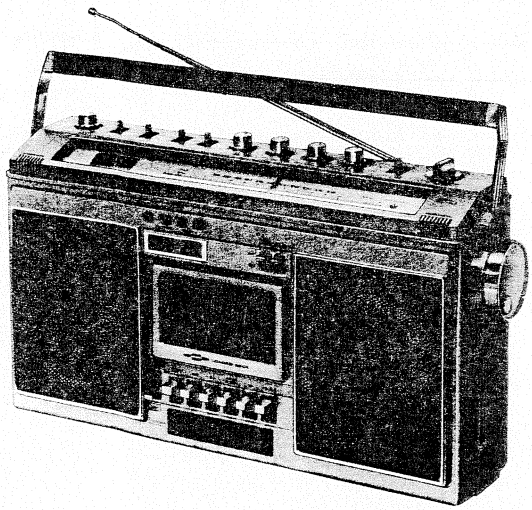
SK-21 KU,KC

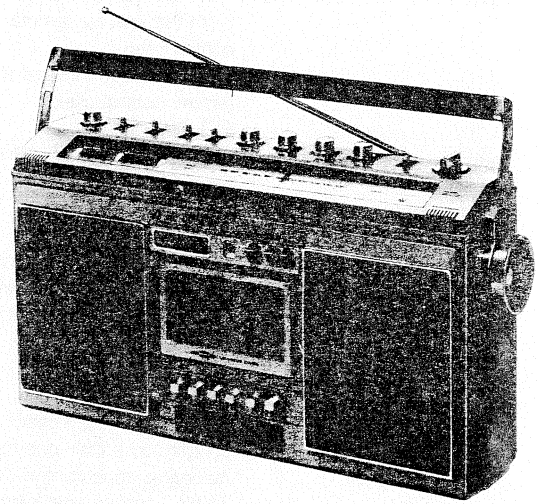
AM/FM STEREO RADIO
CASSETTE RECORDER

SK-31 KU,KC

AM/FM STEREO RADIO
CASSETTE RECORDER

SERVICE MANUAL



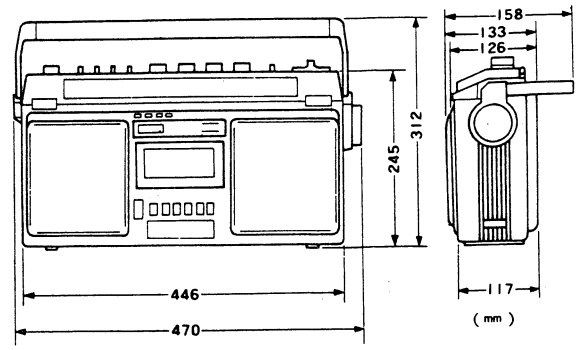


CONTENTS

PIONEER®

1. SPECIFICATIONS

Max. output power	2W + 2W
Speakers	SK-31: 12 cm (4-3/4 in.) woofer 4.2 cm (1-5/8 in.) tweeter SK-21: 12 cm (4-3/4 in.) full range
Wow and flutter	0.09% (WRMS)
Frequency response	50 ~ 12,000 Hz (chrome)
Input	AUX L/R, EXT MIC L/R (with terminal for remote control use), MIX MIC (with terminal for remote control use), EXT FM ANT
Output	LINE OUT L/R, EXT SP L/R, headphone
Subfunction	SK-31: One-side repeat, programmable repeat, memory & stop, song finder, editor, one touch recording, tone control (Bass, Treble), stereo/wide switch, tape selector (Normal/CrO_2), hi-filter, BFC switch SK-21: One-side repeat, songfinder, editor, one touch recording, tone control (Bass, Treble), stereo/wide switch, tape selector (Normal/CrO_2), BFC switch
Indicator	SK-31: Repeat (Green LED), song finder (Red LED), power (Red LED), REC (Red LED), end mark (Red), FM stereo (Red LED), Lch. level meter (Battery check), Rch. level meter (FM center tuning) SK-21: Repeat (Green LED), song finder (Red LED), power (Red LED), REC (Red LED), FM stereo (Red LED). Level meter (Battery check)
Frequency range	FM: 88 ~ 108 MHz AM: 525 ~ 1,650 kHz
Power source	120V AC 60 Hz, 9V DC (Six 1.5V "D" batteries), EXT 9V DC
Power consumption	14W
Dimensions (W × H × D)	446 × 245 × 126 mm (17-1/2 × 9-5/8 × 5 in.)
Weight	SK-31: 5.2 kg (11.4 lbs.) without batteries SK-21: 5 kg (11 lbs.) without batteries



Note:
Specifications and the design subject to possible modification without notice due to improvements.

2. BLOCK DIAGRAM

SK-21
SK-31

• Play back Mode (SK-21)

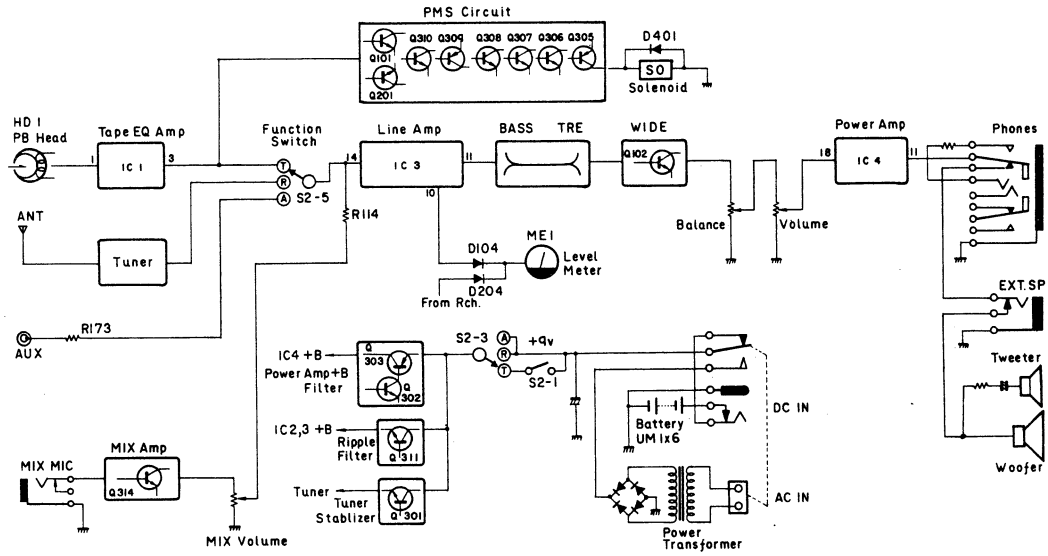


Fig. 1

(SK-31)

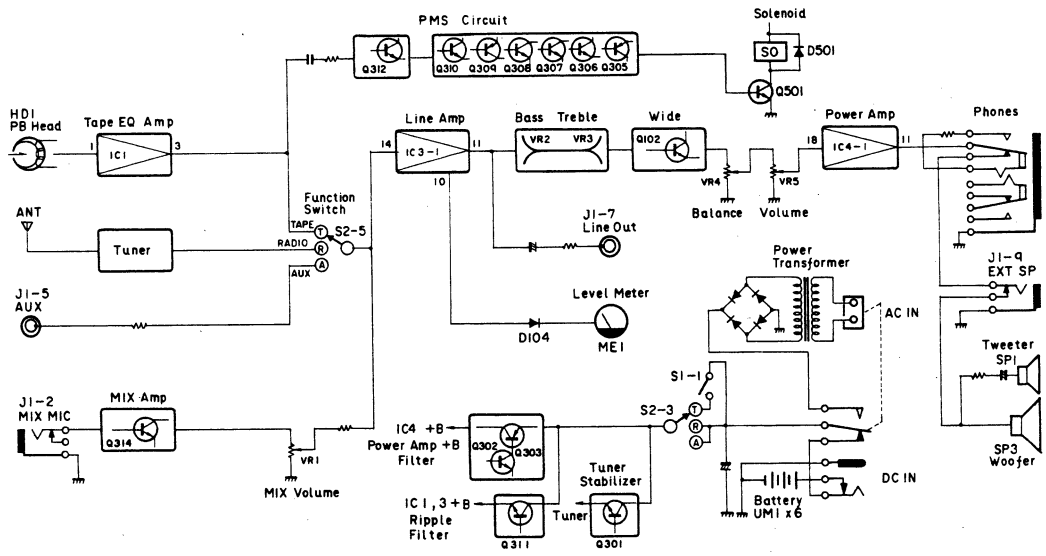


Fig. 2

BLOCK DIAGRAM

• Record Mode (SK-21)

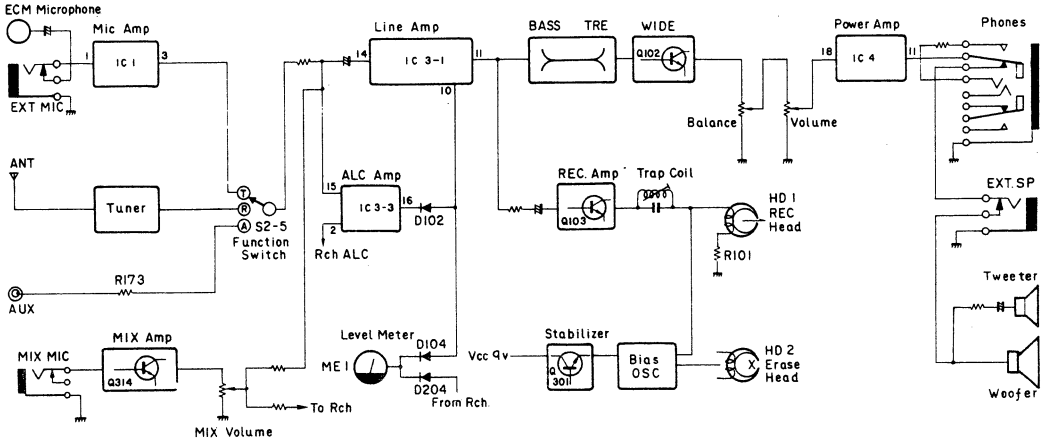


Fig. 3

(SK-31)

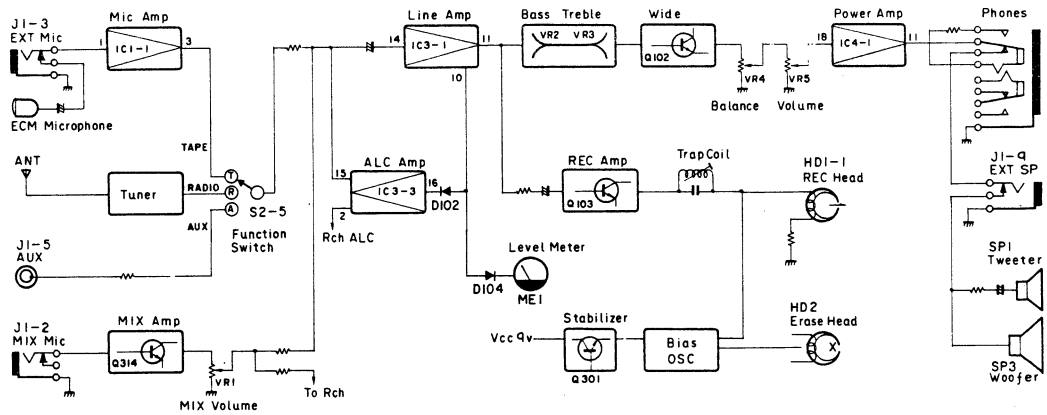


Fig. 4

• Tuner Section

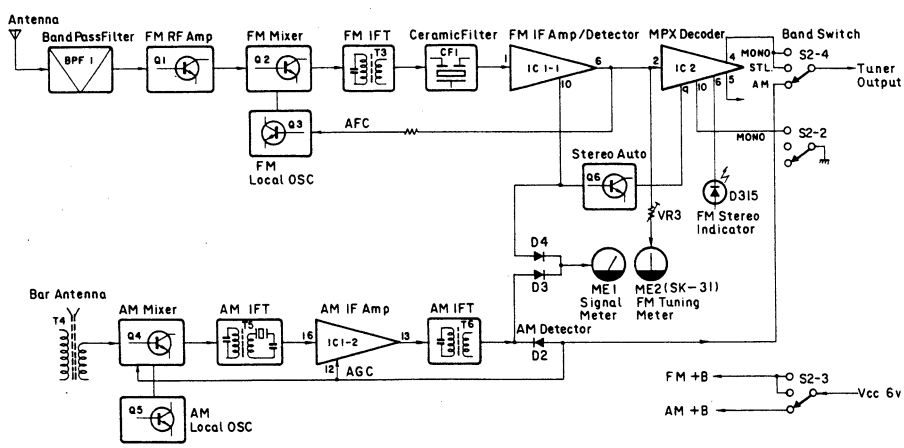


Fig. 5

3. DISASSEMBLY

SK-21
SK-31

• Removing the Rear Case

1. Remove the batteries and check that the AC cord is not connected.
2. Unscrew the six screws which hold the rear case (one of these screws is inside the battery compartment). The bottom of the rear case may be slid, and so to remove it, push down from above. (Fig. 6)
   Now remove the tuner unit connectors and the power unit connectors. (Fig. 7)

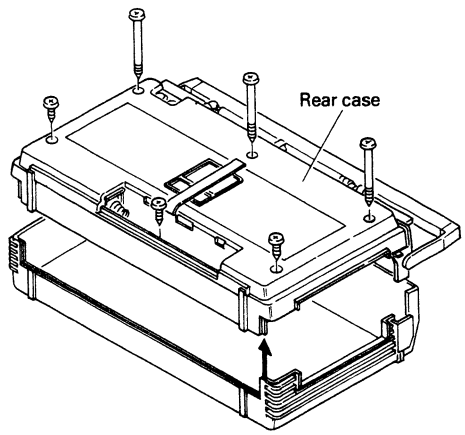


Fig. 6

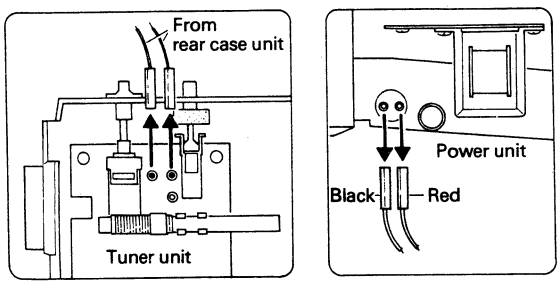


Fig. 7

• Removing the Chassis Assembly

1. Remove the knobs on the front panel. (Fig. 8)
2. Use a screwdriver to remove the tuning knob from the rear side. (Fig. 9)
3. Unscrew the nine screws securing the chassis assembly. (Fig. 8)
4. Push the lever knobs down inside the panel, rotate the bottom of the circuit board on its axis and then lift the chassis assembly up. (Fig. 10)
   When re-mounting the chassis assembly, insert the lever side first, lift the whole unit up and then gently bring the assembly into close contact with the case unit.

Note: Bring the holder of the built-in microphone into close contact with the case.

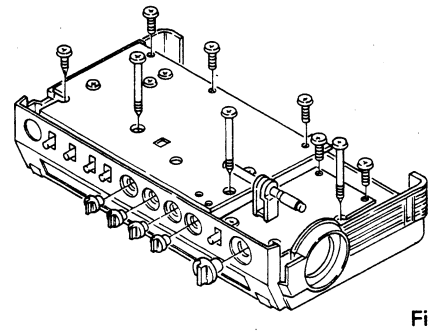


Fig. 8

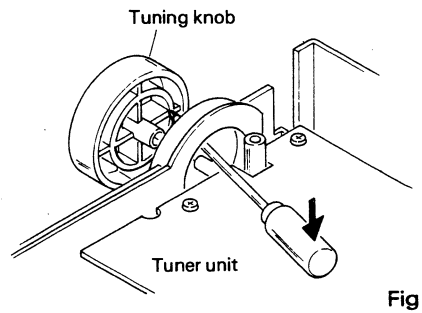


Fig. 9

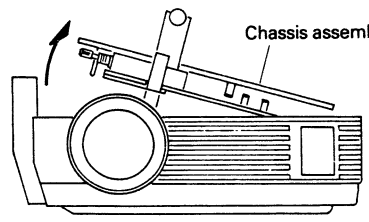


Fig. 10

• Removing the Amplifier Circuit Board

1. The amplifier circuit board can be removed when the five screws holding the chassis and the five nuts holding the volume control are removed.
   When re-assembling the circuit board, check that the clearance between the REC switch and the REC assembly is approximately 1 mm.

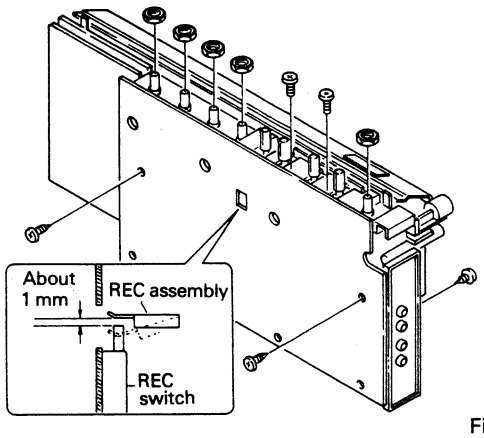


Fig. 11

• Removing the Tuner Circuit Board

1. Remove the screws anchoring the variable condenser and the pully.
2. Unscrew the four screws holding the tuner circuit board and the board can then be removed.
   When re-assembling the circuit board, first adjust for the cutout in the center of the pulley and the projection on the variable condenser to be aligned and then re-assemble. If these screws are too loose, this may cause the meter pointer to deviate.

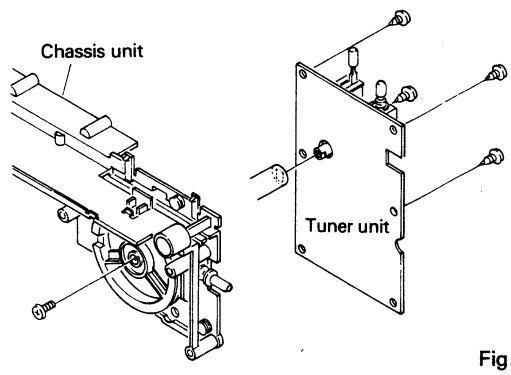


Fig. 12

• Removing the Cassette Mechanism

1. Unscrew the six screws holding the cassette mechanism, pull it right up and then remove.

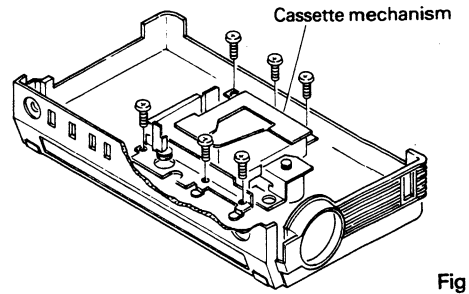


Fig. 13

4. ADJUSTMENT

The batteries cannot be used with the outer case removed and so adjust using AC or DC power. After having performed the adjustments, check the operation using the batteries.

4.1 HEAD AZIMUTH ADJUSTMENT

• Connection Diagram

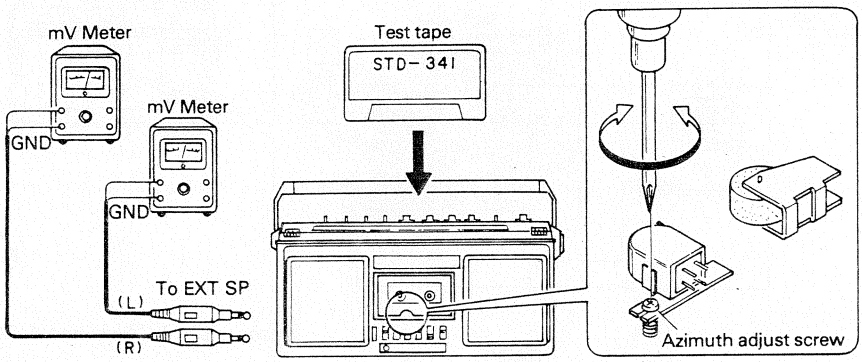


Fig. 14

Switch position
Function switch . . . . . TAPE

• To Adjust

1. Remove the cover of the cassette door.
2. Load the STD-341 (10kHz-20dB) test tape and depress the play lever to set the unit to the playback mode.
3. Adjust the azimuth adjust screw so that the deflection of the mV meter pointer indicates the maximum for both the left and right channels.
4. After adjustment, secure the screw with adhesive.

4.2 REC BIAS ADJUSTMENT

• Connection Diagram

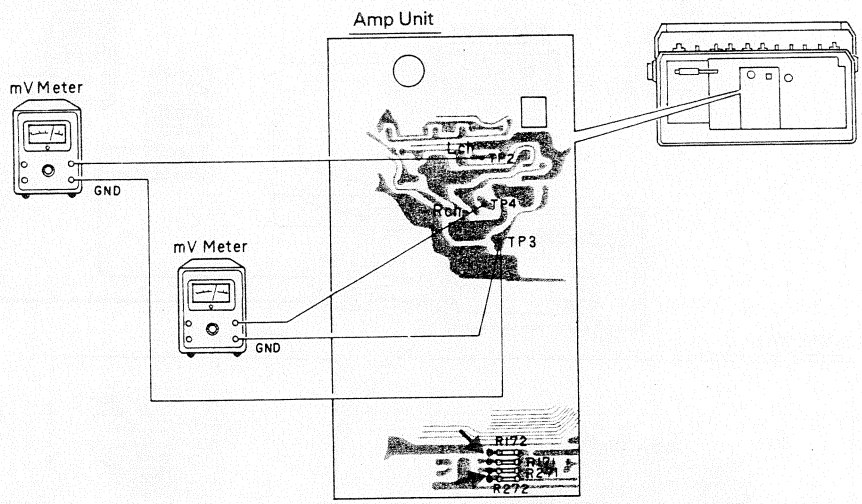


Fig. 15

Switch positions
Function switch . . . . . RADIO
Tape selector switch . . . . . CrO_2

Note: Insert RCA pin into AUX terminal.

• To Adjust

1. Set the unit to the recording mode. The mV meter pointer is set to deflect to 6.5 mV ± 1 dB but if the actual deflection is lower, connect R171, 172 (Lch) and R271, 272 (Rch) in parallel. Connect the sections indicated by the arrows using a soldering iron.

4.3 BIAS TRAP ADJUSTMENT

• Connection Diagram

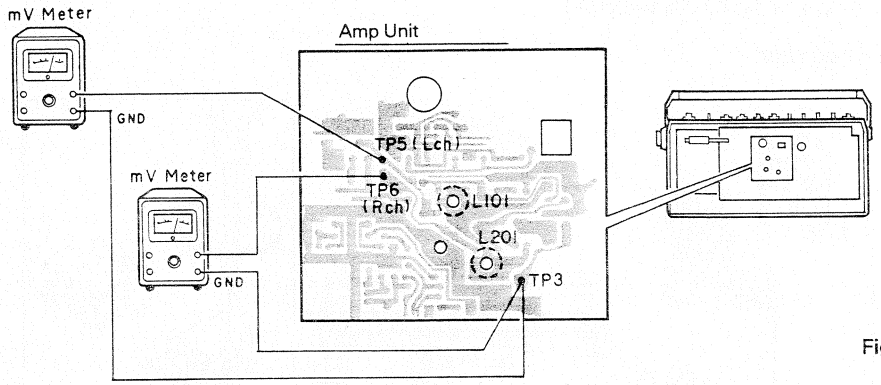


Fig. 16

Switch position
Function switch . . . . . RADIO

Note: Insert RCA pin into AUX terminal.

• To Adjust

1. Set the unit to the recording mode. Rotate L101 (Lch) and 201 (Rch) and adjust so that the mV meter pointer deflects the minimum.

4.4 LEVEL METER ADJUSTMENT

■ Playback Mode

• Connection Diagram

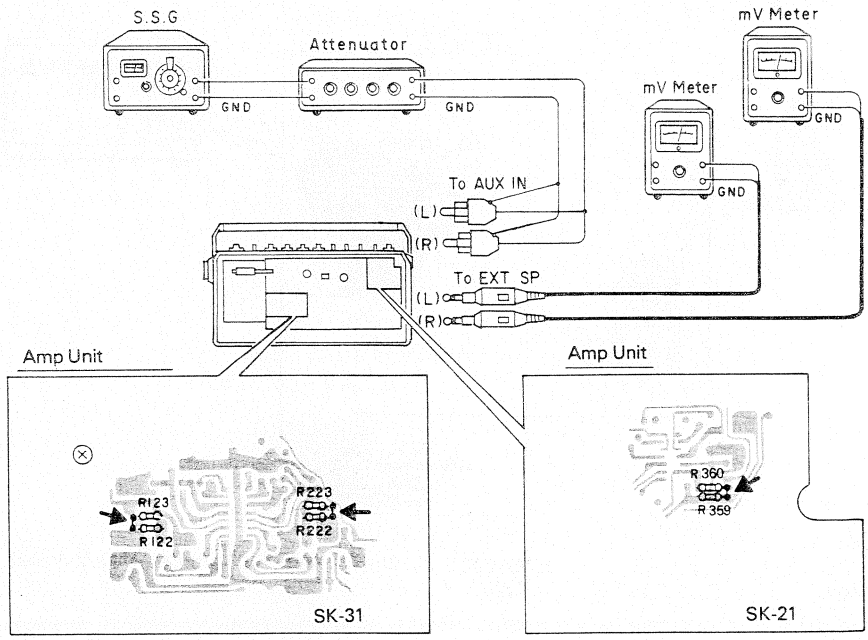


Fig. 17

Switch positions
Function switch . . . . . TAPE
Meter switch . . . . . LEVEL
Tape selector switch . . . . . NORMAL

• To Adjust

1. Set the unit to the playback mode. Apply a 1kHz – 8dB input signal to the AUX IN terminal and adjust the attenuator so that the mV meter pointer deflects to –8dBs.
2. The level meter is set to indicate 0 ± 3VU but if the indication is less, connect R122, 123 (Lch) and R222, 223 (Rch) in parallel. (Connect R360 and 359 for the model SK-21.) Connect the sections indicated by the arrows using a soldering iron.

Once the adjustment is made in the playback mode, there is no need to adjust in the recording mode since this is done automatically.

■ Using a DC (external) Power Supply

• Connection Diagram

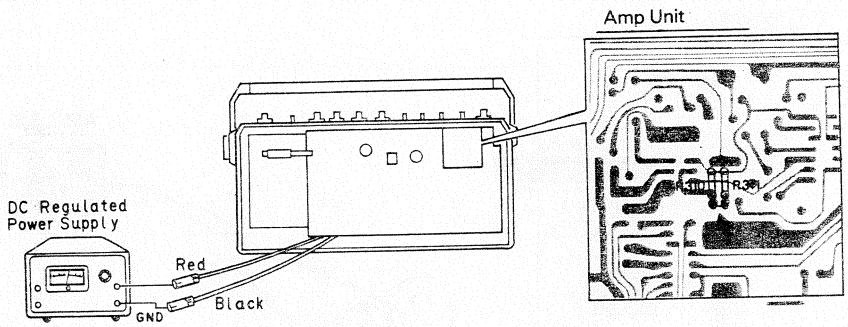


Fig. 18

Switch positions
Function switch . . . . . TAPE
Meter switch . . . . . BATT

• To Adjust

1. Load the STD-341 (330Hz, 0dB) test tape, and depress the play lever to set the unit to the playback mode.
2. The level meter is set to indicate –3VU or more when a voltage of 7V is supplied from a DC regulated power supply. If the actual indication is less, connect R310 and 311 in parallel. Connect the section indicated by the arrow with a soldering iron.

4.5 AM IF ADJUSTMENT

• Connection Diagram

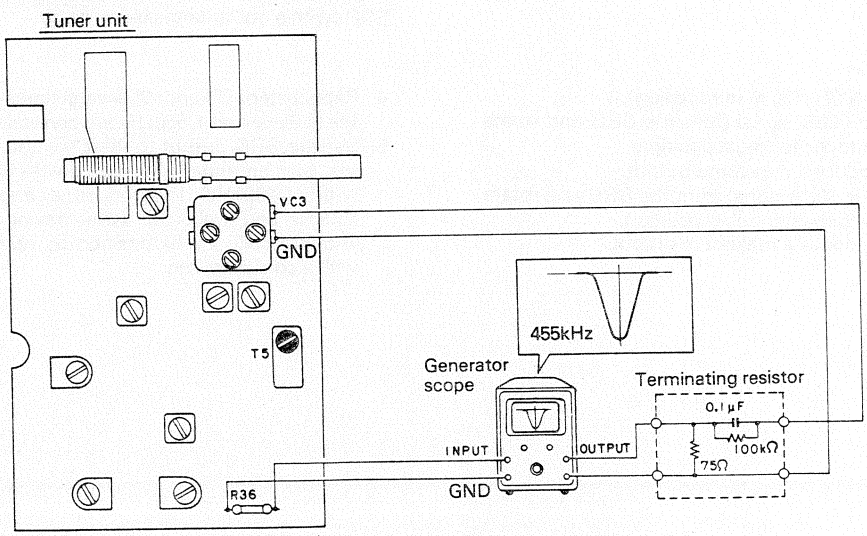


Fig. 19

Generator Scope
Sweep center frequency 455kHz
Input gain 0.3Vp-p/cm

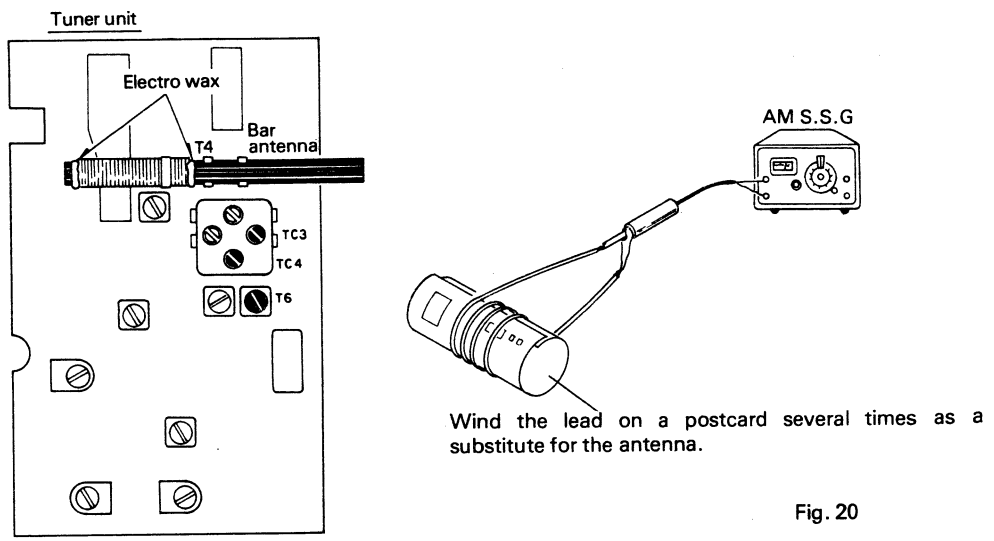
Switch positions
Function switch . . . . . RADIO
Band selector switch . . . . . AM

• To Adjust

1. Apply the minimum output signal enabling the Generator Scope's U curve to be checked from the Generator scope and adjust T5 (green) so that the amplitude of the curve is brought to its maximum and the symmetry is made optimum.

4.6 AM TRACKING ADJUSTMENT

• Connection Diagram



Wind the lead on a postcard several times as a substitute for the antenna.

Fig. 20

Switch, control positions

Function switch ..... RADIO
Band selector switch ..... AM
Balance ..... Center

• To Adjust

1. Set the SSG to 400Hz (30% modulation).
2. Apply a 510kHz 60dB signal from the SSG and rotate the tuning knob to the leftmost position. Adjust T6 to produce a maximum output.
3. Apply a 1,650kHz 60dB signal from the SSG and rotate the tuning knob to the rightmost position. Adjust TC4 to produce a maximum output.

Preparations

Adjustment can easily be performed once the capacity of the TC3 and TC4 variable condenser trimmers is set to the center. Adjust with radio waves being emitted from an AM SSG (with a coil antenna being used).

4. Repeat steps (2) and (3) several times and adjust so that the 510kHz and 1,650kHz are perfectly received.
5. Set the SSG output to 40-50dB and repeatedly adjust the bar antenna (T4) coil (with 600kHz) and TC3 (with 1,400kHz) to produce a maximum output at 600kHz and 1,400kHz. After having adjusted T4 (bar antenna coil), fix its position by applying electro wax with a soldering iron.

4.7 CENTER METER ADJUSTMENT (SK-31)

• Connection Diagram

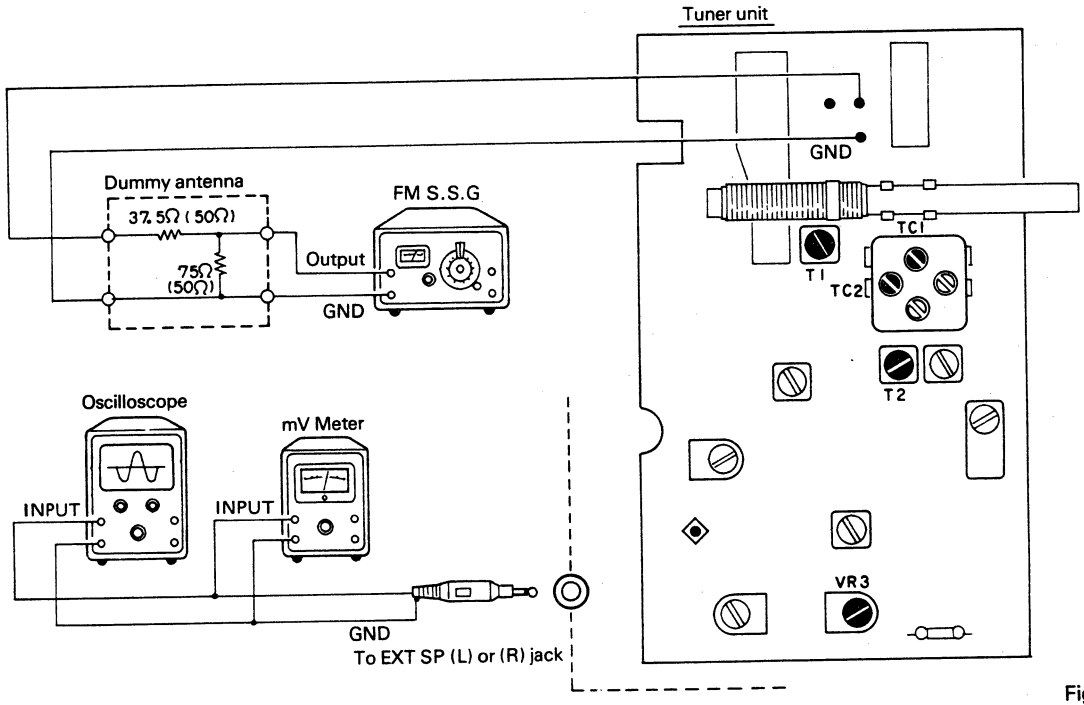


Fig. 21

Switch positions

Function switch ..... RADIO
Band selector switch ..... FM
Meter switch ..... TUNE

• To Adjust

1. Rotate the tuning knob and set it to a spot on the dial where no station is broadcasting.
2. Adjust VR3 so that the meter (ME2) pointer deflects to the center.
3. After having adjusted the FM tracking, set the input signal to 60dB (μV) and check that the meter pointer is centered.
4. If the meter is misaligned, repeat the adjustment from step (1).

4.8 FM IF ADJUSTMENT

• Connection Diagram

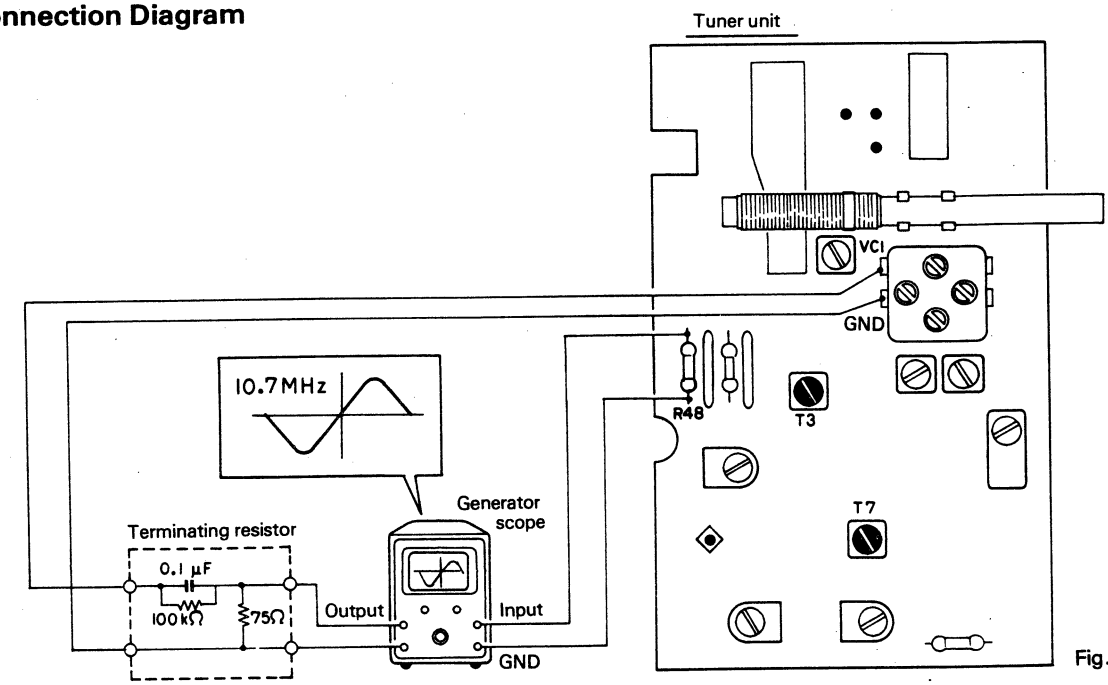


Fig. 22

Generator Scope
Sweep center frequency 10.7MHz
Input gain 0.3Vp-p/cm
Marker . . . . . OFF or minimum

Switch positions
Function switch . . . . . RADIO
Band selector switch . . . . . FM STEREO

• To Adjust

1. Apply an output signal of about 70dB (μV) from the Generator Scope, adjust T3 (purple) and T7 (yellow) and set so that the S curve is symmetrical at the top and bottom and so that the linearity is optimal.

4.9 FM TRACKING ADJUSTMENT

• Connection Diagram

See Fig. 21
Switch and control positions.
Function switch . . . . . RADIO
Band selector switch . . . . . FM STEREO
Balance . . . . . Center
Volume control . . . . . Appropriate position

Preparations
It is easy to conduct the measurement if the TC1, TC2 variable condenser trimmers and FM trimmer capacity is set beforehand to the center.

• To Adjust

1. Set the SSG to a 400Hz, 75kHz deviation (100% modulation).
2. Apply an 86.5MHz, 30dB signal from the SSG and set the tuning knob to its leftmost position.
   Adjust T2 to produce a maximum output.
3. Apply a 109.5MHz 30dB signal from the SSG and rotate the tuning knob to the rightmost position.
   Adjust TC2 to produce a maximum output.
4. Repeat steps (2) and (3) several times and adjust so that the 86.5MHz and 109.5MHz are perfectly received.
5. Set the SSG output to 10~20dB, and then repeatedly adjust T1 (with 90MHz) and TC1 (with 106MHz) to produce a maximum output at 90MHz and 106MHz.

4.10 FM MPX ADJUSTMENT

• Connection Diagram

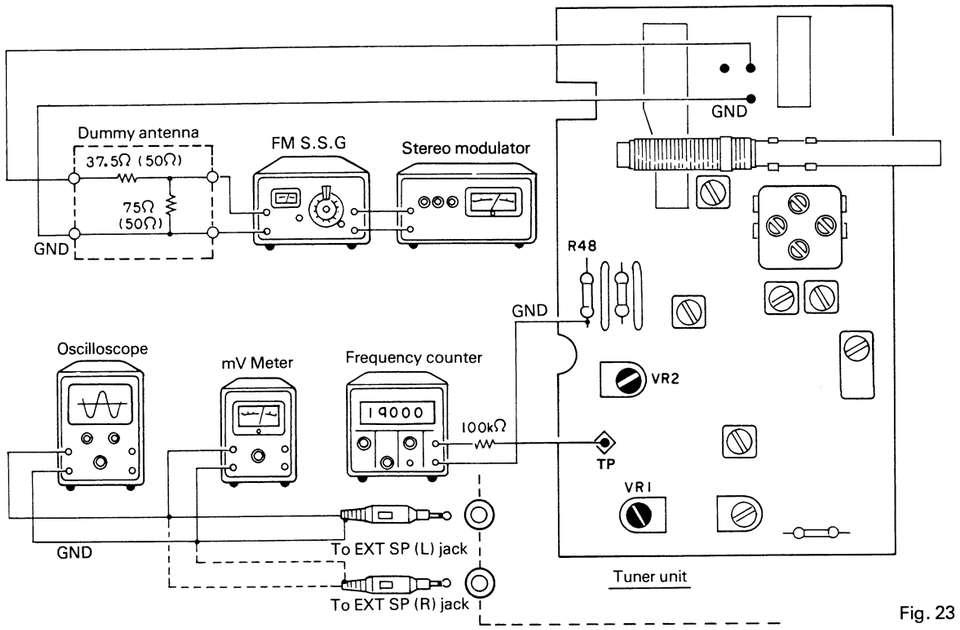


Fig. 23

Stereo modulator

Modulation frequency	1kHz
Modulation	100%
Pilot	7.5kHz
Main	67.5kHz

Switch positions

Function switch	RADIO
Band selector switch	FM STEREO

Note: Always set the band selector switch to FM STEREO.

•To Adjust

1. Apply an 98MHz 10dB signal from the FM SSG, and rotate the tuning knob to tune into 98MHz.
2. Set the FM SSG output to 60dB and set the modulation to OFF.
3. Adjust VR1 so that the frequency counter indicates 19kHz ± 20Hz.
4. Apply modulation to the Lch or Rch and adjust VR2 so that the separation is made optimal.
5. If a frequency counter is not available, proceed in the seem way until step (2) and then modulate the Lch or Rch. The stereo indicator lights up when VR2 is rotated slowly. When further rotated, the indicator goes off. Set VR2 in the center of this range.

5. DIAL STRINGING

1. Remove the scale.
2. Position the dial thread with reference to the figure. (Proceed in numerical order.)
3. When the thread has been positioned or when the variable condenser of the tuner circuit board or the pulley has been replaced, the cutout of the pulley and the projection of the variable condenser may be thrown out of alignment. In cases like this, first align the parts properly and then tighten the mounting screw. If the screw is too loose, the meter pointer may deviate.

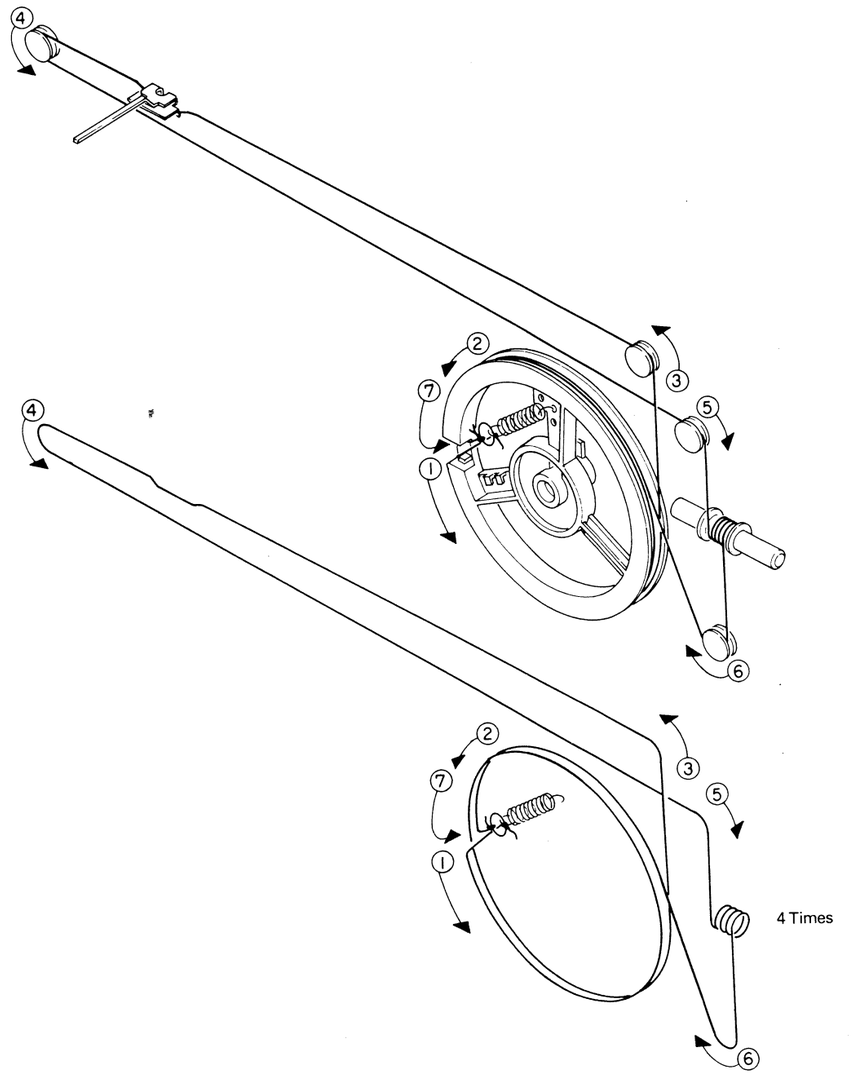
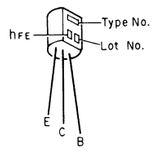


Fig. 24

• IC's and Transistors



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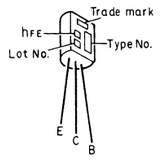
2SC2060
2SA934
2SA826



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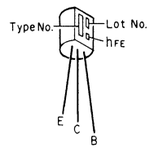

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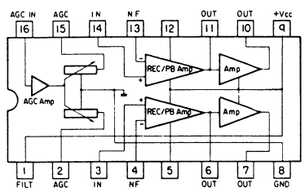
2SC1675
2SA733
2SC828

2SC461



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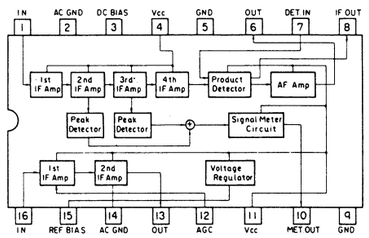

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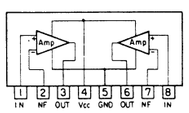

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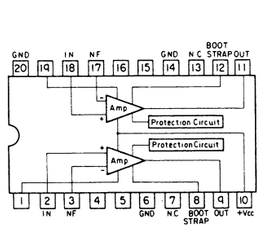

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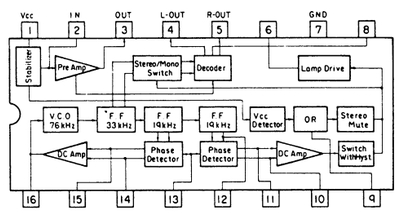
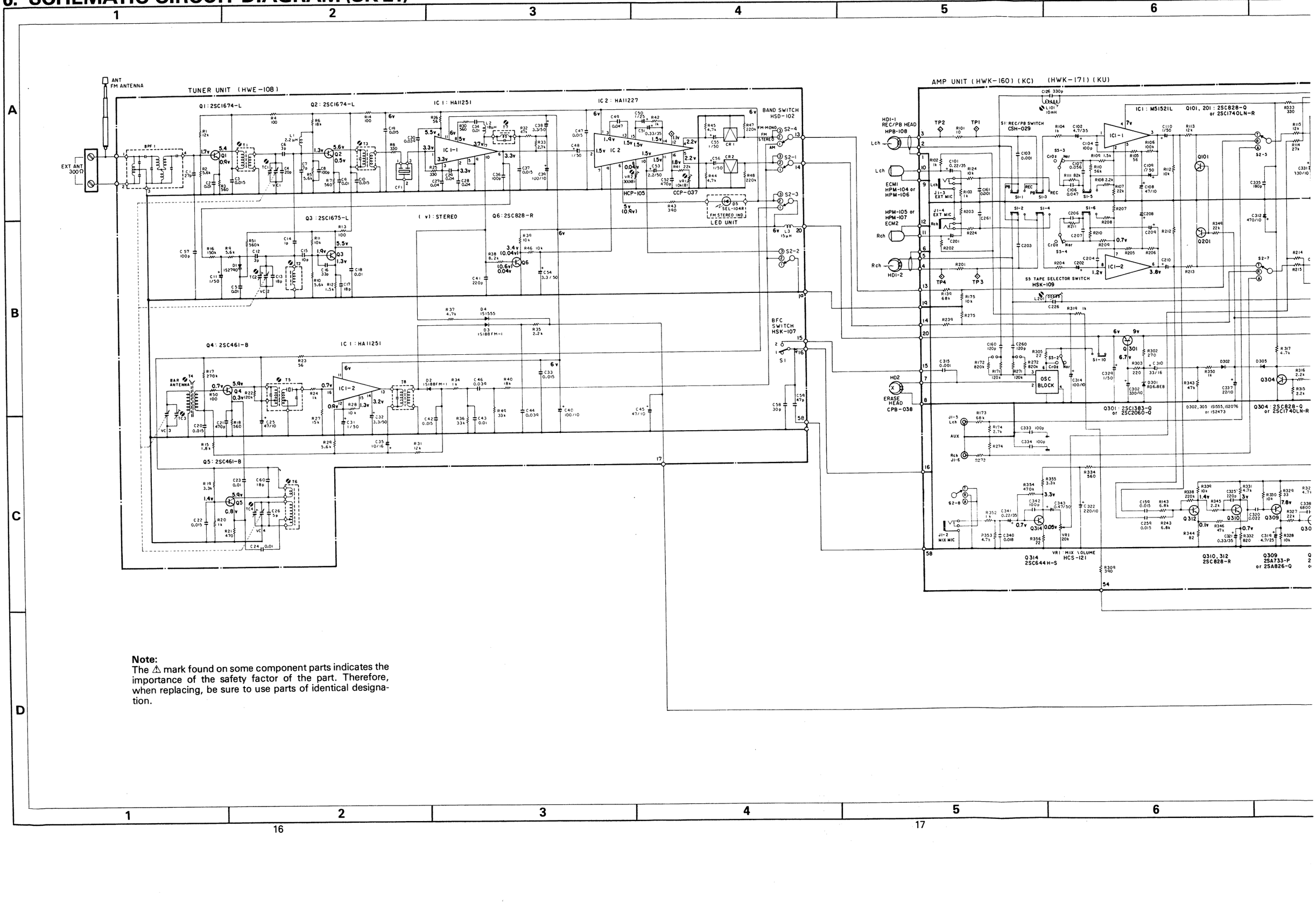


HA11227

6. SCHEMATIC CIRCUIT DIAGRAM (SK-21)



Note:
The ⚠ mark found on some component parts indicates the importance of the safety factor of the part. Therefore, when replacing, be sure to use parts of identical designation.

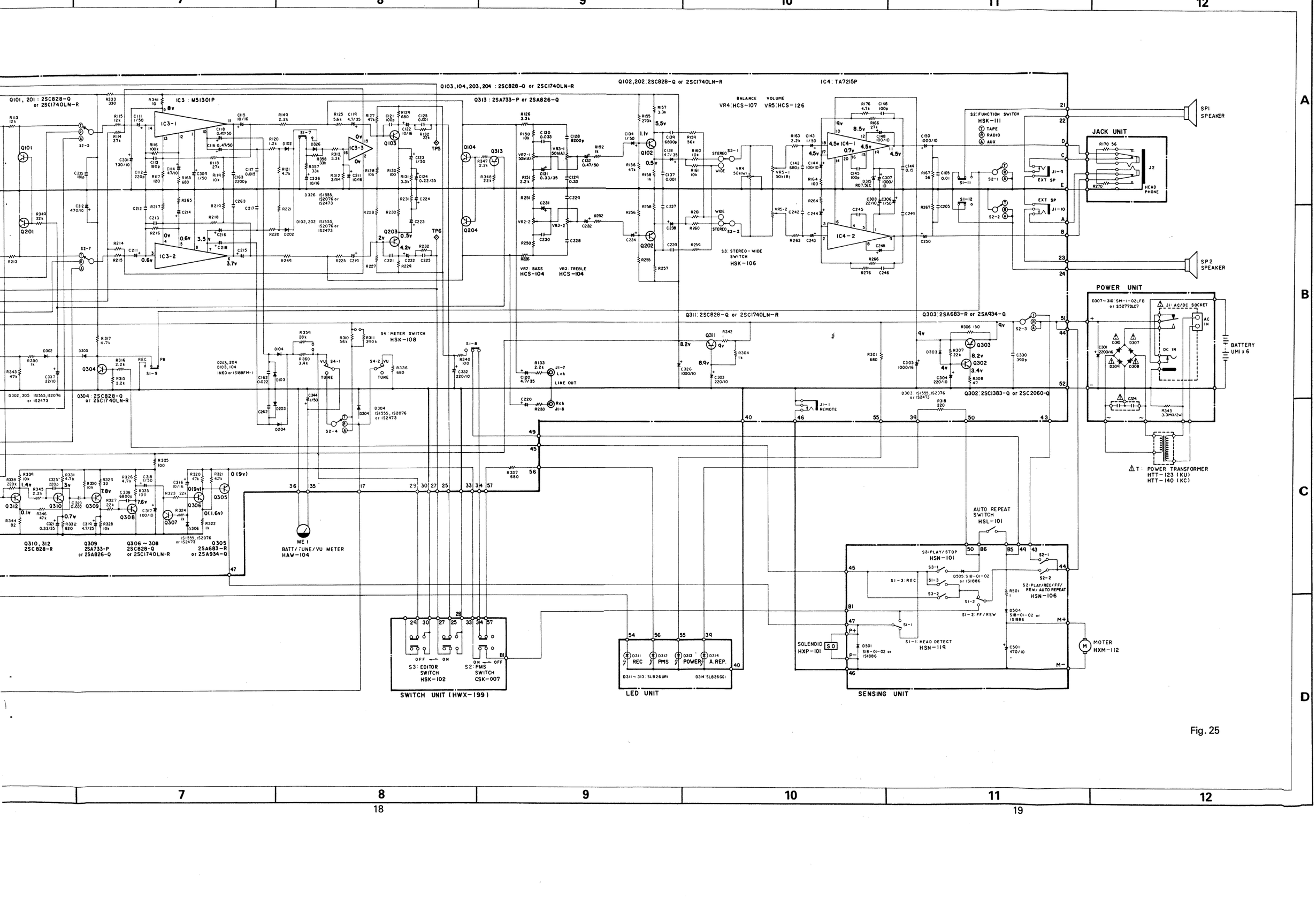
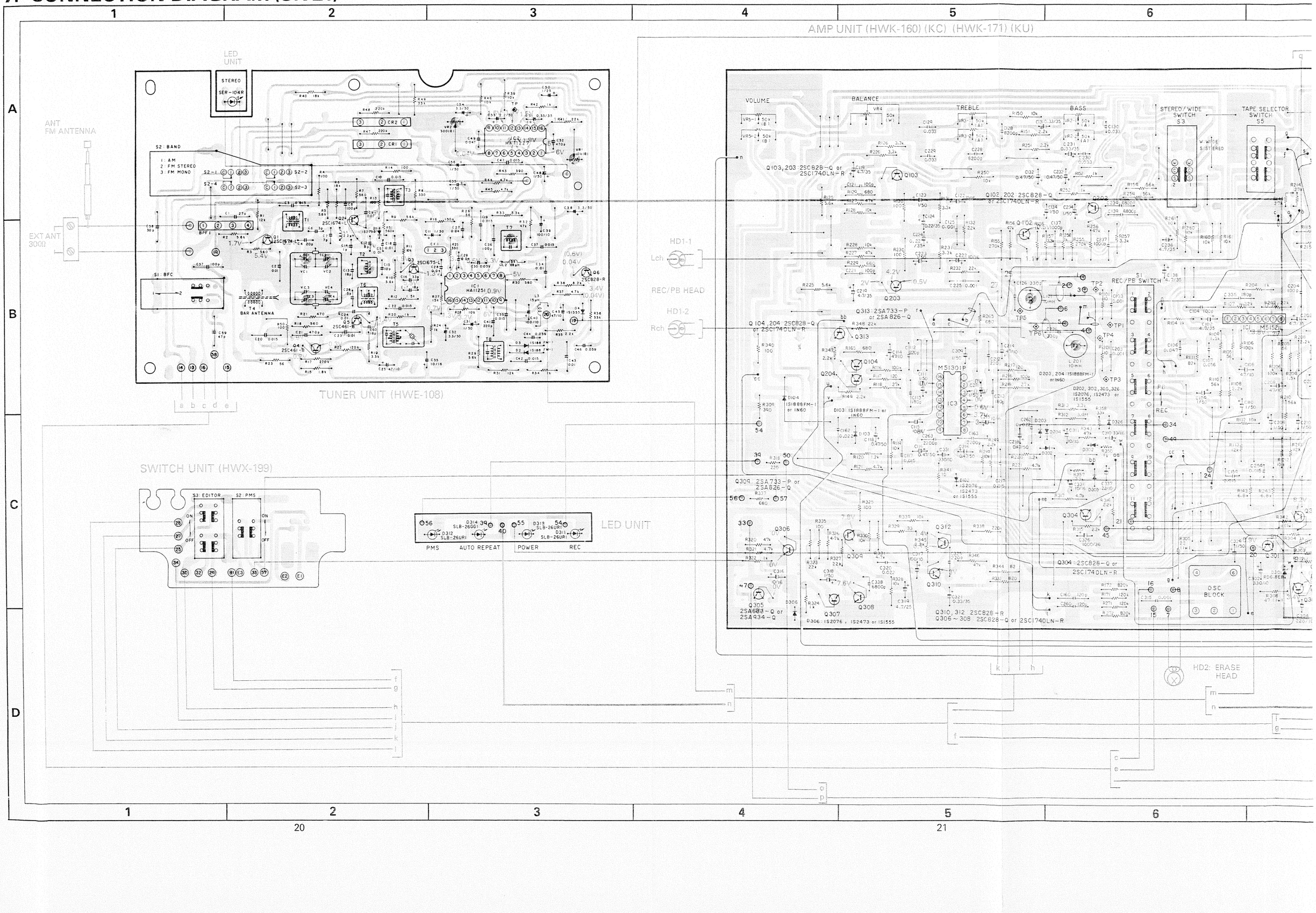

Q101, 201 : 2SC828-Q or 2SC1740LN-R
Q103,104,203,204 : 2SC828-Q or 2SC1740LN-R
Q102,202: 2SC828-Q or 2SC1740LN-R
IC4: TA7215P
Q313 : 2SA733-P or 2SA826-Q
IC3 : M51301P
BALANCE VOLUME
VR4: HCS-107 VR5: HCS-126
S2: FUNCTION SWITCH HSK-111
T: TAPE R: RADIO A: AUX
SP1 SPEAKER
SP2 SPEAKER
JACK UNIT
EXT SP
HEAD PHONE
POWER UNIT
J1: AC/DC SOCKET
AC IN
DC IN
BATTERY UM1 x 6
Q311: 2SC828-Q or 2SC1740LN-R
Q303: 2SA683-R or 2SA934-Q
Q302: 2SC1383-Q or 2SC2060-Q
Q304: 2SC828-Q or 2SC1740LN-R
S4: METER SWITCH HSK-108
LINE OUT
REMOTE
Q310, 312 2SC828-R
Q309 2SA733-P or 2SA826-Q
Q306 ~ 308 2SC828-Q or 2SC1740LN-R
Q305 2SA683-R or 2SA934-Q
ME1 BATT/TUNE/VU METER HAW-104
S3: EDITOR SWITCH HSK-102
S2: PMS SWITCH CSK-007
SWITCH UNIT (HWX-199)
LED UNIT
REC PMS POWER A.REP.
AUTO REPEAT SWITCH HSL-101
S3: PLAY/STOP HSN-101
S2: PLAY/REC/FF/REW/AUTO REPEAT HSN-106
S1-3: REC
S1-2: FF/REW
S1-1: HEAD DETECT HSN-119
SOLENOID HXP-101
MOTER HXM-112
SENSING UNIT
VR2: BASS HCS-104
VR3: TREBLE HCS-104
S3: STEREO - WIDE SWITCH HSK-106
△T: POWER TRANSFORMER
HTT-123 (KU)
HTT-140 (KC)

Fig. 25

7. CONNECTION DIAGRAM (SK-21)



7	8	9	10	11	12

JACK UNIT

J2 HEADPHONE JACK

ME1 : BATT/TUNE/VU METER

POWER UNIT

AC IN

DC IN

J1 AC/DC SOCKET

T POWER TRANSFORMER

BATTERY UM1 × 6

TAPE SELECTOR SWITCH S5

FUNCTION SWITCH S2

METER SWITCH S4

MIX VOLUME

J1-1 REMOTE

J1-2 MIX MIC

J1-3 EXT MIC(L)

J1-4 EXT MIC(R)

J1-5 AUX (L)

J1-6 AUX (R)

J1-7 LINE OUT (L)

J1-8 LINE OUT (R)

J1-9 EXT SP(L)

J1-10 EXT SP(R)

ECM1

Lch

Rch

ECM2

SP2 SPEAKER

SP1 SPEAKER

IC1 M51521

IC4 TA7215P

Q314 2SC644H-S

Q101, 201: 2SC828-Q or 2SC1740LN-R

Q311: 2SD828-Q or 2SC1740LN-R

Q301, 302: 2SC1383-Q or 2SC2060-Q

Q303: 2SA683-R or 2SA934-Q

D304: IS2076, IS2473 or IS1555

D305: RD7.5E

D306: IS2076 or IS1555

D307 ~ 310: SM-1-02LFB or S5277DLC7

D501, 504, 505, 507, 509: SI-B01-02 or IS1886

OSC BLOCK

HD2: ERASE HEAD

SOLENOID

SO

MOTOR

SENSING UNIT

SI-1 : HEAD DETECT
SI-2 : FF/REW
SI-3 : REC

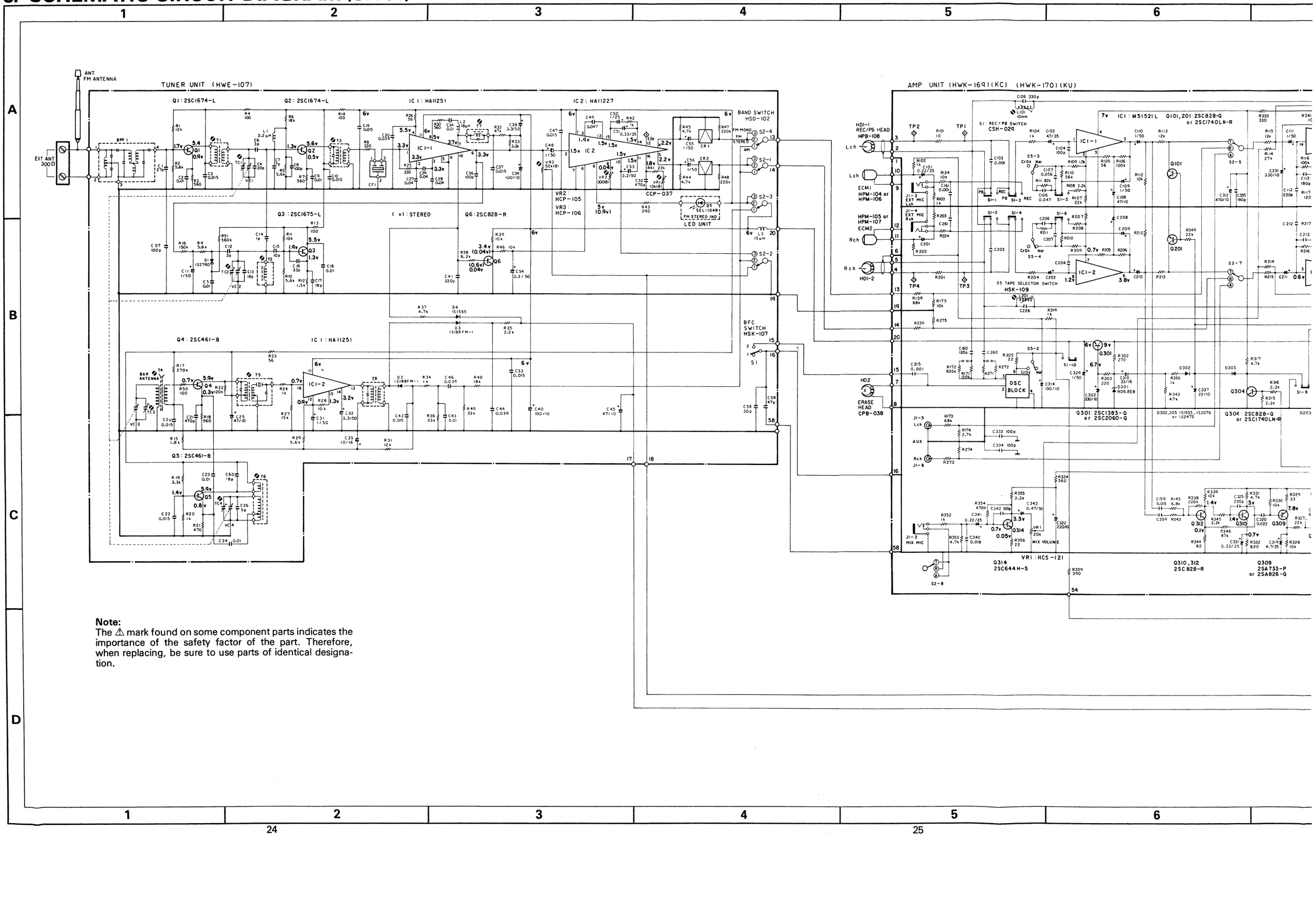
S1: AUTO REPEAT SWITCH

S2: PLAY/REC/FF/REW /AUTO REPEAT

S3: PLAY/STOP

Fig. 26

8. SCHEMATIC CIRCUIT DIAGRAM (SK-31)



Note:
The ⚠ mark found on some component parts indicates the importance of the safety factor of the part. Therefore, when replacing, be sure to use parts of identical designation.

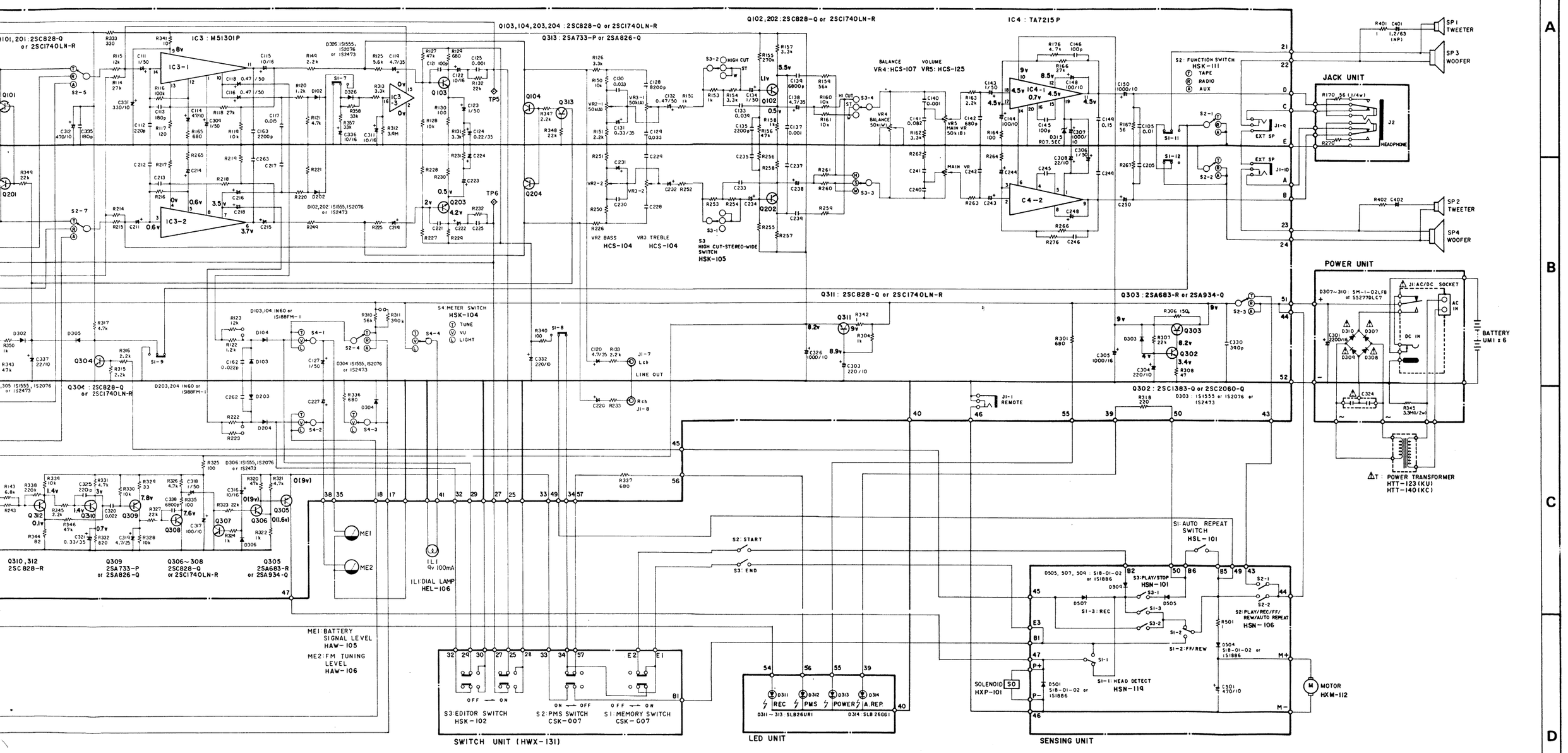
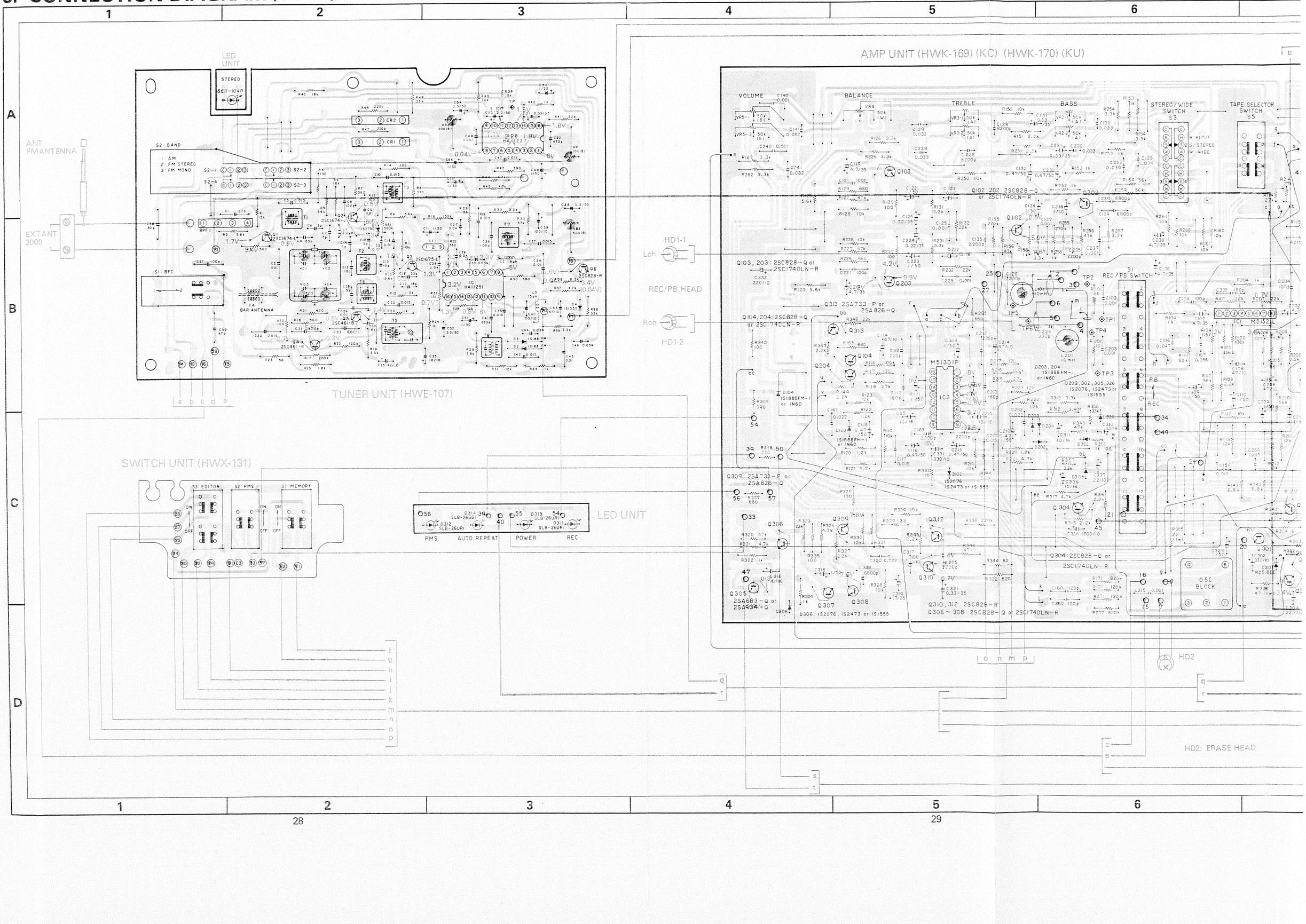

Q101,201:2SC828-Q or 2SC1740LN-R
IC3 : M51301P
Q103,104,203,204 : 2SC828-Q or 2SC1740LN-R
Q313 : 2SA733-P or 2SA826-Q
Q102,202:2SC828-Q or 2SC1740LN-R
IC4 : TA7215P
S2 : FUNCTION SWITCH HSK-111
TAPE
RADIO
AUX
JACK UNIT
SP1 TWEETER
SP3 WOOFER
SP2 TWEETER
SP4 WOOFER
EXT SP
HEADPHONE
POWER UNIT
AC IN
DC IN
BATTERY UM1 x 6
Q311 : 2SC828-Q or 2SC1740LN-R
Q303 : 2SA683-R or 2SA934-Q
Q304 : 2SC828-Q or 2SC1740LN-R
Q302 : 2SC1383-Q or 2SC2060-Q
S4 METER SWITCH HSK-104
TUNE
VU
LIGHT
LINE OUT
REMOTE
Q312
Q310
Q309
Q308
Q307
Q306
Q305
0.1v
1.4v
1.4v
0.7v
7.8v
7.6v
0(9v)
0(11.6v)
Q310,312 2SC828-R
Q309 2SA733-P or 2SA826-Q
Q306~308 2SC828-Q or 2SC1740LN-R
Q305 2SA683-R or 2SA934-Q
ME1
ME2
IL1 9v 100mA
IL1:DIAL LAMP HEL-106
ME1:BATTERY SIGNAL LEVEL HAW-105
ME2:FM TUNING LEVEL HAW-106
S2:START
S3:END
S1:AUTO REPEAT SWITCH HSL-101
S3:PLAY/STOP HSN-101
S1-3:REC
S1-2:FF/REW
S2:PLAY/REC/FF/REW/AUTO REPEAT HSN-106
S1-1:HEAD DETECT HSN-119
SOLENOID SO HXP-101
MOTOR HXM-112
S3:EDITOR SWITCH HSK-102
S2:PMS SWITCH CSK-007
S1:MEMORY SWITCH CSK-007
SWITCH UNIT (HWX-131)
D311~313:SLR326UR1
D314:SLR266G1
REC
PMS
POWER
A.REP
LED UNIT
SENSING UNIT
S3 HIGH CUT-STEREO-WIDE SWITCH HSK-105
VR2 BASS HCS-104
VR3 TREBLE HCS-104
VR4:HCS-107 VR5:HCS-125
BALANCE
VOLUME
MAIN VR
HIGH CUT
D103,104 IN60 or 1SI88FM-1
D203,204 IN60 or 1SI88FM-1
D306:1S1555,1S2076 or 1S2473
D304 1S1555,1S2076 or 1S2473
D326 1S1555, 1S2076 or 1S2473
D102,202 1S1555,1S2076 or 1S2473
D505,507,509 : S1B-01-02 or 1S1886
D501 S1B-01-02 or 1S1886
D504 S1B-01-02 or 1S1886
D507 S1B-01-02 or 1S1886
D307~310 : SM-1-02LFB or S5277DLC7
J1:AC/DC SOCKET
T : POWER TRANSFORMER HTT-123(KU) HTT-140(KC)

Fig. 27

9. CONNECTION DIAGRAM (SK-31)



7 | 8 | 9 | 10 | 11 | 12

A
B
C
D

JACK UNIT

J2 HEADPHONE JACK

A B C D E

R270 56 (1/4w)
R170 56 (1/4w)

ME2 : FM TUNING LEVEL

ME1 : BATTERY SIGNAL LEVEL

POWER UNIT

C301 2200/16

D307 ~ 310 SM-1-02LFB or S5277DLC7

D307
D310
D308
D309

C324

R345 3.3Ω (1/2w)

J1 AC/DC SOCKET

AC IN

DC IN

T POWER TRANSFORMER

BATTERY UM1 × 6

TAPE SELECTOR SWITCH S5

FUNCTION SWITCH S2

METER SWITCH S4

MIX VOLUME VR1 20k

L LIGHT
V VU
T TUNE

T TAPE
R RADIO
A AUX

Q314 2SC644H-S

Q101, 201, 311 2SC828-Q or 2SC1740LN-R

Q301, 302 2SC1383-Q or 2SC2060-Q

Q303 2SA683-R or 2SA934-Q

IC1 M5152L

IC4 TA7215P

OSC BLOCK

J1-1 REMOTE

J1-2 MIX MIC

ECM1 Lch

Rch ECM2

J1-3 EXT MIC (L)

J1-4 EXT MIC (R)

J1-5 AUX (L)

J1-6 AUX (R)

J1-7 LINE OUT (L)

J1-8 LINE OUT (R)

J1-9 EXT SP (L)

J1-10 EXT SP (R)

R402 C402

SP2 TWEETER

SP4 WOOFER

R401 C401

SP1 TWEETER

SP3 WOOFER

IL1 9V 100mA

HD2

HD2: ERASE HEAD

MOTOR

SOLENOID SO

D501, 504, 505, 507, 509: S1801-02 or 1S1886

S3: PLAY/STOP

S2: PLAY/REC/FF/REW / AUTO REPEAT

S1-1: HEAD DETECT
S1-2: FF/REW
S1-3: REC

S1: AUTO REPEAT SWITCH

S3: END

S2: END

SENSING UNIT

Fig. 28

10. CABINET EXPLODED VIEW

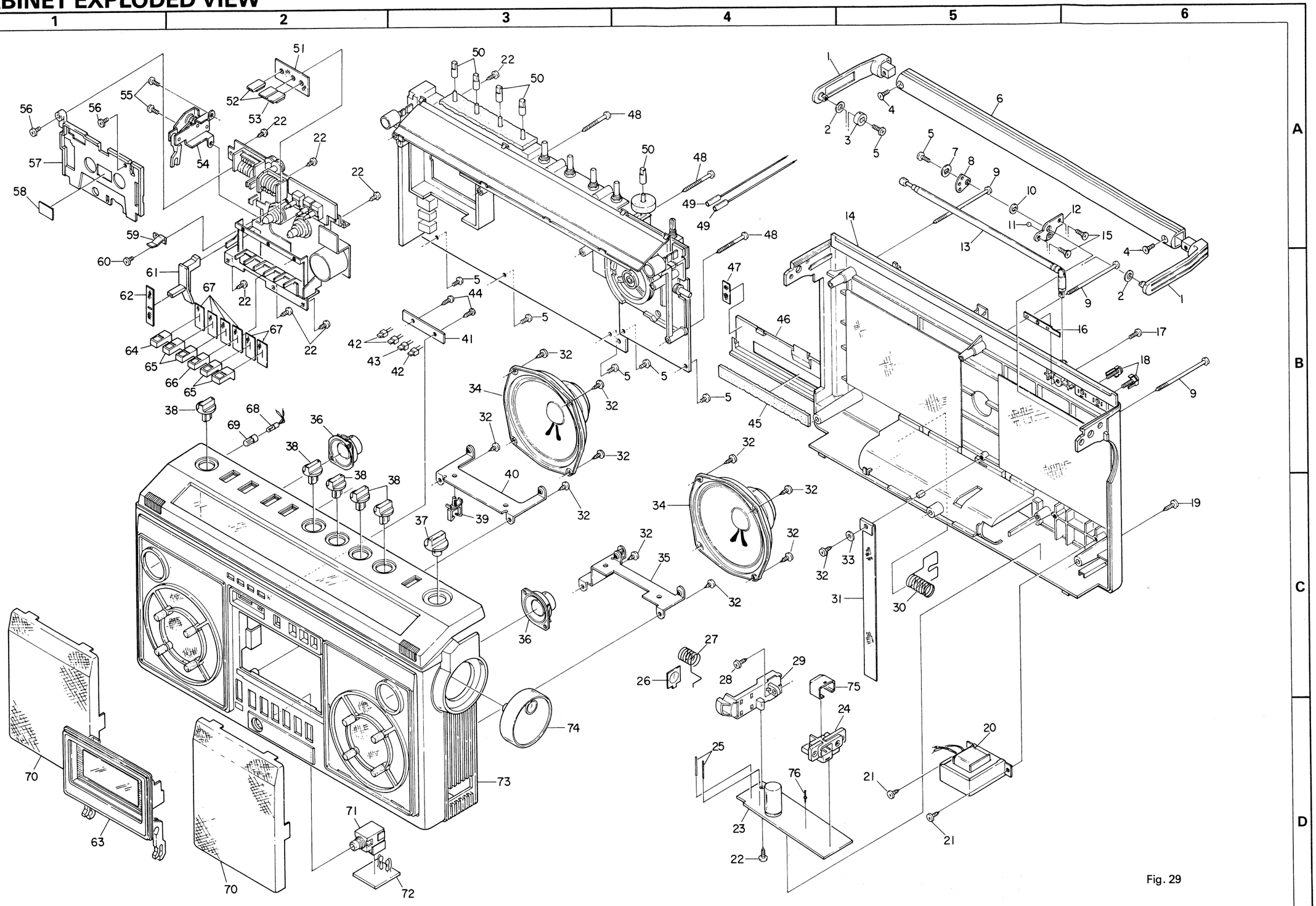


Fig. 29

11. CHASSIS EXPLODED VIEW

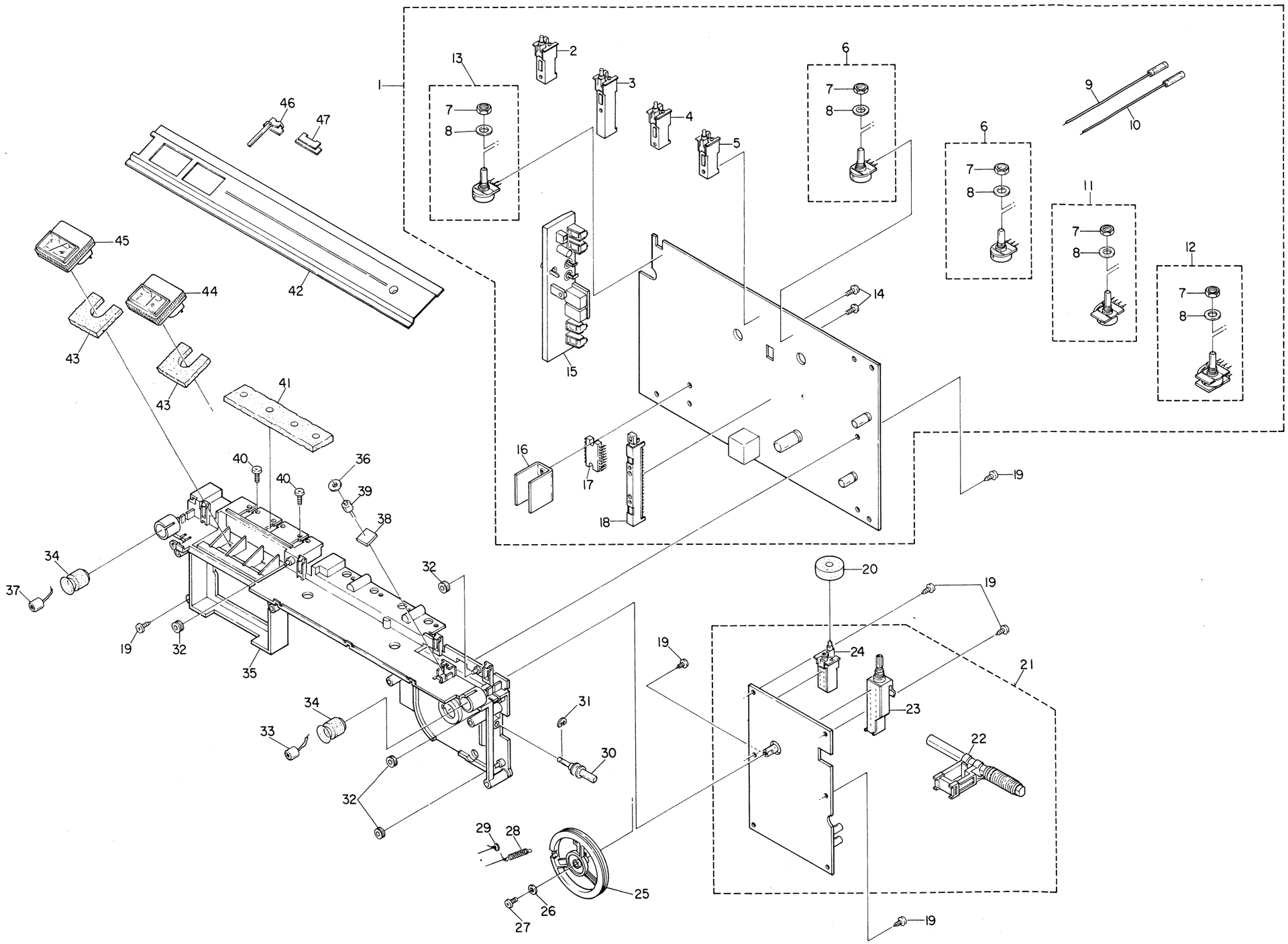


Fig. 30

12. CASSETTE MECHANISM EXPLODED VIEW (TOP)

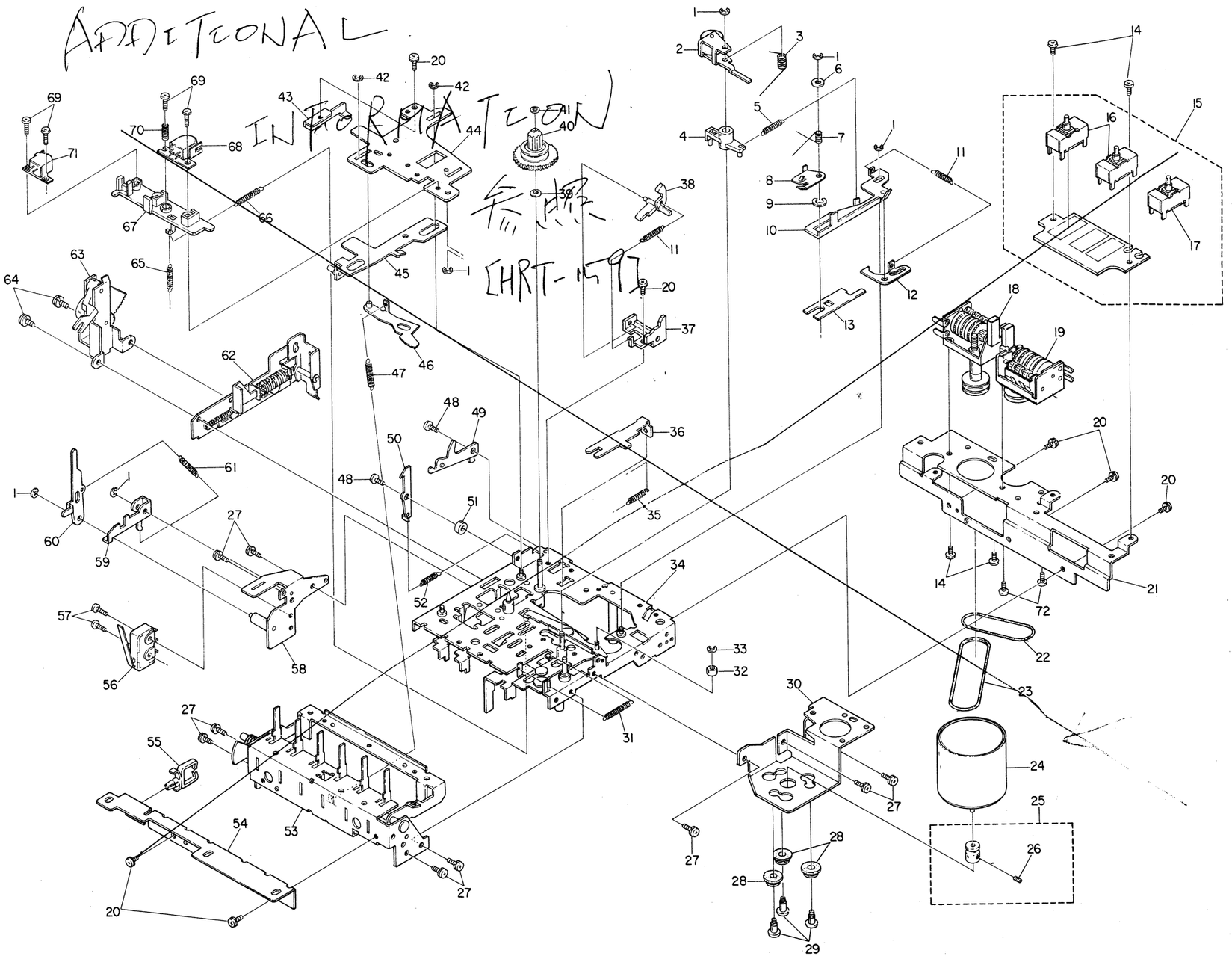


Fig. 31

13. CASSETTE MECHANISM EXPLODED VIEW (BOTTOM) SK-21 SK-31

SLR34016

Sensing Unit (SL-R3501)
HWX-227 (SK-21)
HWX-191 (SK-31)

Fig. 32

14. PACKING METHOD

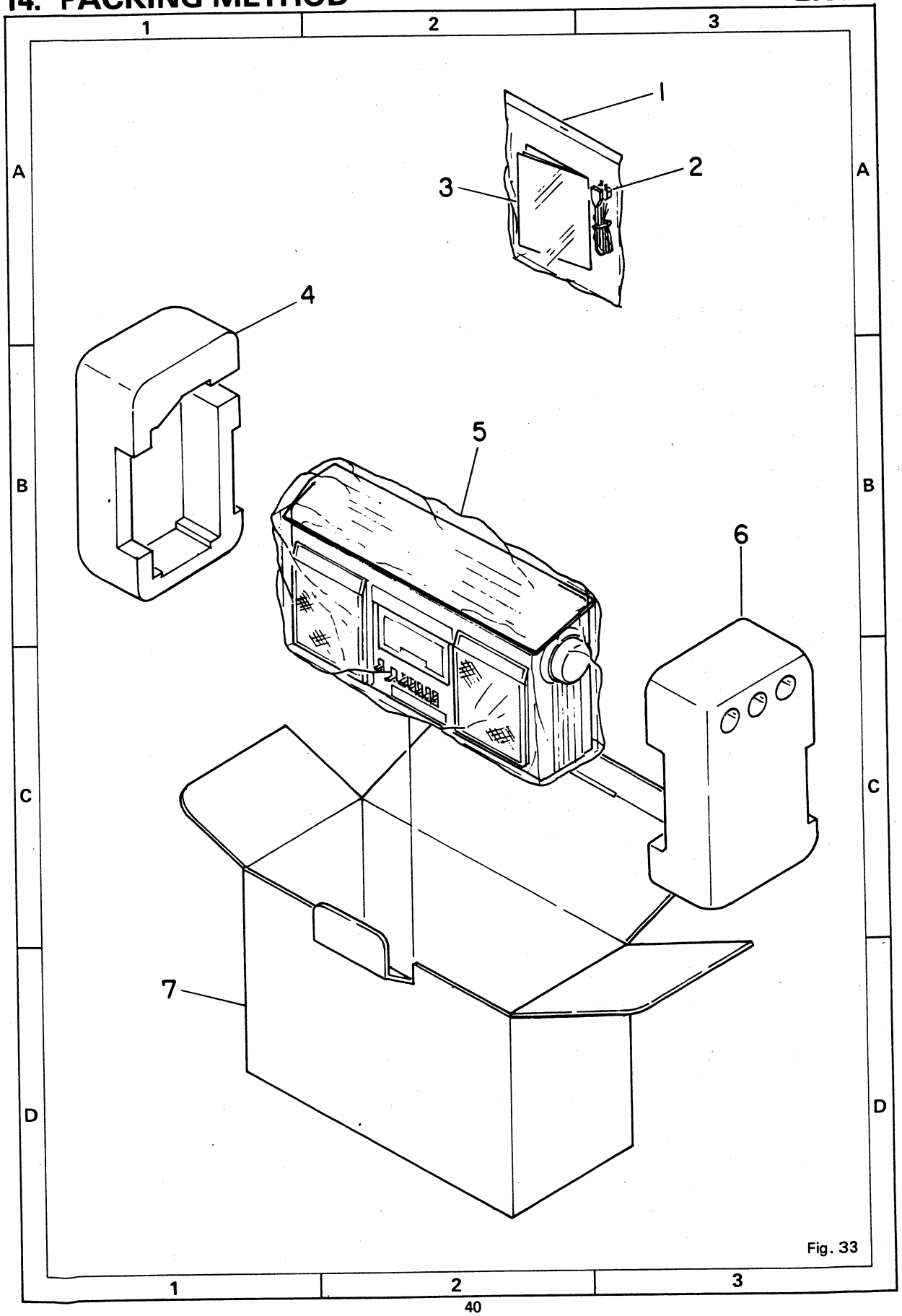


Fig. 33

15. PARTS LIST

NOTE:
When ordering resistors, first convert resistance values into code form as shown in the following examples.

Ex. 1 When there are 2 effective digits (any digit apart from 0), such as 560 ohm and 47k ohm (tolerance is shown by J = 5%, and K = 10%).

560Ω	*56×10¹*	*561*	*RD1/4PS 5 6 1 J*
47kΩ	*47×10³*	*473*	*RD1/4PS 4 7 3 J*
0.5Ω	*0R5*		*RN2H 0 R 5 K*
1Ω	*010*		*RS1P 0 1 0 K*

Ex. 2 When there are 3 effective digits (such as in high precision metal film resistors).

5.62 kΩ 562×10¹ ..... RN1/4SR 5 6 2 1 F

- *The ⚠ mark found on some component parts indicates the importance of the safety factor of the part. Therefore, when replacing, be sure to use oarts of indentical designation.*
- *Parts whose parts numbers are omitted are subject to being not supplied.*

Amp Unit SK-21/KC (HWK-160) SK-21/KU (HWK-171) SK-31/KC (HWK-169) SK-31/KU (HWK-170)

MISCELLANEOUS

Part No.	Symbol & Description	
M51521L	IC1	
VACANT	IC2	
M51301P	IC3	
TA7215P	IC4	
2SC828 or	Q101 – Q104, Q201 – Q204, Q304,	
2SC1740LN	Q306 – Q308, Q311	
2SC1383 or 2SC2060	Q301, Q302	
2SA683 or 2SA934	Q303, Q305	
2SA733 or 2SA826	Q309, Q313	
2SC828	Q310, Q312	
2SC644H-S	Q314	
1S1555 or	D102, D202, D302 – D306, D326	
1S2076 or 1S2473		
1N60 or 1S188FM-1	D103, D104, D203, D204	
RD6.8EB	D301	
~~RD7.5EC~~ RD8.2EB	D315 (SI-R35004)	
CTX-051	L101, L201	Coil, 10mH
HTX-111 or HTX-107	OSC	Oscillator Unit (KC)
HTX-111	OSC	Oscillator Unit (KU)
CKN-058	J2	Jack
HCS-121	VR1	Volume, 20kΩ (B)
HCS-104	VR2, VR3	Volume, 50kΩ (A)
HCS-107	VR4	Volume, 50kΩ (W)
HCS-125	VR5	Volume, 50kΩ (B) (SK-31)

Part No.	Symbol & Description	
HCS-126	VR5	Volume, 50kΩ (B) (SK-21)
CSH-029	S1	Switch
HSK-111	S2	Switch
HSK-105	S3	Switch (SK-31)
HSK-106	S3	Switch (SK-21)
HSK-104	S4	Switch (SK-31)
HSK-108	S4	Switch (SK-21)
HSK-109	S5	Switch

RESISTORS (SK-31)

Part No.	Symbol & Description
RD1/4PM□□□J	R101 – R113, R115 – R132, R139, R143, R150 – R167, R171 – R176, R201 – R213, R215 – R232, R239, R243, R249 – R267, R271 – R276, R302 – R304, R306, R307, R309 – R313, R315 – R326, R328 – R341, R344 – R346, R352 – R356
RD1/4VM□□□J	R114, R133, R149, R214, R233, R301, R343, R347 – R350, R357, R358
RN1P□□□K	R342
RS1P□□□J	R305, R308
RD1/4VS□□□J	R170, R270
VACANT	R134 – R138, R140 – R142, R144 – R148, R168, R169, R177 – R200, R234 – R238, R240 – R242, R244 – R248, R268, R269, R277 – R300, R314, R327, R351

RESISTORS (SK-21)

Part No.	Symbol & Description
RD1/4PM□□□J	R101 – R113, R115 – R121, R124 – R132, R139, R143, R150 – R152, R155 – R161, R163 – R167, R171 – R176, R201 – R213, R215 – R221, R224 – R232, R239, R243, R249 – R252, R255 – R261, R263 – R267, R271 – R276, R302 – R304, R306, R307, R309 – R313, R315 – R326, R328 – R341, R344 – R346, R352 – R356, R359, R360
RD1/4VM□□□J	R114, R133, R149, R214, R233, R301, R343, R347 – R350, R357, R358
RN1P□□□K	R342
RS1P□□□J	R305, R308
RD1/4VS□□□J	R170, R270
VACANT	R122, R123, R134 – R138, R140 – R142, R144 – R148, R153, R154, R162, R168, R169, R177 – R200, R222, R223, R234 – R238, R240 – R242, R244 – R248, R253, R254, R262, R268, R269, R277 – R300, R314, R327, R351

CAPACITORS

Part No.	Symbol & Description
CSZAR22M35	C101, C124, C201, C224, C341
CEA4R7P35	C102, C119, C120, C138, C202, C219, C220, C238
CKPYD102M50	C103, C125, C137, C161, C203, C225, C237, C261, ~~C315~~
CKPYD681J50	C315 (SK-21のみ)
CCPSL101J50	C104, C121, C145, C146, C204, C221, C245, C246, C333, C334, C342
CKDYD103M50	C105, C205
CQMA473K50	C106, C206
CQMA563K50	C107, C207
CCPSL101K50	C370 (SK-21のみ)
CEA470P10	C108, C114, C208, C214
CEA010P50	C109 – C111, C123, C134, C143, C209 – C212, C223, C234, C243, C306, C309, C318, C329, C344
CKPYB221K50	C112, C212, C325
CKPYB181K50	C113, C213, C335
CEA100P16	C115, C122, C215, C222, C311, C316, C336
CEAR47P50	C116, C118, C132, C216, C218, C232, C343
CKPYX153N25	C117, C217
CKPYB331K50	C126, C226
CEA010P50	C127, C227 (SK-31)
CQMA822K50	C128, C228
CQMA333K50	C129, C229
CQMA333M50	C130, C230
CSZAR33M35	C131, C231, C321
CQMA393K50	C133, C233 (SK-31)
CKPYX222M50	C135, C235 (SK-31)
VACANT	C136
CKPYX682M25	C139, C239
CKPYD102M50	C140, C240 (SK-31)
CQMA823K50	C141, C241 (SK-31)
CKPYB681K50	C142, C242
CEA101P10	C144, C148, C244, C248, C314, C317
VACANT	C147
CQMA154M50	C149, C249
CEA102P10	C150, C250, C307
VACANT	C151 – C158
CQMA153M50	C159, C259
CCPSL121J50	C160, C260
CKPYY223N16	C162, C262
CKPYX222M50	C163, C263
VACANT	C164 – C200, C236, C247, C251 – C258, C246 – C301
CEA331P10	C302
CEA221P10	C303, C304, C322, C332
CEA102P16	C305
CEA220P10	C308, C337
CEA330P16	C310
CEA471P10	C312
VACANT	C313
CSZA4R7K25	C319
CQMA223M50	C320
VACANT	C323, C324
HCH-108	C326 Electrolytic, 1000/10V
VACANT	C327, C328
CKPYB391K50	C330
CEA331M10L	C331
CKDYB682K50	C338
VACANT	C339
CQMA183M50	C340
CEA010P50	C344 (SK-21)

Tuner Unit SK-31 (HWE-107) SK-21 (HWE-108)

MISCELLANEOUS

Part No.	Symbol & Description
HA11251	IC1
HA11227	IC2
2SC1674-L	Q1, Q2
2SC1675-L	Q3
2SC461-B	Q4, Q5
2SC828-R	Q6
1S2790	D1
1S188FM-1	D2, D3
1S1555	D4
SEL-104R	D5

PARTS LIST

Part No.	Symbol & Description	
CTF-010	L1	Ferri-Inductor, 2.2μH
CTF-071	L2	Micro-Inductor, 18μH
CTF-016	L3	Ferri-Inductor, 15μH
CTC-061	T1	Coil
HTC-135	T2	OSC Coil
CTC-028 or CTC-040	T3	IF Transformer
HTB-107 or HTB-127	T4	Bar Antenna Assy
HTE-102	T5	IF Transformer
CTB-037 or CTB-031	T6	Coil
CTC-091	T7	Coil
CTE-090	T8	IF Transformer
HWW-106	BPF1	Filter
HWW-105	CR1, CR2	MPX Filter
CCL-072	VC1 – VC4, TC1 – TC4	Variable Condenser
CCP-037	VR1	Semi-fixed, 10kΩ (B)
HCP-105	VR2	Semi-fixed, 300Ω (B)
HCP-106	VR3	Semi-fixed, 50kΩ(B) (SK-31)
HSK-107	S1	Switch
HSD-102	S2	Switch
CTF-038	CF1	Ceramic-filter (SLR35005)

RESISTORS

Part No.	Symbol & Description
RD1/4PM□□□J	R1 – R49
RD1/4VS□□□J	R50
RD1/4VM□□□J	R51

CAPACITORS

Part No.	Symbol & Description
CCPSL270J50	C1
CKPYX103M25	C2, C9, C23, C24, C34, C43,
CKPYX153N25	C3, C10, C19, C20, C22, C33, C37, C42, C47
CCDSH200K50	C4
CKDYD103M50	C5, C18
CCDSL030D50	C6
CCDSL070D50	C7
CCPSL101J50	C8, C36, C57
CEA010P50	C11, C31, C48, C55, C56
CCDSH030D50	C12
CCDRH180K50	C13
CCDCK010C50	C14
CCDSH100F50	C15
CCDSH330K50	C16
CCDSH180K50	C17
CKPYB471K50	C21
CEA470P10	C25, C45
CCDWL050D50	C26
CKDYF403Z25	C27 – C29
CKDBC393M25	C30, C44, C46
CEA3R3P50	C32, C38, C54
CEA100P16	C35
CEA101P10	C39, C40
CKPYB221K50	C41
CKDBC473M25	C49
CSZA010M25	C50
CSZAR33M35	C51
CCDUJ471J50	C52
CEA2R2P50	C53
CCPSL300J50	C58
CCPSL470J50	C59
CCDSL180K50	C60

Power Unit

Part No.	Symbol & Description	
⚠ S5277DLC7 or ⚠ SM-1-02LFB	D307 – D310	
RD1/2PS□□□J	R345	
CEA222P16	C301	
⚠ CWW-006	C324	
⚠ CKP-025	J1	AC/DC Socket

LED Unit

Part No.	Symbol & Description
SLB26UR1	D311 – D313
SLB26GG1	D314

Switch Unit SK-31 (HWX-131), SK-21 (HWX-199)

Part No.	Symbol & Description	
CSK-007	S1	Switch (SK-31)
CSK-007	S2	Switch
HSK-102	S3	Switch

Sensing Unit

Part No.	Symbol & Description	
SIB01-02 or 1S1886	D501, D504, D505, D507 (SK-31) D509 (SK-31)	
RN1P□□□K	R501	
CEA471P10	C501	
HSN-119	S1	Switch
HSN-106	S2	Switch
HSN-101	S3	Switch

Miscellaneous Parts List

Note:
For "ECM1 and ECM2" employ parts combination of either "HPM-104 and HPM-105" or "HPM-106 and HPM-107" or "HPM-114 and HPM-115".

Part No.	Symbol & Description	
HAW-105	ME1	Meter (SK-31)
HAW-104	ME1	Meter (SK-21)
HAW-106	ME2	Meter (SK-31)
HEL-106	IL1	Lamp, 9V 100mA (SK-31)
HPB-108	HD1	Head
CPB-038	HD2	Head
HPM-104 or HPM-106 or HPM-114	ECM1	Microphone Assy
HPM-105 or HPM-107 or HPM-115	ECM2	Microphone Assy
HXM-112	M	Motor
HXP-101	SO	Solenoid
HSL-101	S1	Switch
⚠ HTT-123	T	Power Transformer (SK-31/KU, SK-21/KU)
⚠ HTT-140	T	Power Transformer (SK-31/KC, SK-21/KC)
HPV-102 or CPV-028	SP1, SP2	Speaker (SK-21)
	SP3, SP4	Speaker (SK-31)
HPT-102 or HPT-105 or CPT-006	SP1, SP2	Speaker (SK-31)
CDX-022 or CDX-024	ANT	Rod Antenna

Cabinet

Key No.	Part No.	Description
1.	HNR-108	Handle Cast
2.	CBL-142	Spring
3.	HBE-105	Bush
4.	CMZ30P100FMC	Screw
5.	BMZ30P060FMC	Screw
6.	HNS-258	Handle
7.	HBE-104	Bush
8.	HBL-102	Spring
9.	HBA-130	Screw, M4×95
10.	HBE-103	Bush
11.	B20-401-A	Ball
12.		Bracket
13.	CDX-022 or CDX-024	Rod Antenna
14.	HNS-254	Rear Case
15.	CMZ30P060FMC	Screw
16.	HNC-125	Terminal
17.	PMZ30P120FNi	Screw
18.	HNC-123	Terminal
19.	PNC40P160FMC	Screw
⚠ 20.	HTT-123	Power Transformer (SK-31/KU, SK-21/KU)
	HTT-140	Power Transformer (SK-31/KC, SK-21/KC)
21.	BNC30P140FMC	Screw
22.	BNC30P120FMC	Screw
23.	HWP-155	P.W. Board (SF-B35046)
⚠ 24.	CKP-025	AC/DC Socket
25.	CKF-019	Terminal
26.	HNC-142	Terminal
27.	HBH-134	Spring
28.	BNC30P100FMC	Screw
29.	HNV-143	Holder
30.	HBH-119	Spring
31.	HNM-115	Band
32.	BNC30P080FMC	Screw
33.	WC30FMC	Washer
34.	HPV-102 or CPV-028	Speaker
35.		Holder
36.	HPT-102 or HPT-105 or CPT-006	Speaker (SK-31)
37.	HAA-108	Knob
38.	HAA-147	Knob
39.		Clip
40.		Holder
41.		P.W. Board
42.	SLB26UR1	LED
43.	SLB26GG1	LED
44.	BNC26P060FMC	Screw
45.	HNM-114	Cushion
46.	HNS-260	Cover
47.	HNM-105	Cushion
48.	VNC30P380FMC	Screw
49.	HDE-109,	Connector
50.	CAA-185	Knob
51.	HNM-124	Cover
52.	HAC-164	Lever
53.	HAC-165	Lever
54.	HXA-438	Damper REC Assy
55.	PMA26P060FMC	Screw
56.	BMZ26P080FBK	Screw
57.	HNV-280	Cover
58.	HNM-127	Seal

PARTS LIST

Key No.	Part No.	Description
59.	CBL-172	Spring
60.	BMZ26P050FMC	Screw
61.	HAC-163	Lever
62.	HNM-122	Cover
63.	HXA-511	Door Unit
64.	HAC-151	Lever
65.	HAC-150	Lever
66.	HAC-152	Lever
67.	HNM-192	Cover
68.	HEL-106	Lamp, 9V 100mA (SK-31)
69.	E32-762	Cap (SK-31)
70.	HNB-107	Net
71.	CKN-058	Jack
72.		P.W. Board
73.	HXA-507	Front Case Unit (SK-31)
	HXA-506	Front Case Unit (SK-21)
74.	HAA-110	Knob Unit
75.	CNV-977	Cover
76.	CKF-047	Terminal
77	HXA-470 HXA-460	Cassette Mechanism Ass'y (SK-31) / (SK-21). (SLR35001)

Chassis

Note:
For "No. 33 and No. 37" employ parts combination of either "HPM-104 and HPM-105" or "HPM-106 and HPM-107" or "HPM-114 and HPM-115".

Key No.	Part No.	Description
1.	HWK-160	Amp Unit (SK-21/KC)
	HWK-169	Amp Unit (SK-31/KC)
	HWK-170	Amp Unit (SK-31/KU)
	HWK-171	Amp Unit (SK-21/KU)
2.	HSK-104	Switch (SK-31)
	HSK-108	Switch (SK-21)
3.	HSK-111	Switch
4.	HSK-109	Switch
5.	HSK-105	Switch (SK-31)
	HSK-106	Switch (SK-21)
6.	HCS-104	Volume, 50kΩ (A)
7.	CBN-003	N7Ø×2t
8.	CBE-012	FW7Ø×0.5t
9.		Connector
10.		Connector
11.	HCS-107	Volume, 50kΩ (W)
12.	HCS-125	Volume, 50kΩ (B) (SK-31)
	HCS-126	Volume, 50kΩ (B) (SK-21)
13.	HCS-121	Volume, 20kΩ (B)
14.	BMZ30P120FMC	Screw
15.	HKW-114	Jack Unit (SLR35042)
16.		Heat Sink
17.	TA7215P	IC
18.	CSH-029	Switch
19.	BNC30P100FMC	Screw
20.		Cover
21.	HWE-107	Tuner Unit (SK-31)
	HWE-108	Tuner Unit (SK-21)
22.	HTB-107 or HTB-127	Bar Antenna Assy
23.	HSD-102	Switch
24.	HSK-107	Switch
25.	HNV-136	Pulley
26.	WC26FMC	Washer
27.	PMA26P060FMC	Screw
28.	CBH-438	Spring
29.		Ring
30.	HLA-116	Shaft
31.	YE30FMC	Washer
32.	HNV-151	Pulley
33.	HPM-104 or HPM-106 or HPM-114	Microphone Assy
34.	HNV-162	Holder
35.	HNV-130	Chassis
36.	WA35W075D100	Washer
37.	HPM-105 or HPM-107 or HPM-115	Microphone Assy
38.		P.W. Board
39.	SEL-104R	LED
40.	BMZ30P060FMC	Screw
41.		Cover
42.	HAG-158	Scale (SK-31)
	HAG-159	Scale (SK-21)
43.	HNM-116	Cushion (SK-31)
	HNM-117	Cushion (SK-21)
44.	HAW-106	Meter (SK-31)
45.	HAW-105	Meter (SK-31)
	HAW-104	Meter (SK-21)
46.	HAF-105	Pointer
47.	HNM-152	Spacer

Cassette Mechanism (Top)

Key No.	Part No.	Description
1.	YE20FUC	Washer
2.	CXB-661	Roller Unit
3.	CBH-491	Spring
4.		Arm
5.	CBH-482	Spring
6.	CBF-111	Washer
7.	CBH-492	Spring
8.	CNE-137	Arm
9.	YE30FUC	Washer
10.	CNE-131	Lever
11.		Lever
12.	CNE-139	Arm
13.	CBH-479	Spring
14.	BMZ30P060FMC	Screw
15.	HWX-199	Switch Unit (SK-21)
	HWX-131	Switch Unit (SK-31)
16.	CSK-007	Switch
17.	HSK-102	Switch
18.	HAW-101	Counter (SK-21)
	HAW-102	Counter (SK-31)
19.	HAW-103	Counter (SK-31)
20.	PMA26P040FMC	Screw
21.		Bracket
22.	~~HNT-106~~	Belt (SK-31)
23.	~~HNT-104~~	Belt (SK-21)
11 2.	HNT-105	Belt (SK-31)
✓24.	~~HXA-484~~ 679-A	Pulley Unit
✓25.	ZMK26M030FMC	Screw
✓26.	HNC-284	Bracket
✓27.	CNV-840	Cushion
28.		Roller
29.	HBA-126	Screw
30.	CBH-481	Spring
31.	CLA-752	Roller
32.	YE12FUC	Washer
33.	CBH-488	Spring
34.		Lever
35.	HBF-115	Washer
36.	HXA-489	Reel Unit
37.	HBF-145	Washer
38.		Holder
39.	PMA26P050FMC	Screw
40.	CBH-479	Spring
41.		Stopper
42.	YE15FUC	Washer
43.		Lever
44.		Lever
45.		Head-plate Unit
46.		Lever Unit
47.		Arm Unit
48.	CBH-505	Spring
49.		Arm
50.		Collar
51.		Arm
52.		Collar
53.	CBH-497	Spring
54.		Chassis Unit
55.		Frame Unit
56.	HSL-101	Switch
57.	BMZ20P080FMC	Screw
58.		Arm
59.		Lever
60.	CBH-494	Spring
61.	CBH-476	Spring
62.	HXA-438	Damper REC Assy
63.	CBH-480	Spring
64.	CBH-477	Spring
65.		Base
66.	HPB-108	Head
67.	BMZ20P100FMC	Screw
68.	CBH-475	Spring
69.	CPB-038	Head
70.	BMZ26P060FMC	Screw
71.	HXM-112	Motor
72.	BMZ30P060FMC	Screw (SK-31)

Cassette Mechanism (Bottom)

Key No.	Part No.	Description
1.	HXA-495	Reel Unit
2.	CBH-485	Spring
3.		Lever Unit
4.	HNV-~~265~~ 231-A	Lever
5.	YE25FUC	Washer
6.	YE20FUC	Washer
7.	HBH-121	Spring
8.	CBF-103	Washer
9.	HXA-492	Base Unit
10.	PMA26P050FMC	Screw
11.	CNV-843	Holder
12.	HBF-145	Washer
13.	HXP-101	Solenoid
14.	BMZ26P060FMC	Screw
15.	CNT-068	Belt
16.	HNR-137	Flywheel
17.	HBF-148	Washer
18.	CNV-833	Screw
19.	BMZ26P060FMC	Screw
20.		Plate Unit

PARTS LIST

Key No.	Part No.	Description
21.	HXA-488	Reel Unit
22.	YE40FUC	Washer
23.	CBH-493	Spring
24.	CNV-879	Lever
25.	HXA-491	Gear Unit
26.	CBH-486	Spring
27.		Washer
28.	CBE-088	Washer
29.	HNT-121	Belt ,
30.	YE12FUC	Washer
31.		Arm
32.	CBF-111	Washer
33.	PMA26P040FMC	Screw
34.	HNR-138	Flywheel
35.		Lever
36.	CBH-481	Spring
37.		P.W. Board
38.	VACANT	
39.	HSN-106	Switch
40.	HSN-101	Switch
41.	HSN-119	Switch
42.	VACANT	
43.		Bracket
44.	(HXA-173)	Lever Assy
45.	CBH-498	Spring
46.	CNV-881	Plate
47.		Holder Unit
48.	CBH-495	Spring
49.	CBH-476	Spring
50.	CBH-494	Spring
51.		Holder
52.	CBH-487	Spring
53.	~~CBH~~ BBH-210 (SI-P34008)	Spring
54.	CBH-497	Spring
55.		Chassis Unit
56.		Screw

Packing Method

Key No.	Part No.	Description
1.	HEG-131	Polyethylene Bag
⚠ 2.	CDG-029	AC Cord
3.	HRB-143	Owner's Manual (SK-31/KC)
	HRB-144	Owner's Manual (SK-21/KC)
	HRB-150	Owner's Manual (SK-31/KU)
	HRB-151	Owner's Manual (SK-21/KU)
4.	HHA-159	Styrofoam
5.	HEG-137	Polyethylene Bag
6.	HHA-160	Styrofoam
7.	HHA-392	Carton (SK-31/KC)
	HHA-394	Carton (SK-21/KC)
	HHA-427	Carton (SK-31/KU)
	HHA-426	Carton (SK-21/KU)

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