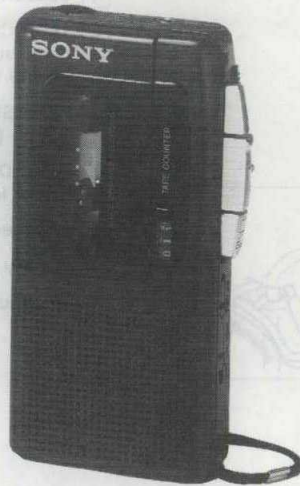


M-405/505

SERVICE MANUAL

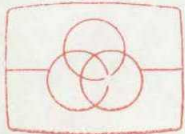


*US Model
Canadian Model
AEP Model
UK Model
E Model*

M-405

*Canadian Model
AEP Model
UK Model*

M-505



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PHOTO : M-505

Model Name Using Similar Mechanism	NEW
Tape Transport Mechanism Type	MZ-405-14 : M-405
	MZ-505-14 : M-505

SPECIFICATIONS

Tape **MICROCASSETTE™** (normal position type)
Recording system 2-track 1-channel monaural
Speaker Approx. 3.6 cm (1 7/16 inches) dia.
Tape speed 2.4 cm/s (1 5/16 ips), 1.2 cm/s (1 5/32 ips)
Frequency response 250 - 4,000 Hz (at 2.4cm position)
Output Earphone jack (minijack) for 8 - 300 ohms earphone
Power output 160 mW (at 10 % harmonic distortion)
Battery life (recording) Sony SUM-3 (NS): Approx. 6 hours
 Sony AM3 (N): Approx. 14 hours
Power requirements 3 V DC, two R6 (size AA) batteries
 DC IN 3V jack accepts:
 US, Canadian Model :
 • Sony AC-E30M AC power adaptor (not supplied) for use on 120V AC, 60Hz.
 AEP Model :
 • Sony AC-E30M AC power adaptor (not supplied) for use on 220V AC, 50Hz.
 UK Model :
 • Sony AC-E30M AC power adaptor (not supplied) for use on 240V AC, 50Hz.
 E Model :
 • Sony AC-E30M AC power adaptor (not supplied) for use on 120/220V AC, 50/60Hz.
 • Sony DCC-E130L car battery cord, (not supplied) for use with 12 V car battery.

Dimensions
 M-405: Approx. 66 × 119.5 × 25.5 mm (w/h/d)
 (2 5/8 × 4 3/4 × 1 1/16 inches) incl. projecting parts and controls
 M-505: Approx. 66 × 119.5 × 26.1 mm (w/h/d)
 (2 5/8 × 4 3/4 × 1 1/16 inches) incl. projecting parts and controls

Weight M-405: Approx. 155 g (5.5 oz.) incl. batteries
 M-505: Approx. 160 g (5.6 oz.) incl. batteries
Accessory supplied Carrying case (1), Microcassette (1), Batteries (2), Handstrap (1, M-505 only)

Design and specifications subject to change without notice.

Note

This appliance conforms with EEC Directive 87/308/EEC regarding interference suppression.

Note on the AC power adaptor

Use only the AC-E30M AC power adaptor (not supplied), Do not use any other AC power adaptor.



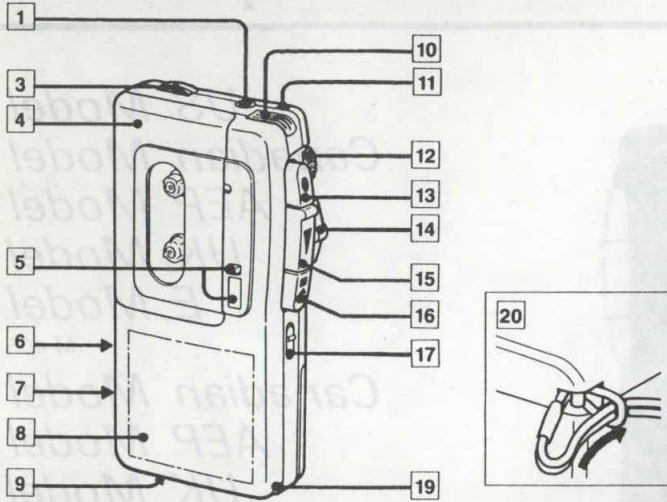
Polarity of the plug
(Unified polarity type)

MICROCASSETTE™ - CORDER
SONY®



This section is extracted from instruction manual.

PARTS IDENTIFICATION



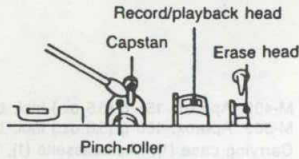
- 1 EAR (earphone) jack
- 3 VOL (volume) control
- 4 Cassette holder
- 5 TAPE COUNTER and counter reset button (M-505 only)
- 6 TAPE SPEED (2.4cm/1.2cm) switch (left side)
- 7 DC IN 3V (external power input) jack (left side)
- 8 Speaker (built-in)
- 9 Battery compartment (rear)
- 10 MIC (built-in microphone)
- 11 BATT (battery) indicator (M-505 only)
- 12 PAUSE switch
- 13 (recording) button
- 14 CUE-fast forward/ REVIEW-rewind control
- 15 (playback) button
- 16 (eject/stop) button
- 17 FAST PB (fast playback) switch
- 19 Handstrap catch
- 20 Handstrap (supplied with M-505 only)

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MAINTENANCE

Cleaning the heads

Clean the tape heads after every 10 hours of use to enjoy optimum sound. Moisten a cotton swab or a soft cloth with alcohol and wipe the parts shown in the illustration.

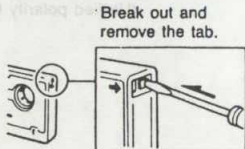


Cleaning the casing

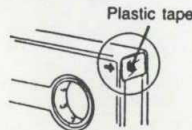
Clean the casing with a soft cloth slightly moistened with water or a mild detergent solution. Do not use alcohol, benzine or thinner as they may mar the finish.

Notes on Microcassette

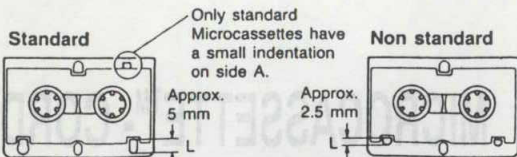
To protect cassettes from accidental erasure



To reuse a cassette
Cover the slot with plastic tape.



This unit uses only standard Microcassettes. Non standard cassettes cannot be used because their "L" dimension (see illustration) is different.



SERVICING NOTE

Repairing printed resistor

Cut both sides of the resistor and solder the carbon resistor having same value in place of printed one of the conductor side.

1/4W carbon resistor is supplied for the replacing part of the printed resistor.

Notes on chip component replacement

- Never reuse a disconnected chip component.
- Notice that the minus side of a tantalum capacitor may be damaged by heat.

SECTION 1 ADJUSTMENTS

1-1. MECHANICAL ADJUSTMENT AND MEASUREMENT

PRECAUTION

1. Clean the following parts with a denatured alcohol-moistened swab :

record/playback head	pinch roller
erase head	rubber belts
capstan	
2. Demagnetize the record/playback head with a head demagnetizer. (Do not bring the head demagnetizer close to the erase head)
3. Do not use a magnetized screwdriver for the adjustments.
4. The adjustments should be performed with the rated power supply voltage unless otherwise noted.

Power supply voltage : 3Vdc
TAPE SPEED switch : 2.4cm

Torque Measurement

Torque	Meter Reading	Torque Meter
Forward	5 ~ 13g · cm (0.07 ~ 0.18oz · inch)	CQ-103M
Fast Forward	5 ~ 13g · cm (0.07 ~ 0.18oz · inch)	CQ-201M
Rewind	more than 20g · cm (more than 0.28oz · inch)	CQ-201M

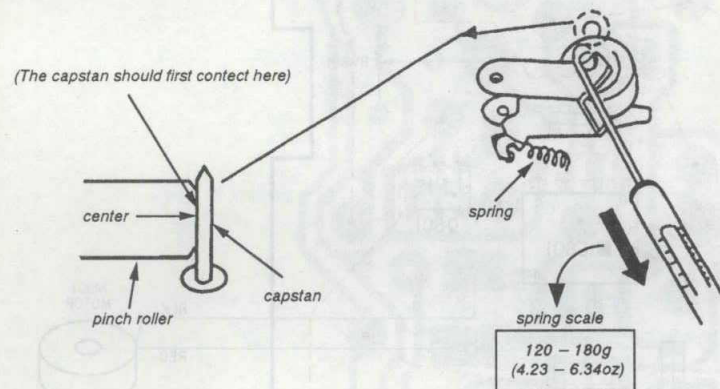
Tape Tension Measurement

Meter	Meter Reading
CQ-403M	more than 40g · cm (more than 0.56oz · inch)

Pinch Roller Pressure Adjustment

- Playback Mode -

Slowly return the pinch roller and read the spring scale just when the pinch roller starts rotating.



1-2. ELECTRICAL ADJUSTMENTS

Test Tape

Type	Signal	Used for	Tape Speed (cm/s)
WS-12			1.2
WS-24	3kHz, -10dB	Tape Speed Adjustment	2.4
S-2-A030	3kHz, -20dB	Head Azimuth Adjustment	2.4

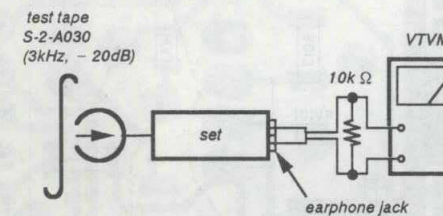
Record/Playback Head Azimuth Adjustment

setting :

VOLUME control : mechanical mid
TAPE SPEED switch : 2.4cm/s
VOR switch : OFF

Procedure :

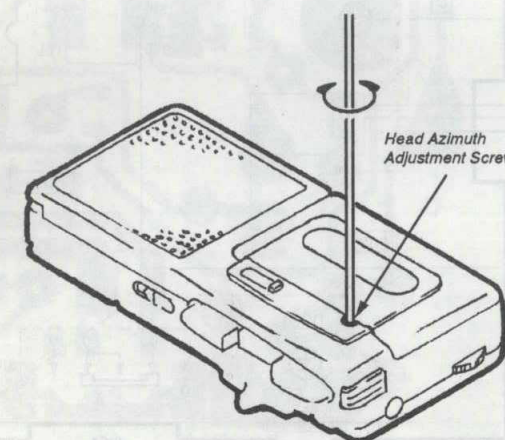
1. Mode : playback



2. Turn the adjustment screw to obtain the maximum reading on VTVM.

Note : Several peaks may appear, but take the maximum.

Adjustment Location :



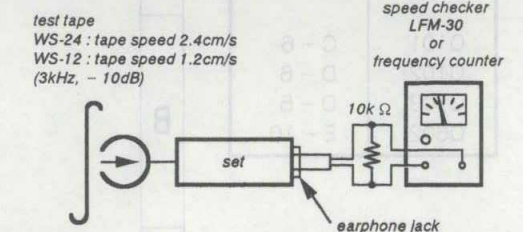
Tape Speed adjustment

Setting :

VOLUME control : mechanical mid
VOR switch : OFF

Procedure :

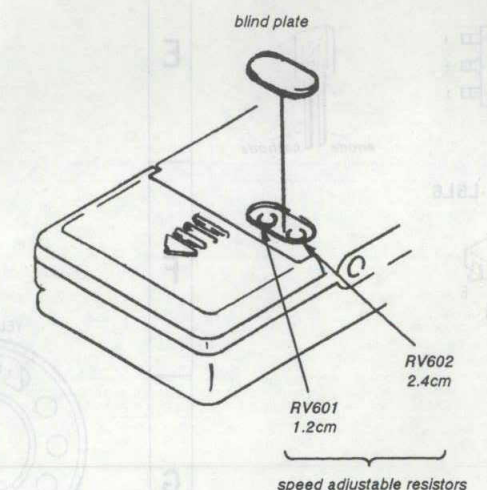
- Reform 2.4cm/s speed adjustment before 1.2cm/s speed adjustment
- mode : Playback



Tape speed	Speed checker	Frequency counter
2.4cm/s	± 2%	2,940~3,060Hz
1.2cm/s	± 2%	1,470~1,530Hz

Frequency difference between the beginning and the end of the tape should be within 0.5%.
2.4cm/s (15Hz)
1.2cm/s (7.5Hz)

Adjustment Location :



SECTION 2 DIAGRAMS

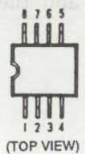
• SEMICONDUCTOR LOCATION

Ref. No.	Location
D101	C - 5
D102	C - 7
D201	G - 3
IC101	E - 5
IC601	E - 9
Q101	C - 6
Q102	D - 6
Q103	D - 5
Q602	E - 10

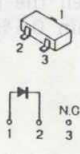
2-1. PRINTED WIRING BOARDS

• SEMICONDUCTOR LEAD LAYOUTS

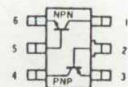
NJM2073M
LA5521M



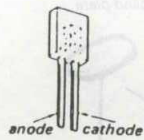
DA204U



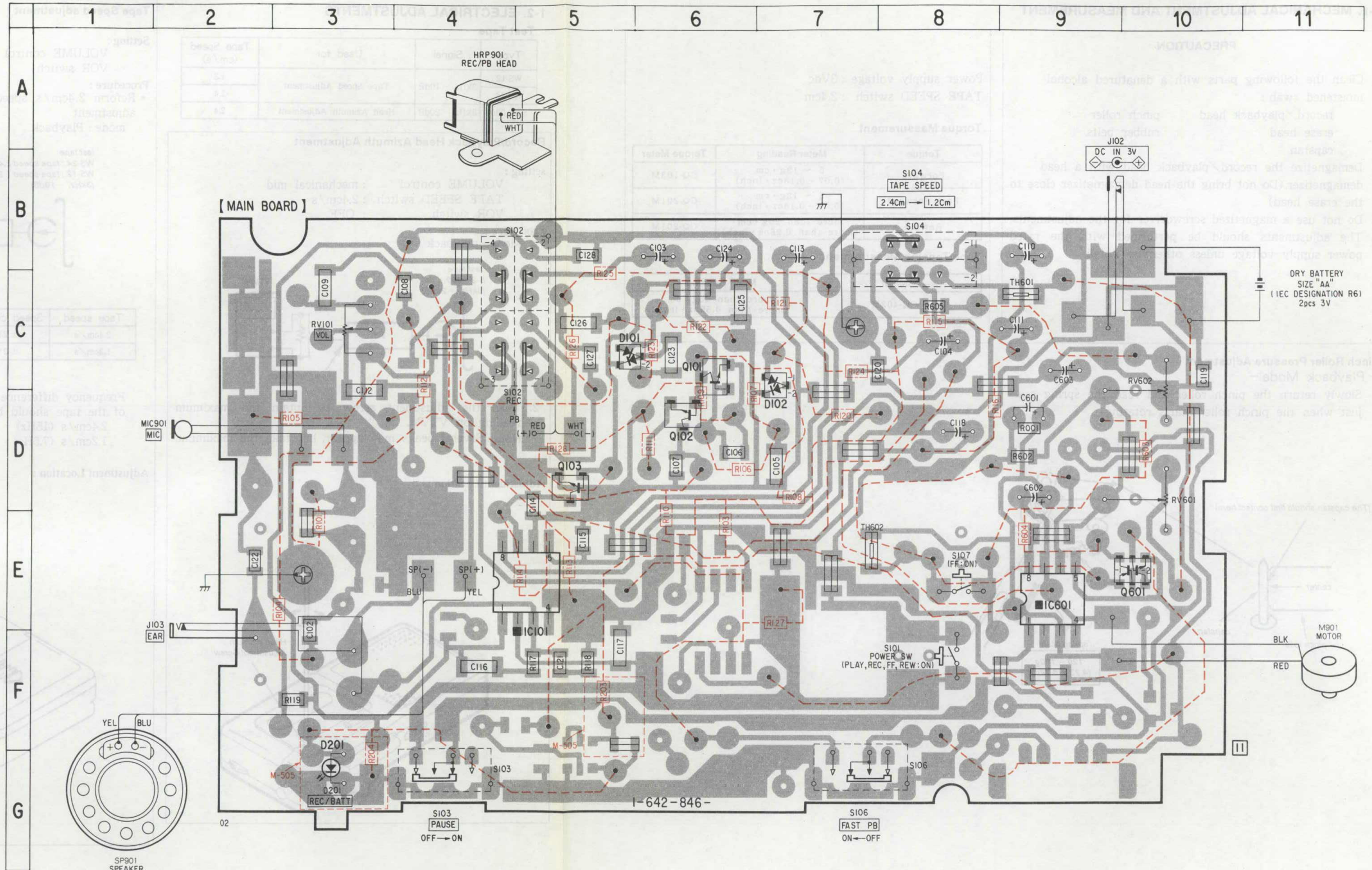
XN4312



GL8PR42



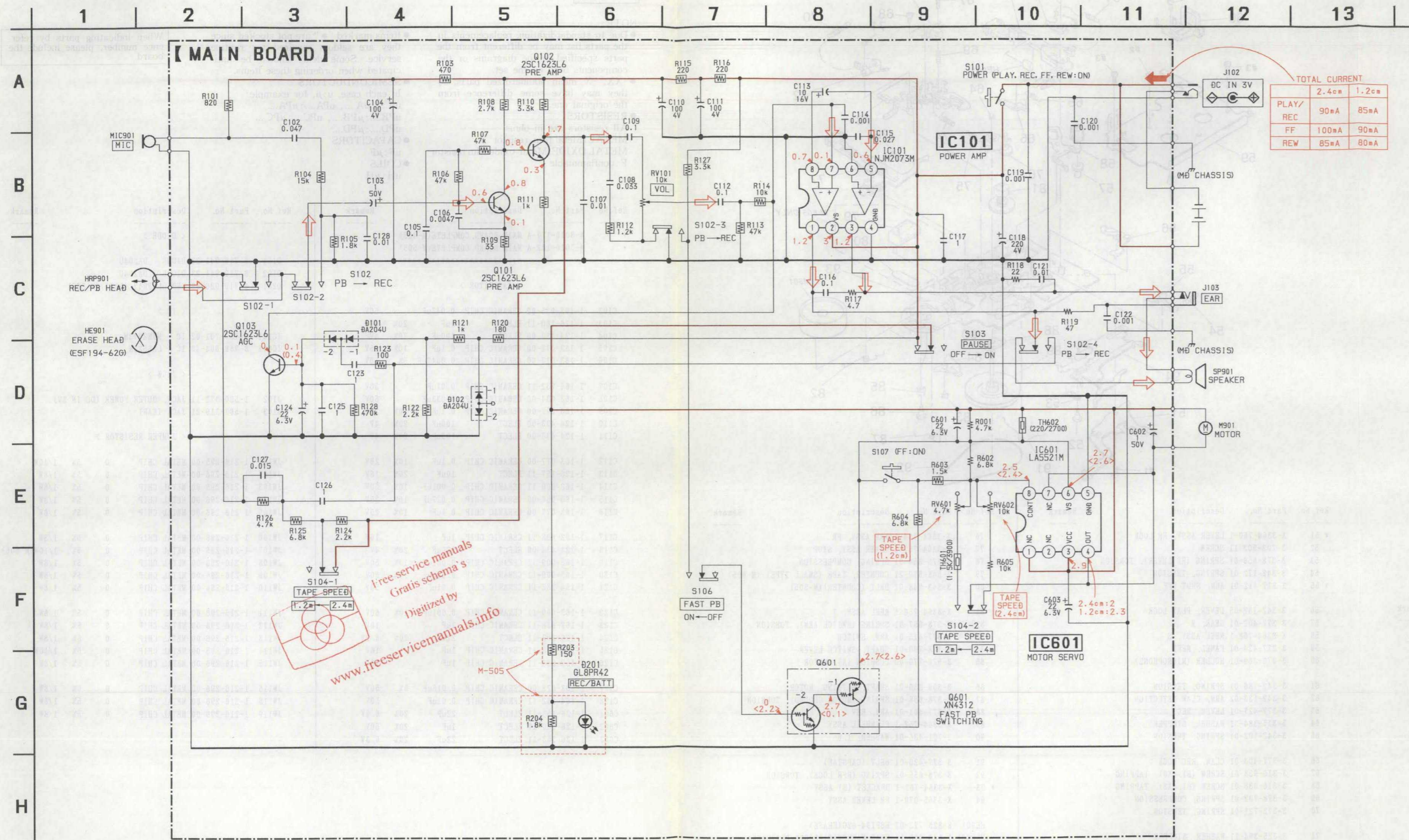
2SC1623-L5L6



Note :

- : parts extracted from the component side.
- : parts mounted on the conductor side.
- : Through hole.
- ▨ : Pattern on the side which is seen.
- ⋯ : Pattern of the rear side.
- : printed resistor.

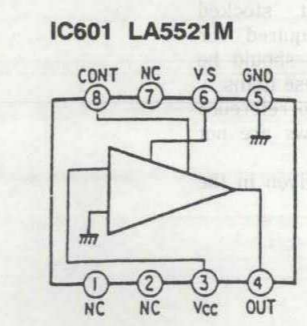
2-2. SCHEMATIC DIAGRAM



TOTAL CURRENT

	2.4cm	1.2cm
PLAY/REC	90mA	85mA
FF	100mA	90mA
REW	85mA	80mA

IC BLOCK DIAGRAM



- Note:
- All capacitors are in μF unless otherwise noted. pF: $\mu \mu F$. 50WV or less are not indicated except for electrolytics and tantalums.
 - All resistors are in Ω and $\frac{1}{4}W$ or less unless otherwise specified.
 - : printed resistor.
 - : B+ Line
 - : adjustment for repair.
 - Total current is measured with no cassette installed.
 - Power voltage is dc 3V and fed with regulated dc power supply from external power voltage jack.
 - Voltage and waveforms are dc with respect to ground under no-signal conditions.
 - no mark : PLAY
 - () : REC
 - () : FAST PLAY
 - Voltages are taken with a VOM (input impedance 10M Ω). Voltage variations may be noted due to normal production tolerances.
 - Signal path.
 - : PLAY

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SECTION 3 EXPLODED VIEWS

NOTE:
-XX, -X mean standardized parts, so they may have some differences from the original one.
The construction parts of an assembled part are indicated with a collation number in the remark column.
Color indication of Appearance Parts
Example:
KNOB, BALANCE (WHITE)....(RED)
Parts color Cabinet's color

Items marked "*" are not stocked since they are seldom required for routine service. Some delay should be anticipated when ordering these items.
The mechanical parts with no reference number in the exploded views are not supplied.
Hardware (# mark) list is given in the last of this parts list.

3-1. GENERAL SECTION

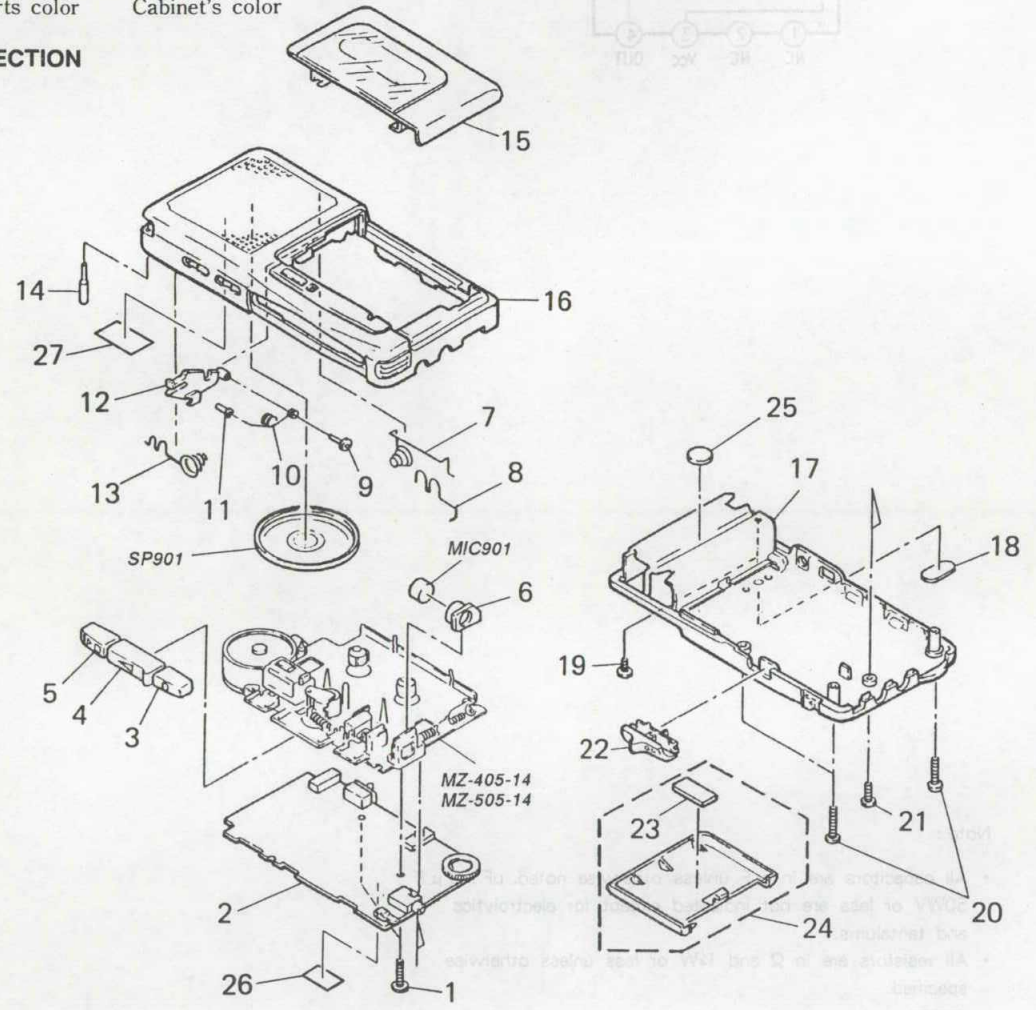


Table with 4 columns: Ref.No., Part No., Description, Remark. Lists parts 1 through 14 including screws, main boards, buttons, and springs.

Table with 4 columns: Ref.No., Part No., Description, Remark. Lists parts 15 through 27 including lid assemblies, cabinet parts, and cushions.

3-2. MECHANISM SECTION (MZ-405-14) : M-405, (MZ-505-14) : M-505

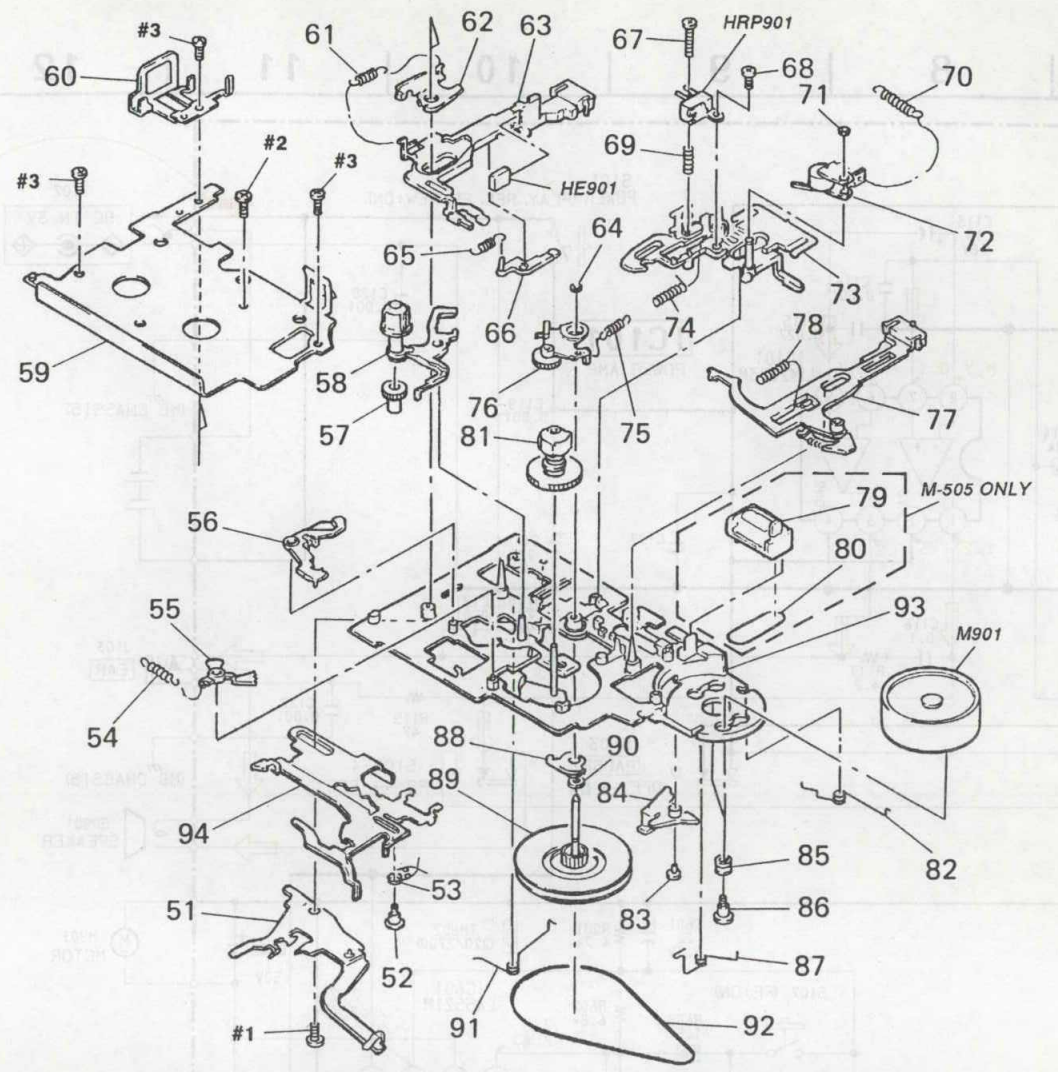


Table with 4 columns: Ref.No., Part No., Description, Remark. Lists parts 51 through 75 including levers, gears, springs, and arms.

Table with 4 columns: Ref.No., Part No., Description, Remark. Lists parts 76 through 94 including reel assembly, lever, arm, shaft, and belt.

SECTION 4 ELECTRICAL PARTS LIST

MAIN

NOTE:
Due to standardization, replacements in the parts list may be different from the parts specified in the diagrams or the components used on the set.
-XX, -X mean standardized parts, so they may have some difference from the original one.
RESISTORS
All resistors are in ohms
METAL: Metal-film resistor
METAL OXIDE: Metal oxide-film resistor
F: nonflammable

Items marked "*" are not stocked since they are seldom required for routine service. Some delay should be anticipated when ordering these items.
SEMICONDUCTORS
In each case, u:μ, for example:
uA.....:μA....., uPA.....:μPA.....
uPB.....:μPB....., uPC.....:μPC.....
uPD.....:μPD.....
CAPACITORS
uF:μF
COILS
uH:μH

When indicating parts by reference number, please include the board.

Table with 4 columns: Ref.No., Part No., Description, Remark. Lists electronic components like capacitors, resistors, and diodes.

Table with 4 columns: Ref.No., Part No., Description, Remark. Lists electronic components like diodes, ICs, and jacks.

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MAIN

Ref.No.	Part No.	Description	Remark
< TRANSISTOR >			
Q101	8-729-120-28	TRANSISTOR 2SC1623-L5L6	
Q102	8-729-120-28	TRANSISTOR 2SC1623-L5L6	
Q103	8-729-120-28	TRANSISTOR 2SC1623-L5L6	
Q601	8-729-420-20	TRANSISTOR XN4312	
< RESISTOR >			
R001	1-216-065-00	METAL CHIP 4.7K 5% 1/10W	
R101	1-249-416-11	CARBON 820 5% 1/4W	
R103	1-249-413-11	CARBON 470 5% 1/4W	
R104	1-249-431-11	CARBON 15K 5% 1/4W	
R105	1-249-420-11	CARBON 1.8K 5% 1/4W	
R106	1-249-437-11	CARBON 47K 5% 1/4W	
R107	1-249-437-11	CARBON 47K 5% 1/4W	
R108	1-249-422-11	CARBON 2.7K 5% 1/4W	
R109	1-249-399-11	CARBON 33 5% 1/4W	
R110	1-249-423-11	CARBON 3.3K 5% 1/4W	
R111	1-249-417-11	CARBON 1K 5% 1/4W	
R112	1-249-418-11	CARBON 1.2K 5% 1/4W	
R113	1-249-437-11	CARBON 47K 5% 1/4W	
R114	1-249-429-11	CARBON 10K 5% 1/4W	
R115	1-249-409-11	CARBON 220 5% 1/4W	
R116	1-249-409-11	CARBON 220 5% 1/4W	
R117	1-216-308-00	METAL CHIP 4.7 5% 1/10W	
R118	1-216-009-00	METAL CHIP 22 5% 1/10W	
R119	1-216-017-00	METAL CHIP 47 5% 1/10W	
R120	1-249-408-11	CARBON 180 5% 1/4W	
R121	1-249-417-11	CARBON 1K 5% 1/4W	
R122	1-249-421-11	CARBON 2.2K 5% 1/4W	
R123	1-249-405-11	CARBON 100 5% 1/4W	
R124	1-249-421-11	CARBON 2.2K 5% 1/4W	
R125	1-249-427-11	CARBON 6.8K 5% 1/4W	
R126	1-249-425-11	CARBON 4.7K 5% 1/4W	
R127	1-249-423-11	CARBON 3.3K 5% 1/4W	
R128	1-215-485-00	METAL 470K 1% 1/6W	
R203	1-249-407-11	CARBON 150 5% 1/4W(M-505)	
R204	1-249-420-11	CARBON 1.8K 5% 1/4W(M-505)	
R602	1-216-069-00	METAL CHIP 6.8K 5% 1/10W	
R603	1-249-419-11	CARBON 1.5K 5% 1/4W	
R604	1-249-427-11	CARBON 6.8K 5% 1/4W	
R605	1-216-073-00	METAL CHIP 10K 5% 1/10W	
< VARIABLE RESISTOR >			
RV101	1-237-731-21	RES, VAR, CARBON 10K (VOL)	
RV601	1-228-993-00	RES, ADJ, METAL 4.7K (1.2cm)	
RV602	1-228-994-00	RES, ADJ, METAL 10K (2.4cm)	
< SWITCH >			
S101	1-572-288-11	SWITCH, PUSH (POWER)	
S102	1-572-246-11	SWITCH, SLIDE (REC/PB)	
S103	1-571-275-31	SWITCH, SLIDE (PAUSE)	

Ref.No.	Part No.	Description	Remark
S104	1-571-478-11	SWITCH, SLIDE (TAPE SPEED)	
S106	1-571-275-31	SWITCH, SLIDE (FAST PB)	
S107	1-572-288-11	SWITCH, PUSH (FF)	
< THERMISTOR >			
TH601	1-808-956-11	THERMISTOR, POSITIVE	
TH602	1-809-757-21	THERMISTOR, POSITIVE	

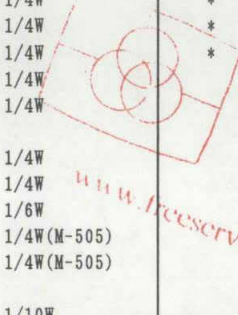
MISCELLANEOUS			

79	1-548-579-21	COUNTER, TAPE (SMALL TYPE) (M-505)	
M901	1-541-961-11	MOTOR, DC	
HE901	8-825-772-01	ESF194-62G (ERASE)	
SP901	1-544-657-11	SPEAKER (3.6CM)	
HRP901	1-543-918-11	HEAD, MAGNETIC (RECORD/PLAYBACK)	
MIC901	1-542-080-11	MICROPHONE, BUILT-IN	

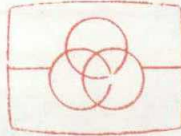
ACCESSORIES & PACKING MATERIALS			

*	3-338-735-01	BAG, PROTECTION (EXCEPT M-405:US)	
*	3-358-325-01	CASE, CARRYING (UK)	
*	3-376-612-01	CUSHION (EXCEPT M-405:US)	
*	3-376-613-01	INDIVIDUAL CARTON (M-405:Canadian, E)	
*	3-376-615-01	INDIVIDUAL CARTON (M-405:UK)	
*	3-376-623-01	INDIVIDUAL CARTON (M-505:Canadian)	
*	3-376-625-01	INDIVIDUAL CARTON (M-505:UK)	
*	3-381-315-01	INDIVIDUAL CARTON (M-405:AEP)	
*	3-381-316-01	INDIVIDUAL CARTON (M-505:AEP)	
	3-754-871-11	MANUAL, INSTRUCTION (ENGLISH/FRENCH/ SPANISH/PORTUGUESE) (AEP, E)	
	3-754-871-21	MANUAL, INSTRUCTION (ENGLISH) (M-405:US)	
	3-754-871-31	MANUAL, INSTRUCTION (ENGLISH/FRENCH) (Canadian)	
	3-754-871-41	MANUAL, INSTRUCTION (GERMAN/SWEDISH/ITALIAN/DUTCH) (AEP)	
	3-754-871-51	MANUAL, INSTRUCTION (ENGLISH) (UK)	
	X-3338-703-1	STRAP ASSY (M-505)	

***** HARDWARE LIST *****			
#1	7-627-850-07	SCREW, PRECISION +P 1.4X2	
#2	7-627-551-57	SCREW, PRECISION +P 1.4X3	
#3	7-627-551-68	SCREW, PRECISION +P 1.4X3.5	



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US Model
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CORRECTION-2

File this Correction with the Service Manual.

Canadian Model
AEP Model
UK Model

M-505

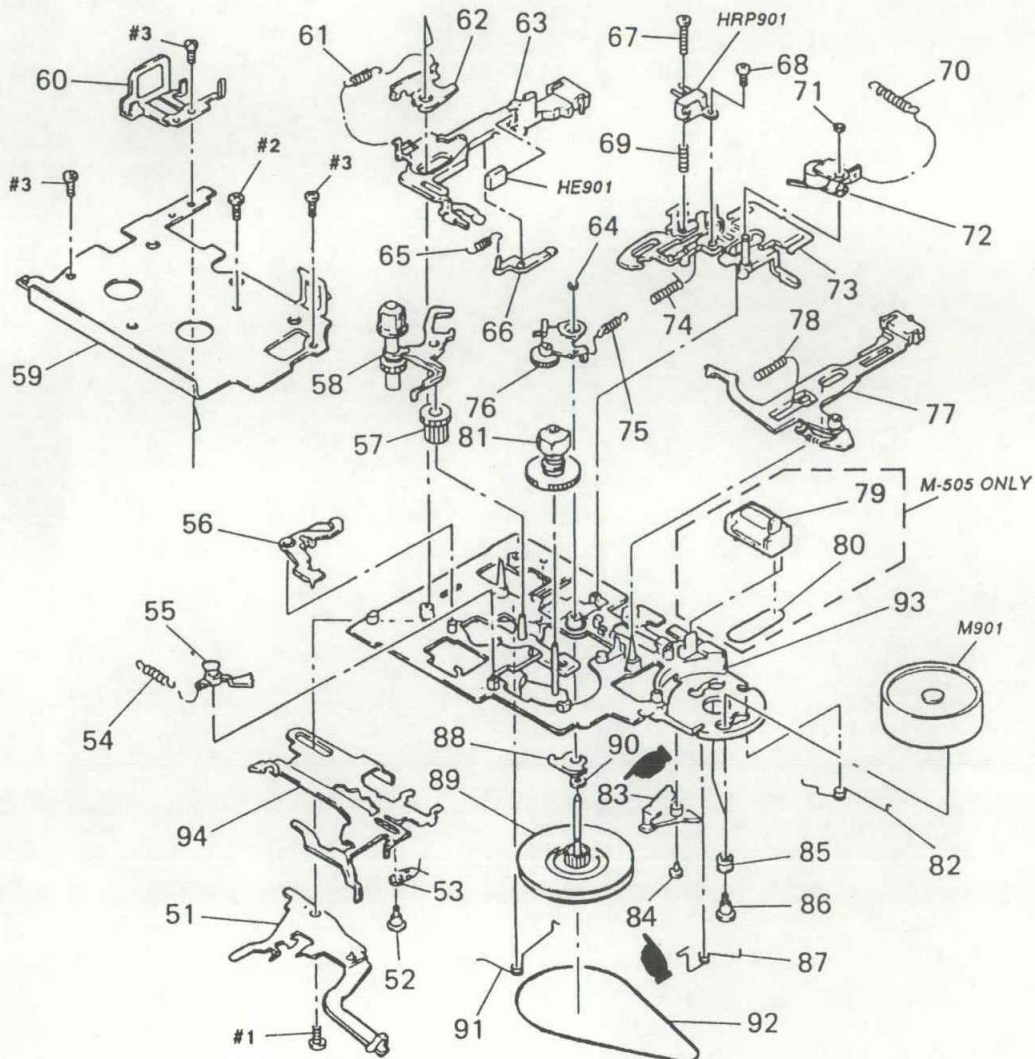
Subject: EXPLODED VIEWS

(RPC-95069)

MECHANISM SECTION (Service Manual see page 11.)

(MZ-405-14): M-405, (MZ-505-14): M-505

: corrected portion



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Consumer A & V Products Company
Personal A & V Products Div.

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