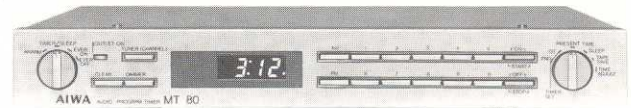


SERVICE MANUAL

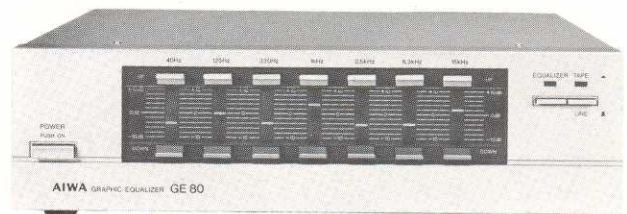
MODEL NO.

AUDIO PROGRAM TIMER MT-80



Code No. 21-800-000-03

GRAPHIC EQUALIZER GE-80



Code No. 34-800-000-03

TYPE. U

DATE OF ISSUE 12/1981

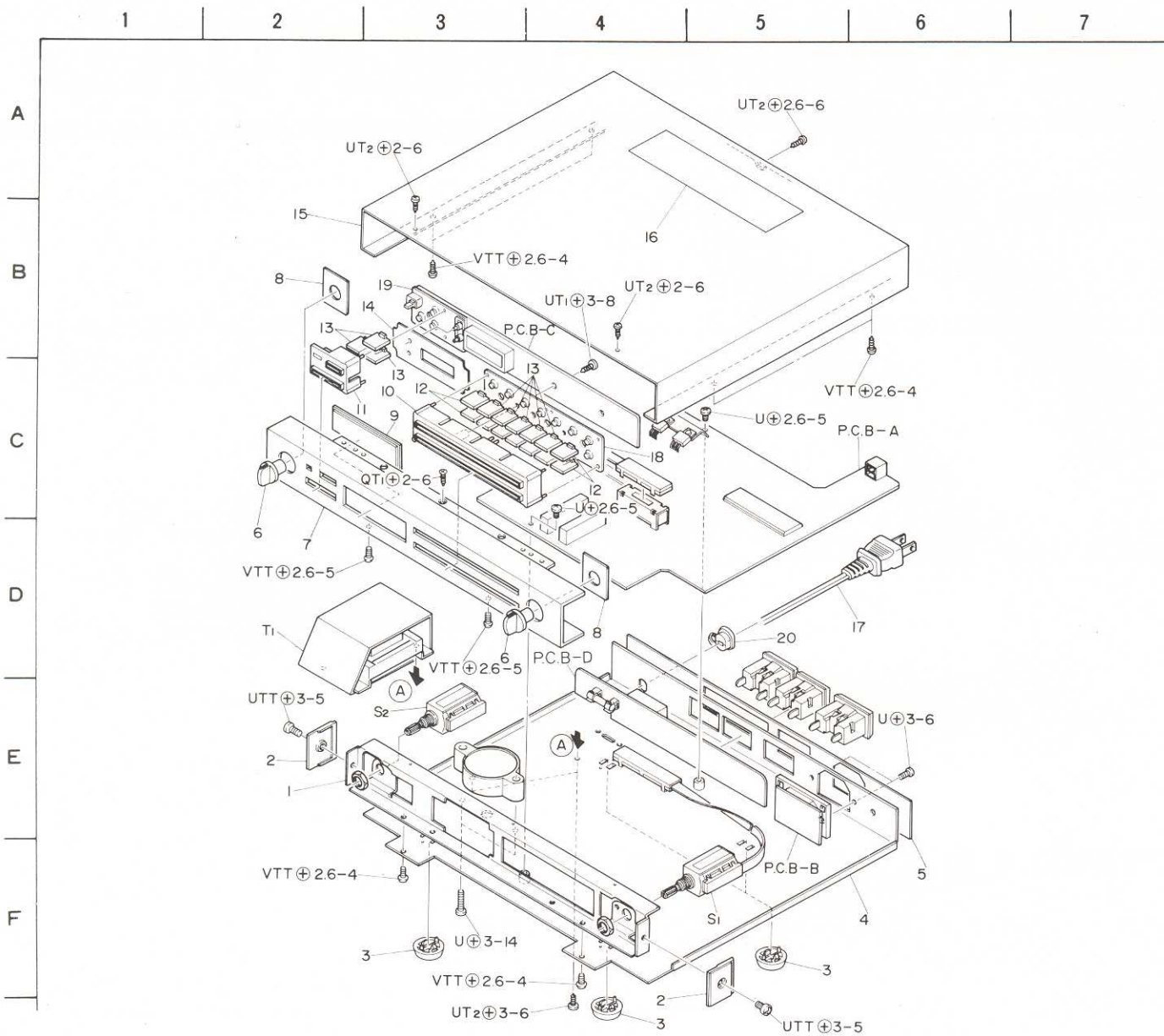
SPECIFICATIONS

	MT-80U		GE-80U
Type:	Digital Audio Program Timer	Semiconductors:	15 transistors, 2 diodes, 9 LEDs,
Semiconductors:	5 IC's, 14 transistors, 16 diodes, 4 LED's	Power supply:	AC 120V, 60 Hz
Power supply:	AC 120V, 60 Hz	Power consumption:	5.5W
Power consumption:	8W	Dimensions:	250(W) x 71(H) x 240(D) mm (9 7/8" x 2 3/4" x 9 1/2")
Dimensions:	250(W) x 36(H) x 262(D) mm (9 7/8" x 1 1/2" x 10 1/2")	Weight:	2 kg (4.40 lbs.)
Weight:	1.6 kg (3.52 lbs.)	Frequency response:	10 Hz (-0.5dB)~35kHz (± 0.5 dB)
Accuracy:	± 15 s./month (at 25°C)	Total harmonic distortion:	Less than 0.03% (at OUTPUT 1V)
Timer accuracy:	Within 0.02 s. of the displayed time	Cross talk:	More than 60 dB
Timer setting:	24 hours, in 1 minute steps, 2 ON/OFF cycles per 24 hours possible	Equalizer frequency:	40, 125, 220, 1k, 2.5k, 6.3k, 15kHz $\pm 20\%$
Sleep timer operation:	1 s. to 99 minutes, in 1 s. steps	Equalizer variable range:	Upper +10 ± 1.5 dB Lower -10 ± 1.5 dB
Zero reset control:	1 ~ 29 s. set back, 30 ~ 59 s. advanced.	Input impedance:	50k Ω $\pm 30\%$
		Output impedance:	2.6k Ω $\pm 30\%$
		Inputs:	150mV (1000Hz)
		Outputs:	135 ± 8 mV
		Output noise:	Less than 0.015mV
		Output level:	More than 5V

• Specifications and external appearance are subject to change without due to product improvement.

AIWA CO., LTD. TOKYO JAPAN

EXPLODED VIEW



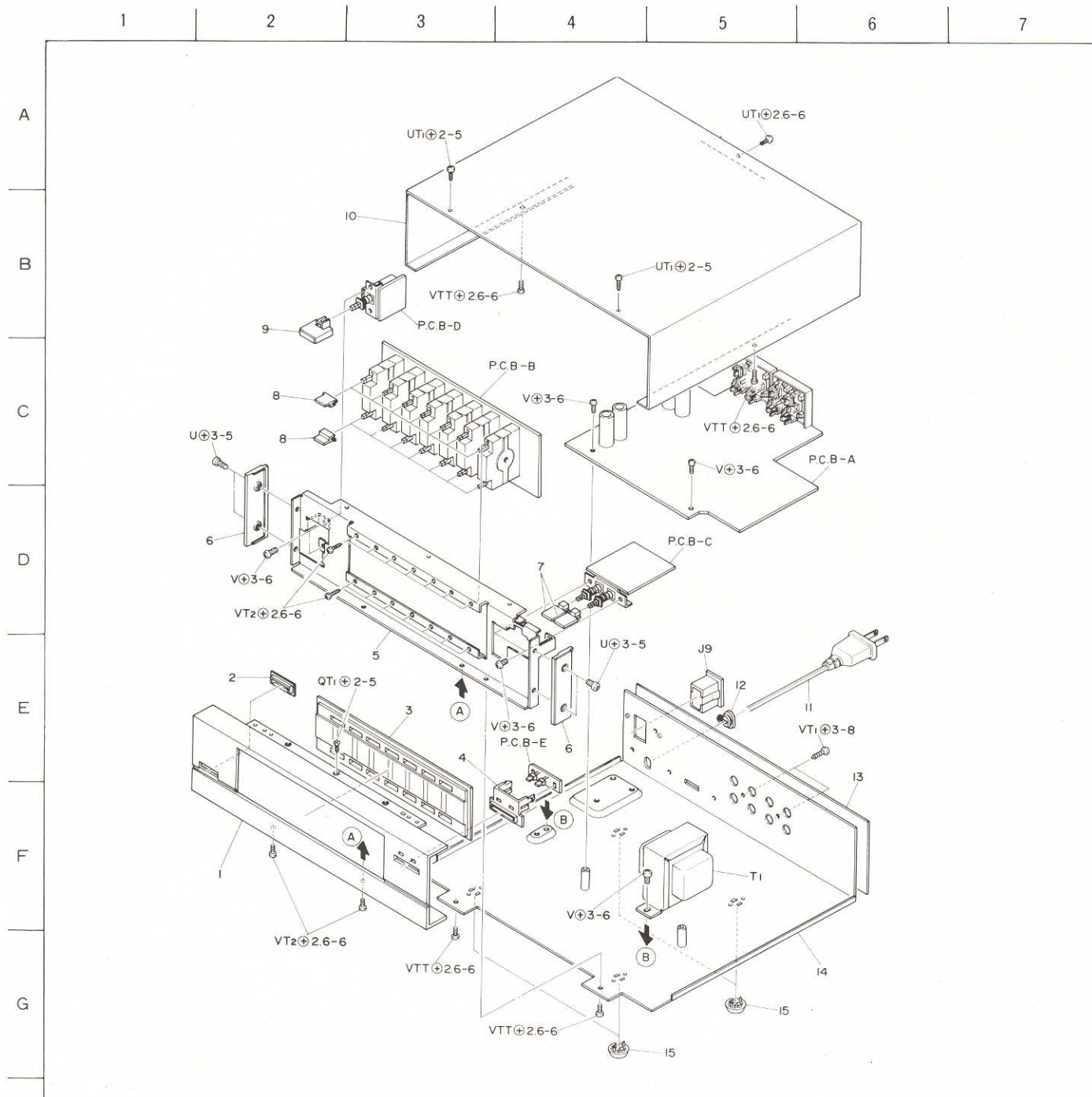
PARTS LIST

MECHANICAL PARTS

■ * mark in this part list shows exclusive part.

Ref. No.	Part No.	Part No. Changed to	Description	Common Model	Q'ty
1	82-753-201-01		Chassis, Front	MT-50	1
2	82-782-018-01		Panel, Side	*	2
3	82-745-019-11		Foot		4
4	82-753-208-11		Amp. chassis H ass'y	MT-50	1
5	82-753-013-01		Jack plate	MT-50	1
6	82-782-005-01		Knob, Selector	*	2
7	82-782-001-01		Panel, Front		1
8	82-753-214-11		Knob, Guide selector	MT-50	2
9	82-753-004-01		Window	MT-50	1
10	82-782-002-01		Guide A, Push-button	*	1
11	82-782-003-01		Guide B, Push-button	*	1
12	82-782-017-01		Push-key A (GRY)	*	4
13	82-779-007-01		Push-key A	ST-R80	13
14	82-782-015-01		Display panel	*	1
15	82-782-008-01		Cabinet, Steel	*	1
16	82-782-011-01		Name plate Spec.	*	1
17	87-034-929-01		AC power cord		1
18	82-782-601-01		Rubber switch A	*	1
19	82-782-602-01		Rubber switch B	*	1
20	87-085-101-01		Cord bushing		1

EXPLODED VIEW



PARTS LIST

MECHANICAL PARTS

■ * mark in this part list shows exclusive part.

Ref. No.	Part No.	Part No. Changed to	Description	Common Model	Q'ty
1	82-783-011-01		Panel, Front	*	1
2	82-783-021-01		Guide, Power	*	1
3	82-783-014-01		Window	*	1
4	82-783-022-01		Guide (EQ)	*	1
5	82-783-201-01		Front chassis	*	1
6	82-783-018-01		Panel, Side	*	2
7	82-781-004-01		Selector knob	SA-P80	2
8	82-783-015-01		Push-button A	*	14
9	82-780-008-01		Button, Power	SA-C80	1
10	82-783-017-01		Cabinet, Steel	*	1
11	82-783-614-01		AC power cord	*	1
12	82-783-220-01		Cord bushing	*	1
13	82-783-025-01		Jack plate	*	1
14	82-783-202-01		Chassis, Amp.	*	1
15	82-745-019-11		Foot	*	4

ACCESSORIES/PACKAGE = MT-80U

Ref. No.	Part No.	Part No. Changed to	Description	Common Model	Q'ty
1	82-782-853-01		Printed indiv., Packing	*	1
2	82-753-852-11		Cushion L, Printed indiv.	MT-50	1
3	82-753-853-11		Cushion R, Printed indiv.	MT-50	1
4	87-051-131-11		Poly-vinyl sack		1
5	87-056-604-01		Poly-vinyl sack		1
6	82-782-908-01		Instructions booklet	*	1
7	87-051-171-11		Poly-vinyl sack		1
8	87-056-057-01		Service station list		1
9	87-056-045-01		Guarantee card		1
10	85-439-002-01		Syncrate cord CW-150K		1
11	85-488-001-01		Connection cord CW-250K		1
12	87-056-050-01		Safety instruction		1

ACCESSORIES/PACKAGE = GE-80U

Ref. No.	Part No.	Part No. Changed to	Description	Common Model	Q'ty
1	82-783-851-01		Printed indiv., Packing	*	1
2	82-748-856-21		Cushion L, Printed indiv.	SA-C50	1
3	82-748-857-31		Cushion R, Printed indiv.	SA-C50	1
4	87-056-604-01		Poly-vinyl sack		1
5	87-056-057-01		Service station list		1
6	87-051-171-11		Poly-vinyl sack		1
7	82-783-905-01		Instructions booklet	*	1
8	82-783-070-01		Connection cord	*	2
9	87-056-045-01		Guarantee card		1
10	87-056-050-01		Safety instruction		1

ELECTRICAL MAIN PARTS LIST

Symbol No.	Part No.	Description
◀ MAIN CIRCUIT BOARD SECTION ▶		
PCB-A	*	Main circuit board
⚡ IC1	87-027-685-01	IC, TCP-4620-5002
⚡ IC2	87-027-747-01	IC, MSM4001RS
⚡ IC3	87-027-510-01	IC, μ PD4001
IC4	87-027-614-01	IC, TD62103P
IC5	87-027-616-01	IC, TC4050BP
Q1,2	89-408-804-51	Transistor, 2SD880Y(GR)
Q3,4	89-318-154-01	Transistor, 2SC1815(Y)
Q5,6,7,8 9,10,11 12,13,14	89-110-154-01	Transistor 2SA1015(Y)
D1	87-027-376-01	Diode, 1B4B41
D2,3,4, 7,8,9, 10,11,12 14	87-027-097-01	Diode, 1S1555
D13	87-027-369-01	Zener diode, 05Z6.2L
L1	82-401-661-01	Choke coil, 600 μ H
TC1	85-708-604-21	Trimmer, 30pF
S1	82-753-613-01	Slide switch (PRESET TIME)
S2	82-753-616-01	Slide switch (TIMER/SLEEP)
J1	87-032-882-01	Jack, 2.5 ϕ (TAPE TIME)
X1	87-030-075-01	Crystal resonator
		< Resistor >
R6	87-025-283-01	12k Ω Metal film resistor
R7	87-025-292-01	6.8k Ω Metal film resistor
		< Capacitor >
C1	87-015-459-01	1000 μ F 25V Electrolytic
◀ REMOTE JACK CIRCUIT BOARD SECTION ▶		
PCB-B	*	Remote jack circuit board
J2	87-049-064-01	Remote jack (REMOTE)
◀ SWITCH CIRCUIT BOARD SECTION ▶		
PCB-C	82-782-603-01	Switch circuit board
D1	87-027-613-01	LED, TLG-4125
D2,3	87-027-377-01	LED, GL2PR1
D4	87-027-542-01	LED, LN217RP
D5,6,7,8	87-027-097-01	Diode, 1S1555
S3,4,5,7, 8	82-782-602-01	Rubber switch B (1, 2, 3, 4, 5, 6, 7, 8, 9, 10 AM, PM, ON/START, OFF/STOP)
S6,9,10	82-782-601-01	Rubber switch A (TUNER, DIMMER, CLEAR)
◀ AC OUTLET CIRCUIT BOARD SECTION ▶		
⚡ PCB-D	82-753-628-01	AC outlet circuit board
⚡ RY1	87-045-145-01	Relay, G2L-113P
⚡ J3,4,5	87-032-937-01	AC outlet
⚡	82-304-743-01	1P terminal
◀ MISCELLANEOUS ▶		
⚡ T1	82-753-622-01	Power transformer
	86-992-611-11	Ceramic buzzer
S1	82-753-612-01	Remote rotary A (PRESET TIME)
S2	82-753-615-01	Remote rotary B (TIMER/SLEEP)
⚡	87-034-929-01	AC power cord
	87-032-972-01	Connector, 12P
	82-753-617-11	Flat cable, 12P
	82-753-618-11	Flat cable, 12P
	82-753-619-01	Flat cable, 4P
	82-753-620-01	Flat cable, 4P

C-MOS IC handling precaution

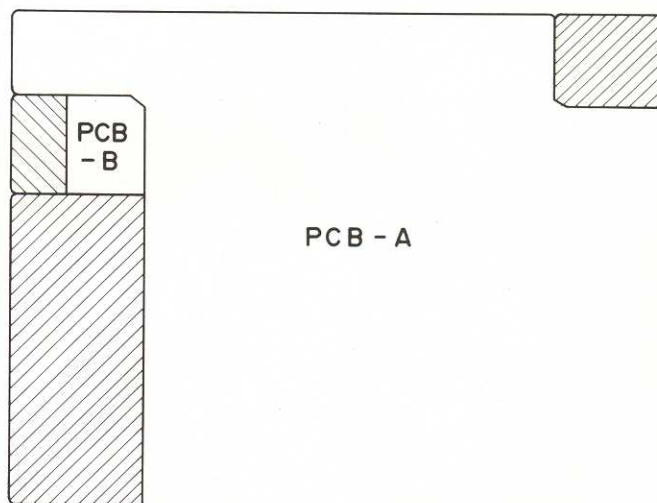
The C-MOS IC's construction makes this part susceptible to damage by static electricity and so take sufficient care in regard to following articles.

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 (⚡).

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 82-782-605-01



⚡ Safety component symbol

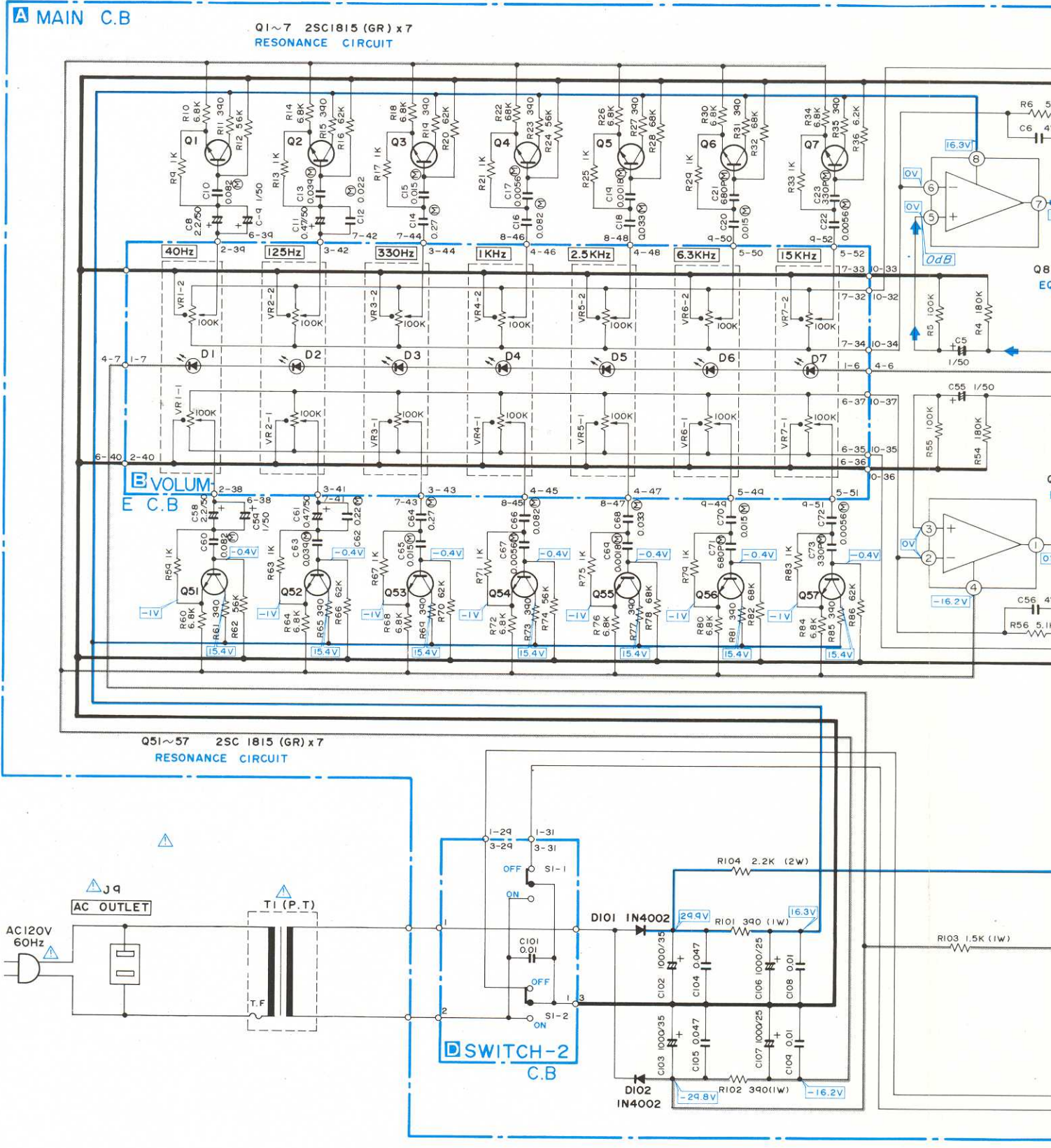
This symbol is given to important parts which serve to maintain the safety of the product, and which are made to conform to special safety specifications. Therefore, when replacing a component with this symbol, make absolutely sure that you use a designated part.

☆☆☆☆☆☆☆☆☆☆☆☆☆☆ MEMO ☆☆☆☆☆☆☆☆☆☆☆

SCHEMATIC DIAGRAM

1 2 3 4 5 6 7 8

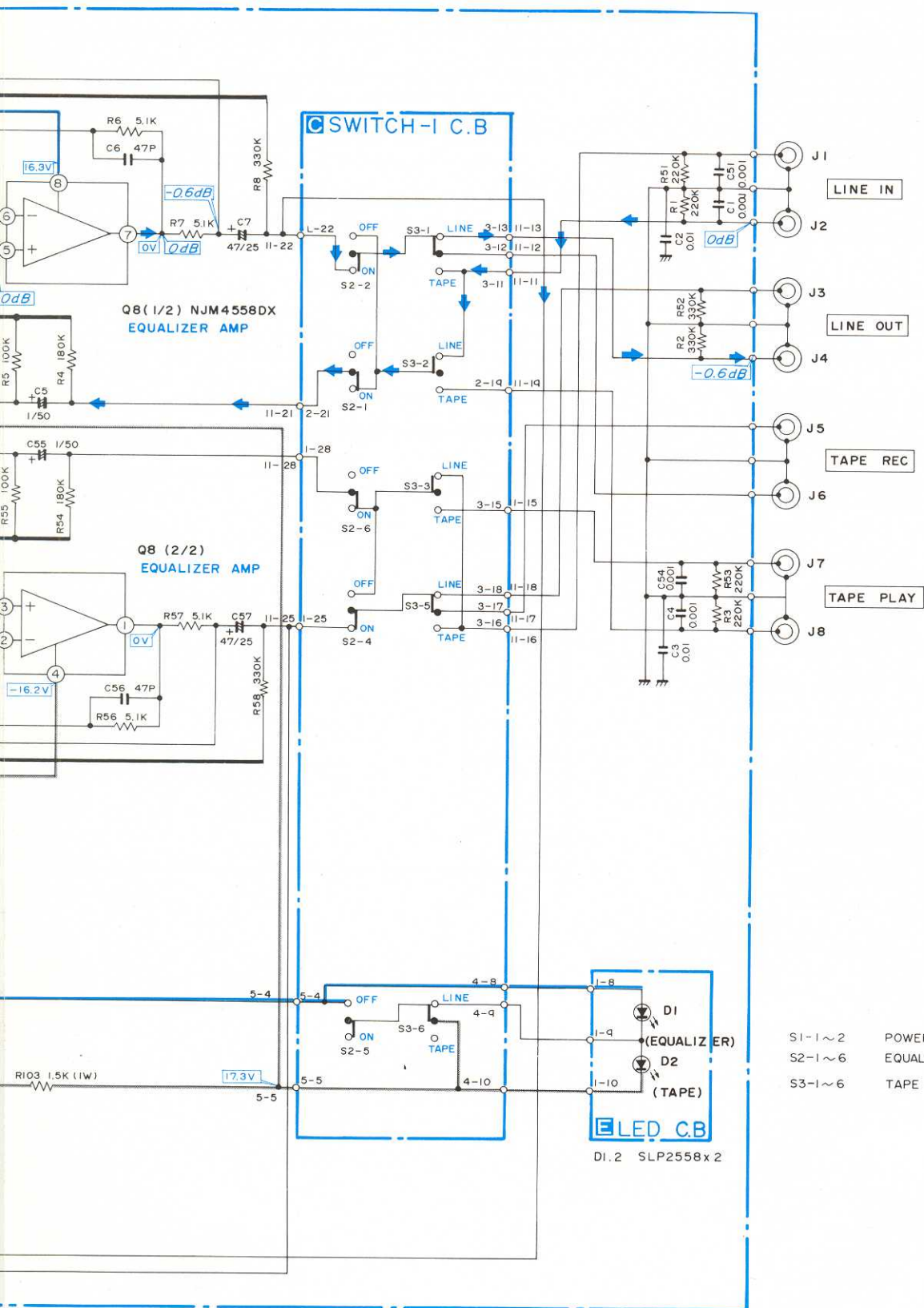
A
B
C
D
E
F
G
H
I
J



NOTES:

- 1) B (+) 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 50VV.
- 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)
- 8) Explanation of symbols
 - ⊗ Mylar capacitor
 - ⊏ Fuse resistor

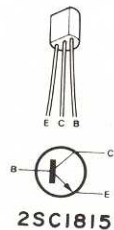
⚠ Safety component symbol
 This symbol is given to maintain the safety of the product made to conform to the applicable standards. Therefore, when replacing a component, make absolutely certain that the replacement part is the same as the original. This schematic diagram is for your reference and notice in the interests of safety.



- S1-1~2 POWER (OFF)
- S2-1~6 EQUALIZER (ON)
- S3-1~6 TAPE (LINE)

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

This schematic diagram is subject to change without
 notice in the interests of improved performance.



ELECTRICAL MAIN PARTS LIST

Symbol No.	Part No.	Description
« MAIN CIRCUIT BOARD SECTION »		
PCB-A	*	Main circuit board
Q1,2,3,4, 5,6,7,51 52,53,54 55,56,57	89-318-155-01	Transistor, 2SC1815 (GR)
Q8	87-027-629-01	IC, NJM 4558DX
D101,102	82-783-602-01	Diode, IN 4002
J1,2,3,4, 5,6,7,8	87-049-055-01	4P Pin jack (LINE IN, LINE OUT TAPE REC, TAPE PLAY)
« VOLUME CIRCUIT BOARD SECTION »		
PCB-B	*	Volume circuit board
VR1,2,3,4, 5,6,7	82-783-606-01	LED, Push-volume (40Hz, 125Hz, 330Hz, 1kHz, 2.5kHz, 6.3kHz, 15kHz)
D1,2,3,4, 5,6,7		
« SWITCH-1 CIRCUIT BOARD SECTION »		
PCB-C	*	Switch-1 circuit board
S2,3	82-783-604-01	Push-switch (EQUALIZER, TAPE)
« SWITCH-2 CIRCUIT BOARD SECTION »		
PCB-D	*	Switch-2 circuit board
S1	82-783-605-01	Push-switch (POWER)
« LED CIRCUIT BOARD SECTION »		
PCB-E	*	LED circuit board
D1,2	82-783-603-01	LED, SLP-255B (EQUALIZER, TAPE)
« MISCELLANEOUS »		
⚠ T1	82-783-613-01	Power transformer
⚠ J9	82-783-045-01	AC outlet
⚠	82-783-614-01	AC power cord
⚠	82-783-220-01	Cord bushing
⚠	82-783-607-01	Pin, 3P



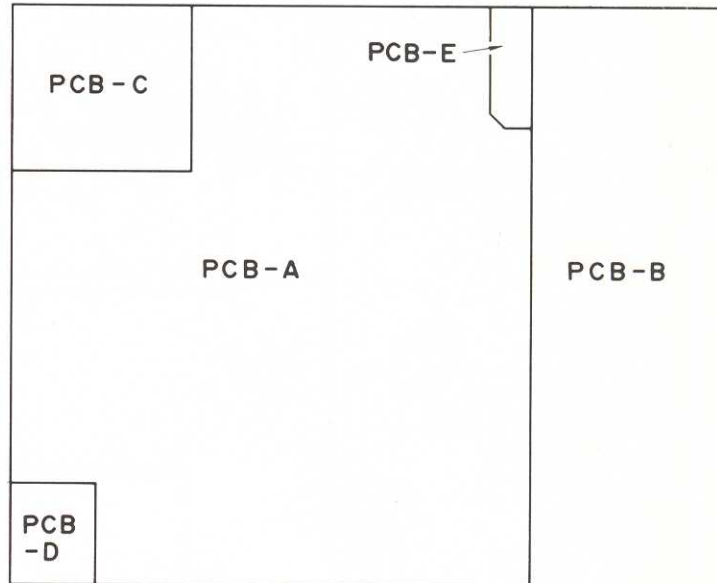
Safety component symbol

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

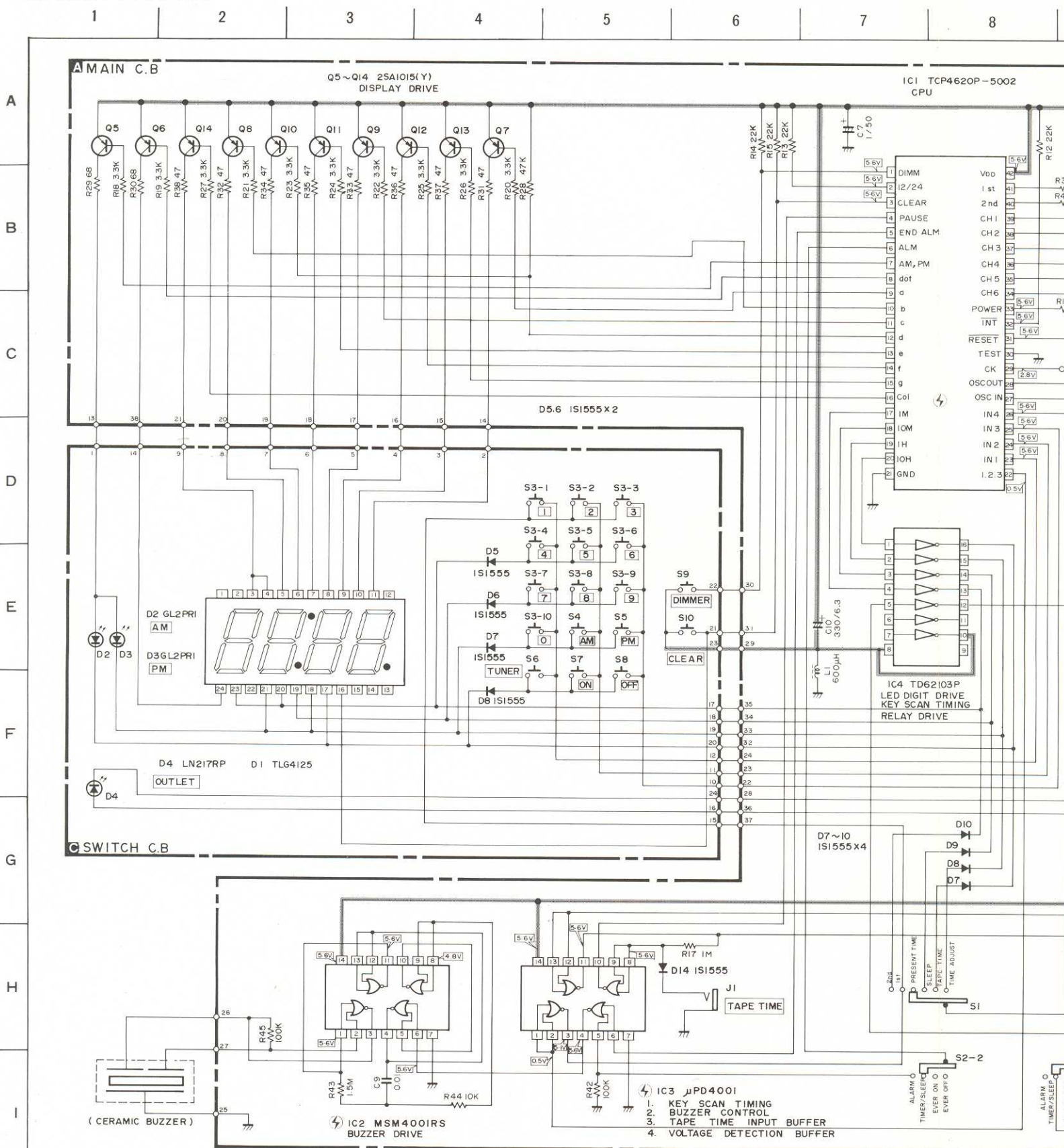
The parts on the electrical parts list which are indicated by an asterisk (*) are supplied as one single combined circuit board. Therefore, they will not be supplied separately. If this becomes necessary, please order the entire circuit board.

Combination circuit board 82-783-601-01



☆☆☆☆☆☆☆☆☆☆☆☆☆☆☆☆☆☆☆☆ MEMO ☆☆☆☆☆☆☆☆☆☆☆☆☆☆☆☆☆☆☆

SCHEMATIC DIAGRAM

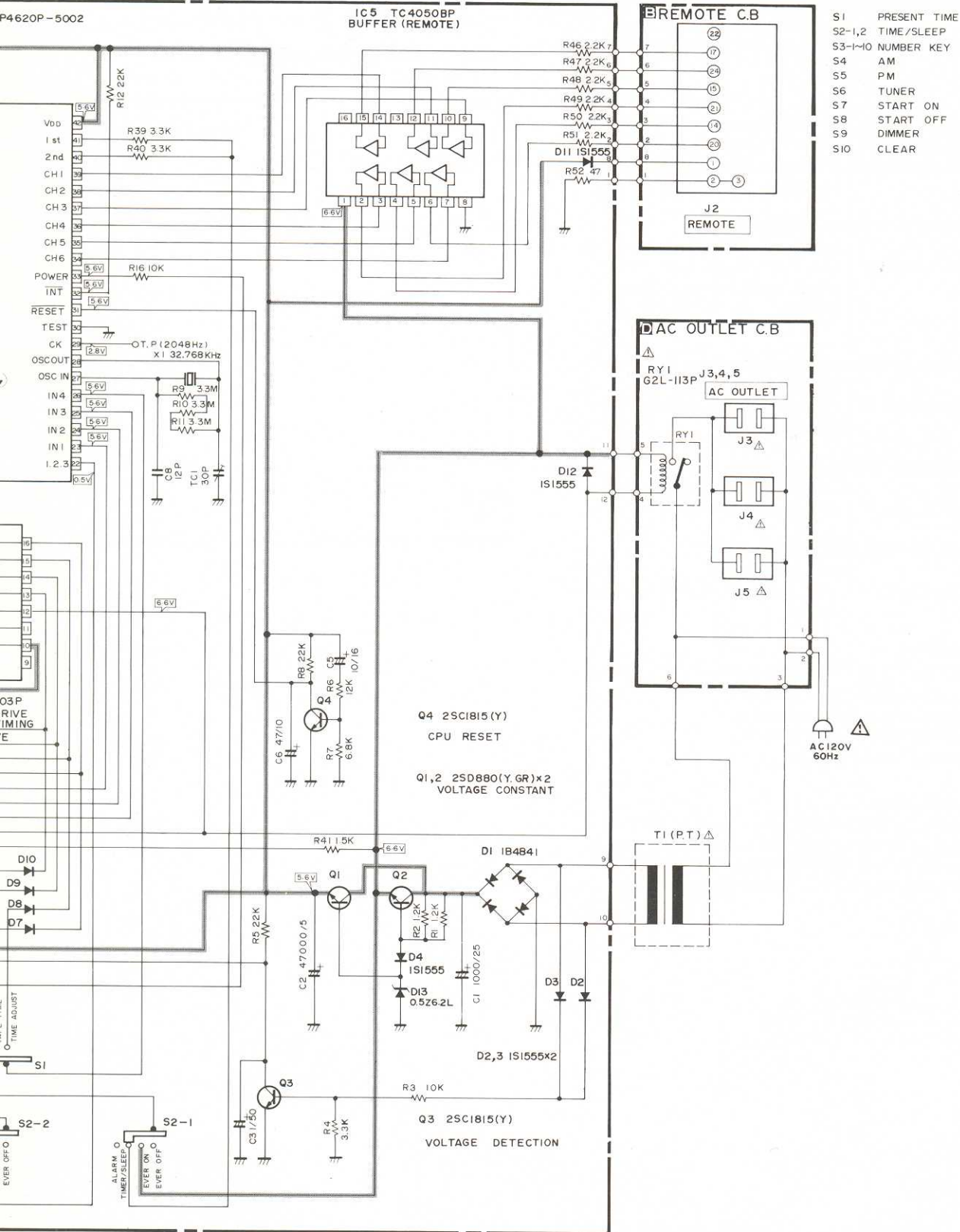


NOTES:

- 1) B (+) power supply
- 2) The voltage is the reference value measured with a tester (20 k-ohms/V DC) when there are no signals.
- 3) Resistors with no designation have a rated power of 1/4W and a tolerance of ±5%.
- 4) Capacitors with no designation have a dielectric strength of less than 50VV.

- 5) The only capacitor tolerance indicated are ±5% (J) and ±10% (K).
- 6) Ceramic capacitor symbols:
 - ||— For temperature compensation (SL)
 - |Y— High dielectric constant system (YY)
 - |Y— High dielectric constant system (YW, YP, YZ)
 - |— Semiconductor ceramic

⚠ Safety component
 This symbol is given to maintain the safety made to conform to Therefore, when rep symbol, make absolu signated part.
 • This schematic diagram notice in the interests

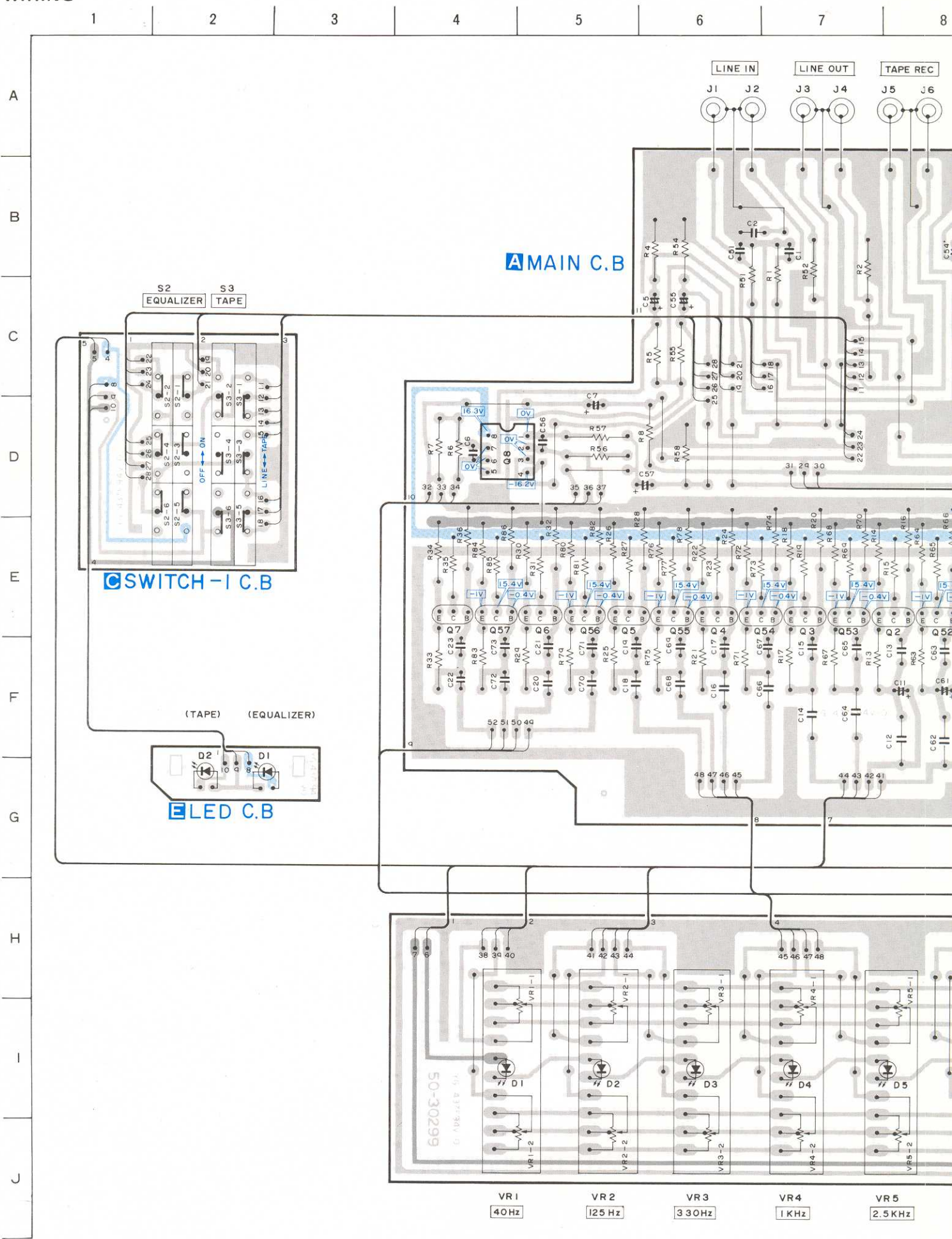


△ Safety component symbol
 This symbol is given to important parts which serve to maintain the safety of the product, and which are made to conform to special safety specifications. Therefore, when replacing a component with this symbol, make absolutely sure that you use a designated part.
 This schematic diagram is subject to change without notice in the interests of improved performance.

The ICs on the electrical parts which are indicated by an C MOS IC symbol mark ().

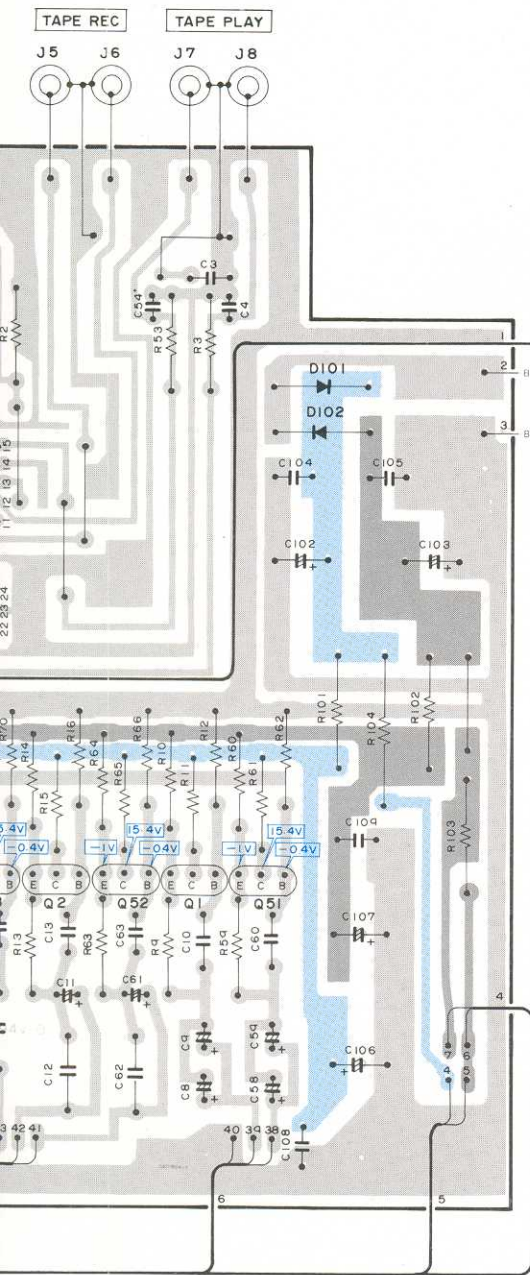
NOTES (1) [Blue Hatched] B(+) Pattern [Grey Hatched] B(-) Pattern [White] Others pattern
 (2) The voltage is the reference value measured with a tester (20 K ohms/V DC) when

WIRING

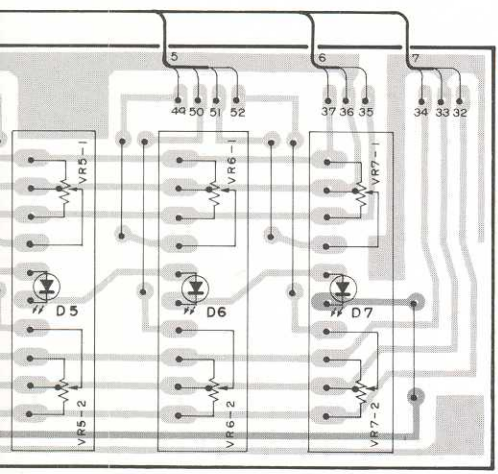
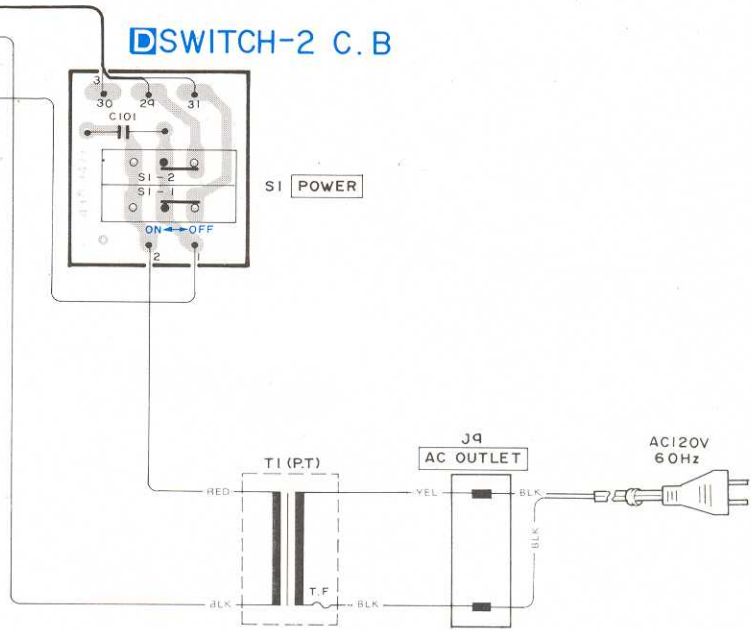


V DC) when there are no signals.

8 9 10 11 12 13 14 15



SWITCH-2 C.B

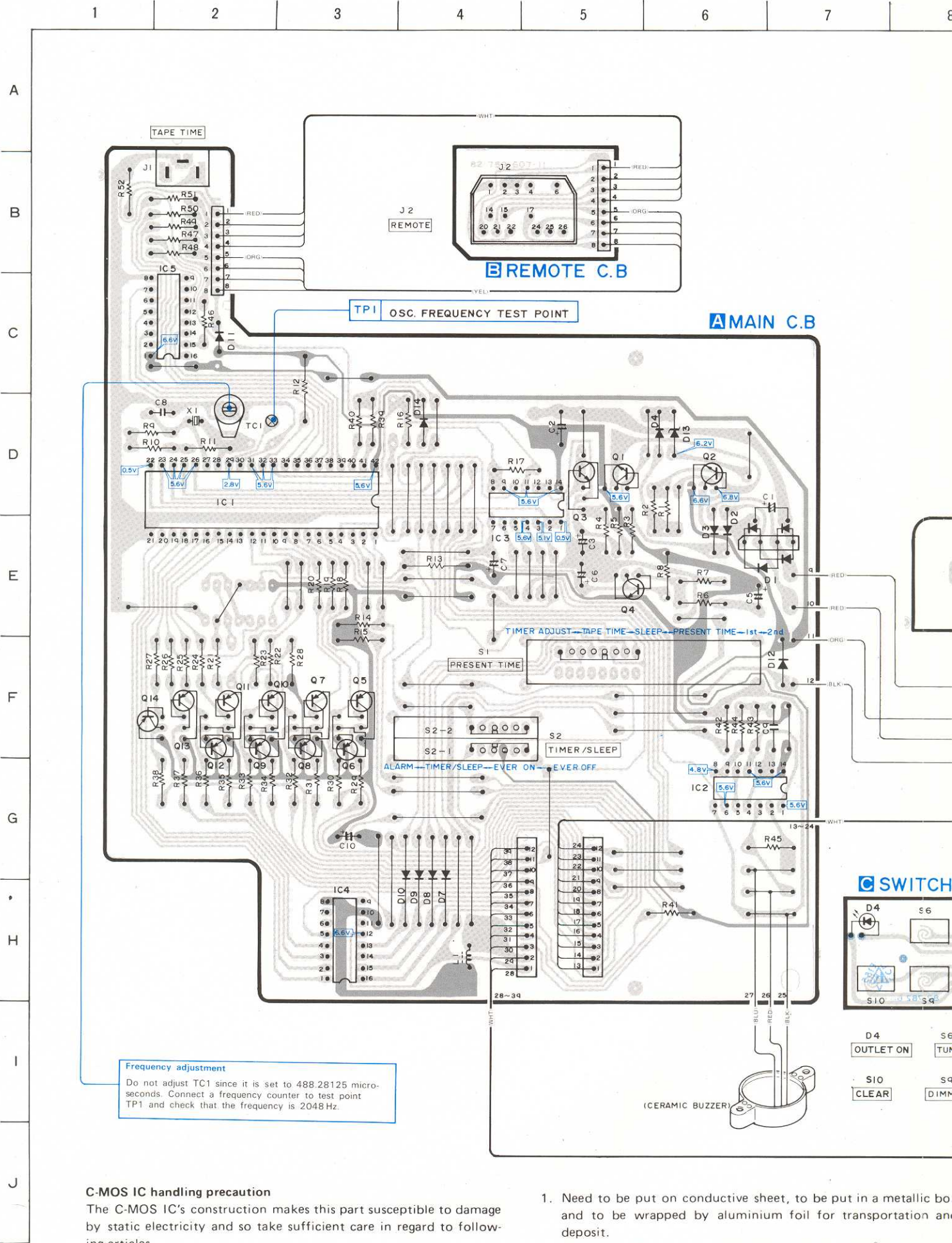


VOLUME C.B

- VR 5 2.5 KHz
- VR 6 6.3 KHz
- VR 7 15 KHz

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

WIRING



Frequency adjustment
 Do not adjust TC1 since it is set to 488.28125 micro-seconds. Connect a frequency counter to test point TP1 and check that the frequency is 2048Hz.

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.

There are no signals.

8

9

10

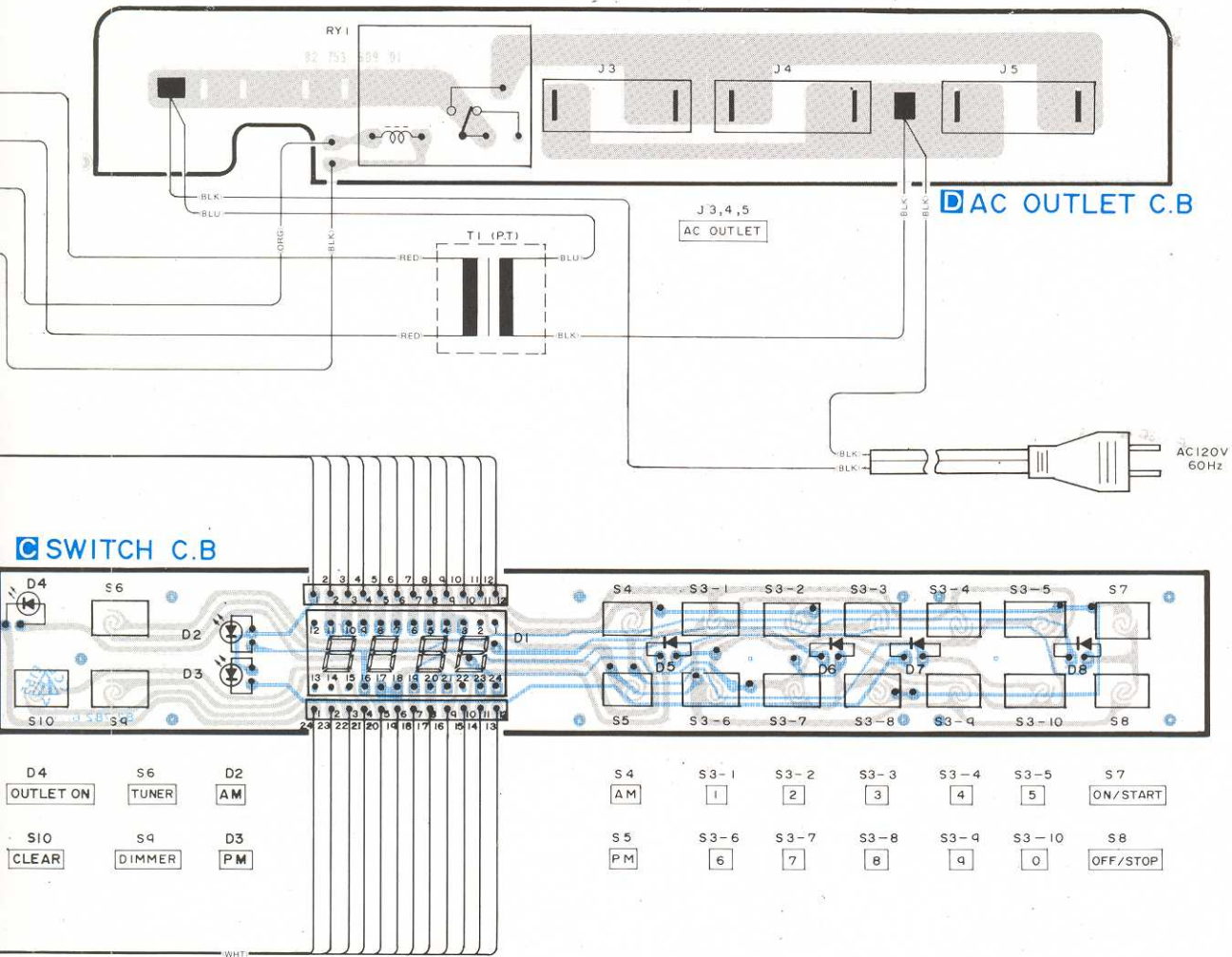
11

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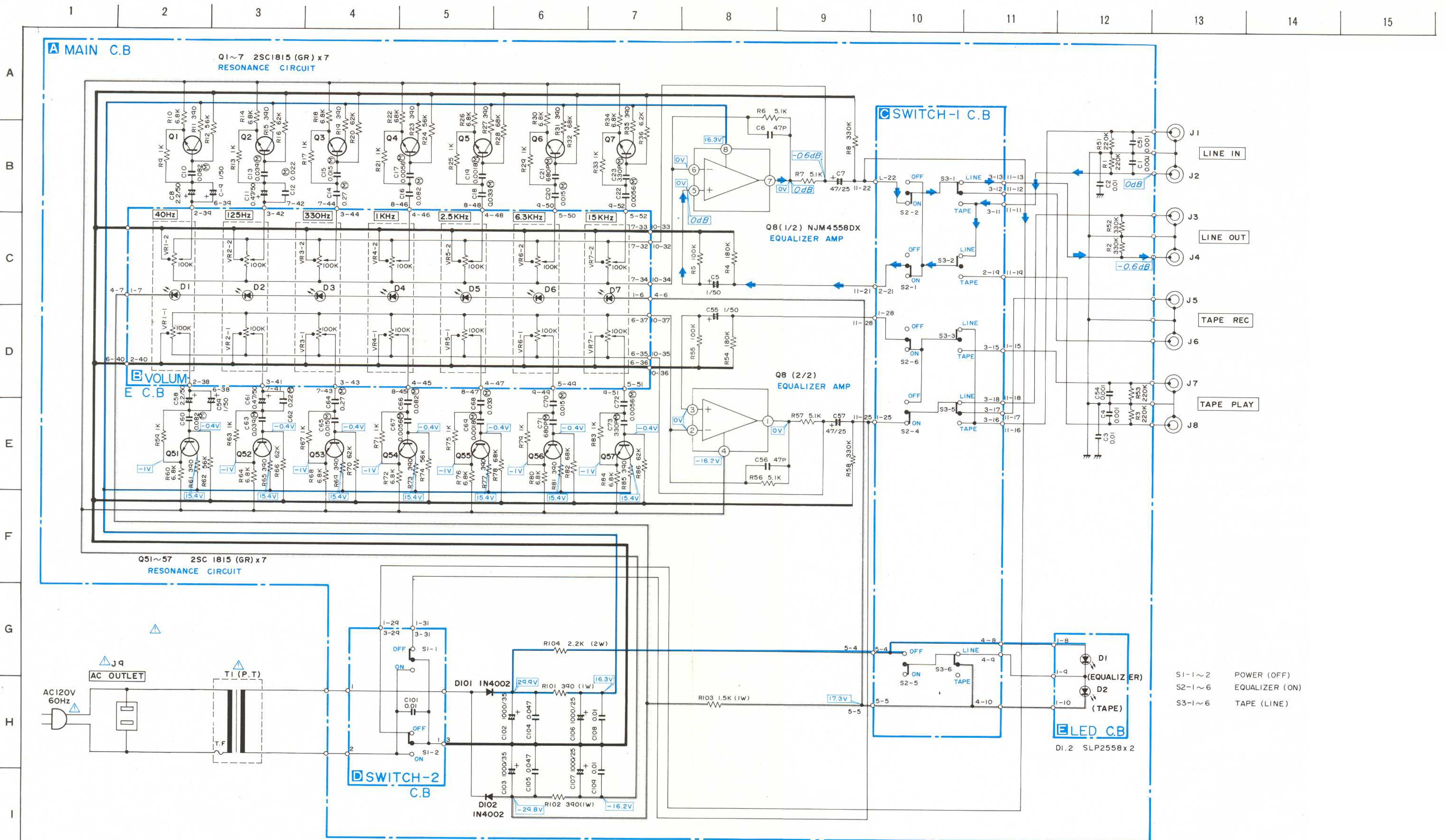
15



in a metallic box for transportation and
 260°C) of power heat more than 10

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 CMOS IC symbol mark (C).

SCHEMATIC DIAGRAM



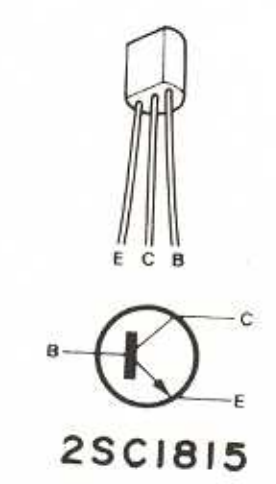
S1-1~2 POWER (OFF)
 S2-1~6 EQUALIZER (ON)
 S3-1~6 TAPE (LINE)

NOTES:

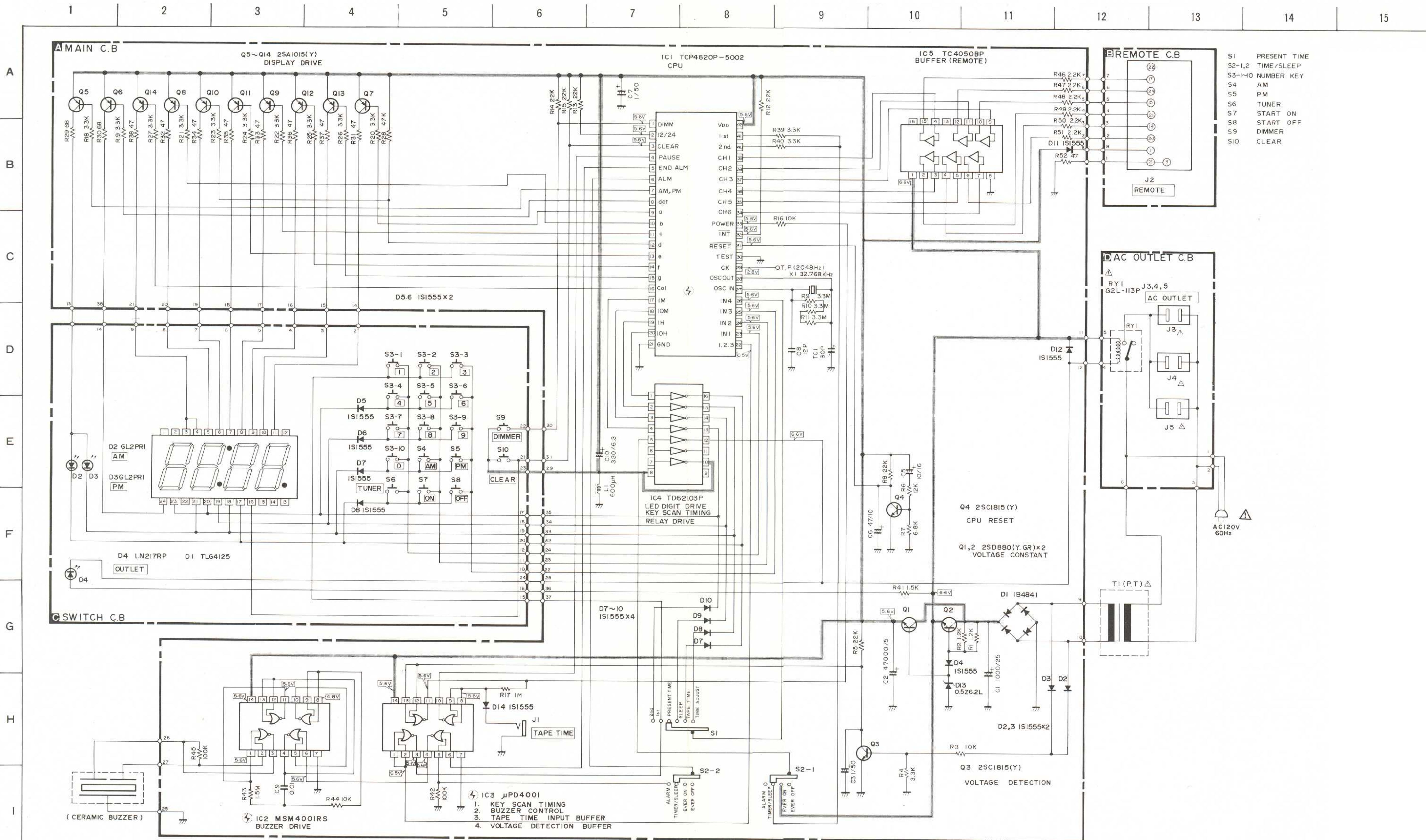
- 1) B (+) power supply
- 2) Signal path
- 3) The voltage is the reference value measured with a tester (20 k-ohms/V DC) when there are no signals.
- 4) Resistors with no designation have a rated power of 1/4W and a tolerance of ±5%.
- 5) Capacitors with no designation have a dielectric strength of less 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)
- 8) Explanation of symbols
 - Ⓜ Mylar capacitor
 - Ⓦ Fuse 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.



SCHEMATIC DIAGRAM



NOTES:

- 1) B (+) power supply
- 2) The voltage is the reference value measured with a tester (20 k-ohms/V DC) when there are no signals.
- 3) Resistors with no designation have a rated power of 1/4W and a tolerance of ±5%.
- 4) Capacitors with no designation have a dielectric strength of less than 50WV.
- 5) The only capacitor tolerance indicated are ±5% (J) and ±10% (K).
- 6) Ceramic capacitor symbols:
 - |—|— For temperature compensation (SL)
 - |—|— High dielectric constant system (YY)
 - |—|— High dielectric constant system (YW, YP, YZ)
 - |—|— Semiconductor ceramic

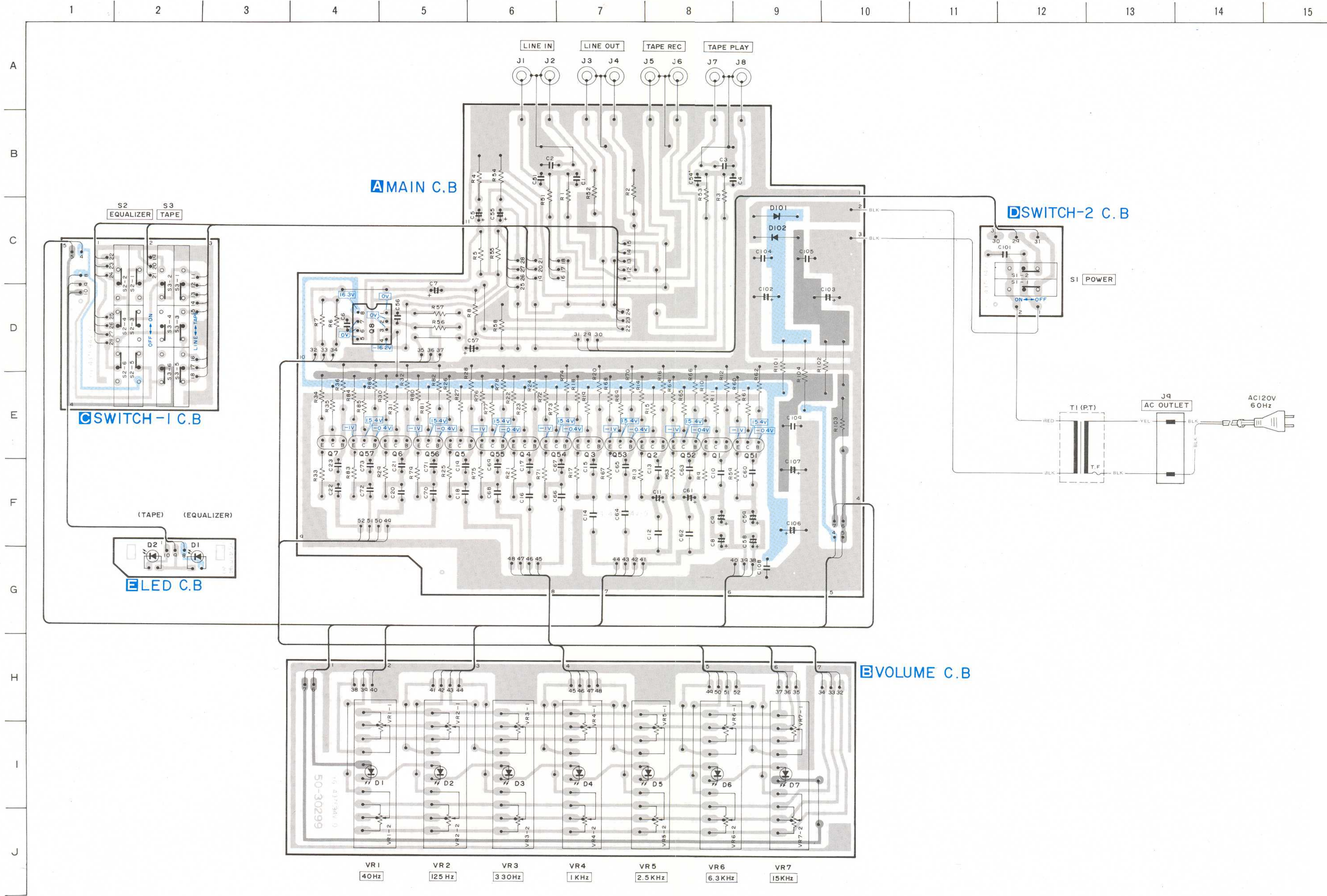
⚠ Safety component symbol
 This symbol is given to important parts which serve to maintain the safety of the product, and which are made to conform to special safety specifications. Therefore, when replacing a component with this symbol, make absolutely sure that you use a designated part.

The ICs on the electrical parts which are indicated by an C MOS IC symbol mark (⚡).

• This schematic diagram is subject to change without notice in the interests of improved performance.

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.

WIRING



MAIN C.B

SWITCH-2 C.B

SWITCH-1 C.B

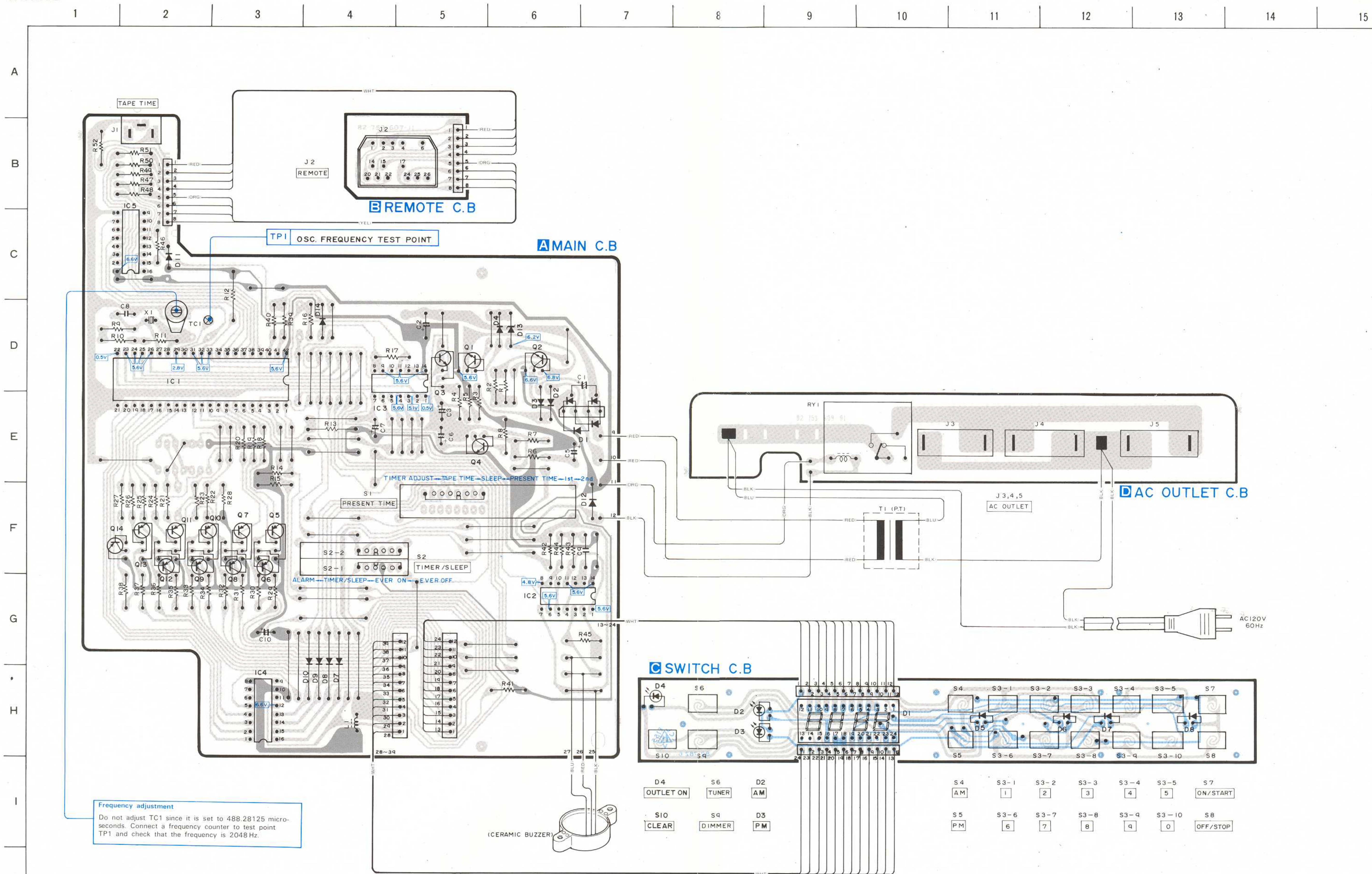
LED C.B

VOLUME C.B

- VR1
40Hz
- VR2
125 Hz
- VR3
330Hz
- VR4
1 KHz
- VR5
2.5 KHz
- VR6
6.3 KHz
- VR7
15KHz

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

WIRING



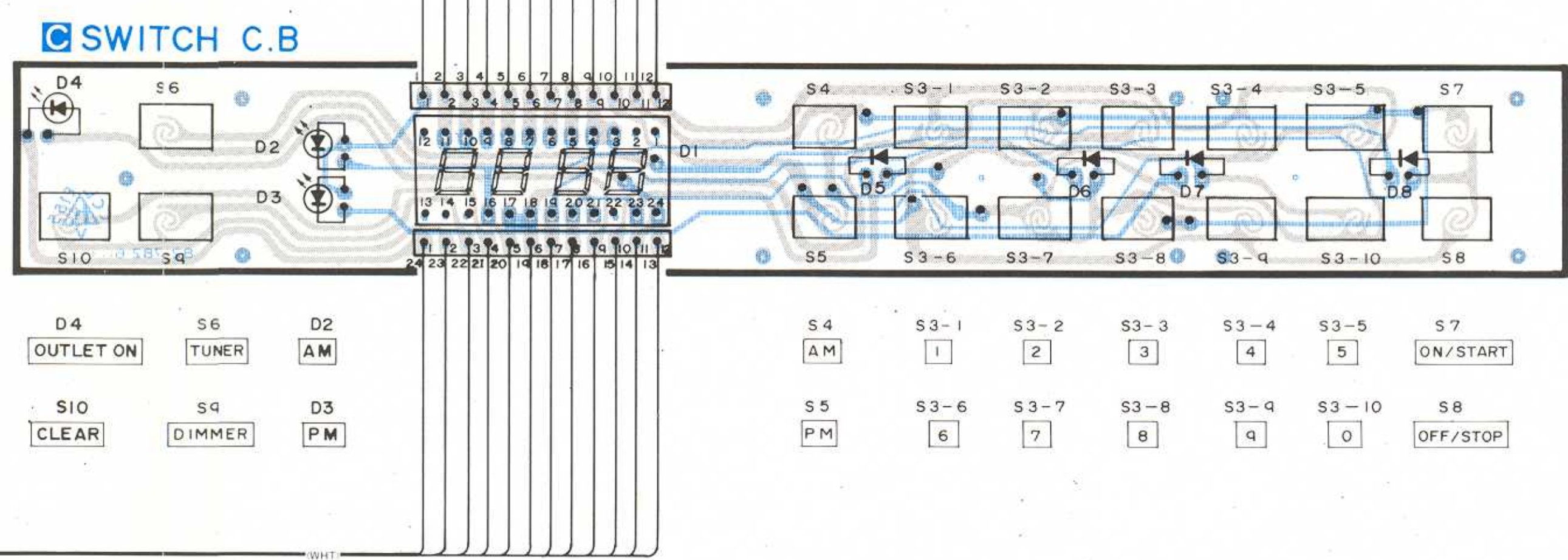
Frequency adjustment
 Do not adjust TC1 since it is set to 488.28125 micro-seconds. Connect a frequency counter to test point TP1 and check that the frequency is 2048 Hz.

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 (C).



D4	S6	D2	S4	S3-1	S3-2	S3-3	S3-4	S3-5	S7
OUTLET ON	TUNER	AM	AM	1	2	3	4	5	ON/START
S10	S9	D3	S5	S3-6	S3-7	S3-8	S3-9	S3-10	S8
CLEAR	DIMMER	PM	PM	6	7	8	9	0	OFF/STOP