

**JUKI**  
AUTOMATION SYSTEMS

# PLACE-MAT 360 OPERATION MANUAL

For Reference Only

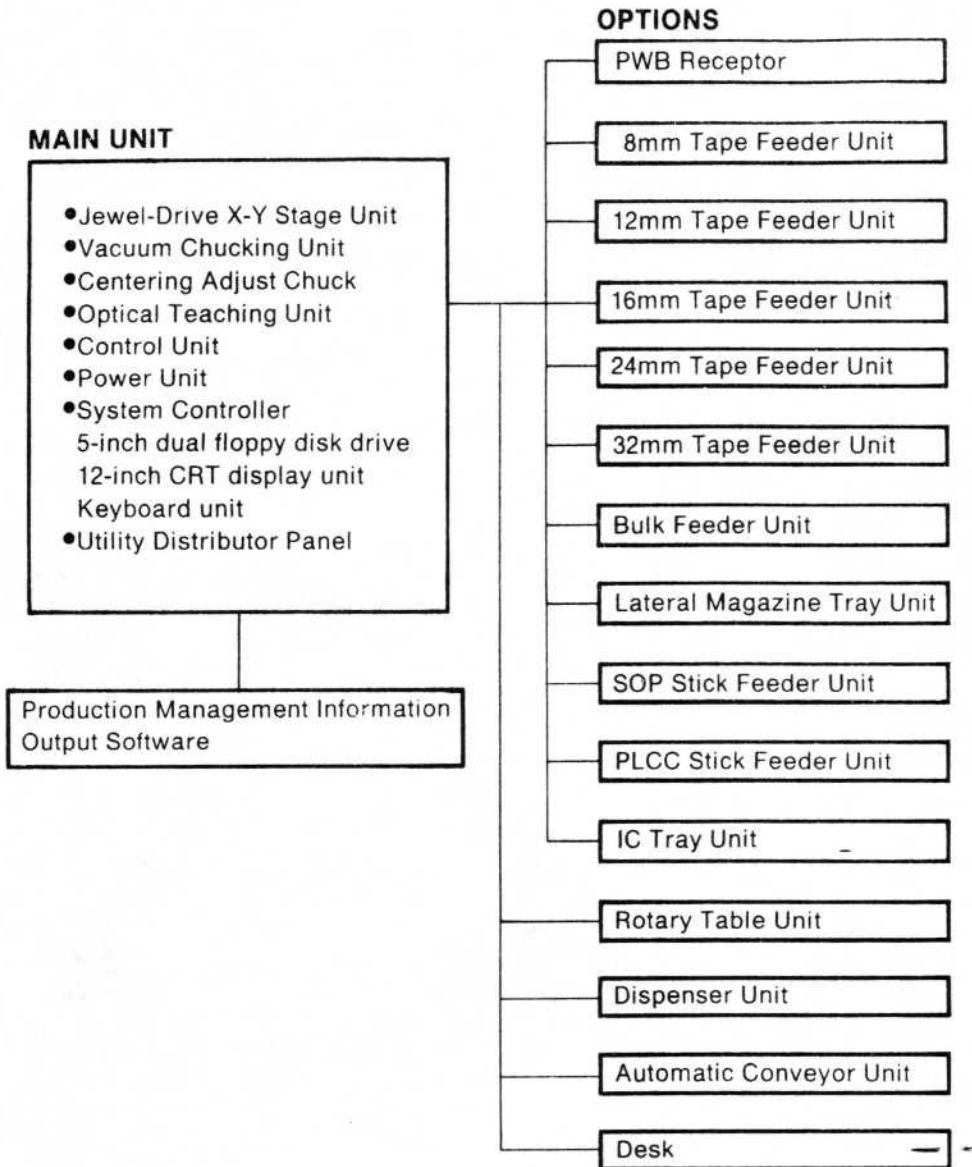
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# SYSTEM ORGANIZATION

Section **1**





# SPECIFICATIONS

## Section

# 2

## 1.

### APPLICABLE ASSEMBLY BOARDS

#### 1. Board Measurements

|   |                         |   |
|---|-------------------------|---|
| X | 300mm (max) 30mm (min)  | Manual Set                                    |
|   | 330mm (max) 30mm (min)  | when using auto-<br>matic conveying<br>system |
| Y | 250mm (max) 30mm (min)  |   |
| t | 2.3mm (max) 0.6mm (min) |   |

#### 2. Position Fixing Method

Hole or Perimeter Standard (See Fig. 2-1).

#### 3. Top/Bottom Height Limits for Assembly Board Parts

(See Fig. 2-2)

#### 4. Allowable Warp of Boards

|                 |               |
|-----------------|---------------|
| Paper Phenol    | Up/Down 1mm   |
| Glass Epoxy     | Up/Down 1mm   |
| Alumina Ceramic | Up/Down 0.2mm |

#### 5. Board Setting Method

Manual Set (With automatic conveyor, automatic)

#### 6. Board Width Adjustment Method

Manual

## 2.

### MOUNTING HEAD

#### 1. Mounting Accuracy

$\pm 0.2\text{mm}$

#### 2. Mounting Angle

$0^\circ, \pm 90^\circ$  (However, with rotary table can be mounted every  $15^\circ$ )

#### 3. Mounting Head Repetition Accuracy

$\pm 0.1\text{mm}$

#### 4. Mounting Timing Interval

1.2 seconds, minimum

#### 5. Head Movement Speed

450mm/second

## 6. Number of Heads

1 head

## 7. Number of Bits

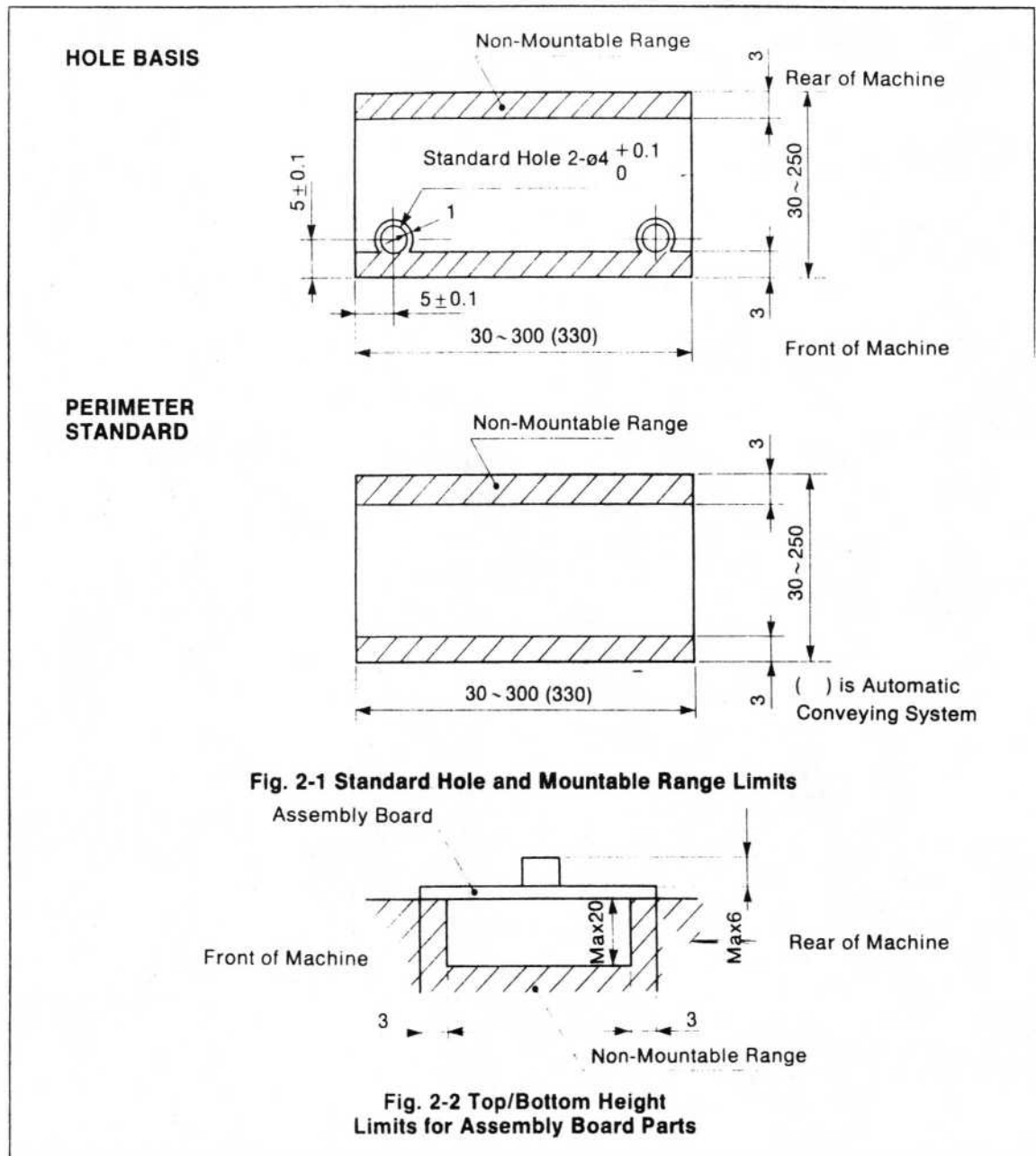
4 types, interchangeable to fit various parts  
For small chips  
For medium chips  
For large chips  
For QFP

## 8. Operational Air Pressure

5 kg/cm<sup>2</sup> (Dry air)

## 9. Operational Air Consumption

Within 60NI/min



### 3.

## PARTS AND PARTS PACKING

Table 2-1

| Parts                 | Width<br>Pitch | Parts Packing *3 |         |         |         |         |          |          |          |          |          |    | Bit *3 |    |    |   |   |   |   |    |    |
|-----------------------|----------------|------------------|---------|---------|---------|---------|----------|----------|----------|----------|----------|----|--------|----|----|---|---|---|---|----|----|
|                       |                | Tape             |         |         |         |         |          |          |          |          |          | BU | ST     | TO | MG | 1 | 2 | 3 | 4 | 5  |    |
|                       |                | 8<br>4           | 12<br>4 | 12<br>8 | 16<br>4 | 16<br>8 | 16<br>12 | 24<br>12 | 24<br>16 | 24<br>20 | 32<br>12 |    |        |    |    |   |   |   |   |    |    |
| Square Chip           | 2125           | ○                |         |         |         |         |          |          |          |          |          |    | ○      |    |    |   |   |   |   |    |    |
|                       | 3216           | ○                |         |         |         |         |          |          |          |          |          |    | ○      |    |    |   |   |   |   |    |    |
|                       | 3819           | ○                |         |         |         |         |          |          |          |          |          |    |        |    |    |   |   |   |   |    |    |
|                       | 4726           |                  | ○       |         |         |         |          |          |          |          |          |    |        |    |    |   |   |   |   |    |    |
|                       | 6332           |                  |         | ○       |         |         |          |          |          |          |          |    |        |    |    |   |   |   |   |    |    |
|                       | 7343           |                  |         | ○       |         |         |          |          |          |          |          |    |        |    |    |   |   |   |   |    |    |
| MELF                  | 1/16W          | ○                |         |         |         |         |          |          |          |          |          |    | ○      |    |    |   |   |   |   |    |    |
|                       | 1/8W           | ○                |         |         |         |         |          |          |          |          |          |    | ○      |    |    |   |   |   |   |    |    |
|                       | 1/4W           |                  |         | ○       |         |         |          |          |          |          |          |    | ○      |    |    |   |   |   |   |    |    |
| Mini-mord Transistor  |                | ○                |         |         |         |         |          |          |          |          |          |    |        |    | ○  | ○ |   |   |   |    |    |
| Mini-power Transistor |                |                  | ○       |         |         |         |          |          |          |          |          |    |        |    | ○  | ○ |   |   |   |    |    |
| Mini-flat IC          | 8P             |                  |         | ○       |         | ○       |          |          |          |          |          |    | ○      | ○  |    |   |   |   | ○ |    |    |
|                       | 14P            |                  |         |         |         | ○       | ○        |          |          |          |          |    | ○      | ○  |    |   |   |   | ○ |    |    |
|                       | 16P            |                  |         |         |         | ○       | ○        |          |          |          |          |    | ○      | ○  |    |   |   |   | ○ |    |    |
|                       | 20P            |                  |         |         |         |         |          |          | ○        |          |          |    | ○      | ○  |    |   |   |   | ○ |    | *2 |
|                       | 24P            |                  |         |         |         |         |          |          |          | ○        |          |    | ○      | ○  |    |   |   |   | ○ |    | ○  |
|                       | 28P            |                  |         |         |         |         |          |          |          | ○        | ○        |    | ○      | ○  |    |   |   |   | ○ |    | *1 |
| PLCC                  | 18P            |                  |         |         |         |         |          |          | ○        |          |          |    | ○      |    |    |   |   |   |   |    | ○  |
|                       | 20P            |                  |         |         |         |         |          | ○        | ○        |          |          |    | ○      |    |    |   |   |   |   |    | ○  |
|                       | 28P            |                  |         |         |         |         |          |          | ○        | ○        |          |    | ○      |    |    |   |   |   |   | *1 | ○  |
|                       | 32P            |                  |         |         |         |         |          |          |          | ○        | ○        |    | ○      |    |    |   |   |   |   | ○  | ○  |
|                       | 44P            |                  |         |         |         |         |          |          |          |          |          |    | ○      |    |    |   |   |   |   | ○  | ○  |
|                       | 52P            |                  |         |         |         |         |          |          |          |          |          |    | ○      |    |    |   |   |   |   | ○  | ○  |
|                       | 68P            |                  |         |         |         |         |          |          |          |          |          |    | ○      |    |    |   |   |   |   | ○  | ○  |
| QFP (44~64P)          |                |                  |         |         |         |         |          |          |          |          |          |    |        |    | ○  |   |   |   |   | ○  |    |

\* 1) When the size of the element is  $\square$  11.4mm or larger, use a No.4 bit.

\* 2) When the width of the resin part is 6 mm or larger, use a No.5 bit.

\* 3) BU: Bulk                      Bit type 1: for small chips  
 ST: Stick                        2: for medium chips  
 TO: Tray                         3: for SOP (small)  
 MG: Magazine                  4: for PLCC  
    5: for SOP (large)

Load pitch for mini-flat IC, PLCC, and QFP: 1 mm or more

Maximum kinds of parts that can be loaded: 88

Supply Direction: Front, Rear, Left, Right (depending on how parts are packed)

\* Parts other than the above may be used providing specifications are compatible.

**4.** **CONTROL EQUIPMENT**

1. **Axis Control Method**  
Open Loop by Pulse Motor
2. **Data Input Method**  
Teaching and MDI
3. **Minimum Specification Range**  
0.1mm
4. **Maximum Mounting Points**  
2000 Points
5. **Vacuum System Error Detection Method**  
Pressure Sensor
6. **Control Equipment**  
8-bit Computer (5-inch floppy disk, double-disk drive)
7. **Operation Modes**  
Production Mode (Continuous or Step)  
Teaching Mode  
Data Input Mode

**5.** **GENERAL SPECIFICATIONS**

1. **External**  
670mm(W) x 750mm(D) x 280mm(H) (Main unit cover only)
2. **Weight**  
62kg (Main unit only)
3. **Voltage**  
100V ± 10%  
110V, 120V  
220V, 240V Selectable Specifications
4. **Power Consumption**  
450VA (main unit)  
750VA (maximum when using options)
5. **Frequency**  
50/60Hz
6. **Environment**

|         |             |             |
|---------|-------------|-------------|
| Working | Temperature | 5 to 40°C   |
|         | Humidity    | 10 to 80%   |
| Storage | Temperature | -20 to 60°C |
|         | Humidity    | 10 to 90%   |

The above specifications do not apply to the personal computer.

Also, they apply only when there is no condensation.

**1. Lateral Magazine Tray Unit**

Number 4 per unit  
 Maximum Loading Units 2 units

**2. Bulk Feeder Unit**

Number of Lanes 10 lanes per unit  
 Maximum Loading Units 8 units  
 Number of Parts Receivable 3,000 per hopper (max)  
 (However, the maximum number varies depending on the chip. For 1/4W MELF, the maximum is 100 to 150.)

**3. Tape Feeder Unit**

## • 8/12mm Tape Feeder Unit

Tape Reel Specifications: Conforms to EIAJ Standard, RC1009  
 Number of Tape Cassettes: 6 cassettes per unit  
 Maximum Loadable Units: 6 units  
 Tape Width: 8, 12mm  
 Tape Feeding Pitch: 4, 8mm  
 Compatible Reel Diameter: 178mm  
 Other diameters require special arrangement.

## • 32mm Tape Feeder Unit

Tape Reel Specifications: Conforms to EIAJ Standard, RC1011  
 Number of Tape Cassettes: 6 cassettes per unit  
 Maximum Loadable Units: 6 units  
 Tape Width: 32mm  
 Tape Feeding Pitch: 12mm  
 Compatible Reel Diameter: 382mm  
 Other diameters require special arrangement.

## • 16/24mm Tape Feeder Unit

Tape Reel Specifications: Conforms to EIAJ Standard, RC1009  
 Number of Tape Cassettes: 4 cassettes per unit  
 Maximum Loadable Units: 4 units  
 Tape Width: 16, 24mm  
 Tape Feeding Pitch: 4, 8, 12, 16, 20mm  
 Compatible Reel Diameter: 178, 330, 382mm  
 Other diameters require special arrangement.

**4. PWB Receptor**

Applicable Assembly Board Dimensions

|   |             |             |
|---|-------------|-------------|
| X | 300mm (max) | 30mm (min)  |
| Y | 250mm (max) | 30mm (min)  |
| t | 2.3mm (max) | 0.6mm (min) |

## 5. **Automatic Conveyor Unit for Assembly Boards**

Applicable Assembly Board Dimensions

X 330mm (max) 30mm (min)

Y 250mm (max) 30mm (min)

Assembly Board Progression Right to left, or left to right  
(Determined at time of shipping)

## 6. **Rotary Table Unit**

Mounting Angle Every 15°

Perimeter Dimensions of Mounting Area

Within 25.6mm x 25.6mm

Lead Pitch 1mm or more

## 7. **Stick Feeder Unit**

PLCC Stick Feeder Unit

### • Standard Type

Number of Lanes 2 lanes per unit

Maximum Loadable Units 5 units

Compatible Stick Width: 10.5 to 15mm

Dimensions Height: 4.5 to 10mm

Length: 175 to 600mm

Any length beyond 600mm requires special arrangement

Compatible Parts

PLCC 18, 20, 28 or 32 pins  
Compatible part dimensions are listed in the table

### • Wide Type

Number of Lanes 1 lane per unit

Maximum Loadable Units 5 units

Compatible Stick Width: 10.5 to 15mm

Dimensions Height: 4.5 to 10mm

Length: 175 to 600mm

Any length beyond 600mm requires special arrangement

Compatible Parts

PLCC 18, 20, 28, 32, 44, 52 or 68 pins  
Compatible part dimensions are listed in the table

| No. of Pins | w: Width [mm] | l: Length [mm] | t: Thickness [mm] |
|-------------|---------------|----------------|-------------------|
| 18          | 8.0 to 8.5    | 13.0 to14.0    | 3.1 to 4.0        |
| 20          | 9.5 to 10.0   | 9.5 to10.0     | 4.0 to 5.0        |
| 28          | 12.1 to 12.6  | 12.1 to12.6    | 4.0 to 5.0        |
| 32          | 12.1 to 12.6  | 14.5 to15.5    | 3.1 to 4.0        |
| 44          | 17.2 to 17.7  | 17.2 to17.7    | 4.0 to 5.0        |
| 52          | 19.7 to 20.2  | 19.7 to20.2    | 4.0 to 5.0        |
| 68          | 24.9 to 25.4  | 24.9 to25.4    | 4.0 to 5.0        |

Any dimension not listed in the table above requires special arrangement.

### **8. IC Tray Unit**

|                                   |  |
|-----------------------------------|--|
| Maximun Loadable Unit             | 1 unit   |
| Compatible Parts                  | QFP, PLCC  |
| External dimension<br>of elements | 11.4 to 25.6mm per side  |
| Compatible Tray<br>Dimensions     | Width: 130 to 146mm<br>Length: 314 to 319mm<br>Height: 9mm or less<br>Other dimensions require<br>speial arrangement |

## 9. Dispenser Unit

- Dispenser Unit

|                                       |   |
|---------------------------------------|---|
| Control method                        | Pneumatic electronic control  |
| Pressure adjustment range             | 0.1 to 0.7kgf/cm <sup>2</sup>   |
| Power consumption                     | 7VA or more   |
| Timer                                 | 0.001 to 9.999 sec<br>Digital setting in 1ms Units; Quartz timer<br>(Can be internally switched in a range of 0.01 + 99.99 seconds) |
| Operating performance<br>(Controller) | 400 operations/min.   |
| Vacuum mechanism<br>(Controller)      | Built-in  |
| Syringe capacity                      | 10cc  |
| Metallic needle                       | Provided with S18, S20 (made by Uni-controls),<br>or any corresponding part.  |
| Compatible materials                  | Adhesive for chip parts<br>Cream solder (for dispenser)   |

- Thermostat for Dispenser

|                      |  |
|----------------------|--|
| Range of temperature | 0 to 99.9°C<br>Digital setting in 0.1°C units  |
| Control method       | Time-ratio control   |
| Heat control power   | Max 700W (separate transformer provided)   |
| Usable voltage       | AC100V 50/60Hz   |
| Thermostat syringe   | Recommended operating range Max 50°C<br>Temperature sensor Platinum<br>Compatible syringe 10cc |

## 10. Special desk

|        |                  |
|--------|------------------|
| Size   | Width: 670mm     |
|        | Depth: 750mm     |
|        | Height: 735mm    |
|        | 1195mm           |
|        | (Up to CRT base) |
| Weight | 60kg             |

\* Main specifications subject to change without notice upon improvement.



# 7.

## NAMES OF PARTS

### 1. Front View

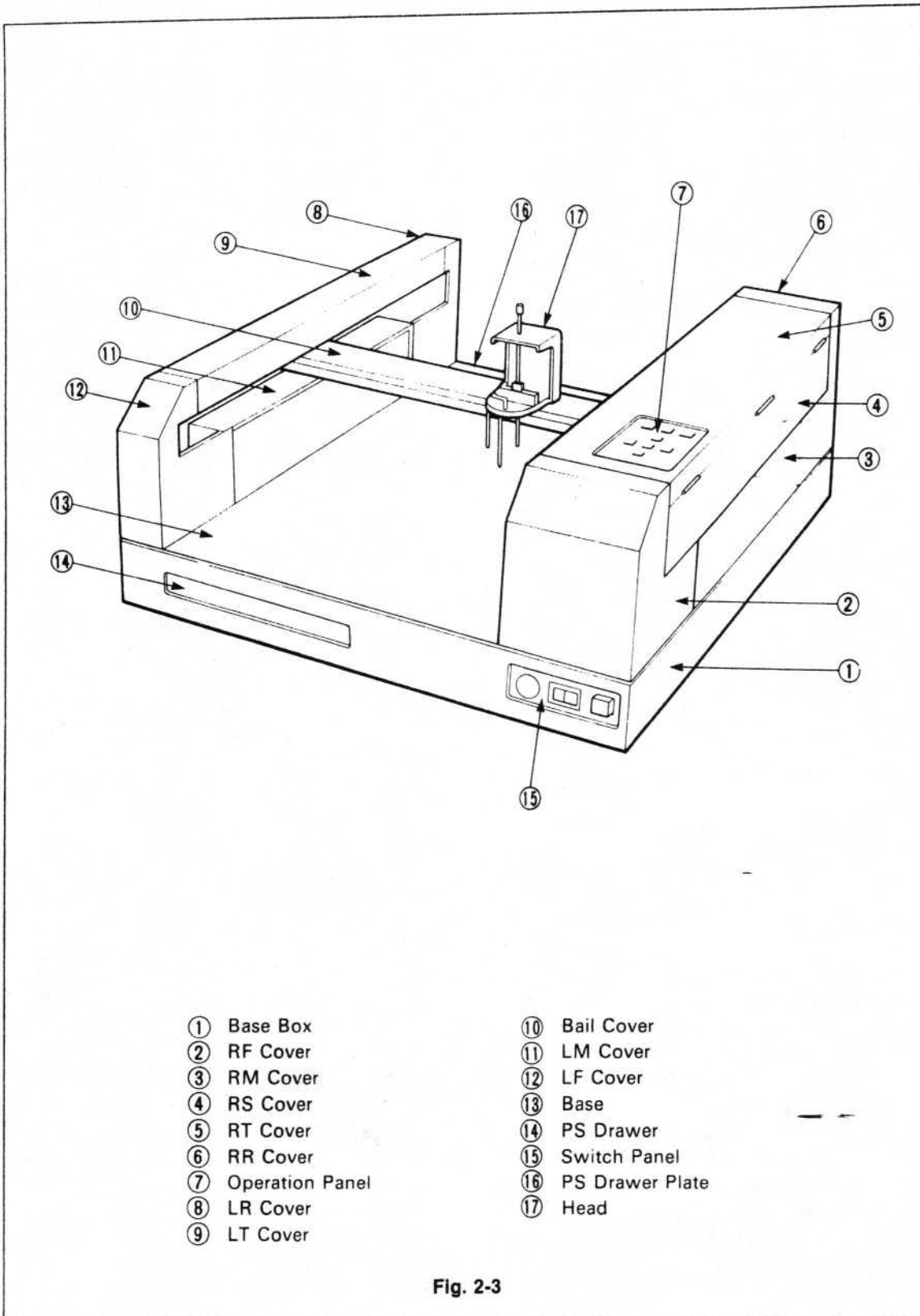
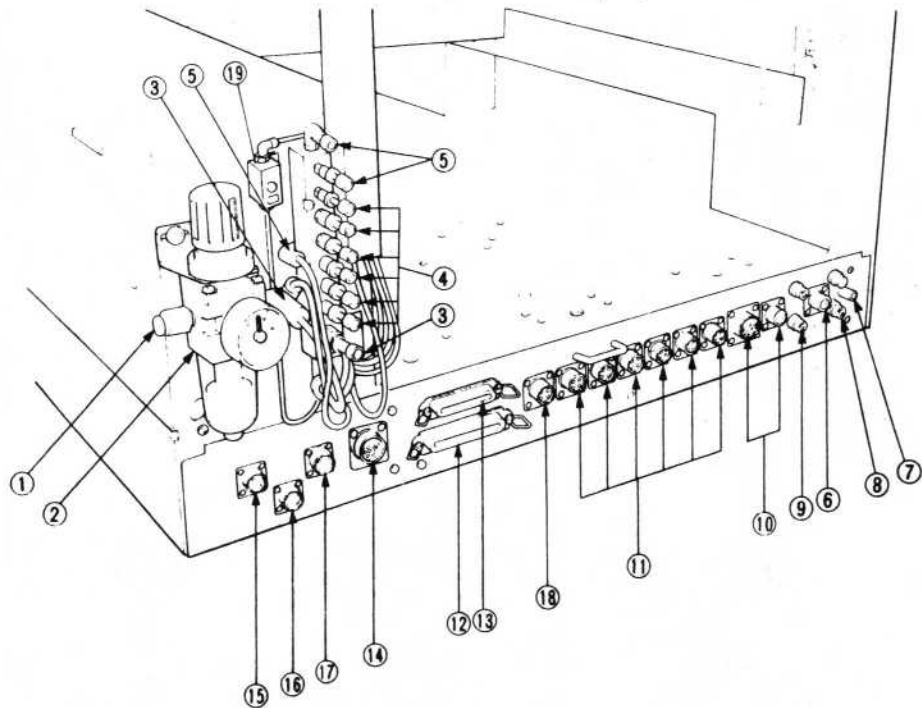


Fig. 2-3

## 2. Rear View



- |   |  |
|---|--|
| ① Air Insertion Opening (ø8 tubes)                          | ⑩ Connector (for automatic conveyor unit)        |
| ② Filter Regulator (setting pressure 5 kg/cm <sup>2</sup> ) | ⑪ Connector (for feeder)                         |
| ③ Manifold Piping Joint (ø8 tubes)                          | ⑫ Connector (for personal computer pin no. 50)   |
| ④ Manifold Piping Joint (ø6 tubes)                          | ⑬ Connector (for personal computer pin no. 36)   |
| ⑤ Manifold Piping Joint (ø4 tubes)                          | ⑭ Connector (for rotary table unit)              |
| ⑥ Power Connector (AC 100V)                                 | ⑮ Connector (for joint-in)                       |
| ⑦ Ground terminal   | ⑯ Connector (for dispenser unit)                 |
| ⑧ Fuse (7A)   | ⑰ Connector (for joint-out)                      |
| ⑨ Fuse (3A)   | ⑱ Connector (for personal computer power source) |
|   | ⑲ Pressure Switch                                |

Fig. 2-4

# OPERATIONS OF EACH PART

## Section

# 3

### 1.

#### MAIN UNIT, FRONT

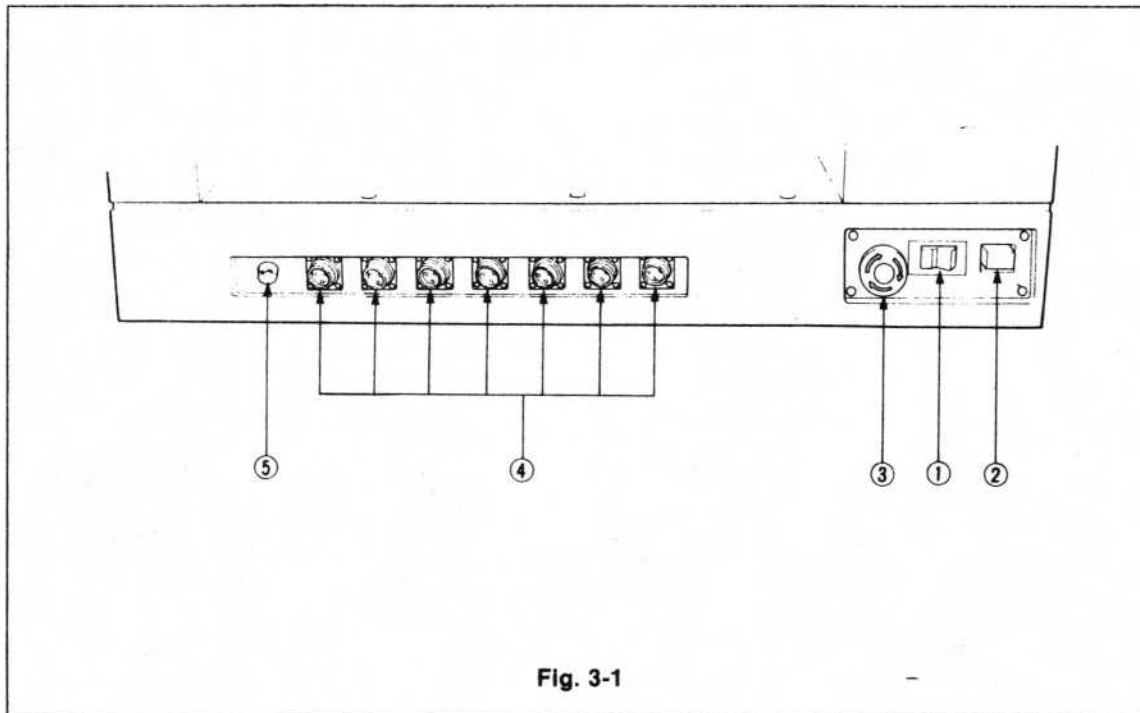
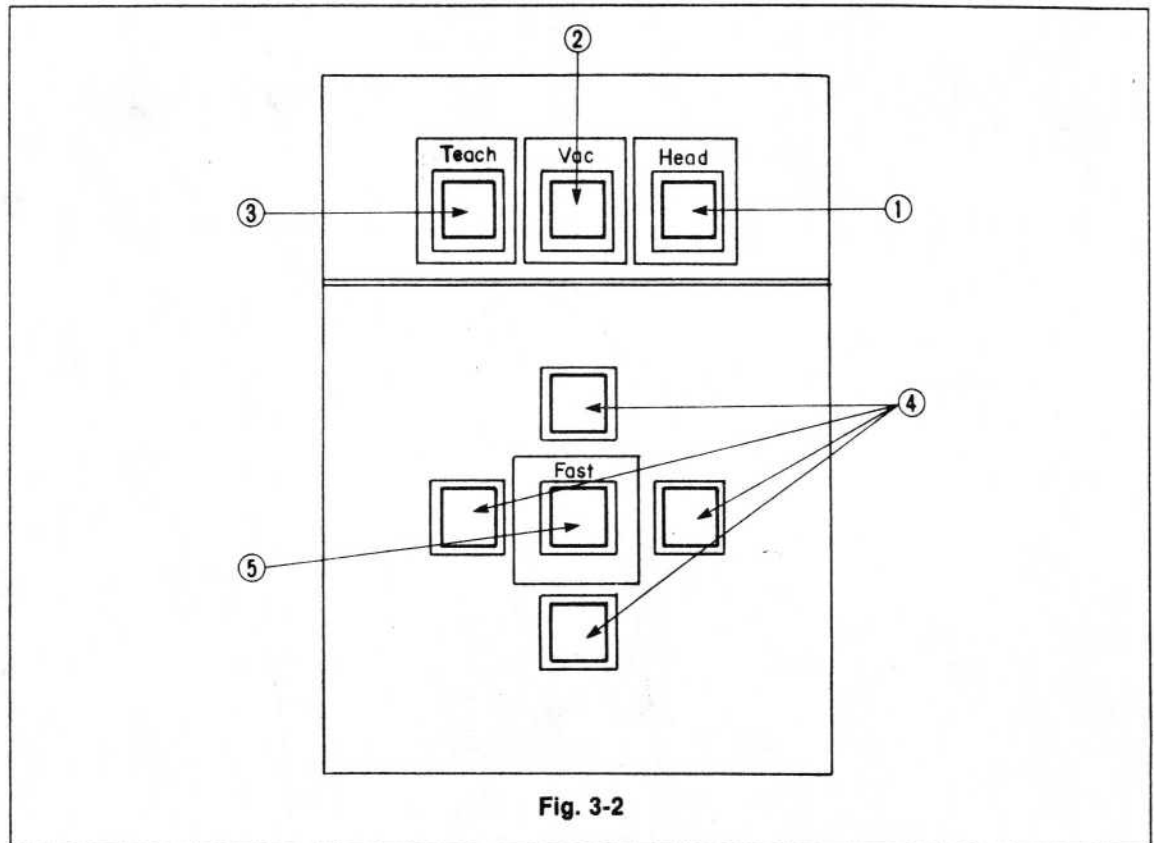


Fig. 3-1

- ① Power Switch  
When this is turned on, power is supplied to the main unit.
- ② Home Switch  
When this is turned on in the teaching mode, the head moves, and stops at the starting point (home position).
- ③ Emergency Stop Switch  
Press this switch to stop the machine in an emergency.
- ④ Connectors (for feeders)  
Connect power cords from these connectors to each feeder on the front of the base.
- ⑤ Fuse (3A)

## 2.

### EXPLANATION OF OPERATION PANEL



**Fig. 3-2**

- ① HEAD Switch  
When in teaching mode, or for an I/O test, press this switch to move the head bit up and down.
- ② Vac (Vacuum) Switch  
When this switch is pressed in teaching mode, or for an I/O test, the head is in "vacuum" position, ready to pick up an assembly board.
- ③ TEACH Switch  
If this is pressed in the teaching mode, the current XY coordinates will be input for the head position.
- ④ ← → ↑ ↓ Switches  
The head moves in the direction of the arrow.
- ⑤ FAST Switch  
The speed of the head movement increases when this switch is pressed while holding down switch ④.

### 3.

### CONNECTIONS

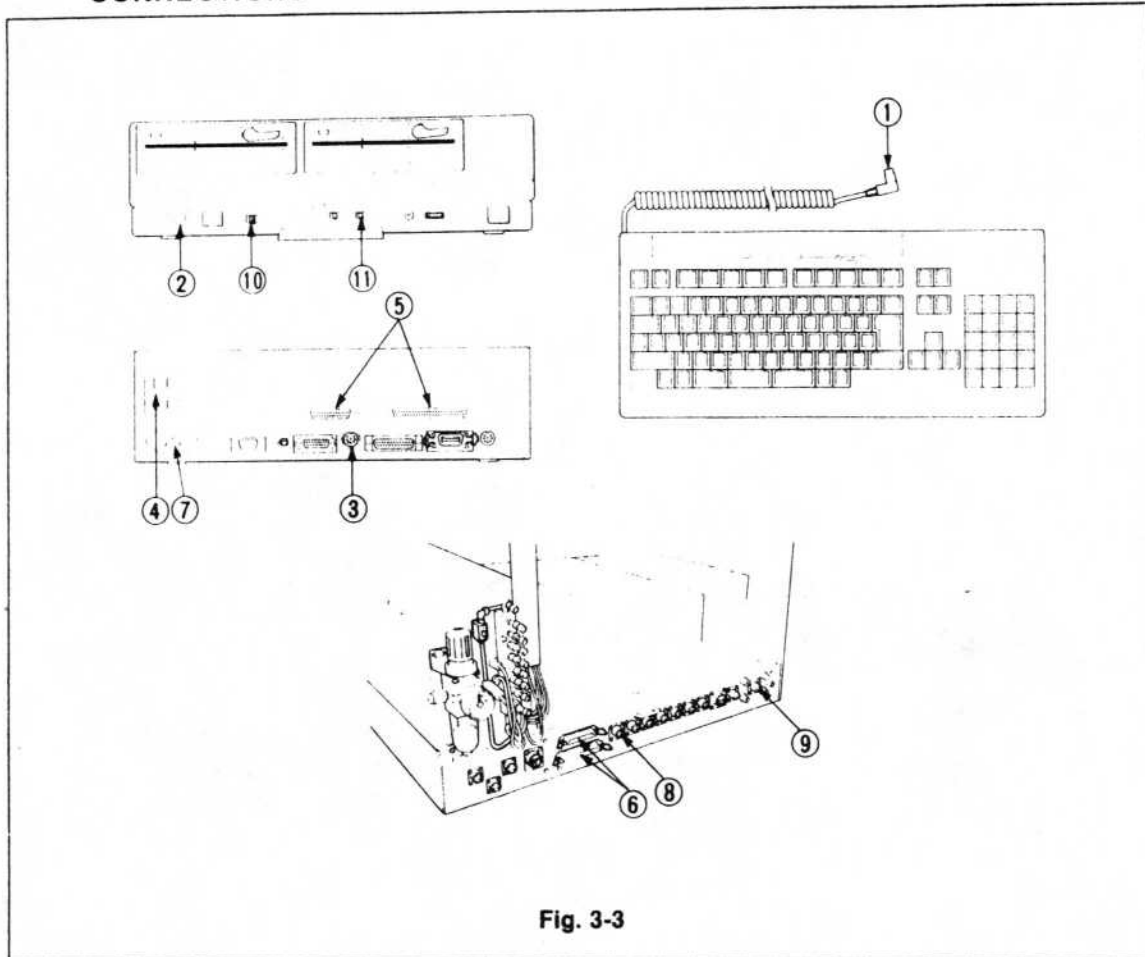


Fig. 3-3

#### 3. Main Unit and Controller Connections

1. Make sure power to the placer main unit, controller, CRT display, and all other mechanisms is turned OFF.
2. Connect the cord of the keyboard ① to the keyboard connector ② on the front of the controller.
3. Connect the CRT cable to the (Digital RGB) CRT connector ③ of the controller. Connect the other end to the connector on the rear panel of the display.
4. Connect the power cord of the display to the AC 100V connector ④ of the controller.
5. Connect the two signal cables to the corresponding extension board connectors (50, 36 pins) ⑤, and fasten the other ends firmly to the connectors ⑥ of the main unit.
6. Also connect one end of the power cord of the controller to the AC connector ⑦ on the rear panel of the controller, and the other end to the connector ⑧ on the rear panel.
7. Connect the power cord to the power connector ⑨ of the main unit.
8. The switches of the front panel of the controller should be set as follows:

|                          |      |
|--------------------------|------|
| Operation Clock Switch ⑩ | 8MHz |
| System Mode Switch ⑪     | V2   |

## 2. Connecting the Air System Parts

Please refer to Fig. 2-4.

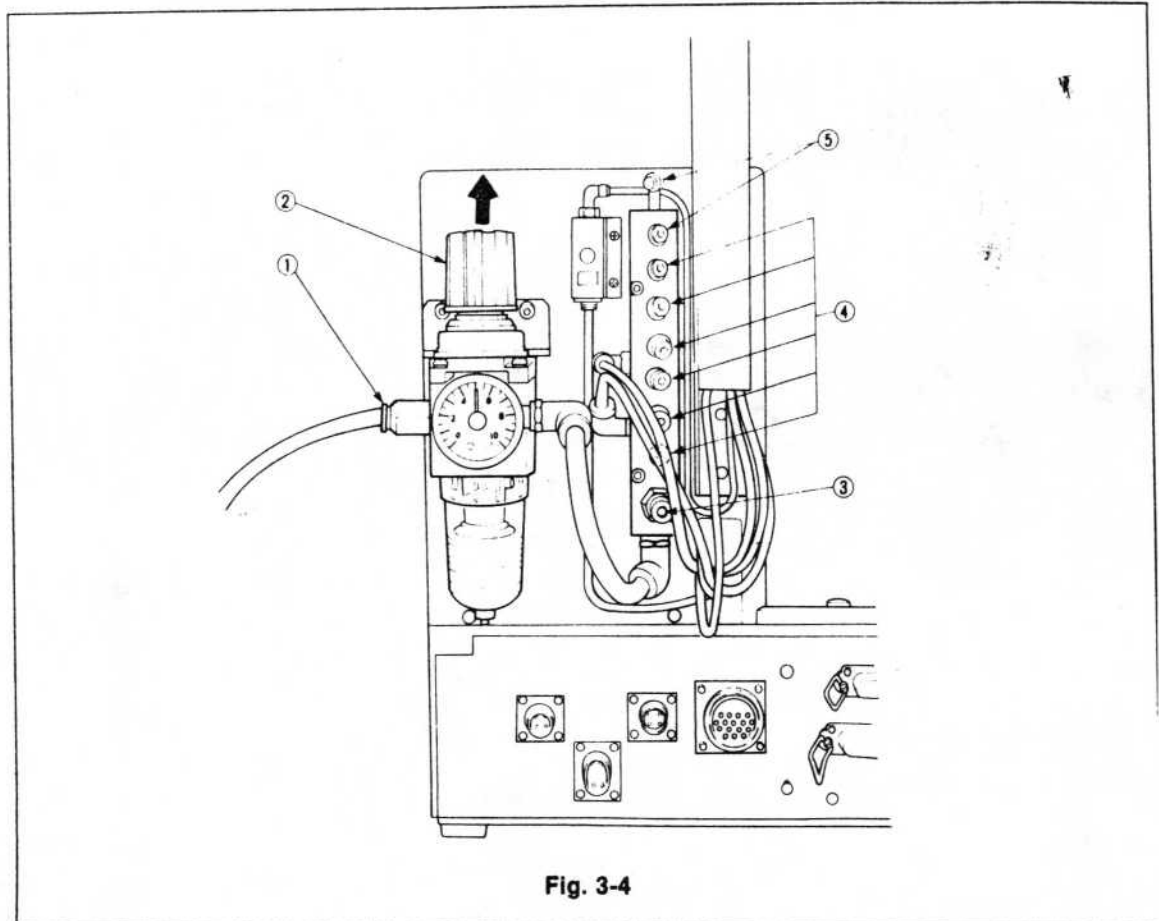


Fig. 3-4

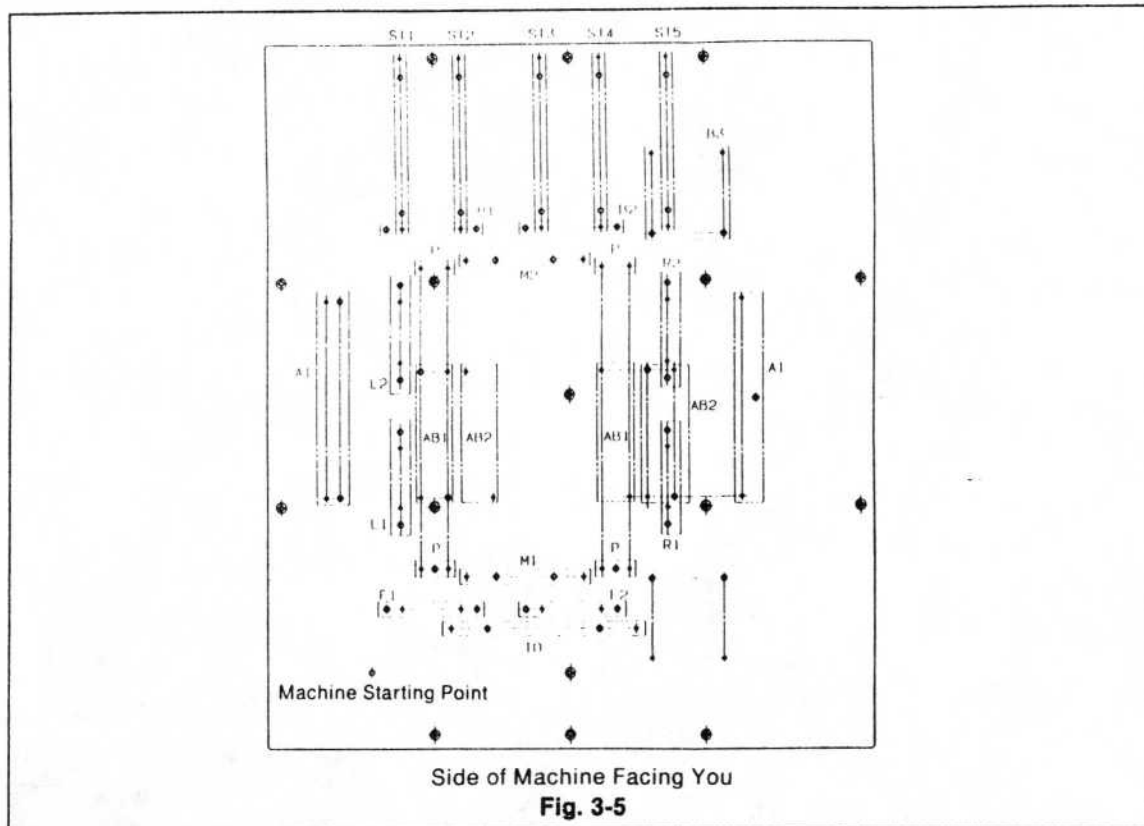
1. For air supply (dry air), use an accessory air hose ( $\varnothing 8$  tube) and attach it to the Air Intake ①.
2. Raise the filter regulator ② knob in the direction of the arrow as shown in Fig. 3-4 and rotate it clockwise. When the air pressure reaches  $5 \text{ kg/cm}^2$  lower the knob.
3. The air piping of the various feeders is connected as outlined below.  
Air opening of the feeder ( $\varnothing 8$  tube) ③.....Dispenser Unit  
Air opening of the feeder ( $\varnothing 6$  tube) ④.....Tape Feeder Unit  
Air opening of the feeder ( $\varnothing 4$  tube) ⑤.....Rotary Table Unit, Automatic Conveyor Unit

### NOTE:

When making connections, make sure that you put any removed caps/covers in safe places so they are not lost.

### 3. Connecting Option Attachments

Diagram of Option Attachment Positions



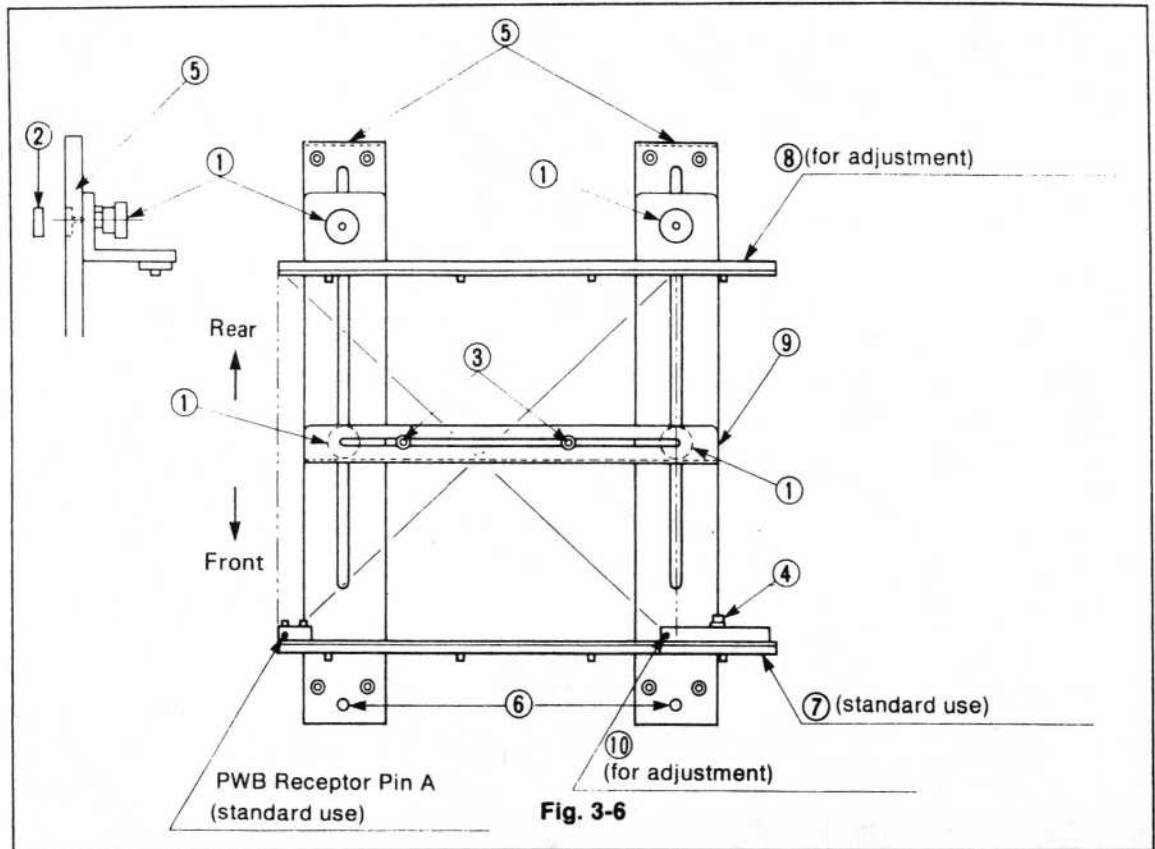
| Attachment Position              | Option                               |
|----------------------------------|--------------------------------------|
| F1<br>F2<br>B1<br>B2<br>L1<br>L2 | Tape Feeder Unit<br>Bulk Feeder Unit |
| R1<br>R2                         | Bulk Feeder Unit                     |
| P                                | PWB Receptor                         |
| M1<br>M2                         | Lateral Magazine Tray Unit           |
| ST1<br>ST2<br>ST3<br>ST4<br>ST5  | Stick Feeder Unit                    |

| Attachment Position | Option   |
|---------------------|--|
| T0                  | IC Tray Unit   |
| B3                  | Rotary Table Unit  |
| A1                  | Assembly Board Automatic Conveyor Unit                                 |
| AB1                 | Assembly Board Automatic Conveyor Unit Backup Pin Base (right to left) |
| AB2                 | Assembly Board Automatic Conveyor Unit Backup Pin Base (left to right) |

**NOTE:**

- When attaching any of the options, make sure you first turn off the power switch. Then move the head so it doesn't get bumped or struck.
- When an assembly board automatic conveyor unit is attached, the option attachment positions L1, L2, R1 and R2 cannot be used.
- The tape feeder unit of 16mm or 24mm tape width cannot be mounted using positions L1 and L2.
- When a 16/24mm tape feeder is installed in F1, and F2, the Lateral Magazine Tray Unit cannot be installed in M1. The same is true regarding M2 when B1 and B2 are being used.

## 4. **PWB RECEPTOR**



### 1. **Attaching to the Main Unit (See Fig. 3-5, page 3-5.)**

Insert Position Fixing Pin B ⑥ into the hole in the main unit as shown in Fig. 3-6, and secure the bolts (M5 x 10), using the wrench provided. Next, fasten Bracket F ⑦ to the base ⑤ of the PWB Receptor with a bolt (M5 x 10), using the wrench provided. Attach Bracket B ⑧ and the Center Bracket ⑨ by inserting the PWB Receptor Nut ② into the slot on the base ⑤ from the back and secure it by turning the handknob ① tightly.

### 2. **Adjusting the Width**

When changing the size of the assembly boards, the PCB Receptor Bracket B ⑧ must be moved back and forth until it matches the width of the board. Loosen the two handknobs ① and set the new position for the assembly board width.

### 3. **Aligning the Position Fixing Pin**

Loosen the bolt ④ holding the PWB Receptor Pin B ⑩ and realign it to fit in the hole on the assembly board.

### 4. **Aligning the Backup Pin**

When the assembly board is large, the pressure between the bit head (when down) and the backup pin ③ keeps the board from curling. Loosen the two handknobs ① and the center pins ③, and set the board in position so that the backup pin is not touching any of the parts on the assembly board.



## 5.

### LATERAL MAGAZINE TRAY UNIT

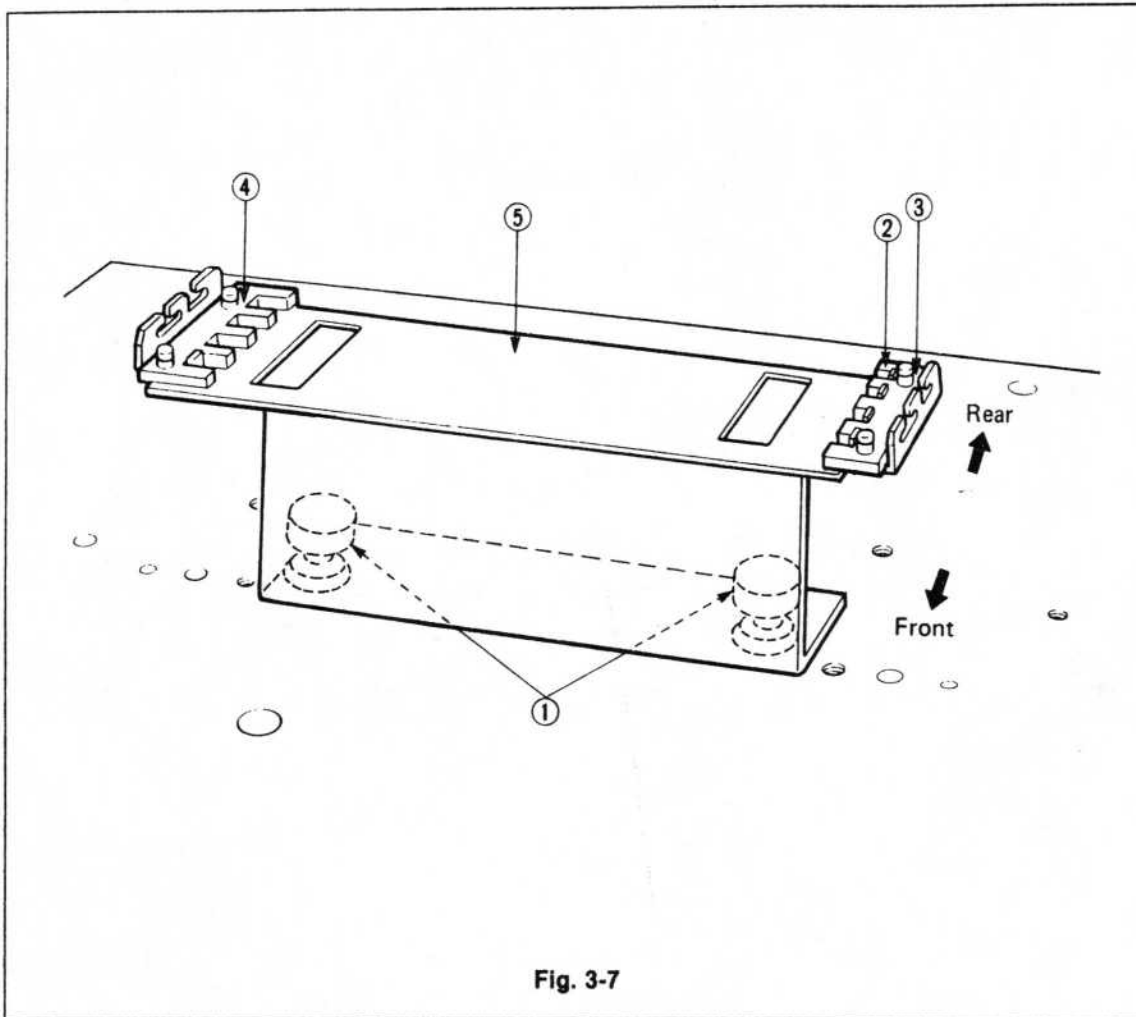


Fig. 3-7

**1. Attaching to the Main Unit (See Fig. 3-5, page 3-5.)**

Attach the two handknobs ① to the fixed knock pin holes on the base. (See Fig. 3-7) At this time, attach the magazine pusher ② to the right.

**2. Connecting and Disconnecting the Magazine**

Insert the magazine from above, into the slot of the Magazine Guide ③ which is attached to the Magazine Pusher ②. Then attach it to the opposite Magazine Guide ④.

Make sure the end side of the magazine and the reverse end side of Magazine Guide ④ are touching securely. To remove the magazine, insert your finger in the hole of the magazine bracket ⑤ and push up on the magazine.

3. Pass the L-shaped end of the wire ⑥ through the notch of the wire holder ⑦ from the inside. (Fig. 3-8-a)  
Insert the wire ⑥ between the magazines, and push down on the magazines (so that the V-shaped wire is positioned downward and the projections hold down both magazines.)  
Slide the wire ⑥ slowly in the direction of the arrows shown in the figure, until the L-shaped end of the wire ⑥ is stopped at the notch of the wire holder ⑦. (Fig. 3-8-b.)

**NOTE:**

When the wire is installed, make sure that both magazines have already been installed.

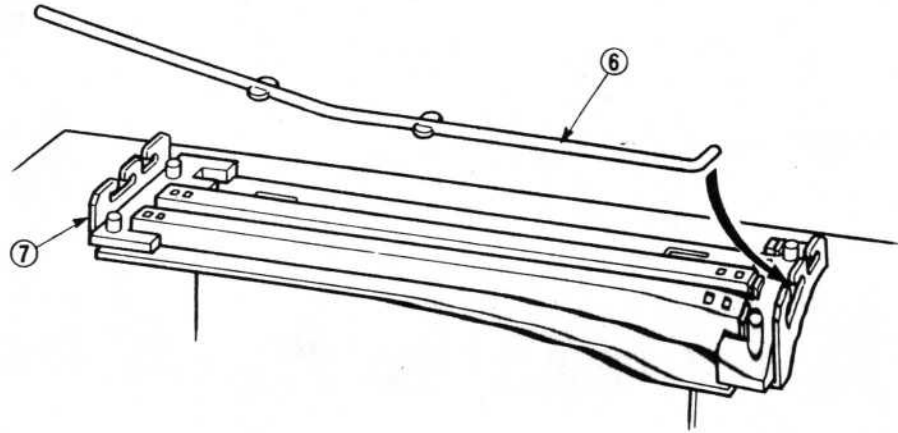


Fig. 3-8-a

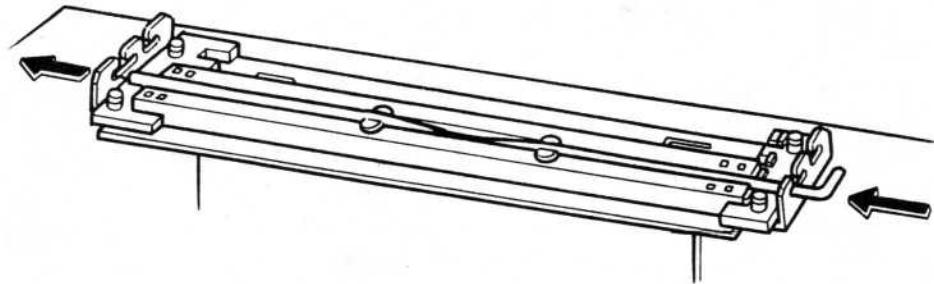


Fig. 3-8-b

## 6.

### BULK FEEDER UNIT

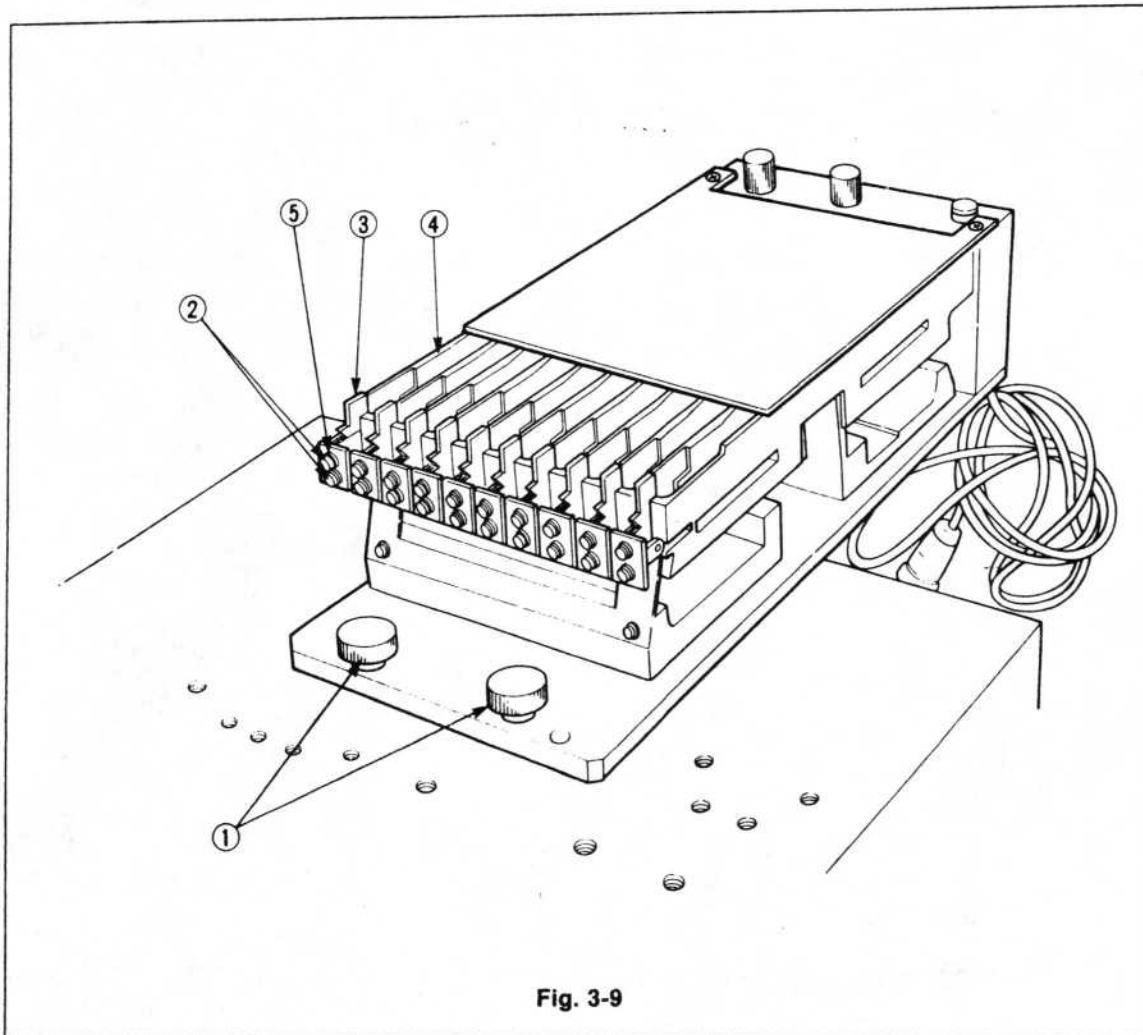


Fig. 3-9

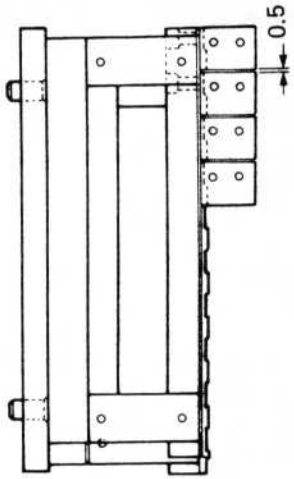
#### 1. Attaching to the Main Unit (See Fig. 3-5, page 3-5.)

Attach the bulk feeder unit to the fixed knock pin holes of the main unit, and secure it with the 2 handknobs ①.

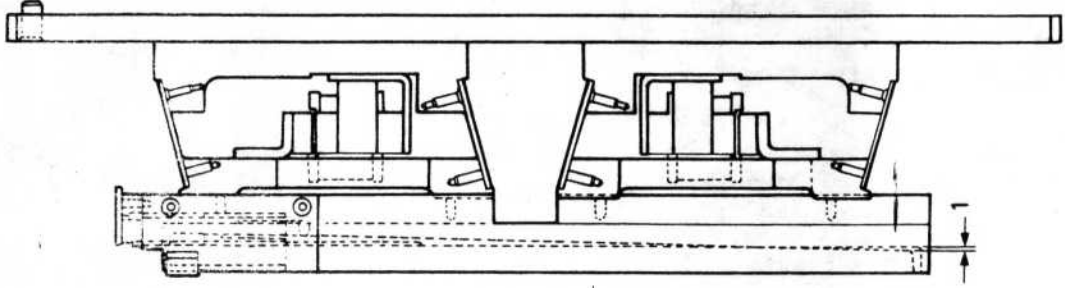
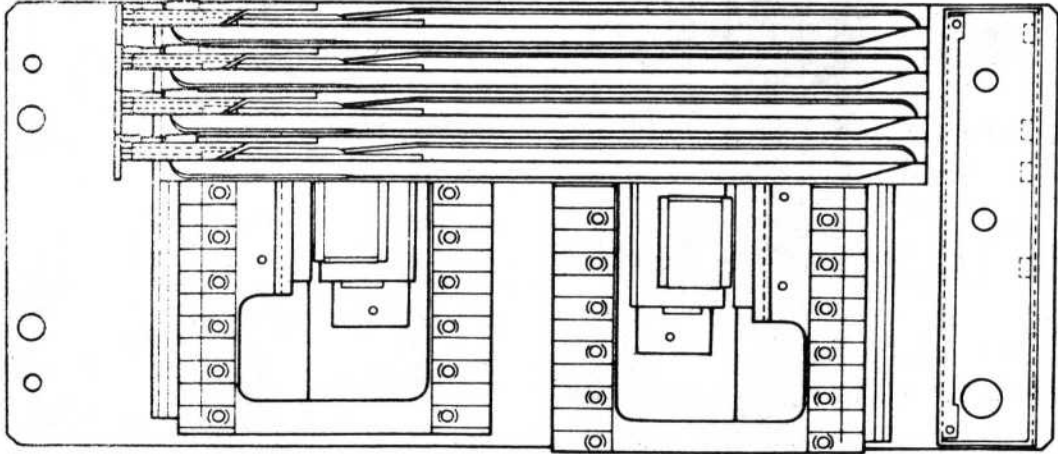
#### 2. Exchanging the Alignment Blocks

Exchange the alignment blocks of the end sections to match the dimensions of the parts. First, remove the cover from the end section ③. Next remove the two screws ② and pull the blocks toward you to remove them. Line up the new blocks with the hole in Tray A ④ and insert them. Secure the end section stopper ⑤ with the screws ②. Next, press the end section cover ③ into place from above in a position such that the distance between the cover and the end stoppers is slightly longer than the length of the parts dimensions. The dimensions of the slot into which the blocks are fit are as shown in Fig. 3-10.

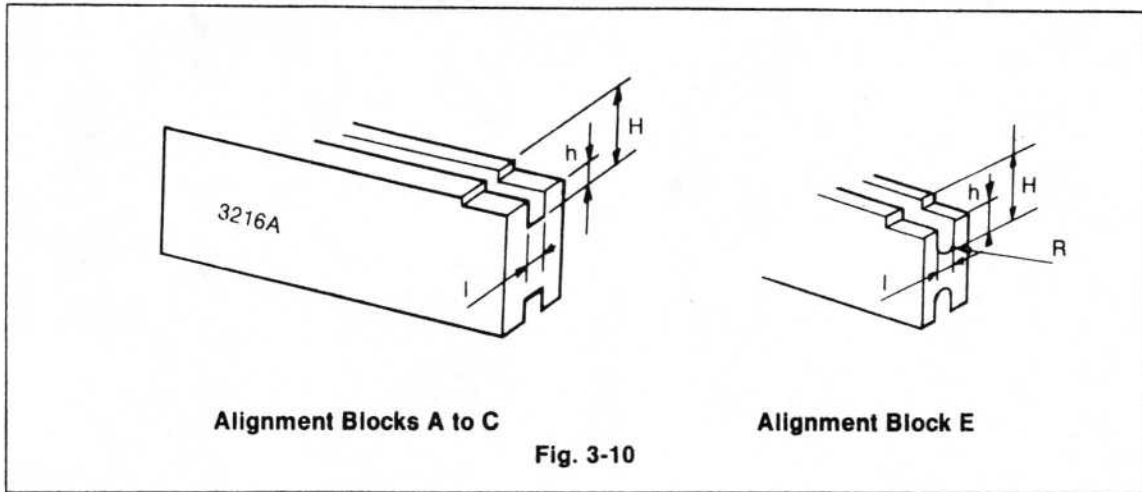
*Layout of Bulk Feeder Lineup*



| Layout Block Arrangement |      |
|--------------------------|------|
| MELF                     | Φ2.5 |
| MELF                     | Φ1.5 |
| 3216C                    |      |
| 3216B                    |      |
| 3216A                    |      |
| MELF                     | Φ2.5 |
| MELF                     | Φ1.5 |
| 2125A                    |      |
| 2125B                    |      |
| 2125C                    |      |



**Fig. 3-7-1**



**Table 3-1**

(Unit: mm)

| Part Name         | Symbol | H    | h    | l    |           |
|-------------------|--------|------|------|------|-----------|
| Alignment Block A | 3216 A | 1.35 | 0.8  | 1.85 | +0.1<br>0 |
|                   | 2125 A |      |      | 1.5  |           |
| Alignment Block B | 3216 B | 1.05 | 0.65 | 1.85 |           |
|                   | 2125 B |      |      | 1.5  |           |
| Alignment Block C | 3216 C | 0.7  | 0.4  | 1.85 |           |
|                   | 2125 C | 0.6  |      | 1.5  |           |
| Alignment Block E |        | 2.5  | 2    | 2.5  |           |
|                   |        | 1.5  | 1    | 1.5  |           |

### 3. Connecting the Power and Adjusting the Control Box

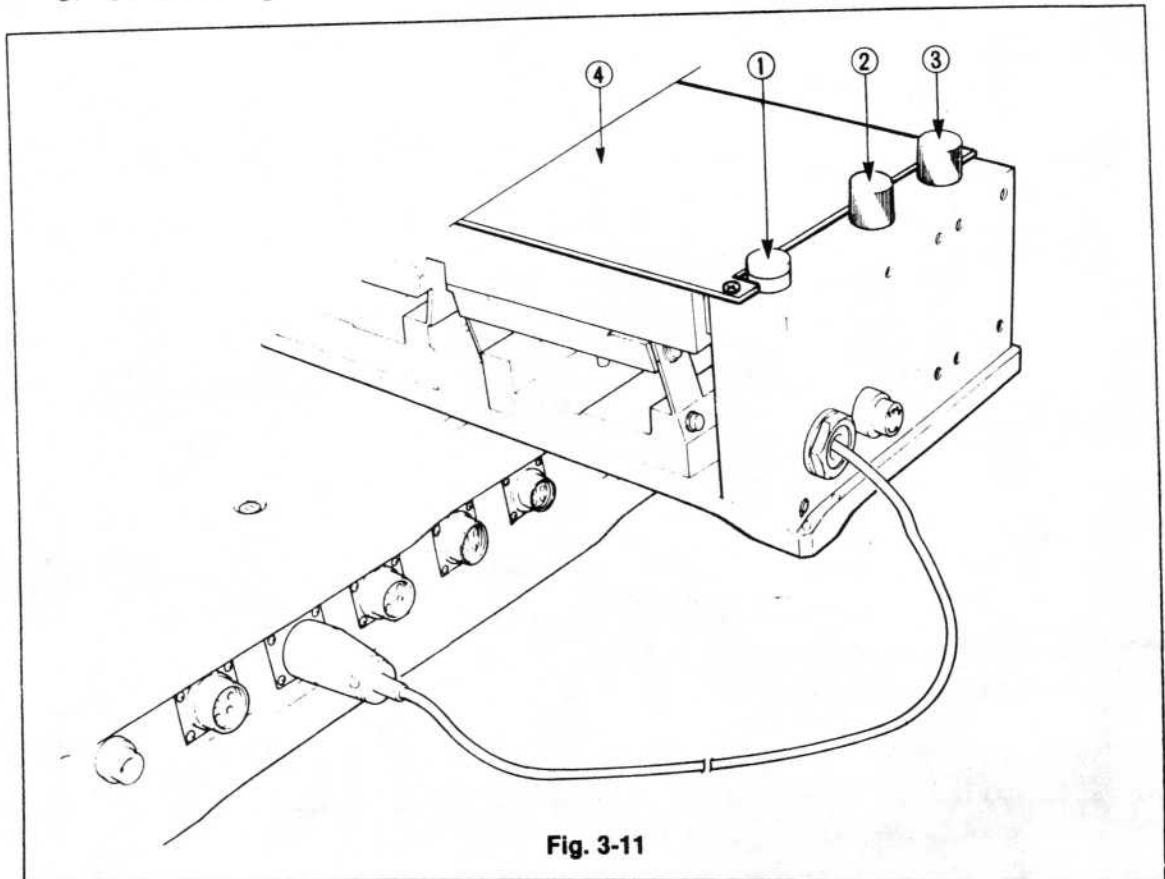


Fig. 3-11

Connect the power cord to the main unit at the connector for feeder use near the bulk feeder unit (see Figs. 2-4, 3-1, pages 2-7 and 3-1 respectively).

Open the plastic cover ④ by pulling it toward you. When the proper amounts of parts have been loaded onto each tray, close the cover and rotate the vibration adjustment knobs of the hopper ② and feeder ③ counterclockwise to the "Minimum" position (to avoid vibration). Turn on the power switch ①.

Rotate the vibration adjustment knob clockwise until the optimum position has been found.

**NOTE:**

Vibration may result, depending on how the adjustment is made. Please adjust the knob carefully to avoid vibration. Also, the amount of variation may change if large and small elements are sent together. In a case like this, re-adjustment may be necessary. If the elements of an alignment block are out of alignment, replace or supplement the elements.

# 7.

## TAPE FEEDER (FOR 8mm, 12mm)

### 1. Names of Parts

#### a) Tape Feeder

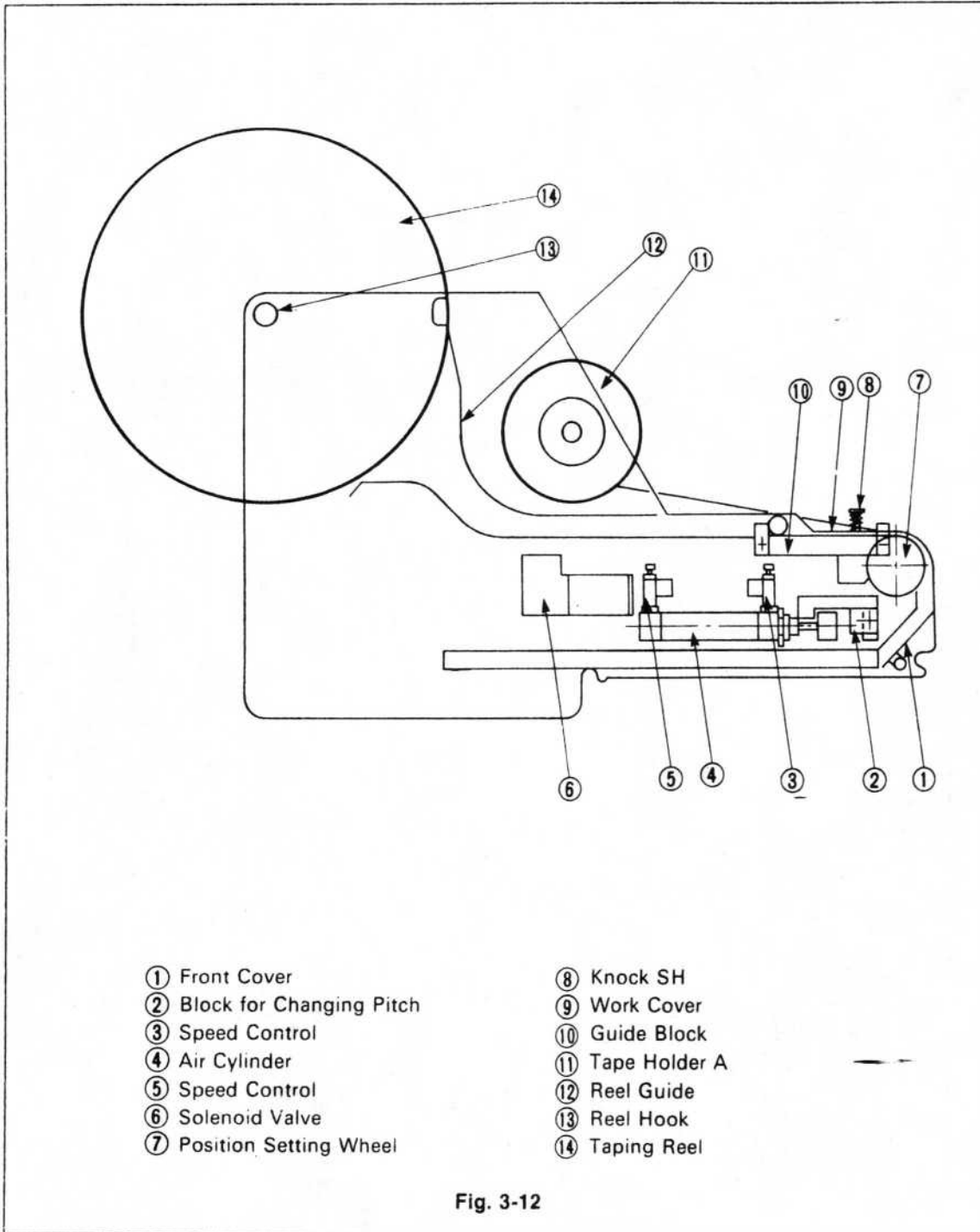


Fig. 3-12

b) Tape Cassette Attachment Assembly

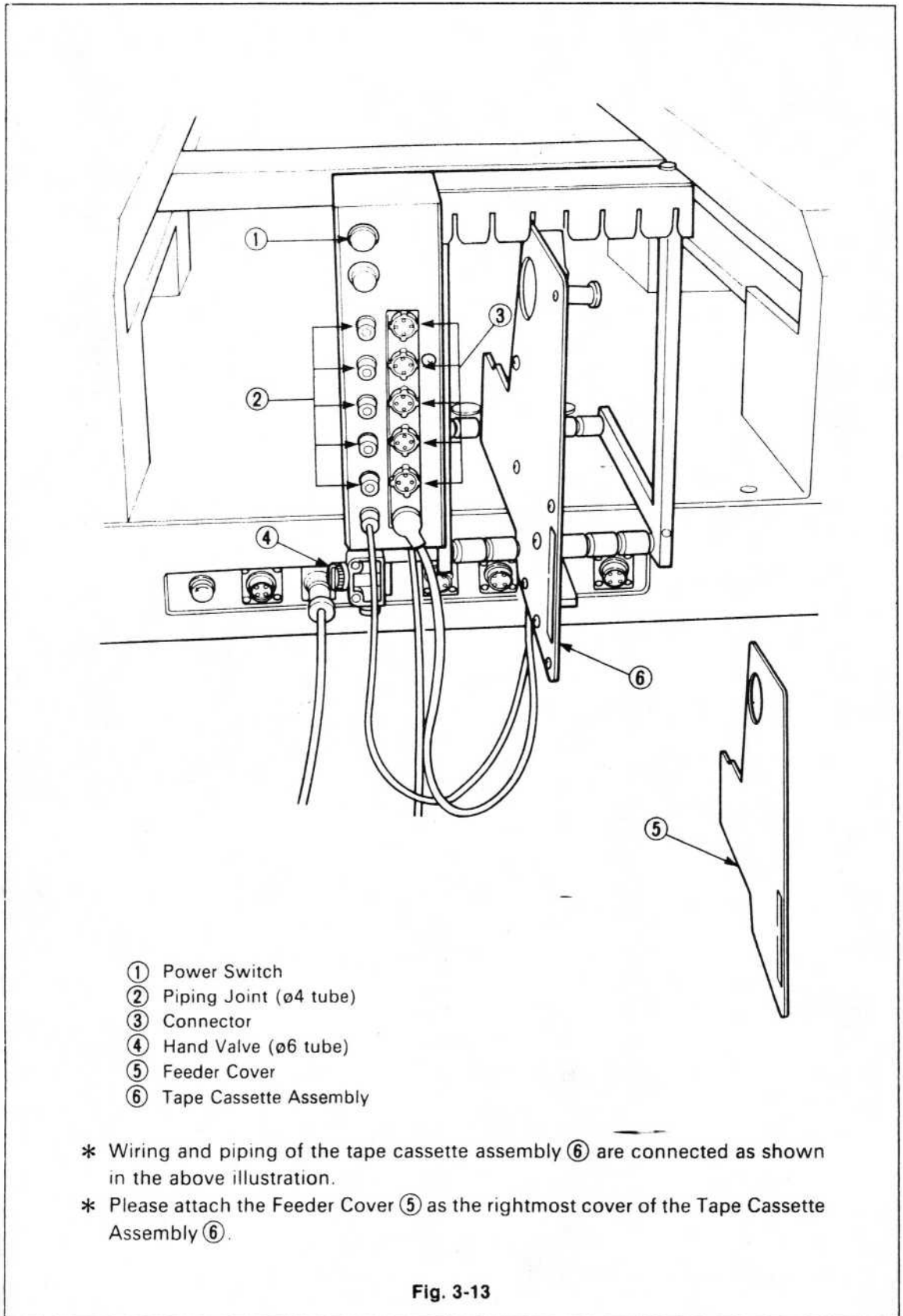


Fig. 3-13



## 2. Attaching the Tape Cassette Attachment Assembly

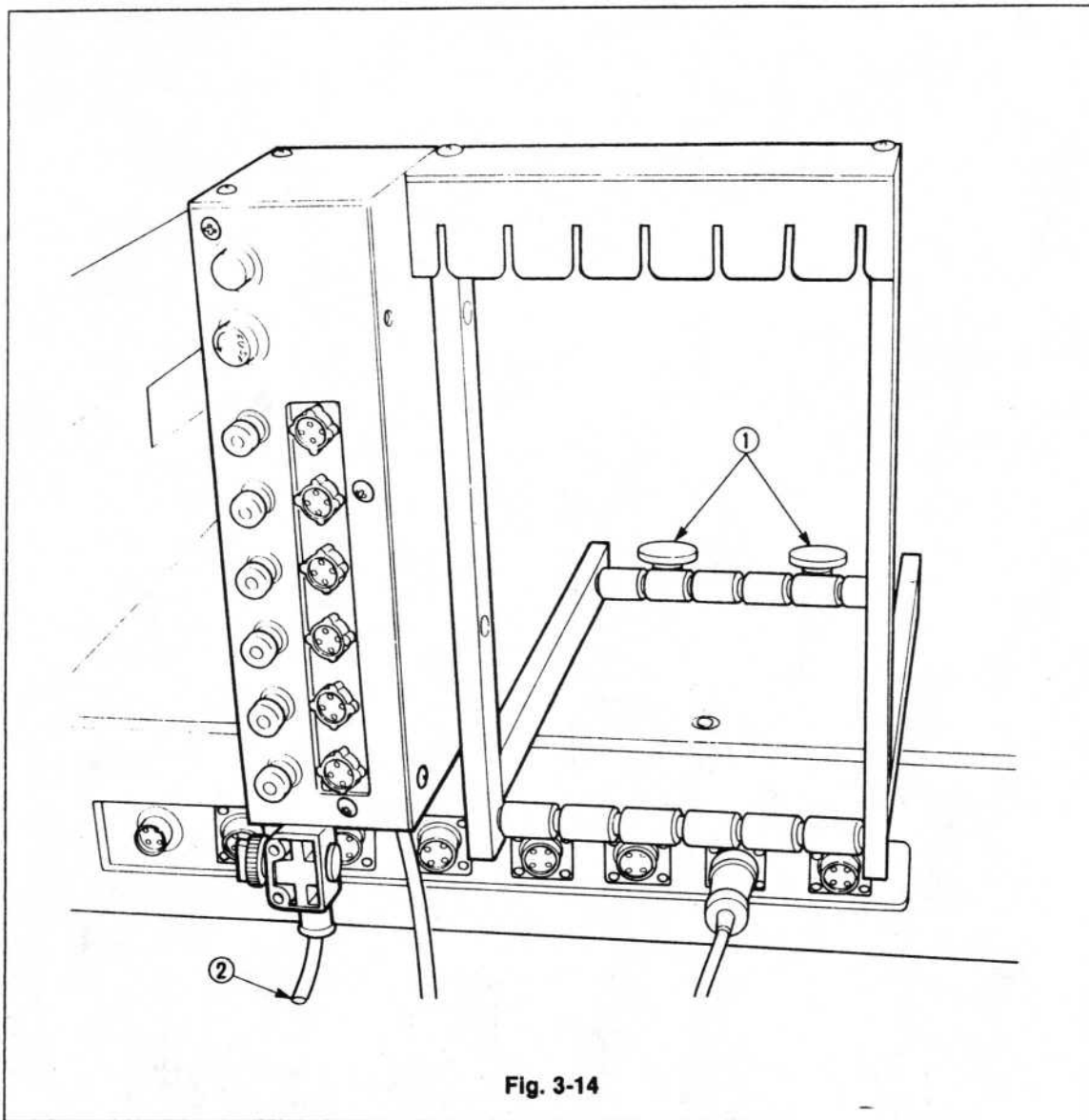


Fig. 3-14

1. Fasten the attachment assembly to the base using the 2 handknobs ①, as in Fig. 3-13.
2. Remove the cap from the air opening for feeders on the back of the main unit, and plug in the air hose ( $\phi 6$  tube) ②. (Use the filter regulator ② shown in Fig. 3-4 to set the air pressure to 0.)
3. Attach the power cord to the connector (for feeders) on either the front or rear panel of the main unit.  
Please check first that the power to the main unit is OFF.

### 3. Explanation of Operations

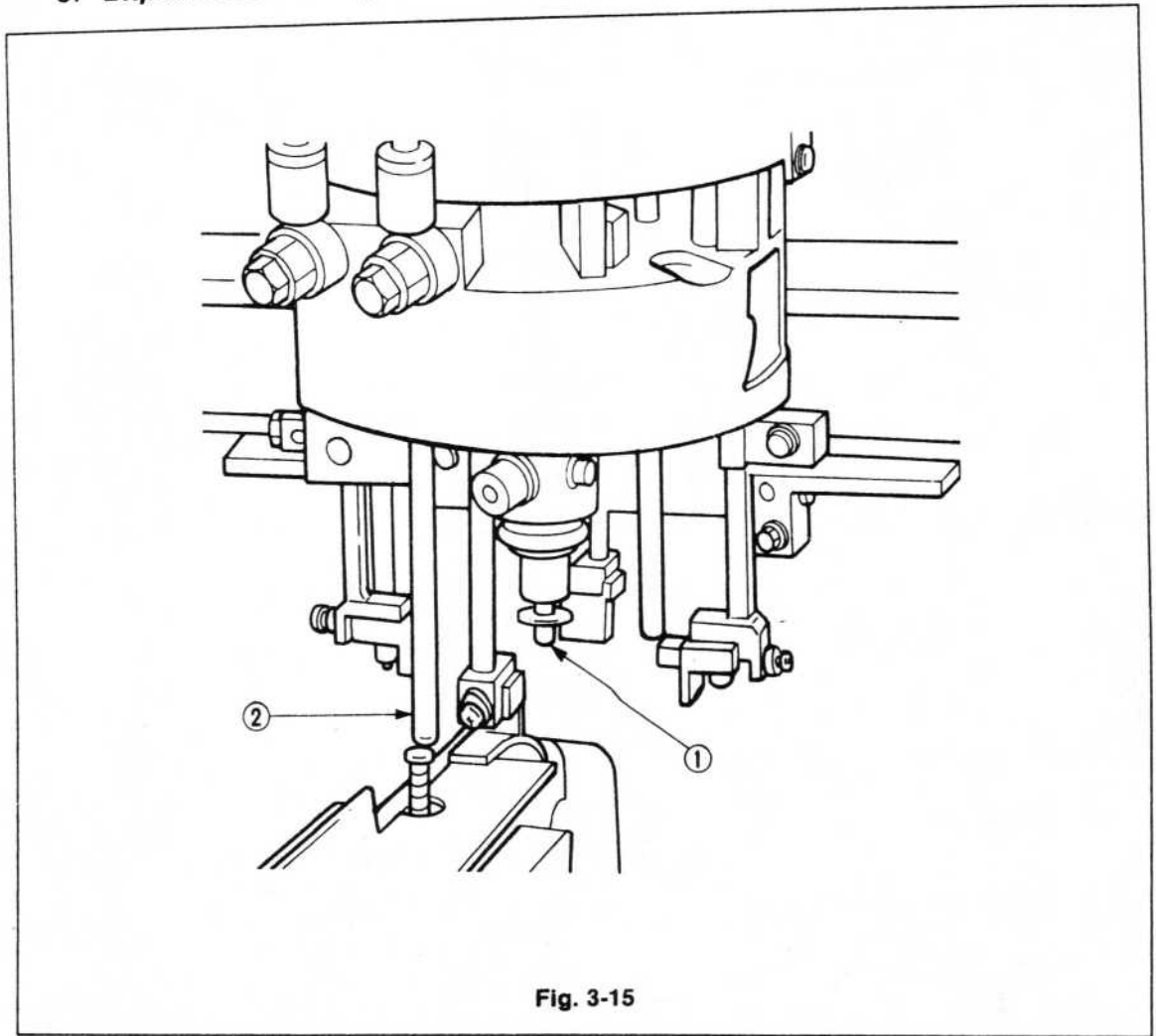


Fig. 3-15

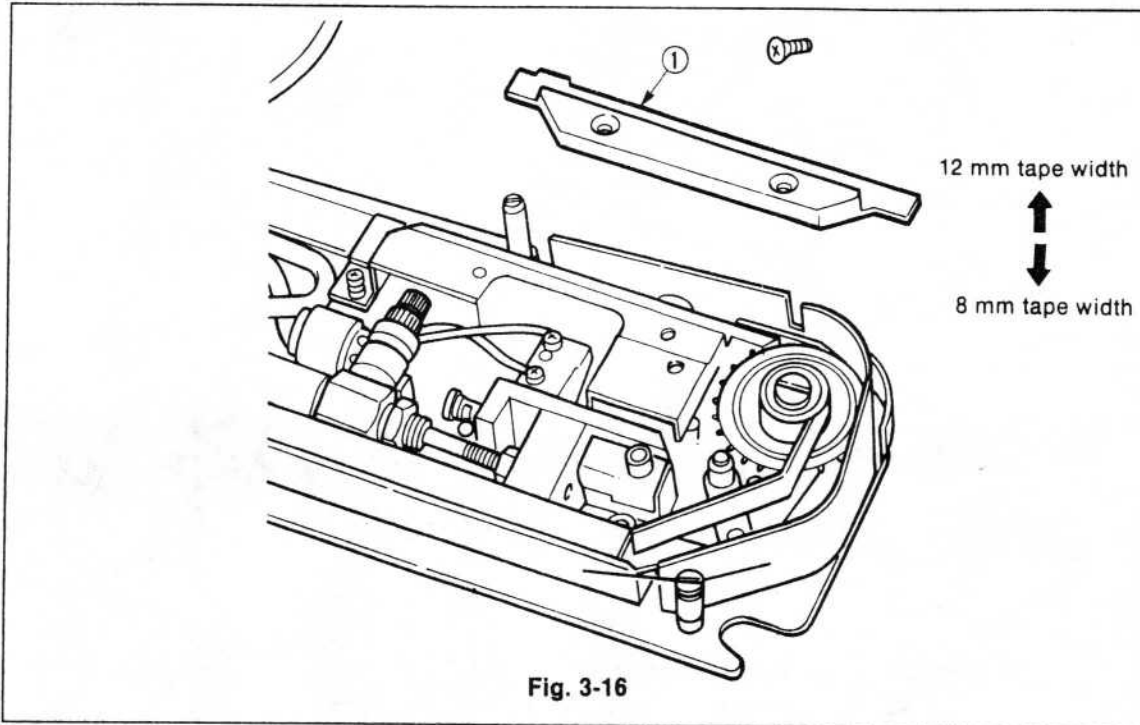
At the same time that the work on the carrier tape of the tape feeder (whose position is determined by the knock pins on top of the main unit), is being held by the vacuum bit ①, the knock load ②, which is equipped with the head, presses the knock SH of the tape feeder.

After the bit which held the work by vacuum has lifted, the knock SH returns, and the tape advances one pitch.

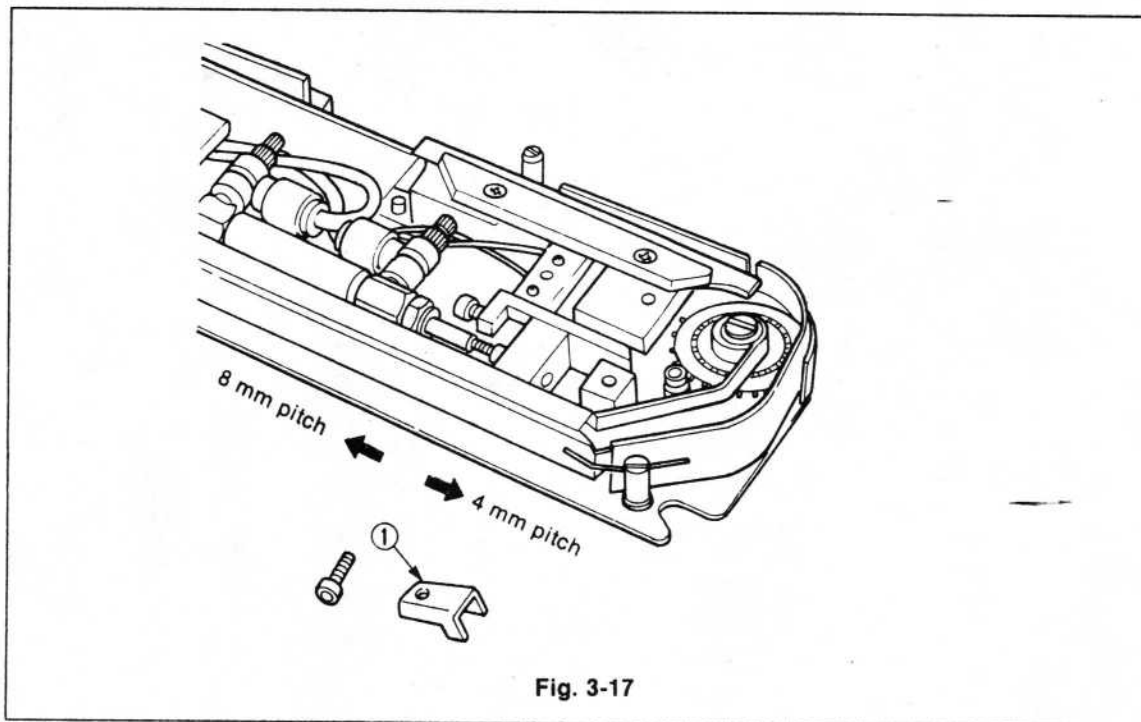
#### 4. Handling

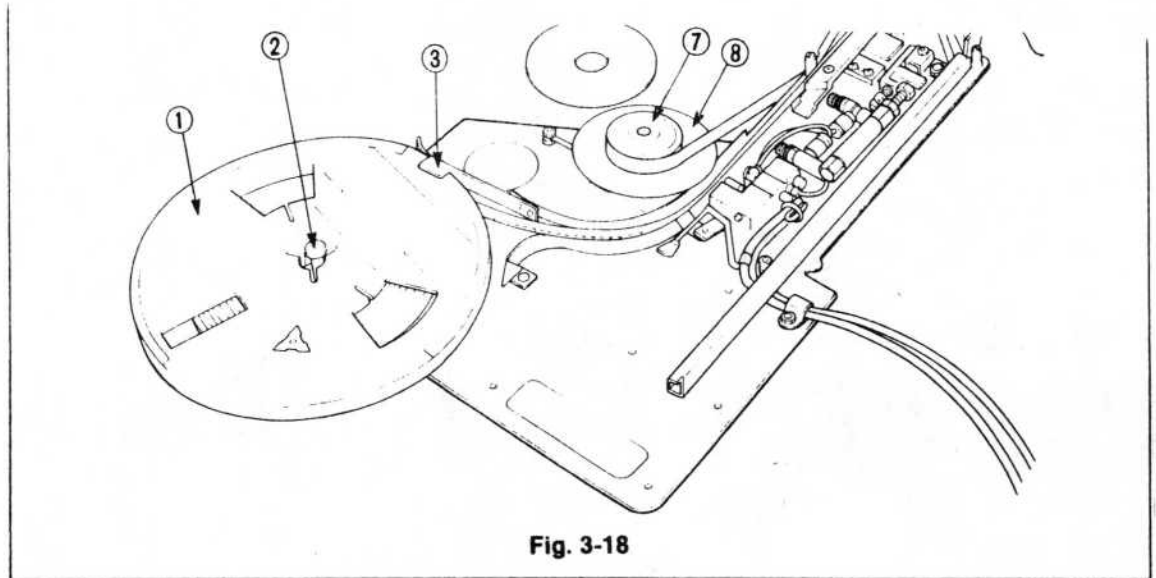
##### 1) Attaching the Taping Reel

- a) First the tape width is determined. Specify the width at the back of the guide blocks ①.



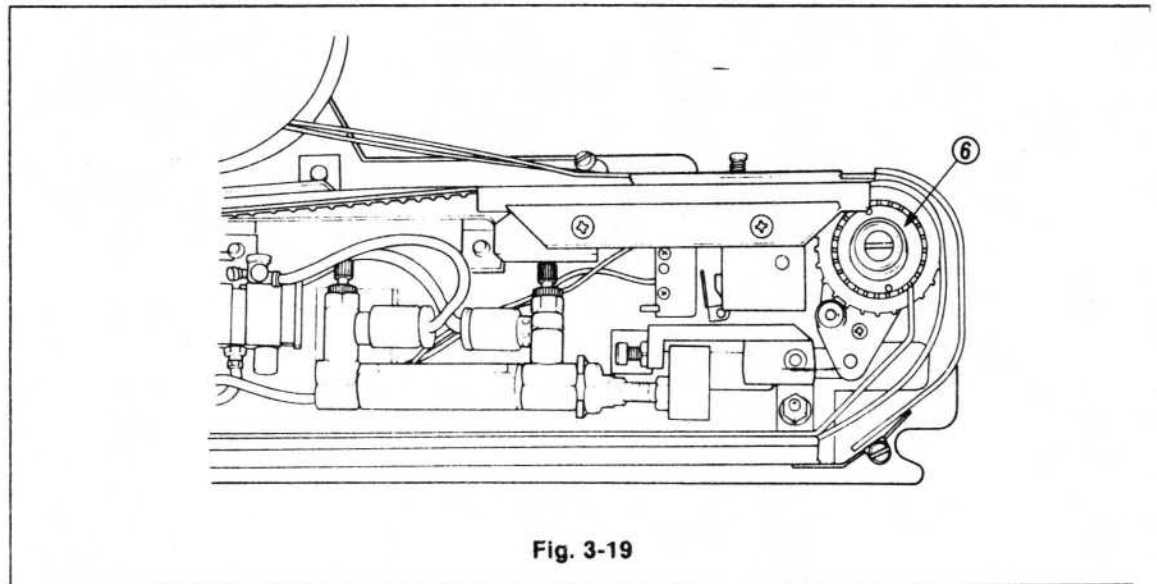
- b) Next, the tape pitch is determined. Rotate the block for changing the pitch ① 180°.





**Fig. 3-18**

- d) Open the front cover (4) towards you, and open the work cover (5).
- e) Draw out the tape from the reel, and, following the guide, align the hole in the carrier tape with the pin of the wheel (6).
- f) Hook the cover tape to the cutaway section of the work cover (5), and stick the tape to the reel curler (7) that was taken off from the main unit. After the tape has been stuck onto the reel curler, replace the reel on the main unit, return the work cover (5) to its original condition, fixing it in place with the front cover (4), and rotate Tape Holder A (8) clockwise to take up any slack in the cover tape.



**Fig. 3-19**

- g) Rotate the cylinder ① by hand and make sure that both the carrier tape and the cover tape are advancing. Advance the carrier tape until it reaches the middle of the discharge guide ②.
- h) When using 8mm-pitch tape, confirm the center. There is no need for confirmation when using 4mm-pitch tape, but when using 8mm-pitch tape, adjust the position of the pitch switch block so that the center of each part comes to the center of the front cover ③ and the work cover ④ window.

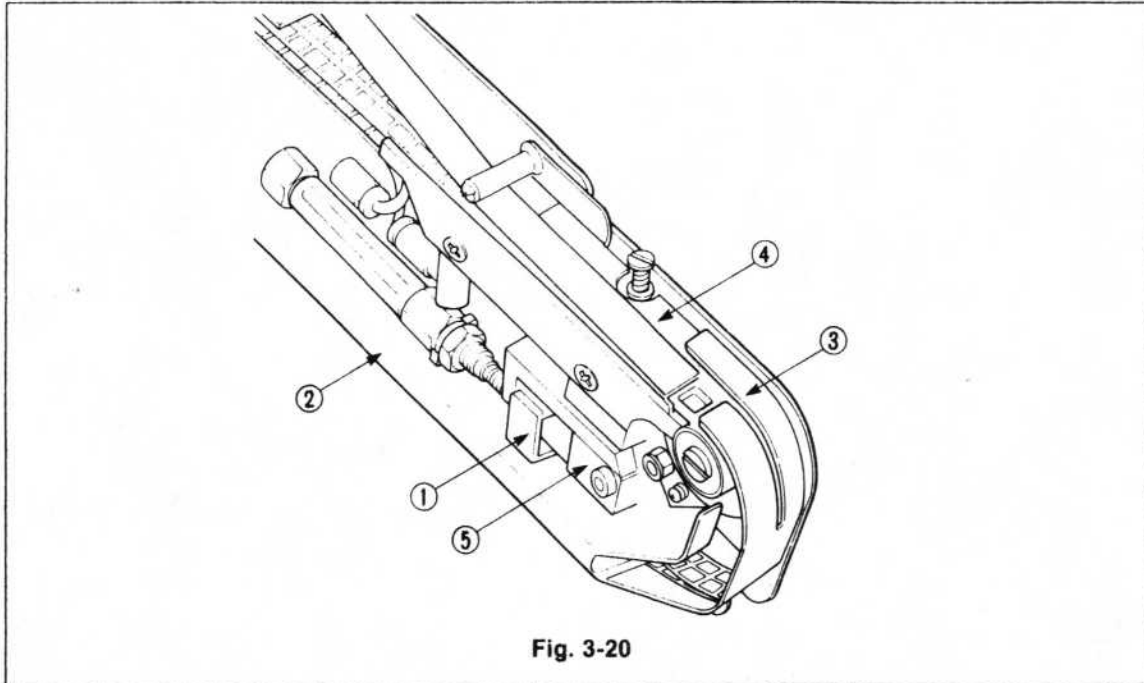
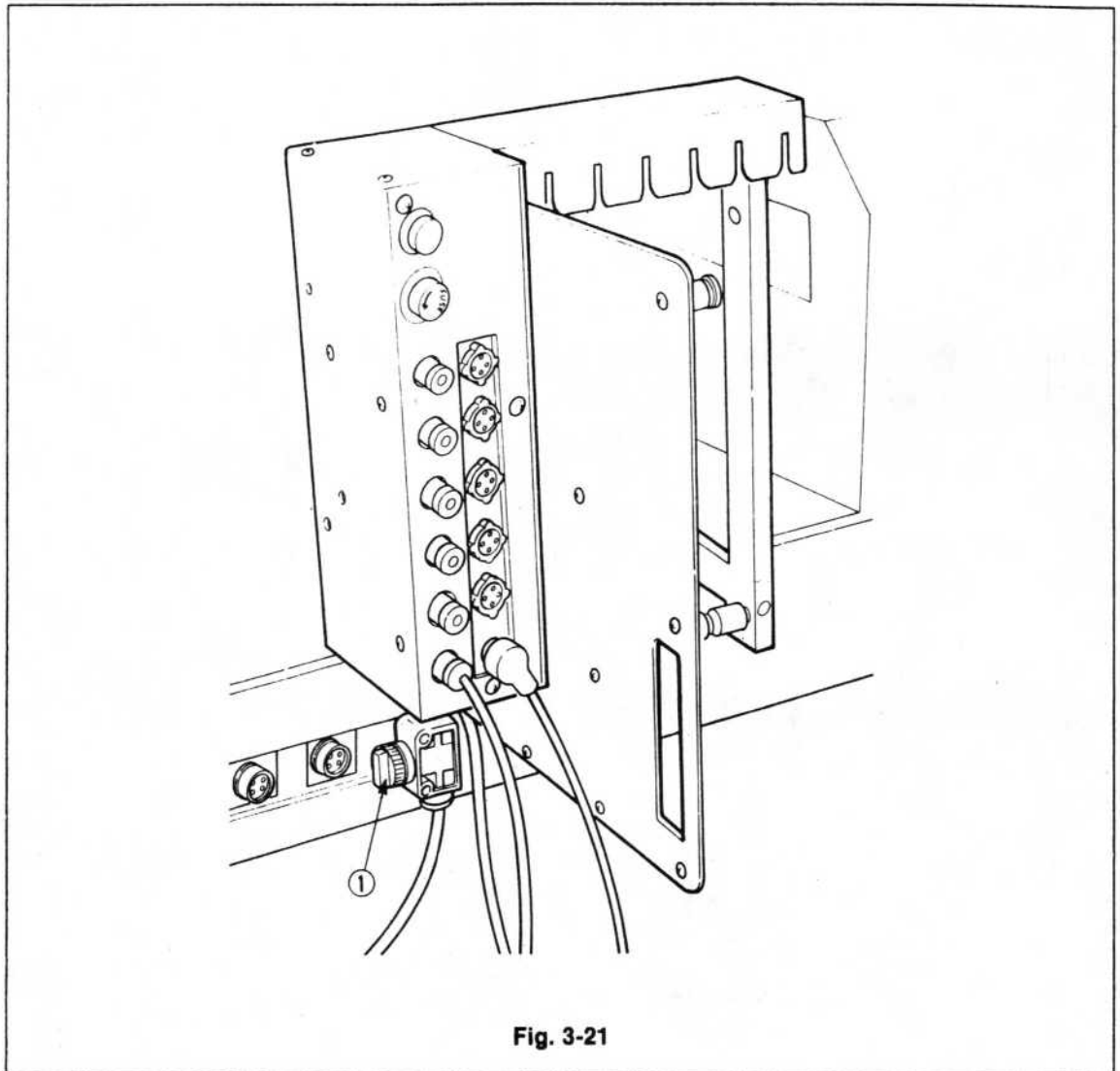


Fig. 3-20

## 2) Attaching the Tape Cassette Assembly

- a) Insert one end of the position fixing shaft of the tape cassette assembly into the U-shaped slot on the front side of the feeder. Next, insert the other end of the shaft into the rear side of the attachment assembly.
- b) Remove the caps from the piping joints of the top/front cover box and insert the air hose ( $\phi 4$  tube) of the tape cassette assembly.
- c) Insert the tape cassette assembly connector into the connector of the top/front cover box.
- d) Rotate the hand valve in the ON direction to supply air.
- e) Press the knock SH pin lightly with your fingertip to advance the carrier tape until the work comes to the bit position.

### 3) Removing the Tape Cassette Assembly



- a) Rotate the hand valve knob ① 90° to shut off the air supply.
- b) Disconnect the feeder connector from the control box.
- c) Remove the air tube of the feeder from the control box.

**NOTE:**

To remove it, push up on the plastic section of the piping joint and pull the tube off.

- d) Pull the feeder towards you while lifting it up.

### 5. Reversing the Left and Right of the TF Cover Box

When two tape cassette assemblies have been attached next to each other, if the TF cover box is not attached with right and left reversed, it cannot be connected to the main unit. When right and left are attached in the same position, change one of them as shown in the diagram below.

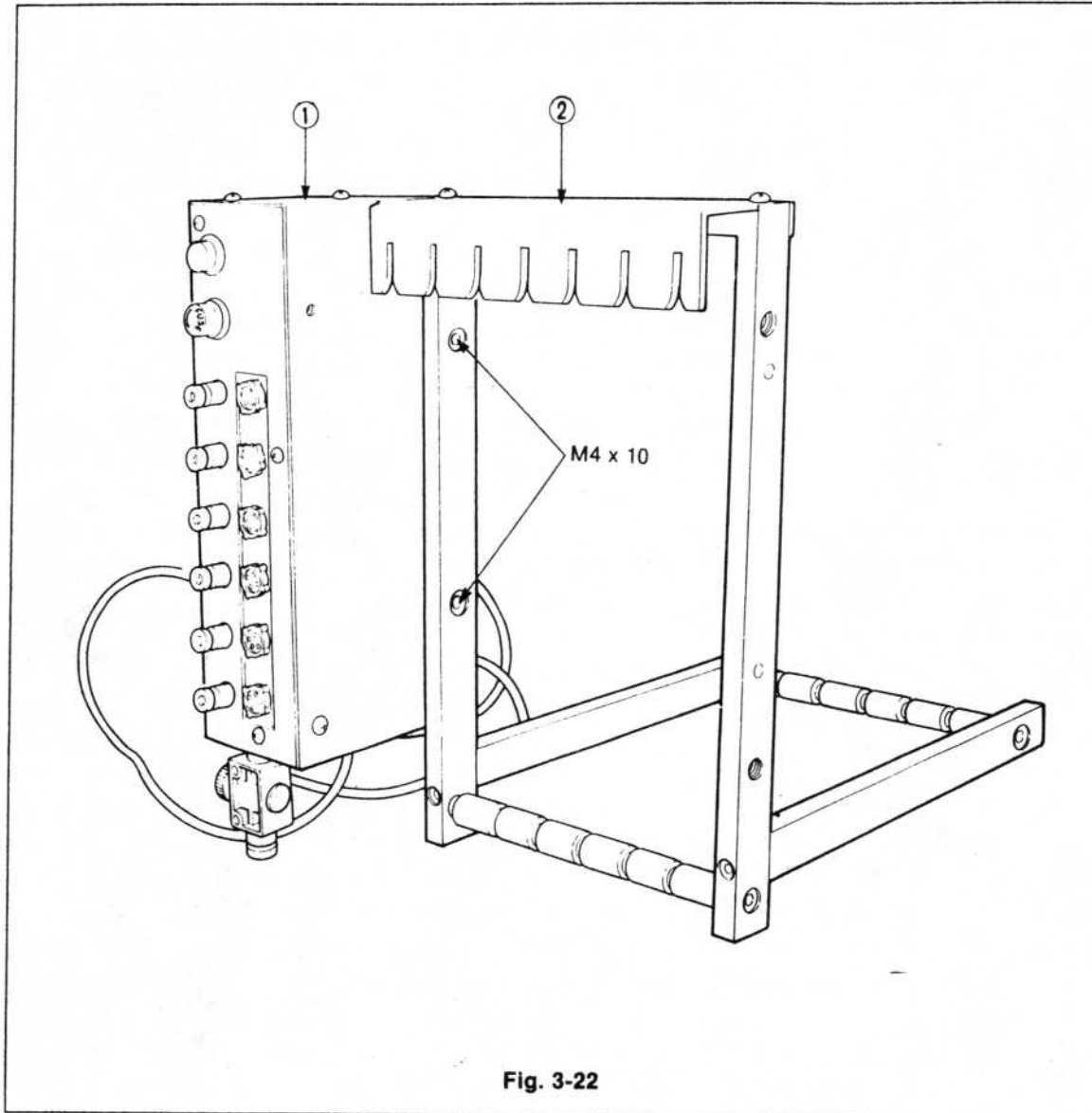


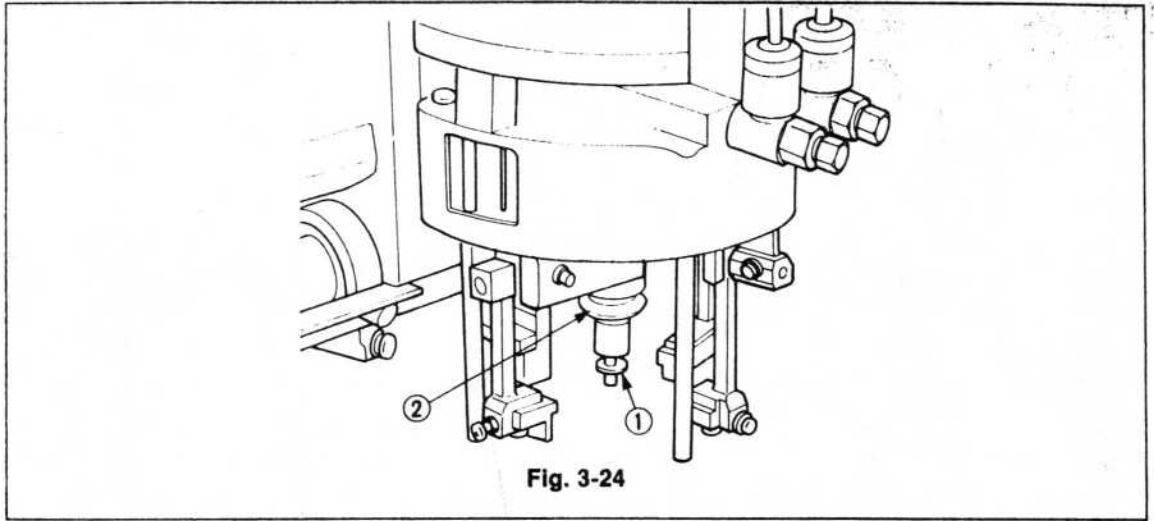
Fig. 3-22

With the wrench provided (M4), remove the 2 screws (M4 x 10) holding the box ①, and connect it to the back support ② opposite.

## 8. \_\_\_\_\_

### REPLACING THE BIT

For bit replacement, refer to Table 2-1 (page 2-3) for the bit that matches the parts size.



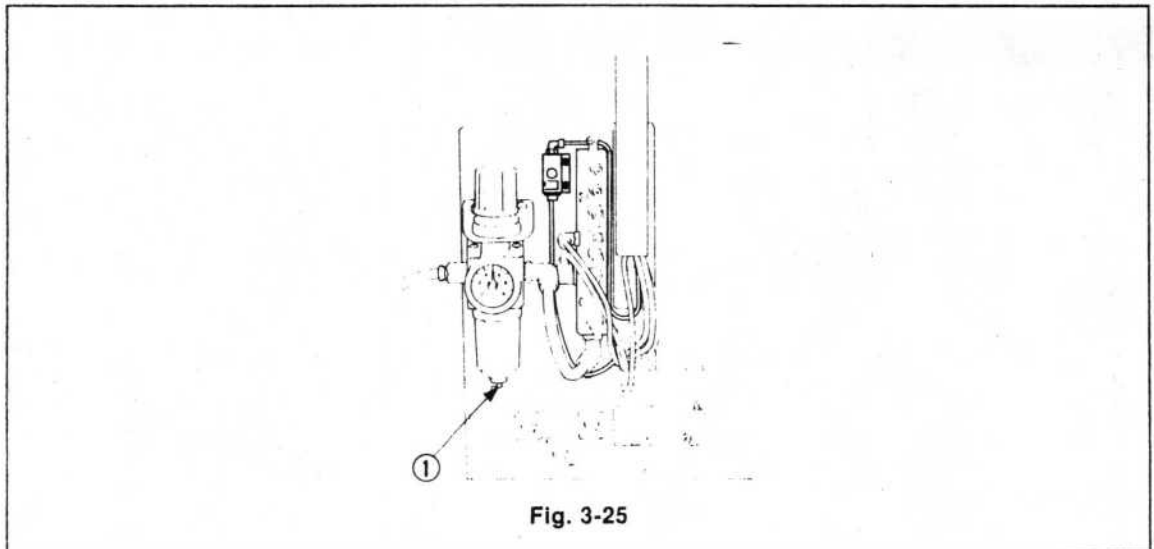
To remove the bit, when the message "Change the Bit" appears on the CRT display, the head moves to the right side of the machine nearest you, and stops. Take hold of the slot in the end of the bit ① with your fingers and pull the bit downwards while rotating it. To attach the bit, push the bit ① up through the hole of the pin hold ② and rotate it until it clicks.

## 9. \_\_\_\_\_

### INSPECTION

Before starting operation, check to make sure that water has not collected in the filter regulator.

If it has, press up on the notch ① with your finger as shown in the illustration below. Lay a cloth or something under the drainhole so that water doesn't drip into the main unit.





# 10. \_\_\_\_\_

## LUBRICATION

| Parts to be Lubricated   | Oil Supply Period   | Usable Grease   |
|--|---------------------|---|
| ① Guideshaft A<br>② Guideshaft B<br>Guideshaft C<br>③ Guidebar | Once every 6 months | A good-quality No.2 grease with a lithium soap base or similar grease |
| ④ Head   | 1 or 2 drops/week   | Tufoil (accessory)  |

## REMOVING THE COVER

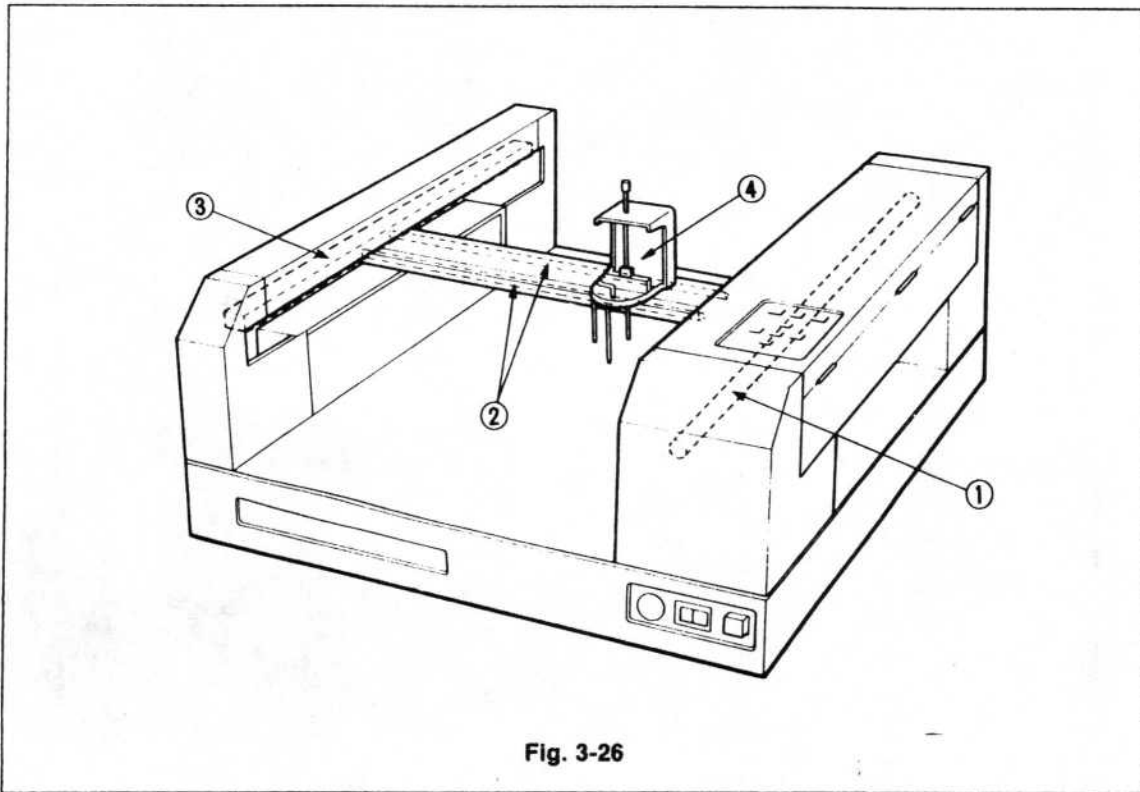


Fig. 3-26

- ① Guideshaft A  
Remove the two screws (M3 x 8) and open the RT cover.
- ② Guideshafts B and C  
Remove the six screws (M3 x 6) and take off the bail cover.
- ③ Guidebar  
Remove the seven screws (M3 x 8) and take off the LT cover.

**NOTE:**

Be careful not to get grease on the belt pulley or the belt.

④ Head

Be sure to lubricate the locations shown in Fig. 3-27 when work is finished. When lubricating before you start work, or operating immediately after lubrication, push the knock cap down 4 or 5 times ensure good oil penetration.

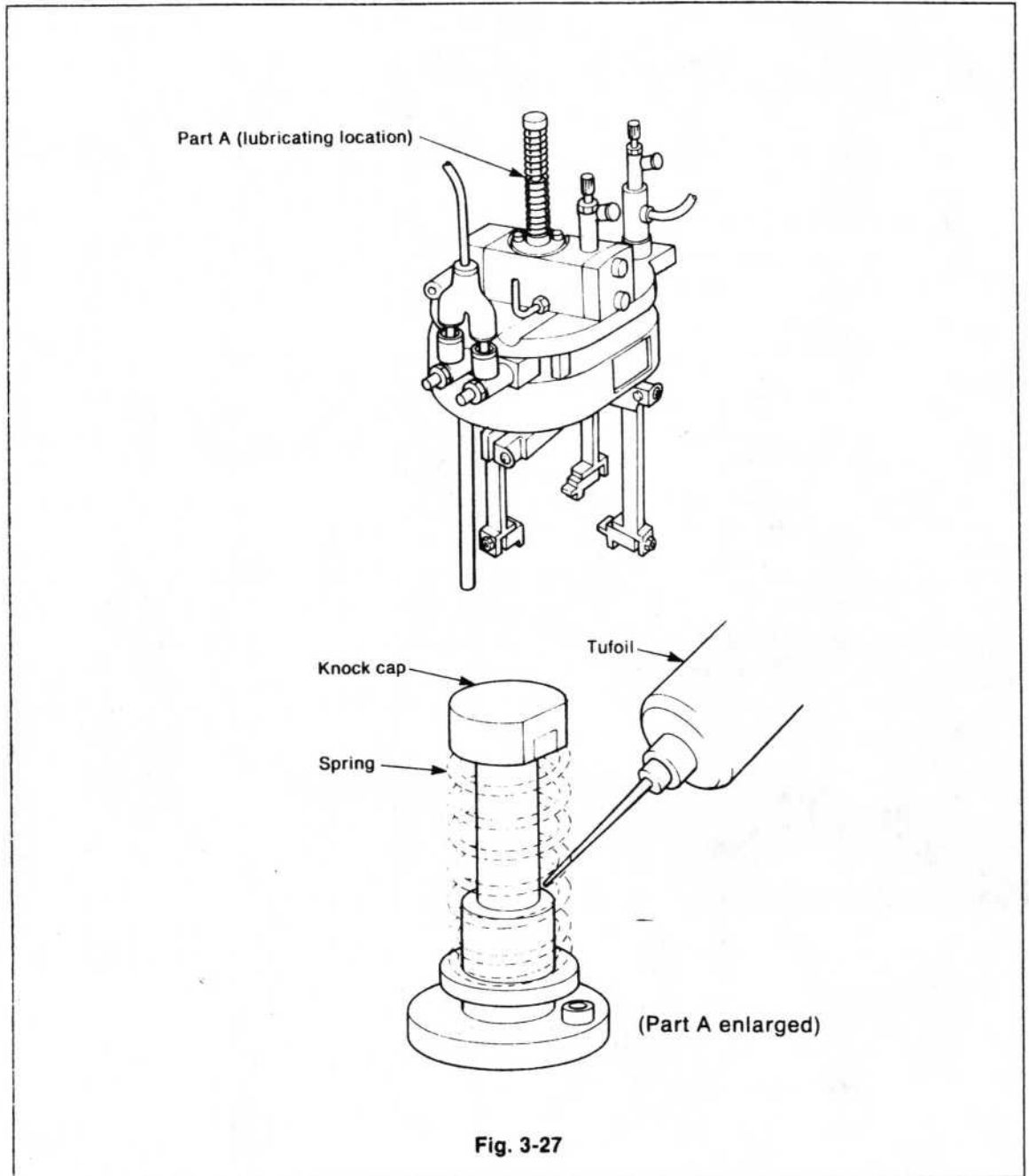


Fig. 3-27

# 11.

## ADJUSTING THE PRESSURE SENSOR

- ① First, adjust the air pressure of the filter regulator to 5 kg/cm<sup>2</sup>.
- ② Change the bit to 1.
- ③ Set the unit to the head check of the I/O test mode, lower the bit, and set the vacuum to ON. At this time, before the parts have been mounted, adjust the volume so that the red lamp illuminates.
- ④ Next, turn the volume knob to the right until the red lamp goes out. (Be careful not to turn it too far.)
- ⑤ Using MELF 1/8 W, set the re-try. Be sure to confirm that the re-try function is operating properly. If you are not using MELF, check this with a square chip.

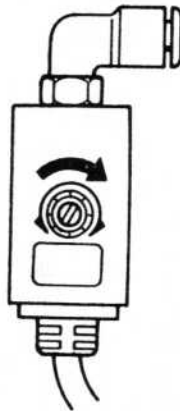


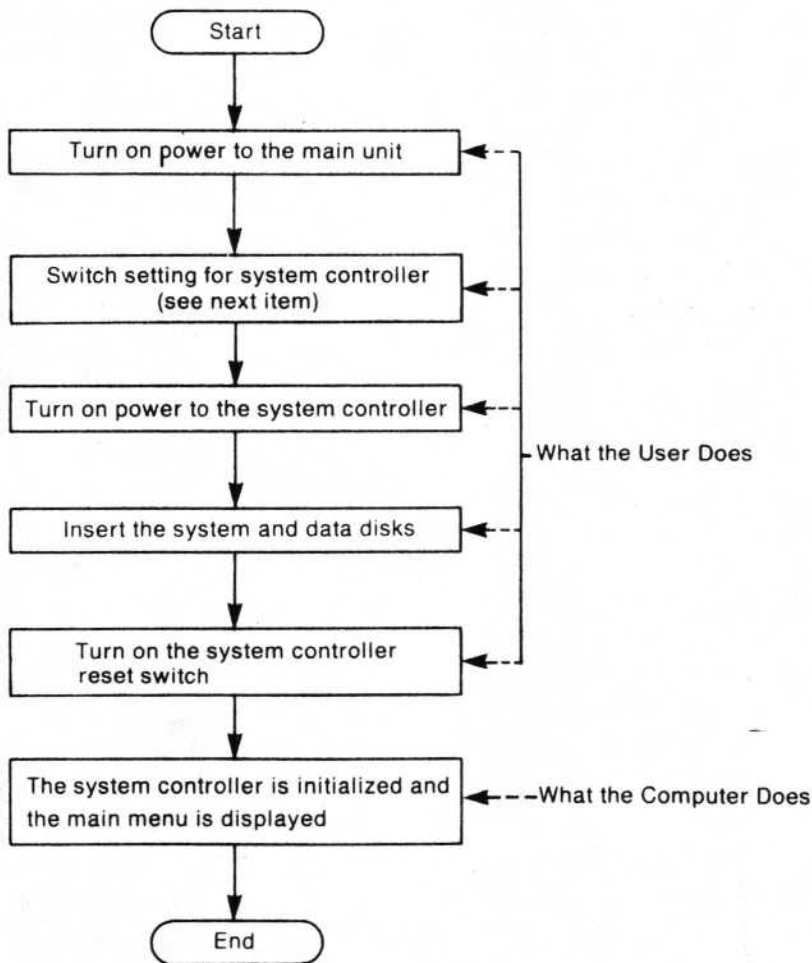
Fig. 3-28

# SETTING UP THE SYSTEM

## Section

# 4

The set-up procedure of the system is described as follows:



\*1.....Insert the system disk in drive 1, and the data disk in drive 2.

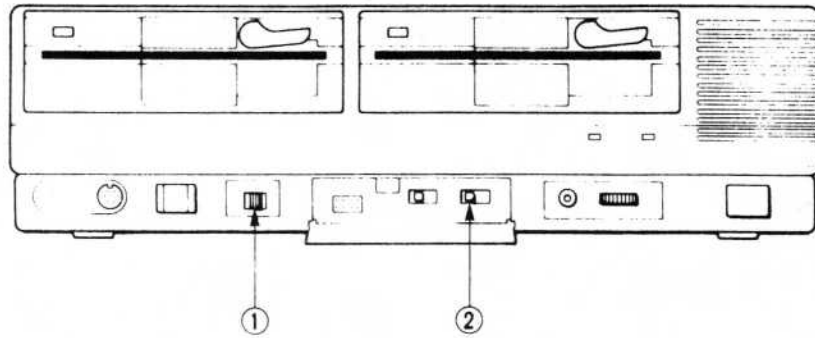
\*2.....Upon initialization, the following two programs are run automatically.

KBIOS..... program for displaying Japanese.

PK1INIT..... contains the program for XY motor control and rotary table control, and also initializes the I/O ports and the XY motor controller IC.

## PC-8801 FH Switch Setting

The front panel switches of the PC-8801 are shown next.



- ① Operation Clock Switch ..... 8 MHz
- ② System Mode Switch ..... V2

# MAIN MENU

Section

# 5

When the setup process is finished, the following main menu screen is displayed.

(Screen 5-1 / Main Menu)

| Main Menu                |
|--------------------------|
| 1 · Feeder Coordinate In |
| 2 · Placement Data In    |
| 3 · Product              |
| 4 · Test                 |
| 5 · Sub Operations       |
| / · End                  |
| Select No.               |

## 1.

### OUTLINE

The following items are activated depending on which selection is made, from items 1 to 5, or /.

1. Unit Data Input determines unit specifications, as well as defining the supply position of parts.
2. Mount Data Input determines the loading position of parts, based on the unit data.
3. In the production phase, bonding and paste solder are applied to already positioned assembly boards, and parts are inserted on them.
4. The test phase is divided into 5 parts covering Input Check, Head, XY Movement, Rotary Table, and Automatic Conveyor. This function tests the operation of the driver simplex and checks the I/O port signals, etc.
5. Auxiliary Operations covers input of the cement pattern and parts data as well as data file deletion.

# UNIT DATA INPUT

Section

# 6

\*\* Feeder Set \*\*

|                       |                  |             |                  |
|-----------------------|------------------|-------------|------------------|
|                       | B1 (*)<br>Stick  | B2<br>Stick | B3<br>R.T        |
| L2 (*)<br>Tape<br>(3) | M2 (*)<br>Magaz. |             | R2               |
|                       | PWB              |             |                  |
| L1 (*)<br>Tape<br>(6) | M1 (*)<br>Tray   |             | R1 (*)<br>Linear |
|                       | F1               | F2          |                  |

(Screen 6-1 / Unit Data Input)

|                   |               |         |
|-------------------|---------------|---------|
| Filename          | MANUAL        | (12/12) |
| Key Operations    |               |         |
| f1: Load File     | ESC : Data In |         |
| f6: Save          | / : End       |         |
| Feeder No.        |               |         |
| 1. Linear Feeder  | (Linear)      |         |
| 2. Tape Feeder/ 6 | (Tape (6))    |         |
| 3. Tape Feeder/ 4 | (Tape (4))    |         |
| 4. Tape Feeder/ 3 | (Tape (3))    |         |
| 5. Stick Feeder   | (Stick)       |         |
| 6. Magazine       | (Magaz.)      |         |
| 7. IC Tray        | (Tray)        |         |
| 8. Rotary Table   | (R.T)         |         |
| 0. Delete         |               |         |
| Select No.        |               |         |

**NOTE:**

1. The bulk feeder is indicated as the linear feeder at the top of the screen.
2. An asterisk (\*) is displayed to the right of the unit position when feeder information for the unit has been specified.

## 1. UNIT SPECIFICATIONS

To specify a unit in a unit specification position, move the cursor to the position of the unit that you want to specify and press the number of the unit. The correspondence table is shown below.

**Table 6 1**

(Items marked with a ( ) indicate that specification is possible )

| Unit<br>Position | Bulk Feeder | Tape Feeder     | Stick Feeder | Magazine        | IC Tray          | Rotary Table |
|------------------|-------------|-----------------|--------------|-----------------|------------------|--------------|
| F1               | ○           | ○               |              |                 | • <sup>1</sup> ○ |              |
| F2               | ○           | ○               |              |                 | • <sup>1</sup> ○ |              |
| B1               | ○           | ○               | ○            |                 |                  |              |
| B2               | ○           | ○               | ○            |                 |                  |              |
| B3               |             |                 | ○            |                 |                  | ○            |
| R1               | ○           |                 |              |                 |                  |              |
| R2               | ○           |                 |              |                 |                  |              |
| L1               | ○           | ○• <sup>2</sup> |              |                 |                  |              |
| L2               | ○           | ○• <sup>2</sup> |              |                 |                  |              |
| M1               |             |                 |              | ○• <sup>3</sup> | • <sup>1</sup> ○ |              |
| M2               |             |                 |              | ○• <sup>3</sup> |                  |              |

- \*<sup>1</sup> .....When using an IC Tray, F1, F2, and M1 can all three be accessed. However, only M1 will be set and displayed; F1 and F2 are not fully displayed.
- \*<sup>2</sup> .....Setting cannot be performed in the case four tape feeders (of 16mm or 24mm type) are installed.
- \*<sup>3</sup> .....When a 16/24mm tape feeder is installed in F1, and F2, the magazine cannot be installed in M1. When the feeder is installed in B1, and B2, the magazine cannot be installed in M2.

**1. Explanation of Key Operations (Functions Shown in Screen 6-1)**

**[f.1]** .....This is used to call a data file from a disk.  
**(Load File)** If the **[f.1]** key is pressed, the file directory will be displayed. Input either the number or the name of the file you want. If you want to abort the operation, press **[f.1]** again.

**[f.6]** .....This is used to save input data on a disk.  
**(Save)** If the **[f.6]** key is pressed, the file directory will be displayed. Input either a number (1 to 12) or a name for the file you want to save. The name can be up to 8 letters (English alphabet). If you specify a number other than 1 to 12, the number will be stored as the file name, so be careful to store a valid number. If you want to abort the operation, press **[f.6]** again. Up to 12 files can be stored.

**[ESC]** .....When you want to specify the feeder coordinates after specifying a unit, move the cursor to the target unit position and press **[ESC]**. The screen switches to the Feeder Coordinate Input screen.

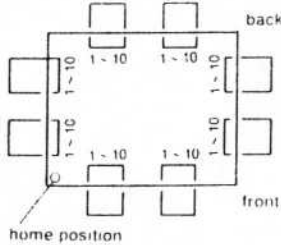
**[/]** .....Press to terminate.  
**(End)** When this key is pressed, the message "Do you want to save? (Y/N)" appears. To save, press "Y"; otherwise press "N". If a different key is pressed, the operation will continue without being terminated.

**NOTE:**  
**[f.1], [f.2] ... [f.10]** are function keys.



**SPECIFYING FEEDER COORDINATES**

After specifying a unit, the parts supply positions of each unit (in the case of a linear feeder, 10 places) are specified here. Saving the specifications is done on the unit specification screen. In the illustrations below, the coordinates specification screen for each individual unit is shown, followed by a chart of the operations.



**NOTE:**  
As shown at the left, the rail numbers of each unit are organized with the rail nearest the starting point being the lowest number.

**1. Explanation of the Screen**  
**(a) Bulk Feeder Unit**

[Feeder Pos.: R1 Feeder: Linear]

| No. | Kind | Comp. Data | Size | Bit | X mm  | Y mm  |
|-----|------|------------|------|-----|-------|-------|
| 1   | **** | 1: 2125    | 2.0  | 1   | 356.1 | 145.5 |
| 2   | **** | 2: 3216    | 3.2  | 1   | 356.7 | 159.5 |
| 3   | **** | 3: MLF16W  | 1.6  | 1   | 355.9 | 173.5 |
| 4   | **** | 4: MLF8F   | 2.0  | 1   | 356.1 | 187.5 |
| 5   | **** | 5: MLF4F   | 5.9  | 2   | 358.0 | 201.5 |
| 6   | **** | :          |      |     |       |       |
| 7   | **** | :          |      |     |       |       |
| 8   | **** | :          |      |     |       |       |
| 9   | **** | :          |      |     |       |       |
| 10  | **** | :          |      |     |       |       |

(Screen 6-2)

|                |                   |      |     |
|----------------|-------------------|------|-----|
| Filename       | MANUAL            |      |     |
| Bit Pos.       | X = 2.4 Y = 429.6 |      |     |
| Key Operations |                   |      |     |
| f1: Load File  | f4 :Delete        |      |     |
| f2: Teach/B    | ESC: Compo.Tbl.   |      |     |
| f3: Teach/S    | / :End            |      |     |
| No.            | Name              | Size | Bit |
| 1              | : 2125            | 2.0  | 1   |
| 2              | : 3216            | 3.2  | 1   |
| 3              | : MLF16W          | 1.6  | 1   |
| 4              | : MLF8W           | 2.0  | 1   |
| 5              | : MLF4W           | 5.9  | 2   |
| 6              | : SOP8P           | 6.0  | 3   |
| 7              | : SOP16P          | 12.5 | 3   |
| 8              | :                 |      |     |
| No. or Name    |                   |      |     |

\* One unit has 10 bulk feeders. The input data consists of the Parts Data (which is input by number and name or by bit) and the X-axis and Y-axis coordinates (which are input by MDI or by teaching). Teaching is also performed in case fine adjustments are performed. As you can see in the righthand side of Screen 6-2, when you press the **ESC** key, parts data can be displayed 8 items at a time (32 altogether).

**NOTE:**  
For information on selecting the corresponding bit for a part, please refer to Section 6-3, "Bit No. Specification."

**b) Tape Feeder Unit**  
**[Feeder Pos.: L1 Feeder: Tape (6)]**

| No. | Kind | Comp. Data | Size | Bit | X mm | Y mm  |
|-----|------|------------|------|-----|------|-------|
| 1   | 8mm  | 1: 2125    | 2.0  | 1   | 0.1  | 142.5 |
| 2   | 8mm  | 2: 3216    | 3.2  | 1   | 0.1  | 164.0 |
| 3   | 12mm | 5: MLF4W   | 5.9  | 2   | 0.1  | 187.3 |
| 4   | 12mm | :          |      | 2   | 0.1  | 208.8 |
| 5   |      | :          |      |     |      |       |
| 6   |      | :          |      |     |      |       |
|     |      |            |      |     |      |       |
|     |      |            |      |     |      |       |
|     |      |            |      |     |      |       |
|     |      |            |      |     |      |       |

**(Screen 6-3)**

| Filename       | MANUAL            |      |     |
|----------------|-------------------|------|-----|
| Bit Pos.       | X = 2.4 Y = 429.6 |      |     |
| Key Operations |                   |      |     |
| f1: Load File  | f4 :Delete        |      |     |
| f2: Teach/B    | ESC: Compo.Tbl.   |      |     |
| f3: Teach/S    | / :End            |      |     |
| No.            | Name              | Size | Bit |
| 1              | : 2125            | 2.0  | 1   |
| 2              | : 3216            | 3.2  | 1   |
| 3              | : MLF16W          | 1.6  | 1   |
| 4              | : MLF8W           | 2.0  | 1   |
| 5              | : MLF4W           | 5.9  | 2   |
| 6              | : SOP8P           | 6.0  | 3   |
| 7              | : SOP16P          | 12.5 | 3   |
| 8              | :                 |      |     |
| 8, 12 (mm)     |                   |      |     |

\* One unit may have either three tape feeders (of 32mm tape width), four tape feeders (of 16mm or 24mm tape width), or six tape feeders (8mm or 12mm tape width). In case of six or four feeders, the input data consists of the "Type," "Parts Data" (input of only the bit is also permitted), as well as the X-axis and Y-axis coordinates (which are input by MDI or by teaching). In case of three feeders, the input data consists of the "Parts Data" (input of only the bit is also permitted) as well as the X-axis and Y-axis coordinates (which are input by MDI or by teaching). Note that "Parts Data" can ordinarily be input by the number and name or by the size and bit. During teaching, the Up/Down movements of the bit on the tape element may cause elements to jump or be skipped; therefore, make sure to perform fine adjustments where there are no elements and, as the last step, make sure the elements are positioned below the bit.

**NOTE:**

For information on selecting the corresponding bit for a part, please refer to Section 6-3, "Bit No. Specification."

**c) Stick Feeder Unit**  
**[Feeder Pos.: B1 Feeder: Stick (S)]**

| No. | Type  | Parts Data | Size | Bit | X mm  | Y mm  |
|-----|-------|------------|------|-----|-------|-------|
| 1   | STD.  | 6: SOP8P   | 6.0  | 3   | 19.5  | 495.3 |
| 2   | STD.  | 6: SOP8P   | 6.0  | 3   | 51.5  | 495.3 |
| 3   | WIDE. | 7: SOP16P  | 12.5 | 3   | 100.5 | 498.5 |
| 4   |       |            |      |     |       |       |
|     |       |            |      |     |       |       |
|     |       |            |      |     |       |       |
|     |       |            |      |     |       |       |
|     |       |            |      |     |       |       |
|     |       |            |      |     |       |       |

**(Screen 6-4)**

| Filename       | MANUAL            |      |     |
|----------------|-------------------|------|-----|
| Bit Pos.       | X = 2.4 Y = 429.6 |      |     |
| Key Operations |                   |      |     |
| f1: Load File  | f4 :Delete        |      |     |
| f2: Teach/B    | ESC: Compo.Tbl.   |      |     |
| f3: Teach/S    | / :End            |      |     |
| No.            | Name              | Size | Bit |
| 1              | : 2125            | 2.0  | 1   |
| 2              | : 3216            | 3.2  | 1   |
| 3              | : MLF16W          | 1.6  | 1   |
| 4              | : MLF8W           | 2.0  | 1   |
| 5              | : MLF4W           | 5.9  | 2   |
| 6              | : SOP8P           | 6.0  | 3   |
| 7              | : SOP16P          | 12.5 | 3   |
| 8              | :                 |      |     |
| 1:STD. 2:WIDE  |                   |      |     |

\* Based on the dimensions of the parts, one unit may consist of two standard-type stick feeders or one wide-type stick feeder. Two units can be set at the unit positions B1 and B2, whereas one unit can be set at unit position B3 (a maximum of 10 stick feeders can be loaded). The wide-type stick feeders can only be set to No. 1 and No. 3 (B3 can only be set to No. 1). In this case, the settings of No. 2 and No. 4 are disabled. The input data consists of the Parts Data (which is input by number and name or by Bit) as well as the X-axis and Y-axis coordinates (which are input by MDI or by teaching).

**NOTE:**

For information on selecting the corresponding bit for a part, please refer to Section 6-3, "Bit No. Specification."

**d) Lateral Magazine Tray Unit**

[Feeder Pos.: M2 Feeder: Magazine No: 1]

| No. | X mm  | Y mm  |
|-----|-------|-------|
| 1   | 100.0 | 200.0 |
| 2   | 103.5 | 200.0 |
| 3   | 107.0 | 200.0 |
| 4   | 110.5 | 200.0 |
| 5   | 114.0 | 200.0 |
| 6   | 117.5 | 200.0 |
| 7   | 121.0 | 200.0 |
| 8   | 124.5 | 200.0 |
| 9   | 128.0 | 200.0 |
| 10  | 131.5 | 200.0 |

| No. | X mm  | Y mm  |
|-----|-------|-------|
| 11  | 135.0 | 200.0 |
| 12  | 138.5 | 200.0 |
| 13  | 142.0 | 200.0 |
| 14  | 145.5 | 200.0 |
| 15  | 149.0 | 200.0 |
| 16  | 152.5 | 200.0 |
| 17  | 156.0 | 200.0 |
| 18  | 159.5 | 200.0 |
| 19  | 163.0 | 200.0 |
| 20  | 166.5 | 200.0 |

| No. | X mm  | Y mm  |
|-----|-------|-------|
| 21  | 170.0 | 200.0 |
| 22  | 173.5 | 200.0 |
| 23  | 177.0 | 200.0 |
| 24  | 180.5 | 200.0 |
| 25  | 184.0 | 200.0 |

(Screen 6-5)

|                |                   |
|----------------|-------------------|
| Filename       | MANUAL            |
| Bit Pos.       | X = 2.4 Y = 429.6 |
| Key Operations |                   |
| f1: Read       | f6 :AC Func.      |
| f2: Teach/B    | ESC: Input SW.    |
| f3: Teach/S    | / :End            |
| f4: Delete     |                   |
| f5: Page SW.   |                   |
| X Pos.         |                   |

< Base Data >

| No. | X mm  | Y mm  | Pitch | Bit |
|-----|-------|-------|-------|-----|
| 1   | 100.0 | 200.0 | 3.5mm | 1   |
| 2   |       |       |       |     |
| 3   |       |       |       |     |
| 4   |       |       |       |     |

\* There are two kinds of lateral magazine tray unit (hereafter called "magazine"), one in which the space between parts is 3.5mm (50 parts per magazine) and one in which it is 7mm (25 parts per magazine). Four magazines can be specified for one unit. Data is input in the area called "Source Data" seen in the lower righthand section of Screen 6-5. If the AC function is activated, the expanded data in the lefthand section is calculated automatically. The source data of one unit is divided into four sections. The following is an explanation of the four sections:

- Xmm, Ymm : The parts coordinates of the leftmost edge of the magazine case.
- Pitch : Select 3.5 or 7 (inputting "mm" is not necessary)
- Bit : For information on selecting the corresponding bit for a part, please refer to Section 6-3, "Bit No. Specification."

If even one item on any line of source data is left out, the automatic calculation (AC) function will not be possible. Also, by changing the input ([ESC] key), inputting by MDI and teaching is possible. (The input position can be switched from source data to expanded data and vice versa by using the [ESC] key.)

### e) IC Tray Unit

[IC Tray]

| No. | X mm  | Y mm |
|-----|-------|------|
| 1   | 10.0  | 10.0 |
| 2   | 35.0  | 10.0 |
| 3   | 60.0  | 10.0 |
| 4   | 85.0  | 10.0 |
| 5   | 110.0 | 10.0 |
| 6   | 135.0 | 10.0 |
| 7   | 160.0 | 10.0 |
| 8   | 185.0 | 10.0 |
| 9   | 210.0 | 10.0 |
| 10  | 235.0 | 10.0 |

| No. | X mm  | Y mm |
|-----|-------|------|
| 11  | 10.0  | 30.0 |
| 12  | 35.0  | 30.0 |
| 13  | 60.0  | 30.0 |
| 14  | 85.0  | 30.0 |
| 15  | 110.0 | 30.0 |
| 16  | 135.0 | 30.0 |
| 17  | 160.0 | 30.0 |
| 18  | 185.0 | 30.0 |
| 19  | 210.0 | 30.0 |
| 20  | 235.0 | 30.0 |

| No. | X mm  | Y mm |
|-----|-------|------|
| 21  | 10.0  | 50.0 |
| 22  | 35.0  | 50.0 |
| 23  | 60.0  | 50.0 |
| 24  | 85.0  | 50.0 |
| 25  | 110.0 | 50.0 |

(Screen 6-6)

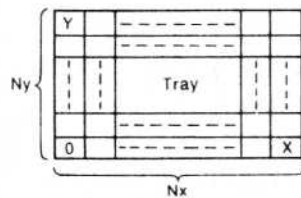
|                |                   |
|----------------|-------------------|
| Filename       | MANUAL            |
| Bit Pos.       | X = 2.4 Y = 429.6 |
| Key Operations |                   |
| f1: Lo. File   | f6 :AC Func.      |
| f2: Teach/B    | ESC: Input SW.    |
| f3: Teach/S    | / : End           |
| f4: Delete     |                   |
| f5: Page SW.   |                   |
| X Pos.         |                   |

< Base Data >

| Po | X mm  | Y mm |
|----|-------|------|
| 0  | 10.0  | 10.0 |
| X  | 235.0 | 10.0 |
| Y  | 10.0  | 90.0 |

|     |    |
|-----|----|
| Nx  | 10 |
| Ny  | 5  |
| Bit | 3  |

- \* It is possible to use a tray which holds a maximum of 50 parts. In the same way as the magazine, it is necessary to input source data, and after inputting the data, the AC function can be used to obtain expanded coordinates. An explanation of each item of source data is found below:



- 0,X,Y : The coordinates for the bonding position of parts (shown at left) (input by MDI or teaching)
- Nx : The number of parts in the direction X
- Ny : The number of parts in the direction Y
- Bit : For information on selecting the corresponding bit for a part, please refer to Section 6-3, "Bit No. Specification."

Fig. 6-2

If even one item on any line of source data is left out, the automatic calculation (AC) function will not be possible. Also, by changing the input (|ESC| key), inputting by MDI and teaching is possible. (The input position can be switched from source data to expanded data and vice versa by using the |ESC| key.)

### f) Rotary Table Unit

The rotary table can be specified only at B3, and specification is only possible when declaring unit specifications. (It is not necessary to specify the coordinates.)

## 2. Explanation of Key Operations

**f.1** .....See Section 6-1-1 (page 6-2).  
(Load File)

**f.2** .....When this key is pressed, the teaching mode is entered, depending on the bit. Use the cursor key on the keyboard of the main unit to move the cursor to the desired position. Moving the bit up and down, determine the location where the part will be bonded or loaded. Press the "Teach" key on the main unit to memorize the coordinates of the position. If you want to cancel at any point, press the **f.2** key again.  
(Teaching/Bit)

**f.3** .....In contrast to the bit teaching of **f.2**, this function controls "spotlight" teaching, but the optical teaching unit is an option. If you want to cancel at any point, press the **f.3** key again.  
(Teaching/Spot)

### NOTE:

To input the following 5 parts supply positions: L1, L2, B1, B2 and B3 (see Page 6-1) by teaching, please use Teaching/Bit.

**f.4** .....Move the cursor to the line that you want to delete and press **f.4**. The line where the cursor is will be deleted.  
(Delete)

**f.5** .....This function is used on the Magazine or IC Tray screens. Since expanded coordinates can be displayed 25 at a time, pressing the **f.5** key will display expanded coordinates 1 to 25 and then 26 to 50 alternately.  
(Page Switch)

**f.6** .....Used to automatically calculate the coordinate positions of the magazine or IC tray. Input the basic data, then press the **f.6** key.  
AC Function  
(Automatic Calculation)

**ESC** .....The input position can be moved from source data to expanded data and back again by pressing this key.  
(Input Switch)

**/** .....When this is pressed, you return to the unit specifications screen. Data is stored as a block on the unit specifications screen.  
(End)

### 3.

#### EXPLANATION OF BIT NO.

##### SPECIFICATION

For this unit, when inputting Mount Data for the following items, for head chucking specifications (see 4.1).(3)), rotation operation other than the bit pattern (see 4.1).(2)) specification rotation is necessary for Mount Data Input, for centering of mini-mold transistors, mini-flat ICs, etc., along the wide direction of the chuck (left/right direction). However, for parts without leads, such as square chips, which are not affected by the chuck width, operation is changed depending on the bit number at the time feeder coordinates are specified, to avoid unnecessary operation.

Consequently, please specify bit numbers for those parts by referring to the chart below, which shows the correspondence between the parts and their bit numbers.

**Correspondence Chart for Parts and Their Bit Numbers**

| No. | Part                            | (Note 3)<br>Bit No. | 1 | 2 | 3   | 4             | 5             | 6 | 7 | 8   | 9   |
|-----|---------------------------------|---------------------|---|---|-----|---------------|---------------|---|---|-----|-----|
| 1   | Square chip                     | 2125                | ○ |   |     |               |               |   |   |     |     |
| 2   |                                 | 3216                | ○ |   |     |               |               |   |   |     |     |
| 3   |                                 | 3819                | ○ | ○ |     |               |               |   |   |     |     |
| 4   |                                 | 4726                |   | ○ |     |               |               |   |   |     |     |
| 5   |                                 | 6332                |   | ○ |     |               |               |   |   |     |     |
| 6   |                                 | 7343                |   | ○ |     |               |               |   |   |     |     |
| 7   | MELF                            | 1/16 W              | ○ |   |     |               |               |   |   |     |     |
| 8   |                                 | 1/8 W               | ○ |   |     |               |               |   |   |     |     |
| 9   |                                 | 1/4 W               | ○ | ○ |     |               |               |   |   |     |     |
| 10  | Mini-mold transistor            |                     |   |   |     |               |               |   |   | ○   |     |
| 11  | Mini-power transistor           |                     |   |   |     |               |               |   |   |     | ○   |
| 12  | SOP                             | 8P                  |   |   | ○   |               |               |   |   |     |     |
| 13  |                                 | 14P                 |   |   | ○   |               |               |   |   |     |     |
| 14  |                                 | 16P                 |   |   | ○   |               |               |   |   |     |     |
| 15  |                                 | 20P                 |   |   | ○   |               | (Note 2)<br>○ |   |   |     |     |
| 16  |                                 | 24P                 |   |   |     |               | ○             |   |   |     |     |
| 17  |                                 | 28P                 |   |   |     | (Note 1)<br>○ | ○             |   |   |     |     |
| 18  | PLCC                            | 18P                 |   |   |     |               | ○             |   |   |     |     |
| 19  |                                 | 20p                 |   |   |     |               | ○             |   |   |     |     |
| 20  |                                 | 28P                 |   |   |     | (Note 1)<br>○ | ○             |   |   |     |     |
| 21  |                                 | 32p                 |   |   |     | ○             |               |   |   |     |     |
| 22  |                                 | 44P                 |   |   |     | ○             |               |   |   |     |     |
| 23  |                                 | 52p                 |   |   |     | ○             |               |   |   |     |     |
| 24  |                                 | 68P                 |   |   |     | ○             |               |   |   |     |     |
| 25  | QFP 44P ~ 64P                   |                     |   |   |     | ○             |               |   |   |     |     |
| 26  |                                 |                     |   |   |     |               |               |   |   |     |     |
| 27  |                                 |                     |   |   |     |               |               |   |   |     |     |
|     | Head operation pattern (Note 4) |                     | A | A | B,C | A             | B,C           | A | A | B,C | B,C |



**NOTE:**

1. If the width of the part (including the lead) is more than 11.4mm, please use Bit 4.
2. If the width of the resin is more than 6mm, please use bit 5.
3. Please use the following bit numbers for the bits listed below:

| Bit No. | Bit Type               |
|---------|------------------------|
| 1       | Bit 1 for small chips  |
| 2       | Bit 2 for medium chips |
| 3       | Bit 3 for small SOP    |
| 4       | Bit 4 for PLCC         |
| 5       | Bit 5 for large SOP    |
| 6       |                        |
| 7       |                        |
| 8       | Bit 1 for small chips  |
| 9       | Bit 2 for medium chips |

Nos. 6 and 7 are used for special designations.

4. The chart below shows the head operation pattern and the corresponding pattern for each unit and its specified position.

**Head Operation Pattern Chart**

| Pattern | Operation Specified by Mount Data | Operation Chart  |
|---------|-----------------------------------|--|
| A       | +90° + chuck                      | Right rotation → Picking → Left rotation → Chuck → Placing |
|         | -90° + Chuck                      | Picking → Right rotation → Chuck → Placing                 |
|         | Chuck                             | Picking → Chuck → Placing                                  |
| B       | +90° + Chuck                      | Right rotation → Picking → Chuck → Left rotation → Placing |
|         | -90° + Chuck                      | Picking → Chuck → Right rotation → Placing                 |
|         | Chuck                             | Picking → Chuck → Placing                                  |
| C       | +90° + Chuck                      | Right rotation → Picking → Left rotation → Chuck → Placing |
|         | -90° + Chuck                      | Picking → Right rotation → Chuck → Placing                 |
|         | Chuck                             | Picking → Right rotation → Chuck → Left rotation → Placing |

**Operation Pattern for Each Unit and its Specification Position**

| Unit          | Unit position | F1 | F2 | B1 | B2 | B3 | L1             | L2             | R1 | R2 | M1 | M2 |
|---------------|---------------|----|----|----|----|----|----------------|----------------|----|----|----|----|
| Bulk          |               | A  | A  | A  | A  | /  | A              | A              | A  | A  | /  | /  |
| Tape (6)      |               | C  | C  | C  | C  | /  | B              | B              | /  | /  | /  | /  |
| Tape (3), (4) |               | B  | B  | B  | B  | /  | C <sup>1</sup> | C <sup>1</sup> | /  | /  | /  | /  |
| Magazine      |               | /  | /  | /  | /  | /  | /              | /              | /  | /  | B  | B  |
| Stick         |               | /  | /  | C  | C  | C  | /              | /              | /  | /  | /  | /  |
| IC Tray       |               | /  | /  | /  | /  | /  | /              | /              | /  | /  | A  | /  |

\* 1 ..... These patterns cannot be set for the four tape feeders.

# MOUNT DATA INPUT

## Section 7

[ Placement Data In ]

| No. | F.Pos | BTT | HDC | RTT | AH | X mm  | Y mm  |
|-----|-------|-----|-----|-----|----|-------|-------|
| 1   | R1- 1 |     |     |     |    | 100.0 | 100.0 |
| 2   | R1- 2 | 90  | *   |     |    | 110.0 | 100.0 |
| 3   | R1- 3 |     |     |     |    | 100.0 | 110.0 |
| 4   | L1- 1 | -90 |     |     |    | 150.0 | 150.0 |
| 5   | M2- 1 |     |     |     |    | 170.0 | 170.0 |
| 6   | M2- 1 |     |     |     |    | 170.0 | 180.0 |
| 7   | L2- 1 |     | *   |     |    | 160.0 | 150.0 |
| 8   | M1    |     |     | 45  |    | 150.0 | 200.0 |
| 9   | M1    |     |     | 90  |    | 170.0 | 200.0 |
| 10  | M1    |     |     | *   |    | 190.0 | 200.0 |

(Screen 7-1)

|                             |                    |              |
|-----------------------------|--------------------|--------------|
| Filename                    | MANUAL             | (12/12)      |
| Bit Pos.                    | X = 2.4 Y = 429.6  |              |
| PWB H.P.                    | X = 0.0 Y = 0.0    |              |
| Key Operations              |                    |              |
| f:1 : Load File             | f:7 : SCR Up       |              |
| f:2 : Teach/B               | f:8 : SCR Down     |              |
| f:3 : Teach/S               | f:9 : Bit Optim.   |              |
| f:4 : Delete                | f:10 : Step & Rep. |              |
| f:5 : Insert                | ESC: PWS H.P.      |              |
| f:6 : Save                  | / : End            |              |
| < Feeder Pos. .... 10-key > |                    |              |
| 7(B1)                       | 8(B2)              | 9(B3)        |
| 4(L2)                       | 5(M2)              | 6(R2)        |
| 1(L1)                       | 2(M1)              | 3(R1) = (D1) |
| 0(F1)                       | , (F2)             |              |
| Feeder Pos.                 |                    |              |


- \* A maximum of 2,000 mount coordinates can be memorized in one file. Under auxiliary operations, 2,000 points can be used to specify another bonding pattern, but in the case of paste solder, for example, you need to specify 64 points for the QFP of the 64 pins. An explanation of the input items at the lefthand side of Screen 7-1 is given below.

## 1. EXPLANATION OF INPUT ITEMS

### 1. F.Pos (Feeder Position)

The position where the part will be bonded is specified by "Unit Number + (Rail Number)". However, for the IC Tray, only the unit number (M1) is necessary. The unit number is not input directly but input using the 10-key correspondence system illustrated below.



|     |      |    |   |
|-----|------|----|---|
| CLR | HELP | -  | /   |
| 7   | 8    | 9  | *   |
| B1  | B2   | B3 |   |
| 4   | 5    | 6  | +   |
| L2  | M2   | R2 |   |
| 1   | 2    | 3  | =   |
| L1  | M1   | R1 | DI  |
| 0   |      | •  |  |
| F1  | F2   |    |   |

- \* The upper section of each key shows the keyboard symbol, while the lower section shows the unit number. However, "DI" shows the dispenser and is indicated when solder cream is used.

**NOTE:**

Please refer to Screen 6-1 (page 6-1) regarding unit positions.

**2. BTT (Bit Turn)**

This function turns parts  $\pm 90^\circ$  and loads them. There are three types of commands:

|   |           |
|---|-----------|
| 0 | : No turn |
| + | : +90°    |
| - | : -90°    |

**NOTE:**

To specify no rotation, either the return key or the cursor can be used. (The same applies to the following.)

**3. HDC (Head Chucking)**

When there is a need for special accuracy in loading parts, the centering adjust chuck attached to the head, or the rotary table, must be used for chucking. The commands for the centering adjust chuck are explained below.

There are two types of centering adjust chuck commands. For the rotary table, please refer to the description in the following section, "Rotary Table Turn".

|   |               |
|---|---------------|
| 0 | : No chucking |
| * | : Chucking    |

#### 4. RTT (Rotary Table Turn)

This function is used to rotate parts or for chucking. Parts are rotated in 15° notches, so specifications can range from 0 to 345°.

The commands are:

|        |                                   |
|--------|-----------------------------------|
| 0      | : Not being used                  |
| 15~345 | : Rotate only the indicated value |
| *      | : Chucking only                   |

The rotary table is optional.

#### 5. CM (Cement Pattern)

It is possible to specify items (1 to 40) memorized in auxiliary operations. The maximum offset position from the parts loading position is 8 points.

#### 6. Xmm, Ymm (Parts Loading Positions)

These are coordinates for parts loading positions. Input by MDI or teaching.

#### NOTE:

Even if a rotary table setting exists within a single unit of mount data, in the case that head chucking or rotation has been concurrently set, the rotary table will have priority and the settings of chucking and rotation will be disregarded.

## 2.

### EXPLANATION OF KEY OPERATIONS

**f.1** ..... See 6-1-1 (page 6-2).  
(Load File)

**f.2** ..... See 6-2-2 (page 6-7).  
(Teaching/Bit)

**f.3** ..... See 6-2-2 (page 6-7).  
(Teaching/Spot)

**f.4** ..... With this function, data can be deleted no matter what screen you are on, by specifying the line number or numbers that you want to delete.

Ex) Delete Line 1  or Delete Lines 1-3

**f.5** ..... Move the cursor to the place where you want to insert a line and press the **f.5** key. One line will be opened up. At that position, the cursor cannot be moved to any other position until data has been input or



**f.6** ..... See 6-1-1 (page 6-2).  
(Save)

**f.7** ..... Advances the text on the screen by units of one page (scrolling).  
(Screen Up)

**f.8** ..... Moves in reverse order in units of one page (scrolling).  
(Screen Down)

#### 4. RTT (Rotary Table Turn)

This function is used to rotate parts or for chucking. Parts are rotated in 15° notches, so specifications can range from 0 to 345°.

The commands are:

|        |                                   |
|--------|-----------------------------------|
| 0      | : Not being used                  |
| 15~345 | : Rotate only the indicated value |
| *      | : Chucking only                   |

The rotary table is optional.

#### 5. CM (Cement Pattern)

It is possible to specify items (1 to 40) memorized in auxiliary operations. The maximum offset position from the parts loading position is 8 points.

#### 6. Xmm, Ymm (Parts Loading Positions)

These are coordinates for parts loading positions. Input by MDI or teaching.

#### NOTE:

Even if a rotary table setting exists within a single unit of mount data, in the case that head chucking or rotation has been concurrently set, the rotary table will have priority and the settings of chucking and rotation will be disregarded.

## 2.

### EXPLANATION OF KEY OPERATIONS

**f.1** ..... See 6-1-1 (page 6-2).  
(Load File)

**f.2** ..... See 6-2-2 (page 6-7).  
(Teaching/Bit)

**f.3** ..... See 6-2-2 (page 6-7).  
(Teaching/Spot)

**f.4** ..... With this function, data can be deleted no matter what screen you are on, by specifying the line number or numbers that you want to delete.  
(Delete)  
Ex) Delete Line 1  or Delete Lines 1-3

**f.5** ..... Move the cursor to the place where you want to insert a line and press the **f.5** key. One line will be opened up. At that position, the cursor cannot be moved to any other position until data has been input or the line deleted.  
(Insert)

**f.6** ..... See 6-1-1 (page 6-2).  
(Save)

**f.7** ..... Advances the text on the screen by units of one page (scrolling).  
(Screen Up)

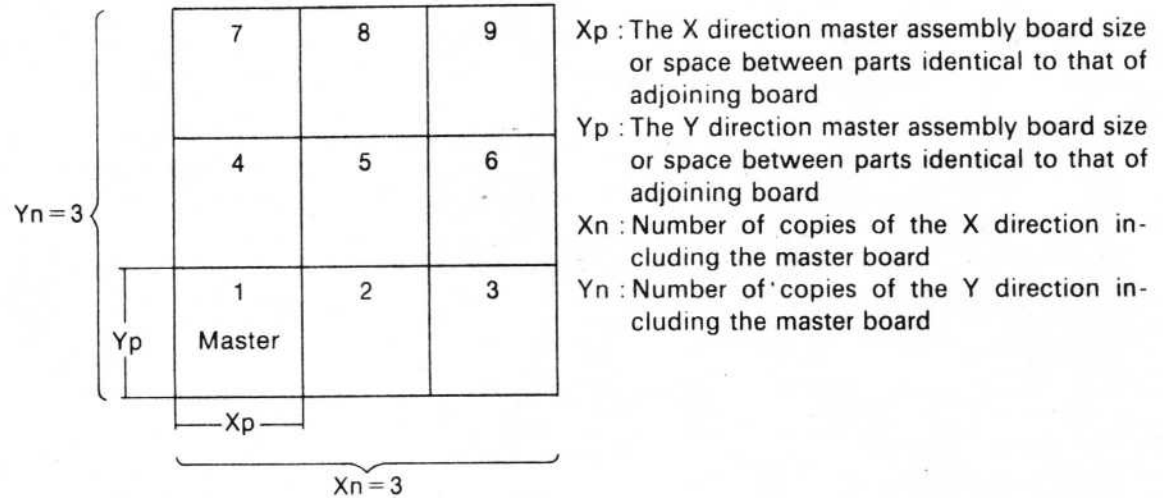
**f.8** ..... Moves in reverse order in units of one page (scrolling).  
(Screen Down)

**f.9** ..... This function sorts mount data according to the type of bit. However, **(Bit Optimization)** the dispenser data is brought to the very first position.

**f.10** ..... In the case of a cracked assembly board, etc., if master data only is created, if you input the x, y direction of the space between assembly boards and number of boards, the complete mount data can be created.

If correct data is input for each of the items shown below, by drawing on the master data, coordinates will be developed for the pitch and number of items in x and y.

**(Example)**



**ESC** ..... To set the board origin point for mount data input, the **ESC** key can **(Board Origin Point)** be used to move the cursor to the x-axis board origin point at the top right of the mount data input screen, thereby permitting the x-axis and y-axis coordinates of the board origin point to be alternately set. To terminate this operation, press the **ESC** key again. (While in this mode, the cursor in the left screen becomes invalid.)

**/** ..... Press to terminate.  
**(End)** ..... When this key is pressed, the message "Do you want to save? (Y/N)" appears. To save, press "Y"; otherwise press "N". If a different key is pressed, the operation will continue without being terminated.

# PRODUCTION

## Section

# 8

\*\* Product \*\*

(Screen 8-1)

| No. | F.Pos | BTT | HDC | RTT | AM | X mm  | Y mm  |
|-----|-------|-----|-----|-----|----|-------|-------|
| 1   | R1- 1 |     |     |     |    | 100.0 | 100.0 |
| 2   | R1- 2 | 90  | *   |     |    | 110.0 | 100.0 |
| 3   | R1- 3 |     |     |     |    | 100.0 | 110.0 |
| 4   | L1- 1 | -90 |     |     |    | 150.0 | 150.0 |
| 5   | M2- 1 |     |     |     |    | 170.0 | 170.0 |
| 6   | M2- 1 |     |     |     |    | 170.0 | 180.0 |
| 7   | L2- 1 |     | *   |     |    | 160.0 | 150.0 |
| 8   | M1    |     |     | 45  |    | 150.0 | 200.0 |
| 9   | M1    |     |     | 90  |    | 170.0 | 200.0 |
| 10  | M1    |     |     | *   |    | 190.0 | 200.0 |

|   |                   |         |            |   |       |          |   |     |         |   |        |             |   |   |        |   |  |           |   |  |
|---|-------------------|---------|------------|---|-------|----------|---|-----|---------|---|--------|-------------|---|---|--------|---|--|-----------|---|--|
| Filename  | MANUAL            | (12/12) |            |   |       |          |   |     |         |   |        |             |   |   |        |   |  |           |   |  |
| Bit Pos.  | X = 2.4 Y = 429.6 |         |            |   |       |          |   |     |         |   |        |             |   |   |        |   |  |           |   |  |
| PWB H.P.  | X = 0.0 Y = 0.0   |         |            |   |       |          |   |     |         |   |        |             |   |   |        |   |  |           |   |  |
| Key Operations  |                   |         |            |   |       |          |   |     |         |   |        |             |   |   |        |   |  |           |   |  |
| f-1: Load File  | f-6: Save         |         |            |   |       |          |   |     |         |   |        |             |   |   |        |   |  |           |   |  |
| f-2: Teach/B  | f-7: SCR. Up      |         |            |   |       |          |   |     |         |   |        |             |   |   |        |   |  |           |   |  |
| f-3: Teach/S  | f-8: SCR. Down    |         |            |   |       |          |   |     |         |   |        |             |   |   |        |   |  |           |   |  |
| f-4: Exec.  | f-9: Prod. Cond.  |         |            |   |       |          |   |     |         |   |        |             |   |   |        |   |  |           |   |  |
| f-5: Stop   | /: End            |         |            |   |       |          |   |     |         |   |        |             |   |   |        |   |  |           |   |  |
| <table border="1"> <tr> <td>Prod. Mode</td> <td>:</td> <td>Mount</td> </tr> <tr> <td>Conveyor</td> <td>:</td> <td>Off</td> </tr> <tr> <td>Re-pick</td> <td>:</td> <td>On (1)</td> </tr> <tr> <td>Prod. Count</td> <td>:</td> <td>1</td> </tr> <tr> <td>Feeder</td> <td>:</td> <td></td> </tr> <tr> <td>Placement</td> <td>:</td> <td></td> </tr> </table> |                   |         | Prod. Mode | : | Mount | Conveyor | : | Off | Re-pick | : | On (1) | Prod. Count | : | 1 | Feeder | : |  | Placement | : |  |
| Prod. Mode  | :                 | Mount   |            |   |       |          |   |     |         |   |        |             |   |   |        |   |  |           |   |  |
| Conveyor  | :                 | Off     |            |   |       |          |   |     |         |   |        |             |   |   |        |   |  |           |   |  |
| Re-pick   | :                 | On (1)  |            |   |       |          |   |     |         |   |        |             |   |   |        |   |  |           |   |  |
| Prod. Count   | :                 | 1       |            |   |       |          |   |     |         |   |        |             |   |   |        |   |  |           |   |  |
| Feeder  | :                 |         |            |   |       |          |   |     |         |   |        |             |   |   |        |   |  |           |   |  |
| Placement   | :                 |         |            |   |       |          |   |     |         |   |        |             |   |   |        |   |  |           |   |  |
| Select key!   |                   |         |            |   |       |          |   |     |         |   |        |             |   |   |        |   |  |           |   |  |

\* Based on unit data and mount data, parts are loaded and bonded on the assembly board. The chart on the left side of Screen 8-1 provides a reference for data. Data cannot be altered here. However, during Step Operation, changes are possible when the activate command is issued (at each interrupt position) for teaching.

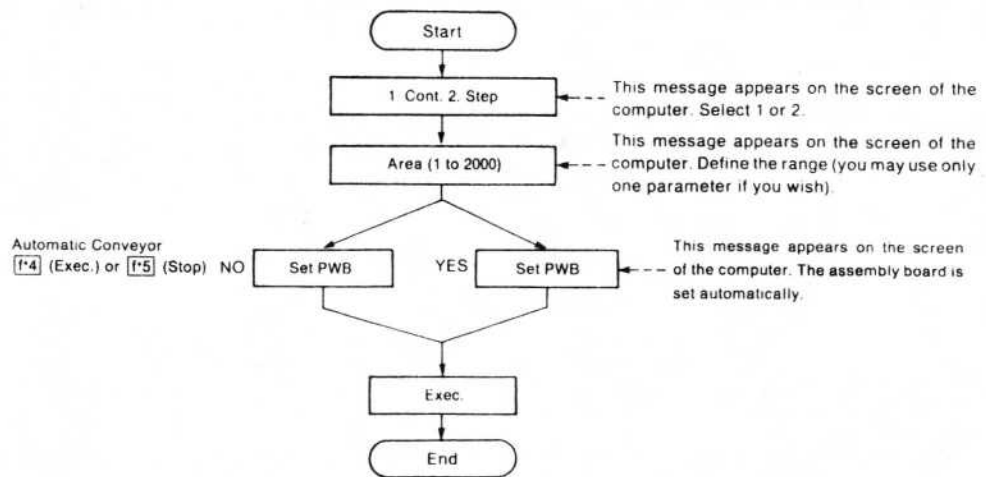
## 1. EXPLANATION OF KEY OPERATIONS

**f-1** ..... See 6-1-1 (page 6-2).  
(Load File)

**f-2** ..... See 6-2-2 (page 6-7).  
(Teaching/Bit)

**f-3** ..... See 6-2-2 (page 6-7).  
(Teaching/Spot)

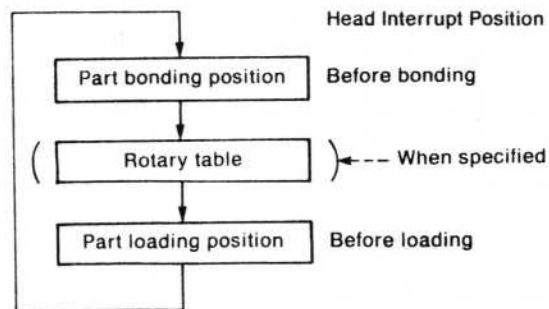
**f-4** ..... This activates production (including after a temporary interruption).  
(Execution)      The production process is shown below.



If the process is interrupted, the message "1: Continuous 2: Step" appears. It is possible to change from continuous operation to step operation while the production process is underway.

After each step operation, bit change, IC tray or magazine exchange, press **[f.4]** to continue.

#### Operation Procedure for Step Activation



**[f.5]** .....When you want to temporarily interrupt production, press this once.  
**(Stop)** .....If you want to halt production completely, press it twice. To continue after a temporary interruption, press the **[f.4]** (Activation) key.

**[f.6]** .....See 6-1-1 page 6-2. During production in the Step mode, if teaching took place and the coordinates were changed, data is saved with this function.  
**(Save)**

**[f.7]** .....Advances the data by one screen (scrolling).  
**(Screen Up)**

**[f.8]** .....Returns to the data of the previous screen (scrolling).  
**(Screen down)**

**[f.9]** .....Setting conditions appropriate for production.  
**(Production Conditions)**

|             |  |
|-------------|--|
| Prod. Mode: | 1. Place 2. Adhe. 3. Sold                      |
| Conveyor:   | 1. on 2. off                                   |
| Repick:     | 1. on 2. off (Number of retries up to 9 times) |
| Prod-Count: | 4 digits ( $\leq 9999$ )                       |

To terminate, press the **f9** key again.

**/** ..... Press to terminate.

**(End)**

When this key is pressed, the message "Do you want to save? (Y/N)" appears. To save, press "Y"; otherwise press "N". If a different key is pressed, the operation will continue without being terminated.

# I/O TEST

## Section

# 9

(Screen 9-1)

| I/O Test                |
|-------------------------|
| 1. Input Check          |
| 2. Head                 |
| 3. X-Y Movement         |
| 4. R Table              |
| 5. Automatic Conveyor   |
| /. End                  |
| Please select a number. |

\* Activates a simple I/O test.

**1.**

### INPUT CHECK

[Input Check]

(Screen 9-2)

| Item  | Input | Item | Input | Item      | Input |
|-------|-------|------|-------|-----------|-------|
| HEAD  | off   | - Y  | off   | HOME      | off   |
| VAC.  | off   | + Y  | off   | R.T (CTR) | off   |
| TEACH | off   | - X  | off   | R.T (CW)  | off   |
| FAST  | off   | + X  | off   | R.T (CCW) | off   |

Push Keys of each Item

/: End

\* Check the input conditions (conductive conditions) of the main keyboard, HOME key, and rotary table switch. Normally "OFF" is displayed but if a key is pressed "ON" is displayed during that time only.



## 2. \_\_\_\_\_

### HEAD

[Head] (Screen 9-3)

| Item      | P. key | Out | In  |
|-----------|--------|-----|-----|
| UP/DOWN   | f · 1  | off | off |
| Rotate    | f · 2  | off | *** |
| Vacuum    | f · 3  | off | off |
| T. Knock  | f · 4  | off | *** |
| Centering | f · 5  | off | *** |
| Dispenser | f · 6  | off | *** |

ESC : Stop

/ : End

- \* The simplex operation of the centering adjust chuck takes place as a result of the up and down movement, rotation, vacuum and tape knock of the bit of the head section. (Alternately ON and OFF) The dispenser's operation is one-shot. The UP/DOWN of the "Input" of Illustration 6-3 is effective only for the dispenser head. Vacuum is sensed by the vacuum sensor.

## 3. \_\_\_\_\_

### X-Y MOVEMENT

(Screen 9-4)

[X-Y Move]

f · 1 : HOME

f · 2 : Exec.

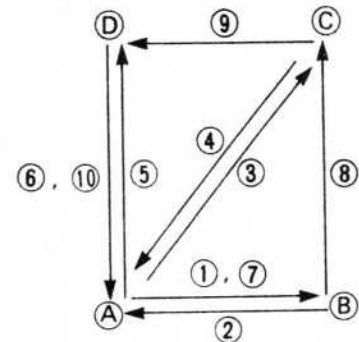
ESC : Stop

/ : End

#### NOTE:

The HOME key of [f · 1] causes a return to the starting point of the machine.

- \* The X-Y axis moves continuously in the pattern shown at the right. ( 1 to 10) Operation can be interrupted at any point from A to D by using the [ESC] key.



## 4.

### ROTARY TABLE

[R-Table] (Screen 9-5)

| Item      | F.Key | Out |
|-----------|-------|-----|
| CW(180°)  | f·1   | off |
| CCW(180°) | f·2   | off |
| Centering | f·3   | off |

/: End

- \* A simple check of rotary table operation occurs.  
Three kinds of operation are possible: a 180° rotation towards CW, a 180° rotation towards CCW, and centering (chucking).

## 5.

### AUTOMATIC CONVEYOR

[Conveyor] (Screen 9-6)

| Item           | F.Key | Out | Item             | In  |
|----------------|-------|-----|------------------|-----|
| Conveyor Motor | f·1   | off | Pass Detect(In)  | off |
| Stopper        | f·2   | off | PWB Detect       | off |
| Centering Pin  | f·3   | off | Center.Pin Conf. | off |
| Support        | f·4   | off | Ready In         | off |
| Ready Out      | f·5   | off | Pass Detect(Out) | off |

/: End

- \* The operation check of each mechanism of the automatic conveyor is displayed, along with the input conditions of its accompanying sensor.
- \* If an automatic conveyor is not attached, "ON" is displayed for transition detection (in) and transition detection (out). This does not signify a problem.

# AUXILIARY OPERATION

# 10

Section

(Screen 10-1)

| Sub Menu   |                  |
|------------|------------------|
| 1.         | Component Data   |
| 2.         | Adhesive Pattern |
| 3.         | Delete File      |
| 4.         | Print Data       |
| 5.         | Prod. Inform.    |
| /.         | End              |
| Select No. |                  |

\* The five kinds of operations listed above take place under Auxiliary Operations.

## 1.

### PARTS DATA

\*\* Component Data In \*\*

(Screen 10-2)

| No. | Name   | Size | B |
|-----|--------|------|---|
| 1   | 2125   | 2.0  | 1 |
| 2   | 3216   | 3.2  | 1 |
| 3   | MLF16W | 1.6  | 1 |
| 4   | MLF8W  | 2.0  | 1 |
| 5   | MLF4W  | 5.9  | 2 |
| 6   | SOP8P  | 6.0  | 3 |
| 7   | SOP16P | 12.5 | 3 |
| 8   |        |      |   |

| No. | Name | Size | B |
|-----|------|------|---|
| 9   |      |      |   |
| 10  |      |      |   |
| 11  |      |      |   |
| 12  |      |      |   |
| 13  |      |      |   |
| 14  |      |      |   |
| 15  |      |      |   |
| 16  |      |      |   |

| No. | Name | Size | B |
|-----|------|------|---|
| 17  |      |      |   |
| 18  |      |      |   |
| 19  |      |      |   |
| 20  |      |      |   |
| 21  |      |      |   |
| 22  |      |      |   |
| 23  |      |      |   |
| 24  |      |      |   |

| No. | Name | Size | B |
|-----|------|------|---|
| 25  |      |      |   |
| 26  |      |      |   |
| 27  |      |      |   |
| 28  |      |      |   |
| 29  |      |      |   |
| 30  |      |      |   |
| 31  |      |      |   |
| 32  |      |      |   |

< Key Operations >  
name

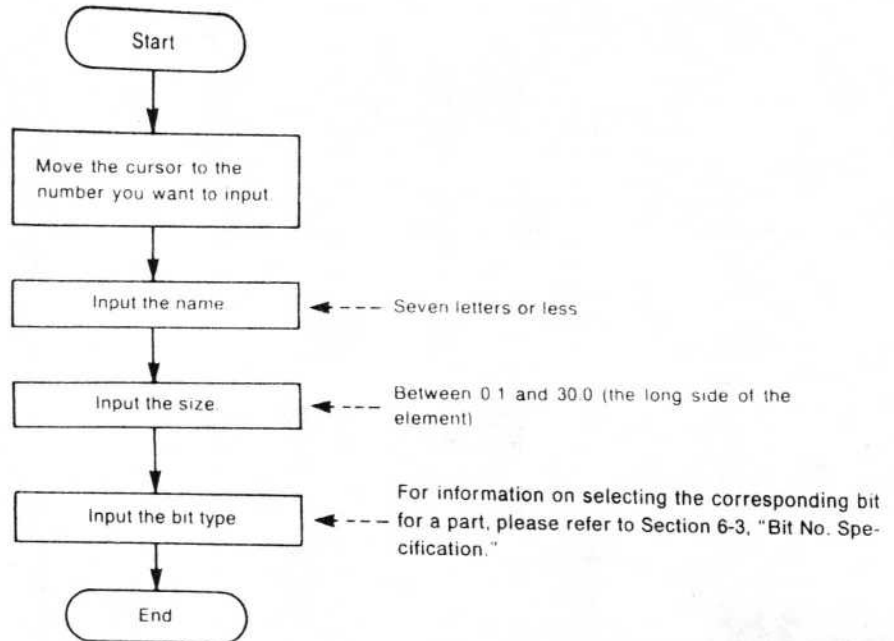
F · 4: Delete

· End

\* At this time, if NO. 1-32 were stored as Name information, the name will take priority over the number.

# 1. Explanation of Key Operations

A maximum of 32 items of parts data can be stored. The procedure by which data is entered is shown below.



**f-4** ..... See 7-2 (page 7-2).  
 (Delete)

**/** ..... Data is automatically saved upon termination.  
 (End)

## 2. CEMENT PATTERN

### \*\* Adhesive Pattern \*\*

< Registration > (Screen 10-3)

|       |    |     |     |     |
|-------|----|-----|-----|-----|
| 1:    | 5: | 9:  | 13: | 17: |
| 2:    | 6: | 10: | 14: | 18: |
| 3: 4P | 7: | 11: | 15: | 19: |
| 4:    | 8: | 12: | 16: | 20: |

Table 10-1

< No: 3/ Name: 4P >

|         |   |   |   |   |   |   |   |   |
|---------|---|---|---|---|---|---|---|---|
| Point   | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
| X of mm |   |   |   |   |   |   |   |   |
| Y of mm |   |   |   |   |   |   |   |   |

Table 10-2

|                    |                  |                  |
|--------------------|------------------|------------------|
| < Key Operations > | ESC: Call/Return | f · 4 : Delete   |
| Name               | f · 2 : Regist.  | f · 5 : Page SW. |
|                    |                  | / : End          |

\* For bonding points, a value with a maximum of 8 points and 40 patterns offset from the parts loading position can be stored. (The input range is from -15.0 to +15.0.)

# AUXILIARY OPERATION **10**

Section

(Screen 10-1)

| Sub Menu   |                  |
|------------|------------------|
| 1.         | Component Data   |
| 2.         | Adhesive Pattern |
| 3.         | Delete File      |
| 4.         | Print Data       |
| 5.         | Prod. Inform.    |
| /.         | End              |
| Select No. |                  |

\* The five kinds of operations listed above take place under Auxiliary Operations.

## 1. PARTS DATA

\*\* Component Data In \*\*

(Screen 10-2)

| No. | Name   | Size | B |
|-----|--------|------|---|
| 1   | 2125   | 2.0  | 1 |
| 2   | 3216   | 3.2  | 1 |
| 3   | MLF16W | 1.6  | 1 |
| 4   | MLF8W  | 2.0  | 1 |
| 5   | MLF4W  | 5.9  | 2 |
| 6   | SOP8P  | 6.0  | 3 |
| 7   | SOP16P | 12.5 | 3 |
| 8   |        |      |   |

| No. | Name | Size | B |
|-----|------|------|---|
| 9   |      |      |   |
| 10  |      |      |   |
| 11  |      |      |   |
| 12  |      |      |   |
| 13  |      |      |   |
| 14  |      |      |   |
| 15  |      |      |   |
| 16  |      |      |   |

| No. | Name | Size | B |
|-----|------|------|---|
| 17  |      |      |   |
| 18  |      |      |   |
| 19  |      |      |   |
| 20  |      |      |   |
| 21  |      |      |   |
| 22  |      |      |   |
| 23  |      |      |   |
| 24  |      |      |   |

| No. | Name | Size | B |
|-----|------|------|---|
| 25  |      |      |   |
| 26  |      |      |   |
| 27  |      |      |   |
| 28  |      |      |   |
| 29  |      |      |   |
| 30  |      |      |   |
| 31  |      |      |   |
| 32  |      |      |   |

|                            |               |       |
|----------------------------|---------------|-------|
| < Key Operations ><br>name | f · 4: Delete | ⏏ End |
|----------------------------|---------------|-------|

\* At this time, if NO. 1-32 were stored as Name information, the name will take priority over the number.

Table 10-1 of Illustration 10-3 shows the save conditions for patterns. When the cursor is here, the pattern name can be stored or the pattern deleted. To call a pattern, align the cursor with the number of the pattern you want to call, and press the **[ESC]** key. The pattern contents will be displayed as shown in Table 10-2, and the cursor will also move to the chart. At this point you can make changes in the pattern, and the pattern can be stored, but if you delete, the X and Y coordinates of the position where the cursor is will be deleted.

### 1. Explanation of Key Operations

- [ESC]** .....Align the cursor with the pattern you want to call, and press the  
**(Call/Return)** **[ESC]** key. The pattern will be called to Table 10-2. If there is no pattern memorized in the indicated location, press the **[ESC]** key again to return the cursor to Table 10-1.
- [f.2]** .....When the cursor is on Table 10-2, if you press the **[f.2]** key, a Memory  
**(Save)** Number will be asked for (from 1 to 40). Input the number you want to store and it will be saved.
- [f.4]** .....See 6-2-2 (page 6-7). On Table 10-1, the pattern at the cursor location  
**(Delete)** will be deleted.  
 On Table 10-2, the offset values for X and Y at the cursor location will be deleted.
- [f.5]** .....When the cursor is on Table 10-1, if you press the **[f.5]** key, patterns  
**(Page Switch)** 1 to 20 and 21 to 40 will be displayed alternately.
- [/]** .....Returns to the Sub-Menu. When this is pressed, data is automatically  
**(End)** saved.

## 3. FILE DELETION

Screen 10-4

| File Directory      |             |
|---------------------|-------------|
| 1 : AO1             | 7 : SOP1    |
| 2 : AO2             | 8 : XX      |
| 3 : SOP             | 9 : KAZ     |
| 4 : MANUAL          | 10 : CHACK  |
| 5 : INA             | 11 : ROT    |
| 6 : TETSU           | 12 : CENTER |
| < Delete File >     |             |
| Select No. ( : End) |             |

- \* On the Sub-Menu screen, when file deletion is activated, the directory screen appears. Input the number of the file that you want to delete. After a confirmation message appears, the file is deleted. Press the **[/]** key to terminate and return to the Sub-Menu.

## 4. \_\_\_\_\_

### Data output

Connect up a printer which has a centro parallel interface. Five items can be output; unit data, mount data, parts data, bonding data and production management information. When any of these items is selected in Auxiliary Operations, screen 10-5 is displayed.

(Screen 10-5)

| File Directory |     |
|----------------|-----|
| 1: PROG 1      | 7:  |
| 2: PROG 2      | 8:  |
| 3: PROG 3      | 9:  |
| 4: MANUAL      | 10: |
| 5:             | 11: |
| 6:             | 12: |

< Feeder (ESC : Item) >  
Select No (/ : END)

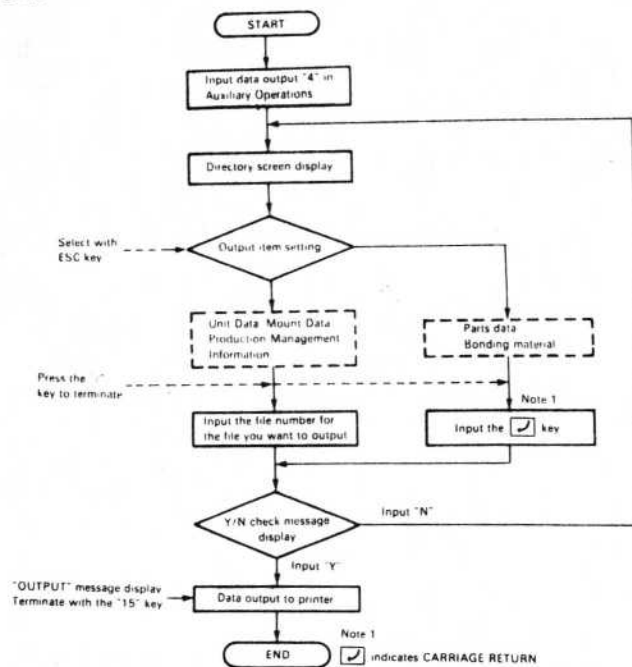
#### a) Explanation of operation

In the case of unit data, mount data and production management information, input the file number you wish to output. For parts data, in the case of bonding press CR only (carriage return key) (output items are set with the **[ESC]** key). The required data are read in accompanied by a READING IN display. At the end of a read-in, a Y/N execution check message appears on the screen. If you want to terminate "Y" during execution, input an "N". If a "Y" is input, data is output to the printer and an OUTPUT message appears on the screen. If you want to terminate this operation press the **[f.5]** key (to clear data already stored in the printer's buffer, switch OFF the power to the printer and then switch ON again).

#### NOTE:

If data is output when the printer is disconnected, an error message from the internal OS (operating system) of the PC remains on part of the screen. In this case, end the operation and connect up the printer.

## b) Data output flow



## c) Output example

\*\*\*\*\* Feeder \*\*\*\*\*

Filename : MANUAL

Feeder pos.: B1

Feeder : Stick

| No | Kind  | Comp.Data | Size | Bit | X mm  | Y mm  |
|----|-------|-----------|------|-----|-------|-------|
| 1  | STD.  | 6:SOP8P   | 6.0  | 3   | 19.5  | 495.3 |
| 2  | STD.  | 6:SOP8P   | 6.0  | 3   | 51.5  | 495.3 |
| 3  | WIDE. | 7:SOP16P  | 12.5 | 3   | 100.5 | 498.5 |
| 4  |       |           |      |     |       |       |

Feeder pos.: R1

Feeder : Linear

| No | Kind | Comp. Data | Size | Bit | X mm  | Y mm  |
|----|------|------------|------|-----|-------|-------|
| 1  | **** | 1:2125     | 2.0  | 1   | 356.1 | 145.5 |
| 2  | **** | 2:3216     | 3.2  | 1   | 356.7 | 159.5 |
| 3  | **** | 3:MLF16W   | 1.6  | 1   | 355.9 | 173.5 |
| 4  | **** | 4:MLF8W    | 2.0  | 1   | 356.1 | 189.5 |
| 5  | **** | 5:MLF4W    | 5.9  | 2   | 358.0 | 201.5 |
| 6  | **** | :          |      |     |       |       |
| 7  | **** | :          |      |     |       |       |
| 8  | **** | :          |      |     |       |       |
| 9  | **** | :          |      |     |       |       |
| 10 | **** | :          |      |     |       |       |



\*\*\*\*\* Placement \*\*\*\*\*

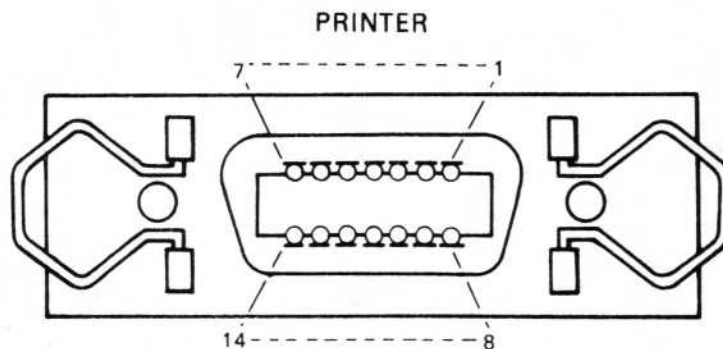
Filename : MANUAL

| No | F.Pos | BTT | HDC | RTT | AH | X mm  | Y mm  |
|----|-------|-----|-----|-----|----|-------|-------|
| 1  | R1- 1 |     |     |     |    | 100.0 | 100.0 |
| 2  | R1- 2 | 90  | *   |     |    | 110.0 | 100.0 |
| 3  | R1- 3 |     |     |     |    | 100.0 | 110.0 |
| 4  | L1- 1 | -90 |     |     |    | 150.0 | 150.0 |
| 5  | M2- 1 |     |     |     |    | 170.0 | 170.0 |
| 6  | M2- 1 |     |     |     |    | 170.0 | 180.0 |
| 7  | L2- 1 |     | *   |     |    | 160.0 | 150.0 |
| 8  | M1    |     |     | 45  |    | 150.0 | 200.0 |
| 9  | M1    |     |     | 90  |    | 170.0 | 200.0 |
| 10 | M1    |     |     | *   |    | 190.0 | 200.0 |

#### d) Interface and Character Code Set

(1) Printer Interface of PC-8801 FH30

| Signal Pin No. | Signal | Direction | Description   |
|----------------|--------|-----------|---|
| 1              | PSTB   | OUT       | PSTB pulse to write data out<br><br>TTL, Data outputs to printer<br>8 bit parallel data |
| 2              | PDB0   | OUT       |   |
| 3              | PDB1   | OUT       |   |
| 4              | PDB2   | OUT       |   |
| 5              | PDB3   | OUT       |   |
| 6              | PDB4   | OUT       |   |
| 7              | PDB5   | OUT       |   |
| 8              | PDB6   | OUT       |   |
| 9              | PDB7   | OUT       |   |
| 10             | NC     |           |   |
| 11             | BUSY   | IN        | "LOW" level is printer ready.   |
| 12             | NC     |           |   |
| 13             | GND    |           |   |
| 14             | GND    |           |   |



(2) Character Code Set of PC-8801 FH30

Column (MSB)

|   | 0              | 1              | 2  | 3 | 4 | 5 | 6 | 7 | 8 | 9 | A | B | C | D | E | F |
|---|----------------|----------------|----|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 0 |                | D <sub>E</sub> | 0  | @ | P |   | p | — | ⊥ |   | — | タ | ミ | 二 | × |   |
| 1 | S <sub>H</sub> | D <sub>1</sub> | !  | 1 | A | Q | a | q | — | ト | 。 | ア | チ | ム | ト | 円 |
| 2 | S <sub>X</sub> | D <sub>2</sub> | "  | 2 | B | R | b | r | — | 十 | 「 | イ | ツ | メ | 十 | 年 |
| 3 | E <sub>X</sub> | D <sub>3</sub> | #  | 3 | C | S | c | s | — | ト | 」 | ウ | テ | モ | コ | 月 |
| 4 | E <sub>T</sub> | D <sub>4</sub> | \$ | 4 | D | T | d | t | — | 、 | 。 | エ | ト | ヤ | ▲ | 日 |
| 5 | E <sub>Q</sub> | N <sub>K</sub> | %  | 5 | E | U | e | u | — | — | ・ | オ | ナ | ユ | ▲ | 時 |
| 6 | A <sub>K</sub> | S <sub>N</sub> | &  | 6 | F | V | f | v | — |   | ヲ | カ | ニ | ヨ | ▲ | 分 |
| 7 | B <sub>L</sub> | E <sub>B</sub> | '  | 7 | G | W | g | w | — |   | ア | キ | ヌ | ラ | ▲ | 秒 |
| 8 | B <sub>S</sub> | C <sub>N</sub> | (  | 8 | H | X | h | x | — | ┌ | イ | ク | ネ | リ | ♣ |   |
| 9 | H <sub>T</sub> | E <sub>M</sub> | )  | 9 | I | Y | i | y | — | └ | ウ | ケ | ノ | ル | ♥ |   |
| A | L <sub>F</sub> | S <sub>B</sub> | *  | : | J | Z | j | z | — | ┌ | エ | コ | ハ | レ | ♦ |   |
| B | H <sub>M</sub> | E <sub>C</sub> | +  | : | K | [ | k | { | — | └ | オ | サ | ヒ | ロ | ♣ |   |
| C | C <sub>L</sub> | →              | ,  | < | L | ¥ | l |   | — | └ | ヤ | シ | フ | ワ | ● |   |
| D | C <sub>R</sub> | ←              | -  | = | M | ] | m | } | — | └ | ユ | ス | ハ | ン | ○ |   |
| E | S <sub>O</sub> | ↑              | .  | > | N | ^ | n | ~ | — | └ | ヨ | セ | ホ | ' | ／ |   |
| F | S <sub>I</sub> | ↓              | /  | ? | O | - | o |   | + | └ | ツ | ソ | マ | ° | ＼ |   |

NOTE:

The code of character "A" is 41 H

## 5.

### **Production Management Information**

The quantity of parts loaded and of parts missed during production are counted for each feeder. At this part of the program, that data (excluding, however, the data on cement and cream solder) can next be displayed on the screen then initialized. To perform output, select "Data Output" of Auxiliary Operations.

Condition: "The count of production management information can be performed for entire range of executable data, but only in the case of continuous execution." In other words, in the case of partial loading or during step execution, the production management information involved will be ignored by the counter. If step execution is performed or execution is cancelled after the above condition has been met, however, the production management information concerned will be counted by the counter.

The menu will initially be set to "Display," but can be switched to "Initial" by pressing the **ESC** key. (The "Display"/"Initial" setting can be alternately switched by pressing the **ESC** key.) When a file number is input in "Display" status, the contents of the selected file are displayed in chart form. When a file number is input in "Initial" status, that file's contents will be initialized.

**(Screen 10-6)**

| File Directory |     |
|----------------|-----|
| 1: PROG 1      | 7:  |
| 2: PROG 2      | 8:  |
| 3: PROG 3      | 9:  |
| 4: MANUAL      | 10: |
| 5:             | 11: |
| 6:             | 12: |

< Display (ESC: Item) )  
Select No. (/: END)

### a) Screen display

By pressing the **[ESC]** key and setting the status to "Display," the quantity of parts picked and of parts missed can be displayed in chart form. After inputting a number to select the desired file, the quantity of parts picked is displayed first. To display the quantity of parts missed, press the **[ESC]** key. (The two charts can be alternately selected by pressing the **[ESC]** key.) To end the "Display" status, press the **[/]** key.

#### (1) Screen for parts picked Screen 10-6-1

File name: MANUAL      Count: 5      <Placement>

|    | F1 | F2 | B1        | B2 | R1     | R2 | L1       | L2       |
|----|----|----|-----------|----|--------|----|----------|----------|
|    |    |    | Stick (S) |    | Linear |    | Tape (6) | Tape (3) |
| 1  |    |    | 100       |    | 50     |    | 50       | 25       |
| 2  |    |    | 100       |    | 50     |    | 50       | 0        |
| 3  |    |    | 100       |    | 0      |    | 0        | 0        |
| 4  |    |    | 100       |    | 0      |    | 0        |          |
| 5  |    |    |           |    | 0      |    | 0        |          |
| 6  |    |    |           |    | 0      |    | 0        |          |
| 7  |    |    |           |    | 0      |    |          |          |
| 8  |    |    |           |    | 0      |    |          |          |
| 9  |    |    |           |    | 0      |    |          |          |
| 10 |    |    |           |    | 0      |    |          |          |

|   | M1   | M2     |
|---|------|--------|
|   | Tray | Magaz. |
| 1 | 20   | 40     |
| 2 |      | 0      |
| 3 |      | 0      |
| 4 |      | 0      |
|   | B3   |        |
|   |      |        |
| 1 |      |        |
| 2 |      |        |

(ESC : Charge, / : END)

#### (2) Screen for number of parts missed Screen 10-6-2

File name: MANUAL      Count: 5      <Vac. Error>

|    | F1 | F2 | B1       | B2 | R1     | R2 | L1       | L2       |
|----|----|----|----------|----|--------|----|----------|----------|
|    |    |    | Stic (S) |    | Linear |    | Tape (6) | Tape (3) |
| 1  |    |    | 0        |    | 1      |    | 0        | 0        |
| 2  |    |    | 0        |    | 0      |    | 0        | 0        |
| 3  |    |    | 2        |    | 0      |    | 0        | 0        |
| 4  |    |    | 0        |    | 0      |    | 1        |          |
| 5  |    |    |          |    | 0      |    | 0        |          |
| 6  |    |    |          |    | 0      |    | 0        |          |
| 7  |    |    |          |    | 0      |    |          |          |
| 8  |    |    |          |    | 0      |    |          |          |
| 9  |    |    |          |    | 0      |    |          |          |
| 10 |    |    |          |    | 0      |    |          |          |

|   | M1   | M2     |
|---|------|--------|
|   | Tray | Magaz. |
| 1 | 1    | 2      |
| 2 |      | 0      |
| 3 |      | 0      |
| 4 |      | 0      |
|   | B3   |        |
|   |      |        |
| 1 |      |        |
| 2 |      |        |

(ESC : Change, / : END)

### b) Initializing files

This job initializes a file that contains production management information. Press the **[ESC]** key to switch the setting to "Initial", then input the number of the file you wish to initialize. The "Sure? (Y/N)" message will appear next, so press "Y" to execute initialization or "N" to cancel it.

### c) Handling the Production Management Information

The production management information is designed to be processed in daily batches. Therefore, after outputting the data once a day, always make sure to initialize the data. Moreover, please note that the maximum count value for each data type is "60,000" and that the counter will return to "1" if this count is exceeded.

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# MISCELLANEOUS

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## Section

# 11

## 1. ---

### POINTER FUNCTION

When you want to call mount data specified at mount data input or production, input "P (No)". The data will be displayed at the top of the screen, starting with the specified number. On the last line, "P\*" will be displayed. If "P" is input, the first line is displayed.

## 2. ---

### DISK FORMATTING

If there are two disk drives, use the following procedure for formatting (Formatting Procedure for Drive 2).

- (1) Confirm that A> is displayed on the screen.
- (2) Insert the new disk that you want to format in Drive B.
- (3) Next, type in FORMAT and press the

A > FORMAT

- (4) The following message appears on the screen.

```
Format Utility Program Ver. 1.0
** Format Mainmenu **
```

```
A. Exit to CP/M.
B. Select disk. Current is B:
C. Format selected disk.
```

```
WARNING - Formatting destroys
any data on the disk.
```

Your selection?

- Use A to return control to the CP/M.
  - B selects the disk upon which the operation will be performed. Drive B is currently indicated.
  - Select C to go ahead with the formatting operation on the indicated disk.
  - "Your selection?" indicates that you should type A, B, or C, whichever you have chosen.
- (5) At this point, type in C.

- (6) The following message is displayed on the screen.

```
Format Utility Program Ver. 1.0  
Formatting PC-80S31/32 drive=B:
```

- A. Exit to the \*\* Format Mainmenu \*\*  
B. Format this disk.

Your selection?

- Use A to return to the main menu.
- Use B to indicate the formatting operation.

- (7) Type in B.  
(8) The following confirmation message appears. Type in Y (Yes). If you type in N (No), the screen returns to the screen in (6).

Your selection? B


Sure (Y/N)?

- (9) When you type in Y, you will hear a clicking sound. The formatting process is beginning, when it ends, the message in (6) is displayed again.  
(10) If you want to format another new disk, substitute the new disk for the already-formatted disk in Drive B, and type in B. The process repeats from (8).  
(11) When the message in (4) is displayed again, to return control to the CP/M type in A.  
(12) The system will wait for CP/M commands, and the prompt A > will be displayed.

### **3. SYSTEM AND DATA DISK BACKUP**

If there are two drive units, use the following procedure:


First, insert the CP/M system disk in Drive A, and press RESET.

- (1) Check that "A>" is displayed on the screen (this is called the "prompt A>").  
Right behind the prompt A>, type in "BACKUP" and press the  key.

```
A>BACKUP 
```


- (3) The following message appears on the screen:

```
Please mount SOURCE disk on drive A:  
hit RETURN if you are ready.
```

- (4) At this point, insert the disk that you want to copy (the source disk) in Drive A, and press the  key.  
(For a CP/M backup, the source disk is the CP/M master disk, so it doesn't matter if you don't insert a floppy disk at this point.)


- (5) The following message is displayed:

```
Please mount DESTINATION disk on Drive B:  
hit RETURN if you are ready.
```

- (6) Insert a formatted disk in Drive B, and press the  key.  
(7) There will be a clicking sound, and the disk copying operation begins. At this time, whenever one track is finished, a dot is displayed. The dots line up next to each other as tracks are copied.

- (8) When the copying operation is finished, the following message is displayed:  
Complete.

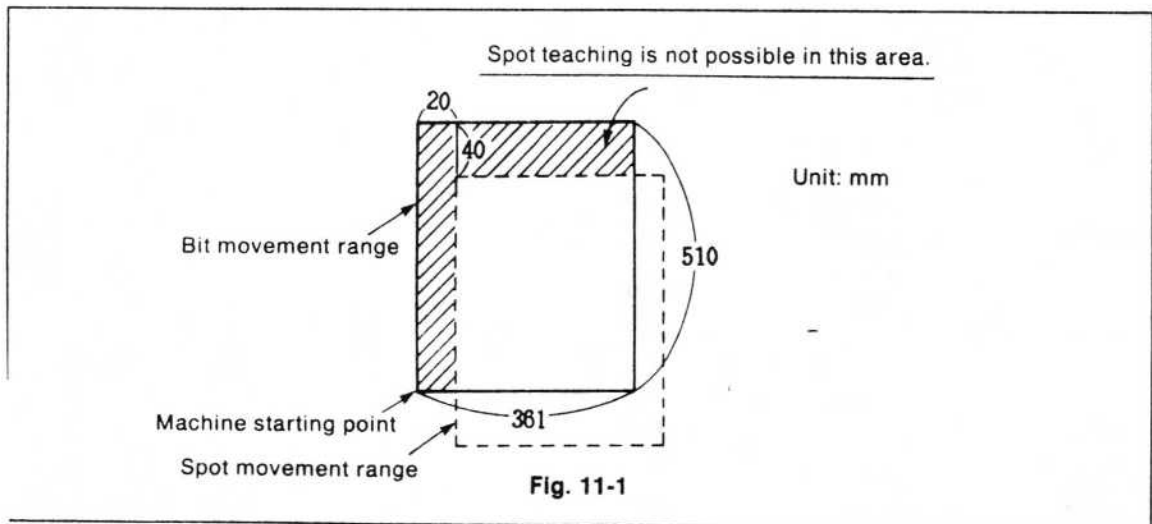
Hit RETURN to do it again, hit ^ C to return to CP/M.

- (9) If you want to copy onto one more disk, press the  key.  
The screen returns to step 3, and you can repeat the procedure beginning with step 4.  
If you are finished copying, press **CTRL** C.
- (10) When **CTRL** C is pressed, control returns to the CP/M. The system is waiting for CP/M commands to be input and the prompt A> is displayed.

## **4. \_\_\_\_\_**

### **OPERATION INDICATIONS AND PRECAUTIONS**

- (1) When the number of stored files reaches 12, the message "DISK full!" will be displayed at the top of the Unit Data, Mount Data, and Production Screens. To create and save new data, data must be erased under auxiliary operations, or a new data disk substituted and the reset button pressed, or, if you want to reference data and start production, press CR (Carriage Return) to go ahead with normal operation, with no changes.
- (2) If you tried to save data in Mount Data Input but there is ineffective data, that line number is displayed once, up to 8 digits. Correct the data on the relevant line number and store it again.
- (3) When spot teaching, discrepancies may appear as shown in the illustration when compared with bit teaching, and there are occasions when spot teaching of feeder coordinates becomes impossible (especially for the values of L1, L2, B1, B2, and B3). In these cases, please use bit teaching. (Refer to Fig. 11-1).



- (4) If changes were made in parts data input through auxiliary operations, the changes are not automatically made in the parts data input section of "Unit Dta Input" after drawing up th data is completed. Therefore, it is necessary to ~~make~~ make the changes once again in this seciton.

- (5) At Unit Data Input and Mount Data Input, teaching is possible via bit and spot, but not via dispenser head. At production, if mounting was done in Production mode, teaching via bit and spot is possible, and if soldering was done, teaching via dispenser head is possible. However, teaching is not possible in Cement mode.
- (6) Regarding the display of data by this system, in case any data has been set to a value outside of its permissible range, the data concerned will either be ignored or not displayed.
- (7) After inserting another disk during the operation of this system, always make sure to press the Reset switch at the bottom left of the computer to reboot the system. If you insert another disk then attempt to write data to it without first having reset the system, the Operating System will display an error message (Bdos error on A(B:)) and program execution will stop.  
If this happens, press the Reset switch to reboot the system, then repeat the writing operation once more.
- (8) When reading or saving a data file, numbers and characters other than 1 – 12 (01, 001, etc. are treated the same as 1) are handled as names if specified as file numbers. (However, effective file names may consist of up to 8 alphabetic characters only.)  
If 12 files have already been stored, be careful with name or number designation, since only the numbers 1-12 are effective file names when reading out and writing into files.
- (9) There may be cases where pressing DEL on the personal computer (PC-8801 FH) which controls the KP-350 causes the display to disappear. This does not affect operation.



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