


# XR-C8220

## SERVICE MANUAL

US Model  
E Model



For RM-X4S (Remote Commander), please refer to RM-X4S Service Manual (9-925-698-III) previously issued.

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Model Name Using Similar Mechanism	XR-C9100
Tape Transport Mechanism Type	MG-25D-136

### SPECIFICATIONS

#### Cassette player section

Tape track	4-track 2-channel stereo
Wow and flutter	0.08 % (WRMS)
Frequency response	30 - 20,000 Hz
Signal-to-noise ratio	

Cassette type	Dolby B NR	Dolby NR off
TYPE II, IV	67 dB	61 dB
TYPE I	64 dB	58 dB

#### Tuner section

<b>FM</b>	
Tuning range	FM tuning interval: 50 kHz/200 kHz switchable 87.5 - 108.0 MHz (at 50 kHz step) 87.5 - 107.9 MHz (at 200 kHz step)
Aerial terminal	External aerial connector
Intermediate frequency	10.7 MHz
Usable sensitivity	8 dBf
Selectivity	75 dB at 400 kHz
Signal-to-noise ratio	65 dB (stereo), 68 dB (mono)
Harmonic distortion at 1 kHz	0.7 % (stereo), 0.4 % (mono)
Separation	35 dB at 1 kHz
Frequency response	30 - 15,000 Hz

<b>AM</b>	
Tuning range	AM tuning interval: 9 kHz/10 kHz switchable 531 - 1,602 kHz (at 9 kHz step) (E model) 530 - 1,710 kHz (at 10 kHz step)
Aerial terminal	External aerial connector
Intermediate frequency	10.71 MHz/450 kHz
Sensitivity	30 $\mu$ V

#### Power amplifier section

Outputs	Speaker outputs (sure seal connectors)
Speaker impedance	4 - 8 ohms
Maximum power output	45 W $\times$ 4 (at 4 ohms)

#### General

Outputs	Line outputs (2) Subwoofer output (1) Power aerial relay control lead Power amplifier control lead Telephone ATT control lead Illumination control lead
Tone controls	Bass $\pm$ 8 dB at 100 Hz Treble $\pm$ 8 dB at 10 kHz
Power requirements	12 V DC car battery (negative ground)
Dimensions	Approx. 178 $\times$ 50 $\times$ 180 mm (w/h/d)
Mounting dimensions	Approx. 182 $\times$ 53 $\times$ 160 mm (w/h/d)
Mass	Approx. 1.5 kg
Supplied accessories	Rotary commander (1) Card remote commander (1) Parts for installation and connections (1 set) Front panel case (1)

*Design and specifications are subject to change without notice.*

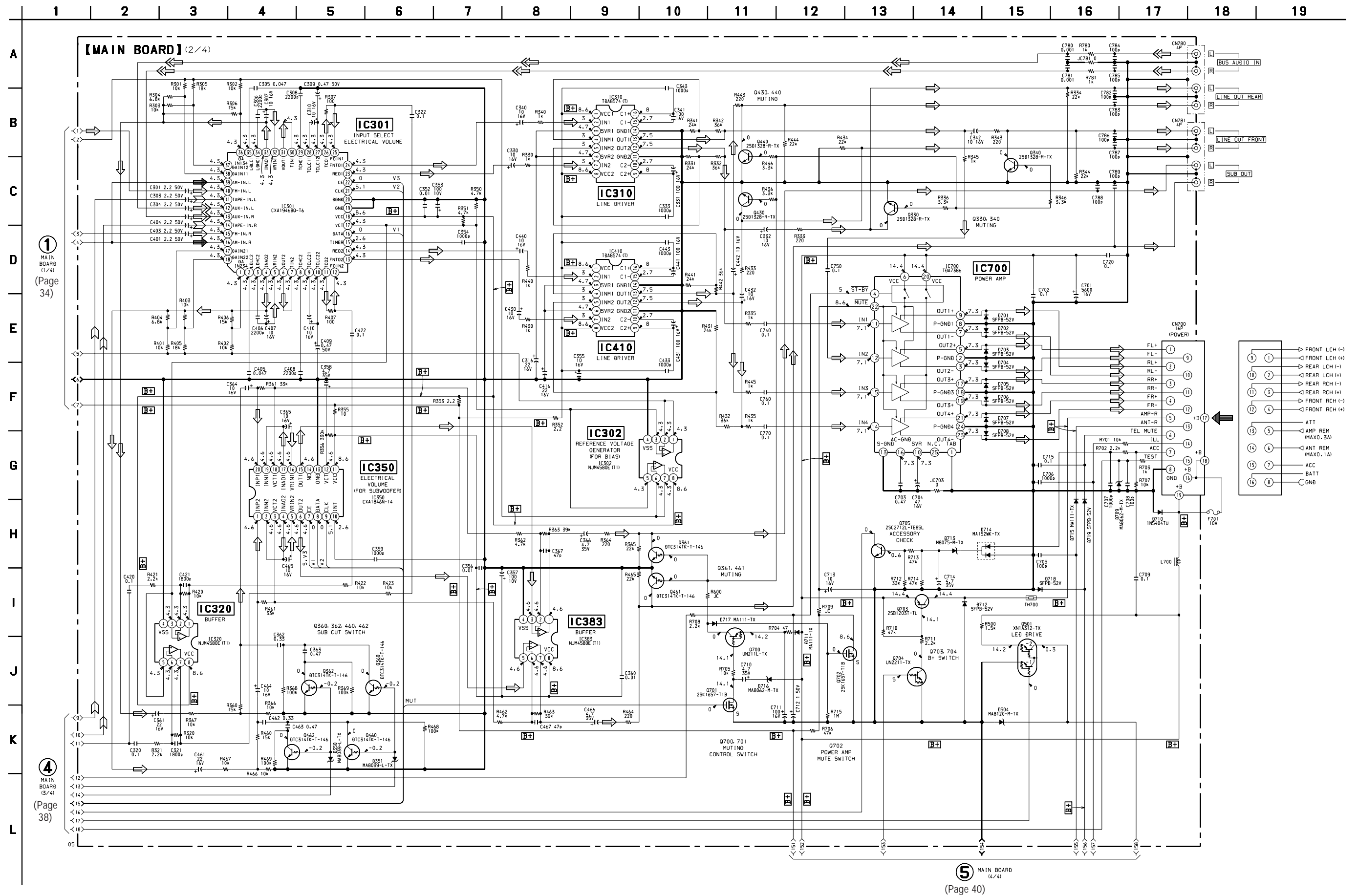
## FM/AM CASSETTE CAR STEREO



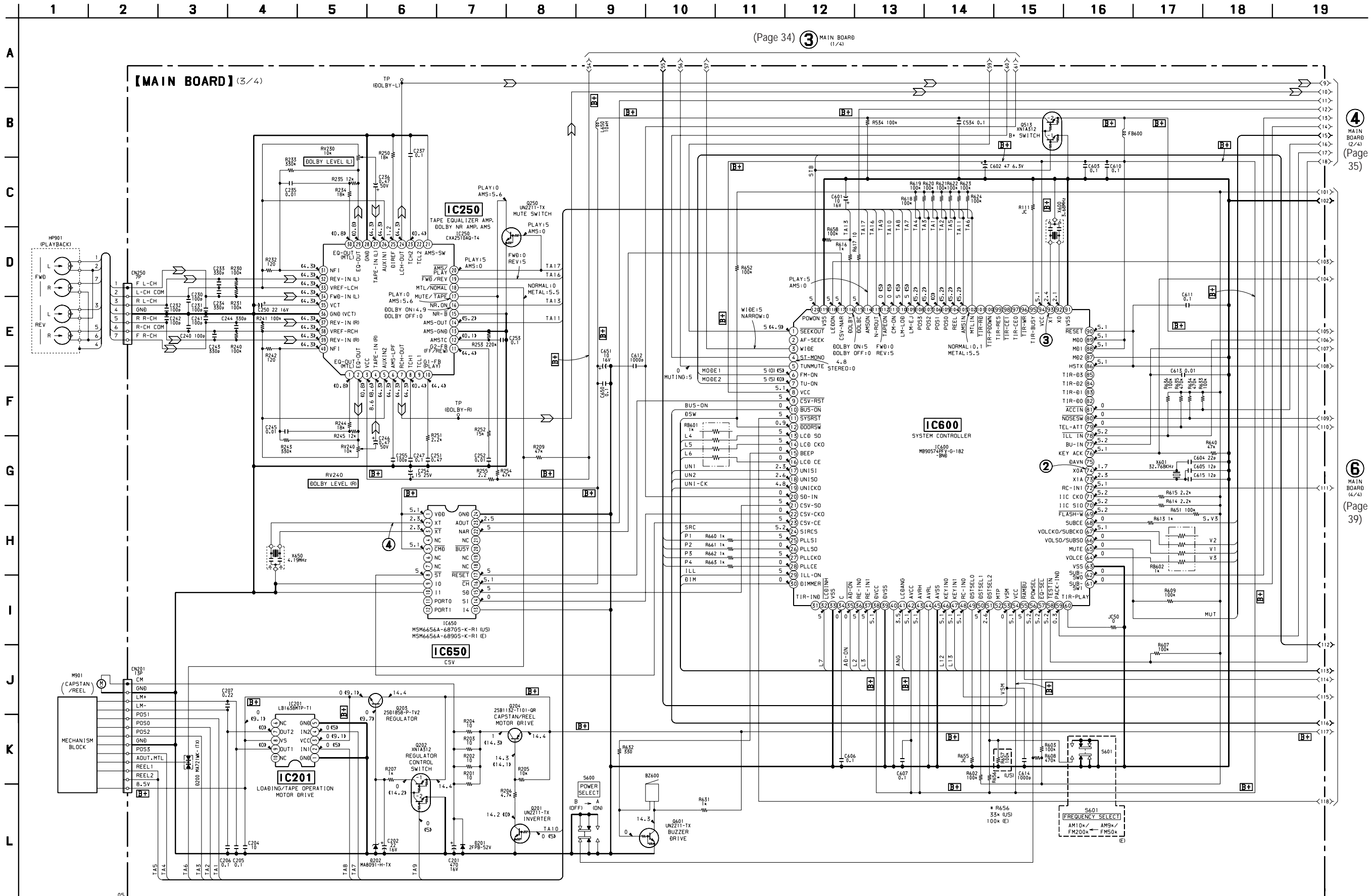
# SONY®



6-9. SCHEMATIC DIAGRAM – MAIN Section (2/4) – • See page 48 for IC Block Diagrams.



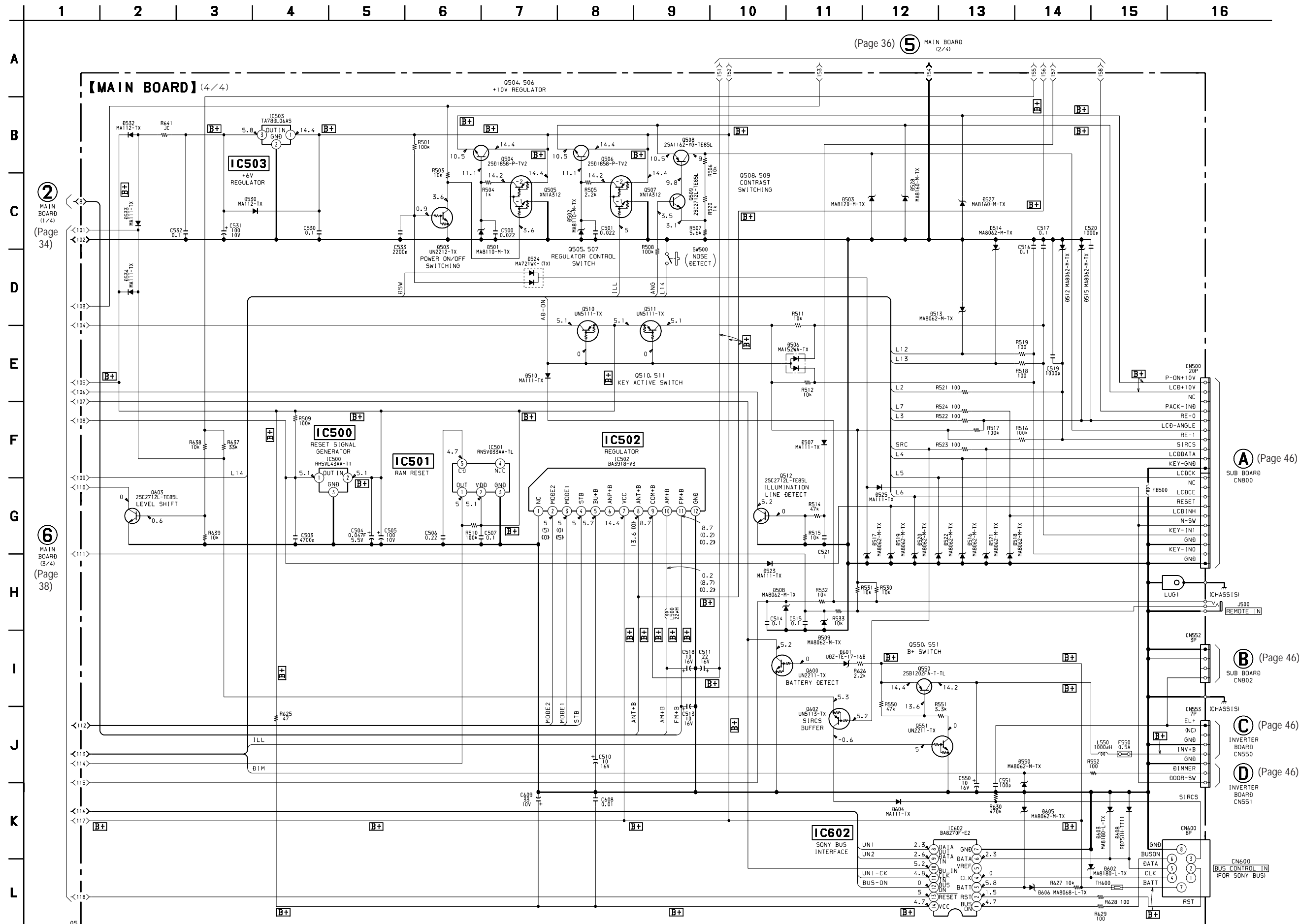
6-10. SCHEMATIC DIAGRAM – MAIN Section (3/4) – • See page 28 for Waveforms. • See page 47 for IC Block Diagrams.



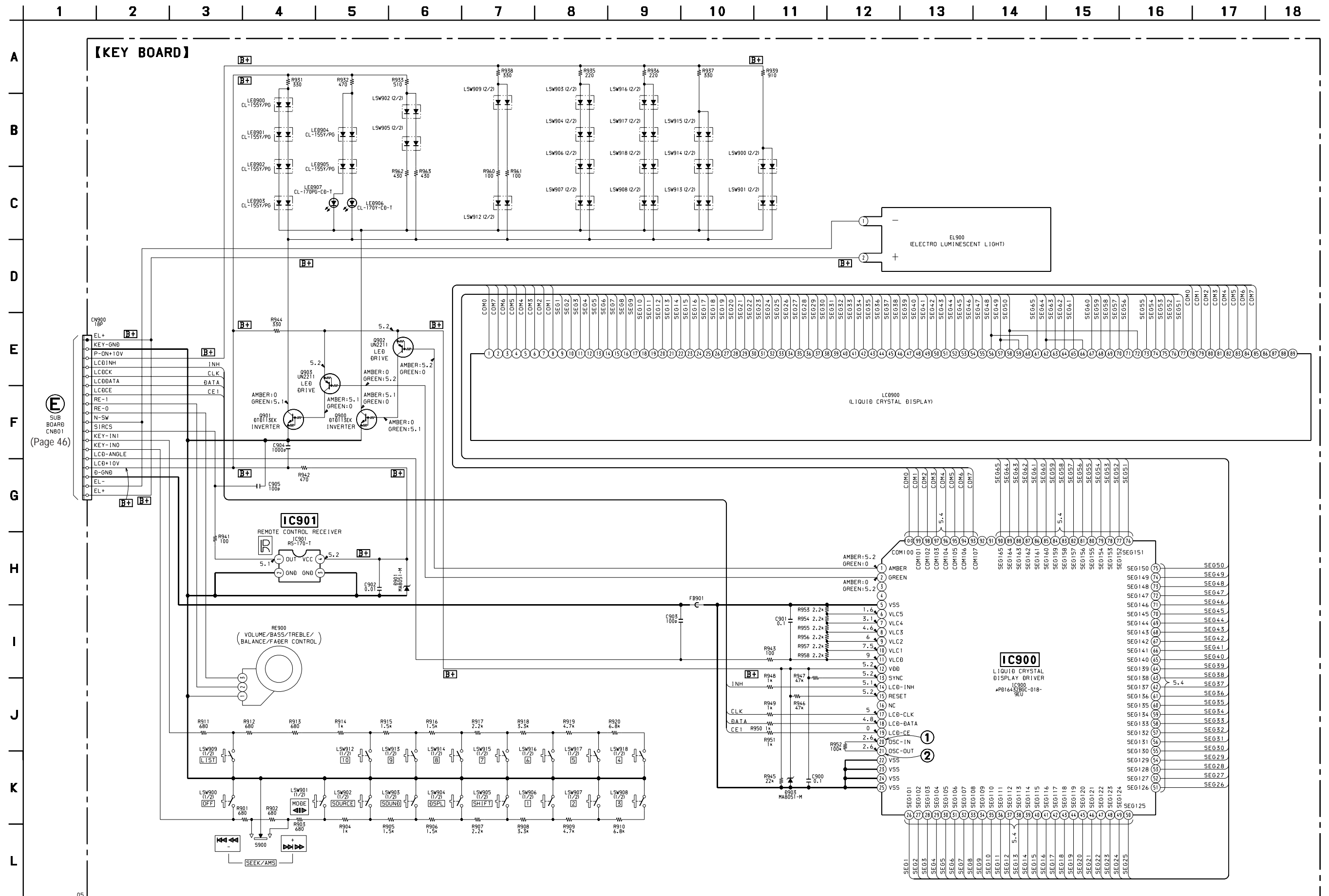
④ MAIN BOARD (2/4) (Page 35)

⑥ MAIN BOARD (4/4) (Page 39)

6-11. SCHEMATIC DIAGRAM – MAIN Section (4/4) – • See page 49 for IC Block Diagrams.



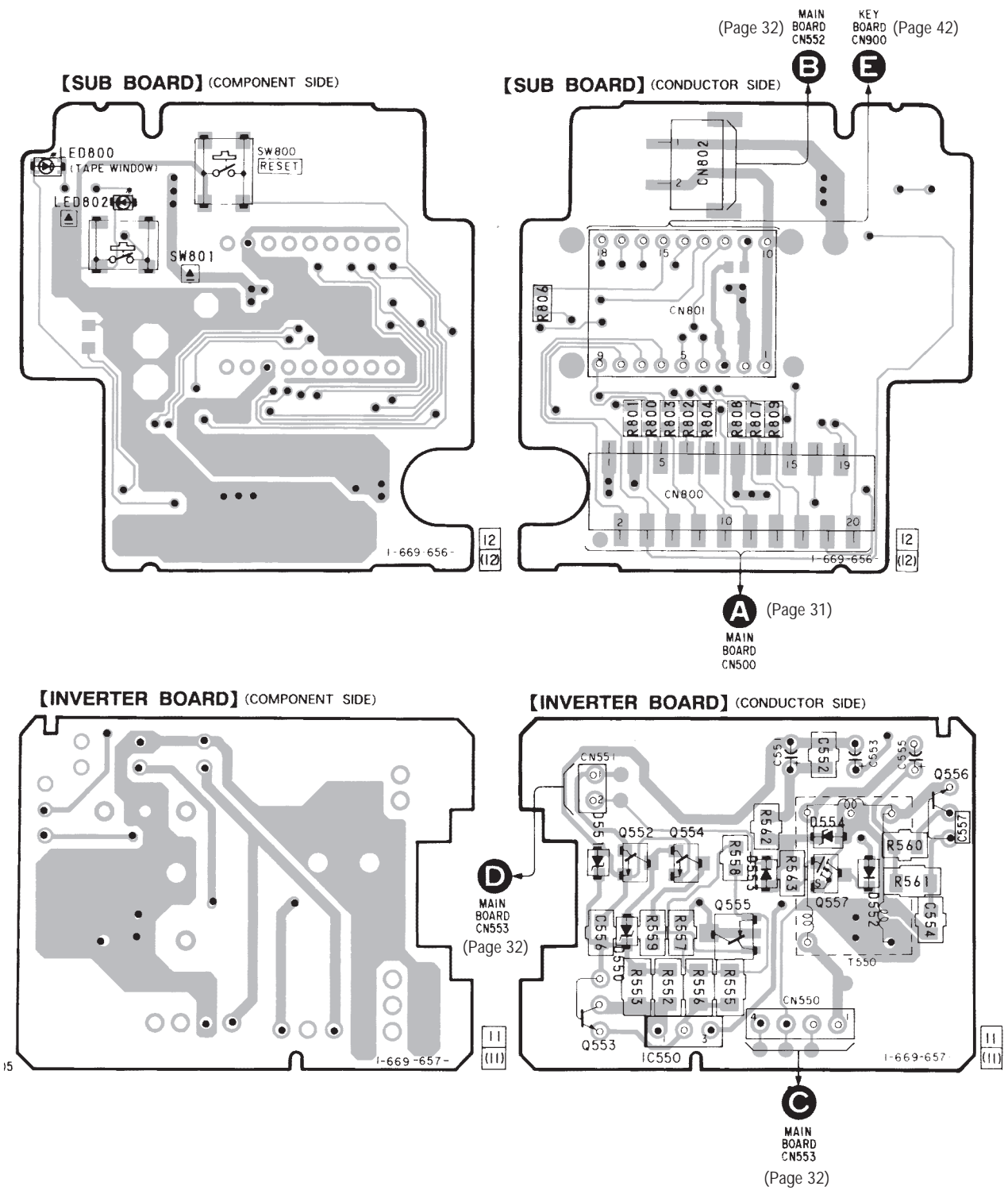
6-13. SCHEMATIC DIAGRAM – PANEL Section – • See page 28 for Waveforms.



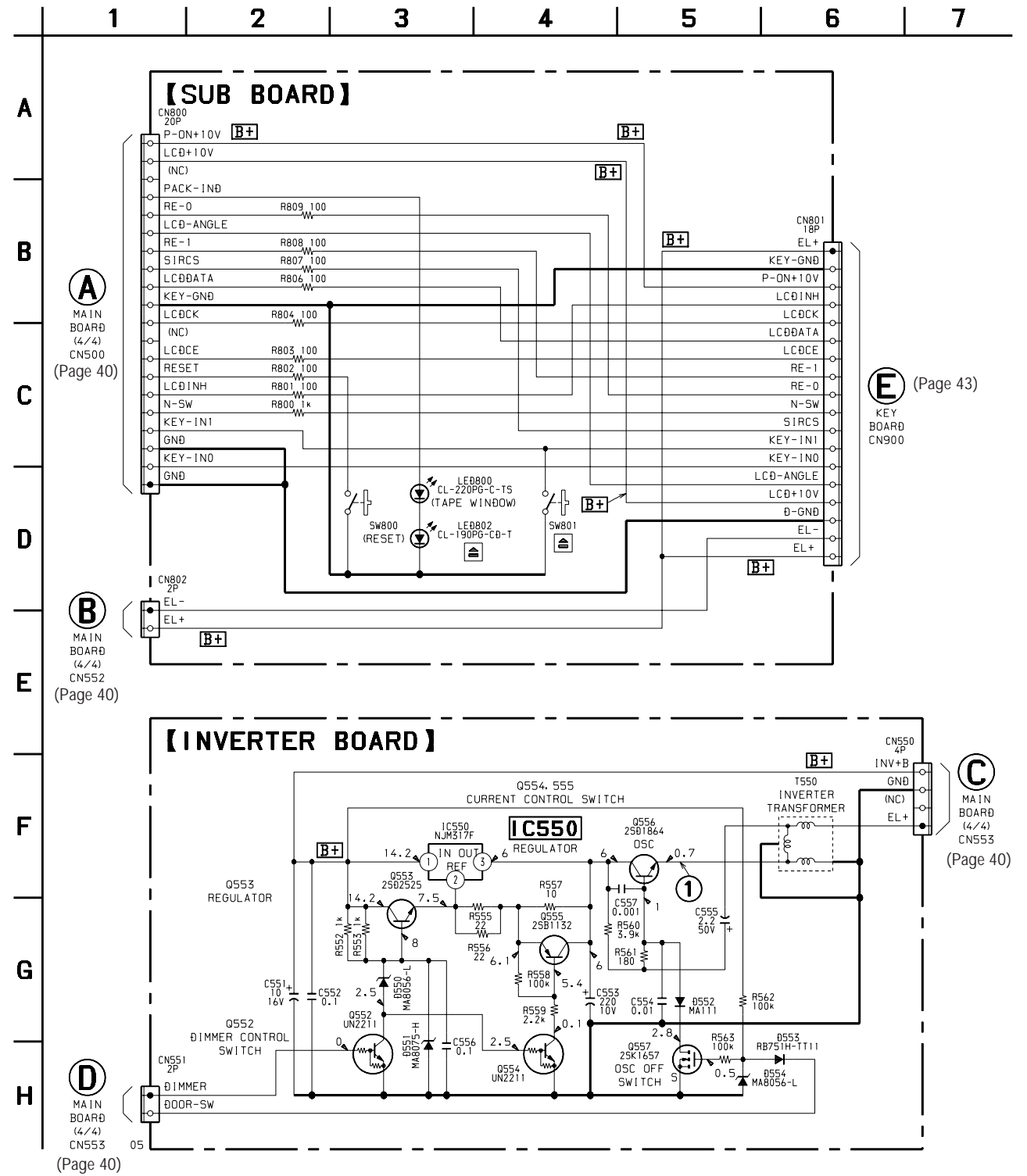
(E) SUB BOARD CN801 (Page 46)



6-14. PRINTED WIRING BOARD – SUB/INVERTER Section –

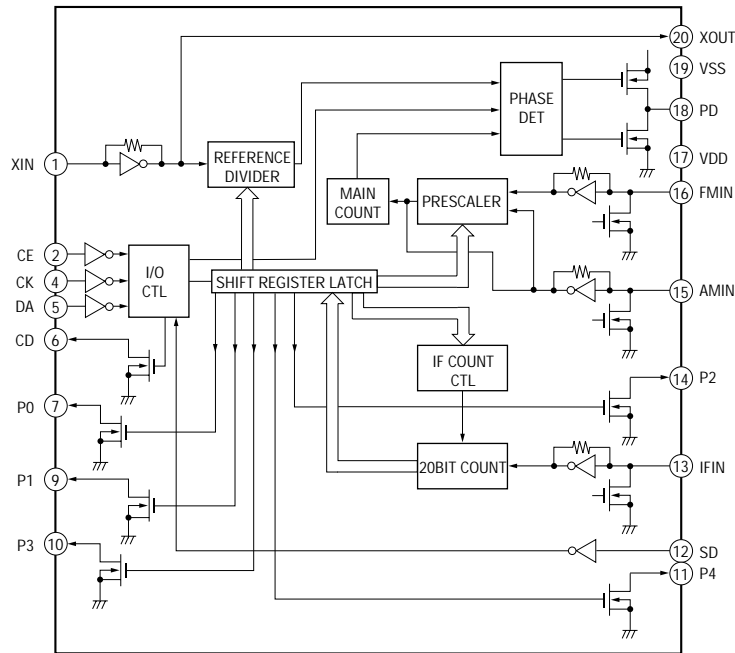


6-15. SCHEMATIC DIAGRAM – SUB/INVERTER Section – • See page 28 for Waveform.

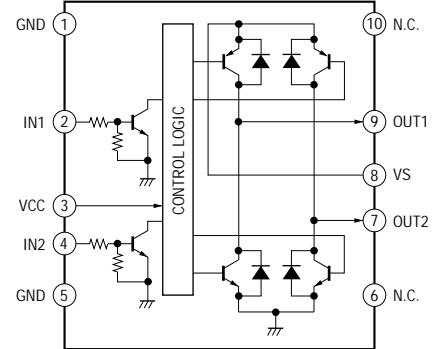


• IC Block Diagrams  
– MAIN Board –

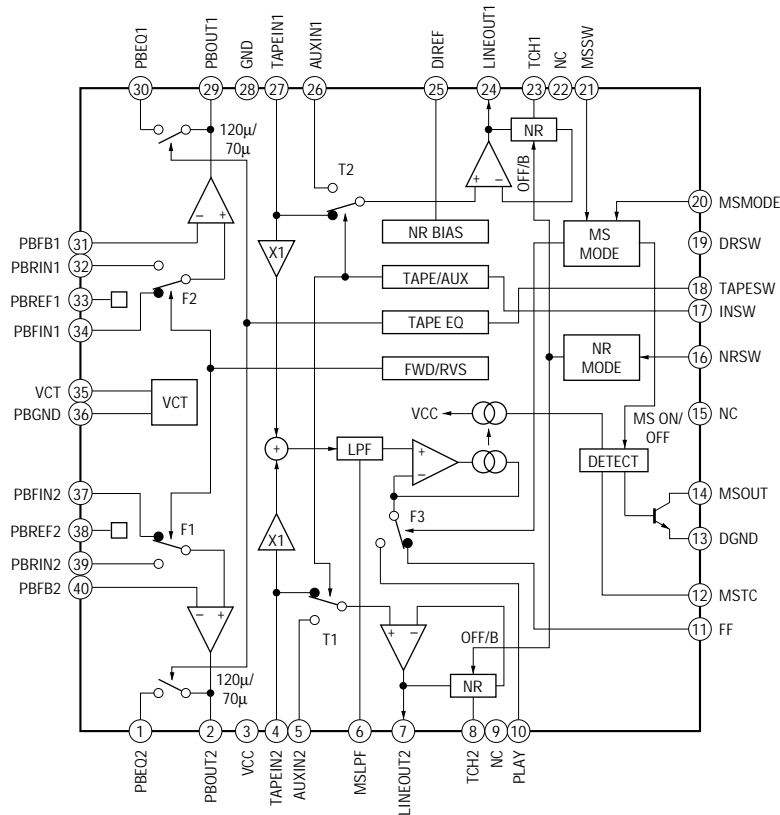
IC10 BU2624FV-E2



IC201 LB1638M

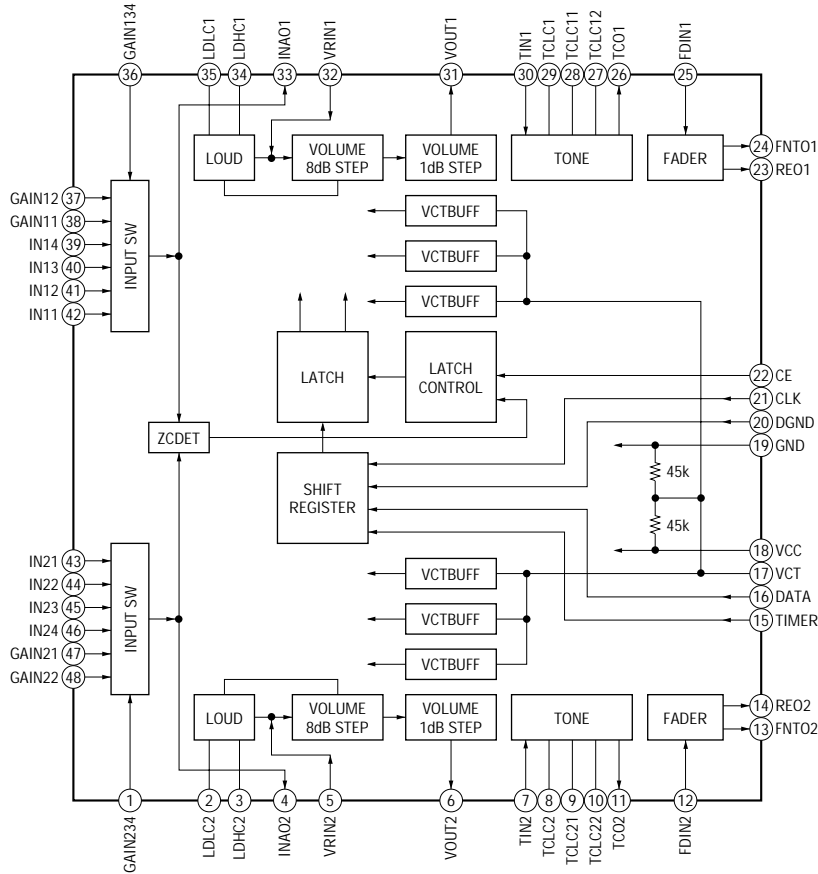


IC250 CXA2510AQ-T4

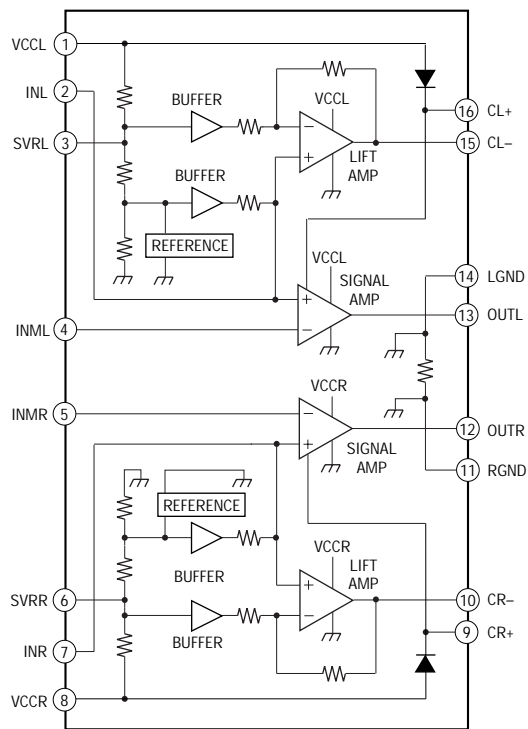




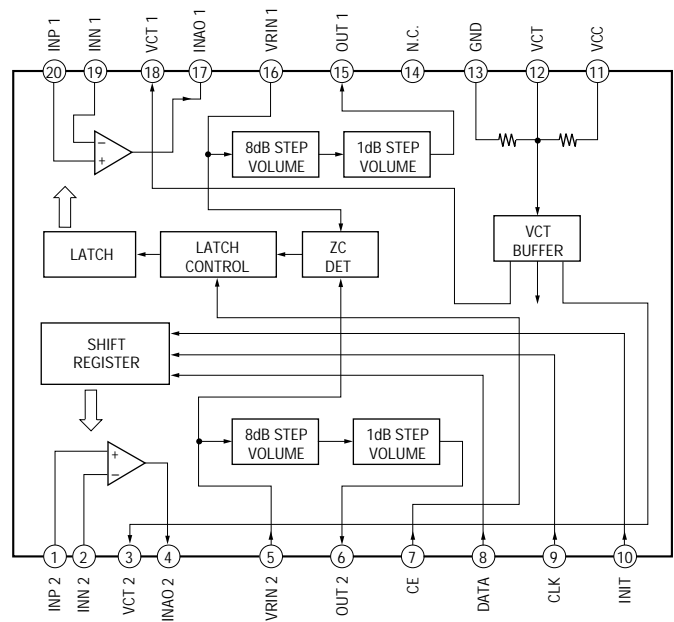
**IC301 CXA1946BQ-T6**



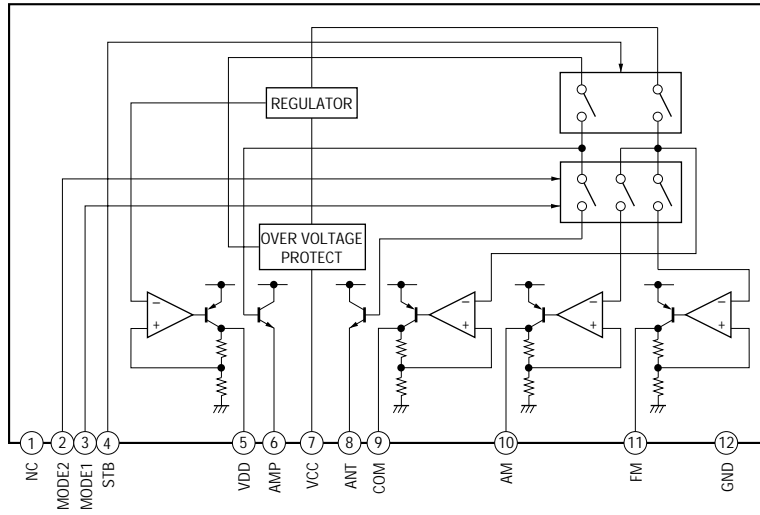
**IC310, 410 TDA8574 (T)**



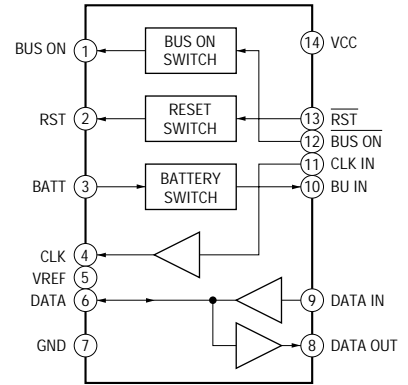
**IC350 CXA1846BN-T4**



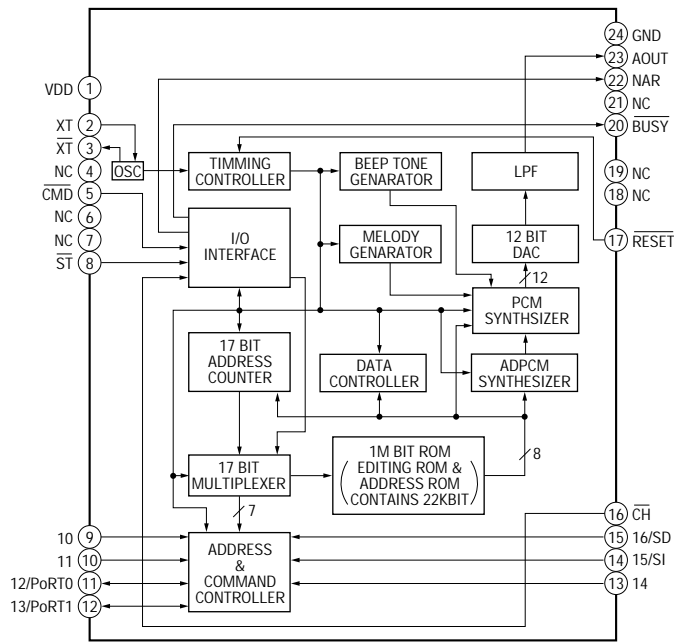
**IC502 BA3918-V3**



**IC602 BA8270F-E2**










**IC650 MSM6656A-687GS-KR1 (US model)**  
**IC650 MSM6656A-689GS-KR1 (E model)**



## 6-16. IC PIN FUNCTION DESCRIPTION

### • MAIN BOARD IC600 MB90574PFV-G-182-BND (SYSTEM CONTROLLER)

Pin No.	Pin Name	I/O	Function
1	<u>SEEKOUT</u>	O	Seek control signal output to the FM/AM tuner unit (TUX10) AM mode: Used for IF count output/SD output request/AGC cut at SEEK or BTM FM mode: Used for SD speed up at SEEK, BTM, or AF “L” is output at tuner off
2	AF-SEEK	O	PLL low-pass filter time constant selection signal output at AF SEEK “H” is output when AF SEEK Not used (open)
3	WIDE	O	IF band select signal output to the FM/AM tuner unit (TUX10) “H”: wide mode In receiving FM signals, interference noise from adjacent stations is removed by narrowing the IF band automatically in the tuner unit so as to raise the selectivity, but in this case, the distortion may increase and accordingly, the IF band is widened forcibly
4	ST-MONO	I/O	FM stereo broadcasting detection signal input from the FM/AM tuner unit (TUX10), or forced monaural control signal output to the FM/AM tuner unit (TUX10) “L” is input in the FM stereo mode, or “L” is output in the forced monaural mode
5	TUNMUTE	O	Muting on/off control signal output of the FM and AM tuner signal “H”: muting on
6	FM-ON	O	FM system power supply on/off control signal output to the BA3918 (IC502) “L”: AM power on, “H”: FM power on
7	TU-ON	O	Tuner system power supply on/off control signal output to the BA3918 (IC502) “H”: tuner power on
8	VCC	—	Power supply terminal (+5V)
9	<u>CSV-RST</u>	O	Reset signal output to the CSV (IC650) “L”: reset
10	<u>BUS-ON</u>	O	Bus on/off control signal output to the SONY bus interface (IC602) “L”: bus on
11	<u>SYRST</u>	O	Reset signal output to the SONY bus interface (IC602) “L”: reset
12	<u>DOORSW</u>	I	Front panel open/close detection signal input “L” is input when the front panel is closed
13	LCD SO	O	Serial data output to the liquid crystal display driver (IC900)
14	LCD CKO	O	Serial data transfer clock signal output to the liquid crystal display driver (IC900)
15	BEEP	O	Beep sound drive signal output terminal
16	LCD CE	O	Chip enable signal output to the liquid crystal display driver (IC900) “H” active
17	UNISI	I	Serial data input from the SONY bus interface (IC602)
18	UNISO	O	Serial data output to the SONY bus interface (IC602)
19	UNICKO	O	Serial data transfer clock signal output to the SONY bus interface (IC602)
20	SD-IN	I	Station detector detect input from the FM/AM tuner unit (TUX10) Stop level for SEEK, BTM, etc. is determined SD is present at input of “H”
21	CSV-SO	O	Serial data output to the CSV (IC650)
22	CSV-CKO	O	Serial data transfer clock signal output to the CSV (IC650)
23	CSV-CE	O	Chip enable signal output to the CSV (IC650) “L” active
24	SIRCS	I	Sircs remote control signal input from the remote control receiver (IC901)
25	PLLSI	I	PLL serial data input from the FM/AM PLL (IC10)
26	PLL SO	O	PLL serial data output to the FM/AM PLL (IC10)
27	PLLCKO	O	PLL serial data transfer clock signal output to the FM/AM PLL (IC10)
28	PLLCE	O	PLL chip enable signal output to the FM/AM PLL (IC10) “H” active
29	ILL-ON	O	Power on/off control signal output of the illumination LED and liquid crystal display driver (IC900) “H”: power on Depends on initial setting of power select switch (S600) Power select switch (S600) on: “H” output at the accessory on Power select switch (S600) off: “H” output at the power on
30	DIMMER	I/O	Dimmer control in/out terminal At initial mode: The presence of dimmer select function is set (if this status, if “L” is input, the dimmer select function is present) At normal mode: LCD back light brightness control signal output
31	TIR-IND	O	LED drive signal output of the TIR indicator “H”: LED on Not used (open)

Pin No.	Pin Name	I/O	Function
32	LCD INH	O	Blank indicate control signal output to the liquid crystal display driver (IC900) "L": no display
33	VSS	—	Ground terminal
34	C	—	Connected to coupling capacitor for the power supply
35	AD-ON	O	A/D converter power control signal output terminal When the KEYACK (pin ⑩) that controls reference voltage power for key A/D conversion input is active, "L" is output from this terminal to enable the input
36	RE-IN0	I	Dial pulse input of the rotary encoder (RE900) (for VOLUME/BASS/TREBLE/BALANCE/FADER control)
37	RE-IN1	I	
38	DVCC	—	Power supply terminal (+5V) (for D/A converter)
39	DVSS	—	Ground terminal (for D/A converter)
40	—	I	Not used (fixed at "L")
41	LCDANG	O	View field angle control signal is output when front panel is fully opened "H": front panel is fully opened
42	AVCC	—	Power supply terminal (+5V) (for A/D converter)
43	AVRH	I	Reference voltage (+5V) input terminal (for A/D converter)
44	AVRL	I	Reference voltage (0V) input terminal (for A/D converter)
45	AVSS	—	Ground terminal (for A/D converter)
46	KEYIN0	I	Key input terminal (A/D input) (LSW900, S900, LSW901 to LSW908) OFF, SEEK/AMS +     -, MODE  , SOURCE, SOUND, DSPL, SHIFT, 1, 2, 3 keys input
47	KEYIN1	I	Key input terminal (A/D input) (SW801, LSW909, LSW912 to LSW918)  , LIST, 10, 9, 8, 7, 6, 5, 4 keys input
48	RC-IN0	I	Rotary remote commander key input terminal (A/D input)
49	DSTSEL0	I	Destination setting terminal (fixed at "L")
50	DSTSEL1	I	Destination setting terminal (fixed at "H")
51	DSTSEL2	I	Destination setting terminal (US model: fixed at 3/4 voltage, E model: frequency select switch input)
52	MTP	I	Multi-path detection signal input from the RDS decoder Not used (open)
53	VSM	I	FM and AM signal meter voltage detection input from the FM/AM tuner unit (TUX10) (A/D input)
54	VCC	—	Power supply terminal (+5V)
55	RAMBU	I	Internal RAM reset detection signal input from the RN5VD33AA (IC501) Input terminal to check that RAM data are not destroyed due to low voltage This checking is made within 100 msec after reset
56	POWSEL	I	Power select switch (S600) input terminal "L": off (halt mode), "H": on (operation mode)
57	EQ-SEL	I	Not used (fixed at "H")
58	TESTIN	I	Setting terminal for the test mode "L": test mode, Normally: fixed at "H"
59	PACK-IND	O	LED drive signal output of the tape window illumination and  indicators (LED800, 802) "H": LED on "H" is output to turn on LED when front panel is opened
60	TIR-PLAY	O	AM/TIR selection signal output terminal "L": AM signal, "H": TIR signal Not used (pull down)
61	SUB-SW1	O	Sub woofer output cut-off frequency select signal output terminal
62	SUB-SW0	O	Sub woofer output cut-off frequency select signal output terminal
63	VSS	—	Ground terminal
64	VOLCE	O	Chip enable signal output to the main electrical volume (IC301) "H": active
65	MUTE	O	Audio line muting on/off control signal output terminal "H": muting on
66	VOLSO/ SUBSO	O	Serial data output to the main electrical volume (IC301) and sub electrical volume (IC350)
67	VOLCKO/ SUBCKO	O	Serial data transfer clock signal output to the main electrical volume (IC301) and sub electrical volume (IC350)

Pin No.	Pin Name	I/O	Function
68	SUBCE	O	Chip enable signal output to the sub electrical volume (IC350) “H” active
69	<u>FLASH-W</u>	I	Internal flash memory data write mode detection signal input terminal “L”: data write mode Not used (fixed at “H” in this set)
70	IIC SIO	I/O	Two-way data bus with the external device Not sued (fixed at “H”)
71	IIC CKO	O	Bus clock signal output to the external device Not sued (pull-up)
72	RC-IN1	I	Rotary remote commander shift key input terminal “L”: shift
73	X1A	O	Sub system clock output terminal (32.768 kHz)
74	X0A	I	Sub system clock input terminal (32.768 kHz)
75	DAVN	I	Data transmit completed detect signal input from the RDS decoder “H” active Not sued (open)
76	KEYACK	I	Input of acknowledge signal for the key entry Acknowledge signal is input to accept function and eject keys in the power off status On at input of “H”
77	BU-IN	I	Battery detect signal input from the SONY bus interface (IC602) and battery detect circuit “L” is input at low voltage
78	<u>ILL IN</u>	I	Auto dimmer control illumination line detection signal input terminal “L” is input at dimmer detection
79	TEL-ATT	I	Telephone muting signal input terminal At input of “H”, the signal is attenuated by –20 dB
80	<u>NOSESW</u>	I	Front panel block remove/attach detection switch (SW500) input terminal “L”: front panel is attached
81	<u>ACC IN</u>	I	Accessory detect signal input terminal “L”: accessory on
82 to 85	TIR-D0 to TIR-D3	I/O	Two-way data bus with the external device Not used (open)
86	HSTX	I	Hardware standby input terminal “L”: hardware standby mode Reset signal input in this set
87	MD2	I	Setting terminal for the CPU operational mode (fixed at “L” in this set)
88	MD1	I	Setting terminal for the CPU operational mode (fixed at “H” in this set)
89	MD0	I	Setting terminal for the CPU operational mode (fixed at “H” in this set)
90	<u>RESET</u>	I	System reset signal input from the reset signal generator (IC500) and reset switch (SW800) “L”: reset “L” is input for several 100 msec after power on, then it changes to “H”
91	VSS	—	Ground terminal
92	X0	I	Main system clock input terminal (3.68 MHz)
93	X1	O	Main system clock output terminal (3.68 MHz)
94	VCC	—	Power supply terminal (+5V)
95	<u>TIR-BUSY</u>	I	Busy detection signal input from the external device Not used (fixed at “L”)
96	<u>TIR-WR</u>	O	Data write strobe signal output to the external device Not used (open)
97	<u>TIR-CE0</u>	O	Chip enable signal output to the external device Not used (open)
98	<u>TIR-CE1</u>	O	Chip enable signal output to the external device Not used (open)
99	<u>TIR-RES</u>	O	Reset signal output to the external device “H”: reset Not used (open)
100	<u>TIR-PDOWN</u>	O	Power down control signal output to the external device “L”: power down Not used (open)
101	<u>TIR-RD</u>	O	Data read strobe signal output to the external device Not used (open)
102	MTLIN	I	Metal detection signal input terminal “L”: normal position, “H”: metal position
103	AMSIN	I	Whether a music is present or not from CXA2510AQ (IC250) is detected at auto music sensor “L”: music is present, “H”: music is not present
104	REEL	I	Rotation detect signal input from supply reel sensor and take-up reel sensor on the deck mechanism
105	POS0	I	Tape position (EJECT/FF/REW/ REV/FWD mode) detect input from the tape operation switch on the deck mechanism POS0: “L”: EJECT mode, “H”: others mode POS1: “L”: FF and FWD mode, “H”: others mode POS2: “L”: REW mode, “H”: others mode POS3: “L”: REV and EJECT mode, “H”: others mode
106	POS1	I	
107	POS2	I	
108	POS3	I	
109	LM-EJ	O	Motor drive signal output to the loading/tape operation motor drive (IC201) “H” active (For the eject direction and reverse side operation) *1

Pin No.	Pin Name	I/O	Function
110	LM-LOD	O	Motor drive signal output to the loading/tape operation motor drive (IC201) "H" active (For the loading direction and forward side operation) *1
111	CM-ON	O	Capstan/reel motor (M901) drive signal output terminal "H": motor on
112	TAPEON	O	Tape system power supply on/off control signal output terminal "H": tape on
113	N-ROUT	O	Forward/reverse direction control signal output to the CXA2510AQ (IC250) "L": forward direction, "H": reverse direction
114	AMSON	O	Tape auto music sensor control signal output to the CXA2510AQ (IC250) "L" is output to lower the gain for audio level at FF/REW mode
115	DOLBC	O	Standby on/off control signal output to the power amplifier (IC700) "L": standby mode, "H": amp on
116	DOLBY	I/O	Dolby control in/out terminal At initial mode: valid/invalid selection input of dolby function (valid at "L" input) At normal mode: dolby on/off control signal output to the CXA2510AQ (IC250) (dolby on at "H" output)
117	CSV-NAR	I	"H" is input when CSV (IC650) sends data
118	LEDON	O	Power supply on/off control signal output of the illumination LED "H": power on
119	VSS	—	Ground terminal
120	POWON	O	Main system power supply on/off control signal output to the BA3918 (IC502) "H": power on

\*1 Loading/tape operation motor control

Terminal \ Mode	STOP	LOADING/ FORWARD	EJECT/ REVERSE	BRAKE
	LM-LOD (pin ⑩)	"L"	"H"	"L"
LM-EJ (pin ⑨)	"L"	"L"	"H"	"H"