SERV. 34445E

FH-7MKII

SERVICE MANUAL

US Model
Canadian Model
AEP Model
UK Model
E Model

Photo : US model

CONTENTS

FH-7MKII

— Continued on page 2 —

ATTENTION AU COMPOSANT AYANT RAPPORT À LA SÉCURITÉ!

LES COMPOSANTS IDENTIFIÉS PAR UNE TRAME ET UNE MARQUE ⚠ SUR LES DIAGRAMMES SCHÉMATIQUES ET LA LISTE DES PIÈCES SONT CRITIQUES POUR LA SÉCURITÉ DE FONCTIONNEMENT. NE REMPLACER CES COMPOSANTS QUE PAR DES PIÈCES SONY DONT LES NUMÉROS SONT DONNÉS DANS CE MANUEL OU DANS LES SUPPLÉMENTS PUBLIÉS PAR SONY.

SAFETY-RELATED COMPONENT WARNING!!

COMPONENTS IDENTIFIED BY SHADING AND MARK ⚠ ON THE SCHEMATIC DIAGRAMS AND IN THE PARTS LIST ARE CRITICAL TO SAFE OPERATION. REPLACE THESE COMPONENTS WITH SONY PARTS WHOSE PART NUMBERS APPEAR AS SHOWN IN THIS MANUAL OR IN SUPPLEMENTS PUBLISHED BY SONY.

MICROFILM

COMPACT HI-DENSITY COMPONENT SYSTEM

SONY®

AUD

FH-7MK II

MELF (Metal Electodes Face-Bonding) Components

Warning

If MELF components are forcibly removed from the printed circuit board with pincers or pliers, the circuit board pattern is likely to peel away. Always remove MELF components according to the procedure described on the next page. Replace MELF components with the lead type components.

MELF components are soldered directly to the surface of the printed circuit board.

MELF resistors and capacitors have the same dimensions and are distinguished by their background colors: light brown for resistors, and pink or light green for capacitors.

The MELF resistor color coding is the same as for conventional resistors, and MELF capacitor color coding is the same as for tube-type ceramic capacitors. Note, however, that all MELF resistors are rated at ¼W and ±5%.

Components larger than resistors and without a color code are cross conductors, which are used instead of jumper wires.

1. Structure

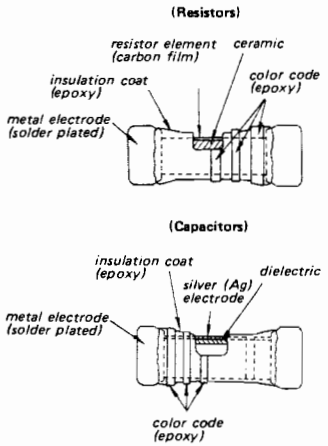
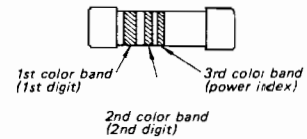
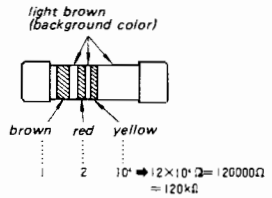


Fig. 1

2. Color Code Reading



(Example of Resistor)



(Example of Capacitor)

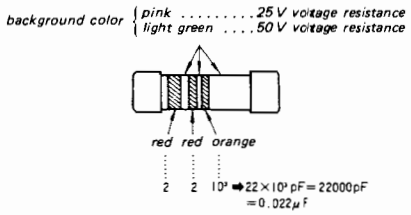


Fig. 2

3. How to Remove MELF Components and Mount Replacements

Use a soldering iron of at least 40W with an iron tip 4 mm in diameter and file the tip down to the angle shown in the diagram.

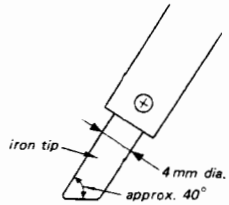


Fig. 3

1. Bring the flat surface of the soldering iron in equal contact with both soldered ends of the component.
2. The solder should melt in about 4 seconds. (The solder will melt more readily if a small amount of solder is attached to the iron tip and the iron tip is placed against the component.)
3. Once the solder has melted, tap the component aside with the tip of the soldering iron, and remove it from the board.

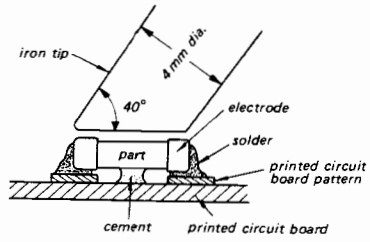


Fig. 4

4. Use lead type resistors or capacitors to replace the MELF components.
These replacements may be mounted either with short leads (see Fig. 5), or by covering a lead with tubing (see Fig. 6).

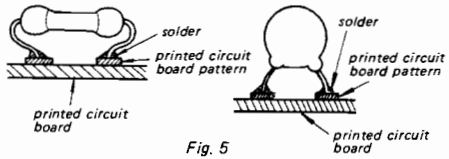


Fig. 5

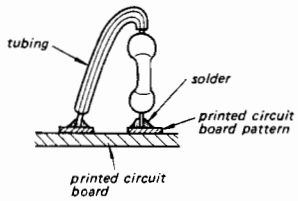


Fig. 6

CAUTION ON POWER SUPPLY

There are two ways of power supply in FH-7MKII. One is by AC-78II using AC power supply, the other is by DC power unit EBP-78MKII (optional accessory). Each of them has different signal path and B+ bus mutually.

- **THE CASE BY AC-78II USING AC POWER SUPPLY**
  There are five B+ buses from AC-78II, +DC (AC power supply), +VccH, −VccH, +Vcc and −Vcc. +DC (AC power supply) is supplied to ST-78II, TA-78II and TC-78II, or also +VccH, −VccH, +Vcc and −Vcc are supplied to TA-78II only. These four B+ buses to TA-78II are for IC103 (L-CH) and IC104 (R-CH) as the power amplifier in TA-78II. Signals from each set are amplified at IC103, 104 and drive the speakers.

- **THE CASE BY EBP-78MKII (optional accessory)**
  B+ bus from EBP-78MKII is only +DC (DC power supply), and this B+ bus is supplied to ST-78II, TA-78II and TC-78II (or TC-78CII).
  According to one B+ bus by +DC (DC power supply), power is not supplied to IC103, 104 as the power amplifier in TA-78II, so there is no amplification at TA-78II. Therefore, there is IC101 as a amplifier in EBP-78MKII. Signals are amplified there, and drive the speakers.
  See page 7 – 10 on connection and signal path of the each case by AC-78II, EBP-78MKII.

SAFETY CHECK-OUT (US Model)

After correcting the original service problem, perform the following safety check before releasing the set to the customer:
Check the antenna terminals, metal trim, "metallized" knobs, screws, and all other exposed metal parts for AC leakage. Check leakage as described below.

LEAKAGE TEST

The AC leakage from any exposed metal part to earth ground and from all exposed metal parts to any exposed metal part having a return to chassis, must not exceed 0.5 mA (500 microampers). Leakage current can be measured by any one of three methods.

1. A commercial leakage tester, such as the Simpson 229 or RCA WT-540A. Follow the manufacturers' instructions to use these instruments.
2. A battery-operated AC milliammeter. The Data Precision 245 digital multimeter is suitable for this job.
3. Measuring the voltage drop across a resistor by means of a VOM or battery-operated AC voltmeter. The "limit" indication is 0.75 V, so analog meters must have an accurate low-voltage scale. The Simpson 250 and Sanwa SH-63Trd are examples of a passive VOM that is suitable. Nearly all battery operated digital multimeters that have a 2 V AC range are suitable. (See Fig. A)

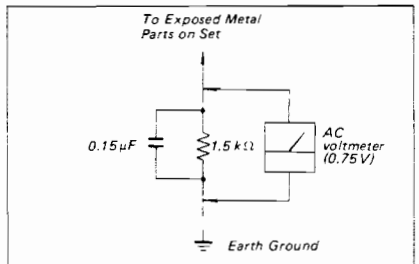
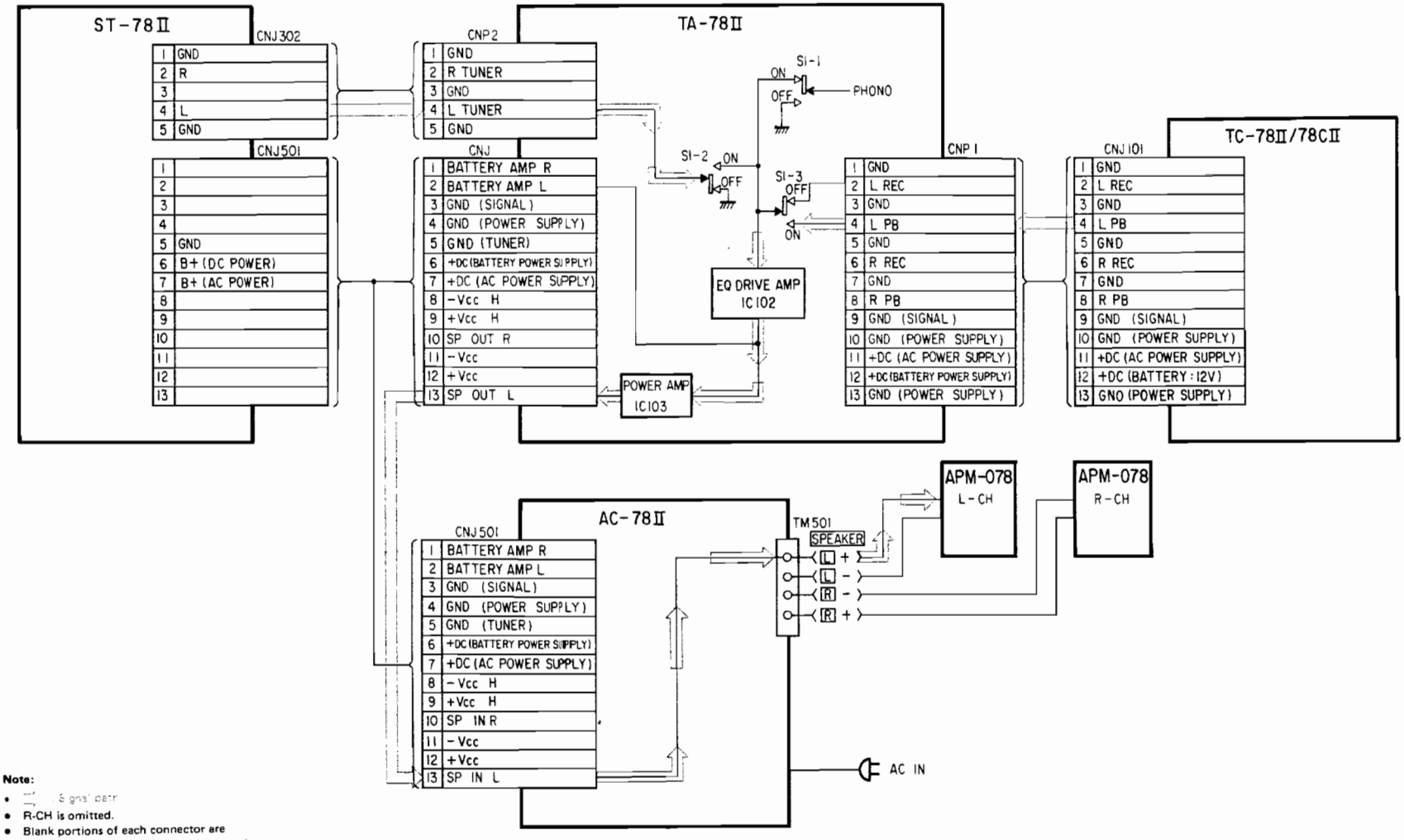


Fig. A. Using an AC voltmeter to check AC leakage.

CONNECTION BETWEEN EACH SET AND SIGNAL PATH

The Case of Power Supply by AC-78II

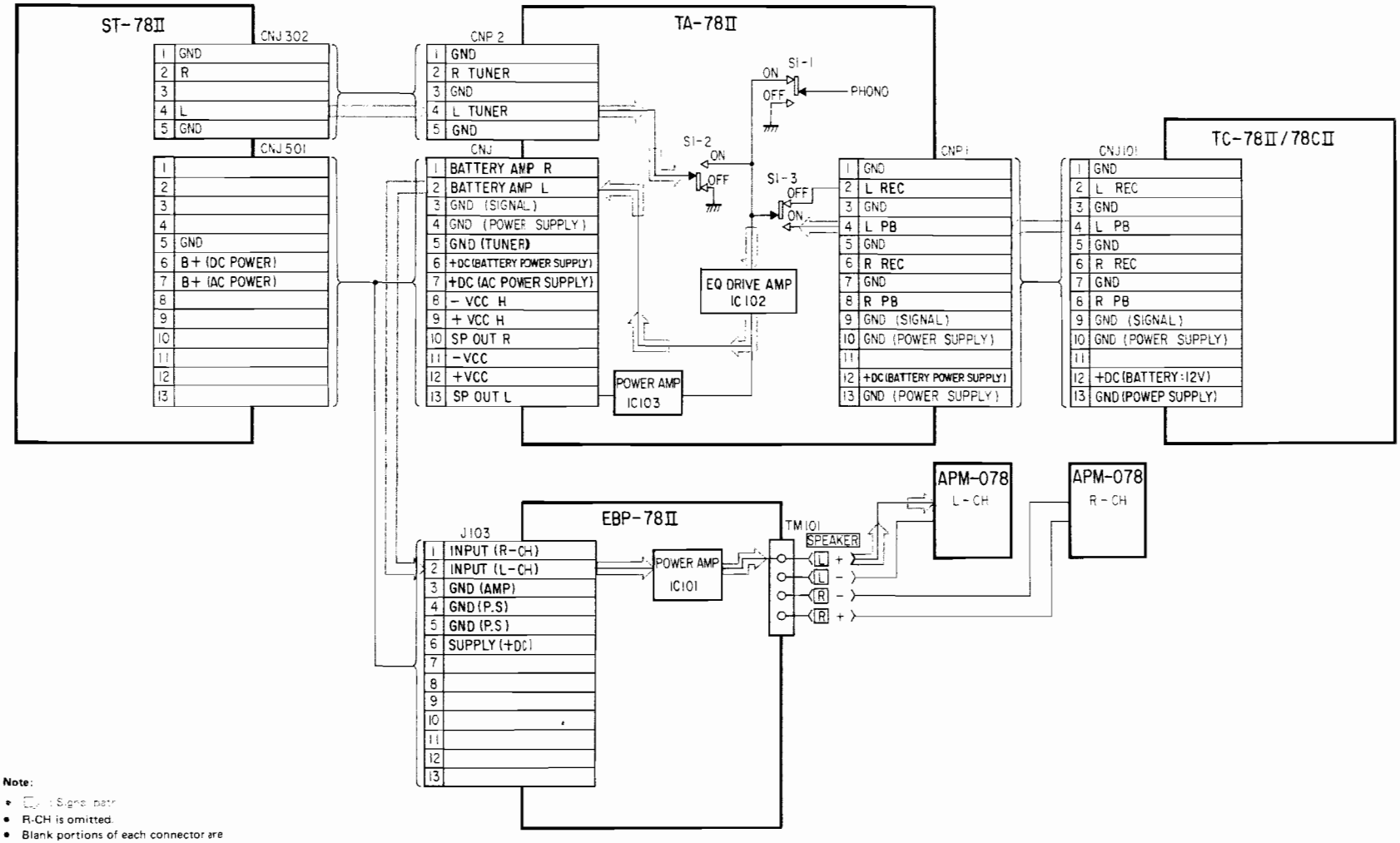


Note:

- Signal path
- R-CH is omitted.
- Blank portions of each connector are not used in the set, and/or not connected inside of the set.

CONNECTION BETWEEN EACH SET AND SIGNAL PATH

The Case of Power Supply by EBP-78II (optional accessory)



Note:

- : Signal path
- R-CH is omitted.
- Blank portions of each connector are not used in the set, and/or not connected inside of the set.

SPECIFICATIONS

ST-78II (AEP, UK, E Model)

System: FM stereo, FM/AM superheterodyne tuner
Quartz-locked digital synthesizer system

FM tuner section

Tuning range	87.5—108 MHz
Antenna terminals	75 ohm unbalanced
Intermediate frequency	10.7 MHz
Usable sensitivity	2.3 μV, S/N = 30 dB/75 ohm
Signal-to-noise ratio	78 dB (mono), 70 dB (stereo)
Harmonic distortion	0.2% (mono), 0.5% (stereo) at 1 kHz
Separation	Better than 40 dB at 1 kHz
Selectivity	55 dB (400 kHz)

MW/LW tuner section (for AEP, UK model)

		MW	LW
Tuning range		522—1,602 kHz	153—344 kHz
Antenna		Built-in ferrite bar antenna, External antenna terminal	
Intermediate frequency		450 kHz	450 kHz
Usable sensitivity	built-in antenna	250 μV/m (1,000 kHz)	500 μV/m (230 kHz)
	external antenna	100 μV (1,000 kHz)	150 μV (230 kHz)
Signal-to-noise ratio (50 mV/m)		52 dB	52 dB
Harmonic distortion (50 mV/m, 400 Hz)		0.3%	0.3%
Selectivity		30 dB (9 kHz)	40 dB (9 kHz)

SW/MW tuner section (for E model)

		SW 1	SW 2	MW
Tuning range		3.2 - 7.3 MHz	9.5 - 21.75 MHz	531 - 1,602 kHz (at 9 kHz step) 530 - 1,610 kHz (at 10 kHz step)
Antenna		External antenna terminal		Built-in ferrite bar antenna, External antenna terminal
Intermediate frequency		450 kHz		450 kHz
Usable sensitivity	built-in antenna	—	—	250 μV/m (1,000 kHz)
	external antenna	23 μV (5 MHz)	30 μV (15 MHz)	100 μV (1,000 kHz)
Signal-to-noise ratio		50 dB (5 mV)		52 dB (50 mV/m)
Harmonic distortion		0.3% (5 mV, 400 Hz)		0.3% (50 mV/m, 400 Hz)
Selectivity		30 dB (9 kHz)		30 dB (9 kHz)

General

Dimensions	Approx. 215 × 55 × 240 mm (w/h/d) (8 1/2 × 2 1/8 × 9 3/8 inches) incl. projecting parts and controls
Weight	Approx. 1.1 kg (2 lb. 7 oz) net

ST-78II (US, Canadian Model)

System: FM stereo, FM/AM superheterodyne tuner
Quartz- locked digital synthesizer system

FM tuner section

Tuning range	87.5 - 108 MHz
Antenna terminals	75 ohm unbalanced
Intermediate frequency	10.7 MHz
Sensitivity at 50 dB quieting	21.2 dBf 6.3 μV (mono)
Usable sensitivity	11.2 dBf, 2.0 μV, (IHF)
Signal-to-noise ratio	78 dB (mono), 70 dB (stereo)
Harmonic distortion	0.2% (mono), 0.5% (stereo) at 1 kHz
Separation	Better than 40 dB at 1 kHz
Selectivity	55 dB (400 kHz)

AM tuner section

Tuning range	530 - 1610 kHz (at 10 kHz step) 531 - 1602 kHz (at 9 kHz step)
Antenna	Built-in ferrite bar antenna External antenna terminal
Intermediate frequency	450 kHz
Usable sensitvity	
built-in antenna	250 μV/m (1,000 kHz)
external antenna	100 μV (1,000 kHz)
Signal-to-noise ratio (50 mV/m)	52 dB
Harmonic distortion (50 mV/m, 400 Hz)	0.3%
Selectivity	30 dB (9 kHz)

General

Dimensions	Approx. 215 × 55 × 240 mm (w/h/d) (8 1/2 × 2 1/8 × 9 3/8 inches) incl. projecting parts and controls
Weight	Approx. 1.1 kg (2 lb. 7 oz) net

TC-78II

Recording system	4-track 2-channel stereo
Frequency response	DOLBY NR OFF (DIN)
	With TYPE IV cassette (Sony METALLIC cassette)
	30 - 16,000 Hz (±3 dB)
	With TYPE II cassette (Sony UCX cassette)
	30 - 15,000 Hz (±3 dB)
	With TYPE I cassette (Sony BHF cassette)
	30 - 14,000 Hz (±3 dB)
Wow and flutter	0.07% WRMS (NAB) ±0.2% (DIN)

General

Dimensions	Approx. 215 × 103 × 235 mm (w/h/d) (8 1/2 × 4 1/8 × 9 1/2 inches) incl. projecting parts and controls
Weight	Approx. 2.5 kg (5 lb. 9 oz) net

TC-78CII

Recording system 4-track 2-channel stereo
Frequency response DOLBY NR OFF (DIN)
With TYPE IV cassette (Sony METALLIC cassette)
30 - 16,000 Hz (±3 dB)
With TYPE II cassette (Sony UCX cassette)
30 - 15,000 Hz (±3 dB)
With TYPE I cassette (Sony HFX cassette)
30 - 14,000 Hz (±3 dB)
Wow and flutter 0.07% WRMS (NAB)
±0.2% (DIN)

General
Dimensions Approx. 215 × 103 × 235 mm (w/h/d) (8½ × 4⅛ × 9⅜ inches) incl. projecting parts and controls
Weight Approx. 2.5 kg (5 lb 9 oz) net

TA-78II

Continuous RMS power output
(for AEP, UK model)
38 + 38 watts (6 ohms, at 1 kHz, 5% THD)
30 + 30 watts (6 ohms, at 1 kHz, 0.5% THD)
24 + 24 watts (6 ohms, 40 Hz - 20 kHz, 0.5% THD)
(for US, Canadian model) 22 + 22 watts (6 ohms, 40 Hz – 20 kHz, 0.5 % THD)
Peak music power output (for E model) 280 W (6 ohms)
Music power output (for E model) 140 W (6 ohms)

Inputs

	Sensitivity	Impedance
PHONO (phono jacks)	2.5 mV	50 kilohms
CD/AUX (stereo phone jack)	150 mV	50 kilohms

Frequency response PHONO : RIAA curve ± 0.5 dB
CD/AUX : 15 Hz - 60 kHz $^{+0}_{-3}$ dB

General
Dimensions Approx. 215 × 55 × 240 mm (w/h/d) (8½ × 2⅛ × 9½ inches) incl. projecting parts and controls
Weight Approx. 1.2 kg (2 lb. 11 oz) net

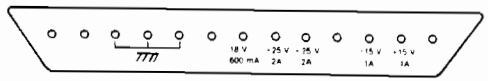
AC-78II (US, Canadian Model)

Power requirements 120 V ac, 60 Hz
Outputs
HEADPHONES Accepts headphones of 8 ohms or more
SPEAKER Accepts speakers of 6 to 16 ohms

General
Dimensions Approx. 215 × 55 × 235 mm (w/h/d) (8½ × 2⅛ × 9⅜ inches) incl. projecting parts and controls
Weight Approx. 3.5 kg (7 lbs 12 oz) net

AC-78II (AEP, UK, E Model)

Power requirements AEP model: Operates on 220 V ac, 50 Hz
UK model: Operates on 240 V ac, 50 Hz
E model: Operates on 120, 220 or 240 V ac, 50 Hz adjustable
Outputs
HEADPHONES Accepts headphones of 8 ohms or more
SPEAKER Accepts speakers of 6 to 16 ohms
13-pin DC output connector of AC-78II unit (rear panel)



General
Dimensions Approx. 215 × 55 × 235 mm (w/h/d) (8½ × 2⅛ × 9⅜ inches) incl. projecting parts and controls
Weight Approx. 3.5 kg (7 lb. 12 oz) net

APM-078

Speaker system 2-way speaker system
Speaker units APM Woofer : 77 cm²
Tweeter : 5 cm. cone type
Enclosure type Bass reflex
Power handling capacity Nominal 38 watts
Frequency range 70 Hz - 20 kHz
Sensitivity 88 dB/W/m
Impedance 6 ohms

General
Dimensions Approx. 160 × 260 × 230 mm (w/h/d) (6⅜ × 10¼ × 9⅛ inches)
Weight Approx. 2.7 kg (6 lb.) net per unit

General

Power consumption AEP, E, US model: 55 watts
UK model: 220 watts
Canadian model: 100 watts
Dimensions Approx. 535 × 320 × 240 mm (w/h/d) (21⅛ × 12⅝ × 9½ inches) incl. projecting parts and controls
Weight Approx. 15.1 kg (33 lb. 5 oz) net
Approx. 16.5 kg (36 lb. 7 oz) in shipping carton

MODEL IDENTIFICATIONS
(TA-78II & APM-078 have no differences by the model.)

AC-78II

SONY MODEL NO. AC-78II
POWER SUPPLY UNIT
COMPACT HI-DENSITY COMPONENT SYSTEM FH-7MKII
SERIAL NO.
MADE IN JAPAN

AC. 220V ~ 50/60Hz 65W . . . AEP Model
AC. 240V ~ 50/60Hz 220W . . . UK Model
AC. 120/220/240V ~ 50/60Hz 65W . . . E Model

SONY MODEL NO. AC-78II
POWER SUPPLY UNIT
COMPACT HI-DENSITY COMPONENT SYSTEM FH-7MKII
SERIAL NO.
MADE IN JAPAN

AC. 120V 60Hz 65W . . . US Model
AC. 120V 60Hz 100W . . . Canadian Model

ST-78II

SONY MODEL NO. ST-78II
FM STEREO/FM-AM TUNER
COMPACT HI-DENSITY COMPONENT SYSTEM
FH-7MKII
FREQUENCY RANGE:
IF FM; 10.7MHz AM; 450kHz
SERIAL NO.
MADE IN JAPAN

US, Canadian, G-AEP

- This label is sticked on TC-78II or TC-78CII

SONY MODEL NO. FH-7MKII
COMPACT HI-DENSITY COMPONENT SYSTEM
ST-78II : FM STEREO/FM-AM TUNER
TA-78II : INTEGRATED STEREO AMPLIFIER
TC-78II : STEREO CASSETTE DECK
AC-78II : POWER SUPPLY UNIT
APM-078 : APM 2WAY SPEAKER SYSTEM
SERIAL NO.
MADE IN JAPAN

TC-78II . . . G-AEP model
TC-78CII . . . US, Canadian model

TC-78II/78CII

TC-78II : AEP, UK, E Model
TC-78CII : US, Canadian Model

SONY MODEL NO.
STEREO CASSETTE DECK
COMPACT HI-DENSITY COMPONENT SYSTEM
FH-7MKII
SERIAL NO.
MADE IN JAPAN

FM : 87.5–108MHz
MW : 522–1602kHz LW : 153–344kHz ... AEP UK Model

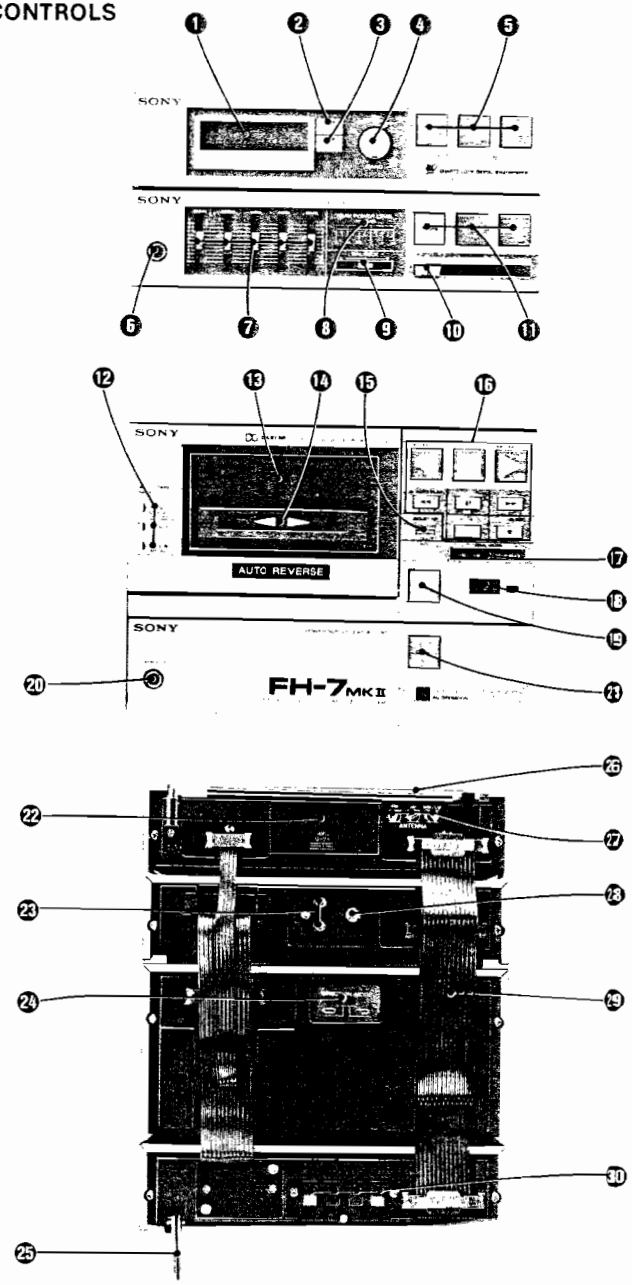
FM : 87.5–108MHz AM : 530–1610kHz ... US, Canadian Model

FM : 87.5–108MHz SW2 : 9.5–21.75MHz
SW1 : 3.2–7.3MHz MW : 531–1602kHz ... E Model

BLANK ... AEP, UK, US, Canadian, E Model
FTZ-PRÜFNUMMER U185 ... For WEST GERMANY

SECTION 1
OUTLINE

FUNCTION OF CONTROLS
(AEP, UK, E Model)



AEP, UK, E Model

Tuner ST-78II
(The photo shows AEP, UK model)

❶ Frequency display
Permits reading the received frequency at a glance from the figures.

❷ STEREO indicator
This indicator will light when an FM stereo program of sufficient signal strength is tuned in.

❸ TUNED indicator
Lights up when a signal is tuned in accurately

❹ BAND selector
Selects the desired band.
AEP, UK model: FM, MW or LW.
For FM reception, normally set to FM STEREO. When it is difficult to hear the broadcast due to noise, set to MONO. The reception will be more stable and noise will be reduced.
E model: FM, MW, SW_1 or SW_2.

❺ TUNING buttons
Press either the "+" or "−" button to change the frequency.
Press the "−" button to go to a lower frequency and the "+" button to go to a higher. To change the frequency rapidly, press the FAST button while pressing "+" or "−" button.

For E model, a METER BAND indicator is furnished, which lights up to show that the receiving frequency is in an SW meter band.

Amplifier TA-78II

❻ CD/AUX input jack (stereo phone jack)
This stereo phone jack allows you to quickly and easily connect a CD (compact disc) player, external tuner or cassette deck for playback. For connection, use the optional RK-81A connecting cord.

❼ Graphic equalizer controls
The LEDs light up when the POWER switch is turned on. Slide the controls downwards or upwards to equalize the reproduced sound.

❽ PEAK POWER LEVEL meters
These meters show the output level of the power amplifier.

❾ BALANCE control
This controls the balance of the left and right channel output level. Normally set the control to the center position.

❿ VOLUME control
This controls the overall output level.

⓫ FUNCTION selectors
Press the desired program source button.
PHONO: For disc programs connected to PHONO inputs or the auxiliary programs connected to the CD/AUX jack. Disconnect the phone plug connected to the CD/AUX jack when reproducing disc programs.
TUNER: For broadcasting programs.
TAPE: For taped programs.

Cassette deck TC-78II

⓬ Tape type indicators
The type of the tape being used is automatically detected by the automatic tape selector system and the corresponding indicator lights.

⓭ Cassette holder

⓮ Tape direction indicators
During playback or recording, one of the indicators illuminates to show the direction of the tape transport.

⓯ DOLBY NR switch
To record with the Dolby NR* (Noise Reduction) process, depress this switch. To record without the Dolby NR process, press again and release this switch.
When playing back, set this switch to the same position used in recording

*"Dolby" and the double-D symbol are trade marks of the Dolby Laboratories Licensing Corporation. Noise reduction system manufactured under license from Dolby Laboratories Licensing Corporation

⓰ Function buttons
It is possible to switch directly from one mode to another.
▶ (forward) button: Press this button to play the front side of the cassette. The tape is transported to the right.
▶▶ (fast-forward) button: Press this button to advance the tape rapidly to the right.
● (record) button: Press this button together with the ▶ button to start recording. The indicator will illuminate.
■ (stop) button: To stop the tape, press this button.
❚❚ (pause) button: To stop the tape for a moment during recording or playback, press this button. To restart, press this button again. This button is also used to control more precisely the start of recording and to release the record muting mode. This button also operates during playback of the reverse side.
○ (record muting) button: Press this button to eliminate unwanted material and to insert a blank space during recording.
◀ (reverse) button: Press this button to play the back side of the cassette.
◀◀ (fast-reverse) button: Press this button to advance the tape rapidly to the left.

⓱ LEVEL METER
These meters show the input level during recording and recorded levels during playback.

⓲ TAPE COUNTER and reset button
The tape counter provides a numerical reference point while recording which can be used to index a recorded cassette. To reset to zero, press the reset button.

⓳ ≙ (eject) button
Press this button to open the cassette holder.

AC power supply unit AC-78II

⑳ **HEADPHONES jack (stereo phone jack)**
Accepts headphones with a phone plug. The headphone volume can be adjusted with the VOLUMEcontrol.

㉑ **POWER switch**
Press to turn on the powers of amplifier, tuner and cassette deck. To turn them off, press it again.

rear panel

㉒ **Battery compartment**

㉓ **PHONO input jacks (phono jack)**
For connecting an optional turntable system.

㉔ **DIRECTION MODE switch**
⇄ : for repeat playback of both sides of a cassette.
→ : for playing back from the front to the reverse side once only. If playback begins with the reverse side, the tape will stop after this side is played back once.
This switch functions only during playback.

㉕ **AC power cord**

㉖ **Telescopic antenna**
Used for FM or SW (only for E model) reception.

㉗ **External antenna and ground terminals**

㉘ **Ground terminal (⏚)**
Connect the ground wire of a turntable system to this terminal.

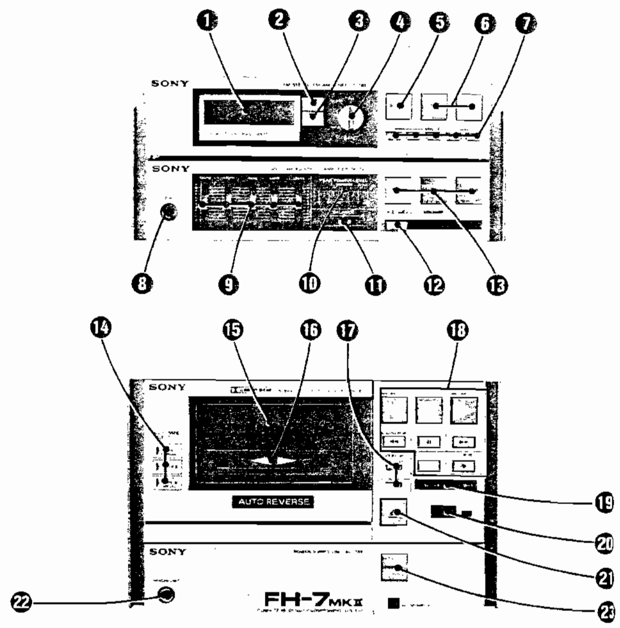
㉙ **ISS (Interference suppress switch)**
If interference is encountered while recording MW or LW program, slide the switch to 2 or 3 position depending on which best reduces the noise. Normally set the switch to 1 position.

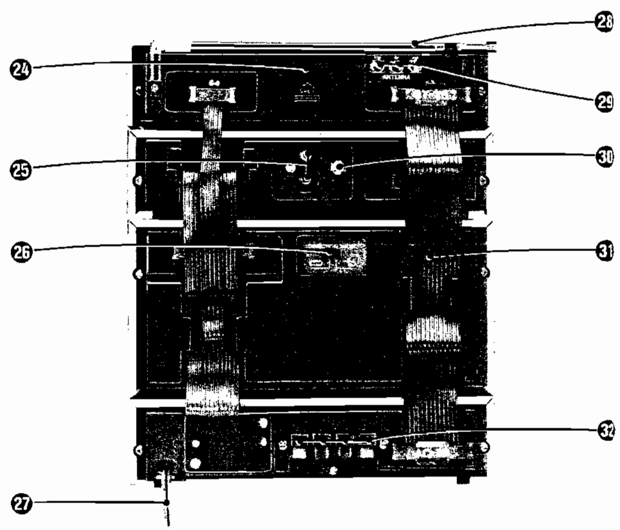
㉚ **Speaker terminal**
Connect the speaker system APM-078 with the supplied speaker cords.

Voltage selector (only for E model)
Turn the selector so that the arrow on the selector points to the appropriate voltage.

US, Canadian Model

FUNCTION OF CONTROLS
(US, Canadian Model)





Tuner ST-78Ⅱ

1 Frequency display
Permits reading the received frequency at a glance from the figures.

2 STEREO indicator
This indicator will light when an FM stereo program of sufficient signal strength is tuned in.

3 TUNED indicator
Lights up when a signal is tuned in accurately.

4 BAND selector
Selects the desired band FM or AM.

5 MEMORY button
Press to operate memory circuit. The MEMORY indicator will appear in the frequency display for a few seconds indicating that the memory circuit is standing by.

6 TUNING buttons
Press either the "+" or "−" button to change the frequency.
Press the "−" button to go to a lower frequency and the "+" button to go to a higher.

7 Station PRESET buttons
To memorize a station, press a desired button while MEMORY indicator lights up.
To call up a memorized station press the appropriate button.

Amplifier TA-78Ⅱ

8 CD/AUX input jack (stereo phone jack)
This stereo phone jack allows you to quickly and easily connect a CD (compact disc) player, external tuner or cassette deck for playback. For connection, use the optional RK-81A connecting cord.

9 Graphic equalizer controls
The LEDs light up when the POWER switch is turned on. Slide the controls downwards or upwards to equalize the reproduced sound.

10 PEAK POWER LEVEL meters
These meters show the output level of the power amplifier.

11 BALANCE control
This controls the balance of the left and right channel output level. Normally set the control to the center position.

12 VOLUME control
This controls the overall output level.

13 FUNCTION selectors
Press the desired program source button.
PHONO: For disc programs connected to PHONO inputs or the auxiliary programs connected to the CD/AUX jack. Disconnect the phone plug connected to the CD/AUX jack when reproducing disc programs.
TUNER: For broadcasting programs.
TAPE: For taped programs.

Cassette deck TC-78CⅡ

14 Tape type indicators
The type of the tape being used is automatically detected by the automatic tape selector system and the corresponding indicator lights.

15 Cassette holder

16 Tape direction indicators
During playback or recording, one of the indicators illuminates to show the direction of the tape transport.

17 DOLBY NR switches
The upper switch turns the Dolby NR* (Noise Reduction) system on and off and the lower switch selects either the B-type or C-type Dolby NR system.
To record with the Dolby NR process, depress the ON/OFF switch to the ON position and choose between B-TYPE (⊓) and C-TYPE (⊔).
To record without the Dolby NR process, press the ON/OFF switch again to release.
When playing back, set these switches to the same position used in recording.

* "Dolby" and the double-D symbol are trade marks of the Dolby Laboratories Licensing Corporation. Noise reduction system manufactured under license from Dolby Laboratories Licensing Corporation.

18 Function buttons
It is possible to switch directly from one mode to another.
- ▶ (forward) button: Press this button to play the front side of the cassette. The tape is transported to the right.
- ▶▶ (fast-forward) button: Press this button to advance the tape rapidly to the right.
- ● (record) button: While pressing this button, press the ▶ button to start recording. The indicator will illuminate.
- ■ (stop) button: To stop the tape, press this button.
- ❚❚ (pause) button: To stop for a moment during recording or playback, press this button. To restart, press this button again. This button is also used to control more precisely the start of recording and to release the record muting mode. This button also operates during playback of the reverse side.
- ○ (record muting) button: Press this button to eliminate unwanted material and to insert a blank space during recording.
- ◀ (reverse) button: Press this button to play the back side of the cassette.
- ◀◀ (fast-reverse) button: Press this button to advance the tape rapidly to the left.

19 LEVEL METER
These meters show the input level during recording and recorded level during playback.

20 TAPE COUNTER and reset button
The tape counter provides a numerical reference point while recording which can be used to index a recorded cassette. To reset to zero, press the reset button.

21 ⏏ (eject) button
Press this button to open the cassette holder.

US, Canadian Model

AC power supply unit AC-78II

㉒ HEADPHONES jack (stereo phone jack)
Accepts headphones with a phone plug. The headphone volume can be adjusted with the VOLUME control.

㉓ POWER switch
Press to turn on the powers of amplifier, tuner and cassette deck. To turn them off, press it again.

rear side

㉔ Battery compartment

㉕ PHONO input jacks (phono jack)
For connecting an optional turntable system.

㉖ DIRECTION MODE switch
⇄ : for repeat playback of both sides of a cassette.
⇉ : for playing back from the front to the reverse side once only.
If playback begins with the reverse side, the tape will stop after this side is played back once.
This switch functions only during playback.

㉗ AC power cord

㉘ Telescopic antenna
Used for FM reception.

㉙ Antenna terminals and ground terminal

㉚ Ground terminal (⏚)
For connecting the ground wire of a turntable system.

㉛ ISS (interference suppress switch)
If interference is encountered while recording AM program, slide the switch to 2 or 3 position depending on which best reduces the noise. Normally set the switch to 1 position.

㉜ Speaker terminals
Connect the speaker system APM-078 with the supplied speaker cords.

FEATURES

The Sony FH-7MKII is a compact high-density component system consisting of an FM stereo/FM-AM tuner, a high quality cassette deck, and integrated amplifier. You can take it anywhere so that you can enjoy a variety of program sources—broadcast programs, taped programs, etc., anytime you like.
Each matched component of the FH-7MKII is the equal of fine separate components and has the following features :

- Three different power sources usable: house current using supplied AC power supply unit, batteries and 12 V car battery using the optional DC power supply unit (EBP-78 MKII).
- Flat connecting cords, supplied, which enable you to connect each component quickly and securely.
- The connectable carrying handle makes the FH-7MKII carriable as a small suit case.

Amplifier section
- CD/AUX input jack for connecting a CD (compact disc) player, external tuner or cassette deck and PHONO input jacks for listening to records.
- Five frequency band equalizer with LEDs to compose the source sound to your liking

Tuner section (AEP, UK, E model)
- The quartz-locked digital synthesizer system with a sophisticated Phase Locked Loop (PLL) circuit allows extremely precise tuning of FM and MW/LW or SW stations with an electronic digital readout on the frequency display.
- Built-in telescopic antenna and external antenna terminals.

Tuner section (US, Canadian model)
- The quartz-locked digital synthesizer system with a sophisticated Phase Locked Loop (PLL) circuit allows extremely precise tuning of FM and AM stations with an electronic digital readout on the frequency display.
- Each station PRESET button allows you to memorize 5 stations : one station for each band, and to select these memorized stations with the touch of a button.
- Built-in telescopic antenna and external antenna terminals.

Cassette deck section
- The cassette deck can use the metal tapes, providing wider dynamic range and extended frequency response.
- Auto-reverse function enables you to repeat playback of both sides of the cassette, once or continuously.
- Automatic Music Sensor (AMS) allows easy playback of the selection being played and easy skipping to the next selection.
- The automatic recording control system sets the recording level automatically.
- The record muting function allows you to eliminate material you do not want to record, such as commercials, and to make a blank space between selections.
- The Dolby NR (noise reduction) system reduces tape hiss and assures high quality recording and playback. (AEP, UK, E model)
- The C-type Dolby NR (noise reduction) system reduces tape noise twice as effectively as the conventional B-type Dolby NR system and assures high quality recording and playback. (US, Canadian model)

AC power supply section
- Permits headphones to be connected. Their volume is adjustable.
- This section supplies power to the tuner, amplifier and cassette deck.

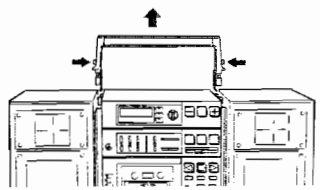
Speaker section
- A two way speaker system with an APM (Accurate Pistonic Motion) woofer provides clear sound.

SECTION 2
DISASSEMBLY

REMOVAL

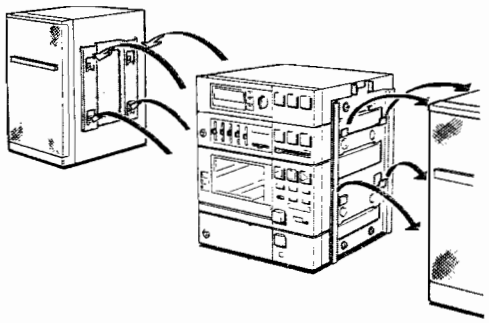
HANDLE

Pull out handle by pushing the button of both sides.

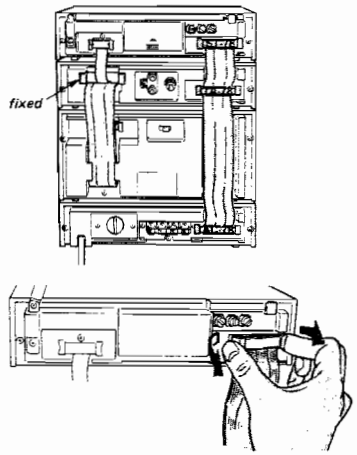


SPEAKERS

Remove speakers.

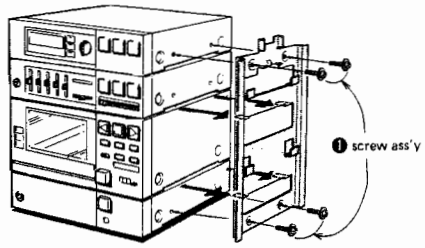


CONNECTORS



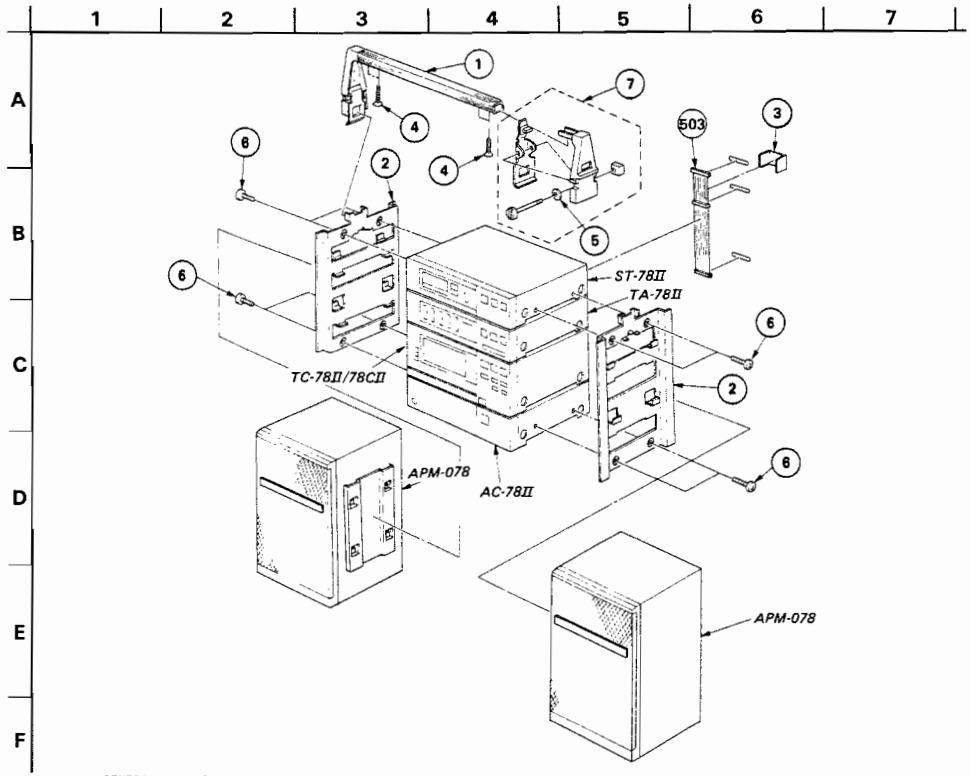
Remove connectors.

SIDE PLATE



❷ Pull out both side plates.

SECTION 3
EXPLODED VIEW & PARTS LIST



GENERAL SECTION

No.	Part No.	Description
1	2-249-402-21	HANDLE
2	4-884-807-00	(SILVER)...PLATE (A), SIDE
2	4-884-807-11	(RED).....PLATE (A), SIDE
2	4-884-807-21	(BLACK)....PLATE (A), SIDE
3	4-884-875-00	LABEL (A) (CONNECTOR), CAUTION
4	7-682-248-09	SCREW +K 3X8
5	7-688-004-02	W 4, SMALL
6	X-4884-807-0	SCREW ASSY, SIDE PLATE
7	X-4884-813-1	HANDLE ASSY

ACCESSORY & PACKING MATERIAL

No.	Part No.	Description
41	3-309-143-00	(TC-78II)...BAG, PROTECTION
42	3-701-308-00	(BLACK)....LABEL, PRODUCT COLOR
43	3-701-311-00	(RED).....LABEL, PRODUCT COLOR
44	3-703-729-00	(SILVER)...LABEL, PRODUCT COLOR
45	3-701-630-00	BAG, POLYETHYLENE (FOR PRINTED MATTER)
46	3-701-613-00	BAG, POLYETHYLENE (FOR SCREW ASSY)
47	3-703-390-01	(US)....INSTRUCTION
48	3-703-538-01	(G-AEP)...INSTRUCTION, FTZ
49	3-773-765-11	(AEP).....MANUAL, INSTRUCTION
50	3-773-765-51	(AEP,UK,E).....MANUAL, INSTRUCTION
51	3-773-765-21	(US,Canadian)...MANUAL, INSTRUCTION
52	3-773-765-41	(G-AEP).....MANUAL, INSTRUCTION

ACCESSORY & PACKING MATERIAL

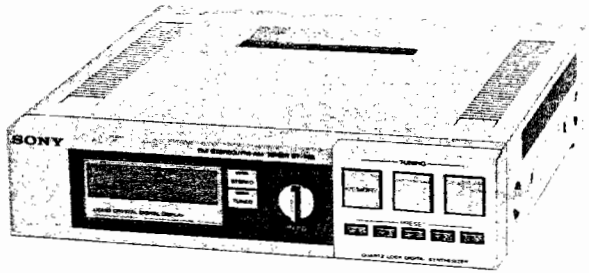
No.	Part No.	Description
53	3-793-82B-11	QUESTIONNAIRE
54	3-795-491-11	(E2 ONLY)....INSTRUCTION
55	3-795-571-11	INSTRUCTION
56	4-883-916-00	(APM-078)...BAG, PROTECTION
57	4-884-885-11	(AC-78II,ST-78II,TA-78II)..... SHEET, PROTECTION (FOR SIDE PLATE)
58	4-884-886-00	CUSHION (REAR), UPPER
59	4-884-888-00	CUSHION (FRONT), UPPER
60	4-884-889-00	BOX, ACCESSORY
61	4-884-945-00	PARTITION
62	4-884-976-00	CAROBOARD, ACCESSORY
63	4-885-192-00	(TC-78II/CII)...SHEET, PROTECTION
64	4-903-021-01	(E)...INDIVIDUAL CARTON
65	4-903-034-01	(US,Canadian,AEP,UK)...INDIVIDUAL CARTON
66	8-890-454-10	(Canadian)...TAPE (UCX-S)
67	X-3701-105-0	ROD ASSY, CLEANING, HEAD
68	X-4884-816-0	CUSHION ASSY, LOWER

ELECTRICAL PARTS

No.	Part No.	Description
501	1-555-839-00	(AEP,UK,E).....CORD, SPEAKER
502	1-556-737-00	(US,Canadian)...CORD, SPEAKER CONNECTION
503	1-557-310-11	CORD (WITH CONNECTOR) 13P

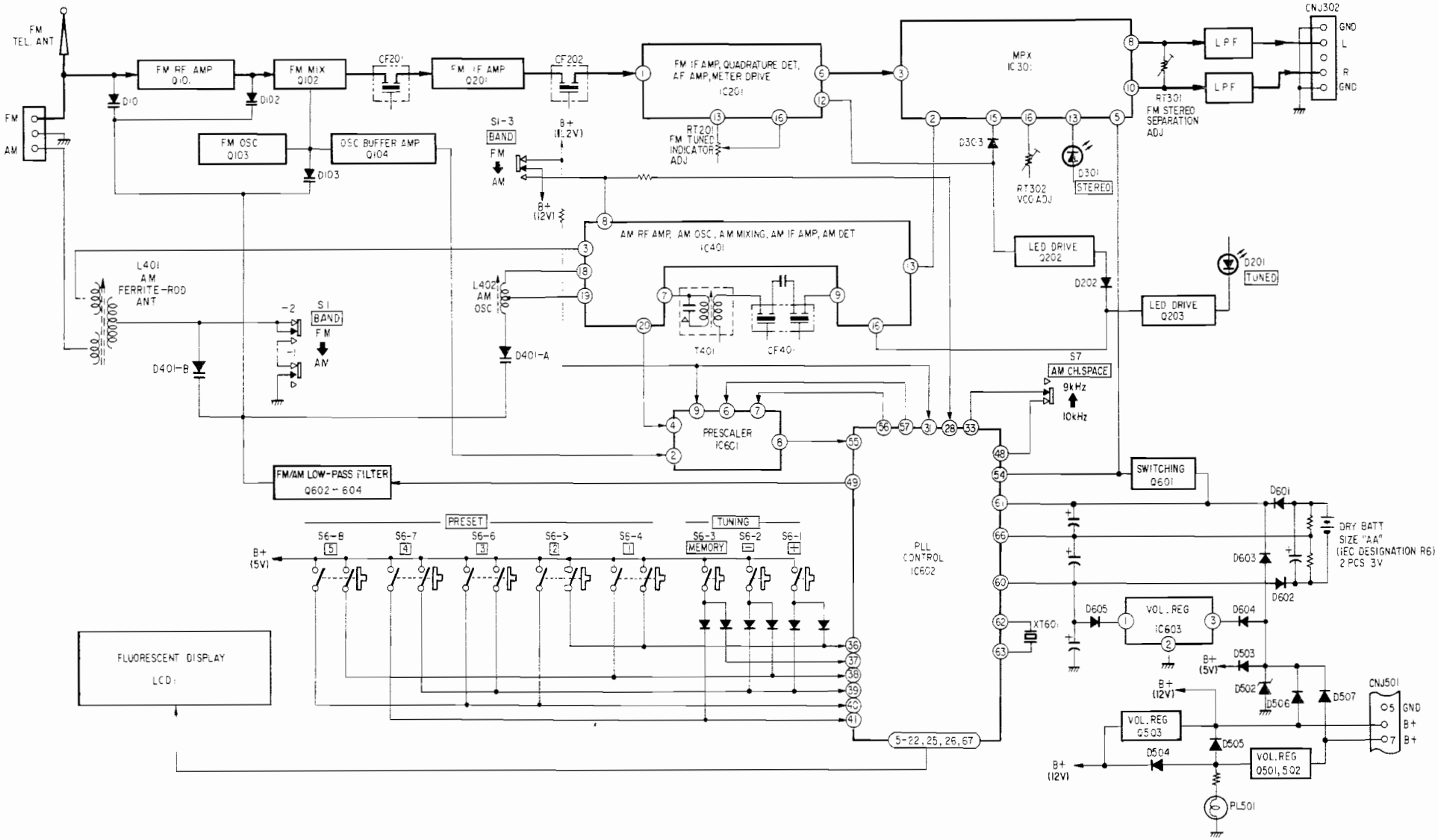
FM STEREO/FM-AM TUNER
(ST-78II)

US Model
Canadian Model



Note: ST-78II is an FM stereo/FM-AM tuner in FH-7MKII.

MEMO


FM TEL. ANT
FM
AM
FM RF AMP Q101
FM MIX Q102
CF201
FM IF AMP Q201
CF202
FM IF AMP, QUADRATURE DET, AF AMP, METER DRIVE IC201
MPX IC301
CNJ302
GND
L
R
GND
LPF
LPF
RT301 FM STEREO SEPARATION ADJ
D101
D102
D103
FM OSC Q103
OSC BUFFER AMP Q104
S1-3 BAND
FM
AM
B+ (8.2V)
RT201 FM TUNED INDICATOR ADJ
D303
RT302 VCO ADJ
D301 STEREO
B+ (12V)
AM RF AMP, AM OSC, AM MIXING, AM IF AMP, AM DET IC401
LED DRIVE Q202
D201 TUNED
D202
LED DRIVE Q203
L401 AM FERRITE-ROD ANT
L402 AM OSC
T401
CF401
S1 BAND FM AM
D401-A
D401-B
S7 AM CH.SPACE
9kHz
10kHz
PRESCALER IC601
FM/AM LOW-PASS FILTER Q602 ~ 604
SWITCHING Q601
PRESET
TUNING
S6-8
S6-7
S6-6
S6-5
S6-4
S6-3 MEMORY
S6-2
S6-1
B+ (5V)
PLL CONTROL IC602
D601
DRY BATT SIZE "AA" (IEC DESIGNATION R6) 2 PCS 3V
D603
D602
D605
VOL. REG IC603
D604
XT601
D503
B+ (5V)
B+ (12V)
D502
D506
D507
CNJ501
GND
B+
B+
VOL. REG Q503
D505
D504
VOL. REG Q501, 502
B+ (12V)
PL501
FLUORESCENT DISPLAY LCD
5-22, 25, 26, 67

FM SECTION 1

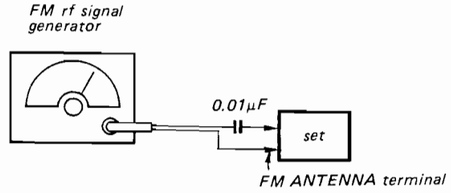
Setting:

BAND selector switch: FM

FM/AM PLL Bias Adjustment

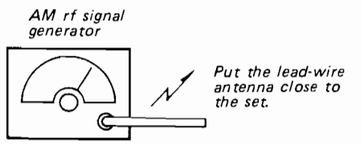
Setting:

FM

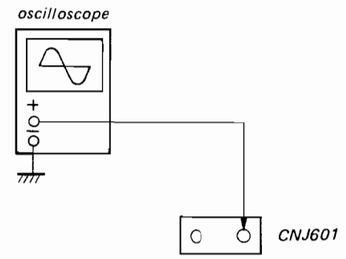


Carrier frequency: 87.5MHz, 108MHz
Modulation: 1kHz, 75kHz deviation
Output level: 1mV (60dB)

AM



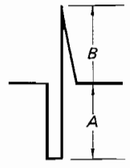
Carrier frequency: 530kHz, 1,610kHz
Modulation: 30% amplitude modulation by 400Hz signal



Procedure:

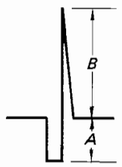
1. Connect the oscilloscope as shown on the left.
2. Set BAND selector switch (S1) to FM.
3. Push TUNING (+, –) button for 87.5MHz.
4. Adjust RT601 so that the waveform is shown below.

   A : B = 1 : 1
   A is approx. 0.6V



5. Push the button for 108MHz. Confirm that the waveform is locked as shown below.

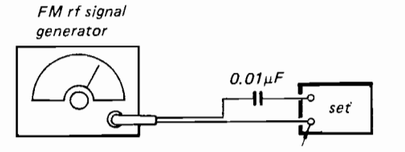
   A : B = 1 : 2
   (reference)



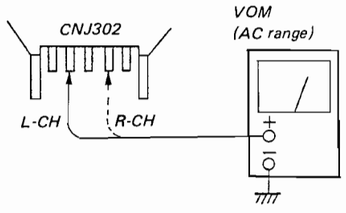
6. Set BAND selector switch (S1) to AM.
   Set AM CH. SPACE switch (S7) to 10kHz.
7. Confirm that the waveform is locked when the set is tuned to 530kHz.
8. Confirm that the waveform is locked when the set is tuned to 1,610kHz.

FM Tracking Adjustment

Setting:

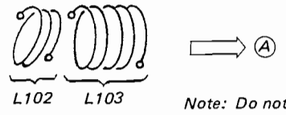


Carrier frequency: 87.5MHz, 98MHz, 108MHz
Modulation: 1kHz, 75kHz deviation
Output level: 3.16μV (10dB)



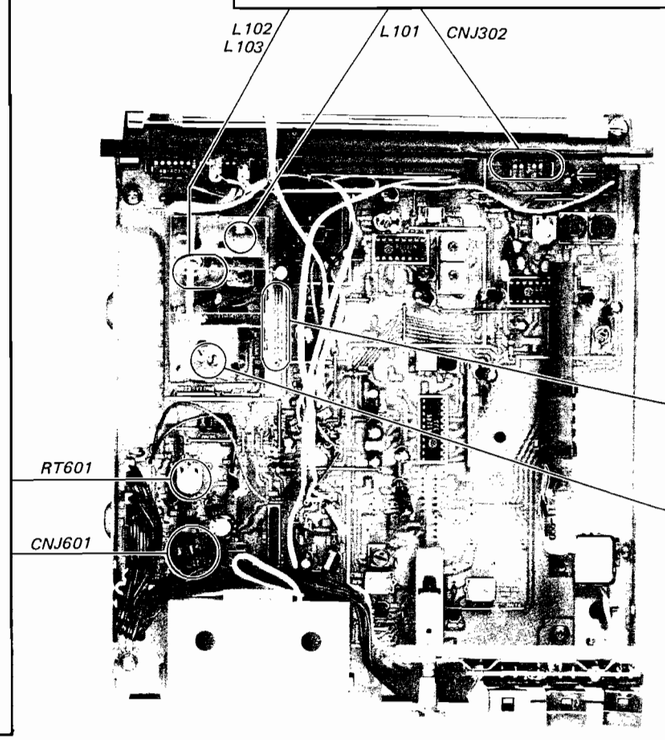
Procedure:

1. Couple L102 and L103 closely (Do not touch them).
2. Push the TUNING (+, –) button for 87.5MHz.
3. Adjust L103 for a maximum reading on the VOM. (Adjust L103 in the direction as shown by arrow Ⓐ .)



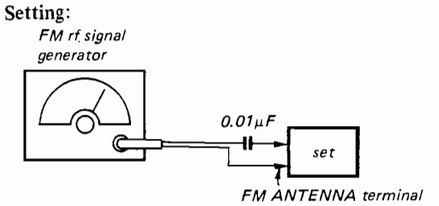
Note: Do not touch L102.

4. Push the TUNING (+, –) button for 108MHz.
5. Adjust CT101 for a maximum reading on the VOM.
6. Push the TUNING (+, –) button for 98MHz.
7. Adjust L101 for a maximum reading on the VOM.
8. Repeat the adjustments several times.

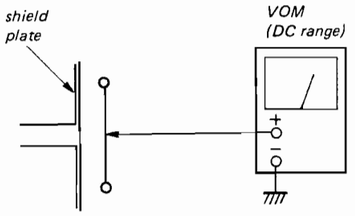


FM OSC Voltage Adjustment

Setting:

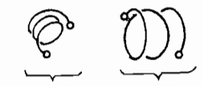


Carrier frequency: 108MHz
Modulation: 1kHz, 75kHz deviation
Output level: 1mV (60dB)



Procedure:

1. Push the TUNING (+, –) button for 108MHz.
2. Adjust L105 for 8.9 – 9V reading on the VOM.

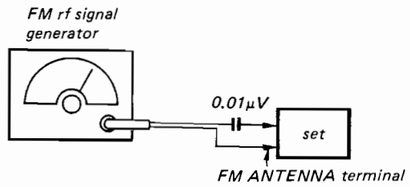


Note:
- *Do not touch L106.*
- *Adjust so that L105 does not approach to L106.*

FM SECTION 2

FM TUNED Indicator Adjustment

Setting:



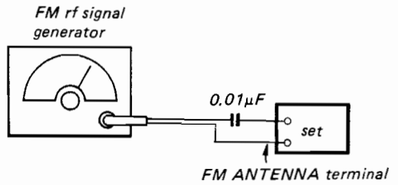
Carrier frequency: 98MHz
Modulation: 1kHz, 75kHz deviation
Output level: 31.6μV (30dB)

Procedure:

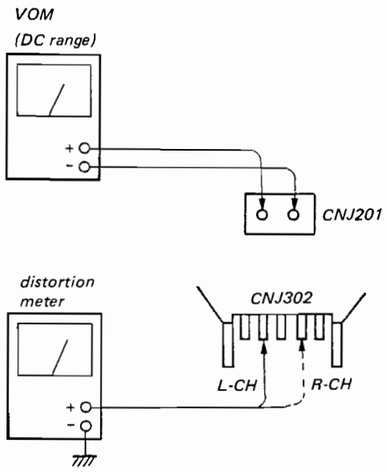
1. Push the TUNING (+, –) button for 98MHz.
2. Adjust RT201 so that the TUNED indicator (D201) lights up.

FM Discriminator NULL and MONO Distortion Adjustment

Setting:



Carrier frequency: 98MHz
Modulation: 1kHz, 75kHz deviation
Output level: 1mV (60dB)



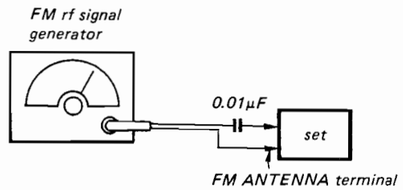
Procedure:

1. Push the TUNING (+, –) button for 98MHz.
2. Adjust T201 for 0V reading on the VOM.
3. Adjust T202 for a minimum reading on the distortion meter.
4. Repeat the adjustments several times.

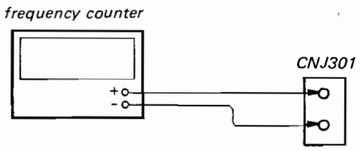
VCO Adjustment

A) Regular Method

Setting:



Carrier frequency: 98MHz
Modulation: no modulation
Output level: 1mV (60dB)



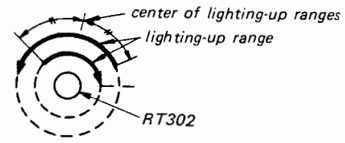
Procedure:

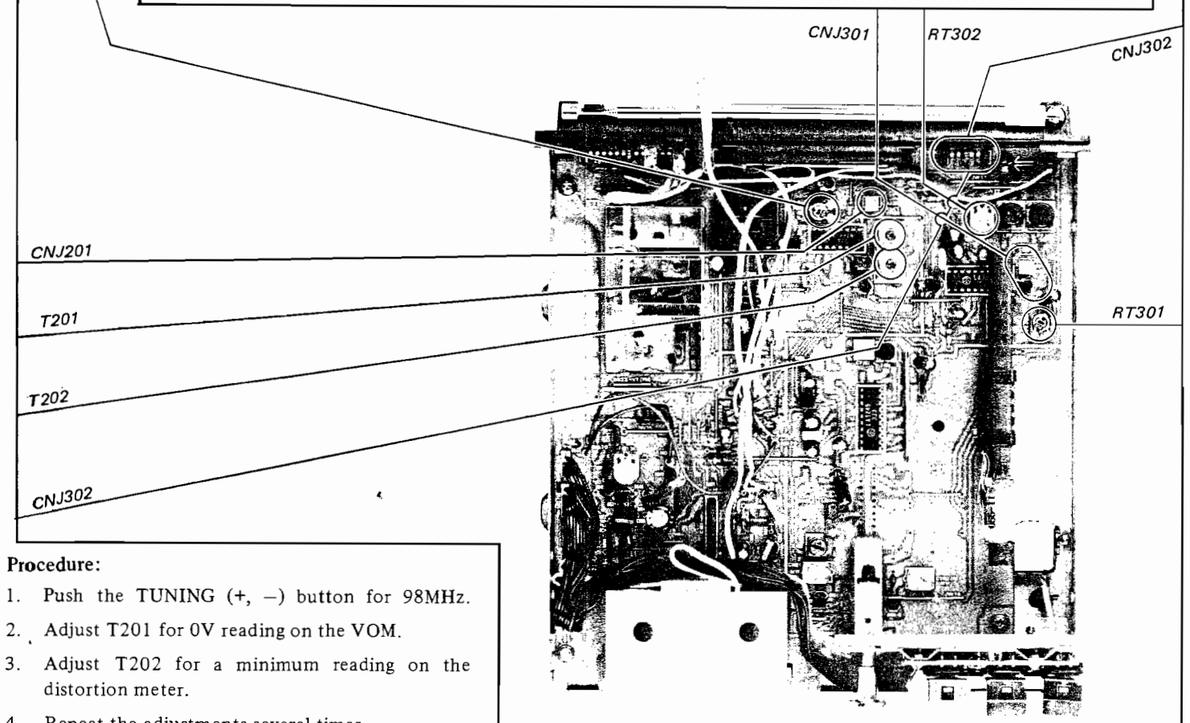
1. Push the TUNING (+, –) button for 98MHz.
2. Adjust RT302 for 19kHz ±50Hz reading on the frequency counter.

B) Simple Method

Procedure:

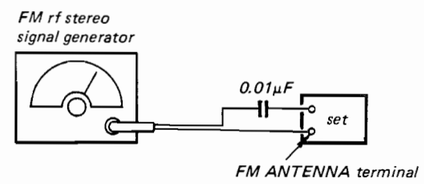
1. Push the TUNING (+, –) button to the FM stereo broadcasting signal.
2. Turn RT302 clockwise or counterclockwise and memorize the lighting-up range of the STEREO indicator (D301).
3. Secure RT302 at the center of the lighting-up range of both turns as shown below.



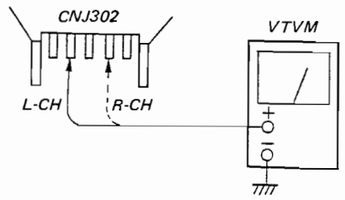


FM Stereo Separation Adjustment

Setting:



Carrier frequency: 98MHz
Modulation: audio (1kHz): 33.75kHz deviation
pilot (19kHz): 7.5kHz deviation
sub-channel (38kHz): 33.75kHz deviation
Output level: 1mV (60dB)
Mode: stereo



Procedure:

FM stereo signal generator output channel	VTVM connection	VTVM reading (dB)
L-CH	L-CH	Ⓐ
R-CH	L-CH	Ⓑ Adjust RT301 for minimum reading.
R-CH	R-CH	Ⓒ
L-CH	R-CH	Ⓓ Adjust RT301 for minimum reading.

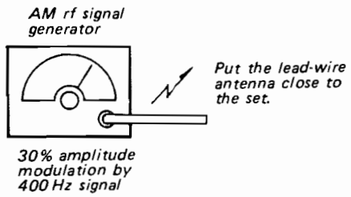
L-CH Stereo separation: Ⓐ – Ⓑ
R-CH Stereo separation: Ⓒ – Ⓓ

The separations of both channels should be equal.

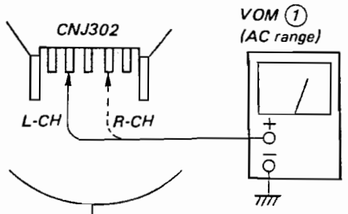
AM SECTION 1

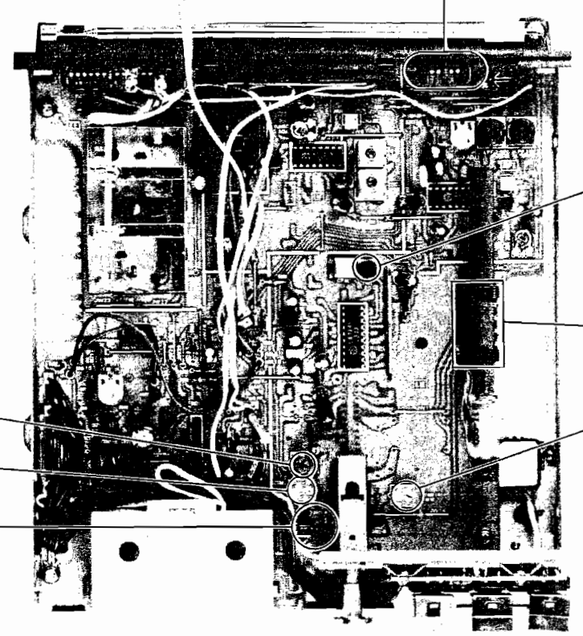
Setting:

BAND selector switch: AM
AM CH. SPACE switch: 10kHz



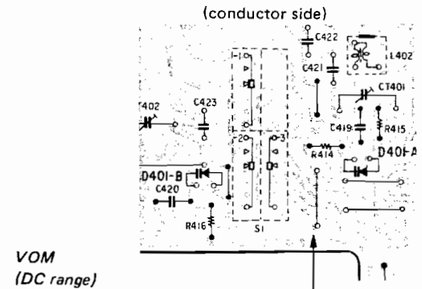
- Repeat the procedures in each adjustment several times, and the OSC voltage and tracking adjustments should be finally done by the trimmer capacitors.





AM OSC Voltage Adjustment

Setting:



Procedure:

1. Set BAND selector switch (S1) to AM.
2. Push TUNING (+, –) button for 530kHz.
   Adjust L402 for 1.0 – 1.1V VOM reading.
3. Push the button for 1,610kHz.
   Adjust CT401 for 8.9 – 9.0V VOM reading.

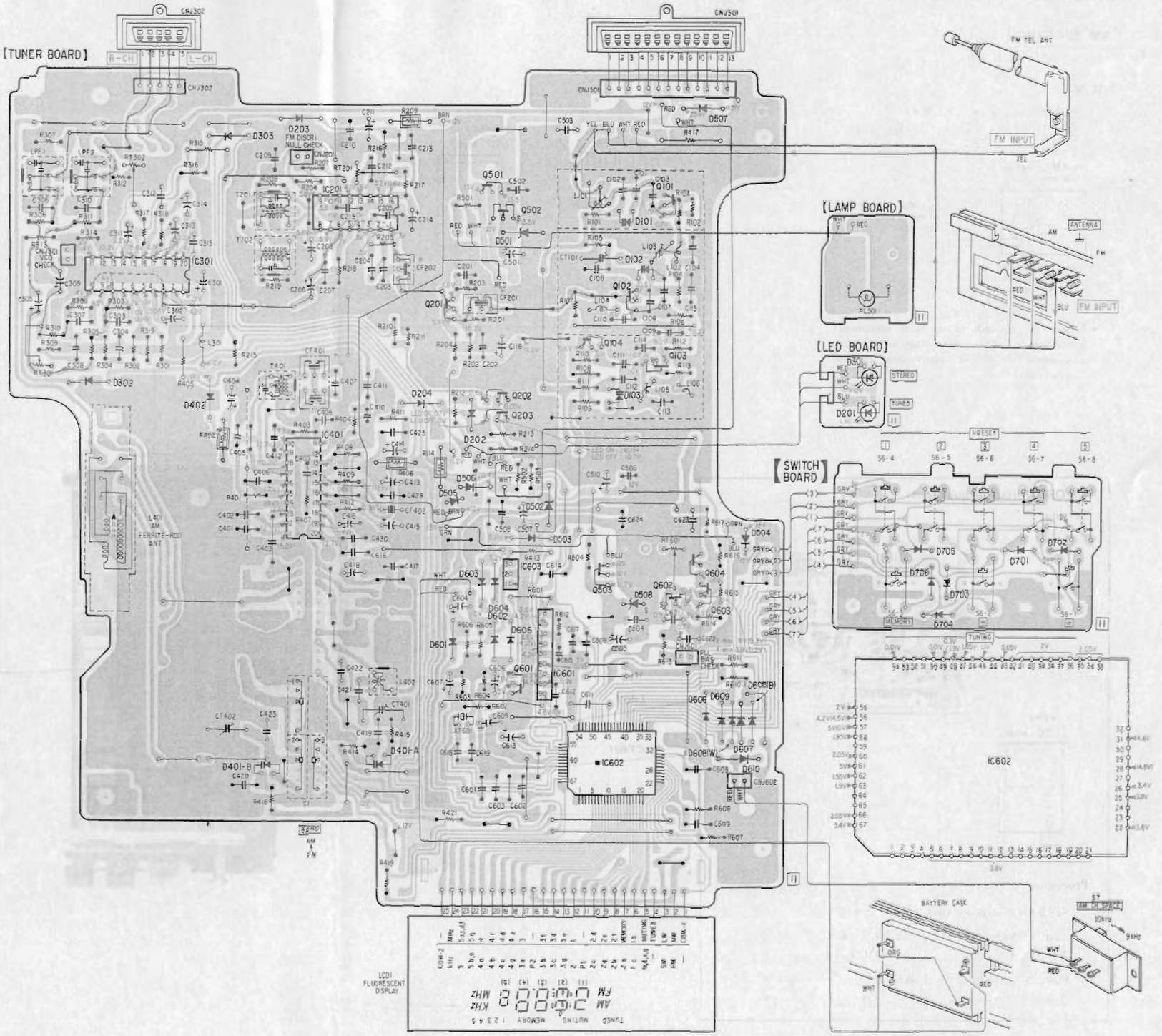
AM IF ADJUSTMENT	
Adjust for a maximum reading on VOM ①.	
T401	450kHz

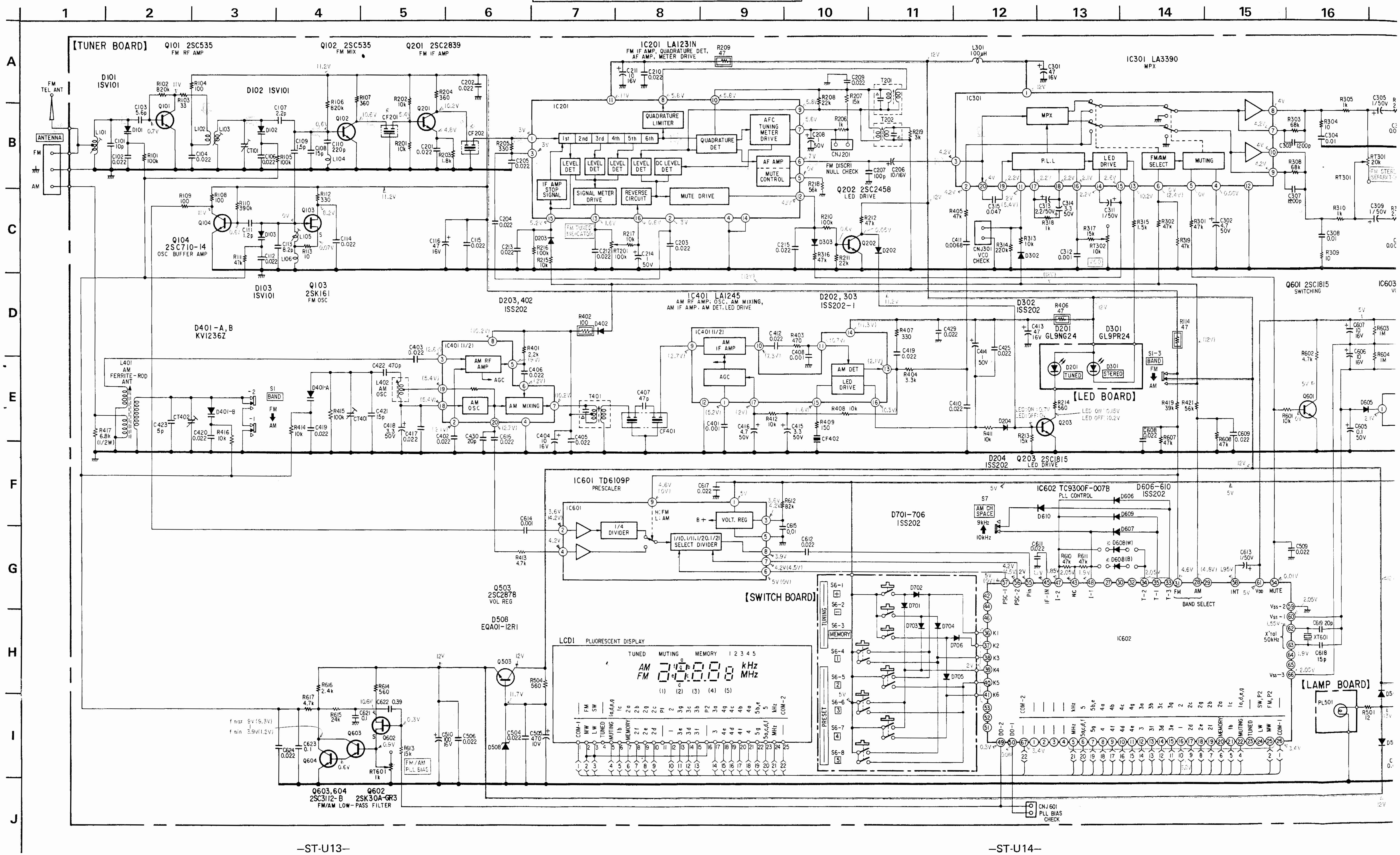
AM TRACKING ADJUSTMENT	
Adjust for a maximum reading on VOM ①.	
L401	600kHz
CT402	1,400kHz

Semiconductor Lead Layouts: See Page ST-U16.

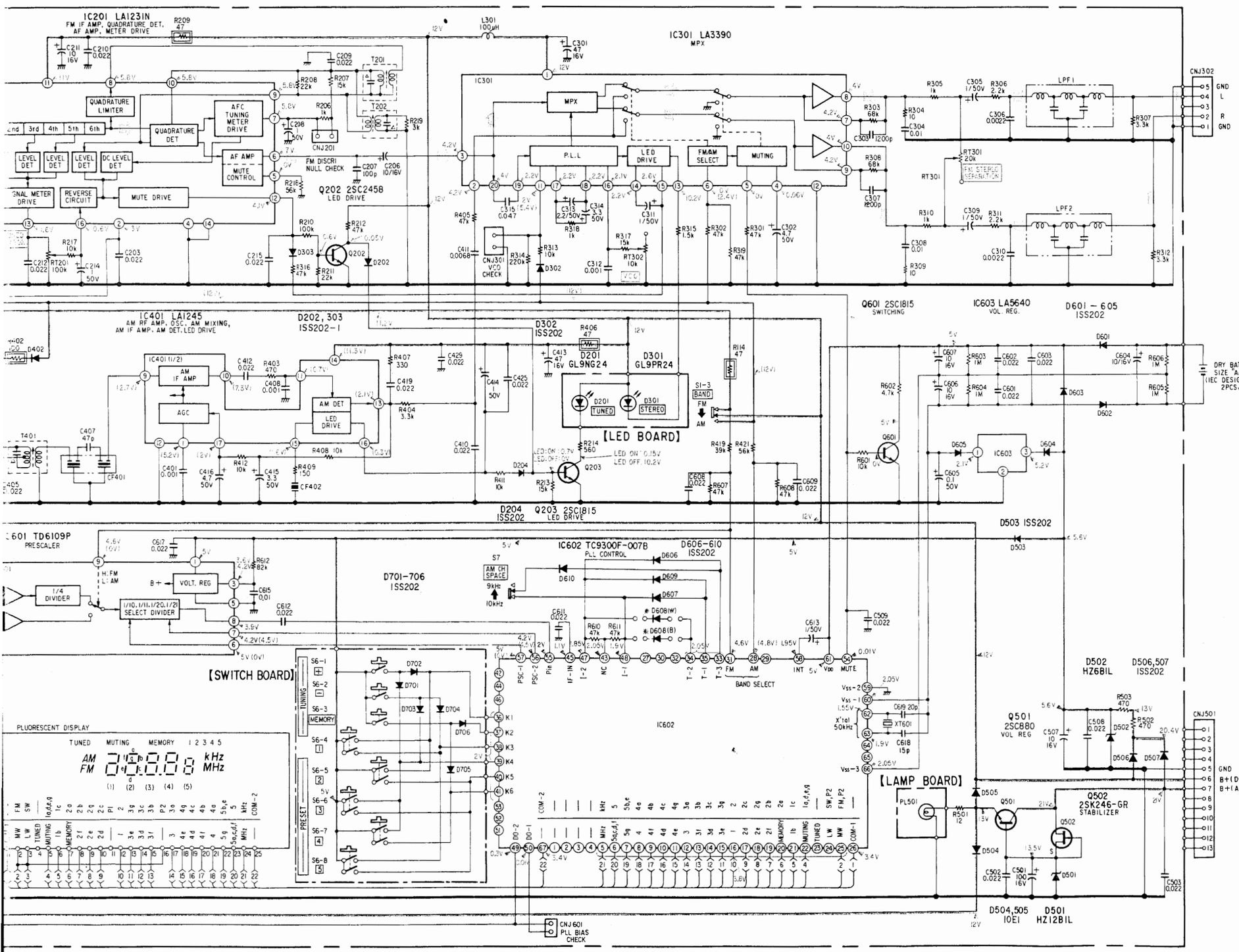
Note:
- ○—: parts extracted from the component side.
- ■: part mounted on the conductor side.
- [ ]—: indicates side identified with part number.
- MELF components.
- : signal path
- : L-CH signal path
- : R-CH signal path
- : B+ pattern

Q, IC	D
	507
	203
	303
501	
101	101
IC201	
502	501
IC301	102
102	
201	
104	
103	301
	302
	103
202	402,204
203	201
	202
IC401	506
	505
	502
	504
	503
	705,701,702
604	
IC603	
503	603,604
603	508
602	704
	601,602,605
IC601	
601	
	606
	609, 608(W)
	607, 608(B)
	610
IC602	401-A
	401-B
	404
	403
Q, IC	D




【TUNER BOARD】
Q101 2SC535 FM RF AMP
Q102 2SC535 FM MIX
Q201 2SC2839 FM IF AMP
IC201 LA1231N FM IF AMP, QUADRATURE DET, AF AMP, METER DRIVE
IC301 LA3390 MPX
D101 1SV101
D102 1SV101
D103 1SV101
Q104 2SC710-14 OSC BUFFER AMP
Q103 2SK161 FM OSC
D203, 402 1SS202
IC401 LA1245 AM RF AMP, OSC, AM MIXING, AM IF AMP, AM DET, LED DRIVE
D202, 303 1SS202-1
D302 1SS202
D201 GL9NG24
D301 GL9PR24
Q202 2SC2458 LED DRIVE
D401-A,B KV1236Z
L401 AM FERRITE-ROD ANT
【LED BOARD】
D204 1SS202
Q203 2SC1815 LED DRIVE
Q601 2SC1815 SWITCHING
IC601 TD6109P PRESCALER
IC602 TC9300F-007B PLL CONTROL
D606-610 1SS202
D701-706 1SS202
【SWITCH BOARD】
Q503 2SC2878 VOL REG
D508 EQA01-12R1
LCD1 FLUORESCENT DISPLAY
Q603, 604 2SC3112-B
Q602 2SK30A-GR3
FM/AM LOW-PASS FILTER
【LAMP BOARD】
CNJ601 PLL BIAS CHECK

US, Canadian Model
FH-7 MK II
ST-78 II



Note:

- All capacitors are in μF unless otherwise noted. pF : μμF 50WV or less are not indicated except for electrolytics and tantalums.
- All resistors are in ohms, ¼W unless otherwise noted. kΩ : 1000Ω, MΩ : 1000kΩ
- △ : internal component.
- ▭ : adjustment for repair.
- ▬ : B+ bus.
- Voltages are dc with respect to ground unless otherwise noted.
- Readings are taken under no-signal conditions. no mark : FM ( ) : AM
- Voltage variations may be noted due to normal production tolerances.
- ▬ : signal path

Note: Voltages are measured with a VOM (50kΩ/V).

※: When replacing ceramic filters CF201 and CF202, color marking on their bodies should be the same. Connect or remove D608 according to color marking of ceramic filters.

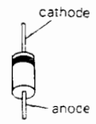
CF201, 202 color marking	D608
black	D608(B), connected
red	not connected
white	D608(W), connected

- **Semiconductor Lead Layouts**

2SC535
2SC1364
2SC3112-B
2SC2878

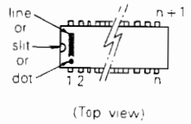
2SK30A-GR3
2SK246-GR

1SS202
10E2
EQA01-12R1
HZ6B1L
HZ12B1L

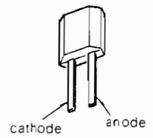


2SC710-14

LA1231
LA1245
LA3390

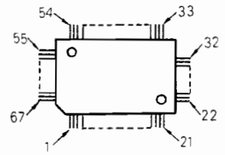


1SV101

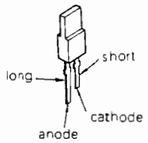


2SC2839

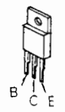
TC9300F-007B



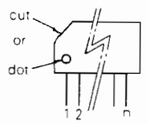
GL9NG24
GL9PR24



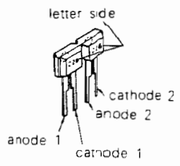
2SD880



TD6109P

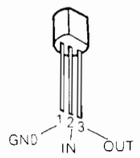


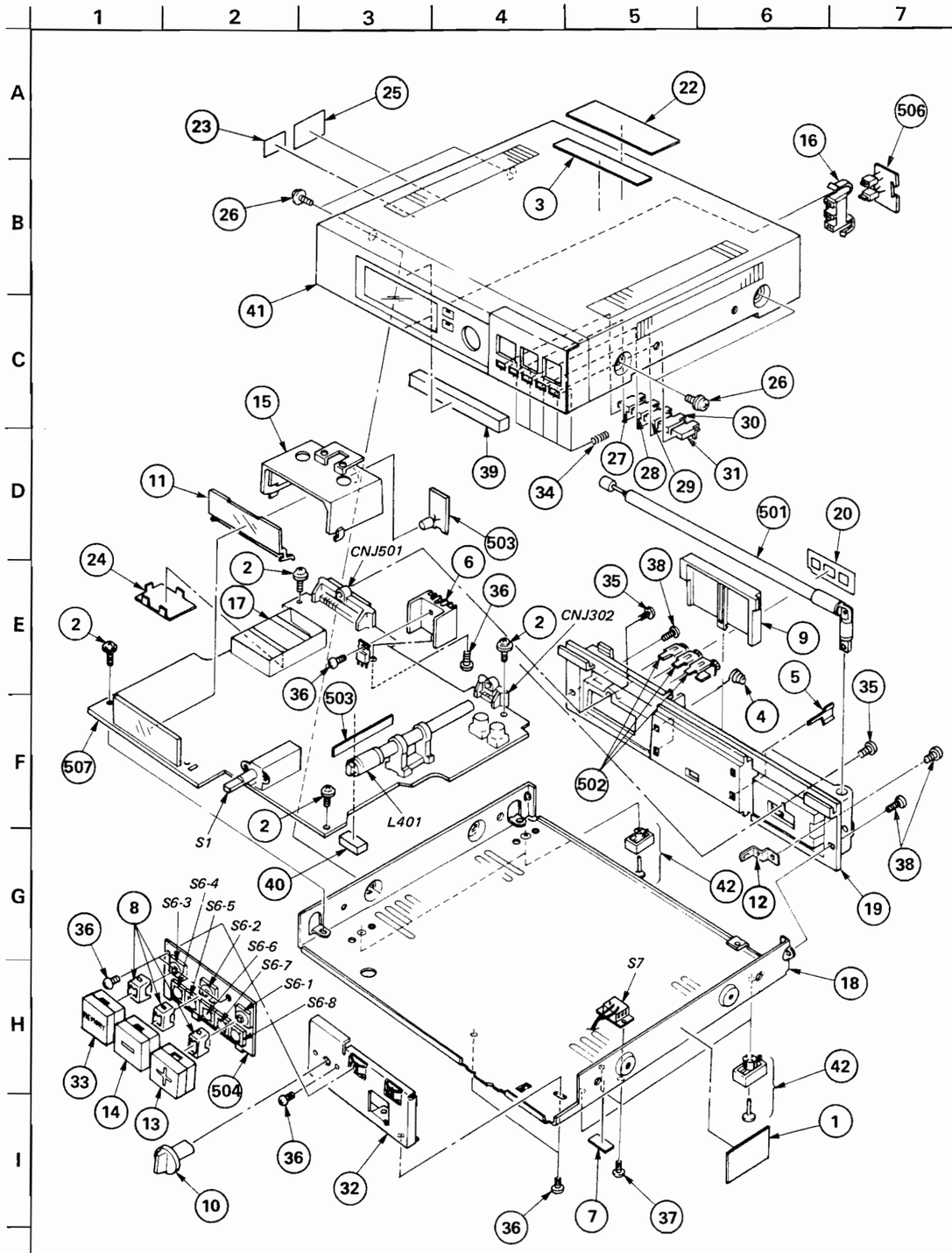
KV1236Z



2SK161

LA5640





No.	Part
1	3-7(
2	3-7(
3	♦;3-7(
4	3-8
5	3-8
6	♦;4-8
7	♦;4-8
8	4-8
9	4-8
10	4-8
10	4-8
11	4-8
12	♦;4-9
13	4-8
13	4-8
14	4-8
14	4-8
15	♦;4-8
16	4-8
17	♦;4-8
18	♦;4-8
19	4-8
20	4-8
21	...
22	4-8
23	♦;4-9
24	♦;4-8
25	4-8
26	4-8
26	4-8
27	4-9
27	4-9
28	4-9
28	4-9
29	4-9
29	4-9
30	4-9
30	4-9
31	4-9
31	4-9
32	♦;4-9
33	4-9
33	4-9

NOTE
· Th
nu
st
· It
th
se
pa
· Du
nu
ma
se
· If
se
ty
ca
ci

GENERAL SECTION

No.	Part No.	Description
1	3-701-030-00	LABEL, SERIAL NUMBER
2	3-701-589-00	SCREW, SELF-TAPPING
3 ♦	3-703-679-00	(US).... LABEL, REPLACEMENT, PILOT LAMP
4	3-883-424-00	SPRING
5	3-883-428-00	PLATE, TERMINAL (POSITIVE)
6 ♦	4-863-132-00	HEAT SINK (SMALL)
7 ♦	4-866-752-00	LABEL (A), SWITCH
8	4-881-725-00	RING (TACT), FLEXIBLE
9	4-884-845-11	LID, BATTERY CASE
10	4-884-847-00	(SILVER)...KNOB, ROTARY SWITCH, BAND
10	4-884-847-11	(BLACK)....KNOB, ROTARY SWITCH, BAND
11	4-884-848-00	ILLUMINATOR (ST)
12 ♦	4-902-935-01	TERMINAL BOARD
13	4-884-853-00	(SILVER)...KNOB (16X16) (+), SQUARE
13	4-884-853-11	(BLACK)....KNOB (+), SQUARE
14	4-884-854-00	(SILVER)...KNOB (16X16) (-), SQUARE
14	4-884-854-11	(BLACK)....KNOB (-), SQUARE
15 ♦	4-884-856-00	HOUSE, LAMP
16	4-884-857-00	HOLDER, LED
17 ♦	4-884-858-00	PLATE, SHIELD
18 ♦	4-884-859-00	CHASSIS
19	4-884-860-21	PLATE, JACK
20	4-884-881-11	LABEL, ANTENNA
21	.....	
22	4-884-927-00	LABEL (SYSTEM), CAUTION
23 ♦	4-903-019-00	(US)....LABEL, FCC
24 ♦	4-884-994-00	PLATE (B), SHIELD
25	4-884-998-01	LABEL, MODEL NUMBER
26	4-889-321-01	(SILVER)...SCREW
26	4-889-321-11	(BLACK)....SCREW
27	4-901-308-01	(BLACK)....KNOB, SQUARE, 1
27	4-903-017-01	(SILVER)...KNOB, SQUARE, 1
28	4-901-308-11	(BLACK)....KNOB, SQUARE, 2
28	4-903-017-11	(SILVER)...KNOB, SQUARE, 2
29	4-901-308-21	(BLACK)....KNOB, SQUARE, 3
29	4-903-017-21	(SILVER)...KNOB, SQUARE, 3
30	4-901-308-31	(BLACK)....KNOB, SQUARE, 4
30	4-903-017-31	(SILVER)...KNOB, SQUARE, 4
31	4-901-308-41	(BLACK)....KNOB, SQUARE, 5
31	4-903-017-41	(SILVER)...KNOB, SQUARE, 5
32 ♦	4-901-309-00	CHASSIS, SUB
33	4-901-311-00	(BLACK)....KNOB (MEMORY), SQUARE
33	4-901-311-11	(SILVER)...KNOB (MEMORY), SQUARE

GENERAL SECTION

No.	Part No.	Description
34	4-901-318-00	SPRING, COMPRESSION
35	7-685-647-11	SCREW +BVTP 3X10 TYPE2 N-S
36	7-685-871-01	SCREW +BVTT 3X6 (S)
37	7-682-147-01	SCREW +P 3X6
38	7-685-872-01	SCREW +BVTT 3X8 (S)
39	9-911-815-02	CUSHION (B)(t=5)
40	9-911-843-XX	CUSHION, RUBBER (t=10)
41	X-4884-849-2	(BLACK)....PANEL ASSY
41	X-4884-849-3	(SILVER)...PANEL ASSY
42	X-4884-801-0	FOOT ASSY, RUBBER

ELECTRICAL PARTS

Ref.No.	Part No.	Description		
501	1-501-270-00	ANTENNA, TELESCOPIC		
502	1-536-742-00	TERMINAL BOARD, ANTENNA		
503 ♦	1-560-242-11	BUS BAR 3P		
504 ♦	1-611-696-00	PC BOARD, SWITCH		
505 ♦	1-611-697-00	PC BOARD, LAMP		
506 ♦	1-611-698-00	PC BOARD, LED		
507 ♦	A-4351-370-A	MOUNTED PCB, TUNER		
C101	1-101-999-00	CERAMIC	10PF	50V
C102	1-161-055-00	CERAMIC	0.022MF 10%	50V
C103	1-161-276-00	CERAMIC	5.6PF 10%	50V
C104	1-161-055-00	CERAMIC	0.022MF 10%	50V
C106	1-161-055-00	CERAMIC	0.022MF 10%	50V
C107	1-102-406-00	CERAMIC	2PF	50V
C108	1-102-851-00	CERAMIC	15PF	50V
C109	1-101-576-00	CERAMIC	1.5PF	50V
C110	1-102-110-00	CERAMIC	220PF 10%	50V
C111	1-102-934-00	CERAMIC	1PF	50V
C112	1-161-055-00	CERAMIC	0.022MF 10%	50V
C113	1-161-300-00	CERAMIC	8.2PF 10%	50V
C114	1-161-055-00	CERAMIC	0.022MF 10%	50V
C115	1-161-055-00	CERAMIC	0.022MF 10%	50V
C116	1-123-332-00	ELECT	47MF 20%	25V
C201	1-161-055-00	CERAMIC	0.022MF 10%	50V
C202	1-161-055-00	CERAMIC	0.022MF 10%	50V
C203	1-161-055-00	CERAMIC	0.022MF 10%	50V
C204	1-161-055-00	CERAMIC	0.022MF 10%	50V
C205	1-161-055-00	CERAMIC	0.022MF 10%	50V
C206	1-123-356-00	ELECT	10MF 20%	50V
C207	1-102-973-00	CERAMIC	100PF 5%	50V
C208	1-123-380-00	ELECT	1MF 20%	100V
C209	1-161-055-00	CERAMIC	0.022MF 10%	50V

NOTE:
- The mechanical parts with no reference number in the exploded views are not supplied.
- Items marked " ♦ " are not stocked since they are seldom required for routine service. Some delay should be anticipated when ordering these items.
- Due to standardization, parts with part numbers (Δ-ΔΔΔ-ΔΔΔ-XX or Δ-ΔΔΔΔ-ΔΔΔ-X) may be different from those used in the set.
- If there are two or more same circuitsin a set such as a stereophonic machine, only typical circuit parts may be indicated and capacitors and resistors in other same circuits may be omitted.

CAPACITORS:
MF:μF, PF:μμF.

RESISTORS
- All resistors are in ohms.
- F : nonflammable

COILS
- MMH : mH, UH : μH

SEMICONDUCTORS
In each case, U : μ, for example:
UA···: μA···, UPA···: μPA···, UPC···: μPC,
UPD···: μPD···

ELECTRICAL PARTS

Ref.No.	Part No.	Description			
C210	1-161-055-00	CERAMIC	0.022MF	10%	50V
C211	1-123-356-00	ELECT	10MF	20%	50V
C212	1-161-055-00	CERAMIC	0.022MF	10%	50V
C213	1-161-055-00	CERAMIC	0.022MF	10%	50V
C214	1-123-380-00	ELECT	1MF	20%	100V
C215	1-161-055-00	CERAMIC	0.022MF	10%	50V
C301	1-123-332-00	ELECT	47MF	20%	16V
C302	1-123-369-00	ELECT	4.7MF	20%	63V
C303	1-161-324-00	CERAMIC	0.0012MF	20%	50V
C304	1-161-013-00	CERAMIC	0.01MF	10%	25V
C305	1-123-380-00	ELECT	1MF	20%	100V
C306	1-161-043-00	CERAMIC	0.0022MF	10%	50V
C307	1-161-324-00	CERAMIC	0.0012MF	20%	50V
C308	1-161-013-00	CERAMIC	0.01MF	10%	25V
C309	1-123-380-00	ELECT	1MF	20%	100V
C310	1-161-043-00	CERAMIC	0.0022MF	10%	50V
C311	1-123-380-00	ELECT	1MF	20%	100V
C312	1-104-077-00	POLYSTYRENE	0.001MF	5%	50V
C313	1-123-381-00	ELECT	2.2MF	20%	100V
C314	1-123-382-00	ELECT	3.3MF	20%	100V
C315	1-108-595-00	MYLAR	0.047MF	5%	50V
C401	1-102-074-00	CERAMIC	0.001MF	10%	50V
C402	1-161-055-00	CERAMIC	0.022MF	10%	50V
C403	1-161-055-00	CERAMIC	0.022MF	10%	50V
C404	1-123-356-00	ELECT	10MF	20%	50V
C405	1-161-055-00	CERAMIC	0.022MF	10%	50V
C406	1-161-055-00	CERAMIC	0.022MF	10%	50V
C407	1-101-880-00	CERAMIC	47PF	5%	50V
C408	1-102-074-00	CERAMIC	0.001MF	10%	50V
C409	1-161-055-00	CERAMIC	0.022MF	10%	50V
C410	1-161-055-00	CERAMIC	0.022MF	10%	50V
C411	1-161-049-00	CERAMIC	0.0068MF	10%	50V
C412	1-161-055-00	CERAMIC	0.022MF	10%	50V
C413	1-123-319-00	ELECT	47MF	20%	16V
C414	1-123-380-00	ELECT	1MF	20%	100V
C415	1-123-382-00	ELECT	3.3MF	20%	100V
C416	1-123-369-00	ELECT	4.7MF	20%	63V
C417	1-161-055-00	CERAMIC	0.022MF	10%	50V
C418	1-123-382-00	ELECT	3.3MF	20%	100V
C419	1-161-055-00	CERAMIC	0.022MF	10%	50V
C420	1-161-055-00	CERAMIC	0.022MF	10%	50V
C421	1-102-880-00	CERAMIC	15PF	5%	50V
C422	1-104-069-00	POLYSTYRENE	470PF	5%	50V
C423	1-101-997-00	CERAMIC	5PF		50V
C425	1-161-055-00	CERAMIC	0.022MF	10%	50V

ELECTRICAL PARTS

Ref.No.	Part No.	Description			
C429	1-161-055-00	CERAMIC	0.022MF	10%	50V
C430	1-102-958-00	CERAMIC	20PF	5%	50V
C501	1-123-333-00	ELECT	100MF	20%	25V
C502	1-161-055-00	CERAMIC	0.022MF	10%	50V
C503	1-101-005-00	CERAMIC	0.022MF		50V
C504	1-101-005-00	CERAMIC	0.022MF		50V
C505	1-123-323-00	ELECT	470MF	20%	16V
C506	1-161-055-00	CERAMIC	0.022MF	10%	50V
C507	1-123-356-00	ELECT	10MF	20%	50V
C508	1-161-055-00	CERAMIC	0.022MF	10%	50V
C509	1-161-055-00	CERAMIC	0.022MF	10%	50V
C510	1-123-333-00	ELECT	100MF	20%	25V
C601	1-161-055-00	CERAMIC	0.022MF	10%	50V
C602	1-161-055-00	CERAMIC	0.022MF	10%	50V
C603	1-161-055-00	CERAMIC	0.022MF	10%	50V
C604	1-123-356-00	ELECT	10MF	20%	50V
C605	1-123-607-00	ELECT	0.1MF	20%	50V
C606	1-123-356-00	ELECT	10MF	20%	50V
C607	1-123-356-00	ELECT	10MF	20%	50V
C608	1-161-055-00	CERAMIC	0.022MF	10%	50V
C609	1-161-055-00	CERAMIC	0.022MF	10%	50V
C611	1-161-494-00	CERAMIC	0.022MF	30%	25V
C612	1-161-055-00	CERAMIC	0.022MF	10%	50V
C613	1-123-611-00	ELECT	1MF	20%	50V
C614	1-102-074-00	CERAMIC	0.001MF	10%	50V
C615	1-161-013-00	CERAMIC	0.01MF	10%	25V
C616	1-161-055-00	CERAMIC	0.022MF	10%	50V
C617	1-161-055-00	CERAMIC	0.022MF	10%	50V
C618	1-102-851-00	CERAMIC	15PF		50V
C619	1-161-351-00	CERAMIC	20PF	5%	50V
C621	1-130-632-00	FILM	0.1MF	5%	50V
C622	1-130-639-00	FILM	0.39MF	5%	50V
C623	1-130-632-00	FILM	0.1MF	5%	50V
C624	1-161-055-00	CERAMIC	0.022MF	10%	50V
CF201	1-527-968-00	FILTER, CERAMIC			
CF202	1-527-968-00	FILTER, CERAMIC			
CF401	1-527-937-00	FILTER, CERAMIC			
CF402	1-527-981-00	FILTER, CERAMIC			
♦CNJ201	1-560-060-00	PIN, CONNECTOR 2P			
♦CNJ301	1-560-060-00	PIN, CONNECTOR 2P			
CNJ302	1-562-067-00	SOCKET, CONNECTOR 5P			
CNJ501	1-562-068-00	SOCKET, CONNECTOR 13P			
♦CNJ602	1-560-060-00	PIN, CONNECTOR 2P			
CT101	1-141-171-00	CAP, TRIMMER 20P			
CT401	1-141-180-00	CAP, TRIMMER 15P			
CT402	1-141-180-00	CAP, TRIMMER 15P			

NOTE:
- The mechanical parts with no reference number in the exploded views are not supplied.
- Items marked " ♦ " are not stocked since they are seldom required for routine service. Some delay should be anticipated when ordering these items.
- Due to standardization, parts with part numbers (Δ-ΔΔΔ-ΔΔΔ-XX or Δ-ΔΔΔΔ-ΔΔΔ-X) may be different from those used in the set.
- If there are two or more same circuitsin a set such as a stereophonic machine, only typical circuit parts may be indicated and capacitors and resistors in other same circuits may be omitted.

CAPACITORS:
MF:μF, PF:μμF.

RESISTORS
- All resistors are in ohms.
- F : nonflammable

COILS
- MMH : mH, UH : μH

SEMICONDUCTORS
In each case, U : μ, for example:
UA···: μA···, UPA···: μPA···, UPC···: μPC,
UPD···: μPD···

ELECTRICAL PARTS

Ref.No.	Part No.	Description
D101	8-719-800-09	DIODE 1SV101
D102	8-719-800-09	DIODE 1SV101
D103	8-719-800-09	DIODE 1SV101
D201	8-719-903-07	DIODE GL9NG24
D202	8-719-107-76	DIODE 1SS202
D203	8-719-107-76	DIODE 1SS202
D204	8-719-107-76	DIODE 1SS202
D301	8-719-903-11	DIODE GL9PR24
D302	8-719-107-76	DIODE 1SS202
D303	8-719-107-76	DIODE 1SS202
D401	8-719-902-79	DIODE KV1236Z
D402	8-719-107-76	DIODE 1SS202
D501	8-719-910-24	DIODE HZ12B1L
D502	8-719-910-64	DIODE HZ6B1L
D503	8-719-107-76	DIODE 1SS202
D504	8-719-200-02	DIODE 10E2
D505	8-719-200-02	DIODE 10E2
D506	8-719-107-76	DIODE 1SS202
D507	8-719-107-76	DIODE 1SS202
D508	8-719-991-21	DIODE EQA01-12R1
D601	8-719-107-76	DIODE 1SS202
D602	8-719-107-76	DIODE 1SS202
D603	8-719-107-76	DIODE 1SS202
D604	8-719-107-76	DIODE 1SS202
D605	8-719-107-76	DIODE 1SS202
D606	8-719-107-76	DIODE 1SS202
D607	8-719-107-76	DIODE 1SS202
D608	8-719-107-76	DIODE 1SS202
D609	8-719-107-76	DIODE 1SS202
D610	8-719-107-76	DIODE 1SS202
D701	8-719-107-76	DIODE 1SS202
D702	8-719-107-76	DIODE 1SS202
D703	8-719-107-76	DIODE 1SS202
D704	8-719-107-76	DIODE 1SS202
D705	8-719-107-76	DIODE 1SS202
D706	8-719-107-76	DIODE 1SS202
IC201	8-759-812-31	IC LA1231
IC301	8-759-833-90	IC LA3390
IC401	8-759-812-45	IC LA1245
IC601	8-759-201-03	IC TD6109P
IC602	8-759-202-09	IC TC9300F-007B
IC603	8-759-800-63	IC LA5640
L101 ♦	1-422-093-00	COIL, AIR-CORE
L102 ♦	1-422-094-00	COIL, AIR-CORE
L103 ♦	1-422-096-00	COIL, AIR-CORE

ELECTRICAL PARTS

Ref.No.	Part No.	Description
L104 ♦	1-422-039-00	COIL, AIR-CORE
L105 ♦	1-422-098-00	COIL, AIR-CORE
L106 ♦	1-422-099-00	COIL, AIR-CORE
L301	1-408-575-00	MICRO INDUCTOR 100UH
L401	1-402-055-00	ANTENNA, FERRITE-ROD (MW)
L402	1-406-033-00	COIL (OSC)
LCD1	1-806-642-00	DISPLAY PANEL, LIQUID CRYSTAL
LPF1	1-235-164-00	FILTER, LOW PASS
LPF2	1-235-164-00	FILTER, LOW PASS
PL501	1-518-511-00	(SILVER)...LAMP, PILOT
PL501	1-518-511-21	(BLACK)....LAMP, PILOT
Q101	8-729-353-52	TRANSISTOR 2SC535
Q102	8-729-353-52	TRANSISTOR 2SC535
Q103	8-729-216-13	TRANSISTOR 2SK161
Q104	8-729-671-14	TRANSISTOR 2SC710-14
Q201	8-729-883-92	TRANSISTOR 2SC2839
Q202	8-729-663-47	TRANSISTOR 2SC1364
Q203	8-729-663-47	TRANSISTOR 2SC1364
Q501	8-729-288-02	TRANSISTOR 2SD880
Q502	8-729-224-62	TRANSISTOR 2SK246-GR
Q503	8-729-201-04	TRANSISTOR 2SC2878
Q601	8-729-663-47	TRANSISTOR 2SC1364
Q602	8-729-203-05	TRANSISTOR 2SK30A-GR3
Q603	8-729-201-84	TRANSISTOR 2SC3112-B
Q604	8-729-201-84	TRANSISTOR 2SC3112-B
R101	1-247-179-00	CARBON 100K 5% 1/4W
R102	1-246-543-00	CARBON 820K 5% 1/4W
R103	1-247-095-00	CARBON 33 5% 1/4W
R104	1-247-107-00	CARBON 100 5% 1/4W
R105	1-247-179-00	CARBON 100K 5% 1/4W
R106	1-246-543-00	CARBON 820K 5% 1/4W
R107	1-247-120-00	CARBON 360 5% 1/4W
R108	1-247-107-00	CARBON 100 5% 1/4W
R109	1-247-107-00	CARBON 100 5% 1/4W
R110	1-246-535-00	CARBON 390K 5% 1/4W
R111	1-247-171-00	CARBON 47K 5% 1/4W
R112	1-247-119-00	CARBON 330 5% 1/4W
R113	1-247-083-00	CARBON 10 5% 1/4W
R114	1-247-099-00	CARBON 47 5% 1/4W F
R201	1-247-155-00	CARBON 10K 5% 1/4W
R202	1-247-155-00	CARBON 10K 5% 1/4W
R203	1-247-137-00	CARBON 1.8K 5% 1/4W
R204	1-247-120-00	CARBON 360 5% 1/4W

NOTE:
- The mechanical parts with no reference number in the exploded views are not supplied.
- Items marked " ♦ " are not stocked since they are seldom required for routine service. Some delay should be anticipated when ordering these items.
- Due to standardization, parts with part numbers (Δ-ΔΔΔ-ΔΔΔ-XX or Δ-ΔΔΔΔ-ΔΔΔ-X) may be different from those used in the set.
- If there are two or more same circuitsin a set such as a stereophonic machine, only typical circuit parts may be indicated and capacitors and resistors in other same circuits may be omitted.

CAPACITORS:
MF:μF, PF:μμF.

RESISTORS
- All resistors are in ohms.
- F : nonflammable

COILS
- MMH : mH, UH : μH

SEMICONDUCTORS
In each case, U : μ, for example:
UA···: μA···, UPA···: μPA···, UPC···: μPC,
UPD···: μPD···

ELECTRICAL PARTS

Ref.No.	Part No.	Description				
R205	1-247-119-00	CARBON	330	5%	1/4W	
R206	1-247-131-00	CARBON	1K	5%	1/4W	
R207	1-247-159-00	CARBON	15K	5%	1/4W	
R208	1-247-163-00	CARBON	22K	5%	1/4W	
R209	1-247-099-00	CARBON	47	5%	1/4W	F
R210	1-247-179-00	CARBON	100K	5%	1/4W	
R211	1-247-163-00	CARBON	22K	5%	1/4W	
R212	1-247-171-00	CARBON	47K	5%	1/4W	
R213	1-247-159-00	CARBON	15K	5%	1/4W	
R214	1-247-125-00	CARBON	560	5%	1/4W	
R215	1-247-155-00	CARBON	10K	5%	1/4W	
R216	1-247-179-00	CARBON	100K	5%	1/4W	
R217	1-247-155-00	CARBON	10K	5%	1/4W	
R218	1-247-173-00	CARBON	56K	5%	1/4W	
R219	1-247-142-00	CARBON	3K	5%	1/4W	
R301	1-247-171-00	CARBON	47K	5%	1/4W	
R302	1-247-171-00	CARBON	47K	5%	1/4W	
R303	1-247-175-00	CARBON	68K	5%	1/4W	
R304	1-247-083-00	CARBON	10	5%	1/4W	
R305	1-247-131-00	CARBON	1K	5%	1/4W	
R306	1-247-139-00	CARBON	2.2K	5%	1/4W	
R307	1-247-143-00	CARBON	3.3K	5%	1/4W	
R308	1-247-175-00	CARBON	68K	5%	1/4W	
R309	1-247-083-00	CARBON	10	5%	1/4W	
R310	1-247-131-00	CARBON	1K	5%	1/4W	
R311	1-247-139-00	CARBON	2.2K	5%	1/4W	
R312	1-247-143-00	CARBON	3.3K	5%	1/4W	
R313	1-247-155-00	CARBON	10K	5%	1/4W	
R314	1-246-529-00	CARBON	220K	5%	1/4W	
R315	1-247-135-00	CARBON	1.5K	5%	1/4W	
R316	1-247-171-00	CARBON	47K	5%	1/4W	
R317	1-247-159-00	CARBON	15K	5%	1/4W	
R318	1-247-131-00	CARBON	1K	5%	1/4W	
R319	1-247-171-00	CARBON	47K	5%	1/4W	
R401	1-247-139-00	CARBON	2.2K	5%	1/4W	
R402	1-247-107-00	CARBON	100	5%	1/4W	F
R403	1-247-123-00	CARBON	470	5%	1/4W	
R404	1-247-143-00	CARBON	3.3K	5%	1/4W	
R405	1-247-171-00	CARBON	47K	5%	1/4W	
R406	1-247-099-00	CARBON	47	5%	1/4W	F
R407	1-247-119-00	CARBON	330	5%	1/4W	
R408	1-247-155-00	CARBON	10K	5%	1/4W	
R409	1-247-111-00	CARBON	150	5%	1/4W	
R411	1-247-155-00	CARBON	10K	5%	1/4W	
R412	1-247-155-00	CARBON	10K	5%	1/4W	

ELECTRICAL PARTS

Ref.No.	Part No.	Description				
R413	1-247-147-00	CARBON	4.7K	5%	1/4W	
R414	1-247-155-00	CARBON	10K	5%	1/4W	
R415	1-247-179-00	CARBON	100K	5%	1/4W	
R416	1-247-155-00	CARBON	10K	5%	1/4W	
R417	1-202-593-00	SOLID	6.8K	20%	1/2W	
R419	1-247-169-00	CARBON	39K	5%	1/4W	
R421	1-247-173-00	CARBON	56K	5%	1/4W	
R501	1-247-157-00	CARBON	12	5%	1/4W	
R502	1-247-123-00	CARBON	470	5%	1/4W	
R503	1-247-123-00	CARBON	470	5%	1/4W	
R504	1-247-125-00	CARBON	560	5%	1/4W	
R601	1-247-155-00	CARBON	10K	5%	1/4W	
R602	1-247-147-00	CARBON	4.7K	5%	1/4W	
R603	1-246-545-00	CARBON	1M	5%	1/4W	
R604	1-246-545-00	CARBON	1M	5%	1/4W	
R605	1-246-545-00	CARBON	1M	5%	1/4W	
R606	1-246-545-00	CARBON	1M	5%	1/4W	
R607	1-247-171-00	CARBON	47K	5%	1/4W	
R608	1-247-171-00	CARBON	47K	5%	1/4W	
R610	1-247-171-00	CARBON	47K	5%	1/4W	
R611	1-247-171-00	CARBON	47K	5%	1/4W	
R612	1-247-177-00	CARBON	82K	5%	1/4W	
R613	1-247-159-00	CARBON	15K	5%	1/4W	
R614	1-247-125-00	CARBON	560	5%	1/4W	
R615	1-247-164-00	CARBON	24K	5%	1/4W	
R616	1-247-140-00	CARBON	2.4K	5%	1/4W	
R617	1-247-147-00	CARBON	4.7K	5%	1/4W	
RT201	1-226-239-00	RES, ADJ, CARBON 100K				
RT301	1-226-237-00	RES, ADJ, CARBON 20K				
RT302	1-228-505-00	RES, ADJ, METAL GLAZE 10K				
RT601	1-226-663-00	RES, ADJ, METAL GLAZE 1K				
S1	1-554-265-00	SWITCH, ROTARY SLIDE (BAND)				
S6-1	1-552-412-00	SWITCH, KEY BOARD (+)				
S6-2	1-552-412-00	SWITCH, KEY BOARD (-)				
S6-3	1-552-412-00	SWITCH, KEY BOARD (MEMORY)				
S6-4	1-552-174-00	SWITCH, PUSH (1)				
S6-5	1-552-174-00	SWITCH, PUSH (2)				
S6-6	1-552-174-00	SWITCH, PUSH (3)				
S6-7	1-552-174-00	SWITCH, PUSH (4)				
S6-8	1-552-174-00	SWITCH, PUSH (5)				
S7	1-554-716-11	SWITCH, SLIDE (AM CH.SPACE)				
T201	1-404-400-00	TRANSFORMER, DISCRIMINATOR				
T202	1-404-401-00	TRANSFORMER, DISCRIMINATOR				
T401	1-404-413-00	TRANSFORMER, IF				
XT601	1-527-995-00	VIBRATOR, CRYSTAL				

NOTE:

- The mechanical parts with no reference number in the exploded views are not supplied.
- Items marked " ♦ " are not stocked since they are seldom required for routine service. Some delay should be anticipated when ordering these items.
- Due to standardization, parts with part numbers (Δ-ΔΔΔ-ΔΔΔ-XX or Δ-ΔΔΔΔ-ΔΔΔ-X) may be different from those used in the set.
- If there are two or more same circuitsin a set such as a stereophonic machine, only typical circuit parts may be indicated and capacitors and resistors in other same circuits may be omitted.

CAPACITORS:

MF:μF, PF:μμF.

RESISTORS

- All resistors are in ohms.
- F : nonflammable

COILS

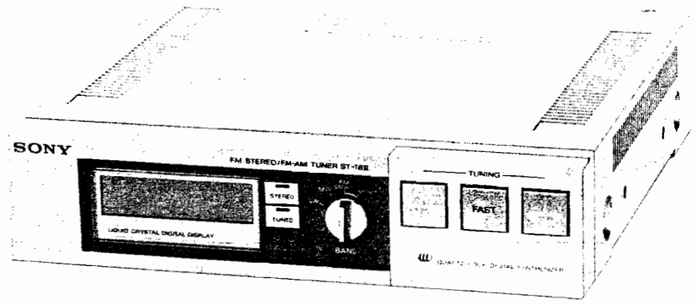
- MMH : mH, UH : μH

SEMICONDUCTORS

In each case, U : μ, for example:
UA···: μA···, UPA···: μPA···, UPC···: μPC,
UPD···: μPD···

FM STEREO/FM-AM TUNER
(ST-78II)

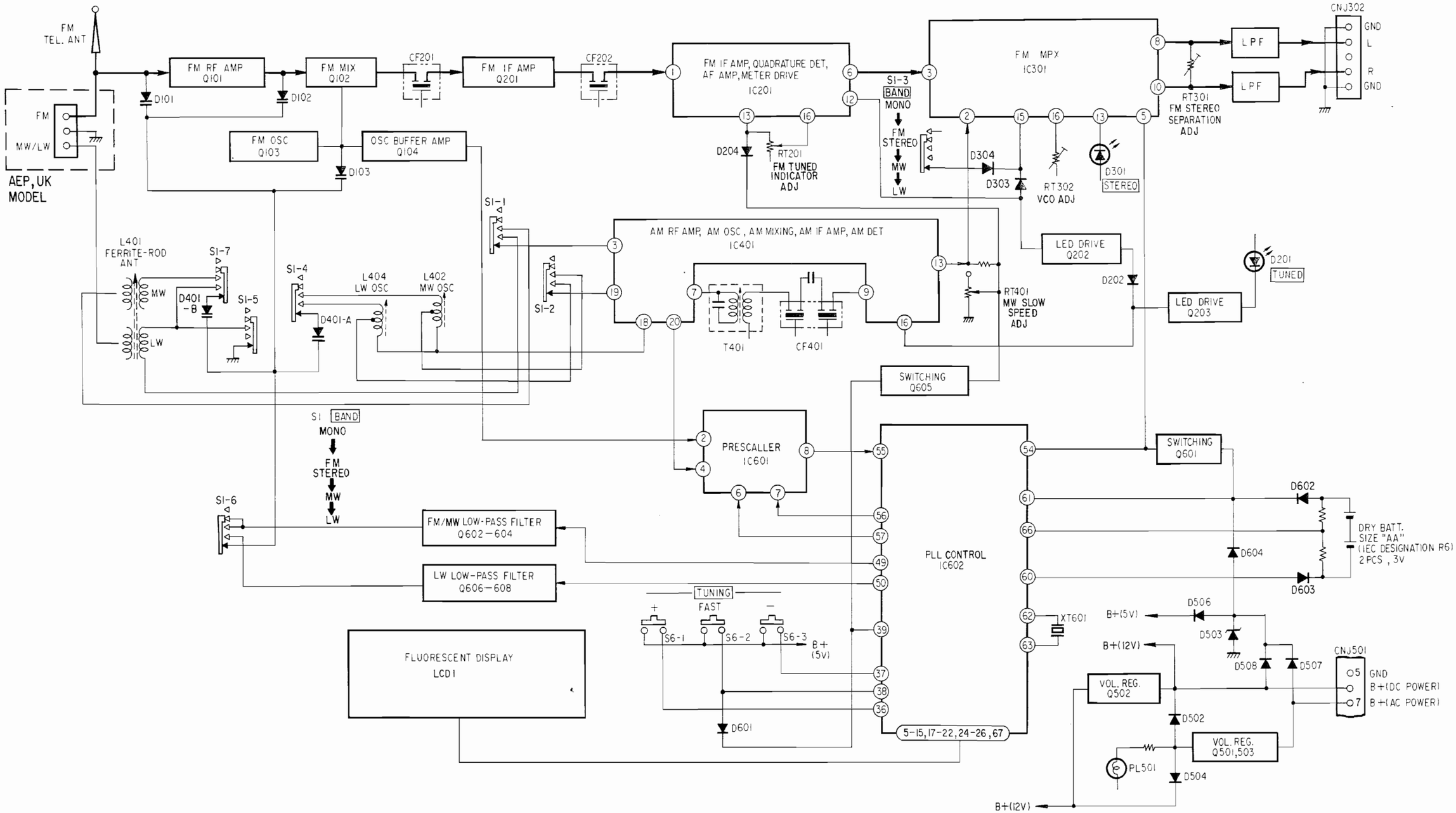
AEP Model
UK Model



Note: ST-78II is an FM stereo/FM-AM tuner in FH-7MKII.

MEMO

SECTION 1
BLOCK DIAGRAM



SECTION 2
ADJUSTMENTS

FM SECTION 1

Setting:

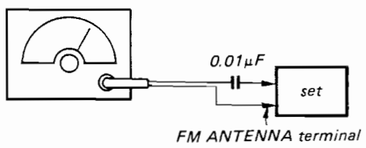
BAND selector switch: FM

FM/MW PLL Bias Adjustment

Setting:

FM

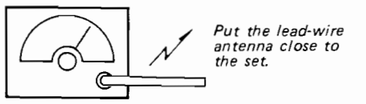
FM rf signal generator



Carrier frequency: 87.5MHz, 108MHz
Modulation: 1kHz, 40kHz deviation
Output level: 1mV (60dB)

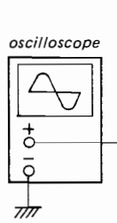
MW

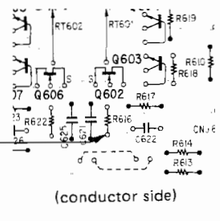
AM rf signal generator



Carrier frequency: 522kHz, 1,602kHz
Modulation: 30% amplitude modulation by 400Hz signal

oscilloscope



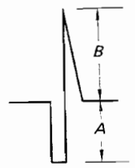


(conductor side)

Procedure:

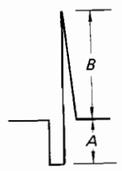
1. Connect the oscilloscope as shown on the left.
2. Set BAND selector switch (S1) to FM.
3. Push TUNING (+, –) button for 87.5MHz.
4. Adjust RT601 so that the waveform is shown below.

   A : B = 2 : 3
   A is approx. 0.4V



5. Push the button for 108MHz.
   Confirm that the waveform is locked as shown below.

   A : B = 1.5 : 3.5
   (reference)

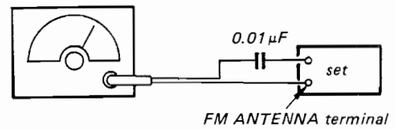


6. Set BAND selector switch (S1) to MW.
   Confirm that the waveform is locked when the set is tuned to 522kHz.
7. Confirm that the waveform is locked when the set is tuned to 1,602kHz.

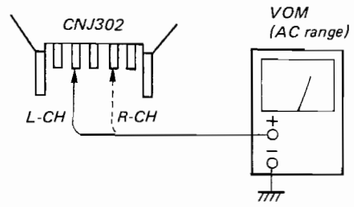
FM Tracking Adjustment

Setting:

FM rf signal generator



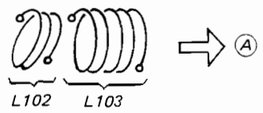
Carrier frequency: 98MHz
Modulation: 1kHz, 40kHz deviation
Output level: 3.16µV (10dB)



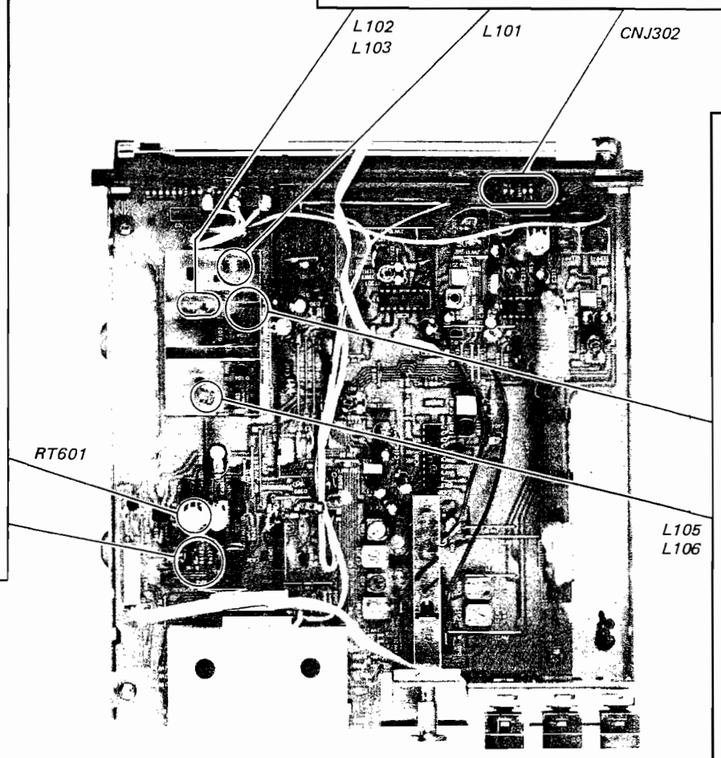
Procedure:

1. Push TUNING (+, –) button for 98MHz.
2. Approach L102 and L103 not to contact each other.
3. Adjust L101 and L103, and repeat the adjustment 2 – 3 times for maximum VOM reading.

   (Adjust L103 in the direction as shown by arrow Ⓐ.)



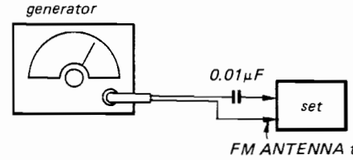
Note: Do not touch L102.



FM OSC Voltage Adjustment

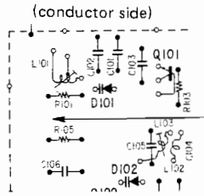
Setting:

FM rf signal generator

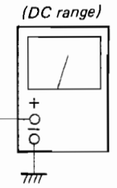


Carrier frequency: 108MHz
Modulation: 1kHz, 40kHz deviation
Output level: 1mV (60dB)

(conductor side)

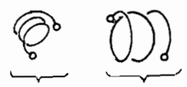


VOM (DC range)



Procedure:

1. Push the TUNING (+, –) button for 108MHz.
2. Adjust L105 for 8.9 – 9V reading on the VOM.

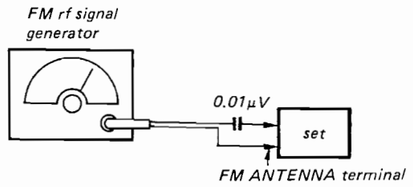


Note:
- *Do not touch L106.*
- *Adjust so that L105 does not approach to L106.*

FM SECTION 2

FM TUNED Indicator Adjustment

Setting:



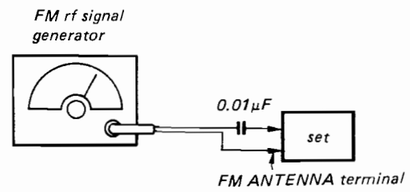
Carrier frequency: 98MHz
Modulation: 1kHz, 40kHz deviation
Output level: 17.8μV (25dB)

Procedure:

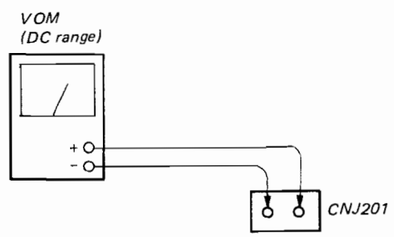
1. Push the TUNING (+, –) button for 98MHz.
2. Adjust RT201 so that the TUNED indicator (D201) lights up.

FM Discriminator Adjustment

Setting:



Carrier frequency: 98MHz
Modulation: 1kHz, 40kHz deviation
Output level: 1mV (60dB)



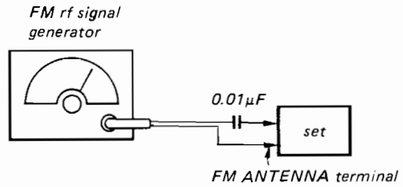
Procedure:

1. Push the TUNING (+, –) button for 98MHz.
2. Adjust T201 for 0V reading on the VOM.

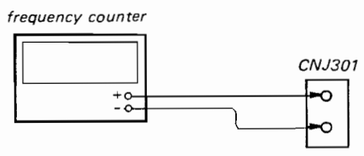
VCO Adjustment

A) Regular Method

Setting:



Carrier frequency: 98MHz
Modulation: no modulation
Output level: 1mV (60dB)



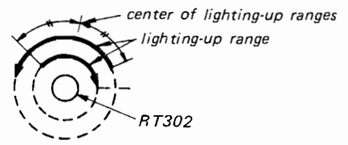
Procedure:

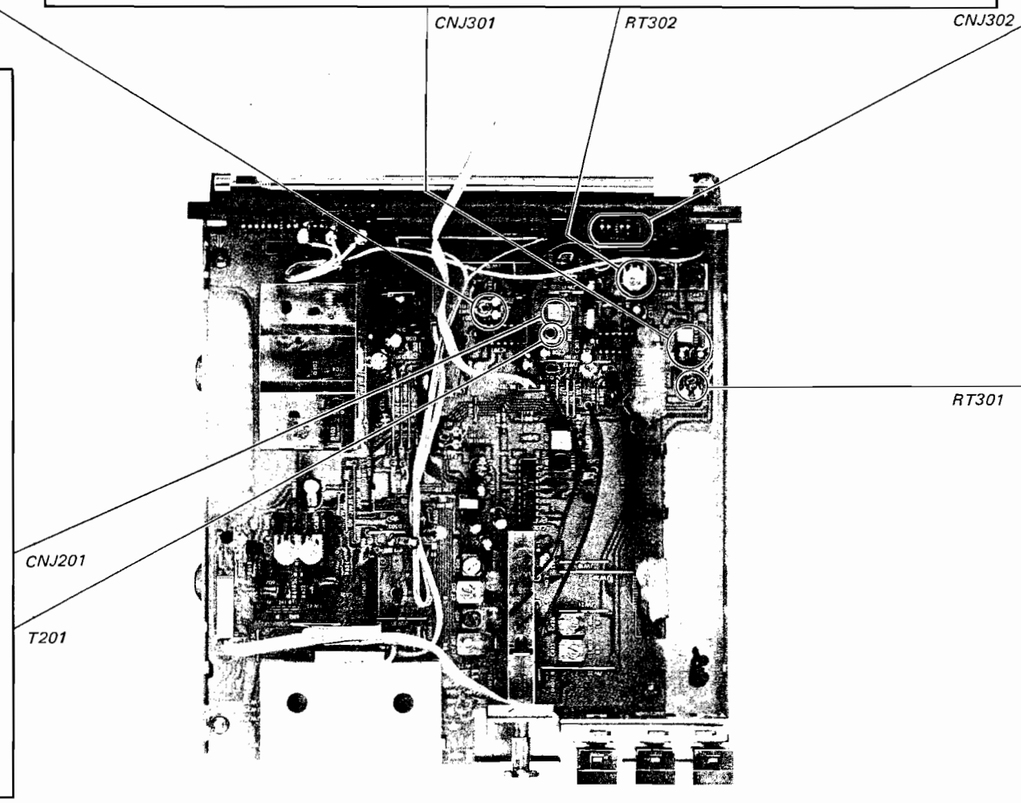
1. Push the TUNING (+, –) button for 98MHz.
2. Adjust RT302 for 19kHz ±50Hz reading on the frequency counter.

B) Simple Method

Procedure:

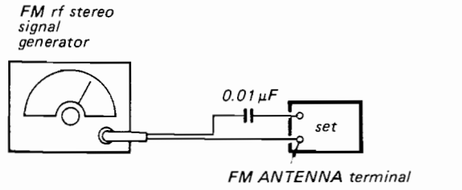
1. Push the TUNING (+, –) button to the FM stereo broadcasting signal.
2. Turn RT302 clockwise or counterclockwise and memorize the lighting-up range of the STEREO indicator (D301).
3. Secure RT302 at the center of the lighting-up range of both turns as shown below.



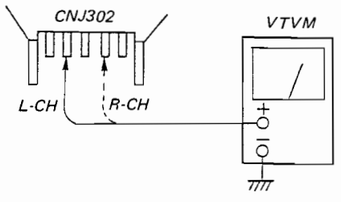


FM Stereo Separation Adjustment

Setting:



Carrier frequency: 98MHz
Modulation: audio (1kHz): 16.25kHz deviation
pilot (19kHz): 7.5kHz deviation
sub-channel (38kHz): 16.25kHz deviation
Output level: 1mV (60dB)
Mode: stereo



Procedure:

FM stereo signal generator output channel	VTVM connection	VTVM reading (dB)
L-CH	L-CH	Ⓐ
R-CH	L-CH	Ⓑ Adjust RT301 for minimum reading.
R-CH	R-CH	Ⓒ
L-CH	R-CH	Ⓓ Adjust RT301 for minimum reading.

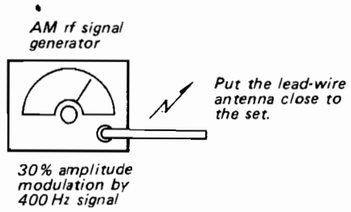
L-CH Stereo separation: Ⓐ – Ⓑ
R-CH Stereo separation: Ⓒ – Ⓓ

The separations of both channels should be equal.

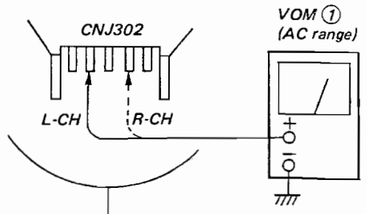
MW/LW SECTION

Setting:

BAND selector switch: MW or LW

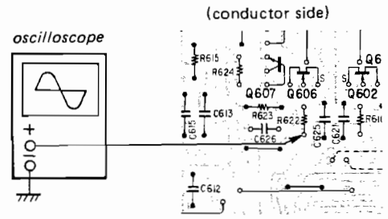


- Repeat the procedures in each adjustment several times, and the OSC voltage and tracking adjustments should be finally done by the trimmer capacitors.



LW PLL Bias Adjustment

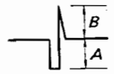
Setting:



Procedure:

1. Connect the oscilloscope as shown on the left.
2. Set BAND selector switch (S1) to LW.
3. Push TUNING (+, –) button for 153kHz.
4. Adjust RT602 so that the waveform is shown below.

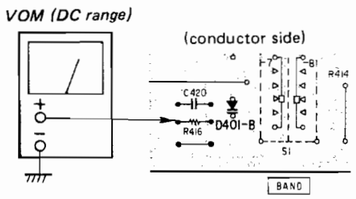
   A : B = 1 : 1
   A is more than 0.7V



5. Confirm that the waveform is locked when the set is tuned to 344kHz.

MW/LW OSC Voltage Adjustment

Setting:

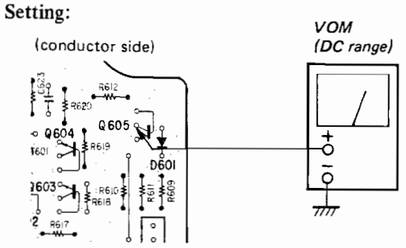


Procedure:

1. Set BAND selector switch (S1) to MW.
2. Push TUNING (+, –) button for 522kHz. Adjust L402 for 1.0 – 1.1V VOM reading.
3. Push the button for 1,602kHz. Adjust CT401 for 8.9 – 9.0V VOM reading.
4. Set BAND selector switch (S1) to LW.
5. Push TUNING (+, –) button for 153kHz. Adjust L404 for 1.0 – 1.1V VOM reading.
6. Push the button for 344kHz. Adjust CT403 for 8.9 – 9.0V VOM reading.

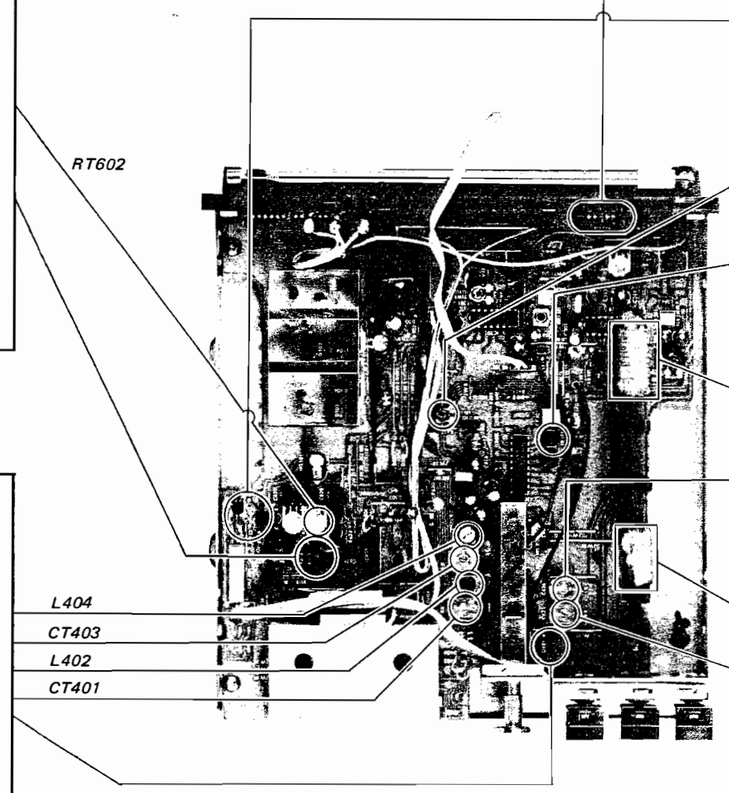
MW Slow Speed Action Level Adjustment

Setting:



Procedure:

1. Set BAND selector switch (S1) to MW. Confirm that the receiving condition is no signal.
2. Adjust RT401 so that the collector voltage of Q605 is 4.0 – 5.0V.



MW IF ADJUSTMENT	
Adjust for a maximum reading on VOM ①.	
T401	450kHz

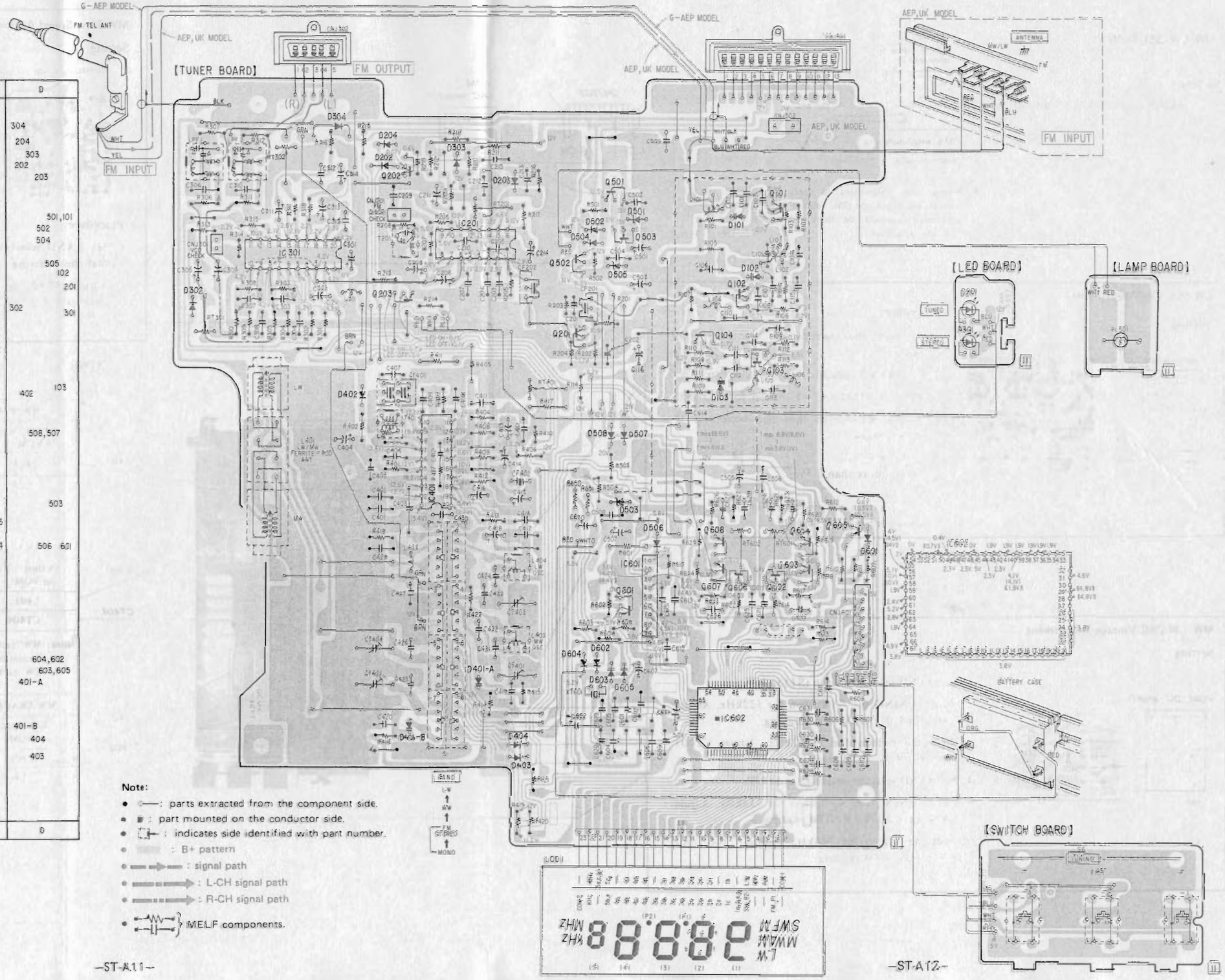
LW TRACKING ADJUSTMENT	
Adjust for a maximum reading on VOM ①.	
L401	170kHz
CT404	310kHz

Note: MW tracking adjustment should be made after LW tracking adjustment.

MW TRACKING ADJUSTMENT	
Adjust for a maximum reading on VOM ①.	
L401	603kHz
CT402	1,404kHz

Semiconductor Lead Layouts:
See Page ST-A16.

Q , IC	D
	304
	204
	303
202	202
	203
501	
101	
	501,101
503	502
IC201	504
IC301 502	
	505
	102
	201
203 102	
	302 301
201,104	
103	
	402 103
	508,507
IC401	
	503
605	
608,604	506 601
607,603	
606,602	
IC601	
601	
	604,602
	603,605
	401-A
IC602	
	401-B
	404
	403
Q , IC	D



Note:

- ○—: parts extracted from the component side.
- ■ : part mounted on the conductor side.
- [ ]— : indicates side identified with part number.
- : B+ pattern
- : signal path
- : L-CH signal path
- : R-CH signal path
- MELF components.

1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17

【TUNER BOARD】

Q101 2SC535 FM RF AMP

Q102 2SC535 FM MIX

Q201 2SC2839 FM IF AMP

IC201 LA1231N FM IF AMP, QUADRATURE DET, AF AMP, METER DRIVE

IC301 LA3390 MPX

Q202 2SC1815 LED DRIVE

Q104 2SC710-14 OSC BUFFER AMP

Q103 2SK161 FM OSC

D203, 204, 402 IS2473

IC401 LA1245 AM RF AMP, OSC, AM MIX, AM IF AMP, AM DET, METER DRIVE

D202, 303, 304 IS2473

D401-A, B KV1236Z

D302 IS2473

D201 GL9NG24

D301 GL9PR24

D403, 404 MDS-01

Q601 2SC1815 SWITCHING

【LED BOARD】

Q203 2SC1815 LED DRIVE

IC601 TD6109P PRESCALLER

IC602 TC9300F-005A PLL CONTROL

【SWITCH BOARD】

D601 IS2473

LCD1 FLUORESCENT DISPLAY

Q502 2SC2878 VOL REG

D505 EQA01-12R1

Q607, 608 2SC1362 LW LOW-PASS FILTER

Q606 2SK30A-GR3

Q603, 604 2SC1362 FM, MW LOW-PASS FILTER

Q602 2SK30A-GR3

【LAMP

AEP, UK Model
FH-7 MK II / ST-78 II

8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23

A B C D E F G H I J

IC201 LA1231N
FM IF AMP, QUADRATURE DET, AF AMP, METER DRIVE

IC301 LA3390
MPX

IC401 LA1245
AM RF AMP, OSC, AM MIX, AM IF AMP, AM DET, METER DRIVE

IC601 TD6109P
PRESCALLER

IC602 TC9300F-005A
PLL CONTROL

Q202 2SC1815
LED DRIVE

Q203 2SC1815
LED DRIVE

Q601 2SC1815
SWITCHING

Q605 2SC1815
SWITCHING

Q501 2SD880
VOL REG

Q503 2SK246-GR
STABILIZER

D202, 303, 304 IS2473

D302 IS2473

D403, 404 MDS-01

D602 – 605 MDS-01

D506 IS2473

D601 IS2473

D503 HZ6BIL

D507, 508 IS2473

D501 HZ12BIL

D504 10E-7

D502 10E1

D505 EQA01-12R1

【LED BOARD】

【SWITCH BOARD】

【LAMP BOARD】

LCD1 FLUORESCENT DISPLAY

LW
MWAM
SWFM
28.8.8.8 kHz MHz

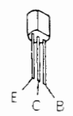
Note:

- All capacitors are in μF unless otherwise noted. pF : μμF 50WV or less are not indicated except for electrolytics and tantalums.
- All resistors are in ohms, ¼ W unless otherwise noted. kΩ : 1000 Ω, MΩ : 1000 kΩ
- △ : internal component.
- ▭ : adjustment for repair.
- ——: B+ bus.
- Voltages are dc with respect to ground unless otherwise noted.
- Readings are taken under detuned conditions.
  no mark : FM
  ( ) : MW
  (( )) : LW
- Voltage variations may be noted due to normal production tolerances.
- ▒ : signal path

Note: Voltages are measured with a VOM (50kΩ/V).

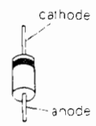
• Semiconductor Lead Layouts

2SC535
2SC1362-48
2SC1364
2SC2878

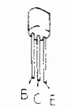


2SK30A-GR3
2SK246-GR

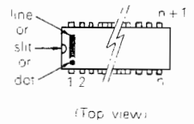
1S1555
10E2
EQA01-12R1
HZ6B1L
HZ12B1L



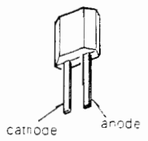
2SC710-14



LA1231
LA1245
LA3390

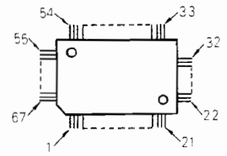


1SV101

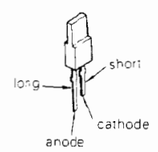


2SC2839

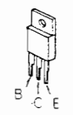
TC9300F-005A



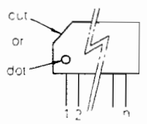
GL9NG24
GL9PR24



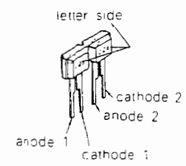
2SD880



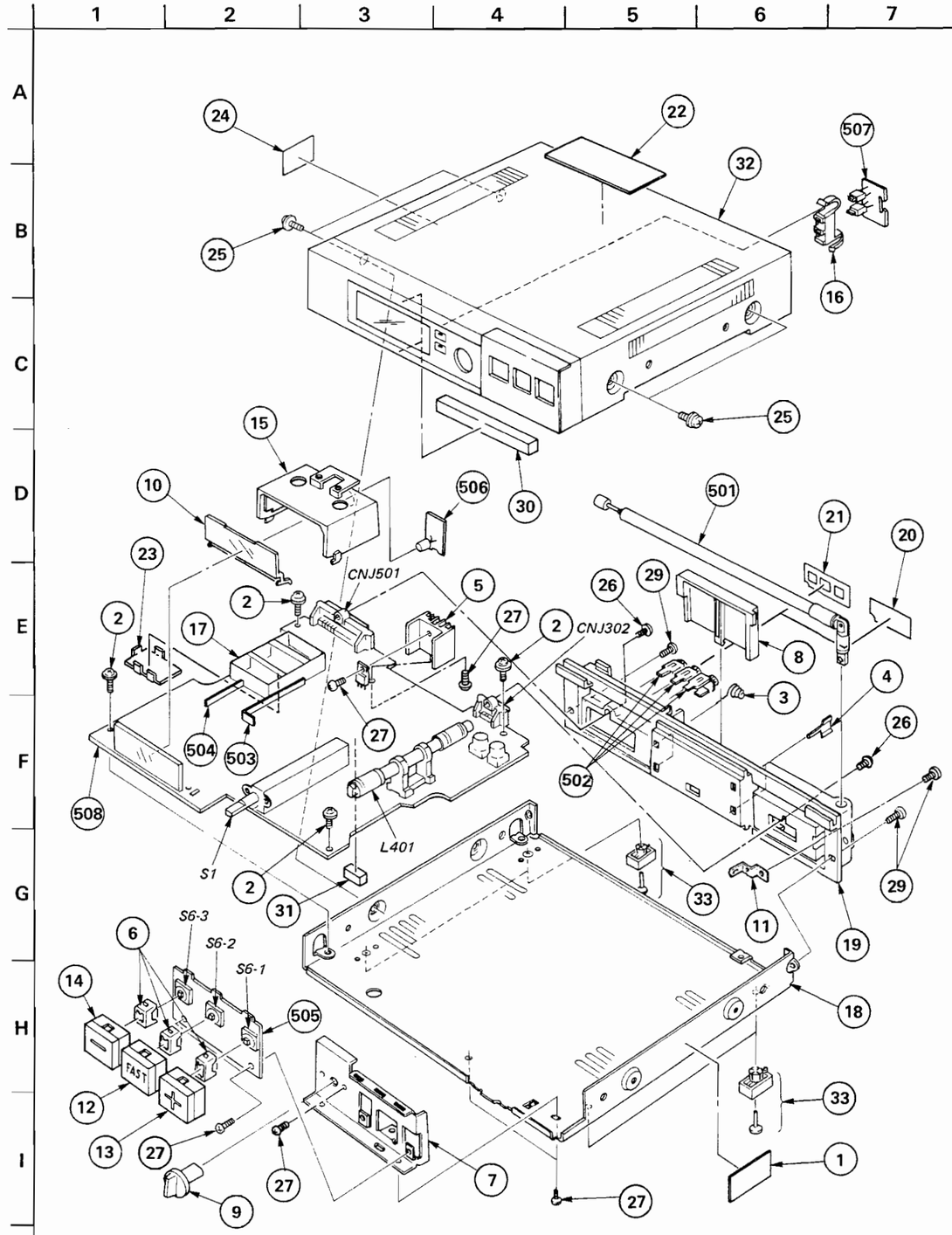
TD6109P



KV1236Z



2SK161



No.	Part
1	3-7(
2	3-7(
3	3-8{
4	3-8{
5 ♦	4-8(
6	4-8{
7 ♦	4-8{
8	4-8{
9	4-8{
9	4-8{
10	4-8{
11 ♦	4-9(
12	4-8{
12	4-8{
13	4-8{
13	4-8{
14	4-8{
14	4-8{
15 ♦	4-8{
16	4-8{
17 ♦	4-8{
18 ♦	4-8{
19	4-8{
19	4-8{
20	4-9(
21	4-8{
22	4-8{
23 ♦	4-8{
24	4-8{
25	4-8{
25	4-8{
26	7-6
27	7-6
28	...
29	7-6
30	9-9
31	9-9
32	X-4
32	X-4
32	X-4
33	X-4

NOTE:
· Items w
criptic
are se
· Items r
they a
servic
pated w
· Due to
number
may be
set.

GENERAL SECTION

No.	Part No.	Description
1	3-701-030-00	LABEL, SERIAL NUMBER
2	3-701-589-00	SCREW, SELF-TAPPING
3	3-883-424-00	SPRING
4	3-883-428-00	PLATE, TERMINAL (POSITIVE)
5 ♦	4-863-132-00	HEAT SINK (SMALL)
6	4-881-725-00	RING (TACT), FLEXIBLE
7 ♦	4-884-844-00	CHASSIS, SUB
8	4-884-845-11	LID, BATTERY CASE
9	4-884-847-00	(RED,SILVER)...KNOB, ROTARY SWITCH, BAND
9	4-884-847-11	(BLACK).....KNOB, ROTARY SWITCH, BAND
10	4-884-848-00	ILLUMINATOR (ST)
11 ♦	4-902-935-01	TERMINAL BOARD
12	4-884-852-00	(RED,SILVER)...KNOB (16X16) (FAST), SQUARE
12	4-884-852-11	(BLACK).....KNOB (16X16) (FAST), SQUARE
13	4-884-853-00	(RED,SILVER)...KNOB (16X16) (+), SQUARE
13	4-884-853-11	(BLACK).....KNOB (+), SQUARE
14	4-884-854-00	(RED,SILVER)...KNOB (16X16) (-), SQUARE
14	4-884-854-11	(BLACK).....KNOB (-), SQUARE
15 ♦	4-884-856-00	HOUSE, LAMP
16	4-884-857-00	HOLDER, LED
17 ♦	4-884-858-00	PLATE, SHIELD
18 ♦	4-884-859-00	CHASSIS
19	4-884-860-21	(AEP,UK)...PLATE, JACK
19	4-884-860-31	(G-AEP)....PLATE, JACK
20	4-903-022-01	(G-AEP)....COVER, ANTENNA
21	4-884-916-11	(AEP,UK)...LABEL, ANTENNA
22	4-884-927-00	LABEL (SYSTEM), CAUTION
23 ♦	4-884-994-00	(G-AEP)...PLATE(B), SHIELD
24	4-884-995-01	LABEL, MODEL NUMBER
25	4-889-321-01	(RED,SILVER)...SCREW
25	4-889-321-11	(BLACK).....SCREW
26	7-685-647-11	SCREW +BVTP 3X10 TYPE2 N-S
27	7-685-871-01	SCREW +BVTT 3X6 (S)
28	.....	
29	7-685-872-01	SCREW +BVTT 3X8 (S)
30	9-911-815-02	CUSHION (B)(t=5)
31	9-911-843-XX	CUSHION, RUBBER (t=10)
32	X-4884-850-1	(RED).....PANEL ASSY
32	X-4884-850-2	(BLACK)....PANEL ASSY
32	X-4884-850-3	(SILVER)...PANEL ASSY
33	X-4884-801-0	FOOT ASSY, RUBBER

NOTE:
- Items with no part number and no description are not stocked because they are seldom required for routine service.
- Items marked " ♦ " are not stocked since they are seldom required for routine service. Some delay should be anticipated when ordering these items.
- Due to standardization, parts with part numbers (Δ-ΔΔΔ-ΔΔΔ-XX or Δ-ΔΔΔΔ-ΔΔΔ-X) may be different from those used in the set.

ELECTRICAL PARTS

Ref.No.	Part No.	Description			
501	1-501-270-00	ANTENNA, TELESCOPIC			
502	1-536-742-00	(AEP,UK)...TERMINAL BOARD, ANTENNA			
503 ♦	1-560-242-21	BUS BAR 4P			
504 ♦	1-560-242-61	BUS BAR 2P			
505 ♦	1-611-692-00	PC BOARD, SWITCH			
506 ♦	1-611-693-00	PC BOARD, LAMP			
507 ♦	1-611-694-00	PC BOARD, LED			
508 ♦	A-4351-371-A	(AEP,UK)...MOUNTED PCB, TUNER			
508 ♦	A-4351-393-A	(G-AEP)....MOUNTED PCB, TUNER			
C101	1-101-999-00	CERAMIC	10PF		50V
C102	1-161-055-00	CERAMIC	0.022MF	10%	50V
C103	1-161-276-00	CERAMIC	5.6PF	10%	50V
C104	1-161-055-00	CERAMIC	0.022MF	10%	50V
C105	1-102-749-00	CERAMIC	12PF		50V
C106	1-161-055-00	CERAMIC	0.022MF	10%	50V
C107	1-102-406-00	CERAMIC	2PF		50V
C108	1-102-851-00	CERAMIC	15PF		50V
C109	1-102-934-00	CERAMIC	1PF		50V
C110	1-102-110-00	CERAMIC	220PF	10%	50V
C111	1-102-934-00	CERAMIC	1PF		50V
C112	1-161-055-00	CERAMIC	0.022MF	10%	50V
C113	1-161-300-00	CERAMIC	8.2PF	10%	50V
C114	1-161-055-00	CERAMIC	0.022MF	10%	50V
C115	1-161-055-00	CERAMIC	0.022MF	10%	50V
C116	1-123-319-00	ELECT	47MF	20%	25V
C201	1-161-055-00	CERAMIC	0.022MF	10%	50V
C202	1-161-055-00	CERAMIC	0.022MF	10%	50V
C203	1-161-055-00	CERAMIC	0.022MF	10%	50V
C204	1-161-055-00	CERAMIC	0.022MF	10%	50V
C205	1-161-055-00	CERAMIC	0.022MF	10%	50V
C206	1-123-356-00	ELECT	10MF	20%	50V
C207	1-102-973-00	CERAMIC	100PF	5%	50V
C208	1-123-380-00	ELECT	1MF	20%	100V
C209	1-161-055-00	CERAMIC	0.022MF	10%	50V
C210	1-161-055-00	CERAMIC	0.022MF	10%	50V
C211	1-123-356-00	ELECT	10MF	20%	50V
C212	1-161-055-00	CERAMIC	0.022MF	10%	50V
C213	1-161-055-00	CERAMIC	0.022MF	10%	50V
C214	1-123-380-00	ELECT	1MF	20%	100V
C215	1-161-055-00	CERAMIC	0.022MF	10%	50V
C301	1-123-332-00	ELECT	47MF	20%	25V
C302	1-123-369-00	ELECT	4.7MF	20%	63V
C303	1-102-116-00	CERAMIC	680PF	10%	50V
C304	1-161-013-00	CERAMIC	0.01MF	10%	25V
C305	1-123-380-00	ELECT	1MF	20%	100V
C306	1-161-043-00	CERAMIC	0.0022MF	10%	50V
C307	1-102-116-00	CERAMIC	680PF	10%	50V
C308	1-161-013-00	CERAMIC	0.01MF	10%	25V
C309	1-123-380-00	ELECT	1MF	20%	100V

CAPACITORS:
- All capacitors are in μF. Common capacitors are omitted. Refer to the following lists for their part numbers. MF:μF, PF:μμF.

RESISTORS
- All resistors are in ohms. Common 1/4W, 1/8W and 1/16W carbon resistors are omitted. Refer to the following lists for their part numbers.
- F : nonflammable

COILS
- MMH : mH, UH : μH

SEMICONDUCTORS
In each case, U : μ, for example:
UA···: μA···, UPA···: μPA···, UPC···: μPC,
UPD···: μPD···

ELECTRICAL PARTS

Ref.No.	Part No.	Description			
C310	1-161-043-00	CERAMIC	0.0022MF	10%	50V
C311	1-123-380-00	ELECT	1MF	20%	100V
C312	1-104-077-00	POLYSTYRENE	0.001MF	5%	50V
C313	1-123-381-00	ELECT	2.2MF	20%	100V
C314	1-123-382-00	ELECT	3.3MF	20%	100V
C315	1-108-595-00	MYLAR	0.047MF	5%	50V
C401	1-102-074-00	CERAMIC	0.001MF	10%	50V
C402	1-161-055-00	CERAMIC	0.022MF	10%	50V
C403	1-161-055-00	CERAMIC	0.022MF	10%	50V
C404	1-123-356-00	ELECT	10MF	20%	50V
C405	1-161-055-00	CERAMIC	0.022MF	10%	50V
C406	1-161-055-00	CERAMIC	0.022MF	10%	50V
C407	1-101-880-00	CERAMIC	47PF	5%	50V
C408	1-102-074-00	CERAMIC	0.001MF	10%	50V
C409	1-161-055-00	CERAMIC	0.022MF	10%	50V
C410	1-161-055-00	CERAMIC	0.022MF	10%	50V
C411	1-161-049-00	CERAMIC	0.0068MF	10%	50V
C412	1-161-055-00	CERAMIC	0.022MF	10%	50V
C413	1-123-332-00	ELECT	47MF	20%	25V
C414	1-123-380-00	ELECT	1MF	20%	100V
C415	1-123-382-00	ELECT	3.3MF	20%	100V
C416	1-123-369-00	ELECT	4.7MF	20%	63V
C417	1-161-055-00	CERAMIC	0.022MF	10%	50V
C418	1-123-382-00	ELECT	3.3MF	20%	100V
C419	1-161-055-00	CERAMIC	0.022MF	10%	50V
C420	1-161-055-00	CERAMIC	0.022MF	10%	50V
C421	1-102-880-00	CERAMIC	15PF	5%	50V
C422	1-104-069-00	POLYSTYRENE	470PF	5%	50V
C423	1-101-999-00	CERAMIC	10PF		50V
C424	1-102-733-00	CERAMIC	91PF	5%	50V
C426	1-102-726-00	CERAMIC	39PF	5%	50V
C427	1-161-042-00	CERAMIC	0.0018MF	10%	50V
C428	1-161-040-00	CERAMIC	0.0015MF	10%	50V
C430	1-102-958-00	CERAMIC	20PF	5%	50V
C432	1-103-707-00	POLYSTYRENE	180PF	5%	50V
C501	1-123-333-00	ELECT	100MF	20%	25V
C502	1-161-055-00	CERAMIC	0.022MF	10%	50V
C503	1-123-323-00	ELECT	470MF	20%	16V
C504	1-161-055-00	CERAMIC	0.022MF	10%	50V
C505	1-123-333-00	ELECT	100MF	20%	25V
C506	1-161-055-00	CERAMIC	0.022MF	10%	50V
C507	1-123-356-00	ELECT	10MF	20%	50V
C508	1-161-055-00	CERAMIC	0.022MF	10%	50V
C509	1-101-005-00	CERAMIC	0.022MF		50V
C601	1-161-055-00	CERAMIC	0.022MF	10%	50V
C602	1-161-055-00	CERAMIC	0.022MF	10%	50V
C603	1-161-055-00	CERAMIC	0.022MF	10%	50V
C604	1-161-055-00	CERAMIC	0.022MF	10%	50V

ELECTRICAL PARTS

Ref.No.	Part No.	Description			
C605	1-161-055-00	CERAMIC	0.022MF	10%	50V
C606	1-161-055-00	CERAMIC	0.022MF	10%	50V
C607	1-123-607-00	ELECT	0.1MF	20%	50V
C609	1-161-055-00	CERAMIC	0.022MF	10%	50V
C610	1-161-055-00	CERAMIC	0.022MF	10%	50V
C611	1-161-055-00	CERAMIC	0.022MF	10%	50V
C612	1-161-013-00	CERAMIC	0.01MF	10%	25V
C612	1-161-055-00	CERAMIC	0.022MF	10%	50V
C613	1-161-055-00	CERAMIC	0.022MF	10%	50V
C614	1-102-074-00	CERAMIC	0.001MF	10%	50V
C615	1-161-013-00	CERAMIC	0.01MF	10%	25V
C616	1-161-013-00	CERAMIC	0.01MF	10%	25V
C619	1-161-351-00	CERAMIC	20PF	5%	50V
C620	1-102-851-00	CERAMIC	15PF		50V
C621	1-161-351-00	CERAMIC	20PF	5%	50V
C622	1-130-644-00	FILM	1MF	5%	50V
C623	1-130-632-00	FILM	0.1MF	5%	50V
C624	1-130-632-00	FILM	0.1MF	5%	50V
C625	1-161-279-00	CERAMIC	10PF	5%	50V
C626	1-130-644-00	FILM	1MF	5%	50V
C627	1-130-632-00	FILM	0.1MF	5%	50V
C628	1-130-632-00	FILM	0.1MF	5%	50V
C629	1-161-055-00	CERAMIC	0.022MF	10%	50V
C630	1-161-055-00	CERAMIC	0.022MF	10%	50V
C631	1-161-055-00	CERAMIC	0.022MF	10%	50V
C650	1-123-356-00	ELECT	10MF	20%	50V
C651	1-123-610-00	ELECT	0.47MF	20%	50V
C652	1-123-381-00	ELECT	2.2MF	20%	100V
CF201	1-527-968-00	FILTER, CERAMIC			
CF202	1-527-968-00	FILTER, CERAMIC			
CF401	1-527-937-00	FILTER, CERAMIC			
CF402	1-527-981-00	FILTER, CERAMIC			
♦CNJ201	1-560-060-00	PIN, CONNECTOR 2P			
♦CNJ301	1-560-060-00	PIN, CONNECTOR 2P			
CNJ302	1-562-067-00	SOCKET, CONNECTOR 5P			
CNJ501	1-562-068-00	SOCKET, CONNECTOR 13P			
♦CNJ601	1-560-339-00	PIN, CONNECTOR 9P			
CT401	1-141-180-00	CAP, TRIMMER 15P			
CT402	1-141-180-00	CAP, TRIMMER 15P			
CT403	1-141-181-11	CAP, TRIMMER			
CT404	1-141-171-00	CAP, TRIMMER 20P			
D101	8-719-800-09	DIODE 1SV101			
D102	8-719-800-09	DIODE 1SV101			
D103	8-719-800-09	DIODE 1SV101			
D201	8-719-903-07	DIODE GL9NG24			
D202	8-719-815-55	DIODE 1S1555			
D203	8-719-815-55	DIODE 1S1555			

NOTE:
- Items with no part number and no description are not stocked because they are seldom required for routine service.
- Items marked " ♦ " are not stocked since they are seldom required for routine service. Some delay should be anticipated when ordering these items.
- Due to standardization, parts with part numbers (Δ-ΔΔΔ-ΔΔΔ-XX or Δ-ΔΔΔΔ-ΔΔΔ-X) may be different from those used in the set.

CAPACITORS:
- All capacitors are in μF. Common capacitors are omitted. Refer to the following lists for their part numbers. MF:μF, PF:μμF.

RESISTORS
- All resistors are in ohms. Common 1/4W, 1/8W and 1/16W carbon resistors are omitted. Refer to the following lists for their part numbers.
- F : nonflammable

COILS
- MMH : mH, UH : μH

SEMICONDUCTORS
In each case, U : μ, for example:
UA···: μA···, UPA···: μPA···, UPC···: μPC,
UPD···: μPD···

ELECTRICAL PARTS

Ref.No.	Part No.	Description
D204	8-719-815-55	DIODE 1S1555
D301	8-719-903-11	DIODE GL9PR24
D302	8-719-815-55	DIODE 1S1555
D303	8-719-815-55	DIODE 1S1555
D304	8-719-815-55	DIODE 1S1555
D401	8-719-902-79	DIODE KV1236Z
D402	8-719-815-55	DIODE 1S1555
D403	8-719-815-55	DIODE 1S1555
D404	8-719-815-55	DIODE 1S1555
D501	8-719-910-24	DIODE HZ12B1L
D502	8-719-200-02	DIODE 10E2
D503	8-719-910-64	DIODE HZ6B1L
D504	8-719-200-02	DIODE 10E2
D505	8-719-991-21	DIODE EQA01-12R1
D506	8-719-815-55	DIODE 1S1555
D507	8-719-815-55	DIODE 1S1555
D508	8-719-815-55	DIODE 1S1555
D601	8-719-815-55	DIODE 1S1555
D602	8-719-815-55	DIODE 1S1555
D603	8-719-815-55	DIODE 1S1555
D604	8-719-815-55	DIODE 1S1555
D605	8-719-815-55	DIODE 1S1555
IC201	8-759-812-31	IC LA1231
IC301	8-759-833-90	IC LA3390
IC401	8-759-812-45	IC LA1245
IC601	8-759-201-03	IC TD6109P
IC602	8-759-202-43	IC TC9300F-005A
L101 ♦	1-422-093-00	COIL, AIR-CORE
L102 ♦	1-422-094-00	COIL, AIR-CORE
L103 ♦	1-422-096-00	COIL, AIR-CORE
L104 ♦	1-422-039-00	COIL, AIR-CORE
L105 ♦	1-422-098-00	COIL, AIR-CORE
L106 ♦	1-422-099-00	COIL, AIR-CORE
L301	1-408-421-00	MICRO INDUCTOR 100UH
L401	1-402-002-00	ANTENNA, FERRITE-ROD (LW/MW)
L402	1-406-033-00	COIL (OSC)
L403	1-408-425-00	MICRO INDUCTOR 220UH
L404	1-406-034-00	COIL (OSC)
LCD1	1-806-544-00	DISPLAY PANEL, LIQUID CRYSTAL
LPF1	1-235-164-00	FILTER, LOW PASS
LPF2	1-235-164-00	FILTER, LOW PASS
PL501	1-518-511-00	(SILVER).....LAMP, PILOT
PL501	1-518-511-21	(RED,BLACK)...LAMP, PILOT
Q101	8-729-353-52	TRANSISTOR 2SC535
Q102	8-729-353-52	TRANSISTOR 2SC535
Q103	8-729-216-13	TRANSISTOR 2SK161

ELECTRICAL PARTS

Ref.No.	Part No.	Description
Q104	8-729-671-14	TRANSISTOR 2SC710-14
Q201	8-729-883-92	TRANSISTOR 2SC2839
Q202	8-729-663-47	TRANSISTOR 2SC1364
Q203	8-729-663-47	TRANSISTOR 2SC1364
Q501	8-729-288-02	TRANSISTOR 2SD880
Q502	8-729-201-04	TRANSISTOR 2SC2878
Q503	8-729-224-62	TRANSISTOR 2SK246-GR
Q601	8-729-663-47	TRANSISTOR 2SC1364
Q602	8-729-203-05	TRANSISTOR 2SK30A-GR3
Q603	8-729-664-48	TRANSISTOR 2SC1362-48
Q604	8-729-664-48	TRANSISTOR 2SC1362-48
Q605	8-729-663-47	TRANSISTOR 2SC1364
Q606	8-729-203-05	TRANSISTOR 2SK30A-GR3
Q607	8-729-664-48	TRANSISTOR 2SC1362-48
Q608	8-729-664-48	TRANSISTOR 2SC1362-48

Ref.No.	Part No.	Description			
R101	1-247-179-00	CARBON	100K	5%	1/4W
R102	1-246-543-00	CARBON	820K	5%	1/4W
R103	1-247-095-00	CARBON	33	5%	1/4W
R104	1-247-107-00	CARBON	100	5%	1/4W
R105	1-247-179-00	CARBON	100K	5%	1/4W
R106	1-246-543-00	CARBON	820K	5%	1/4W
R107	1-247-120-00	CARBON	360	5%	1/4W
R108	1-247-107-00	CARBON	100	5%	1/4W
R109	1-247-107-00	CARBON	100	5%	1/4W
R110	1-246-535-00	CARBON	390K	5%	1/4W
R111	1-247-171-00	CARBON	47K	5%	1/4W
R112	1-247-119-00	CARBON	330	5%	1/4W
R113	1-247-083-00	CARBON	10	5%	1/4W
R114	1-247-099-00	CARBON	47	5%	1/4W
R201	1-247-137-00	CARBON	1.8K	5%	1/4W
R202	1-247-155-00	CARBON	10K	5%	1/4W
R203	1-247-137-00	CARBON	1.8K	5%	1/4W
R204	1-247-120-00	CARBON	360	5%	1/4W
R205	1-247-119-00	CARBON	330	5%	1/4W
R206	1-247-131-00	CARBON	1K	5%	1/4W
R207	1-247-159-00	CARBON	15K	5%	1/4W
R208	1-247-163-00	CARBON	22K	5%	1/4W
R209	1-247-099-00	CARBON	47	5%	1/4W
R210	1-247-179-00	CARBON	100K	5%	1/4W
R211	1-247-163-00	CARBON	22K	5%	1/4W
R212	1-247-163-00	CARBON	22K	5%	1/4W
R213	1-247-155-00	CARBON	10K	5%	1/4W
R214	1-247-125-00	CARBON	560	5%	1/4W
R215	1-247-155-00	CARBON	10K	5%	1/4W
R216	1-247-179-00	CARBON	100K	5%	1/4W
R217	1-247-155-00	CARBON	10K	5%	1/4W
R218	1-247-143-00	CARBON	3.3K	5%	1/4W

NOTE:
- Items with no part number and no description are not stocked because they are seldom required for routine service.
- Items marked " ♦ " are not stocked since they are seldom required for routine service. Some delay should be anticipated when ordering these items.
- Due to standardization, parts with part numbers (Δ-ΔΔΔ-ΔΔΔ-XX or Δ-ΔΔΔΔ-ΔΔΔ-X) may be different from those used in the set.

CAPACITORS:
- All capacitors are in μF. Common capacitors are omitted. Refer to the following lists for their part numbers. MF:μF, PF:μμF.

RESISTORS
- All resistors are in ohms. Common 1/4W, 1/8W and 1/16W carbon resistors are omitted. Refer to the following lists for their part numbers.
- F : nonflammable

COILS
- MMH : mH, UH : μH

SEMICONDUCTORS
In each case, U : μ, for example:
UA···: μA···, UPA···: μPA···, UPC···: μPC, UPD···: μPD···

ELECTRICAL PARTS

Ref.No.	Part No.	Description			
R219	1-247-163-00	CARBON	22K	5%	1/4W
R301	1-247-171-00	CARBON	47K	5%	1/4W
R302	1-247-155-00	CARBON	10K	5%	1/4W
R303	1-247-175-00	CARBON	68K	5%	1/4W
R304	1-247-083-00	CARBON	10	5%	1/4W
R305	1-247-131-00	CARBON	1K	5%	1/4W
R306	1-247-139-00	CARBON	2.2K	5%	1/4W
R307	1-247-143-00	CARBON	3.3K	5%	1/4W
R308	1-247-175-00	CARBON	68K	5%	1/4W
R309	1-247-083-00	CARBON	10	5%	1/4W
R310	1-247-131-00	CARBON	1K	5%	1/4W
R311	1-247-139-00	CARBON	2.2K	5%	1/4W
R312	1-247-143-00	CARBON	3.3K	5%	1/4W
R313	1-247-155-00	CARBON	10K	5%	1/4W
R314	1-246-529-00	CARBON	220K	5%	1/4W
R315	1-247-135-00	CARBON	1.5K	5%	1/4W
R316	1-247-171-00	CARBON	47K	5%	1/4W
R317	1-247-159-00	CARBON	15K	5%	1/4W
R318	1-247-131-00	CARBON	1K	5%	1/4W
R401	1-247-139-00	CARBON	2.2K	5%	1/4W
R402	1-247-107-00	CARBON	100	5%	1/4W
R403	1-247-123-00	CARBON	470	5%	1/4W
R404	1-247-143-00	CARBON	3.3K	5%	1/4W
R405	1-247-171-00	CARBON	47K	5%	1/4W
R406	1-247-099-00	CARBON	47	5%	1/4W
R407	1-247-119-00	CARBON	330	5%	1/4W
R408	1-247-155-00	CARBON	10K	5%	1/4W
R409	1-247-111-00	CARBON	150	5%	1/4W
R410	1-247-145-00	CARBON	3.9K	5%	1/4W
R411	1-247-155-00	CARBON	10K	5%	1/4W
R412	1-247-155-00	CARBON	10K	5%	1/4W
R413	1-247-147-00	CARBON	4.7K	5%	1/4W
R414	1-247-155-00	CARBON	10K	5%	1/4W
R415	1-247-179-00	CARBON	100K	5%	1/4W
R416	1-247-155-00	CARBON	10K	5%	1/4W
R417	1-247-179-00	CARBON	100K	5%	1/4W
R418	1-246-545-00	CARBON	1M	5%	1/4W
R419	1-247-169-00	CARBON	39K	5%	1/4W
R420	1-247-173-00	CARBON	56K	5%	1/4W
R421	1-247-173-00	CARBON	56K	5%	1/4W
R422	1-247-099-00	CARBON	47	5%	1/4W
R501	1-247-157-00	CARBON	12	5%	1/4W
R502	1-247-125-00	CARBON	560	5%	1/4W
R503	1-247-123-00	CARBON	470	5%	1/4W
R504	1-247-123-00	CARBON	470	5%	1/4W
R601	1-247-155-00	CARBON	10K	5%	1/4W
R602	1-247-147-00	CARBON	4.7K	5%	1/4W
R603	1-247-149-00	CARBON	5.6K	5%	1/4W

ELECTRICAL PARTS

Ref.No.	Part No.	Description			
R604	1-247-149-00	CARBON	5.6K	5%	1/4W
R605	1-247-149-00	CARBON	5.6K	5%	1/4W
R606	1-247-163-00	CARBON	22K	5%	1/4W
R607	1-247-163-00	CARBON	22K	5%	1/4W
R608	1-247-163-00	CARBON	22K	5%	1/4W
R609	1-247-163-00	CARBON	22K	5%	1/4W
R610	1-247-161-00	CARBON	18K	5%	1/4W
R611	1-247-167-00	CARBON	33K	5%	1/4W
R612	1-247-155-00	CARBON	10K	5%	1/4W
R613	1-246-537-00	CARBON	470K	5%	1/4W
R614	1-246-537-00	CARBON	470K	5%	1/4W
R615	1-247-177-00	CARBON	82K	5%	1/4W
R616	1-247-160-00	CARBON	16K	5%	1/4W
R617	1-247-125-00	CARBON	560	5%	1/4W
R618	1-247-162-00	CARBON	20K	5%	1/4W
R619	1-247-140-00	CARBON	2.4K	5%	1/4W
R620	1-247-147-00	CARBON	4.7K	5%	1/4W
R621	1-247-147-00	CARBON	4.7K	5%	1/4W
R622	1-247-159-00	CARBON	15K	5%	1/4W
R623	1-247-125-00	CARBON	560	5%	1/4W
R624	1-247-162-00	CARBON	20K	5%	1/4W
R625	1-247-140-00	CARBON	2.4K	5%	1/4W
R626	1-247-147-00	CARBON	4.7K	5%	1/4W
R627	1-247-147-00	CARBON	4.7K	5%	1/4W
R628	1-247-171-00	CARBON	47K	5%	1/4W
R629	1-247-171-00	CARBON	47K	5%	1/4W
R630	1-247-171-00	CARBON	47K	5%	1/4W
R650	1-246-545-00	CARBON	1M	5%	1/4W
R651	1-246-545-00	CARBON	1M	5%	1/4W
RT201	1-226-239-00	RES, ADJ, CARBON 100K			
RT301	1-226-237-00	RES, ADJ, CARBON 20K			
RT302	1-228-505-00	RES, ADJ, METAL GLAZE 10K			
RT401	1-226-238-00	RES, ADJ, CARBON 50K			
RT601	1-226-663-00	RES, ADJ, METAL GLAZE 1K			
RT602	1-226-663-00	RES, ADJ, METAL GLAZE 1K			
S1	1-554-715-11	SWITCH, ROTARY SLIDE (BAND)			
S6-1	1-552-412-00	SWITCH, KEY BOARD (+)			
S6-2	1-552-412-00	SWITCH, KEY BOARD (FAST)			
S6-3	1-552-412-00	SWITCH, KEY BOARD (-)			
T201	1-404-419-00	COIL, DISCRIMINATOR			
T401	1-404-413-00	TRANSFORMER, IF			
XT601	1-527-995-00	VIBRATOR, CRYSTAL			

NOTE:
- Items with no part number and no description are not stocked because they are seldom required for routine service.
- Items marked " ♦ " are not stocked since they are seldom required for routine service. Some delay should be anticipated when ordering these items.
- Due to standardization, parts with part numbers (Δ-ΔΔΔ-ΔΔΔ-XX or Δ-ΔΔΔΔ-ΔΔΔ-X) may be different from those used in the set.

CAPACITORS:
- All capacitors are in μF. Common capacitors are omitted. Refer to the following lists for their part numbers. MF:μF, PF:μμF.

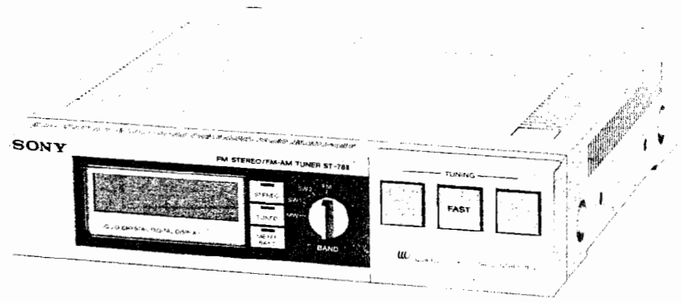
RESISTORS
- All resistors are in ohms. Common 1/4W, 1/8W and 1/16W carbon resistors are omitted. Refer to the following lists for their part numbers.
- F : nonflammable

COILS
- MMH : mH, UH : μH

SEMICONDUCTORS
In each case, U : μ, for example:
UA···: μA···, UPA···: μPA···, UPC···: μPC, UPD···: μPD···

FM STEREO/FM-AM TUNER
(ST-78II)

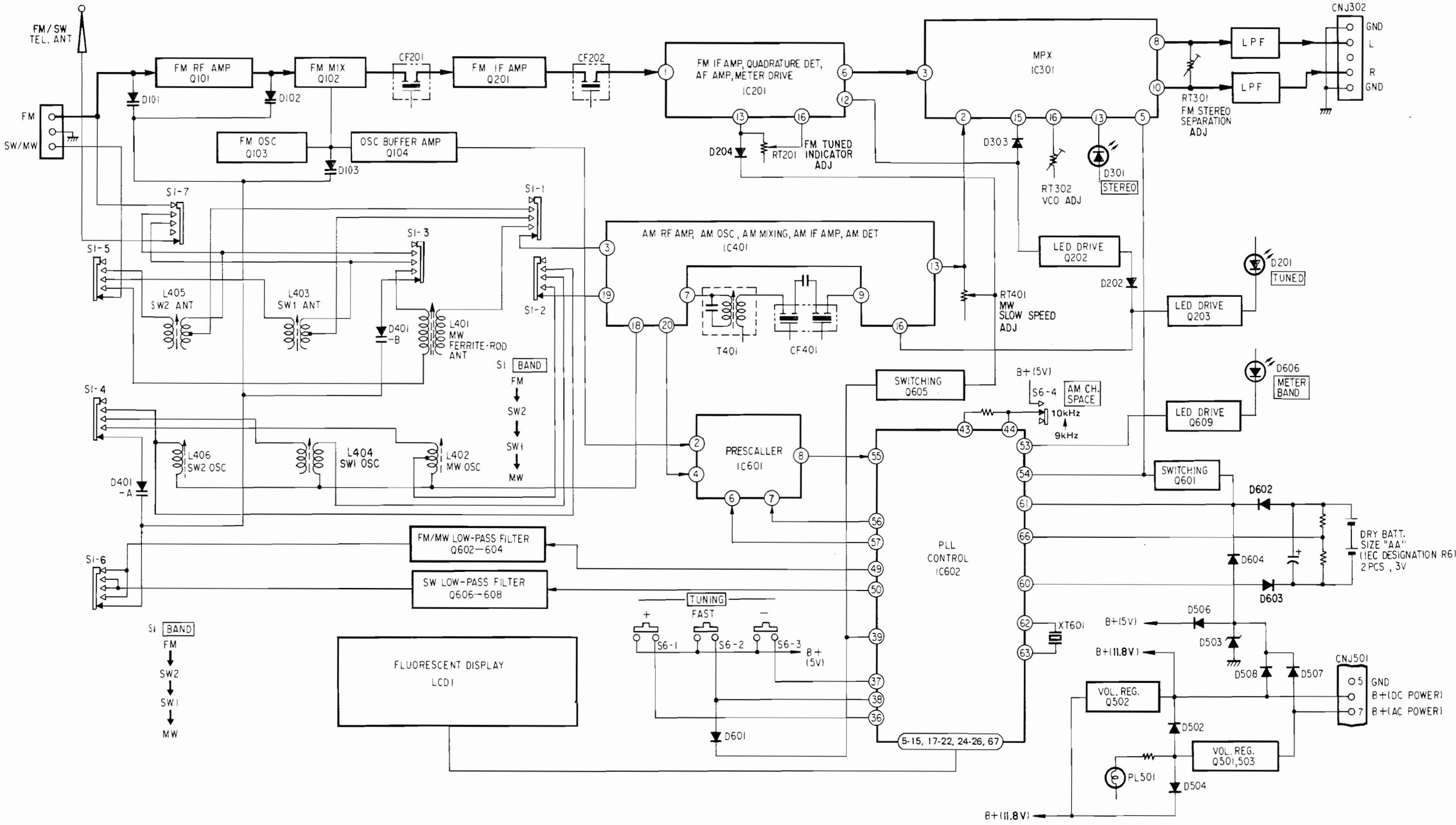
E Model



Note: ST-78II is an FM stereo/FM-AM tuner in FH-7MKII

MEMO

SECTION 1
BLOCK DIAGRAM



SECTION 2
ADJUSTMENTS

FM SECTION 1

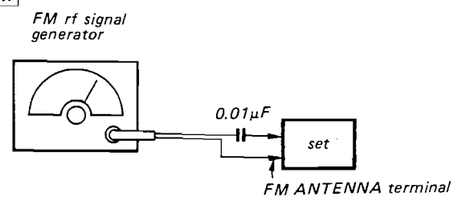
Setting:

BAND selector switch: FM

FM/MW PLL Bias Adjustment

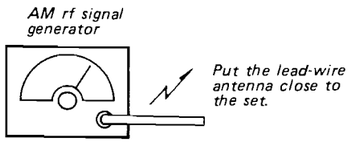
Setting:

FM

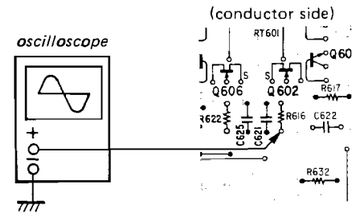


Carrier frequency: 87.5MHz, 108MHz
Modulation: 1kHz, 75kHz deviation
Output level: 1mV (60dB)

MW



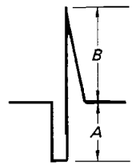
Carrier frequency: 531kHz, 1,602kHz
Modulation: 30% amplitude modulation by 400Hz signal



Procedure:

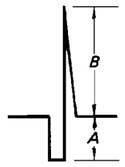
1. Connect the oscilloscope as shown on the left.
2. Set BAND selector switch (S1) to FM.
3. Push TUNING (+, –) button for 87.5MHz.
4. Adjust RT601 so that the waveform is shown below.

   A : B = 2 : 3
   A is approx. 0.4V



5. Push the button for 108MHz. Confirm that the waveform is locked as shown below.

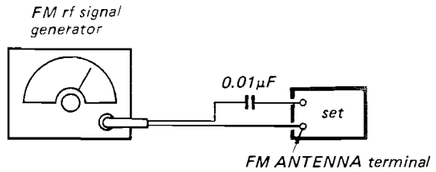
   A : B = 1.5 : 3.5
   (reference)



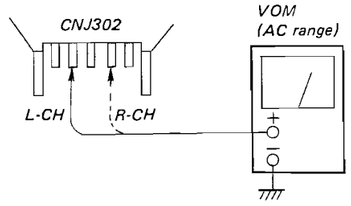
6. Set BAND selector switch (S1) to MW.
   Set AM CH. SPACE switch (S6-4) to 9kHz.
7. Confirm that the waveform is locked when the set is tuned to 531kHz.
8. Confirm that the waveform is locked when the set is tuned to 1,602kHz.

FM Tracking Adjustment

Setting:



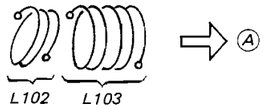
Carrier frequency: 98MHz
Modulation: 1kHz, 75kHz deviation
Output level: 3.16μV (10dB)



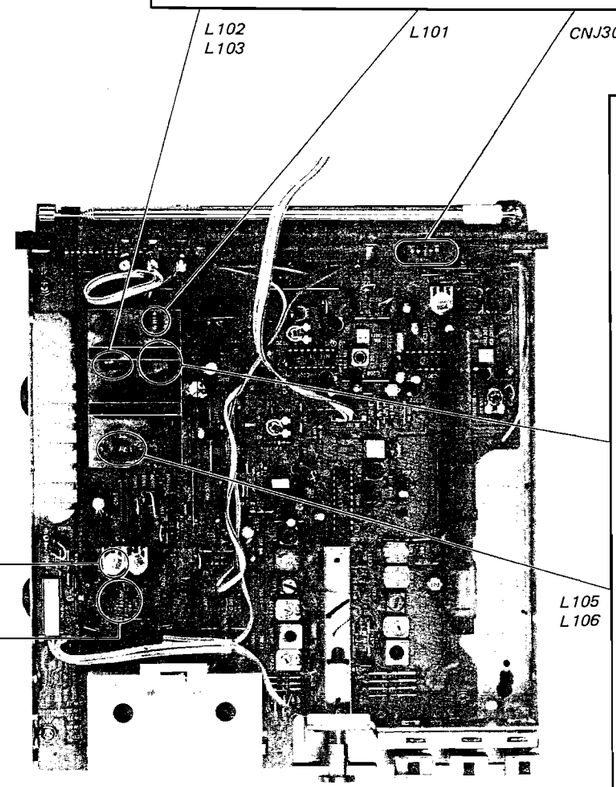
Procedure:

1. Push TUNING (+, –) button for 98MHz.
2. Approach L102 and L103 not to contact each other.
3. Adjust L101 and L103, and repeat the adjustment 2–3 times for maximum VOM reading.

   (Adjust L103 in the direction as shown by arrow Ⓐ.)

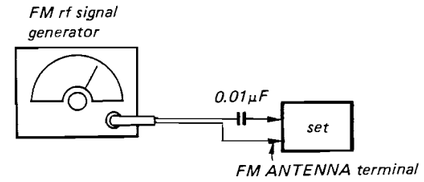


Note: Do not touch L102.

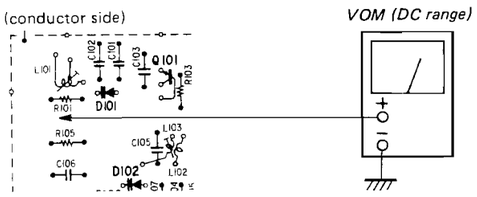


FM OSC Voltage Adjustment

Setting:

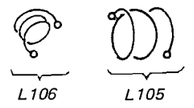


Carrier frequency: 108MHz
Modulation: 1kHz, 75kHz deviation
Output level: 1mV (60dB)



Procedure:

1. Push the TUNING (+, –) button for 108MHz.
2. Adjust L105 for 8.9 – 9V reading on the VOM.

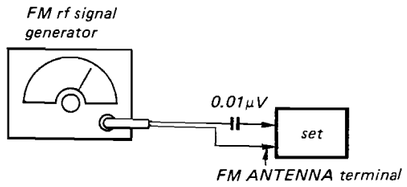


Note:
- *Do not touch L106.*
- *Adjust so that L105 does not approach to L106.*

FM SECTION 2

FM TUNED Indicator Adjustment

Setting:



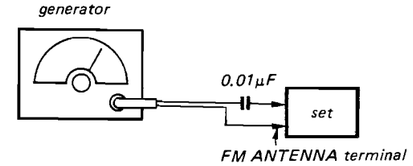
Carrier frequency: 98MHz
Modulation: 1kHz, 75kHz deviation
Output level: 17.8μV (25dB)

Procedure:

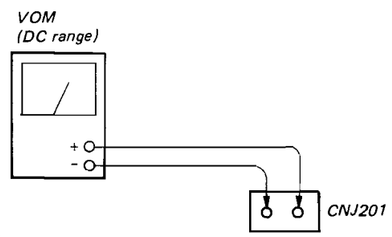
1. Push the TUNING (+, –) button for 98MHz.
2. Adjust RT201 so that the TUNED indicator (D201) lights up.

FM Discriminator Adjustment

Setting:



Carrier frequency: 98MHz
Modulation: 1kHz, 75kHz deviation
Output level: 1mV (60dB)



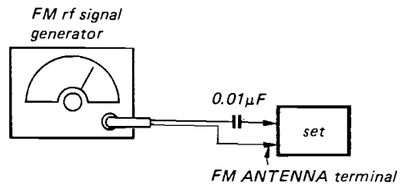
Procedure:

1. Push the TUNING (+, –) button for 98MHz.
2. Adjust T201 for 0V reading on the VOM.

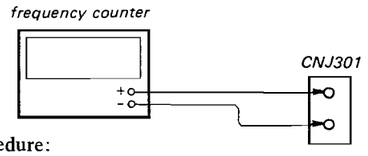
VCO Adjustment

A) Regular Method

Setting:



Carrier frequency: 98MHz
Modulation: no modulation
Output level: 1mV (60dB)



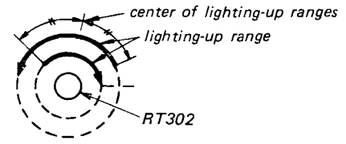
Procedure:

1. Push the TUNING (+, –) button for 98MHz.
2. Adjust RT302 for 19kHz ±50Hz reading on the frequency counter.

B) Simple Method

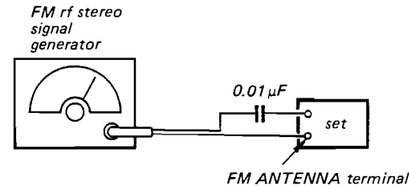
Procedure:

1. Push the TUNING (+, –) button to the FM stereo broadcasting signal.
2. Turn RT302 clockwise or counterclockwise and memorize the lighting-up range of the STEREO indicator (D301).
3. Secure RT302 at the center of the lighting-up range of both turns as shown below.

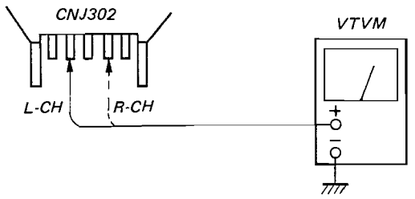


FM Stereo Separation Adjustment

Setting:



Carrier frequency: 98MHz
Modulation: audio (1kHz): 33.75kHz deviation
pilot (19kHz): 7.5kHz deviation
sub-channel (38kHz): 33.75kHz deviation
Output level: 1mV (60dB)
Mode: stereo

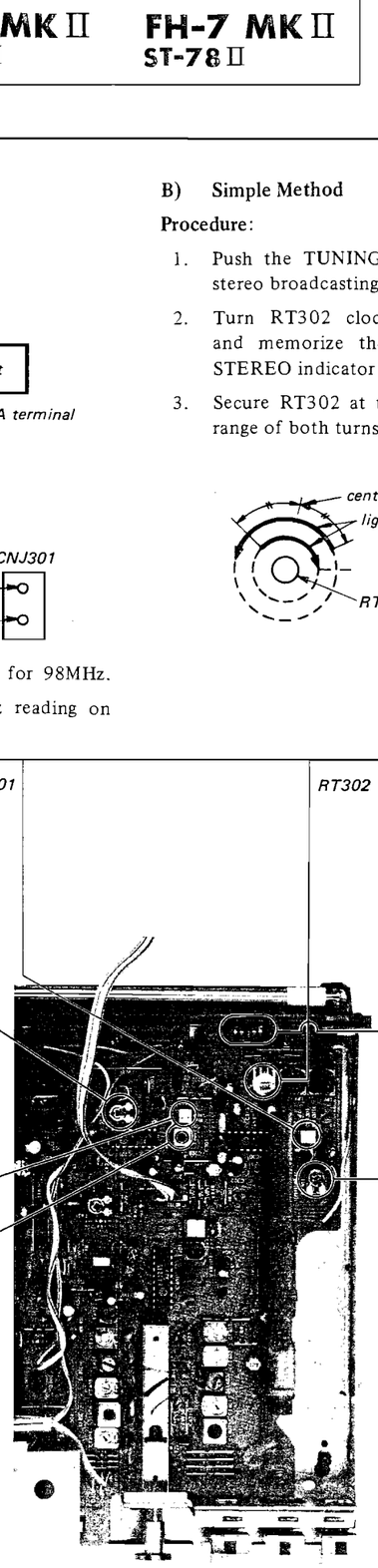


Procedure:

FM stereo signal generator output channel	VTVM connection	VTVM reading (dB)
L-CH	L-CH	Ⓐ
R-CH	L-CH	Ⓑ Adjust RT301 for minimum reading.
R-CH	R-CH	Ⓒ
L-CH	R-CH	Ⓓ Adjust RT301 for minimum reading.

L-CH Stereo separation: Ⓐ – Ⓑ
R-CH Stereo separation: Ⓒ – Ⓓ

The separations of both channels should be equal.

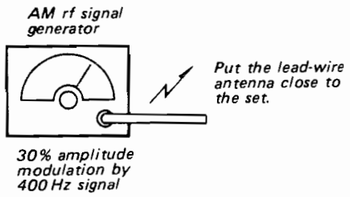


MW/SW SECTION 1

Setting:

BAND selector switch: MW, SW1 or SW2

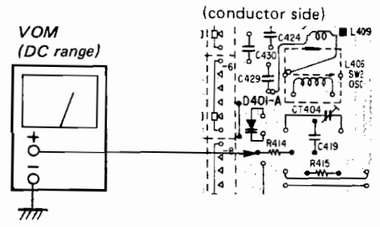
AM CH. SPACE switch: 9kHz



- Repeat the procedures in each adjustment several times, and the OSC voltage and tracking adjustments should be finally done by the trimmer capacitors.

MW/SW1/SW2 OSC Voltage Adjustment

Setting:

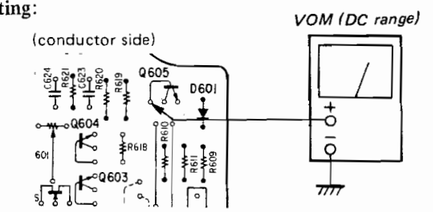


Procedure:

1. Set BAND selector switch (S1) to MW.
2. Push TUNING (+, –) button for 531kHz. Adjust L402 for 1.0 – 1.1V VOM reading.
3. Push the button for 1,602kHz. Adjust CT406 for 8.9 – 9.0V VOM reading.
4. Set BAND selector switch (S1) to SW1.
5. Push TUNING (+, –) button for 3.2MHz. Adjust L404 for 1.0 – 1.1V VOM reading.
6. Push the button for 7.3MHz. Adjust CT405 for 8.9 – 9.0V VOM reading.
7. Set BAND selector switch (S1) to SW2.
8. Push TUNING (+, –) button for 9.5MHz. Adjust L406 for 1.0 – 1.1V VOM reading.
9. Push the button for 21.75MHz. Adjust CT404 for 8.9 – 9.0V VOM reading.

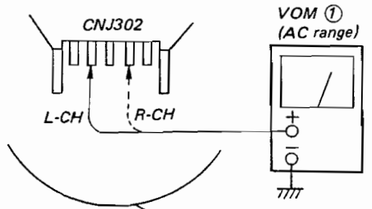
MW Slow Speed Action Level Adjustment

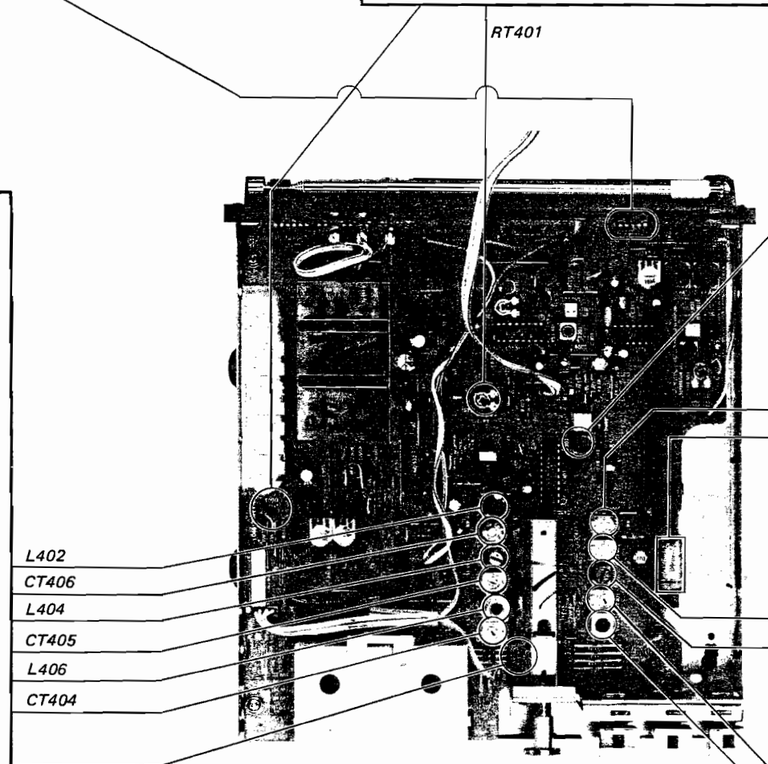
Setting:



Procedure:

1. Set BAND selector switch (S1) to MW. Confirm that the receiving condition is no signal.
2. Adjust RT401 so that the collector voltage of Q605 is 4.0 – 5.0V.





MW IF ADJUSTMENT	
Adjust for a maximum reading on VOM ①.	
T401	450kHz

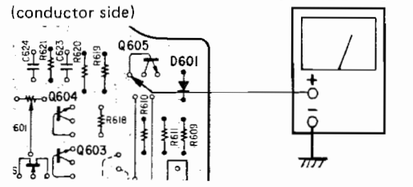
MW TRACKING ADJUSTMENT	
Adjust for a maximum reading on VOM ①.	
CT403	1,404kHz
L401	603kHz

SW1 TRACKING ADJUSTMENT	
Adjust for a maximum reading on VOM ①.	
CT402	6.5MHz
L403	3.5MHz

SW2 TRACKING ADJUSTMENT	
Adjust for a maximum reading on VOM ①.	
CT401	20MHz
L405	10MHz

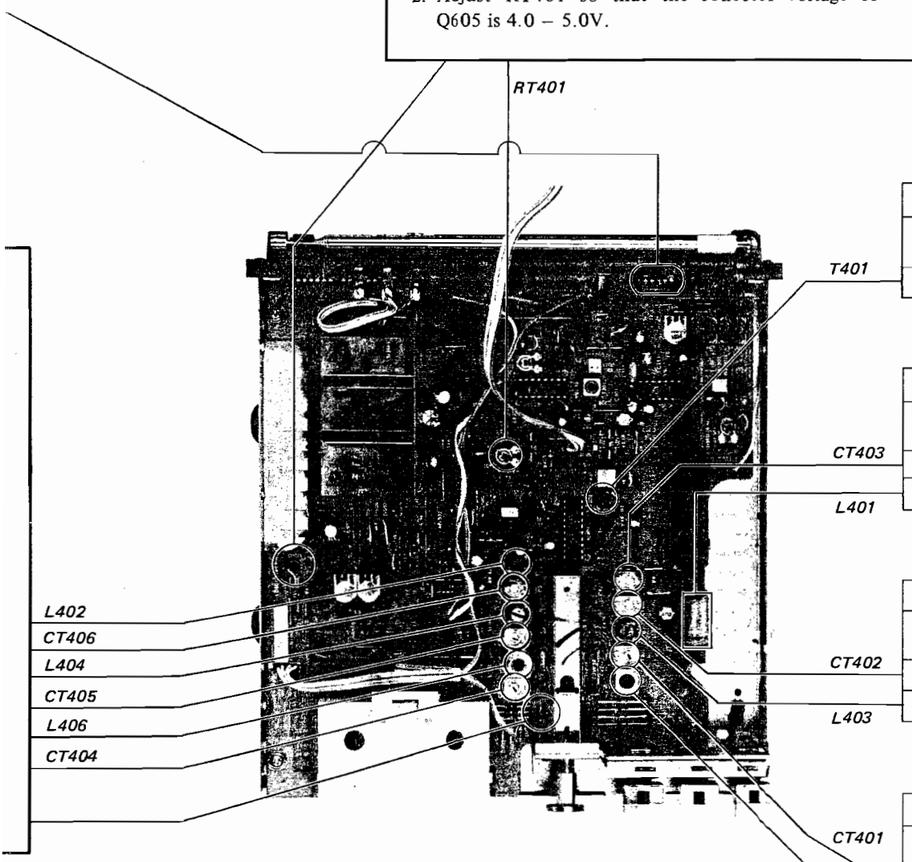
MW Slow Speed Action Level Adjustment

Setting:



Procedure:

1. Set BAND selector switch (S1) to MW. Confirm that the receiving condition is no signal.
2. Adjust RT401 so that the collector voltage of Q605 is 4.0 – 5.0V.



MW IF ADJUSTMENT	
Adjust for a maximum reading on VOM ①.	
T401	450kHz

MW TRACKING ADJUSTMENT	
Adjust for a maximum reading on VOM ①.	
CT403	1,404kHz
L401	603kHz

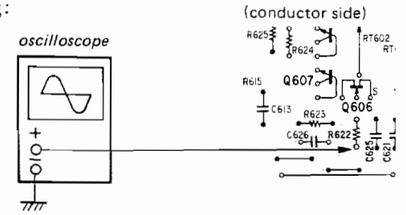
SW1 TRACKING ADJUSTMENT	
Adjust for a maximum reading on VOM ①.	
CT402	6.5MHz
L403	3.5MHz

SW2 TRACKING ADJUSTMENT	
Adjust for a maximum reading on VOM ①.	
CT401	20MHz
L405	10MHz

MW/SW SECTION 2

SW1/SW2 PLL Bias Adjustment

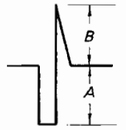
Setting:



Procedure:

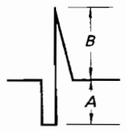
1. Connect the oscilloscope as shown below.
2. Set BAND selector switch (S1) to SW2.
3. Push TUNING (+, –) button for 9.5MHz.
4. Adjust RT602 so that the waveform is as shown below.

   A : B = 1 : 1
   A is more than 0.65V



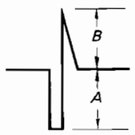
5. Push the button for 21.75MHz. Confirm that the waveform is locked as shown below.

   A : B = 0.46V : 0.84V
   (reference)



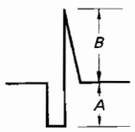
6. Set BAND selector switch (S1) to SW1. Confirm that the waveform is locked when the set is tuned to 3.2MHz.

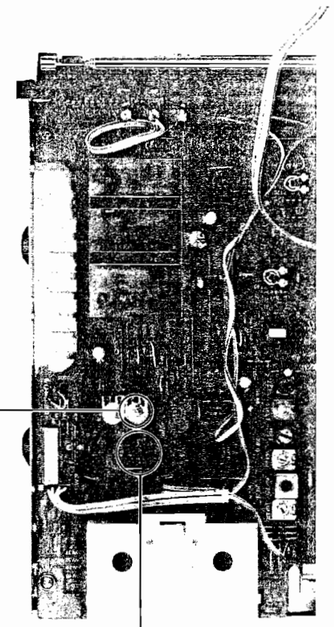
   A : B = 1 : 1
   A is more than 0.65V



7. Confirm that the waveform is locked when the set is tuned to 7.3MHz.

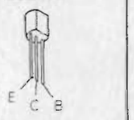
   A : B = 0.46V : 0.84V
   (reference)





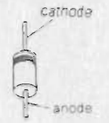
• Semiconductor Lead Layouts

2SC535
2SC1362-48
2SC1364
2SC2878



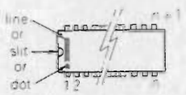
2SK30A-GR3
2SK246-GR

1S1555
10E2
EQA01-12R1
HZ6B1L
HZ12B1L

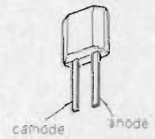


2SC710-14

LA1231
LA1245
LA3390

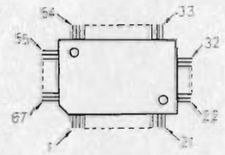


1SV101

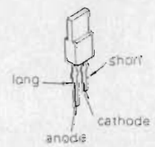


2SC2839

TC9300F-005A

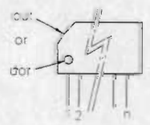


GL9NG24
GL9PR24

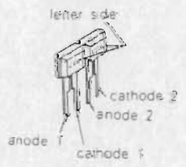


2SD880

TD6109P

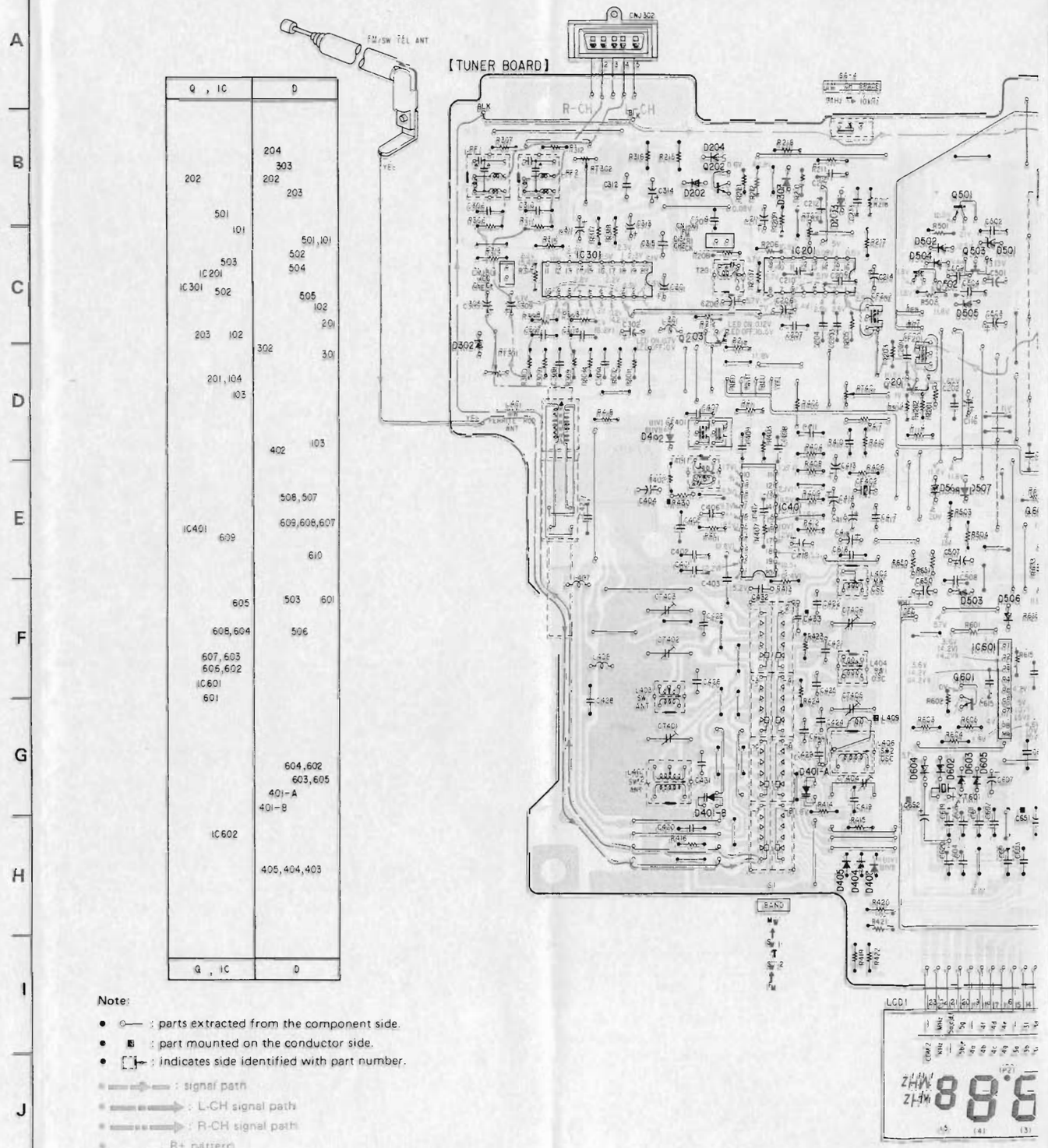


KV1236Z



2SK161

3-1. MOUNTING DIAGRAM
– Conductor Side –



Note:

- ○— : parts extracted from the component side.
- ■ : part mounted on the conductor side.
- [ ]— : indicates side identified with part number.
- ▬▬▶ : signal path
- ▬▬▶ : L-CH signal path
- ▬▬▶ : R-CH signal path
- B+ pattern

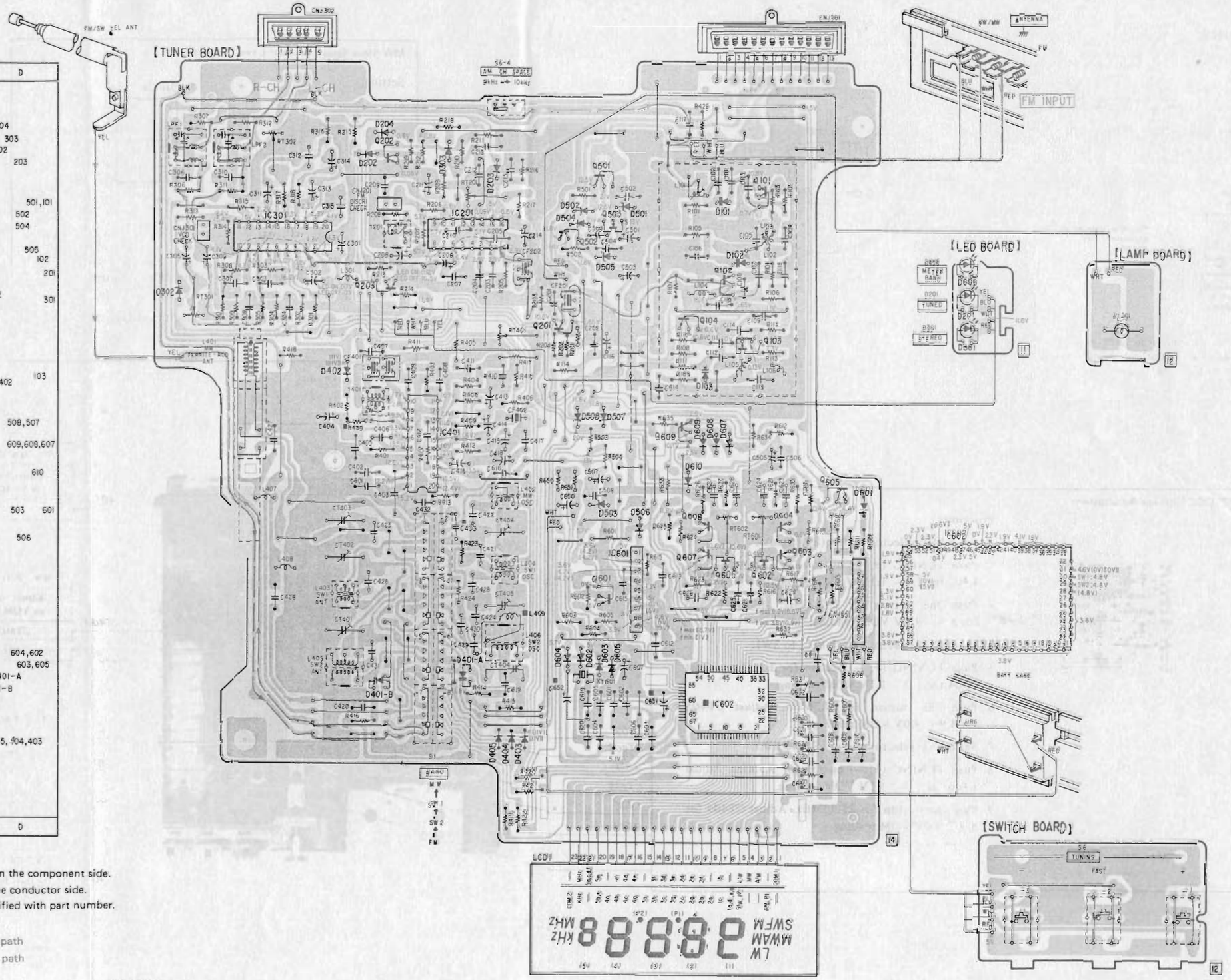
FH-7 MK II
ST-78 II

E Model

3-1. MOUNTING DIAGRAM

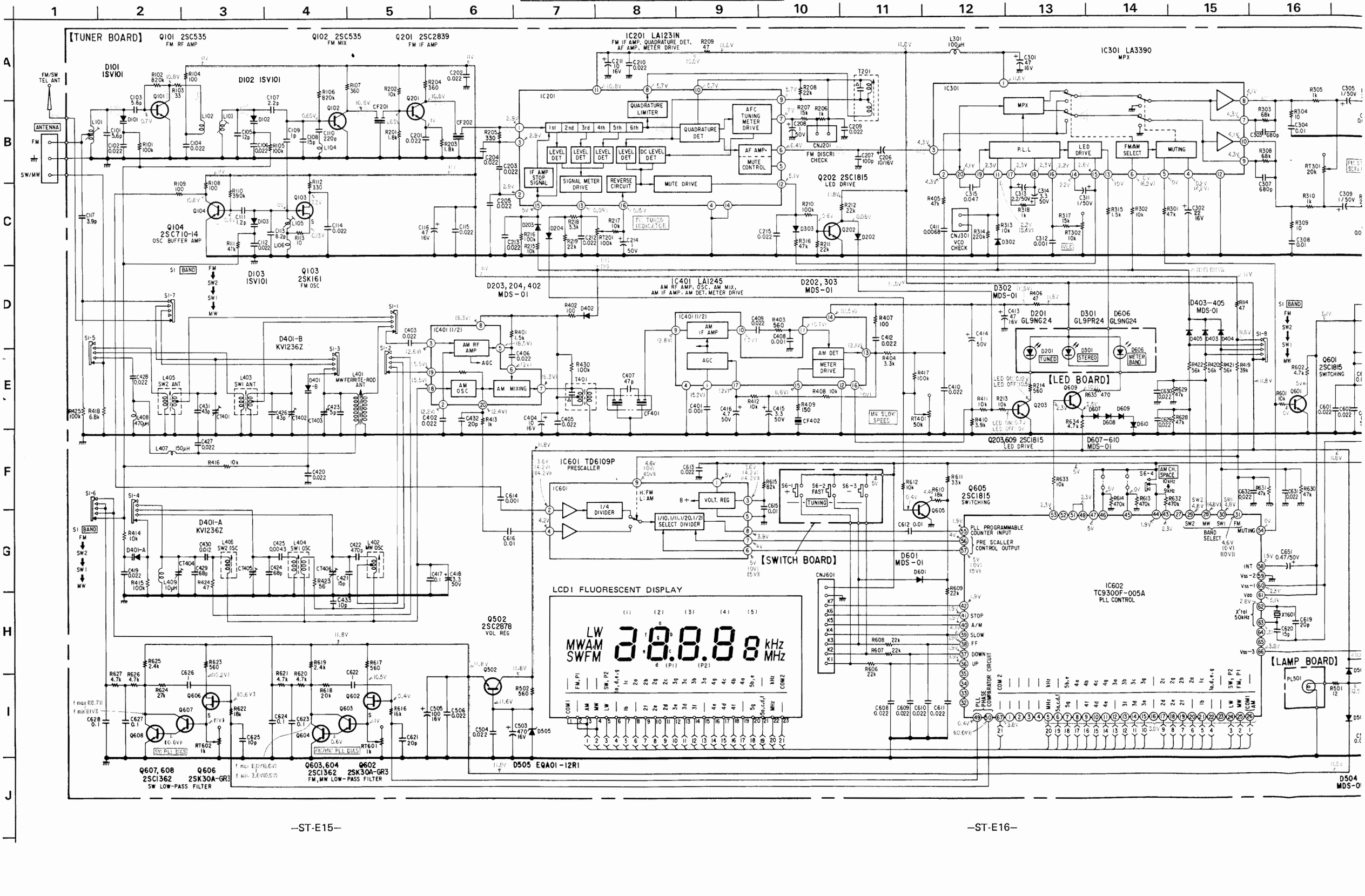
– Conductor Side –

Q , IC	D
	204
	303
202	202
	203
501	
101	501,101
	502
503	504
IC201	
IC301 502	505
	102
	201
203 102	
302	301
201,104	
103	
	103
402	
	508,507
IC401	609,608,607
609	
	610
605	503 601
608,604	506
607,503	
606,602	
IC601	
601	
	604,602
	603,605
	401-A
	401-B
IC602	
	405,404,403
Q , IC	D

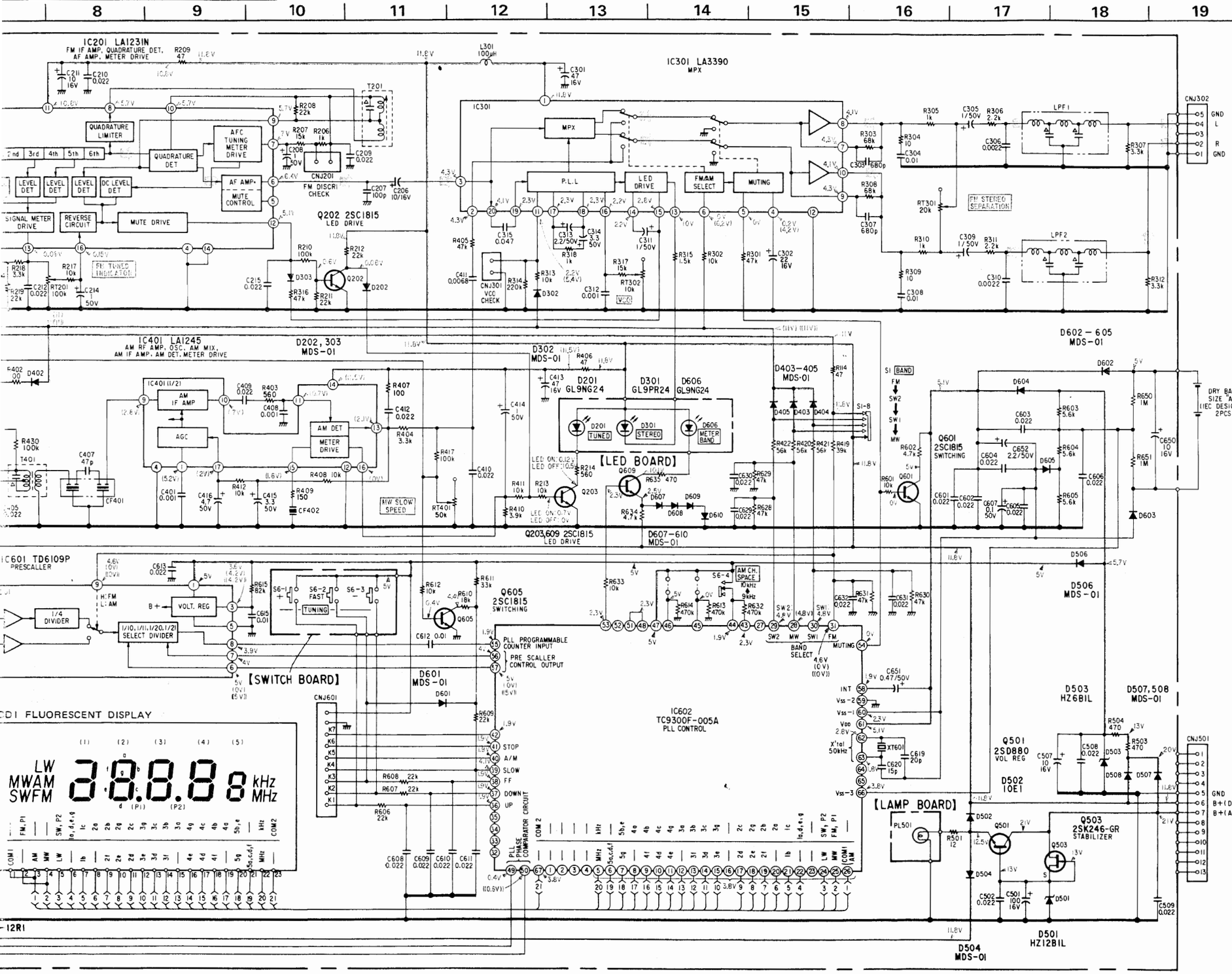


Note:

- ○— : parts extracted from the component side.
- ■ : part mounted on the conductor side.
- ⊏⊐ : indicates side identified with part number.
- ▬▶ : signal path
- ▬▶ : L-CH signal path
- ▬▶ : R-CH signal path
- ▬ : B+ pattern


【TUNER BOARD】
Q101 2SC535 FM RF AMP
Q102 2SC535 FM MIX
Q201 2SC2839 FM IF AMP
IC201 LA1231N FM IF AMP, QUADRATURE DET, AF AMP, METER DRIVE
IC301 LA3390 MPX
Q202 2SC1815 LED DRIVE
Q104 2SC710-14 OSC BUFFER AMP
Q103 2SK161 FM OSC
D101 1SV101
D102 1SV101
D103 1SV101
D203, 204, 402 MDS-01
D202, 303 MDS-01
IC401 LA1245 AM RF AMP, OSC, AM MIX, AM IF AMP, AM DET, METER DRIVE
D302 MDS-01
D201 GL9NG24
D301 GL9PR24
D606 GL9NG24
D403-405 MDS-01
【LED BOARD】
Q203,609 2SC1815 LED DRIVE
D607-610 MDS-01
D401-B KV1236Z
D401-A KV1236Z
IC601 TD6109P PRESCALER
【SWITCH BOARD】
Q605 2SC1815 SWITCHING
D601 MDS-01
LCD1 FLUORESCENT DISPLAY
IC602 TC9300F-005A PLL CONTROL
【LAMP BOARD】
Q502 2SC2878 VOL REG
Q607, 608 2SC1362 SW LOW-PASS FILTER
Q606 2SK30A-GR3
Q603, 604 2SC1362 FM, MW LOW-PASS FILTER
Q602 2SK30A-GR3
D505 EQA01-12R1
D504 MDS-01
Q601 2SC1815 SWITCHING
ANTENNA
FM
SW/MW
FM/SW TEL ANT
SW1 MW
SW2 FM
SW1 SW
SW2 MW
BAND
SW PLL BIAS
FM/MW PLL BIAS
AM RF AMP
AM OSC
AM MIXING
AM IF AMP
AM DET
METER DRIVE
AGC
QUADRATURE LIMITER
QUADRATURE DET
AFC TUNING METER DRIVE
AF AMP+ MUTE CONTROL
IF AMP STOP SIGNAL
SIGNAL METER DRIVE
REVERSE CIRCUIT
MUTE DRIVE
LEVEL DET
DC LEVEL DET
FM TUNED INDICATOR
FM DISCRI CHECK
VCO CHECK
MPX
P.L.L
LED DRIVE
FM/AM SELECT
MUTING
1/4 DIVIDER
VOLT. REG
1/10.1/11.1/20.1/21 SELECT DIVIDER
PRESCALER
TUNING
FAST
PLL PROGRAMMABLE COUNTER INPUT
PRE SCALER CONTROL OUTPUT
PLL PHASE COMPARATOR CIRCUIT
STOP
A/M
SLOW
FF
DOWN
UP
MW SLOW SPEED
LED ON: 0.7V
LED OFF: 0V
AM CH. SPACE 10kHz
9kHz
BAND SELECT
MUTING
X'tal 5.0kHz
LW
MWAM
SWFM
kHz
MHz

E Model
FH-7 MK II
ST-78 II

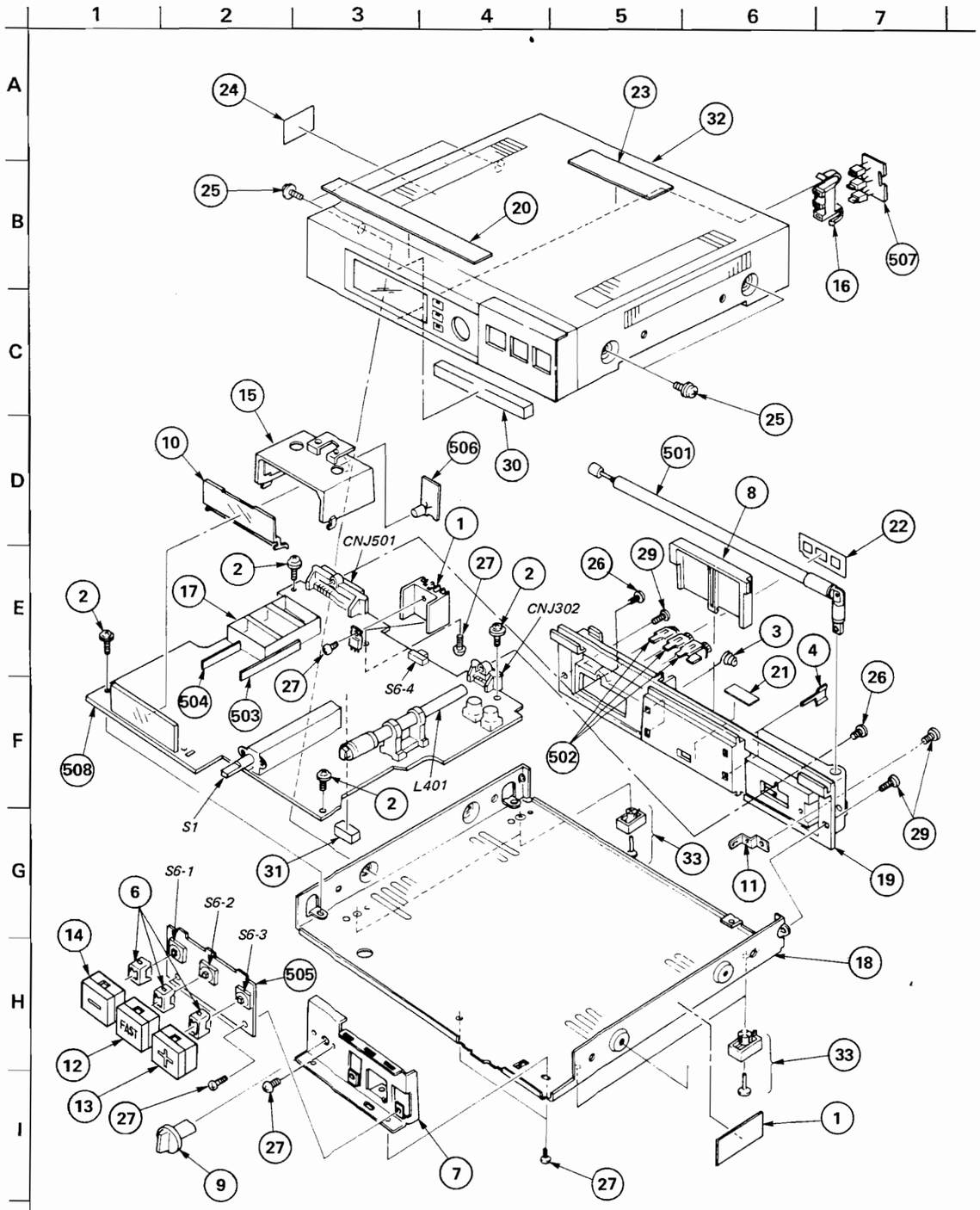


Note:

- All capacitors are in μF unless otherwise noted. pF : μμF 50WV or less are not indicated except for electrolytics and tantalums.
- All resistors are in ohms, ¼W unless otherwise noted. kΩ : 1000Ω, MΩ : 1000kΩ
- △ : internal component.
- ▭ : adjustment for repair.
- ——— : B+ bus.
- Voltages are dc with respect to ground unless otherwise noted.
- Readings are taken under detuned conditions.
  no mark : FM
  ( ) : MW
  (( )) : SW
- Voltage variations may be noted due to normal production tolerances.
- MELF components.
- ▒ : signal path

Note: Voltages are measured with a VOM (50kΩ/V).

SECTION 4
EXPLODED VIEW AND PARTS LIST



GENERAL SECTION

No.	Part No.	Description
1	3-701-030-00	LABEL, SERIAL NUMBER
2	3-701-589-00	SCREW, SELF-TAPPING
3	3-883-424-00	SPRING
4	3-883-428-00	PLATE, TERMINAL (POSITIVE)
5 ♦	4-863-132-00	HEAT SINK (SMALL)
6	4-881-725-00	RING (TACT), FLEXIBLE
7 ♦	4-884-844-00	CHASSIS, SUB
8	4-884-845-11	LID, BATTERY CASE
9	4-884-847-00	(RED,SILVER)...KNOB, ROTARY SWITCH, BAND
9	4-884-847-11	(BLACK).....KNOB, ROTARY SWITCH, BAND
10	4-884-848-00	ILLUMINATOR (ST)
11 ♦	4-902-935-01	TERMINAL BOARD
12	4-884-852-00	(RED,SILVER)...KNOB (16X16) (FAST), SQUARE
12	4-884-852-11	(BLACK).....KNOB (16X16) (FAST), SQUARE
13	4-884-853-00	(RED,SILVER)...KNOB (16X16) (+), SQUARE
13	4-884-853-11	(BLACK).....KNOB (+), SQUARE
14	4-884-854-00	(RED,SILVER)...KNOB (16X16) (-), SQUARE
14	4-884-854-11	(BLACK).....KNOB (-), SQUARE
15 ♦	4-884-856-00	HOUSE, LAMP
16	4-884-857-00	HOLDER, LED
17 ♦	4-884-858-00	PLATE, SHIELD
18 ♦	4-884-859-00	CHASSIS
19	4-884-860-21	PLATE, JACK
20	4-884-873-00	SEAL, INDICATION, METER BAND
21 ♦	4-866-752-00	LABEL (A), SWITCH
22	4-884-915-11	LABEL, ANTENNA
23	4-884-927-00	LABEL (SYSTEM), CAUTION
24	4-884-996-01	LABEL, MODEL NUMBER (E2/E3)
25	4-889-321-01	(RED,SILVER)...SCREW
25	4-889-321-11	(BLACK).....SCREW
26	7-685-647-11	SCREW +BVTP 3X10 TYPE2 N-S
27	7-685-871-01	SCREW +BVTT 3X6 (S)
28	.....	
29	7-685-872-01	SCREW +BVTT 3X8 (S)
30	9-911-815-02	CUSHION (B) (t=5)
31	9-911-843-XX	CUSHION, RUBBER (t=10)
32	X-4884-851-1	(RED).....PANEL ASSY
32	X-4884-851-2	(BLACK)....PANEL ASSY
32	X-4884-851-3	(SILVER)...PANEL ASSY
33	X-4884-801-0	FOOT ASSY, RUBBER

ELECTRICAL PARTS

Ref.No.	Part No.	Description			Ref.No.	P
501	1-501-270-00	ANTENNA, TELESCOPIC			C305	1
502	1-536-742-00	TERMINAL BOARD, ANTENNA			C306	1
503 ♦	1-560-242-11	BUS BAR 3P			C307	1
504 ♦	1-560-242-61	BUS BAR 2P			C308	1
505 ♦	1-608-559-00	PC BOARD, SWITCH			C309	1
506 ♦	1-608-560-00	PC BOARD, LAMP			C310	1
507 ♦	1-608-561-00	PC BOARD, LED			C311	1
508 ♦	A-4351-373-A	MOUNTED PCB, TUNER			C312	1
					C313	1
C101	1-161-290-00	CERAMIC	5.6PF	10% 50V		
C102	1-161-055-00	CERAMIC	0.022MF	10% 50V	C314	1
C103	1-161-276-00	CERAMIC	5.6PF	10% 50V	C315	1
					C401	1
C104	1-161-055-00	CERAMIC	0.022MF	10% 50V		
C105	1-102-749-00	CERAMIC	12PF	50V	C402	
C106	1-161-055-00	CERAMIC	0.022MF	10% 50V	C403	
					C404	
C107	1-102-406-00	CERAMIC	2PF	50V		
C108	1-102-851-00	CERAMIC	15PF	50V	C405	
C109	1-102-934-00	CERAMIC	1PF	50V	C406	
					C407	
C110	1-102-110-00	CERAMIC	220PF	10% 50V		
C111	1-102-934-00	CERAMIC	1.2PF	50V	C408	
C112	1-161-055-00	CERAMIC	0.022MF	10% 50V	C409	
					C410	
C113	1-161-300-00	CERAMIC	8.2PF	10% 50V		
C114	1-161-055-00	CERAMIC	0.022MF	10% 50V	C411	
C115	1-161-055-00	CERAMIC	0.022MF	10% 50V	C412	
					C413	
C116	1-123-332-00	ELECT	47MF	20% 25V		
C117	1-102-942-00	CERAMIC	5PF	50V	C414	
C201	1-161-055-00	CERAMIC	0.022MF	10% 50V	C415	
					C416	
C202	1-161-055-00	CERAMIC	0.022MF	10% 50V		
C203	1-161-055-00	CERAMIC	0.022MF	10% 50V	C417	
C204	1-161-055-00	CERAMIC	0.022MF	10% 50V	C418	
					C419	
C205	1-161-055-00	CERAMIC	0.022MF	10% 50V		
C206	1-123-356-00	ELECT	10MF	20% 50V	C420	
C207	1-102-973-00	CERAMIC	100PF	5% 50V	C421	
					C422	
C208	1-123-380-00	ELECT	1MF	20% 100V		
C209	1-161-055-00	CERAMIC	0.022MF	10% 50V	C423	
C210	1-161-055-00	CERAMIC	0.022MF	10% 50V	C424	
					C425	
C211	1-123-356-00	ELECT	10MF	20% 50V		
C212	1-161-055-00	CERAMIC	0.022MF	10% 50V	C426	
C213	1-161-055-00	CERAMIC	0.022MF	10% 50V	C427	
					C428	
C214	1-123-380-00	ELECT	1MF	20% 100V		
C215	1-161-055-00	CERAMIC	0.022MF	10% 50V	C429	
C301	1-123-332-00	ELECT	47MF	20% 25V	C430	
					C431	
C302	1-123-330-00	ELECT	22MF	20% 25V	C432	
C303	1-102-116-00	CERAMIC	680PF	10% 50V	C433	
C304	1-161-013-00	CERAMIC	0.01MF	10% 25V	C501	
					C502	

NOTE:
- The mechanical parts with no reference number in the exploded views are not supplied.
- Items marked " ♦ " are not stocked since they are seldom required for routine service. Some delay should be anticipated when ordering these items.
- Due to standardization, parts with part numbers (Δ-ΔΔΔ-ΔΔΔ-XX or Δ-ΔΔΔΔ-ΔΔΔ-X) may be different from those used in the set.
- If there are two or more same circuitsin a set such as a stereophonic machine, only typical circuit parts may be indicated and capacitors and resistors in other same circuits may be omitted.

CAPACITORS:
MF:μF, PF:μμF.

RESISTORS
- All resistors are in ohms.
- F : nonflammable

COILS
- MMH : mH, UH : μH

SEMICONDUCTORS
In each case, U : μ, for example:
UA···: μA···, UPA···: μPA···, UPC···: μPC,
UPD···: μPD···

NOTI
- T n s
- I t s p
- D n m s
- I s t c c

ELECTRICAL PARTS

Ref.No.	Part No.	Description			
C305	1-123-380-00	ELECT	1MF	20%	100V
C306	1-161-043-00	CERAMIC	0.0022MF	10%	50V
C307	1-102-116-00	CERAMIC	680PF	10%	50V
C308	1-161-013-00	CERAMIC	0.01MF	10%	25V
C309	1-123-380-00	ELECT	1MF	20%	100V
C310	1-161-043-00	CERAMIC	0.0022MF	10%	50V
C311	1-123-380-00	ELECT	1MF	20%	100V
C312	1-104-077-00	POLYSTYRENE	0.001MF	5%	50V
C313	1-123-381-00	ELECT	2.2MF	20%	100V
C314	1-123-382-00	ELECT	3.3MF	20%	100V
C315	1-108-595-00	MYLAR	0.047MF	5%	50V
C401	1-102-074-00	CERAMIC	0.001MF	10%	50V
C402	1-161-055-00	CERAMIC	0.022MF	10%	50V
C403	1-161-055-00	CERAMIC	0.022MF	10%	50V
C404	1-123-356-00	ELECT	10MF	20%	50V
C405	1-161-055-00	CERAMIC	0.022MF	10%	50V
C406	1-101-005-00	CERAMIC	0.022MF		50V
C407	1-101-880-00	CERAMIC	47PF	5%	50V
C408	1-102-074-00	CERAMIC	0.001MF	10%	50V
C409	1-161-055-00	CERAMIC	0.022MF	10%	50V
C410	1-161-055-00	CERAMIC	0.022MF	10%	50V
C411	1-161-049-00	CERAMIC	0.0068MF	10%	50V
C412	1-161-055-00	CERAMIC	0.022MF	10%	50V
C413	1-123-332-00	ELECT	47MF	20%	25V
C414	1-123-380-00	ELECT	1MF	20%	100V
C415	1-123-382-00	ELECT	3.3MF	20%	100V
C416	1-123-369-00	ELECT	4.7MF	20%	63V
C417	1-161-025-00	CERAMIC	0.1MF	10%	25V
C418	1-123-382-00	ELECT	3.3MF	20%	100V
C419	1-161-055-00	CERAMIC	0.022MF	10%	50V
C420	1-161-055-00	CERAMIC	0.022MF	10%	50V
C421	1-102-880-00	CERAMIC	15PF	5%	50V
C422	1-104-069-00	POLYSTYRENE	470PF	5%	50V
C423	1-101-997-00	CERAMIC	5PF		50V
C424	1-102-676-00	CERAMIC	68PF	5%	50V
C425	1-104-092-00	POLYSTYRENE	0.0043MF	5%	50V
C426	1-102-674-00	CERAMIC	43PF	5%	50V
C427	1-161-055-00	CERAMIC	0.022MF	10%	50V
C428	1-161-055-00	CERAMIC	0.022MF	10%	50V
C429	1-102-860-00	CERAMIC	68PF	5%	50V
C430	1-108-581-00	MYLAR	0.012MF	5%	50V
C431	1-102-727-00	CERAMIC	43PF	5%	50V
C432	1-102-958-00	CERAMIC	20PF	5%	50V
C433	1-102-947-00	CERAMIC	10PF	5%	50V
C501	1-123-333-00	ELECT	100MF	20%	25V
C502	1-161-055-00	CERAMIC	0.022MF	10%	50V

ELECTRICAL PARTS

Ref.No.	Part No.	Description			
C503 *	1-123-323-00	ELECT	470MF	20%	16V
C504	1-161-055-00	CERAMIC	0.022MF	10%	50V
C505	1-123-333-00	ELECT	100MF	20%	25V
C506	1-161-055-00	CERAMIC	0.022MF	10%	50V
C507	1-123-356-00	ELECT	10MF	20%	50V
C508	1-161-055-00	CERAMIC	0.022MF	10%	50V
C509	1-101-005-00	CERAMIC	0.022MF		50V
C601	1-161-055-00	CERAMIC	0.022MF	10%	50V
C602	1-161-055-00	CERAMIC	0.022MF	10%	50V
C603	1-161-055-00	CERAMIC	0.022MF	10%	50V
C604	1-161-055-00	CERAMIC	0.022MF	10%	50V
C605	1-161-055-00	CERAMIC	0.022MF	10%	50V
C606	1-161-055-00	CERAMIC	0.022MF	10%	50V
C607	1-123-607-00	ELECT	0.1MF	20%	50V
C608	1-161-055-00	CERAMIC	0.022MF	10%	50V
C609	1-161-055-00	CERAMIC	0.022MF	10%	50V
C610	1-161-055-00	CERAMIC	0.022MF	10%	50V
C611	1-161-055-00	CERAMIC	0.022MF	10%	50V
C612	1-161-013-00	CERAMIC	0.01MF	10%	25V
C613	1-161-055-00	CERAMIC	0.022MF	10%	50V
C614	1-102-074-00	CERAMIC	0.001MF	10%	50V
C615	1-161-013-00	CERAMIC	0.01MF	10%	25V
C616	1-161-013-00	CERAMIC	0.01MF	10%	25V
C619	1-161-351-00	CERAMIC	20PF	5%	50V
C620	1-102-851-00	CERAMIC	15PF		50V
C621	1-161-351-00	CERAMIC	20PF	5%	50V
C622	1-130-644-00	FILM	1MF	5%	50V
C623	1-130-632-00	FILM	0.1MF	5%	50V
C624	1-130-632-00	FILM	0.1MF	5%	50V
C625	1-161-279-00	CERAMIC	10PF	5%	50V
C626	1-130-644-00	FILM	1MF	5%	50V
C627	1-130-632-00	FILM	0.1MF	5%	50V
C628	1-130-632-00	FILM	0.1MF	5%	50V
C629	1-161-055-00	CERAMIC	0.022MF	10%	50V
C630	1-161-055-00	CERAMIC	0.022MF	10%	50V
C631	1-161-055-00	CERAMIC	0.022MF	10%	50V
C632	1-161-055-00	CERAMIC	0.022MF	10%	50V
C650	1-123-356-00	ELECT	10MF	20%	50V
C651	1-123-610-00	ELECT	0.47MF	20%	50V
C652	1-123-381-00	ELECT	2.2MF	20%	100V
CF201	1-527-968-00	FILTER, CERAMIC			
CF202	1-527-968-00	FILTER, CERAMIC			
CF401	1-527-937-00	FILTER, CERAMIC			
CF402	1-527-981-00	FILTER, CERAMIC			

NOTE:
- The mechanical parts with no reference number in the exploded views are not supplied.
- Items marked " ♦ " are not stocked since they are seldom required for routine service. Some delay should be anticipated when ordering these items.
- Due to standardization, parts with part numbers (Δ-ΔΔΔ-ΔΔΔ-XX or Δ-ΔΔΔΔ-ΔΔΔ-X) may be different from those used in the set.
- If there are two or more same circuitsin a set such as a stereophonic machine, only typical circuit parts may be indicated and capacitors and resistors in other same circuits may be omitted.

CAPACITORS:
MF:μF, PF:μμF.

RESISTORS
- All resistors are in ohms.
- F : nonflammable

COILS
- MMH : mH, UH : μH

SEMICONDUCTORS
In each case, U : μ, for example:
UA···: μA···, UPA···: μPA···, UPC···: μPC,
UPD···: μPD···

ELECTRICAL PARTS

Ref.No.	Part No.	Description
♦CNJ201	1-560-060-00	PIN, CONNECTOR 2P
♦CNJ301	1-560-060-00	PIN, CONNECTOR 2P
CNJ302	1-562-067-00	SOCKET, CONNECTOR 5P
CNJ501	1-562-068-00	SOCKET, CONNECTOR 13P
♦CNJ601	1-560-339-00	PIN, CONNECTOR 9P
CT401	1-141-181-11	CAP, TRIMMER
CT402	1-141-181-11	CAP, TRIMMER
CT403	1-141-180-00	CAP, TRIMMER 15P
CT404	1-141-181-11	CAP, TRIMMER
CT405	1-141-181-11	CAP, TRIMMER
CT406	1-141-180-00	CAP, TRIMMER 15P
D101	8-719-800-09	DIODE 1SV101
D102	8-719-800-09	DIODE 1SV101
D103	8-719-800-09	DIODE 1SV101
D201	8-719-903-07	DIODE GL9NG24
D202	8-719-815-55	DIODE 1S1555
D203	8-719-815-55	DIODE 1S1555
D204	8-719-815-55	DIODE 1S1555
D301	8-719-903-11	DIODE GL9PR24
D302	8-719-815-55	DIODE 1S1555
D303	8-719-815-55	DIODE 1S1555
D401	8-719-902-79	DIODE KV1236Z
D402	8-719-815-55	DIODE 1S1555
D403	8-719-815-55	DIODE 1S1555
D404	8-719-815-55	DIODE 1S1555
D405	8-719-815-55	DIODE 1S1555
D501	8-719-910-24	DIODE HZ12B1L
D502	8-719-200-02	DIODE 10E2
D503	8-719-910-64	DIODE HZ6B1L
D504	8-719-815-55	DIODE 1S1555
D505	8-719-991-21	DIODE EQA01-12R1
D506	8-719-815-55	DIODE 1S1555
D507	8-719-815-55	DIODE 1S1555
D508	8-719-815-55	DIODE 1S1555
D601	8-719-815-55	DIODE 1S1555
D602	8-719-815-55	DIODE 1S1555
D603	8-719-815-55	DIODE 1S1555
D604	8-719-815-55	DIODE 1S1555
D605	8-719-815-55	DIODE 1S1555
D606	8-719-903-07	DIODE GL9NG24
D607	8-719-815-55	DIODE 1S1555
D608	8-719-815-55	DIODE 1S1555
D609	8-719-815-55	DIODE 1S1555
D610	8-719-815-55	DIODE 1S1555

ELECTRICAL PARTS

Ref.No.	Part No.	Description
IC201	8-759-812-31	IC LA1231
IC301	8-759-833-90	IC LA3390
IC401	8-759-812-45	IC LA1245
IC601	8-759-201-03	IC TD6109P
IC602	8-759-202-43	IC TC9300F-005A
L101	♦;1-422-093-00	COIL, AIR-CORE
L102	♦;1-422-094-00	COIL, AIR-CORE
L103	♦;1-422-096-00	COIL, AIR-CORE
L104	♦;1-422-039-00	COIL, AIR-CORE
L105	♦;1-422-098-00	COIL, AIR-CORE
L106	♦;1-422-099-00	COIL, AIR-CORE
L301	1-408-421-00	MICRO INDUCTOR 100UH
L401	1-402-001-00	ANTENNA, FERRITE-ROD (MW)
L402	1-406-033-00	COIL (OSC)
L403	1-401-998-00	COIL (ANT)
L404	1-406-088-11	COIL (OSC)
L405	1-401-999-00	COIL (ANT)
L406	1-406-036-00	COIL (OSC)
L407	1-408-423-00	MICRO INDUCTOR 150UH
L408	1-408-429-00	MICRO INDUCTOR 470UH
L409	1-408-409-00	MICRO INDUCTOR 10UH
LCD1	1-806-544-00	DISPLAY PANEL, LIQUID CRYSTAL
LPF1	1-235-164-00	FILTER, LOW PASS
LPF2	1-235-164-00	FILTER, LOW PASS
PL501	1-518-511-00	(SILVER).....LAMP, PILOT
PL501	1-518-511-21	(RED,BLACK)...LAMP, PILOT
Q101	8-729-353-52	TRANSISTOR 2SC535
Q102	8-729-353-52	TRANSISTOR 2SC535
Q103	8-729-216-13	TRANSISTOR 2SK161
Q104	8-729-671-14	TRANSISTOR 2SC710-14
Q201	8-729-883-92	TRANSISTOR 2SC2839
Q202	8-729-663-47	TRANSISTOR 2SC1364
Q203	8-729-663-47	TRANSISTOR 2SC1364
Q501	8-729-288-02	TRANSISTOR 2SD880
Q502	8-729-201-04	TRANSISTOR 2SC2878
Q503	8-729-224-62	TRANSISTOR 2SK246-GR
Q601	8-729-663-47	TRANSISTOR 2SC1364
Q602	8-729-203-05	TRANSISTOR 2SK30A-GR3
Q603	8-729-664-48	TRANSISTOR 2SC1362-48
Q604	8-729-664-48	TRANSISTOR 2SC1362-48
Q605	8-729-663-47	TRANSISTOR 2SC1364
Q606	8-729-203-05	TRANSISTOR 2SK30A-GR3
Q607	8-729-664-48	TRANSISTOR 2SC1362-48
Q608	8-729-664-48	TRANSISTOR 2SC1362-48
Q609	8-729-663-47	TRANSISTOR 2SC1364

NOTE:
- The mechanical parts with no reference number in the exploded views are not supplied.
- Items marked " ♦ " are not stocked since they are seldom required for routine service. Some delay should be anticipated when ordering these items.
- Due to standardization, parts with part numbers (Δ-ΔΔΔ-ΔΔΔ-XX or Δ-ΔΔΔΔ-ΔΔΔ-X) may be different from those used in the set.
- If there are two or more same circuitsin a set such as a stereophonic machine, only typical circuit parts may be indicated and capacitors and resistors in other same circuits may be omitted.

CAPACITORS:
MF:μF, PF:μμF.

RESISTORS
- All resistors are in ohms.
- F : nonflammable

COILS
- MMH : mH, UH : μH

SEMICONDUCTORS
In each case, U : μ, for example:
UA···: μA···, UPA···: μPA···, UPC···: μPC,
UPD···: μPD···

ELECTRICAL PARTS

Ref.No.	Part No.	Description			
R101	1-247-179-00	CARBON	100K	5%	1/4W
R102	1-246-543-00	CARBON	820K	5%	1/4W
R103	1-247-095-00	CARBON	33	5%	1/4W
R104	1-247-107-00	CARBON	100	5%	1/4W
R105	1-247-179-00	CARBON	100K	5%	1/4W
R106	1-246-543-00	CARBON	820K	5%	1/4W
R107	1-247-120-00	CARBON	360	5%	1/4W
R108	1-247-107-00	CARBON	100	5%	1/4W
R109	1-247-107-00	CARBON	100	5%	1/4W
R110	1-246-535-00	CARBON	390K	5%	1/4W
R111	1-247-171-00	CARBON	47K	5%	1/4W
R112	1-247-119-00	CARBON	330	5%	1/4W
R113	1-247-083-00	CARBON	10	5%	1/4W
R114	1-247-099-00	CARBON	47	5%	1/4W
R201	1-247-137-00	CARBON	1.8K	5%	1/4W
R202	1-247-155-00	CARBON	10K	5%	1/4W
R203	1-247-137-00	CARBON	1.8K	5%	1/4W
R204	1-247-120-00	CARBON	360	5%	1/4W
R205	1-247-119-00	CARBON	330	5%	1/4W
R206	1-247-131-00	CARBON	1K	5%	1/4W
R207	1-247-159-00	CARBON	15K	5%	1/4W
R208	1-247-163-00	CARBON	22K	5%	1/4W
R209	1-247-099-00	CARBON	47	5%	1/4W
R210	1-247-179-00	CARBON	100K	5%	1/4W
R211	1-247-163-00	CARBON	22K	5%	1/4W
R212	1-247-163-00	CARBON	22K	5%	1/4W
R213	1-247-155-00	CARBON	10K	5%	1/4W
R214	1-247-125-00	CARBON	560	5%	1/4W
R215	1-247-155-00	CARBON	10K	5%	1/4W
R216	1-247-179-00	CARBON	100K	5%	1/4W
R217	1-247-155-00	CARBON	10K	5%	1/4W
R218	1-247-143-00	CARBON	3.3K	5%	1/4W
R219	1-247-163-00	CARBON	22K	5%	1/4W
R301	1-247-171-00	CARBON	47K	5%	1/4W
R302	1-247-155-00	CARBON	10K	5%	1/4W
R303	1-247-175-00	CARBON	68K	5%	1/4W
R304	1-247-083-00	CARBON	10	5%	1/4W
R305	1-247-131-00	CARBON	1K	5%	1/4W
R306	1-247-139-00	CARBON	2.2K	5%	1/4W
R307	1-247-143-00	CARBON	3.3K	5%	1/4W
R308	1-247-175-00	CARBON	68K	5%	1/4W
R309	1-247-083-00	CARBON	10	5%	1/4W
R310	1-247-131-00	CARBON	1K	5%	1/4W
R311	1-247-139-00	CARBON	2.2K	5%	1/4W
R312	1-247-143-00	CARBON	3.3K	5%	1/4W

ELECTRICAL PARTS

Ref.No.	Part No.	Description			
R313	1-247-155-00	CARBON	10K	5%	1/4W
R314	1-246-529-00	CARBON	220K	5%	1/4W
R315	1-247-135-00	CARBON	1.5K	5%	1/4W
R316	1-247-171-00	CARBON	47K	5%	1/4W
R317	1-247-159-00	CARBON	15K	5%	1/4W
R318	1-247-131-00	CARBON	1K	5%	1/4W
R401	1-247-135-00	CARBON	1.5K	5%	1/4W
R402	1-247-107-00	CARBON	100	5%	1/4W
R403	1-247-125-00	CARBON	560	5%	1/4W
R404	1-247-143-00	CARBON	3.3K	5%	1/4W
R405	1-247-171-00	CARBON	47K	5%	1/4W
R406	1-247-099-00	CARBON	47	5%	1/4W
R407	1-247-107-00	CARBON	100	5%	1/4W
R408	1-247-155-00	CARBON	10K	5%	1/4W
R409	1-247-111-00	CARBON	150	5%	1/4W
R410	1-247-145-00	CARBON	3.9K	5%	1/4W
R411	1-247-155-00	CARBON	10K	5%	1/4W
R412	1-247-155-00	CARBON	10K	5%	1/4W
R413	1-247-131-00	CARBON	1K	5%	1/4W
R414	1-247-155-00	CARBON	10K	5%	1/4W
R415	1-247-179-00	CARBON	100K	5%	1/4W
R416	1-247-155-00	CARBON	10K	5%	1/4W
R417	1-247-179-00	CARBON	100K	5%	1/4W
R418	1-247-151-00	CARBON	6.8K	5%	1/4W
R419	1-247-169-00	CARBON	39K	5%	1/4W
R420	1-247-173-00	CARBON	56K	5%	1/4W
R421	1-247-173-00	CARBON	56K	5%	1/4W
R422	1-247-173-00	CARBON	56K	5%	1/4W
R423	1-247-101-00	CARBON	56	5%	1/4W
R424	1-247-099-00	CARBON	47	5%	1/4W
R425	1-247-179-00	CARBON	100K	5%	1/4W
R430	1-247-179-00	CARBON	100K	5%	1/4W
R501	1-247-157-00	CARBON	12	5%	1/4W
R502	1-247-125-00	CARBON	560	5%	1/4W
R503	1-247-123-00	CARBON	470	5%	1/4W
R504	1-247-123-00	CARBON	470	5%	1/4W
R601	1-247-155-00	CARBON	10K	5%	1/4W
R602	1-247-147-00	CARBON	4.7K	5%	1/4W
R603	1-247-149-00	CARBON	5.6K	5%	1/4W
R604	1-247-149-00	CARBON	5.6K	5%	1/4W
R605	1-247-149-00	CARBON	5.6K	5%	1/4W
R606	1-247-163-00	CARBON	22K	5%	1/4W
R607	1-247-163-00	CARBON	22K	5%	1/4W
R608	1-247-163-00	CARBON	22K	5%	1/4W
R609	1-247-163-00	CARBON	22K	5%	1/4W

NOTE:
- The mechanical parts with no reference number in the exploded views are not supplied.
- Items marked " ♦ " are not stocked since they are seldom required for routine service. Some delay should be anticipated when ordering these items.
- Due to standardization, parts with part numbers (Δ-ΔΔΔ-ΔΔΔ-XX or Δ-ΔΔΔΔ-ΔΔΔ-X) may be different from those used in the set.
- If there are two or more same circuitsin a set such as a stereophonic machine, only typical circuit parts may be indicated and capacitors and resistors in other same circuits may be omitted.

CAPACITORS:
MF:μF, PF:μμF.

RESISTORS
- All resistors are in ohms.
- F : nonflammable

COILS
- MMH : mH, UH : μH

SEMICONDUCTORS
In each case, U : μ, for example:
UA···: μA···, UPA···: μPA···, UPC···: μPC,
UPD···: μPD···

ELECTRICAL PARTS

Ref.No.	Part No.	Description			
R610	1-247-161-00	CARBON	18K	5%	1/4W
R611	1-247-167-00	CARBON	33K	5%	1/4W
R612	1-247-155-00	CARBON	10K	5%	1/4W
R613	1-246-537-00	CARBON	470K	5%	1/4W
R614	1-246-537-00	CARBON	470K	5%	1/4W
R615	1-247-177-00	CARBON	82K	5%	1/4W
R616	1-247-160-00	CARBON	16K	5%	1/4W
R617	1-247-125-00	CARBON	560	5%	1/4W
R618	1-247-162-00	CARBON	20K	5%	1/4W
R619	1-247-140-00	CARBON	2.4K	5%	1/4W
R620	1-247-147-00	CARBON	4.7K	5%	1/4W
R621	1-247-147-00	CARBON	4.7K	5%	1/4W
R622	1-247-161-00	CARBON	18K	5%	1/4W
R623	1-247-125-00	CARBON	560	5%	1/4W
R624	1-247-165-00	CARBON	27K	5%	1/4W
R625	1-247-140-00	CARBON	2.4K	5%	1/4W
R626	1-247-147-00	CARBON	4.7K	5%	1/4W
R627	1-247-147-00	CARBON	4.7K	5%	1/4W
R628	1-247-171-00	CARBON	47K	5%	1/4W
R629	1-247-171-00	CARBON	47K	5%	1/4W
R630	1-247-171-00	CARBON	47K	5%	1/4W
R631	1-247-171-00	CARBON	47K	5%	1/4W
R632	1-246-537-00	CARBON	470K	5%	1/4W
R633	1-247-155-00	CARBON	10K	5%	1/4W
R634	1-247-147-00	CARBON	4.7K	5%	1/4W
R635	1-247-123-00	CARBON	470	5%	1/4W
R650	1-246-545-00	CARBON	1M	5%	1/4W
R651	1-246-545-00	CARBON	1M	5%	1/4W
RT201	1-226-239-00	RES, ADJ, CARBON 100K			
RT301	1-226-237-00	RES, ADJ, CARBON 20K			
RT302	1-228-505-00	RES, ADJ, METAL GLAZE 10K			
RT401	1-226-238-00	RES, ADJ, CARBON 50K			
RT601	1-226-663-00	RES, ADJ, METAL GLAZE 1K			
RT602	1-226-663-00	RES, ADJ, METAL GLAZE 1K			
S1	1-554-267-00	SWITCH, ROTARY SLIDE (BAND)			
S6-1	1-552-412-00	SWITCH, KEY BOARD (+)			
S6-2	1-552-412-00	SWITCH, KEY BOARD (FAST)			
S6-3	1-552-412-00	SWITCH, KEY BOARD (-)			
S6-4	1-553-510-00	SWITCH, SLIDE (9KHz/10KHz SELECT)			
T201	1-404-419-00	COIL, DISCRIMINATOR			
T401	1-404-413-00	TRANSFORMER, IF			
XT601	1-527-995-00	VIBRATOR, CRYSTAL			

NOTE:

- The mechanical parts with no reference number in the exploded views are not supplied.
- Items marked " ♦ " are not stocked since they are seldom required for routine service. Some delay should be anticipated when ordering these items.
- Due to standardization, parts with part numbers (Δ-ΔΔΔ-ΔΔΔ-XX or Δ-ΔΔΔΔ-ΔΔΔ-X) may be different from those used in the set.
- If there are two or more same circuitsin a set such as a stereophonic machine, only typical circuit parts may be indicated and capacitors and resistors in other same circuits may be omitted.

CAPACITORS:

MF:μF, PF:μμF.

RESISTORS

- All resistors are in ohms.
- F : nonflammable

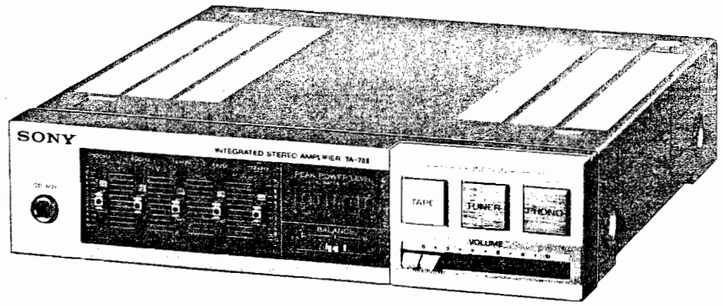
COILS

- MMH : mH, UH : μH

SEMICONDUCTORS

In each case, U : μ, for example:
UA···: μA···, UPA···: μPA···, UPC···: μPC,
UPD···: μPD···

INTEGRATED STEREO AMPLIFIER
(TA-78II)



Note: TA-78II is an integrated stereo amplifier in FH-7MKII.

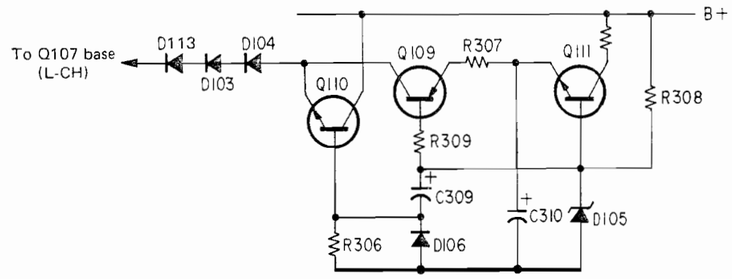
1. CIRCUIT DESCRIPTION

MUTING CIRCUIT

Q107 is a muting transistor.
It mutes output when the power switch is turned on and off or power voltage is much decreased.
When the power switch is ON:
Current flows on R308, C309 and R306, when the power switch is turned on.
Q110 is on until C309 finishes charging.
Q107 mutes output while Q110 is on.
When the power switch is off.
When Q109 base voltage is 0.6V lower than that of the emitter, Q109 is on.
Voltage charged to C310 is discharged through R307.
Then, Q107 turns on.

Power voltage fluctuation.

D105 is an 11V zener diode. Therefore, Q111 base voltage is 11V.
At this time, Q111 emitter voltage is 10.4V.
When power voltage decreases, and Q109 base voltage becomes 0.6V lower than that of the emitter, Q109 turns on.
Then Q107 mutes output.
When power voltage increased a little, Q110 turns ON.
Then Q107 turns ON and mutes output.



Graphic EQ circuit

Fig. 1 shows a part of graphic EQ circuit redrawn for easy comprehension.
Graphic EQ circuit consists of C1, 2, R1, 2, Q1.
The output level of frequency band decreases when S1 is set to side ① , because certain frequency band of output signal passes through EQ circuit to the ground.
The output level of frequency band increases when S1 is set to side ② , because NF circuit is connected to the EQ circuit causing certain frequency band to pass through the EQ circuit to the ground.
The frequency band of this EQ circuit can be changed by changing the value of a capacitor.

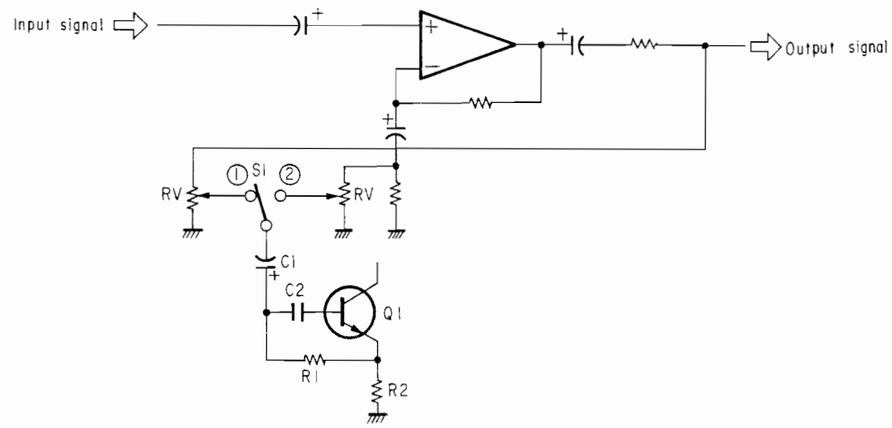
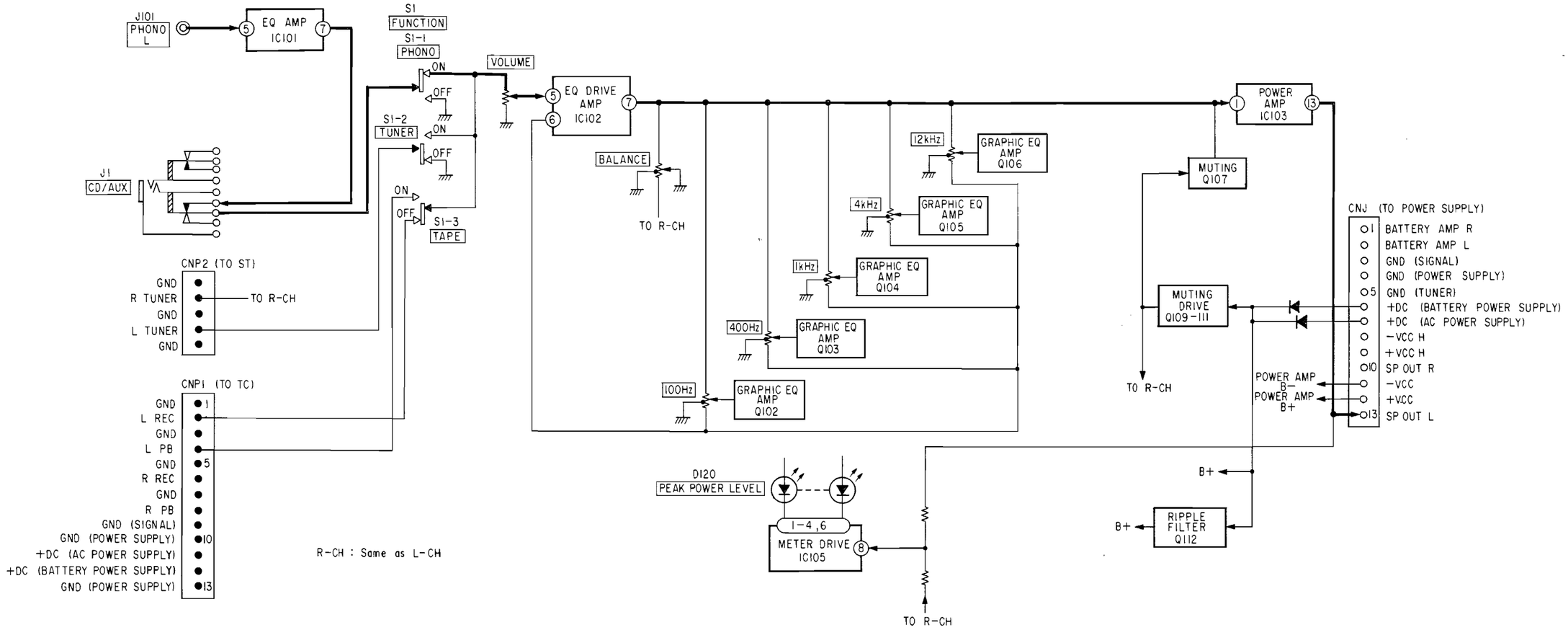


Fig. 1

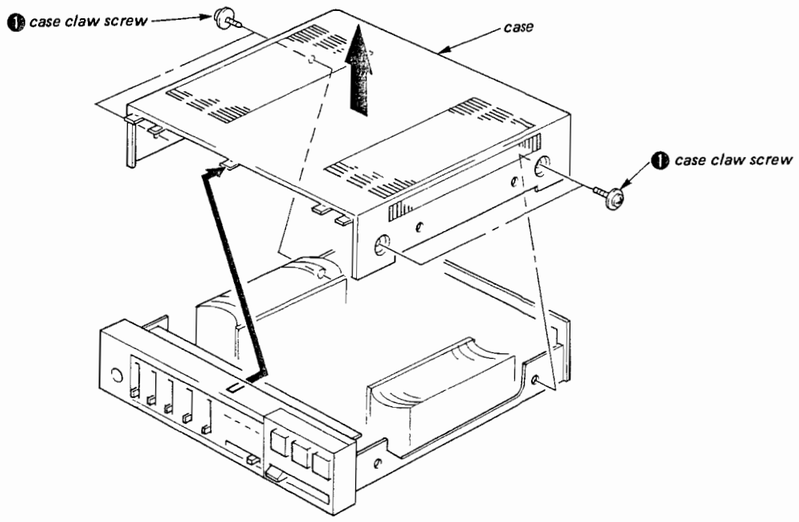
2. BLOCK DIAGRAM



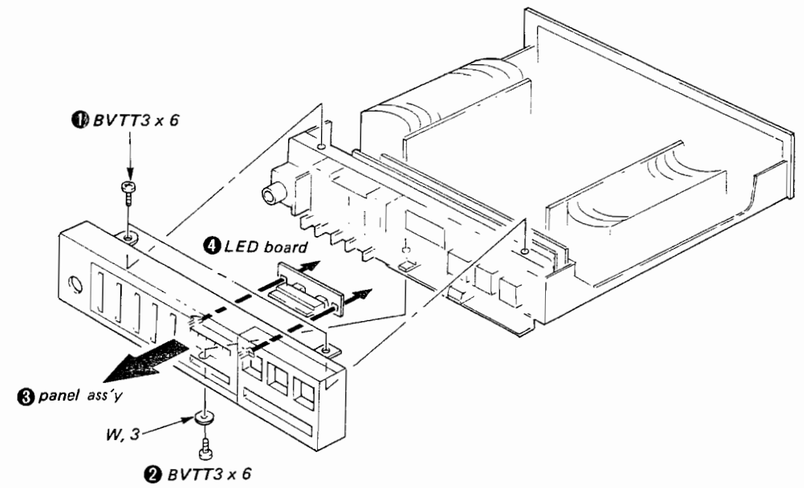
3. DISASSEMBLY

Note: Follow the disassembly procedure in the numerical order given.

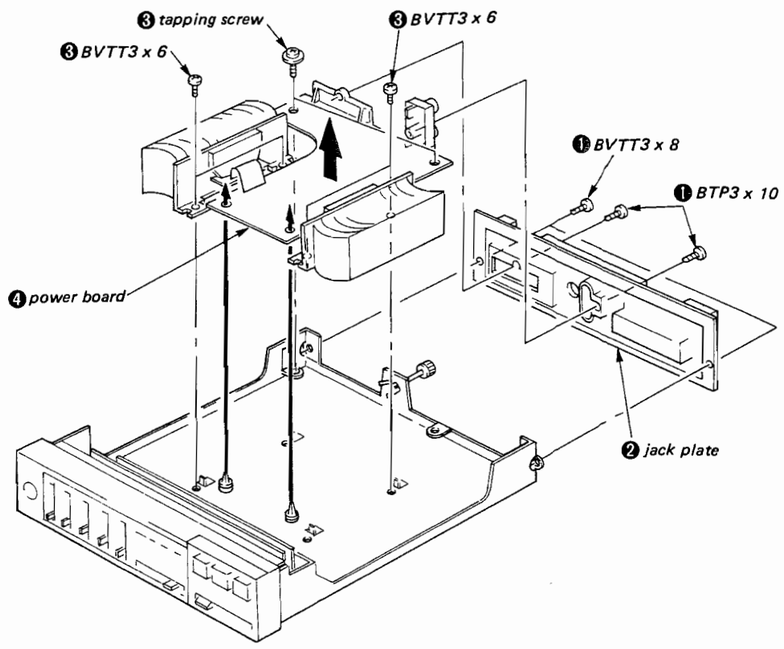
CASE



PANEL ASSEMBLY

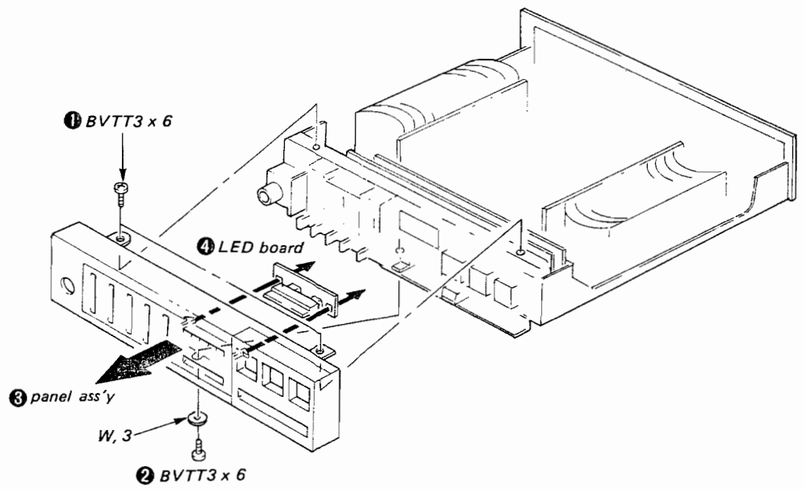


POWER BOARD

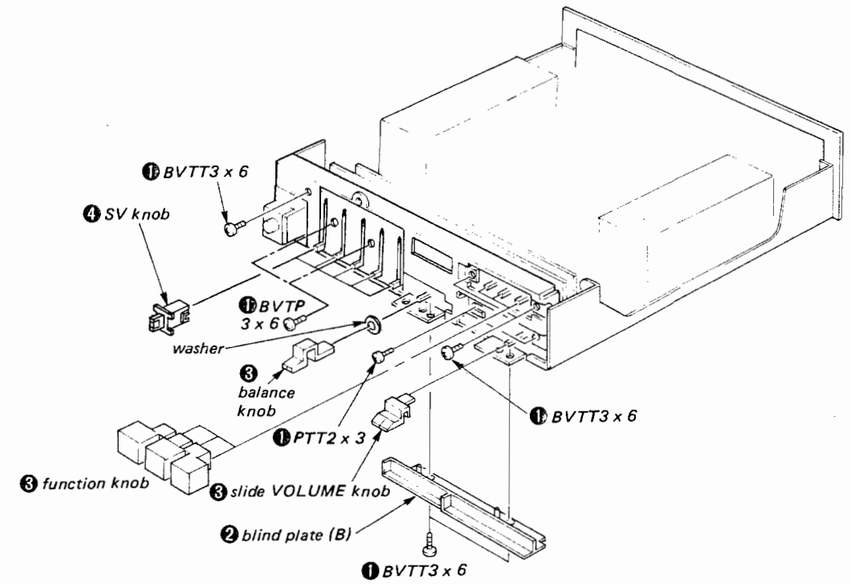


TONE

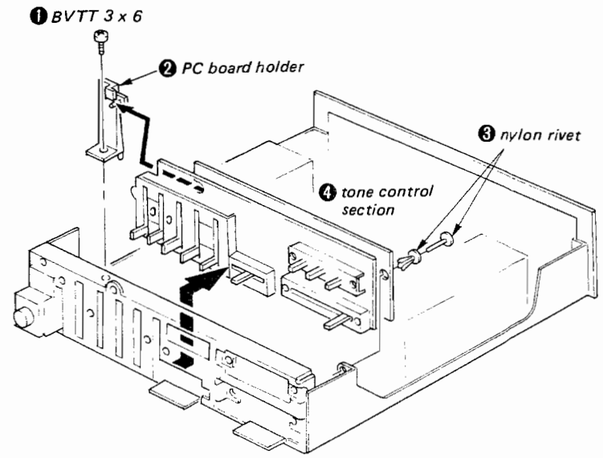
PANEL ASSEMBLY



TONE CONTROL SECTION (1)



TONE CONTROL SECTION (2)



4. MOUNTING DIAGRAM

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Q					111 109 108	110	112									
IC			IC104			IC105		107	IC103						IC101	
D			120		105 110 109 106 104 111 112 114	103 113	107 108 101									

Note:

- Color code of sleeving over the end of the jacket.

- ○— : parts extracted from the component side.
- ●— : parts extracted from the conductor side.
- ▨ : B+ pattern
- ▨ : B- pattern
- ━▷━ : signal path
- ━━▷ : L-CH signal path
- ━━▷ : R-CH signal path

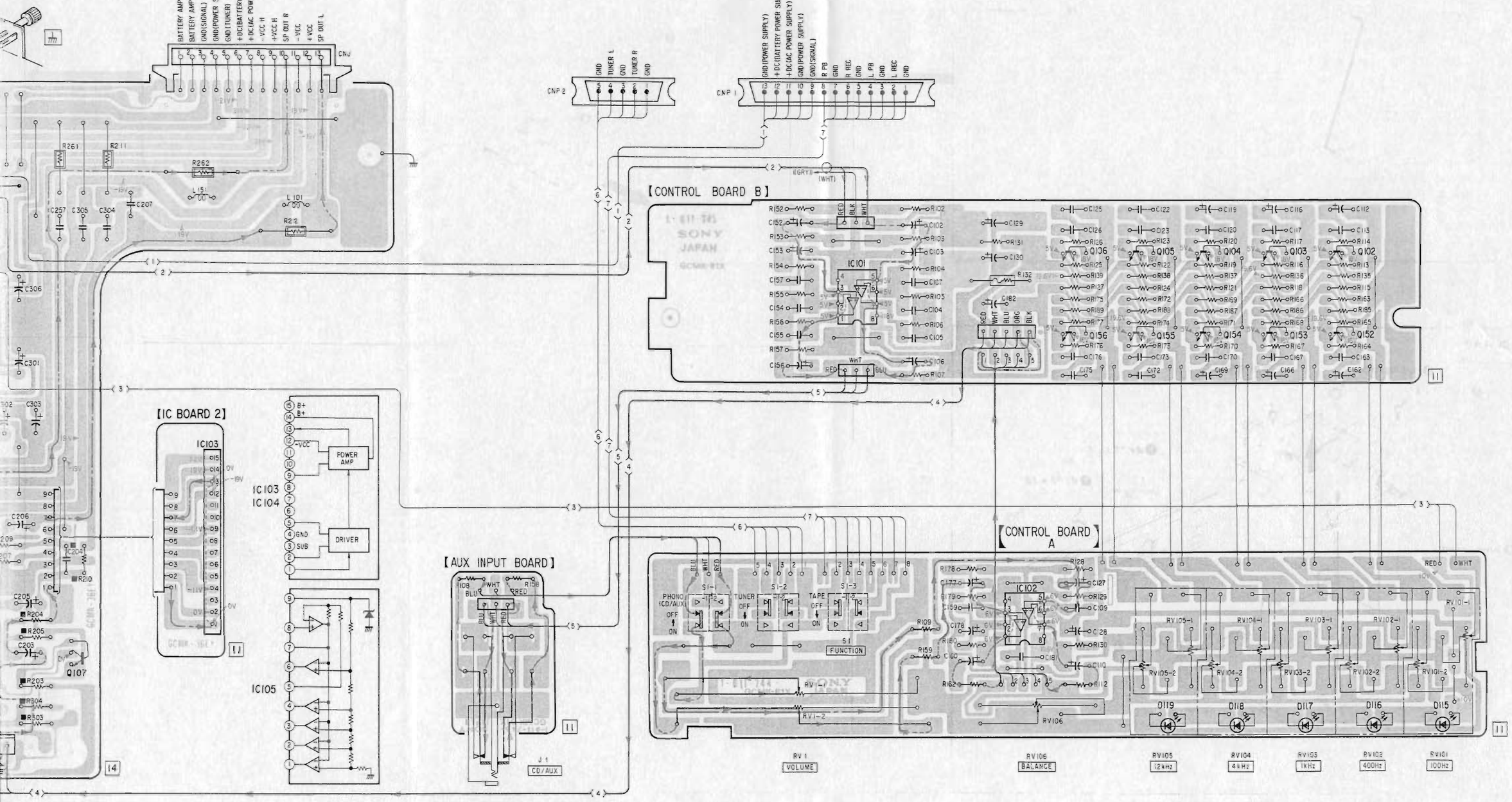
FH-7 MK II
TA-78 II

7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23

A B C D E F G H I J

IC101 IC102 106 156 105 155 104 154 103 153 102 152 Q IC

107 IC103 119 118 117 116 115 D



FH-7 MK II / TA-78 II　FH-7 MK II / TA-78 II

SCHEMATIC DIAGRAM

1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17

【POWER BOARD (1/2)】

【CONTROL BOARD B (1/2)】

【CONTROL BOARD A (1/2)】

【CONTROL BOARD B (1/2)】

IC102 M5218P
EQ DRIVE AMP

Q102–105, 152–155 2SC2458
GRAPHIC EQ AMP

IC101 M5218P
PHONO EQ AMP

【AUX INPUT BOARD】

【LED BOARD】

D120 SLP252B

D111, 112 EQA01-05R

IC105 LB1413
LED DRIVE

CNP1 (to TC)

GND
L REC
GND
L PB
GND
R REC
GND
R PB
GND (SIGNAL)
GND (POWER SUPPLY)
+DC (AC POWER SUPPLY)
+DC (BATTERY POWER SUPPLY)
GND (POWER SUPPLY)

CNP2 (to ST)

GND
R TUNER
GND
L TUNER
GND

Note: The components identified by shading and mark ⚠ are critical for safety. Replace only with part number specified.

152—155 2SC2458
RAPHIC EQ AMP

【POWER BOARD (1/2)】

IC103, 104 STK4026S
POWER AMP

【IC BOARD 2】

【IC BOARD 1】

Q107, 108 2SC2458
MUTING

Q110, 111 2SC2458 Q109 2SA1175F
MUTING DRIVE

【CONTROL BOARD A (1/2)】

D115 – 119 : These diodes are included in RV101-105.

D111, 112 EQA01-05R

D109, 110 IS2473VE

Q112 2SC1475
RIPPLE FILTER

D113 GL3PR9
D103, 104 IS2473VE

D106 IS2473VE

D105 EQA01-11R

D101 10E2

D107, 108 10E2

D114 ISS202

CNJ
(to POWER SUPPLY)

1	BATTERY AMP R
	BATTERY AMP L
	GND (SIGNAL)
	GND (POWER SUPPLY)
5	GND (TUNER)
	+DC (BATTERY POWER SUPPLY)
	+DC (AC POWER SUPPLY)
	−VCC H
	+VCC H
10	SP OUT R
	−VCC
	+VCC
13	SP OUT L

Note:

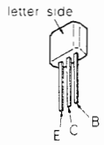
- All capacitors are in μF unless otherwise noted. pF : μμF 50WV or less are not indicated except for electrolytics and tantalums.
- All resistors without on POWER BOARD are in ohms, 1/6W. Resistors on POWER BOARD are in ¼W, unless otherwise noted.
- : nonflammable resistor.
- : fusible resistor.
- : panel designation.
- : adjustment for repair.
- Readings are taken under no-signal conditions.
- : L-CH signal path
- : R-CH signal path

Note: Voltages are measured with a VOM (50kΩ/V).

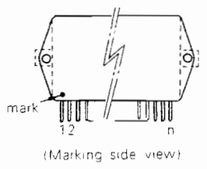
FH-7 MK II
TA-78 II

- **Semiconductor Lead Layouts**

2SA1175



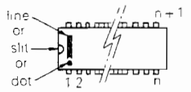
STK4026S



(Marking side view)

2SC2458

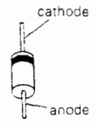
TL4558PK



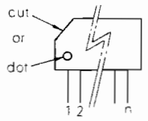
(Top view)

2SD774

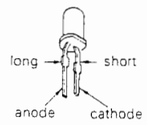
1S1555
1SS202
10E2
EQA01-05R
EQB01-11R



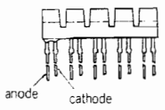
LB1413



GL3PR5

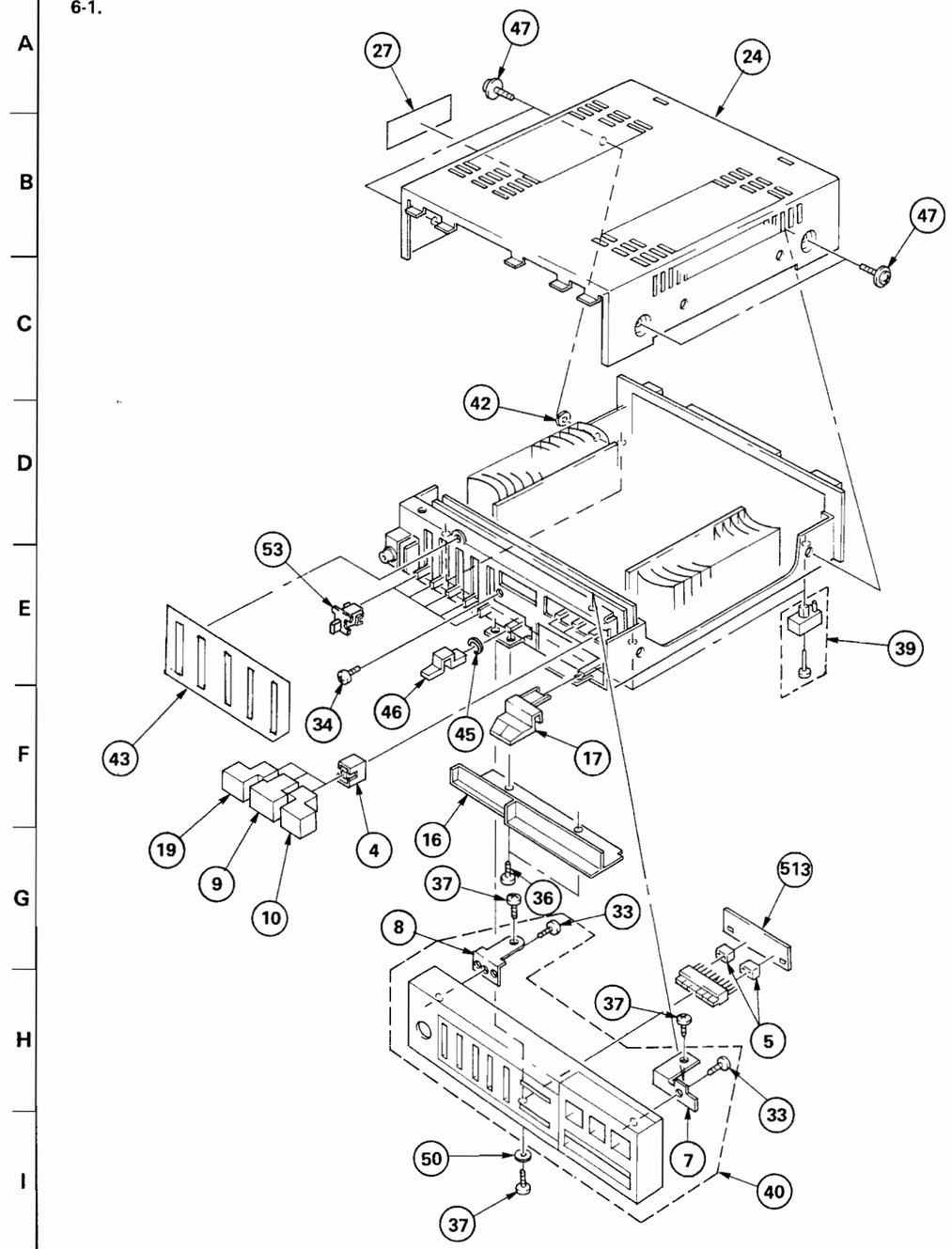


SLP-252B-06

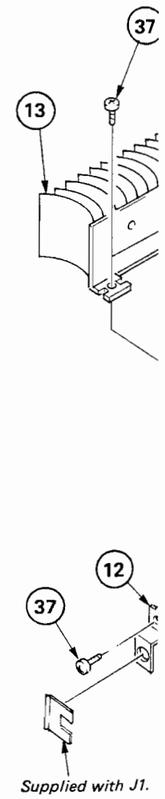


6. EXPLODED VIEWS AND PARTS LIST

6-1.

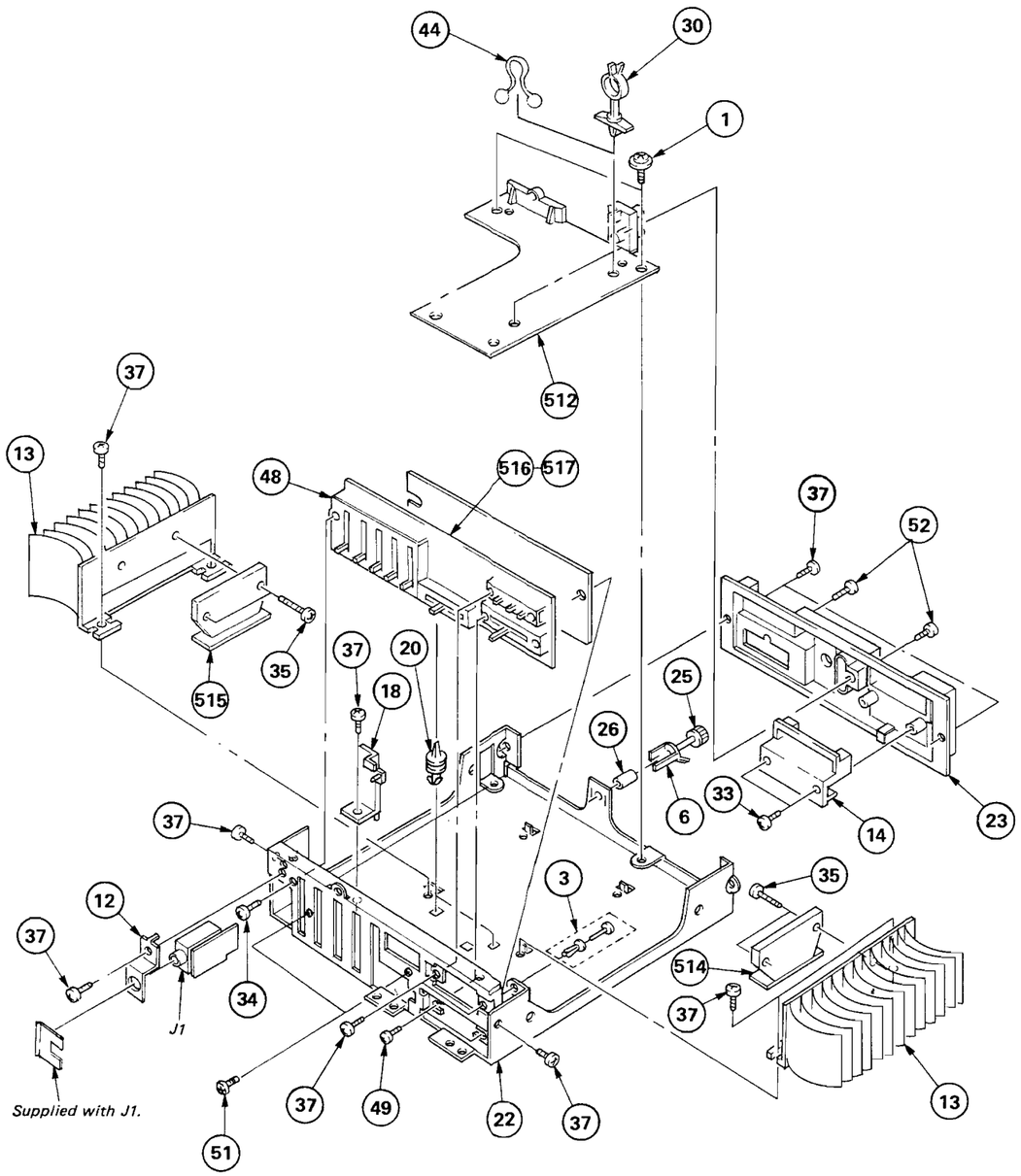


6-2.



Supplied with J1.

6-2.



GENERAL SECTION

No.	Part No.	Description
1	3-701-589-00	SCREW, SELF-TAPPING
2	.....	
3	4-812-134-00	RIVET NYLON, 3.5
4	4-864-307-00	RING
5 ♦	4-881-653-00	SPACER, LED
6 ♦	4-884-817-00	WASHER, TERMINAL
7 ♦	4-884-819-00	BRACKET (A)
8 ♦	4-884-820-00	BRACKET (B)
9	4-884-821-00	(SILVER, RED)...KNOB (16X16), SQUARE(TUNER)
9	4-884-821-11	(BLACK)...KNOB, SQUARE (TUNER)
10	4-884-822-00	(SILVER, RED)...KNOB (16X16), SQUARE(PHONO)
10	4-884-822-11	(BLACK)...KNOB, SQUARE (PHONO)
11	.....	
12 ♦	4-884-824-00	BRACKET, H.P
13 ♦	4-884-825-00	HEAT SINK
14 ♦	4-884-826-11	HOLDER (A), WIRE
15	.....	
16 ♦	4-884-828-00	PLATE (B), BLIND
17	4-884-829-00	(SILVER, RED)...KNOB, SLIDE CONTROL
17	4-884-829-11	(BLACK).....KNOB, SLIDE CONTROL
18 ♦	4-884-830-00	HOLDER (C), PC BOARD
19	4-884-831-00	(SILVER, RED)...KNOB (16X16) (TAPE), SQUARE
19	4-884-831-11	(BLACK)...KNOB (TAPE), SQUARE
20 ♦	4-884-834-00	SUPPORT, PC
21	.....	
22 ♦	4-884-839-00	CHASSIS
23 ♦	4-884-840-11	PLATE, JACK
24	4-884-841-11	(BLACK)....CASE
24	4-884-841-21	(RED).....CASE
24	4-884-841-41	(SILVER)...CASE
25	4-884-862-00	SCREW, GROUND
26	4-884-863-00	COLLAR
27	4-884-999-01	LABEL, MODEL NUMBER (W)
28	.....	
29	.....	
30 ♦	4-884-882-00	CLAMP
31	.....	
32	.....	
33	7-685-646-11	SCREW +BVTP 3X8 TYPE2 N-S
34	7-685-645-11	SCREW +BVTP 3X6 TYPE2 N-S
35	7-685-650-21	SCREW +BVTP 3X16 TYPE2 SLIT
36	7-685-870-01	SCREW +BVTT 3X5
37	7-685-871-01	SCREW +BVTT 3X6 (S)
38	.....	
39	X-4884-801-0	FOOT ASSY, RUBBER

GENERAL SECTION

No.	Part No.	Description
40	X-4884-843-1	(RED).....PANEL ASSY
40	X-4884-844-1	(BLACK)....PANEL ASSY
40	X-4884-845-1	(SILVER)...PANEL ASSY
41	.....	
42	4-830-092-00	WASHER, FIBER
43	3-831-441-XX	PLATE, BLIND
44	3-701-417-00	(E)....PURSE LOCK (11 DIA)
45	3-701-441-21	WASHER
46	4-886-818-21	(SILVER)...KNOB, CONTROL, SLIDE
46	4-886-818-31	(BLACK)....KNOB, CONTROL, SLIDE
46	4-886-818-41	(RED).....KNOB, CONTROL, SLIDE
47	4-889-321-01	(SILVER, RED)...SCREW
47	4-889-321-11	(RED).....SCREW
48 ♦	4-903-009-01	BRACKET, SV
49	7-621-255-15	SCREW +P 2X3
50	7-688-003-11	W 3, MIDDLE
51	7-682-545-04	SCREW +B 3X4
52	7-685-547-11	SCREW +BTP 3X10 TYPE2 N-S
53	X-4884-852-3	(RED).....KNOB ASSY
53	X-4884-852-2	(BLACK)....KNOB ASSY
53	X-4884-852-1	(SILVER)...KNOB ASSY

NOTE:
- The mechanical parts with no reference number in the exploded views are not supplied.
- Items marked " ♦ " are not stocked since they are seldom required for routine service. Some delay should be anticipated when ordering these items.
- Due to standardization, parts with part numbers (Δ-ΔΔΔ-ΔΔΔ-XX or Δ-ΔΔΔΔ-ΔΔΔ-X) may be different from those used in the set.
- If there are two or more same circuitsin a set such as a stereophonic machine, only typical circuit parts may be indicated and capacitors and resistors in other same circuits may be omitted.

CAPACITORS:
MF:μF, PF:μμF.

RESISTORS
- All resistors are in ohms.
- F : nonflammable

COILS
- MMH : mH, UH : μH

SEMICONDUCTORS
In each case, U : μ, for example:
UA···: μA···, UPA···: μPA···, UPC···: μPC, UPD···: μPD···

The components identified by shading and mark ⚠ are critical for safety. Replace only with part number specified.

ELECTRICAL PARTS

Ref.No.	Part No.	Description
501	1-217-589-00	CONDUCTOR, CROSS (MELF)
502	♦;1-535-425-00	PLATE, JAMPER
503	1-535-426-00	PLATE, JAMPER
504	1-535-494-11	PLATE, JUMPER
505	1-535-495-11	PLATE, JAMPER
506	♦;1-562-250-00	SOCKET, CONNECTOR 5P
507	♦;1-561-441-00	SOCKET, CONNECTOR 5P
508	♦;1-561-439-00	SOCKET, CONNECTOR 3P
509	♦;1-562-327-00	SOCKET, CONNECTOR 3P
510	♦;1-561-443-00	SOCKET, CONNECTOR 7P
511	.....	
512	♦;1-608-440-13	PC BOARD, POWER
513	♦;1-608-441-00	PC BOARD, LED
514	♦;1-608-442-00	PC BOARD, IC (1)
515	♦;1-608-443-00	PC BOARD, IC (2)
516	♦;1-611-744-11	PC BOARD, CONTROL (A)
517	♦;1-611-745-11	PC BOARD, CONTROL (B)
518	♦;1-611-746-11	PC BOARD, AUX INPUT

Ref.No.	Part No.	Description			
C101	1-102-030-00	CERAMIC MELF	330PF	10%	50V
C102	1-123-380-00	ELECT	1MF	20%	50V
C103	1-123-356-00	ELECT	10MF	20%	16V
C104	1-130-480-00	MYLAR	0.0056MF	5%	50V
C105	1-130-473-00	MYLAR	0.0015MF	5%	50V
C106	1-123-328-00	ELECT	4.7MF	20%	25V
C107	1-102-106-00	CERAMIC	100PF	10%	50V
C109	1-102-106-00	CERAMIC	100PF	10%	50V
C110	1-123-328-00	ELECT	4.7MF	20%	25V
C112	1-123-611-00	ELECT	1MF	20%	50V
C113	1-130-628-00	FILM	0.047MF	5%	50V
C116	1-123-609-00	ELECT	0.33MF	20%	50V
C117	1-130-622-00	FILM	0.015MF	5%	50V
C119	1-123-607-00	ELECT	0.1MF	20%	50V
C120	1-130-480-00	MYLAR	0.0056MF	5%	50V
C122	1-130-626-00	FILM	0.033MF	5%	50V
C123	1-130-473-00	MYLAR	0.0015MF	5%	50V
C125	1-130-620-00	FILM	0.01MF	5%	50V
C126	1-102-114-00	CERAMIC	470PF	10%	50V
C127	1-123-611-00	ELECT	1MF	20%	50V
C128	1-123-328-00	ELECT	4.7MF	20%	25V
C129	1-123-307-00	ELECT	100MF	20%	10V
C130	1-123-330-00	ELECT	22MF	20%	25V
C151	1-102-030-00	CERAMIC MELF	330PF	10%	50V
C152	1-123-380-00	ELECT	1MF	20%	50V
C153	1-123-356-00	ELECT	10MF	20%	16V
C154	1-130-480-00	MYLAR	0.0056MF	5%	50V

ELECTRICAL PARTS

Ref.No.	Part No.	Description			
C155	1-130-473-00	MYLAR	0.0015MF	5%	50V
C156	1-123-328-00	ELECT	4.7MF	20%	25V
C157	1-102-106-00	CERAMIC	100PF	10%	50V
C159	1-102-106-00	CERAMIC	100PF	10%	50V
C160	1-123-328-00	ELECT	4.7MF	20%	25V
C162	1-123-611-00	ELECT	1MF	20%	50V
C163	1-130-628-00	FILM	0.047MF	5%	50V
C166	1-123-609-00	ELECT	0.33MF	20%	50V
C167	1-130-622-00	FILM	0.015MF	5%	50V
C169	1-123-607-00	ELECT	0.1MF	20%	50V
C170	1-130-480-00	MYLAR	0.0056MF	5%	50V
C172	1-130-626-00	FILM	0.033MF	5%	50V
C173	1-130-473-00	MYLAR	0.0015MF	5%	50V
C175	1-130-620-00	FILM	0.01MF	5%	50V
C176	1-102-114-00	CERAMIC	470PF	10%	50V
C177	1-123-611-00	ELECT	1MF	20%	50V
C178	1-123-328-00	ELECT	4.7MF	20%	25V
C181	1-162-112-00	CERAMIC	0.0047MF	30%	25V
C182	1-123-330-00	ELECT	22MF	20%	25V
C202	1-102-030-00	CERAMIC MELF	330PF	10%	50V
C203	1-123-380-00	ELECT	1MF	20%	50V
C204	1-102-944-00	CERAMIC MELF	6.8PF	10%	50V
C205	1-123-318-00	ELECT	33MF	20%	16V
C206	1-123-359-00	ELECT	47MF	20%	35V
C207	1-108-597-00	MYLAR	0.056MF	5%	50V
C252	1-102-030-00	CERAMIC MELF	330PF	10%	50V
C253	1-123-380-00	ELECT	1MF	20%	50V
C254	1-102-944-00	CERAMIC MELF	6.8PF	10%	50V
C255	1-123-318-00	ELECT	33MF	20%	16V
C256	1-123-344-00	ELECT	47MF	20%	35V
C257	1-108-597-00	MYLAR	0.056MF	5%	50V
C301	1-123-361-00	ELECT	220MF	20%	50V
C302	1-123-356-00	ELECT	10MF	20%	50V
C303	1-123-356-00	ELECT	10MF	20%	50V
C304	1-108-597-00	MYLAR	0.056MF	5%	50V
C305	1-108-597-00	MYLAR	0.056MF	5%	50V
C306	1-123-334-00	ELECT	220MF	20%	25V
C307	1-101-880-00	CERAMIC MELF	47PF	5%	50V
C308	1-123-495-00	ELECT	220MF	20%	25V
C309	1-123-356-00	ELECT	10MF	20%	50V
C310	1-123-321-00	ELECT	220MF	20%	16V
C311	1-123-356-00	ELECT	10MF	20%	50V
C312	1-123-356-00	ELECT	10MF	20%	50V
C313	1-123-608-00	ELECT	0.22MF	20%	50V
C314	1-123-333-00	ELECT	100MF	20%	16V

NOTE:
- The mechanical parts with no reference number in the exploded views are not supplied.
- Items marked " ♦ " are not stocked since they are seldom required for routine service. Some delay should be anticipated when ordering these items.
- Due to standardization, parts with part numbers (Δ-ΔΔΔ-ΔΔΔ-XX or Δ-ΔΔΔΔ-ΔΔΔ-X) may be different from those used in the set.
- If there are two or more same circuitsin a set such as a stereophonic machine, only typical circuit parts may be indicated and capacitors and resistors in other same circuits may be omitted.

CAPACITORS:
MF:μF, PF:μμF.

RESISTORS
- All resistors are in ohms.
- F : nonflammable

COILS
- MMH : mH, UH : μH

SEMICONDUCTORS
In each case, U : μ, for example:
UA···: μA···, UPA···: μPA···, UPC···: μPC,
UPD···: μPD···

The components identified by shading and mark ⚠ are critical for safety. Replace only with part number specified.

ELECTRICAL PARTS

Ref.No.	Part No.	Description			
C320	1-101-002-00	CERAMIC	0.0022MF		50V
C321	1-161-047-00	CERAMIC MELF	0.0047MF	30%	25V
CNP1	1-556-475-00	CORD (WITH CONNECTOR) 13P			
CNP2	1-557-309-00	CORD (WITH CONNECTOR) 5P			
♦CNP301	1-560-708-00	PIN, CONNECTOR 2P			
♦CNP302	1-560-604-00	PIN, CONNECTOR 5P			
CNJ	1-562-068-00	SOCKET, CONNECTOR 13P			
D101	8-719-200-02	DIODE 10E-2			
D103	8-719-815-55	DIODE 1S1555			
D104	8-719-815-55	DIODE 1S1555			
D105	8-719-930-11	DIODE EQB01-11R			
D106	8-719-815-55	DIODE 1S1555			
D107	8-719-200-02	DIODE 10E-2			
D108	8-719-200-02	DIODE 10E-2			
D109	8-719-815-55	DIODE 1S1555			
D110	8-719-815-55	DIODE 1S1555			
D111	8-719-936-05	DIODE EQA01-05R			
D112	8-719-936-05	DIODE EQA01-05R			
D113	8-719-903-05	DIODE GL3PR5			
D114	8-719-107-94	DIODE 1SS202			
D120	8-719-925-26	DIODE SLP-252B (LED)			
IC101	8-759-935-58	IC TL4558PK			
IC102	8-759-935-58	IC TL4558PK			
IC103	8-749-940-26	IC STK4026S			
IC104	8-749-940-26	IC STK4026S			
IC105	8-759-800-28	IC LB1413			
J1	1-507-932-11	JACK, LARGE TYPE (CD/AUX)			
J101	1-507-807-00	JACK, PIN 2P (PHONO L)			
J201	1-507-807-00	JACK, PIN 2P (PHONO R)			
L101	♦;1-420-872-00	COIL, AIR CORE			
L151	♦;1-420-872-00	COIL, AIR CORE			
Q102	8-729-245-83	TRANSISTOR 2SC2458			
Q103	8-729-245-83	TRANSISTOR 2SC2458			
Q104	8-729-245-83	TRANSISTOR 2SC2458			
Q105	8-729-245-83	TRANSISTOR 2SC2458			
Q106	8-729-245-83	TRANSISTOR 2SC2458			
Q107	8-729-245-83	TRANSISTOR 2SC2458			
Q108	8-729-245-83	TRANSISTOR 2SC2458			
Q109	8-729-117-54	TRANSISTOR 2SA1175			
Q110	8-729-245-83	TRANSISTOR 2SC2458			
Q111	8-729-245-83	TRANSISTOR 2SC2458			
Q112	8-729-177-43	TRANSISTOR 2SD774			
Q152	8-729-245-83	TRANSISTOR 2SC2458			

ELECTRICAL PARTS

Ref.No.	Part No.	Description				
Q153	8-729-245-83	TRANSISTOR 2SC2458				
Q154	8-729-245-83	TRANSISTOR 2SC2458				
Q155	8-729-245-83	TRANSISTOR 2SC2458				
Q156	8-729-245-83	TRANSISTOR 2SC2458				
R101	1-247-131-00	CARBON MELF	1K	5%	1/4W	
R102	1-247-871-00	CARBON	47K	5%	1/6W	
R103	1-247-891-00	CARBON	330K	5%	1/6W	
R104	1-247-831-00	CARBON	1K	5%	1/6W	
R105	1-247-900-00	CARBON	750K	5%	1/6W	
R106	1-247-871-00	CARBON	47K	5%	1/6W	
R107	1-247-871-00	CARBON	47K	5%	1/6W	
R108	1-247-847-00	CARBON	4.7K	5%	1/6W	
R109	1-247-831-00	CARBON	1K	5%	1/6W	
R112	1-247-847-00	CARBON	4.7K	5%	1/6W	
R113	1-247-871-00	CARBON	47K	5%	1/6W	
R114	1-247-833-00	CARBON	1.2K	5%	1/6W	
R115	1-247-851-00	CARBON	6.8K	5%	1/6W	
R116	1-247-871-00	CARBON	47K	5%	1/6W	
R117	1-247-833-00	CARBON	1.2K	5%	1/6W	
R118	1-247-851-00	CARBON	6.8K	5%	1/6W	
R119	1-247-871-00	CARBON	47K	5%	1/6W	
R120	1-247-833-00	CARBON	1.2K	5%	1/6W	
R121	1-247-851-00	CARBON	6.8K	5%	1/6W	
R122	1-247-871-00	CARBON	47K	5%	1/6W	
R123	1-247-833-00	CARBON	1.2K	5%	1/6W	
R124	1-247-851-00	CARBON	6.8K	5%	1/6W	
R125	1-247-871-00	CARBON	47K	5%	1/6W	
R126	1-247-833-00	CARBON	1.2K	5%	1/6W	
R127	1-247-851-00	CARBON	6.8K	5%	1/6W	
R128	1-247-891-00	CARBON	330K	5%	1/6W	
R129	1-247-847-00	CARBON	4.7K	5%	1/6W	
R130	1-247-873-00	CARBON	56K	5%	1/6W	
R131	1-247-847-00	CARBON	4.7K	5%	1/6W	
R132	⚠1-217-395-00	FUSIBLE	47	5%	1/4W	F
R135	1-247-821-00	CARBON	390	5%	1/6W	
R136	1-247-821-00	CARBON	390	5%	1/6W	
R137	1-247-821-00	CARBON	390	5%	1/6W	
R138	1-247-821-00	CARBON	390	5%	1/6W	
R139	1-247-821-00	CARBON	390	5%	1/6W	
R151	1-247-131-00	CARBON MELF	1K	5%	1/4W	
R152	1-247-871-00	CARBON	47K	5%	1/6W	
R153	1-247-891-00	CARBON	330K	5%	1/6W	
R154	1-247-831-00	CARBON	1K	5%	1/6W	
R155	1-247-900-00	CARBON	750K	5%	1/6W	
R156	1-247-871-00	CARBON	47K	5%	1/6W	
R157	1-247-871-00	CARBON	47K	5%	1/6W	

NOTE:
- The mechanical parts with no reference number in the exploded views are not supplied.
- Items marked " ♦ " are not stocked since they are seldom required for routine service. Some delay should be anticipated when ordering these items.
- Due to standardization, parts with part numbers (Δ-ΔΔΔ-ΔΔΔ-XX or Δ-ΔΔΔΔ-ΔΔΔ-X) may be different from those used in the set.
- If there are two or more same circuitsin a set such as a stereophonic machine, only typical circuit parts may be indicated and capacitors and resistors in other same circuits may be omitted.

CAPACITORS:
MF:μF, PF:μμF.

RESISTORS
- All resistors are in ohms.
- F : nonflammable

COILS
- MMH : mH, UH : μH

SEMICONDUCTORS
In each case, U : μ, for example:
UA···: μA···, UPA···: μPA···, UPC···: μPC,
UPD···: μPD···

The components identified by shading and mark ⚠ are critical for safety. Replace only with part number specified.

FH-7 MK II TA-78 II

ELECTRICAL PARTS

Ref.No.	Part No.	Description			
R158	1-247-847-00	CARBON	4.7K	5%	1/6W
R159	1-247-831-00	CARBON	1K	5%	1/6W
R162	1-247-847-00	CARBON	4.7K	5%	1/6W
R163	1-247-871-00	CARBON	47K	5%	1/6W
R164	1-247-833-00	CARBON	1.2K	5%	1/6W
R165	1-247-851-00	CARBON	6.8K	5%	1/6W
R166	1-247-871-00	CARBON	47K	5%	1/6W
R167	1-247-833-00	CARBON	1.2K	5%	1/6W
R168	1-247-851-00	CARBON	6.8K	5%	1/6W
R169	1-247-871-00	CARBON	47K	5%	1/6W
R170	1-247-833-00	CARBON	1.2K	5%	1/6W
R171	1-247-851-00	CARBON	6.8K	5%	1/6W
R172	1-247-871-00	CARBON	47K	5%	1/6W
R173	1-247-833-00	CARBON	1.2K	5%	1/6W
R174	1-247-851-00	CARBON	6.8K	5%	1/6W
R175	1-247-871-00	CARBON	47K	5%	1/6W
R176	1-247-833-00	CARBON	1.2K	5%	1/6W
R177	1-247-851-00	CARBON	6.8K	5%	1/6W
R178	1-247-891-00	CARBON	330K	5%	1/6W
R179	1-247-847-00	CARBON	4.7K	5%	1/6W
R180	1-247-873-00	CARBON	56K	5%	1/6W
R185	1-247-821-00	CARBON	390	5%	1/6W
R186	1-247-821-00	CARBON	390	5%	1/6W
R187	1-247-821-00	CARBON	390	5%	1/6W
R188	1-247-821-00	CARBON	390	5%	1/6W
R189	1-247-821-00	CARBON	390	5%	1/6W
R202	1-247-131-00	CARBON MELF	1K	5%	1/4W
R203	1-247-131-00	CARBON MELF	1K	5%	1/4W
R204	1-247-138-00	CARBON MELF	2K	5%	1/4W
R205	1-247-173-00	CARBON MELF	56K	5%	1/4W
R206	1-247-149-00	CARBON MELF	5.6K	5%	1/4W
R207	1-247-142-00	CARBON MELF	3K	5%	1/4W
R208	1-247-138-00	CARBON MELF	2K	5%	1/4W
R209	1-247-138-00	CARBON MELF	2K	5%	1/4W
R210	1-214-174-00	METAL MELF	56K	1%	1/4W
R211 ⚠	1-247-192-00	CARBON	10	5%	1/2W F
R212 ⚠	1-247-192-00	CARBON	10	5%	1/2W F
R252	1-247-131-00	CARBON MELF	1K	5%	1/4W
R253	1-247-131-00	CARBON MELF	1K	5%	1/4W
R254	1-247-138-00	CARBON MELF	2K	5%	1/4W
R255	1-247-173-00	CARBON MELF	56K	5%	1/4W
R256	1-247-149-00	CARBON MELF	5.6K	5%	1/4W
R257	1-247-142-00	CARBON MELF	3K	5%	1/4W
R258	1-247-138-00	CARBON MELF	2K	5%	1/4W
R259	1-247-138-00	CARBON MELF	2K	5%	1/4W

ELECTRICAL PARTS

Ref.No.	Part No.	Description			
R260	1-214-174-00	METAL MELF	56K	1%	1/4W
R261 ⚠	1-247-192-00	CARBON	10	5%	1/2W F
R262 ⚠	1-247-192-00	CARBON	10	5%	1/2W F
R301	1-247-155-00	CARBON MELF	10K	5%	1/4W
R303	1-247-143-00	CARBON MELF	3.3K	5%	1/4W
R304	1-247-148-00	CARBON MELF	5.1K	5%	1/4W
R305	1-247-143-00	CARBON MELF	3.3K	5%	1/4W
R306	1-246-537-00	CARBON MELF	470K	5%	1/4W
R307	1-247-148-00	CARBON MELF	5.1K	5%	1/4W
R308	1-247-131-00	CARBON MELF	1K	5%	1/4W
R309	1-246-537-00	CARBON MELF	470K	5%	1/4W
R310	1-247-155-00	CARBON MELF	10K	5%	1/4W
R311	1-247-151-00	CARBON MELF	6.8K	5%	1/4W
R312	1-247-145-00	CARBON MELF	3.9K	5%	1/4W
R313	1-247-163-00	CARBON MELF	22K	5%	1/4W
R314	1-247-163-00	CARBON MELF	22K	5%	1/4W
R315	1-247-157-00	CARBON MELF	12K	5%	1/4W
R316 ⚠	1-212-849-00	FUSIBLE	4.7	5%	1/4W F
R317	1-247-111-00	CARBON MELF	150	5%	1/4W
R318	1-247-146-00	CARBON MELF	4.3K	5%	1/4W
R319 ⚠	1-247-209-00	CARBON	51	5%	1/2W F
R320	1-246-475-00	CARBON	1.2K	5%	1/4W
R321	1-246-475-00	CARBON	1.2K	5%	1/4W
RV1	1-228-777-00	RES, VAR, SLIDE 100K/100K (VOLUME)			
RV101	1-230-345-11	(RED, BLACK)...RES, VAR, SLIDE(LED)250KX2			
RV101	1-230-345-21	(SILVER).....RES, VAR, SLIDE(LED)250KX2			
RV102	1-230-345-11	(RED, BLACK)...RES, VAR, SLIDE(LED)250KX2			
RV102	1-230-345-21	(SILVER).....RES, VAR, SLIDE(LED)250KX2			
RV103	1-230-345-11	(RED, BLACK)...RES, VAR, SLIDE(LED)250KX2			
RV103	1-230-345-21	(SILVER).....RES, VAR, SLIDE(LED)250KX2			
RV104	1-230-345-11	(RED, BLACK)...RES, VAR, SLIDE(LED)250KX2			
RV104	1-230-345-21	(SILVER).....RES, VAR, SLIDE(LED)250KX2			
RV105	1-230-345-11	(RED, BLACK)...RES, VAR, SLIDE(LED)250KX2			
RV105	1-230-345-21	(SILVER).....RES, VAR, SLIDE(LED)250KX2			
RV106	1-230-346-11	RES, VAR, SLIDE 250K (BALANCE)			
S1	1-554-268-00	SWITCH, PUSH (3 KEY) (FUNCTION)			

NOTE:

- The mechanical parts with no reference number in the exploded views are not supplied.
- Items marked " ♦ " are not stocked since they are seldom required for routine service. Some delay should be anticipated when ordering these items.
- Due to standardization, parts with part numbers (Δ-ΔΔΔ-ΔΔΔ-XX or Δ-ΔΔΔΔ-ΔΔΔ-X) may be different from those used in the set.
- If there are two or more same circuitsin a set such as a stereophonic machine, only typical circuit parts may be indicated and capacitors and resistors in other same circuits may be omitted.

CAPACITORS:
MF:μF, PF:μμF.

RESISTORS
- All resistors are in ohms.
- F : nonflammable

COILS
- MMH : mH, UH : μH

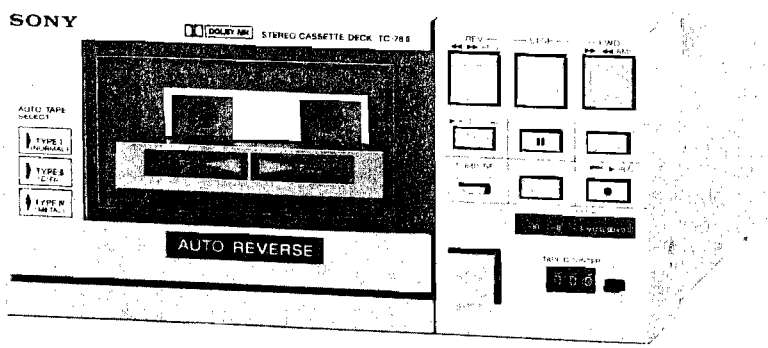
SEMICONDUCTORS
In each case, U : μ, for example:
UA···: μA···, UPA···: μPA···, UPC···: μPC,
UPD···: μPD···

The components identified by shading and mark ⚠ are critical for safety. Replace only with part number specified.

STEREO CASSETTE DECK

[TC-78 II]

AEP Model
UK Model
E Model

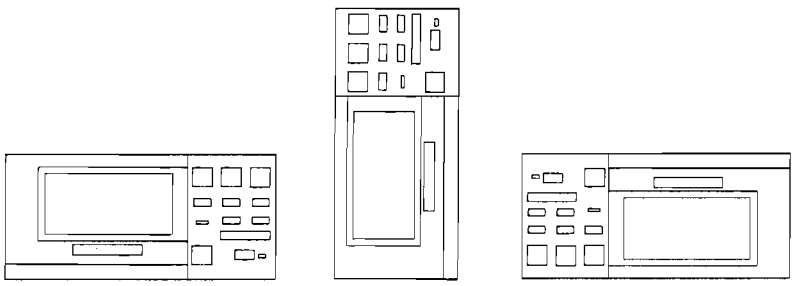


Note: TC-78II is an integrated stereo amplifier in FH-7MKII.

Tape Transport Mechanism Type	PEARL SILVER TCM-130R11 BLACK, RED TCM-130R12

NOTES ON REPAIR

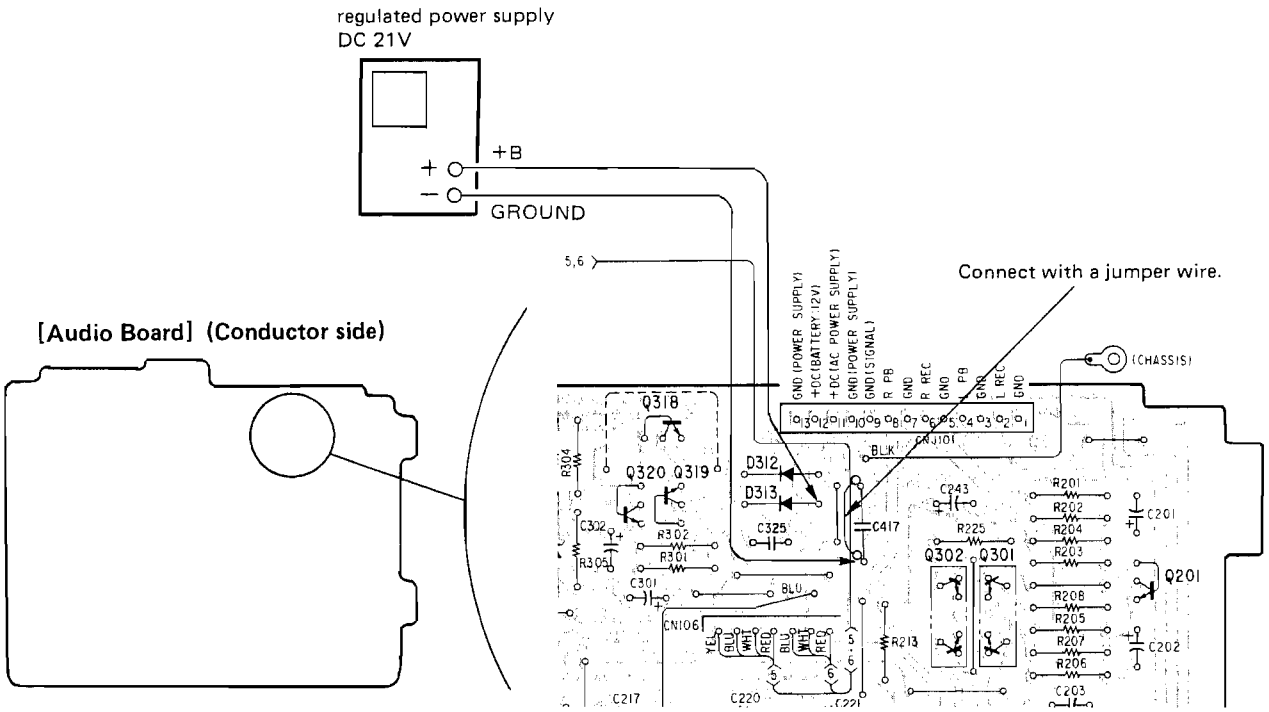
When the mech deck is operated with the set in an upside-down position, misoperation may result. For repair while operating the mech deck, perform with the set in its normal position or standing on its side.



good good wrong

[To apply B+ voltage in repair]

The power supply voltage of this unit is fed from AC-78II via TA-78II.
There are two ground lines for signal and power supply circuits, which are not connected in this unit.
When this unit alone operates, connect the two ground lines with a jumper wire and a regulated power supply as illustrated.
After repairing, remove the jumper wire connected.

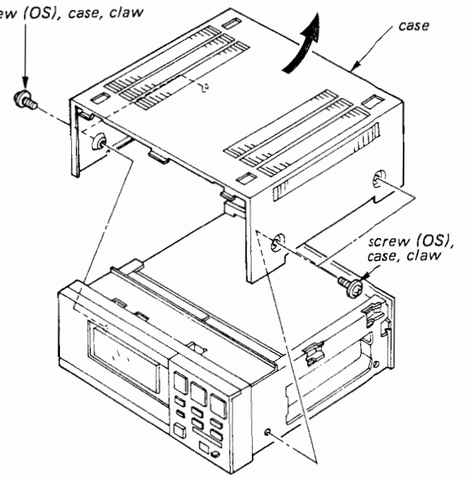


- Refer to the service manual of TC-78 for the circuit description and the mechanical operation.
  (They are identical to those of TC-78.)

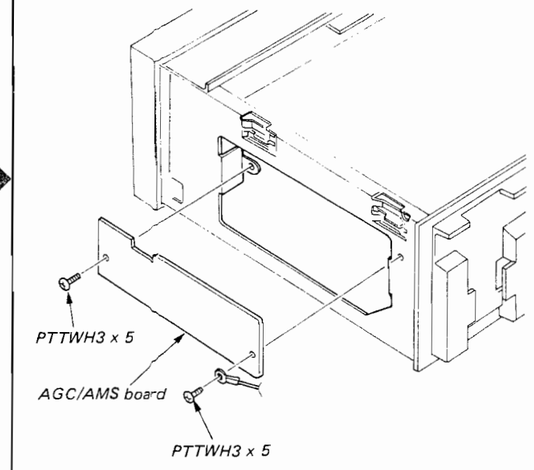
SECTION 2
DISASSEMBLY

Note: Follow the disassembly procedure in the numerical order given.

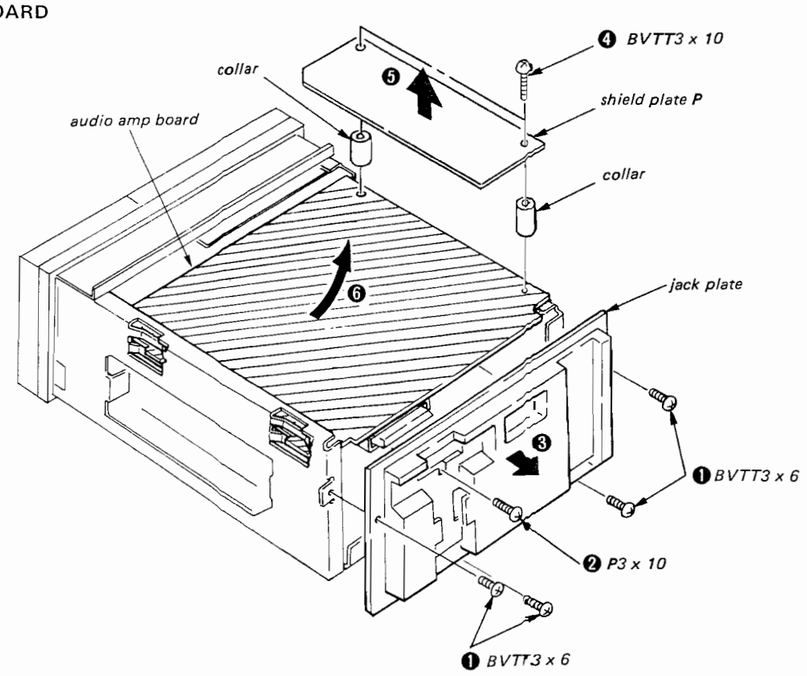
CASE



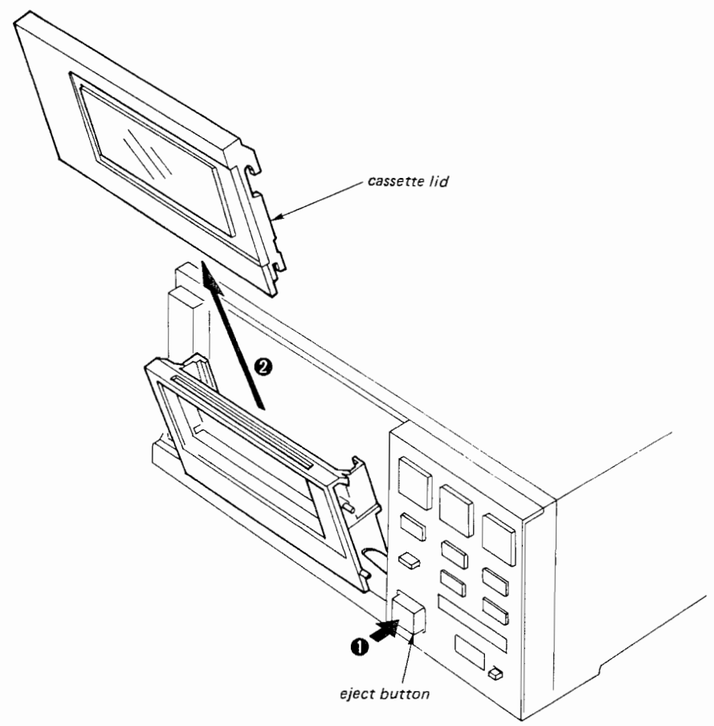
AGC/AMS BOARD



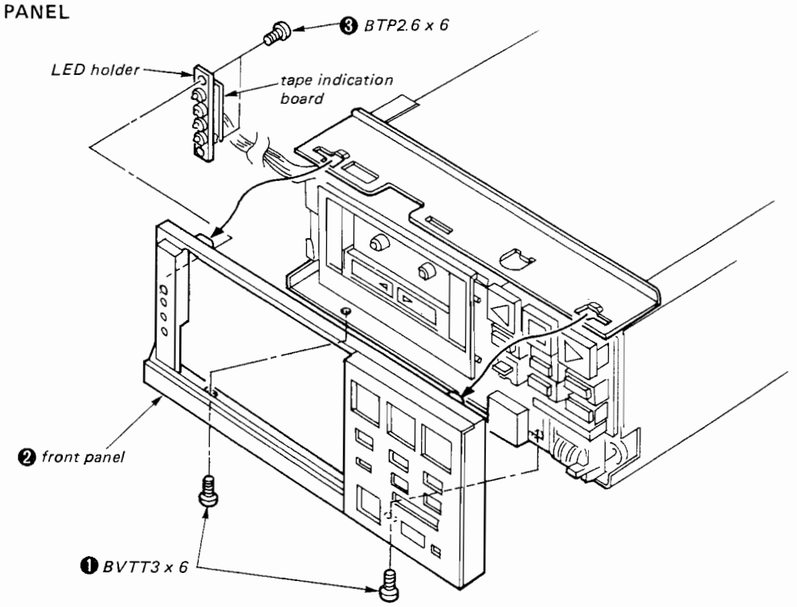
AUDIO AMP BOARD



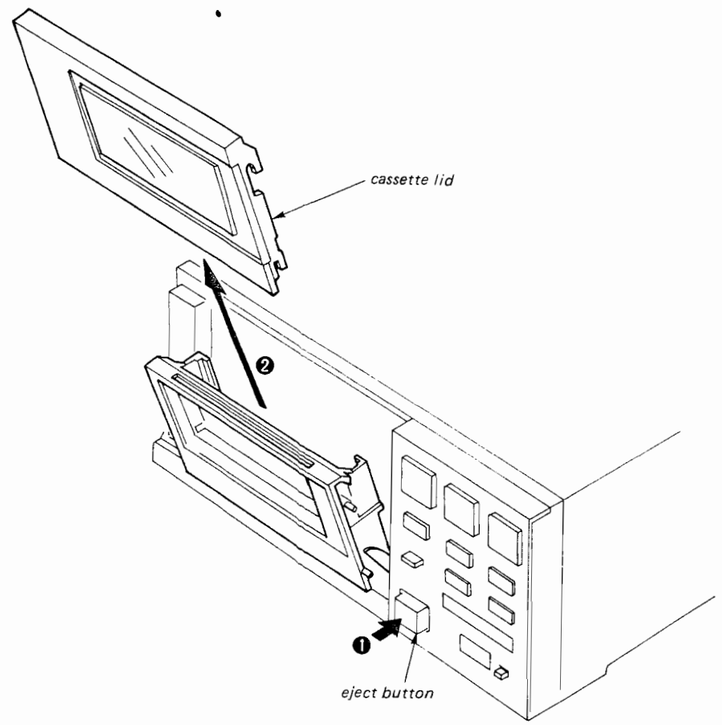
CASSETTE LID



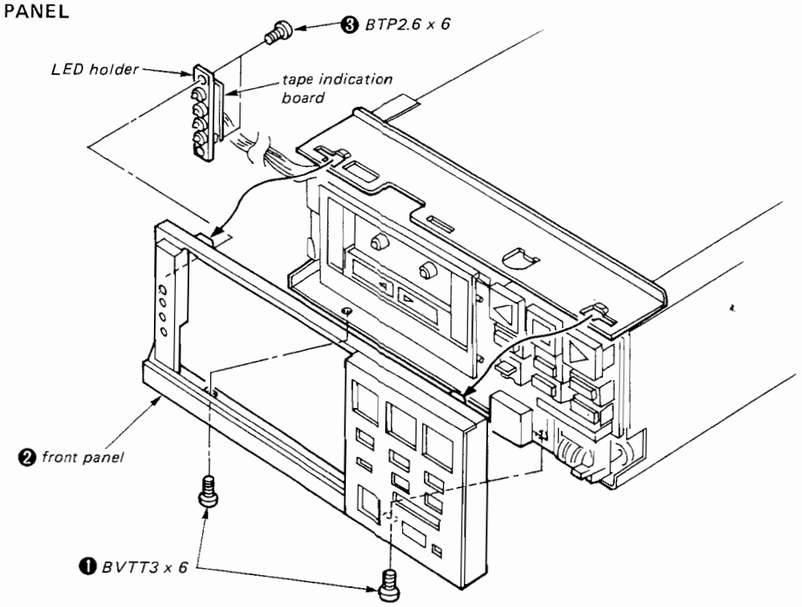
FRONT PANEL



CASSETTE LID

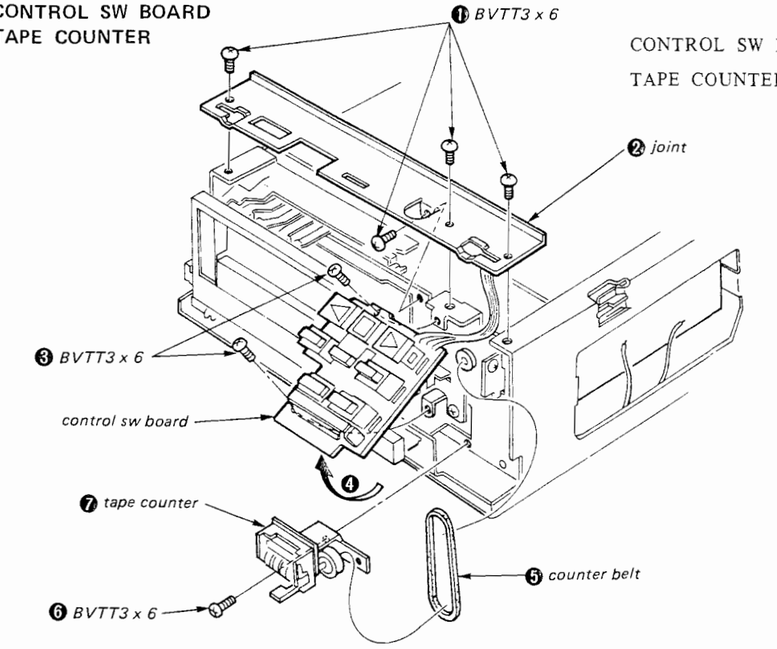


FRONT PANEL

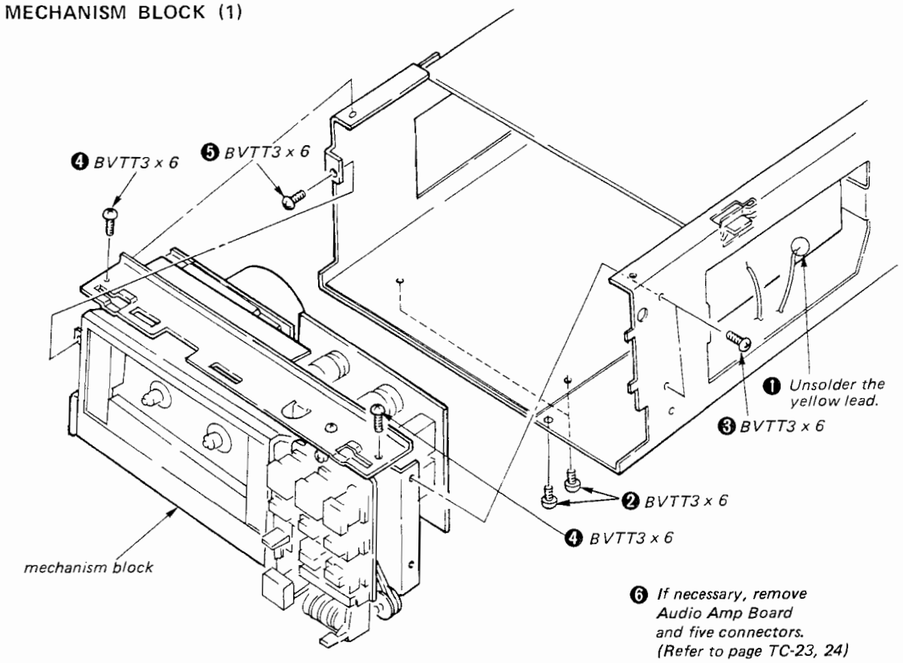


CONTROL SW BOARD
TAPE COUNTER

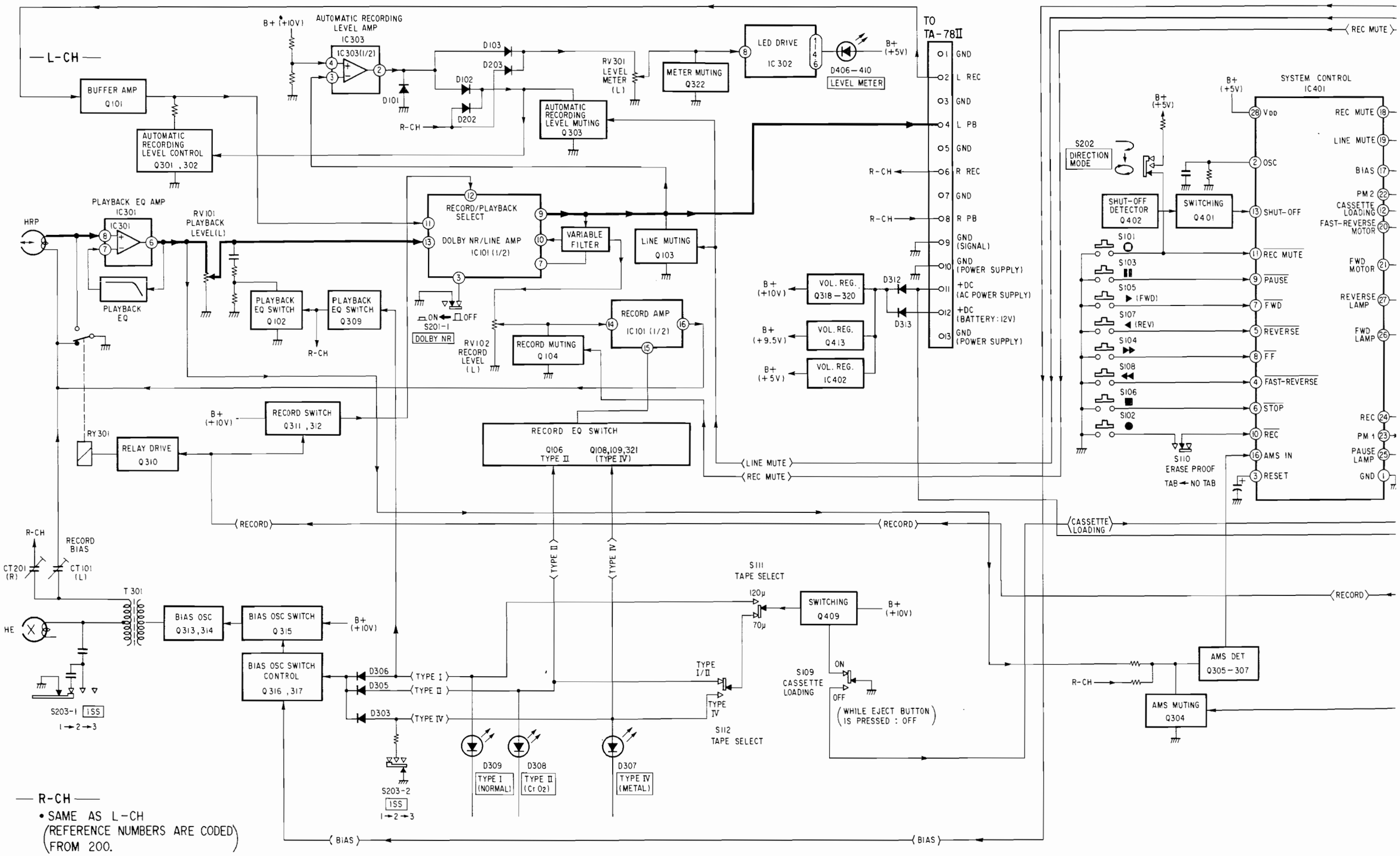
CONTROL SW BOARD: ❶~❹
TAPE COUNTER: ❶~❼



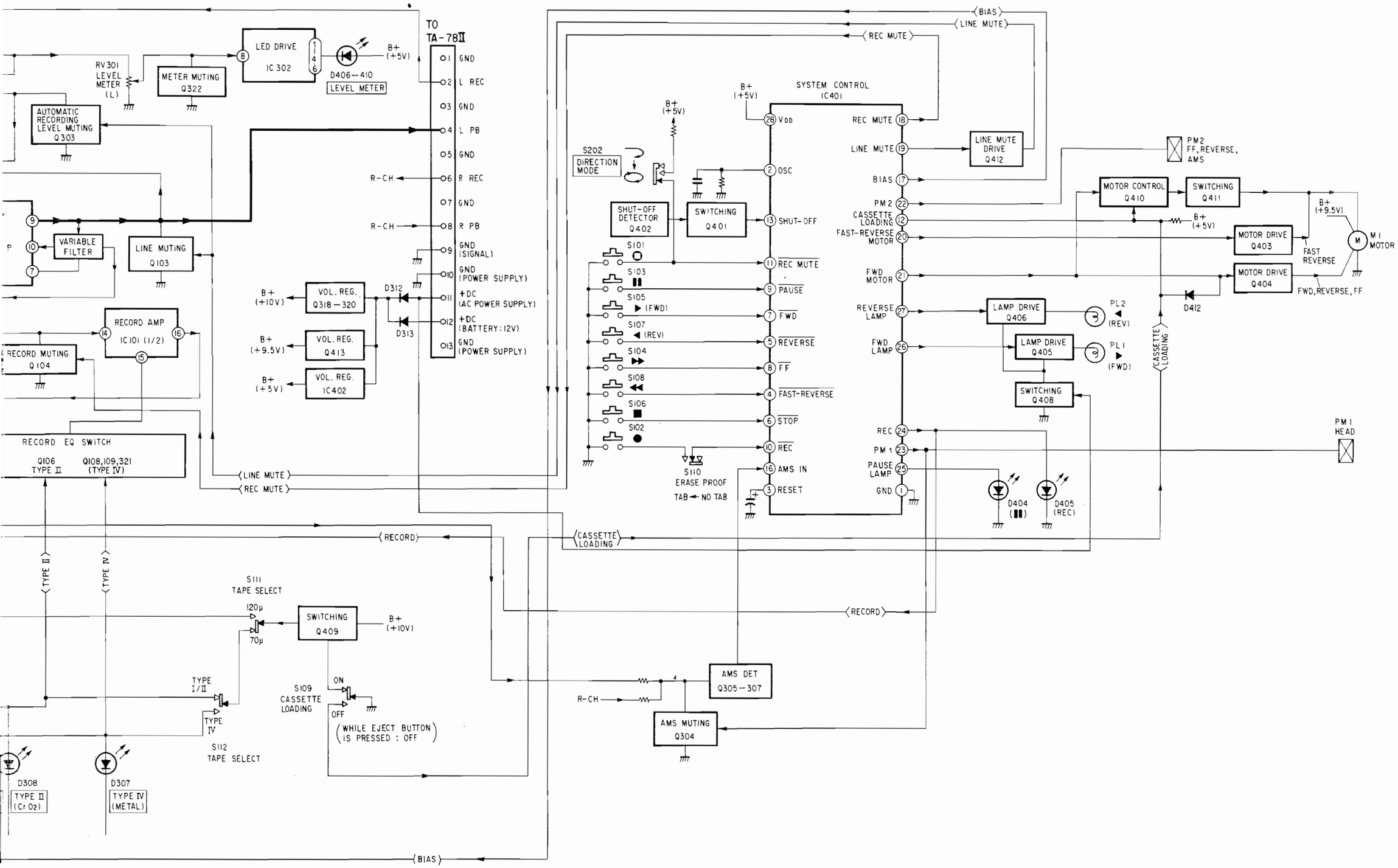
MECHANISM BLOCK (1)



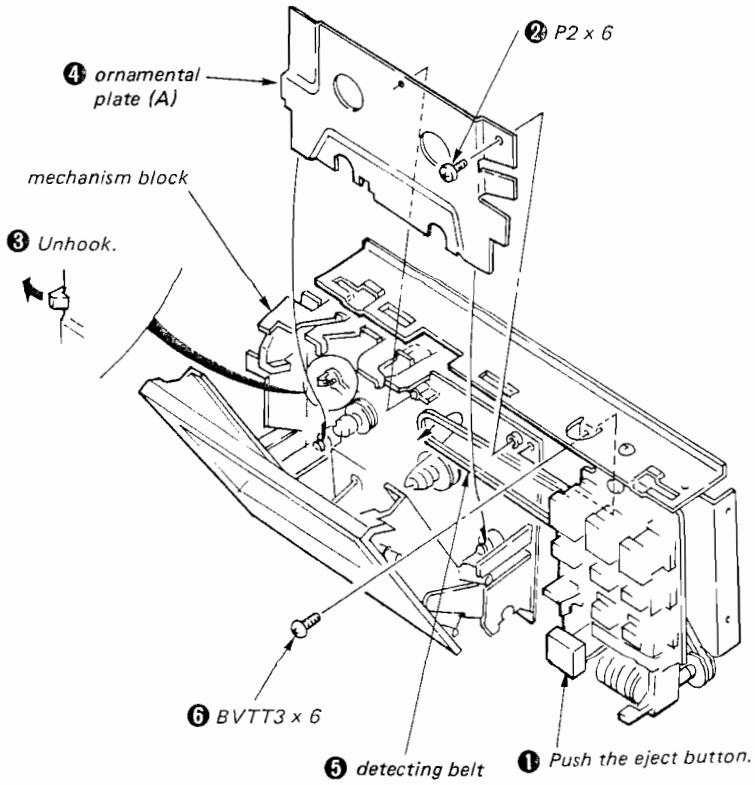
1-1. BLOCK DIAGRAM



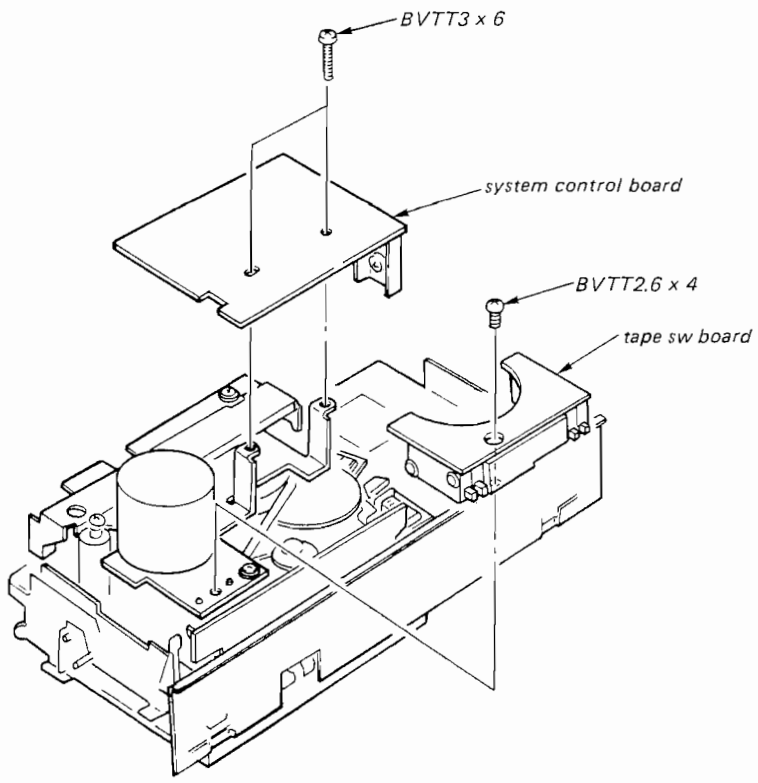
AEP, UK, E Model
FH-7MK II
TC-78 II



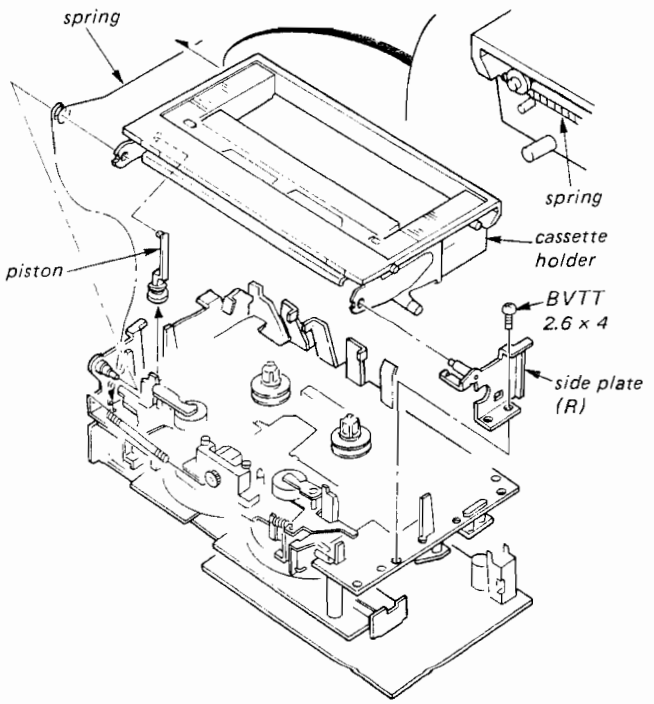
MECHANISM BLOCK (2)



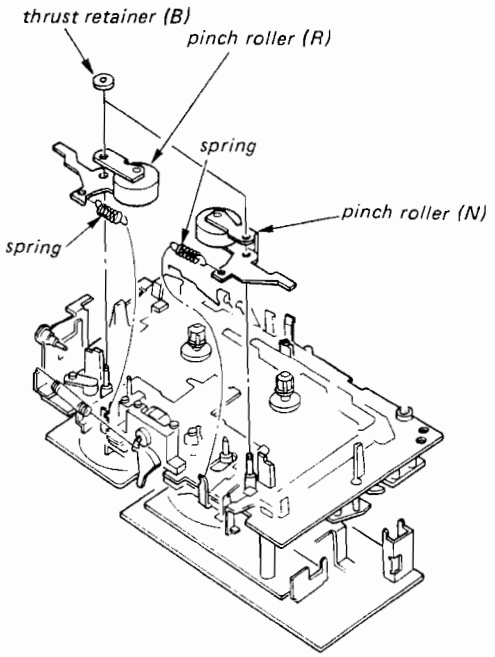
TAPE SW BOARD, SYSTEM CONTROL BOARD



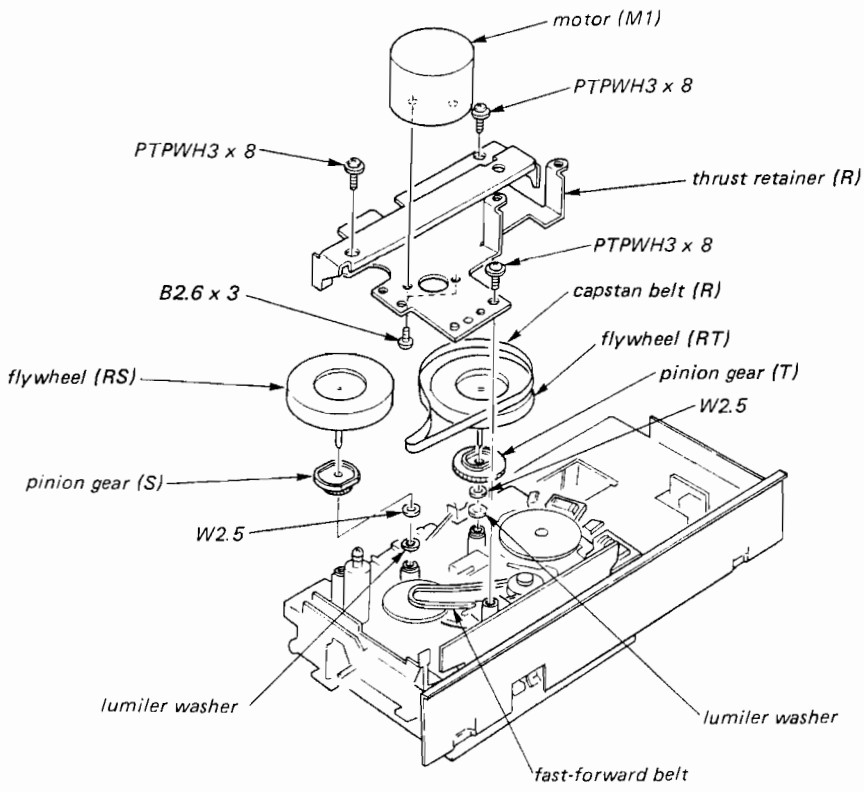
CASSETTE HOLDER



PINCH ROLLER



MOTOR, FLYWHEEL



SECTION 3
ADJUSTMENTS

3-1. MECHANICAL ADJUSTMENTS

PRECAUTION

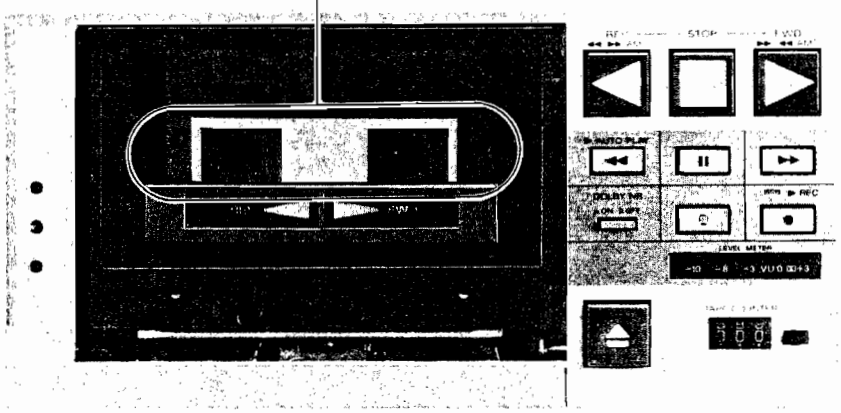
1. Clean the following parts with a denatured-alcohol-moistened swab:

record/playback head	pinch roller
erase head	rubber belts
capstan	idlers

2. Demagnetize the record/playback head with a head demagnetizer.
3. Do not use a magnetized screwdriver for the adjustments.
4. After the adjustments, apply suitable locking compound to the parts adjusted.
5. The adjustments should be performed with the rated power supply voltage (dc 2.5V) unless otherwise noted.

Torque Measurement

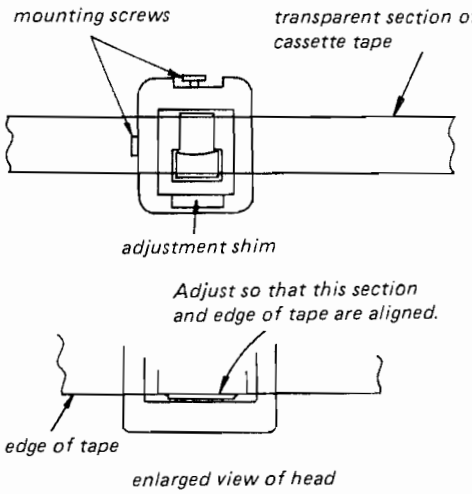
Torque	Torque meter	Meter reading
FWD	CQ-102C	28 – 60 g·cm (0.39 – 0.83 oz·inch)
FWD Back tension	CQ-102C	2 – 8 g·cm (0.03 – 0.1 oz·inch)
REV	CQ-102R	28 – 60 g.cm (0.39 – 0.83 oz·inch)
REV Back tension	CQ-102R	2 – 8 g·cm (0.03 – 0.1 oz·inch)
FF, REW	CQ-201B	80 – 165 g·cm (1.1 – 2.28 oz·inch)



Head Height Adjustment

The following adjustments should be made when the record/playback head is replaced.

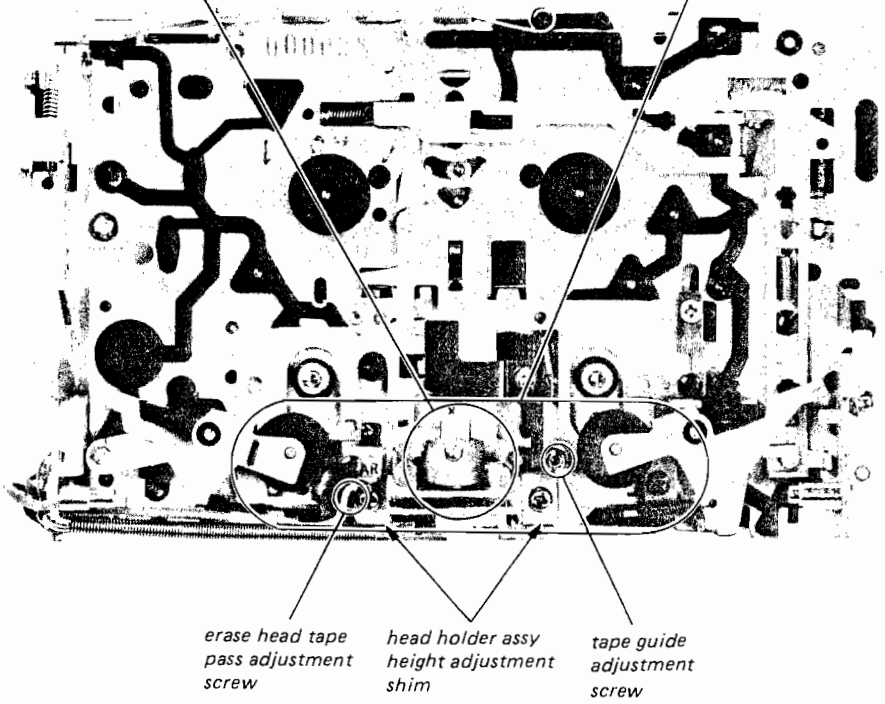
1. The head should be made after removing the head pad of the mirror cassette tape.
2. Using the leader section of the mirror cassette tape, adjustments are made by changing the adjusting shim so that the core and the edge of the tape become as shown in the illustration below when the tape is moved across the head.



Tape Path Adjustment

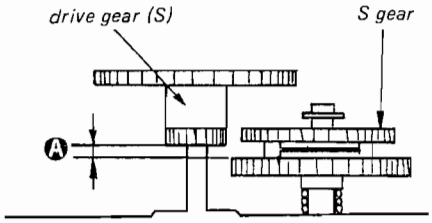
When assembling the erase head and head holder, and when replacing the tape guide (L), be sure to perform the following adjustments.

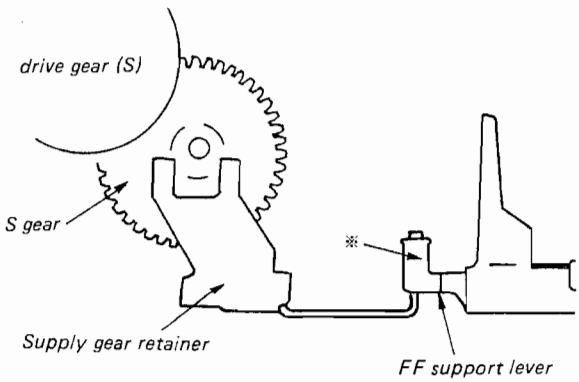
1. Using a mirror cassette, adjust each of the adjustment screws until there is not tape curling.
2. Perform adjustments by changing the height adjustment shim of the head holder assembly and the height adjustment shim of the record/playback head, so that the core of the record/playback head is positioned correctly for both FWD and REV.

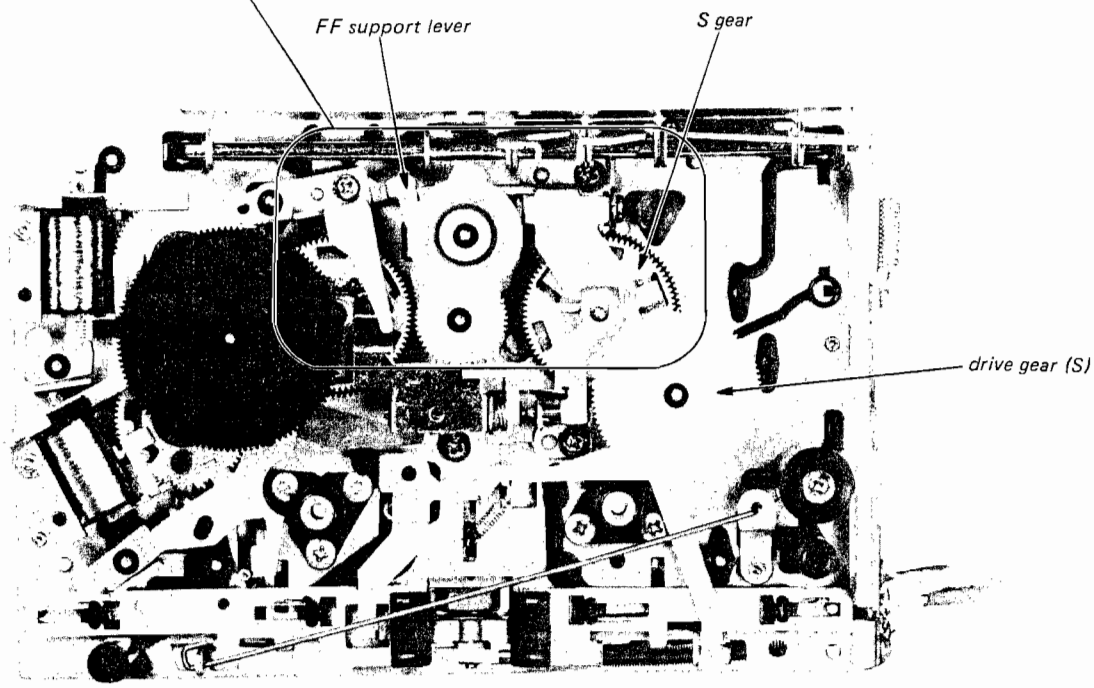


Supply Gear Retainer Position Adjustment

1. With the deck in the REV mode.
2. Bend the FF supplementary lever at the place indicated by the asterik (※) to make adjustments so that the dimension of Ⓐ is 1mm, ±0.5mm.

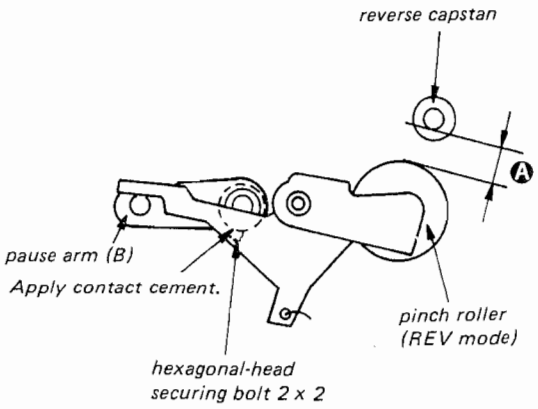


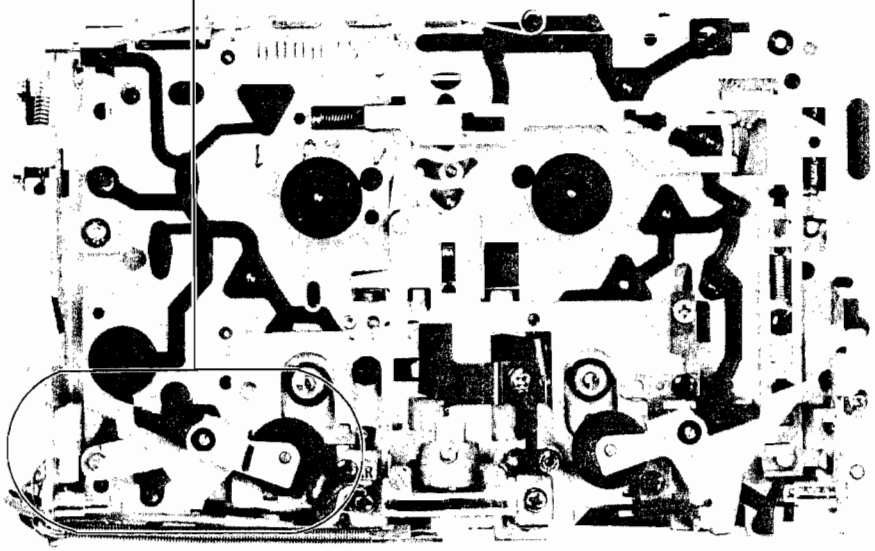




Pause Arm Position Adjustment

1. With the deck in the REV mode.
2. Loosen the hexagonal head securing bolts and adjust the position of the pause arm B so that the dimension of Ⓐ below becomes 0.5mm – 1.0mm.
3. After the adjustment, lock the screws with contact cement.

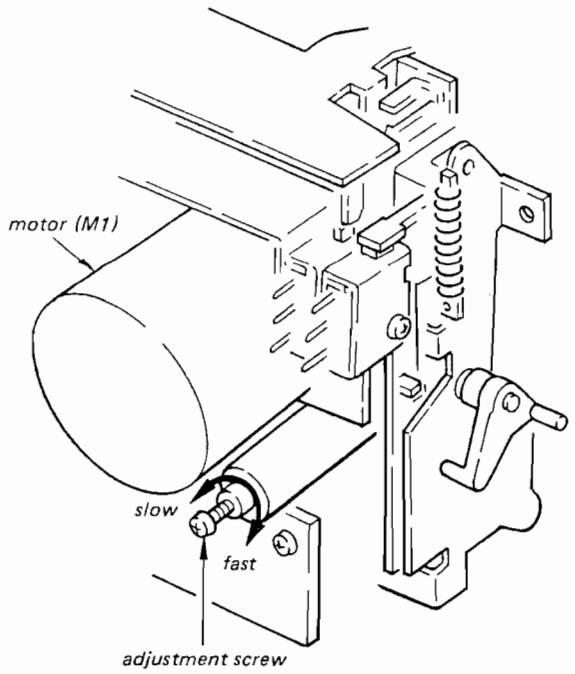




Cassette Holder Opening/Closing Speed Adjustment

1. Insert a CHF-90 or equivalent tape (in terms of weight).
2. Adjust the adjustment screw so that the time required for the cassette holder is 0.4 – 1.0 seconds when the EJECT button is depressed.

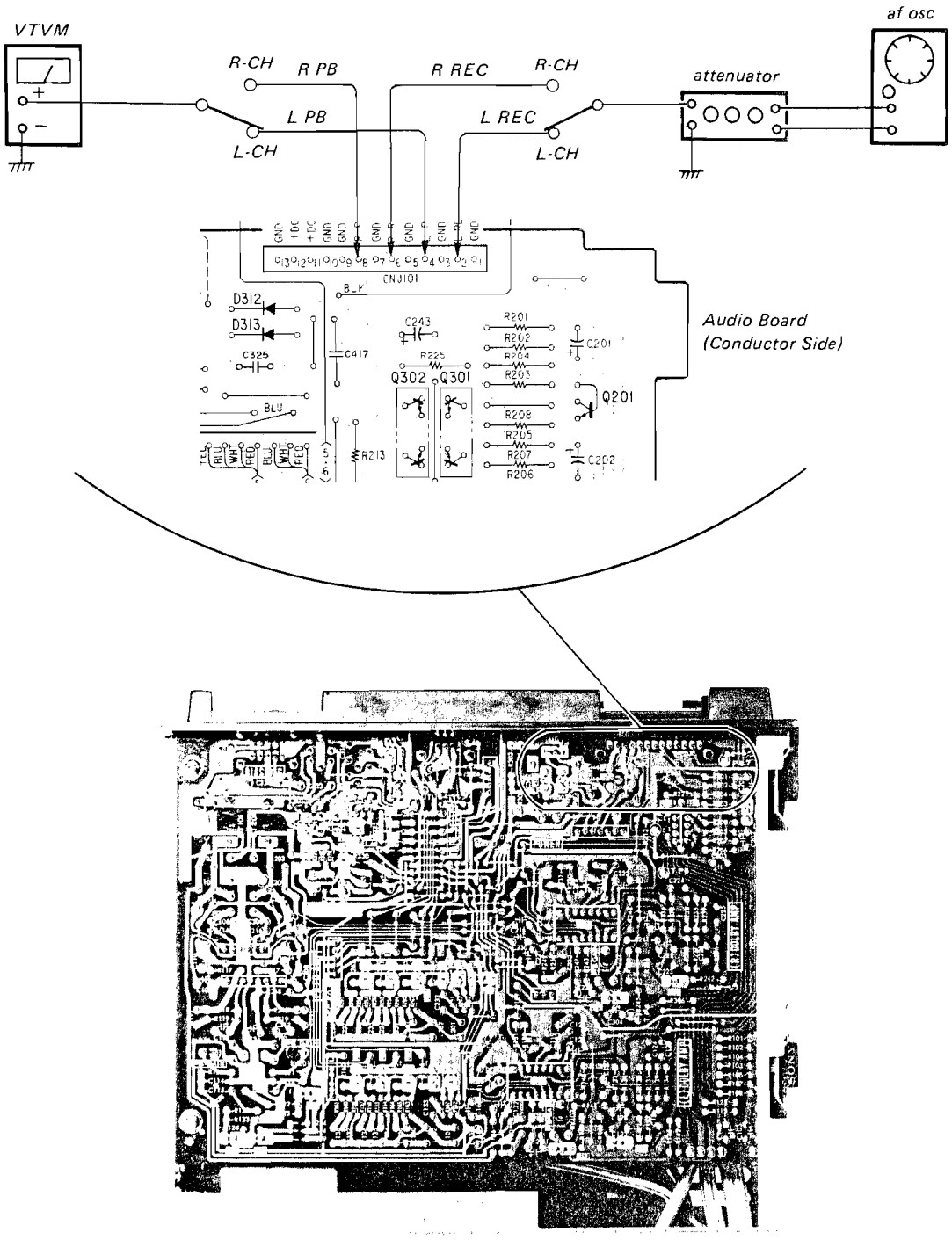
Adjustment Location:



3-2. ELECTRICAL ADJUSTMENTS

Note: The adjustment should be performed in the order given in this service manual. (Playback section may be adjusted earlier than record section.)
The adjustments should be performed for both L-CH and R-CH.

- **Output level check point**
- **Input level check point**



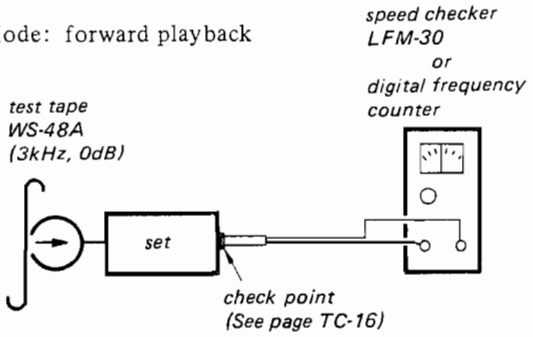
Tape Speed Adjustment

Setting:

TAPE SELECTOR switch: AUTO
DOLBY NR: OFF

Procedure:

Mode: forward playback

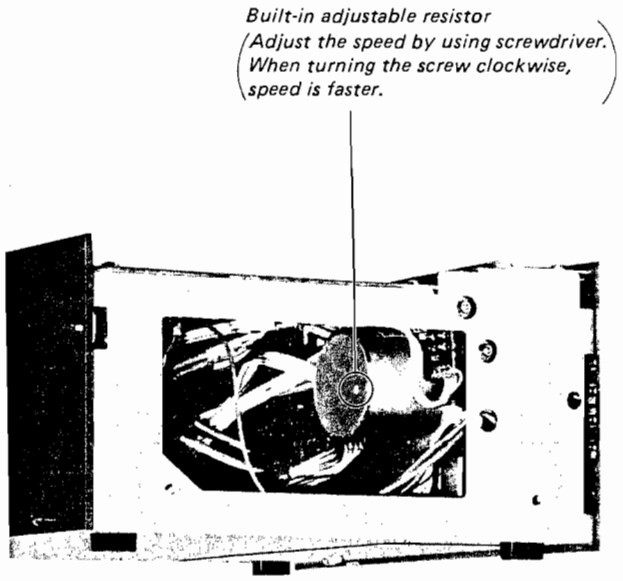


Specifications:

Speed checker	Digital frequency counter
±0.5%	2,985 – 3,015Hz

Frequency difference between the beginning and the end of the tape should be within 1% (30Hz).

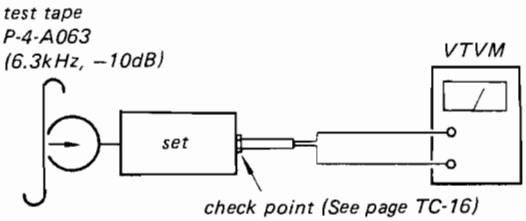
Adjustment Location: Motor (M1)



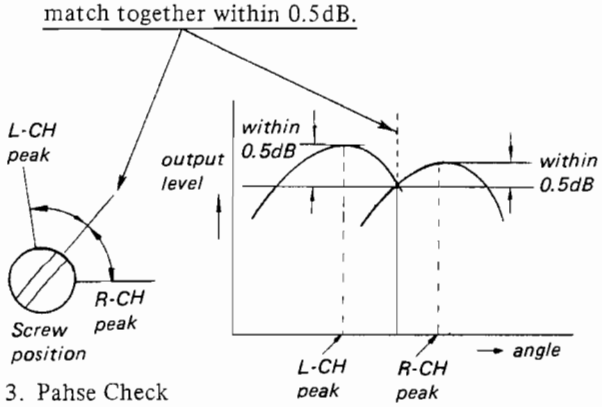
Forward Record/playback Head Azimuth Adjustment

Procedure:

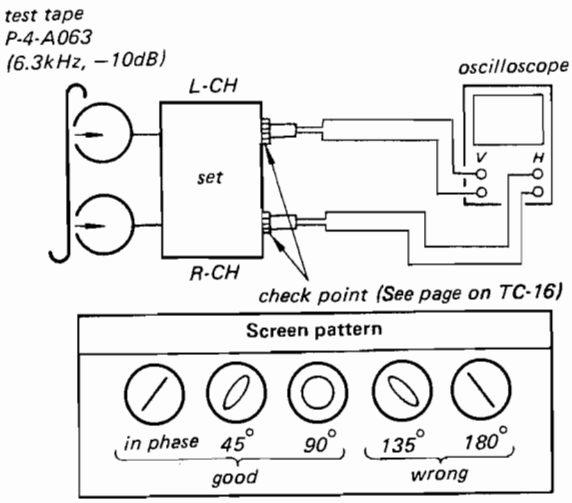
1. Mode: forward playback



2. Turn the adjustment screw for the maximum output levels. If these levels do not match, turn the adjustment screw until both of output levels match together within 0.5dB.

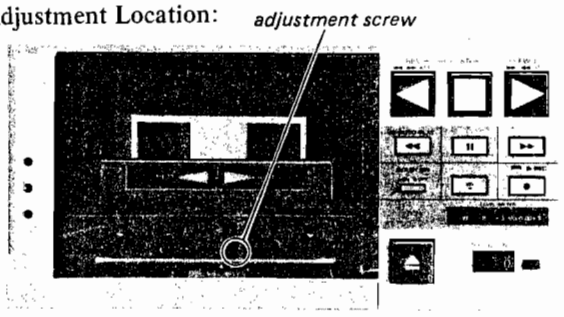


3. Pahse Check
Mode: forward playback



4. After the adjustment, lock the screws with locking compound.

Adjustment Location:

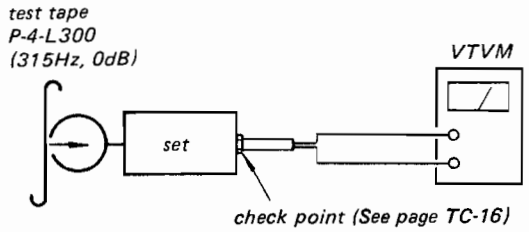


Playback Level Adjustment

Setting.

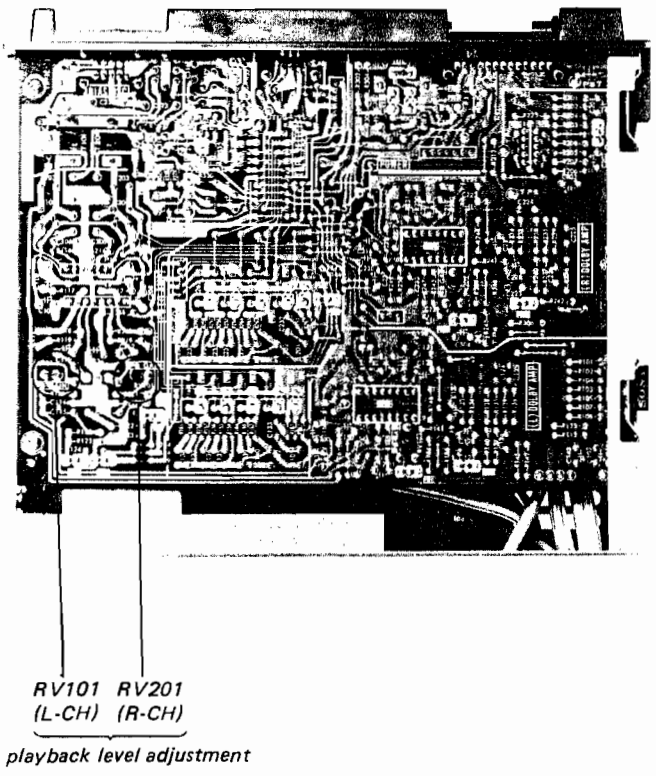
DOLBY NR switch: OFF
TAPE SELECTOR switch: AUTO

Procedure:



Adjust RV101 (L-CH) and RV201 (R-CH) to obtain 0.29 – 0.32V (–7.5 to –8.5dB) on the VTVM.
Check that the Line out level does not change in playback mode while changing the mode from playback to stop several times.

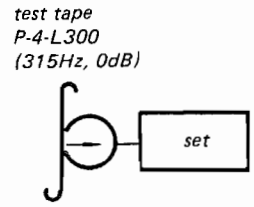
Adjustment Location: Audio Board



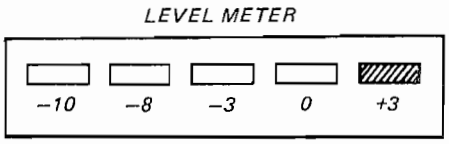
Level Meter Calibration

Proceudre:

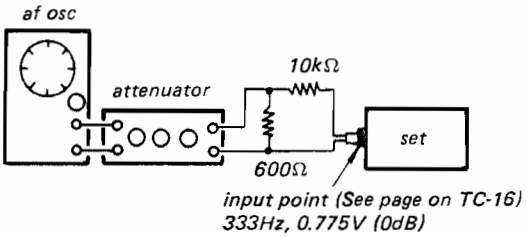
1. Mode: playback



2. Adjust RV301 so that the most-rightside segment (+3dB) of the LED meter goes on and again turn it in the reverse direction until the segment just goes off.

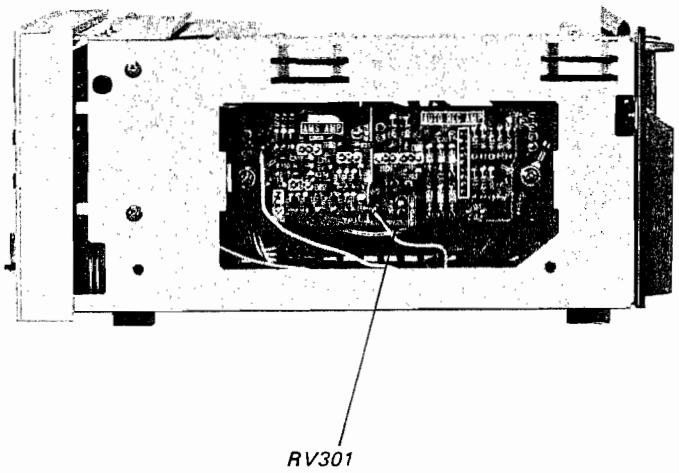


3. Mode: record



Make sure that all LEDs of level meter go on.

Adjustment Location: Audio Board



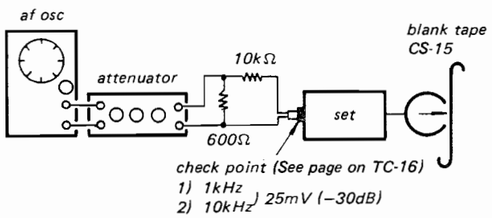
Record Bias Adjustment

Setting:

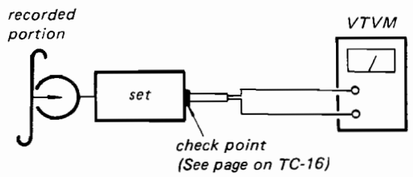
DOLBY NR switch:	OFF
TAPE SELECTOR switch:	AUTO
ISS switch:	1

Procedure:

1. Mode: record

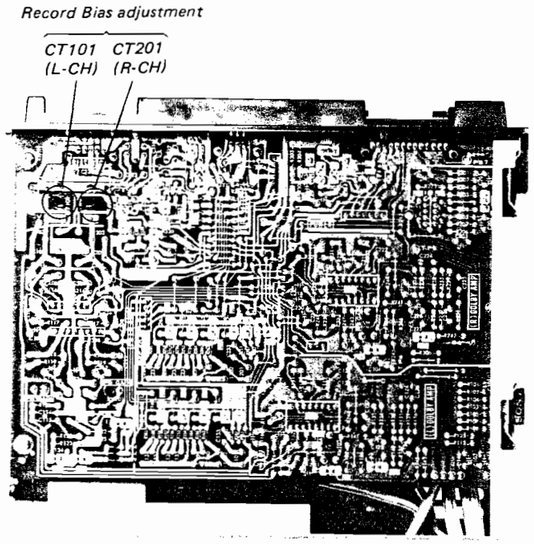


2. Mode: playback



Adjust CT101 (L-CH), CT201 (R-CH) so that the measurement point level of 10kHz signal in 0dB relative to that of 1kHz.

Adjustment Location: audio board .



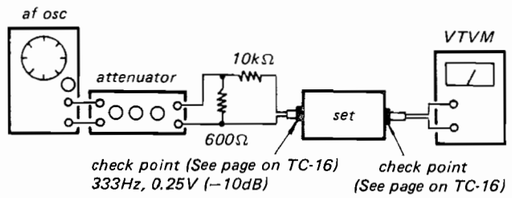
Record Level Adjustment

Setting:

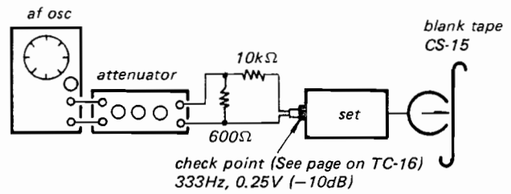
DOLBY NR switch:	OFF
TAPE SELECTOR switch:	AUTO
ISS switch:	1

Procedure:

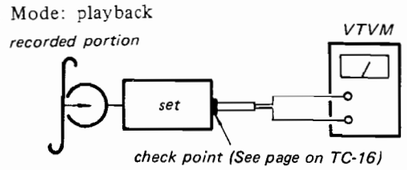
1. Mode: record



2. Mode: record

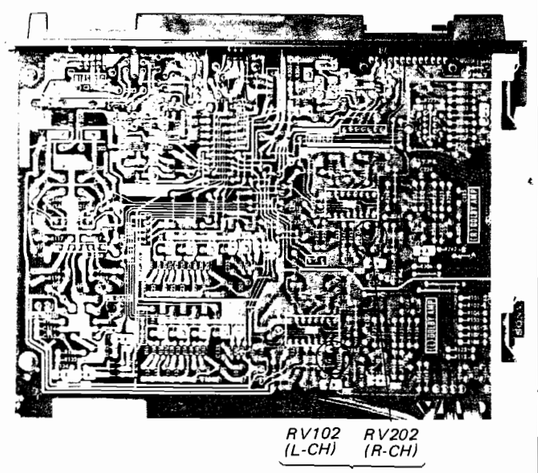


3. Mode: playback



4. Adjust RV102 (L-CH) and RV202 (R-CH) so that playback output level of step 3 is 0 ±0.5dB relative to that of step 1.

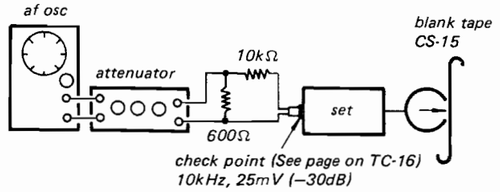
Adjustment Location: audio board



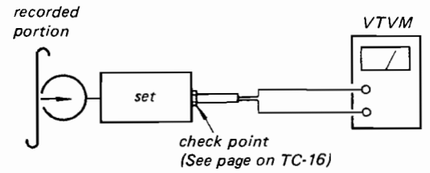
Reverse Playback Head Azimuth Adjustment

Procedure:

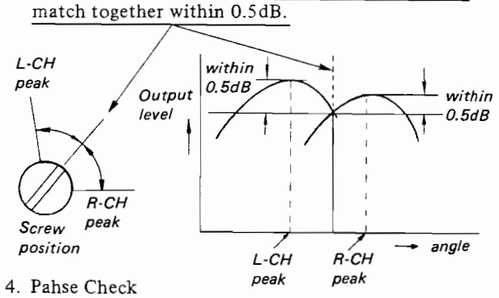
1. Mode: record



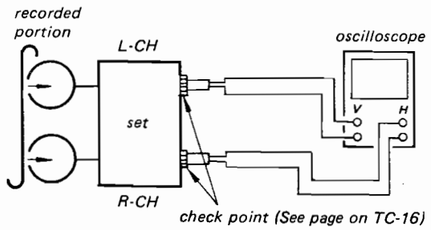
2. Mode: reverse playback

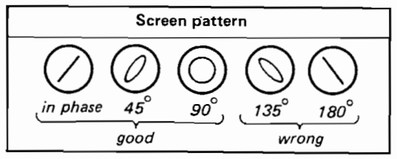


3. Turn the adjustment screw for the maximum output levels. If these levels do not match, turn the adjustment screw until both of output levels match together within 0.5dB.



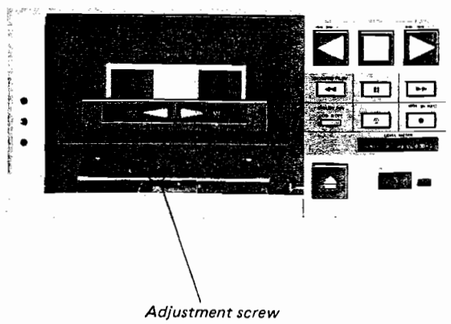
4. Pahse Check
   Mode: reverse playback





5. After the adjustment, lock the screws with locking compound.

Adjustment Location:

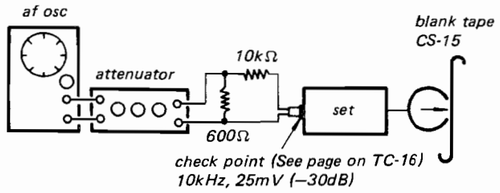


MEMO

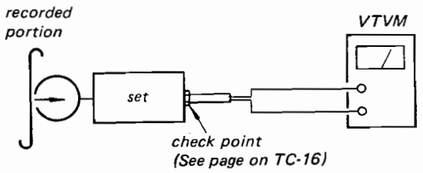
Reverse Playback Head Azimuth Adjustment

Procedure:

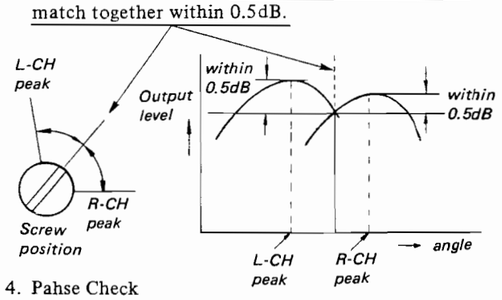
1. Mode: record



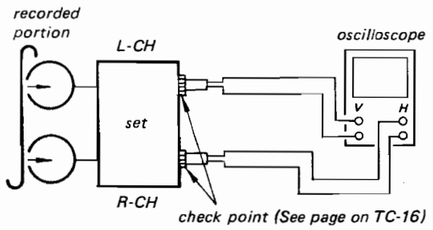
2. Mode: reverse playback

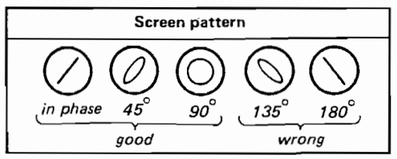


3. Turn the adjustment screw for the maximum output levels. If these levels do not match, turn the adjustment screw until both of output levels match together within 0.5dB.



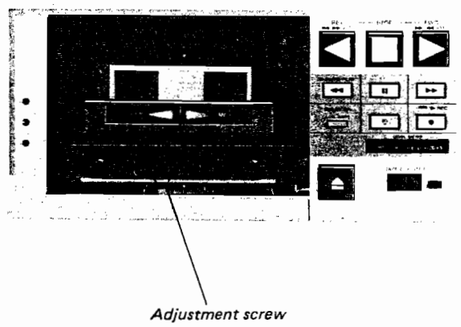
4. Pahse Check
   Mode: reverse playback





5. After the adjustment, lock the screws with locking compound.

Adjustment Location:

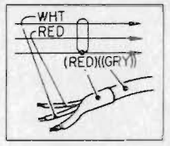


MEMO

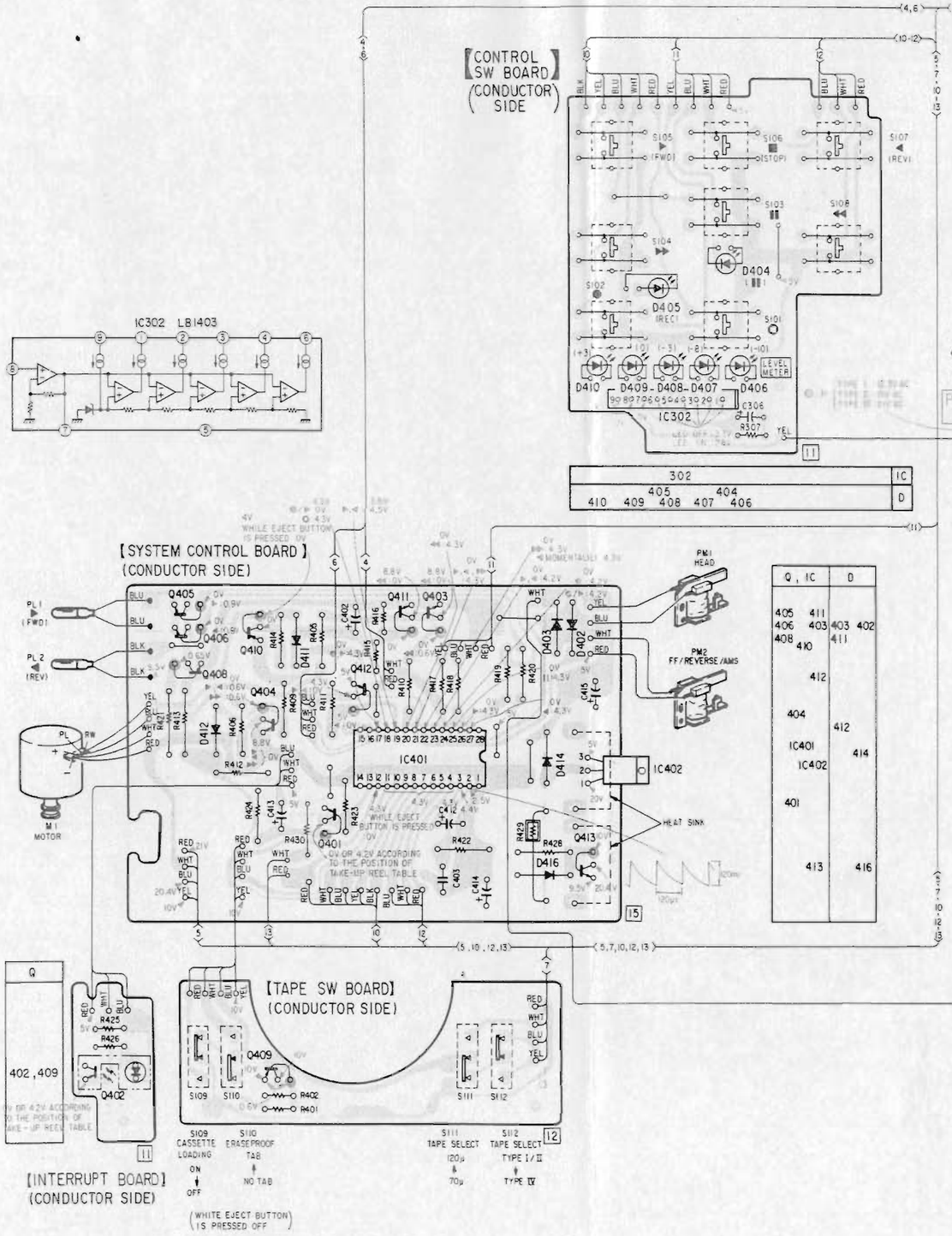
• See page TC-31 for Semiconductor lead layouts.

Note:

- Color code of sleeving over the end of the jacket.



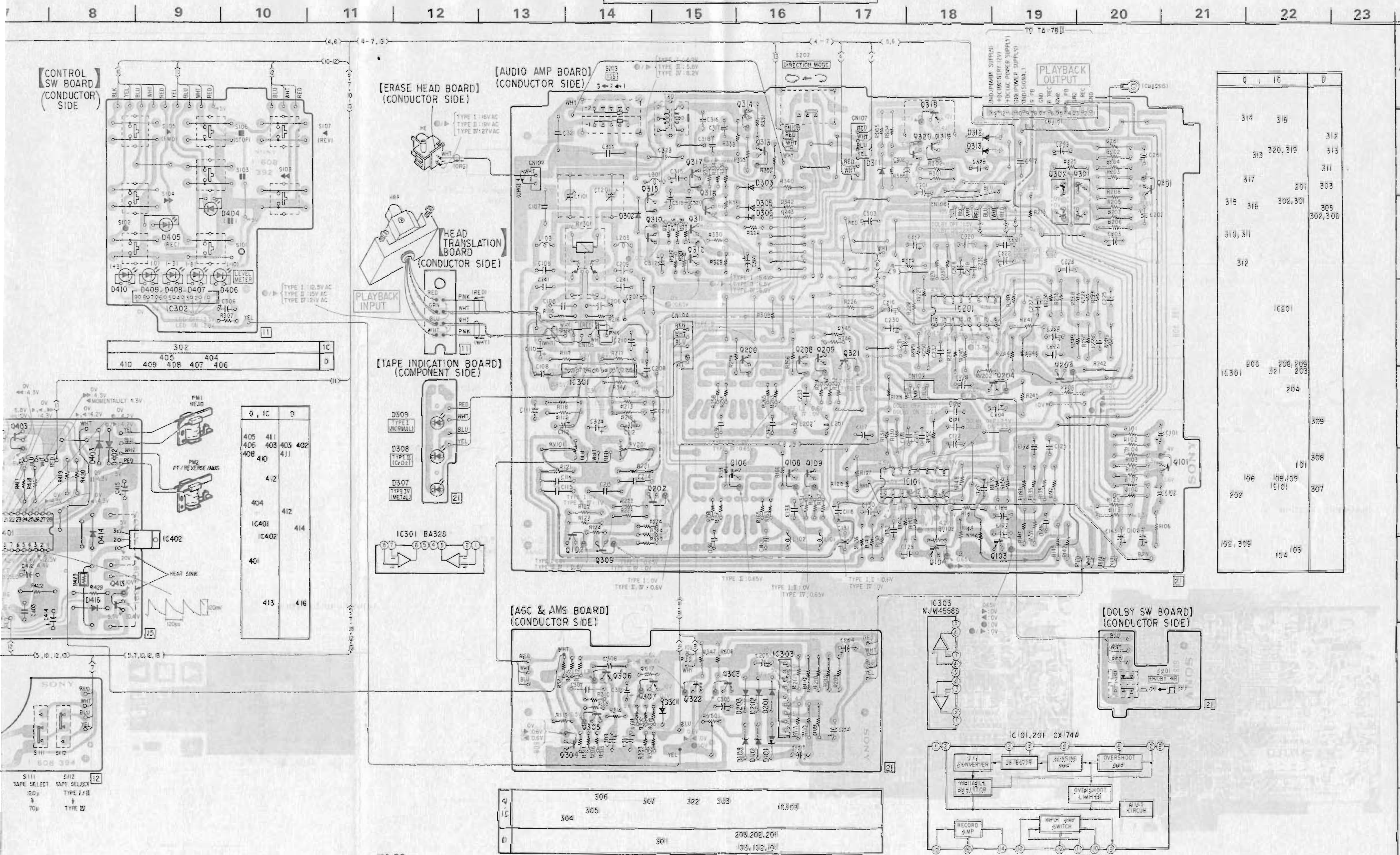
- ○— : parts extracted from the component side.
- —○ : parts extracted from the conductor side.
- ■ : part mounted on the conductor side.
- : B + pattern
- signal path
- : L-CH signal path
- : R-CH signal path

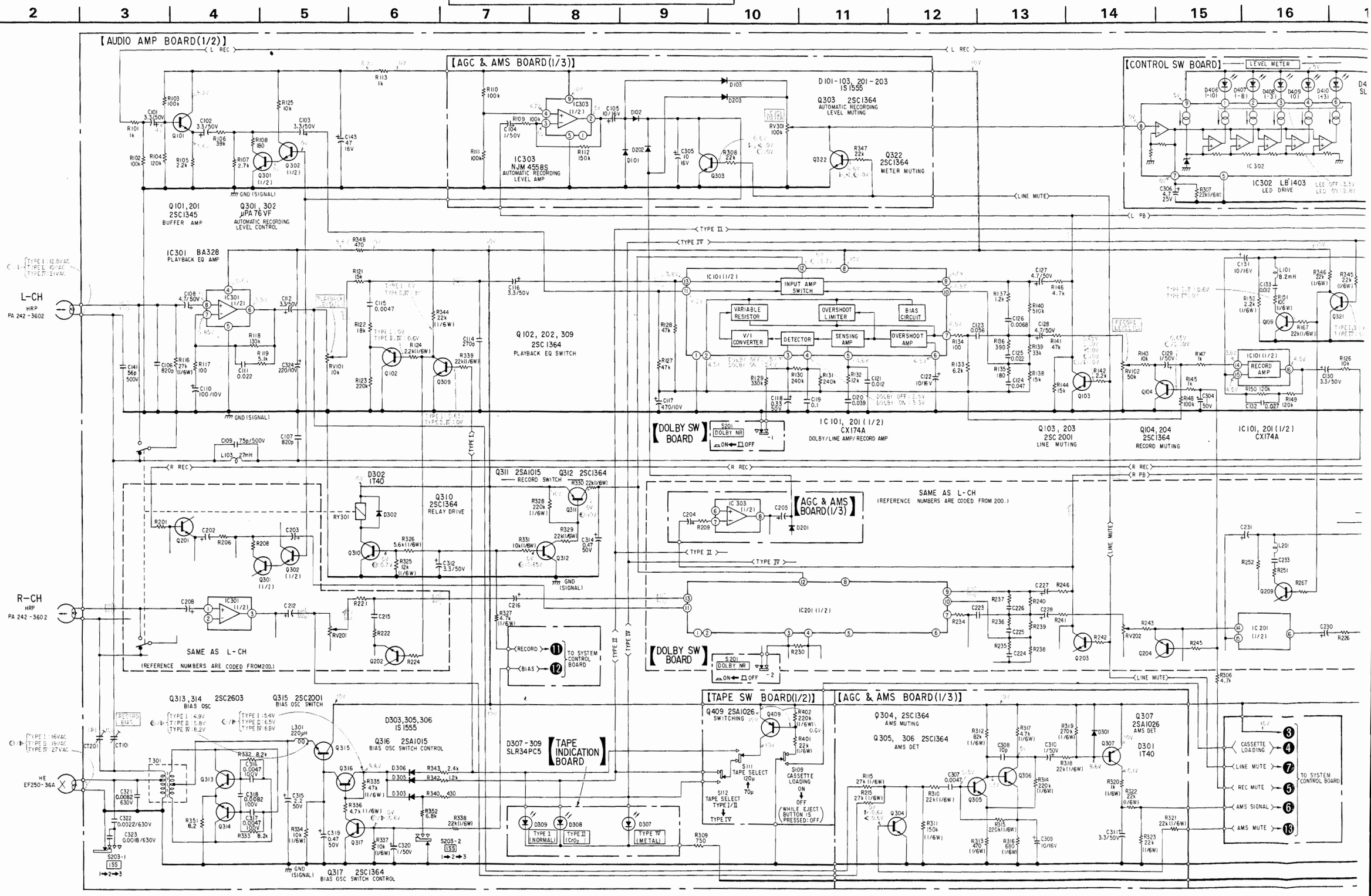


Q, IC	D
405 411	
406 403	403 402
408 410	411
412	
404	412
IC401	414
IC402	
401	
413	416

302	IC
405 404	D
410 409 408 407 406	

Q	306 307 322 303
IC	305 IC303
	304
D	301 203,202,201
	103,102,101


[CONTROL SW BOARD] (CONDUCTOR SIDE)
[ERASE HEAD BOARD] (CONDUCTOR SIDE)
[AUDIO AMP BOARD] (CONDUCTOR SIDE)
[HEAD TRANSLATION BOARD] (CONDUCTOR SIDE)
PLAYBACK INPUT
PLAYBACK OUTPUT
[TAPE INDICATION BOARD] (COMPONENT SIDE)
IC301 BA328
[AGC & AMS BOARD] (CONDUCTOR SIDE)
IC303 NJM4558S
[DOLBY SW BOARD] (CONDUCTOR SIDE)
IC101, 201 CX174A
V/I CONVERTER
DETECTOR
SENSING AMP
OVERSHOOT AMP
VARIABLE RESISTOR
OVERSHOOT LIMITER
BIAS CIRCUIT
RECORD AMP
SWITCH
TO TA-78II

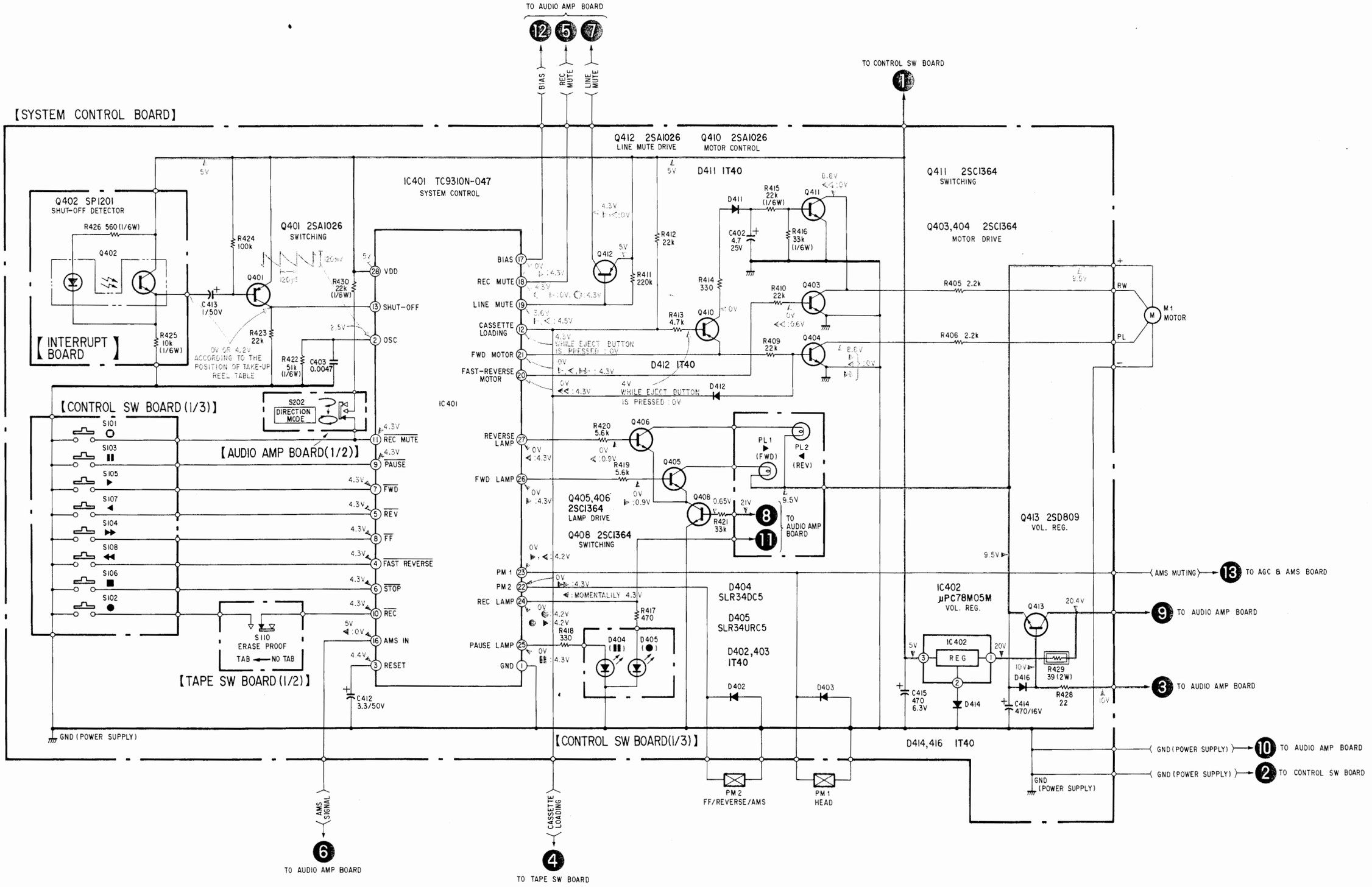

【AUDIO AMP BOARD(1/2)】
【AGC & AMS BOARD(1/3)】
【CONTROL SW BOARD】
【DOLBY SW BOARD】
【TAPE SW BOARD(1/2)】
【TAPE INDICATION BOARD】
L-CH
R-CH
HRP PA 242-3602
HE EF250-36A
IC301 BA328 PLAYBACK EQ AMP
Q101, 201 2SC1345 BUFFER AMP
Q301, 302 μPA76VF AUTOMATIC RECORDING LEVEL CONTROL
IC303 NJM4558S AUTOMATIC RECORDING LEVEL AMP
D101-103, 201-203 IS1555
Q303 2SC1364 AUTOMATIC RECORDING LEVEL MUTING
Q322 2SC1364 METER MUTING
IC302 LB1403 LED DRIVE
Q102, 202, 309 2SC1364 PLAYBACK EQ SWITCH
IC101(1/2) INPUT AMP SWITCH
VARIABLE RESISTOR
V/I CONVERTER
DETECTOR
OVERSHOOT LIMITER
SENSING AMP
OVERSHOOT AMP
BIAS CIRCUIT
IC101, 201 (1/2) CX174A DOLBY/LINE AMP/RECORD AMP
Q103, 203 2SC2001 LINE MUTING
Q104, 204 2SC1364 RECORD MUTING
IC101, 201 (1/2) CX174A
RECORD AMP
Q310 2SC1364 RELAY DRIVE
Q311 2SA1015 RECORD SWITCH
Q312 2SC1364
D302 1T40
RY301
SAME AS L-CH (REFERENCE NUMBERS ARE CODED FROM 200.)
Q313, 314 2SC2603 BIAS OSC
Q315 2SC2001 BIAS OSC SWITCH
Q316 2SA1015 BIAS OSC SWITCH CONTROL
Q317 2SC1364 BIAS OSC SWITCH CONTROL
D303, 305, 306 IS1555
D307-309 SLR34PC5
D309 TYPE I (NORMAL)
D308 TYPE II (CrO2)
D307 TYPE IV (METAL)
TO SYSTEM CONTROL BOARD
RECORD
BIAS
Q409 2SA1026 SWITCHING
S111 TAPE SELECT
S112 TAPE SELECT TYPE I/II
S109 CASSETTE LOADING
Q304, 2SC1364 AMS MUTING
Q305, 306 2SC1364 AMS DET
Q307 2SA1026 AMS DET
D301 1T40
CASSETTE LOADING
LINE MUTE
REC MUTE
AMS SIGNAL
AMS MUTE
S201 DOLBY NR
ON
OFF
L REC
L PB
R REC
R PB
GND (SIGNAL)

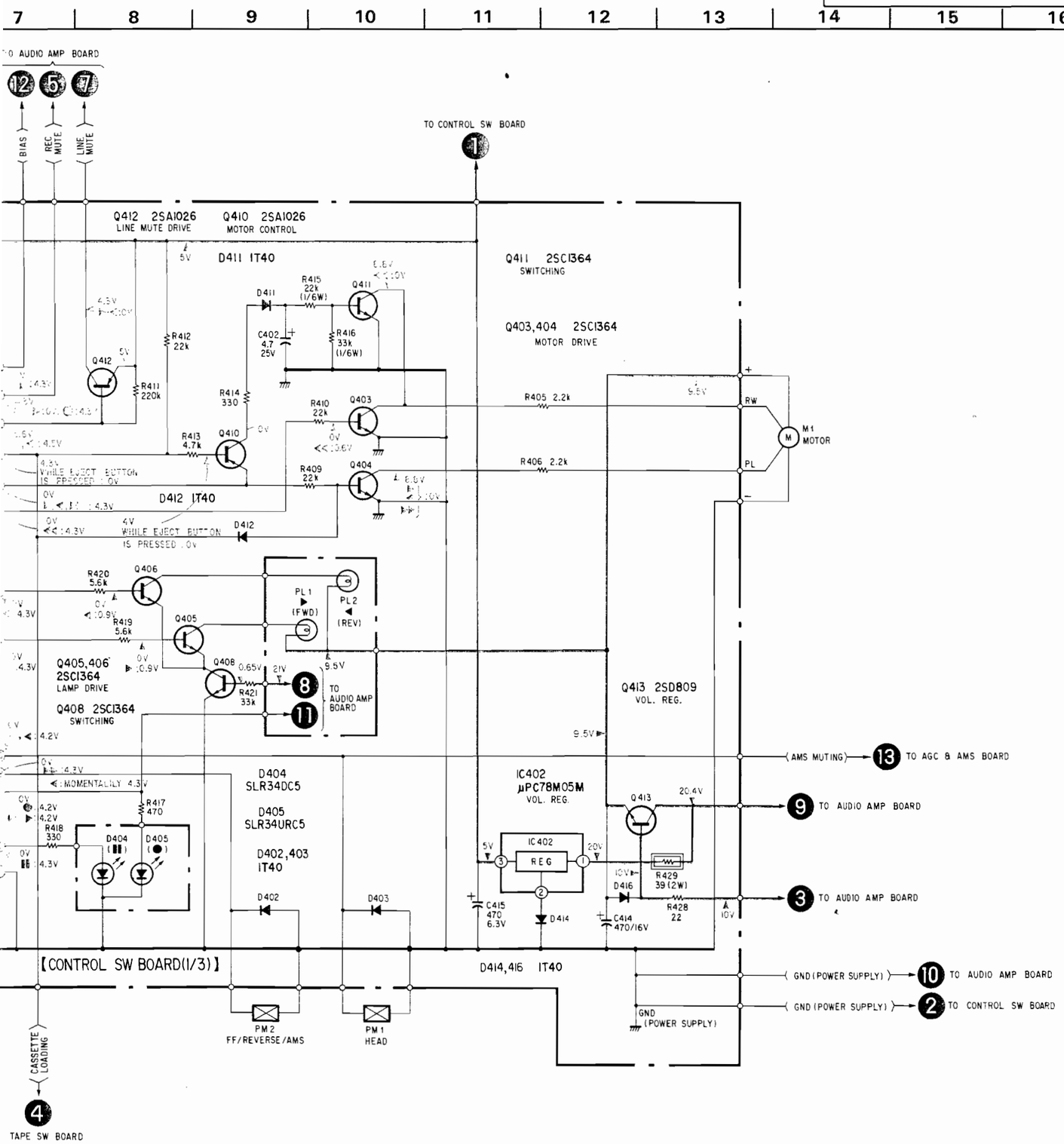
AEP, UK, E Model FH-7MK II / TC-78 II

8 9 10 11 12 13 14 15 16 17 18 19 20 21 22

A B C D E F G H I J

[AMS BOARD(1/3)]
IC303 NJM4558S AUTOMATIC RECORDING LEVEL AMP
D101-103, 201-203 1S1555
Q303 2SC1364 AUTOMATIC RECORDING LEVEL MUTING
Q322 2SC1364 METER MUTING
[CONTROL SW BOARD]
LEVEL METER
D406-410 SLP251B
IC302 LB1403 LED DRIVE
TO SYSTEM CONTROL BOARD
Q102, 202, 309 2SC1364 PLAYBACK EQ SWITCH
IC101, 201 (1/2) CX174A DOLBY/LINE AMP/RECORD AMP
Q103, 203 2SC2001 LINE MUTING
Q104, 204 2SC1364 RECORD MUTING
Q106, 108, 109 2SC1364
Q206, 208, 209 2SC1364
Q321 2SC1364
RECORD EQ SWITCH
[DOLBY SW BOARD] S201 DOLBY NR ON/OFF
Q311 2SA1015 Q312 2SC1364 RECORD SWITCH
SAME AS L-CH (REFERENCE NUMBERS ARE CODED FROM 200.)
[AGC & AMS BOARD(1/3)]
IC201 (1/2)
TO TA-78II
[TAPE SW BOARD(1/2)]
Q409 2SA1026 SWITCHING
S111 TAPE SELECT 120μ 70μ
S112 TAPE SELECT TYPE I/II TYPE IV
S109 CASSETTE LOADING ON OFF (WHILE EJECT BUTTON IS PRESSED: OFF)
D307-309 SLR34PC5 [TAPE INDICATION BOARD]
D309 TYPE I (NORMAL)
D308 TYPE II (CrO_2)
D307 TYPE IV (METAL)
[AGC & AMS BOARD(1/3)]
Q304, 2SC1364 AMS MUTING
Q305, 306 2SC1364 AMS DET
Q307 2SA1026 AMS DET
D301 1T40
CASSETTE LOADING
LINE MUTE
REC MUTE
AMS SIGNAL
AMS MUTE
TO SYSTEM CONTROL BOARD
Q318 2SD809 VOL. REG
Q319, 320 2SC1364
D312, 313 10E2
D311 HZ6B2L
CN3101
GND
L REC
L PB
R REC
R PB
GND (SIGNAL)
GND (POWER SUPPLY)
+DC (AC POWER SUPPLY)
+DC (BATTERY: 12V)
RECORD
BIAS
TO SYSTEM CONTROL BOARD


TO AUDIO AMP BOARD
12 5 7
BIAS
REC MUTE
LINE MUTE
TO CONTROL SW BOARD
1
【SYSTEM CONTROL BOARD】
Q412 2SA1026
LINE MUTE DRIVE
Q410 2SA1026
MOTOR CONTROL
D411 IT40
Q411 2SC1364
SWITCHING
Q403,404 2SC1364
MOTOR DRIVE
IC401 TC9310N-047
SYSTEM CONTROL
Q402 SPI201
SHUT-OFF DETECTOR
R426 560(1/6W)
Q402
R425 10k (1/6W)
【INTERRUPT BOARD】
R424 100k
Q401 2SA1026
SWITCHING
C413 1/50V
R423 22k
R430 22k (1/6W)
R422 51k (1/6W)
C403 0.0047
0V OR 4.2V ACCORDING TO THE POSITION OF TAKE-UP REEL TABLE
VDD
SHUT-OFF
OSC
BIAS
REC MUTE
LINE MUTE
CASSETTE LOADING
FWD MOTOR
FAST-REVERSE MOTOR
REVERSE LAMP
FWD LAMP
PM 1
PM 2
REC LAMP
PAUSE LAMP
GND
R412 22k
R411 220k
R414 330
R413 4.7k
R415 22k (1/6W)
R416 33k (1/6W)
C402 4.7 25V
R410 22k
R409 22k
4.3V WHILE EJECT BUTTON IS PRESSED : 0V
D412 IT40
D412
R405 2.2k
R406 2.2k
RW
PL
M1 MOTOR
【CONTROL SW BOARD (1/3)】
S101
S103
S105
S107
S104
S108
S106
S102
S202 DIRECTION MODE
S110 ERASE PROOF TAB ← NO TAB
【AUDIO AMP BOARD(1/2)】
【TAPE SW BOARD (1/2)】
REC MUTE
PAUSE
FWD
REV
FF
FAST REVERSE
STOP
REC
AMS IN
RESET
C412 3.3/50V
R420 5.6k
Q406
R419 5.6k
Q405
Q405,406 2SC1364 LAMP DRIVE
Q408 2SC1364 SWITCHING
Q408
R421 33k
PL1 (FWD)
PL2 (REV)
TO AUDIO AMP BOARD
8
11
R417 470
R418 330
D404 (■)
D405 (●)
D404 SLR34DC5
D405 SLR34URC5
D402,403 IT40
D402
D403
PM2 FF/REVERSE/AMS
PM1 HEAD
Q413 2SD809
VOL. REG.
IC402 μPC78M05M
VOL. REG.
REG
C415 470 6.3V
D414
C414 470/16V
D416
R429 39 (2W)
R428 22
D414,416 IT40
AMS MUTING
13 TO AGC & AMS BOARD
9 TO AUDIO AMP BOARD
3 TO AUDIO AMP BOARD
GND (POWER SUPPLY)
10 TO AUDIO AMP BOARD
GND (POWER SUPPLY)
2 TO CONTROL SW BOARD
GND (POWER SUPPLY)
【CONTROL SW BOARD(1/3)】
AMS SIGNAL
6 TO AUDIO AMP BOARD
CASSETTE LOADING
4 TO TAPE SW BOARD



NOTE FOR SCHEMATIC DIAGRAM

– Audio Amp Section –

Note:

- Components for right channel have same values as for left channel. Reference numbers are coded from 200.
- All capacitors are in µF unless otherwise noted. pF : µµF 50WV or less are not indicated except for electrolytics and tantalums.
- All resistors are in ohms, ¼W unless otherwise noted. kΩ : 1000Ω, MΩ : 1000kΩ
- ⌐¬ : adjustment for repair.
- ——— : B+ bus.
- Readings are taken under no-signal conditions.

  No mark: STOP
  - ▶ : FWD
  - ◀ : REV
  - ▶▶ : FF
  - ◀◀ : FAST-REVERSE
  - ● : REC
  - ●/▶ : REC/FWD
  - ○ : REC MUTE
  - ▮▮ : PAUSE
- ⌐¬ : signal path
- Switch

Ref. No.	Switch	Position
S109	CASSETTE LOADING	ON
S111	TAPE SELECTOR	70µ
S112	TAPE SELECTOR	TYPE I/II
S201	DOLBY NR	⌐¬ OFF
S203	ISS	1

– System Control Section –

Note:

- All capacitors are in µF unless otherwise noted. pF : µµF 50WV or less are not indicated except for electrolytics and tantalums.
- All resistors are in ohms, ¼W unless otherwise noted. kΩ : 1000Ω, MΩ : 1000kΩ
- ⌐¬ : nonflammable resistor.
- ——— : B+ bus.
- Readings are taken under no-signal conditions.

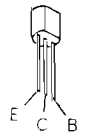
  No mark: STOP
  - ▶ : FWD
  - ◀ : REV
  - ▶▶ : FF
  - ◀◀ : FAST-REVERSE
  - ● : REC
  - ●/▶ : REC/FWD
  - ○ : REC MUTE
  - ▮▮ : PAUSE
- Switch

Ref. No.	Switch	Position
S101	○ (REC MUTE)	OFF
S102	● (REC)	OFF
S103	▮▮ (PAUSE)	OFF
S104	▶▶ (FF)	OFF
S105	▶ (FWD)	OFF
S106	■ (STOP)	OFF
S107	◀ (REV)	OFF
S108	◀◀ (FAST-REVERSE)	OFF
S110	ACCIDENTAL-ERASURE PREVENTION	NO TAB
S202	DIRECTION MODE	⏎

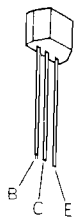
Note: Voltages are measured with a VOM (50kΩ/V).

SEMICONDUCTOR LEAD LAYOUTS

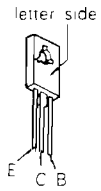
2SA1015
2SC945
2SC1345
2SC1364
2SC2001



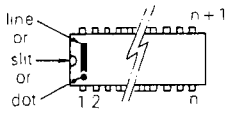
2SC2458



2SD809

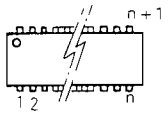


CX174A
MB84069UB
TC9310N-001
μPD4011C



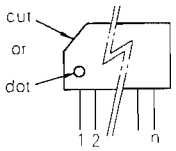
(Top view)

MB84001B
MB84011B

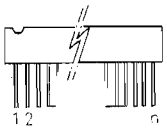


(Top view)

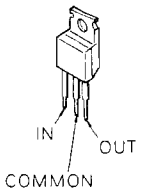
LB1403
NJM4558S



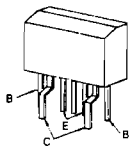
BA328



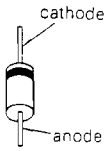
NJM78M05A



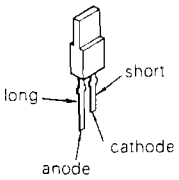
μPA76V-FA



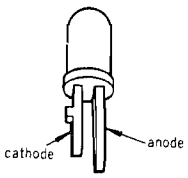
10E2
1S1555
1SS133
HZ6B1L



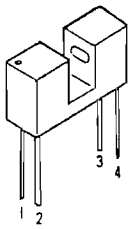
SLP251B

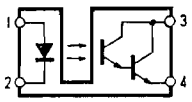


SLR34DC5
SLR34PC5
SLR34URC5



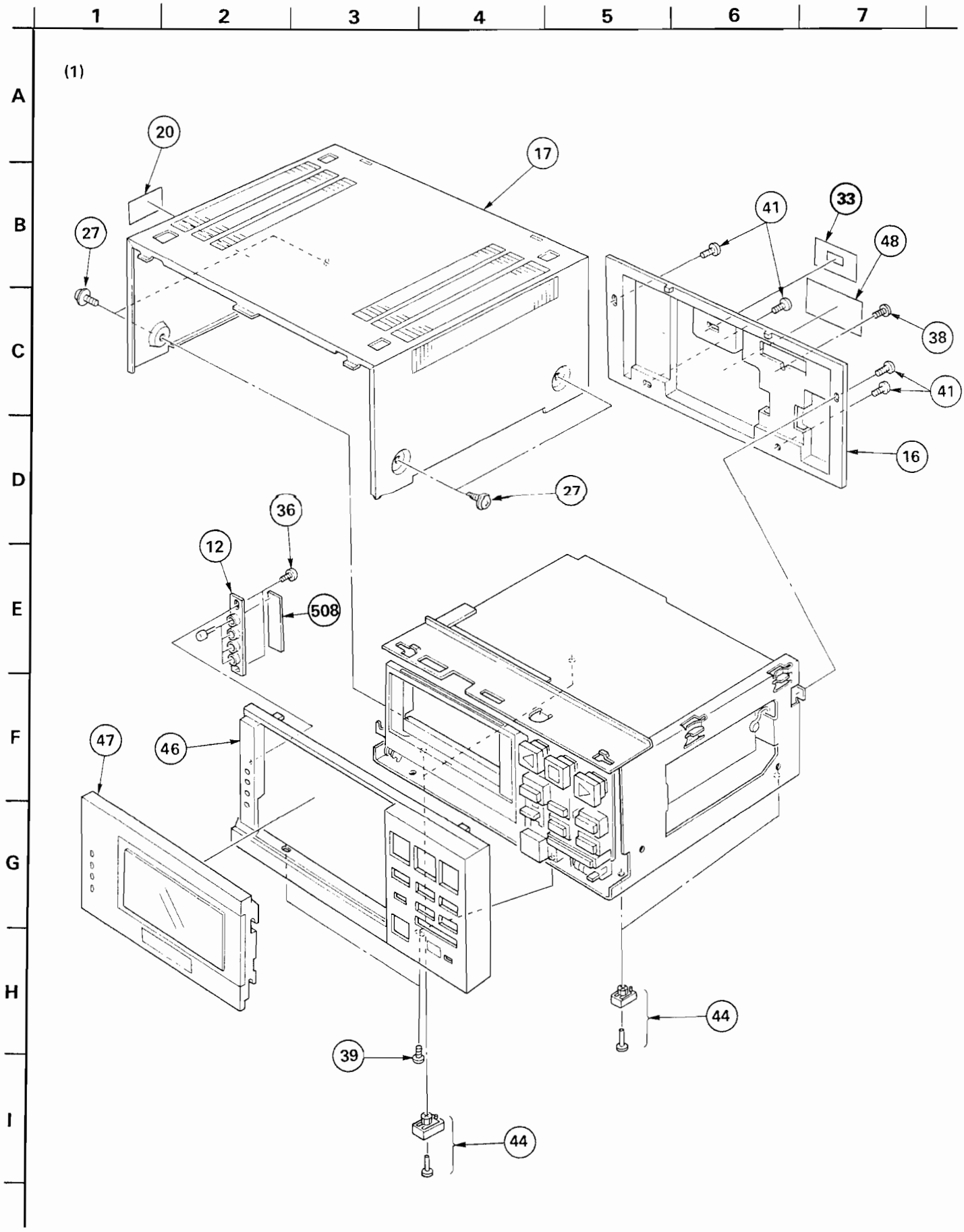
SPI201



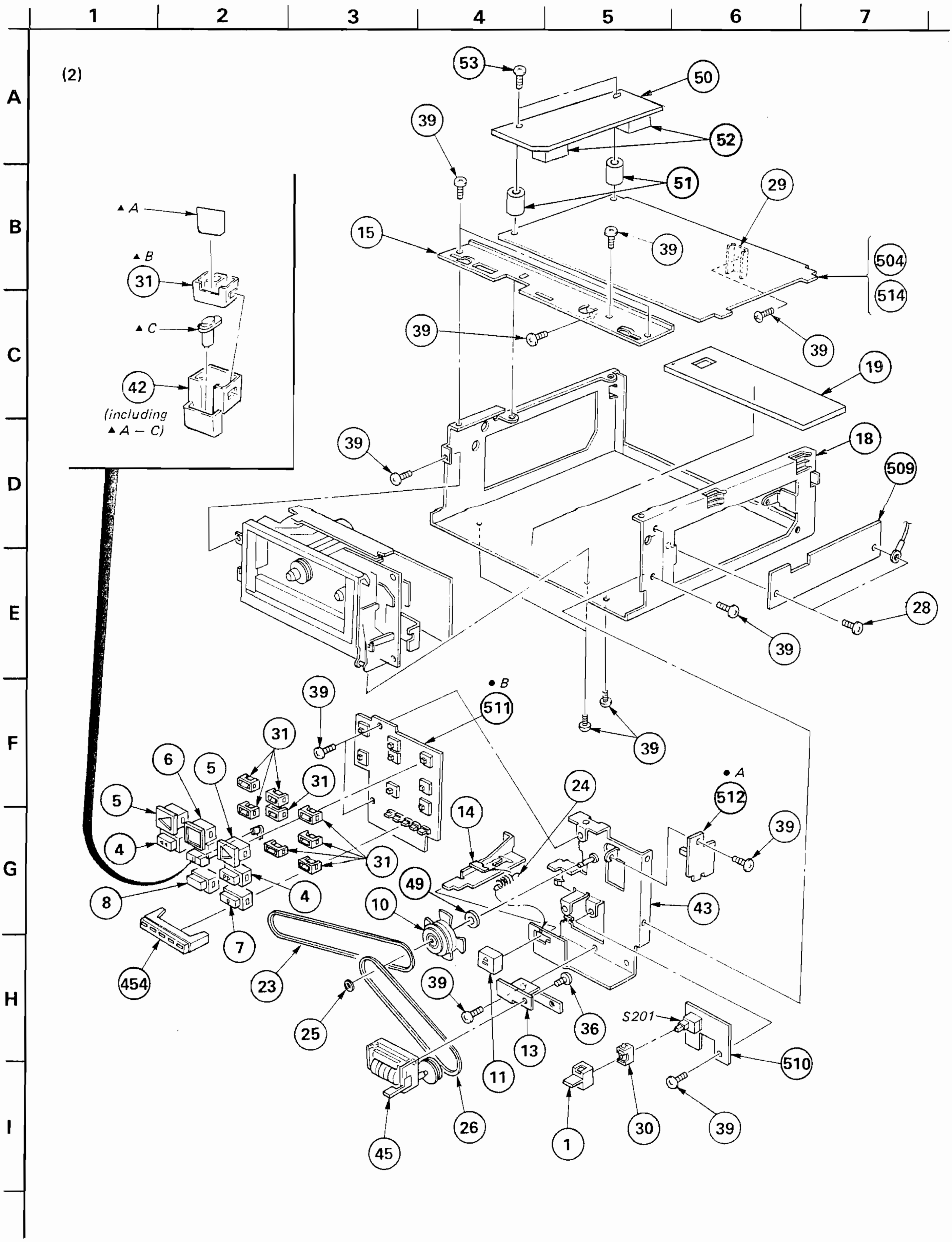


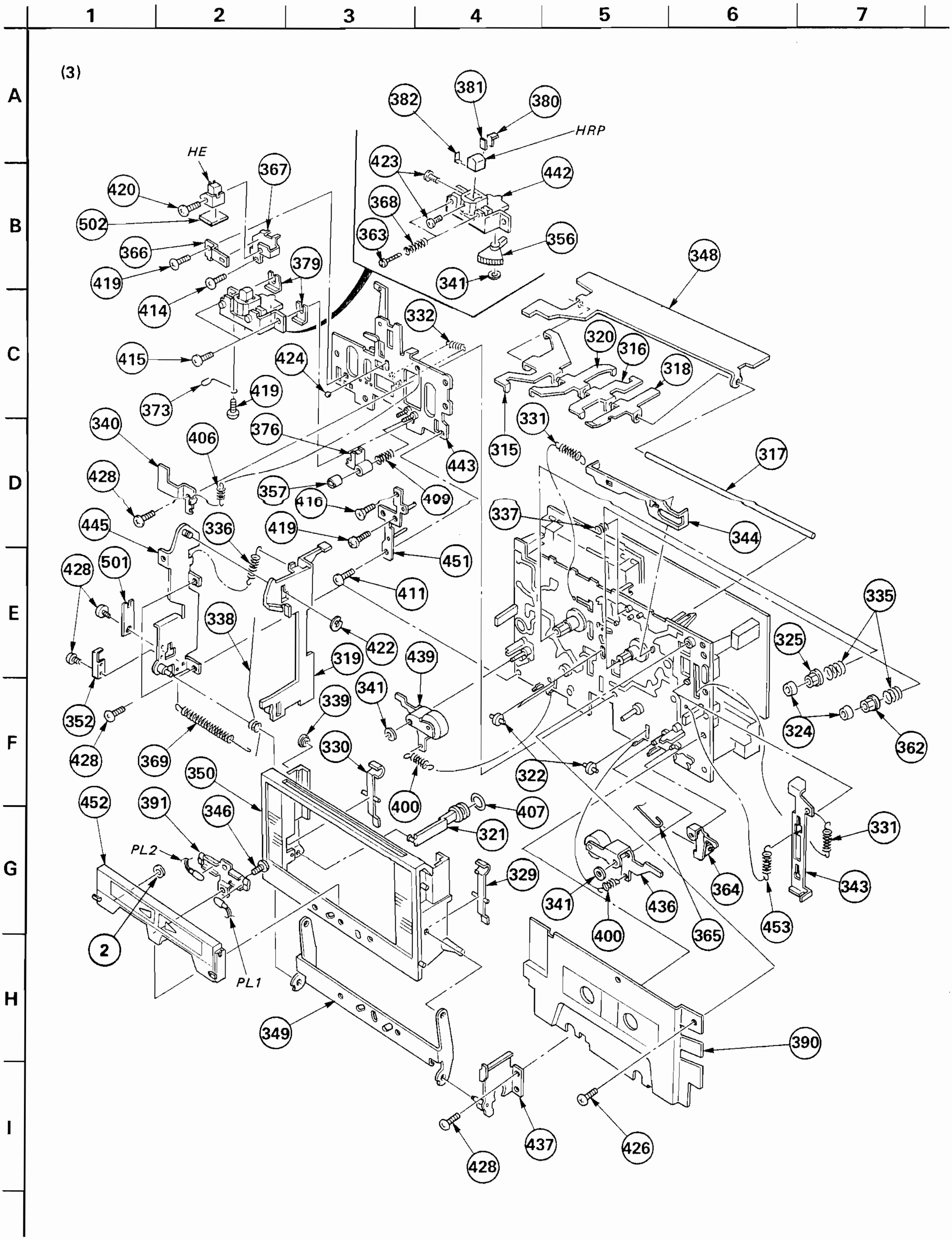
SECTION 5
EXPLODED VIEWS AND PARTS LIST

5-1. EXPLODED VIEWS

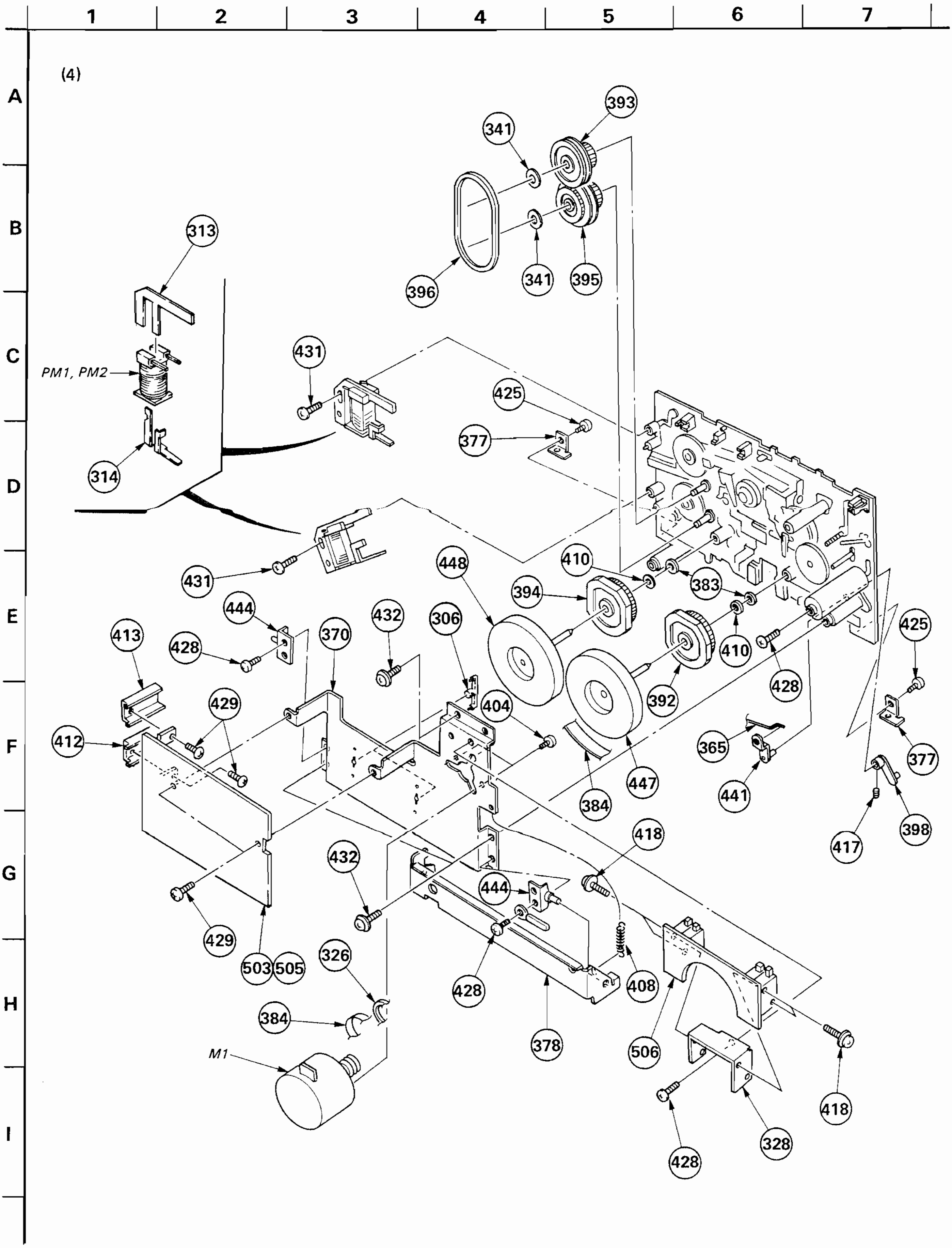


(2)


1
2
3
4
5
6
7
A
B
C
D
E
F
G
H
I
▲A
▲B
▲C
31
42
(including
▲A – C)
53
50
52
51
39
29
15
504
514
19
18
509
28
●B
511
●A
512
24
14
43
10
49
23
454
8
7
6
5
4
31
25
45
26
11
13
36
S201
510
1
30


1
2
3
4
5
6
7
A
B
C
D
E
F
G
H
I
(3)
HE
HRP
PL2
PL1
381
380
382
423
442
367
420
502
368
363
356
348
366
379
419
341
414
332
320
316
318
415
424
373
419
376
340
331
443
315
317
406
428
357
416
409
337
344
445
336
419
451
428
501
411
335
338
422
439
325
319
341
339
352
324
362
428
330
322
369
428
350
400
407
452
391
346
321
331
329
364
343
341
436
453
2
400
365
349
390
437
426
428

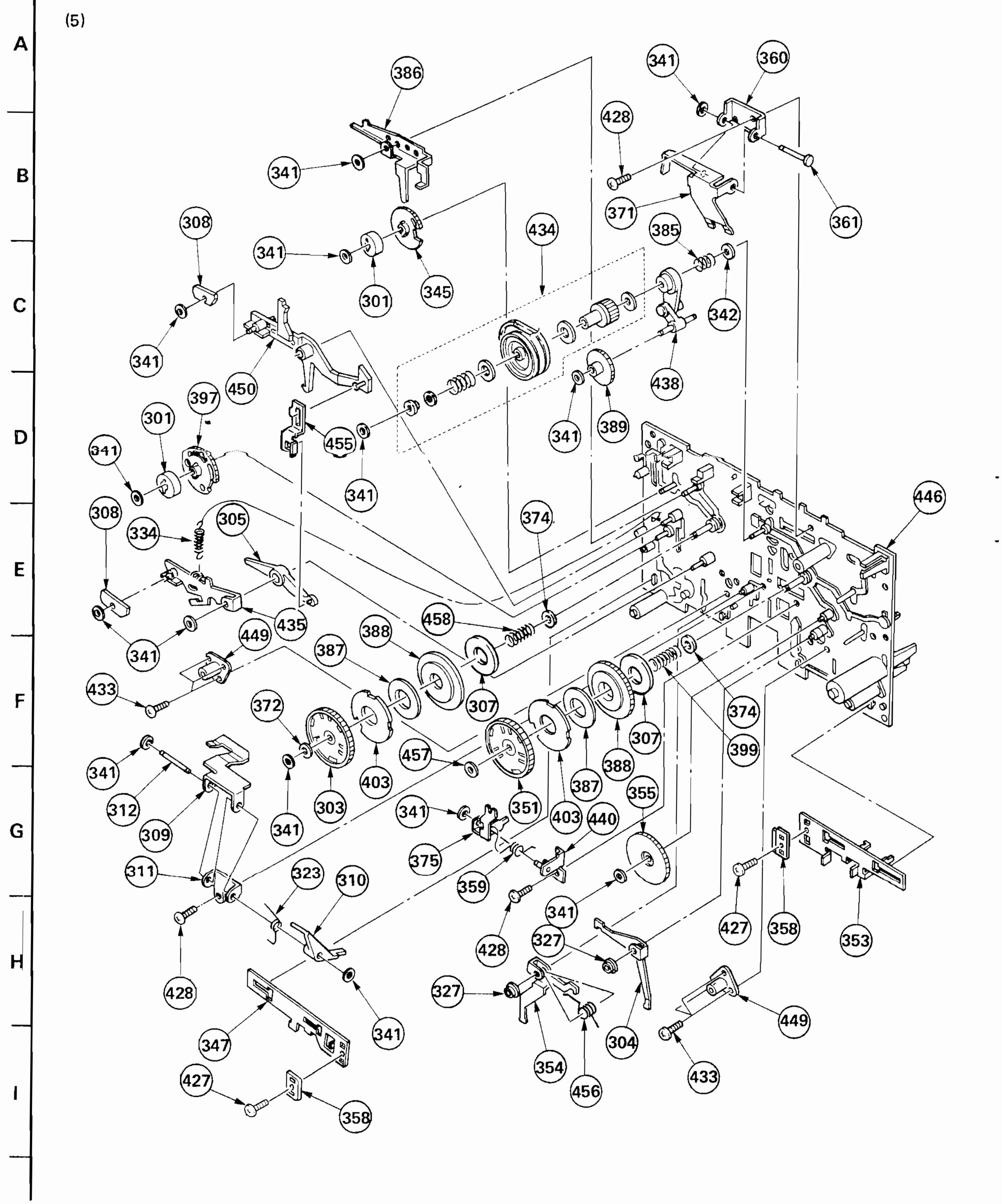
(4)


1
2
3
4
5
6
7
A
B
C
D
E
F
G
H
I
393
341
396
341
395
313
PM1, PM2
314
431
425
377
431
448
410
394
383
444
432
306
370
413
428
410
428
392
425
429
404
412
365
377
384
447
441
418
398
384
417
432
444
429
503
505
326
428
408
378
506
384
M1
418
328
428

AEP, UK, E Model

	1	2	3	4	5	6	7

(5)



GENERAL SECTION

No.	Part No.	Description
1	3-302-902-00	(PEARL SILVER,RED)....KNOB, PUSH
1	3-302-902-41	(BLACK).....KNOB, PUSH
2	3-307-390-00	BUSHING, LOADING SPRING
3	.....	
4	3-309-102-00	(PEARL SILVER,RED)....BUTTON, REW-FF
4	3-309-102-11	(BLACK).....BUTTON, REW-FF
5	3-309-106-00	(PEARL SILVER,RED)....BUTTON, REV-FWD
5	3-309-106-11	(BLACK).....BUTTON, REV-FWD
6	3-309-107-00	(PEARL SILVER,RED)....BUTTON, STOP
6	3-309-107-11	(BLACK).....BUTTON, STOP
7	3-309-111-00	(PEARL SILVER,RED)....BUTTON, REC
7	3-309-111-11	(BLACK).....BUTTON, REC
8	3-309-113-00	(PEARL SILVER,RED)....BUTTON, REC MUTE
8	3-309-113-11	(BLACK).....BUTTON, REC MUTE
9	.....	
10	3-309-116-00	PULLEY, MIDWAY
11	3-309-117-00	(PEARL SILVER,RED)....BUTTON, EJECT
11	3-309-117-11	(BLACK).....BUTTON, EJECT
12	3-309-118-00	HOLDER, TS-LED
13 ♦	3-309-119-00	BLACKET, COUNTER
14 ♦	3-309-120-00	SLIDER, EJECT
15 ♦	3-309-128-00	JOINT
16 ♦	3-309-129-11	PLATE, JACK
17	3-309-130-11	(BLACK).....CASE
17	3-309-130-21	(RED).....CASE
17	3-309-130-31	(PEARL SILVER)...CASE
18 ♦	3-309-132-00	CHASSIS
19 ♦	3-309-133-00	PLATE, SHIELD
20	3-309-155-01	LABEL, MODEL NUMBER (AE,UK,E)
21	.....	
22	.....	
23	3-530-181-XX	BELT, DETCTING
24	3-542-475-00	SPRING, TENSION
25	3-558-708-01	WASHER, STOPPER
26	3-533-363-00	BELT, COUNTER
27	3-703-354-11	SCREW (OS), CASE, CLAW
28	3-703-486-00	PTTWH 3X5
29 ♦	3-312-615-31	HEAT SHINK
30	4-864-307-00	RING
31	4-881-725-00	RING (TACT), FLEXIBLE
32	.....	
33	3-309-154-01	LABEL, DIRECTION MODE
34	.....	
35	.....	

GENERAL SECTION

No.	Part No.	Description
36	7-685-533-19	SCREW +BTP 2.6X6 TYPE2 N-S
37	.....	
38	7-685-147-11	SCREW +P 3X10 TYPE2 NON-SLIT
39	7-685-871-01	SCREW +BVTT 3X6 (S)
40	.....	
41	7-685-871-09	SCREW +BVTT 3X6 (S)
42	X-3309-126-1	(PEARL SILVER,RED)...BOTTON ASSY
42	X-3309-127-1	(BLACK).....BOTTON ASSY
43 ♦	X-3309-101-0	CHASSIS ASSY, AMPLIFIER
44	X-4884-801-0	FOOT ASSY, RUBBER
45	1-548-563-31	COUNTER, TAPE
46	X-3309-119-1	(PEARL SILVER)...PANEL ASSY, FRONT
46	X-3309-120-1	(RED).....PANEL ASSY, FRONT
46	X-3309-121-1	(BLACK).....PANEL ASSY, FRONT
47	X-3309-114-1	(PEARL SILVER)...LID ASSY, CASSETTE
47	X-3309-115-1	(RED).....LID ASSY, CASSETTE
47	X-3309-116-1	(BLACK).....LID ASSY, CASSETTE
48	3-309-157-01	(G-AEP)...LABEL MODEL NOMBER(FH-7MKII)
49	3-701-439-01	WASHER
50	3-309-145-00	PLATE, SHIELD, PC BOARD
51	3-660-624-00	COLLAR
52	4-862-384-00	CUSHION
53	7-685-873-01	SCREW +BVTT 3X10

NOTE:

- The mechanical parts with no reference number in the exploded views are not supplied.
- Items marked " ♦ " are not stocked since they are seldom required for routine service. Some delay should be anticipated when ordering these items.
- Due to standardization, parts with part numbers (Δ-ΔΔΔ-ΔΔΔ-XX or Δ-ΔΔΔΔ-ΔΔΔ-X) may be different from those used in the set.
- If there are two or more same circuitsin a set such as a stereophonic machine, only typical circuit parts may be indicated and capacitors and resistors in other same circuits may be omitted.

CAPACITORS:

MF:μF, PF:μμF.

RESISTORS

- All resistors are in ohms.
- F : nonflammable

COILS

- MMH : mH, UH : μH

SEMICONDUCTORS

In each case, U : μ, for example:
UA···: μA···, UPA···: μPA···, UPC···: μPC,
UPD···: μPD···

MECHANISM SECTION

No.	Part No.	Description
301	1-452-202-00	MAGNET
302	.....	
303	3-307-305-00	GEAR (T), REEL
304 ♦	3-307-306-00	LEVER, SELECT, REVERSE
305	3-307-307-00	LEVER, FWD
306	3-307-309-00	RETAINER (A), THRUST
307	3-307-313-00	PLATE, YOKE
308	3-307-315-00	ARBOR, MOVABLE
309	3-307-319-00	RETAINER, TAKE-UP GEAR
310	3-307-328-00	LEVER, TAKE-UP SELECTION
311 ♦	3-307-329-00	PLATE, FULCRUM, SELECTION LEVER
312	3-307-330-00	PIN, FULCRUM PLATE
313	3-307-332-00	ARBOR, FIXED
314	3-307-333-00	ARBOR, TRIGGER
315 ♦	3-307-337-00	LEVER, REC DETECTION
316 ♦	3-307-338-00	LEVER, METAL DETECTION
317 ♦	3-307-339-00	SHAFT, DETECTION LEVER
318 ♦	3-307-344-00	LEVER, HALF RETAINER
319	3-307-345-00	SLIDER, EJECT
320 ♦	3-307-346-00	LEVER, DETECTION
321	3-307-347-00	PISTON
322	3-307-348-00	ROLLER
323	3-307-355-00	SPRING
324	3-307-362-00	CAP, REEL
325	3-307-363-00	CLAW (N), REEL
326	3-307-366-00	BELT, FAST FORWARD
327	3-307-367-00	BUSHING, SELECT LEVER
328 ♦	3-307-370-00	BRACKET, SWITCH
329	3-307-371-00	SPRING (LEFT)
330	3-307-372-00	SPRING (RIGHT)
331	3-307-374-00	SPRING, TENSION
332	3-307-375-00	SPRING, TENSION
333	.....	
334	3-307-378-00	SPRING, TENSION
335	3-307-380-00	SPRING, COMPRESSION
336	3-531-541-00	SPRING, TENSION
337	3-307-382-00	SPRING
338	3-307-383-00	SPRING
339	3-307-390-00	BUSHING, LOADING SPRING
340	3-307-391-00	SPRING
341	3-307-394-00	RETAINER (B), THRUST
342	3-307-395-00	RETAINER, SPRING
343	3-307-397-00	SLIDER, PAUSE
344 ♦	3-307-399-00	SLIDER, MODE
345	3-307-401-00	GEAR, FF CAM

MECHANISM SECTION

No.	Part No.	Description
346	7-685-533-19	SCREW +BTP 2.6X6 TYPE2 N-S
347 ♦	3-307-403-00	SLIDER, FWD
348 ♦	3-307-404-00	RETAINER, DETECTION SWITCH
349 ♦	3-307-405-00	PLATE, FULCRUM, CASSETTE HOLDER
350	3-307-407-00	HOLDER, CASSETTE
351	3-307-412-00	GEAR, TAKE-UP REEL
352	3-307-416-00	STOPPER, LOADING
353 ♦	3-307-420-00	SLIDER, REVERSE
354 ♦	3-307-421-00	LEVER (R), FWD SELECTION
355	3-307-423-00	GEAR (S), DRIVING
356	3-307-427-00	GEAR, HEAD, ROTARY
357	3-307-435-00	NUT, ADJUSTMENT, TAPE GUIDE
358 ♦	3-307-437-00	BLOCK, HEAD SELECTION
359	3-307-441-00	SPRING
360 ♦	3-307-443-00	BRACKET, RETAINER, SUPPLY GEAR
361 ♦	3-307-445-00	SHAFT, RETAINER, SUPPLY GEAR
362	3-307-447-00	CLAW (R), REEL
363	3-307-448-00	SCREW, ADJUSTMENT, AZIMUTH
364 ♦	3-307-449-00	LEVER (R), PAUSE
365 ♦	3-307-450-00	ROD, PULL, PAUSE
366	3-307-457-00	SPRING
367	3-307-458-00	PLATE (L), ADJUSTMENT, HEAD
368	3-307-460-00	SPRING, COMPRESSION
369	3-307-461-00	SPRING, TENSION
370 ♦	3-307-462-00	RETAINER (R), THRUST
371 ♦	3-307-464-00	RETAINER, SUPPLY GEAR
372	3-307-465-00	RETAINER, TAKE-UP
373 ♦	3-307-466-00	CLAMP
374 ♦	3-307-467-00	RETAINER, SPRING
375	3-307-469-00	LEVER, SELECTION, SUPPLY
376	3-307-470-00	GUIDE (R), TAPE
377 ♦	3-307-472-00	BRACKET, MD
378 ♦	3-307-474-00	LEVER (R2), EJECT
379	3-307-477-01	SEAM (A), HEAD ADJUSTMENT
379	3-307-477-11	SEAM (A), HEAD ADJUSTMENT
379	3-307-477-21	SEAM (A), HEAD ADJUSTMENT
379	3-307-477-31	SEAM (A), HEAD ADJUSTMENT
379	3-307-477-41	SEAM (A), HEAD ADJUSTMENT
380	3-307-479-01	SEAM (B), HEAD ADJUSTMENT
380	3-307-479-11	SEAM (B), HEAD ADJUSTMENT
380	3-307-479-21	SEAM (B), HEAD ADJUSTMENT
380	3-307-479-31	SEAM (B), HEAD ADJUSTMENT
381	3-307-480-02	SEAM, HEAD
382	3-307-481-00	BASE, HEAD
383	3-307-482-00	WASHER, LUMILER

NOTE:

- The mechanical parts with no reference number in the exploded views are not supplied.
- Items marked " ♦ " are not stocked since they are seldom required for routine service. Some delay should be anticipated when ordering these items.
- Due to standardization, parts with part numbers (Δ-ΔΔΔ-ΔΔΔ-XX or Δ-ΔΔΔΔ-ΔΔΔ-X) may be different from those used in the set.
- If there are two or more same circuitsin a set such as a stereophonic machine, only typical circuit parts may be indicated and capacitors and resistors in other same circuits may be omitted.

CAPACITORS:

MF:μF, PF:μμF.

RESISTORS

- All resistors are in ohms.
- F : nonflammable

COILS

- MMH : mH, UH : μH

SEMICONDUCTORS

In each case, U : μ, for example:
UA···: μA···, UPA···: μPA···, UPC···: μPC,
UPD···: μPD···

MECHANISM SECTION

No.	Part No.	Description
384	3-307-483-00	BELT (R), CAPSTAN
385	3-312-452-00	SPRING, COMPRESSION
386 ♦	3-307-490-00	LEVER, FF
387	3-307-493-01	SPACER
387	3-307-493-11	SPACER
387	3-307-493-21	SPACER
387	3-307-493-31	SPACER
387	3-307-493-41	SPACER
387	3-307-493-51	SPACER
388	3-307-953-00	MAGNET, REEL TABLE
389	3-307-970-00	GEAR, FR
390	3-309-101-00	PLATE (A), ORNAMENTAL, MD
391	3-309-115-00	HOLDER, LAMP
392 ♦	3-312-403-00	GEAR (S), PINION
393	3-312-405-00	PULLEY, DRIVING
394	3-312-406-00	GEAR (T), PINION
395	3-312-408-00	GEAR (B), CONVERSION
396	3-312-409-00	BELT, DRIVING
397	3-312-412-00	GEAR (B), CAM, FWD
398 ♦	3-312-428-00	ARM (B), PUASE
399	3-307-471-31	SPRING, COMPRESSION
400	3-312-432-00	SPRING, TENSION
401	.....	
402	.....	
403	3-561-827-11	PLATE (A), HYSTERESIS
404	7-621-775-00	SCREW +B 2.6X3
405	.....	
406	3-312-451-00	SPRING, TENSION
407	3-575-392-00	RING, PISTON
408	3-578-393-00	SPRING, TENSION
409	3-644-718-00	SPRING, COMPRESSION
410	3-701-438-11	WASHER, 2.5
411	3-701-467-00	SCREW, LOCK
412 ♦	3-309-144-31	HEAT SINK
413 ♦	3-312-615-31	HEAT SINK
414	7-621-255-20	SCREW +P 2X4
415	7-621-259-35	SCREW +P 2.6X5
416	7-621-555-35	SCREW +K 2X5
417	7-621-733-08	SET-SCT, HEX 2X4 FLAT POINT
418	7-621-760-05	+PSW, 2.6X16
419	7-621-772-00	SCREW +B 2X3
420	7-621-772-40	SCREW +B 2X8
421	.....	
422	7-624-105-04	STOP RING 2.3, TYPE -E
423	7-627-552-07	SCREW, PRECISION +P 1.7X2.5

MECHANISM SECTION

No.	Part No.	Description
424	7-671-111-11	STEEL, BOUL 1.5MM
425	7-682-546-04	SCREW +BVTT 3X5 (S)
426	7-685-104-19	SCREW +P 2X6 TYPE2 NON-SLIT
427	7-685-851-01	SCREW +BVTT 2X4 (S)
428	7-685-860-04	SCREW +BVTT 2.6X4 (S)
429	7-685-871-01	SCREW +BVTT 3X6 (S)
430	.....	
431	7-687-204-21	TOTSU PTPWH 2X6 NON-SLIT, TYPE2
432	7-687-246-21	SCREW, TOTSU PTPWH 3X8, TYPE2
433	7-687-701-39	SCREW, TOTSU BTT 2.6X4
434	A-2142-022-A	PULLEY ASSY, FR
435 ♦	X-3307-305-0	LEVER ASSY, FWD LOCK
436	X-3307-307-0	PINCH ROLLER (N) ASSY
437 ♦	X-3307-310-0	PLATE (RIGHT) ASSY, SIDE
438	X-3307-312-0	LEVER ASSY, FR
439	X-3307-316-0	PINCH ROLLER (R) ASSY
440 ♦	X-3307-317-3	PLATE ASSY, FULCRUM, LEVER
441 ♦	X-3307-319-0	ARM (A) ASSY, PAUSE
442	X-3307-321-0	HOLDER ASSY, HEAD
443	X-3307-323-0	CHASSIS (R) ASSY, HEAD
444 ♦	X-3307-326-0	PLATE (R2) ASSY, FULCRUM, EJECT
445 ♦	X-3307-327-0	PLATE (L2) ASSY, SIDE
446	X-3307-331-1	CHASSIS ASSY, MECHANISM
447	X-3307-336-2	FLYWHEEL (RS) ASSY
448	X-3307-337-2	FLYWHEEL (RT) ASSY
449	X-3307-338-0	BEARING ASSY, CAPSTAN
450	X-3307-348-0	LEVER ASSY, FF LOCK
451	X-3307-920-0	PLATE ASSY, ADJUSTMENT
452	X-3309-102-0	PLATE ASSY, ORNAMENTAL, HEAD
453	3-312-448-00	SPRING, TENSION
454	3-309-105-00	(PEARL SILVER)...HOLDER, REC-LED
454	3-309-105-11	(RED,BLACK).....HOLDER, REC-LED
455 ♦	3-307-487-00	STOPPER, FR
456	3-312-442-00	SPRING
457	7-623-922-01	WASHER 2.0, NYLON
458	3-312-430-00	SPRING, COMPRESSION

NOTE:

- The mechanical parts with no reference number in the exploded views are not supplied.
- Items marked " ♦ " are not stocked since they are seldom required for routine service. Some delay should be anticipated when ordering these items.
- Due to standardization, parts with part numbers (Δ-ΔΔΔ-ΔΔΔ-XX or Δ-ΔΔΔΔ-ΔΔΔ-X) may be different from those used in the set.
- If there are two or more same circuitsin a set such as a stereophonic machine, only typical circuit parts may be indicated and capacitors and resistors in other same circuits may be omitted.

CAPACITORS:

MF:μF, PF:μμF.

RESISTORS

- All resistors are in ohms.
- F : nonflammable

COILS

- MMH : mH, UH : μH

SEMICONDUCTORS

In each case, U : μ, for example:
UA···: μA···, UPA···: μPA···, UPC···: μPC,
UPD···: μPD···

ELECTRICAL PARTS

Ref.No.	Part No.	Description
501	♦;1-608-170-00	PC BOARD, HEAD TRANSLATION
502	♦;1-608-268-00	PC BOARD, ERASE HEAD
503	♦;1-608-391-00	PC BOARD, SYSTEM CONTROL
504	♦;A-2056-215-A	MOUNTED, PCB, AUDIO
505	♦;A-2019-162-A	(PEARL SILVER)...MOUNTED PCB, SYSTEM CONTROL
505	♦;A-2019-163-A	(RED,BLACK).....MOUNTED PCB, SYSTEM CONTROL
506	♦;1-608-394-00	PC BOARD, TAPE SWITCH
507	♦;1-608-387-21	PC BOARD, AUDIO
508	♦;1-608-388-21	PC BOARD, TAPE INDICATION
509	♦;1-608-389-21	PC BOARD, AGC & AMS
510	♦;1-608-390-21	PC BOARD, DOLBY SWITCH
511	♦;1-608-392-00	PC BOARD, CONTROL SWITCH
512	♦;1-608-393-00	PC BOARD, INTERRUPT

C101	1-123-382-00	ELECT	3.3MF	20%	50V
C102	1-123-382-00	ELECT	3.3MF	20%	50V
C103	1-123-354-00	ELECT	3.3MF	20%	50V
C104	1-123-380-00	ELECT	1MF	20%	50V
C105	1-123-356-00	ELECT	10MF	20%	16V
C106	1-102-117-00	CERAMIC	820PF	10%	50V
C107	1-161-322-00	CERAMIC	820PF	10%	50V
C108	1-123-369-00	ELECT	4.7MF	20%	25V
C109	1-107-167-00	MICA	75PF	5%	500V
C110	1-123-307-00	ELECT	100MF	20%	10V
C111	1-130-624-00	FILM	0.022MF	5%	50V
C112	1-123-382-00	ELECT	3.3MF	20%	50V
C114	1-161-316-00	CERAMIC	270PF	10%	50V
C115	1-161-377-00	CERAMIC	0.0047MF	20%	50V
C116	1-123-382-00	ELECT	3.3MF	20%	50V
C117	1-123-310-00	ELECT	470MF	20%	10V
C118	1-123-286-00	ELECT	0.33MF	20%	50V
C119	1-130-632-00	FILM	0.1MF	5%	50V
C120	1-130-627-00	FILM	0.039MF	5%	50V
C121	1-130-621-00	FILM	0.012MF	5%	50V
C122	1-123-356-00	ELECT	10MF	20%	16V
C123	1-130-629-00	FILM	0.056MF	5%	50V
C124	1-130-628-00	FILM	0.047MF	5%	50V
C125	1-130-624-00	FILM	0.022MF	5%	50V
C126	1-108-575-00	MYLAR	0.0068MF	5%	50V
C127	1-123-369-00	ELECT	4.7MF	20%	50V
C128	1-123-369-00	ELECT	4.7MF	20%	50V
C129	1-123-380-00	ELECT	1MF	20%	50V
C130	1-123-382-00	ELECT	3.3MF	20%	50V
C131	1-123-356-00	ELECT	10MF	20%	16V

ELECTRICAL PARTS

Ref.No.	Part No.	Description			
C132	1-130-625-00	FILM	0.027MF	5%	50V
C133	1-130-621-00	FILM	0.012MF	5%	50V
C136	1-130-622-00	FILM	0.015MF	5%	50V
C140	1-108-567-00	MYLAR	0.0033MF	5%	50V
C141	1-107-165-00	MICA	56PF	5%	500V
C143	1-123-319-00	ELECT	47MF	20%	16V
C209	1-107-167-00	MICA	75PF	5%	500V
C211	1-130-624-00	FILM	0.022MF	5%	50V
C219	1-130-632-00	FILM	0.1MF	5%	50V
C220	1-130-627-00	FILM	0.039MF	5%	50V
C221	1-130-621-00	FILM	0.012MF	5%	50V
C223	1-130-629-00	FILM	0.056MF	5%	50V
C224	1-130-628-00	FILM	0.047MF	5%	50V
C225	1-130-624-00	FILM	0.022MF	5%	50V
C232	1-130-625-00	FILM	0.027MF	5%	50V
C233	1-130-621-00	FILM	0.012MF	5%	50V
C236	1-130-622-00	FILM	0.015MF	5%	50V
C237	1-130-627-00	FILM	0.039MF	5%	50V
C239	1-130-627-00	FILM	0.039MF	5%	50V
C241	1-107-165-00	MICA	75PF	5%	500V
C301	1-123-332-00	ELECT	47MF	20%	25V
C302	1-123-294-00	ELECT	47MF	20%	6.3V
C303	1-123-323-00	ELECT	470MF	20%	16V
C304	1-123-380-00	ELECT	1MF	20%	50V
C305	1-131-371-00	TANTALUM	10MF	20%	16V
C306	1-123-328-00	ELECT	4.7MF	20%	25V
C307	1-161-377-00	CERAMIC	0.0047MF	20%	50V
C308	1-161-259-00	CERAMIC	10PF	5%	50V
C309	1-123-356-00	ELECT	10MF	20%	16V
C310	1-123-380-00	ELECT	1MF	20%	50V
C311	1-123-382-00	ELECT	3.3MF	20%	50V
C312	1-123-382-00	ELECT	3.3MF	20%	50V
C314	1-123-351-00	ELECT	0.47MF	20%	50V
C315	1-124-089-00	ELECT	2.2MF	20%	50V
C316	1-130-289-00	FILM	0.0047MF	5%	100V
C317	1-130-289-00	FILM	0.0047MF	5%	100V
C318	1-130-295-00	FILM	0.0082MF	5%	100V
C319	1-123-379-00	ELECT	0.47MF	20%	50V
C320	1-123-380-00	ELECT	1MF	20%	50V
C321	1-129-713-00	FILM	0.0082MF	10%	630V
C322	1-129-898-00	FILM	0.0022MF	5%	630V
C323	1-129-705-00	FILM	0.0018MF	10%	630V
C324	1-123-308-00	ELECT	220MF	20%	10V
C325	1-101-880-00	CERAMIC	47PF	5%	50V
C402	1-123-328-00	ELECT	4.7MF	20%	25V

NOTE:
- The mechanical parts with no reference number in the exploded views are not supplied.
- Items marked " ♦ " are not stocked since they are seldom required for routine service. Some delay should be anticipated when ordering these items.
- Due to standardization, parts with part numbers (Δ-ΔΔΔ-ΔΔΔ-XX or Δ-ΔΔΔΔ-ΔΔΔ-X) may be different from those used in the set.
- If there are two or more same circuitsin a set such as a stereophonic machine, only typical circuit parts may be indicated and capacitors and resistors in other same circuits may be omitted.

CAPACITORS:
MF:μF, PF:μμF.

RESISTORS
- All resistors are in ohms.
- F : nonflammable

COILS
- MMH : mH, UH : μH

SEMICONDUCTORS
In each case, U : μ, for example:
UA···: μA···, UPA···: μPA···, UPC···: μPC,
UPD···: μPD···

ELECTRICAL PARTS

Ref.No.	Part No.	Description			
Q312	8-729-663-47	TRANSISTOR 2SC1364			
Q313	8-729-606-32	TRANSISTOR 2SC2063			
Q314	8-729-606-32	TRANSISTOR 2SC2063			
Q315	8-729-100-13	TRANSISTOR 2SC2001			
Q316	8-729-612-77	TRANSISTOR 2SA1027R			
Q317	8-729-663-47	TRANSISTOR 2SC1364			
Q318	8-729-180-92	TRANSISTOR 2SD809-K			
Q319	8-729-663-47	TRANSISTOR 2SC1364			
Q320	8-729-663-47	TRANSISTOR 2SC1364			
Q321	8-729-663-47	TRANSISTOR 2SC1364			
Q322	8-729-663-47	TRANSISTOR 2SC1364			
Q401	8-729-117-54	TRANSISTOR 2SA1175			
Q402	8-719-902-90	PHOTO INTERRUPTOR SPI201-20			
Q403	8-729-663-47	TRANSISTOR 2SC1364			
Q404	8-729-663-47	TRANSISTOR 2SC1364			
Q405	8-729-663-47	TRANSISTOR 2SC1364			
Q406	8-729-663-47	TRANSISTOR 2SC1364			
Q408	8-729-663-47	TRANSISTOR 2SC1364			
Q409	8-729-117-54	TRANSISTOR 2SA1175			
Q410	8-729-117-54	TRANSISTOR 2SA1175			
Q411	8-729-663-47	TRANSISTOR 2SC1364			
Q412	8-729-117-54	TRANSISTOR 2SA1175			
Q413	8-729-180-92	TRANSISTOR 2SD809-K			
R101	1-247-131-00	CARBON	1K	5%	1/4W
R102	1-247-179-00	CARBON	100K	5%	1/4W
R103	1-247-179-00	CARBON	100K	5%	1/4W
R104	1-246-523-00	CARBON	120K	5%	1/4W
R105	1-247-139-00	CARBON	2.2K	5%	1/4W
R106	1-246-511-00	CARBON	39K	5%	1/4W
R107	1-246-483-00	CARBON	2.7K	5%	1/4W
R108	1-246-455-00	CARBON	180	5%	1/4W
R109	1-247-179-00	CARBON	100K	5%	1/4W
R110	1-247-179-00	CARBON	100K	5%	1/4W
R111	1-247-179-00	CARBON	100K	5%	1/4W
R112	1-246-525-00	CARBON	150K	5%	1/4W
R113	1-247-131-00	CARBON	1K	5%	1/4W
R115	1-247-865-00	CARBON	27K	5%	1/6W
R116	1-247-865-00	CARBON	27K	5%	1/6W
R117	1-247-107-00	CARBON	100	5%	1/4W
R118	1-246-524-00	CARBON	130K	5%	1/4W
R119	1-246-490-00	CARBON	5.1K	5%	1/4W
R121	1-247-159-00	CARBON	15K	5%	1/4W
R122	1-247-161-00	CARBON	18K	5%	1/4W
R123	1-246-529-00	CARBON	220K	5%	1/4W

ELECTRICAL PARTS

Ref.No.	Part No.	Description			
R124	1-247-839-00	CARBON	2.2K	5%	1/6W
R125	1-247-155-00	CARBON	10K	5%	1/4W
R126	1-247-155-00	CARBON	10K	5%	1/4W
R127	1-247-171-00	CARBON	47K	5%	1/4W
R128	1-246-513-00	CARBON	47K	5%	1/4W
R129	1-246-533-00	CARBON	330K	5%	1/4W
R130	1-246-530-00	CARBON	240K	5%	1/4W
R131	1-246-530-00	CARBON	240K	5%	1/4W
R132	1-246-499-00	CARBON	12K	5%	1/4W
R133	1-246-492-00	CARBON	6.2K	5%	1/4W
R134	1-247-107-00	CARBON	100	5%	1/4W
R135	1-246-455-00	CARBON	180	5%	1/4W
R136	1-247-121-00	CARBON	390	5%	1/4W
R137	1-247-133-00	CARBON	1.2K	5%	1/4W
R138	1-247-159-00	CARBON	15K	5%	1/4W
R139	1-247-167-00	CARBON	33K	5%	1/4W
R140	1-246-538-00	CARBON	510K	5%	1/4W
R141	1-247-176-00	CARBON	47K	5%	1/4W
R142	1-247-139-00	CARBON	2.2K	5%	1/4W
R143	1-247-155-00	CARBON	10K	5%	1/4W
R144	1-247-159-00	CARBON	15K	5%	1/4W
R145	1-247-131-00	CARBON	1K	5%	1/4W
R146	1-247-147-00	CARBON	4.7K	5%	1/4W
R147	1-247-131-00	CARBON	1K	5%	1/4W
R148	1-247-179-00	CARBON	100K	5%	1/4W
R149	1-246-523-00	CARBON	120K	5%	1/4W
R150	1-246-523-00	CARBON	120K	5%	1/4W
R151	1-247-807-00	CARBON	100	5%	1/6W
R152	1-247-839-00	CARBON	2.2K	5%	1/6W
R157	1-247-855-89	CARBON	10K	5%	1/6W
R158	1-247-861-00	CARBON	18K	5%	1/6W
R159	1-246-505-00	CARBON	22K	5%	1/4W
R163	1-247-851-00	CARBON	6.8K	5%	1/6W
R165	1-247-815-00	CARBON	220K	5%	1/6W
R166	1-246-505-00	CARBON	22K	5%	1/4W
R167	1-247-863-00	CARBON	22K	5%	1/6W
R301	1-247-149-00	CARBON	5.6K	5%	1/4W
R302	1-247-155-00	CARBON	10K	5%	1/4W
R303	1-247-151-00	CARBON	6.8K	5%	1/4W
R304	1-246-485-00	CARBON	3.3K	5%	1/4W
R305	1-247-149-00	CARBON	5.6K	5%	1/4W
R306	1-247-147-00	CARBON	4.7K	5%	1/4W
R307	1-247-863-00	CARBON	22K	5%	1/6W
R308	1-246-505-00	CARBON	22K	5%	1/4W

NOTE:

- The mechanical parts with no reference number in the exploded views are not supplied.
- Items marked " ♦ " are not stocked since they are seldom required for routine service. Some delay should be anticipated when ordering these items.
- Due to standardization, parts with part numbers (Δ-ΔΔΔ-ΔΔΔ-XX or Δ-ΔΔΔΔ-ΔΔΔ-X) may be different from those used in the set.
- If there are two or more same circuitsin a set such as a stereophonic machine, only typical circuit parts may be indicated and capacitors and resistors in other same circuits may be omitted.

CAPACITORS:

MF:μF, PF:μμF.

RESISTORS

- All resistors are in ohms.
- F : nonflammable

COILS

- MMH : mH, UH : μH

SEMICONDUCTORS

In each case, U : μ, for example:
UA···: μA···, UPA···: μPA···, UPC···: μPC,
UPD···: μPD···

ELECTRICAL PARTS

Ref.No.	Part No.	Description			
R309	1-246-470-00	CARBON	750	5%	1/4W
R310	1-247-863-00	CARBON	22K	5%	1/6W
R311	1-247-883-00	CARBON	150K	5%	1/6W
R312	1-247-877-00	CARBON	82K	5%	1/6W
R313	1-247-823-00	CARBON	470	5%	1/6W
R314	1-247-887-00	CARBON	220K	5%	1/6W
R315	1-247-887-00	CARBON	220K	5%	1/6W
R316	1-247-827-00	CARBON	680	5%	1/6W
R317	1-247-847-00	CARBON	4.7K	5%	1/6W
R318	1-247-863-00	CARBON	22K	5%	1/6W
R319	1-247-889-00	CARBON	270K	5%	1/6W
R320	1-247-831-00	CARBON	1K	5%	1/6W
R321	1-247-863-00	CARBON	22K	5%	1/6W
R322	1-247-863-00	CARBON	22K	5%	1/6W
R323	1-247-863-00	CARBON	22K	5%	1/6W
R325	1-247-857-00	CARBON	12K	5%	1/6W
R326	1-247-849-00	CARBON	5.6K	5%	1/6W
R327	1-247-847-00	CARBON	4.7K	5%	1/6W
R328	1-247-887-00	CARBON	220K	5%	1/6W
R329	1-247-863-00	CARBON	22K	5%	1/6W
R330	1-247-863-00	CARBON	22K	5%	1/6W
R331	1-247-855-00	CARBON	10K	5%	1/6W
R332	1-246-495-00	CARBON	8.2K	5%	1/4W
R333	1-246-495-00	CARBON	8.2K	5%	1/4W
R334	1-247-855-00	CARBON	10K	5%	1/6W
R335	1-247-871-00	CARBON	47K	5%	1/6W
R336	1-247-847-00	CARBON	4.7K	5%	1/6W
R337	1-247-855-00	CARBON	10K	5%	1/6W
R338	1-247-863-00	CARBON	22K	5%	1/6W
R339	1-247-863-00	CARBON	22K	5%	1/6W
R340	1-246-464-00	CARBON	430	5%	1/4W
R342	1-247-133-00	CARBON	1.2K	5%	1/4W
R343	1-246-482-00	CARBON	2.4K	5%	1/4W
R344	1-247-863-00	CARBON	22K	5%	1/6W
R345	1-247-863-00	CARBON	22K	5%	1/6W
R346	1-247-863-00	CARBON	22K	5%	1/6W
R347	1-246-505-00	CARBON	22K	5%	1/4W
R348	1-247-123-00	CARBON	470	5%	1/4W
R351	1-246-423-00	CARBON	8.2	5%	1/4W
R352	1-247-151-00	CARBON	6.8K	5%	1/4W
R401	1-247-863-00	CARBON	22K	5%	1/6W
R402	1-247-887-00	CARBON	220K	5%	1/6W
R405	1-247-139-00	CARBON	2.2K	5%	1/4W
R406	1-247-139-00	CARBON	2.2K	5%	1/4W
R409	1-246-505-00	CARBON	22K	5%	1/4W

ELECTRICAL PARTS

Ref.No.	Part No.	Description				
R410	1-246-505-00	CARBON	22K	5%	1/4W	
R411	1-246-529-00	CARBON	220K	5%	1/4W	
R412	1-246-505-00	CARBON	22K	5%	1/4W	
R413	1-247-147-00	CARBON	4.7K	5%	1/4W	
R414	1-247-119-00	CARBON	330	5%	1/4W	
R415	1-247-863-00	CARBON	22K	5%	1/6W	
R416	1-247-867-00	CARBON	33K	5%	1/6W	
R417	1-247-123-00	CARBON	470	5%	1/4W	
R418	1-247-119-00	CARBON	330	5%	1/4W	
R419	1-247-149-00	CARBON	5.6K	5%	1/4W	
R420	1-247-149-00	CARBON	5.6K	5%	1/4W	
R421	1-247-167-00	CARBON	33K	5%	1/4W	
R422	1-247-872-00	CARBON	51K	5%	1/6W	
R423	1-246-505-00	CARBON	22K	5%	1/4W	
R424	1-247-179-00	CARBON	100K	5%	1/4W	
R425	1-247-855-00	CARBON	10K	5%	1/6W	
R426	1-247-825-00	CARBON	560	5%	1/6W	
R428	1-246-433-00	CARBON	22	5%	1/4W	
R429	1-206-477-00	METAL OXIDE	39	5%	2W	F
R430	1-247-863-00	CARBON	22K	5%	1/6W	
RV101	1-226-236-00	RES, ADJ, CARBON 10K				
RV102	1-226-238-00	RES, ADJ, CARBON 50K				
RV201	1-226-236-00	RES, ADJ, CARBON 10K				
RV202	1-226-238-00	RES, ADJ, CARBON 50K				
RV301	1-226-239-00	RES, ADJ, CARBON 100K				
RY301	1-515-473-00	RELAY				
S101	1-552-412-00	SWITCH, KEY BOARD, REC MUTE				
S102	1-552-412-00	SWITCH, KEY BOARD, REC				
S103	1-552-412-00	SWITCH, KEY BOARD, PAUSE				
S104	1-552-412-00	SWITCH, KEY BOARD, FF				
S105	1-552-412-00	SWITCH, KEY BOARD, FWD				
S106	1-552-412-00	SWITCH, KEY BOARD, STOP				
S107	1-552-412-00	SWITCH, KEY BOARD, REVERSE				
S108	1-552-412-00	SWITCH, KEY BOARD, FAST REVERS				
S109	1-554-205-00	SWITCH, SLIDE, CASSETTE LOADING				
S110	1-554-205-00	SWITCH, SLIDE, ERASE PROOF				
S111	1-554-205-00	SWITCH, SLIDE, TAPE SELECT				
S112	1-554-205-00	SWITCH, SLIDE, TAPE SELECT				
S201	1-554-118-00	SWITCH, PUSH, DOLBY NR				
S202	1-552-334-00	SWITCH, DIRECTION MODE				
S203	1-554-277-00	SWITCH, SLIDE, ISS				
T301	1-433-281-11	TRANSFORMER, BIAS OSCILLATOR				

NOTE:
- The mechanical parts with no reference number in the exploded views are not supplied.
- Items marked " ♦ " are not stocked since they are seldom required for routine service. Some delay should be anticipated when ordering these items.
- Due to standardization, parts with part numbers (Δ-ΔΔΔ-ΔΔΔ-XX or Δ-ΔΔΔΔ-ΔΔΔ-X) may be different from those used in the set.
- If there are two or more same circuitsin a set such as a stereophonic machine, only typical circuit parts may be indicated and capacitors and resistors in other same circuits may be omitted.

CAPACITORS:
MF:μF, PF:μμF.

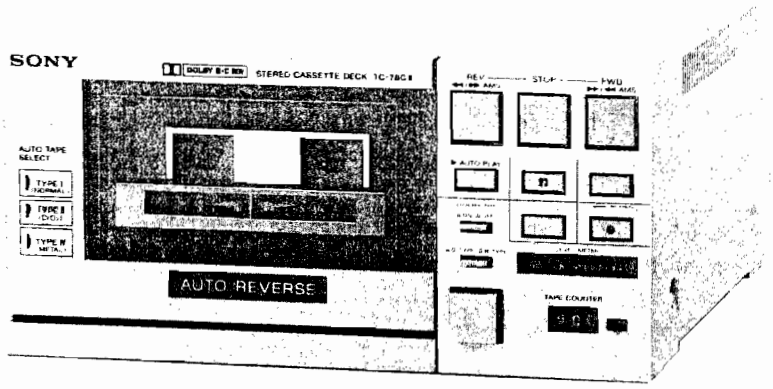
RESISTORS
- All resistors are in ohms.
- F : nonflammable

COILS
- MMH : mH, UH : μH

SEMICONDUCTORS
In each case, U : μ, for example:
UA···: μA···, UPA···: μPA···, UPC···: μPC,
UPD···: μPD···

STEREO CASSETTE DECK
[TC-78CII]

US Model
Canadian Model

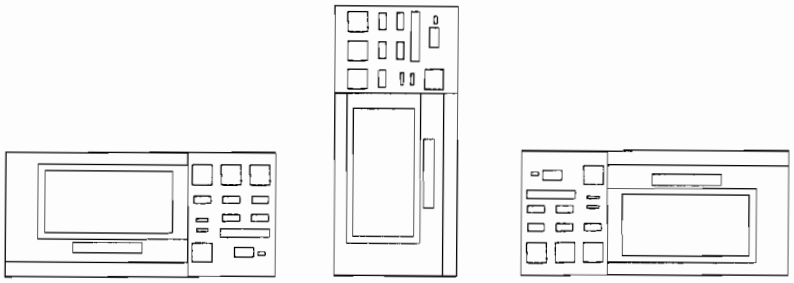


Note: TC-78CII is an integrated stereo amplifier in FH-7MKII.

Tape Transport Mechanism Type	PEARL SILVER TCM-130R13 BLACK TCM-130R14

NOTES ON REPAIR

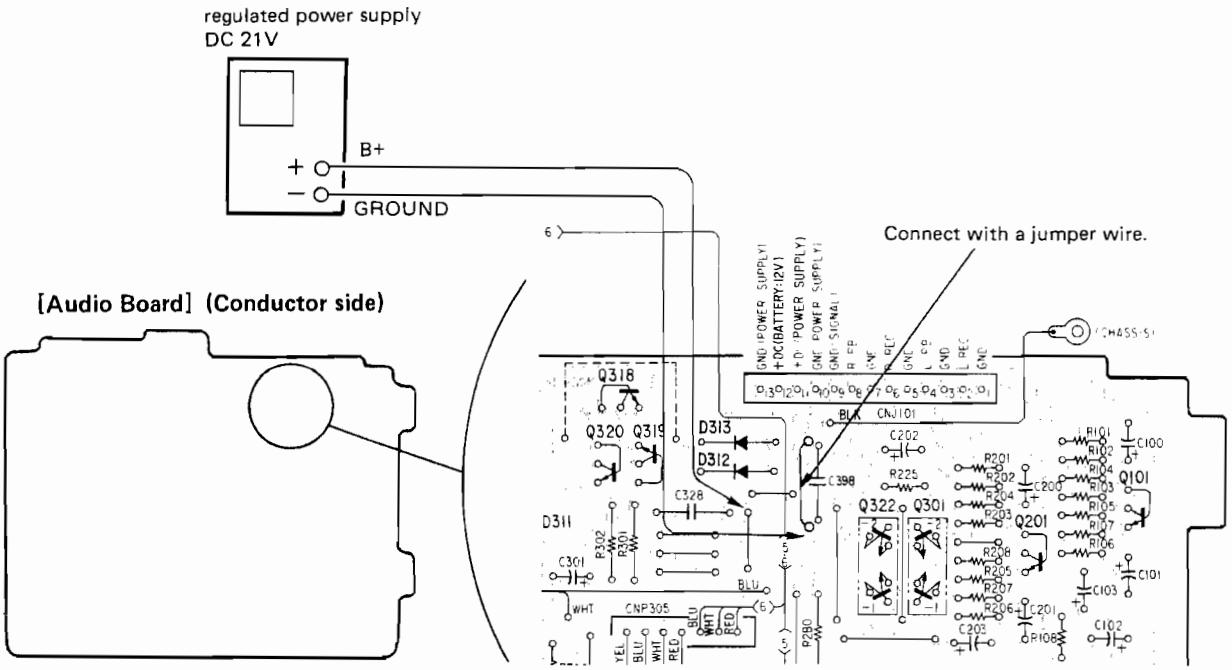
When the mechanism is operated with the set in an upside-down position, misoperation may result. For repair while operating the mechanism, perform with the set in its normal position or standing on its side.



good good wrong

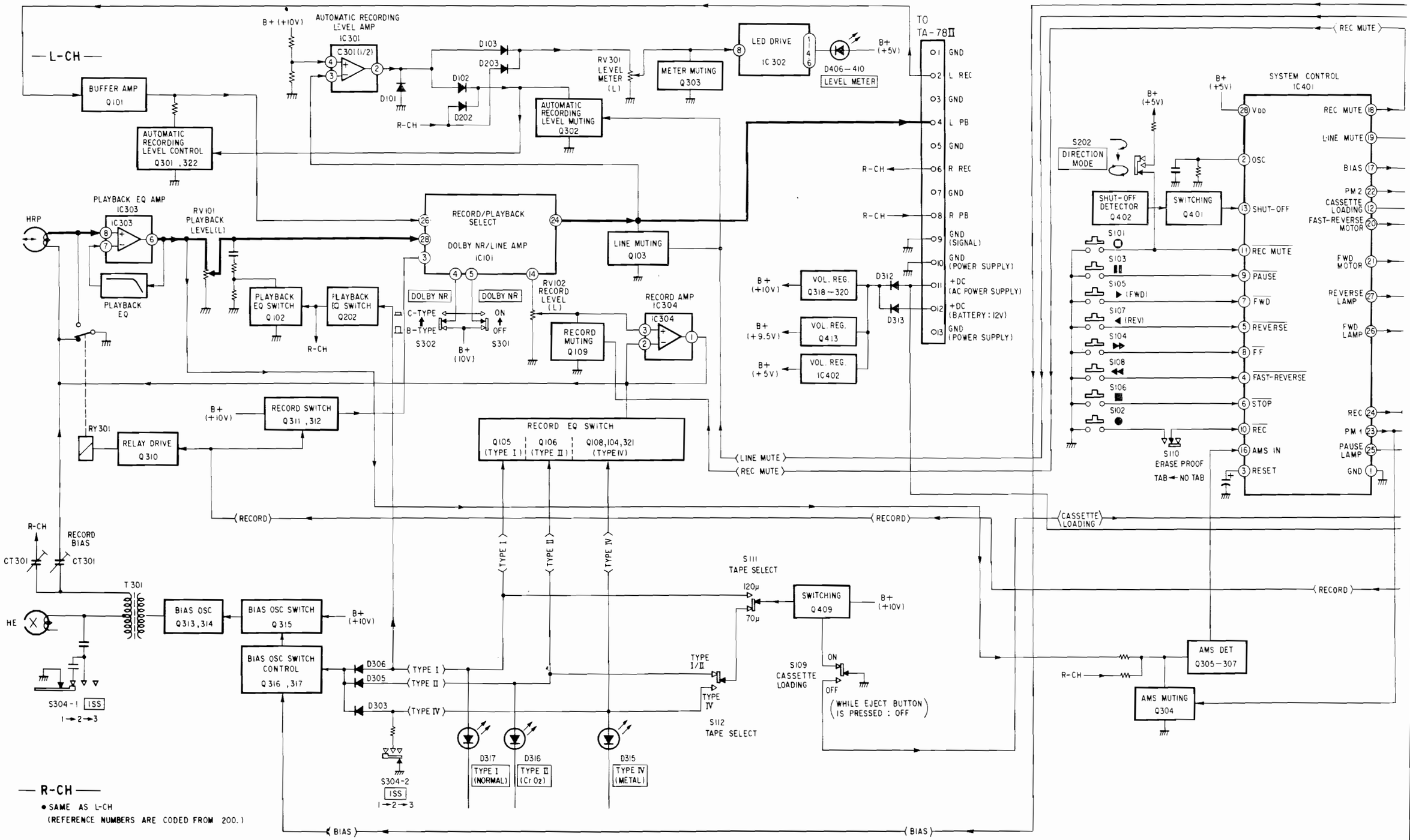
[To apply B+ voltage in repair]

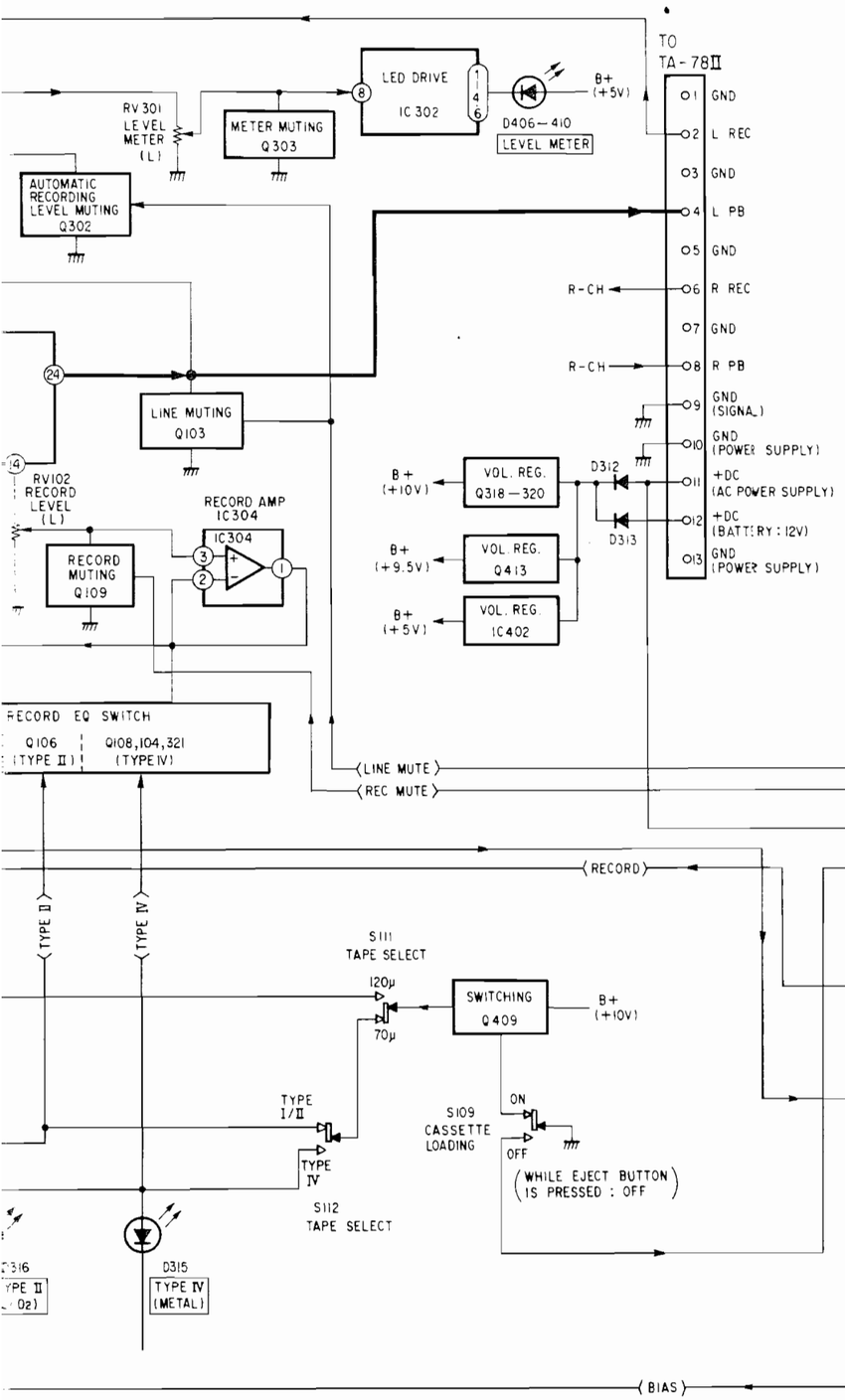
The power supply voltage of this unit is fed from AC-78II via TA-78II.
There are two ground lines for signal and power supply circuits, which are not connected in this unit. When this unit alone operates, connect the two ground lines with a jumper wire and a regulated power supply as illustrated.
After repairing, remove the jumper wire connected.

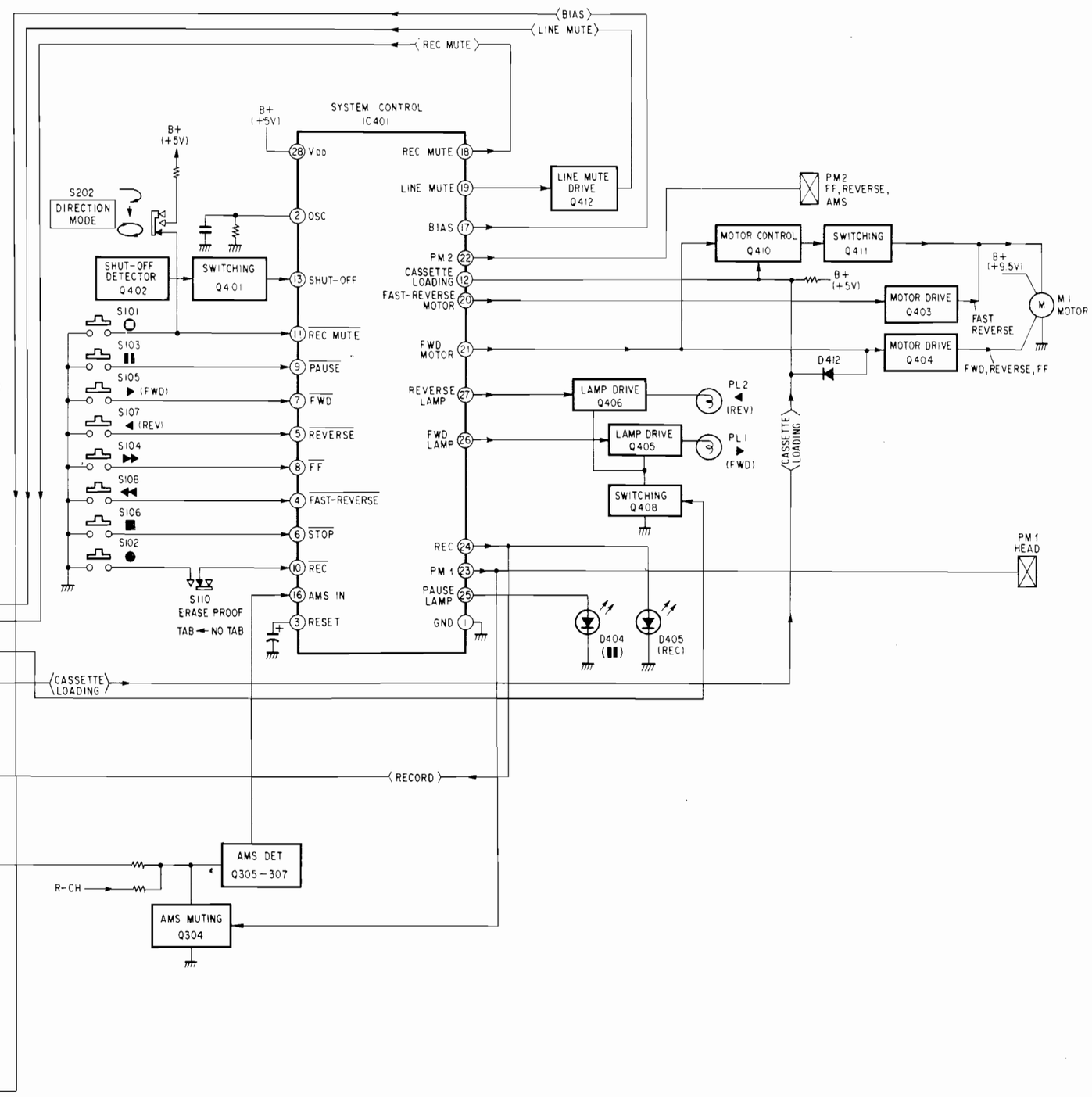


- Refer to the service manual of TC-78 for the circuit description and the mechanical operation.
  (They are identical to those of TC-78.)

1-1. BLOCK DIAGRAM



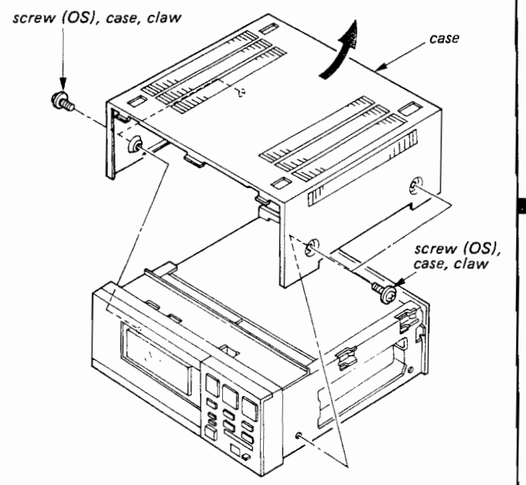

TO TA-78II
LED DRIVE IC302
B+ (+5V)
D406–410 LEVEL METER
RV301 LEVEL METER (L)
METER MUTING Q303
AUTOMATIC RECORDING LEVEL MUTING Q302
LINE MUTING Q103
RV102 RECORD LEVEL (L)
RECORD AMP IC304
RECORD MUTING Q109
VOL. REG. Q318–320
VOL. REG. Q413
VOL. REG. IC402
D312
D313
B+ (+10V)
B+ (+9.5V)
B+ (+5V)
01 GND
02 L REC
03 GND
04 L PB
05 GND
06 R REC
07 GND
08 R PB
09 GND (SIGNAL)
10 GND (POWER SUPPLY)
11 +DC (AC POWER SUPPLY)
12 +DC (BATTERY: 12V)
13 GND (POWER SUPPLY)
R-CH
RECORD EQ SWITCH
Q106 (TYPE II)
Q108,104,321 (TYPE IV)
LINE MUTE
REC MUTE
RECORD
CASSETTE LOADING
BIAS
TYPE II
TYPE IV
S111 TAPE SELECT
120μ
70μ
SWITCHING Q409
TYPE I/II
TYPE IV
S112 TAPE SELECT
S109 CASSETTE LOADING
ON
OFF
(WHILE EJECT BUTTON IS PRESSED : OFF
D315 TYPE IV (METAL)
AMS DET Q305–307
AMS MUTING Q304


BIAS
LINE MUTE
REC MUTE
SYSTEM CONTROL IC401
B+ (+5V)
S202 DIRECTION MODE
SHUT-OFF DETECTOR Q402
SWITCHING Q401
S101
S103
S105 (FWD)
S107 (REV)
S104
S108
S106
S102
S110 ERASE PROOF TAB ← NO TAB
28 VDD
2 OSC
13 SHUT-OFF
11 REC MUTE
9 PAUSE
7 FWD
5 REVERSE
8 FF
4 FAST-REVERSE
6 STOP
10 REC
16 AMS IN
3 RESET
LINE MUTE DRIVE Q412
PM2 FF, REVERSE, AMS
MOTOR CONTROL Q410
SWITCHING Q411
MOTOR DRIVE Q403
MOTOR DRIVE Q404
M1 MOTOR
FAST REVERSE
FWD, REVERSE, FF
D412
LAMP DRIVE Q406
LAMP DRIVE Q405
SWITCHING Q408
PL2 (REV)
PL1 (FWD)
CASSETTE LOADING
PM1 HEAD
REC
PM1
PAUSE LAMP
GND
D404
D405 (REC)

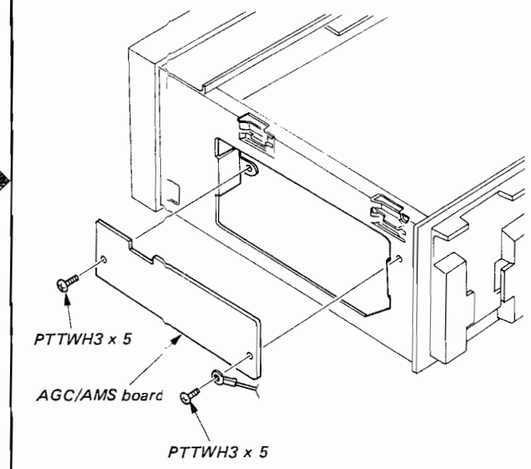
SECTION 2
DISASSEMBLY

Note: Follow the disassembly procedure in the numerical order given.

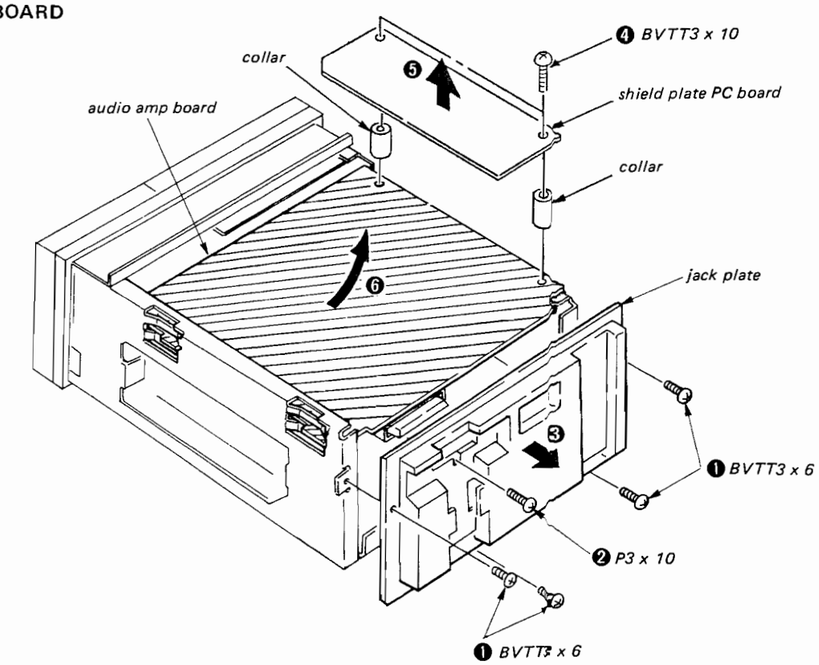
CASE



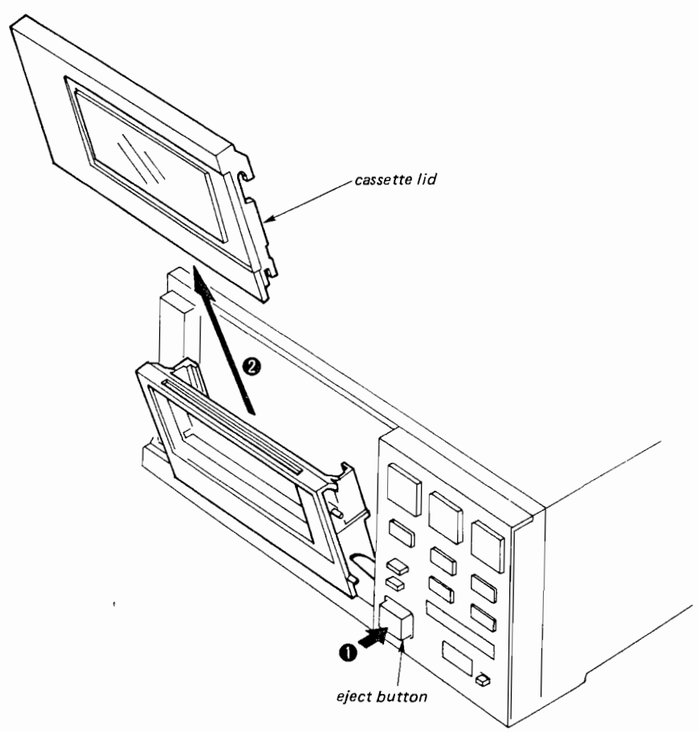
AGC/AMS BOARD



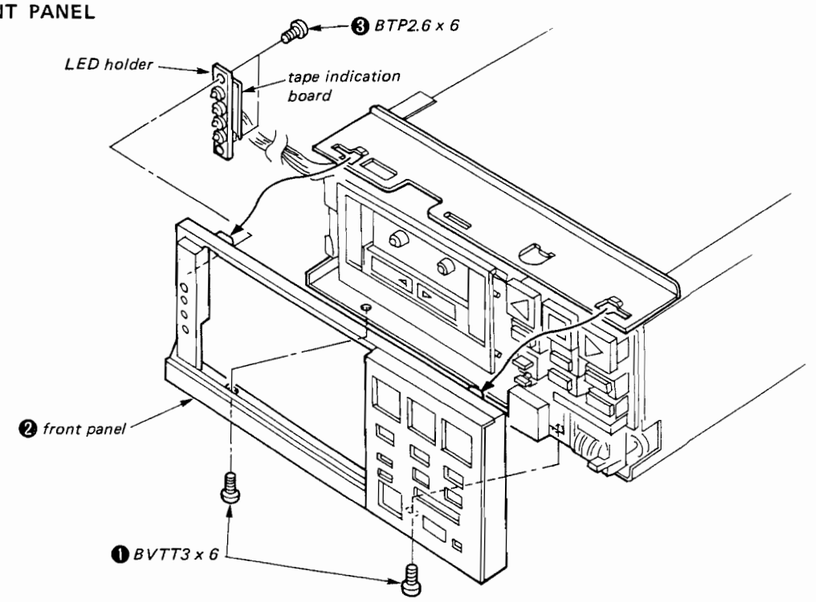
AUDIO AMP BOARD



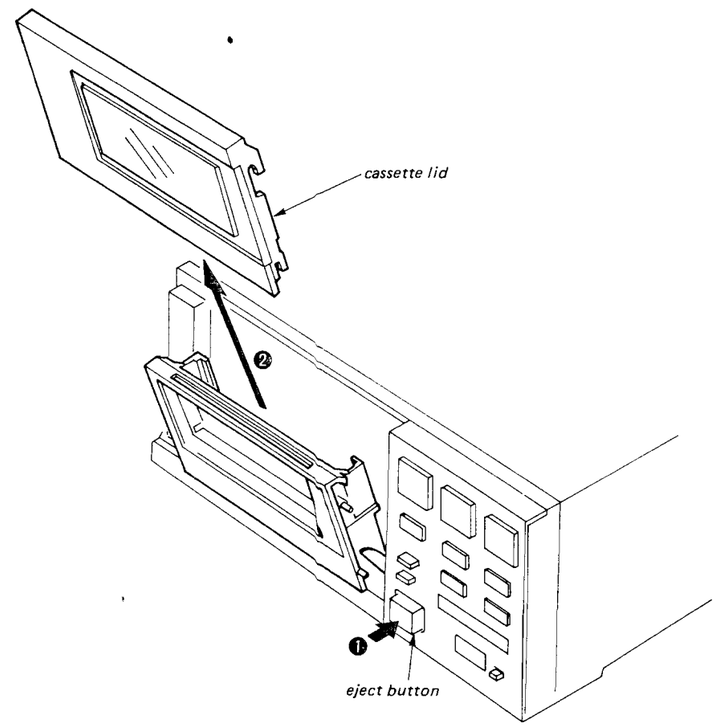
CASSETTE LID



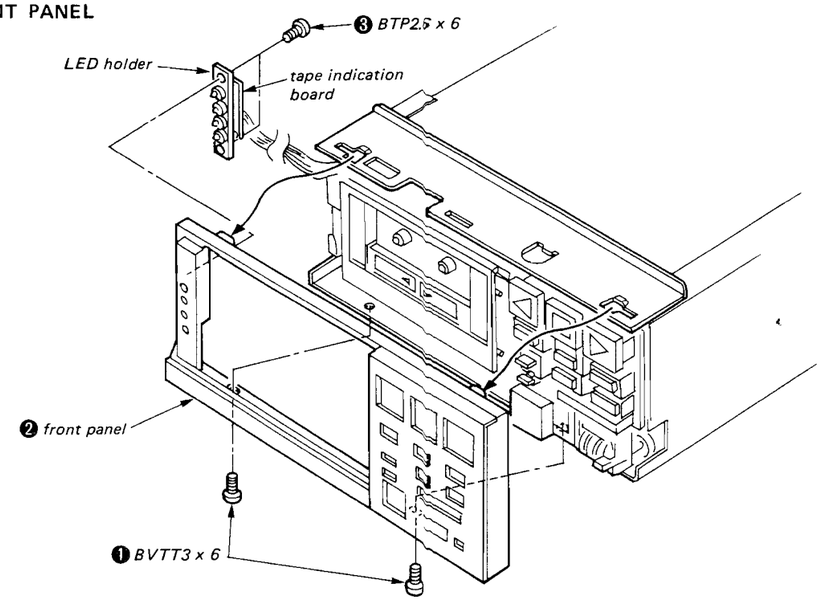
FRONT PANEL



CASSETTE LID



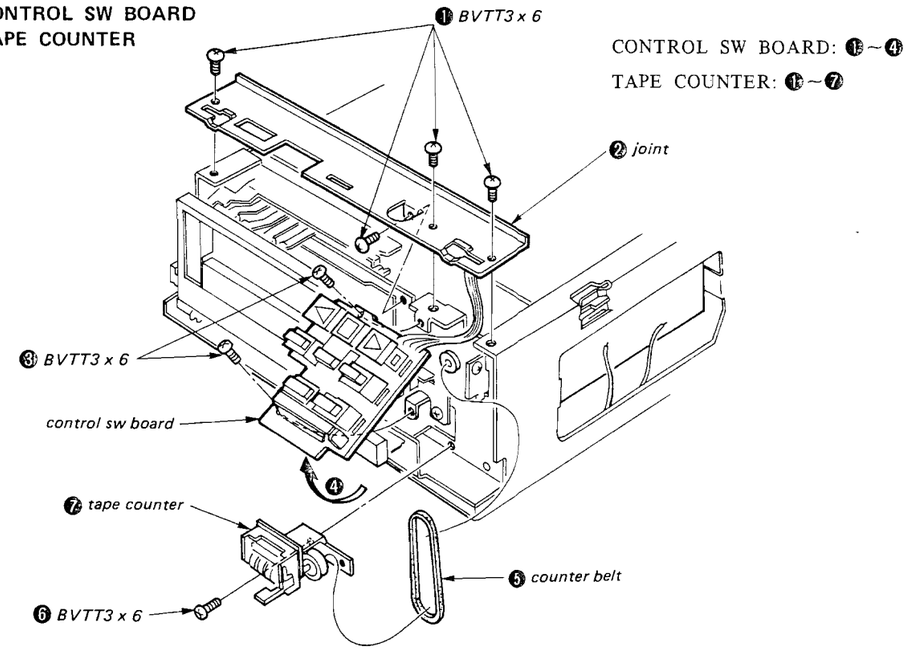
FRONT PANEL



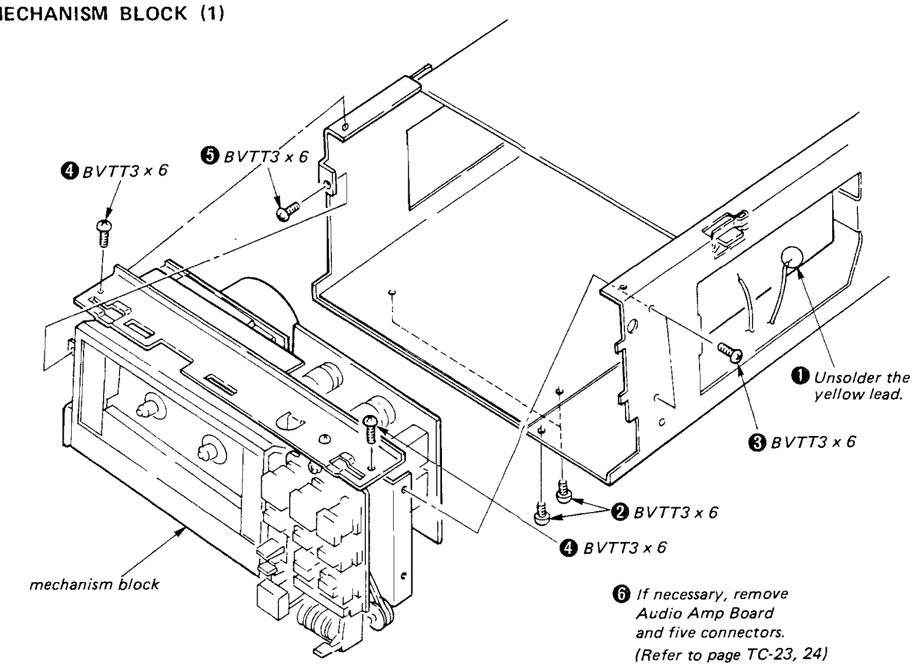
CONTROL SW BOARD
TAPE COUNTER

CONTROL SW BOARD: ❶~❹

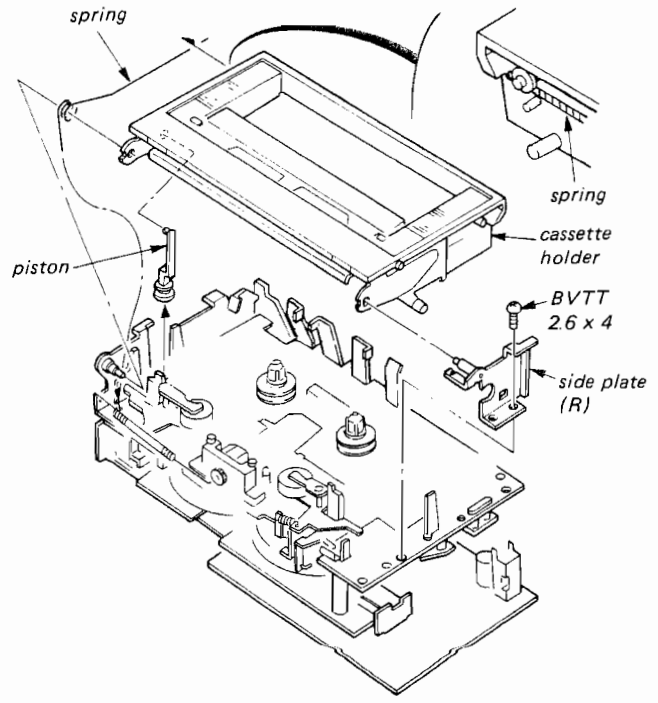
TAPE COUNTER: ❶~❼



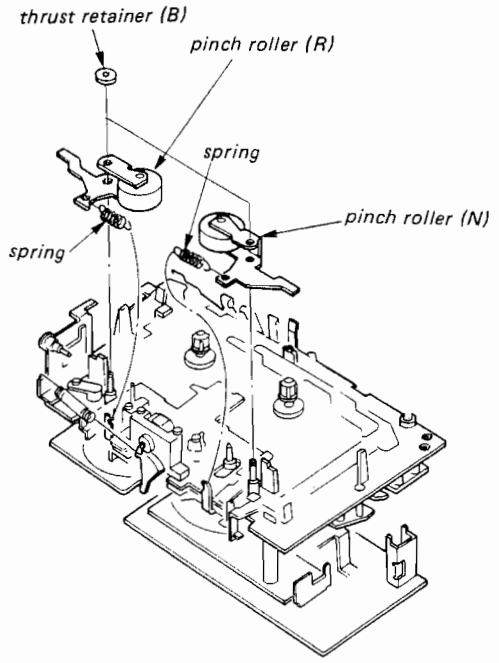
MECHANISM BLOCK (1)



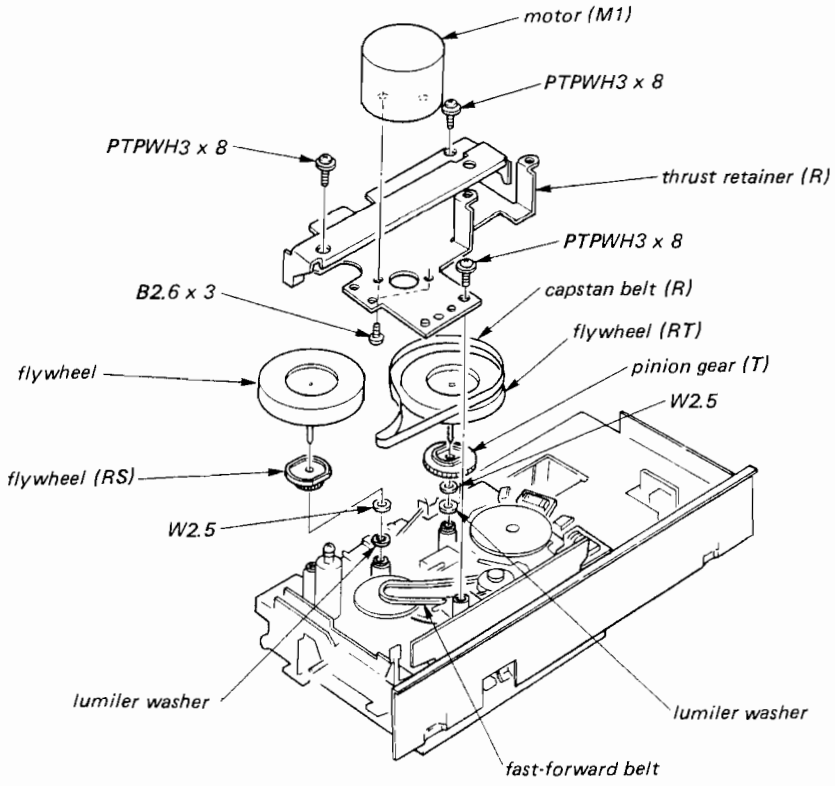
CASSETTE HOLDER



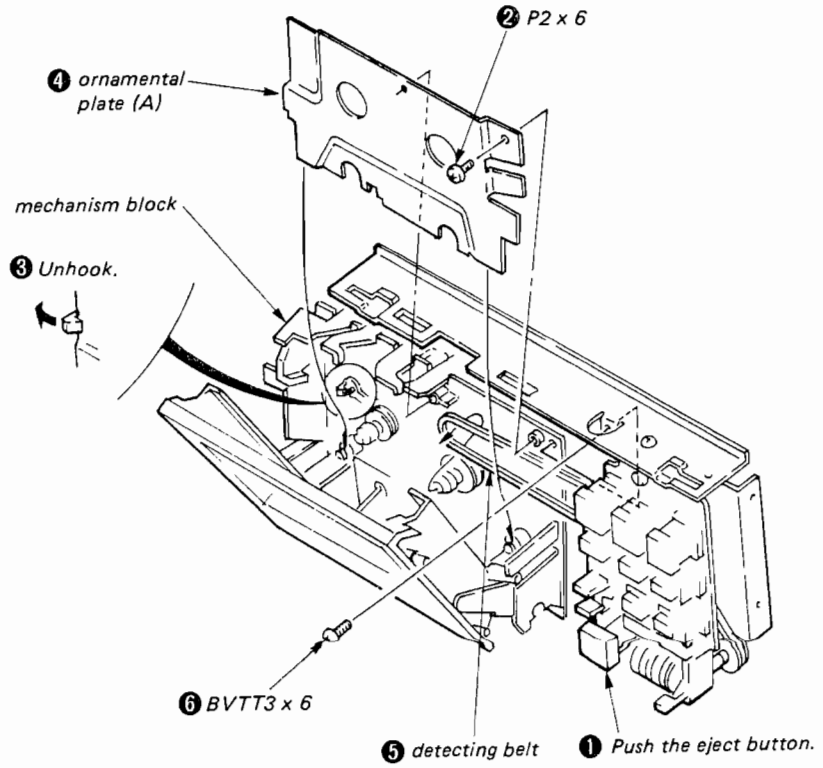
PINCH ROLLER



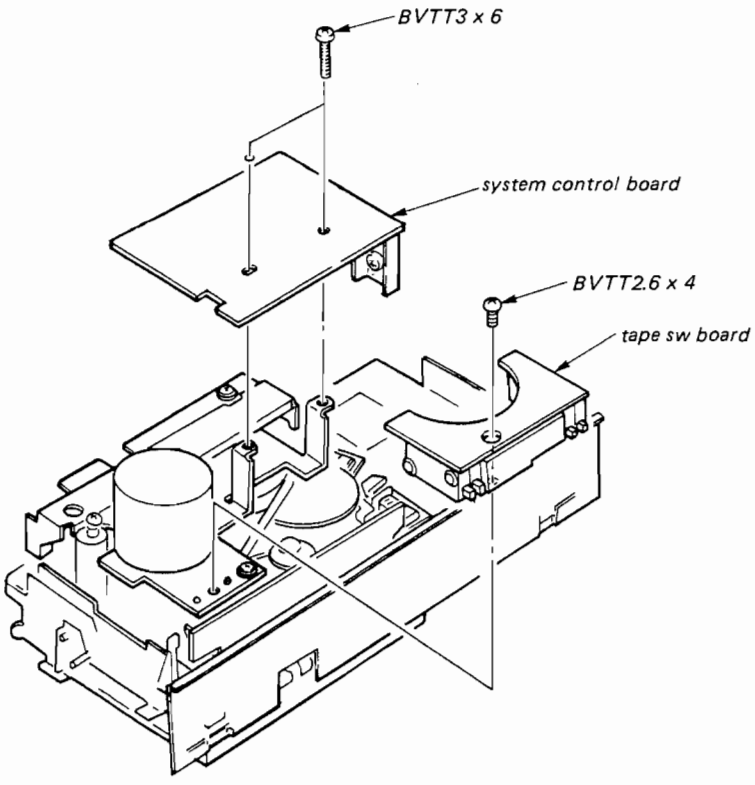
MOTOR, FLYWHEEL



MECHANISM BLOCK (2)



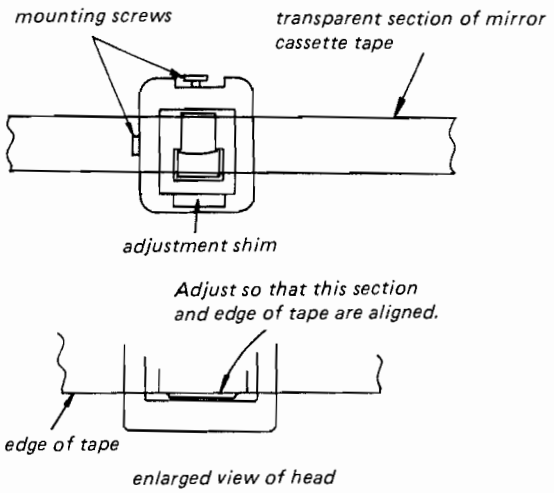
TAPE SW BOARD, SYSTEM CONTROL BOARD



Head Height Adjustment

The following adjustments should be made when the record/playback head is replaced.

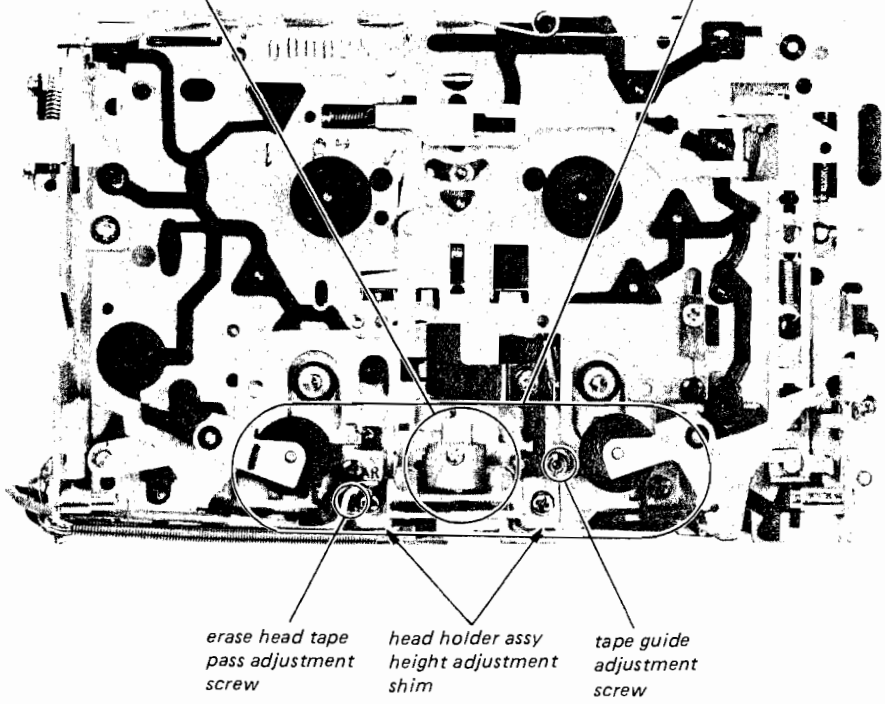
1. The head should be made after removing the head pad of the mirror cassette tape.
2. Using the leader section of the mirror cassette tape, adjustments are made by changing the adjusting shim so that the core and the edge of the tape become as shown in the illustration below when the tape is moved across the head.



Tape Path Adjustment

When assembling the erase head and head holder, and when replacing the tape guide (L), be sure to perform the following adjustments.

1. Using a mirror cassette, adjust each of the adjustment screws until there is not tape curling.
2. Perform adjustments by changing the height adjustment shim of the head holder assembly and the height adjustment shim of the record/playback head, so that the core of the record/playback head is positioned correctly for both FWD and REV.



SECTION 3
ADJUSTMENTS

3-1. MECHANICAL ADJUSTMENTS

PRECAUTION

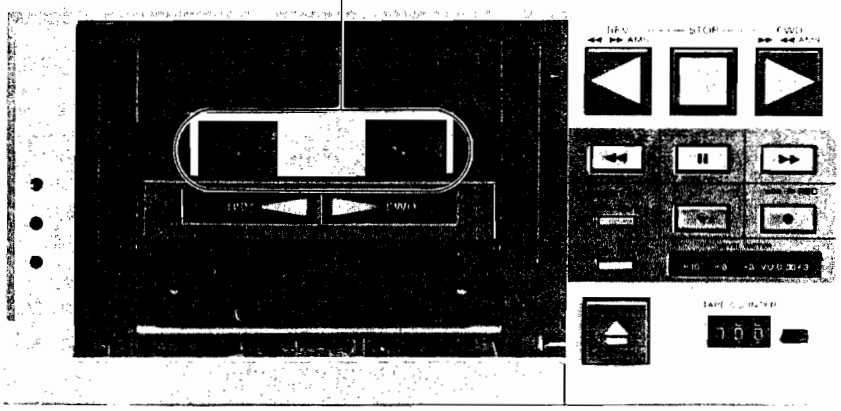
1. Clean the following parts with a denatured-alcohol-moistened swab:

record/playback head	pinch roller
erase head	rubber belts
capstan	idlers

2. Demagnetize the record/playback head with a head demagnetizer.
3. Do not use a magnetized screwdriver for the adjustments.
4. After the adjustments, apply suitable locking compound to the parts adjusted.
5. The adjustments should be performed with the rated power supply voltage (dc 2.5V) unless otherwise noted.

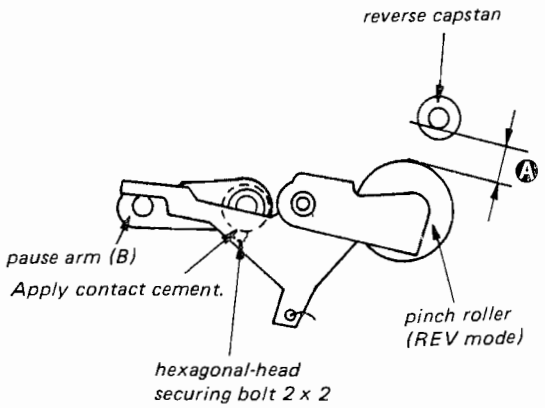
Torque Measurement

Torque	Torque meter	Meter reading
FWD	CQ-102C	28 – 60 g·cm (0.39 – 0.83 oz·inch)
FWD Back tension	CQ-102C	2 – 8 g·cm (0.03 – 0.1 oz·inch)
REV	CQ-102R	28 – 60 g.cm (0.39 – 0.83 oz·inch)
REV Back tension	CQ-102R	2 – 8 g·cm (0.03 – 0.1 oz·inch)
FF, REW	CQ-201B	80 – 165 g·cm (1.1 – 2.28 oz·inch)

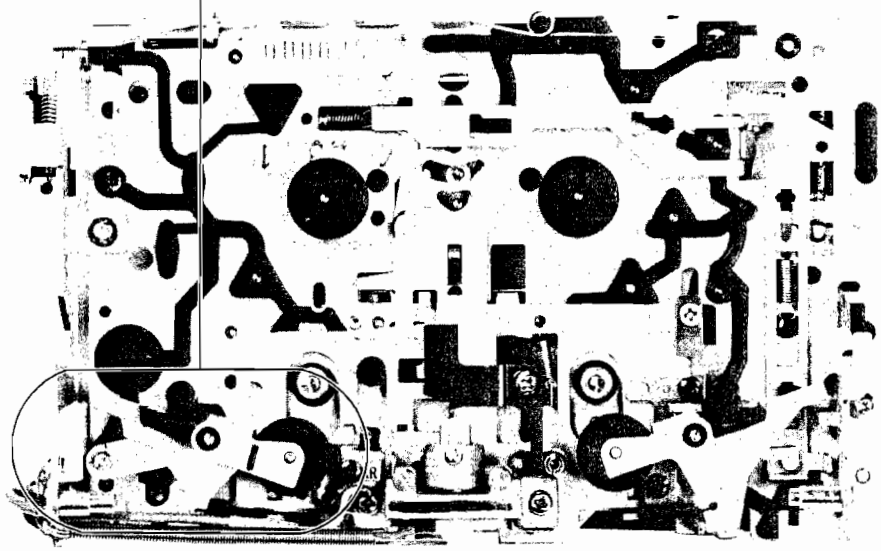


Pause Arm Position Adjustment

1. With the deck in the REV mode.
2. Loosen the hexagonal head securing bolts and adjust the position of the pause arm B so that the dimension of Ⓐ below becomes 0.5mm – 1.0mm.

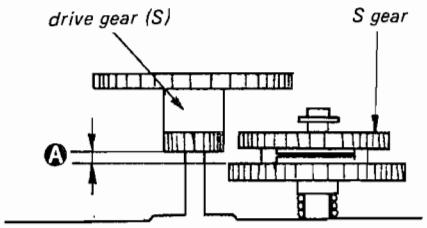


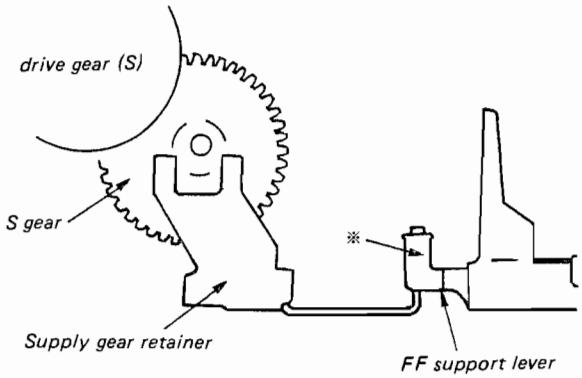
3. After the adjustment, lock the screws with contact cement.

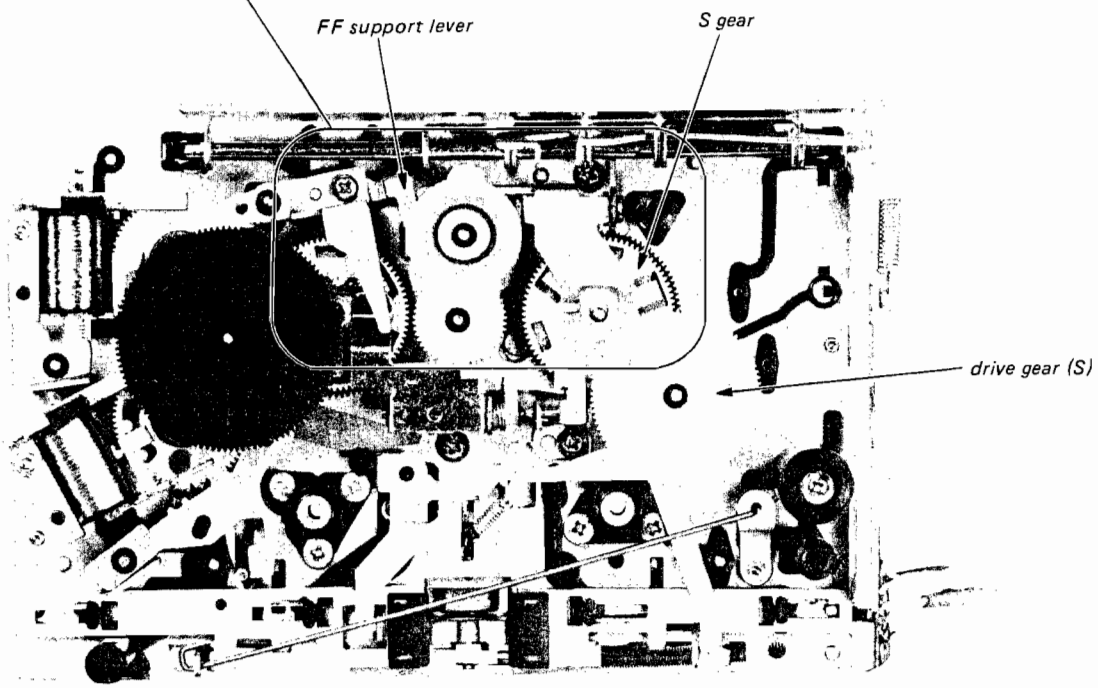


Supply Gear Retainer Position Adjustment

1. With the deck in the REV mode.
2. Bend the FF supplementary lever at the place indicated by the asterisk (※) to make adjustments so that the dimension of Ⓐ is 1mm, ±0.5mm.



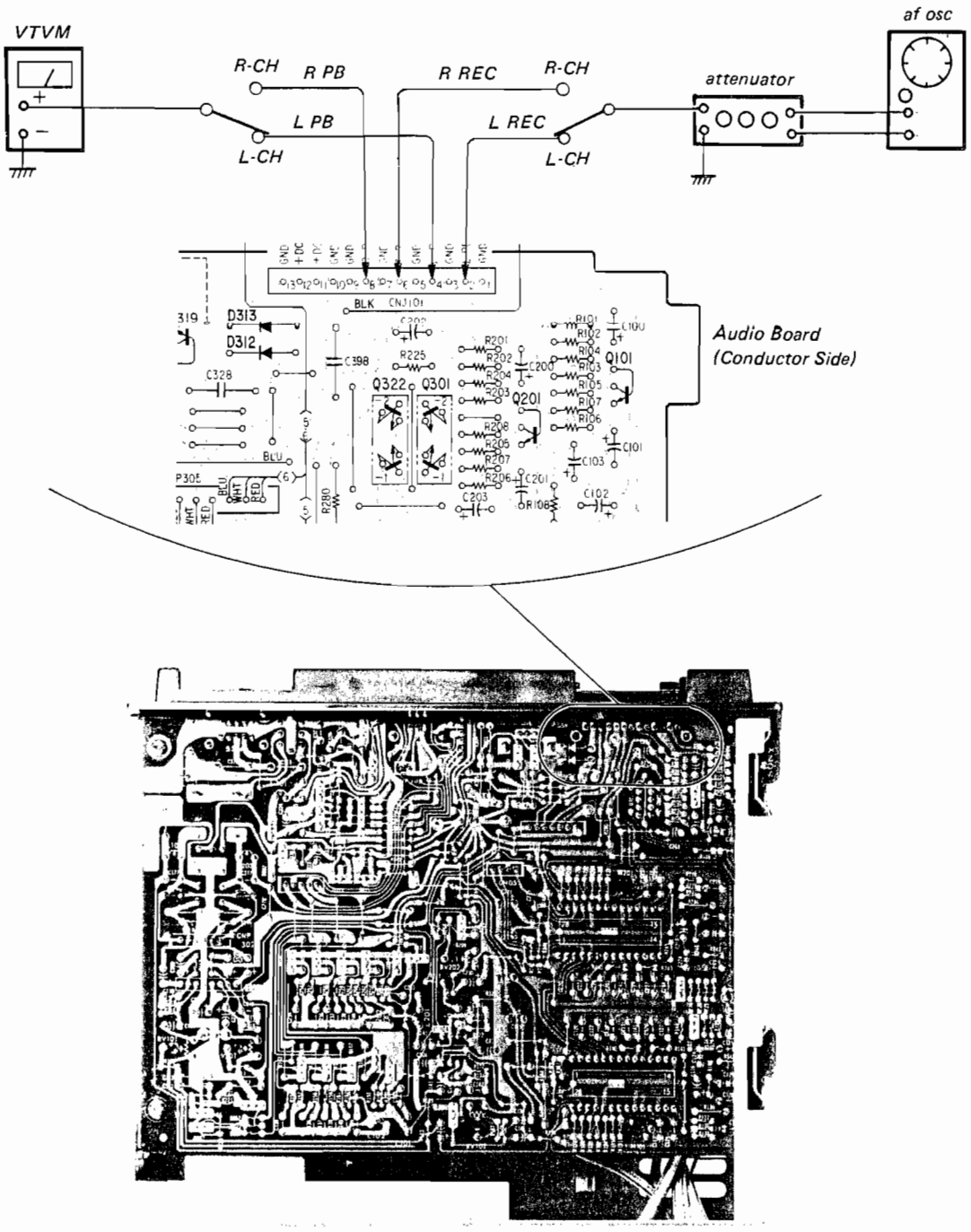




3-2. ELECTRICAL ADJUSTMENT

Note: The adjustment should be performed in the order given in this service manual. (Playback section may be adjusted earlier than record section.)
The adjustments should be performed for both L-CH and R-CH.

- **Output level check point**
- **Input level check point**



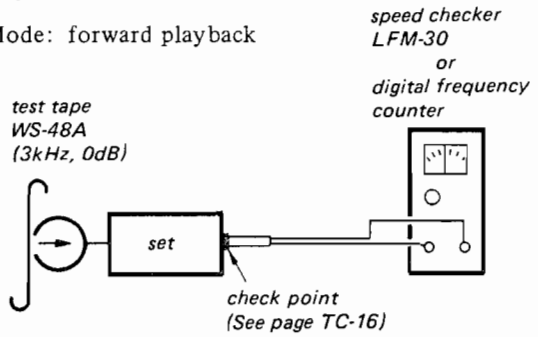
Tape Speed Adjustment

Setting:

TAPE SELECTOR switch: AUTO
DOLBY NR: OFF

Procedure:

Mode: forward playback

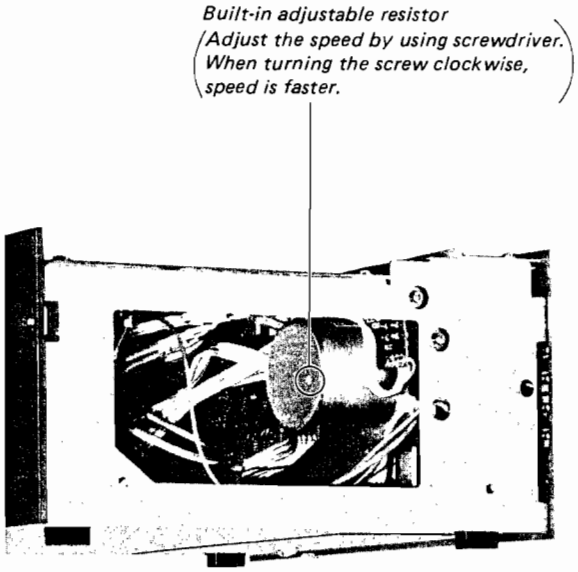


Specifications:

Speed checker	Digital frequency counter
±0.5%	2,985 – 3,015Hz

Frequency difference between the beginning and the end of the tape should be within 1% (30Hz).

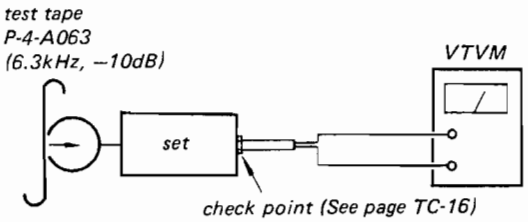
Adjustment Location: Motor (M1)



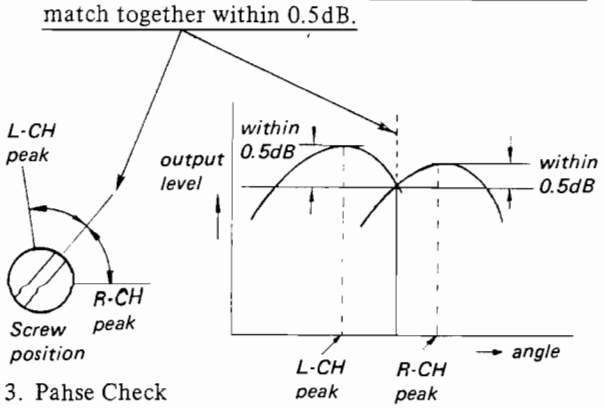
Forward Record/playback Head Azimuth Adjustment

Procedure:

1. Mode: forward playback

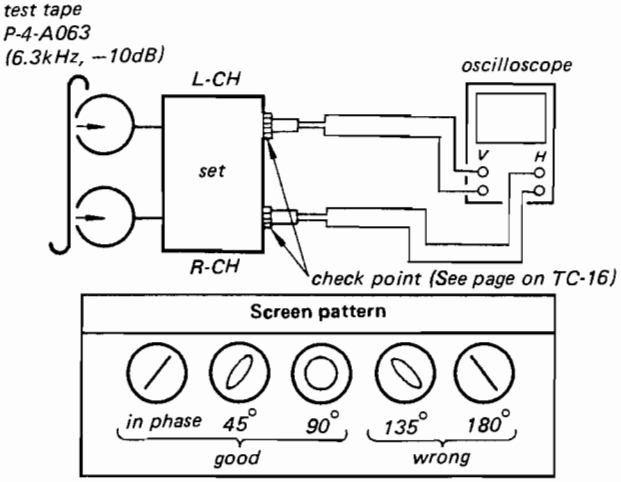


2. Turn the adjustment screw for the maximum output levels. If these levels do not match, turn the adjustment screw until both of output levels match together within 0.5dB.



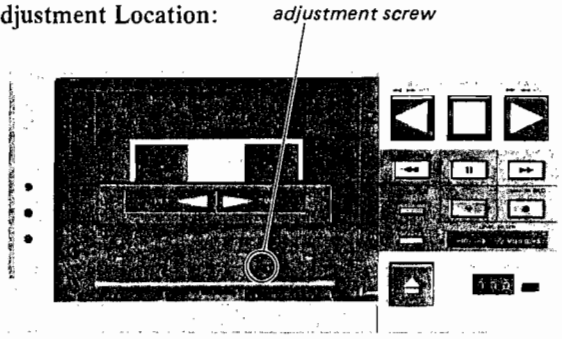
3. Pahse Check

Mode: forward playback



4. After the adjustment, lock the screws with locking compound.

Adjustment Location:

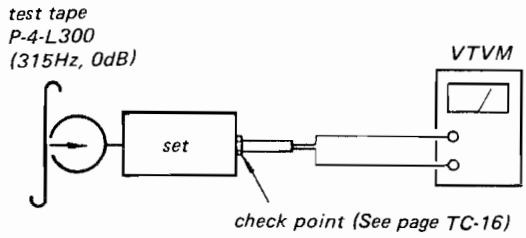


Playback Level Adjustment

Setting.

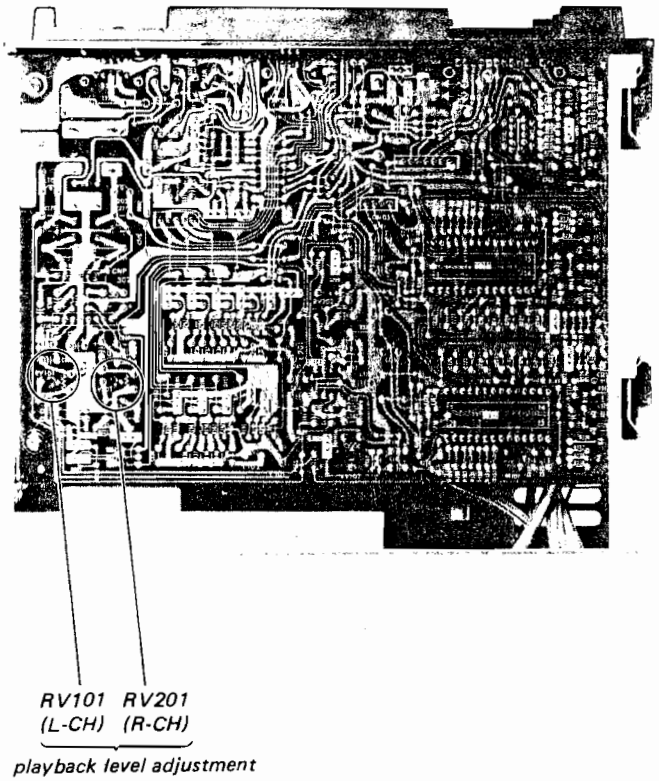
DOLBY NR switch: OFF
TAPE SELECTOR switch: AUTO

Procedure:



Adjust RV101 (L-CH) and RV201 (R-CH) to obtain 0.29 – 0.32V (–7.5 to –8.5dB) on the VTVM.
Check that the Line out level does not change in playback mode while changing the mode from playback to stop several times.

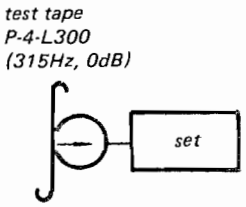
Adjustment Location: Audio Board



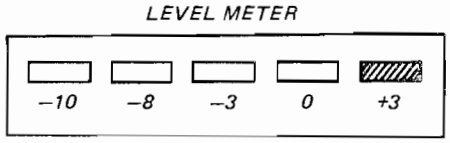
Level Meter Calibration

Proceudre:

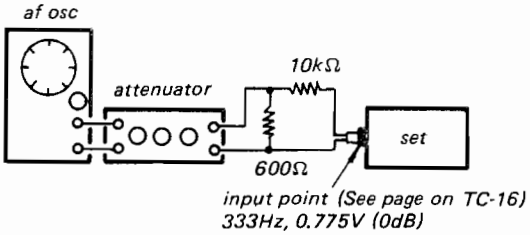
1. Mode: playback



2. Adjust RV301 so that the most-rightside segment (+3dB) of the LED meter goes on and again turn it in the reverse direction until the segment just goes off.

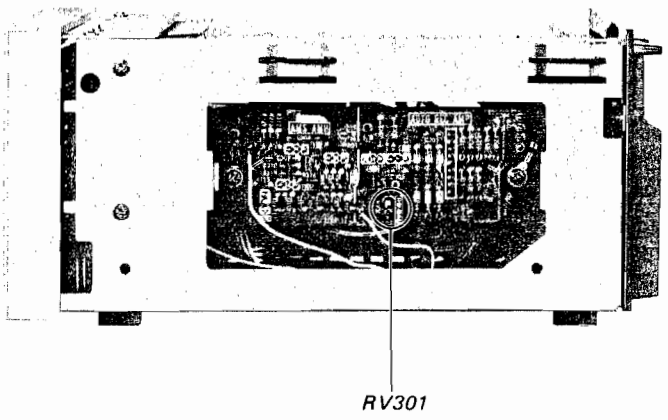


3. Mode: record



Make sure that all LEDs of level meter go on.

Adjustment Location: Audio Board



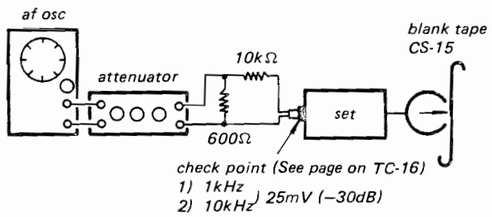
Record Bias Adjustment

Setting:

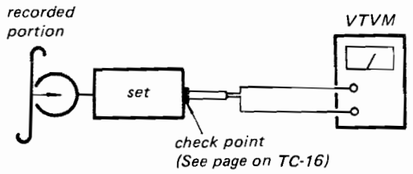
DOLBY NR switch:	OFF
TAPE SELECTOR switch:	AUTO
ISS switch:	1

Procedure:

1. Mode: record

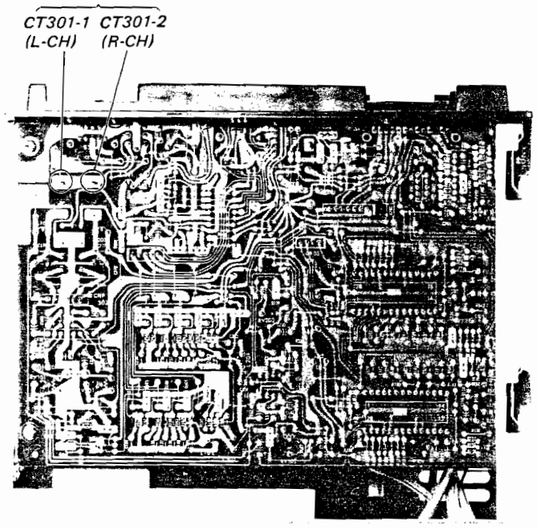


2. Mode: playback



Adjust CT301 (L-CH. R-CH) so that the measurement point level of 10kHz signal in 0dB relative to that of 1kHz.

Adjustment Location: audio board



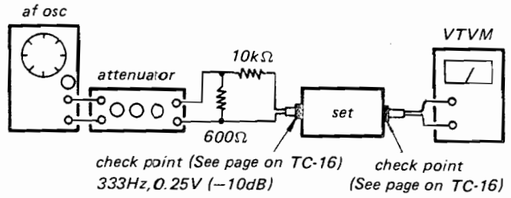
Record Level Adjustment

Setting:

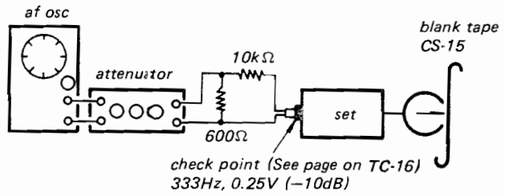
DOLBY NR switch:	OFF
TAPE SELECTOR switch:	AUTO
ISS switch:	1

Procedure:

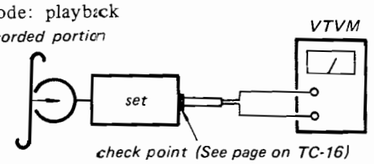
1. Mode: record



2. Mode: record

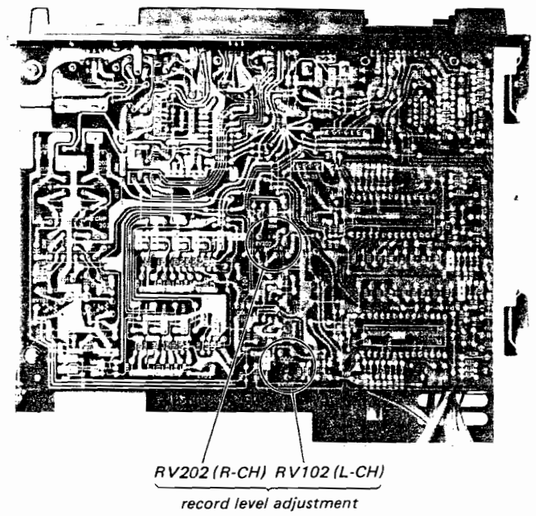


3. Mode: playback



4. Adjust RV102 (L-CH) and RV202 (R-CH) so that playback output level of step 3 is 0 ±0.5dB relative to that of step 1.

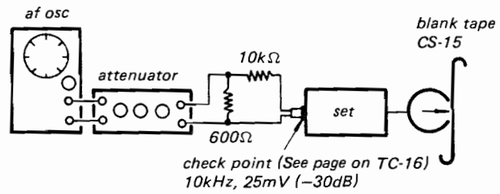
Adjustment Location: audio board



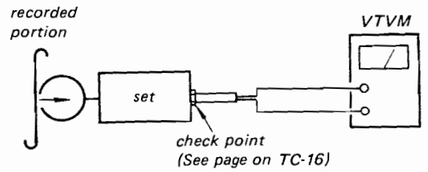
Reverse Playback Head Azimuth Adjustment

Procedure:

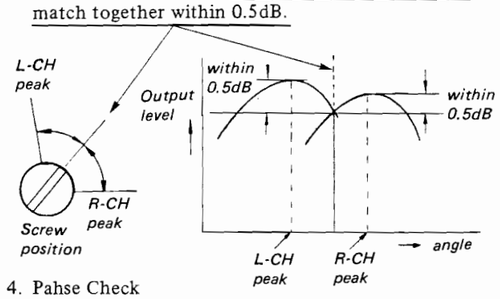
1. Mode: record



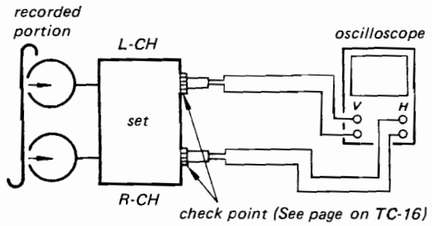
2. Mode: reverse playback

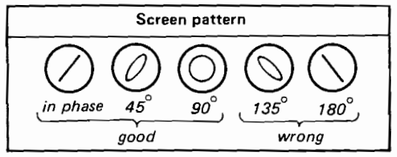


3. Turn the adjustment screw for the maximum output levels. If these levels do not match, turn the adjustment screw until both of output levels match together within 0.5dB.

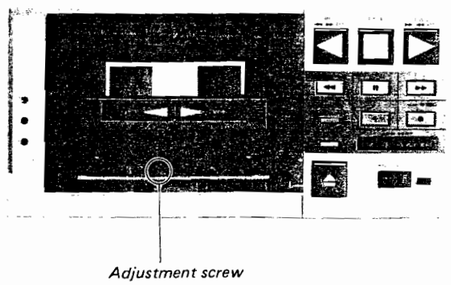


4. Pahse Check
   Mode: reverse playback





Adjustment Location:



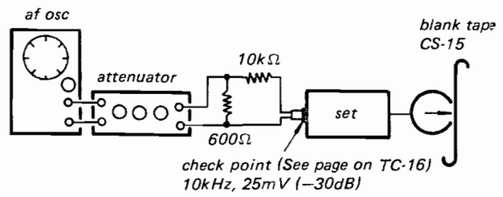
5. After the adjustment, lock the screws with locking compound.

MEMO

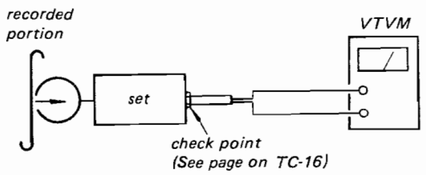
Reverse Playback Head Azimuth Adjustment

Procedure:

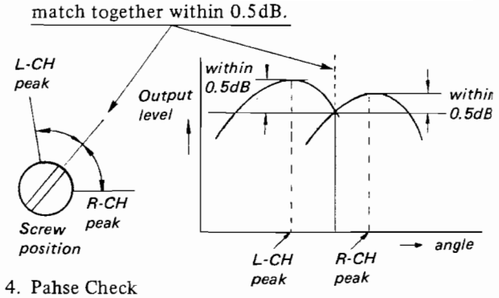
1. Mode: record



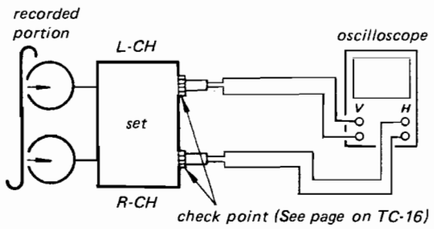
2. Mode: reverse playback

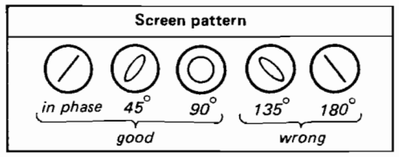


3. Turn the adjustment screw for the maximum output levels. If these levels do not match, turn the adjustment screw until both of output levels match together within 0.5dB.



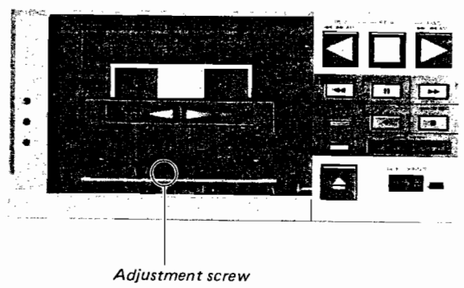
4. Pahse Check
   Mode: reverse playback



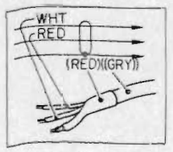


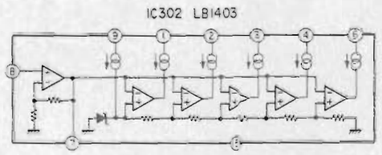
5. After the adjustment, lock the screws with locking compound.

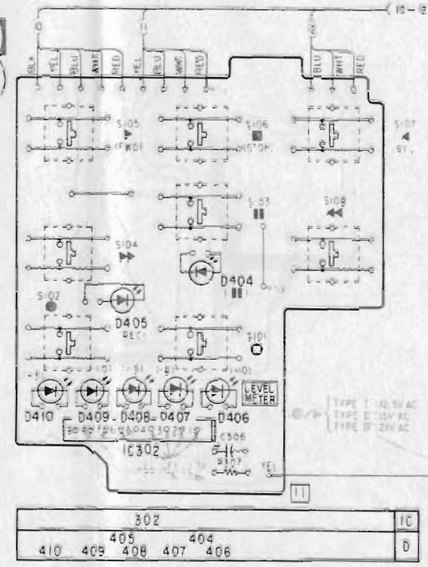
Adjustment Location:

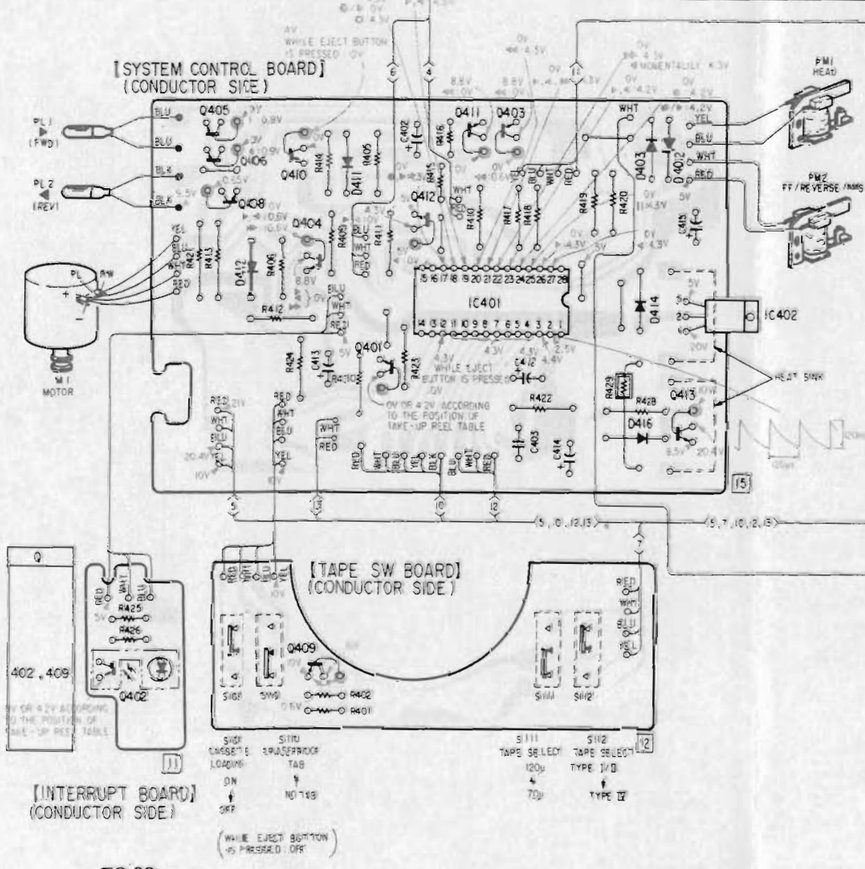


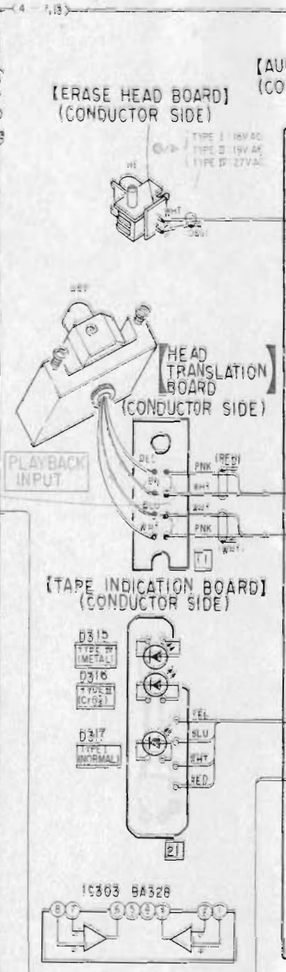
MEMO

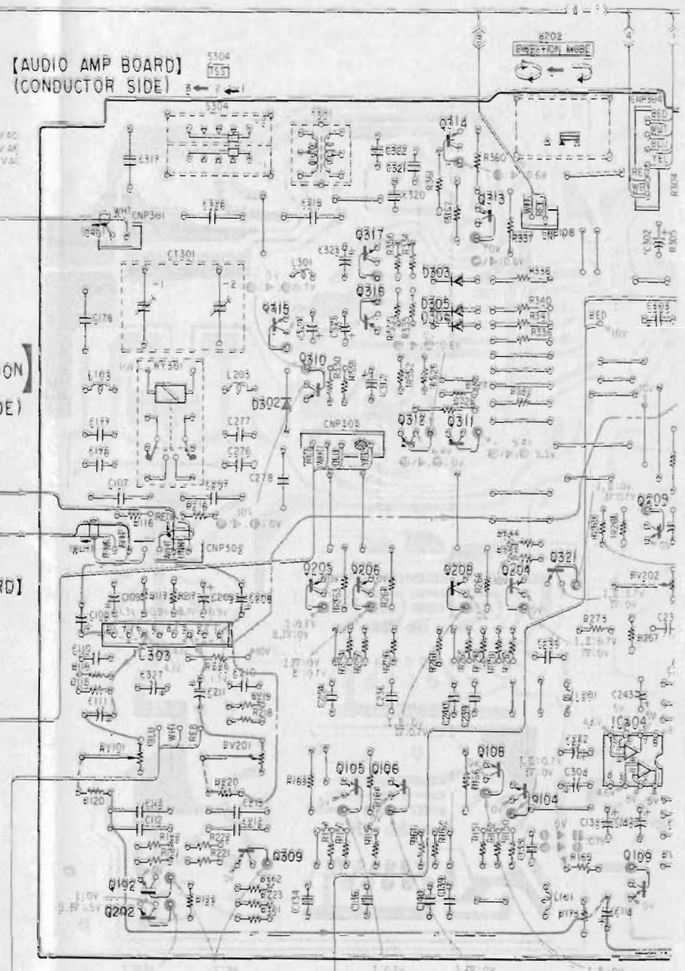












US, Canadian Model

SECTION 4
DIAGRAMS

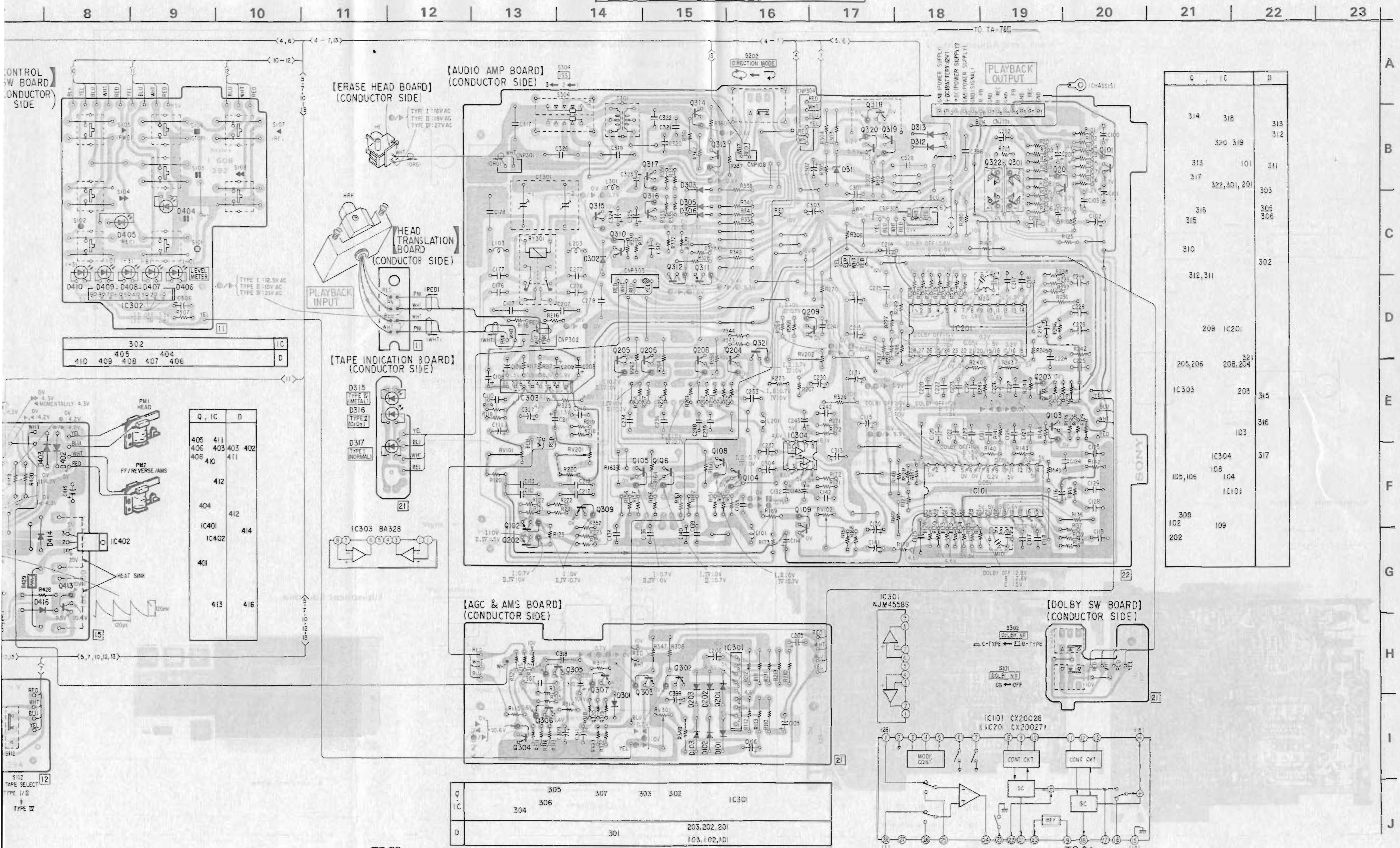
4-1. MOUNTING DIAGRAM

- See page TC-31 for Semiconductor lead layouts.

Note:

- ○—: parts extracted from the component side.
- ●—: parts extracted from the conductor side.
- Color code of sleeving over the end of the jacket.

- ▨ : B+ pattern
- ⇨ : signal path
- ⇨ : L-CH signal path
- ⇨ : R-CH signal path


CONTROL SW BOARD (CONDUCTOR SIDE)
[ERASE HEAD BOARD] (CONDUCTOR SIDE)
[AUDIO AMP BOARD] (CONDUCTOR SIDE)
S202 DIRECTION MODE
TO TA-78II
PLAYBACK OUTPUT
HEAD TRANSLATION BOARD (CONDUCTOR SIDE)
PLAYBACK INPUT
LEVEL METER
[TAPE INDICATION BOARD] (CONDUCTOR SIDE)
D315 TYPE III (METAL)
D316 TYPE II (CrO2)
D317 TYPE I (NORMAL)
IC303 BA328
PM1 HEAD
PM2 FF/REVERSE/AMS
HEAT SINK
[AGC & AMS BOARD] (CONDUCTOR SIDE)
IC301 NJM4558S
[DOLBY SW BOARD] (CONDUCTOR SIDE)
S302 DOLBY NR
C-TYPE ← B-TYPE
S301 DSCRI NR
ON ← OFF
IC101 CX20028 (IC201 CX20027)
MODE CONT
CONT CKT
SC
REF
S112 TAPE SELECT TYPE I/II TYPE IV
SONY

● See page TC-30 for Notes.

US, Canadian Model

FH-7MK II TC-78C II **FH-7MK II TC-78C II**

US, Canadian Model

1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17

【AUDIO AMP BOARD(1/2)】

Q101 2SC1345 BUFFER AMP

Q301,322 μPA76V AUTOMATIC RECORDING LEVEL CONTROL

IC101 CX20028 DOLBY/LINE AMP/RECORD AMP

IC303 BA328 PB EQ AMP

L-CH HRP PA 242-3602

Q102 2SC1364 PB EQ SWITCH

Q202 2SC1364 PB EQ SWITCH

Q201 2SC1345 BUFFER AMP

IC201 CX20027 DOLBY/LINE AMP/RECORD AMP

IC303 BA328 PB EQ AMP

R-CH HRP PA 242-3602

Q309 2SC1364 PB EQ SWITCH

Q312 2SC1364 Q311 2SA1026 REC SWITCH

D302 IT40

RY301

Q310 2SC1364 RELAY DRIVE

Q315 2SC2001 BIAS OSC SWITCH

T301 ME ES 237-36

Q313,314 2SC945 BIAS OSC

Q316 2SA1026 Q317 2SC1364 BIAS OSC SWITCH CONTROL

(RECORD) (BIAS) TO SYSTEM CONTROL BOARD

S302 DOLBY NR C-TYPE B-TYPE

S301 DOLBY NR ON OFF

【DOLBY SW BOARD】

D303,305,306 IT40

D315-317 SLR34PC5

S304-1 S304-2 ISS

【TAPE INDICATION BOARD】

Q409 2SA1026 SWITCHING

S111 TAPE SELECT 120μ 70μ

S112 TAPE SELECT TYPE I/II TYPE IV

S109 CASSETTE LOADING ON OFF (WHILE EJECT BUTTON IS PRESSED: OFF)

【TAPE SW BOARD(1/2)】

IC301 NJM4558S AUTOMATIC RECORDING LEVEL AMP

D101-103,201-203 IT40

Q302 2SC1364 AUTOMATIC RECORDING LEVEL MUTING

Q303 2SC13[illegible] METER MUTING

【AGC & AMS BOARD(1/3)】

IC304 NJM4560D-D REC AMP

Q109 2SC1364 REC MUTING

Q321 2SC1364 REC EQ SWITCH

Q104-106,108 2SC1364 REC EQ SWITCH

IC304 NJM4560D REC AMP

Q209 2SC2785F REC MUTING

Q204-206,208 2SC1364 REC EQ SWITCH

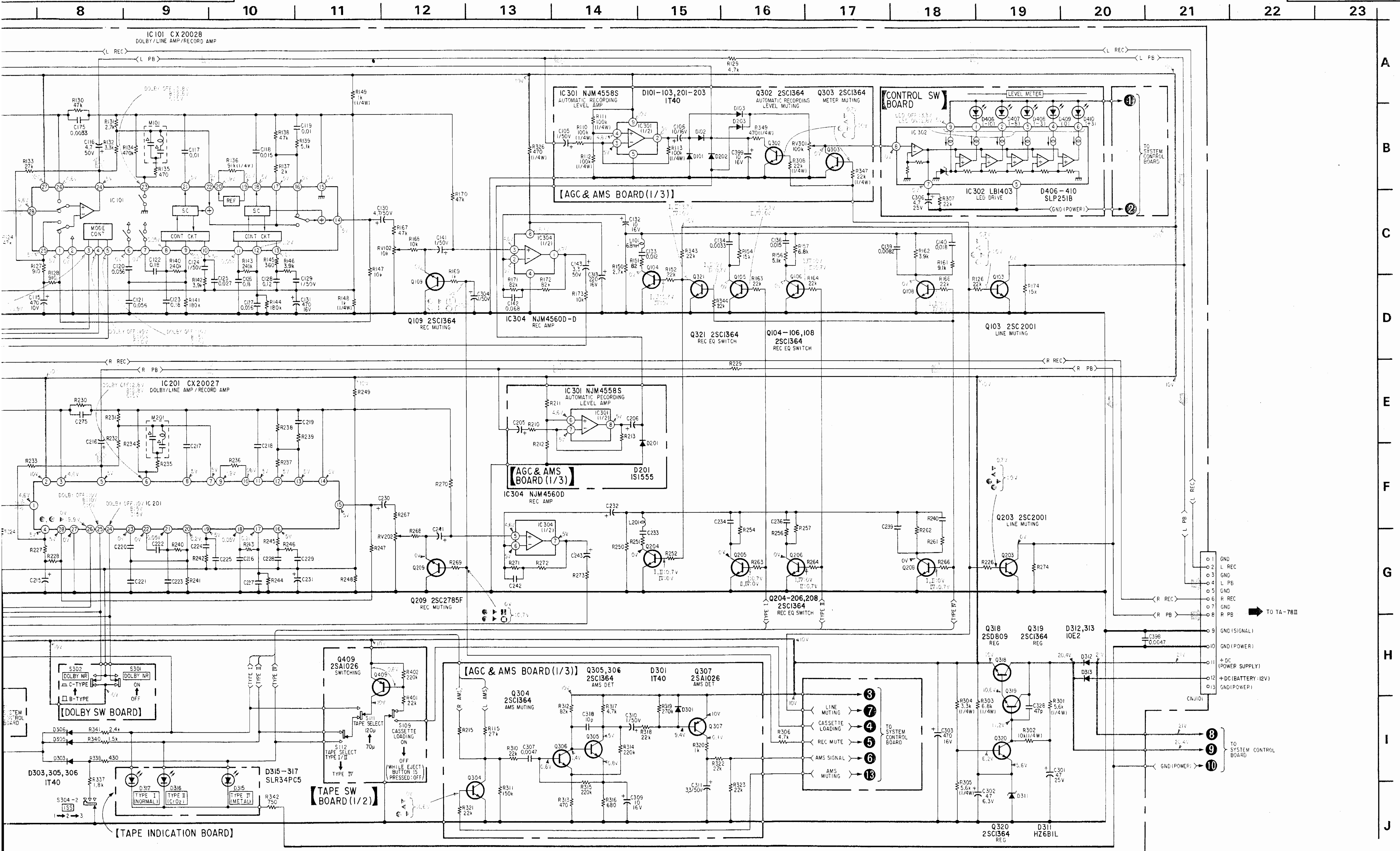
Q304 2SC1364 AMS MUTING

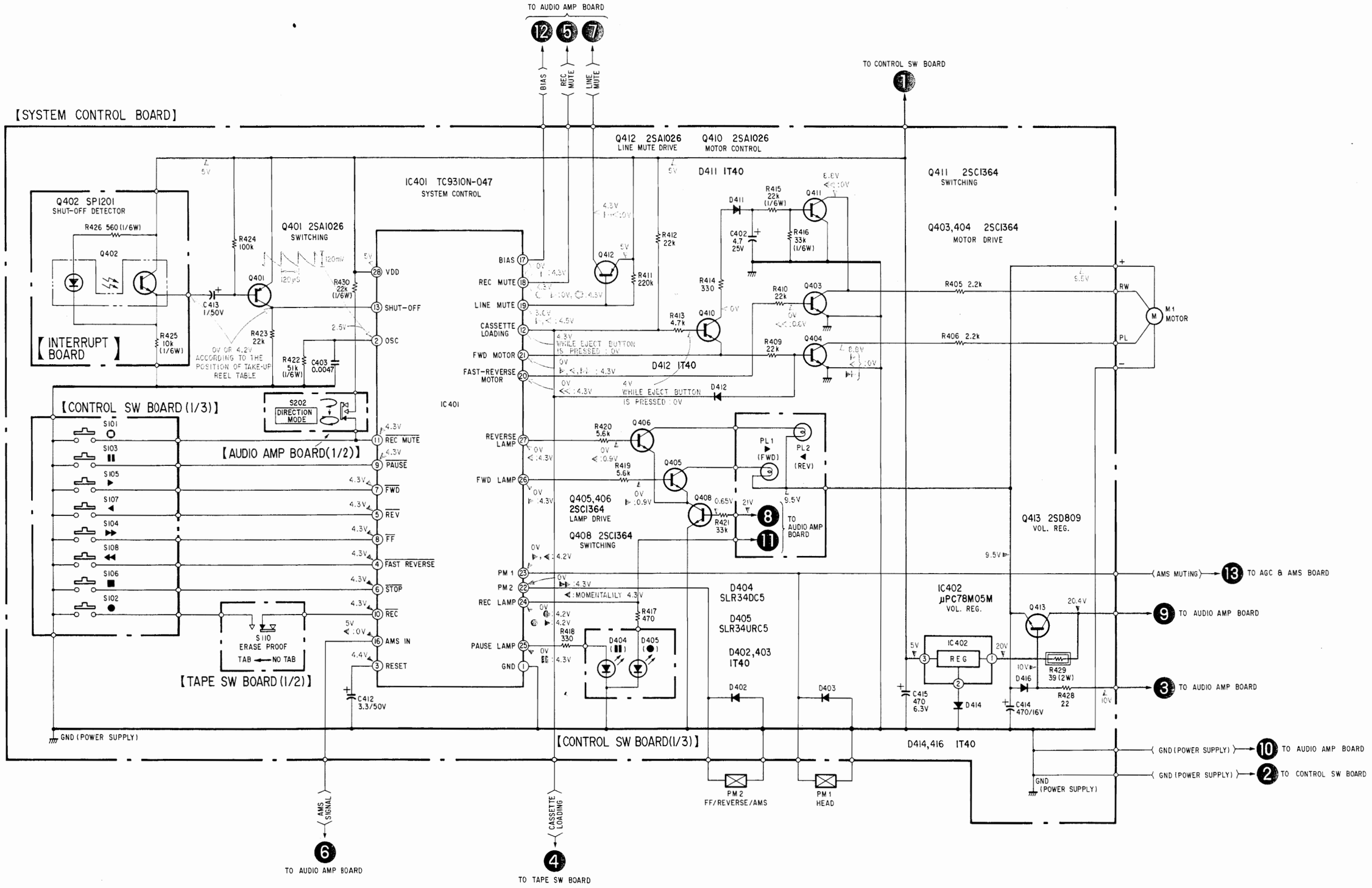
Q305,306 2SC1364 AMS DET

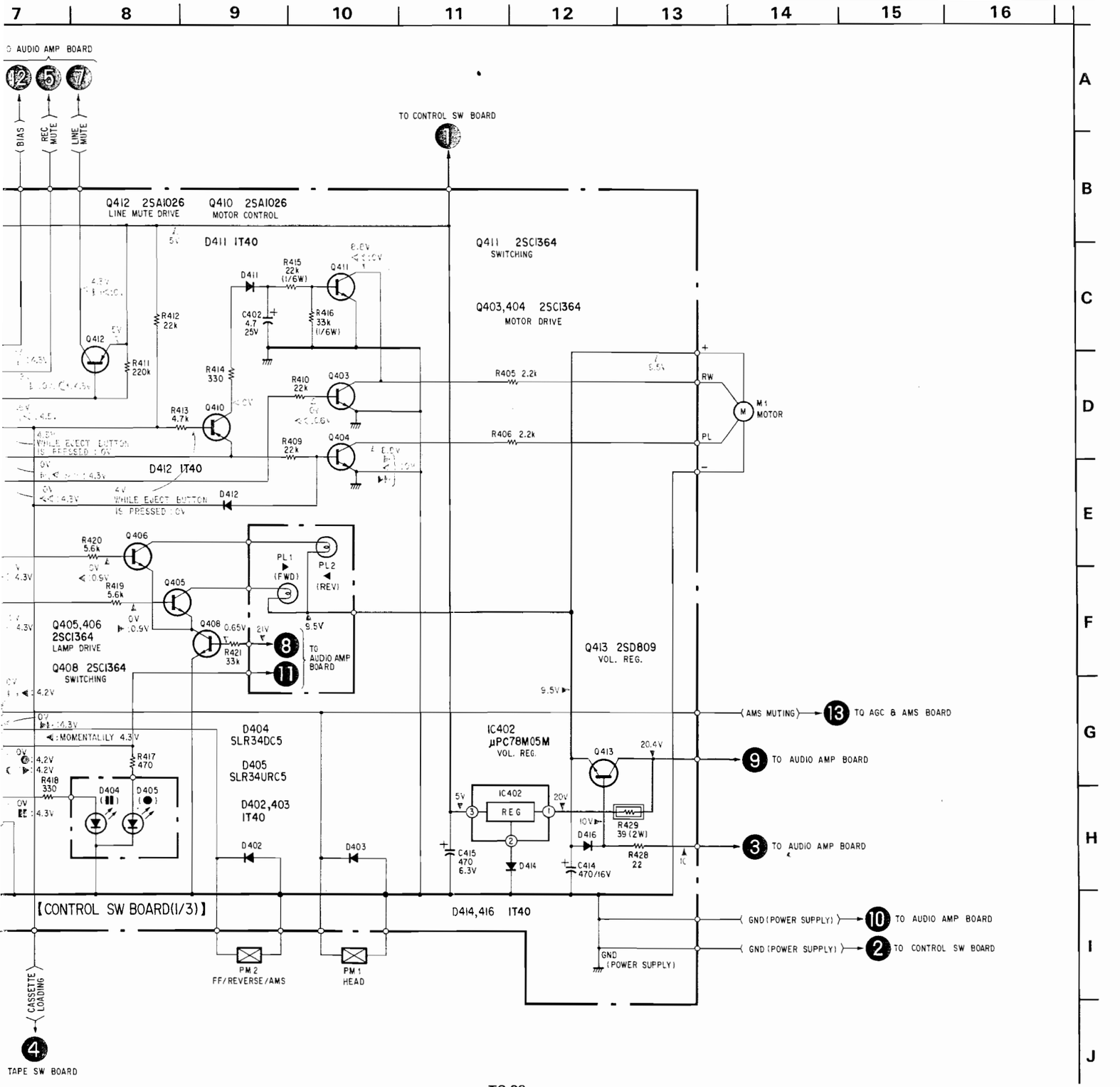
D301 IT40

Q307 2SA1026 AMS DET

LINE MUTING
CASSETTE LOADING
REC MUTE
AMS SIGNAL
AMS MUTING


IC101 CX20028
DOLBY/LINE AMP/RECORD AMP
IC201 CX20027
DOLBY/LINE AMP/RECORD AMP
IC301 NJM4558S
AUTOMATIC RECORDING LEVEL AMP
D101-103, 201-203
1T40
Q302 2SC1364
AUTOMATIC RECORDING LEVEL MUTING
Q303 2SC1364
METER MUTING
[CONTROL SW BOARD]
LEVEL METER
IC302 LB1403
LED DRIVE
D406-410
SLP251B
TO SYSTEM CONTROL BOARD
[AGC & AMS BOARD (1/3)]
IC304 NJM4560D-D
REC AMP
Q109 2SC1364
REC MUTING
Q321 2SC1364
REC EQ SWITCH
Q104-106,108
2SC1364
REC EQ SWITCH
Q103 2SC2001
LINE MUTING
D201
1S1555
IC304 NJM4560D
REC AMP
Q203 2SC2001
LINE MUTING
Q209 2SC2785F
REC MUTING
Q204-206,208
2SC1364
REC EQ SWITCH
Q318
2SD809
REG
Q319
2SC1364
REG
D312,313
10E2
TO TA-78II
GND
L REC
L PB
R REC
R PB
GND (SIGNAL)
GND (POWER)
+DC (POWER SUPPLY)
+DC (BATTERY 12V)
GND (POWER)
CNJ101
[DOLBY SW BOARD]
Q409
2SA1026
SWITCHING
[TAPE SW BOARD (1/2)]
Q305,306
2SC1364
AMS DET
D301
1T40
Q307
2SA1026
AMS DET
Q304
2SC1364
AMS MUTING
LINE MUTING
CASSETTE LOADING
REC MUTE
AMS SIGNAL
AMS MUTING
D303,305,306
1T40
D315-317
SLR34PC5
[TAPE INDICATION BOARD]
Q320
2SC1364
REG
D311
HZ6B1L


TO AUDIO AMP BOARD
12
5
7
BIAS
REC MUTE
LINE MUTE
TO CONTROL SW BOARD
1
【SYSTEM CONTROL BOARD】
Q412 2SA1026
LINE MUTE DRIVE
Q410 2SA1026
MOTOR CONTROL
IC401 TC9310N-047
SYSTEM CONTROL
D411 1T40
Q411 2SC1364
SWITCHING
Q403,404 2SC1364
MOTOR DRIVE
Q402 SP1201
SHUT-OFF DETECTOR
R426 560(1/6W)
Q402
【INTERRUPT BOARD】
R425 10k (1/6W)
R424 100k
Q401 2SA1026
SWITCHING
120mV
120μS
C413 1/50V
R430 22k (1/6W)
R423 22k
R422 51k (1/6W)
C403 0.0047
0V OR 4.2V ACCORDING TO THE POSITION OF TAKE-UP REEL TABLE
28 VDD
13 SHUT-OFF
2 OSC
BIAS 17
REC MUTE 18
LINE MUTE 19
CASSETTE LOADING 12
FWD MOTOR 21
FAST-REVERSE MOTOR 20
REVERSE LAMP 27
FWD LAMP 26
PM 1 23
PM 2 22
REC LAMP 24
PAUSE LAMP 25
GND 1
R412 22k
Q412
R411 220k
R413 4.7k
Q410
4.3V WHILE EJECT BUTTON IS PRESSED : 0V
D412
4V WHILE EJECT BUTTON IS PRESSED : 0V
R414 330
D411
R415 22k (1/6W)
Q411
C402 4.7 25V
R416 33k (1/6W)
R410 22k
Q403
R409 22k
Q404
R405 2.2k
R406 2.2k
RW
PL
M1 MOTOR
R420 5.6k
Q406
R419 5.6k
Q405
Q405,406 2SC1364
LAMP DRIVE
Q408 2SC1364
SWITCHING
Q408
R421 33k
PL1 (FWD)
PL2 (REV)
8
11
TO AUDIO AMP BOARD
Q413 2SD809
VOL. REG.
9.5V
D404 SLR34DC5
D405 SLR34URC5
D402,403 1T40
R417 470
D404 (■)
D405 (●)
IC402 μPC78M05M
VOL. REG.
IC402 REG
C415 470 6.3V
D414
C414 470/16V
D416
R429 39 (2W)
R428 22
20.4V
10V
【CONTROL SW BOARD (1/3)】
S101
S103
S105
S107
S104
S108
S106
S102
S202 DIRECTION MODE
【AUDIO AMP BOARD(1/2)】
REC MUTE 11
PAUSE 9
FWD 7
REV 5
FF 8
FAST REVERSE 4
STOP 6
REC 10
AMS IN 16
RESET 3
S110 ERASE PROOF TAB ← NO TAB
【TAPE SW BOARD (1/2)】
C412 3.3/50V
GND (POWER SUPPLY)
【CONTROL SW BOARD(1/3)】
D414,416 1T40
PM2 FF/REVERSE/AMS
PM1 HEAD
AMS MUTING
13
TO AGC & AMS BOARD
9
TO AUDIO AMP BOARD
3
TO AUDIO AMP BOARD
GND (POWER SUPPLY)
10
TO AUDIO AMP BOARD
GND (POWER SUPPLY)
2
TO CONTROL SW BOARD
AMS SIGNAL
6
TO AUDIO AMP BOARD
CASSETTE LOADING
4
TO TAPE SW BOARD



NOTE FOR SCHEMATIC DIAGRAM
– Audio Amp Section –

Note:

- Components for right channel have same values as for left channel. Reference numbers are coded from 200.
- All capacitors are in μF unless otherwise noted. pF : μμF 50WV or less are not indicated except for electrolytics and tantalums.
- All resistors are in ohms, 1/6W unless otherwise noted. kΩ : 1000Ω, MΩ : 1000kΩ
- ▭ : panel designation.
- ——— : B+ bus.
- Reading are taken under no-signal conditions.
  No mark : STOP
  ▶ : FWD
  ◀ : REV
  ▶▶ : FF
  ◀◀ : FAST-REVERSE
  ● : REC
  ●/▶ : REC/FWD
  ○ : REC MUTE
  ▮▮ : PAUSE
- ▭ : signal path.
- Switch

Ref. No.	Switch	Position
S109	CASSETTE LOADING	ON
S111	TAPE SELECTOR	70μ
S112	TAPE SELECTOR	TYPE I/II
S301	DOLBY NR	OFF
S302	DOLBY NR	⎍ B-TYPE
S304	ISS	1

– System Control Section –

Note:

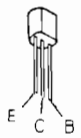
- All capacitors are in μF unless otherwise noted. pF : μμF 50WV or less are not indicated except for electrolytics and tantalums.
- All resistors are in ohms, ¼W unless otherwise noted. kΩ : 1000Ω, MΩ : 1000kΩ
- ⏦ : nonflammable resistor.
- ——— : B+ bus.
- Reading are taken under no-signal conditions.
  No mark : STOP
  ▶ : FWD
  ◀ : REV
  ▶▶ : FF
  ◀◀ : FAST-REVERSE
  ● : REC
  ●/▶ : REC/FWD
  ○ : REC MUTE
  ▮▮ : PAUSE
- Switch

Ref. No.	Switch	Position
S101	○ (REC MUTE)	OFF
S102	● (REC)	OFF
S103	▮▮ (PAUSE)	OFF
S104	▶▶ (FF)	OFF
S105	▶ (FWD)	OFF
S106	■ (STOP)	OFF
S107	◀ (REV)	OFF
S108	◀◀ (FAST-REVERSE)	OFF
S110	ACCIDENTAL-ERASURE PREVENTION	NO TAB
S202	DIRECTION MODE	⮌

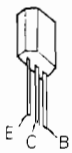
Note: Voltages are measured with a VOM (50kΩ/V).

SEMICONDUCTOR LEAD LAYOUTS

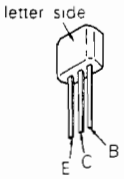
2SA733
2SC945
2SC1345
2SC1364
2SC2001



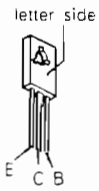
2SA1026
2SA1027R



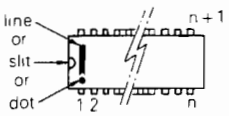
2SC2458
2SC2785
2SC2785F



2SD809

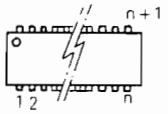


CX20028
MB84069UB
NJM4560D-D
TC9310N-001



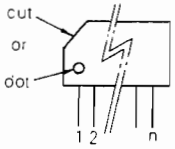
(Top view)

MB84001B
MB84011B

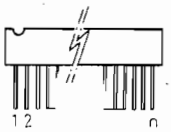


(Top view)

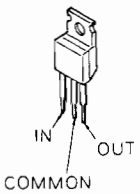
LB1403
NJM4558S



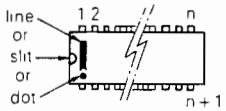
BA328



NJM78M05A

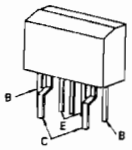


CX20027

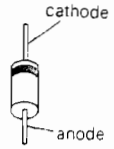


(Top view)

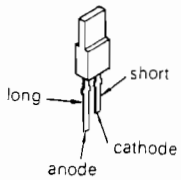
μPA76V-FA



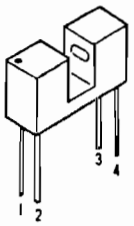
10E-2
1S1555
1SS133
HZ6B1L

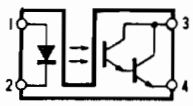


SLP251B

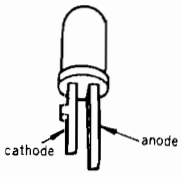


SPI201



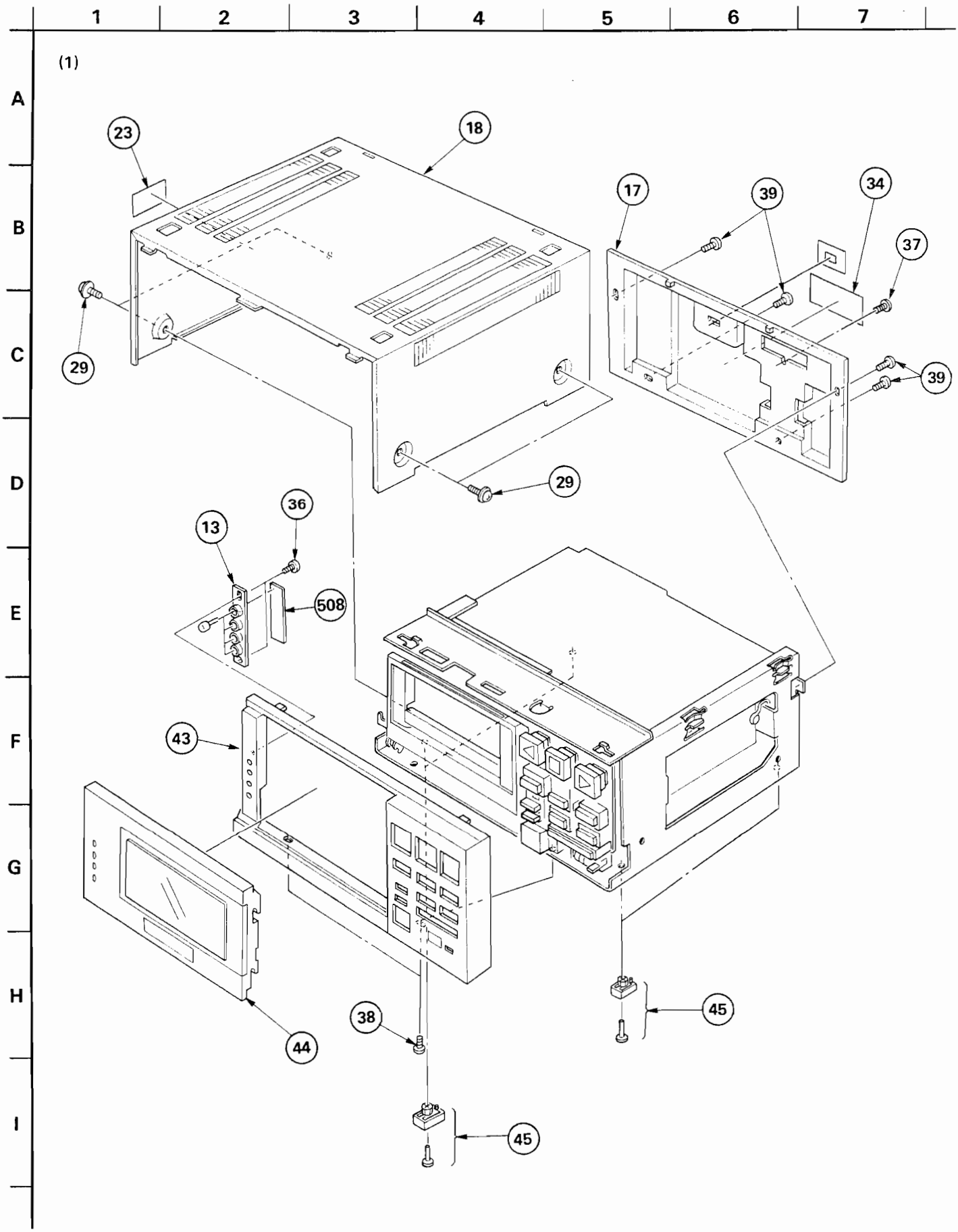


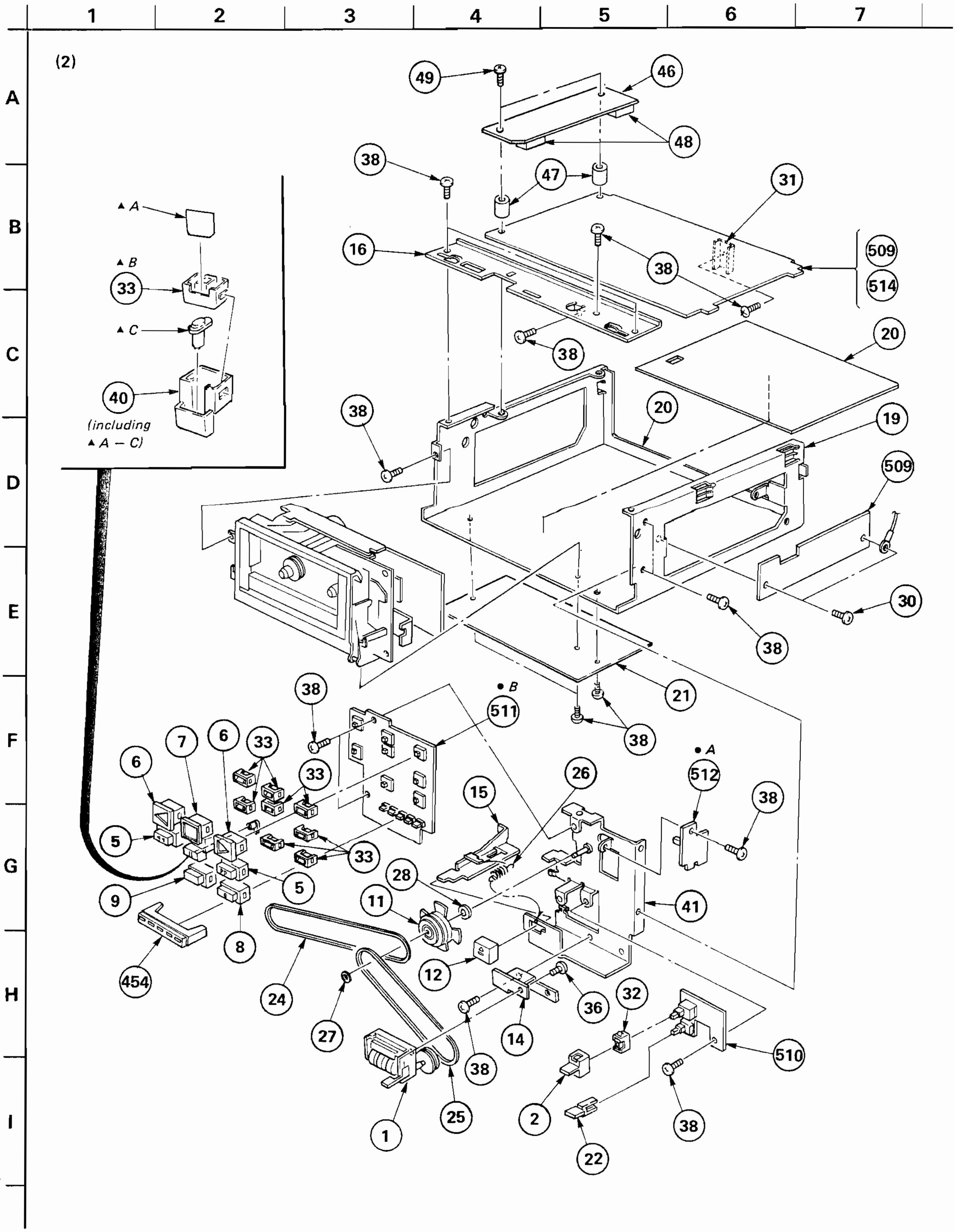
SLR34DC5
SLR34PC5
SLR34URC5

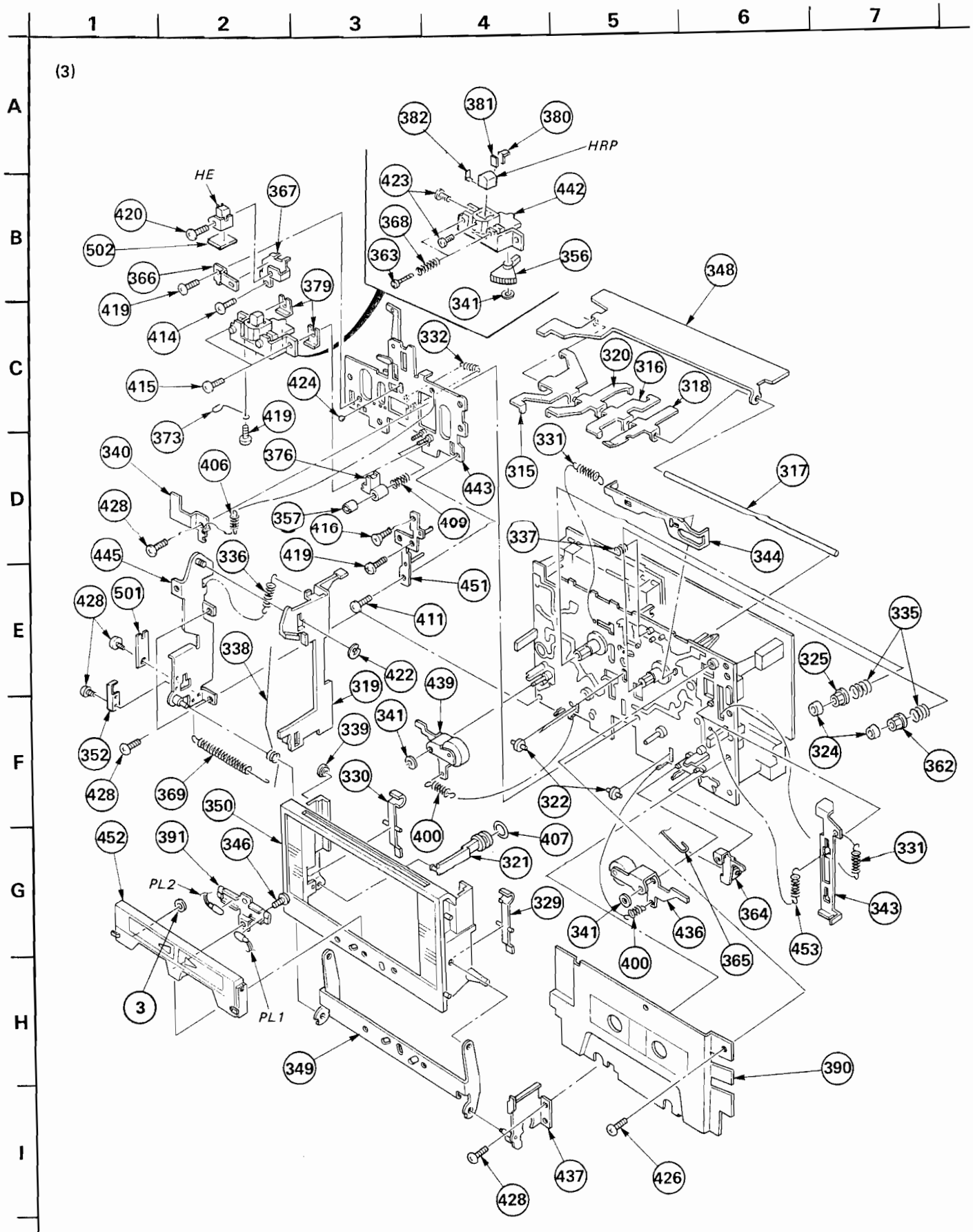


SECTION 5
EXPLODED VIEWS AND PARTS LIST

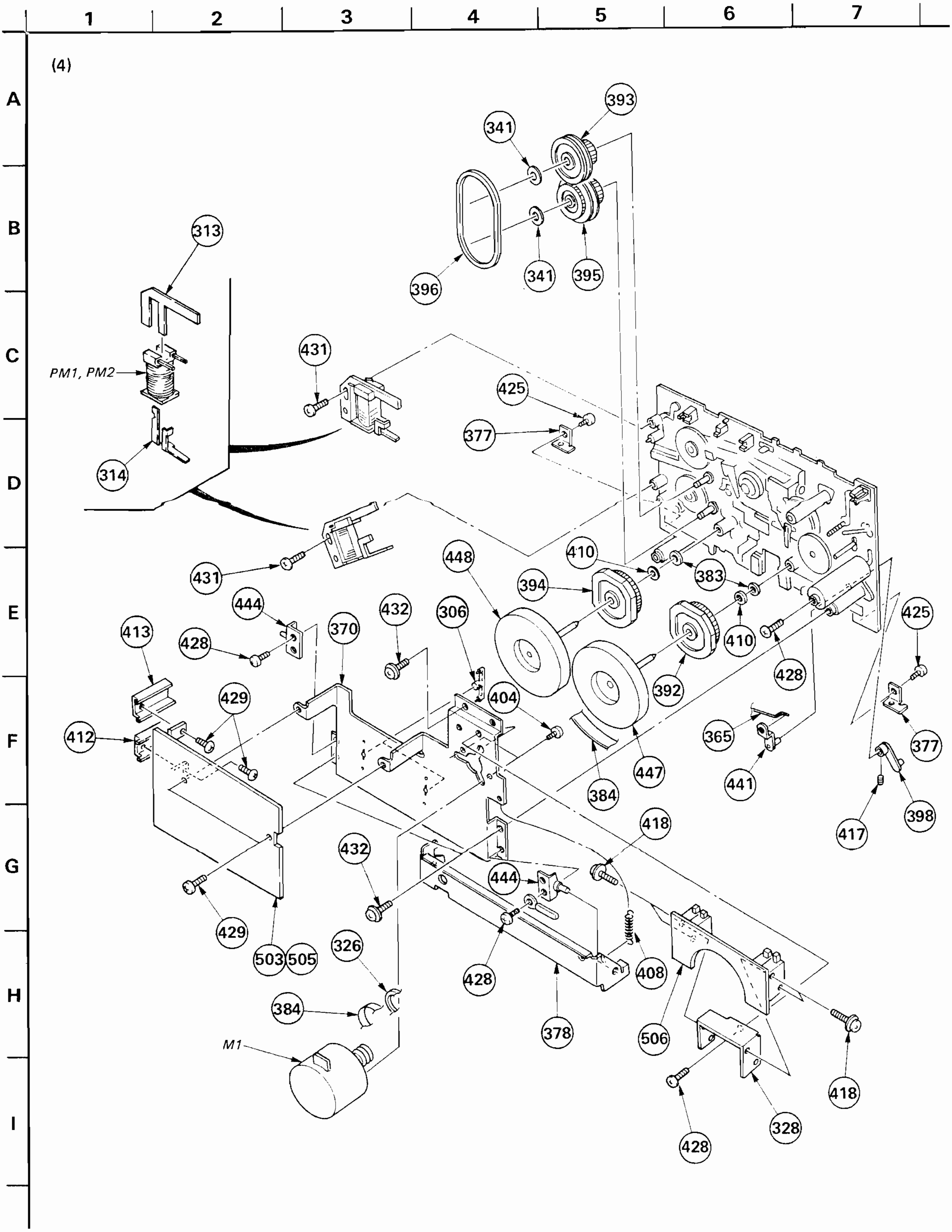
5-1. EXPLODED VIEWS



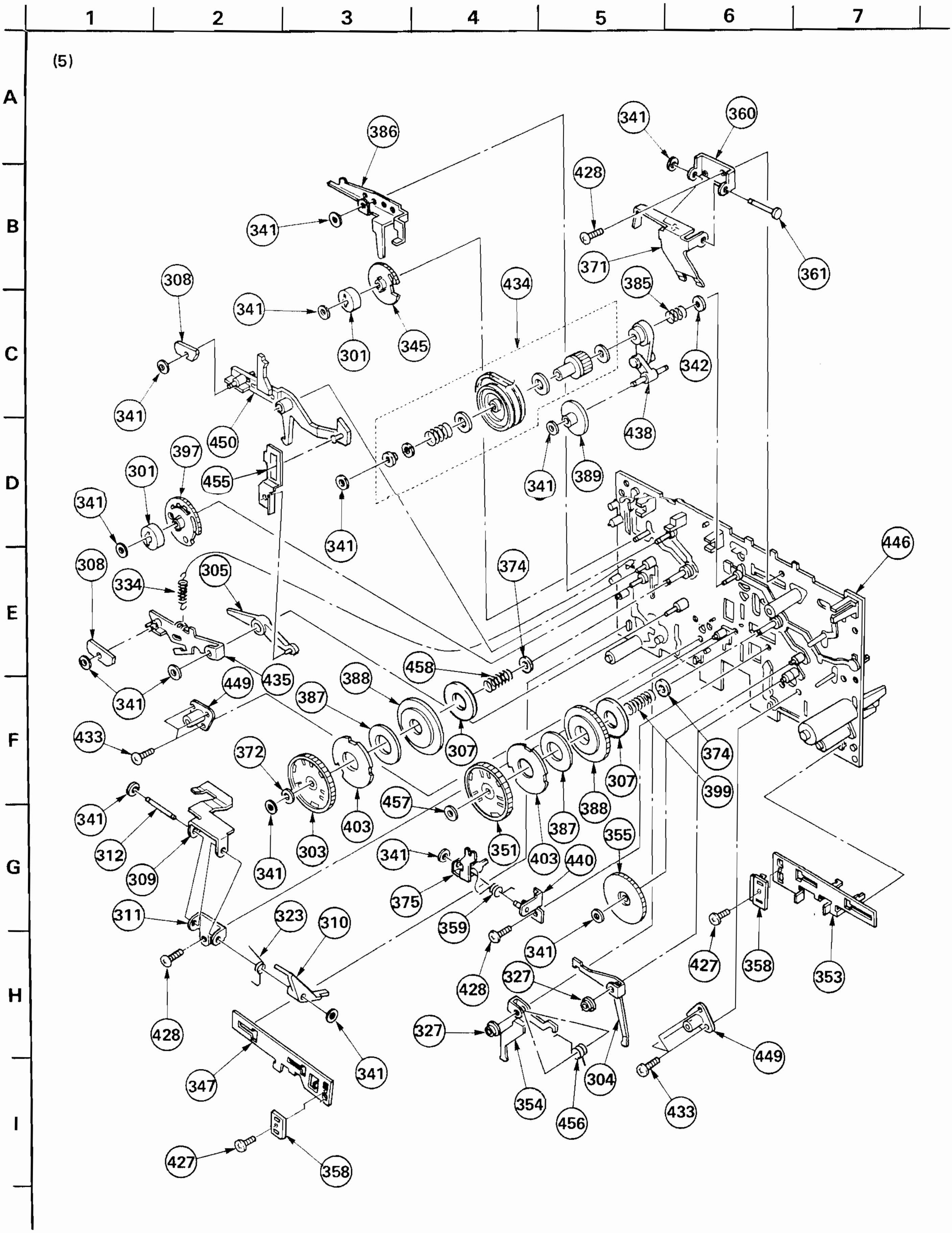

1
2
3
4
5
6
7
A
B
C
D
E
F
G
H
I
(2)
▲A
▲B
33
▲C
40
(including
▲A – C)
49
46
48
38
47
31
16
38
509
514
38
20
20
38
19
509
30
38
21
38
● B
511
38
7
6
33
33
6
5
33
9
5
8
454
15
26
● A
512
38
28
11
41
12
24
27
36
32
14
38
25
1
2
22
38
510


(3)
1
2
3
4
5
6
7
A
B
C
D
E
F
G
H
I
HE
HRP
PL1
PL2
3
320
316
318
315
348
317
344
331
337
335
325
324
362
322
407
321
329
341
400
436
365
364
343
453
331
390
426
437
428
349
452
391
346
350
330
339
341
439
319
422
338
336
445
501
428
352
369
451
411
419
409
416
357
376
443
406
340
373
424
332
415
414
379
419
366
420
502
367
382
381
380
423
442
368
363
356
341

(4)


1
2
3
4
5
6
7
A
B
C
D
E
F
G
H
I
393
341
395
341
396
313
PM1, PM2
314
431
425
377
431
410
448
383
394
444
432
306
370
413
428
410
425
392
428
429
404
412
365
377
447
441
384
398
418
417
432
444
429
503
505
326
408
428
384
506
378
M1
418
428
328

US, Canadian Model



GENERAL SECTION

No.	Part No.	Description
1	1-548-563-31	COUNTER, TAPE
2	3-302-902-00	(PEARL SILVER)...KNOB, PUSH
2	3-302-902-41	(BLACK).....KNOB, PUSH
3	3-307-390-00	BUSHING, LOADING SPRING
4	.....	
5	3-309-102-00	(PEARL SILVER)...BUTTON, REW-FF
5	3-309-102-11	(BLACK).....BUTTON, REW-FF
6	3-309-106-00	(PEARL SILVER)...BUTTON, REV-FWD
6	3-309-106-11	(BLACK).....BUTTON, REV-FWD
7	3-309-107-00	(PEARL SILVER)...BUTTON, STOP
7	3-309-107-11	(BLACK).....BUTTON, STOP
8	3-309-111-00	(PEARL SILVER)...BUTTON, REC
8	3-309-111-11	(BLACK).....BUTTON, REC
9	3-309-113-00	(PEARL SILVER)...BUTTON, REC MUTE
9	3-309-113-11	(BLACK).....BUTTON, REC MUTE
10	.....	
11	3-309-116-00	PULLEY, MIDWAY
12	3-309-117-00	(PEARL SILVER)...BUTTON, EJECT
12	3-309-117-11	(BLACK).....BUTTON, EJECT
13	3-309-118-00	HOLDER, TS-LED
14 ♦	3-309-119-00	BLACKET, COUNTER
15 ♦	3-309-120-00	SLIDER, EJECT
16 ♦	3-309-128-00	JOINT
17 ♦	3-309-129-11	PLATE, JACK
18	3-309-130-11	(BLACK).....CASE
18	3-309-130-31	(PEARL SILVER)...CASE
19 ♦	3-309-132-00	CHASSIS
20 ♦	3-309-133-00	PLATE, SHIELD
21 ♦	3-309-137-00	PLATE, SHIELD, MD
22	3-309-139-00	KNOB (C)
23	3-309-156-01	LABEL, MODEL NUMBER
24	3-530-181-XX	BELT, DETCTING
25	3-533-363-00	BELT, COUNTER
26	3-542-475-00	SPRING, TENSION
27	3-558-708-01	WASHER, STOPPER
28	3-701-439-01	WASHER
29	3-703-354-11	SCREW (OS), CASE, CLAW
30	3-703-486-00	PTTWH 3X5
31 ♦	3-312-615-31	HEAT SHINK
32	4-864-307-00	RING
33	4-881-725-00	RING (TACT), FLEXIBLE

GENERAL SECTION

No.	Part No.	Description
34	3-309-163-01	LABEL, MODEL NUMBER
35	.....	
36	7-685-533-19	SCREW +BTP 2.6X6 TYPE2 N-S
37	7-685-547-19	SCREW +BVTP 3X10 TYPE2 N-S
38	7-685-871-01	SCREW +BVTT 3X6 (S)
39	7-685-871-09	SCREW +BVTT 3X6 (S)
40	X-3309-126-1	(PEARL SILVER)...BOTTON ASSY
40	X-3309-127-1	(BLACK).....BOTTON ASSY
41 ♦	X-3309-101-0	CHASSIS ASSY, AMPLIFIER
42	X-3309-102-0	(PEARL SILVER)...PLATE ASSY, ORNAMENTAL, HEAD
42	X-3309-107-0	(BLACK)..PLATE ASSY, ORNAMENTAL, HEAD
43	X-3309-122-1	(PEARL SILVER)...PANEL ASSY, FRONT
43	X-3309-122-1	(BLACK).....PANEL ASSY, FRONT
44	X-3309-117-1	(PEARL SILVER)...LID ASSY, CASSETTE
44	X-3309-118-1	(BLACK).....LID ASSY, CASSETTE
45	X-4884-801-0	FOOT ASSY, RUBBER
46	3-309-145-00	PLATE, SHIELD, PC BOARD
47	3-660-624-00	COLLAR
48	4-862-384-00	CUSHION
49	7-685-873-01	SCREW +BVTT 3X10

NOTE:

- The mechanical parts with no reference number in the exploded views are not supplied.
- Items marked " ♦ " are not stocked since they are seldom required for routine service. Some delay should be anticipated when ordering these items.
- Due to standardization, parts with part numbers (Δ-ΔΔΔ-ΔΔΔ-XX or Δ-ΔΔΔΔ-ΔΔΔ-X) may be different from those used in the set.
- If there are two or more same circuitsin a set such as a stereophonic machine, only typical circuit parts may be indicated and capacitors and resistors in other same circuits may be omitted.

CAPACITORS:

MF:μF, PF:μμF.

RESISTORS

- All resistors are in ohms.
- F : nonflammable

COILS

- MMH : mH, UH : μH

SEMICONDUCTORS

In each case, U : μ, for example:
UA···: μA···, UPA···: μPA···, UPC···: μPC,
UPD···: μPD···

MECHANISM SECTION

No.	Part No.	Description
301	1-452-202-00	MAGNET
302	.....	
303	3-307-305-00	GEAR (T), REEL
304 ♦	3-307-306-00	LEVER, SELECT, REVERSE
305	3-307-307-00	LEVER, FWD
306	3-307-309-00	RETAINER (A), THRUST
307	3-307-313-00	PLATE, YOKE
308	3-307-315-00	ARBOR, MOVABLE
309	3-307-319-00	RETAINER, TAKE-UP GEAR
310	3-307-328-00	LEVER, TAKE-UP SELECTION
311 ♦	3-307-329-00	PLATE, FULCRUM, SELECTION LEVER
312	3-307-330-00	PIN, FULCRUM PLATE
313	3-307-332-00	ARBOR, FIXED
314	3-307-333-00	ARBOR, TRIGGER
315 ♦	3-307-337-00	LEVER, REC DETECTION
316 ♦	3-307-338-00	LEVER, METAL DETECTION
317 ♦	3-307-339-00	SHAFT, DETECTION LEVER
318 ♦	3-307-344-00	LEVER, HALF RETAINER
319	3-307-345-00	SLIDER, EJECT
320 ♦	3-307-346-00	LEVER, DETECTION
321	3-307-347-00	PISTON
322	3-307-348-00	ROLLER
323	3-307-355-00	SPRING
324	3-307-362-00	CAP, REEL
325	3-307-363-00	CLAW (N), REEL
326	3-307-366-00	BELT, FAST FORWARD
327	3-307-367-00	BUSHING, SELECT LEVER
328 ♦	3-307-370-00	BRACKET, SWITCH
329	3-307-371-00	SPRING (LEFT)
330	3-307-372-00	SPRING (RIGHT)
331	3-307-374-00	SPRING, TENSION
332	3-307-375-00	SPRING, TENSION
333	.....	
334	3-307-378-00	SPRING, TENSION
335	3-307-380-00	SPRING, COMPRESSION
336	3-531-541-00	SPRING, TENSION
337	3-307-382-00	SPRING
338	3-307-383-00	SPRING
339	3-307-390-00	BUSHING, LOADING SPRING
340	3-307-391-00	SPRING
341	3-307-394-00	RETAINER (B), THRUST
342	3-307-395-00	RETAINER, SPRING
343	3-307-397-00	SLIDER, PAUSE
344 ♦	3-307-399-00	SLIDER, MODE
345	3-307-401-00	GEAR, FF CAM

MECHANISM SECTION

No.	Part No.	Description
346	7-685-533-19	SCREW +BTP 2.6X6 TYPE2 N-S
347 ♦	3-307-403-00	SLIDER, FWD
348 ♦	3-307-404-00	RETAINER, DETECTION SWITCH
349 ♦	3-307-405-00	PLATE, FULCRUM, CASSETTE HOLDER
350	3-307-407-00	HOLDER, CASSETTE
351	3-307-412-00	GEAR, TAKE-UP REEL
352	3-307-416-00	STOPPER, LOADING
353 ♦	3-307-420-00	SLIDER, REVERSE
354 ♦	3-307-421-00	LEVER (R), FWD SELECTION
355	3-307-423-00	GEAR (S), DRIVING
356	3-307-427-00	GEAR, HEAD, ROTARY
357	3-307-435-00	NUT, ADJUSTMENT, TAPE GUIDE
358 ♦	3-307-437-00	BLOCK, HEAD SELECTION
359	3-307-441-00	SPRING
360 ♦	3-307-443-00	BRACKET, RETAINER, SUPPLY GEAR
361 ♦	3-307-445-00	SHAFT, RETAINER, SUPPLY GEAR
362	3-307-447-00	CLAW (R), REEL
363	3-307-448-00	SCREW, ADJUSTMENT, AZIMUTH
364 ♦	3-307-449-00	LEVER (R), PAUSE
365 ♦	3-307-450-00	ROD, PULL, PAUSE
366	3-307-457-00	SPRING
367	3-307-458-00	PLATE (L), ADJUSTMENT, HEAD
368	3-307-460-00	SPRING, COMPRESSION
369	3-307-461-00	SPRING, TENSION
370 ♦	3-307-462-00	RETAINER (R), THRUST
371 ♦	3-307-464-00	RETAINER, SUPPLY GEAR
372	3-307-465-00	RETAINER, TAKE-UP
373 ♦	3-307-466-00	CLAMP
374 ♦	3-307-467-00	RETAINER, SPRING
375	3-307-469-00	LEVER, SELECTION, SUPPLY
376	3-307-470-00	GUIDE (R), TAPE
377 ♦	3-307-472-00	BRACKET, MD
378 ♦	3-307-474-00	LEVER (R2), EJECT
379	3-307-477-01	SEAM (A), HEAD ADJUSTMENT
379	3-307-477-11	SEAM (A), HEAD ADJUSTMENT
379	3-307-477-21	SEAM (A), HEAD ADJUSTMENT
379	3-307-477-31	SEAM (A), HEAD ADJUSTMENT
379	3-307-477-41	SEAM (A), HEAD ADJUSTMENT
380	3-307-479-01	SEAM (B), HEAD ADJUSTMENT
380	3-307-479-11	SEAM (B), HEAD ADJUSTMENT
380	3-307-479-21	SEAM (B), HEAD ADJUSTMENT
380	3-307-479-31	SEAM (B), HEAD ADJUSTMENT
381	3-307-480-02	SEAM, HEAD
382	3-307-481-00	BASE, HEAD
383	3-307-482-00	WASHER, LUMILER

NOTE:

- The mechanical parts with no reference number in the exploded views are not supplied.
- Items marked " ♦ " are not stocked since they are seldom required for routine service. Some delay should be anticipated when ordering these items.
- Due to standardization, parts with part numbers (Δ-ΔΔΔ-ΔΔΔ-XX or Δ-ΔΔΔΔ-ΔΔΔ-X) may be different from those used in the set.
- If there are two or more same circuitsin a set such as a stereophonic machine, only typical circuit parts may be indicated and capacitors and resistors in other same circuits may be omitted.

CAPACITORS:

MF:μF, PF:μμF.

RESISTORS

- All resistors are in ohms.
- F : nonflammable

COILS

- MMH : mH, UH : μH

SEMICONDUCTORS

In each case, U : μ, for example.
UA···: μA···, UPA···: μPA···, UPC···: μPC,
UPD···: μPD···

MECHANISM SECTION

No.	Part No.	Description
384	3-307-483-00	BELT (R), CAPSTAN
385	3-312-452-00	SPRING, COMPRESSION
386 ♦	3-307-490-00	LEVER, FF
387	3-307-493-01	SPACER
387	3-307-493-11	SPACER
387	3-307-493-21	SPACER
387	3-307-493-31	SPACER
387	3-307-493-41	SPACER
387	3-307-493-51	SPACER
388	3-307-953-00	MAGNET, REEL TABLE
389	3-307-970-00	GEAR, FR
390	3-309-101-00	PLATE (A), ORNAMENTAL, MD
391	3-309-115-00	HOLDER, LAMP
392 ♦	3-312-403-00	GEAR (S), PINION
393	3-312-405-00	PULLEY, DRIVING
394	3-312-406-00	GEAR (T), PINION
395	3-312-408-00	GEAR (B), CONVERSION
396	3-312-409-00	BELT, DRIVING
397	3-312-412-00	GEAR (B), CAM, FWD
398 ♦	3-312-428-00	ARM (B), PUASE
399	3-307-471-31	SPRING, COMPRESSION
400	3-312-432-00	SPRING, TENSION
401	.....	
402	.....	
403	3-561-827-11	PLATE (A), HYSTERESIS
404	7-621-775-00	SCREW +B 2.6X3
405	.....	
406	3-312-451-00	SPRING, TENSION
407	3-575-392-00	RING, PISTON
408	3-578-393-00	SPRING, TENSION
409	3-644-718-00	SPRING, COMPRESSION
410	3-701-438-11	WASHER, 2.5
411	3-701-467-00	SCREW, LOCK
412 ♦	3-309-144-31	HEAT SINK
413 ♦	3-312-615-31	HEAT SINK
414	7-621-255-20	SCREW +P 2X4
415	7-621-259-35	SCREW +P 2.6X5
416	7-621-555-35	SCREW +K 2X5
417	7-621-733-08	SET-SCT, HEX 2X4 FLAT POINT
418	7-621-760-05	+PSW, 2.6X16
419	7-621-772-00	SCREW +B 2X3
420	7-621-772-40	SCREW +B 2X8
421	.....	
422	7-624-105-04	STOP RING 2.3, TYPE -E
423	7-627-552-07	SCREW, PRECISION +P 1.7X2.5

MECHANISM SECTION

No.	Part No.	Description
424	7-671-111-11	STEEL, BOUL 1.5MM
425	7-682-546-04	SCREW +BVTT 3X5 (S)
426	7-685-104-19	SCREW +P 2X6 TYPE2 NON-SLIT
427	7-685-851-01	SCREW +BVTT 2X4 (S)
428	7-685-860-04	SCREW +BVTT 2.6X4 (S)
429	7-685-871-01	SCREW +BVTT 3X6 (S)
430	.....	
431	7-687-204-21	TOTSU PTPWH 2X6 NON-SLIT, TYPE2
432	7-687-246-21	SCREW, TOTSU PTPWH 3X8, TYPE2
433	7-687-701-39	SCREW, TOTSU BTT 2.6X4
434	A-2142-022-A	PULLEY ASSY, FR
435 ♦	X-3307-305-0	LEVER ASSY, FWD LOCK
436	X-3307-307-0	PINCH ROLLER (N) ASSY
437 ♦	X-3307-310-0	PLATE (RIGHT) ASSY, SIDE
438	X-3307-312-0	LEVER ASSY, FR
439	X-3307-316-0	PINCH ROLLER (R) ASSY
440 ♦	X-3307-317-3	PLATE ASSY, FULCRUM, LEVER
441 ♦	X-3307-319-0	ARM (A) ASSY, PAUSE
442	X-3307-321-0	HOLDER ASSY, HEAD
443	X-3307-323-0	CHASSIS (R) ASSY, HEAD
444 ♦	X-3307-326-0	PLATE (R2) ASSY, FULCRUM, EJECT
445 ♦	X-3307-327-0	PLATE (L2) ASSY, SIDE
446	X-3307-331-1	CHASSIS ASSY, MECHANISM
447	X-3307-336-2	FLYWHEEL (RS) ASSY
448	X-3307-337-2	FLYWHEEL (RT) ASSY
449	X-3307-338-0	BEARING ASSY, CAPSTAN
450	X-3307-348-0	LEVER ASSY, FF LOCK
451	X-3307-920-0	PLATE ASSY, ADJUSTMENT
452	.....	
453	3-312-448-00	SPRING, TENSION
454	3-309-105-00	(PEARL SILVER)...HOLDER, REC-LED
454	3-309-105-11	(BLACK).....HOLDER, REC-LED
455 ♦	3-307-487-00	STOPPER, FR
456	3-312-442-00	SPRING
457	7-623-922-01	WASHER 2.0, NYLON
458	3-312-430-00	SPRING, COMPRESSION

NOTE:

- The mechanical parts with no reference number in the exploded views are not supplied.
- Items marked " ♦ " are not stocked since they are seldom required for routine service. Some delay should be anticipated when ordering these items.
- Due to standardization, parts with part numbers (Δ-ΔΔΔ-ΔΔΔ-XX or Δ-ΔΔΔΔ-ΔΔΔ-X) may be different from those used in the set.
- If there are two or more same circuitsin a set such as a stereophonic machine, only typical circuit parts may be indicated and capacitors and resistors in other same circuits may be omitted.

CAPACITORS:

MF:μF, PF:μμF.

RESISTORS

- All resistors are in ohms.
- F : nonflammable

COILS

- MMH : mH, UH : μH

SEMICONDUCTORS

In each case, U : μ, for example:
UA···: μA···, UPA···: μPA···, UPC···: μPC,
UPD···: μPD···

ELECTRICAL PARTS

Ref.No.	Part No.	Description
501	♦;1-608-170-00	PC BOARD, HEAD TRANSLATION
502	♦;1-608-268-00	PC BOARD, ERASE HEAD
503	♦;1-608-391-00	PC BOARD, SYSTEM CONTROL
504	♦;A-2056-216-A	MOUNTED PCB, AUDIO
505	♦;A-2019-162-A	(PEARL SILVER)....MOUNTED PCB, SYSTEM CONTROL
505	♦;A-2019-163-A	(BLACK)....MOUNTED PCB, SYSTEM CONTROL
506	♦;A-608-394-00	PC BOARD, TAPE SWITCH
507	♦;1-609-388-22	PC BOARD, AUDIO
508	♦;1-609-389-21	PC BOARD, TAPE INDICATION
509	♦;1-609-390-21	PC BOARD, AGC&AMS
510	♦;1-609-391-21	PC BOARD, DOLBY SWITCH
511	♦;1-608-392-00	PC BOARD, CONTROL SWITCH
512	♦;1-608-393-00	PC BOARD, INTERRUPT

C100	1-123-382-00	ELECT	3.3MF	20%	50V
C101	1-123-382-00	ELECT	3.3MF	20%	50V
C102	1-123-319-00	ELECT	47MF	20%	16V
C103	1-123-382-00	ELECT	3.3MF	20%	50V
C105	1-123-380-00	ELECT	1MF	20%	50V
C106	1-123-356-00	ELECT	10MF	20%	16V
C107	1-161-322-00	CERAMIC	820PF	10%	50V
C108	1-123-369-00	ELECT	4.7MF	20%	50V
C109	1-123-307-00	ELECT	100MF	20%	10V
C110	1-130-624-00	FILM	0.022MF	5%	50V
C111	1-123-380-00	ELECT	1MF	20%	50V
C112	1-161-328-00	CERAMIC	0.0047MF	30%	50V
C113	1-161-316-00	CERAMIC	270PF	10%	50V
C114	1-123-382-00	ELECT	3.3MF	20%	50V
C115	1-123-310-00	ELECT	470MF	20%	10V
C116	1-123-369-00	ELECT	4.7MF	20%	50V
C117	1-130-620-00	FILM	0.01MF	5%	50V
C118	1-130-622-00	FILM	0.015MF	5%	50V
C119	1-130-620-00	FILM	0.01MF	5%	50V
C120	1-130-629-00	FILM	0.056MF	5%	50V
C121	1-130-629-00	FILM	0.056MF	5%	50V
C122	1-130-635-00	FILM	0.18MF	5%	50V
C123	1-130-635-00	FILM	0.18MF	5%	50V
C124	1-123-228-00	ELECT	1MF	20%	50V
C125	1-130-625-00	FILM	0.027MF	5%	50V
C126	1-130-635-00	FILM	0.18MF	5%	50V
C127	1-130-629-00	FILM	0.056MF	5%	50V
C128	1-130-633-00	FILM	0.12MF	5%	50V
C129	1-123-228-00	ELECT	1MF	20%	50V
C130	1-123-369-00	ELECT	4.7MF	20%	50V
C131	1-123-323-00	ELECT	470MF	20%	16V
C132	1-123-356-00	ELECT	10MF	20%	16V
C133	1-130-621-00	FILM	0.012MF	5%	50V

ELECTRICAL PARTS

Ref.No.	Part No.	Description			
C134	1-108-567-00	MYLAR	0.0033MF	5%	50V
C136	1-130-622-00	MYLAR	0.015MF	5%	50V
C139	1-108-577-00	MYLAR	0.0082MF	5%	50V
C140	1-130-623-00	FILM	0.018MF	5%	50V
C141	1-123-380-00	ELECT	1MF	20%	50V
C142	1-130-630-00	FILM	0.068MF	5%	50V
C143	1-123-382-00	ELECT	3.3MF	20%	50V
C175	1-161-327-00	CERAMIC	0.0033MF	30%	50V
C176	1-107-165-00	MICA	56PF	5%	500V
C177	1-107-167-00	MICA	75PF	5%	500V
C178	1-161-322-00	CERAMIC	820PF	10%	50V
C210	1-130-624-00	FILM	0.022MF	5%	50V
C217	1-130-620-00	FILM	0.01MF	5%	50V
C219	1-130-620-00	FILM	0.01MF	5%	50V
C220	1-130-629-00	FILM	0.056MF	5%	50V
C221	1-130-629-00	FILM	0.056MF	5%	50V
C225	1-130-625-00	FILM	0.027MF	5%	50V
C233	1-130-621-00	FILM	0.012MF	5%	50V
C240	1-130-623-00	FILM	0.018MF	5%	50V
C242	1-130-630-00	FILM	0.068MF	5%	50V
C276	1-107-165-00	MICA	56PF	5%	500V
C277	1-107-167-00	MICA	75PF	5%	500V
C301	1-123-332-00	ELECT	47MF	20%	25V
C302	1-123-294-00	ELECT	47MF	20%	6.3V
C303	1-123-323-00	ELECT	470MF	20%	16V
C304	1-123-380-00	ELECT	1MF	20%	50V
C306	1-123-328-00	ELECT	4.7MF	20%	25V
C307	1-161-328-00	CERAMIC	0.0047MF	30%	50V
C309	1-123-356-00	ELECT	10MF	20%	16V
C310	1-123-380-00	ELECT	1MF	20%	50V
C311	1-123-382-00	ELECT	3.3MF	20%	50V
C312	1-123-382-00	ELECT	3.3MF	20%	50V
C313	1-123-321-00	ELECT	220MF	20%	16V
C317	1-129-714-00	FILM	0.01MF	5%	630V
C318	1-161-259-00	CERAMIC	10PF	5%	50V
C319	1-129-898-00	FILM	0.0022MF	5%	630V
C320	1-130-289-00	FILM	0.0047MF	5%	100V
C321	1-130-287-00	FILM	0.0039MF	5%	100V
C322	1-130-287-00	FILM	0.0039MF	5%	100V
C323	1-123-380-00	ELECT	1MF	20%	50V
C324	1-123-379-00	ELECT	0.47MF	20%	50V
C325	1-123-380-00	ELECT	1MF	20%	50V
C326	1-129-928-00	MYLAR	0.0027MF	99%	630V
C327	1-123-321-00	ELECT	220MF	20%	16V
C328	1-161-267-00	CERAMIC	47PF	5%	50V
C398	1-161-328-00	CERAMIC	0.0047MF	30%	50V

NOTE:

- The mechanical parts with no reference number in the exploded views are not supplied.
- Items marked " ♦ " are not stocked since they are seldom required for routine service. Some delay should be anticipated when ordering these items.
- Due to standardization, parts with part numbers (Δ-ΔΔΔ-ΔΔΔ-XX or Δ-ΔΔΔΔ-ΔΔΔ-X) may be different from those used in the set.
- If there are two or more same circuitsin a set such as a stereophonic machine, only typical circuit parts may be indicated and capacitors and resistors in other same circuits may be omitted.

CAPACITORS:

MF:μF, PF:μμF.

RESISTORS

- All resistors are in ohms.
- F : nonflammable

COILS

- MMH : mH, UH : μH

SEMICONDUCTORS

In each case, U : μ, for example:
UA···: μA···, UPA···: μPA···, UPC···: μPC,
UPD···: μPD···

ELECTRICAL PARTS

Ref.No.	Part No.	Description			
C399	1-131-371-00	TANTALUM	10MF	20%	16V
C402	1-123-328-00	ELECT	4.7MF	20%	25V
C403	1-108-571-00	MYLAR	0.0047MF	5%	50V
C412	1-123-382-00	ELECT	3.3MF	20%	50V
C413	1-123-380-00	ELECT	1MF	20%	50V
C414	1-123-323-00	ELECT	470MF	20%	16V
C415	1-123-298-00	ELECT	470MF	20%	6.3V
♦CNP101	1-560-060-00	PIN, CONNECTOR 2P			
♦CNP102	1-560-063-00	PIN, CONNECTOR 5P			
♦CNP103	1-560-064-00	PIN, CONNECTOR 6P			
♦CNP104	1-560-064-00	PIN, CONNECTOR 6P			
♦CNP105	1-560-338-00	PIN, CONNECTOR 7P			
CNP106	1-562-068-00	SOCKET, CONNECTOR 13P			
♦CNP107	1-560-062-00	PIN, CONNECTOR 4P			
♦CNP108	1-560-060-00	PIN, CONNECTOR 2P			
CT301	1-141-225-00	CAP, TUNING, TRIMAR			
D101	8-719-815-55	DIODE 1S1555			
D102	8-719-815-55	DIODE 1S1555			
D103	8-719-815-55	DIODE 1S1555			
D201	8-719-815-55	DIODE 1S1555			
D202	8-719-815-55	DIODE 1S1555			
D203	8-719-815-55	DIODE 1S1555			
D301	8-719-815-55	DIODE 1S1555			
D302	8-719-815-55	DIODE 1S1555			
D303	8-719-815-55	DIODE 1S1555			
D305	8-719-815-55	DIODE 1S1555			
D306	8-719-815-55	DIODE 1S1555			
D311	8-719-910-64	DIODE HZ6B1L			
D312	8-719-200-02	DIODE 10E-2			
D313	8-719-200-02	DIODE 10E-2			
D315	8-719-902-77	DIODE SLR-34PC5			
D316	8-719-902-77	DIODE SLR-34PC5			
D317	8-719-902-77	DIODE SLR-34PC5			
D402	8-719-815-55	DIODE 1S1555			
D403	8-719-815-55	DIODE 1S1555			
D404	8-719-902-78	DIODE SLR-34DC5			
D405	8-719-934-05	DIODE SLR-34URC5			
D406	8-719-902-51	DIODE SLP251B			
D407	8-719-902-51	DIODE SLP251B			
D408	8-719-902-51	DIODE SLP251B			
D409	8-719-902-51	DIODE SLP251B			
D410	8-719-902-51	DIODE SLP251B			
D411	8-719-815-55	DIODE 1S1555			
D412	8-719-815-55	DIODE 1S1555			
D414	8-719-815-55	DIODE 1S1555			
D416	8-719-815-55	DIODE 1S1555			

ELECTRICAL PARTS

Ref.No.	Part No.	Description
HE	8-825-535-20	HEAD, ERASE (ES237-36)
HRP	8-825-548-10	HEAD, R/P (PA242-3602)
IC101	8-752-002-80	IC CX20028
IC201	8-752-002-70	IC CX20027
IC301	8-759-700-08	IC NJM4558S
IC302	8-759-800-32	IC LB1403
IC303	8-759-932-80	IC BA328
IC304	8-759-745-61	IC NJM4560D-D
IC401	8-759-202-06	IC TC9310N-047
IC402	8-759-170-05	IC UPC78M05H
L101	1-408-255-00	MICRO INDUCTOR 6.8MMH
L103	1-408-262-00	MICRO INDUCTOR 27MMH
L201	1-408-255-00	MICRO INDUCTOR 6.8MMH
L203	1-408-262-00	MICRO INDUCTOR 27MMH
L301	1-407-177-XX	MICRO INDUCTOR 470UH
L302	1-407-177-XX	MICRO INDUCTOR 470UH
M1	1-541-201-00	MOTOR
M101	1-235-186-00	ENCAPSULATED COMPONENT
M201	1-235-186-00	ENCAPSULATED COMPONENT
PL1	1-518-512-11	LAMP, PILOT
PL2	1-518-512-21	LAMP, PILOT
PM1	1-454-316-00	SOLENOID, PLUNGER
PM2	1-454-316-00	SOLENOID, PLUNGER
Q101	8-729-334-58	TRANSISTOR 2SC1345
Q102	8-729-178-54	TRANSISTOR 2SC2785
Q103	8-729-100-13	TRANSISTOR 2SC2001
Q104	8-729-178-54	TRANSISTOR 2SC2785
Q105	8-729-178-54	TRANSISTOR 2SC2785
Q106	8-729-178-54	TRANSISTOR 2SC2785
Q108	8-729-178-54	TRANSISTOR 2SC2785
Q109	8-729-178-54	TRANSISTOR 2SC2785
Q201	8-729-334-58	TRANSISTOR 2SC1345
Q202	8-729-178-54	TRANSISTOR 2SC2785
Q203	8-729-100-13	TRANSISTOR 2SC2001
Q204	8-729-178-54	TRANSISTOR 2SC2785
Q205	8-729-178-54	TRANSISTOR 2SC2785
Q206	8-729-178-54	TRANSISTOR 2SC2785
Q208	8-729-178-54	TRANSISTOR 2SC2785
Q209	8-729-178-54	TRANSISTOR 2SC2785
Q301	8-759-101-13	IC UPA74V-FA
Q302	8-729-178-54	TRANSISTOR 2SC2785
Q303	8-729-178-54	TRANSISTOR 2SC2785
Q304	8-729-178-54	TRANSISTOR 2SC2785
Q305	8-729-178-54	TRANSISTOR 2SC2785

NOTE:
- The mechanical parts with no reference number in the exploded views are not supplied.
- Items marked " ♦ " are not stocked since they are seldom required for routine service. Some delay should be anticipated when ordering these items.
- Due to standardization, parts with part numbers (Δ-ΔΔΔ-ΔΔΔ-XX or Δ-ΔΔΔΔ-ΔΔΔ-X) may be different from those used in the set.
- If there are two or more same circuitsin a set such as a stereophonic machine, only typical circuit parts may be indicated and capacitors and resistors in other same circuits may be omitted.

CAPACITORS:
MF:μF, PF:μμF.

RESISTORS
- All resistors are in ohms.
- F : nonflammable

COILS
- MMH : mH, UH : μH

SEMICONDUCTORS
In each case, U : μ, for example:
UA···: μA···, UPA···: μPA···, UPC···: μPC,
UPD···: μPD···

ELECTRICAL PARTS

Ref.No.	Part No.	Description			
Q306	8-729-178-54	TRANSISTOR 2SC2785			
Q307	8-729-612-77	TRANSISTOR 2SA1027R			
Q309	8-729-178-54	TRANSISTOR 2SC2785			
Q310	8-729-178-54	TRANSISTOR 2SC2785			
Q311	8-729-612-77	TRANSISTOR 2SA1027R			
Q312	8-729-178-54	TRANSISTOR 2SC2785			
Q313	8-729-663-47	TRANSISTOR 2SC1364			
Q314	8-729-663-47	TRANSISTOR 2SC1364			
Q315	8-729-100-13	TRANSISTOR 2SC2001			
Q316	8-729-612-77	TRANSISTOR 2SA1027R			
Q317	8-729-178-54	TRANSISTOR 2SC2785			
Q318	8-729-180-92	TRANSISTOR 2SD809-K			
Q319	8-729-178-54	TRANSISTOR 2SC2785			
Q320	8-729-178-54	TRANSISTOR 2SC2785			
Q321	8-729-178-54	TRANSISTOR 2SC2785			
Q322	8-759-101-13	IC UPA74V-FA			
Q401	8-759-117-54	TRANSISTOR 2SA1175			
Q402	8-719-902-90	PHOTO INTERRUPTOR SPI201-20			
Q403	8-729-663-47	TRANSISTOR 2SC1364			
Q404	8-729-663-47	TRANSISTOR 2SC1364			
Q405	8-729-663-47	TRANSISTOR 2SC1364			
Q406	8-729-663-47	TRANSISTOR 2SC1364			
Q408	8-729-663-47	TRANSISTOR 2SC1364			
Q409	8-759-117-54	TRANSISTOR 2SA1175			
Q410	8-759-117-54	TRANSISTOR 2SA1175			
Q411	8-729-663-47	TRANSISTOR 2SC1364			
Q412	8-759-117-54	TRANSISTOR 2SA1175			
Q413	8-729-180-92	TRANSISTOR 2SD809-K			
R101	1-247-831-00	CARBON	1K	5%	1/6W
R102	1-247-879-00	CARBON	100K	5%	1/6W
R103	1-247-879-00	CARBON	100K	5%	1/6W
R104	1-247-881-00	CARBON	120K	5%	1/6W
R105	1-247-839-00	CARBON	2.2K	5%	1/6W
R106	1-247-866-00	CARBON	30K	5%	1/6W
R107	1-247-839-00	CARBON	2.2K	5%	1/6W
R108	1-247-813-00	CARBON	180	5%	1/6W
R110	1-247-179-00	CARBON	100K	5%	1/4W
R111	1-247-179-00	CARBON	100K	5%	1/4W
R112	1-247-179-00	CARBON	100K	5%	1/4W
R113	1-247-179-00	CARBON	100K	5%	1/4W
R115	1-247-865-00	CARBON	27K	5%	1/6W
R116	1-247-865-00	CARBON	27K	5%	1/6W
R117	1-247-805-00	CARBON	82	5%	1/6W
R118	1-247-883-00	CARBON	150K	5%	1/6W
R119	1-247-848-00	CARBON	5.1K	5%	1/6W
R120	1-247-859-00	CARBON	15K	5%	1/6W

ELECTRICAL PARTS

Ref.No.	Part No.	Description			
R121	1-247-887-00	CARBON	220K	5%	1/6W
R122	1-247-861-00	CARBON	18K	5%	1/6W
R123	1-247-839-00	CARBON	2.2K	5%	1/6W
R124	1-247-871-00	CARBON	47K	5%	1/6W
R125	1-247-855-00	CARBON	10K	5%	1/6W
R126	1-247-863-00	CARBON	22K	5%	1/6W
R127	1-247-830-00	CARBON	910	5%	1/6W
R128	1-247-830-00	CARBON	910	5%	1/6W
R129	1-247-847-00	CARBON	4.7K	5%	1/6W
R130	1-247-871-00	CARBON	47K	5%	1/6W
R131	1-247-841-00	CARBON	2.7K	5%	1/6W
R132	1-247-843-00	CARBON	3.3K	5%	1/6W
R133	1-247-865-00	CARBON	27K	5%	1/6W
R134	1-247-895-00	CARBON	470K	5%	1/6W
R135	1-247-823-00	CARBON	470	5%	1/6W
R136	1-214-776-00	METAL	91K	1%	1/4W
R137	1-247-838-00	CARBON	2K	5%	1/6W
R138	1-247-871-00	CARBON	47K	5%	1/6W
R139	1-247-848-00	CARBON	5.1K	5%	1/6W
R140	1-247-888-00	CARBON	240K	5%	1/6W
R141	1-247-885-00	CARBON	180K	5%	1/6W
R142	1-247-845-00	CARBON	3.9K	5%	1/6W
R143	1-247-888-00	CARBON	240K	5%	1/6W
R144	1-247-885-00	CARBON	180K	5%	1/6W
R145	1-247-820-00	CARBON	360	5%	1/6W
R146	1-247-845-00	CARBON	3.9K	5%	1/6W
R147	1-247-855-00	CARBON	10K	5%	1/6W
R148	1-247-131-00	CARBON	1K	5%	1/4W
R149	1-247-131-00	CARBON	1K	5%	1/4W
R150	1-247-841-00	CARBON	2.7K	5%	1/6W
R151	1-247-805-00	CARBON	82	5%	1/6W
R152	1-247-863-00	CARBON	22K	5%	1/6W
R154	1-247-859-00	CARBON	15K	5%	1/6W
R156	1-247-848-00	CARBON	5.1K	5%	1/6W
R157	1-247-851-00	CARBON	6.8K	5%	1/6W
R161	1-247-854-00	CARBON	9.1K	5%	1/6W
R162	1-247-845-00	CARBON	3.9K	5%	1/6W
R163	1-247-863-00	CARBON	22K	5%	1/6W
R164	1-247-863-00	CARBON	22K	5%	1/6W
R166	1-247-863-00	CARBON	22K	5%	1/6W
R167	1-247-871-00	CARBON	47K	5%	1/6W
R168	1-247-855-00	CARBON	10K	5%	1/6W
R169	1-247-831-00	CARBON	1K	5%	1/6W
R170	1-247-871-00	CARBON	47K	5%	1/6W
R171	1-247-877-00	CARBON	82K	5%	1/6W

NOTE:
- The mechanical parts with no reference number in the exploded views are not supplied.
- Items marked " ♦ " are not stocked since they are seldom required for routine service. Some delay should be anticipated when ordering these items.
- Due to standardization, parts with part numbers (Δ-ΔΔΔ-ΔΔΔ-XX or Δ-ΔΔΔΔ-ΔΔΔ-X) may be different from those used in the set.
- If there are two or more same circuitsin a set such as a stereophonic machine, only typical circuit parts may be indicated and capacitors and resistors in other same circuits may be omitted.

CAPACITORS:
MF:μF, PF:μμF.

RESISTORS
- All resistors are in ohms.
- F : nonflammable

COILS
- MMH : mH, UH : μH

SEMICONDUCTORS
In each case, U : μ, for example:
UA···: μA···, UPA···: μPA···, UPC···: μPC,
UPD···: μPD···

ELECTRICAL PARTS

Ref.No.	Part No.	Description			
R172	1-247-877-00	CARBON	82K	5%	1/6W
R173	1-247-855-00	CARBON	10K	5%	1/6W
R174	1-247-859-00	CARBON	15K	5%	1/6W
R180	1-247-131-00	CARBON	1K	5%	1/4W
R201	1-247-831-00	CARBON	1K	5%	1/6W
R202	1-247-879-00	CARBON	100K	5%	1/6W
R203	1-247-879-00	CARBON	100K	5%	1/6W
R204	1-247-881-00	CARBON	120K	5%	1/6W
R205	1-247-839-00	CARBON	2.2K	5%	1/6W
R206	1-247-866-00	CARBON	30K	5%	1/6W
R207	1-247-839-00	CARBON	2.2K	5%	1/6W
R208	1-247-813-00	CARBON	180	5%	1/6W
R210	1-247-179-00	CARBON	100K	5%	1/4W
R211	1-247-179-00	CARBON	100K	5%	1/4W
R212	1-247-179-00	CARBON	100K	5%	1/4W
R213	1-247-179-00	CARBON	100K	5%	1/4W
R215	1-247-865-00	CARBON	27K	5%	1/6W
R216	1-247-865-00	CARBON	27K	5%	1/6W
R217	1-247-805-00	CARBON	82	5%	1/6W
R218	1-247-883-00	CARBON	150K	5%	1/6W
R219	1-247-848-00	CARBON	5.1K	5%	1/6W
R220	1-247-859-00	CARBON	15K	5%	1/6W
R221	1-247-887-00	CARBON	220K	5%	1/6W
R222	1-247-861-00	CARBON	18K	5%	1/6W
R223	1-247-839-00	CARBON	2.2K	5%	1/6W
R224	1-247-871-00	CARBON	47K	5%	1/6W
R225	1-247-855-00	CARBON	10K	5%	1/6W
R226	1-247-863-00	CARBON	22K	5%	1/6W
R227	1-247-830-00	CARBON	910	5%	1/6W
R228	1-247-830-00	CARBON	910	5%	1/6W
R229	1-247-847-00	CARBON	4.7K	5%	1/6W
R230	1-247-871-00	CARBON	47K	5%	1/6W
R231	1-247-841-00	CARBON	2.7K	5%	1/6W
R232	1-247-843-00	CARBON	3.3K	5%	1/6W
R233	1-247-865-00	CARBON	27K	5%	1/6W
R234	1-247-895-00	CARBON	470K	5%	1/6W
R235	1-247-823-00	CARBON	470	5%	1/6W
R236	1-214-776-00	METAL	91K	1%	1/4W
R237	1-247-838-00	CARBON	2K	5%	1/6W
R238	1-247-871-00	CARBON	47K	5%	1/6W
R239	1-247-848-00	CARBON	5.1K	5%	1/6W
R240	1-247-888-00	CARBON	240K	5%	1/6W
R241	1-247-885-00	CARBON	180K	5%	1/6W
R242	1-247-845-00	CARBON	3.9K	5%	1/6W
R243	1-247-888-00	CARBON	240K	5%	1/6W

ELECTRICAL PARTS

Ref.No.	Part No.	Description			
R244	1-247-885-00	CARBON	180K	5%	1/6W
R245	1-247-820-00	CARBON	360	5%	1/6W
R246	1-247-845-00	CARBON	3.9K	5%	1/6W
R247	1-247-855-00	CARBON	10K	5%	1/6W
R248	1-247-131-00	CARBON	1K	5%	1/4W
R249	1-247-131-00	CARBON	1K	5%	1/4W
R250	1-247-841-00	CARBON	2.7K	5%	1/6W
R251	1-247-805-00	CARBON	82	5%	1/6W
R252	1-247-863-00	CARBON	22K	5%	1/6W
R254	1-247-859-00	CARBON	15K	5%	1/6W
R256	1-247-848-00	CARBON	5.1K	5%	1/6W
R257	1-247-851-00	CARBON	6.8K	5%	1/6W
R261	1-247-854-00	CARBON	9.1K	5%	1/6W
R262	1-247-845-00	CARBON	3.9K	5%	1/6W
R263	1-247-863-00	CARBON	22K	5%	1/6W
R264	1-247-863-00	CARBON	22K	5%	1/6W
R266	1-247-863-00	CARBON	22K	5%	1/6W
R267	1-247-871-00	CARBON	47K	5%	1/6W
R268	1-247-855-00	CARBON	10K	5%	1/6W
R269	1-247-831-00	CARBON	1K	5%	1/6W
R270	1-247-871-00	CARBON	47K	5%	1/6W
R271	1-247-877-00	CARBON	82K	5%	1/6W
R272	1-247-877-00	CARBON	82K	5%	1/6W
R273	1-247-855-00	CARBON	10K	5%	1/6W
R274	1-247-859-00	CARBON	15K	5%	1/6W
R280	1-247-131-00	CARBON	1K	5%	1/4W
R101	1-247-149-00	CARBON	5.6K	5%	1/4W
R102	1-247-155-00	CARBON	10K	5%	1/4W
R103	1-247-151-00	CARBON	6.8K	5%	1/4W
R104	1-246-485-00	CARBON	3.3K	5%	1/4W
R105	1-247-149-00	CARBON	5.6K	5%	1/4W
R106	1-247-847-00	CARBON	4.7K	5%	1/6W
R107	1-247-863-00	CARBON	22K	5%	1/6W
R108	1-246-505-00	CARBON	22K	5%	1/4W
R110	1-247-863-00	CARBON	22K	5%	1/6W
R111	1-247-883-00	CARBON	150K	5%	1/6W
R112	1-247-877-00	CARBON	82K	5%	1/6W
R113	1-247-823-00	CARBON	470	5%	1/6W
R114	1-247-887-00	CARBON	220K	5%	1/6W
R115	1-247-887-00	CARBON	220K	5%	1/6W
R116	1-247-827-00	CARBON	680	5%	1/6W
R117	1-247-847-00	CARBON	4.7K	5%	1/6W
R118	1-247-863-00	CARBON	22K	5%	1/6W
R119	1-247-889-00	CARBON	270K	5%	1/6W
R120	1-247-831-00	CARBON	1K	5%	1/6W

ELECTRICAL PARTS

Ref.No.	Part No.	Description			
R321	1-247-863-00	CARBON	22K	5%	1/6W
R322	1-247-863-00	CARBON	22K	5%	1/6W
R323	1-247-863-00	CARBON	22K	5%	1/6W
R325	1-247-123-00	CARBON	470	5%	1/4W
R326	1-247-123-00	CARBON	470	5%	1/4W
R327	1-247-887-00	CARBON	220K	5%	1/6W
R328	1-247-887-00	CARBON	220K	5%	1/6W
R329	1-247-879-00	CARBON	100K	5%	1/6W
R330	1-247-857-00	CARBON	12K	5%	1/6W
R331	1-247-849-00	CARBON	5.6K	5%	1/6W
R332	1-247-853-00	CARBON	8.2K	5%	1/6W
R333	1-247-855-00	CARBON	10K	5%	1/6W
R334	1-247-847-00	CARBON	4.7K	5%	1/6W
R335	1-247-871-00	CARBON	47K	5%	1/6W
R336	1-247-863-00	CARBON	22K	5%	1/6W
R337	1-247-837-00	CARBON	1.8K	5%	1/6W
R338	1-247-822-00	CARBON	430	5%	1/6W
R339	1-247-839-00	CARBON	2.2K	5%	1/6W
R340	1-247-835-00	CARBON	1.5K	5%	1/6W
R341	1-247-840-00	CARBON	2.4K	5%	1/6W
R342	1-247-828-00	CARBON	750	5%	1/6W
R343	1-247-863-00	CARBON	22K	5%	1/6W
R344	1-247-863-00	CARBON	22K	5%	1/6W
R347	1-246-505-00	CARBON	22K	5%	1/4W
R349	1-247-123-00	CARBON	470	5%	1/4W
R350	1-247-855-00	CARBON	10K	5%	1/6W
R351	1-247-863-00	CARBON	22K	5%	1/6W
R352	1-247-863-00	CARBON	22K	5%	1/6W
R360	1-246-413-00	CARBON	3.3	5%	1/4W
R361	1-246-499-00	CARBON	12K	5%	1/4W
R362	1-246-499-00	CARBON	12K	5%	1/4W
R401	1-247-863-00	CARBON	22K	5%	1/6W
R402	1-247-887-00	CARBON	220K	5%	1/6W
R405	1-247-139-00	CARBON	2.2K	5%	1/4W
R406	1-247-139-00	CARBON	2.2K	5%	1/4W
R409	1-246-505-00	CARBON	22K	5%	1/4W
R410	1-246-505-00	CARBON	22K	5%	1/4W
R411	1-246-529-00	CARBON	220K	5%	1/4W
R412	1-246-505-00	CARBON	22K	5%	1/4W
R413	1-247-147-00	CARBON	4.7K	5%	1/4W
R414	1-247-119-00	CARBON	330	5%	1/4W
R415	1-247-863-00	CARBON	22K	5%	1/6W
R416	1-247-867-00	CARBON	33K	5%	1/6W
R417	1-247-123-00	CARBON	470	5%	1/4W
R418	1-247-119-00	CARBON	330	5%	1/4W

ELECTRICAL PARTS

Ref.No.	Part No.	Description			
R419	1-247-149-00	CARBON	5.6K	5%	1/4W
R420	1-247-149-00	CARBON	5.6K	5%	1/4W
R421	1-247-167-00	CARBON	33K	5%	1/4W
R422	1-247-872-00	CARBON	51K	5%	1/4W
R423	1-246-505-00	CARBON	22K	5%	1/4W
R424	1-247-179-00	CARBON	100K	5%	1/4W
R425	1-247-855-00	CARBON	10K	5%	1/6W
R426	1-247-825-00	CARBON	560	5%	1/6W
R428	1-246-433-00	CARBON	22	5%	1/4W
R429	1-206-477-00	METAL OXIDE	39	5%	2W F
R430	1-247-863-00	CARBON	22K	5%	1/6W
RV101	1-226-236-00	RES, ADJ, CARBON 10K			
RV102	1-226-236-00	RES, ADJ, CARBON 10K			
RV201	1-226-236-00	RES, ADJ, CARBON 10K			
RV202	1-226-236-00	RES, ADJ, CARBON 10K			
RV301	1-226-239-00	RES, ADJ, CARBON 100K			
RY301	1-515-473-00	RELAY			
S101	1-552-412-00	SWITCH, KEY BOARD, REC MUTE			
S102	1-552-412-00	SWITCH, KEY BOARD, REC			
S103	1-552-412-00	SWITCH, KEY BOARD, PAUSE			
S104	1-552-412-00	SWITCH, KEY BOARD, FF			
S105	1-552-412-00	SWITCH, KEY BOARD, FWD			
S106	1-552-412-00	SWITCH, KEY BOARD, STOP			
S107	1-552-412-00	SWITCH, KEY BOARD, REVERSE			
S108	1-552-412-00	SWITCH, KEY BOARD, FAST REVERSE			
S109	1-554-205-00	SWITCH, SLIDE, CASSETTE LOADING			
S110	1-554-205-00	SWITCH, SLIDE, ERASE PROOF			
S111	1-554-205-00	SWITCH, SLIDE, TAPE SELECT			
S112	1-554-205-00	SWITCH, SLIDE, TAPE SELECT			
S202	1-552-334-00	SWITCH, DIRECTION MODE			
S301	1-554-118-00	SWITCH, PUSH, DOLBY NR ON/OFF			
S302	1-554-118-00	SWITCH, PUSH, DOLBY NR B/C			
S304	1-554-277-00	SWITCH, SLIDE, ISS			
T301	1-433-259-00	TRANSFORMER, BIAS OSCILLATOR			

NOTE:
- The mechanical parts with no reference number in the exploded views are not supplied.
- Items marked " ♦ " are not stocked since they are seldom required for routine service. Some delay should be anticipated when ordering these items.
- Due to standardization, parts with part numbers (Δ-ΔΔΔ-ΔΔΔ-XX or Δ-ΔΔΔΔ-ΔΔΔ-X) may be different from those used in the set.
- If there are two or more same circuitsin a set such as a stereophonic machine, only typical circuit parts may be indicated and capacitors and resistors in other same circuits may be omitted.

CAPACITORS:
MF:μF, PF:μμF.

RESISTORS
- All resistors are in ohms.
- F : nonflammable

COILS
- MMH : mH, UH : μH

SEMICONDUCTORS
In each case, U : μ, for example:
UA···: μA···, UPA···: μPA···, UPC···: μPC,
UPD···: μPD···

NOTE:
- The mechanical parts with no reference number in the exploded views are not supplied.
- Items marked " ♦ " are not stocked since they are seldom required for routine service. Some delay should be anticipated when ordering these items.
- Due to standardization, parts with part numbers (Δ-ΔΔΔ-ΔΔΔ-XX or Δ-ΔΔΔΔ-ΔΔΔ-X) may be different from those used in the set.
- If there are two or more same circuitsin a set such as a stereophonic machine, only typical circuit parts may be indicated and capacitors and resistors in other same circuits may be omitted.

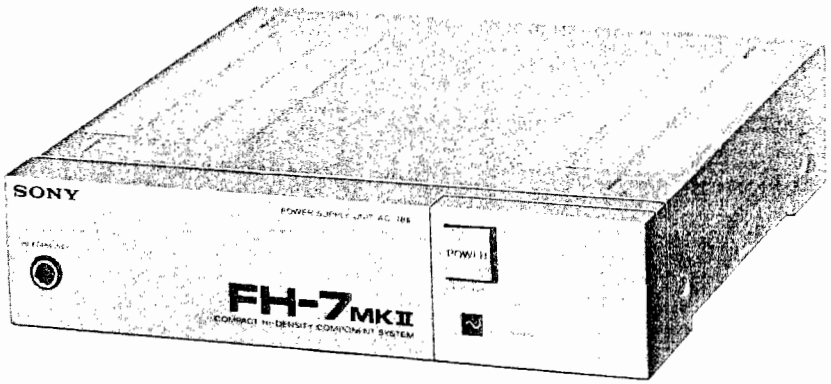
CAPACITORS:
MF:μF, PF:μμF.

RESISTORS
- All resistors are in ohms.
- F : nonflammable

COILS
- MMH : mH, UH : μH

SEMICONDUCTORS
In each case, U : μ, for example:
UA···: μA···, UPA···: μPA···, UPC···: μPC,
UPD···: μPD···

POWER SUPPLY UNIT
[AC-78II]



Note: AC-78II is a power supply unit in FH-7 MKII.

CIRCUIT DESCRIPTION

Shift Circuit

In the case of a conventional amp, high voltage is required to obtain large output, and even during small output, high voltage continues to be supplied.
The heat produced from the amplifier is proportional to the voltage applied.
However, all the unneeded voltage changes into heat. It is disadvantageous for a low-output amplifier such as this unit.
The shift circuit on this model is employed to limit the high voltage supplied during small output to the minimum necessary, and control heat.

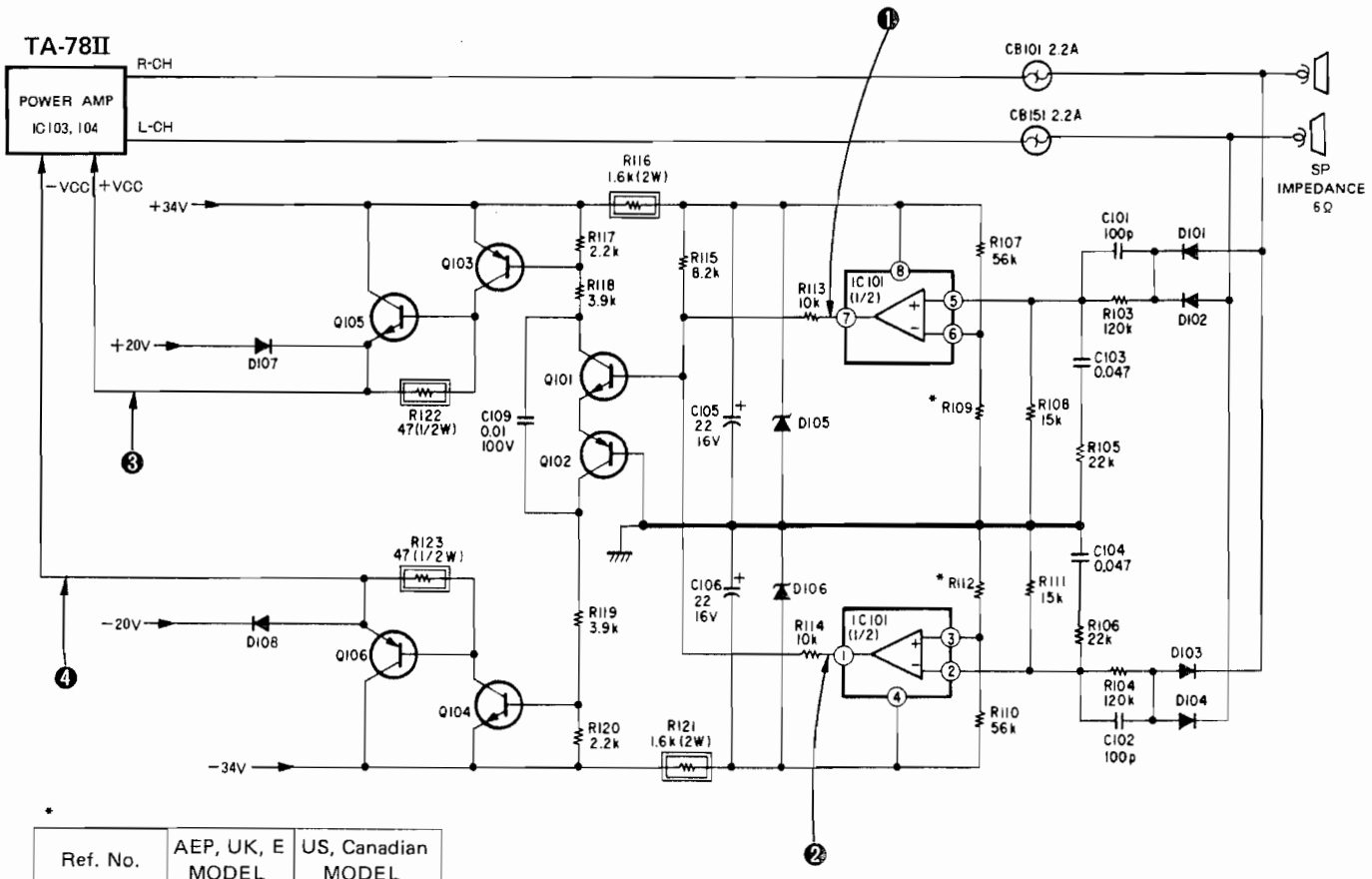
Shift Circuit Operation

The output signals from both channels of the TA-78II power amplifier enter D101 – 104, and are separated into plus and minus output by this circuit.

The detected output signal enters IC101, where it is compared with the level set at IC101 and the TA-78II output signal detected from D101 – 104.

During small output (approx. 5W), IC101 output goes low. At this time shift drive (Q101 – 104) all go off, and no bias is applied to Q105, Q106, which also go off, so +Vcc (AEP, UK, E MODEL: +19V, US, Canadian MODEL: +22.7V) and –Vcc (AEP, UK, E MODEL: –19V, US, Canadian MODEL: –22.7V) pass through D107, D108 respectively and are supplied to the power amplifier.
During large output (approx. 28W), IC101 output goes high. At this time shift drive (Q101 – 104) all go on, as do Q105, Q106.
±Vcc passes through Q105, Q106, becomes +Vcc (approx. +24.5V) and –Vcc (AEP, UK, E MODEL: approx. –24V, US, Canadian MODEL: approx. –24.5V) and is supplied to the power amplifier. +Vcc (AEP, UK, E MODEL: +19V, US, Canadian MODEL: +22.7V) and –Vcc (AEP, UK, E MODEL. –19V, US, Canadian MODEL: –22.7V) are cut by D107, D108 being reverse biased.

Shift Circuit



*

Ref. No.	AEP, UK, E MODEL	US, Canadian MODEL
R109, R112	3.9k	5.1k

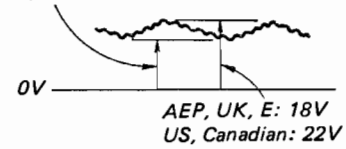
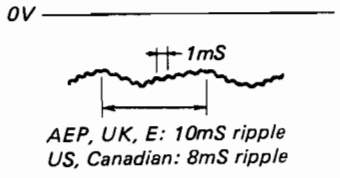
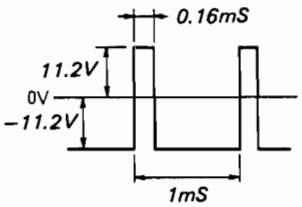
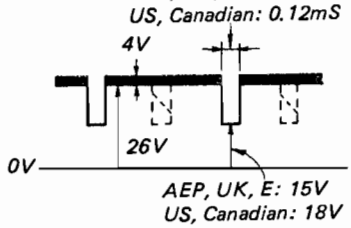
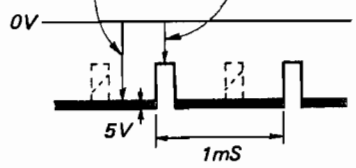
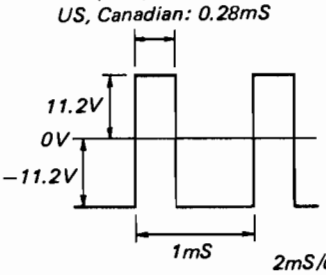
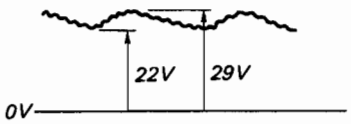
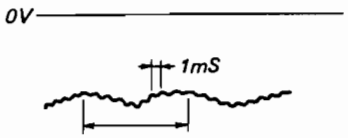
Note: Waveforms and Voltage Values of check points ❶ – ❹.

Notes on Repair

On this model's shift circuit, ±Vcc voltage changes according to the increase and decrease of the TA-78II output signal.

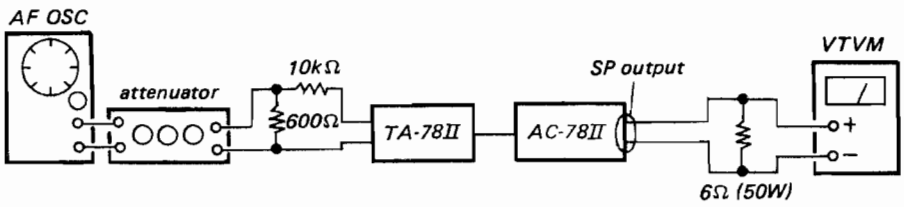
This indicates that the shift circuits operating properly. To check shift circuit operation, refer to the chart below.

Waveforms and Voltage Values of shift circuit operation check points ❶—❹.

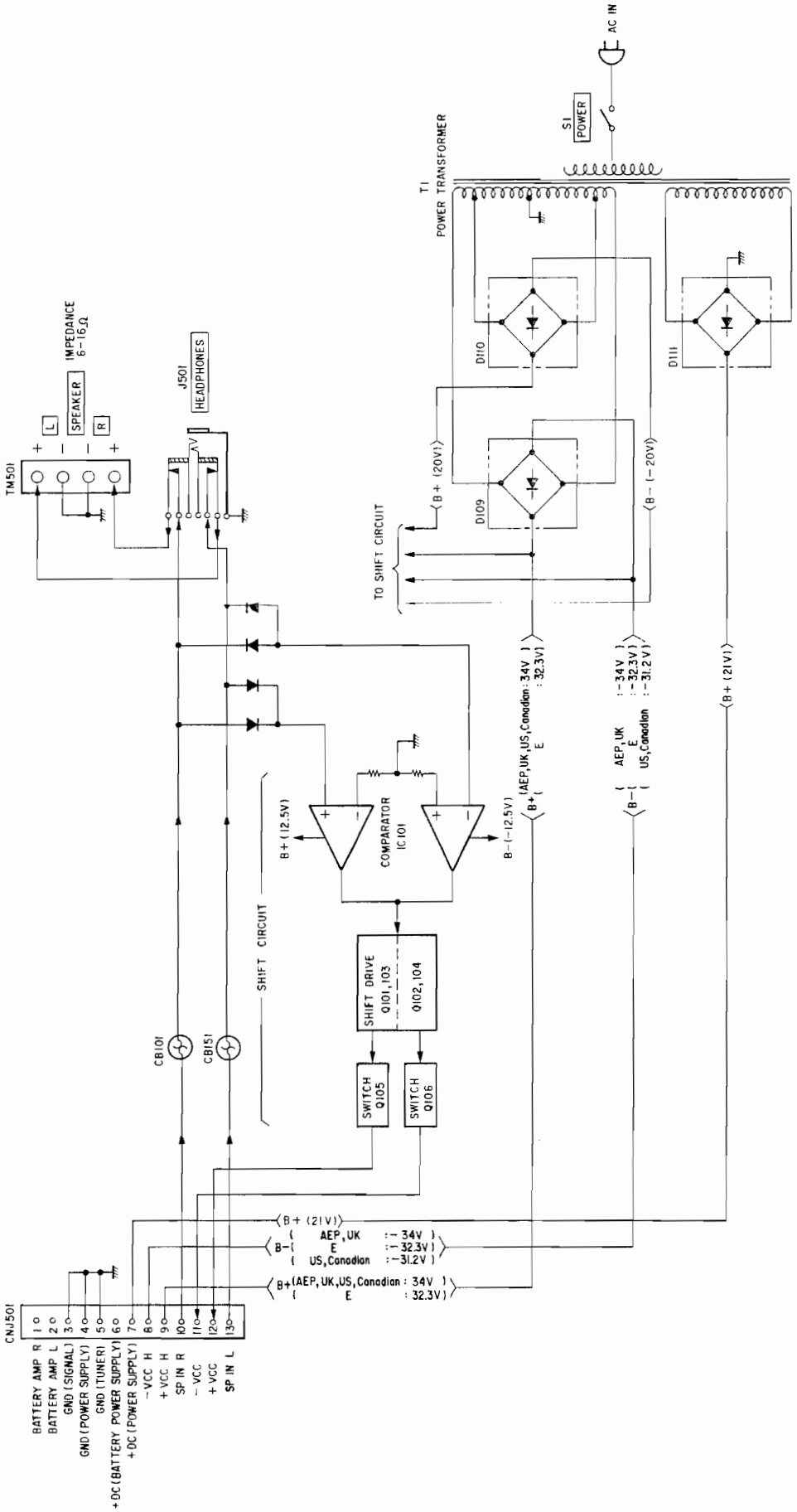
SP Output Voltage (VTVM)	❶, ❷	❸	❹
0V with no signal output	(−11.5V)	AEP, UK, E: (+19V) US, Canadian: (+22.7V)	AEP, UK, E: (−19V) US, Canadian: (−22.7V)
AEP, UK, E: 5.5V with low output US, Canadian: 7V with low output	(−11.5V)	AEP, UK, E: (+16.5V) US, Canadian: (+19.6V) *AEP, UK, E: 15V* *US, Canadian: 18V*  *0V* *AEP, UK, E: 18V* *US, Canadian: 22V* *2mS/div*	AEP, UK, E: (−16.5V) US, Canadian: (−19.6V)  *0V* *1mS* *AEP, UK, E: 10mS ripple* *US, Canadian: 8mS ripple* *2mS/div*
AEP, UK, E: 8V with normal output US, Canadian: 9.8V with normal output	(−7.4V)  *0.16mS* *11.2V* *0V* *−11.2V* *1mS* *0.2mS/div*	(+26.5V) *AEP, UK, E: 0.09mS* *US, Canadian: 0.12mS*  *4V* *26V* *0V* *AEP, UK, E: 15V* *US, Canadian: 18V* *Note: Square wave or sawtooth wave may appear at the sections indicated by dotted lines in the diagram.* *0.2mS/div*	(−26.5V) *AEP, UK, E: 15V* *AEP, UK, E: 25V* *US, Canadian: 18V* *US, Canadian: 26V*  *0V* *5V* *1mS* *Note: Square wave or sawtooth wave may appear at the sections indicated by dotted lines in the diagram.* *0.2mS/div*
13V with high output	AEP, UK, E: (−3.2V) US, Canadian: (−4.8V) *AEP, UK, E: 0.35mS* *US, Canadian: 0.28mS*  *11.2V* *0V* *−11.2V* *1mS* *2mS/div*	(+24.5V)  *22V* *29V* *0V* *2mS/div*	(−24.5V)  *0V* *1mS* *AEP, UK, E: 10mS ripple* *US, Canadian: 8mS ripple* *2mS/div*

( ) : VOM voltage values

AF OSC 1kHz (sinewave)
SP impedance : 6Ω/with both channels driven



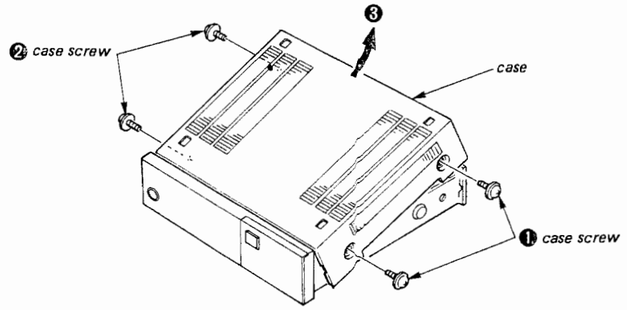
SECTION 1
BLOCK DIAGRAM



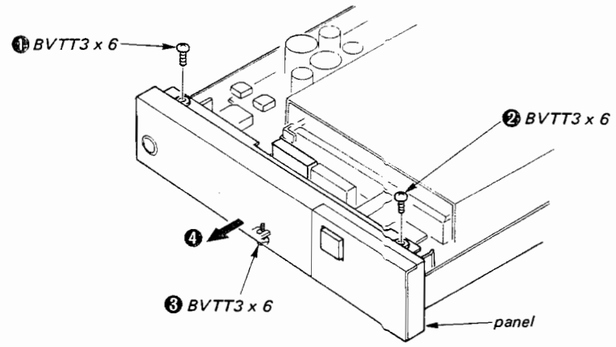
SECTION 2
DISASSEMBLY

Note: Follow the disassembly procedure in the numerical order given.

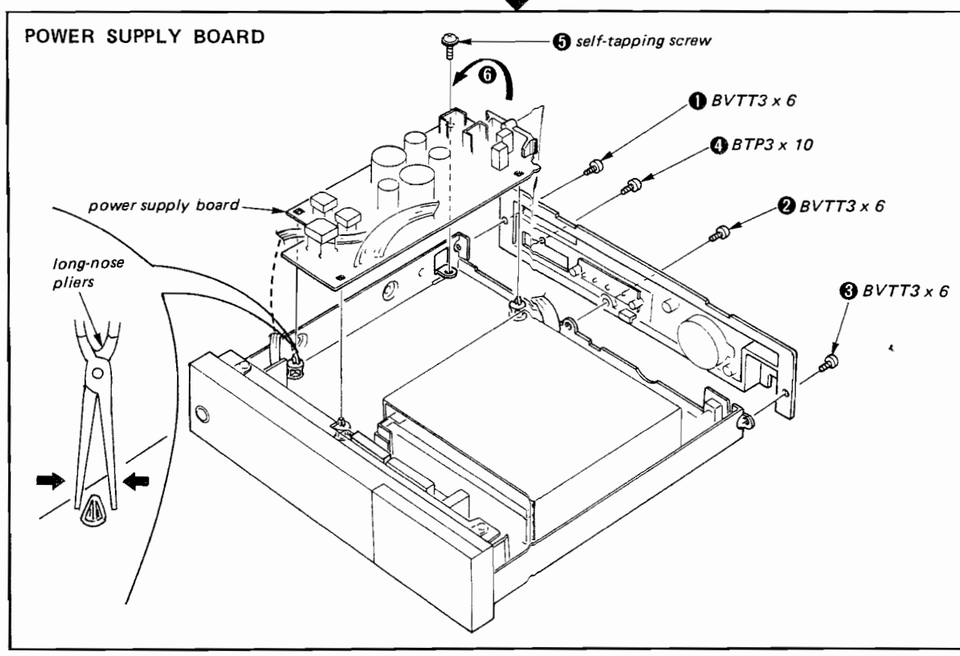
CASE



PANEL

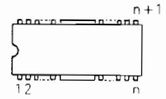


POWER SUPPLY BOARD



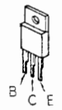
SEMICONDUCTOR LEAD LAYOUTS

NJM4560D-D



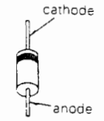
(Top view)

2SA770-Y
2SC1985-Y

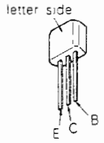


2SC2458
2SC2458-GR

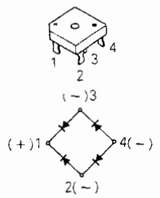
1S1585
1S2076A
30DL4
30DL4FA
EQA01-12R1



2SA1175
2SA1175-F



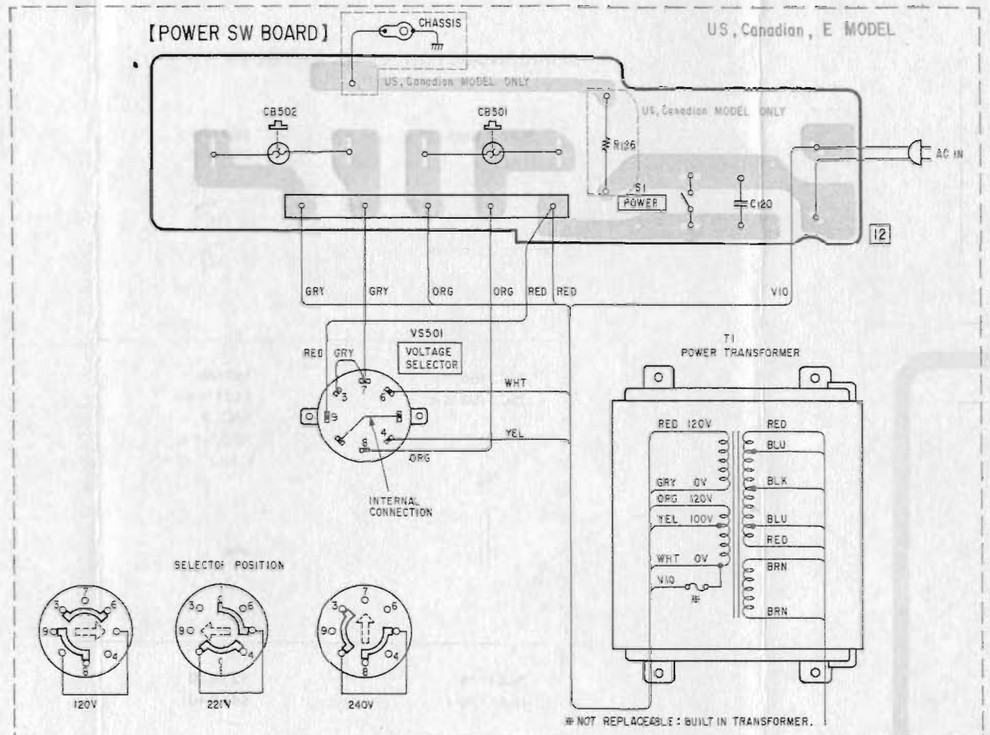
S2VB20
S4VB40

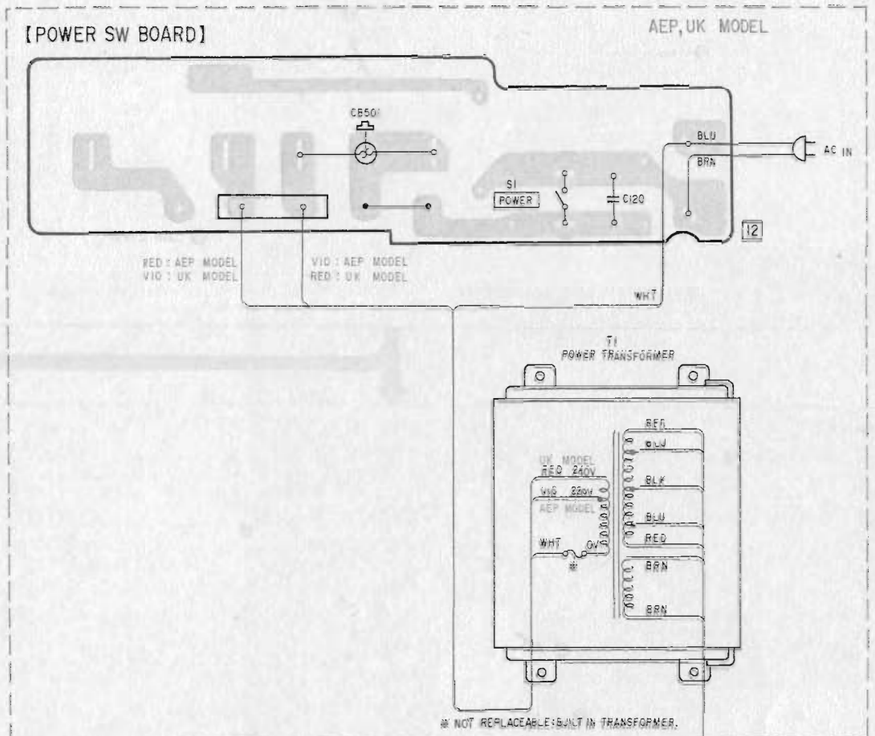


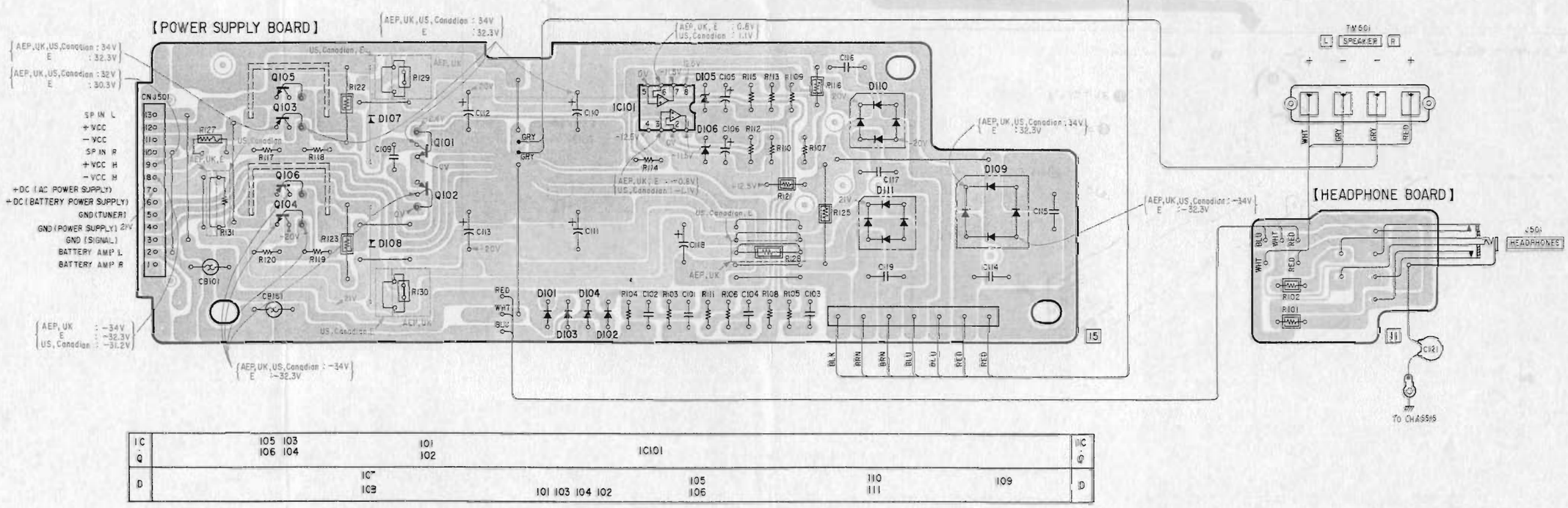
2SB734
2SD774

3-1. MOUNTING DIAGRAM

Note:
- ○— : parts extracted from the component side.
- : B + pattern
- : B - pattern

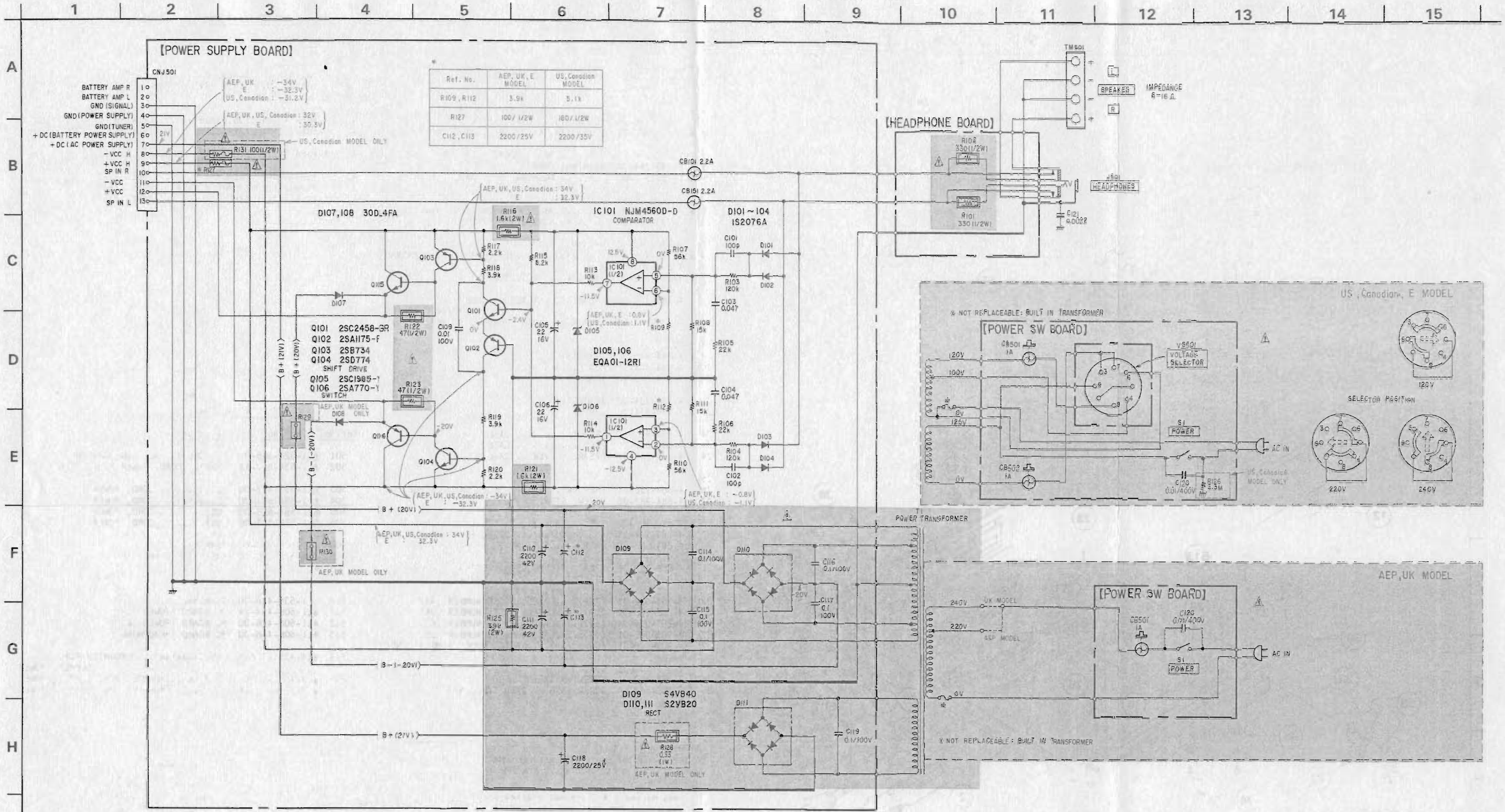






IC Q	105 103 106 104	101 102	IC101	IIC Q
D	107 108	101 103 104 102	105 106 110 111 109	D

3-2. SCHEMATIC DIAGRAM



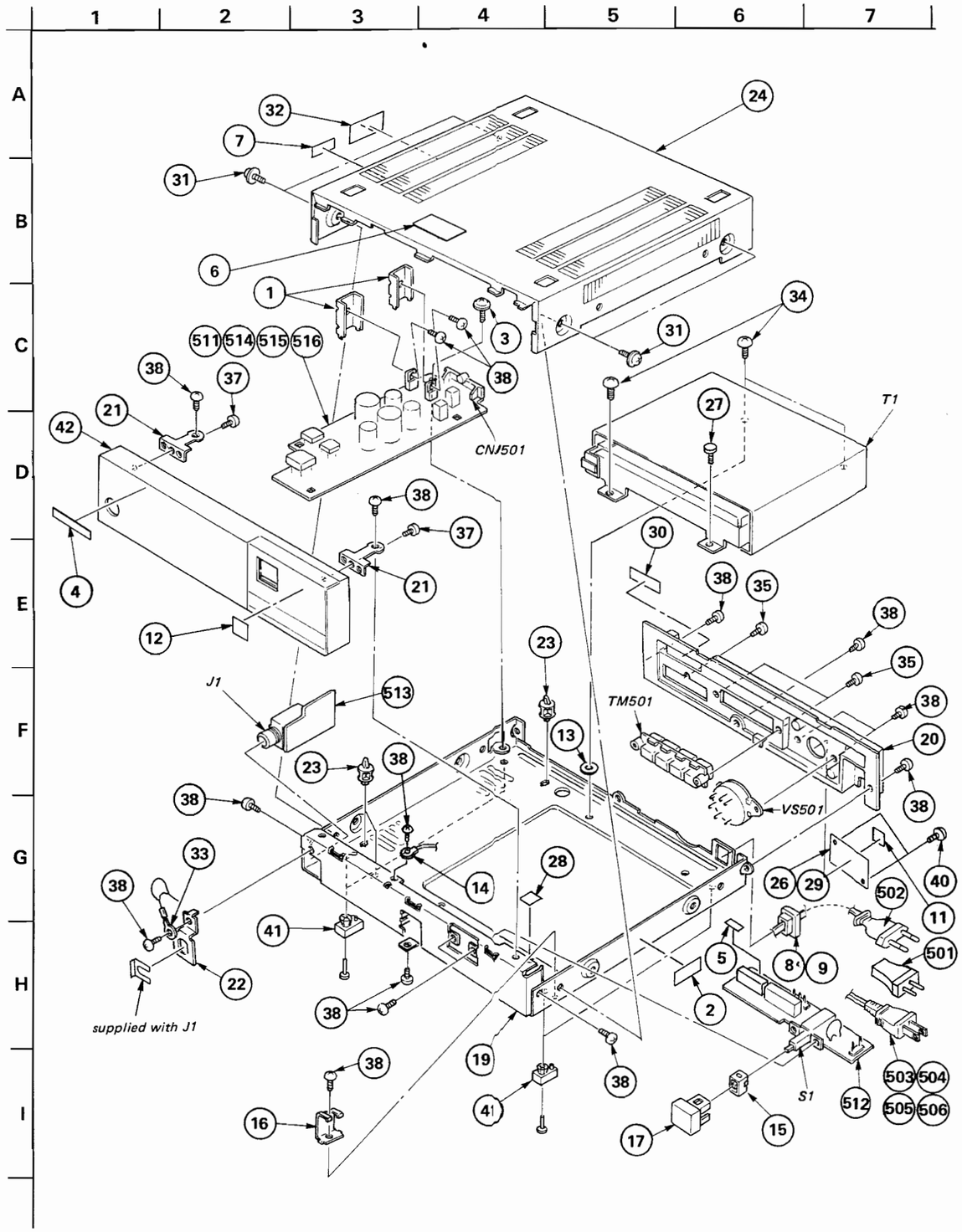
Note:

- All capacitors are in μF unless otherwise noted. pF : μμF 50WV or less are not indicated except for electrolytics and tantalums.
- All resistors are in ohms, ¼W unless otherwise noted. kΩ : 1000Ω, MΩ : 1000kΩ
- ▭ : nonflammable resistor.
- ▭ : fusible resistor.
- ▭ : panel designation.
- ——— : B+ bus.
- – – – : B- bus.
- Voltages are dc with respect to ground unless otherwise noted.
- Readings are taken with a VOM (50kΩ/V).
- Voltage variations may be noted due to normal production tolerances.

Note: Voltages are measured with a VOM (50kΩ/V).

Note: The components identified by shading and mark ⚠ are critical for safety. Replace only with part number specified.

SECTION 4
EXPLODED VIEW AND PARTS LIST



GENERAL SECTION

No.	Part No.	Description
1	♦;3-309-144-31	HEAT SINK
2	3-701-030-00	LABEL, SERIAL NUMBER
3	3-701-589-00	SCREW, SELF-TAPPING
4	♦;3-701-690-00	(UK).....LABEL (MADE IN JAPAN)
5	3-701-946-30	(Canadian)...LABEL, FUSE
6	♦;3-703-043-21	(Canadian,UK)...LABEL, CAUTION, MAIN
7	3-703-208-11	(US)....LABEL, IDENTIFICATION
8	⚠.3-703-244-00	BUSHING, CORD
9	⚠.3-703-571-00	(US,E)...BUSHING (S), CORD
10	.....	
11	♦;3-703-680-00	(US)....LABEL, CAUTION, SUB, NEW UL
12	3-703-709-00	STICKER, SONY SYMBOL (15)
13	4-830-092-00	WASHER, FIBER
14	♦;4-838-926-00	(US,Canadian)...PLATE (A), LUG TERMINAL
15	4-864-307-00	RING
16	♦;4-884-808-00	(AEP,UK)...PROTECTOR
17	4-884-810-00	(PEARL SILVER,RED)...KNOB (16X16) (POWER), SQUARE
17	4-884-810-11	(BLACK)....KNOB (POWER), SQUARE
18	.....	
19	♦;4-884-815-00	CHASSIS
20	4-884-816-11	PLATE, JACK
21	♦;4-884-820-00	BRACKET (B)
22	♦;4-884-824-00	BRACKET, H.P
23	♦;4-884-834-00	SUPPORT, PC
24	4-884-841-11	(BLACK).....CASE
24	4-884-841-21	(RED).....CASE
24	4-884-841-41	(PEARL SILVER)...CASE
25	.....	
26	4-884-932-11	(AEP,UK)...COVER, SELECTOR, VOLTAGE
27	4-884-982-00	SCREW, STEP
28	♦;4-884-986-00	(US,Canadian)...SHEET, INSULATING
29	4-884-987-11	(US,Canadian)...COVER, SELECTOR, VOLTAGE
30	♦;4-884-991-00	(AEP)....CAUTION
31	4-889-321-01	(PEARL SILVER,RED)...SCREW
31	4-889-321-11	(BLACK).....SCREW
32	4-903-002-01	(AEP)....LABEL, MODEL NUMBER (AEP)
32	4-903-003-01	(UK).....LABEL, MODEL NUMBER (UK)
32	4-903-004-01	(E).....LABEL, MODEL NUMBER (E)
32	4-903-005-01	(US).....LABEL, MODEL NUMBER (US)
32	4-903-006-01	(Canadian)....LABEL, MODEL NUMBER (CND)
33	7-623-508-01	LUG, 3
34	7-682-560-01	SCREW +B 4X6
35	7-685-547-14	SCREW +BTP 3X10 TYPE2 N-S

GENERAL SECTION

No.	Part No.	Description
36	.....	
37	7-685-646-11	SCREW +BVTP 3X8 TYPE2 N-S
38	7-685-871-01	SCREW +BVTT 3X6 (S)
39	.....	
40	7-685-547-14	(US,Canadian)...SCREW +BTP 3X10 TYPE2 N-S
40	7-685-872-01	(AEP,UK).....SCREW +BVTT 3X8 (S)
41	X-4884-801-0	FOOT ASSY, RUBBER
42	X-4884-840-1	(BLACK).....PANEL ASSY
42	X-4884-841-1	(PEARL SILVER)...PANEL ASSY
42	X-4884-842-1	(RED).....PANEL ASSY

ELECTRICAL PARTS

Ref.No.	Part No.	Description
501	⚠.1-526-565-00	(E3 ONLY)...AC PLUG ADAPTOR
502	⚠.1-534-817-XX	(AEP)...CORD, POWER, EULO PLUG
503	⚠.1-551-472-00	(E).....CORD, POWER
504	⚠.1-551-511-00	(Canadian)...CORD, POWER
505	⚠.1-551-628-00	(US).....CORD, POWER
506	⚠.1-551-884-00	(UK).....CORD, POWER
507	♦;1-535-120-00	TERMINAL
508	♦;1-535-140-00	BASE POST 19MM (10MM PITCH) 3P
509	♦;1-535-142-00	(US,Canadian,E)...BASE POST 19MM (10MM PITCH) 5P
510	1-535-416-00	TERMINAL
511	♦;1-608-444-14	PC BOARD, POWER SUPPLY
512	♦;1-608-445-00	PC BOARD, POWER SW
513	♦;1-608-446-00	PC BOARD, HEADPHONE
514	♦;A-4351-332-A	(US,Canadian).....MOUNTED PCB, SUPPLY, POWER
515	♦;A-4351-325-A	(AEP,UK)...MOUNTED PCB, SUPPLY, POWER
516	♦;A-4351-326-A	(E).....MOUNTED PCB, SUPPLY, POWER

NOTE:
- The mechanical parts with no reference number in the exploded views are not supplied.
- Items marked " ♦ " are not stocked since they are seldom required for routine service. Some delay should be anticipated when ordering these items.
- Due to standardization, parts with part numbers (Δ-ΔΔΔ-ΔΔΔ-XX or Δ-ΔΔΔΔ-ΔΔΔ-X) may be different from those used in the set.
- If there are two or more same circuitsin a set such as a stereophonic machine, only typical circuit parts may be indicated and capacitors and resistors in other same circuits may be omitted.

CAPACITORS:
MF:μF, PF:μμF.

RESISTORS
- All resistors are in ohms.
- F : nonflammable

COILS
- MMH : mH, UH : μH

SEMICONDUCTORS
In each case, U : μ, for example:
UA···: μA···, UPA···: μPA···, UPC···: μPC, UPD···: μPD···

The components identified by shading and mark ⚠ are critical for safety. Replace only with part number specified.

ELECTRICAL PARTS

Ref.No.	Part No.	Description
C101	1-102-973-00	CERAMIC 100PF 5% 50V
C102	1-102-973-00	CERAMIC 100PF 5% 50V
C103	1-108-595-00	MYLAR 0.047MF 5% 50V
C104	1-108-595-00	MYLAR 0.047MF 5% 50V
C105	1-123-330-00	ELECT 22MF 20% 16V
C106	1-123-330-00	ELECT 22MF 20% 16V
C109	1-106-196-00	MYLAR 0.01MF 5% 100V
C110 ⚠	1-124-166-00	ELECT 2200MF 20% 42V
C111 ⚠	1-124-166-00	ELECT 2200MF 20% 42V
C112 ⚠	1-123-917-00	(US,Canadian)...ELECT 2200MF 20% 35V
C112 ⚠	1-123-918-00	(AEP,UK,E).....ELECT 2200MF 20% 25V
C113 ⚠	1-123-917-00	(US,Canadian)...ELECT 2200MF 20% 35V
C113 ⚠	1-123-918-00	(AEP,UK,E).....ELECT 2200MF 20% 25V
C114 ⚠	1-108-389-00	MYLAR 0.1MF 10% 100V
C115 ⚠	1-108-389-00	MYLAR 0.1MF 10% 100V
C116 ⚠	1-108-389-00	MYLAR 0.1MF 10% 100V
C117 ⚠	1-108-389-00	MYLAR 0.1MF 10% 100V
C118 ⚠	1-123-918-00	ELECT 2200MF 20% 25V
C119 ⚠	1-108-389-00	MYLAR 0.1MF 10% 100V
C120 ⚠	1-161-744-00	CERAMIC 0.01MF 400V
C121	1-101-002-00	CAP, CERAMIC 0.0022MF F
CB101	1-532-564-00	BREAKER, CIRCUIT
CB151	1-532-564-00	BREAKER, CIRCUIT
CB501 ⚠	1-532-518-00	(US,Canadian)...CIRKIT BREAKER
CB501 ⚠	1-532-535-00	(AEP,UK,E).....CIRKIT BREAKER
CB502 ⚠	1-532-518-00	(US,Canadian)...CIRKIT BREAKER
CB502 ⚠	1-532-535-00	(E).....CIRKIT BREAKER
CNJ501	1-562-068-00	SOCKET, CONNECTOR 13P
D101	8-719-815-85	DIODE 1S1585
D102	8-719-815-85	DIODE 1S1585
D103	8-719-815-85	DIODE 1S1585
D104	8-719-815-85	DIODE 1S1585
D105	8-719-991-21	DIODE EQA01-12R1
D106	8-719-991-21	DIODE EQA01-12R1
D107	8-719-230-24	DIODE 30DL4
D108	8-719-230-24	DIODE 30DL4
D109 ⚠	8-719-504-40	DIODE S4VB40
D110 ⚠	8-719-502-20	DIODE S2VB20
D111 ⚠	8-719-502-20	DIODE S2VB20
IC101	8-759-745-61	IC NJM4560D-D
J1	1-507-729-00	JACK, LARGE TYPE

ELECTRICAL PARTS

Ref.No.	Part No.	Description
Q101	8-729-245-83	TRANSISTOR 2SD2458
Q102	8-729-117-54	TRANSISTOR 2SA1175
Q103	8-729-103-43	TRANSISTOR 2SB734
Q104	8-729-177-43	TRANSISTOR 2SD774
Q105	8-729-300-44	TRANSISTOR 2SA1985-Y
Q106	8-729-300-42	TRANSISTOR 2SA770-Y
R101 ⚠	1-247-228-00	CARBON 330 5% 1/2W F
R102 ⚠	1-247-228-00	CARBON 330 5% 1/2W F
R103	1-246-523-00	CARBON 120K 5% 1/4W
R104	1-246-523-00	CARBON 120K 5% 1/4W
R105	1-247-163-00	CARBON 22K 5% 1/4W
R106	1-247-163-00	CARBON 22K 5% 1/4W
R107	1-247-173-00	CARBON 56K 5% 1/4W
R108	1-247-541-00	CARBON 1.5K 5% 1/4W
R109	1-247-145-00	(AEP,UK,E).....CARBON 3.9K 5% 1/4W
R109	1-247-530-00	(US,Canadian)...CARBON 5.1K 5% 1/4W
R110	1-247-173-00	CARBON 56K 5% 1/4W
R111	1-247-541-00	CARBON 1.5K 5% 1/4W
R112	1-247-145-00	(AEP,UK,E).....CARBON 3.9K 5% 1/4W
R112	1-247-530-00	(US,Canadian)...CARBON 5.1K 5% 1/4W
R113	1-247-537-00	CARBON 10K 5% 1/4W
R114	1-247-537-00	CARBON 10K 5% 1/4W
R115	1-247-535-00	CARBON 8.2K 5% 1/4W
R116 ⚠	1-206-669-00	METAL OXIDE 1.6K 5% 2W F
R117	1-247-521-00	CARBON 2.2K 5% 1/4W
R118	1-247-145-00	CARBON 3.9K 5% 1/4W
R119	1-247-145-00	CARBON 3.9K 5% 1/4W
R120	1-247-521-00	CARBON 2.2K 5% 1/4W
R121 ⚠	1-206-669-00	METAL OXIDE 1.6K 5% 2W F F
R122 ⚠	1-247-208-00	CARBON 47 5% 1/2W F F
R123 ⚠	1-247-208-00	CARBON 47 5% 1/2W F F
R125 ⚠	1-206-678-00	METAL OXIDE 3.9K 5% 2W F
R126 ⚠	1-202-725-00	(US,Canadian)...SOLID 3.3M 10% 1/2W F
R127 ⚠	1-212-988-00	(US,Canadian).....FUSE 180 5% 1/2W
R127 ⚠	1-212-982-00	(AEP,UK,E).....FUSIBLE 100 5% 1/2W F
R128 ⚠	1-212-354-00	(AEP,UK)...METAL OXIDE 0.33 5% 1W
R129 ⚠	1-532-675-00	(AEP,UK)...LINK, IC
R130 ⚠	1-532-675-00	(AEP,UK)...LINK, IC
R131 ⚠	1-212-982-00	(US,Canadian)...FUSIBLE 100 5% 1/2W
S1 ⚠	1-553-318-00	SWITCH, PUSH (AC POWER)
T1 ⚠	1-447-406-00	(US,Canadian)...TRANSFORMER, POWER
T1 ⚠	1-447-407-00	(AEP,UK).....TRANSFORMER, POWER
T1 ⚠	1-447-408-00	(E).....TRANSFORMER, POWER
TM501	1-536-705-21	TERMINAL BOARD (SP)
VS501 ⚠	1-526-576-51	(US,Canadian,E)...SELECTOR,

NOTE:
- The mechanical parts with no reference number in the exploded views are not supplied.
- Items marked " ♦ " are not stocked since they are seldom required for routine service. Some delay should be anticipated when ordering these items.
- Due to standardization, parts with part numbers (Δ-ΔΔΔ-ΔΔΔ-XX or Δ-ΔΔΔΔ-ΔΔΔ-X) may be different from those used in the set.
- If there are two or more same circuitsin a set such as a stereophonic machine, only typical circuit parts may be indicated and capacitors and resistors in other same circuits may be omitted.

CAPACITORS:
MF:μF, PF:μμF.

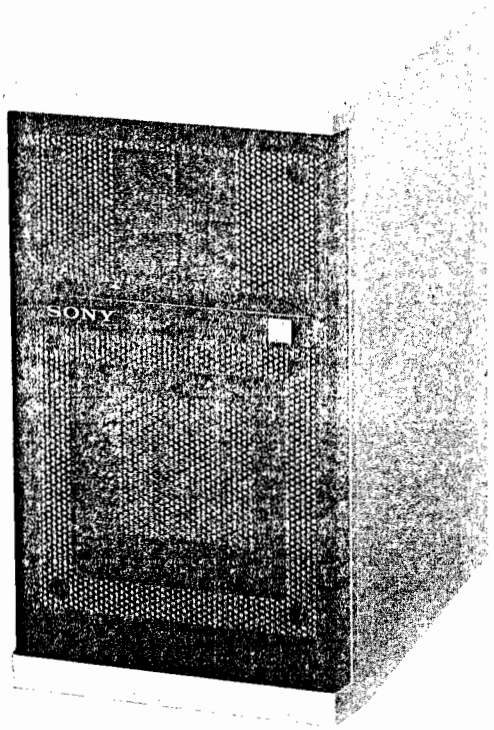
RESISTORS
- All resistors are in ohms.
- F : nonflammable

COILS
- MMH : mH, UH : μH

SEMICONDUCTORS
In each case, U : μ, for example:
UA···: μA···, UPA···: μPA···, UPC···: μPC,
UPD···: μPD···

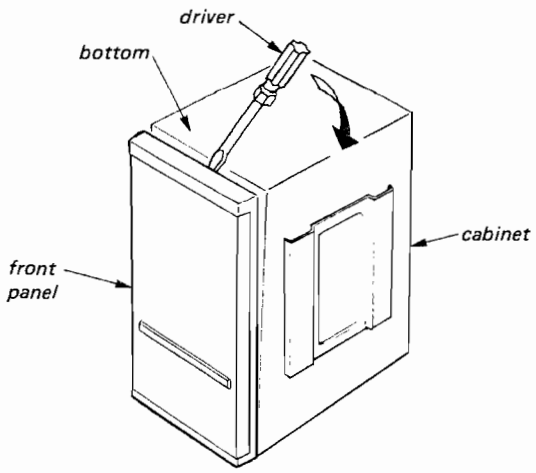
The components identified by shading and mark ⚠ are critical for safety. Replace only with part number specified.

SPEAKER SYSTEM
(APM-078)



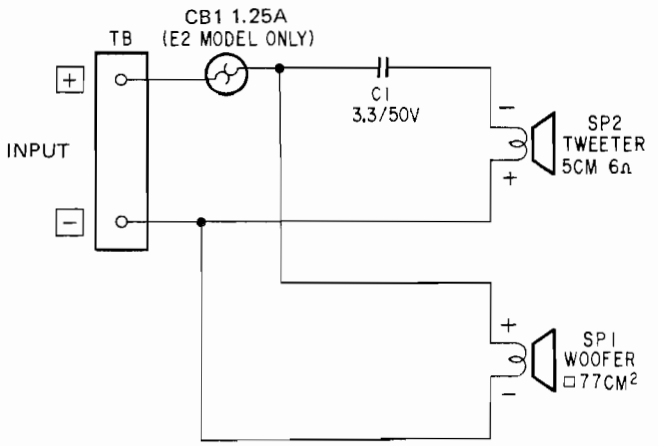
Note: APM-078 is a speaker system in FH-7 MK II.

1. DISASSEMBLY
FRONT PANEL REMOVAL



Note: Be careful not to scratch the cabinet.

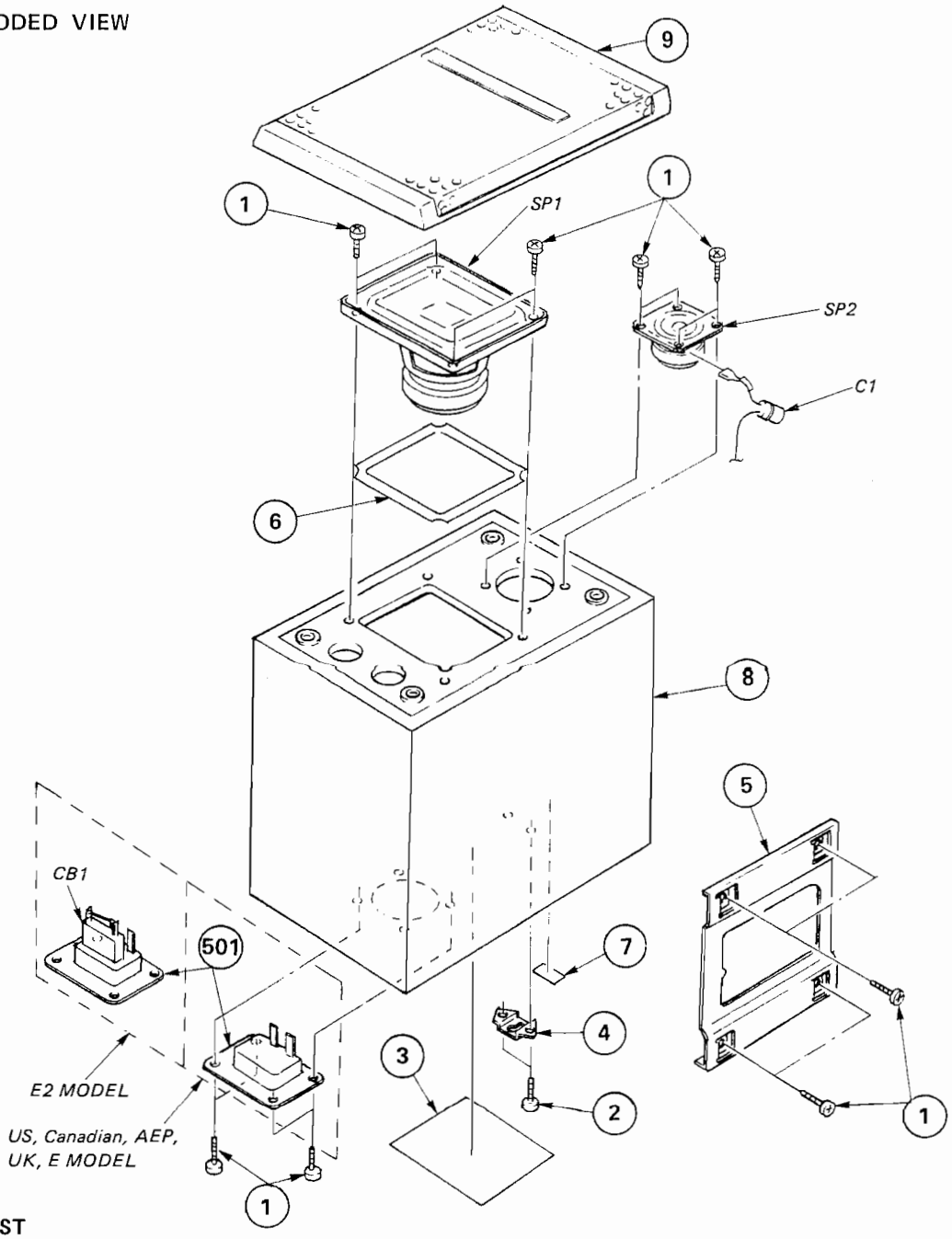
2. SCHEMATIC DIAGRAM



Note: All capacitors are in μF.

CATION:
Be careful to the polarity of the speaker when connecting the speaker.

3. EXPLODED VIEW



4. PARTS LIST

GENERAL SECTION

No.	Part No.	Description
1	4-874-614-11	SCREW (M3.5), + BV TAPPING
2	4-874-614-41	SCREW, TAPPING, BV (+) (3.5)
3 ♦	4-875-621-00	LABEL, CAUTION
4 ♦	4-883-903-11	HOOK
5	4-883-913-00	(SILVER)...PLATE, SIDE (B)
5	4-883-913-11	(BLACK)....PLATE, SIDE (B)
5	4-883-913-21	(RED).....PLATE, SIDE (B)
6	4-883-942-01	PACKING, WOOFER
7	4-883-936-01	LABEL, MODEL NUMBER
8	X-4883-911-1	(SILVER)...CABINET ASSY (S), SPEAKER
8	X-4883-912-1	(BLACK)....CABINET ASSY (B), SPEAKER
8	X-4883-913-1	(RED).....CABINET ASSY (R), SPEAKER
9	X-4883-914-1	(SILVER)...PANEL ASSY (S), FRONT
9	X-4883-915-1	(BLACK)....PANEL ASSY (B), FRONT
9	X-4883-916-1	(RED).....PANEL ASSY (R) , FRONT

ELECTRICAL PARTS

Ref.No.	Part No.	Description
501	1-536-832-00	TERMINAL BOARD (SPEAKER)
C1	1-123-546-00	CAP, ELECT (NONPOLAR) 3.3MF 50V
CB1	1-532-664-00	(E2 ONLY)...CIRCUIT BREAKER 1.25A
SP1	8-927-155-00	SPEAKER UNIT (WOOFER)
SP2	1-503-323-11	SPEAKER (TWEETER)

NOTE: · Items marked " ♦ " are not stocked since they are seldom required for routine service. Some delay should be anticipated when ordering these items.