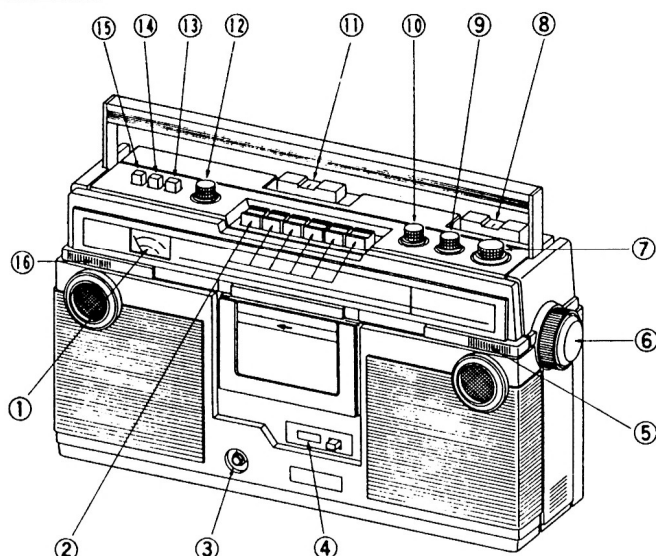


SERVICE MANUAL

No. 987



KEY TO ILLUSTRATIONS

- ① REC/TUN/BATT 3 WAY METER
- ② CASSETTE OPERATION BUTTONS
- ③ HEADPHONE JACK
- ④ TAPE COUNTER
- ⑤ BUILT-IN MICROPHONE (Right)
- ⑥ TUNING CONTROL
- ⑦ VOLUME CONTROL
- ⑧ BAND SELECTOR (FM/MW/LW)
- ⑨ TREBLE CONTROL
- ⑩ BASS CONTROL
- ⑪ FUNCTION SELECTOR (TAPE/RADIO/SLEEP)
- ⑫ BALANCE CONTROL
- ⑬ AFC SWITCH (ON/OFF)
- ⑭ MODE SWITCH (STEREO/MONO)
- ⑮ TAPE SWITCH (Nor/CrO₂)
- ⑯ BUILT-IN MICROPHONE (Left)

SPECIFICATIONS

GENERAL

Semi-conductors.....	6 IC's, 6 transistors, 20 diodes
Power Supply	AC: 220V, 50 Hz (E) 240V, 50 Hz (BS) DC: 9V ("D" × 6)
Power Consumption	10W
Speaker	12 cm, 4Ω × 2 5 cm, 8Ω × 2
Power Output	1.8W (T.H.D. 10%)
Dimensions	23.3 (H) × 42.2 (W) × 11.7 (D) cm
Weight	4.7 kg (with batteries)

RADIO

Circuit System	FM/MW/LW 3 band Superheterodyne
Tuning Range	FM: 87.5 – 108 MHz MW: 530 – 1605 kHz LW: 150 – 350 kHz
Intermediate Frequency	FM: 10.7 MHz MW/LW: 465 kHz
Sensitivity.....	FM: 12 dB MW: 48 dB LW: 53 dB
Antenna.....	FM: Telescopic antenna MW/LW: Ferrite core antenna
Accessory	FM dipole antenna (BS)

TAPE RECORDER

Tape	Cassette tape
Tape Speed.....	4.75 cm/s
Track System.....	4 track, 2 channel
Recording System.....	AC bias, 27/29 kHz
Erasing System	Quasi AC erase
Frequency Range	Normal: 50 – 10,000 Hz CrO ₂ : 50 – 12,000 Hz
S/N Ratio	45 dB
Cross Talk.....	40 dB
Input Sensitivity and Impedance.....	Mic: –55 dBm, 600 ohms DIN: 50k ohms
Output level and Impedance.....	DIN: 5k ohms Speaker: 4 ohms
Erase Ratio	60 dB
Motor	DC micromotor
Fast Forwarding or Rewinding Time.....	120 sec. (Using C-60)

TAPE RECORDER WITH FM/MW/LW RADIO

July 1977

SAFETY PRECAUTION

The following precautions should be observed when servicing.

1. Since many parts in the unit have special safety-related characteristics, always use genuine Hitachi's replacement parts. Especially critical parts in the power circuit block should not be replaced with other makes. Critical parts are marked with ★ in the schematic diagram, and circuit board diagram.
2. Before returning a repaired unit to the customer, the service technician must thoroughly test the unit to ascertain that it is completely safe to operate without danger of electrical shock.

EXPLANATION OF NEW CIRCUIT

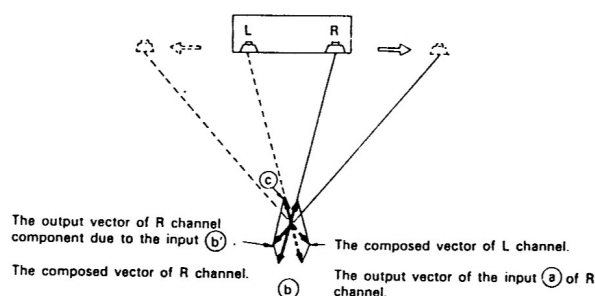
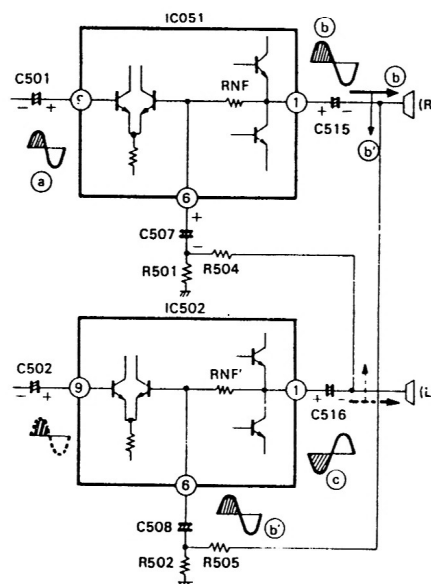
OUTPUT CIRCUIT

With the stereo set accommodated in one box, the stereophonic effect is inferior because of the small distance between the left and right speakers, and so the output circuit as shown in the figure below has been adopted in the TRK-5190E to obtain a more effective stereophonic sound.

As shown in the diagram, when the positive half-cycle signal (a) is applied to the input pin (9) of IC501 (502), the positive half-cycle signal (b) with the same phase is taken to the output pin (1). When the positive half-cycle signal (b) is applied to the input pin (6), the negative half-cycle which is out of phase is outputted because a differential amplification circuit is used. This works as negative feedback, and the amount of feedback is determined by the ratio of R501 (502) and RNF (RNF').

R504 (503) is the resistor for applying the output of the R channel to the input pin (6) of the L channel (IC502) and the output of the L channel to the input pin (6) of the R channel. Considering just the R channel, the total of the in-phase components (b) of the input pin (9) and the negative-phase-sequence component (c) is outputted to the output pin (1). In the same way, the output of the L channel is the total of the in-phase components of the input and the negative-phase-sequence output of the R channel.

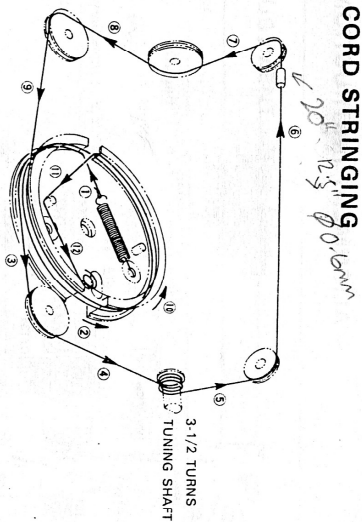
The above is shown in the figure using vectors. Outputs are composed in the air and a directional feeling at the listening point becomes the same as that when the distance between the left and right speakers is made larger due to sum of vectors, and the stereo effect is increased.



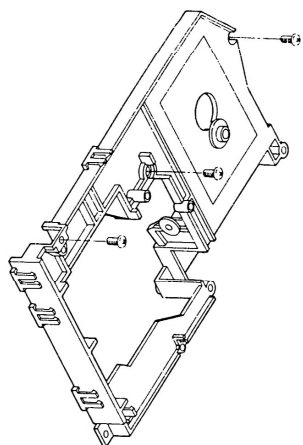
DIAL CORD STRINGING

METHOD

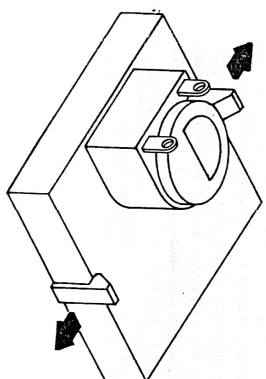
1. Set pointer (TUNING SHAFT) to low frequency position.
2. Turn pulley fully counterclockwise.
3. String dial cord to direction of arrow (No. ① ~ ⑫).



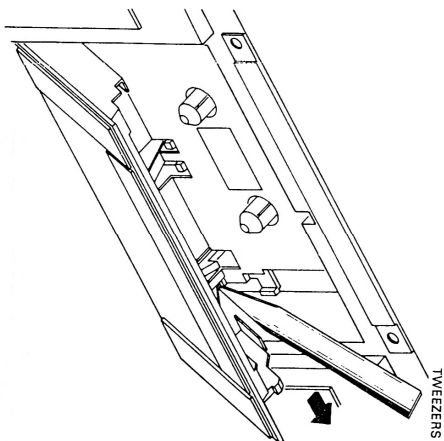
3. Radio chassis



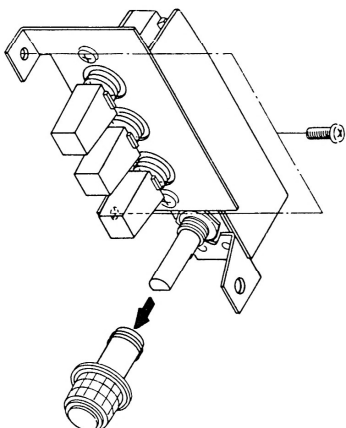
6. Level meter



7. Cassett lid

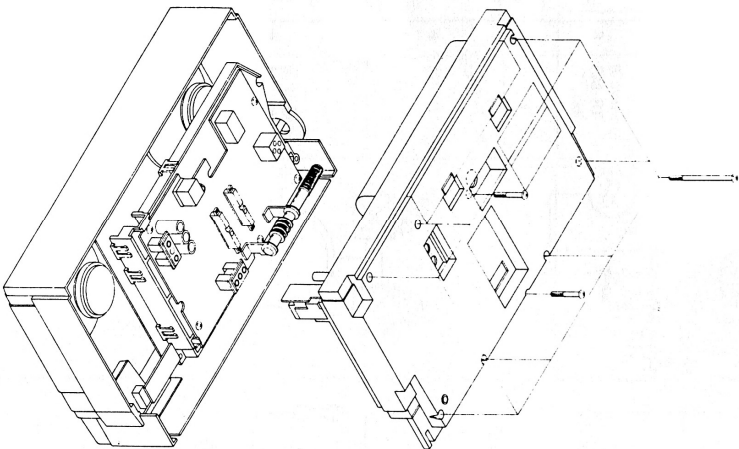


4. Volume P.C.B.

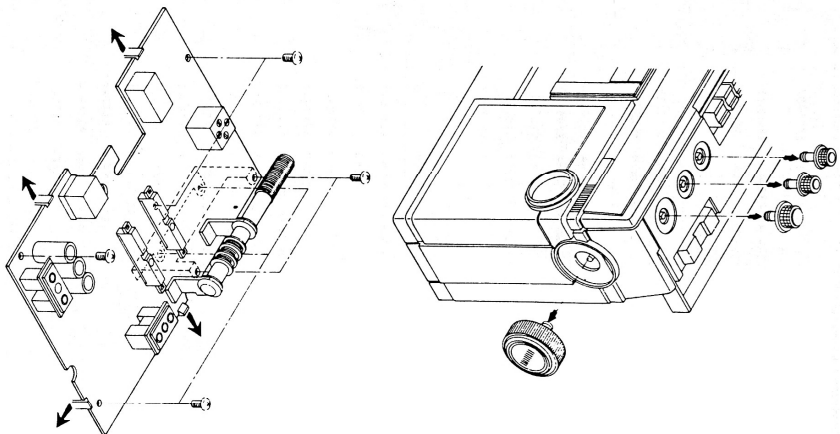


DISASSEMBLY

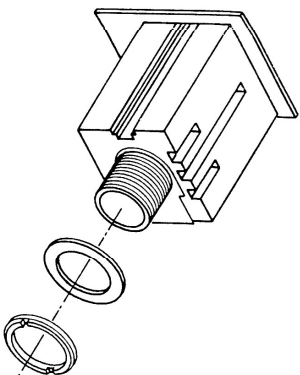
1. Rear case



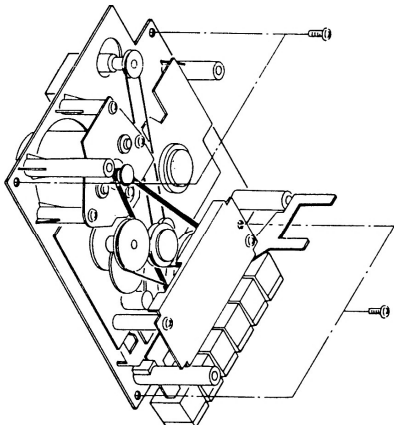
2. Main P.C.B.



5. Headphone jack P.C.B.



8. Deck chassis



LUBRICATION

Lubricate one or two drops of machine oil rotating point or lubricate grease to sliding point.
Lubricate the respective part below once every 1000 hours or once a year under normal conditions of use.
Avoid oiling then excessively, or rotation may become irregular because of oil splashes.

	Lubrication point	Oil or Grease
Cassette deck	Motor shaft bearing	Oil
	Capstan shaft bearing	Oil
	Pinch roller shaft bearing	Oil

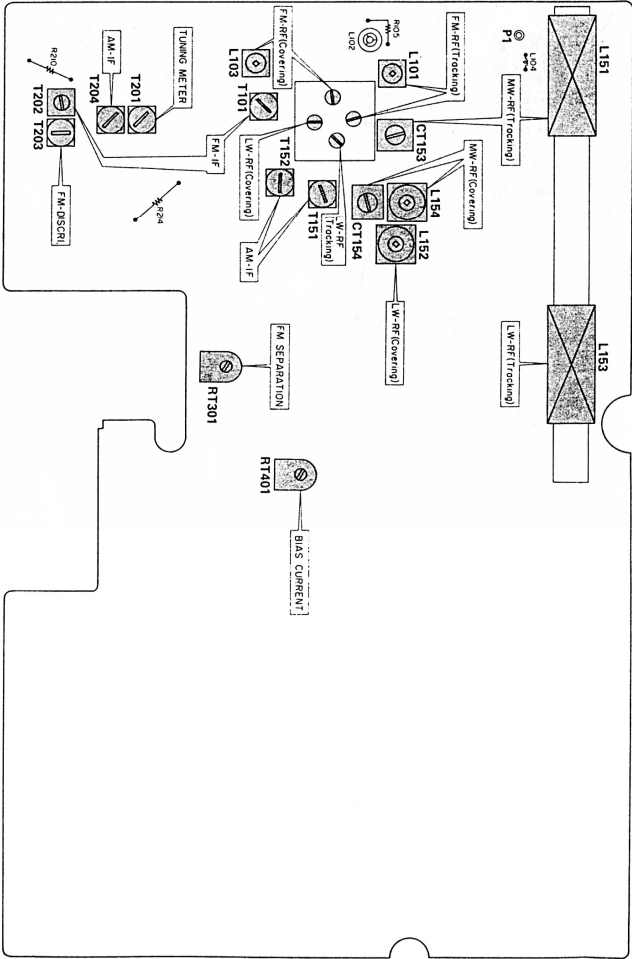
INSPECTION

Mode	Item	Pressure or Torque
Playback	Pressure of pressure roller	300g + 50 g - 70 g
	Pressure of take-up roller	50 - 120g
	Take-up torque	40 - 70g cm
	Supply reel back tension	3g cm or less
Rewind	Rewind torque	55 - 85g cm
	Take-up reel back tension	4.5g cm or less
Fast Forward	Fast Forward torque	55 - 85g cm

ADJUSTMENT (TAPE RECORDER)

Sequence	Setting		Connection	Adjust for	
	Mode	Tape		Adjust	Indication
1	Head Azimuth	Playback	f 10 kHz (MTT-116)	J5, J6 : EXT. SP	V max.
2	Bias Current	Record	_____	RT401	8V

ALIGNMENT INSTRUCTIONS (RADIO)



ADJUSTMENT (RADIO)

REPLACEMENT PARTS LIST

Sequence	Connection		Setting		Adjust for	
	Input	Output	Tuning	Signal	Adjust	Indication
	Sweep Generator	Signal Generator	Oscilloscope V.T.V.M.			
Set core (T203: fully clockwise)						
1 FM-IF			f max.	10.7 MHz	T101 T202	10.7 MHz
2 FM DISCRI			f min.	87 MHz	L103	10.7 MHz
3 (Covering) FM-RF (Tracking)			f max.	109 MHz	CT102	V max.
			90 MHz	90 MHz	L101	
			106 MHz	106 MHz	CT101	
4 MW/LW-IF			f max.	465 kHz	T151 T152 T204	465 kHz
			f min.	515 kHz	L154	
5 (Covering) MW-RF (Tracking)			f max.	1650 kHz	CT154	
			600 kHz	600 kHz	L151	
			1400 kHz	1400 kHz	CT153	
			f min.	145 kHz	L152	V max.
6 (Covering) LW-RF (Tracking)			f max.	360 kHz	CT152	
			160 kHz	160 kHz	L153	
			330 kHz	330 kHz	CT151	
7 FM Separation	Apply output of stereo signal generator (98 MHz, 600 dB, pilot signal 10%, L+R signal 30%) to terminal P1. Adjust RT301 so that separation is maximized.					
8 TUNING METER	In FM reception, adjust T201 for maximum deflection of the tuning meter.					

SYMBOL-NO	P-NO	DESCRIPTION	SYMBOL-NO	P-NO	DESCRIPTION
CAPACITORS					
CT101	5052191	PLASTIC FILM VARIABLE	D406	0575001	DIODE GERMANIUM 1N34A
CT102	5052191	PLASTIC FILM VARIABLE	D601	5330373	DIODE 5V-018
CT151	5052191	PLASTIC FILM VARIABLE	D602	5330374	DIODE 5V-028
CT152	5052191	PLASTIC FILM VARIABLE	IC201	5351061	IC AM2588
CT153	5058191	TRIMMER 10PF	IC301	5351141	IC LA1301
CT154	5058191	TRIMMER 10PF	IC401	5350581	IC LA1021
CV101	5052191	PLASTIC FILM VARIABLE	IC501	5350582	IC LA102R
CV102	5052191	PLASTIC FILM VARIABLE	IC502	5350582	IC LA102R
CV151	5052191	PLASTIC FILM VARIABLE	Q101	5321271	TRANSISTOR SILICON 2SC1674L 600MHZ
CV152	5052191	PLASTIC FILM VARIABLE	Q102	5321271	TRANSISTOR SILICON 2SC1674L 600MHZ
CI07	0246428	CERAMIC DISCAL 5P-0	Q151	5321281	TRANSISTOR SILICON 2SC1675-L 230MHZ
CI09	0246425	CERAMIC DISCAL 5P-0	Q201	5321281	TRANSISTOR SILICON 2SC1675-L 230MHZ
CI10	0246442	CERAMIC 12PF 5% 0C50W	Q401	5321291	TRANSISTOR 2SC1740R
RESISTORS					
RC201	0186001	CR PACK 100HM 10% 0.01MF-80K-20K X 2	Q402	5321291	TRANSISTOR 2SC1740R
RC202	0186357	CR PACK	TRANSFORMERS		
RC601	0186451	CR PACK	T001	5211921	POWER 1VA, 4000(LE)
RC602	0186451	CR PACK	T001	5212123	POWER (BS)
RT301	0151806	SEMI VARIABLE 1K OHM B	T101	5140017	FM IF
RT401	0151807	SEMI VARIABLE 500 OHM	T151	5130034	AM IF
RV401	5000293	VARIABLE 100K OHM(B)	T152	5130031	AM IF 20K OHM : 3K OHM
RV402	5000293	VARIABLE 100K OHM(B)	T201	5140019	FM IF
RV403	5000294	VARIABLE 100K OHM(C)	T202	5146012	DISCRIMINATOR-1ST
RV404	5000294	VARIABLE 100K OHM(C)	T203	5146034	FM IF
RV405	5000281	VARIABLE 50K OHM(B)	T204	5130033	AM IF
RV406	5000274	VARIABLE 10K OHM(B)	COILS		
RV407	5000274	VARIABLE 10K OHM(B)	L101	5126006	FM RF 0.5 MICRO H
SEMI-CONDUCTORS					
D101	5330131	DIODE SILICON 1S2076	L102	5150791	CHOKE
D102	5330572	DIODE SILICON 1S2473HC	L103	5126362	FM-OSC
D103	5330661	DIODE SILICON LS2790 200MHZ 80HM	L104	5150791	CHOKE
D151	0575001	DIODE GERMANIUM 1N34A	L151	5113192	FERRITE ANTENNA
D201	5330731	DIODE GERMANIUM 1N60 80MHZ 50HM	L152	5120174	NM OSCILLATOR
D203	5330721	DIODE GERMANIUM 1N34A 10MHZ 50HM	L153	5113192	FERRITE ANTENNA
D204	5330731	DIODE GERMANIUM 1N60 80MHZ 50HM	L154	5120195	NM OSCILLATOR
D205	5330731	DIODE GERMANIUM 1N60 80MHZ 50HM	L301	5120189	36KHZ TUNER
D206	5330732	DIODE GERMANIUM 1N60P 80MHZ 50HM	L302	5120189	36KHZ TUNER
D207	5330732	DIODE GERMANIUM 1N60P 80MHZ 50HM	L303	5120189	36KHZ TUNER
D401	0575001	DIODE GERMANIUM 1N34A	L401	5120304	TAP
D402	0575001	DIODE GERMANIUM 1N34A	L402	5120304	TAP
D403	5330572	DIODE SILICON 1S2473HC	MISCELLANEOUS		
D404	5330572	DIODE SILICON 1S2473HC	ANT	5752341	ROD ANTENNA
D405	0575001	DIODE GERMANIUM 1N34A	BP101	5141551	FM BAND PASS FILTER
			CP201	5160211	CERAMIC FILTER CP107A

SCHEMATIC DIAGRAM (RADIO)



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[illegible]

D203
IN34A
AM DET.

D201, D204, D205
IN60
FM/AM TUN. METER

D205, D207
IN60P
FM DISC.

LC 301
LA3301
FM MPX.

1. Voltage measured at base of chassis with minimum volume control and no signal.
2. Nomenclature of Resistors and Capacitors.

	Circuit No.	No. of students (10/ans)
	Value	M: 1000 S: 10
	Tolerance	No. of students: ±5% K: ±10% R: ±20%
Wiring	No. of students: 1/4W	
Sort	No. of students: Carbon film R/C Composition M/C Metal film R/C: Outside metal film M/C: Fixed metal film	

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3. Be sure to make your orders of resistors and capacitors with value, voltage, tolerance and size specified on parts list since required temperature characteristics.

SCHEMATIC DIAGRAM (TAPE RECORDER)

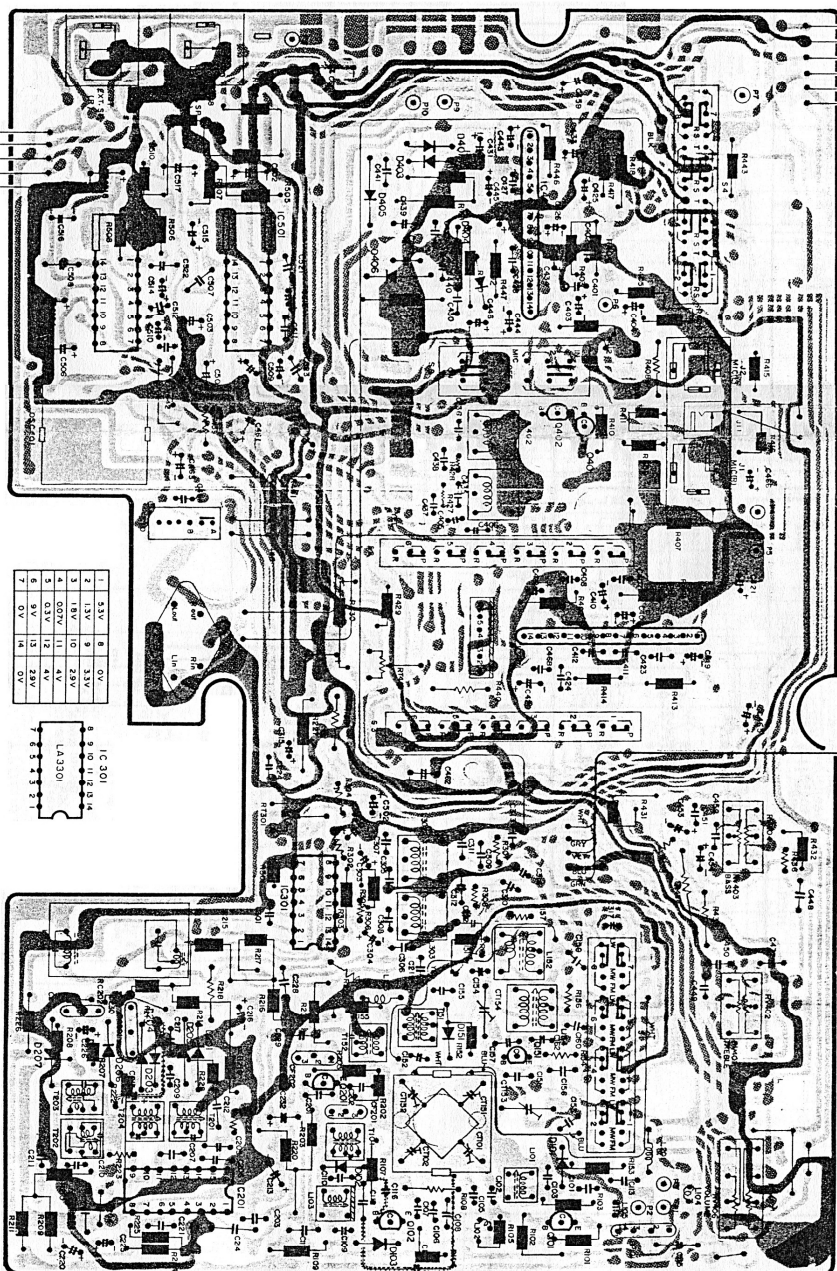
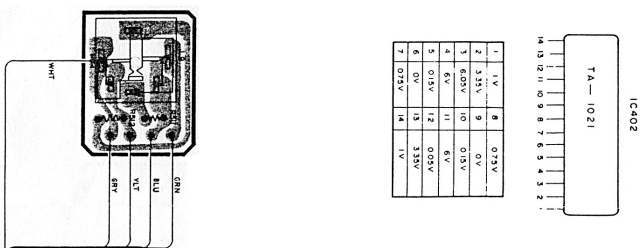
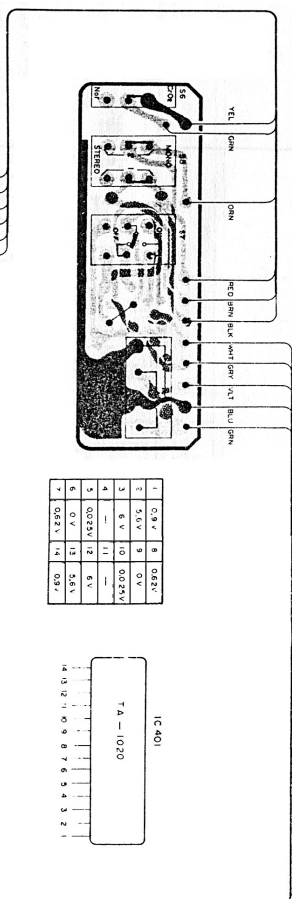


- 12 -

[illegible]

■ : SIDE OF THE COMPONENT EARTH ■ : SIDE OF THE COMPONENT SIGNAL. +B, ETC. ■ : EARTH ■ : SIGNAL. +B, ETC.

CIRCUIT BOARD DIAGRAM



Q 201
B 1.45V
C 3.5V
E —

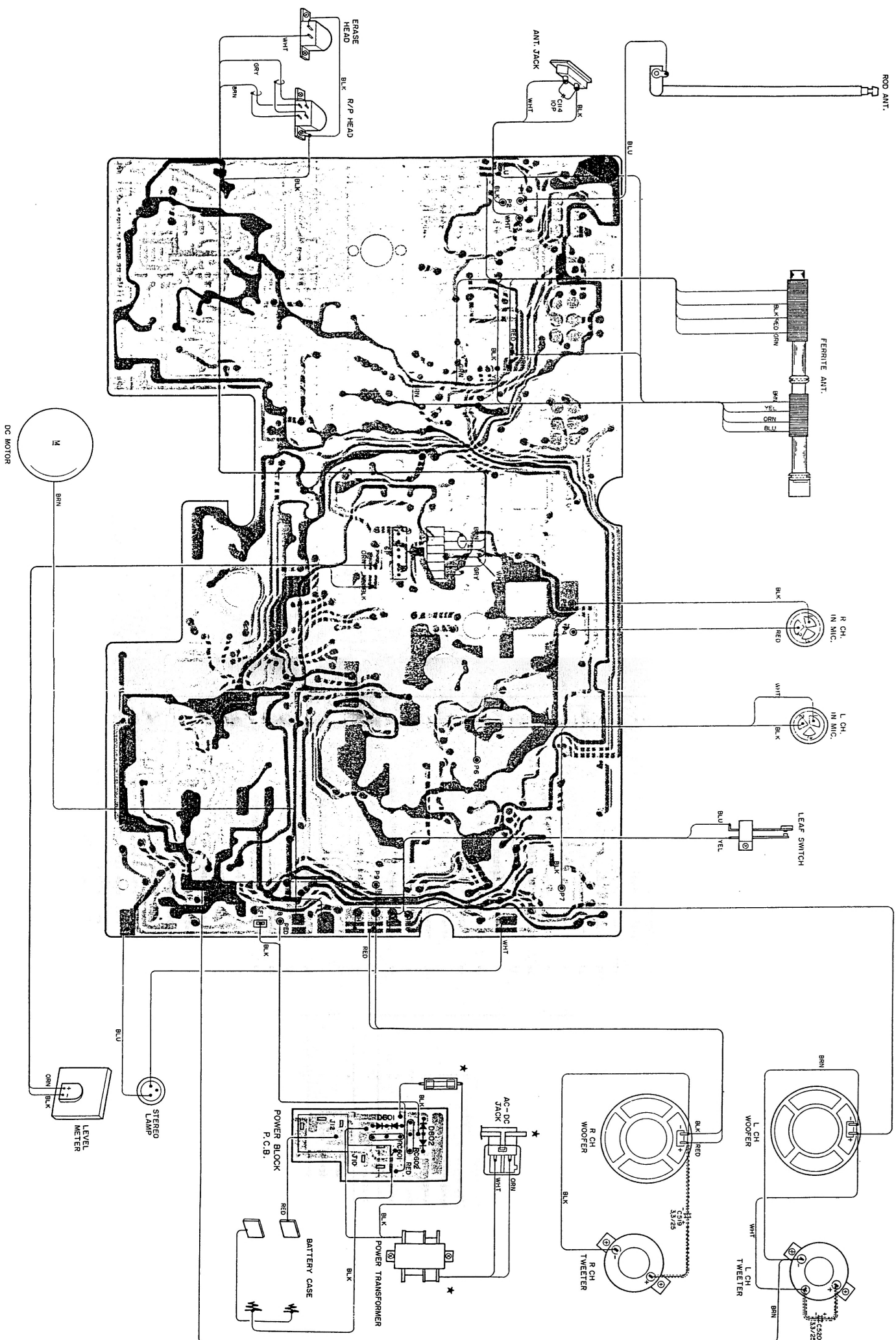
IC 201
AN2538B
1 1V
2 1.5V
3 0V
4 1.1V
5 1.2V
6 0.65V
7 3.3V
8 0.25V
9 3.5V
10 0V

Q 102
B 1.45V
C 3.5V
E 0.8V

Q 151
B 1.5V
C 3.5V
E 0.8V

Q 101
B 1.5V
C 3.5V
E 0.8V

WIRING DIAGRAM

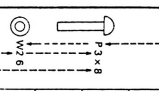
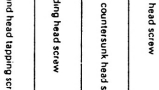


REPLACEMENT PARTS LIST

REPLACEMENT PARTS LIST

SYMBOL-NO	P-NO	DESCRIPTION	SYMBOL-NO	P-NO	DESCRIPTION
CF202	5160211	CERAMIC FILTER CF107A	17	7286232	PR PLATE
FM ANT+J	5671661	FM ANTENNA TERMINAL	18	7286143	LOCK PLATE
F001	5720173	FUSE 0.8A	19	6536471	CASSETTE HOLDER
J 1	5679431	JACK PLATE	20	6740971	BRAKE FUNCTION ARM
J 2	5679431	JACK PLATE	21	6740981	EJECT ARM
J 7	5679432	JACK PLATE	22	6741183	EJECT SLIDER
J 8	5679432	JACK PLATE	23	6741111	AS FUNCTION PLATE
J 9	5670654	HEAD PHONE JACK	24	6741711	SWITCH FUNCTION ARM
J10	5653241	AC-DC SOCKET	25	7287692	SW PLATE
J12	5653241	AC-DC SOCKET	26	7288513	RC PLATE
J13	5653211	DIN JACK	27	7288494	FUNCTION PLATE
LM	5554411	LEVEL METER (BS)	28	6308102	SPRING
LM	5554413	LEVEL METER (CS)	29	6307733	SPRING
MIC	5421014	MICROPHONE	30	6307711	SPRING
OSC401	5260642	OSC BLOCK	31	6300373	SPRING
PL	5160822	LAMP	32	7286241	PAUSE LOCK PIECE
S 1	5620362	SLIDE SWITCH	33	7286211	RECORD SLIDER
S 2	5623271	SLIDE SWITCH	34	7286222	RECORD SLIDER
S 3	5623271	SLIDE SWITCH	35	7286042	PAUSE SLIDER ASSEMBLY
S 4	5620362	SLIDE SWITCH	36	7286061	STOP SLIDER
S 5	5634114	PUSH SWITCH	37	7286171	PLAY SLIDER
S 6	5634114	PUSH SWITCH	38	7286203	FF SLIDER
S 7	5634114	PUSH SWITCH	39	7286193	RECORDING LOCK LEVER
S 8	5620701	SLIDE SWITCH	40	5572612	MOTOR ASSEMBLY
SP	5401511	SPEAKER-5CM	41	6576083	RUBBER PLATE
SP	5406221	SPEAKER-12CM	42	7575001	COLLAR
S10	5621101	SLIDE SWITCH	43	0711309	PAN HEAD SCREW - 2.6MMD X 9MM
S11	5603231	LEAF SWITCH	44	8611113	WASHER - 2.6MMD X 9MM
FOR ACCESSARYS					
5743898 POWER CORD (E)					
5746341 CORD ASSEMBLY (BS)					
FOR CASSETTE DECK ASSEMBLY (A)					
1	6050202	BUTTON ASSEMBLY	49	6300373	SPRING
2	6050201	BUTTON ASSEMBLY	50	6324014	SPRING
3	0948692	BALL - 2MMD	51	7286031	FR LEVER
4	7105833	HEAD PLATE	52	6412302	TAKE UP ARM ASSEMBLY
5	6321734	SPRING	53	6301101	SPRING
6	5444351	RECORD TAPBACK HEAD	54	6301232	SPRING
7	7780912	TAPPING SCREW-2MMD X 6MM	55	6301022	SPRING
8	7781004	SCREW	56	6740996	FR ARM ASSEMBLY
9	5445101	ERASE HEAD	57	6300981	SPRING
10	7780912	TAPPING SCREW-2MMD X 6MM	58	6301361	SPRING
11	0948492	BALL - 2MMD	59	6323064	SPRING
12	6329631	HEAD PLATE HOLDER	60	6301011	LOCK LEVER SPRING
13	6363142	PRESSURE ROLLER ARM ASSEMBLY	61	6300991	SPRING
14	6307741	SPRING	62	6372551	FLYWHEEL ASSEMBLY
15	7286182	PR LEVER	63	6357131	FLYWHEEL BELT
16	6741102	RECORD PREVENTION ARM	64	6421224	AS PULLEY
			65	6354601	BELT
			66	6743861	THRUST SUPPORT

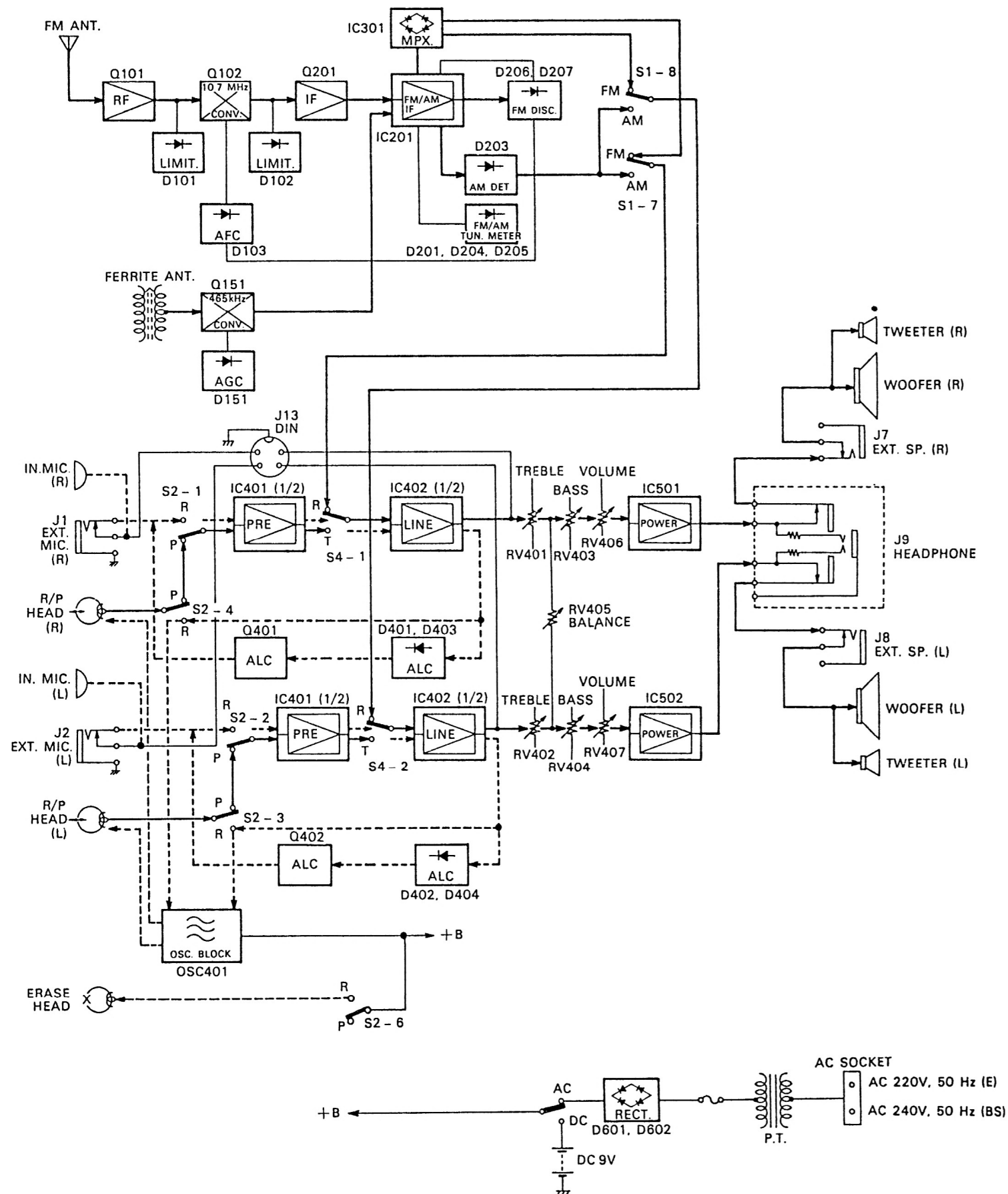
SYMBOL-NO	P-NO	DESCRIPTION	SYMBOL-NO	P-NO	DESCRIPTION
FOR CASSETTE DECK ASSEMBLY (A)					
67	7786421	POLYSLIDER WASHER	86	6259971	KNOB
FOR CASSETTE DECK ASSEMBLY (B)					
68	6743972	CHASSIS ASSEMBLY	87	6138662	FRONT CASE ASSEMBLY (BS)
69	6421073	PULLEY	88	6138664	FRONT CASE ASSEMBLY (E)
70	6316231	SPRING M	89	7781134	BINDING SCREW
71	7539831	STOPPER	90	6712962	LAMP WINDOW
72	6530272	RECORD SPRING	91	6570061	MIC COVER
73	5559071	COUNTER (M2)	92	6090923	CASSETTE LID ASSEMBLY (BS)
74	6354471	COUNTER BELT	93	6399574	POINTER ASSEMBLY (BS)
MISCELLANEOUS					
75	6281921	KNOB ASSEMBLY	94	6399573	POINTER ASSEMBLY (E)
76	6281901	KNOB ASSEMBLY	95	6743991	POINTER GUIDE
77	6281566	TUNING KNOB ASSEMBLY (E)	96	6478946	SCALE PLATE (BS)
78	6281564	TUNING KNOB ASSEMBLY (BS)	97	6478947	SCALE PLATE (E)
79	6296302	SLIDE KNOB	98	6090929	CASSETTE LID ASSEMBLY (E)
80	7767814	SPACER (S)	99	6138712	REAR CASE ASSEMBLY (E)
81	6333435	HANDLE ASSEMBLY	100	6138713	REAR CASE ASSEMBLY (BS)
82	7781301	TAPPING SCREW-3MMD X 6MM	101	6173212	BATTERY LID ASSEMBLY (E)
83	7777948	BIND HEAD FORMING TIGHTENING SCREW	102	6173213	BATTERY LID ASSEMBLY (BS)
84	6201394	CLEAR PANEL ASSEMBLY (BS)	103	0081129	SPRING A
85	6201393	CLEAR PANEL ASSEMBLY (E)	104	6324112	SPRING
			105	7450342	TERMINAL
			106	7450341	TERMINAL
			107	5720011	1P FUSE HOLDER
			108	0711306	PAN HEAD SCREW-2.6MMD X 6MM
			109	6741393	LEVER ASSEMBLY
			110	6744243	LEVER ASSEMBLY
			111	5659121	BACK COVER

Type of head			
P	Flat head screw	BT	Binding head tapping screw
F	Flat countersunk head screw	BL	Bolt
B	Binding head screw	W	Washer
T	Round head tapping screw	E	"E"-ring
Length (L, mm)		Diameter (D, mm)	
			

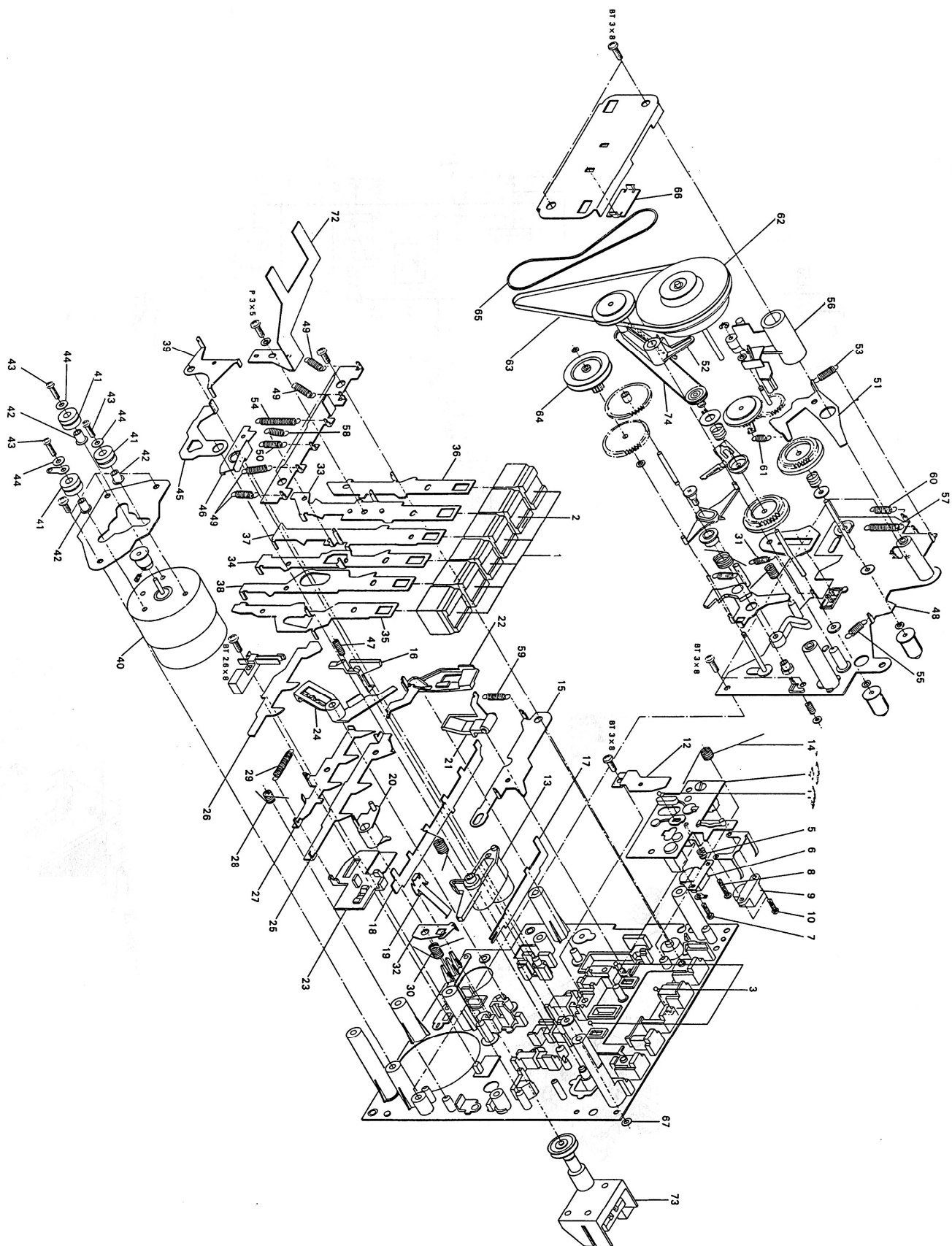
When ordering hardware excluding stated on these lists, be sure to make your orders with type and size.

[illegible]

BLOCK DIAGRAM



CASSETTE MECHANISM EXPLODED VIEW



**HITACHI SALES EUROPA GmbH**

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