

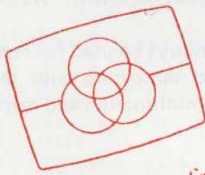
AIWA® SERVICE MANUAL

S/M Cord No. 85-028 **W**

DATE OF ISSUE 6/1985

MULTIBAND STEREO RADIO CASSETTE RECORDER

MODEL NO.

CS-230

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TYPE. HJS, HJR, HJB, CWR, KS, KWR, KB, GB, FJB, HB, HS, HR, UB, UWR, CB, CS, EB, ES, EWR, ZB, ZS, ZWR, GB, GS

SPECIFICATIONS

Type	Stereo multiband radio cassette recorder	Recording time	90 minutes (C-90 cassette, both directions)
Power source	Batteries, DC 9 V (R20P×6) CS-230H,F AC 110—120 V/220—240 V (switchable), 50—60 Hz CS-230U AC 120 V/220 V—240 V (switchable), 50—60 Hz CS-230C AC 120 V, 60 Hz CS-230G AC 240 V, 50—60 Hz	Frequency response	50—12,500 Hz
Output	5.4 W maximum (2.7 + 2.7W) CS-230U (FTC Rule) 1.4 watts per channel, Min. RMS at 2.6 ohms, from 200 Hz to 10 kHz, with no more than 10% Total Harmonic Distortion	Radio Section	
Power consumption	CS-230H,F 11 W CS-230U 9 W CS-230C 11 W CS-230G 13 W	Frequency ranges	CS-230H,F FM: 88—108 MHz MW: 530—1,605 kHz SW ₁ : 2.3—7.0 MHz SW ₂ : 7.0—22 MHz CS-230U,C,G FM: 88—108 MHz AM 530—1,605 kHz
Speakers	100 mm cone type × 2	Antennas	CS-230H,F Whip antenna for FM and SW ₂ Ferrite bar antenna for MW and SW ₁ CS-230U,C,G Whip antenna for FM Ferrite bar antenna for AM
Tape Recorder Section		Dimensions (W×H×D)	444 × 152 × 105 mm
Built-in microphone	Electret condenser microphone	Weight	2.1 kg
Tape speed	4.8 cm/sec (1-7/8 ips)	Accessories	AC power cord 1
Recording system	AC bias		
Erasing system	DC erase		

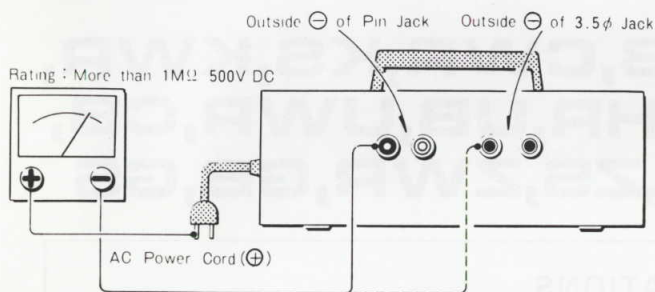
Note:
Please check the copy right laws relating to recordings from discs, radio or external tape for the country in which the machine is being used

- Specification of type E, K, Z is printed on inside pages.
- Design and specifications are subject to change without notice.

Follow the instructions carefully, which will allow the user to optimise the products' performance and give many years of service.

1. No scratch and melting shall be made to covered lead-wires of an a.c. primary circuit including mains leads.
2. No illegibility shall be given to the specification plate, the caution labels, the fuse labels and others.
3. When, on pattern sides of circuit boards, additional repair-parts have been made up, the parts shall be firmly glued to circuit boards or other components, unless the parts can be attached firmly.
4. The following matters shall be maintained as they are, when repairing.
 - 1) Soldering of lead-wire ends
 - * Care should be taken of the space distance in an a.c. primary circuit as well as soldering.
 - 2) Wiring and holding of lead-wires with wire-clips and binders
 - 3) Materials of lead-wires
 - * e.g.; For UL models, lead-wires to be used shall be approved or accepted by the UL.
 - 4) Location of all kinds of insulators
 - 5) Setting of voltage selector switch
 - * Set the Voltage Selector Switch to 240V, 220V, or 120V, According to your Local Voltage.
5. After repaired, the insulation resistance or leakage current shall be measured with $500 \pm 5V$ D.C and shall be not less than $1M\Omega$.

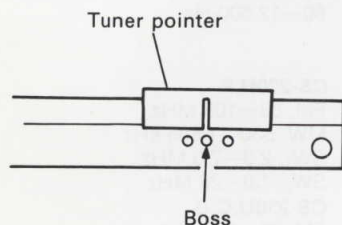
Measuring Point



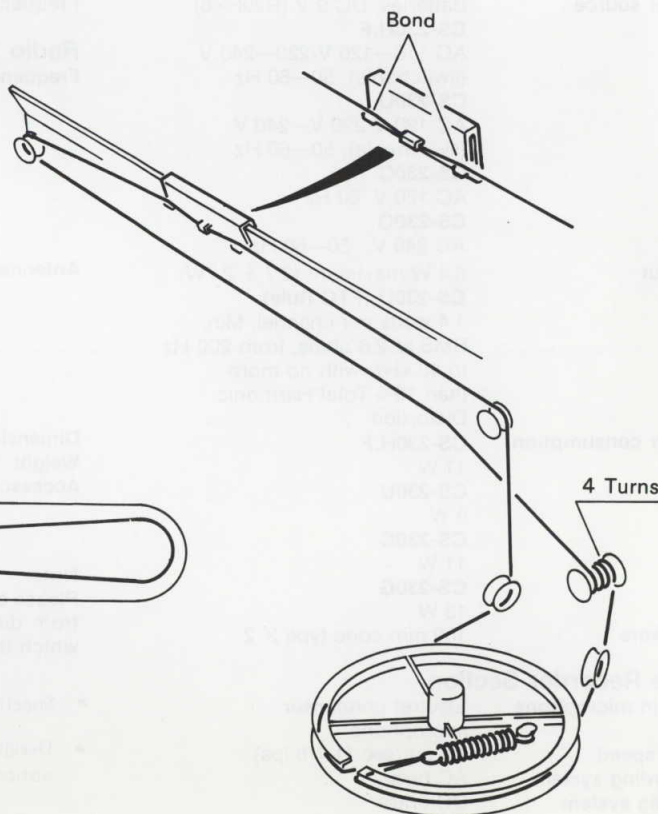
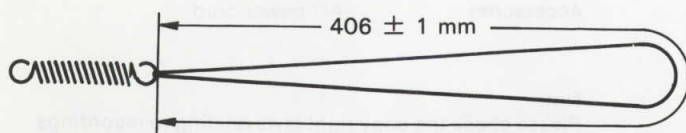
6. General instructions for mechanism repair

- 1) The heads, capstan and pinch roller shall be cleaned of good quality alcohol after repaired, because dirty heads shall cause distorted sounds while dirty capstan and pinch roller shall occur wow/flutter and take-up fault.
- 2) Lubricants been stained the surfaces of transmitting portion of the belts, idlers, capstan and pinch roller shall be removed, because slippery and faulty tape travel shall be caused.
- 3) When oiling, only one or two drops shall be applied so as not to run over and be dispersed. Note should be taken of the metal fitting for the capstan and rotating portions of the idlers and pinch-roller, especially.
- 4) E-rings and poly slider washers shall be replaced with new ones, if once those have been removed. — No re-utilization due to unreliability.
- 5) Regular spare-parts shall always be used for repair, because using irregular parts and tampering with the products shall cause deterioration, malfunction and damage.

DIAL CORD STRINGING



Adjust the center of tuner pointer to the boss as shown in the Figure.



ELECTRICAL MAIN PARTS LIST

Ref.No.	Part.No.	Description
=== IC ===		
	87-020-461	IC,BA4234L
	87-020-368	IC,TA7283AP
	87-020-446	IC,TA7343AP
	87-020-356	IC,TA7358P
	87-027-951	IC,TA7668BP
=== TRANSISTOR ===		
	89-110-155	TRANSISTOR,2SA1015 GR
	89-313-833	TRANSISTOR,2SC1383NCR
	89-318-154	TRANSISTOR,2SC1815Y,GR
	89-319-233	TRANSISTOR,2SC1923 O
=== TUNER CIRCUIT BOARD SECTION ===		
PCB-A	*	TUNER CIRCUIT BOARD (E,K ONLY)
PCB-A	*	TUNER CIRCUIT BOARD (U,C,G,Z ONLY)
BPF1	* 87-030-087	FILTER BPMB6
C1	* 87-018-109	CAP,CERA-SOL SS 22P (EXCEPT E,K,Z)
C1	* 87-018-110	CAP,CERA-SOL SS 24P (Z ONLY)
C2	* 87-018-133	CAP,CERA-SOL SS 4700P
C3	* 87-018-134	CAP,CERA-SOL SS 0.01
C4	* 87-018-097	CAP,CERA-SOL SS 2.2P
C5	* 87-018-104	CAP,CERA-SOL SS 10P
C6	* 87-018-134	CAP,CERA-SOL SS 0.01
C7	* 87-018-134	CAP,CERA-SOL SS 0.01
C8	* 87-018-134	CAP,CERA-SOL SS 0.01
C9	* 87-018-162	CAP,CERA-SOL SS 15P RH
C10	* 87-018-150	CAP,CERA-SOL SS 18P CH (Z ONLY)
C11	* 87-018-147	CAP,CERA-SOL SS 3.3P CH
C12	* 87-018-134	CAP,CERA-SOL SS 0.01
C13	* 87-018-106	CAP,CERA-SOL SS 15P
C14	* 87-018-133	CAP,CERA-SOL SS 4700P
C15	* 87-018-134	CAP,CERA-SOL SS 0.01
C16	* 87-012-105	CAP,CERA-SOL SS 0.022
C17	* 87-012-105	CAP,CERA-SOL SS 0.022
C18	* 87-018-134	CAP,CERA-SOL SS 0.01
C21	* 87-018-104	CAP,CERA-SOL SS 10P (U,C,G,Z ONLY)
C22	* 87-018-134	CAP,CERA-SOL SS 0.01
C23	* 87-018-119	CAP,CERA-SOL SS 100P
C37	* 87-018-170	CAP,CERA-SOL SS 8.2P UJ (U,C ONLY)
C37	* 87-018-106	CAP,CERA-SOL SS 15P (E,K,G,Z ONLY)
C38	* 87-018-108	CAP,CERA-SOL,20P (E,K ONLY)
C39	* 87-018-131	CAP,CERA-SOL SS 1000P (E,K ONLY)
C39	* 87-012-105	CAP,CERA-SOL 0.022 (U,C,G,Z ONLY)
C40	* 87-012-105	CAP,CERA-SOL 0.022
C41	* 87-018-134	CAP,CERA-SOL SS 0.01 (E,K ONLY)
C42	* 87-018-176	CAP,CERA-SOL SS 22P UJ (E,K ONLY)
C43	* 87-018-174	CAP,CERA-SOL SS 18P UJ (E,K ONLY)
C44	* 87-014-045	CAP,PP 330P (E,K ONLY)
C45	* 87-014-033	CAP,PP 100P (E,K ONLY)
C45	* 87-018-134	CAP,CERA-SOL SS 0.01 (U,C,E,K ONLY)
C46	* 87-018-179	CAP,CERA-SOL SS 30P UJ (E,K ONLY)
C46	* 87-018-114	CAP,CERA-SOL SS 39P (U,C,E,K ONLY)
C48	* 87-012-105	CAP,CERA-SOL 0.022 (E,K ONLY)
C49	* 87-012-105	CAP,CERA-SOL 0.022 (E,K ONLY)
C53	* 87-018-134	CAP,CERA-SOL SS 0.01 (E,K ONLY)
C54	* 87-018-109	CAP,CERA-SOL SS 22P (E,K ONLY)
C55	* 87-018-110	CAP,CERA-SOL SS 24P (E,K ONLY)
C56	* 87-018-110	CAP,CERA-SOL SS 24P (E,K ONLY)
CF1	* 87-008-261	FILTER SFE10.7MA5-A (U,C,G ONLY)
CF1	* 87-008-264	FILTER SFE10.7MS2-A (Z ONLY)
CF2	* 87-008-261	FILTER SFE10.7MA5-A (U,C,G ONLY)

- * -mark means less required items and availabilities may be limited.
- +++ mark denotes a component of assembled part which part code is represented by a previously stated component.

Ref.No.	Part.No.	Description
CF2	* 87-008-264	FILTER SFE10.7MS2-A (Z ONLY)
D1	87-017-004	DIODE,SD-117
D4	87-020-110	DIODE 1SS177 (U,C,G,Z ONLY)
IFT1	* 87-008-292	IFT FM PS
IFT2	* 87-008-293	IFT FM(QUAD)PS
L1	* 87-006-084	COIL RF FM
L2	* 87-007-162	COIL OSC FM
L3	* 87-006-088	COIL,ANT SW (E,K ONLY)
L3	* 81-546-605	ANT,FERRITE BAR AM-4 PS (U,C,G,Z ONLY)
L4	* 81-532-680	ANT,FERRITE BAR LW-MW (E,K ONLY)
L5	+++	ANT,FERRITE BAR LW-MW (E,K ONLY)
L4	* 87-007-150	COIL,OSC AM (U,C,G,Z ONLY)
L5	* 87-003-118	COIL,CHOKE 0.27UH (U,C,G,Z ONLY)
L6	* 87-007-156	COIL,OSC SW PS (E,K ONLY)
L7	* 87-007-154	COIL,OSC MW PS (E,K ONLY)
L8	* 87-007-153	COIL,OSC LW PS (E,K ONLY)
L9	* 87-003-118	COIL,CHOKE 0.27UH (E,K ONLY)
L10	* 87-005-165	COIL,CHOKE 1UH (E,K ONLY)
MFT1	* 87-008-294	FILTER CFMA-468PS
R30	* 87-025-332	RES,NONFLAM 10 1/4W (EXCEPT C,G,Z,E,K)
SFR1	* 87-021-741	SFR 4.7K
TC5	* 87-011-164	TRIMMER,CERAMIC 30PF (E,K ONLY)
TC6	* 87-011-154	TRIMMER,CERAMIC 6PF (E,K ONLY)
TC7	* 87-011-155	TRIMMER,CERAMIC 10PF (E,K ONLY)
TC8	* 87-011-164	TRIMMER,CERAMIC 30PF (E,K ONLY)
VC1	* 87-011-167	PVC 335-20P (E,K ONLY)
VC2	+++	PVC 335-20P (E,K ONLY)
VC3	+++	PVC 335-20P (E,K ONLY)
VC4	+++	PVC 335-20P (E,K ONLY)
TC1	+++	PVC 335-20P (E,K ONLY)
TC2	+++	PVC 335-20P (E,K ONLY)
TC3	+++	PVC 335-20P (E,K ONLY)
TC4	+++	PVC 335-20P (E,K ONLY)
VC1	* 87-011-171	PVC TRACKINGLESS 20P (U,C,G,Z ONLY)
VC2	+++	PVC TRACKINGLESS 20P (U,C,G,Z ONLY)
VC3	+++	PVC TRACKINGLESS 20P (U,C,G,Z ONLY)
VC4	+++	PVC TRACKINGLESS 20P (U,C,G,Z ONLY)
TC1	+++	PVC TRACKINGLESS 20P (U,C,G,Z ONLY)
TC2	+++	PVC TRACKINGLESS 20P (U,C,G,Z ONLY)
TC3	+++	PVC TRACKINGLESS 20P (U,C,G,Z ONLY)
TC4	+++	PVC TRACKINGLESS 20P (U,C,G,Z ONLY)
S1	81-546-621	ROTARY SW (BAND) (E,K ONLY)

=== MAIN CIRCUIT BOARD SECTION ===

PCB-B	*	MAIN CIRCUIT BOARD (C ONLY)
PCB-B	*	MAIN CIRUCIT BOARD (U ONLY)
PCB-B	*	MAIN CIRUCIT BOARD (E,K,G,Z ONLY)
C1	* 87-018-040	CAP,CERA-SOL 470P
C2	* 87-018-040	CAP,CERA-SOL 470P
C5	* 87-018-042	CAP,CERA-SOL S,680P
C6	* 87-018-042	CAP,CERA-SOL S,680P
C9	* 87-018-040	CAP,CERA-SOL 470P
C10	* 87-018-040	CAP,CERA-SOL 470P
C13	* 87-018-034	CAP,CERA-SOL S 150P
C14	* 87-018-034	CAP,CERA-SOL S 150P
C17	* 87-018-046	CAP,CERA-SOL 4700P
C18	* 87-018-046	CAP,CERA-SOL 4700P
C21	* 87-018-046	CAP,CERA-SOL 4700P
C22	* 87-018-046	CAP,CERA-SOL 4700P
C39	* 87-018-040	CAP,CERA-SOL 470P
C40	* 87-018-040	CAP,CERA-SOL 470P
C52	* 87-018-047	CAP,CERA-SOL 0.01
C53	* 87-018-047	CAP,CERA-SOL 0.01
C55	* 87-018-047	CAP,CERA-SOL 0.01

Ref.No.	Part.No.	Description
C56	* 87-018-047	CAP,CERA-SOL 0.01
C58	* 87-018-047	CAP,CERA-SOL 0.01
C66	* 87-018-047	CAP,CERA-SOL 0.01
C67	* 87-018-045	CAP,CERA-SOL 2200P
C68	* 87-012-105	CAP,CERA-SOL 0.022
C76	* 87-018-047	CAP,CERA-SOL 0.01
C77	* 87-018-047	CAP,CERA-SOL 0.01
D5	87-027-244	DIODE,ZENER 05Z8.2
D6	87-027-625	DIODE,ZENER 05Z6.8
D7	87-027-365	DIODE S5277B
D8	87-027-365	DIODE S5277B
D9	87-027-365	DIODE S5277B
D10	87-027-365	DIODE S5277B
D11	87-027-365	DIODE S5277B
J1	87-049-436	JACK 3.5 ST SS (AUX)
J2	87-049-333	JACK 3.5 ST SS (PHONES)
AJ3	87-032-954	JACK AC (U,C ONLY)
AJ3	87-032-977	JACK AC (E,K,G,Z ONLY)
L1	* 81-544-611	COIL OSC BIAS
R35	* 87-025-239	RES,NONFLAM 1/4W 2.2
R36	* 87-025-239	RES,NONFLAM 1/4W 2.2
R45	* 87-025-332	RES,NONFLAM 1/4W 10 (EXCEPT U)
S1	81-544-630	SLIDE SW (FUNCTION) (U,C,G,Z ONLY)
S1	81-544-605	LEVER SW (FUNCTION) (E,K ONLY)
S2	81-031-761	PUSH SW (FM MO/ST)
S3	81-546-601	SLIDE SW 1-9-2 (REC/PB)
S4	81-544-615	LEAF SW (MOTOR)
AS5	87-031-780	SLIDE SW (AC VOLTAGE) (U,C ONLY)
AT1	81-546-612	POWER TRANSFORMER (U,C ONLY)
AT1	81-546-613	POWER TRANSFORMER (E,K,G,Z ONLY)
VR1	81-546-603	SLIDE VOLUME 20KDX2 (TONE)
VR2	81-546-602	SLIDE VOLUME 50KBX2 TAP (VOLUME)

=== MISCELLANEOUS ===

ECM	* 81-546-606	ECM ASSY
EH	* 87-046-264	EH HEAD
M1	87-045-215	MOTOR
RPH	87-046-239	HEAD RPH
SP1	* 81-546-609	SPEAKER
SP2	* 81-546-609	SPEAKER



Safety component symbol
This symbol is given to important parts which serve to maintain the safety of the product, and which are made to conform to special safety specifications. Therefore, when replacing a component with this symbol, make absolutely sure that you use a designated part.

Practical Service Figure

<RADIO SECTION>

Sensitivity: E, K models
(IHF, THD 3%) FM Less than 23 dB (at 98 MHz)
(S/N 10 dB) SW Less than 32 dB (at 10 MHz)
(S/N 10 dB) MW Less than 42 dB (at 1000 kHz)
(S/N 10 dB) LW Less than 52 dB (at 200 kHz)

U, C, G, Z, models
(IHF, THD 3%) FM Less than 23 dB (at 98 MHz)
(S/N 10 dB) MW Less than 44 dB (at 1000 kHz)

Intermediate Frequency FM 10.7 MHz
AM 468 kHz

<TAPE RECORDER SECTION>

Tape Speed: 4.8 cm/s $\pm$ 3% (7/8 ips-3%)
Wow & Flutter: Less than 0.35% (RMS)
Record bias frequency: 61 kHz
Erasing ratio: More than 53 dB
Channel balance: Less than 5 dB (at REC/PB)
Distortion: Less than 8% (at REC/PB)
Signal noise ratio: More than 39 dB (PB/DC)
Noise level: Less than 21 mV (AC, Vol. MAX)
Pinch roller pressure: 430 $\pm$ 50g
Take up torque: 40 $\begin{smallmatrix} +20 \\ -10 \end{smallmatrix}$ g-cm
FF & rewind torque: 110 $\begin{smallmatrix} +40 \\ -30 \end{smallmatrix}$ g-cm

NOTES:

- 1) B (+) power supply
 - 2) Signal path
 Rec path, AM signal path.
 - 3) The voltage is the reference value measured with a tester (20k-ohms/V DC) when there are no signals. But () is with AM reception or recording. With a vacuum-tube voltmeter during recording.
 - 4) Resistors with no designation have a rated power of 1/8W and a tolerance of $\pm$ 5%.
 - 5) Capacitors with no designation have a dielectric strength of less than 50WV.
 - 6) The only capacitor tolerance indicated are $\pm$ 5% (J) and $\pm$ 10% (K).
 - 7) Ceramic capacitor symbols:
 For temperature compensation (SL)
 High dielectric constant system (YY)
 High dielectric constant system (YW, YP, YZ)
 Semiconductor ceramic
 For temperature compensation (SH)
 - 8) Explanation of symbols
 Mylar capacitor
 Aluminum solid capacitor
 Polypropylene film capacitor
 Bi-polarized capacitor
 Low-leakage capacitor
 Fuse resistor
 Nonflammable resistor
- Safety component symbol
This symbol is given to important parts which serve to maintain the safety of the product, and which are made to conform to special safety specifications. Therefore, when replacing a component with this symbol, make absolutely sure that you use a designated part.
- This schematic diagram is subject to change without notice in the interests of improved performance.



2SA1015
2SC1383
2SC1815
2SC1923



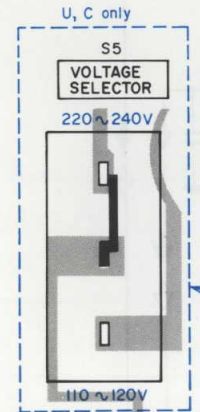
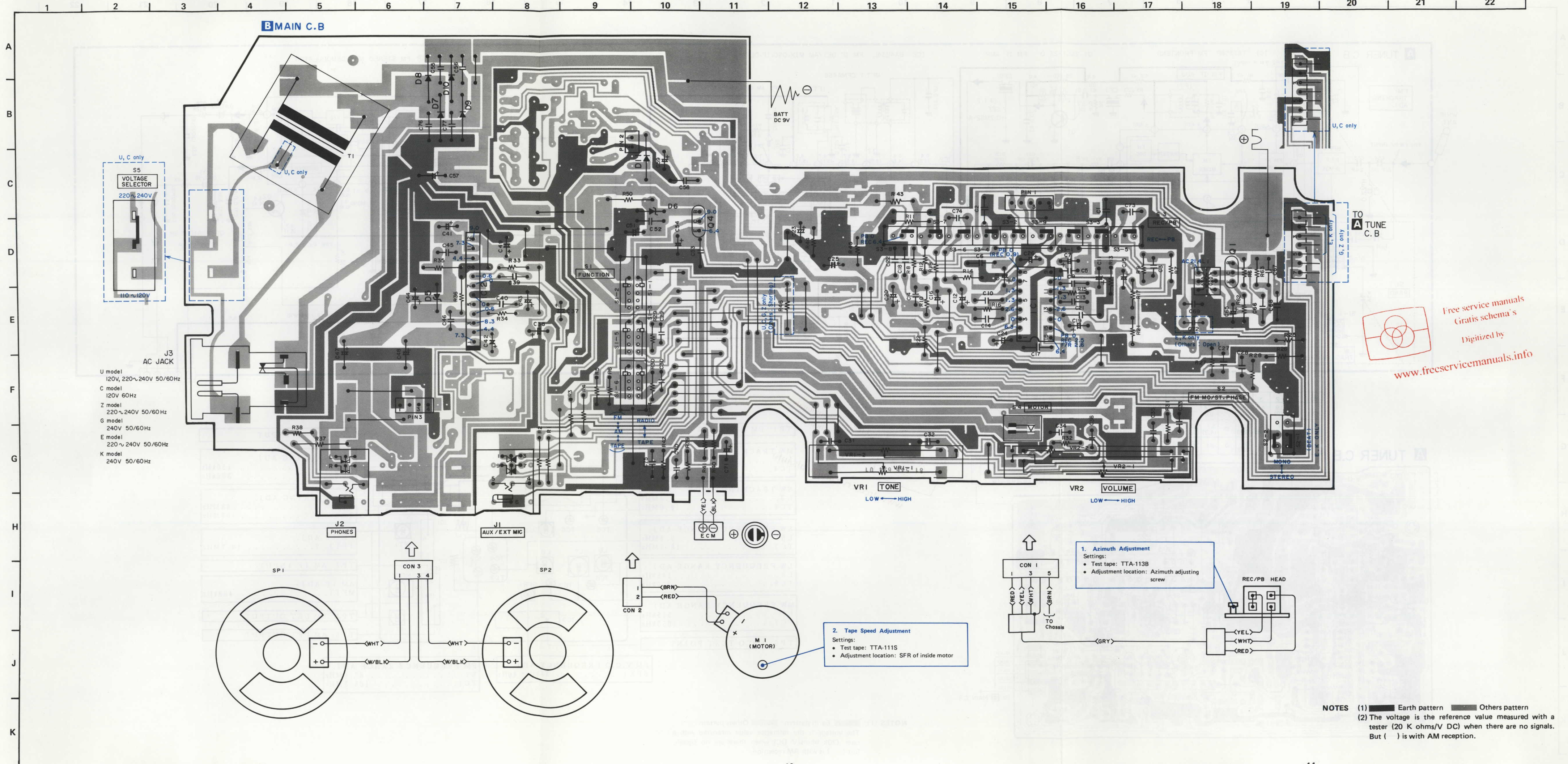
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SPECIFICATIONS

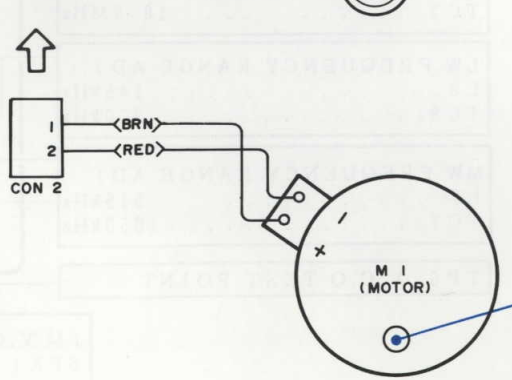
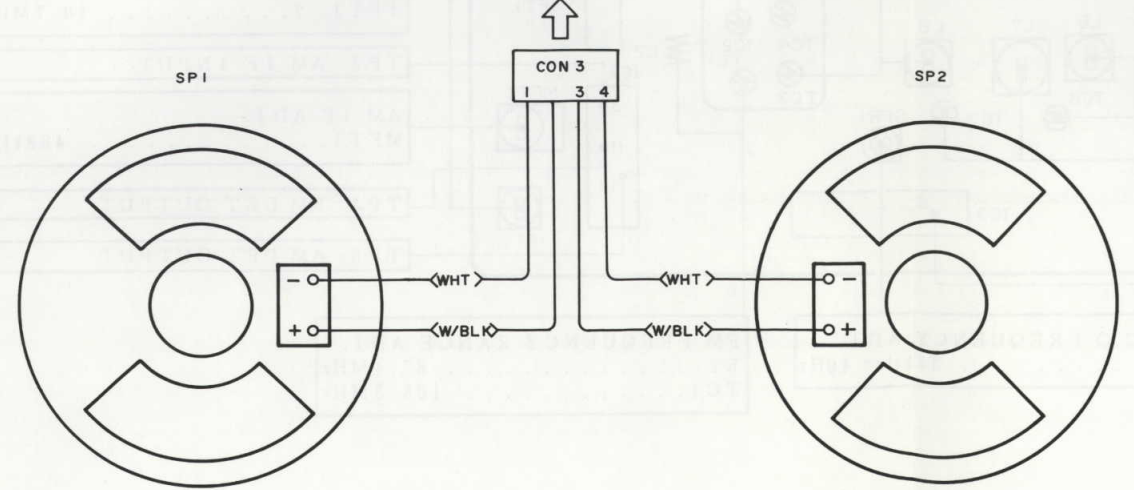
Type	Stereo multiband radio cassette recorder	Radio Section	
Power source	Batteries, DC 9 V (R20P $\times$ 6) CS-230E,Z AC 220—240 V, 50—60 Hz CS-230K AC 240 V, 50—60 Hz 6 W maximum (3W + 3W) CS-230E 11 W CS-230K 13 W CS-230Z 11 W	Frequency ranges	CS-230E,K FM: 88—108 MHz SW: 5.9—18 MHz MW: 530—1,605 kHz LW: 150—285 kHz CS-230Z FM: 88—108 MHz AM: 530—1,605 kHz
Output		Antennas	CS-230E,K Whip antenna for FM and SW Ferrite bar antenna for MW and LW CS-230Z Whip antenna for FM Ferrite bar antenna for AM
Power consumption		Dimensions (W $\times$ H $\times$ D)	444 $\times$ 152 $\times$ 105 (mm)
Speakers	100 mm cone $\times$ 2	Weight	2.1 kg
Tape Recorder Section		Accessories	AC power cord $\times$ 1
Built-in microphone	Electret condenser microphone		
Tape speed	4.8 cm/sec		
Recording system	AC bias		
Erasing system	DC erase		
Recording time	90 minutes (C-90 cassette, both directions)		
Frequency response	50—12,500 Hz		

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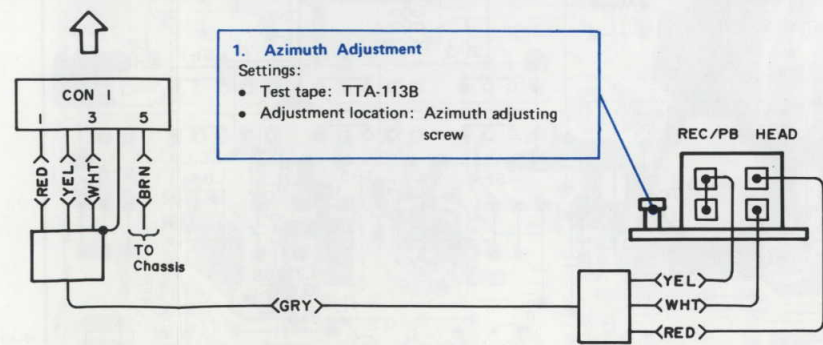




- J3 AC JACK
- U model 120V, 220~240V 50/60Hz
 - C model 120V 60Hz
 - Z model 220~240V 50/60Hz
 - G model 240V 50/60Hz
 - E model 220~240V 50/60Hz
 - K model 240V 50/60Hz



2. Tape Speed Adjustment
Settings:
• Test tape: TTA-111S
• Adjustment location: SFR of inside motor



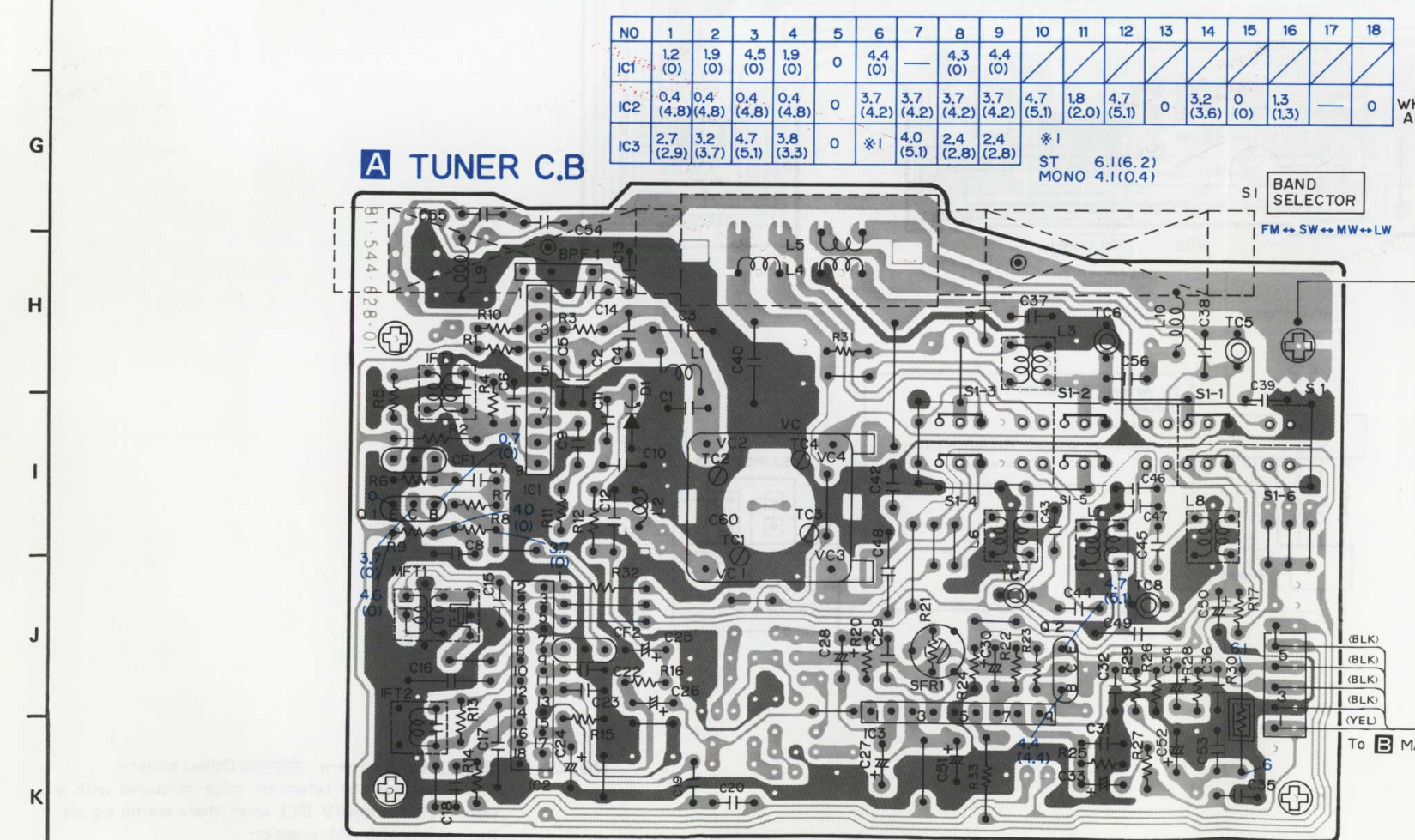
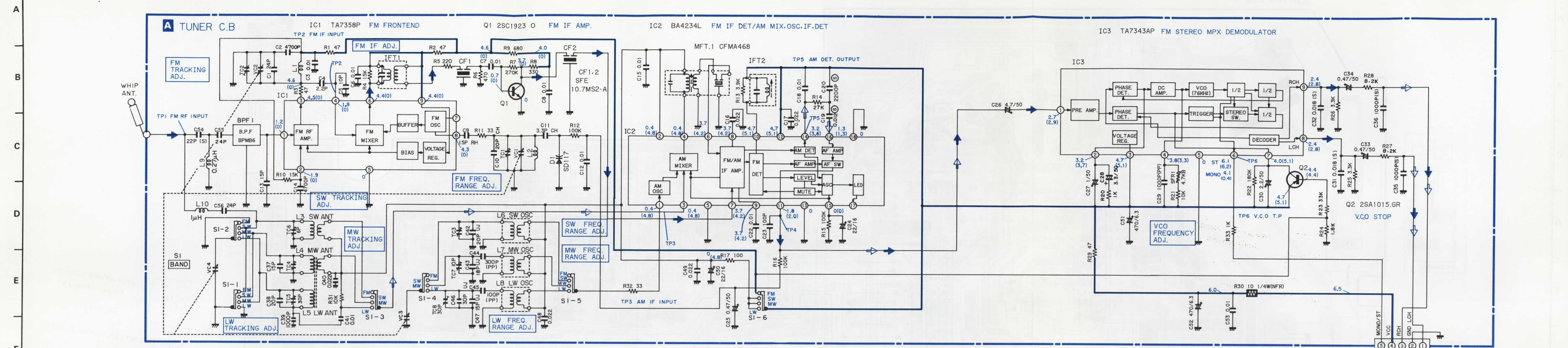
1. Azimuth Adjustment
Settings:
• Test tape: TTA-113B
• Adjustment location: Azimuth adjusting screw

NOTES (1) Earth pattern Others pattern
(2) 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.

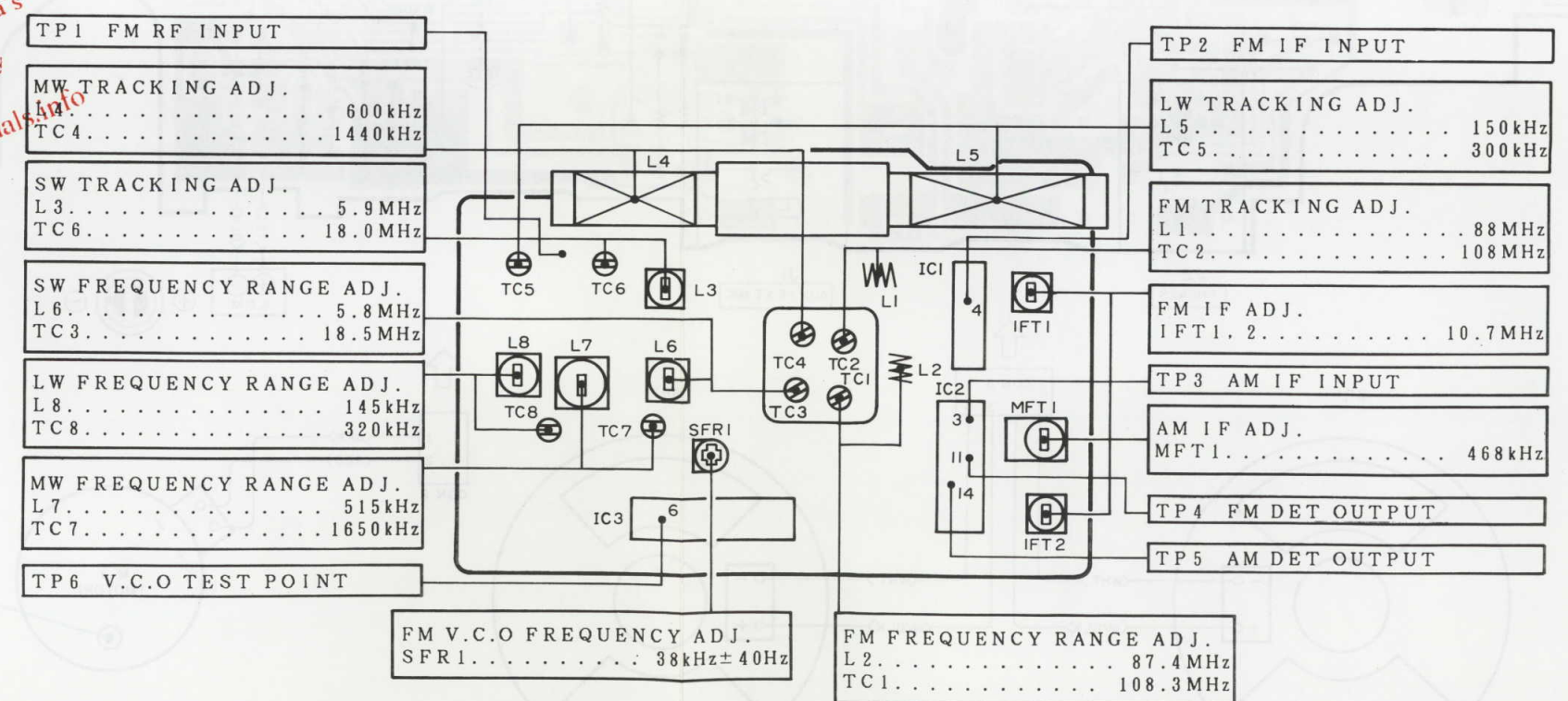
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SCHEMATIC DIAGRAM-2 · WIRING-2 (CS-230 E, K model)

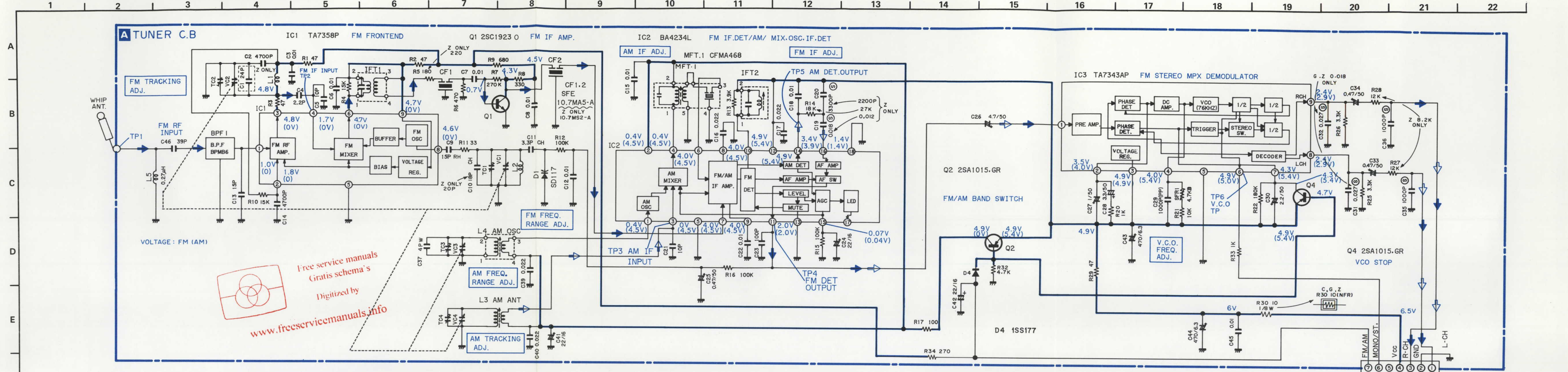
1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22



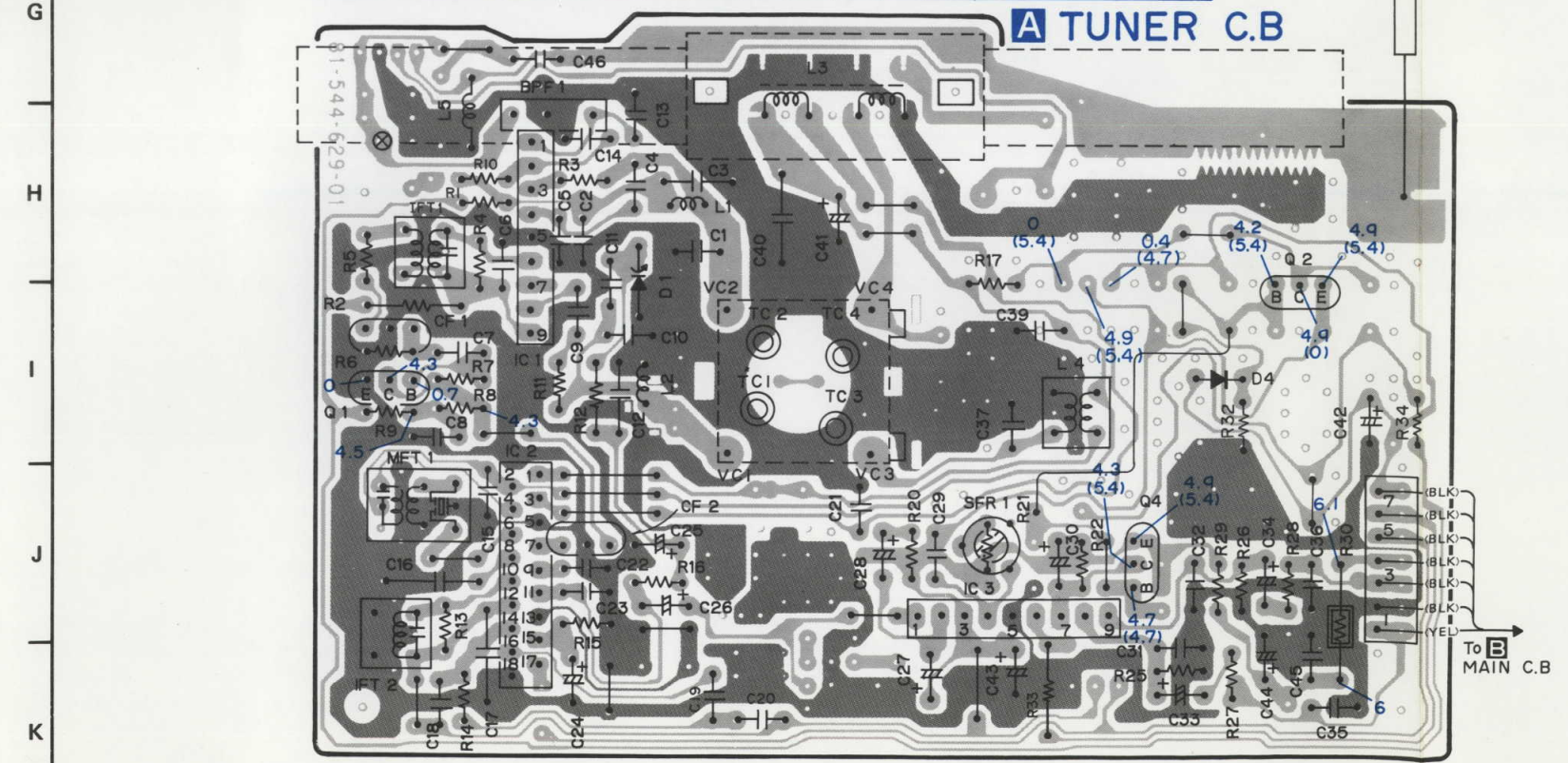
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NOTES (1) ■ Earth pattern ■ Others pattern
The voltage is the reference value measured with a tster (20k ohms/V DC) when there are no signals.
But () is with AM reception.

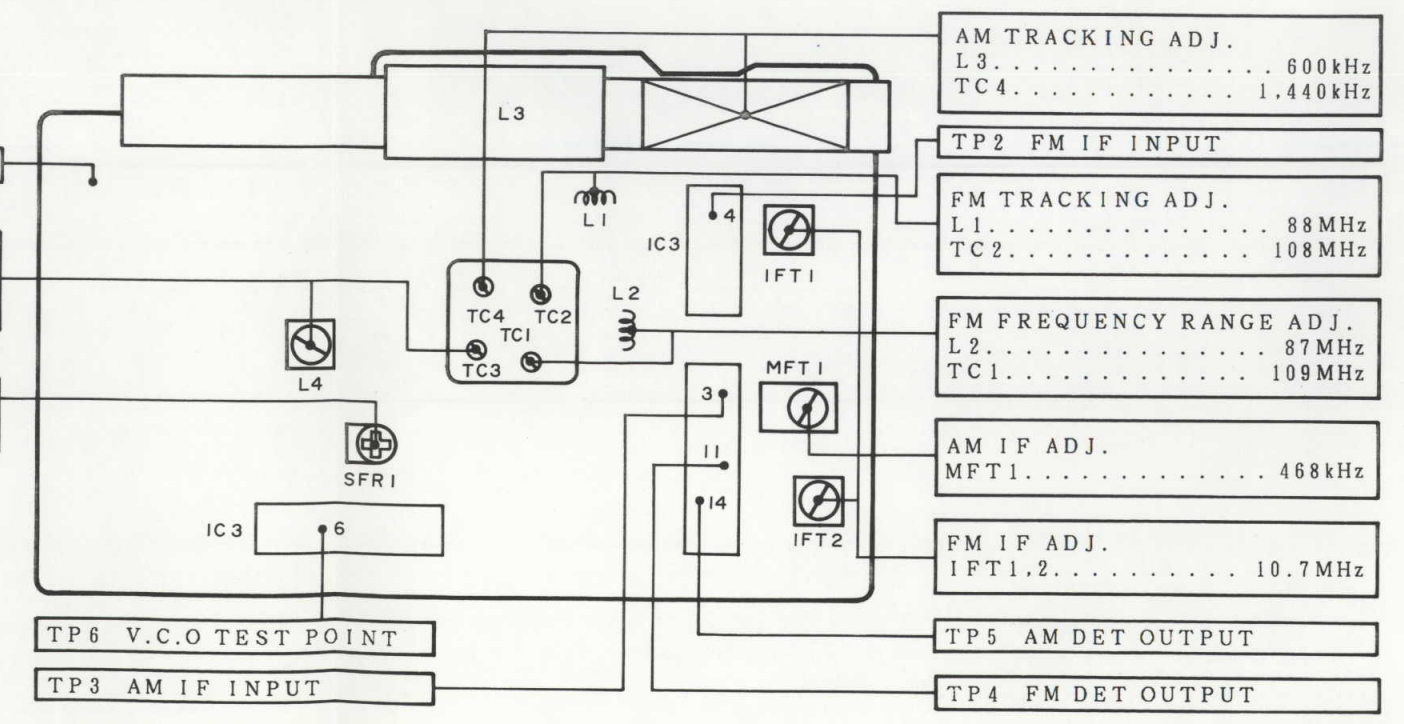


NO.	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
IC1	1.0 (0)	1.8 (0)	4.8 (0)	1.7 (0)	—	4.7 (0)	3.9 (0)	4.6 (0)	4.7 (0)	—	—	—	—	—	—	—	—	—
IC2	0.4 (4.5)	0.4 (4.5)	0.4 (4.5)	0.4 (4.5)	—	4.0 (4.5)	4.0 (4.5)	4.0 (4.5)	4.0 (4.5)	2.0 (5.4)	4.9 (5.4)	—	3.4 (3.9)	0.07 (0.04)	1.4 (1.4)	—	—	—
IC3	2.8 (3.0)	3.5 (4.0)	4.9 (5.4)	4.0 (5.4)	—	4.9 (5.0)	4.3 (5.4)	2.4 (2.4)	2.4 (2.4)	—	—	—	—	—	—	—	—	—



NOTES (1) Earth pattern Others pattern
The voltage is the reference value measured with a tester (20k ohms/V DC) when there are no signals. But () is with AM reception.

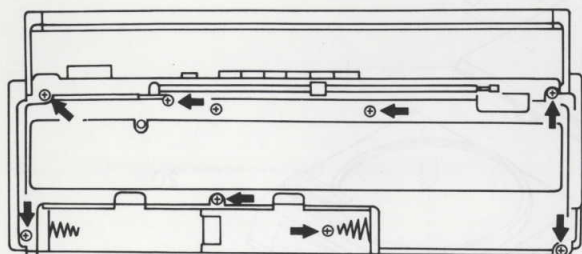
- TP1 FM RF INPUT
- AM FREQUENCY RANGE ADJ.
L4..... 517kHz
TC3..... 1.650kHz
- FM V.C.O FREQUENCY ADJ.
SFR1..... 38kHz± 20Hz



DISASSEMBLY INSTRUCTIONS

1. Removing Front Cabinet

- 1) Remove the 8 screws.
- 2) Remove the 3 knobs and open the cassette lid detach in the direction of the arrow. (See Figure-1)



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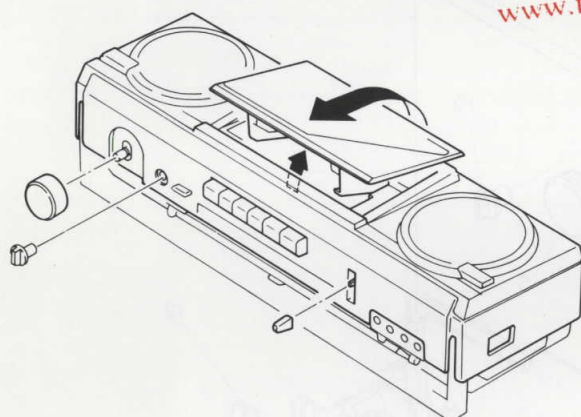


Fig-1

2. Removing Mechanism

- 1) Remove the 2 screws.
- 2) Lift up the plate dial-back and detach the mechanism in the direction of the arrow. (See Figure-2)

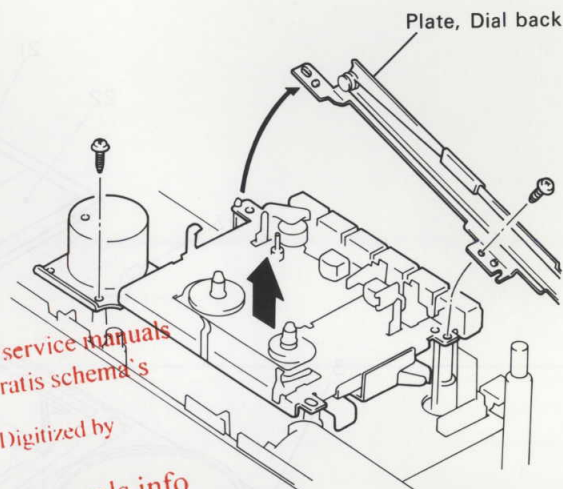


Fig-2

3. Removing Main C.B

- 1) Remove the 5 screws and detach in the direction of the arrow. (See Figure-3)

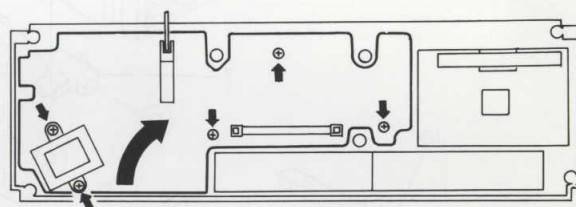


Fig-3

Note) Perform in accordance with the following procedures when assembling main board.

1. Be sure to perform positional adjustment of 2 VRs.
2. Attach main board below the rid as shown in Figure 4.

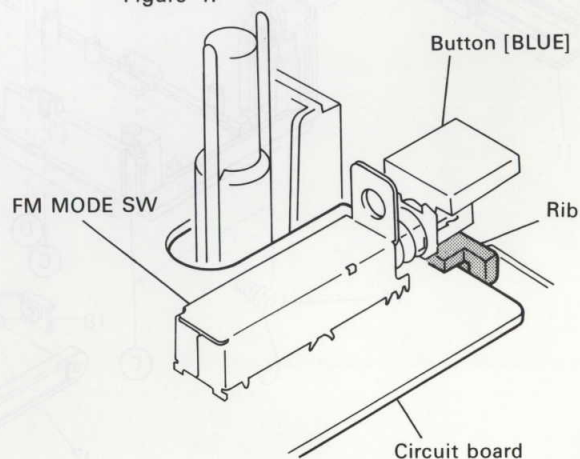
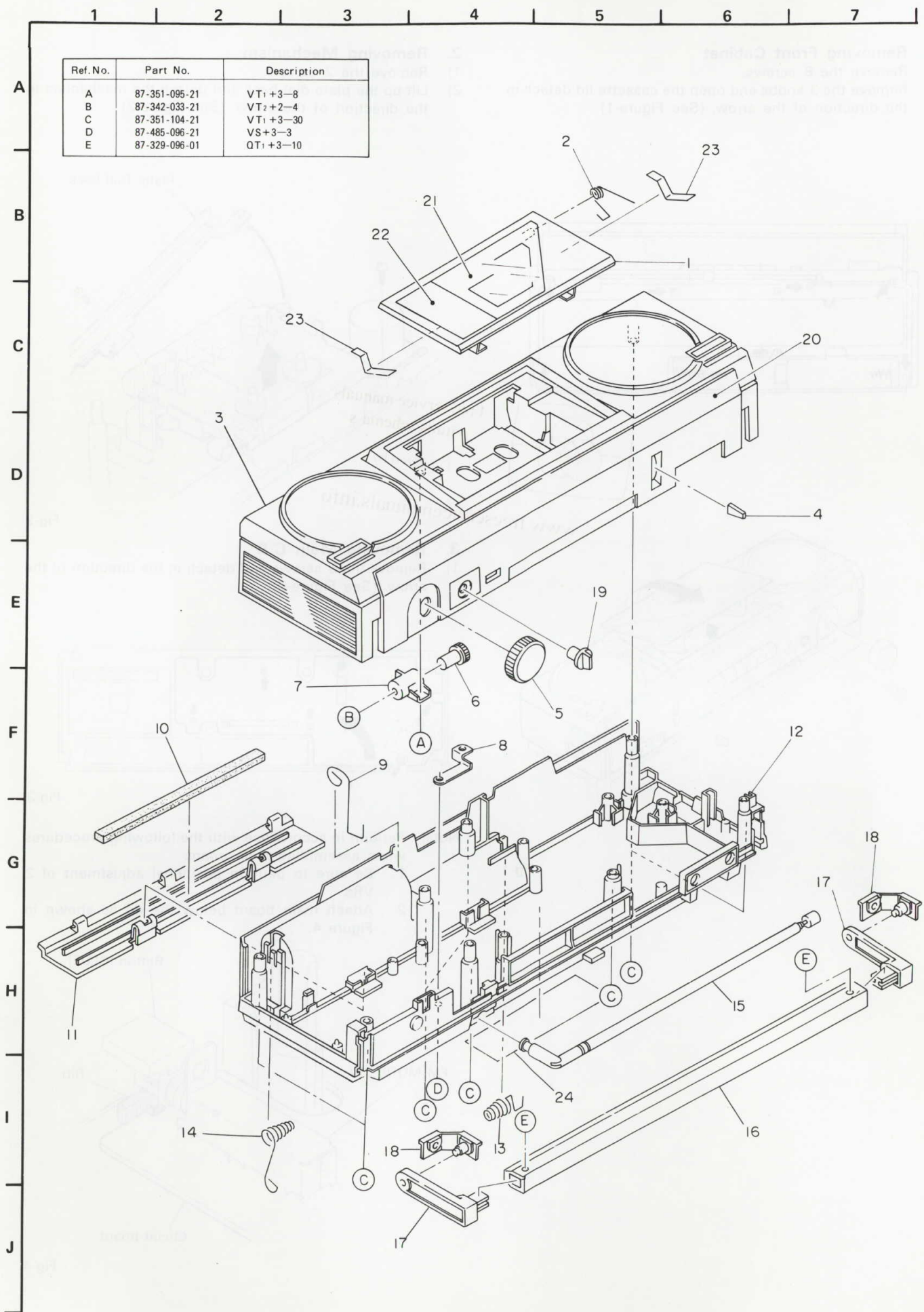


Fig-4

EXPLODED VIEW-1



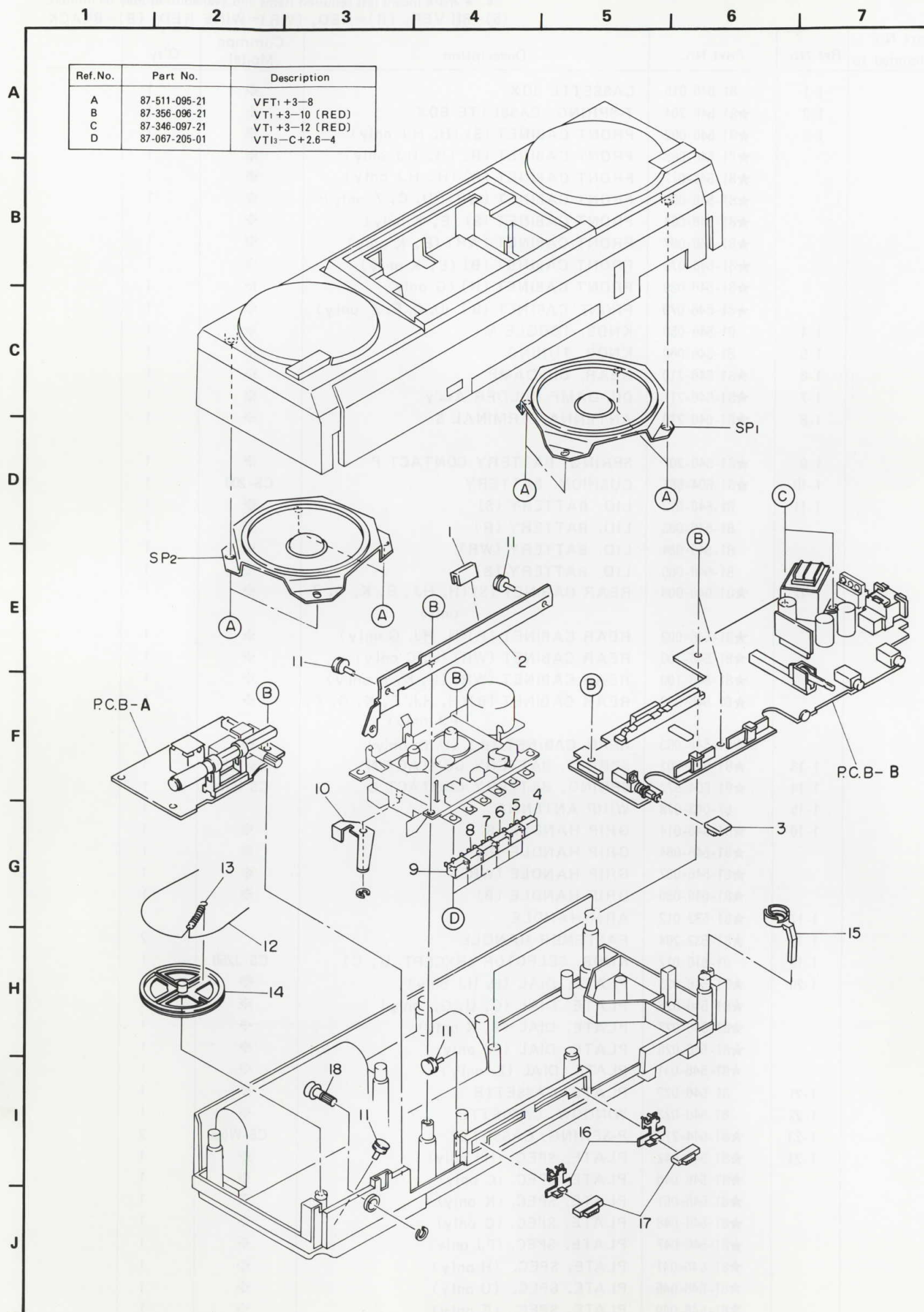
MECHANICAL PARTS LIST

- *-mark in this part list shows exclusive part.
 - *-mark means less required items and availabilities may be limited.
- (S)=SILVER, (R)=RED, (WR)=WINE RED, (B)=BLACK

Part No. Changed to	Ref.No.	Part.No.	Description	Common Model	Q'ty	
	1-1	81-546-015	CASSETTE BOX	※	1	
	1-2	★81-546-204	T-SPRING, CASSETTE BOX	※	1	
	1-3	★81-546-002	FRONT CABINET (S) (H, HJ only)	※	1	
		★81-546-088	FRONT CABINET (R) (H, HJ only)	※	1	
		★81-546-077	FRONT CABINET (B) (H, HJ only)	※	1	
		★81-546-096	FRONT CABINET (WR) (U, C, Z only)	※	1	
		★81-546-004	FRONT CABINET (S) (E, K only)	※	1	
		★81-546-097	FRONT CABINET (WR) (E, K only)	※	1	
		★81-546-079	FRONT CABINET (B) (E, K only)	※	1	
		★81-546-089	FRONT CABINET (R) (G only)	※	1	
		★81-546-079	FRONT CABINET (B) (U, C, E, Z only)	※	1	
	1-4	81-546-059	KNOB, TOGGLE M	※	1	
	1-5	81-546-060	KNOB, TUNING	※	1	
	1-6	★81-546-210	GEAR, OIL-DAMP	※	1	
	1-7	★81-546-211	OIL-DAMP HOLDER Ass'y	※	1	
	1-8	★81-546-219	ANTENNA TERMINAL S	※	1	
	1-9	★81-546-207	SPRING, BATTERY CONTACT P	※	1	
	1-10	★81-504-581	CUSHION, BATTERY	CS-200	1	
	1-11	81-546-012	LID, BATTERY (S)	※	1	
		81-546-063	LID, BATTERY (R)	※	1	
		81-546-084	LID, BATTERY (WR)	※	1	
		81-546-085	LID, BATTERY (B)	※	1	
	1-12	★81-546-009	REAR CABINET (S) (H, HJ, E, K, G, Z only)	※	1	
		★81-546-092	REAR CABINET (R) (H, HJ, G only)	※	1	
		★81-546-100	REAR CABINET (WR) (U, C only)	※	1	
		★81-546-199	REAR CABINET (WR) (E, K, Z only)	※	1	
		★81-546-082	REAR CABINET (B) (H, HJ, E, K, G, Z, FJ only)	※	1	
		★81-546-083	REAR CABINET (B) (U, C only)	※	1	
	1-13	★81-545-202	SPRING, BATTERY CONTACT N	CS-R20	1	
	1-14	★81-504-577	SPRING, BATTERY CONTACT C	CS-R200	1	
	1-15	87-043-078	WHIP ANTENNA		1	
	1-16	★81-546-014	GRIP HANDLE (S)	※	1	
		★81-546-064	GRIP HANDLE (R)	※	1	
		★81-546-087	GRIP HANDLE (WR)	※	1	
		★81-546-086	GRIP HANDLE (B)	※	1	
	1-17	★81-532-012	ARM HANDLE		2	
	1-18	★81-532-204	FASTENER HANDLE		2	
	1-19	81-516-012	KNOB, SELECTOR (EXCEPT U, C)	CS-J250	1	
	1-20	★81-546-025	PLATE, DIAL (H, HJ only)	※	1	
		★81-546-026	PLATE, DIAL (C, U, G, only)	※	1	
		★81-546-027	PLATE, DIAL (E, K only)	※	1	
		★81-546-028	PLATE, DIAL (FJ only)	※	1	
		★81-546-031	PLATE, DIAL (Z only)	※	1	
	1-21	81-546-022	PLATE, CASSETTE	※	1	
	1-22	81-546-023	WINDOW, CASSETTE	※	1	
	1-23	★81-544-210	P-SPRING, CASSETTE	CS-W550	2	
	1-24	★81-546-042	PLATE, SPEC. (HJ only)	※	1	
		★81-546-046	PLATE, SPEC. (C only)	※	1	
		★81-546-051	PLATE, SPEC. (K only)	※	1	
		★81-546-048	PLATE, SPEC. (G only)	※	1	
		★81-546-047	PLATE, SPEC. (FJ only)	※	1	
		★81-546-041	PLATE, SPEC. (H only)	※	1	
		★81-546-045	PLATE, SPEC. (U only)	※	1	
		★81-546-049	PLATE, SPEC. (E only)	※	1	
		★81-546-052	PLATE, SPEC. (Z only)	※	1	

EXPLODED VIEW-2

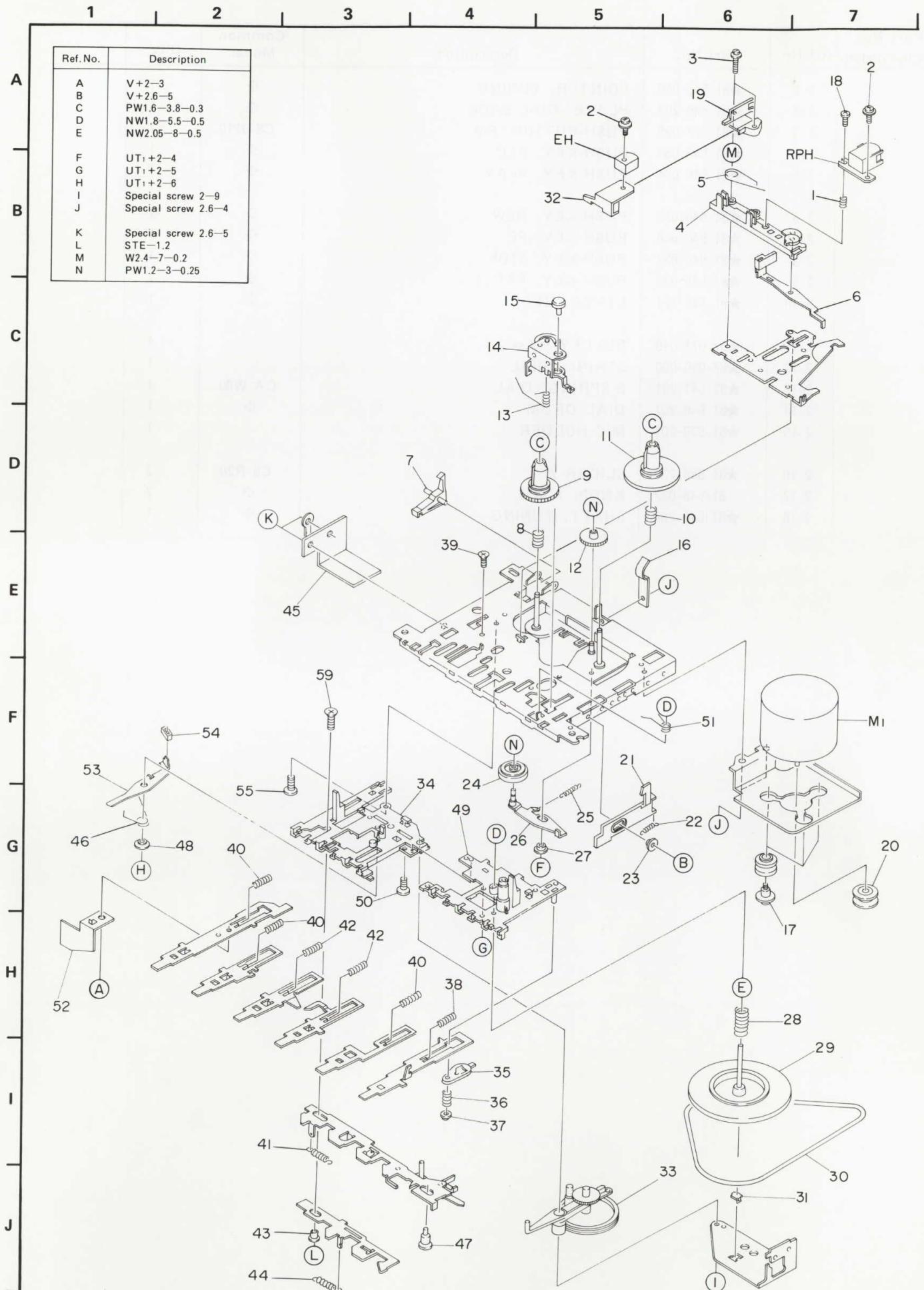
Ref.No.	Part No.	Description
A	87-511-095-21	VFT ₁ +3-8
B	87-356-096-21	VT ₁ +3-10 (RED)
C	87-346-097-21	VT ₁ +3-12 (RED)
D	87-067-205-01	VT ₁₃ -C+2.6-4



EXPLODED VIEW-3

Part No. Changed to	Ref.No.	Part.No.	Description	Common Model	Q'ty	
	2-1	★81-546-030	POINTER, TUNING	※	1	
	2-2	★81-546-203	PLATE, DIAL BACK	※	1	
	2-3	★81-527-025	PUSH-BUTTON, FM	CS-J210	1	
	2-4	★81-546-033	PUSH-KEY, REC	※	1	
	2-5	★81-546-034	PUSH-KEY, PLAY	※	1	
	2-6	★81-546-035	PUSH-KEY, REW	※	1	
	2-7	★81-546-036	PUSH-KEY, FF	※	1	
	2-8	★81-546-037	PUSH-KEY, STOP	※	1	
	2-9	★81-546-038	PUSH-KEY, PAUSE	※	1	
	2-10	★81-546-221	LEVER, REC	※	1	
	2-11	★87-071-019	PULLEY-7 Ass'y		4	
	2-12	★87-096-090	STRING, DIAL		1	
	2-13	★82-541-291	E-SPRING, DIAL	CA-W90	1	
	2-14	★81-546-201	DIAL DRUM	※	1	
	2-15	★81-529-201	MIC HOLDER		1	
	2-16	★81-545-230	SLIDER A	CS-R20	2	
	2-17	81-546-032	KNOB, SLIDE	※	2	
	2-18	★81-546-208	SHAFT, TUNING	※	1	

EXPLODED VIEW-3

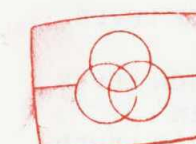


Part No. Changed to	Ref.No.	Part.No.	Description	Common Model	Q'ty
	3-	★81-546-215	MECHANISM Ass'y	※	1
	3-1	★81-504-206	HEAD SPRING	CS-200	1
	3-2	★81-504-256	⊕⊕SCREW M2×7	CS-200	2
	3-3	★81-504-257	⊕⊕SCREW M2×8	CS 200	2
	3-4	★81-504-204	HEAD BASE	CS-200	1
	3-5	★81-518-302	RC SPRING	CS-W330	1
	3-6	★81-518-262	DETECTION PLATE Ass'y	CS-W330	1
	3-7	★81-504-202	REC SAFETY LEVER	CS-200	1
	3-8	★81-544-286	BACK TENSION SPRING	CS-W550	1
	3-9	81-504-223	SUPPLY REEL PLATFORM Ass'y	CS-200	1
	3-10	★81-504-222	BACK TENSION SPRING	CS-200	1
	3-11	81-544-270	TAKE-UP REEL PLATFORM Ass'y	CS-W550	1
	3-12	81-504-216	GEAR, FF	CS-200	1
	3-13	★81-504-209	SPRING, PINCH ROLLER	CS-200	1
	3-14	81-504-208	PINCH ROLLER Ass'y	CS-200	1
	3-15	★81-504-210	ARM STOPPER, PINCH ROLLER	CS-200	1
	3-16	★81-504-251	P-SPRING, PACK HOLDER	CS-200	1
	3-17	★81-504-229	COLLAR SCREW S	CS-200	3
	3-18	★81-546-238	AZIMUTH SCREW M2×7	※	1
	3-19	★81-544-264	EH BASE	CS-W550	1
	3-20	81-527-203	MOTOR PULLEY	CS-J210	1
	3-21	★81-518-270	EJECT SLIDE LEVER	CS-W330	1
	3-22	★81-504-231	SPRING, EJECT SLIDE LEVER	CS-200	1
	3-23	★81-504-232	EJECT COLLAR	CS-200	1
	3-24	81-504-213	T.ROLLER Ass'y	CS-200	1
	3-25	★81-504-214	SPRING, T.ROLLER ARM	CS-200	1
	3-26	★81-504-212	T.ROLLER ARM A	CS-200	1
	3-27	★81-504-215	T.ROLLER ARM COLLAR	CS-200	1
	3-28	★81-504-220	SPRING, FLYWHEEL	CS-200	1
	3-29	81-546-229	FLYWHEEL Ass'y	※	1
	3-30	81-546-231	BELT, MAIN	※	1
	3-31	★81-504-219	PLATE, FLYWHEEL	CS-200	1
	3-32	★81-544-278	EH BASE PLATE	CS-W550	1
	3-33	81-546-228	RF PULLEY ARM Ass'y	※	1
	3-34	★81-518-271	BUTTON BASE R	CS-W330	1
	3-35	★81-544-252	LEVER, PAUSE	CS-W550	1
	3-36	★81-546-233	SPRING, PAUSE LEVER	※	1
	3-37	★81-518-276	P STOPPER	CS-W330	1
	3-38	★81-518-296	SPRING, BUTTON LEVER	CS-W330	1
	3-39	★81-518-301	COLLAR SCREW	CS-W330	1
	3-40	★81-504-240	SPRING, BUTTON LEVER	CS-200	3
	3-41	★81-518-323	SPRING, ACTUATING PLATE	CS-W330	1
	3-42	★81-504-242	SPRING, BUTTON LEVER	CS-200	2
	3-43	★81-546-237	COLLAR, ACTUATING PLATE SHAFT	※	1
	3-44	★81-518-322	SPRING, ACTUATING PLATE	CS-W330	1
	3-45	★81-546-216	REC HOLDER	※	1

Part No. Changed to	Ref.No.	Part.No.	Description	Common Model	Q'ty
	3-46	★81-544-261	SPRING, BLACK LEVER	CS-W550	1
	3-47	★81-504-246	SHAFT, ACTUATING PLAT	CS-200	1
	3-48	★81-518-309	COLLAR	CS-W330	1
	3-49	★81-518-272	BUTTON BASE L	CS-W330	1
	3-50	★81-544-292	COLLAR SCREW	CS-W550	1
	3-51	★82-518-336	SPRING, HEAD PANEL	CS-W330	1
	3-52	★82-544-253	SPRING	CS-W550	1
	3-53	★81-544-241	BLACK LEVER	CS-W550	1
	3-54	★81-544-257	HOLDER, BLAKE LEVER	CS-W550	1
	3-55	★81-518-288	COLLAR SCREW Z	CS-W330	1
	3-56	★81-527-210	P-SPRING, REC	CS-J210	1

ACCESSORIES/PACKAGE LIST

Part No. Changed to	Ref.No.	Part No.	Description	Common Model	Q'ty
	1	★81-546-904	BOOKLET, INST.H (EXCEPT E, K, Z)	※	1
	2	★81-546-905	BOOKLET, INST.E (E, K, Z only)	※	1
	3	★82-593-968	AC CORD SET H (H, HJ, FJ only)		1
	4	★87-034-984	AC CORD Ass'y CSA (U, C only)		1
	5	★81-504-968	AC CORD SET K (K only)		1
	6	★81-504-967	AC CORD SET AS (G only)		1
	7	★87-034-989	AC CORD SET E (E, Z only)		1
	8	★87-032-845	SIEMENS PLUG (H, HJ, FJ only)		1



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