

SERVICE MANUAL

CASSETTE RECORDER

**SANYO****M9990**

(U.S.A.)



SPECIFICATIONS

Recording system	AC bias, 4 tracks stereo	Frequency response	50 – 14,000Hz (CrO ₂)
Erasing system	DC erase		50 – 14,000Hz (FeCr)
Tape speed	4.75 cm/s (1-7/8 i.p.s.)		50 – 12,000Hz (NORMAL)
Rewind and fast forward time	Rewind: 2 min. (C-60) Fast forward: 3 min. 40 sec. (C-60)	Output power	2.7W x 2 maximum
Frequency range	FM: 88 – 108MHz AM: 525 – 1,615kHz	Power source	DC: 12V "D" (UM-1) x 8 1.5V "AA" (UM-3) x 1 (Clock) 12V Car battery adaptor
Terminal impedance	EXT. MIC: 10k ohms (0.3mV) LINE IN: 2M ohms (100mV) LINE OUT: 18k ohms (0.7V) EXT SP: 6 – 8 ohms HEADPHONES: 8 ohms	Power consumptions	AC: 120V 60Hz 20W
		Dimensions	490(W) x 123(D) x 295(H) mm (19-3/8" x 4-7/8" x 11-5/8")
		Weight	Approx. 6.5 kg (14 lbs. 5 ozs.) including batteries

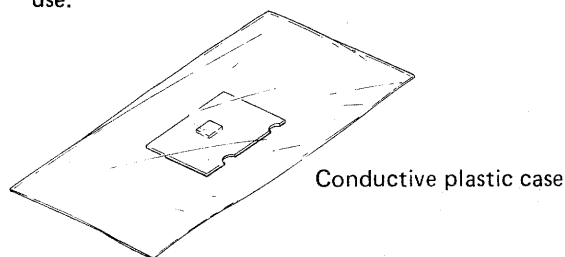
* Specification subject to change without notice.

CAUTION

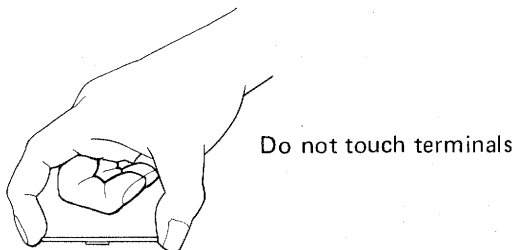
The large-scale integrated circuit (LSI) incorporates in its small size highly sophisticated circuitry. It must be handled with utmost care to protect it against destruction because it works on a very weak current and is highly sensitive to static electricity.

A. PRECAUTIONS FOR LSI-MOUNTED CIRCUIT BOARD

1. Do not take this LSI-mounted circuit board out of the electrically conductive plastic case right before use.



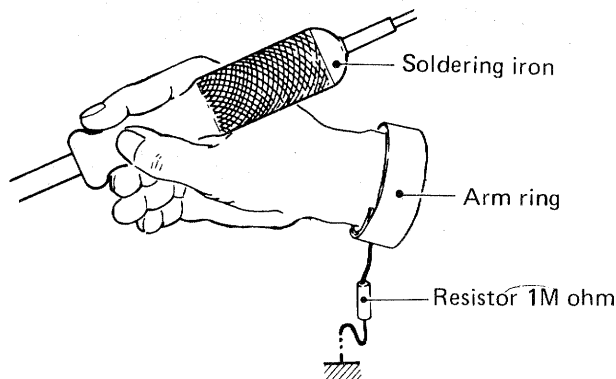
2. When handling this circuit board, hold it at its ends and take care not to touch its foil-pattern and components parts mounted thereon.



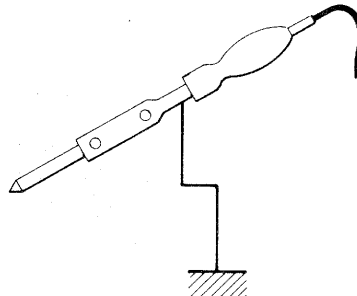
3. The LSI shouldn't be kept in a Hot, high moisture place. Strong magnetism is also detrimental.

B. REPAIR

1. Please be sure to unplug the power cord before setting or taking off an LSI. Do not forget to ground the B-lines (at the one specified spots).
Do the same when replacing the printed circuit board. Three parts to be grounded: (at both ends of) electrolytic capacitors C2, C4.
2. Be sure to connect a grounding conductor to every instrument and tool to be employed. (Either at E or G) The engineer who does the repair work should have a grounding conductor attached to his body (he should wear an arm ring connected to a grounding line having a resistance value of 1M ohms)
Before handling an LSI, he should touch the B-line and discharge into the earth static electricity charged in his body.



3. AC leakage from the soldering iron being employed should be prevented. It must be less than 1V when the iron is hot. Be sure to ground it before use.



C. MISCELLANEOUS

1. Do not wipe an LSI with a dry cloth. (If necessary, use a cloth impregnated with antistatic agent.)
2. A tester can be used for measuring voltage and amperage. It should not be used for measuring resistance.

D. HANDLING OF P.C.B. ASSEMBLY

1. Place a conductive urethane foam sheet on the repair desk.
2. Do not take it out of an electrically conductive case until immediately before use.
3. Do not touch the patterned surface of the PCB with hand.

If you can not get an arm ring and a conductive urethane foam sheet in your stateside, please order to end of this book address:

HOW TO HANDLE LCD

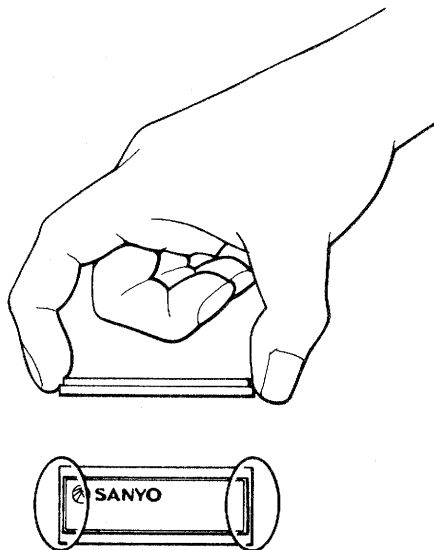
Always Keep LCD (Liquid Crystal Display) fitted with Bias Plate (Deflecting Filter), because LCD is sensitive to ultra-violet rays.

1. Storing of LCD

- Store LCD in some dark place until you use it. Be careful that you do not keep LCD under direct rays of the sun or other strong light sources.
- Keep LCD in 0°C (32°F) to 50°C (122°F) temperature and in low humidity.

2. How to Hold LCD

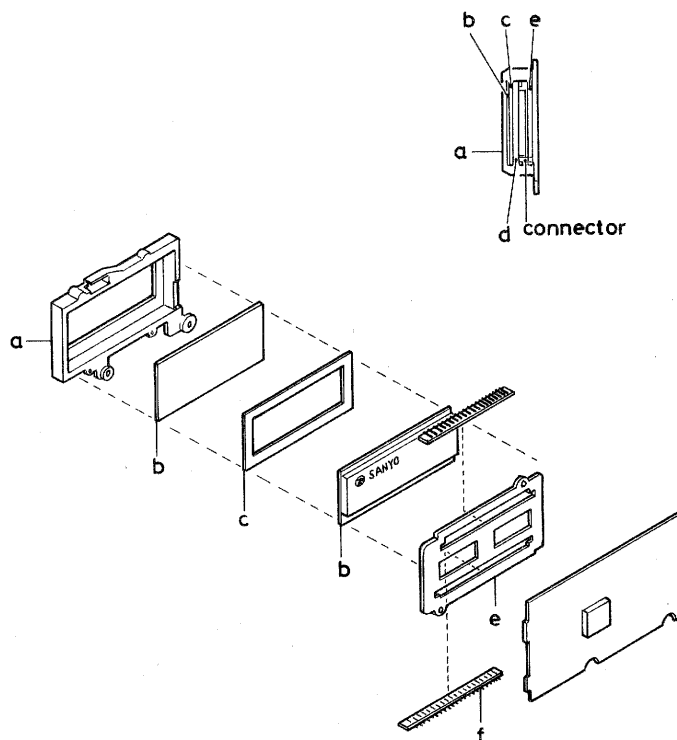
- When holding LCD, you should hold both ends of the package carefully with your fingers. Don't touch the surface of the terminal.
- Be careful that LCD surface is not subjected to strong pressure or struck.



3. Precautions in Repairing

- When you change an old LCD for a new one, give attention to the up and down sides for correct fitting directions.
- Don't touch the surface of the terminal with your tester or other tools.
- Be careful to keep LCD away from static electricity the same as you do for Printed Circuit Board with LSI (Large Scale Integrated Circuit).

- Ⓐ BRACKET FRAME
- Ⓑ BIAS PLATE (Deflecting Filter)
- Ⓒ SPACER
- Ⓓ LCD
- Ⓔ SPACER
- Ⓕ CONNECTOR



You scarcely need readjust the pace of Sanyo's Clock-Radios, because each product has been severely and precisely adjusted on the assembling and testing line with Quartz Timer (Pacemeasuring machine equipped exclusively for Sanyo timepieces with LCD). However, if you want to change some parts such as LCD, Trimmer and so on, you may take the following steps:

1. Preparation Before Readjusting

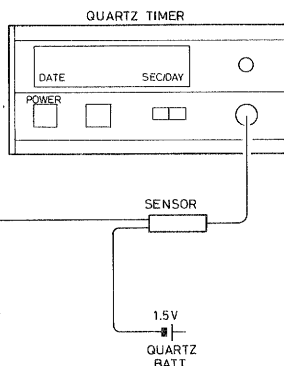
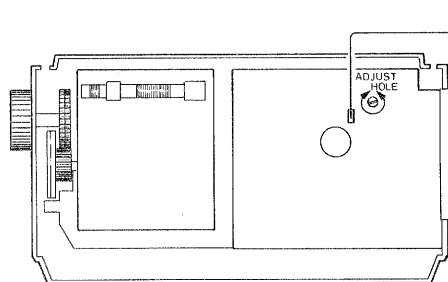
Turn off the radio switch as the first step.

- 1) Give your Clock-Radio a rest in a room of $23^{\circ}\text{C} \pm 3^{\circ}\text{C}$ ($73^{\circ}\text{F} \pm 5^{\circ}\text{F}$) temperature for about 1 hour. Don't start any repairing work while LCD and Trimmer are in unstable condition, because they are sensitive to heat, and may change their oscillating frequency.
- 2) As you see, Trimmer for pace readjusting is rather small. Therefore handle it carefully with a tiny screw driver with minus-point (—).
- 3) DC $1.5\text{V} \pm 0.1\text{V}$ power source is recommended to supply power to the clock.

3. How to Readjust

- 1) When Using a Quartz Timer

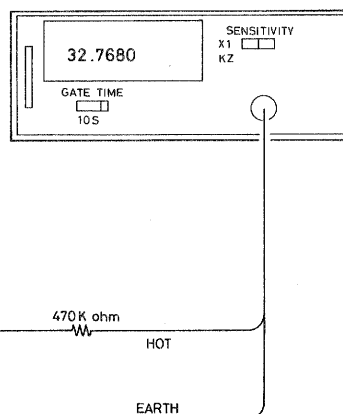
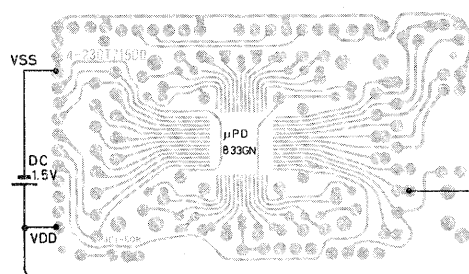
Choose a sensor which can measure up to 32.768kHz of crystal oscillation, and connect it to Quartz Timer. Then operate the Trimmer to fix the daily rate to between $+0.2$ and -0.1 sec./day.



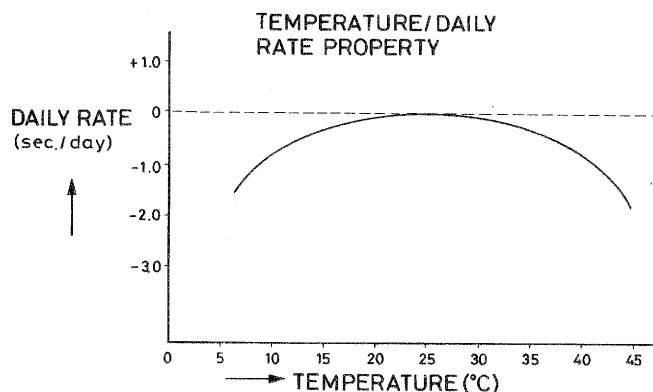
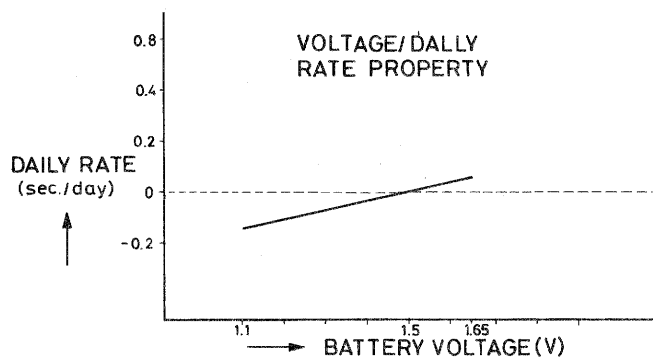
HANDLING OF TRIMMER AND CRYSTAL

1. Never apply strong force or impact to the trimmer and crystal.
2. When handling crystal leads, hold leads and bend carefully so as not to apply force to lead roots.
3. Solder trimmer and crystal at 270°C , and within 3 seconds.
4. After adjusting and mounting, do not touch the parts.

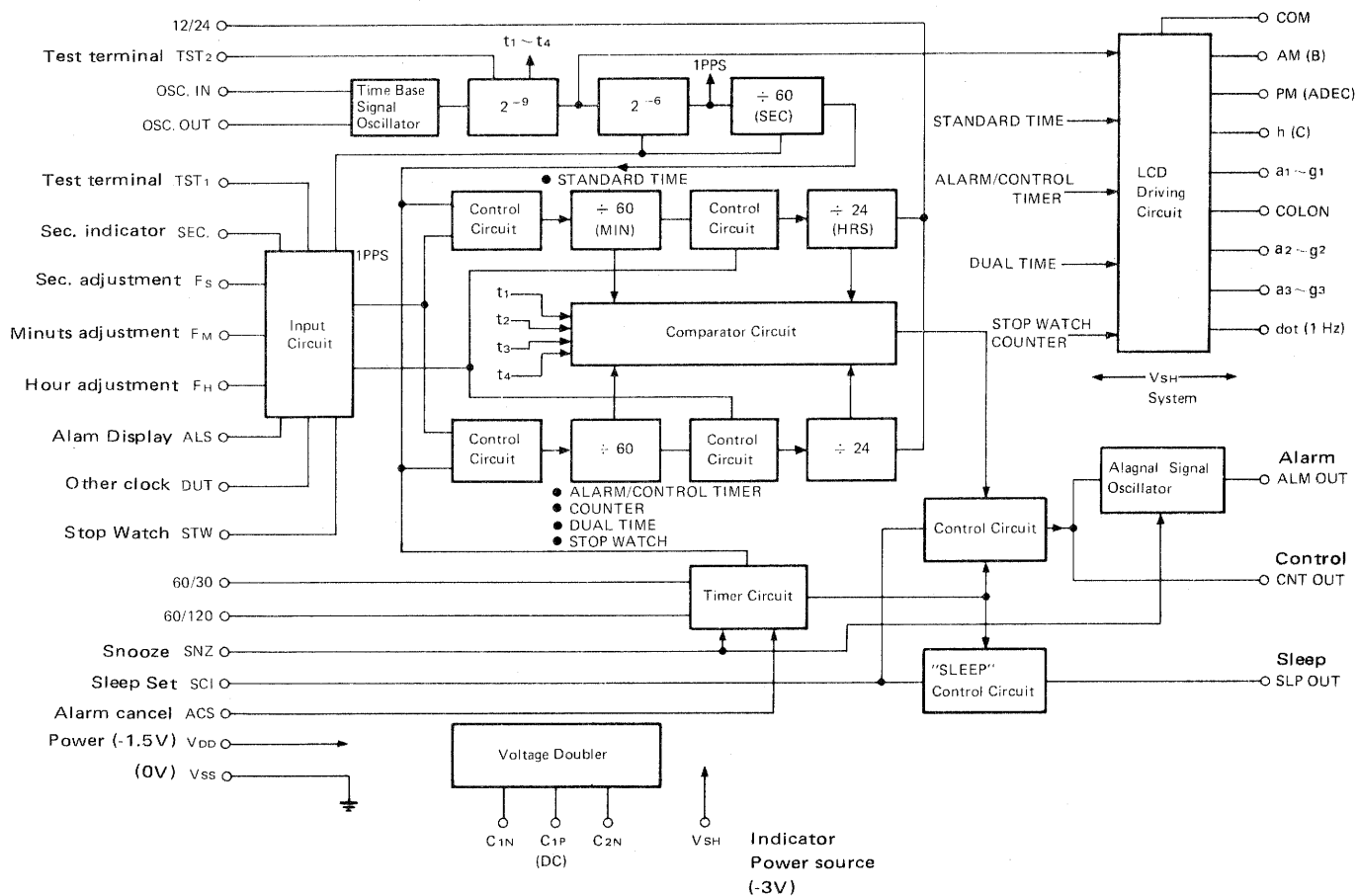
4. When using frequency counter



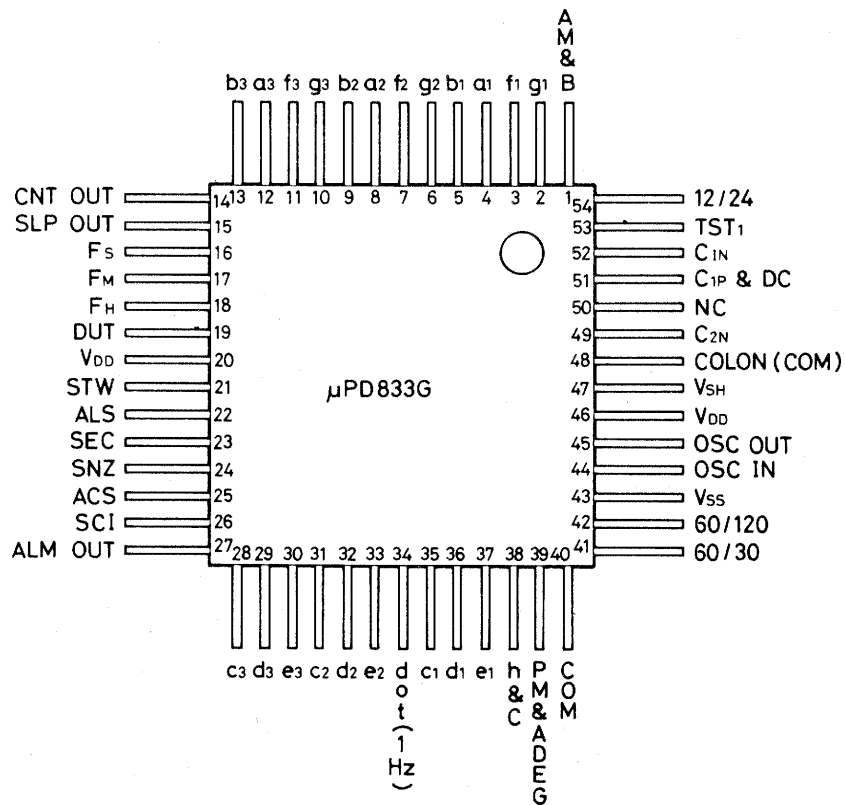
2. Special Properties of the Clock



BLOCK DIAGRAM (CLOCK)



TERMINAL OF CLOCK LSI



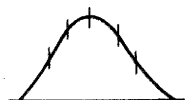
TUNER ADJUSTMENT

ADJUSTMENT OF AM FREQUENCY COVERAGE

- (1) Adjust the AM frequency coverage at 530 kHz and 1600 kHz.
- (2) Set the dial to 530 kHz, and turn L109 to adjust to 530 kHz.
- (3) Set the dial to 1600 kHz, and turn CT104 to adjust to 1600 kHz.
- (4) Repeat steps (2) and (3) to adjust to each frequency.

ADJUSTMENT OF FM IF

- (1) The IF waveform should be mirror symmetrical and the wave center should be adjusted to 10.7 MHz as far as possible. However, since ceramic filter is used, the wave center should be adjusted to the center frequency of the ceramic filter used, not necessarily equal to 10.7 MHz, although the waveform should be mirror symmetrical.
- (2) The waveshape should be as illustrated below.



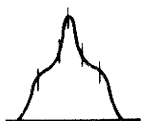
GOOD
Round
peak



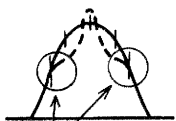
GOOD
Flat
hill



GOOD
Small
"shoulder"



WRONG
Steep
peak —
caused by
faulty
adj. of
T303



Improved by
T303 adj.,
but gain should
not be dropped.

- (3) S-curve should be vertically symmetrical around the center of IF waveform.

ADJUSTMENT OF FM FREQUENCY COVERAGE

- (1) Keep AFC switch turned off.
- (2) Adjust coverage at 90 kHz and 108 MHz.

ADJUSTMENT OF TUNING INDICATOR

- (1) The color of indicator LED is green.
- (2) Adjust tuning indicator after FM and AM tracking.
- (3) Receive 98 MHz in FM band, and adjust SVR350 to an extent that LED is dimly lit at an input of 18 dB. (In this state, when the input is increased about 12 dB, LED will light brightly.)
- (4) Do not turn SVR350 until LED illumination becomes bright, otherwise the actual lighting sensitivity may be discrepant.
- (5) Rating of lighting sensitivity
FM 98 MHz : 20 dB \pm 5 dB
AM 1400 kHz : 68 dB to 80 dB

ADJUSTMENT OF FM MPX SECTION

[1] CONDITIONS OF ADJUSTMENT AND MEASUREMENT

- (1-1) Apply modulation input into FM SG from stereo signal generator (SSG). And adjust modulation of SG so that the pilot signal be 7.5 kHz dev. (10% mod.) and the stereo signal be, with SSG at MAIN, 23.5 Hz dev. (30% mod.). Modulation frequency should be 1000 Hz.
- (1-2) Keeping the output signal switch of SSG at MAIN, set reception frequency to 98 MHz and tune in to it.
Hereafter "tuning" means this state.
- (1-3) During adjustment, keep AFC switch turned off.
- (1-4) Hold mode switch at STEREO.

[2] 19 KHZ ADJUSTMENT (V.C.O. ADJUSTMENT)

- (2-1) In FM stereo mode, tune in to 98 MHz at 60 dB.
- (2-2) Connect the earth wire and hot wire of frequency counter to TP4 and TP5, respectively.
- (2-3) Unmodulate FM input. (To unmodulate, turn off both MAIN & SUB signal switch and PILOT signal switch of SSG.)
- (2-4) With FM input unmodulated, adjust SVR502 so that the counter frequency be 10 kHz \pm 100 Hz.

[3] INSPECTION OF V.C.O. KILLER

- (3-1) After the 19 kHz adjustment, check the following items.
- (3-2) Set mode switch to MONO, and see that 19 kHz changes to 0 Hz.
- (3-3) With mode switch at STEREO, set band switch to AM, and see that 19 kHz changes to 0 Hz.

[4] ADJUSTMENT OF SEPARATION

- (4-1) Tune in to FM stereo signal (with MAIN & SUB signal and PILOT signal switches turned on) at an input of 60 dB.
- (4-2) Keeping treble control at MIN and bass at center, turn VR to adjust the output to standard output.
- (4-3) Left side separation
Turn on the LEFT side of output switch. This output is A. And the leakage output generated in the right side amplifier is B. Make sure the difference between A and B is more than 20 dB.
- (4-4) After making sure the output difference is more than 20 dB, turn on AFC switch and see that the output difference is also more than 20 dB.
- (4-5) Right side separation
In the same way as checking the left side separation, check the output difference caused in the left side amplifier.
- (4-6) Since separation is of non-adjusting type, adjust IF waveform and S-curve with special care.
If the separation is inferior, check the IF waveform and T301 adjustment again; if the separation is ruined by turning on AFC, check again if the center of S-curve is deviated.
- (4-7) Separation rating
400 Hz, 1000 Hz : More than 20 dB in both L & R chs.
10 kHz : More than 10 dB
- (4-8) To check the 10 kHz separation, set the VR to maximum position and turn the treble control to adjust to the standard output.

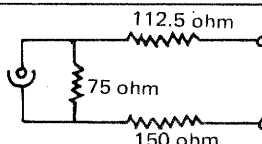
[5] CHECKING OF PILOT LAMP LIGHTING SENSITIVITY (LOCK LEVEL)

- (5-1) The color of indicator LED is red.
- (5-2) Tune in under the same condition as above. Once reduce SG ATT to 0 dB and then increase gradually until pilot lamp lights up. Measure the input at this time.
- (5-3) Lock level rating: Less than 26 dB

FM ALIGNMENT

Step	Adjusting Circuit	Connections		SG frequency	Position of tuning dial	Adjustment	VTVM Oscilloscope
		Input	Output				
1	I. F.	Connect sweep generator to FM ANT terminal TP1, TP2	Connect oscilloscope to test point TP3(H) Shield case(E)	$\div 10.7\text{MHz}$ (0% modulation) Tune to ceramic filter frequency	Near max. capacity of VC. at position with no unrequired signal.	T301 ~ T303	Match waveform with Center of Ceramic Filter
2	Ratio Det.		Connect oscilloscope to test point			T304	
3	O. S. C.	Connect FM SG. to FM ANT. Terminals TP1, TP2	Connect VTVM to speaker terminal. R323 (H)Shield case (E)	87 MHz (400 Hz 30% modulation)	Low end of dial scale	L107	Max.
4				109 MHz (400 Hz 30% modulation)	High end of dial scale	CT102	
5	ANT.	Connect FM SG. to FM ANT. Terminals	Connect VTVM to speaker terminal.	90 MHz (400 Hz 30% modulation)	90 MHz on dial scale	L104 L105	Max.
6				106MHz (400 Hz 30% modulation)	108 MHz on dial scale	CT101	
7	Repeat adjustments.						

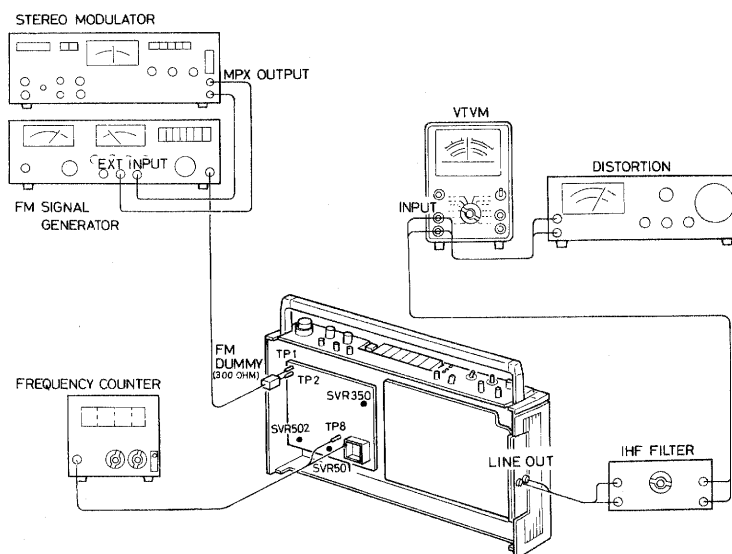
- PREPARE:
1. Add to AC120V 60Hz. & AFC SW-OFF.
 2. Set the dial pointer to very left line of dial scale.
 3. Connect sweep generator, FM SG. VTVM and oscilloscope. FM aerial input impedance is 75 ohm.
 4. Use a screwdriver with plastic grip for all adjustments.
 5. Use a 300 ohm balanced dummy load.



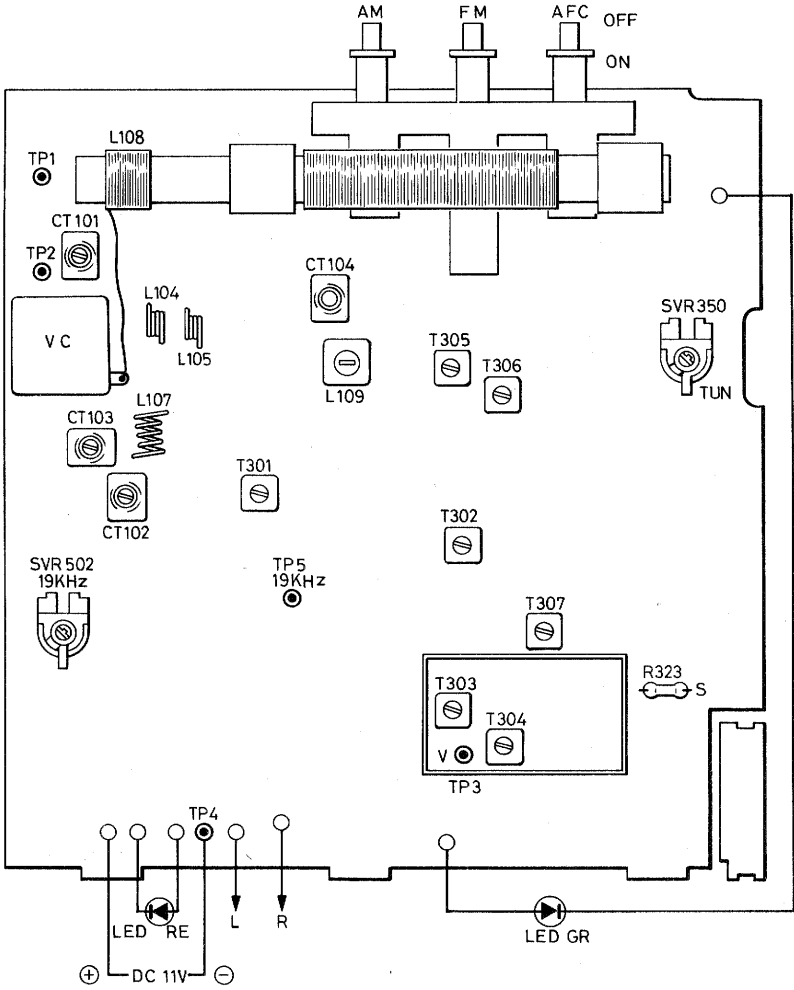
AM ALIGNMENT

Step	Adjusting Circuit	Connections		SG frequency	Position of tuning dial	Adjustment	VTVM Oscilloscope
		Input	Output				
1	I. F.	Connect sweep generator to TEST LOOP.	Connect oscilloscope to EXT. SP.	457 KHz (400 Hz 30% modulation)	Low end of dial scale at position of no un-required signal.	T305 ~ T307	Max.
2	O. S. C.	Connect AM SG. to TEST LOOP.	Connect VTVM to EXT. SP. terminals	505 KHz (400 Hz 30% modulation)	Low end of dial scale	L109	Max.
3				1650 KHz (400 Hz 30% modulation)	High end of dial scale	CT104	
4	ANT.	Connect AM SG. to TEST LOOP .	Connect VTVM to EXT. SP. terminals.	600 KHz (400 Hz 30% modulation)	600 KHz on dial scale	L108.	Max.
5				1400 KHz (400 Hz 30% modulation)	1400 KHz on dial scale	CT103	
6	Repeat adjustment						

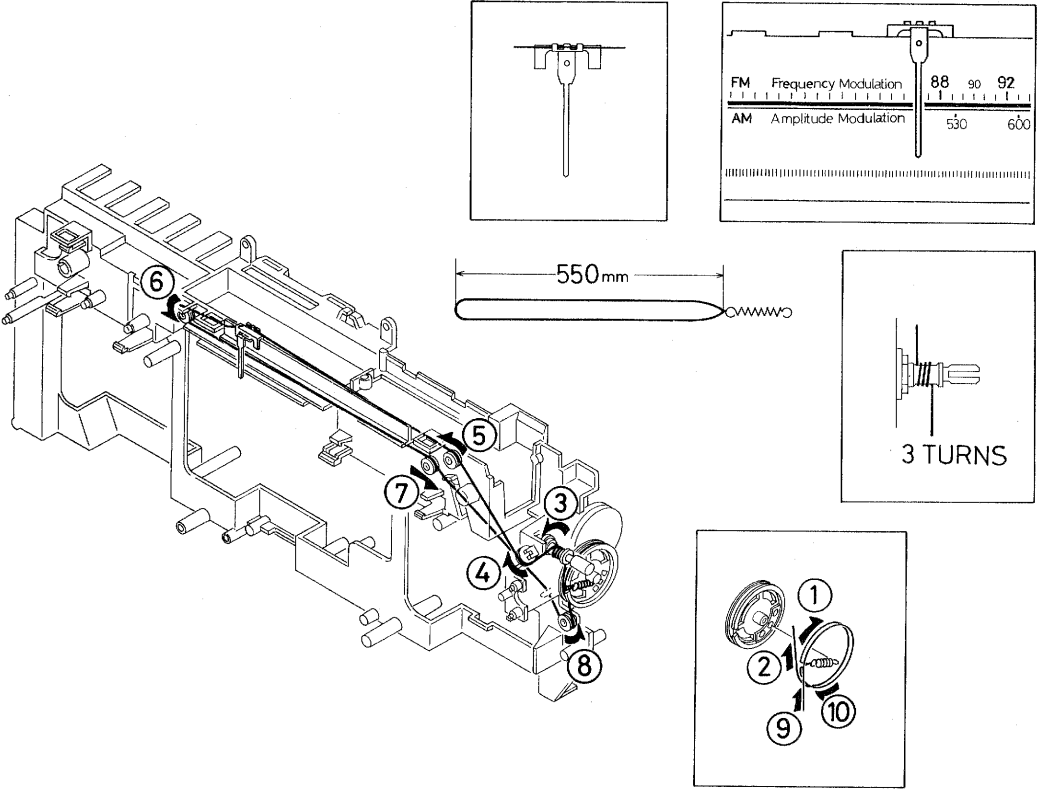
- PREPARE:
1. Add to AC 120V 60 Hz.
 2. Set the dial pointer to very left line on dial scale.
 3. Use a screwdriver with plastic grip for all adjustments.
 4. Selector switch to "AM".
 5. Connect sweep generator, AM SG, VTVM and oscilloscope.



PARTS LOCATION



DIAL CORD STRINGING



AMPLIFIER ADJUSTMENT

PREPARATION

Supply voltage: 12 volts

Tone controls (bass, treble): Mechanical center

Switches

Function switch : TAPE
AUTO switch : OFF
Tape switch : NORMAL
Mode switch : STEREO

(1) ADJUSTMENT OF PLAYBACK GAIN

Set volume controls to minimum.

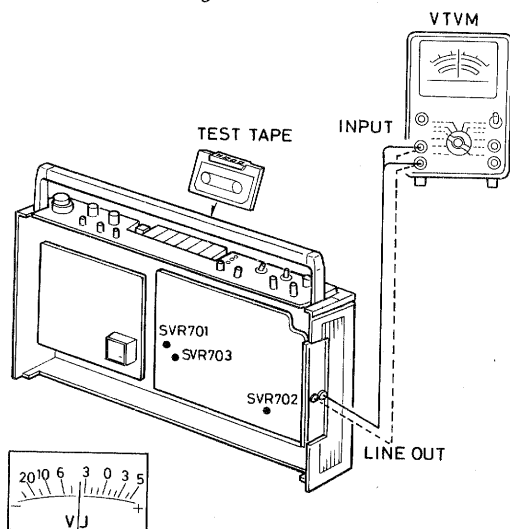
Play back test tape (1 kHz, 0 dB), and adjust SVR701 (20 KB) so that the outputs from line output terminals of both right and left channels be equal to each other.

(2) ADJUSTMENT OF METER

Carry out after playback gain adjustment.

Play back test tape (1 kHz, 0 dB), reduce volume controls (simultaneously R and L sides) until the left channel meter indicates - 1 VU.

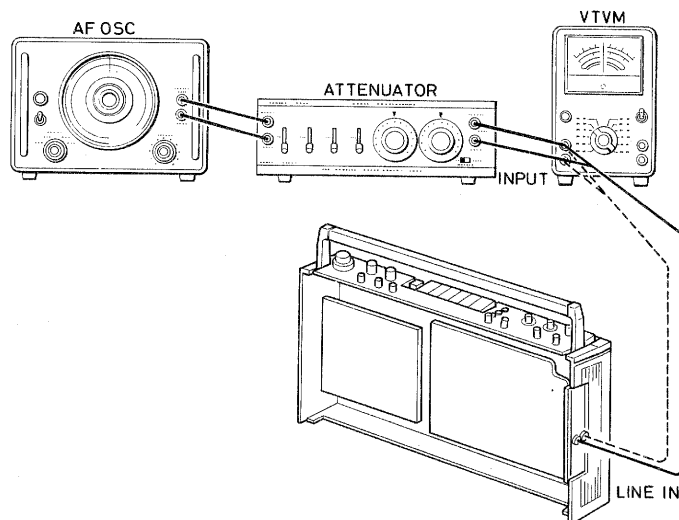
Adjust SVR703 (100 KB) so that the right channel meter reading be equal to the left channel reading.



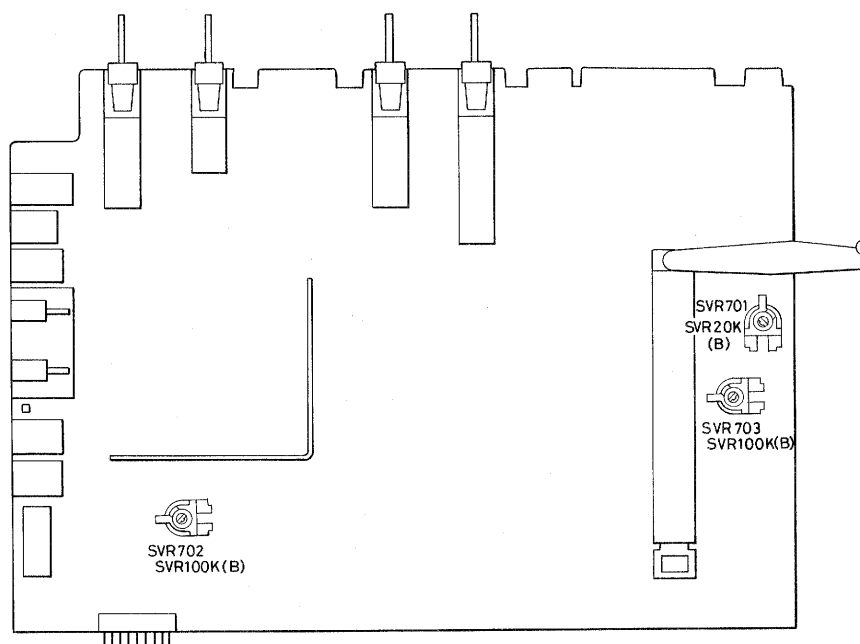
(3) ADJUSTMENT OF RECORDING GAIN

Set volume controls to minimum.

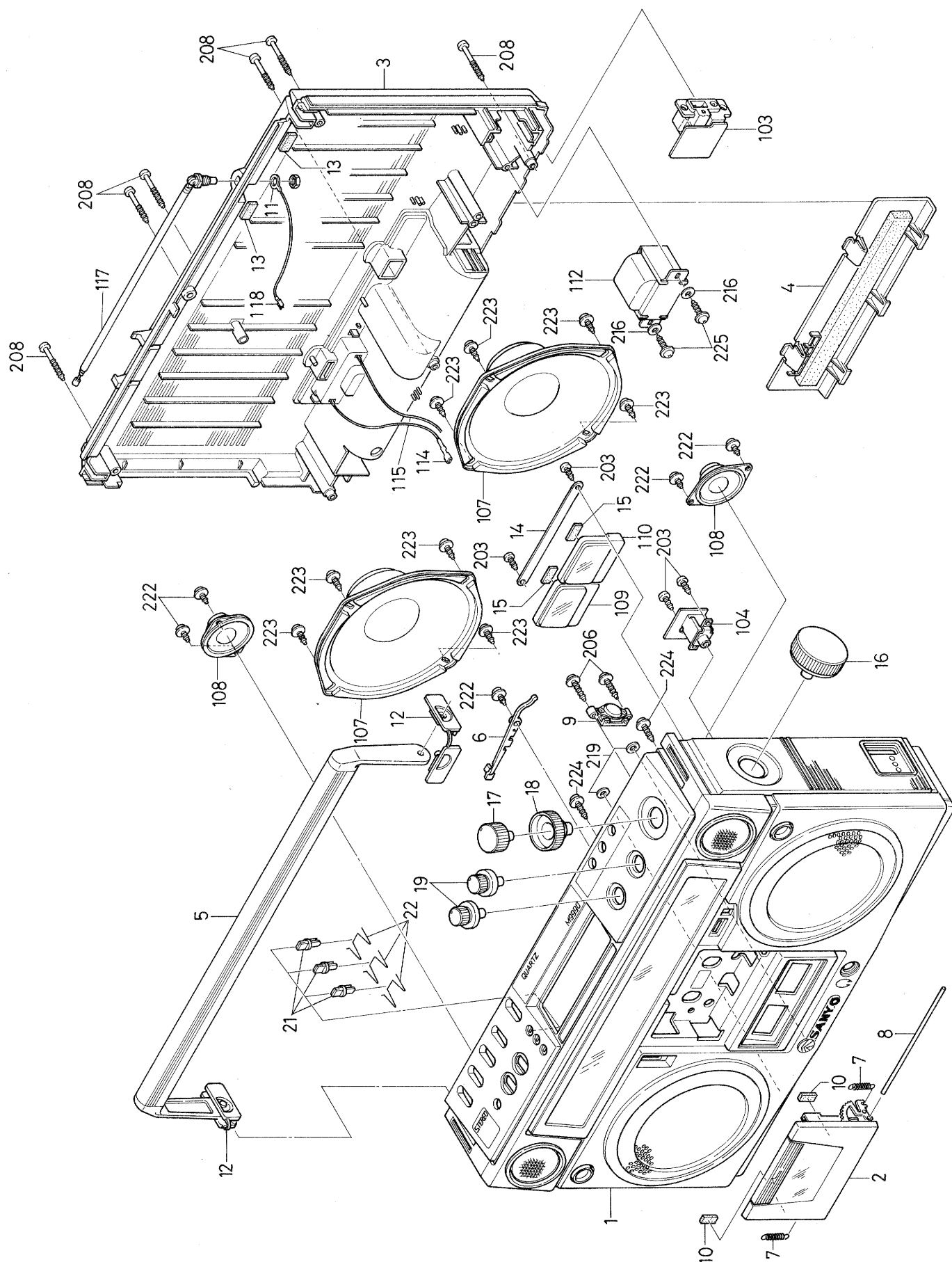
Load with blank tape, set in record mode, and pass a signal of 1 kHz, -30 dB (50 mV) into line input terminal (LINE IN), and one of 1 kHz, -80 dB (0.15 mV) into MIC terminal. Connect vacuum tube voltmeter (VTVM) to the collectors of transistors Q805 and Q905, and adjust SVR702 (100 KB) so that the output from both right and left channels be equal to each other.



PARTS LOCATION



EXPLODED VIEW (CABINET)



PARTS LIST

Key No.	Part No.	Description	Q'ty	Key No.	Part No.	Description	Q'ty
PACKING				CHASSIS			
	141 6 132T 95100	Individual Carton	1	75	141 2 581T 11000	Gear	1
	141 6 410T 19200	Instruction Manual	1	76	141 2 581T 11100	Gear	1
	141 6 144T 51400	Foam Plastic Case	1	77	141 2 538T 09800	Drum	1
	141 6 144T 51600	Foam Plastic Case	1	78	141 2 855T 26100	Spring Coil, Gear	1
	141 6 440T 00609	Hang Tag	1	79	141 2 851T 06300	Spring Coil, Drum	1
	141 6 231T 45707	Inner Polye Cover, Set	1	80	141 2 340T 00200	Rope	1
	141 6 231T 20352	Inner Polye Cover, Instruction B.	1	81	141 2 153T 44600	Escutcheon, Dial	1
	141 6 479T 28700	Label, Patent	1	82	141 2 853T 55400	Spring Plate, R/P	1
	141 6 493T 01100	Customer Card	1	83	141 2 385T 02200	Bracket, Microphone	2
	141 6 316T 98700	Pad, Handle	1	84	141 2 511T 15300	Pointer	1
	141 2 171T 09500	Handle	1	85	141 2 146T 19501	Dial Scale	1
ACCESSORIES				ELECTRICAL PARTS			
	4 243T 80900	Power Cord	1	105	4 612T 12000	Pilot Lamp	1
	4 241T 08600	Cassette Tape	1	106	4 231T 79600	Switch, Dial	1
	4 241T 12800	Cassette Tape		107	4 151T 28500	Speaker, Woofer 16cm	2
	4 241T 10879	Cassette Tape		108	4 151T 17873	Speaker, Tweeter 5cm	2
CABINET				109	4 511T 10700	Meter, VU	1
1	141 0 111T 37401	Cabinet Assembly	1	110	4 511T 10771	Meter, VR/Battery	1
2	141 0 124T 22521	Top Lid Assembly	1	111	4 235T 56200	Socket, 9P	1
3	141 0 126T 26201	Back Lid Assembly	1	112	4 251T 87700	Power Trans	1
4	141 0 128T 13201	Battery Lid Assembly	1	113	4 153T 10500	Microphone	2
5	141 0 171T 14600	Handle Assembly	1	114	4 243T 12807	Lead, (-)	1
6	141 2 742T 10500	Lever, Eject	1	115	4 243T 12808	Lead, (+)	1
7	141 2 855T 06200	Spring Coil, Top Lid	2	116	141 2 464T 08700	Fixer	2
8	141 2 753T 52000	Shaft, Top Lid	1	117	4 244T 03200	Telescopic Rod Antenna	1
9	141 0 581T 01200	Gear Assembly, Top Lid	1	118	4 235T 34600	Socket, Rod Antenna	1
10	141 2 447T 62000	Cushion, 15x3x2	2	119	4 257T 29502	Antenna Coil Assembly	1
11	123 2 472R 11100	Lug	1	120	141 2 382T 11000	Terminal, Clock	1
12	141 2 271T 14900	Bracket, Handle	2	121	4 235T 58900	Socket, Clock 12P	1
13	141 2 447T 15400	Cushion, 10x10x3t	2	126	4 970T 00200	LCD	1
14	141 2 373T 06600	Bracket, Meter	1	127	4 400T 03100	Connector	2
15	141 2 447T 65000	Cushion, 10x30x2t	4	128	4 243T 12803	Lead, Yellow	1
16	141 2 163T 55500	Rotary Knob, Tuning	1	129	4 612T 11001	Lamp Assembly	1
17	141 2 163T 45600	Rotary Knob, Volume Right	1	130	4 960T 00271	Bias Plate	1
18	141 2 163T 45730	Rotary Knob, Volume Left	1	HARDWARE			
19	141 0 163T 45802	Rotary Knob Assembly, Tone	2	201		Pan Head Screw, 3x6mm	6
20	141 2 162T 15200	Lever Knob, Clock	2	202		Flat Head Screw, 2.6x4mm	2.6
21	141 2 161T 56900	Push Button, Clock	3	203		Tapping Screw, 3x8mm	6
22	141 2 852T 51500	Spring Wire, Clock	3	204		Tapping Screw, 3x10mm	16
23	141 2 162T 15300	Lever Knob	1	205		Tapping Screw, 3x12mm	2
24	141 2 157T 31701	Inlay	4	206		Tapping Screw, 3x16mm	4
25	141 2 157T 31802	Inlay, Eject	1	207		Tapping Screw, 3x18mm	2
26	141 2 157T 31803	Inlay, Record	1	208		Tapping Screw, 3x20mm	6
27	141 2 447T 66000	Cushion	6	209		Tapping Screw, 3x25mm	3
CHASSIS				210		Tapping Screw, 3x45mm	5
51	141 2 161T 56700	Push Button, Band Select	4	211		Nut, 3mm	2
52	141 0 162T 14000	Lever Knob Assembly, Switch	5	212		Hexagon Bolt, 2.6x12mm	1
53	141 2 241T 13200	Veil	2	213		Washer, 3x8x0.5mm	1
54	141 2 322T 46000	Shield Plate, Clock	1	214		Washer, 3x8x1mm	1
55	141 2 361T 15200	Bracket, Volume	1	215		Washer, 3x10x0.5mm	2
56	141 2 365T 41200	Bracket, Switch	1	216		Washer, 3x16x1mm	2
57	141 2 445T 11801	Rubber Cushion, Lamp	1	217		External "E" Ring, 2mm	2
58	141 2 114T 01700	Frame, Clock	1	218		External "E" Ring, 4mm	1
59	141 2 352T 33900	Spacer, Clock	1	219		Fiber Washer, 3x12x1mm	2
60	141 2 352T 34000	Spacer, Clock	1	220		Pan Head Screw with Washer & Spring Washer, 1.4x5mm	4
61	123 2 411R 10900	Plate Nut	1	221		Pan Head Screw with Spring Washer, 3x4mm	1
62	141 2 367T 31501	Bracket Socket	1	222		Tapping Screw with Washer, 3x6mm	5
63	123 2 472R 10200	Lug	2	223		Tapping Screw with Washer, 3x8mm	8
64	141 2 246T 50400	Sheet	2	224		Tapping Screw with Washer, 3x12mm	2
65	141 2 742T 25100	Lever, R/P	1	225		Tapping Screw with Washer, 3x14mm	2
66	123 2 566R 12000	Tuning Shaft	2				
67	141 2 363T 08700	Bracket, VC	1				
68	141 2 311T 30300	Chassis	1				
69	141 2 661T 24600	Pulley	5				
70	141 2 567T 02000	Pulley Shaft	4				
71	141 2 567T 02100	Pulley Shaft	1				
72	141 2 569T 00100	Guide Shaft, Rope	1				
73	141 0 566T 08400	Tuning Shaft Assembly	1				
74	123 2 415R 10100	Hexagon Nut	1				

PARTS LIST

Key No.	Part No.	Description	Q'ty
VOLUME PCB ASS'Y			
101	141 4 230T 73100	P.C. Board Assembly, Volume	1
	4 222T 67200	Variable Resistor, Volume	1
	4 222T 67300	Variable Resistor, Bass/Treble	2
	RESISTORS		
R842,942	Carbon 10K ohm	±10% ¼W	2
R845,945	Carbon 2.2K ohm	±10% ¼W	2
R844,944	Carbon 1.5K ohm	±10% ¼W	2
	CAPACITORS		
C835,935	AL Electrolytic 0.33µF 16V	+40-20%	2
C832,932	Mylar 0.068µF 50V ±20%		4
836,936	Mylar 0.022µF 50V ±20%		2
C834,934	Mylar 0.01µF 50V ±20%		2
C833,933	Ceramic 0.0022µF 50V ±10%		2
C837,937			

AMP PCB ASS'Y			
102	141 4 230T 72971	P.C. Board Assembly, AMP	1
	141 2 464T 08700	Fixer	3
	4 231T 74300	Switch, Mono-Stereo/Side-Auto	2
	4 231T 74400	Switch, Nor-FeCr-Cr	1
	4 231T 74500	Switch, Tape-Radio-Sleep	1
	4 231T 74600	Switch, R/P	1
	4 231T 65200	Switch, Beat	1
	4 231T 79800	Switch, Sleep Time Set	1
	4 235T 57300	Socket, Line In-Out	1
	4 235T 38000	Socket, Ext. SP, Microphone	3
	4 222T 39578	Volume	3
SVR701	4 252T 01015	Low Frequency Choke	2
702	4 253T 04200	Hi Frequency Choke	1
	4 258T 07100	OSC Coil	1
	4 236T 10576	Plug 9P	1
	4 235T 37900	Socket, Microphone	1
	4 235R 15700	Socket, Remote	1
	123 2 411R 10900	Plate Nut, Remote	1
	4 252T 06700	Choke	1
	4 236T 10279	Plug, 12P	1
	141 2 464T 24100	Fixer	1
	141 2 368T 19500	Heat Sink	1
IC801,	IC BA532 S2		2
901			
Q802,902	Transistor 2SC1571 G or 2SC693		2
Q801,901	Transistor 2SC536 G		6
804,904			
806,906			
Q803,903	Transistor 2SC536 F		4
805,905			
Q703	Transistor 2SA608 F		1
Q704,705	Transistor 2SD612E		2
Q701	Transistor 2SB187 RED		1
Q702,706	Transistor 2SC945 Q		2
D701,702	Diode DS442		6
802,902			
703,704			
D803,903	Diode 1S188 AM		4
804,904			
D709,711	Diode DS442		11
712,801			
901,717			
708,710			
713,716			
718			
D715	Diode MA26 W		1
D719	Zener Diode BZ061 JRC		1

Key No.	Part No.	Description	Q'ty
AMP PCB ASS'Y			
	RESISTOR		
R803,903	Carbon 2.2M ohm	±10% ¼W	2
R809,909	Carbon 1M ohm	±10% ¼W	2
R806,906	Carbon 820K ohm	±10% ¼W	2
R818,918	Carbon 560K ohm	±10% ¼W	2
R839,939	Carbon 470K ohm	±10% ¼W	2
R817,917	Carbon 820K ohm	±10% ¼W	2
R824,924	Carbon 270K ohm	±10% ¼W	4
850,950			
R816,916	Carbon 220K ohm	±10% ¼W	4
831,931			
R813,913	Carbon 100K ohm	±10% ¼W	6
836,936			
749,706			
R849,702	Carbon 82K ohm	±10% ¼W	4
703,704			
R751	Carbon 56K ohm	±10% ¼W	1
R812,912	Carbon 47K ohm	±10% ¼W	5
823,923			
748			
R953,747	Carbon 39K ohm	±10% ¼W	2
R822,922	Carbon 27K ohm	±10% ¼W	2
R808,908	Carbon 22K ohm	±10% ¼W	2
R841,941	Carbon 18K ohm	±10% ¼W	2
R827,927	Carbon 12K ohm	±10% ¼W	2
R826,926	Carbon 10K ohm	±10% ¼W	6
851,951			
712,714			
R754	Carbon 100K ohm	±10% ¼W	1
R360	Carbon 390K ohm	±10% ¼W	1
R949	Carbon 82K ohm	±10% ¼W	1
R820,920	Carbon 150K ohm	±10% ¼W	2
R814,914	Carbon 8.2K ohm	±10% ¼W	2
R804,904	Carbon 6.8K ohm	±10% ¼W	5
805,905			
718			
R811,911	Carbon 4.7K ohm	±10% ¼W	5
726,727			
709			
R724,852	Carbon 3.9K ohm	±10% ¼W	3
952			
R819,919	Carbon 3.3K ohm	±10% ¼W	4
708,722			
R801,901	Carbon 2.2K ohm	±10% ¼W	6
821,921			
725,705			
R825,925	Carbon 1.5K ohm	±10% ¼W	2
R802,902	Carbon 1.2K ohm	±10% ¼W	2
R833,933	Carbon 1K ohm	±10% ¼W	5
835,935			
707			
R828,928	Carbon 820 ohm	±10% ¼W	2
R717	Carbon 470 ohm	±10% ¼W	1
R846,946	Carbon 390 ohm	±10% ¼W	2
R830,930	Carbon 330 ohm	±10% ¼W	5
710,711			
713			
R720	Carbon 220 ohm	±10% ¼W	1
R834,934	Carbon 120 ohm	±10% ¼W	2
R716	Carbon 82 ohm	±10% 1W	1
R807,907	Carbon 56 ohm	±10% ¼W	5
832,932			
733			
R838,938	Carbon 33 ohm	±10% ¼W	2
R752	Carbon 330K ohm	±10% ¼W	1
R829,929	Carbon 5.6K ohm	±10% ¼W	2
R755	Carbon 270 ohm	±10% ¼W	1
R715	Carbon 56 ohm	±10% 1W	1
R721	Carbon 180 ohm	±10% ¼W	1
R810,910	Carbon 22 ohm	±10% ¼W	2
R728	Carbon 10 ohm	±10% ¼W	1
R723	Carbon 10 ohm	±10% ¼W	1
R719	Carbon 8.2 ohm	±10% ¼W	1
R10	Carbon 1M ohm	±10% ¼W	1
R840,940	Carbon 2.7K ohm	±10% ¼W	2

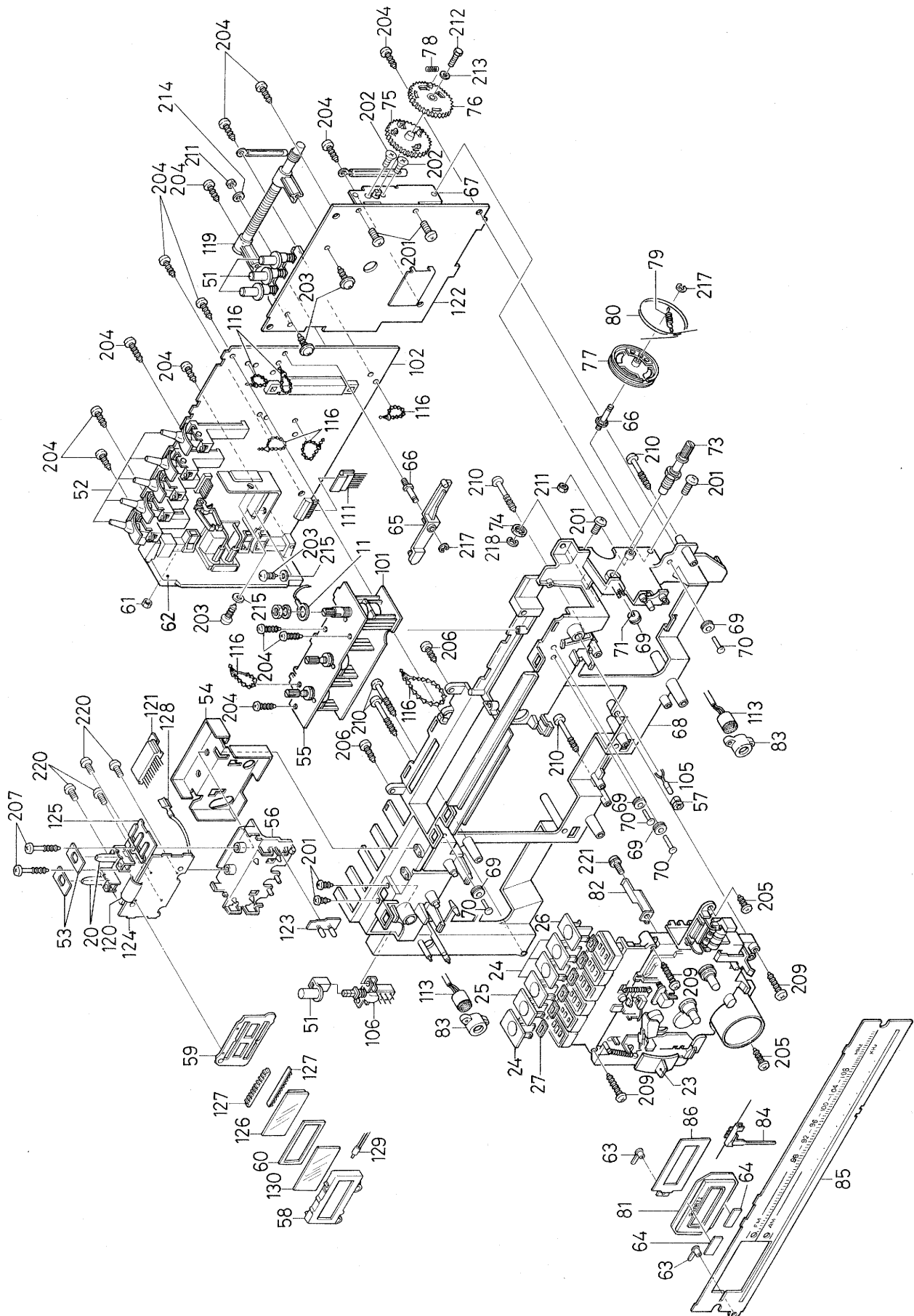
PARTS LIST

Key No.	Part No.	Description	Q'ty	Key No.	Part No.	Description	Q'ty
AMP PCB ASS'Y				TUNER PCB ASS'Y			
		CAPACITORS					
C705		Electrolytic 2200 μ F 25V	1	122	141 4 230T 73371	P.C. Board Assembly, Tuner	1
C710		Electrolytic 2200 μ F 16V	1	L109	4 258T 08131	OSC Coil	1
C716		Electrolytic 1000 μ F 16V	1	VC101	4 224T 09300	Variable Capacitor	1
C847,947		Electrolytic 1000 μ F 10V	2	CT101	4 224R 11671	Trimmer	3
C845,945		Electrolytic 470 μ F 10V	2	102			
C708		Electrolytic 220 μ F 16V	1	104			
C804,904		Electrolytic 220 μ F 10V	2	CT103	4 224T 08800	Trimmer	1
C849,949		Electrolytic 100 μ F 16V	2	L101	4 265R 11600	VHF Coil	1
C817,917		Electrolytic 100 μ F 10V	2	L106	4 265R 12600	VHF Coil	1
C714		Electrolytic 22 μ F 10V	1	L102	4 265R 00500	VHF Coil	1
C805,905		Electrolytic 4.7 μ F 25V	2	L103	4 265R 01200	VHF Coil	1
C838,938		Electrolytic 3.3 μ F 25V	2	L107	4 265R 10800	VHF Coil	1
C809,909		Electrolytic 1 μ F 25V	4	L104	4 265R 11700	VHF Coil	1
818,918				L105	4 265R 13500	VHF Coil	1
C820,920		Electrolytic 1 μ F 25V	4	T301	4 256R 20831	I.F.T	1
824,924				T302	4 256R 02131	I.F.T	1
C825,925		Electrolytic 1 μ F 25V	4	T303	4 256R 15131	I.F.T	1
829,929				T304	4 256R 02331	I.F.T	1
C826,926		Electrolytic 1 μ F 25V	4	T305,306	4 256R 00131	I.F.T	2
831,931				T307	4 256R 00231	I.F.T	1
C828,928		Electrolytic 470 μ F 16V	2		4 256T 80400	I.F.Filter	
C707,729		Electrolytic 47 μ F 10V	4	CF301	4 256T 80471	I.F.Filter	
841,941					4 256T 80472	I.F.Filter	
C715,732		Electrolytic 33 μ F 10V	2		4 256T 80473	I.F.Filter	
C840,940		Electrolytic 22 μ F 16V	2		4 256T 80474	I.F.Filter	
C821,921		Ceramic 0.0047 μ F 50V $\pm 10\%$	2	S101	4 231T 83900	Switch	1
C815,915		Ceramic 0.001 μ F 50V $\pm 10\%$	4	B101	123 2 471R 10900	Core	1
839,939				CR501	4 227T 02300	CR Pack	2
C731,730		Ceramic 0.001 μ F 50V $\pm 10\%$	2	502			
C811,911		Ceramic 680pF 50V $\pm 10\%$	2	SVR350	4 222T 39475	Semi Fixed Variable Resistor,	2
C851,951		Ceramic 470pF 50V $\pm 10\%$	2	502		10K-B	
C843,943		Ceramic 270pF 50V $\pm 10\%$	2		141 2 322T 18900	Shield Plate	1
C933		Ceramic 220pF 50V $\pm 10\%$	1		141 2 322T 18100	Shield Plate	1
C806,906		Ceramic 100pF 50V $\pm 10\%$	2	IC501		IC AN7410	1
C807,907		Ceramic 82pF 50V $\pm 10\%$	4	Q102		Transistor 2SC930 E RF	1
830,930				Q103,301		Transistor 2SC930 D2 Conv.	2
C711		Ceramic 47pF 50V $\pm 10\%$	1	Q302		Transistor 2SC930 E IF	1
C803,903		Ceramic 0.0015 μ F 50V $\pm 10\%$	2	Q303		Transistor 2SC930 D IF	1
C813,913		Ceramic 0.0039 μ F 50V $\pm 10\%$	2	Q304,305		Transistor 2SC536 G	2
C801,901		AL Electrolytic 0.22 μ F 16V	2	Q306,307		Transistor 2SC536 G	2
		+40-20%		Q101		Transistor 2SC930 D RF	1
C823,923		AL Electrolytic 0.1 μ F 16V	4	D104		Diode 1S553	1
808,908		+40-20%		D304,305		Diode 1S188 FM1	2
C802,902		AL Electrolytic 0.1 μ F 16V	2	D102,103		Diode 1S2473	9
		+40-20%		105,301			
C848,948		Mylar 0.15 μ F 50V $\pm 20\%$	2	302,303			
C846,946		Mylar 0.1 μ F 50V $\pm 20\%$	2	307,350			
C819,919		Mylar 0.047 μ F 50V $\pm 20\%$	2	352			
C812,912		Mylar 0.022 μ F 50V $\pm 20\%$	2	D306		Diode RD4.7E C	1
C713		Mylar 0.022 μ F 50V $\pm 20\%$	1	D106		Diode MV11 T	1
C822,922		Mylar 0.012 μ F 50V $\pm 20\%$	2	D351,353		Diode 1S2473	2
C814,914		Mylar 0.0082 μ F 50V $\pm 20\%$	2				
C712		Mylar 820pF 50V $\pm 20\%$	1				
POWER SOURCE PCB ASS'Y						RESISTORS	
103	141 4 230T 73071	P.C. Board Assembly Power Source	1	R110		Carbon 10 ohm $\pm 10\%$ $\frac{1}{4}$ W	1
	4 235T 35800	Socket AC/DC	1	R103		Carbon 33 ohm $\pm 10\%$ $\frac{1}{4}$ W	1
	141 2 135T 44900	Cover	1	R514		Carbon 180 ohm $\pm 10\%$ $\frac{1}{4}$ W	1
	4 243T 12806	Lead Assembly, Orange	1	R311		Carbon 150 ohm $\pm 10\%$ $\frac{1}{4}$ W	1
	4 243T 12806	Lead Assembly, Blue	1	R111		Carbon 180 ohm $\pm 10\%$ $\frac{1}{4}$ W	1
D706,707		Diode 1N4001	4	R351		Carbon 390 ohm $\pm 10\%$ $\frac{1}{4}$ W	1
713,714				R306		Carbon 330 ohm $\pm 10\%$ $\frac{1}{4}$ W	1
C701,702				R304,305		Carbon 560 ohm $\pm 10\%$ $\frac{1}{4}$ W	3
703,704				308			
		Ceramic Cap. 0.022 μ F 50V	4	R104		Carbon 820 ohm $\pm 10\%$ $\frac{1}{4}$ W	1
		+80-20%		R352,510		Carbon 820 ohm $\pm 10\%$ $\frac{1}{4}$ W	2
				R310,317		Carbon 1K ohm $\pm 10\%$ $\frac{1}{4}$ W	4
				502,511			
				R107		Carbon 1K ohm $\pm 10\%$ $\frac{1}{4}$ W	1
				R303,326		Carbon 1.5K ohm $\pm 10\%$ $\frac{1}{4}$ W	2
				R112		Carbon 5.6K ohm $\pm 10\%$ $\frac{1}{4}$ W	1
				R105		Carbon 5.6K ohm $\pm 10\%$ $\frac{1}{4}$ W	1
				R320		Carbon 6.8K ohm $\pm 10\%$ $\frac{1}{4}$ W	1
				R325		Carbon 220 ohm $\pm 10\%$ $\frac{1}{4}$ W	1
				R324		Carbon 10K ohm $\pm 10\%$ $\frac{1}{4}$ W	1
				R515,516		Carbon 2.2K ohm $\pm 10\%$ $\frac{1}{4}$ W	2
				R319		Carbon 8.2K ohm $\pm 10\%$ $\frac{1}{4}$ W	1
				R358		Carbon 10K ohm $\pm 10\%$ $\frac{1}{4}$ W	1
				R506,507		Carbon 5.6K ohm $\pm 10\%$ $\frac{1}{4}$ W	2
				R503		Carbon 18K ohm $\pm 10\%$ $\frac{1}{4}$ W	1
				R318,353		Carbon 39K ohm $\pm 10\%$ $\frac{1}{4}$ W	1
				R508		Carbon 27K ohm $\pm 10\%$ $\frac{1}{4}$ W	1
HEADPHONE PCB ASS'Y							
104	141 4 230T 73200	P.C. Board Assembly Headphone	1				
	4 235T 50100	Socket	1				
R848,948		Carbon Res 100 ohm $\pm 10\%$ $\frac{1}{4}$ W	2				
C850,950		Electrolytic Cap 4.7 μ F 16V	2				
		Nonpolar					

PARTS LIST

Key No.	Part No.	Description	Q'ty
TUNER PCB ASS'Y			
		RESISTORS	
R501		Carbon 47K ohm $\pm 10\%$ $\frac{1}{4}W$	1
R108,322		Carbon 100K ohm $\pm 10\%$ $\frac{1}{4}W$	2
R356,357		Carbon 100K ohm $\pm 10\%$ $\frac{1}{4}W$	2
R101		Carbon 120K ohm $\pm 10\%$ $\frac{1}{4}W$	1
R102,301		Carbon 150K ohm $\pm 10\%$ $\frac{1}{4}W$	2
R350		Carbon 270K ohm $\pm 10\%$ $\frac{1}{4}W$	1
R309		Carbon 270K ohm $\pm 10\%$ $\frac{1}{4}W$	1
R359		Carbon 330K ohm $\pm 10\%$ $\frac{1}{4}W$	1
R302		Carbon 820K ohm $\pm 10\%$ $\frac{1}{4}W$	1
R321		Carbon 220K ohm $\pm 10\%$ $\frac{1}{4}W$	1
R512		Carbon 27K ohm $\pm 10\%$ $\frac{1}{4}W$	1
R307		Carbon 56K ohm $\pm 10\%$ $\frac{1}{4}W$	1
R353		Carbon 47K ohm $\pm 10\%$ $\frac{1}{4}W$	1
R508		Carbon 10K ohm $\pm 10\%$ $\frac{1}{4}W$	1
R312		Carbon 270 ohm $\pm 10\%$ $\frac{1}{4}W$	1
R313,314		Carbon 1K ohm $\pm 10\%$ $\frac{1}{4}W$	2
R315,316		Carbon 5.6K ohm $\pm 10\%$ $\frac{1}{4}W$	2
R323		Carbon 1K ohm $\pm 10\%$ $\frac{1}{4}W$	1
R109		Carbon 100 ohm $\pm 10\%$ $\frac{1}{4}W$	1
		CAPACITORS	
C308		Ceramic 1pF 50V $\pm 0.25pF$	1
C309		Ceramic 3pF 50V $\pm 0.25pF$	1
C108,116		Ceramic 4pF 50V $\pm 0.25pF$	2
C301		Ceramic 7pF 50V $\pm 0.5pF$	1
C112		Ceramic 7pF 50V $\pm 0.5pF$	1
C115		Ceramic 10pF 50V $\pm 0.5pF$	1
C350		Ceramic 2pF 50V $\pm 0.25pF$	1
C351		Ceramic 5pF 50V $\pm 0.5pF$	1
C102		Ceramic 10pF 50V $\pm 0.5pF$	1
C103		Ceramic 15pF 50V $\pm 10\%$	1
C109		Ceramic 16pF 50V $\pm 5\%$	1
C110		Ceramic 20pF 50V $\pm 10\%$	1
C311		Ceramic 30pF 50V $\pm 10\%$	1
C104		Ceramic 36pF 50V $\pm 10\%$	1
C105		Ceramic 47pF 50V $\pm 10\%$	1
C310		Ceramic 100pF 50V $\pm 10\%$	1
C302		Ceramic 220pF 50V $\pm 10\%$	1
C326,327		Ceramic 100pF 50V $\pm 10\%$	3
328			
C314,315		Ceramic 220pF 50V $\pm 10\%$	3
317			
C111		Ceramic 330pF 50V $\pm 10\%$	1
C106,107		Ceramic 0.01 μF 50V $+80-20\%$	4
114,305			
C117,118		Ceramic 0.022 μF 50V	6
120,306		$+80-20\%$	
319,320			
C353,354		Ceramic 0.022 μF 50V	3
355		$+80-20\%$	
C304		Ceramic 0.04 μF 50V $+80-20\%$	1
C119		Ceramic 0.047 μF 50V	1
		$+80-20\%$	
C307		BC CON 0.22 μF 12V $\pm 20\%$	1
C356		Ceramic 0.022 μF 50V $+80-20\%$	1
C352,513		Ceramic 0.001 μF 50V $\pm 10\%$	2
C330,331		Ceramic 100pF 50V $\pm 10\%$	2
C329		Ceramic 0.001 μF 50V $\pm 10\%$	1
C324		Electrolytic 470 μF 10V	1
C325		Electrolytic 4.7 μF 10V	1
C316,318		Electrolytic 4.7 μF 6.3V	2
C503,506		AL Electrolytic 0.47 μF 10V	2
		$+40-20\%$	
C504		AL Electrolytic 0.22 μF 10V	1
		$+40-20\%$	
C510,511		AL Electrolytic 0.1 μF 10V	2
		$+40-20\%$	
C507		Styrol 470pF 50V $\pm 5\%$	1
C122		Styrol 120pF 50V $\pm 5\%$	1
C323,502		Mylar 0.047 μF 50V $\pm 20\%$	2
C321		Mylar 0.022 μF 50V $\pm 20\%$	1
C508,509		Mylar 0.012 μF 50V $\pm 20\%$	2
C303,312		Mylar 0.01 μF 50V $\pm 20\%$	3
313			
C121		Mylar 0.0068 μF 50V $\pm 20\%$	1
C322		Electrolytic 1 μF 6.3V	1
C358		AL Electrolytic 0.1 μF 10V	1
		$+40-20\%$	

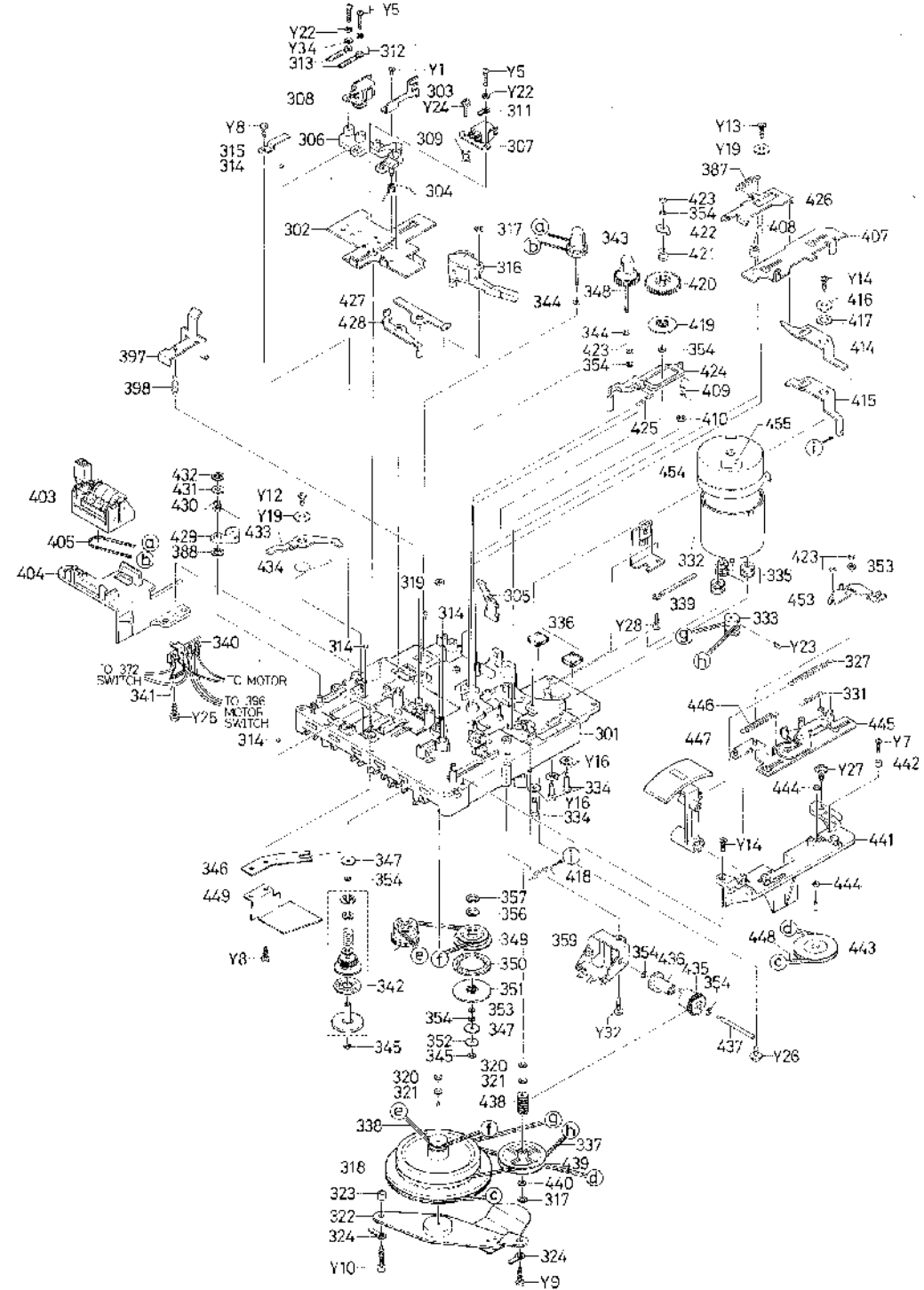
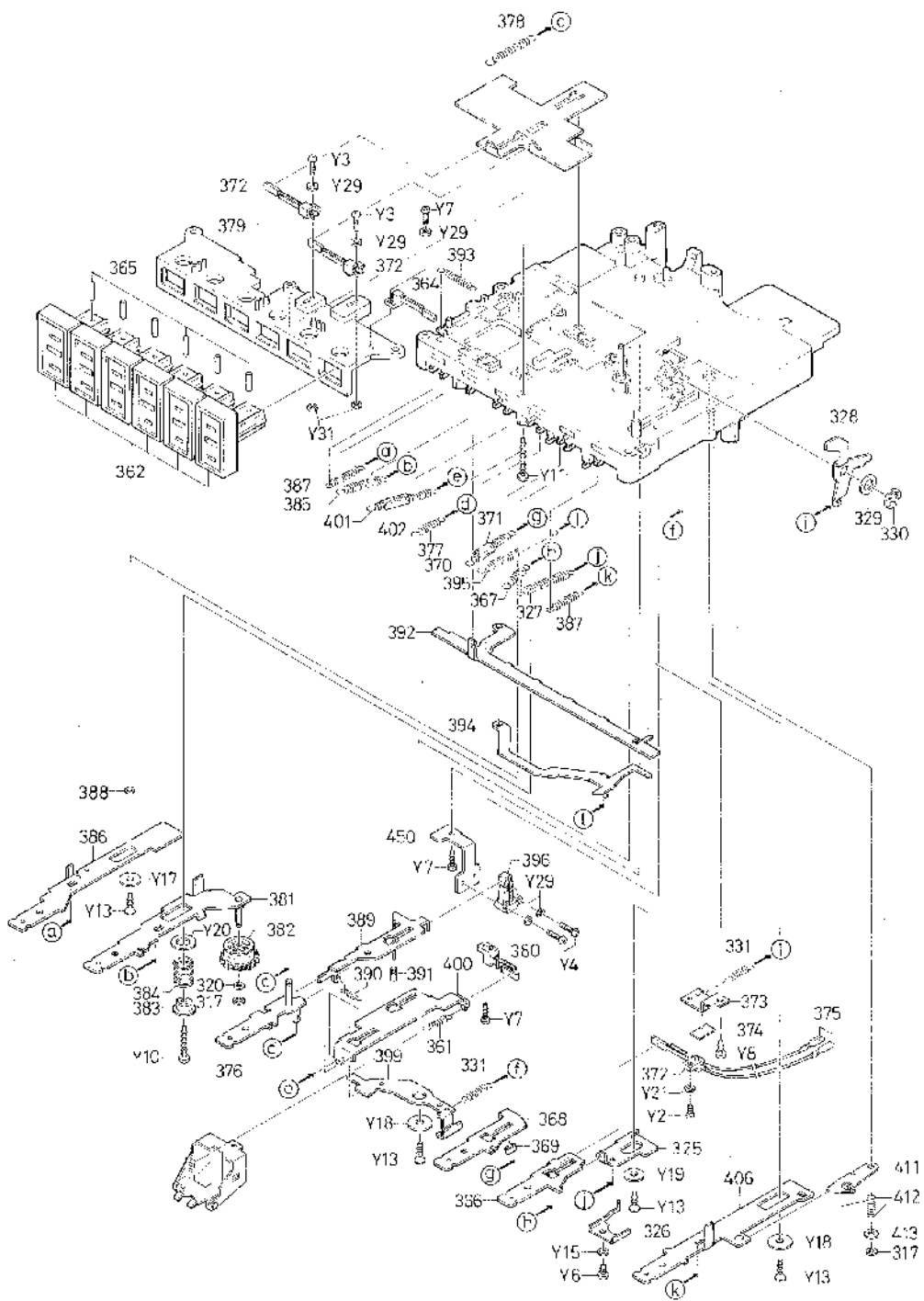
Key No.	Part No.	Description	Q'ty
TUNER PCB ASS'Y			
		CAPACITORS	
C512		Electrolytic 2200 μF 16V	1
C514		Electrolytic 1 μF 16V	1
LED PCB ASS'Y			
123	141 4 230T 79500	P.C. Board Assembly, LED	1
D501		LED SLP-131B-A or B or C Red	1
D354		LED SLP231B GR	1
CLOCK PCB ASS'Y			
124	141 4 230T 71501	P.C. Board Assembly, Clock	1
R1,2,3	4 221T 02700	Resistor	1
4,5			
X1	4 225T 01671	Crystal	1
CT-1	4 224T 12100	Trimmer	1
IC-1		LSI MPD 833GN	1
		CAPACITORS	
C2,4		Tantal 0.22 μF 10V $\pm 20\%$	2
C3,7,8		Ceramic 0.001 μF 50V $\pm 10\%$	3
C1		BC CON 0.1 μF 12V $+40-20\%$	1
C6		Ceramic 22pF 50V $\pm 10\%$	1
C10		Ceramic 5pF 50V $\pm 0.5pF$	1
C5		Ceramic 0.0047 μF 50 $+80-20\%$	1
		RESISTORS	
R9		Mini Carbon 1M ohm $\pm 10\%$ 1/8W	1
R6,7,8		Mini Carbon 1M ohm $\pm 10\%$ 1/8W	3
CLOCK SWITCH PCB ASS'Y			
125	141 2 230T 71600	P.C. Board Assembly, Clock	1
S5	4 231T 47800	Special Switch	1
S4-1	4 231T 47700	Switch	1
4-2			
	141 2 382T 11100	Terminal	1
	141 2 467T 01603	Rivet, 2x3	3

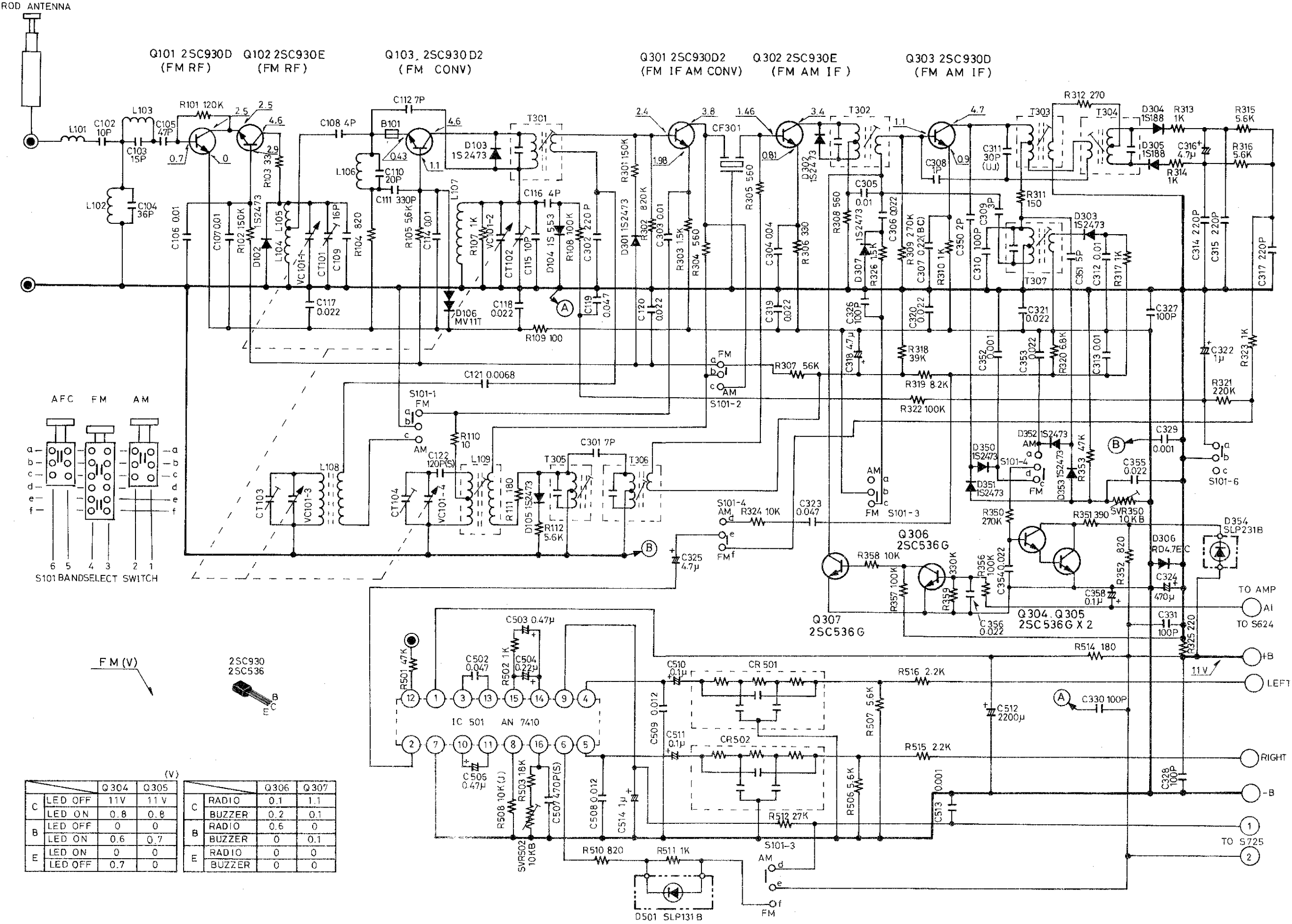


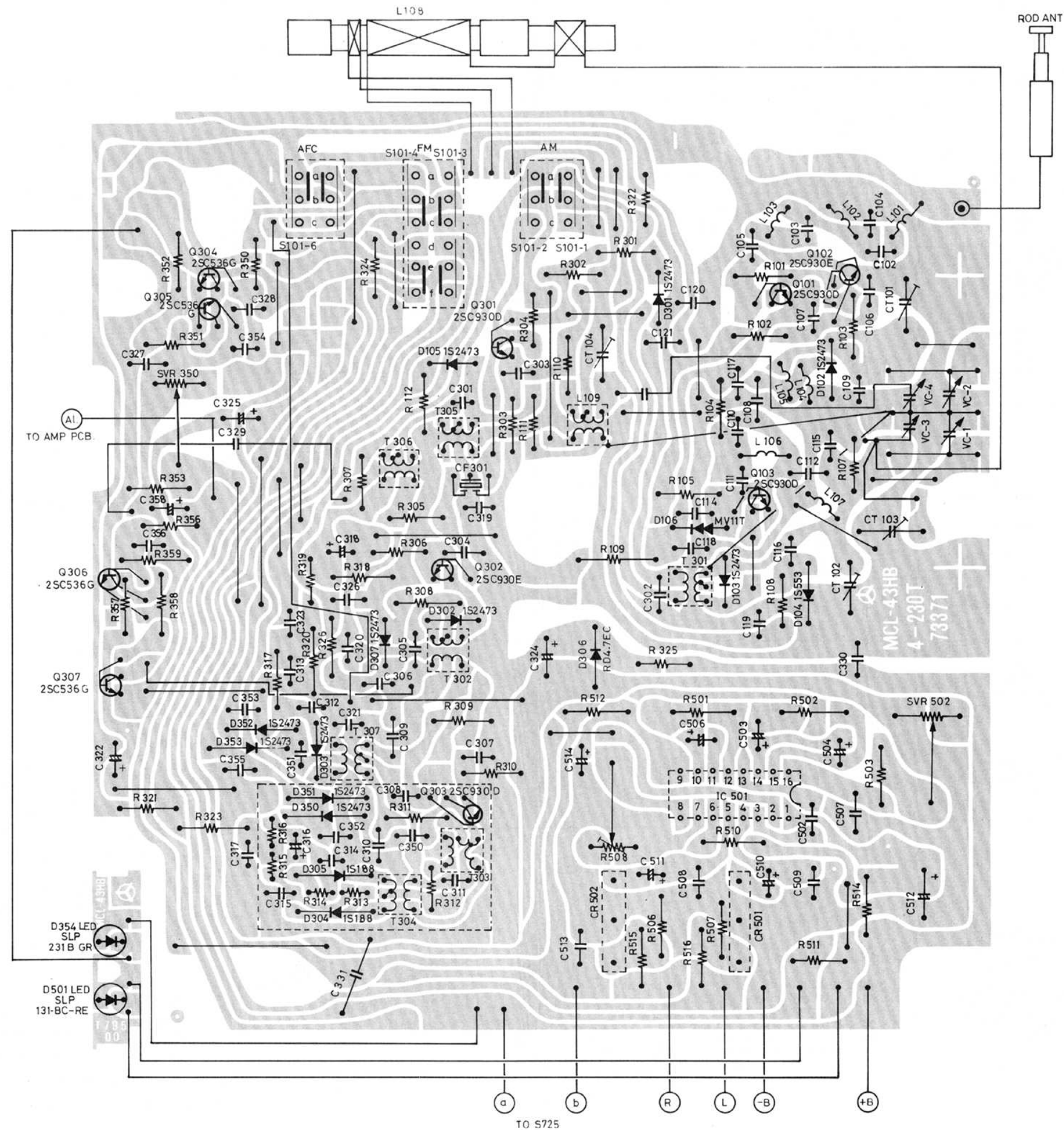
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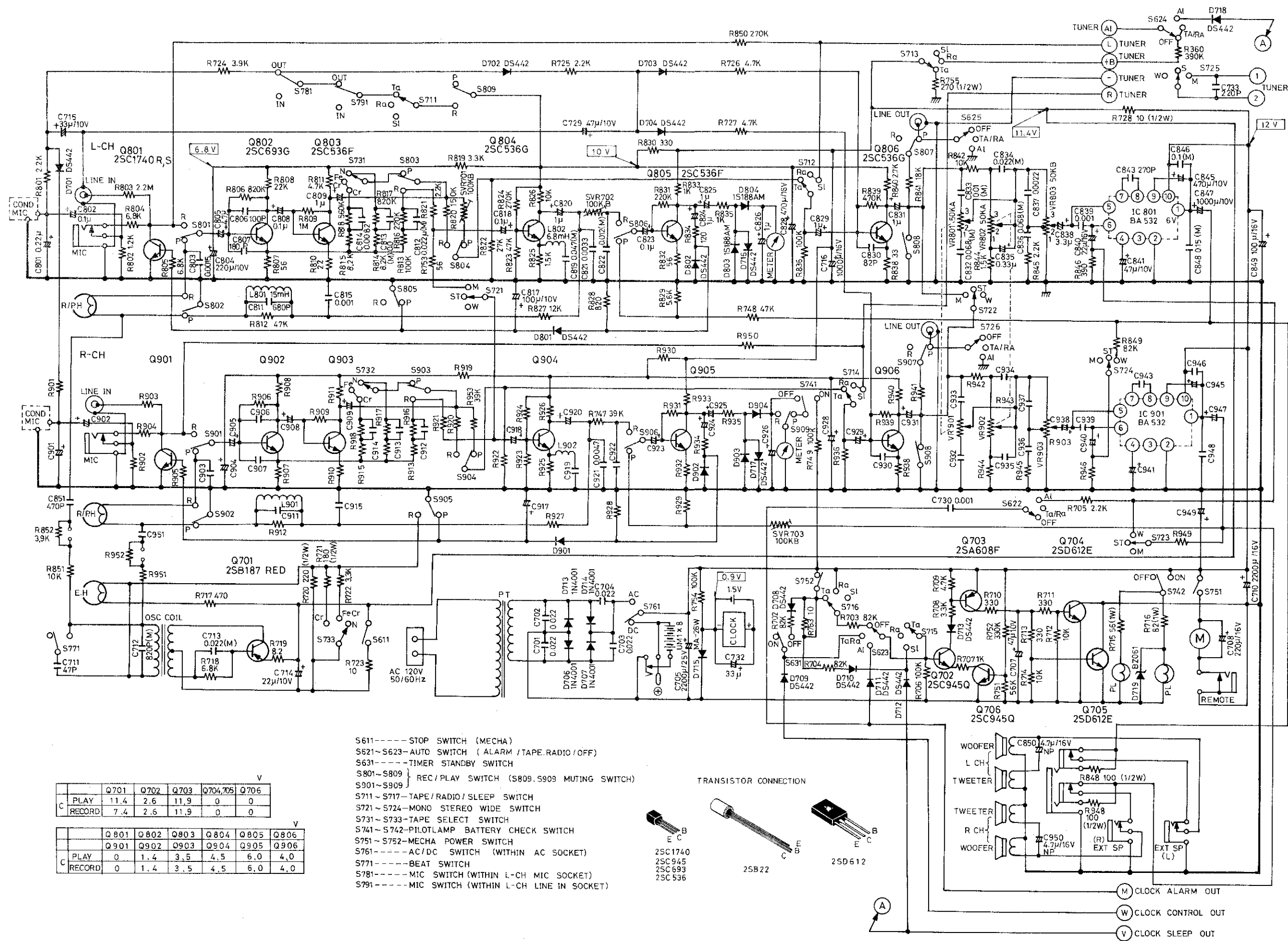
Key No.	Part No.	Description	Q'ty	Key No.	Part No.	Description	Q'ty
MECHANISM				MECHANISM			
301	141 0 311T 26221	Chassis Assy	1	377	141 2 855T 28800	Spring Coil	1
302	141 2 731T 37502	Slide, Head	1	378	141 2 851T 96400	Spring Coil	1
303	141 2 821T 10700	Tape Guide	1	379	141 2 351T 43300	Bracket Mounting	1
304	141 2 852T 43700	Spring Wire, Pinch Roller	1	380	4 231T 71200	Switch FWD	1
305	141 2 853T 46901	Spring Plate, Cassette plase	1	381	141 0 731T 54500	Slide Assy, REW (141-0-731T-16400)	1
306	141 2 375T 06900	Bracket, Head	1	382	141 2 661T 22600	Pulley, REW	1
307	4 242T 21671	R/P Head	1	383	141 2 461T 30200	Pipe	1
308	4 242T 19500	E Head	1	384	141 2 851T 65600	Spring Coil	1
309	141 2 851T 82700	Spring Coil, R/P Head	1	385	141 2 855T 17400	Spring Coil	1
311	123 2 472R 00200	Lug	1	386	141 2 731T 57800	Slide, REC	1
312	141 2 472T 02200	Lug	2	387	141 2 851T 93000	Spring Coil	3
313	141 2 490T 00600	Tube	2	388	141 2 453T 30700	Washer 5.2x8x0.13 Nylon	2
314	141 2 345T 00400	Steel Ball	4	389	141 2 731T 43101	Slide	1
315	141 2 853T 53200	Spring Plate	1	390	141 2 855T 00200	Spring Coil	1
316	141 0 545T 04720	Lever Pinch Roller (141-0-545T-02900)	1	391	141 2 490T 05000	Tube	6
317	141 2 457T 23000	Special Washer	4	392	141 0 731T 16501	Slide Assy, Button Lock	1
318	141 0 521T 09300	Flywheel Assy	1	393	141 2 851T 73800	Spring Coil	1
319	141 2 457T 04300	Special Washer	1	394	141 2 742T 07100	Lever	1
320	141 2 453T 30201	Washer 2.5x5x0.25 Nylon	3	395	141 2 851T 91200	Spring Coil	1
321	141 2 453T 30202	Washer 2.6x4.7x0.5 Nylon	1	396	4 231T 82600	Switch, Main	1
322	141 0 524T 07801	Bracket Flywheel Assy	1	397	141 2 742T 12500	Lever	1
323	141 2 683T 22800	Ring	1	398	141 2 851T 87701	Spring Coil	1
324	123 2 472R 00400	Lug	2	399	141 2 742T 08100	Lever	1
325	141 2 742T 08201	Lever	1	400	141 2 731T 55300	Slide	1
326	141 2 853T 52900	Spring Plate	1	401	141 2 855T 19600	Spring Coil	1
327	141 2 851T 80100	Spring Coil	1	402	141 2 490T 00900	Tube	1
328	141 2 741T 96400	Lever	1	403	141 2 811T 05400	Counter	1
329	141 2 453T 30802	Washer 6.2x9.5x0.5 Nylon	1	404	141 2 812T 07000	Bracket, Counter	1
330	141 2 457T 23200	Special Washer	1	405	141 2 564T 18200	Square Belt	1
331	141 2 851T 56100	Spring Coil	3	406	141 0 731T 54901	Slide Assy, Pouse Button	1
332	4 527T 11200	Motor	1	407	141 2 731T 57600	Slide, Pouse	1
333	141 2 661T 69200	Pully, Motor	1	408	141 2 461T 30700	Pipe	1
334	141 2 421T 12501	Special Screw, Motor	3	409	141 2 852T 42800	Spring Wire	1
335	141 2 445T 07000	Rubber Cushion, Motor	3	410	141 2 457T 10300	Special Washer 3.2x5.7x0.1	1
336	141 2 447T 36000	Cushion, Motor	3	411	141 2 614T 05200	Lever Lock	1
337	141 2 564T 19900	Square Belt Main	1	412	141 2 852T 37900	Spring Wire	1
338	141 2 564T 20000	Belt	1	413	141 2 453T 01200	Washer 3x8x1	1
339	141 2 464T 08700	Fixer	1	414	141 2 742T 07400	Lever, Pouse	1
340	4 237T 02100	Terminal Board	1	415	141 2 742T 06900	Lever	1
341		Carbon 680 ohm $\pm 10\%$ 1/4W	1	416	141 2 461T 28700	Pipe	1
342	141 0 661T 22700	Pulley Assy, Supply (141-0-661T-02400)	1	417	141 2 453T 30800	Washer 6.2x9.5x0.13 Nylon	1
343	141 2 531T 10101	Reel Plate, Supply	1	418	141 2 855T 15000	Spring Coil	1
344	141 2 457T 11000	Special Washer	4	419	141 2 661T 24300	Pulley	1
345	141 2 457T 23700	Special Washer	2	420	141 0 581T 00100	Gear Assy	1
346	141 2 853T 48000	Spring Plate, Back Tention	2	421	141 2 855T 16500	Spring Coil	1
347	141 2 457T 06200	Special Washer, Back Tention	2	422	141 2 858T 08100	Bracket, Spring	1
348	141 2 531T 10700	Reel Plate, Tack UP	1	423	141 2 457T 23800	Special Washer	3
349	141 2 661T 22901	Pully, Tack Up	1	424	141 2 731T 53400	Slide, Auto Stop	1
350	141 2 452T 02300	Felt	1	425	141 2 855T 15400	Spring Coil	1
351	141 2 661T 23001	Pulley, Tack Up	1	426	141 2 731T 54200	Slide, Rev	1
352	141 2 453T 31200	Washer 2x8.5x0.25 Poly	1	427	141 2 742T 07500	Lever, Rev	1
353	141 2 453T 30100	Washer 2.1x4x0.13 Nylon	2	428	141 2 742T 07600	Lever, Cue	1
354	141 2 453T 30101	Washer 2.1x4x0.25 Nylon	4	429	141 2 742T 07900	Lever, Rec	1
355	141 2 453T 32400	Washer 4.9x8x0.13 Nylon	1	430	141 2 852T 45400	Spring Wire	1
356	141 2 453T 32401	Washer 4.9x8x0.25	1	431	141 2 453T 00800	Washer 3x8x0.5	1
357	141 2 445T 21200	Rubber Cushion	1	432	141 2 457T 20100	Special Washer	1
358	141 0 742T 07000	Lever Assy	1	433	141 2 742T 08000	Lever	1
	141 2 851T 96200	Spring Coil		434	141 2 852T 43300	Spring Wire	1
	141 2 855T 01900	Spring Coil		435	141 2 581T 09100	Gear, Auto Stop	1
361	141 2 855T 12400	Spring Coil } or	1	436	141 2 661T 24400	Pulley, Auto Stop	1
	141 2 855T 19900	Spring Coil		437	141 2 753T 20800	Shaft	1
	141 2 855T 28700	Spring Coil		438	141 2 581T 01900	Gear	1
362	141 2 161T 48800	Push Button	6	439	141 0 661T 25300	Pulley Assy	1
365	141 2 488T 01801	Pin	1	440	141 2 453T 30200	Washer 2.6x4.7x0.13 Nylon	2
366	141 2 731T 55000	Slide, Stop Button	1	441	141 0 312T 15300	Sub Chassis Assy	1
367	141 2 855T 29900	Spring Coil	1	442	141 2 461T 32800	Pipe	1
368	141 2 731T 54300	Slide, FF Button	1	443	141 0 661T 13200	Pully Assy	1
369	141 2 490T 00500	Tube	3	444	141 2 453T 30001	Washer 1.7x3.2x0.25	1
370	141 2 855T 29800	Spring Coil	1	445	141 0 731T 18200	Slide Assy	1
371	141 2 490T 01100	Tube	1	446	141 2 851T 63800	Spring Coil	1
372	4 231T 68000	Switch	3	447	141 0 741T 12700	Lever Assy	1
373	141 2 365T 37900	Bracket, Switch	1	448	141 2 564T 19500	Square Belt	1
374	141 2 352T 26900	Spacer	1	449	141 2 322T 31401	Shield Plate	1
375	4 243T 12805	Lead	2	450	141 2 365T 41300	Bracket Switch	1
376	141 0 731T 54400	Slide Assy (141-0-731T-16300)	1	453	141 2 742T 22200	Lever	1
				454	141 2 323T 00300	Shield Box, Motor	1
				455	141 6 479T 35300	Label Motor	1

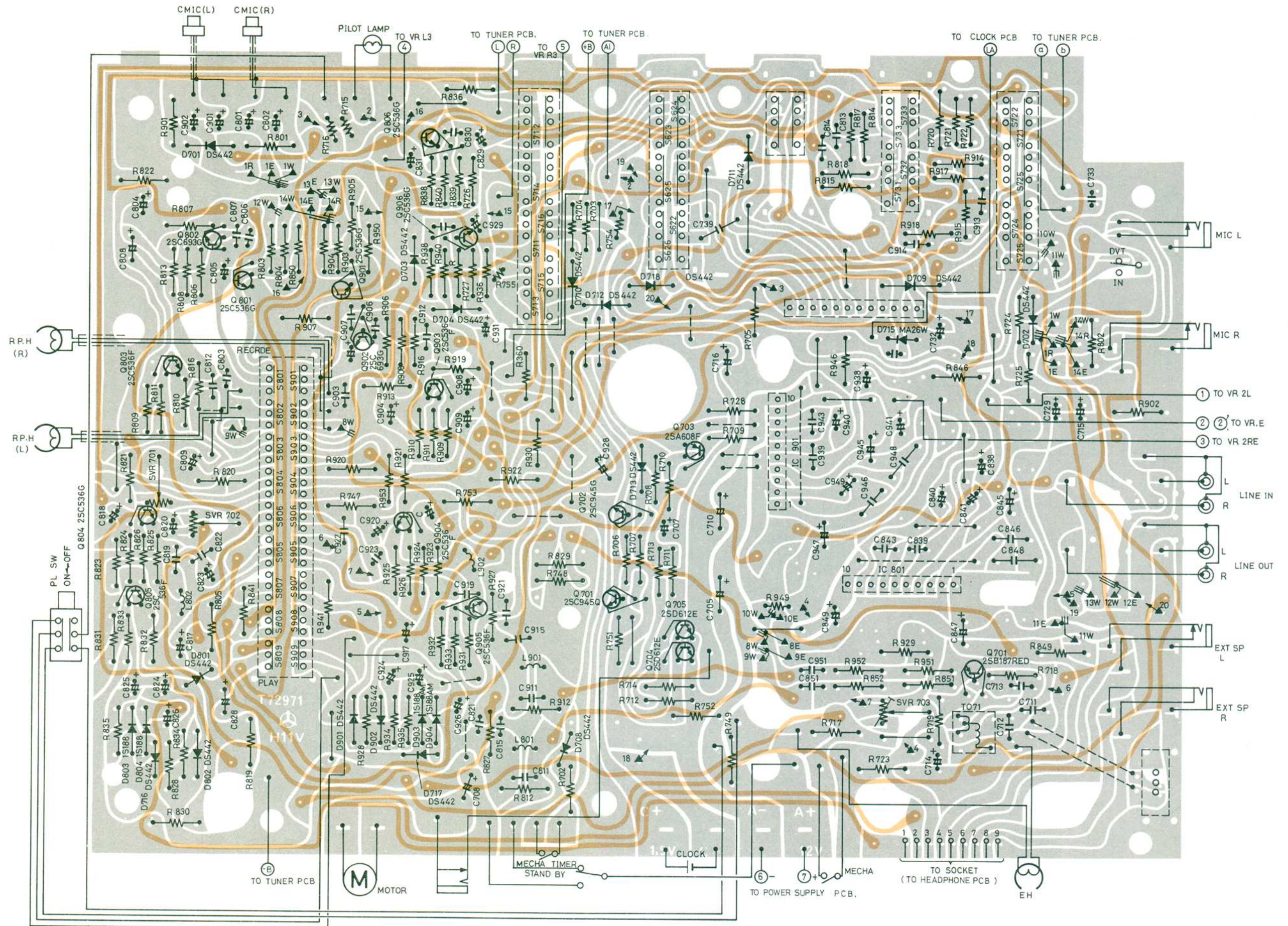
Key No.	Part No.	Description	Q'ty
MECHANISM SCREWS			
Y1		Pan Hd. Screw 2x2	1
Y2		Pan Hd. Screw 2x4	1
Y3		Pan Hd. Screw 3x8	2
Y4		Pan Hd. Screw 2.6x6	2
Y5		Pan Hd. Screw 2x12	3
Y6		Pan Hd. Screw 2.6x4	1
Y7		Pan Hd. Tapping Screw 2.3x8	3
Y8		Pan Hd. Tapping Screw 3x6	3
Y9		Pan Hd. Tapping Screw 3x10	1
Y10		Pan Hd. Tapping Screw 3x14	2
Y11		Pan Hd. Tapping Screw 3x20	1
Y12		Pan Hd. Tapping Screw 3x6	1
Y13		Flat Hd. Tapping Screw 3x8	5
Y14		Flat Hd. Tapping Screw 3x10	2
Y15		Washer 2.6x5x0.5	1
Y16		Washer 3x8x0.5	3
Y17		Washer 3x10x1	1
Y18		Flat Hd. Wood Screw 3x12	2
Y19		Washer 4x10x0.8	3
Y20		Washer 6x11.5x0.8	1
Y21		Washer 2x4.8x0.3	1
Y22		Spring Washer 2	3
Y23		Head Less Screw 2x3	1
Y24		Pan Hd. Screw W/Washer 2x12	1
Y25		Pan Hd. Tapping Screw 3x10	1
Y26		Pan Hd. Tapping Screw W/Washer 3x6	1
Y27		Pan Hd. Tapping W/Washer 3x10	1
Y29		Washer 2x4.3x0.3	3
Y30		Pan Hd. Tapping Screw 2.3x6	1
Y28		Tapping Screw 3.5x8mm	1
Y31		Nut 2mm	2
Y32		Pan Hd. Tapping Screw 3x8	1
Y34		Washer 2	1
Y35		Washer 3.5	2

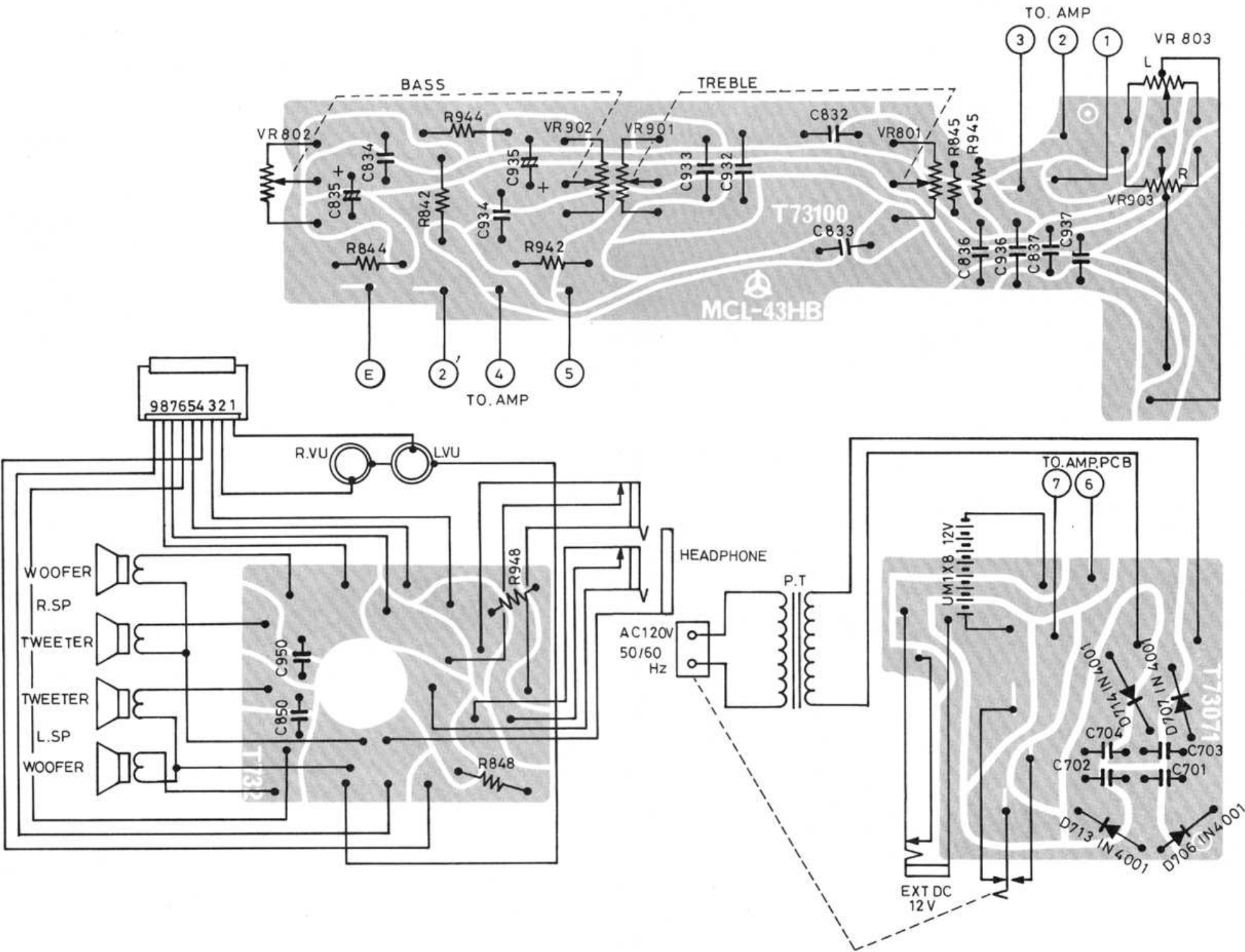


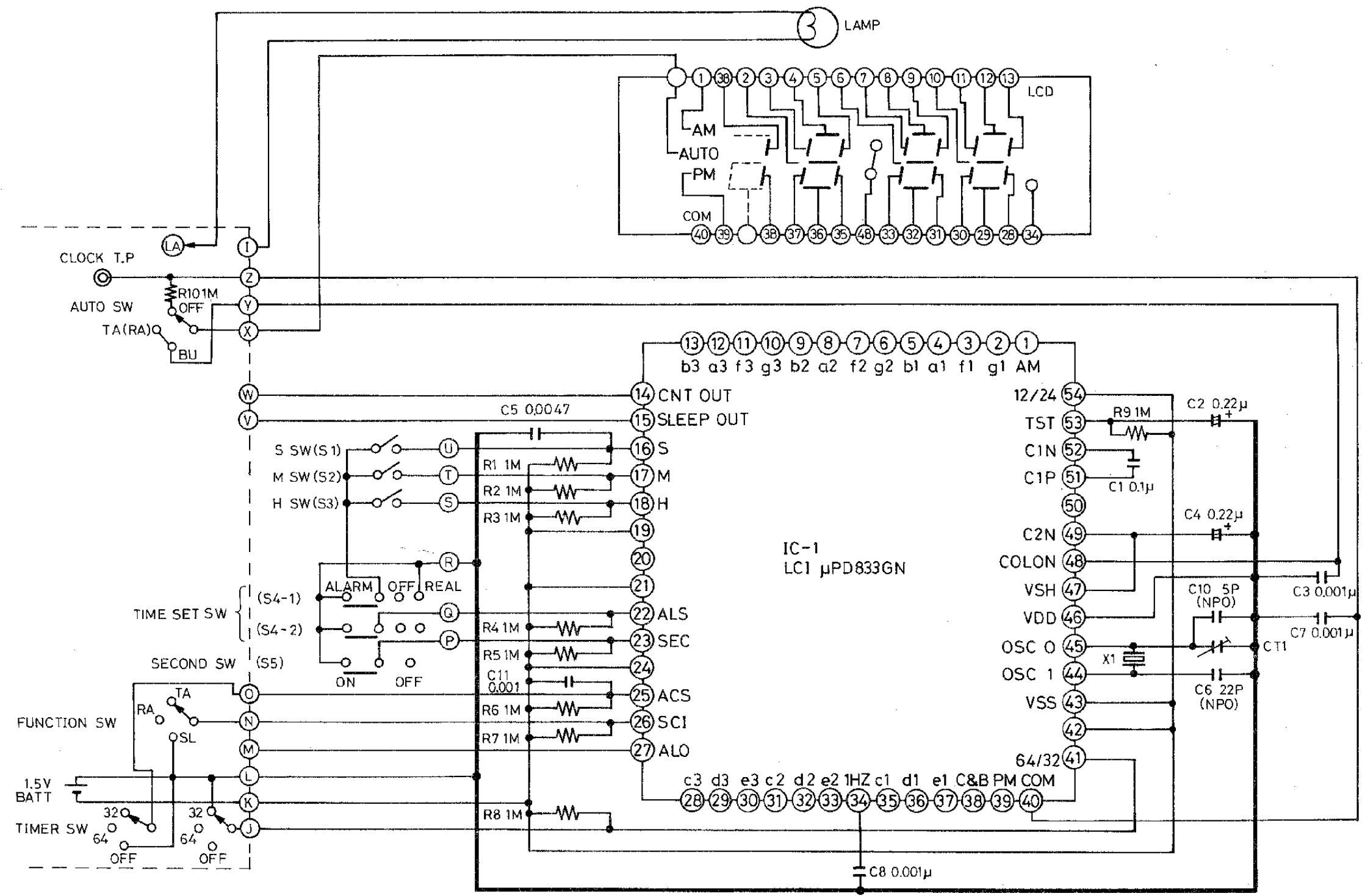


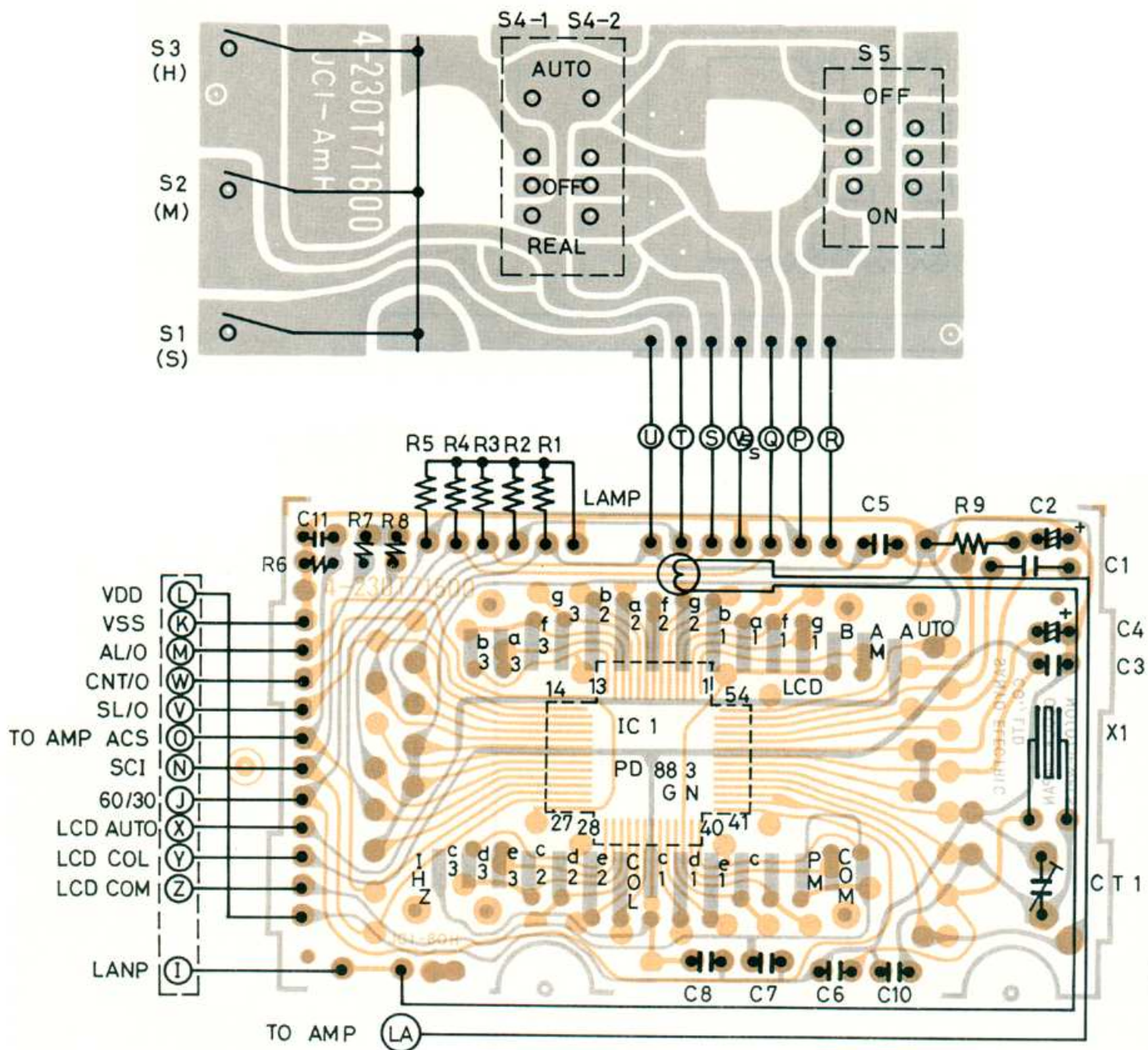












SANYO ELECTRIC INC.
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Brea, California 92620

Sept. 78/790051 Trans. Japan

A SUPERDUPER Manual

FOR PERSONAL USE ONLY
- DO NOT DISTRIBUTE THIS MANUAL -

Intended for owner repair of personally owned equipment.

This manual NOT TO BE SOLD.

MODIFICATION NOTICE

CASSETTE RECORDER



SANYO

M 9990 (USA) M 9990LU
M 9990K M 9990LG
M 9990 (Canada)
M 9990K (Aus)

Date Feb. 12, 1980 Issued by _____

The following corrections should be made in the SERVICE MANUALS and PARTS (PRICE) LIST.

		Section	Key No.	Part No.	Description	Q'ty	Remark	Reason
1	From	Clock PCB Assy	125	141-2-230T-71600	PCB Assy, Clock	1		E
	To		125	141-4-230T-71600	PCB Assy, Clock	1		
2	From							
	To							
3	From							
	To							

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INTERCHANGEABLE NOT INTERCHANGEABLE	Serial No. Chassis No.	Effective from
Q'ty of initial production before modification.	Identification of modified unit.	
REASON FOR MODIFICATION A Standardization C Improvement of reliability E Miss print G B Change of materials D Improvement of performance F Miss register		

MODIFICATION NOTICE

CASSETTE RECORDER

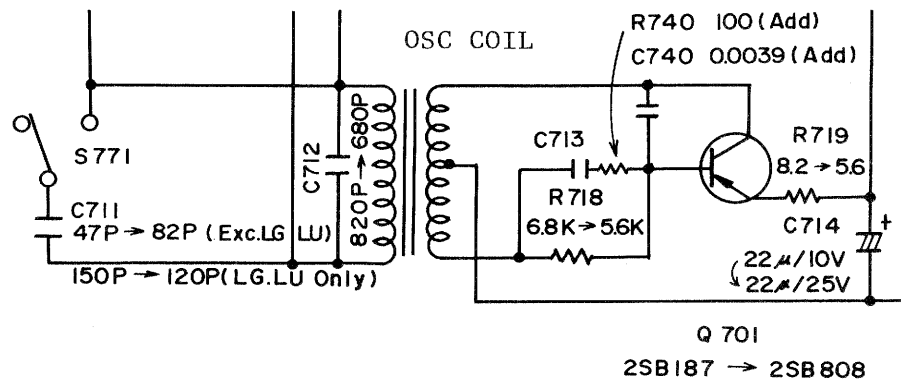


M 9990 (USA)	M 9990LU
M 9990 (CANADA)	M 9990LG
M 9990K (AUSTRALIA)	M 9990K

Date Apr. 20, 1981 Issued by _____

The following corrections should be made in the SERVICE MANUALS and PARTS (PRICE) LIST.

From	To	
102 141-4-230T-72971	141-4-230T-72971-5	P.C. Board Assy. (USA)
102 141-4-230T-72972	141-4-230T-72972-5	P.C. Board Assy (CANADA, AUSTRALIA, GENERAL)
102 141-4-230T-72973	141-4-230T-72973-5	P.C. Board Assy (LG, LU)
Q701 2SB187	2SB808	Transistor
R718 6.8K ohm	5.6K ohm	Carbon Resistor
R719 8.2 ohm	5.6 ohm	"
R740	100 ohm	" (Add)
C711 47pF	82pF	Ceramic Cap. (US/CAN/AUS/K)
C711 150pF	120pF	Ceramic Cap (LG, LU)
C712 820pF	680pF	Mylar Cap.
C714 22μF 10V	22μF 25V	Elect. Cap.
C740	0.0039μF	Mylar Cap. (Add)



INTERCHANGEABLE NOT INTERCHANGEABLE	Serial No. Chassis No.	Effective from
Q'ty of initial production before modification.	Identification of modified unit.	
<p>REASON FOR MODIFICATION</p> <p>A Standardization C Improvement of reliability E Miss print G Change of Transistor</p> <p>B Change of materials D Improvement of performance F Miss register</p>		

MODIFICATION NOTICE

CASSETTE RECORDER



SANYO

M 9990 (USA)	WM-3546
M 9990LG (UK)	WM-4199
M 9990LU (EUROPE)	WM-4184
M 9990 (CANADA)	WM-4088
M 9990K (AUSTRALIA)	WM-3868
M 9990K	WM-3692

Date Apr. 30. 1983 Issued by _____

The following corrections should be made in the SERVICE MANUALS and PARTS (PRICE) LIST.

		Section	Key No.	Part No.	Description	Q'ty	Remark	Reason
1	From	Mechanism	447	141-0-741T-12700	Lever Assy			E
	To		"	141-2-742T-12700	Lever			
2	From							
	To							
3	From							
	To							
INTERCHANGEABLE NOT INTERCHANGEABLE					Serial No. Chassis No.	Effective from		
Q'ty of initial production before modification.					Identification of modified unit.			
REASON FOR MODIFICATION A Standardization C Improvement of reliability E Miss print G B Change of materials D Improvement of performance F Miss register								

MODIFICATION NOTICE

CASSETTE RECORDER



SANYO

M 9990 (USA)

Date Oct. 25, 1979 Issued by _____

The following corrections should be made in the SERVICE MANUALS and PARTS (PRICE) LIST.

The Parts List and Exploded View of the cassette mechanism described in the M9990 Service Manual include some errors. These are corrected as shown on the following page.

INTERCHANGEABLE	NOT INTERCHANGEABLE	Serial No. Chassis No.	Effective from
Q'ty of initial production before modification.		Identification of modified unit.	
REASON FOR MODIFICATION			
A Standardization	C Improvement of reliability	E Miss print	G
B Change of materials	D Improvement of performance	F Miss register	

PARTS LIST

Key No.	Part No.	Description	Q'ty	Key No.	Part No.	Description	Q'ty
MECHANISM				MECHANISM			
301	141 0 311T 26220	Chassis Assy	1	377	141 2 855T 28800	Spring Coil	1
302	141 2 731T 37502	Slide, Head	1	378	141 2 851T 96400	Spring Coil	1
303	141 2 821T 10700	Tape Guide	1	379	141 2 351T 43300	Bracket Mounting	1
304	141 2 852T 43700	Spring Wire, Pinch Roller	1	381	141 0 731T 54500	Side Assy, REW (141-0-731T-16400)	1
305	141 2 853T 46901	Spring Plate, Cassette plase	1	382	141 2 661T 22600	Pulley, REW	1
306	141 2 375T 06900	Bracket, Head	1	383	141 2 461T 30200	Pipe	1
307	4 242T 21671	R/P Head	1	384	141 2 851T 65600	Spring Coil	1
308	4 242T 19500	E Head	1	385	141 2 855T 17400	Spring Coil	1
309	141 2 851T 82700	Spring Coil, R/P Head	1	386	141 2 731T 57800	Slide, REC	1
311	123 2 472R 00200	Lug	1	387	141 2 851T 93002	Spring Coil	3
312	141 2 472T 05900	Lug	2	388	141 2 453T 30700	Washer 5.2x8x0.13 Nylon	2
313	141 2 490T 00600	Tube	2	389	141 2 731T 43101	Slide	1
314	141 2 345T 00400	Steel Ball	4	390	141 2 855T 00200	Spring Coil	1
315	141 2 853T 53200	Spring Plate	1	391	141 2 490T 05000	Tube	6
316	141 0 545T 04720	Lever Pinch Roller (141-0-545T-02900)	1	392	141 0 731T 55100	Slide Assy, Button Lock (141 0 731T 16500)	1
317	141 2 457T 23000	Special Washer	4	393	141 2 851T 73800	Spring Coil	1
318	141 0 521T 09300	Flywheel Assy	1	394	141 2 742T 07100	Lever	1
319	141 2 457T 04300	Special Washer	1	395	141 2 851T 91200	Spring Coil	1
320	141 2 453T 30201	Washer 2.5x5x0.25 Nylon	3	396	4 231T 82600	Switch, Main	1
321	141 2 453T 30202	Washer 2.6x4.7x0.5 Nylon	1	397	141 2 742T 12500	Lever	1
322	141 0 524T 07800	Bracket Flywheel Assy	1	398	141 2 851T 87701	Spring Coil	1
323	141 2 683T 22800	Ring	1	399	141 2 742T 08100	Lever	1
324	123 2 472R 00400	Lug	2	400	141 2 731T 55300	Slide	1
325	141 2 742T 08201	Lever	1	401	141 2 855T 19600	Spring Coil	1
326	141 2 853T 52900	Spring Plate	1	402	141 2 490T 00900	Tube	1
327	141 2 851T 80100	Spring Coil	2	403	141 2 811T 06400	Counter	1
328	141 2 741T 96400	Lever	1	404	141 2 812T 07000	Bracket, Counter	1
329	141 2 453T 30802	Washer 6.2x9.5x0.5 Nylon	1	405	141 2 564T 18200	Square Belt	1
330	141 2 457T 23200	Special Washer	1	406	141 0 731T 54900	Slide Assy, Pouse Button	1
331	141 2 851T 56100	Spring Coil	3	407	141 2 731T 57600	Slide, Pouse	1
332	4 527T 10271	Motor	1	408	141 2 461T 30700	Pipe	1
	141 2 661T 72500	Pully, Motor	1	409	141 2 852T 42800	Spring Wire	1
333	141 2 661T 72501			410	141 2 457T 10300	Special Washer 3.2x5.7x0.1	1
	141 2 661T 72502			411	141 2 614T 05200	Lever Lock	1
334	141 2 421T 12501	Special Screw, Motor	2	412	141 2 852T 37900	Spring Wire	1
335	141 2 445T 07000	Rubber Cushion, Motor	2	413	141 2 453T 01200	Washer 3x8x1	1
336	141 2 447T 36000	Cushion, Motor	2	414	141 2 742T 07400	Lever, Pouse	1
337	141 2 564T 19800	Square Belt Main	1	415	141 2 742T 06900	Lever	1
338	141 2 564T 19700	Belt	1	416	141 2 461T 28700	Pipe	1
339	141 2 464T 08700	Fixer	1	417	141 2 453T 30800	Washer 6.2x9.5x0.13 Nylon	1
342	141 0 661T 22701	Pulley Assy, Supply (141-0-661T-02400)	1	418	141 2 855T 15100	Spring Coil	1
343	141 2 531T 10101	Reel Plate, Supply	1	419	141 2 661T 24300	Pulley	1
344	141 2 457T 11000	Special Washer	4	420	141 0 581T 09000	Gear Assy	1
345	141 2 457T 23700	Special Washer	2	421	141 2 855T 16500	Spring Coil	1
346	141 2 853T 48000	Spring Plate, Back Tention	1	422	141 2 858T 08100	Bracket, Spring	1
347	141 2 457T 06200	Special Washer, Back Tention	2	423	141 2 457T 23800	Special Washer	3
348	141 2 531T 10700	Reel Plate, Tack UP	1	424	141 2 731T 53400	Slide, Auto Stop	1
349	141 2 661T 22901	Pully, Tack Up	1	425	141 2 855T 15400	Spring Coil	1
350	141 2 452T 02300	Felt	1	426	141 2 731T 54200	Slide, Rev	1
351	141 2 661T 23001	Pulley, Tack Up	1	427	141 2 742T 07500	Lever, Rev	1
352	141 2 453T 31200	Washer 2x8.5x0.25 Poly	1	428	141 2 742T 07600	Lever, Cue	1
353	141 2 453T 30100	Washer 2.1x4x0.13 Nylon	2	429	141 2 742T 07900	Lever, Rec	1
354	141 2 453T 30101	Washer 2.1x4x0.25 Nylon	4	430	141 2 852T 45400	Spring Wire	1
355	141 2 453T 32400	Washer 4.9x8x0.13 Nylon	1	431	141 2 453T 00800	Washer 3x8x0.5	1
356	141 2 453T 32401	Washer 4.9x8x0.25	1	432	141 2 457T 20100	Special Washer	1
357	141 2 445T 21200	Rubber Cushion	1	433	141 2 742T 08000	Lever	1
358	141 0 742T 07000	Lever Assy	1	434	141 2 852T 43300	Spring Wire	1
	141 2 851T 96200	Spring Coil	1	435	141 2 581T 09100	Gear, Auto Stop	1
	141 2 855T 01900	Spring Coil		436	141 2 661T 24400	Pulley, Auto Stop	1
361	141 2 855T 12400	Spring Coil		437	141 2 753T 20800	Shaft	1
	141 2 855T 19900	Spring Coil		438	141 2 581T 01900	Gear	1
	141 2 855T 28700	Spring Coil		439	141 0 661T 25300	Pulley Assy	1
362	141 2 161T 48800	Push Button	6	440	141 2 453T 30200	Washer 2.6x4.7x0.13 Nylon	2
364	4 231T 50900	Switch, Stand by	1	441	141 0 312T 15300	Sub Chassis Assy	1
365	141 2 488T 01801	Pin	6	442	141 2 461T 32800	Pipe	1
366	141 2 731T 55000	Slide, Stop Button	1	443	141 0 661T 13200	Pully Assy	1
367	141 2 855T 29900	Spring Coil	1	444	141 2 453T 30001	Washer 1.7x3.2x0.25	1
368	141 2 731T 54300	Slide, FF Button	1	445	141 0 731T 57700	Slide Assy	1
369	141 2 490T 00500	Tube	3	446	141 2 851T 63800	Spring Coil	1
370	141 2 855T 29800	Spring Coil	1	447	141 0 741T 12700	Lever Assy	1
371	141 2 490T 01100	Tube 5φx10mm	1	448	141 2 564T 19500	Square Belt	1
372	4 231T 68000	Switch	3	449	141 2 322T 31401	Shield Plate	1
373	141 2 365T 37900	Bracket, Switch	1	450	141 2 365T 41300	Bracket Switch	1
374	141 2 352T 26900	Spacer	1	453	141 2 742T 22200	Lever	1
376	141 0 731T 54400	Slide Assy (141-0-731T-16300)	1	454	141 2 421T 22100	Special Screw, Motor	1
				455	123 2 472R 00400	Lug, Motor	1

PARTS LIST

Key No.	Part No.	Description	Q'ty
MECHANISM SCREWS			
Y1		Pan Hd. Screw 2x2	1
Y2		Pan Hd. Screw 2x4	1
Y4		Pan Hd. Screw 2.6x6	2
Y5		Pan Hd. Screw 2x12	3
Y6		Pan Hd. Screw 2.6x4	1
Y7		Pan Hd. Tapping Screw 2.3x8	2
Y8		Pan Hd. Tapping Screw 3x6	2
Y9		Pan Hd. Tapping Screw 3x10	1
Y10		Pan Hd. Tapping Screw 3x14	2
Y11		Pan Hd. Tapping Screw 3x20	1
Y12		Pan Hd. Tapping Screw 3x6	1
Y13		Flat Hd. Tapping Screw 3x8	5
Y14		Flat Hd. Tapping Screw 3x10	2
Y15		Washer 2.6x5x0.5	1
Y16		Washer 3x8x0.5	2
Y17		Washer 3x10x1	1
Y18		Flat Hd. Wood Screw 3x12	2
Y19		Washer 4x10x0.8	3
Y20		Washer 6x11.5x0.8	1
Y21		Washer 2x4.8x0.3	1
Y22		Spring Washer 2	3
Y23		Head Less Screw 2x3	1
Y24		Pan Hd. Screw W/Washer 2x12	1
Y26		Pan Hd. Tapping Screw W/Washer 3x6	2
Y27		Pan Hd. Tapping W/Washer 3x10	1
Y29		Washer 2x4.3x0.3	1
Y30		Pan Hd. Tapping Screw 2.3x6	1
Y31		Nut 2 mm	2
Y32		Pan Hd. Tapping Screw 3x8	1
Y34		Washer 2m	1
Y35		Washer 3.5m	2

EXPLODED VIEW (MECHANISM)

