

KP-500

ZE

SUPERTUNER CASSETTE CAR STEREO WITH FM STEREO

SERVICE MANUAL

SUGGESTED ~~RETAIL PRICE~~ ^{#1400}



SPECIFICATIONS

Semi-Conductors	AF: 4 IC's, 4 transistors, 7 diodes RF: 4 IC's, 1 FET, 6 transistors, 5 diodes	Radio Section	Frequency Range	88~108 MHz
Controls	Volume, balance, bass, treble, eject, fast forward, rewind, tuning, local/distant, radio, loudness, muting	Usable Sensitivity	50dB Quieting Sensitivity	10dBf (0.9μV/75Ω) 10dBf (0.9μV/75Ω)
Power Source	DC 13.8V (11~16V allowable)	Signal to Noise Ratio	Capture Ratio	68dB 1.7dB
Grounding	Negative ground system	Selectivity	Image Rejection	73dB (+400 kHz), 75dB (-400 kHz) 61dB
Cartridge	PHILIPS-type cassette (C-30, C-60)	IF Rejection	Distortion	80dB 0.8%
Wow and Flutter	Less than 0.3% (WRMS)	Frequency Response	Muting Level	30 ~ 12,000 Hz (-3 dB) 5dB
Rewind Time	Approx. 100 sec (C-60)	Distant Switch Effect	Stereo Separation	25dB Attenuation ON/OFF 32dB
Fast Forward Time	Approx. 100 sec (C-60)	Dimensions (W x H x D)	Weight	192 x 75 x 190 mm (7-5/8 x 3 x 7-1/2 in.) 2.3 kg (5 lbs)
Power Output	Rated (RMS): 8W			
Frequency Response	40~10,000 Hz			
Tone Control	Bass: ±10dB (100 Hz) Treble: ±10dB (10 kHz)			
Loudness Contour	+9dB (100 Hz), +4dB (10 kHz) (Volume: -30dB)			
Cross Talk	More than 45dB			
Signal to Noise Ratio	More than 50dB			
Load Impedance	4Ω (2~8Ω allowable)			

 PIONEER

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• Top View

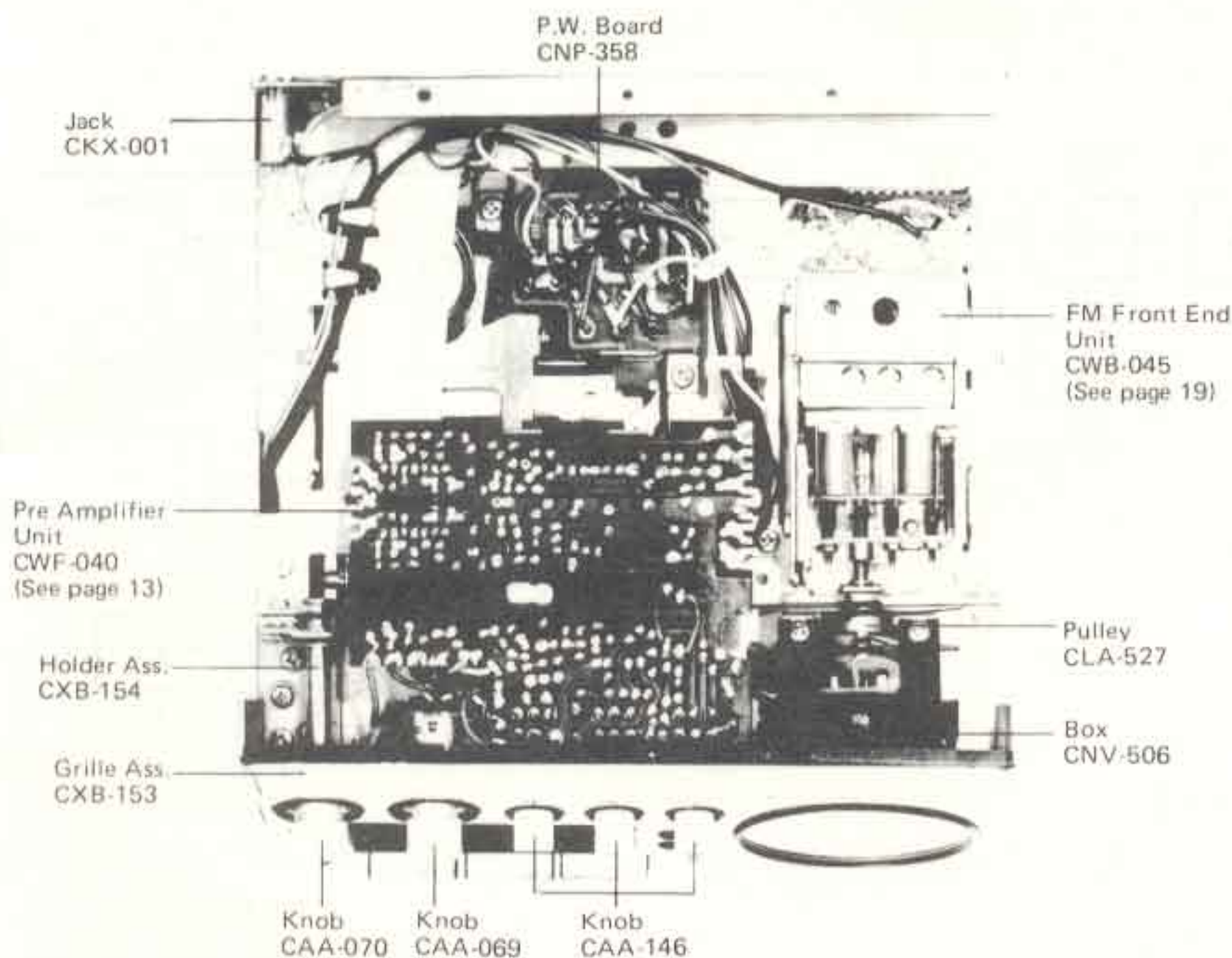


Fig. 1

• Bottom View

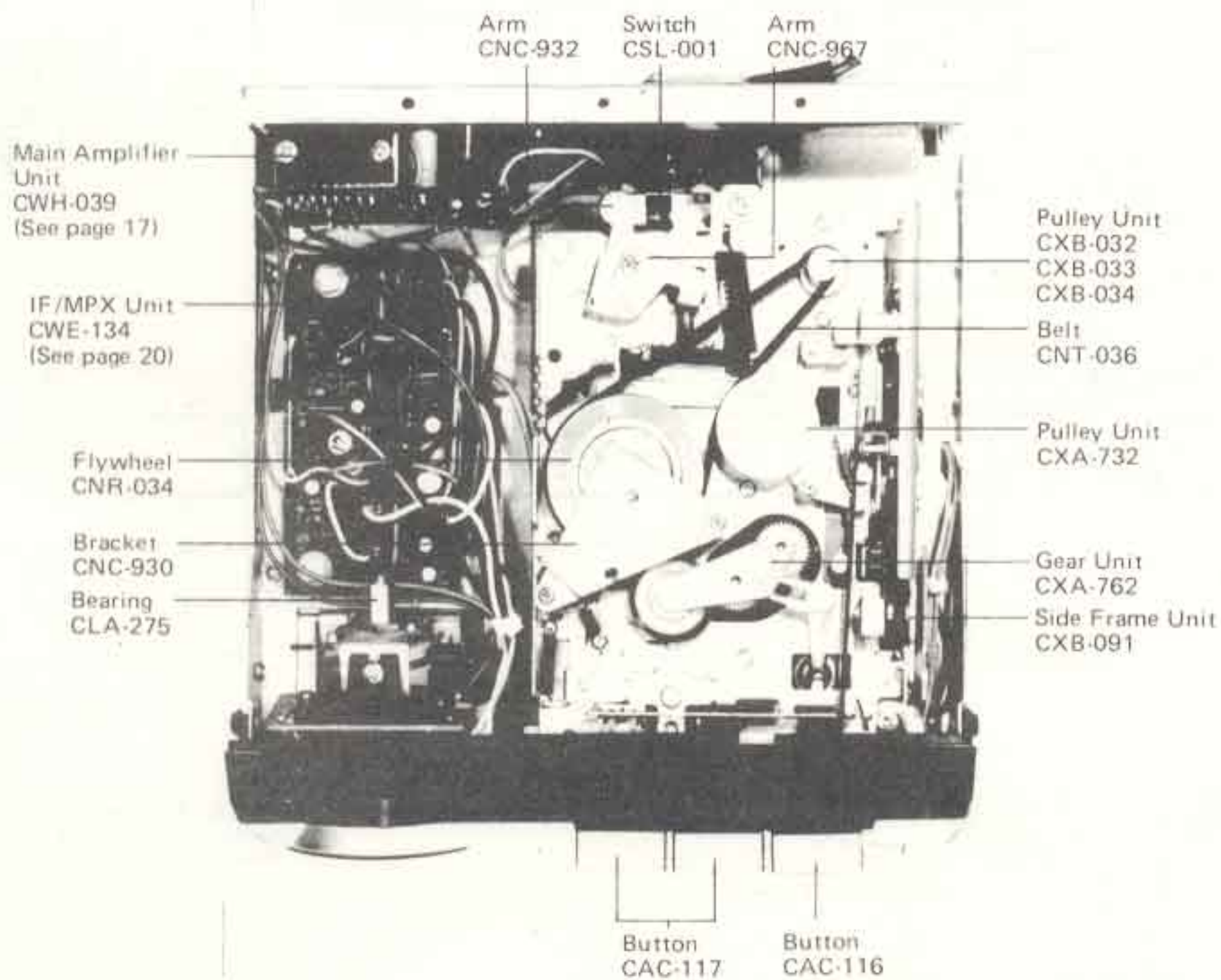


Fig. 2

2. CIRCUIT DESCRIPTION

• Block Diagram

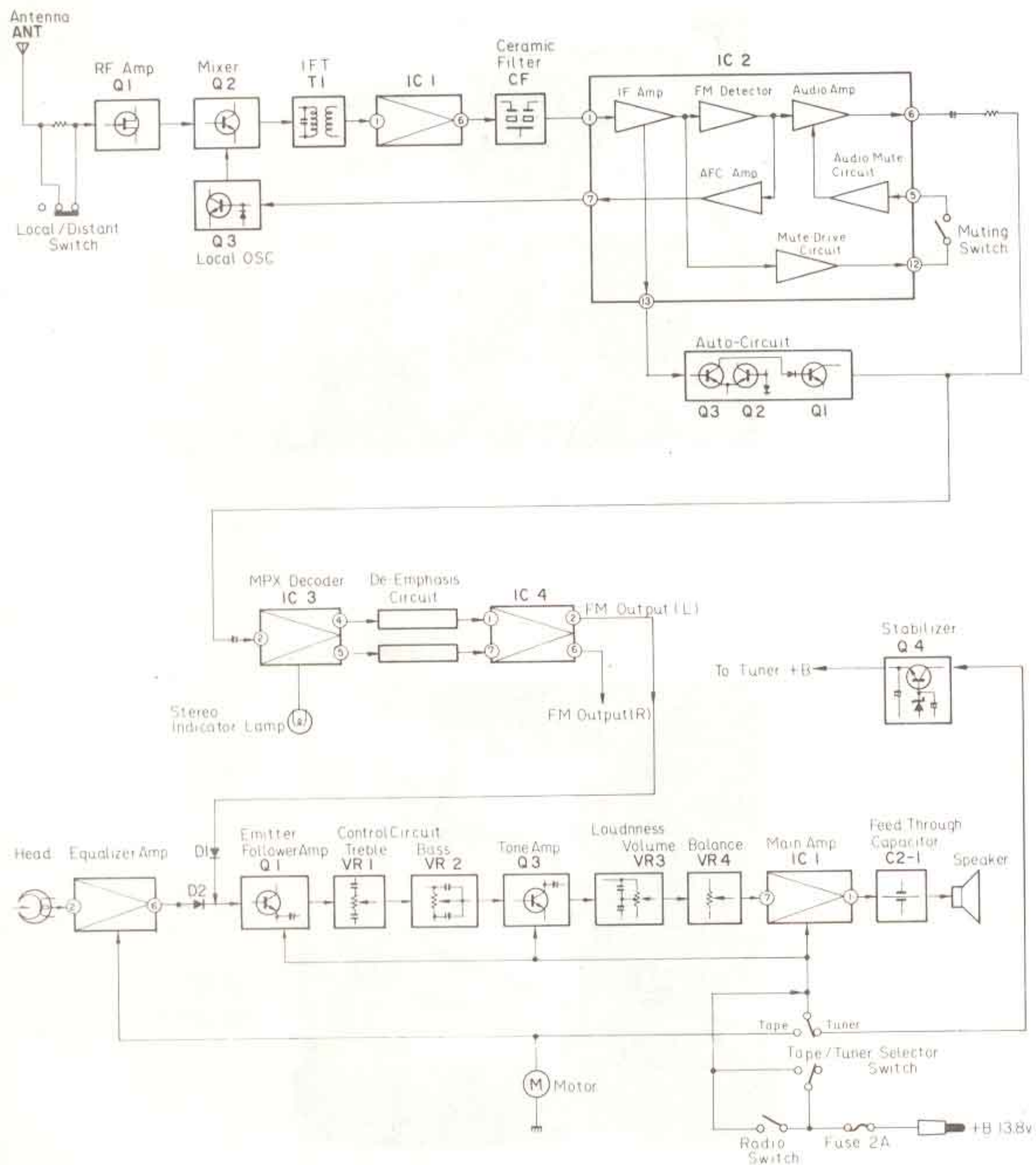


Fig. 3

• Level Diagram

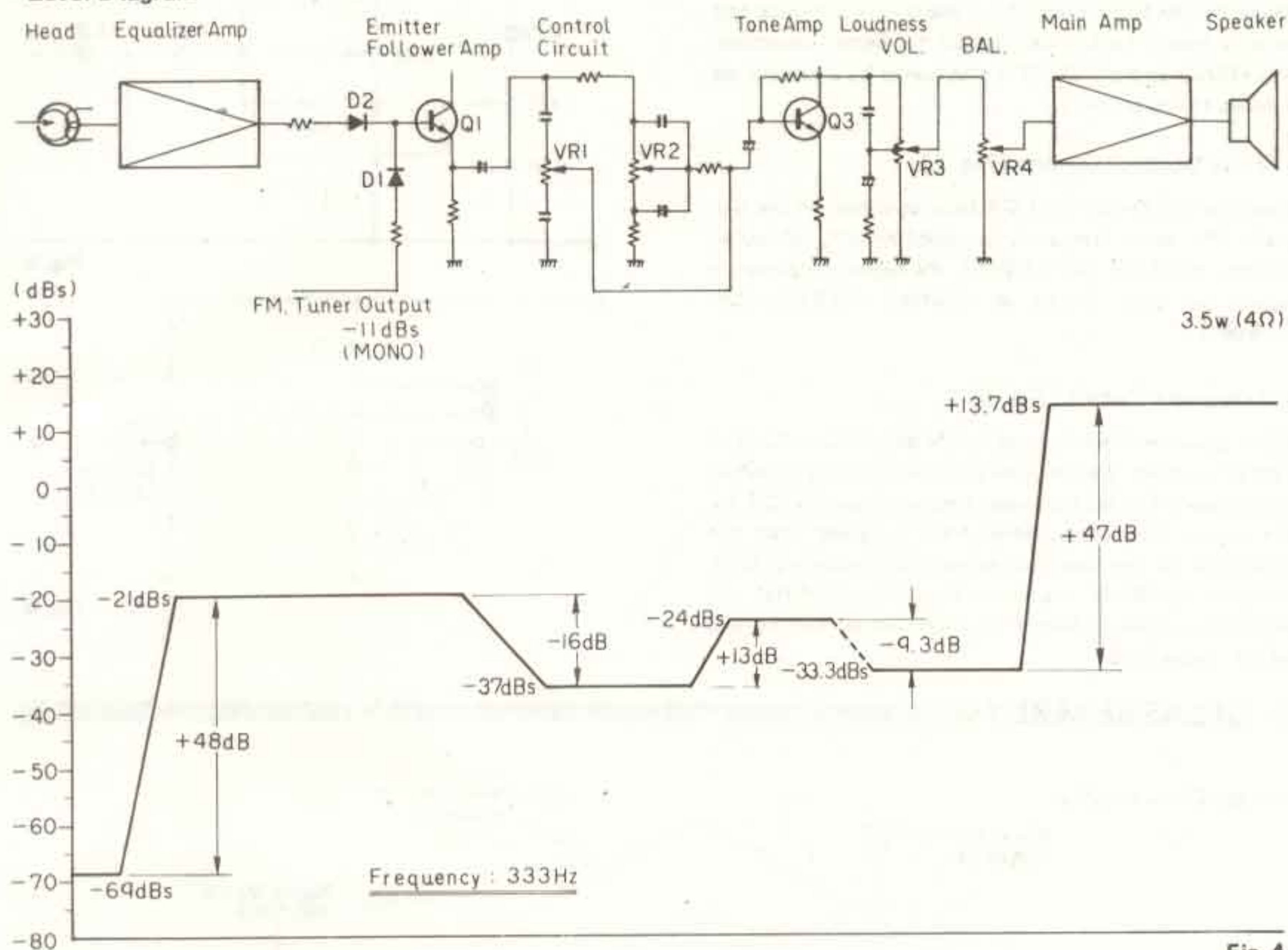


Fig. 4

• IF/MPX Circuit

IC (H8D1177) which utilizes two ceramic filters is employed for the input to IF amplifier. Another ceramic filter is employed behind the IC. Owing to these three ceramic filters, the selectivity of two signals has been improved.

The output from IF amplifier is added to the quadrature IC (HA1137) and is detected. This IC, which is to be used at 13V, directly adds +B without passing through the stabilizing power source.

The detection output is added to the second terminal of MPX IC (KB4409) and when pilot signal is received at MPX IC, the signal is separated by PLL operation of MPX, and the stereo lamp will light up. The separated signal is added to the active filter via the fourth and fifth terminals. De-emphasis is determined by R20, 21, C27, 28 which are connected to the fourth and fifth terminals. The active filter can obtain 8 dB gain, thus reducing

the frequency characteristic of 15 kHz by -3 dB.

MONO/STEREO automatic switch-over circuit and muting circuit are located between the detection circuit and MPX. When listening a broadcast in the weak electric field where large ignition noise is heard, the auto-circuit (Q2, 3 auto-level regulating semi-fixed VR1) is activated to switch over to MONO. At the same time, the frequency characteristic of higher register is reduced by C16 and R13, and the noise is minimized. The reduced amount is 10 kHz approx. 13 dB. And de-emphasis frequency characteristic is -28 dB in the weak electric field, and -15 dB in the medium strong electric field. When the electric field becomes weak, set the muting switch to ON, and the muting circuit of IC2 is activated to erase the unpleasant noise (inter-station noise) at the non-broadcasting part of the dial.

CIRCUIT DESCRIPTION

• LOCAL/DX Switch

When the input signal level from the antenna is weak and noise is heard, switch over to DX for better reception. At LOCAL, approx. 25 dB is attenuated by a resistor set in series to the antenna.

• Tone Control Circuit (Fig. 5)

Tone control circuit is of CR type as shown in the diagram. The lower frequency is varied by VR2 (Boost at 100 Hz: +10.5 dB, Cut: -9.5 dB), the higher frequency is varied by VR1 (Boost at 10 kHz: +10.5 dB, Cut: -9.5 dB).

• Loudness Circuit (Fig. 6)

When Loudness Switch is set to ON and Volume Control (VR3) is varied, the frequency characteristic is modified by C33 and R33 for the lower frequency and by C31 for the higher frequency. When VR3 is varied from the maximum to the position where the frequency is attenuated by 30 dB, the lower frequency (100 Hz) and higher frequency (10 kHz) are modified by +10 dB and +4 dB, respectively.

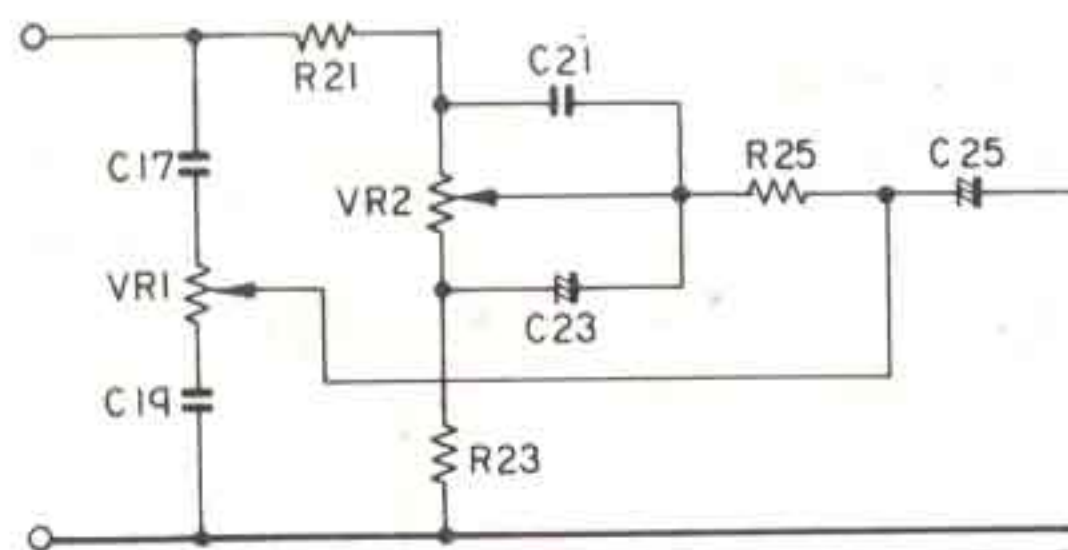


Fig. 5

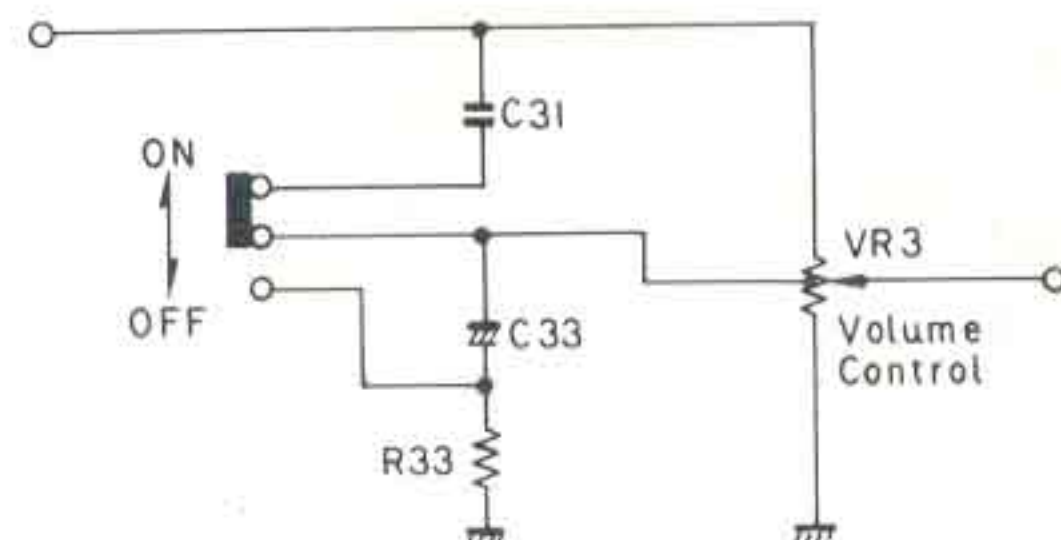


Fig. 6

3. DISASSEMBLY

• Case Disassembly

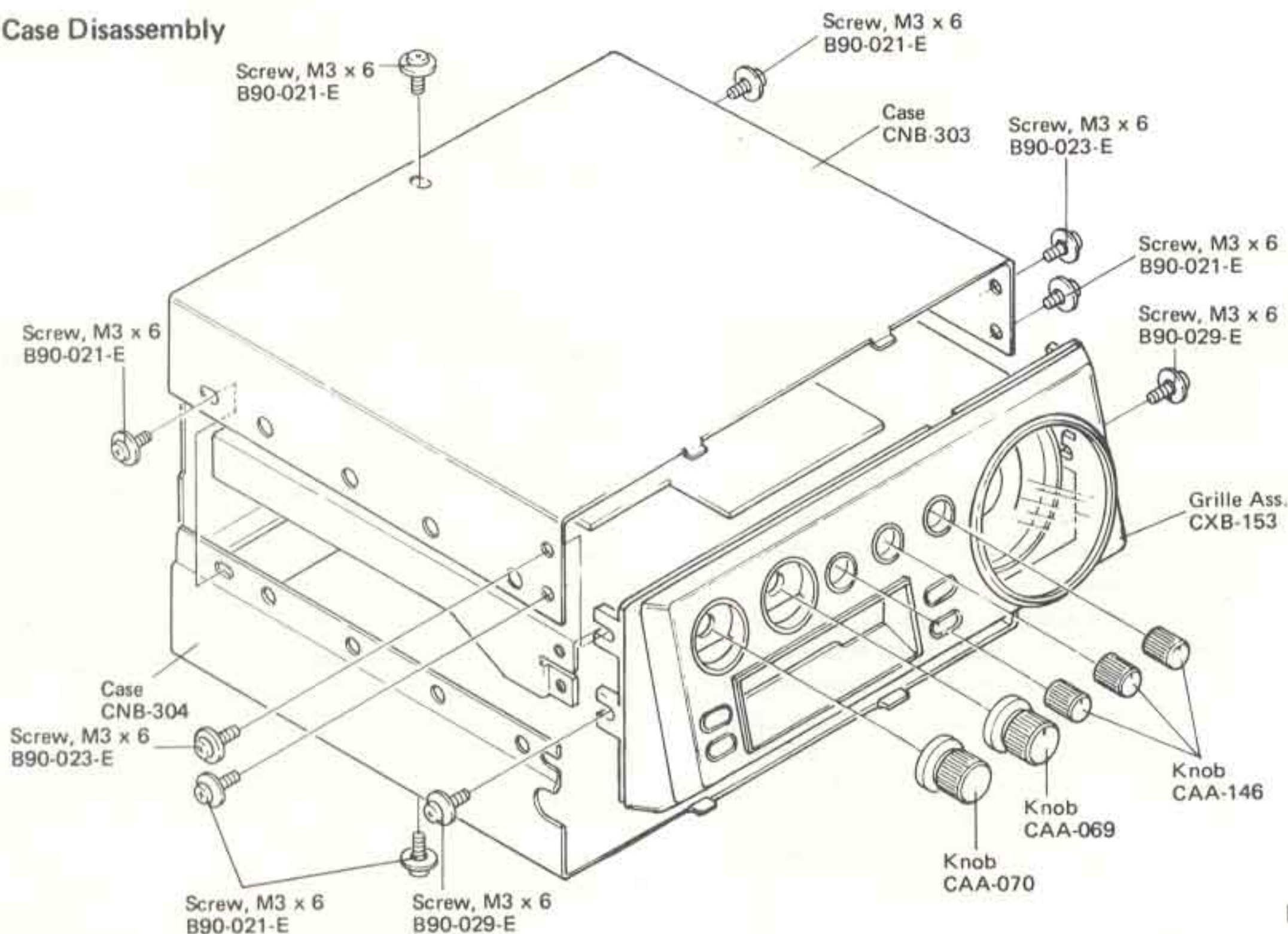


Fig. 7

• Cassette Mechanism Disassembly

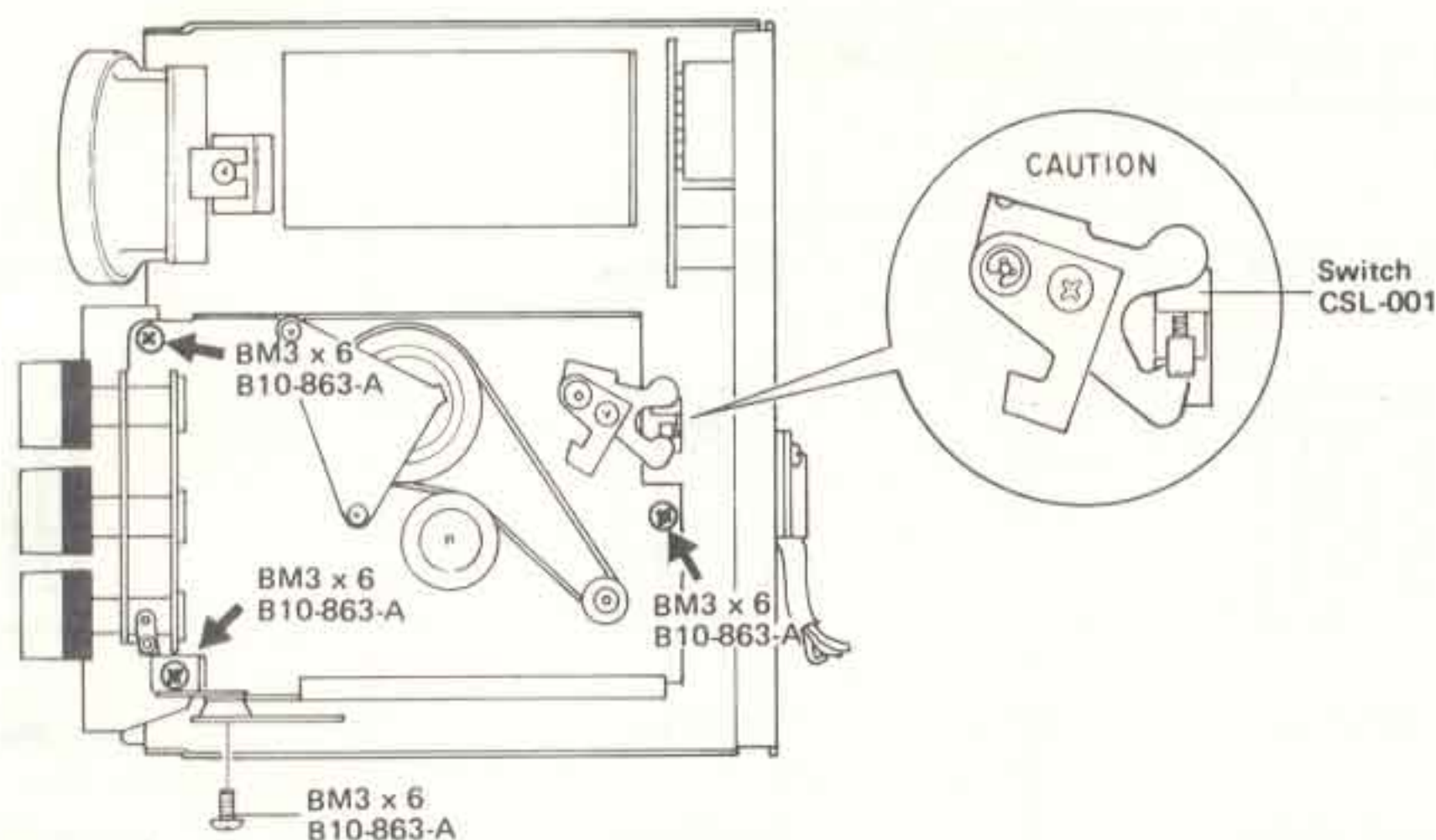


Fig. 8

4. ADJUSTMENT

4.1 TAPE SPEED ADJUSTMENT

Tape speed can be adjusted by replacing the motor pulley. Three types of pulleys differing in diameter are available as shown in the table below. The pulley surface has either one groove, two grooves or no groove to help distinguish the diameter (Fig. 9).

Diameter	Parts No.	No. of Grooves
9.22 mm	CXB-032	None
9.35 mm	CXB-033	One
9.47 mm	CXB-034	Two

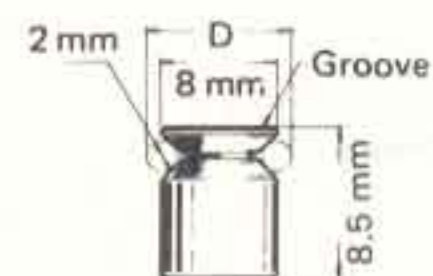
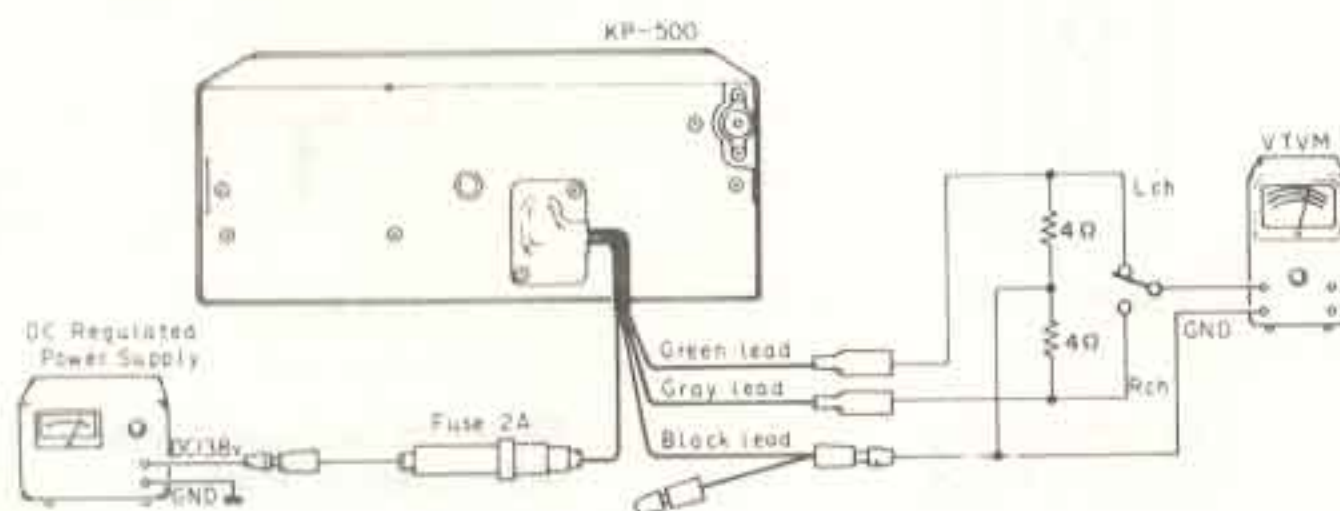


Fig. 9

4.2 AZIMUTH ADJUSTMENT

• Connection Diagram



Azimuth Adjusting Screw

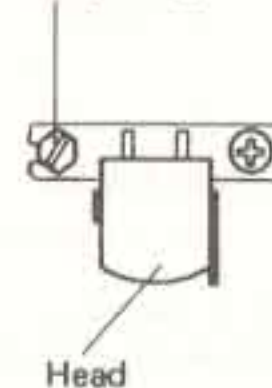


Fig. 10

• To Adjust

1. Set bass, treble and balance to intermediate level and insert test tape CT-113 (6.3 kHz, -10 dBs) after adjusting volume to optional level.
2. Turn the azimuth adjusting screw so that outputs of Lch and Rch are each at maximum symmetrically.

• Head Connection

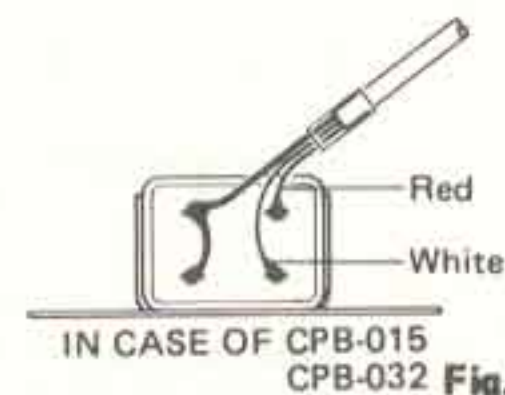
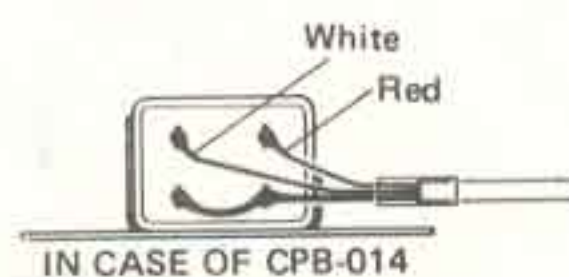
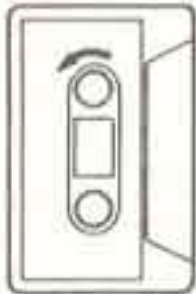
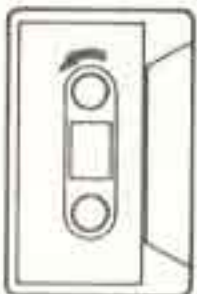
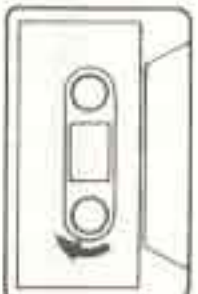
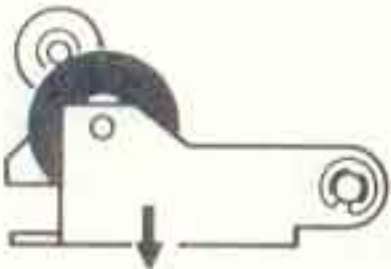
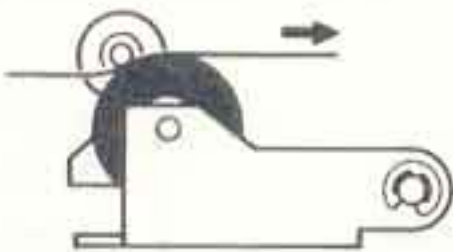
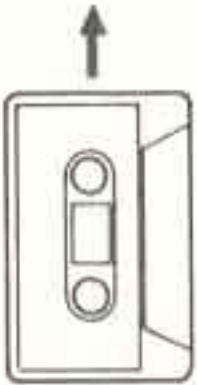
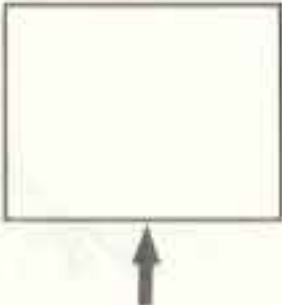
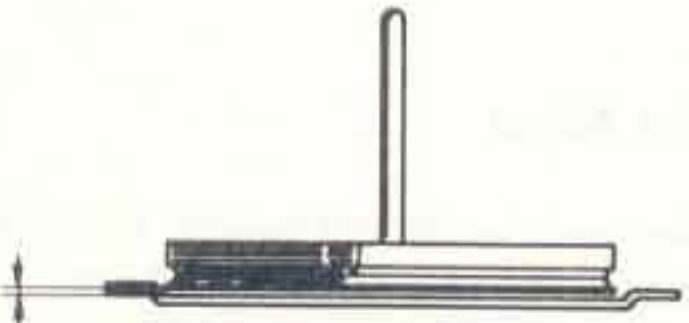


Fig. 11

4.3 CHECK POINTS OF CASSETTE MECHANISM

When replaced or repaired cassette mechanism parts, refer to values in the following table.

Wind Torque  40~75 gcm	F.F. Torque  120±30 gcm	Rewind Torque  120 ± 30gcm
Pinch Roller Pressure  400 ± 50g	Tape Tensile Strength  More than 160g	Sensing Arm Working Force  40~60g
Sensing Arm Stroke  0.4~1.8mm	Cassette Loading Force  Less than 3kg	Eject Button Operating Force  Less than 1.5kg
F.F. Button Operating Force  Less than 2.5kg	Rewind Button Operating Force  Less than 2.5kg	Clearance between Flywheel and Flywheel Bracket  Less than 0.3mm

4.4 FM IF ADJUSTMENT

• Connection Diagram

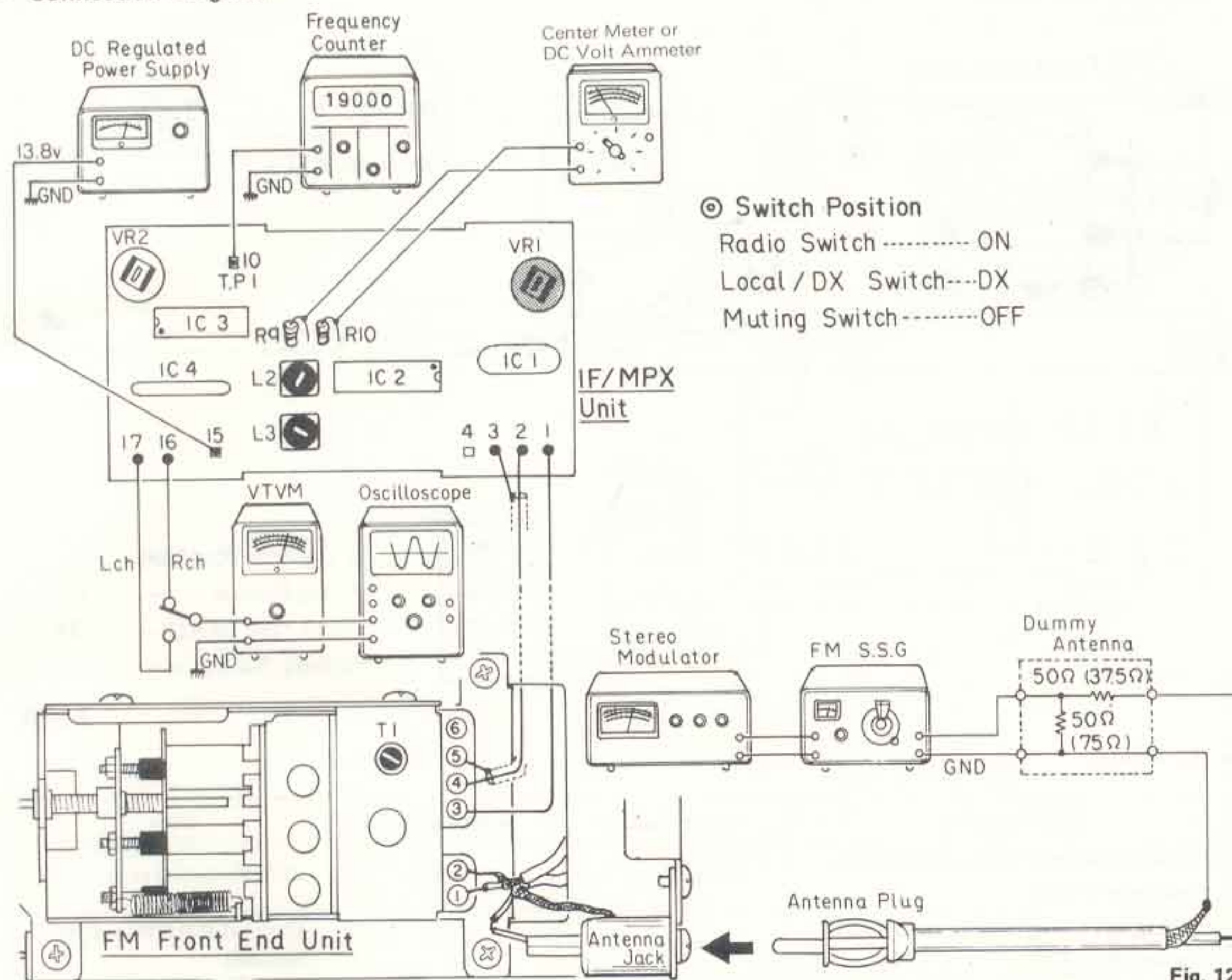


Fig. 12

• To Adjust

1. Add output signal of 0dB from SSG and adjust L3 (orange color) so that the pointer of center meter (use one graduated for over 200μA) will come to the center. When using a DC volt ammeter (use one graduated for over 200μA), set the pointer to 0.
2. Add output signal of 98MHz 60dB from SSG and tune to 98MHz on the dial (the pointer of the center meter is at the center).
3. Add output signal of 5dB from SSG and adjust T1 (front end) so that the output will become maximum.
4. Add output signal of 0dB from SSG, adjust L3 (orange color) so that the pointer of the center meter is at the center.

Note: When adjusting, do not move L2.

4.5 FM TRACKING ADJUSTMENT

• Connection Diagram

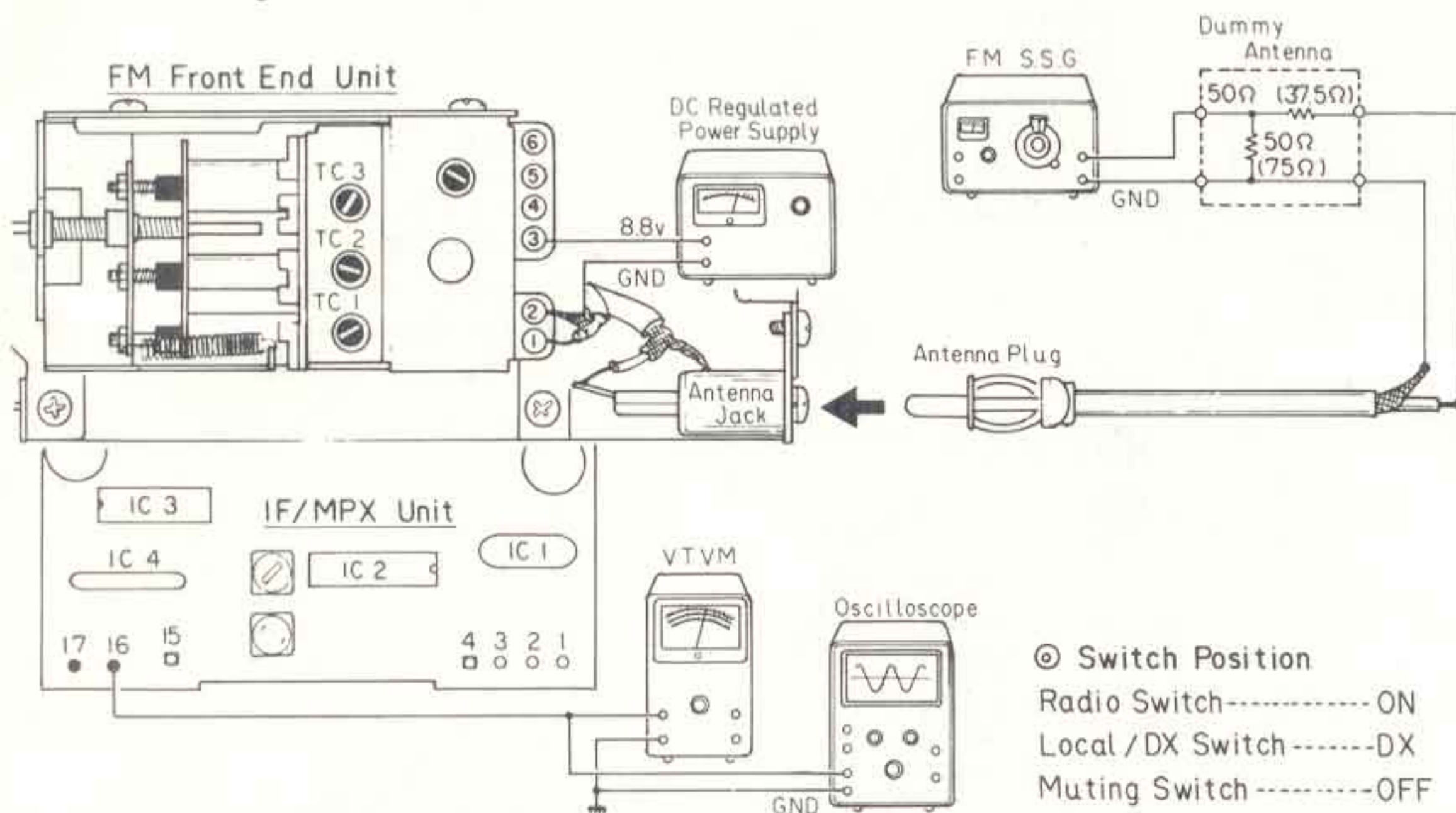


Fig. 13

• To Adjust

SSG frequency	Pointer Position	Adjustment Point	Note
1. 87 MHz (400 Hz, 100% modulation), output level 8 dB	Minimum	TC3	87 MHz can be received
2. 109 MHz (400 Hz, 100% modulation), output level 8 dB	Maximum		Check if 109 MHz can be received
3. 98 MHz (400 Hz, 100% modulation), output level 5 dB	Tuned position	TC1, TC2	Maximum output

4.6 STEREO LIGHTING LEVEL ADJUSTMENT

• Connection Diagram

Connect as shown in Fig. 12. Set the position of the switch as well.

• To Adjust

1. Add unmodulated signal of 60dB from SSG and adjust VR2 so that the frequency counter will indicate $19\text{kHz} \pm 20\text{Hz}$ (any tuning position will do).
2. Add 98MHz output 30dB from SSG and multi-signal of modulated frequency 1,000Hz of stereo modulator. Adjust VR1 so that the stereo indicator will light up. Slowly turn VR1 and set it at the position just before the stereo indicator will go out.
3. Gradually lower SSG output signal from 60dB and check if the stereo indicator is lighting at the range between 27 and 32dB.

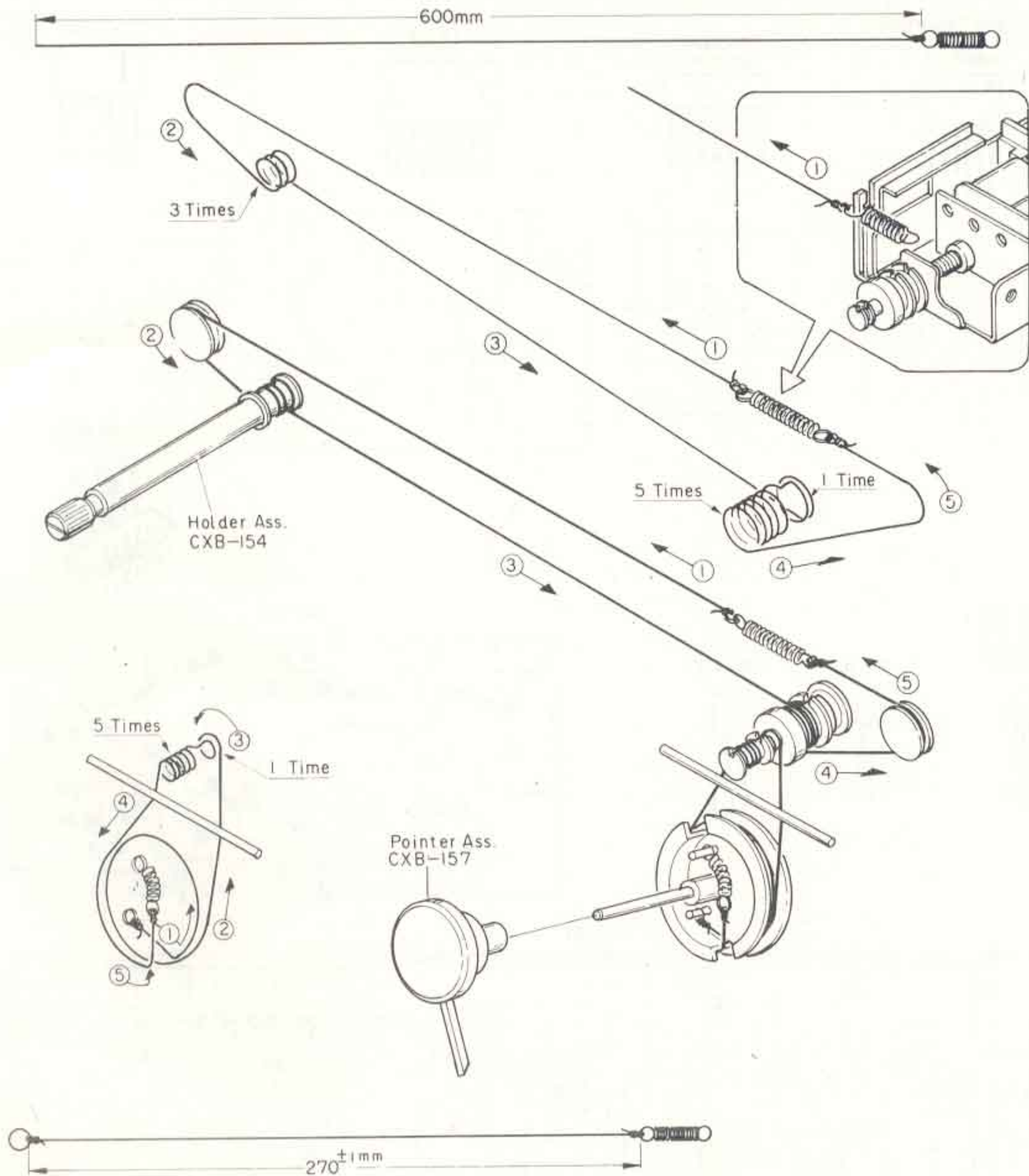


Fig. 14

• IC's and Transistors

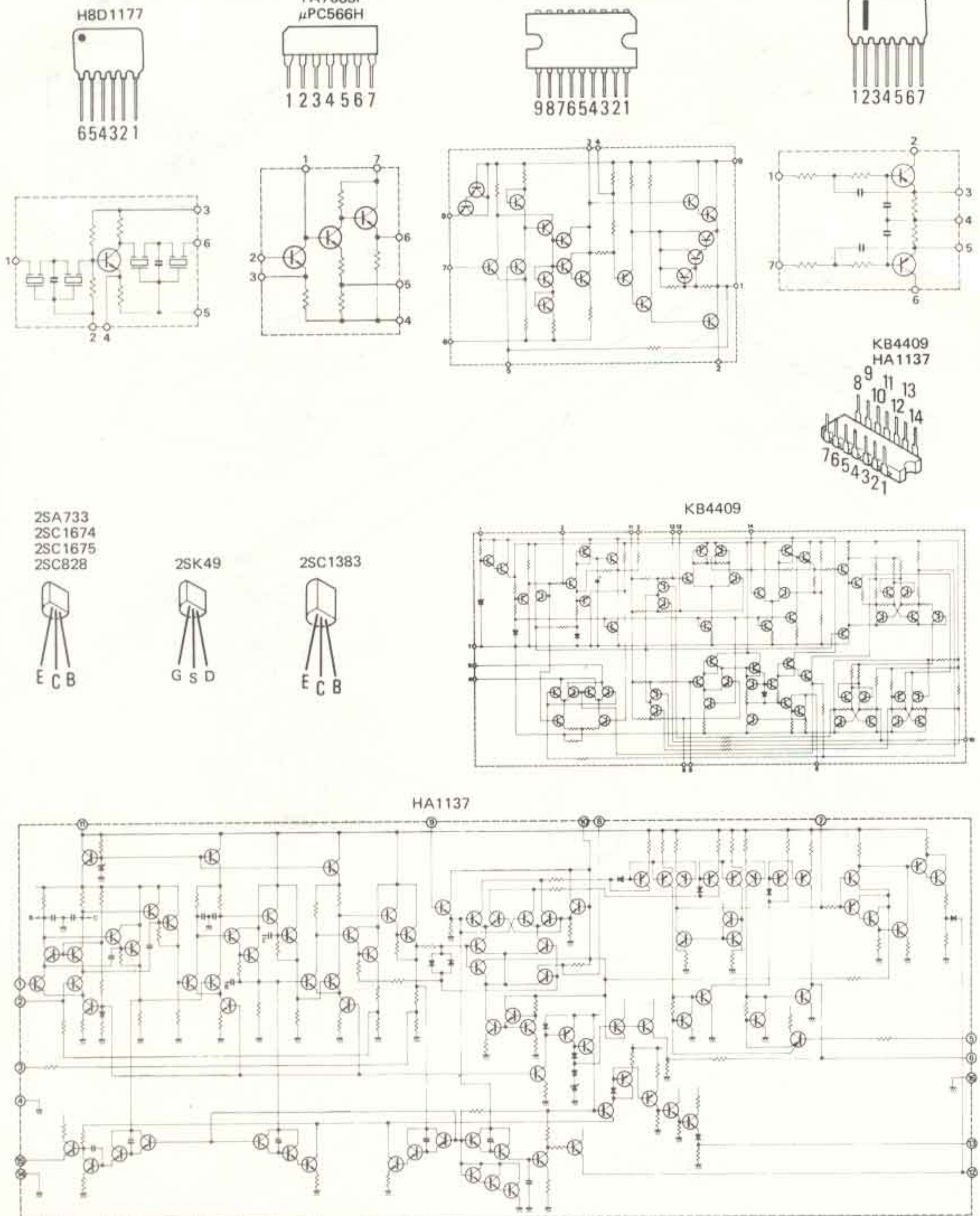
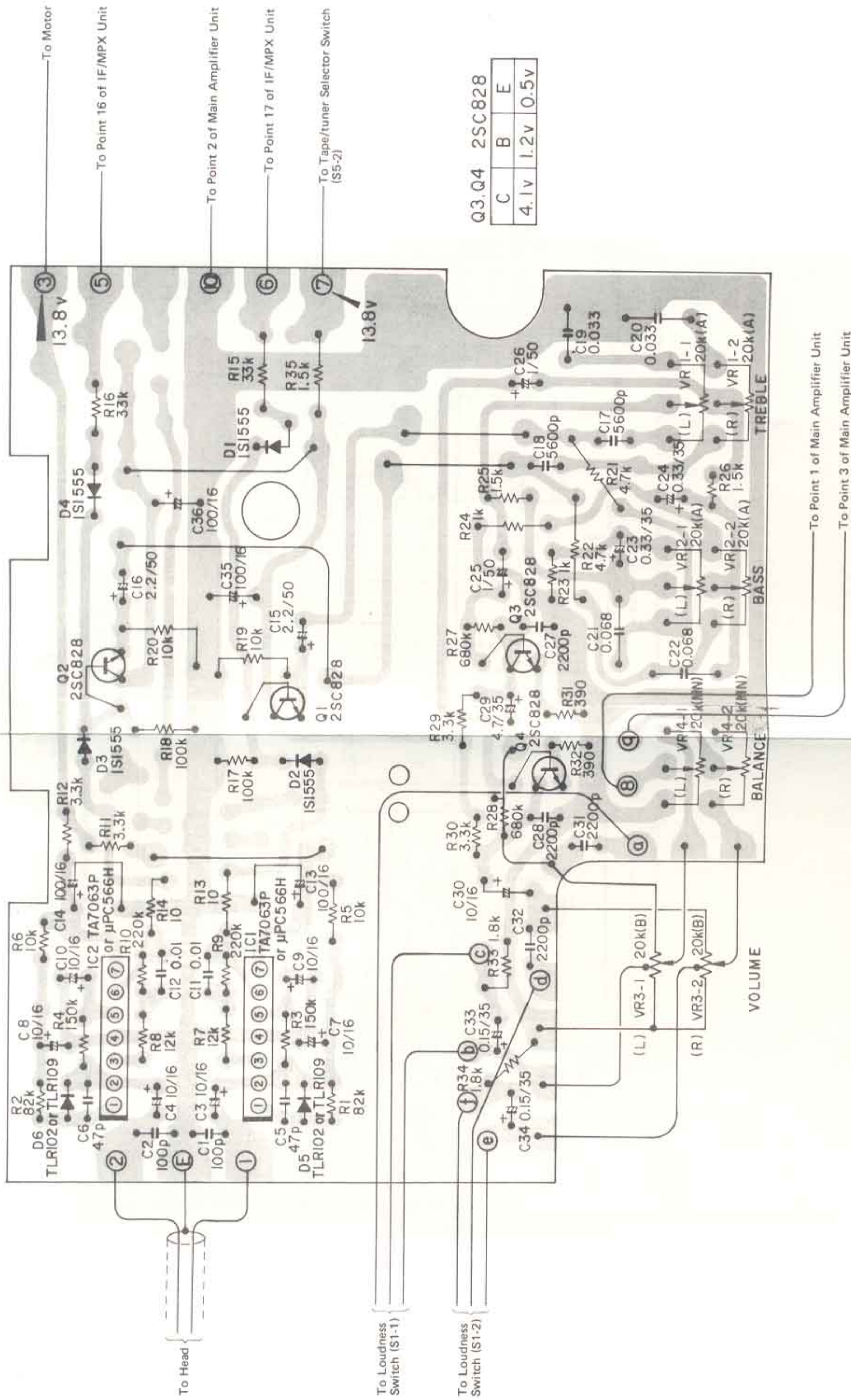


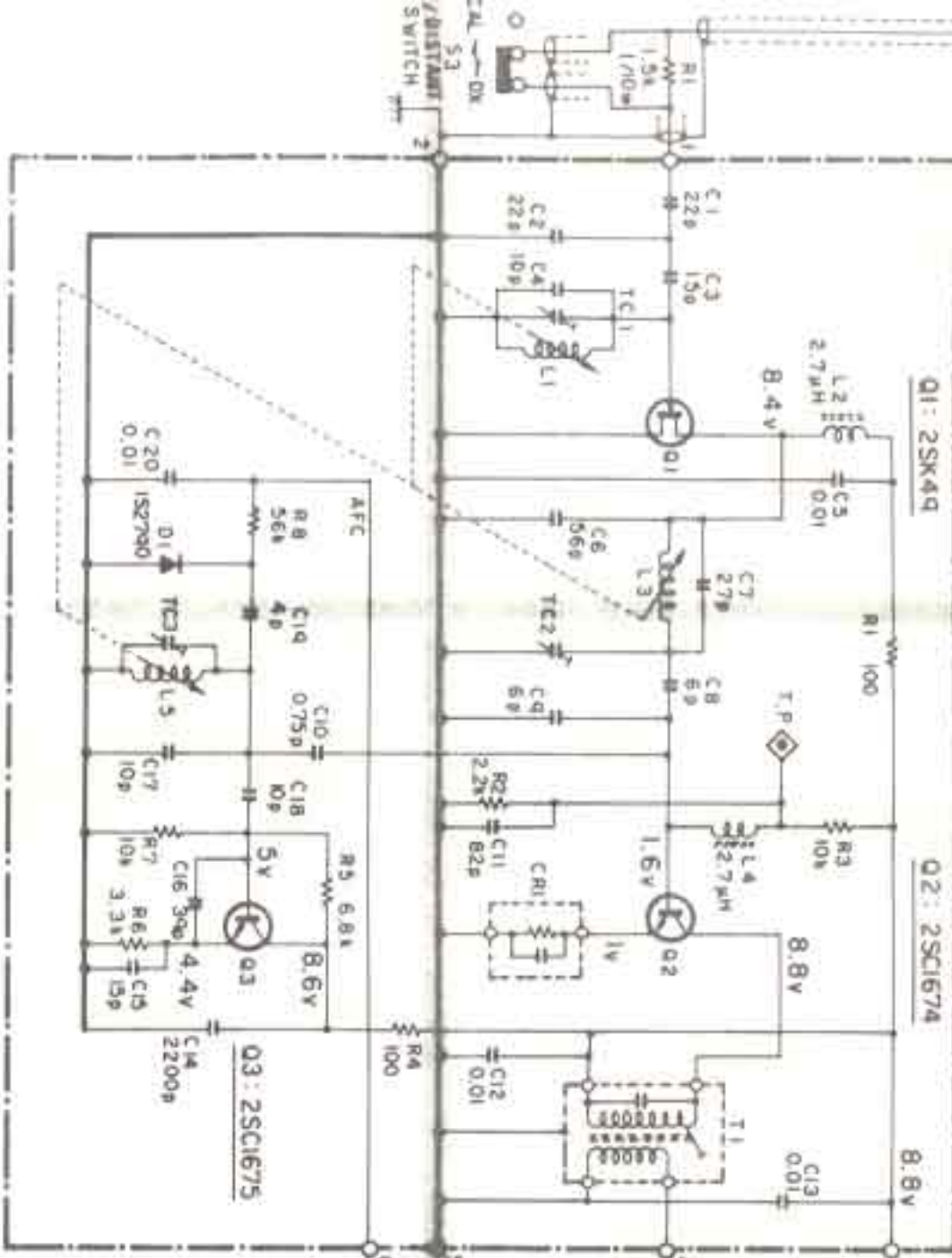
Fig. 15

C	B	E
8.5v	4.8v	4.2v

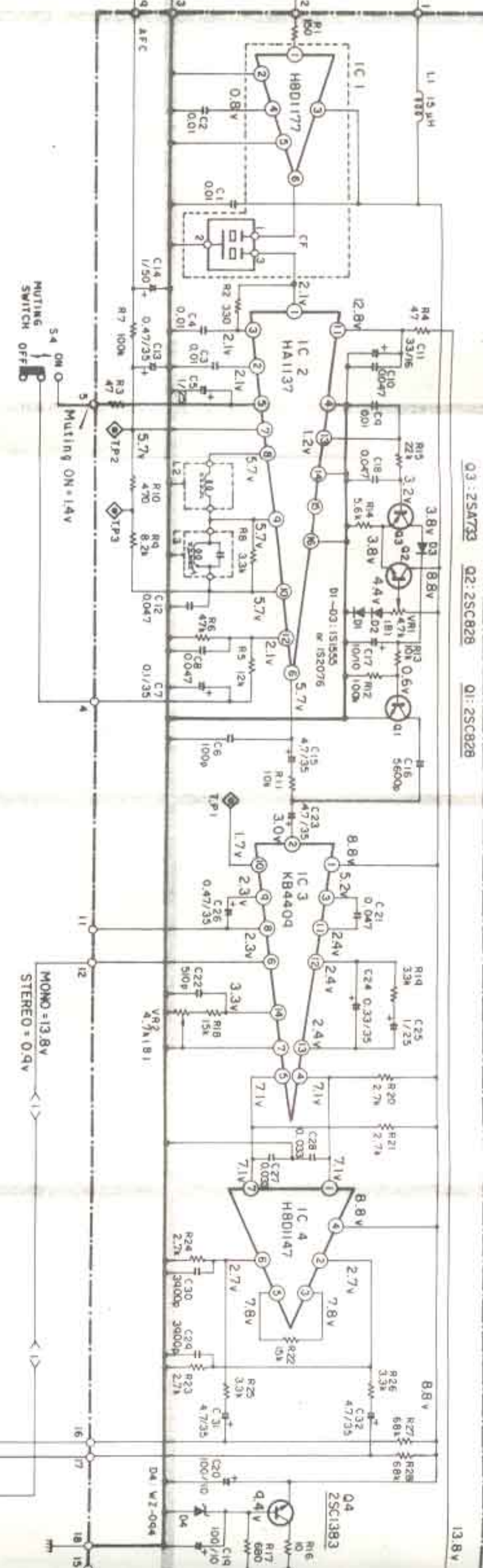


C	B	E
4.1v	1.2v	0.5v

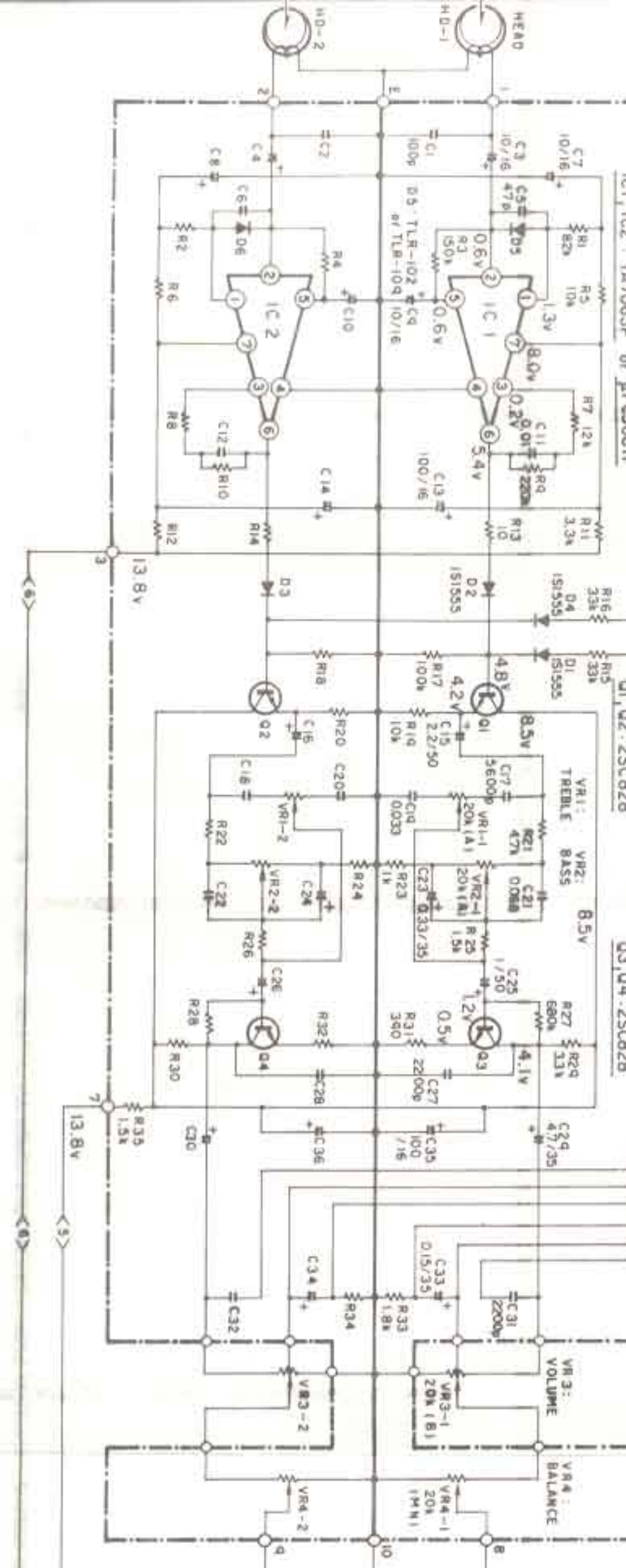
FM FRONTEND UNIT (CWB-045)



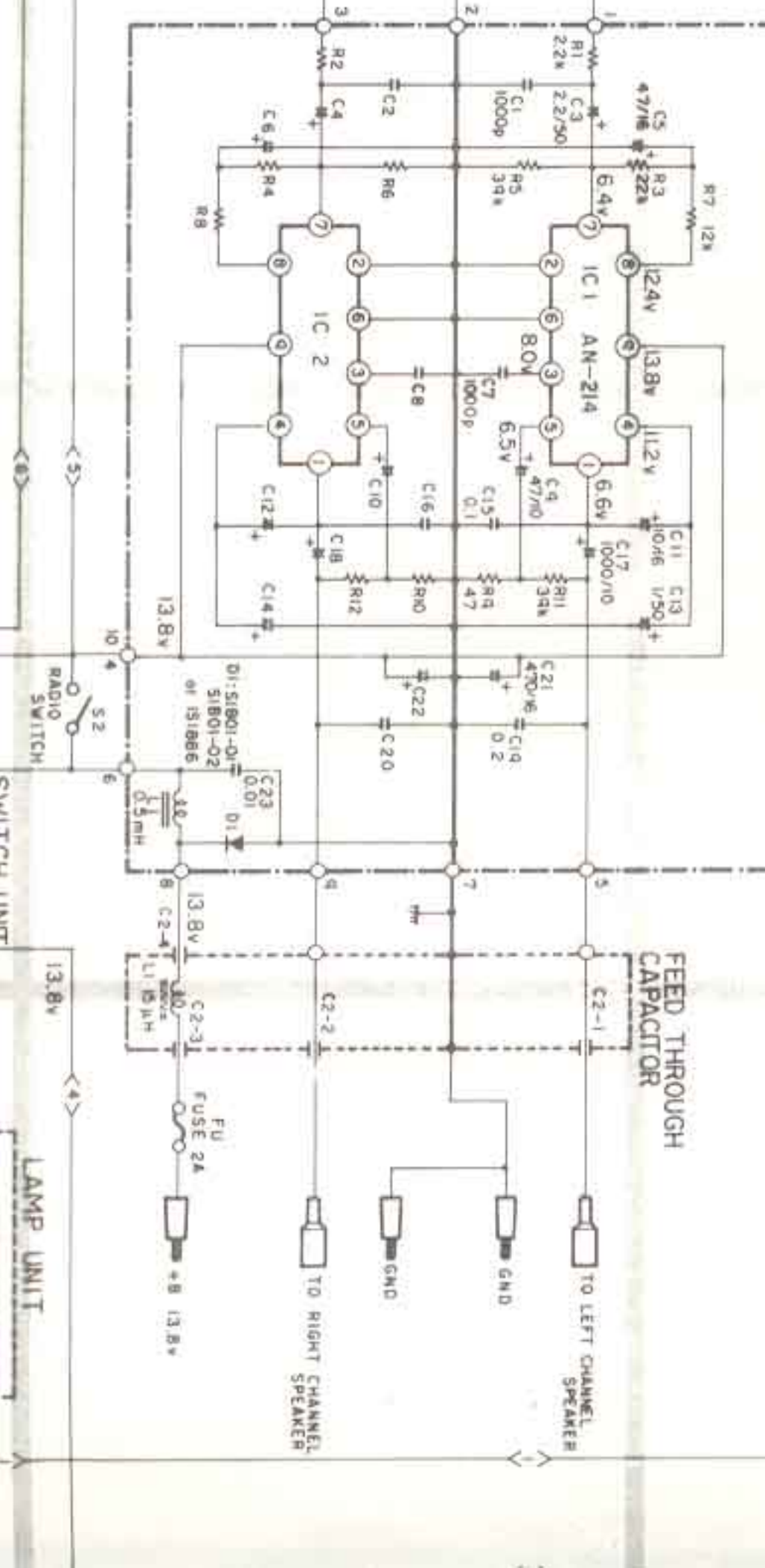
IF / MPX UNIT (CWE-134)



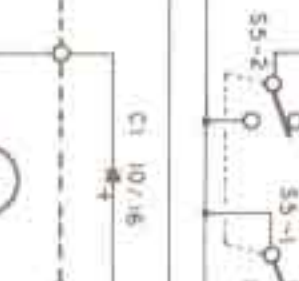
PRE AMPLIFIER UNIT (CWF-040)



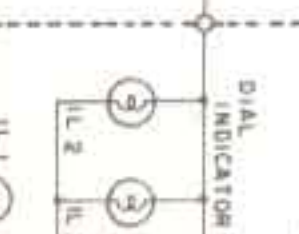
MAIN AMPLIFIER UNIT (CWH-039)



SWITCH UNIT



LAMP UNIT





MAIN AMPLIFIER UNIT (CWH-039)

12

- **Parts List**

NOTICE: Of the descriptive symbols of the resistor and capacitor, the encircled alphabetic letter denotes the allowable error.

Example: RD1/4VS100 (J) C: $\pm 0.25\text{pF}$ F: $\pm 1\text{pF}$ J: $\pm 5\%$ M: $\pm 20\%$ Z: $\begin{smallmatrix} +80\% \\ -20\% \end{smallmatrix}$
CEA100 (P) 25 D: $\pm 0.5\text{pF}$ G: $\pm 2\%$ K: $\pm 10\%$ X: $\begin{smallmatrix} +40\% \\ -20\% \end{smallmatrix}$ P: $\begin{smallmatrix} +100\% \\ -10\% \end{smallmatrix}$

MISCELLANEOUS

Ref. Key	Parts No.	Description	Notes
IC1	G09-009-B ~ D or G09-029-B ~ D	IC, TA7063P B ~ D or IC, μ PC566H B ~ D	
IC2	G09-009-B ~ D or G09-029-B ~ D	IC, TA7063P B ~ D or IC, μ PC566H B ~ D	
Q1	G05-036-D, E	Transistor, 2SC828R, S	
Q2	G05-036-D, E	Transistor, 2SC828R, S	
Q3	G05-036-D, E	Transistor, 2SC828R, S	
Q4	G05-036-D, E	Transistor, 2SC828R, S	
D1	G01-803-A	Diode, 1S1555	
D2	G01-803-A	Diode, 1S1555	
D3	G01-803-A	Diode, 1S1555	
D4	G01-803-A	Diode, 1S1555	
D5	G01-604-A or G01-605-A	LED, TLR-102 or LED, TLR-109	
D6	G01-604-A or G01-605-A	LED, TLR-102 or LED, TLR-109	
VR1	CCS-108	Volume	20k Ω (A), Treble
VR2	CCS-108	Volume	20k Ω (A), Bass
VR3	CCS-112	Volume	20k Ω (B), Volume
VR4	CCS-109	Volume	20k Ω (MN), Balance
S1	CSL-006	Switch	Loudness

RESISTORS

Ref. Key	Parts No.	Description
R1	RD¼VS823J	Resistor 82kΩ ¼W
R2	RD¼VS823J	Resistor 82kΩ ¼W
R3	RD¼VS154J	Resistor 150kΩ ¼W
R4	RD¼VS154J	Resistor 150kΩ ¼W
R5	RD¼VS103J	Resistor 10kΩ ¼W
R6	RD¼VS103J	Resistor 10kΩ ¼W
R7	RD¼VS123J	Resistor 12kΩ ¼W
R8	RD¼VS123J	Resistor 12kΩ ¼W
R9	RD¼VS224J	Resistor 220kΩ ¼W
R10	RD¼VS224J	Resistor 220kΩ ¼W
R11	RD¼VS332J	Resistor 3.3kΩ ¼W
R12	RD¼VS332J	Resistor 3.3kΩ ¼W
R13	RD¼VS100J	Resistor 10Ω ¼W
R14	RD¼VS100J	Resistor 10Ω ¼W
R15	RD¼VS333J	Resistor 33kΩ ¼W
R16	RD¼VS333J	Resistor 33kΩ ¼W
R17	RD¼VS104J	Resistor 100kΩ ¼W
R18	RD¼VS104J	Resistor 100kΩ ¼W
R19	RD¼VS103J	Resistor 10kΩ ¼W
R20	RD¼VS103J	Resistor 10kΩ ¼W

CAPACITORS

Ref. Key	Parts No.	Description
C1	CKDYB101K50	Capacitor 100pF 50V
C2	CKDYB101K50	Capacitor 100pF 50V
C3	CEA100P16	Capacitor 10μF 16V
C4	CEA100P16	Capacitor 10μF 16V
C5	CKDYB470K50	Capacitor 47pF 50V
C6	CKDYB470K50	Capacitor 47pF 50V
C7	CEA100P16	Capacitor 10μF 16V
C8	CEA100P16	Capacitor 10μF 16V
C9	CEA100P16	Capacitor 10μF 16V
C10	CEA100P16	Capacitor 10μF 16V
C11	CQMA103K50	Capacitor 0.01μF 50V
C12	CQMA103K50	Capacitor 0.01μF 50V
C13	CEA101P16	Capacitor 100μF 16V
C14	CEA101P16	Capacitor 100μF 16V
C15	CEA2R2P50	Capacitor 2.2μF 50V
C16	CEA2R2P50	Capacitor 2.2μF 50V
C17	CQMA562K50	Capacitor 5600pF 50V
C18	CQMA562K50	Capacitor 5600pF 50V
C19	CQMA333K50	Capacitor 0.033μF 50V
C20	CQMA333K50	Capacitor 0.033μF 50V

Ref. Key	Parts No.	Description
R21	RD¼VS472J	Resistor 4.7kΩ ¼W
R22	RD¼VS472J	Resistor 4.7kΩ ¼W
R23	RD¼VS102J	Resistor 1kΩ ¼W
R24	RD¼VS102J	Resistor 1kΩ ¼W
R25	RD¼VS152J	Resistor 1.5kΩ ¼W
R26	RD¼VS152J	Resistor 1.5kΩ ¼W
R27	RD¼VS684J	Resistor 680kΩ ¼W
R28	RD¼VS684J	Resistor 680kΩ ¼W
R29	RD¼VS332J	Resistor 3.3kΩ ¼W
R30	RD¼VS332J	Resistor 3.3kΩ ¼W
R31	RD¼VS391J	Resistor 390Ω ¼W
R32	RD¼VS391J	Resistor 390Ω ¼W
R33	RD¼VS182J	Resistor 1.8kΩ ¼W
R34	RD¼VS182J	Resistor 1.8kΩ ¼W
R35	RD¼VS152J	Resistor 1.5kΩ ¼W

Ref. Key	Parts No.	Description
C21	CQMA683K50	Capacitor 0.068μF 50V
C22	CQMA683K50	Capacitor 0.068μF 50V
C23	CSZAR33M35	Capacitor 0.33μF 35V
C24	CSZAR33M35	Capacitor 0.33μF 35V
C25	CEA010P50	Capacitor 1μF 50V
C26	CEA010P50	Capacitor 1μF 50V
C27	CQMA222K50	Capacitor 2200pF 50V
C28	CQMA222K50	Capacitor 2200pF 50V
C29	CEA4R7P35	Capacitor 4.7μF 35V
C30	CEA4R7P35	Capacitor 4.7μF 35V
C31	CQMA222K50	Capacitor 2200pF 50V
C32	CQMA222K50	Capacitor 2200pF 50V
C33	CSZAR15M35	Capacitor 0.15μF 35V
C34	CSZAR15M35	Capacitor 0.15μF 35V
C35	CEA101P16	Capacitor 100μF 16V
C36	CEA101P16	Capacitor 100μF 16V

• Parts Connection

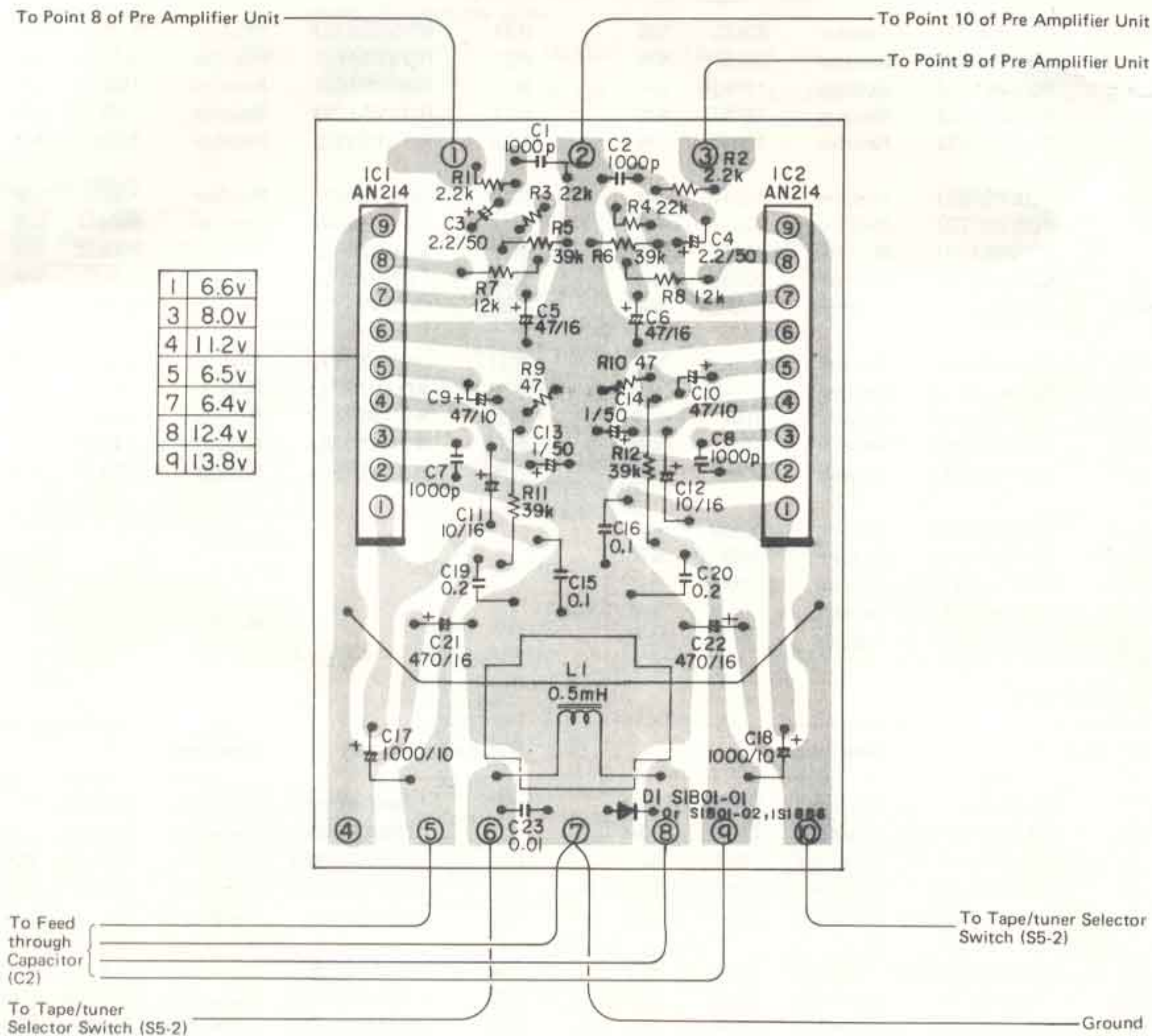


Fig. 18

• Parts Connection

Q2 2SC1674		
C	B	E
8.8v	1.6v	1v

Q3 2SC1675		
C	B	E
8.6v	5v	4.4v

• Parts List

MISCELLANEOUS

Ref. Key	Parts No.	Description	Notes
Q1	G08-007-B	FET, 2SK49H2	
Q2	G05-065-A ~ C	Transistor, 2SC1674L, M, K	
Q3	G05-066-A	Transistor, 2SC1675M	
D1	G01-406-A	Diode, 1S2790	
T1	CTC-043	IF Transformer	
L2	CTF-039	Ferri-Inductor	2.7μH
L4	CTF-039	Ferri-Inductor	2.7μH
TC1	CCG-008	Ceramic Trimmer	
TC2	CCG-008	Ceramic Trimmer	
TC3	CCG-008	Ceramic Trimmer	
CR1	CCX-001	Multiple Components	

RESISTORS

Ref. Key	Parts No.	Description	Ref. Key	Parts No.	Description
R1	RD1/8VS101J	Resistor 100Ω 1/8W	R6	RD1/10PS332J	Resistor 3.3kΩ 1/10W
R2	RD1/8VS222J	Resistor 2.2kΩ 1/8W	R7	RD1/10PS103J	Resistor 10kΩ 1/10W
R3	RD1/8VS103J	Resistor 10kΩ 1/8W	R8	RD1/8VS563J	Resistor 56kΩ 1/8W
R4	RD1/8VS101J	Resistor 100Ω 1/8W			
R5	RD1/10PS682J	Resistor 6.8kΩ 1/10W			

CAPACITORS

Ref. Key	Parts No.	Description	Ref. Key	Parts No.	Description
C1	CCDSL220K500	Capacitor 22pF 500V	C11	CCDSL820J50	Capacitor 82pF 50V
C2	CCDSL220J50	Capacitor 22pF 50V	C12	CKDYD103M50	Capacitor 0.01μF 50V
C3	CCDSL150J50	Capacitor 15pF 50V	C13	CKDYF103Z25	Capacitor 0.01μF 25V
C4	CCDRH100F50	Capacitor 10pF 50V	C14	CKDYB222K50	Capacitor 2200pF 50V
C5	CKDYF103Z25	Capacitor 0.01μF 25V	C15	CCDTH150J50	Capacitor 15pF 50V
C6	CCDSL560J50	Capacitor 56pF 50V	C16	CCDTH390J50	Capacitor 39pF 50V
C7	CCDRH270J50	Capacitor 27pF 50V	C17	CCDTH100F50	Capacitor 10pF 50V
C8	CCDCH060D50	Capacitor 6pF 50V	C18	CCDTH100F50	Capacitor 10pF 50V
C9	CCDCH060D50	Capacitor 6pF 50V	C19	CCDCH040D50	Capacitor 4pF 50V
C10	CGBR75K500	Capacitor 0.75pF 500V	C20	CKDYF103Z25	Capacitor 0.01μF 25V

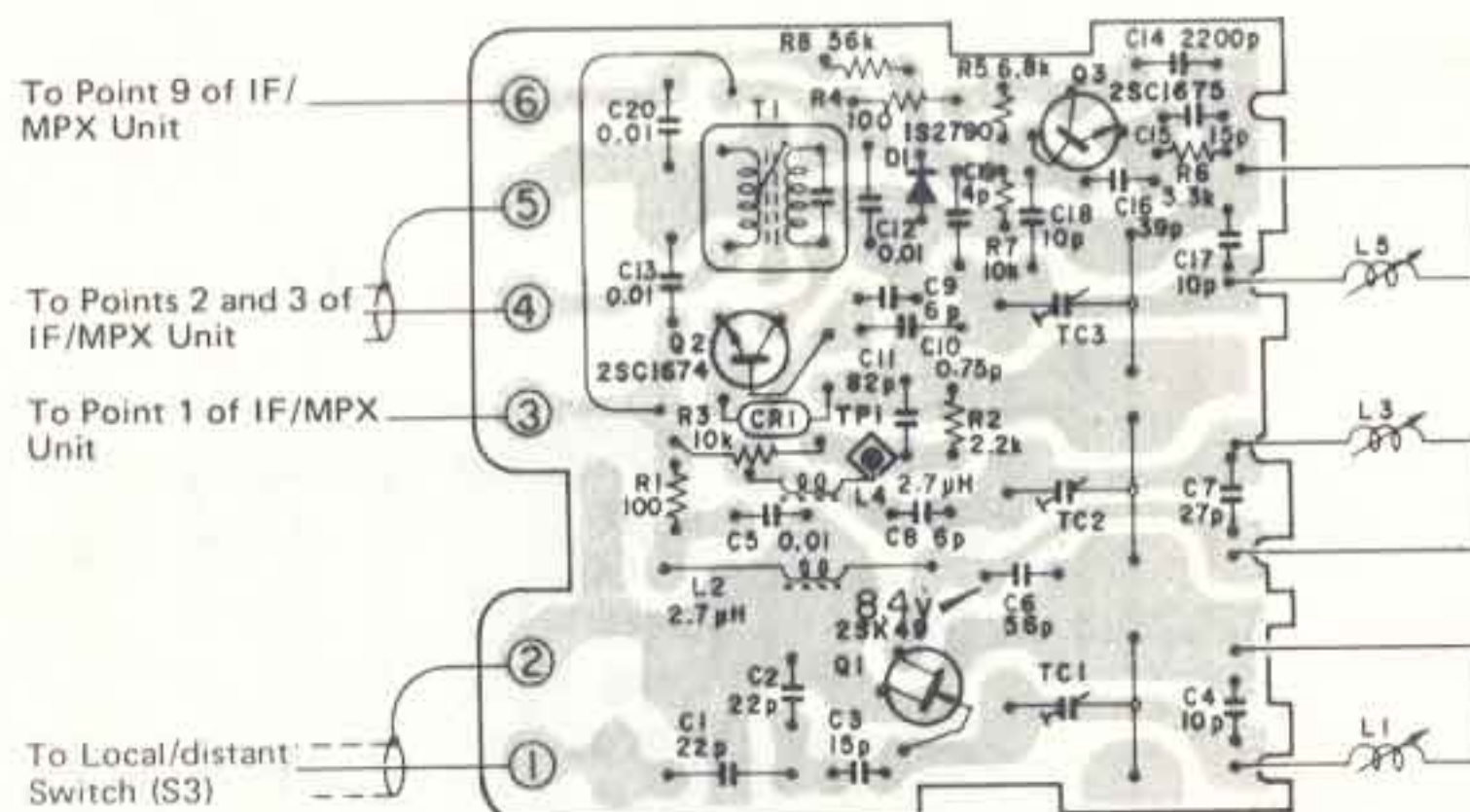


Fig. 19

10. IF/MPX UNIT (CWE-134)

• Parts Connection

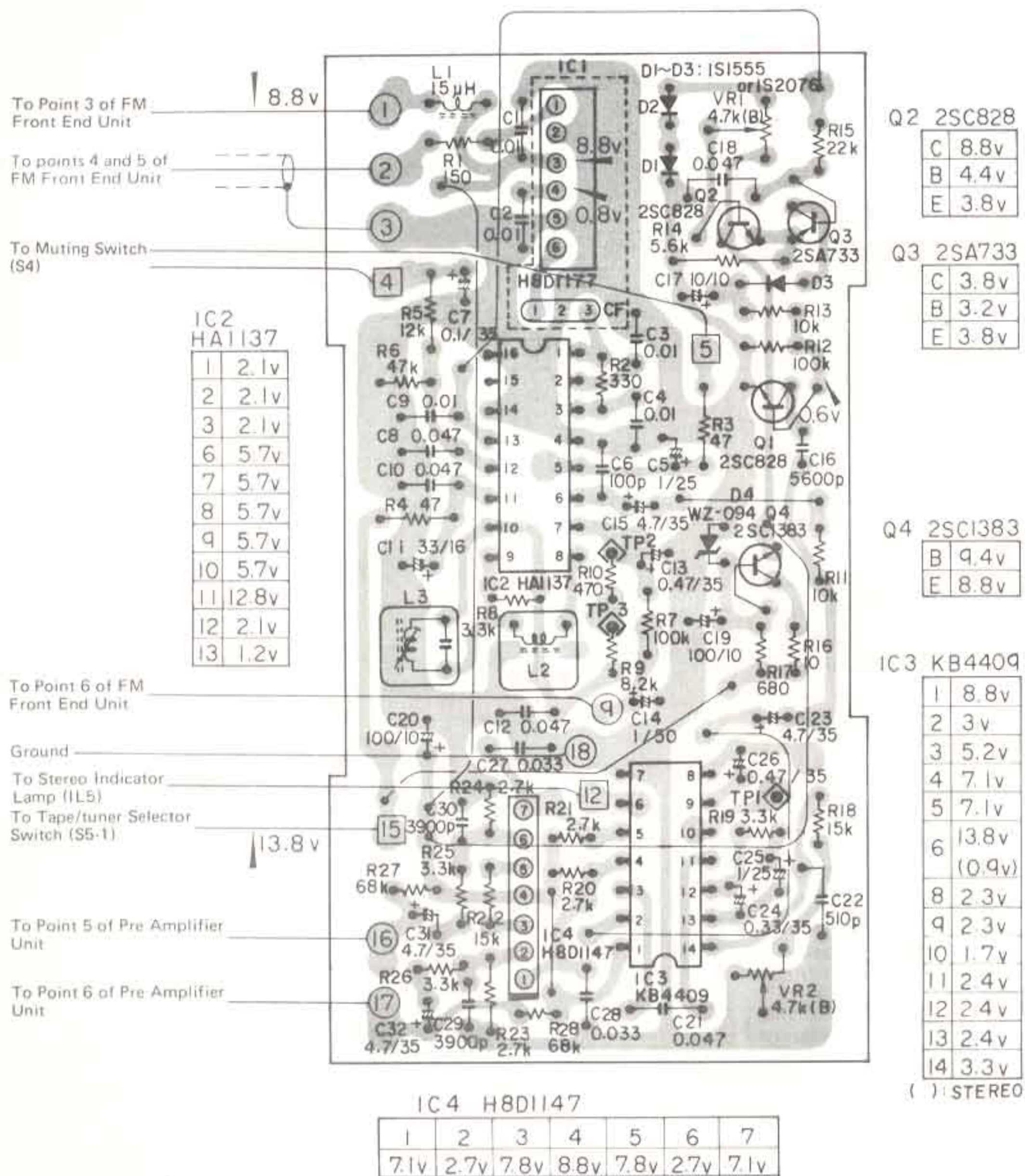


Fig. 20

• Parts List

MISCELLANEOUS

Ref. Key	Parts No.	Description	Notes
IC1	CWW-010	IC and Ceramic Filter	
IC2	G09-018-A	IC, HA1137P	
IC3	G09-034-A	IC, KB4409	
IC4	G09-505-A	IC, H8D1147	
Q1	G05-061-B ~ D	Transistor, 2SC828P ~ R	
Q2	G05-061-B ~ D	Transistor, 2SC828P ~ R	
Q3	G03-017-B ~ D	Transistor, 2SA733P ~ R	
Q4	G05-415-B, C	Transistor, 2SC1383Q, R	
D1	G00-012-A or G01-803-A	Diode, 1S2076 or Diode, 1S1555	
D2	G00-012-A or G01-803-A	Diode, 1S2076 or Diode, 1S1555	
D3	G00-012-A or G01-803-A	Diode, 1S2076 or Diode, 1S1555	
D4	G01-036-H	Diode, WZ-094	
L1	CTF-016	Ferri-Inductor	15 μ H
L2	CTC-056	IF Transformer	FM DET
L3	CTC-055	IF Transformer	FM DET
VR1	C92-618	Semi-Variable Resistor	4.7k Ω
VR2	C92-618	Semi-Variable Resistor	4.7k Ω

RESISTORS

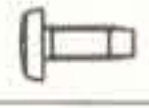
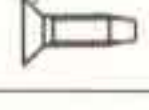
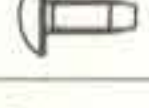
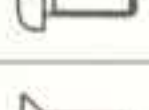
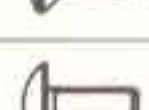
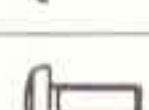
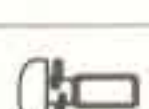
Ref. Key	Parts No.	Description	Ref. Key	Parts No.	Description
R1	RD $\frac{1}{4}$ VS151J	Resistor 150 Ω $\frac{1}{4}$ W	R16	RD $\frac{1}{4}$ VS100J	Resistor 10 Ω $\frac{1}{4}$ W
R2	RD $\frac{1}{4}$ VS331J	Resistor 330 Ω $\frac{1}{4}$ W	R17	RD $\frac{1}{4}$ VS681J	Resistor 680 Ω $\frac{1}{4}$ W
R3	RD $\frac{1}{4}$ VS470J	Resistor 47 Ω $\frac{1}{4}$ W	R18	RD $\frac{1}{4}$ VS153J	Resistor 15k Ω $\frac{1}{4}$ W
R4	RD $\frac{1}{4}$ VS470J	Resistor 47 Ω $\frac{1}{4}$ W	R19	RD $\frac{1}{4}$ VS332J	Resistor 3.3k Ω $\frac{1}{4}$ W
R5	RD $\frac{1}{4}$ VS123J	Resistor 12k Ω $\frac{1}{4}$ W	R20	RD $\frac{1}{4}$ VS272J	Resistor 2.7k Ω $\frac{1}{4}$ W
R6	RD $\frac{1}{4}$ VS473J	Resistor 47k Ω $\frac{1}{4}$ W	R21	RD $\frac{1}{4}$ VS272J	Resistor 2.7k Ω $\frac{1}{4}$ W
R7	RD $\frac{1}{4}$ VS104J	Resistor 100k Ω $\frac{1}{4}$ W	R22	RD $\frac{1}{4}$ VS153J	Resistor 15k Ω $\frac{1}{4}$ W
R8	RD $\frac{1}{4}$ VS332J	Resistor 3.3k Ω $\frac{1}{4}$ W	R23	RD $\frac{1}{4}$ VS272J	Resistor 2.7k Ω $\frac{1}{4}$ W
R9	RD $\frac{1}{4}$ PS822J	Resistor 8.2k Ω $\frac{1}{4}$ W	R24	RD $\frac{1}{4}$ VS272J	Resistor 2.7k Ω $\frac{1}{4}$ W
R10	RD $\frac{1}{4}$ PS471J	Resistor 470 Ω $\frac{1}{4}$ W	R25	RD $\frac{1}{4}$ VS332J	Resistor 3.3k Ω $\frac{1}{4}$ W
R11	RD $\frac{1}{4}$ VS103J	Resistor 10k Ω $\frac{1}{4}$ W	R26	RD $\frac{1}{4}$ VS332J	Resistor 3.3k Ω $\frac{1}{4}$ W
R12	RD $\frac{1}{4}$ VS104J	Resistor 100k Ω $\frac{1}{4}$ W	R27	RD $\frac{1}{4}$ VS683J	Resistor 68k Ω $\frac{1}{4}$ W
R13	RD $\frac{1}{4}$ VS103J	Resistor 10k Ω $\frac{1}{4}$ W	R28	RD $\frac{1}{4}$ VS683J	Resistor 68k Ω $\frac{1}{4}$ W
R14	RD $\frac{1}{4}$ VS562J	Resistor 5.6k Ω $\frac{1}{4}$ W			
R15	RD $\frac{1}{4}$ VS223J	Resistor 22k Ω $\frac{1}{4}$ W			

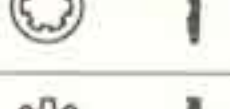
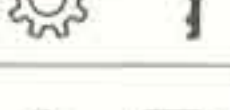
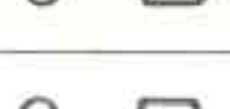
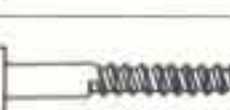
11. MISCELLANEOUS PARTS LIST KP-500

Ref. Key	Parts No.	Description	Notes
R1	RD1/10PS152J	Resistor 1.5k Ω 1/10W	
R2	RS1P181K	Resistor 180 Ω 1W	
R3	RS1P181K	Resistor 180 Ω 1W	
R4	RS1P220K	Resistor 22 Ω 1W	
C1	CEA100P16	Capacitor 10 μ F 16V	
C2	CCL-045	Feed through Capacitor	
L1	CTF-003	Coil	15 μ H
IL1	CEL-001	Lamp, 5V 60mA	Tape Ind.
IL2	CEL-021	Lamp, 14V 60mA	Dial Ind.
IL3	CEL-021	Lamp, 14V 60mA	Dial Ind.
IL4	CEL-021	Lamp, 14V 60mA	Dial Ind.
IL5	CEL-001	Lamp, 5V 60mA	Stereo Ind.
HD	CPB-014 or CPB-015 or CPB-032	Head Head Head	
M	CXM-031 or CXM-032	Motor Motor	
ANT	CKX-001	Jack	Antenna
S2	CSL-005	Switch	Radio
S3	CSL-005	Switch	Local/distant
S4	CSL-005	Switch	Muting
S5	CSL-001	Switch	Tape/tuner Select
FU	E21-005	Fuse, 2A	

12. NOMENCLATURE OF SCREWS, WASHERS AND NUTS

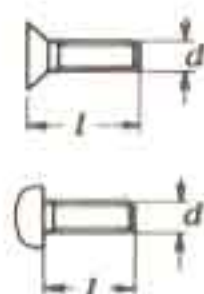
The following symbols stand for screws, washers and nuts as shown in exploded view.

Symbol	Description	Shape
RT	Brazier head tapping screw	
PT	Pan head tapping screw	
BT	Binding head tapping screw	
CT	Countersunk head tapping screw	
TT	Truss head tapping screw	
OCT	Oval countersunk head tapping screw	
PM	Pan head machine screw	
CM	Countersunk head machine screw	
OCM	Oval countersunk head machine screw	
TM	Truss head machine screw	
BM	Binding head machine screw	
PSA	Pan head screw with spring lock washer	
PSB	Pan head screw with spring lock washer and flat washer	
PSF	Pan head screw with flat washer	

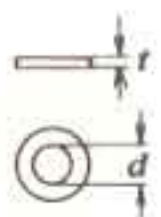
Symbol	Description	Shape
EW	E type washer	
FW	Flat washer	
SW	Spring lock washer	
N	Nut	
WN	Washer faced nut	
ITW	Internal toothed lock washer	
OTW	Outernal toothed lock washer	
SC	Slotted set screw (Cone point)	
SF	Slotted set screw (Flat point)	
HS	Hexagon socket headless set screw	
OCW	Oval countersunk head wood screw	
CW	Countersunk head wood screw	
RW	Round head wood screw	

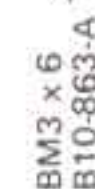
EXAMPLE

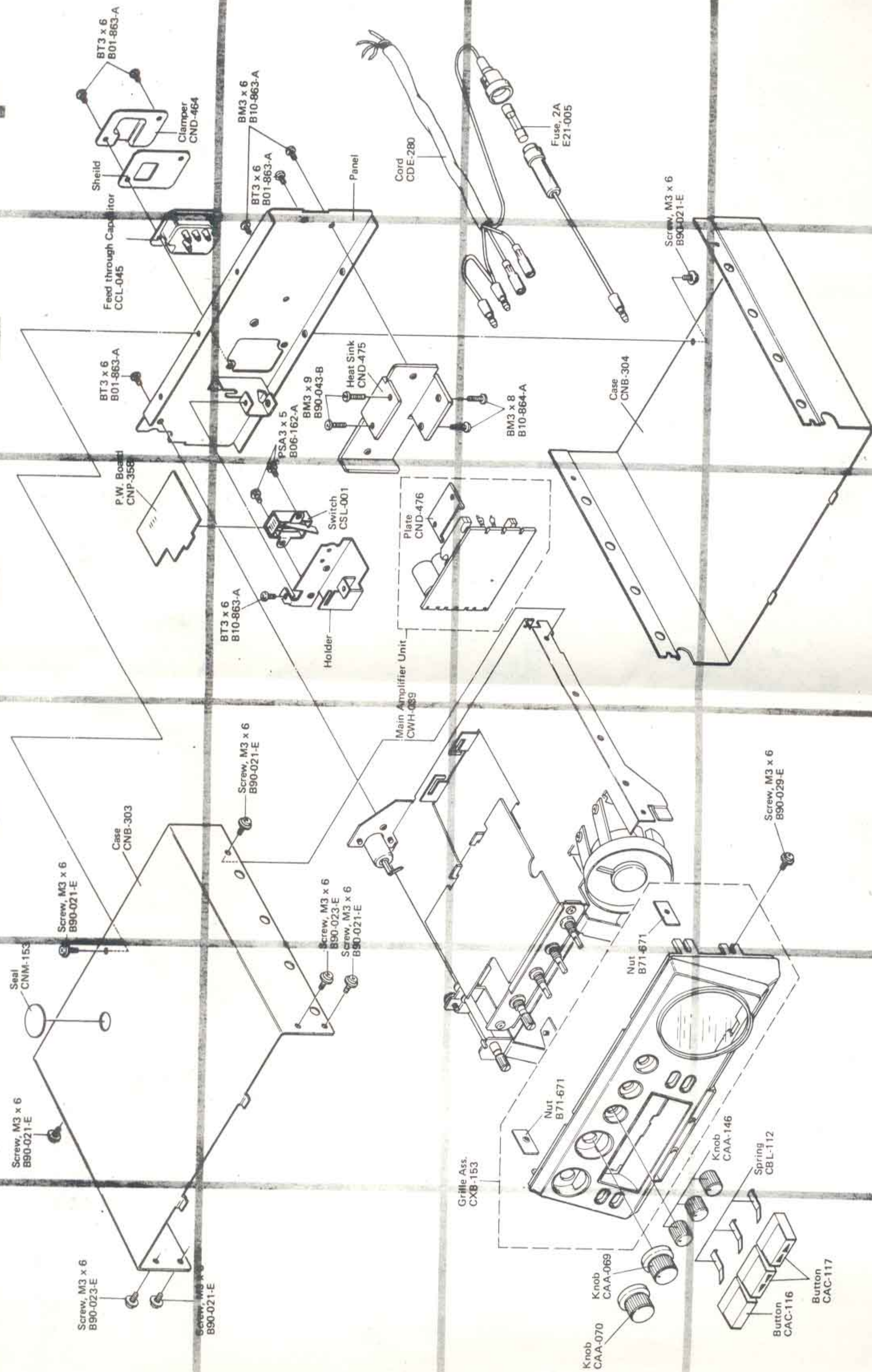
PM 3x8
 length in mm (l)
 diameter in mm (d)
 Symbol

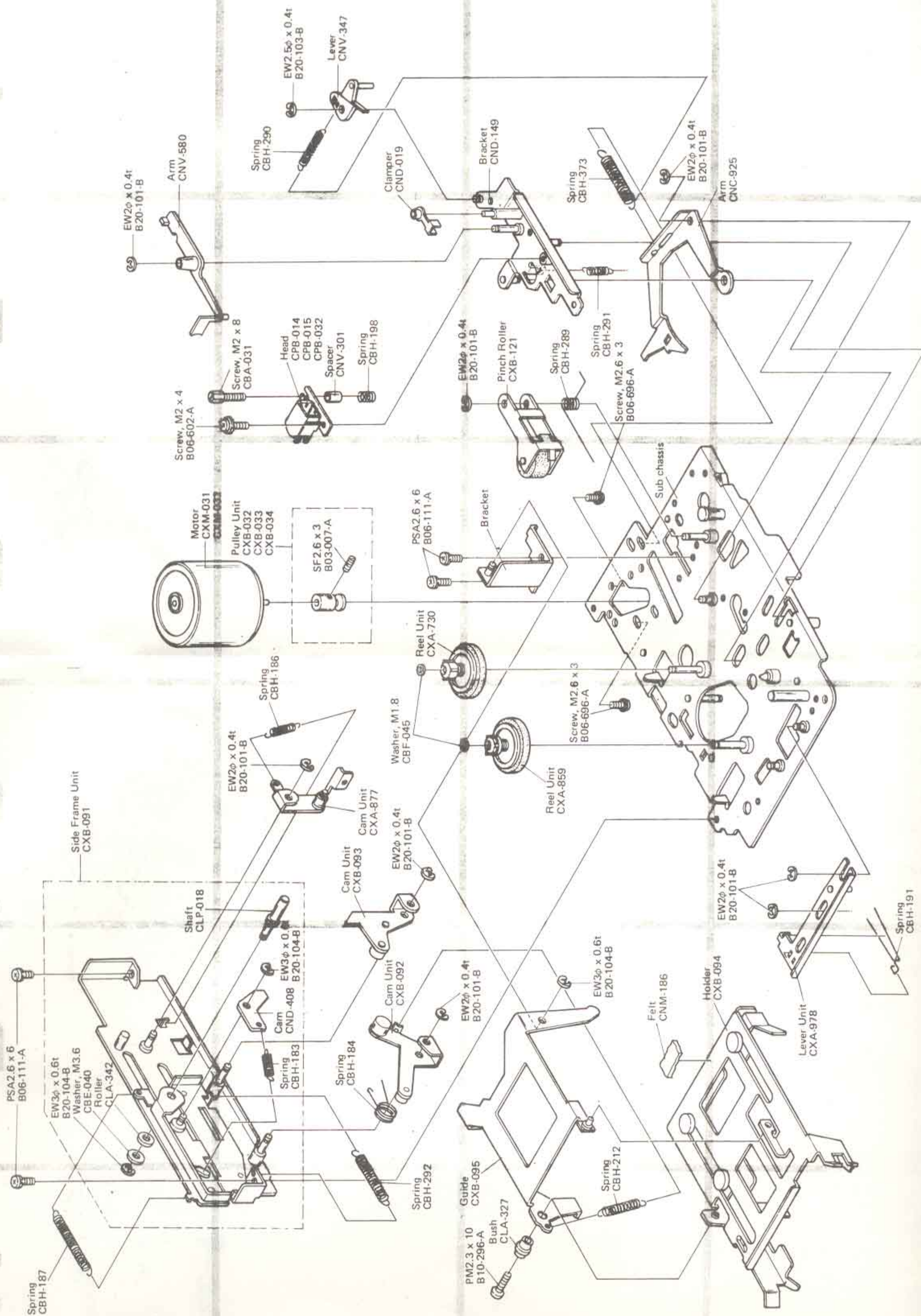


FW 9 ϕ x 1 t
 thickness in mm (t)
 diameter in mm (d)
 Symbol









17. PACKING METHOD

KP-500

NOTICE: Parts whose parts numbers are omitted are subject to being not supplied.

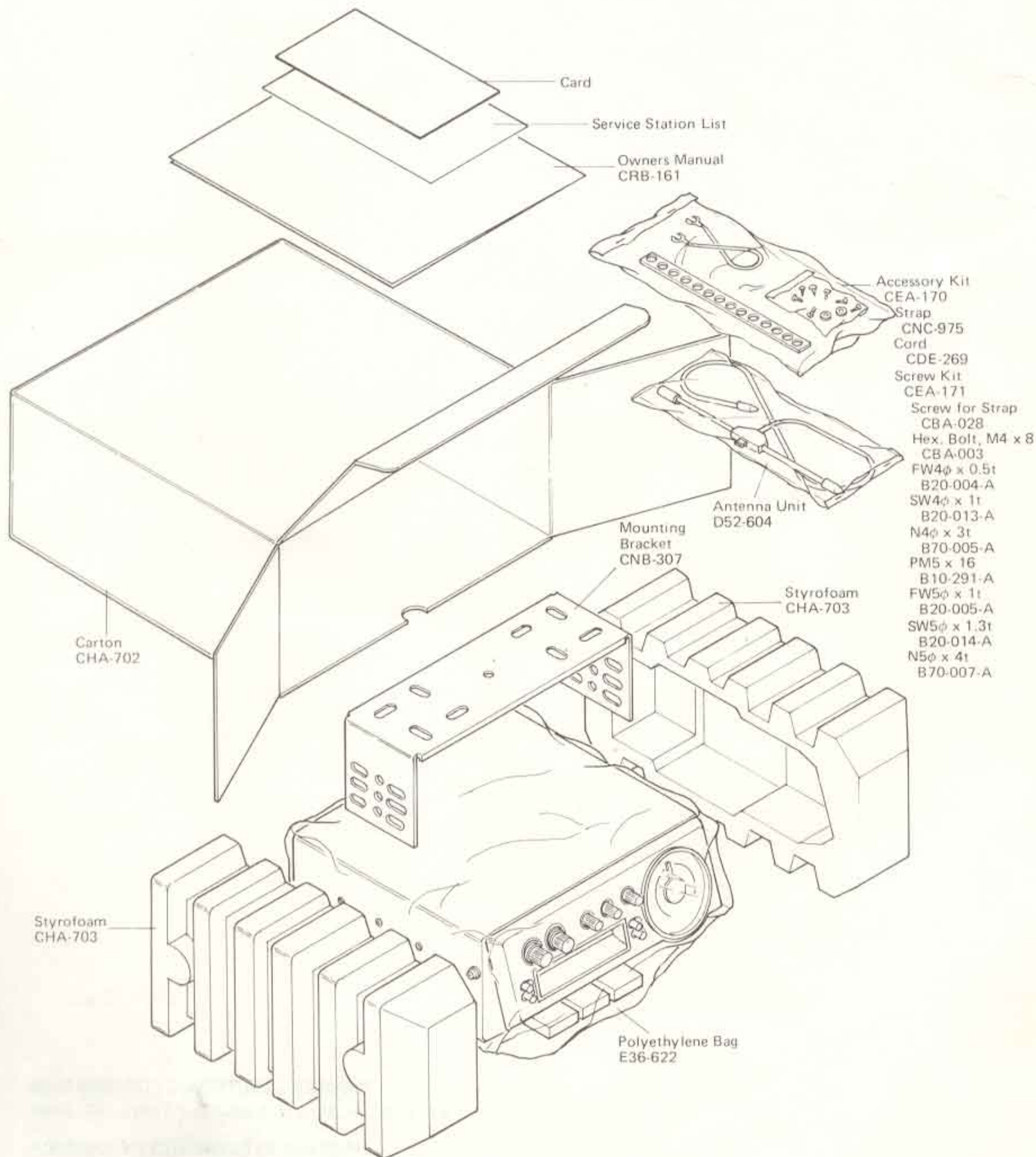


Fig. 25

PIONEER ELECTRONIC CORPORATION
4-1, 1-Chome, Meguro, Meguro-ku, Tokyo 153, Japan

PIONEER ELECTRONICS OF AMERICA
1925 E. Dominguez Street
Long Beach, CA 90810