- S911 REC MUTE
- S912 PAUSE
- S913 STOP
- S914 TIMER
- S915 VOLTAGE SELECTOR (IN HQ MODEL ONLY)
- S951 CASSETTE DETECTION
- S952 MISS ERASE BLOCKING
- S953 CDD
- S954 METAL

WIRING

NOTES (1) ■ B(+) Pattern ■ B (-) Pattern ■ Others pattern
 (2) The voltage is the reference value measured with a tester (20 K ohms/V DC) when there are no signals.



1. Offset Voltage Adjustment
 Setting
 • Test point: TP1 (L ch) TP2 (R ch)
 • Adjustment location: SFR1 (L ch) SFR2 (R ch)
 Method
 Connect a DC voltmeter across test points TP1, 2. Adjust SFR 1, 2, so that the level is 0.5mV.

2. Power LED Adjustment
 Settings
 • Input signal: AUX, 1 kHz, 10 dB
 • FUNCTION switch: AUX
 • Adjustment location: SFR3
 Method
 Adjust SFR3 so that the 1st LED (normal) lights when the output is set to 330mV and goes off when the input is reduced by 0.2 dB.

(H, HU MODEL)

(K, G MODEL)

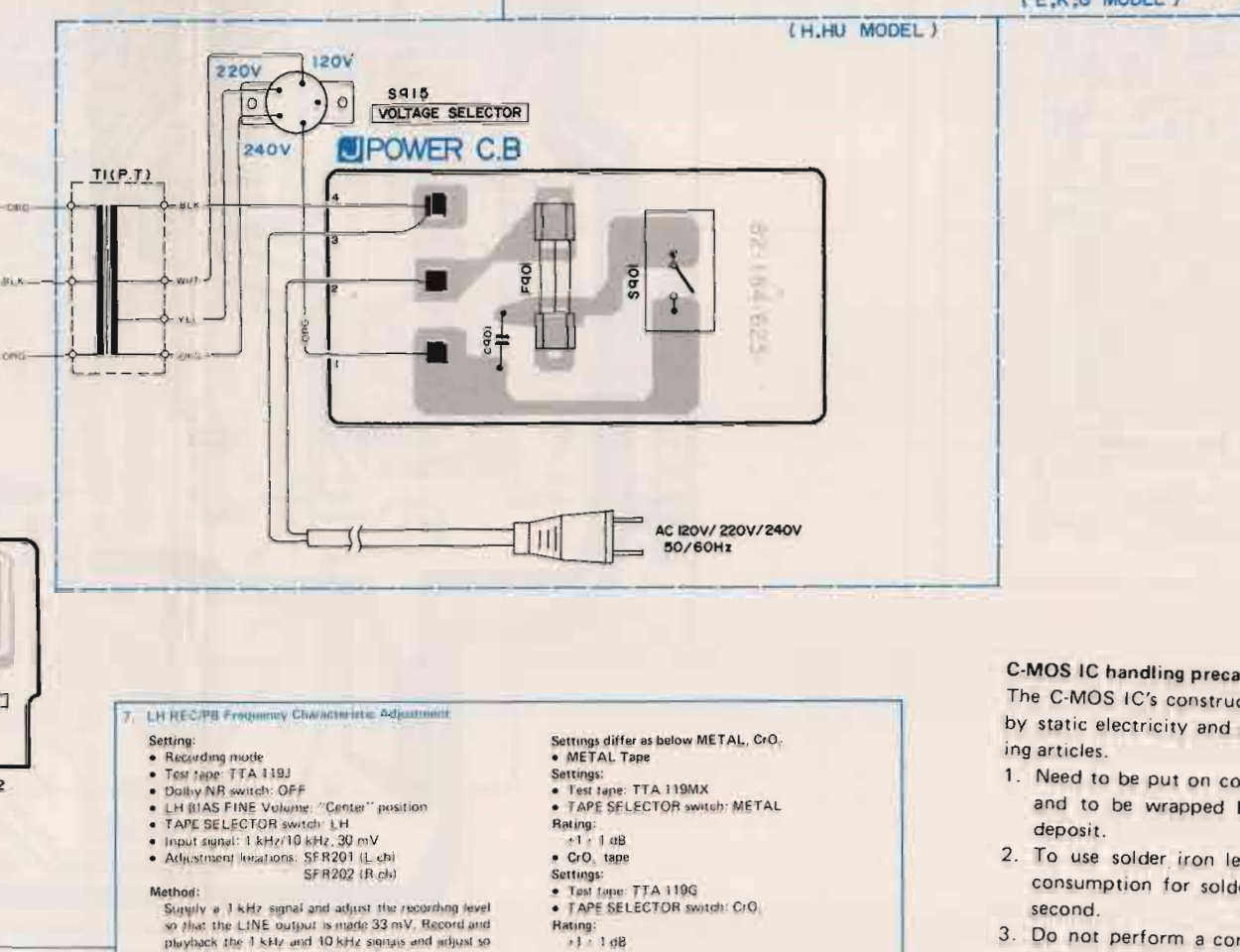
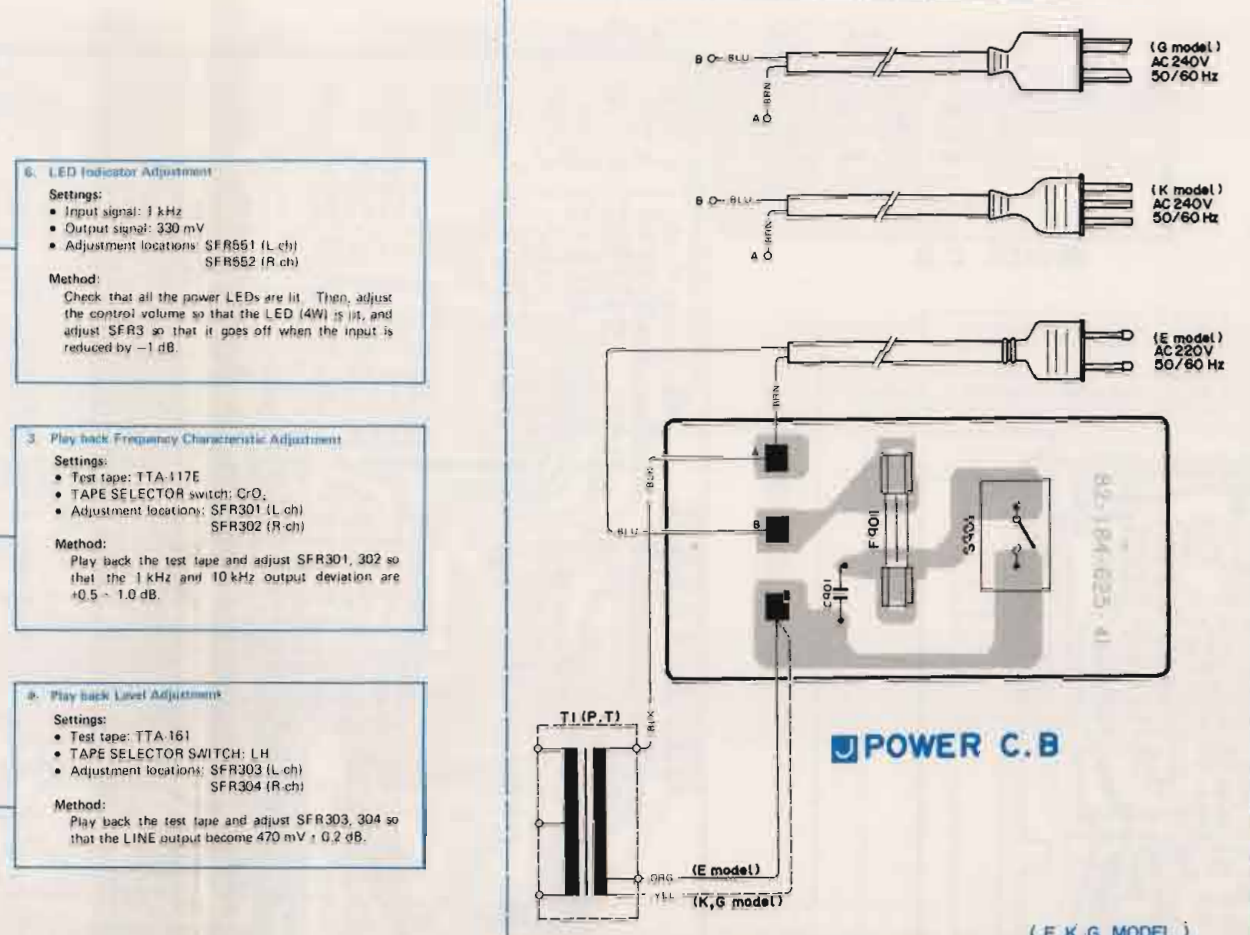
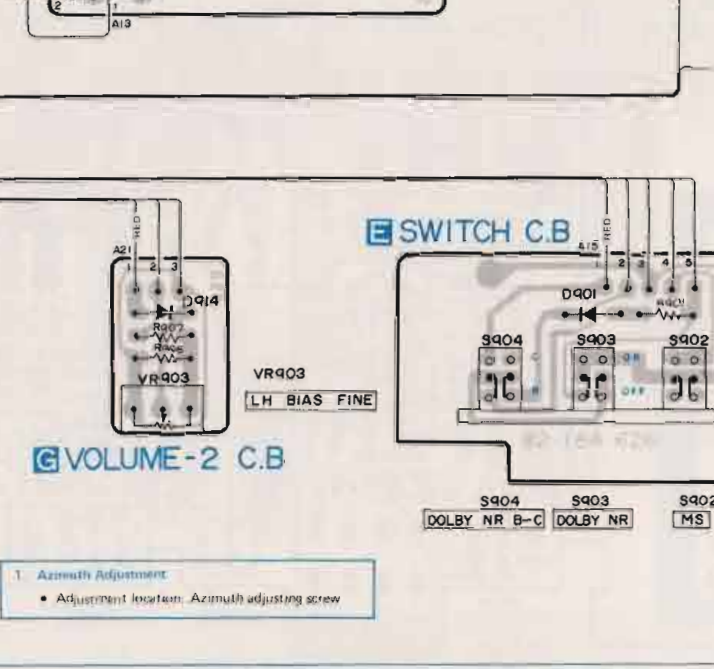
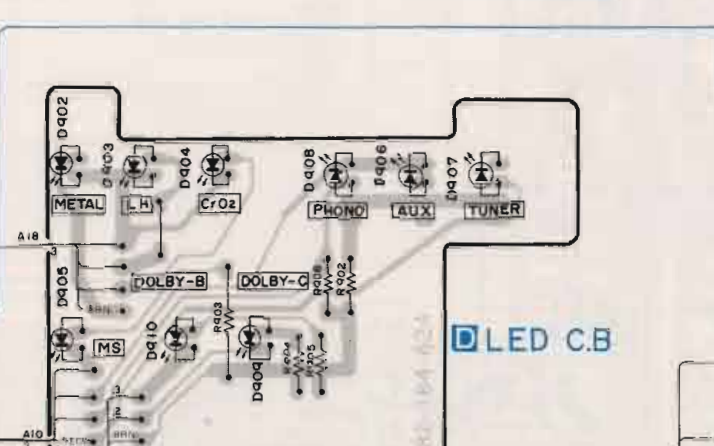
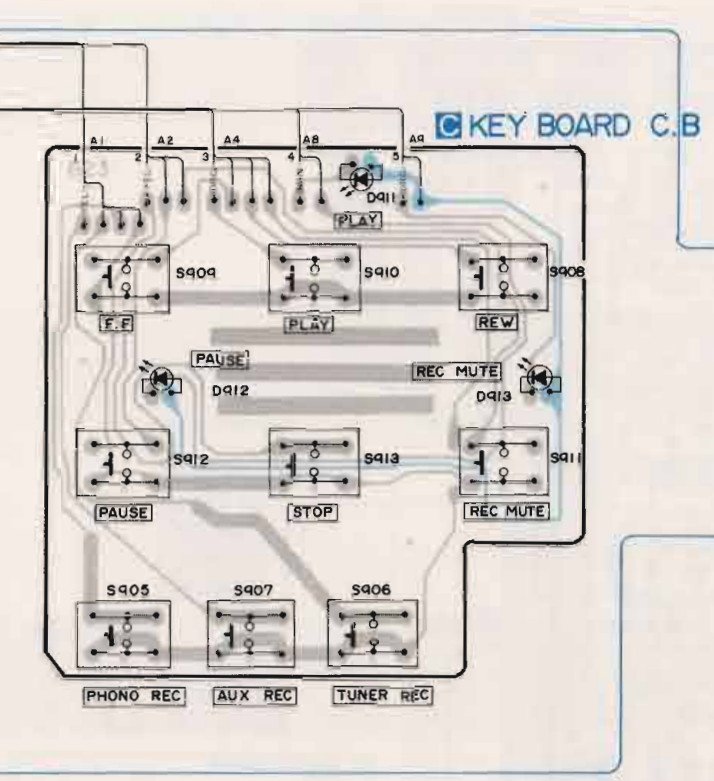
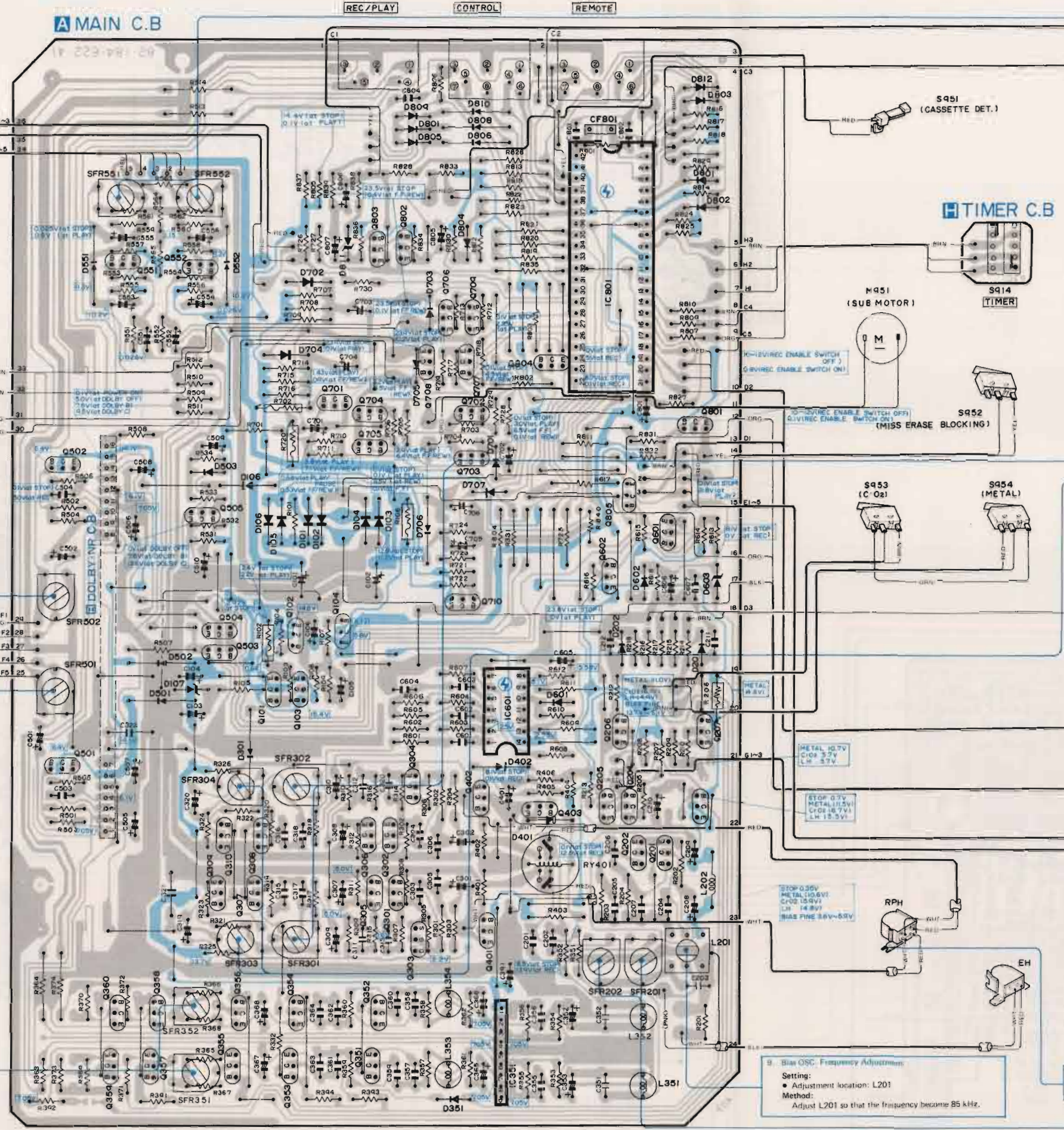
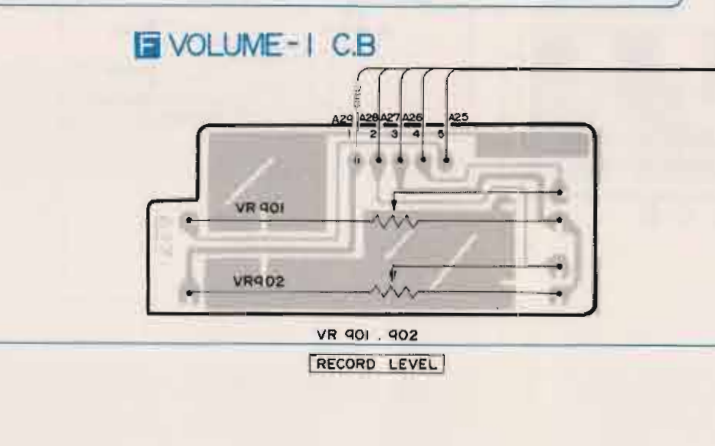
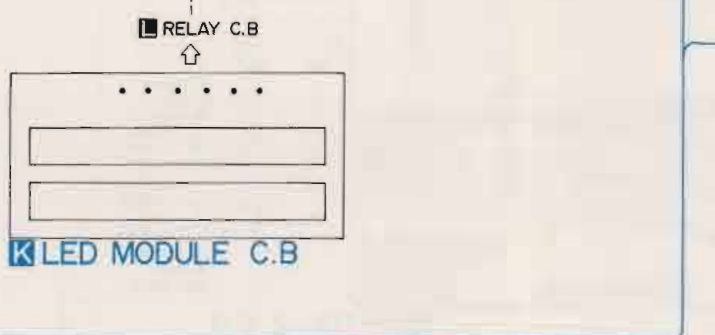
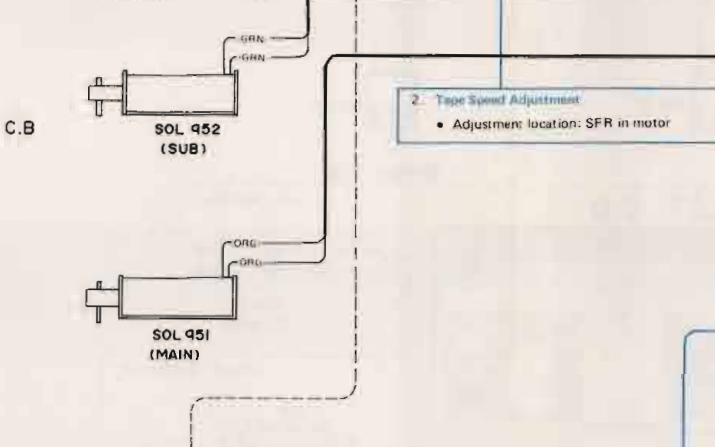
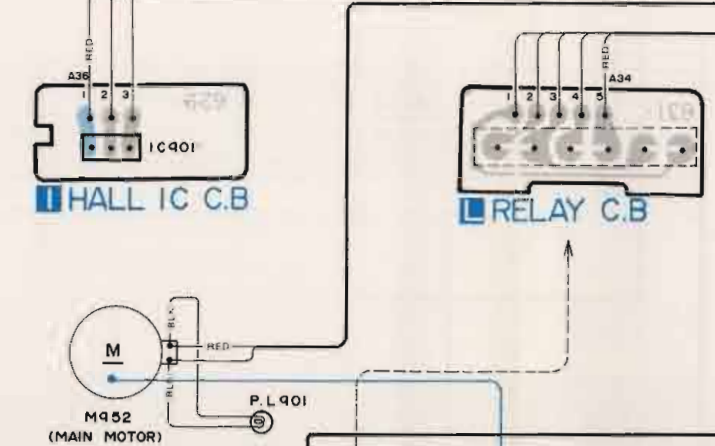
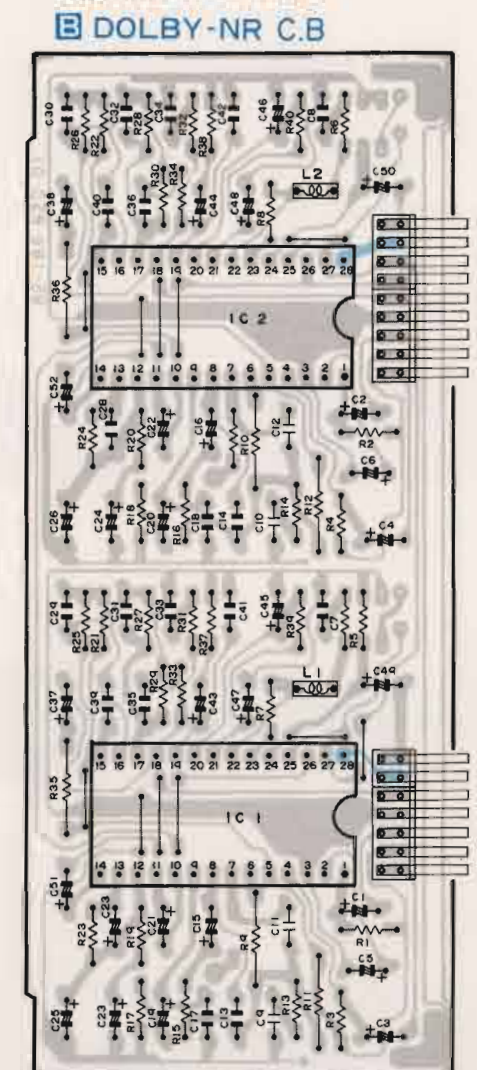
(E MODEL)

WIRING

1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31

A B C D E F G H I J

NOTES (1) B(+) Pattern Others pattern
 (2) The voltage is the reference value measured with a tester (20 K ohms/V DC) when there are no signals. An asterisk (*) indicates that the value was measured with a vacuum-tube voltmeter during recording.



5. Volume Preset Level Adjustment
 Settings:
 • REC Volume: "Center" position
 • Input signal: 10.6 dB, 1 kHz
 • Adjustment locations: SFR501 (L ch), SFR502 (R ch)
 Method:
 Adjust SFR501, 502 so that the LINE output become 470 mV.

7. REC/PH Sensitivity Adjustment
 • LH tape
 Settings:
 • Recording mode
 • Test tape: TTA 119J
 • Input signal: 1 kHz
 • Output level: 33 mV
 • TAPE SELECTOR switch: LH
 • Adjustment locations: SFR351 (L ch), SFR352 (R ch)
 Method:
 Supply a 1 kHz input signal and adjust SFR351, 352 so that the LINE output become 33 mV. Record and playback the signal and adjust so that the output become 33 mV.
 Settings differ as below METAL, CrO₂, METAL Tape
 Settings:
 • Test tape: TTA 119MX
 • Tape selector: METAL
 • CrO₂ tape
 Settings:
 • Test tape: TTA 119G
 • Tape selector: CrO₂

2. Tape Speed Adjustment
 • Adjustment location: SFR in motor

8. Bias OSC. Frequency Adjustment
 Setting:
 • Adjustment location: L201
 Method:
 Adjust L201 so that the frequency become 85 kHz.

1. Azimuth Adjustment
 • Adjustment location: Azimuth adjusting screw

6. LED Indicator Adjustment
 Settings:
 • Input signal: 1 kHz
 • Output signal: 330 mV
 • Adjustment locations: SFR551 (L ch), SFR552 (R ch)
 Method:
 Check that all the power LEDs are lit. Then, adjust the control volume so that the LED (4W) is lit, and adjust SFR3 so that it goes off when the input is reduced by -1 dB.

3. Playback Frequency Characteristic Adjustment
 Settings:
 • Test tape: TTA 117E
 • TAPE SELECTOR switch: CrO₂
 • Adjustment locations: SFR301 (L ch), SFR302 (R ch)
 Method:
 Playback the test tape and adjust SFR301, 302 so that the 1 kHz and 10 kHz output deviation are ±0.5 - 1.0 dB.

4. Playback Level Adjustment
 Settings:
 • Test tape: TTA 161
 • TAPE SELECTOR switch: LH
 • Adjustment locations: SFR303 (L ch), SFR304 (R ch)
 Method:
 Playback the test tape and adjust SFR303, 304 so that the LINE output become 470 mV ± 0.2 dB.

7. LH REC/PH Frequency Characteristic Adjustment
 Setting:
 • Recording mode
 • Test tape: TTA 119J
 • Dolby NR switch: OFF
 • LH BIAS FINE Volume: "Center" position
 • TAPE SELECTOR switch: LH
 • Input signal: 1 kHz/10 kHz, 30 mV
 • Adjustment locations: SFR201 (L ch), SFR202 (R ch)
 Method:
 Supply a 1 kHz signal and adjust the recording level so that the LINE output is about 33 mV. Record and playback the 1 kHz and 10 kHz signals and adjust so that the 1 kHz outputs are set to 0 - ±0.5 dB.

Settings differ as below METAL, CrO₂, METAL Tape
 Settings:
 • Test tape: TTA 119MX
 • TAPE SELECTOR switch: METAL
 • CrO₂ tape
 Settings:
 • Test tape: TTA 119G
 • TAPE SELECTOR switch: CrO₂
 Method:
 ±1 - 1 dB

C-MOS IC handling precaution
 The C-MOS IC's construction makes this part susceptible to damage by static electricity and so take sufficient care in regard to following articles.
 1. Need to be put on conductive sheet, to be put in a metallic box and to be wrapped by aluminium foil for transportation and deposit.
 2. To use solder iron less than 40W (less than 260°C) of power consumption for soldering. But do not overheat more than 10 second.
 3. Do not perform a conductivity test with a tester, etc. Refer to the circuit voltages of each part.
 4. The ICs on the electrical parts which are indicated by an C-MOS IC symbol mark (Ⓢ).


ELECTRICAL MAIN PARTS LIST

Symbol No.	Part No.	Description
◀ MAIN CIRCUIT BOARD SECTION ▶		
PCB-A	*	Main circuit board
IC3,4	87-027-629-01	IC, 4558DX
IC5,6	87-027-871-01	IC, STK-0060, 2
IC7	87-027-787-01	IC, μ PC1237H
Q11	89-304-954-01	Transistor, 2SC495 (Y)
Q12,13,41	89-318-154-01	Transistor, 2SC1815 (Y)
Q21	89-107-336-01	Transistor, 2SA733 (P)
Q22,23,25, 26,31,32	89-309-456-01	Transistor, 2SC945L (P)
Q33,34,39 40,43	89-320-011-21	Transistor, 2SC2001 (L)
Q35,37	89-110-154-01	Transistor, 2SA1015 (Y)
Q36,38	89-109-521-01	Transistor, 2SA952 (K)
Q42,93	89-313-846-01	Transistor, 2SC1384 (R)
Q81,82	89-318-156-01	Transistor, 2SC1815 (BL)
Q85	89-110-155-01	Transistor, 2SA1015 (GR)
Q91	89-412-653-01	Transistor, 2SD1265 (OP)
Q92	89-209-412-31	Transistor, 2SB941 (PQ)
D11	87-027-686-01	Zener diode, HZ-12A1
D12,14,15, 23,24,31 71,72,73, 74,81,125, 126	87-027-219-01	Diode, MA-150
D13	87-027-347-01	Zener diode, HZ 18-2L
D21,22	87-027-393-01	Zener diode, HZ4C2
D32,33	87-027-416-01	Zener diode, HZ3C2
D34	87-027-405-01	Zener diode, RD2,2EB
D75,76,77, 78	87-027-628-01	Variable capacitor SV-03
D82	87-027-365-01	Diode, S5277B
D85,86	87-027-661-01	Zener diode, HZ30-2L
D87,88,89, 90	87-027-626-01	Diode, S5277D
D91	87-027-788-01	Diode, D5FB20
D92	87-027-469-01	Zener diode, HZ16-2
D93	87-027-376-01	Diode, IB4B41
L1,2	82-499-639-01	Inductor coil, 1 μ H
J5,6,7,8	82-788-621-01	Pin jack ass'y (REC/PB, TAPE CONTROL, TUNER)
J10	87-049-067-01	Jack, 6.3 ϕ (MIC)
J11	87-049-089-01	Jack, 6.3 ϕ (PHONES)
RY1	87-045-167-01	Relay, 24V
VR1,2,M1 S20,21	87-021-714-01	Motor volume, 50k Ω -A (VOLUME, MOTOR, VOLUME CONTROL, MOTOR CONTROL)
VR3,4	87-021-713-01	Volume, 50k Ω -B (MIC MIX)
VR5,6,7,8	87-021-715-01	Volume, 50k Ω -B (TREBLE, BASS)
VR9,10	87-021-716-01	Volume, 10k Ω -MN (BALANCE)
S11,12	82-788-623-01	Push switch (MODE, FILTER)
S13	87-031-699-01	Push switch (SPEAKER)
SFR3	87-021-613-01	Semi-fixed resistor, 10k Ω -B
	82-788-624-01	Speaker terminal, 4P
PIN-2	87-049-109-01	Pin, 3P
PIN-1	82-481-697-01	Pin, 5P
PIN-3	87-049-108-01	Pin, 11P
< Resistors >		
R453,454	87-029-114-01	4.7 Ω 1/4W Fuse resistor
R456	87-029-117-01	10 Ω 1/4W Fuse resistor
R303,304	87-025-250-01	0.22 Ω 3W Cement resistor

Symbol No.	Part No.	Description
R305,306	87-025-193-01	10 Ω 2W Metal film resistor
R173	87-025-331-01	8 Ω 2W Metal film resistor
R315,316	87-025-055-01	270 Ω 2W Metal film resistor
R317,318	87-025-318-01	10 Ω 1W Metal film resistor
< Capacitors >		
C237,238	87-015-916-01	22 μ F 100V Electrolytic
C235,236	87-015-914-01	47 μ F 100V Electrolytic
C239,240	87-015-945-01	15000 μ F 56V Electrolytic
C36,254	87-015-379-01	1 μ F 50V Electrolytic BP
C225	87-015-450-01	220 μ F 25V Electrolytic BP
◀ DRIVER CIRCUIT BOARD SECTION ▶		
PCB-B	*	Driver circuit board
Q51,52	89-501-505-01	FET, 2SK150GR
Q53,54	89-315-834-01	Transistor, 2SC1583 (F)
Q55,56	89-111-246-01	Transistor, 2SA1124 (R)
Q57,58	89-326-326-01	Transistor, 2SC2632 (R)
Q59	89-322-354-01	Transistor, 2SC2235 (Y)
Q60	89-109-654-01	Transistor, 2SA965Y
Q61,62	89-318-154-01	Transistor, 2SC1815 (Y)
D41,42,47, 48	87-027-323-01	Zener diode, HZ22-2L
D49,50	87-027-402-01	Zener diode, HZ24-2L
SFR1,2	87-021-559-01	Semi-fixed resistor, 100 Ω -B
PIN	87-032-633-01	Pin, 3P
◀ SWITCH-1 CIRCUIT BOARD SECTION ▶		
PCB-C	*	Switch-1 circuit board
S7,8,9,10	82-788-622-01	Push-switch (TONE, DSL, DSL1,2, MUTING)
PIN5	82-788-661-01	Pin, 3P
PIN4	82-788-663-01	Pin, 4P
◀ JACK CIRCUIT BOARD SECTION ▶		
PCB-D	*	Jack circuit board
J1,2,3,4,9	82-788-621-01	Pin jack ass'y (PHONO, AUX, SYNC, GND)
◀ POWER CIRCUIT BOARD SECTION ▶		
PCB-E	*	Power circuit board
S14	87-031-700-01	Push-switch (POWER) (H, HU model only)
F1	87-035-312-01	Fuse, 7A (H, HU model only)
F1	87-098-079-01	Fuse label, 7A (H, HU model only)
F1	87-035-190-01	Fuse, "T" 2A (E,K,G model only)
F1	87-098-019-01	Fuse label, "T" 2A (E, K, G model only)
	87-033-147-01	Fuse clamp
< Capacitor >		
C51	87-019-112-01	0.01 μ F Spark killer
◀ INDICATOR CIRCUIT BOARD SECTION ▶		
PCB-F	*	Indicator, circuit board
Q65	89-318-154-01	Transistor, 2SC1815 (Y)
Q66,67,68 69	89-110-154-01	Transistor, 2SA1015 (Y)
D7	88-052-188-11	Diode, IS188 (FM)

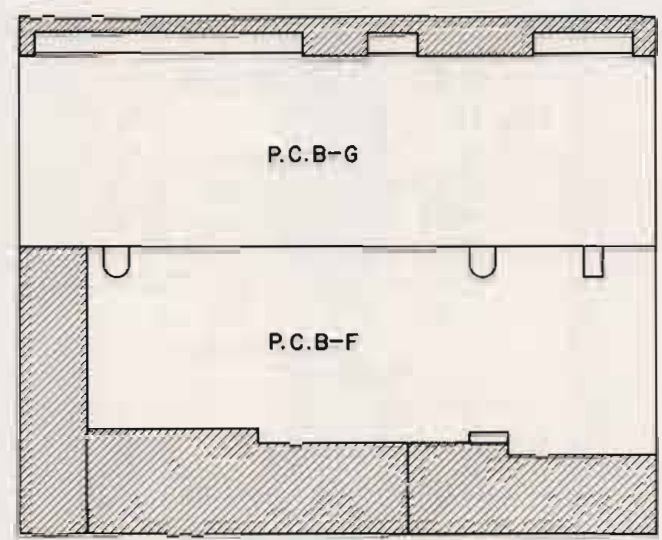
Symbol No.	Part No.	Description
D55,57,58, 59	87-027-820-01	LED, LT9030N
D56	87-027-219-01	Diode, MA150
D60,61,62, 63	87-027-772-01	LED, GL-9PR4
D64	87-027-320-01	Zener diode, HZ7C2
D65,66,67,68	87-027-584-01	Zener diode, HZ9CIL
S1,2,3,4	87-031-712-01	Tact switch (PHONO, AUX, TAPE, TUNER)
S5,6	87-031-698-01	W tact switch (UP, DOWN) KHF-10901
CON5	82-788-662-01	Connector ass'y, 3P
CON4	82-788-664-01	Connector ass'y, 4P
◀ EQ CIRCUIT BOARD SECTION ▶		
PCB-G	*	EQ circuit board
IC1	87-027-629-01	IC, 4558DX
IC2	87-027-829-01	IC, TK10321
Q1,2,3,4	89-109-916-01	Transistor, 2SA991 (F)
Q5,6	89-406-555-01	Transistor, 2SD655E
Q7,8	89-318-154-01	Transistor, 2SC1815 (Y)
D1,2,3,4	87-027-219-01	Diode, MA150
D5	87-027-584-01	Zener diode, HZ9CIL
D8	87-027-097-01	Diode, IS1555
D9,10	87-027-347-01	Zener diode, HZ18-2L
D95,96,97, 98	88-052-188-11	Diode, IS188FM
PIN	87-032-633-01	Pin, 3P
PIN	87-032-634-01	Pin, 4P
PIN	87-032-637-01	Pin, 7P
PIN	87-032-640-01	Pin, 10P
< Resistors >		
R17,18	87-025-280-01	3.9k Ω 1/4W Metal film resistor
R19,20	87-025-288-01	47k Ω 1/4W Metal film resistor
< Capacitors >		
C3,4	87-015-643-01	2.2 μ F 50V Electrolytic LL
C13,14	87-014-122-01	0.018 μ F PP
C17,18	87-014-123-01	0.068 μ F PP
◀ LED MODULE CIRCUIT BOARD SECTION ▶		
PCB-H	87-027-869-01	LED module (with PCB-H)
◀ MOTOR CIRCUIT BOARD SECTION ▶		
PCB-I	*	Motor circuit board
◀ OUTLET CIRCUIT BOARD SECTION ▶ = "E model only"		
PCB-J	*	Outlet circuit board
J12	87-049-014-01	AC outlet
F2	87-035-219-01	Fuse, "T" 500mA
F2	87-098-013-01	Fuse label, "T" 500mA
F2	87-033-147-01	Fuse clamp
◀ SWITCH-2 CIRCUIT BOARD SECTION ▶ = "H, HU model only"		
PCB-K	*	Switch-2 circuit board
S15	87-031-731-01	Rotary switch (VOLTAGE SELECTOR)
F2	87-035-256-01	Fuse 3, 15A
F2	87-098-045-01	Fuse label, 3.15A
F2	87-033-147-01	Fuse clamp

Symbol No.	Part No.	Description
◀ MISCELLANEOUS ▶		
T1	82-788-606-01	Power transformer (H, HU model only)
T1	82-788-608-01	Power transformer (E model only)
T1	82-788-609-01	Power transformer (K, G model only)
J12	87-049-070-01	AC outlet (H, HU model only)
J12	87-032-996-01	AC outlet (K, G model only)
	87-034-962-01	AC power cord (H, HU model only)
	87-788-674-01	AC power cord (E model only)
	87-788-673-01	AC power cord (K model only)
	87-034-892-01	AC power cord (G model only)
	87-085-181-01	Cord bushing A (H, HU model only)
	87-085-166-01	Holder, AC power cord (E, K, G model only)

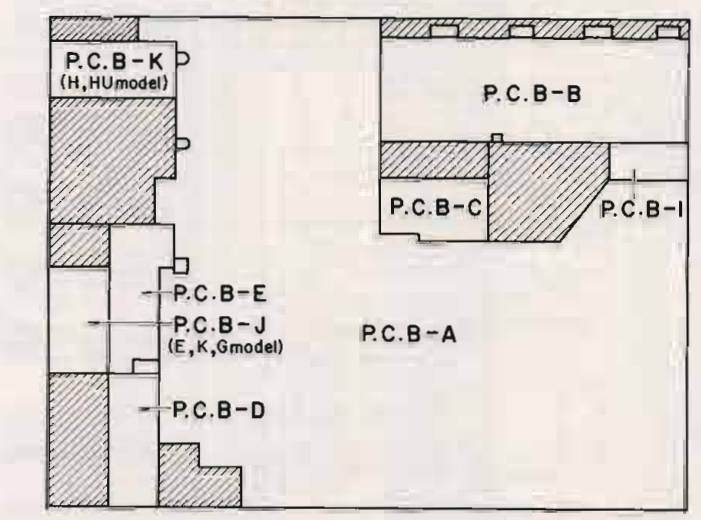
 Safety component symbol
This symbol is given to important parts which serve to maintain the safety of the product, and which are made to conform to special safety specifications. Therefore, when replacing a component with this symbol, make absolutely sure that you use a designated part.

Note: Combination Circuit Board
The parts on the electrical parts list which are indicated by an asterisk (*) are supplied as one single combined circuit board. Therefore, they will not be supplied separately. If this becomes necessary, please order the entire circuit board.

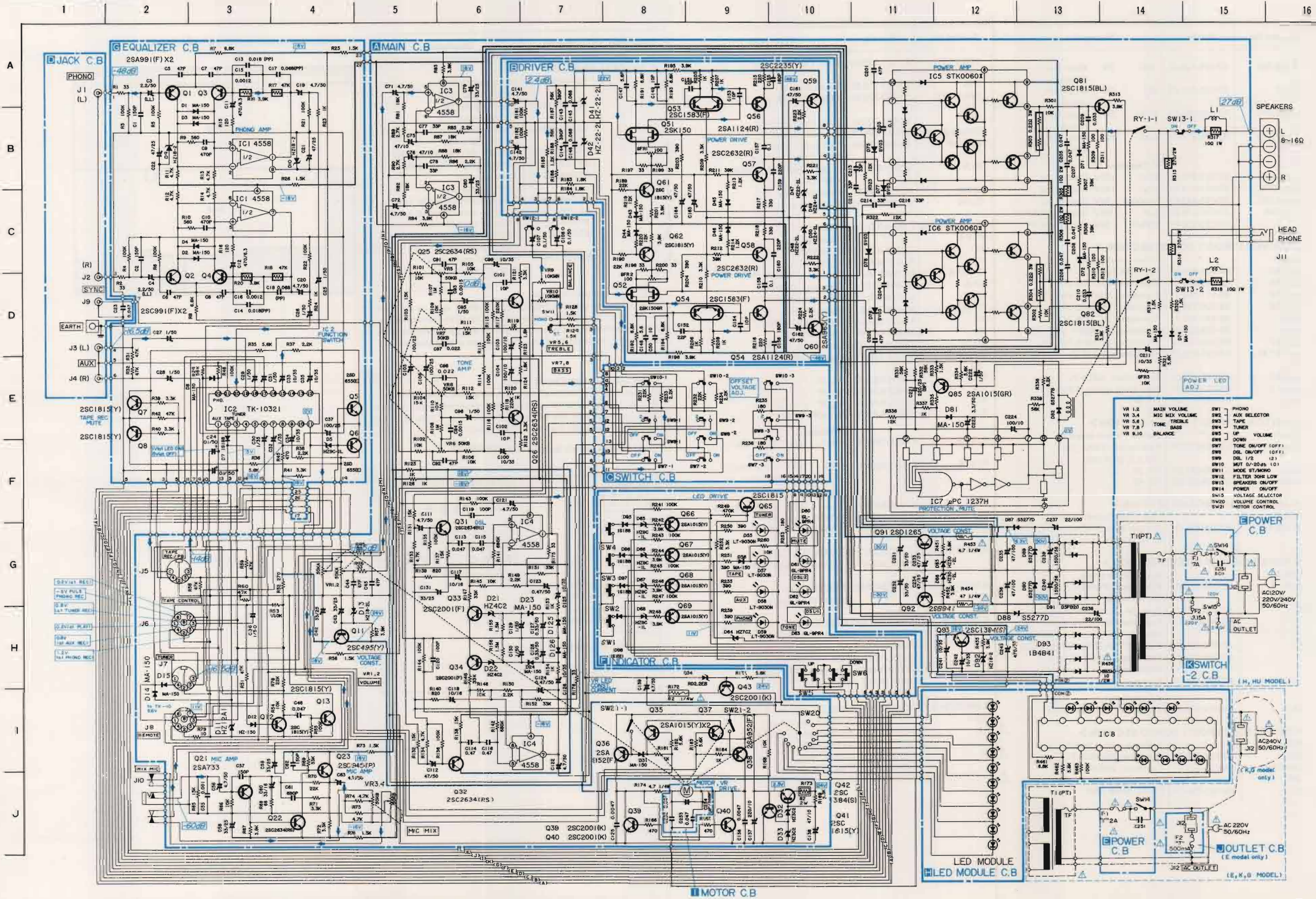
Combination circuit board B 82-788-640-21



Combination circuit board A 82-788-610-21

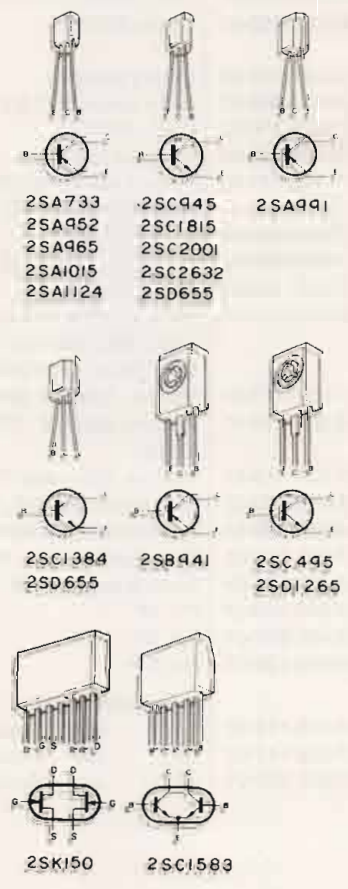


SCHEMATIC DIAGRAM



NOTES:

- 1) B (+) power supply β (-) power supply
 - 2) Signal path
 - 3) The voltage is the reference value measured with a tester (20 k-ohms/V DC) when there are no signals.
 - 4) Resistors with no designation have a rated power of 1/4W and a tolerance of ±5%.
 - 5) Capacitors with no designation have a dielectric strength of less than 50WV.
 - 6) The only capacitor tolerance indicated are ±5% (J) and ±10% (K).
 - 7) Ceramic capacitor symbols:
 - For temperature compensation (SL)
 - ⊥ High dielectric constant system (YY)
 - ⊥ High dielectric constant system (YW, YP, YZ)
 - ⊥ Semiconductor ceramic
 - 8) Explanation of symbols
 - ⊖ Mylar capacitor
 - ⊖ Aluminum solid capacitor
 - ⊖ Polypropylene film capacitor
 - ⊖ Bi-polarized capacitor
 - ⊖ Low-leakage capacitor
 - ⊖ Tantalum capacitor
 - ⊖ Fuse resistor
 - ⊖ Nonflammable resistor
 - ⊖ Low noise resistor
- ▲ Safety component symbol
 This symbol is given to important parts which serve to maintain the safety of the product, and which are made to conform to special safety specifications. Therefore, when replacing a component with this symbol, make absolutely sure that you use a designated part.
- This schematic diagram is subject to change without notice in the interests of improved performance.



2SA733 2SC945 2SA91
 2SA952 2SC1815
 2SA465 2SC2001
 2SA1015 2SC2632
 2SA1124 2SD655

2SC1384 2SB941 2SC445
 2SD655 2SD1265

2SK150 2SC1583

AC240V 220V/240V 50/60Hz
 AC240V 50/60Hz

AC240V 50/60Hz
 AC220V 50/60Hz