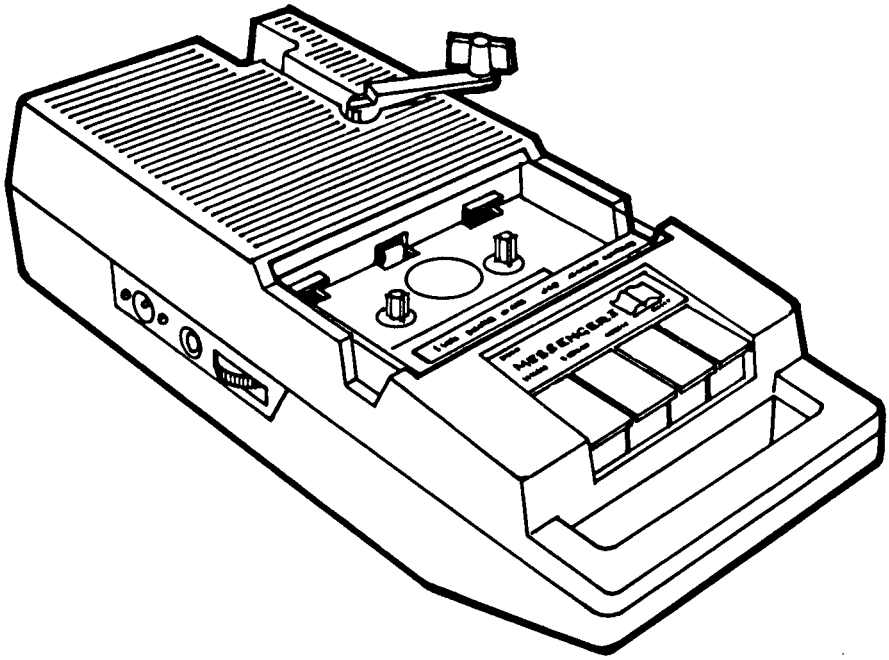
MESSENGER-II

HAND-WIND CASSETTE PLAYER

SERVICE MANUAL



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INTRODUCTION

Language Recordings has produced the Messenger-II player because of the worldwide demand from missions and churches for a compact, reliable cassette player that is not dependent on batteries or other costly power sources.

The purpose of this service manual is to provide the necessary technical information, parts lists and drawings for those who will be doing in-service repairs and maintenance to these players.

The technical descriptions have been kept as simple as possible and have been prepared with the non-technical person in mind. As well as providing this Service Manual and any necessary spare parts, we believe in the concept that "prevention is better than cure", and we strongly recommend that where any "Messenger-II" players are put into use that those using them should be given careful instructions in the basic care and maintenance of those players.
(See 'Care of Cassette Players' on operating instructions leaflet).

The Messenger-II Player is produced in two different 'formats':
a. Player Designation: LRI-03M = Plain Mabuchi i.e. Mabuchi Generator.
b. " " LRI-03MP = Mabuchi with Power i.e. Mabuchi Generator plus Mains Power Transformer.

TABLE OF CONTENTS

EQUIPMENT & SPECIFICATIONS FOR TESTING

NECESSARY EQUIPMENT

1.Basic
- a. Multimeter - With approx. 2-3v A.C. range, full deflection. e.g. A meter with a sensitivity of at least 100k/volt
- b. Dummy Load - 7.5 ohms resistance and lead; or external speaker(8ohms).
- c. D.C. Power Test Lead - To allow measurement of voltage & current. (Ref. Figure 1&3)
- d. Test Tapes - 6.3 KHz at 15dB for Head Azimuth.
  - 1 KHz at OdB for current consumption & output level.
- e. 6v regulated power supply or 6v battery pack, (Fig. 1&3)

Note: Language Recordings is prepared to supply any of the above equipment to those who do not have ready access to such.

2. Optional
   a. Oscilloscope)
   b. Frequency counter) desirable for major servicing
   c. Cassette Torque Meter) centres.
   d. Signal Generator - helpful for trouble shooting of circuit board.

MEASUREMENTS & ALIGNMENT

1. Supply voltage for testing: 6v +/- 0.2v Measure the voltage across supply used for testing, with 1Khz tape playing at full volume into dummy load (fitted to external speaker socket). If the voltage is outside of tolerance, incorrect readings may be obtained for other tests.

2. Generator Output Voltage: Must be over 4.5v
Measure voltage across the Generator Leads at the Circuit Board while playing 1 KHz tape at full volume into dummy load, and cranking at normal speed.

3. Playback Head Azimuth Adjustment:
(NOTE. A dot on the Name Plate Label, C120 indicates the location of a hole in the Front Case provided for the insertion of a small screwdriver to adjust the head alignment screw).

After cleaning and demagnetising playback head, adjust the volume control to maximum and use 6.3KHz -15dB test tape to adjust the head azimuth. Adjust output to maximum reading and when satisfied place some contact cement on srew heads to prevent vibration moving them.
(Beware of false harmonic readings) For this reading the oscilloscope is adjusted to the following settings – Sweep range 100-1K; Vertical gain 1/100. If an oscilloscope is unavailable a multimeter may be used.

4. Motor Speed Adjustment
Use the 1KHz -11dB tape to adjust the speed (1000-1010Hz) on the digital frequency counter, or digital multimeter with frequency range. The adjustment is made by inserting a small screwdriver through the small hole in the top of the drive motor and turning the adjusting screw.

5. Output Level Adjustment
Using the 1KHz -11dB tape, check the output level. It should measure about 3.6 volts peak to peak. If necessary adjust the variable resistor VR2 to achieve the desired output. Too high a level will cause distortion(clipping of the waveform).
If an oscilloscope is not available use the following procedure.
i.) Using an extension speaker plug and a piece of wire, fit a dummy load of 8.2 ohms across the plug. (See Fig. 2)
ii.) Attach an AC volt meter with approximately 5-10 volts full scale deflection.
iii.) With a 1KHz -11dB tape at maximum volumethe output should be 1.3 volts RMS. (Equal to 3.6 volts peak to peak.)
iv.) The same variable resistor adjustment VR2 can be used to obtain the right voltage reading.

6. Current consumption:190-270 mA at 6v.
Using the 1KHz -11dB tape and volume at minimum the current should be approximately 130mA, played into an 8.2 ohm dummy load plugged into the external speaker socket. With the volume at maximum the current should be approximately 200mA. If current is excessively high check for free movement of mechanical parts, especially the capstan flyhweel assembly and the pinch roller.

7.Wow and Flutter: Less than 2% Play 1 KHz tape and listen for clear tone, or observe wave stability on oscilloscope. Set up the Oscilloscope as for Azimuth Alignment and check stability at the right hand side of the screen. Variation should not exceed 2% of screen width. Rapid fluctuation usually indicates a bent capstan, while slower fluctuation (about 1 second duration) would indicate a worn pinch roller or other drive component.

8.Take up Torque: 35-60 gm/cm Measured with cassette torque meter. Too much torque tends to raise current consumption of the machine. Low torque can cause tape to wrap around capstan.

TROUBLESHOOTING PROCEDURE

INTRODUCTION

The key to efficient, effective repair is a logical approach to troubleshooting and diagnosing the fault. The first step in any troubleshooting process is to examine carefully all the symtoms of the fault. This investigation should guide us to a limited range of possible problem areas in the machine. At the same time we need to eliminate areas that are functioning correctly. This enables us to focus attention on a particular part of the machine and should help us to locate and rectify the fault as quickly as possible.

This first step could be called the "mapping" step since the effect is to map out the problem areas for further investigation. It is important to do a complete "mapping" of the machine before proceeding to analyse each of the areas which may have caused the trouble. Premature assessment of a fault, without logical and thorough investigation, can result in unnecessary removal of parts for observation, needless replacement of good parts, tampering with adjustments that should be left alone, and, in general, wasting a lot of valuable time.

The service manual is an essential part of the "troubleshooter's" equipment. The information provided in the drawings, circuit diagrams, block diagrams, parts list, etc. will help us to quickly isolate a fault to a single area of the machine.

The novice or layman in the area of electronic repair should not be overawed by the apparent complexity of the service manual. The manual has been prepared with the non-expert in mind and we trust that the instructions given will be clear enough for all to follow. Regular experience in maintenance and repair of the Messenger-II will soon help the novice to become familiar with the parts of the machine most likely to give problems. Those who only carry out repairs on odd occasion s or in emergencies need to take special care and be aware that hasty action or diagnosis of the problems may lead to a lot more expense and time expended than is really necessary.

TROUBLESHOOTING PROCEDURE

The three major areas of the troubleshooting map that need to be considered when working on a Messenger-II player are:-

1. The generator assembly
2. The cassette mechanism
3. The amplifier

1. The Generator Assembly

The generator assembly is probably the most straight forward mechanism within the Messenger-II player, consisting of a drive train of gears and pulleys. However, it is subject to more wear than any other part of the machine and usually requires a greater amount of maintenance.

2. The Cassette Mechanism

The cassette mechanism can be further broken down into smaller areas, e.g. Motor, keyboard, fast forward mechanism etc. and each of these can be examined as separate entities. Keep in mind that a machine takes a source of motion and processes it so as to fulfill some useful purpose. For example, the motor provides the motion necessary to move the tape within the cassette case. It does this via a belt, pulleys and wheels. As another example, a finger can be the source of movement. It can be used to depress a key which then directs the motion from the motor to drive the tape forward, into rewind, play, or if the stop key is depressed, to halt all tape motion.

3. The Amplifier

When considring the amplifie we also need to take into account the playback head, volume control,

extension speaker socket and speaker. The magnetically encoded signal on the tape produces a very weak signal in the playback head as it passes over it. This is then amplified for the purpose of driving the speaker.

SAMPLE PROCEDURE - 1

Symptoms of faulty player. The Messenger-II player will not operate at the correct speed when powered by its own generator.

Preliminary Diagnosis
At first consideration you cannot help but be equally suspicious of the three main areas -

1. The generator belt may have slackened with age or the generator itself may have failed.

2. The cassette mechanism could have a faulty motor, a jammed pinch roller etc.

3. The amplifier could have a fault which causes it to drain an excess amount of current from the generator.

You need to eliminate as many areas of the "map" as you can and concentrate on the one area at fault.

Procedure for investigation
1. Plug in an extenal 6v D.C. Source. If the player now works correctly and does not draw excessive current, then the generator most likely is at fault. Conversely, if the player still does not work then the generator is probably not at fault and the fault lies in one of the two other areas.

2. Check the motor by disconnecting it from the circuit board and connecting it to a seperate 6v D.C. Power supply. If motor and mechanism operate, they are probably not at fault. If motor speed appears to be slow, investigate current consumption of motor or replace motor.

3. Investigate current consumption of circuit board, or replace circuit board.

By following this type of procedure you are successfully reducing the areas in which you need to look for the fault and by carrying out tests like these on each of the possible areas of failure you will be able to locate and identify the offending component.

SAMPLE PROCEDURE - 2

Symptoms of Faulty Player: No sound.
Preliminary Diagnosis
The fault is probably in the amplifier but, before proceding to investigate this, do the following quick checks :-

1. Check the cassette tape. Is it broken, jammed, or simply stopped at its end?

2. Check the cassette mechanism. In play mode is the mechanism working correctly and pulling the tape across the playback head?

If both of the above checks show that the cassette and mechanism are satisfactory we can then move on to investigate the amplifier chain. Note that there are 3 main sections of this:-

a) The speaker and extension speaker socket.

b) The amplifier section of circuit board.
c) The playback head.
(refer also to block diagram, fig. 5, p.4)

Procedure for Investigation

1. Plug an extension speaker into the extension speaker socket. This effectively by-passes the player's own speaker and introduces a new one. If the extension speaker works, then either the speaker in the player is faulty, or else there is possibly a fault in the switch which is located within the extension speaker socket or a broken wire.

2. If Procedure 1 produces no result, move on to the amplifier board. First, check this visually to see if there are any obvious broken or loose connections. These should be resoldered. If no sound results, place finger on both connections of the lead from the head where it 3 joins the circuit board and turn volume up. If no noise is heard the circuit board is possibly at fault and should be replaced.

3. If Procedure 2 produces noise, proceed to check the playback head and its connections. Use a mutimeter to check the wires from the head to the amplifier board. if the connections are satisfactory the head should be replaced.

Messenger-II PLAYER PARTS LIST
HOW TO ORDER PARTS

1.INTRODUCTION

a. SERIAL NUMBER: Example of a serial No. 09-89 M DCEC 00022
The serial number, as found both inside and outside the player, is composed of three main parts.

i. Date of manufacture '09-89' Letter- 'M' Designates what generator type is used, and whether A.C. power supply is included, e.g. M= Mabuchi, MP= Mabuchi with A.C. Power.

ii. Batch Letters - These designate the revision batches of the main assemblies in the machine. These are essential for supply of correct repalcement parts. They are stamped on each assembly as indicated on the parts drawings and are listed in the serial number in the following order -
Case Assembly - Generator Assembly - Mechanism Assembly - Circuit Board Assembly.

iii. Machine No. - Identifies the particular machine.

e.g. Model Letters	Batch Letters	Machine No.
M	D C E C	00022

b.PARTS NUMBERS: Example of a Part No. 5G217
These consist of -
i. A prefix letter '5G' which indicates which assembly the part is from, and thereby on which drawing it is shown.

ii. A single digit numeral to indicate major part revisions or alternative types. These are listed underneath each other in the parts list, and must be determined when ordering parts. An 'x' indicates alternative types of the part, and that appropriate type no. must be selected from the parts list when ordering. (The '5' is a computer prefix)
e.g. Gx17 refers to G117 or G217 in parts list.

iii. A two digit numeral to identify the particular part in the assembly.

	Assembly Letter	Type No.	Part No.
e.g. Part No. B104	B	1	04

2. HOW TO ORDER PARTS.

Please identify the part from Parts Drawings, and write both its Part No. (including appropriate type), and Name plus Quantity.

Also, please include complete Serial Number/s of the player/s for which the parts are required. If the parts are for spares for a a quantity of players, then the most common Model Letters and Batch Letters would be sufficient.

Sample Order

QUANTITY	PART NO.	NAME	SERIAL NO.
5	05-G104	Gen. Belt	MP-DCEC-01548

If possible, please try to explain what is the fault in worn parts and what may have caused them to fail. Also describe the symptoms of the fault and the in-service age of the player. This will greatly help us to develop a better player for the mutual benefit of all users of these players.

MESSENGER-II DISASSEMBLY AND SERVICING

Please refer to Drg. M-02

To Open Case (See also drg. M-03)

a) Unscrew the Crank arm Assembly G150 by raising the handle and turning it anticlockwise (opposite direction to the arrow). This may require a sharp tap on the winding arm to begin the unwinding.

b) Remove 5 screws (4 Case Screws C114 and one Handle Screw C115) in back of case. Carefully pull the two halves fo the case apart while keeping them parallel to each other. There may be some resistance at first, until the Crank Shaft G109 is pulled through the Upper Crank Bearing C106, but pull the halves apart carefully as the generator wires may be broken. It is now possible to unplug socket connector G141 on Mabuchi player without power, and socket connector p112 on Mabuchi player with power, from the circuit board and so separate the two halves of the player case. Note: Be careful not to pull on the wires. Grasp the socket connector between thumb and forefinger from above and gently ease out with the help of a small screw driver.

2. To Remove Mechanism 05-M200 and Circuit Board Assemblies.
(See also drg. M-03, M-05)

a) Buttons (keys) M102, M103, M104, M105 must be in OFF position.
b) Desolder the two wires from the Speaker C103, and unplug PIN connector.
c) Unscrew the Spacer Post C112, Motor Plate Screw S12 and the Mechanism Screw C116 located near the Clutch Assembly on the mechanism, then lift the mechanism from the Front Case C101.

3. Circuit Board Assembly B600. (See also Drg. M-97)

a. To Remove and Disassemle

i. Remove Circuit Board Screw M106 and Washer M107. Loosen the Side Plate Screws M108 and then move the assembly sideways from the mechanism.
ii. If the circuit board is to be replaced, desolder all wires from the circuit board, noting their colour and position on the board. Remove the two D.C. Socket Screws S02 and the Dress Ring B207 from the External speaker Socket B206 and them remove the Side Plate B208. Remove the Volume Control Screw S01 and Wheel B202.

b. To Reassemble and Replace

i. Replace Volume Control Wheel B202 and Screw S01
ii. Attach Side Plate B208 with Screws S02 and Dress Ring B207.
iii. Position the Circuit Board Assembly correctly on the mechanism, by pushing the slots of the Side Plate firmly against the Side Plate Screws M108 before tightening them. Then replace Circuit Board Screw M106 and Washer M107.

4. Servicing the Mechanism M100 (See also drg. M-05)

a) With the mechanism removed from the case, all pars of it are easily accessible for adjustment and replacement of parts.

b) Before removing any part, note it's position and method of retention. Also observe other associated parts which may be disturbed during removal, such as springs and washers. Very carefully remove the small components, such as 'E' clips, which may be easily lost.

c) If the Flywheel is removed, care should be taken that its capstan shaft is not knocked in any way during handling. Any damage to the capstan shaft would cause the player to produce a rapidly wavering sound. After replacing the Flywheel, or removing the Flywheel Retainer Plate, its end-play should be checked. This should be 0.005" - 0.010" (0.13 - 0.25 mm). If this is incorrect, it should be adjusted as follows:-

   i. Make certain the 3 screws securing the Flywheel Retainer Plate are tight. N.B. Do not overtighten any screws on the mechanism.
   ii. Using a screwdriver, adjust the End Thrust Bearing in the Retainer Plate until there is a slight gap between the bearing and the end of the shaft of the Flywheel.
   iii. Remove the Drive Belt M120 from the Motor Pulley. Move the Flywheel up and down to feel the end-play, while slowly screwing the Thrust Bearing in, until the end-play just disappears. Then unscrew the Bearing 1 turn and check that the Flywheel has the correct amount of end-play and spins freely.
   iv. Replace the drive belt, and seal the Thrust Bearing in place with contact cement.

d) To replace the Playback Head M114, unsolder the wires, remove only the screw nearest the pinch roller. Then move the Head sideways out from under the other screw. If the Playback Head is replaced or disturbed, its azimuth angle will need to be adjusted to ensure correct playback of all frequencies. This is achieved by adjusting the spring loaded mounting screw while playing a 6.3 KHz at -15dB alignment tape, and adjusting for maximum signal level (please refer to testing procedures). If a special alignment tape is not available, a good music passage on a commercially produced tape may do. Listen for sharpness of high frequency parts of the music. Finally, seal the alignment screw which contact cement.
   Azimuth Alignment tapes may be obtained from Language Recordings Inc., Australia.

e) Before reassembling the machine, check that the Leaf Switch operates properly when the Play Button (Key) is depressed. Check that all moving parts of the mechanism are operating satisfactorily, and check that all springs & 'E' clips are in place and that screws are not loose.
   N.B. Do not over-tighten any screws on the mechanism.

5. Generator Assembly G100

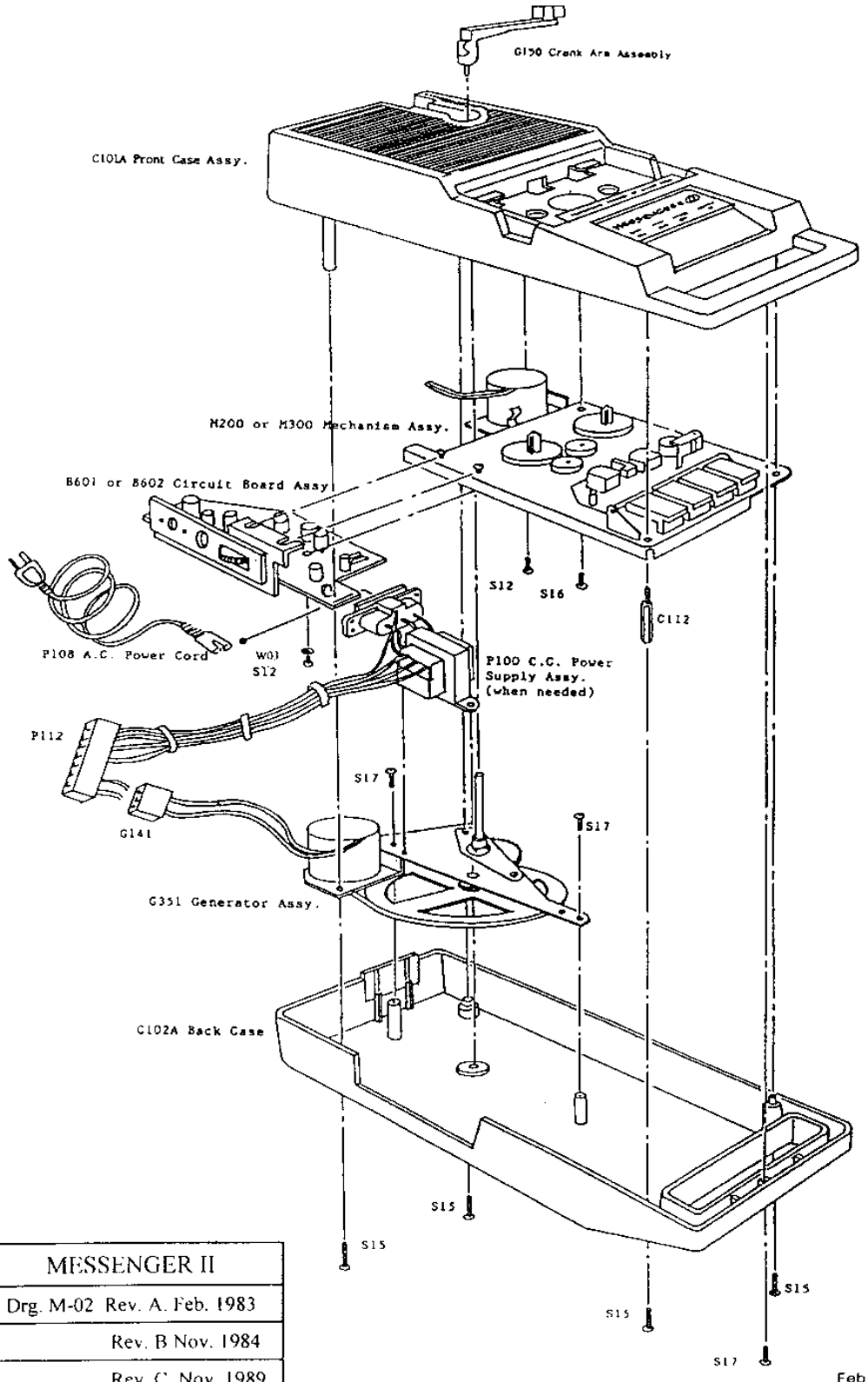
Servicing of the Generator Assembly G100 other than replacing the Belt, is best carried out by replacing any faulty sub-assembly with a new unit (see parts list). Individual parts may be replaced if it is determined that only one part is at fault.

6. Closing Case

When closing the case check carefully that the lead from the Generator to the circuit board is not touching any moving parts.

7. Re-checking Player Performance.

After repairs or adjustments are completed, re-check the relevant specifications of the player using the test procedures listed under "Equipment & Specifications for Testing". Remove all dirt and dust from the player before closing the case and clean head, capstan and pinch roller as described in the Operating Instructions.

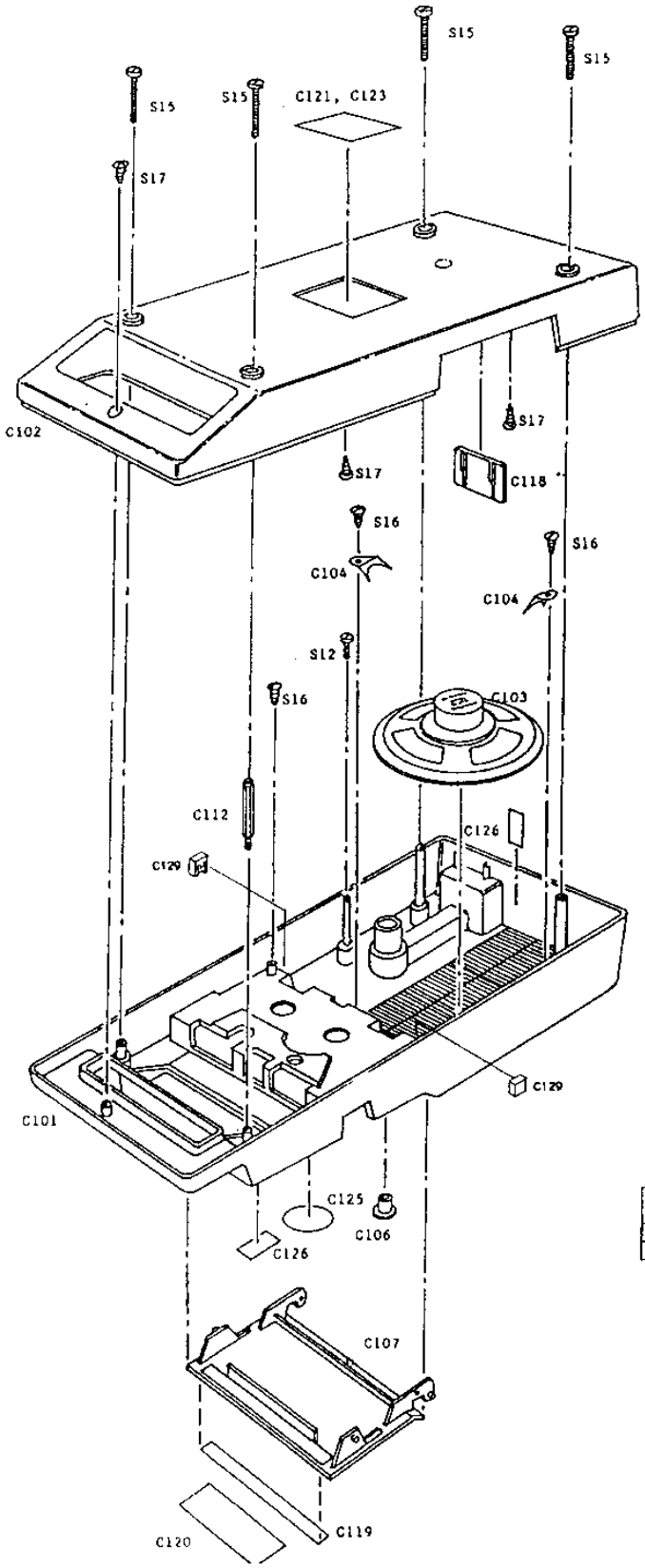


MESSENGER II
Drg. M-02 Rev. A. Feb. 1983
Rev. B Nov. 1984
Rev. C. Nov. 1989

Feb.90

Messenger-II PLAYER PARTS LIST
CASE ASSEMBLY - No. C100

NO.	PART	DESCRIPTION
C101	Front Case	Moulded ABS, includes C108 - C111.
C102	Back Case	Moulded ABS.
C103	Speaker	3" dia, 8 ohms, 0.5 watt, Ferrite or Alnico type.
C104	Speaker Clamps x2	Pressed steel, 22g
C106	Upper Crank Bearing	Acetal Bearing
C107	Cassette Well Cover	Moulded polycarbonate.
C108	Mounting Post 'A' x 2	1/4" x 0.925" machine brass.
C109	Mounting Post 'B'	1/4" x 1.850" machined brass.
C110	Mounting Post 'C'	1/4" x 2.283" machined brass.
C111	Mounting Post 'D'	1/4" x2.600" machined brass.
C112	Spacer Post	1/4"AF x 0.0948" Hex-steel, machined
C118	Blanking Plate	Moulded Nylon
C119	Label-Cassette Cover	"Press STOP button before removing cassette"/
C120	Label-Name Plate	Messenger-II: LRI-02
C121	Label-Model M	LRI-02- Mabuchi Generator, D.C. only.
C123	Label-Model MP	LRI-03MP - Mabuchi Generator A.C. power input.
C125	Reflective Sticker	24mm dia, orange, self adhesive.
C126	Label - Serial No. (2 off)	
C129	Cassette Well Cover Locks	Moulded plastic
S12	Motor Post Screw	M3 x 0.5 x 6mm, machine screw
S15	Case Screws (4 off)	M3 x 0.5 x 16mm, machine screw
S16	Speaker Clamps screws x2	M3 x 6 self tapping screw
S16	Mechanism Screw	M3 x 6 self tapping screw
S17	Handle Screw (1 off)	M3 x 10 self tapping screw
S17	Generator Assembly screws x2	M3 x 10 self tapping screw



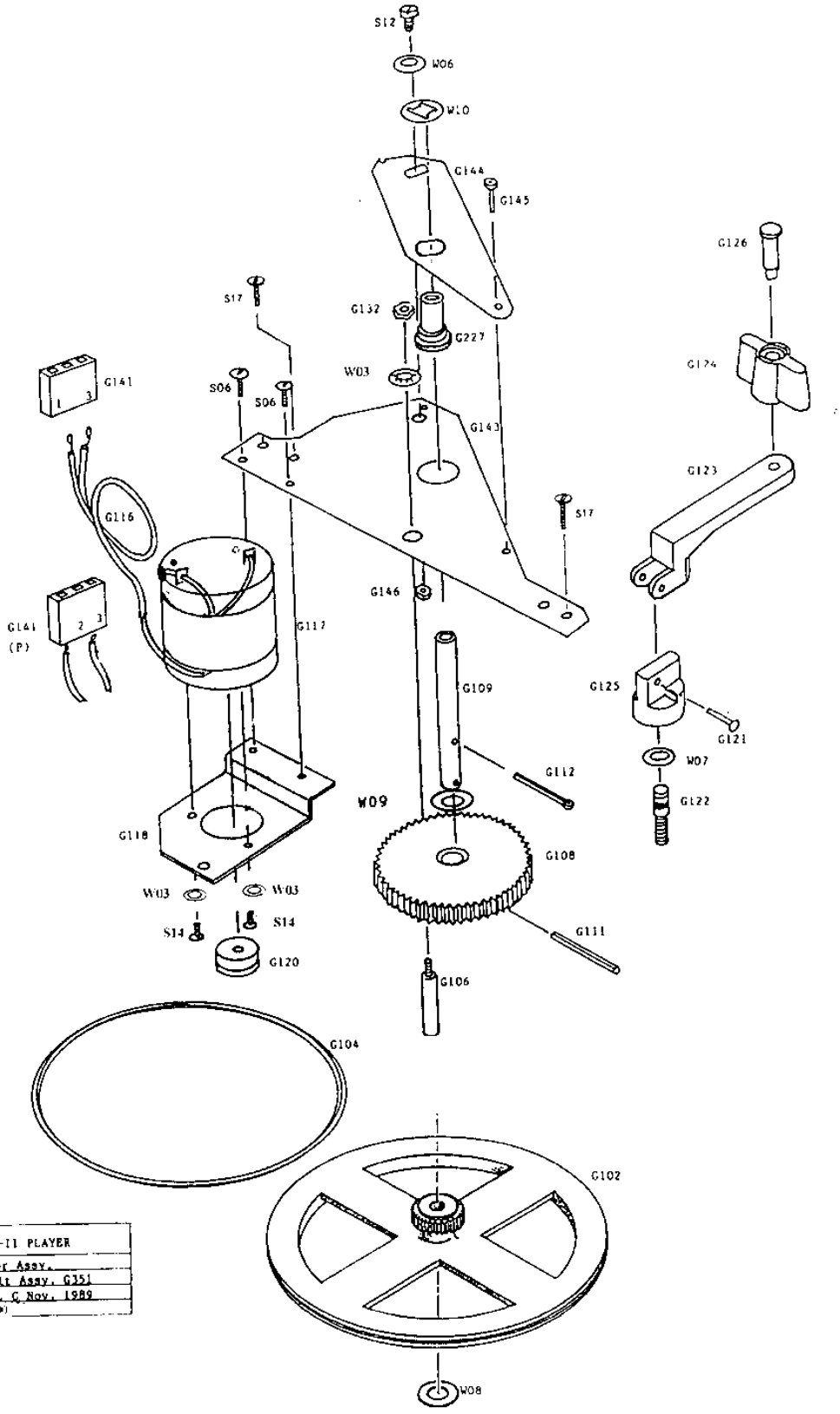
MESSENGER - II PLAYER
Case Assembly C101A
Drg. M-03 Rev. Nov. 1989

Messenger-II PARTS LIST
GENERATOR ASSEMBLIES - NO. G100

NO.	PART	DESCRIPTION
G102	Pulley Wheel	Moulded acetal
G104	Generator Belt	2.2mm sq. section, polyurethane.
G106	Pulley Wheel Shaft	Machined steel, 5mm dia.
G107	Gear Plate	Pressed Steel, galv., 20g
G108	Gear Wheel	Moulded Nylon
G109	Crank Shaft	Machined Steel, 1/4 dai.
G111	Roll Pin	1/16" x 1/2" steel pin.
G112	Split Pin	1.6 x 12mm steel, split pin
G117	Generator	Mabuchi RF—370C 15370
G118	Generator Plate	Pressed steel, galv, 20g
G120	Generator Pulley	12mm dia. x 7mm wide (M)
G121	Crank Arm Pin	3/32" dia. x 12mm, tubular alum. rivet.
G122	Crank Drive Stud	Machined steel
G123	Crank Arm	Moulded Glass filled nylon
G124	Crank Knob	Moulded nylon
G125	Crank Hub	Moulded glass filled nylon
G126	Crank Knob Pin	Machined steel
G132	Pulley Shaft Nut	1/8" B.S.W., hex, steel.
G141	Generator Socket Connector	Utilux H9540-3 KK connector.
G143	Gear Plate	
G144	Gear Adjusting Plate	
G145	Gear Adj. Plate Rivet	
G146	Gear Adj. Plate Root Nut	
G227	Lower Crank Bearing	Moulded acetal .250" I.D.
P106	Cable Tie 150mm	Moulded plastic
P114	Terminal Clip (large)	
S06	Generator Plate Screws x 2	M2.6 x 4 Taptite Screws
S12	Gear Adjusting Plate Screw.	M3 x 0.5 x 6mm machine screw
S14	Generator Screws x 2	M3 x 0.5 x 3.5mm machine screws
W03	Generator Screw Washer	M3 internal shake proof washer
W03	Pulley Shaft Washer	M3 internal shakeproof (star) washer
W06	Gear Adj. Plate Washer	1/8 x 3/8 washer
W07	Crank Thrust Washer	5/32” x 3/8” x 21g flat washer
W08	Pulley Wheel Washer	M10 x 5 x 0.5 steel washer
W09	Crank Bearing Washer	1/4" x 1/2" x 24g flat washer
W10	Lower crank Bearing clamp	Pressed spring steel

SUB ASSEMBLIES

G110	Crank Shaft Assembly	Comprises part nos. G109, G111
G116	Generator Lead Assembly	Comprises twin core wire, plus G141, 2 x P114
G138	Generator Assembly	Comprises part nos. G117, G120,G116,P106
G142	Gear Plate Assembly	Comprises part nos. G143, G146
G150	Crank Arm Assembly	Comprises Part Nos. G121—G126, W07



MESSENGER-II PLAYER
Generator Assy.
Generator Unit Assy. G351
Drg. No4 Rev. C Nov. 1989
Dig. Rev Feb 2000

MECHANISM ASSEMBLY - No. M200

NO.	PART	DESCRIPTION
5E01	Reel cap circlip x 2	M1.5
5E02	Brake plate guide pin circlip x 3	M2
5E02	Pinch Roller frame post circlip	M2
5E03	Clutch swivil pin circlip	M3
5E03	Head base guide circlip x 3	M3
5M108	Motor screw sleeve (x3)	Machined brass
5M110	Drive motor assembly	
5M114	Playback head	
5M115	Pinch roller assembly	
5M117	Capstan flywheel assembly	
5M120	Drive belt	75 x 1.2mm square section polyurethane
5M122	Leaf switch (x2)	
5M127	Flywheel assembly	
5M139	Pinch roller frame spring	
5M143	Head base assembly	
5M145	Head base spring	
5M149	Azimuth alignment spring	
5M153	Latch plate	
5M154	Latch plate spring	
5M161	Flywheel support plate	
5M162	Flywheel thrust bearing	
5M166	Brake plate assembly	
5M168	Brake plate spring	
5M170	Rewind motor assembly	
5M172	Rewind motor plate	
5M174	Rewind motor plate spring	
5M174	Take-up Clutch spring	
5M178	Cassette tension spring	
5M193	Reel stand spring	
5M194	Reel stand (1 piece) (x2)	
5M195	Reel stand rubber (x2)	
5M203	Motor Cushion (x3)	
5M208	Deck Plate Assembly	
5M238	Take-up clutch assembly	
5P106	Cable Tie 100mm	
5S03	Leaf switch screw (x2)	M2x5 taptite screw
5S08	Button frame screw (x3)	M2.6x6 taptite screw
5S08	Rewind Motor Plate screw (x2)	M2.6x6 taptite screw
5S10	Playback head alignment screw	M2x6 Philips machine screw
5S12	Circuit board screw	M3x6 Philips machine screw
5S12	Flywheel supt. post screw (x3)	M3x6 Philips machine screw
5S22	Side Plate screw (x2)	M3x6 Philips taptite screw
5S23	Drive Motor screw (x3)	M2.7x6 machine screw
5S24	Rewind motor screws (x2)	M3x3.5 Philips machine screw
5W01	Reel Stand Washer	Polyslider M2.2x4x0.3
5W01	Flywheel Assembly Washer	Polyslider M2.2x4x0.3
5W03	Circuit board washer	M3 internal shakeproof washer

SUB-ASSEMBLIES

5M110 Drive Motor Assembly

5M109	Drive motor	Mabuchi EG-510D-6F2, 6v, 2400rpm
5M111	Drive motor pulley	
5P106	Cable Tie 150mm	

5M115 Pinch Roller Assembly

5M136	Pinch roller	M130OD x 6.5 x 2.5 bore
5M137	Pinch roller axle	M11.2 x 2.5
5M138	Pinch roller frame	

5M130 Button frame assembly

5E02	Button shaft circlip	M2 E-clip
5M102	Stop button (red)	
5M103	Play button (green)	
5M104	Forward button (yellow)	
5M105	Rewind button (blue)	
5M131	Button frame	Pressed steel
5M132	Button frame shaft	
5M135	Button blade (x4)	Pressed steel
5M175	Button spring (f) (x2)	
5M176	Button spring (g) (x2)	

5M143 Head Base Assembly

5M144	Head Base
5M146	Replay head stud
5M150	Azimuth alignment stud
5M151	Cable Tie stud
5M213	Pinch Roller Frame post

5M157 Capstan Bearing Assembly

5M158	Capstan bearing housing
5M159	Capstan bearings (x2)

5M166 Brake Plate Assembly

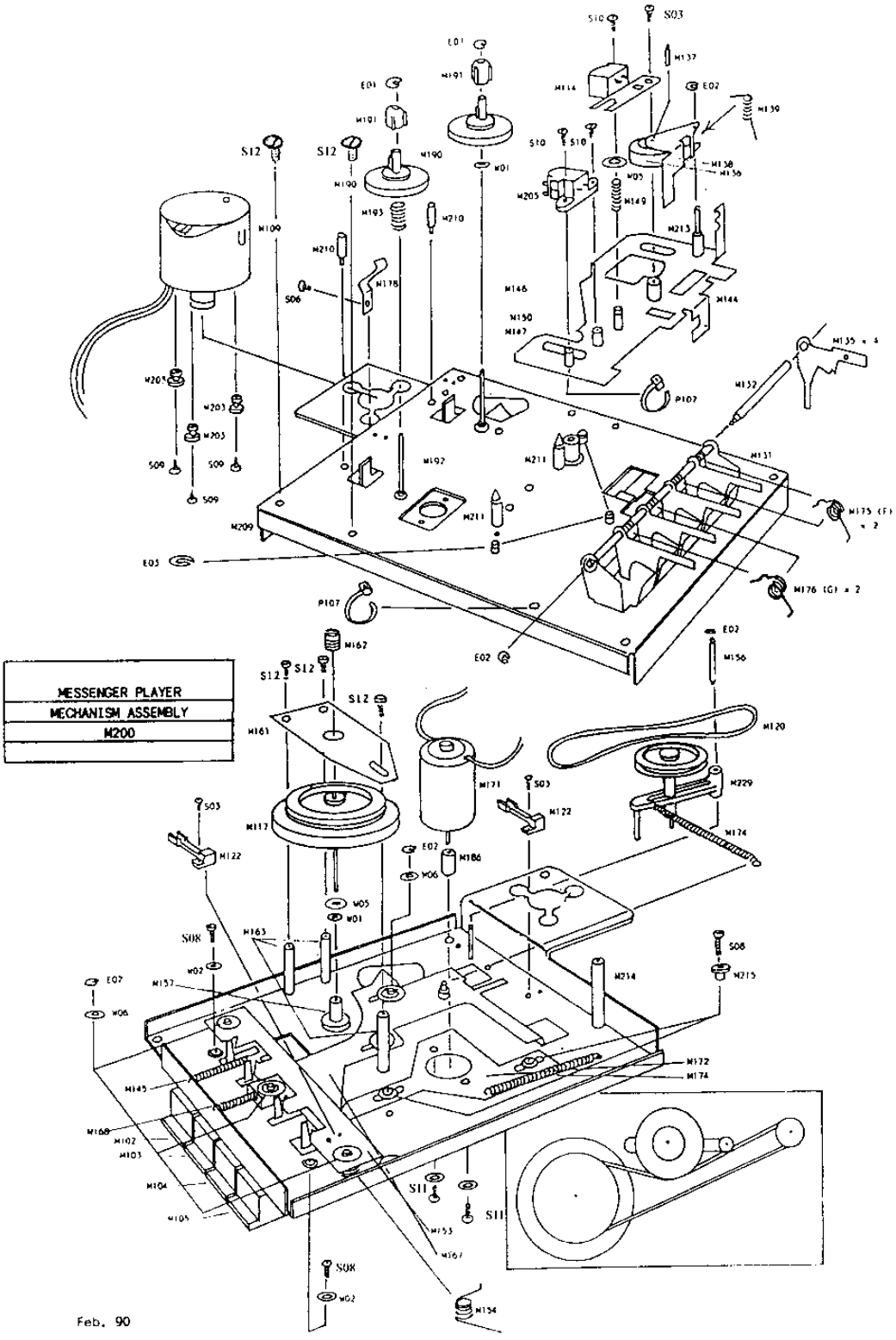
5M167	Brake plate
5M169	Brake Plate guide pin

5M170 Rewind Motor Assembly

5G117	Generator/Rewind motor	Mabuchi RF-370-15370
5M186	Rewind Motor Pulley	
5P106	Cable Tie 150mm	

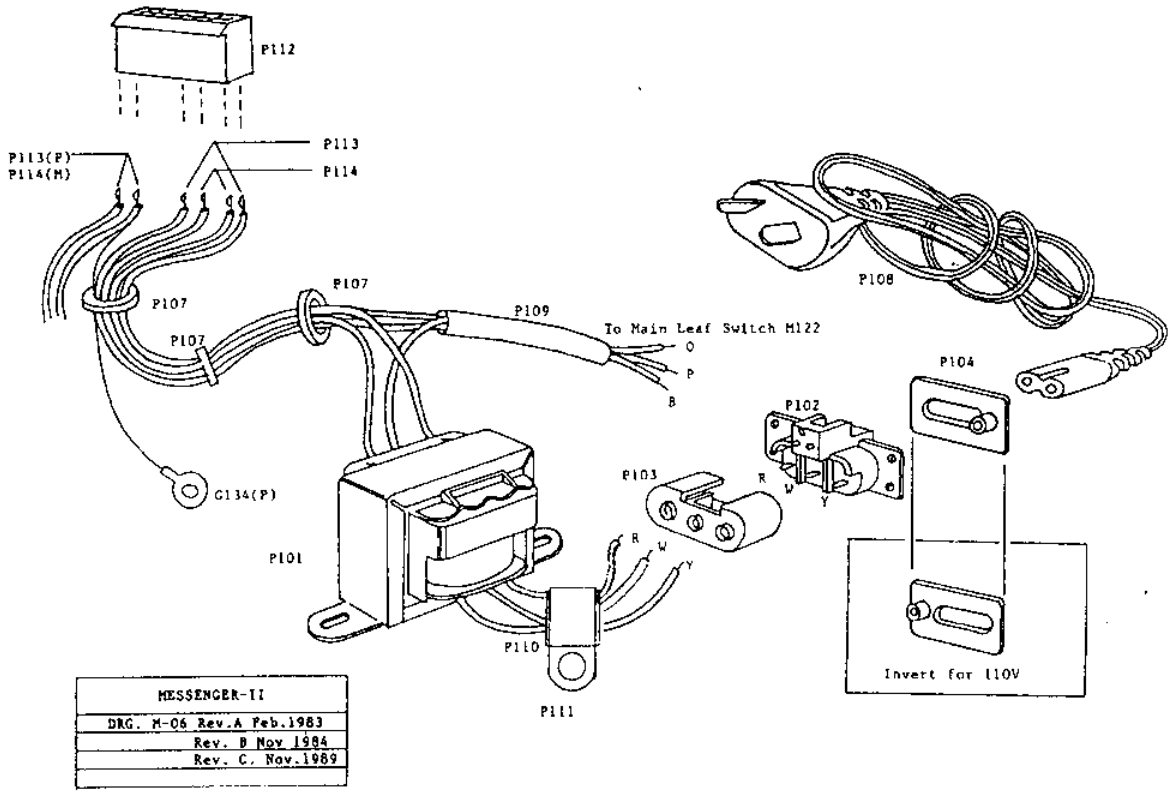
5M208 Deck Plate Assembly

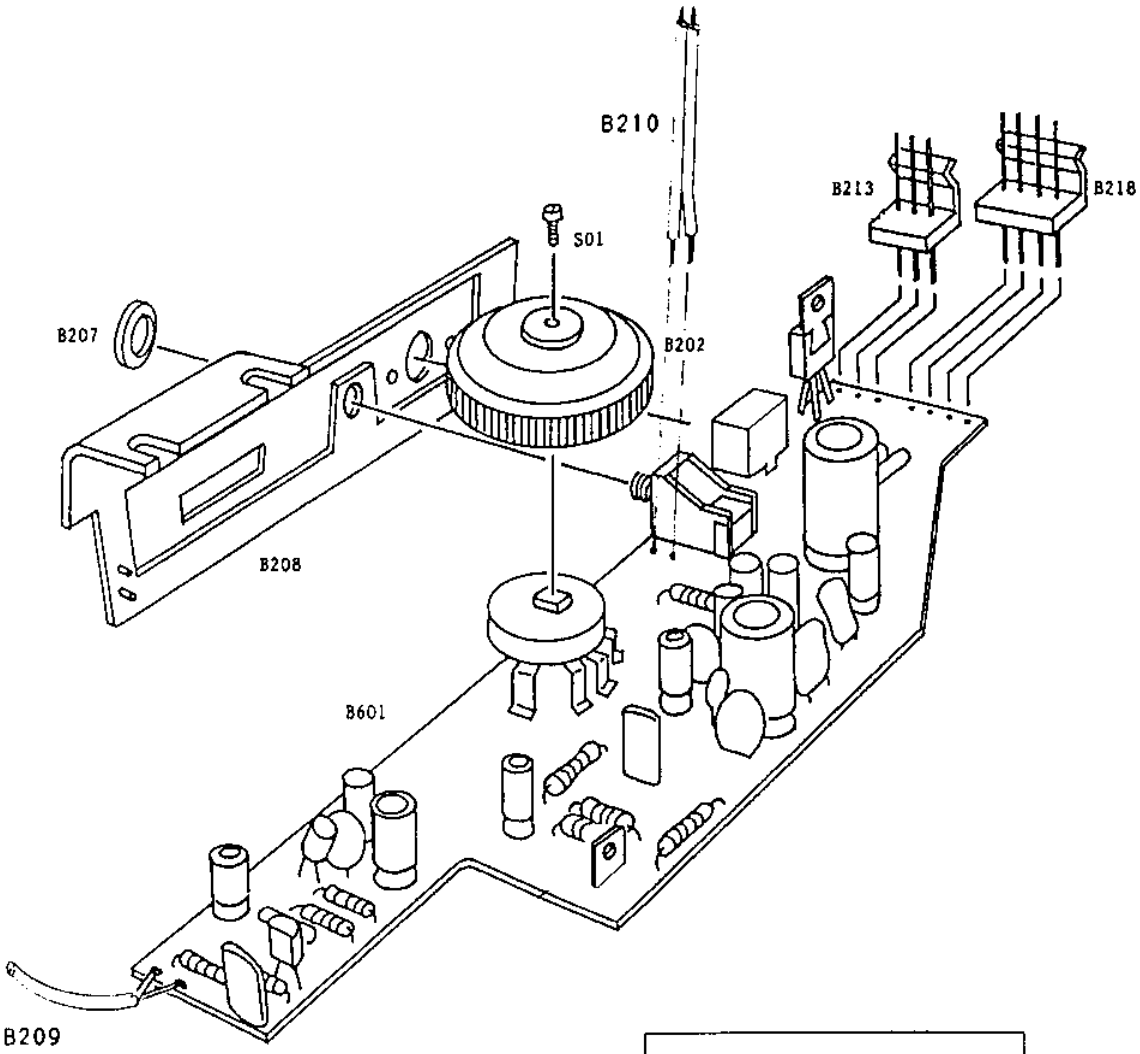
5M155	Latch plate posts (x2)
5M157	Capstan Bearing Assembly
5M163	Flywheel support post (x3)
5M169	Brake plate guide pins (x3)
5M192	Reel Shaft Assembly (x2)
5M209	Deck Plate
5M210	Cassette Support stud (x2)
5M211	Cassette location pin (x2)
5M212	Head Bases Guide Pin (x3)
5M214	Cct board support post
5M256	Clutch swivil pin


MESSENGER PLAYER
MECHANISM ASSEMBLY
M200
Feb. 90

MESSENGER PLAYER PARTS LIST
A.C. POWER SUPPLY ASSEMBLY NO. P100

No.	PART	DESCRIPTION
5P101	Transformer	110/24v, 60Hz: 7v x 2, 250mA
5P102	A.C. Socket	Hosiden type No. HSC0438
5P103	A.C. Socket back cover	Hosiden type No. HSC0438-03-010
5P104	Selector plate	Moulded glass filled nylon
5P107	Cable Tie x3	
5P108	A.C. Power cord	
5P109	Loom sleeve	M8 O.D. X 20mm PVC tubing
5P110	Cable insulation sleeve	Cable tie with screw hole
5P112	Pin connector	3303-108 Adilam
5P113	Terminal clip (small)	3400-113 Adilam
5P114	Terminal clip (large)	3400-111 Adilam





MESSENGER-II PLAYER
Circuit Board Assy. B601
Drg. M14

CIRCUIT BOARD ASSEMBLIES B601 & B602

5B601 Circuit Board Assembly (plain)

5B600	Circuit Board ex supplier
5B202	Volume Control wheel
5B208	Side plate
5B213	Pin connector (3 pin)
5B214	Polarised Header
5S01	Volume Control screw M1.7 x 5 machine screw

5B602 Circuit Board Assembly (power)

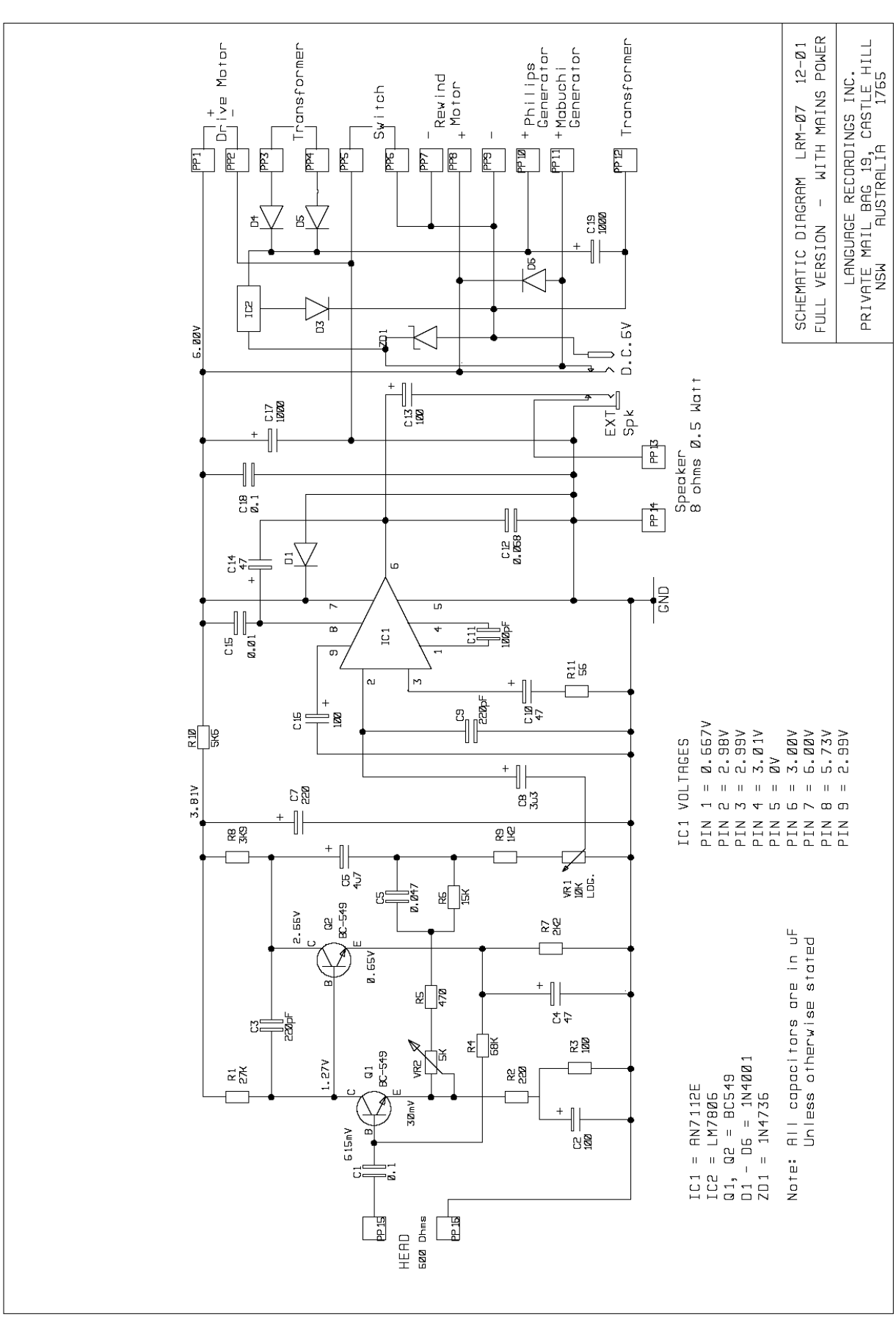
5B601	Circuit Board Assembly (plain)
5B218	Pin connector (4 pin)
5B215	Voltage Regulator
5B216	Regulator diode
5B217	Capacitor 1000uF 16V

5B219 Side Plate Assembly (plain)

5B601	Cct brd assmy plain
5B207	Dress ring
5B208	Side Plate

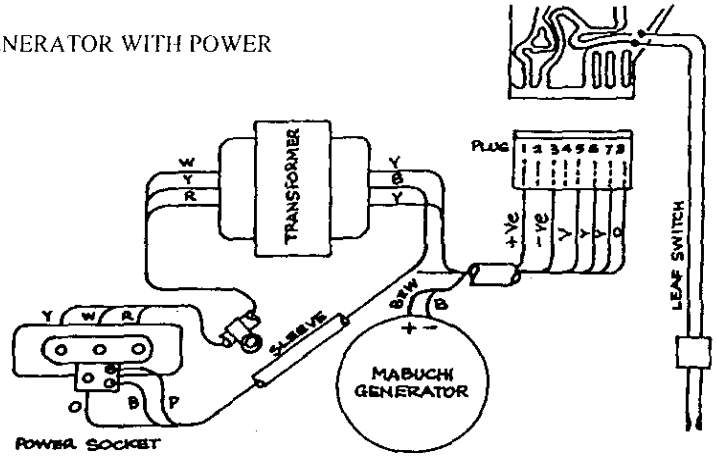
5B220 Side Plate Assembly (power)

5B602	Side Plate Assembly power
5B207	Dress Ring
5B208	Side Plate

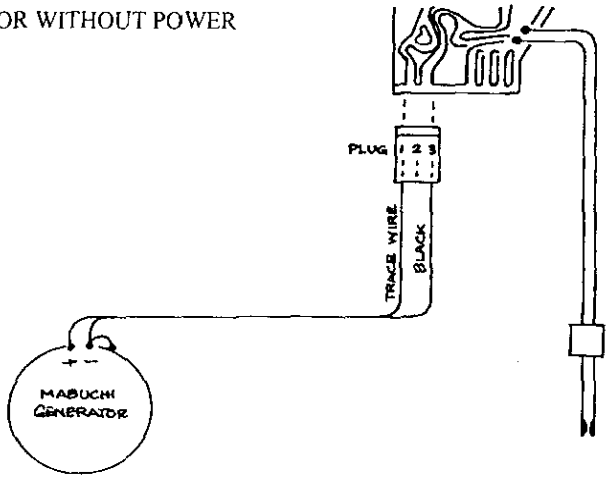


Note: Power and non-power versions are identical, except that non-power models may have components IC2, D3-D5,C19 omitted.

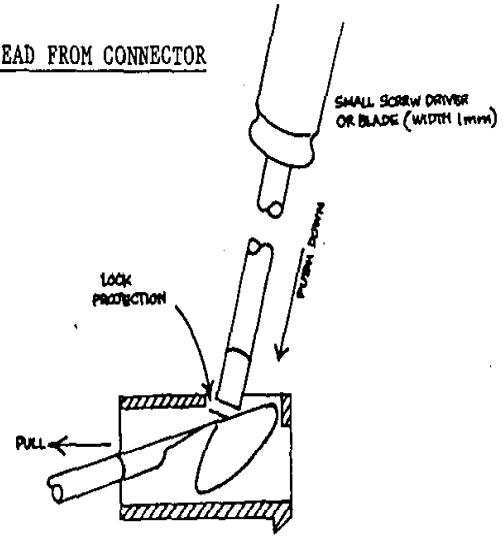
A. MABUCHI GENERATOR WITH POWER



B. MABUCHI GENERATOR WITHOUT POWER



TO REMOVE GENERATOR LEAD FROM CONNECTOR



MESSENGER PLAYER – TROUBLE-SHOOTING GUIDE

The following is an outline of some possible causes of faults that may occur in the player.

SYMPTOM	POSSIBLE CAUSE
1. No Action – when operating from external power	* No power to player – (not switched on at power source. Play button not depressed, batteries flat, broken power lead.) * Switches dirty * Motor belt worn or broken. * Motor faulty
2. No Action – when operating by hand.	* Not cranking fast enough. * Generator belt worn or stretched. * Generator mechanism worn out. * Faulty generator.
3. No sound	* Tape finished, jammed or broken. * Wiring joints faulty. * Volume control not turned up, or faulty. * Speaker faulty * Circuit board faulty * Head faulty
4. Sound not clear	* Tape worn or old * Head dirty or worn * Head alignment incorrect * Low power supply * Capstan bent
5. Speed slow or irregular	* Cassette faulty or jammed * Generator or motor belt slipping * Take-up cluth worn out * Motor faulty * Capstan bent * Faulty pinch roller assembly
6. Speed too fast	* High supply voltage * Pinch Roller not contacting capstan * Motor faulty
7. Tape winds around capstan shaft	* Dirty capstan and pinch roller * Faulty or mal-adjusted take-up clutch * Take-up spindle seized, bent or faulty * Cassette tape not running freely in housing.
8. Grinding noise when cranking	* Worn gears and/or bearings. * Generator mechanism parts clashing.
9. No sound from external speaker	* Speaker or wiring faulty. * Speaker socket faulty.
10. Rewind faulty	* Rewind motor pully not contacting rubber ring of reel stand. * Faulty or dirty switch. * Faulty rewind motor or wiring.