

SERVICE
MANUAL

CP-130

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marantz®

model CP130

Portable Cassette Recorder

MARANTZ DESIGN AND SERVICE

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1. Complete address
2. Complete part numbers and quantities required
3. Description of parts
4. Model number for which part is required
5. Way of shipment
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Parts may be ordered at the following addresses:

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A 1101 Wien
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Telex: 132.332

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Telex: 24466

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Denmark
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Kaivokatu 8
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Telex: 124811

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4 Rue Bernard Palissy
92600 Asnières
France
Telex: 611651

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MARANTZ GERMANY GmbH
Alexanderstrasse 1
2000 Hamburg
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3526 KV Utrecht
The Netherlands
Telex: 4748

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Norway
Telex: 72640

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Unit 15/16
Saxon Way Industrial Estate
Moor Lane
Harmondsworth UB7 0LW
Great Britain
Telex: 935196

GREECE
SHERTON ELECTRONICS S.A.
P.O.Box 21025
Hippocrates Street 188
Athens 11471
Greece
Telex: 216.795

JAPAN
MARANTZ JAPAN, Inc.
35-1, 7-chome, Sagamiono
Sagamihara-shi, Kanagawa
Japan

KUWAIT
AL ALAMIAH ELECTRONICS
Ussama Building
Fahd al Saleem Street
P.O.Box 23781
Safat-Kuwait
Telex: 22694

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MARANTZ ITALIANA S.P.A.
Via Chiese, 74
20126 Milano
Italy

MARANTZ INTERNATIONAL
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5600 MD Eindhoven
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Telefax: +31/40.75.82.99
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AL ALAMIAH ELECTRONICS
P.O.Box 5954
University Street
Riyadh 11432
Saudi Arabia
Telex: 401530

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MARANTZ
DIVISION OF PHILIPS S.A.
Main Road Martindale
P.O. Box. 58088
Newville 21114
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MARANTZ
DIVISION OF PHILIPS
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Tegeluddsvägen 1
S-115 84 Stockholm
Sweden
Telex: 14060

SWITZERLAND
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Technischer Service
Duenstrasse 3
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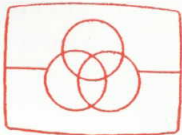
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All of the above locations are fully equipped to take care of your total service needs. Because various countries have differing configuration requirements, it is necessary that you contact the service facility in your particular country. In the event that there is no service location listed for your country, please, contact the nearest facility for the necessary assistance.

In case of difficulties, do not hesitate to contact the Technical Department at abovementioned address.

MODEL CP130 PORTABLE CASSETTE RECORDER



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TABLE OF CONTENTS

Section	Page
1. BLOCK DIAGRAM	3
2. SCHEMATIC DIAGRAM AND PARTS LOCATIONS	5
3. EXPLODED VIEW AND PARTS LIST	10
4. MECHANISM AND CIRCUIT DESCRIPTION	14
5. ELECTRICAL ADJUSTMENTS	15
6. ELECTRICAL PARTS LIST	17

TECHNICAL SPECIFICATIONS

Tape Drive System	Single Capstan Drive
Cartridge	Philips type compact cassette
Track System	2-track 1-channel
Tape Speed	1-7/8 ips and 15/16 ips
Heads	2 Head System
	Record/Playback: Super Hard Metal Alloy
	Erase: Dual Gap Metal Alloy
Motor	DC Servo Motor

Frequency Response:

	Standard Speed 1-7/8 ips (± 3 dB)	Long Play 15/16 ips (± 3 dB)
Normal Tape	40 Hz ~ 12 kHz	40 Hz ~ 6 kHz
CrO ₂ Tape	40 Hz ~ 13.5 kHz	40 Hz ~ 7 kHz
Metal Tape	40 Hz ~ 14 kHz	40 Hz ~ 8 kHz

Signal to Noise Ratio:

Normal Tape	55 dB
CrO ₂ Tape	57 dB
Metal Tape	57 dB

Wow and Flutter (WRMS)

Standard Speed 1-7/8 ips	0.12%
Long Play 15/16 ips	0.15%

Output Level/Impedance

Line	650 mV/2 k ohms
Headphone	280 mV/8 ohms

Input Sensitivity/Impedance

Line	40 mV/56 kohms
Microphone	0.3 mV/9 k ohms

General:

Power Requirements	120 V, 50/60 Hz
Battery Requirements (RB430 Battery Pack Optional)	3 D Cells or RB430 Rechargeable Battery Pack

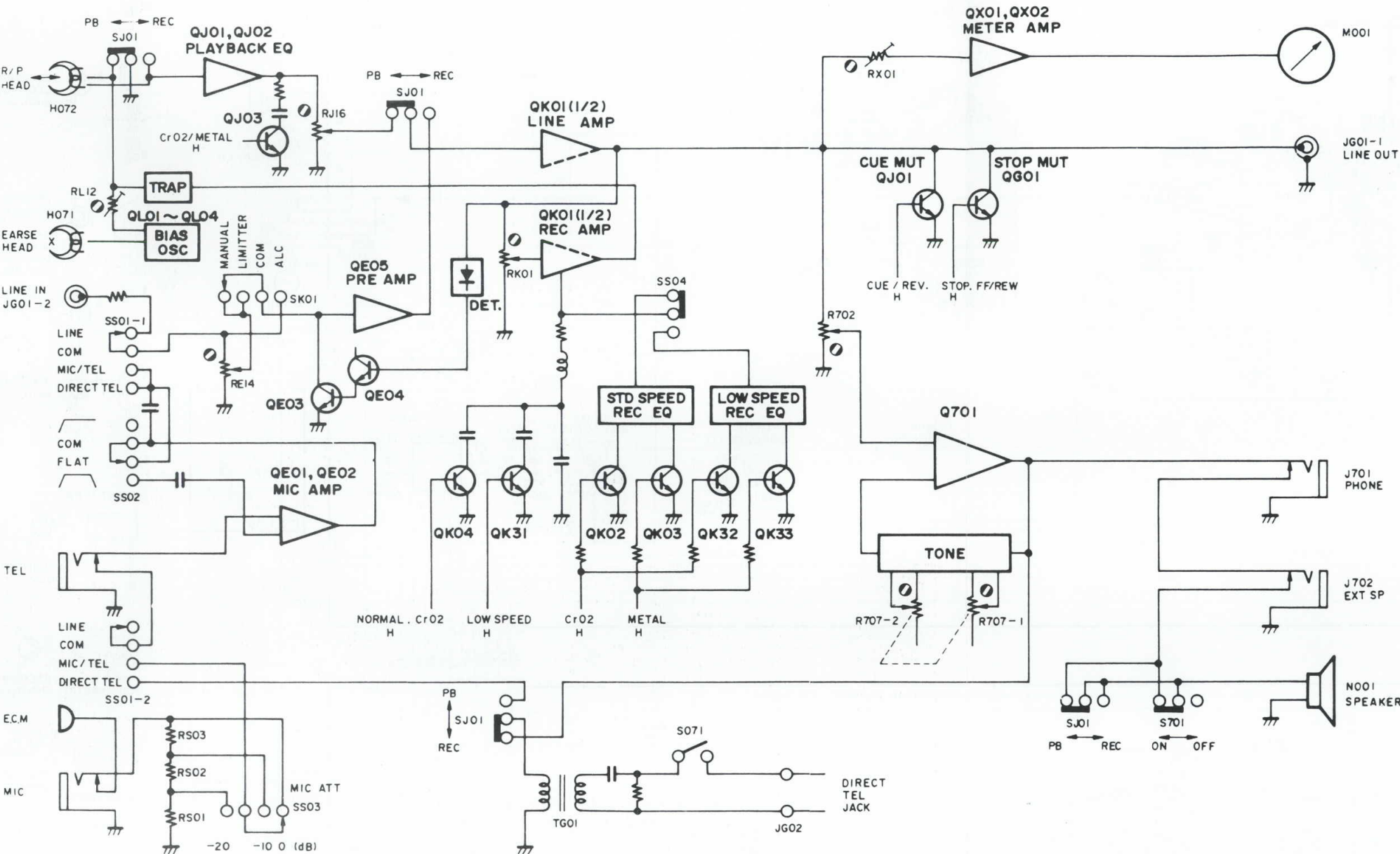
Battery Life

With Alkaline Batteries	
Playback Time	7.5 Hours
Recording Time with Metal Tape	5.5 Hours
With RB430 Battery Pack (optional)	
Playback Time	4.5 Hours
Recording Time with Metal Tape	4.0 Hours

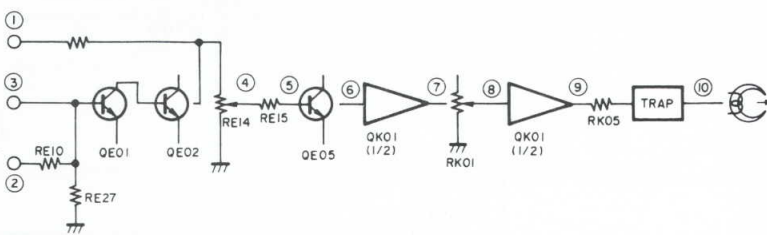
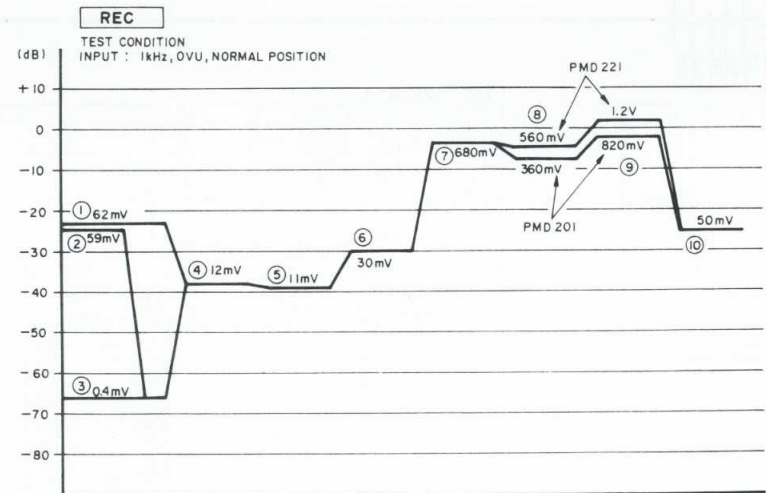
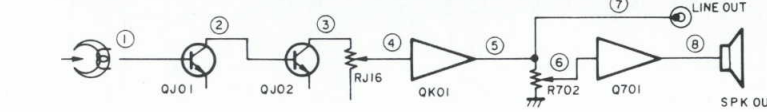
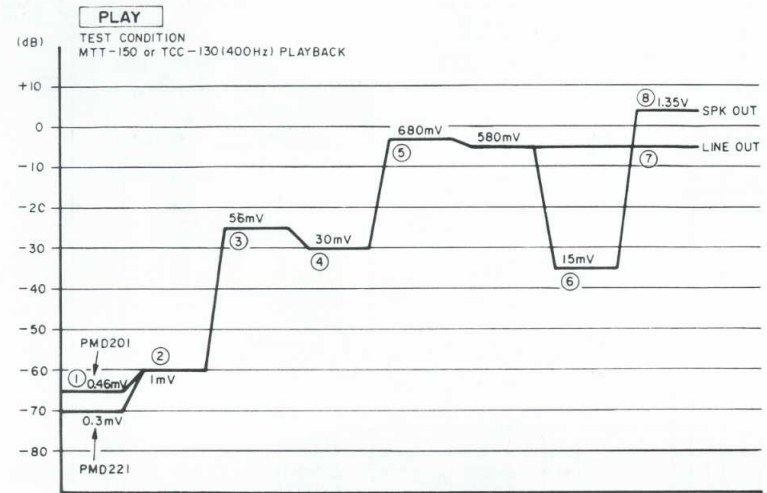
Unit Dimensions and Weight

Width	228 mm (9")
Height	51 mm (2")
Depth	165 mm (6.5")
Weight	1.3 kg (2.87 lbs.)

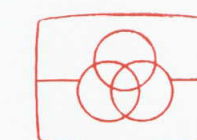
1. BLOCK DIAGRAM



Level Diagram

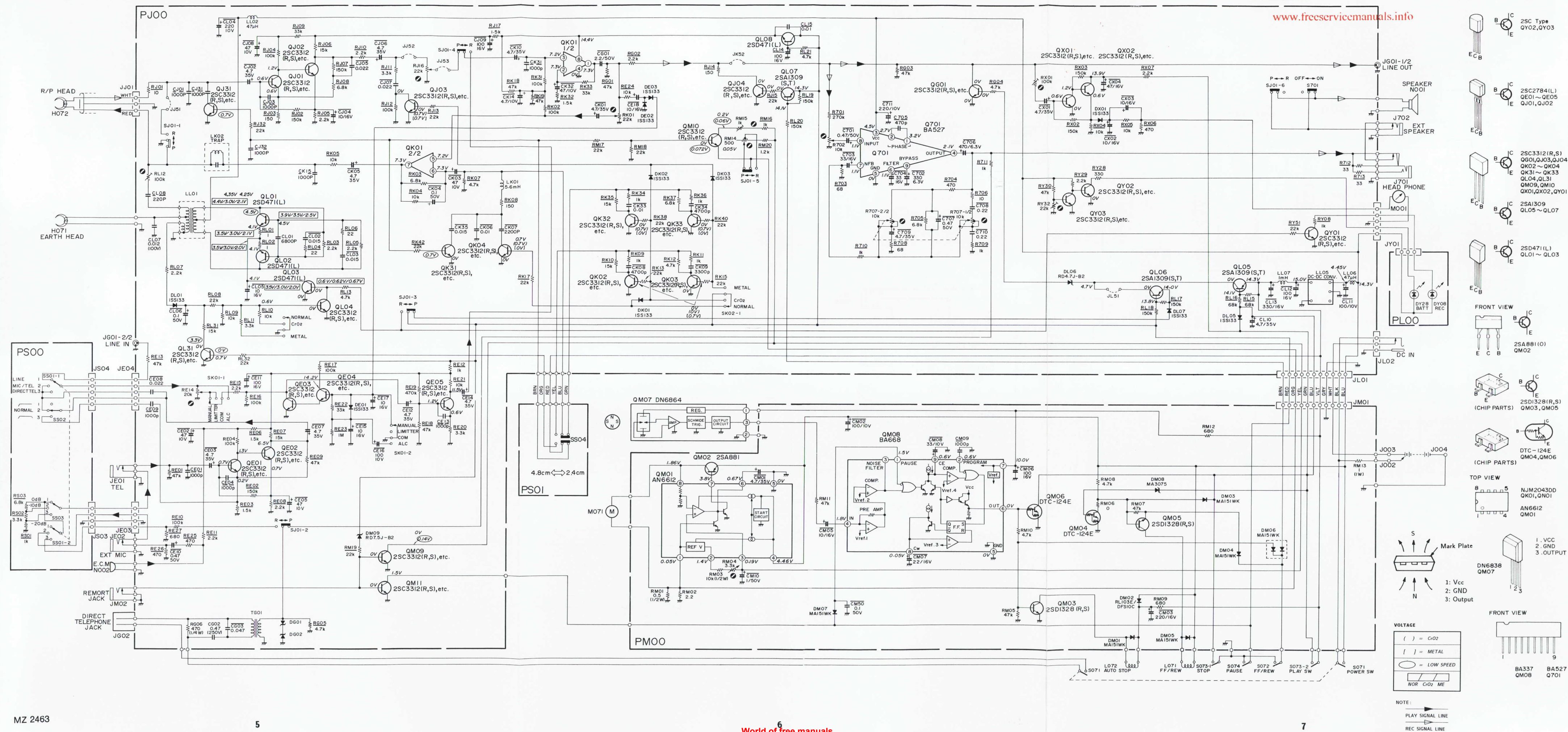


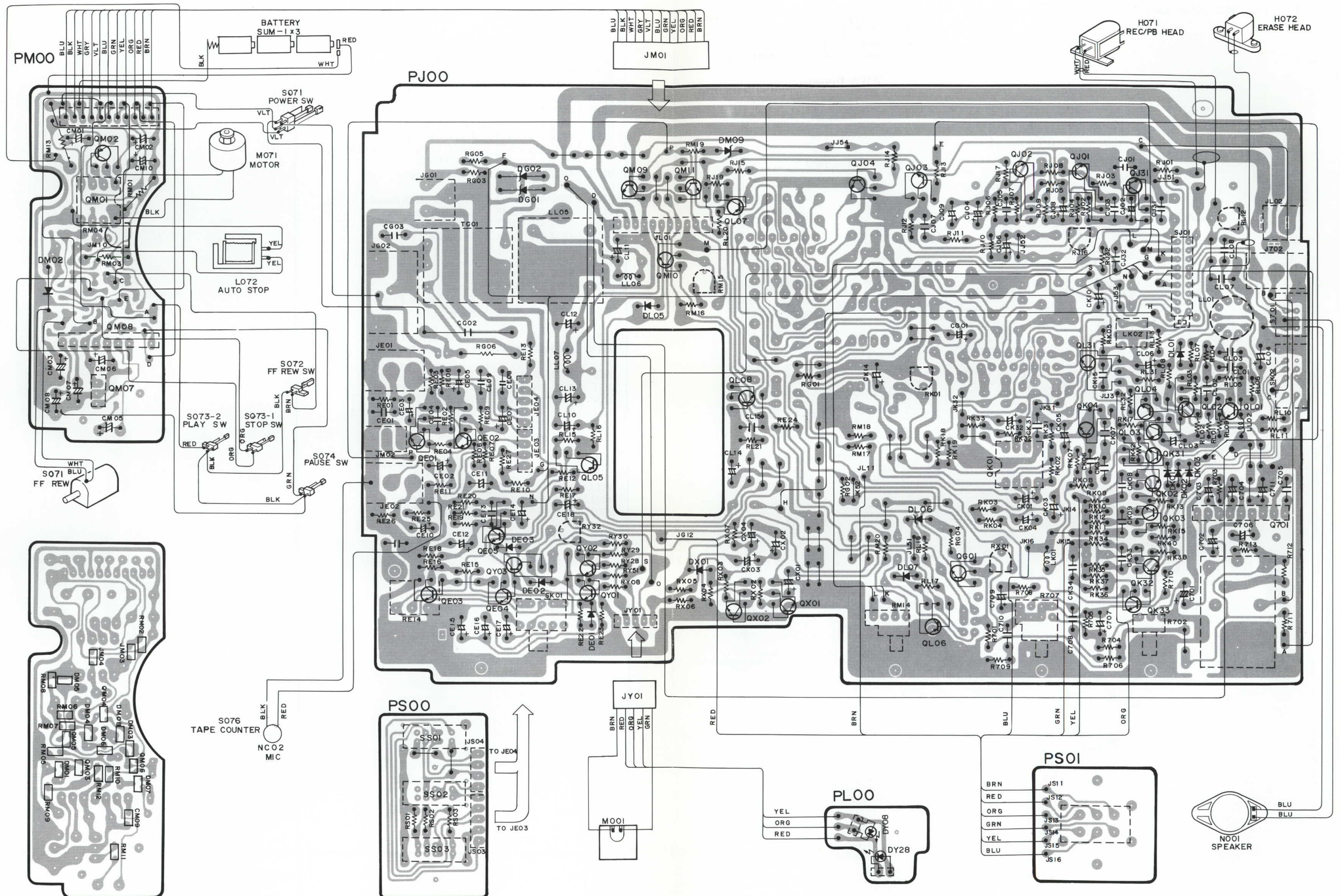
2. SCHEMATIC DIAGRAM AND PARTS LOCATION (Pattern Side)

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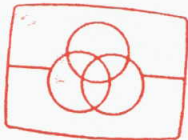
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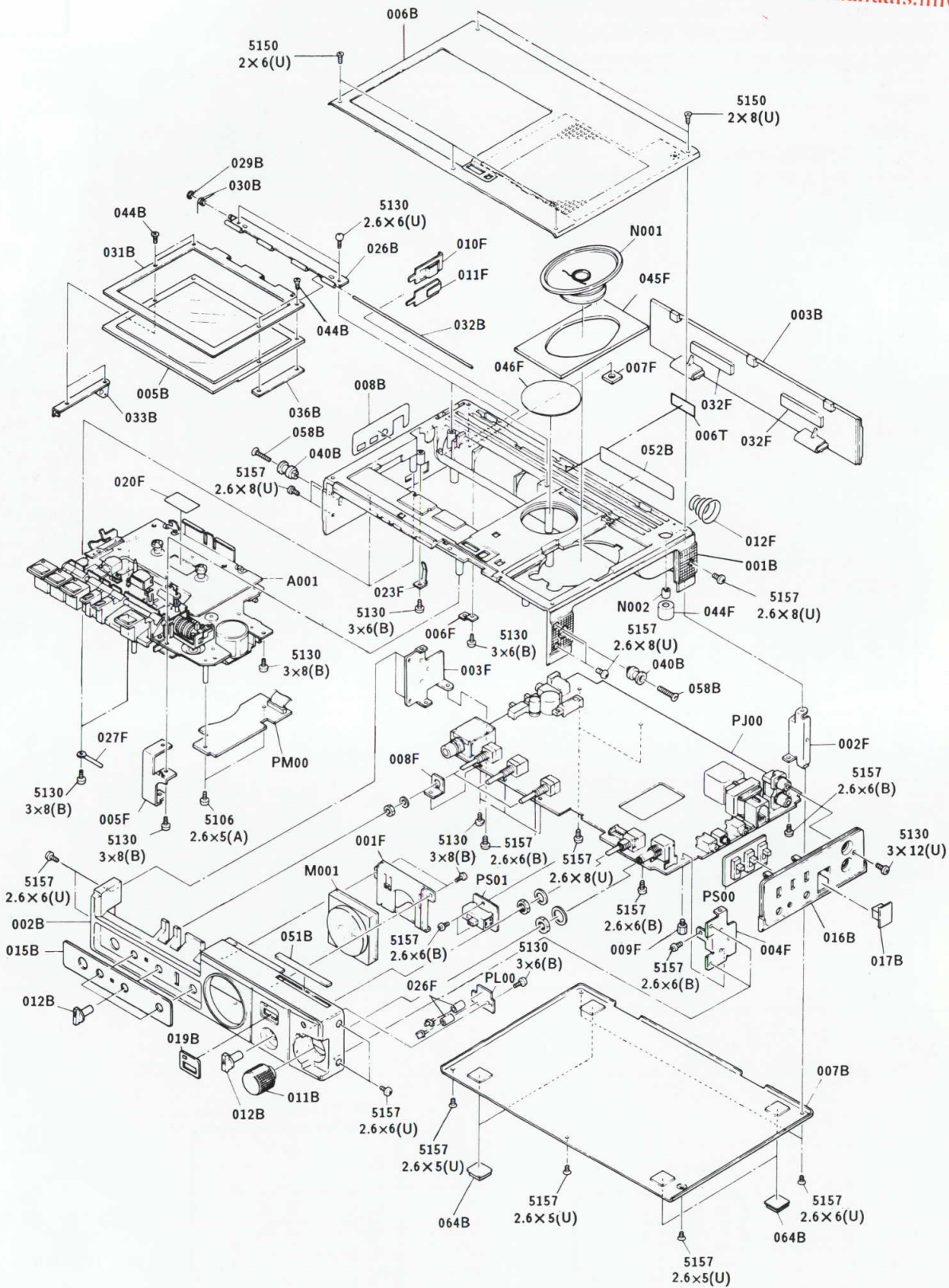


3. EXPLODED VIEW AND PARTS LIST

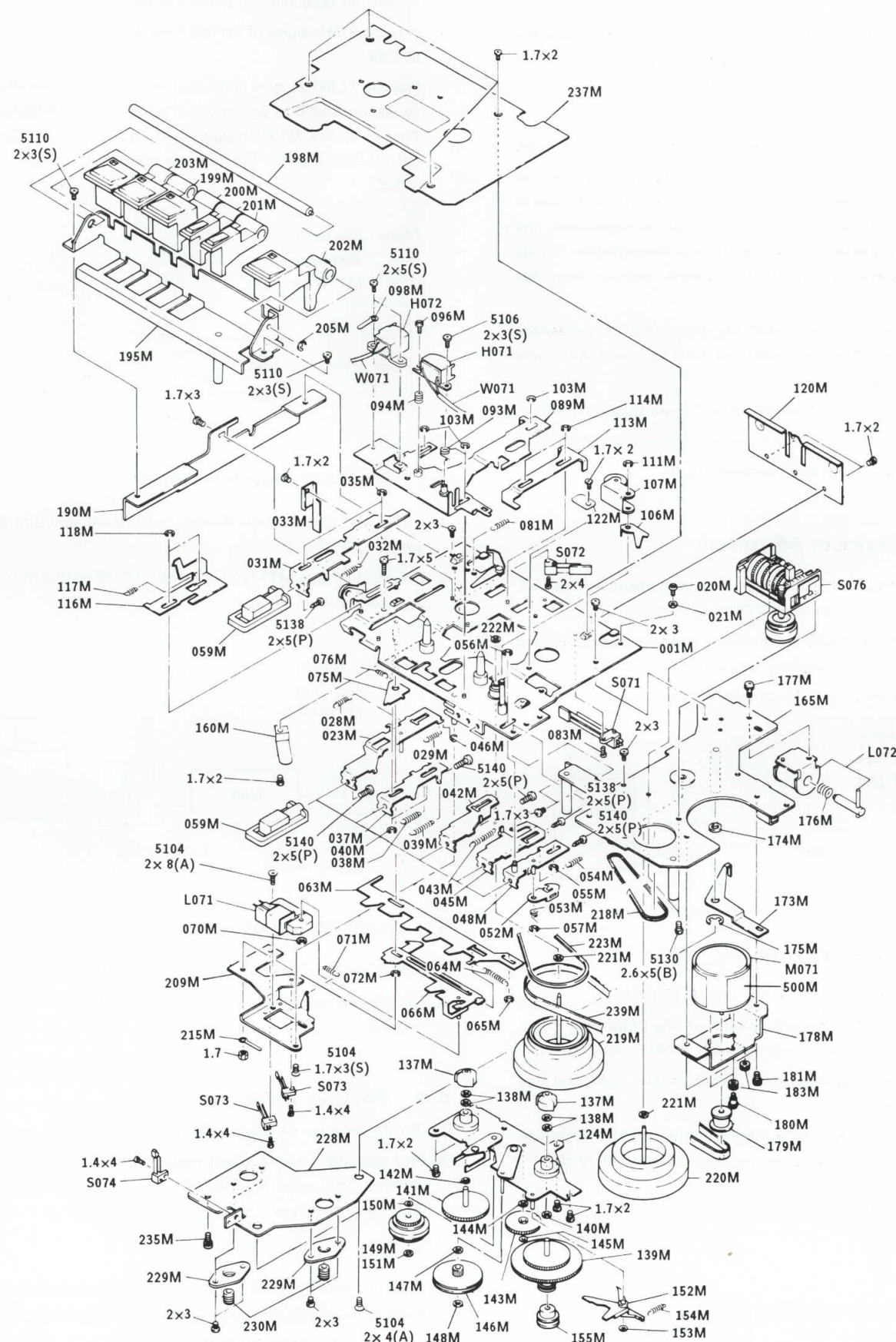


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REF. DESIG.	PART NO.	DESCRIPTION
001B	4822 443 40888	Case (A), Top
002B	4822 443 40889	Front Panel
003B	4822 426 50757	Lid, Battery
005B	4822 426 50759	Lid, (C) Cassette
006B	4822 443 30774	Cover (A), Top
007B	4822 443 30775	Cover (B), Bottom
008B	4822 459 10952	Label, Case (A)
011B	4822 413 41567	Knob, REC Level
012B	4822 412 20075	Knob, LEVEL, TONE, PITCH, REC MODE
015B	4822 454 12552	Indicator, Front
016B	4822 454 12553	Indicator, Jack Board
017B	4822 462 71649	Cap, Indicator
019B	4822 459 40657	Mask, Indicator
026B	4822 417 10854	Hinge Ass'y (A)
029B	4822 532 11301	RG Ring, E
030B	4822 492 41426	Spring
031B	4822 417 10853	Hinge (B)
040B	4822 532 11254	Collar
044B	4822 502 12163	F.H.M. Screw F2×4
051B	4822 459 10691	Badge
058B		F.H.M. Screw F3×18
064B	4822 462 40869	Leg, Cover (B)
010F	4822 290 60593	Terminal (+)
011F	4822 290 60594	Terminal
012F	4822 290 40212	Terminal (-)
018F	4822 502 30401	P. Tapped Screw P2.6×4
020F	4822 380 20226	Reflector
023F	4822 492 41427	Spring
A001		Mechanism Assembly
M001	4822 347 10303	V.U. Meter
N001	4822 240 30543	Speaker 4Ω 0.5W
N002	4822 242 30206	Mic Unit, ECM
001T	4822 736 20575	User Manual
001V	4822 498 20097	Strap
ZA01	4822 263 50114	A.C. Adaptor



REF. DESIG.	PART NO.	DESCRIPTION	REF. DESIG.	PART NO.	DESCRIPTION
020M		Screw	177M	4822 502 12426	L. Washer Screw L2.6×4
021M	4822 532 11285	Washer	180M		Screw, Motor
028M	4822 492 41462	Spring, S/F Select Cam	181M	4822 502 12426	L. Washer Screw L2.6×4
029M	4822 492 33146	Spring, Stop Lever	183M	4822 532 11956	Bushing, Motor
032M	4822 492 33149	Spring, REC Lever	199M	4822 410 24504	Button, Stop
035M	4822 532 52213	RG Ring, REC Lever	200M	4822 410 24505	Button, FWD
038M	4822 492 33152	Spring, Head Base	201M	4822 410 24506	Button, REW & FF
039M	4822 492 41463	Spring, FWD Lever	202M	4822 410 24507	Button, Pause
040M	4822 532 52213	RG Ring, FWD Lever	203M	4822 410 24508	Button, REC
043M	4822 492 41465	Spring, REW Lever	205M	4822 532 52212	RG Ring, Button Shaft
046M	4822 492 41658	Spring, FF Lever	218M	4822 358 30523	Belt, Counter
052M	4822 403 40299	Arm, Pause Lock Cam	219M	4822 528 60319	Flywheel
053M	4822 492 41424	Spring, Pause Lock Cam	220M	4822 528 60234	Flywheel Ass'y, Sub
054M	4822 492 33147	Spring, Pause Lever	221M	4822 532 11291	Washer, Under Flywheels
055M	4822 532 52213	RG Ring, Pause Lever	222M	4822 532 51805	Spacer, Oil Fence
056M	4822 532 52212	RG Ring, Pause Lever	223M	4822 358 30533	Belt, Drive
057M	4822 532 52213	RG Ring, Pause Cam	229M	4822 403 52968	Retainer
063M	4822 522 31987	Cam, Lock Plate	230M	4822 403 52724	Adjuster
064M	4822 492 41429	Spring, Lock Plate	235M	4822 502 12426	L. Washer Screw L2.6×4
065M	4822 532 52213	RG Ring, Lock Plate	239M	4822 358 30522	Belt, Main
066M	4822 522 31988	Cam, QMS Lock Plate Ass'y	H071	4822 249 10398	REC/Play Head
070M	4822 532 52213	RG Ring, E	H072	4822 249 40194	Erase Head
071M	4822 492 41466	Spring, QMS Lock Plate	L071	4822 281 30176	Solenoid Coil, QMS Auto REW
072M	4822 532 52212	RG Ring, Lock Plate	L072	4822 281 30179	Solenoid Coil, Auto Stop
076M	4822 492 41467	Spring, REC Inter Lock	M071	4822 361 60338	D.C. Motor
081M	4822 492 33151	Spring, REC Safety	S071	4822 271 30701	Mini Switch, Motor
083M		F.H.M. Screw F1.7×3	S072	4822 276 11618	Mini Switch, F/R
093M	4822 492 33148	Spring, Pinch Roller	S073	4822 271 30699	Mini Switch, Play/Stop
094M	4822 492 41461	Spring, Azimuth	S074	4822 271 30699	Mini Switch, Pause
096M	4822 502 13595	Screw, Azimuth	S076	4822 349 50339	Counter
103M	4822 532 52213	RG Ring, Head Base			
107M	4822 403 53998	Arm Ass'y, Pinch Roller			
111M	4822 532 52213	RG Ring, Pinch Arm			
114M	4822 532 52213	RG Ring, Switch C/R Lever			
117M	4822 492 41468	Spring, Hook Lever			
118M	4822 532 52213	RG Ring, Hook Lever			
120M	4822 492 41418	Spring, Cassette Back			
137M	4822 528 10777	Hub, Take-Up & S Reel Cap			
138M	4822 532 11286	Washer, Under Reel Cap			
139M	4822 522 31989	Gear, Take-Up Reel Gear Ass'y			
140M	4822 532 11285	Washer, Under Clutch			
141M	4822 522 31991	Gear, Supply Reel Gear Ass'y			
142M	4822 532 11285	Washer, Under Supply Reel Ass'y			
143M	4822 522 31994	Gear, FF			
144M	4822 532 11285	Washer, Under FF Gear			
145M	4822 532 52209	Washer, FF Gear			
146M	4822 528 50198	Pulley, FWD Idler			
147M	4822 532 11291	Washer, Under FWD Idler			
148M	4822 532 52208	Spacer, FWD Idler			
149M	4822 528 50199	Center Pulley Ass'y			
150M	4822 532 52207	Spacer, Under C Clutch			
151M	4822 532 52208	Spacer, C Pulley Ass'y			
152M	4822 403 40219	ARM, Shut OFF			
153M	4822 532 52211	Washer, Shut OFF Arm			
154M	4822 492 41422	Spring, Shut OFF Arm			
155M	4822 528 50193	Pulley Counter			
160M	4822 492 41419	Spring, Leaf			
174M	4822 532 11396	Washer, Auto Stop Link			
175M	4822 532 11296	RG Ring, Auto Stop Link			
176M	4822 492 41421	Spring, Auto Stop Solenoid			

4. MECHANISM AND CIRCUIT DESCRIPTION

4.1 Muting System

The muting circuit is provided to reduce the pops noise when generates on the Line Out at power ON/OFF.

1) When power is turned on

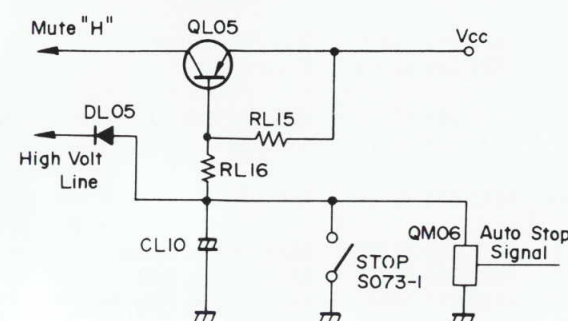
As the emitter voltage of QL05 is higher than the base voltage during the charge current flows to CL10 through RL15 & RL16, QL05 is ON and it sends the muting voltage.

CL10 has been charged up, both the base and the emitter voltages of QL05 are equal. QL05 is OFF and the muting is released.

2) When the STOP button is depressed

When the stop switch S073-1 is ON, the base current flows through. Also discharging CL10, QL05 is ON instantly, the muting system operates to reduce the pops noise at power ON/OFF. QM06 provides to discharge CL10 on AUTO STOP.

As the muting time is in proportional to capacitance of CL10, it is preset by matching the threshold time of TAPE EQ Amp. DL05 provides to discharge CL10 on FF and REW.

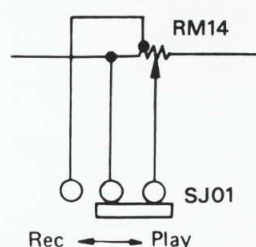


4.2 Auto Stop

The AUTO STOP function which detects the end of the tape is carried out by hole IC (QM07). The signal from QM07 is added to the pin ④ of QM08, while the auto stop duration is designated inside QM08. The time it takes for the auto stop function to activate after the tape stops, is determined in CM08. At this time TE is $TE = 75 \times CM08 (\mu F)mSec$, while TW is $TW = 30 \times CM07 (\mu F)mSec$ as long as the auto stop function is operating. When it does not shut off the first time, TE-TW-TE-TW is repeated until it shuts off.

4.3 Pitch Control

The pitch control is used to vary the tape speed for playback operation. During recording, it is automatically set to the RM14 center position by SJ01.

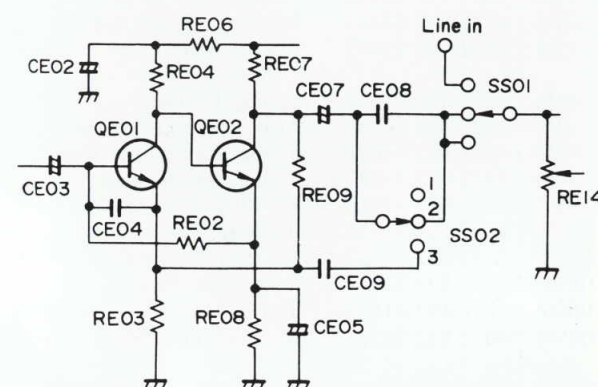


4.4 Ambient Noise Control (ANC)

ANC changes the bandwidth of the signals with the Mic Amp.

1. High pass
2. Normal
3. Band pass

CE08 and RE14 determine the Low Frequency cut. The NF volume of CE09 determines the High Frequency cut.

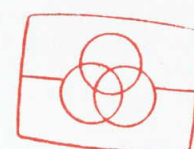
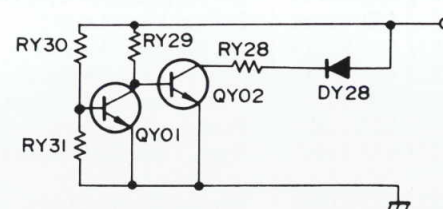


4.5 Low Battery Indicator

This circuit illuminates the LED when the supply voltage level is attenuated.

The dividing ratio for RY30 and RY31 determines the voltage at which the light is illuminated.

LED (DY28) is lit up when the base voltage of QY01 is less than about 0.6V.



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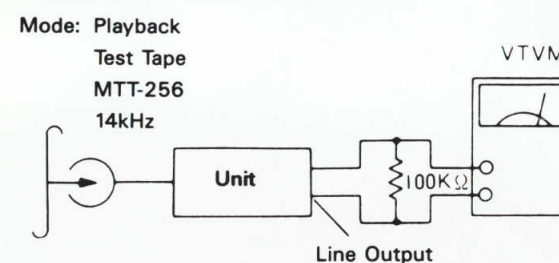
5. ELECTRICAL ADJUSTMENTS

Precautions for Adjustment and Measurement

1. Before playing back the test tape, thoroughly demagnetize the heads, capstan and similar metal parts using an erase, as the test tape-recorded tone is easily erased.
2. Do not place the test tape on any measuring instrument.
3. Do not put the test tape near a place where the eraser is used.
4. Method of Demagnetization: Turn the eraser power switch on at a position far away from the heads. Bring the eraser close to the heads, capstan and other parts to be demagnetized, and move it up and down four or five times to demagnetize. Slowly separate the eraser far away from the parts, and turn the power switch off.
5. Do not use any magnetized adjusting tool. If necessary, demagnetize with a bulk eraser from time to time in the course of each adjustment.
6. Do not turn semi-fixed resistor or coil more than needed.
7. Measure speed and wow and flutter in the normal operating state.
8. Do not apply locking bond excessively.

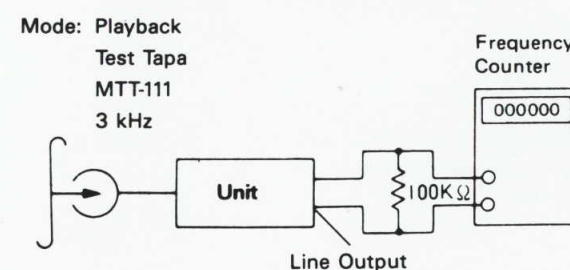
5.1 Head Azimuth Adjustment

1. Play the test tape MTT256 back. Adjust the head azimuth adjusting screw for maximum VTVM reading.
2. After adjustment, repeat the playback and stop settings several times to confirm no azimuth deviation.
3. After adjustment, lock the screws with bond.



5.2 Tape Speed Adjustment

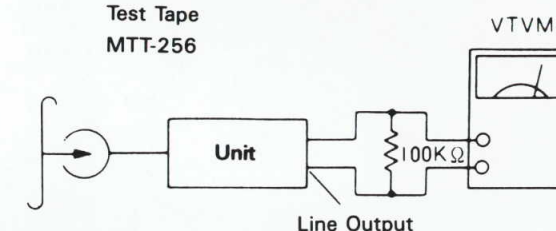
1. Play the 3kHz signal of the test tape MTT-111 back.
2. Adjust the adjusting resistor (RM04) on the PM00 P.W. Board so that counter readings are between 2990 - 3010Hz.
3. Then, adjust the Speed Selector Switch to LOW PLAY, and play MTT-111 back.
4. Adjust the adjusting resistor (RM15) on the PJ00 P.W. Board so that the counter readings are between 2900 - 3010 Hz.



5.3 Playback Equalizer Measurement

1. Adjust the tape selector switch to NORMAL.
2. Play the 315Hz signal of the test tape MTT-256 back. The VTVM at OdB.
3. Play the 12.5kHz signal of the test tape back. Confirm a frequency response of 0 to 2dB in reference to the 315Hz signal level. Then, play the 12.5kHz signal back. Set the tape selector to CrO₂, Metal. Confirm the 12.5kHz signal readings at - 4.5dB, ± 1dB.

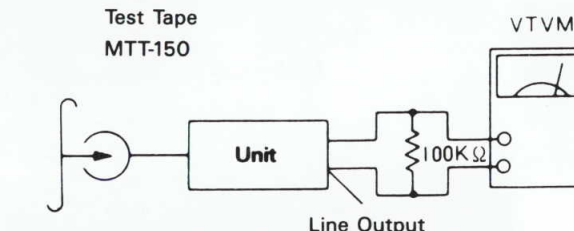
Mode: Playback
Test Tape
MTT-256



5.4 Playback Level Adjustment

1. Adjust the Tape Selector Switch to NORMAL and turn the NR switch OFF.
2. Play the test tape MTT-150 back. Adjust RJ16 so that the voltage of Line output is 580mV.

Mode: Playback
Test Tape
MTT-150



5.5 Level Meter Adjustment

1. Adjust the Tape Selector Switch to NORMAL.
2. Play the test tape MTT-150 back. Adjust RX01 at OdB Level Meter reading.

5.6 Playback Noise Measurement

1. Set the selector switch to NORMAL.
2. Play back the blank tape and make sure that the noise volume is below 2mV when the REC LEVEL Knob is set to both maximum and minimum.

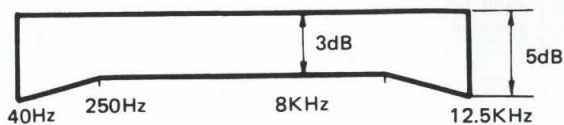
NOTES:

1. Perform measurements when the power hum is at a minimum.
2. Perform measurements under conditions where induction noise will not affect measurements.

5.7 Record/Playback Frequency Response and Recording Level Adjustment

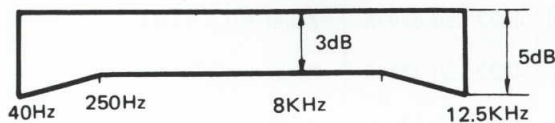
[NORMAL]

1. Set the tape selector switch to NORMAL.
2. Insert the AC-212 test tape in the cassette holder and set the recording conditions and attenuate from 1kHz, 580mV to -25dB on Line Out.
3. Rewind and play the tape back, then set RL12 so that the level of 1kHz is brought within ± 0.5 dB.
4. When playing the tape back, set RK01 so that the level of 1kHz is the same as that on the Rec Monitor.
5. After making these adjustments, record and play back at 1kHz, 10kHz, 12.5kHz. Make sure results comply with the following diagram.



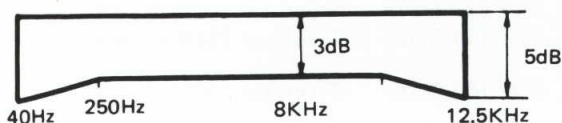
[CrO₂]

1. Set the tape selector switch to CrO₂.
2. Insert the AC-512 test tape in the cassette holder and set the recording conditions. Attenuate from 580mV to -25dB on Line Out with the attenuator and record at 1kHz, 10kHz, and 12.5kHz on an unrecorded section of the tape.
3. Record and playback at 1kHz, 10kHz, and 12.5kHz. Make sure results comply with the following diagram:



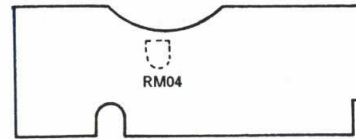
[METAL]

1. Adjust the Tape Selector Switch to METAL.
2. Load the test tape AC-712 into cassette holder. Perform measurements as with CrO₂, and make sure they conform with the Chart.

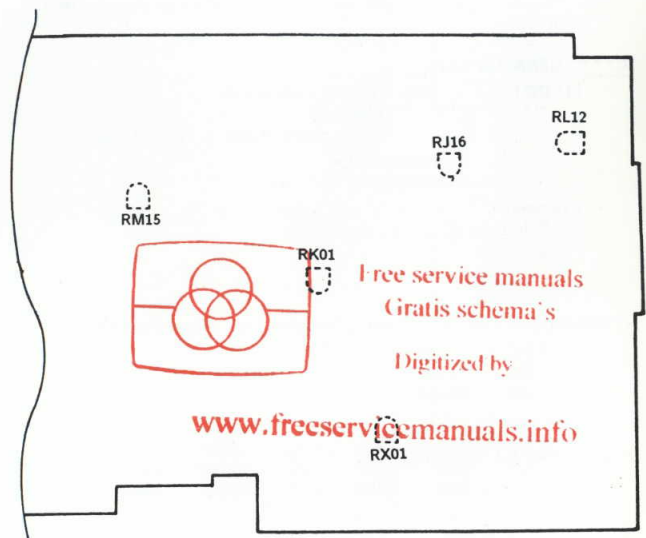


5.8 Alignment Points

PM00



PJ00



6. ELECTRICAL PARTS LIST

ASSIGNMENT OF COMMON PARTS CODES

RESISTOR

- R***** (1) GD05□□□140, Carbon film fixed resistor, $\pm 5\%$, 1/4W
R*** (2) GD05□□□160, Carbon film fixed resistor, $\pm 5\%$, 1/6W

① — Resistance value

Examples

① Resistance value

0.1 Ω ... 001 100 Ω ... 100 1k Ω ... 102 100k Ω ... 104
 0.5 Ω ... 005 18 Ω ... 180 2.7k Ω ... 272 680k Ω ... 684
 1 Ω ... 010 100 Ω ... 101 10k Ω ... 103 1M Ω ... 105
 6.8 Ω ... 068 390 Ω ... 391 22k Ω ... 223 2.2M Ω ... 225

(Note) Please distinguish 1/4W from 1/6W by the shape of parts used actually.

C*** : CERAMIC CAP.

- (1) DD1□□□370, Ceramic condenser

① Disc type
 ② Temp. coeff. P350 ~ N1000, 50V
 Capacity value
 Tolerance

Examples

① Tolerance (Capacity deviation)

$\pm 0.25\text{pF}$... 0
 $\pm 0.5\text{pF}$... 1
 $\pm 5\%$... 5

* Tolerance of COMMON PARTS handled here are as follows:

0.5pF ~ 5pF ... $\pm 0.25\text{pF}$
 6pF ~ 10pF ... $\pm 0.5\text{pF}$
 12pF ~ 560pF ... $\pm 5\%$

② Capacity value

0.5pF ... 005 3pF ... 030 100pF ... 101
 1pF ... 010 10pF ... 100 220pF ... 221
 1.5pF ... 015 47pF ... 470 560pF ... 561

C*** : CERAMIC CAP.

- (1) DK16□□□300, High dielectric constant ceramic condenser

① Disc type
 Temp. chara. 2B4, 50V
 Capacity value

Examples

① Capacity value

100pF ... 101 1000pF ... 102 10000pF ... 103
 470pF ... 471 2200pF ... 222

C*** : ELECTROLY CAP. (⚡), FILM CAP. (⚡)

- (1) EA□□□□□10, Electrolytic condenser

① One-way lead type, Tolerance $\pm 20\%$
 ② Dielectric strength
 Capacity value

Examples

① Capacity value

0.1 μF ... 104 4.7 μF ... 475 100 μF ... 107
 0.33 μF ... 334 10 μF ... 106 330 μF ... 337
 1 μF ... 105 22 μF ... 226 1000 μF ... 108
 2200 μF ... 228

② Working voltage

6.3V ... 006 25V ... 025
 10V ... 010 35V ... 035
 16V ... 016 50V ... 050

- (2) DF15□□□350, Plastic film condenser

① One-way type, Mylar $\pm 5\%$ 50V
 Capacity value

Examples

① Capacity value

0.001 μF (1000pF) ... 102 0.015 μF ... 153
 0.0018 μF ... 182 0.1 μF ... 104
 0.01 μF ... 103 0.56 μF ... 564
 1 μF ... 105

REF. DESIG.	PART NO.	DESCRIPTION
		PJ00-REC/PLAY AMP CIRCUIT BOARD
		PJ00-CAPACITORS
		Film 0.012 μF $\pm 5\%$
		PJ00-RESISTORS
CL07	4822 121 42768	
R702	4822 100 30096	10k Ω (A) Variable
R707	4822 100 30099	10k Ω (W) Variable
RE14	4822 100 30097	20k Ω (B) Variable
RJ16	4822 100 10922	22k Ω (B) Trimming
RK01	4822 100 10922	22k Ω (B) Trimming
RL12	4822 100 20188	100k Ω (B) Trimming
RM14	4822 100 30098	500 Ω (B) Variable
RM15	4822 100 20183	1k Ω (B) Trimming
RX01	4822 100 20188	100k Ω (B) Trimming
RY32	4822 100 10922	22k Ω (B) Trimming
		PJ00-SEMICONDUCTORS
DE01	4822 130 33305	Diode 1SS133
DE02	4822 130 33305	Diode 1SS133
DE03	4822 130 33305	Diode 1SS133
DK01	4822 130 33305	Diode 1SS133
DK02	4822 130 33305	Diode 1SS133
DK03	4822 130 33305	Diode 1SS133
DL01	4822 130 33305	Diode 1SS133
DL05	4822 130 33305	Diode 1SS133
DL06	4822 130 33758	Zener RD-4.7J-B2
DL07	4822 130 33305	Diode 1SS133
DM09	4822 130 82038	Zener RD-7.5J-B2
DX01	4822 130 33305	Diode 1SS133
Q701	4822 209 62229	IC BA527
QE01	4822 130 43313	Transistor 2SC3312 (R,S),etc.
QE02	4822 130 43313	Transistor 2SC3312 (R,S),etc.
QE03	4822 130 43313	Transistor 2SC3312 (R,S),etc.
QE04	4822 130 43313	Transistor 2SC3312 (R,S),etc.
QE05	4822 130 43313	Transistor 2SC3312 (R,S),etc.
QG01	4822 130 43313	Transistor 2SC3312 (R,S),etc.
QJ01	4822 130 43313	Transistor 2SC3312 (R,S),etc.
QJ02	4822 130 43313	Transistor 2SC3312 (R,S),etc.
QJ03	4822 130 43313	Transistor 2SC3312 (R,S),etc.
QJ04	4822 130 43313	Transistor 2SC3312 (R,S),etc.
QJ31	4822 130 43313	Transistor 2SC3312 (R,S),etc.
QK01	4822 209 83631	IC 4558 DD
QK02	4822 130 43313	Transistor 2SC3312 (R,S),etc.
QK03	4822 130 43313	Transistor 2SC3312 (R,S),etc.
QK04	4822 130 43313	Transistor 2SC3312 (R,S),etc.
QK31	4822 130 43313	Transistor 2SC3312 (R,S),etc.
QK32	4822 130 43313	Transistor 2SC3312 (R,S),etc.
QK33	4822 130 43313	Transistor 2SC3312 (R,S),etc.

REF. DESIG.	PART NO.	DESCRIPTION	REF. DESIG.	PART NO.	DESCRIPTION
QL01	4822 130 43347	Transistor 2SD471 L	PM00-SEMICONDUCTORS		
QL02	4822 130 43347	Transistor 2SD471 L	DM01	4822 130 43408	Diode Chip MA151WK
QL03	4822 130 43347	Transistor 2SD471 L	DM02	4822 130 32508	Diode RL1031E/DSF10C
QL04	4822 130 43313	Transistor 2SC3312 (R,S),etc.	DM03	4822 130 43408	Diode Chip MA151WK
QL05	4822 130 60088	Transistor 2SA1309 (S,T)	DM04	4822 130 43408	Diode Chip MA151WK
QL06	4822 130 60088	Transistor 2SA1309 (S,T)	DM05	4822 130 43408	Diode Chip MA151WK
QL07	4822 130 60088	Transistor 2SA1309 (S,T)	DM06	4822 130 43408	Diode Chip MA151WK
QL08	4822 130 43347	Transistor 2SD471 L	DM07	4822 130 43408	Diode Chip MA151WK
QL31	4822 130 43313	Transistor 2SC3312 (R,S),etc.	DM08	4822 130 32874	Zener MA3075
QM09	4822 130 43313	Transistor 2SC3312 (R,S),etc.	QM01	4822 209 83693	IC AN6612
QM10	4822 130 43313	Transistor 2SC3312 (R,S),etc.	QM02	5322 130 61158	Transistor 2SA881
QM11	4822 130 43313	Transistor 2SC3312 (R,S),etc.	QM03	4822 130 60749	Transistor 2SD1328 R.S Chip
QX01	4822 130 43313	Transistor 2SC3312 (R,S),etc.	QM04	4822 130 62236	Semicon. Comp DTC-124E K
QX02	4822 130 43313	Transistor 2SC3312 (R,S),etc.	QM05	4822 130 60749	Transistor 2SD1328 R.S Chip
QY01	4822 130 43313	Transistor 2SC3312 (R,S),etc.	QM06	4822 130 62236	Semicon. Comp DTC-124E K
QY02	4822 130 43313	Transistor 2SC3312 (R,S),etc.	QM07	4822 209 82278	IC DN6838
QY03	4822 130 43313	Transistor 2SC3312 (R,S),etc.	QM08	4822 209 83699	IC BA668
J701	4822 267 31175	Jack Headphone	PS00-INPUT SELECT CIRCUIT BOARD		
J702	4822 267 31172	Jack Ext SP	PS00-MISCELLANEOUS		
JE01	4822 267 31172	Jack Tel Pick up	SS01	4822 277 21389	Slide Switch Input Select
JE02	4822 267 31172	Jack Mic	SS02	4822 277 21389	Slide Switch Anc Select
JE03	4822 323 10125	Jumper Lead	SS03	4822 277 21389	Slide Switch Mic Att.
JE04	4822 323 10238	Jumper Lead	PS01-TAPE SPEED SELECT CIRCUIT BOARD		
JG01	4822 267 30604	Terminal Pin Jack 2P	SS04	4822 277 30751	Slide Switch Tape Speed
JL01	4822 265 10069	Jack Connector			
JL02	4822 265 10085	Jack DC IN			
JM02	4822 267 31174	Jack Remote			
JY01	4822 265 10071	Jack Connector			
LK01	4822 157 62213	Choke Coil 5.6mH			
LK02	4822 156 10845	Choke Coil Bias Trap 85kHz			
LL01	4822 157 62205	Osc Transf. Bias Osc Coil			
LL02	4822 156 10676	Choke Coil 47 μ H			
LL05	4822 146 10145	Osc Transf. DC-DC Converter			
LL06	4822 156 10676	Choke Coil 47 μ H			
LL07	4822 157 62204	Choke Coil 1mH			
S701	4822 277 30749	Slide Switch, Speaker ON/OFF			
SJ01	4822 277 21391	Slide Switch Rec/Play			
SK01	4822 273 10207	Rotary Switch Rec Mode			
SK02	4822 277 21388	Slide Switch Tape Select			
PL00-LED CIRCUIT BOARD					
PL00-MISCELLANEOUS					
DY08	4822 130 33211	LED Rec Ind. LN228PR			
DY28	4822 130 33173	LED Batt Ind.LN222RP			
PM00-MECHA CONTROL CIRCUIT BOARD					
PM00-RESISTORS					
RM01	4822 115 90189	0.5 Ω 1/2W			
RM03	4822 115 90191	10k Ω 1/2W			
RM04	4822 101 30706	3.3k Ω (B) Trimming			
RM13	4822 116 60321	4.7 Ω 1W			



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