Instructions for use

1) Set a cassette ribbon when you use ordinary typing paper for printing with this machine, but you do not need it when you use thermal paper for printing. Insert a sheet of paper only, whether ordinary typing paper or thermal paper.

2) No carbon copy can be taken from this machine.

Important

** Thermal paper can be used on one side only. Therefore, please be sure to print only on the side of the paper in this package that faces this card.

Precautions concerning handling of thermal paper

Although this paper appears to be ordinary typing paper, it is a special paper on which the color develops through a thermal/chemical reaction. The following precautions must be taken in handling this paper.

1. Storage
   a) Since this paper is very sensitive to heat, dampness and light, it should be stored in a dry, cool place.
   b) Particularly, it should not be placed near a stove, a tightly closed space, or an area exposed to sunlight. (For example, an automobile's trunk or a window ledge.)
   c) After the package is opened, it should be used as soon as possible, and the package should be resealed tightly.

2. Handling and Use
   a) If you touch the paper, your finger prints may be imprinted on the paper, and the printing itself may be weakened or faded.
   b) Rubbing the paper with a hard object may damage the paper.
   c) If such things as oil come in contact with the paper, the paper may color, or the printed copy may begin to fade.
   d) Do not expose the paper to direct sunlight, as this tends to turn the paper yellow.

Made in Japan
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Made in Japan
DEAR CUSTOMER:
PLEASE KEEP THIS ORDER FORM TO BE USED WHEN ORDERING
INTERFACE CABLES, CASSETTE RIBBON AND PAPER IN THE FUTURE.
PLEASE ENCLOSE CHECK OR MONEY ORDER.
ALL PRICES INCLUDE SHIPPING AND HANDLING CHARGES.

<table>
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<tr>
<th>PRINTER MODEL</th>
<th>MODEL</th>
<th>PRICE</th>
<th>QTY.</th>
<th>TOTAL</th>
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<td>9.95</td>
<td></td>
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</tr>
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</table>

SUB TOTAL
NEW JERSEY AND CALIFORNIA RESIDENTS ADD APPLICABLE SALES TAX

TOTAL

BROTHER INTERNATIONAL CORP.
TYPEWRITER DIVISION
P. O. BOX 159
PISOATAWAY, NJ 08854

NAME_____________________
ADDRESS___________________
CITY, STATE, ZIP___________

597520-0.81 (58-10) PRINTED IN JAPAN
IMPORTANT NOTICE! - When this starter supply of typing paper has been exhausted, please use paper that is similar in smoothness and thickness to the starter supply, such as copy machine paper. Should you have difficulty in locating quality paper, please order by using the paper order form packed with your machine.

597520088
printed in Japan
NOTE

"This equipment generates and uses radio frequency energy and if not installed and used properly, that is, in strict accordance with the manufacturer's instructions, may cause interference to radio and television reception. It has been type tested and found to comply with the limits for a Class B computing device in accordance with the specifications in Subpart J of Part 15 of FCC Rules, which are designed to provide reasonable protection against such interference in a residential installation. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- reorient the receiving antenna
- relocate the computer with respect to the receiver
- move the computer away from the receiver
- plug the computer into a different outlet so that computer and receiver are on different branch circuits.

If necessary, the user should consult the dealer or an experienced radio/television technician for additional suggestions. The user may find the following booklet prepared by the Federal Communications Commission helpful:

"How to Identify and Resolve Radio-TV Interference Problems". This booklet is available from the US Government Printing Office, Washington, D.C., 20402, Stock No. 004-000-00345-4."

Caring for your new printer

1) Do not clean the printer and keys with alcohol, thinner or other organic agents. They can cause corrosion. Simply wipe off the dust from time to time with a soft dry cloth.

2) Do not let paper clips or other metal items fall into the printer. They can cause a major breakdown.

3) Do not use the machine or leave the cassette ribbon in a place exposed to direct sunlight, heat, excessive dust, moisture, rain, or mechanical shock.

4) Replace the lid cover when the printer is not in use.
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SPECIFICATIONS

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<thead>
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<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>No. of keys</td>
<td>44</td>
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<tr>
<td>Printing speed</td>
<td>17 chrs/sec.</td>
</tr>
<tr>
<td>Paper capacity</td>
<td>Within 8 3/4&quot;</td>
</tr>
<tr>
<td>Printing capacity</td>
<td>Within 7 1/2&quot;</td>
</tr>
<tr>
<td>No. of characters per line</td>
<td>75</td>
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<tr>
<td>Printing method</td>
<td>5 x 7 Thermal dot matrix</td>
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<tr>
<td>Ribbon</td>
<td>One-time heat transfer black carbon</td>
</tr>
<tr>
<td>Display</td>
<td>16-digit liquid crystal display</td>
</tr>
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<tr>
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</tr>
<tr>
<td>Power sources</td>
<td>Four batteries, IEC designation R20 (Manganese) or LR20 (Alkaline Manganese)</td>
</tr>
<tr>
<td></td>
<td>AC power adaptor</td>
</tr>
<tr>
<td>Dimensions</td>
<td>12 1/2&quot; (width)</td>
</tr>
<tr>
<td></td>
<td>1 3/4&quot; (height)</td>
</tr>
<tr>
<td></td>
<td>8 3/4&quot; (depth)</td>
</tr>
<tr>
<td>Weight</td>
<td>5.3 lbs. (including batteries)</td>
</tr>
</tbody>
</table>
**Battery installation**

1. Press the notches and remove the battery compartment lid (rear).

2. Insert four "D" cell batteries, IEC designation R20 (Manganese) or LR20 (Alkaline Manganese), with correct polarity as indicated inside.

3. Replace the lid.
   - If the batteries become weak while in operation, the message "WEAK BATTERIES" will appear on the display when the return key is depressed.
   - Replace all the batteries with new ones.
   - Remove the batteries to avoid the damage caused by battery leakage or corrosion when the unit is not used for a long period of time, or is operated with AC adaptor for a long time.

**AC power adaptor**

- Connect the AC power adaptor with the units.
- The internal batteries will be automatically disconnected.
- Disconnect the AC power adaptor from the wall outlet when the unit is not in use for an extended period of time.
**SLIDE SWITCHES**

**Line space setting**

Use the line space selector to set the desired space between lines. There are three settings:

1: For single-spacing typing
1 1/2: For 1 1/2 space between lines
2: For double-spacing typing

**Print/Cal mode setting**

Use the Print/Cal mode selector to set the desired mode. There are three settings:

NP: Non Print mode
CP: Correction Print mode
DP: Direct Print mode

NP: Four basic calculator function are possible.

**Normal/Store/Printer mode setting**

Use the Normal/Store/Printer mode selector as follows:

Normal: For normal printing
Store: For storing the typed content and printing the text stored in the memory.
Printer: For use as a terminal printer
**PRINT/CAL MODE SETTING**

### NP (NON PRINT)

In this position characters will be displayed without actual printing on paper. Four basic calculations without printing are possible.

* When switching over from NP mode to CP mode, the characters beyond the right margin start flashing (overflow). These characters can not be printed on the same line. The operation at this time is the same as when an overflow occurred at CALCULATE mode. (See page 19)

### CP (CORRECTION PRINT)

In this position printing is made automatically after going through 16 characters display. Namely, first character is printed out after 17th character is keyed-in (including space). Character correction can be made on display by using cursor keys, insert key and delete key, but not possible after print out. Four basic calculations with printing are possible.

This allows you to see what is about to be typed and correct it if necessary before actually putting it on paper. To correct on the display, please refer to "Display/Correction" on the following page.

### DP (DIRECT PRINT)

In this position printing is immediately made after a key is depressed. No calculation is possible. Margin and tabulation are set easily in this position.
## Display

A maximum 16 characters appear on the display at any mode position (NP, CP, DP). Cursor does not appear at DP mode.

Cursor does not appear while characters are being input at NP or CP mode. But cursor appears at the extreme right-hand side of the display when the cursor left key (↓) is depressed, and moves to left by each depression.

## Display adjuster

This knob adjusts the angle and density of the display. Turn the knob clockwise for strong and dark character appearance or counterclockwise for light character appearance to suit your eyes.

## Correction

1. Cursor moves to left by each depression of the cursor left key. *(Cursor moves if the cursor left key is kept depressed.)*
2. Depress a correct character.
3. Cursor moves to right by each depression of the cursor right key. After the correction, cursor must be returned to extreme right side of display so that cursor will disappear. *(Cursor moves continuously if the cursor right key kept depressed.)*
Delete

i) Using cursor keys
(1) Press the cursor and move to the character to be deleted.
(2) Depress the delete key.
(3) After deletion, always move the cursor to the extreme right side of display so that cursor will disappear.
   * If you want to delete next character too, depress the delete key again, or if you want to delete all the characters after the cursor, just keep the delete key depressed.
   * If you want to delete the characters before the cursor, press the backspace key.

ii) Using backspace key
Press the backspace key to delete characters one by one from the extreme right side of display.

iii) How to delete all characters on display
Depress the clear key to delete all of the characters on the display.
   * At CP mode, the characters on the display are printed, and disappear from the display.
(1) Move the cursor to the position at which a character is to be inserted by depressing the cursor left key.

(2) When the insert key is depressed, character on the cursor starts flashing.

(3) Depress the character. The character is inserted on the left-hand side of cursor.

(4) After insertion, move the cursor to the extreme right side of display so that the cursor will disappear.

- Any number of characters can be inserted consecutively unless characters go beyond the margin.
- When 16 characters appear on the display, no character can be inserted at the extreme left side of display.
- When the insert key is depressed again, flashing stops, and the INSERT mode is cleared.
Push the power switch to the ON position.

* The printer has auto power off function. If the printer is kept about 10 minutes after the last key-in with power switch at ON position, the power will be automatically shut off to save battery consumption. You can resume the power by the stop key.

Turning the power switch ON—OFF—ON for the first time in the auto power off state assumes resetting from the auto power off just the same as when the stop key is depressed.

(1) Insert paper in space behind the platen.
* Only one sheet of paper can be used because no carbon copy is attainable.

(2) Depress the index key and hold it down until the paper appears.

Note: Typing paper selection
Most types of SMOOTH FINISH TYING PAPER are acceptable for use with your printer. The type of paper that works best with your machine is copy machine paper, duplicator paper, off set paper or paper similar in texture and thickness to the paper that is packed with your printer. Rough type paper such as expensive “rag-content” paper is not recommended. If you use thermal typing paper, you can type without using the cassette ribbon.
(3) Lift up the transparent paper bail cover with both thumbs.

(4) Place top edge of paper under paper bail cover. Close the paper bail cover.

(5) Pull the paper release lever toward you.
(6) Should the paper fail to be positioned properly, adjust as desired.

(7) Return the paper release lever to its original position.

* To retract the paper, use the reverse index key.

* Do not pull out the paper from the printer by hand but use only index or reverse index key.
Margin setting

(1) Set the mode selector at DP position.

(2) Use space bar or backspace key to move the cassette carrier to the desired left-hand margin position.

(3) Press the left margin set key.

(4) Move the carrier to the right by using space bar.

(5) Press the right margin set key at the desired position.

- Should the margin be set second time, the previous setting is automatically cancelled.
- Use the margin release key to set margins beyond the previously set margins.
Tab set and clear

(1) Set the mode selector at DP position.
(2) To set a tab stop, space to the desired position and press the tab set key.

(3) To clear tab, press the tab clear key at the position where the cassette carrier stopped.
To clear all tab stops, press the tab clear key and then repeat key. (All tab stops are thus cleared, no matter where the carrier happens to be.)

Tabulator

Set the tab stops first. Press tab key. The carrier will move to the right to the next tab stop. If the key is kept depressed, the carrier will move to the next tab stop points continuously.
* At CP mode if there are letters on display, the carrier will move to the next tab stop after printing them out.
HOW TO TYPE EFFICIENTLY

Shift key

1) To type capitals, use shift key.
2) To type capitals consecutively, depress shift lock (LED shift lamp beside will light).
3) Release by depressing either right or left shift key.

The character positions align with the red line.

Printing head

Second shift key

Keep the 2nd shift key depressed and press the keys so that special letters, accents and signs on the panel are printed.

Accents (‘’, ’’, ’’, ”) work only with following letters and accents should always be keyed-in before letter.

- — AEIOU aeiou
-
- — AON aon

When printing, using a cassette ribbon, the last two characters printed are behind the cassette ribbon.
**Space bar**

Depress once for a space or hold down for repeat spacing (release to stop).

**Repeat key**

Depress and hold the repeat key so that the last character or function (space bar, backspace, etc) you pressed will repeat. (excluding arithmetical keys.) Also, the following keys will repeat themselves if kept depressed.

* Space bar, Backspace key, Index key, Reverse index key, Cursor left key, Cursor right key, Delete key, Tab key, Return key.

**Margin release**

Use margin release key to extend a line beyond set margin. Extension may be to right or left.

* The warning "beep" sounds six spaces before the end of right margin. The warning "beep" sounded at other times is a sign of cancellation. Make a correct operation in such cases.
Return key

Press the return key to return the carrier to left-hand margin and advance paper one line.
• Key input is also possible during return.
• At CP mode if there are letters on display, the carrier will return after printing them out.

Backspace key

(1) At CP mode, letters on display will be erased one by one from the right by each depression of the key.
To move carrier backward, press code and backspace key together.
(2) At DP mode, backspacing is possible by depressing only backspace key.

How to move carrier

(1) At CP mode, press code key and space bar together to move the carrier to right.
(2) At DP mode, the carrier can be moved by depressing only the space bar.
By depressing the reverse index key (↑) or index key (↓), the paper can be advanced or returned by 1/2 line, independent of the set line feed length.

An example where this function is used is shown below.

(1) \(10^{14}\)

(2) \(H_2O\)

(1) At CP mode
When the reverse index key (↑) or index key (↓) is depressed together with the code key, the font ! or ! appears on the display. When the font thus displayed exceeds the display, the paper is advanced or returned to allow printing which is shown in the example to be made.

(2) At DP mode
The paper is advanced or returned as soon as the reverse index key (↑) or index key (↓) is depressed, to allow printing which is shown in the example to be made.
* During memory typing, to be described later, the code key must be used at the same time for memorizing.

(3) At NP mode
The function as shown in the example is not available for ordinary typing.
* During memory typing, to be described later, memorizing is possible by using the code key at the same time.
### CALCULATION FUNCTION

Maximum digits for calculation including calculated results are 12.

<table>
<thead>
<tr>
<th>Arithmetical keys</th>
<th>Clear key</th>
<th>Error sign “E”</th>
</tr>
</thead>
</table>

1. **Arithmetical keys**

   - Set the Normal/Store/Printer selector at Normal.
   - Set the Print/Cal mode selector at NP for non-printing calculation or at CP for printing calculation.

2. **Keys for calculation are:**
   - 0 - 9 numerals
   - (decimal point)
   - + - = ... out of normal 44 keys.
   - use only separate arithmetical keys.

3. **Clear key**

   - Clear the internal memory and display using the clear key before making a new calculation.
   - At NP mode, just clear the display. But at CP mode, numbers on display will be automatically printed out and clear the display.
   - Therefore, if an incorrect number is depressed, correct it using the backspace key, cursor key, insert or delete keys.

4. **Error sign “E”**

   - The display indicates “E” sign (error)
   - 1) When more than 13 digits are keyed-in.
   - 2) When the calculated result exceeds 12 digits.
   - 3) When divided by 0 in division calculation.
When numbers on display flash at CP mode

If calculated result overflows past the right margin stop, overflow numbers will start flashing. In this case, the overflow numbers cannot be printed on the same line.

(A) When flashing numbers are not necessary
Depress the cursor left key to move the cursor to the extreme left number which is flashing, and hold down the delete key.
Or erase flashing numbers by using the backspace key.

(B) When printing flashing numbers on next line
Depress the return key while numbers are flashing. The flashing numbers are printed on the next line.

(C) When printing all numbers on next line
Erase all numbers and equal sign on the display by using the cursor key and the delete key or the backspace key, and depress the return key. Then depress the equal key so that calculated result will be resumed on display, and printed out on the next line.

(D) When printing numbers beyond right margin
Depress the margin release key so that flashing will stop.
Depress the return key so that numbers will be printed beyond the right margin.
Calculation example

(A) Addition & Subtraction
\[-1 + 5 - 2 = 2\]

(B) Multiplication & Division
\[12.3 \times 456 \times (-7.89) \div 5.4 = -8195.08\]

(C) Mixed Calculation
\[2 \times (3 + 4) = 14\]

* This printer always calculates from the beginning, and disregards parentheses or other letters and symbols from the calculation. Namely, in this case, calculation is made:
  \[2 \times 3 = 6\] then \[6 + 4 = 10\]

* Therefore, to get the correct result, calculation should be made in this manner: \[(3 + 4) \times 2 = 14\]
D) Inserting letters, etc. into result

@ $100 x 50 pcs = $5000 — $5000

You can print and calculate as follows by correcting the calculated result on the display before printing out.

E) Rough estimation

4.56 / 1.23 = 3.70731707317 — 3.71

You can print and calculate as follows by correcting the calculated result on the display before printing out.

* The round-off numbers can be inserted after erasing low-order digits which are unnecessary by using the backspace key.

When not printing calculation process

PEANUTS 123 + 456 → PEANUTS 579 pcs

CP mode

NP mode

PEANUTS

123 + 456

= 579

CP mode

579

579 pcs

* This function is convenient when printing by inserting only calculation results between letters.
Cautions on calculation function

1. Clear the internal memory using the clear key before making a new calculation, because when there is no number before the arithmetical symbol, the last number which was previously input into the internal memory is regarded as a number.

   No. 123 ABC 567Kg
   DEFHIJ x A50PCS = 28'350  567 x 50

2. When there is no arithmetical symbol between equal keys, the result of the calculation last time is output again.

   123 x 456 = 56088  ABCD
   ABC 123 CDE = 56088

3. When arithmetical symbols were used consecutively, priority is given to the function of the first arithmetical symbol.

   123 x ÷ + − 22 = 2706  123 x 22

4. The arrangement (numeral) (operator) is handled in the same manner as for the arrangement (numeral) (operator) (numeral).

   123 x = 15129  123 x 123
   123 + 456 x = 335241  (= [ 123 + 456 ] x [ 123 + 456 ])

5. Tab, space, letter, "", etc. distinguish numerals.
   For example, in the case of alphanumeric codes with tab, the letter of the two which are divided by the tab is given priority for operation.

   No. 20 ABC$S50000 x 60PCS = 300000  . . . 50000 x 60
   ↑  ↑
   Ignored  Given priority
## MEMORY TYPING

### Function keys

<table>
<thead>
<tr>
<th>Code</th>
<th>Function</th>
</tr>
</thead>
<tbody>
<tr>
<td>CODE + N (NEW)</td>
<td>Memory typing start (Stored text will be erased).</td>
</tr>
<tr>
<td>CODE + A (APPEND)</td>
<td>Addition of text to memory</td>
</tr>
<tr>
<td>CODE + S (STOP)</td>
<td>Insertion of stop code during memory typing</td>
</tr>
<tr>
<td>CODE + B (BACK)</td>
<td>Deletion of last line of text during memory typing</td>
</tr>
<tr>
<td>CODE + P (PRINT)</td>
<td>Printing of memory content from beginning</td>
</tr>
<tr>
<td>CODE + D (DELETE)</td>
<td>Deletion of memory text thereafter while printing is stopped</td>
</tr>
<tr>
<td>CODE + R (REMAIN)</td>
<td>Display of remaining quantity of memory on screen</td>
</tr>
<tr>
<td>STOP</td>
<td>Memory typing end</td>
</tr>
<tr>
<td></td>
<td>Stopping printing from memory</td>
</tr>
<tr>
<td>CONT</td>
<td>Continuing printing from memory</td>
</tr>
</tbody>
</table>
The capacity of the memory is 2,015 characters including the page format.

Preface

(1) When the Normal/Store/Printer selector is set at Store position, the memory typing function becomes available.

* In this case, operate the code key and the (A) key together, or the code key and the (N) key together at first, or the mode remains the same as ordinary typing, at which time no storing is made.

(2) At NP, CP or DP mode, functions are the same as at ordinary typing. But the four basic calculations are impossible at memory typing.

(3) When the selector is at NP, no printing is made. But when the typed character reaches the right margin, the beep sounds.
Making a new text

1. Set the mode selector at Store.
2. Make a selection using the Print/Cal mode selector.
3. Depress the code key and the (N) key together at the same time.
4. Press (Y) key to execute, or any other key to cancel.

* When the (Y) key is depressed, all the text which has been previously stored in the memory will be erased.
(5) Type the text.
* It is also possible to change the margin and tab set during typing.

NOTE: 1) Tabs and margins stored in the memory will override tabs and margins set for normal typing.
2) After memory typing, you must reset margins and tabs.

(6) Depress the STOP/ON key when typing is over.

(7) The message above is displayed, signing that the text has been stored in memory.
* Make sure to depress the STOP/ON key whenever you finish memory typing.
Making an addition to previous text

1. Set the mode selector at Store.
2. Make a selection using the Print/Cal mode selector.
3. Depress the code key and the (A) key together.
4. The last 16 characters of the text which is stored in the memory are displayed.
   * When nothing is stored in the memory, "# NEW TEXT?" will be displayed.
   * Press (Y) key to execute memory typing or other keys to cancel.
(5) Make an addition to the text.
   * It is also possible to change the margin and tab while making an addition.

(6) Depress the STOP/ON key after making an addition.

(7) The message above is displayed, signing that the text has been stored in memory.
   * Make sure to depress the STOP/ON key whenever you finish memory typing.
Stop code

(1) Depress the code key and the (S) key together during memory typing.
   * Refer to Application (1), page 35.

(2) At NP or CP mode, the stop code $S$ is displayed on the display. At DP mode, it is not displayed, but stored in the memory.
   * The stop code is not printed.

(3) Continue memory typing.
Deletion of last line

1) When deleting the last line during memory storage,
(ex)

2) depress the code key and the (B) key together.

3) The last line is deleted, and the last 16 characters of the preceding line appears on the display. One or more lines can be deleted by using this function continuously.
HOW TO PRINT OUT TEXT MEMORY

Automatic printing from memory

(1) Make a setting using the Print/Cal mode selector according to the table below.

<Display and Print Out>

<table>
<thead>
<tr>
<th>Display</th>
<th>Printout</th>
</tr>
</thead>
<tbody>
<tr>
<td>NP</td>
<td>yes</td>
</tr>
<tr>
<td>CP</td>
<td>no</td>
</tr>
<tr>
<td>DP</td>
<td>no</td>
</tr>
</tbody>
</table>

(2) Depress the code key and the (P) key together.

* The beep sounds when there is nothing stored in the memory.

(3) Printing is started in the selected mode when the (Y) key is depressed. When a key other than the (Y) key is depressed, print mode will be cancelled.
Stop and continuation of printing from memory

(1) Printing stops when the STOP/ON key is depressed.
* Printing stops at the end of each line.

* Printing stops also when a stop code (page 29) is in the text.

(2) To resume memory printout, depress the CONT key.
* One-line printing is possible by depressing the CONT key and the STOP/ON key in succession.
Text delete

(1) With printing being stopped by using the STOP key with the stop code, depress the code key and the (D) key together. When deleting all the text, depress the code key and the (H) key together (p25).

(2) If the (Y) key is depressed, subsequent memory will be cleared. No deletion is made when a key other than the (Y) key is depressed.
(1) Depress the code key and the (R) key together.

(2) The number of remaining characters in the memory is displayed while the key is held down.

(3) The display returns to the previous position when the key is released.
Examples of application

(1) Printout with insertion to the stored text

Mr. and Mrs. Ray Gebbs
request the pleasure of the company
of $f$

for cocktails
on Friday, the eleventh of November
at half past seven o'clock

The Grand Hotel  R.S.V.P.
New York, New York
389-8752

(1) Store a text after depressing the code key and the (N) key together.

(2) When storing in the memory, insert a stop code as above portion.

(3) Complete memory typing by depressing the STOP/ON key.

(4) Set the Print/Cal mode selector at CP or DP, and print text by depressing the code key and the (P) key together then the (Y) key.
Mr. and Mrs. Ray Gebbs
request the pleasure of the company of
Mr. and Mrs. Reingrod

Mr. and Mrs. Ray Gebbs
request the pleasure of the company of

Mr. and Mrs. Reingrod

for cocktails
on Friday, the eleventh of November
at half past seven o'clock

The Grand Hotel
New York, New York

R.S.U.P.
389-8752

(5) When printing stops, type in the desired text.
* This text is not stored in the memory.

(6) When the insertion is over, depress the CONT key to print
Example of application

(2) Not printing middle of text stored in memory, but printing parts before and after middle of text continually.

<table>
<thead>
<tr>
<th>Year</th>
<th>Men Employes</th>
<th>Percent</th>
<th>Woman Employes</th>
<th>Percent</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>1976</td>
<td>32</td>
<td>40.1%</td>
<td>48</td>
<td>60.9%</td>
<td>80</td>
</tr>
<tr>
<td>1977</td>
<td>35</td>
<td>38.8%</td>
<td>55</td>
<td>61.2%</td>
<td>90</td>
</tr>
<tr>
<td>1978</td>
<td>40</td>
<td>38.1%</td>
<td>65</td>
<td>61.9%</td>
<td>105</td>
</tr>
<tr>
<td>1979</td>
<td>45</td>
<td>35.0%</td>
<td>69</td>
<td>65.0%</td>
<td>114</td>
</tr>
<tr>
<td>1980</td>
<td>42</td>
<td>36.1%</td>
<td>60</td>
<td>63.9%</td>
<td>102</td>
</tr>
</tbody>
</table>

(1) Store a text after depressing the code key and the (N) key together.

(2) Complete memory typing by depressing the STOP/ON key.

(3) Print text by depressing the code key and (P) key together, then the (Y) key. (Set Print/Cal mode selector at CP or DP.)

(4) Stop printing by depressing the STOP/ON key before the line which you do not want to print.
5) **Switch the Print/Cal mode selector to NP.**
Printout undesirable parts in NP mode.

- Printing at NP mode only appears on the display.

(6) **Depress the stop key while reviewing display before the lines you wish to print.**

Return the Print/Cal mode selector to CP or DP, and print the remaining memory by depressing the **CONT** key.
Example of application  (3) Erasing last line of text from memory

<table>
<thead>
<tr>
<th>Mr.</th>
<th>Mister</th>
</tr>
</thead>
<tbody>
<tr>
<td>Messrs.</td>
<td>Messieurs</td>
</tr>
<tr>
<td>Mrs.</td>
<td>Mistress</td>
</tr>
<tr>
<td>Dr.</td>
<td>Doctor</td>
</tr>
<tr>
<td>Prof.</td>
<td>Professor</td>
</tr>
<tr>
<td>a.</td>
<td>quality</td>
</tr>
<tr>
<td>qt. or qty.</td>
<td>quantity</td>
</tr>
<tr>
<td>E.</td>
<td>East</td>
</tr>
<tr>
<td>S.</td>
<td>South</td>
</tr>
<tr>
<td>W.</td>
<td>West</td>
</tr>
<tr>
<td>N.</td>
<td>North</td>
</tr>
<tr>
<td>S.E.</td>
<td>Southeast</td>
</tr>
<tr>
<td>S.W.</td>
<td>Southwest</td>
</tr>
<tr>
<td>N.E.</td>
<td>Northeast</td>
</tr>
</tbody>
</table>

(1) Strove a text after depressing the code key and the (N) key together.

(2) Stop memory typing by depressing the [(STOP)ON] key.

(3) If a beep sounds when pressing the code and (B) keys, it is a signal that you have stopped memory typing. Press code and (A) keys together. Last line of the text is displayed.
<table>
<thead>
<tr>
<th>Mr.</th>
<th>Mister</th>
</tr>
</thead>
<tbody>
<tr>
<td>Messrs.</td>
<td>Messieurs</td>
</tr>
<tr>
<td>Mrs.</td>
<td>Mistress</td>
</tr>
<tr>
<td>Dr.</td>
<td>Doctor</td>
</tr>
<tr>
<td>Prof.</td>
<td>Professor</td>
</tr>
<tr>
<td>et al. or et al.</td>
<td>quality</td>
</tr>
<tr>
<td>E.</td>
<td>East</td>
</tr>
<tr>
<td>S.</td>
<td>South</td>
</tr>
<tr>
<td>W.</td>
<td>West</td>
</tr>
<tr>
<td>N.</td>
<td>North</td>
</tr>
<tr>
<td>S.E.</td>
<td>Southeast</td>
</tr>
<tr>
<td>S.W.</td>
<td>Southwest</td>
</tr>
<tr>
<td>N.E.</td>
<td>Northeast</td>
</tr>
</tbody>
</table>

When the code key and the (B) key are depressed together, the last line is deleted from the memory, and the new last line appears on the display.

(5) Repeat the procedure described in (4) for the number of lines to be erased.

(6) Depress the STOP/ON key after deletion.
* When it is desired to continue memory typing after deletion, continue typing without making the operation described in (6).
Dismounting & Remounting of connector cover

1) Remove the connector cover as shown above.
2) Replace cover in the reverse manner from which you removed it.

Storage in lid case

Store the dismounted connector cover in the lid case.
(See above diagram)
(1) When the Normal/Store/Printer selector is set at Printer, R/O printing is possible. The auto power off function, which is available at Normal or Store mode, is not available in the printer mode.

(2) When the mode selector is set at Printer, the pattern which is shown above appears on display.

"300B" is transfer rate of 300 baud (300 bit/sec).
The CONT key, which is described later, must be depressed before printing to assume the on line state.

* To select 75 baud, push the return key.

In the case of printer mode, there is no difference between NP, CP and DP designation.
Key operation

(1) CONT
The on-line (connected with the computer) state is assumed when this key is depressed.
In this state, depression of keys other than the STOP key is ineffective.

The above pattern appears on the display during the on-line operation.

(2) STOP
"OFF LINE 300 B." (disconnected from the computer) is displayed when the key is depressed.
In this state, the depression of the CONT key and of the following keys (3) – (5) are effective.
(3) ↑ , ↓ (paper feed).
Paper is advanced and retracted when these keys are depressed.

(4) C (buffer clear)
The data which is stored in the printing buffer is cleared when this key is depressed.
Even if the STOP key is depressed to assume the off line state during printing, the data remains in the printing buffer. Therefore, the remaining data is printed out when the CONT key is depressed, even if the host (computer) was turned off.
If this is not desirable, depress the clear key for buffer clear to stop printing of the undesired content.

(5) Carrier return
The transfer rate is switched between 300 baud and 75 baud using this key.
### Data code table ... ASCII code and expanded code

<table>
<thead>
<tr>
<th>$b_8$</th>
<th>$b_7$</th>
<th>$b_6$</th>
<th>$b_5$</th>
<th>$b_4$, $b_3$, $b_2$, $b_1$</th>
<th>0</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
<th>8</th>
<th>9</th>
<th>A</th>
</tr>
</thead>
<tbody>
<tr>
<td>0 0 0 0</td>
<td>0 0 0 0</td>
<td>0 0 0 0</td>
<td>0 0 0 1 1 1 1 0 0 0 0 1 1 1</td>
<td>SP</td>
<td>0</td>
<td>P</td>
<td>@</td>
<td>p</td>
<td>Ç</td>
<td>É</td>
<td>á</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>0 0 0 1</td>
<td>1 1 1 1</td>
<td>1 1 1 1</td>
<td>0 0 0 1 1 1 1 0 0 0 0 1 1 1</td>
<td>!</td>
<td>1</td>
<td>A</td>
<td>Q</td>
<td>q</td>
<td>æ</td>
<td>ë</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>0 0 1 0</td>
<td>0 0 0 0</td>
<td>0 0 0 0</td>
<td>0 0 0 1 1 1 1 0 0 0 0 1 1 1</td>
<td>&quot;</td>
<td>2</td>
<td>B</td>
<td>R</td>
<td>r</td>
<td>é</td>
<td>Æ</td>
<td>Ñ</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>0 0 1 1</td>
<td>0 0 0 0</td>
<td>0 0 0 0</td>
<td>0 0 0 1 1 1 1 0 0 0 0 1 1 1</td>
<td>#</td>
<td>3</td>
<td>C</td>
<td>S</td>
<td>s</td>
<td>à</td>
<td>ò</td>
<td>Ú</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>0 1 0 0</td>
<td>0 0 0 0</td>
<td>0 0 0 0</td>
<td>0 0 0 1 1 1 1 0 0 0 0 1 1 1</td>
<td>$</td>
<td>4</td>
<td>D</td>
<td>T</td>
<td>t</td>
<td>ã</td>
<td>ó</td>
<td>Ñ</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>0 1 0 1</td>
<td>0 0 0 0</td>
<td>0 0 0 0</td>
<td>0 0 0 1 1 1 1 0 0 0 0 1 1 1</td>
<td>%</td>
<td>5</td>
<td>E</td>
<td>U</td>
<td>u</td>
<td>à</td>
<td>ò</td>
<td>Ñ</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>0 1 1 0</td>
<td>0 0 0 0</td>
<td>0 0 0 0</td>
<td>0 0 0 1 1 1 1 0 0 0 0 1 1 1</td>
<td>&amp;</td>
<td>6</td>
<td>F</td>
<td>V</td>
<td>v</td>
<td>â</td>
<td>û</td>
<td>a</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>0 1 1 1</td>
<td>0 0 0 0</td>
<td>0 0 0 0</td>
<td>0 0 0 1 1 1 1 0 0 0 0 1 1 1</td>
<td>'</td>
<td>7</td>
<td>G</td>
<td>W</td>
<td>w</td>
<td>ç</td>
<td>û</td>
<td>ò</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1 0 0 0</td>
<td>0 0 0 0</td>
<td>0 0 0 0</td>
<td>0 0 0 1 1 1 1 0 0 0 0 1 1 1</td>
<td>BS</td>
<td>8</td>
<td>H</td>
<td>X</td>
<td>x</td>
<td>è</td>
<td>ë</td>
<td>Ç</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1 0 0 1</td>
<td>0 0 0 0</td>
<td>0 0 0 0</td>
<td>0 0 0 1 1 1 1 0 0 0 0 1 1 1</td>
<td>9</td>
<td>I</td>
<td>Y</td>
<td>i</td>
<td>y</td>
<td>ë</td>
<td>Ó</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1 0 1 0</td>
<td>0 0 0 0</td>
<td>0 0 0 0</td>
<td>0 0 0 1 1 1 1 0 0 0 0 1 1 1</td>
<td>LF</td>
<td>J</td>
<td>Z</td>
<td>j</td>
<td>z</td>
<td>õ</td>
<td>Ù</td>
<td>Ì</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1 0 1 1</td>
<td>0 0 0 0</td>
<td>0 0 0 0</td>
<td>0 0 0 1 1 1 1 0 0 0 0 1 1 1</td>
<td>+</td>
<td>K</td>
<td>K</td>
<td>k</td>
<td>k</td>
<td>ë</td>
<td>ë</td>
<td>%</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1 1 0 0</td>
<td>0 0 0 0</td>
<td>0 0 0 0</td>
<td>0 0 0 1 1 1 1 0 0 0 0 1 1 1</td>
<td>CR</td>
<td>L</td>
<td>M</td>
<td>l</td>
<td>m</td>
<td>ë</td>
<td>ë</td>
<td>Ì</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1 1 0 1</td>
<td>0 0 0 0</td>
<td>0 0 0 0</td>
<td>0 0 0 1 1 1 1 0 0 0 0 1 1 1</td>
<td>&lt;</td>
<td>N</td>
<td>n</td>
<td>~</td>
<td>A</td>
<td>SP</td>
<td>Å</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1 1 1 0</td>
<td>0 0 0 0</td>
<td>0 0 0 0</td>
<td>0 0 0 1 1 1 1 0 0 0 0 1 1 1</td>
<td>&gt;</td>
<td>O</td>
<td>o</td>
<td>Å</td>
<td>f</td>
<td>Å</td>
<td>Å</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1 1 1 1</td>
<td>0 0 0 0</td>
<td>0 0 0 0</td>
<td>0 0 0 1 1 1 1 0 0 0 0 1 1 1</td>
<td>/</td>
<td>?</td>
<td>O</td>
<td>o</td>
<td>Å</td>
<td>f</td>
<td>Å</td>
<td>Å</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Control codes and functions

(1) BS 08H (backspace)
Moving the head back by one character. The BS at zero position is ignored.

(2) LF OAH (line feed)
Paper is fed by the number of lines of the line space selector.

(3) CR ODH (carrier return)
Automatic line feed by the number of lines of the line space selector after printing the data which is stored in the data buffer. Only paper feed is executed when there is no printing data before this code.

(4) Host output signals Processing of EP-22

<table>
<thead>
<tr>
<th>Host output signals</th>
<th>Processing of EP-22</th>
</tr>
</thead>
<tbody>
<tr>
<td>CR + LF</td>
<td>NL</td>
</tr>
<tr>
<td>LF + CR</td>
<td>NL</td>
</tr>
<tr>
<td>LF + CR + LF</td>
<td>NL + LF</td>
</tr>
<tr>
<td>CR + LF + LF</td>
<td>NL + LF</td>
</tr>
</tbody>
</table>

NL (New Line) means bringing the head to zero position after executing paper feed. With CR + LF, for example, paper feed by two lines is not executed, but NL is executed once, as mentioned earlier.
### Specification

<table>
<thead>
<tr>
<th>Transfer rate</th>
<th>300 baud and 75 baud</th>
</tr>
</thead>
<tbody>
<tr>
<td>Synchronization system</td>
<td>Asynchronous system (Start-stop synchronization system)</td>
</tr>
<tr>
<td>Communication control procedure</td>
<td>No procedure</td>
</tr>
<tr>
<td>Data format</td>
<td>10 bit/character</td>
</tr>
<tr>
<td></td>
<td>SPACE</td>
</tr>
<tr>
<td></td>
<td>MARK</td>
</tr>
<tr>
<td>ST</td>
<td>Start bit</td>
</tr>
<tr>
<td>b₁ ~ b₈</td>
<td>Data bit without parity</td>
</tr>
<tr>
<td></td>
<td>8 bits (b₁ for LSB)</td>
</tr>
<tr>
<td>SP</td>
<td>Stop bit</td>
</tr>
<tr>
<td></td>
<td>1 bit (MARK)</td>
</tr>
</tbody>
</table>
### Signal levels

<table>
<thead>
<tr>
<th>Logic</th>
<th>Receiving-end voltage</th>
</tr>
</thead>
<tbody>
<tr>
<td>MARK (OFF)</td>
<td>-3V and under</td>
</tr>
<tr>
<td>SPACE (ON)</td>
<td>+3V and over</td>
</tr>
</tbody>
</table>

### Connector and pin layout

<table>
<thead>
<tr>
<th>Pin No.</th>
<th>Signal</th>
<th>Symbol</th>
<th>Control – Printer</th>
</tr>
</thead>
<tbody>
<tr>
<td>3</td>
<td>Received data</td>
<td>RD</td>
<td></td>
</tr>
<tr>
<td>7</td>
<td>Ground for signal</td>
<td>SG</td>
<td></td>
</tr>
<tr>
<td>20</td>
<td>Data terminal ready</td>
<td>DTR</td>
<td></td>
</tr>
</tbody>
</table>

#### Description of signals

- **Receiving data (RD)**
  - Receiving the data which is sent from the control side.

- **Data terminal ready (DTR)**
  - The state of the printer is transmitted to the control side to receive the data.
  - This line is normally in the SPACE (+V) state while the printer can receive the data, but turns into the MARK (-V) state when the printer turned into the busy state (in which no data can be accepted.)
This machine has 78 bytes as the printing buffer.

The ready signal is ON when the number of bytes in the printing buffer is 25 or less, and OFF when it is 55 or more.

(A signal is sent to the computer so that it stops data transfer with the ready signal OFF. Some computers do not stop data transfer even if the ready signal was turned OFF, and sometimes incur an overrun error at 300 baud. In this case, connection is sometimes restored by changing the transfer rate into 75 baud).

When the cont key is depressed, LF is executed when the buffer is empty, and the succeeding part is printed when it is not empty.

The printing buffer is cleared when the CLEAR key is depressed.
CR is inserted into Buffer 76 when the next code in Buffer 75 is a character data. When the next code is a CR code or CR + LF, LF + CR, the head returns to zero position after making line feed.
(Refer to page 46, Control codes and functions)

(Ex.)

Buffer

| Character data 75 | + | Character data |

Cassette carrier

| Character data 75 | + | CR or CRLF or LFCR |

Cassette carrier
CASSETTE RIBBON CHANGE

1. Lift the transparent paper bail cover up with both thumbs.
2. Pull the paper release lever toward you.
3. Remove the cassette ribbon.

- Spare cassette ribbons can be stored inside lid cover.
(4) Insert a new cassette and push the center of the cassette down with forefinger.
* Make sure to hook the printing head with ribbon.

(5) Turn the knob counterclockwise to take the slack of the ribbon.

(6) Return the paper release lever to its original position.

(7) Put back the paper bail cover.
(1) Turn the power switch to OFF.

(2) When the AC power adaptor is used, disconnect the unit adaptor plug after disconnecting the adaptor from the wall outlet.
* When memorizing the content of memory typing or the positions of tab and margin, keep the batteries installed and completely disconnect the unit adaptor plug.

(3) Put back the lid cover.
LIMITED WARRANTY

Your new Brother Personal Electronic Printer is warranted to be the finest precision construction and is manufactured under the rigid control in the world’s most modern factory. The parts, with the exception of ribbons and batteries, are warranted for one year from date of purchase. This Warranty does not cover damage from misuse, neglect or accident. The Warranty extends to the original owner only. The sum of $5.00 should be remitted by check or money order to cover postage and handling when merchandise is returned under warranty for service. A copy of proof of purchase in the form of a sales slip or proof of delivery must accompany the merchandise.

RETURN TO:
BROTHER INTERNATIONAL CORPORATION
8 CORPORATE PLACE
P.O. BOX 159
PISCATAWAY, N.J. 08854

Personal
Electronic
Printer EP-22
MADE IN JAPAN
Personal Electronic Printer EP-22

MADE IN JAPAN

Weighs only 5 lbs.
Size: 8 3/4”D x 1 3/4”H x 12 1/2”W
Operates on Batteries and A.C.