

# Operating & Maintenance Instructions

## 350 Braille Reproduction Machine

### Table of Contents

1. General.....	2
2. Commissioning & Preparation for use .....	2
3. Pre Operation Tests .....	3
4. Machine Operation.....	3
5. Machine Maintenance.....	4
6. Moisture in Material.....	4
7. Clamp Frame Adjustment & Platen Changing .....	5
8. Poor Reproduction & Possible Causes.....	6
9. Non Scheduled Servicing.....	7
10. Technical Specifications.....	7
Appendix 1 - Fault Finding .....	8

## 1. General

The Model 350 supersedes our previous Model 375 and is designed primarily for the reproduction of Braille and tactile diagrams. The standard platens and clamp frame supplied with each machine will accommodate the most commonly used sheet sizes, namely 11 x 11.5in (280x292mm) and 11.8.5in (208x216mm). Other sizes can be supplied to special order upon request. The machine may be supplied in 220-240 Volt-50Hz and 110-120 Volt-50/60Hz; please note commissioning instructions before connecting to the power supply.

The new version is more compact, lighter and the reliance on mechanical moving components has been transferred to electro-mechanical which tend to be more durable and often customer serviceable. The heater hood is generously ventilated and of low thermal mass; this facilitates rapid warm up and cooling times. Copies may be produced within five minutes of switching on. The vacuum pump specified has proven to be extremely reliable in service and after considerable use, only the diaphragm and cylinder head valves should require any attention. The manufacturer's operating instructions and parts list are included in this manual under Appendix 11 at the rear, together with service points which in some countries it may be more convenient to contact rather than to refer back to the equipment manufacturer.

## 2. Commissioning & Preparation for use

Check that intended voltage and power supply matches that indicated on the rating label located adjacent to the incoming mains lead. 220-240V-50Hz machines will be supplied with a B.S. 13 amp square pin moulded on plug compatible with the majority of UK socket outlets. Alternative voltages will require a suitable plug to be provided compatible with local requirements.

### **IMPORTANT**

The wires in this mains lead are coloured in accordance with the following code:

Green and Yellow	Earth
Blue	Neutral
Brown	Live

### **WARNING - THIS APPLIANCE MUST BE EARTHED**

As the colours of the wires in this mains lead may not correspond with the coloured markings identified in your plug appliance, proceed as follows:

The wire which is coloured green and yellow must be connected to the terminal which is marked with the letter E or by the earth symbol (symbol) or coloured green or yellow and green.

The wire which is coloured blue must be connected to the terminal which is marked with the letter N or coloured blue or black.

The wire which is coloured brown must be connected to the terminal which is marked with the letter L or coloured brown or red.

### 3. Pre Operation Tests

Switch the machine on and the clear indicator above the switch will be illuminated. Turn the heat regulator to "full" and the heater will begin to warm up. Set the timer to 2 seconds then lower and clamp the clamp frame and push under the heater. For test purposes no material needs to be loaded onto the platen. After the elapsed time the vacuum pump will energise and provide the signal for withdrawal of the clamp frame. Just before completion of the platen return stroke the vacuum will be cancelled automatically. Turn the heat regulator to a mid setting and observe that the amber indicator flashes approximately every 40 - 60 seconds. This confirms that the regulator is functioning. All machine functions have now been checked and it is ready for use.

### 4. Machine Operation

Switch on and set the heater energy regulator to its maximum. Load a formed manilla master face upwards onto the platen, locating against the rear and left-hand fence. Place a thermoplastic copy sheet such as "Brailon" on top, textured surface uppermost. Ensure that both master and copy sheet are the same size and both will be clamped by the frame. Lower the clamp frame and clamp by rotating the clamp handle until it meets a positive stop. The clamping pressure will have been set during manufacture and should not require any adjustment.

If the heater has not been on for more than four minutes, set the timer to 6 seconds and slide the platen under the heater until it hits the backstop. When the vacuum pump is heard to operate, withdraw the platen fully.. Before removing the copy, check for quality and if unsatisfactory, repeat the process without unloading the original copy sheet. Until both the machine and platen reach normal running temperatures, the first few copies will require slightly extended heating times. Once satisfactory copies are being achieved start reducing the time setting until a heating cycle of 2 - 3 seconds is reached. It is unrealistic to reduce heating times further and during prolonged continuous use (say 20 - 30 minutes or more) it may be necessary to reduce heater power. In warm ambient conditions the ideal "run" setting may be as low as 2 or 3.

To reduce the number of operator functions the vacuum pump is automatically cancelled just prior to the platen returning to the loading position. Should a particular master require an extended vacuum period, to ensure adequate cooling, simply pause before completing the final part of the platen return stroke.

An operation counter is incorporated which counts the number of copies produced. This may be pre-set or left to provide a cumulative record of copies produced. Heater and timer controls have tactile legend plates to assist visually handicapped operators. All other controls with the exception of the operation counter are easily identifiable by touch.

## 5. Machine Maintenance

Always ensure that the mains lead and plug terminations are maintained in good order. These should be inspected regularly and, if in doubt t about their safety, a qualified electrical engineer consulted. A light smear of silicone oil or any other suitable lubricant may be applied occasionally to the platen slide bars if operation becomes “sticky”.

When not in use do not leave the platen clamped as this will prematurely compress the seals and reduce their ability to achieve high vacuum levels and good copy quality. Leave the platen in the up position or resting on top of the clamping roller.

## 6. Moisture in Material

Most thermoplastics absorb moisture and if copy sheets are stored in damp or even slightly humid conditions some absorption will take place. Moisture absorbed in this way may, during forming, be released in the form of water and will become evident in a small pool forming under the machine. There is no electrical danger and this phenomena will only be experienced in extreme conditions. The moisture condenses in the vacuum pump and will finally exit at the exhaust port.

If moisture accumulation becomes troublesome please refer back and we will make recommendations accordingly.

## 7. Clamp Frame Adjustment & Platen Changing

The clamp frame striker plate has a simple setscrew stop. This is set to provide approximately 30% compression of the platen seal sponge. If vacuum loss is suspected, move the setscrew one position to increase clamp loading. It is also important to ensure that the striker plate is adjusted to eliminate any side movement during clamping otherwise creasing of the copy sheet will occur.

If necessary, re-adjust so that any clearance between striker plate and clamping boss is on the right-hand side and as the clamp frame is lowered it lightly brushes the boss on the left-hand side, thus preventing sideways movement of the platen during clamping. Hexagon wrenches and spare fuses will be found in a container located alongside the vacuum pump beneath the machine or with the instruction manual supplied with the machine.

To change a platen it is necessary to move the rear cross member of the clamp frame to the appropriate position further forward. Remove the previous platen and loosely locate the new one in position. Lower the now reduced clamp frame and adjust platen alignment appropriately before final tightening of the fixing screws.

Crease pattern produced if striker plate incorrectly adjusted

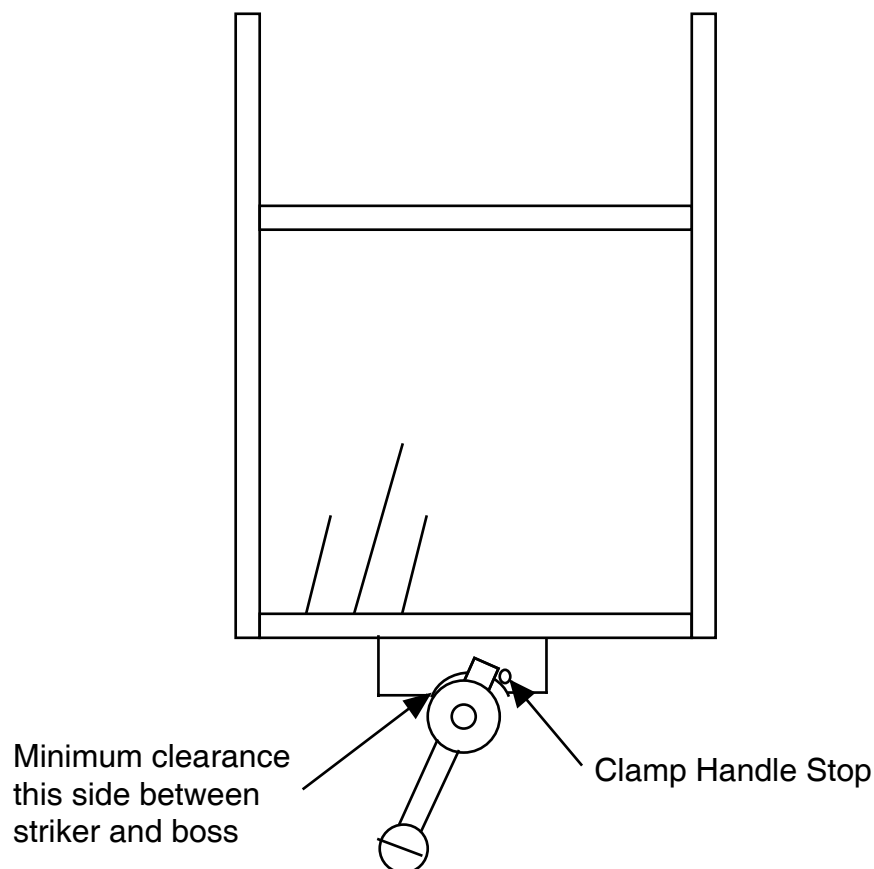


Fig 1

## 8. Poor Reproduction & Possible Causes

The following points have been identified from our service records as the most common causes of unsatisfactory performance. Many identify technique or the obvious but, when a problem does occur, they should be checked before looking any further. A mechanical fault finding chart can be found under appendix 1.

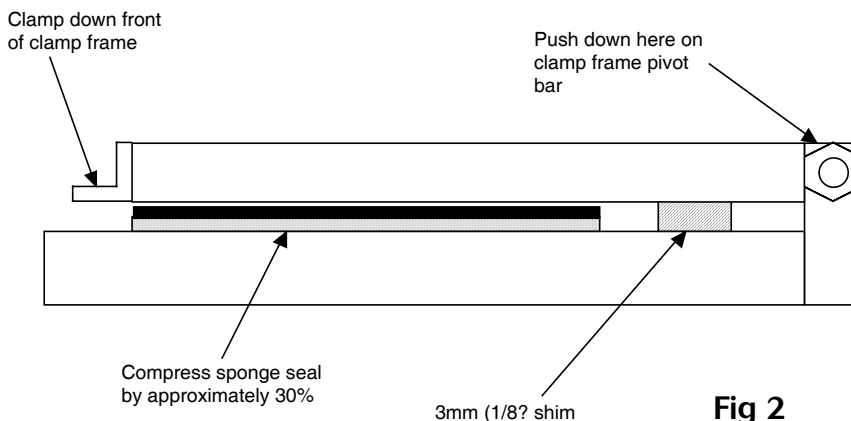
Effect	Cause	Remedy
Far edge of copy sheet prone to curl.	Over heating of the clamp frame near the heater.	1) Reduce timer to 2 seconds if running at a higher setting. 2) Reduce energy regulator setting.
Poor definition near clamp frame or in corners.	Copy sheet temperature too low for complete forming.	1) Increase heat. 2) Increase timer setting.
Material forms initially but then recovers on removal of vacuum power and loses the impression.	Platen and master too hot causing plastic memory to revert back to a flat sheet.	Reduce running temperature by reducing energy regulator or time.
No definition but vacuum pump appears to provide vacuum at platen, This can be checked by removing the perforated platen and putting a finger over the air entry hole with the pump running.	Air leak due to poor sealing.	1) Does the master and the copy sheet extend over the full area of the platen and clamp frame? 2) Have binding holes already been punched in the copy sheet? 3) Has the clamp frame been changed for a smaller sheet without changing to the smaller perforated platen.
Vacuum pump does not run	Vacuum pump plug dislodged during transit or removal.	Vacuum pump has a flying lead so that it can be removed for service without need for electrical expertise. Socket and pump can be accessed by turning the machine on its side.

## 9. Non Scheduled Servicing

Ease of servicing has been of paramount importance in the re-design of the Model 350. The vacuum pump is accessible and removable without requiring any electrical expertise. The moving vacuum pipe is mounted externally and can be replaced easily in the event of failure. One end is secured with a union nut and the other may be released by pulling whilst applying pressure in the opposite direction to the small sleeve through which the pipe passes. The olive at the union nut end is not re-usable.

Adjustment of the clamp frame is by means of the slotted pivot brackets at the rear and should only be necessary at very

infrequent intervals. Do not over compress the seals as this will reduce their life, aim for 30% compression of the lower perforated platen seal and remember when readjusting the rear pivot blocks that considerably more pressure will be necessary on the counter balance spring side.



**Fig 2**

During assembly a packing shim of 3mm thickness is used as shown in Fig 2 and a similar shim of steel sock, wood or plastic will suffice for field use.

Maintenance of efficient vacuum seals is essential for good copies. The perforated platen seal will require attention only after considerable service use and the upper seal (a pressure chord seated in a groove on the underside of the frame) can be easily replaced in the field. First, remove the old seal and any retaining adhesive and replace with a new cord using a few spots of suitable adhesive such as "Dunlop" Thixofix, adjacent to the corners and near the ends of the rear (movable) clamp frame bar.

## 10. Technical Specifications

Standard Platens	11 x 11.5ins and 11 x 8.5ins	
Power supply options	240V/50Hz	115V/60Hz
Current	6.75A	13.5A
Watts	1620	
Vacuum (typ.)	-0.83 bar (25ins Hg)	
Physical Specification (Machine)	480 x 1010 x 380mm (19 x 40 x 15in)	
Weight	38kg (84lb)	
Shipping Specification	510 x 1050 x 460mm (20 x 42 x 15in)	
Shipping Weight	44kg (97lb)	

## Appendix 1 - Fault Finding

Symptom	Check
Mains neon fails to illuminate	<ol style="list-style-type: none"> <li>1) Plug fuse</li> <li>2) Plug connectors</li> <li>3) Power supply, particularly if running off an extension lead.</li> </ol>
Mains neon illuminates but all other functions dead	<ol style="list-style-type: none"> <li>1) Plug fuse</li> <li>2) Plug connections</li> </ol>
Heater inoperative	<ol style="list-style-type: none"> <li>1) Fuse</li> <li>2) Heater regulator</li> <li>3) Element or element terminals, nearest heater most likely due to corrosion after considerable use</li> <li>4) Relay (heater)</li> <li>5) Faulty cables or crimp connectors</li> </ol>
Vacuum pump inoperative	<ol style="list-style-type: none"> <li>1) Fuse - vacuum pump</li> <li>2) Fuse - control circuits</li> <li>3) Micro switch adjustment - Note set for minimum travel for operation do not allow the plunger to bottom</li> <li>4) Vacuum pump faulty or lead disconnected - access under machine</li> <li>5) Timer faulty or dislodged</li> <li>6) Relay (latching) faulty or dislodged</li> </ol>
Vacuum pump will not re-set	<ol style="list-style-type: none"> <li>1) Fuse - control circuits</li> <li>2) Relay</li> <li>3) Microswitch adjustment</li> </ol>
Low vacuum - poor quality reproductions	<ol style="list-style-type: none"> <li>1) Clamp frame adjustment</li> <li>2) Platen seals</li> <li>3) Vacuum pump and connections</li> <li>4) Filters in pump head blocked</li> </ol>