

User's Manual

CITIZEN TERMINAL SLIP PRINTER MODEL CBM-820

Japan CBM Corporation

Declaration of Conformity

Manufacturer's Name : Japan CBM Corporation
Manufacturer's Address : CBM Bldg., 5-68-10, Nakano, Nakano-ku,
Tokyo 164-0001 Japan

Declare the Product

Product Name : Terminal Slip Printer
Model Number(s) : CBM-820
(CBM-820R, CBM-820P)
(S. No.9890001 -)

Conform to the following Standards

LVD : EN60950 : A4:1997
EMC : EN55022 : 1994 Class B
: EN61000-3-2 : 1995
: EN61000-3-3 : 1995
: EN50082-1 : 1997
: EN61000-4-2 : 1995 ± 4 KV CD, ± 8 KV AD
: EN61000-4-3 : 1995 3V/m, 80MHz-1000MHz AM 1KHz 80%
: ENV50204 : 1995 3V/m,895MHz-905MHz
(Pulse 200Hz,duty cycle50%)
: EN61000-4-4 : 1995 ± 1.0 KV(AC Mains), ± 0.58 KV (Signal Lines)
: EN61000-4-5 : 1995 1KV Differential mode, 2KV Common mode
: EN61000-4-6 : 1996 3V, 0.15MHz-80MHz AM 1KHz 80%
: EN61000-4-8 : 1993 50Hz, 3A/m
: EN61000-4-11 : 1991-80%, 10ms/-60%,100ms/-100%, 5000ms

Supplementary Information

"The product complies with the requirements of the Low Voltage Directive 73/23/EEC, 93/68/EEC and the EMC Directive 89/336EEC, 92/31/EEC, 93/68EEC"

Place : Tokyo, Japan

Signature



Date :August.1998

Full Name : Mikio Moriya

Position : General Manager
R & D Department

European Contact :

Norco Declaration AB

Box 7146 S-250 07 Helsingborg Sweden

This declaration is applied only for 230V model.

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 or 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 are not 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 by 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.

WICHTIGE SICHERHEITSANWEISUNGEN

- Lesen Sie die nachfolgenden Anweisungen sorgfältig durch und bewahren Sie sie auf.
- Befolgen Sie alle auf dem Drucker vermerkten Hinweise und Anweisungen. Vor dem Reinigen grundsätzlich Stecker aus der Steckdose ziehen. Keine Flüssigkeiten oder Aerosolreiniger benutzen. Nut mit einem feuchten Tuch abwischen.
- Der Drucker darf nicht in der Nähe von Wasser aufgestellt werden.
- Drucker nicht auf einem unstabilen Wagen, Stand oder Tisch aufstellen. Der Drucker könnte herunterfallen und dabei beschädigt werden.
- Schlitze und Öffnungen im Gehäuse, in der Rückwand und im Boden dienen der Belüftung. Sie dürfen keinesfalls zugedeckt oder blockiert werden, da sich der Drucker sonst überhitzt. Drucker nicht auf ein Bett, Sofa, Teppich oder dergleichen stellen. Drucker nicht in der Nähe eines Heizkörpers aufstellen. Drucker darf nicht eingebaut werden, falls nicht für ausreichende Belüftung gesorgt ist.
- Drucker nur mit der auf dem Typschild angegebenen Spannung betreiben. Wenn Sie sich nicht sicher sind, fragen Sie ihren Händler oder ihr zuständiges Elektrizitätswerk.
- Nichts auf das Stromanschlußkabel stellen. Kabel muß so verlegt werden, daß man nicht darauftreten kann.
- Ein etwaiges Verlängerungskabel muß der Stromstärke aller daran angeschlossenen Geräte entsprechen.
- Keine Gegenstände in die Gehäuseschlitze schieben.
- Drucker darf nur da gewartet werden, wo im Handbuch angegeben, Öffnen und. Abnehmen von Abdeckungen, die mit "Do not remove" gekennzeichnet sind, könnte gefährliche spannungsführende Stellen oder sonstige Gefahrenpunkte freilegen. Die Wartung solcher Stellen darf grundsätzlich nur von besonders ausgebildetem Fachpersonal vorgenommen werden.
 - A. Wenn das Stromanschlußkabel oder der Stecker beschädigt oder durch-gescheuert ist.
 - B. Wenn Flüssigkeit auf dem Drucker verschüttet wurde.
 - C. Wenn der Drucker im Regen gestanden hat oder Wasser darauf verschüttet wurde.
 - D. Wenn der Drucker trotz genauer Befolgung der Betriebsvorschriften nicht richtig arbeitet. Nur die in der Bedienungsanleitung angegebenen Einstellungen vornehmen. Ein Verstellen anderer Bedienungselemente könnte den Drucker beschädigen und macht umständliche Arbeiten eines qualifizierten Technikers erforderlich, um den Drucker Wieder auf den normalen Betrieb einzustellen.
 - E. Wenn der Drucker heruntergefallen ist oder das Gehäuse beschädigt wurde.
 - F. Wenn der Drucker in seiner Leistung nachläßt.
- Bitte halten Sie den Kunststoffbeutel, in den die Ware verpackt ist, von Kindern entfernt, oder werfen Sie ihn weg, damit er nicht in die Hände von Kindern gerät. Das Überstülpen des Beutels kann zum Ersticken führen.

Lärmemission kleiner 70 dBA

IMPORTANT: This equipment generates, uses, and can radiate radio frequency energy and if not installed and used in accordance with the instruction manual, may cause interference to radio communications. It has been tested and found to comply with the limits for a Class A computing device pursuant to Subpart J of Part 15 of FCC Rules, which are designed to provide reasonable protection against such interference when operated in a commercial environment. Operation of this equipment in a residential area is likely to cause interference, in which case the user at his own expense will be required to take whatever measures may be necessary to correct the interference.

CAUTION: Use shielded cable for this equipment.

Sicherheitshinweis

Die Steckdose zum Anschluß dieses Druckers muß nahe dem Gerät angebracht und leicht zugänglich sein.

For Uses in Canada

This digital apparatus does not exceed the class A limits for radio noise emissions from digital, apparatus, as set out in the radio interference regulations of the Canadian department of communications.

Pour L'utilisateurs Canadiens

Cet appareil numérique ne dépasse pas les limites de catégorie A pour les émissions de bruit radio émanant d'appareils numériques, tel que prévu dans les règlements sur l'interférence radio du département Canadien des communications.

< CAUTIONS >

1. 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.
2. The information contained herein may be changed without prior notice.
3. Reproduction of part or all of this User's Manual without permission is strictly prohibited.
4. Never service, disassemble, or repair parts that are not mentioned in this User's Manual.
5. Note that we will not be responsible for damages attributable to a user's incorrect operation/ handling or an improper operating environment.
6. Operate the equipment only as described in this User's Manual; otherwise accidents or problems may result.
7. 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.
8. If you have any questions or notice any clerical errors or omissions regarding the information in this manual, please contact our office.
9. Please note that, notwithstanding Item 8 above, we will not be responsible for any effects resulting from operation of the equipment.

Note:

- Citizen and Citizen logo are registered trademarks of Citizen Watch Co., Ltd.
- ESC/POS and TM-295 are trademarks of Seiko Epson Co., Ltd.
- Auto Side Loading™ is a trademark of Star Micronics Co., Ltd.
- Windows codepage is a registered trademark of Microsoft Corporation.

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 equipment 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 adversely 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 injury 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.

1. Printer Setup

This chapter contains important information on setting up your printer. Be sure to read this chapter carefully before using the printer for the first time. In this chapter you will learn about:

- Choosing a place for the printer
- Unpacking and setting up the printer
- Installing the ribbon cassette
- Connecting to a host computer
- Inserting paper

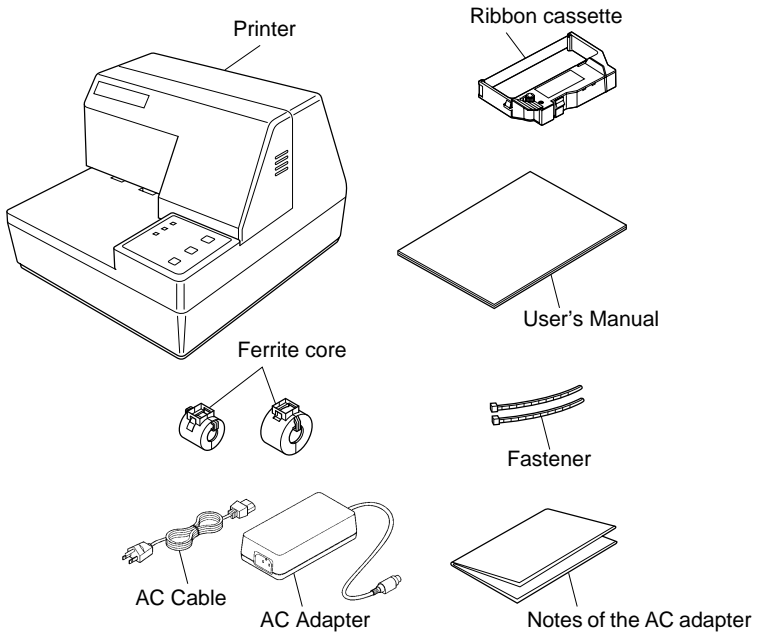
1.1 Choosing a place for the printer

Before actually unpacking the printer, you should take a few minutes to think about where you plan to use it. Remember the following points when doing this.

- ✓ Choose a firm, level surface where the printer will not be exposed to vibration.
- ✓ The power outlet you plan to connect to for power should be nearby and unobstructed.
- ✓ Make sure that the printer is close enough to your host computer for you to connect the two.
- ✓ Make sure that the printer is not exposed to direct sunlight.
- ✓ Make sure that the printer is well away from heaters and other sources of extreme heat.
- ✓ Make sure that the surrounding area is clean, dry, and free of dust.
- ✓ Make sure that the printer is connected to a reliable power outlet. It should not be on the same electric circuit as copiers, refrigerators, or other appliances that cause power spikes.
- ✓ Use a power outlet that matches the power rating noted on the label affixed to the bottom of your printer.
- ✓ Make sure that the room where you are using the printer is not too humid.

1.2 Unpacking the printer

Check to make sure that the carton contains each of the items shown in the following illustration.



Note:

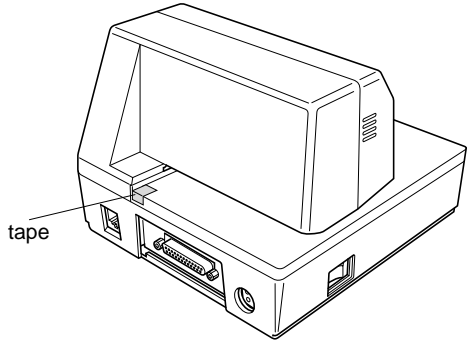
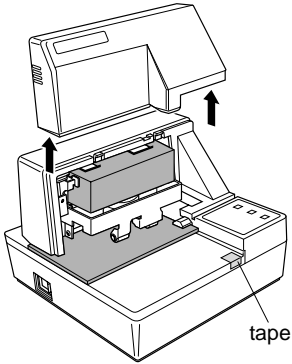
The AC adapter is accompanied by Notes. Be sure to read this document prior to using the AC adapter, and keep it together with this manual.

If anything is missing, contact the dealer where you bought the printer and ask them to supply the missing part. Note that it is a good idea to keep the original box and all the packing materials just in case you need to pack the printer up again and send it somewhere at a later date.

Always keep the Instruction Manual and Notes near the printer, for ready reference whenever necessary.

1.3 Removing the protective materials

Four protective materials are inserted into the printer to protect components during shipping. Before using the printer, be sure to remove all protective materials as shown in the illustration.



2. Specifications

2.1 General Specifications

Printing System	Serial impact dot-matrix
Number of Head Pins	9 wires
Printing Speed	3.1 lines/sec maximum
Number of Print Columns	35
Total dots	210
Printing width	63 mm
Dot spacing	Horizontal: 0.30mm Vertical: 0.35mm
Paper Width	80mm to 182mm
Sensors	Paper out top-of-form, bottom-of-form sensors
Command Modes	ESC/POS mode (TM-295 emulation)
Interface	Serial (RS-232C standard)
Data Buffer	2 K bytes / 35 bytes (Can be selected by DIP switch)
Reliability	Mechanism (MCBF): 2.5 million lines Printer head life: 70 million characters

Operating Environment

Temperature	41°F to 104°F (5°C to 40°C)
Humidity	10% to 80% RH at 40°C (non-condensing)

Storage Environment

Temperature	-4°F to 140°F (-20°C to 60°C)
Humidity	5% to 90% RH at 40°C (non-condensing)

Reliability

Printable lines	MCBF 2,500,000 lines
Head life	70,000,000 characters

Ink Ribbon

Type	Cartridge cassette
Color	Purple
Ribbon Material	Nylon # 40 denier
Life	2.2 million characters

Important!

Use only the specified type of ribbon. Use of another type of ribbon can cause malfunction of and damage to the printer.

Applicable Standards

115 V model: UL, C-UL, FCC Class-A
230 V model: TÜV, CE Marking

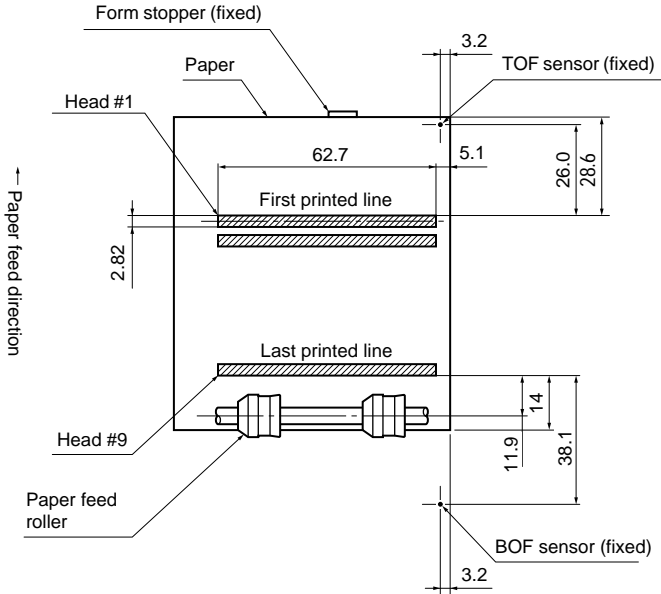
*Those standards are applicable when our exclusive AC adapter (31AD series) is used.

2.2 Printing Specifications

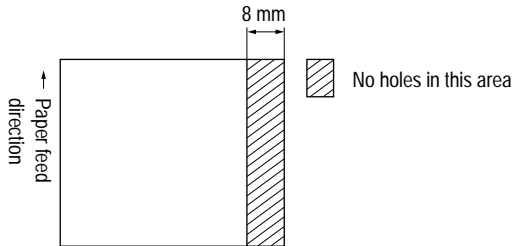
Character Set	Codepage PC437 (USA, European Standard)
	Codepage Katakana (Japanese)
	Codepage PC850 (Multilingual)
	Codepage PC860 (Portuguese)
	Codepage PC863 (Canadian-French)
	Codepage PC865 (Nordic)
	Codepage PC852 (Eastern Europe)
	Codepage PC866 (Russian)
	Codepage PC857 (Turkish)
	Windows Codepage
Codepage PC858 (Multilingual II)	
Character Matrix	7 × 9 (half), 42 columns
	5 × 9, 35 columns
Character Dimensions	7 × 9 font (half): 1.2 (W) × 2.42 (H) mm
	5 × 9 font (2 pulses per dot): 1.5 (W) × 2.42 (H) mm
	5 × 9 font (3 pulses per dot): 2.1 (W) × 2.42 (H) mm

2.3 Paper Specifications and Print Area

Paper Width	80 to 182mm / 3.15" to 7.17"	
Paper Length	80 to 257mm / 3.15" to 10.8"	
Copies	Original + 2	
Paper Thickness	1-ply: 0.09 to 0.2mm / 0.0035" to 0.0079"	
	Duplicates	0.12 mm (minimum for 2-ply forms) to 0.25 mm/0.0047" to 0.0098" <Maximum 0.2 mm when printing graphics>
Copy Offset	1.5mm maximum/15 lines (between top sheet and bottom sheet)	
Binding	Top or left	
Print Area	Distance from first printed line (Head #1) to top of form (form stopper):	28.6 mm
	Distance from first printed line (Head #1) to TOF sensor:	26.0 mm
	(However, with the automatic start position operation, this distance is set to 26.5 mm.	
	The automatic start position operation can be enabled or disabled with the memory switches.	
	When the top-of-form sensor is disabled, a command can be used to perform a reverse paper feed enabling printing to begin at approximately 20 mm from the top of the paper.)	
Distance from last printed line (Head #9) to bottom of form (BOF sensor):	38.1 mm	
(Printing may continue to 27.3 mm from the bottom of the paper.)		
When the BOF sensor is disabled, printing can continue to 14.0 mm from the bottom of the paper.		
Right margin:	5.1 mm	
Print area width:	62.7 mm	



Print Position



Do not use paper with perforations within the shaded area. Perforations may cause the paper sensor to erroneously report an out of paper condition.

Paper Feed

Drive	Stepping motor
Pitch	Adjustable in $n/60''$ units (approximate)
Speed (while printing)	3.5" per second
Speed (while ejecting)	4.5" per second

Important!

Slip paper must be flat, smooth, and free of curls, bends, wrinkles and folds, all of which can cause jamming and soiling by ink.

2.4 Power Supply Specifications

Power Supply

AC Adaptor	31AD, switching type
Input	AC100 to 240V 50/60Hz
Output	DC 24V \pm 5%, 1.9A
Plug	TCP8927-83-1100 (Hoshiden brand or equivalent.)

Consumption Current

	Conditions: DC 24V, excluding external equipment driving
Operating (approximate averages)	Continuous ASCII printing + paper feed: 0.6A Solid block printing + paper feed: 1.0A Solid block printing: 1.9A Peak (solid printing): 3.1A
Stand-by (approximate averages)	Paper release deactivated: 0.24 A Paper release activated: 0.07A

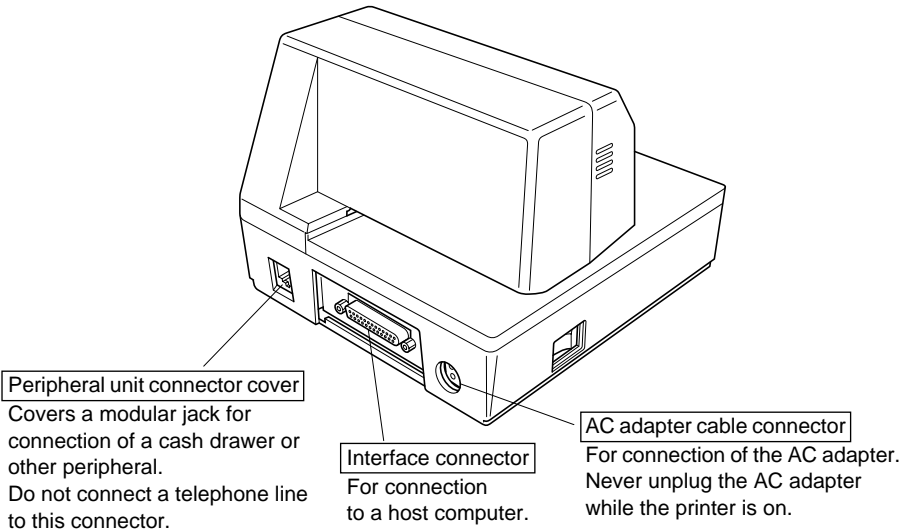
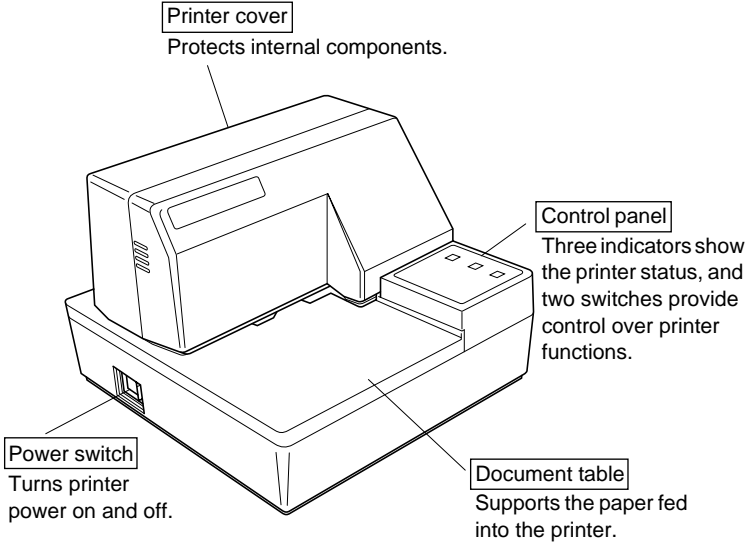
Important!

- *When using a printer power supply other than the specified AC adaptor (31AD), be sure that the following cautions are observed.*
 - *Use a power supply of DC 24 V \pm 5% and more than 1.9 A.*
 - *Be careful about installing the printer in an area where there is noise. Take the appropriate measures to protect against electrostatic AC line noise, etc.*
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3. Outer Appearance and Component Parts

3.1 General guide

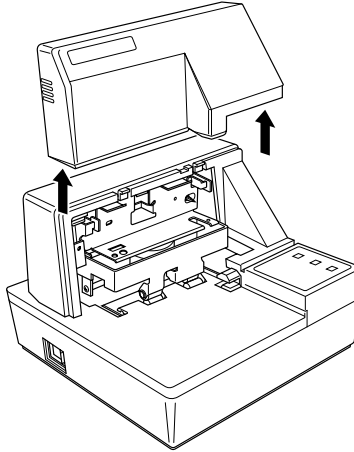
The following illustrations describe the major components, buttons, and connectors of your printer.



4. Operation

4.1 Removing the printer cover

- Push straight up on the ridged locations on the sides of the printer cover to remove it from the printer.

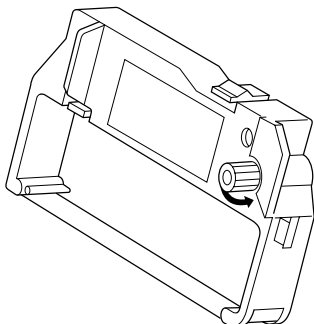


- To replace the cover, slide it back down into position. Gently press down on the cover until you hear it click securely into place.

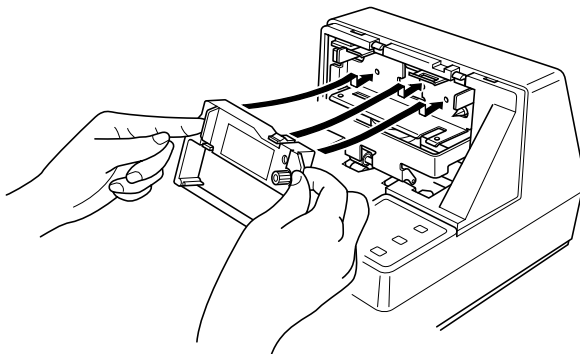
4.2 Installing the ribbon cassette

- Make sure that the printer's paper release is activated (the paper is not held in place by the paper feed roller). If it cannot be determined whether or not the paper release is activated, turn on the printer and check if the **RELEASE** indicator on the control panel is lit. If the indicator is not lit, press the **RELEASE** button until the indicator lights up.
- Make sure that the printer is turned off and unplugged from its power outlet.
- Remove the printer cover.

- ❑ Remove the ribbon cassette from its packaging, and turn its knob in the direction indicated by the arrow to take up any slack in the ribbon.



- ❑ Holding the ribbon cassette so that the ribbon is facing down, install the cassette into the slip printer as shown in the illustration.

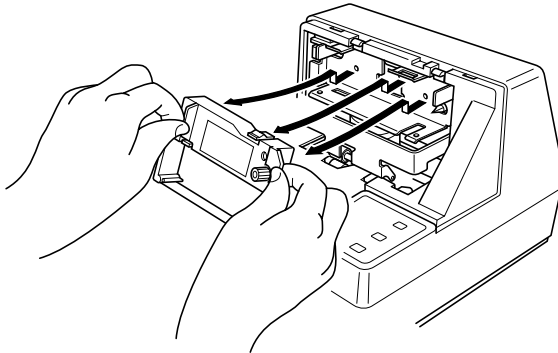


- ❑ Press gently but firmly on the cassette until it snaps securely into place.
- ❑ Rotate the knob on the cassette again to take up any slack.
- ❑ Replace the printer cover.

4.3 Removing the ribbon cassette

Use the following procedure to remove the ribbon cassette from the slip printer when you want to replace it with a new one.

- Make sure that the printer is turned off and unplugged from its power outlet.
- Remove the printer cover.
- Grasping the ribbon cassette as shown, gently pull it away from the printing mechanism.



- Use the procedure under “Installing the ribbon cassette” on page 9 to install a new cassette.

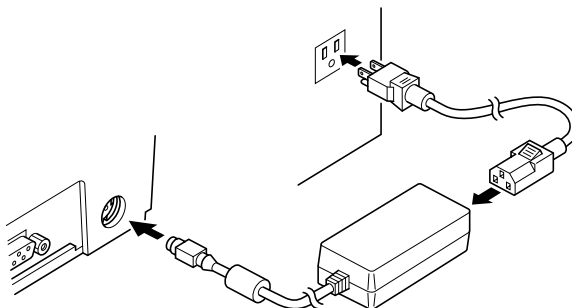
4.4 Connecting to a power outlet and turning power on and off

- Make sure that the printer is turned off.
- Plug the AC adapter that comes with the printer into the printer’s AC adapter cable connector.
- Connect a three-prong grounded power cord to the power cord connector of the AC adapter.

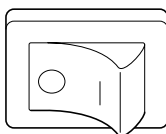
Note:

The printer does not come with a power cord, so you must provide one yourself.

- ❑ Plug the other end of the power cord to a standard household wall outlet.



- ❑ Use the power switch on the left side of the printer to turn power on and off.



Important!

We recommend that you unplug the printer from the power outlet whenever you do not plan to use it for long periods. Because of this, you should locate the printer so that the power outlet it is plugged into is nearby and easy to access.

At this point you may want to perform a test of the printer to make sure it is working properly. See page 20 for details on how to test the printer.

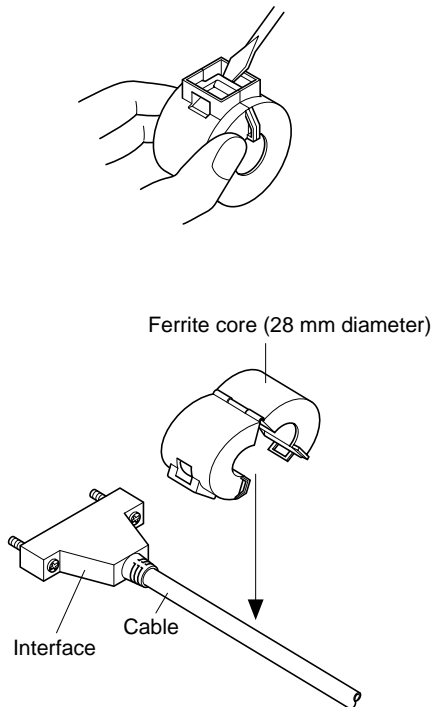
4.5 Connecting to your host computer

The computer sends data to the printer through a cable to the printer's standard serial interface (Connector Type: D-sub 25-pin). This printer does not come with a cable, so it is up to you to obtain one that suits your needs.

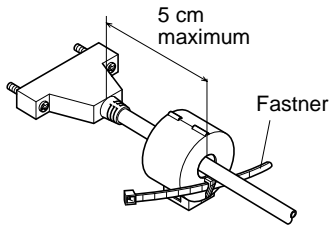
Important!

- *The following instructions apply to the interface cable that is used with an IBM-compatible personal computer. Note that they do not apply to all types of computers and cables. If you are unsure about what type of cable you should use to connect with your computer, consult your dealer.*
 - *Make sure that the printer is turned off and unplugged from the AC outlet and that the computer is turned off before connecting them.*
-

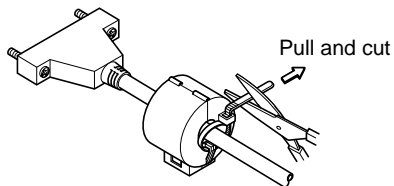
- Affix the larger ferrite core onto the interface cable as shown in the illustration below.



Pass the fastener through the ferrite core.



Loop the fastener around the cable and lock it. Use scissors to cut off any excess.



- ❑ Plug one end of the serial cable into the serial port of your computer, and the other end of the cable into the socket on the back of the printer. Secure both connectors in place with the screws that are provided.

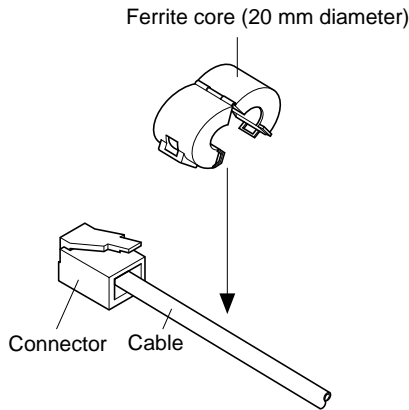
4.6 Connecting to a peripheral unit

You can connect a peripheral unit to the printer using a modular plug. The following describes how to install the ferrite core and make the actual connection. See “Modular plug” on page 31 for details about the type of modular plug that is required. Note that this printer does not come with a modular plug or wire, so it is up to you to obtain one that suits your needs.

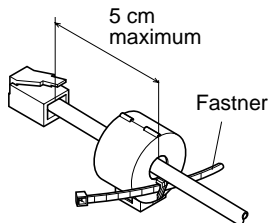
Important!

Make sure that the printer is turned off and unplugged from the AC outlet and that the computer is turned off before making connections.

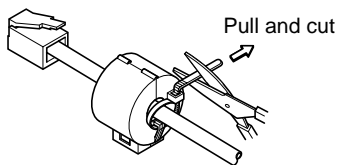
- Affix the smaller ferrite core onto the modular wire as shown in the illustration below.



Pass the fastener through the ferrite core.



Loop the fastener around the cable and lock it. Use scissors to cut off any excess.



- Plug one end of the modular cable into the modular jack of the peripheral.
- Remove the modular jack cover from the back of the printer and plug the other end of the modular cable into the jack of the printer.

4.7 Inserting the paper into the printer

Use only the specified type of paper for this printer. Do not use inappropriate types of paper, or it could cause malfunction or damage of the printer.

The following procedure describes how to print on paper. Before trying to print, be sure to install a ribbon cassette into the printer using the procedure under “Installing the ribbon cassette” on page 9.

- Make sure that the printer is plugged in and turned on.
- Check that the **RELEASE** indicator on the control panel is lit. If the indicator is not lit, press the **RELEASE** button until the indicator lights up.

Important!

Insertion and removal of paper should be done only when the printer is released condition (the paper is not held by paper feed roller).

- Place a piece of the paper onto the printer's document table and slide its right edge into the printer. Printing will be performed on the side of the paper that is facing up (the one you can see), starting from the top of the paper.

Important!

Do not use wrinkled or curled paper. In case of multiple paper, neatly align the sheets.

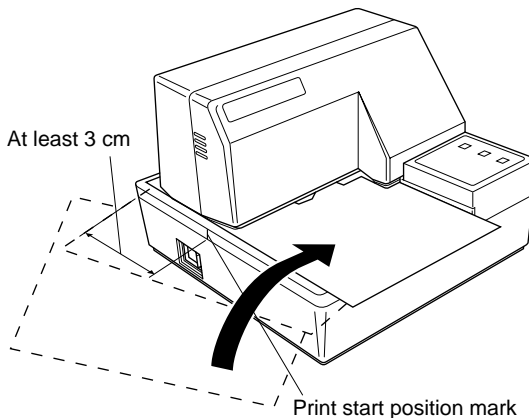
Though paper can be inserted either from the front or side of the printer, front paper insertion may result in paper jams, depending on the condition of the paper. Because of this, it is recommended that you always insert paper from the side.

4.8 AutoSide Loading™

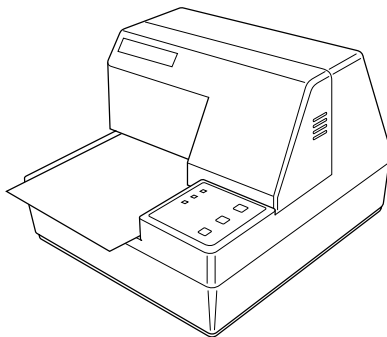
This printer is equipped with paper sensors, so you do not have to perform any special procedure to align the location from which printing should start. Simply insert the paper into the printer and the sensor locates the top of the paper. The paper will be moved automatically into position for printing.

Important!

When inserting the paper into the printer, make sure that there are at least 3 cm between the top edge of the paper and the print start position mark on the printer. Otherwise the paper sensor may not be able to correctly locate the top of the paper.

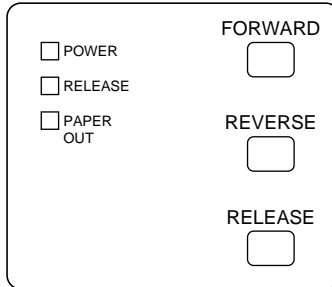


- Push the right edge of the paper into the printer until it stops. At that time, the **PAPER OUT** indicator will go out, and the printer mechanism will automatically align the paper for printing from the top.
- Send data from your host computer to be printed on the paper.
- After printing, press the **RELEASE** button to automatically release the paper.



4.9 Control Panel Operations

The control panel gives you some push-button control over the slip printer operation. It also includes indicator lights, which tell you the current status of the printer at a glance.



4.9.1 Indicator lights

The following table describes the meaning of indicator lights when it is on, off, or flashing.

Indicator Light	Off	On	Flashing
POWER	Power off	Power on	Dot Alignment Adjust Mode
PAPER OUT	Paper inserted	No paper	Insert paper prompt
RELEASE	Slip paper engaged	Slip paper released	Mechanical error

4.9.2 Buttons

The following table describes the function of the three control buttons of the control panel.

Button	Description
FORWARD	Feeds the slip paper forward, toward the back of the printer. One press feeds one line, holding down performs continuous feed.
REVERSE	Feeds the slip paper back, toward the front of the printer. One press feeds one line, holding down performs continuous feed.
RELEASE	Activates the printer's paper release (the paper is not held in place by the paper feed roller). Clears recoverable errors.

4.9.3 Producing a test print

The following procedure can be used at any time to test the printer.

- Turn on the printer and insert a piece of paper (page 11, 16).
- Turn off printer power.
- While holding down **RELEASE**, turn printer back on. Keep **RELEASE** depressed for a few moments until the printer beeps and the printer test print starts.

The printer test will continue until it reaches the end of the paper.

4.9.4 Adjusting the dot alignment

You may never have to use the procedure described in this section, but after you have been using your printer for some time you may find that the dots of some graphics do not align correctly. For example, what should look like:



may come out looking like one of the following:



or like this

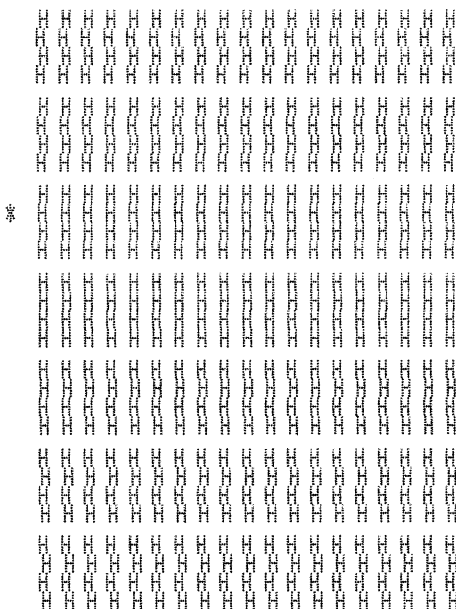


This is caused when mechanical parts of the printer get out of alignment. This happens only rarely and you may never experience it at all throughout the life of the printer. If you do have problems, use the following procedure to correct it.

- Turn on the printer and insert a piece of paper.
- Turn off printer power.
- While holding down the control panel's **FORWARD** and **REVERSE** buttons, turn the printer back on to enter the Dot Alignment Adjust Mode, which is indicator by a flashing **POWER** indicator flashes.

Entering the Dot Alignment Adjust Mode causes seven blocks to be printed, each of which indicates a dot alignment setting, as shown below. An asterisk to the left of the blocks indicates which block is currently selected.

Dot Alignment Adjust Mode



- Use **FORWARD** to specify the block that appears to have the best aligned characters. Press **FORWARD** once to specify the first block, twice to specify the second block, and so on up to seven times to specify the seventh block.

Warning beep will sound if you press **FORWARD** more than seven times.

- After specifying a block, press **REVERSE** to register your selection and exit the Dot Alignment Adjust Mode.

4.9.6 Errors

There are three types of errors: *recoverable* errors that require some action by you before they clear, *non-recoverable* errors that require servicing by an authorized service provider, and a *data receive* error. Errors are indicated by an audible buzzer and the indicators.

(1) Recoverable Errors

Error Type	Indicators			Recovery
	POWER	RELEASE	PAPER OUT	
Paper jam		Flashing		Correct the cause of the problem and then press RELEASE.
Carriage motor lockup				
Abnormal home position signal				
Abnormal timing signal				

(2) Non-recoverable Errors

Error Type	Indicators			Recovery
	POWER	RELEASE	PAPER OUT	
RAM read/write	Off	On	On	Turn off the printer, then after waiting a few minutes, turn the printer back on. If the printer does not recover, contact your nearest service provider.
CPU lockup				

(3) Data Receive Error

This type of error is caused whenever a problem is encountered during data receipt. The method used by the printer to recover from a data receive error depends on the current command mode.

Data Receive Error Recover Procedure
Memory switch 4-0=0 : The printer prints a question mark. Memory switch 4-0=1 : The printer discards the received data.

4.10 Paper Sensors

The following paper sensors are available.

TOF Sensor

This top-of-form sensor detects the leading edge of the paper.

When enabled, the TOF sensor detects when there is no paper present and stops printing.

BOF Sensor

This bottom-of-form sensor detects the trailing edge of the paper. When

enabled, the BOF sensor detects when there is no paper present and printing is interrupted.

When the TOF or BOF sensor detects that no paper is present, the printer stops its motor after printing of 0 to a maximum of two more lines.

The BOF sensor detects a paper out condition whenever the distance between print head pin #9 and the trailing edge of the paper becomes 38.1 mm or less.

The print stop operation is not entered until the distance between print head pin #9 and the trailing edge of the paper becomes 27.3 mm or less.

When the auto clamp is enabled with Memory Switch 5-1, the auto clamp operation is performed about 1.0 second (Initial value is approximately 1 second) after the presence of paper is detected both by the TOF and BOF sensors, following a paper out condition. The auto clamp function is not affected by whether the TOF or BOF sensor is enabled or disabled.

The top of form positioning function is enabled with Memory Switch 5-0. Even if the auto clamp function is disabled, auto top of form positioning is performed if the paper is clamped when printing starts.

The PAPER OUT lamp flashes to request insertion of paper when the sensors detect there is no paper (when a sensor enabled by command detects no paper) after data is received by the printer. At that time, the user inserts paper, and printing begins after the sensor detects that paper is present.

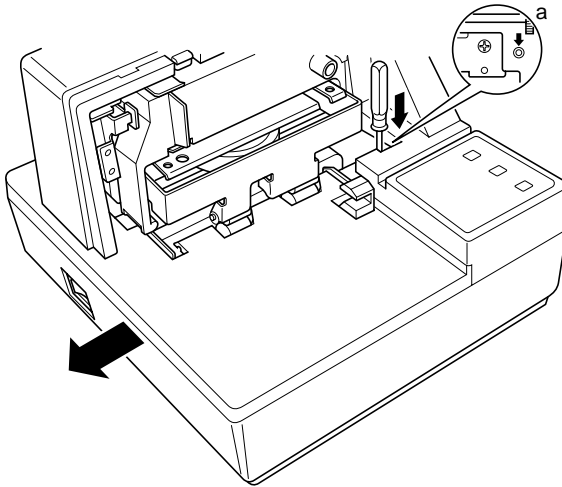
5. Making DIP Switch Settings

The printer's DIP switches let you specify communications parameters, receive buffer size, and emulation. This "5. Making DIP Switch Settings" explains the settings you can make and tells you how to actually change DIP switch settings.

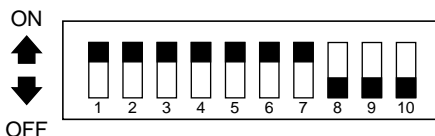
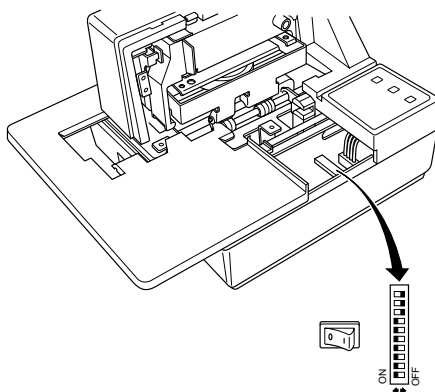
5.1 Accessing the DIP switches

The DIP switches are located inside the printer, underneath the document table. Use the following procedure to remove the document table so you can operate the DIP switches.

- Make sure that the printer is turned off and unplugged from its wall outlet.
- Remove the printer cover.
- While using a screwdriver or other similar instrument to press down at the location marked (a) in the illustration below, carefully slide the document table in the direction indicated by the arrow until it is out of the way.



It is not necessary to remove the document table completely, just move it enough so you can get at the DIP switches inside.



Note:

If the document table seems to be getting caught on the rollers, it means that you are not pressing down at point (a) enough. Pressing at point (a) should separate the rollers so the document table can slide freely.

- After the document table is opened sufficiently, use a thin flat-blade screwdriver or some other similar object to change DIP switch settings.

Note:

See the following section for details on available DIP switch settings.

- After making the settings you want, slide the document table back into place while pressing down at point (a). Make sure that the document table is correctly seated in place before releasing point (a).
- Replace the printer cover.

5.2 Available DIP switch settings

The following table shows all the possible settings for the DIP switch. The factory default settings are ON for switches 1 through 7 and OFF for switches 8 through 10.

Switch	Parameter	ON	OFF
1	Baud Rate	See table below	
2			
3	Data Length	8 bits	7 bits
4	Parity Check	Disabled	Enabled
5	Parity	Odd	Even
6	Handshake	DTR/DSR	XON/XOFF
7	Receive Buffer Size	2K bytes	35 bytes
8	Character Code Set	Japanese (Katakana)	International (PC437)
9	Pin 6 (DSR) Reset Signal	Enabled	Disabled
10	Pin 25 (INIT) Reset Signal	Enabled	Disabled

Baud Rate	Switch 1	Switch 2
1200BPS	OFF	OFF
2400BPS	ON	OFF
4800BPS	OFF	ON
9600BPS	ON	ON

5.3 Memory Switch Settings

Each memory switch is a 16-bit word store in EEPROM. For details on the functions and settings of memory switches, see the “9. Print Control Functions (ESC#)”.

The table below shows the factory settings for the memory switches.

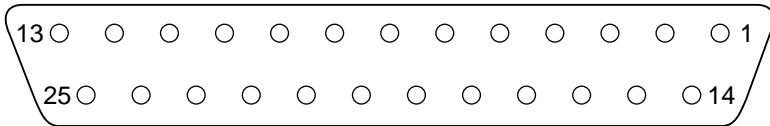
Memory Switch	Hexadecimal Code
# 0	-
# 1	-
# 2	-
# 3	-
# 4	0000
# 5	0000

Warning!

Changing the memory switch settings can cause the printer to fail to operate correctly.

6. Interface

This appendix provides detailed specifications for the printer's standard serial interface.



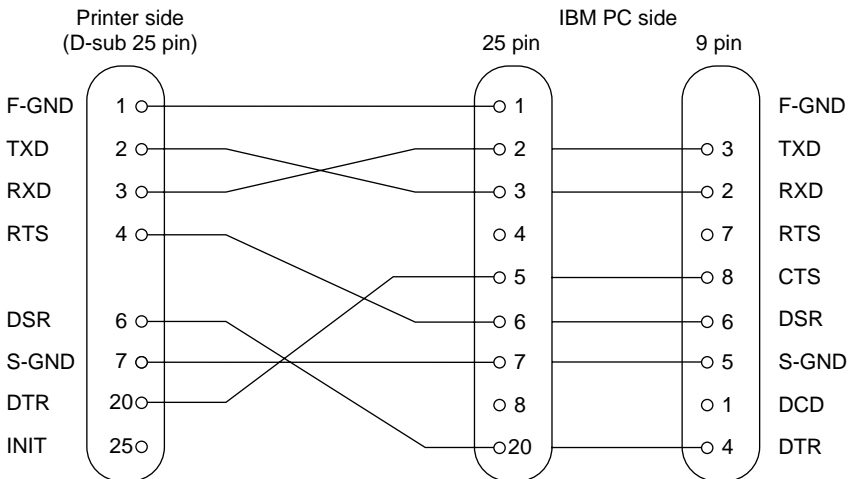
6.1 Pins and Signal Names

Pin No.	Signal Name	Direction	Function
1	FG	—	Frame ground
2	TXD	OUT	Transmission data
3	RXD	IN	Receive data
4	RTS	OUT	Same as DTR signal
5	N.C.		Not connected
6	DSR	IN	<ul style="list-style-type: none"> • DIP Switch 9 = OFF In DTR/DSR communication mode when Memory Switch4-5 = 0, indicates whether data receive from host is enabled or disabled. Space: Receive enabled Mark: Receive disabled This signal is not checked in the X-ON/X-OFF communication mode.
			<ul style="list-style-type: none"> • DIP Switch 9 = ON This signal used for external reset. Printer is reset whenever signal is in mark state with pulse width of 1mS or more.
7	SG		Signal ground
8-19	N.C.		Not connected

Pin No.	Signal Name	Direction	Function
20	DTR	OUT	Indicates whether data receive from host is enabled or disabled. DTR/DSR Communication Mode Space when receive is enabled. X-On/X-Off Communication Mode Always space, except during following conditions: <ul style="list-style-type: none"> • Period between reset and communication enabled • During self-test printing and dot alignment adjustment
21 - 24	N.C.		Not connected
25	INIT	IN	• DIP Switch 10 = OFF This signal not used.
			• DIP Switch 10 = ON This signal becomes reset signal. Printer is reset whenever signal is in mark state with pulse width of 1mS or more.

6.2 Interface Connections

Refer to the interface specifications of the host for details on connecting to its interface connector. The following illustration shows a typical connection configuration.



7. Peripheral Unit Driver Circuit

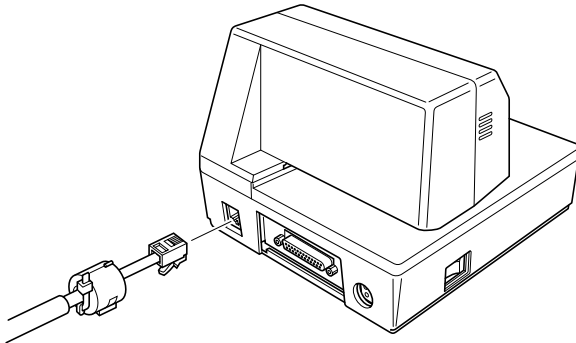
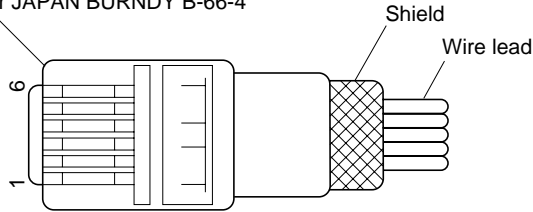
This printer is equipped with a circuit for driving peripheral units, such as cash drawers. A 6-pin modular connector for connection of the peripheral unit is located on the back of the printer. To connect to the drive circuit, connect the peripheral unit to the modular connector using a cable supplied by you like that one shown in the figure below.

Important!

Never connect any other type of plug to the peripheral unit connector.

7.1 Modular plug

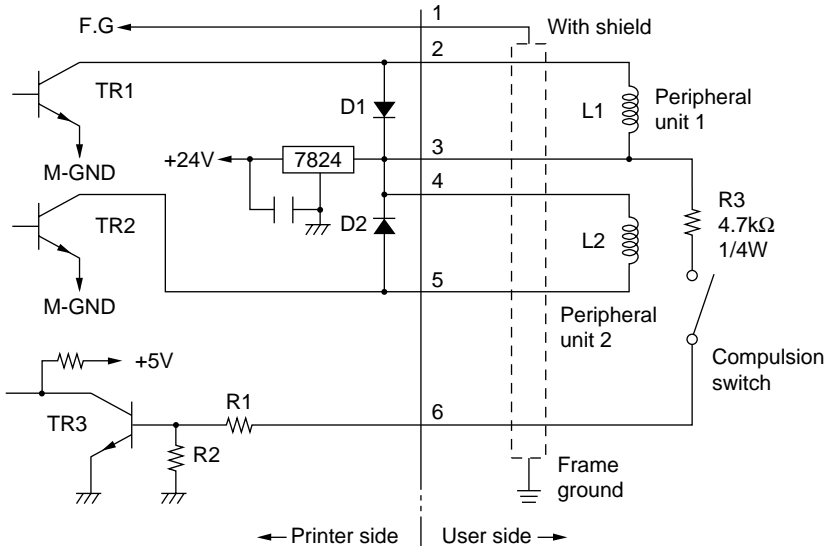
Modular plug: MOLEX 90075-0007,
AMP641337, or JAPAN BURNDY B-66-4



7.2 Drive circuit

The recommended drive unit is shown below.

Drive output: 24V, 1.0A max.



Notes

- Peripheral Units 1 and 2 cannot be driven simultaneously.
- For continuous driving, do not use drive duty greater than 20%.
- Compulsion switch status is available as status data.
- Minimum resistance for coils L1 and L2 is 24Ω.
- Absolute maximum ratings for diodes D1 and D2 ($T_a = 25^\circ\text{C}$) are:
Average Rectified Current $I_o = 1\text{A}$
Maximum forward surge current (60Hz, 1-cycle sine wave) $I_{FSM} = 40\text{A}$
- Absolute maximum rating for transistors TR1 and TR2 ($T_a = 25^\circ\text{C}$) are:
Collector current $I_c = 2\text{A}$
Collector loss $P_c = 1.2\text{W}$

8. Maintenance and Service

For the information on maintenance and service, please contact our dealer or at the following address.

North America

CBM America Corporation
Service Center
365 Van Ness Way
Suite 510
Torrance, CA 90501, U.S.A

TEL +1-310-781-1460

FAX +1-310-781-9157

Other Areas

Japan CBM Corporation
Information Systems Division
CBM Bldg., 5-68-10, Nakano,
Nakano-ku, Tokyo 164-0001
Japan

TEL +81-3-5345-7540

FAX +81-3-5345-7541

9. Print Control Functions

This printer supports one command mode: the ESC/POS mode.

The ESC/POS mode emulates the Epson TM-295 slip printer.

This chapter provides you with all of the commands supported by this printer.

9.1 List of ESC/POS Commands

Command	Function	Code	Standard Mode	Page Mode	Page
HT	Horizontal Tab	09H			37
LF	Line Feed	0AH			37
FF	Prints and Ejects Single Sheet, and Prints and Returns in Paper Mode	0CH			38
DLE EOT	Sends Status at Real Time	10H 04H n			39
CAN	Cancels Print Data in Page Mode	18H	Disabled		42
ESC SP	Sets Space Size to Right of Characters	1BH 20H n			42
ESC !	Selects Print Mode in Batch	1BH 21H n			43
ESC #	Sets Memory Switch (Unique Extension Command)	1BH 23H N n1 n2 n3 n4			44
ESC %	Selects/Deselects Download Character Set	1BH 25H n			46
ESC &	Defines Download Characters	1BH 26H y c1 c2			47
ESC	Selects Bit Image Mode	1BH 2AH m		☐	49
ESC 2	Sets 1/6-inch Line Feed	1BH 32H			51
ESC 3	Sets n/60-inch Line Feed (Approximate Value)	1BH 33H n			51
ESC =	Selects Peripheral Device	1BH 3DH n			52
ESC @	Initializes Printer	1BH 40H			53
ESC C	Sets Single Sheet Ejection Length	1BH 43H			53
ESC D	Sets Horizontal Tab Position	1BH 44H			54
ESC F	Selects/Deselects Ejection of Single Sheet in Reverse Direction	1BH 46H n			55
ESC J	Print and n/60-inch Paper Feed (Approximate Value)	1BH 4AH n			55
ESC K	Print and n/60-inch Reverse Paper Feed (Approximate Value)	1BH 4BH n		Disabled	56
ESC L	Selects Page Mode	1BH 4CH n	(Line)	Disabled	57
ESC R	Selects International Characters	1BH 52H n			58
ESC T	Selects Character Print Direction in Page Mode	1BH 54H n	(Set)		59

Command	Function	Code	Standard Mode	Page Mode	Page
ESC W	Sets Print Area in Page Mode	1BH 57H	(Set)		60
ESC c4	Selects No-paper Sensor Valid for Print Stop	1BH 63H 34H n			61
ESC c5	Enables/Disables Panel Switch	1BH 63H 35H n			62
ESC d	Print and N-line Paper Feed	1BH 64H n			62
ESC e	Print and N-line Reverse Paper Feed	1BH 65H n		Disabled	63
ESC f	Sets Single Sheet Waiting Time	1BH 66H t1 t2			63
ESC p	Generates Specified Pulses	1BH 70H m t1 t2			64
ESC q	Release	1BH 71H		Disabled	65
ESC t	Selects Character Code Table	1BH 74H n			66
ESC u	Sends Peripheral Device Status	1BH 75H n			67
ESC v	Sends Paper Sensor Status	1BH 76H			68
ESC {	Selects/Deselects Inverted Print	1BH 7BH n	(Line)	(Set)	69
GS l	Sends Printer ID	1DH 49H n			70
GS a	Enables/Disables Automatic Status Sending	1DH 61H n			71
GS r	Sends Status	1DH 72H n			74

: Enabled

(Line) : Enabled only at the head of the line

(Set) : Only setting is enabled

: Only part of setting is enabled

⊘ : Ignores partially Disabled: An argument is processed as next data

9.2 Command Details

9.2.1 Description of Each Items

XXXX

[Function]	Shows a command function.
[Code]	Shows a sequence of code consisting the command; ASCII represents the ASCII code and []k a repeat count of k-times.
[Range]	Shows a settable range of an argument.
[Outline]	Outlines the command.
[Caution]	Describes a caution for the command as required.
[Default]	Describes an initial value for the command, if accompanied by an argument.
[See Also]	Describes other associated commands in using the command.
[Example]	Describes an example of using the command.
< >H:	Denotes a hexadecimal number.
< >B:	Denotes a binary number. < >: Denotes a decimal number.

Notes Of "Enabled only at the head of the line" in Section 9.1, the "head of the line" refers to the case when the following condition is satisfied.

- (1) There is no print data (space and skipping portion by HT included) in the current print buffer.

9.2.2 Command Details

HT

[Function] Horizontal Tab

[Code] ASCII HT
Hexadecimal 09
Decimal 9

[Outline] This command shifts a printing position to the next horizontal tab position.

[Caution]

- The horizontal tab position is set by ESC D.
- The command is ignored if the next horizontal tab position has not been set.
- Initial setting of the horizontal tab position is every 8 characters of the 5×7 font(9th, 17th, 25th character, and so on)

[See Also] ESC D

LF

[Function] Line Feed

[Code] ASCII LF
Hexadecimal 0A
Decimal 10

[Outline] This command prints the data in the print buffer and feeds the paper by a set line feed amount.

[Caution]

- The head of the line is assumed to be the next printing start position.

[See Also] ESC 2, ESC 3

FF

[Function] Prints and Ejects Single Sheet, and Prints and Returns in Paper Mode

[Code] ASCII FF
Hexadecimal 0C
Decimal 12

There is the following difference between the standard mode and page mode:

<Standard Mode>

[Outline] This command prints the data in the print buffer and ejects a single sheet.

[Caution]

- If a single sheet ejection length by ESC C has not been set, the paper will be ejected completely. If it has been set, the paper will be ejected by a set amount. If the no-paper condition is detected halfway ejection, the printer will stop paper ejection even before reaching the set ejection amount.
- The single sheet ejecting direction is specified by ESC F.

[See Also] ESC F, ESC C

<Page Mode>

[Outline] Prints in batch the data developed across the print area and returns to the standard mode. When this is done, all the developed data are erased after printing. The paper is not ejected.

[Caution]

- The head of the line is assumed to be the next printing position.

[See Also] ESC L

DLE EOT n

[Function] Sends Status at Real Time

[Code] ASCII DLE EOT n
 Hexadecimal 10 04 n
 Decimal 16 4 n

[Range] 1 n 3, n = 5

[Outline] This command sends the n-specified status at real time.

n	Description
1	Sends the printer status.
2	Sends the off-line factor status.
3	Sends the error factor status.
5	Sends the slip status.

[Caution]

- For the status sent, see the tables on the following pages.
- This command runs processing upon its reception.
- When sending the status, only one byte is sent without confirming the DSR signal status.
- The command is executed in the off-line state, reception buffer full state, and error state as well.
- The user should note that the operation of this command is also executed when a data sequence of <10>H<04>H<n> (1 n 3, n = 5) is received, other than this command.

<Example>

d1 = <10>H, d2 = <04>H, d3 = <1> in ESC * m nL nH [d]nL + 256 × nH

- This command must not be used by interrupting the code sequence of other command consisting of 2 bytes or more.

<Example>

If DLE EOT 3 is sent after sending up to ESC 3, attempting to send ESC 3 n from the host, it will be processed as ESC 3 n = <10>H. Therefore, the use should take heed of this.

- If ASB has been enabled by GS a, it is necessary to distinguish the status by this command from that of ASB. See "6. Interface" for how to distinguish them
- If n is beyond the range, this command will be ignored.

n = 1: Printer status

Bit	Description	Hexadecimal	Decimal
0	Unused	00	0
1	Unused	02	2
2	Status of the drawer kick connector No. 3 pin = L	00	0
	Status of the drawer kick connector No. 3 pin = H	04	4
3	On-line status	00	0
	Off-line status	08	8
4	Unused	10	16
5	Undefined	-	-
6	Undefined	-	-
7	Unused	00	0

n = 2: Off-line factor status

Bit	Description	Hexadecimal	Decimal
0	Unused	00	0
1	Unused	02	2
2	Undefined	-	-
3	Not feeding the paper by the Paper Feed switch	00	0
	Feeding the paper by the Paper Feed switch	08	8
4	Unused	10	16
5	No print stop because of no paper.	00	0
	Print stop because of no paper.	20	32
6	No error	00	0
	Error	40	64
7	Unused	00	0

Bit 5 : If there is no paper when the TOF or BOF sensor enables no-paper print stop by ESC c 4, the printer will stop printing, resulting in 32 (print stopping).

n = 3: Error factor status

Bit	Description	Hexadecimal	Decimal
0	Unused	00	0
1	Unused	02	2
2	Undefined	-	-
3	Undefined	-	-
4	Unused	10	16
5	No irrecoverable error	00	0
	Irrecoverable error	20	32
6	Undefined	-	-
7	Unused	00	0

n = 5: Slip status

Bit	Description	Hexadecimal	Decimal
0	Unused	00	0
1	Unused	02	2
2	The slip has been selected	00	0
3	Slip insertion non-waiting status	00	0
	Slip insertion waiting status	08	8
4	Unused	10	16
5	Paper set in the BOF sensor	00	0
	No paper set in the BOF sensor	20	32
6	Paper set in the TOF sensor	00	0
	No paper set in the TOF sensor	40	64
7	Unused	00	0

Bit 3 : Detects a slip of paper and results in 0 immediately before starting the operation (not waiting for insertion)

Bits 5, 6 : Send the current status of the TOF and BOF sensors.

[See Also]

ESC u, ESC v, GS a, 6. Interface

CAN

[Function]	Cancels Print Data in Page Mode		
[Code]	ASCII	CAN	
	Hexadecimal	18	
	Decimal	24	
[Outline]	This command erases all the print data in the current print area in the page mode.		
[Caution]	<ul style="list-style-type: none">• This command is valid only in the page mode.• Even the print data in the previously set print area is erased, if it is extended over the currently set print area.		
[See Also]	ESC W		

ESC SP n

[Function]	Sets Space Size to Right of Characters		
[Code]	ASCII	ESC SP n	
	Hexadecimal	1B 20 n	
	Decimal	27 32 n	
[Range]	0 n 32		
[Outline]	This command sets the right space size of the characters.		
[Caution]	<ul style="list-style-type: none">• In the double width mode, the right space size is doubled.• The space size is set in increments of half dot.• In the page mode, the space size may be shifted a half dot from a set value.• There are two set values for the standard and page modes, respectively.		
[Default]	n = 0		

ESC ! n

[Function] Selects Print Mode in Batch

[Code] ASCII ESC ! n
 Hexadecimal 1B 21 n
 Decimal 27 33 n

[Range] 0 n 32

[Outline] This command specifies the print mode.
 Each bit has the following meaning.

Bit	Description	Hexadecimal	Decimal
0	Character font 5 × 7	00	0
	Character font 7 × 7	01	1
1	Undefined	–	–
2	Undefined	–	–
3	Undefined	–	–
4	Deselects double height	00	0
	Selects double height	10	16
5	Deselects double width	00	0
	Selects double width	20	32
6	Undefined	–	–
7	Deselects underline	00	0
	Selects underline	80	128

[Caution] • The underline is drawn across the print character width, not the blank skipped by HT.
 • If both double height and double width are specified, the characters will be quadrupled.
 • For selection of the underline and 7 × 7 font in the page mode, only their setting is enabled.

[Default] n = 0

ESC

- [Function] Sets Memory Switch
- [Code] <ESC> "#N, n1 n2 n3 n4" <LF> <NUL>
 N : Memory switch segment number (4 and 5 only)
 n1 n2 n3 n4 : Set data
- [Range] 0 n 255
- [Outline] The memory switch is stored in the nonvolatile EEPROM memory. To change this setting, send a command from the host side. After setting with the command, turn on the power again, or reset with the following reset command, to enable setting. (If reset with the command, self-printing will be implemented.)
 Reset command: <ESC> <CAN> <LF> <NUL>
- [Caution] The EEROM has a data-writing life. Do not execute this command every time. Note that if the EEROM's life is running out due to frequent use of this command, printer operation cannot be guaranteed.
 The memory switch segment numbers other than 3 to 5 do not have relevant setting items, but they actually exist. Therefore, use of other numbers besides 3 to 5 will be valid as a command and change the data in the EEROM. If this is the case, operation will not be guaranteed.
 Exercise full care when using this command.
- [Default]
- [Example]

1) Memory Switch 4 (MSW4)

The setting upon shipment from the factory is indicated with " " .

Bit	Description	0	1
F			
E			
D			
C			
B			
A			
9			
8			
7			
6			
5	DSR signal check at status sending time	Checks	Does not check
4			
3			
2			
1			
0	Data reception	Prints "?"	Ignores

(: Denotes setting enabled)

(Note) X-ON/X-OFF output timing: Setting whether to output the X-ON code every 3 seconds

2) Memory Switch 5 (MSW5)

The setting upon shipment from the factory is indicated with " " .

Bit	Description	0	1
F			
E			
D	<ESC> "q" command function	See Table 4-3	
C	<ESC> "q" command function	See Table 4-3	
B			
A			
9			
8			
7			
6			
5			
4			
3			
2			
1	Automatic clamp function	Enabled	Disabled
0	Automatic head search function	Enabled	Disabled

MSW5-D	MSW5-C	<ESC> "q" Command Function
0	0	Implements releasing
1	0	Implements releasing
0	1	Implements releasing after discharging all in the forward direction (far side).
1	1	Implements releasing after discharging all in the reverse direction (near side).

ESC % n

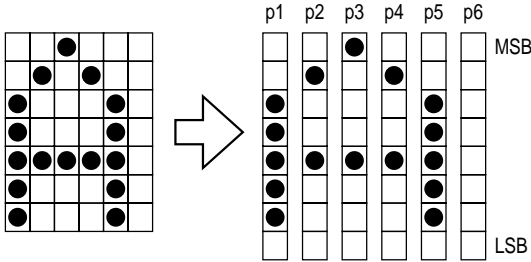
[Function]	Selects/Deselects Download Character Set			
[Code]	ASCII	ESC	%	n
	Hexadecimal	1B	25	n
	Decimal	27	37	n
[Range]	0 n 255			
[Outline]	This command selects or deselects the download character set. n is valid only for the least significant bit. <ul style="list-style-type: none">• At n = < 0>B, the command deselects the download character set(selects an internal character set).• At n = < 1>B, the command selects the download character set.			
[Default]	n = 0			
[See Also]	ESC &			

ESC & y c1 c2 [x[d]yxx]c2-c1+1

[Function]	Defines Download Characters
[Code]	ASCII ESC & y c1 c2 [x [d] y × x] c2-c1+1 Hexadecimal 1B 26 y c1 c2 [x [d] y × x] c2-c1+1 Decimal 27 38 y c1 c2 [x [d] y × x] c2-c1+1
[Range]	y = 1 32 c1 c2 126 0 x 6 (When the 5 × 7 font is selected) 0 x 10 (When the 7 × 7 font is selected) 0 d1 ... d y × x 255
[Outline]	This command defines the font of the alphanumeric or Kana download characters. <ul style="list-style-type: none">• y denotes the number of vertical bytes.• c1 denotes the start character code and c2, end character code, respectively. When defining only one character, set c1 = c2.• The definable character code is the 95 ASCII code characters from <20>H to <7E>H.• x denotes the number of horizontal dots to be defined.• d denotes the data to be defined; a horizontal x dots pattern from the left. The right remaining pattern results in spaces.
[Caution]	<ul style="list-style-type: none">• Once the download characters are defined, they will remain valid until they are redefined, ESC @ is executed, the printer is reset, or the power is turned off.• If y, c1, c2, or x is beyond the range, this command will be ignored, processing the subsequent data as normal one.• In case of the 7 × 7 font, define the data so that the horizontally adjacent dots will not be contained, because they cannot be printed.
[Default]	Identical pattern with the internal character set
[See Also]	ESC %

[Example]

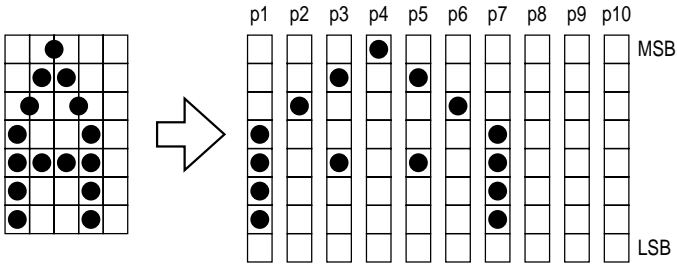
- When selecting the 5 × 7 font



When defining the pattern above to the code 20H

	ESC	&	y	c1	c2	x	p1	p2	p3	p4	p5
Code (hex.)	1B	26	01	20	20	05	3E	48	88	48	3E

- When selecting the 7 × 7 font



When defining the pattern above to the code 20H

	ESC	&	y	c1	c2	x	p1	p2	p3	p4	p5	p6	p7
Code (hex.)	1B	26	01	20	20	07	1E	20	48	80	48	20	1E

ESC * m nL nH [d]k

[Function] Selects Bit Image Mode

[Code]	ASCII	ESC	m	nL	nH	[d]	k
	Hexadecimal	1B 2A	m	nL	nH	[d]	k
	Decimal	27 42	m	nL	nH	[d]	k

[Range]

m = 0, 1
 0 nL 255
 0 nH 3
 0 d 255
 k = nL nH × 256

[Outline]

- This command specifies the bit image of the m-mode as to the number of dots specified with nL and nH.
- nL and nH denote the number of horizontal dots of the bit image to be printed, resulting in [nL + nH × 256] dots.
- If the bit image data is input beyond the dot position printable in one line, the surplus data will be discarded.
- d denotes the bit image data. Set "1" in the corresponding bit when printing, and "0" when not printing.
- The following table lists the bit image mode selected with m.

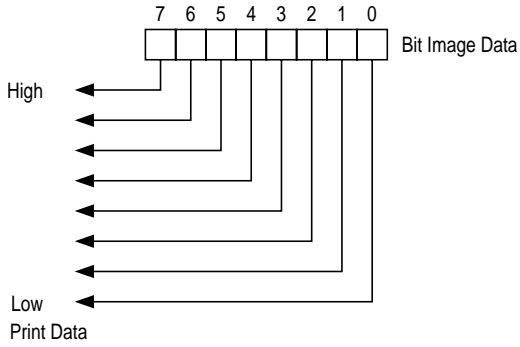
m	Mode	Vertical Direction	Horizontal Direction (1)
		Dots	Max. Dots
0	8-dots single density	8	210
1	8-dots double density	8	420

1: The total number of horizontal dots in the page mode differs depending on the printing area secured with ESC W and printing direction specified with ESC T.

[Caution]

- If a value of m or nH goes beyond the range, this command will be ignored, processing the subsequent data as normal one.
- Normal data processing is restored after printing the bit image.
- The following page shows the relations between the bit image data and the dots printed.
- The double density bit image is invalidated in the page mode.

- The following shows the relations between the bit image data and the dots printed.



ESC 2

[Function]	Sets 1/6-inch Line Feed		
[Code]	ASCII	ESC	2
	Hexadecimal	1B	32
	Decimal	27	50
[Outline]	This command sets a line feed amount per line to 1/6 inch.		
[Caution]	There are two kinds of line feed amounts for the standard mode and page mode. <ul style="list-style-type: none">• For the standard mode: Set to 1/6 inch.• For the page mode: Set to 10 dots (10/72 inch)		
[See Also]	ESC 3		

ESC 3 n

[Function]	Sets Line Feed Amount			
[Code]	ASCII	ESC	3	n
	Hexadecimal	1B	33	n
	Decimal	27	51	n
[Range]	0 n 255			
[Outline]	This command sets a line feed amount per line to n/60 inch.			
[Caution]	There are two kinds of set values for the standard mode and page mode. Since the printer has the minimum paper feed pitch of 1/144 inch, the line feed amount of n/60 inch is treated as follows: <ul style="list-style-type: none">• For the standard mode: Set an approximate value of $\text{INT}((6n+5)+0.5)/72$ inch.• For the page mode: Set n/72 inch(n coordinate).			
[Default]	n = 10 (1/6 inch for the standard mode and 10 dots (10/72 inch for the page mode))			
[See Also]	ESC 2			

ESC = n

[Function] Selects Peripheral Device

[Code] ASCII ESC = n
 Hexadecimal 1B 3D n
 Decimal 27 61 n

[Range] 0 n 3

[Outline] This command selects a peripheral device which validates the subsequent data, depending on a value of n.

- Each bit has the following different meanings.
- If Printer Disabled has been selected, the printer will discard all the received data until Printer Enabled is selected with this command.

Bit	Peripheral Device	Hexadecimal	Decimal
0	Printer Disabled	00	0
	Printer Enabled	01	1
1	Undefined	–	–
2	Undefined	–	–
3	Undefined	–	–
4	Undefined	–	–
5	Undefined	–	–
6	Undefined	–	–
7	Undefined	–	–

[Caution] • Even if Printer Disabled has been selected, the printer may be made off-line by operating it.

[Default] n = 1

ESC @

[Function] Initializes Printer

[Code] ASCII ESC @
Hexadecimal 1B 40
Decimal 27 64

[Outline] This command clears the data in the print buffer to initialize various settings.

[Caution] • The setting of the DIP switch is not re-read.
 • The data in the reception buffer is not cleared.

ESC C n

[Function] Sets Single Sheet Ejection Length

[Code] ASCII ESC C n
Hexadecimal 1B 43
Decimal 27 67

[Range] 0 n 127

[Outline] This command sets a single sheet ejection length to n lines.
 • If n = 0, the ejection length will not be set

[Caution] • Even if the line feed amount is changed after setting the ejection length, the latter will not change
 • The ejection length set here is meaningful only when FF is executed

[Default] n = 0

[See Also] FF

ESC D [n]k NUL

[Function]	Sets Horizontal Tab Position		
[Code]	ASCII	ESC D	[n] k NUL
	Hexadecimal	1B 44	[n] k 00
	Decimal	27 68	[n] k 0
[Range]	1 n	255	
	0 k	32	
[Outline]	This command sets a horizontal tab position. <ul style="list-style-type: none">• n denotes the number of columns from the head of the line to the horizontal tab setting position. n is equal to the setting column position - 1, and if the horizontal tab is to be set in the 9th column, for example, set n = 8.• k denotes the number of horizontal tab positions to be set.• The tab position is set to the position at a distance of the character width × n from the head of the line. This character width includes the right space size of the character, and if double width is selected, the character width will be doubled. A horizontal magnification selection is followed even in the page mode.• The data, <n>k, which denotes a setting position is input in the ascending order and ends with <00>H.• ESC D NUL clears all the set tab positions. After clearing, HT is ignored.		
[Caution]	<ul style="list-style-type: none">• If the data <n>k is equal to or smaller than the preceding data <n>k-1, it is assumed that horizontal tab setting has been finished. If this is the case, the subsequent data will be processed as normal one.• Up to 32 tab positions can be set. The data exceeding this limit is processed as normal data.• If HT is executed, a move to the tab position beyond the print area will be made to the position of the print area + 1 dot.• Even if the character width is changed after setting the horizontal tab position, the latter will not change.• There are two kinds of right space sizes of the characters; for the standard mode and page mode. To set the horizontal tab position in the respective modes, set the right space size of the characters in the very mode you are in.		
[Default]	Every 8 characters of the 5 × 7 font (9th, 17th, 25th character, and so on)		
[See Also]	HT		

ESC F n

[Function]	Selects/Deselects Ejection of Single Sheet in Reverse Direction		
[Code]	ASCII	ESC F	n
	Hexadecimal	1B 46	n
	Decimal	27 70	n
[Range]	0 n 255		
[Outline]	This command selects or deselects single sheet ejection in the reverse direction with FF. • n is valid only for the least significant bit. At n = < 1>B, the command selects reverse directional ejection. At n = < 0>B, the command deselects reverse directional ejection(selects forward directional ejection).		
[Default]	n = 0		
[See Also]	FF		

ESC J n

[Function]	Print and Paper Feed		
[Code]	ASCII	ESC J	n
	Hexadecimal	1B 4A	n
	Decimal	27 74	n
[Range]	0 n 255		
[Outline]	This command prints the data in the print buffer and feeds the paper by n/60 inch. Since the printer has the minimum paper feed pitch of 1/144 inch, a paper feed amount of n/60 inch is treated as follows: • For the standard mode: The paper is fed by an approximate value of $\text{INT}((6n+5)+0.5)/72$ inch. • For the page mode: The paper is fed by n/72 inch(n coordinate).		
[Caution]	The head of the line is assumed to be the next printing start position.		

ESC K n

[Function] Print and Reverse Paper Feed

[Code]	ASCII	ESC	K	n
	Hexadecimal	1B	4B	n
	Decimal	27	75	n

[Range] 0 n 255

[Outline] This command prints the data in the print buffer and feeds the paper by $n/60$ inch in the reverse direction. Since the printer has the minimum paper feed pitch of $1/144$ inch, $n/60$ -inch reverse directional paper feed is treated as follows:

- For the standard mode: The paper is fed by an approximate value of $\text{INT}((6n+5)+0.5)/72$ inch.

[Caution]

- The command is valid only in the standard mode.
- The head of the line is assumed to be the next printing start position.
- A set amount does not remain.

ESC L

[Function]	Selects Page Mode
[Code]	ASCII ESC L Hexadecimal 1B 4C Decimal 27 76
[Outline]	<p>This command switches from the standard mode to the page mode.</p> <ul style="list-style-type: none">• The page mode deploys the received data over the specified print area and prints it in batch with the FF command. Consequently, normal print commands such as LF only deploy the data in the printer's memory, but not actually print it.• The printer returns to the standard mode after printing the data in the specified print area with FF.
[Caution]	<ul style="list-style-type: none">• The command is valid only when it is input at the head of the line.• In the page mode, half dots are not used, but only normal dots. Therefore, you should take heed in setting in increments of half dot in the standard mode.• Only the font consisting of normal dots is valid.• The following commands have two kinds of set values for the standard mode and page mode:<ul style="list-style-type: none">ESC SP Sets the right space size of the charactersESC 2 Sets the 1/6-inch line feed amountESC 3 Sets the line feed amount• The following commands are ignored in the page mode:<ul style="list-style-type: none">ESC K Print and reverse directional paper feedESC e Print and n-line reverse directional paper feedESC * Specifies the double density bit imageESC q Release• The following commands are valid only for their setting in the page mode:<ul style="list-style-type: none">ESC { Selects/deselects the inverted charactersESC ! Selects/deselects the 7×7 font and underline• The command is valid only in the standard mode.• ESC @ returns you to the standard mode without printing.
[Default]	The standard mode has been selected.
[See Also]	FF, 6. Interface

ESC R n

[Function] Selects International Characters

[Code] ASCII ESC R n
Hexadecimal 1B 52 n
Decimal 27 82 n

[Range] 0 n 10

[Outline] This command selects the character sets for the countries listed below, depending on a value of n.

n	Character Set
0	U.S.A
1	France
2	Germany
3	England
4	Denmark I
5	Sweden
6	Italy
7	Spain
8	Japan
9	Norway
10	Denmark II

[Caution] If n is beyond the range, this command will be ignored.

[Default] n = 0

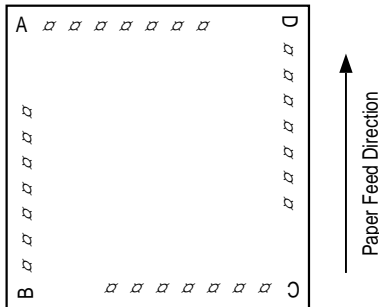
ESC T n

[Function] Selects Character Print Direction in Page Mode

[Code]	ASCII	ESC	T	n
	Hexadecimal	1B	54	n
	Decimal	27	84	n

[Range] 0 n 3, 48 n 51

[Outline] This command specifies the character printing direction and start point in the page mode. The character printing direction is specified with n.
n = 0, 48 : □ (Start point at upper left: A)
n = 1, 49 : ◓ (Start point at lower left: B)
n = 2, 50 : ◑ (Start point at lower right: C)
n = 3, 51 : ◒ (Start point at upper right: D)



[Caution]

- If the printing direction is specified or changed, the subsequent characters will have different printing direction and start point (upper left, lower left, lower right, or upper right), depending on a value of n.
- Only setting is valid in the standard mode.
- If n is beyond the range, this command will be ignored.

[Default] n = 0

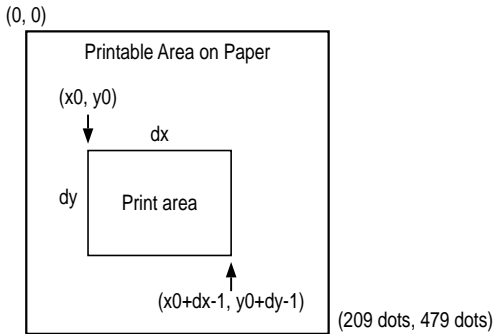
ESC W xL xH yL yH dxL dxH dyL dyH

[Function]	Sets Print Area in Page Mode													
[Code]	ASCII	ESC	W	xL	xH	yL	yH	dxL	dxH	dyL	dyH			
	Hexadecimal	1B	57	xL	xH	yL	yH	dxL	dxH	dyL	dyH			
	Decimal	27	87	xL	xH	yL	yH	dxL	dxH	dyL	dyH			
[Range]	0	xL	255,	xH = 0,	0	yL	255,	0	yH	1,	0	dxL	255,	dxH = 0
	0	dyL	255,	0	dyH	1	(Except dxL = dxH = 0 or dyL = dyH = 0)							

[Outline] This command sets the position and size of the print area in the page mode.

- The upper left start point is represented by (x0, y0), y-directional(vertical) length by dy dots, and x-directional(horizontal) length by dx dots.

$$x0 = [(xL + xH \times 256)] \quad y0 = [(yL + yH \times 256)]$$

$$dx = [(dxL + dxH \times 256)] \quad dy = [(dyL + dyH \times 256)]$$


- [Caution]
- Setting beyond the printable area on the paper is automatically adjusted to the maximum settable area, based on the effective values from xL to dyH (i.e., xL, xH, yL, yH, dxL, dxH, dyL and dyH).
 - The maximum x-directional dot in the printable area is 210.
 - The maximum y-directional dot in the printable area is 480.
 - When deploying the print data in the specified area, a print area length in the character printing direction and vertical direction must be always 8 dots or more.
 - Set the print area to the size fittable within the printing paper.
 - If the start point (x0, y0) is beyond the printable area, this command will be ignored.
 - Only setting is valid in the standard mode.

[Default] xL = xH = yL = yH = 0, dxL = 210,
dxH = 0, dyL = 224, dyH = 1

[See Also] CAN, ESC L, ESC T

ESC c 4 n

[Function] Selects No-paper Sensor Valid for Print Stop

[Code] ASCII ESC c 4 n
Hexadecimal 1B 63 34 n
Decimal 27 99 52 n

[Range] 0 n 255

[Outline] • This command selects in which status of the no-paper Sensor printing should be stopped. Each bit has the following different meanings.

Bit	Sensor	Hexadecimal	Decimal
0	Undefined	–	–
1	Undefined	–	–
2	Undefined	–	–
3	Undefined	–	–
4	TOF sensor disabled	00	0
	TOF sensor enabled	10	16
5	BOF sensor disabled	00	0
	BOF sensor enabled	20	32
6	Undefined	–	–
7	Undefined	–	–

[Caution] • It is possible to select multiple sensors as a printing stop condition, but if any one of them detects the no-paper condition, the printer will stop printing.
• The printer stops printing after printing the on-going line and feeding the paper. If the panel switch is disabled at this time, the printer will release the paper automatically and waits for new paper to be set.

[Default] n = 0

[See Also] ESC c 5

ESC c 5 n

[Function]	Enables/Disables Panel Switch			
[Code]	ASCII	ESC c	5	n
	Hexadecimal	1B 63	35	n
	Decimal	27 99	53	n
[Range]	0 n 255			
[Outline]	This command enables/disables the panel switch. • n is valid only for the least significant bit. At n = < 0>B, the command enables the panel switch. At n = < 1>B, the command disables the panel switch.			
[Caution]	• If the panel switch is disabled with this command, all the panel switches will be disabled.			
[Default]	n = 0			

ESC d n

[Function]	Print and N-line Paper Feed			
[Code]	ASCII	ESC d	n	
	Hexadecimal	1B 64	n	
	Decimal	27 100	n	
[Range]	0 n 255			
[Outline]	This command prints the data in the print buffer and feeds the paper by n-lines.			
[Caution]	• The head of the line is assumed to be the next printing start position. • The line feed amount set with ESC 2 or ESC 3 does not change.			
[See Also]	ESC 2, ESC 3			

ESC e n

[Function]	Print and N-line Reverse Paper Feed			
[Code]	ASCII	ESC	e	n
	Hexadecimal	1B	65	n
	Decimal	27	101	n
[Range]	0 n 255			
[Outline]	This command prints the data in the print buffer and feeds the paper by n-lines in the reverse direction.			
[Caution]	<ul style="list-style-type: none">• This command is valid only in the standard mode.• The head of the line is assumed to be the next printing start position.• The set amount does not remain.			

ESC f t1 t2

[Function]	Sets Single Sheet Waiting Time			
[Code]	ASCII	ESC	f	t1 t2
	Hexadecimal	1B	66	t1 t2
	Decimal	27	102	t1 t2
[Range]	t1 = 0 0 t2 64			
[Outline]	This command sets the time to wait for insertion of single sheets and the time to start operation after inserting the single sheets. <ul style="list-style-type: none">• The paper insertion waiting time shall be infinite.• The printer starts operating $t2 \times 0.1$ second after detecting insertion of the paper.			
[Caution]	<ul style="list-style-type: none">• If either t1 or t2 goes beyond the range, this command will be disabled, not changing the set values so far.			
[Default]	t1 = 0, t2 = 10			

ESC p m t1 t2

[Function] Generates Specified Pulses

[Code] ASCII ESC p m t1 t2
Hexadecimal 1B 70 m t1 t2
Decimal 27 112 m t1 t2

[Range] m = 0, 1, 48, 49
0 t1 255
0 t2 255

[Outline] This command outputs the signal specified with t1 or t2 to the connector pin m.
• The following table lists the types of m.

m	Connector Pin
0, 48	Drawer kick connector No. 2 pin
1, 49	Drawer kick connector No. 5 pin

• The ON time shall be $t1 \times 2$ mS and OFF time $t2 \times 2$ mS, respectively.

[Caution] If m goes beyond the range, this command will be ignored, processing the subsequent data as normal data.

[See Also] 5.3 Memory Switch Settings, 7. Peripheral Unit Driver Circuit

ESC q

[Function] Release

[Code] ASCII ESC q
Hexadecimal 1B 71
Decimal 27 113

[Outline] This command executes a release. The function can be selected with the Memory switch.

Memory Switch		Description
4-D	4-C	
0	0	Executes a release.
1	0	
0	1	Executes a release after ejecting all the paper in the forward direction (far side).
1	1	Executes a release after ejecting all the paper in the reverse direction (near side) (1).

1. Do not select this setting for the bound paper, because the paper may jam if it is all ejected in the reverse direction.

[Caution]

- If the panel switch is disabled and the no-paper sensor valid for print stop detects the no-paper condition, the printer will execute a release regardless of this command.
- This command is valid only in the standard mode.

[See Also] ESC c 4, ESC c 5

ESC "t" n

[Function] Selects Character Code Table

[Code] ASCII ESC t n
 Hexadecimal 1B 74 n
 Decimal 27 116 n

[Range] 0 n 10

[Outline] This command selects Page-n in the Character Code List..

n	Character Type
0	Codepage PC437 (USA, European Standard)
1	Codepage Katakana (Japanese)
2	Codepage PC850 (Multilingual)
3	Codepage PC860 (Portuguese)
4	Codepage PC863 (Canadian-French)
5	Codepage PC865 (Nordic)
6	Codepage PC852 (Eastern Europe)
7	Codepage PC866 (Russian)
8	Codepage PC857 (Turkish)
9	Windows Codepage
10	Codepage PC850 (Multilingual II)

[Caution] • If n goes beyond the range, this command will be ignored.
 • Windows Codepage will be available from ROM Version "V1.3".
 • The ROM version can be confirmed in a test print. For the test print operating method, see "4.9.3 Producing a test print".

[Default] n = 0

[See Also] 10. Character Codes Table

ESC u n

[Function] Sends Peripheral Device Status

[Code] ASCII ESC u n
 Hexadecimal 1B 75 n
 Decimal 27 117 n

[Range] n = 0, 48

[Outline] This command sends the status of the connector pin n every time the command is executed. The following lists the type of n.

n	Connector Pin
0, 48	Drawer kick connector No. 3 pin

[Caution] The following table describes the status sent.

- If nothing is connected to the connector, the bit 0 will be always "1".
- If DTR/DSR control is selected and the memory switch 4-5 is set to 0, the printer sends only 1 byte after confirming that the host is ready to receive (the DSR signal status is Space). If the host is not ready (the DSR signal status is Mark), the printer will wait until it will be ready to receive. If XON/XOFF control is selected or the memory switch 4-5 is set to 1, the printer will send only 1 byte without confirming the DSR signal status.
- Since this command is executed at deployment of the reception buffer, there may be a delay between command reception and status sending, depending on the reception buffer condition.
- If ASB is enabled by GS a, it is necessary to distinguish the status by this command from that of ASB. See "6. Interface" for how to distinguish them.
- If n goes beyond the range, this command will be ignored.

Bit	Peripheral Device	Hexadecimal	Decimal
0	No. 3 pin's level = L	00	0
	No. 3 pin's level = H	01	1
1	Undefined	-	-
2	Undefined	-	-
3	Undefined	-	-
4	Unused	00	0
5	Undefined	-	-
6	Undefined	-	-
7	Unused	00	0

[See Also] DLE EOT, GS a, 6. Interface, 7. Peripheral Unit Driver Circuit

ESC v

[Function] Sends Paper Sensor Status

[Code] ASCII ESC v
Hexadecimal 1B 76
Decimal 27 118

[Outline] This command sends the status of the paper sensor when it is executed.

[Caution] The following table describes the status sent.

- If DTR/DSR control is selected and the memory switch 4-5 is set to 0, the printer sends only 1 byte after confirming that the host is ready to receive (the DSR signal status is Space). If the host is not ready (the DSR signal status is Mark), the printer will wait until it will be ready to receive. If XON/XOFF control is selected or the memory switch 4-5 is set to 1, the printer will send only 1 byte without confirming the DSR signal status.
- If printing is under way, the printer will send the then status after printing that line and feeding the paper (the status sending timing differs from ESC u and GS l).
- Since this command is executed at deployment of the reception buffer, there may be a delay between command reception and status sending, depending on the reception buffer condition.
- If ASB is enabled by GS a, it is necessary to distinguish the status by this command from that of ASB. See "6. Interface" for how to distinguish them.

Bit	Description	Hexadecimal	Decimal
0	BOF sensor with paper	00	0
	BOF sensor without paper	01	1
1	TOF sensor with paper	00	0
	TOF sensor without paper	02	2
2	Undefined	–	–
3	Undefined	–	–
4	Unused	00	0
5	Undefined	–	–
6	Undefined	–	–
7	Unused	00	0

[See Also] DLE EOT, GS a, 2.3 Paper Specifications and Print Area, 6. Interface

ESC { n

[Function] Selects/Deselects Inverted Print

[Code] ASCII ESC { n
 Hexadecimal 1B 7B n
 Decimal 27 123 n

[Range] 0 n 255

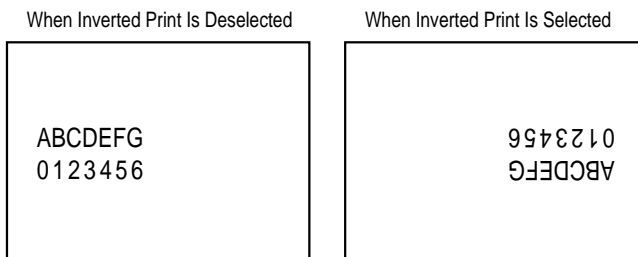
[Outline] This command selects or deselects inverted print.

- n is valid only for the least significant bit.
 - At n = < 0>B, the command deselects inverted print.
 - At n = < 1>B, the command selects inverted print.

[Caution] • Inverted print refers to turning the line by 180 degrees to print it upside down.
 • The command is valid only when it is input at the head of the line.
 • Only setting is valid in the page mode.

[Default] n = 0

[Example]



Paper Feed Direction

GS I n

[Function] Sends Printer ID

[Code] ASCII GS I n
 Hexadecimal 1D 49 n
 Decimal 29 73 n

[Range] 1 n 3, 49 n 51

[Outline] This command sends the printer ID listed in the table below, depending on setting of n, when it is executed.

n	Type of Printer ID	Specification	ID (Hex.)
1, 49	Model ID	CBM-820	02H
2, 50	Type ID	See Table below	
3, 51	ROM version	Depends on ROM version	

- [Caution]
- If DTR/DSR control is selected and the memory switch 4-5 is set to 0, the printer sends only 1 byte after confirming that the host is ready to receive (the DSR signal status is Space). If the host is not ready (the DSR signal status is Mark), the printer will wait until it will be ready to receive. If XON/XOFF control is selected or the memory switch 4-5 is set to 1, the printer will send only 1 byte without confirming the DSR signal status.
 - Since this command is executed at deployment of the reception buffer, there may be a delay between command reception and status sending, depending on the reception buffer condition.
 - If ASB is enabled by GS a, it is necessary to distinguish the status by this command from that of ASB. See "6. Interface" for how to distinguish them.
 - The ROM version may be changed.
 - If n goes beyond the range, this command will be ignored.

n = 2 Type ID

Bit	Description	Hexadecimal	Decimal
0	Unused	00	0
1	Unused	00	0
2	Undefined	-	-
3	Undefined	-	-
4	Unused	00	0
5	Undefined	-	-
6	Undefined	-	-
7	Unused	00	0

[See Also] 5. Making DIP Switch Settings, 6. Interface

GS a n

[Function] Enables/Disables Automatic Status Sending

[Code] ASCII GS a n
 Hexadecimal 1D 61 n
 Decimal 29 97 n

[Range] 0 n 255

[Outline] This command selects which status should be the target of automatic status sending (ASB: Automatic Status Back). Each bit has the following different meanings.

Bit	ASB Target Status	Hexadecimal	Decimal
0	Drawer kick connector No. 3 pin status disabled	00	0
	Drawer kick connector No. 3 pin status enabled	01	1
1	On-line/off-line status disabled	00	0
	On-line/off-line status enabled	02	2
2	Error status disabled	00	0
	Error status enabled	04	4
3	Undefined	-	-
4	Undefined	-	-
5	Single sheet sensor status disabled	00	0
	Single sheet sensor status enabled	20	32
6	Undefined	-	-
7	Undefined	-	-

[Caution]

- If none of the status is selected, the ASB function will be invalid.
- If any one of the status is selected, the ASB function will be valid, and the printer will automatically send the 4-byte status every time the selected status changes.
- If ASB is valid when this command is handled, the current status will be sent unconditionally.
- See the tables on the following pages for the status to be sent.
- When sending the status, the printer sends 4 bytes without confirming the DSR signal status. The 4-byte status to be sent must be always successive except the XOFF code.
- Since this command is executed at deployment of the reception buffer, there may be a delay between command reception and status sending, depending on the reception buffer condition.
- If Printer Disabled is selected by ESC = (Selects Peripheral Device), this command will be invalid, but ASB will be always valid.
- When using DLE EOT, ESC u, ESC v, or GS I, it is necessary to distinguish the status of this command and ASB from that by the respective commands. See "6. Interface" for how to distinguish them.

1st Byte (Printer Information)

Bit	Status	Hexadecimal	Decimal
0	Unused	00	0
1	Unused	00	0
2	Drawer kick connector No. 3 pin status = L	00	0
	Drawer kick connector No. 3 pin status = H	04	4
3	On-line status	00	0
	Off-line status	08	8
4	Unused	10	16
5	Unused	00	0
6	Not feeding the paper by the Paper Feed switch	00	0
	Feeding the paper by the Paper Feed switch	40	64
7	Unused	00	0

2nd Byte (Error Information)

Bit	Status	Hexadecimal	Decimal
0	Undefined	-	-
1	Undefined	-	-
2	Undefined	-	-
3	Undefined	-	-
4	Unused	00	0
5	No irrecoverable error	00	0
	Irrecoverable error	20	32
6	Undefined	-	-
7	Unused	00	0

3rd Byte (Paper Sensor Information)

Bit	Status	Hexadecimal	Decimal
0	Undefined	-	-
1	Undefined	-	-
2	Undefined	-	-
3	Undefined	-	-
4	Unused	00	0
5	Paper set in the BOF sensor	00	0
	No paper set in the BOF sensor	20	32
6	Paper set in the TOF sensor	00	0
	No paper set in the TOF sensor	40	64
7	Unused	00	0

4th Byte (Paper Sensor Information)

Bit	Status	Hexadecimal	Decimal
0	Slip selected	00	0
1	Slip printable	00	0
	Slip unprintable	02	2
2	Undefined	-	-
3	Undefined	-	-
4	Unused	00	0
5	Undefined	-	-
6	Undefined	-	-
7	Unused	00	0

[Default]

- Bit 1:
- "0" (printable) when the slip is inserted, and "1" (unprintable) when ejection starts.
 - If the printer is waiting for insertion of the slip;
 - The bits 5 and 6 of the 3rd byte will be turned to "1" (no paper) and the bit 1 of the 4th byte to "1" (unprintable), respectively.
 - If no-paper print stop (ESC c 4) is disabled, the slip status will not be turned to "1" (unprintable), even if the print area of the slip paper runs out.

[Default]

n = 0 n = 0

[See Also]

DLE EOT, ESC u, ESC v, 6. Interface

GS r n

[Function] Sends Status

[Code] ASCII GS r n
 Hexadecimal 1D 72 n
 Decimal 29 114 n

[Range] 1 n 2, 49 n 50

[Outline] This command sends the status, depending on setting of n.

n	Description
1, 49	Sends the paper sensor status. (Same as ESC v)
2, 50	Sends the status of the drawer kick connector. (Same as ESC u 0)

[Caution]

- The following tables describe the status sent.
- If DTR/DSR control is selected and the memory switch 4-5 is set to 0, the printer sends only 1 byte after confirming that the host is ready to receive (the DSR signal status is Space). If the host is not ready (the DSR signal status is Mark), the printer will wait until it will be ready to receive. If XON/XOFF control is selected or the memory switch 4-5 is set to 1, the printer will send 1 byte without confirming the DSR signal status.
- Since this command is executed at deployment of the reception buffer, there may be a delay between command reception and status sending, depending on the reception buffer condition.
- If ASB is enabled by GS a, it is necessary to distinguish the status by this command from that of ASB. See "6. Interface" for how to distinguish them.
- If n goes beyond the range, this command will be ignored.

n = 1, 49 : Paper sensor status

Bit	Status	Hexadecimal	Decimal
0	BOF sensor with paper	00	0
	BOF sensor without paper	01	1
1	TOF sensor with paper	00	0
	TOF sensor without paper	02	2
2	Undefined	-	-
3	Undefined	-	-
4	Unused	00	0
5	Undefined	-	-
6	Undefined	-	-
7	Unused	00	0

n = 2, 50 : Drawer kick connector status

Bit	Status	Hexadecimal	Decimal
0	Drawer kick connector No. 3 pin status = L	00	0
	Drawer kick connector No. 3 pin status = H	01	1
1	Undefined	-	-
2	Undefined	-	-
3	Undefined	-	-
4	Unused	00	0
5	undefined	-	-
6	Undefined	-	-
7	Unused	00	0

[See Also]

DLE EOT, ESC u, ESC v, GS a, 6. Interface

1. Character Codes Table

1.1 Codepage PC437 (USA, European Standard)

	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
0	NUL	DLE	SP	0	@	P	'	p	Ç	É	á	⌘	⌞	⌟	α	≡
1		XON	!	1	A	Q	a	q	ü	æ	í	⌘	⌞	⌟	β	±
2			"	2	B	R	b	r	é	Æ	ó	⌘	⌞	⌟	Γ	≙
3		XOF	#	3	C	S	c	s	â	ô	ú	|	⌞	⌟	π	≚
4	EOT	DC4	\$	4	D	T	d	t	ä	ö	ñ	⌞	⌟	⌞	Σ	ƒ
5	ENQ		%	5	E	U	e	u	à	ò	Ñ	⌞	⌟	⌞	σ	Ƶ
6			&	6	F	V	f	v	â	û	á	⌞	⌟	⌞	μ	÷
7			'	7	G	W	g	w	ç	ù	ø	⌞	⌟	⌞	τ	≈
8		CAN	(	8	H	X	h	x	ê	ÿ	¿	⌞	⌟	⌞	Φ	◊
9	HT		)	9	I	Y	i	y	ë	Ö	⌞	⌟	⌞	⌟	θ	•
A	LF		*	:	J	Z	j	z	è	Û	⌞	|	⌞	⌟	Ω	•
B		ESC	+	;	K	[	k	{	ï	ø	½	⌞	⌟	■	δ	√
C	FF	FS	,	<	L	\	l	|	î	£	¼	⌞	⌟	■	∞	∞
D	CR	GS	-	=	M	]	m	}	ì	¥	¡	⌞	⌟	■	φ	²
E			.	>	N	^	n	~	Ä	Pt	«	⌞	⌟	⌞	€	■
F			/	?	O	_	o		Å	f	»	⌞	⌟	⌞	∩	

1.2 Codepage Katakana (Japanese)

	8	9	A	B	C	D	E	F
0	—	⊥	SP	—	タ	ミ	ニ	×
1	—	⊥	°	ア	チ	ム	ト	円
2	—	⊥	⊥	イ	ツ	メ	キ	年
3	■	⊥	⊥	ウ	テ	モ	ヨ	月
4	■	—	、	エ	ト	ヤ	▲	日
5	■	—	・	オ	ナ	ユ	▲	時
6	■	||	ヲ	カ	ニ	ヨ	▼	分
7	■	|	ア	キ	ヌ	ラ	▼	秒
8	|	⊥	イ	ク	ネ	リ	♠	〒
9	|	⊥	ウ	ケ	ノ	ル	♥	市
A	|	⊥	エ	コ	ハ	レ	◆	区
B	|	⊥	オ	サ	ヒ	ロ	♣	町
C	|	/	ヤ	シ	フ	ワ	●	村
D	|	)	ユ	ス	ヘ	ン	○	人
E	|	(	ヨ	セ	ホ	“	/	※
F	+	/	ツ	ソ	マ	°	\	SP

1.3 Codepage PC850 (Multilingual)

	8	9	A	B	C	D	E	F
0	Ç	É	á	⌘	⌞	ð	Ó	—
1	ü	æ	í	⌘	⌞	Ð	β	±
2	é	Æ	ó	⌘	⌞	Ê	Ô	=
3	â	ô	ú	|	⌞	Ë	Ò	‰
4	ä	ö	ñ	⌞	—	È	ø	¶
5	à	ò	Ñ	Á	+	€	Ö	§
6	á	û	ä	Â	ã	Í	μ	÷
7	ç	ù	ø	À	Ã	Î	þ	›
8	ê	ÿ	¿	©	⌞	Ï	ƒ	。
9	ë	Û	®	⌞	⌞	⌞	Ú	“
A	è	Û	¬	|	⌞	⌞	Û	•
B	ĩ	φ	½	⌞	⌞	■	Ù	¹
C	î	£	¼	⌞	⌞	■	ý	ª
D	ì	Φ	¡	¢	—	⌞	Ý	²
E	Ä	×	«	¥	+	ì	—	■
F	Å	f	»	⌞	□	■	˘	

1.4 Codepage PC860 (Portuguese)

	8	9	A	B	C	D	E	F
0	Ç	É	á	⋮	⊥	⊥	α	≡
1	ü	À	í	⊗	⊥	⊥	β	±
2	é	È	ó	⊗	⊥	⊥	Γ	≧
3	â	ô	ú	|	⊥	⊥	π	≦
4	ã	õ	ñ	⊥	—	⊥	Σ	∫
5	à	ò	Ñ	⊥	+	⊥	σ	∫
6	Á	Ú	ã	⊥	⊥	⊥	μ	÷
7	ç	ù	ø	⊥	⊥	+	τ	≈
8	ê	î	¿	⊥	⊥	+	Φ	°
9	Ê	Ï	Ò	⊥	⊥	⊥	θ	▪
A	è	Û	¬	|	⊥	⊥	Ω	.
B	Í	é	½	⊥	⊥	■	δ	√
C	Ô	£	¼	⊥	⊥	■	∞	n
D	ì	Û	¡	⊥	—	■	φ	²
E	Ã	Pt	<<	⊥	+	■	∈	■
F	Â	Ó	>>	⊥	⊥	■	∩	

1.5 Codepage PC863 (Canadian-French)

	8	9	A	B	C	D	E	F
0	Ç	É	ı	⋮	⊥	⊥	α	≡
1	ü	È	˘	⊗	⊥	⊥	β	±
2	é	Ê	ó	⊗	⊥	⊥	Γ	≧
3	â	ô	ú	|	⊥	⊥	π	≦
4	Â	È	¨	⊥	—	⊥	Σ	∫
5	à	Ī	˘	⊥	+	⊥	σ	∫
6	¶	ù	³	⊥	⊥	⊥	μ	÷
7	ç	ù	—	⊥	⊥	+	τ	≈
8	ê	▯	Î	⊥	⊥	+	Φ	◦
9	ë	Ô	⊥	⊥	⊥	⊥	θ	•
A	è	Û	⊥	|	⊥	⊥	Ω	.
B	ï	¢	½	⊥	⊥	■	δ	√
C	î	£	¼	⊥	⊥	■	∞	n
D	=	Û	¾	⊥	—	■	φ	²
E	À	Û	«	⊥	+	■	∈	■
F	§	f	»	⊥	⊥	■	∩	

1.6 Codepage PC865 (Nordic)

	8	9	A	B	C	D	E	F
0	Ç	É	á	⋮	⊥	⊥	α	≡
1	ü	æ	í	⊗	⊥	⊥	β	±
2	é	Æ	ó	⊗	⊥	⊥	Γ	≧
3	â	ô	ú	|	⊥	⊥	π	≦
4	ä	ö	ñ	⊥	—	⊥	Σ	ƒ
5	à	ò	Ñ	⊥	+	⊥	σ	∫
6	â	û	ǻ	⊥	⊥	⊥	μ	÷
7	ç	ù	ø	⊥	⊥	+	τ	≈
8	ê	ÿ	¿	⊥	⊥	+	Φ	°
9	ë	Ö	⊥	⊥	⊥	⊥	θ	•
A	è	Û	⊥	|	⊥	⊥	Ω	.
B	ï	φ	½	⊥	⊥	■	δ	√
C	î	£	¼	⊥	⊥	■	∞	n
D	ì	Φ	¡	⊥	—	■	φ	²
E	Ä	Pt	«	⊥	+	■	∈	■
F	Å	f	□	⊥	⊥	■	∩	

1.7 Codepage PC852 (Eastern Europe)

	8	9	A	B	C	D	E	F
0	Ç	É	á	⋮	Ł	đ	Ó	-
1	ü	Ł	í	⋮	⊥	Đ	β	"
2	é	í	ó	⋮	⊥	Ď	Ŏ	˘
3	â	ô	ú	|	†	Ě	Ň	˘
4	ä	ö	À	†	—	ď	í	˘
5	ü	Ł	a	Á	†	Ň	ň	§
6	ć	ł	ż	Â	À	í	š	+
7	ç	š	ž	Ě	ä	î	š	,
8	ł	ś	Ę	Ş	⊥	é	Ř	°
9	ë	Ö	ę	≡	⊥	∟	Ú	˘
A	Ó	Ü		||	⊥	∟	í	•
B	ó	ř	z	≡	⊥	■	Ú	ů
C	î	ř	Č	≡	⊥	■	ý	Ř
D	ž	ł	ş	Ž	=	Ť	Ý	ř
E	Ā	×	«	z	≡	Ü	ł	■
F	Ć	č	»	ł	α	■	'	SP

1.8 Codepage PC866 (Russian)

	8	9	A	B	C	D	E	F
0	А	Р	а	⋮	⊥	⊥	р	È
1	Б	С	б	⊗	⊥	⊥	с	è
2	В	Т	в	⊗	⊥	⊥	т	Е
3	Г	У	г	|	⊥	⊥	у	ε
4	Д	Ф	д	⊥	—	⊥	ф	Ï
5	Е	Х	е	⊥	+	⊥	х	ï
6	Ж	Ц	ж	⊥	⊥	⊥	ц	ÿ
7	З	Ч	з	⊥	⊥	+	ч	ÿ
8	И	Ш	и	⊥	⊥	+	ш	°
9	Й	Щ	й	⊥	⊥	⊥	щ	•
A	К	Ъ	к	|	⊥	⊥	ъ	·
B	Л	Ы	л	⊥	⊥	■	ы	√
C	М	Ь	м	⊥	⊥	■	ь	No
D	Н	Э	н	⊥	—	■	э	□
E	О	Ю	о	⊥	+	■	ю	■
F	П	Я	п	⊥	⊥	■	я	

1.9 Codepage PC857 (Turkish)

	8	9	A	B	C	D	E	F
0	Ç	É	á	⋮	⊥	⊥	α	≡
1	ü	æ	í	⊗	⊥	⊥	β	±
2	é	Æ	ó	⊗	⊥	⊥	Γ	≧
3	â	ô	ú	|	⊥	⊥	π	≦
4	ä	ö	ñ	⊥	—	⊥	Σ	∫
5	à	ò	Ñ	⊥	+	⊥	σ	∫
6	â	û	Ç	⊥	⊥	⊥	μ	÷
7	ç	ù	ğ	⊥	⊥	+	τ	≈
8	ê	ı	ı	⊥	⊥	+	Φ	°
9	ë	Ö	⊥	⊥	⊥	⊥	θ	•
A	è	Û	⊥	|	⊥	⊥	Ω	.
B	ï	ç	½	⊥	⊥	■	δ	√
C	î	£	¼	⊥	⊥	■	∞	n
D	ì	¥	ı	⊥	—	■	φ	²
E	Ä	§	«	⊥	+	■	∈	■
F	Å	§	»	⊥	⊥	■	∩	

1.10 Windows Codepage

	8	9	A	B	C	D	E	F
0	€			°	À	Ð	À	ð
1		‘	ı	±	Á	Ñ	Á	ñ
2	,	’	¢	²	Â	Ò	Â	ò
3	f	“	£	³	Ã	Ó	Ã	ó
4	„	”	¤	´	Ä	Ô	Ä	ô
5	…	•	¥	µ	Å	Ö	Å	ö
6	†	–	¦	¶	Æ	Ö	Æ	ö
7	‡	—	§	·	Ç	×	Ç	÷
8	^	-	¨	˙	È	Ø	è	ø
9	‰	™	©	ı	É	Ù	é	ù
A	Š	š	ª	º	Ê	Ú	ê	ú
B	‹	›	«	»	Ë	Û	ë	û
C	Œ	œ	¬	¼	Ì	Ü	ì	ü
D			-	½	Í	Ý	í	ý
E			®	¾	Î	Þ	î	þ
F		ÿ		¿	Ï	ß	ï	ÿ

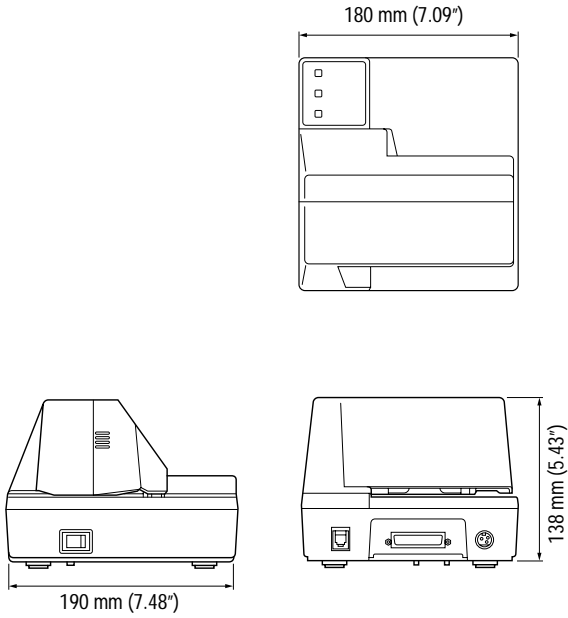
1.11 Codepage PC858 (Multilingual II)

	8	9	A	B	C	D	E	F
0	Ç	É	á	⋮	⊥	ð	Ó	—
1	ü	æ	í	⌘	⊥	Ð	β	±
2	é	Æ	ó	⌘	⊥	Ê	Ô	=
3	â	ô	ú	|	⊥	Ë	Ò	‰
4	ä	ö	ñ	⊥	—	È	ø	¶
5	à	ò	Ñ	Á	+	€	Ö	§
6	â	û	a	Â	ã	Í	μ	÷
7	ç	ù	q	À	Ã	Î	þ	›
8	ê	ÿ	¿	©	⊥	Ï	ƒ	。
9	ë	Ï	®	⊥	⊥	⊥	Ú	“
A	è	Û	¬	|	⊥	⊥	Û	•
B	ĩ	φ	½	⊥	⊥	■	Ù	¹
C	î	£	¼	⊥	⊥	■	ý	ª
D	ì	Φ	ì	¢	—	⊥	Ý	²
E	Ä	×	«	¥	+	ì	—	■
F	Å	f	»	⊥	□	■	˘	

Appendix 1: Outline Drawing of Printer (CBM-820)

Dimensions and Weight

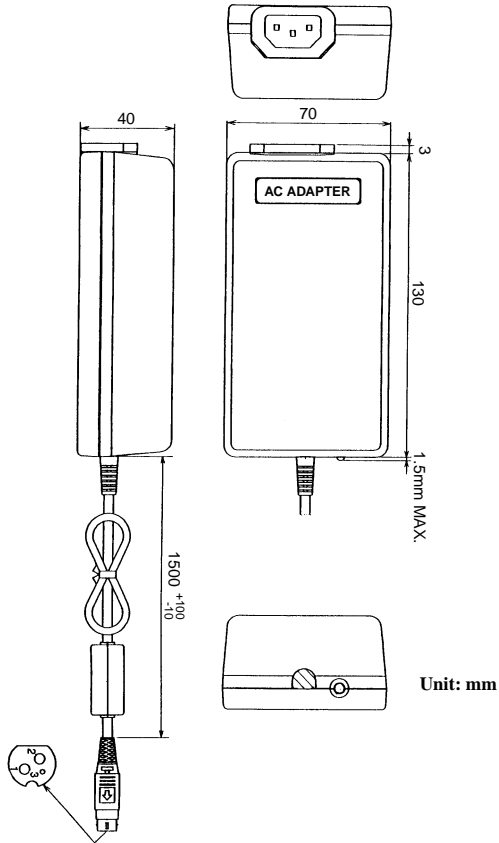
Dimensions 180 (W) × 190 (D) × 138 (H) mm / 7.09" × 7.48" × 5.43"
Weight 2.1 kg / 4.6 lbs.



Appendix 2: Outline Drawing of AC Adapter (31AD)

Dimensions and Weight

Dimensions 70 (W) × 130 (D) × 40 (H) mm / 2.76" × 5.12" × 1.58"
Weight 0.43 kg / 0.94 lbs.



1. Drucker-Einrichtung

Dieses Kapitel enthält wichtige Informationen zur Vorbereitung Ihres Druckers. Bitte dieses Kapitel sorgfältig durchlesen, bevor Sie den Drucker zum ersten Mal in Betrieb nehmen. In diesem Kapitel erfahren Sie Einzelheiten über:

- Wahl eines Aufstellungsorts für den Drucker
- Auspacken und Vorbereiten des Druckers
- Einsetzen der Farbbandkassette
- Anschließen an den Hostcomputer
- Einsetzen des Papiers

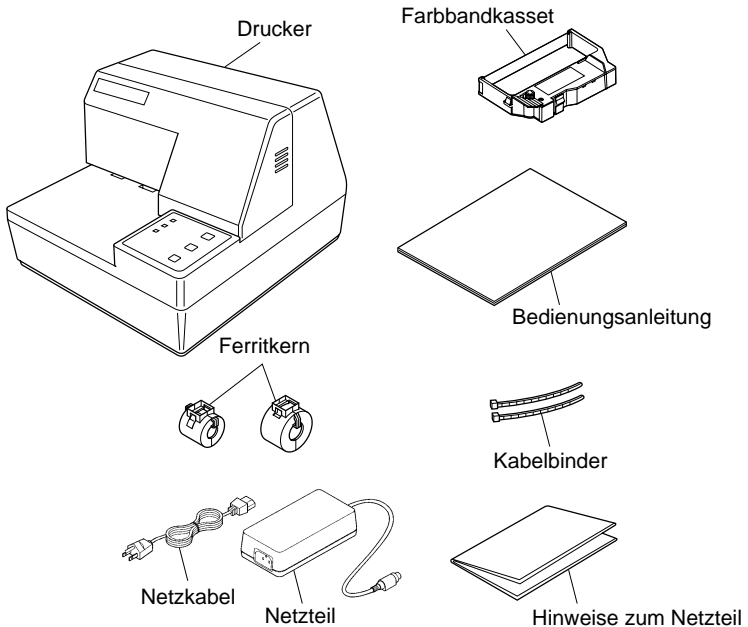
1.1 Wahl eines Aufstellungsorts für den Drucker

Bevor Sie den Drucker auspacken, sollten Sie einige Minuten damit verbringen, einen geeigneten Aufstellungsort auszusuchen. Denken Sie dabei an die folgenden Punkte:

- ✓ Den Drucker auf einem flachen, aber festen Untergrund aufstellen, wo keine Vibrationen vorhanden sind.
- ✓ Die verwendete Steckdose soll in der Nähe und frei zugänglich sein.
- ✓ Sicherstellen, daß der Drucker nahe genug am Computer ist, um die Geräte mit dem Druckerkabel verbinden zu können.
- ✓ Sicherstellen, daß der Drucker vor direktem Sonnenlicht geschützt ist.
- ✓ Sicherstellen, daß der Drucker ausreichend weit von Heizkörpern entfernt steht.
- ✓ Dafür sorgen, daß die Umgebung des Druckers sauber, trocken und staubfrei ist.
- ✓ Sicherstellen, daß der Drucker an eine einwandfreie Stromzufuhr angeschlossen ist. Er sollte nicht an Steckdosen angeschlossen werden, an denen bereits Geräte mit möglichen Netzstörungen wie Kopierer, Kühlschränke u.a. angeschlossen sind.
- ✓ Die Versorgungsspannung muß dem Spannungswert auf dem Typenschild an der Unterseite des Druckers entsprechen.
- ✓ Den Drucker nicht an Orten mit hoher Luftfeuchtigkeit aufstellen.

1.2 Auspacken des Druckers

Überprüfen Sie den Kartoninhalt, und vergewissern Sie sich, daß alle unten abgebildeten Teile vorhanden sind.



Hinweis:

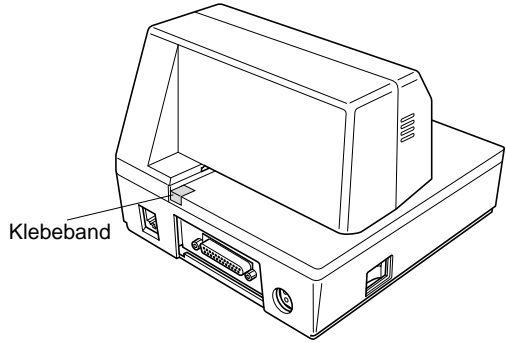
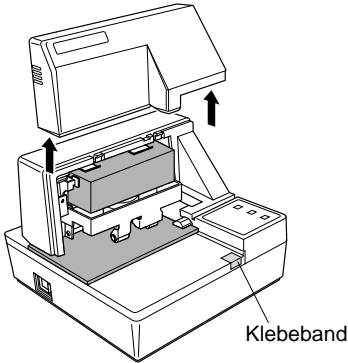
Das Netzteil wird von Hinweisen begleitet. Bitte dieses Dokument vor der Verwendung des Netzteils durchlesen, und zusammen mit dieser Anleitung aufbewahren.

Falls Teile fehlen, wenden Sie sich zwecks Nachlieferung bitte an den Fachhandel, bei dem das Gerät gekauft wurde. Im Hinblick auf einen eventuellen zukünftigen Transport des Druckers empfiehlt es sich, den Lieferkarton und das gesamte Verpackungsmaterial aufzubewahren.

Immer die Bedienungsanleitung und die Hinweise in der Nähe des Druckers aufbewahren, zum schnellen Nachschlagen bei Bedarf.

1.3 Entfernen der Schutzmaterialien

Schutzstreifen und ein Stück Pappe sind im Drucker eingelegt, um die internen Bauteile beim Transport zu schützen. Vor der Inbetriebnahme des Druckers müssen die in der Abbildung markierten Schutzmaterialien entfernt werden.



2. Technische Daten

2.1 Allgemeine Daten

Drucksystem	Serieller Nadeldruck
Anzahl der Druckkopfnadeln	9 Stifte
Druckgeschwindigkeit	Maximal 3,1 Zeilen/s
Anzahl der Druckspalten	35
Gesamt-Punkte	210
Druckbreite	63 mm
Punktabstand	Horizontal: 0,30 mm Vertikal: 0,35 mm
Papierbreite	80 mm bis 182 mm
Sensoren	Sensor für Papier verbraucht, obere Papierkante, untere Papierkante
Befehlsmodi	ESC/POS-Modus (TM-295-Emulation)
Schnittstelle	Serielle Schnittstelle (RS-232C Standard)
Datenpuffer	2KB/35 Bytes (Kann mit DIP-Schalter gewählt werden)
Zuverlässigkeit	Mechanismus (MCBF): 2,5 Millionen Zeilen Lebensdauer des Druckkopfes: 70 Millionen Zeichen

Betriebsumgebung

Temperatur	5°C bis 40°C
Luftfeuchtigkeit	10% bis 80% relative Luftfeuchtigkeit bei 40°C (ohne Kondensat)

Lagerumgebung

Temperatur	-20°C bis 50°C
Luftfeuchtigkeit	5% bis 90% relative Luftfeuchtigkeit bei 40°C (ohne Kondensat)

Zuverlässigkeit

Druckbare Zeilen	MCBF 2.500.000 Zeilen
Kopflebensdauer	70.000.000 Zeichen

Farbband

Typ	Farbbandkassette
Farbe	Violett
Farbbandmaterial	Nylonband, Denier Nr. 40
Betriebslebensdauer	2,2 Millionen Zeichen

Wichtig!

Ausschließlich Farbbänder des vorgeschriebenen Typs verwenden. Andere Farbbandtypen können zu Funktionsstörungen oder zur Beschädigung des Druckers führen.

Gültige Standards

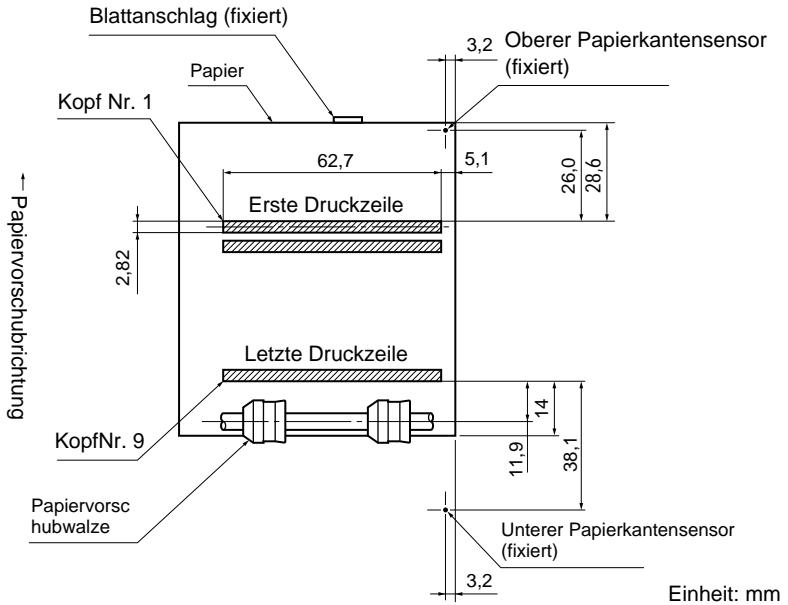
115-V-Modell: UL, C-UL, FCC Klasse A
230-V-Modell: TÜV, CE-Kennzeichnung
* Diese Standards sind gültig, wenn unser exklusives Netzteil (Serie 31 AD) verwendet wird.

2.2 Druckspezifikationen

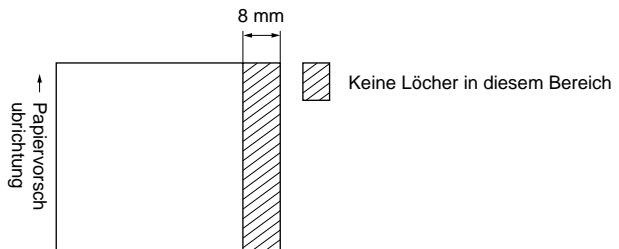
Zeichensatz	Codepage PC437 (USA, European Standard) Codepage Katakana (Japanese) Codepage PC850 (Multilingual) Codepage PC860 (Portuguese) Codepage PC863 (Canadian-French) Codepage PC865 (Nordic) Codepage PC852 (Eastern Europe) Codepage PC866 (Russian) Codepage PC857 (Turkish) Windows Codepage Codepage PC858 (Multilingual II)
Zeichenmatrix	7 × 9 (halb), 42 Spalten 5 × 9,35 Spalten
Zeichengröße	7 × 9 Schrifttyp (halb): 1,2 (B) × 2,42 (H) mm 5 × 9 Schrifttyp (2 Impulse pro Punkt): 1,5 (B) × 2,42 (H) mm 6 × 8 Schrifttyp (3 Impulse pro Punkt): 2,1 (B) × 2,42 (H) mm

2.3 Papier-Spezifikationen und Druckbereich

Papierbreite	80 bis 182 mm
Papierlänge	80 bis 257 mm
Kopien	Original + 2
Papierstärke	Einfach: 0,09 bis 0,2 mm Zweilagig: 0,12 mm (Minimum für doppellagiges Papier) bis 0,25 mm (maximal 0,2 mm bei Drucken von Grafiken)
Kopienverschiebung	Maximal 1,5 mm/15 Zeilen (zwischen oberem und unterem Blatt)
Binden	Oben oder links
Druckbereich	Abstand von der ersten Druckzeile (Kopf Nr. 1) bis zur oberen Papierkante (Blattanschlag): 28,6 mm Abstand von der ersten Druckzeile (Kopf Nr. 1) bis zum oberen Papierkantensensor: 26,0 mm (Die automatische Startpositionsfunktion stellt diesen Abstand jedoch auf 26,5 mm ein. Die automatische Startpositionsfunktion kann mit den Speichertasten aktiviert und deaktiviert werden.) Bei deaktiviertem oberem Papierrandsensor kann mit einem Befehl ein umgekehrter Papiervorschub ausgeführt und die Startposition damit auf etwa 20 mm von der oberen Papierkante eingestellt werden. Abstand von der letzten Druckzeile (Kopf Nr. 9) bis zum unteren Papierrand (unterer Papierrandsensor): 38,1 mm (Der Druck kann bis zu 27,3 mm vom unteren Papierrand fortgesetzt werden.) Bei deaktiviertem unterem Papierrandsensor kann bis auf 14,0 mm vom unteren Papierrand weitergedruckt werden. Rechter Rand: 5,1 mm Druckbereichbreite: 62,7 mm



Print Position



Kein Papier mit Löchern in diesem Bereich verwenden. Löcher im Papier können Fehlfunktionen des Papiersensors verursachen.

Papiervorschub

Antrieb	Schrittmotor
Abstand	In Einheiten von ca. $n/60$ Zoll einstellbar
Geschwindigkeit (während des Druckbetriebs)	3,5 Zoll/s
Geschwindigkeit (während des Druckbetriebs)	4,5 Zoll/s

Wichtig!

Das Papier muß eben, glatt und frei von Wellen, Krümmungen, Falten und Kniffen sein, da eine derartige Beschaffenheit des Papiers zu Papierstaus und zum Verschmieren der Tinte führen kann.

2.4 Technische Daten zur Netzversorgung

Netzversorgung

Netzteil	31AD, Schalttyp
Eingang	100 bis 240 V Netzspannung, 50/60 Hz
Ausgang	DC 24V Gleichspannung $\pm 5\%$, 1,9 A
Stecker	TCP8927-83-1100 (Hersteller: HOSHIDEN, oder gleichwertiges Teil)

Leistungsaufnahme

Bedingungen: DC 24 V, Antrieb für externe Geräte nicht eingeschlossen

Betrieb

(Durchschnittswerte)	Fortlaufender ASCII-Druck +Papiervorschub: 0,6 A
	Vollflächendruck + Papiervorschub: 1,0 A
	Vollflächendruck: 1,9 A
	Spitze (Flächendruck): 3,1 A

Bereitschaft

	Papierfreigabe deaktiviert: 0,24 A
(Durchschnittswerte)	Papierfreigabe aktiviert: 0,07 A

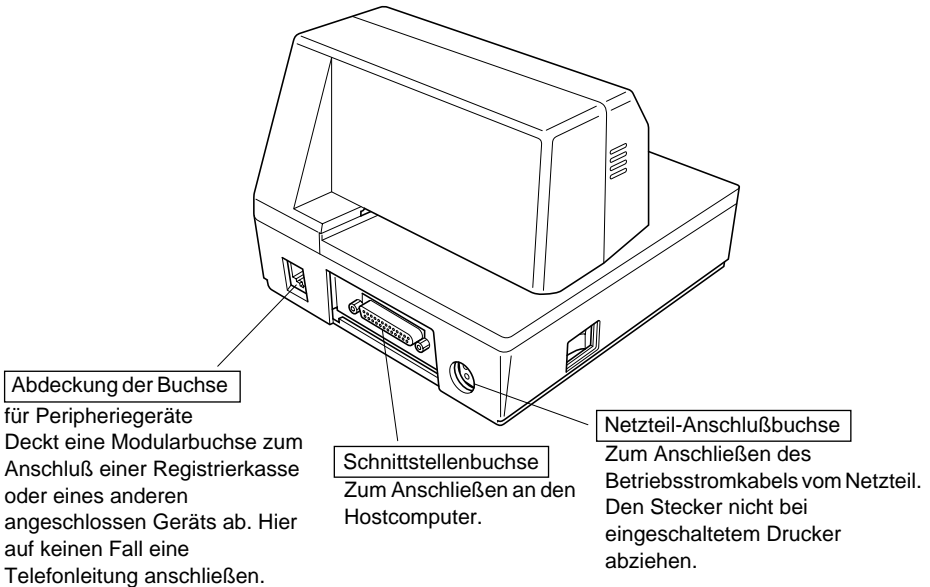
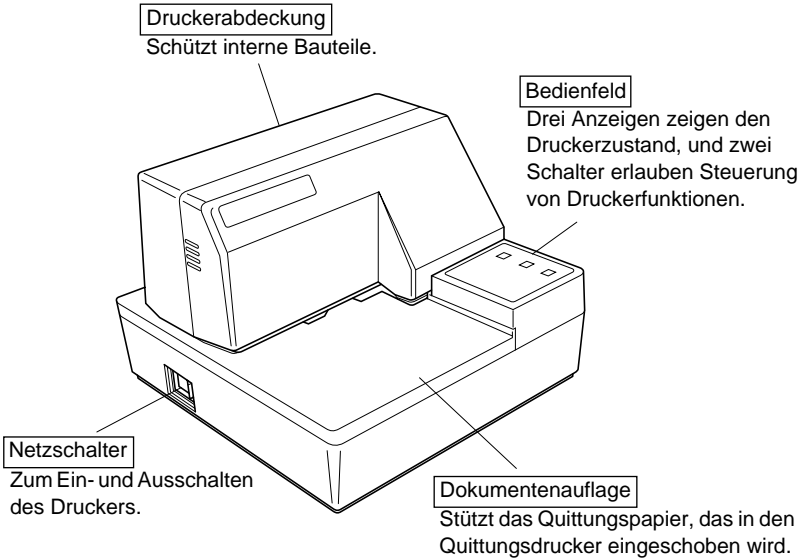
Wichtig!

- *Wenn eine andere Stromversorgung als das vorgeschriebene Netzteil (31AD) verwendet wird, immer die folgenden Vorsichtsmaßnahmen beachten.*
 - *Eine Gleichspannungsquelle von 24 V $\pm 5\%$ und mehr als 1,9 A verwenden.*
 - *Vorsicht bei der Aufstellung des Druckers in Bereichen, wo Rauschstörungen auftreten. In diesem Fall sind geeignete Schutzmaßnahmen gegen elektrostatisches Netzleitungsrauschen usw. zu treffen.*
-

3. Außenansicht und Bauteile

3.1 Allgemeine Anleitung

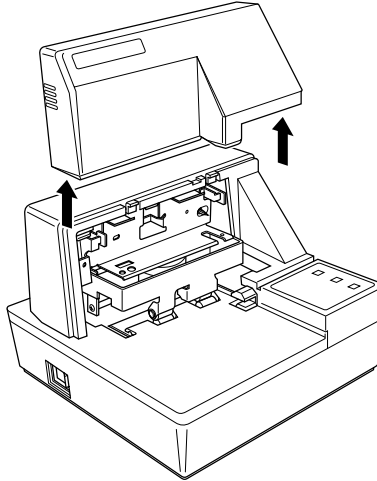
Die folgenden Abbildungen zeigen die Hauptbauteile des Druckers.



4. Betrieb

4.1 Abnehmen der Druckerabdeckung

- Die geriffelten Teile an den Druckerseiten gerade nach oben drücken, um die Abdeckung abzunehmen.

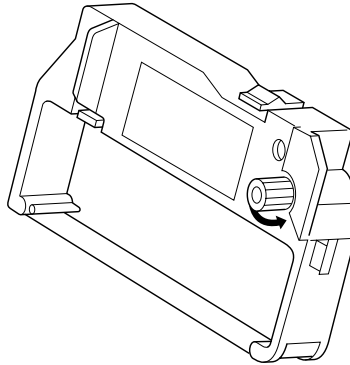


- Zum Schließen die Abdeckung wieder nach unten aufsetzen. Vorsichtig aufdrücken, bis sie hörbar einrastet.

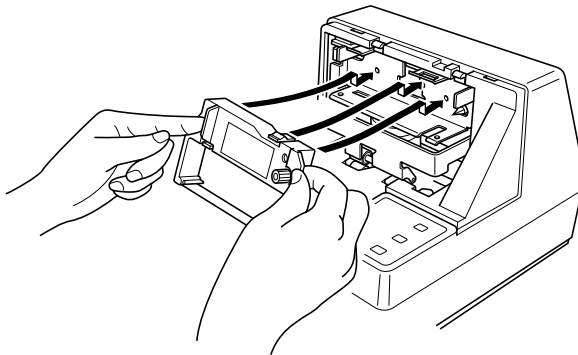
4.2 Einsetzen der Farbbandkassette

- Stellen Sie sicher, daß die Papierfreigabe des Druckers aktiviert ist (das Papier wird nicht von der Papier-Zufuhrrolle festgehalten). Sollten Sie nicht feststellen können, ob die Papierfreigabe aktiv ist, schalten Sie den Drucker ein und prüfen Sie, ob die Anzeige **RELEASE** am Bedienungsfeld leuchtet. Sollte diese Anzeige nicht leuchten, drücken Sie die Taste **RELEASE** so lange, bis diese Anzeige leuchtet.
- Darauf achten, daß der Drucker ausgeschaltet und von der Betriebsstromversorgung getrennt ist.
- Die Abdeckung des Druckers abnehmen.

- ❑ Die Farbbandkassette aus der Verpackung nehmen, und den Knopf auf der Farbbandkassette im Uhrzeigersinn drehen, um eventuell vorhandene Bandschlaufen aufzuwickeln.



- ❑ Die Farbbandkassette so halten, daß das Farbband nach unten weist und die Kassette in den Drucker einsetzen, wie in der Abbildung gezeigt.

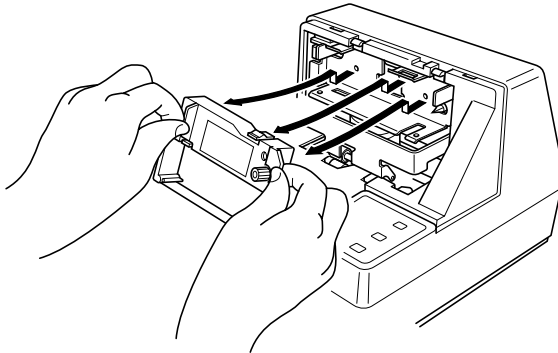


- ❑ Die Farbbandkassette sanft aber fest herunterdrücken, bis sie hörbar einrastet.
- ❑ Den Farbband-Spannknopf auf der Kassette noch einmal drehen, um das Band zu straffen.
- ❑ Die Abdeckung aufsetzen.

4.3 Entnehmen der Farbbandkassette

Folgendermaßen vefahren, um die Farbbandkassette zum Austausch aus dem Drucker zu nehmen.

- Sicherstellen, daß der Drucker ausgeschaltet und von der Betriebsstromversorgung getrennt ist.
- Die Druckerabdeckung abnehmen.
- Die Farbbandkassette wie in der Abbildung gezeigt greifen und vorsichtig aus dem Druckmechanismus ziehen.



- Die unter "Einsetzen der Farbbandkassette" auf Seite 60 beschriebenen Schritte ausführen.

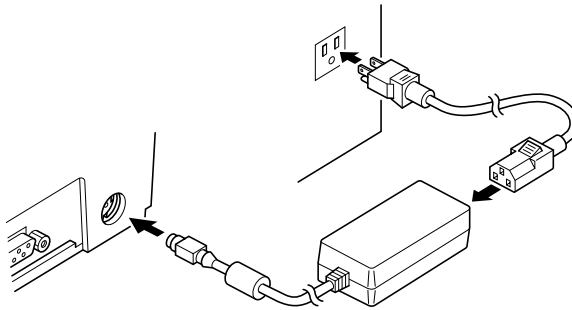
4.4 Anschluß an eine Netzsteckdose und Ein-/Ausschalten der Netzversorgung

- Sicherstellen, daß der Drucker ausgeschaltet ist.
- Das mit dem Drucker mitgelieferte Netzteil an die Betriebsstrom-Eingangsbuchse des Druckers anschließen.
- Ein Netzkabel mit Erdungsleitung an die dreipolige Netzeingangsbuchse am Netzteil anschließen.

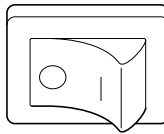
Hinweis:

Der Drucker wird nicht mit Netzkabel geliefert; dieses müssen Sie selber stellen.

- Den anderen Stecker des Netzkabels an eine Netzsteckdose anschließen.



- Den Netzschalter an der linken Seite des Druckers zum Ein- und Ausschalten verwenden.



Wichtig!

Wir empfehlen, den Netzstecker aus der Steckdose zu ziehen, wenn der Drucker längere Zeit lang nicht benutzt werden soll. Der Drucker sollte vorzugsweise an einem Platz aufgestellt werden, der leichten Zugang zur Netzsteckdose gewährt.

Zu diesem Zeitpunkt sollte ein Druckertest ausgeführt werden, um sicherzustellen, daß er richtig arbeitet. Siehe "Erstellen eines Testdrucks" auf Seite 115 betr. Einzelheiten zur Durchführung des Tests.

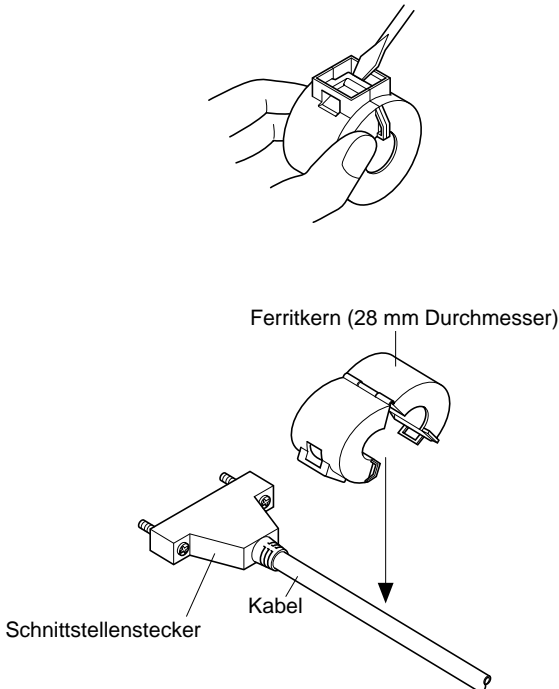
4.5 Anschließen an den Hostcomputer

Die Datenübertragung vom Computer zum Drucker erfolgt über ein Kabel zur seriellen Schnittstellenbuchse des Druckers (Buchse: D-sub 25polig). Das Kabel ist im Lieferumfang dieses Druckers nicht enthalten und muß getrennt gekauft werden.

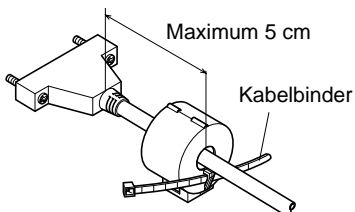
Wichtig!

- Die folgende Anleitung bezieht sich auf das mit IBM-kompatiblen Personalcomputern verwendete Schnittstellenkabel. Beachten Sie, daß die hier gegebenen Anweisungen nicht für alle Computer und Kabel zutreffen. Wenden Sie sich bitte an Ihren Fachhändler, falls Sie Fragen hinsichtlich des für Ihren Computer geeigneten Kabeltyps haben.
 - Vor dem Anschließen der Kabel sicherstellen, daß der Drucker ausgeschaltet und vom Netz getrennt ist.
-

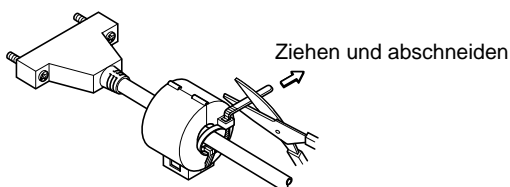
- Befestigen Sie den großen Ferritkern am Schnittstellenkabel, wie in der Abbildung unten gezeigt.



Führen Sie den Kabelbinder durch den Ferritkern.



Führen Sie den Kabelbinder um das Kabel und sperren Sie ihn.
Schneiden Sie überschüssiges Band mit einer Schere ab.



- Ein Ende des Kabels an den seriellen Anschluß des Computers anschließen und das andere Ende an die Buchse an der Rückseite des Druckers an. Wenn die Stecker durch Schrauben gesichert werden können, diese festziehen.

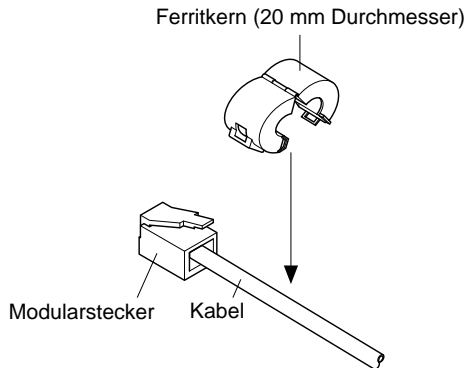
4.6 Anschluß an ein Peripheriegerät

Es kann ein Peripheriegerät an den Drucker mit einem Modularstecker angeschlossen werden. Im folgenden wird beschrieben, wie der Ferritkern angebracht und die Verbindung hergestellt wird. "Modularstecker" auf Seite 126 für den Typ von Modularstecker, der dazu erforderlich ist. Beachten Sie, daß der Drucker nicht mit einem Modularstecker oder Kabel ausgestattet ist. Diese Teile müssen vom Anwender besorgt werden.

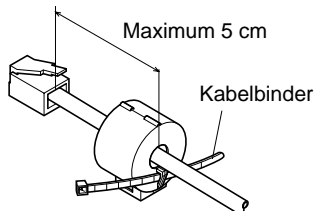
Wichtig!

Vor dem Anschließen der Kabel sicherstellen, daß der Drucker ausgeschaltet und vom Netz getrennt ist.

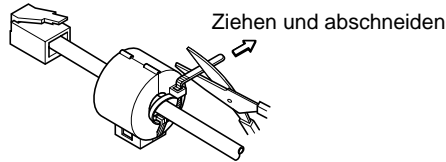
- Befestigen Sie den kleineren Ferritkern am seriellen Kabel, wie das in der folgenden Abbildung gezeigt wird.



Den Kabelbinder durch den Ferritkern führen.



Das Befestigungsband um das Kabel wickeln und sperren.
Schneiden Sie überschüssiges Band mit einer Schere ab.



- Einen Stecker des Modularkabels in die Modularbuchse am Peripheriegerät stecken.
- Die Modularbuchsenabdeckung von der Rückseite des Druckers abnehmen, und den anderen Stecker des Modularkabels in die Modularbuchse am Drucker stecken.

4.7 Papier in den Drucker einlegen

Benutzen Sie nur Papierarten, die für diesen Drucker speziell angegeben sind. Benutzen Sie kein Papier, das nicht geeignet ist. Dadurch können Fehlfunktionen und eine Beschädigung des Druckers die Folge sein.

Die folgende Beschreibung zeigt Ihnen das Einlegen des Papiers in den Drucker. Bevor Sie zu drucken beginnen, prüfen Sie, ob eine Farbbandkassette in den Drucker eingelegt ist. Sollte das nicht der Fall sein, legen Sie eine Farbbandkassette ein, wie das im Abschnitt "Einsetzen der Farbbandkassette" auf der Seite 104 zu sehen ist.

- Prüfen Sie, ob der Drucker angeschlossen und eingeschaltet ist.
- Prüfen Sie, ob die Anzeige **RELEASE** am Bedienungsfeld leuchtet. Sollte diese Anzeige nicht leuchten, drücken Sie die Taste **RELEASE** so lange, bis diese Anzeige leuchtet.

Wichtig!

Das Einlegen und Entfernen des Papiers sollte nur erfolgen, wenn der Drucker das Papier freigegeben hat (das Papier wird nicht von der Papier-Zufuhrrolle festgehalten).

- ❑ Legen Sie ein Blatt Papier auf den Dokumententisch des Druckers und schieben Sie die rechte Ecke in den Drucker. Der Ausdruck erfolgt auf der Seite, die nach oben zeigt (die Seite, die Sie sehen können) und beginnt am oberen Rand des Blattes.

Wichtig!

Benutzen Sie kein verknicktes oder verwelltes Papier. Im Falle eines mehrseitigen Dokumentensatzes richten Sie alle einzelnen Seiten des Dokumentes aus.

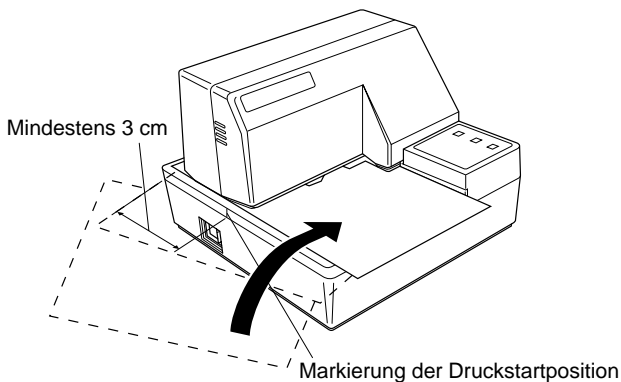
Das Papier kann von vorne oder von der Seite in den Drucker eingelegt werden. Es kann aber beim Einlegen von vorne, in Abhängigkeit vom Zustand des Papiers, ein Papierstau verursacht werden. Aus diesem Grund wird empfohlen, daß das Papier immer von der Seite eingelegt wird.

4.8 Automatischer Papiereinzug (AutoSide Loading™)

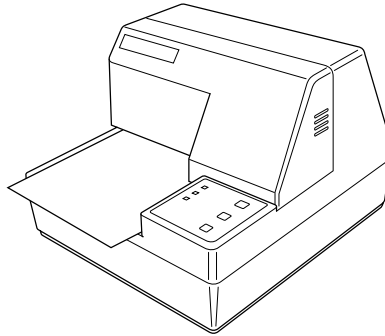
Dieser Drucker ist mit einem Papiersensor ausgestattet, so daß Sie keine besonderen Prozeduren durchführen müssen, um den Startpunkt einzustellen, an dem der Ausdruck erfolgen soll. Legen Sie das Papier einfach in den Drucker und der Sensor erkennt automatisch den oberen Rand des Papiers. Das Papier wird dann automatisch in seine Startposition eingezogen, an der der Ausdruck beginnen soll.

Wichtig!

Wenn Sie Papier in den Drucker legen, prüfen Sie, daß sich mindestens 3 cm Platz zwischen dem oberen Rand des Blattes und der auf dem Drucker markierten Startposition befinden. Sollte das nicht der Fall sein, kann der Papiersensor das Blatt nicht erkennen und ist daher nicht in der Lage, das Papier in seine Druckstartposition einzuziehen.

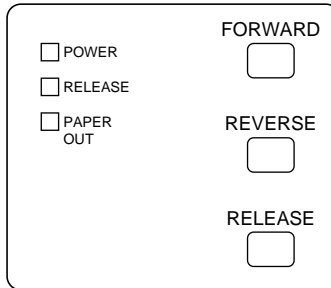


- Schieben Sie die rechte Ecke des Blattes in den Drucker, bis Sie einen Widerstand spüren. Zu diesem Zeitpunkt wird die Anzeige **PAPER OUT** ausgehen und der Druckermechanismus zieht das Blatt automatisch ein und richtet es an der Druckstartposition aus.
- Senden Sie die Druckdaten, die auf dieses Blatt gedruckt werden sollen, von ihrem Computer zum Drucker.
- Drücken Sie nach erfolgtem Ausdruck auf die Taste **RELEASE** und das Blatt wird automatisch freigegeben.



4.9 Bedienfeld

Das Bedienungsfeld enthält einige Tasten, mit deren Hilfe Sie den Drucker bedienen können. Es enthält auch einige LED-Anzeigen, die Sie über den aktuellen Status des Druckers informieren.



4.9.1 Anzeigeleuchten

Die folgende Tabelle stellt die Bedeutung des Leuchtens, Nichtleuchtens oder Blinkens der Anzeigeleuchten dar.

Anzeigeleuchte	Aus	Ein	Blinkt
POWER	Ausgeschaltet	Eingeschaltet	Punktausrichtung-Einstellmodus
PAPER OUT	Papier eingelegt	Kein Papier	Papier-Einlegen-Aufforderung
RELEASE	Quittungspapier eingesetzt	Quittungspapier freigegeben	Mechanischer Fehler

4.9.2 Tasten

Die folgende Tabelle stellt die Funktion der drei Steuertasten am Bedienfeld dar.

Taste	Beschreibung
FORWARD	Drücken, um das Quittungspapier zur Rückseite des Druckers zuzuführen. Ein Tastendruck schiebt um eine Zeile vor, Gedrückthalten schiebt kontinuierlich vor.
REVERSE	Drücken, um das Quittungspapier zur Vorderseite des Druckers zurückzuführen. Ein Tastendruck schiebt um eine Zeile vor, Gedrückthalten schiebt kontinuierlich vor.
RELEASE	Aktiviert die Freigabe des Papiers (das Papier wird nicht von der Papierzufuhrrolle festgehalten). Löscht behebbare Fehler.

4.9.3 Erstellen eines Testdrucks

Mit Hilfe der folgenden Prozedur können Sie den Drucker zu jeder Zeit testen.

- Den Drucker einschalten, und ein Stück Papier einsetzen (Seite 106, 111).
- Den Drucker ausschalten.
- Die Taste **RELEASE** gedrückt gehalten, und den Drucker wieder einschalten. **RELEASE** einige Sekunden lang gedrückt halten, bis der Drucker einen Piepton abgibt und der Testdruck am Quittungsdrucker startet.

Der Quittungsdrucker-Test wird fortgesetzt, bis das Ende des Papiers erreicht ist.

4.9.4 Einstellen der Punktausrichtung

Das hier beschriebene Verfahren wird nur selten nötig. Es kann aber vorkommen, daß nach längerem Gebrauch des Druckers die Punkte einzelner Grafiken nicht mehr richtig miteinander übereinstimmen. So kann z.B. was folgendermaßen aussehen soll:



kann folgendermaßen aussehen:



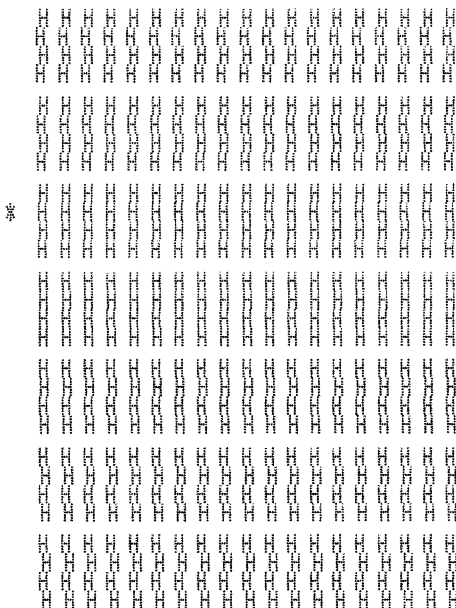
oder wie



Der Grund dafür ist, daß mechanische Teile des Druckers gegeneinander verschoben werden. Dies geschieht nur selten, und die meisten Anwender werden während der Lebensdauer des Druckers damit nicht konfrontiert werden. Falls aber dieses Problem auftritt, kann es auf folgende Weise behoben werden.

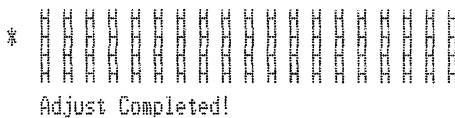
- Schalten Sie den Drucker ein und legen Sie ein Blatt Papier ein.
- Den Drucker ausschalten.
- Die Tasten **FORWARD** und **REVERSE** am Bedienfeld gedrückt halten, und den Drucker erneut einschalten, um auf Punktausrichtung zu schalten. Die Betriebsart wird durch das Blinken der **POWER**-Anzeige angezeigt. Wenn der Punktjustierung-Modus eingeschaltet wird, werden sieben Zeichenblöcke ausgedruckt, wie unten gezeigt. Ein Sternchen erscheint links neben den Blöcken, um anzuzeigen, welcher Block momentan gewählt ist.

Dot Alignment Adjust Mode



- Die Taste **FORWARD** drücken, um den Block zu wählen, der die am besten ausgerichteten Zeichen hat. Die Taste einmal drücken, um den ersten Block zu wählen, zweimal für den zweiten Block, und so weiter bis zum siebten Block. Wenn die Taste mehr als sieben Mal gedrückt wird, ertönt ein Warnton.
- Nach dem Wählen eines Blocks die Taste **REVERSE** drücken, um die Wahl einzugeben, und den Punkteinstellmodus zu verlassen.

Die Einstellungen für die Punktausrichtung werden im Druckerspeicher gespeichert, und ein Muster wird mit der gewählten Einstellung ausgedruckt, gefolgt von der Meldung "Adjust Complete!". Der Drucker gibt das Papier nach dem Druckvorgang aus.



Hinweis:

Wenn der Drucker ausgeschaltet wird, ohne die Taste REVERSE zum Verlassen des Punkteinstellmodus zu drücken, werden die Einstellungen nicht gespeichert. Tritt in diesem Modus ein Fehler beim Papiereinzug auf, wirft der Drucker das Papier aus und bricht diesen Modus ab.

4.9.5 Sedezimaler Datenausdruck

Bei diesem Verfahren werden alle Codes (Zeichencodes und SteuerCodes), die vom Computer zum Drucker gesandt werden, in sedezimaler Form ausgedruckt. Der Drucker führt dabei keine SteuerCodes aus (wie etwa 0A -- Zeilenvorschub), sondern druckt sie nur aus. Der sedezimale Datenausdruck ist nützlich, wenn Programme zur Druckersteuerung geschrieben werden.

- Schalten Sie den Drucker ein und legen Sie ein Blatt Papier ein.
- Den Drucker ausschalten.
- Die Taste **FORWARD** am Bedienfeld gedrückt halten und den Drucker wieder einschalten, um auf Sedezimalen Datenausdruck zu schalten.
- Zum Verlassen des Sedezimal-Datenausdruck-Modus den Drucker ausschalten.

Hinweis:

Der Drucker reagiert nicht auf Befehle, die eingegeben werden, während er im Sedezimal-Datenausdruck-Modus ist.

4.9.6 Fehler

Es gibt drei Typen von Fehlern: *behebbar Fehler*, die zum Beheben eine Maßnahme von Seiten des Anwenders erfordern, und *nicht behebbar Fehler*, die Wartungsmaßnahmen durch den Kundendienst erfordern, und *Datenempfangsfehler*. Die Fehlertypen werden durch ein Tonsignal und die Anzeigen dargestellt.

(1) Behebbar Fehler

Fehlertyp	Anzeigen			Behebung
	POWER	RELEASE	PAPER OUT	
Papierstau		Blinkt		Die Ursache des Problems beheben, und dann RELEASE drücken.
Wagenmotor-Blockierung				
Falsches Grundstellungssignal				

(2) Nicht behebbar Fehler

Fehlertyp	Anzeigen			Behebung
	POWER	RELEASE	PAPER OUT	
RAM Lesen/Schreiben	Aus	Ein	Ein	Schalten Sie den Drucker aus und nach einigen Minuten wieder ein. Sollte der Fehler dann weiterhin auftreten, wenden Sie sich an Ihren örtlichen Fachhändler.
CPU-Blockierung				

(3) Datenempfangsfehler

Dieser Fehler kann auftreten, wenn ein Problem während des Datenempfanges aufgetreten ist. Die Methode, wie der Drucker einen Fehler beim Empfangen der Daten versucht zu beheben, ist davon abhängig, in welchen aktuellen Befehlsmodus der Drucker geschaltet ist.

Methode zur Behebung des Datenempfangsfehlers
Speicherschalter 4-0 = 0: Der Drucker druckt ein Fragezeichen. Speicherschalter 4-0 = 1: Der Drucker löscht die empfangenen Daten.

4.10 Papiersensoren

Die folgenden Papiersensoren stehen zur Verfügung.

TOF-Sensor

Dieser Vorderkantensensor ("top of form") erkennt die Papiervorderkante. Wenn er aktiviert ist, erkennt der TOF-Sensor, daß kein Papier vorhanden ist und stoppt den Druckvorgang.

BOF-Sensor

Dieser Hinterkantensensor ("bottom of form") erkennt die Hinterkante des Papiers. Wenn er aktiviert ist, erkennt der BOF-Sensor, daß kein Papier vorhanden ist und unterbricht den Druckvorgang.

Wenn der TOF- oder BOF-Sensor erkennt, daß kein Papier vorhanden ist, stoppt der Drucker den Motor nach einem Druck von 0 bis maximal zwei weiteren Zeilen.

Der Hinterkantensensor (BOF) erkennt den Papier-Verbraucht-Zustand, wenn der Abstand zwischen dem Druckkopf-Pin Nr. 9 und der Hinterkante des Papiers 38,1 mm oder weniger wird. Der Druckstoppvorgang wird nicht eingeschaltet, bis der Abstand zwischen Druckkopfstift Nr. 9 und Hinterkante des Papiers 27,3 mm oder weniger ist.

Wenn Auto-Festspannen mit dem Memory-Schalter 5-1 aktiviert ist, wird der Auto-Festspannen-Vorgang etwa 1,0 Sekunden (Anfangswert etwa 1 Sekunde) nach dem Erkennen des Vorhandenseins von Papier von sowohl dem TOF- als auch dem BOF-Sensor ausgeführt, nach einem Papier-Aus-Zustand. Die Auto-Festspannen-Funktion wird nicht davon beeinflusst, ob der TOF- oder BOF-Sensor aktiviert oder deaktiviert ist.

Die TOF-Positionierung Funktion wird mit dem Memory-Schalter 5-0 aktiviert. Auch wenn die Auto-Festspannen-Funktion deaktiviert ist, wird die TOF-Positionierung Funktion ausgeführt, wenn das Papier beim Druckstart festgespannt ist.

Das Lämpchen PAPER OUT blinkt, um das Einführen von Papier auszuführen, wenn die Sensoren erkennen, daß kein Papier vorhanden ist (wenn ein durch Befehl aktivierter Sensor erkennt, daß Papier fehlt), nachdem Daten vom Drucker empfangen werden.

Zu diesem Zeitpunkt setzt der Anwender Papier ein, und der Druck beginnt, nachdem der Sensor erkennt, daß Papier vorhanden ist.

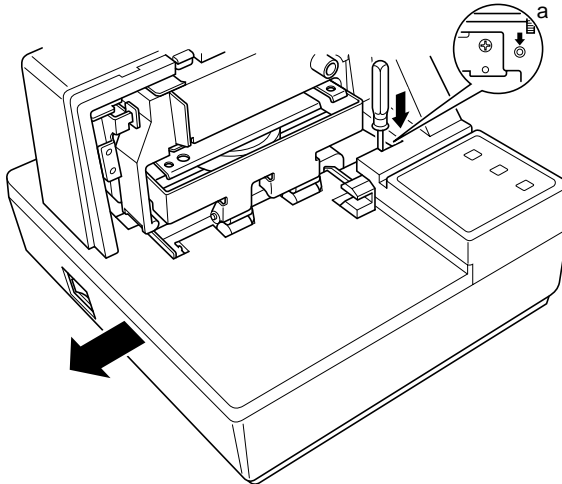
5. DIP-Schaltereinstellung

Die DIP-Schalter des Druckers dienen zum Einstellen der Datenaustauschparameter. Der Abschnitt "5. DIP-Schaltereinstellung" erklärt die Einstellungen, die Sie vornehmen können und beschreibt, wie DIP-Schalter umgestellt werden.

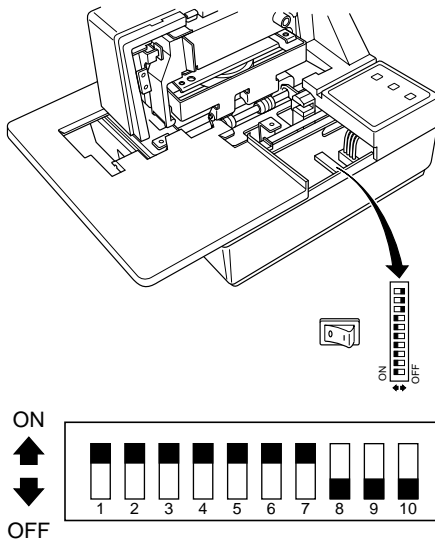
5.1 Zugang zu den DIP-Schaltern

Die DIP-Schalter befinden sich im Drucker unter der Papierauflage. Für Zugang zu den DIP-Schaltern ist die Papierauflage wie folgt zu verschieben.

- Vergewissern, daß der Drucker ausgeschaltet und der Netzstecker aus der Steckdose gezogen ist.
- Die Druckerabdeckung entfernen.
- Mit einem Schraubendreher oder dergleichen vorsichtig auf die in der untenstehenden Abbildung mit (a) markierte Stelle drücken und die Papierauflage gleichzeitig in Pfeilrichtung schieben, bis die DIP-Schalter freiliegen.



Die Papierauflage braucht hierzu nicht vollständig entfernt zu werden. Es genügt die Auflage soweit zur Seite zu schieben, bis die DIP-Schalter zugänglich sind.



Hinweis:

Falls die Papierauflage durch die Walzen festgehalten wird, bedeutet dies, daß nicht stark genug auf Punkt (a) gedrückt wird. Durch ausreichenden Druck auf Punkt (a) lösen sich die Walzen von der Papierablage, wonach sich die Ablage ungehindert verschieben läßt.

- Nach dem Aufschieben der Papierablage die DIP-Schalter mit einem Flachenschraubendreher oder dergleichen wie benötigt einstellen.

Hinweis:

Einzelheiten zum Einstellen der DIP-Schalter enthält der folgende Abschnitt.

- Nach Ausführung der gewünschten Einstellungen die Papierablage bei gleichzeitigem Drücken auf Punkt (a) wieder in die ursprüngliche Stellung zurückschieben. Vor dem Freigeben des Punktes (a) vergewissern, daß die Papierablage korrekt positioniert ist.
- Die Druckerabdeckung wieder ansetzen.

5.2 Verwendbare DIP-Schaltereinstellungen

Die folgende Tabelle zeigt alle möglichen DIP-Schaltereinstellungen. Die Schalter 1 bis 7 sind werksseitig auf ON gestellt, während die Schalter 8 bis 10 werksseitig auf OFF gestellt sind.

Schalter	Parameter	ON	OFF
1	Baudrate	Siehe untenstehende Tabelle	
2			
3	Datenlänge	8 bits	7 bits
4	Paritätsprüfung	Inaktiv	Aktiv
5	Parität	Ungerade	Gerade
6	Quittungsaustausch	DTR/DSR	XON/XOFF
7	Empfangspuffergröße	2 K bytes	35 bytes
8	Zeichencode-Satz	Japanisch (Katakana)	International (PC437)
9	Stift 6 (DSR) Rückstellsignal	Aktiv	Inaktiv
10	Stift 25 (INIT) Rückstellsignal	Aktiv	Inaktiv

Baudrate	Schalter 1	Schalter 2
1200BPS	OFF	OFF
2400BPS	ON	OFF
4800BPS	OFF	ON
9600BPS	ON	ON

5.3 Einstellen der Speicherschalter

Jeder Speicherschalter ist ein 16-Bit-Wortspeicher in EEPROM. Einzelheiten über Funktionen und Einstellungen der Speicherschalter siehe “9. Print Control Functions (ESC#)”.

Die untenstehende Tabelle zeigt die werksseitigen Einstellungen der Speicherschalter.

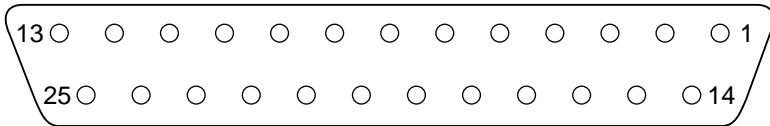
Speicherschalter	Hexadezimalcode
# 0	-
# 1	-
# 2	-
# 3	-
# 4	0000
# 5	0000

Wichtig!

Ein Umstellen der Speicherschalter kann zu Funktionsstörungen des Druckers führen.

6. Schnittstelle

Dieser Anhang enthält detaillierte Spezifikationen für die Standardeinstellung der Druckerschnittstelle.



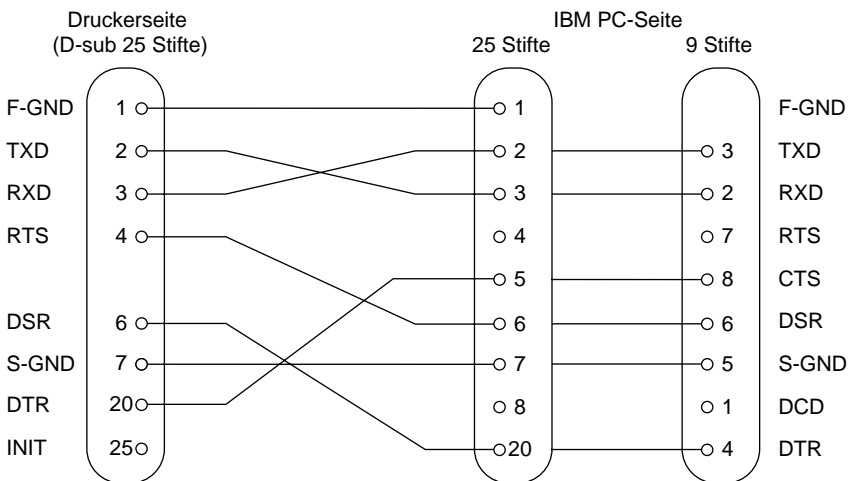
6.1 Stifte und Signalnamen

Stift-Nr.	Signal name	Richtung	Funktion
1	FG	-	Gehäuseerdung
2	TXD	OUT	Übertragungsdaten
3	RXD	IN	Empfangsdaten
4	RTS	OUT	ESC/POS-Modus Identisch mit DTR-Signal
5	N.C.		Nicht angeschlossen
6	DSR	IN	<ul style="list-style-type: none"> • DIP-Schalter 9 = OFF Speicherschalter 4-5 im DTR/DSR-Datenaustauschmodus = 0 zeigt an, ob der Datenempfang vom Hauptrechner aktiv oder inaktiv ist. SPACE: Empfang aktiviert MARK: Empfang deaktiviert Dieses Signal wird im X-ON/X-OFF-Datenaustauschmodus nicht überprüft.
			<ul style="list-style-type: none"> • DIP-Schalter 9 = ON Dieses Signal dient zur externen Rückstellung. Der Drucker wird jedesmal rückgestellt, wenn sich das Signal im MARK-Status mit einer Impulsbreite von 1 ms oder mehr befindet.
7	SG		Signalerdung
8-19	N.C.		Nicht angeschlossen

Stift-Nr.	Signal name	Richtung	Funktion
20	DTR	OUT	Zeigt an, ob der Datenempfang vom Hauptrechner aktiv oder inaktiv ist. DTR/DSR-Datenaustauschmodus SPACE, wenn Empfang aktiv ist. X-ON/X-OFF-Datenaustauschmodus Immer SPACE, außer im folgenden Zustand: <ul style="list-style-type: none"> • Wenn der Punkt zwischen Rückstellung und Datenaustausch aktiv ist • Während des Selbsttestdrucks oder der Punktausrichtung
21-24	N.C.		Nicht angeschlossen
25	INIT	IN	• DIP-Schalter 10 = OFF Dieses Signal wird nicht verwendet.
			• DIP-Schalter 10 = ON Dieses Signal wird das Rückstellsignal. Der Drucker wird jedesmal rückgestellt, wenn sich das Signal im MARK-Status mit einer Impulsbreite von 1 ms oder mehr befindet.

6.2 Schnittstellenanschlüsse

Einzelheiten zum Anschluß des Schnittstellensteckers entnehmen Sie bitte den technischen Daten der Schnittstelle des Hauptrechners. Die folgende Abbildung zeigt eine typische Anschlußkonfiguration.



7. Treiberschaltung für periphere Einheiten

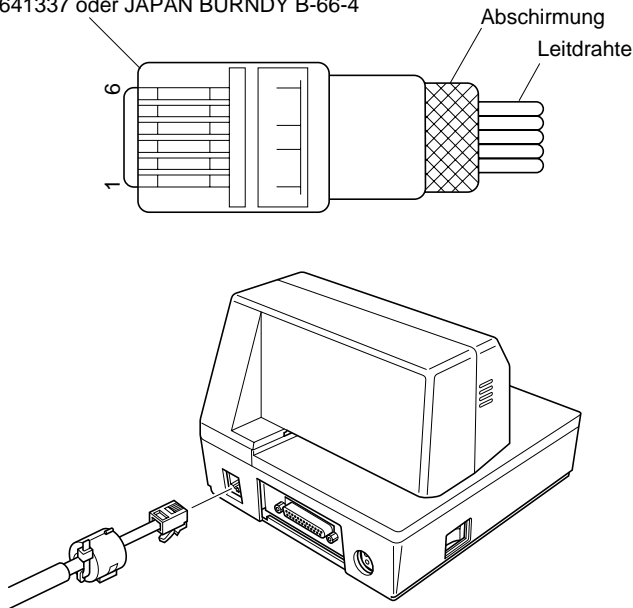
Dieser Drucker verfügt über eine Treiberschaltung für periphere Einheiten, wie z.B. Geldschubladen. An der Rückwand des Druckers befindet sich ein modularer 6-Stift-Stecker für den Anschluß peripherer Einheiten. Zum Anschluß an die Treiberschaltung ist die periphere Einheit mit einem im Fachhandel erhältlichen Kabel (siehe Abbildung unten) an den modularen Stecker anzuschließen.

Wichtig!

Niemals einen anderen als den hier gezeigten Steckertyp für den Anschluß an die periphere Einheit verwenden.

7.1 Modularstecker

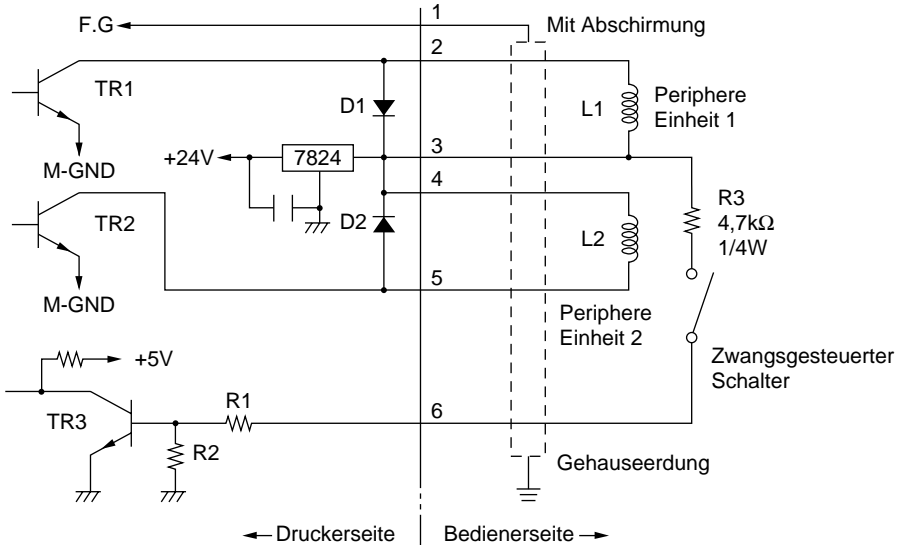
Modularstecker: MOLEX 90075-0007
AMP641337 oder JAPAN BURNDY B-66-4



7.2 Treiberschaltung

Die folgende Abbildung zeigt die empfohlene Treiberschaltung.

Treiber Ausgang: 24V, 1,0A max.



Hinweis:

- Die peripheren Einheiten 1 und 2 können nicht gleichzeitig angetrieben werden.
- Für fortlaufenden Antrieb keine höhere Treiberbelastung als 20% verwenden.
- Der Status des zwangsgesteuerten Schalters ist als Statusdatenwert verfügbar.
- Mindestwiderstand für die Spulen L1 und L2: 24Ω .
Absolute Höchstnennwerte für die Dioden D1 und D2 ($T_a = 25^\circ\text{C}$):
durchschnittlicher Richtstrom $I_o = 1\text{ A}$
Maximaler Vorwärtsstromstoß (60 Hz, 1-Zyklus-Sinuswelle) $I_{FSM} = 40\text{ A}$
- Absoluter Höchstnennwert für die Transistoren TR1 und TR2 ($T_a = 25^\circ\text{C}$):
Kollektorstrom $I_c = 2\text{ A}$
Kollektorverlust $P_c = 1,2\text{ W}$

8. Wartung und Dienst

Bitte wenden Sie sich an die folgenden Stellen für weitergehende Informationen.

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