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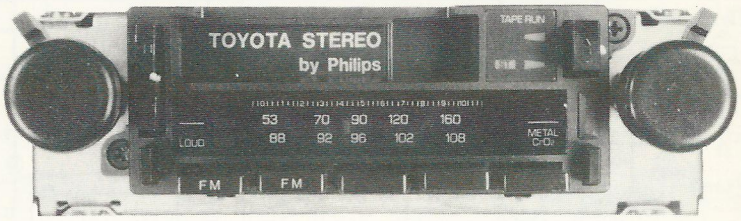



# Service Manual

FOUR TRACK AUTO REVERSE STEREO CASSETTE PLAYER WITH
AM/FM/FM-STEREO RADIO

12 V

PRODUCED FOR AUSTRALIAN MOTOR INDUSTRIES
FOR FITMENT TO TOYOTA CORONA

## SPECIFICATIONS

| | |
|---|---|
| TUNING RANGE | AM 525 to 1605kHz<br>FM 88 to 108MHz |
| INTERMEDIATE FREQUENCY | AM 455kHz<br>FM 10.7MHz |
| TAPE SPEED | 4.76cm/sec. |
| PINCHROLLER PRESSURE | 300 - 400g |
| TAKE UP TORQUE | 45 - 60g.cm |
| POWER OUTPUT | 3 WATTS PER CHANNEL |
| SPEAKER IMPEDANCE | 4 ohms PER CHANNEL |
| POWER SUPPLY | 12 VOLTS NEGATIVE TO EARTH |
| CURRENT | APPROX 0.6amp (at 0.5 WATT OUTPUT) |
| SEMICONDUCTORS | 9 IC's<br>12 TRANSISTORS<br>4DIODES<br>5LED's<br>1 FET |

# ADJUSTMENT FOR TAKE UP TORQUE CM1 - CM2

With the motor running, use an appropriate gauge to measure the take-up torque. This should be between 45 and 55 g-cm. If adjustment is required, loosen the set screw in the torque adjustment nut (Fig. 3) and turn the nut clockwise to increase the torque or anti-clockwise to decrease it. Tighten the set screw.

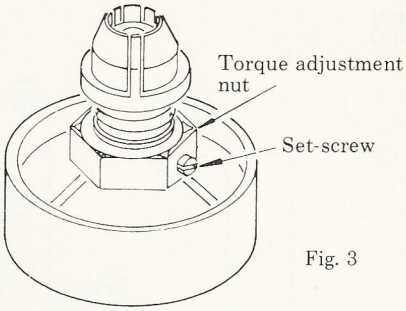



Fig. 3

# CLEANING

After extended use, the tape playback head and the drive capstan will build up a layer of iron oxide from the tape. The 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 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)

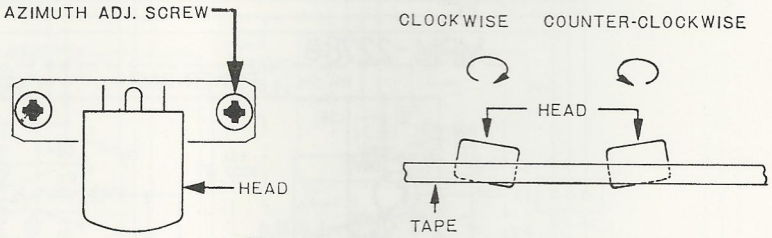



Fig. 4

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.

* IN CASE OF USING TEST TAPE FOR AZIMUTH ADJUSTMENT

Insert a test tape for the azimuth adjustment and set the control knob to a proper level :

VOLUME CONTROL KNOB (VOL)..... In a proper level

BALANCE CONTROL KNOB (BAL) ..... In a center position

TONE CONTROL KNOB (TONE) ..... Treble tone

Carefully adjust the azimuth adjust screw for maximum volume and treble tone. It is recommended that you connect a VTVM or circuit tester with the speaker terminals for obtaining the maximum value because test tape for azimuth adjustment is recorded high treble tones (6,300 Hz ordinary), and it is difficult to find the maximum volume without using test instrument. If test tape is not available, use a stereo tape with some high treble tones (piano or violin music is good for this) and follow the same procedure as outlined above.

# AM ALIGNMENT

* Standard adjustment condition
  a. Power supply ····· 13.2 VDC
  b. AM/FM changing switch ····· AM
  c. Balance and tone control ····· Center
  d. Volume ····· Adjust to get 1V output level.
  e. Connections

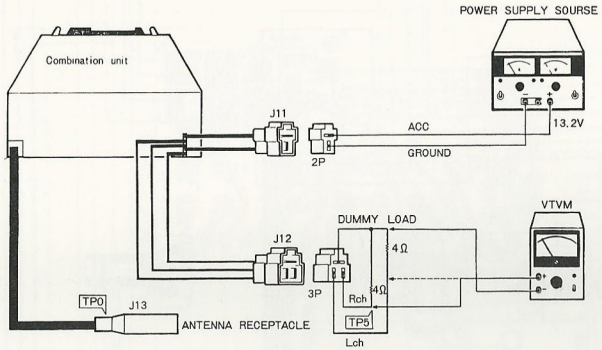



Fig. 5 (C33171432)

〔1〕 IF Alignment

(1) Connections

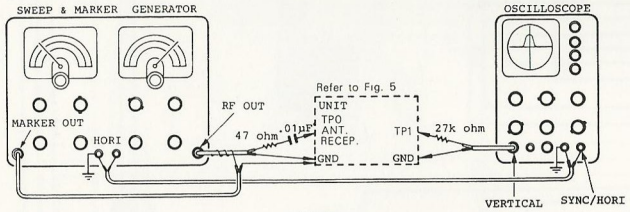



Fig. 6

| SWEEP GENERATOR OUTPUT | OSCILLOSCOPE VERTICAL INPUT | OSCILLOSCOPE HORIZONTAL INPUT |
|---|---|---|
| Connect TP 0 in Fig. 5 through 0.01 μF capacitor & 47 ohm resistor | Connect TP 1 in Fig. 14 through 27k-ohm resistor | Connect with HORIZONTAL terminal of sweep generator |

(2) Alignment (Refer to Fig. 14 for ADJUSTMENT POINTS.)

| STEP | PURPOSE | SWEEP GENERATOR FREQUENCY | SET TUNER TO | ADJUSTMENT POINTS | PROCEDURE |
|---|---|---|---|---|---|
| 1 | IF | 455 kHz | Near 1,000 kHz no signal exists | T 4 | Get maximum IF curve and best symmetry on both sides. |
| 2 | Repeat STEP 1 until no further gain in output can be obtained. | | | | |


# AM ALIGNMENT

* Standard adjustment condition
  a. Power supply ····· 13.2 VDC
  b. AM/FM changing switch ····· AM
  c. Balance and tone control ····· Center
  d. Volume ····· Adjust to get 1V output level.
  e. Connections

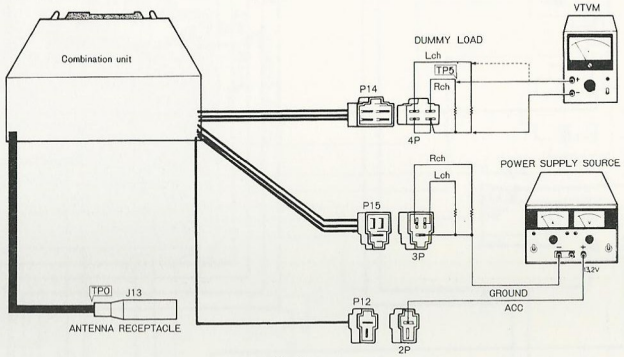




Fig. 5


〔1〕 IF Alignment

(1) Connections

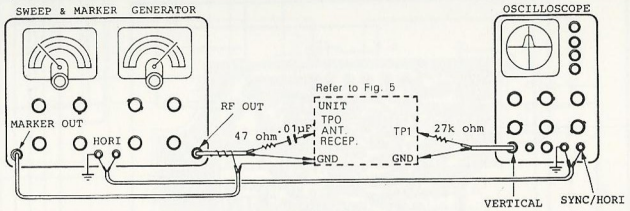




Fig. 6 (EOI-011)


| SWEEP GENERATOR OUTPUT | OSCILLOSCOPE VERTICAL INPUT | OSCILLOSCOPE HORIZONTAL INPUT |
|---|---|---|
| Connect TP 0 in Fig. 5 through 0.01 μF capacitor & 47 ohm resistor | Connect TP 1 in Fig. 14 through 27k-ohm resistor | Connect with HORIZONTAL terminal of sweep generator |

(2) Alignment (Refer to Fig. 14 for ADJUSTMENT POINTS.)

| STEP | PURPOSE | SWEEP GENERATOR FREQUENCY | SET TUNER TO | ADJUSTMENT POINTS | PROCEDURE |
|---|---|---|---|---|---|
| 1 | IF | 455 kHz | Near 1,000 kHz no signal exists | T 4 | Get maximum IF curve and best symmetry on both sides. |
| 2 | Repeat STEP 1 until no further gain in output can be obtained. | | | | |

〔2〕 Tuning range and tracking alignment

(1) Connections

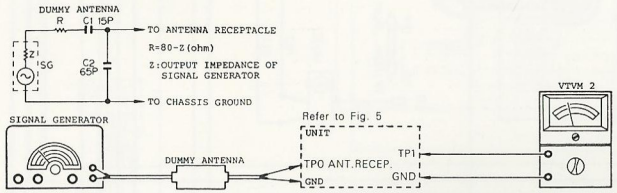



Fig. 9 (EOT-008)

(2) Alignment (Refer to Fig. 14 for ADJUSTMENT POINTS.)

| STEP | PURPOSE | GENERATOR FREQUENCY | SET TUNER TO | ADJUSTMENT POINTS | PROCEDURE |
|---|---|---|---|---|---|
| 1 | Tuning range | 1,640 kHz (400 Hz, 30% AM) | High-end stop | TC 3 | Adjust for maximum meter indication. |
| 2 | | 600 kHz (400 Hz, 30% AM) | 600 kHz | T 3 | |
| 3 | Repeat STEP 1 and 2 until no further gain in output can be obtained. | | | | |
| 4 | Tracking | 1,400 kHz (400 Hz, 30% AM) | Just tune in SG frequency | TC 2 | Adjust for maximum meter indication. |
| 5 | | | | TC 1 | |

NOTE: Always readjust antenna trimmer TC 1 when radio or antenna is reinstalled, tuning in a weak station around 1,400 kHz and get maximum volume.

# FM ALIGNMENT

* Standard Adjustment Condition

FM adjustment should be the same as in AM standard adjusting condition. (AM/FM selector switch is, however, in FM position.)

〔1〕 IF Alignment

(1) Connection

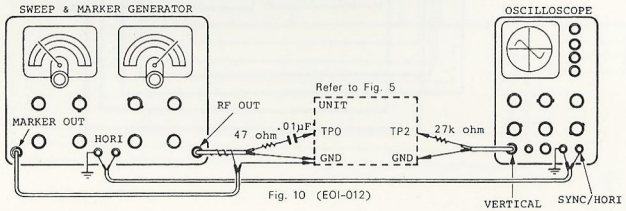



Fig. 10 (EOI-012)

| SWEEP GENERATOR OUTPUT | OSCILLOSCOPE VERTICAL INPUT | OSCILLOSCOPE HORIZONTAL INPUT |
|---|---|---|
| Connect TP 0 in Fig. 5 through 0.01 μF capacitor & 47 ohm resistor | Connect TP 2 in Fig. 14 through 27k-ohm resistor | Connect with HORIZONTAL terminal of sweep generator |

(2) Alignment (Refer to Fig. 14 for ADJUSTMENT POINTS.)

| STEP | PURPOSE | SWEEP GENERATOR FREQUENCY | SET TUNER TO | ADJUSTMENT POINTS | PROCEDURE |
|---|---|---|---|---|---|
| 1 | IF circuit | Center frequency varies according to the color of the ceramic filter (Refer to chart given below) | Near 98 MHz no signal exists | IFT-1 | S-curve adjust for full gain and length of at linears. (See Fig. 12) |
| 2 | | | | | |
| 3 | Detector circuit | | | T 1 | Keep S-curve straight at the center, and adjust waveform for best symmetry of S-curve against the axis as much as possible. (See Fig. 12) |
| 4 | Repeat STEP 1 to 3 until no further gain output can be obtained. | | | | |

| COLOR | CENTER FREQUENCY |
|---|---|
| Black | 10.64 MHz ± 30 kHz |
| Blue | 10.67 MHz ± 30 kHz |
| Red | 10.70 MHz ± 30 kHz |
| Orange | 10.73 MHz ± 30 kHz |
| White | 10.76 MHz ± 30 kHz |

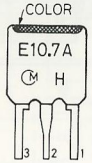



Fig. 11

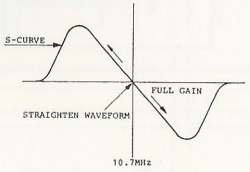



Fig. 12

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

◎Points to watch in replacing ceramic filter

In the FM circuit there are two ceramic filters. It is important that both filters have the same color. (i.e the same center frequency).

a. Readjustment is not necessary if a defective ceramic filter is replaced with one of the same color.

b. Both filters should be changed to the same color if one of them must be replaced with a different colored filter. Readjustment will be necessary because of the changed center frequency.

〔2〕 Tuning range alignment (Refer to Fig. 14 for ADJUSTMENT POINTS.)

(1) Connections

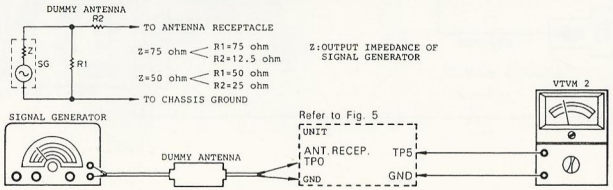



Fig. 13 (EOT-009)

(2) Alignment (Refer to Fig. 14 for ADJUSTMENT POINTS.)

| STEP | PURPOSE | GENERATOR FREQUENCY | SET TUNER TO | ADJUSTMENT POINTS | PROCEDURE |
|---|---|---|---|---|---|
| 1 | Tuning range | 88 MHz (400 Hz, 30% FM) | Low-end stop | CT-2 | Adjust for maximum meter indication. |
| 2 | | 108 MHz (400 Hz, 30% FM) | High-end stop | — | 106 MHz must be received. |
| 3 | Tracking | 98 MHz (400 Hz, 30% FM) | Just tune in SG frequency | CT-1 | Adjust for maximum meter indication. |
| 4 | | | | | |

## [3] Limiting Sensitivity

◎ Limiting sensitivity is defined as the antenna input voltage measured in the undermentioned procedure.

(a) Apply the antenna input voltage of 54 dB/$\mu$V to the receiver and adjust the volume control to get 0.5W output.

(b) Decrease the antenna input gradually so that the output gets 3 dB down, then read the input voltage. This is limiting sensitivity.

(1) Connections Refer to Fig. 13

(2) Adjustment (Refer to Fig. 14 for ADJUSTMENT POINTS.)

This model is so designed as to be 10 ± 5 dB limiting sensitivity in standard specifications.

(a) Set the output of the SSG to 54 dB (400 Hz, 30% modulated). (In case the level indicator of the SSG shows an open terminal voltage, set the level to 60 dB.)

(b) Adjust the volume control to get 0.5W (1.4V) output with the tone control at extreme treble.

(c) Reset the SSG level to 8 dB (to 14 dB in case of an open terminal indicator).

(d) Adjust the VR1 to get −3 dB (1V) of output reading.

NOTE: The receiver will not operate with the VR1 turned fully counterclockwise.

## [4] Noise blanker alignment

(1) Connections a. Stereo signal generator·····Connect TP Q in Fig. 5

b. Oscilloscope·····Connect TP 3 in Fig. 14

(2) Alignment (Refer to Fig. 14 for ADJUSTMENT PNINTS)

| STEP | STEREO SIGNAL GENERATOR FREQUENCY | STEREO SIGNAL GENERATOR OUTPUT LEVEL | ADJUSTMENT POINT | PROCEDURE |
|---|---|---|---|---|
| 1 | 98 MHz (No modulation, Stereo mode) | 54 dB$\mu$ | T 2 | After making sure of "STEREO" display, adjust the pilot signal wave (19 kHz) to minimum. |

## [5] Separation alignment

(1) Connections a. Stereo signal generator·····Connect TP 0 in Fig. 5

b. Oscilloscope·····Connect TP 5 in Fig. 5

(2) Alignment (Refer to Fig. 14 for ADJUSTMENT POINTS)

| STEP | STEREO SIGNAL GENERATOR FREQUENCY | STEREO SIGNAL GENERATOR OUTPUT LEVEL | ADJUSTMENT POINT | PROCEDURE |
|---|---|---|---|---|
| 1 | 98 MHz (L-ch: 400 kHz, 30% R-ch: no modulation) | 60 dB$\mu$ | VR 3 | Adjust R-ch. output level to minimum. |

## [6] ASC Working sensitivity adjustment

(1) Connections Same as separation alignment

(2) Alignment (Refer to Fig. 14 for ADJUSTMENT POINTS)

| STEP | STEREO GENERATOR FREQUENCY | STEREO GENERATOR OUTPUT LEVEL | ADJUSTMENT POINT | PROCEDURE |
|---|---|---|---|---|
| 1 | 98 MHz (L-ch: 1 kHz, 30% R-ch: no modulation) | 40 dB$\mu$ | VR 2 | Adjust the separation for 15±6 dB |

# ADJUSTMENT POINTS (C33171434)

MPM-2281A

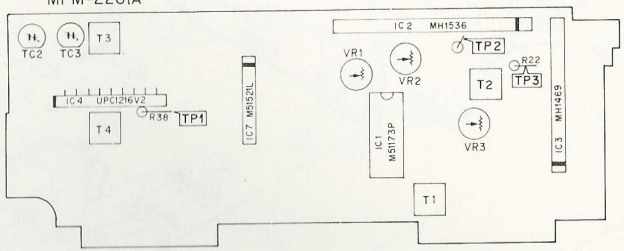



Fig. 14-a

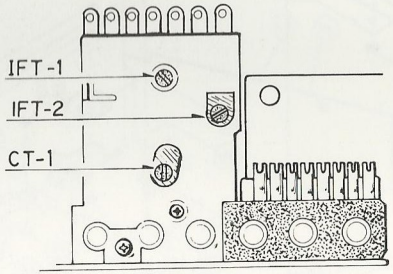



Fig. 14-b

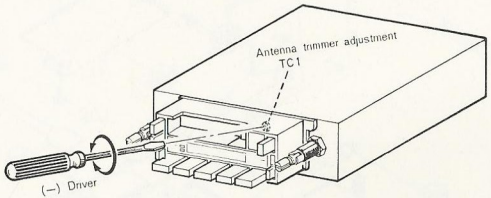



Fig. 14-c

## CONNECTIONS (REAR VIEW) CM3

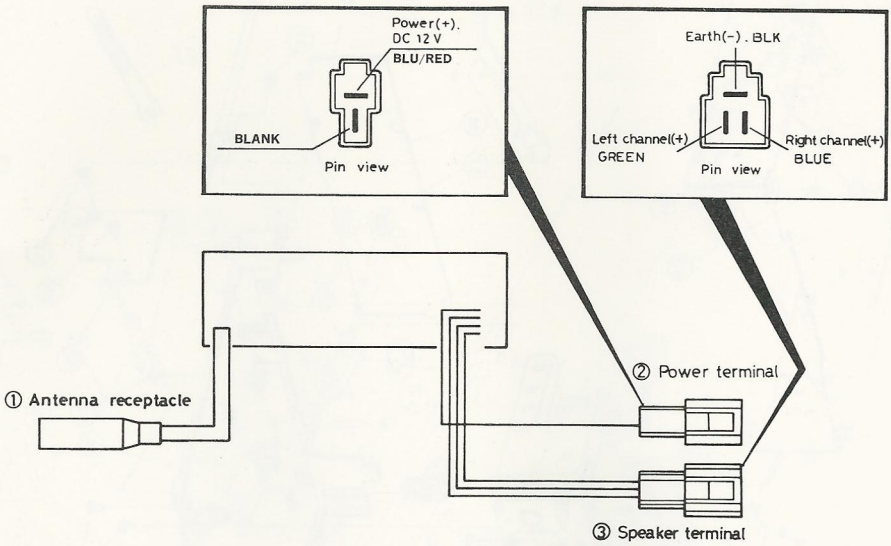
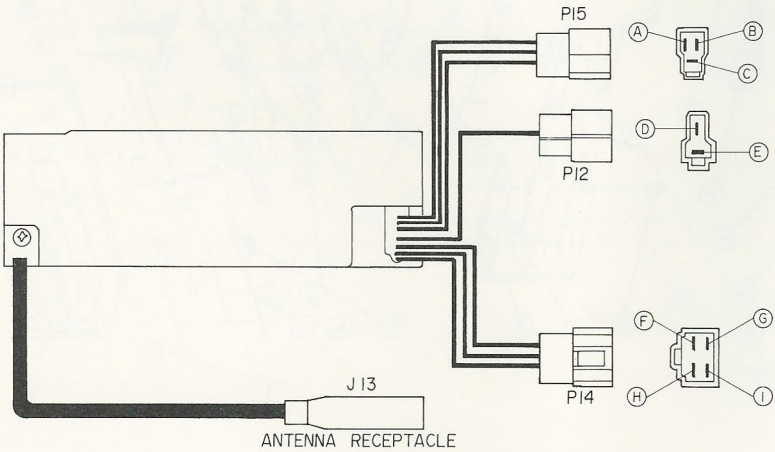



Fig. 1 (C23171432)

## CONNECTIONS (REAR VIEW) CM4




(PIN VIEW)

| PIN | | COLOR |
|---|---|---|
| A | Rch (+) | BLUE |
| B | Lch (+) | GREEN |
| C | EARTH | BLACK |
| D | ——— | |
| E | POWER SUPPLY | BLUE/RED |
| F | Rch (+) FRONT | WHITE |
| G | EARTH | BLACK |
| H | Lch (+) FRONT | RED |
| I | ——— | |

Fig. 1 (C23171432)

# EXPLODED VIEW

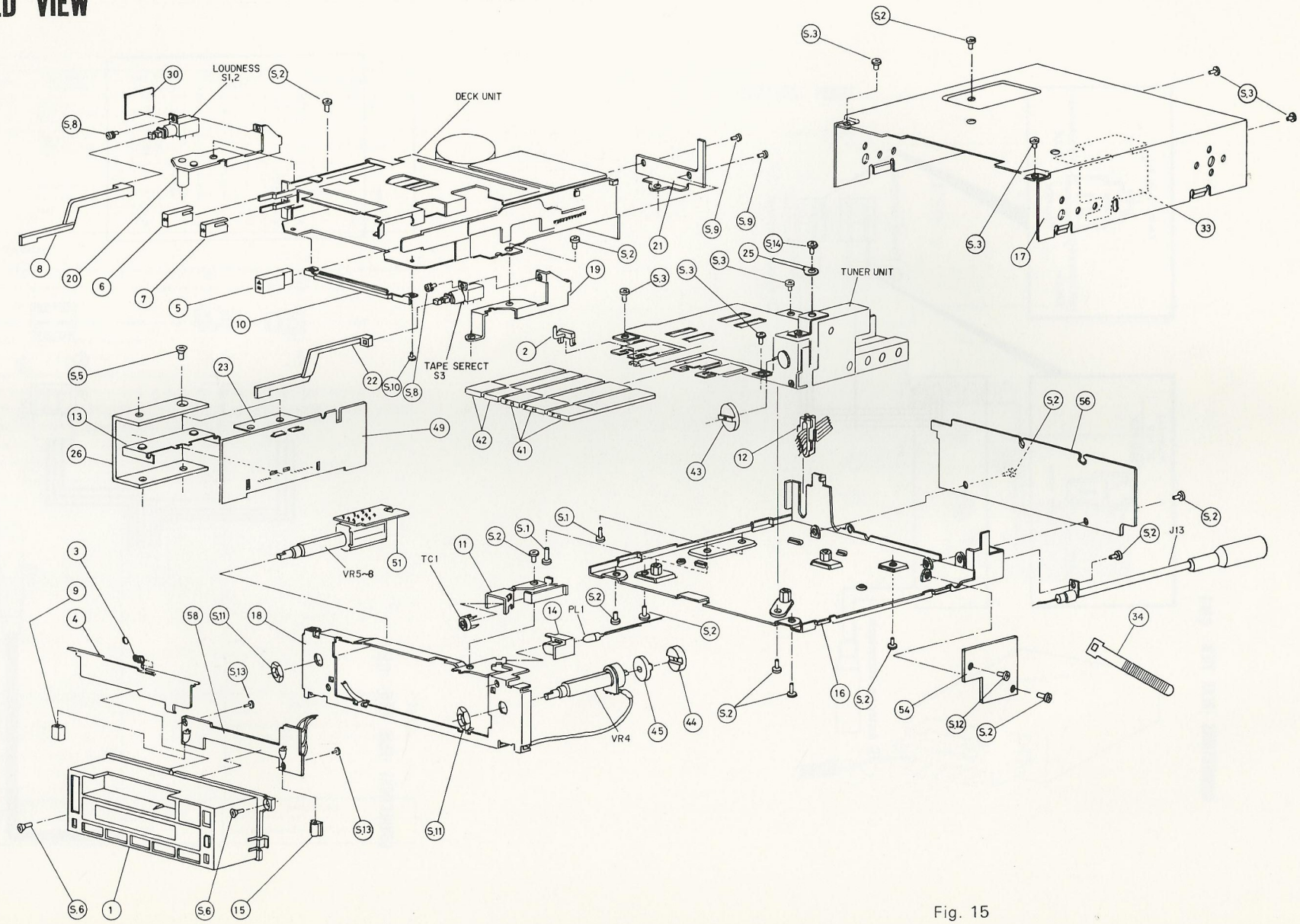



Fig. 15

# EXPLODED VIEW (CASSETTE DECK DK-54/5)

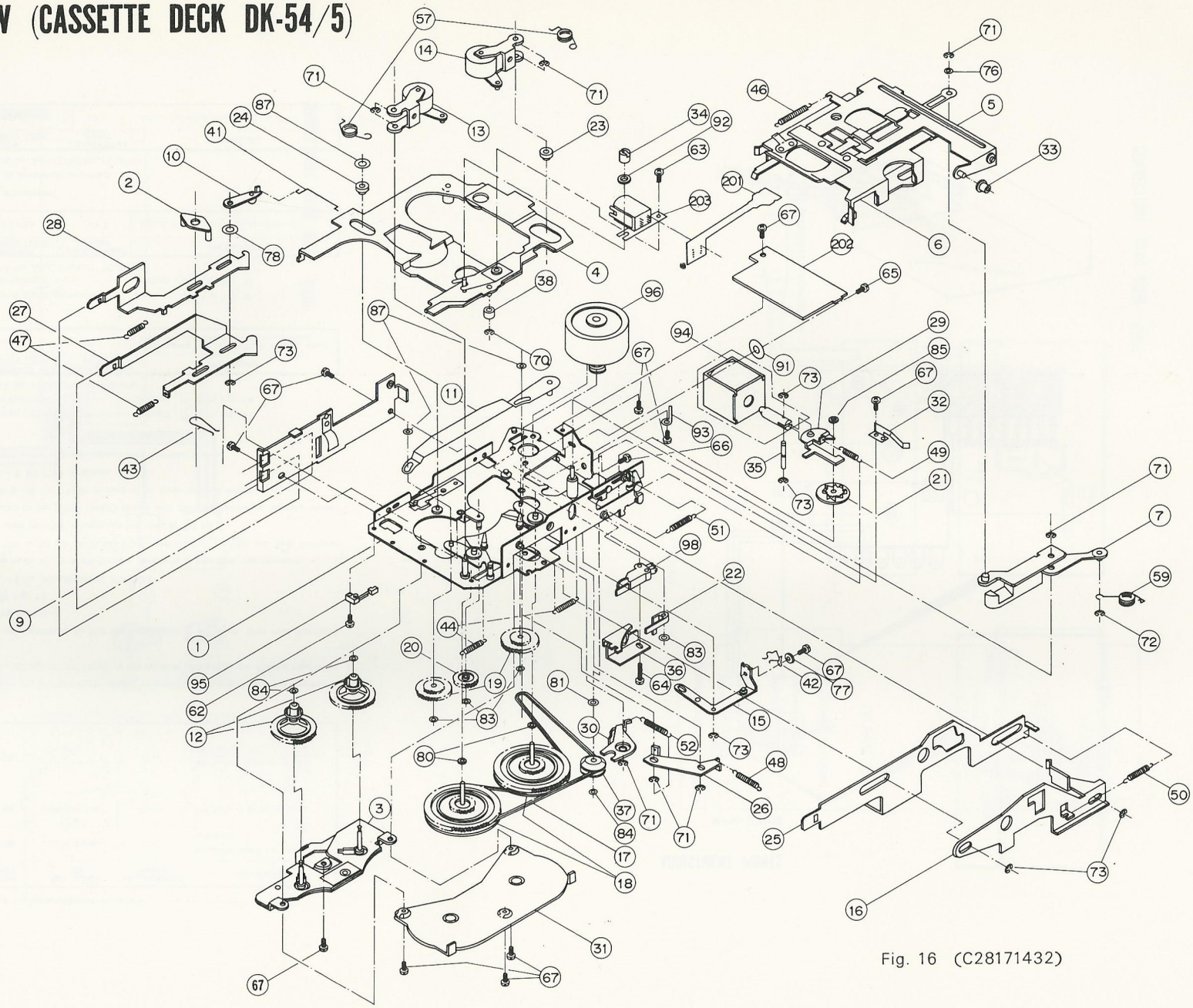



Fig. 16 (C28171432)

# PARTS LIST

| REF. NO. | DESCRIPTION | SERVICE CODE |
|---|---|---|
| **RESISTORS** | | |
| VR1 | RES. VAR 300 ohms | 100 17103 |
| VR2 | RES VAR 50 k ohms | 100 17096 |
| VR3 | RES VAR 20 k ohms | 100 17097 |
| VR4 | RES VAR 20 k Balance | 102 27113 |
| VR5-8 S6.S7 | RES VAR Vol + Tone + Switch | 102 27114 |
| **COILS, FILTERS & CHOKES** | | |
| CF1 | CERAMIC FILTER FM | 242 77116 |
| CF2 | CERAMIC FILTER FM | 242 77117 |
| CF3 | CERAMIC FILTER AM | 242 77091 |
| CF4 | CERAMIC FILTER AM | 242 77088 |
| T1 | TRANSFORMER FM IF | 158 17307 |
| T2 | COIL TRAP | 156 17141 |
| T3 | COIL MW Oscillator | 156 27205 |
| T4 | COIL AM IF | 153 17361 |
| L1.L2 | COIL CHOKE | 158 17205 |
| L3 | COIL CHOKE | 158 17103 |
| L4 | COIL CHOKE | 158 17104 |
| L6 | COIL CHOKE | 158 17275 |
| L5 | COIL CHOKE | 158 17199 |
| **SEMICONDUCTORS** | | |
| IC1 | IC M51173P | 209 87519 |
| IC2 | IC MH1536 | 209 87502 |
| IC3 | IC MH1469 | 209 87501 |
| IC4 | IC UPC1216V2 | 209 81222 |
| IC5.6 | IC M51517L | 209 87493 |
| IC7 | IC M51521L | 209 87107 |
| IC8.9 | IC DN6838 | 209 80748 |
| IC10 | IC AN6248 | 209 87466 |
| TR1 | Transistor 2SC710D (use BF494) | 130 44195 |
| TR2 | Transistor 2SC1847Q or R (use 2SC1847) | Per 130 47432 |
| TR3.4 5.8.9 | Transistor 2SC1684-Q or R (use 2SC1684) | 130 41532 |
| TR6.7 | Transistor 2SD655-D or D (use 2SD655) | 130 41607 |
| D1 | DIODE LN310GA (Green) | 130 37305 |
| D2 | DIODE MZ309 (use BZX79B9V1) Zener | 130 30862 |
| D4-7 | DIODE LN410YP (Orange) | 130 37448 |
| D10 | DIODE SR1K2 (use RYV96B) | 130 37022 |
| D11 | DIODE 1S1555 (use DA626.2.0) | 130 37033 |
| **CAPACITORS** | | |
| TC1 | CAP TRIMMER AM ANT | 125 67038 |
| TC2.3 | CAP TRIMMER AM Oscillator | 125 57104 |
| **MISCELLANEOUS ELECTRICAL** | | |
| — | TUNER COMPONENT | 210 17128 |
| A1 | HEAD PLAYBACK | 249 37022 |
| E1 | SOLENOID | 281 57021 |
| M1 | MOTOR | 361 27131 |
| J1 | LEAD ASSEMBLY 6 PIN | 321 27246 |
| J2 | LEAD ASSEMBLY 7 PIN | 321 27247 |
| J3 | LEAD ASSEMBLY 3 PIN | 321 27248 |
| J4 | LEAD ASSEMBLY 8 PIN | 321 27249 |
| J5 | LEAD ASSEMBLY 3 PIN | 321 27251 |
| J6 | LEAD ASSEMBLY 2 PIN | 321 27252 |
| J7 | LEAD ASSEMBLY 3 PIN | 321 27253 |
| J8 | LEAD ASSEMBLY 3 PIN | 321 27254 |
| J9 | LEAD ASSEMBLY 5 PIN | 321 27255 |
| J10 | LEAD ASSEMBLY 2 PIN | 321 27256 |
| J11 | LEAD ASSEMBLY 2 PIN | 321 27257 |
| J12 | LEAD ASSEMBLY 3 PIN | 321 27258 |
| J14 | LEAD ASSEMBLY 4 PIN | 321 27259 |
| PL1.2 | LAMP (use BSX20) | 134 40417 |
| PL3 | LAMP | 134 47156 |
| S1.2.3 | SWITCH PUSH | 276 17156 |
| S4 | SWITCH SLIDE | 277 27135 |
| S5 | SWITCH LEAF | 278 97091 |
| S8 | SWITCH LEAF | 278 97082 |
| S9 | SWITCH SLIDE | 277 27128 |
| **MISCELLANEOUS MECHANICAL** | | |
| 1 | ESCUTCHEON | 459 17597 |
| 2 | POINTER | 450 87164 |
| 3 | SPRING | 492 37519 |
| 4 | CASSETTE FLAP (DOOR) | 454 27074 |
| 5 | BUTTON EJECT | 410 27581 |
| 6 | BUTTON FF | 410 27582 |
| 7 | BUTTON REW | 410 27583 |
| 8 | BUTTON LOUDNESS | 410 27584 |
| 22 | BUTTON TAPE SELECT | 410 27585 |
| 41 | BUTTON FM | 410 27586 |
| 42 | BUTTON AM | 410 27587 |
| 43 | ROLLER UNIVERSAL JOINT | 402 67155 |
| 44 | ROLLER UNIVERSAL JOINT | 402 67156 |
| 45 | ROLLER UNIVERSAL JOINT | 402 67157 |
| **CASSETTE DECK** | | |
| 2 | LEVER | 402 67158 |
| 5 | HOLDER CASSETTE | 443 67263 |
| 7 | LEVER | 402 67159 |
| 12 | CLUTCH SLIP MECHANISM | 528 87269 |
| 13 | PINCHROLLER ASSEMBLY REAR | 403 47103 |
| 14 | PINCHROLLER ASSEMBLY FRONT | 403 47104 |
| 17 | BELT | 358 27036 |
| 18 | FLYWHEEL | 528 67101 |
| 19 | GEAR | 528 17268 |
| 20 | GEAR | 528 17269 |
| 21 | CAM | 528 37044 |
| 23 | ROLLER | 528 77225 |
| 24 | ROLLER | 528 77226 |
| 32 | SPRING | 492 37475 |
| 33 | ROLLER | 528 77227 |
| 34 | NUT SPECIAL | 502 37148 |
| 37 | ROLLER | 528 77228 |
| 38 | ROLLER | 528 77229 |
| 42 | SPRING | 492 37476 |
| 43 | SPRING | 492 37521 |
| 44 | SPRING | 492 37478 |
| 46 | SPRING | 492 37481 |
| 47 | SPRING | 492 37482 |
| 48 | SPRING | 492 37483 |
| 49 | SPRING | 492 37484 |
| 50 | SPRING | 492 37522 |
| 51 | SPRING | 492 37523 |
| 52 | SPRING | 492 37524 |
| 55 | SPRING | 492 37525 |
| 57 | SPRING | 492 37526 |
| 59 | SPRING | 492 37527 |

# DC VOLTAGE

## IC VOLTAGE

| Pin No. \ IC No. | IC 1 | IC 2 | IC 3 | IC 4 | IC 5,6 | IC 7 | IC 8,9 | IC 10 |
|---|---|---|---|---|---|---|---|---|
| 1 | 1.9 | 3.7 | — | 2.7 | 13 | 1.2 | 13 | 11.7 |
| 2 | 1.9 | 0 | — | 2 | .1 | .7 | 0 | 13 |
| 3 | 1.9 | — | — | .07 | 1.3 | 3.4 | 0~13 | 0 |
| 4 | 0 | 2.5 | 11.5 | 11 | 3.3 | 6.9 | / | 0 |
| 5 | 4.7 | 3.7 | 0 | 1.3 | 12.6 | 0 | / | 1.3 |
| 6 | 5.5 | 4.8 | 0 | 2 | 0 | 3.5 | / | 13 |
| 7 | 5.5 | 4 | 0 | 11.4 | 6.7 | .7 | / | 13 |
| 8 | 5.6 | 0 | 4.7 | 11 | 6.7 | 1.2 | / | / |
| 9 | 5.6 | — | 4.7 | 0 | 0 | / | / | / |
| 10 | 5.6 | 0 | 2.4 | 0 | 12.6 | / | / | / |
| 11 | 9 | — | 2.4 | 3.4 | 3.3 | / | / | / |
| 12 | 5.1 | — | 3.1 | 3.1 | 1.3 | / | / | / |
| 13 | .06 | — | 2.5 | 1 | .1 | / | / | / |
| 14 | 0 | — | 9 | 9.3 | 13 | / | / | / |
| 15 | 4.4 | — | / | 1.6 | / | / | / | / |
| 16 | 3.9 | 8.9 | / | 3 | / | / | / | / |
| 17 | / | 9 | / | 1 | / | / | / | / |
| 18 | / | 0 | / | 9.4 | / | / | / | / |
| 19 | / | / | / | 11.4 | / | / | / | / |

## Tr VOLTAGE

| Tr No. \ Pin No. | E | B | C |
|---|---|---|---|
| 1 | 1.7 | 2.4 | 8 |
| 2 | 8.9 | 9.6 | 13 |
| 3 | 0 | 0.65 | 0 |
| 4 | 6.6 | 0.95 | 0.33 |
| 5 | 6.6 | 0.95 | 0.33 |
| 6 | 0 | 0.6 | 0 |
| 7 | 0 | 0.6 | 0 |
| 8 | 0 | 0.65 | 0 |
| 9 | 0 | 0.65 | 0 |
| 10 | 0 | 0.5 | 7 |

(Unit : V)

# IC CONNECTIONS

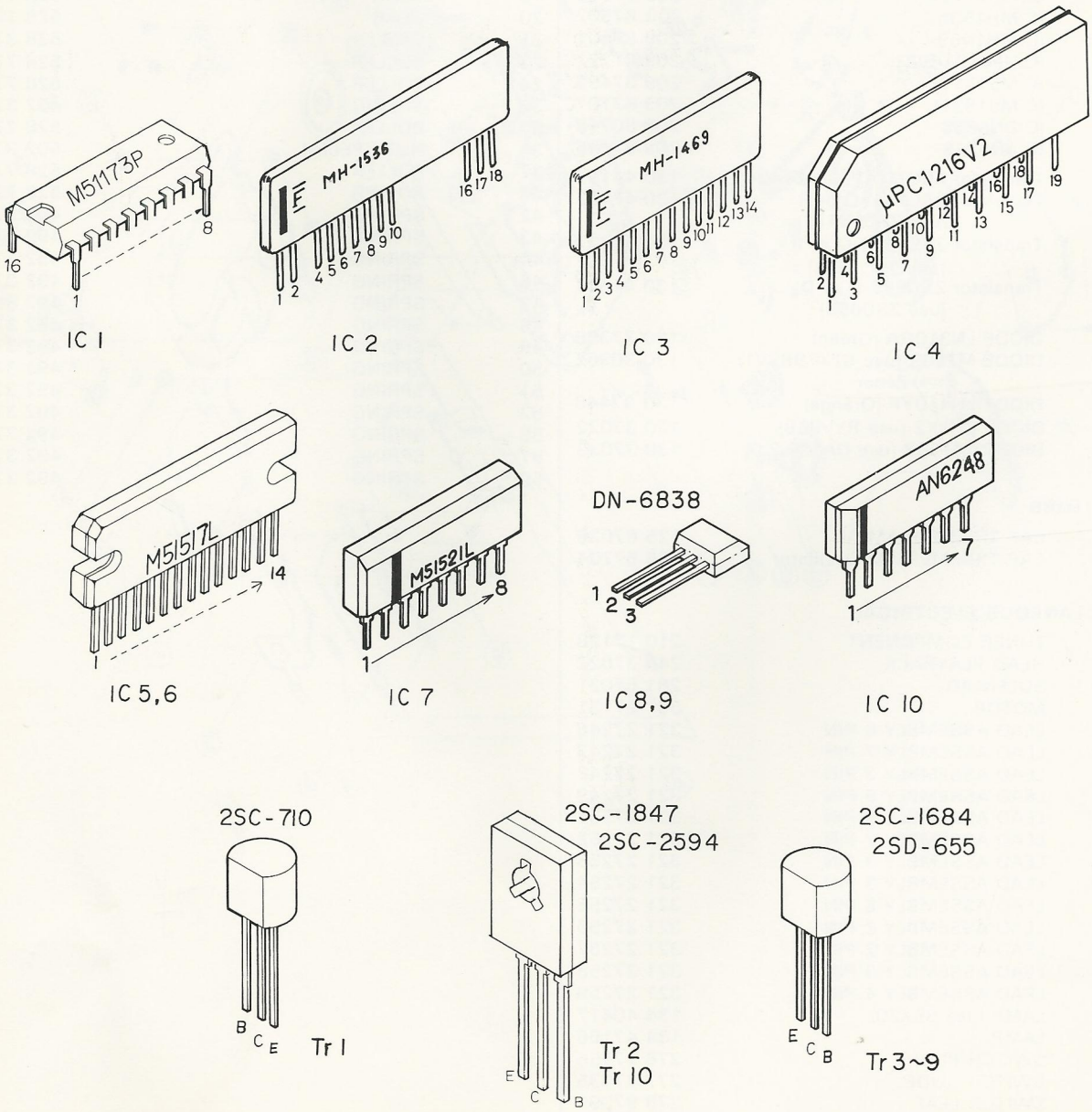
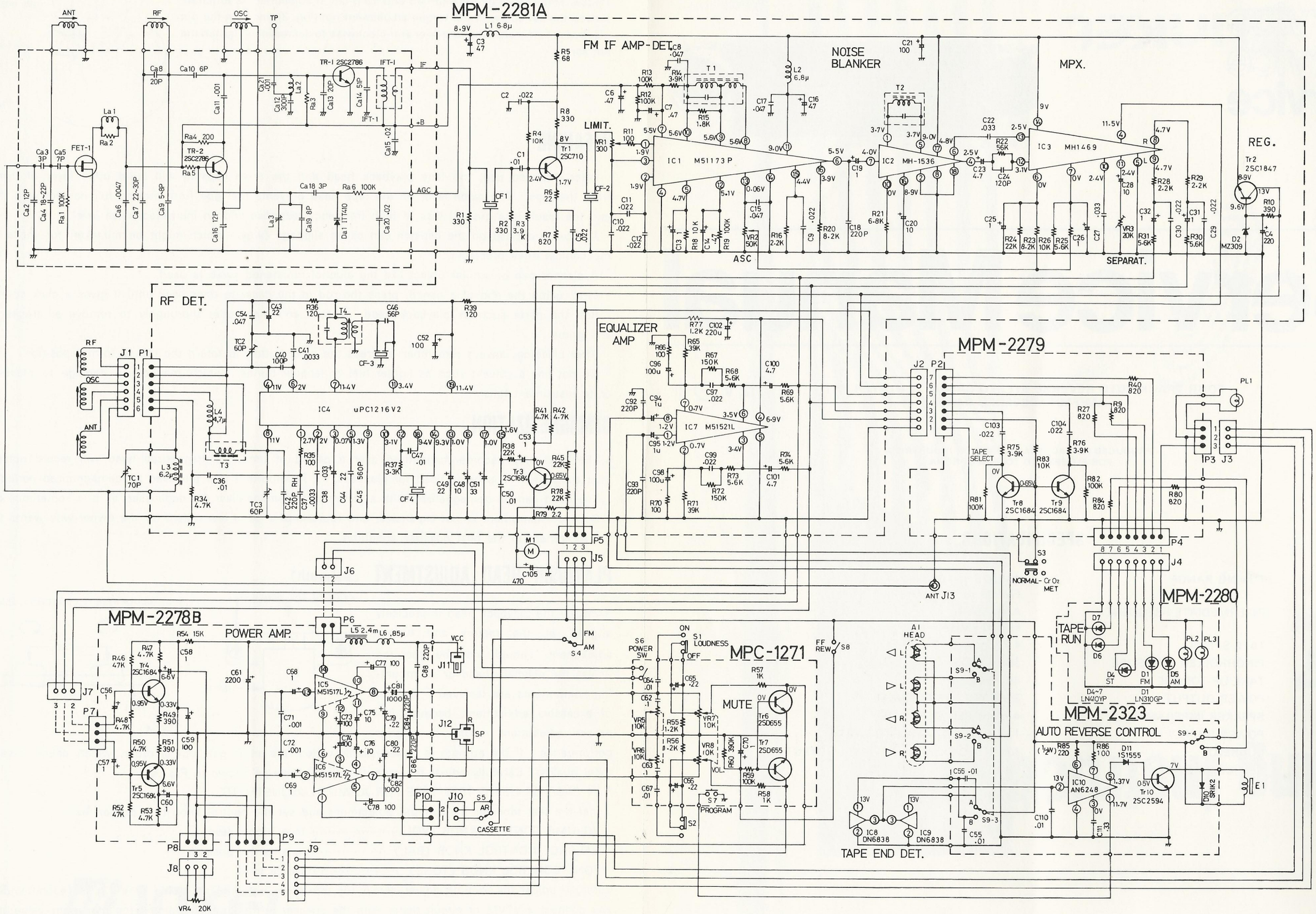



Fig. 2 (C30171434)

# SCHEMATIC
# CM3




NOTES: 1. All resistance in ohm, K=$10^3$

2. All capacitance in $\mu$F, P=$\mu\mu$F

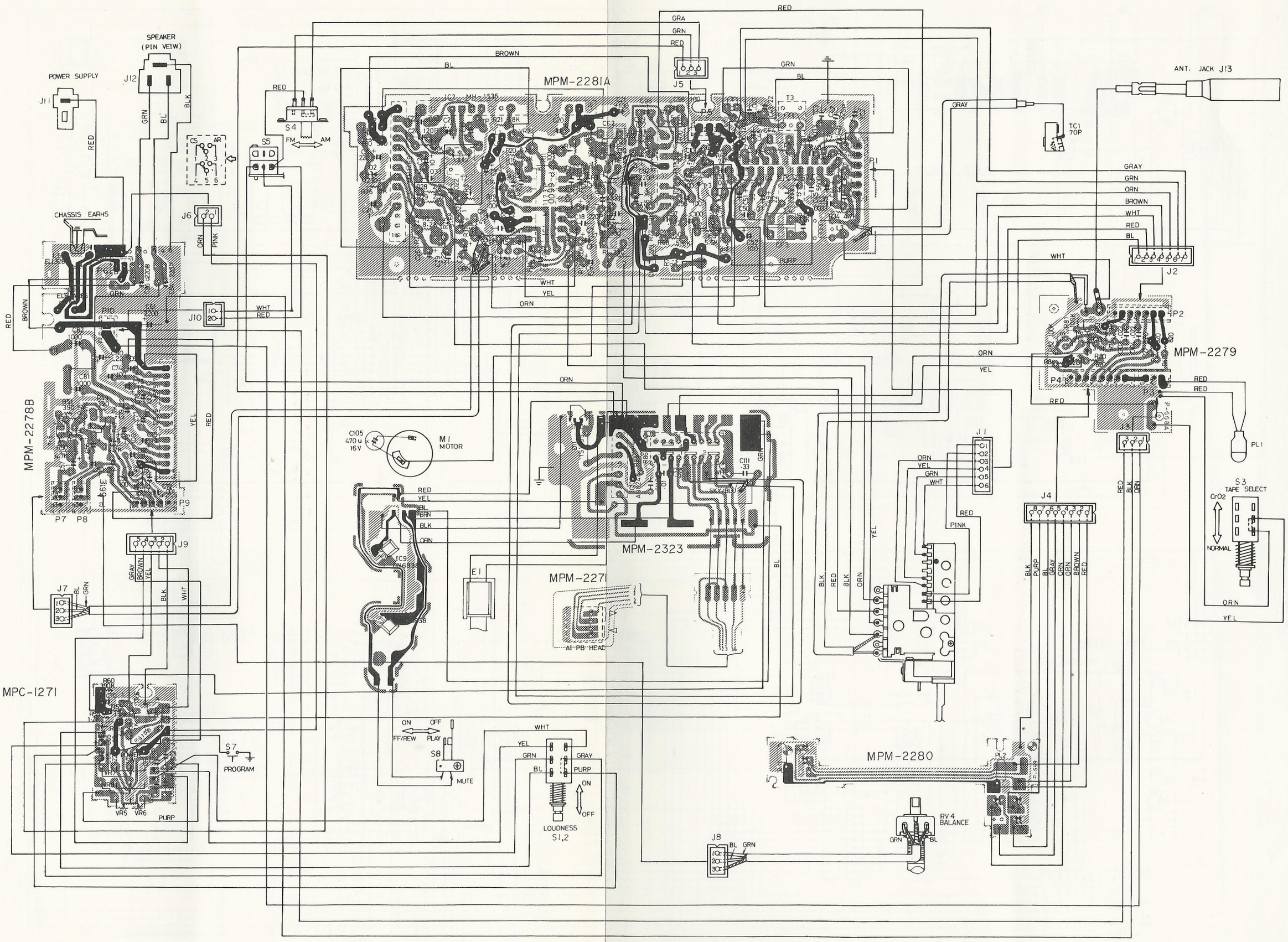
3. All inductance in henry, m=$10^{-3}$

Fig. 7

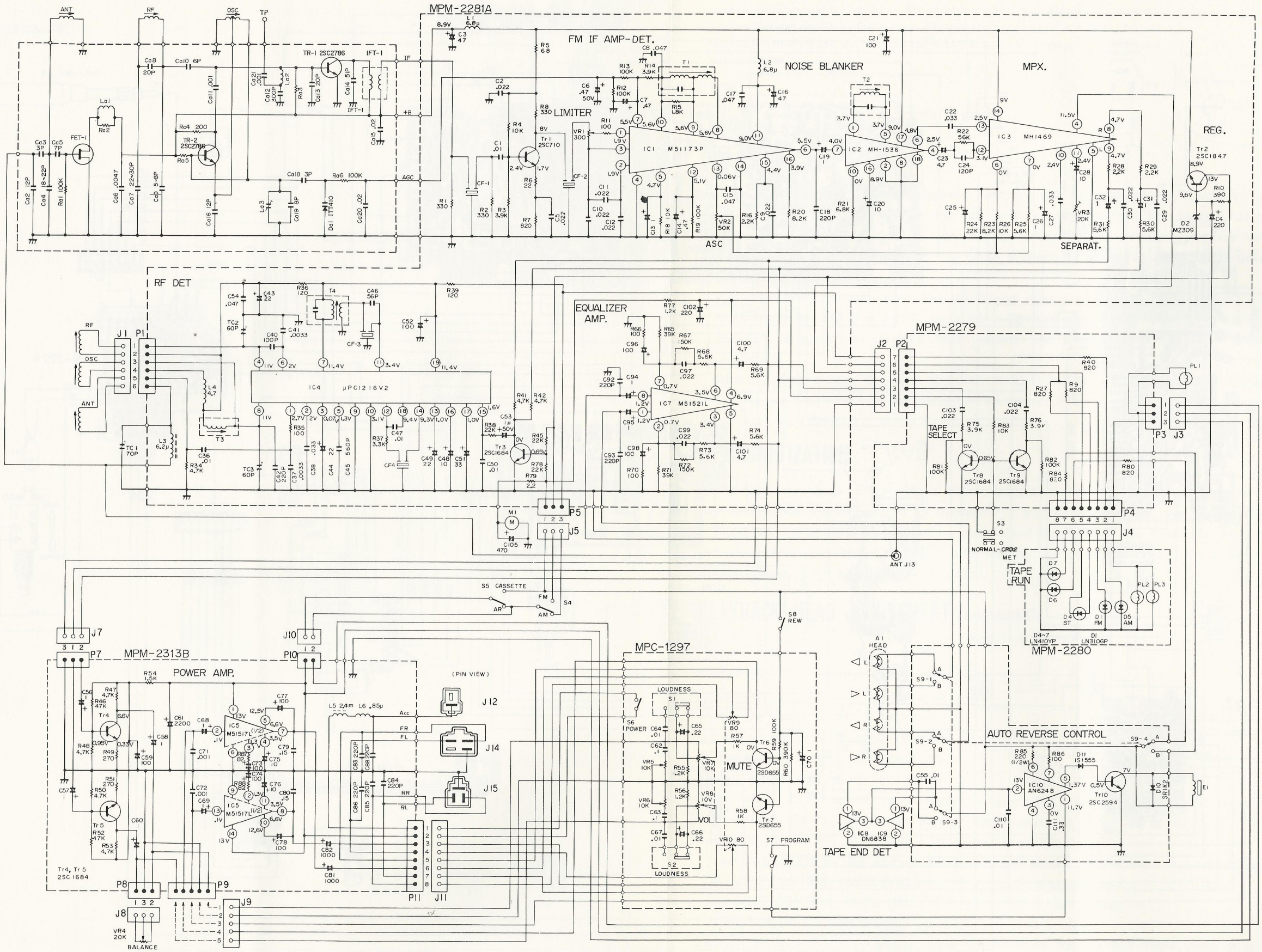
4. DC voltage against the chassis measured with 100k ohm/volt meter, power supply set at +13.2 VDC, signal input.

# WIRING ON PC BOARDS

## CM3



# SCHEMATIC
# CM4




NOTES: 1. All resistance in ohm, K=$10^3$

2. All capacitance in $\mu$F, P=$\mu\mu$F

3. All inductance in henry, m=$10^{-3}$

Fig. 7

4. DC voltage against the chassis measured with 100k ohm/volt meter, power supply s signal input.

# WIRING ON PC BOARDS

## CM4