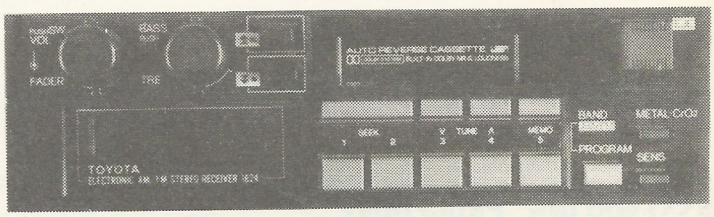
Car Radio Cassette Player CS201A
CS202A

Service
Service
Service

TEN MOD Nº CE 5130 X1



Service Manual

SPECIFICATIONS

RADIO SECTION	AM	FM
Tuning Range:	531 to 1611 kHz (9 kHz step)	88.1 to 107.9 MHz (.1 MHz step)
Intermediate Frequency:	450 kHz	10.7 Mhz
Sensitivity:	35dBμ or better (1.4V output)	
Sensitivity at Electronic Tuning:	Distant: 32 ± 6 dBμ Local: "Distant" plus 25 ± 6 dBμ	Distant: 20 ± 6 dBμ Local: "Distant" plus 25 ± 6 dBμ
Speaker Impedance:	4 ohm per channel	
Power Output:	2.5 watts x 2 (THD = 10%)	
Power Input: Voltage Current	12V car battery, negative terminal to ground 13.2VDC Approx. 1 ampere (0.5 watt x 4) Approx. 3 amperes (Max.)	
Semiconductor:	1 LSI, 18 ICs, 30 Transistors, 5 FETs, 46 Diodes	
Dimensions:	180 (W) x 55 (H) x 162 (D)mm (7-5/64", 2-11/64", 6-3/8")	
Weight:	Unit – 1.6kg (3.5lbs.)	

Subject to modification
4802 725 17142
Printed in Australia

PHILIPS

DISASSEMBLING PROCEDURE

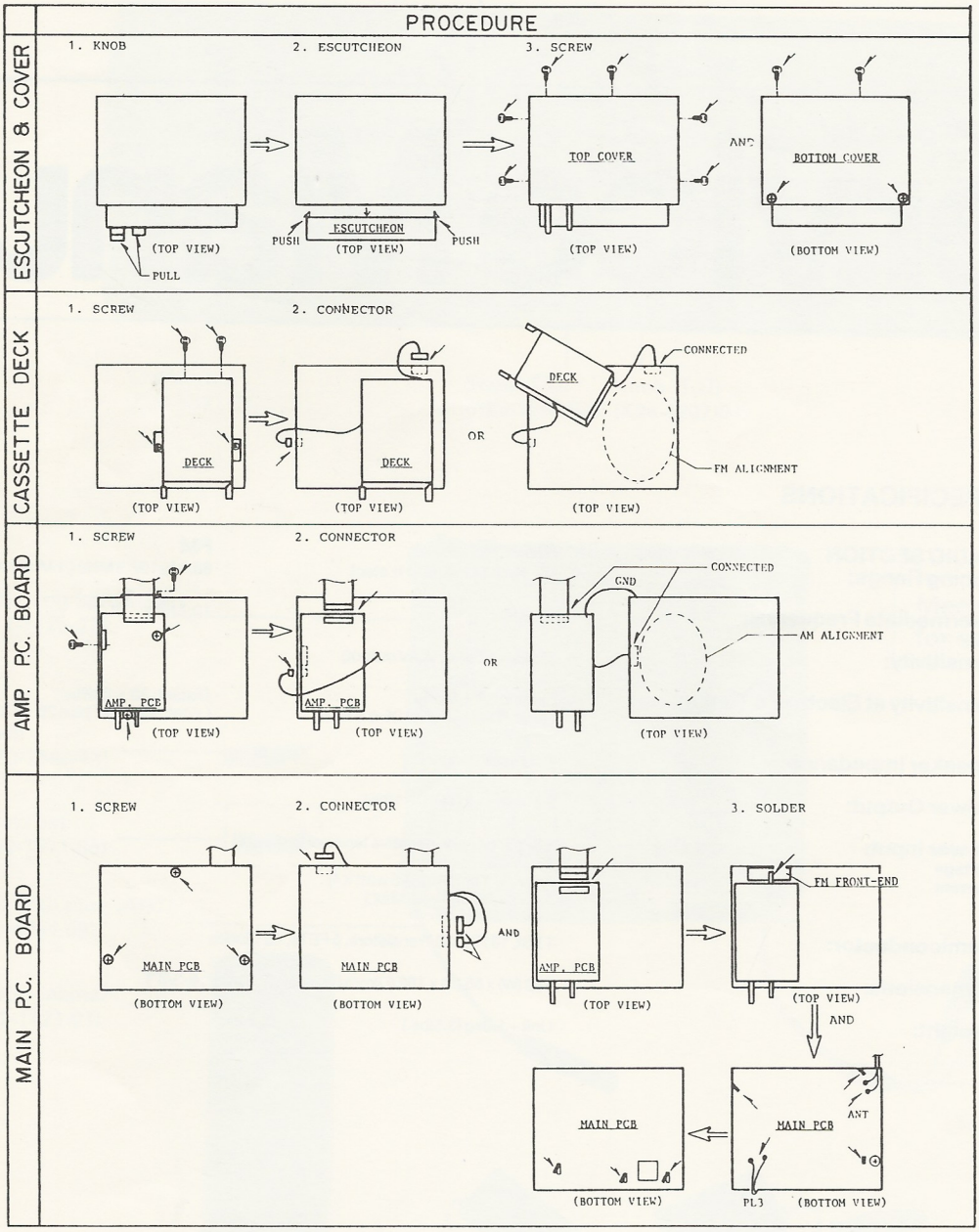


Fig. 2

DETAILS OF CONNECTOR

CS201A

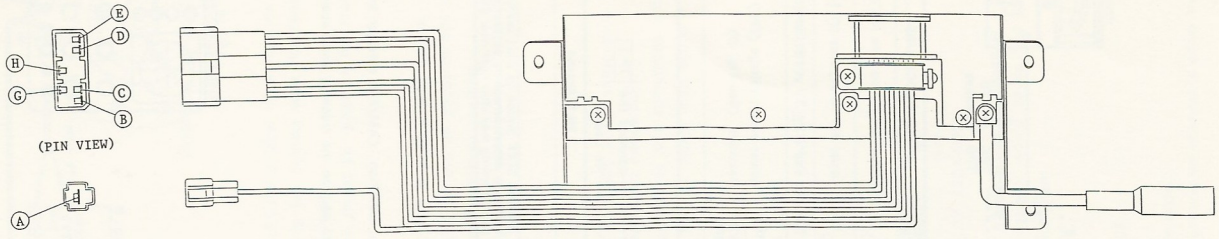


Fig. 1-1

CS202A

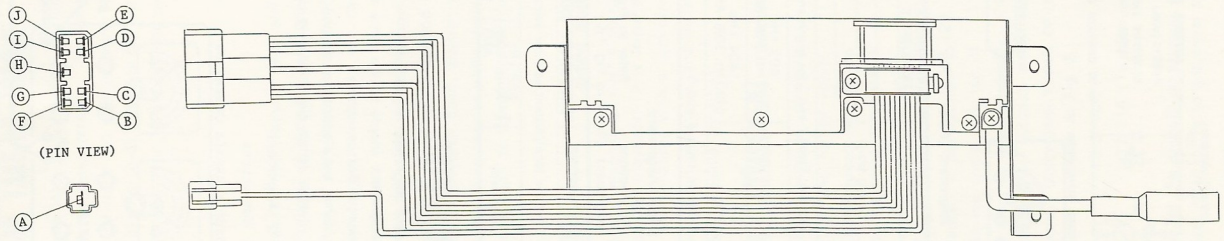


Fig. 1-2

PIN No.	DETAILS	COLOR	PIN No.	DETAILS	COLOR
A	BACK UP (+13.2V)	YEL	F	GROUND (REAR SP.)	BLK
B	FRONT SPEAKER (R ch)	BLU	G	GROUND (FRONT SP.)	BLK
C	FRONT SPEAKER (L ch)	GRN	H	GROUND	BLK
D	POWER SUPPLY (+13.2V)	RED	I	REAR SPEAKER (L ch)	LIGHT•GRN
E	AUTO ANT. (+13.2V)	ORG	J	REAR SPEAKER (R ch)	SKY•BLU

AM ALIGNMENT

Pre-setting of the frequency at each adjustment point will make the tuning for adjustment easier.
AM Frequnecy to be pre-set: 603 kHz, 999 kHz, 1404 kHz, 531 kHz, 1611 kHz
FM Frequency to be pre-set: 88.1 MHz, 98.1 MHz, 107.9 MHz, 105.1 MHz, 95.1 MHz
Standard alignment condition

a. Power supply·····13.2V
b. AM/FM Changing switch·····AM
c. Sensitivity switch·····Distant
d. Balance, bass and treble control·····Center
e. Fader control·····front
f. Volume control·····Adjust to get 1.4V output level.
g. Connections

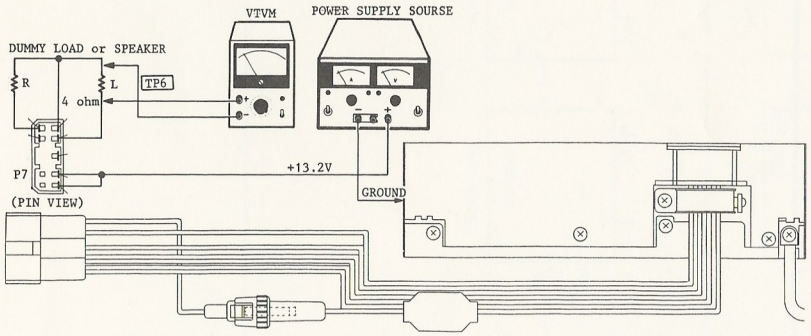


Fig. 8 (C33190135)

〔1〕 IF Alignment

(1) Connections

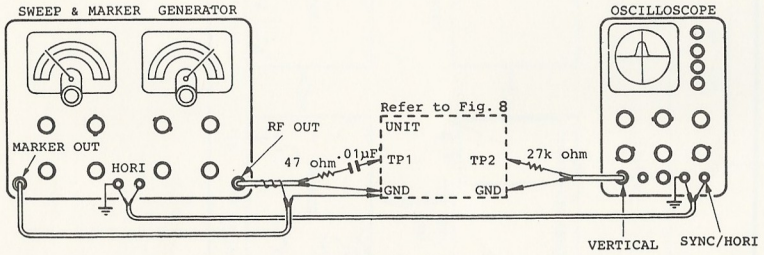


Fig. 9 (EOI-011)

SWEEP GENERATOR OUTPUT	OSCILLOSCOPE VERTICAL INPUT	OSCILLOSCOPE HORIZONTAL INPUT
Antenna receptacle (JO)	Connect TP 2 in Fig. 15 through 27k-ohm resistor	Connect with HORIZONTAL terminal of sweep generator

(2) Alignment (Refer to Fig. 15)

STEP	SWEEP GENERATOR MARKER	SWEEP GENERATOR OUTPUT LEVEL	ADJUSTMENT POINTS	PROCEDURE
1	450 kHz	Minimum	T 4	Get maximum IF curve and best symmetry on both sides.
2			T 5	
3	Repeat STEP 1 to 2 until no further gain in output can be obtained.			

〔2〕 Tuning bias and tracking alignment

(1) Connections

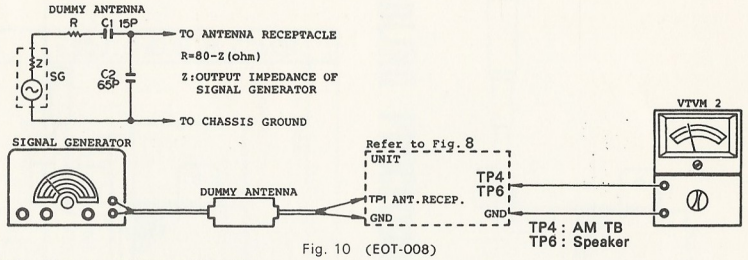


Fig. 10 (EOT-008)

(2) Alignment (Refer to Fig. 15)

STEP	PURPOSE	SIGNAL GENERATOR FREQUENCY	FREQ. DISPLAY OF UNIT	ADJUSTMENT POINTS	PROCEDURE
1	Tuning bias range	———	1611 kHz	CV 1 (OSC)	Adjust AM tuning bias for 7.3V.
2		———	531 kHz	T 6 (OSC)	Adjust AM tuning bias for 1.4V.
3	Repeat Steps 1 and 2 for alignment to stably obtain 1.4±.05V at 531 kHz and 7.3±.1V at 1611 kHz as bias.				
4	Tracking	603 kHz (400 Hz, 30%, AM)	603 kHz	T 2, T 3 (ANT, RF)	Adjust output voltage (TP6) for maximum. (See Fig. 8)
5		1404 kHz (400 Hz, 30%, AM)	1404 kHz	CV2, CV3 (ANT, RF)	
6	Repeat steps 4 and 6.				

〔3〕 SEEK Alignment

(1) Connections Refer to Fig. 10 Signal generator·····connect the TP 1
(2) Alignment (Refer to Fig. 15) VTVM2 ·····No used

STEP	PURPOSE	SIGNAL GENERATOR FREQUENCY	SIGNAL GENERATOR OUTPUT LEVEL	ADJUSTMENT POINTS	PROCEDURE
1	Set the local/distant selector switch in the distant position.				
2	Distant sensitivity	999 kHz (400Hz, 30% AM)	32 dBμ (±6 dBμ)	RV 6	Depress SEEK button to start searching, and then adjust sensitivity so that the search tuning may stop right near 999 kHz.

FM ALIGNMENT

* Standard alignment Condition
FM alignment should be the same as in AM standard alignment condition. (AM/FM selector switch is, however, in FM position.)

NOTE: Since the electronic tuner unit is employed at FM front end section, no tracking and receiving frequency range alignment are required.

〔1〕 IF Alignment

(1) Connections

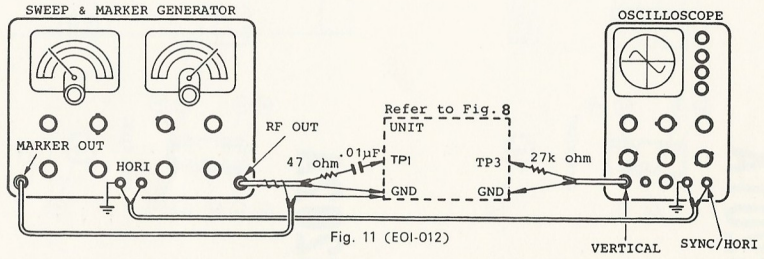
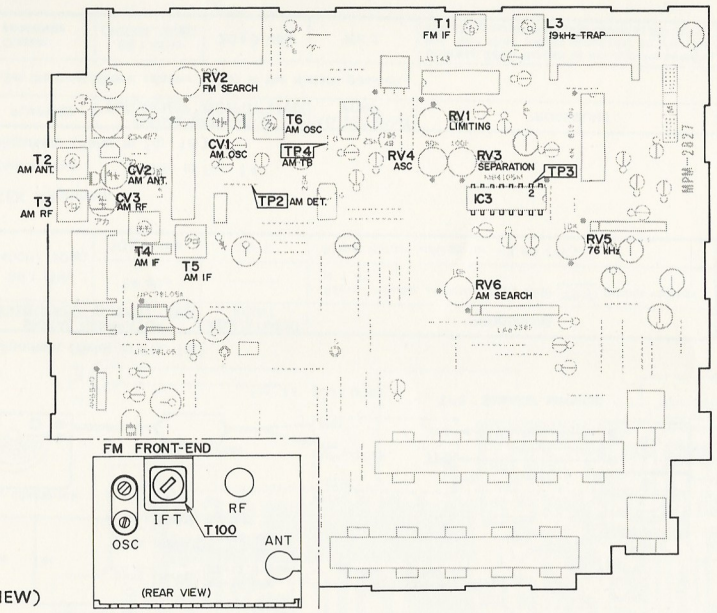


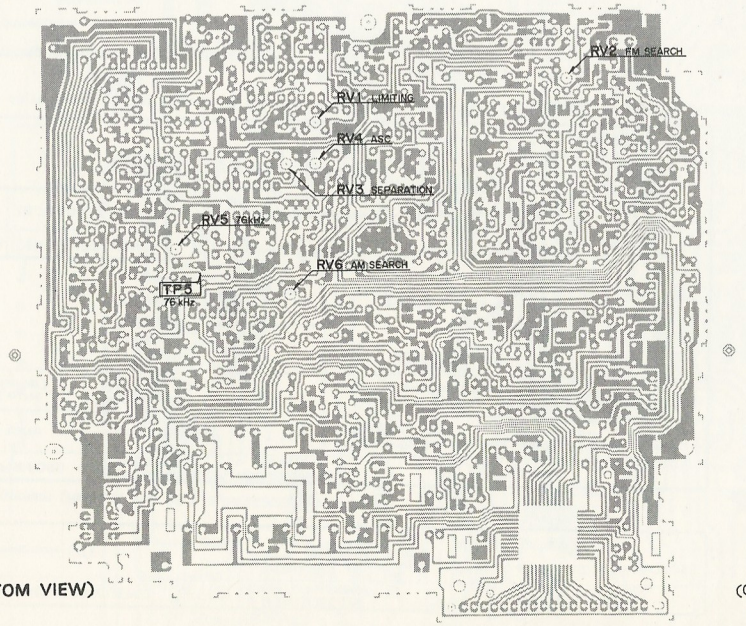
Fig. 11 (EOI-012)

ADJUSTMENT POINTS



(TOP VIEW)

Fig. 15-1
(C33190135)



(BOTTOM VIEW)

Fig. 15-2
(C33190135)

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.

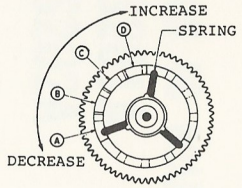


Fig. 16

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. 17. 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.

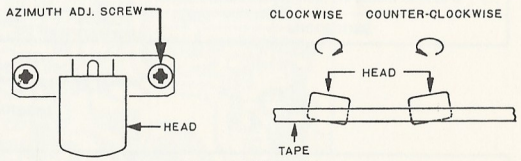


Fig. 17 (EOA-002)

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.

SWEEP GENERATOR OUTPUT	OSCILLOSCOPE VERTICAL INPUT	OSCILLOSCOPE HORIZONTAL INPUT
Antenna receptacle (J1)	Connect TP 3 in Fig. 15 through 27K-ohm resistor	Connect with HORIZONTAL terminal of sweep generator

(2) Alignment (Refer to Fig. 15)

STEP	PURPOSE	SWEEP GENERATOR FREQUENCY	ADJUSTMENT POINTS	PROCEDURE
1	S curve	10.7 MHz	T 100	Adjust for full gain and length of s-curve at linears. (See Fig. 13)
2	S curve (Center)	SG 10.7 MHz (400 Hz, 30%)	T 1	Fine-adjust the potential difference between IC 1 ⑦ and ⑬ pins for 0V.

COLOR	CENTER FREQUENCY
Red	10.70 MHz ± 30 kHz

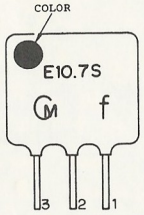


Fig. 12

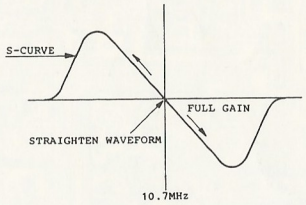


Fig. 13

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

[2] Limiting sensitivity alignment

(1) Connections

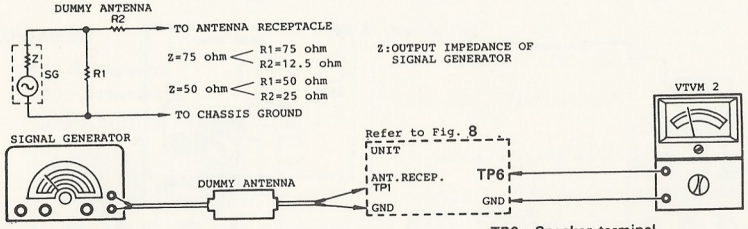


Fig. 14 (EOT-009)

TP6 : Speaker terminal

(2) Alignment (Refer to Fig. 15)

STEP	SIGNAL GENERATOR FREQUENCY	SIGNAL GENERATOR OUTPUT LEVEL	ADJUSTMENT POINT	PROCEDURE
1	98.1 MHz (400Hz, 30%)	54 dBμ	———	Adjust volume control (VOL) until TP 6 output voltage is 1.4V.
2		10±6 dBμ	RV 1	Adjust output voltage for −3 dB (1V).

[3] SEEK Alignment

(1) Connections Refer to Fig. 14

(2) Alignment (Refer to Fig. 15)

STEP	PURPOSE	SIGNAL GENERATOR FREQUENCY	SIGNAL GENERATOR OUTPUT LEVEL	ADJUSTMENT POINT	PROCEDURE
1	Set the local/distant selector switch in the distant position.				
2	Distant sensitivity	98.1 MHz (400Hz, 30%)	20±6 dBμ	RV 2	Depress SEEK button to actuate the searching, and then adjust sensitivity so that the searching action may stop nearly at 98.1MHz.

[4] Noise blanker alignment

(1) Connections
a. Stereo signal generator·····Connect the TP 1
b. Oscilloscope ·····Connect the TP 3

(2) Alignment (Refer to Fig. 15)

STEP	STEREO SIGNAL GENERATOR FREQUENCY	STEREO SIGNAL GENERATOR OUTPUT LEVEL	ADJUSTMENT POINT	PROCEDURE
1	98.1 MHz (No modulation, Stereo mode)	54 dBμ	L 3	After making sure of "STEREO" display, adjust the pilot signal wave (19 kHz) for minimum.

[5] Separation alignment

(1) Connections
a. Stereo signal generator·····Connect the TP 1
b. Oscilloscope ·····Connect the TP 6 (L-ch)

(2) Alignment (Refer to Fig. 15)

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)	74 dBμ	RV 3	Adjust R-ch. output level for minimum.

[6] ASC Working sensitivity alignment

(1) Connections Same as separation alignment

(2) Alignment (Refer to Fig. 15)

STEP	SIGNAL GENERATOR FREQUENCY	SIGNAL GENERATOR OUTPUT LEVEL	ADJUSTMENT POINT	PROCEDURE
1	98.1 MHz	74 dBμ	———	Adjust volume control until the output voltage is 1.4V.
2	(1 kHz, 30%, ST)	35 dBμ	RV 4	Adjust the separation for 10 dB.

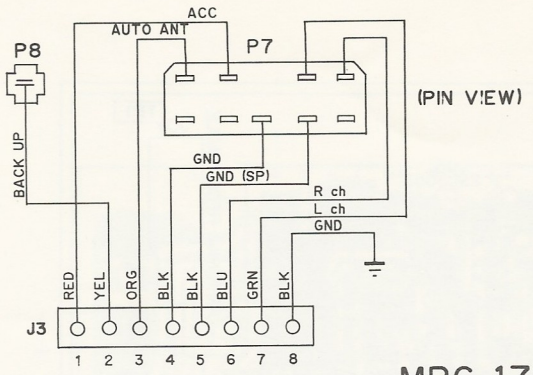
[7] Free running frequency alignment

(1) Connections a. Frequency counter·····Connect the TP 5

(2) Aligement (Refer to Fig. 15)

STEP	ADJUSTMENT POINT	PROCEDURE
1	RV 5	Adjust the free running frequency for 76 kHz (±100 Hz).

POWER AMP PC BOARD
CS201A



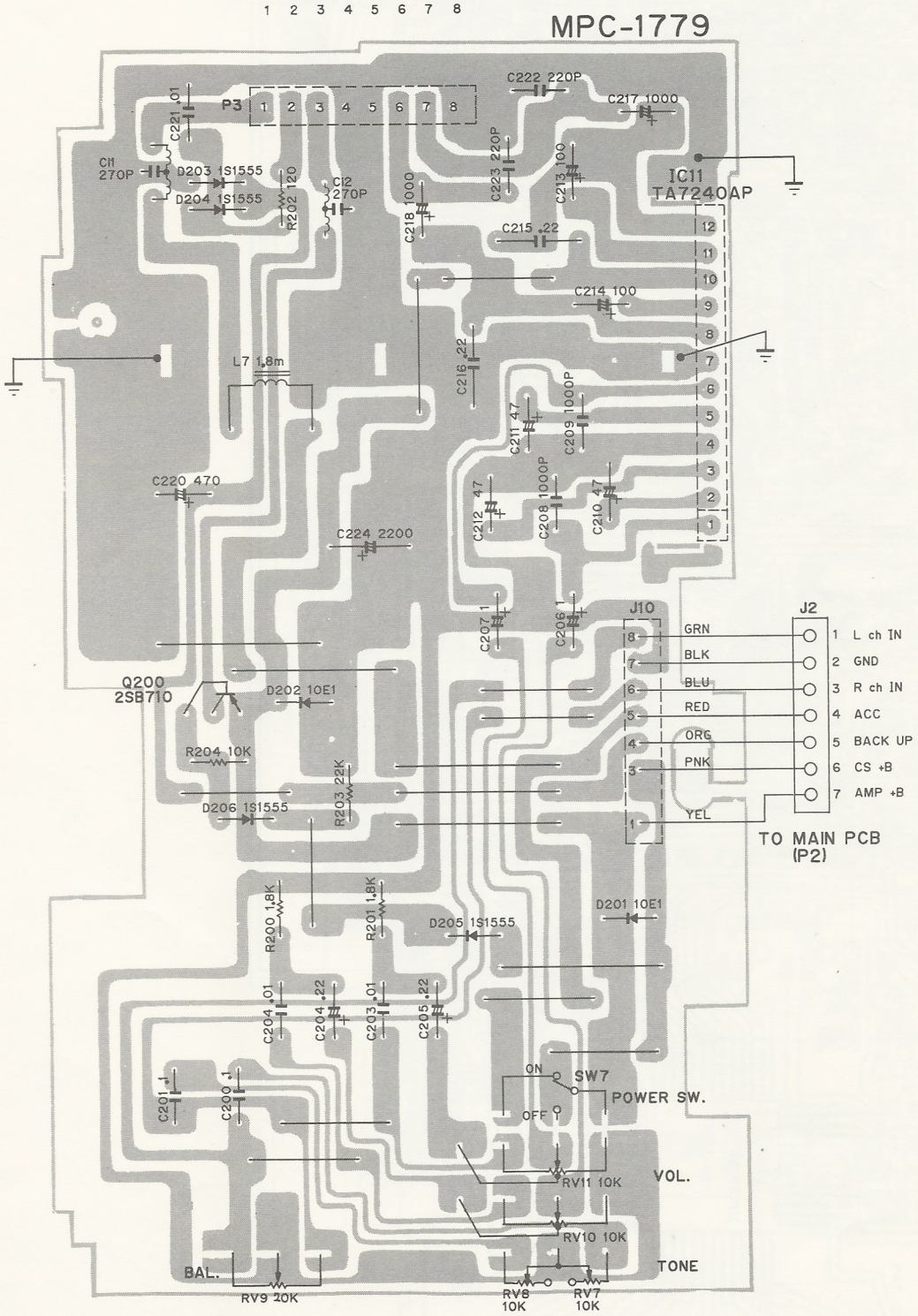


Fig. 7-1 (C27190139)

POWER AMP PC BOARD
CS202A

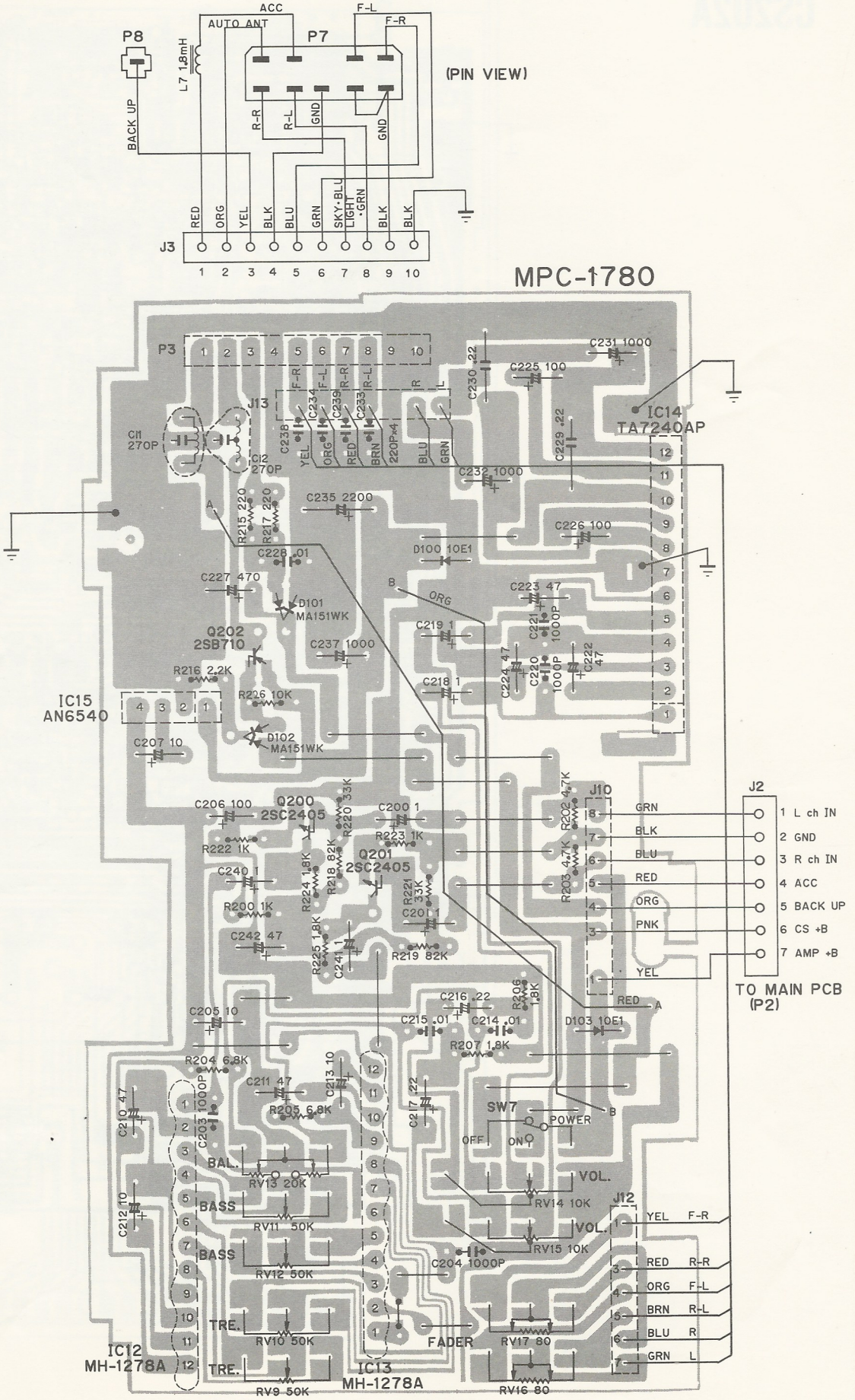


Fig. 7-2 (C27190140)

CASSETTE DECK PC BOARDS

CS201A
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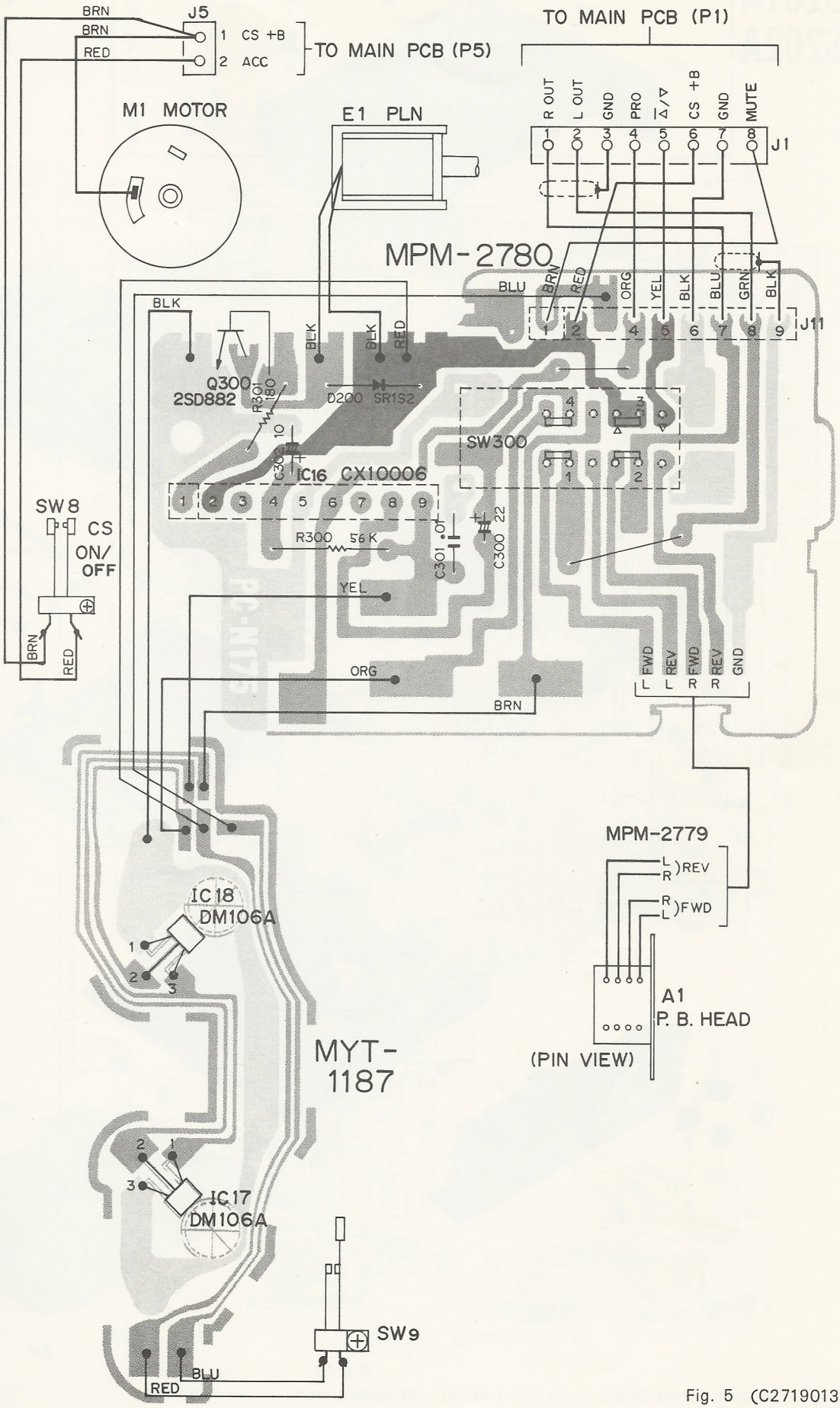

Fig. 5 (C27190131)

EXPLODED VIEW
CS201A
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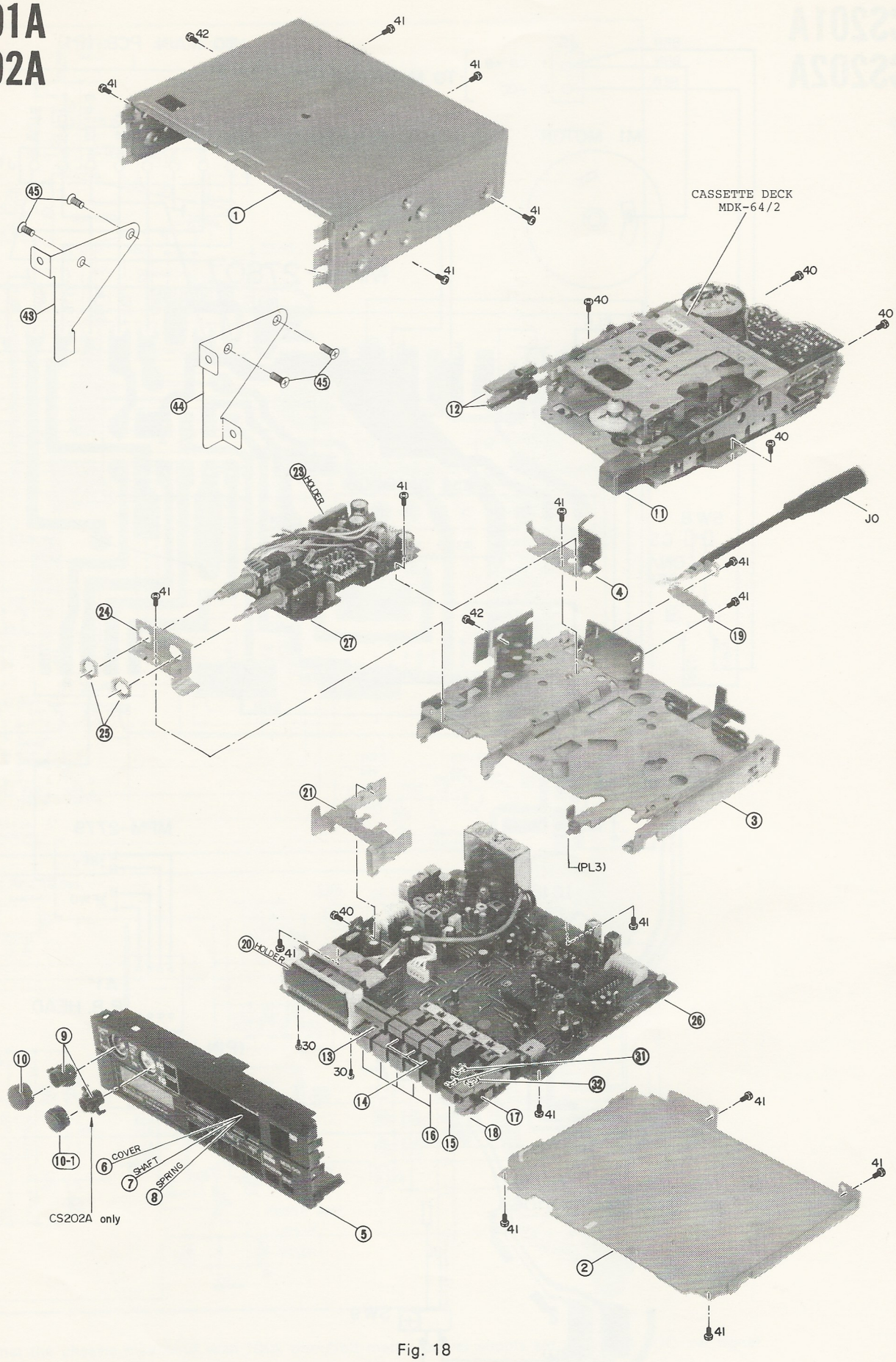

Fig. 18

NOTE : Printed circuit board does not include component parts to be mounted.

WIRING ON PC BOARDS
CS201A
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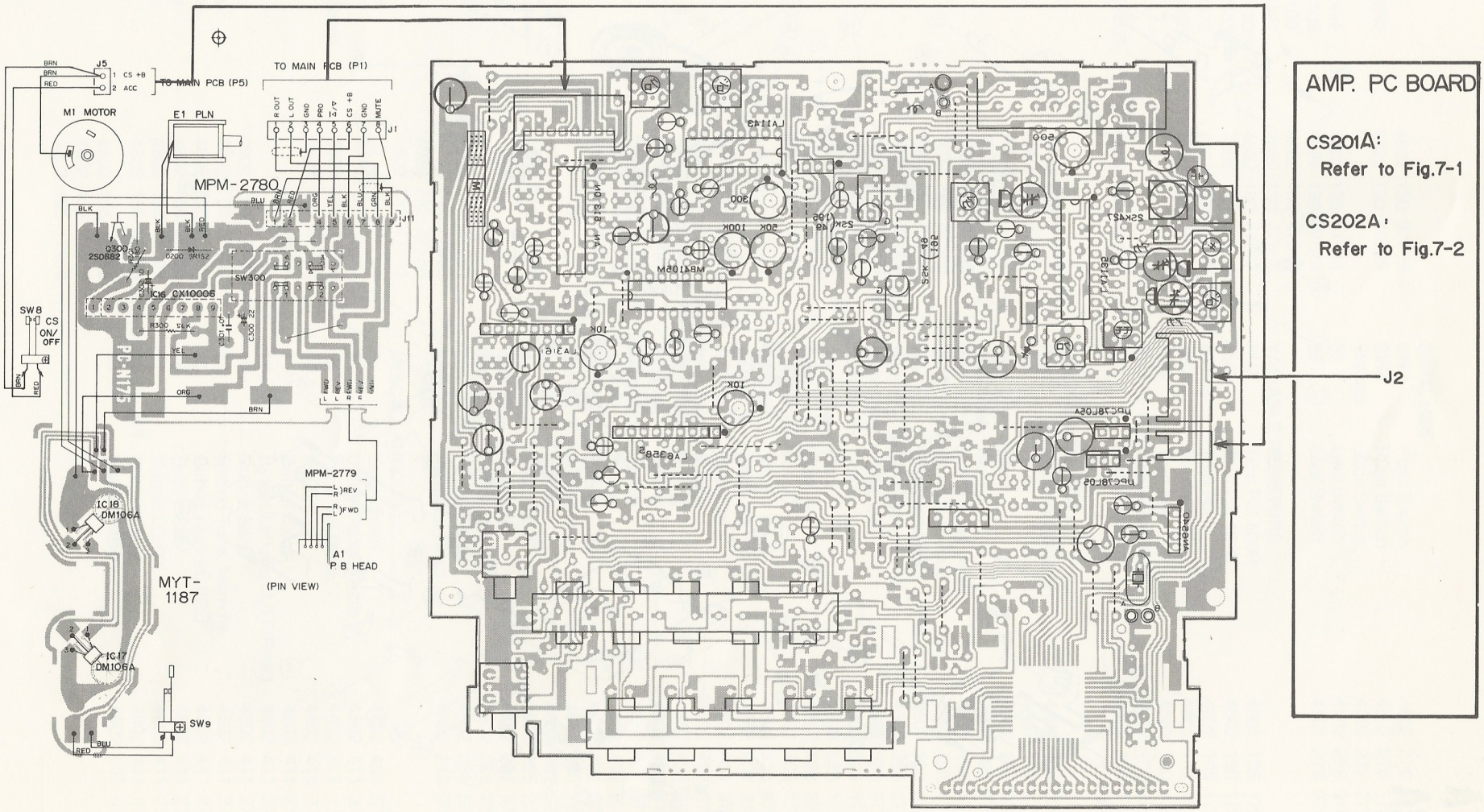

Fig. 4 (C27190139)

EXPLODED VIEW (CASSETTE DECK) MDK-64/2

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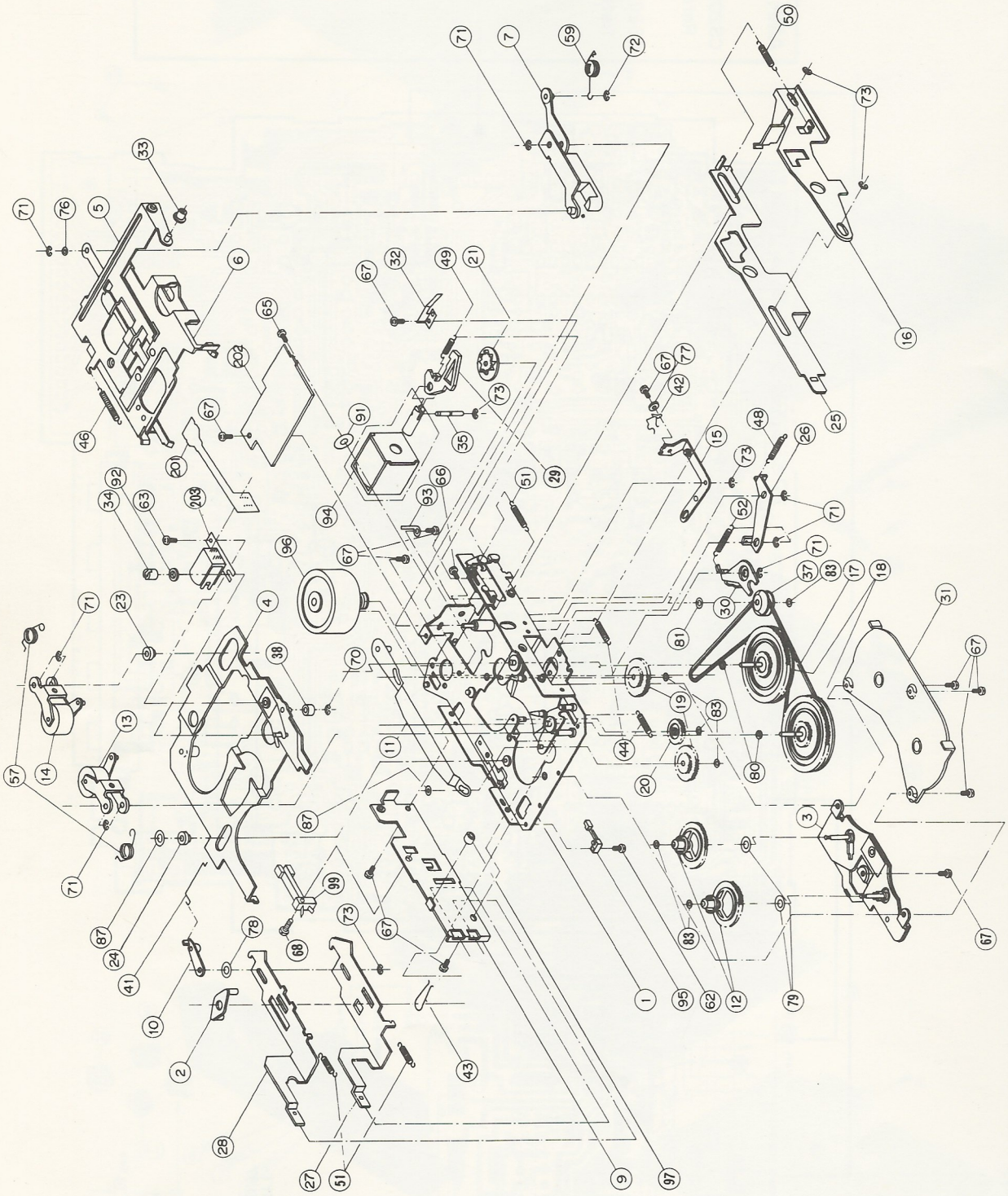


Fig. 19 (C28190131)

PARTS LIST CS201A/CS202A

TRANSISTORS

VE-1	LCD DISPLAY	4802 130 37775
Q300	Transistor 2SD882	4822 130 40982
Q1-3, 5, 6, 16, 17	Transistor 2SK49F	4802 130 47541
Q23-26	Transistor 2SB709	4802 130 47544
Q10	Transistor 2SJ106	4802 130 47565
Q9	Transistor 2SK427	4802 130 47566
Q23-26	Transistor 2SA1235	4802 130 47567
Q27, 28	Transistor 2SD1328	4802 130 47568
Q18-20, 22	Transistor 2SB970	4802 130 47976
Q4, 7, 8, 11-13, 21, 29, 30	Transistor 2SC3052	4802 130 47977
Q200, 201	Transistor 2SC2405	4802 130 47543

INTEGRATED CIRCUITS

IC1	LA1143	4802 209 17002
IC2	AN6130N	4802 209 87471
IC3	MB4105M	4802 209 17003
IC4	LA1135	4802 209 27154
IC5	LA6358S	4802 209 27155
IC6	AN6540	4802 209 87559
IC8	UPC78L05	4802 209 87303
IC9	LA3161	4802 209 87658
IC10	UPC1708	4802 209 27158
IC11, 14	TA7240A	4802 209 87822
IC12, 13	MH1278	4802 209 87461
IC16	CX10006	4802 209 27156
IC17, 18	DM106A	4802 209 27153

DIODES

D2	1S446	4822 130 30191
D101, 102	MA151A	4802 130 37774
D203-206	1S1555	4822 130 30621
D202	10E1	4822 130 30684
D200	SR1K2	4822 130 31127
D14	MA151K	4822 130 31742
LED	TLR102A	4802 130 37774

FM FRONT END

TV-1	FM Tuner	4802 210 17155

FILTERS

CF1	Ceramic Filter	4802 242 27005
CF2	Ceramic Filter	4802 242 77093
CF3	Ceramic Filter	4802 242 77156
EX1	Crystal	4802 242 77293

AERIAL CABLE

JO	Recepticle Antenna	4802 267 17059
NE1	Neon Lamp	4802 134 27026

INDUCTORS

T1	IF Transformer	4802 154 77001
T2	BC Transformer	4802 156 37248
T3	BC Transformer	4802 156 37249
T4	IF Transformer	4802 156 57002
T5	IF Transformer	4802 156 57005
T6	Transformer	4802 156 57006
L1, 2	Coil, Choke	4802 158 17418
L7	Choke, Filter	4802 152 27051
L3	Coil	4802 165 17156

CAPACITORS

CV2, 3	Trimmer Capacitor	4802 125 57125
C11	Trimmer Capacitor	4802 125 57126
C12	Trimmer Capacitor	4802 125 57162

SWITCHES

SW1	Push Switch	4802 276 17271
SW4	Push Switch	4802 276 17272
SW300	Slide Switch	4802 277 27199
95	Leaf Switch	4802 278 97082
99	Leaf Switch	4802 278 97125

VARIABLE RESISTORS

RV2	Trim Pot 500R	4802 105 17221
RV3	Trim Pot 100K	4802 100 17095
RV5, 6	Trim Pot	4802 105 17222
RV7-11	Potentiometer	4802 105 17227
RV4	Trim Pot	4802 100 17096
RV9-10	Treble/Bass/Bal.	4802 102 37183
RV14	Fader/Volume	4802 102 37184

MECHANICAL PARTS

Item 5	Support/Holder	4802 404 27096
Item 7	Lever	4802 402 67159
Item 7	Shaft	4802 535 97353
Item 8	Spring	4802 492 37686
Item 13	Pinch Roller Assy.	4802 403 47151
Item 14	Pinch Roller Assy.	4802 403 47149
Item 12	Slip Mechanism	4802 528 87269
Item 17	Drive Belt	4802 358 27036
Item 18	Fly Wheel	4802 528 67101
Item 19	Gear	4802 528 17268
Item 20	Gear	4802 528 17296
Item 21	Cam	4802 528 37081
Item 29	Lever	4802 403 37136
Item 35	Shaft	4802 535 97381
Item 43	Brkt. Left	4802 404 37244
Item 44	Brkt. Right	4802 404 37245
Item 44	Spring	4802 492 37478
Item 46	Spring	4802 492 37725
Item 49	Spring	4802 492 37484
Item 51	Spring	4802 492 37523
Item 57	Spring	4802 492 37526
Item 59	Spring	4802 492 37527
Item 71	E Type Ring	4802 530 77119
Item 83	Washer	4802 532 57217
Item 91	Insulator	4802 325 27094
Item 94	Solenoid	4802 281 57043
Item 96	DC Motor	4802 361 27194
Item 201	PB PC Board	4802 214 57202
Item 203	Playback Head	4802 249 37031

MISCELLANEOUS

5	Escutcheon	4802 459 57116
9	Button Fader/Treble	4802 411 27302
10	Knob Vol./Bass	4802 411 27303
10-1	Knob Bal.	4802 413 37361
11	Button Eject	4802 411 27294
12	Button Left, Right (FF/Rew.)	4802 411 27295
13	Button Seek	4802 411 27296
14	Button Tune, Memo	4802 411 27297
15	Button AM/FM, PRO	4802 411 27298
16	Button Set	4802 411 27299
17	Button LO/DX	4802 411 27302
18	Button Metal	4802 411 27301
46	Spacer Knob	4802 532 57218

MAIN PC BOARD
CS201A
CS202A

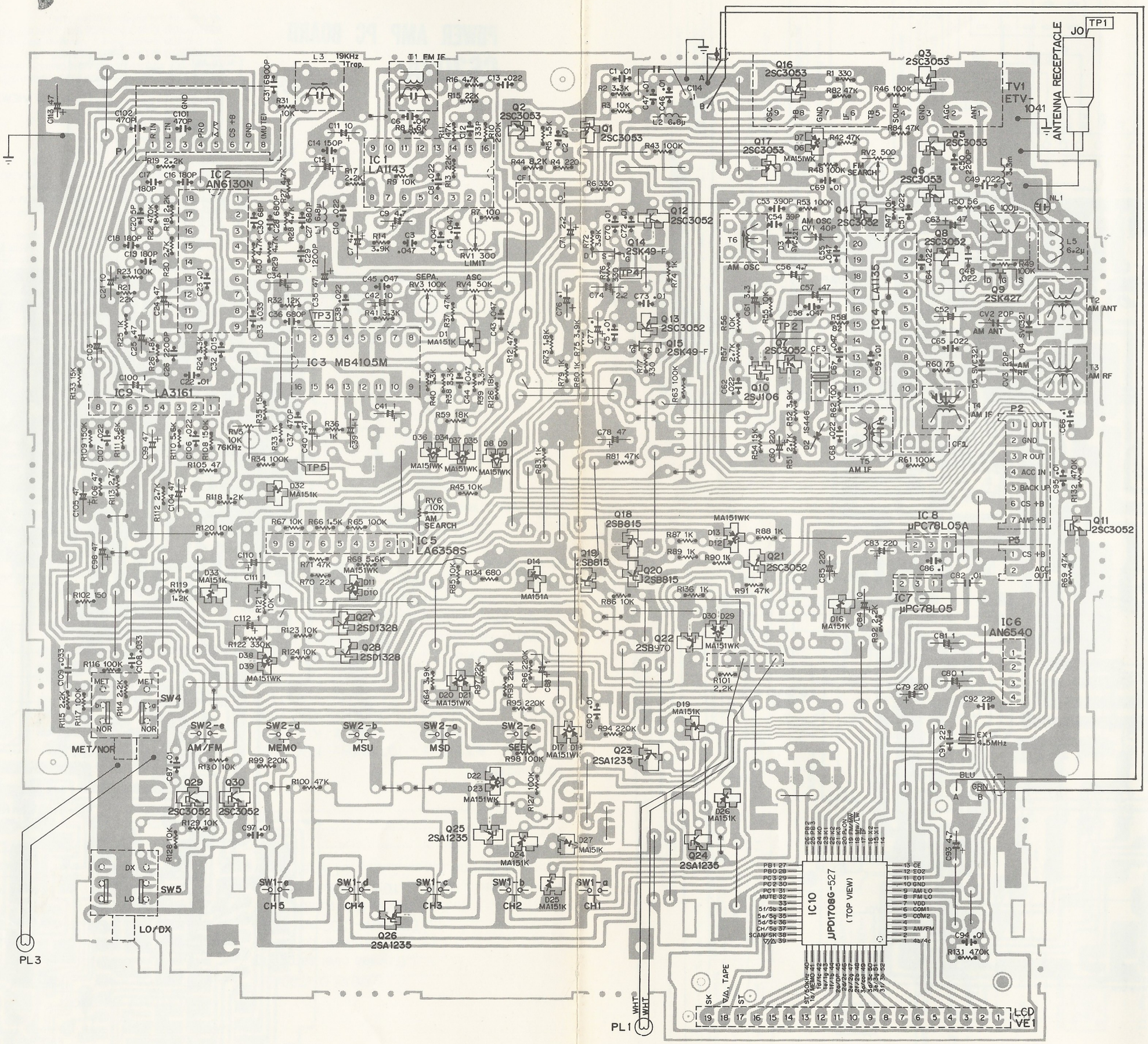
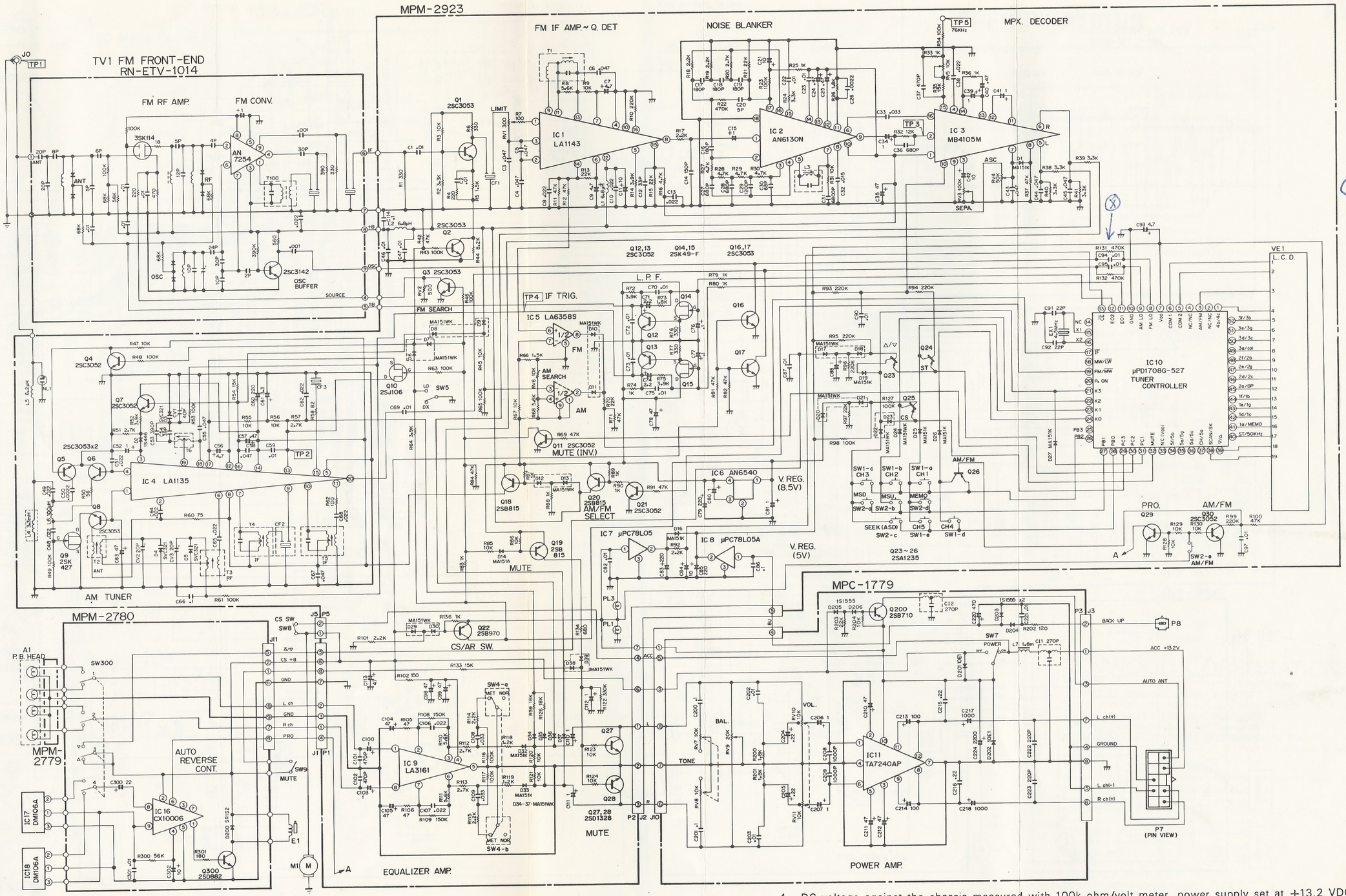


Fig. 6 (C27190139)

SCHEMATIC
CS201A



Noise on FM
C94 o/c
sounds like AM
off station

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

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

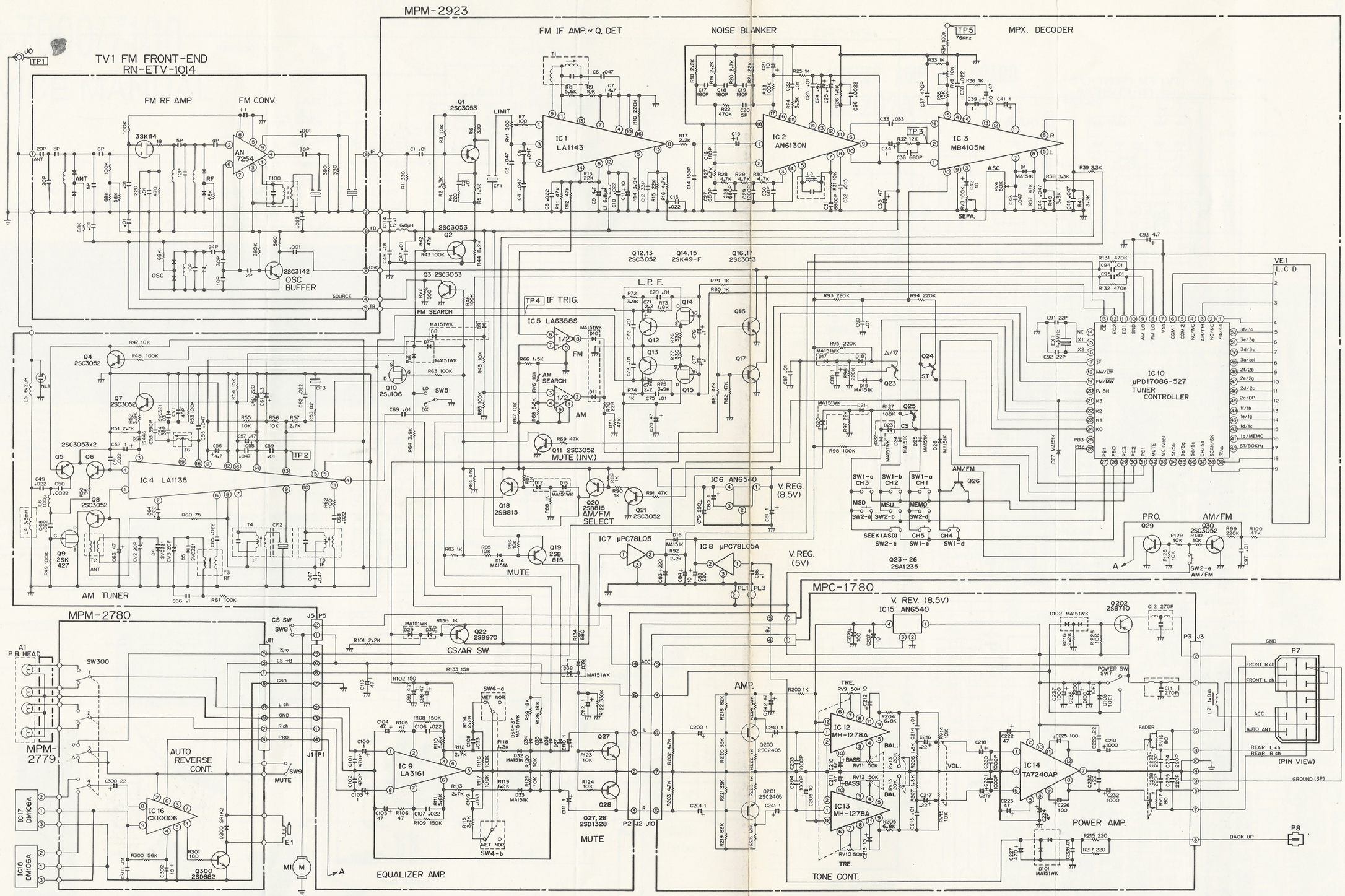
3. All inductance in henly, $m=10^{-3}$, $\mu=10^{-6}$

Fig. 3-1 (C24190139)

4. DC voltage against the chassis measured with 100k ohm/volt meter, power supply set at +13.2 VDC, no signal input.

5. A red line and a red dotted feeble line show a power supply system flow and a signal system flow, respectively.

SCHEMATIC
CS202A



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

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

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

Fig. 3-2 (C24190140)

4. DC voltage against the chassis measured with 100k ohm/volt meter, power supply set at +13.2 VDC, no signal input.

5. A red line and a red dotted feeble line show a power supply system flow and a signal system flow, respectively.