

FM/SW/MW STEREO  
RADIO CASSETTE RECORDER

MODEL **TPR-920U**

**AIWA**®  
[SERVICE MANUAL]



Set using ISO screws

DATE OF ISSUE 26/12/1977

**SPECIFICATIONS**

**GENERAL**

<b>Semiconductors:</b>	3 IC's, 42 transistors, 20 diodes & 2 LED's, 1 FET (9 transistors, 8 diodes, 1 IC, 1 FET for tuner section)
<b>Power source:</b>	Batteries, DC 9V (UM-1 x 6) Car battery (thru car adapter) AC120V 60 Hz
<b>Power output:</b>	2 watts per channel, Min. RMS at 8 ohms, from 70 Hz to 10 kHz, with no more than 10% Total Harmonic Distortion.
<b>Power consumption:</b>	13 W
<b>Speakers:</b>	120mmφ x 2
<b>Dimensions:</b>	17-9/16" (W) x 11-1/8" (H) x 4-5/8" (D) (445 x 287 x 117mm)
<b>Weight:</b>	12.3 lbs (5.6 kg) (w/batteries)
<b>Supplied accessories:</b>	AC power cord x 1 Cassette tape x 1 Batteries (UM-1) x 6 Head cleaning stick x 1 Erase plug x 1

**RADIO SECTION**

<b>Circuit:</b>	Superheterodyne
<b>Frequency ranges:</b>	FM 87 ~ 109 MHz SW 3.1 ~ 12.3 MHz MW 515 ~ 1650 kHz
<b>Intermediate frequency:</b>	FM 10.7 MHz SW, MW 455 kHz
<b>Sensitivity: (S/N 6 dB)</b>	FM 4±3 dB (at 88 MHz) 3±3 dB (at 98, 108 MHz) SW 35±4 dB (at 3.2 MHz) 28±3 dB (at 8 MHz) 24±3 dB (at 12 MHz) MW 40±5 dB (at 600 kHz) 39±4 dB (at 1000 kHz) 38±4 dB (at 1400 kHz)
<b>FM stereo separation:</b>	30±5 dB (at 1 kHz)
<b>Antennas:</b>	Built-in whip antenna for FM, SW Built-in ferrite bar antenna for MW External antenna terminal for FM

**TAPE RECORDER SECTION**

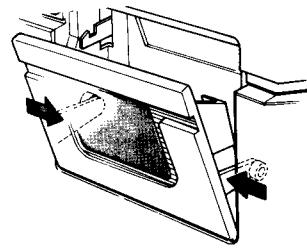
<b>Tape speed:</b>	4.75 cm/sec ± 3%
<b>Recording system:</b>	AC bias
<b>Erasing system:</b>	AC erase
<b>Record bias frequency:</b>	52±1 kHz (AFC: OFF)
<b>Distortion:</b>	1.5±1.0% (at PB) 2.0±1.0% (at RPB)
<b>Frequency response:</b>	NORMAL: 50 ~ 12 kHz at PB, DIN OUT CrO <sub>2</sub> : 50 ~ 14 kHz
<b>Signal to noise ratio: (Un-weighted)</b>	at PB 55/52±4 dB (DC/AC) at RPB 48/45±5 dB (DC/AC)
<b>Erasing ratio:</b>	65/60±5 dB (NORMAL/CrO <sub>2</sub> )
<b>Separation</b>	35±5 dB (at RPB)
<b>Head:</b>	Super permalloy head
<b>FF &amp; rewind time:</b>	80±5 sec. (w/C-60 cassette)
<b>Automatic stop system:</b>	Mechanical full auto-stop
<b>Automatic shut-off action time:</b>	Less than 10 sec.
<b>Pinch roller pressure:</b>	350±30 g
<b>Wow &amp; Flutter:</b>	0.07±0.04% (WRMS)
<b>Take-up torque:</b>	50±10 g-cm
<b>FF &amp; rewind torque:</b>	100 +20 -10 g-cm

- The specifications and external appearance of this set are subject to change without prior notice.

DISASSEMBLY INSTRUCTIONS

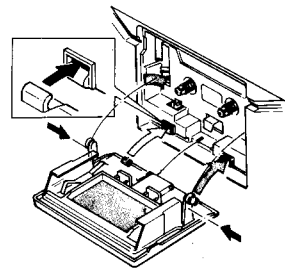
To Remove Cassette Lid

1) While pressing hard the arrow-indicated parts (left and right) in the directions indicated by the respective arrow marks in figure, pull out the cassette lid for removal.

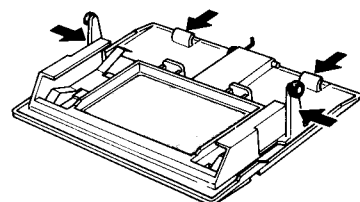


To Install Cassette lid

Place the pawls and spring of the cassette lid exactly on the groove of the case, and fix it on the case by pressing the parts of the cassette lid shown by arrows slowly.

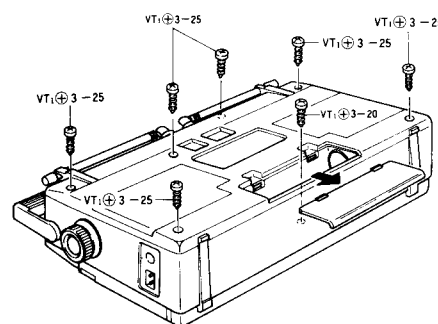


Note: Do not remove or assemble the cassette lid by force as the parts of the cassette lid indicated by arrows might be broken.



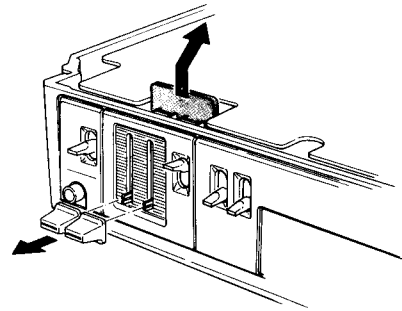
To Remove Back Cover

1) Remove 7 screws.  
Note: Be careful as 4 connectors are connected.



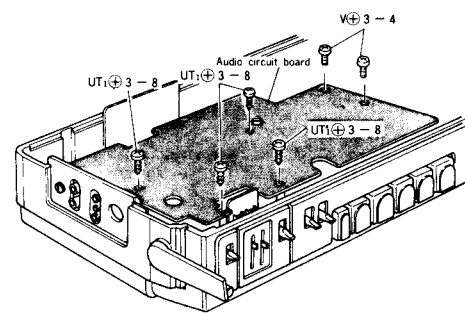
To Remove Rec. Volume Circuit Board

1) Remove 2 recording volume knobs and pull the circuit board up in the direction shown by the arrow.



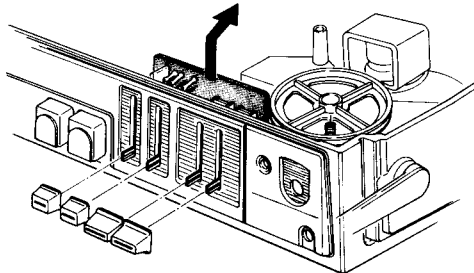
To Remove Audio Circuit Board

1) Remove 6 screws.



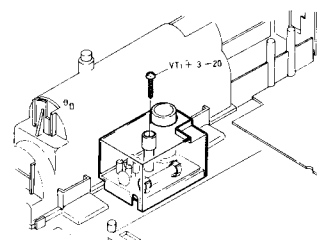
To Remove Control Circuit Board

1) Remove 4 volume control knobs and pull the circuit board up in the direction shown by the arrow.



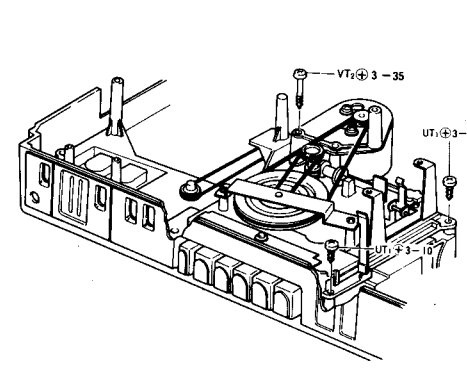
To Remove Power Circuit Board

1) Remove mounting screw.



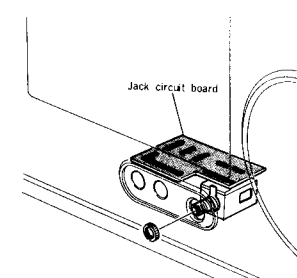
To Remove Chassis

1) Remove 3 screws.



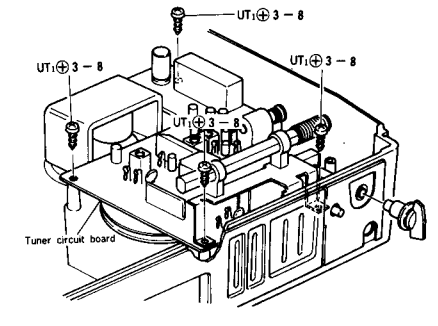
To Remove Jack Circuit Board

1) Remove 3 nuts.



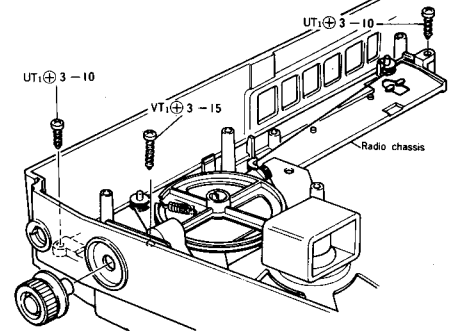
To Remove Tuner Circuit Board

1) Remove 4 screws.

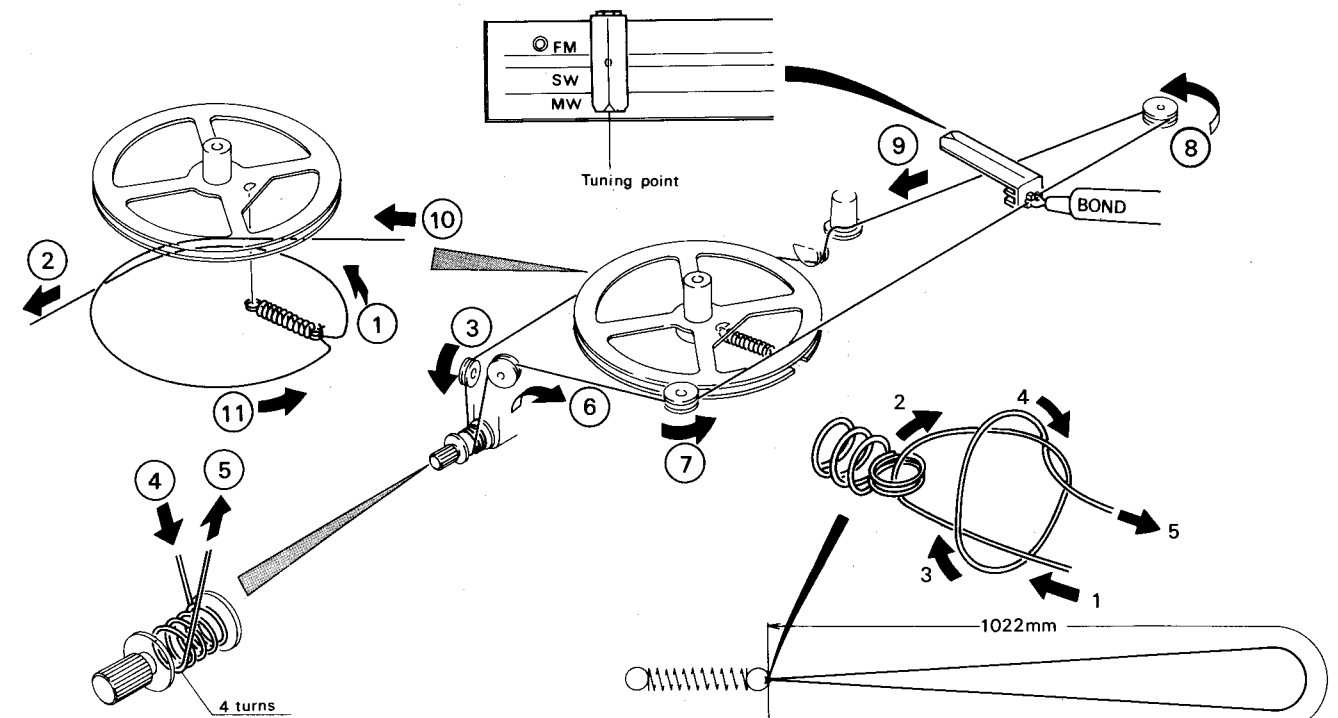


To Remove Radio Chassis

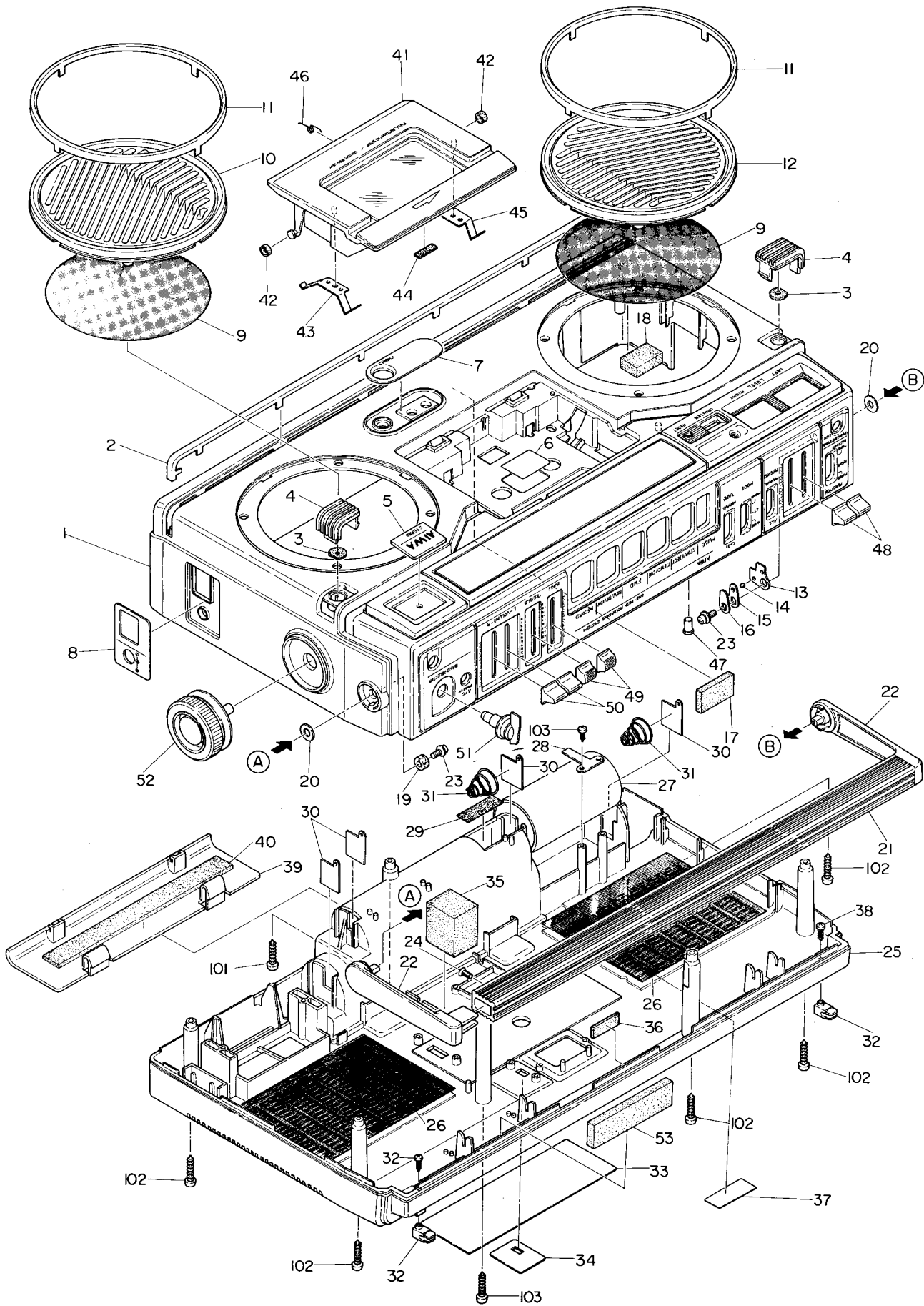
1) Pull out 4 control knobs.  
2) Remove 3 screws.



DIAL CORD STRINGING



EXPLODED VIEW-1



PARTS LIST

MECHANICAL PARTS

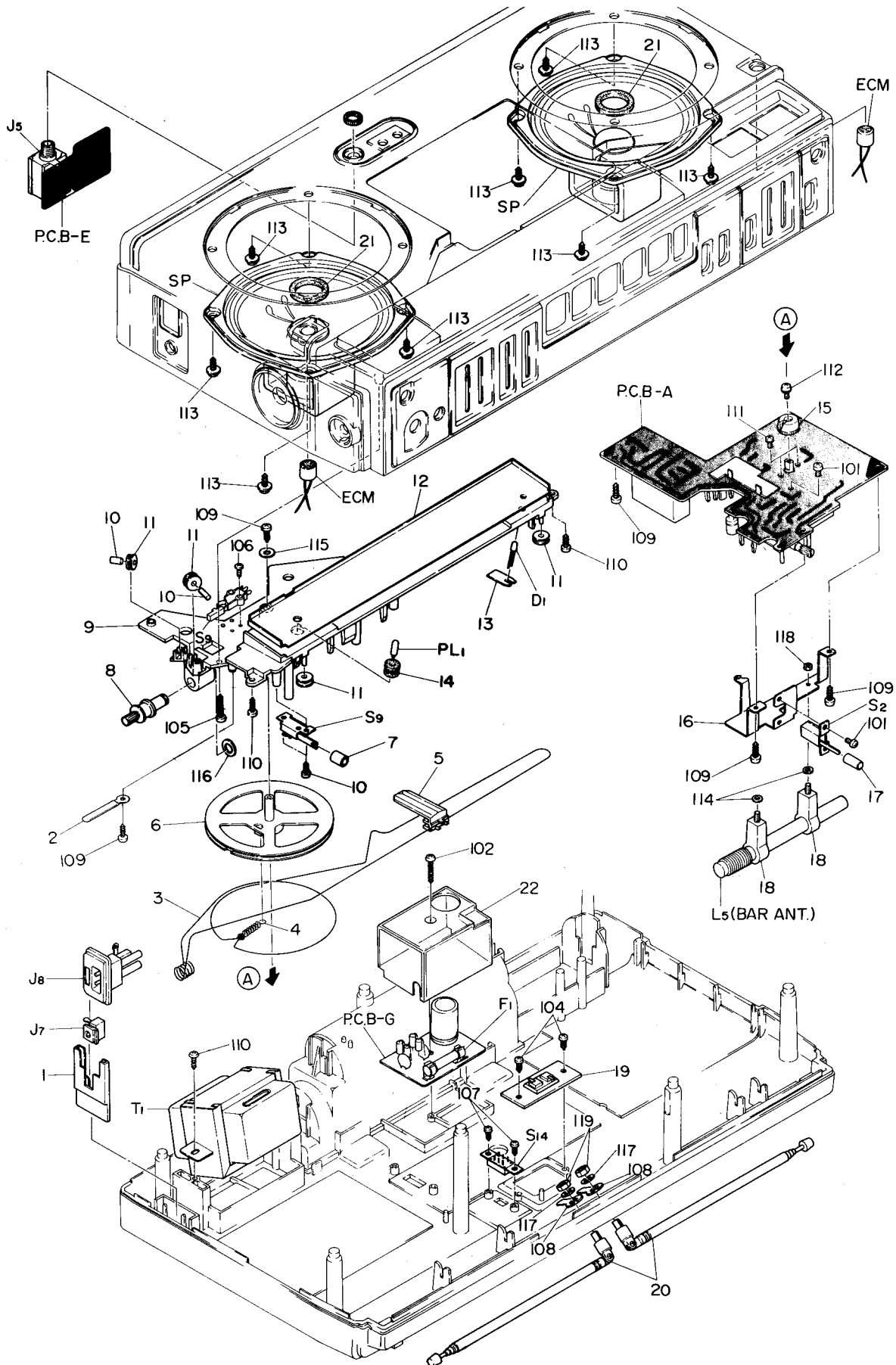
\* mark in this part list shows exclusive part (which is used) for only Model TPR-920.

Ref. No.	Part No.	Part No. Changed to	Description	Common Model	Q'ty
1~40	09-017-417-01		<b>Cabinet Assembly</b> (Main case ass'y + Back cover ass'y + Battery room lid ass'y)		
1~24	09-017-418-01		<b>Main case ass'y</b>		
1-1	82-533-061-01		Main case ass'y	*	1
1-2	82-533-013-01		Decorative plate, Front	*	1
1-3	87-064-059-01		Holder, ECM	*	2
1-4	82-533-012-01		Grille, ECM	*	2
1-5	82-533-075-01		Name plate, AIWA badge	*	1
1-6	82-386-033-01		Label, Tape indicator	AD-1250	1
1-7	82-533-046-01		Name plate, Phones	*	1
1-8	82-533-098-01		Name plate, Jack	*	1
1-9	82-461-344-01		Dust screen cloth, Speaker	TPR-930	2
1-10	82-533-009-01		Grille, Speaker R	*	1
1-11	82-533-011-01		Ring, Speaker	*	2
1-12	82-533-010-01		Grille, Speaker L	*	1
1-13	82-461-303-01		Pressure plate, Carrying handle	TPR-930	1
1-14	87-073-006-01		Steel ball 3φ		1
1-15	82-461-353-01		Actuating plate, Carrying handle	TPR-930	1
1-16	82-461-324-01		Pressure plate Spring, Carrying handle	TPR-930	1
1-17	82-533-230-01		Cushion U, 15-10-10	*	1
1-18	82-533-229-01		Cushion U, 20-15-13	*	1
1-19	82-461-366-01		Felt, Carrying handle	TPR-930	1
1-20	82-422-251-01		Poly-slider washer		2
1-21	82-533-036-01		Carrying handle	*	1
1-22	82-461-054-01		Metal fitting, Carrying handle	TPR-930	2
1-23	87-490-095-01		VWS + 3-8		2
1-24	87-233-097-01		Q + 3-12		2
25~38	09-017-419-01		<b>Back cover ass'y</b>		
1-25	82-533-004-01		Back cover	*	1
1-26	82-533-048-01		Dust screen cloth, Back cover	*	2
1-27	82-533-211-01		Pipe, Battery	*	1
1-28	82-533-222-01		Holder, Battery pipe	*	1
1-29	82-533-227-01		Himeron cloth		
1-30	87-038-032-01		Terminal plate, Battery		4
1-31	82-222-036-01		Terminal spring, Battery		2
1-32	82-476-029-01		Holder, Antenna		2
1-33	82-533-091-01		Name plate, Spec.	*	1
1-34	82-533-055-01		Name plate, Antenna	*	1
1-35	82-533-233-01		Cushion U, 30-25-20	*	1
1-36	82-533-057-01		S cushion	*	1
1-37	87-057-085-01		Label, FCC		1
1-38	87-341-074-01		UT <sub>1</sub> + 2.6-8		2
1-39	82-533-005-01		Battery room lid	*	1
1-40	82-533-232-01		Cushion U, 160-20-5	*	1
41~46	09-017-355-01		<b>Cassette lid ass'y</b>		
1-41	82-533-006-01		Cassette lid ass'y	*	1
1-42	82-461-319-01		Cushion, Cassette lid	TPR-930	2
1-43	82-432-239-01		Pressure spring R, Cassette lid	TPR-212	1
1-44	82-422-236-01		Himeron cloth, Cassette lid	TPR-203	1
1-45	82-432-238-01		Pressure spring L, Cassette lid	TPR-212	1
1-46	82-294-216-01		Spring, Cassette lid	TP-762	1
1-47	82-533-059-01		Push button, RESET	*	1
1-48	82-533-022-01		Knob, REC volume	*	2
1-49	82-533-056-01		Knob, Tone (BASS, TREBLE)	*	2
1-50	82-533-020-01		Volume knob	*	2
1-51	82-530-028-01		Selector knob ass'y	TPR-216	1
1-52	82-533-024-01		Tuning knob ass'y	*	1
1-53	82-533-231-01		Cushion U, 80-18-5	*	1

Ref. No.	Part No.	Description	Q'ty
1-101	87-351-102-01	VT <sub>1</sub> + 3-20	1
1-102	87-351-103-01	VT <sub>1</sub> + 3-25	6

Ref. No.	Part No.	Description	Q'ty
1-103	87-341-074-01	UT <sub>1</sub> + 2.6-8	1

EXPLODED VIEW-2

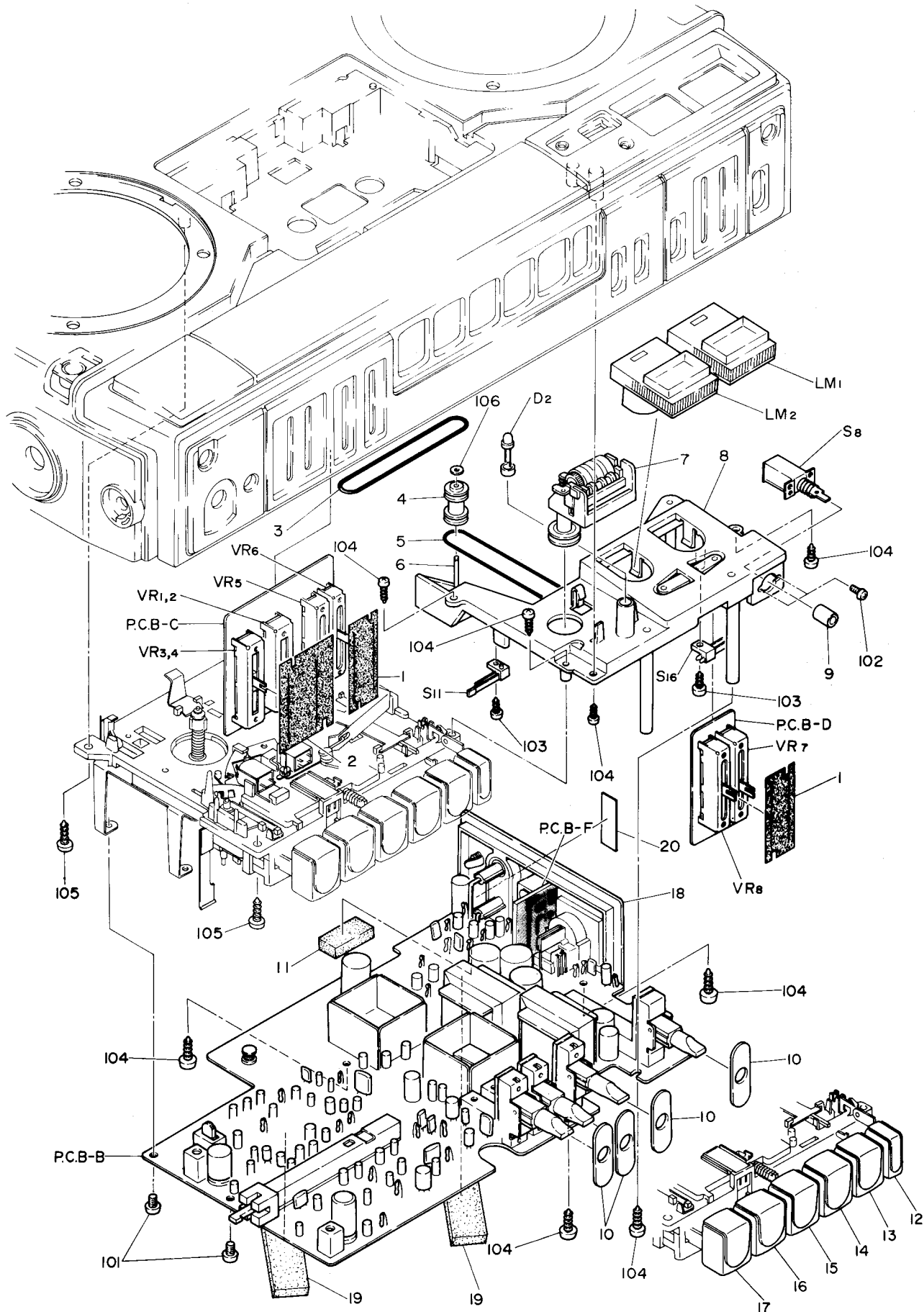


Ref. No.	Part No.	Part No. Changed to	Description	Common Model	Q'ty
2-1	82-432-215-01		Holder, Jack	TPR-212	1
2-2	87-038-039-01		Wire binder		1
2-3	87-096-045-01		String, Tuning dial		1100mm
2-4	82-439-359-01		Spring, Dial drum	TPR-300	1
2-5	82-533-033-01		Pointer, Tuning dial	*	1
2-6	82-439-310-01		Drum, Tuning dial	TPR-300	1
2-7	82-533-034-01		Button, POWER	*	1
2-8	82-533-206-01		Shaft, Tuning	*	1
2-9	82-533-204-01		Radio chassis	*	1
2-10	82-422-253-01		Shaft, Roller	TPR-203	2
2-11	81-302-107-01		Roller		4
2-12	82-533-092-01		Dial plate	*	1
2-13	82-533-215-01		Pressure plate, LED	*	1
2-14	87-087-029-01		Rubber cushion		1
2-15	82-439-311-01		Joint, Dial drum	TPR-300	1
2-16	82-533-203-01		Holder, Bar antenna	*	1
2-17	82-533-023-01		Button, AFC	*	1
2-18	87-064-045-01		Holder, Antenna		2
2-19	87-033-139-01		External antenna terminal		1
2-20	87-043-039-01		Antenna, Whip		2
2-21	82-533-057-01		S cushion, Speaker	*	2
2-22	82-533-650-01		Fuse cover	*	1

Ref. No.	Part No.	Description	Q'ty
2-101	87-263-092-01	V + 3-4	3
2-102	87-351-102-01	VT <sub>1</sub> + 3-20	1
2-103	87-351-033-01	VT <sub>1</sub> 2-4	2
2-104	87-351-094-01	VT <sub>1</sub> + 3-6	2
2-105	87-351-099-01	VT <sub>1</sub> 3-15	1
2-106	87-341-036-01	UT <sub>1</sub> + 2-8	1
2-107	87-341-073-01	UT <sub>1</sub> + 2.6-6	2
2-108	87-450-418-01	LB-8	2
2-109	87-341-095-01	UT <sub>1</sub> + 3-8	6
2-110	87-341-096-01	UT <sub>1</sub> + 1-10	3
2-111	87-480-071-01	VS + 2.6-4	2

Ref. No.	Part No.	Description	Q'ty
2-112	87-081-224-01	VS + 2.6-8	1
2-113	87-490-095-01	VTF + 3-8	8
2-114	87-081-015-01	W3-8-0.5	2
2-115	87-081-165-01	W3-10-0.5	1
2-116	87-081-570-01	PW5-10-0.6	1
2-117	87-421-309-01	SW-5	2
2-118	87-391-013-01	N-1.6	2
2-119	87-391-028-11	N-5	2
2-120	87-450-414-01	LB-4	1

EXPLODED VIEW-3



Ref. No.	Part No.	Part No. Changed to	Description	Common Model	Q'ty
3-1	82-533-043-01		Himeron cloth A, Volume	*	2
3-2	82-533-044-01		Himeron cloth B, Volume	*	1
3-3	82-446-205-01		Relay belt, Counter		1
3-4	82-422-230-01		Relay pulley, Counter	TPR-203	1
3-5	82-533-219-01		Belt, Counter	*	1
3-6	82-380-244-01		Shaft, Tape running holder		1
3-7	87-040-089-01		Counter		1
3-8	82-533-205-01		Sub-chassis	*	1
3-9	82-533-049-01		Push-button, Light	*	1
3-10	82-533-094-01		Name plate, Switch knob	*	4
3-11	82-533-221-01		Cushion, LED	*	1
3-12	82-533-014-01		Button, POUSE	*	1
3-13	82-533-015-01		Button, STOP	*	1
3-14	82-533-016-01		Button, FF	*	1
3-15	82-533-017-01		Button, PLAY	*	1
3-16	82-533-018-01		Button, REW	*	1
3-17	82-533-019-01		Button, REC	*	1
3-18	82-533-083-01		Jack board ass'y	*	1
3-19	82-533-231-01		Cushion U, 80-18-6	*	2
3-20	82-533-060-01		Earth plate		1

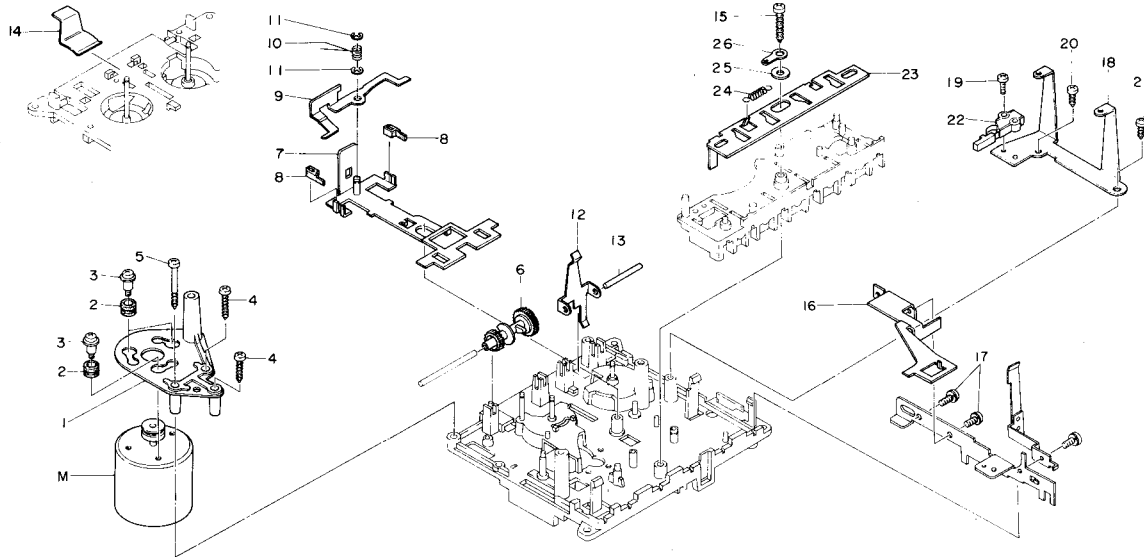
Ref. No.	Part No.	Description	Q'ty
3-101	87-263-092-01	V + 3-4	2
3-102	87-253-034-01	U + 2-5	2
3-103	87-351-035-01	VT <sub>1</sub> + 2-6	2

Ref. No.	Part No.	Description	Q'ty
3-104	87-341-095-01	UT <sub>1</sub> + 3-8	8
3-105	87-341-096-01	UT <sub>1</sub> + 3-10	2
3-106	87-081-464-01	PW1.8-5-0.5	1



**EXPLODED VIEW-4**

As this is a PM-1 mechanism, the exploded view is omitted (see the supplement PM-1 mechanism adjustment manual). The exploded view below shows the additional mechanism of the PM-1. Also shown are the attachments of the motor and a list of such.



Ref. No.	Part No.	Part No. Changed to	Description	Common Model	Q'ty
4-1	82-443-232-01		Holder, Motor	TPR-206	1
4-2	87-087-029-01		Rubber cushion		3
4-3	87-081-483-01		Motor screw, M2.6		2
4-4	87-351-102-01		VT <sub>1</sub> + 3-20		2
4-5	87-352-105-01		VT <sub>2</sub> + 3-35		1
4-6	82-439-408-01		Worm wheel L ass'y	TPR-300	1
4-7	82-439-270-01		Brake plate ass'y	TPR-300	1
4-8	82-439-426-01		Brake shoe A	TPR-300	2
4-9	82-439-271-01		Lever, CrO <sub>2</sub> selector	TPR-300	1
4-10	82-439-274-01		Spring, CrO <sub>2</sub> selector lever	TPR-300	1
4-11	87-441-006-01		STE-2.3		2
4-12	82-533-212-01		Plate spring, CrO <sub>2</sub> selector	*	1
4-13	82-439-398-01		Shaft, CrO <sub>2</sub> selector plate spring	TPR-300	1
4-14	82-294-213-01		Pressure plate spring, Cassette	TP-762	1
4-15	87-081-556-01		VT <sub>1</sub> + 3-21		1
4-16	82-294-214-01		Lever, One-push recording	TP-762	1
4-17	87-480-071-01		VS + 2.6-4		1
4-18	82-533-210-01		Metal fitting, Circuit board	*	1
4-19	87-253-036-01		U + 2-8		1
4-20	87-351-099-01		VT <sub>1</sub> + 3-15		1
4-21	87-341-096-01		UT <sub>1</sub> + 3-10		1
4-22	87-031-362-01		Micro switch, PLAY		1
4-23	82-294-215-01		Plate, One-push recording	TP-762	1
4-24	82-283-289-01		Spring A, Play idler	TP-770	1
4-25	87-081-165-01		W3-10-0.3		1
4-26	87-450-414-01		LB-4		1


The following is the part number list of the ☆☆☆ marked parts of the PM-1 mechanism.


Ref. No.	Part No.	Description	Q'ty	Ref. No.	Part No.	Description	Q'ty
1-13	82-385-332-01	Spring B, Head adjusting	1	2-33	82-294-217-01	REC lever ass'y	1
1-14	87-046-126-01	Rec./Pb head	1	2-49	82-422-237-11	Main belt	1
1-25	82-439-237-01	Cassette lock lever	1	2-50	82-385-307-01	Flywheel ass'y	1
1-31	87-046-127-01	Erase head	1	2-51	82-385-314-21	Rubber belt	1
2-31	87-480-071-01	Mounting screw, REC plate spring	1	2-52	82-385-311-01	Screw for thrust	1
2-32	82-533-216-01	Plate spring, REC	1	2-53	82-474-219-01	Lower shaft bearing plate	1
				2-60	82-385-309-11	Worm gear B ass'y	1


ACCESSORIES/PACKAGE


Ref. No.	Part No.	Part No. Changed to	Description	Common Model	Q'ty
1	82-533-861-01		Printed indiv., Packing	*	1
2	82-533-852-01		Cushion L, Printed indiv.	*	1
3	82-533-853-01		Cushion R, Printed indiv.	*	1
4	82-533-857-01		Protection sheet	*	1
5	87-051-137-01		Poly-vinyl sack (for AC cord)		1
6	87-051-182-01		Poly-vinyl sack (for case)		1
7	82-533-906-01		Instructions booklet	*	1
8	87-056-024-01		Service station list		1
9	87-056-028-01		Card, Limited warranty		1
10	87-057-085-01		Label, FCC		1
11	80-291-657-01		Tape cassette, DMC-146		1
12	87-034-810-01		AC cord C		1
13	87-034-916-01		Shorting plug		1
14	87-047-061-01		Battery, SUM-1AE		6
15	87-058-025-01		Head cleaning pole ass'y		1


HARDWARE NOMENCLATURE


V: Pan head screw 


Q: Flat countersunk head screw 


VT1: Pan head tapping screw 

UT1: Binding head tapping screw 

VS: Pan head screw with spring washer 

VWS: Pan head tapping screw with spring washer and washer 

SW: Spring washer 


VTF: Flange and Pan head tapping screw 

STE: Ering 

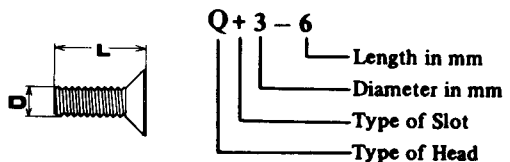
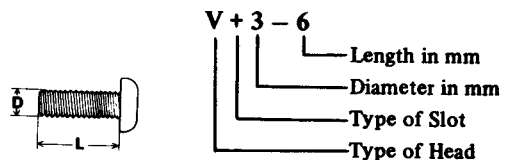
W: Washer 

PW: Poly-slider washer

N: Nut 

LB: Lug terminal plate 

Example:

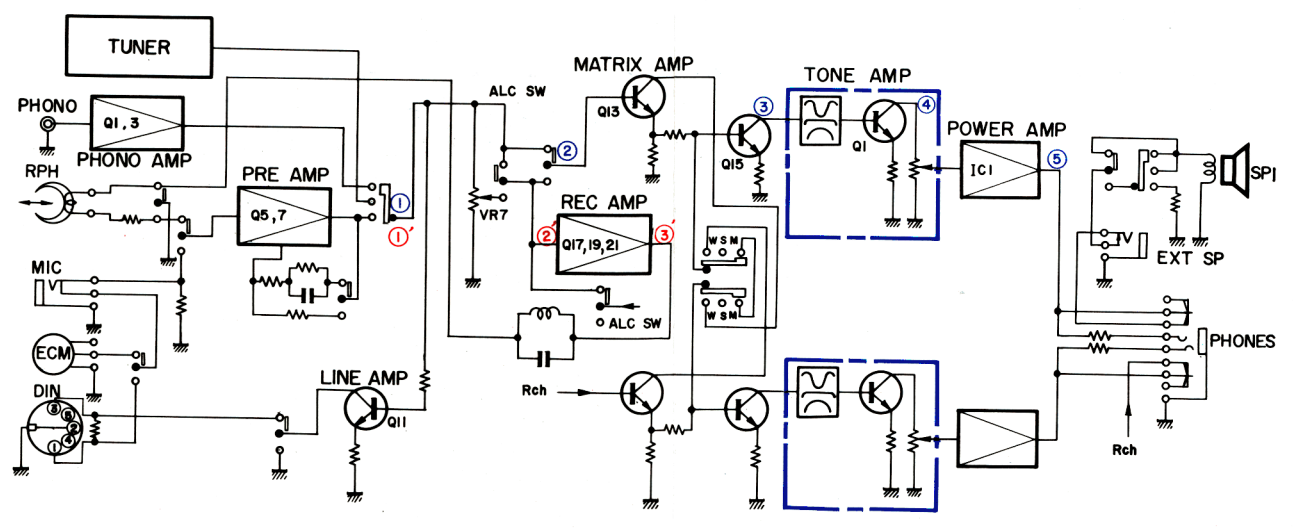


## ELECTRICAL MAIN PARTS LIST

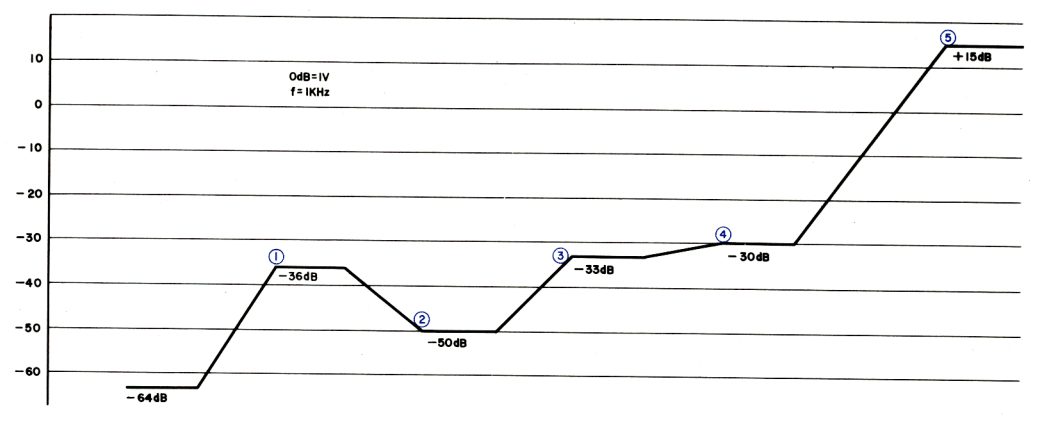
Symbol No.	Part No.	Description
<b>◀ TUNER CIRCUIT BOARD SECTION ▶</b>		
PCB-A	82-535-631-11	Tuner circuit board
IC1	87-027-169-01	IC, $\mu$ PC585 (C)
Q1	87-026-109-01	Transistor, 2SK49 (E2)
Q2	89-316-742-01	Transistor, 2SC1674 (L)
Q3	89-305-352-01	Transistor, 2SC535 (B)
Q5,7	89-316-751-01	Transistor, 2SC1675 (K)
Q4,6,8	89-303-803-01	Transistor, 2SC380 (O)
Q9	89-303-804-01	Transistor, 2SC380 (Y)
Q10	89-316-752-01	Transistor, 2SC1675 (L)
D1	88-052-553-01	Diode, 1S553
D2,3	88-051-060-01	Diode, 1N60
D4,5,6	87-027-134-01	Diode, 1S2473
D7	87-027-225-01	Zener diode, 05Z5.1 (L)
L1	82-535-614-01	FM antenna coil
L2	87-006-017-01	FM coil, 2 $\frac{1}{2}$ t
L3	87-007-088-01	FM OSC coil, 2 $\frac{1}{2}$ t
L4	87-006-052-01	SW antenna coil
L5	82-533-680-01	MW Bar antenna coil
L6	87-007-089-01	SW OSC coil
L7	87-007-048-01	MW OSC coil
L8,9	87-005-101-01	FM choke coil, 2.2 $\mu$ H
L10	87-030-051-01	MPX unit
IFT1	87-008-174-01	FM IFT
IFT2	87-008-164-01	AM IFT
IFT3	82-474-646-01	FM IFT (ratio P)
IFT4	82-474-647-01	FM IFT (ratio S)
CF1,2	87-008-153-01	FM ceramic filter, 230k
CFT1	87-008-162-01	AM ceramic filter trans
LPF1,2	87-028-037-01	Low pass filter
TC1,2,3	87-011-099-01	Trimmer
VC1~5	87-011-100-01	PVC
TC5~7		
S1	82-533-607-01	Rotary slide switch (BAND SELECTOR)
SFR1	87-021-237-01	Semi-fixed resistor, 1k $\Omega$ -B
SFR2	87-021-488-01	Semi-fixed resistor, 10k $\Omega$ -B
<b>&lt; Capacitors &gt;</b>		
C71	87-015-318-01	0.1 $\mu$ F 10V Aluminum solid
C45	87-015-319-01	0.22 $\mu$ F 10V Aluminum solid
C72,73	87-015-320-01	0.33 $\mu$ F 10V Aluminum solid
C62	87-015-321-01	0.47 $\mu$ F 10V Aluminum solid
C21,29,49	87-017-003-01	0.022 $\mu$ F Semiconductor
<b>◀ AUDIO CIRCUIT BOARD SECTION ▶</b>		
PCB-B	82-533-652-01	AUDIO circuit board
IC1,2	87-027-195-01	IC, HA1329 (W)
Q1,2,5,6	89-312-222-01	Transistor, 2SC1222 (E)
Q3,4,7,8,17,18	89-309-455-01	Transistor, 2SC945 (Q)
Q11,12,13,14,19,20,21,22	89-309-456-01	Transistor, 2SC945 (P)
Q15,16	89-307-335-01	Transistor, 2SC733 (G)
Q23,24	89-106-285-01	Transistor, 2SA628 (F)
Q25,26,205,206	89-318-154-01	Transistor, 2SC1815 (Y)
Q201,202	89-402-275-01	Transistor, 2SD227 (V)
Q203,204	89-200-562-01	Transistor, 2SB56 (B)
Q207	89-404-683-01	Transistor, 2SD468 (C)
D1,2,5,6,7,8	88-051-060-01	Diode, 1N60 (FM)
D3,4	87-026-066-01	Diode, M8513A (O)
D201	87-027-228-01	Zener diode, 05Z7.1 (U)
L1,2	87-003-034-01	Trap coil, 10mH
L201	82-418-612-01	Bias OSC coil
L202	82-401-661-01	Choke coil, 600 $\mu$ H
L203	87-003-039-01	Choke coil, 36 $\mu$ H
T1,2	82-533-666-01	Output transformer
J5	87-032-741-01	5P DIN socket W/switch
S3	82-533-608-01	Slide switch (REC/PB)
S4	88-533-604-01	Lever switch (FUNCTION)
S5,7	88-533-606-01	Lever switch (ALC/MANUAL TAPE SELECTOR)
S6	88-533-605-01	Lever switch (MODE)
S15	82-439-664-01	Slide switch (CrO <sub>2</sub> AUTO)
SFR1	87-021-467-01	Semi-fixed resistor, 10k $\Omega$ -B
SFR2	87-021-357-01	Semi-fixed resistor, 10k $\Omega$ -B

Symbol No.	Part No.	Description
SFR201,202	87-021-359-01	Semi-fixed resistor, 30k $\Omega$ -B
SFR203	87-021-454-01	Semi-fixed resistor, 200k $\Omega$ -B
<b>&lt; Resistors &gt;</b>		
R143,144,145,146	87-029-053-01	1.8 $\Omega$ 1/4W Nonflammable resistor
R218	87-029-007-01	22 $\Omega$ 1/4W Fuse resistor
<b>&lt; Capacitors &gt;</b>		
C53,54,63,64	87-015-311-01	0.1 $\mu$ F 10V Aluminum solid
C35,36,37,38	87-015-313-01	0.33 $\mu$ F 10V Aluminum solid
C99,100,113,114	87-015-314-01	0.47 $\mu$ F 10V Aluminum solid
<b>◀ CONTROL CIRCUIT BOARD SECTION ▶</b>		
PCB-C	82-533-615-11	Control circuit board
Q1,2	89-309-456-01	Transistor 2SC945 (P)
VR1,2,3,4	82-533-603-01	Volume (BASS, TREBLE)
VR5,6	82-533-602-01	Volume, 20k $\Omega$ -A (VOLUME)
<b>&lt; Capacitor &gt;</b>		
C7,8	87-015-094-01	0.33 $\mu$ F 6.3V Aluminum solid
<b>◀ REC VOLUME CIRCUIT BOARD SECTION ▶</b>		
PCB-D	82-533-649-01	REC volume circuit board
VR7,8	82-533-602-01	Volume, 20k $\Omega$ -A
<b>◀ JACK CIRCUIT BOARD SECTION ▶</b>		
PCB-E	82-533-654-01	Jack circuit board
J6	87-032-847-01	Jack 6.3 $\phi$ (PHONES)
J7,8	87-032-846-01	Jack 3.5 $\phi$ (EXT-SP)
<b>◀ MIC JACK CIRCUIT BOARD SECTION ▶</b>		
PCB-F	82-533-648-01	MIC jack circuit board
J3,4	87-032-373-01	Jack 3.5 $\phi$ (MIC)
J9	82-422-612-11	Jack 2.5 $\phi$ (REMOTE)
<b>◀ POWER CIRCUIT BOARD SECTION ▶</b>		
PCB-G	82-533-645-11	Power circuit board
D1,2,3,4	87-027-083-01	Diode, 1S1885
F1	87-035-287-01	Fuse, 4A
	87-057-837-01	Fuse label, 4A
	87-032-844-01	Fuse clamp
	82-533-650-11	Fuse cover
<b>&lt; Resistor &gt;</b>		
R1	87-023-001-01	2.2M $\Omega$ 1/2W $\pm$ 5%
<b>◀ MISCELLANEOUS ▶</b>		
T1	82-533-646-01	Power transformer
T2	87-006-048-01	Balun transformer
D1	87-026-105-01	Light emitting diode (STEREO)
D2	87-026-085-01	Light emitting diode (TAPE RUN)
RPH	87-047-126-01	REC/PB head
EH	87-046-127-01	Erase head
ECM	85-868-019-01	ECM, CMU-9 (B)
PL	82-423-607-01	Pilot lamp (LIGHT)
M	87-045-106-01	Motor
LM1	82-533-609-01	Level meter (L)
LM2	82-533-610-01	Level meter (R)
F2	87-035-290-01	Fuse, 1.6A
	87-057-846-01	Fuse label, 1.6A
SP1,2	82-533-601-01	Speaker
S2	82-533-614-01	Push switch (AFC/OSC)
S8	82-533-613-01	Push switch (BATT/TUNE)
S9	87-031-286-01	Push switch (SLEEP)
S10	87-031-418-01	Micro switch (PLAY)
S11,16	87-031-361-01	Leaf switch (PAUSE, DIAL LIGHT)
S12	87-031-393-01	Leaf switch (AUTO STOP)
S14	82-533-628-01	Slide switch (ANTENNA SELECTOR)
J10	82-266-214-11	DC jack
J11	87-032-854-01	AC jack
	87-005-080-01	RH core
	87-033-139-01	Antenna socket (EXT ANT)

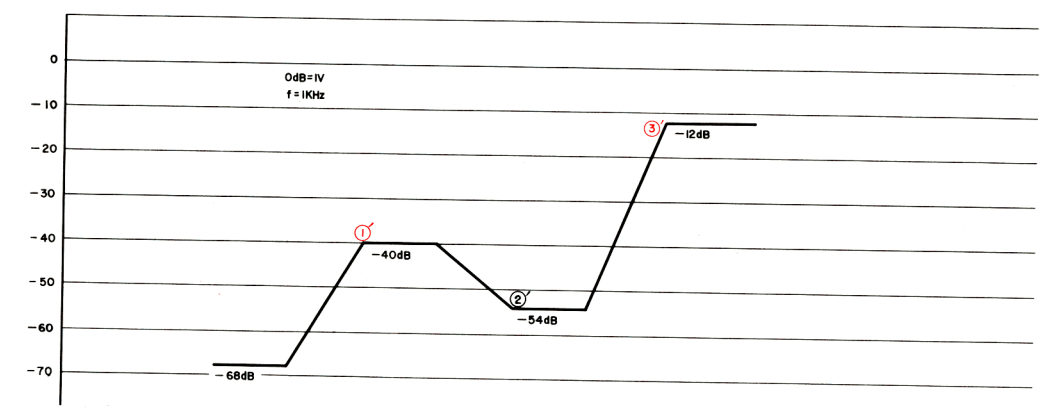
LEVEL DIAGRAM



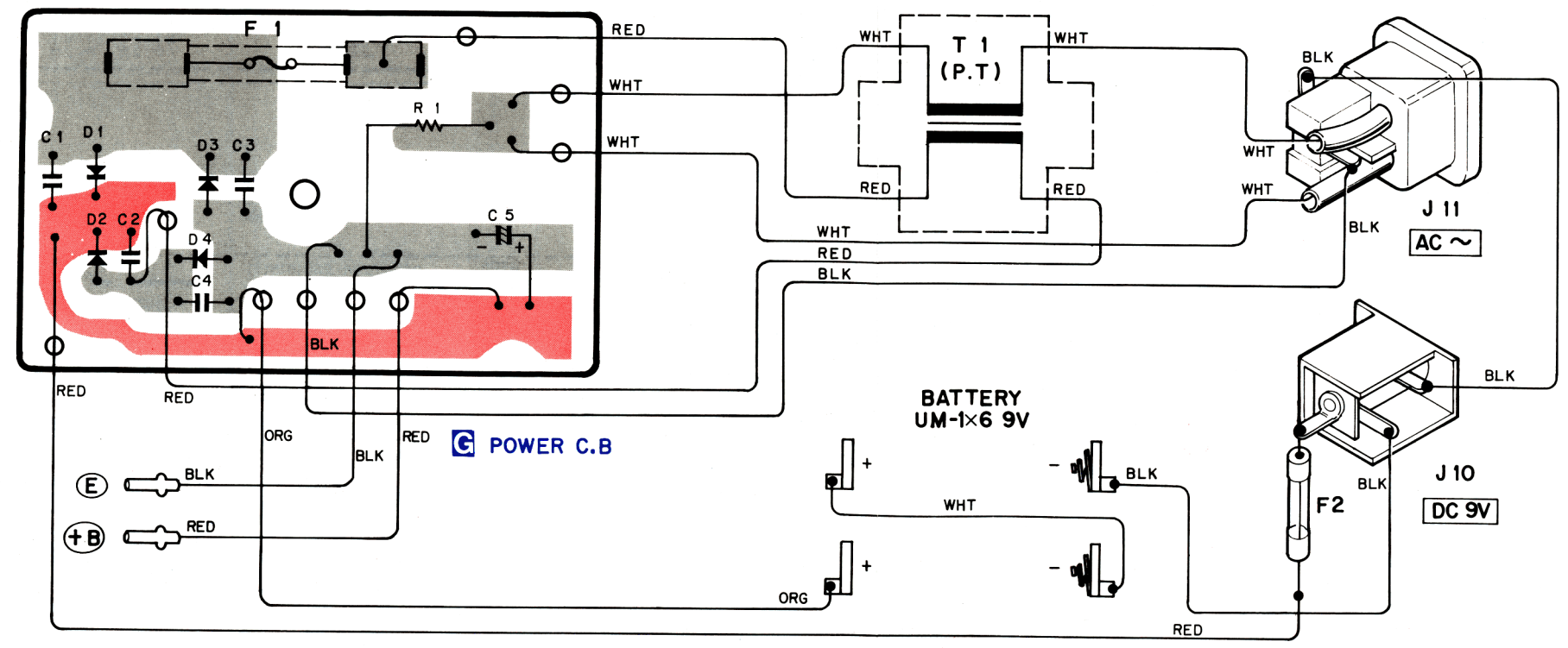
• Playback



• Record

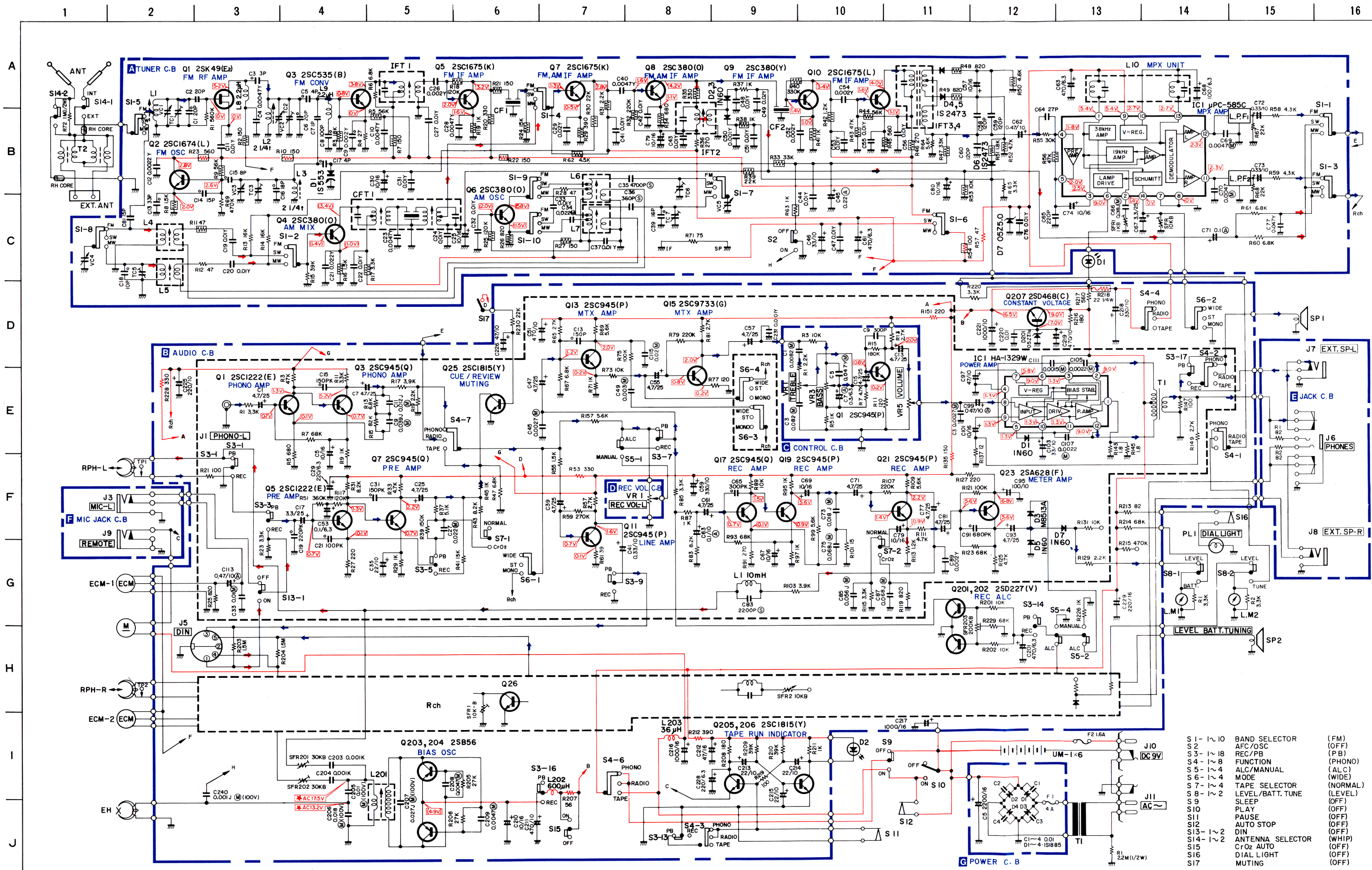


POWER CIRCUIT BOARD

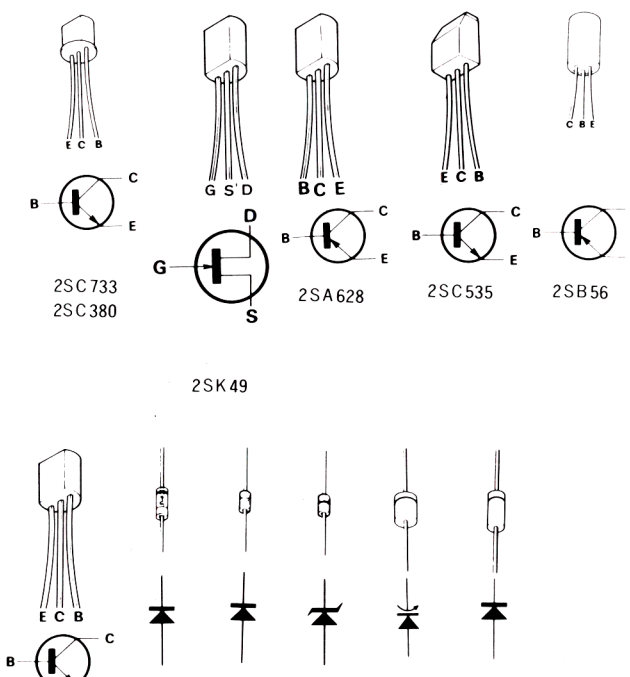




SCHEMATIC DIAGRAM



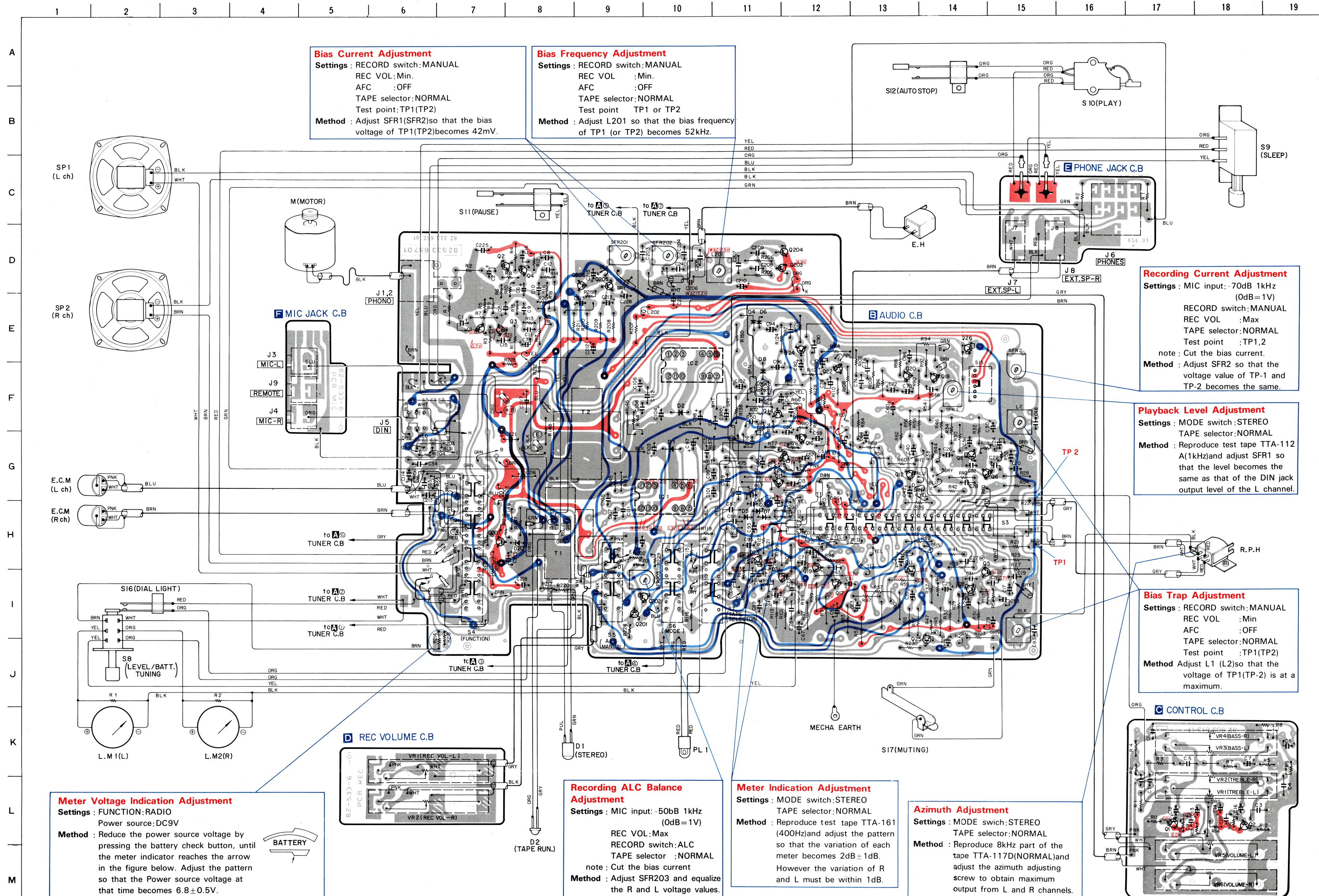
- NOTES:**
- 1) — B (+) power supply
  - 2) → Signal path
  - 3) The voltage is the reference value measured with a tester 20 k-ohms/V DC when there are no signals. But ( ) is with AM reception or recording. An asterisk (\*) indicates that the value was measured with a vacuum-tube voltmeter during recording.
  - 4) Resistors with no designation have a rated power of 1/4W and a tolerance of ±5%.
  - 5) Capacitors with no designation have a dielectric strength of less than 50WV.
  - 6) Ceramic capacitor symbols:  
 □ For temperature compensation (SL)  
 ▭ High dielectric constant system (YY)  
 ▮ High dielectric constant system (YW, YP, YZ)
  - 7) The only capacitor tolerances indicated are ±5% (J) and ±10% (K).
  - 8) Explanation of symbols  
 (M) Mylar capacitor  
 (S) Styrol capacitor  
 (C) Mica capacitor  
 (A) Aluminum solid capacitor  
 [ ] Printed resistor
- \* This schematic diagram is subject to change without notice in the interests of improved performance.



- |      |      |                  |          |
|------|------|------------------|----------|
| S1-1 | 1-10 | BAND SELECTOR    | (FM)     |
| S2   | 1-10 | AFC/OSC          | (OFF)    |
| S3   | 1-18 | REC/PB           | (PB)     |
| S4   | 1-8  | FUNCTION         | (PHONO)  |
| S5   | 1-4  | ALC/MANUAL       | (ALC)    |
| S7   | 1-4  | MODE             | (WIDE)   |
| S8   | 1-2  | TAPE SELECTOR    | (NORMAL) |
| S9   | 1-2  | LEVEL/BATT. TUNE | (LEVEL)  |
| S10  | 1-2  | SLEEP            | (OFF)    |
| S11  | 1-2  | PLAY             | (OFF)    |
| S12  | 1-2  | PAUSE            | (OFF)    |
| S13  | 1-2  | AUTO STOP        | (OFF)    |
| S14  | 1-2  | DIN              | (OFF)    |
| S15  | 1-2  | ANTENNA SELECTOR | (WHIP)   |
| S16  | 1-2  | CrO2 AUTO        | (OFF)    |
| S17  | 1-2  | DIAL LIGHT       | (OFF)    |
| S17  | 1-2  | MUTING           | (OFF)    |



WIRING-1



**Bias Current Adjustment**  
**Settings :** RECORD switch:MANUAL  
 REC VOL :Min.  
 AFC :OFF  
 TAPE selector:NORMAL  
 Test point:TP1(TP2)  
**Method :** Adjust SFR1(SFR2)so that the bias voltage of TP1(TP2)becomes 42mV.

**Bias Frequency Adjustment**  
**Settings :** RECORD switch:MANUAL  
 REC VOL :Min.  
 AFC :OFF  
 TAPE selector:NORMAL  
 Test point TP1 or TP2  
**Method :** Adjust L201 so that the bias frequency of TP1 (or TP2) becomes 52kHz.

**Recording Current Adjustment**  
**Settings :** MIC input: -70dB 1kHz  
 (0dB=1V)  
 RECORD switch:MANUAL  
 REC VOL :Max  
 TAPE selector:NORMAL  
 Test point :TP1,2  
 note : Cut the bias current.  
**Method :** Adjust SFR2 so that the voltage value of TP-1 and TP-2 becomes the same.

**Playback Level Adjustment**  
**Settings :** MODE switch:STEREO  
 TAPE selector:NORMAL  
**Method :** Reproduce test tape TTA-112 A(1kHz)and adjust SFR1 so that the level becomes the same as that of the DIN jack output level of the L channel.

**Bias Trap Adjustment**  
**Settings :** RECORD switch:MANUAL  
 REC VOL :Min  
 AFC :OFF  
 TAPE selector:NORMAL  
 Test point :TP1(TP2)  
**Method :** Adjust L1 (L2)so that the voltage of TP1(TP-2) is at a maximum.

**Meter Voltage Indication Adjustment**  
**Settings :** FUNCTION:RADIO  
 Power source:DC9V  
**Method :** Reduce the power source voltage by pressing the battery check button, until the meter indicator reaches the arrow in the figure below. Adjust the pattern so that the Power source voltage at that time becomes  $6.8 \pm 0.5V$ .

**Recording ALC Balance Adjusting**  
**Settings :** MIC input: -50db 1kHz  
 (0dB=1V)  
 REC VOL:Max  
 RECORD switch:ALC  
 TAPE selector :NORMAL  
 note : Cut the bias current  
**Method :** Adjust SFR203 and equalize the R and L voltage values.

**Meter Indication Adjustment**  
**Settings :** MODE switch:STEREO  
 TAPE selector:NORMAL  
**Method :** Reproduce test tape TTA-161 (400Hz)and adjust the pattern so that the variation of each meter becomes  $2dB \pm 1dB$ . However the variation of R and L must be within 1dB.

**Azimuth Adjustment**  
**Settings :** MODE switch:STEREO  
 TAPE selector:NORMAL  
**Method :** Reproduce 8kHz part of the tape TTA-117D(NORMAL)and adjust the azimuth adjusting screw to obtain maximum output from L and R channels.

NOTES (1) B (+) Pattern Component Side Pattern Others Pattern (2) The voltage is the reference value measured with a tester (20Kohms/VDC) when there are no signals.



**ADJUSTMENTS**

● **Instruments Required**

**Signal Source**

1. RF Signal generator (AM, FM).
2. IF sweep generator (Centered 455 kHz for AM and 10.7 MHz for FM).
3. Loop antenna
4. Capacitor 8pF

**Output Indicator**

1. V.T.V.M.
2. Oscilloscope

● **Regulator Adjusting Steps**

For band	For stages on each band
1. AM	1st: IF
2. MW	1st: RF frequency range 2nd: RF tracking
3. SW	1st: RF frequency range 2nd: RF tracking
4. FM	1st: IF 2nd: RF frequency range 3rd: RF tracking.

**AM-IF Alignment**

Step	Signal source	Set signal to	Alignment indicator	Set radio dial to	Adjust	Adjust for
	Connect to		Connect to			
1	AM IF sweep gen.	Sweep centered 455 kHz	Oscilloscope	Min. Freq.	CFT1	Maximum
	TP1 (AM IF input)		TP2 (AM DET output)			

**MW-RF Alignment**

Step	Signal source	Set signal to	Alignment indicator	Set radio dial to	Adjust	Adjust for
	Connect to		Connect to			
1	AM signal gen.	515 kHz (Modulated)	V.T.V.M.	515 kHz (Low end)	L7 (OSC coil)	Maximum
	Loop antenna		TP2 (AM DET output)			
2	Loop antenna	1650 kHz (Modulated)	TP2 (AM DET output)	1650 kHz (High end)	TC7 (OSC trim.)	Maximum
3	(Repeat steps 1 and 2 to obtain frequency range.)					
4	Loop antenna	600 kHz (Modulated)	TP2 (AM DET output)	600 kHz	L5 (ANT coil)	Maximum
5	Loop antenna	1400 kHz (Modulated)	TP2 (AM DET output)	1400 kHz	TC5 (ANT trim.)	Maximum
6	(Repeat steps 4 and 5 to minimize tracking error, and also step 3 if necessary)					

**SW-RF Alignment**

Step	Signal source	Set signal to	Alignment indicator	Set radio dial to	Adjust	Adjust for
	Connect to		Connect to			
1	AM signal gen.	3.1 MHz (Modulated)	V.T.V.M.	3.1 MHz (Low end)	L6 (OSC coil)	Maximum
	Antenna terminal		TP2 (AM DET output)			
2	Antenna terminal	12.3 MHz (Modulated)	TP2 (AM DET output)	12.3 MHz (High end)	TC6 (OSC trim.)	Maximum
3	(Repeat steps 1 and 2 to obtain frequency range.)					
4	Antenna terminal	3.2 MHz (Modulated)	TP2 (AM DET output)	3.2 MHz	L4 (ANT coil)	Maximum
5	Antenna terminal	12 MHz (Modulated)	TP2 (AM DET output)	12 MHz	—	—
6	(Repeat steps 4 and 5 to minimize tracking error, and also step 3 if necessary.)					

**FM-IF Alignment**

Step	Signal source	Set signal to	Alignment Indicator	Set radio dial to	Adjust	Adjust for
	Connect to		Connect to			
1	FM IF sweep gen.	Sweep centered 10.7 MHz	Oscilloscope	Max. Freq.	IFT1 IFT3	Max. Symmetrical response. equal heights
	TP3 (FM IF input)		TP4 (FM DET output)			
2	TP3 (FM IF input)	Sweep centered 10.7 MHz	TP4 (FM DET output)	Max. Freq.	IFT4	Symmetrical response. centered 10.7 MHz
3	(Repeat 1 and 2 to obtain a balanced "S" curve linearity.)					

**FM-RF Alignment**

Step	Signal source	Set signal to	Alignment Indicator	Set radio dial to	Adjust	Adjust for
	Connect to		Connect to			
1	FM signal gen.	87 MHz (Modulated)	V.T.V.M.	87 MHz (Low end)	L3 (OSC coil)	Maximum
	Antenna terminal		TP4 (FM DET output)			
2	Antenna terminal	109 MHz (Modulated)	TP4 (FM DET output)	109 MHz (High end)	TC3 (OSC trim.)	Maximum
3	(Repeat steps 1 and 2 to obtain frequency range.)					
4	Antenna terminal	88 MHz (Modulated)	TP4 (FM DET output)	88 MHz	L1, L2 (ANT coil)	Maximum
5	Antenna terminal	108 MHz (Modulated)	TP4 (FM DET output)	108 MHz	TC1, TC2 (ANT trim.)	Maximum
6	(Repeat steps 4 and 5 to minimize tracking error, and step 3 if necessary.)					

**FM MPX Adjustment**

**Adjustment Conditions**

Carrier frequency	98 MHz
Input Signal	54 dB
Modulation frequency	1 kHz
Modulation	100%

MODE switch to STEREO; input applied to FM ANT INPUT: TUNER OUT output employed.

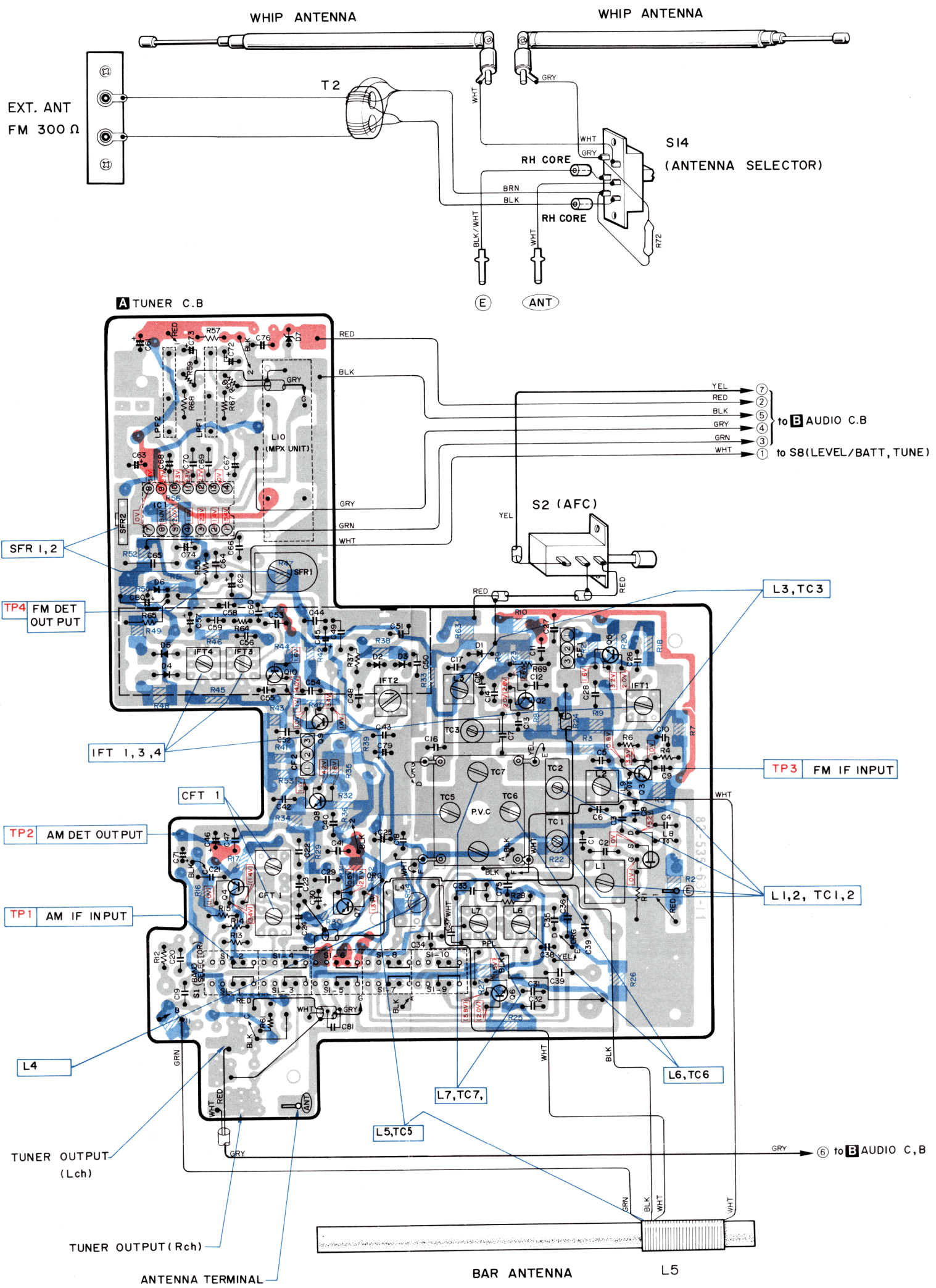
**Adjustment:**

Adjust separation semi-fixed resistor SFR1 for optimum separation. Then, adjust SFR2 so that the stereo indicator lights up when the input signal is 20 dB.

WIRING-2

1 2 3 4 5 6 7 8 9 10

A  
B  
C  
D  
E  
F  
G  
H  
I  
J  
K  
L  
M



NOTES (1)  B (+) Pattern  Component Side Pattern  Others Pattern

(2) The voltage is the reference value measured with a tester (20Kohms/VDC) when there are no signals.





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