IMPORTANT SAFETY INSTRUCTIONS

- Read all of these instructions and save them for future reference.
- Follow all warnings and instructions marked on the product.
- Unplug this product from the wall outlet before cleaning. Do not use liquid or aerosol cleaners. Use a damp cloth for cleaning.
- Do not use this product near water.
- Do not place this product on an unstable cart, stand or table. The product may fall, causing serious damage to the product.
- Slots and openings on the back or bottom of the case are provided for ventilation. To ensure reliable operation of the product and to protect it from overheating, do not block or cover these openings. The openings should never be blocked by placing the product on a bed, sofa, rug of other similar surface.
- This product should never be placed near or over a radiator or heater.
- This product should not be placed in an built-in installation unless proper ventilation is provided.
- This product should be operated from the type of power source indicated on the marking label. If you renot sure of the type of power available, consult your dealer or local power company.
- Do not allow anything to rest on the power cord. Do not place this product where the cord will be walked on.
- If an extension cord is used with this product, make sure that the total of the ampere ratings of the products plugged into the extension cord does not exceed the extension cord ampere rating. Also, make sure that the total of all products plugged into the wall outlet does not exceed 15 amperes.
- Never push objects of any kind into this product through cabinet slots as they may touch dangerous voltage points or short out parts that could result in a risk of fire or electric shock. Never spill liquid of any kind on the product.
- Except as explained elsewhere in this manual, do not attempt to service this product by yourself. Opening and removing the covers that are marked
- Do Not Remove" may expose you to dangerous voltage points or other risks.
- Refer all servicing on those compartments to service personnel.
- Unplug this product from the wall outlet and refer servicing to qualified service personnel under the following conditions:

A. When the power cord or plug is damaged or frayed.
B. If liquid has been spilled into the product.
C. If the product has been exposed to rain or water.

D. If the product does not operate normally when the operating instructions are followed. Adjust only those controls that are covered be the operating instructions since improper adjustment of other controls may result in damage and will often require extensive work by a qualified technician to restore the product to normal operation.
E. If the product has been dropped or the cabinet has been damaged.
F. If the product exhibits a distinct change in performance, indicating a need for service.

- Please keep the poly bag which this equipment is packed in away from children or throw it away to prevent children from putting it on. Putting it on may cause suffocation.

<CAUTIONS>

- Prior to using the equipment, be sure to read this User's Manual thoroughly. Please keep it handy for reference whenever it may be needed.
- The information contained herein may be changed without prior notice.
- Reproduction of part or all of this User's Manual without permission is strictly prohibited.
- Never service, disassemble, or repair parts that are not mentioned in this User's Manual.
- Note that we will not be responsible for damages attributable to a user's incorrect operation/ handling or an improper operating environment.
- Operate the equipment only as described in this User's Manual; otherwise accidents or problems may result.
- Data are basically temporary; they cannot be stored or saved permanently or for a long time. Please note that we will not be responsible for damages or losses of profit resulting from losses of the data attributable to accidents, repairs, tests, and so on.
- If you have any questions or notice any clerical errors or omissions regarding the information in this manual, please contact our office.
- Please note that, notwithstanding Item 8 above, we will not be responsible for any effects resulting from operation of the equipment.

SAFETY PRECAUTIONS – BE SURE TO OBSERVE

In order to prevent hazards to an operator or other persons and damage to property, be sure to observe the following precautions.

• The following describes the degrees of hazard and damages that can occur if the given instructions are neglected or the printer is incorrectly operated.

WARNING

Negligence of this precaution may result in death or serious injury.

CAUTION

Negligence of this precaution may result in injury or damage to property.

This is an illustration mark used to alert your attention.

This is an illustration mark used to indicate such information as an instruction or the like.

WARNING

- **Never handle the equipment in the following manners, as it may break, become out of order, or overheat causing smoke and resulting in fire or electric shock. If the equipment is used in an abnormal condition, such as when broken, then problems, smoke emission, abnormal odor/noise, and fire can result. If an abnormal condition exists, be sure to disconnect the power plug from a plug socket, and contact our dealer. Never repair the equipment on your own – it is very dangerous.**
- Do not allow the equipment to receive a strong impact or shock, such as kicking, stomping, hitting, dropping, and the like.
- Install the equipment in a well-ventilated place. Do not use it in such a manner that its ventilation port will be blocked.
- Do not install the equipment in a place like a laboratory where chemical reactions are expected, or in a place where salt or gases are contained in the air.
- Do not connect/disconnect a power cord or a data cable, while holding the cable.
- Do not pull, install, use, or carry the equipment in such a manner that force will be applied to the cables.
- Do not drop or insert any foreign substances, such as clips or pins, into the equipment.
- Do not spill any liquid or spray any chemical-containing liquid over the equipment. If any liquid is spilled on it, turn off the power, disconnect the power cable and power cord from the plug socket, and so on, and contact our dealer.
- Never disassemble or remodel the equipment. Negligence of this may cause fire or electric shock.
- Use the equipment only with the specified commercial power supply and AC adapter. Negligence of this may result in fire, electric shock, or problems.
- If you drop or break the AC adapter, or if water or the like gets inside it, unplug it immediately from the socket and contact your dealer.
- Do not damage, break, process, bend/pull by force, twist, or head an AC adapter cord. Also, do not put a heavy substance on it or heat it. The AC adapter cord could be broken, resulting in fire, electric shock, or trouble. If the AC adapter cord is damaged, contact our dealer.
- Do not connect/disconnect the AC adapter with wet hands.
- Do not overload a single electrical outlet, using a table tap or a current tap socket.
- An equipment packing bag must be discarded or kept away from children. A child can suffocate if the bag is placed over the head.

PRECAUTIONS FOR INSTALLATION

- Do not use or store the equipment in a place exposed to fire, moisture, or direct sunshine, or in a place near a heater or thermal device where the prescribed operating temperature and humidity are not met, or in a place exposed to much oil, iron powder, or dust. The equipment may become out of order, emit smoke, or catch fire.
- Do not install or use the equipment in a place like a laboratory where chemical reactions are expected, or in a place where salt or gases are contained in the air. There is a danger of fire or electric shock.
- Install the printer on a flat, stable desk or table that is free from vibration, in a well-ventilated place.
- Do not install the printer at a location where its operation could be hindered.
- Do not place anything on the printer or leave small objects, like a clip or pin, around it. A foreign object could cause trouble if it gets inside.
- Do not use any sharp-pointed object, such as a pen, for example, to touch the operation panel of the printer. It could cause trouble.
- Do not use the equipment near a radio or TV receiver. Do not share the power from a plug socket a radio or TV receiver is connected to. It may cause a reception problem.
- Use the equipment only at the specified power supply, voltage and frequency. Otherwise, it may emit smoke and catch fire or cause other problems.
- Connect only the specified power source. Use of an unspecified power source could cause trouble or smoke/fire.
- Confirm that a plug socket used for connection has sufficient capacity.
- Avoid connecting a power cable to a plug socket shared by other devices or extending the wiring too far. It may result in the cable catching fire or a power outage. Also, do not step on or apply an excessive force (Pull, load) to the cable, and do not use the printer with such a force applied to it.
- Never connect a grounding cable (Frame ground) to a gas pipe. There is a danger of explosion. When connecting or disconnecting the grounding cable, be sure to disconnect the power cable and the power plug from the plug socket.
- When connecting/disconnecting the cables, be sure to turn off the power first, including the connected side, and then connect/disconnect them, holding a plug and a connector. Pulling the cable itself could cause it to snap or become damaged.
- Connect a power cable or a connector cable securely. If a reverse-polarity connection is made, internal elements may be broken or a mating device may be ad versely affected.
- Use a shielding wire or twisted pair wire for a signal line, in order to minimize noise effect. Do not route the cable too long or connect it to a noisy device. Connection to a noisy device could cause erroneous printing due to corrupt data, and so on.
- Use the equipment in an environment where there is a plug socket near the main body and you can easily disconnect the power plug from it, to shut off the power.
- When the equipment will not be used for a long period of time, unplug it and remove the paper roll from it.
- When transporting the equipment, remove the paper roll from the paper holder.

PRECAUTIONS FOR HANDLING

Do not handle the equipment in the following manners, because problems may result.

- Do not use any other power source besides the accessory AC adapter. Also, do not use the AC adapter for other purposes.
- Do not print without paper.
- Do not drop or put any foreign object, such as a clip, pin, or the like, inside the printer.
- Do not spill any liquid or spray any chemical-containing liquid over the equipment.
- Never use a pointed object, such as a pen, to operate the operation panel.
- Do not use Scotch tape to fasten paper together for continuous use. It could damage the printing head.
- Never pull the set paper forcibly. When opening/closing the printer cover, take care that the paper will not be caught. It could cause the paper to jam.
- Be sure to use the specified paper. Use of other paper could deteriorate the print quality or cause a problem with the printing head.

To Prevent Injury and Spreading of Damage

- Never touch the printing head, motor, or paper cutting blade. Your finger may be cut.
- During power-on or immediately after printing, do not touch electrical parts or moving parts, such as the mechanism, motor, internal gear, etc. They may be very hot and can burn your hand/finger.
- Be careful to avoid bodily injure or damaging other objects with an edge of sheet metal.

· Should any error occur while operating the equipment, stop it immediately and disconnect the power plug from the plug socket.
· Only a qualified serviceman is allowed to disassemble or repair the printer.
· Should a problem occur, leave solving it to our serviceman. Do not disassemble the equipment on your own.
· When opening/closing the printer cover, and so on, be careful not to catch your hand or finger on the equipment.
· After using the equipment, turn off the power switch and unplug the AC adapter from a plug socket.

DAILY MAINTENANCE

- At the time of maintenance, be sure to turn off the power switch of the printer and unplug it from the socket.
- Use a dry soft cloth to wipe off stains and dust from the surfaces of the main body case. For severe soiling, dip the cloth in water and wring it, for wiping off the soil. Never use organic solvents, such as alcohol, thinner, trichlene, benzene, ketone, or chemical dusters.
- If the equipment is contaminated with paper powder, use a soft brush to clean it. Be careful not to damage the printing head.

CAUTION:

The printing head and motor are very hot. Be careful not to touch them immediately after printing. Do not touch the heating surface of the head with a bare hand or metal.

- Cleaning the Printing Head

1. Referring to “4.5 Removing Paper Jam,” detach the platen roller unit.
2. Moisten gauze slightly with alcohol, and clean the heating surface of the printing head with it.
3. Reattach the platen roller unit.

CAUTION:

The printing head and motor are very hot. Be careful not to touch them immediately after printing. Do not touch the heating surface of the head with a bare hand or metal. When detaching or reattaching the platen roller unit, be sure to raise up the printing head; otherwise, they could be damaged. Handle the detached platen roller unit carefully so as not to damage it.

CONTENTS

1. OUTLINE

This small line thermal printer is designed for various types of data communication terminals and measuring instrument terminals. Its abundant built-in features allow you to widely use this printer for different applications. Prior to using it, read and understand this manual thoroughly.

1.1 Features

1. Small, lightweight, and installable in a narrow area
2. High speed and low noise, owing to line thermal print
3. Long-life printing head and high reliability, owing to the simple mechanism
4. Easy paper-loading, owing to the auto-loading function
5. Built-in input buffer
6. Capable of printing a bar code
7. Capable of accommodating both thermal paper and label paper
8. A little discharge (1 sheet) of the label paper at power-on or paper replacement

1.2 Unpacking

When unpacking the package, confirm that the following parts are provided:

- Printer body 1 unit
- Sample paper roll 1 roll
- AC adapter 1 piece
- User's manual 1 copy

CAUTION

- Install the printer body on a flat and stable desk or mount it onto the wall, etc., using a hook, etc.
- Do not install the printer near a heater or in a place exposed to the direct sunshine.
- Do not use the printer in a high-temperature, high-humidity, or contaminated environment.
- Do not allow dew condensation to form on the printer. If such condensation should form, do not turn on the power until it has completely gone away.
- Use only the accessory AC adapter. Do not use it for any other purpose.
- If you do not use the printer for a long period, disconnect the power cable from the socket.
- Keep this manual carefully at hand for ready reference.

2. BASIC SPECIFICATIONS

2.1 Basic Specifications

Item \ Model	DATECS EP-50
Printing system	Line thermal dot printing
Printing width	48 mm (384 dots/line)
Dot density	8 dots/mm (Wight, Length)
Paper feed pitch	0.125 mm
Printing speed	Approx. 11 lines/sec. (At maximum)
Printing columns and character size	32 columns (12 x 24 Font A) 1.25 x 3.00 mm 42 columns (9 x 24 Font B) 0.88 x 1.92 mm
Line interval	Initial value: 4.23 mm (1/6 inch) Can be set with a command (1/360 inch at minimum)
Character types	Alphanumeric characters, symbols, international characters
Character code	IBM characters
Bar code type	UPC-A/E, JAN (EAN) 13-/8-column, ITF, CODE 39, CODE 128, CODABAR
Paper (See Paper Specifications)	Thermal paper roll: 58 + 0/- 1 mm x ø83 (max.) mm, 60 ~75 µm thick
Interface	Serial (RS-232C), Parallel (CENTRONICS compliant)
Input buffer	2 KB
Download characters	Font A, B: 95 characters each
Paper and fuction	Provided
Paper near end fuction	Provided
AC adapter AC cord	Rated input :100 ~ 240 V, 50/60 Hz, 40 VA Rated output : 12 V DC, 3A 2-core cord (Depends on the destination)
Supply voltage	100 ~ 240 V 50/60 Hz
Power consumption	At non-printing: Approx. 2 W At printing: Approx. 15 W (approx. 20 W at maximum)
Weight	Main bodi: Approx. 750g (Paper roll exculded) AC adapter: Approx. 350g
Outer dimensions	106 (W) x 183 (D) x 126 (H) mm
Operating temperature and humidity	5 ~ 40˚C, 35 ~ 85% RH (No dew condenstation)
Storage temperature and humidity	-20 ~ 60˚C, 10 ~ 90% RH (No dew condenstation)
Reliability	Printing head life: (25˚C) Pulse resistance: 50 million pulses or more (Print rate 12.5%) Wear resistance: 50 kg or more (With recommended thermal paper at normal temperature and humidity)

2.3 Paper Specifications

2.3.1 Recommended Paper

(1) Thermal paper roll

- Type : Thermal paper
- Paper width : 58 + 0/–1 mm
- Paper thickness : 60~75mm
- Roll diameter : f83 mm or less
- Printing surface : Outside of the roll (Surface)
- Recommended paper : TF50KS-E2C (Monochrome) made by NIPPON SEISHI or its equivalent 735FA(2-color, Black based) made by RICOH or its equivalent PB670(2-color, Red based) made by MITSUBISHI SEISHI or its equivalent
- Core :f12 mm(Inner dia.), f18 mm (Outer dia.)

(2) Thermal label paper(L and M spec. only)

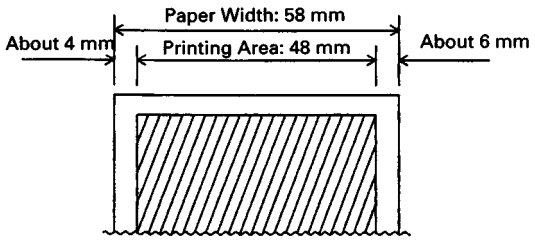
- Type : Thermal paper (Printing surface)
- Paper width : 58 + 0/- 1 mm
- Label width : 56 mm or less
- Label length : 25~300 mm (For label interval detection) 25~300 mm (For black mark detection) * Black mark section excluded
- Label interval : 3~300 mm (Black mark interval for the black mark detection)
- Black mark width : 15 mm or more (From the center of the paper, black paper only)
- Paper thickness : 150mm or less
- Roll diameter : f83 mm or less (Depends on the outer diameter of the core)
- Printing surface : Outside of the roll (Surface)
- Recommended paper : For label interval detection KPT86S P22 G63BC (Monochrome) made by OHJI TUCK or its equivalent For black mark detection KPT865P (Monochrome) made by OHJI TUCK or its equivalent
- Core : f12 mm or more (Inner dia.), 3 mm thick

CAUTION:

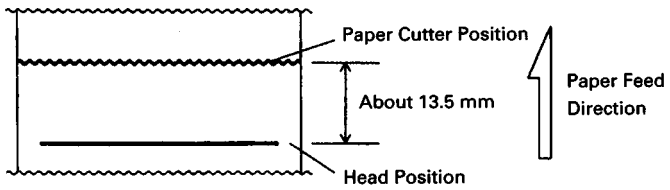
- Use of non-specified paper may cause irregularity of print density. If this is the case, use the DIP switch to reset print density. (See 5. DIP SWITCH SETTING)
- Do not paste the paper to the core.
- If the paper comes in contact with a chemical or oil, it may discolor or lose a record.
- Do not rub the paper surface strongly with a nail or hard metal. It may discolor.
- Discoloring starts at about 70°C. Watch out for effects of heat, humidity, light, and so on.
- Do not use the label paper when the printer has been set for thermal paper, and vice versa. Be careful not to mistake a type of label paper. It could cause malfunctioning or damage the printing head.

2.3.2 Printing Position

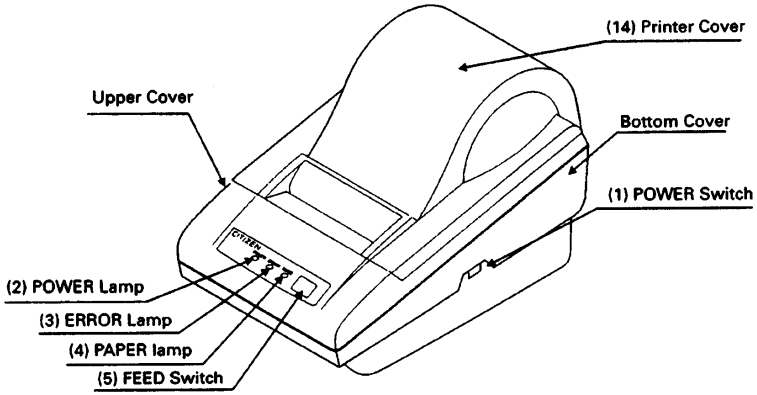
Thermal paper

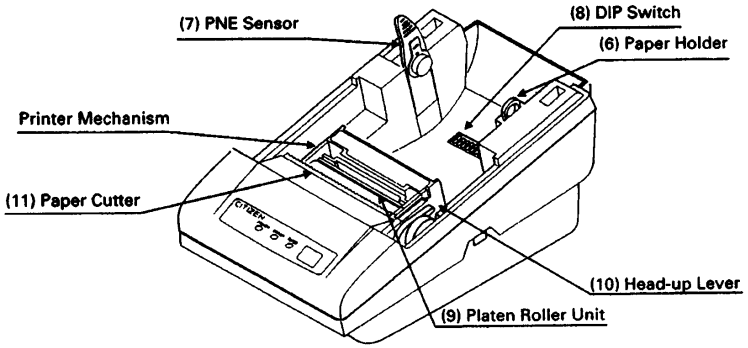


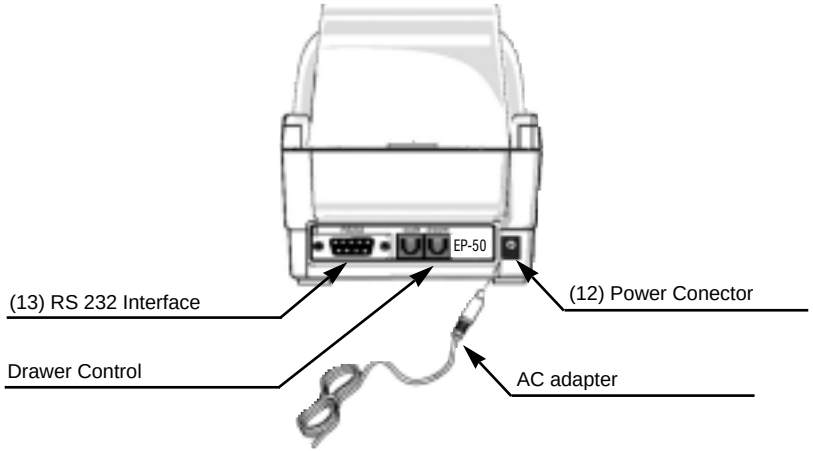
2.3.3 Printing Head and Paper Cutter Layout



3. OUTER APPEARANCE AND COMPONENT PARTS







(1) POWER switch
Turns on/off the power for the printer body.

(2) POWER lamp

(3) ERROR lamp
Illuminated at the time of a head-up mechanical error, and blinks at the time of starting a macro.

(4) PAPER lamp
Illuminated when the paper is running out (when there is little paper left), and blinks when a label paper cut is specified.

(5) FEED switch
Feeds the paper. It is fed continuously while the switch is held down. For the label paper, it is fed by one label.

(6) Paper holder
Set the paper roll in this holder.

(7) PNE sensor
Detects that the paper is running out.

(8) DIP switch
Initially sets the printer at power-on and sets the functions.

(9) Platen roller unit
Detach this unit when the paper is jamming or when you clean the head.

(10) Head-up lever
Used when replacing the paper or detaching/reattaching the platen roller unit.

(11) Paper cutter
Cuts the printed paper.

(12) Power connector
Connects to the accessory AC adapter.

(13) Interface connector
Connects to a communication interface cable.

(14) Printer cover
Detach this cover when replacing the paper.

4. OPERATION

4.1 Connecting AC Adapter

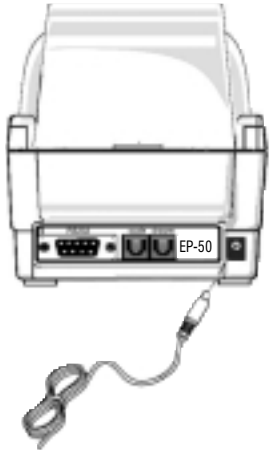
1 Turn off the power.

2 Connect the cable connector of the AC adapter to the power connector located on the back of the printer.

3 Connect the AC power cord of the AC adapter, and plug it into a socket.

CAUTION:

- Use only the specified AC adapter.
- When disconnecting/reconnecting the cable connector of the AC adapter, be sure to hold the connector.
- Separate the AC adapter from other noise-generating devices.
- Pulling the AC power cord may damage it, resulting in a fire, electric shock, or snapping.
- If a thunder/lightning storm is nearby, disconnect the AC adapter from the socket and do not use the printer, because a fire or electric shock may occur.
- Do not put the AC power cord close to a heating device. Its coating can mel and cause a fire or electric shock.
- Install the printer in a well-ventilated place, because the AC adapter generates heat when it is used.
- Use the specified AC power source. Connect to a power source with sufficient capacity. If the capacity is insufficient, a fire may result from heat generation.
- After using the printer or when not using it for a long period of time, be sure to unplug the AC adapter from a plug socket for your safety.



4.2 Connecting Interface Cable

1 Turn off the power. (Mating side included)

2 Check the top and bottom of cable terminals, and connect to the interface connector.

3 Fix the cable terminals. Serial interface : Tighten screws, to fix it.

4 Connect the cable to the host computer.

CAUTION:

- Referring to “7. SERIAL INTERFACE,” check the pin configuration of the interface connector and cable. Wrong wiring could cause trouble or malfunctioning to not only the printer body but also the host computer.
- When disconnecting/reconnecting the interface cable, be sure to hold the connector. Pulling the cable itself may snap the internal wires.
- Connect the interface cable securely. Otherwise, communications may not be obtained due to a connection failure.

4.3 Inserting the Paper

CAUTION:

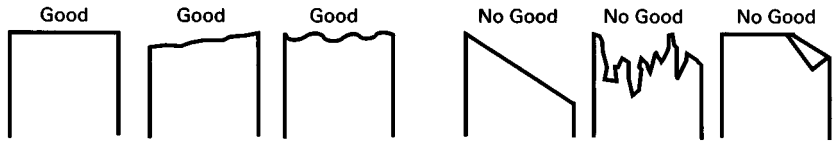
- Be sure to use the specified paper roll.
- Use of non-specified peper may not guarantee the print quality, printing head life, and so on.

1 Hold the convexity on the rear of the printer cover, and raise it upward.

2 Cut the front end of the paper roll almost at a right angle.

CAUTION:

- The printer cover is not stationary (Opening/Closing). After detaching it, be careful not to lose or break it
- Do not insert a ragged or dog-eared end of the paper roll, because it could result in a paper jam or insertion error.



3 Make sure that the power is turned on.

4 Pull the head-up level to this side to raise up the printing head.

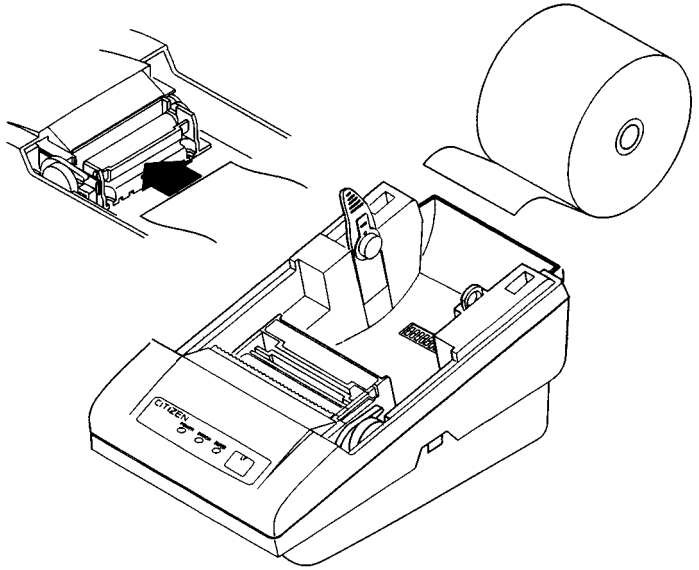
5 If there is still some paper remaining after a paper-out indication, eliminate the paper roll according to “4.8 How to Remove Remaining Paper Roll.”

6 Insert the front end of the paper roll straight into a paper insertion slot.

7 Set the paper roll firmly in the paper holder.

8 Put back the head-up lever. The paper roll is automatically puiied in by the platen roller to feed a constant amount of paper. (When auto-loading is enabled.)

9 Put back the printer cover.



CAUTION:

- If the paper roll is still slack, rewind the paper to remove the slack
- If the paper roll is tilted, rais the head-up lever to correct the paper roll posotion, or pull out the paper roll and set it again.
- Do not open the printer cover while printing.
- Do not hold or press the paper roll while printing, because it could cause a paper jam.
- After the paper is set, the printer is made ready to start printing. Note that if data is remaining in the buffer, the printer will start printing after the paper is set.
- Do not run the printer with its cover removed, because it could cause malfunctioning or an irregularity of the sensor.

4.5 Eliminating the Paper Jam

1 Turn off the power.

2 Detach the printer cover.

3 Cut the paper roll near the paper insertion slot.

4 Raise the head-up lever.

5 Raise the blue levers located on both sides of the platen roller unit, to gently detach the unit. The platen roller unit can be detached by manually raising the blue levers.

6 Remove the remaining paper roll completely from the paper passage.

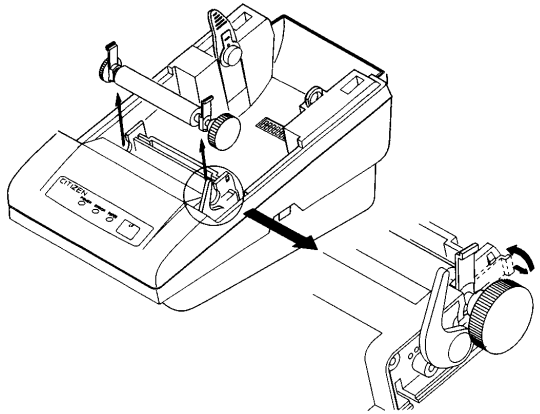
7 If the label paper is used, some paste may be adhered. Dip soft cloth, etc. in alcohol and wipe away the paste carefully so as not to damage the printing head.

8 Confirming the direction of the platen roller unit, reattach it to the mechanism. Shift down the blue levers on both sides, to fix the unit.

9 Lower the head-up lever.

CAUTION:

- Do not carry out this work just after printing because the printing head is very hot.
- Be sure to turn off the power when detaching the platen roller unit.
- When eliminating remaining paper, do not touch the heating surface of the head with a bare hand or metal piece.
- Do not detach the platen roller unit unless necessary, such as for a paper jam.
- When putting back the platen roller unit, be sure to confirm that it is correctly reattached.
- Never detach or reattach the platen roller unit with the head-up lever lowered.



4.6 FEED Switch Function

4.6.1 When Thermal Paper is Used

Pressing the switch, feed the paper by 1 line. If the switch is held down, the paper will be fed continuously.

4.6.2 When Label Paper is Used

Pressing the switch, feed the paper by 1 line. If the switch is held down for 1 second or more, the paper will be fed by one label.

CAUTION:

If the label paper is fed by 1 line by pressing the FEED switch, the label head position will be dislocated. Note that if printing starts in this state, the label will be printed dislocated. (It is recommended to feed the paper by 1 label.)

4.7 Paper End Function

If the printing paper runs out, the serial interface will output DTR to stop printing, respectively. If some data are still remaining in the buffer, printing will be resumed after replacing the paper. Replace the paper according to “4.3 Inserting the Paper.”

4.8 How to Remove Remaining Paper Roll

1 Remove the printer cover.

2 Raiser the head-up lever.

3 Gently pull out the paper to the near side. If the paper roll is still remaining, cut it just before the paper insertion slot before pulling it out

CAUTION:

- Do not pull out the paper roll in the opposite direction.
- Never take out paper with the head-up lever lowered, because it could damage the printing head.
- The printer mechanism may be very hot just after printing, so be duly careful.

5. DIP SWITCH SETTING

5.1 Location of DIP Switch

1. Turn off the power.
2. Detach the printer cover, and take out the paper roll. (The switch is found under the paper roll.)
3. There is 1 DIP switch (8-pole) for the serial interface.

5.2 DIP Switch Function

DS1 – The three least significant bits from the DIP Switch are used to determine the communication speed.

Sw1	Sw2	Sw3	SPEED (bps)
OFF	OFF	OFF	1200
ON	OFF	OFF	2400
OFF	ON	OFF	4800
ON	ON	OFF	9600
OFF	OFF	ON	19200
ON	OFF	ON	38400
OFF	ON	ON	57600
ON	ON	ON	115200

	OFF	ON
Sw4	Reserved	
Sw5	Reserved	
Sw6	Hardware protocol	XON / XOFF protocol

6. SERIAL INTERFACE

6.1 Specifications

1. Synchronous system : Asynchronous
2. Baud rate : 1,200, 2,400, 4,800, 9,600, 19,200 bps, 38,400, 57,600, 115,200
(Selected by DIP SWITCH)
3. 1-word configuration
Start bits : 1 bit
Data bits : 8 bits
Parity bits: No parity
Stop bits : 1 bit or more
4. Signal polarity
RS-232C
Mark = Logic “1” (-3 ~ -12 V)
Space = Logic “0” (+3 ~ +12 V)
5. Received data (RXD signal)
Mark = 1
Space = 0
6. Reception control (DTR signal)
Mark : Data not transferable
Space : Data transferable
7. Transmission control (TXD signal)
DC1 code(11H) X-ON : Data receivable
DC3 code(13H) X-OFF : Data not receivable

6.2 Input and Output Signals

1. RXD
Serial received data signal. If a framing error, overrun error, or parity error takes place, the relevant data will be printed as “?”.

2. DTR
Write the data or a command when this signal is Ready. If you write at Busy, the previous data will be ignored, resulting in an overrun error. The data can be written in the input buffer even during printing. Busy is also issued at power-on, during test printing, at on-line, or at reset.

3. TXD
If the remaining capacity of the input buffer comes to 128 bytes or less while receiving the data, DC3(13H) will be output as a data not receivable signal. If the remaining

capacity comes to 256 bytes or more, DC1(11H) will be output to the host side as a data receivable signal.
When sending the status information, it is confirmed that DSR is a space prior to sending the data, if DTR/DSR control has been selected. If DTR/DSR control has not been selected, the data will be sent, ignoring the DSR signal.

4. FG
Ground for the case

5. GND
Common ground for the circuits

7. POWER CONNECTOR

This connector is to supply the power from the special AC adapter(DATECS PS).

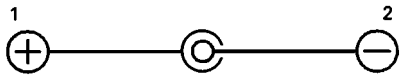
Connector Schematic

No.	Function
1	12V
2	GND

Jack used : HEC0470-01-640 (HOSHIDEN) or its equivalent
Applicable plug : JXP series type A (I.D.: 2.45 mm, O.D.: 5.5 mm) (HOSHIDEN) or its equivalent

CAUTION:

Inner terminal: Plus pole:
- Be sure to use the specified AC adapter. Use of any other power source could cause trouble to or break the printer.
- Do not connect the power source with different polarity.
- After using the printer or when not using it for a long period of time, be sure to unplug the AC adapter from a plug socket for your safety.



Inner terminal: Plus pole
Outer terminal : Minus pole(GND)

DATECS EP-50M COMMAND SET

1. COMMAND DETAILS

1.1 Description of Items

XXXX **ALL**

[Function]	Command Function
[Code]	A sequence of code constituting a command is represented in hexadecimal number for <>H, binary number for < >B, and decimal number for < >, respectively; [ ]k represents a repeat count of k-times.
[Range]	Describes an argument value(setting range) for the command.
[Outline]	Describes a command outline.
[Caution]	Describes a caution as required.
[Default]	Describes an initial value for the command when accompanied by an argument.
[See Also]	Describes the associated commands for use.
[Sample Program]	Describes a coding example in the Q-BASIC sample program.

* This example is only for your reference and differs depending on the language used, version, and so on. For details, see the manual for the language used.

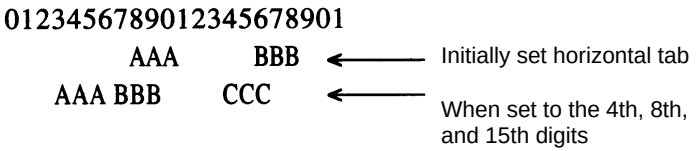
HT

[Function]	Horizontal Tab Command
[Code]	<09>H
[Outline]	Shifts the printing position to the next horizontal tab position. - Ignored when the next horizontal tab position has not been set.
[Caution]	- The horizontal tab position is set by ESC D. - Initial setting of the horizontal tab position is each 8 characters in 9th, 17th, 25th,columns.
[See Also]	ESC D

[Sample Program]

```
LPRINT “012345678901234567890123456789”;
LPRINT CHR$ (&HA);
LPRINT CHR$ (&H9) + “AAA”;
LPRINT CHR$ (&H9) + “BBB”;
LPRINT CHR$ (&HA);
LPRINT CHR$ (&H1B) + “D”;
LPRINT CHR$ (3) + CHR$ (7) + CHR$ (14) + CHR$ (0);
LPRINT CHR$ (&H9) + “AAA”;
LPRINT CHR$ (&H9) + “BBB”;
LPRINT CHR$ (&H9) + “CCC” + CHR$ (&HA);
```

[Print Results]



LF

[Function] Printing and Paper Feed Command

[Code] <0A>H

[Outline] Prints data inside the input buffer and feeds lines based on the line feed amount having been set.
- The head of the line becomes the next print starting position.

[See Also] ESC 2, ESC 3

[Sample Program]

```
LPRINT “AAA” + CHR$ (&HA);
LPRINT “BBB” + CHR$ (&HA);
LPRINT CHR$ (&HA);
LPRINT “CCC” + CHR$ (&HA);
```

[Print Results]

AAA ← Print and line feed
BBB ← Print and line feed
← Line feed only
CCC ← Print and line feed

CR

[Function] Back to printing

[Code] <0D>H

[Outline] This command is ignored.

ESC SP n

[Function] Setting the right space amount of the character

[Code] <1B>H<20>H<n>

[Range] {0 =< n=< 20} Data is described in Hex code.

[Outline] The rightward space amount is set in dot unit (1/203 inch unit).
In the initial value, it is n=0.

[Caution] The rightward space amount in doublewide mode
is made double of the set volume.

[Default] n = 0

[Sample Program]

```
LPRINT CHR$ (&H1B) + “ “ + CHR$ (0);
LPRINT “AAAAA” + CHR$ (&HA);
LPRINT CHR$ (&H1B) + “ “ + CHR$ (1);
LPRINT “AAAAA” + CHR$ (&HA);
LPRINT CHR$ (&H1B) + “ “ + CHR$ (12);
LPRINT “AAAAA” + CHR$ (&HA);
```

[Print Results]

AAAAA ← 0-dot space
AAAAA ← 1-dot space
A A A A A ← 12-dot space

ESC $ n1 n2

[Function] Specifying the Absolute Positions

[Code] <1B>H<24>H<n1><n2>

[Range] {0 =< n1 =< FF}
{0 =< n2 =< 1} Data is described in Hex code.

[Outline] The printing start position is specified in the number of dots (1/203 inch unit) from the beginning of line.
-The number of dots is divided by 256, whose quotient is taken as n2 and the residual as n1.
- Therefore, the printing start position is equal to n1+n2 x 256 from the begin ning of line.

[Caution] Specifying beyond the line end is ignored.

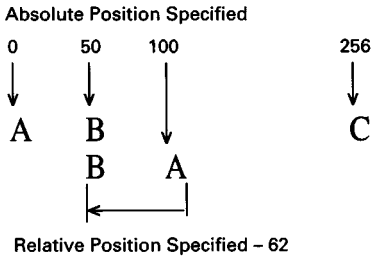
[Default] The initial value is not specified.

[See Also] ESC \

[Sample Program]

```
LPRINT CHR$ (&H1B) + "$";
LPRINT CHR$ (0) + CHR$ (0) + "A";
LPRINT CHR$ (&H1B) + "$";
LPRINT CHR$ (50) + CHR$ (0) + "B";
LPRINT CHR$ (&H1B) + "$";
LPRINT CHR$ (0) + CHR$ (1) + "C";
LPRINT CHR$ (&HA);
LPRINT CHR$ (&H1B) + "$";
LPRINT CHR$ (100) + CHR$ (0) + "A";
LPRINT CHR$ (&H1B) + "&#165;";
LPRINT CHR$ (&HC2) + CHR$ (&HFF) + "B";
LPRINT CHR$ (&HA);
```

[Print Results]



ESC % n

[Function] Specifying/Canceling Download Character Set

[Code] <1B>H<25>H<n>

[Range] {0 =< n =< FF} data is described in Hex code.

[Outline] Specifying/canceling download characters.
Further, only the lowest bit (n0) is valid for n.
The lowest bit (n0) indicates the following.

n0	Function
0	Selecting download character set
1	Canceling download character set

[Caution] Download characters and download bit images cannot be defined simultaneously.

[Default] n = 0

[See Also] ESC &

ESC & m n1 n2 [d] k

[Function] Define user characters

[Code] <1B>H<26>H<m><n1><n2>[<d>]k

[Range] { m = 0-3 Subcommand}
{20h <= n1 <= FFh }
{n1 <= n2 <= FFh }
{k = (n2-n1+1)*48 for m=2 and k = (n2-n1+1)*16 for m=3 }

[Outline] Defines a group of user characters.

m=0: Copy internal character set A to user character set A (Parameters n1, n2 and d are omitted }

m=1: Copy internal character set B to user character set B (Parameters n1, n2 and d are omitted }

m=2: Define character group with ASCII codes between >=n1 and <=n2 for character set A (12x24). Every character is 48 bytes, two bytes for each line. Only the first nibble of the second byte is used.

m=3: Define character group with ASCII codes between >=n1 and <=n2 for character set B (9x16). Every character is 16 bytes.

[Caution] The data for character set A is composed from left to right and from top to bottom with two bytes for each horizontal line. The first bite contains teh first 8 bits with the left most bit is MSB. The second byte contains only the first nibble (the most significant 4 bits)
The data for character set B is composed from left to right and from top to bottom with only one byte for each horizontal line. The nineth bith is alawys

ESC ! n

[Function] Collective Specifying Printing Mode

[Code] <1B>H<21>H<n>

[Range] {0 =< n=< FF} Data is described in Hex code.

[Outline] Printing mode is assigned. Each n bit indicates the following:

		Va l ue	
Bit	Function	0	1
0	Character Font	Font A	Font B
1	Undefined		
2	Undefined		
3	High-lighting	Canceled	Specified
4	Double height	Canceled	Specified
5	Double width	Canceled	Specified
6	Undefined		
7	Underline	Canceled	Specified

[Caution] - With double height and double width being specified simultaneously, double wide and double high characters are consisted.
- An underline is attached to the full character width, which, however, is not attached to the part having been skipped by the horizontal tab.
Neither is it attached to 90°-right-turned characters.
- The underline width is as having been specified by <ESC ->. (The default setting is 1 dot width.)
- Specification with this command is invalid to Kanji, except specification and cancellation of highlighting
- In case that double wide character and normal character exist in same one line, the layout of underline is consistent one.

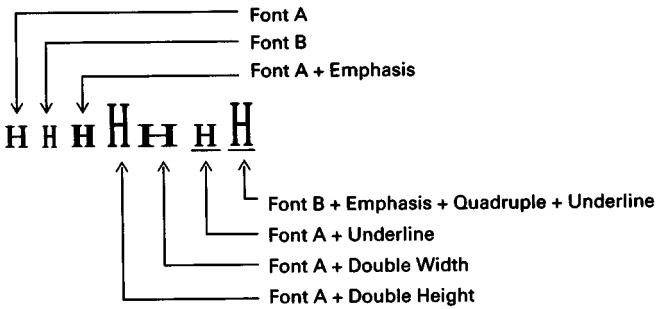
[Default] n = 0

[See Also] ESC E,ESC _

[Sample Program]

```
LPRINT CHR$(&H1B) + "!" + CHR$(&H00) + "H" ;
LPRINT CHR$(&H1B) + "!" + CHR$(&H01) + "H" ;
LPRINT CHR$(&H1B) + "!" + CHR$(&H08) + "H" ;
LPRINT CHR$(&H1B) + "!" + CHR$(&H10) + "H" ;
LPRINT CHR$(&H1B) + "!" + CHR$(&H20) + "H" ;
LPRINT CHR$(&H1B) + "!" + CHR$(&HB9) + "H" ;
LPRINT CHR$(&HA) ;
END
```

[Print Results]



ESC * m n1 n2 [d] k

[Function] Specifying the Bit Image Mode

[Code] <1B>H<2A>H<m><n1><n2> [<d>] k

[Range] {m= 0, 1, 32, 33 bit image mode (See the table below.)}
{0 =< n1 =< FF(Hex)}
{0 =< n2 =< 03(Hex)}
{0 =< d =< FF(Hex)}
{k = n1 + FF(Hex) n2 (m = 0, 1)
{k = (n1+ FF(Hex) n2) 3} (m = 32, 33)

[Outline] According to the number of dots specified in n1, n2, specify the bit image of mode n.
– The No. of dots printed is divided by 256, whose quotient is taken as n2 and residual as n1.
– The total no. of dots printed in the bit image is equal to n1 + (256 x n2).
– When bit image data have been input in excess of dot position of one line (384 dots) , the excess data is handled as normal data.
– d is bit image data, the bits subject to printing are taken as "1" and those not as "0".
– The bit image modes specified by m are shown as follows:

		Vertical Direction		Horizontal Direction	
m(Hex)	Mode	Dots	Dot Density	Dot Density	Max. Dots
0	8-dot single density	8	67 DPI	101 DPI	192
1	8-dot double density	8	67 DPI	203 DPI	384
32	24-dot single density	24	203 DPI	101 DPI	192
33	24-dot double density	24	203 DPI	203 DPI	384

[Caution] – When the values set in m (bit image mode) are out of the above range, the data following after n1 is processed as normal printing data.
– After completion of bit image printing, printer returns to normal data processing mode.

ESC – n

[Function] Specifying/Canceling underline

[Code] <1B>H<2D>H<n>

[Range] 0<n<2

[Outline] Specifying/canceling an underline.

n	Function
0,30h	Canceling an underline
1,31h	Specifying an underline for 1-dot width
2,32h	Specifying an underline for 2-dots width

[Caution] – An underline is attached to the full character width. It is, however, not attached to the part having been skipped by horizontal tab command.
– An underline is not attached to a 90 - right-turned characters.

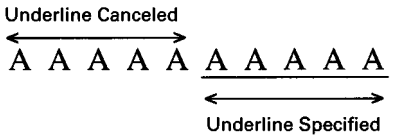
[Default] n = 0

[See Also] ESC !

[Sample Program]

```
LPRINT CHR$(&H1B) + "-" + CHR$(0);
LPRINT "AAAAA";
LPRINT CHR$(&H1B) + "-" + CHR$(1);
LPRINT "AAAAA" + CHR$(&HA);
END
```

[Print Results]



ESC .

[Function] Printer self test
[Code] <1B>H<2E>H
[Range] none
[Outline] Prints character table, character samples with different attributes and diagnostics.
[See Also] ESC T

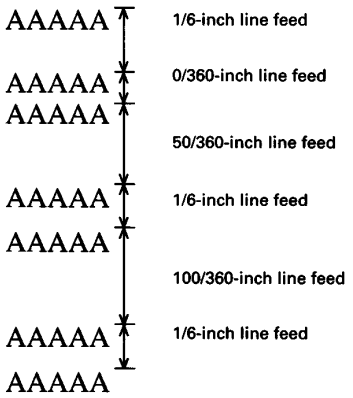
ESC 2

[Function] Specifying 1/6-inch line feed rate
[Code] <1B>H<32>H
[Outline] The line feed rate per line is specified by 1/6 inch.

[Sample Program]

```
LPRINT "AAAAA" + CHR$ (&HA);
LPRINT CHR$ (&H1B) + "3" + CHR$ (0);
LPRINT "AAAAA" + CHR$ (&HA);
LPRINT CHR$ (&H1B) + "3" + CHR$ (50);
LPRINT "AAAAA" + CHR$ (&HA);
LPRINT CHR$ (&H1B) + "2";
LPRINT "AAAAA" + CHR$ (&HA);
LPRINT "AAAAA";
LPRINT CHR$ (&H1B) + "J" + CHR$ (100);
LPRINT "AAAAA" + CHR$ (&HA);
LPRINT "AAAAA" + CHR$ (&HA);
```

[Print Results]



ESC 3 n

[Function] Setting line feed rate of minimum pitch

[Code] <1B>H<33>H<n>

[Range] {0 =< n =< FF} Data is described in Hex code.

[Outline] The line feed rate per line is specified by n/360 inch.
Since an actual mechanical pitch is 1/203 inch,
it is internally converted approximate to the value specified with this command.

[Default] The initial value is n = 60 (1/6 inch) (18H), being 4.23 mm line feed rate.

[Sample Program] See Sample Program and Print Results for ESC 2

ESC = n

[Function] Data Input Control

[Code] <1B>H<3D>H<n>

[Range] {0 =< n =< FF} Data is described in Hex code.

[Outline] Selecting equipment in which data input from the host is effective.
– Each bit of n indicates as follows:

Bit	Equipment	Va l ue	
		0	1
0	Printer	Invalid	Valid
1	Not defined		
2	Not defined		
3	Not defined		
4	Not defined		
5	Not defined		
6	Not defined		
7	Not defined		

– When the printer has not been selected, this printer abandons all the received data until it is selected by this command.

[Caution] – Even when the printer has not been selected, it can become BUSY state through printer operation.
– When the printer is deselected, this printer discards all the data until it is selected with this command.

[Default] The initial value of n is “1”.

[Sample Program]

```
LPRINT “AAAAA”;
LPRINT CHR$ (&H1B) + “=” + CHR$ (0);
LPRINT “aaaaa” + CHR$ (&HA);
LPRINT CHR$ (&H1B) + “=” + CHR$ (1);
LPRINT “AAAAA” + CHR$ (&HA);
```

[Print Results]

A A A A A C C C C C
↑
BBBBB is not printed

ESC @

[Function] Initializing the Printer

[Code] <1B>H<40>H

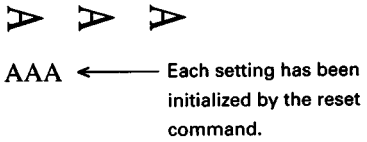
[Range] Clears data stored in the print buffer and brings various settings to the initial state (Default state).

[Caution] Data inside the internal input buffer are not cleared.

[Sample Program]

```
LPRINT CHR$ (&H1B) + " ! " + CHR$ (&H30) ;
LPRINT CHR$ (&H1B) + "V" + CHR$ (1);
LPRINT "AAA" + CHR$ (&HA);
LPRINT CHR$ (&H1B) + "@";
LPRINT "AAA" + CHR$ (&HA);
```

[Print Results]



ESC D [n] k NUL

[Function] Setting Horizontal Tab Position

[Code] <1B>H<44>H [<n>] k<00>H

[Range] {0 =< n =< FFH} Data is described in Hex code.
{0 =< k =< 20H} Data is described in Hex code.

[Outline] Specifying a horizontal tab position.
– "n" indicates the no. of columns from the beginning to the horizontal tab position.
At this time, n= set position _ 1 is to be specified. For example, to set the position at 9th column, n=8 is to be specified.
– k denotes the number of horizontal tab positions you want to set.
– The tab position is set at position where it is "character width x n" from the line beginning.
The character width, at this time, includes the rightward space amount.
In double wide characters, it is made double of the ordinary case.
– Tab positions can be specified are maximum 32.
Specifying exceeding this is ignored.
<n> k, which denotes a setting position, is input in the increasing order and ends at <00> H.
– ESC D NUL clears all the set tab positions. Following clearing, horizontal tab command is ignored.

[Caution] When the data, <n> k, is equal to or smaller than its preceding data, <n> k-1, it is assumed that tab setting is finished. If this is the case, the next data onward will be processed as normal data.
When the data, <n> k, exceeds a 1-line print area, set the horizontal tab position, assuming "Set digit position = Maximum print digits + 1." The horizontal tab position does not change even if the character width is altered after setting the horizontal tab position.

[Default] Initial value is specified for each eight characters (9th.17th.25th column) of ANK characters.

[See Also] HT

[Sample Program]

[Print Results]

See Sample Program and Print Results for HT.

ESC E n

[Function] Specifying/canceling highlighting

[Code] <1B>H<45>H<n>

[Range] {0 =< n =<FF} Data is described in Hex code.

[Outline] Specifying/canceling the highlighting characters.
• “n” is valid only for the lowest bit (n0).
• Control by the lowest bit (n0) is shown as follows:

n0	Type
0	Canceling highlighting.
1	Specifying highlighting.

• This is effective to all characters.
• Dot configuration of a highlighted character includes one extra dot added at its side.

[Caution] – The print result of Double printing and highlight character printing is completely same.

[See Also] ESC !

[Sample Program]

```
LPRINT CHR$ (&H1B) + “E” + CHR$ (0);
LPRINT “AAABBB” + CHR$ (&HA);
LPRINT CHR$ (&H1B) + “E” + CHR$ (1);
LPRINT “AAABBB” + CHR$ (&HA);
```

[Print Results]

AAABBB ← Highlighting canceled

AAABBB ← Highlighting specified

ESC G n

[Function] Specifying/canceling Double Printing

[Code] <1B>H<47>H<n>

[Range] {0 =< n =< FF} Data is described in Hex code.

[Outline] Specifying/canceling the double printing.
• “n” is valid only for the lowest bit (n0).
• Control by n is shown as follows.

n0	Type
0	Canceling double printing.
1	Specifying double printing.

• This is effective to all characters.

[Caution] – The print result of Double printing and highlight character printing is completely same.

[See Also] ESC E

[Sample Program]

```
LPRINT CHR$ (&H1B) + “G” + CHR$ (0);
LPRINT “AAABBB” + CHR$ (&HA);
LPRINT CHR$ (&H1B) + “G” + CHR$ (1);
LPRINT “AAABBB” + CHR$ (&HA);
```

[Print Results]

AAABBB ← Highlighting canceled

AAABBB ← Highlighting specified

ESC J n

[Function] Printing and feeding paper n/203 inch

[Code] <1B>H<4A>H<n>

[Range] {0 =< n =< FF} Data is described in Hex code.

[Outline] Prints data inside the print buffer and feeds paper by n/360 inch. Since an actual mechanical pitch is 1/203 inch, it is inte nally converted approximate to the value specified with this command.
– Specified volume does not remain.
– The beginning of the line is to be considered as the next printing start position.
– Initial value is not defined.

[Sample Program]

[Print Results]

See Sample Program and Print Results for ESC 2 on Page 48.

ESC T

[Function] Printing of diagnostic information

[Code] <1B>H<54>H

[Range] {0 =< n =< 4} Data is described in Hex code.

[Outline] Prints diagnostic information for the printer

ESC V n

[Function] Specifying/Canceling 90°-right- turned Characters

[Code] <1B>H<56>H<n>

[Range] {0 =< n =< 1} Data is described in Hex code.

[Outline] Specifying/canceling characters 90°-right- turned character. “n” means the followings.

n (Hex)	Condition
0	Canceling 90°-right- turned Characters
1	Specifying 90°-right- turned Characters

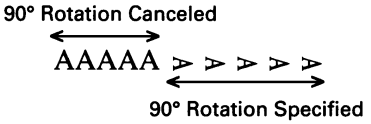
[Caution] No underlines are attached to 90°-right- turned characters.

[Default] The initial value of n is “0”.

[Sample Program]

```
LPRINT CHR$ (&H1B) + “V” + CHR$ (0);
LPRINT “AAAAA”;
LPRINT CHR$ (&H1B) + “V” + CHR$ (1);
LPRINT “AAAAA” + CHR$ (&HA);
```

[Print Results]



ESC Y n

[Function] Specifying print density

[Code] <1B>H<59>H<n>

[Range] {0 =< n =< 5} Data is described in Hex code.

[Outline] Specifies the print density.
"n" means the followings.

n (Hex)	Condition
0	70% density
1	80% density
2	90% density
3	100%density
4	120 %density
5	150 %density

[Caution] Higher density may lead to slower printing

[Default] The initial value of n is "3".(100%)

[Sample Program]

```
LPRINT CHR$ (&H1B) + "Y" + CHR$ (0);
LPRINT "AAAAA";
LPRINT CHR$ (&H1B) + "Y" + CHR$ (5);
LPRINT "AAAAA" + CHR$ (&HA);
```

[Print Results]

ESC \ n1 n2

[Function] Specifying the relative positions

[Code] <1B>H<5C>H<1n><2n>

[Range] 0 ≤ 1n ≤ 225
0 ≤ 2n ≤ 225

[Outline] The printing starts position is specified in the number of dots (1/203 inch unit) from the current position.
• Rightward direction is taken as plus and leftward direction as minus
• To specify N dot in minus (left) direction, use a complement of N for assignment.
– N dots = 65536 – N
• The number of dots is divided by 256, whose quotient is taken as n2 and the residual as n1.

[Caution] • Specifying exceeding the top of line or the end of line is ignored.
• One line consists of 384 dots.

[Default] The initial value is not specified.

[Sample Program] See Sample Program and Print Results for ESC $.

[Print Results]

ESC a n

[Function] Aligning the characters

[Code] <1B>H<61>H<n>

[Range] {0 =< n =< 2} Data is described in Hex code.

[Outline] All the printed data within one line are aligned in the specified position.
Depending on n value, positional alignment is carried out as in the table below:

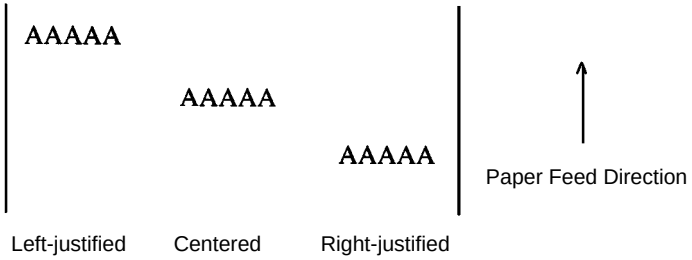
n (Hex)	Position
0	Left end alignment
1	Centering
2	Right end alignment

[Caution] –This is valid only when n is inputted at the beginning of line.
– The initial value of n is “0”.

[Sample Program]

```
LPRINT CHR$ (&H1B) + “a” + CHR$ (0);
LPRINT “AAAAA” + CHR$ (&HA);
LPRINT CHR$ (&H1B) + “a” + CHR$ (1);
LPRINT “AAAAA” + CHR$ (&HA);
LPRINT CHR$ (&H1B) + “a” + CHR$ (2);
LPRINT “AAAAA” + CHR$ (&HA);
```

[Print Results]



ESC c5 n

[Function] Enabling/Disabling Panel Switches

[Code] <1B>H<63>H<35>H<n>

[Range] {0 =< n =< FF} Data is described in Hex code.

[Outline] Selecting the LF switch valid/invalid.
– “n” is valid only in the lowest bit (n0).
– “n” bit means the followings.

n0	Condition
0	LFSW valid.
1	LFSW invalid.

[Caution] When the panel switch is disabled with this command, the LF switch is disabled. Therefore, the paper cannot be fed by operating the LF switch.

[Default] The initial value of n is “0”.

[Sample Program]

```
LPRINT CHR$ (&H1B) + “c5” + CHR$ (0); &#188;&#188;
When enabling the LF switch
LPRINT CHR$ (&H1B) + “c5” + CHR$ (1); &#188;&#188;
When disabling the LF switch
```

ESC d n

[Function] Printing and Feeding the paper by n lines

[Code] <1B>H<64>H<n>

[Range] 0 =< n =< FF} Data is described in Hex code.

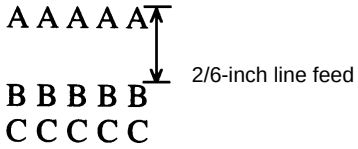
[Outline] Prints data inside the buffer and feeds paper by n lines.
Specified line does not remain.
The beginning of the line is to be considered as
the next printing start position.

[Default] The initial value is not defined.

[Sample Program]

```
LPRINT “AAAAA”
LPRINT CHR$ (&H1B) + “d” + CHR$ (2);
LPRINT “AAAAA” + CHR$ (&HA);
```

[Print Results]



ESC i

[Function] Feeding receipt paper for cutting

[Code] <1B>H<69>H

[Range]

[Outline] This command is used to feed the receipt, so that when it is cut all the information is present on it. This command is used for issuing receipts in POS systems.

[Caution] This command is valid only if it is in the beginning of a line.

[Default] The initial value is not defined.

ESC p m n1 n2

[Function] Generating pulses for cash drawer opening

[Code] <1B>H<70>H<m><n1><n2>

[Range] m is ignored
0 <n1 <255
0< n2< 255

[Outline] The signals specified by “n1” and “n2” are output to the connector pin.
The ON time is n1 * 2 ms, and OFF time n2 * 2 ms.

[Caution] The drawer drive duty must be within the following range:
ON time
ON time + OFF time
(The OFF time should be 4 times or more longer than the ON time.
Otherwise no pulses are generated)

[Default] The initial value for “m”, “n1” and “n2” is not defined.

[Sample Program]

```
LPRINT CHR$(&H1B) + “p”;
LPRINT CHR$(0);
LPRINT CHR$(5); Sets ON time to 10ms
LPRINT CHR$(50); Sets OFF time to 100ms
END
```

ESC v

[Function] Transmitting the printer status

[Code] <1B> H <76> H

[Outline] Current printer status is transmitted..

[Caution] –Status sent out consists of 1 byte whose content is as in the table below.
– In DTR/DSR control, after receptible state of the host (DSR signal being in SPACE state) is confirmed, only 1 byte is transmitted. In XON/XOFF control, -bDSR signal state not being confirmed, only 1 byte is transmitted.
– In DTR/DSR control, when the host is in unreceptible state (DSR signal being in MARK state), it waits until receptible state is created.
– In paper end (paper near end) status, this command may be unreceptible state due to BUSY state.

		Value	
Bit	Function	0	1
0	Not defined		
1	Not defined		
2	Paper end	With paper	Without paper
3	Not defined		
4	Not used	Fixed to 0 -	
5	Not defined		
6	Not defined		
7	Not defined		

[Sample Program]

```
OPEN “COM1:N81NN” AS #1 ;
PRINT #1, CHR$ (&H1B) ; “v” ;
A$ = INPUT$ (1, #1) ;
CLOSE #1
END
```


ESC { n

[Function] Specifying/Canceling the Inverted Characters

[Code] <1B>H<7B>H<n>

[Range] {0 =< n =< FF} Data is described in Hex code.

[Outline] Specifying/canceling inverted characters.
– “n” is valid only for the lowest bit (n0).
– Bit n (n0) means the followings.

n0	Condition
0	Canceling inverted characters.
1	Specifying inverted characters.

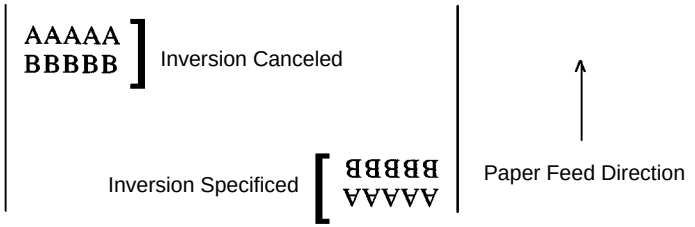
[Caution] – Inverted-printing means printing the line at 180°turned.
– This is valid only when this is specified at the beginning of a line.

[Default] – The initial value of n is “0”.

[Sample Program]

```
LPRINT CHR$ (&H1B) + “{“ + CHR$ (0);
LPRINT “AAAAA” + CHR$ (&HA);
LPRINT “BBBBB” + CHR$ (&HA);
LPRINT CHR$ (&H1B) + “{“ + CHR$ (1);
LPRINT “AAAAA” + CHR$ (&HA);
LPRINT “BBBBB” + CHR$ (&HA);
```

[Print Results]



GS k n [d] k NUL

[Function] Printing the Bar Code

[Code] <1D>H<6B>H<n> [< d>] k <00>H

[Range] {0 =< n =< 7} Data are described in Hex code.

[Outline] Specifying a type of bar code and printing bar codes.
– The beginning of line is considered as the next printing start position.
– Depending on the value of n, the following bar code can be selected.
– d indicates a character code to be printed and k indicates the number of character to be printed.

n (Hex)	Bar Code System	Maximum Columns
0	UPC-A	–
1	UPC-E	–
2	JAN13 (EAN)	–
3	JAN 8 (EAN)	–
4	CODE 39	11
5	ITF	22
6	CODABAR (NW-7)	15
7	CODE 128	14
8	CODE 93	

[Caution] – When data being held in the print buffer, this command is ignored.
– Regardless of the specified feed pitch, this command feeds the paper to be required to print a bar code.
– If the character code d cannot be printed in the respective bar code system, the bar code so far will be printed, processing the subsequent data as normal data.
– When a bar code whose number of characters to be printed is fixed has been selected, the number of characters k have to be always made equal to the number of characters to be printed. (The bar code is not printed when not matching.)
– When the horizontal direction exceeds one line length, the excess part is not printed.

[Default] The initial value is not specified.

[Description of Bar Codes] For print examples, see Page 67. >

UPC-A This bar code, consisting of numerals only, has a fixed length of 12 column; a 11-columns number entered from the host or application software plus a check column(12th column) automatically calculated inside the printer. If the 12th-column numeral is sent from the host, the entire bar code will be printed as it is.

UPC-E This bar code, consisting of numerals only, has a fixed length of 8 column; the first number system character is “0” stationary. A 12 column numeral entered from the host or application software is compressed to 8 columns with a check column and printed. The 12th-column check column is automatically calculated inside the printer and sent from the host, the entire bar code will be printed, compressed to 8 columns.

JAN-13 (EAN) This bar code, consisting of numerals only, has a fixed length of 13 column; a 12-column number entered from the host or application software plus a check column(13th column) automat cally calculated inside the printer. If the 13th-column numeral is sent from the host, the entire bar code will be printed as it is.

JAN-8 (EAN) This bar code, consisting of numerals only, has a fixed length of 8 column; a 7-column number entered from the host or application software plus a check column(8th column) automatically calculated inside the printer. If the 8th-column numeral is sent from the host, the entire bar code will be printed as it is.

CODE39 This bar code, consisting of uppercase alphabets and numerals, has a variable length of column. A start/stop code “*” is automatcally added by the printer. Available characters include a space and “$, %, +, -, · , /, 0, 1, 2, 3, 4, 5, 6, 7, 8, 9,” and uppercase alphabets. ITF This bar code, consisting of numerals only, has a variable length of even column. If an odd-column code is tranferred, nothing will be printed.

CODABAR (NW-7) This bar code, consisting of alpha numerals, has a variable length of column. Available characters include “0, 1, 2, 3, 4, 5, 6, 7, 8, 9, A, B, C, D, $, +, -,., /, :.” A start/stop code is required; any one of A, B, C, and D is used.

CODE128 This bar code consists of all of 128 ASCII code characters and has a variable length of column. This printer supports the code subsets A, B, and C. By prefixing a transfer code with any one character of A, B, and C, you can select the code subset to start from.
If not prefixed with A, B, or C, the code subset B will be selected.

– The code subset A is the bar code consisting of standard uppercase alphabets, numerals, symbols, and special codes.
– The code subset B is the bar code consisting of standard uppercase/lowercase alphabets, numerals, symbols, control codes, and special codes.
– The code subset C is the bar code consisting of special characters and 100 kinds of numbers ranging from 00 to 99.

The check column automatically calculated inside the printer is added to the end of the entered column to be printed.

– Processing of the special characters
The characters above the ASCII code number 96 are considered special characters. The following lists the converted characters for entering these characters.

ASCII Code	Converted Character	Subset Code A	Subset Code B	Subset Code C
96	80h	FNC 3	FNC 3	-N/A-
97	81h	FNC 2	FNC 2	-N/A-
98	82h	SHIFT	SHIFT	-N/A-
99	83h	CODE C	CODE C	-N/A-
100	84h	CODE B	FNC 4	CODE B
101	85h	FNC 4	CODE A	CODE A
102	86h	FNC 1	FNC 1	FNC 1

The following exemplifies a selection of the code subset as a method to utilize the special characters.

<Selection of Code Subset>
Initial selection: Enter any one character of A, B, and C.
Conversion on the way: Enter any one character of 82h through 85h Example) When initially testing with the code subset B, and then, printing the bar code, “123,” with the code subset A
Input code : B TEST <85> 123
Bar code data : <CODE B>TEST<CODE A>123

[Sample Program]

```
LPRINT CHR$ (&H1D) + “H” + CHR$ (2);
LPRINT CHR$ (&H1D) + “k”;
LPRINT CHR$ (4);
LPRINT “123” + CHR$ (0);
```

[Print Results]

When the data “123” is printed with the code 39

[Descriptionof BarCodes]

UPC-A, UPC-E, JAN-13 (EAN), JAN-8 (EAN), CODE39, ITF, CODABAR, CODE128

Type	Print Sample	Outline of Symbol	Max. column
UPC-A		12-column fixed-length bar code consisting of numerals only	–
UPC-E		8-column fixed-length bar code consistingof numerals only. Abbreviated version of UPC-A	–
JAN-13		13-column fixed-length bar code consisting of numerals only	–
JAN-8		8-column fixed-length bar code consisting of numerals only	–
CODE39		Variable-length bar code consisting of alphabets and numerals. The start/stop code “*” is automatically added.	11
ITF		Even-column variable-length bar code consisting of numerals only	22
CODABAR (NW-7)		Variable-length bar code consisting of alpha numerals. Any one of A, B, C, and D is required as the start/stop code.	15
CODE128		Variable-length bar code consisting of all 128 ASCII code characters.	14

Printing is done depending on bar code specification type, number of print column, bar code height, width (Magnification), visible code presence, and bar code data specification.

GS w n

[Function] Selecting the horizontal size (Scale factor) of the Bar Code

[Code] <1D>H <77>H<n>

[Range] {2 =< n =< 4} Data is described in Hex code.

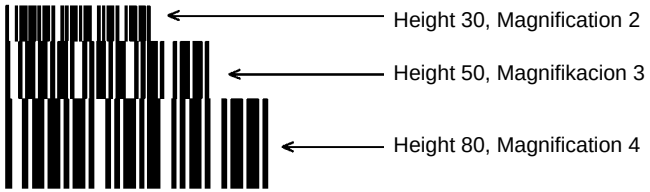
[Outline] Selecting bar code width.
n denotes the number of dots in fine element width.

[Default] The initial value of this width is “3”.

[Sample Program]

```
LPRINT CHR$ (&H1D) + “h” + CHR$ (30);
LPRINT CHR$ (&H1D) + “w” + CHR$ (2);
GOSUB BC
LPRINT CHR$ (&H1D) + “h” + CHR$ (50);
LPRINT CHR$ (&H1D) + “w” + CHR$ (3);
GOSUB BC
LPRINT CHR$ (&H1D) + “h” + CHR$ (80);
LPRINT CHR$ (&H1D) + “w” + CHR$ (4);
GOSUB BC
END
BC:
LPRINT CHR$ (&H1D) + “k”;
LPRINT CHR$ (4);
LPRINT “12” + CHR$ (0);
RETURN
```

[Print Results]



GS h n

[Function] Selecting the height of the Bar Code

[Code] <1D>H<68>H<n>

[Range] {1 =< n =< FF} Data is described in Hex code.

[Outline] Selecting bar code height.
n denotes the number of dots in the vertical direction.

[Default] The initial value of n is “162”.

[Sample Program]

[Print Results]

See Sample Program and Print Results for GS w on page 68.

GS H n

[Function] Selecting of Printing Position of HRI Code

[Code] <1D>H<48>H<n>

[Range] {0 =< n =< 3} Data is described in Hex code.

[Outline] Selecting printing position of HRI code in printing bar codes.
– “n” means the followings.

n (Hex)	Printing Position
0	No printing
1	Above the bar code
2	Below the bar code
3	Both above and below the bar code

The HRI code refers to the bar code-turned characters so that you can read them.

[Caution] The HRI code is printed in the font selected with GS f. Specify before the GS k command.

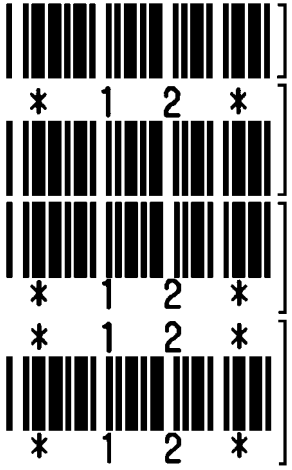
[Default] The initial value of n is “0”.

[See Also] GS f

[Sample Program]

```
LPRINT CHR$ (&H1B) + “3” + CHR$ (5);
LPRINT CHR$ (&H1D) + “h” + CHR$ (50);
LPRINT CHR$ (&H1D) + “H” + CHR$ (0);
GOSUB BC
LPRINT CHR$ (&H1D) + “H” + CHR$ (1);
GOSUB BC
LPRINT CHR$ (&H1D) + “H” + CHR$ (2);
GOSUB BC
LPRINT CHR$ (&H1D) + “H” + CHR$ (3);
GOSUB BC
END
BC:
LPRINT CHR$ (&H1D) + “k”;
LPRINT CHR$ (4);
LPRINT “12” + CHR$ (0);
LPRINT CHR$ (&HA);
RETURN
```

[Print Results]



No Visible Code

Printed above

Printed below

Printed above and below

GS f n

[Function] Selecting the font of HRI code

[Code] <1D>H<66>H<n>

[Range] n = 0, 1

[Outline] Selecting the font of HRI code in printing bar code.
The type of font can be printed by selecting n is as follows.
The HRI code refers to the bar code-turned characters
so that you can read them.

n	Font
0	Font A
1	Font B

[Caution] The HRI code is printed at the position specified with GS h on page 63.

[Default] The initial value of n is “0”.

[See Also] GS H

[Sample Program]

```
LPRINT CHR$ (&H1D) + “h” + CHR$ (50);
LPRINT CHR$ (&H1D) + “H” + CHR$ (2);
LPRINT CHR$ (&H1D) + “f” + CHR$ (0);
GOSUB BC
LPRINT CHR$ (&H1D) + “f” + CHR$ (1);
GOSUB BC
END
BC:
LPRINT CHR$ (&H1D) + “k”;
LPRINT CHR$ (4);
LPRINT “123” + CHR$ (0);
LPRINT CHR$ (&HA);
RETURN
```

[Print Results]

FONT A

FONT B

GS * n1 n2 [d] n1 n2 D1 ..... Dn

[Function] Defining the Download Bit Image (LOGO)

[Code] <1D>H<2A>H<n1><n2> [< d >]

[Range] {1 =< n1 =< 7F} defines horizontal size of downloaded image.
{1 =< n2 =< F8} defines the vertical size of downloaded image

[Outline] Defines downloading bit images of the number of dots specified by n1/n2.
The numbers of dots are n1 x 8 in horizontal direction and n2 x 8 in vertical direction. The number of horizontal bytes can be up to 7F, but only the first 48 (30H) bytes will be printed. The rest will be rejected.
– d indicates bit image data.
– The download bit image thus defined remains effective until redefinition, ESC @ execution, ESC &. It remains downloaded even after Power is switched OFF.

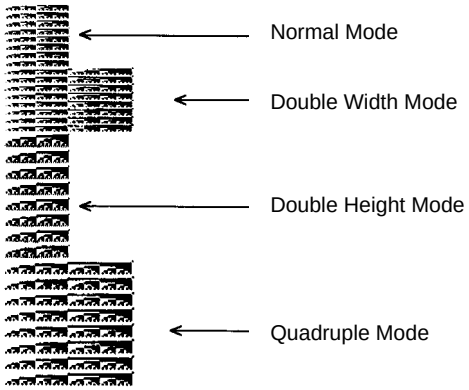
[Caution] – A download character and a download bit image can not be defined simulta neously.
– With this command executed, defined content of a download character is cleared.
The maximum size of the Bit image cannot exceed 16KB.
Relations between the bit image data and the dot defined are shown below:

[See Also] GS /

[Sample Program]

```
GOSUB IMG
LPRINT CHR$ (&H1D) + "/" + CHR$ (0);
LPRINT CHR$ (&H1D) + "/" + CHR$ (1);
LPRINT CHR$ (&H1D) + "/" + CHR$ (2);
LPRINT CHR$ (&H1D) + "/" + CHR$ (3);
END
IMG:
n 1 = 10 : n 2= 5
LPRINT CHR$ (&H1D) + "*";
LPRINT CHR$ (n1) + CHR$ (n2);
FOR J=1 TO n1*8
FOR I=1 TO n2
LPRINT CHR$ (J);
NEXT I
NEXT J
RETURN
```

[Print Results]



GS / m

[Function] Printing the Download, Bit Image

[Code] <1D>H<2F>H<m>

[Range] {0 =< m =< 03} Data is described in Hex code.

[Outline] Prints download bit image in a mode specified by m.
– Modes can be selected by m are shown below.

m Mode	Name Dot	Density in Vertical Direction	Dot Density in Horizontal Direction
0	Normal mode	203 DPI	203 DPI
1	Double wide mode	203 DPI	101 DPI
2	Double high mode	101 DPI	203 DPI
3	Double wide/double high mode	101 DPI	101 DPI

[Caution] – When data exist inside the print buffer, this command is ignored.
– When a download bit image has not been defined, this command is ignored.
– A portion of a download bit image exceeding one line length is not printed.
– A download character and a download bit image cannot be defined simultaneously.

[Default] The initial value is not specified.

[See Also] GS *

[Sample Program]

[Print Results]

See Sample Program and Print Results for GS *.

GS :

[Function] Starting / Ending Macro Definition

[Code] <1D>H<3A>H

[Outline] Specifying starting / ending macro definition.
Means termination when received while defining a macro.

[Caution] – Maximum content available for macro definition is 2048 bytes.
– A portion exceeding 2048 bytes is not defined.
– Even with ESC @ (initialization of the printer) having been executed, defined content is not cleared. Therefore, it is possible to include ESC @ into the content of macro definition.
– Normal printing operation is carried out even while in macro definition

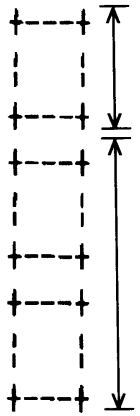
[Default] Initially, Macro is not specified.

[See Also] GS ^

[Sample Program]

```
LPRINT CHR$ (&H1D) + ": " ;
LPRINT "+___+" + CHR$ (&HA);
LPRINT " | | " + CHR$ (&HA);
LPRINT "+___+" + CHR$ (&HA);
LPRINT CHR$ (&H1D) + ": ";
LPRINT CHR$ (&H1D) + " ^ ";
LPRINT CHR$ (2) + CHR$ (10);
LPRINT CHR$ (0);
```

[Print Results]



GS ^ n1 n2 n3

[Function] Executing the Macro

[Code] <1D>H<5E>H<n1><n2><n3>

[Range] {0 =< n1 =< FF}
{0 =< n2 =< FF}
{0 =< 3 =< 1} Data is described in Hex code.

[Outline] Executing contents defined in macro.
"n1~ n3" indicate as follows:
n1 : The number of times of macro execution
n2 : Waiting time on macro execution
Waiting time of n2 x 100msec is given for every execution.
n3 : Macro execution mode

n3	Mode
0	Continuous execution
1	Execution by LFSW

Continuous execution: The Macro is executed n1 times continuously at the time intervals specified by n2.
Execution by FEED S: After waiting for lapse of time specified by n2, the LF switch is waited to be pressed. When it is pressed, the macro is executed once.
This action is repeated n1 times.

[Caution] – When this command is received while in macro definition, suspension of macro definition is indicated. At this time, the defined content is cleared.
– No execution takes place when macro is held undefined or n1=0.
– While in macro execution with n3=1, paper feed with the LF SW is not available.

[Default] Initially, this command is not specified.

[See Also] GS :

[Sample Program]

[Print Results]
See Sample Program and Print Results for GS : .

GS B n

[Function] Specifying/Canceling the black/white inverted printing

[Code] <1D>H<42>H<n>

[Range] 0 n 255

[Outline] This command specifies or cancels the black/white inverted printing.
– "n" is valid only for the lowest bit (n0).
– Control by the lowest bit (n0) is shown as follows:

n0	Function
0	The black/white inverted printing is canceled.
1	The black/white inverted printing is specified.

[Caution] – Number "n" is only valid in the lowest bit.
– The black/white inversion works on internal and downloaded characters.
– The black/white inversion works also on the right spacing of characters defined by ESC SP.
– This command does not affect the bit image, downloaded bit image, bar code, HRI characters, or the skip area specified by HT, ESC $, or ESC \.
– This command does not affect the space between lines.
– Black/white inversion specification takes precedence over underline specification. Underline printing specified is, therefore, nullified if black/white inversion is specified; the underline setting, however, remains unchanged.

[Default] n = 0

Notes

Notes

Notes