

HCD-C20/G202

SERVICE MANUAL

Ver 1.1 2001.06



Photo: HCD-C20 (AEP model)

HCD-C20/G202 is the tuner, deck, CD and amplifier section in MHC-C20/G202.

US Model
Canadian Model
HCD-G202

AEP Model
UK Model
E Model
Australian Model
HCD-C20

CD SECTION	Model Name Using Similar Mechanism		NEW
	CD Mechanism Type		CX3
	Base Unit Type		KSM-213BCM
	Optical Pick-up Type		KSS-213B/S-N
TAPE DECK SECTION	Model Name Using Similar Mechanism		HCD-H100
	Tape Transport Mechanism Type	DECK-A	TK20FX-SW943-800
		DECK-B	TK20FX-SW943-800

SPECIFICATIONS

For the U.S. model

AUDIO POWER SPECIFICATIONS

POWER OUTPUT AND TOTAL HARMONIC DISTORTION:

With 6 ohm loads, both channels driven, from 70 – 20,000 Hz; rated 32 watts per channel minimum RMS power, with no more than 0.9% total harmonic distortion from 250 milliwatts to rated output.

Amplifier section

Continuous RMS power output
EXCEPT AEP, UK models : 40 + 40 watts
(6 ohms at 1 kHz,
10% THD)

AEP, UK models : 28 + 28 watts
(8 ohms at 1 kHz,
10% THD)

Music power output (US, Canadian models)

75 + 75 W

Peak music power output (EXCEPT US, Canadian,
AEP, UK models)

550 watts

Music power output (AEP, UK models)

50 + 50 watts

DIN power output (AEP, UK models)

20 watts + 20 watts
(8 ohms, at 1 kHz, DIN)

Outputs
PHONES (stereo phone
jack): accepts
headphones of 8 ohms or
more.
SPEAKER: accepts
impedance of 8 to
16 ohms.

CD player section

System	Compact disc and digital audio system
Laser	Semiconductor laser ($\lambda=780 - 790$ nm) Emission duration: continuous
Laser output	Max. 400 μ W* *This output is the value measured at a distance of 200 mm from the objective lens surface on the Optical Pick-up Block with 7 mm aperture.
Frequency response	40 Hz – 16 kHz (± 0.5 dB)

Tape player section

Recording system	4-track 2-channel stereo
Frequency response	60 – 13,000 Hz (± 3 dB), using Sony TYPE I cassette

Tuner section

FM stereo, FM/AM superheterodyne tuner

FM tuner section

Tuning range	87.5 – 108.0 MHz
Antenna	FM lead antenna
Antenna terminals	75 ohm unbalanced
Intermediate frequency	10.7 MHz

AM tuner section

Tuning range	
US, Canadian, Mexican models:	
	530 – 1,710 kHz (with the tuning interval set at 10 kHz)
AEP, UK, Australian models:	
	531 – 1,602 kHz (with the interval set at 9 kHz)
Other models:	
	531 – 1,602 kHz (with the tuning interval set at 9 kHz)
	530 – 1,710 kHz (with the tuning interval set at 10 kHz)
Antenna	AM loop antenna External antenna terminals
Intermediate frequency	450 kHz

— Continued on next page —

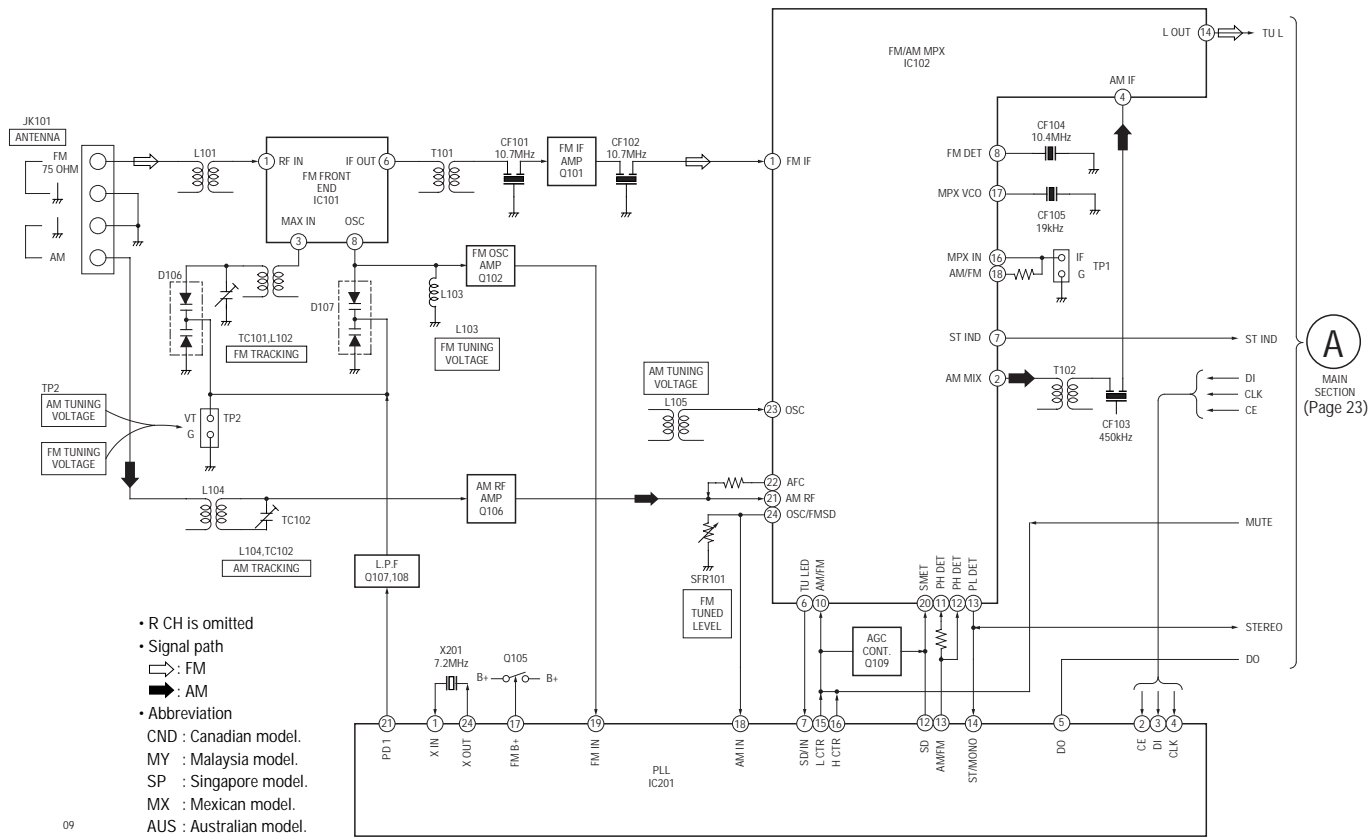
COMPACT DISC DECK RECEIVER

9-960-868-12
2001F0200-1
© 2001.6

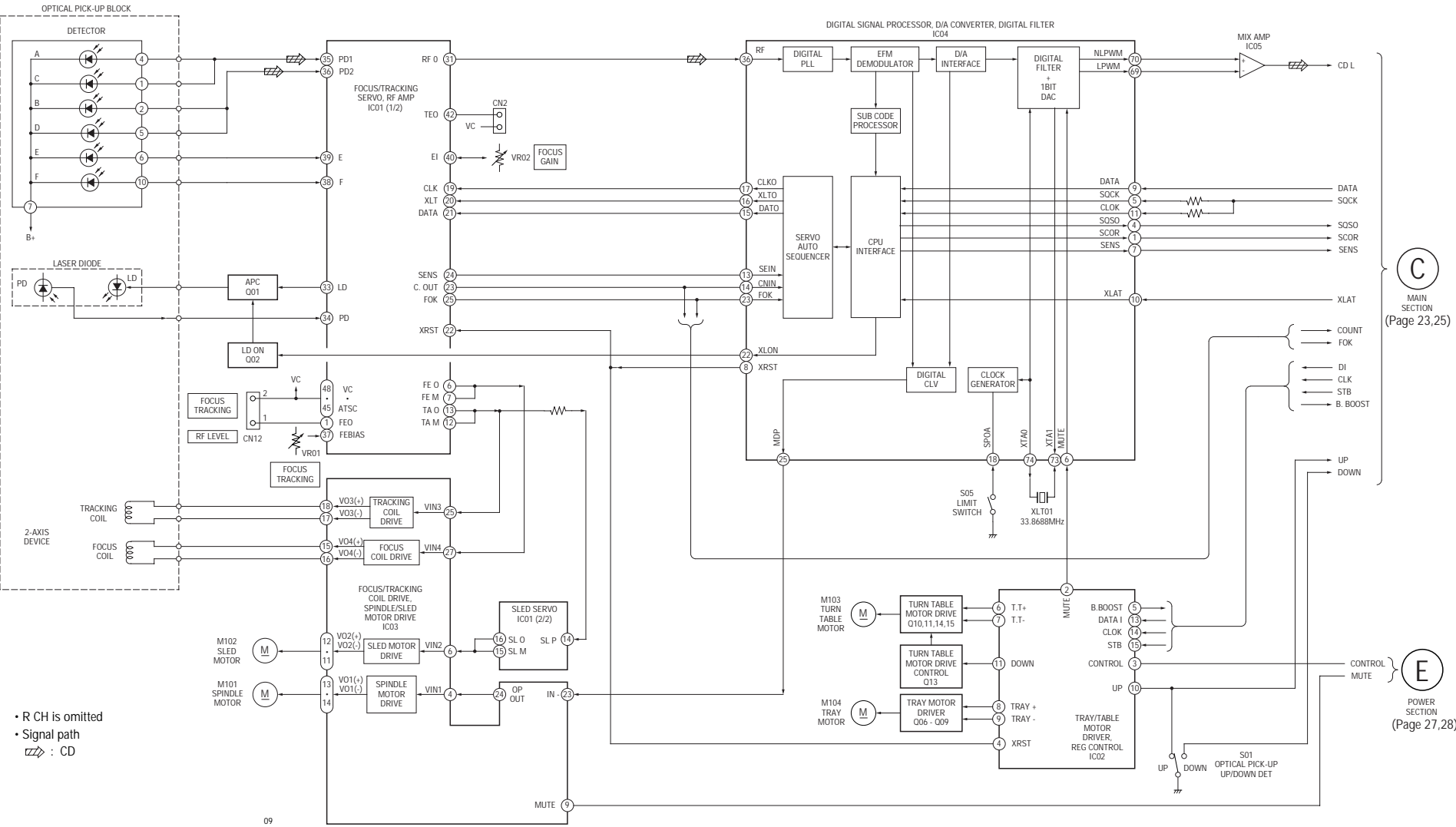
Sony Corporation
Home Audio Company
Shinagawa Tec Service Manual Production Group

SONY®

5-2. BLOCK DIAGRAMS
— TUNER SECTION — (US, CND, E, MY, SP, MX, AUS MODELS)



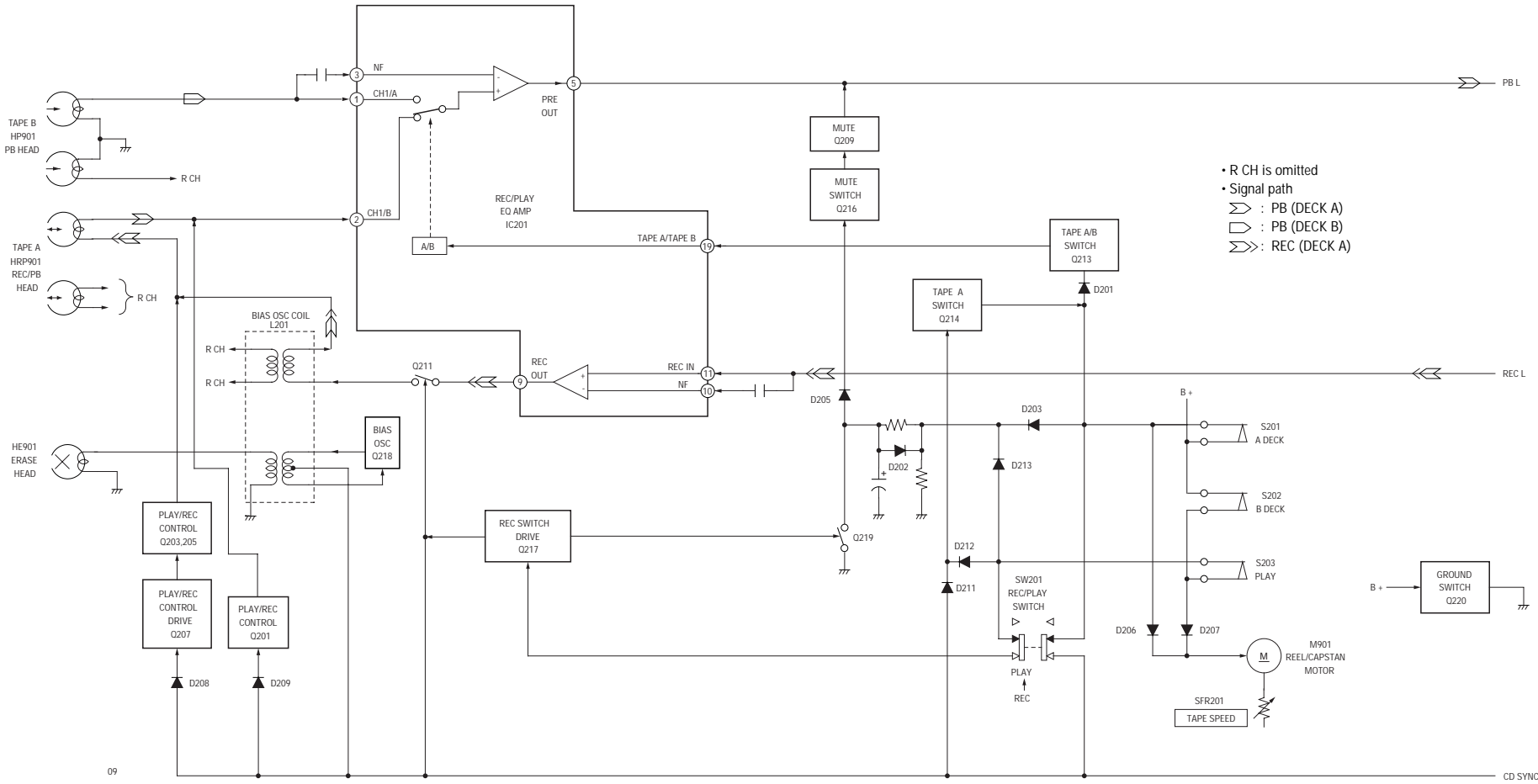




C
MAIN
SECTION
(Page 23,25)

E
POWER
SECTION
(Page 27,28)

— DECK SECTION —



(B)
MAIN
SECTION
(Page 23,25)

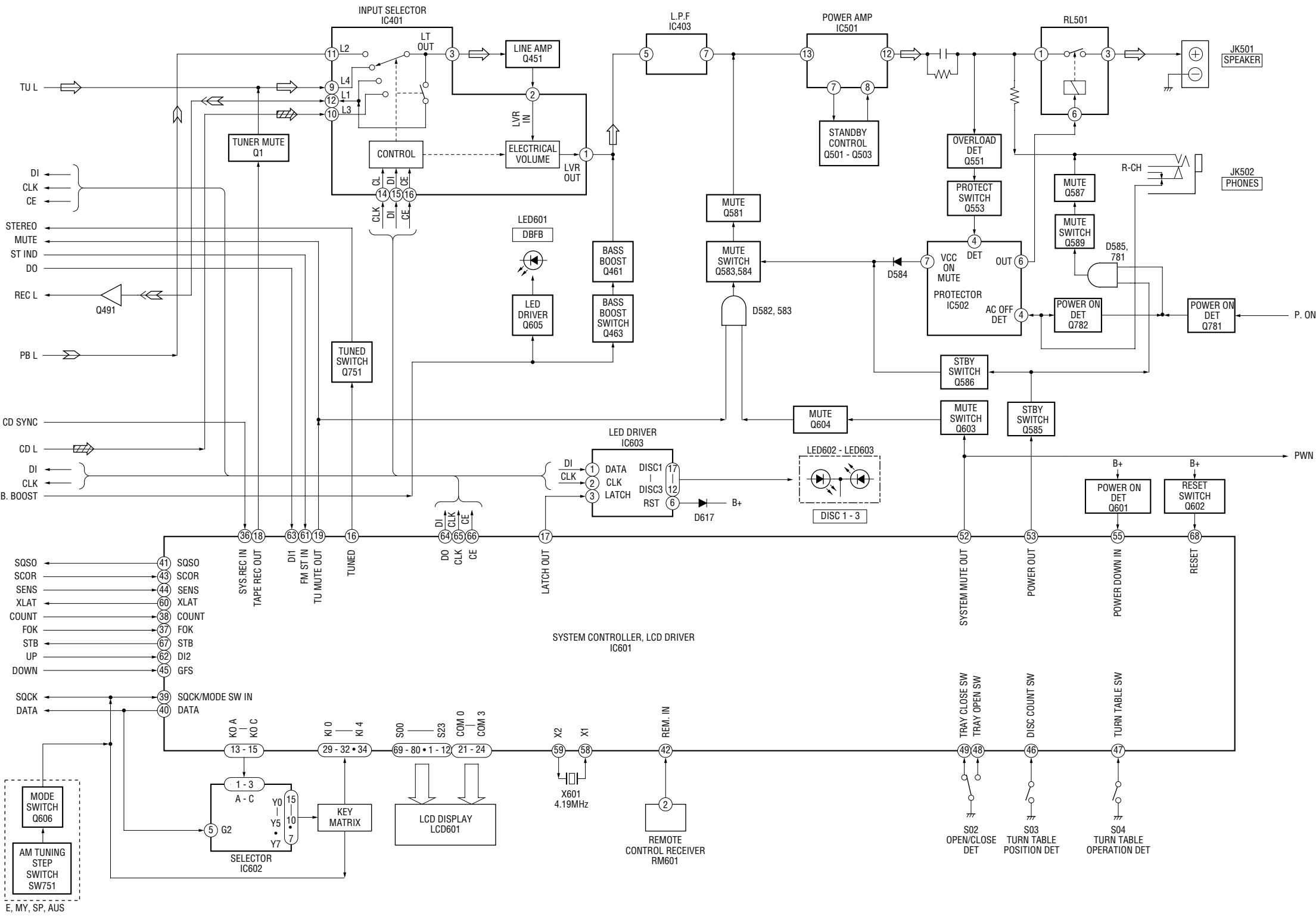
— MAIN SECTION — (US, CND, E, MY, SP, MX, AUS models)

A
TUNER
SECTION
(Page 16)

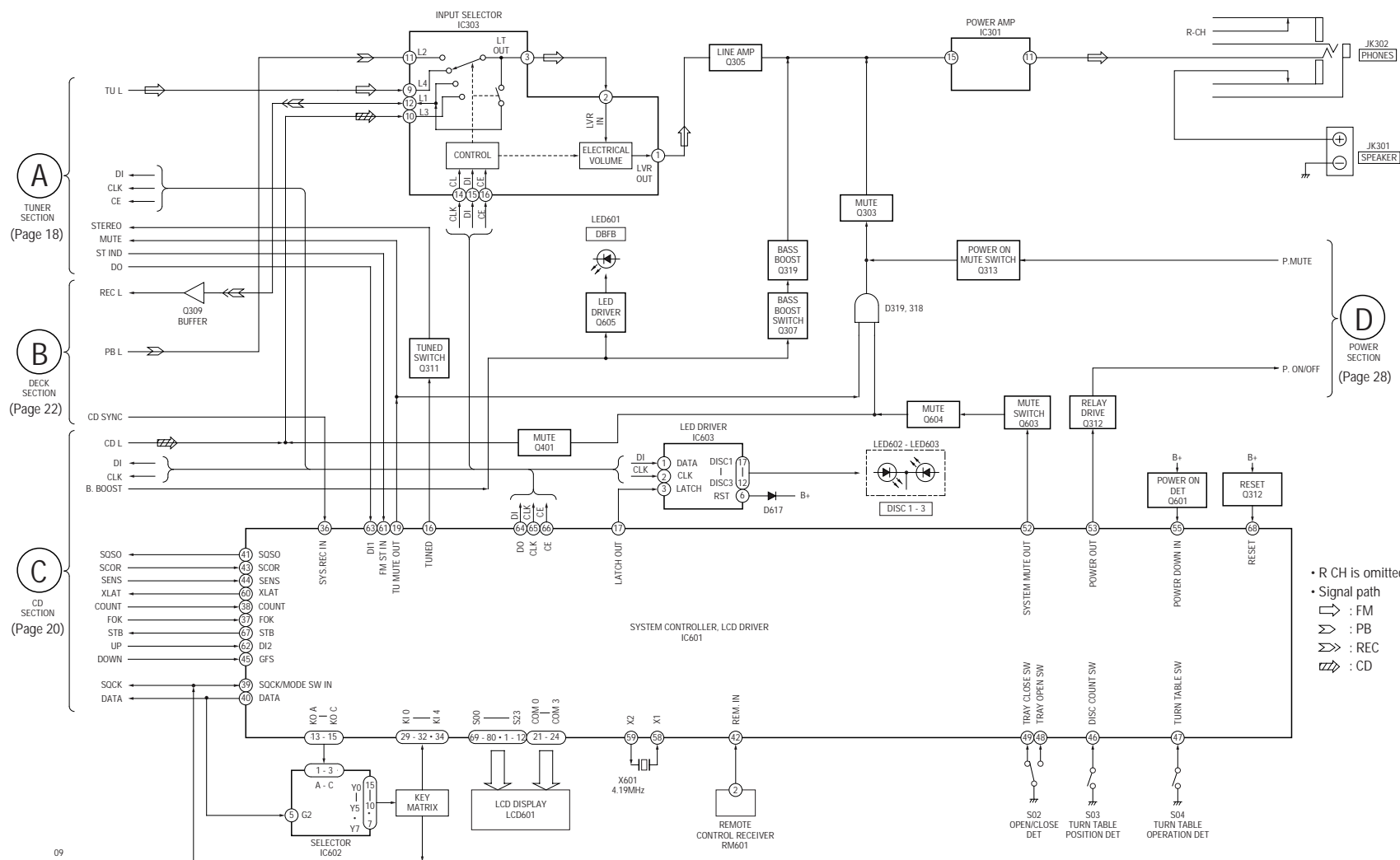
B
DECK
SECTION
(Page 22)

C
CD
SECTION
(Page 20)

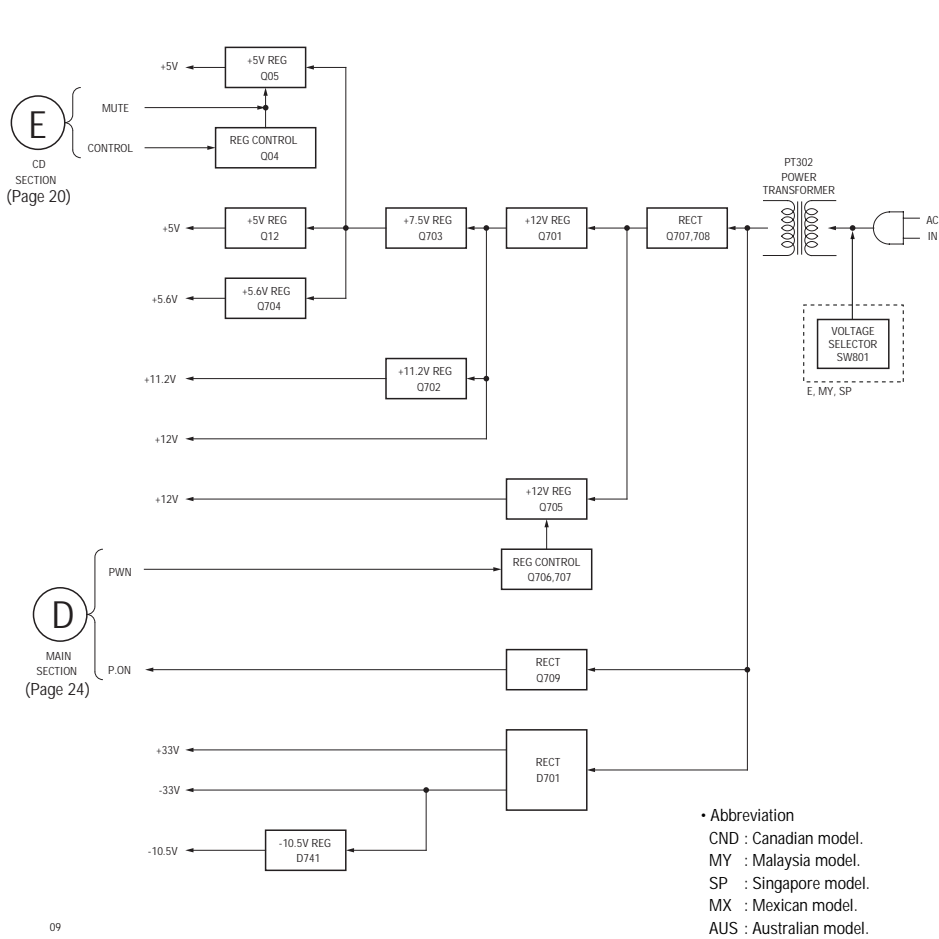
D
POWER
SECTION
(Page 27)



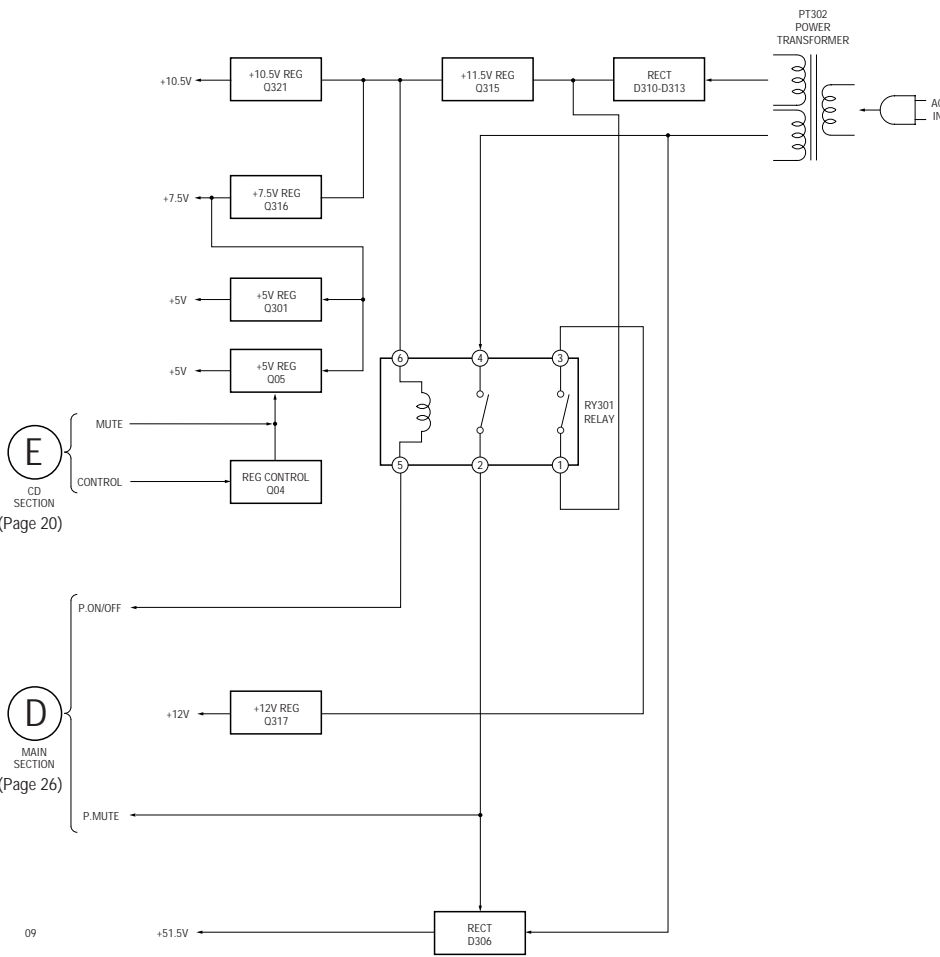
- R CH is omitted.
- Signal path
 - ➡ : FM
 - : PB
 - : REC
 - : CD
- Abbreviation
 - CND : Canadian model.
 - MY : Malaysia model.
 - SP : Singapore model.
 - MX : Mexican model.
 - AUS : Australian model.



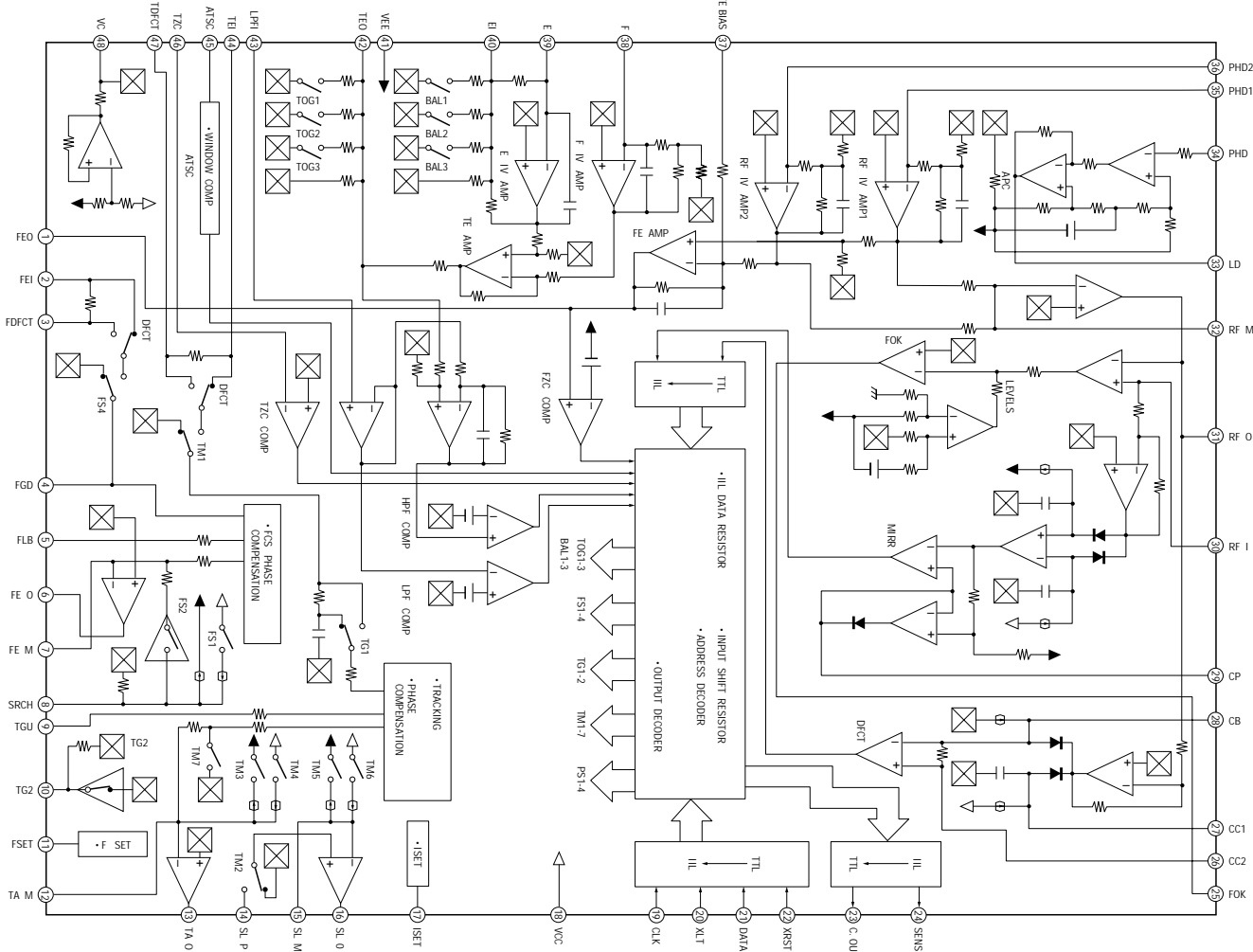
— POWER SECTION — (US, CND, E, MY, SP, MX, AUS models)



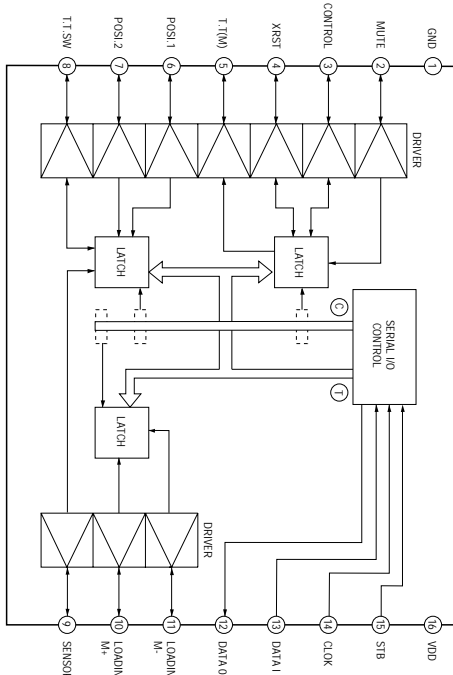
— POWER SECTION — (AEP, UK models)



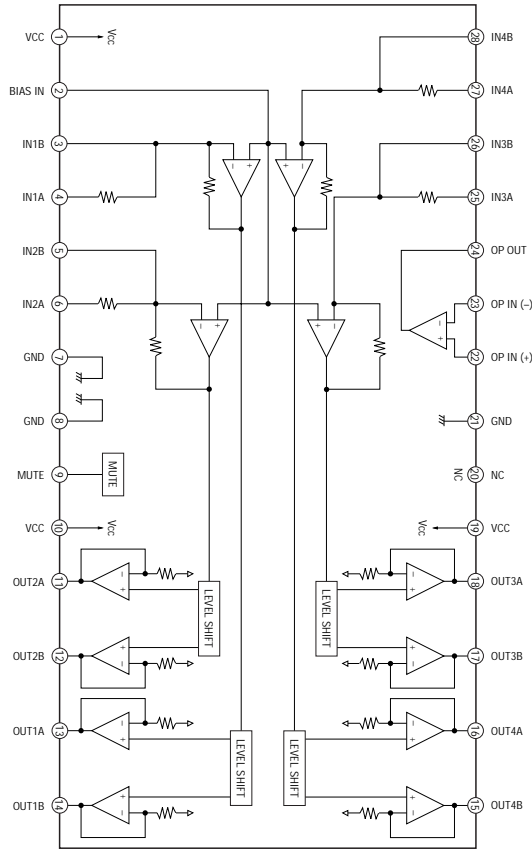
5-3. IC BLOCK DIAGRAMS
— CD SECTION —
IC01 CXA1782BQ



IC02 TC9173P



IC03 BA5941FP



The diagram illustrates the 68000 microprocessor with its 64 pins and internal functional blocks. The pins are organized as follows:

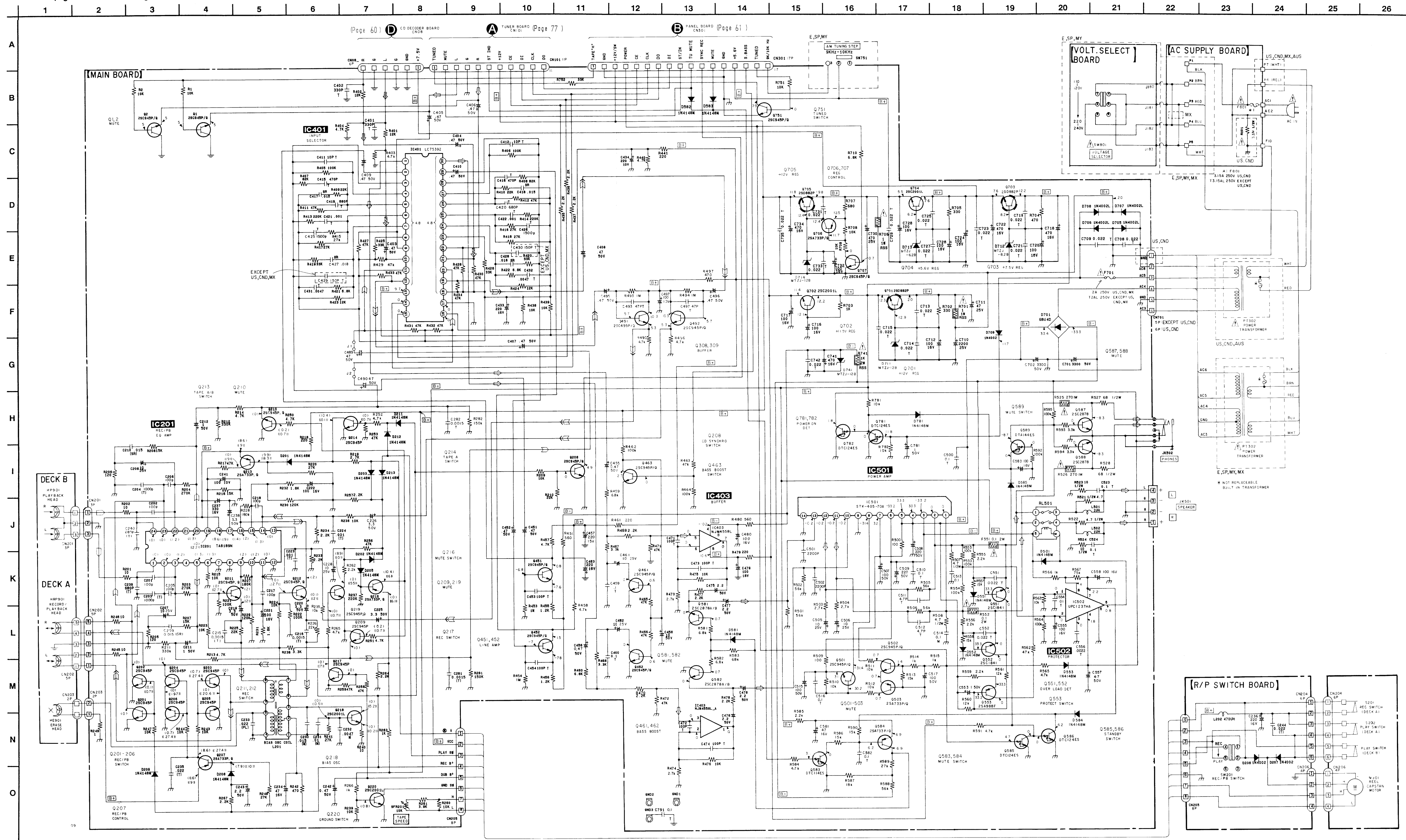
- Pin 1:** SCOR
- Pin 2:** SRSO
- Pin 3:** ECKC
- Pin 4:** SCSO
- Pin 5:** SCKC
- Pin 6:** MUTE
- Pin 7:** SRSB
- Pin 8:** XRSB
- Pin 9:** DATA
- Pin 10:** XLAT
- Pin 11:** CCLK
- Pin 12:** VSS
- Pin 13:** CPU INTERFACE
- Pin 14:** CMM
- Pin 15:** DATO
- Pin 16:** XLTO
- Pin 17:** CCLK
- Pin 18:** SPCB
- Pin 19:** SPCB
- Pin 20:** SPOC
- Pin 21:** XRSB
- Pin 22:** SCKC
- Pin 23:** ECKC
- Pin 24:** MON
- Pin 25:** MDP
- Pin 26:** MDS
- Pin 27:** LOCK
- Pin 28:** TEST
- Pin 29:** FILO
- Pin 30:** FILT
- Pin 31:** PCO
- Pin 32:** VDD
- Pin 33:** AVSS1
- Pin 34:** CLTV
- Pin 35:** AVDD1
- Pin 36:** RF
- Pin 37:** BIAS
- Pin 38:** ASY1
- Pin 39:** ASY0
- Pin 40:** ASVE
- Pin 41:** WIDCK
- Pin 42:** LACK
- Pin 43:** LACK
- Pin 44:** POND
- Pin 45:** POND
- Pin 46:** BCK
- Pin 47:** BCK1
- Pin 48:** GTPC
- Pin 49:** XGFC
- Pin 50:** RPCK
- Pin 51:** RFCK
- Pin 52:** RFCK
- Pin 53:** VSS
- Pin 54:** CPO
- Pin 55:** XPOC
- Pin 56:** MNT3
- Pin 57:** MNTT
- Pin 58:** MNTT
- Pin 59:** FSIT
- Pin 60:** CAM
- Pin 61:** DOOUT
- Pin 62:** EMPH
- Pin 63:** EMPH
- Pin 64:** WFCR

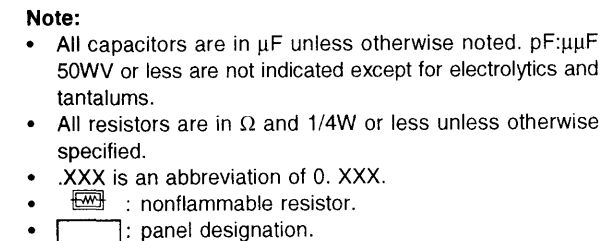
Internal functional blocks include:



- CLOCK GENERATOR**: Connected to pins 17, 18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35, 36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53, 54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64.
- SERVO AUTO SEQUENCER**: Connected to pins 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35, 36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53, 54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64.
- DIGITAL FILTER 18BIT DMC**: Connected to pins 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35, 36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53, 54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64.
- DIGITAL CLTV**: Connected to pins 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35, 36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53, 54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64.
- D/A INTERFACE**: Connected to pins 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35, 36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53, 54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64.
- 16K RAM**: Connected to pins 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35, 36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53, 54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64.
- ERROR CORRECTOR**: Connected to pins 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35, 36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53, 54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64.
- DEMULATOR**: Connected to pins 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35, 36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53, 54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64.
- DIGITAL OUT**: Connected to pins 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35, 36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53, 54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64.
- ASMETRY CORRECTOR**: Connected to pins 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35, 36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53, 54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64.
- DIGITAL PLL**: Connected to pins 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35, 36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53, 54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64.
- SUB CODE PROCESSOR**: Connected to pins 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35, 36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53, 54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64.








[illegible]

5-5. SCHEMATIC DIAGRAM — MAIN SECTION — (US, CND, E, SP, MY, MX, AUS models)
 • See page 32 for IC Block Diagrams.



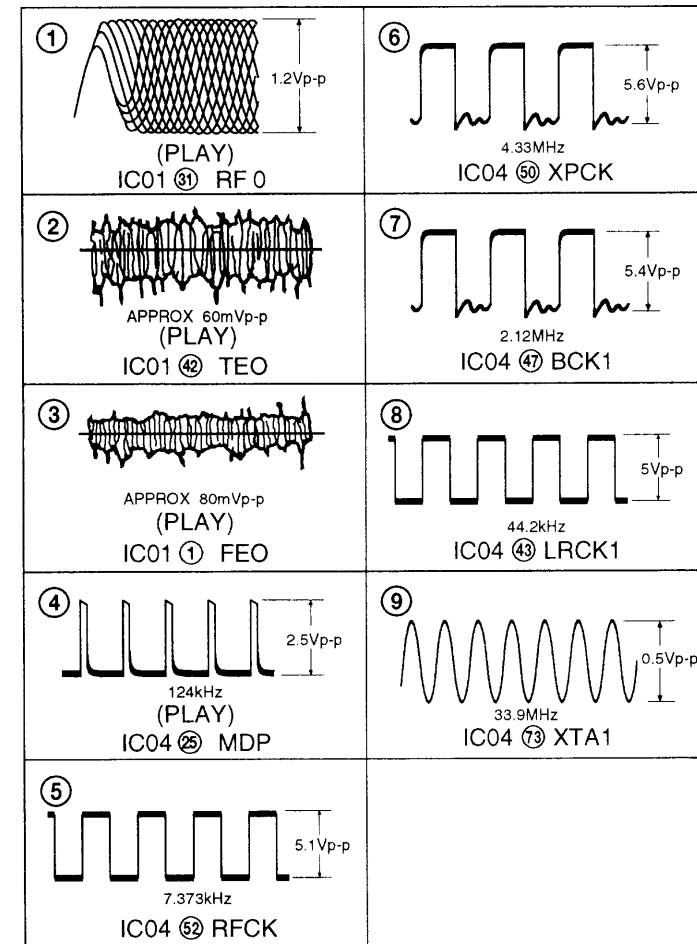


Note:
The components identified by mark  or dotted line with mark  are critical for safety.
Replace only with part number specified.

-  : B+ Line
-  : B- Line
-  : adjustment for repair.
- Voltage and waveforms are dc with respect to ground under no-signal (detuned) conditions.
no mark : FM
 < :> : PB
 (()) : REC
- Voltages are taken with a VOM (Input impedance 10M Ω).
Voltage variations may be noted due to normal production tolerances.
- Signal path.
 < : FM
  : PB (DECK A)
  : PB (DECK B)
  : REC (DECK A)
  : CD
- For detailed German, East European, CIS model, refer to AEP model.

5-9. SCHEMATIC DIAGRAM — CD SECTION —
• See page 29 for IC Block Diagrams.

• Waveforms



Note:

- All capacitors are in μF unless otherwise noted. pF ; μF 50WV or less are not indicated except for electrolytics and tantalums.
- All resistors are in Ω and 1/4W or less unless otherwise specified.

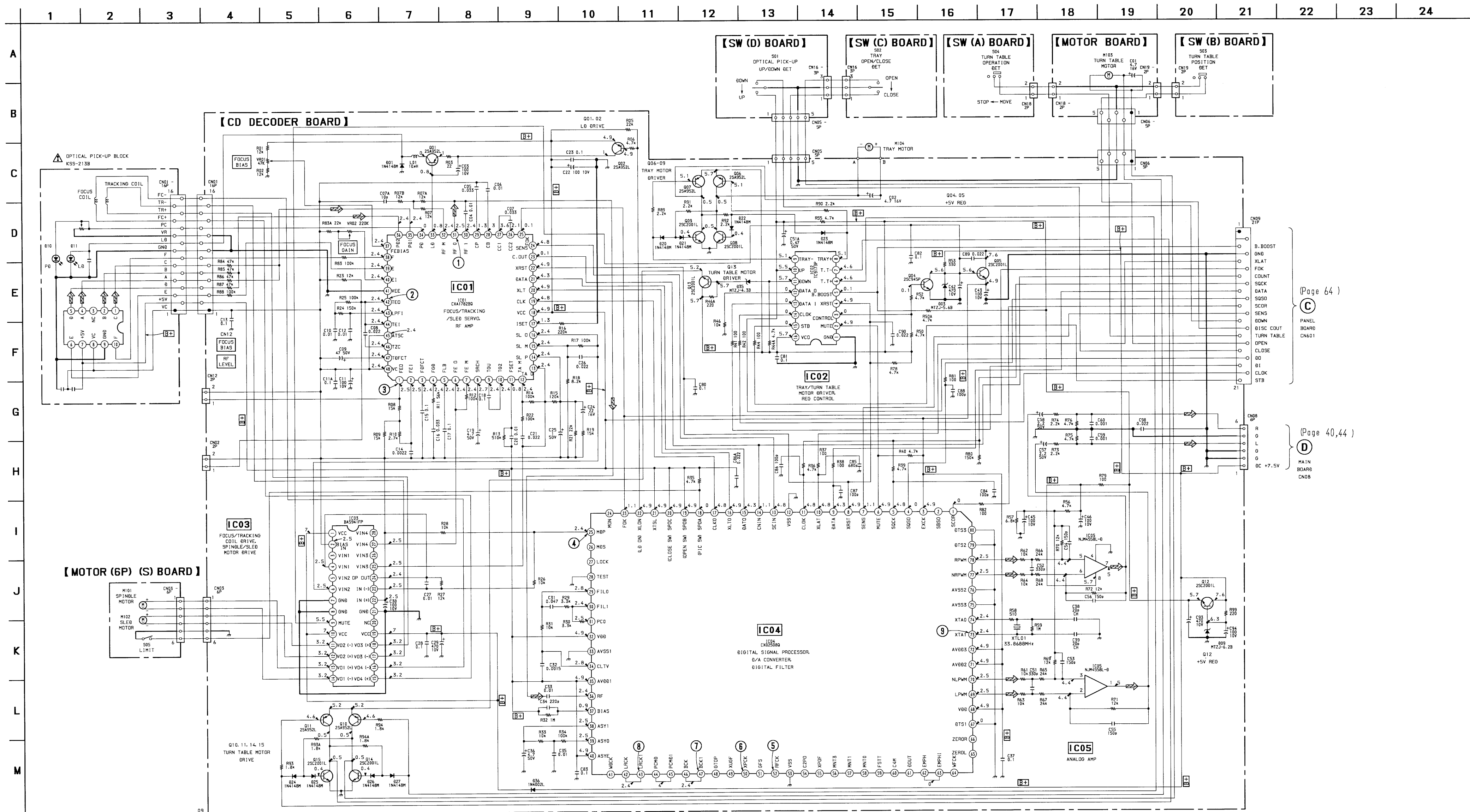
Note:

The components identified by mark Δ or dotted line with mark Δ are critical for safety. Replace only with part number specified.

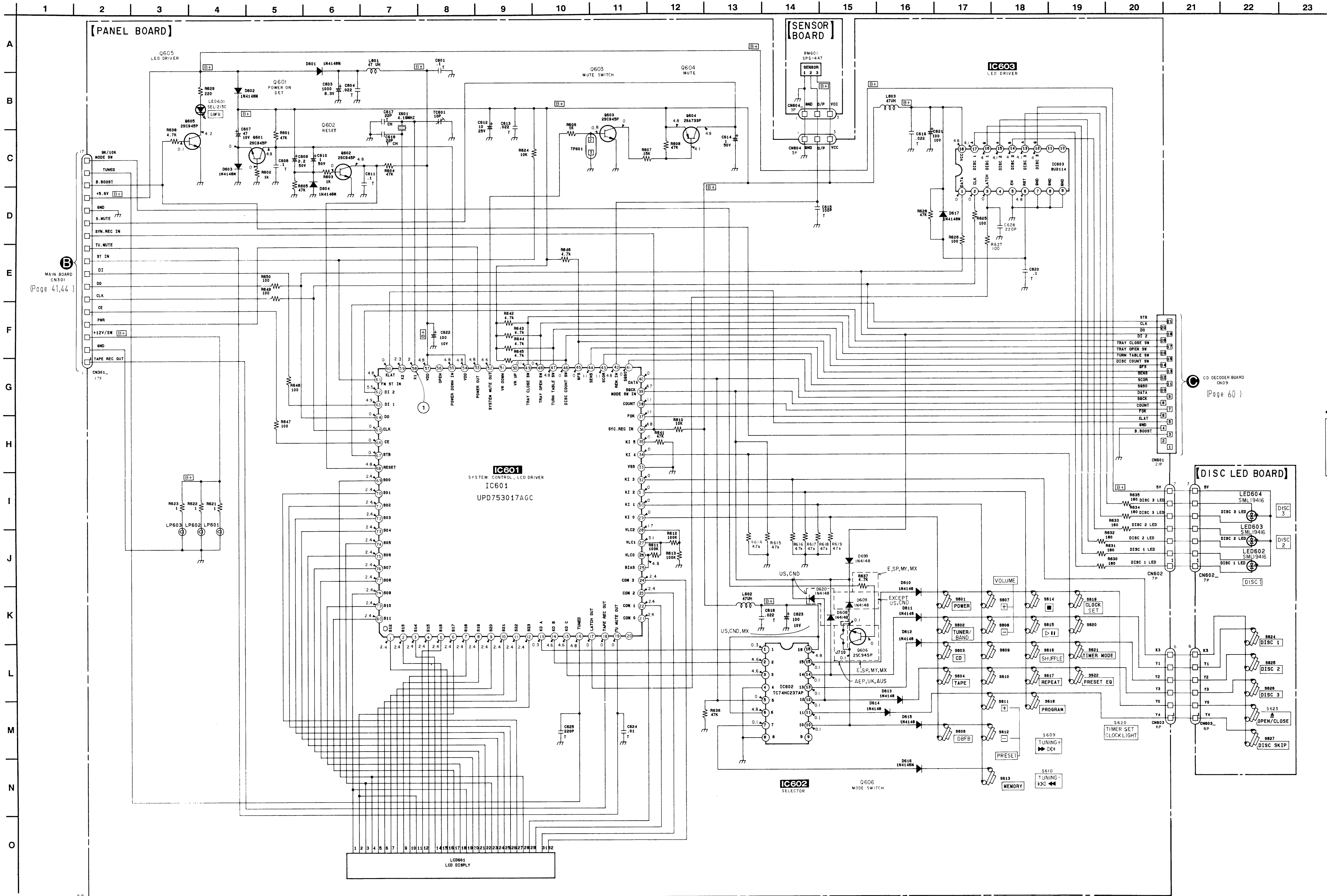
Note:

Les composants identifiés par une marque Δ sont critiques pour la sécurité. Ne les remplacer que par une pièce portant le numéro spécifié.

- B+ : B+ Line
- \square : adjustment for repair.
- Voltage and waveforms are dc with respect to ground under no-signal conditions.
- no mark: STOP
- Voltages are taken with a VOM (input impedance 10M Ω). Voltage variations may be noted due to normal production tolerances.
- Waveforms are taken with an oscilloscope. Voltage variations may be noted due to normal production tolerances.
- Circled numbers refer to waveforms.
- Signal path.
- \Rightarrow : CD



5-10. SCHEMATIC DIAGRAM — PANEL SECTION —
• See page 33 for IC Block Diagrams. • See page 87 for IC Pin Functions.



Waveform

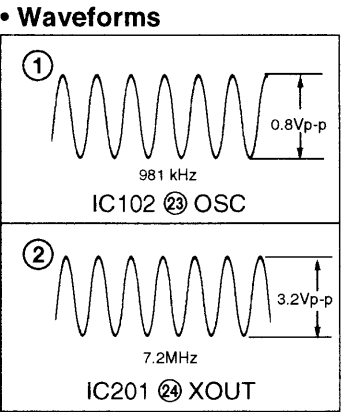
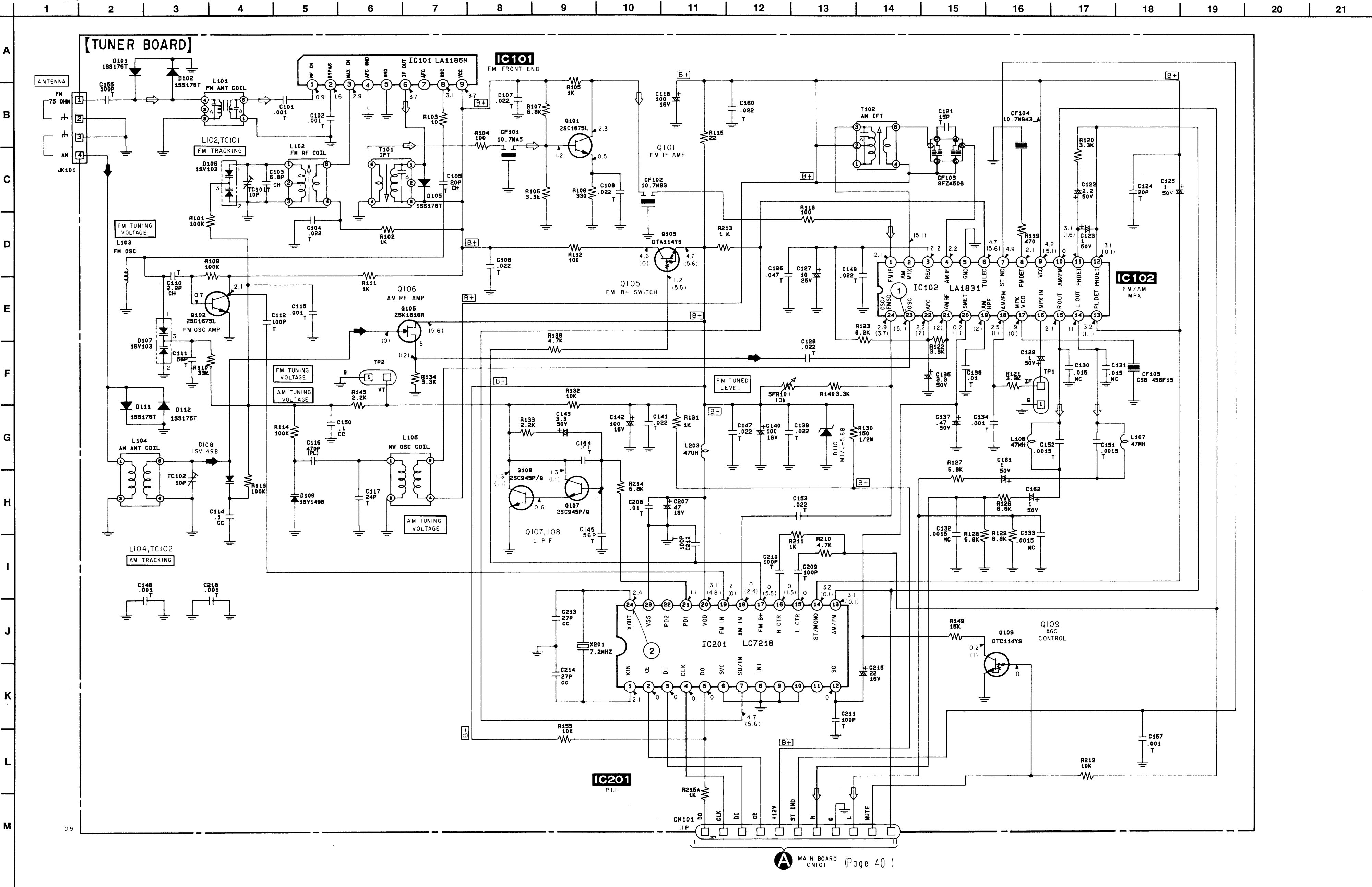
①

4.193 MHz
IC601 (X1)

Note:

- All capacitors are in μF unless otherwise noted. pF: μF
- 50WV or less are not indicated except for electrolytics and tantalums.
- All resistors are in Ω and 1/4W or less unless otherwise specified.
- .XXX is an abbreviation of 0. XXX.
- Δ: internal component.
- : panel designation.
- B+: adjustment for repair.
- Voltage and waveforms are dc with respect to ground under no-signal (detuned) conditions.
- no mark: FM
- Voltages are taken with a VOM (Input impedance 10MΩ). Voltage variations may be noted due to normal production tolerances.
- Waveforms are taken with an oscilloscope. Voltage variations may be noted due to normal production tolerances.
- Circled numbers refer to waveforms.
- Abbreviation
- CND: Canadian model.
- SP: Singapore model.
- MY: Malaysia model.
- MX: Mexican model.
- AUS: Australian model.
- For detailed German, East European, CIS model, refer to AEP model.

5-13. SCHEMATIC DIAGRAM — TUNER SECTION — (US, CND, E, SP, MY, MX, AUS models)
• See page 31 for IC Block Diagrams.



Note:

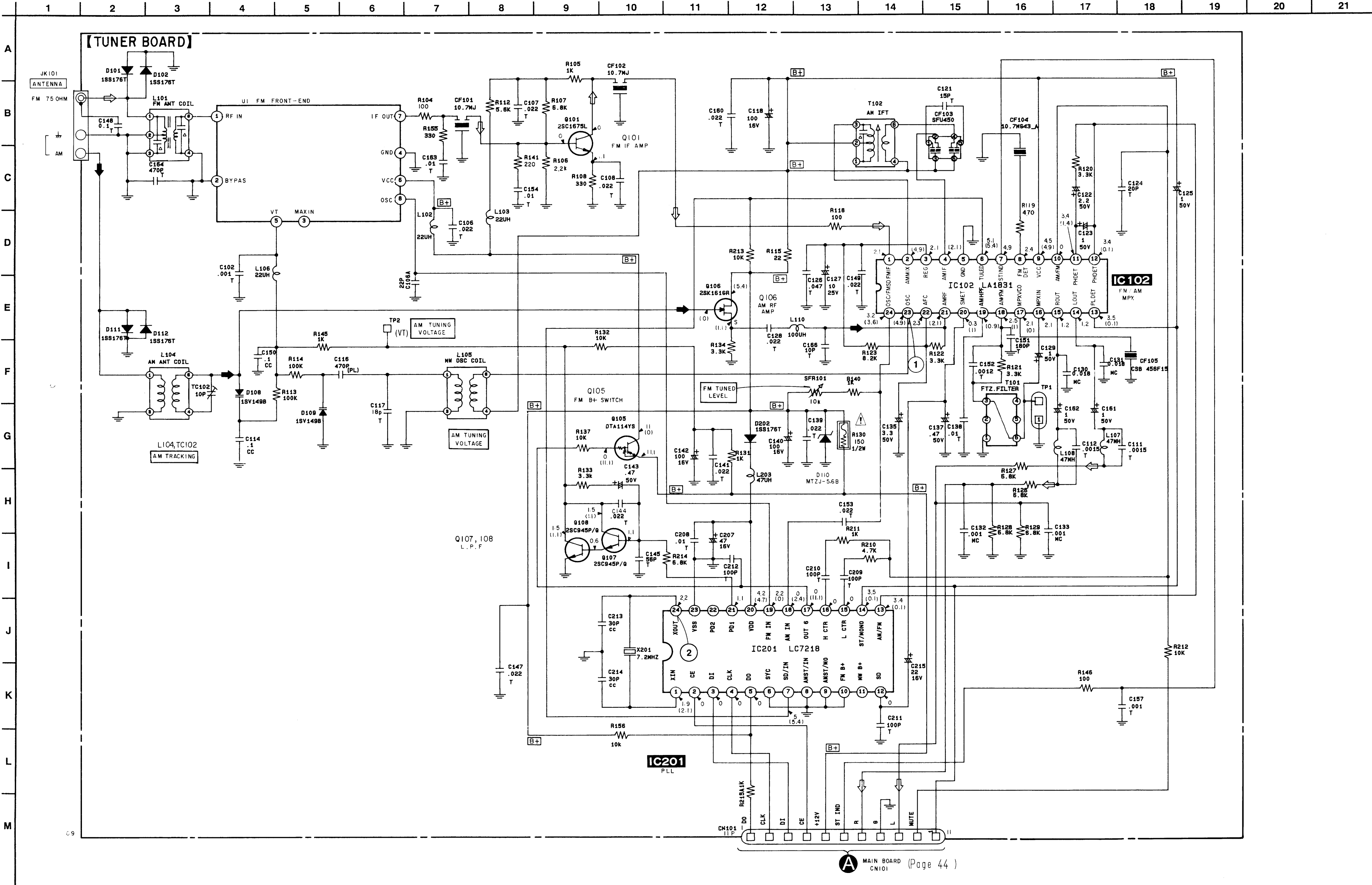
- All capacitors are in μF unless otherwise noted. pF ; μF 50WV or less are not indicated except for electrolytics and tantalums.
- All resistors are in Ω and $1/4\text{W}$ or less unless otherwise specified.
- XXX is an abbreviation of 0. XXX.
- XXX: nonflammable resistor.
- Panel designation.

Note:
The components identified by mark Δ or dotted line with mark Δ are critical for safety. Replace only with part number specified.

Note:
Les composants identifiés par une marque Δ sont critiques pour la sécurité. Ne les remplacer que par une pièce portant le numéro spécifié.

• B+: B+ Line
• Adjustment for repair.
• Voltage and waveforms are dc with respect to ground under no-signal (detuned) conditions.
• () : FM
• () : AM
• Voltages are taken with a VOM (Input impedance 10M Ω). Voltage variations may be noted due to normal production tolerances.
• Waveforms are taken with an oscilloscope. Voltage variations may be noted due to normal production tolerances.
• Circled numbers refer to waveforms.
• Signal path.
• \rightarrow : FM
• \rightarrow : AM
• Abbreviation
CND : Canadian model.
SP : Singapore model.
MY : Malaysia model.
MX : Mexican model.
AUS : Australian model.

5-14. SCHEMATIC DIAGRAM — TUNER SECTION — (AEP, UK models)
• See page 31 for IC Block Diagrams.
• See page 78 for Waveforms.



Note:
• All capacitors are in μF unless otherwise noted. $\text{pF}; \mu\text{F}; \text{mF}$
50WV or less are not indicated except for electrolytics and
tantalums.
• All resistors are in Ω and $1/4\text{W}$ or less unless otherwise
specified.
• .XXX is an abbreviation of 0. XXX.
• : nonflammable resistor.
• : panel designation.

Note:
The components identified by mark Δ or
dotted line with mark Δ
are critical for safety.
Replace only with part
number specified.

• B+ : B+ Line
• : adjustment for repair.
• Voltage and waveforms are dc with respect to ground
under no-signal (detuned) conditions.
no mark : FM
() : AM
• Voltages are taken with a VOM (input impedance $10\text{M}\Omega$).
Voltage variations may be noted due to normal production
tolerances.
• Waveforms are taken with an oscilloscope.
Voltage variations may be noted due to normal production
tolerances.
• Circled numbers refer to waveforms.
• Signal path.
◀ : FM
▶ : AM
• For detailed German, East European, CIS model,
refer to AEP model.

5-16. IC PIN FUNCTION

• IC601 System Controller, LCD driver (μPD753017AGC)

Pin No.	Pin Name	I/O	Function
1 to 12	SI2 to S23	O	Segment output to LCD.
13	KO A	O	Key control signal output A "H" : active
14	KO B	O	Key control signal output B "H" : active
15	KO C	O	Key control signal output C "H" : active
16	TUNED	I	Tuned detection signal from tuner
17	LATCH OUT	O	Latch output to LED driver "H" : active (Not used)
18	TAPE REC OUT	O	REC/PB select signal output to tape selector
19	TU MUTE OUT	O	Tuner mute control signal output
20	—	—	Not used
21 to 24	COM 1 to COM 3	O	LCD drive signal output
25	BIAS	O	Not used
26 to 28	VLC 0 to VLC 2	O	Not used
29	KI 0	I	Key input 0 "H" : active
30	KI 1	I	Key input 1 "H" : active
31	KI 2	I	Key input 2 "H" : active
32	KI 3	I	Key input 3 "H" : active
33	VSS	—	Ground
34	KI 4	I	Key input 4 "H" : active
35	KI 5	I	Key input 5 "H" : active (Not used)
36	SYC. REC IN	I	CD SYNCHRO REC signal input "L" : active
37	FOK	I	FOK signal input from CXD2508Q
38	COUNT	I	COUNT signal input from CXD2508Q
39	SOCK/MODE SW IN	I/O	SOCK/CLOCK/MODE SW signal input/output
40	DATA	O	Serial data output
41	SQSO	I	Serial data input from CXD2508Q
42	REM. IN	I	Remote control signal input "L" : active
43	SCOR	I	SCOR signal input from CXD2508Q
44	SENS	I	SENS signal input from CXD2508Q
45	GFS	I	Optical pick-up down detection signal input "L" : down
46	DISC COUNT SW	I	Detection signal input of turn table position
47	TURN TABLE SW	I	Detection signal input of turn table operation
48	TRAY OPEN SW	I	Disc tray open detection signal input
49	TRAY CLOSE SW	I	Disc tray close detection signal input
50	VR UP	I/O	Volume encoder signal input and volume motor control signal output (Not used)
51	VR DOWN	I/O	
52	SYSTEM MUTE OUT	O	System mute control signal output "H" : ON
53	POWER OUT	O	Power ON/OFF control signal output "H" : OFF, "L" : ON
54	VDD	—	+5V power supply
55	POWER DOWN IN	I	Power down detect input "L" : active
56	OPEN	—	Not used

• Abbreviation
LCD: Liquid Crystal Display

Pin No.	Pin Name	I/O	Function
57	VDD	—	+5V power supply
58	X1	—	System clock (4.19 MHz)
59	X2	—	
60	XLAT	O	Latch signal output to CXD2508Q
61	FM ST IN	I	FM stereo detection signal input
62	DI 2	I	Optical pick-up up detection signal input
63	DI 1	I	Serial data input
64	DO	O	Serial data output
65	CLK	O	Serial clock output
66	CE	O	Chip enable output
67	STB	O	STB signal output
68	RESET	I	Reset input "L" : reset
69 to 80	S00 to S11	O	Segment output to LCD