CE-5230 EX1

"TEN" SERVICE MANUAL

CASSETTE DECK WITH ELECTRONIC TUNING TUNER

(AM/FM, MPX, SEEK, 5PB, AUTO-REVERSE)

Model CE-5230EX1

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FUJITSU TEN LIMITED

REPAIRING PRECAUTIONS MOS IC

The following precautions are necessary for repairing PC boards containing MOS IC.
This model contains MOS ICs as follows :

RN-EIM-UPD1708G-011

1. MOS ICs should be stored or transported in conductive material so that all exposed leads are shorted together.
   MOS ICs must not be inserted into conventional stylo-form or plastic trays of the type used for storage and transportation of other semiconductor devices.
   Sometimes, several kilo-volt static may exist on an ungrounded bench surface and human body.
2. Therefore, MOS ICs should be placed on a grounded bench surface and the technicians should ground themselves prior to handling devices. This is done most effectively by having the technician wear a conductive wrist strap in series with 100k ohm to ground.
3. Nylon clothing should not be worn while handling MOS circuits.
4. Do not insert or remove MOS ICs with power applied.
5. Use a grounded soldering iron when soldering.
6. MOS ICs should be handled by their packages and not by the leads, if at all possible. Prior to touching the unit, the technician should touch an electrical ground to remove any static charge that may have been accumulated.

COMPOSITION

CE-5230EX1

Illus. No.	Stock No.	Description	Q'ty	Illus. No.	Stock No.	Description	Q'ty
1	CE-5230	Combination unit	1	11	RN-MBW-C5×16S	Bolt with washer	1
2	RN-MYC-1016A	Knob	2	12	RN-MTN-A6×16S	Screw, tapping	1
3	RN-MYD-1031	Knob	2	13	RN-EWJ-1744	Wiring sub-assembly, ground	1
4	RN-MDP-1393	Escutcheon	1	14	RN-EWJ-3382	Wiring sub-assembly, speaker	1
5	RN-MPF-1003	Packing	1	15	RN-EWJ-3408	Wiring sub-assembly, power lead	1
6	RN-MBF-11	Bracket	1	16	RN-MXK-143	Owners manual	1
7	RN-MSN-19	Nut, 9mm	4	17	RN-MXW-117	Warranty cord	1
8	RN-MWS-1039	Washer, 9mm	4	18	F6-SBD-2.6×10S	Screw, 2.6×10mm	1
9	RN-MET-1229	Special screw	1	19	RN-MSS-1006	Spacer	1
10	RN-MNR-D5S	Nut, 9mm	2				

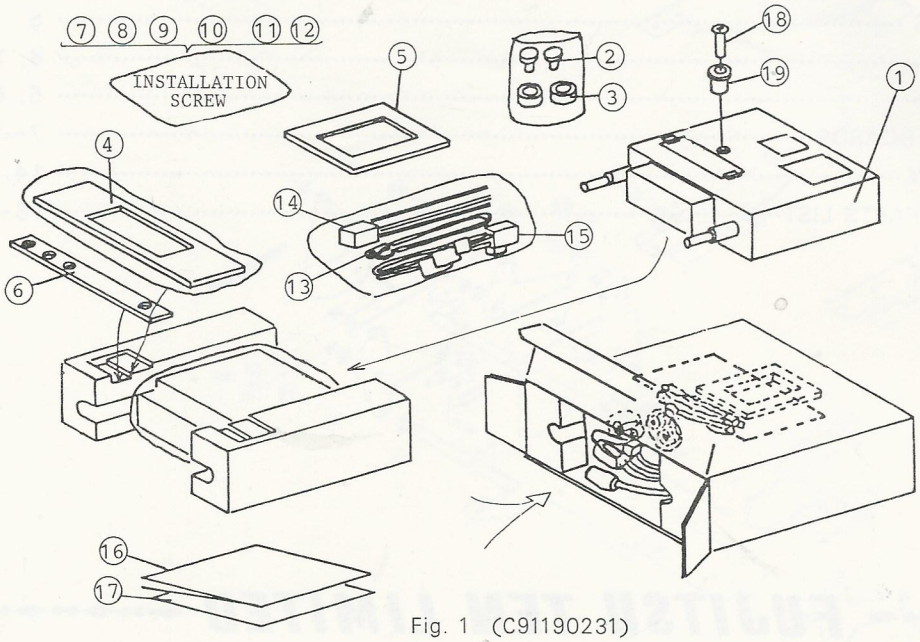


Fig. 1 (C91190231)

SPECIFICATIONS

〔CE-5230EX1〕

(RADIO SECTION)	AM	FM
TUNING RANGE	530 to 1620 kHz (10 kHz step) 522 to 1620 kHz (9 kHz step)	87.5 to 107.9 MHz (200 kHz step) 87.5 to 108 MHz (100 kHz step)
INTERMEDIATE FREQUENCY	450 kHz	10.7 MHz
SENSITIVITY	30 dBμ or better	
SENSITIVITY AT ELECTRONIC TUNING	Distant : 34 ± 8 dBμ Local : Distant sens. +24 ± 6 dBμ	Distant : 18 ± 6 dBμ Local : Distant sens. +25 ± 6 dBμ
LIMITING SENSITIVITY		$8\ ^{+5}_{-8}$ dBμ
SEPARATION		22 dB or better (at 1 kHz)
ELECTRICAL FIDELITY	100 Hz : 0±3 dB (74 dBμ input, Refer. 400 Hz) 4 kHz : −15 ± 6 dB (74 dBμ input, Refer. 400 Hz)	100 Hz : 0±3 dB (54 dBμ input, Refer. 400 Hz) 10 kHz : −17 ± 5 dB (54 dBμ input, Refer. 400 Hz)

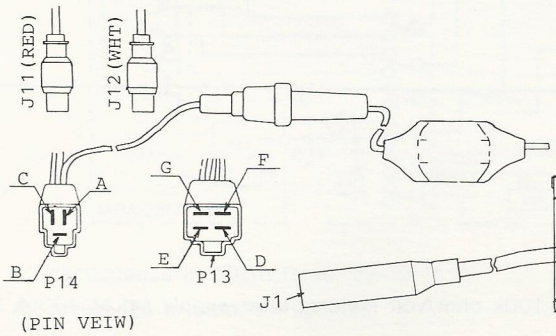
(CASSETTE DECK SECTION)

NUMBER OF TRACKS	4-track 2-channels
TAPE CARTRIDGE	Stereo/Monaural compact cassette
TAPE SPEED	4.76 cm/sec. (1-7/8″, i.p.s.)
WOW & FLUTTER	0.25% or less (WRMS)
CROSSTALK	35 dB or better
SEPARATION	25 dB or better
FREQUENCY RESPONSE	125 Hz : $0\ ^{+3}_{-5}$ dB (Refer. 1 kHz) 8 kHz : $0\ ^{+3}_{-8}$ dB (Refer. 1 kHz)
EQUALIZATION	Normal : t_1=3,180μsec., t_2=120μsec. Crome and metal t_1=3,180μsec., t_2=70μsec.
SIGNAL TO NOISE RATIO	43 dB or better (with MTT-112B test tape)
TAKE-UP TORQUE	40 to 80 g-cm

(COMMON SECTION)

LOAD IMPEDANCE	10k ohm (RCA termi.) 4 ohm (Speaker termi.)
OUTPUT POWER	4 watts×2 (THD=10%, 14.4V)
OUTPUT VOLTAGE	150 mV (Test tape : −10 dB, 1 kHz RCA termi.)
POWER INPUT	12-volt car battery, negative terminal to ground
Voltage	13.2 VDC
Current	Approx. 0.6 ampere (0.5watt×2) Approx. 1.5 ampere (Max.)
SEMICONDUCTOR	1 LSI, 11 ICs, 26 Transistors, 43 Diodes
DIMENSIONS	177(W)×50(H)×135(D)mm (6-31/32″, 1-31/32″, 5-5/16″)
WEIGHT	Unit—1.4 kg (3.1 lbs.)

CONNECTIONS



PIN NO.	CONNECTION	COLOR
A	POWER SUPPLY(+13.2V)	BLU/RED
B	BACK UP(+13.2V)	RED
C	AUTO ANT.(+13.2V)	ORG
D	SPEAKER L ch(+)	GRN
E	SPEAKER R ch(+)	BLU
F	SPEAKER L ch(-)	BLK
G	SPEAKER R ch(-)	BLK
J11	LINE OUTPUT R ch(+)	RED
J12	LINE OUTPUT L ch(+)	BLU

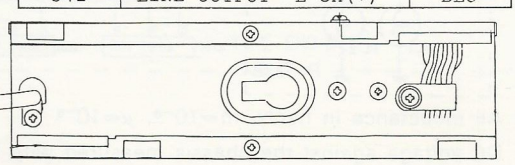


Fig. 2
(C23190231)

ADJUSTMENT FOR TAKE-UP TORQUE

Measure the take-up torque by inserting the torque gauge cartridge into the slip mechanism with the motor rotating. The torque should be always between 40 and 80g-cm. The roller has four positions for the spring to be set.

Set the spring in one of Ⓐ-Ⓓ positions for the sufficient value.

The take-up torque may vary 7g-cm per one step of the roller.

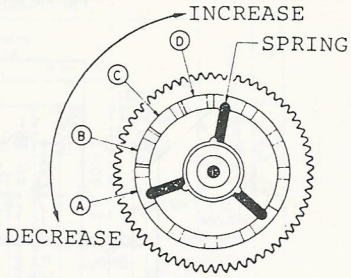


Fig. 3

CLEANING

After extended use, the tape playback head and the drive capstan will build up a layer of iron oxide from the tape. The iron oxide layer on the tape head prevents the tape from making full contact with the head and the result is a gradual loss of high frequency response and an increased noise level.

The iron oxide deposit on the capstan can cause slippage (wow) which might be mistaken for more serious mechanical drive problems.

A cleaner pen or similar object like the alcohol moistened swab is used.

First, using the end of a pencil, press the rod in the cassette door back until it gives a click sound.

Rub the parts such as playback head, capstan and pinchroller thoroughly to remove all traces of dirt and grime.

After cleaning, always remember to press the eject button to return the rod to former position.

Do not use a solvent such as lighter fuel or lacquer thinner, which may cause damage to plastic parts or to instrument finish.

DEMAGNETIZATION

The head may become magnetized over a period of time. A magnetized head will record noise on a tape even when it is being used for playback. It is important that the head be demagnetized periodically.

The head can be demagnetized with a commercial demagnetizer (or degausser, as it is sometimes called.)

Such an instrument is not expensive, and represents a good investment for the owner who wants to keep his equipment in the best possible condition.

PLAYBACK HEAD ADJUSTMENT (Azimuth)

Normally the playback head is precisely aligned at the factory and further adjustment should not be required unless the playback head or its mounting components are replaced. Beware of excessive adjustment. because improper adjustment results in inferior performance. If the azimuth is unnecessarily varied, the angle gets out of order, which cause lowering of tonal quality. Carefully adjust the azimuth adjust screw as shown in Fig. 4. Always use the test tape for azimuth adjustment because improper adjuustment would cause bad effect on the Dolby level adjustment. Dolby level should be readjusted after azimuth adjustment.

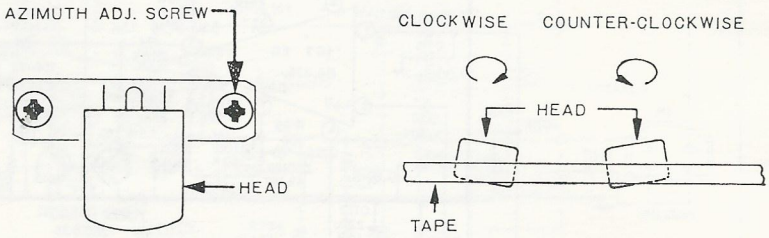


Fig. 4 (EOA-002)

a. Connections : Refer to Fig. 8.

b. Power supply : 13.2 VDC

c. Test tape : MTT-114 (10 kHz, −10 dB Full track recording)

Alignment Prodedure

Insert a test tape for the azimuth adjustment and drive the screw a little once.

Adjust the playback head so as to get equal and maximum output or right and left channel in either track, loosening the screw.

FM ALIGNMENT

Standard adjustment condition

a. Power supply ·····13.2V
b. AM/FM changing switch ·····FM
c. Loudness switch ·····off
d. Sensitivity switch ·····Distant
e. Balance ·····Center
f. Bass/treble ·····Center
g. Volume ····· Adjust to get 1.4V output level.
h. Connections

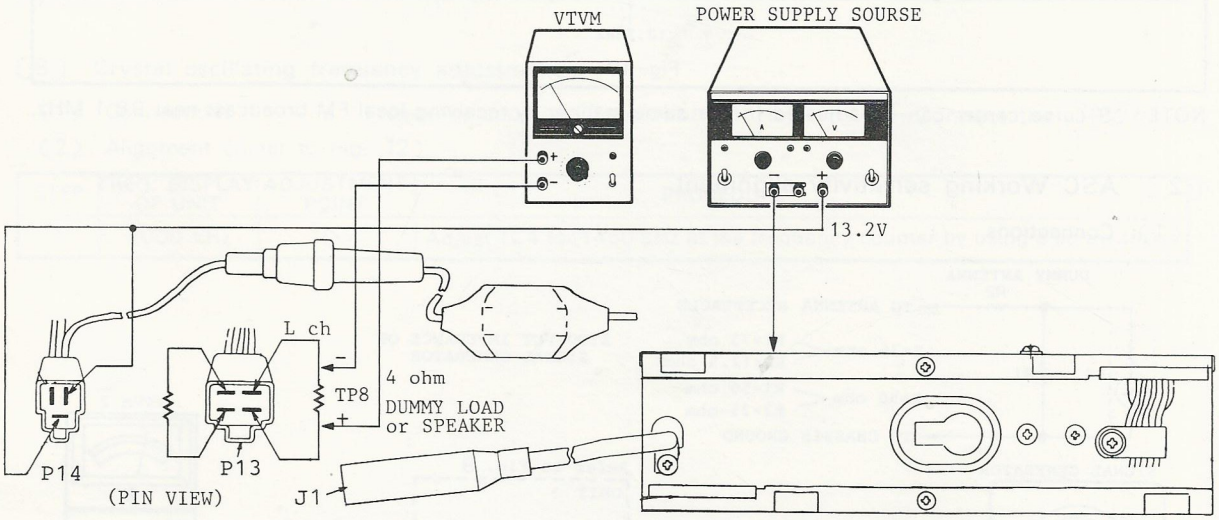


Fig. 8 (C33190231)

〔1〕 IF Alignment

(1) Connections

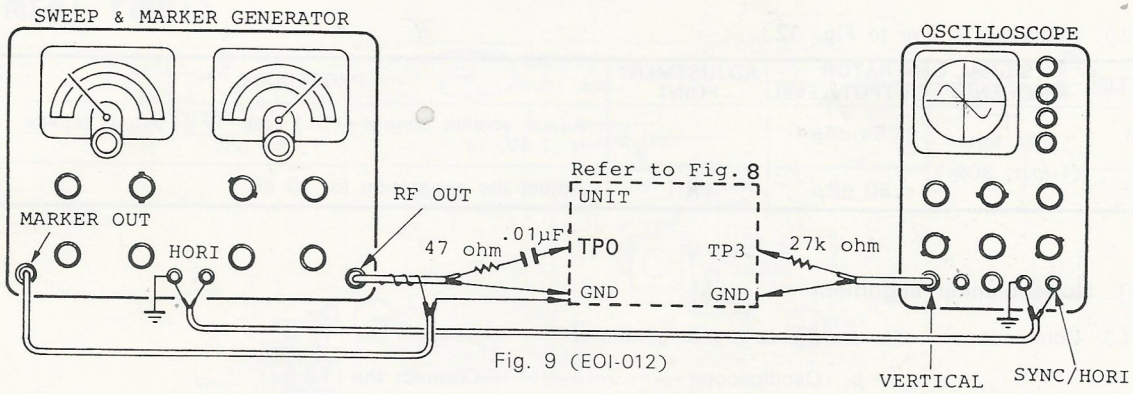


Fig. 9 (EOI-012)

SWEEP GENERATOR OUTPUT	OSCILLOSCOPE VERTICAL INPUT	OSCILLOSCOPE HORIZONTAL INPUT
Antenna receptacle (J1)	Connect TP 3 in Fig. 12 through 27K-ohm resistor	Connect with HORIZONTAL terminal of sweep generator

(2) Alignment (Refer to Fig. 12)

STEP	PURPOSE	SWEEP GENERATOR FREQUENCY	ADJUSTMENT POINTS	PROCEDURE
1	S curve	10.7 MHz	F IFT2	Adjust for full gain and length of s-curve at linears. (See Fig. 10)
2	S curve (Center)	SG 10.7 MHz (400 Hz, 30%)		Fine-adjust the potential difference between IC 2 ⑦ and ⑩ pins for 0V.

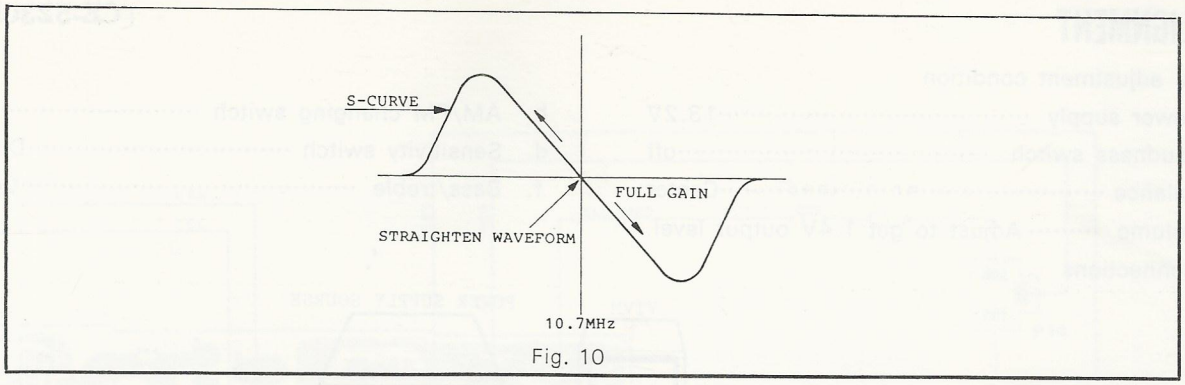


Fig. 10

NOTE: S curve center can be adjusted in the same manner by receiving local FM broadcast near 98.1 MHz.

〔2〕 ASC Working sensitivity alignment

(1) Connections

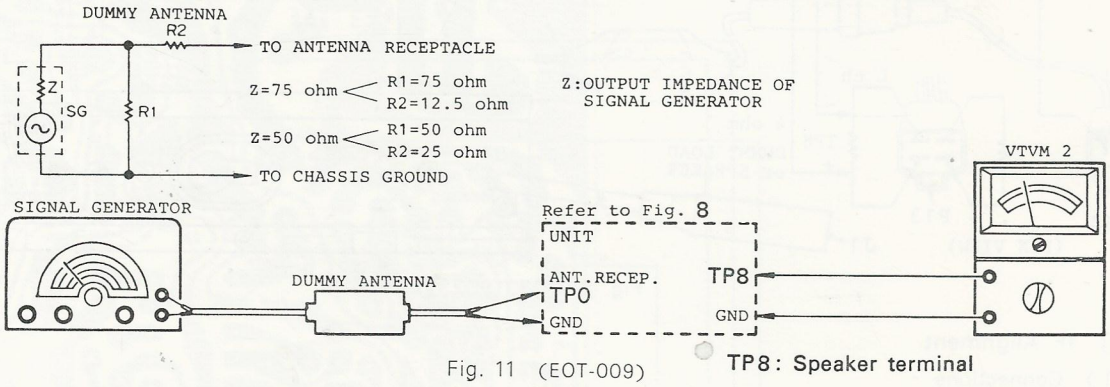


Fig. 11 (EOT-009)

TP8: Speaker terminal

(2) Alignment (Refer to Fig. 12)

STEP	SIGNAL GENERATOR FREQUENCY	SIGNAL GENERATOR OUTPUT LEVEL	ADJUSTMENT POINT	PROCEDURE
1	98.1 MHz (1 kHz, 30%)	54 dBμ	———	Adjust volume control (VOL) until TP8 output voltage is 1.4V.
2		30 dBμ	VR 1	Adjust the separation for 10 dB.

〔3〕 Noise blanker alignment

(1) Connections a. Stereo signal generator·····Connect the TP 0

b. Oscilloscope ·····Connect the TP 5

(2) Alignment (Refer to Fig. 12)

STEP	STEREO SIGNAL GENERATOR FREQUENCY	STEREO SIGNAL GENERATOR OUTPUT LEVEL	ADJUSTMENT POINT	PROCEDURE
1	98.1 MHz (Stereo mode, No modulation)	54 dBμ	VR 2	After making sure of "STEREO" display, adjust the pilot signal wave (19 kHz) for minimum.

〔4〕 Free running frequency alignment

(1) Connections a. Frequency counter·····Connect the TP 6

(2) Aligement (Refer to Fig. 12)

STEP	ADJUSTMENT POINT	PROCEDURE
1	VR 4	Adjust the free running frequency for 76 kHz (±50 Hz).

[5] Separation alignment

(1) Connections
a. Stereo signal generator·····Connect the TP 0
b. Oscilloscope ·····Connect the TP 8 (L-ch)

(2) Alignment (Refer to Fig. 12)

STEP	STEREO SIGNAL GENERATOR FREQUENCY	STEREO SIGNAL GENERATOR OUTPUT LEVEL	ADJUSTMENT POINT	PROCEDURE
1	98.1 MHz (R-ch : 1 kHz, 30% L-ch : no modulation)	54 dBμ	VR 3	Adjust R-ch output level for minimum.

[8] Crystal oscillating frequency adjustment

(1) Connections
a. Frequency counter (Resolution : 1 Hz)·····Connect the TP 4

(2) Alignment (Refer to Fig. 12)

STEP	FREQ. DISPLAY OF UNIT	ADJUSTMENT POINT	PROCEDURE
1	1000 kHz	TC 4	Adjust TC4 for 1450 kHz at the frequency counter by using a screwdriver.

ADJUSTMENT POINTS

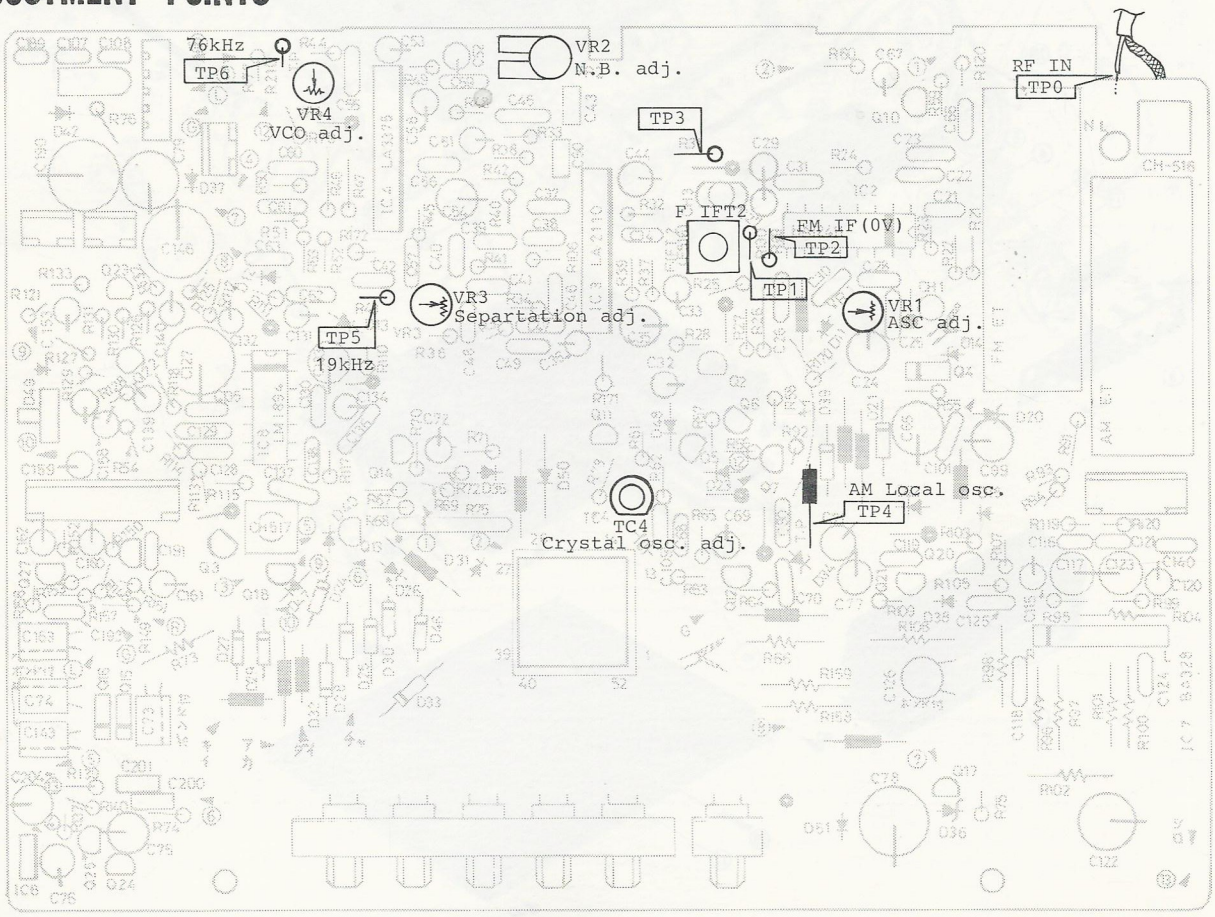


Fig. 12 (C33190231)

EXPLODED VIEW

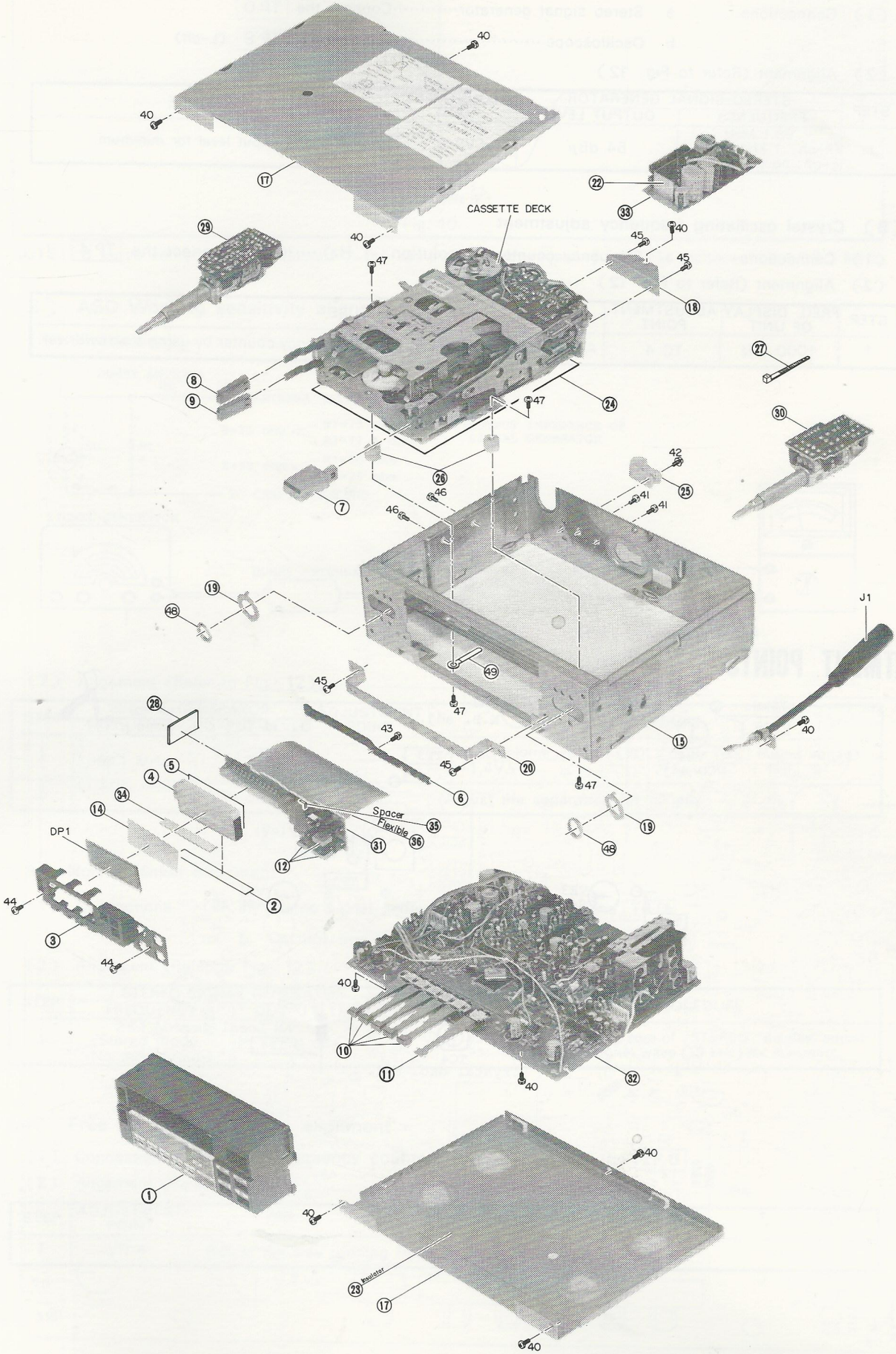


Fig. 13

EXPLODED VIEW (CASSETTE DECK) MDK-54/11 〔CE-5230EX1〕

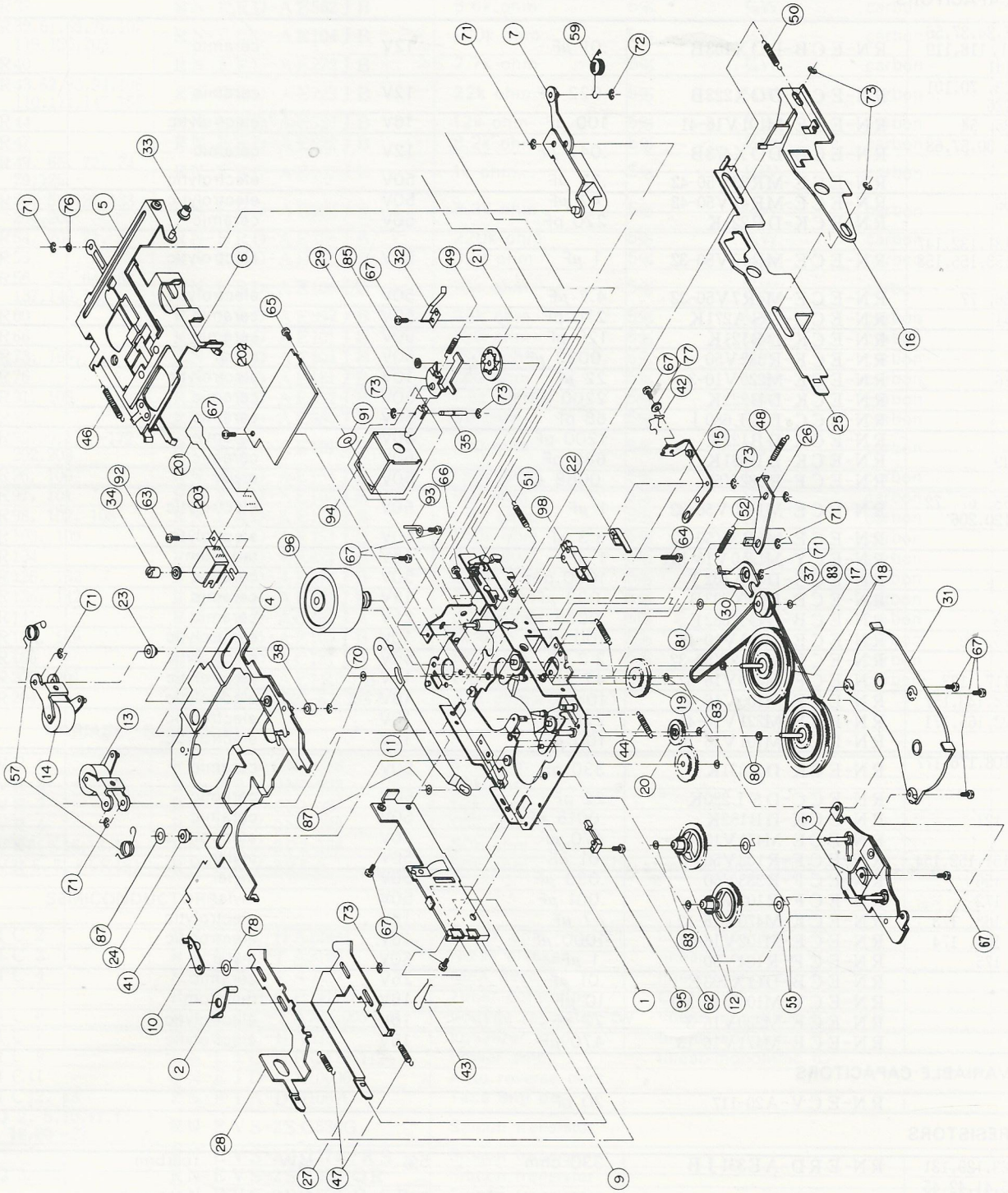


Fig. 14 (C28190231)

REPLACEMENT PARTS LIST

Note: Main replacement parts are marked ○ in the remarks column.

Symbol No. (Fig. 5)	Stock No.	Description				Remark
CAPACITORS						
C21,28,34,37,56 60, 61, 118,119 124,141	RN-ECB-DOX103B	.01 μF	12V		ceramic	
C22, 23, 70,101 125,126	RN-ECB-DOX223B	.022 μF	12V		ceramic	
C24, 35, 54	RN-ECE-M101V16-41	100 μF	16V		electrolytic	
C25,26,30,57,68 197	RN-ECB-DOX473B	.047 μF	12V		ceramic	
C27	RN-ECE-MR33V50-42	.33 μF	50V		electrolytic	
C29, 66	RN-ECE-MR47V50-42	.47 μF	50V		electrolytic	
C31	RN-ECK-DB221K	220 pF	50V		ceramic	
C 32,131,132,147 150,153,155,158 159	RN-ECE-MR10V50-32	.1 μF	50V		electrolytic	
C33, 36, 77	RN-ECE-M4R7V50-32	4.7 μF	50V		electrolytic	
C38~41	RN-ECG-DSA271K	270 pF	50V		ceramic	
C42	RN-ECK-DB121K	120 pF	50V		ceramic	
C43	RN-ECF-R332V50	.0033 μF	50V		mylar	
C44, 76	RN-ECE-M220V10-3	22 μF	10V		electrolytic	
C45	RN-ECK-DB222K	2200 pF	50V		ceramic	
C46	RN-ECC-DSL680J	68 pF	50V		ceramic	
C47	RN-ECK-DB122K	1200 pF	50V		ceramic	
C48, 49	RN-ECK-DB681K	680 pF	50V		ceramic	
C50	RN-ECF-R682V50	.0068 μF	50V		mylar	
C51, 58, 67, 72 115,120,206	RN-ECE-M1R0V50-32	1 μF	50V		electrolytic	
C52	RN-ECE-M3R3V50-32	3.3 μF	50V		electrolytic	
C53	RN-ECY-M1R0V16-M1	1 μF	16V		tantalum	
C55	RN-ECG-DSA102J	1000 pF	50V		ceramic	
C59	RN-ECB-DOX333B	.033 μF	12V		ceramic	
C62, 63	RN-ECB-DOX682E	.0068 μF	25V		ceramic	
C65, 75, 99	RN-ECE-M101V10-42	100 μF	10V		electrolytic	
C69	RN-ECE-M2R2V50-32	2.2 μF	50V		electrolytic	
C71, 117, 123	RN-ECE-M470V16-32	47 μF	16V		electrolytic	
C73, 74,143,157	RN-ECE-M100V16-42	10 μF	16V		electrolytic	
C78,122,165,171	RN-ECE-M221V10-41	220 μF	10V		electrolytic	
C79	RN-ECE-M101V16-10	100 μF	16V		electrolytic	
C107,108,176,177 189	RN-ECK-DB331K	330 pF	50V		ceramic	
C109	RN-ECC-DSL220K	22 pF	50V		ceramic	
C116, 121	RN-ECK-DB152K	.0015 μF	50V		ceramic	
C146	RN-ECE-M471V10-4	470 μF	10V		electrolytic	
C148,151,152,154	RN-ECF-R103V50	.01 μF	50V		mylar	
C149, 156	RN-ECF-R333V50	.033 μF	50V		mylar	
C164, 172	RN-ECF-R102V50	.001 μF	50V		mylar	
C166, 168, 173	RN-ECE-M470V16-12	47 μF	16V		electrolytic	
C167, 169, 174	RN-ECE-M102V16-51	1000 μF	16V		electrolytic	
C170, 175	RN-ECF-R104V50	.1 μF	50V		mylar	
C195	RN-ECB-DOX103E	.01 μF	25V		ceramic	
C196	RN-ECY-M100V16-M1	10 μF	16V		tantalum	
C198	RN-ECE-M220V16-3	22 μF	16V		electrolytic	
C205	RN-ECE-M471V16-13	470 μF	16V		electrolytic	
VARIABLE CAPACITORS						
TC 4	RN-ECV-A20-117	20 pF				
RESISTORS						
R21, 23,129,131	RN-ERD-AE331JB	330 ohm	5%	¼W	carbon	
R22,25,41,42,45 124,136,138,144 145,211	RN-ERD-AE222JB	2.2k ohm	5%	¼W	carbon	
R24	RN-ERD-AE474JB	470k ohm	5%	¼W	carbon	
R26, 28, 48	RN-ERD-AE333JB	33k ohm	5%	¼W	carbon	
R27	RN-ERD-AE183JB	18k ohm	5%	¼W	carbon	
R29, 30	RN-ERD-AE822JB	8.2k ohm	5%	¼W	carbon	
R31	RN-ERD-AC222JA	2.2k ohm	5%	⅛W	carbon	
R32, 67,115,118 128,130	RN-ERD-AE473JB	47k ohm	5%	¼W	carbon	
R33, 59, 134	RN-ERD-AE682JB	6.8k ohm	5%	¼W	carbon	
R34~36,52,53,57 63, 75,139	RN-ERD-AE472JB	4.7k ohm	5%	¼W	carbon	

Symbol No. (Fig. 5)	Stock No.	Description				Remark
R37, 46	RN-ERD-AE392JB	3.9k ohm	5%	¼W	carbon	
R38	RN-ERD-AE562JB	5.6k ohm	5%	¼W	carbon	
R39,61,69,78,107 119,120,203	RN-ERD-AE104JB	100k ohm	5%	¼W	carbon	
R40	RN-ERD-AE272JB	2.7k ohm	5%	¼W	carbon	
R43,62,93,94,106 110,111,147,155	RN-ERD-AE223JB	22k ohm	5%	¼W	carbon	
R44	RN-ERD-AE123JB	12k ohm	5%	¼W	carbon	
R47	RN-ERD-AE822JB	8.2k ohm	5%	¼W	carbon	
R49, 65, 72, 74 79,125	RN-ERD-AE102JB	1k ohm	5%	¼W	carbon	
R50, 51,127,133 204,205	RN-ERD-AE332JB	3.3k ohm	5%	¼W	carbon	
R54, 70, 71, 77	RN-ERD-AE224JB	220k ohm	5%	¼W	carbon	
R55	RN-ERD-AE391JB	390 ohm	5%	¼W	carbon	
R56, 58, 64, 68 137,140,143	RN-ERD-AE103JB	10k ohm	5%	¼W	carbon	
R60	RN-ERD-AE393JB	39k ohm	5%	¼W	carbon	
R66	RN-ERD-AE101JB	100 ohm	5%	¼W	carbon	
R73, 165, 210	RN-ERD-AE104JB	100k ohm	5%	¼W	carbon	
R76	RN-ERD-AE181JB	180 ohm	5%	¼W	carbon	
R91, 105	RN-ERD-AE152JB	1.5k ohm	5%	¼W	carbon	
R92	RN-ERD-AE680JB	68 ohm	5%	¼W	carbon	
R95,99,170～172 202,203	RN-ERD-AE101JB	100 ohm	5%	¼W	carbon	
R96, 100	RN-ERD-AE154JB	150k ohm	5%	¼W	carbon	
R97, 101	RN-ERD-AE103JB	10k ohm	5%	¼W	carbon	
R98, 102, 108	RN-ERD-AE152JB	1.5k ohm	5%	¼W	carbon	
R103, 109	RN-ERD-AE154JB	150k ohm	5%	¼W	carbon	
R104	RN-ERD-AE821JB	820 ohm	5%	¼W	carbon	
R126, 132	RN-ERD-AE274JB	270k ohm	5%	¼W	carbon	
R135, 142	RN-ERD-AE332JB	3.3k ohm	5%	¼W	carbon	
R141	RN-ERD-AC682JA	6.8k ohm	5%	⅛W	carbon	
R158, 159	RN-ERD-AE102JB	1k ohm	5%	¼W	carbon	
R166	RN-ERD-AC181JA	180 ohm	5%	⅛W	carbon	
R200, 201	RN-ERD-AE1R0JB	1 ohm	5%	¼W	carbon	
R204	RN-ERI-1028-6R333J	33k ohm×6 (arry)				
VARIABLE RESISTORS						
VR 1	RN-ERV-0N1-288	47k ohm				
VR 2	RN-ERV-0N1-223	50k ohm				
VR 3	RN-ERV-0N1-287	10k ohm				
VR 4	RN-ERV-0N1-289	10k ohm				
VR5(S16,18,19)	RN-ERV-2P2-196	50k ohm : treble				○
VR 6, 7, 8 (S13)	RN-ERV-2R5-3	50k ohm : bass, 50k ohm : volume, 100k ohm : balance				○
SEMICONDUCTORS						
IC 2	RN-EIC-HA12411	FM IF amp.～Q.DET		linear-monolithic IC		○
IC 3	RN-EIC-LA2110	Noise blanker		linear-monolithic IC		○
IC 4	RN-EIC-LA3375	MPX decoder		linear-monolithic IC		○
IC 5	RN-EIM-UPD1708G-011	Tuner controller		C-MOS IC		○
IC 6	RN-EIC-TA78L005AP	Voltage regulator, 5V		linear-monolithic IC		○
IC 7	RN-EIC-BA328	Equalizer amp.		linear-monolithic IC		○
IC 9	RN-EIC-UPC1185H2	Power amp.		linear-monolithic IC		○
IC11	RN-EID-CX10006	Auto reverse cont.				○
IC12, 13	RN-EIA-DM106A	Tape end det.				○
Q 2, 5,10,11,14 18,20～23	RN-EVS-2SC536G	Silicon transistor				○
or	RN-EVS-2SC1740-RS	Silicon transistor				○
Q 3, 13	RN-EVS-2SA933-QR	Silicon transistor				○
or	RN-EVS-2SA608-E-SP	Silicon transistor				○
Q 4	RN-EVS-2SD1225M-QK	Silicon transistor				○
Q 6, 7	RN-EVS-2SA562Y	Silicon transistor				○
Q12	RN-EVS-2SC982-TM	Silicon transistor				○
Q15, 16	RN-EVS-2SA937-QR	Silicon transistor				○
Q17	RN-EVS-2SC1815-GR	Silicon transistor				○
Q24, 25	RN-EVS-2SD655S	Silicon transistor				○
Q30	RN-EVS-2SD882	Silicon transistor				○
D11～13, 15, 21 ～33,35,38～40 46～52	RN-EDS-1S2473	Silicon diode				○
D14	RN-EDT-MZ309-B	Zener diode				○

CASSETTE DECK UNIT (MDK-54/11)

Illus. No. (Fig. 14)	Stock No.	Description	Q'ty	Re-mark
1	RN-MAS-1058	Chassis main	1	
2	RN-MUL-1150	Lever	1	
3	RN-MYT-1187	Sub-chassis	1	
4	RN-MYT-1188	Sub-chassis	1	
5	RN-MHE-1207	Holder	1	
6	RN-MKI-1008B	Slide plate assembly	1	
7	RN-MUL-1151	Lever	1	
9	RN-MHL-1023	Holder	1	
10	RN-MUL-1132	Lever	1	
11	RN-MUL-1152	Lever	1	
12	RN-MKS-1021	Slip mechanism	2	O
13	RN-MKR-1026	Pinchroller assembly	1	
14	RN-MKR-1027	Pinchroller assembly	1	
15	RN-MUL-1153	Lever	1	
16	RN-MUL-1154	Lever	1	
17	RN-MUB-1024	Belt	1	O
18	RN-MUF-1008	Flywheel	2	
19	RN-MUG-1049	Gear	2	
20	RN-MUG-1050	Gear	1	
21	RN-MUC-1005	Cum	1	
22	RN-MUL-1145	Lever	1	
23	RN-MRP-1055	Roller	1	
24	RN-MRP-1056	Roller	1	
25	RN-MUL-1156	Lever	1	
26	RN-MUL-1138	Lever	1	
27	RN-MUL-1139	Lever	1	
28	RN-MUL-1140	Lever	1	
29	RN-MUL-1141	Lever	1	
30	RN-MUL-1127A	Lever	1	
31	RN-MYT-1038	Sub-chassis	1	
32	RN-MSP-1017A	Spring	1	
33	RN-MRP-1057	Roller	1	
34	RN-MEN-1022	Special nut	1	
35	RN-MSI-1035	Shaft	1	
37	RN-MRP-1044	Roller	1	
38	RN-MRP-1094	Roller	1	
41	RN-MUL-1128	Lever	1	
42	RN-MSW-1002	Spring	1	
43	RN-MSW-1004	Spring	1	
44	RN-MSC-1130	Spring	2	
46	RN-MSC-1132A	Spring	1	
47	RN-MSC-1133	Spring	2	
48	RN-MSC-1134	Spring	1	
49	RN-MSC-1135	Spring	1	

Illus. No. (Fig. 14)	Stock No.	Description	Q'ty	Re-mark
50	RN-MSC-1152	Spring	1	
51	RN-MSC-1153	Spring	1	
52	RN-MSC-1154	Spring	1	
55	RN-MSP-1020	Spring	2	
57	RN-MSC-1157	Spring	2	
59	RN-MSC-1158	Spring	1	
62	F6-SBD-1.7×4S	Screw, 1.7×4mm	1	
63	F6-SBD-2×3S	Screw, 2×3mm	1	
64	RN-MET-1207	Spcial screw	1	
65	F6-SBD-3×6S	Screw, 3×6mm	1	
66	F6-SW4NA-3×4S	Screw, 3×4mm	1	
67	F6-SNA-2.6×3S	Screw, 2.6×3mm	11	
70	F6-ER-1.2SUS	E-type ring, 1.2mm	1	
71	RN-MHJ-1003	E-type ring, 3mm	7	
72	F6-ER-2SUS	E-type ring, 2mm	1	
73	F6-ER-2.5SUS	E-type ring, 2.5mm	6	
76	F6-WK-3S	Washer	1	
77	F6-WK-2.6S	Washer	1	
78	RN-MWS-1013	Washer	1	
80	RN-MWP-1043	Washer	2	
81	RN-MWP-1044	Washer	1	
83	RN-MWP-1029	Washer	6	
85	RN-MWP-1033	Washer	1	
87	RN-MWP-1041	Washer	3	
91	RN-MIT-1005	Insulator	1	
92	RN-MST-133	Spacer	1	
93	RN-MCF-1018	Clamp	1	
94	RN-EEM-1011A	Plunger solenoid	1	
95	RN-ESL-1017	Leaf switch	1	O
96	RN-EDM-1037	DC motor	1	O
98	RN-ESL-1016	Leaf switch	1	O
201	RN-MPM-2816	PC Board, head	1	
202	RN-MPM-2838	PC Board	1	
203	RN-EHM-C44-73	P.B. head	1	O

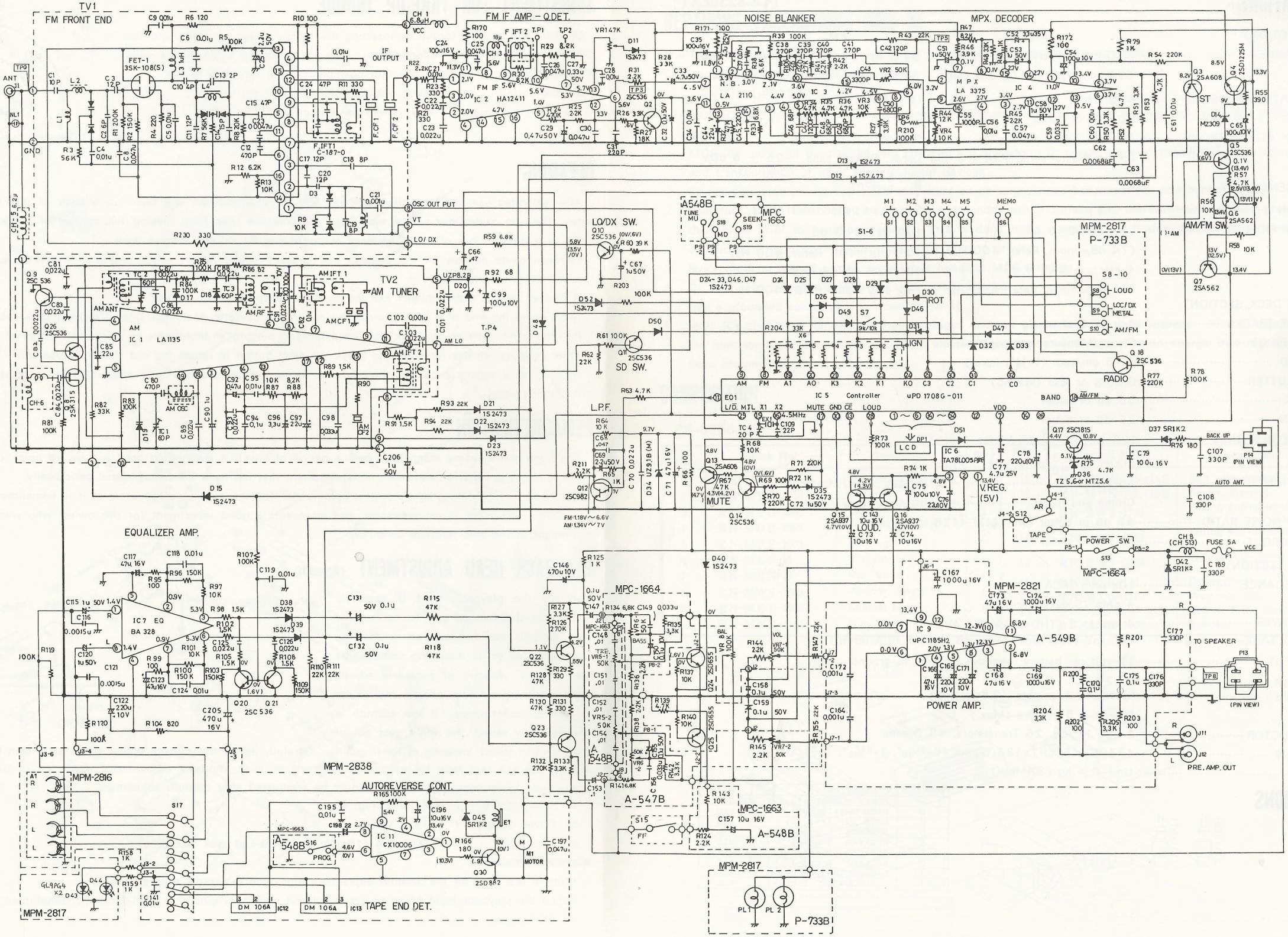
Manufactured by

FUJITSU TEN LIMITED

Kobe, Japan

Printed in Japan
8412DE1.3K

SCHEMATIC



NOTES: 1. All capacitance in Micro farad, $P=10^{-12}$

2. All resistance in ohm, $K=10^{3}$

Fig. 5

3. All inductance in henly, $m=10^{-3}$, $\mu=10^{-6}$

4. DC voltage against the chassis measured with 100k ohm/volt meter, power supply set at +13.4 VDC, no signal input.

WIRING ON PC BOARDS

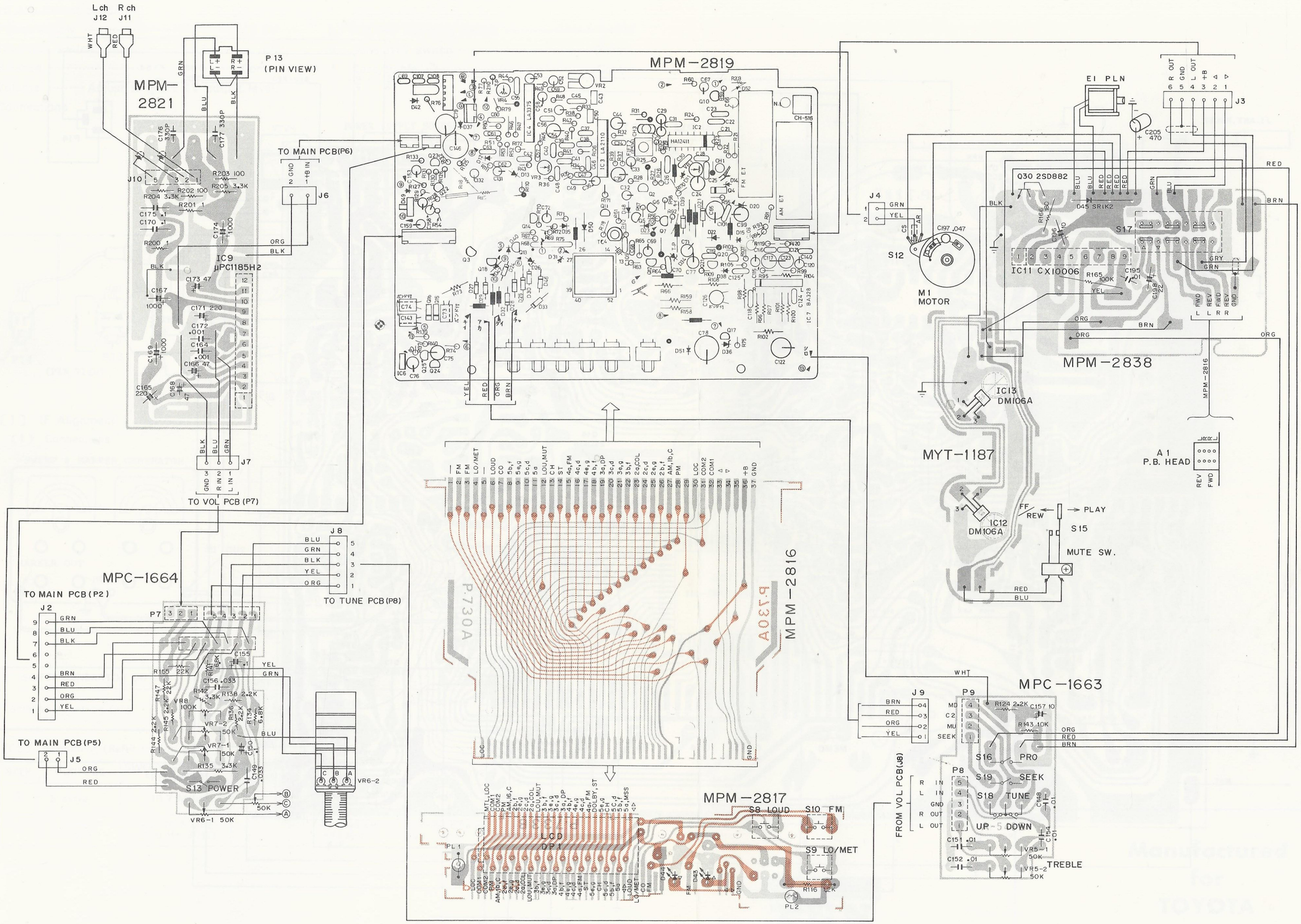


Fig. 6 (C27190230)

MAIN PC BOARD

〔CE-5230EX1〕

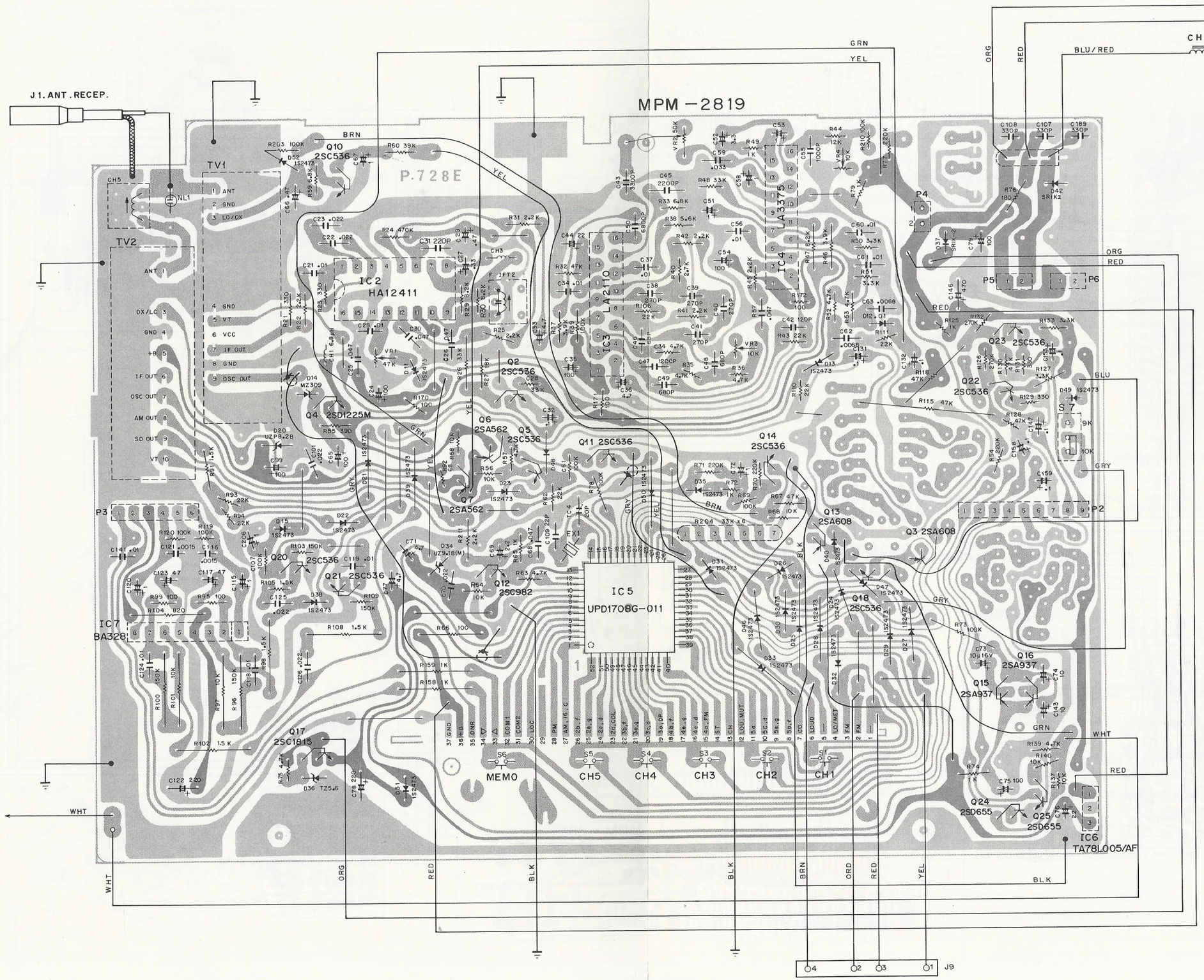


Fig. 7 (C27190230)