

HCD-H991AV

SERVICE MANUAL

*US Model
Canadian Model
AEP Model
UK Model
E Model
Australian Model
PX Model*



Photo: E model

HCD-H991AV is the tuner, deck, CD and amplifier section in MHC-991AV/G99AV.

CD SECTION	Model Name Using Similar Mechanism	HCD-H771/H771D
	CD Mechanism Type	CDM38-5BD19
	Base Unit Type	BU-5BD19
	Optical Pick-up Type	KSS-213BA/F-NP
TAPE DECK SECTION	Model Name Using Similar Mechanism	HCD-H771/H771D
	Tape Transport Mechanism Type	TCM-220WR2E

SPECIFICATIONS

For the U.S. model

AUDIO POWER SPECIFICATIONS

POWER OUTPUT AND TOTAL HARMONIC DISTORTION:

With 8 ohm loads, both channels driven, from 70 – 20,000 Hz; rated 100 watts per channel minimum RMS power, with no more than 0.9 % total harmonic distortion from 250 milliwatts to rated output (FRONT SPEAKER).

CD player section

System	Compact disc and digital audio system
Laser	Semiconductor laser ($\lambda = 780 \text{ nm}$) Emission duration: continuous
Laser output	Max. 44.6 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	2 Hz – 20 kHz ($\pm 0.5 \text{ dB}$)
Wavelength	780 – 790 nm
Signal-to-noise ratio	More than 90 dB
Dynamic range	More than 90 dB
CD DIGITAL OUT OPTICAL (Square optical connector jack, rear panel)	
Wavelength	600 nm
Output Level	– 18 dBm

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

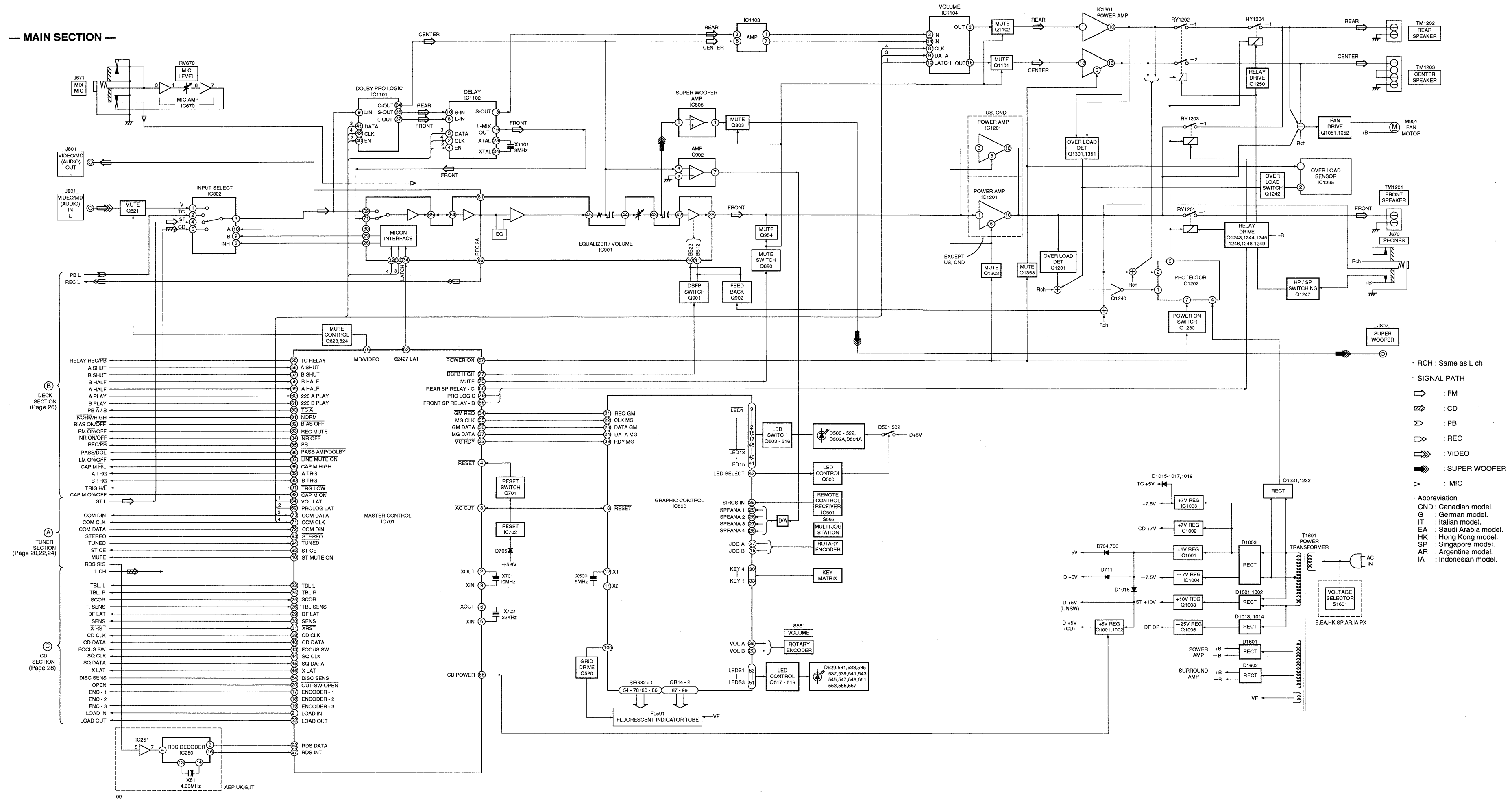
Tuning range	
US, Canadian models:	AM: 531 – 1,710 kHz (with the tuning interval set at 9 kHz) 530 – 1,710 kHz (with the tuning interval set at 10 kHz)
German, Italian models:	AM: 531 – 1,602 kHz (with the interval set at 9 kHz)
AEP, UK models:	MW: 531 – 1,602 kHz (with the interval set at 9 kHz) LW: 153 – 279 kHz (with the interval set at 3 kHz)
Australian, Argentine models:	AM: 531 – 1,602 kHz (with the tuning interval set at 9 kHz) 530 – 1,710 kHz (with the tuning interval set at 10 kHz)

— Continue on next page —

COMPACT DISC DECK RECEIVER
SONY®



— MAIN SECTION —



(B) DECK SECTION (Page 26)

(A) TUNER SECTION (Page 20, 22, 24)

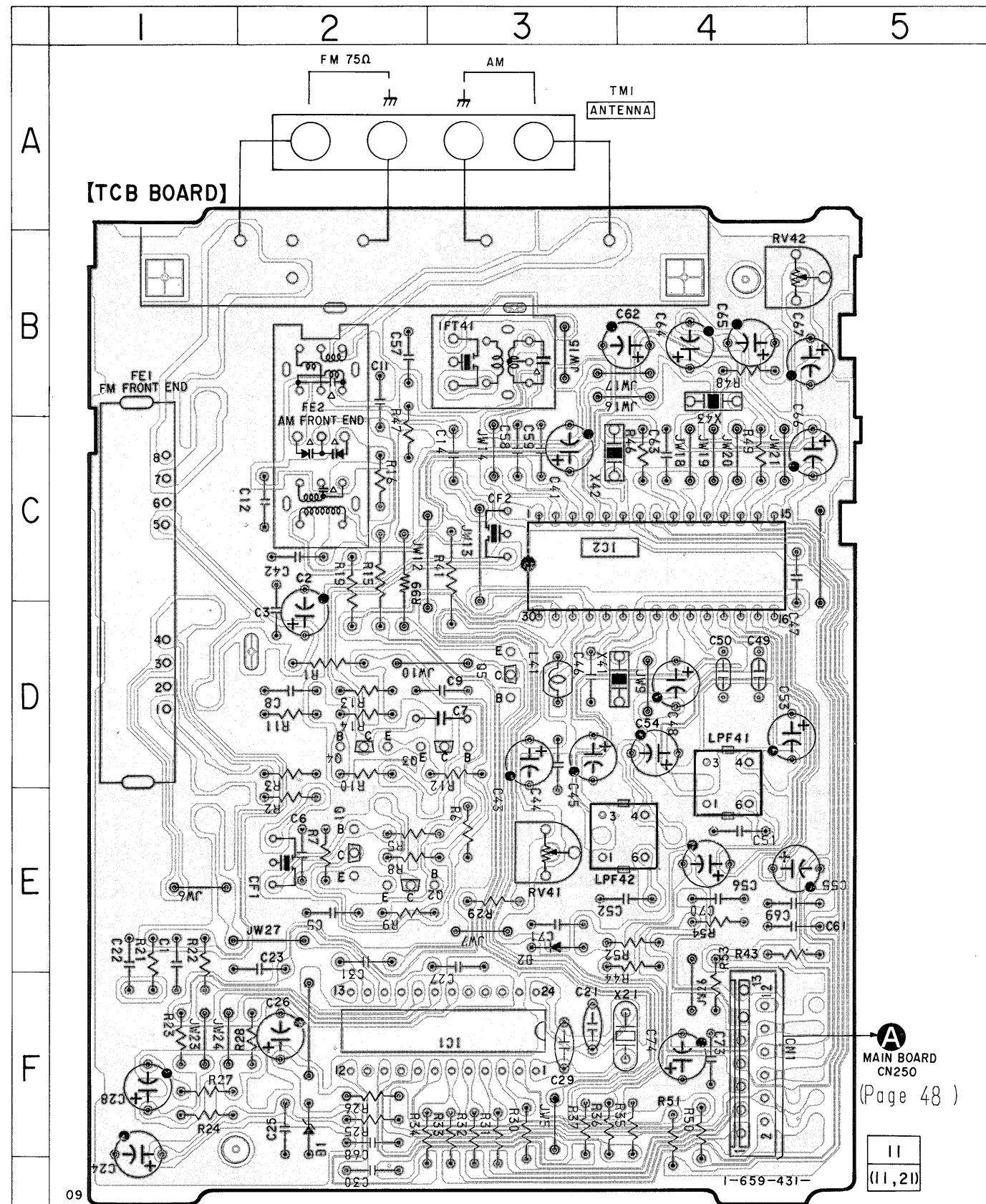
(C) CD SECTION (Page 28)

- RCH : Same as L ch
- SIGNAL PATH
- ◁ : FM
- ◁ : CD
- ▷ : PB
- ▷ : REC
- ▷ : VIDEO
- ◁ : SUPER WOOFER
- ▷ : MIC
- Abbreviation
- CND : Canadian model.
- G : German model.
- IT : Italian model.
- EA : Saudi Arabia model.
- SP : Singapore model.
- AR : Argentine model.
- IA : Indonesian model.

6-3. PRINTED WIRING BOARD — TUNER SECTION —

(US, CND, E2, AR, AUS, TH MODEL)

• See page 18 for Circuit Boards Location.



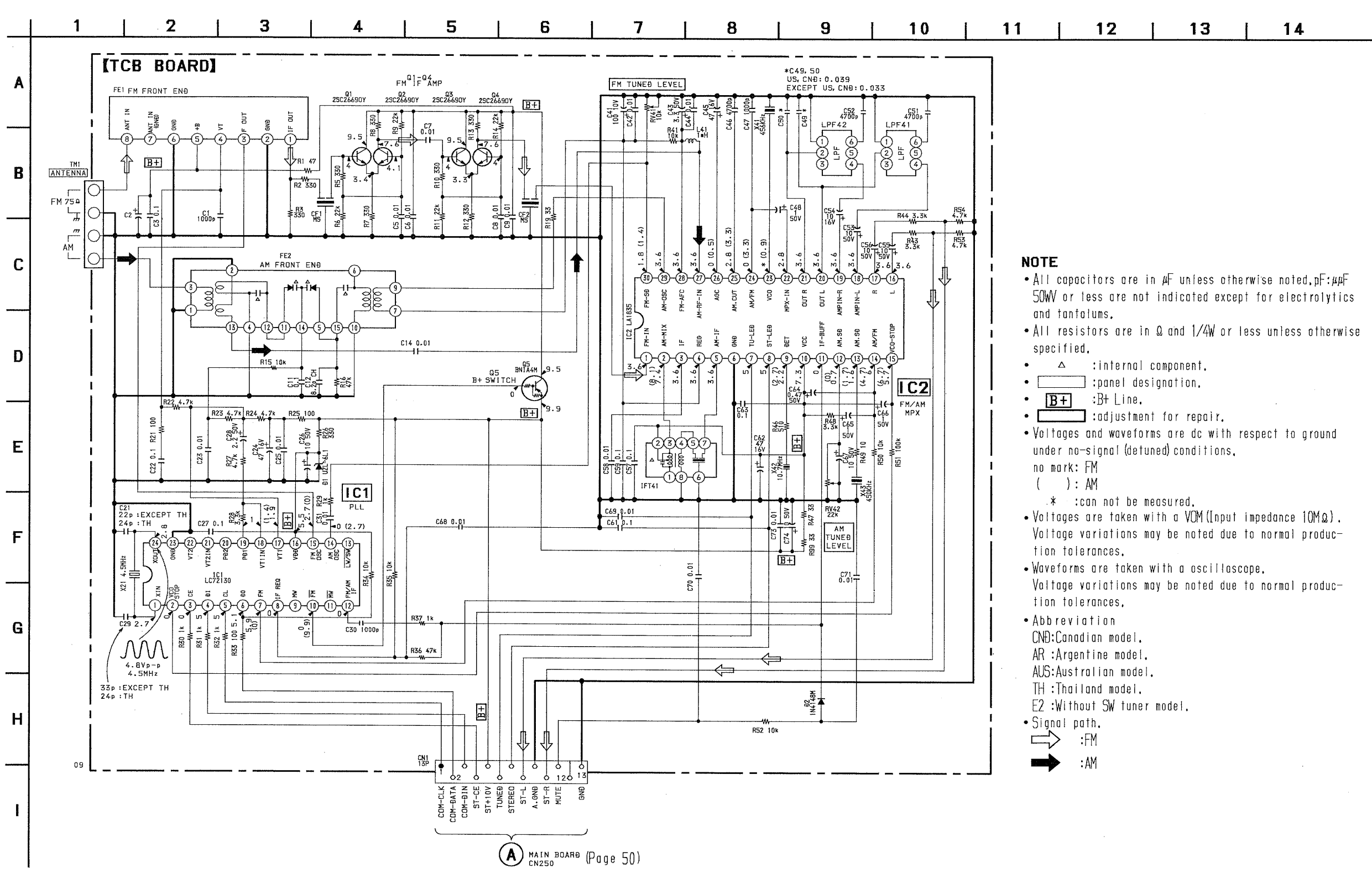
- Note:
- : parts extracted from the component side.
 - Δ : Internal component.
 - : Pattern from the side which enable seeing.

- Abbreviation
- CND : Canadian model.
 - AUS : Australian model.
 - AR : Argentine model.
 - TH : Thailand model.
 - E2 : Without SW tuner model.

6-4. SCHEMATIC DIAGRAM — TUNER SECTION —

(US, CND, E2, AR, AUS, TH MODEL)

• See page 44 for IC Block Diagrams.



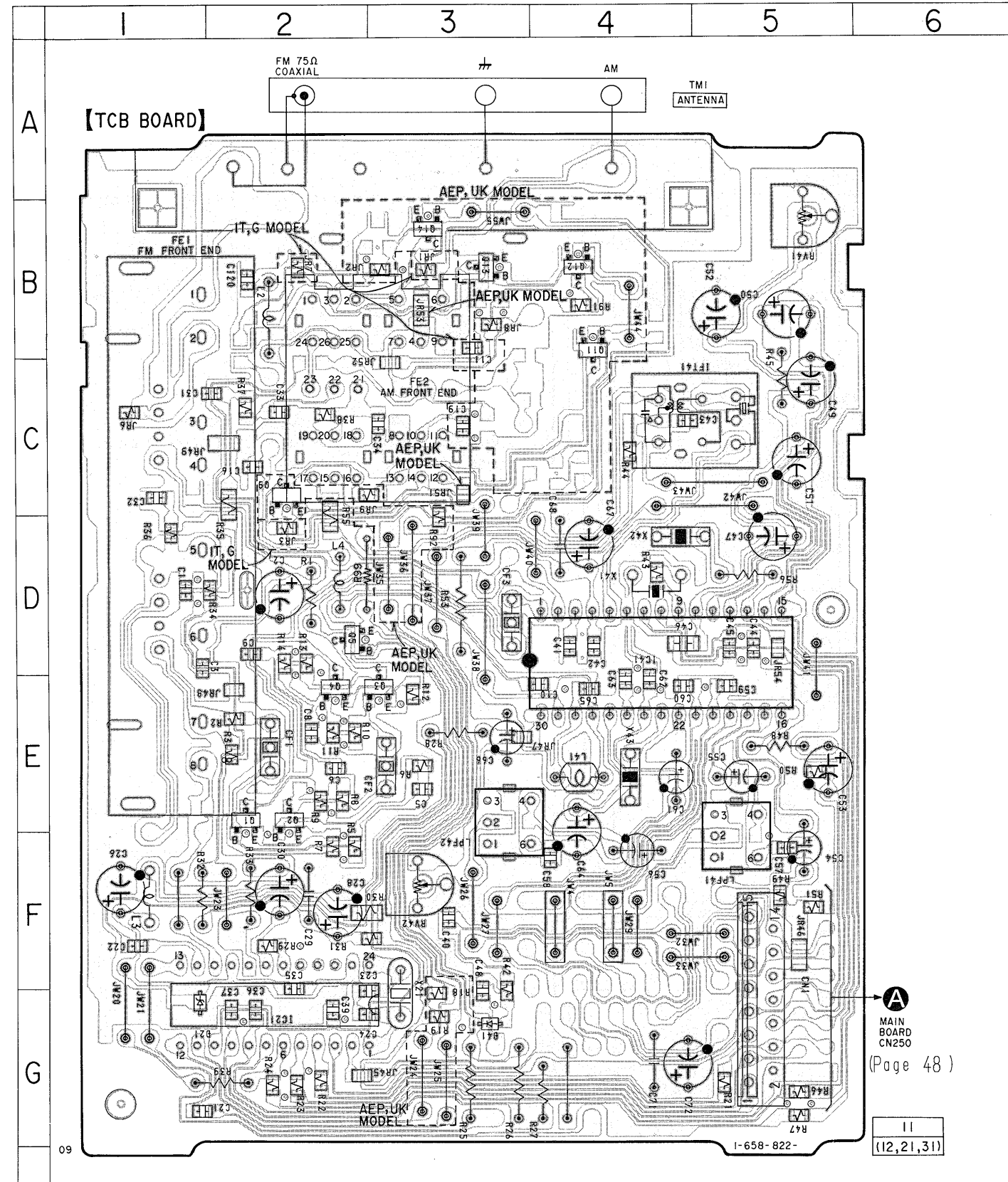
- NOTE**
- All capacitors are in μF unless otherwise noted. μF : μF , 50W or less are not indicated except for electrolytics and tantalums.
 - All resistors are in Ω and $1/4\text{W}$ or less unless otherwise specified.
 - Δ : internal component.
 - : panel designation.
 - B+ : B+ Line.
 - : adjustment for repair.
 - Voltages and waveforms are dc with respect to ground under no-signal (detuned) conditions.
 - no mark: FM
 - (): AM
 - * : can not be measured.
 - 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 a oscilloscope. Voltage variations may be noted due to normal production tolerances.
 - Abbreviation
 - CND: Canadian model.
 - AR : Argentine model.
 - AUS: Australian model.
 - TH : Thailand model.
 - E2 : Without SW tuner model.
 - Signal path.
 - : FM
 - : AM

• Semiconductor Location

Ref. No.	Location
D1	F-2
D2	E-3
IC1	F-3
IC2	C-3
Q1	E-2
Q2	E-2
Q3	D-2
Q4	D-2
Q5	D-3

6-5. PRINTED WIRING BOARD — TUNER SECTION —
(AEP, UK, G, IT MODEL)

• See page 18 for Circuit Boards Location.



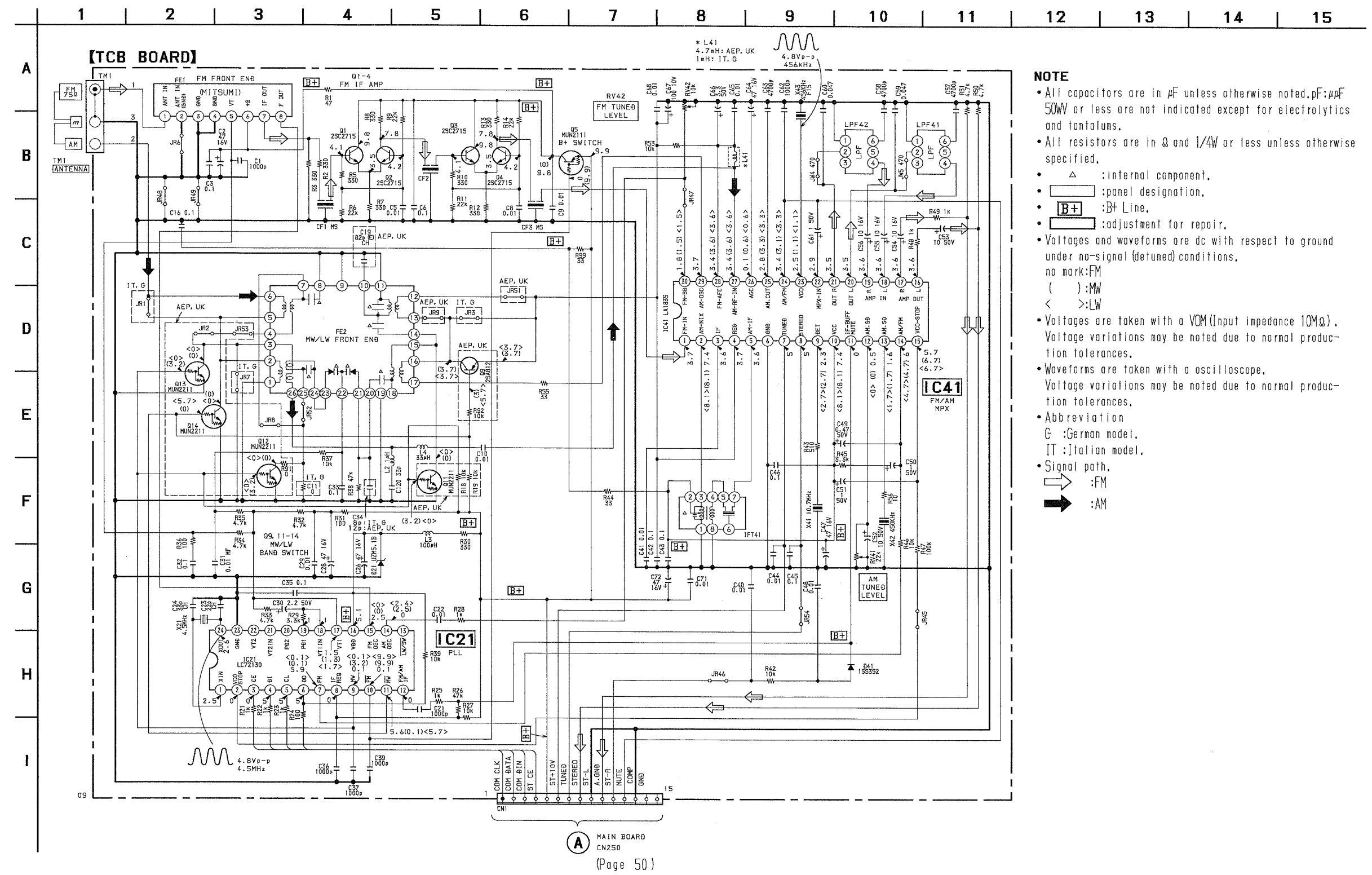
• Semiconductor Location

Ref. No.	Location
D21	G-1
D41	G-3
IC21	G-2
IC41	D-4
Q1	E-2
Q2	E-2
Q3	E-3
Q4	E-2
Q5	D-2
Q9	C-2
Q11	B-4
Q12	B-4
Q13	B-3
Q14	B-3

Note:
 • — : parts extracted from the component side.
 • Δ : Internal component.
 • □ : Pattern from the side which enable seeing.

• Abbreviation
 G : German model.
 IT : Italian model.

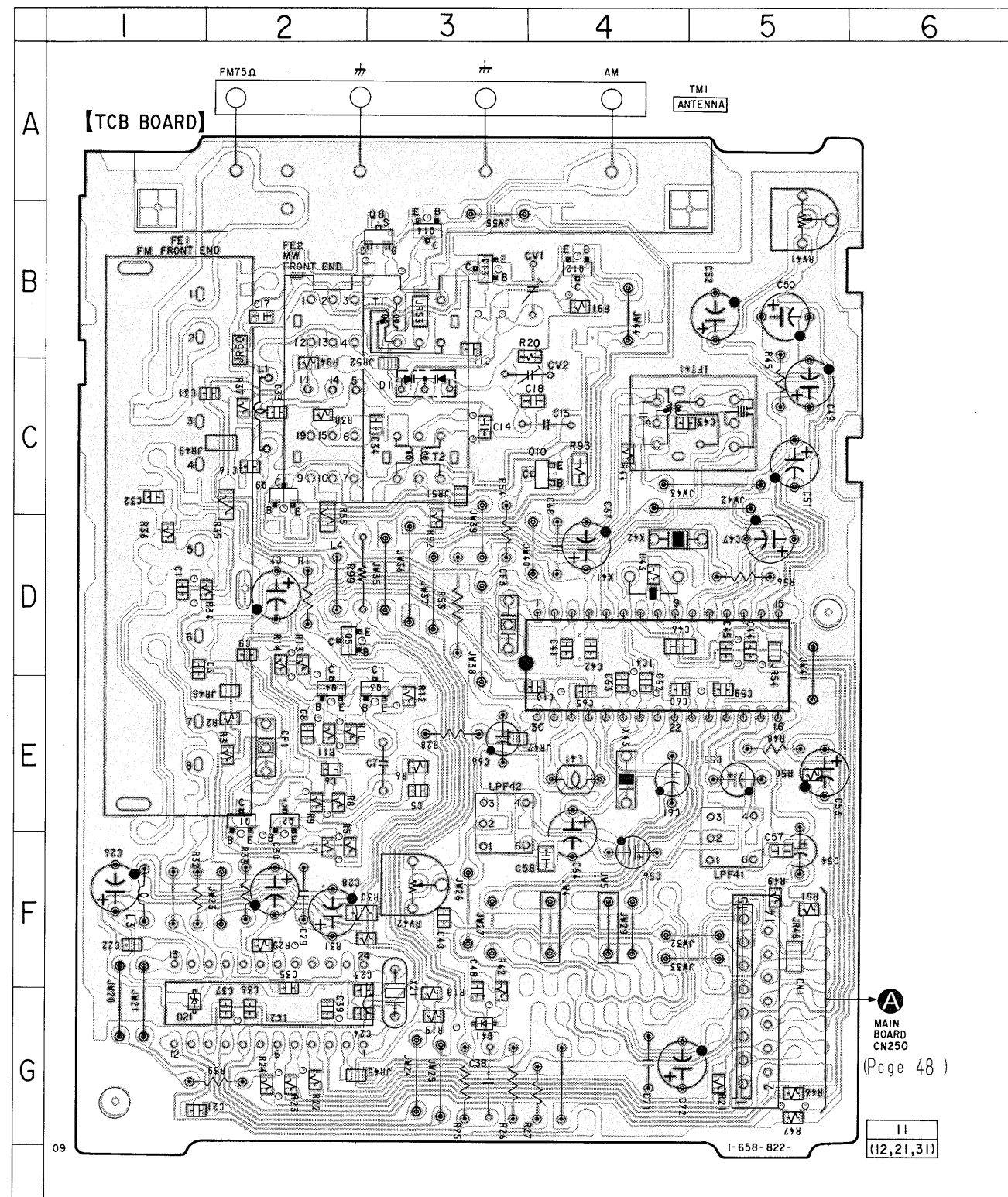
6-6. SCHEMATIC DIAGRAM — TUNER SECTION —
(AEP, UK, G, IT MODEL)



NOTE

- All capacitors are in μF unless otherwise noted. $\text{pF} = \mu\text{F} \times 10^{-6}$. 50W 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.
- Δ : internal component.
- □ : panel designation.
- [B+] : B+ Line.
- □ : adjustment for repair.
- Voltages and waveforms are dc with respect to ground under no-signal (detuned) conditions.
 () : MW
 < > : LW
- 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.
- Abbreviation
 G : German model.
 IT : Italian model.
- Signal path.
 ⇨ : FM
 ⇩ : AM

6-7. PRINTED WIRING BOARD — TUNER SECTION —
(E3, EA, HK, SP, MY, IA, PX MODEL)
• See page 18 for Circuit Boards Location.



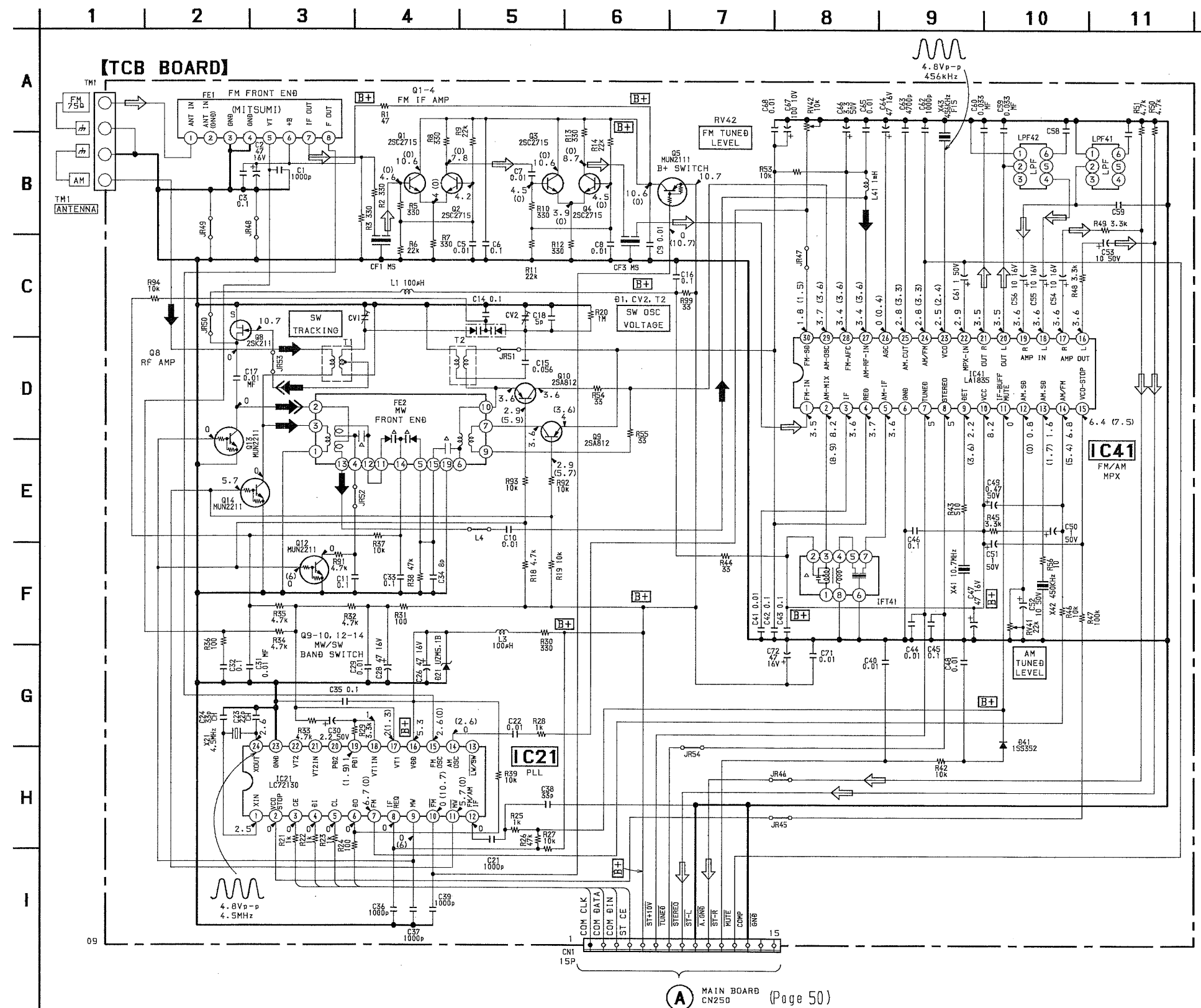
• Semiconductor Location

Ref. No.	Location
D1	C-3
D21	Q-1
D41	G-4
IC21	G-2
IC41	E-5
Q1	F-2
Q2	F-3
Q3	F-3
Q4	F-3
Q5	E-3
Q8	B-3
Q9	D-3
Q10	D-4
Q12	B-5
Q13	B-4
Q14	B-3

Note:
• — : parts extracted from the component side.
• Δ : Internal component.
• □ : Pattern from the side which enable seeing.

• Abbreviation
EA : Saudi Arabia model.
SP : Singapore model.
MY : Malaysia model.
HK : Hong Kong model.
IA : Indonesian model.
E3 : With SW tuner model.

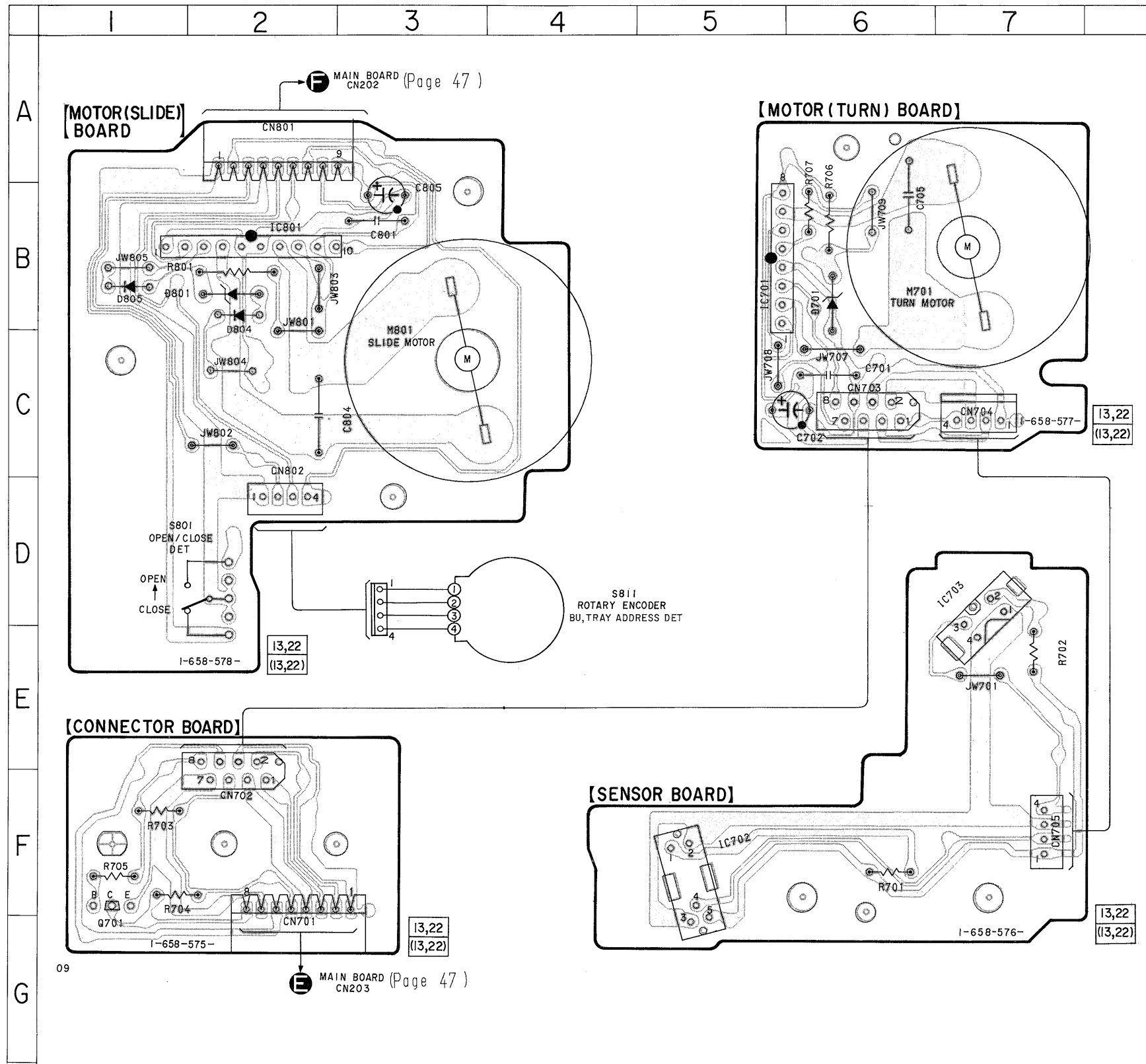
6-8. SCHEMATIC DIAGRAM — TUNER SECTION —
(E3, EA, HK, SP, MY, IA, PX MODEL)



NOTE

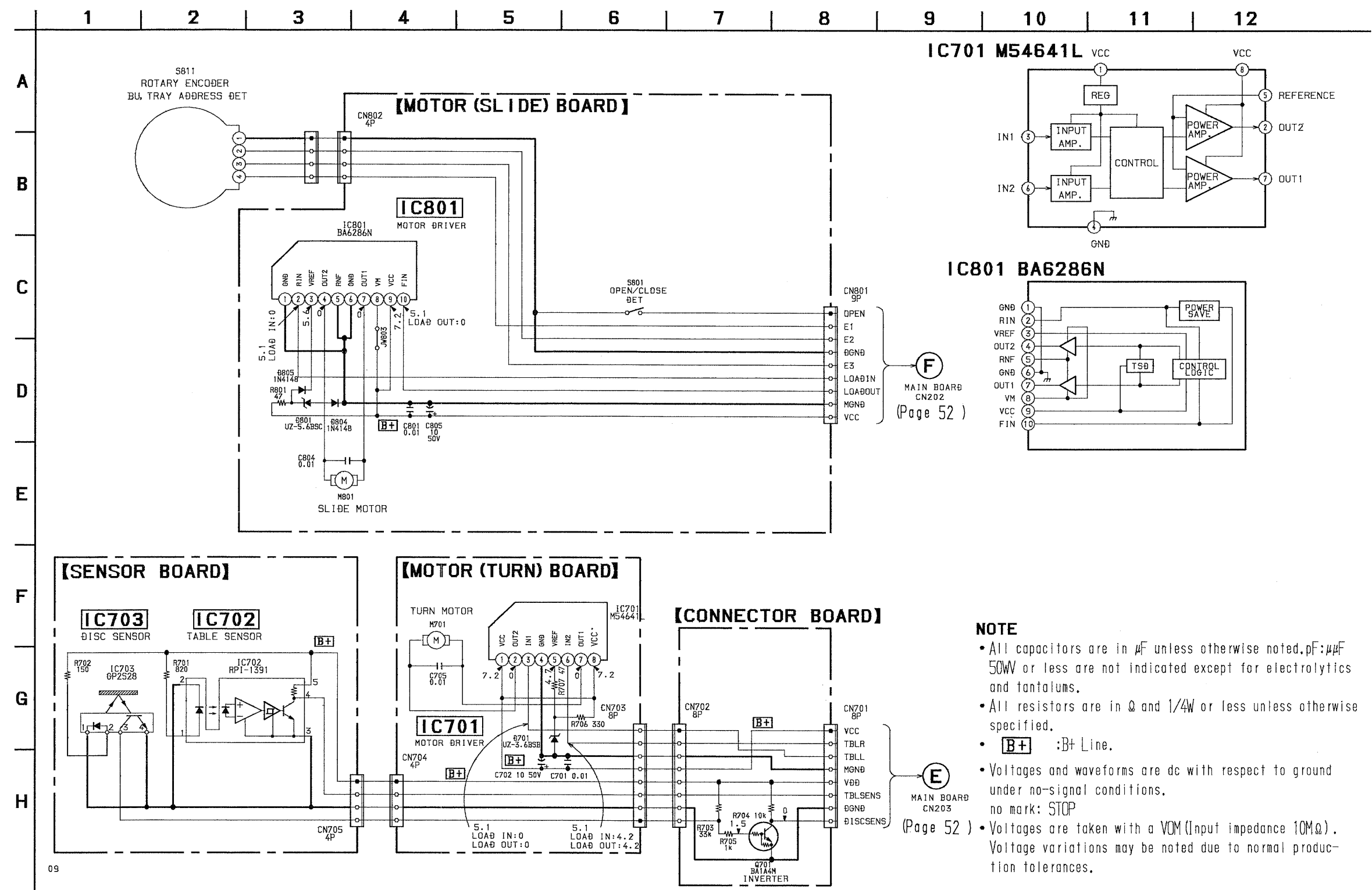
- All capacitors are in μF unless otherwise noted, pF : μF 50WV or less are not indicated except for electrolytics and tantalums.
- All resistors are in Ω and $1/4W$ or less unless otherwise specified.
- Δ : internal component.
- □ : panel designation.
- B+ : B+ Line.
- □ : adjustment for repair.
- Voltages 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 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.
- Abbreviation
EA : Saudi Arabia model.
HK : Hong Kong model.
SP : Singapore model.
MY : Malaysia model.
IA : Indonesian model.
E3 : With SW tuner model.
- Signal path.
→ : FM
→ : MW
→ : SW

6-9. PRINTED WIRING BOARD — CD MOTOR SECTION —
 • See page 18 for Circuit Boards Location.



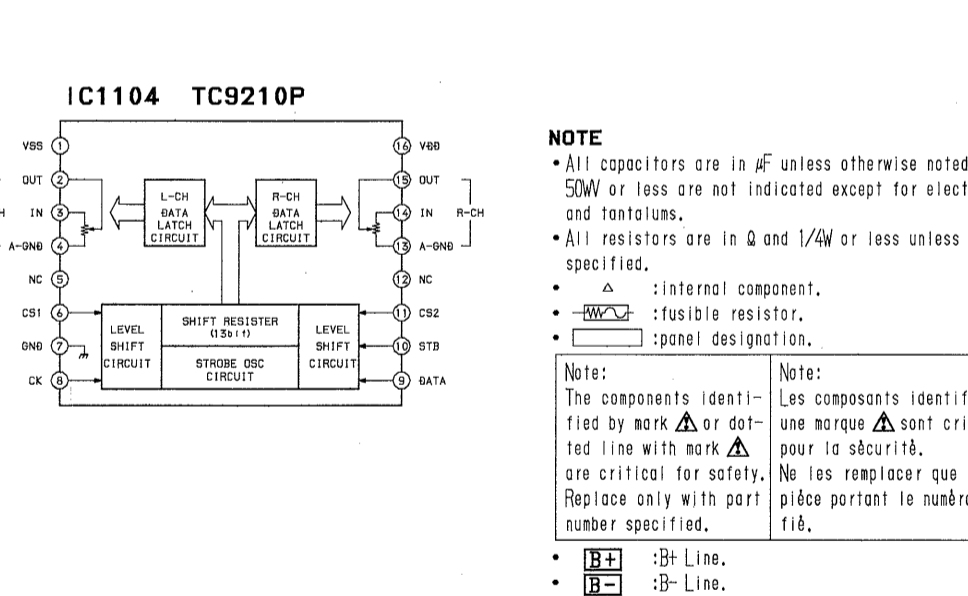
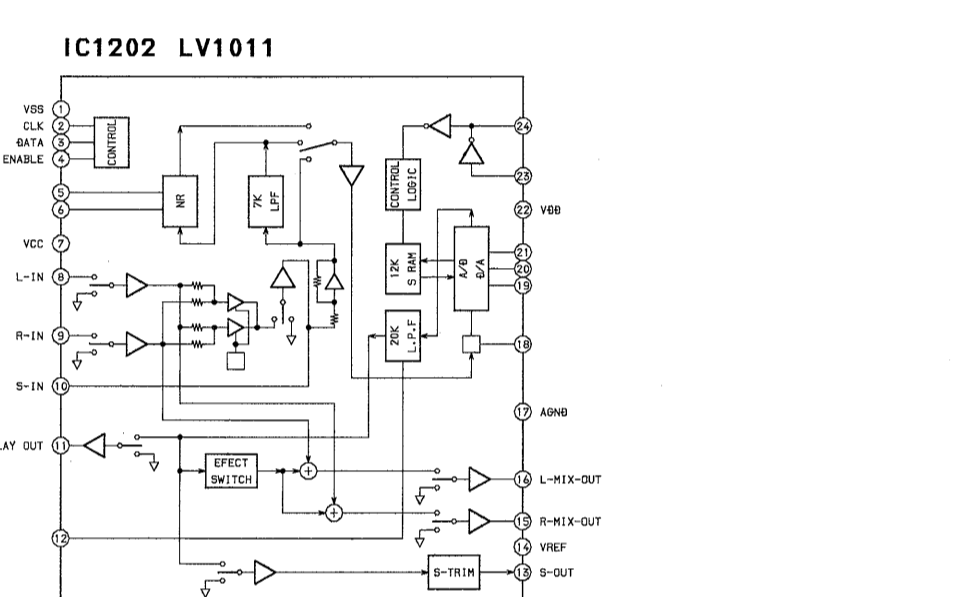
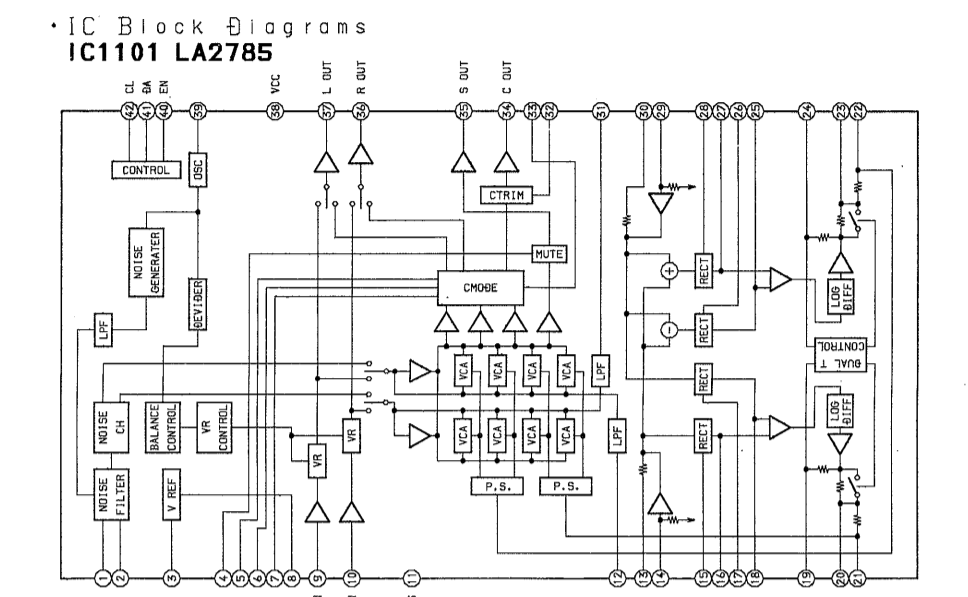
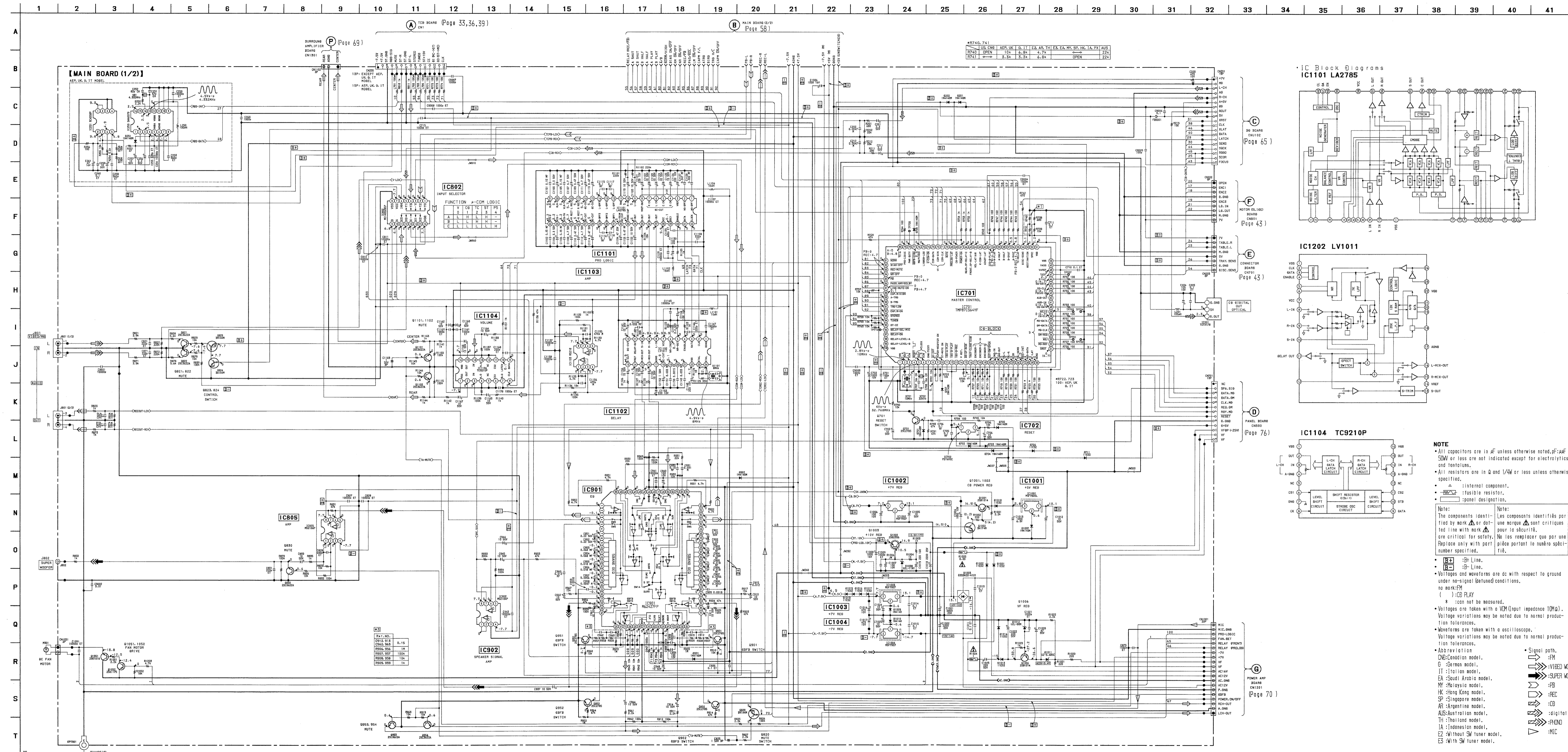
Note:
 • — : parts extracted from the component side.
 • — : Pattern from the side which enable seeing.

6-10. SCHEMATIC DIAGRAM — CD MOTOR SECTION —



NOTE
 • All capacitors are in μF unless otherwise noted. $\text{pF} = \mu\text{F} / 100$
 50W 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.
 • **[B+]** : B+ Line.
 • Voltages and waveforms are dc with respect to ground under no-signal conditions.
 no mark: STOP
 • Voltages are taken with a VOM (Input impedance $10\text{M}\Omega$).
 Voltage variations may be noted due to normal production tolerances.

6-13. SCHEMATIC DIAGRAM — MAIN SECTION —
• See page 82 for IC Pin Function. (IC701)



NOTE

- All capacitors are in μF unless otherwise noted; pF: pF
- 50W or less are not indicated except for electrolytics and tantalums.
- All resistors are in Ω and $1/\text{W}$ or less unless otherwise specified.
- Δ : internal component.
- ∇ : fusible resistor.
- \square : panel designation.

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

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

- \square : B-Line.
- \square : B-Line.
- Voltagages and waveforms are dc with respect to ground under no-signal (detuned) conditions.
- no mark: \square : CD PLAY
- * : can not be measured.
- Voltagages 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.

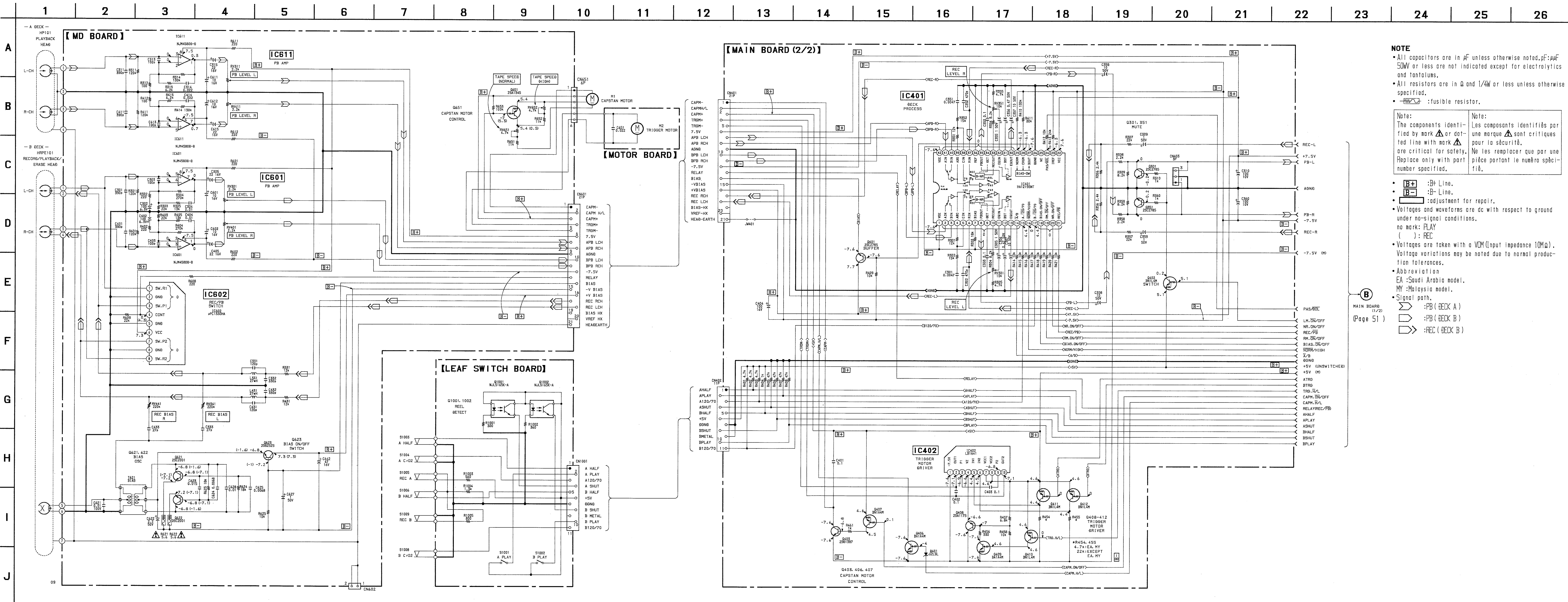
Abbreviation

- CM: Canadian model.
- G: German model.
- IT: Italian model.
- EA: Saudi Arabia model.
- MY: Malaysia model.
- HK: Hong Kong model.
- SP: Singapore model.
- AR: Argentine model.
- AU: Australian model.
- TH: Thailand model.
- IA: Indonesian model.
- E2: With SM tuner model.

Signal path

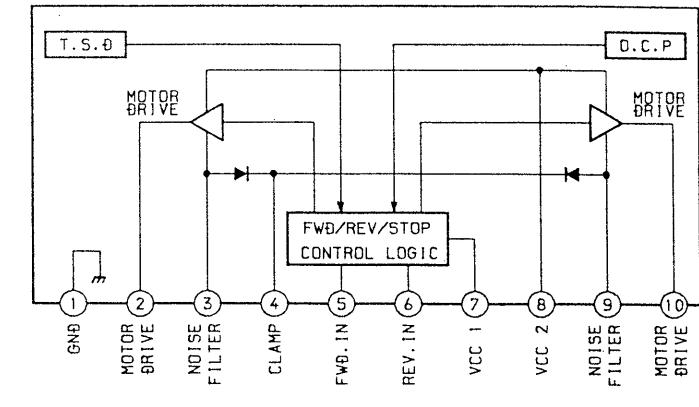
- \rightarrow : FM
- \rightarrow : VIBED MOOPER
- \rightarrow : SUPER MOOPER
- \rightarrow : FB
- \rightarrow : FCD
- \rightarrow : REC
- \rightarrow : PHONO
- \rightarrow : MIC

6-14. SCHEMATIC DIAGRAM — DECK SECTION —
 • See page 47 for Printed Wiring Board. (MAIN BOARD)

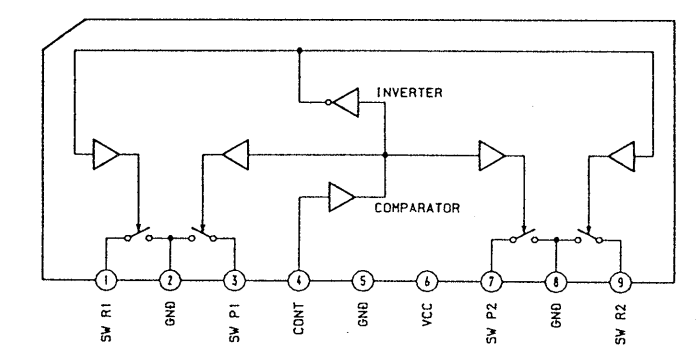


IC Block Diagrams

IC402 LB1641



IC602 μPC1330HA



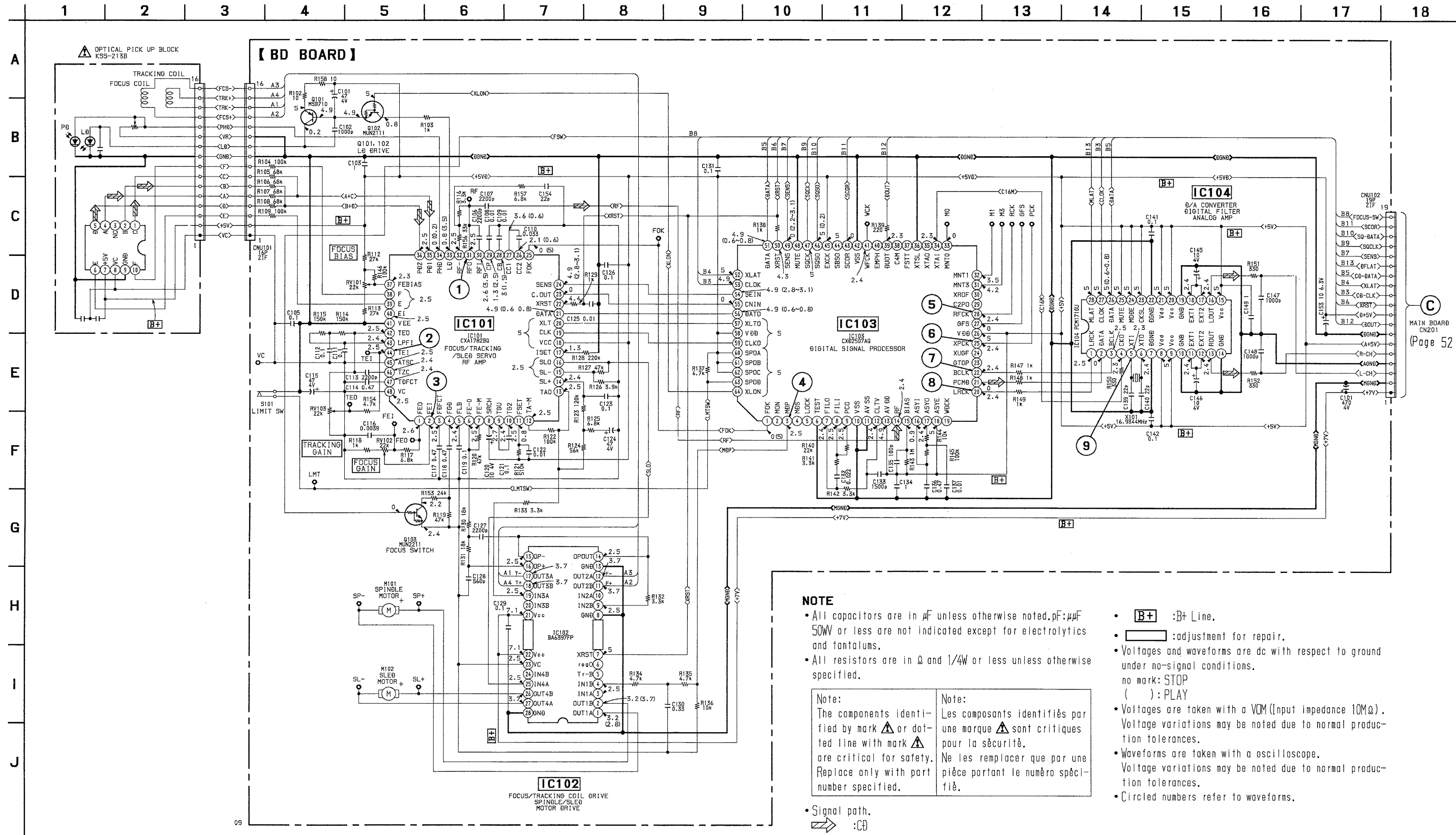
NOTE
 • All capacitors are in μF unless otherwise noted. μF : μF , μF : μF , μF : μF
 50W or less are not indicated except for electrolytics and tantalums.
 • All resistors are in Ω and $1/4\text{W}$ or less unless otherwise specified.
 • $\text{---}\text{---}$: fusible resistor.

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.

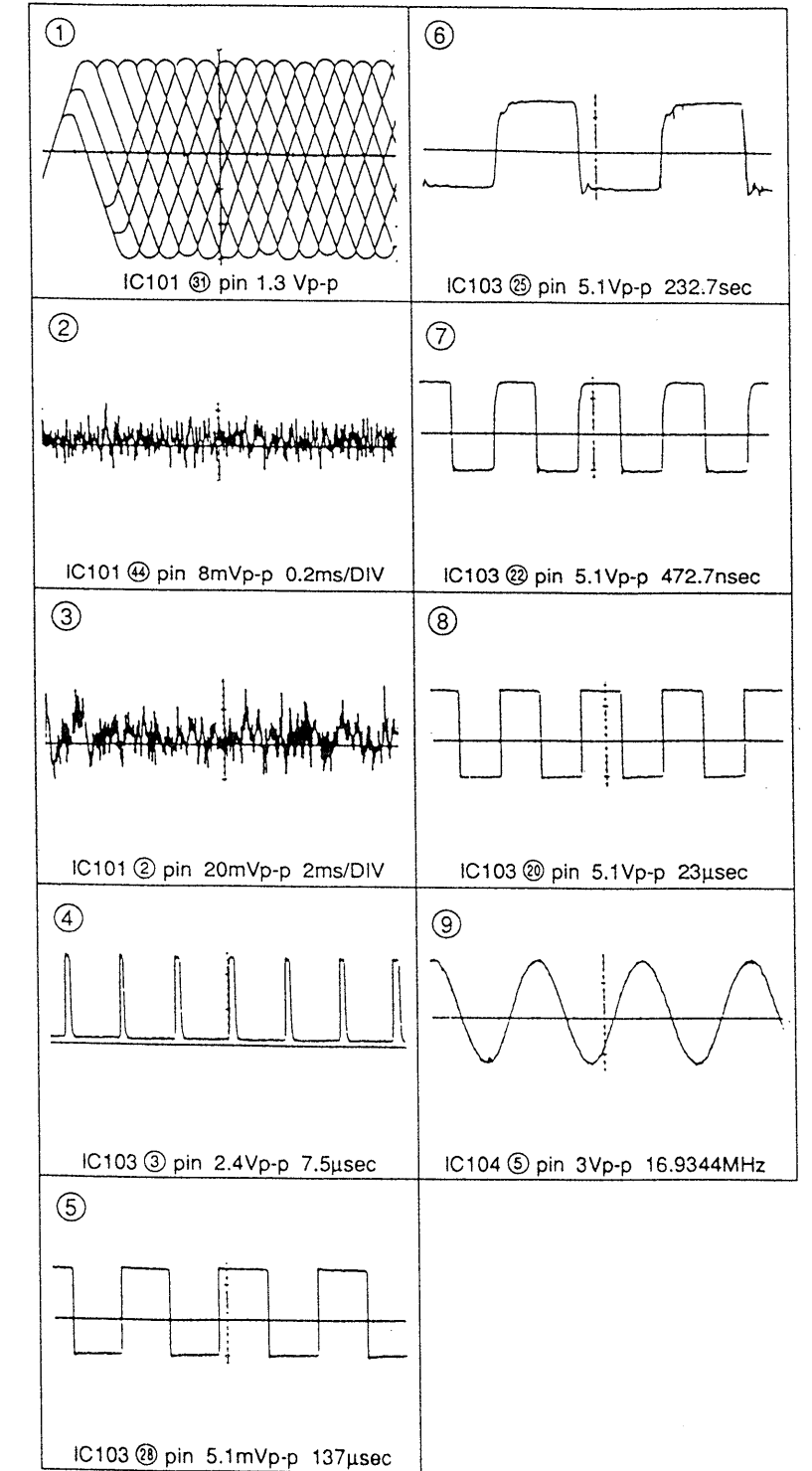
- $\text{---}\text{---}$: BF Line.
- $\text{---}\text{---}$: B Line.
- $\text{---}\text{---}$: adjustment for repair.
- Voltages and waveforms are dc with respect to ground under no-signal conditions. no mark: PLAY () : REC
- Voltages are taken with a VOM (input impedance 10M Ω). Voltage variations may be noted due to normal production tolerances.
- Abbreviation
 EA : Saudi Arabia model.
 MY : Malaysia model.
 Signal path.

(B) MAIN BOARD (1/2) (Page 51)

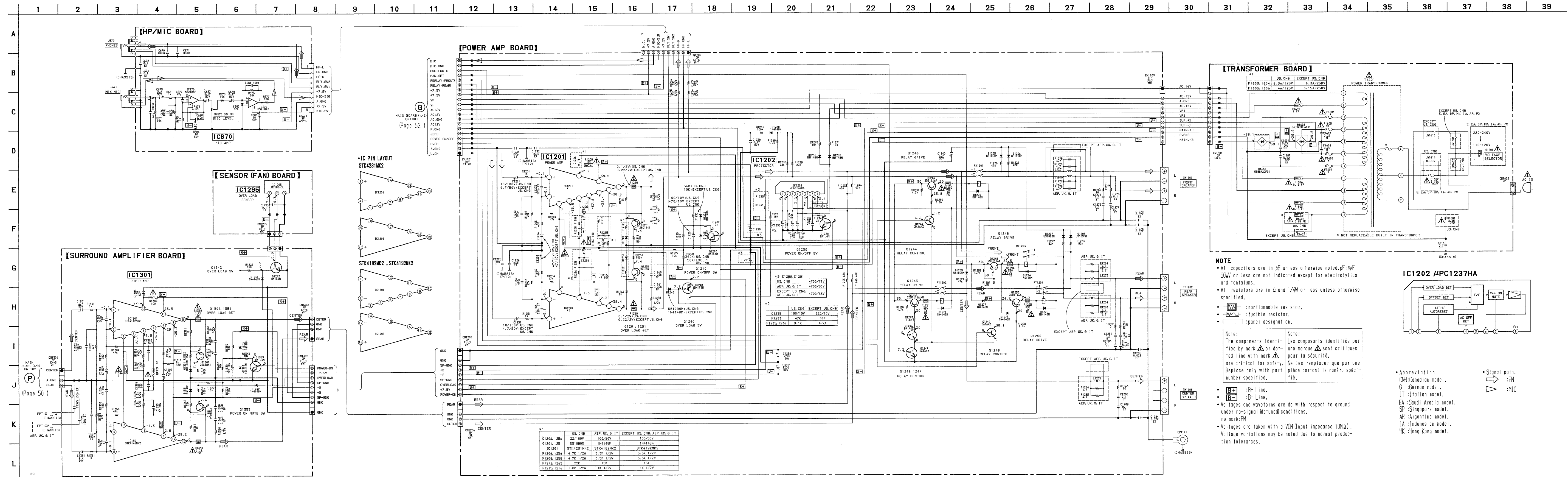
6-17. SCHEMATIC DIAGRAM — CD SECTION —
• See page 85 for IC Block Diagrams.



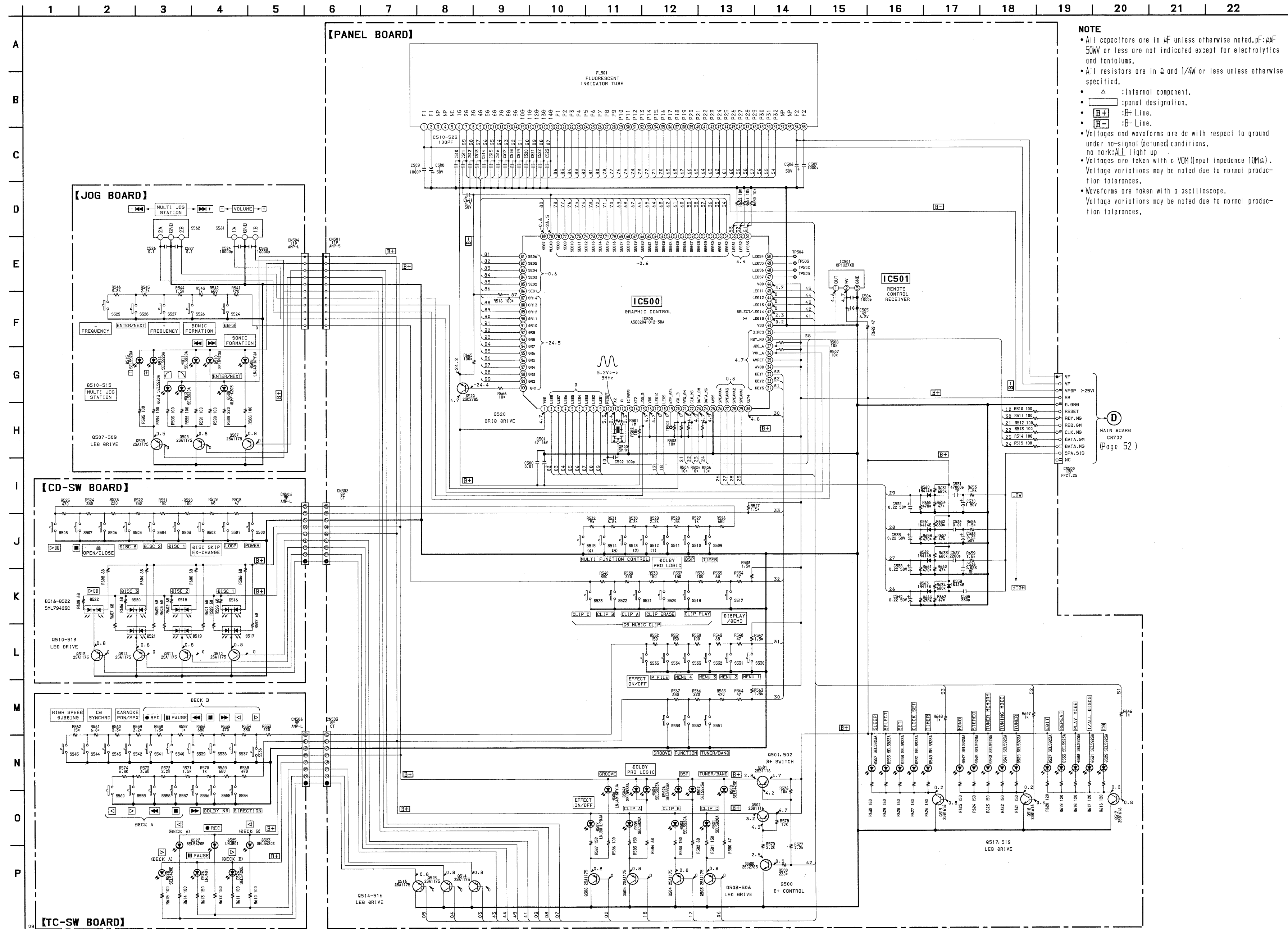
• Waveforms



6-19. SCHEMATIC DIAGRAM — POWER SECTION —



6-20. SCHEMATIC DIAGRAM — PANEL SECTION —
• See page 81 for IC Pin Function. (IC500)



NOTE

- All capacitors are in μF unless otherwise noted. $\text{pF} = \mu\text{F} \times 10^{-6}$. 50W 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.
- Δ : internal component.
- \square : panel designation.
- B+ : B+ Line.
- B- : B- Line.
- Voltages and waveforms are dc with respect to ground under no-signal (detuned) conditions, no mark: ALL light up.
- 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.

(D)
MAIN BOARD
CN702
(Page 52)