



**NCR 7167 Two-Station POS Printer
Release 2.0
Owner's Manual**



B005-000-1406
Revision E
July 2004

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To maintain the quality of our publications, we need your comments on the accuracy, clarity, organization, and value of this book.

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Important Information to the User

In order to ensure compliance with the Product Safety, FCC and CE marking requirements, you must use the power supply, power cord, and interface cable which were shipped with this product or which meet the following parameters:

Power Supply

UL Listed (QGGQ), Class 2 power supply with SELV (Secondary Extra Low Voltage), non-energy hazard output, limited energy source, input rated 100-240 Vac, 1.5/0.8 A, 50/60 Hz, output rated 24 Vdc, 2.3 A. or 3.15A

Use of this product with a power supply other than the NCR power supply will require you to test this power supply and NCR printer for FCC and CE mark certification.

Interface Cable

A shielded (360 degree) interface cable must be used with this product. The shield must be connected to the frame or earth ground connection or earth ground reference at EACH end of the cable.

Use of a cable other than described here will require that you test this cable with the NCR printer and your system for FCC and CE mark certification.

Power Cord

A UL listed, detachable power cord must be used for this product. For applications where the power supply module may be mounted on the floor, a power cord with Type SJT marking must be used. For applications outside the US, power cords which meet the particular country's certification and application requirements should be used.

Use of a power cord other than described here may result in a violation of safety certifications which are in force in the country of use.

Federal Communications Commission (FCC)**Radio Frequency Interference Statement**

Warning: Changes or modifications to this unit not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.

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

Communication Cables

Shielded communication cables must be used with this unit to ensure compliance with the Class A FCC limits.

Information to User

This equipment must be installed and used in strict accordance with the manufacturer's instructions. However, there is no guarantee that interference to radio communications will not occur in a particular commercial installation. If this equipment does cause interference, which can be determined by turning the equipment off and on, the user is encouraged to contact NCR immediately.

The NCR company is not responsible for any radio or television interference caused by unauthorized modification of this equipment or the substitution or attachment of connecting cables and equipment other than those specified by NCR. The correction of interferences caused by such unauthorized modification, substitution or attachment will be the responsibility of the user.

Industry Canada (IC)**Radio Frequency Interference Statement**

This Class A digital apparatus meets all requirements of the Canadian Interference-Causing Equipment Regulations.

Cet appareil numérique de la classe A respecte toutes les exigences du Règlement sur le matériel brouilleur du Canada.

Quick Reference

This Quick Reference will direct you to key areas of the Service Manual. For a complete listing of topics, consult the Table of Contents or the Index.

Setting Up the Printer page 9

Basic requirements for unpacking and installation, connecting the printer, turning it on, and running the print test.

Diagnostics page 53

Procedures for setting up the printer for items such as communications, diagnostics, and other printer options.

Printer Commands..... page 83

Printer firmware commands

How to Use this Book

Use this book as a general and technical reference manual and as a guide when replacing parts on the printer. The service guide is intended as a guide for service representatives, field engineers, and those who will be installing and learning about the 7167 printer. It can also be used as a reference for service courses.

See the Quick Reference page, the Contents, or the Index for detailed listings of what is contained in this book.

Who Should Use this Book?

You must be a trained service representative to service the 7167 Thermal Receipt and Impact printer.

How to Obtain More Information

For more information see the following documents:

7167 Two - Station POS Printer: Service Manual (B005-000-1407)

7167 Two - Station POS Printer: Parts Identification Manual (B005-000-1408)

For this and additional copies of the Owner's Manual, contact your sales representative.

Revision Record

Issue	Date	Remarks
A	Mar 2003	First printing
B	May 2003	Update to reflect first production configuration.
C	November 2003	Updated to add the 7167 check scan information.
D	April 2004	Removed Automatic Status Back commands and replaced with Unsolicited Status Update
E	July 2004	Added RS485 information

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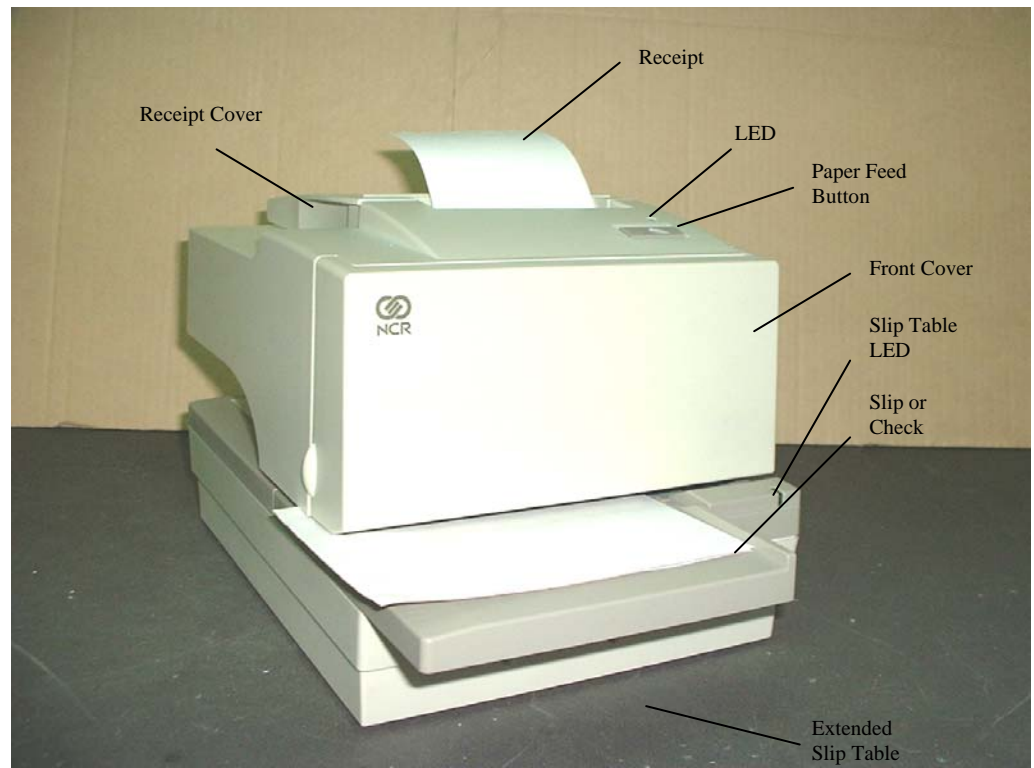
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Chapter 1: About the 7167 Printer



The 7167 printer is a fast, quiet, relatively small and very reliable multiple-function printer. It prints receipts, validates and prints checks, and prints on a variety of single- or multiple-part forms. There is no journal as it is kept electronically by the host computer.

The industry-standard RS-232C communication interface allows the 7167 to be connected to any host computer that uses RS-232C or USB communication interface.

With thermal printing technology on the more frequently used receipt station, there is no ribbon cassette to change and paper loading is extremely simple. Printing on single- or multiple-part forms, validating checks, and printing checks is also easy in the accommodating slip station. An additional option is the Magnetic Ink Character Recognition (MICR) check reader with parsing which reads account numbers on checks for easy verification. An extended slip table is available for handling large forms and is standard with the MICR option.

Features and Options

The 7167 printer comes with several features and options.

Receipt Station

Thermal printing

Standard pitch (host selectable): 15.2 characters per inch, 44 columns

Compressed pitch (host selectable): 19.0 characters per inch, 56 columns

Resident bar codes

- Code 39
- Code 93
- Code 128
- UPC-A
- UPC-E
- JAN8 (EAN)
- JAN13 (EAN)
- Interleaved 2 of 5
- Codabar
- PDF417

Drop-in paper loading requiring no spindle or threading paper

Paper low indicator

Paper exhaust indicator

Slip Station

Bi-directional, impact printing

Standard pitch (host selectable): 13.9 characters per inch, 45 columns

Compressed pitch (host selectable): 17.1 characters per inch, 55 columns

Printing of forms up to five plies

- Front insertion of forms with forms stop
- Side insertion of forms with override of forms stop
- Automatic and manual insertion of forms

Form alignment sensors and Slip In LED indicator

Horizontal flat-bed slip table with optional extension (standard with MICR check reader)

Snap-on ribbon cassette

Resident bar codes

- Code 39
- Code 93
- Code 128
- UPC-A
- UPC-E

- JAN8 (EAN)
- JAN13 (EAN)
- Interleaved 2 of 5
- Codabar

Receipt and Slip Print Stations

Variety of print modes: double high (receipt station only), double strike (slip station only), double wide, upside down, and rotated

14 resident character language Code Pages:

- PC Code Page 437 (US English)
- PC Code Page 850 (Multilingual)
- PC Code Page 852 (Slavic)
- PC Code Page 858 (with Euro symbol)
- PC Code Page 860 (Portuguese)
- PC Code Page 862 (Hebrew)
- PC Code Page 863 (French Canadian)
- PC Code Page 864 (Arabic)
- PC Code Page 865 (Nordic)
- PC Code Page 866 (Cyrillic)
- PC Code Page 874 (Thai)
- PC Code Page 1252 (Windows Latin #1)
- PC Code Page Katakana
- Space Page
- Code Page 932*
- Code Page 936*
- Code Page 949*
- Code Page 950*

16K RAM for downloaded character sets or bit-mapped graphics (such as logos)

General Features

Knife

Cover open sensors

Industry standard RS-232C and USB communication interface

One cash drawer connector (supports 2 cash drawers)

History EEROM for custom settings

Audible tone (controlled by application)

Note: The 7167 does not have a paper journal. The journal is kept electronically by the host computer.

* Not supported by model 7167-1035 and 7167-2035.

Options

Magnetic Ink Character Recognition (MICR) check reader built into the slip station for verifying checks (includes custom MICR field parsing). E13B and CMC-7 is support with auto sensing of the MICR type provided.

Extended slip table for handling large forms (standard with MICR check reader)

Remote power supply

Check Scanning function

Thermal Print Head

The 7167 Receipt Station uses a thermal print head for printing receipts, and is extremely fast and quiet. Since it uses heat to print directly on paper, there is no cassette or ribbon to change, eliminating soiled fingers and paper dust.

There is no regularly scheduled maintenance for the print head and it does not need to be regularly cleaned. However, if it does appear dirty, wipe it with cotton swabs and rubbing alcohol. If spotty or light printing problems persist after the thermal print head has been cleaned, see “Chapter 3: Solving Problems” for more information.

Note: The thermal print head does not normally require cleaning if the recommended paper is used. If non-recommended paper has been used for an extended period of time, cleaning the print head with cotton swabs and rubbing alcohol will not be of much benefit. See “Ordering Receipt Paper” on the next page for the recommended paper.

The print head is designed for a very long life, but it may be replaced if needed. Only a trained service representative may replace the print head. See “Chapter 3: Solving Problems” to determine if the print head needs to be replaced.

Impact Print Head

The bi-directional, impact print head is designed for a very long life, but it may be replaced if needed. Only a trained service technician may replace the impact print head. See “Chapter 3: Solving Problems” to determine if the print head needs to be replaced.

Ordering Paper and Supplies

Thermal receipt paper, ribbon cassettes, and forms can be ordered. Documentation is also available.

Ordering Thermal Receipt Paper

The 7167 requires NCR qualified thermal paper to be used on the thermal receipt print station to insure proper operation of the printer. In addition the paper rolls must have the following dimension.

Diameter	Length	Width
80 mm max. (3.15 in.)	83 meters (273 ft.)	80 mm \pm .5 mm (3.15 \pm .008 in.)

The paper must not be attached at the core. Otherwise the receipt station will be damaged when the paper is exhausted.

Paper grades available from NCR

Paper Stock	Paper Grade Description
856911	Economy (for text printing)
856966	Standard Sensitivity (for text and simple graphics)
878559	High Sensitivity (for text, bar codes & detailed graphics)
856380	For improved archiveability and added resistance to incompatible substances
856461	Red/Black
856458	Blue/Black

The paper must not be attached at the core. Otherwise the receipt station will be damaged when the paper is exhausted.

To order thermal receipt paper, contact your sales representative or order from NCR at the following address or toll free number:

NCR

Media Products Division

9995 Washington Church Road

Miamisburg, OH 45342

Voice: 1(800)543-8130 (toll free), or local listing of The NCR Media Products sales office

It is critical that only certified thermal paper be used with this printer, otherwise damage may result causing poor print quality or cause damage to the printer.

Ordering Forms

The 7167 prints on single- or multiple-part forms in the slip station (up to five-part forms). Forms and slips must meet the following requirements:

Front insertion (minimum):

51 mm (2.0 inches) wide
70 mm (2.75 inches) long

Side insertion (minimum):

203 mm (8.0 inches) wide
51 mm (2.0 inches) long

Single-ply forms should be on paper that is greater than 15 pounds

Multiple-part forms (up to five parts) should be no thicker than .406 mm
(.016 inches)

If multi-part formare used the cardstock must be the last ply of the form.

To order forms, contact your sales representative or order from NCR at the following address or toll free number:

NCR

Media Products Division
9995 Washington Church Road
Miamisburg, OH 45342

Voice: 1(800)543-8130 (toll free), or local listing of The NCR Media Products sales office

Ordering Ribbon Cassettes

To order ribbon cassettes, contact your sales representative or order from NCR at the following address or toll free number:

NCR

Media Products Division
9995 Washington Church Road
Miamisburg, OH 45342

Voice: 1(800)543-8130 (toll free), or local listing of Media Products sales office

Stock Numbers: (purple ribbon cassette—8 million characters) 127022
(black ribbon cassette—5 million characters) 127035

Ordering Other Supplies

Contact your NCR sales representative to order the supplies listed in the table.

Item	Type	Number
Power supply with attached cable to printer and U.S. power supply cord	75 Watt Power Supply	7167-K331-V001
Power supply (w/o power cord)	75 Watt Power Supply	7167-K302-V001
Power supply cord (to outlet)	United States	1406-C325-0030
	International (no plug)	1416-C319-0030
	United Kingdom	1416-C321-0030
	S.E.V.	1416-C320-0030
	Australia	1416-C322-0030
	International (with plug)	1416-C323-0030
RS-232C Communication Cables		
9-pin to 9-pin (G11)	0.7 meters	1416-C359-0007
9-pin to 9-pin (G11)	4.0 meters (13.2 feet)	1416-C266-0040
9-pin to 9-pin (CG1)	4.0 meters (13.2 feet)	1416-C879-0040
DC Plus Power Cable		
DC Power from NCR POS Terminal (G11)	1.0 Meters	1416-C712-0010
DC Power from NCR POS Terminal (G11)	4.0 Meters	1416-C712-0040
DC Power from NCR POS Terminal (CG1)	4.0 Meters	1416-C881-0040
USB Communication Cables		
USB Type A to Type B Connector	2.0 Meters	1416-C528-0010
USB Type A to Type B Connector	4.0 Meters	1416-C528-0040
USB Plus Power Cables		
USB/Plus Power to Type B Connector (G11)	3.0 Meters	1416-C713-0010
USB/Plus Power to Type B Connector (G11)	4.0 Meters	1416-C713-0040
USB/Plus Power to Type B Connector (CG1)	4.0 Meters	1416-C880-0040
Extended Slip Table (Standard)		7167-K280-V001
Cash Drawer	2189	2189-K002-V001 (Switchable for Drawer 1 or Drawer 2)
Cash Drawer Cable	Y Cable	1416-C372-0006

Ordering Documentation

Contact your sales representative to obtain the following documentation:

7167 Thermal Receipt and Impact Slip Printer: Parts Identification Manual (B005-0000-1408)

7167 Thermal Receipt and Impact Slip Printer: Service Manual (B0005-0000-1407)

(includes Troubleshooting Guide and the Preventative Maintenance Guide)

Cleaning the Printer

Cleaning the Cabinet

The external cabinet materials and finish are durable and resistant to these items:

Cleaning solutions

Lubricants

Fuels

Cooking oils

Ultraviolet light

There is no scheduled maintenance required for the 7167.

Clean the cabinet as needed to remove dust and finger marks. Use any household cleaner designed for plastics, but test it first on a small unseen area. If the receipt bucket is dirty, wipe it with a clean, damp cloth.

Cleaning the Thermal Print Head

Caution: Do not spray or try to clean the thermal print head or the inside of the printer with any kind of cleaner as this may damage the thermal print head and electronics.

If the thermal print head appears dirty, wipe it with cotton swabs and isopropyl alcohol.

If spotty or light printing problems persist after the thermal print head has been cleaned, see "Chapter 3: Solving Problems" for more information.

Note: The thermal print head does not normally require cleaning if the recommended paper grades are used. If non-recommended paper has been used for an extended period of time, cleaning the print head with cotton swabs and rubbing alcohol will not be of much benefit. See "Ordering Paper and Supplies" earlier in this manual for recommended paper.

Cleaning the Scanner Sensor

Caution: Do not spray or try to clean the thermal print head or the inside of the printer with any kind of cleaner as this may damage the scanner sensor and electronics.

If the scanner sensor appears dirty, wipe it with cotton swabs and isopropyl alcohol.

If spotty or light printing problems persist after the scanner sensor has been cleaned, see "Chapter 3: Solving Problems" for more information.

Note: The scanner sensor does not normally require cleaning if the recommended paper grades are used. If non-recommended paper has been used for an extended period of time, cleaning the print head with cotton swabs and isopropyl alcohol will not be of much benefit. See "Ordering Paper and Supplies" earlier in this manual for recommended paper.

Chapter 2: Setting Up and Using the Printer

What Is in the Box?

The following items are packed in the shipping box:

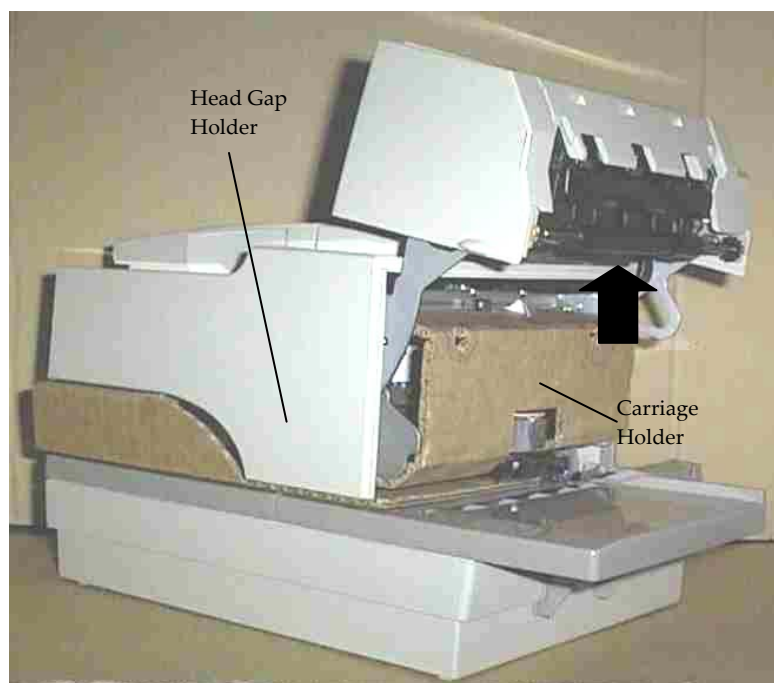
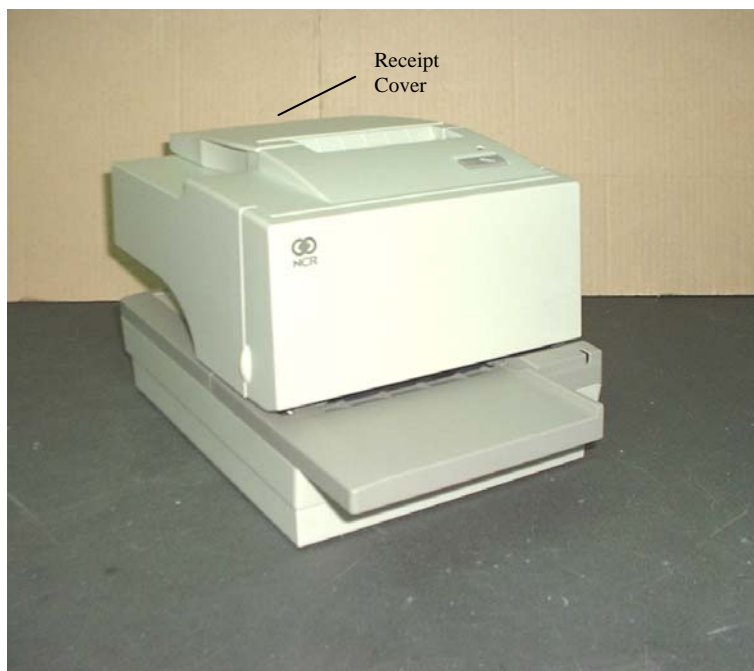
- Printer enclosed in a plastic bag and foam pack
- Ribbon cassette
- Thermal receipt paper roll

Cardboard restraint for carriage (behind front cover)

These items may be ordered as options from NCR and will be shipped separately:

- Communication cable (from host computer to printer)
- DC Power Cable
- Remote Power Supply
- USB plus Power Cables
- Cash drawer cables (may be ordered from other equipment suppliers: see “Ordering Other Supplies” in chapter 1)

Removing the Packing Material



1. Remove the printer from the foam pack and plastic bag.
2. Open the front cover and remove the carriage holder.
3. Remove the head gap holder from the slip table.

4. Remove the ribbon cassette / receipt paper roll and cables from the foam packing material.
5. Save all packing materials for future storing, moving, or shipping the printer.

Caution: Remove the carriage holder and the head gap holder before using the printer.

Do not pickup the printer using the slip table as a handle.

Re Packing the Printer

Review the illustrations on the previous pages to pack the printer.

1. Place receipt paper between the receipt cover and the print head for protection.
2. Remove the ribbon cassette, move the carriage to the corner, and place the cardboard restraint in the slip carriage area.
3. Place the cardboard support on the slip table.
4. Place the printer in the plastic bag and foam pack, place the packed printer in the box, and secure the box with packing tape.
5. If you are sending the printer to NCR for repair, call your NCR-authorized service representative for instructions on where to send the printer.

Be prepared to answer questions concerning shipping and billing.

Choosing a Location

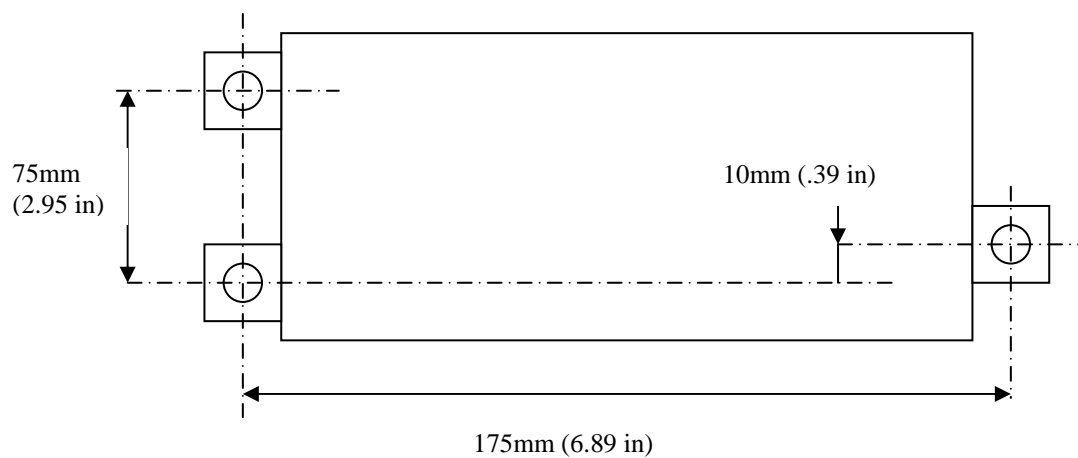
The 7167 printer takes up relatively little counter space and may be set on or near the host computer. Make sure there is enough room to open the receipt cover to change the paper and to open the front cover to change the ribbon cassette. The illustration shows the actual dimensions of the printer, but leave several inches around the printer for connecting and accessing the cables.

Note: The optional Magnetic Ink Character Recognition (MICR) check reader feature is designed to operate under a normal operating environment with a host computer. However, additional devices, such as CRT monitors, or large metal surfaces that are near the printer can affect the printer's magnetic field, causing intermittent reading errors when the MICR check reader is in operation. Relocating these devices may be required to prevent this interference.



c) Wall mounted Power Supply (Option)

The 75 watt power supply may be mounted on a vertical wall by using the holes on the cover. Mount the screws on the wall using the following recommended mount dimensions. Use a #8 wood screw which is to be securely fastened to a wall stud or using “Molly” fasteners (not provided).

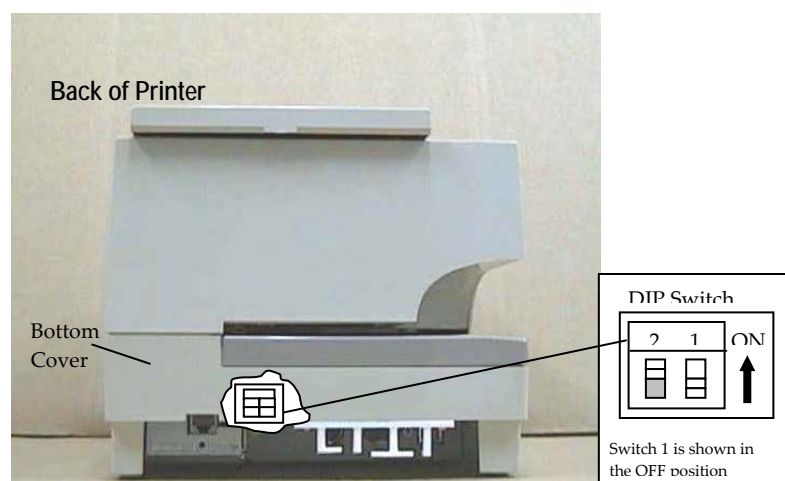


Setting Switches

The DIP switches, located at the back of the printer, are used for three purposes:

- To set variables for several printer functions (see the sections for the various printer functions in “Level 1 Diagnostics” in “Chapter 4: Diagnostics” for Setting Up The Printer)
- To perform diagnostic tests (see the sections for the various diagnostic tests in “Level 1 Diagnostics” in “Chapter 4: Diagnostics” for Setting Up The Printer)

Caution: The DIP switches are set to OFF.



Note: Switch 1 is shown in the Off position for reference.

Use a paper clip or other pointed object to set the switches.

1. Set the switches to the desired settings shown in the table.
2. Reset the printer.

Printer Reset

The printer is reset by disconnecting/reconnecting the DC power or by opening the slip door and closing the slip door while holding the receipt paper feed button down.

DIP Switch Settings

Switch 1 Settings	Switch 2 Settings	Printer State
OFF (0)	OFF (0)	On-line Mode (default)
ON (1)	OFF (0)	Diagnostic Mode
OFF (0)	ON (1) *	Flash Download Mode
ON (1)	ON (1)	Vendor Adjustment Mode

- It is optional to set this switch to ON when reflashing the IPL firmware.

Connecting the Cables

There are three different types of cables that connect to the printer:

- Power supply cable supplying power from the host POS terminal or from a external power supply
- Communication cable (RS-232 or USB) connecting the printer to the host computer
- Cash drawer cable connecting the printer to one or two cash drawers

Caution: Disconnect the power before connecting the cables. Always connect the communication cable and cash drawer cables before connecting power to the power source. Always disconnect power to the power source before disconnecting the communication and cash drawer cables.

Follow these steps to connect the cables. See the illustration on the next page.

1. Unplug the power cable from its power source.
2. Connect the power and communication cables to their respective connectors under the printer as shown in the illustration.

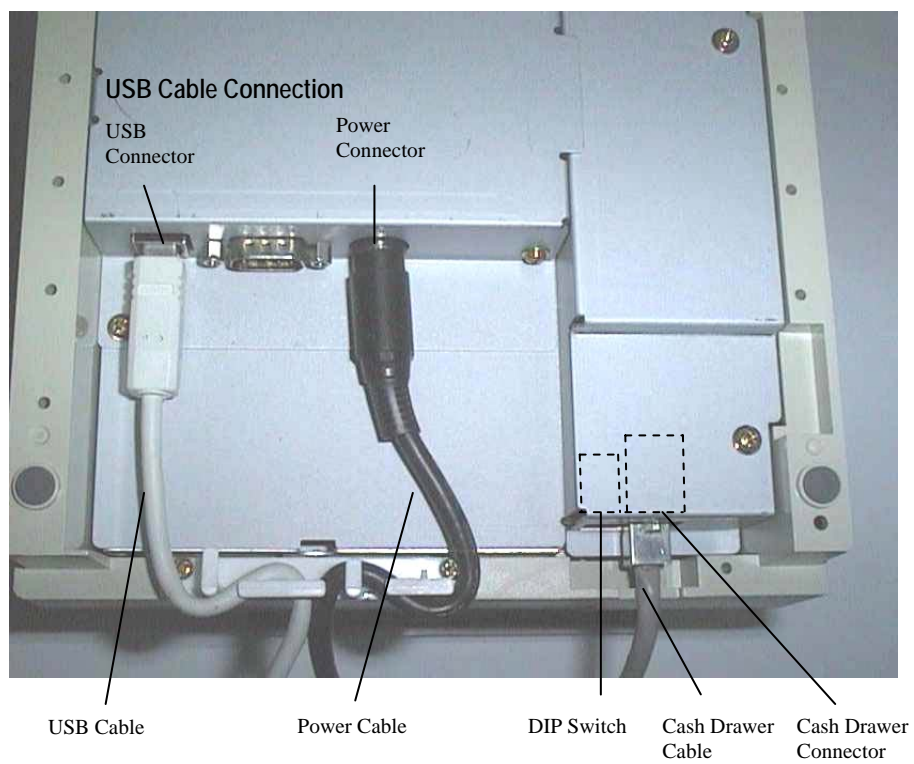
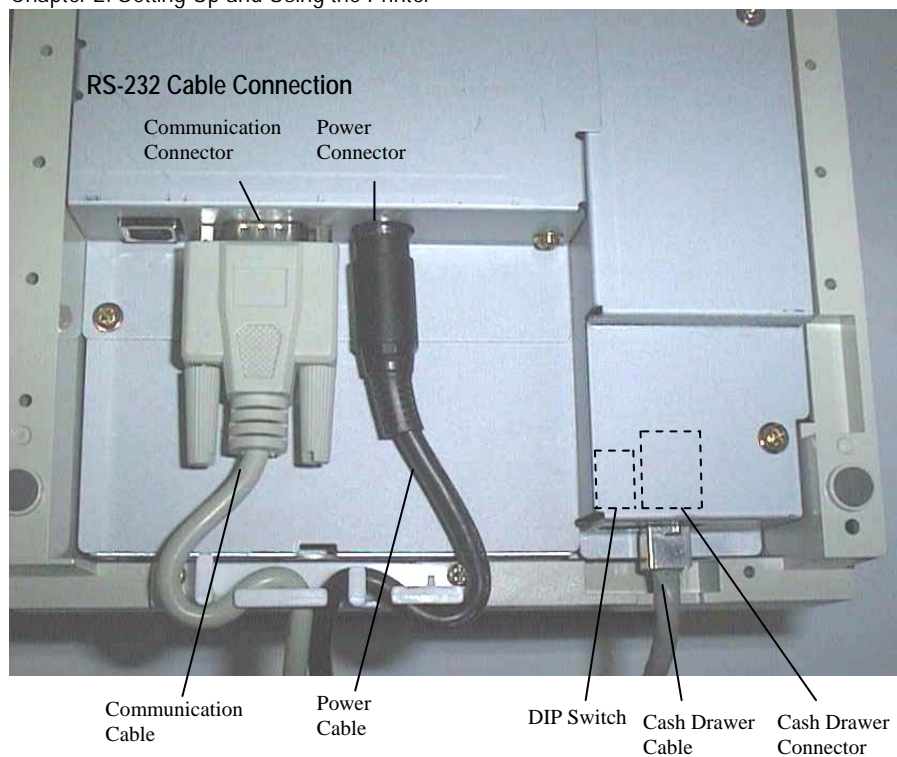
For RS232 cable, be sure to screw the communication cable to the communication connector.

3. Route the cables through the cable strain relief on the bottom of the printer, then through the two slots in the cable access cover as shown in the illustration.
4. Connect the communication cable to the appropriate host computer connector.
5. Connect the cash drawer cable to the printer and cash drawer.

The connectors is a standard phone jack located at the rear of the printer.

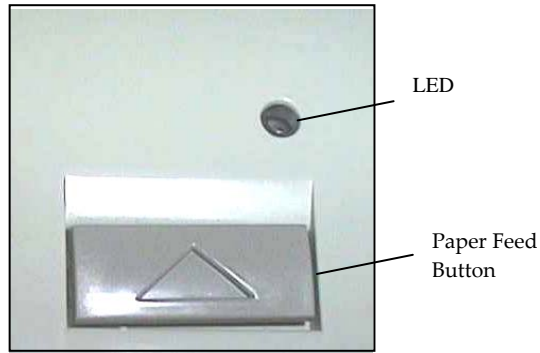
6. For Host powered installation plug the DC cable into the POS terminal or plug the power cord into the power supply for remote power supply installation, then plug the power supply into an outlet.

At this point, the printer receives power. If the On Line LED (green) is on, the printer is on-line. Otherwise, the printer is not receiving power. Check to insure that the host terminal is on or that the power supply is on.



Bottom of the printer

Using the Printer



Note: See “Setting Switches” earlier in this book for instructions on setting the DIP switches.

1. Connect the power supply cable to the printer and turn on the power source.

The printer goes through a self-test routine to ensure everything is working properly then “beeps.” After the printer has completed its “startup” cycle, it is ready to receive data.

If the LED blinks, or the host computer indicates that there is a problem, see “Chapter 3: Solving Problems” for more information.

2. To perform a Configuration check (optional), reset the printer while holding the Paper Feed Button, or open the receipt door and while pressing the paper feed button close the receipt door, let go of the Paper Feed Button once the printing begins.

Note: The printer receives power when the power supply is on even if the printer is off-line. To completely remove power, unplug the power supply from the outlet, or turn the POS terminal off.

Loading and Changing the Receipt Paper

Although the illustrations show a used roll being removed, the instructions apply to loading paper for the first time.

Change the paper when either of the following two conditions occurs:

- LED blinks (slow): the paper is low

There are approximately 1 ½ to 7 ½ meters (5-25 feet) of paper remaining on the roll. Change the paper as soon as possible to avoid running out part way through a transaction.

Depending on the application program, the host computer may alert you when the paper is low.

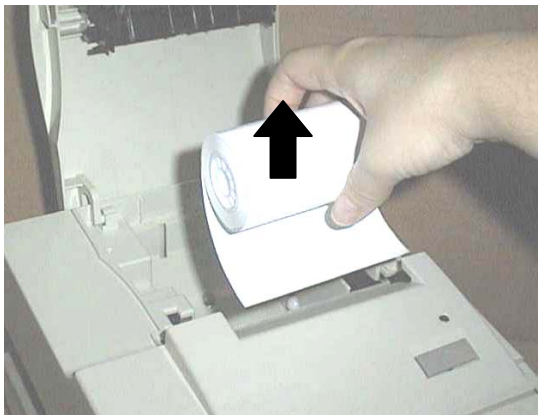
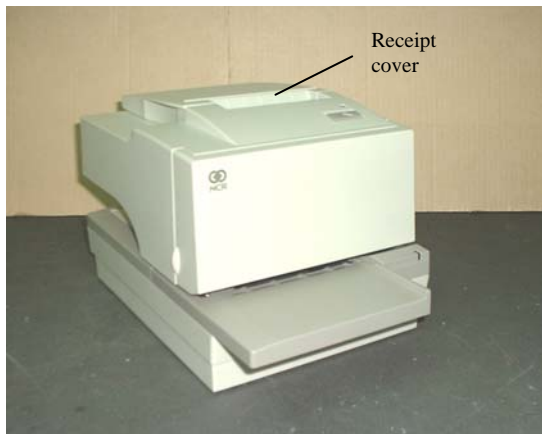
- LED blinks (fast): the paper is out

Change the paper immediately or data may be lost.

Caution: Do not operate the printer or host computer if the printer runs out of paper. The printer will not operate without paper, but it may continue to accept data from the host computer. Because the printer cannot print any transactions, the data may be lost.

Removing the Paper Roll

1. Open the receipt cover.
2. Remove the used roll.



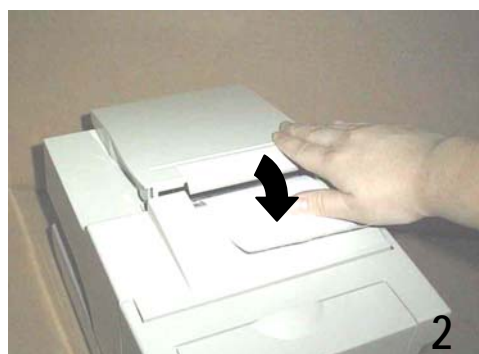
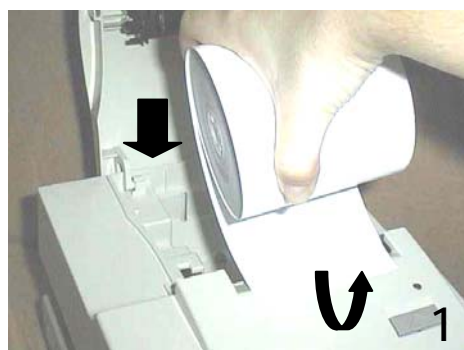
Loading the Paper Roll

Note: Tear off the end of the new roll so that the edge is loose.

1. Place the new roll in the bin with a little extra paper extending over the front.

Be sure the paper unrolls from the bottom of the roll. Otherwise the paper will not be printed on because the thermal coating will be on the wrong side.

2. Close the receipt cover.
3. Remove the excess paper by tearing it against the tear-off blade.



Advancing Paper

1. Press the Paper Feed button on the operator panel to advance the paper.

The cover must be closed. To ensure print quality and the proper alignment of the paper, advance about 30 cm (12 inches) of paper.

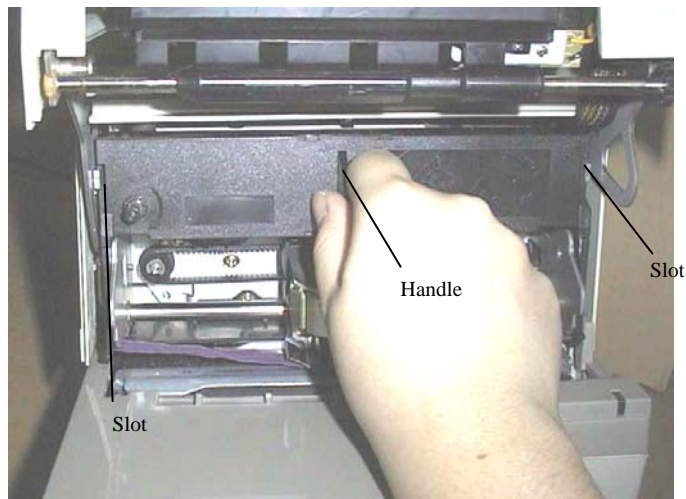
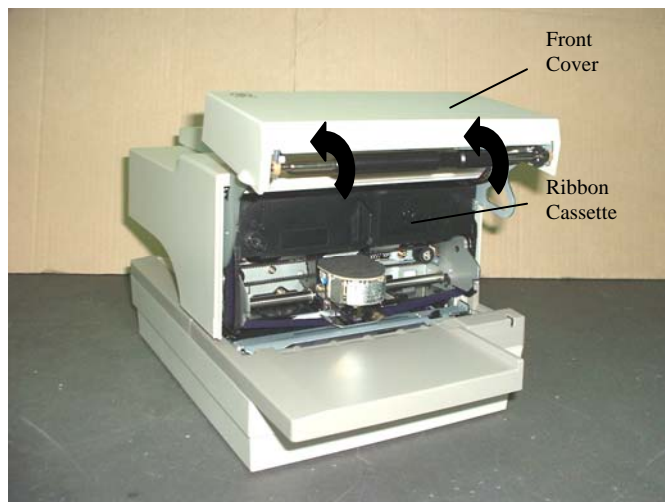
2. Tear off the excess paper against the tear-off blade.

Installing and Changing the Ribbon Cassette

Change the ribbon cassette when the print is too light or the ribbon is frayed.

Removing the Ribbon Cassette

1. Open the front cover.
2. Use the handle on the cassette and pull the cassette from the printer.



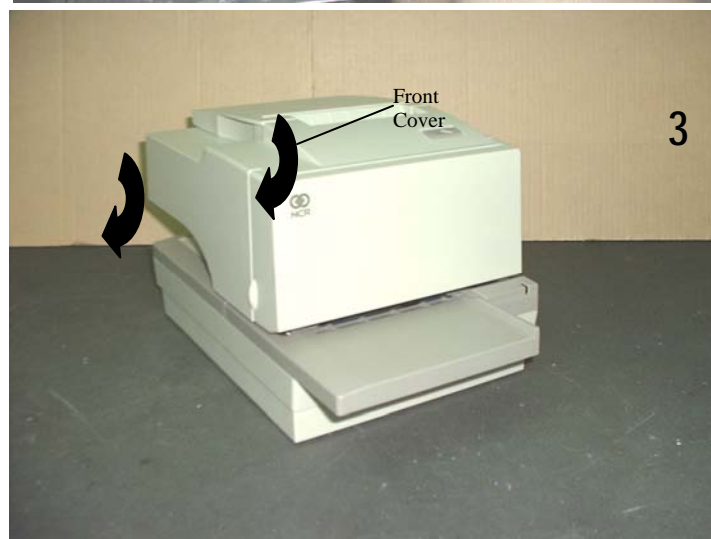
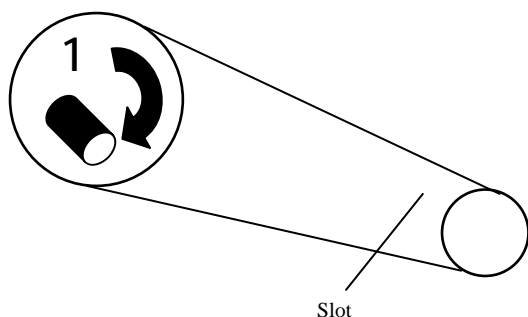
Installing the Ribbon Cassette

1. Tighten the ribbon by turning the knob in the direction of the arrow.
2. Position the ribbon cassette slot at the catch on the printer slip frame and push it into place.

Be sure the ribbon is in front of or underneath the print head and between the print head and the ribbon shield.

Tighten the ribbon using the shaft at the upper left corner of the cassette. Rotate the shaft clockwise until the ribbon is positioned between the print head and the metal ribbon guide.

3. Close the front cover.



Printing on Forms or Checks

There are several types of transactions that require you to insert a form or check into the printer:

- Credit card transaction (some credit card transactions may be printed on the receipt station and not require any forms)
- Multiple-part forms such as credit transactions or merchandise returns
- Electronic funds transfers
- Check printing (printing the date, payee, and amount on the check face)
- Check endorsement

Although the illustration on the facing page shows a check being inserted into the printer, the instructions apply to any type of form. The 7167 can print on forms up to five-parts thick. See "Ordering Forms" in chapter 1 for more information about the type of forms that can be used.

1. Insert the form or check (check shown in the illustration) from the front and place it on the slip table top first and with the print side up.

If the form is extra long, you may need to insert it from the side.

2. Slide the form or check to the right until it lines up against the slip guide.

If the form is extra long, you need to slide it over the form stop to disengage it. In this situation use the mark that is located on the slip door to align the form for printing in the proper location on the form.

3. Slide the form or check toward the back of the printer until it contacts the form stop (it won't be able to go any further);

Or, align the form or check with the mark on the slip door.

The green LED on the slip table turns on when the form or check is properly inserted (the form has to cover two sensors on the slip table).

4. Follow the instructions from the host computer.

The printer begins printing.

5. Remove the form or check after it has been fed back out.
6. Follow the instructions from the host computer to finish the transaction.

PAY TO THE ORDER OF _____ 19 _____ \$ _____

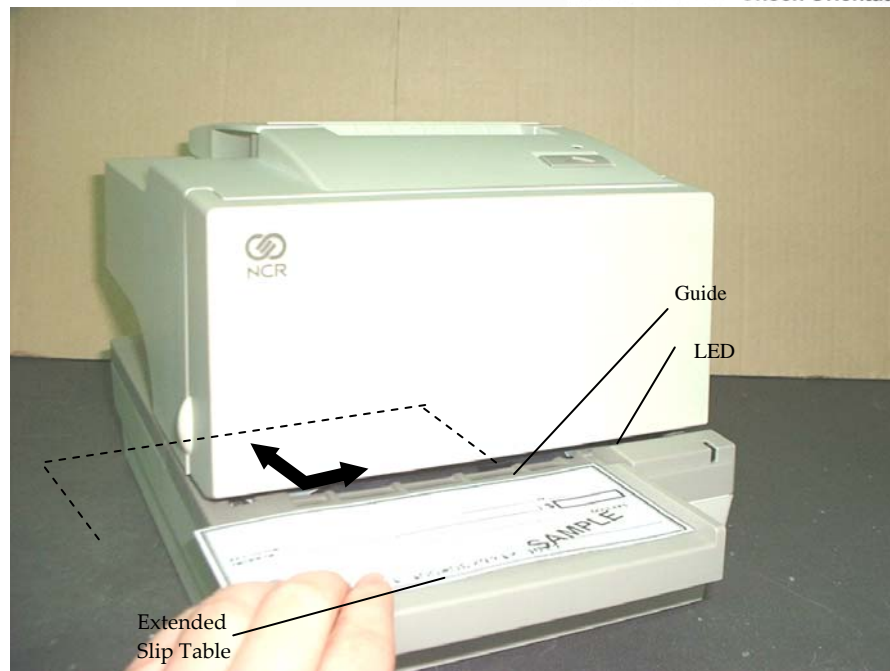
_____ DOLLARS

MEMO _____

⑆031209591⑆01 100⑆062971⑆ 3427

SAMPLE

Check Orientation



Validating and Verifying Checks

Note: If the MICR check reader feature is present, checks are verified then validated.

1. Insert the check from the front and place it on the slip table face down as shown in the illustration on the facing page.
2. Slide the check to the right until it lines up against the guide (wall).
3. Slide the check toward the back of the printer until it contacts the form stop (it won't be able to go any further);

Or, align the check with any preset mark you may have made on the slip table.

The green LED on the slip table turns on when the form or check is properly inserted (it has to cover two sensors on the slip table).

4. Follow the instructions from the host computer.

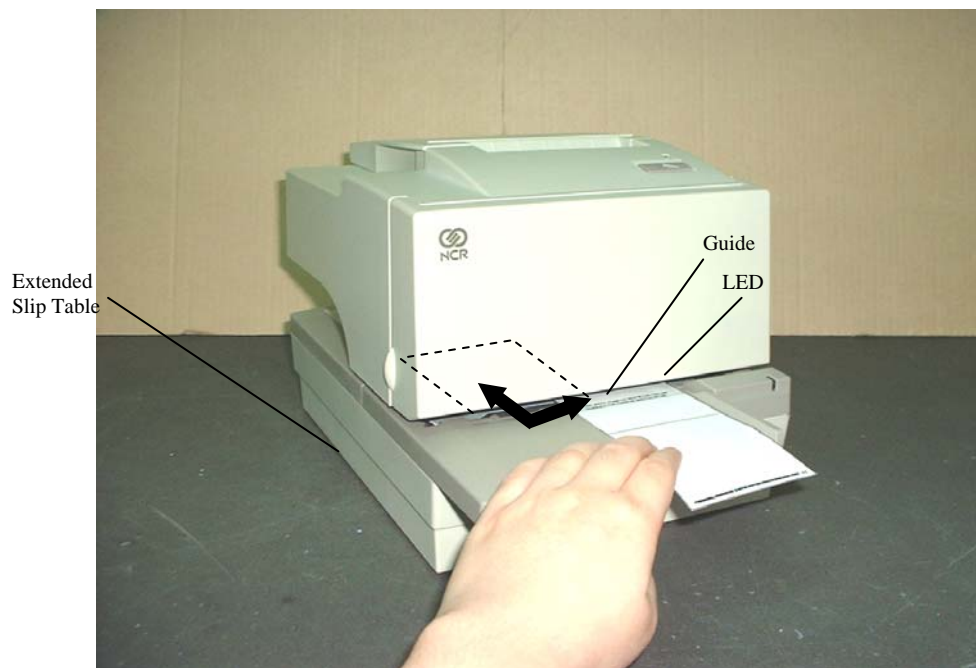
If the MICR check reader feature is present, the check is fed in and out while the check numbers are read. If the check is verified as good, it is then validated. If the check is not verified as good, it is not validated.

Note: Do not hold or keep the check from moving during the MICR check reader transaction or the check numbers will not be read accurately.

5. Remove the check after it has been fed all the way back out.
6. Follow the instructions from the host computer to finish the transaction.

ENDORSE HERE
DO NOT WRITE, STAMP OR SIGN BELOW THIS LINE RESERVED FOR FINANCIAL INSTITUTION USE
FEDERAL RESERVE NOTE

Check Orientation



About the Universal Serial Bus

The Universal Serial Bus (USB) is a peripheral bus for personal computers that was first released in January 1996. Since that time, virtually all Intel Architecture personal computers have the hardware to support USB, and a large number of computers exist that have both the hardware and software support required to interface with USB peripherals.

Advantages of USB connections

USB has a number of advantages over legacy connection schemes (e.g., serial RS-232). These advantages include:

- **High Speed:** up to 12 MB/second for high-speed devices.
- **Plug and Play:** Devices are automatically recognized and configured at installation.
- **Hot plug:** Bus supports installation and removal of devices with the power applied.
- **Up to 127 devices:** One host can support up to 127 devices with the use of hubs.
- **“Free ports”:** Most PC architecture machines contain two USB ports in the base hardware.

These advantages have become attractive to the POS industry for a couple of reasons.

Additional POS devices. Some POS systems are required to host more peripherals than can be supported by two RS-232 ports typical in a platform. With the addition of one (or two) USB connectors, the platform can now support the additional devices that had previously required a serial port expander card.

Higher bandwidths. New devices coming into use have bandwidth requirements that are higher than the bandwidth that can be supported on legacy interfaces. These devices include image scanners and printers. As the speed and capability of POS printers increases, the performance of the printer in an application can become limited by the speed of the communications interface. USB provides ample bandwidth to support current and future POS printer requirements.

Advantages of the NCR USB Solution

NCR has eliminated any cost associated with porting applications to USB by implementing a USB solution that simulates standard serial communications in Windows 98 (SR2), Windows 98 USB Hot Patch, ID: Q236934, NT 4.0 (Service Pack 3 or higher) and Windows 2000. Application developers need only redirect their software to the virtual serial ports created by the NCR USB solution to use the printer.

Checking for USB Support on the Host Computer

If the USB interface communications is required, the host computer must be equipped and setup properly. If it is not, you need to install a USB interface card. With the required hardware in place,

Windows 98 (SR 2), Windows 98 USB Hot Patch, ID: Q236934, NT 4.0 (Service Pack 3 or higher) and Windows 2000 natively support plug-and-play USB with a built-in driver; Windows NT does not, and the NCR windows NT USB driver needs to be installed.

IMPORTANT: You need to have internet access to download the USB drivers from the NCR Web site://www.NCR.com

Host Configuration

Verify that the proper hardware has been installed in the host terminal.

Windows 98:

1. Open the Control Panel.
2. Click on System (Windows 98).
3. Click the Device Manager tab.
4. In the Device Manager window, scroll down the list of installed hardware devices until you find an entry for "Universal serial bus controller."

If this entry exists, your host computer is set up for USB operation. If this entry does not appear:

- Consult your computer documentation to see if USB must be enabled in the BIOS setup.

Windows NT:

To see if your POS terminal is USB-compliant, look at the back.

- If it has a USB connector port, your hardware is all set.

Note: Even though the host may have a USB port, Windows NT does not natively support plug-and-play USB because it does not have a built-in driver. You will need to load the NCR Windows NT USB driver (see "Installing the USB Printer Drivers").

Windows 2000:

1. Open the Control Panel.
2. Click on System.
3. Click on Hardware.
4. Click the Device Manager tab.
5. In the Device Manager window, scroll down the list of installed hardware devices until you find an entry for "Universal serial bus controller."

If this entry exists, your host computer is set up for USB operation. If this entry does not appear:

- Consult your computer documentation to see if USB must be enabled in the BIOS setup.

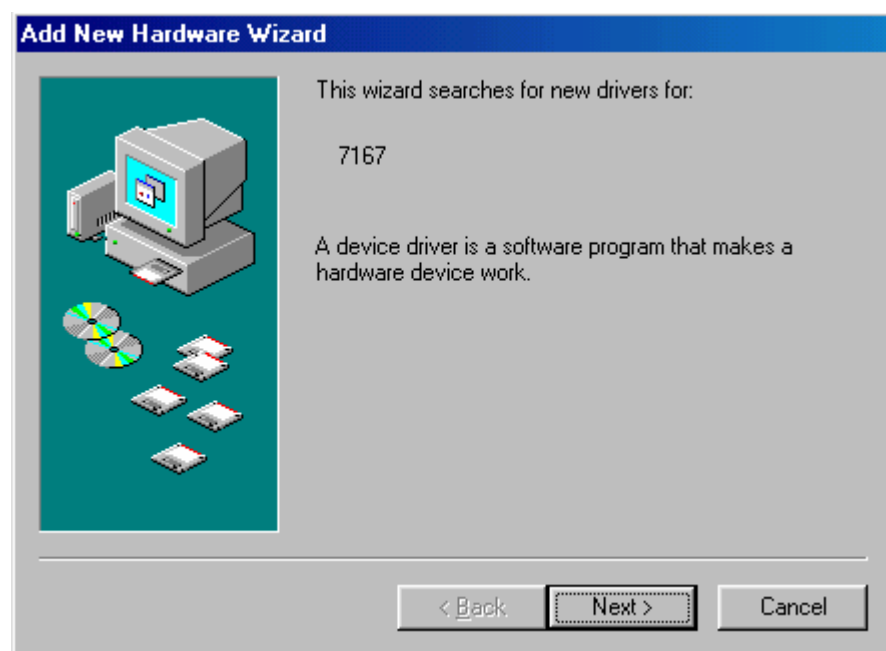
Installing the USB Printer Drivers

Windows NT users need to run Service Pak 3 or higher for a successful installation and should exit all Windows programs before starting.

1. Verify that the printer is plugged in and the power is on.
2. The installation varies depending on the operating system.

Windows 98

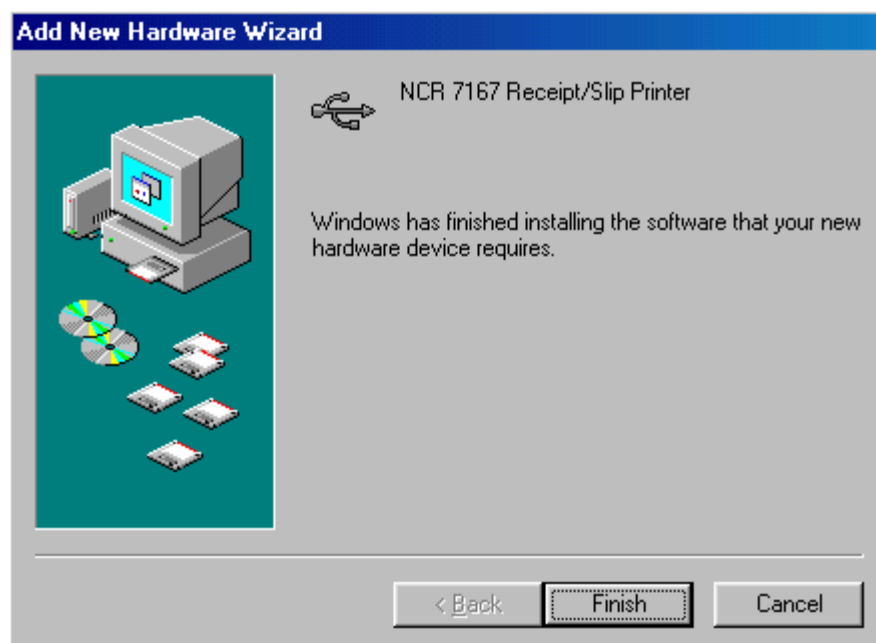
Follow the on-screen instructions. The printer beeps when the USB device is recognized. Go to the location where you downloaded the drivers and double click the file.







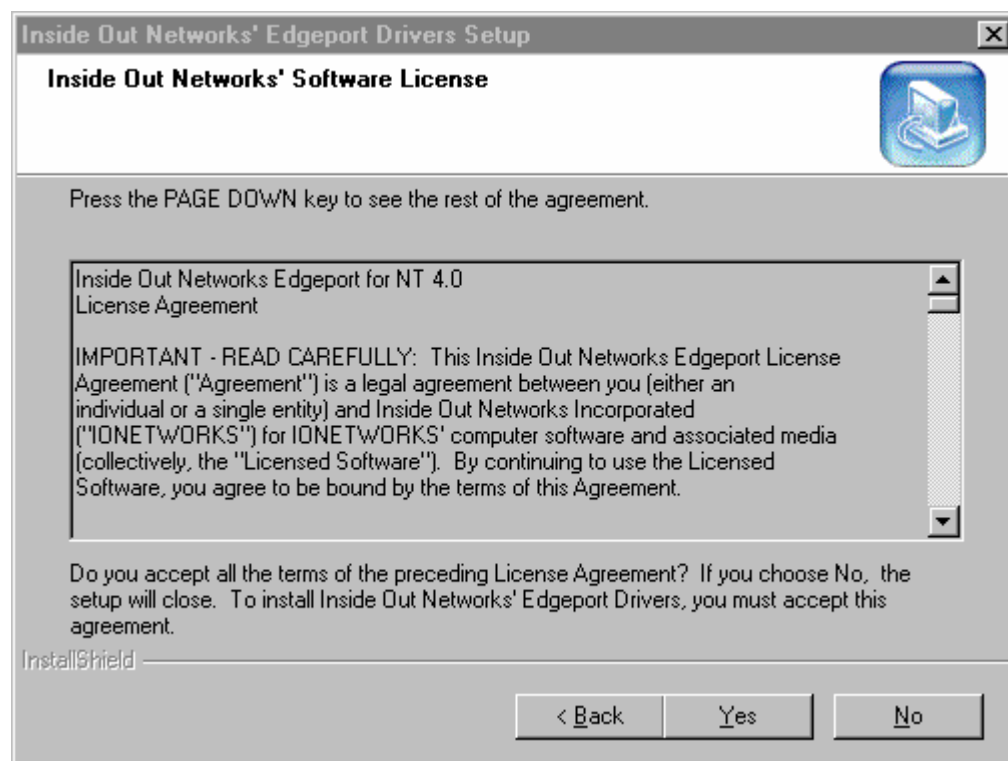
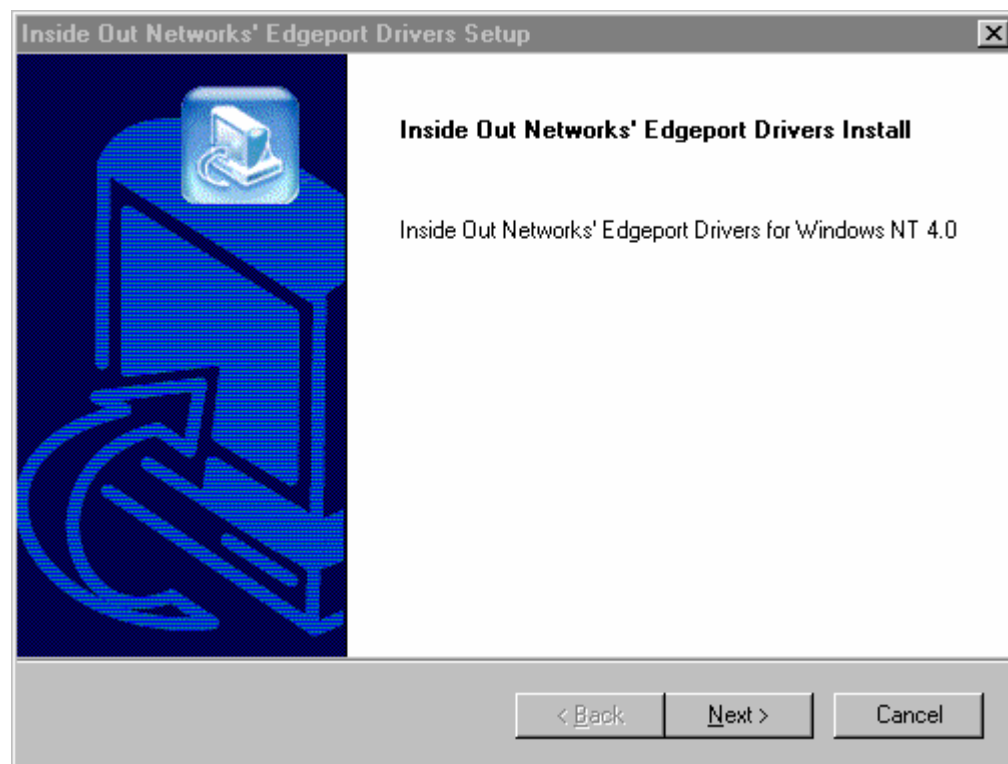
Note: Location of the IONetworks files on the CD-ROM may vary depending on the version of the CD that is being used.

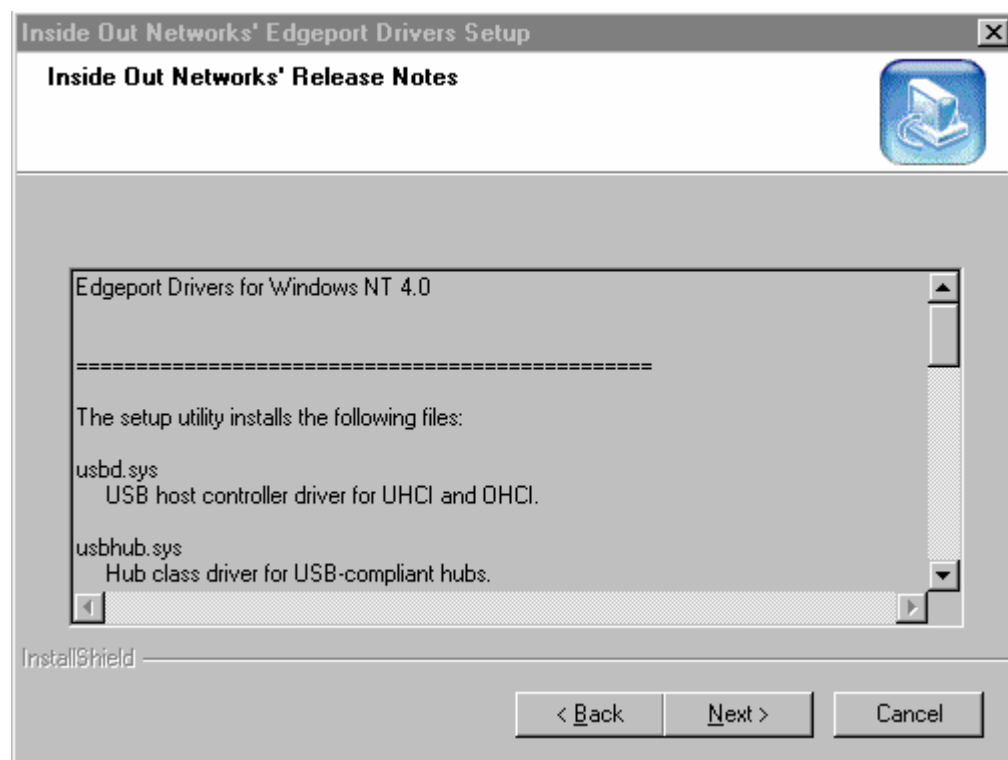


Also verify that you have the Windows 98 USB Hot Patch, ID: Q236934, created: 08-Jul-1999 and modified: 10Aug-1999 installed. To verify if this hot patch is installed check file `c:\Windows\System32\Drivers\usbhub.sys`. This file should be dated 08/13/99, size 36,672, version 4.10.22223.

Windows NT

The printer beeps when it is plugged in to show the USB device is recognized. Click on the file you downloaded and follow the on-screen instructions.

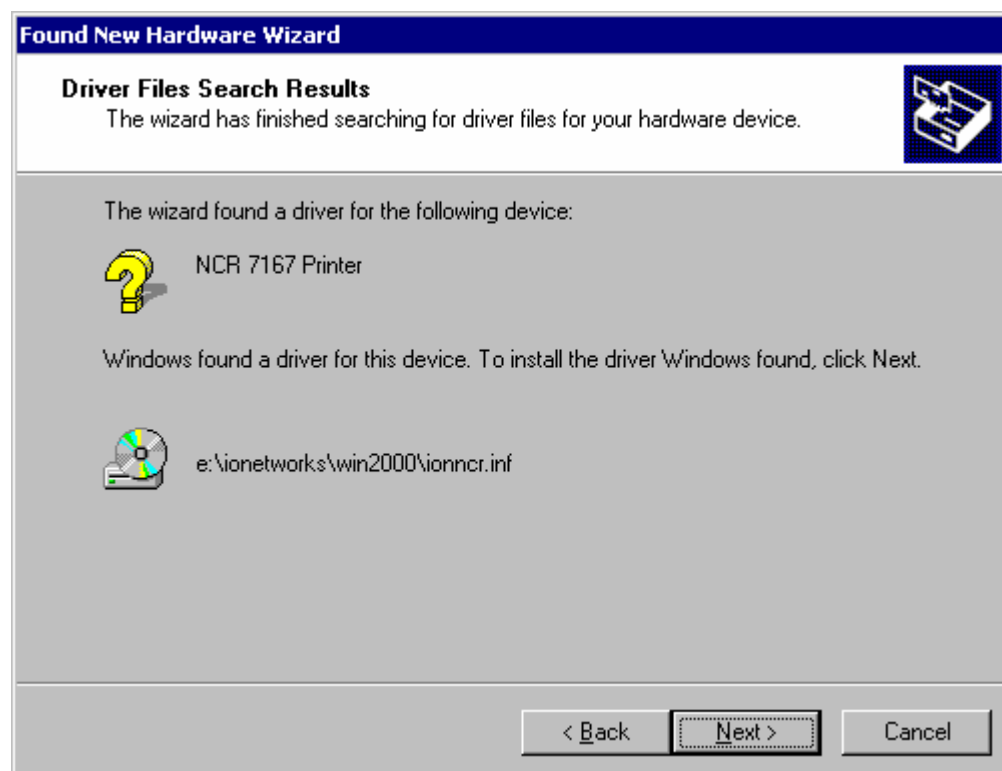
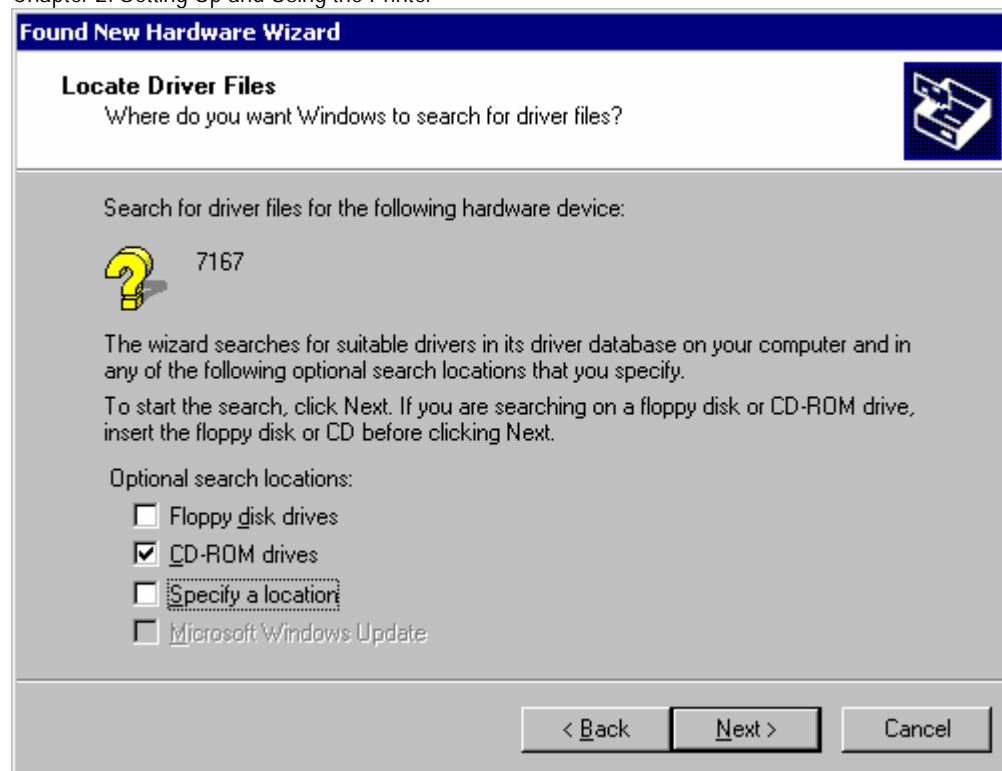




Windows 2000

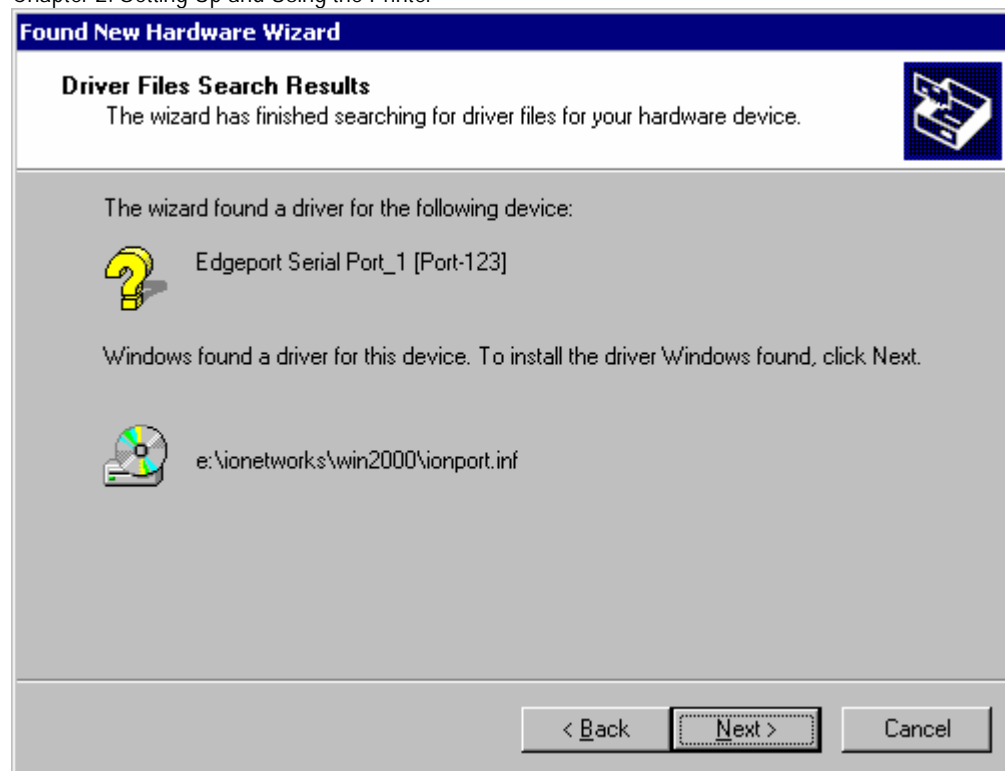
Follow the on-screen instructions. The printer beeps when the USB device is recognized. Go to the location where you downloaded the drivers and double click the file.



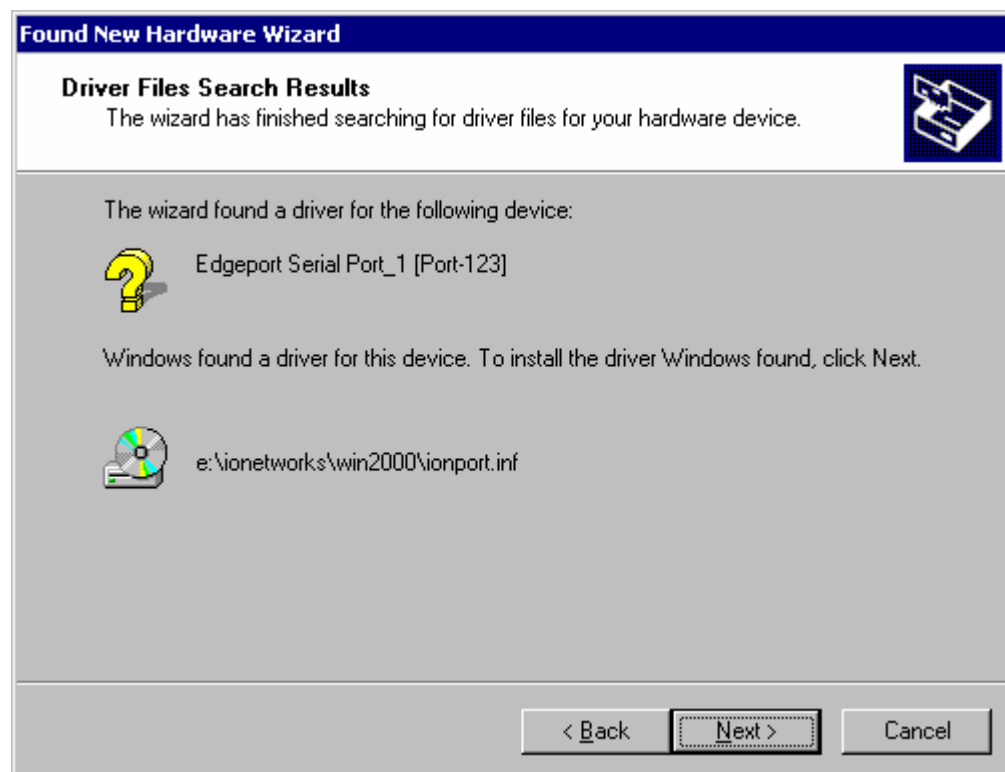


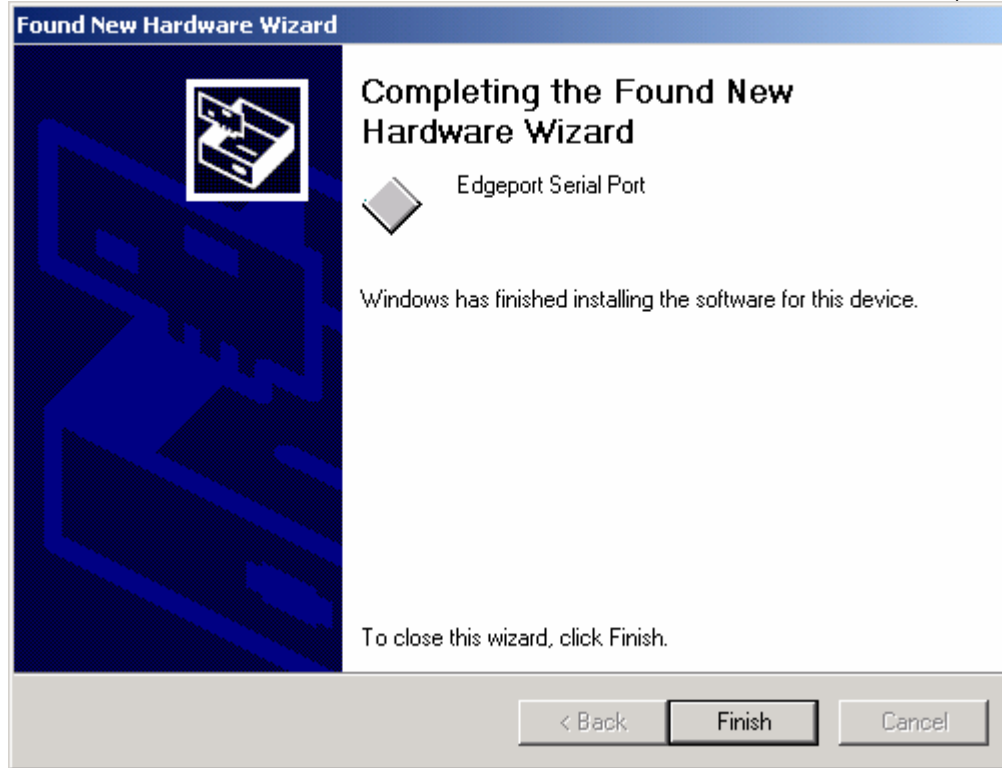
Note: Location of the IONetworks files on the CD-ROM may vary depending on the version of the CD that is being used.





Note: Location of the IONetworks files on the CD-ROM may vary depending on the version of the CD that is being used.





Checking the Installation

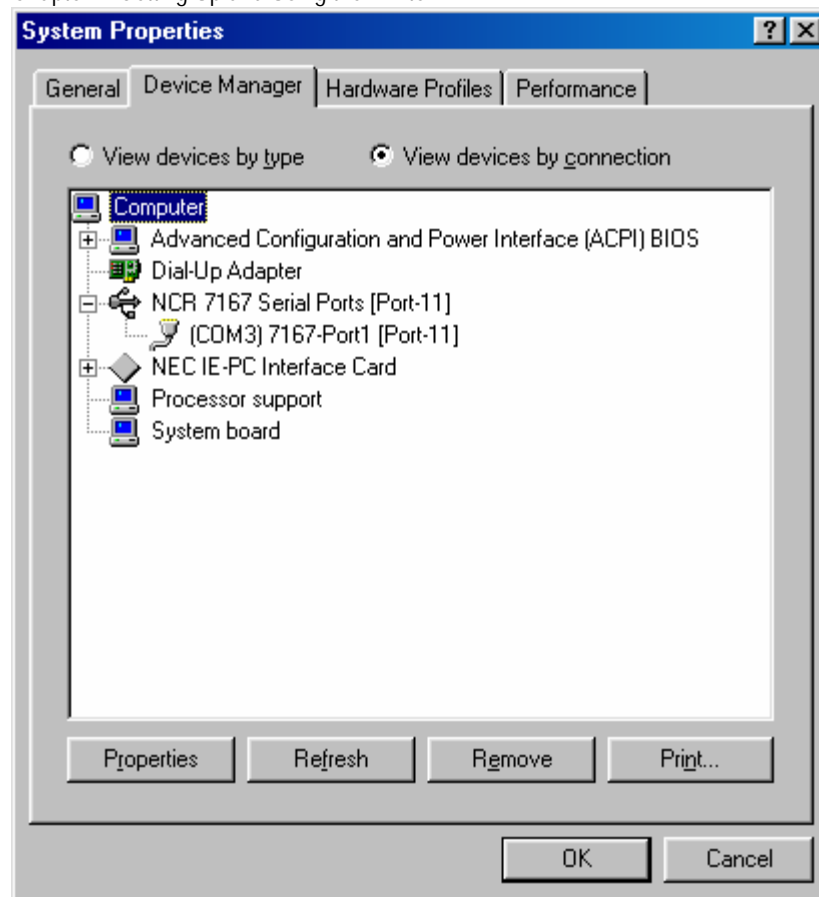
You need to verify that the device drivers were installed correctly:

Windows 98:

1. Open the Device Manager window, as you did in "Checking for USB Support."
2. Scroll down to "Universal serial bus controllers."

The following devices should be displayed:

- NCR 7167 Printer
- NCR 7167 Serial Ports [Port#] (where the # is the location of the printer)



3. Scroll back up to “Ports.”

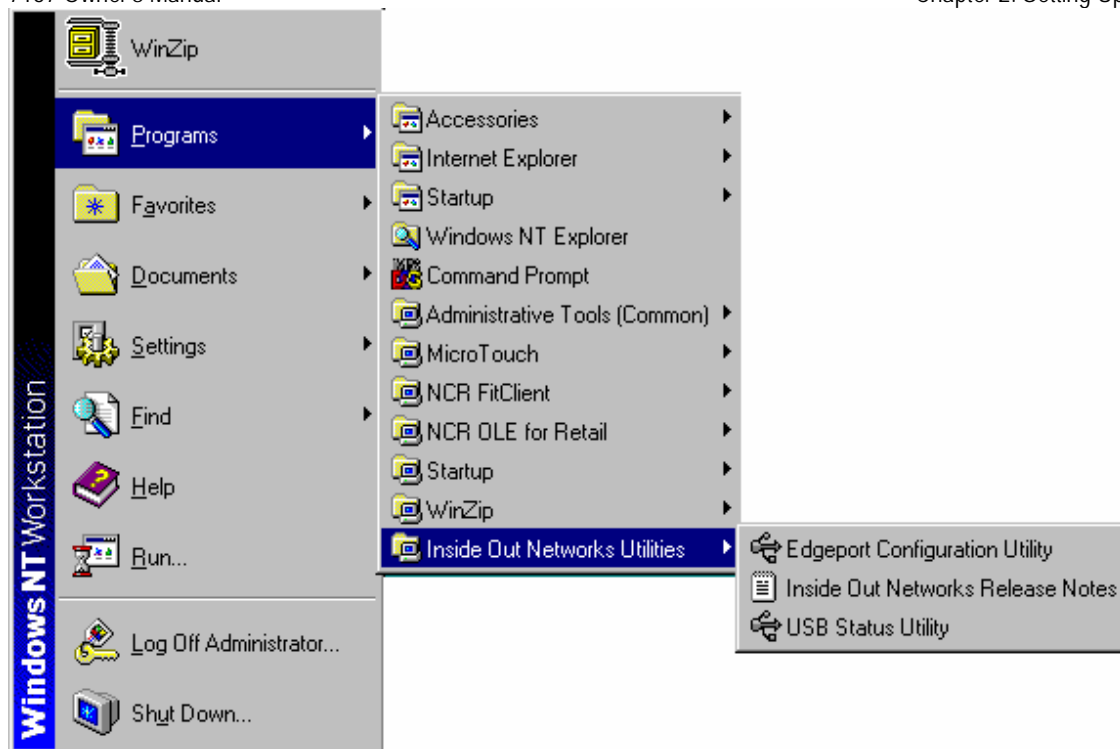
You should see a COM number and port description for the **NCR** printer.

If the devices are missing or are not listed correctly, the installation wasn't successful. You will need to reinstall the drivers.

Windows NT:

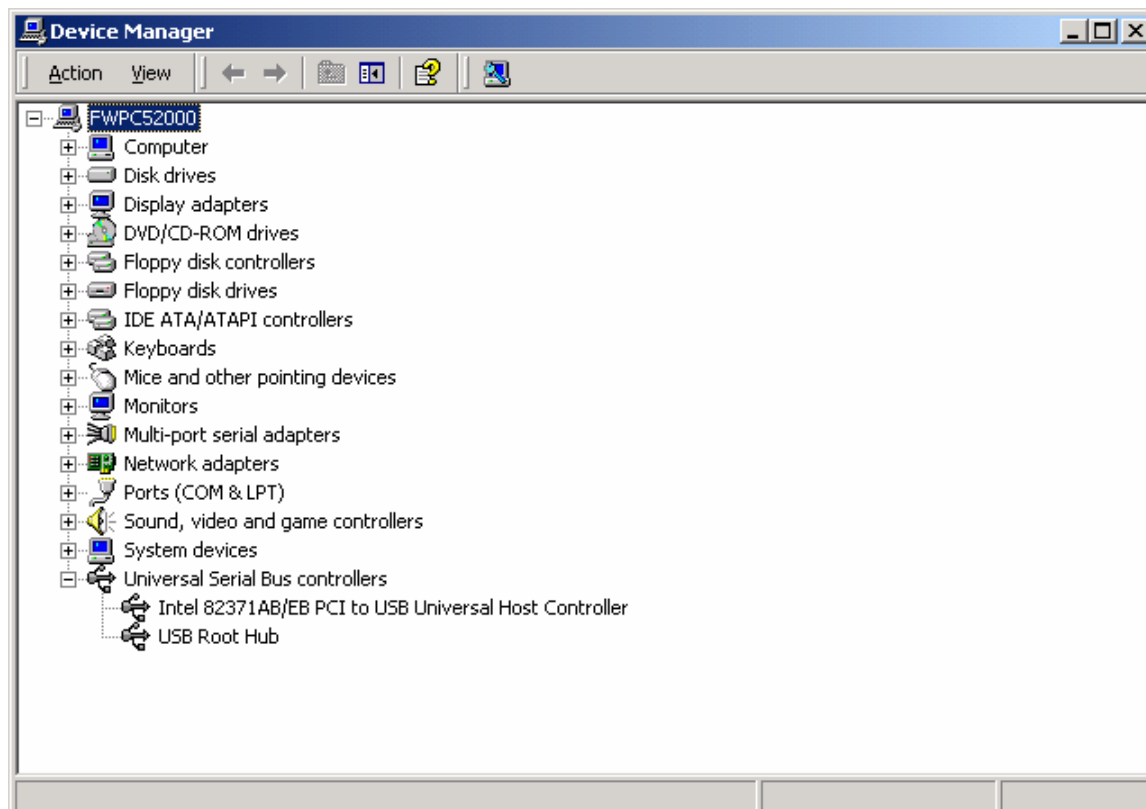
Go the Windows Start button and select Programs > InsideOut Networks Utilities > Edgeport Configuration Utility. A window opens that contains the name of the printer, and the port assignment.

If this information is not listed, then the installation was not successful. You will need to reinstall the drivers.



Windows 2000:

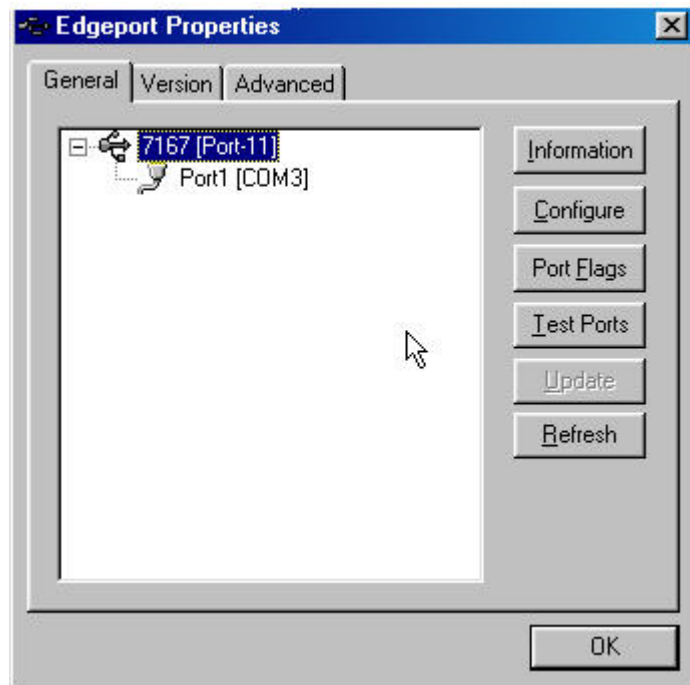
1. Open the Device Manager window, as you did in “Checking for USB Support.”
2. Scroll down to “Universal serial bus controllers.”



3. Scroll back up to "Ports."

If the devices are missing or are not listed correctly, the installation wasn't successful. You will need to reinstall the drivers.

If this information is not listed, then the installation was not successful. You will need to reinstall the drivers.



Configuring Serial Port Number Assignments

This section described how the NCR USB solution assigns serial port numbers (e.g., COMx) to the printer. The information that determines the assigned port number is stored in the host computer and not in the printer. This assignment is made in one of three ways. The first method is the default method that automatically assigns a serial port number to the printer. The other two methods require the user to specify a port number. These methods are described more fully in "Serial Port Configuration Methods" on the following page.

Running the Edgeport Utility

You'll need to run the Edgeport utility to check which serial port has been assigned to the printer. This utility queries and configures the operating system and driver for the information regarding the virtual serial port.

Windows 98

1. Open the Device Manager and make sure "View Devices By Type" is selected.
2. Scroll down to Universal serial bus controller, and expand the list by pressing the "+" symbol. You'll see two entries for your **NCR** printer.
3. Select the printer name and click Properties.
4. Select the Details tab, then press the Details button to start the Edgeport utility.

Windows NT 4.0

From the Windows Start menu, select Programs > Inside Out Networks Utilities > Edgeport Configuration Utility.

Windows 2000

1. Open the Device Manager and make sure "View Devices By Type" is selected.
2. Scroll down to Universal serial bus controller, and expand the list by pressing the "+" symbol. You'll see two entries for your **NCR** printer.
3. Select the printer name and click Properties.
4. Select the Details tab, then press the Details button to start the Edgeport utility.

Serial Port Configuration Methods

Automatic (Default). When the printer is plugged into the USB port of the host and the drivers are loaded, the printer will default to the next available serial port number. In many cases this is exactly what is desired. You can check the assigned serial port by clicking the General tab in the Edgeport utility. You'll see an entry for the NCR printer. Expand the list to see which serial port has been assigned to the printer.

Assigning a serial port to the printer. If the default assignment does not meet the requirements of the installation, you can assign a different serial port to the printer. From the General tab of the Edgeport utility, select the printer and press Configure. Follow the directions on the resulting form to assign a new port to the printer.

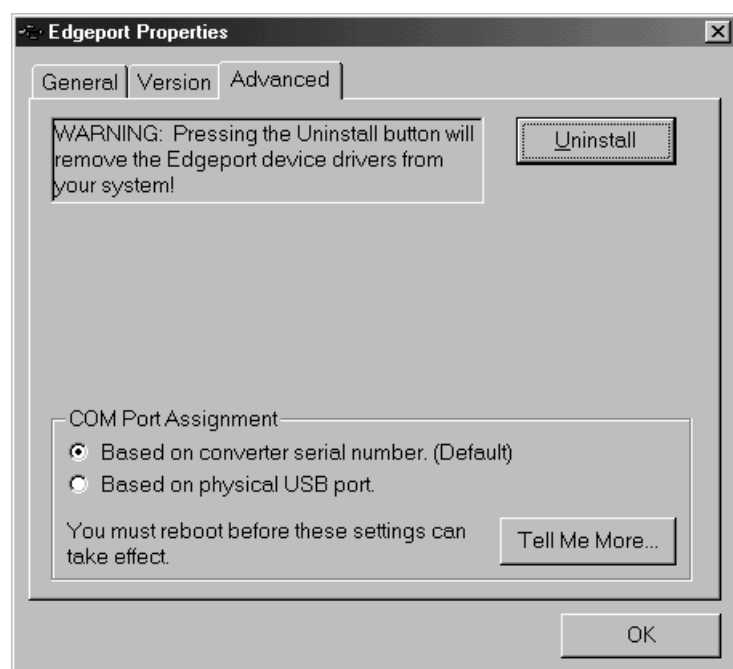
Associating a serial port with a specific USB port. (Windows 98 and NT) In certain installations it is desirable to associate a serial port number with a specific USB port. This is particularly important if

multiple identical printers are installed on one host. Select the Advanced tab in the Edgeport utility, and follow the instructions for configuring the serial port number based on the physical USB port.

Uninstalling the Drivers

Windows 98:

1. Open the Device Manager and make sure “View Devices By Type” is selected.
2. Scroll down to Universal serial bus controller, and expand the list by pressing the “+” symbol. You’ll see two entries for your NCR printer.
3. Select the printer name and click Properties.
4. Select the Details tab, then press the Details button to start the Edgeport utility.
5. Click the Advanced tab.
6. Click the Uninstall button and follow the on-screen instructions.



Windows NT:

Windows NT users will need to run the Edgeport Configuration Utility to uninstall the drivers.

1. Press Windows Start Menu button.
2. Choose Programs, then Inside Out Networks Utilities.
3. Choose Edgeport Configuration Utility.
4. Click the Advanced tab.
5. Click the Uninstall button and follow the on-screen instructions.

Windows 2000:

1. Open the Device Manager and make sure "View Devices By Type" is selected.
2. Scroll down to Universal serial bus controller, and expand the list by pressing the "+" symbol. You'll see two entries for your NCR printer.
3. Select the printer name and click Properties.
4. Select the Details tab, then press the Details button to start the Edgeport utility.
5. Click the Advanced tab.
6. Click the Uninstall button and follow the on-screen instructions.

Chapter 3: Solving Problems

The 7167 printer is a simple, generally trouble-free printer, but from time to time minor problems may occur. For example, the power supply may be interrupted or the thermal print head may overheat.

A green LED on the operator panel signals that something may be wrong.

For some problems, the printer communicates the information to the host computer and relies on the application to indicate what the problem is.

The information on the following pages describes some problems that you may encounter: problems that you can easily fix, and others that you will need to contact a service representative for.

You may be able to correct many of the conditions or problems without calling for service. However, if a problem persists, contact a service representative. See "Contacting a Service Representative" at the end of this chapter.

Green LED Does Not Come On/Printer Will Not Print

Problem	What to Do	Where to Go
Cables may not be connected properly	Check all cable connections. Check that the host computer and power supply are both on (the power supply is turned on by plugging it into an outlet).	See "Connecting the Cables" in chapter 2.
Power supply may be defective	If the power supply is plugged in, but does not come on, you will need to order a new power supply.	See "Ordering Other Supplies" in chapter 1.

Green LED Blinking (Slow)

Problem	What to Do	Where to Go
Receipt paper is low*	There are about 4 ½ meters, ± 3 meters, (15 feet, ± 10 feet) of paper left. Change the paper soon to avoid running out of paper part way through a transaction.	See "Loading and Changing the Receipt Paper" in chapter 2.

Green LED Blinking (Fast)

Problem	What to Do	Where to Go
Receipt paper is out	Change the paper now. Do not run a transaction without paper as the data may be lost.	See "Loading and Changing the Receipt Paper" in chapter 2.
Receipt cover or front cover is open	Close the cover. The printer will not operate with either of the covers open.	
Knife failure	Open the receipt cover and check the knife. Clear any jammed paper you can see. Tear off any excess paper against the tear-off blade.	
	Contact a service representative if this does not resolve the problem.	See "Contacting a Service Representative" later in this chapter.
Paper jam in slip station	Open the front cover and check the slip table and under the carriage. Remove any paper you see.	
	If you cannot see a paper jam or other obstruction, contact a service representative.	See "Contacting a Service Representative" later in this chapter.
Paper jam in carriage	Open Front Cover and clear paper from path.	
Paper jam during flip	If visible through Front Window, open access door and clear paper jam, if not, open Front Cover and clear jam.	

AC supply voltage is out of range	If paper is not low and no conditions indicate that the thermal print head is too hot, then it is likely that the power supply voltage is out of range.	See "Contacting a Service Representative" later in this chapter.
Thermal print head temperature is out of range	<p>The print head may overheat when printing in a room where the temperature is above the recommended operating temperature or when printing high-density graphics continuously, regardless of the room temperature. In either case, the printer will shut off.</p> <p>If the temperature of the print head is too hot, adjust the room temperature or move the printer to a cooler location.</p> <p>If the print head is overheating because of printing high density graphics continuously, reduce the demand on the printer.</p>	<p>See "Environmental Conditions" in Appendix A for the recommended temperature range for operating the printer.</p> <p>See "Contacting a Service Representative" later in this chapter.</p>
Power supply voltage is out of range	If paper is not low and no conditions indicate that the print head is too hot, the power supply voltage is out of range. Contact a service representative.	See "Contacting a Service Representative" later in this chapter.

Slip or Forms Printing is Light

Problem	What to Do	Where to Go
Ribbon cassette is worn	Replace the ribbon cassette.	See "Putting In and Changing the Ribbon Cassette" in chapter 2.
	Contact a service representative if this does not resolve the problem.	See "Contacting a Service Representative" later in this chapter.

Receipt Printing is Light or Spotty

Problem	What to Do	Where to Go
Thermal print head may be dirty	Open the receipt cover and clean the thermal print head with cotton swabs and isopropyl alcohol.	See "Cleaning the Printer" in chapter 2.
	Caution: Do not use the alcohol to clean other parts of the printer. Damage will occur. Contact a service representative if this does not resolve the problem.	See "Contacting a Service Representative" later in this chapter.
	Note: The thermal print head does not normally require cleaning if the recommended paper grades are used. If non-recommended paper has been used for an extended period of time, cleaning the print head with the alcohol and cotton swabs will not be of much benefit. See "Ordering Thermal Paper" in chapter 1 for recommended paper.	

LED (Slip Table) Does Not Come On

Problem	What to Do	Where to Go
Form or check not inserted properly	Line up the form or check against the guide (wall) and slide it toward the back of the printer until it contacts the form stop and can't go any further. Extra long forms may need to be inserted from the side to disengage the form stop.	See "Printing on Forms or Checks" or "Validating and Verifying Checks" in chapter 2
	Contact a service representative if this does not resolve the problem.	See "Contacting a Service Representative" later in this chapter.

Forms Skew or Catch

Problem	What to Do	Where to Go
Form or check skewing or catching in slip station due to an obstruction or paper jam	Open the front cover and check for any paper jams or obvious obstruction in the slip station. Clear the obstruction or jammed paper.	
	Contact a service representative if this does not resolve the problem.	See "Contacting a Service Representative" later in this chapter.

MICR Check Reader Not Reading Properly

Problem	What to Do	Where to Go
MICR (Magnetic Ink Character Recognition) check reader does not read or misreads checks	Open the slip cover and clean the MICR read head with cotton swabs and isopropyl alcohol.	See "Adjusting the MICR Check Reader" in chapter 4.

Other Serious Problems

The following problems all need to be corrected by a qualified service representative. See the next section, "Contacting a Service Representative."

MICR check reader not operating properly

Forms not feeding into the slip/forms area properly

Missing dots in slip or forms printing

Printer will not cycle or stop when required

Illegible characters

Paper will not feed

Knife will not cycle or cut

Platen will not open or close

Printer will not communicate with Host

Contacting a Service Representative

For serious problems, such as the printer not printing, not communicating with the host computer, or not turning on, contact your NCR-authorized service organization to arrange for a service call. In addition to the service manual listed below, other service-related materials may be available. Contact your NCR-authorized service representative to obtain the service manual.

7167 Thermal Receipt and Impact Slip Printer: Service Manual (B005-000-1407)
(includes the Troubleshooting Guide and the Preventative Maintenance Guide)

Chapter 4: Diagnostics

The following diagnostic tests are available for the 7167:

Level 0 Diagnostics (Startup)

Performed during the startup cycle.

Level 1 Diagnostics (Printer Configuration)

Allows configuration of the printer using a Configuration Menu that is printed on a receipt.

Level 2 Diagnostics (Runtime)

The printer checks the status of these conditions during normal operation.

Level 3 Diagnostics (Remote)

The printer keeps track of counters during normal operation.

Vendor Adjustment

Performed in off-line mode. Allows to change settings for mechanical and perform printer test.

Modifications of these settings are to be made by service personnel only.

Level 0 Diagnostics

The printer automatically performs level 0 diagnostics when it is put on-line. Level 0 diagnostics comprise the following actions:

Motors are turned off.

Microprocessor timing is checked, CRC check of the firmware ROM is performed, external RAM is read.

- The green LED on the slip table flashes once if this action succeeds.
- Level 0 diagnostics stop if this action fails. Failure is indicated by the printer going dead: knife and print head do not home, the platen does not open, LEDs are not lit, the printer is unable to communicate with the host computer.
- Knife is homed. A fault condition is caused if this action fails.
- Slip platen is opened.
- Slip print head is homed. A fault condition is caused if this action fails.
- The status of all sensors is checked, and the status bytes are updated.

If the printer has not been turned on before, the default values for the printer functions will be loaded into the non volatile memory during level 0. These values can be changed in level 1 diagnostics. See "Level 1 Diagnostics" for the functions and their settings.

When the last step is complete, the Paper Feed button is enabled and the printer is ready for normal operation. Information about the tests is available to the communication interface through the commands.

Level 1 Diagnostics

Level 1 diagnostics (setup mode) allow you to change the settings for various printer functions and run certain tests.

Keep the following information in mind when changing the settings:

The settings can only be changed when the printer is in level 1 diagnostics (setup mode): Switch 1 must be set to On and Switch 2 must be set to Off.

The default options are set at the factory and are stored in the history non volatile memory

Once the settings have been changed and stored in the non volatile memory, the diagnostic setup is exited which saves the settings.

Caution: If you are changing the printer settings, be sure they are the correct settings for that particular function or test to avoid accidentally changing the settings for another function or test. If the settings are accidentally changed you must reenter the setup mode and reenter the correct settings. If you need assistance, contact a service representative. See "Contacting a Service Representative" in chapter 3.

Printer Configuration

Printers are generally shipped with all appropriate configuration settings pre-set at the factory. The only time the user should need to change the printer configuration is if a new option is installed or the firmware is changed. It is also possible the user may need to run certain tests using the Configuration Menu.

The user configures the printer using a convenient Configuration Menu that is printed on receipt paper. The Configuration Menu prints instructions and setting options interactively as the user goes through the configuration process. The following functions and parameters can be changed with the scrolling Configuration Menu:

- Configuring the Printer
 - Communication Interface
 - Interface Type
 - Baud Rate
 - Number of Data Bits
 - Number of Stop Bits
 - Parity
 - Flow Control
 - Data Reception Errors
 - Receive Buffer
 - Setting Diagnostic Modes
 - Off, Normal Mode
 - Datascope Mode
 - Slip Test Mode
 - Receipt Test Mode
 - MICR Test Mode
 - Check Flip Test Mode
 - Print Head Gap Adjust Test Mode

Setting Emulation/Software Options

Emulation

Printer ID

Default Lines Per Inch

Carriage Return Usage

Asian Mode¹

Slip Print Width

Receipt Synchronization

Platen Waiting Time

Setting Hardware Options

Print Density

Maximum Power Option

Paper Low Sensor

Paper Width

Knife Options

MICR Option

Check Flip Option

Color Paper Option

MICR Dual Pass

Scan

Setting Default Code Page

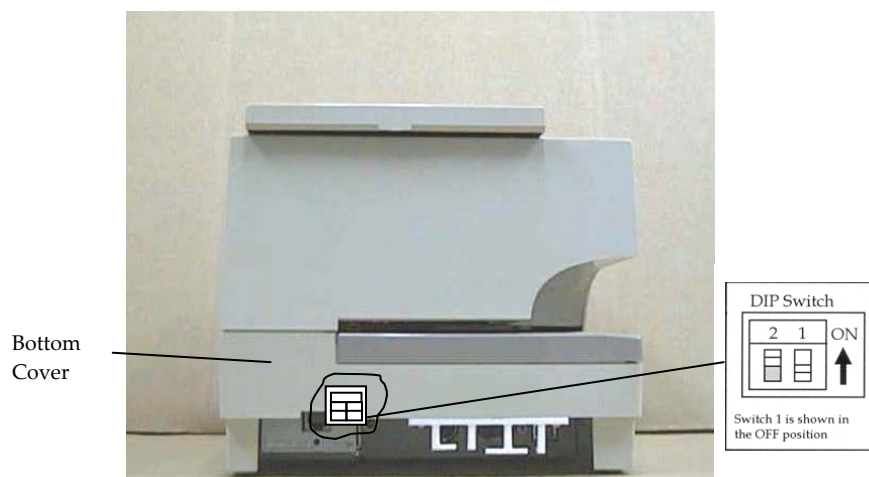
Setting EEPROM to default settings

¹ Asian Mode isn't supported by model 7167-1035 and 7167-2035.

Configuring the Printer

Use the Configuration Menu to select functions or change various settings as indicated in the preceding sections. The Configuration Menu prints instructions and setting options interactively as the user goes through the configuration process.

Caution: Be extremely careful in changing any of the printer settings to avoid changing settings that might affect the performance of the printer.



1. Set DIP Switch 2 to Off, Switch 1 to On.
2. Reset the printer.

For resetting the printer instruction see Chapter 2 page 13

This configuration menu allows you to set mechanical adjustment parameters and select printer test.

Sub-menus are entered and selections are made using the Paper Feed Button.

- Short Click: Feed Button is quickly depressed and released
- Long click: Feed Button is held down more than 1 second

Press the paper feed for the configuration you want.

Defaults are marked with asterisk (*).

***** **Main Menu** *****

Select a sub-menu:

EXIT	> 1 Click
Print Current Configuration	> 2 Clicks
Set Communication Interface	> 3 Clicks
Set Diagnostics Modes	> 4 Clicks
Set Emulation/Software	> 5 Clicks
Set Hardware Options	> 6 Clicks
Set Default Code page	> 7 Clicks
Set EEPROM To Default Settings	> 8 Clicks

Enter code, then hold Button DOWN
 at least 1 second to validate

***** Diagnostics Form *****

Model number : 7167
 Serial number : A991703053

Boot Firmware
 Revision : V00.17
 CRC : C525

Flash Firmware
 Revision : V03.12
 CRC : 0EFF

Hardware
 Flash Memory Size : 2Mbytes
 Flash Logos Size : 256Kbytes
 Flash Fonts Size : 64Kbytes
 Flash User Storage : 64Kbytes

Communication Interface
 Interface Type : RS232/USB
 Parameters
 Baud Rate : 9600
 Data Bits : 8
 Stop Bits : 1
 Parity : None
 Flow Control : DTR/DSR
 Reception Errors : Print '?'
 Receive Buffer : 4K Bytes

Diagnostic Mode : OFF, Normal Mode

Emulation/Software
 Printer Emulation : 7158 Native Mode
 Printer ID Mode : 7158 Native ID
 Default LPI : 7.52

To enter Diagnostics Mode:
 1) Flip DIP switch #1 on
 2) Reset the printer by pressing
 and holding the Receipt Feed switch
 down while disconnecting and
 reconnecting the power.

***** Printer Config Menu *****

The config menu allows you to set general printer parameters. Sub-menus are entered and selections are made using the Paper Feed Button:

- Short Click : Feed Button is quickly depressed then released.
- Long Click : Feed Button is held Down more than 1sec then released.

CAUTION !!
 The settings are predetermined in factory and should generally not be changed to avoid changing other functions.

******* Main Menu *******

Select a sub -menu:

- EXIT 1 Click
- Print Current Configuration 2 Clicks
- Set Communication Interface 3 Clicks
- Set Diagnostics Modes 4 Clicks
- Set Emulation/Software 5 Clicks
- Set Hardware Options 6 Clicks
- Set Default Code Page 7 Clicks
- Set EEPROM To Default 8 Clicks

Enter code, then hold Button DOWM at least 1 second to validate

Important: Ensure that the configuration settings match your host computer, if not, enter the Configuration Menu to make changes.

Configuration Menu and Print Test samples (show approximately 60% of size).

4. Press the Paper Feed Button to make the selections.

The instructions indicate whether to select something with a short click, a long click, or a series of short clicks. Indicate Yes with a long click, No with a short click.

Press and hold the Paper Feed Button for at least one second for a long click. Press the Paper Feed Button quickly for a short click.

5. When finished, set DIP Switch 1 to Off and reset printer.

Communication Interface Modes

The Configuration Menu gives the user the option of setting the printer to use an RS-232C serial port. (See "Configuring the Printer" for instructions on how to enter the Configuration Menu.)

RS-232C Interface Settings

If the user sets the printer to use an RS-232C serial interface, the Configuration Menu can be used to set the following RS-232C specific settings:

Set a baud rate 115200, 57600, 38400, 19200, 9600, 4800, 2400, or 1200 baud

Set the number of data bits to seven or eight

Set the number of stop bits to one or two

Enable or disable parity

Set flow control to software (XON/XOFF) or Hardware (DTR/DSR)

Set the printer to ignore data errors or print a "?" upon encountering an error

The settings used will depend on the software the operator is using and the capabilities of the host computer.

Press the paper feed button for the communications settings you want.

Defaults are marked with asterisks (*).

**** SET INTERFACE TYPE ?**

YES > Long Click

NO > Short Click

RS232/USB* > 1 Click

RS232 > 2 Clicks

USB > 3 Clicks

Enter code, then hold Button Down

At least 1 second to validate

**** SET BAUD RATE ?**

YES > Long Click

NO > Short Click

115200 Baud > 1 Click

57600 Baud > 2 Clicks

38400 Baud	> 3 Clicks
19200 Baud	> 4 Clicks
More	> 5 Clicks

Enter code, then hold Button DOWN
At least 1 second to validate

9600 Baud*	> 1 Clicks
4800 Baud	> 2 Clicks
2400 Baud	> 3 Clicks
1200 Baud	> 4 clicks

Enter code, then hold Button DOWN
At least 1 second to validate

**** SET NUMBER OF DATA BITS ?**

YES	> Long Click
NO	> Short Click

8 Data Bits*	> Long Click
7 Data Bits	> Short Click

**** SET NUMBER OF STOP BITS ?**

YES	> Long Click
NO	> Short Click

1 Stop Bits*	> Long Click
2 Stop Bits	> Short Click

**** SET PARITY ?**

YES	> Long Click
NO	> Short Click

No Parity*	> 1 Click
Even Parity	> 2 Clicks
Odd Parity	> 3 Clicks

Enter code, then hold Button DOWN
At least 1 second to validate

**** SET FLOW CONTROL METHOD ?**

YES	> Long Click
NO	> Short Click

Software (XON/XOFF)	-> Long Click
Hardware (DTR/DSR)*	-> Short Click

**** SET DATA RECEPTION ERRORS OPTION ?**

YES	> Long Click
NO	> Short Click

Ignore Errors	> Long Click
Print '?'*	> Short Click

Note: Press the Paper Feed Button for at least one second to validate the selection.

Save Parameters

This function allows to save the selected communication settings or return to the communication settings to select additional options.

Press the Paper Feed Button for the option you want.

Save new parameters ?

YES	> Long Click
NO , MODIFY	> Short Click

Diagnostic Modes

This function allows the user to put the printer into the following diagnostic modes:

OFF, Normal Mode: this is the normal operating mode of the printer.

Datascope Mode: the receipt printer prints incoming commands and data in hexadecimal format.

Slip test Mode: the slip printer prints two code pages.

Receipt Test Mode: the receipt printer prints two code pages.

MICR Test Mode: the receipt printer prints all characters recognized by the MICR.

Check Flip Test Mode: the check flip mechanism will flip an inserted check.

Print Head Test Mode: the slip printer prints several lines of rolling ascii even if the receipt cover is open.

The diagnostic modes are enabled or disabled by using the Configuration Menu. See "Configuration the Printer," for instructions on how to enter the Configuration Menu.

Press the Paper Feed Button for the diagnostic mode you want.

**** SET DIAGNOSTICS MODE ?**

YES > Long Click

NO > Short Click

OFF, Normal Mode* > 1 Click

Data Scope Mode > 2 Clicks

Slip Test Mode > 3 Clicks

Receipt Test Mode > 4 Clicks

More Options > 7 Clicks

Enter code, then hold Button DOWN

At least 1 second to validate

MICR Test mode > 1 Click

Check Flip Test mode > 2 Clicks

Print Head Test Mode > 3 Clicks

Enter code, then hold Button DOWN

At least 1 second to validate

Datascope Mode

Datascope Mode allows the user to test the printer's communications. When in Datascope Mode the printer receives all communications, but instead of executing the commands it prints them out on receipt paper as hexadecimal numbers in the order received. For example, the ASCII character "A" is printed as the hexadecimal number 41 and so on.

To run the Datascope Mode:

1. Enter the Configuration Menu. See "Configuring the Printer" for instruction on how to enter the Configuration Menu.
2. After you have enabled the Datascope Mode through the Configuration Menu, exit the Configuration Menu.
3. Run a transaction from the host computer.

All commands and data sent from the host computer will be printed as hexadecimal numbers as shown in the illustration.

30	31	32	33	34	35	36	37	38	39	40	41	:	0	1	2	3	4	5	6	7	8	9	@	A
41	42	43	44	45	46	47	48	49	50	51	52	:	A	B	C	D	E	F	G	H	I	J	K	L

To exit the Datascope Mode:

1. Enter the Configuration Menu again
2. Disable the Datascope Mode
3. Exit the Configuration Menu

The printer is in Normal Mode and can communicate with the host computer.

Slip Test Mode

To run the Slip Test Mode:

1. Enable the Slip Test Mode through the Configuration Menu, (See "Configuring the Printer," for instructions on how to enter Configuration Menu). Then exit the Configuration Menu.
2. Insert a slip into the slip station.
3. Push the Paper Feed Button
4. All code pages will be printed.
5. Go to step 2 again to repeat this test.

To exit the Slip Test Mode:

1. Enter the Configuration Menu again.
2. Disable the Slip Test Mode.
3. Exit the Configuration Menu.

The printer is in the Normal Mode and can communicate with the host computer.

Receipt Test Mode

To run the Receipt Test Mode:

1. Enable the Receipt Test Mode through the Configuration Menu. See "Configuring the Printer," for instructions on how to enter the Configuration Menu. Then exit the Configuration Menu.
2. Push Paper Feed Button and the receipt station will print all code pages.
3. The test ends with a cut.
4. Go to step 2 again to repeat this test.

To exit the Receipt Test Mode:

1. Enter the Configuration Menu again.
2. Disable the Receipt Test Mode
3. Exit the Configuration Menu

The printer is in Normal Mode and can communicate with the host computer.

MICR Test Mode

MICR Test Mode allows the user to test whether the MICR is operating correctly. When the printer is in this mode the MICR reads characters on a cheque as usual, but instead of transmitting the values to the software it prints on receipt paper.

To run the MICR Test Mode:

1. Enter the Configuration Menu. See "Configuring the Printer," for instructions on how to enter the Configuration Menu.
2. After enabling the MICR Test Mode through the Configuration Menu, exit the Configuration Menu.
3. Insert a check into the slip station. (See "Verifying and Validating Checks" section.)
4. The printer waits until a check is inserted and detected before the platen closes and the characters are read by the MICR check reader. The decoded data is printed on receipt paper, the platen is opened, and the test is re-started.
5. The printed numbers should match the numbers on the check. If the MICR check reader misreads a character, the test prints question mark "?". If the MICR check reader is unable to read any characters, the test prints "NO MICR DATA TO DECODE."

*** GOOD READ ***
MICR Data:
5001234UT33456789T 123 67 5

To exit the MICR Test Mode:

1. Enter the Configuration Menu again.
2. Disable the MICR Test Mode.
3. Exit the Configuration Menu.

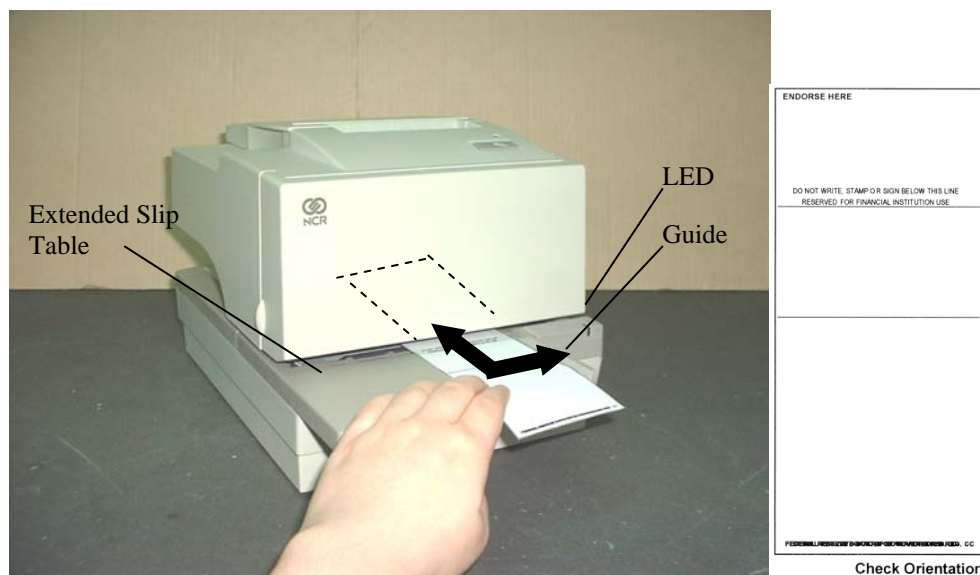
The printer is in the Normal Mode and can communicate with the host computer.

Check Flip Test Mode

To run the Check Flip Test Mode:

1. Enable the Check Flip Test Mode through the Configuration Menu (See "Configuring the Printer," for instruction on how to enter the Configuration Menu), then exit the Configuration Menu.
2. Insert a check as if validating the check, lengthwise and face down into the slip station. (See "Verifying and Validating Checks" section to insert check.)

A check must be used - if any other slip or form is inserted the printer will not perform the check flip operation correctly.



3. Push Paper Feed Button.
4. The check then goes through the flip routine only - no printing takes place.

To exit the Check Flip Test Model:

1. Enter the Configuration Menu again.
2. Disable the Check Flip Test Mode.
3. Exit the Configuration Menu

The printer is in Normal Mode and can communicate with the host computer.

Print Head Test Mode

Print Head Test Mode prints three lines of rolling ASCII characters.

To run the Print Head Test Mode:

1. Enable the Print Head Test Mode through the Configuration Menu ("See Configuring the Printer," for instructions on how to enter the Configurations Menu). Then exit the Configuration Menu.
2. Insert a slip into the slip station.
3. Push Paper Feed Button.
4. Several lines of Rolling ASCII character will be printed.

Note: Printing will take place even when receipt cover is open.

5. Go to step 2 again if you want to repeat this test.

To exit the Print Head Test Mode:

1. Enter the Configuration Menu again.
2. Disable the Print Head Test Mode.
3. Exit the Configuration Menu.

The printer is in Normal Mode and can communicate with the host computer.

Save Parameters

This function allows to save the selected communication settings or return to the communication settings to select additional options.

Press the Paper Feed Button for the option you want.

Save new parameters ?

YES > Long Click

NO, MODIFY > Short Click

Emulation/Software Options

Printer Emulations

Printer emulations determine the commands that are available to the printer. They are set by using the Configuration Menu. (See "Configuring the Printer," for instructions on how to enter the Configuration Menu.). The available options are:

7158 Native Mode
 7156 Mode
 7150 Mode
 7167 Native Mode

Press the Paper Feed Button for the emulation you want.

** SET EMULATION ?

YES > Long Click
 NO > Short Click

7158 Native Mode* > 1 Click
 7156 Mode > 2 Clicks
 7150 Mode > 3 Clicks
 7167 Mode > 4 Clicks

Enter code, then hold Button DOWN
 At least 1 second to validate

Note: Press the Paper Feed Button for at least one second to validate the selection.

Printer ID Mode

This function determines which printer ID is currently effective to the printer. They are set by using the Configuration Menu. (See "Configuring the Printer," for instructions on how to enter the Configuration Menu.). The available options are:

7158 Native ID
 Emulated Printer ID
 7167 Native ID

Press the Paper Feed Button for the printer ID you want.

** SET PRINTER ID MODE ?

YES > Long Click
 NO > Short Click

7158 Native ID* > 1 Click
 Emulated Printer ID > 2 Clicks
 7167 Native ID > 3 Clicks

Enter code, then hold Button DOWN
 At least 1 second to validate

Note: Press the Paper Feed Button for at least one second to validate the selection.

Default Lines Per Inch

This function allows the user to set the default lines per inch printed by the thermal printer to 6, 7.52 or 8.13. (See "Configuring the Printer" for instructions on how to enter the Configuration Menu to change this setting.)

Press the Paper Feed Button for the lines per inch you want.

** SET DEFAULT LINES PER INCH ?

YES > Long Click
NO > Short Click

8.13 Lines per Inch > 1 Click
7.52 Lines per Inch* > 2 Clicks
6 Lines per Inch > 3 Clicks

Enter code, then hold Button DOWN
At least 1 second to validate

Note: Press the Paper Feed Button for at least one second to validate the selection.

Carriage Return Usage

This function allows the printer to ignore or use the Carriage Return (hexadecimal 0D) command depending on the application. Some applications expect the command to be ignored while others use the command as a print command. (See "Configuring the Printer" for instructions on how to enter the Configuration Menu to change this setting.)

Press the Paper Feed Button for the carriage return usage you want.

** SET CARRIAGE RETURN USAGE ?

YES > Long Click
NO > Short Click

Ignore CR > Long Click
Use CR as Print Cmd* > Short Click

Note: Press the Paper Feed Button for at least one second to validate the selection.

Asian Mode

This function makes it possible for the user to select an Asian character for the printer. (See “Configuring the Printer” for instructions on how to enter the Configuration Menu to change this setting.)

Note: For Asian code pages, only one (either 932, 936, 949 or 950) will exist in the firmware.

Asian Mode isn't supported by model 7167-1035 and 7167-2035.

Press the Paper Feed Button for the Asian mode you want.

**** SET ASIAN MODE ?**

YES > Long Click
NO > Short Click

Asian Mode On > Long Click
Asian Mode Off* > Short Click

Note: Press the Paper Feed Button for at least one second to validate the selection.

Slip Printing Width

This function makes it possible for the user to select the width of slip printing. When set in the 7158/7156 mode the printer will allow the printer to accept 66 columns of printer but will discard the left most 21 characters. This will eliminate changes to applications when migrating to the 7167 printer if data is only being printed in the right 45 columns of the 66 columns on the 7156/7158. (See “Configuring the Printer” for instructions on how to enter the Configuration Menu to change this setting.)

Press the Paper Feed Button for the slip printing width you want.

**** SET SLIP PRINTING WIDTH ?**

YES > Long Click
NO > Short Click

7167* > Long Click
7158/7156 > Short Click

Note: Press the Paper Feed Button for at least one second to validate the selection.

Receipt Synchronization

This function makes it possible for the user to select whether to enable or disable receipt synchronization printing. (See "Configuring the Printer" for instructions on how to enter the Configuration Menu to change this setting.)

Press the Paper Feed Button for the receipt synchronization option you want.

**** SET RECEIPT SYNCHRONIZATION ?**

YES > Long Click
NO > Short Click

Enable > Long Click
Disable* > Short Click

Platen Waiting Time

This function makes it possible for the user to select whether to select wait time which paper detect from . (See "Configuring the Printer" for instructions on how to enter the Configuration Menu to change this setting.)

Press the Paper Feed Button for the platen waiting time option you want.

**** SET PLATEN WAITING TIME ?**

YES > Long Click
NO > Short Click

No Extra Time* > 1 Click
Extra 1 sec > 2 Clicks
Extra 2 sec > 3 Clicks

Save Parameters

This function allows to save the selected communication settings or return to the communication settings to select additional options.

Press the Paper Feed Button for the option you want.

Save new parameters ?

YES > Long Click
NO > Short Click

Hardware Options

Print Density

This function makes it possible to adjust the energy level of the print head to darken the printout. An adjustment should only be made when necessary. The factory setting is 100%.

Warning: Choose an energy level no higher than necessary to achieve a dark printout.

Failure to observe this rule may result in a printer service call or voiding of the printer warranty. Consult your NCR technical support specialist if you have any questions.

Press the Paper Feed Button for the print density you want.

**** SET PRINT DENSITY ?**

YES > Long Click
NO > Short Click

100% > 1 Click
110 % > 2 Clicks
120 % > 3 Clicks

Enter code, then hold Button DOWN

At least 1 second to validate

Note: Press the Paper Feed Button for at least one second to validate the selection.

Maximum Power Option

This function allows the user to set the maximum power for the printer to 75W or 55W.

Press the Paper Feed Button for the option you want.

**** SET MAX POWER OPTION ?**

YES > Long Click
NO > Short Click

55W Power Supply* > Long Click
75W Power Supply > Short Click

Note: Press the Paper Feed Button for at least one second to validate the selection.

Paper Low Sensor

Paper Low Sensor makes it possible to enable or disable the paper low sensor for particular printer configurations.

Press the Paper Feed Button for the option you want.

**** SET PAPER LOW SENSOR OPTION ?**

YES > Long Click
NO > Short Click

Enable Paper Low Sensor* > Long Click

Disable Paper Low Sensor > Short Clicks

Note: Press the Paper Feed Button for at least one second to validate the selection.

Paper Width

This function allows the user to set the default paper width for the receipt thermal printer to 58mm or 80mm wide.

Press the Paper Feed Button for the paper width option you want.

**** SET PAPER WIDTH ?**

YES > Long Click
NO > Short Click

Paper Width = 80 mm* > 1 Click
Paper Width = 58 mm > 2 Clicks

Enter code, then hold Button DOWN
At least 1 second to validate

Note: Press the Paper Feed Button for at least one second to validate the selection.

Knife Option

This option makes it possible to set the Knife Option if it is installed in the printer. This setting should only be changed if the option is added or removed.

Press the Paper Feed Button for the option you want.

**** SET KNIFE OPTION ?**

YES > Long Click
NO > Short Click

Enable Knife* > Long
Disable Knife > Short

Note: Press the Paper Feed Button for at least one second to validate the selection.

MICR Option

This function makes it possible to set the MICR Option if it is installed in the printer. This setting should only be changed if the option is added or removed.

Press the Paper Feed Button for the option you want.

**** SET MICR OPTION ?**

YES > Long Click
NO > Short Click

Enable MICR* > Long

Disable MIC > Short

Note: Press the Paper Feed Button for at least one second to validate the selection.

Check Flip Option

This function makes it possible to set the Check Flip Option if it is installed in the printer. This setting should only be changed if the option is added or removed.

Press the Paper Feed Button for the option you want.

** SET CHECK FLIP OPTION ?

YES > Long Click
NO > Short Click

Enable Check Flip* > Long
Disable Check Flip > Short

Note: Press the Paper Feed Button for at least one second to validate the selection.

Color Paper Option

This function allows the user to set the color paper for the receipt thermal printer to one color paper or two color paper.

Press the Paper Feed Button for the option you want.

** SET COLOR PAPER OPTION ?

YES > Long Click
NO > Short Click

Monochrome* > Long Click
Color Paper > Short Click

Note: Press the Paper Feed Button for at least one second to validate the selection.

MICR Dual Pass Option

This function allows the user to set MICR dual pass option either enabled or disabled.

Press the Paper Feed Button for the option you want.

** SET MICR DUAL PASS OPTION ?

YES > Long Click
NO > Short Click

Enable Dual Pa > Long Click
Disable Dual Pass* > Short Click

Note: Press the Paper Feed Button for at least one second to validate the selection.

Scan Option

This function allows the user to set Scan option either enabled or disabled.

Press the Paper Feed Button for the option you want.

**** SET SCAN OPTION ?**

YES > Long Click

NO > Short Click

Enable Scan* > Long Click

Disable Scan > Short Click

Note: Press the Paper Feed Button for at least one second to validate the selection.

Save Parameters

This function allows to save the selected communication settings or return to the communication settings to select additional options.

Press the Paper Feed Button for the option you want.

Save new parameters ?

YES > Long Click

NO MODIFY > Short Click

Default Code Page

This function makes it possible to select the default code page.

These are the code pages available for printing:

- Code page 437 (US English)
- Code page 850 (Multilingual)
- Code page 852 (Slavic)
- Code page 858 (with Euro symbol)
- Code page 860 (Portuguese)
- Code page 862 (Hebrew)
- Code page 863 (French Canadian)
- Code page 864 (Arabic)
- Code page 865 (Nordic)
- Code page 866 (Cyrillic)
- Code page 874 (Thai)
- Code page 1252 (Windows Latin #1)
- Code page Katakana
- Code page 932 (MS Japan)
- Space page

Note: For Asian code pages, code page 936, 949, or 950 replaces code page 932. Only one Asian code page (either 932, 936, 949, 950) will exist in firmware.

Asian code page (Either 932, 936, 949, 950) isn't supported by model 7167-1035 and 7167-2035.

Press the Paper Feed Button for the Default Code Page you want.

**** SET CODE PAGE ?**

YES > Long Click
NO > Short Click

FOR 7158 Mode:

Code Page 437* > 1 Click
Code Page 850 > 2 Clicks
Code Page 852 > 3 Clicks
Code Page 858 > 4 Clicks
More Options > 5 Clicks

Enter code, then hold Button DOWN
At least 1 second to validate

Code Page 860 > 1 Click
Code Page 862 > 2 Clicks
Code Page 863 > 3 Clicks
Code Page 864 > 4 Clicks
More Options > 5 Clicks

Enter code, then hold Button DOWN
At least 1 second to validate

Enter code, then hold Button DOWN
At least 1 second to validate

Code Page Katakana > 1 Click
Code Page 932 > 2 Clicks

Enter code, then hold Button DOWN
At least 1 second to validate

FOR 7156 Mode:

Code Page 437* > 1 Click
Code Page 850 > 2 Clicks

Enter code, then hold Button DOWN
At least 1 second to validate

Note: Press the Paper Feed Button for at least one second to validate the selection.
For Asian code pages, code page 936, 949 or 950 replaces code page 932 in the above shown menu. Only one Asian code page (Either 932, 936, 949 or 950) will exist in firmware. Asian code page (Either 932, 936, 949 or 950) isn't supported by model 7167-

1035 and 7167-2035.

Save Parameters

This function allows to save the selected communication settings or return to the communication settings to select additional options.

Press the Paper Feed Button for the option you want.

Save new parameters ?

YES > Long Click

NO > Short Click

EEPROM to Default Settings

This selection resets the configuration to the Default Settings.

Caution: Be extremely careful changing any of the printer settings to avoid inadvertently changing other settings that might affect the performance of the printer.

**** RESET EEPROM TO DEFAULT VALUES ?**

YES > Long Click

NO > Short Click

Note: Press the Paper Feed Button for at least one second to validate the selection.

Save Parameters

This function allows to save the selected communication settings or return to the communication settings to select additional options.

Press the Paper Feed Button for the option you want.

Save new parameters ?

YES > Long Click

NO , MODIFY > Short Click

Mfg Adjustment

If you need to change the settings for mechanical, or perform the printer test, use the menu feature. This feature prints instructions on the receipt for selecting and changing any of the functions and parameters. Use caution in making these adjustments

Mfg Adjustment:

Caution:

Be extremely careful when changing any of the printer settings to avoid changing other settings that might effect the performance of the printer.

1. Set DIP switch 1 and DIP switch 2 to ON.
2. Power on the printer while holding the Paper Feed Button. The printer will print the current configuration, then cuts the paper to print the Mfg Adjustment Menu.
3. If you do not hold the Paper Feed Button while resetting the printer, it will go to Online Mode.

This configuration menu allows you to set mechanical adjustment parameters and select printer test.

Sub-menus are entered and selections are made using the Paper Feed Button.

- Short Click: Feed Button is quickly depressed and released
- Long click: Feed Button is held down more than 1 second

Current settings are marked with an asterisk (*).

===== Mfg Adjustment Menu =====

Select a sub-menu:

- | | | |
|---|--------------------------------|------------|
| - | EXIT | > 1 Click |
| - | Sensor Calibration | > 2 Clicks |
| - | Left Margin Adjustment(Slip) | > 3 Clicks |
| - | Alignment Adjustment(Slip) | > 4 Clicks |
| - | Rolling ASCII Print Test(Rcpt) | > 5 Clicks |
| - | H Print Test(Receipt) | > 6 Clicks |
| - | Duty Check Print Test(Rcpt) | > 7 Clicks |
| - | B&W Shading Corection | > 8 Clicks |
| - | More Options | > 9 Clicks |

Enter code then hold Button DOWN
at least 1 second to validate.

Select a sub-menu: (More Options)

- Rolling ASCII Print Test(Slip) > 1 Click
- H Print Test(Slip) > 2 Clicks
- Duty Check Print Test(Slip) > 3 Clicks
- Continuous Flip Test > 4 Clicks
- Slip Print Test(Cont) > 5 Clicks
- Alternate Print Test > 6 Clicks
- Continuous MICR Test > 7 Clicks
- Print Current Setting > 8 Clicks
- Continuous Scan Test > 9 Clicks
- Reset all EEPROM to Default > 10 Clicks

Enter code then hold Button DOWN
at least 1 second to validate.

Note : B/W Shading Correction and Continuous Scan Test are supported by model 7167-1035 and 7167-2035 only.

Sensor Calibration

This option calibration all reflective type sensor.

Press the Paper Feed Button for the calibration sensor option you want.

**** START SENSOR CALIBRATION?**

- Return Main Menu > Short Click
- Start calibration > Long Click

Procedure:

- 1 . Take out the paper from slip unit before calibration starts.
- 2 . Press paper feed receipt button to start calibration.
- 3 . After a few seconds, insert the paper into slip unit.
- 4 . The printer will perform calibration on the following sensors.
 - TOF (Top Of Form) Sensor for slip unit
 - BOF (Bottom Of Form) Sensor for slip unit
 - FLS (Flip Sensor) Sensor for slip unit if installed
- 5 . When the calibration is completed the printer will return to the Mfg Adjustment Menu. If the test is unsuccessful the printer will halt. To recover reset print and check if sensors are connected and working properly.
- 6 . To review the results of the sensor calibration test perform a "Printer Current Setting". If the results show all zeros there is a problem with that sensor. Check to ensure that the sensor is plugged in properly. If so then replace sensor.

Left margin adjustment (Slip)

This option will let you to adjust the left margin position for the slip unit. The left margin is the distance between the left edge of the slip and the 1st character. However in making the adjustment it may be easier to adjust to the right edge of the slip. The nominal distance from the right edge to the 1st column is 3.2 mm (.125 in).

The range of the left value is $-4.76 \text{ mm} \leq 0 \leq 4.76 \text{ mm}$ (.187 in). The resolution is 1/80 inch (0.3175mm).

Press the Paper Feed Button for the left margin adjustment option required.

**** START LEFT MARGIN ADJUSTMENT?**

Return Main Menu > Short Click

Start Adjustmet > Long Click

Procedure:

1. When a long click is selected insert a form into the printer which will result in the following form to be printed. Short Click will return to Mfg Adjustment Menu.

[illegible]

To stop the test hold the Paper Feed Button down. The printer will return to the Mfg Adjustment Menu.

3. Measure from the right edge of the paper to the first column to select the row that is closest to 3.2 mm (.125).. The value printed above this line is to be used in the following step.

Left margin adjustment(Slip)

Enter value (Max 7) > Short Click

Done adjustment > Long Click

Procedure:

1. To enter the adjustment value perform a series of short clicks equal to the value from the previous measurement. In other words if the value is 3 perform 3 short clicks and then a long click to input the selection.
2. Insert a form into the slip station and a sample print out will be printed with the current selection for verification of the setting for the left margin adjustment. The following menu will be printed on the receipt station.

**** START LEFT MARGIN ADJUSTMENT?**

Return Main Menu > Short Click

Start Adjustment > Long Click

1. To Exit the test enter a Short Click.
2. To continue the test enter a Long Click

Alignment adjustment (Slip)

This option will let you to adjust the alignment for Slip unit. The alignment is the adjustment for bi-directional printing. Sample alignments will be printed and you will select the optimum alignment value and enter this value using short clicks equal to the value of the selection.

The range of value is $-0.40 \text{ mm} (.015) \leq 0 \leq 0.40 \text{ mm}$. The resolution is $1/960 \text{ inch} (0.0265\text{mm})$.

Press the Paper Feed Button for the alignment adjustment option you want.

**** START ALIGNMENT ADJUSTMENT?**

Return Main Menu > Short Click

Start Adjustment > Long Click

Procedure:

1. Enter a short click to return to the Mfg Adjustment Menu
2. Enter a long click to start the adjustment which

To stop the test hold the Paper Feed Button down. The printer will return to the Mfg Adjustment Menu.

```
+1  
#####  
#####  
#####  
#####  
  
+2  
#####  
#####  
#####  
#####  
  
+3  
#####
```

Current Margin:+7

Inspect the print out to determine the best vertical print alignment of the Hs from row to row. The value above the selected H pattern is the number to be used in the following input.

Alignment Adjustment(Slip)

Enter value (Max 11) > Short Click

Done adjustment > Long Click

Procedure:

- 1 . To enter the adjustment value perform a series of short clicks equal to the value from the previous selection. In other words if the value is 7 perform 7 short clicks and then a long click to input the selection.
- 2 . Insert a form into the slip station and a sample print out will be printed with the current selection for verification of the setting for the alignment adjustment. The following menu will be printed on the receipt station.

Rolling ASCII print test (Receipt, Slip)

This option let you run rolling ASCII printing test. The printer prints the resident character set in standard pitch continuously.

Press the Paper Feed Button to start or stop the test.

** START ROLLING ASCII PRINT TEST?

Return Main Menu	> Short Click
Start test	> Long Click

Procedure:

1. Enter a Short Click to return to the Mfg Adjustment Menu.
2. Enter a Long Click to begin the Rolling ASCII Print Test.

Rolling ASCII

```
000000001
!"#$%&'()*+,-./012345678:;?@ABCDEFGHIJK
!"#$%&'()*+,-./012345678:;?@ABCDEFGHIJKL
!"#$%&'()*+,-./012345678:;?@ABCDEFGHIJKLM
!"#$%&'()*+,-./012345678:;?@ABCDEFGHIJKLMNO
!"#$%&'()*+,-./012345678:;?@ABCDEFGHIJKLMNOP
!"#$%&'()*+,-./012345678:;?@ABCDEFGHIJKLMNOPQ
!"#$%&'()*+,-./012345678:;?@ABCDEFGHIJKLMNOPQR
!"#$%&'()*+,-./012345678:;?@ABCDEFGHIJKLMNOPQRS
!"#$%&'()*+,-./012345678:;?@ABCDEFGHIJKLMNOPQRST
!"#$%&'()*+,-./012345678:;?@ABCDEFGHIJKLMNOPQRSTU
```

To stop the test hold the Paper Feed Button down. The printer will return to the Mfg Adjustment Menu.

H print test (Receipt or Slip)

This option let you run H printing test. The printer prints the 'H' character in standard pitch continuously.

Press the Paper Feed Button to start or stop the test.

** START H PRINT TEST?

Return Main Menu	> Short Click
Start test	> Long Click

1. Enter a Short Click to return to the Mfg Adjustment Menu.
2. Enter a Long Click to begin the H Print Test

000000001

#####

To stop the test hold the Paper Feed Button down. The printer will return to the Mfg Adjustment Menu.

Duty check print test (Receipt, Slip)

This option let you run duty check printing test. The printer prints the 12.5%, 25%, 50% and 100% duty original pattern.

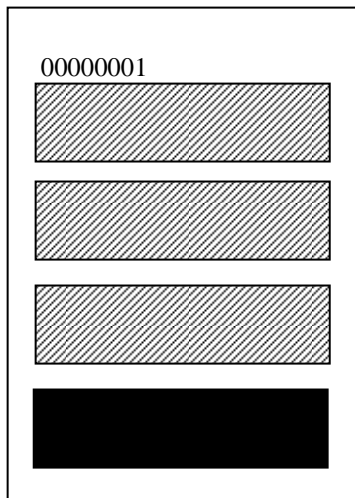
Press the Paper Feed Button to start or stop the test.

**** START DUTY CHECK PRINT TEST?**

Return Main Menu -> Short Click

Start test -> Long Click

1. Enter a Short Click to return to the Mfg Adjustment Menu.
2. Enter a Long Click to begin the Duty Check Print Test.



For Duty Check Print

Stop and exit test -> Short Click

Continue Duty Check Print -> Long Click

Note: Press the Paper Feed Button for at least one second to validate the selection.

B&W Shading Correction (Scanner)

This option runs black and white shading correction for CIS head.

Paste a piece of white paper onto the surface of CIS. Press the Paper Feed Button to start or stop correction.

**** START B&W SHADING CORRECTION?**

Return Main Menu > Short Click

Start Correction > Long Click

1. Enter a Short Click to return to the Mfg Adjustment Menu.
2. Enter a Long Click to begin shading correction.

Note : B/W Shading Correction is supported by model 7167-1035 and 7167-2035 only.

Continuous Flip Test

This option runs the continuous check flip.

Press the Paper Feed Button for the continuous check flip option you want.

**** START CHECK FLIP TEST?**

Return Main Menu > Short Click

Start Check Flip Test > Long Click

Procedure:

1. Enable the check flip option through the Configuration Menu.
2. Enter a short click to return to the Mfg Adjustment Menu.
3. Enter a long click to start the Check Flip Test.
4. After a few seconds, insert the paper into slip unit.
5. Printer performs continuous check flip test.
6. To stop the test hold the Paper Feed Button down. The printer will return to the Mfg Adjustment Menu.

Continuous MICR Test

This option runs the continuous micr test.

Press the Paper Feed Button for the continuous micr option you want.

**** START MICR TEST?**

Return Main Menu > Short Click

Start Check Flip Test > Long Click

Procedure:

1. Enable the MICR option through the Configuration Menu, then exit the Configuration Menu.
2. Enter a short click to return to the Mfg Adjustment Menu.
3. Enter a long click to start the MICR Test.
4. After a few seconds, insert the check into slip unit.
5. Printer performs continuous MICR test.. The results of the MICR read will be printed on the receipt station. The following is an example of a good read.

```

*** GOOD READ ***
MICR Data:
5001234UT33456789T 123 67 5

```

6. To stop the test hold the Paper Feed Button down. The printer will return to the Mfg
7. Adjustment Menu.

Print current setting

This option let you print current setting on receipt.

Procedure:

1. Enable the Print Current Setting through the Configuration Menu, then exit the Configuration Menu.
2. Enter a Long Click to Print the Current Setting.
3. Enter a Short Click to return to the Mfg Adjustment Menu.

***** Current Setting Form *****

```

Model number      : 7167
Serial number     : 12345678

```

```

Boot Firmware
Revision          : V01.00
CRC               : D3CE
Flash Firmware
Revision          : V01.00
CRC               : AC12

```

```

Adjustment setting
Sensor Level (On, Off, TH)
TOF               : 0.1V, 3.0V, 2.5V
BOF               : 3.2V, 0.5V, 2.5V
FLS               : 3.0V, 0.2V, 2.5V
Left Margin(Receipt) : 00

```

Continuous Scan Test

This option run the continuous scan test.

Press the Paper Feed Button for the continuous scan option you want.

Procedure:

1. Enable the Scan option through the Configuration Menu, then exit the Configuration Menu.
2. Enter a short click to return to the Mfg Adjustment Menu.
3. Enter a long click to start the Continuous Scan Test.
4. After a few seconds, insert the check into slip unit.
5. Printer performs continuous scan test.. The scanned image is printed by receipt printer.
6. To stop the test hold the Paper Feed Button down. The printer will return to the Mfg Adjustment Menu.

EEPROM to Default Settings

This selection resets the configuration to the Default Settings.

Caution: Be extremely careful changing any of the printer settings to avoid inadvertently changing other settings that might affect the performance of the printer.

**** RESET EEPROM TO DEFAULT VALUES ?**

- | | |
|-----|---------------|
| YES | > Long Click |
| NO | > Short Click |

Procedure:

1. Enable the EEPROM to Default Setting option through the Configuration Menu, Enter a short click to return to the Mfg Adjustment Menu.
2. Enter a Long Click to reset the EEPROM to the Default Values.
3. Enter a Short Click to return to the Mfg Adjustment Menu without resetting to the default values.

See Appendix for RS485 Diagnostic Setup

Level 2 Diagnostics

Level 2 diagnostics run during normal printer operation. When the following conditions occur, the printer automatically turns off the appropriate motor, disables printing to prevent damage, and turns on the green LED (flashes the green LED if the receipt print head is too hot or the voltages are out of range):

- Paper out
- Cover open
- Knife unable to go back to home position
- Print head too hot
- Power supply voltage out of range
- Slip or flip motor jam

See “Chapter 3: Solving Problems” for more information about other conditions that may occur and how to correct them.

Status	LED Behaviour
Power Off	Off
Firmware Download	Very Fast Blink
Level 0 Diagnostics	No Blink
Receipt Paper Low	Slow Blink
Temperature Error	No Blink
Voltage Error	No Blink
Cover Open	Fast Blink
Receipt Paper Out	Fast Blink
Knife Jam	Fast Blink, then Slow Blink
Slip Cover Open	Fast Blink
Flip Cover Open	Fast Blink
Receipt Cover Open	Fast Blink
Slip Motor Jam	Fast Blink
Flip Motor Jam	Fast Blink
Slip Ribbon Carriage Error	Fast Blink
All other states	On

Level 3 Diagnostics

Level 3 diagnostics keeps track of the following tallies and prints them on the receipt during the receipt test. See “Sample Print Test” later in this chapter.

Serial number

Model number

CRC number

Number of receipt lines printed

Number of knife cuts

Number of slip lines

Number of slip characters

Number of MICR reads

Number of hours printer is on

Number of flash cycles

Maximum temperature reached

Number of cutter jams

Number of times the door is open

Chapter 5: Communication

Communication Overview

In order for a receipt to be printed, a program must be in place that translates the data from the host computer into a language that the printer can understand. This program must tell the printer exactly how to print each character. This chapter describes how to create such a program or modify an existing one.

Interface

In order for the printer to communicate with the host, a communication link must be set up. The 7167 supports the industry standard RS-232C communication interface. This interface has a protocol associated with it that the host computer must understand and adhere. The printer also supports USB communications.

Only when the interface parameters are matched and the proper protocol is used will the host and the printer be able to communicate. See the section, "RS-232C Interface" on the next page for a description of the protocol associated with the RS-232C interface.

Sending Commands

Once the communication link is established, commands can be sent to the printer. This section describes how to send commands to the printer using DOS and BASIC. This section does not take into account the necessary protocol, but is meant as a general introduction to how the printer functions.

Using DOS to Send Commands

One way of getting commands to the printer is to send them directly from DOS. For example, the command

```
COPY CON: COM1:
```

This sets the computer up such that the Hex code corresponding to any key that was pressed would be sent to the RS-232C communication port COM1 when the COPY mode is exited. If the printer is connected to COM1, then the data will go to the printer.

Exit the COPY mode by typing

```
CTRL Z
```

and then pressing the ENTER key. This directs the data from any print command to the proper port, commands can be sent from any software program.

Using BASIC to Send Commands

In BASIC, printer commands are sent as a string of characters preceded by the LPRINT command. For example,

```
LPRINT CHR$( &H0A )
```

sends the hexadecimal number 0A to the printer, which causes the printer to print the contents of its print buffer. Previously sent commands tell the printer exactly how this data should appear on the paper. For example,

```
LPRINT CHR$( &H12 ) ; "ABC" ; CHR$( &H0A )
```

sends the Hex numbers 12 41 42 43 0A to the printer. This causes the printer to set itself to double wide mode (12), load the print buffer with "ABC" (41 42 43), and finally, print (0A). Again, the communication link that the BASIC program outputs to must be matched to that of the printer.

RS-232C Interface

The RS-232C interface uses either XON/XOFF or DTR/DSR protocol. For XON/XOFF, a particular character is sent back and forth between the host and the printer to regulate the communication. For DTR/DSR, changes in the DTR/DSR signal coordinate the data flow.

The RS-232C version of the 7167 offers the standard options which are selectable in the Diagnostic mode. See "Diagnostics: Communications Interface Settings" later in this book.

Print Speed and Timing

The fast speed of the printer requires the application to send data to the printer at least as fast as it is printed. This application must also allow receipt lines to be buffered ahead at the printer, so the printer can print each line immediately after the preceding line, without stopping to wait for more data. Ideally, the application will send all the data for an entire receipt without pausing between characters or lines transmitted.

If the application sends data at 9600 baud and pauses between lines for as little as 50 milliseconds, the printer will never be able to print at full speed. But, if the application sends data at 19.2 K baud and does not pause between lines, the printer will be able to print at its full speed of 1020 lines/minute.

The table shows that with a pause of 50 milliseconds after each line, the transmit time equals or exceeds the print time, slowing down the printer, regardless of the baud rate.

Char./Line	Lines/Receipt	Transmit Time: (9600 Baud)	Transmit Time: (19.2 K Baud)	Print Time
20	20	1.4 Seconds	1.2 Seconds	0.5 Seconds
20	40	2.8 Seconds	2.4 Seconds	1.0 Seconds
44	20	1.88 Seconds	1.44 Seconds	1.1 Seconds
44	40	3.76 Seconds	2.88 Seconds	2.2 Seconds

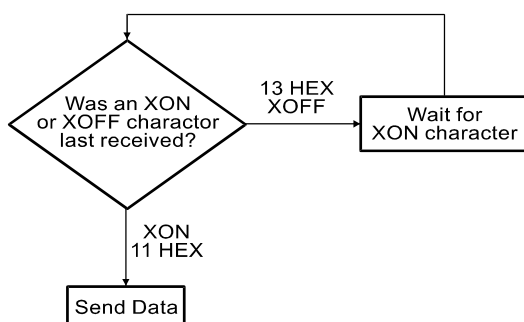
The next table shows that with no delay between lines, the transmit time is much less than the print time, allowing the printer to print at full speed.

Char./Line	Lines/Receipt	Transmit Time: (9600 Baud)	Transmit Time: (19.2 K Baud)	Print Time
20	20	0.4 Seconds	0.2 Seconds	0.5 Seconds
20	40	0.8 Seconds	0.4 Seconds	1.0 Seconds
44	20	0.88 Seconds	0.44 Seconds	1.1 Seconds
44	40	1.76 Seconds	0.88 Seconds	2.2 Seconds

XON/XOFF Protocol

The XON/XOFF characters coordinate the information transfer between the printer and the host computer. The printer sends an XON character when it is ready to receive data and it sends an XOFF character when it cannot accept any more data. The software on the host computer must monitor the communication link as shown in the following flowchart in order to send data at the appropriate times.

If XON/XOFF has been selected, the printer also toggles the DTR signal, as described in the next section, but it does not look at the DSR signal to transmit data.

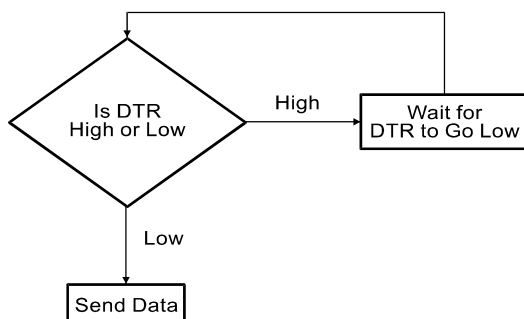


XON character = Hex 11.

XOFF character = Hex 13.

DTR/DSR Protocol

The DTR signal is used to control data transmission to the printer. It is driven low when the printer is ready to receive data and driven high when it cannot accept any more data. Data is transmitted from the printer after it confirms that the DSR signal is low.



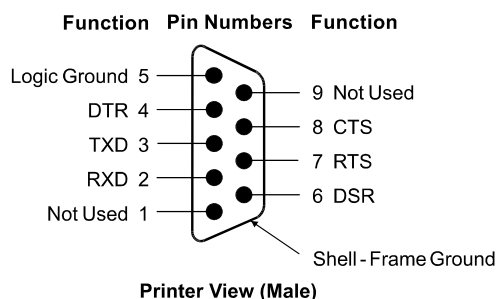
RS-232C Technical Specifications

This section describes the pin settings for the connectors and the RS-232C interface parameters. The RS-232C parameters are selectable in the Diagnostic mode. See "Diagnostics: Communications Interface Settings" in chapter 4 for the position of the DIP switches. The RS-232C parameters must match those of the host.

Connectors

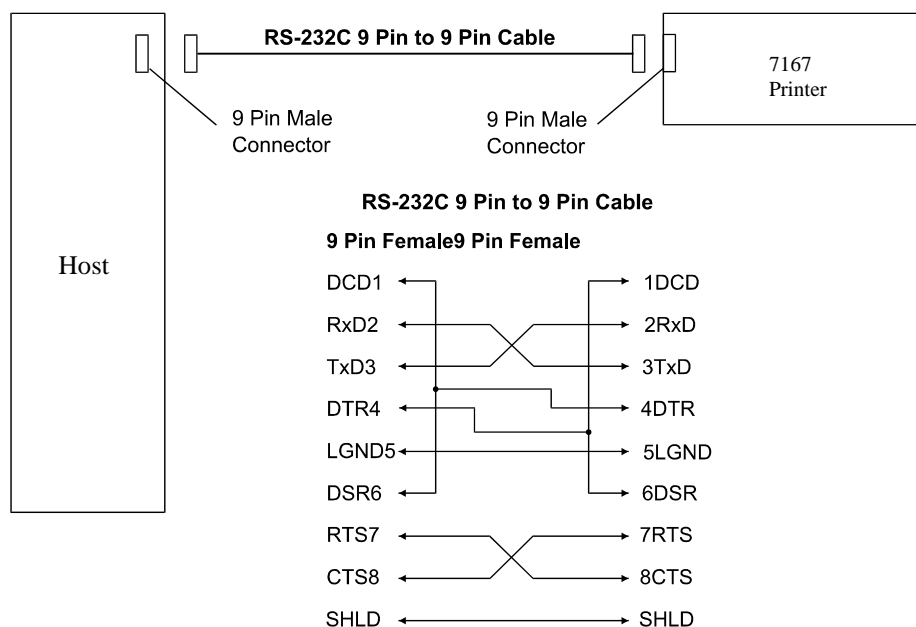
RS-232C Communication Connector Pin Assignments

The illustration shows the RS-232C communication connector and pin assignments. The connector is a 9-pin male D-shell connector and is located in the hollow cavity under the printer at the rear.



RS-232C 9-Pin to 9-Pin Cable Diagram

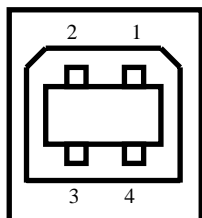
Note: This information is provided for testing and troubleshooting only.



Other Connector Information

USB Cable Connector

The following illustration is for the USB Type B communication connector and pin assignment.



Printer View End

Pin No	Signal
1	+5 V – USB
2	Data -
3	Data +
4	Ground

Power Cable Connector

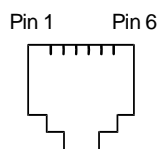
The illustration shows the power cable connector and pin assignments. The power cable connector is a 3-pin DIN plug and is located in the hollow cavity under the printer at the rear.



Printer View End (Female)

Cash Drawer Connector and Pin Assignments

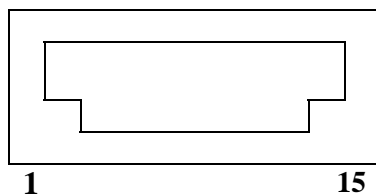
The following illustration shows the pin out designation for the cash drawer connectors. The following table provides the pinout assignments for cash drawers one and two. The cash drawer connectors are located at the rear of the printer.



Pin Number	Cash Drawer 1 Connector
1	Frame Ground
2	Drawer 1 Solenoid
3	Drawer 1 & 2 Status Switch
4	+24 Volts (to Solenoid +)
5	Drawer 2 Solenoid
6	Ground (Status Switch Return)

RS485 Communications Connector and Pin Assignments

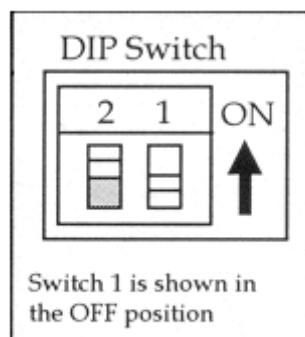
The following illustration is for the RS485 communication connector and pin assignment.



Pin No	Signal
1	+ 5 Volt
2	5 Volt Return
3	+ 5 Volt
4	5 Volt Return
5	+ 5 Volt
6	5 Volt Return
7	RS485 -B
8	RS485-A
9	36 Volt Return
10	36 Volt
11	36 Volt Return
12	36 Volt
13	36 Volt Return
14	36 Volt
15	36 Volt Return
16	36 Volt

Switch Settings

The DIP switches are located on the PC board at the back of the printer as shown in the illustration in “Level 1 Diagnostics” in chapter 4. The switches are used to put the printer into various modes for printer configuration set up.



Use a paper clip or other pointed object to set the switches.

1. Set the switches to the desired settings shown in the table.
2. Reset the printer.

Caution: Setting switch 1 to On puts the printer in level 1 diagnostics (setup mode) where other functions and tests can be changed.

DIP Switch Settings for RS-232C Parameters

Switch 1 Setting	Switch 2 Setting	Printer State
OFF (0)	OFF (0)	On-line Mode (default)
ON(1)	OFF (0)	Diagnostic Mode
OFF (0)	ON (1)	Flash Download Mode
ON (1)	ON (1)	Vendor Adjustment Mode

Setting Extra RS-232C Options

The following extra options are available for the RS-232C Interface:

Data errors

- Print “?” for data errors (default)
- Ignore data errors

Chapter 6: Commands

Introduction

The different features and functions provided by the printer are controlled by sending commands from the host computer to the printer. This section describes the commands that are supported by the printer. The printer commands are made up of one or more bytes of data starting with a command control code followed by its supporting parameters.

Commands control all operations and functions of the printer. This includes selecting the size and placement of characters and graphics on the receipt or the slip and feeding and cutting the paper. Unless otherwise noted, any of the commands may be used in any combination to communicate with the printer from a program in a host computer.

In order to allow the graceful handling of commands that may be available in other printers but are not available in this printer, some commands will be listed and described but identified as "not implemented." If the printer receives one of these "not implemented" commands, the command and its supporting operands will be discarded. Any other data bytes, including unrecognized commands, are sent to the print buffer as data, and the printer will attempt to print the data when it is instructed to print the buffer.

List of Commands and Location

This section presents groups of lists of the hexadecimal command codes, parameters, and the command names. A page reference is provided for the page on which the command is more fully described. If this document is being viewed online, the page reference will be linked to the actual page and may be clicked to go to that page.

The first section lists all of the commands. The following lists are separated into functional category groupings.

All commands **listed in bold** or italics are new or have additional functionality when compared to the NCR 7156. Commands in italics are supported by model 7167-1035 and 7167-2035. These two models can not support commands in bold italics.

By Command Code

All items in **BOLD** are new or have additional functionality when compared to the 7156. All items in italic letters are commands for scanner function and are supported only by model 7167-1035 and 7167-2035. Items in bold italic are Asian mode commands and are not supported by model 7167-1035 and 7167-2035.

Hexadecimal Command Code and Operands	Command Name	Page
09	Horizontal Tab	129
0A	Print and Feed Paper One Line	120
0C	Print and Return to Standard Mode	198
0C	Print and Eject Slip	120
0D	Print and Carriage Return	121
10	Clear Printer	105
10 04 <i>n</i>	Real Time Status Transmission (DLE Sequence)	180
10 05 <i>n</i>	Real Time Request to Printer (GS Sequence)	183
11	Close Form	106
12	Select Double-Wide Characters	136
13	Select Single-Wide Characters	136
14 <i>n</i>	Feed <i>n</i> Print Lines	121
15 <i>n</i>	Feed <i>n</i> Dot Rows	122
16 <i>n</i>	Add <i>n</i> Extra Dot Rows	122
17	Print	123
18	Open Form	106
18	Cancel Print Data in Page Mode	199
19	Perform Full Knife Cut	107
1A	Perform Partial Knife Cut	107
1B (+ *.bmp)	Download BMP Logo	156
1B 07	Generate Tone	108
1B 0C	Print Data in Page Mode	199
1B 12	Select 90 Degree Counter-Clockwise Rotated Print	137
1B 14 <i>n</i>	Set Column	129

Hexadecimal Command Code and Operands	Command Name	Page
1B 16 <i>n</i>	Select Pitch (Column Width)	137
1B 20 <i>n</i>	Set Character Right-Side Spacing	138
1B 21 <i>n</i>	Select Print Modes	140
1B 24 <i>n1 n2</i>	Set Absolute Starting Position	130
1B 25 <i>n</i>	Select or Cancel User-Defined Character Set	141
1B 26 3 <i>c1 c2...dn</i>	Define User-Defined Characters	142
1B 27 <i>m a0 a1 a2 d1 ... dm</i>	Write to User Data Storage	220
1B 2A <i>m n1 n2 d1 ... dn</i>	Select Bit Image Mode	157
1B 2D <i>n</i>	Select or Cancel Underline Mode	144
1B 32	Set Line Spacing to 1/6 Inch	124
1B 33 <i>n</i>	Set Line Spacing	124
1B 34 <i>m a0 a1 a2</i>	Read from User Data Storage	221
1B 3A 30 30 30	Copy Character Set from ROM to RAM	144
1B 3C	Return Home	108
1B 3D <i>n</i>	Select Peripheral Device (For Multi-Drop)	108
1B 3F <i>n</i>	Cancel User-defined Characters	145
1B 40	Initialize Printer	109
1B 43 <i>n</i>	Set Slip Paper Eject Length	109
1B 44 [<i>n</i>] <i>k 00</i>	Set Horizontal Tabs	131
1B 45 <i>n</i>	Select or Cancel Emphasized Mode	145
1B 47	Select Double Strike (<u>7156 Emulation</u>)	146
1B 48	Cancel Double Strike	147
1B 49 <i>n</i>	Set or Cancel Italic Print	147
1B 4A <i>n</i>	Print and Feed Paper	125
1B 4B <i>n</i>	Print and Reverse Feed Paper	125
1B 4C	Select Page Mode	200
1B 4C <i>n1 n2 d1...dn</i>	Select Double Density Graphics (<u>7156 Emulation</u>)	160
1B 52 <i>n</i>	Select International Character Set	148
1B 53	Select Standard Mode	201
1B 54 <i>n</i>	Select Print Direction in Page Mode	202
1B 55 <i>n</i>	Select or Cancel Unidirectional Printing Mode	149

Hexadecimal Command Code and Operands	Command Name	Page
1B 56 <i>n</i>	Select or Cancel 90 Degrees Clockwise Rotated	149
1B 57 <i>n1, n2,...n8</i>	Set Printing Area in Page Mode	203
1B 59 <i>n1 n2 d1...dn</i>	Select Double Density Graphics	160
1B 5B 7D	Switch to Flash Download Mode	257
1B 5C <i>n1 n2</i>	Set Relative Print Position	132
1B 61 <i>n</i>	Select Justification	133
1B 63 30 <i>n</i>	Select Receipt or Slip for Printing; Slip for MICR Read	109
1B 63 31 <i>n</i>	Select Receipt or Slip for Setting Line Spacing	111
1B 63 34 <i>n</i>	Select Sensors to Stop Printing	112
1B 63 35 <i>n</i>	Enable or Disable Panel Buttons	113
1B 64 <i>n</i>	Print and Feed <i>n</i> Lines	126
1B 63 37 <i>n</i>	Enable or Disable Slip Paper End Feeding Stop	114
1B 65 <i>n</i>	Print and Reverse Feed <i>n</i> Lines	126
1B 66 <i>m n</i>	Set Slip Paper Waiting Time	115
1B 69	Perform Full Knife Cut	107
1B 6A <i>k</i>	Read from Non-Volatile Memory	222
1B 6D	Perform Partial Cut	107
1B 70 <i>n p1 p2</i>	Generate Pulse to Open Cash Drawer	116
1B 72 <i>n</i>	Select Print Color	150
1B 73 <i>n1 n2 k</i>	Write to Non-Volatile Memory (NVRAM)	222
1B 74 <i>n</i>	Select International Character Set	148
1B 75 0	Transmit Peripheral Device Status	166
1B 76	Transmit Printer Status	166
1B 77 01	Read MICR Data and Transmit	208
1B 77 46	Check Flip	220
1B 77 50	Define Parsing Format, Save in NVRAM	209
1B 77 52	Reread MICR Data	208
1B 77 70	Define Parsing Format, Do Not Save Permanently	209
1B 7A <i>n</i>	Select or Cancel Parallel Printing Mode on R&J	117
1B 7B <i>n</i>	Select or Cancel Upside Down Printing Mode	150
1C	Select Slip Station	117
1C 21 <i>n</i>	Select print modes for Kanji characters	229
1C 28 67 <i>pL pH 28</i>	Scanning Threshold	233
1C 28 67 <i>pL pH 29</i>	Scanning Area	234
1C 28 67 <i>pL pH 32</i>	Compression Mode	234

Hexadecimal Command Code and Operands	Command Name	Page
<i>1C 28 67 pL pH 38</i>	<i>Deletes Cropping Area</i>	235
<i>1C 28 67 pL pH 39</i>	<i>Set Cropping Area</i>	236
<i>1C 28 67 pL pH 3C</i>	<i>Transmission Format</i>	237
<i>1C 28 67 pL pH 50</i>	<i>Transmits Threshold Level</i>	238
<i>1C 28 67 pL pH 51</i>	<i>Transmits Scanning Area</i>	239
<i>1C 28 67 pL pH 5A</i>	<i>Transmits Compression Method</i>	240
<i>1C 28 67 pL pH 61</i>	<i>Transmits the cropping area</i>	241
<i>1C 28 67 pL pH 64</i>	<i>Transmits the File Format</i>	243
<i>1C 28 67 pL pH 65</i>	<i>Select Scanning mode</i>	244
<i>1C 28 67 pL pH 66</i>	<i>Transmits scanning mode</i>	244
1C 2D n	Turn underline mode ON/OFF for Kanji	230
1C 32 c1 c2 d1...dn	Define user-defined Kanji characters	230
1C 53 n1 n2	Set Kanji character spacing	231
1F 56 n	Send Printer Software Version	176
1c 57 n	Set quadruple mode ON/OFF for Kanji	232
1D 00	Request Printer ID	258
1D 01	Return Segment Number Status of Flash Memory	259
1D 02 n	Select Flash Memory Sector to Download	259
1D 03 n	Real Time Request to Printer (DLE Sequence)	183
1D 04 n	Real Time Status Transmission (GS Sequence)	180
1D 05	Real Time Printer Status Transmission	185
1D 06	Get Firmware CRC	260
1D 07	Return Microprocessor CRC	260
1D 0E	Erase the Flash Memory	260
1D 0F	Return Main Program Flash CRC	261
1D 10 n	Erase Selected Flash Sector	261
1D 11 al ah cl ch d1...dn	Download to Active Flash Sector	262
1D 11 FF n	Baseline State Request	187
1D 14 n	Reverse Feed n Lines	127
1D 15 n	Reverse Feed n Dots	127
1D 1F n	Enable / Disable Unsolicited Status Update	186
1D 21 n	Select Character Size	151
1D 22 n	Select Memory Type (SRAM/Flash) Where to Save Logos or User-Defined Fonts	223
1D 22 55 n1 n2	Flash Allocation	224
1D 23 n	Select the Current Logo (Downloaded Bit	160

Hexadecimal Command Code and Operands	Command Name	Page
	Image)	
1D 24 nL nH	Set Absolute Vertical Print Position in Page Mode	204
1D 28 47 pL pH 41	Executes Scan	244
1D 28 47 pL pH 42	Transmits Scan Data from Working Buffer	252
1D 28 47 pL pH 44	Print Scanned Image	256
1D 28 47 pL pH 45	Execute Shading Correction	256
1D 28 47 pL pH 46	Store Image into Flash ROM	254
1D 28 47 pL pH 47	Clear All Scan Image Files in Flash ROM	255
1D 28 47 pL pH 49	Transmits Scan Data from Flash ROM	253
1D 28 47 pL pH 4A	Reverse Feed to top of form	257
1D 2A n1 n2 d1...dn]	Define Downloaded Bit Image	161
1D 2F m	Print Downloaded Bit Image	163
1D 3A	Start or End Macro Definition	206
1D 40 n	Erase User Flash Sector	225
1D 42 n	Select or Cancel White/Black Reverse Print Mode	152
1D 48 n	Select Printing Position for HRI Characters	192
1D 49 n	Transmit Printer ID	167
1D 49 40 n	Transmit Printer ID, Remote Diagnostics Extension	169
1D 4C nL nH	Set Left Margin	134
1D 50 x y	Set Horizontal and Vertical Minimum Motion Units	128
1D 56 m	Select Cut Mode and Cut Paper	117
1D 56 m n	Select Cut Mode and Cut Paper	117
1D 57 nL nH	Set Printing Area Width	135
1D 5C nL nH	Set Relative Vertical Print Position in Page Mode	205
1D 5E r t m	Execute Macro	207
1D 61 n	Select or Cancel Unsolicited Status Update	185
1D 66 n	Select Pitch for HRI Characters	193
1D 68 n	Select Bar Code Height	193
1D 6B m d1...	Print Bar Code	194
1D 6B m n d1...dn	Print Bar Code	194
1D 72 n	Transmit Status	170
1D 77 n	Select Bar Code Width	197
1D FF	Reboot Printer	263

Hexadecimal Command Code and Operands	Command Name	Page
1E	Select Receipt Station	119
1F 04 <i>n</i>	Convert 6 Dots/mm Bitmap to 8 Dots/mm Bitmap	164
1F 05 <i>n</i>	Select Superscript or Subscript Modes	153
1F 11 [<i>m n</i>],[<i>m n</i>]...[<i>m</i> <i>n</i>] <i>OFFH</i>	Printer Setting Change	226
1F 56	Send Printer Software Version	176
1F 74	Print Test Form	119

Printer Function Commands

Hexadecimal Command Code and Operands	Command Name	Page
10	Clear Printer	105
11	Close Form	106
18	Open Form	106
19	Perform Full Knife Cut	107
1A	Perform Partial Knife Cut	107
1B 07	Generate Tone	108
1B 3C	Return Home	108
1B 3D	Select Peripheral Device (for Multi-Drop)	108
1B 40	Initialize Printer	109
1B 43 n	Set Slip Paper Eject Length	109
1B 63 30 n	Select Receipt or Slip for Printing; Slip for MICR Read	109
1B 63 31 n	Select Receipt or Slip for Setting Line Spacing	111
1B 63 34 n	Select Sensors to Stop Printing	112
1B 63 35 n	Enable or Disable Panel Buttons	113
1B 63 37 n	Enable or Disable Slip Paper End Feeding Stop	114
1B 66 m n	Set Slip Paper Waiting Time	115
1B 69	Perform Full Knife Cut	107
1B 6D	Perform Partial Knife Cut	107
1B 70 n p1 p2	Generate Pulse to Open Cash Drawer	116
1B 7A n	Select or Cancel Parallel Printing Mode on R&J	117
1C	Select Slip Station	117
1D 56 m	Select Cut Mode and Cut Paper	117
1D 56 m n	Select Cut Mode and Cut Paper	117
1E	Select Receipt Station	119
1F 74	Print Test Form	119

Vertical Positioning and Print

Hexadecimal Command Code and Operands	Command Name	Page
0A	Print and Feed Paper One Line	120
0C	Print and Return to Standard Mode/Print and Eject Slip	120
0D	Print and Carriage Return	121
14 n	Feed <i>n</i> Print Lines	121
15 n	Feed <i>n</i> Dot Rows	122
16 n	Add <i>n</i> Extra Dot Rows	122
17	Print	123
1B 32	Set Line Spacing to 1/6 Inch	124
1B 33 n	Set Line Spacing	124
1B 4A n	Print and Feed Paper	125
1B 4B n	Print and Reverse Feed Paper	126
1B 64 n	Print and Feed <i>n</i> Lines	127
1B 65 n	Print and Reverse Feed <i>n</i> Lines	126
1D 14 n	Reverse Feed <i>n</i> Lines	127
1D 15 n	Reverse Feed <i>n</i> Dots	127
1D 50 x y	Set Horizontal and Vertical Minimum Motion Units	128

Horizontal Positioning Commands

Hexadecimal Command Code and Operands	Command	Page
09	Horizontal Tab	129
1B 14 n	Set Column	129
1B 24 n1 n2	Set Absolute Starting Position	130
1B 44 [n] k 00	Set Horizontal Tabs	131
1B 5C n1 n2	Set Relative Print Position	132
1B 61 n	Select Justification	133
1D 4C nL nH	Set Left Margin	134
1D 57 nL nH	Set Printing Area Width	135

Print Characteristic Commands

Hexadecimal Command Code and Operands	Command	Page
12	Select Double-Wide Characters	136
13	Select Single-Wide Characters	136
1B 12	Select 90 Degree Counter-Clockwise Rotated Print	137
1B 16 n	Select Pitch (Column Width)	137
1B 20 n	Set Character Right-Side Spacing	138
1B 21 n	Select Print Modes	140
1B 25 n	Select or Cancel User-Defined Character Set	141
1B 26 s c1 c2 d1...dn	Define User-Defined Characters	142
1B 2D n	Select or Cancel Underline Mode	144
1B 3A 30 30 30	Copy Character Set from ROM to RAM	144
1B 3F n	Cancel User-Defined Characters	145
1B 45 n	Select or Cancel Emphasized Mode	145
1B 47	Select Double Strike (7156 Emulation Mode)	146
1B 47 n	Select Double Strike (7158/7167 Native Modes)	146
1B 48	Cancel Double Strike	147
1B 49 n	Select or Cancel Italic Print	147
1B 52 n	Select International Character Set	148
1B 55 n	Select or Cancel Unidirectional Printing Mode	149
1B 56 n	Select or Cancel 90 Degrees Clockwise Rotated Print	149
1B 72 n	Select Print Color	150
1B 74 n	Select International Character Set	148
1B 7B n	Select or Cancel Upside Down Printing Mode	150
1D 21 n	Select Character Size	151
1D 42 n	Select or Cancel White/Black Reverse Print Mode	152
1F 05 n	Select Superscript or Subscript Modes	153

Graphics Commands

Hexadecimal Command Code and Operands	Command	Page
1B (+*.bmp)	Download BMP Logo	156
1B 2A m n1 n2 d1...dn	Select Bit Image Mode	157
1B 4C n1 n2 d1...dn	Select Double-Density Graphics (in 7156 Emulation Mode)	160
1B 59 n1 n2 d1...dn	Select Double-Density Graphics	160
1D 23 n	Select Current Logo (Downloaded Bit Image)	160
1D 2A n1 n2 d1...dn]	Define Downloaded Bit Image	161
1D 2F m	Print Downloaded Bit Image	163
1F 04 n	Convert 6 Dots/mm Bitmap to 8 Dots/mm Bitmap	164

Status Commands

Hexadecimal Command Code and Operands	Command	Page
1B 75 0	Transmit Peripheral Device Status	166
1B 76	Transmit Printer Status	166
1D 49 n	Transmit Printer ID	167
1D 49 40 n	Transmit Printer ID, Remote Diagnostics Extension	169
1D 72 n	Transmit Status	170
1F 56 n	Send Printer Software Version	176

Real Time Commands

Hexadecimal Command Code and Operands	Command	Page
10 04 n	Real Time Status Transmission (DLE Sequence)	180
10 05 n	Real Time Request to Printer (GS Sequence)	183
1D 03 n	Real Time Request to Printer (DLE Sequence)	183
1D 04 n	Real Time Status Transmission (GS Sequence)	180
1D 05	Real Time Printer Status Transmission	185

Unsolicited Status Update

Hexadecimal Command Code and Operands	Command	Page
1D 61 n	Select or Cancel Unsolicited Status Update	185
1D 11 FF <i>n</i>	Baseline State Request	187
1D 1F <i>n</i>	Enable / Disable Unsolicited Status Update	186

Bar Code Commands

Hexadecimal Command Code and Operands	Command	Page
1D 48 n	Select Printing Position for HRI Characters	192
1D 66 n	Select Pitch for HRI Characters	193
1D 68 n	Select Bar Code Height	193
1D 6B m d1...dk 00 or 1D 6B m n d1...dn	Print Bar Code	194
1D 77 n	Select Bar Code Width	197

Page Mode Commands

Hexadecimal Command Code and Operands	Command	Page
0C	Print and Return to Standard Mode/Print and Eject Slip	198
18	Cancel Print Data in Page Mode	199
1B 0C	Print Data in Page Mode	199
1B 4C	Select Page Mode	200
1B 53	Select Standard Mode	201
1B 54 n	Select Print Direction in Page Mode	202
1B 57 n1, n2...n8]	Set printing Area in Page Mode	203
1D 24 nL nH	Set Absolute Vertical Print Position in Page Mode	204
1D 5C nL nH	Set Relative Vertical Print Position in Page Mode	205

Macro Commands

Hexadecimal Command Code and Operands	Command	Page
1D 3A	Start or End Macro Definition	206
1D 5E r t m	Execute Macro	207

MICR Check Reader Commands

MICR Reading

Hexadecimal Command Code and Operands	Command	Page
1B 77 01	Read MICR Data and Transmit	208
1B 77 52	Reread MICR Data	208

MICR Parsing

Hexadecimal Command Code and Operands	Command	Page
1B 77 50	Define Parsing Format, Save in NVRAM	209
1B 77 70	Define Parsing Format, Do Not Save Permanently	209

Check Flip Command

Hexadecimal Command Code and Operands	Command	Page
1B 77 46	Check Flip Command	220

User Data Storage Commands

Hexadecimal Command Code and Operands	Command	Page
1B 27 m addr d1...dm	Write to User Data Storage	220
1B 34 m addr	Read from User Data Storage	221
1B 6A k	Read from Non-Volatile Memory	222
1B 73 n1 n2 k	Write to Non-Volatile Memory (NVRAM)	222
1D 22 n	Select Memory Type (SRAM/Flash) Where to Save Logos or User-Defined Fonts	223
1D 22 55 n1 n2	Flash Allocation	224
1D 40 n	Erase User Flash Sector	225
1F 11 [m n],[m n]...[m n] 0FFH	Printer Setting Change	226

Asian Character Commands

Hexadecimal Command Code and Operands	Command	Page
1C 21 n	Select print modes for Kanji characters	229
1C 2D n	Turn underline mode ON/OFF for Kanji	230
1C 32 c1 c2 d1...dn	Define user-defined Kanji characters	230
1C 53 n1 n2	Set Kanji character spacing	231
1c 57 n	Set quadruple mode ON/OFF for Kanji	232

Scanner Function Commands

Hexadecimal Command Code and Operands	Command	Page
1C 28 67 pL pH 28	Scanning Threshold	233
1C 28 67 pL pH 29	Scanning Area	234
1C 28 67 pL pH 32	Compression Mode	234
1C 28 67 pL pH 38	Deletes Cropping Area	235
1C 28 67 pL pH 39	Set Cropping Area	236
1C 28 67 pL pH 3C	Transmission Format	237
1C 28 67 pL pH 50	Transmits Threshold Level	238
1C 28 67 pL pH 51	Transmits Scanning Area	239
1C 28 67 pL pH 5A	Transmits Compression Method	240
1C 28 67 pL pH 61	Transmits the cropping area	241
1C 28 67 pL pH 64	Transmits the File Format	243
1C 28 67 pL pH 65	Select Scanning mode	244
1C 28 67 pL pH 66	Transmits scanning mode	244
1D 28 47 pL pH 41	Executes Scan	244
1D 28 47 pL pH 42	Transmits Scan Data from Working Buffer	252
1D 28 47 pL pH 44	Print Scanned Image	256
1D 28 47 pL pH 45	Execute Shading Correction	256
1D 28 47 pL pH 46	Store Image into Flash ROM	254
1D 28 47 pL pH 47	Clear All Scan Image Files in Flash ROM (Function 71 of GS (G command))	255
1D 28 47 pL pH 49	Transmits Scan Data from Flash ROM	253
1D 28 47 pL pH 4A	Reverse Feed to top of form	257

Flash Download Commands

Hexadecimal Command Code and Operands	Command	Page
1B 5B 7D	Switch Flash Download Mode	257
1D 00	Request Printer ID	258
1D 01	Return Segment Number Status of Flash Memory	259
1D 02 n	Select Flash Memory Sector to Download	259
1D 06	Get Firmware	260
1D 07	Return Microprocessor CRC	260
1D 0E	Erase the Flash Memory	260
1D 0F	Return Main Program Flash CRC	260
1D 10 n	Erase Selected Flash Sector	261
1D 11 aL aH cL cH d1...dn	Download to Active Flash Sector	262
1D FF	Reboot the Printer	263

Comparison Chart

The following table details the list of commands whose behavior differs from the NCR 7156 because of the physical differences of a 6 dots/mm head (7156) versus an 8 dots/mm head (7167). Where the 7156 made movements in $n/152$ inch increments, the 7167 makes $n/203$ inch movements.

Command	Description	Difference between a 7156 and a 7167 configured in 7156 Emulation Mode.
15 <i>n</i>	Feed <i>n</i> Dot Rows	This command will move the paper on the receipt in $n/203$ inch steps instead of $n/152$ inch steps.
16 <i>n</i>	Add <i>n</i> Extra Dot Rows	The dot rows will be measured in $n/203$ inches versus $n/152$ inches.
1B 20 <i>n</i>	Set Right-Side Character Spacing	This command sets the right side spacing to “ <i>n</i> ” horizontal motion units. By default, these units are in terms of $1/203$ inches versus $1/152$ inches.
1B 24 <i>n1 n2</i>	Set Absolute Starting Position	For graphics commands, the position is scaled to best match the previous product. In text mode, the equivalent character position is calculated.
1B 26 <i>s c1 c2 n1 d1...nn dn]</i>	Define User-Defined Character Set	Since the dots on the new print head are smaller, user-defined characters that were used on the previous 7156 printer will appear smaller on the 7156 printer.
1B 2A <i>m n1 n2 d1...dn</i>	Select Bit Image Mode	In 7156 Emulation Mode, graphics are scaled to best match the size of the graphic in the 7156 printer.
1B 33 <i>n</i>	Set Line Spacing	This command uses <i>n</i> in terms of $n/360$ inches. Since the previous product had a fundamental step of $1/180$ inch and the new product has a fundamental step of $1/203$ inch, the actual line spacing will not exactly

Command	Description	Difference between a 7156 and a 7167 configured in 7156 Emulation Mode.
		match the requested spacing.
1B 4A <i>n</i>	Print and Feed Paper	(Same as above)
1B 59 <i>n1 n2 d1...dn</i>	Select Double-Density Graphics	In 7156 Emulation Mode, the printer scales the graphics to provide the best match.
1B 5C <i>n1 n2</i>	Set Relative Print Position	The parameter to this command is in units of dots. However, the command moves and aligns to character positions. In 7156 Emulation Mode, this command calculates how many character positions to move based on the 7156's character width in dots (10) versus the 7167's width (13).
1B 61 <i>n</i>	Select Justification	This command does true dot resolution alignment for centering versus character-aligned centering.
1D 2A <i>n1 n2 d1...dn</i>	Define Downloaded Bit Image	In 7156 Emulation Mode, this command scales the incoming data to provide a best match to the size of the image as it printed on the 7156 printer.
1D 2F <i>m</i>	Print Downloaded Bit Image	(Same as above)

Command Descriptions

This section provides the detailed description of the commands. These commands are separated into groups according to their function or use. The previous sections can be used as an index for the following sections.

The following lists and describes the headings used to present the elements of the commands in the descriptions in this section. Each command code is presented in three formats: ASCII, hexadecimal, and decimal. Choose the format that best suits the programming implementation. The printer interprets the 8-bit bytes it gets through its communication interface; it does not care what format the program lists them in.

Name: Name of Command

ASCII: The ASCII representation of the command control code followed by its operands.

Hexadecimal: The hexadecimal representation of the command control code followed by its operands.

Decimal: The decimal representation of the command control code followed by its operands.

Operand *n*: A description of the command operand. Other command operands may be *m*, *p1*, *p2*, *x*, or *y*.

Range of *n*: The upper and lower limits or list of possible values of the command operand. The values are listed as decimal values unless specified otherwise.

Default of *n*: The command operand default value after printer reset or startup.

Description: A brief description of the use of the command.

Formulas: Any formulas used for this command.

Example: Coding example of how to send the command in Visual Basic. This code assumes we are doing output to an opened and ready device called "MSCOMM1." The examples use the hexadecimal command code formats; the ASCII or decimal formats could also be used in VB. In commands that use an operand, a specific value is used, and the result of using the selected value for the operand is described.

Exceptions: Describes any exceptions to this command, e.g., incompatible commands.

Related Information: Describes related information for this command, e.g., bit information.

Printer Function Commands

The printer function commands control the following basic printer functions and are described in order of their hexadecimal codes:

1. Station Select
2. Platen Control
3. Resetting the printer
4. Cutting the paper
5. Opening the cash drawers

Clear Printer

ASCII: DLE

Hexadecimal: 10

Decimal: 16

Clears the print line buffer without printing and sets the printer to the following condition:

1. Receipt station is selected
2. Double-Wide command (0x12) is cancelled
3. Line Spacing, Pitch, and User-Defined Character Sets are maintained at current selections (RAM is not affected)
4. Single-Wide, Single-High, Non-Rotated, and Left-Aligned characters are set
5. Printer is restarted and error status is cleared if a fault condition existed
6. Printing position is set to column one
7. Slip platen is opened
8. Slip print head is homed
9. Knife is homed

Example:

```
MSComm1.Output = Chr$(&H10)
```

Exceptions:

A DLE command followed by a hexadecimal 04 or 05 is interpreted as a "real time command".
(See Real Time commands)

Close Form

ASCII: DC1

Hexadecimal: 11

Decimal: 17

Closes the feed roller and platen and retracts the forms arm stop to the forms stop position. If the printer is reset or the Clear command (0x10) is received, the feed roller and platen are opened.

This command executes if the platen is already closed. This command is processed regardless of which station is selected.

Example:

```
MSComm1.Output = Chr$(&H11)
```

Open Form

ASCII: CAN

Hexadecimal: 18

Decimal: 24

When the printer is in 7156 Emulation Mode or in non-Page Mode, this command opens the feed roller and platen so that a form may be inserted (default position).

This command has the same code as the Cancel Print Data in Page Mode command, which is only executed in Page Mode.

This command executes if the platen is already open. This command executes (opens the feed roller and platen) regardless of which station is selected.

Example:

```
MSComm1.Output = Chr$(&H18)
```


Perform Partial Knife Cut

ASCII: EM or ESC i

Hexadecimal: 19 or 1B 69

Decimal: 25 or 27 105

Cuts the receipt, leaving .20 inch (5 mm) of paper. This command is implemented the same as Partial Knife Cut (1A, 1B 6D). There are two codes for this command. Both codes perform the same function.

A Line Feed is executed first if the print buffer is not empty.

This command is executed (cuts the receipt) regardless of which station is selected.

Example:

MSComm1.Output = Chr\$(&H19) or

MSComm1.Output = Chr\$(&H1B) & Chr\$(&H69)

Perform Partial Knife Cut

ASCII: SUB or ESC m

Hexadecimal: 1A or 1B 6D

Decimal: 26 or 27 109

Cuts the receipt, leaving .20 inch (5 mm) of paper. This command is implemented the same as Full Knife Cut (19, 1B 69) which results in a partial knife cut. There are two codes for this command and both perform the same function.

This command is processed regardless of which station is selected.

Example:

MSComm1.Output = Chr\$(&H1A) or

MSComm1.Output = Chr\$(&H1B) & Chr\$(&H6D)

Exceptions:

A line Feed is executed first if the printer buffer is not empty.

This command is executed)cuts the receipt) regardless of which station is selected.

Generate Tone

ASCII: ESC BEL

Hexadecimal: 1B 07

Decimal: 27 7

Generates an audible tone. This allows the application to provide an audible tone to the operator.

Example:

```
MSComm1.Output = Chr(&H1B) & Chr(&H07)
```

Return Home

ASCII: ESC <

Hexadecimal: 1B 3C

Decimal: 27 60

Moves the impact print head (unless it is already in the home position) to the home position.

This command is processed regardless of station, either receipt unit or slip unit.

Related Information:

The printer is able to detect carriage motor jams, eliminating the need to home the print head after each slip transaction.

Example:

```
MSComm1.Output = Chr(&H1B) & Chr(&H3C)
```

Initialize Printer**ASCII:** ESC @**Hexadecimal:** 1B 40**Decimal:** 27 64

Default:	<u>Receipt</u>	<u>Slip</u>
Character Pitch:	15.6 CPI	13.9 CPI
Column Width:	44 characters (80mm) 32 characters (58mm)	45 characters
Extra Dot Rows:	2	3
Character Set:	Code Page 437	Code Page 437
Printing Position:	Column One	Column One

Clears the print line buffer and resets the printer to the default settings for the startup configuration (refer to Default settings above.)

Single-Wide, Single-High, Non-Rotated, and Left-Aligned characters are set and User-defined characters or logo graphics are cleared (Flash Memory is not affected). Tabs are reset to default settings. Receipt selection state is selected.

Example:

```
MSCComm1.Output = Chr$(&H1B) & Chr$(&H40)
```

Set Slip Paper Eject Length**ASCII:** ESC C *n***Hexadecimal:** 1B 43 *n***Decimal:** 27 67 *n***Value of *n*:** 0 to 255

Example:

```
MSCComm1.Output = Chr$(&H1B) & Chr$(&H43) & Chr$(n)
```

Exception:

This command is ignored.

Select Receipt or Slip for Printing; Slip for MICR Read**ASCII:** ESC c 0 *n***Hexadecimal:** 1B 63 30 *n***Decimal:** 27 99 48 *n***Value of *n* :** 0 Journal selected

1, 2, 3 Receipt selected

4 Slip selected

Default of *n* : 1

Selects the station for printing. When the slip station is selected, the printer waits (based on the slip waiting time setting [ie: 1B 66 m n]) for the paper to be inserted. When the slip station has already been selected and the selection is changed, the form feed roller is opened.

If the station has already been selected and it is re-selected, no action takes place.

Example:

This statement selects the receipt for printing:

MSComm1.Output = Chr\$(&H1B) & Chr\$(&H63) & Chr\$(&H30) & Chr\$(&H01)

Exceptions:

Receiving the command discards unprinted data in the buffer, forcing a “beginning of line” state.

When *n* is out of range this command and it's supporting operands are discarded.

Select Receipt or Slip for Setting Line Spacing

ASCII: ESC c 1 *n*

Hexadecimal: 1B 63 31 *n*

Decimal: 27 99 49 *n*

Value of *n*: 0 Journal selected

1, 2, 3 Select receipt

4 Select Slip

Default of *n* : 1

Selects which station receives the effects of the following commands:

1. Select Default Line Spacing (1B 32)
2. Set Line Spacing (1B 33)
3. Add *n* extra dot rows (16 *n*)

Example:

This statement selects the slip station for line spacing commands:

```
MSComm1.Output = Chr$(&H1B) & Chr$(&H63) & Chr$(&H31) & Chr$(&H04)
```

Exceptions:

This *n* is out of range this command it's supporting operands are discarded.

Select Sensors to Stop Printing

ASCII: ESC c 4 *n*

Hexadecimal: 1B 63 34 *n*

Decimal: 27 99 52 *n*

Value of *n* :

If this bit of <i>n</i> is 1	Function Performed
Bit 0, or bit 1	Stop Receipt on Receipt Low
Bit 4	Stop Slip if Trailing Edge Uncovered
Bit 5	Stop Slip if Leading Edge Uncovered

Default: 0

Determines which sensor causes the printer to stop printing on the respective station. The command does not affect the paper out sensor on the receipt station, which will automatically stop the printer when the paper is depleted.

Example:

This statement causes the receipt to stop on paper low and the slip to stop if the leading edge is uncovered (bits 0 and 5 equal to 1 yields hexadecimal 21 - binary 00100001):

MSComm1.Output = Chr\$(&H1B) & Chr\$(&H63) & Chr\$(&H34) & Chr\$(&H21)

All other bits are ignored.

Enable or Disable Panel Buttons

ASCII: ESC c 5 *n*

Hexadecimal: 1B 63 35 *n*

Decimal: 27 99 53 *n*

Value of *n*: 0 = Enable

1 = Disable

Default: 0 (Enable)

Enables or disables the Paper Feed Button. If the last bit is 0, the Paper Feed Button is enabled. If the last bit is 1, the Paper Feed Button is disabled so pressing the paper feed button will result in no response.

Example:

```
MSComm1.Output = Chr(&H1B) & Chr(&H63) & Chr(&H35) & Chr(n)
```

Related Information:

Functions that require using the Paper Feed Button (except for the Execute Macro [1D 5E] command) cannot be used when it is disabled with this command.

Enable or Disable Slip Paper End Feeding Stop

ASCII: ESC c 7 *n*

Hexadecimal: 1B 63 37 *n*

Decimal: 27 99 55 *n*

Value of *n*: 0 = Enable

1 = Disable

Default: 0 (Enable)

Enables or disables the the slip paper end feeding stop function. When this feature is enabled the printer will print a line but will not perform a line feed when the slip paper end is detected.

Example:

MSComm1.Output = Chr(&H1B) & Chr(&H63) & Chr(&H37) & Chr(*n*)

Related Information:

When either the trailing edge sensor or the leading edge sensor does not sense the paper the printer recongnizes this as a paper end condition.

Set Slip Paper Waiting Time

ASCII: ESC f *m n*

Hexadecimal: 1B 66 *m n*

Decimal: 27 102 *m n*

Value of *m*: Minutes

Value of *n*: Tenths of seconds

Sets the time (in *m* minutes) that the printer waits for a slip to be inserted into the slip station. It also sets the time (*n* x 0.1 seconds) that the printer waits to close the platen and start printing once the slip has been inserted. The printer reads that a slip is inserted when the leading edge and trailing edge sensors are covered. The LED on the slip table is lit (green) when both sensors are covered.

If a slip is not inserted in the time specified, the receipt station is selected for the next function. If *m* = 0, the printer waits forever for a slip to be inserted. The times set by this command are used only by the command, Select Receipt or Slip for Printing, Slip for MICR Read (1B 63 30 *n*), with *n* set to 04.

Example:

MSComm1.Output = Chr\$(&H1B) & Chr\$(&H66) & Chr\$(*m*) & Chr\$(*n*)

Generate Pulse to Open Cash Drawer**ASCII:** ESC p *n* *p1* *p2***Hexadecimal:** 1B 70 *n* *p1* *p2***Decimal:** 27 112 *n* *p1* *p2***Value of *n* :** 0, 48 = Drawer 1

1, 49 = Drawer 2

Value of *p1*: 0 - 255**Value of *p2*:** 0 - 255

Sends a pulse to open the cash drawer.

Formulas:

The value for either *p1* or *p2* is the hexadecimal number multiplied by 2 msec to equal the total time.

1. On time = *p1* × 2 msec2. Off time = *p2* × 2 msec

Example:

MSComm1.Output = Chr\$(&H1B) & Chr\$(&H70) & Chr\$(*n*) & Chr\$(*n*)**Related Information:**

The off-time is the delay before the printer performs the next operation.

The recommend time for NCR cash drawers is 110 msec on time.

Refer to cash drawer specifications for required on and off times.

Select or Cancel Parallel Printing Mode on Receipt and Journal

ASCII: ESC *z n*

Hexadecimal: 1B 7A *n*

Decimal: 27 122 *n*

Because there is no journal station on the printer this command is not implemented and is ignored if received. The command and its supporting operands will be discarded.

Select Slip Station

ASCII: FS

Hexadecimal: 1C

Decimal: 28

Selects the Slip Station for all functions. The receipt station is the default setting after the printer is initialized or the Clear Printer (0x10) command is received. The Hex command: 1B 63 30 *n*, where *n* = 4 will also select the slip station.

Example:

MSComm1.Output = Chr\$(&H1C)

Exceptions:

This command is ignored if Asian mode is On by diagnostic setting.

Select Cut Mode and Cut Paper

ASCII: GS *V m* or GS *V m n*

Hexadecimal: 1D 56 *m* or 1D 56 *m n*

Decimal: 29 86 *m* or 29 86 *m n*

Value of *m*: Selects the mode as shown in the table

Value of *n*: Determines cutting position only if *m* is 65 or 66.

<i>m</i>	Feed and Cut Mode
0, 48	Full cut (no extra feed). Partial cut on the 7158/7167.
1, 49	Partial cut (no extra feed).
65	Feeds paper to cutting position + (<i>n</i> times vertical motion unit), and cuts the paper completely.
66	Feeds paper to cutting position + (<i>n</i> times vertical motion unit), and performs a partial cut.
Range of <i>m</i>:	0, 48; 1, 49 65, 66 (when used with <i>n</i>)
Range of <i>n</i>:	0 - 255
Default of <i>n</i>:	0
Default of <i>m</i>:	0

Selects a mode for cutting paper and cuts the paper. There are two formats for this command, one requiring one parameter *m*, the other requiring two parameters, *m* and *n*. The format is indicated by the parameter *m*.

Formulas: *n* times the vertical motion unit is used to determine the cutting position to the distance that the paper is fed.

Example:

MSComm1.Output = Chr\$(&H1D) & Chr\$(&H56) & Chr\$(m) & Chr\$(n)

Exceptions:

If *m* is out of the specified range, the command is ignored.

Select Receipt Station

ASCII: RS

Hexadecimal: 1E

Decimal: 30

Selects the Receipt Station for all functions. The receipt station is the default setting after the printer is initialized or the Clear Printer (0x10) command is received. The Hex command: 1B 63 30 n , where n = 1, 2, 3 will also select the receipt station.

Example:

```
MSComm1.Output = Chr$(&H1E)
```

Print Test Form

ASCII: US t

Hexadecimal: 1F 74

Decimal: 31 116

Prints the current printer configuration settings on the receipt.

Disabled in page mode.

Example:

```
MSComm1.Output = Chr$(&H1F) & Chr$(&H74)
```

Vertical Positioning and Print Commands

The vertical positioning and print commands control the vertical print positions of characters on the receipt and slip.

Print and Feed Paper One Line

ASCII: LF

Hexadecimal: 0A

Decimal: 10

Prints one line from the buffer and feeds paper one line.

Example:

```
MSComm1.Output = Chr$(&H0A)
```

Related Information:

Carriage Return + Line Feed, prints and feeds only one line.

Print and Eject Slip

ASCII: FF

Hexadecimal: 0C

Decimal: 12

Prints data from the buffer to the slip station and if the paper sensor is covered, reverses the slip out the front of the printer far enough to be accessible to the operator. The impact station opens the platen in all cases.

This command has the same code as the Print and Return to Standard Mode command, which is executed only when the printer is in Page Mode. When the printer is not in Page Mode this command executes the print and eject slip function.

Example:

```
MSComm1.Output = Chr$(&H0C)
```

Exceptions:

This command is ignored if the receipt station is the current station.

Print and Carriage Return

ASCII: CR

Hexadecimal: 0D

Decimal: 13

Prints one line from the buffer and feeds paper one line. The printer can be set through the configuration menu to ignore or use this command. Some applications expect the command to be ignored while others use it as print command.

Example:

```
MSComm1.Output = Chr$(&H0D)
```

Related Information:

See Ignoring/Using the Carriage Return in *Diagnostics* for more information.

Carriage Return + Line Feed, prints and feeds only one line.

Feed *n* Print Lines

ASCII: DC4 *n*

Hexadecimal: 14 *n*

Decimal: 20 *n*

Value of *n*: The number of lines to feed at current line height setting.

Range of *n* : 0 – 127 7156 Emulation Mode

0 – 255 7158 Native Mode or 7167 Native Mode

Feeds paper *n* lines at the current line height without printing.

Ignored on receipt if the current line is not empty.

Example:

```
MSComm1.Output = Chr$(&H14) & Chr$(n)
```

Feed n Dot Rows**ASCII:** NAK n **Hexadecimal:** 15 n **Decimal:** 21 n **Value of n :** Receipt Slip $n/203$ inch $n/72$ inch**Range of n :** 0 – 127 7156 Emulation Mode

0 – 255 7158 Native Mode or 7167 Native Mode

Feeds paper n dot rows without printing. Receipt moves n rows if the print buffer is empty.

Example:

MSComm1.Output = Chr\$(&H15) & Chr\$(n)**Add n Extra Dot Rows****ASCII:** SYN n **Hexadecimal:** 16 n **Decimal:** 22 n **Value of n :** Receipt Slip $n/203$ inch $n/72$ inch**Range of n :** 0 - 12**Default:** Receipt Slip

3

3

Adds n extra dot rows to the character height to increase space between print lines or decrease number of lines per inch.

Formulas:

The following table shows the relationship between the number of lines per inch and each extra dot row(s) added for both the receipt and slip stations:

Receipt Station			Slip Station		
Extra Rows	Lines Per Inch	Dot Rows	Extra Rows	Lines Per Inch	Dot Rows
0	8.47	24	0	10.29	7
1	8.13	25	1	9.00	8
2	7.81	26	2	8.00	9
3	7.52	27	3	7.20	10
4	7.25	28	4	6.55	11
5	7.00	29	5	6.00	12
6	6.77	30	6	5.54	13
7	6.55	31	7	5.14	14
8	6.35	32	8	4.80	15
9	6.16	33	9	4.50	16
10	5.98	34	10	4.24	17
11	5.81	35	11	4.00	18
12	5.64	36	12	3.79	19

Example:

MSComm1.Output = Chr\$(&H16) & Chr\$(n)

Print

ASCII: ETB

Hexadecimal: 17

Decimal: 23

Prints one line from the buffer and feeds paper one line. Executes LF on receipt. Executes LF on slip if previous character was not a CR.

Example:

MSComm1.Output = Chr\$(&H17)

Set Line Spacing to 1/6 Inch**ASCII:** ESC 2**Hexadecimal:** 1B 32**Decimal:** 27 50**Default:** 0.13 Inch (3.33 mm)

Sets the default line spacing to 1/6 of an inch (4.25 mm).

Example:

MSCComm1.Output = Chr\$(&H1B) & Chr\$(&H32)

Set Line Spacing**ASCII:** ESC 3 *n***Hexadecimal:** 1B 33 *n***Decimal:** 27 51 *n***Value of *n*:** *n*/406 inches on receipt*n*/144 inches in slip**Range of *n*:** 0 – 255

Default: Receipt .13 inch (3.37 mm or 7.52 lines per inch, 3 extra dot rows.).

Slip 14 inch (7.2 lines per inch, 3 extra dot rows.)

Sets the line spacing for the receipt and for the slip. For the receipt the spacing is set to *n*/406 inches. For the slip, the line spacing is set to *n*/144 inches. The line spacing equals the character height when *n* is too small.

If the Set Horizontal and Vertical Minimum Motion Units command (1D 50) is used to change the horizontal and vertical minimum motion unit, the parameters of this command (Set Line Spacing) will be interpreted accordingly.

Related Information:

For more information, see the description of the Set Horizontal and Vertical Minimum Motion Units command in this document.

Print and Feed Paper

ASCII: ESC J *n*

Hexadecimal: 1B 4A *n*

Decimal: 27 74 *n*

Value of *n*: *n*/203 inches receipt

n/144 inches slip

Range of *n*: 0 - 255

Prints one line from the buffer and feeds the paper.

On the receipt station, the line height equals the character height when *n* is too small. This does not apply to the slip station. Use *n* = 0 to print a line without feeding the paper. This allows the printer to print on the last line of the slip (at .59 inches from the trailing edge) and still retain the slip in the feed rollers for reverse feeding the paper back out of the slip station.

Example:

MSComm1.Output = Chr\$(&H1B) & Chr\$(&H4A) & Chr\$(*n*)

Related Information:

For more information, see the description of the Set Horizontal and Vertical Minimum Motion Units command in this document.

Print and Reverse Feed Paper

ASCII: ESC K *n*

Hexadecimal: 1B 4B *n*

Decimal: 27 75 *n*

Value of *n*: Slip = *n*/144 of an inch

Range of *n*: 0 - 255

Prints one line from the buffer and reverse feeds the paper *n*/144 of an inch on the slip station.

Example:

MSComm1.Output = Chr\$(&H1B) & Chr\$(&H4B) & Chr\$(*n*)

Exceptions:

The receipt station cannot be reverse fed.

Print and Feed n Lines**ASCII:** ESC d n **Hexadecimal:** 1B 64 n **Decimal:** 27 100 n **Value of n :** Number of lines to be printed and fed.**Range of n :** 1 – 255

(0 is interpreted as 1 on the receipt station)

Prints one line from the buffer and feeds paper n lines at the current line height.

Example:

```
MSComm1.Output = Chr$(&H1B) & Chr$(&H64) & Chr$(n)
```

Print and Reverse Feed n Lines**ASCII:** ESC e n **Hexadecimal:** 1B 65 n **Decimal:** 27 101 n **Value of n :** The number of lines on the slip station to be reverse fed.**Range of n :** 0 – 255

Prints one line from the buffer and reverse feeds the paper n lines on the slip station. The receipt station cannot be reverse fed.

Example:

```
MSComm1.Output = Chr$(&H1B) & Chr$(&H65) & Chr$(n)
```

Reverse Feed n Lines**ASCII:** GS DC4 n **Hexadecimal:** 1D 14 n **Decimal:** 29 20 n **Range of n :** 0 – 127 7156 Emulation Mode

0 – 255 7158 Native Mode or 7167 Native Mode

Reverses the paper feed in the slip station by n lines at the current spacing. The next character feed command returns the paper feed back to the normal feed direction. This command is ignored if slip is not the selected station. Current spacing is not a factor.

Example:

MSComm1.Output = Chr\$(&H1D) & Chr\$(&H14) & Chr\$(n)**Reverse Feed n Dots****ASCII:** GS NAK n **Hexadecimal:** 1D 15 n **Decimal:** 29 21 n **Value of n :** n dots at 1/72 inch**Range of n :** 0 – 127 7156 Emulation Mode

0 – 255 7158 Native Mode or 7167 Native Mode

Reverses the paper feed in the slip station by n dots at 1/72 inch (NCR 7150™ command). This command is ignored if receipt station is selected.

Example:

MSComm1.Output = Chr\$(&H1D) & Chr\$(&H15) & Chr\$(n)

Set Horizontal and Vertical Minimum Motion Units

ASCII: GS P x y

Hexadecimal: 1D 50 x y

Decimal: 29 80 x y

Value of x : Horizontal

Value of y : Vertical

Range of x : 0 - 255

Range of y : 0 - 255

Default: of x : 203

Default: of y : 203

Sets the horizontal and vertical motion units to $1/x$ inch and $1/y$ inch respectively.

When x or y is set to 0, the default setting for that motion unit is used.

The default horizontal motion is $x = 203$.

Example:

MSComm1.Output = Chr\$(&H1D) & Chr\$(&H50) & Chr\$(x) & Chr\$(y)

Exceptions:

This command is ignored if slip station is selected.

Horizontal Positioning Commands

The horizontal positioning commands control the horizontal print positions of characters on the receipt and slip.

Horizontal Tab

ASCII: HT

Hexadecimal: 09

Decimal: 9

Moves the print position to the next tab position set by the Set Horizontal Tab Positions (1B 44 *n*1 *n*2 ... 00) command. The print position is reset to column one after each line.

Tab treats the left margin as column one, therefore changes to the left margin will move the tab positions.

When there are no tabs defined to the right of the current position, or if the next tab is past the right margin, line feed is executed (both slip and receipt.) HT has no effect in page mode. Printer initialization sets 32 tabs at column 9, 17, 25, ... (Every 8 characters)

Example:

MSComm1.Output = Chr\$(&H09)

Set Column

ASCII: ESC DC4 *n*

Hexadecimal: 1B 14 *n*

Decimal: 27 20 *n*

Value of *n*: Receipt

Slip

1 - 44 (Standard,80 mm)

1 - 45 (Standard)

1 - 56 (Compressed,80 mm)

1 - 55 (Compressed)

1 - 32 (Standard,58mm)

1 - 42 (Compressed, 58mm)

Default of *n*: 1

Prints the first character of the next print line in column n . It must be sent for each line not printed at column one. The value of n is set to one after each line.

Example:

`MSCComm1.Output = Chr$(&H1B) & Chr$(&H14) & Chr$(n)`

Exceptions:

The command cannot be used with Single- or Double-Density graphics.

Set Absolute Starting Position

ASCII: ESC \$ $n1$ $n2$

Hexadecimal: 1B 24 $n1$ $n2$

Decimal: 27 36 $n1$ $n2$

Value of n : Number of dots to be moved from the beginning of the line.

Value of $n1$: Remainder after dividing n by 256.

Value of $n2$: Integer after dividing n by 256.

The values for $n1$ and $n2$ are two bytes in low byte, high byte word orientation.

Sets the print starting position to the specified number of dots (up to the right margin) from the beginning of the line. The print starting position is reset to the first column after each line.

Formulas:

Determine the value of n by multiplying the column for the absolute starting position by 10 (slip, or receipt standard pitch) or 8 (receipt compressed pitch). The example shows how to calculate column 29 (10 dots per column) as the absolute starting position.

$28 \times 10 = 280$ dots (beginning of column 29)

$280/256 = 1$, remainder of 24

$n1 = 24$ $n2 = 1$

Example:

`MSCComm1.Output = Chr$(&H1B) & Chr$(&H24) & Chr$(n1) & Chr$(n2)`

Related Information:

This command is also used in the graphics mode on the receipt. See Graphics Commands in this chapter for more information.

If the Set Horizontal and Vertical Minimum Motion Units command (1D 50) is used to change the horizontal and vertical minimum motion unit, the parameters of this command (Set Absolute Print Position) will be interpreted accordingly. For more information, see the description of the Set Horizontal and Vertical Minimum Motion Units command (1D 50) in this document.

Set Horizontal Tabs

ASCII: ESC D [*n*] *k* NUL

Hexadecimal: 1B 44 [*n*] *k* 00

Decimal: 27 68 [*n*] *k* 0

Value of *n*: Column for tab minus one.

n is always less than or equal to the current selected column width.

Value of *k*: 0 - 32

Default: Every 8 characters from column. 1 (9, 17, 25, etc.) for normal print.

Sets up to 32 horizontal tab positions *n* columns from column one, but does not move the print position. See the Horizontal Tab (09) command.

The tab positions remain unchanged if the character widths are changed after the tabs are set. This command ends with hexadecimal 00; hexadecimal 1B 44 00 clears all tabs. Tabs assumed to be in strictly ascending order. A tab out of order terminates the command string as if it were 00, and remaining tab values are taken as normal data.

Formulas:

Set the tab positions in ascending order and put Hex 00 at the end.

Hex 1B 44 00 (number of tabs not specified) clears all tab positions.

Example:

MSComm1.Output = Chr\$(&H1B) & Chr\$(&H44) & Chr\$(&H00)

Exceptions:

The tabs cannot be set higher than the column width of the current pitch.

Set Relative Print Position**ASCII:** ESC \ *n1 n2***Hexadecimal:** 1B 5C *n1 n2***Decimal:** 27 92 *n1 n2***Value of *n*:**

To Move the Relative Starting Position Right of the Current Position by *n* dots:

n1 = Remainder after dividing *n* by 256.

n2 = Integer after dividing *n* by 256.

The values for *n1* and *n2* are two bytes in low byte, high byte word orientation.

To Move the Relative Starting Position Left of the Current Position by *n* dots:

n1 = Remainder after dividing (65,536-*n*) by 256

n2 = Integer after dividing (65,536-*n*) by 256

The values for *n1* and *n2* are two bytes in low byte, high byte word orientation.

Moves the print starting position the specified number of dots either right (up to the right margin) or left (up to the left margin) of the current position. The print starting position is reset to the first column after each line.

Formulas:

To move to the left:

Determine the value of *n* by multiplying the number of columns to move left of the current position by 13 (receipt standard pitch) or 10 (slip or receipt compressed pitch). The example shows how to set the relative position two columns in standard pitch (10 dots per column) to the left of the current position.

$2 \times 10 = 20$ dots (two columns to be moved left of the current position)

$65,536 - 20 = 65,516$

$65,516 / 256 = 255$, remainder of 236

n1 = 236 *n2* = 255

To move to the right:

Determine the value of *n* by multiplying the number of columns to move right of the current position by 10 (slip or receipt standard pitch) or 8 (receipt compressed pitch). The example shows how to set the relative position two columns in standard pitch (10 dots per column) to the right of the current position.

$2 \times 10 = 20$ dots (two columns to be moved right of the current position)

$20 / 256 = 0$, remainder of 20

n1 = 20 *n2* = 0

Example:

```
MSComm1.Output = Chr$(&H1B) & Chr$(&H5C) & Chr$(n1) & Chr$(n2)
```

Related Information:

If the Set Horizontal and Vertical Minimum Motion Units command (1D 50) is used to change the horizontal and vertical minimum motion unit, the parameters of this command (Set Relative Print Position) will be interpreted accordingly. For more information, see the description of the Set Horizontal and Vertical Minimum Motion Units command (1D 50) in this document.

Compatibility Information (7167 receipt vs. 7156 receipt)

There is a difference in the normal behavior of this command in 7158 Native Mode/7167 Native Mode as compared to the original 7156. The difference exists when the command is used to move to the left. The 7156 processes the whole print string prior to putting it in the buffer for the print head. This method of processing allows the 7156 to backup in the print string and replace characters and their associated attributes when a "Set Relative Print Position" command instructs the printer to move the print position to the left.

In order to improve the speed of printing, the 7167 moves the data into a buffer for the print head when it receives it. When the "Set Relative Print Position" command contains a move to the left, this causes the new data to overstrike the previous data. This behavior can be used to an application's advantage to provide the ability to create compound characters on the receipt station.

Select Justification

ASCII: ESC a *n*

Hexadecimal: 1B 61 *n*

Decimal: 27 97 *n*

Value of *n*: 0, 48 = Left Aligned

1, 49 = Center Aligned

2, 50 = Right Aligned

Range of *n*: 0 – 2, 48-50

Default: 0 (Left aligned)

Specifies the alignment of the characters, graphics, logos, and bar codes on the receipt station.

Example:

```
MSComm1.Output = Chr$(&H1B) & Chr$(&H61) & Chr$(n)
```

Exceptions:

The command is valid only when input at the beginning of a line.

Set Left Margin

ASCII: GS L *nL nH*

Hexadecimal: 1D 4C *nL nH*

Decimal: 29 76 *nL nH*

Range of *nL*: 0 - 255

Range of *nH*: 0 - 255

Default: 80 mm width 576 dots (the maximum printable area)

58 mm width 424 dots (the maximum printable area)

Sets the left margin of the printing area. The left margin is set to $((nH \times 256) + nL)$ times horizontal motion unit) inches. The horizontal motion units are set by the Set Horizontal and Vertical Minimum Motion Units command (1D 50), described in this manual.

The width of the printing area is set by the Set Printing Area Width command (1D 57), which follows this command. See the Set Printing Area Width command (1D 57) in this document for a description of that command.

If the setting exceeds the printable area, the maximum value of the printable area is used. The maximum printable area is 576 dots. See the illustration.

Formulas:

To set the left margin to one inch at the default horizontal motion unit of 1/203 inches, send the four-byte string:

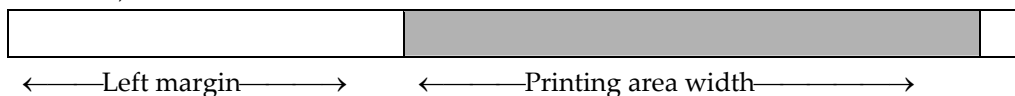
GS L 203 0

Or, to set the left margin to two inches at the default horizontal motion unit of 1/203 units per inch, send the four-byte string:

GS L 150 1

Where 2 inches = 406/203, and 406 = $(1 \times 256) + 150$.

←— Printable area: 576 dots for 80 mm width, 424 dots for 58 mm width
→



Example:

MSCComm1.Output = Chr\$(&H1D) & Chr\$(&H4C) & Chr\$(*nL*) & Chr\$(*nH*)

Exceptions:

The command is effective only at the beginning of a line.

This command is ignored if the line buffer is not empty, and only effects the Receipt interface.

Set Printing Area Width

ASCII: GS W *nL nH*

Hexadecimal: 1D 57 *nL nH*

Decimal: 29 87 *nL nH*

Range of *nL*: 0 – 255

Range of *nH*: 0 - 255

Default: 80 mm width 576 dots (the maximum printable area)

58 mm width 424 dots (the maximum printable area)

Sets the width of the printing area. If the setting exceeds the printable area, the maximum value of the printable area is used.

The width of the printing area is set to $((nH \times 256) + nL)$ times horizontal motion unit) inches. The horizontal motion units are set by the Set Horizontal and Vertical Minimum Motion Units command (1D 50).

The width of the printing area follows the Set Left Margin command (1D 4C).

See the Set Left Margin command (1D 4C...) earlier in this document for a description.

Formulas:

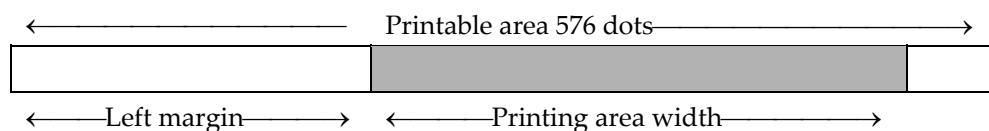
To set the width of the printing area to one inch at the default horizontal motion unit of 1/203 inches, send the four-byte string:

GS W 203 0

Or, to set the width of the printing area to two inches at the default horizontal motion unit of 1/203 units per inch, send the four-byte string:

GS W 150 1

Where 2 inches = 406/203, and $406 = (1 \times 256) + 150$.



Example:

MSComm1.Output = Chr\$(&H1D) & Chr\$(&H57) & Chr\$(*nL*) & Chr\$(*nH*)

Exceptions:

This command is effective only at the beginning of a line.

This command is ignored if the line buffer is not empty, and only effects the Receipt interface.

If the setting exceeds the printable area, the maximum value of the printable area is used. The maximum printable area is 576 dots for 80 mm paper width and 424 dots for 58 mm paper width. See the illustration in the Set Left Margin command (1D 4C).

Print Characteristic Commands

These commands control what the printed information looks like: selection of character sets, definition of custom-defined characters, and setting of margins. The commands are described in order of their hexadecimal codes

Select Double-Wide Characters

ASCII: DC2

Hexadecimal: 12

Decimal: 18

Prints double-wide characters. The printer is reset to single-wide mode after a line has been printed or the Clear Printer (0x10) command is received. Double-wide characters may be used in the same line with single-wide characters.

Example:

```
MSComm1.Output = Chr$(&H12)
```

Select Single-Wide Characters

ASCII: DC3

Hexadecimal: 13

Decimal: 19

Prints single-wide characters. Single-wide characters may be used in the same line with double-wide characters.

Example:

```
MSComm1.Output = Chr$(&H13)
```

Select 90 Degree Counter-Clockwise Rotated Print**ASCII:** ESC DC2**Hexadecimal:** 1B 12**Decimal:** 27 18

Rotates characters 90 degrees counter-clockwise. The command remains in effect until the printer is reset or until a Clear Printer (0x10), Select or Cancel Upside-Down Print (1B 7B), or Select or Cancel Rotated Print (1B 56) command is received.

Example:

```
MSComm1.Output = Chr$(&H1B) & Chr$(&H12)
```

Exceptions:

This command is valid only at the beginning of a line.

Rotated print and non-rotated print characters cannot be used together in the same line.

Related Information:

See Summary of Rotated Printing in this chapter.

Select Pitch (Column Width)**ASCII:** ESC SYN *n***Hexadecimal:** 1B 16 *n***Decimal:** 27 22 *n***Value of *n*:** 0 = Standard Pitch

1 = Compressed Pitch

Default: 0 (Standard pitch)

Selects the character pitch for a print line.

Formulas:

The following table provides the print characteristics for both pitches on the receipt and slip stations.

Pitch	Receipt Columns	Receipt CPI	Slip Columns	Slip CPI
Standard	44 for 80 mm paper 32 for 58 mm paper	15.6	45	13.9
Compressed	56 for 80 mm paper 42 for 58 mm paper	20.3	55	17.1

Example:

```
MSComm1.Output = Chr$(&H1B) & Chr$(&H16) & Chr$(n)
```

Related Information:

See “Technical Specifications” for descriptions of character pitches (print modes).

Set Character Right-Side Spacing

ASCII: ESC SP *n*

Hexadecimal: 1B 20 *n*

Decimal: 27 32 *n*

Range of *n*: 0 - 32

Default: 0

Sets the right side character spacing to [*n* x horizontal or vertical motion units]. Values for this command are set independently in Standard and Page Mode.

The units of horizontal and vertical motion are specified by the Set Horizontal and Vertical Minimum Motion Units (1D 50...) command. Changes in the horizontal or vertical units do not affect the current right side character spacing. When the horizontal or vertical motion unit is changed by the Set Horizontal and Vertical Minimum Motion Units (1D 50...) command the value must be in even units and not less than the minimum amount of horizontal movement.

In Standard Mode the horizontal motion unit is used.

In Page Mode the horizontal or vertical motion unit differs and depends on the starting position of the printable area. When the starting printing position is the upper left or lower right of the printable area (set by Select Print Direction in Page Mode, 1B 54 *n*) the horizontal motion unit (*x*) is used. When the starting printing position is the upper right or lower left of the printable area (set by Select Print Direction in Page Mode, 1B 54 *n*) the vertical motion unit (*y*) is used.

Example:

```
MSComm1.Output = Chr$(&H1B) & Chr$(&H20) & Chr$(n)
```

Exception:

This command is ignored in 7156 Emulation Mode and is only valid on the receipt station.

Select Print Modes**ASCII:** ESC ! *n***Hexadecimal:** 1B 21 *n***Decimal:** 27 33 *n***Value of *n*:** Pitch selection (standard, compressed, double high, or double wide.)

Bit	Function	0	1
Bit 0	Pitch	Standard Pitch ¹ 15.6 CPI (Receipt) 44 Col/Line (80 mm) 32 Col/Line (58 mm) 13.9 CPI (Slip) 45 Col/Line	Compressed Pitch 20.3 CPI (Receipt) 56 Col/Line (80 mm) 42 Col/Line (58 mm) 17.1 CPI (Slip) 55 Col/Line
Bit 3	Emphasized Mode	Canceled	Set
Bit 4	Double-high ²	Canceled	Set
Bit 5	Double-wide	Canceled	Set
Bit 7	Underlined Mode	Canceled	Set

Bits 1, 2, 6 are not used.

¹Standard and compressed pitch cannot be used together in the same line.²Double-high characters cannot be used with normal characters in the same line.**Default:** 0 (for bits 0, 3, 4, 5, 7)

Selects the print mode: standard, compressed, double high, or double wide.

Example:

MSComm1.Output = Chr\$(&H1B) & Chr\$(&H21) & Chr\$(n)

Related Information:

The bits in this command perform the same function as the standalone functions:

1B 16 n	Select Pitch
1B 45 n	Emphasized
12	Double-wide
13	Single-wide
1B 2D n	Underline

Select or Cancel User-Defined Character Set

ASCII: ESC % *n*

Hexadecimal: 1B 25 *n*

Decimal: 27 37 *n*

Value of *n*: 0= Code Page 437

1= User-defined (RAM character set)

2= Code Page 850

Range: 0 - 2

Default: 0 (Code Page 437)

Selects the character set. When an undefined RAM character is selected, the Code Page 437 character is used. See the *Printing Specification Guide* for the character sets.

Example:

```
MSComm1.Output = Chr$(&H1B) & Chr$(&H25) & Chr$(n)
```

Define User-Defined Characters

	Receipt	Slip
ASCII:	ESC & 3 <i>c1 c2 n1 d1 ... nm dn</i>	ESC & 0 <i>c1 c2 d1 ... dn</i>
Hexadecimal:	1B 26 3 <i>c1 c2 n1 d1 ... nm dn</i>	1B 26 0 <i>c1 c2 d1 ... dn</i>
Decimal:	27 38 3 <i>c1 c2 n1 d1 ... nm dn</i>	27 38 0 <i>c1 c2 d1 ... dn</i>

Defines and enters downloaded characters into RAM or Flash. The command may be used to overwrite single characters. User-defined characters are available until power is turned off or the Initialize Printer command (1B 40) is received.

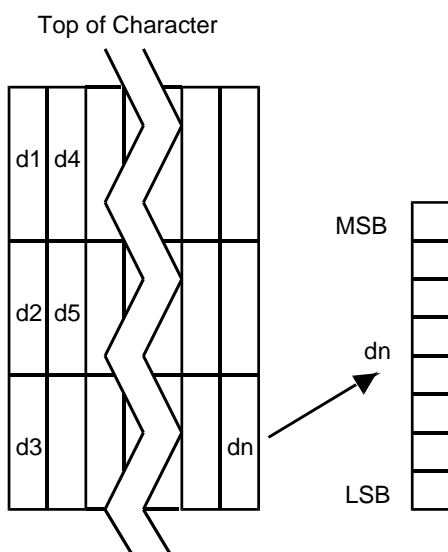
Any invalid byte (*s*, *c1*, *c2*, *n1*) aborts the command.

User-defined character sets for both slip and receipt may be used at the same time. The command clears bit image logo data from RAM. The illustration below provides a sample of a character cell.

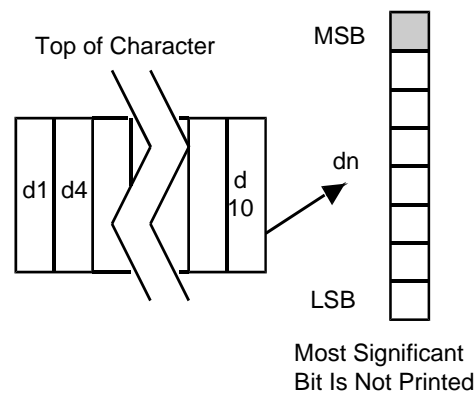
Defining User-Defined Characters for the Slip and Receipt Station

Defines and enters downloaded characters into RAM.

Receipt Characters (1B 26 3)



Slip Characters (1B 26 0)



Values and Ranges:

Receipt

c = the ASCII codes of the first ($c1$) and last ($c2$) characters respectively

$c1$ = Hex 20-FF (Hex 20 is always printed as a space)

$c2$ = Hex 20-FF (Hex 20 is always printed as a space)

To define only one character, use the same code for both $c1$ and $c2$.

n = the number of dot columns for the n th character as specified by $n1 \dots nn$

n = 1-10 (standard pitch), 12 and less accepted but ignored

n = 1-8 (compressed pitch), 12 and less accepted but ignored

d = the column data for the n th character as specified by $d1 \dots dn$

The number of bytes for a particular character cell is $3 \times n1$.

The bytes are printed down and across each cell.

Slip

c = the ASCII codes of the first ($c1$) and last ($c2$) characters respectively

$c1$ = Hex 20-FF (Hex 20 is always printed as a space)

$c2$ = Hex 20-FF (Hex 20 is always printed as a space)

To define only one character, use the same code for both $c1$ and $c2$.

d = the column data for the n th character as specified by $d1 \dots dn$

Each character is defined by 12 bytes (only bytes 2-11 are printed.)

Each byte is one 7-dot high column (full- or half-dot column.)

Overlapped dots are not printed

The data must contain $[(c2 - c1 + 1) \times 12]$ bytes

Related Information:

See 1D 22 n (Select Memory Type Where to Save User-Defined Fonts.)

Select or Cancel Underline Mode**ASCII:** ESC - *n***Hexadecimal:** 1B 2D *n***Decimal:** 27 45 *n***Value of *n*:** 0, 48 = Cancel underline mode

1, 49 = Select underline mode

Default of *n*: 0 (Cancels underline mode)

Turns underline mode on or off. Underlines cannot be printed for spaces set by the Horizontal Tab, Set Absolute Start Position, or Set Relative Print Position commands.

This command and the Select Print Mode(s) command (1B 21) turn underline on and off in the same way.

Example:

```
MSComm1.Output = Chr$(&H1B) & Chr$(&H2D) & Chr$(n)
```

Exceptions:

This command is ignored if *n* is out of the specified range.

This command is only available in 7158 Native Mode and 7167 Native Mode.

Copy Character Set from ROM to RAM**ASCII:** ESC : 0 0 0**Hexadecimal:** 1B 3A 30 30 30**Decimal:** 27 58 48 48 48**Default:** Code Page 437

Copies characters in the active ROM set to RAM. Use this command to re-initialize the User-Defined Character Set. Code Page 437 is copied by default at initialization.

The command is ignored if current font is the user font.

Example:

```
MSComm1.Output = Chr$(&H1B) & Chr$(&H3A) & Chr$(&H30) & Chr$(&H30)
& Chr$(&H30)
```

Related Information:

To modify characters in one of the character set variations, such as Rotated Print, select one of the Rotated Print commands, copy to RAM, then use the Define User-Defined Character Set command (1B 26).

Cancel User-Defined Characters

ASCII: ESC ? *n*

Hexadecimal: 1B 3F *n*

Decimal: 27 63 *n*

Value of *n*: Specified character code

Range of *n*: 32 - 255

Cancels the pattern defined for the character code specified by *n*. After the user-defined character is canceled, the corresponding pattern from Code Page 437 is printed.

Example:

```
MSComm1.Output = Chr$(&H1B) & Chr$(&H3F) & Chr$(n)
```

Exceptions:

This command is ignored if *n* is out of range or if the user-defined character is not defined.

Select or Cancel Emphasized Mode

ASCII: ESC E *n*

Hexadecimal: 1B 45 *n*

Decimal: 27 69

Value of *n*: 0 (bit 0), not selected

1 (bit 0), selected

Range of *n*: 0 - 255

Default: 0 (bit 0)

Starts or stops emphasized printing on slip and receipt. In Emphasized Mode on the slip, each line is printed twice to improve penetration of multi-part forms and increase print contrast. The second pass is printed the same direction as the first to ensure accuracy of the overprint. Printing speed decreases due to the second printing pass.

Example:

MSComm1.Output = Chr\$(&H1B) & Chr\$(&H45) & Chr\$(n)

Exceptions:

Only the lowest bit of *n* is effective.

Emphasized printing cannot be used with bit-images or downloaded bit-images.

Related Information:

This command and the Select Print Mode(s) command (1B 21) function identically.

Select Double Strike

	7156 Emulation	7158 Native and 7167 Native Mode
ASCII:	ESC G	ESC G <i>n</i>
Hexadecimal:	1B 47	1B 47 <i>n</i>
Decimal:	27 71	27 71 <i>n</i>
Value of <i>n</i>:		0 = Off 1 = On

Turns double strike mode on for the slip station. Overprints a second pass of the print line on the slip station to improve penetration of multi-part forms and increase print contrast. The second pass is printed the same direction as the first to ensure accuracy of the overprint. The printer is reset to the standard print mode after a line has been printed or after a Clear Printer (0x10) command is received.

Example:

MSComm1.Output = Chr\$(&H1B) & Chr\$(&H47) & Chr\$(n)

Exceptions:

These settings do not apply in Page Mode. However they can be set or cleared in Page Mode.

Double-strike printing cannot be used with bit-images or downloaded bit-images.

This command functions the same as the 7156 when the printer is in 7156 Emulation Mode. In Native Mode, the command takes a parameter to enable and disable it.

Related Information:

Printer output is the same as in Emphasized Mode.

Cancel Double Strike**ASCII:** ESC H**Hexadecimal:** 1B 48**Decimal:** 27 72

Turns off double strike mode on the slip station in **7156 Emulation Mode**.

This command is ignored in the **7158 Native Mode** and 7167 Native Mode.

This command works on both slip and receipt stations.

Example:

MSComm1.Output = Chr\$(&H1B) & Chr\$(&H48)

Select or Cancel Italic Print**ASCII:** ESC I *n***Hexadecimal:** 1B 49 *n***Decimal:** 27 73 *n***Value of *n*:** 0 = Off

1 = On

(When 0 and 1 are the Least Significant Bit, LSB)

Default: 0 (Off)

Turns Italic print mode on or off. This command is only available in **7158 Native Mode** and 7167 Native Mode.. Italic print mode is available for built-in, user-defined characters. This command only works on the receipt station.

Example:

MSComm1.Output = Chr\$(&H1B) & Chr\$(&H49) & Chr\$(*n*)

Exceptions:

Only the lowest bit of *n* is valid. This command is only valid for the receipt station in 7158 Native Mode and 7167 Native Mode..

Select International Character Set**ASCII:** ESC R *n* or ESC t *n***Hexadecimal:** 1B 52 *n* or 1B 74 *n***Decimal:** 27 82 *n* or 27 116 *n*7158 Native Mode and7156 Emulation

7167 Native Mode.

Value of *n*: 0 = Code Page 437 US English 0 = Code Page 437

1 = Code Page 850 Multilingual 1 = Code Page 850

2 = Code Page 852 Slavic

3 = Code Page 860 Portuguese

4 = Code Page 863 French Canadian

5 = Code Page 865 Nordic

6 = Code Page 858 Multilingual with Euro Symbol

7 = Code Page 866 Cyrillic

8 = Code Page 1252 Windows Latin I

9 = Code Page 862 Hebrew

20 = Code Page Katakana

21 = Code Page 874 Thailand

22 = Code Page 864 Arabic

128 = Code Page 932 Kanji²129 = Code Page 936 Simple Chinese¹130 = Code Page Korean¹

² Not supported by 7167-1035 and 7167-2035

131 = Code Page Traditional Chinese¹

Selects the character set to be used. See *Print Specifications* for the character sets.

There are two codes for this command. Both codes perform the same function.

Example:

```
MSComm1.Output = Chr$(&H1B) & Chr$(&H52) & Chr$(n)
```

Related Information:

This command may also be known as Select Character Code Table.

Select Character Code Table

See the previous command, Select International Character Set.

Select or Cancel Unidirectional Printing Mode

ASCII: ESC U *n*

Hexadecimal: 1B 55 *n*

Decimal: 27 85 *n*

Value of *n*: 0 = select bi-directional

1 = select unidirectional

Default: 0 (bi-directional)

Toggles between unidirectional and bi-directional printing on the slip station.

Unidirectional printing increases column alignment and provides higher quality printing.

Printing is normally bi-directional because of the faster speed.

Example:

```
MSComm1.Output = Chr$(&H1B) & Chr$(&H55) & Chr$(n)
```

Select or Cancel 90 Degrees Clockwise Rotated Print

ASCII: ESC V *n*

Hexadecimal: 1B 56 *n*

Decimal: 27 86 *n*

Value of *n*: 0 = Cancel

1 = Set

Default: 0 (Cancel)

Rotates characters 90 degrees clockwise. The command remains in effect until the printer is reset or the Clear Printer (0x10) command is received. See Summary of Rotated Printing in this chapter.

Example:

MSComm1.Output = Chr\$(&H1B) & Chr\$(&H56) & Chr\$(n)

Select Print Color

ASCII: ESC r *n*

Hexadecimal: 1B 72 *n*

Decimal: 27 114 *n*

Value of *n*: 0 = Black

1 = 2nd Color

Default: 0 (Black)

Selects color printing. Color printing is valid for character, graphics, logo, and barcodes.

Example:

MSComm1.Output = Chr\$(&H1B) & Chr\$(&H72) & Chr\$(n)

Exceptions:

The command is valid only for receipt station.

Select or Cancel Upside Down Printing Mode

ASCII: ESC { *n*

Hexadecimal: 1B 7B *n*

Decimal: 27 123 *n*

Value of *n*: 0 = Cancel

1 = Set

Default: 0 (Cancel)

Prints upside-down characters. The character order is inverted in the buffer so text is readable. The command remains in effect until the Rotated Print (1B 12) command is received. Only bit 0 is used. Bits 1-7 are not used. See Summary of Rotated Printing in this document for more information.

Example:

```
MSComm1.Output = Chr$(&H1B) & Chr$(&H7B) & Chr$(n)
```

Exceptions:

The command is valid only at the beginning of a line.

The Rotated Print command (1B 12) cancels this command.

Select Character Size

ASCII: GS ! *n*

Hexadecimal: 1D 21 *n*

Decimal: 29 33 *n*

Value of *n*: 1 - 8 = vertical number of times normal font

1 - 8 = horizontal number of times normal font

Range of *n*: 00 - 07, 10 - 17, ... 70 - 77

Default of *n*: 0

Selects the character height using bits 0 to 2 and selects the character width using bits 4 to 7, as follows:

Character Width Selection		
Hex	Decimal	Width
00	0	1 (normal)
10	16	2 (two times width)
20	32	3 (three times width)
30	48	4 (four times width)
40	64	5 (five times width)
50	80	6 (six times width)
60	96	7 (seven times width)
70	112	8 (eight times width)

Character Height Selection		
Hex	Decimal	Height
00	0	1 (normal)
01	1	2 (two times height)
02	2	3 (three times height)
03	3	4 (four times height)
04	4	5 (five times height)
05	5	6 (six times height)
06	6	7 (seven times height)
07	7	8 (eight times height)

This command is effective for all characters (except for HRI characters).

In Standard Mode, the vertical direction is the paper feed direction, and the horizontal direction is perpendicular to the paper feed direction. However, when character orientation changes in 90 degree clockwise-rotation mode, the relationship between vertical and horizontal directions is reversed.

In Page Mode, vertical and horizontal directions are based on the character orientation. When characters are enlarged with different sizes on one line, all the characters on the line are aligned at the baseline.

The Select Print Mode (1B 21 *n*) command can also select or cancel double-width and double-height modes. However, the setting of the last received command is effective.

Example:

```
MSCComm1.Output = Chr$(&H1D) & Chr$(&H21) & Chr$(n)
```

Exceptions:

If *n* is out of the defined range, this command is ignored. This command is only valid for the receipt station.

This is only available in 7158 Native Mode and 7167 Native Mode..

Select or Cancel White/Black Reverse Print Mode

ASCII: GS B *n*

Hexadecimal: 1D 42 *n*

Decimal: 29 66 *n*

Value of *n*: 0 = Off

Range of *n*: 1 = On(Only the lowest bit is used.)

Default of *n*: 0 – 255

0 (Off)

Turns on White/Black reverse printing mode. This command is only available in 7158 Native Mode and 7167 Native Mode.. In White/Black reverse printing mode, print dots and non-print dots are reversed, which means that white characters are formed by printing a black background. When the White/Black reverse printing mode is selected it is also applied to character spacing which is set by Right-Side Character Spacing (1B 20).

This command can be used with built-in characters and user-defined characters, but does not affect the space between lines.

White/Black Reverse Print Mode does not affect bit image, downloaded bit image, bar code, HRI characters, and spacing skipped by Horizontal Tab (09), Set Absolute Starting Position (1B 24...), and Set Relative Print Position (1B 5C).

White/Black reverse mode has a higher priority than Underline Mode. When Underline Mode is on and White/Black Reverse Print Mode is selected, Underline Mode is disabled, but not canceled.

Example:

```
MSCComm1.Output = Chr$(&H1D) & Chr$(&H42) & Chr$(n)
```

Exceptions:

This command is only valid on the receipt station.

This is only available in 7158 Native Mode and 7167 Native Mode..

Select or Cancel Smoothing Mode

ASCII: GS b *n*

Hexadecimal: 1D 62 *n*

Decimal: 29 98 *n*

This command is ignored.

Example:

```
MSCComm1.Output = Chr$(&H1D) & Chr$(&H62) & Chr$(n)
```

Select Superscript or Subscript Modes

ASCII: US ENQ *n*

Hexadecimal: 1F 05 *n*

Decimal: 31 05 *n*

Value of *n*: 0 = Normal character size

1 = Select subscript size

2 = Select superscript size

Default: 0 (normal size)

Turns superscript or subscript modes on or off. This attribute may be combined with other characters size settings commands (12, 13, 1B 21 *n*, 1D 21 *n*, ...)

This command is only available on the receipt station in [7158](#) Native Mode and 7167 Native Mode..

Example:

```
MSComm1.Output = Chr$(&H1F) & Chr$(&H05) & Chr$(n)
```

Exceptions:

This command is ignored if *n* is out of the specified range.

This is only available in 7158 Native Mode and 7167 Native Mode..

Summary of Rotated Printing

The table shows the combinations of Set/Cancel Upside-Down Print, Set/Cancel Rotated Print (clockwise), and Rotated Print (counterclockwise). Rotated CCW is mutually exclusive with the other two commands. Unintended consequences may result when rotated CCW is mixed with other commands.

The samples of the print show only the normal size characters. Double-wide and double-high characters are printed in the same orientation (double-high characters cannot be printed on the slip station). They may also be mixed on the same line.

Upside Down (1B 7B <i>n</i>)	Rotated CW (1B 56 <i>n</i>)	Rotated CCW (1B 12)	Resulting Output
Canceled	Canceled	Cleared	A B C
Canceled	Set	X	A B C
Set	Canceled	X	A B C
Set	Set	X	A B C
X	X	Set	A B C

Note: The following print modes cannot be mixed on the same line:

1. Standard and compressed pitch
2. Vertical (normal) and rotated
3. Right-side up and upside down
4. Single high (normal) and double high

Graphics Commands

These commands are used to enter and print graphics data and are described in order of their hexadecimal codes.

Download BMP Logo

ASCII: ESC (+*.BMP file data)

Hexadecimal: 1B (+*.BMP file data)

Decimal: 27 (+*.BMP file data)

Value: Maximum width = 576

Maximum height = 512

Enters a BMP file data into RAM or Flash.

This command is used by sending the file data of a monochrome BMP file preceded by a 0 x 1B. The bit map is stored in the printer in the same manner as a down loaded bit image.

The downloaded BMP file can be printed by using the Print Downloaded Bit Image (1D 2F m) command.

Example:

1. MSComm1.Output = Chr\$(&H1B)
2. Open bitmapfile For Binary As filehandle
3. filecontent = Input(LOF(filehandle), filehandle)
4. MSComm1.Output = filecontent & vbLf
5. This last step is to use the print downloaded image command to print

Exceptions:

BMP file images that are not monochrome are ignored. This command is only valid for the receipt station.

This is only available in 7158 Native Mode and 7167 Native Mode..

Related Information:

See 1D 22 n (Select Memory Type to save logos.)

For the 7158 native mode and 7167 Native Mode. of operation, if multiple logos are to be defined and used, this command should be preceded by the Select Current Logo command to define the number by which this downloaded logo is to be referenced.

Select Bit Image Mode

ASCII: ESC * *m n1 n2 d1 ... dn*

Hexadecimal: 1B 2A *m n1 n2 d1 ... dn*

Decimal: 27 42 *m n1 n2 d1 ... dn*

Sets the print resolution and enters one line of graphics data into the print buffer. Excess data is accepted but ignored. Any print command is required to print the data, after which the printer returns to normal processing mode.

See the illustration graphic representation of the bit image.

In 7156 Emulation Mode, slip graphics are only 7-bit (MSB not printed.) In 7158 Native Mode and 7167 Native Mode., slip graphics are 8-bit.

Values:

Receipt Station

Value of <i>m</i>	Mode	No. of Dots (Vertical)	No. of Dots (Horizontal)	Number of Dots/Line
0	8 Dot Single Density	8 (68 DPI)	0-288 (101DPI, 80mm) 0-212 (101DPI, 58mm)	8x288 (80mm) 8x212 (58mm)
1	8 Dot Double Density	8 (68 DPI)	0-576 (101DPI, 80mm) 0-424 (101DPI, 58mm)	8x576 (80mm) 8x424 (58mm)
32	24 Dot Single Density	24 (203 DPI)	0-288 (101DPI, 80mm) 0-212 (101DPI, 58mm)	24x288 (80mm) 24x212 (58mm)
33	24 Dot Double Density	24 (203 DPI)	0-576 (101DPI, 80mm) 0-424 (101DPI, 58mm)	24x576 (80mm) 24x424 (58mm)

Slip Station

Value of m	Mode	No. of Dots** (Vertical)	No. of Dots (Horizontal)	Number of Dots/Line
0	7 Dot Single Density	7 (72 DPI)	224 (69.5 DPI)	7 x 224
1*	7 Dot Double Density	7 (72 DPI)	448 (139 DPI)	7 x 448
32, 33	Not Available on Slip			

In single density, one byte (7 dots) is printed in each full dot column; in double density, one byte is printed in each half/full dot column.

*Adjacent horizontal dots (overlapping dots) are not printed on the slip.

**In 7158 Native Mode and 7167 Native Mode.. There are 8 vertical dots.

Value of n (8-Dot Single-Density Mode)	Value of n (24-Dot Single-Density Mode)	Value of d
$n1 + (256 \times n2)$	$3 \times [n1 + (256 \times n2)]$	Number of Bytes of Data*

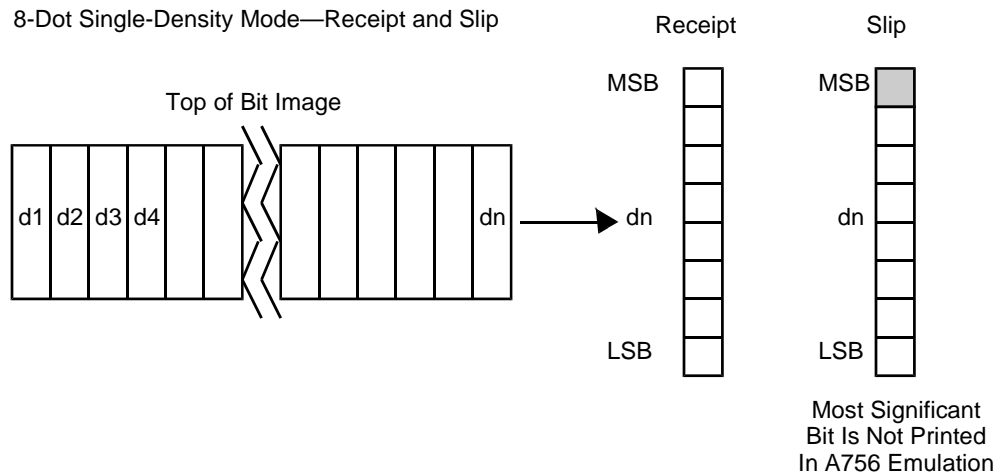
*Printed left to right (8-dot mode); Printed down then across (24-dot mode).

Formulas:

8 Dot Single Density $n1 + (256 \times n2)$

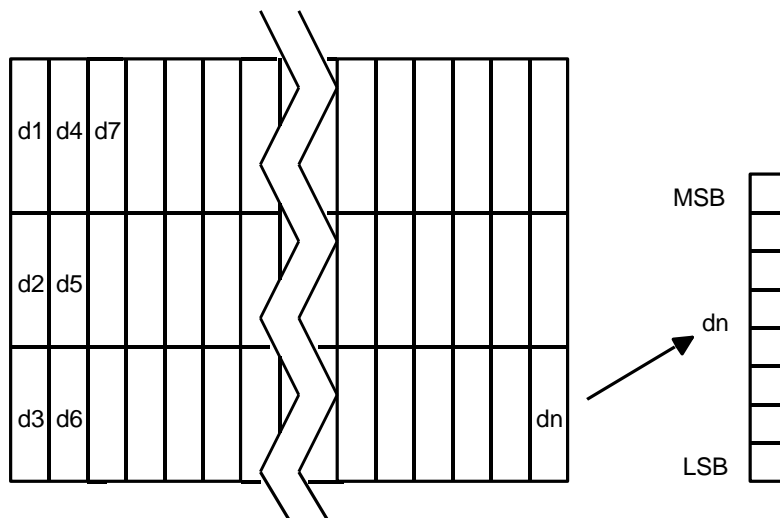
24 Dot Single Density $3 \times [n1 + (256 \times n2)]$

8-Dot Single-Density Mode—Receipt and Slip



24-Dot Single-Density Mode—Receipt Only

Top of Bit Image



Select Double-Density Graphics

ASCII:	ESC Y $n1\ n2\ d1\ \dots\ dn$	or	ESC L $n1\ n2\ d1\ \dots\ dn$
Hexadecimal:	1B 59 $n1\ n2\ d1\ \dots\ dn$	or	1B 4C $n1\ n2\ d1\ \dots\ dn$
Decimal:	27 89 $n1\ n2\ d1\ \dots\ dn$	or	27 76 $n1\ n2\ d1\ \dots\ dn$

Value of n :

Value of n (8-Dot Single Density Mode)	Value of n (24-Dot Single Density Mode)	Value of d
$n1 + (256 \times n2)$	$3 \times [n1 + (256 \times n2)]$	Number of Bytes of Data (Printed Down, Then Across)

Enters one line of 7 (slip in 7156 mode) or 8-dot double-density graphics into the print buffer. Any print command is required to print the line, after which the printer returns to normal processing mode. The number of bytes sent is represented by the formulas in the table.

Each bit corresponds to one horizontal dot. Compare to Set Bit Image Mode (1B 2A, m=1) earlier in this document.

Exception:

1B 4C $n1\ n2\ d1\ \dots\ dn$ is only valid in 7156 Emulation Mode.

Select the Current Logo (Downloaded Bit Image)

ASCII: GS # n

Hexadecimal: 1D 23 n

Decimal: 29 35 n

Range of n : 0 – 255

Selects a logo to be defined or printed. The active logo n remains in use until this command is sent again with a different logo n .

When this command precedes a logo definition, that definition is stored in Flash Memory as logo n . If there is already a different definition in Flash Memory for logo n , the first is inactivated and the new definition is used. The inactive definition is not erased from Flash and continues to take up space in Flash Memory.

When this command precedes a logo print command and n is different from the previously active logo selected, the printer retrieves the logo definition for n from Flash Memory and prints it. If there is no definition for logo n , then no logo is printed.

In the case of a previously existing application that expects only one possible logo, the printer will not receive the Select Current Logo (1D 23 n) command. In this case, the

printer assigns 0 as the active logo identifier. It automatically stores any new logo definition in Flash Memory as logo 0, inactivating any previous logo 0 definition. If the Flash Memory space available for logos fills up with inactive logo 0 definitions, the firmware erases the old definitions at the next power cycle. This is the only case in which the printer erases Flash Memory without an application command.

In the case of a new application using multiple logos, the Select Current Logo (1D 23 *n*) command is used. After that, the printer no longer automatically erases the logo definition Flash Memory page when it fills with multiple definitions. A new application using multiple logos, writing a user-defined character set into Flash Memory, or both, is responsible for erasing the logo and user-defined character set Flash Memory page when the logo area is full or before a new character set is defined.

Example:

```
MSComm1.Output = Chr$(&H1D) & Chr$(&H23) & Chr$(n)
```

Exceptions:

This command is only valid for the receipt station. However, it will be processed correctly regardless of whether the receipt station is currently selected.

Define Downloaded Bit Image

ASCII: GS * *n1 n2 d1 ... dn*

Hexadecimal: 1D 2A *n1 n2 d1 ... dn*

Decimal: 29 42 *n1 n2 d1 ... dn*

Value of *n1*: See the following table.

Value of *n2*: See the following table.

Value of *d*: See the following table.

Value of <i>n1</i>	Value of <i>n2</i>	Value of <i>d</i>
1-72 (8 x <i>n1</i> = Number of Horizontal Dot Columns)	1-64 (Number of Vertical Bytes)*	Bytes of Data (Printed Down Then Across)

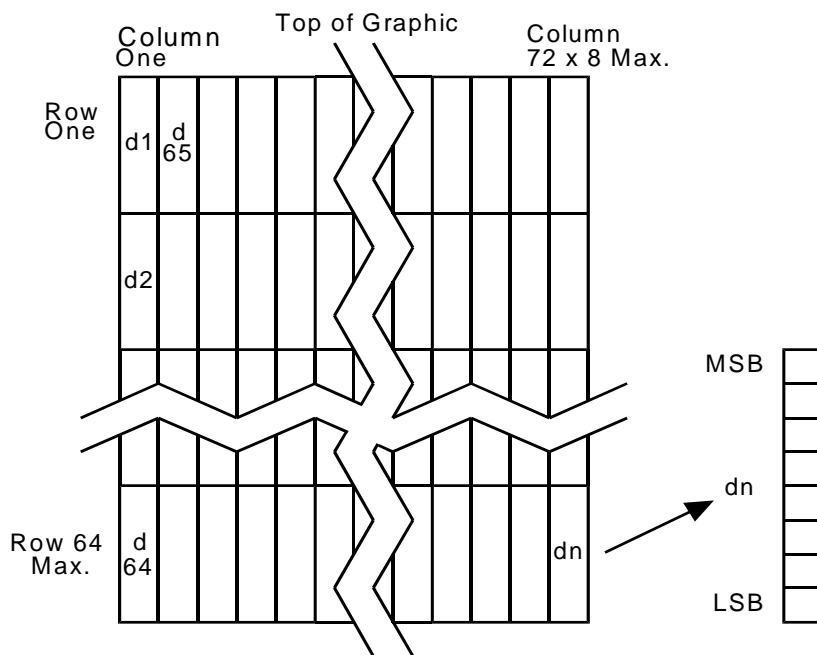
*The number of bytes sent is represented by the following formula:

$n = 8 \times n1 \times n2$ (*n1* x *n2* must be less than or equal to 4608).

Enters a downloaded bit image (such as a logo) into RAM or Flash with the number of dots specified by *n1* and *n2* in 7156 Emulation, unless loaded into Flash. The downloaded bit image is available until power is turned off, another bit image is defined, or either Initialize Printer (1B 40), or Define User-Defined Character Set (1B 26), command is received.

By default, 7156 Emulation loads downloaded bit image to SRAM, while 7158 Native Mode and 7167 Native Mode loads them to Flash.

See the illustration on the following page for a graphic representation of the downloaded bit image.



Exceptions:

See the illustration for the Print Downloaded Bit Image command (1D 2F) for a representation of the bit image.

Related Information:

See 1D 22 n (Select Memory Type to store logos) and 1D 23 n (Select the Current Logo.)

For the 7158 native mode and 7167 Native Mode of operation, if multiple logos are to be defined and used, this command should be preceded by the Slect Current Logo command to define the number by which this downloaded logo is to be referenced.

Print Downloaded Bit Image

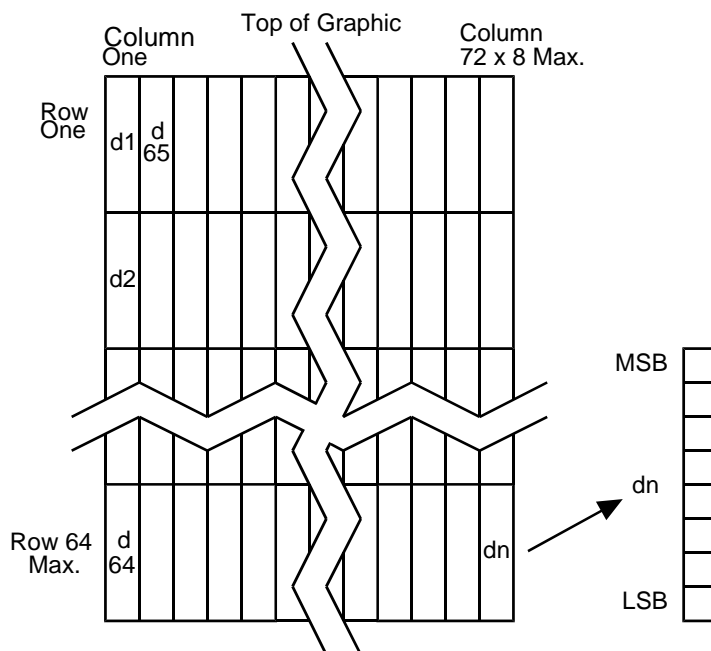
ASCII:	<i>GS / m</i>
Hexadecimal:	1D 2F <i>m</i>
Decimal:	29 47 <i>m</i>
Value and Range of <i>m</i>:	

Value of <i>m</i>	Print Mode	Vertical DPI ¹	Horizontal DPI*
0	Normal	203	203
1	Double Wide	203	101
2	Double High	101	203
3	Quadruple	101	101

¹Dot density measured in dots per inch

Prints a downloaded bit image in RAM or Flash on the receipt station at a density specified by *m*. It is ignored if any data is in the print buffer, if the downloaded bit image is undefined, or if the data defined exceeds one line.

See the illustration for a representation of the bit image.



Example:

```
MSComm1.Output = Chr$(&H1D) & Chr$(&H2F) & Chr$(m)
```

Related Information:

See 1D 22 n (Select Memory Type to store logos) and 1D 23 n (Select the Current Logo.)

Convert 6 Dots/mm Bitmap to 8 Dots/mm Bitmap

ASCII: US EOT *n*

Hexadecimal: 1F 04 *n*

Decimal: 31 04 *n*

Value: 0 = Off

1 = On

Default: 0 (Off)

Selects or cancels 6 dot/mm in 7158 Emulation Mode and 7167 Native Mode.

When the 6 dot/mm emulation is selected, logos and graphics are expanded horizontally and vertically to emulate their size on a 6 dot/mm printer. The horizontal positioning commands also emulate positioning on a 6 dot/mm printer.

Example:

MSComm1.Output = Chr\$(&H1F) & Chr\$(&H04) & Chr\$(n)

Exception:

This command is available in 7158 Native Mode and 7167 Native Mode only.

Status Commands

Status Command Introduction

The 7167 has three methods of providing status to the application. These methods are through Batch Status Commands, Real Time Status Commands, and Unsolicited Status Update. An application may use one or more of these methods to understand the current status of the printer. A brief description of each of these methods follows.

Batch Status Commands – These commands are sent to the printer and stored in the printer's buffer. Once the printer has processed all the previous commands these commands are processed and the proper status is returned to the application. In the event a condition causes the printer to go BUSY, it stops processing commands from the printer buffer. If a Batch Status Command remained in the buffer during this busy condition, it would not be processed. In fact, no Batch Commands are processed while the printer is in this state.

Real-Time Commands – These commands are sent to the printer and are NOT stored in the printer's buffer. Instead, they are acted on immediately (regardless of the printer's BUSY status) and their response (if any) is returned to the application. This gives the application the ability to query the printer when it is in a busy state in order to correct whatever fault has occurred.

Auto Status Back – This mechanism allows the application developer to program the printer to automatically respond with a four byte status when certain conditions in the printer change.

Please see the subsequent sections for a more detailed description of these status commands. At the end of this Status Commands section is a page entitled "Recognizing Data from the Printer". This describes how to interpret what command or setting (in the case of Auto Status Back) triggered a response from the printer.

Batch Mode

For RS-232C printers, these commands enable the printer to communicate with the host computer following the selected handshaking protocol, either DTR/DSR or XON/XOFF. They are stored in the printer's data buffer as they are received, and are handled by the firmware in the order in which they are received.

When a fault occurs, the printer will go busy at the RS-232C interface and not respond to any of the Batch Mode Printer Status commands. If the fault causing the busy condition can be cleared, such as by loading paper, or letting the thermal print head cool down, the printer will resume processing the data in its receive buffer.

Transmit Peripheral Device Status

ASCII: ESC u 0

Hexadecimal: 1B 75 0

Decimal: 27 117 0

	<u>Bit 0</u>	<u>Bit 1</u>
Return Value:	1 = Drawer 1 closed	1 = Drawer 2 closed
	0 = Drawer 1 open	0 = Drawer 2 open
	(Bits 2-7 are not used)	

Transmits current status of the cash drawers. One byte is sent to the host computer. In DTR/DSR protocol the printer waits for DSR = SPACE. If a drawer is not connected, the status will indicate it is closed.

Example:

```
MSComm1.Output = Chr(&H1B) & Chr(&H75) & Chr(&H0)
```

Transmit Printer Status**ASCII:** ESC v**Hexadecimal:** 1B 76**Decimal:** 27 118

Sends status data to the host computer. The printer sends one byte to the host computer when it is not busy or in a fault condition. In DTR/DSR protocol, the printer waits for DSR = SPACE.

Status Byte (RS-232C)

Bit	Function	0 Signifies	1 Signifies
0	Receipt Paper	Ok	Low
1	Receipt Cover or Front Cover	Closed	Open
2	Receipt Paper	Ok	Out
3	Knife or Slip	Ok	Jam
4	Always Zero		
5	Slip Leading Edge Sensor	Not Covered	Covered
6	Slip Trailing Edge Sensor	Not Covered	Covered
7	Thermal Head Temp or Voltage	Ok	Out of Range

Example:

```
MSCComm1.Output = Chr(&H1B) & Chr(&H76)
```

Related Information:

See Real Time Commands, in this document for details about fault condition reporting.

Transmit Printer ID**ASCII** GS I *n***Hexadecimal** 1D 49 *n***Decimal** 29 73 *n***Value of *n*** 1, 49 = Printer model ID

2, 50 = Type ID

3, 51 = ROM version ID

4, 52 = Logo definition

Transmits the printer ID specified by *n* as follows:

N	Printer ID	Specification	ID (hexadecimal)
1, 49	Printer model ID	NCR 7167	0xA1 (7167 Native Mode)
1, 49	Printer model ID	NCR 7158	0x28 (7158 Native Mode)
1, 49	Printer model ID	NCR 7156	0x26 (7156 Emulation)
1, 49	Printer model ID	NCR 7150	0x02 (7150 Mode)
2, 50	Type ID	Installed options	Refer to the table below
3, 51	ROM version ID	ROM version	0x00
4, 52	Logo Definition	Logo Definition	Refer to table below

Type ID (n=2)

Bit	Off/On	Hex	Decimal	Function
0	Off	00	0	No two-byte character code installed.
	On	01	1	Two-byte character code installed.
1	Off	00	0	No knife installed.
	On	02	2	Knife installed.
2	-	-	-	Undefined
3	Off	00	0	No MICR installed.
	On	08	8	MICR installed.
4	Off	00	0	Not used. Fixed to Off.
5	-	-	-	Undefined
6	-	-	-	Undefined
7	Off	00	0	Not used. Fixed to Off.

Type ID (n=4)

Bit	Off/On	Hex	Decimal	Function
0	Off	00	0	No logo definition loaded by application.
	On	01	1	Logo loaded by application.
1	-	-	-	Undefined
2	-	-	-	Undefined
3	-	-	-	Undefined
4	Off	00	0	Not used. Fixed to Off.
5	-	-	-	Undefined
6	-	-	-	Undefined
7	Off	00	0	Not used. Fixed to Off.

Example:

MSCComm1.Output = Chr\$(&H1D) & Chr\$(&H49) & Chr\$(n)

Transmit Printer ID, Remote Diagnostics Extension

ASCII: GS I @ *n*

Hexadecimal: 1D 49 40 *n*

Decimal: 29 73 64 *n*

Values of *n*: Refer to table above

Range of *n*: 32 – 255

(not all defined but reserved)

Performs the remote diagnostic function specified by *n*.

Eighteen remote diagnostic items are defined: eight printer ID items and ten printer tally items. A group of four remote diagnostic functions is assigned to each diagnostic item. Most of the diagnostic items are maintained in non-volatile memory (NVRAM), but some are maintained in read-only memory (ROM).

The table that follows describes the variables.

The first item group in the table includes an example of data to send and to receive. Data sent from the host to write to NVRAM must contain all digits required by the remote diagnostic item. All data must be ASCII. The printer returns all ASCII data. It is preceded by the parameter *n* to identify the diagnostic item and is followed by a Carriage Return (0D) to signify the end of the data.

The command performs the remote diagnostic function specified by *n* as described in the following table.

Value of <i>n</i>			Remote Diagnostic Item	Function
ASC	Hex	Dec		
Space	20	32	Serial #, 10 digit ASCII	Write to NVRAM Example, send 14 bytes to printer: GS I @ 0x20 1234567890
!	21	33	Serial # , 10 digit ASCII	Write to NVRAM, and print on receipt to verify Example, send 14 bytes to printer: GS I @ ! 1234567890 This will print on receipt: Serial # written: 1234567890
"	22	34	Serial #	Not available, cannot clear Serial # item
#	23	35	Serial #	Return Serial #, preceded by <i>n</i> to identify Printer returns 12 bytes in above example: #1234567890<CR>
\$	24	36	Class/model #, 15 digit ASCII	Write to NVRAM
%	25	37	Class/model #	Write to NVRAM, and print on receipt to verify
'	27	39	Class/model #	Return Class/model #, returns 17 bytes
+	2B	43	Boot firmware part #, 12 digit ASCII	Return Boot firmware part #, returns 14 bytes
/	2F	47	Boot firmware CRC, 4 digit ASCII	Return Boot firmware CRC, returns 6 bytes
3	33	51	Flash firmware part #, 12 digit ASCII	Return Flash firmware part #, returns 14 bytes
7	37	55	Flash firmware CRC, 4 digit ASCII	Return Flash firmware CRC, returns 6 bytes
Ç	80	128	Receipt lines tally, 8 digit ASCII numeric, max 99,999,999	Write to NVRAM Example, send 12 bytes to printer: GS I @ Ç00010000 To set receipt lines tally to 10,000
ü	81	129	Receipt lines tally	Write to NVRAM, and print on receipt to verify Example, send 12 bytes to printer: GS I @ ü00010000 This will print on receipt: Receipt tally written: 10,000
é	82	130	Receipt lines tally	Clear receipt lines tally to 0

Value of <i>n</i>			Remote Diagnostic Item	Function
ASC	Hex	Dec		
â	83	131	Receipt lines tally	Return receipt lines tally, preceded by <i>n</i> to identify Printer returns 10 bytes in above example: â00010000<CR>
ä	84	132	Knife cut tally, 8 digit ASCII numeric, max 99,999,999	Write to NVRAM
à	85	133	Knife cut tally	Write to NVRAM, and print on receipt to verify
å	86	134	Knife cut tally	Clear knife cut tally to 0
ç	87	135	Knife cut tally	Return knife cut tally, returns 10 bytes
ê	88	136	Slip character tally, 8 digit ASCII numeric, max 99,999,999	Write to NVRAM
ë	89	137	Slip character tally	Write to NVRAM, and print on receipt to verify
è	8A	138	Slip character tally	Clear slip character tally to 0
ï	8B	139	Slip character tally	Return slip character tally, returns 10 bytes
î	8C	140	MICR read tally, 8 digit ASCII numeric, max 99,999,999	Write to NVRAM
ì	8D	141	MICR read tally	Write to NVRAM, and print on receipt to verify
Ä	8E	142	MICR read tally	Clear MICR read tally to 0
Å	8F	143	MICR read tally	Return MICR read tally, returns 10 bytes
É	90	144	Hours on tally, 8 digit ASCII numeric, max 99,999,999	Write to NVRAM
æ	91	145	Hours on tally	Write to NVRAM, and print on receipt to verify
Æ	92	146	Hours on tally	Clear Hours on tally to 0
ô	93	147	Hours on tally	Return Hours on tally, returns 10 bytes
ù	97	151	Boot firmware version	Return Boot firmware version, returns 6 bytes
ú	A3	163	Flash firmware version	Return Flash firmware version, returns 6 bytes

Value of <i>n</i>			Remote Diagnostic Item	Function
ASC	Hex	Dec		
ñ	A4	164	Flash cycles tally, 8 digit ASCII numeric, max 99,999,999	Write to NVRAM
Ñ	A5	165	Flash cycles tally	Write to NVRAM, and print on receipt to verify
␣	A6	166	Flash cycles tally	Clear Flash cycles cut tally to 0
␣	A7	167	Flash cycles tally	Return Flash cycles cut tally, returns 10 bytes
¿	A8	168	Knife jams tally, 8 digit ASCII numeric, max 99,999,999	Write to NVRAM
␣	A9	169	Knife jams tally	Write to NVRAM, and print on receipt to verify
␣	AA	170	Knife jams tally	Clear Knife jams tally to 0
½	AB	171	Knife jams tally	Return Knife jams tally, returns 10 bytes
¼	AC	172	Cover openings tally, 8 digit ASCII numeric, max 99,999,999	Write to NVRAM
i	AD	173	Cover openings tally	Write to NVRAM, and print on receipt to verify
«	AE	174	Cover openings tally	Clear Cover openings tally to 0
»	AF	175	Cover openings tally	Return Cover openings tally, returns 10 bytes
■	B2	178	Max Temperature tally	Clear Max temp tally
	B3	179	Max Temperature tally	Return Max Temperature tally, returns 10 bytes
⊢	B4	180	Slip lines tally, 8 digit ASCII numeric, max 99,999,999	Write to NVRAM
⊢	B5	181	Slip lines tally	Write to NVRAM, and print on receipt to verify
⊢	B6	182	Slip lines tally	Clear Slip lines tally to 0
⊢	B7	183	Slip lines tally	Return Slip Lines tally, returns 10 bytes

Example:

```
MSComm1.Output = Chr$(&H1D) & Chr$(&H49) & Chr$(&H40) & Chr$(n) & CHR$(&H0D)
```

Transmit Status

ASCII: GS r *n*

Hexadecimal 1D 72 *n*
:

Decimal: 29 114 *n*

Value of *n*: 1, 49 = printer status

2, 50 = cash drawer status

3, 51 = slip paper status

4, 52 = Flash Memory status

Transmits the status specified by *n*. This is a batch mode command which transmits the response after all prior data in the receive buffer has been processed. There may be a time lag between the printer receiving this command and transmitting the response, depending on the receive buffer status.

When DTR/DSR RS232C communications handshaking control is selected, the printer transmits the one byte response only when the host signal DSR indicates it is ready to receive data.

When XON/XOFF RS232C communications handshaking control is selected, the printer transmits the one byte response regardless of the host signal DSR.

The status bytes to be transmitted are described in the following four tables.

Printer Status ($n = 1$ or $n = 49$)

Bit	Off/On	Hex	Decimal	Status for Transmit Status
0	Off	00	0	Receipt paper adequate.
	On	01	1	Receipt paper low.
1	Off	00	0	Receipt paper adequate.
	On	02	2	Receipt paper low.
2	Off	00	0	Receipt paper present.
	On	04	4	Receipt paper exhausted.
3	Off	00	0	Receipt paper present.
	On	08	8	Receipt paper exhausted.
4	Off	00	0	Not used. Fixed to off.
5	Off	00	0	Slip leading edge sensor: paper present
	On	20	32	Slip leading edge sensor: no paper.
6	Off	00	0	Slip trailing edge sensor: paper present
	On	40	64	Slip trailing edge sensor: no paper.
7	Off	00	0	Not used. Fixed to off.

Cash Drawer Status ($n = 2$ or $n = 50$)

Bit	Off/On	Hex	Decimal	Status for Transmit Status
0	Off	00	0	One or both cash drawers open.
	On	01	1	Both cash drawers closed.
1	Off	00	0	One or both cash drawers open.
	On	02	2	Both cash drawers closed.
2	-	-	-	Undefined
3	-	-	-	Undefined
4	Off	00	0	Not used. Fixed to off.
5	-	-	-	Undefined
6	-	-	-	Undefined
7	Off	00	0	Not used. Fixed to off.

Slip Paper Status ($n = 3$ or $n = 51$)

Value of Byte Returned	Slip Status
0	There is no more printing space on the current slip, or the slip paper is not selected.
1 to 8	<p>Remaining print area on the current slip, in number of lines, at the currently set line spacing, when the trailing edge sensor has become uncovered.</p> <p>Until the trailing edge sensor becomes uncovered the value reported will be 6, because there are at least 6 lines remaining.</p> <p>There can be 7 or 8 lines remaining when the slip line spacing has been set to less than 7.2 lines per inch.</p>

Flash Memory Status ($n = 4$ or $n = 52$)

Bit	Off/On	Hex	Decimal	Status for Transmit Status
0	Off	00	0	Undefined. Fixed to off.
1	Off	00	0	Undefined. Fixed to off.
2	Off	00	0	User data storage write successful.
	On	04	4	User data storage write failed. Specified area not erased.
3	Off	00	0	Flash logo area adequate. Definition stored.
	On	08	8	Flash logo area not adequate for recent definition.
4	Off	00	0	Not used. Fixed to off.
5	Off	00	0	No thermal user-defined characters written to Flash
	On	20	32	Thermal user-defined characters written to Flash.
6	Off	00	0	No impact user-defined characters written to Flash.
	On	04	64	Impact user-defined characters written to Flash.
7	Off	00	0	Not used. Fixed to off.

Range of n : 1 – 4
 49 - 52

Example:

MSComm1.Output = Chr\$(&H1D) & Chr\$(&H72) & Chr\$(n)

Exceptions:

When n is out of the specified range, the command is ignored.

Send Printer Software Version**ASCII:** US V**Hexadecimal:** 1F 56**Decimal:** 31 86

The printer returns 8 bytes containing the boot and Flash software version. The first 4 bytes returned are an ASCII string for the boot version. The second 4 bytes are an ASCII string for the boot version. Example: for 1.234.56(8bytes), the boot version is 1.23 and the Flash version is 4.56.

Example:

```
MSComm1.Output = Chr$(&H1F) & Chr$(&H56)
```

Recognizing Data from the Printer

An application sending various Real Time and non-Real Time commands to which the printer responds can determine which command a response belongs to by the table below.

Responses to Transmit Peripheral Device Status (1B 75) and Transmit Paper Sensor Status (1B 76) are non-Real Time responses and will arrive in the order in which they were solicited.

Batch Mode Response		Response Recognized By:									
ASCII	HEX										
ESC u 0	1B 75 0	0	0	0	0	0	0	x	x		Binary
ESC v	1B 76	0	0	0	0	0	x	x	x		Binary
GS I <i>n</i>	1D 49 <i>n</i>	0	x	x	0	x	x	x	x		Binary
GS r <i>n</i>	1D 72 <i>n</i>	0	x	x	0	x	x	x	x		Binary

Real-Time Response		Response Recognized By:									
ASCII	HEX										
GS EOT <i>n</i>	1D 04 <i>n</i>	0	x	x	1	x	x	1	0		Binary
DLE EOT <i>n</i>	10 04 <i>n</i>	0	x	x	1	x	x	1	0		Binary
GS ENQ	1D 05	1	x	x	x	x	x	x	x		Binary
XON		0	0	0	1	0	0	0	1		Binary
XOFF		0	0	0	1	0	0	1	1		Binary

Auto Status Back (ASB)		Response Recognized By:									
ASB Byte 1		0	x	x	1	x	x	0	0		Binary
ASB Bytes 2-4		0	x	x	0	x	x	x	x		Binary

Real Time Commands

These commands provide an application interface to the printer even when the printer is not handling other commands (RS-232C communication interface only):

1. Real Time Status Transmission (GS Sequence and DLE Sequence)
2. Real Time Request to Printer (GS Sequence and DLE Sequence)
3. Real Time Printer Status Transmission

The Batch Mode Printer Status commands are placed in the printer's data buffer as they are received and handled by the firmware in the order in which they are received. If the paper exhausts while printing data that was in the buffer ahead of the status command, the printer goes busy at the RS-232C interface and suspends processing the data in the buffer until paper is reloaded. This is true for all error conditions: knife home error, slip paper jam, thermal print head overheat, etc.

In addition, there is no way to restart the printer after a paper jam, or to cancel a slip waiting condition when using the Wait for Slip command.

The Real Time commands are implemented in two ways to correct these problems. Both implementations offer the same functionality; which one you choose depends on the current usage of your application.

Preferred Implementation

For a new application the GS (1D) sequences are recommended to avoid possible misinterpretation of a DLE (0x10) sequence as a Clear Printer (0x10 0, ASCII DLE NUL) command.

An application using these GS (1D) sequences, does not need to distinguish for the printer between the new real time commands and the Clear Printer command. This implementation is ideal for an existing 7156 application that already uses the Clear Printer command or for a new application being developed.

Alternate Implementation

The alternate implementation uses the DLE (0x10) sequences as implemented on other printers. An application using these DLE (0x10) sequences and the original 7156 Clear Printer command (0x10) must distinguish for the printer between the new real time commands and the Clear Printer command by adding a NUL (0x00) to the Clear Printer command.

An application using these DLE (0x10) sequences must also send the second byte of the sequence within 100 milliseconds of the first, to prevent the first byte being mistaken for a Clear Printer command.

Rules for Using Real Time Commands

Three situations must be understood when using real time commands.

First, the printer executes the Real Time command upon receiving it and will transmit status regardless of the condition of the DSR signal.

Second, the printer transmits status whenever it recognizes a Real Time Status Transmission command sequence, even if that sequence happens to occur naturally within the data of another command, such as graphics data.

In this case the sequence will also be handled correctly as the graphics data it is intended to be when the graphics command is executed from the buffer.

Third, care must be taken not to insert a Real Time command into the data sequence of another command that consists of two or more bytes.

In this case the printer will use the real time command sequence bytes instead of the other command's parameter bytes when finally executing that other command from the buffer; the other command will NOT be executed correctly.

These three situations generally preclude use of standard DOS drivers for the serial communication ports when using real time commands.

Moving Data Through the Buffer

Another consideration is that an application should take care not to let the buffer fill up with real time commands when the printer is busy at the RS-232C interface. A busy condition at the RS-232C interface can be determined by bit 3 of the response to 1D 05 or 1D 04 1 or 10 04 1. The reason for a particular busy condition can be determined by other responses to 1D 04 n or 10 04 n.

Although the printer responds to Real Time commands when it is busy, it will place them into the buffer behind any other data there, and flush them out in the order in which they were received. When the printer is busy due simply to buffer full (that is, it can't print data as fast as it can receive it), then data continues to be processed out of the buffer at approximately print speed and the Real Time commands will eventually get flushed out.

When the printer is busy due to an error condition, then data stops being processed out of the buffer until the condition clears one way or another. In either case, but more quickly in the case of an error condition, the buffer can fill with real time commands.

When the DLE sequences are being used, the last byte stored when the buffer fills up could be the DLE code, with no room for the subsequent EOT or ENQ. When this lone DLE byte is finally processed out of the buffer it will be interpreted as a Clear Printer command.

Similarly, when the GS sequences are being used, the last byte stored when the buffer fills up could be the GS code, with no room for the subsequent EOT or ETX or ENQ. When this lone GS byte is finally processed out of the buffer it will use the next byte, whatever it is, as the second byte in its GS sequence.

To guard against this situation, an application should determine the cause of a busy condition and take appropriate action or pace further real time commands to avoid filling the buffer. There are a minimum of 256 bytes available in the printer's buffer when it goes busy.

Real Time Status Transmission

	<u>GS Sequence</u>	<u>DLE Sequence</u>
ASCII:	GS EOT <i>n</i>	DLE EOT <i>n</i>
Hexadecimal:	1D 04 <i>n</i>	10 04 <i>n</i>
Decimal:	29 4 <i>n</i>	16 4 <i>n</i>
Value of <i>n</i>:	GS/DLE Sequence	
	1 = Transmit printer status	
	2 = Transmit RS-232C busy status	
	3 = Transmit error status	
	4 = Transmit receipt paper status	
	5 = Slip paper status	

Transmits the selected one byte printer status specified by *n* in Real Time according to the following parameters. This command includes two sequences: GS and DLE and using either or will produce the same result.

Example:

```
MSComm1.Output = Chr(&H1D) & Chr(&H04) & Chr(n)
```

Exceptions:

The command is ignored if *n* is out of range.

An application using the DLE sequence must send EOT within 100 milliseconds of DLE or the printer will misinterpret the DLE and execute a Clear Printer command. Avoid this possibility by using the 1D 04 *n* sequence, which is handled exactly the same as 10 04 *n*.

Related Information:

1 = Transmit Printer Status

Bit	Status	Hex	Decimal	Function
0	Off	00	0	Fixed to Off
1	On	02	2	Fixed to On
2	Off	00	0	One or both cash drawers open
	On	04	4	Both cash drawers closed
3	Off	00	0	Not busy at the RS-232C interface
	On	08	8	Printer is Busy at the RS-232C interface
4	On	10	16	Fixed to On
5				Undefined
6				Undefined
7	Off	00	0	Fixed to Off

2 = Transmit RS-232C Busy Status

Bit	Status	Hex	Decimal	Function
0	Off	00	0	Fixed to Off
1	On	02	2	Fixed to On
2	Off	00	0	Both receipt and cassette doors closed
	On	04	4	Receipt or cassette door open
3	Off	00	0	Paper Feed Button is not pressed
	On	08	8	Paper Feed Button is pressed
4	On	10	16	Fixed to On
5	Off	00	0	Printing not stopped due to paper condition
	On	20	32	Printing stopped due to paper condition
6	Off	00	0	No error condition
	On	40	64	Error condition exists in the printer
7	Off	00	0	Fixed to Off

3 = Transmit Error Status

Bit	Status	Hex	Decimal	Function
0	Off	00	0	Fixed to Off
1	On	02	2	Fixed to On
2	Off	00	0	No slip motor or flip jam
	On	04	4	Slip motor or flip jam occurred
3	Off	00	0	No knife error
	On	08	8	Knife error occurred
4	On	10	16	Fixed to On
5	Off	00	0	No unrecoverable error
	On	20	32	Unrecoverable error occurred
6	Off	00	0	Thermal print head temp./power supply voltage are in range
	On	40	64	Thermal print head temp./power supply voltage are out of range
7	Off	00	0	Fixed to Off

4 = Transmit Receipt Paper Status

Bit	Status	Hex	Decimal	Function
0	Off	00	0	Fixed to Off
1	On	02	2	Fixed to On
2	Off	00	0	Receipt paper adequate
	On	04	4	Receipt paper low
3	Off	00	0	Receipt paper adequate
	On	08	8	Receipt paper low
4	On	10	16	Fixed to On
5	Off	00	0	Receipt paper present
	On	20	32	Receipt paper exhausted
6	Off	00	0	Receipt paper present
	On	40	64	Receipt paper exhausted
7	Off	00	0	Fixed to Off

5 = Transmit Slip Paper Status

Bit	Status	Hex	Decimal	Function
0	Off	00	0	Fixed to Off
1	On	02	2	Fixed to On
2	Off	00	0	Slip paper selected
	On	04	4	Receipt paper selected
3	Off	00	0	Not waiting for slip
	On	08	8	Waiting for slip
4	On	10	16	Fixed to On
5	Off	00	0	Slip leading edge sensor: paper preset
	On	20	32	Slip leading edge sensor: no paper
6	Off	00	0	Slip trailing edge sensor: paper preset
	On	40	64	Slip trailing edge sensor: no paper
7	Off	00	0	Fixed to Off

Real Time Request to Printer

	<u>GS Sequence</u>		<u>DLE Sequence</u>
ASCII:	GS ETX <i>n</i>	or	DLE ENQ <i>n</i>
Hexadecimal:	1D 03 <i>n</i>	or	10 05 <i>n</i>
Decimal:	29 3 <i>n</i>	or	16 5 <i>n</i>
Value of <i>n</i>:	1 = Recover and restart		
	2 = Recover and clear buffers		
	3 = Cancel slip waiting		

The printer responds to a request from the host specified by *n*. This command includes two sequences: GS and DLE. The operations performed depend on the value of *n*, according to the following parameters.

***n* = 1:**

Restarts printing from the beginning of the line where an error occurred, after recovering from the error. Print settings that are normally preserved from line to line, such as character height and width, are still preserved with this command. This sequence is ignored except when the printer is busy due to an error condition.

If the receipt is selected, this command will attempt recovery from a knife error. Other errors associated with the receipt, such as paper out or print head overheating, can be recovered from only by clearing the specific condition, such as loading paper or letting the print head cool down.

If the slip is selected, this command will attempt recovery from a slip motor or flip jam by re-homing the print head and waiting for a slip to be inserted before restarting the print. Other errors associated with the slip, such as cassette door open, can be recovered from only by clearing the specific condition, such as closing the cassette door.

$n = 2$:

Recovers from an error after clearing the receive and print buffers. Print settings that are normally preserved from line to line, such as character height and width, are still preserved with this command. This sequence is ignored except when the printer is busy due to an error condition.

If the slip was selected when the error occurred, the receipt becomes selected when the buffers are cleared. When printing on the slip is to continue, the slip must be selected again.

The same error recovery possibilities exist as for $n = 1$.

$n = 3$:

Cancels the slip waiting status. This sequence is ignored except when the printer is waiting for a slip to be inserted.

When slip waiting is canceled, the receive and print buffers are cleared and the receipt is selected. When printing on the slip is to continue, the slip must be selected again.

Example using the GS sequence:

```
MSComm1.Output = Chr(&H1D) & Chr(&H03) & Chr(n)
```

Exceptions:

The command is ignored if n is out of range

An application using the DLE sequence must send ENQ within 100 milliseconds of DLE or the printer will misinterpret the DLE and execute a Clear Printer command. Avoid this possibility by using the 1D 03 n sequence that is handled exactly the same as 10 05 n.

Real Time Printer Status Transmission

ASCII: GS ENQ

Hexadecimal: 1D 05

Decimal: 29 5

Transmits one byte status of the printer in real time.

Value of Byte:

Bit	Status	Hex	Decimal	Function
0	Off	00	0	Receipt paper adequate
	On	01	1	Receipt paper low
1	Off	00	0	Receipt paper adequate
	On	02	2	Receipt paper low
2	Off	00	0	Both receipt and cassette doors closed
	On	04	4	Receipt or cassette door open
3	Off	00	0	Not busy at the RS-232C interface
	On	08	8	Printer is busy at the RS-232C interface
4	Off	00	0	One or both cash drawers open
	On	1	16	Both cash drawers closed
5	Off	00	0	Paper present at both slip sensors
	On	20	32	Paper not present at one or both slip sensors
6	Off	00	0	No error condition
	On	40	64	Error condition exists in the printer
7	On	00	0	Fixed to On

Example:

MSComm1.Output = Chr(&H1D) & Chr(&H05)

Unsolicited Status Update Validation

The Host uses this command to determine if the device supports USU

ASCII: GS *a x*

Hexadecimal: 1D 61 *x*

Decimal: 29 97 *x*

Value of *x* 0 - FF

Response To Host (Hex): 1A, 9F, 1F

If the printer responds to the Unsolicited Status Update Validation message with this 3-byte response message, then the printer firmware supports the Unsolicited Status Update messages. If there is no response, or the printer responds with some other sequence of bytes, then the printer does not support the Unsolicited Status Updates messages.

Enable / Disable Unsolicited Status Update

Tells the printer to start or stop reporting Unsolicited Status Updates.

ASCII: GS US *n*

Hexadecimal: 1D 1F *n*

Decimal: 29 31 *n*

Value of *n* 0 or 1

Where *n* defines the action to be taken by the firmware.

n = 0 – Tell the printer to stop sending Unsolicited Status Updates to the host.

n = 1 – Tells the printer to start sending Unsolicited Status Updates to the host upon change of a sensor or state.

Baseline State Request

This request tells the printer to send an Unsolicited Status Update message for all Sensors and States supported by the firmware. This allows the Application, Driver, or Control to establish an initial picture of the state of the printer.

ASCII: GS DC1 *n*

Hexadecimal: 1D 11 FF *n*

Decimal: 29 17 255 *n*

Value of *n* 0 or 1

Message To Printer (Hex): 1D 1E 1F – Causes the printer to fire off a series of USU messages to the host to establish a baseline.

Unsolicited Messages

The following is the general message structure for the Unsolicited Status Update messages:

The Unsolicited Message will always consist of at least three bytes. The top 4 bits (7, 6, 5, 4) of each byte will be an identifier that when compared to the bytes before and after it will identify the byte as part of the three byte Unsolicited Status Update (USU) message. The remaining 4 bits (3, 2, 1, 0) will contain the information that is being passed to the host from the printer.

The lower 4 bits of the first two bytes when examined as continuous bits of a single number identify the sensor or state for which USU message is reporting a change. The lower 4 bits of the last byte will identify the state that is being reported to the host.

	BIT							
	7	6	5	4	3	2	1	0
Byte (1)	1	0	0	1	x	x	x	x
Byte (2)	1	0	1	0	y	y	y	y
Byte (3)	1	0	1	1	z	z	z	z

The host can determine if any unsolicited 3-byte sequence from the printer is a USU message by checking the upper 4 bits of the three bytes received. If the upper 4 bits match those of the USU message, then the remaining lower 4 bits are to be interpreted as the information bits of a USU message.

The information bits of a USU message are to be interpreted as follows:

The lower 4 bits of Byte (1) and Byte (2) should be combined in the following manner to constitute an identifier value in the range of 0-255. This **identifier** then determines how the host should interpret the **state value** of the lower 4 bits of Byte (3).

Combined Bits from Byte (1) and Byte (2) in high bit to low bit order:

Identifier Value by Bit Definition							
7	6	5	4	3	2	1	0
x	x	x	x	y	y	y	y

Status Update Messages Defined

The following table defines the sensor or state information specified by each identifier value, and the meaning of the information in the lower 4 bits of the 3rd byte for that identifier value. In cases where there are two different messages that refer to the same RTC response bit, separate USU messages should be sent if the printer firmware can distinguish between the events. If the firmware does not have separate sensors, then a USU message should be chosen to send when either event is encountered:

Identifier Value (Hex)	Description of sensor or state RTC Sensor Bit if Applicable for 7167 / 7197 (Note: RTC might be different for other printers)	State Value	Meaning
1	Receipt Paper Exhaust Sensor	1	No paper available for printing
	RTC Response (10 04 04) – Bit 6	0	Paper available for printing
2	Receipt Paper Low Sensor	1	Paper has reach low threshold limit
	RTC Response (10 04 04) – Bit 3	0	Paper has been replenished
3	Journal Paper Exhaust Sensor	1	No paper available for printing
	(Reserved Not Used 7167 / 7197 RTC Response 10 04 04 – Bit 5)	0	Paper available for printing
4	Journal Paper Low Sensor	1	Paper has reach low threshold limit
	(Reserved Not Used 7167 / 7197 RTC Response 10 04 04 – Bit 2)	0	Paper has been replenished
5	Slip leading edge sensor	1	Paper Present
	RTC Response (10 04 05) – Bit 5	0	No Paper
6	Slip trailing edge sensor	1	Paper Present
	RTC Response (10 04 05) – Bit 6	0	No Paper
7	Paper Station Selected	1	Slip Paper Selected
	RTC Response (10 04 05) – Bit 2	2	Receipt Paper Selected
		3	Journal Paper Selected
8	Slip Paper Waiting State	1	Waiting for Slip Paper
	RTC Response (10 04 05) – Bit 3	0	Not waiting for Slip Paper
9	Cash Drawer 1 (Both if printer cannot determine)	1	Drawer Open
	RTC Response (10 04 01) – Bit 2	0	Drawer Closed
A	Cash Drawer 2 (if printer can determined drawer 2)	1	Drawer Open
		0	Drawer Closed
B	RS-232 Interface Status	1	Busy due to Error or Flow Control
	RTC Response (10 04 01) – Bit 3	0	Printer in Normal state
C	Receipt Paper Door on Print Mechanism	1	Door Open
	RTC Response (10 04 02) – Bit 2	0	Door Closed
D	Slip Cassette Door	1	Door Open
	RTC Response (10 04 02) – Bit 2	0	Door Closed
E	Paper Feed Button	1	Pressed
	RTC Response (10 04 02) – Bit 3	0	Not Pressed
F	Print Stopped due to Error Condition	1	Stopped
	RTC Response (10 04 02) – Bit 5	0	Returned to Normal
10	Error Condition	1	Error Detected
	RTC Response (10 04 02) – Bit 6	0	No Error
11	Slip Flip Jam	1	Jam Error on Slip Flip
	RTC Response (10 04 03) – Bit 2	0	Normal State

Identifier Value (Hex)	Description of sensor or state RTC Sensor Bit if Applicable for 7167 / 7197 (Note: RTC might be different for other printers)	State Value	Meaning
12	Slip Motor Jam	1	Motor in Jam state
	RTC Response (10 04 03) – Bit 2	0	Normal State
13	Knife Condition	1	Knife in Error Condition
	RTC Response (10 04 03) – Bit 3	0	Normal State
14	Unrecoverable Error	1	Unrecoverable Error Encountered
	RTC Response (10 04 03) – Bit 5	0	Printer has been Reset
15	Thermal Print Head Temperature	1	Out of operating range
	RTC Response (10 04 03) – Bit 6	0	Normal operating range
16	Power Supply Voltage	1	Out of operating range
	RTC Response (10 04 03) – Bit 6	0	Normal operating range
17	Printer Paper Sensor	1	Paper Present
	RTC Response (10 19 01) – Bit 0	0	No Paper
18	Printer Reset	1	Printer Physical Reset Took Place
	RTC Response (10 19 01) – Bit 6		
19	Presenter Mechanism State	1	Presenter in Error
	RTC Response (10 19 02) – Bit 0	0	Presenter in Normal State
1A	Paper jam status	1	Printer is in Jam State
	RTC Response (10 19 02) – Bit 1	0	Printer in Normal State
1B	Kiosk Door State	1	Door Open
	RTC Response (10 19 02) – Bit 3	0	Door Closed
1C	Black Mark Detection Status	1	Detection Failure
	RTC Response (10 19 02) – Bit 5	0	Normal Status
1D	Print Head Condition	1	Print Head Damaged
	RTC Response (10 19 02) – Bit 6	0	Print Head OK
1E	Flip Mechanism Door State	1	Door Open
	No RTC equivalent	0	Door Closed
FA	Reserved for future use which might include defining additional bytes to extend the message structure beyond the existing 3 bytes.		
FB	Reserved for future use which might include defining additional bytes to extend the message structure beyond the existing 3 bytes.		
FC	Reserved for future use which might include defining additional bytes to extend the message structure beyond the existing 3 bytes.		
FD	Reserved for future use which might include defining additional bytes to extend the message structure beyond the existing 3 bytes.		
FE	Reserved for future use which might include defining additional bytes to extend the message structure beyond the existing 3 bytes.		
FF	Reserved for future use which might include defining additional bytes to extend the message structure beyond the existing 3 bytes.		

Printer Firmware Implementation Considerations

The printer firmware will constantly monitor the states listed above. Once the **Enable USU** command has been received, from that time forward until the **Disable USU** command is received, the printer firmware should transmit a USU message anytime there is a change to a state. When multiple messages need to be transmitted, there should be a delay of at least 100ms between messages.

The current state of the USU mechanism Enabled or Disabled should be maintained in the non-volatile memory. If the printer is reset or power-cycled, and the USU mechanism is in the Enabled state based on the value in non-volatile memory, the printer should transmit the current status of all Sensor and State information in the same manner it does in response to a **Baseline State Request**. This transmission should be performed once the power-up initialization of the printer has been completed, and the communications channel has been established.

The purpose of the transmission after power-up is to handle the case of the printer entering an error state that requires a reset, or power-cycle of the printer to correct it. Unless the current status of Sensor and State information is transmitted to the host, the controlling software on the host might be unaware of any changes in status resulting from the reset or power-cycle. The host software would remain in an error state unless it polled the printer for status information.

Bar Code Commands

These following describes the commands for the printing of bar codes and described in the order of their hexadecimal codes.

Note: 7156 firmware can be set for module widths in bar codes ranging from 2 dots to 4 dots per module (DPM) for the narrow modules. The default is 3 DPM. 7167 firmware ranges from 1 dot per module to 5 dots per module (DPM) printed on the receipt. The default is 2 DPM.

Select Printing Position for HRI Characters

ASCII: GS H *n*

Hexadecimal: 1D 48 *n*

Decimal: 29 72 *n*

Value of *n*: Printing position

0 = Not printed

1 = Above the bar code

2 = Below the bar code

3 = Both above and below the bar code

Default: 0 (Not printed)

Prints HRI (Human Readable Interface) characters above or below the bar code.

Example:

```
MSComm1.Output = Chr$(&H1D) & Chr$(&H48) & Chr$(n)
```

Select Pitch for HRI Characters

ASCII: GS f *n*

Hexadecimal: 1D 66 *n*

Decimal: 29 102 *n*

Value of *n*: Pitch

0 = Standard Pitch at 15.2 CPI on receipt

1 = Compressed Pitch at 19 CPI on receipt

Default: 0 (Standard Pitch at 15.2 CPI)

Selects standard or compressed font for printing Bar Code characters.

When slip is selected as the interface, HRI is always compressed.

Example:

MSComm1.Output = Chr\$(&H1D) & Chr\$(&H66) & Chr\$(*n*)

Select Bar Code Height

ASCII: GS h *n*

Hexadecimal: 1D 68 *n*

Decimal: 29 104 *n*

Value of *n*: Number of dots

Range of *n*: 1 - 255

Default: 162

Sets the bar code height to *n* dots or *n*/8 mm (*n*/203 inch) for receipt or *n*/8.5 mm (*n*/216 inch) for slip.

Example:

MSComm1.Output = Chr\$(&H1D) & Chr\$(&H68) & Chr\$(*n*)

Print Bar Code

	<u>First Variation</u>		<u>Second Variation</u>
ASCII:	GS k <i>m d1...dk</i> NUL	or	GS k <i>m n d1...dn</i>
Hexadecimal:	1D 6B <i>m d1...dk</i> 00	or	1D 6B <i>m n d1...dn</i>
Decimal:	29 107 <i>m d1...dk</i> 0	or	29 107 <i>m n d1...dn</i>

0 = End of command.

Values:

First Variation: String terminated with NUL Character

m = 0 – 6, 10

d = 32 - 126 (see the table)

n = 1 - 255 (see the table)

Selects the bar code type and prints a bar code for the ASCII characters entered. If the width of the bar code exceeds one line, the barcode is not printed.

There are two variations to this command. The first variation uses a NUL character to terminate the string; the second uses a length byte at the beginning of the string to compensate for the Code 128 bar code, which can accept a NUL character as part of the data. With the second variation the length of byte is specified at the beginning of the string.

Fixed-length codes can be aligned left, center, or right using the Align Positions command (1B 61). Variable-length codes are always center aligned in 7156 Emulation. This function is applicable to the receipt station only. Barcodes on the slip station are always right justified.

The check digit is calculated for UPC and JAN (EAN) codes if it is not sent from the host computer. Six-character zero-suppressed UPC-E tags are generated from full 11 or 12 characters sent from the host computer according to standard UPC-E rules. Start/Stop characters are added for Code 39 if they are not included.

<i>m</i>	Bar Code	<i>D</i>	<i>n</i> , Length
0	UPC-A	48- 57 (ASCII numerals)	Fixed Length: 11, 12
1	UPC-E	48- 57	Fixed Length: 11, 12
2	JAN13 (EAN13)	48- 57	Fixed Length: 12, 13
3	JAN8 (EAN8)	48- 57	Fixed Length: 7, 8
4	Code 39	48- 57, 65- 90 (ASCII alphabet), 32, 36, 37, 43, 45, 46, 47 (ASCII special characters) <i>d1 = dk = 42</i> (start/stop code is supplied by printer if necessary)	Variable Length
5	Interleaved 2 of 5 (ITF)	48- 57	Variable Length (Even Number)
6	CODABAR (NW-7)	65- 68, start code 48- 57, 36, 43, 45, 46, 47, 58	Variable Length
10	PDF 417 (7158 Native Mode and 7167 Native Mode)	1-255	Variable Length 7158 Native Mode and 7167 Native Mode

Second Variation: Length of Byte Specified at Beginning of String

m = 65 - 73, 75 (see the table)

d = 0 - 127 (see the table)

n = 1 - 255 (see the table)

The value of *m* selects the bar code system as described in the table. When data is present in the print buffer, the printer processes the data following *m* as normal data.

The variable *d* indicates the character code to be encoded into the specified bar code system. See the table. If character code *d* cannot be encoded, the printer prints the bar code data processed so far, and the following data is treated as normal data.

m	Bar Code	D	n, Length
65	UPC-A	48- 57 (ASCII numerals)	Fixed Length: 11, 12
66	UPC-E	48- 57	Fixed Length: 11, 12
67	JAN13 (EAN13)	48- 57	Fixed Length: 12, 13
68	JAN8 (EAN8)	48- 57	Fixed Length: 7, 8
69	CODE 39	48- 57, 65- 90 (ASCII alphabet), 32, 36, 37, 43, 45, 46, 47 (ASCII special characters) <i>d1 = dn = 42</i> (start/stop code is supplied by printer if necessary)	Variable
70	Interleaved 2 of 5 (ITF)	48- 57	Variable (Even Number)
71	CODABAR (NW-7)	65- 68, start code 48- 57, 36, 43, 45, 46, 47, 58	Variable
72	Code 93	0 - 127	Variable (7158 Native Mode and 7167 Native Mode only)
73	Code 128	0-105 <i>d1 = 103-105</i> (must be a Start code) <i>d2 = 0-102</i> (data bytes) (Stop code is provided by the printer)	Variable
75	PDF417	0 – 255	Variable Length (7158 Native Mode only and 7167 Native Mode)

Example:

```
MSComm1.Output = Chr$(&H1D) & Chr$(&H6B) & Chr$(m) & "123456789012" & Chr$(0)
```

The above command will print the number above or below the bar code, depending on which parameter for m that specify.

Exceptions:

Illegal data cancels this command.

The command is valid only at the beginning of a line.

PDF 417 format cannot be printed on the slip.

Barcodes on the Slip are always right justified.

PDF417 and Code 93 are only available in 7158 Native Mode and 7167 Native Mode.

Select Bar Code Width

ASCII: GS w *n*

Hexadecimal: 1D 77 *n*

Decimal: 29 119 *n*

Value of *n*: 1, 2, 3, 4, 5

Default: 3 for receipt; 2 for slip

Sets the bar code width to *n* dots.

Formulas:

$n + 1/8$ mm ($n + 1/203$ inch) for receipt, $n + 1/5.7$ mm ($n + 1/144$ inch) for slip.

Slip module sizing: *n* must be even (it is rounded up if odd) and the size of modules is $n + 1/5.7$ mm ($n + 1/144$ inch).

Example:

MSCComm1.Output = Chr\$(&H1D) & Chr\$(&H77) & Chr\$(*n*)

Page Mode Commands

Page Mode is one of two modes, which the 7167 printer uses to operate. Standard Mode is typical of how most printers operate by printing data as it is received and feeding paper as the various paper feed commands are received. Page Mode is different in that it processes or prepares the data as a “page” in memory before it prints it. Think of this as a virtual page. The page can be any area within certain parameters that you define. Once the printer receives the (0x0C) command, it prints the page and returns the printer to Standard Mode.

The Select Page Mode command (1B 4C) puts the printer into Page Mode. Any commands that are received are interpreted as Page Mode commands. Several commands react differently when in Standard Mode and Page Mode. The descriptions of these individual commands in this chapter indicate the differences in how they operate in the two modes.

Limitations

Page mode is only implemented on the receipt station in 7158 Native Mode and 7167 Native Mode only.

Print and Return to Standard Mode

ASCII: FF

Hexadecimal: 0C

Decimal: 12

The processed data is printed and the printer returns to Standard Mode. The developed data is deleted after being printed. This command has the same code as the Print and Eject Slip command, which is executed when the printer is not in Page Mode.

Example:

```
MSComm1.Output = Chr$(&H0C)
```

Exceptions:

This command is enabled only in Page Mode.

Cancel Print Data in Page Mode

ASCII: CAN

Hexadecimal: 18

Decimal: 24

Deletes all the data to be printed in the “page” area. Any data from the previously selected “page” area that is also part of the current data to be printed is deleted.

This command has the same code as the Open Form command, which is performed when the printer is not in Page Mode.

Example:

```
MSComm1.Output = Chr$(&H18)
```

Exceptions:

This command is only used in Page Mode.

Print Data in Page Mode

ASCII: ESC FF

Hexadecimal: 1B 0C

Decimal: 27 12

Collectively prints all buffered data in the printing area.

After printing, the printer does not clear the buffered data and sets values for Select Print Direction in Page Mode (1B 54 n) and Set Print Area in Page Mode (1B 57...), and sets the position for buffering character data.

Example:

```
MSComm1.Output = Chr$(&H1B) & Chr$(&H0C)
```

Exceptions:

This command enabled only in Page Mode.

Select Page Mode

ASCII: ESC L

Hexadecimal: 1B 4C

Decimal: 27 76

Switches from Standard Mode to Page Mode. After printing has been completed either by the Print and Return to Standard Mode (FF) command or Select Standard Mode (1B 53) the printer returns to Standard Mode. The developed data is deleted after being printed.

This command sets the position where data is buffered to the position specified by Select Print Direction in Page Mode (1B 54) within the printing area defined by Set Print Area in Page Mode (1B 57).

This command switches the settings for the following commands (which values can be set independently in Standard Mode and Page Mode) to those for Page Mode.

1. Set Right-Side Character Spacing (1B 20)
2. Select 1/6-Inch Line Spacing (1B 32)
3. Set Line Spacing (1B 33)
4. It is possible only to set values for the following commands in Page Mode. These commands are not executed.
5. Select or Cancel 90 Degree Clockwise Rotation (1B 56)
6. Select Justification (1B 61)
7. Select or Cancel Upside Down Printing (1B 7B).
8. Set Left Margin (1D 4C)
9. Set Print Area Width (1D 57)

Example:

```
MSComm1.Output = Chr$(&H1B) & Chr$(&H4C)
```

Exceptions:

The command is enabled only when input at the beginning of a line.

The command is available only when the receipt is selected by Select Paper (1B 63 30).

The command has no effect if Page Mode has previously been selected.

The Select Paper (1B 63 30) command can not be used in Page Mode.

In 7156 Emulation Mode, (1B 4C...) is used for double density graphics.

Select Standard Mode

ASCII: ESC S

Hexadecimal: 1B 53

Decimal: 27 83

Switches from Page Mode to Standard Mode. In switching from Page Mode to Standard Mode, data buffered in Page Mode is cleared, the printing area set by Set Print Area in Page Mode (1B 57) is initialized and the print position is set to the beginning of the line.

This command switches the settings for the following commands (the values for these commands can be set independently in Standard Mode and Page Mode) to those for Standard Mode:

1. Set Right-Side Character Spacing (1B 20)
2. Select 1/6 Inch Line Spacing (1B 32)
3. Set Line Spacing (1B 33)

Standard Mode is automatically selected when power is turned on, the printer is reset, or the Initialize Printer command (1B 40) is used.

Example:

```
MSComm1.Output = Chr(&H1B) & Chr(&H53)
```

Exceptions:

This command is effective only in Page Mode.

Select Print Direction in Page Mode

ASCII: ESC T *n*

Hexadecimal: 1B 54 *n*

Decimal: 27 84 *n*

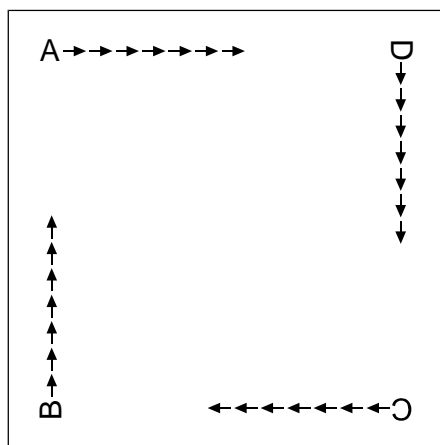
Value of *n*: Start position

- 0 Upper left corner proceeding across page to the right (A)
- 1 Lower left corner proceeding up the page (B)
- 2 Lower right corner proceeding across page to the left (upside down) (C)
- 3 Upper right corner proceeding down page (D)

A, B, C and D note the direction of of print. See illustration.

Selects the printing direction and start position in Page Mode. See the illustration.

The command can be sent multiple times so that several different print areas, aligned in different print directions, can be developed in the printer's page buffer before being printed by the Eject Slip command (0C).



Default: 0 (Upper left corner proceeding across page to the right)

Example:

```
MSComm1.Output = Chr$(&H1B) & Chr$(&H54) & Chr$(n)
```

Exceptions:

This command is valid only in Page Mode.

This command is ignored if the value of n is out of the specified range.

Set Printing Area in Page Mode

ASCII: ESC W $n1, n2 \dots n8$.]

Hexadecimal: 1B 57 $n1, n2 \dots n8$]

Decimal: 27 87 $n1, n2 \dots n8$]

Range: 0 - 255

Default: $n1-4 = 0$

$n5 = 64$

$n6 = 2$

$n7 = 64$

$n8 = 2$

Sets the position and size of the printing area in Page Mode.

The command can be sent multiple times so that several different print areas, aligned in different print directions, can be developed in the printer's page buffer before being printed by the Eject Slip command (0C).

Defaults equal an origin of 0,0 and a size of 576x576. This command is allowed in any mode.

Formulas:

The starting position of the print area is the upper left of the area to be printed ($x0, y0$). The length of the area to be printed in the y direction is set to dy inches. The length of the area to be printed in the x direction is set to dx inches. Use the equations to determine the Value of $x0, y0, dx$, and dy .

See the illustration for a graphic representation of the printing area. For more information about the fundamental calculation pitch, see the Set Fundamental Calculation Pitch command (1D 50).

1. $x0 = [(n1 + n2 \times 256) \times (\text{horizontal direction of the fundamental calculation pitch})]$
2. $y0 = [(n3 + n4 \times 256) \times (\text{vertical direction of the fundamental calculation pitch})]$
3. $dx = [(n5 + n6 \times 256) \times (\text{horizontal direction of the fundamental calculation pitch})]$
4. $dy = [(n7 + n8 \times 256) \times (\text{vertical direction of the fundamental calculation pitch})]$
5. Keep the following notes in mind for this command.

6. The fundamental calculation pitch depends on the vertical or horizontal direction.
7. The maximum printable area in the x direction is 576/203 inches.
8. The maximum printable area in the y direction is 2000/203 inches.

First the printer must be set to page mode, then the following command should be sent.

Example:

```
MSCComm1.Output = Chr$(&H1B) & Chr$(&H57) & Chr$(&H40) & Chr$(&H0) & Chr$(&H40) &
Chr$(&H0) & Chr$(&H40) & Chr$(&H1) & Chr$(&H40) & Chr$(&H1)
```

Exception:

This command is effective only in Page Mode.

Set Absolute Vertical Print Position in Page Mode

ASCII: GS \$ *nL nH*

Hexadecimal: 1D 24 *nL nH*

Decimal: 29 36 *nL nH*

Formulas:

$[(nL + nH \times 256) \times (\text{vertical or horizontal motion unit})]$ inches.

Sets the absolute vertical print starting position for buffer character data in Page Mode.

The vertical or horizontal motion unit for the paper roll is used and the horizontal starting buffer position does not move.

The reference starting position is set by Select Print Direction in Page Mode (1B 54). This sets the absolute position in the vertical direction when the starting position is set to the upper left or lower right; and sets the absolute position in the horizontal direction when the starting position is set to the upper right or lower left. The horizontal and vertical motion unit are specified by the Set Horizontal and Vertical Minimum Motion Units (1D 50) command.

The Set Horizontal and Vertical Minimum Motion Units (1D 50) command can be used to change the horizontal and vertical motion unit. However, the value cannot be less than the minimum horizontal movement amount, and it must be in even units of the minimum horizontal movement amount.

Example:

```
MSCComm1.Output = Chr$(&H1D) & Chr$(&H24) & Chr$(nL) & Chr$(nH)
```

Exceptions:

This command is effective only in Page Mode. If the $[(nL + nH \times 256) \times (\text{vertical or horizontal motion unit})]$ exceeds the specified printing area, this command is ignored.

Set Relative Vertical Print Position in Page Mode

ASCII: GS \ *nL nH*

Hexadecimal: 1D 5C *nL nH*

Decimal: 29 92 *nL nH*

Sets the relative vertical print starting position from the current position. This command can also change the horizontal and vertical motion unit. The unit of horizontal and vertical motion is specified by this command.

This command functions as follows, depending on the print starting position set by Select Print Direction in Page Mode (1B 54):

When the starting position is set to the upper left or lower left of the printing area, the vertical motion unit (*y*) is used.

When the starting position is set to the upper right or lower left of the printing area, the horizontal motion unit (*x*) is used.

Value:

The value for the horizontal and vertical movement cannot be less than the minimum horizontal movement amount, and must be in even units of the minimum horizontal movement amount.

Formulas:

The distance from the current position is set to $[(nL + nH \times 256) \times \text{vertical or horizontal motion unit}]$ inches. The amount of movement is calculated only for the receipt.

When pitch *n* is specified to the movement downward:

$$nL + nH \times 256 = n$$

When pitch *n* is specified to the movement upward (the negative direction), use the complement of 65536.

When pitch *n* is specified to the movement upward:

$$nL + nH \times 256 - 65536 = N$$

Exceptions:

This command is used only in Page Mode, otherwise it is ignored.

Any setting that exceeds the specified printing area is ignored.

Example:

MSComm1.Output = Chr\$(&H1D) & Chr\$(&H5C) & Chr\$(nL) & Chr\$(nH)

Macro Commands

These commands are used to select and perform a user-defined sequence of printer operations.

Start or End Macro Definition

ASCII: GS :

Hexadecimal: 1D 3A

Decimal: 29 58

Starts or ends macro definition. Macro definition begins when this command is received during normal operation and ends when this command is received during macro definition. The macro definition is cleared, during definition of the macro, when the Execute Macro (1D 5E) command is received.

Normal printing occurs while the macro is defined. When the power is turned on the macro is not defined.

The defined contents of the macro are not cleared by the Initialize Printer (1B 40), thus, the Initialize Printer (1B 40) command may be used as part of the macro definition.

If the printer receives a second Select or Cancel Macro Definition (1D 3A) command immediately after previously receiving a Select or Cancel Macro Definition (1D 3A) the printer remains in the macro undefined state.

Formulas:

The contents of the macro can be defined up to 2048 bytes.

Example:

MSComm1.Output = Chr\$(&H1D) & Chr\$(&H3A)

Exceptions:

If the macro definition exceeds 2048 bytes, excess data is not stored.

This command is available in 7158 Native Mode and 7167 Native Mode only.

Execute Macro**ASCII:** GS ^ r t m **Hexadecimal:** 1D 5E r t m **Decimal:** 29 94 r t m **Value of r :** The number of times to execute the macro.**Value of t :** The waiting time for executing the macro.**Value of m :** Macro executing mode

0 (Bit0): The Macro executes r times continuously with waiting time specified by t .

1 (Bit0): The printer waits for feed button to be pressed after waiting for the period specified by t . If the button is pressed, the printer executes the macro once. The printer repeats the operation r times.

Executes a macro. After waiting for a specified period the LED indicators blink and the printer waits for the Paper Feed Button to be pressed. After the button is pressed, the printer executes the macro once. The printer repeats this operation the number of specified times.

When the macro is executed by pressing the Paper Feed Button ($m = 1$), paper cannot be fed by using the Paper Feed Button.

Formulas:

The waiting time is $t \times 100$ msec for every macro execution.

m specifies macro executing mode when the LSB (Least significant bit) $m = 0$

The macro executes r times continuously at the interval specified by t when the LSB (Least significant bit) of $m = 1$.

Example:

MSCmm1.Output = Chr\$(&H1D) & Chr\$(&H5E) & Chr\$(r) & Chr\$(t) & Chr\$(m)

Exceptions:

If this command is received while a macro is being defined, the macro definition is aborted and the definition is cleared.

If the macro is not defined or if r is 0, nothing is executed.

This command is available in 7158 Native Mode and 7167 Native Mode only.

MICR Commands

MICR Reading

These commands control the Magnetic Ink Character Recognition (MICR) check reader, including how it parses the character strings on checks.

The section, MICR Parsing, describes how to create a parsing format and how to create and maintain an Exceptions table.

Read MICR Data and Transmit

ASCII: ESC w 1

Hexadecimal: 1B 77 01

Decimal: 27 119 1

Default: All data returned

Reads and transmits the MICR data and adds a Carriage Return (0x0D). If no parsing format is selected with either of the Define Parsing Format commands (see below), all data will be returned, which is the default.

Example:

MSComm1.Output = Chr(&H1B) & Chr(&H77) & Chr(&H01)

Reread MICR Data

ASCII: ESC w R

Hexadecimal: 1B 77 52

Decimal: 27 119 82

Resends the previously decoded MICR data to the host.

Example:

MSComm1.Output = Chr(&H1B) & Chr(&H77) & Chr(&H52)

MICR Parsing

This section describes MICR parsing in detail and includes several examples of useful parsing variations. It also describes how to create a parsing format and how to create and maintain an exception table.

Define Parsing Format, Save in NVRAM

ASCII: ESC w P *d1 d2 ... dn* CR

Hexadecimal: 1B 77 50 *d1 d2 ... dn* 0D

Decimal: 27 119 80 *d1 d2 ... dn* 13

Defines and saves parsing format. See Parsing Parameter String Options in this document. Send with this command the parse data that is to be the default parse string at printer power-up. If no parameters are selected, parsing is not performed.

d1 through *dn* are the parse string. The string must be CR terminated. If the string has invalid characters in it or is too long, the printer will store a null string, and raw MICR data will be returned.

See sample parsing examples

Define Parsing Format, Do Not Save Permanently

ASCII: ESC w p *d1 d2 ... dn* CR

Hexadecimal: 1B 77 70 *d1 d2 ... dn* CR

Decimal: 27 119 112 *d1 d2 ... dn* CR

Defines, but does not save parsing format. See Parsing Parameter String Options in this document. Send this command as often as desired to change the previous parse format string. The data sent with 1B 77 50 will be restored at power-up.

d1 through *dn* are the parse string. The string must be CR terminated. If the string has invalid characters in it or is too long, the printer will store a null string, and raw MICR data will be returned.

See examples of parsing

Exceptions:

If no parameters are selected, parsing is not performed.

Parsing Parameter String Options

Variable Length Fields

Variable Length Field Name	Selector	Comments
Transit Number	T	Full 9 digit routing/transit number
Bank Number	B	Digits 4-8 of transit number
Check Digit	D	Digit 9 of transit number
Account Number	A	
Check Serial Number	C	Separate from account number
Amount	\$	This field may not be present or readable

Variable Length Field Optional Modifiers

	Selector	Comments
Zero fill to length	0	ASCII zero preceding maximum length
Maximum length	nn	1- or 2-digit ASCII number
Remove space/dash	X	
Replace space/dash with 0	x	

Examples of Variable Length Field Format Specifications

Account #, all characters in the field, keep spaces and dashes	A
Account #, all characters in the field, replace spaces and dashes	xA
Account #, maximum 12 characters, keep spaces and dashes	12A
Account #, always 12 characters zero filled, remove spaces and dashes	012XA

Other Parameters

Error Number	E	One Digit Returned
	0	Read OK
	1	Read error: bad character, empty field invalid length, check digit invalid
Status	S	Two Digits Returned
	00	No error
	01	No MICR data
	09	Mexican check
	08	Canadian check
	05	Error in transit number
	07	Error in account number
	04	Error in check serial number
	10	Business or commercial check
	11	Amount field present

Field Separator 'x'		
Field separator preceded by a single quote, so a field separator of the letter A would be sent as 'A (0x27 0x41).		
If a Carriage Return is specified as a separator (0x27 0x0D), a final Carriage Return must still terminate the parsing parameter string.		
Country Code	Un	One Digit Returned
	N	returned if US check
	Nothing	returned if not US check
Country Code	Km	One Digit Returned
	M	returned if Canadian check
	Nothing	returned if not Canadian check
Check Type	L	One Digit Returned
	1	Personal check
	2	Business or commercial check

Ten parameters are more than enough to specify all variable length fields with a field separator each and other status information that may be helpful to an application. More than 10 parameters are not recommended because they use up space in non-volatile memory (NVRAM) available for the exception table.

The parsing parameter string is stored packed in NVRAM starting at word 10, with the total byte length stored in the high order byte of word 10. While most parameters take two bytes of NVRAM, the following parameters take only one byte: B, D, E, S, L. None of the parsing examples in the following section take more than 14 bytes (seven words) of NVRAM.

The exception table starts at word 20. If the parsing parameter string extends into word 20, then the first exception table entry is unavailable.

Sample Parsing Formats

The following strings show various sample formats that you can use assuming they meet your parsing format needs. Included with the sample format is a description of the data that is returned to the application.

ESC w p 18 A <CR>

Maximum 18 characters in the account number

Final Carriage Return

ESC w p 18 X A <CR>

Maximum 18 characters in the account number with spaces and dashes removed

Final Carriage Return

ESC w p 18 x A <CR>

Maximum 18 characters in the account number with spaces and dashes replaced with 0

Final Carriage Return

ESC w p 018 A <CR>

Always 18 characters in the account number (high order zero-filled if necessary)

Final Carriage Return

ESC w p 018 X A <CR>

Always 18 characters in the account number with spaces and dashes removed

Final Carriage Return

ESC w p 018 x A <CR>

Always 18 characters in the account number with spaces and dashes replaced with 0

Final Carriage Return

ESC w p T 18 X A 04C <CR>

All characters in the transit number

All characters in the account number (up to 18) with spaces and dashes removed

Always four characters in the check number (zero-filled if check number is only three characters long)

Final Carriage Return

ESC w p K9 X T 18 X A 04C <CR>

Canadian check: dash in transit number removed; "9" inserted at beginning, resulting in a fully numeric nine character transit number

All nine characters in the transit number (because there are no dashes)

All characters in the account number (up to 18) with spaces and dashes removed

Always four characters in the check number (zero-filled if check number is only three characters long)

Final Carriage Return

ESC w p T ' A ' C ' S <CR>

All characters in the transit number

Field separator: /

All characters in the account number

Field separator: /

All characters in the check number

Field separator: /

Two-digit status

Final Carriage Return

Notes

All parameters are ASCII characters, i.e. greater than or equal to 0x20, with the exception of a non-ASCII character enclosed in single quotes as a field separator. This applies both to parameter specifications sent from application to printer, and to MICR data returned from printer to application.

Parameters are positional; their order in the parameter string is the order in which the parsed MICR data will be returned. Unrecognized parameters will be ignored, and processing of the parsing parameters will stop. Any data remaining after the unrecognized parameter will be treated as normal input data.

If parameters are not defined (for example, 1B 77 50 <CR> or 1B 77 70 <CR>) parsing is not selected. One status byte followed by all decoded MICR characters will be returned. This is the default parsing format if no other is selected:

Status	Status Byte Value
Good read, data follows	0x00
Bad read, data follows	0x01
No check present, no data	0x02
Paper jam, no data	0x03
No MICR characters, no data	0x04

MICR Characters	ASCII	Hexadecimal
Numerics	0...9	0x30...0x39
Unrecognized Character	?	0x3F
Space		0x20
Amount symbol	&	0x26
Dash symbol	'	0x27
"on us" symbol	(0x28
Transit symbol)	0x29

Once a parsing format is specified, the following values are returned:

MICR Characters	ASCII	Hexadecimal
Numerics	0...9	0x30...0x39
Space		0x20
Dash	-	0x2D
Field separator*		
Country code*		

*As specified in the parsing parameter string

Check Serial Number

Parsing the Check Serial Number

Most banks print the check serial number in three easily recognizable spots. The printer firmware will look for the number in these spots, using the following ordered algorithm. The examples use letters to represent symbols on the check:

- t Transit symbol
- o "on us" symbol
- \$ Amount symbol
- Dash
- c Check serial number
- x Any other number

A number bracketed by "on us" symbols in the auxiliary "on us" field is the check serial number.

```
oooooooo txxxxxxxxxt xxxxxxxxo
```

Otherwise, a three or more digit number to the right of the rightmost "on us" symbol, and to the left of the leftmost amount symbol if an amount field is present, is the check serial number.

```
txxxxxxxxxt xxxxxxxxo cccc
txxxxxxxxxt xxxxxxxxo cccc $xxxxxx$
```

If both of these searches fail to produce the check serial number, extract the whole account number field from between the rightmost transit symbol and the rightmost "on us" symbol. A three, four, or five-digit number to the right of the rightmost transit symbol, separated by a space or a dash from the rest of the account number is the check serial number.

```
txxxxxxxxxt cccc xxxxxxxxo
txxxxxxxxxt cccc-xxxxxxxo
txxxxxxxxxt cccc xxxxxxxxo xx
```

If all of these searches fail to produce the distinct check serial number, and the check serial number field has been specified in the parsing parameter string options, no check serial number will be returned. If it is imbedded within the account number field, it will be returned as part of that variable length field.

Exceptions

Some banks print the check serial number in a location that cannot be electronically distinguished without specific exception information, although it can be visually distinguished because it is repeated in the upper right corner of the check. For these cases, the printer can hold up to nine exceptions for specific banks in its non-volatile memory (NVRAM), which is accessed by the read and write NVRAM commands. The specific bank is picked out by its transit number, and the firmware will look in the exception table for a transit number match before looking in the normal check serial number locations.

In this example, without an exception table entry, the firmware would always pick the rightmost four-digit number as the check serial number following rule two above. The bank with the three digit check serial number and the four digit extension after the “on us” symbol would need to be exceptionally recognized:

```
txxxxxxxxxt ccc-xxxxxxxxxxxxxxx
txxxxxxxxxt xxx-xxxxxxxxxxxxccc
```

In this example, without an exception table entry, the firmware would not be able to pick out the check serial number because it is not separated from the rest of the account number:

```
txxxxxxxxxt cccxxxxxxxxxxxxxo
```

In this example, without an exception table entry, the firmware would not be able to pick out the check serial number correctly, because it is imbedded within the rest of the account number:

```
txxxxxxxxxt xxx-ccc-xxxxxxxxxxxo
```

Loading the Exception Table

The exception table begins at word 20 in NVRAM. Each entry takes five words. There is room for eight exceptions with a sumcheck written in the last word. An application can load local exceptions into the printer using the write NVRAM command:

```
0x1B 0x73 n1 n2 k
```

which writes the two byte word n1:n2 to word k in NVRAM.

Exception Table Entry Format

Each exception table entry consists of five words. The first two words contain the first eight characters of the transit number by packing the low order nibble of the numeric transit number characters. For Canadian checks, eliminate the dash and store the eight numerics.

The next three words are used as six individual bytes to tell the firmware how to interpret the MICR characters that fall to the right of the rightmost transit symbol. Each of the six bytes is positional and consists of two parts: character type and number.

The three high order bits of each byte mark the character type. The characters can be marked in three ways: check serial # character, account # character, or “skip this character or symbol.”

The five low order bits of each byte contain the number of characters of that type to extract. Most exceptions will not need to use all six bytes; in that case clear the unused bytes to zero.

Bits within Byte	7	6	5	4	3	2	1	0
check serial # character string	0	0	1	n	n	n	n	n
account # character string	0	1	0	n	n	n	n	n
character string to ignore	1	0	0	n	n	n	n	n

Example 1

t123456780t12349876543210o 1234 is the check serial #
9876543210 is the account #

To load the second table entry, which starts at word 25, the transit number 123456780 would be stored in the first two words of its table entry using this string of commands:

```
0x1B 0x73 0x12 0x34 25
0x1B 0x73 0x56 0x78 26
```

After the right transit symbol are immediately the four characters of the check serial #, followed immediately by the ten characters of the account number. These would be bitwise encoded as:

001 00100 (check #, four characters)
and 010 01010 (account #, 10 characters)

then stored in the other three words of the table entry using:

```
0x1B 0x73 0x24 0x4A 27
0x1B 0x73 0x00 0x00 28
0x1B 0x73 0x00 0x00 29
```

Example 2

t22137-632t001 6042202o927540 2754 is the check serial #
6042202 is the account #

To load the third table entry, which starts at word 30, the transit number 2137-632 would be stored in the first two words of its table entry using this string of commands:

```
0x1B 0x73 0x22 0x13 30
0x1B 0x73 0x76 0x32 31
```

After the right transit symbol are four characters to skip, a seven digit account number, two characters to skip, and finally a four digit check serial #. The final character to skip need not be encoded. These would be bitwise encoded as:

```

1 0 0 0 0 1 0 0 (skip four characters)
0 1 0 0 0 1 1 1 (account #, seven characters)
1 0 0 0 0 0 1 0 (skip two characters)
0 0 1 0 0 1 0 0 (check #, four characters)

```

then stored in the other three words of the table entry using:

```
0x1B 0x73 0x84 0x47 32
0x1B 0x73 0x82 0x24 33
0x1B 0x73 0x00 0x00 34.
```

Maintaining the Exception Table

Present contents of the exception table can be examined using the read NVRAM command:

0x1B 0x6A k

which reads and returns word k in NVRAM. When the exception table is full, a new entry can replace an older, less frequently used entry, by merely rewriting the words for that table entry.

Check Flip Command

Check Flip Command

ASCII: ESC w F

Hexadecimal: 1B 77 46

Decimal: 27 119 70

Causes a check on the slip table to be fed into the printer, flipped and left with the trailing edge of the check in the slip feed rollers. Prior to the flip, the check is measured to see that it is of an appropriate size (see Appendix B) to be flipped. If not, the check is fed back to the user.

Example:

MSComm1.Output = Chr\$(&H1B) & Chr\$(&H77) & Chr\$(&H46)

Exception:

This command is available only in 7158 Native Mode and 7167 Native Mode.

User Data Storage Commands

Write to User Data Storage

ASCII: ESC ' m a0 a1 a2 d1 ... dm

Hexadecimal: 1B 27 m a0 a1 a2 d1 ... dm

Decimal: 27 39 m a0 a1 a2 d1 ... dm

Value of m: 0 – 255

Writes m bytes of data to the User Data Storage Flash Page at the address specified. The printer waits for m bytes of data following the 3-byte address, addr.

If any of the memory locations addressed by this command are not currently erased, the command is not executed.

Example:

```
MSComm1.Output = Chr$(&H1B) & Chr$(&H27) & Chr$(&H5) & Chr$(&H0) & Chr$(&H0) &  
Chr$(&H0) & "Hello"
```

The above command writes the word 'Hello' to the User Data Storage Flash Page.

Read from User Data Storage

ASCII: ESC 4 *m a0 a1 a2*

Hexadecimal: 1B 34 *m a0 a1 a2*

Decimal: 27 52 *m a0 a1 a2*

Value of *m*: 0 – 255

Reads *m* bytes of data from the User Data Storage Flash Page at the address specified.

Example:

```
MSComm1.Output = Chr$(&H1B) & Chr$(&H34) & Chr$(&H5) & Chr$(&H0) & Chr$(&H0) &  
Chr$(&H0)
```

Read from Non-Volatile Memory

ASCII: ESC j *k*

Hexadecimal 1B 6A *k*
:

Decimal: 27 106 *k*

Range of *k*: 20 – 63 (decimal)

Reads a two-byte word from location *k* in the history EEROM. The printer returns the word at the next available opportunity.

Example:

MSCComm1.Output = Chr\$(&H1B) & Chr\$(&H6A) & Chr\$(*k*)

Write to Non-Volatile Memory (NVRAM)

ASCII: ESC s *n1 n2 k*

Hexadecimal: 1B 73 *n1 n2 k*

Decimal: 27 115 *n1 n2 k*

Value of *n1*: 1st Byte

Value of *n2*: 2nd Byte

Range of *k*: 20 - 63 (decimal)

Writes the two-byte word, *n1 n2*, to location *k* in history EEROM.

Example:

MSCComm1.Output = Chr\$(&H1B) & Chr\$(&H73) & Chr\$(*n1*) & Chr\$(&H*n2k*)

Select Memory Type (SRAM/Flash) Where to Save Logos or User-Defined Fonts

ASCII: GS " *n*

Hexadecimal: 1D 22 *n*

Decimal: 29 34 *n*

Value of *n*: 48 - 51

Specifies whether to load the logos or user-defined characters to Flash Memory or to RAM (volatile memory). The selection remains in effect until it is changed via this command or until the power cycles.

n = 48 (ASCII *n* = 0)

Loads active logo to RAM only. This is used to print a special logo but not have it take up Flash Memory. A logo defined following this command is not preserved over a power cycle.

n = 49 (ASCII *n* = 1)

Loads active logo to Flash Memory. This is the default condition for logo Flash storage. A logo defined following this command is stored in Flash Memory.

n = 50 (ASCII *n* = 2)

Loads user-defined characters to RAM only. This is the default condition for user-defined character storage. Any user-defined characters defined following this command are not preserved over a power cycle.

n = 51 (ASCII *n* = 3) Loads user-defined characters to Flash Memory. An application must use this command to store user-defined characters in Flash Memory. Any user-defined characters defined following this command are stored in Flash Memory. A user-defined character cannot be redefined in Flash Memory. The Flash Memory page must be erased by an application before redefining user-defined characters. For more information, see the Erase User Flash Sector (1D 40 *n*) command.

Example:

```
MSComm1.Output = Chr$(&H1D) & Chr$(&H22) & Chr$(n)
```

Flash Allocation**ASCII:** GS " U *n1 n***Hexadecimal:** 1D 22 55 *n1 n2***Decimal:** 29 34 85 *n1 n2***Default Value** 1 (see below)
of *n1*:**Default Value** 1 (see below)
of *n2*:

n1 is the number of 64k sectors used for logos and user-defined characters.

n2 is the number of 64k sectors used for user data storage.

This command sets the allocation of Flash sectors between user data storage and logos/user-defined characters. This allocation is saved in the EEPROM of the printer and is therefore saved across power cycles.

$n1 + n2 \leq 6$ (3M)

The 7167 has been configured at the factory with 2M of Flash memory. If $n1 + n2$ is greater than the maximum number of sectors available, the command is ignored. Reissuing this command with different parameters will erase all sectors.

Example:

MSComm1.Output = Chr\$(&H1D) & Chr\$(&H22) & Chr\$(&H55) & Chr\$(&Hn1) & Chr\$(Hn2)

Exception:

This command is available only in 7158 Native Mode and 7167 Native Mode.

Erase User Flash Sector

GS @ *n*

ASCII:

Hexadecimal: 1D 40 *n*
Decimal: 29 64 *n*
Value of *n*: 49 - 50

Erases a page of Flash Memory and sends a carriage return when the operation is complete.

n = 49 (ASCII *n* = 1)

This command erases all sectors available for user-defined characters and multiple logos. The page should be erased in two situations: when the logo definition area is full and an application is attempting to define new logos, and when an application wants to replace one user-defined character set with another. In both cases, all logos and character set definitions are erased and must be redefined.

n = 50 (ASCII *n* = 2)

This command erases all sectors available for user data storage.

Important: While erasing Flash Memory, the printer disables all interrupts, including communications. To provide feedback to the application, the printer responds to the application when the erase is complete. After sending the Erase User Flash Sector (1D 40 *n*) command, an application should wait for the response from the printer before sending data. Otherwise, data will be lost. If an application is unable to receive data, it should wait a minimum of five seconds after sending the Erase User Flash Sector (1D 40 *n*) command before sending data.

Example:

```
MSComm1.Output = Chr$(&H1D) & Chr$(&H40) & Chr$(n)
```

Printer Setting Change

ASCII: US DC1 [*m n*], [*m n*], ... [*m n*] 0FFH

Hexadecimal: 1F 11 [*m n*], [*m n*], ... [*m n*] 0FFH

Decimal: 31 17 [*m n*], [*m n*], ... [*m n*] 0FFH

Value of *m, n*:

<i>m</i> (Hex)	Function	<i>n</i> (Hex)	Function
10	Interface type	00	USB/RS232C
		01	RS232C
		02	USB
11	Baud rate	00	115200 bps
		01	57600 bps
		02	38400 bps
		03	19200 bps
		04	9600 bps
		05	4800 bps
		06	2400 bps
		07	1200 bps
12	Number of data bit	00	8 data bits
		01	7 data bits
13	Number of stop bit	00	1 stop bits
		01	2 stop bits
14	Parity	00	No parity
		01	Even parity
			Odd parity
15	Flow control	00	Software (XON/XOFF)
		01	Hardware (DTR/DSR)
16	Data reception errors option	00	Ignore errors
		01	Print "?"
17	One Line Buffer	00	4 K Buffer
		01	Single Line Buffer (64 bytes)

<i>m</i> (Hex)	Function	<i>n</i> (Hex)	Function
19	Printer ID mode	00	7158 Native ID
		01	Emulated Printer ID
		02	7167 Native ID
20	Emulation	00	7158 Native mode
		01	7156 mode
		02	7150 mode
		03	7167 Mode
<i>m</i> (Hex)	Function	<i>n</i> (Hex)	Function
21	Default lines per inch	00	8.13 lines per inch
		01	7.52 lines per inch
		02	6 lines per inch
22	Carriage return usage	00	Ignore CR
		01	Use CR as Print cmd.
23	Asian mode	00	Asian mode on
		01	Asian mode off
24	Slip Print Width Option	00	82.2 mm (7167 Mode)
		01	120.7 Conversion (7156/58 Mode)
25	Receipt synchronization	00	Enabled
		01	Disabled
30	Print density	00	100%
		01	110%
		02	120%
31	Paper Low sensor option	00	Paper low sensor enable
		01	Paper low sensor disable
32	Paper width	00	80 mm
		01	58 mm
33	Knife option	00	Enable knife
		01	Disable knife
34	MICR option	00	Enable MICR
		01	Disable MICR
35	Check Flip option	00	Enable check flip
		01	Disable check flip
36	Max Power	00	55 W
		01	75 W
37	Color Paper Option	00	One color paper
		01	Two color paper

<i>m</i> (Hex)	Function	<i>n</i> (Hex)	Function
38	MICR dual pass option	00	Dual pass disable
		01	Dual pass enable
39	Scan Option	00	Enable scan option
		01	Disable scan option
40	Default Code page	00	437
		01	850
		02	852
		03	858
		04	860
		05	862
		06	863
		07	864
		08	865
		09	866
		0A	874
		0B	1252
		0C	Katakana
		0D	932 (or 936, 949, 950) ¹
50	EEPROM default setting	00	EEPROM default setting

Set the printer configuration specified by *m* and *n*. The printer is reset after receiving this command to activate the configuration setting. If *m* or *n* is out of range, this command is ignored. The printer will wait for the data until the terminator code "0FFH" is received.

Example:

The following command would set the communication baud rate to 115,200 bps.

```
MSComm1.Output = Chr$(&H1F) & Chr$(&H11) & Chr$(&H11) & Chr$(&H0) & Chr$(&HFF)
```

¹ Not supported by 7167-1035 and 7167-2035

Asian Character Commands³

Select print modes for Kanji characters

ASCII: FS ! *n*

Hexadecimal: 1C 21 *n*

Decimal: 28 33 *n*

Value of *n*: The character attribute for Asian character

Bit	Off/On	Hex	Decimal	Function
0	-	-	-	Select font
1	Off	00	0	Undefined
2	Off	00	0	Double width mode is not selected
	On	01	1	Double width mode is selected
3	Off	00	0	Double height mode is not selected
	On	01	1	Double height mode is selected
4	-	-	-	Undefined
5	-	-	-	Undefined
6	-	-	-	Undefined
7	Off	00	0	Underline mode is not selected
	On	01	1	Underline mode is selected

Default of *n*: 0

Selects character attribute for Asian character.

The underline mode can be turned on or off by using FS – or ESC – also.

The thickness of underline is defined by FS – or ESC -, it does not relate to character size.

Example:

MSComm1.Output = Chr\$(&H1C) & Chr\$(&H21) & Chr\$(n)

³ These commands are not supported by model 7167-1035 and 7167-2035

FS – Turn underline mode ON/OFF for Kanji**ASCII:** FS - *n***Hexadecimal:** 1C 2D *n***Decimal:** 28 45 *n***Value of *n*:** 0 = Cancel

1 = 1 dot height underline

2 = 2 dot height underline

Default *n*: 0 (Cancel)

Turn underline mode on or off for Asian character.

All characters could be underlined, including character right side spacing.

Underline can be selected by FS ! and ESC – also, the last received command is effective.

Example:

MSCmm1.Output = Chr\$(&H1C) & Chr\$(&H2D) & Chr\$(n)

Define user-defined Kanji characters**ASCII:** FS 2 *c1 c2 d1 ... dn***Hexadecimal:** 1C 32 *c1 c2 d1 ... dn***Decimal:** 28 50 *c1 c2 d1 ... dn***Value of *c1*:** Specified the beginning Asian character code**Value of *c2*:** Specified the end Asian character code**Value of *d*:** Image data

Range of $c1, c2$:	Japanese (CP932)	$F0 \leq c1 \leq F9$, $40 \leq c2 \leq 7E$ and $80 \leq c2 \leq FC$
	Simplified Chinese (CP936)	$A1 \leq c1 \leq A7$, $40 \leq c2 \leq 7E$ and $80 \leq c2 \leq A0$, $AA \leq c1 \leq AF$, $A1 \leq c2 \leq FE$, $F8 \leq c1 \leq FE$, $A1 \leq c2 \leq FE$
	Korean (CP949)	$c1 = C9$ and $c1 = FE$, $A1 \leq c2 \leq FE$
	Traditional Chinese (CP950)	$81 \leq c1 \leq A0$ and $FA \leq c1 \leq FE$, $40 \leq c2 \leq 7E$ and $80 \leq c2 \leq FE$ $C7 \leq c1 \leq C8$, $A1 \leq c2 \leq FE$

Defines and enters downloaded characters into RAM. The user-defined character will be cleared by ESC @ or power off of printer. Each character requires 72 bytes for character definition.

The maximum number of user-defined character is 100.

Example:

MSComm1.Output = Chr\$(&H1C) & Chr\$(&H32) & Chr\$(&HF0) & Chr\$(&H40) & Chr\$(d1) & Chr\$(dn)

Set Kanji character spacing

ASCII: FS S $n1$ $n2$

Hexadecimal: 1C 53 $n1$ $n2$

Decimal: 28 83 $n1$ $n2$

Value of $n1$: Ignored (0)

Value of $n2$: Character right side spacing dots (1/203 inch)

Default of $n2$: 1 for 1 byte character, 2 for 2 bytes character

Sets the character right side spacing for characters in Asian character.

The underline is valid on the space set by this command. ESC SP command is not valid for Asian character code pages. Therefore, this command is used to set the character right side spacing for characters in Asian code page.

Example:

MSComm1.Output = Chr\$(&H1C) & Chr\$(&H53) & Chr\$(0) & Chr\$(100)

FS W (Set quadruple mode ON/OFF for Kanji)

ASCII: FS W *n*

Hexadecimal: 1C 57 *n*

Decimal: 28 87 *n*

Value of *n*: The quadruple mode for Asian characters.

0 (Bit 0) = Quadruple mode off

1 (Bit 0) = Quadruple mode on

Default of *n*: 0 (Quadruple mode off)

Selects or cancels the quadruple mode for Asian characters.

FS ! and GS ! also have control over character size. This, latest received command is effective.

Example:

MSComm1.Output = Chr\$(&H1C) & Chr\$(&H57) & Chr\$(*n*)

Scanner Function Commands⁴

pL, pH specify (pL + (pH x 256)) as the number of bytes after pH (fn and m).

Scanning Threshold FS (g pL pH fn m d1 d2 d3 (when fn = 40)

The threshold level of the scanning density is specified by this command.

ASCII	FS (g pL pH fn m d1 d2 d3
Hex	1C 28 67 pL pH fn m d1 d2 d3
Decimal	28 40 103 pL pH fn m d1 d2 d3
Para Value	(pL + pH x 256) = 5 (pL =5, pH = 0) fn = 40;m = 48;d1 = 1;d2 = 49;-128 ≤ d3 ≤ 127;
Default	d3 = 0

d3		Function
Hex	Decimal	
80H – FEH	-128 - - 1	Specifies a density lighter than the standard density level (the lightest density: – 128)
00H	0	Specifies the standard density level
01H – 7FH	1 – 127	Specifies a density darker than the standard density level (the darkest density – 127)

⁴ These commands are supported only by 7167-1035 and 7167-2035.

Scanning Area FS (g pL pH fn x1 y1 x2 y2 (when fn = 41)

The area on the check to be scanned is defined by this function.

ASCII	FS (g pL pH fn x1 y1 x2 y2
Hex	1C 28 67 pL pH fn x1 y1 x2 y2
Decimal	28 40 103 pL pH fn x1 y1 x2 y2

Range (pL + pH x 256) = 5 (pL = 5, pH = 0)

fn = 41

$0 \leq x1 \leq 101$

$0 \leq y1 \leq 229$

$x1 < x2 \leq 102$, $x2=0$

$y1 < y2 \leq 230$, $y2=0$

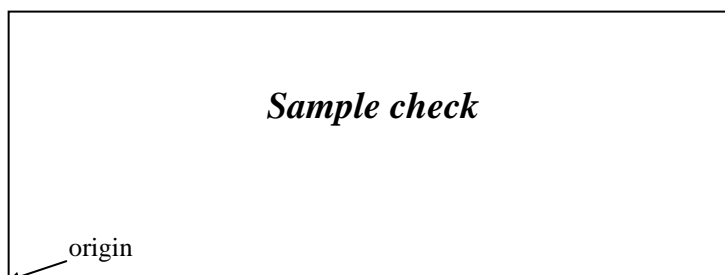
Default x1 = 0

y1 = 0

x2 = 70

y2 = 0

- x1, y1 Specifies the starting point to scan.
 - x2, y2 specifies the end point that is to be scanned.
 - The possible scanning range is 102 mm (4.02) in the X direction and 230 mm (9.06) in the Y direction.
- x2 > 102 or x2 = 0 specifies the maximum scanning range (=102) in X direction
- y2 > 230 specifies the maximum scanning range (=230) in Y direction
- If y2 = 0, the scanning range is to the bottom of the sheet within the maximum scanning range of 230 mm.
- All setting values are specified in millimeters for the distance from the origin (lower left corner in the check).



Compression Mode FS (g pL pH fn m n (when fn = 50)

This command sets the compression method and the file transmission format for the image data.

ASCII	FS (g pL pH fn m n
Hex	1C 28 67 pL pH fn m n
Decimal	28 40 103 pL pH fn m n

Range pL + pH x 256 = 3 (pL = 3, pH = 0)

fn = 50

m = 48, 49

n = 48, 49, 50 (when m = 48)

n = 48, 49 (when m = 49)

Default m = 49, n = 48

m	Compression Method	N	File Transmission Format	
		48	TIFF format	
48	No Compression	49	BMP format	
		50	Raw data	
49	Compress ON, if B/W mode, compress use CCITT (Group 4); if 8-bit gray scale mode, use JPEG algorithm	48	TIFF format	
		49	B&W	Gray scale
			N/A	JPEG format

Deletes Cropping Area FS (g pL pH fn n (when fn = 56)

The defined cropping area n is deleted

ASCII	FS (g pL pH fn n
Hex	1C 28 67 pL pH fn n
Decimal	28 40 103 pL pH fn n

Range (pL + pH x 256) = 2 (pL = 2, pH = 0)

fn = 56

$0 \leq n \leq 10$

N = 0 deletes all cropping areas.

After the cropping area is deleted the area number n is cleared.

Set Cropping Area FS (g pL pH fn n x1 y1 x2 y2 (when fn = 57)

The area to be cropped is the area of data that is to be retained. The remaining area of the scanned area is returned as “white” data. The area to be cropped is defined by n.

- x1, y1 specifies the starting point to be cropped
- x2, y2 specifies the ending point to be cropped
- The scanning range is 102 mm (4.02) in the X direction and 230 mm (9.06) in the Y direction.
x2 > 102 specifies the maximum cropping range (= 102) in the X direction.
y2 > 230 specifies the maximum cropping range (= 230) in the Y direction.
- All values are specified in millimeters for the distance from the origin of the check.
(lower left corner of the check).

ASCII	FS (g pL pH fn n x1 y1 x2 y2
Hex	1C 28 67 pL pH fn n x1 y1 x2 y2
Decimal	28 40 103 pL pH fn n x1 y1 x2 y2

Range (pL + pH x 256) = 6 (pL = 6, pH = 0)

Fn = 57

$1 \leq n \leq 10$

$x_{1scan} \leq x1 < x_{2scan}$

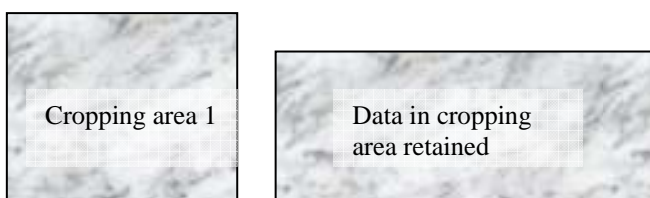
$y_{1scan} \leq y1 < y_{2scan}$

$x1 < x2 \leq x_{2scan}$

$y1 < y2 \leq y_{2scan}$

Default No cropping area is set

Scan Area outside cropping areas are turned white and sent together when CropID in corresponding commands are not 41H-4AH



Transmission Format FS (g pL pH fn m (When fn = 60)

This command sets the transmission file format as binary or hexadecimal

ASCII	FS (g pL pH fn m
Hex	1C 28 67 pL pH fn m
Decimal	28 40 103 pL pH fn m

Range (pL + pH x 256) = 2 (pL = 2, pH = 0)
 fn = 60
 m = 48, 49

Default m = 48

m	Transmission Method
48	Transmits the image data in Binary format.
49	Transmits the image data with Hexadecimal character strings format.

Notes Since the default value of this command is set to the one most suitable for the kind of interface, it is recommended to use the default as is. The default value can be checked with function 100.

With the serial interface model, when XON/OFF control is selected, specify m = 49.

Transmits Threshold Level FS (g pL pH fn m (when fn = 80)

The density of the threshold level of the scanned image for Function 40 is communicated to the host.

ASCII	FS (g pL pH fn m
Hex	1C 28 67 pL pH fn m
Decimal	28 40 103 pL pH fn m

Range (pL + pH x 256) = 2 (pL = 2, pH = 0)
 fn = 80
 m = 48

Transmission Data	Hexadecimal	Decimal	Amount of Data
Header	37H	55	1 byte
Identifier	3BH	59	1 byte
Fixed Value	34H, 38H	52, 56	2 bytes
Separator	1FH	31	1 byte
m of Function 40	34H, 38H	52, 56	2 bytes
Separator	1FH	31	1 byte
d1 of Function 40	31H	49	1 byte
Separator	1FH	31	1 byte
d2 of Function 40	34H, 39H	52, 57	2 bytes
Separator	1FH	31	1 byte
d3 of Function 40	30H - 39H	48 - 57	1 - 3 bytes
NUL	00H	0	1 byte

The value and transmission data of d3 of Function 40 are as follows:

Setting value	-128	...	-1	0	1	...	127
Transmission data	128	...	255	0	1	...	127

The transmission data values are converted to hexadecimal characters strings for the image data.

Example: When data is 48 the transmission data will be:

Hexadecimal: 34H, 38H
 Decimal: 52, 56

Transmits Scanning Area FS (g pL pH fn m (when fn = 81)

The scanned image area for Function 41 is communicated to the host.

ASCII FS (g pL pH fn m
 Hex 1C 28 67 pL pH fn m
 Decimal 28 40 103 pL pH fn m

Range $(pL + pH \times 256) = 2$ ($pL = 2$, $pH = 0$)
 fn = 81
 m = 48

Default Same as Function 41 of FS (g.

Transmission Data	Hexadecimal	Decimal	Amount of Data
Header	37H	55	1 byte
Identifier	3CH	60	1 byte
Fixed Value	34H, 38H	52, 56	2 bytes
Separator	1FH	31	1 byte
x1 of Function 41	30H - 39H	48 - 57	1 - 3 bytes
Separator	1FH	31	1 byte
y1 of Function 41	30H - 39H	48 - 57	1 - 3 bytes
Separator	1FH	31	1 byte
x2 of Function 41	30H, 39H	48 - 57	1 - 3 bytes
Separator	1FH	31	1 byte
y2 of Function 41	30H - 39H	48 - 57	1 - 3 Bytes
NUL	00H	0	1 Byte

The transmission data values are converted to hexadecimal characters strings for the image data.

Example: When data is 48 the transmission data will be:

Hexadecimal: 34H, 38H
 Decimal: 52, 56

Transmits Compression Method FS (g pL pH fn m (when fn = 90)

Command Description:

The method of file compression and the file transmission format for the image data will be communicated to the host device for the value of Function 50.

ASCII FS (g pL pH fn m
 Hex 1C 28 67 pL pH fn m
 Decimal 28 40 103 pL pH fn m

Range (pL + pH x 256) = 2 (pL =2, pH = 0)
 fn = 90
 m = 48

Transmission Data	Hexadecimal	Decimal	Amount of Data
Header	37H	55	1 byte
Identifier	3DH	61	1 byte
Fixed Value	34H, 38H	52, 56	2 bytes
Separator	1FH	31	1 byte
m of Function 50	34H, 38H or 34H, 39H	52, 56 or 52, 57	2 bytes
Separator	1FH	31	1 byte
n of Function 50	34H ,38H or 34H, 39H or 35H,30H	52, 56 or 52, 57 or 53, 48	2 bytes
NUL	00H	0	1 Byte

The transmission data values are converted to hexadecimal characters strings for the image data.

Example: When data is 48 the transmission data will be:

Hexadecimal: 34H, 38H

Decimal: 52, 56

Transmits the cropping area FS (g pL pH fn m (when fn = 97)

Command Description:

The cropping area of the scanned image as defined is communicated to the host

ASCII	FS (g pL pH fn m
Hex	1C 28 67 pL pH fn m
Decimal	28 40 103 pL pH fn m

Range (pL + pH x 256) = 2 (pL =2, pH = 0)

fn = 97

m = 48

Transmission Data	Hexadecimal	Decimal	Amount of Data
Header	37H	55	1 byte
Identifier	75H	117	1 byte
Fixed Value	40H, last Block 41H next Blk exist	64 or 65	1 byte
Separator	1FH	31	1 byte
Data	30H - 39H and 1FH	48 - 57 and 31	9 - 80 bytes
NUL	00H	0	1 Byte

The “Data” will consist of data groups enumerated with the associated key codes.

If the total amount of data exceeds 80 bytes when several cropping areas are set, the data is divided up to a maximum of 80 bytes, then transmitted.

Transmission Data	Hexadecimal	Decimal	Amount of Data
n of Function 57	30H - 39H	48 - 57	1-2 byte
Separator	1FH	31	1 byte
x1 of Function 57	30H - 39H	48 - 57	1 - 3 bytes
Separator	1FH	31	1 byte
y1 of Function 57	30H - 39H	48 - 57	1 - 3 bytes
Separator	1FH	31	1 byte
x2 of Function 57	30H - 39H	48 - 57	1 - 3 bytes
Separator	1FH	31	1 byte
y2 of Function 57	30H - 39H	48 - 57	1 - 3 bytes
Separator	1FH	31	1 byte

Data transmission by this command is controlled by the ESC/POS handshaking protocol. The ESC/POS handshaking protocol is defined as the protocol that the printer receives as a response from the host after the [Header-NUL] is transmitted: then it performs the following process, corresponding to the response.

When the identification status (existence of the next data block) is
Hexadecimal = 41H/Decimal = 65

Response			Process Performed
ASCII	HEX	Decimal	
ACK	06H	6	Transmits the next data block
NAK	15H	21	Transmits the previous data block again
CAN	18H	24	Cancels the process

When the identification status (for the previous data block) is
Hexadecimal = 40H / Decimal = 64

Response			Process Performed
ASCII	HEX	Decimal	
ACK	06H	6	Ends the process
NAK	15H	21	Transmits the previous data block again
CAN	18H	24	Cancels the process

Transmits the File Format FS (g pL pH fn m (when fn = 100)

Command Description:

This command transmits the format of the file transmission formation for the function value of 60 for the image data.

ASCII FS (g pL pH fn m
 Hex 1C 28 67 pL pH fn m
 Decimal 28 40 103 pL pH fn m

Range (pL + pH x 256) = 2 (pL =2, pH = 0)
 fn = 100
 m = 48

Transmission Data	Hexadecimal	Decimal	Amount of Data
Header	37H	55	1 byte
Identifier	3EH	62	1 byte
Fixed Value	34H, 38H	52, 56	2 bytes
Separator	1FH	31	1 byte
m of Function 60	34H, 38H or 34H, 39H	52, 56 or 52, 57	2 bytes
NUL	00H	0	1 Byte

The transmission data values are converted to hexadecimal characters strings for the image data.

Example: When data is 48 the transmission data will be:

Hexadecimal: 34H, 38H
 Decimal: 52, 56

Select Scanning mode FS (g pL pH fn m (when fn = 101)

Command Description:

This command selects the scanning mode.

ASCII FS (g pL pH fn m
Hex 1C 28 67 pL pH fn m
Decimal 28 40 103 pL pH fn m

Range (pL + pH x 256) = 2 (pL =2, pH = 0)

fn = 101

m = 48,49

Default m = 48

m	Scanning Mode
48	Black / White mode
49	8 bit gray scale mode

Transmits Scanning mode FS (g pL pH fn m (when fn = 102)

Command Description:

This command transmits the scanning mode.

ASCII FS (g pL pH fn
Hex 1C 28 67 pL pH fn
Decimal 28 40 103 pL pH fn

Range (pL + pH x 256) = 1 (pL =1, pH = 0)

fn = 102

This command transmits the scanning mode as the following format.

Transmission Data	Hexadecimal	Decimal	Amount of Data
Header	37H	55	1 byte
Identifier	3AH	62	1 byte
Fixed Value	34H, 38H	52, 56	2 bytes
Separator	1FH	31	1 byte
m of Function 101	34H, 38H or 34H, 39H	52, 56 or 52, 57	2 bytes
NUL	00H	0	1 Byte

The transmission data values are converted to hexadecimal characters strings for the image data.

Example: When data is 48 the transmission data will be:

Hexadecimal: 34H, 38H

Decimal: 52, 56

Executes Scan GS (G pL pH fn nL nH m1 m2 [d1...dk] (when fn = 65)

Command Description:

Executes the process for the scanning of the image from the slip station and then transmits the scanned data to the host computer.

Hogan makes busy status during executing of scanning. Host can't send any data to Hogan in that time.

- If [d1..dk] is specified, [d1..dk] is added to the image data.
- If m1 is 48, when the scan operation is successful the printer transmits a three-block data group: file information block, size information block and an image data block in that sequence.
- Scan result will be retained in working buffer until another scan is performed or power off.
- If m1 is 49, this command executes scanning only. It doesn't transmit image data.
- When an error occurs in scanning, the printer transmits the file information block only.
- The contents of each data block are as shown below:

```

ASCII      GS (  G pL pH fn nl nH m1 m2 [d1...dk]
Hex        1D 28 67 pL pH fn nl nH m1 m2 [d1...dk]
Decimal    29 40 103 pL pH fn nl nH m1 m2 [d1...dk]

```

Range $5 \leq (pL + pH \times 256) \leq 260$ ($0 \leq pL \leq 255, 0 \leq pH \leq 1$)

fn = 65

$(nl + nH \times 256) = 1$ (nl = 1, nH = 0)

m1 = 48, 49

m2 = 48

$0 \leq d \leq 255$

$0 \leq k \leq 255$

a) When Binary is selected as file transmission format with Function 60 of FS (g.

Transmission Data	Hexadecimal	Decimal	Amount of Data
Header	53H	83	1 byte
Identifier	20H	32	1 byte
Identification status	42H : last Blk 43H : next Blk exist	64 – 67	1 byte
Information data (See below)	Selections from 00H – FFH	0 - 255	1 byte

Identification status is indicates

40H: current block is last data block

41H:existence of the next data block

Information data in the file information block is as follows:

Transmission Data	Hexadecimal	Decimal	Amount of Data
Block Code	46H	70	1 byte
Fixed value	31H	49	1 byte
Separator	1FH	31	1 byte
Scanning status	Normal: 50H Abnormal: 70H	Normal: 80 Abnormal: 112	1 byte
Detailed information (See Table below)	40H – 48H	64 – 72	1 byte

Separator	1FH	31	1 byte
Compression process (*1)(*2)	30H – 39H	48 – 57	0 – 2 bytes
File transmission format (*1)	30H – 39H	48 – 57	0 – 2 bytes
Separator	1FH	31	1 byte
Fixed value (*1)	34H, 38H, 30H, 34H 38H, 34H, 38H	52, 56, 48, 52, 56, 52, 56	1 – 7 bytes
NUL	00H	0	1 byte

*1. This type of data is not transmitted if an error has occurred.

*2. This value depends on the value set with Function 50 of FS (g.

Status	Information	Hexadecimal	Decimal
Normal	Not abnormal status	40	64
Abnormal	There isn't any data for the scanned image	41	65
Abnormal	Processing stopped due to cover open.	44	68
Abnormal	An error occurred in the compression of image data	47	71
Abnormal	A check feeding error occurred during the scan of the check.	48	72

*3. The check size is smaller than scan area size.

The size information block for the information data is shown below (This data is not transmitted if an error occurred).

Information Data	Hexadecimal	Decimal	Amount of Data
Block Code	53H	83	1 byte
Fixed value	30H, 30H	48, 48	2 bytes
Separator	1FH	31	1 byte
X starting point (*1)	30H – 39H	48 – 57	1 – 3 bytes
Separator	1FH	31	1 byte
Y starting point (*1)	30H – 39H	48 – 57	1 – 3 bytes
Separator	1FH	31	1 byte
X ending point (*2)	30H – 39H	48 – 57	1 – 3 bytes
Separator	1FH	31	1 byte
Y ending point (*2)	30H – 39H	48 – 57	1 – 3 bytes
Separator	1FH	31	1 byte
Amount of data in X (*3)	30H – 39H	48 – 57	1 – 4 bytes
Separator	1FH	31	1 byte
Amount of data in Y (*4)	30H – 39H	48 – 57	1 – 4 bytes
NUL	00H	0	1 byte

*1. This value depends on the value set with Function 41 of FS (g).

*2. This point indicates the ending point of the actual reading area.

*3. This numerical value indicates the amount of actual scanning data in the X direction (dots).

*4. This number value indicates the amount of the actual scanning data in the Y direction (dots).

Information data for the image data block is shown below (this data is not transmitted if an error occurred).

Information Data	Hexadecimal	Decimal	Amount of Data
Block Code	53H 20H	83, 32	2 bytes
Identification status	40H : last Blk 41H : next Blk exist	64 – 65	1 bytes
Block Size	1-FFFFH	1-65535	2 bytes
image data	00H – FFH	0 – 255	1 – 65535 bytes

If the total amount of data exceeds 65535 bytes, the data is divided up to a maximum of 65536 bytes, then transmitted

b) When Hexadecimal character strings is selected as file transmission format with Function 60 of FS (g).

Transmission Data	Hexadecimal	Decimal	Amount of Data
Header	37H	55	1 byte
Identifier	74H	116	1 byte
Identification status	42H : last Blk 43H : next Blk exist	64 – 65	1 byte
Information data (See below)	30H – 39H 41H – 46H	48 – 57 65 – 70	1 – 80 bytes
NULL	00H	0	1 byte

Information data in the file information block is as follows:

Transmission Data	Hexadecimal	Decimal	Amount of Data
Block Code	46H	70	1 byte
Fixed value	31H	49	1 byte
Separator	1FH	31	1 byte
Scanning status	Normal: 50H Abnormal: 70H	Normal: 80 Abnormal: 112	1 byte
Detailed information (See Table below)	40H – 48H	64 – 72	1 byte
Separator	1FH	31	1 byte
Compression process (*1)(*2)	30H – 39H	48 – 57	0 – 2 bytes
File transmission format (*1)	30H – 39H	48 – 57	0 – 2 bytes
Separator	1FH	31	1 byte
Fixed value (*1)	34H, 38H, 30H, 34H 38H, 34H, 38H	52, 56, 48, 52, 56, 52, 56	1 – 7 bytes
NUL	00H	0	1 byte

*1. This type of data is not transmitted if an error has occurred.

*2. This value depends on the value set with Function 50 of FS (g.

Status	Information	Hexadecimal	Decimal
Normal	Not abnormal status	40	64
Abnormal	There isn't any data for the scanned image	41	65
Abnormal	Processing stopped due to cover open.	44	68
Abnormal	An error occurred in the compression of image data	47	71
Abnormal	A check feeding error occurred during the scan of the check.	48	72

The size information block for the information data is shown below (This data is not transmitted if an error occurred).

Information Data	Hexadecimal	Decimal	Amount of Data
Block Code	53H	83	1 byte
Fixed value	30H, 30H	48, 48	2 bytes
Separator	1FH	31	1 byte
X starting point (*1)	30H – 39H	48 – 57	1 – 3 bytes
Separator	1FH	31	1 byte
Y starting point (*1)	30H – 39H	48 – 57	1 – 3 bytes
Separator	1FH	31	1 byte
X ending point (*2)	30H – 39H	48 – 57	1 – 3 bytes
Separator	1FH	31	1 byte
Y ending point (*2)	30H – 39H	48 – 57	1 – 3 bytes
Separator	1FH	31	1 byte
Amount of data in X (*3)	30H – 39H	48 – 57	1 – 4 bytes
Separator	1FH	31	1 byte
Amount of data in Y (*4)	30H – 39H	48 – 57	1 – 4 bytes
NUL	00H	0	1 byte

*1. This value depends on the value set with Function 41 of FS (g).

*2. This point indicates the ending point of the actual reading area.

*3. This numerical value indicates the amount of actual scanning data in the X direction (dots).

*4. This number value indicates the amount of the actual scanning data in the Y direction (dots).

Information data for the image data block is shown below (this data is not transmitted if an error occurred).

Information Data	Hexadecimal	Decimal	Amount of Data
Block Code	37H 74H	55 116	1 byte
Identification status	40H : last Blk 41H : next Blk exist	64 – 65	1 bytes
image data	30H – 39H, 41H – 46H	48 – 57, 65 - 70	1 – 80 bytes
NUL	00H	0	1 byte

If the total amount of data exceeds 80 bytes, the data is divided up to a maximum of 80 bytes, then transmitted

The printer transmits the image data in the file transmission format specified with Function 50 of FS (g).

If the capacity of the image data is large, the image data is divided into several data blocks, then transmitted.

Only when Hexadecimal is specified as the file transmission format with Function 60 of FS (g, the transmission data values are converted to the hexadecimal character strings for the image data.

Example: When data is 3FH. The transmission data is Hexadecimal: 30H, 46H, Decimal 48, 70.

Data transmitted with this command is controlled by the ESC/POS handshaking protocol. The ESC/POS handshaking protocol is defined as the protocol that the printer receives as a response from the host; then it performs the following process corresponding to the response.

When the identification status is: Hexadecimal = 41H, 43H / Decimal = 65, 67.

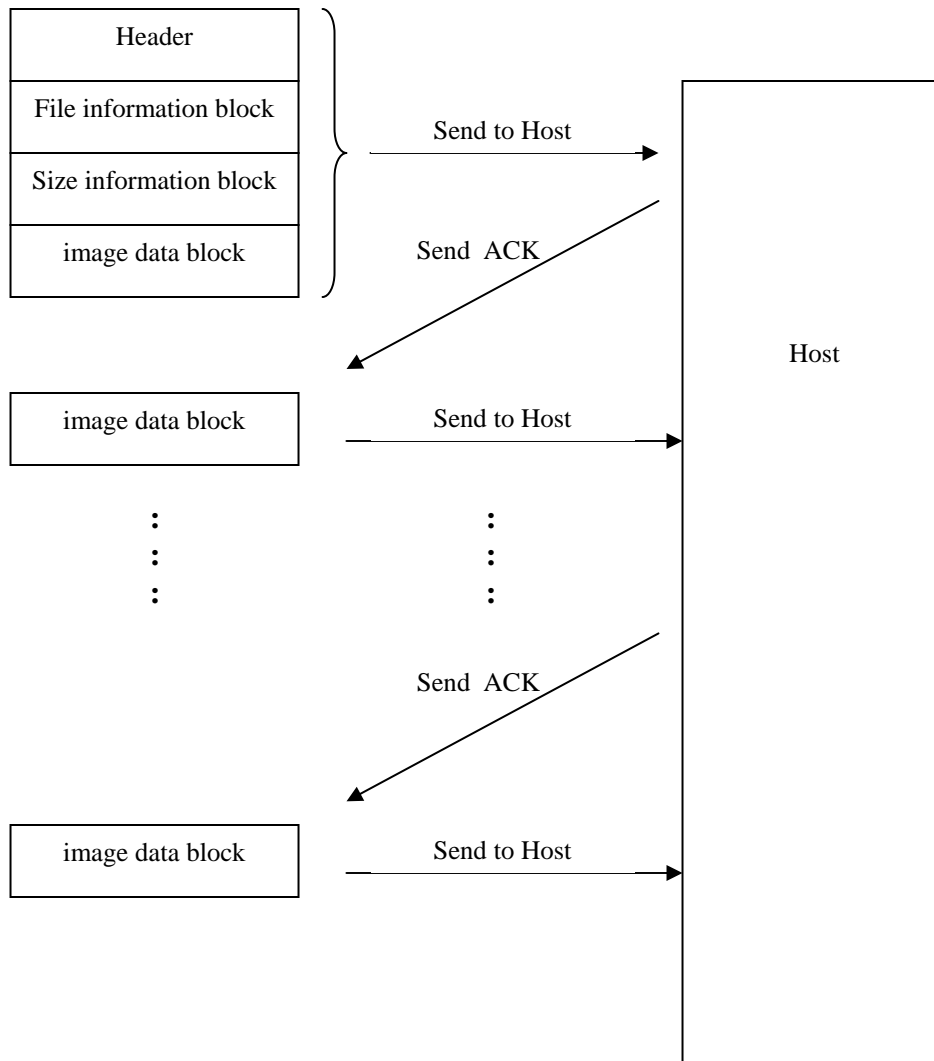
Response			Process Performed
ASCII	HEX	Decimal	
ACK	06H	6	Transmits the next data block
NAK	15H	21	Transmits the previous data block again
CAN	18H	24	Cancels the process

When the identification status is: Hexadecimal = 40H, 42H / Decimal = 64, 66

Response			Process Performed
ASCII	HEX	Decimal	
ACK	06H	6	Ends the process
NAK	15H	21	Transmits the previous data block again
CAN	18H	24	Cancels the process

Notes:

- While transmitting block data, the printer does not process a real-time command or send ASB status. Therefore it is not possible to determine the printer status while transmitting data.



Transmit Scan Image from Working Buffer GS (G pL pH fn m CropID [d1...dk], k=1, ..., 255

Command Description:

- Retrieve original scan data from working buffer (RAM)
- Crop, compress and make image file based on current settings and transmit it to the host
- If scan has not be executed on receiving this command, send error block
- If Bit6 of CropID is ON (CropID= 0x41 to 0x4A), This command transmits cropping area data only.

ASCII	GS (G pL pH fn m CropID [d1...dk]
Hex	1D 28 47 pL pH fn m CropID [d1...dk]
Decimal	29 40 71 pL pH fn m CropID [d1...dk]

Range $2 < (pL + pH \times 256) \leq 257$

fn = 66

m=48: use original data in scan image buffer, crop according to the cropping area set by CropID, compress and make image file based on current settings, then transmit file to host

CropID=0, transmit original (uncropped) image

CropID=1-10, transit image file with the n^{th} cropping area, data outside the cropping area but inside the scanarea will be transmitted as “white”.

CropID=0x41 – 0x4A, transmit image file with the n^{th} (n=1 to 10) cropping area, but only data that resides within the Crop Area is transmitted.

CropID>10 (except 0x41 to 0x4A), transmit image file with all the cropping area set, if no cropping area is set, send the original scan image

When GS (G Function 65 is not executed, only the file information block which consists of the following information data, is transmitted. Information data in the file information block is as follows.

Transmission Data	Hexadecimal	Decimal	Amount of Data
Header	53H / 37H	83/55	1 byte
Identifier	20H / 74H	32/116	1 byte
Identification status	42H : last Blk	66	1 byte
Block Code	46H	70	1 byte
Fixed value	31H	49	1 byte
Separator	1FH	31	1 byte
Scanning status	70H	112	1 byte
Detailed information	41H	65	1 byte
Separator	1FH	31	1 byte
NUL	00H	0	1 byte

If scan has completed normally, Hogan will send image file to host, data strings have the same format as that in “Execute Scan” command.

Notes:

- While transmitting block data, the printer does not process a real-time command or send ASB status. Therefore it is not possible to determine the printer status while transmitting data.

Transmit Scan Image from Flash ROM GS (G pL pH fn m FileIndex (when fn = 73)

Command Description:

- Retrieve scan image file from flash ROM and transmit to host.
- If scan has not be executed on receiving this command, send error block

ASCII GS (G pL pH fn m [File Index]

Hex 1D 28 47 pL pH fn m [File Index]

Decimal 29 40 71 pL pH fn m [File Index]

Range pL + pH x 256=2

fn = 73

m=49: send image file stored in flash ROM to host, the image file is selected using File Index, which is defined by the firmware when image file is stored into flash ROM, FileIndex is larger than 0 in this command.

If cannot find an image file with the specified FileIndex in flash ROM, transmit the following block.

Transmission Data	Hexadecimal	Decimal	Amount of Data
Header	53H / 37H	83/55	1 byte
Identifier	20H / 74H	32/116	1 byte
Identification status	42H : last Blk	66	1 byte
Block Code	46H	70	1 byte
Fixed value	31H	49	1 byte
Separator	1FH	31	1 byte
Scanning status	70H	112	1 byte
Detailed information	41H	65	1 byte
Separator	1FH	31	1 byte
NUL	00H	0	1 byte

If the image file exists, send the file in the same format as that sent in “Execute Scan” command.

Notes:

- While transmitting block data, the printer does not process a real-time command or send ASB status. Therefore it is not possible to determine the printer status while transmitting data.

Store Scan Image to Flash ROM GS (G pL pH fn n [d1..dk] (when fn = 70)

Hogan makes busy status during store scan image. Host can't send any data to Hogan at that time.

Command Description:

- If [d1..dk] is specified, it's added to image file as image description (image tag data); if not specified, use the one specified before. This string is included in the image file.
- Image file will be appended to the end of the last image stored in flash ROM.
- In each image file, the first 2 bytes hold file index (2 byte), the next 4 bytes store the length of the file, followed by 2 blocks of scan information and image file data string.
- Original scan data are retrieved from working buffer, cropped, compressed and made into image file based on current settings.
- The scanner locates all available flash ROM space and compares with the image size.
- If the image file size is smaller than ROM space, increase file index number and write file to flash ROM, send host "store information" block
- If ROM space is too small for image file, transmit "store information" block to host
- Max. number of files can be stored is 255.
- If bit6 of n(CropID) is 1, Hogan stores only image data that resides within the crop area.

ASCII	FS (g pL pH fn n [d1... dk]
Hex	1D 28 47 pL pH fn n [d1 ...dk]
Decimal	29 40 71 pL pH fn n [d1... dk]

Range $2 \leq (pL + pH \times 256) \leq 257$

fn = 70

n: CropID, n = 0, no cropping, or $n \leq 10$ and equal to CropID that is not defined, entire scan area selected;

n = exist CropAreaID (0x00 to 0x0A), only selected crop area is processed and stored,

n = exist CropAreaID (0x41 to 0x4A), only selected crop area is processed and stored. The stored data is only data that resides within the crop area.

n > 10 (except 0x41 to 0x4A), all crop areas are selected

The storage information block is as follows:

Transmission Data	Hexadecimal	Decimal	Amount of Data
Header	37H	55	1 byte
Identifier	77H	119	1 byte
Fixed Value	34H, 38H	52, 56	2 bytes
Separator	1FH	31	1 byte
Store Status	30-33H(*1)	48-51	1 byte
Separator	1FH	31	1 byte
FileIndex	30-39H	48-57	1-3 bytes
Separator	1FH	31	1 byte
Free ROM space	30 - 39H, 41 - 46H	48 - 57, 65 - 70	6 bytes
Separator	1FH	31	1 byte
NUL	00H	0	1 Byte

*1. Store Status:	Successful	30H
	Not enough memory	31H
	Image file not exist	32H
	Flash ROM is cleared	33H

Notes:

- While writing flash ROM, the printer does not process a real-time command or send ASB status. Therefore it is not possible to determine the printer status while storing scan image.

Clear All Scan Images GS (G pL pH fn (when fn = 71)

Hogan makes busy status in clearing flash ROM. Host can't send any data to Hogan at that time.
Command Description:

- Erase all scan image files

ASCII	FS (g pL pH fn
Hex	1D 28 47 pL pH fn
Decimal	29 40 71 pL pH fn

Range
pL=1, pH=0
fn = 71

Notes:

- While clearing flash ROM, the printer does not process a real-time command or send ASB status. Therefore it is not possible to determine the printer status while clearing image files.
- This command sent the information block to host PC. The format is same format of the store to flash ROM command.

Print Scanned Image GS (G pL pH fn m (when fn = 68)

Command Description:

This command performs printing the scanned image data

ASCII GS (G pL pH fn m
Hex 1D 28 47 pL pH fn m
Decimal 29 40 71 pL pH fn m

Range (pL + pH x 256) = 2 (pl = 2, pH = 0)
fn = 68
m = 48,49

Default m = 48

m	Printing ratio of x direction
48	100% printing mode if scan area width > printable width, the extra image is cut.
49	50% printing mode (Horizontal & Vertical direction)

This command is available on Black/White mode. (When scan mode is 8 bit gray scale, this command is ignored.)

Execute Shading correction GS (G pL pH fn m (when fn = 69)

Command Description:

This command performs Black/White shading correction.

ASCII GS (G pL pH fn m
Hex 1D 28 47 pL pH fn m
Decimal 29 40 71 pL pH fn m
Parameter Value (pL + pH x 256) = 2 (pl = 2, pH = 0)
fn = 69
m = 48,49
Default m = 48

m	Shading correction
48	Execute Black Shading correction
49	Execute White Shading correction

Reverse feed to top of form GS (G pL pH fn m (when fn = 74)

Command Description:

This command performs a reverse feed to top of form on the slip print station.
This command is ignored if slip is not the selected station.

ASCII	GS (G pL pH fn m
Hex	1D 28 47 pL pH fn m
Decimal	29 40 71 pL pH fn m
Parameter value	(pL + pH x 256) = 2 (pL = 2, pH = 0) fn = 74 m = 48

Flash Download Commands

These commands are used to load firmware into the printer.

The commands are listed in numerical order according to their hexadecimal codes. Each command is described and the hexadecimal, decimal, and ASCII codes are listed.

There are three ways to enter the Download Mode.

1. Powering the printer up with DIP Switch 2 up.
2. While the printer is running normally, use the command Switch to Flash Download Mode, to leave normal operation and enter the Download Mode.
3. If the Flash is found corrupted during Level 0 diagnostics the Download Mode is automatically entered after the printer has reset.

The printer never goes directly from the Download Mode to normal printer operation. To return to normal printer operation either the operator must turn the power off and then on to reboot or the application must send a command to cancel Download Mode and reboot.

Switch to Flash Download Mode

ASCII: ESC [}

Hexadecimal: 1B 5B 7D

Decimal: 27 91 125

Puts the printer in Flash Download Mode in preparation to receive commands controlling the downloading of objects into Flash Memory. When this command is received, the printer leaves normal operation and can no longer print transactions until the Reboot the Printer command (1D FF) is received or the printer is rebooted.

This command does not affect the current communication parameters. Once the printer is in Flash Download Mode, this command is no longer available.

Example:

```
MSComm1.Output = Chr$(&H1B) & Chr$(&H5B) & Chr$(&H7D)
```

Request Printer ID

ASCII: GS NUL

Hexadecimal: 1D 00

Decimal: 29 0

Returns ACK (06 hex) + 12 bytes ASCII string describing the Flash Memory Boot Sector
Firmware part number. Ex : 189-1234567A

Example:

```
MSComm1.Output = Chr$(&H1D) & Chr$(&H00)
```


Return Segment Number Status of Flash Memory

ASCII: GS SOH

Hexadecimal: 1D 01

Decimal: 29 1

Returns the size of the Flash used. There may be 8, 16, or 32 sectors (64K each) in Flash Memory. This command assures that the firmware to be downloaded is the appropriate size for Flash Memory. The value returned is the maximum sector number that can be accepted by the Select Sector to Download (1D 02 *n*) command.

Example:

MSComm1.Output = Chr\$(&H1D) & Chr\$(&H01)

Exceptions:

Available only in Download Mode.

Select Flash Memory Sector to Download

ASCII: GS STX *n*

Hexadecimal: 1D 02 *n*

Decimal: 29 2 *n*

Value of *n*: The Flash sector to which the next download operation applies

Range of *n*: 0 – 7 (512K)

0 – 15 (1 mB)

0 – 31 (2 mB)

Selects the Flash sector (*nn*) for which the next download operation applies. The values of the possible sector are restricted, depending upon the Flash part type. The printer transmits an ACK if the sector number is acceptable or an NAK if the sector number is not acceptable. Sector numbers start at 0.

Example:

MSComm1.Output = Chr\$(&H1D) & Chr\$(&H02) & Chr\$(*n*)

Exceptions:

Available only in Download Mode.

Get Firmware CRC

ASCII: GS ACK

Hexadecimal: 1D 06

Decimal: 29 6

Causes the printer to calculate the CRC for the currently selected sector and transmits the result. This is performed normally after downloading a sector to verify that the downloaded firmware is correct. The printer also calculates the CRC for each sector during power up and halts the program if any sector is erroneous.

The printer transmits ACK if the calculated CRC is correct for the selected sector; NAK if the CRC is incorrect or if no sector is selected.

Example:

MSComm1.Output = Chr\$(&H1D) & Chr\$(&H06)

Return Microprocessor CRC

ASCII: GS BEL

Hexadecimal: 1D 07

Decimal: 29 7

Returns the CRC calculated over the boot sector code space.

Formulas: ACK <low byte> <high byte>

Example:

MSComm1.Output = Chr\$(&H1D) & Chr\$(&H07)

Erase the Flash Memory

ASCII: GS SO

Hexadecimal: 1D 0E

Decimal: 29 14

Causes the entire Flash Memory (except the boot) to be erased.

The printer returns ACK if the command is successful; NAK if it is unsuccessful.

Example:

MSComm1.Output = Chr\$(&H1D) & Chr\$(&H0E)

Exceptions:

Available only in Download Mode.

Return Main Program Flash CRC

ASCII: GS SI

Hexadecimal: 1D 0F

Decimal: 29 15

Returns the CRC calculated over the Flash firmware code space. The format of the response is ACK <low byte> <high byte>.

Example:

MSComm1.Output = Chr\$(&H1D) & Chr\$(&H0F)

Erase Selected Flash Sector

ASCII: GS DLE *n*

Hexadecimal: 1D 10 *n*

Decimal: 29 16 *n*

Value and Range of *n*: 0 – 7 = 512K bytes Flash

0 – 15 = 1M bytes Flash

0 – 31 = 2M bytes Flash

Erases the previously selected sector. The printer transmits ACK when the sector has been erased. If the previous sector is not successfully erased, or if no sector was selected, the printer transmits NAK.

Example:

MSComm1.Output = Chr\$(&H1D) & Chr\$(&H10) & Chr\$(*n*)

Exceptions:

Available only in Download Mode.

Download to Active Flash Sector

ASCII: GS DC1 *al ah cl ch d1...dn*

Hexadecimal: 1D 11 *al ah cl ch d1...dn*

Decimal: 29 17 *al ah cl ch d1...dn*

Value of *al*: low byte of the address

Value of *ah*: high byte of the address

Value of *cl*: low byte of the count

Value of *ch*: high byte of the count

Value of *d*: data bytes, from 1 to *n*

Contains a start address ($ah * 256 + al$) and count ($ch * 256 + cl$) of binary bytes to load into the selected sector, followed by that many bytes. The start address is relative to the start of the sector. Addresses run from 0 to 64K.

The printer may return one of several responses. ACK means that the data was written correctly and the host should transmit the next block. NAK means that, for some reason, the data was not written correctly. This could mean that communications failed or that the write to Flash failed. The alternatives seem to be to retry the block or halt loading and assume a hardware failure.

Value of <i>n</i> (for number of data bytes)	Range of Address (<i>al ah</i>)	Range of Count (<i>cl ch</i>)
$((ch * 256) + cl)$	2000-FFFF (hexadecimal)	0001-0400 (hexadecimal)

Range: Addresses run from 0 to 64K.

Related Information:

Available only in Download Mode.

Reboot the Printer

ASCII: GS (SPACE)

Hexadecimal: 1D FF

Decimal: 29 255

Ends the load process and reboots the printer. Before executing this command, the printer should have firmware loaded and external switches set to the runtime settings.

Application software for downloading should prompt the user to set the external switches and confirm before sending this command. If the downloading was started from a diagnostic, the reboot will cause the printer to reenter download state unless the external switches are changed.

Example:

```
MSComm1.Output = Chr(&H1D) & Chr(&HFF)
```

Appendix A: Specifications

Printing Specifications

	Thermal Receipt Station	Slip Station
Print head	Fixed 576 Print Elements Direct Thermal Fixed Head Line of Dots	Bi-directional Logic Seeking Serial Dot Matrix Ribbon Cassette Forms Insertion
Character Cell	Standard: 13 x 24 Dots Compressed: 10 x 24 Dots	Standard: 10 x 7 Dots Compressed: 10 x 7 Dots
Character Size	.0525" Wide by .092" High	.057" Wide by .097" High
Character Spacing	15.25 Characters per Inch (horizontal)	
Character Pitch	15.6 Characters/Inch (Standard) 20.3 Characters/Inch (Compressed)	13.9 Characters/Inch (Standard) 17.1 Characters/Inch (Compressed)
Columns (maximum)	For 80 mm paper: 44 Columns (Standard) 56 Columns (Compressed) For 58 mm paper: 32 Columns (Standard) 42 Columns (Compressed)	45 Columns (Standard) 55 Columns (Compressed)
Print Mode	Standard, Compressed, Double High, Double Wide, Upside Down, Rotated, Underline, Scalable, Bold, Superscript, Italic, Subscript	Standard, Compressed, Double Wide, Upside Down, Rotated
Resident Fonts	Code Page 437, 850, 852, 860, 863, 865, 858, 866, 1252, Katakana, 874, 862, 864, and Space page	Code Page 437, 850, 852, 860, 863, 865, 858, 866, 1252, Katakana, 874, 862, 864, and Space page
Speed	3019 Lines / Minute (44 columns), Depend on Line Spacing	240/202/164/142 Lines per Minute; Depending on # of Columns (40 column width)
Print Order	Descending	Descending
Line Spacing	7.52 Lines per Inch (default) 8.47, 8.13, 7.81, 7.25, 7.00, 5.98 Lines /	7.2 Lines / Inch (default) 10.3, 9.0, 8.0, 6.5, 6.0, Lines / Inch

	Thermal Receipt Station	Slip Station
	Inch and variable lines per inch.	and variable lines per inch.
Slew Speed	6.7 Inches per Second	4.0 lines per Second
Print Zone	2.83 Inches Maximum	3.23 Inches Maximum
Noise	57 dBA Sound Pressure (ISO 7779)	62 dBA Sound Pressure (ISO 7779)
Graphics (Optional)	User-Defined Graphics, Logo	User-Defined Graphics
Other	No Reverse Paper Feed	Reverse Paper Feed Two Form in Sensors

	Thermal Receipt Station	Impact Slip Station
Paper Diameter	80 mm Max.	Not Applicable
Paper Length	83 Meters (273 feet)	Side Insertion: 2.0 Inches (Min.) Front Insertion: 2.75 Inches (Min.)
Paper Width	80 mm \pm 1mm (3.15 Inches \pm .02 Inches)	Side Insertion: 8.0 Inches (Min.) Front Insertion: 2.0 Inches (Min.)
Paper Thickness	Not Applicable	.406 mm (.016 Inch)
Printable Area	2.83 Inches (Max.)	3.22 Inches (Max.)

Power Requirements

The 7167 printer receives power from a separate power supply. Here are the voltage requirements for the power supply.

Voltage	Station	Maximum Current	
		Short Term	Long Term
24.0 V \pm 10%	Slip	4.6 Amps	3.15 Amps
	Receipt	6.5 Amps	3.15 Amps

Environmental Conditions

Operating Temperature	5°C to 45°C (40°F to 112°F), models with knife 5°C to 50°C (40°F to 120°F), models with no knife
Operating Humidity	5% to 90%

Condensation may occur when equipment is transferred from cold to warm areas after shipment. The printer's design permits operation after drying out and stabilizing at room temperature.

Reliability

The numbers in the table refer to the Mean Cycle Between Failure (MCBF) for the items indicated.

Thermal Receipt Printer	52 Million Lines
Impact Slip Printer	30 Million Lines
Impact Print head	200 Million Characters
Electronics	347,000 On time Hours
Communications Card	2,000,000 On Time Hours
Control Panel	2,100,000 On Time Hours
Knife	1 Million Cuts
MICR Check Reader	500,000 Reads
Flip	500,000 Flips
Power Supply	200,000 On-time Hours
Flip Mechanism	200,000 Cycles
Scan I/F Board	1,383,000 MTBF
Scanner Mechanism	500,000 Cycles
Scan Head	1,000,000 Hours MTBF

Reliability statistics based on averages exhibited under lab conditions and do not constitute a warranty

Dimensions and Weight

Height	174 mm (6.9 Inches)
Height with Cover Open	296 mm (11.7 Inches)
Width	190 mm (7.5 Inches)
Depth	262 mm (10.3 Inches)
Depth with Extended Slip Table	316 mm (12.5 Inches)
Weight	4.50 Kg (10.0 Pounds), Flip Model 4.25 Kg (9.4 Pounds), Non-Flip Model

Density of Receipt Print Lines

When the receipt station prints high density print lines (graphics), it automatically slows down to a rate slower than 902 lines per minute. High density print lines are defined as lines with over 50% of the dots printing on the line (there are 576 total dot columns on the print station).

Duty Cycle Restrictions (Printing Solid Blocks)

There are restrictions on the duty cycle because of the heat generated by the receipt thermal print head when printing solid blocks (regardless of the length of the block in relation to the print line). The restrictions are ambient temperature, the percentage of time (measured against one minute) of continuous solid printing, and the amount of coverage.

Caution: When the duty cycle approaches the limits shown in the table, the receipt print head will heat up and shut down. This may damage the print head.

To avoid this problem, do one or a combination of the following:

1. Reduce the amount of coverage.
2. Reduce the time of continuous solid printing.
3. Reduce the ambient temperature.

Amount of Solid Coverage	Ambient Temperature		
	25° C	35° C	50° C
20%	100% of 1 min. continuous printing	50% of 1 min. continuous printing	20% of 1 min. continuous printing
40%	50% of 1 min. continuous printing	25% of 1 min. continuous printing	10% of 1 min. continuous printing
100%	20% of 1 min. continuous printing	10% of 1 min. continuous printing	3% of 1 min. continuous printing

Appendix B: Print Characteristics

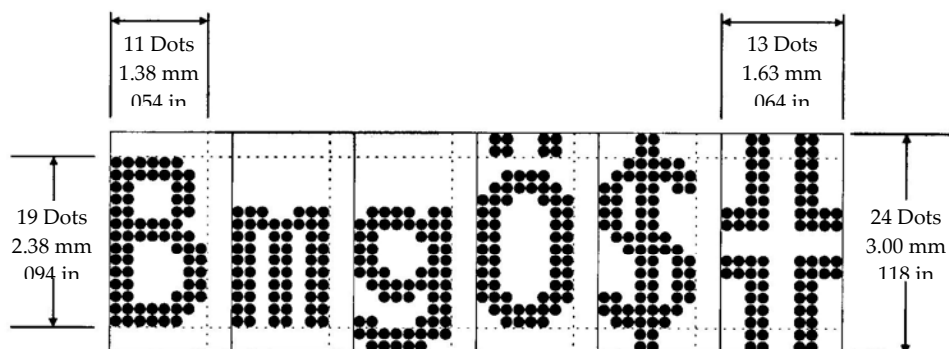
Character Size

This section shows the dot pattern for characters printed on the receipt and slip stations.

Receipt Station

The following two illustrations show the dot patterns of sample characters for standard pitch (15.6 CPI) and compressed pitch (20.3 CPI). Note that compressed pitch uses fewer dots horizontally than standard pitch.

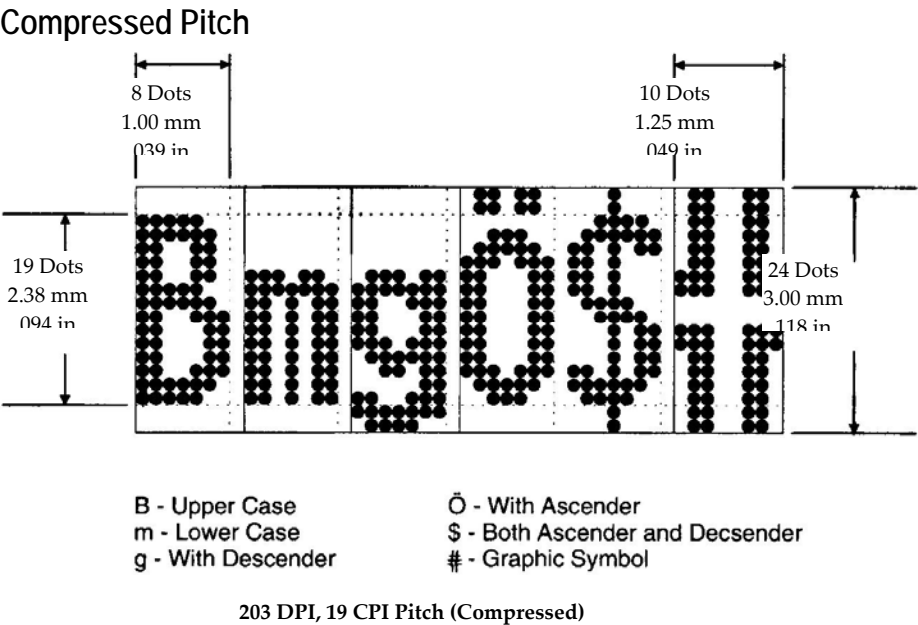
Standard Pitch



B - Upper Case
m - Lower Case
g - With Descender

Ö - With Ascender
\$ - Both Ascender and Desender
- Graphic Symbol

203 DPI, 15.6 CPI Pitch (Standard)

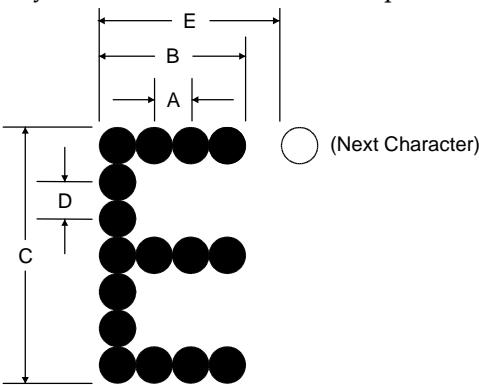


Slip Station

The following illustrations show the dot patterns of sample characters for standard pitch (13.9 CPI), double-wide characters, and rotated characters (counterclockwise).

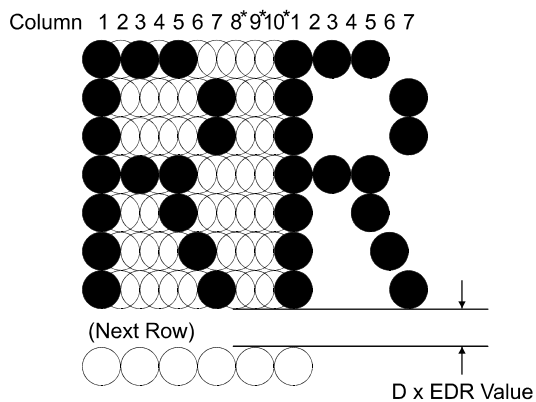
Standard Pitch

The first illustration shows a single character with the dimensions listed in the table that follows (including dimensions for compressed pitch). The second illustration shows the layout of columns for standard pitch characters.



Row spacing is fixed and column spacing depends upon the character pitch as indicated in the table.

Dimension	Standard Pitch (13.9 CPI, 45 Columns)	Compressed Pitch (17.1 CPI, 55 Columns)
A	.366 mm (.0144 inches)	.30 mm (.0117 inches)
B	1.45 mm (.057 inches)	1.24 mm (.049 inches)
C	2.46 mm (.097 inches)	
D	.353 mm (.0139 inches)	
E	1.83 mm (.072 inches)	1.49 mm (.0585 inches)

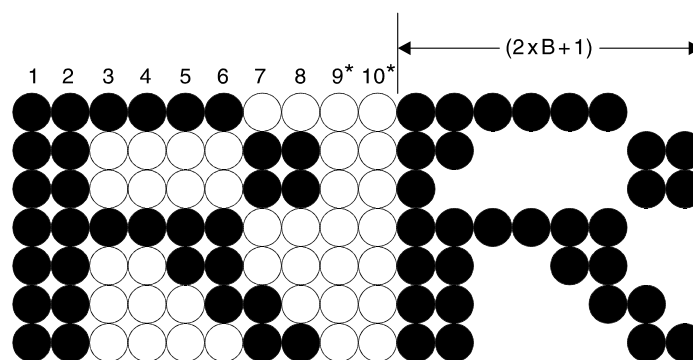


* Columns 8, 9, and 10 are for graphics or for certain special characters

Note: Columns overlap within the format for each print row in half-dot increments (depending upon pitch), but the printer cannot print overlapping dots on a single print row. No ASCII character contains overlapping dots on a print row.

Double-Wide Characters

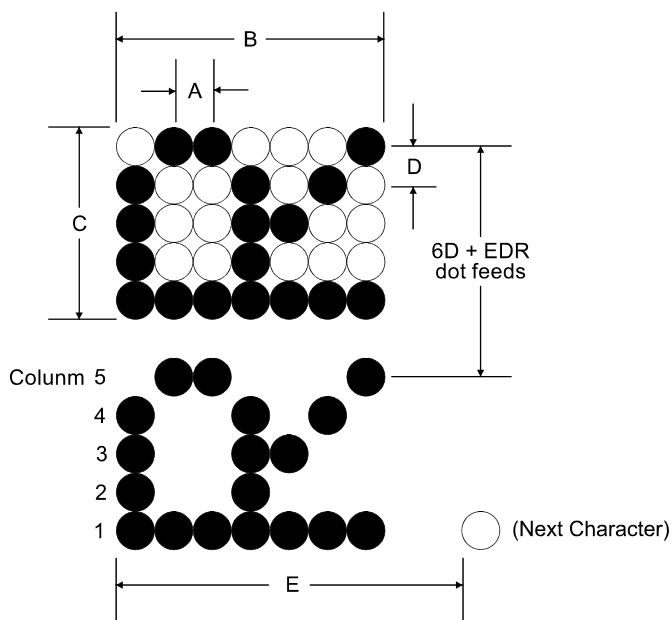
Double-wide characters are upright characters in an 8x7 dot format with twice the column (horizontal) spacing between printed dots as for standard characters.



* Columns 9 and 10 for certain special characters

Rotated Characters

Rotated characters are alternate characters in a 5x7 dot format printed 90 degrees counterclockwise (as shown in the illustration) or clockwise. Only one horizontal pitch is available: 6.95 CPI, 33 columns maximum.



Dimension	Horizontal Pitch (6.95 CPI, 33 Columns)
A	.366 mm (.0144 inches)
B	2.56 mm (.100 inches)
C	1.75 mm (.069 inches)
D	.353 mm (.0139 inches)
E	3.66 mm (.144 inches)

Print Zones

This section shows the printable area for the slip station and the receipt station.

Receipt Station

For 80 mm Paper

The receipt station centers characters (standard pitch and compressed pitch) and graphics on an 80 mm wide (3.15 inches) receipt.

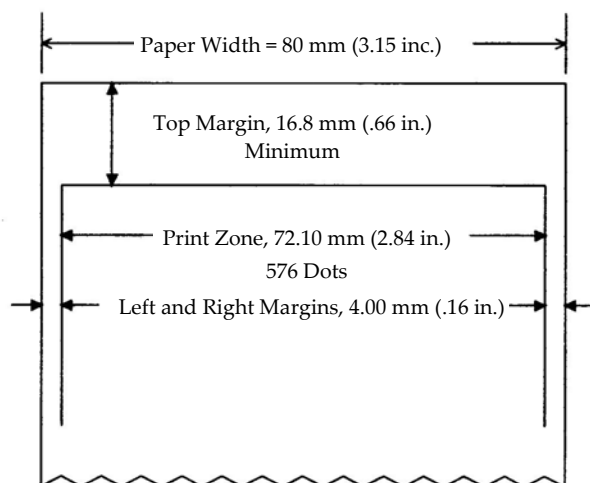
Standard pitch: 13 x 24 dots in character cell, 44 characters (columns) per line

Compressed pitch: 10 x 24 dots in character cell, 56 characters (columns) per line

Double byte character: 24 x 24 dots in character cell, 24 characters (columns) per line

Graphics: 576 addressable bits

The minimum print line height is 24 dots for characters and 24 dots for graphics. The standard print line height is 27 dots (3.38 mm, .133 inches) for characters (with three extra dot rows). See the following illustration (not to scale).

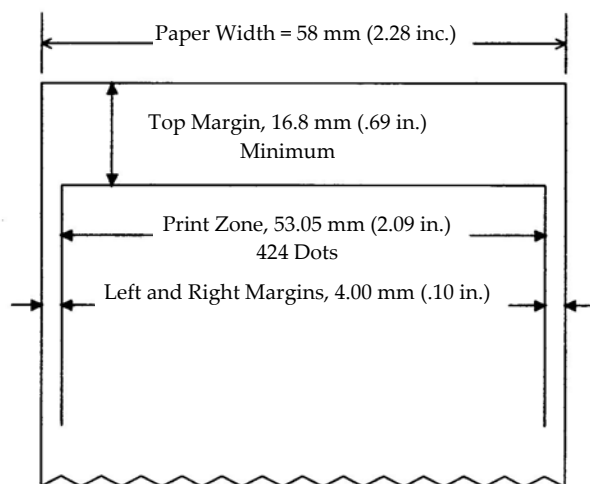


For 58 mm Paper

The receipt station centers characters (standard pitch and compressed pitch) and graphics on an 58 mm wide (2.28 inches) receipt.

Standard pitch: 13 x 24 dots in character cell, 32 characters (columns) per line
 Compressed pitch: 10 x 24 dots in character cell, 42 characters (columns) per line
 Double byte character: 24 x 24 dots in character cell, 17 characters (columns) per line
 Graphics: 424 addressable bits

The minimum print line height is 24 dots for characters and 24 dots for graphics. The standard print line height is 27 dots (3.38 mm, .133 inches) for characters (with three extra dot rows). See the following illustration (not to scale).

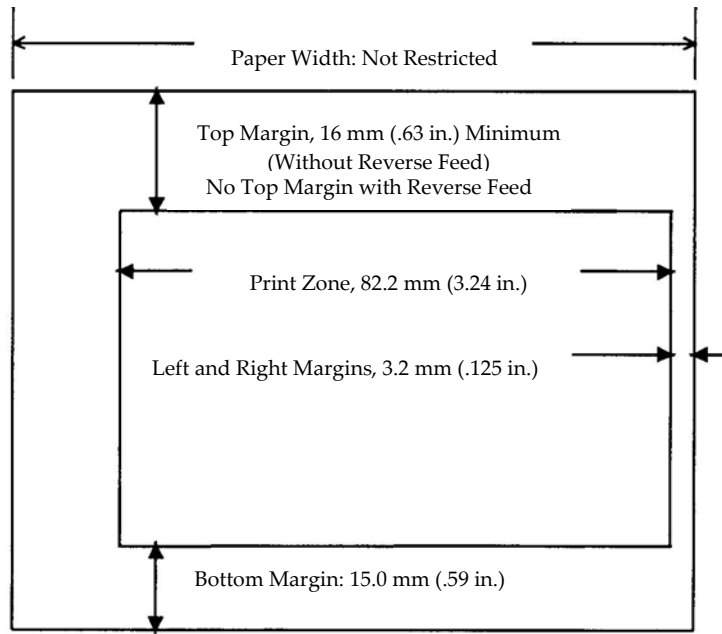


Slip Station

The slip station prints characters (standard pitch and compressed pitch) and graphics in a print zone of 82.2 mm (3.24 inches) wide on a slip or form.

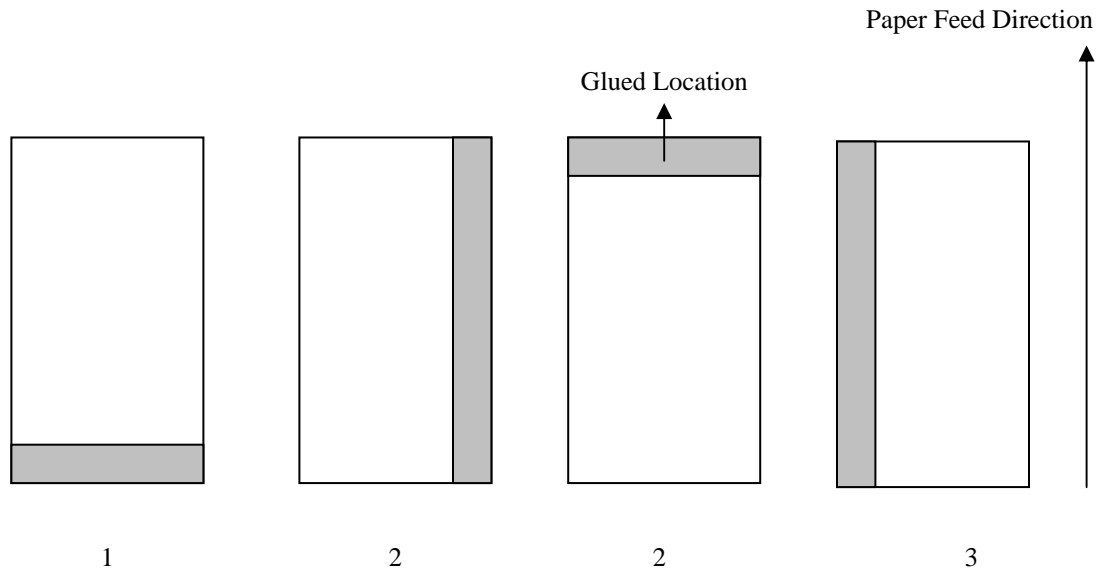
Standard pitch: 45 characters (columns) per line
 Compressed pitch: 55 characters (columns) per line
 Double byte character: 27 characters (columns) per line

The print line height of 10 half dot x 7 dot characters is 2.46 mm (.097 in). With three-dot spacing, the print line height is 3.53 mm (.139 inches). See the following illustration (not to scale). To print as close to the bottom of the slip as possible without the slip leaving the feed rollers, use the **Print and Feed *n* Lines (1B 64 *n*)**, with $n = 0$.



Slip Form Parameters

In order for the printer to handle forms properly the forms shall be flat and void of curls or wrinkles especially at the leading edge of the form.



Form construction for glued edges.

- 1) Bottom edge of form should not be glued
- 2) Paper feeding and insertion are affected by gluing method and the quality of glue used when form is glued on the right or top edge of form.
- 3) Skewing may occur when the form is glued on the left edge or when a wide form is used.

The sensors on the printer slip station use a reflective type photo sensor. Therefore the following precautions must be taken to allow for proper operation.

- Paper that has holes or is translucent in the sensor locations as shown below should not be used.
- When thin paper is used it should be placed between the top and bottom sheets of multiply paper. The thickest ply of paper should be the last ply

Check Size

The size of the check that the slip station and check flip mechanism handles conforms to ANSI/ABA standard X9.13 dated 1999.

Personal Check

6.00" (152.40 mm) wide x 2.750" (69.85 mm) High .

Business

8.75" (222.25 mm) wide x 3.667" (93.14 mm) High

MICR Media Requirements

MICR Printing

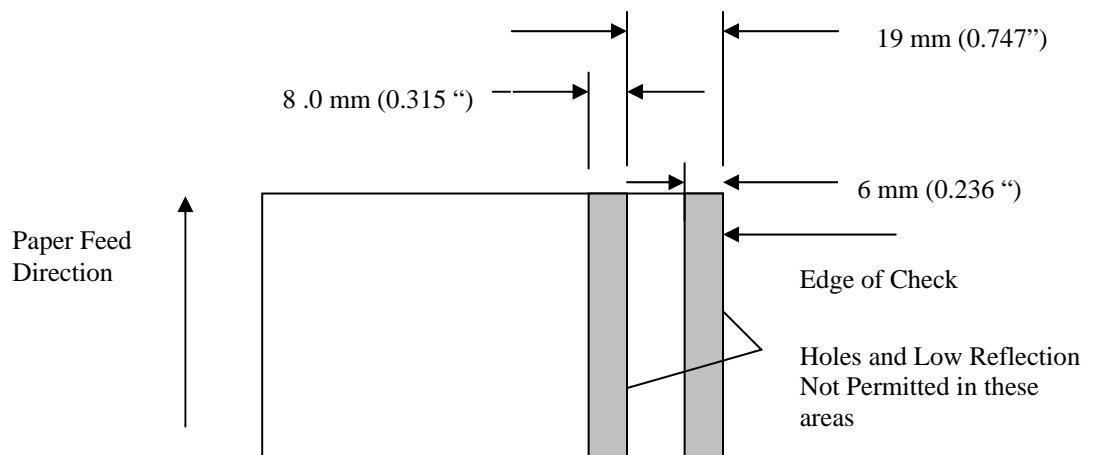
Printing of MICR Characters must conform to MICR standards as defined in ANSI/ABA X9.13, X9.18 and 9.27 as well ISO 1004.

Forms

Checks must be flat and void of curls, folds or wrinkles especially at the leading edges of the checks.

Paper jams and MICR read errors will occur if check have paper clips and staples. Also damage to the printer mechanism may occur to printer components such as the MICR read head, paper feed rollers, impact print head, etc..

When inserting the check into the printer and the the printer feed rolls begin to feed the check release the check immediately. Skewing of the check will occur which will cause check jams and MICR read errors.



Appendix C: Character Sets

The following pages show the character sets.

- PC Code Page 437 (USEnglish)
- PC Code Page 850 (Multilingual)
- PC Code Page 852 (Slavic)
- PC Code Page 860 (Portuguese)
- PC Code Page 862 (Hebrew)
- PC Code Page 863 (French-Canadian)
- PC Code Page 864 (Arabic)
- PC Code Page 865 (Nordic)
- PC Code Page 866 (Cyrillic)
- PC Code Page 1252 (Windows Latin #1)
- PC Code Page Katakana
- PC Code Page 874 (Thai)
- Space Page
- Code Page 932¹
- Code Page 936¹
- Code Page 949¹
- Code Page 950¹

¹ Not supported by 7167-1035 and 7167-2035

Code Page 950 Code Page 437, 850, 852 and 858

Code Page 437.

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01	!	1	A	Q	a	q	ü	æ	í	⋈	⋈	β	±	
02	"	2	B	R	b	r	é	Æ	ó	⋈	⋈	Γ	≥	
03	#	3	C	S	c	s	â	ô	û	⋈	⋈	π	≤	
04	\$	4	D	T	d	t	ä	ö	ñ	⋈	⋈	Σ	∫	
05	%	5	E	U	e	u	à	ò	Ñ	⋈	⋈	σ	∫	
06	&	6	F	V	f	v	â	û	ª	⋈	⋈	μ	+	
07	'	7	G	W	g	w	ç	ü	º	⋈	⋈	τ	≈	
08	(8	H	X	h	x	ê	ÿ	¿	⋈	⋈	φ	°	
09)	9	I	Y	i	y	ë	Ö	¬	⋈	⋈	θ	•	
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02	"	2	B	R	b	r	é	Æ	ó	⋈	⋈	É	ô	¬
03	#	3	C	S	c	s	â	ô	û	⋈	⋈	É	ö	¼
04	\$	4	D	T	d	t	ä	ö	ñ	⋈	⋈	É	ö	¶
05	%	5	E	U	e	u	à	ò	Ñ	⋈	⋈	À	ï	§
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07	'	7	G	W	g	w	ç	ü	º	⋈	⋈	À	í	°
08	(8	H	X	h	x	ê	ÿ	¿	⋈	⋈	À	í	°
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Code Page 852.

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03	#	3	C	S	c	s	â	ô	û	⋈	⋈	Đ	ö	¼
04	\$	4	D	T	d	t	ä	ö	ñ	⋈	⋈	Đ	ö	¶
05	%	5	E	U	e	u	à	ò	Ñ	⋈	⋈	Đ	ö	§
06	&	6	F	V	f	v	â	û	ª	⋈	⋈	Đ	ö	+
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02	"	2	B	R	b	r	é	Æ	ó	⋈	⋈	É	ô	¬
03	#	3	C	S	c	s	â	ô	û	⋈	⋈	É	ö	¼
04	\$	4	D	T	d	t	ä	ö	ñ	⋈	⋈	É	ö	¶
05	%	5	E	U	e	u	à	ò	Ñ	⋈	⋈	À	ï	§
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Code Page 860, 862, 863 and 864

Code Page 860.

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03	#	3	C	S	c	s	â	Ë	ô	û	ü	ü	ü	ü
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09)	9	I	Y	i	y	ë	Ï	ö	ü	ü	ü	ü	ü
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Code Page 862

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02	"	2	B	R	b	r	ı	ı	ı	ı	ı	ı	ı	ı
03	#	3	C	S	c	s	ı	ı	ı	ı	ı	ı	ı	ı
04	\$	4	D	T	d	t	ı	ı	ı	ı	ı	ı	ı	ı
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Code Page 863.

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03	#	3	C	S	c	s	â	Ë	ô	û	ü	ü	ü	ü
04	\$	4	D	T	d	t	ä	Ì	ñ	ü	ü	ü	ü	ü
05	%	5	E	U	e	u	å	Ó	ñ	ü	ü	ü	ü	ü
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Code Page 864

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03	#	3	C	S	c	s	·	·	·	·	·	·	·	·
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Code Page 865, 866, 874 and 1252

Code Page 865.

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Code Page Katakana

Code Page KATAKANA.

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Code Page 932 (Cont)

Code page 932-84

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80	о	п	р	с	т	у	ф	х	ц	ч	ш	щ	ъ	ы	ь	э
90	ю	я														
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C0	3	4	5	6	7	8	9	0	1	2	3	4	5	6	7	8
D0	9	0	1	2	3	4	5	6	7	8	9	0	1	2	3	4
E0	5	6	7	8	9	0	1	2	3	4	5	6	7	8	9	0
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Code page 932-87

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Code page 932-88

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B0	芦	鰲	梓	庄	幹	扱	宛	姐	虻	飴	絢	綾	貼	或	粟	衿
C0	安	庵	按	暗	案	闌	鞍	杏	以	伊	位	依	偉	困	夷	委
D0	威	尉	惟	意	慰	易	椅	為	畏	異	移	維	緯	胃	莖	衣
E0	謂	連	遺	医	井	亥	域	育	郁	磯	一	巷	溢	逸	稻	茨
F0	芋	觸	允	印	咽	員	因	姻	引	飲	淫	胤	蔭			

Code page 932-89

40	院	陰	慚	韻	時	右	宇	烏	羽	迂	雨	卯	鵝	窺	丑	確
50	曰	過	噓	頤	齟	蔚	鯁	姥	厖	浦	瓜	閨	噉	云	運	雲
60	在	餌	餽	營	嬰	影	映	曳	榮	永	泳	洩	瑛	盈	穎	穎
70	英	衡	詠	銳	液	疫	益	厭	悅	謁	越	閱	覆	厭	円	
80	園	堰	奄	婁	延	怨	掩	援	沿	演	炎	焰	煙	燕	猿	緣
90	艷	苑	園	遠	鉛	鶯	塩	於	汚	甥	凹	央	奧	往	厖	押
A0	旺	橫	歐	毆	王	翁	襖	薦	鴉	黃	岡	沖	荻	億	屋	憶
B0	臆	桶	牡	乙	俺	卸	恩	溫	穠	音	下	化	飯	何	伽	伽
C0	佳	加	可	嘉	夏	嫁	家	寡	科	暇	果	架	歌	河	火	珂
D0	禍	禾	稼	箇	花	苛	茄	荷	華	菓	蝦	課	嘩	貨	迦	過
E0	霰	蚊	俄	峨	我	牙	固	臥	芽	蛾	賀	雅	餓	駕	介	會
F0	解	回	塊	壞	迴	快	怪	悔	恢	懷	戒	拐	改			

Code Page 932 (Cont)

Code page 932-8A

40 魁晦械海灰界皆繪芥蟹開階貝凱効外
50 咳害崖慨概涯磚蓋街該鎡骸淫馨蛙垣
60 柿蚯鈎劃嚇各廓拉攬格核殼獲確穫覺
70 角赫較郭闊隔革學岳樂額顫掛笠樞
80 權梔齟瀾割喝恰括活渴滑摹褐轄且輓
90 叶柁樺鮑株兜躑躅釜鐮啣鴨栢茅萱粥
A0 刈刈互乾侃冠蹇刊勸勸卷喚堪姦完官
B0 寬干幹患感憤憾換敢柑桓槍款歡汗漢
C0 澗濬環甘監看竿管簡緩缶翰肝艦莢觀
D0 諫賈選鑑間閑閑陷轄館館丸含岸廐玩
E0 癌眼岩歆廣雁頑顛顛企伎危喜器基奇
F0 嬭寄岐希幾忌揮机旗既期棋棄

Code page 932-8B

40 機煇毅氣汽綫祈季稭紀徽規記實起軌
50 輝飢騎鬼龜偽儀妓宜戲技擬欺機疑祇
60 義蟻誼議掬菊鞠吉吃喫桔橘詰站杳黍
70 却客脚虐逆丘久仇休及吸宮弓急救
80 朽求汲泣灸球究窮笈級糾給旧牛去居
90 巨拒拋拳渠虛許距鋸漁禦魚享享京供
A0 俠僑兇競共凶協匡卿叫喬境峽強疆怯
B0 恐恭挾教矯況狂狹矯胸脅與藩鄉繞響
C0 饗驚仰凝堯曉業局曲極玉桐料僅勤均
D0 巾錦斤欣欽琴禁禽筋繫芹蔭衿襟謹近
E0 金吟銀九俱句区狗玖矩苦軀驅駝駒具
F0 愚虞喰空偶寓遇隅串櫛創屑屈

Code page 932-8C

40 掘窟沓靴鬱窪熊隈衆栗縲桑鍬勲君薰
50 訓群軍郡卦袞祁係傾刑兄啓圭珪型契
60 形徑惠慶慧翹揭携敬景桂溪畦稽系經
70 繼繫野荃荊蚩計詣繫輕頸鷄芸迎鯨
80 劇戟擊激隙柝傑欠穴潔穴結血訣月件
90 儉僣健兼券劍噓圍堅嫌遽憲懸拳捲檢
A0 權牽犬獻研硯絹梟肩見謙賢軒遺鍵陰
B0 顛駭峽元原戲幻弦滅源玄現絃絃言諺
C0 限乎個古呼固姑孤己庫弧戶故枯湖狐
D0 糊袴股胡孤虎誇跨鈞屨顧鼓五互伍午
E0 吳吾娛後御悟梧橋瑚暮語誤護醜乞鯉
F0 交佼侯候倖光公功效勾厚口向

Code page 932-8D

40 后喉坑垢好孔孝宏工巧巷幸庠庚康弘
50 恒慌抗拘控攻昂晃更校梗構江洪浩
60 港溝甲皇硬稿糠紅絃絞綱耕考肯肱腔
70 膏航荒行衡譎賈賈郊醇鉷鉷鋼閣降
80 項香高鴻剛劫号合壕拷濠豪轟趨克刻
90 告国穀酷鵠黑獄滌腰甌忽惚骨拍込此
A0 頃今困坤壘婚恨懇昏昆根梱混痕紺艮
B0 魂些佐叉唆嵯左差查沙瑣砂詐鎖崇坐
C0 座挫價催再最哉賽妻幸彩才採裁歲涪
D0 災采壓碎紫紫齋細菜載載際劑在材罪
E0 財呀坂阪堺榭肴咲崎崎崎驚作削咋搾
F0 昨朔柵窄策索錯梭銑筴匙冊刷

Code page 932-8E

40 察撈撮擦札殺薩雜臯鯖捌鑄鮫皿晒三
50 傘參山慘撒散棧燦珊產算纂蚤讚贊酸
60 餐斬暫殘仕仔伺使刺司史嗣四士始姉
70 姿子屍市師志思指支攷斯施旨枝止
80 死氏獅祉私糸紙紫肢脂至視詞詩試誌
90 諮資錫雌飼齒事似侍兒字寺慈持時次
A0 滋治爾蠶痔磁示而耳自蒨辭汐麗式識
B0 鳴竺軸央嬰七叱執失嫉室悉濕漆疾質
C0 寔部儻僂柴芝屢蕊綺舍写射捨赦斜煮
D0 錫紗著謝車遮蛇邪借勺尺杓灼爵酌煎
E0 錫若寂弱惹主取守手朱殊狩珠種腫趣
F0 酒首儒受呪壽授樹綬需囚収周

Code page 932-8F

40 宗就州修愁拾洲秀秋終繡習奧舟莧衆
50 襲襲蹴躑週酋洲集龍什住充十從戎柔
60 汁滋獸縱重銃叔夙宿淑祝縮爾塾熟出
70 術述俊峻春曉竣舜駿准循旬桶殉淳
80 準潤盾純巡選醇順処初所暑曙渚庶緒
90 署署薯諸諸助叙女序徐恕鋤除傷償勝
A0 匠升召哨商唱嘗獎妾媼宵將少尚庄
B0 床廠彰承抄招掌捷昇昌昭晶松梢樟樵
C0 沼消涉湘燒焦照症省硝礮祥称章笑粧
D0 紹肖薑蔣蕉衡裝訟証詔詳象賞鑿鉦鍾
E0 鐘障鞘上丈丞乘冗剗城場壤壤常情擾
F0 条杖淨狀疊穰蒸讓釀錠囑壇飾

Code Page 932 (Cont)

Code page 932-90

40 拭植殖燭織職色蝕食蝕辱尻伸信侵啓
50 娠環審心憤振新晉森榛漫深申疹真神
60 秦紳臣苾薪親診身辛進針震人仁刃廔
70 王尋甚尽腎訊迅陣鞞鞞須酢囟厨
80 逗吹垂帥推水炊睡粹翠衰遂醉錘錘隨
90 瑞髓崇嵩數矩趨難据杉榻菩頗雀裾澄
A0 摺寸世瀨畝是凄制勢姓征性成政暨星
B0 瞢樓栖正清牲生盛精聖声製西誠暨請
C0 逝醒青靜齊稅脆隻席惜戚斥昔析石積
D0 籍績脊責赤跡蹟碩切拙接攝折設窃節
E0 說雪絕舌蟬仙先干占宣專尖川戰扇撰
F0 桎桷泉淺洗染潛煎燭旋穿箭線

Code page 932-91

40 纖羨腺舛船薦詮賤踐選選錢銑閃鮮前
50 善漸然全禪繕膳糧噲塢措曾曾楚狙
60 疏疎礎祖祖粗素組蘇訴阻遡鼠僧劍双
70 蕞倉喪壯奏爽宋層匝惣想搜掃掃搔
80 操早瞿巢槍槽漕燥爭瘦相窓糴綵綵聰
90 章莊葬蒼藻裝走送遭鎗鏑駭像增憎賊
A0 藏贈造促側則即息捉束測足速俗屬賊
B0 族繞卒袖其掬存孫尊搗村遜他多太汰
C0 訖唾墮妥脣打舵舵橈陀駄驢体堆对耐
D0 岱帶待怠態戴替泰滯胎腿苔袋貸逮遠
E0 隊黛鯛代台大第醍題霽淹瀧卓啄宅托
F0 拆拓沃濯琢託鐸濁諾葦夙蛸只

Code page 932-92

40 叩但達辰奪脫巽豎迪棚谷狸鱧樽誰丹
50 卑嘆坦担探旦歎淡湛炭短端簞綻耽胆
60 蛋誕鍛团墻彈斷暖檀段男談值知地弛
70 恥智池痴稚置致蚰遲馳築蓄竹筑蓄
80 逐秩窒茶嫡釐中仲宙忠抽昼柱注虫衷
90 註耐鑄駐嚮獮猪苧著貯丁兆凋噪寵帖
A0 帳疋弔張彰徵懲挑暢朝潮牒眺眺騰脹
B0 腸蝶調謀超跳銚長頂烏勅抄直朕沈珍
C0 賃鎮陳津墜椎追鎚痛通塚樞樞楓佃
D0 漬柸辻薦櫛鐫樁漬坪壺嫻紬爪吊釣鸛
E0 亭低停偵剝貞呈堤帝底庭廷弟悌抵
F0 挺提梯汀碇禎程締艇訂諦蹄遞

Code page 932-93

40 邸鄭釘鼎泥摘攢敵滴的笛適鐫溺哲徹
50 撤轍迭鉄典墳天展店添纏甜貼軫顛点
60 佻殿澱田電兔吐堵塗妬屠徒斗杜渡登
70 莧賭途都鍤砥砺努度土奴怒倒党冬
80 凍刀唐塔塘套宕島嶋悼投搭東桃榜棟
90 盜洵湯燙灯燈当痘禿等答筒糖統到董
A0 蕩藤討膳豆踏逃透錯陶頭騰關勳勳同
B0 堂導幢撞洞瞳童胴菊道銅峠鷄圍得德
C0 洩特贅禿驚獨詭詭櫟凸突檄屈薦苦
D0 寅酉潯噸屯惇敦沌豚遁頓吞曇鈍奈那
E0 內乍屈薙謎灘捺鍋櫓馴緇囁南桷軟難
F0 汝二厄忒迓勾賑肉虹廿日乳入

Code page 932-94

40 如尿蕕任妊忍認濡欄祢寧葱猫熟年念
50 捻撚燃粘乃迺之莖囊惱濃納能腦膿農
60 視蜚巴把播霸把波派琶破婆芭馬俳
70 癢痒排敗杯盃背肺輩配倍培媒梅
80 煤煤猥賈壳賂陪遺蠅秤矧萩伯剝博拍
90 柏泊白箔柏舶薄迫曝漠爆縛莫駁麦函
A0 箱谿箸箸箸櫛櫛肌畑畠八鉢澆癢癢髮
B0 伐剷拔筏閥鳩鳩鳩鳩隼伴判半反叛帆
C0 搬斑板汜汎版犯班畔繁般藩販範采煩
D0 頒飯挽晚番盤盤蕃蛭匪卑否妃庇彼悲
E0 靡批披斐比泌疲皮碑秘緋罷肥被誹費
F0 避非飛馱馱備尾微枇毘毘眉美

Code page 932-95

40 鼻柁稗匹正髭彥膝菱肘弼必畢筆邇桧
50 姬媛紐百謬倭彪標氷瀧瓢票表評豹廟
60 描病秒苗鎬鉅赫蛭轄品彬斌浜瀕貧寶
70 頻敏瓶不付埠夫婦富富布府怖扶敷
80 斧普浮父符腐膚芙譜負賦赴阜附侮撫
90 武舞葡蕪郇封楓風蕪蕪伏副復幅服福
A0 腹複覆淵弗弘沸仏物魴分吻噴墳憤扮
B0 焚富粉糞紛霧文聞丙併兵摒幣平弊柄
C0 並蔽閉陞米貢僻壁癖碧別瞥薺篋偏奕
D0 片篇編辺返邇便勉婉弁鞭保舖舖團捕
E0 步甫補輔穗募墓慕戛募母簿菩倣倣包
F0 呆報奉宝峰峯崩庖抱捧放方朋

Code Page 932 (Cont)

Code page 932-96

40 法泡烹袍縹胞芳萌蓬蜂褒訪豐邦鋒飽
50 鳳鵬乏亡傍剖坊妨帽忘忙房暴望某棒
60 冒紡肪膨謀貌貿鉞防吠頻北僕卜墨撲
70 朴牧睦穆鈞勃沒殆堀幌奔本翻凡盆
80 摩磨魔麻埋妹枚每哩檣幕膜枕鯖枉
90 鱗枳亦侯又抹末沫迄促繭磨万慢滿漫
A0 蔓味未魅已箕岬密蜜湊養稔脈妙耗民
B0 眠務夢無牟矛霧鷄棕嬌娘冥名命明盟
C0 迷銘鳴姪牝滅免棉綿緬面麵撲模茂妄
D0 孟毛猛盲網耗蒙儲木默目杳勿餅尤戾
E0 初蕢問悶紋門勾也冶夜爺耶野弥矢厄
F0 役約藥詛躍靖柳藪鍾愉愈油癒

Code page 932-97

40 諭輸唯佑優勇友宥幽悠憂揖有柚湧涌
50 猶猷由祐裕誘遊邑郵雄融夕予余与譽
60 與預備幼妖容膚揚搖擁囑楊樣洋溶熔
70 用窯羊耀葉蓉要謠踊遙陽養慾抑欲
80 沃浴翌翼淀羅螺裸來萊賴雷洛絡落酪
90 乱卵嵐欄濫藍蘭覽利吏履李梨理璃俐
A0 裏裡里離陸律率立菴掠路劉流溜琉留
B0 硫粒隆竜龍侶慮旅虜了亮僚兩凌寮料
C0 梁涼獠療瞭稜糧良諒遼量陵領力緣倫
D0 厘林淋淋琳臨輪隣麟麟璫璽淚累類令
E0 伶例冷勵賴伶玲礼苓鈴隸零靈麗齡曆
F0 歷列劣烈裂廉慫憐連煉簾練聯

Code page 932-98

40 蓮連鍊呂魯櫓炉賂路露勞婁廊弄朗樓
50 榔浪漏牢狼竈老聾蠟郎六麓祿肋錄論
60 倭和話歪賄脇惑粹鷺互亘鰭訛薰蕨槐
70 瀉碗腕
80
90 式
A0 巧丕个卅、井、乂乖乘亂、豫爭舒式
B0 于亞亞一亢京毫竄从仍仄仆仗仗伢伢
C0 仵价伉佚估佛佻佻佻佻佻佻佻佻佻佻
D0 侑佻來侖儂俛俛俛俛俛俛俛俛俛俛俛俛
E0 倨倨倪倅倅倅倅倅倅倅倅倅倅倅倅倅
F0 會偕修偈倣倣倣倣倣倣倣倣倣倣倣倣倣

Code page 932-99

40 僉僉僉僉僉僉僉僉僉僉僉僉僉僉僉僉僉僉
50 僂僂僂僂僂僂僂僂僂僂僂僂僂僂僂僂僂僂
60 僉兮龔門同册冉罔霄焉冤一冤冤冤冤
70 冪、決沍冲冰況冽涸涼凜几處夙凭
80 鳳、函刃刊刳刳刳刳刳刳刳刳刳刳刳
90 劓剔剪剝剝剝剝剝剝剝剝剝剝剝剝剝
A0 劓劓劓劓劓劓劓劓劓劓劓劓劓劓劓劓
B0 勿匄匄匄匄匄匄匄匄匄匄匄匄匄匄
C0 卅卅卅卅卅卅卅卅卅卅卅卅卅卅卅卅卅
D0 厰厰厰厰厰厰厰厰厰厰厰厰厰厰厰厰
E0 吭吼吮吮吮吮吮吮吮吮吮吮吮吮吮吮吮
F0 咀啍啍啍啍啍啍啍啍啍啍啍啍啍啍啍啍

Code page 932-9A

40 咫晒咤佬咯聆哥哦唏唔哽唏哭哺弄吟
50 哇啞啞啞啞啞啞啞啞啞啞啞啞啞啞啞啞
60 啞啞啞啞啞啞啞啞啞啞啞啞啞啞啞啞
70 噴嘔嗽噴嗽嗽嗽嗽嗽嗽嗽嗽嗽嗽嗽嗽嗽
80 噫噫噫噫噫噫噫噫噫噫噫噫噫噫噫噫
90 噯噯噯噯噯噯噯噯噯噯噯噯噯噯噯噯
A0 國園圓園園園園園圪圪圪圪圪圪圪圪
B0 垚垚垚垚垚垚垚垚垚垚垚垚垚垚垚垚
C0 圪垚垚垚垚垚垚垚垚垚垚垚垚垚垚垚垚
D0 壙壙壙壙壙壙壙壙壙壙壙壙壙壙壙壙
E0 壘壯壘壘壘壘壘壘壘壘壘壘壘壘壘壘壘
F0 夸夾奇奕奕奕奕奕奕奕奕奕奕奕奕奕奕

Code page 932-9B

40 奸妁妝倭倭妣妣妣倭姜妍姘姚娥娟娑
50 娜嫖嫖嫖嫖嫖嫖嫖嫖嫖嫖嫖嫖嫖嫖嫖嫖
60 嬌嫖嫖嫖嫖嫖嫖嫖嫖嫖嫖嫖嫖嫖嫖嫖嫖
70 嬌嫖子孕孕孕孕孕孩孩孩孩孩孩孩孩
80 它宦宸宸宸宸宸宸宸宸宸宸宸宸宸宸
90 寶冠將專對尔尠尤尠尸尹屁屈屎屎屎
A0 屏屏屏屏屏屏屏屏屏屏屏屏屏屏屏屏
B0 岍岍岍岍岍岍岍岍岍岍岍岍岍岍岍岍岍
C0 崑崑崑崑崑崑崑崑崑崑崑崑崑崑崑崑
D0 嶼嶼嶼嶼嶼嶼嶼嶼嶼嶼嶼嶼嶼嶼嶼嶼
E0 厝厝厝厝厝厝厝厝厝厝厝厝厝厝厝厝
F0 幣幣幣幣幣幣幣幣幣幣幣幣幣幣幣幣

Code page 932-9C

Code page 932-9D

40	憂戩截戮戰戲戲扁扎扞扣扛扞扼扞
50	抉找抒抓抖拔扑坏拗担拑拿拆攢拈
60	拜拌拊拂拇拗拉拈拈拈拈拈拈拈
70	揆揆揆揆揆椅掀掀揆揆揆揆揆揆
80	撮揆揆揆揆揆揣揆揆揆揆揆揆揆
90	撮揆揆揆揆揆揣揆揆揆揆揆揆揆
A0	擒擯擯擯擯擯擯擯擯擯擯擯擯擯
B0	擯擯擯擯擯擯擯擯擯擯擯擯擯擯
C0	攷攷攷攷攷攷攷攷攷攷攷攷攷攷
D0	斷旆旆旆旆旆旆旆旆旆旆旆旆旆旆
E0	晰昵昶昶昶昶昶昶昶昶昶昶昶昶
F0	昶昵昶昶昶昶昶昶昶昶昶昶昶昶

Code page 932-9F

40 槩 藁 檻 榼 榷 檣 檣 檣 檣 檣 檣 檣 檣 檣 檣
50 藁 檣 槩 檣 檣 檣 欵 欵 盜 欵 欵 欵 欵 欵 欵
60 欵 欵 欵 欵 歸 歹 殄 殄 殄 殄 殄 殄 殄 殄
70 殄 殄 殄 殄 殄 殄 殄 殄 殄 殄 殄 殄 殄 殄
80 殄 殄 殄 殄 殄 殄 殄 殄 殄 殄 殄 殄 殄 殄
90 殄 殄 殄 殄 殄 殄 殄 殄 殄 殄 殄 殄 殄 殄
A0 殄 殄 殄 殄 殄 殄 殄 殄 殄 殄 殄 殄 殄 殄
B0 殄 殄 殄 殄 殄 殄 殄 殄 殄 殄 殄 殄 殄 殄
C0 殄 殄 殄 殄 殄 殄 殄 殄 殄 殄 殄 殄 殄 殄
D0 殄 殄 殄 殄 殄 殄 殄 殄 殄 殄 殄 殄 殄 殄
E0 殄 殄 殄 殄 殄 殄 殄 殄 殄 殄 殄 殄 殄 殄
F0 殄 殄 殄 殄 殄 殄 殄 殄 殄 殄 殄 殄 殄 殄

Code page 932-E1

40	𪔐	𪔑	𪔒	𪔓	𪔔	𪔕	𪔖	𪔗	𪔘	𪔙	𪔚	𪔛	𪔜	𪔝	𪔞	𪔟	𪔠	𪔡
50	𪔢	𪔣	𪔤	𪔥	𪔦	𪔧	𪔨	𪔩	𪔪	𪔫	𪔬	𪔭	𪔮	𪔯	𪔰	𪔱	𪔲	𪔳
60	𪔴	𪔵	𪔶	𪔷	𪔸	𪔹	𪔺	𪔻	𪔼	𪔽	𪔾	𪔿	𪕀	𪕁	𪕂	𪕃	𪕄	𪕅
70	𪕆	𪕇	𪕈	𪕉	𪕊	𪕋	𪕌	𪕍	𪕎	𪕏	𪕐	𪕑	𪕒	𪕓	𪕔	𪕕	𪕖	𪕗
80	𪕘	𪕙	𪕚	𪕛	𪕜	𪕝	𪕞	𪕟	𪕠	𪕡	𪕢	𪕣	𪕤	𪕥	𪕦	𪕧	𪕨	𪕩
90	𪕪	𪕫	𪕬	𪕭	𪕮	𪕯	𪕰	𪕱	𪕲	𪕳	𪕴	𪕵	𪕶	𪕷	𪕸	𪕹	𪕺	𪕻
A0	𪕼	𪕽	𪕾	𪕿	𪖀	𪖁	𪖂	𪖃	𪖄	𪖅	𪖆	𪖇	𪖈	𪖉	𪖊	𪖋	𪖌	𪖍
B0	𪖎	𪖏	𪖐	𪖑	𪖒	𪖓	𪖔	𪖕	𪖖	𪖗	𪖘	𪖙	𪖚	𪖛	𪖜	𪖝	𪖞	𪖟
C0	𪖠	𪖡	𪖢	𪖣	𪖤	𪖥	𪖦	𪖧	𪖨	𪖩	𪖪	𪖫	𪖬	𪖭	𪖮	𪖯	𪖰	𪖱
D0	𪖲	𪖳	𪖴	𪖵	𪖶	𪖷	𪖸	𪖹	𪖺	𪖻	𪖼	𪖽	𪖾	𪖿	𪗀	𪗁	𪗂	𪗃
E0	𪗄	𪗅	𪗆	𪗇	𪗈	𪗉	𪗊	𪗋	𪗌	𪗍	𪗎	𪗏	𪗐	𪗑	𪗒	𪗓	𪗔	𪗕
F0	𪗖	𪗗	𪗘	𪗙	𪗚	𪗛	𪗜	𪗝	𪗞	𪗟	𪗠	𪗡	𪗢	𪗣	𪗤	𪗥	𪗦	𪗧

Code page 932-E2

Code page 932-E3

[illegible]

Code page 932-E5

[illegible]

Code page 932-E7

[illegible]

Code page 932-E8

[illegible][illegible][illegible][illegible][illegible][illegible]

Code Page 932 (Cont)

Code page 932-FB

40 涖滓吳清澆森洶湜滌漢泮澈漸瀆瀝瀆
 50 瀨炅炆炇炈燬燿燧燮燹燹燹燹燹燹燹燹
 60 珣珥珧珨珩珪珫班珬班班班班班班班班
 70 皂皤皤皤皤皤皤皤皤皤皤皤皤皤皤皤皤
 80 祥禔福禔竝竝竝竝竝竝竝竝竝竝竝竝竝
 90 罇羨羽茁芋茂菇華蕒蕒蕒蕒蕒蕒蕒蕒蕒蕒
 A0 蛭蟪蛭蛭蛭蛭蛭蛭蛭蛭蛭蛭蛭蛭蛭蛭蛭
 B0 赶赳赳返逸逋郎都鄧鄧鄧鄧鄧鄧鄧鄧
 C0 鈞鈞鈞鈞鈞鈞鈞鈞鈞鈞鈞鈞鈞鈞鈞鈞鈞
 D0 鈞鈞鈞鈞鈞鈞鈞鈞鈞鈞鈞鈞鈞鈞鈞鈞鈞
 E0 鈞鈞鈞鈞鈞鈞鈞鈞鈞鈞鈞鈞鈞鈞鈞鈞鈞
 F0 鈞鈞鈞鈞鈞鈞鈞鈞鈞鈞鈞鈞鈞鈞鈞鈞鈞

Code page 932-FC

40 高界康分魚戶甦生魚老魚發魚愛周鳥卓雀鳥龍鳥黑
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 A0
 B0
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 F0

Code Page 936 Simple Chinese (Cont.)

A840 - A8FF

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A0 ǒ ǒ ǒ ǒ ǒ ǒ ǒ ǒ ǒ ǒ ǒ ǒ ǒ ǒ ǒ
B0 ǒ ǒ ǒ ǒ ǒ ǒ ǒ ǒ ǒ ǒ ǒ ǒ ǒ ǒ
C0 ǒ ǒ ǒ ǒ ǒ ǒ ǒ ǒ ǒ ǒ ǒ ǒ ǒ ǒ
D0 ǒ ǒ ǒ ǒ ǒ ǒ ǒ ǒ ǒ ǒ ǒ ǒ ǒ ǒ
E0 ǒ ǒ ǒ ǒ ǒ ǒ ǒ ǒ ǒ ǒ ǒ ǒ ǒ ǒ
F0

AC40 - ACFF

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C0
D0
E0
F0

A940 - A9FF

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A0
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C0
D0
E0
F0

AD40 - ADFF

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A0
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C0
D0
E0
F0

AA40 - AAFF

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A0
B0
C0
D0
E0
F0

AE40 - AEFF

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A0
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C0
D0
E0
F0

AB40 - ABFF

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A0
B0
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D0
E0
F0

AF40 - AFFF

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A0
B0
C0
D0
E0
F0

Code Page 936 Simple Chinese (Cont.)

B040 - B0FF

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A0 啊阿埃挨哎唉哀皑癌蒿矮艾碍爱隘
B0 鞍氨安俺暗岸胺案肮昂盎凹敖熬翱
C0 袄傲奥懊澳澳捌扒叭吧芭八疤巴拔跋
D0 靶把耙坝霸罢爸白柏百摆佰败拜拜斑
E0 班搬扳般颁板版扮伴瓣半办絆邦帮
F0 梆榜膀绑棒磅蚌傍谤苞胞包褒剝

B140 - B1FF

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90
A0 薄雹保堡饱宝抱报暴豹鲍爆杯碑悲
B0 卑北辈背贝狈倍狈备惫焙被奔笨笨
C0 崩绷甬泵蹦迸逼鼻比鄙笔彼碧蔽毕
D0 毙筈币庇痹闭蔽弊必辟壁臂避陛鞭边
E0 编贬扁便变下辨辨辨遍标彪膘表鳖憋
F0 别邳彬斌濒滨宾兵冰柄丙秉饼炳

B240 - B2FF

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A0 病并玻菠播钵钵波博勃搏铂铂伯帛
B0 舶脖膊渤泊驳捕卜哺补埠不布步簿部
C0 怖掇猜裁材才财睬睬采彩蔡餐蚕蚕
D0 残惭惨灿苍仓沧藏操糙槽曹草厕策
E0 侧册测层蹭插叉荏茶查碴察岔差詫
F0 拆柴豺搀掺蟾馋馋缠铲产阐颤昌猖

B340 - B3FF

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A0 场尝常长偿肠厂敞畅唱倡超抄钞朝
B0 嘲潮巢吵炒车扯撤掣彻澈臣辰尘晨
C0 忱沉陈趁衬撑称城橙成呈乘程惩澄诚
D0 承逞骋秤吃痴持匙池迟弛耻齿侈尺
E0 赤翅斥炽充冲虫崇葱抽酬畴稠愁筹
F0 仇绸瞅丑臭初出橱厨蹒锄雏滁除楚

B440 - B4FF

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A0 础储矗搐触处揣川穿椽传船喘串疮
B0 窗幢床闯创吹炊捶锤垂春椿醇唇淳纯
C0 霰戳绌疵茨磁雌辞慈瓷词此刺赐次聪
D0 葱囱匆丛从凄粗醋簇促蹙篡摧崔催
E0 脆粹粹淬翠村存寸磋撮搓措措措搭达
F0 答瘡打大呆歹傣戴带殆代货袋待逮

B540 - B5FF

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A0 怠耽担丹单郸掸胆旦氮但憚淡诞弹
B0 蛋当挡党档档刀捣蹈倒岛祷导到稻悼
C0 道盗德得的蹬灯登等蹬凳邓堤低滴迪
D0 敌笛狄涤翟嫡抵底地蒂蒂帝弟递缔顛
E0 掂滇碘点典踮垫电佃甸店惦奠淀殿磓
F0 刁雕凋刁掉吊钓调跌爹磔磔迭喋叠

B640 - B6FF

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A0 丁叮叮钉顶鼎锭定订丢东冬董懂动
B0 栋恫冻洞兜抖斗陡豆逗痘都督毒接
C0 独读堵睹赌杜镀肚渡渡妒端短锻段断
D0 缎堆兑队对墩吨蹲敦顿囤钝盾遁遁哆
E0 多夺垛躲朵踪舵剝情墮峨峨鵝俄額訖
F0 娥恶厄扼遏鄂饿恩而儿耳尔洱洱二

B740 - B7FF

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A0 貳发罚筏伐乏阙法珐藩帆番翻樊矾
B0 钒繁凡烦反返范贩犯饭泛坊芳方肪房
C0 防妨仿访妨放非啡啡飞匪匪啡吠肺废
D0 沸费芬酚吩氛分纷纷焚粉份份份份
E0 粪丰丰封枫峰峰峰峰峰峰峰峰峰峰
F0 佛否夫敷肤肤扶扶拂拂幅幅幅幅伏俘服

Code Page 936 Simple Chinese (Cont.)

B840 - B8FF

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A0 浮涪福袱弗甫抚辅俯釜斧脯腑腐
B0 赴副覆赋复付阜父腹负富讷附妇缚
C0 咐噏嘎该改概钙盖溉干甘杆柑竿肝赶
D0 感秆敢赣冈刚钢缸缸纲岗港杠篙皋高
E0 膏羔糕搞稿告哥歌搁戈鹄貉疙割革
F0 葛格蛤阁隔铬个各给根跟耕更庚羹

B940 - B9FF

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A0 埂耿梗工攻功恭龚供躬公宫弓巩汞
B0 拱贡共钩勾沟苟狗垢构购够辜菇咕箍
C0 估沽孤姑鼓古蛊骨谷股故顾固雇刮瓜
D0 刚寡挂褂乖拐怪棺关官冠观馆罐惯
E0 灌贯光广逛瑰规圭硅归龟闺轨鬼诡癸
F0 桂柜跪贵剑辊滚棍郭国果裹过哈

BA40 - BAFF

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A0 骸孩海氦亥害骇酣憨邯韩含涵寒函
B0 喊罕翰憾捍旱憾悍汗汉夯航壕壕
C0 豪毫郝好耗号浩呵喝荷荷核禾和何合
D0 盒貉阍河涸赫褐鹤贺嘿黑痕很狠恨哼
E0 亨横衡恒轰哄烘虹鸿洪宏弘红喉侯猴
F0 吼厚候后呼乎忽瑚壶葫胡瑚弧糊湖

BB40 - BBFF

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A0 弧虎琥护互沪户花哗华猾滑画划化
B0 话槐徊怀淮坏欢坏恒还缓换患唤痪豪
C0 焕涣宦幻荒慌黄磺蝗簧凰惶惶晃幌
D0 恍恍灰挥辉恢恢徊回毁悔慧卉惠晦贿
E0 秽会烺汇讳诲绘莘昏婚魂浑混豁活伙
F0 火获或惑霍货祸击圾基机畸稽积箕

BC40 - BCFF

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A0 肌饥迹激讥鸡姬绩缉吉极棘辑籍集
B0 及急疾汲即嫉级挤几脊己莳技冀季伎
C0 祭剂悸济寄寂计记既忌妓继纪嘉伽
D0 夹佳家加荚颊贾甲钾假稼价架驾嫁歼
E0 监坚尖笺间煎兼肩艰奸碱茧检柬碱硷
F0 拣捡简俭剪减荐槛鉴践贱见键箭件

BD40 - BDFF

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A0 健舰剑饫渐溅涧建僵姜将浆江疆蒋
B0 桨奖讲匠酱降蕉焦焦胶交郊浇轿轿
C0 嚼搅较轿侥脚狡角皎缴较剿教酵轿较
D0 叫窖揭接皆桔街阶截劫节桔杰捷睫竭
E0 洁结解姐戒藉芥界借介疥诫届巾筋斤
F0 金今津襟紧锦仅谨进靳晋禁近烬浸

BE40 - BEFF

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A0 尽劲荆兢茎睛晶鲸京惊精梗经井警
B0 景颈静境敬镜径痉靖竟净炯窘究
C0 纠玖韭久灸九酒厥救旧臼舅咎就疚鞠
D0 拘狙疽居驹菊局咀矩举沮聚拒据巨具
E0 距踞锯俱句惧炬剧捐鹃娟倦眷眷绢掬
F0 攫抉掘倔爵觉决决绝均菌钧军君峻

BF40 - BFFF

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A0 俊竣浚郡骏喀咖卡咯开揩楷凯慨刊
B0 堪勘坎坎看康慷慷抗抗亢炕考拷烤靠
C0 坷苛柯棵磕颞科壳咳可渴克刻客课肯
D0 啃垦恳坑吭空恐孔控扣扣寇枯哭窟
E0 苦酷库裤夸垮垮跨跨跨快快快宽宽匡
F0 筐狂框矿眶旷况亏盔岙窈窕奎魁愧

Code Page 936 Simple Chinese (Cont.)

C040 - C0FF

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A0 馈愧溃坤昆捆困括扩廓阔垃拉喇蜡
B0 腊辣啦莱来赖蓝婪栏拦篮兰澜调搅
C0 览懒缆烂滥琅榔狼廊郎朗浪捞劳牢老
D0 佬姥酪烙涝勒乐雷雷雷磊磊垒擂肋
E0 类泪棱楞冷厘梨梨黎篱理离漓理李里
F0 鲤礼莉荔吏栗丽厉励砾历利例例例

C140 - C1FF

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A0 痢立粒沥隶力璃哩俩联莲连镰廉怜
B0 涟帘敛脸链恋炼粮凉梁良两辆量
C0 晾亮凉撩聊僚疗僚寥辽潦了撂镣廖料
D0 列裂烈劣猎淋林霖霖临邻淋凛赁吝
E0 玲玲菱零龄铃铃铃凌灵陵岭领另令溜
F0 琉榴硫溜留刘瘤流柳六龙聋咙笼隆

C240 - C2FF

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A0 隆垄拢陇楼娄楼萎漏陋芦卢颅庐炉
B0 掬卤虏鲁麓碌露路赂鹿潞禄录陆戮驴
C0 吕侣侣旅履屦缕虑氯律率遽绿峦率李
D0 滦卵乱掠略抡轮仑仑论论萝螺罗逻
E0 锣箩裸裸落洛络络妈麻玛码吗马骂嘛
F0 吗埋买麦卖迈脉瞒慢蛮满蔓曼慢慢

C340 - C3FF

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A0 漫芒茫盲氓忙莽猫茅锚毛矛卯卯茂
B0 冒帽貌贸么玫枚梅霉霉煤没眉媒镁每
C0 美味寐妹媚们们们萌蒙檬盟猛梦孟
D0 眯魅靡靡迷迷弥米秘觅泌蜜密慕棉眠
E0 绵冕免勉婉媿面苗描瞄藐秒渺庙妙蔑
F0 灭民抿皿敏悯闾明螟鸣铭名命谬摸

C440 - C4FF

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A0 摹磨模膜磨摩魔抹末莫墨默沫漠寞
B0 陌谋牟某拇牡亩姆母墓幕募募木目
C0 睦牧穆拿哪呐纳那娜纳氛乃奶耐奈南
D0 男难囊挠挠恼闹凇呢馁内嫩能妮霓倪
E0 泥尼拟你匿腻逆溺溺拈年碾撵捻念娘
F0 酿鸟尿捏聂孽啮镊镍涅您柠柠凝宁

C540 - C5FF

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A0 拧拧牛扭扭纽脓浓农弄奴努怒女暖
B0 虐疟挪糯糯诺哦欧殴殴藕呕偶沓叭叭
C0 爬怕怕琶拍排牌排湃派攀潘盘盼畔
D0 判叛乓庞旁磅胖抛咆刨咆跑跑跑胚胚
E0 培裴赔陪配佩沛喷盆砰抨烹澎彭蓬棚
F0 碰蓬膨朋鹏捧碰坯砒霹批披劈毳毗

C640 - C6FF

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A0 啤脾疲皮匹痞僻屁譬篇偏片骗飘漂
B0 瓢票撇瞥拼频贫品聘乒坪苹萍平凭瓶
C0 评屏坡泼颇婆破魄迫柏剖扑辅仆葡葡
D0 菩蒲埔朴圃普浦谱曝瀑期欺栖戚妻七
E0 凄漆柒沏其棋奇歧畦崎脐齐旗祈祁骑
F0 起岂乞企启契砌器气迄弃汽泣乞抬

C740 - C7FF

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A0 恰洽牵扞钎钎千迁签仟谦乾黔钱钳
B0 前潜遣浅遣蜃嵌欠歉枪呛腔羌墙蔷强
C0 抢惝嗽敲悄桥瞧乔乔巧鞘撬翘峭俏窍
D0 切茄且怯窃钦侵亲秦琴勤芹擒禽寝沁
E0 青轻氢倾卿淸擎擎擎擎情顷庆琼穷秋
F0 丘邱球求囚酉洵趋区蛆曲驱屈驱渠

Code Page 936 Simple Chinese (Cont.)

C840 - C8FF

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A0 娶娶請趣去圍顛权醒泉全痊拳犬券
B0 劝缺快腐却鹁權确雀裙群然燃冉染瓢
C0 壤壤壤让饶抗绕惹热壬仁人忍韧任认
D0 刃妊纫扔仍日戎茸蓉荣融溶容绒冗
E0 揉柔肉茹蠕儒濡如辱乳汝入褥软阮蕊
F0 瑞锐润润若弱撒洒萨腮鳃塞赛叁叁

C940 - C9FF

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A0 伞散桑嗓丧搔搔扫嫂瑟色涩森僧莎
B0 砂杀刹沙纱傻啥煞筛晒珊苫山删煽
C0 衫闪陕擅贻贻善汕扇缮埭伤商晌上
D0 尚裳梢稍稍烧芍勺韶少哨邵奢除蛇
E0 舌舍赦摄射慑涉杜设呻申伸身深娠
F0 绅神沈审审甚肾慎渗声生甥牲升绳

CA40 - CAFF

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A0 省盛剩胜圣师失狮施湿诗尸虱十石
B0 拾时什食蚀实识史矢使屎驶始式示士
C0 世柿事拭誓逝势是嗜噬适仕侍释饰氏
D0 市恃室视试收手首守寿授受瘦兽蔬
E0 枢梳殊抒输叔舒淑疏书嘘熟熟暑暑
F0 署蜀黍鼠属术述树束戌豎豎庶数激

CB40 - CBFF

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A0 恕刷耍摔衰甩帅栓拴霜双爽谁水睡
B0 税吮瞬顺舜说硕朔烁斯嘶思私司丝
C0 死肆寺嗣四伺似伺已松耸怱颂送宋讼
D0 涌搜艘艘嗽苏酥俗素速粟僂塑溯宿诉
E0 肃酸蒜算虽隋随绥髓碎岁穗遂隧祟孙
F0 损笋蓰梭唆缩琐索锁所塌他它她塔

CC40 - CCFF

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A0 獭挞蹒蹒胎苔抬台泰馱太汰坍摊
B0 贪瘫滩坛檀痰潭谈坦毯袒碳探叹炭
C0 汤塘塘堂棠膛唐糖倘淌趟趟涛滔滔
D0 缘萄桃逃淘陶讨套特滕腾疼香梯剔踢
E0 锒提题蹄啼体替嚏惕惕惕天添填田
F0 甜恬舔膜挑条迢眺跳贴铁帖厅听炅

CD40 - CDF

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A0 汀廷停亭庭挺艇通桐桐瞳同铜彤童
B0 捅捅捅捅捅偷投透透凸秃突图徒途涂
C0 屠土吐兔湍团推颓腿腿腿退吞屯臀拖
D0 托脱陀陀驮驼驼妥拓唾挖哇娃娃瓦
E0 袜歪外腕弯湾湾玩顽丸阮阮阮阮阮
F0 宛婉万腕汪王亡枉网网网网网望忘妄威

CE40 - CEFF

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A0 巍微危韦违拖围唯惟为淮淮淮淮委
B0 伟伪尾纬未蔚味畏胃喂魏魏魏魏慰
C0 卫瘟温蚊文闻纹吻稳素问噉翁瓮挝蜗
D0 涡窝我斡卧握沃巫呜钨乌污诬屋无芜
E0 梧吾吴毋武五梧午舞伍侮坞戌雾晤物
F0 勿务误误昔熙析西晒砂嘶嘻吸锡牺

CF40 - CFFF

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A0 稀息希悉膝夕惜熄熄熄熄熄熄熄
B0 习媳喜洗洗洗洗洗洗洗洗洗洗洗洗
C0 侠狹下厦夏吓掀掀掀掀掀掀掀掀掀
D0 闲涎弦显显显显显显显显显显显显
E0 相厢镶香箱襄湘乡翔祥详想响享项巷
F0 像像向象萧萧萧萧萧萧萧萧萧萧萧萧

Code Page 936 Simple Chinese (Cont.)

D040 - D0FF

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A0 小孝校肖啸笑效楔些歇蝎鞋协挟携
B0 邪斜协谐写械卸蟹懈泄泻谢屑薪芯铎
C0 欣辛新忻心信衅星腥猩猩兴刑型形邢
D0 行醒幸杏性姓兄凶胸匈汹雄熊休修羞
E0 朽嗅锈秀袖绣锈戌需虚嘘须徐许蓄酗
F0 叙旭序畜血絮婿绪续轩喧宣悬旋玄

D140 - D1FF

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A0 选癣眩绚靴薛学穴雪血勋熏循旬询
B0 寻驯巡殉讯训迅迅压押鸦鸭呀丫芽
C0 牙蚜崖衙涯雅亚亚讶焉咽阍烟淹盐严
D0 研蜒岩延言顛阎炎沿奄掩眼衍演艳堰
E0 燕厌砚雁唁彦焰宴谚验殃央鸯秧扬扬
F0 佯疡羊洋阳氧仰痒痒样漾遑腰妖瑶

D240 - D2FF

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A0 摇尧遥窑谣姚咬沼药要耀椰噫耶爷
B0 野冶也页掖业叶曳腋夜液一壹医揖铍
C0 依伊衣颐夷遗移仪胰疑沂宜姨彝椅蚁
D0 倚已乙矣以艺抑易邑屹亿役臆逸肄疫
E0 亦裔意毅忆义益溢诣议谊译异翼翌绎
F0 茵荫因殷音阴姻吟银淫寅饮尹引隐

D340 - D3FF

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A0 印英樱婴鹰应纓莹莹荧蝇迎赢盈
B0 影颖硬映哟拥佣臃雍雍踊踊咏泳涌
C0 永愿勇用幽悠悠忧尤由邮釉犹油游酉
D0 有友右佑釉诱又幼迂淤于孟榆虞愚與
E0 余俞逾鱼愉渝渔隅予娱雨与屿禹宇语
F0 羽玉域芋郁吁遇喻峪御愈欲狄育誉

D440 - D4FF

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A0 浴寓裕预豫驭骛渊冤元垣袁原援辕
B0 园员圆猿源缘远苑愿怨院曰约越跃钥
C0 岳粤月悦阅耘云郢匀陨允运蕴酝晕韵
D0 孕匝砸杂裁哉灾宰载再在咱攒暂赞脏
E0 脏葬遭糟茵藻枣早澡蚤躁噪造皂灶燥
F0 责择则泽贼怎增憎曾赠扎渣渣札轧

D540 - D5FF

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A0 侧阂眨柵榨乍炸炸摘斋宅窄债寨
B0 瞻毡詹粘沾盞新辘辘展藤栈占战站湛
C0 绽樟章彰漳张掌涨杖丈帐账仗胀瘴障
D0 招昭找沼赵照罩兆肇召遮折哲蜇轳者
E0 赭蔗这浙珍斟真甄砧臻贞针侦枕疹疹
F0 震振镇阵蔗挣挣征挣争征整拯正政

D640 - D6FF

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A0 帧症郑证芝枝支吱蜘蛛知肢脂汁之织
B0 职直植殖执值侄址指止趾只旨纸志摺
C0 掷至致置帜峙制智秩稚质炙痔滞治窒
D0 中盅忠钟衷终种肿重仲众舟周州洲治
E0 粥轴肘帚咒皱宙昼骤珠株蛛朱猪诸诛
F0 逐竹烛煮拄瞩瞩主著柱助蛀贮铸筑

D740 - D7FF

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A0 住注祝驻抓爪拽专砖转撰赚篆桩庄
B0 装妆撞壮状椎锥追赘坠缀滓准捉拙卓
C0 桌琢茁酌啄着灼浊兹咨资姿滋淄紫
D0 仔籽滓子自渍字辵棕踪踪宗综总纵邹走
E0 奏揍租足卒族祖诅阻组钻篆嘴醉最罪
F0 尊遵昨左佐柞做作坐座

Code Page 936 Simple Chinese (Cont.)

D840 - D8FF

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A0 亅 丌 兀 巧 卅 卅 丕 丞 禹 彘 丩 丩
B0 乚 乚 天 爻 厄 氏 凶 胤 廌 毓 彘 丩 丩
C0 乚 丌 半 李 齋 厶 厶 厶 厶 厶 厶 厶 厶
D0 匚 匚 匚 匚 匚 匚 匚 匚 匚 匚 匚 匚 匚
E0 刂 刂 刂 刂 刂 刂 刂 刂 刂 刂 刂 刂 刂
F0 刂 刂 刂 刂 刂 刂 刂 刂 刂 刂 刂 刂 刂

D940 - D9FF

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A0 佟 佗 佗 佗 佗 佗 佗 佗 佗 佗 佗 佗 佗
B0 佗 佗 佗 佗 佗 佗 佗 佗 佗 佗 佗 佗 佗
C0 佗 佗 佗 佗 佗 佗 佗 佗 佗 佗 佗 佗 佗
D0 佗 佗 佗 佗 佗 佗 佗 佗 佗 佗 佗 佗 佗
E0 佗 佗 佗 佗 佗 佗 佗 佗 佗 佗 佗 佗 佗
F0 佗 佗 佗 佗 佗 佗 佗 佗 佗 佗 佗 佗 佗

DA40 - DAFF

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A0 淞 冢 冢 冢 冢 冢 冢 冢 冢 冢 冢 冢 冢
B0 淞 冢 冢 冢 冢 冢 冢 冢 冢 冢 冢 冢 冢
C0 淞 冢 冢 冢 冢 冢 冢 冢 冢 冢 冢 冢 冢
D0 淞 冢 冢 冢 冢 冢 冢 冢 冢 冢 冢 冢 冢
E0 淞 冢 冢 冢 冢 冢 冢 冢 冢 冢 冢 冢 冢
F0 淞 冢 冢 冢 冢 冢 冢 冢 冢 冢 冢 冢 冢

DB40 - DBFF

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A0 邨 邨 邨 邨 邨 邨 邨 邨 邨 邨 邨 邨 邨
B0 邨 邨 邨 邨 邨 邨 邨 邨 邨 邨 邨 邨 邨
C0 邨 邨 邨 邨 邨 邨 邨 邨 邨 邨 邨 邨 邨
D0 邨 邨 邨 邨 邨 邨 邨 邨 邨 邨 邨 邨 邨
E0 邨 邨 邨 邨 邨 邨 邨 邨 邨 邨 邨 邨 邨
F0 邨 邨 邨 邨 邨 邨 邨 邨 邨 邨 邨 邨 邨

DC40 - DCFF

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A0 邨 邨 邨 邨 邨 邨 邨 邨 邨 邨 邨 邨 邨
B0 邨 邨 邨 邨 邨 邨 邨 邨 邨 邨 邨 邨 邨
C0 邨 邨 邨 邨 邨 邨 邨 邨 邨 邨 邨 邨 邨
D0 邨 邨 邨 邨 邨 邨 邨 邨 邨 邨 邨 邨 邨
E0 邨 邨 邨 邨 邨 邨 邨 邨 邨 邨 邨 邨 邨
F0 邨 邨 邨 邨 邨 邨 邨 邨 邨 邨 邨 邨 邨

DD40 - DDFF

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A0 尊 尊 尊 尊 尊 尊 尊 尊 尊 尊 尊 尊 尊
B0 尊 尊 尊 尊 尊 尊 尊 尊 尊 尊 尊 尊 尊
C0 尊 尊 尊 尊 尊 尊 尊 尊 尊 尊 尊 尊 尊
D0 尊 尊 尊 尊 尊 尊 尊 尊 尊 尊 尊 尊 尊
E0 尊 尊 尊 尊 尊 尊 尊 尊 尊 尊 尊 尊 尊
F0 尊 尊 尊 尊 尊 尊 尊 尊 尊 尊 尊 尊 尊

DE40 - DEFF

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A0 藁 藁 藁 藁 藁 藁 藁 藁 藁 藁 藁 藁 藁
B0 藁 藁 藁 藁 藁 藁 藁 藁 藁 藁 藁 藁 藁
C0 藁 藁 藁 藁 藁 藁 藁 藁 藁 藁 藁 藁 藁
D0 藁 藁 藁 藁 藁 藁 藁 藁 藁 藁 藁 藁 藁
E0 藁 藁 藁 藁 藁 藁 藁 藁 藁 藁 藁 藁 藁
F0 藁 藁 藁 藁 藁 藁 藁 藁 藁 藁 藁 藁 藁

DF40 - DFFF

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A0 摺 摺 摺 摺 摺 摺 摺 摺 摺 摺 摺 摺 摺
B0 摺 摺 摺 摺 摺 摺 摺 摺 摺 摺 摺 摺 摺
C0 摺 摺 摺 摺 摺 摺 摺 摺 摺 摺 摺 摺 摺
D0 摺 摺 摺 摺 摺 摺 摺 摺 摺 摺 摺 摺 摺
E0 摺 摺 摺 摺 摺 摺 摺 摺 摺 摺 摺 摺 摺
F0 摺 摺 摺 摺 摺 摺 摺 摺 摺 摺 摺 摺 摺

Code Page 936 Simple Chinese (Cont.)

E040 - E0FF

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A0 嗜啖啖啖啖啖啖啖啖啖啖啖啖啖啖啖啖啖啖
B0 嗜啖啖啖啖啖啖啖啖啖啖啖啖啖啖啖啖啖啖
C0 嗜啖啖啖啖啖啖啖啖啖啖啖啖啖啖啖啖啖啖
D0 嗜啖啖啖啖啖啖啖啖啖啖啖啖啖啖啖啖啖啖
E0 嗜啖啖啖啖啖啖啖啖啖啖啖啖啖啖啖啖啖啖
F0 嗜啖啖啖啖啖啖啖啖啖啖啖啖啖啖啖啖啖啖

E140 - E1FF

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A0 惟悻悻悻悻悻悻悻悻悻悻悻悻悻悻悻悻悻
B0 崑崙崑崙崑崙崑崙崑崙崑崙崑崙崑崙崑崙崑崙
C0 崑崙崑崙崑崙崑崙崑崙崑崙崑崙崑崙崑崙崑崙
D0 崑崙崑崙崑崙崑崙崑崙崑崙崑崙崑崙崑崙崑崙
E0 崑崙崑崙崑崙崑崙崑崙崑崙崑崙崑崙崑崙崑崙
F0 崑崙崑崙崑崙崑崙崑崙崑崙崑崙崑崙崑崙崑崙

E240 - E2FF

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A0 猓猓猓猓猓猓猓猓猓猓猓猓猓猓猓猓猓猓
B0 猓猓猓猓猓猓猓猓猓猓猓猓猓猓猓猓猓猓
C0 猓猓猓猓猓猓猓猓猓猓猓猓猓猓猓猓猓猓
D0 猓猓猓猓猓猓猓猓猓猓猓猓猓猓猓猓猓猓
E0 猓猓猓猓猓猓猓猓猓猓猓猓猓猓猓猓猓猓
F0 猓猓猓猓猓猓猓猓猓猓猓猓猓猓猓猓猓猓

E340 - E3FF

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A0 悃悃悃悃悃悃悃悃悃悃悃悃悃悃悃悃悃
B0 悃悃悃悃悃悃悃悃悃悃悃悃悃悃悃悃悃
C0 悃悃悃悃悃悃悃悃悃悃悃悃悃悃悃悃悃
D0 悃悃悃悃悃悃悃悃悃悃悃悃悃悃悃悃悃
E0 悃悃悃悃悃悃悃悃悃悃悃悃悃悃悃悃悃
F0 悃悃悃悃悃悃悃悃悃悃悃悃悃悃悃悃悃

E440 - E4FF

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A0 洄洄洄洄洄洄洄洄洄洄洄洄洄洄洄洄洄洄洄洄洄洄洄
B0 洄洄洄洄洄洄洄洄洄洄洄洄洄洄洄洄洄洄洄洄洄洄洄
C0 洄洄洄洄洄洄洄洄洄洄洄洄洄洄洄洄洄洄洄洄洄洄洄
D0 洄洄洄洄洄洄洄洄洄洄洄洄洄洄洄洄洄洄洄洄洄洄洄
E0 洄洄洄洄洄洄洄洄洄洄洄洄洄洄洄洄洄洄洄洄洄洄洄
F0 洄洄洄洄洄洄洄洄洄洄洄洄洄洄洄洄洄洄洄洄洄洄洄

E540 - E5FF

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A0 滹滹滹滹滹滹滹滹滹滹滹滹滹滹滹滹滹滹
B0 滹滹滹滹滹滹滹滹滹滹滹滹滹滹滹滹滹滹
C0 滹滹滹滹滹滹滹滹滹滹滹滹滹滹滹滹滹滹
D0 滹滹滹滹滹滹滹滹滹滹滹滹滹滹滹滹滹滹
E0 滹滹滹滹滹滹滹滹滹滹滹滹滹滹滹滹滹滹
F0 滹滹滹滹滹滹滹滹滹滹滹滹滹滹滹滹滹滹

E640 - E6FF

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A0 姪姪姪姪姪姪姪姪姪姪姪姪姪姪姪姪姪姪姪
B0 姪姪姪姪姪姪姪姪姪姪姪姪姪姪姪姪姪姪姪
C0 姪姪姪姪姪姪姪姪姪姪姪姪姪姪姪姪姪姪姪
D0 姪姪姪姪姪姪姪姪姪姪姪姪姪姪姪姪姪姪姪
E0 姪姪姪姪姪姪姪姪姪姪姪姪姪姪姪姪姪姪姪
F0 姪姪姪姪姪姪姪姪姪姪姪姪姪姪姪姪姪姪姪

E740 - E7FF

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A0 纒纒纒纒纒纒纒纒纒纒纒纒纒纒纒纒纒纒纒纒
B0 纒纒纒纒纒纒纒纒纒纒纒纒纒纒纒纒纒纒纒纒
C0 纒纒纒纒纒纒纒纒纒纒纒纒纒纒纒纒纒纒纒纒
D0 纒纒纒纒纒纒纒纒纒纒纒纒纒纒纒纒纒纒纒纒
E0 纒纒纒纒纒纒纒纒纒纒纒纒纒纒纒纒纒纒纒纒
F0 纒纒纒纒纒纒纒纒纒纒纒纒纒纒纒纒纒纒纒纒

Code Page 936 Simple Chinese (Cont.)

F040 - F0FF

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A0 稂稊穰黏黏穰畎畎畎畎畎畎畎畎畎畎
B0 鸱鸱鸱鸱鸱鸱鸱鸱鸱鸱鸱鸱鸱鸱鸱鸱
C0 鸱鸱鸱鸱鸱鸱鸱鸱鸱鸱鸱鸱鸱鸱鸱鸱
D0 鸱鸱鸱鸱鸱鸱鸱鸱鸱鸱鸱鸱鸱鸱鸱鸱
E0 疣疔疔疔疔疔疔疔疔疔疔疔疔疔疔疔
F0 痧痧痧痧痧痧痧痧痧痧痧痧痧痧痧痧痧

F140 - F1FF

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A0 瘰瘰瘰瘰瘰瘰瘰瘰瘰瘰瘰瘰瘰瘰瘰
B0 瘰瘰瘰瘰瘰瘰瘰瘰瘰瘰瘰瘰瘰瘰瘰
C0 瘰瘰瘰瘰瘰瘰瘰瘰瘰瘰瘰瘰瘰瘰瘰
D0 瘰瘰瘰瘰瘰瘰瘰瘰瘰瘰瘰瘰瘰瘰瘰
E0 瘰瘰瘰瘰瘰瘰瘰瘰瘰瘰瘰瘰瘰瘰瘰
F0 瘰瘰瘰瘰瘰瘰瘰瘰瘰瘰瘰瘰瘰瘰瘰

F240 - F2FF

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A0 颞颞颞颞颞颞颞颞颞颞颞颞颞颞颞
B0 颞颞颞颞颞颞颞颞颞颞颞颞颞颞颞
C0 颞颞颞颞颞颞颞颞颞颞颞颞颞颞颞
D0 颞颞颞颞颞颞颞颞颞颞颞颞颞颞颞
E0 颞颞颞颞颞颞颞颞颞颞颞颞颞颞颞
F0 颞颞颞颞颞颞颞颞颞颞颞颞颞颞颞

F340 - F3FF

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A0 蟪蟪蟪蟪蟪蟪蟪蟪蟪蟪蟪蟪蟪蟪蟪蟪
B0 蟪蟪蟪蟪蟪蟪蟪蟪蟪蟪蟪蟪蟪蟪蟪蟪
C0 蟪蟪蟪蟪蟪蟪蟪蟪蟪蟪蟪蟪蟪蟪蟪蟪
D0 蟪蟪蟪蟪蟪蟪蟪蟪蟪蟪蟪蟪蟪蟪蟪蟪
E0 蟪蟪蟪蟪蟪蟪蟪蟪蟪蟪蟪蟪蟪蟪蟪蟪
F0 蟪蟪蟪蟪蟪蟪蟪蟪蟪蟪蟪蟪蟪蟪蟪蟪

F440 - F4FF

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A0 簪簪簪簪簪簪簪簪簪簪簪簪簪簪簪簪
B0 舩舩舩舩舩舩舩舩舩舩舩舩舩舩舩
C0 舩舩舩舩舩舩舩舩舩舩舩舩舩舩舩
D0 舩舩舩舩舩舩舩舩舩舩舩舩舩舩舩
E0 舩舩舩舩舩舩舩舩舩舩舩舩舩舩舩
F0 舩舩舩舩舩舩舩舩舩舩舩舩舩舩舩

F540 - F5FF

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A0 酢酢酢酢酢酢酢酢酢酢酢酢酢酢酢酢
B0 酢酢酢酢酢酢酢酢酢酢酢酢酢酢酢酢
C0 酢酢酢酢酢酢酢酢酢酢酢酢酢酢酢酢
D0 酢酢酢酢酢酢酢酢酢酢酢酢酢酢酢酢
E0 酢酢酢酢酢酢酢酢酢酢酢酢酢酢酢酢
F0 酢酢酢酢酢酢酢酢酢酢酢酢酢酢酢酢

F640 - F6FF

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A0 舩舩舩舩舩舩舩舩舩舩舩舩舩舩舩
B0 舩舩舩舩舩舩舩舩舩舩舩舩舩舩舩
C0 舩舩舩舩舩舩舩舩舩舩舩舩舩舩舩
D0 舩舩舩舩舩舩舩舩舩舩舩舩舩舩舩
E0 舩舩舩舩舩舩舩舩舩舩舩舩舩舩舩
F0 舩舩舩舩舩舩舩舩舩舩舩舩舩舩舩

F740 - F7FF

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A0 簪簪簪簪簪簪簪簪簪簪簪簪簪簪簪簪
B0 舩舩舩舩舩舩舩舩舩舩舩舩舩舩舩
C0 舩舩舩舩舩舩舩舩舩舩舩舩舩舩舩
D0 舩舩舩舩舩舩舩舩舩舩舩舩舩舩舩
E0 舩舩舩舩舩舩舩舩舩舩舩舩舩舩舩
F0 舩舩舩舩舩舩舩舩舩舩舩舩舩舩舩

EC40 - ECFF

[illegible]

ED40 - EDFF

[illegible]

EE40 - EEFF

[illegible]

EF40 - EFFF

[illegible]

Code Page 936 Simple Chinese (Cont.)

F840 - F8FF

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A0
B0
C0
D0
E0
F0

FC40 - FCFF

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A0
B0
C0
D0
E0
F0

F940 - F9FF

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A0
B0
C0
D0
E0
F0

FD40 - FDFF

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A0
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C0
D0
E0
F0

FA40 - FAFF

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A0
B0
C0
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FE40 - FEFF

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A0
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FB40 - FBFF

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A0
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E0
F0

FF40 - FFFF

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A0
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C0
D0
E0
F0

Code Page 949 Korean

A140 - A1FF

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A0 ` . ' " " - - || \ ~ ' '
B0 " " [] < > < > [] [] [] ± ×
C0 ÷ × ≤ ≥ ∞ ∴ ∴ ∴ ∴ ∴ ∴ ∴ ∴ ∴ ∴
D0 ∠ ⊥ ∼ ∂ ∇ ≡ ≡ ≡ ≡ ≡ ≡ ≡ ≡ ≡ ≡
E0 □ ■ △ ▲ ▽ ▼ → ← ↑ ↓ ↔ = < > √ ∞
F0 ∞ ∴ ∴ ∴ ∴ ∴ ∴ ∴ ∴ ∴ ∴ ∴ ∴ ∴ ∴

A240 - A2FF

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A0 ⇒ ⇔ ∇ ∃ / ~ ~ ~ ~ " ° .
B0 : \$ Σ Π Ω ° F % ◁ ▷ ▶ ♠ ♡ ♥ ♣
C0 ♣ ◊ ◊ ◊ ◊ ◊ ◊ ◊ ◊ ◊ ◊ ◊ ◊ ◊ ◊ ◊ ◊
D0 ♣ ◊ ◊ ◊ ◊ ◊ ◊ ◊ ◊ ◊ ◊ ◊ ◊ ◊ ◊ ◊ ◊
E0 No Co. TM amp. pm. Tel € ®
F0

A340 - A3FF

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A0 ! " # \$ % & ' () * + , - . /
B0 0 1 2 3 4 5 6 7 8 9 : ; < = > ?
C0 @ A B C D E F G H I J K L M N O
D0 P Q R S T U V W X Y Z [\] ^ _
E0 ' a b c d e f g h i j k l m n o
F0 p q r s t u v w x y z { | }

A440 - A4FF

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A0 ㄱ ㅋ ㆁ ㄷ ㅌ ㄴ ㄹ ㄷ ㄹ ㄷ ㄹ ㄷ ㄹ
B0 ㄷ ㄹ ㄷ ㄹ ㄷ ㄹ ㄷ ㄹ ㄷ ㄹ ㄷ ㄹ ㄷ ㄹ
C0 ㅅ ㅆ ㅅ ㅆ ㅅ ㅆ ㅅ ㅆ ㅅ ㅆ ㅅ ㅆ ㅅ ㅆ
D0 ㅅ ㅆ ㅅ ㅆ ㅅ ㅆ ㅅ ㅆ ㅅ ㅆ ㅅ ㅆ ㅅ ㅆ
E0 ㅅ ㅆ ㅅ ㅆ ㅅ ㅆ ㅅ ㅆ ㅅ ㅆ ㅅ ㅆ ㅅ ㅆ
F0 ㅅ ㅆ ㅅ ㅆ ㅅ ㅆ ㅅ ㅆ ㅅ ㅆ ㅅ ㅆ ㅅ ㅆ

A540 - A5FF

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A0 i ii iii iv v vi vii viii ix x
B0 I II III IV V VI VII VIII IX X
C0 A B Γ Δ E Z H Θ I K Λ M N Ξ O
D0 Π Ρ Σ Τ Υ Φ Χ Ψ Ω
E0 α β γ δ ε ζ η θ ι κ λ μ ν ξ ο
F0 π ρ σ τ υ φ χ ψ ω

Code Page 949 Korean (Cont.)

A640 - A6FF

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A0
B0
C0
D0
E0
F0

A840 - A8FF

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A0
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D0
E0
F0

Æ Ð ã ƒ I J L ˆ Ø œ ɔ ɓ ɕ ɔ
ㄱ ㄴ ㄷ ㄹ ㅁ ㅂ ㅅ ㅈ ㅊ ㅋ ㅌ ㅍ ㅎ
ㄱ ㄴ ㄷ ㄹ ㅁ ㅂ ㅅ ㅈ ㅊ ㅋ ㅌ ㅍ ㅎ
a b c d e f g h i j k l m n o p q r s
t u v w x y z 1 2 3 4 5 6 7 8 9
10 11 12 13 14 15 1/2 1/3 2/3 1/4 3/4 1/8 3/8 5/8 7/8

AA40 - AAFF

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A0
B0
C0
D0
E0
F0

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だ ぢ ぢ っ つ づ て で と ど な に ぬ ね の は
ば ば ひ び び ふ ぶ ぶ へ べ べ ほ ぼ ぼ ま み
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ゐ ゑ ぢ ん

A740 - A7FF

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A0
B0
C0
D0
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F0

μ ℓ m ℓ d ℓ ℓ k ℓ c c m m i c m i k m f m n m μ m m m c m
k m m i c m i k m f m n m μ m m m c m k t c a l k a d B ° % / \$ p s
n s μ s m s p v n v μ v m v k v M v p A n A μ A m A k A p W r W
μ W m W k W M W H z k H z M H z G H z T H z Ω k Ω M Ω p F n F μ F m d
c d r a d ° % / \$ s r P a k P a l P a G p a W b l m l x B q G y S v % k g

A940 - A9FF

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C0
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(나)(다)(라)(마)(바)(사)(아)(자)(차)(카)(타)(파)(하)(a)(b)(c)
(d)(e)(f)(g)(h)(i)(j)(k)(l)(m)(n)(o)(p)(q)(r)(s)
(t)(u)(v)(w)(x)(y)(z)(1)(2)(3)(4)(5)(6)(7)(8)(9)
(10)(11)(12)(13)(14)(15) 1 2 3 4 n 1 2 3 4

AB40 - ABFF

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A0
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E0
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Code Page 949 Korean (Cont.)

AC40 - ACFF

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A0	А Б В Г Д Е Ё Ж З И Й К Л М Н
B0	О П Р С Т У Ф Х Ц Ч Ш Щ Ъ Ы Ь Э
C0	Ю Я
D0	а б в г д е ё ж з и й к л м н
E0	о п р с т у ф х ц ч ш щ ъ ы ь э
F0	ю я

AD40 - ADFF

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A0
B0
C0
D0
E0
F0

AE40 - AEFF

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A0
B0
C0
D0
E0
F0

AF40 - AFFF

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A0
B0
C0
D0
E0
F0

B040 - B0FF

[illegible]

B140 - B1FF

[illegible]

B240 - B2FF

[illegible]

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A0	끝남
B0	기남
C0	기남
D0	기남
E0	기남
F0	기남

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A0	한글
B0	한글
C0	한글
D0	한글
E0	한글
F0	한글

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A0
B0
C0
D0
E0
F0

[illegible][illegible]

Code Page 949 Korean (Cont.)

B840 - B8FF

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A0	뽇뽇뽇뽇뽇뽇뽇뽇뽇뽇뽇뽇뽇뽇뽇뽇
B0	린린린린린린린린린린린린린린
C0	린린린린린린린린린린린린린린
D0	린린린린린린린린린린린린린린
E0	린린린린린린린린린린린린린린
F0	린린린린린린린린린린린린린린

BA40 - BAFF

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A0	뽇뽇뽇뽇뽇뽇뽇뽇뽇뽇뽇뽇뽇뽇뽇뽇
B0	뽇뽇뽇뽇뽇뽇뽇뽇뽇뽇뽇뽇뽇뽇뽇뽇
C0	뽇뽇뽇뽇뽇뽇뽇뽇뽇뽇뽇뽇뽇뽇뽇뽇
D0	뽇뽇뽇뽇뽇뽇뽇뽇뽇뽇뽇뽇뽇뽇뽇뽇
E0	뽇뽇뽇뽇뽇뽇뽇뽇뽇뽇뽇뽇뽇뽇뽇뽇
F0	뽇뽇뽇뽇뽇뽇뽇뽇뽇뽇뽇뽇뽇뽇뽇뽇

BC40 - BCFF

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A0	쑈쑈쑈쑈쑈쑈쑈쑈쑈쑈쑈쑈쑈쑈쑈쑈
B0	쑈쑈쑈쑈쑈쑈쑈쑈쑈쑈쑈쑈쑈쑈쑈쑈
C0	쑈쑈쑈쑈쑈쑈쑈쑈쑈쑈쑈쑈쑈쑈쑈쑈
D0	쑈쑈쑈쑈쑈쑈쑈쑈쑈쑈쑈쑈쑈쑈쑈쑈
E0	쑈쑈쑈쑈쑈쑈쑈쑈쑈쑈쑈쑈쑈쑈쑈쑈
F0	쑈쑈쑈쑈쑈쑈쑈쑈쑈쑈쑈쑈쑈쑈쑈쑈

B940 - B9FF

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A0	뽇뽇뽇뽇뽇뽇뽇뽇뽇뽇뽇뽇뽇뽇뽇뽇
B0	뽇뽇뽇뽇뽇뽇뽇뽇뽇뽇뽇뽇뽇뽇뽇뽇
C0	뽇뽇뽇뽇뽇뽇뽇뽇뽇뽇뽇뽇뽇뽇뽇뽇
D0	뽇뽇뽇뽇뽇뽇뽇뽇뽇뽇뽇뽇뽇뽇뽇뽇
E0	뽇뽇뽇뽇뽇뽇뽇뽇뽇뽇뽇뽇뽇뽇뽇뽇
F0	뽇뽇뽇뽇뽇뽇뽇뽇뽇뽇뽇뽇뽇뽇뽇뽇

BB40 - BBFF

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A0	뽇뽇뽇뽇뽇뽇뽇뽇뽇뽇뽇뽇뽇뽇뽇뽇
B0	뽇뽇뽇뽇뽇뽇뽇뽇뽇뽇뽇뽇뽇뽇뽇뽇
C0	뽇뽇뽇뽇뽇뽇뽇뽇뽇뽇뽇뽇뽇뽇뽇뽇
D0	뽇뽇뽇뽇뽇뽇뽇뽇뽇뽇뽇뽇뽇뽇뽇뽇
E0	뽇뽇뽇뽇뽇뽇뽇뽇뽇뽇뽇뽇뽇뽇뽇뽇
F0	뽇뽇뽇뽇뽇뽇뽇뽇뽇뽇뽇뽇뽇뽇뽇뽇

BD40 - BDFF

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A0	쑈쑈쑈쑈쑈쑈쑈쑈쑈쑈쑈쑈쑈쑈쑈쑈
B0	쑈쑈쑈쑈쑈쑈쑈쑈쑈쑈쑈쑈쑈쑈쑈쑈
C0	쑈쑈쑈쑈쑈쑈쑈쑈쑈쑈쑈쑈쑈쑈쑈쑈
D0	쑈쑈쑈쑈쑈쑈쑈쑈쑈쑈쑈쑈쑈쑈쑈쑈
E0	쑈쑈쑈쑈쑈쑈쑈쑈쑈쑈쑈쑈쑈쑈쑈쑈
F0	쑈쑈쑈쑈쑈쑈쑈쑈쑈쑈쑈쑈쑈쑈쑈쑈

BE40 - BEFF

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A0
B0
C0
D0
E0
F0

[illegible][illegible]

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A0	에인오만은물
B0	의없우만는물
C0	엔엇을맛음물
D0	일엇우만요무
E0	임안를문부원
F0	언알와우원
	잇모를관물원
	면알을관음원
	여을원음원
	역연못옛물원
	위일공원음원
	면일우우원
	말인모부원
	업이화원다원
	업이완물원

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Code Page 949 Korean (Cont.)

C440 - C4FF

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A0	치
B0	캅
C0	캅
D0	캅
E0	캅
F0	캅

C540 - C5FF

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A0	킴
B0	킴
C0	킴
D0	킴
E0	킴
F0	킴

C640 - C6FF

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A0	튀
B0	튀
C0	튀
D0	튀
E0	튀
F0	튀

C740 - C7FF

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A0	외
B0	외
C0	외
D0	외
E0	외
F0	외

C840 - C8FF

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A0	헝
B0	헝
C0	헝
D0	헝
E0	헝
F0	헝

C940 - C9FF

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A0	
B0	
C0	
D0	
E0	
F0	

Code Page 949 Korean (Cont.)

CA40 - CAFF

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A0 伽佳假價加可呵哥嘉嫁家暇架枷柯
B0 歌珂痼稼苛茄街袈訶賈迦駕刻却
C0 各恪慤殼珏脚覺角闊侃刊壘奸森干幹
D0 懇揀杆東桿澗痾看礪釋竿簡肝良艱諫
E0 間芻喝曷渴礪竭葛褐竭鞫勘坎堪嵌感
F0 憾戢敢柑橄減甘瘡監敵紺邯鑑鑿龜

CB40 - CBFF

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A0 匣岬甲胛鉀閏剛塢姜岡崗康強彊慷
B0 江薑疆糠絳綱羌腔缸薑襁講綱降鱗介
C0 价個凱埲愷慨改概溉疥皆蓋箇芥蓋
D0 豈鎡關喀喀坑更梗羹穉倨去居巨拒据
E0 據舉渠炬祛距踞車遽鉅鋸乾件健巾違
F0 愠櫛臚虔蹇鍵齋乞傑杰桀儉劍劒檢

CC40 - CCFF

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A0 臉鈐鈐劫怯怯怯揭擊格檄激謁現
B0 隔堅牽犬甄綢繭肩見髓遺鵠抉決潔結
C0 缺缺兼憐箝謙鉗鑣京徑倥傾儻勁勛卿
D0 垓境庚徑慶慶擊敬景曠更梗涇炅炯環
E0 璫瓊瘰硬磬竟競綱經耕耿脛莖馨輕連
F0 鏡頃頸驚鯨係啓堺契季屆悻戒桂械

CD40 - CDF

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A0 榮溪界癸礪稽系繫繼計誠谿階鷄古
B0 叩告呱固姑孤庀庫拷攷故敲蒿枯槁沽
C0 瘡瘰瘰稿羔考股膏苦苾菰蕞疊禱詣賈
D0 辜緇履顧高鼓哭斛曲楷穀谷鵠困坤崑
E0 毘樞棍滾琨袞鯁汨滑骨供公共功孔工
F0 恐恭拱控攻琤空蚣賈聾聾寡戈果瓜

CE40 - CEFF

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A0 科菓誇課跨過鍋顆廓榔藿郭串冠官
B0 寬憤棺款灌琯琯管罐菅觀貫關館刮恕
C0 括适仇光匡墻廣曠洸吹狂琯篋肱鏤卦
D0 掛野乖傀塊塊怪愧拐槐魁宏絃肱轟交
E0 僞咬喬嬌嬌巧攪教校矯狡皎矯絞翹膠
F0 蕎蛟較矯郊較驕敺丘久仇俱具勾

CF40 - CFFF

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A0 區口句咎囁圪垢寇嶮廐懼拘救枸樞
B0 構歐歐毬求溝灸狗玖球響矩究綵耆臼
C0 舅舊苟衛驅驅驅逵邱鈎鉤駒驅鳩鷗龜
D0 國局菊鉤鉤趨君窘群裙軍郡堀屈掘窟
E0 宮弓竈窮芎窮倦券勤卷團拳捲權眷
F0 厥厥厥厥厥機樞潰詭軌饋句晏歸貴

Code Page 949 Korean (Cont.)

D040 - D0FF

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A0 鬼龜叫圭奎揆槻珪硯窺竅糾葵規起
B0 遠闊勻均鈞筠園鈞龜橋克剋劇戟棘極
C0 陳僅仞勳勳斤根權瑾筋芹董觀謹近謹
D0 契今姪摘吟椅琴禁禽岑衿襟金錦級
E0 及急汲汲級給巨競矜肯企伎其冀噤器
F0 圻基琦藝奇妓寄岐崎己幾忌技旗旣

D140 - D1FF

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A0 莓期杞棋棄機欺氣汽沂淇玳琦琪瑾
B0 璣崎磬礫礫那祇祈祺冀紀綺羈耨肌
C0 記讎壹起錡鋸飢機騎騏驎騏緊信吉拮
D0 枯金喫儼喇奈娜懶孌拿獮羅羅螺裸
E0 邇那樂洛烙珞落諾酪駱亂卵暖欄煖爛
F0 蘭難黨捏捺南嵐柎楠滿濫男藍檻拉

D240 - D2FF

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A0 納臘蠟衲囊娘廊朗浪狼郎乃來內奈
B0 奈耐冷女年燃牽念恬拈捻寧寧努勞奴
C0 聾怒搗搗爐爐盧老蘆虜路露鷲魯鷲碌
D0 祿綠萊錄鹿論璽弄濃籠璧膿農惱牢磊
E0 腦賂雷尿疊屢樓淚漏累纒陋嫩納扭紐
F0 勒肋凜凜稜稜能菱陵尼泥匿溺多荼

D340 - D3FF

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A0 丹璽但單團壇彖斷旦檀段湍短端簞
B0 緞蛋袒鄆鍛捷遶獺疸達啖坍愴攢曇淡
C0 湛渾潸疲聃膽蕓覃談譚鎔沓沓答踏選
D0 唐堂塘幢懸撞棠當糖蠟黨代岱迨大對
E0 岱帶待戴搥玳臺袋貸隊黛宅德慝倒刀
F0 到圖堵塗導屠蜀嶋度徒悼挑掉搗桃

D440 - D4FF

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A0 棹櫂洩洩滔濤蕪盜賭禱稻萄觀賭跳
B0 蹈逃途道都鐫陶韜濤濶濶獨督禿簞
C0 蕪讀墩敦敦沌噉燉豚頓芻突全冬
D0 凍動同懂東桐棟洞潼痊腫童洞董銅兜
E0 斗杜抖痘實荳讀豆逗頭屯臀芭遞遞鈍
F0 得燈燈燈登等藤騰鄧騰喇懶孌癩羅

D540 - D5FF

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A0 羅螺裸邏樂洛烙珞絡落諾酪駱丹亂
B0 卵欄鑣瀾欄蘭鸞刺辣嵐舉攢攪濫監纜
C0 藍藍寬拉臘蠟廊朗浪狼琅榔榔郎來崂
D0 徠萊冷掠略亮倆兩涼梁樑糧梁糧良諒
E0 輶量侶僞勵呂慮慮戾旅欄漣礪藥蠟閭
F0 驢驢麗黎力曆歷瀝礫礫麗憐憐擊漣

Code Page 949 Korean (Cont.)

D640 - D6FF

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A0 煉璉練聯蓮盤連鍊冽列劣冽烈裂廉
B0 斂殮瀟瀟獵令伶困率岑嶺伶玲苓玲翎
C0 聆逞鈴零靈領齡例禮禮隸勞怒撈攏
D0 櫓潞瀘盧老蘆虞路絡露魯鷺鹵碌祿
E0 綠某錄鹿麓論壘弄戮瀟璣龍雙僂瀨牢
F0 磊賂賈賴雷了僚寮廖料煉療瞭聊謬

D740 - D7FF

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A0 遼闊龍壘婁屢樓淚漏瘰累縷縷縷縷
B0 陋劉旒柳榴流溜瀏琉瑠留瘤硫膠類六
C0 戮陸侖倫崙淪綸輪律慄栗率隆勒肋凜
D0 凌楞稜綾菱陵隄利厘吏唳履例李梨涅
E0 型狸理璃異痢離權贏莉裏裡里釐離鯉
F0 吝潏熾璫蘭闌鱗麟林淋琳臨霖莅

D840 - D8FF

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A0 立笠粒摩瑪麻碼磨馬魔麻寞幕漠膜
B0 莫邁万已媿鬱彎慢挽晚曼滿漫灣瞞萬
C0 蔓蠻輓饅饅毳抹末沫萊襪寐亡妄忘忙
D0 望網罔芒茫莽綱邛埋妹媒寐昧枚梅每
E0 煤罵賈賈邁魅脈貊陌暮麥孟氓猛盲盟
F0 萌募覓免冕勉棉沔眄眠綿緬面麵滅

D940 - D9FF

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A0 蕙寔名命明瞋檣溟血瞋茗萸螟酪銘
B0 鳴袂侮冒暮姆帽慕摸慕慕某模母毛牟
C0 牡璫眸矛耗茅謀謨貌木沐牧目睦穆
D0 驚殒沒夢朦蒙卯墓妙廟描昂奢渺貓妙
E0 苗錯務巫懣懣戊拇撫无榭武母無珷敵
F0 繆舞茂蕪誣質霧鷗墨默們勿吻問文

DA40 - DAFF

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A0 汶紊紋聞蚊門雯勿勿物味媚尾嶺彌
B0 微未槐檣漢漚厓米美薇謎迷靡微岷悶
C0 慙憫敏旻旻民泯玳珉緇閔密蜜髓剝博
D0 拍搏撲朴樸泊珀璞箔柏縛膊舶縛迫雹
E0 駁伴半反叛拌搬攀斑槃泮潘班畔癢盤
F0 盼磐礪礪絆般蠟返頒飯勃拔撥渤潑

DB40 - DBFF

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A0 發跋黻鉢髮越倣傍坊妨戕幫彷彿放
B0 方旁昉枋榜滂磅紡肪膀芳芳蚌訪訪
C0 邦防龐倍俳北培俳拜排杯湃盃背胚
D0 裴裴棼賠輩配陪伯伯卑柏栢白百魄
E0 樊煩燔番礪繁蕃藩翻伐筏罰閭凡帆梵
F0 汜汎泛犯範范法珙僻劈壁擊擊擊擊

Code Page 949 Korean (Cont.)

DC40 - DCFF

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A0 碧藥關驛便卞弁變辦辯邊別警驚電
B0 丙併兵屏井昞曷柄標炳瓶病秉竝駢餅
C0 駢保堡報寶普步沕滌潛珪南菩補襦譜
D0 輔伏僕匍卜必復服福腹茯節複覆輶輻
E0 瞞瞞本恩倖奉封臺峰捧棒烽燧璚璉蓬
F0 蜂逢鋒鳳不付俯傅副副否咐埠夫婦

DD40 - DDFF

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A0 孚夥富府復扶敷斧浮溥父符簿缶腐
B0 腑膚靜芙葦訃賁賦賻赴趺郚釜阜附駙
C0 曷北分吩噴墳奔奮忿憤扮份份焚盆粉
D0 蕪紛芬費霧不佛弗拂拂崩朋棚棚繡繡
E0 丕備匕匪卑妃婢庇悲憊罷批斐枇樞比
F0 慙毗毘沸泌髒痺砒碑秕秘牝緋緋肥

DE40 - DEFF

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A0 脾臂菲蜚裨排贅費酈非飛鼻嘖嬪彬
B0 斌橫濱浜濱北玼貧實頻憑冰聘聘乍
C0 事些仕伺似使俟僂史司唆嗣四土奢娑
D0 寫寺射巳師徙思搶糾斯栖查梭死沙泗
E0 渣瀉獅砂社祀祠私篩紗絲肆舍莎養蛇
F0 娑詐詞謝賜赦辭邪飼駟霹削數朔索

DF40 - DFFF

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A0 傘刪山散汕珊產疝算蒜酸霰參撒殺
B0 煞薩三參杉森滲苒蓼衫揅澁鋁蠅上傷
C0 傳償商喪嘗嫻尙岬常床庠庠想桑橡湘
D0 爽牀狀相祥籍翔裳鷗詳象實霽塞靈賽
E0 醫塞穢索色牲甥省筌豎墻嶼序庶徐
F0 愬抒揅絃暑曙書栖棲屢瑞苴聚緒署

E040 - E0FF

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A0 胥舒暑西誓逝鋤黍鼠夕爽席惜昔皙
B0 析汐浙瀉石碩席釋錫仙僊先善蟬宣屬
C0 散旋澶瀦琰瑣璇璿癰禪緣繕羨腺膳船
D0 辭蟬詵詵選銑鑄鑄鮮高屑楔泄洩潔舌
E0 薛褻設說霽習剡暹穢纖蟻贍閃陝攝涉
F0 變葉城姓咸性慍成星晨猩城盛省箴

E140 - E1FF

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A0 聖聲腥誠醒世勢歲洗稅筭細說實召
B0 嘯望宵小少巢所掃搔昭梳沼消溯瀟炤
C0 燒黠疏疎瘡笑篠簫素紹蔬蕭蘇訴逍遡
D0 邵銷韶騷俗屬束涑粟續讓贖速孫巽損
E0 獺遜滄率宋悚松淞訟誦送頌刷殺瀾碎
F0 鎖衰釗修受嗽囚垂壽嫂守岫岫帥愁

Code Page 949 Korean (Cont.)

E240 - E2FF

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A0 戌手授搜收數樹殊水洙漱燧狩獸琇
B0 璫瘦睡秀穗堅粹綬綬縵脩茱萸蔭藪
C0 袖誰警輸達達酬銖銖隋陞隨雖需須首
D0 髓鬚叔塾夙孰宿淑瀟熟瑯璫肅菽巡徇
E0 循恂旬枸橘櫛洵詢珣盾瞬筍純霄舜
F0 荀寡蕞詢醇醇錚順馴戍術述毓樂崧

E340 - E3FF

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A0 嵩瑟膝蠶濕拾習褶襲丞乘僧勝升承
B0 昇繩蠅陞侍匙嘶始媼尸屨屨市弒恃施
C0 是時柵柴猜矢示翅蔣晉視試詩諶豕豺
D0 墻塞式息拭植殖濕炮簋蝕讎軾食飾伸
E0 仇僂呻娠宸慎新晨燼申神紳腎臣莘薪
F0 臺臺訊身辛辰迅失室實悉審尋心沁

E440 - E4FF

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A0 沈深潛基苾諶什十拾雙氏亞俄兒啞
B0 娥峨我牙芽莪蛾衙訝阿雅饒鴛鵲岳
C0 嶽嶽惡愕握樂濯鄂鏹鰓鰓安岸按晏
D0 案眼雁鰲鰲鰲鰲鰲鰲鰲鰲鰲鰲鰲
E0 菴聞壓押狎鴨仰央怏昂殃殃鶯匣裏埃
F0 崖爰暖漣磚艾隘羈厄扼掖液縊腋額

E540 - E5FF

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A0 櫻嬰鶯鸛也郇冶夜惹椰椰節耶若野
B0 弱掠略約若葯藥躍亮佯兩涼壤壤恙
C0 揚攘駁陽梁楊穰洋漾燭痒瘍穰穰穰羊
D0 良裏諒諒諒陽量養園御於漁燕樂語馭
E0 魚鯖億憶抑憶臄儼堰彥焉諱孽孽俺
F0 儼嚴奄掩淹巖業円予余勵呂女如廬

E640 - E6FF

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A0 旅歟汝濾璵璵璵與餘茹與聾閻餘曠
B0 麗黎亦力域役易曆歷疫繹譚譚逆囁囁
C0 壞妍媼宴年延憊戀掙撻撻撻撻撻撻撻
D0 淵瀟瀟烟然煙煉燃燕璉璉璉璉璉璉璉
E0 續聯衍軟釐蓮蓮鉛鍊薦列劣咽悅涅烈
F0 熱裂說閱厭廉念捻染殮炎焰琰琰萼

E740 - E7FF

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A0 簾間髻鹽鹽鹽鹽燁葉令困瑩寧嶺嶺影
B0 伶映映楹榮永泳漢穎灑灑灑灑燄燄玲
C0 瑛瑛瑛瑛瑛瑛瑛瑛瑛瑛瑛瑛瑛瑛瑛瑛
D0 領又倪例刈叟曳汨濊猊嚙嚙嚙嚙嚙嚙
E0 裔脂譽豫醴醴醴醴醴醴醴醴醴醴醴醴
F0 鳴塢塢塢塢塢塢塢塢塢塢塢塢塢塢塢

Code Page 949 Korean (Cont.)

E840 - E8FF

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A0 烏熬葵冀蜈誤贅龔屋沃獄玉鈺溫璵
B0 瘟穩縕蘊兀壘擗瓮甕癰翁龔雍甕渦瓦
C0 窩窪臥蛙蝸訖婉宛宛惋惋浣玩琬琬碗
D0 緩翫腕腕莞腕阮頑曰往旺枉汪王倭娃
E0 歪矮外寬覲猥畏了儗僂凹堯夭妖姚寧
F0 棄尿峴拗搖撓擣料曜樂撓療燿瑤療

E940 - E9FF

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A0 窈窕蘇繞燿腰夢姚要謠遙遼邀鎬愀
B0 欲浴縛縛尋僞傭冗勇涌壙容腐憑榕涌
C0 湧溶熔璿用甬聳葶蓍踊鎔鑄龍于佑偶
D0 僂又友右宇寓尤愚憂吁牛玕瑪孟枯耦
E0 萬紆羽芋藕虞迂遇郵紆隅雨彎勛或旭
F0 豈桷煜穉郁璵云暈櫻殞潑煩耘莖莖

EA40 - EAFF

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A0 運隅雲韻蔚鬱亏熊雄元原員圓園垣
B0 嫵嫵冤怨愿援沅洹浚源爰猿瑗苑袁輶
C0 遠阮阮韻鷺月越鉞位偉僞危圍委威尉
D0 慰賄渭爲瑋緯胃葦葦蕪衛禱謂違韋
E0 隸乳侑僦兪劉唯噉孺宥幼幽庾悠惟愈
F0 愉掄攸有杻柔柚柳檣檣油清流游溜

EB40 - EBFF

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A0 漚猶飲琉瑜由留癒硫紐維與莢裕誘
B0 謬諭踰蹂遊逾遺酉釉鎬類六堵戮驍肉
C0 育陸倫允爾尹崙滄澗玃胤贊輪鈇閭律
D0 慄栗率率戎泐絨融隆垠恩慝股閭銀隱
E0 乙吟淫蔭陰音飲掙泣邑凝應膺鷹依倚
F0 儀宜意懿擬椅毅疑矣義繻蕙蠟衣釐

EC40 - ECFE

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A0 議醫二以伊利吏夷姨履已弛彝怡易
B0 李梨泥爾珥理異癘痢移穰而耳鯉苾蓂
C0 裏裡貽貳邇里離飴餌匱濶濶益翊翌翼
D0 謚人仁刃印吝咽困姻寅引忍漣熾璘緗
E0 茵蘭蚓認隣勒勒麟麟一佚份壹曰溢逸
F0 鎡駟任壬妊姪恁林淋稔臨莅賃入什

ED40 - EDFE

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A0 立笠粒仍剩孕苐仔刺咨姊姿子字孜
B0 恣慈滋炙煮茲瓷疵磁紫者自苾蓼藉諮
C0 資雌作勻嚼斫昨灼炸爵緯芍酌雀鵲蹕
D0 機殘滌蹙岑暫潛箴簪蘿雜丈仗匠場墻
E0 壯獎將帳庄張掌曄杖樟櫛機漿牆狀獐
F0 璋章粧腸臟臧莊葬蔣蓄藏裝臟醬長

Code Page 949 Korean (Cont.)

EE40 - EEFF

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A0 陣再載在宰才材栽梓濺澤災穽裁財
 B0 載齋齋爭爭靜錚佇低儲咀姐底抵杵楮
 C0 櫻沮渚狙豬疽簪紵苧蕓藹阻貯躋這
 D0 邱雖齟勛吊嫡寂敵滴狄炙的積笛籍
 E0 績霽荻謫賊赤跡蹟迤迹適鑄佃佻傳全
 F0 典前剪填塲糞專展廛俊戰桎殿氈澱

EF40 - EFFF

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A0 煎瑛田甸畑癩釜簍箭箒纏詮輶轉鈿
 B0 銓錢鐫電顛顛錢切截折浙瘡竊節絕占
 C0 站店漸点粘霑黏點接擲蝶丁井亭停偵
 D0 呈妊定幘庭廷征情挺政整旌晶畚桎楨
 E0 櫪正汀淀淨渟漬潯烜玳玳町睛碇稭程
 F0 穽精緹艇訂諄貞鄭酊釘鉦鉅錠璽靖

F040 - F0FF

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A0 靜頂鼎制劑啼堤帝弟悌提梯濟祭第
 B0 臍齊製諸蹄醍除際霽題齊俎兆凋助嘲
 C0 弔彫描操早晁曹朝條藥槽漕潮照燥
 D0 爪瓖眺祖祚租糶窳粗糴組縵筆藻詔
 E0 調趙躁造遭釣阻雕烏族簇足鐵存尊卒
 F0 拙猝倖宗從悚慄棕涼琮種終綜縱腫

F140 - F1FF

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A0 踪躡鍾鍾佐坐左座挫罪主住侏倣姝
 B0 賁呪周噉奏宙州廚畫朱柱株注洲湊澍
 C0 炷珠囁籌紂紬綢舟蛛註誅走躡躡週耐
 D0 酒鑄駐竹粥俊儻淮垓嵩峻峻樽浚準潯
 E0 煖峻竣霰遼遼雋駿茁中仲衆重卽榔檣
 F0 汁葦增僧曾拯烝甄症縑蒸譴贈之只

F240 - F2FF

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A0 咫地址志持指擊支旨智枝枳止池沚
 B0 漬知砥祉祗紙肢脂至芷芷蛄謁謁謁
 C0 遲直種稷織職嚳噴慶振摺晉晉板榛殄
 D0 漳漳珍瓊進疹疹墨眞膜素縉縉縉縉
 E0 診賑軫辰進鎮陣陳震侄叱姪嫉佚桎瓊
 F0 疾秩竄腫蛭質跌迭斟朕什執濞縉縉

F340 - F3FF

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A0 鑠集徽徽澄且佗借叉嗟嵯差次此礎
 B0 筍茶蹉車遮捉搾着窄錯鑿齷撰潔燦璨
 C0 瓊竄纂纂纂縉縉縉縉縉縉縉縉縉縉
 D0 僧參甄慘慙慙斬站讎讎倉偶創喝媼媼
 E0 彰愴敝昌昶暢槍滄漲獮瘡窓脹觴觴蒼
 F0 債塚窠窠彩採嵒綵菜蔡采釵冊柵策

Code Page Traditional Chinese (Cont.)

F440 - F4FF

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A0 責淒妻懷處個刺剔尺憾戚拓擲斥滌
B0 瘠腎踰陟簋仟千喘天川擅泉淺玢穿舛
C0 蕙賤踐遷釧闌阡韃凸哲詰徹撤澈綴輟
D0 轍鐵僉尖沾添恬騰簪簪簪諂堞妾帖捷
E0 牒疊腫牒貼軀臙晴清聽菁請青鯖切剝
F0 替涕滯締諦遠遞體初剿哨儻抄招梢

F540 - F5FF

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A0 椒楚樵炒焦硝礁礎秒稍肖艸苔草蕉
B0 韶超酢醋醺促囑燭蠹蜀觸寸忖村邨蕞
C0 塚寵恩憶摠總聰蕙統攝催崔最墜拙推
D0 椎楸樞湫皺秋芻荻諏趨追鄒齒錐錘
E0 鎚難驕鰍丑齋祝竺筑築縮菁愛蹴軸逐
F0 耨櫓璫出朮黜充忠沖蟲衝衷悴膝萃

F640 - F6FF

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A0 贅取吹嘴娶就炊翠聚脆奧趣醉驟贅
B0 側仄厠惻測厝侈值嗑峙嶠恥樞治淄熾
C0 瘠痼癰稚穉繼繼置致嶺輜雉馳齒則勦
D0 飭親七柒漆侵寢枕沈浸琛砧針鍼鑿杵
E0 稱快他咤唾墮妥愜打拖朶橈舵陀馱駝
F0 俶卓喙圻度托拓擢暉柝濁濯琢瑋託

F740 - F7FF

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A0 鑲吞嘆坦彈憚歎灘炭綻誕奪脫探眈
B0 耽貪塔搭榻宕帑湯糖蕩兌台太怠態殆
C0 汰泰咎胎苔胎郅駭宅擇澤擇撓吐土
D0 討慟桶洞痛簡統通堆槌腿腿退頹僞套
E0 妬投透闕愿特闕坡婆巴把播擺杷波派
F0 爬蟹破罷芭跛頗判坂板版瓣販辦飯

F840 - F8FF

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A0 阪八叭捌佩喂恃敗沛湏牌狽稗霸貝
B0 彭澎烹膨懷便偏扁片篇編翩遍鞭騙貶
C0 坪平枰萍評呖髒廢弊斃肺蔽閉陞佈
D0 包匍匐咆哺圃布怖拋抱捕暴泡浦庖砲
E0 胞肺苞葡蒲袍褒逋鋪飽鮑幅暴曝爆
F0 輻倭剝彪標杓標漂瓢票表豹驕驕驕

F940 - F9FF

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A0 品稟楓楓豐風馮彼披疲皮被避陂匹
B0 邲必泌泌畢疋筆茲秘乏邇下何厦厦厦
C0 豐河瓊荷蠟賀邇霞蝦壑學虐謔鶴寒恨
D0 憚旱汗漢潞潞罕翰閑閑限轄割轄函含
E0 咸啣喊檻函緘艦銜陷鹹合哈盒蛤閤闔
F0 陝亢伉姁娣巷恒抗杭桁沆港缸肛航

Code Page 949 Korean (Cont.)

FA40 - FAFF

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A0 行降項亥偕咳咳爲孩害懈楷海澀蟹
B0 解該賄選駭駭劾核倖幸杏荇行享向嚮
C0 珣鄉響餉響香噓墟虛許憲櫬獻軒歌險
D0 驗奕嶸赫革倪峴弦懸曉沄炫玄玆現眩
E0 覲絃絢縣絃銜見賢鉉顯孑穴血貢嫌俠
F0 協夾挾挾挾挾脅脇莢缺頰亨兄刑型

FB40 - FBFF

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A0 形洞榮澹澹炯熒玗瑩荊螢衡迺邢螢
B0 馨兮替惠慧曙蕙蹊醴鞋乎互呼壕壺好
C0 岵孤戶雇吳皓臺浩漢湖潏潏濠濠瀨狐
D0 琥瑚輻皓枯糊縞胡芦葫蒿虎號蝴護豪
E0 鎬饒顙惑或酷嬌昏混渾環魂忽惚笏哄
F0 弘永泓洪烘紅虹缸鴻化和燐樺火蠶

FC40 - FCFF

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A0 禍禾花華話譁貨靴廓擴攢確礪禮丸
B0 喚喚宦幻患換歡皖栢渙煥環紈還驪繹
C0 活滑猾豁闊鳳幌惶恍惶恍晃晃晃晃晃
D0 漣漣漣漣璜璜璜璜璜璜璜璜璜璜璜
E0 徊恢恢恢恢會檣淮淮淮淮淮淮淮淮淮
F0 賄劉獲弘橫鎖嚙嚙嚙嚙嚙嚙嚙嚙嚙嚙

FD40 - FDFF

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A0 爻肴醇醕侯侯厚后吼喉嗅喉後朽煦
B0 珣珣勛勛墳墳熾熾熾熾熾熾熾熾熾熾
C0 蒼卉喙毀龔龔龔龔龔龔龔龔龔龔龔龔龔
D0 虧恤譎鷗兇凶匈洵胸黑所欣忻痕吃屹
E0 紇訖欠欽欽吸恰洽禽興僖熙喜噫嚙姬
F0 嬉希憲憲戲唏囁照晝燿燿燿燿燿燿

A440 - A4FF

40	一乙丁七乃九了二上人儿入八凡几刀力	亡匕下卜又三下丈口士丫丸凡久也乞于	小元刃勾千又工己巳市干丹弋子寸
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A0	丑	巧	中
B0	什	仆	仍
C0	分	切	勾
D0	天	户	勿
E0	戈	手	天
F0	母	毛	氏

A540 - A5FF

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A0	{ } { } " " * * ~ ~ # & *
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D0	- × + ± √ < > = ≤ ≥ ≠ ∞ ≡ + -
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F0	♀ ♂ ⊕ ⊗ ↑ ↓ ↗ ↘ ↙ ↘ ↗ ↘ ↗ ↘

40 世不且丘主乍乏乎以付仔仕他仗代令
50 仙勿充兄冉冊冬凹出凸刊加功包匆北
60 匪仟半卉卡占卯扈去可古右召叮叩叨
70 叨司亘叫另只史叱台句叭叻四囚外

央失奴奶孕它巨巧左市布未幼弁
 弘弗戊打奶扒扑巨且左市本末乳正
 母氏永汁汀犯犯女玉瓜瓦生用
 田丞兵乱互血皮亥伊佚佚佚佚
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A640 - A6FF

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A0	_ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _																									
B0	1 2 3 4 5 6 7 8 9 I II III IV V VI VII																									
C0	VIII IX X _ _ _ _ _ _ _ _ _ _ _ _ _ _																									
D0	B C D E F G H I J K L M N O P Q																									
E0	R S T U V W X Y Z a b c d e f g																									
F0	h i j k l m n o p q r s t u v																									

40 共再冰列刑划刳刳劣匡匪印危吉吏
50 同吊吐吁时各向名吃后吆吒因回囤
60 圳地在圭圉圉圩夙多夷夸妾奸妃好她
70 如灼字存宇守宅安寺尖屹州帆并年

A0		式弛忙忖戎戌成扣扛托收旱冒旬
B0	旭曲曳有朽朴朱朵采此死氛汝汗江	
C0	池汐汕污汎汎灰牟牝百竹米伍羊	
D0	羽老考而乘耳韋肋肪臣卑至位舌舛	
E0	舟艮色阿虫血行西阡率自坐住佗	
F0	倭伴佛何估佐佐伺伸佃佔似偈偈	

A740 - A7FF

[illegible]

40 作你伯低伶余佝佈佚兌免兵冶冷别
50 判利刪劊劫助努劓匡即卵吝吭吞吾否
60 呖吧呆呃臬呈呂君吩告吹吻吸吮吵呐
70 吠吼呀吱含吟听囡困團圉坊坑址圪

均坎坡坐坏圯灶夾妝妒妨姪姐妙妖
妍姁姁姁姁姁姁姁姁姁姁姁姁姁姁
尾岐岑岔岌巫希序庇床廷弄弟形形仿
D0 决忘忌忌忍怗怗怗怗怗怗怗怗怗
E0 抉扭把把把把把把把把把把把把把
F0 攻攷旱夏束李杏材材材材材材材材

Code Page 949 Traditional Chinese (Cont.)

A840 - A8FF

40 杓杓步每求求沙沁沈沉沉沛汪決沐汰
50 沌汨沖沒汽沃汲汾汴沅汶沔沔沔沔
60 灼災灸牢牡牠狄狂玖甬甬男甸皂叮矣
70 私秀禿究系罕宵宵肝肘肛肚育良芒
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A0 芋苟見角曹谷豆豕貝赤走足身車辛
B0 辰迂迤迤迤邕邕邢邪邦那酉采里防阮
C0 陴阪阮並乖乳事些亞享京佯依侍佳使
D0 佬供例來侃侃併侈佩佻禽佻佻佻佻
E0 兒兇兩具其典冽函刻券刷刺到刮制制
F0 効効卒協卓卑卦卷卸卹取叔受味呵

A940 - A9FF

40 咖吓咕咀呻呻咄咒咆呼咐呱呶和咚呢
50 周咋咄咄咄咄咄咄咄咄咄咄咄咄咄
60 奈奄奔妾妻妻妻妹妮姑姆姐姍始姓姊姊
70 妳姍姍孟孤季宗定官宜宙宛尙屈屈
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A0 屈岷岡岸岩岫岱岳宿帶帖帕帛帛幸
B0 庚店府底庖延弦弧驚往征佛彼忝忠忽
C0 忿忿快怔怯怵怖怪怕怡性怩怩怩或戕
D0 房房所承拉拌挂挂挂挂挂挂挂挂挂挂
E0 拈拈拈拈拈拈拈拈拈拈拈拈拈拈拈拈
F0 拈拈拈拈拈拈拈拈拈拈拈拈拈拈拈拈

AA40 - AAFF

40 昇服朋杭枋枕東果杏杷枇枝林杯杰板
50 枉松析杵杵杵杵杵杵杵杵杵杵杵杵
60 注泳沱泌泥河沽沽沼沼沫沫法泓沸泄油
70 況沮泗泗決治治治治治治治治治治
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A0 炕炎炒炊炙爬爭豕版牧物狀狎狎狗
B0 狐玩玃玃玃玃玃玃玃玃玃玃玃玃玃
C0 社祀祁棄和空穹竺糾罔羌半耆肺肥肢
D0 肱股肱肱肱肱肱肱肱肱肱肱肱肱肱
E0 芹花芬芥苾苾苾苾苾苾苾苾苾苾苾
F0 返近郅郅郅郅郅采金長門卑陀阿阻附

AB40 - ABFF

40 陂佳雨膏非亟亭亮信優侯便俠備倘保
50 促侶俣俣俣俣俣俣俣俣俣俣俣俣俣
60 曹冠剌剌剌剌剌剌剌剌剌剌剌剌剌
70 厚叛咬衰咨咬咬咬咬咬咬咬咬咬咬
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A0 哄哈咯咫咫咄咄咄咄咄咄咄咄咄咄
B0 城垮垮突契奏奎奕姜姘姿妓姘姘姘姘
C0 姚姘威姻孩宣宦室客宥封屏屏屏屏
D0 峒巷帝帥帝幽庠庠庠庠庠庠庠庠庠
E0 徇徇徇徇徇徇徇徇徇徇徇徇徇徇徇
F0 惆悵恤扁拜挖挖挖挖挖挖挖挖挖挖挖

AC40 - ACFF

40 拯括拾掙挑挂政故斫施既春昭映昧是
50 星昨昱昞曷柿染柱柔某東架枯柵柵柯
60 柄柑楊柚查枸柏柞柳柞柞柞柞柞柞
70 殆段毒毗氤泉洋洲洪流津洌洱洞洗
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A0 活洽派洵洛泵洵洵洵洵洵洵洵洵洵
B0 爲炳烜烜烜烜烜烜烜烜烜烜烜烜
C0 珊玻玲珍珀玳基爾畏界畎畎畎畎畎
D0 疣癯皆皇畎畎畎畎畎畎畎畎畎畎
E0 眇矜矜矜矜矜矜矜矜矜矜矜矜矜
F0 突竿竿籽紂紅紀紂紂紂紂紂紂紂紂

AD40 - ADFF

40 耐耍崙耶胖胥胚胥胥胥胥胥胥胥胥
50 致舢芋范茅苜苜苜苜苜苜苜苜苜苜
60 苜苜苜苜苜苜苜苜苜苜苜苜苜苜苜
70 計訂計訂計訂計訂計訂計訂計訂計訂
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90
A0 迭迫迤迤迤迤迤迤迤迤迤迤迤迤
B0 陞面革章非音貢風飛食首香乘毫信信
C0 倣倣倣倣倣倣倣倣倣倣倣倣倣倣倣
D0 倣倣倣倣倣倣倣倣倣倣倣倣倣倣倣
E0 冢凍凌淮潤割割割割割割割割割割
F0 唐嘈嘈嘈嘈嘈嘈嘈嘈嘈嘈嘈嘈嘈嘈

AE40 - AEFF

40 哦啣唇嚙唏囿囿囿囿囿囿囿囿囿
50 娑娘娜娑娑娑娑娑娑娑娑娑娑娑娑娑
60 害家真宮穹容宸射屑展展嶠嶠嶠嶠嶠
70 峰島坎峴差席師庫庭座弱徒徑徐恙
80
90
A0 忒恥恐恐恭恩恩恩恩恩恩恩恩恩恩
B0 扇拳擊拿揜揜揜揜揜揜揜揜揜揜揜
C0 揜揜揜揜揜揜揜揜揜揜揜揜揜揜揜
D0 晁晁晁晁晁晁晁晁晁晁晁晁晁晁晁
E0 桌桑栽柴桐桀格桃桃桃桃桃桃桃桃
F0 氣氣氣氣氣氣氣氣氣氣氣氣氣氣氣

AF40 - AFFF

40 涅涉浮浚浴浩涌浚浚浚浚浚浚浚浚
50 烈烏蓼特狼狽狽狽狽狽狽狽狽狽狽
60 畔畎畎畎畎畎畎畎畎畎畎畎畎畎畎
70 飽益益益益益益益益益益益益益益
80
90
A0 砥砥砥砥砥砥砥砥砥砥砥砥砥砥砥
B0 秣秣秣秣秣秣秣秣秣秣秣秣秣秣秣
C0 素素素素素素素素素素素素素素素
D0 耘耕耘耘耘耘耘耘耘耘耘耘耘耘耘耘
E0 能脊脊脊脊脊脊脊脊脊脊脊脊脊脊脊
F0 荆荻荻荻荻荻荻荻荻荻荻荻荻荻荻荻

B040 - B0FF

B140 - B1FF

B240 - B2FF

B340 - B3FF

B440 - B4FF

B540 - B5FF

B640 - B6FF

B740 - B7FF

321

Code Page 950 Traditional Chinese (Cont.)

B840 - B8FF

40 瞽瞍睞睞睞睞睞矮碎碰碗碗碗碗碗
50 確確確確確確確確確確確確確確確確
60 節節節節節節節節節節節節節節節節
70 署署署署署署署署署署署署署署署署
80
90
A0 腹腹腹腹腹腹腹腹腹腹腹腹腹腹腹腹
B0 尊尊尊尊尊尊尊尊尊尊尊尊尊尊尊尊
C0 蛻蛻蛻蛻蛻蛻蛻蛻蛻蛻蛻蛻蛻蛻蛻蛻
D0 規規規規規規規規規規規規規規規規
E0 詮詮詮詮詮詮詮詮詮詮詮詮詮詮詮詮
F0 駭駭駭駭駭駭駭駭駭駭駭駭駭駭駭駭

B940 - B9FF

40 辟辟辟辟辟辟辟辟辟辟辟辟辟辟辟辟
50 遁遁遁遁遁遁遁遁遁遁遁遁遁遁遁遁
60 鉞鉞鉞鉞鉞鉞鉞鉞鉞鉞鉞鉞鉞鉞鉞鉞
70 雷雷雷雷雷雷雷雷雷雷雷雷雷雷雷雷
80
90
A0 匏匏匏匏匏匏匏匏匏匏匏匏匏匏匏匏
B0 僂僂僂僂僂僂僂僂僂僂僂僂僂僂僂僂
C0 嘛嘛嘛嘛嘛嘛嘛嘛嘛嘛嘛嘛嘛嘛嘛嘛
D0 塵塵塵塵塵塵塵塵塵塵塵塵塵塵塵塵
E0 嫩嫩嫩嫩嫩嫩嫩嫩嫩嫩嫩嫩嫩嫩嫩嫩
F0 屢屢屢屢屢屢屢屢屢屢屢屢屢屢屢屢

BA40 - BAFF

40 愿愿愿愿愿愿愿愿愿愿愿愿愿愿愿愿
50 摺摺摺摺摺摺摺摺摺摺摺摺摺摺摺摺
60 槁槁槁槁槁槁槁槁槁槁槁槁槁槁槁槁
70 歎歎歎歎歎歎歎歎歎歎歎歎歎歎歎歎
80
90
A0 滿滿滿滿滿滿滿滿滿滿滿滿滿滿滿滿
B0 滌滌滌滌滌滌滌滌滌滌滌滌滌滌滌滌
C0 瑰瑰瑰瑰瑰瑰瑰瑰瑰瑰瑰瑰瑰瑰瑰瑰
D0 碟碟碟碟碟碟碟碟碟碟碟碟碟碟碟碟
E0 箋箋箋箋箋箋箋箋箋箋箋箋箋箋箋箋
F0 綾綾綾綾綾綾綾綾綾綾綾綾綾綾綾綾

BB40 - BBFF

40 罰罰罰罰罰罰罰罰罰罰罰罰罰罰罰罰
50 與與與與與與與與與與與與與與與與
60 寬寬寬寬寬寬寬寬寬寬寬寬寬寬寬寬
70 裴裴裴裴裴裴裴裴裴裴裴裴裴裴裴裴
80
90
A0 說說說說說說說說說說說說說說說說
B0 趕趕趕趕趕趕趕趕趕趕趕趕趕趕趕趕
C0 鄺鄺鄺鄺鄺鄺鄺鄺鄺鄺鄺鄺鄺鄺鄺鄺
D0 鉗鉗鉗鉗鉗鉗鉗鉗鉗鉗鉗鉗鉗鉗鉗鉗
E0 韶韶韶韶韶韶韶韶韶韶韶韶韶韶韶韶
F0 肅肅肅肅肅肅肅肅肅肅肅肅肅肅肅肅

BC40 - BCFF

40 劇劇劇劇劇劇劇劇劇劇劇劇劇劇劇劇
50 嘆嘆嘆嘆嘆嘆嘆嘆嘆嘆嘆嘆嘆嘆嘆嘆
60 嫵嫵嫵嫵嫵嫵嫵嫵嫵嫵嫵嫵嫵嫵嫵
70 廚廚廚廚廚廚廚廚廚廚廚廚廚廚廚廚
80
90
A0 慇慇慇慇慇慇慇慇慇慇慇慇慇慇慇慇
B0 擊擊擊擊擊擊擊擊擊擊擊擊擊擊擊擊
C0 攪攪攪攪攪攪攪攪攪攪攪攪攪攪攪攪
D0 標標標標標標標標標標標標標標標標
E0 瀟瀟瀟瀟瀟瀟瀟瀟瀟瀟瀟瀟瀟瀟瀟瀟
F0 膝膝膝膝膝膝膝膝膝膝膝膝膝膝膝膝

BD40 - BDFF

40 瑾瑾瑾瑾瑾瑾瑾瑾瑾瑾瑾瑾瑾瑾瑾瑾
50 瞋瞋瞋瞋瞋瞋瞋瞋瞋瞋瞋瞋瞋瞋瞋瞋
60 窠窠窠窠窠窠窠窠窠窠窠窠窠窠窠窠
70 絨絨絨絨絨絨絨絨絨絨絨絨絨絨絨絨
80
90
A0 翹翹翹翹翹翹翹翹翹翹翹翹翹翹翹翹
B0 蔑蔑蔑蔑蔑蔑蔑蔑蔑蔑蔑蔑蔑蔑蔑蔑
C0 蝗蝗蝗蝗蝗蝗蝗蝗蝗蝗蝗蝗蝗蝗蝗蝗
D0 請請請請請請請請請請請請請請請請
E0 賞賞賞賞賞賞賞賞賞賞賞賞賞賞賞賞
F0 踢踢踢踢踢踢踢踢踢踢踢踢踢踢踢踢

BE40 - BEFF

40 輓輓輓輓輓輓輓輓輓輓輓輓輓輓輓輓
50 銷銷銷銷銷銷銷銷銷銷銷銷銷銷銷銷
60 羈羈羈羈羈羈羈羈羈羈羈羈羈羈羈羈
70 駛駛駛駛駛駛駛駛駛駛駛駛駛駛駛駛
80
90
A0 缺缺缺缺缺缺缺缺缺缺缺缺缺缺缺缺
B0 剿剿剿剿剿剿剿剿剿剿剿剿剿剿剿剿
C0 壁壁壁壁壁壁壁壁壁壁壁壁壁壁壁壁
D0 憶憶憶憶憶憶憶憶憶憶憶憶憶憶憶憶
E0 擒擒擒擒擒擒擒擒擒擒擒擒擒擒擒擒
F0 檜檜檜檜檜檜檜檜檜檜檜檜檜檜檜檜

BF40 - BFFF

40 濃濃濃濃濃濃濃濃濃濃濃濃濃濃濃濃
50 燕燕燕燕燕燕燕燕燕燕燕燕燕燕燕燕
60 瘴瘴瘴瘴瘴瘴瘴瘴瘴瘴瘴瘴瘴瘴瘴
70 穆穆穆穆穆穆穆穆穆穆穆穆穆穆穆穆
80
90
A0 縑縑縑縑縑縑縑縑縑縑縑縑縑縑縑縑
B0 膩膩膩膩膩膩膩膩膩膩膩膩膩膩膩膩
C0 甥甥甥甥甥甥甥甥甥甥甥甥甥甥甥甥
D0 諱諱諱諱諱諱諱諱諱諱諱諱諱諱諱
E0 頻頻頻頻頻頻頻頻頻頻頻頻頻頻頻頻
F0 還還還還還還還還還還還還還還還還

C040 - COFF

C140 - C1FF

C240 - C2FF

C340 - C3FF

C440 - C4FF

C540 - C5FF

C640 - C6FF

C740 - C7FF

545

Code Page 980 Traditional Chinese (Cont.)

C840 - C8FF

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A0
B0
C0
D0
E0
F0

又乂口口厂万开毛于口兀中彳丐有与
乳元仇仇仇尤勾印办扎劫夫尖市无爻
母气月非井住仁仕佉企企判盟册订圣
苑旁宁充尔尻男岔叮庀庀庆切戍劫气

A0 承汎汎发发玃王内臆防伎优优佯伢
B0 伶伶伶伶伶佻佻佻佻佻佻佻佻佻
C0 翳囧囧囧囧囧囧囧囧囧囧囧囧囧囧
D0 妯妯妯妯妯妯妯妯妯妯妯妯妯妯
E0 伙伙伙伙伙伙伙伙伙伙伙伙伙伙伙
F0 机机机机机机机机机机机机机机机

CA40 - CAFF

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A0
B0
C0
D0
E0
F0

洲刳犴犴犴犴犴犴犴犴犴犴犴犴犴
两邙邙邙邙邙邙邙邙邙邙邙邙邙
佻佻佻佻佻佻佻佻佻佻佻佻佻佻
劬劬劬劬劬劬劬劬劬劬劬劬劬
80
90
A0 咩咩咩咩咩咩咩咩咩咩咩咩咩
B0 峯尖峯尖峯尖峯尖峯尖峯尖峯尖
C0 峯峯峯峯峯峯峯峯峯峯峯峯峯
D0 序序序序序序序序序序序序序序
E0 伙伙伙伙伙伙伙伙伙伙伙伙伙伙
F0 扰扰扰扰扰扰扰扰扰扰扰扰扰扰扰

CB40 - CBFF

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A0
B0
C0
D0
E0
F0

杙杙杙杙杙杙杙杙杙杙杙杙杙杙杙杙
沭沭沭沭沭沭沭沭沭沭沭沭沭沭沭
初初初初初初初初初初初初初初初
疔疔疔疔疔疔疔疔疔疔疔疔疔
80
90
A0 芊芊芊芊芊芊芊芊芊芊芊芊芊芊
B0 阮阮阮阮阮阮阮阮阮阮阮阮阮阮
C0 佻佻佻佻佻佻佻佻佻佻佻佻佻佻
D0 刳刳刳刳刳刳刳刳刳刳刳刳
E0 嘴嘴嘴嘴嘴嘴嘴嘴嘴嘴嘴嘴嘴嘴
F0 囧囧囧囧囧囧囧囧囧囧囧囧囧

CC40 - CCFF

40
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A0
B0
C0
D0
E0
F0

圪圪圪圪圪圪圪圪圪圪圪圪圪圪圪
婢婢婢婢婢婢婢婢婢婢婢婢婢婢
岨岨岨岨岨岨岨岨岨岨岨岨岨岨岨
驺驺驺驺驺驺驺驺驺驺驺驺驺驺
80
90
A0 憾憾憾憾憾憾憾憾憾憾憾憾憾憾
B0 伶伶伶伶伶伶伶伶伶伶伶伶伶伶
C0 挖挖挖挖挖挖挖挖挖挖挖挖挖挖
D0 盼盼盼盼盼盼盼盼盼盼盼盼盼盼
E0 耘耘耘耘耘耘耘耘耘耘耘耘耘耘耘
F0 泣泣泣泣泣泣泣泣泣泣泣泣泣泣

CD40 - CDFF

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A0
B0
C0
D0
E0
F0

派派派派派派派派派派派派派派
快快快快快快快快快快快快快快
结结结结结结结结结结结结结结
毗毗毗毗毗毗毗毗毗毗毗毗毗毗
80
90
A0 矸矸矸矸矸矸矸矸矸矸矸矸矸
B0 肭肭肭肭肭肭肭肭肭肭肭肭肭
C0 芡芡芡芡芡芡芡芡芡芡芡芡芡
D0 达达达达达达达达达达达达达达
E0 偃偃偃偃偃偃偃偃偃偃偃偃偃
F0 剋剋剋剋剋剋剋剋剋剋剋剋剋

CE40 - CEFF

40
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A0
B0
C0
D0
E0
F0

啮啮啮啮啮啮啮啮啮啮啮啮啮
垓垓垓垓垓垓垓垓垓垓垓垓垓
复复复复复复复复复复复复复复
婢婢婢婢婢婢婢婢婢婢婢婢婢婢
80
90
A0 卷卷卷卷卷卷卷卷卷卷卷卷卷卷
B0 幷幷幷幷幷幷幷幷幷幷幷幷幷
C0 德德德德德德德德德德德德德德
D0 恻恻恻恻恻恻恻恻恻恻恻恻恻
E0 振振振振振振振振振振振振振振
F0 弄弄弄弄弄弄弄弄弄弄弄弄弄弄

CF40 - CFFF

40
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A0
B0
C0
D0
E0
F0

柜柜柜柜柜柜柜柜柜柜柜柜柜柜
秩秩秩秩秩秩秩秩秩秩秩秩秩秩
格格格格格格格格格格格格格格
澳澳澳澳澳澳澳澳澳澳澳澳澳澳
80
90
A0 洁洁洁洁洁洁洁洁洁洁洁洁洁洁
B0 炆炆炆炆炆炆炆炆炆炆炆炆炆炆
C0 猊猊猊猊猊猊猊猊猊猊猊猊猊
D0 珎珎珎珎珎珎珎珎珎珎珎珎珎珎
E0 耽耽耽耽耽耽耽耽耽耽耽耽耽耽
F0 玆玆玆玆玆玆玆玆玆玆玆玆玆玆

D040 - D0FF

[illegible]

40 吹啤嘍唆嗒喇喇唸圖垠聖埕埕埕埕
50 垠埕埕埕埕埕埕埕埕埕埕埕埕埕
60 埕埕埕埕埕埕埕埕埕埕埕埕埕埕
70 埕埕埕埕埕埕埕埕埕埕埕埕埕埕
80 幸崑崑崑悅摩摩廢廢強強或惡惡
90
A0 恁懷懷悵悵悵悵悵悵悵悵悵悵悵
B0 嚴華華掙掙掙掙掙掙掙掙掙掙掙掙
C0 掙掙掙掙掙掙掙掙掙掙掙掙掙掙掙
D0 掙掙掙掙掙掙掙掙掙掙掙掙掙掙掙
E0 枹枹枹枹枹枹枹枹枹枹枹枹枹枹
F0 枹枹枹枹枹枹枹枹枹枹枹枹枹枹

40 毯氈毳毼氍冲流浣沔沔沭混漚漚漑
50 漒漑漕漙漘漞漟漠漡漢漣漥漦漤漮
60 漷漸漨漩漪漻漽漿漺漻漼漽漾漿𧀂𧀃
70 焯煖煇煊煏煓煔煕煖煜煝煞煟煠煡煢
80 煣煤煥煦照煨煩煪煫煬煭煮煯煰煱
90 A0 怪拳妙獐狝狎狎狎徐狻狴玃玅玆率玈
B0 玉玊玌玍玎玏玐玑玒玓玔玕玖玗玘玙玚
C0 玛玜玝玞玟玠玡玢玣玤玥玦玧玨玩玪
D0 玫玬玭玮环现玱玲玳玵玶玷玸玹玺玻
E0 玼玽玾玿珁珂珃珄珅珆珇珈珉珊珋珌珍
F0 珎珏珐珑珒珓珔珕珖珗珘珙珚珛珜珝珞

40 笋筴筴笄笄笄笄筍筍板板柴料粗料物
50 統統絆絆絆絆絆絆絆絆絆絆絆絆絆絆絆絆
60 眾眾粉粉翅翅粉粉粉粉粉粉粉粉粉粉粉粉
70 異舩舩汙汙莪莪莪莪莪莪莪莪莪莪莪莪
80
90
A0 莖莖莖莖莖莖莖莖莖莖莖莖莖莖莖莖莖莖
B0 莖莖莖莖莖莖莖莖莖莖莖莖莖莖莖莖莖莖
C0 蛭蛭蛭蛭蛭蛭蛭蛭蛭蛭蛭蛭蛭蛭蛭蛭蛭蛭
D0 蛭蛭蛭蛭蛭蛭蛭蛭蛭蛭蛭蛭蛭蛭蛭蛭蛭蛭
E0 蛭蛭蛭蛭蛭蛭蛭蛭蛭蛭蛭蛭蛭蛭蛭蛭蛭蛭
F0 蛭蛭蛭蛭蛭蛭蛭蛭蛭蛭蛭蛭蛭蛭蛭蛭蛭蛭

40 酇酇鈞鈺鈺陟陟隼隼訂訂鬱鬱俛俛僅僅僕
50 僂僂僂僂僂僂僂僂僂僂僂僂僂僂僂僂僂僂僂僂僂
60 僂僂僂僂僂僂僂僂僂僂僂僂僂僂僂僂僂僂僂僂
70 厖厖啱啱啱啱啱啱啱啱啱啱啱啱啱啱啱啱
80
90
A0 嘒嘒嗒嗒嗒嗒嗒嗒嗒嗒嗒嗒嗒嗒嗒嗒嗒嗒嗒嗒
B0 玆玆埴埴埴埴埴埴埴埴埴埴埴埴埴埴埴埴
C0 埴埴埴埴埴埴埴埴埴埴埴埴埴埴埴埴埴埴
D0 埴埴埴埴埴埴埴埴埴埴埴埴埴埴埴埴埴
E0 埴埴埴埴埴埴埴埴埴埴埴埴埴埴埴埴埴
F0 孫孫夔夔夔夔夔夔夔夔夔夔夔夔夔夔夔夔

[illegible]

40 滄流汚沚潮澗涸洽煨燒焗煨煨煨煨
50 燭燭燭燭燭燭燭燭燭燭燭燭燭燭
60 猝猗猗猗猗猗猗猗猗猗猗猗猗猗猗
70 璵璵璵璵璵璵璵璵璵璵璵璵璵璵璵璵璵
80
90
A0 痘痂疹痂疹痂汪睽睽眊眊眊眊眊眊
B0 瞽瞽眊眊眊眊眊眊眊眊眊眊眊眊眊
C0 袷袷袷袷袷袷袷袷袷袷袷袷袷袷
D0 篋篋篋篋篋篋篋篋篋篋篋篋篋篋篋
E0 秣秣秣秣秣秣秣秣秣秣秣秣秣秣
F0 糲糲糲糲糲糲糲糲糲糲糲糲糲糲糲

40 耒耜𦍋𦍇𦍈𦍉𦍊𦍋𦍌𦍍𦍎𦍇𦍈𦍉𦍊𦍋𦍌𦍍𦍎
50 𦍇𦍈𦍉𦍊𦍋𦍌𦍍𦍎𦍇𦍈𦍉𦍊𦍋𦍌𦍍𦍎𦍇𦍈𦍉𦍊
60 𦍇𦍈𦍉𦍊𦍋𦍌𦍍𦍎𦍇𦍈𦍉𦍊𦍋𦍌𦍍𦍎𦍇𦍈𦍉𦍊𦍋
70 𦍇𦍈𦍉𦍊𦍋𦍌𦍍𦍎𦍇𦍈𦍉𦍊𦍋𦍌𦍍𦍎𦍇𦍈𦍉𦍊𦍋𦍌
80 𦍇𦍈𦍉𦍊𦍋𦍌𦍍𦍎𦍇𦍈𦍉𦍊𦍋𦍌𦍍𦍎𦍇𦍈𦍉𦍊𦍋𦍌
90 𦍇𦍈𦍉𦍊𦍋𦍌𦍍𦍎𦍇𦍈𦍉𦍊𦍋𦍌𦍍𦍎𦍇𦍈𦍉𦍊𦍋𦍌
A0 𦍇𦍈𦍉𦍊𦍋𦍌𦍍𦍎𦍇𦍈𦍉𦍊𦍋𦍌𦍍𦍎𦍇𦍈𦍉𦍊𦍋𦍌
B0 𦍇𦍈𦍉𦍊𦍋𦍌𦍍𦍎𦍇𦍈𦍉𦍊𦍋𦍌𦍍𦍎𦍇𦍈𦍉𦍊𦍋𦍌
C0 𦍇𦍈𦍉𦍊𦍋𦍌𦍍𦍎𦍇𦍈𦍉𦍊𦍋𦍌𦍍𦍎𦍇𦍈𦍉𦍊𦍋𦍌
D0 𦍇𦍈𦍉𦍊𦍋𦍌𦍍𦍎𦍇𦍈𦍉𦍊𦍋𦍌𦍍𦍎𦍇𦍈𦍉𦍊𦍋𦍌
E0 𦍇𦍈𦍉𦍊𦍋𦍌𦍍𦍎𦍇𦍈𦍉𦍊𦍋𦍌𦍍𦍎𦍇𦍈𦍉𦍊𦍋𦍌
F0 𦍇𦍈𦍉𦍊𦍋𦍌𦍍𦍎𦍇𦍈𦍉𦍊𦍋𦍌𦍍𦍎𦍇𦍈𦍉𦍊𦍋𦍌

D840 - D8FF

40	鈞鈇鈇鈇鈇開閤階階階階階階鈇鈇鈇鈇
50	爐爐爐爐爐爐爐爐爐爐爐爐爐爐爐爐
60	銑滄初綢麻頂暗曉嘍嘍嘍嘍嘍嘍嘍嘍
70	嘍嘍嘍嘍嘍嘍嘍嘍嘍嘍嘍嘍嘍嘍嘍嘍嘍嘍
80	
90	
A0	壘堞堞堞堞堞堞堞堞堞堞堞堞堞堞堞
B0	塢塢塢塢塢塢塢塢塢塢塢塢塢塢塢塢
C0	嫗嫗嫗嫗嫗嫗嫗嫗嫗嫗嫗嫗嫗嫗嫗嫗嫗
D0	嫗嫗嫗嫗嫗嫗嫗嫗嫗嫗嫗嫗嫗嫗嫗嫗嫗
E0	嶠嶠嶠嶠嶠嶠嶠嶠嶠嶠嶠嶠嶠嶠嶠嶠嶠
F0	岨岨岨岨岨岨岨岨岨岨岨岨岨岨岨岨岨

[illegible][illegible]

40 罩城煖羨鋤耳聃聃蔽闥捲腊腮腰膝
50 臄臄詭惠載銑錫舄舄舄舄舄舄舄舄舄
60 苑莠苑莠苑莠莠莠莠莠莠莠莠莠莠
70 松到菰味菰菰菰菰菰菰菰菰菰菰
80
90
A0 菰菰菰菰菰菰菰菰菰菰菰菰菰菰菰
B0 燕蚌蚌蚌蚌蚌蚌蚌蚌蚌蚌蚌蚌蚌蚌
C0 衿衿衿衿衿衿衿衿衿衿衿衿衿衿衿
D0 規規規規規規規規規規規規規規規
E0 詒詒詒詒詒詒詒詒詒詒詒詒詒詒詒
F0 詒詒詒詒詒詒詒詒詒詒詒詒詒詒詒

[illegible][illegible][illegible][illegible]

E440 - E4FF

[illegible][illegible]

E540 - E5FF

[illegible]

40 噤囁囁囁囁囁囁囁囁囁囁囁囁囁囁囁囁囁囁囁囁囁囁
50 墜墜墜墜墜墜墜墜墜墜墜墜墜墜墜墜墜墜墜墜墜墜
60 婚孀孀孀孀孀孀孀孀孀孀孀孀孀孀孀孀孀孀孀孀孀
70 幙幙幙幙幙幙幙幙幙幙幙幙幙幙幙幙幙幙幙幙幙
80
90
A0 憚憚憚憚憚憚憚憚憚憚憚憚憚憚憚憚憚憚憚憚憚憚
B0 搬搬搬搬搬搬搬搬搬搬搬搬搬搬搬搬搬搬搬搬搬搬
C0 窠窠窠窠窠窠窠窠窠窠窠窠窠窠窠窠窠窠窠窠窠窠
D0 樛樛樛樛樛樛樛樛樛樛樛樛樛樛樛樛樛樛樛樛樛樛樛樛樛樛
E0 椳椳椳椳椳椳椳椳椳椳椳椳椳椳椳椳椳椳椳椳椳椳椳
F0 欂欂欂欂欂欂欂欂欂欂欂欂欂欂欂欂欂欂欂欂欂欂欂欂欂欂

E640 - E6FF

40 檣檣檣檣檣檣檣檣檣檣檣檣檣檣
50 檣檣檣檣檣檣檣檣檣檣檣檣檣檣
60 檣檣檣檣檣檣檣檣檣檣檣檣檣檣
70 檣檣檣檣檣檣檣檣檣檣檣檣檣檣
80
90
A0 滄滄滄滄滄滄滄滄滄滄滄滄滄滄滄滄
B0 滄滄滄滄滄滄滄滄滄滄滄滄滄滄滄滄
C0 滄滄滄滄滄滄滄滄滄滄滄滄滄滄滄滄
D0 滄滄滄滄滄滄滄滄滄滄滄滄滄滄滄滄
E0 滄滄滄滄滄滄滄滄滄滄滄滄滄滄滄滄
F0 滄滄滄滄滄滄滄滄滄滄滄滄滄滄滄滄

[illegible]

E740 - E7FF

40 祿祿祿祿祿祿祿祿祿祿祿祿祿祿祿祿
50 筵筵筵筵筵筵筵筵筵筵筵筵筵筵筵筵
60 鄰鄰鄰鄰鄰鄰鄰鄰鄰鄰鄰鄰鄰鄰鄰
70 綯綯綯綯綯綯綯綯綯綯綯綯綯綯綯
80
90
A0 稽稽稽稽稽稽稽稽稽稽稽稽稽稽稽
B0 蒺蒺蒺蒺蒺蒺蒺蒺蒺蒺蒺蒺蒺蒺蒺
C0 蒺蒺蒺蒺蒺蒺蒺蒺蒺蒺蒺蒺蒺蒺蒺
D0 蒺蒺蒺蒺蒺蒺蒺蒺蒺蒺蒺蒺蒺蒺蒺
E0 蛭蛭蛭蛭蛭蛭蛭蛭蛭蛭蛭蛭蛭蛭蛭
F0 蛭蛭蛭蛭蛭蛭蛭蛭蛭蛭蛭蛭蛭蛭蛭

40	膊膊膊膊膊膊膊膊膊膊
50	實設衰麗族輝聲菽菽菽菽菽菽菽
60	蒂推遂蘆蓼蕒道撈蘆齒齒齒齒齒
70	確菽篤蓀蓀蓀蓀蓀蓀蓀蓀蓀蓀
80	
90	
A0	蛭蛭蛭蛭蛭蛭蛭蛭蛭蛭
B0	蟻蟻蟻蟻蟻蟻蟻蟻蟻蟻
C0	蠹蠹蠹蠹蠹蠹蠹蠹蠹蠹
D0	親觥觥觥觥觥觥觥觥觥觥
E0	談駢駢駢駢駢駢駢駢駢駢
F0	樹樹樹樹樹樹樹樹樹樹

Code Page 950 Traditional Chinese (Cont.)

E840 - E8FF

40 踴踴踴踴踴踴踴踴踴踴踴踴踴踴踴踴
50 遶遶遶遶遶遶遶遶遶遶遶遶遶遶
60 醺醺醺醺醺醺醺醺醺醺醺醺醺醺
70 銑銑銑銑銑銑銑銑銑銑銑銑銑銑
80
90
A0 鋤鋤鋤鋤鋤鋤鋤鋤鋤鋤鋤鋤鋤鋤
B0 靦靦靦靦靦靦靦靦靦靦靦靦靦靦
C0 裝銑銑銑銑銑銑銑銑銑銑銑銑銑
D0 彰彰彰彰彰彰彰彰彰彰彰彰彰彰彰
E0 紋紋紋紋紋紋紋紋紋紋紋紋紋紋紋
F0 廕廕廕廕廕廕廕廕廕廕廕廕廕廕

E940 - E9FF

40 嘯嘯嘯嘯嘯嘯嘯嘯嘯嘯嘯嘯嘯嘯
50 坐爐爐爐爐爐爐爐爐爐爐爐爐爐
60 嶺嶺嶺嶺嶺嶺嶺嶺嶺嶺嶺嶺嶺嶺
70 磨磨磨磨磨磨磨磨磨磨磨磨磨磨磨
80
90
A0 傲傲傲傲傲傲傲傲傲傲傲傲傲傲傲
B0 敷敷敷敷敷敷敷敷敷敷敷敷敷敷敷
C0 機機機機機機機機機機機機機機機
D0 染染染染染染染染染染染染染染染
E0 歡歡歡歡歡歡歡歡歡歡歡歡歡歡歡
F0 潞潞潞潞潞潞潞潞潞潞潞潞潞潞

EA40 - EAFF

40 瀟瀟瀟瀟瀟瀟瀟瀟瀟瀟瀟瀟瀟瀟瀟
50 桑燭燭燭燭燭燭燭燭燭燭燭燭燭
60 猱猱猱猱猱猱猱猱猱猱猱猱猱猱
70 寢寢寢寢寢寢寢寢寢寢寢寢寢寢寢
80
90
A0 曉曉曉曉曉曉曉曉曉曉曉曉曉曉曉
B0 糜糜糜糜糜糜糜糜糜糜糜糜糜糜糜
C0 質質質質質質質質質質質質質質質
D0 綳綳綳綳綳綳綳綳綳綳綳綳綳綳綳
E0 尉尉尉尉尉尉尉尉尉尉尉尉尉尉尉
F0 臘臘臘臘臘臘臘臘臘臘臘臘臘臘臘

EB40 - EBFF

40 棘棘棘棘棘棘棘棘棘棘棘棘棘棘棘
50 復蕪蕪蕪蕪蕪蕪蕪蕪蕪蕪蕪蕪蕪
60 蜎蜎蜎蜎蜎蜎蜎蜎蜎蜎蜎蜎蜎蜎
70 楹楹楹楹楹楹楹楹楹楹楹楹楹楹
80
90
A0 譚譚譚譚譚譚譚譚譚譚譚譚譚譚譚
B0 謹謹謹謹謹謹謹謹謹謹謹謹謹謹謹
C0 蹀蹀蹀蹀蹀蹀蹀蹀蹀蹀蹀蹀蹀蹀蹀蹀蹀
D0 遶遶遶遶遶遶遶遶遶遶遶遶遶遶遶
E0 鈇鈇鈇鈇鈇鈇鈇鈇鈇鈇鈇鈇鈇鈇鈇鈇
F0 鉤鉤鉤鉤鉤鉤鉤鉤鉤鉤鉤鉤鉤鉤

EC40 - ECFF

40 鋤鋤鋤鋤鋤鋤鋤鋤鋤鋤鋤鋤鋤鋤
50 錐錐錐錐錐錐錐錐錐錐錐錐錐錐錐
60 駮駮駮駮駮駮駮駮駮駮駮駮駮駮
70 髻髻髻髻髻髻髻髻髻髻髻髻髻髻髻髻
80
90
A0 鮎鮎鮎鮎鮎鮎鮎鮎鮎鮎鮎鮎鮎鮎鮎
B0 慶慶慶慶慶慶慶慶慶慶慶慶慶慶慶
C0 啖啖啖啖啖啖啖啖啖啖啖啖啖啖啖
D0 關關關關關關關關關關關關關關關
E0 駮駮駮駮駮駮駮駮駮駮駮駮駮駮
F0 屬屬屬屬屬屬屬屬屬屬屬屬屬屬屬

ED40 - EDFF

40 聚聚聚聚聚聚聚聚聚聚聚聚聚聚聚
50 滌滌滌滌滌滌滌滌滌滌滌滌滌滌滌
60 厲厲厲厲厲厲厲厲厲厲厲厲厲厲厲
70 甌甌甌甌甌甌甌甌甌甌甌甌甌甌甌
80
90
A0 臨臨臨臨臨臨臨臨臨臨臨臨臨臨臨
B0 襪襪襪襪襪襪襪襪襪襪襪襪襪襪襪
C0 搭搭搭搭搭搭搭搭搭搭搭搭搭搭搭
D0 縞縞縞縞縞縞縞縞縞縞縞縞縞縞縞
E0 縷縷縷縷縷縷縷縷縷縷縷縷縷縷縷
F0 縷縷縷縷縷縷縷縷縷縷縷縷縷縷縷

EE40 - EEFF

40 預預預預預預預預預預預預預預預
50 奮奮奮奮奮奮奮奮奮奮奮奮奮奮奮
60 蟻蟻蟻蟻蟻蟻蟻蟻蟻蟻蟻蟻蟻蟻蟻
70 蝗蝗蝗蝗蝗蝗蝗蝗蝗蝗蝗蝗蝗蝗蝗
80
90
A0 禪禪禪禪禪禪禪禪禪禪禪禪禪禪禪
B0 詮詮詮詮詮詮詮詮詮詮詮詮詮詮詮
C0 縶縶縶縶縶縶縶縶縶縶縶縶縶縶縶
D0 銑銑銑銑銑銑銑銑銑銑銑銑銑銑銑
E0 銑銑銑銑銑銑銑銑銑銑銑銑銑銑銑
F0 闕闕闕闕闕闕闕闕闕闕闕闕闕闕闕闕

EF40 - EFFF

40 鞞鞞鞞鞞鞞鞞鞞鞞鞞鞞鞞鞞鞞鞞鞞
50 鰓鰓鰓鰓鰓鰓鰓鰓鰓鰓鰓鰓鰓鰓
60 駮駮駮駮駮駮駮駮駮駮駮駮駮駮
70 絡絡絡絡絡絡絡絡絡絡絡絡絡絡絡
80
90
A0 鴿鴿鴿鴿鴿鴿鴿鴿鴿鴿鴿鴿鴿鴿鴿
B0 散散散散散散散散散散散散散散散
C0 奧奧奧奧奧奧奧奧奧奧奧奧奧奧奧
D0 懷懷懷懷懷懷懷懷懷懷懷懷懷懷懷
E0 櫓櫓櫓櫓櫓櫓櫓櫓櫓櫓櫓櫓櫓櫓櫓
F0 澈澈澈澈澈澈澈澈澈澈澈澈澈澈澈

F040 - F0FF

A0	臘	樞	桃	華	葦	英	菰	紫	蓬	蕁	苳	葵	莢
B0	薑	藟	蔚	蔴	藕	蘋	藻	薺	蒲	鹹	螃	蟻	蝗
C0	螭	蟻	嫁	姆	蝦	螺	蜆	蚌	蚶	蛸	蝨	蠍	蟹
D0	蜃	蝶	蛾	嫩	櫻	檉	樓	椽	櫚	蘭	諤	譔	詔
E0	諸	誼	諱	設	讓	訕	謗	瞋	諠	譏	諛	諂	諷
F0	竊	竊	竊	盜	醫	醫	醫	醫	醫	醫	醫	醫	醫

AO	藥業藥廠藥建藥業藥英藥頭藥周藥腿結藥博藥
BO	駁藥馬藥馬藥馬駒馬駒馬駒馬駒馬駒馬駒馬駒馬駒
CO	鰓鰓鰓鰓鰓鰓鰓鰓鰓鰓鰓鰓鰓鰓鰓鰓鰓鰓鰓鰓
DO	疔癰癰癰癰癰癰癰癰癰癰癰癰癰癰癰癰癰癰癰癰癰
EO	疔癰癰癰癰癰癰癰癰癰癰癰癰癰癰癰癰癰癰癰癰癰
FO	疔癰癰癰癰癰癰癰癰癰癰癰癰癰癰癰癰癰癰癰癰癰

[illegible][illegible][illegible][illegible][illegible][illegible]

Code Page 950 Traditional Chinese (Cont.)

F840 - F8FF

40 燕雛馨證寵贊寵鑲鑲鑲鑲鑲鑲鑲鑲鑲鑲鑲鑲
50 緝緝緝緝緝緝緝緝緝緝緝緝緝緝緝緝緝緝緝
60 緝緝緝緝緝緝緝緝緝緝緝緝緝緝緝緝緝緝緝
70 緝緝緝緝緝緝緝緝緝緝緝緝緝緝緝緝緝緝緝
80
90
A0 醞醞醞醞醞醞醞醞醞醞醞醞醞醞醞醞醞醞醞
B0 醞醞醞醞醞醞醞醞醞醞醞醞醞醞醞醞醞醞醞
C0 醞醞醞醞醞醞醞醞醞醞醞醞醞醞醞醞醞醞醞
D0 醞醞醞醞醞醞醞醞醞醞醞醞醞醞醞醞醞醞醞
E0 醞醞醞醞醞醞醞醞醞醞醞醞醞醞醞醞醞醞醞
F0 醞醞醞醞醞醞醞醞醞醞醞醞醞醞醞醞醞醞醞

F940 - F9FF

40 橫橫橫橫橫橫橫橫橫橫橫橫橫橫橫橫橫橫橫橫
50 橫橫橫橫橫橫橫橫橫橫橫橫橫橫橫橫橫橫橫橫
60 橫橫橫橫橫橫橫橫橫橫橫橫橫橫橫橫橫橫橫橫
70 橫橫橫橫橫橫橫橫橫橫橫橫橫橫橫橫橫橫橫橫
80
90
A0 醞醞醞醞醞醞醞醞醞醞醞醞醞醞醞醞醞醞醞
B0 醞醞醞醞醞醞醞醞醞醞醞醞醞醞醞醞醞醞醞
C0 醞醞醞醞醞醞醞醞醞醞醞醞醞醞醞醞醞醞醞
D0 醞醞醞醞醞醞醞醞醞醞醞醞醞醞醞醞醞醞醞
E0 醞醞醞醞醞醞醞醞醞醞醞醞醞醞醞醞醞醞醞
F0 醞醞醞醞醞醞醞醞醞醞醞醞醞醞醞醞醞醞醞

FA40 - FAFF

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A0
B0
C0
D0
E0
F0

FB40 - FBFF

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80
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A0
B0
C0
D0
E0
F0

FC40 - FCFF

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A0
B0
C0
D0
E0
F0

FD40 - FDFF

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70
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A0
B0
C0
D0
E0
F0

FE40 - FEFF

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A0
B0
C0
D0
E0
F0

FF40 - FFFF

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A0
B0
C0
D0
E0
F0

Appendix D: RS485 Interface

General

The 7167 printer with RS485 communications provides a connector and command compatible printer. The printer will allow for the replacement of the IBM Model 4 printer with the 7167 printer which will allow for the increase print speed of the receipt thermal printer.

In addition the printer provides an USB interface in addition to the RS485 communications.

Basic Printer Functions

- General

Serial I/F (RS485) - Protocol - Data length - Expansion bit - Stop bits - Parity - Baud rate	IBM RS485 8bits 1 bit 2 bits CRC (SDLC16) 187, 500 bps
Serial I/F (RS232) for F/W Flash only - Protocol - Data length - Parity - Baud rate	DTR/DSR, XON/XOFF 8, 7 bits 1, 2 bit(s) Non, Even, Odd 1200, 2400, 4800, 9600, 19200, 38400, 57600, 115200 bps
USB I/F	USB 1.1 Edgeport protocol

- Receipt

Resolution	203dpi X 203 dpi
Paper Width	80 mm
Printable area	
- Normal	38 char per line (15.6 CPI ⁵) = 62mm
- Spread font	30 char per line (12CPI) = 64mm
- Double width	19 char per line (7.8 CPI) = 62mm
Graphics	380dpl=52.8mm
Margin	Left margin = 9mm Right margin = 9mm
Character configuration	Font A of 7167 Printer: 13(H) X 24(V) dots
Character set	Code page ³ 437, 850, 852, 858, 860–866
Logo	380 dots per line
Print line height	Minimum 24 dots, default LDPI
Print attribute	Double width , Double high, double density, spread

- Slip

	Narrow Paper	Wide Paper
Resolution	150 DPI ⁶ X 72DPI	
Paper Width	70 mm	Can not support
Normal	38 char per line 64.3mm(150dpi)	Print only 43/34 characters a line
Spread font	30 char per line 63.5mm(120dpi)	and remaining 43/34 characters
Double width	19 char per line =64mm	are on next line
Graphics	380dpl=64mm	440dpl=80.7mm
Character configuration	10(H) X 7(V) dots	
Logo	380 / 440 (for wide paper) dots per line	
Paper Feed Direction	Forward and Reverse	
Character set	Code page ³ 437, 850, 852, 858, 860–866	
Print line height	0-255 dot row linefeed selectable, default: 6 LPI	
Print attribute	Double width, Double Density, Double High, spread Font.	
MICR	Available	

Emulation

⁵ IBM model 4R is 15 CPI in normal font and 7.5CPI for double wide font

³ Limitation : 7167 Printer does not support Code page 819, 855, 857, 869, 1116-1119, 1250, 1251, 1253, 1254, 1257

⁶ For slip station, IBM model 4R has 15CPI for normal fonts.

³ Limitation : 7167 Printer does not support Code page 819, 855, 857, 869, 1116-1119, 1250, 1251, 1253, 1254, 1257

Command List

4690 Operating System Commands

HEX	Decimal	ASCII	Command	Page
		pstation(text)	Select print station and print	
0A	10	LF	Line Feed	334
0D	13	CR	Carriage Return	334
1B 0E	27 23	ESC SO	Double High Printing	335
1B 3A	27 58	ESC :	Spread Font	335
1B 3B	27 59	ESC ;	Normal Font	334
1B 17	27 69	ESC ETB	Double Density Printing	336
1B 45	27 70	ESC E	Cancel Double Density Printing	336
1B 47	27 71	ESC /	Event Completion Notification	336
1B 4C	27 76	ESC L	Feed Document at Slip Station	337
1B 4D	27 77	ESC M	Eject Document at Slip Station	337
1B 4F	27 79	ESC O	Advance paper to Tear Bar	337
1B 50	27 80	ESC P	Knife Cut	338
1B 51	27 81	ESC Q	Cut Paper and Perform Stamp	338
1B 52	27 82	ESC R	MICR Read	338

Linefeed

ASCII: LF

Hexadecimal: 0A

Decimal: 10

Function:

The line feed control character causes the printer device handler to flush out any buffered data to the printer, advances the paper one line, and leaves the current print position the same. As subsequent write in normal mode to the printer continues at the current position one line below the previously printed line.

Carriage Return

ASCII: CR

Hexadecimal: 0D

Decimal: 13

Function:

The carriage return control character causes the printer device handler to flush out any buffered data to the printer and to move the current print position to the first position of the line.

Normal Font (15 CPI)

ASCII: ESC ;

Hexadecimal: 1B 3B

Decimal: 27 59

Function:

The default font for the printer is normal font (15 CPI) is selected. This command returns to the default if the spread font, double wide font or double high font has been selected. If the default font of 15 CPI is currently selected this command is ignored. Any subsequent writes to any of the print stations remain at 15 CPI until a different font size is selected.

Spread Font

ASCII: ESC :

Hexadecimal: 1B 3A

Decimal: 27 58

Function:

The spread font (12 CPI) font is selected with this command. The print stations continue to print this font until a different font is selected. If the current font selected is 12 CPI this command is ignored.

Double-Wide Font

ASCII: ESC SO

Hexadecimal: 1B 0E

Decimal: 27 14

Function:

Double wide (7.5 CPI) font is selected with this command. The print stations continue to print double wide font until a different font is selected. If the current font selected is 7.5 CPI this command is ignored. The characters to be printed are limited to 10 characters.

Double High Font

ASCII: ESC F

Hexadecimal: 1B 46

Decimal: 27 70

Function:

Double high printing and 7.5 CPI is selected with this command. The print stations continue to print double high font until a different font is selected. If the current font selected is double high then this command is ignored. The characters to be printed are limited to 10 characters.

Double-Density Font

ASCII: ESC ETB

Hexadecimal: 1B 17

Decimal: 27 69

Function:

Double density printing or emphasized font is selected with this command. All print stations continue to print double density font until a different font is selected. If the current font selected is double density then this command is ignored.

Normal Density

ASCII: ESC F

Hexadecimal: 1B 46

Decimal: 27 70

Function:

The default print density is selected with this command. This command disables the double density font print selection. The print stations continue to print normal print density until a different font type is selected. If the current density selected is normal density this command is ignored.

Event Completion Notification

ASCII: ESC G

Hexadecimal: 1B 47

Decimal: 27 71

Function:

The event completion notification indicates to the printer device handler to send a confirmation event message to the application once the data has been successfully printed in the selected stations. A confirmation event message is generated for each selected station. If no stations are selected at the time of the PosWrite() routine call, the chase escape character sequence is discarded.

Register Document

ASCII: ESC L

Hexadecimal: 1B 4C

Decimal: 27 76

Function:

The register document escape character sequence automatically registers a document in the DI station if it is positioned at the front of the DI station. This command is ignored if the DI station has previously been selected.

Release Document

ASCII: ESC M

Hexadecimal: 1B 4D

Decimal: 27 77

Function:

The release document command releases the document that is in the DI stations if it has been previously registered by the register document command. This command disables the double density font print selection. This command is ignored unless the register document command has been selected.

Advance Paper to the Tear Bar

ASCII: ESC O

Hexadecimal: 1B 4F

Decimal: 27 79

Function:

The command will advance the paper on the CR print station to the tear bar location. This positions the last line printed to be positioned just above the tear bar. This command is only recognized when the CR print station is selected.

Cut Paper

ASCII: ESC P

Hexadecimal: 1B 50

Decimal: 27 80

Function:

The cut paper command will perform a paper cut on the CR print station. default print density is selected with this command. The cut paper command will be ignored is the SJ or the DI print stations are selected.

Cut Paper and Stamp

ASCII: ESC Q

Hexadecimal: 1B 51

Decimal: 27 81

Function:

The cut paper and stamp command will perform a paper cut on the CR print station. default print density is selected with this command. The cut paper and stamp command will be ignored if the SJ or the DI print stations is selected.

Read MICR

ASCII: ESC R

Hexadecimal: 1B 52

Decimal: 27 82

Function:

The read MICR command causes the printer to read the account information on the check that is inserted in the DI station. The MICR read command will be ignored if the CR or the SJ print stations is selected.

The printer supports the commands shown below.

Command sequence	Function	Remarks
System Command		
00 03	Ignored	Respond with ROL
00 10	Test (Run exercise program)	
00 20	Status request	
00 40	Software power on reset	
00 80	Request for EC status	

Command sequence	Function	Remarks
Printer Function Commands		
01 01 00 m n	Print normal text on receipt and linefeed	Followed by data to be printed
01 02 00 m n	Store to EJ	
01 06 00 m n	Print normal text on slip and linefeed	Followed by data to be printed
01 07 00 m n	Print normal text on slip and linefeed	Followed by data to be printed
01 08 00 00 00	Model 4: Print head to left home 7167 Printer: Move impact print head to home station	
01 0B 00 00 00	Model 4: Print head to center home position 7167 Printer: Move impact print head to home position	
01 0F 00 00 00	Feed slip to print position	TOF and BOF sensor on
01 11 00 00 00	Model 4: Correct journal path error 7167 Printer: Reserved for future use, ignored now	
01 12 00 00 00	Receipt cut	

Command sequence	Function	Remarks
Vertical Positioning and Print Commands		
01 09 00 m n	Model 4: Feed m X n dot rows in receipt station 7167 Printer: Feed m X 3n dot rows in receipt station	
01 0A 00 m n	7167 Printer: Store to EJ	
01 0C 00 m n	Feed m X n dot rows in slip station	
01 13 00 00 00	Feed slip forward and eject	
01 14 00 00 00	Reverse feed slip and eject	

Command sequence	Function	Remarks
Print Characteristic Commands		
02 01 00 m n	Print spread font on receipt and linefeed	
02 02 00 m n	Store to EJ	
02 06 00 m n	Print spread font on slip and linefeed	
02 07 00 m n	Print spread font on slip and linefeed	
04 01 00 m n	Print double high, double wide font on receipt ,LF	
04 02 00 m n	Store to EJ	
04 06 00 m n	Print double high, double wide font on slip,LF	
04 07 00 m n	Print double high, double wide font on slip LF	
11 01 00 m n	Print double density font on receipt and linefeed	
11 02 00 m n	Store to EJ	
11 06 00 m n	Print double density font on slip and linefeed	
11 07 00 m n	Print double density font on slip and linefeed	
12 01 00 m n	Print double density spread font on receipt LF	
04 02 00 m n	Store to EJ	
12 06 00 m n	Print double density spread font on slip,LF	
12 07 00 m n	Print double density spread font on slip and linefeed	
14 01 00 m n	Print double density double high font on receipt and linefeed	
04 02 00 m n	Store to EJ	

Command sequence	Function	Remarks
Print Characteristic Commands (Cont.)		
14 06 00 m n	Print double density double high font on slip, LF	
14 07 00 m n	Print double density double high font on slip, LF	

Graphics Commands		
06 01 00 m n	Print Logo on receipt (even columns) and feed	Followed by 190 bytes
07 01 00 m n	Print Logo on receipt (odd columns) and feed	Followed by 190 bytes
06 06 00 m n	Print Logo on receipt (even columns) and feed	Followed by 440 bytes
07 06 00 m n	Print Logo on receipt (odd columns) and feed	Followed by 440 bytes
06 07 00 m n	Print Logo on receipt (even columns) and feed	Followed by 190 bytes
07 07 00 m n	Print Logo on receipt (odd columns) and feed	Followed by 190 bytes

Command sequence	Function	Remarks
MICR Command		
01 17 00 00 00	MICR read	

Command sequence	Function	Remarks
Unknown		
09 00 00 D8 08	Ignored	
09 00 00 E0 08	Ignored	
09 00 00 E8 08	Ignored	
09 00 00 F0 08	Ignored	
09 00 00 F8 08	Ignored	
0B 20 00 00 00	Ignored	

Command sequence	Function	Remarks
Electronic Journal (7167 Printer RS485 Without EJ model doesn't support these commands)		
k 02 00 m n	Store journal data into printer memory	k=01, 02, 04, 11, 12, or 14
X'010100010C'^EJ RQ n1 n2	Enable the upload of EJ data	Followed by MICR command
X'010100010C'^EJ Disable n1	Disable the upload of EJ data	
X'0117000000'	Upload the EJ data	EJ upload should be enabled
X'0101xxxxxx'^EJ Size n1	Request the size of the EJ space	Followed by MICR command
X'0101xxxxxx'^EJ ERase n1	Erase the EJ data in the printer	

Command and Status Descriptions

After the printer has been brought on line, the operating system is in control of the printer and delivers properly formatted commands to the printer. All the commands are sent to the printer as I format frames and the execution of the commands is verified by the operating system by analyzing the status frame transmitted back by the printer.

Printer Command Structure

There are five command bytes and some data bytes that communicate the printer which function to perform. The definition of the bit structure of these command bytes is as follows.

Command Byte One

All bits are zero, indicates that the command is a system command. There are four 2-byte system commands:

1. Test – Run Exercise Program (00 10H)
2. Status request (00 20H)
3. Software power on reset (00 40H)
4. EC readout (00 80H)

If in lower 4 bits:

Only bit 0 is set to 1, indicates following command bytes are related to normal printing or basic print functions such as linefeed, paper cut, print head to home, MICR read

Only Bit 1 is 1, the command is to print the following data bytes in spread font on corresponding stations

Only Bit 2 is 1, print data in double height format

06, print logo, the following 190 bytes will be printed in even columns of 8 consecutive dot rows, LSB of each byte is printed on first dot row and MSB is printed on 8th dot row

07, print logo, the following 190 bytes will be printed in odd columns of 8 consecutive dot rows, LSB of each byte is printed on first dot row and MSB is printed on 8th dot row

09, 2nd and 3rd bytes are 00 and 4th byte is one of “D8, E0, E8, F0, F8”, 5th byte is 08, printer initialization

Bit 4 is 1, print following bytes in double density

Command Byte Two

This command byte defines what type of action, e.g. print, print head movement or linefeed is to take place and which station it is to take place in.

01H:	Receipt Station Printing
02H:	Electronic journal save
06H:	DI Station printing (wide)
07H:	DI Station printing
08H:	Move print head to home position
09H:	Linefeed in receipt station
0AH:	Model 4R: Linefeed in journal station

7167 Printer: Save linefeed information in EJ (This is not supported on a printer without the EJ module.)

0BH:	Move print head to home position
0CH:	Linefeed in slip station
0FH:	Move slip to printable position
11H:	Model 4R: Correct journal path error
7167 Printer:	Ignore
12H:	Receipt paper cut
13H:	Feed document and release slip
14H:	Reverse feed document and release slip
17H:	MICR read or EJ upload

Command Byte Three

This command byte is always zero.

Command Byte Four

This command byte indicates number of lines to be fed.

Command Byte Five

This command byte is the current line pitch. The range is from 0 to 255.

For model 4R printer, increasing this value with 1 results in 1 dot row's increment in line height, which is 1/72 inch. It defines number of dot rows to be fed in one linefeed. When this setting is less than one character height (9 dot rows) and the printer only feed one line, the next line will be printed overlapped with the previous line.

For 7167 Printer slip station, value n in this byte indicates $n/72$ inch of line height

For 7167 Printer's receipt station, value n in this byte indicates $2n/203$ inch of line height. If $2n/203$ is less than character height (24/203 inch), current line height is set to 24/203 inch.

Printer Command Details

Online test request

Function: Perform online test.

Command: 00 10

Data: None

Printer Status Request

Function: Request printer to send current status. Printer will respond with an I frame which includes the 4-byte status information.

Command: 00 20

Data: None

Printer Power On reset

Function: Clear the print line buffer and reset the printer to the default settings for the startup configuration (refer to Default settings above.)

Single-Wide, Single-High and Left-Aligned characters are set and User-defined characters or logo graphics are cleared (Flash Memory is not affected). Tabs reset to default.

Command: 00 40

Data: None

Default:

Character Pitch: 15.6 CPI

Column Width: 38 characters

Extra Dot Rows: 2

Character Set: Code Page 858

Printing Position: Column One

Printer EC request

Function: Request printer to send current status and EC information. Printers will respond with an I frame which includes the 4-byte status + 2-byte EC information.

Command: 00 80

Data: None

Printer Initialization

Function: These 5 commands are sent in term when POSIOctl() is called to set printer handler and are ignored by 7167 Printer.

Command: 09 00 00 D8 08
09 00 00 E0 08
09 00 00 E8 08
09 00 00 F0 08
09 00 00 F8 08

Data: None

Print a Line of Normal Text and Linefeed

Function: Printer will print the following bytes in normal font and feed m lines.

Command: 01 k 00 m n

Data: 38 bytes ASCII code for the characters to be printed. If data are more than 38 bytes, extra bytes will be printed next line in the same format; if less than 38 bytes, space characters will be printed after the received bytes.

k: 01: Print on receipt station
02: Print on journal station
Save to EJ. (This function is not supported on a 7167 Printer without EJ)
06: Print on slip (wide). 86 bytes data will follow this command and be printed on two lines
07: Print on slip (38 bytes).

m: 0-255, number of lines to be fed after print

n: Line pitch,

For model 4R and 7167 Printer slip station, 0 –255, line height is set to $n/72$ inch, which is n dot rows,

For 7167 Printer receipt station, line height is $2n/203$ inch. If it's less than character height (24 dots), line height is set to character height

Print a Line of Double Wide Text and Linefeed

Function: Printer will print following even numbered bytes in double width and feed *m* lines.

Command: 01 *k* 00 *m n* 0E *d1* 0E *d2* 0E... 0E *d19*

Data: 19 bytes of ASCII code for the characters to be printed, each byte preceded by '0E'.

If data are more than 38 bytes, extra bytes will be printed next line in the same format; if less than 38 bytes, space characters will be printed after the received bytes.

k: 01: Print on receipt station
 02: Print on journal station
 Save to EJ. (This function is not supported on a 7167 Printer without EJ)
 06: Print on slip (wide). 86 bytes will follow this command, sent in the format of "0E *d1* 0E *d2* 0E... 0E *d43*", "*d1 d2 ... d43*" are printed on two lines
 07: Print on slip (narrow).
m: 0-255, number of lines to be fed after print
n: Line pitch,

For model 4R and 7167 Printer slip station, 0 –255, line height is set to $n/72$ inch, which is *n* dot rows,

For 7167 Printer receipt station, line height is $2n/203$ inch. If it's less than character height (24 dots), line height is set to character height

Print a Line of Double High, Double Wide and Linefeed

Function: Printer will print following even numbered data in double width double height (odd numbered bytes are '0EH') and feed m lines.

Command: 04 k 00 m n 0E d1 0E d2 0E... 0E d19

Data: 19 bytes of ASCII code for the characters to be printed, each byte preceded by '0E' If data are more than 38 bytes, extra bytes will be printed next line in the same format; if less than 38 bytes, space characters will be printed after the received bytes.

k: 01: Print on receipt station
02: Print on journal station
Save to EJ. (7167 Printer RS485 without EJ model doesn't support)
06: Print on slip (wide). 86 bytes will follow this command, sent in the format of "0E d1 0E d2 0E... 0E d43", "d1 d2 ... d43" are printed on two lines
07: Print on slip (narrow).

M: 0-255, number of lines to be fed after print

n: Line pitch,

For model 4R and 7167 Printer slip station, 0 –255, line height is set to $n/72$ inch, which is n dot rows,

For 7167 Printer receipt station, line height is $2n/203$ inch. If it's less than character height (24 dots), line height is set to character height

Print a Line in Spread Font

Function: Printer will print following data in spread font (12 CPI) and feed m lines.

Command: 02 k 00 m n

Data: 30 bytes ASCII code for the characters to be printed. If data are more than 30 bytes, extra bytes will be printed next line in the same format; if less than 30 bytes, space characters will be printed after the received bytes.

k: 01: Print on receipt station
02: Print on journal
Save to EJ (7167 Printer RS485 without EJ model doesn't support)
06: Print on slip (wide). 68 bytes will follow this command and are printed on two lines.
07: Print on slip

m: 0-255, number of lines to be fed after print

n: Line pitch,

For model 4R and 7167 Printer slip station, 0 –255, line pitch is defined to be $n/72$ inch, which is n dot rows,

For 7167 Printer receipt station, when n is less than 24, this value is ignored in this command, the linefeed after printing one line is m lines at current line height

Linefeed

Function: Printer will feed m lines

Command: 01 k 00 m n

Data: None

k: 09: Linefeed in receipt station
0A: Linefeed in journal station
Save to EJ (7167 Printer RS485 without EJ model doesn't support)
0C: Linefeed in slip station

m: 0-255, number of lines to be fed after print

n: 0 -255, line pitch

For model 4R and 7167 Printer slip station, 0 –255, line height is set to $n/72$ inch, which is n dot rows,

For 7167 Printer receipt station, line height is $2n/203$ inch. If it's less than character height (24 dots), line height is set to character height

Print Head Move to Home Position

Function: Either command moves the printer head to home position.

Command: 01 08 00 00 00
01 0B 00 00 00

Data: None

Select Slip Station and Feed Paper to Print Position

Function: Feed slip paper to print position.

Command: 01 0F 00 00 00

Data: None

Correct Journal Error

Function: The 7167 Printer ignores this command.

Command: 01 11 00 00 00

Data: None

In model 4R, this command is sent after Journal path error.

Receipt Paper Cut

Function: Performs paper cut at the receipt station.

Command: 01 12 00 00 00

Data: None

Feed Slip Paper and Eject

Function: Feed slip paper and release slip station.

Command: 01 13 00 00 00

Data: None

Reverse Feed Slip Paper and Eject

Function: Reverse feed slip paper out the front of the printer far enough to be accessible to the operator and release slip station.

Command: 01 14 00 00 00

Data: None

Print a Line in Double Density, Normal Font

Function: Printer will print following data in double density, normal font (15 CPI) and feed m lines.

Command: 11 k 00 m n

Data: 38 bytes ASCII code for the characters to be printed. If data are more than 38 bytes, extra bytes will be printed next line in the same format; if less than 38 bytes, space characters will be printed after the received bytes.

K: 01: Print on receipt station
 02: Print on journal station.
 7167 Printer: Save to EJ. (Not supported on 7167 Printer RS485 without EJ)
 06: Print on slip (wide). 86 bytes data will follow this command and be printed on two lines
 07: Print on slip

m: 0-255, number of lines to be fed after print

N: Line pitch,

For model 4R and 7167 Printer slip station, 0 –255, line height is set to $n/72$ inch, which is n dot rows,

For 7167 Printer receipt station, line height is $2n/203$ inch. If it's less than character height (24 dots), line height is set to character height

Print a Line in Double Density, Spread Font

Function: Printer will print data in double density, spread font (12 CPI) and feed *m* lines.

Command: 12 k 00 m n

Data: 30 bytes ASCII code for the characters to be printed. If data are more than 30 bytes, extra bytes will be printed next line in the same format; if less than 30 bytes, space characters will be printed after the received bytes.

k: 01: Print on receipt station
02: Print on journal station
Save to EJ. (7167 Printer RS485 without EJ model doesn't support)
06: Print on slip (wide). 68 bytes data will follow this command and be printed on two lines
07: Print on slip

M: 0-255, number of lines to be fed after print

n: Line pitch,

For model 4R and 7167 Printer slip station, 0 –255, line height is set to $n/72$ inch, which is *n* dot rows,

For 7167 Printer receipt station, line height is $2n/203$ inch. If it's less than character height (24 dots), line height is set to character height

Print a Line in Double Density, Double High Font

Function: Printer will print following data in double density, double width, double high and feed *m* lines.

Command: 14 k 00 m n 0E *d1* 0E *d2* 0E... 0E *d19*

Data: 19 bytes of ASCII code for the characters to be printed in double density, each byte preceded by '0E'. If data are more than 38 bytes, extra bytes will be printed next line in the same format; if less than 38 bytes, space characters will be printed after the received bytes.**Data:**

k: 01: Print on receipt station
02: Print on journal station
Save to EJ. (7167 Printer RS485 without EJ model doesn't support)
06: Print on slip (wide). 86 bytes will follow this command, sent in the format of "0E *d1* 0E *d2* 0E... 0E *d43*", "*d1 d2 ... d43*" are printed on two lines
07: Print on slip (narrow).

m: 0-255, number of lines to be fed after print

n: Line pitch,

For model 4R and 7167 Printer slip station, 0 –255, line height is set to $n/72$ inch, which is *n* dot rows,

For 7167 Printer receipt station, line height is $2n/203$ inch. If it's less than character height (24 dots), line height is set to character height

Print Logo in Even Numbered Columns

Function: For slip station, logo will be printed as normal.

Command: 06 k 00 m n

Data: 190 bytes of bit image information for the dot to be printed. All data in this command will be printed on even columns of the rows. Each data represents 8 dot rows of a certain column, LSB of each byte is printed on the 1st dot row while MSB is printed on 8th dot row.

k: 01: Print on receipt station
 06: Print on slip (wide, see "Print Logo in Odd Numbered Columns").
 07: Print on slip

m: 0-255, number of lines to be fed after print

n: 0 -255, Line pitch,

For model 4R and 7167 Printer slip station, 0 -255, line height is set to $n/72$ inch, which is n dot rows

For 7167 Printer receipt station, line height is $2n/203$ inch. If it's less than character height (24 dots), line height is set to character height

Print eight-dot-rows bit image on even numbered columns and then feed m lines.

For 7167 Printer, the command must be used in combination with "Print Logo in Odd Numbered Columns". On receipt station, logo will be printed in 6 dot double density (in receipt station, set "Convert from 6dot/mm to 8dot/mm", then print in 8 dot double density).

Print Logo in Odd Numbered Columns

Function: Logo is printed double high on the receipt station.

Command: 07 k 00 m n

Data: 190 bytes of bit image information for the dot to be printed. All data in this command will be printed on odd columns of the rows. Each data represents 8 dot rows of a certain column, LSB of each byte is printed on the 1st dot row while MSB is printed on 8th dot row.

k: 01: Print on receipt station

06: Print on slip (wide).

07: Print on slip

m: 0-255, number of lines to be fed after print

N: 0 –255, Line pitch,

For model 4R and 7167 Printer slip station, line height is set to $n/72$ inch, which is n dot rows, For 7167 Printer receipt station, line height is $2n/203$ inch. If it's less than character height (24 dots), line height is set to character height

Print eight-dot-rows bit image on odd numbered columns and then feed m lines.

For 7167 Printer, the command must be used in combination with "Print Logo in Even Numbered Columns". Logo will be printed in 8 dot double density. If k is 06, print on slip wide, only data in this command is printed and data in print logo in even numbered columns are discarded.

MICR Read

Function: Feed and read MICR information on the check, and send that message to terminal. The printer will send an I frame in which the first 4 bytes are the current printer status, followed by MICR message read.

Command: 01 17 00 00 00

Data: None

Uploading Electronic Journal Data

This section describes the procedure for uploading electronic journal (EJ) data while the printer in Model 4-emulation mode.

7167 Printer RS485 without the EJ module doesn't support these functions.

To put the printer into the mode for starting the EJ upload, the printer must receive a print command with a unique message. The message will include the line number where the upload should start. Because the starting line number is specified, if the printer is reset during the upload, the application will not have to restart from the beginning. The application can send a command to start at the last line that was sent.

When the EJ upload is enabled, all MICR commands will be interpreted as EJ upload.

Enable the Upload of EJ Data

Function: Enables the electronic journal to upload the journal information to the host.

Command Syntax:

RS-485 SYNTAX

ASCII X'010100010C'^EJ RQ n1 n2

Hexadecimal

Decimal

Where:

n1: The line number, which is specified as six decimal ASCII numbers

n2: 25 undefined bytes

If EJ upload is enabled, following "01 17 00 00 00" command will be interpreted as EJ upload request

Example:

X'010100010C'^EJ RQ 00405X'000000000000000000000000....' OR
X'010100010C5E454A20525120303030343035000000000000.....'

Will enable the upload starting at line number 405.

Note: The line number data will be sent as decimal, ASCII numbers.

Note: The line number should not start from 0(zero).

Disable the Upload of EJ Data

Function: Disable the electronic journal to upload the electronic journal to the host.

Command Syntax:

RS-485 SYNTAX

ASCII X'0101000010C'^EJ DIisable n1

Hexadecimal

Decimal

Where:

n1: 27 undefined bytes

When EJ upload is disabled, following "01 17 00 00 00" command will be interpreted as MICR read

Example:

X'010100010C'^EJ Disable X'0000000000....' OR
X'010100010C5E454A2044497361626C65000000.....'

REMARKS:

This command will disable the electronic journal.

Upload the EJ Data

Function: Uploads the electronic journal information to the host.

COMMAND SYNTAX:

RS-485 SYNTAX

ASCII X'0117000000'

Hexadecimal

Decimal

Example:

X'0117000000'

REMARKS:

In response to this command, the printer will send back 4 status bytes, followed by the line number (the line number will be sent as decimal ASCII numbers), followed by 43 bytes of print data. One line in EJ will be sent to host when receive this command, and line pointer will be increased by one.

Note: Line numbers start at number one.

Note: The line number data will be sent as decimal, ASCII numbers.

Request the Size of EJ Space

Function: This command will request the size of the lines that are stored in the electronic journal.

COMMAND SYNTAX:

RS-485 SYNTAX

ASCII X'0101xxxxxx'^EJ SIZe n1

Hexadecimal

Decimal

Where:

n1: 30 undefined bytes

Example:

X'0101xxxxxx'^EJ Size X'000000.....' OR
X'010100010C5E454A2053497A6520000000.....'

Remarks:

When the next MICR read command is sent after this command is sent, the printer will send back the number of lines that are stored in the printer's memory. It will also send the total number of lines that can be stored in the printer's memory. The printer will then return to normal operation and process MICR commands as MICR commands.

The application can use this data to determine if they are close to filling up.

The response to the MICR command following this command will be:

4 byte printer status, 00, 6 bytes - lines stored, 00, 6 bytes - lines total,
Example: X'0B00001B 00 303030303932 00 303032343230'

Erase the EJ Data in the Printer

Function: This command will erase the data that is stored in the electronic journal.

COMMAND SYNTAX:

RS-485 SYNTAX

ASCII X'0101xxxxxx'^EJ ERase n1

Hexadecimal

Decimal

Where:

n1: 28 undefined bytes

Example:

X'0101xxxxxx'^EJ ERase X'000000.....' OR
X'010100010C5E454A20455261736520000000.....'

Remarks:

This command will erase the entire EJ space.

Store Journal Data in the Printer Memory

Function: Printer will change the second byte to “01”, and save this command in printer EJ.

Command: k 02 00 m n

Data: 38 bytes ASCII code for the characters to be printed. If data are more than 38 bytes, extra bytes will be saved as another line in EJ; if less than 38 bytes, space characters will be printed after the received bytes.

k: 01, 02, 04, 11, 12 or 14

m: 0-255, number of lines to be fed after print

n” Line pitch,

For model 4R and 7167 Printer slip station, 0 –255, line height is set to $n/72$ inch, which is n dot rows,

For 7167 Printer receipt station, line height is $2n/203$ inch. If it's less than character height (24 dots), line height is set to character height

Printer Status Report

Upon completion of a command, the printer will send an I frame indicating the current printer status to terminal. There are 4 bytes of printer status, the detail is as following. If the command is MICR read, the result will be right after the 4 status bytes.

Status Byte One

Bit	Description
0 (LSB)	When set to 1, the command is complete. This bit should only be used by the driver.
1	When set to 1, the print head is in the center home position. 7167 Printer: This bit is 1 when impact printer head is at home position.
2	When set to 1, the model 4A printer is present. This bit is set 0 for 7167 Printer.
3	When set to 1, the model 3R, 4R printer is present. This bit is set 1 for 7167 Printer.
4	Reserved. Always set to 0.
5	Home position error. This bit is set to 1 when the print head arrives or leaves a home position too soon or too late. 7167 Printer: This bit is set to 1 when any error occurs
6	Front document insert error. This bit is set to 1 when a front document insert operation is specified and no document is present in the document insert station. 7167 Printer: Unable to load
7 (MSB)	Command reject. When set to 1, a device command reject was received.

Status Byte Two

Bit	Description
0 (LSB)	Reserved. Always set to 0.
1	When set to 1, a paper path error has been detected in the journal station. For 7167 Printer: When set to 1, electronic journal flash ROM full
2	When set to 1, a printer key has been pressed. For 7167 Printer: set when there is paper in slip station
3	When set to 1, the EC level follows.
4	When set to 1, top cover is open. For 7167 Printer: This bit set to 1 indicates receipt cover or front cover is open
5	When set to 0, the document insert station is ready for printing. This occurs when both document sensors are covered, and the document has been fed to first print position. For 7167 Printer: This bit set to 0 means that slip station is ready for printing
6	Document present under the paper lower sensor. This bit set to 0 when a document is under the lower document sensor. For 7167 Printer: This bit set to 0 when slip leading edge sensor is covered
7 (MSB)	Reserved.

Status Byte Three

Bit	Description
0 (LSB)	Left-home position state. This bit is set to 1 when the printer head is in the left-home position. For 7167 Printer: This bit is 1 when impact printer head is at home position.
1	Top registration document insert error. This bit is set to 1 when a top registration command has been issued and no document is present or a JNL print is specified and a document is present in the document insert station or in the journal station. For 7167 Printer: This bit is set to 1 , when there is no document in slip station
2	Document present under upper sensor. This bit is set to 0 when a document is under the upper-document sensor. For 7167 Printer: This bit set to 0 when slip trailing edge sensor is covered
3	Reserved.
4	EEPROM load error. This bit is set to 1 when an error occurs in loading the EEPROM. For 7167 Printer: When this bit is 1, EEPROM or flash ROM error
5	Reserved. Always set to 0.
6	Registration mode for the document insert station. This indicator is valid only if bit5 of status byte 2 is set to 0, indication that a document has been registered. When set to 0, indicates the document has been registered for printing at the top and the current direction is upward; When set to 1, indicates the document has been registered for printing at the bottom and the current direction is downward. See "Register document" on page 17-10. For 7167 Printer: When set to 0, indicated there is paper in slip station and normal printing; when set 1, mean paper in slip station is at position for reverse feed and print
7 (MSB)	Reserved. Always set to 0.

Status Byte Four

This byte is always 38H, the printer Ucode level.

Diagnostics

Diagnostics Overview

The printer performs three types of diagnostic tests to help troubleshoot problems and configure the printer. Each of these is described in detail in the sections that follow.

Startup (Level 0) Diagnostics

The printer performs these tests during the startup cycle.

Printer Configuration (Level 1)

Allows configuration of the printer using a Configuration Menu that is printed on a receipt. One of the configuration settings makes it possible to put the printer into diagnostic mode for running the print test.

Runtime (Level 2) Diagnostics

The printer checks the status of these conditions during normal operation.

Remote (Level 3) Diagnostics

The printer keeps track of these counters during normal operation and prints them upon request.

Startup (Level 0) Diagnostics

The printer automatically performs start up diagnostics during the startup cycle when power is supplied or when the printer goes on-line.

Start up diagnostics comprise the following actions:

- Turn off motors
- Perform CRC check of the firmware ROM, read external RAM
- Failure causes start up diagnostics to stop.
- EEPROM check
- Failure causes start up diagnostics to stop.
- Paper Status LED is turned on
- Check if paper is present
- Return the knife to the home position
- Failure causes a fault condition.
- Check if printer door is closed
- Failure causes turning on the Paper Status LED until the door is closed.

When the last step is complete, the Paper Feed button is enabled and the printer is ready for normal operation. Information about the test is available to the communication interface through the commands. If the printer has not been turned on before, or a new EEPROM has been installed, the default values for the printer functions (set in Level 1 Diagnostics) are loaded into the EEPROM during start up diagnostics. See the tables in "Level 1 Diagnostics" for the printer settings. If the EEPROM load has failed, the Paper Status LED is turned on.

Level 2 Diagnostics

Level 2 diagnostics run during normal printer operation. When the following conditions occur, the printer automatically turns off the appropriate motor, disables printing to prevent damage, and turns on the green LED (flashes the green LED if the receipt print head is too hot or the voltages are out of range):

- Paper out
- Cover open
- Knife unable to go back to home position
- Print head too hot
- Power supply voltage out of range
- Slip or flip motor jam

See “Chapter 4: Troubleshooting” for more information about other conditions that may occur and how to correct them.

Status	LED Behavior
Power Off	Off
Firmware Download	Very Fast Blink
Level 0 Diagnostics	No Blink
Receipt Paper Low	Slow Blink
Temperature Error	No Blink
Voltage Error	No Blink
Cover Open	Fast Blink
Receipt Paper Out	Fast Blink
Knife Jam	Fast Blink, then Slow Blink
Slip Cover Open	Fast Blink
Flip Cover Open	Fast Blink
Receipt Cover Open	Fast Blink
Slip Motor Jam	Fast Blink
Flip Motor Jam	Fast Blink
Slip Ribbon Carriage Error	Fast Blink
All other states	On

Configuring the Printer For RS485 (Level 1)

If you need to select certain functions, or change settings, use the scrolling menu feature. This feature prints instructions on the receipt for selecting and changing any of the functions and parameters.

Caution: Be extremely careful changing any of the printer settings to avoid changing other settings that might affect the performance of the printer.

To Configure the Printer:

Set DIP switch 1 to ON, DIP switch 2 to OFF.

Press and hold receipt feed switch while disconnecting and reconnecting the power, this will reset the printer. The printer will print the current configuration, then cuts the papers to print the Configuration Menu.

If you don't press and hold the feed button after resetting the printer, the printer will go to Online Mode directly.

This configuration menu allows you to set general printer parameters.

Sub-menus are entered and selections are made using the Paper Feed Button.

- short Click : Feed Button is quickly depressed then released
- long Click : Feed Button is held down more than 1 second then released

After you make your selection, the printer will feed the paper, print out your selection and the menu, let you input new selection. (Refer to the Appendix)

Currents setting are marked with an asterisk (*).

***** Main Menu *****

Select a sub-menu:

EXIT	> 1 Click
Print Current Configuration	> 2 Clicks
Set Communication Interface	> 3 Clicks
Set Diagnostics Modes	> 4 Clicks
Set Emulation/Software Options	> 5 Clicks
Set Hardware Options	> 6 Clicks
Set Default Code page	> 7 Clicks
Set EEPROM To Default Settings	> 8 Clicks
Set Electronic Journal Settings	> 9 Clicks
Set Print EJ On Receipt	>10 Clicks
Set Erase EJ In Printer	>11 Clicks
Set Keyboard Model	>12 Clicks
Set POS OS Version	>13 Clicks

Enter code, then hold Button DOWN
at least 1 second to validate

Printers are generally shipped with all appropriate configuration settings pre-set at the factory. The only time you should need to change the printer configuration is if you install a new option or change software. It is also possible you may need to run certain tests using the Configuration Menu.

You configure the printer using a convenient Configuration Menu that is printed on receipt paper. The Configuration Menu prints instructions and setting options interactively as you go through the configuration process. The following functions and parameters can be changed with the scrolling Configuration Menu.

Print Current Configuration

This is the sample of prints out the current printer configuration settings.

<p>*** Diagnostics Form ***</p> <p>Model number : 7167-1115 Serial number : 12345678</p> <p>Boot Firmware Revision : V01.00 CRC : D3CE P/N : 497-0431710</p> <p>Flash Firmware Revision : V05.20 CRC : AC12 P/N : 497-0431712</p> <p>Hardware Flash Memory Size : 2 Mbytes Flash Logo Size : 256 Kbytes Flash Fonts Size : 64 Kbytes Flash User Storage : 64 Kbytes</p> <p>Communication Interface Interface Type : RS232/USB/RS485 Parameters Baud Rate : 9600 Data Bits : 8 Stop Bits : 2 Parity : None Flow Control : IBM RS485 Reception Errors : Print '?' Receive Buffer : 4K Bytes</p> <p>Diagnostics Mode : OFF, Normal Mode</p> <p>Emulation/Software Emulation : Model 4R Printer ID Mode : Default LPI : 6 Carriage Return : Used as Print Command Receipt Sync. : Disable</p> <p>Hardware Print Density : 100 % Max Power : 75W Paper Low Sensor : Enabled Paper Width : 80 mm Knife Option : Enabled</p>		<p>Code Pages Default Code Page : 858 Resident code Pages: 437, 850, 852, 858, 860, 861, 862, 863, 864, 865, 866</p> <p>Logo(s) defined : No User Char(s) defined : No</p> <p>Sensor Level (On, Off, TH) TOF Sensor : 0.0V, 5.0V, 2.5V BOF Sensor : 0.0V, 5.0V, 2.5V Flip Sensor : 0.0V, 5.0V, 2.5V</p> <p>User Tallies Receipt Lines : 389482 Knife Cuts : 12768 Slip Lines : 1100 Slip Characters : 55 MICR Reads : 10 Hours ON : 959 Flash cycles : 5 Knife Jams : 2 Cover Openings : 71 Max Temp Reached : 363</p> <p>Permanent Tallies Receipt Lines : 389482 Knife Cuts : 12768 Slip Lines : 1100 Slip Characters : 55 MICR Reads : 10 Hours ON : 959 Flash cycles : 5 Knife Jams : 2 Cover Openings : 71 Max Temp Reached : 363</p> <p>Keyboard Model : ANPOS OS Version : 4690 V2.0</p> <p>Electronic Journal : Enabled</p> <p>To enter Diagnostics Mode: 1) Flip DIP switch #1 on 2) Reset the printer by pressing and holding Receipt Feed switch down while disconnecting and reconnecting the power.</p>
---	--	--

3.2 Communications Interface Settings

Set the communication interface settings using the configuration menu.

Caution: Be extremely careful changing any of the printer settings to avoid inadvertently changing other settings that might affect the performance of the printer.

Press the Paper Feed Button for the communications settings you want.

Defaults are marked with an asterisk (*).

** SET INTERFACE TYPE ?

YES > Long Click
NO > Short Click

RS232/USB -> 1 Click
RS232 -> 2 Clicks
USB -> 3 Clicks
RS485⁷/USB* -> 4 Clicks
RS485 -> 5 Clicks
Enter code, then hold Button Down
At least 1 second to validate

** SET BAUD RATE ?

(RS485/USB Only)

YES > Long Click
NO > Short Click

115200 Baud -> 1 Click
57600 Baud -> 2 Clicks
38400 Baud -> 3 Clicks
19200 Baud -> 4 Clicks
More -> 5 Clicks
Enter code, then hold Button DOWN
At least 1 second to validate

9600 Baud* -> 1 Clicks
4800 Baud -> 2 Clicks
2400 Baud -> 3 Clicks
1200 Baud -> 4 clicks
Enter code, then hold Button DOWN
At least 1 second to validate

⁷ When set to be RS485, the baud rate is fixed to 187.5Kbps, data byte is 8 bit, stop bit is 2 and there is an additional expansion bit. The flow control uses IBM RS485 protocol. Other configurations in this section will not affect the actual printer functions.

**** SET NUMBER OF DATA BITS ?****(RS485/USB Only)**

YES > Long Click
NO > Short Click

8 Data Bits* -> Long Click
7 Data Bits -> Short Click

**** SET NUMBER OF STOP BITS ?****(RS485/USB Only)**

YES > Long Click
NO > Short Click

1 Stop Bits* -> Long Click
2 Stop Bits -> Short Click

**** SET PARITY ?****(RS485/USB Only)**

YES > Long Click
NO > Short Click

No Parity* -> 1 Click
Even Parity -> 2 Clicks
Odd Parity -> 3 Clicks

Enter code, then hold Button DOWN
At least 1 second to validate

**** SET FLOW CONTROL METHOD ?****(RS485/USB Only)**

YES > Long Click
NO > Short Click
Software (XON/XOFF) -> Long Click
Hardware (DTR/DSR)* -> Short Click

**** SET DATA RECEPTION ERRORS OPTION ?****(RS485/USB Only)**

YES > Long Click
NO > Short Click

Ignore Errors -> Long Click
Print '?'* -> Short Click

**** SET RECEIVE BUFFER SIZE ?****(RS485/USB Only)**

YES > Long Click
NO > Short Click

4K Byte* -> Long Click
One Line -> Short Click

3.3 Diagnostics Modes

**** SET DIAGNOSTICS MODE ?**

YES > Long Click
NO > Short Click

OFF, Normal Mode* -> 1 Click
Data Scope Mode -> 2 Clicks
Receipt Test Mode -> 3 Clicks
Enter code, then hold Button DOWN
At least 1 second to validate

Data Scope Mode (Enable or Disable)

Data scope mode helps troubleshoot communication problems and runs during a normal application (after being enabled through printer configuration). The data scope mode test prints a hexadecimal dump of all data sent to the printer: "1" prints as hexadecimal 31, "A" as hexadecimal 41 and so on.

Data Scope Mode is enabled and disabled using the configuration menu.

Caution: Be extremely careful changing any of the printer settings to avoid inadvertently changing other settings that might affect the performance of the printer.

To run Data Scope Mode:

1. After you have enabled Data Scope Mode through the configuration menu, exit the configuration menu.
2. Run a transaction from the host computer. All commands and data sent from the host computer will be printed as hexadecimal characters as shown in the illustration.

```
30 31 32 33 34 35 36 37 38 39 40 41 :      0 1 2 3 4 5 6 7 8 9 @ A
41 42 43 44 45 46 47 48 49 50 51 52 :      A B C D E F G H I J K L
```

To exit Data Scope Mode:

1. Enter the configuration menu again. See *Configuring the Printer*.
2. Disable Data Scope Mode.
3. Exit the configuration menu. The printer is on-line and can communicate normally with the host computer.

Receipt Test Mode (Enable or Disable)

Receipt Test Mode prints all the code pages. Receipt Test Mode is enabled and disabled using the configuration menu.

Caution: Be extremely careful changing any of the printer settings to avoid inadvertently changing other settings that might affect the performance of the printer.

To run Receipt Test Mode:

1. After you have enabled Receipt Test Mode through the configuration menu, exit the configuration menu.
2. Push the Paper Feed Button.
3. The receipt station will print code pages.
4. The test ends with a cut.
5. Go to step 2 again to repeat this test.

To exit Receipt Test Mode:

1. Enter the configuration menu again. See Configuring the Printer.
2. Disable Receipt Test Mode.
3. Exit the configuration menu. The printer is on-line and can communicate normally with the host computer.

3.4 Emulation/Software Options

Set Emulation

Set the printer emulation using the configuration menu. For information on using the configuration menu, see "Configuring the Printer" later in this document

Caution: Be extremely careful changing any of the printer settings to avoid inadvertently changing other settings that might affect the performance of the printer.

Press the Paper Feed Button for the emulation you want.

** SET EMULATION ?

(RS485/USB Only)

YES > Long Click
NO > Short Click

7158 Mode / Model 4R (RS485 only)* > 1 Click
7156 Mode > 2 Clicks
7150 Mode > 3 Clicks
7167 Native Mode > 4 Clicks
Enter code, then hold Button DOWN
At least 1 second to validate

Note: Press the Paper Feed Button for at least one second to validate the selection.

Set Printer ID Mode

Set the printer ID mode using the configuration menu. For information on using the configuration menu, see "Configuring the Printer" later in this document

Caution: Be extremely careful changing any of the printer settings to avoid inadvertently changing other settings that might affect the performance of the printer.

Press the Paper Feed Button for the emulation you want.

** SET PRINTER ID MODE ?

(RS485/USB Only)

YES > Long Click
NO > Short Click

7158 Native ID* > 1 Click
Emulated Printer ID > 2 Clicks
7167 Native ID > 3 Clicks
Enter code, then hold Button DOWN
At least 1 second to validate

Note: Press the Paper Feed Button for at least one second to validate the selection.

Default Lines Per Inch

Set the lines per inch using the configuration menu. Answer No to the questions printed on the receipt until you come to the instructions for Lines Per Inch.

Caution: Be extremely careful changing any of the printer settings to avoid inadvertently changing other settings that might affect the performance of the printer.

Press the Paper Feed Button for the lines per inch you want.

**** SET DEFAULT LINES PER INCH ?**

YES > Long Click

NO > Short Click

8.13 Lines per Inch > 1 Click

7.52 Lines per Inch* > 2 Clicks

6 Lines per Inch > 3 Clicks

Enter code, then hold Button DOWN

At least 1 second to validate

Note: Press the Paper Feed Button for at least one second to validate the selection.

Set Carriage Return Usage

Set the carriage return usage using the configuration menu. Answer No to the questions printed on the receipt until you come to the instructions for Carriage Return Usage.

Caution: Be extremely careful changing any of the printer settings to avoid inadvertently changing other settings that might affect the performance of the printer.

Press the Paper Feed Button for the carriage return usage you want.

**** SET CARRIAGE RETURN USAGE ?**

YES > Long Click

NO > Short Click

Ignore CR > Long Click

Use CR as Print Cmd* > Short Click

t Asian Mode

Set the Asian Mode using the configuration menu. Answer No to the questions printed on the receipt until you come to the instructions for Asian Mode.

Caution: Be extremely careful changing any of the printer settings to avoid inadvertently changing other settings that might affect the performance of the printer.
Press the Paper Feed Button for the Asian mode you want.

Set Slip Printing Width

Set the slip printing width using the configuration menu. Answer No to the questions printed on the receipt until you come to the instructions for Slip Printing Width.

Caution: Be extremely careful changing any of the printer settings to avoid inadvertently changing other settings that might affect the performance of the printer.

Press the Paper Feed Button for the slip printing width option you want.

** SET SLIP PRINTING WIDTH ?

YES > Long Click
NO > Short Click

7167* > Long Click
7158/7156 > Short Click

Set Receipt Synchronization

Set the receipt synchronization using the configuration menu. Answer No to the questions printed on the receipt until you come to the instructions for Receipt Synchronization.

Caution: Be extremely careful changing any of the printer settings to avoid inadvertently changing other settings that might affect the performance of the printer.
Press the Paper Feed Button for the receipt synchronization mode you want.

** SET RECEIPT SYNCHRONIZATION ?

YES > Long Click
NO > Short Click

Enabled* > Long Click
Disabled > Short Click

3.5 Hardware Options

Set Print Density

Set the print density using the configuration menu.

Caution: Be extremely careful changing any of the printer settings to avoid inadvertently changing other settings that might affect the performance of the printer.

Press the Paper Feed Button for the lines per inch you want.

**** SET PRINT DENSITY ?**

YES > Long Click

NO > Short Click

100 %* > 1 Click

110 % > 2 Clicks

120 % > 3 Clicks

Enter code, then hold Button DOWN

At least 1 second to validate

Note: Press the Paper Feed Button for at least one second to validate the selection.

Set Maximum Power Option

Set the maximum power option using the configuration menu. Answer No to the questions printed on the receipt until you come to the instructions for maximum power option.

Caution: Be extremely careful changing any of the printer settings to avoid inadvertently changing other settings that might affect the performance of the printer.

Press the Paper Feed Button for the option you want.

**** SET MAX POWER OPTION ?**

YES > Long Click
NO > Short Click

55W Power Supply* > Long Click
75W Power Supply > Short Click

Set Paper Low sensor Option

Set the paper low sensor option using the configuration menu. Answer No to the questions printed on the receipt until you come to the instructions for paper low sensor option.

Caution: Be extremely careful changing any of the printer settings to avoid inadvertently changing other settings that might affect the performance of the printer.

Press the Paper Feed Button for the option you want.

**** SET PAPER LOW SENSOR OPTION ?**

YES > Long Click
NO > Short Click

Enable Paper Low Sensor* > Long Click
Disable Paper Low Sensor > Short Clicks

Set Paper Width

Set the paper width for Receipt unit option using the configuration menu. Answer No to the questions printed on the receipt until you come to the instructions for paper width option.

Caution: Be extremely careful changing any of the printer settings to avoid inadvertently changing other settings that might affect the performance of the printer.

Press the Paper Feed Button for the paper width option you want.

** SET PAPER WIDTH ?

YES > Long Click
NO > Short Click

Paper Width = 80 mm* > 1 Click
Paper Width = 58 mm > 2 Clicks
Enter code, then hold Button DOWN
At least 1 second to validate

Note: Press the Paper Feed Button for at least one second to validate the selection.

Set Knife Option

Set the Knife option using the configuration menu. Answer No to the questions printed on the receipt until you come to the instructions for knife option.

Caution: Be extremely careful changing any of the printer settings to avoid inadvertently changing other settings that might affect the performance of the printer.

Press the Paper Feed Button for the option you want.

** SET KNIFE OPTION ?

YES > Long Click
NO > Short Click

Enable Knife* > Long
Disable Knife > Short

Set MICR Option

Set the MICR option using the configuration menu. Answer No to the questions printed on the receipt until you come to the instructions for MICR option.

Caution: Be extremely careful changing any of the printer settings to avoid inadvertently changing other settings that might affect the performance of the printer.

Press the Paper Feed Button for the option you want.

** SET MICR OPTION ?

YES > Long Click

NO > Short Click

Enable MICR* > Long
Disable MICR > Short

Set Check Flip Option

Set the check flip option using the configuration menu. Answer No to the questions printed on the receipt until you come to the instructions for check flip option.

Caution: Be extremely careful changing any of the printer settings to avoid inadvertently changing other settings that might affect the performance of the printer.

Press the Paper Feed Button for the option you want.

** SET CHECK FLIP OPTION ?

YES > Long Click
NO > Short Click

Enable Check Flip* -> Long
Disable Check Flip -> Short

Set Color Paper Option

Set the color paper option using the configuration menu. Answer No to the questions printed on the receipt until you come to the instructions for color paper option.

Caution: Be extremely careful changing any of the printer settings to avoid inadvertently changing other settings that might affect the performance of the printer.

Press the Paper Feed Button for the option you want.

** SET COLOR PAPER OPTION ?

YES > Long Click
NO > Short Click

Monochrome* > Long Click
Color Paper > Short Click

Set MICR Dual Pass Option

Set the MICR dual pass option using the configuration menu. Answer No to the questions printed on the receipt until you come to the instructions for MICR dual pass option.

Caution: Be extremely careful changing any of the printer settings to avoid inadvertently changing other settings that might affect the performance of the printer.

Press the Paper Feed Button for the option you want.

** SET MICR DUAL PASS OPTION ?

YES > Long Click
NO > Short Click

Enabled* > Long Click
Disabled > Short Click

Note: Press the Paper Feed Button for at least one second to validate the selection.

3.6 Default Code Page

This selection is used to select the default code page.

Caution: Be extremely careful changing any of the printer settings to avoid inadvertently changing other settings that might affect the performance of the printer.

Press the Paper Feed Button for the Default Code Page you want.

** SET CODE PAGE ?

YES > Long Click
NO > Short Click

Code Page 437* > 1 Click
Code Page 850 > 2 Clicks
Code Page 852 > 3 Clicks
Code Page 858 > 4 Clicks
More Options -> 5 Clicks
Enter code, then hold Button DOWN
At least 1 second to validate

Code Page 860 > 1 Click
Code Page 862 > 2 Clicks
Code Page 863 > 3 Clicks
Code Page 864 > 4 Clicks
More Options > 5 Clicks
Enter code, then hold Button DOWN
At least 1 second to validate

Code Page 865 > 1 Click
Code Page 866 > 2 Clicks
Cd Pg 874 (USB only) > 3 Clicks
Cd Pg 1252 (USB only) > 4 Clicks
More Options > 5 Clicks
Enter code, then hold Button DOWN
At least 1 second to validate

Code Page Katakana (USB) > 1 Click
Code Page 932 (USB) > 2 Clicks
Enter code, then hold Button DOWN
At least 1 second to validate

FOR 7156 Mode:

Code Page 437* > 1 Click
Code Page 850 > 2 Clicks
Enter code, then hold Button DOWN
At least 1 second to validate

Note: Press the Paper Feed Button for at least one second to validate the selection.
For Asian code pages, code page 936, 949 or 950 replaces code page 932 in the above shown menu. Only one Asian code page (Either 932, 936, 949 or 950) will exist in firmware.

3.7 EEPROM to Default Settings

This selection resets the configuration to the Default Settings.

Caution: Be extremely careful changing any of the printer settings to avoid inadvertently changing other settings that might affect the performance of the printer.

**** RESET EEPROM TO DEFAULT VALUES ?**

YES > Long Click
NO > Short Click

3.8 Electronic Journal Settings

This selection enables the function of EJ station and clears the EJ flash ROM
7167 Printer RS485 without EJ model doesn't support these settings.

**** SET ENABLE ELECTRONIC JOURNAL ?
(RS485 only)**

YES > Long Click
NO > Short Click

Enabled* > Long Click
Disabled > Short Click
Enter code, then hold Button DOWN
At least 1 second to validate

**** SET ENABLE E_JOURNAL UPLOAD ?****(RS485 only)**

YES > Long Click
NO > Short Click

Enabled* > Long Click
Disabl > Short Click
Enter code, then hold Button DOWN
At least 1 second to validate

**** ERASE E_JOURNAL DATA IN PRINTER ?****(RS485 only)**

YES > Long Click
NO > Short Click

Enabled > Long Click
Disabled* > Short Click
Enter code, then hold Button DOWN
At least 1 second to validate

**** PRINT E_JOURNAL DATA ON RECEIPT ?****(RS485 only)**

YES > Long Click
NO > Short Click

Enabled -> Long Click
Disabled* -> Short Click
Enter code, then hold Button DOWN
At least 1 second to validate

Note: Press the Paper Feed Button for at least one second to validate the selection.

Select Keyboard Type

This selection selects keyboard model for EJ keystroke function.

****Change Keyboard Model?**

YES > Long Click
NO > Short Click

Enter code, then hold Button DOWN

At least 1 second to validate

****Select Keyboard Model**

4693 ANPOS Keyboard > 1 Click
4693 POS Keyboard > 2 Clicks
4683 50 Key Keyboard > 3 Clicks
Disable EJ Keystroke > 4 Clicks

Enter code, then hold Button DOWN

At least 1 second to validate

Select POS System OS Version

This selection selects version of the OS system that controls the printer.

****Change POS OS Version?**

YES > Long Click
NO > Short Click

Enter code, then hold Button DOWN

At least 1 second to validate

****Select Keyboard Model**

4694 Windows * > 1 Click
4690 Version 3.0 > 2 Clicks
4690 Version 2.0 > 3 Clicks

Enter code, then hold Button DOWN

At least 1 second to validate

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