Owner's Manual

NCR 7197 Thermal Receipt Printer Series II

Release 2.0

B005-0000-2068
Issue H

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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. Please use the link below to send your comments.

EMail: FD230036@ncr.com

Preface

Audience

This book is written for hardware installer/service personnel, system integrators, and field engineers.

Notice: This document is NCR proprietary information and is not to be disclosed or reproduced without consent.

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 (QQGQ), Class 2 power supply with SELV (Secondary Extra Low Voltage), non–energy hazard output, input rated 100–240 Vac, 1.5/0.8 A, 50/60 Hz, output rated 24 Vdc, 2.3 A. or 3.125A.

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.

Wichtige Benutzerinformationen:

Um die Produktsicherheit und die FCC und CE–Markierungsanforderungen bei der Benutzung des Druckers sicherzustellen, müssen entweder das mitgesante Netzgerät, Netzanschlußkabel und Verbindungskabel verwendet werden oder folgende Anforderungen müssen erfüllt sein:

Netzgerät:

Das Netzgerät muß ein UL verzeichnetes (QQGQ) Netzgerät der Klasse 2 mit SELV (Sekundärextraniederspannung), Nichtenergie Gefahrenausgang, einer Aufnahmeleistung von 100–240 VAC, 1.5/0.8 A und 50/60 Hz, und einer Leistungsabgabe von 24 VDC, 3.125 A.c sein.

Die Benutzung des Produktes mit einem Netzgerät, daß nicht von NCR mitgeliefert wurde erfordert das Testen des Netzgerätes mit dem NCR Drucker auf FCC und CE–Markierungs Befolgung.

Verbindungskabel:

Bei der Benutzung dieses Produkts muß ein abgeschirmtes (360 Grad) Verbindungskabel benutzt werden. Die Abschirmleitung muß entweder mit dem Rahmens des Gerätes oder der Erde verbunden sein oder alternativ müssen alle Enden des Kabels geerdet werden.

Falls das Verbindungskabel nicht in der hier beschrieben Art benutzt wird, muessen das Kabel und der NCR Drucker auf die FCC und CE–Markierungs Befolgung überprüft werden.

Netzanschlußkabel:

Für dieses Produkt muß ein in UL aufgelistete, abnehmbares Netzanschlußkabel benutzt werden. Falls das Netzgerät fest auf dem Boden montiert ist, muß ein Netzanschlußkabel mit der SJT Markierung benutzt werden. Für Anwendungen außerhalb der USA, sollte ein Netzanschlußkabel benutzt werden, daß der Zertifizierung und Bestimmung des jeweiligen Landes entspricht.

Das Abweichen der hier beschriebenen Benutzungsanleitung des Netzanschlußkabels kann gegen die gesetzlichen Sicherheitsbestimmungen des jeweiligen Landes verstoßen.

用户须知

为了确保产品安全和遵守中国电磁兼容(EMC)规定,必须使用随产品附带或符合下列参数的电源，电源线和接口电缆:

电源

中国强制性产品认证, 输入为 : 交流100 ~ 240伏, 1.5/0.8安倍, 50/60赫兹, 输出为: 直流24伏, 2.3或3.125安倍

如使用本产品与非NCR生产的电源产品, 必须测试电源和NCR生产的打印机以符合产品安全和**中国电磁**兼容(EMC)规定

接口电缆

本产品必须使用屏蔽(360度) 接口电缆。屏蔽层必须连接到金属框架或接地或接口电缆两端的接地参考

使用没有在这里描述的接口电缆将要求您必须测试接口电缆和NCR生产的打印机以符合产品安全和**中国电磁**兼容(EMC)规定

电源线

中国强制性产品认证, 可拆卸的电源线.

使用没有在这里描述的电源线可能导致在该国的安全证书失效

销售打印机的安全规定

安全注意事项

维修

注意：本产品不含有用户可自行更换的部件，如需更换，请联系有资质的技术人员。

保险丝的更换

注意：为防止失火只可用相同规格的保险丝进行更换,

안전주의사항

서비스

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퓨즈교체

주의: 화재의 위험에 대한 계속적인 보호를 위해 같은 타입과 등급의 퓨즈로 교체해야 합니다. 。

한국 업무용(A급 기기) 방송통신기자재

이 기기는 업무용(A급) 전자파적합기기로서 판매자 또는 사용자는 이 점을 주의하시기 바라며, 가정 외의 지역에서 사용하는 것을 목적으로 합니다.

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.

Bundeskommunikationen Kommission (FCC) Hochfrequenz–Störungs Richtlinie.

Warnung: Änderungen oder Änderungen an der Maßeinheit, die nicht ausdrücklich von der Seite, die für die Befolgung verantwortlich ist, genehmigt ist, können zum Entzug der Benutzungsberechtigung dieses Gerätes führen.

Anmerkung: Dieses Gerät wurde getested und entspricht der zulässigem Richtlinien eines digitalen Gerätes der Klasse A, gemäß Abschitt 15 in den FCC Richtlinien. Diese Richtlinien sind dazu da, einen angemessenen Schutz gegen schädliche Störung bei der komerziellen Nutzung dieses Gerätes zu gewährleisten. Dieses Gerät erzeugt und benutzt Hochfrequenzenergie und kann Hochfrequenzenergie ausstrahlen. Wenn die Installierung und Benutzung dieses Gerätes nicht wie im Benutzer Handbuch beschrieben ist, durchgeführt wird, kann eine schädliche Störung von Funkverbindungen verursacht werden. Der Betrieb dieses Gerät in einem Wohngebiet kann schädliche Störung verursachen die auf Kosten des Benutzers behoben werden müssen.

Kommunikationskabel:

Dieses Gerät muß in Uebereinstimmung mit Kategorie A FCC Richtlinien mit einem abgeshirmten Kabel betrieben werden.

Benutzerinformationen:

Dieses Gerät muß wie in der Hersteller Anweisungen beschrieben installiert und benutzt werden. Jedoch gibt es keine Garantie dafür, daß Funkstörung nicht in bestimmten kommerziellen Installation auftritt. Für den Fall, daß das Gerät Funkstörungen verursacht, was durch das An und Abschalten des Gerätes festgestellt werden kann, wird der Benutzer aufgefordert sofort mit NCR Kontakt aufzunehmen.

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Industrie–Kanada (IS) Hochfrequenz–Störungs Richtlinie:

Dieses digitale Gerät der Klasse A entspricht allen Anforderungen der kanadischen Störung–Verursachende Geräte Richtlinie.

无线电频率干扰声明

用户须知

本设备已经过测试，证明其符合A级数字设备的限定。这些限制旨在对设备在商业环境中运作时提供合理的保护,以防有害干扰。本设备产生，使用，并能发射无线电频率能量.因此如果不按照使用说明书安装和使用,可能对无线电通讯造成有害干扰. 如果在住宅区使用本设备很可能造成干扰. 用户将被要求自费纠正干扰 。

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此为A级产品，在生活环境中，该产品可能会造成无线电干扰。在这种情况下，可能需要用户自费对其干扰采取切实可行的措施。

Caution labels information

Hot Surface, Do not touch / Surface chaude, Ne pas toucher.

Hazardous Moving Parts, Keep Fingers and Other Body Parts Away/ Parties Mobiles Dangereuses Tenir Les Doigts Et Les Autres Parties Du Corps Éloignés.

References

- *NCR 7197 Thermal Receipt Printer Series II Service Guide* (B005-0000-2069)
- *NCR 7197 Thermal Receipt Printer Series II Parts Identification Manual* (B005-0000-2070)

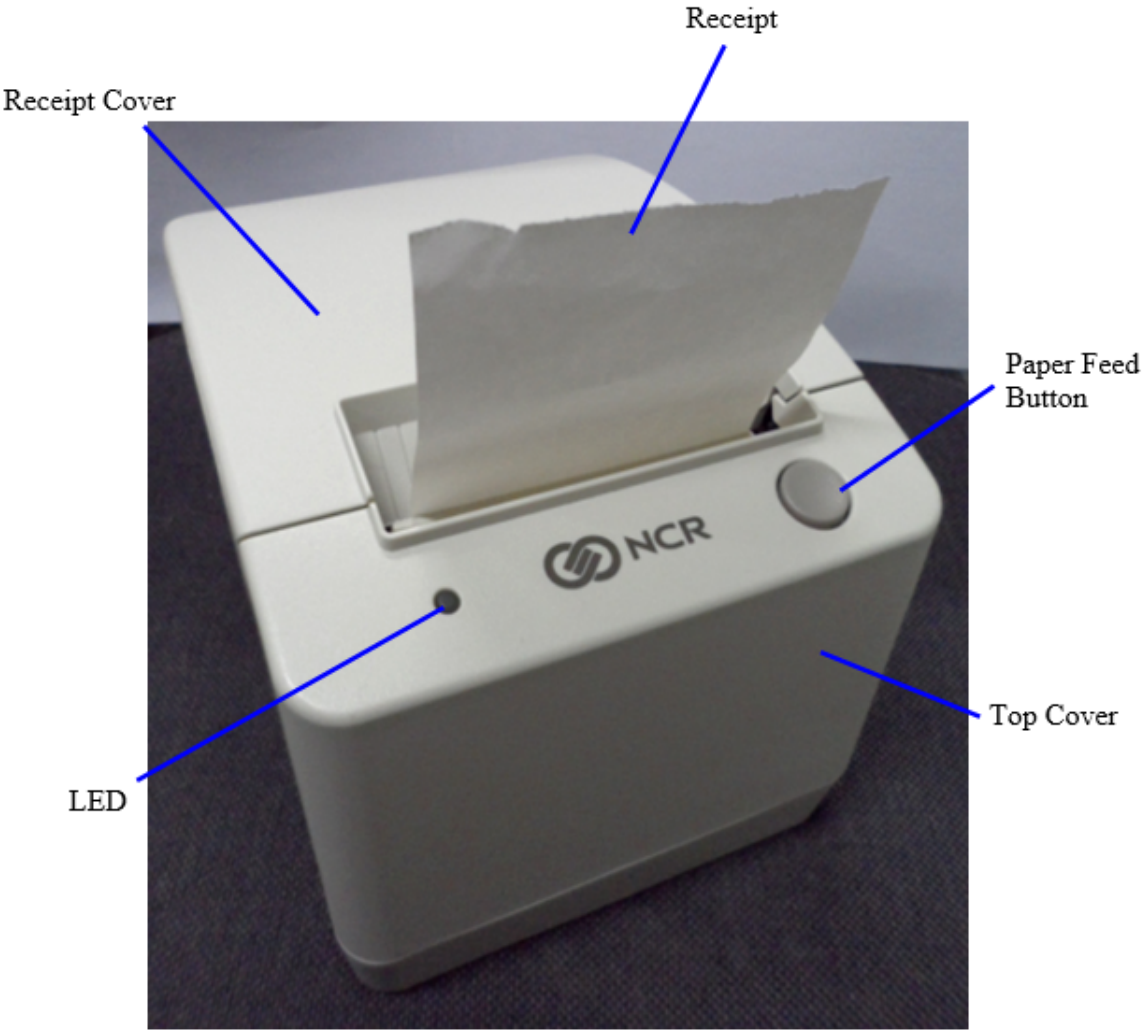
Table of Contents

Revision Record

Issue	Date	Remarks
A	June 2011	First printing
B	April 2013	Add Aldi model information
C	October 2013	Add WIFI model information
D	November 2015	Add Power Consumption and Print Speeds
E	July 2016	Add Downloaded Bit Image Registration/Printing Add Printer Setting Change command parameter *57* and *58*
F	Aug 2017	Added printer setup procedures for Windows 8, 10, and POSReady 7
G	Feb 2018	Updated the Ordering Other Supplies table
H	Sep 2019	• Removed "Limited Energy Source" phrase from the *Power Supply* safety information • Added the "Hazardous Moving Parts" caution

Chapter 1: About the 7197 Series II Printer

General Description



The 7197 Series II printer is a fast, quiet, relatively small and very reliable multiple–function printer. It prints receipts and two–color printing.

The industry–standard RS-232C communication interface allows the 7197 Series II to be connected to any host computer that uses RS-232C or USB communication interface. 7197 Series II is also available in Ethernet communication interface and WIFI communication interface.

Features

The 7197 Series II 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
- ECO feature
- Resident bar codes
  - Code 39
  - Code 93
  - Code 128
  - UPC–A
  - UPC–E
  - JAN8 (EAN)
  - JAN13 (EAN)
  - Interleaved 2 of 5
  - Codabar
  - PDF417
  - GS1 DataBar Omnidirectional
  - GS1 DataBar Truncated
  - GS1 DataBar Stacked
  - GS1 DataBar Stacked Omnidirectional
  - GS1 DataBar Limited
  - GS1 DataBar Expanded
  - GS1 DataBar Expanded Stacked
- QR Barcode
- Drop-in paper loading requiring no spindle or threading paper
- Paper low indicator
- Paper exhaust
- Variety of print modes:
  - double high (receipt station only)

  - double wide
  - upside down
  - rotated
- 14 resident single byte 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 Euo 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 1256 (Windows Arabic)
  - PC Code Page Katakana
- Unicode (UTF-16) support
- Space Page
- Maximum 384K flash memory for downloaded character sets and bit–mapped graphics such as logos
- 128K RAM for download bit–mapped graphics such as logos

General Features

- Knife
- Cover open sensors
- Industry standard RS-232C and USB communication interface, also available with Ethernet communication interface
- One cash drawer connector (supports 2 cash drawers)
- History EEROM for custom settings
- Audible tone (controlled by application)
- ENERGY STAR qualified

- Thermal head failure detection
- ECO (Paper reduction, Power reduction)

Note: The 7197 Series II does not use a paper journal. The journal is kept electronically by the host computer.

Options

- Remote power supply
- Communication cables
- 4 optional double byte character language Code Pages:
  - PC Code Page 932 (Japanese)
  - PC Code Page 936 (Simplified Chinese)
  - PC Code Page 949 (Korean)
  - PC Code Page 950 (Big5)
- Wall mount kit

Thermal Print Head

The 7197 Series II 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 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, refer to *Solving Problems* on page 61 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. Refer to *Ordering Paper and Supplies* on the facing 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. Refer to“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 7197 Series II requires NCR qualified thermal paper to be used on the thermal receipt print station to ensure proper operation of the printer. In addition the paper rolls must be have the following dimension.

Diameter	Length	Width
80 mm (3.15 in.) max.	**83 m** (273 ft.)	**80 mm ± 0.5 mm** (3.15 ± 0.008 inches)

Note: The paper must not be attached at the core. Use paper with a colored stripe at the end to indicate that the paper is running low.

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 achievability and added resistance to incompatible substances
856461	Red/Black
856458	Blue/Black

Note: 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:
Voice: 1(800)543-8130 (toll free), or local listing of Iconex product sales office.

Note: 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 Other Supplies

Contact your sales representative to order the supplies listed in the table. The numbers are for reference only. Suppliers may use other numbers.

Item	Type	Alias Number
External Power Supply	75W External Power Supply, No Power Cord	7167-K511
	75W External Power Supply with US Power Cord	7167-K510
	60W External Power Supply	7197-K510
AC Cables for External Power Supply	US Power Cord	1416-C325-0030
	UK Power Cord	1416-C321-0030
	SEV Power Cord	1416-C320-0030
	Australian Power Cord	1416-C322-0030
	International Power Cord	1416-C323-0030
	Argentina Power Cord	1416-C009-0018
	International (with plug) Power Cord	1416-C319-0030
Non-Powered RS-232 (Serial) Interface	1.0 meter	1416-C879-0010
	4.0 meters	1416-C879-0040
Non Powered USB Cable	1.0 meter	1432-C083-0010
	4.0 meters	1432-C083-0040
	4.0 meters (USB)	1432-C089-0040
Powered USB Cable	24V Powered USB Cable, 1.0 meter, Black	1432-C086-0010
	24V Powered USB Cable, 4.0 meters, Black	1432-C402-0040
Narrow 58mm Width Paper Guide	Release 1.0	7167-K058
	Series II	7167-K059
Ethernet Cable	8–wire	1432-C046-0030

Item	Type	Alias Number
Power only USB Cable for Serial Configuration	1.0 meter	1432-C092-0010
	4.0 meters	1432-C092-0040
Cash Drawer Cable	1.8 meters	1639-K044
		1639-K043
		1639-K213
	0.6 meter (Y-Cable)	1416-C372-0006
		1639-K045
Wall Mount	Release 1.0	7197-K915
	Release 2.0	7197-K100
Fiscal	Poland (G11)	7197-K901
	Poland (CG1)	7197-K902
	Chile	7197-K003
	Russia (G11), w/o Interface PCB	7197-K903
	Russia (CG1) w/o Interface PCB	7197-K904
	Universal (CG1)	7197-K905
	Universal (G11)	7197-K906
WiFi Interface Card		7197-K200
Ethernet Upgrade Kit		7197-K802

Ordering Documentation

Contact your sales representative to obtain the following documentation:

- *7197 Series II Receipt Printer: Parts Identification Manual* (B005-000-2070)
- *7197 Series II Receipt Printer: Service Manual* (B005-000-2069) (includes Troubleshooting Guide)
- *7197 Series II Receipt Printer: Owners Manual* (B0005-0000-2068)

Cleaning the Printer

Cleaning the Cabinet

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

- Cleaning solutions
- Lubricants
- Fuels
- Cooking oils
- Ultraviolet light

Note: There is no scheduled maintenance required for the 7197 Series II.

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.

Caution: Do not use the alcohol to clean other parts of the printer. Damage will occur.

If spotty or light printing problems persist after the thermal print head has been cleaned, refer to *Solving Problems* on page 61 for more information.

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 rubbing alcohol will not be of much benefit. This practice will damage the print heard which will result in poor print quality and require replacement of the print head. For information about the recommended paper, refer to *Ordering Paper and Supplies* on page 5 for the recommended paper.

Chapter 2: Setting Up and Using the Printer

What Is in the Box?

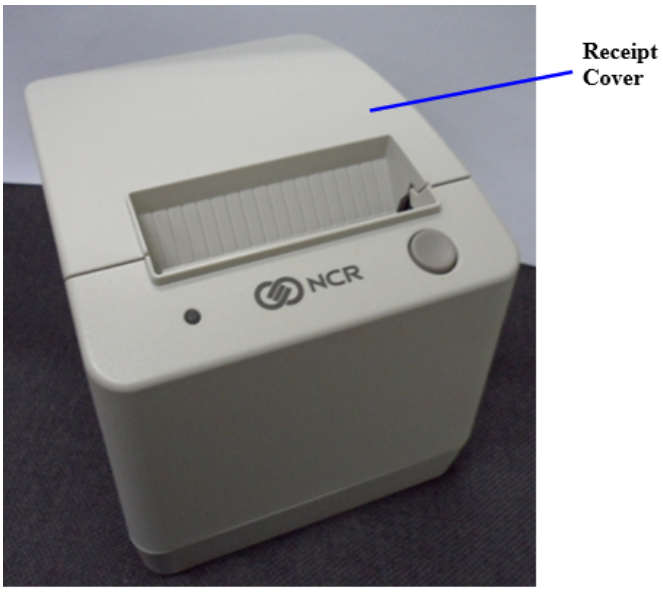
The following items are packed in the shipping box:

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

The following 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
- Cash drawer with cables. These may be ordered from other equipment suppliers. Refer to *Ordering Other Supplies* on page 6.
- Wall Mount kit

Removing the Packing Material



1. Remove the printer from the foam pack and plastic bag.
2. Remove the receipt paper roll from the foam packing material.
3. Save all packing materials for future storing, moving, or shipping the printer.

Repacking the Printer

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

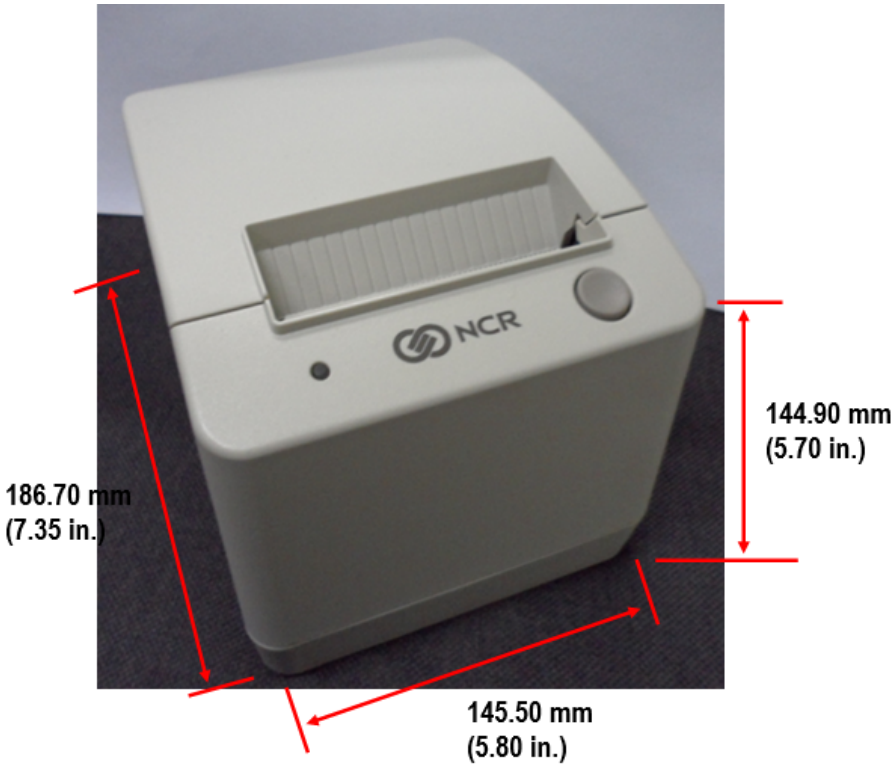
1. Place receipt paper between the receipt cover and the print head for protection.
2. Place the printer in the plastic bag and foam pack, place the packed printer in the box, and secure the box with packing tape.
3. If you are sending the printer to NCR for repair, call your NCR–authorized service representative for instructions on where to send the printer.

Note: Be prepared to answer questions concerning shipping and billing.

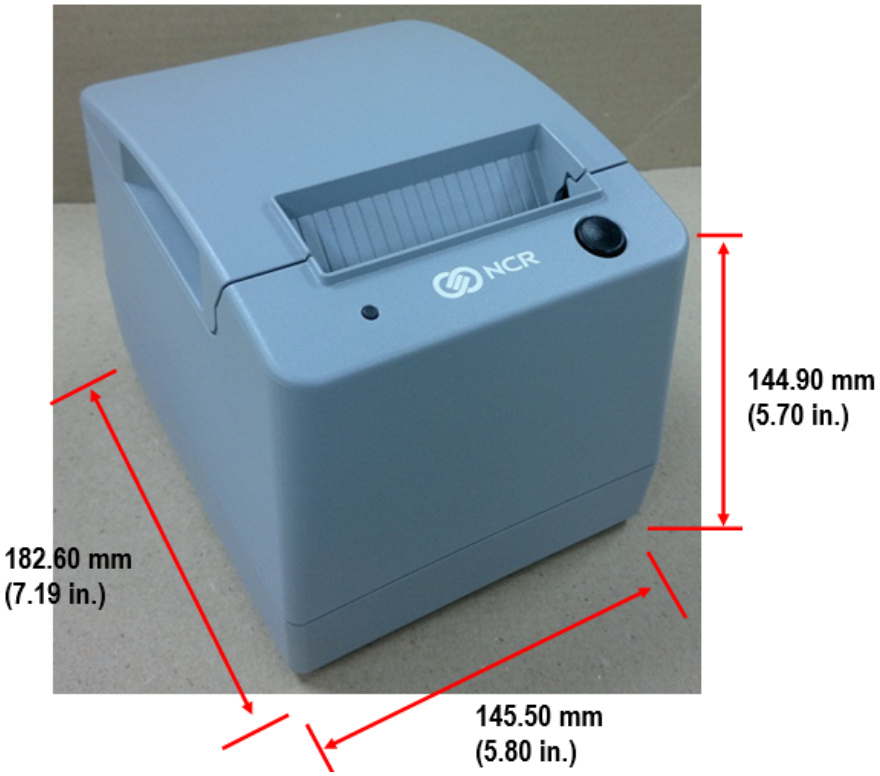
Choosing a Location

Normal Table Top

The 7197 Series II 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. The illustration shows the actual dimensions of the printer but leaves several inches around the printer for connecting and accessing the cables.



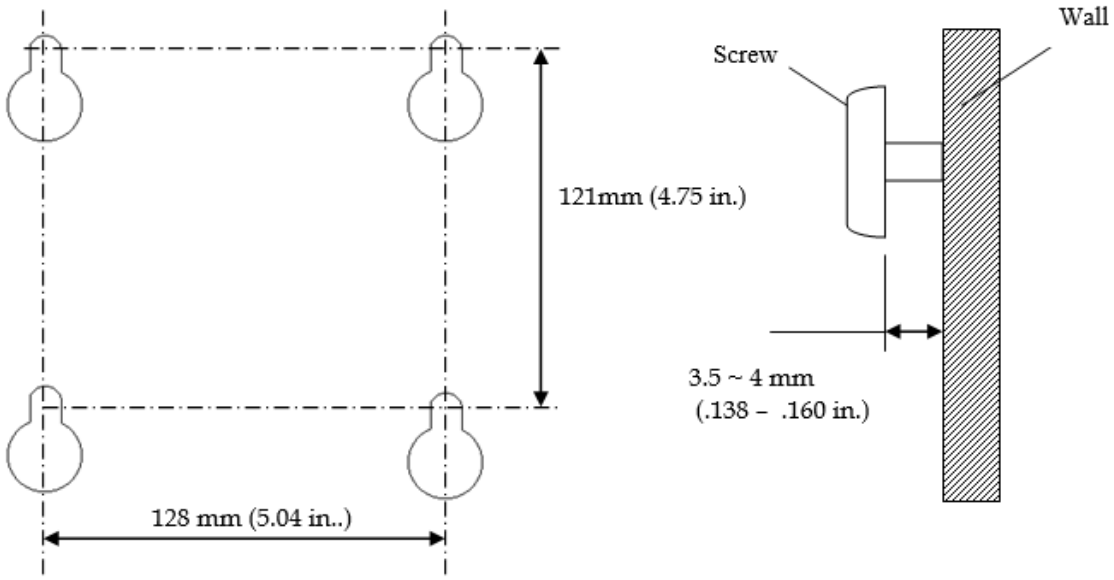
Dimension for standard model



Dimension for ALDI model

Wall-mounted

The 7197 Series II printer may be mounted on a vertical wall with a Wall Mount Kit (Option). Make sure there is enough room to open the receipt cover to change the paper. 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 a *Molly* fastener (not provided).

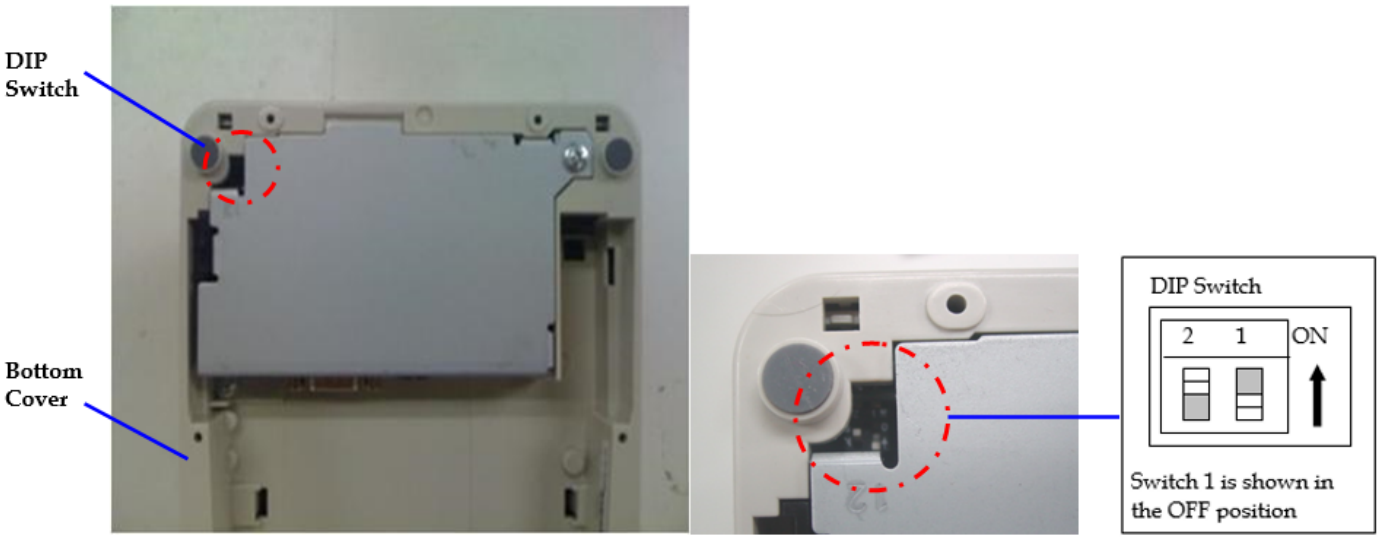


Setting Switches

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

- To set variables for several printer functions. Refer to the various printer functions in *Level 1 Diagnostics* on page 69 for setting up the printer.
- To perform diagnostic tests. Refer to the various diagnostic tests in *Level 1 Diagnostics* on page 69 for setting up the printer.

Caution: The DIP switches are set at the factory to predetermined settings and should not be changed unless when changing parameters or reflashing the firmware.



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

1. Set the switches to the desired settings shown in the table. Use a paper clip or other pointed object to set the switches.
2. Reset the printer by disconnecting and reconnecting the power to the printer.

Resetting the Printer

The printer is reset by disconnecting/reconnecting the DC power.

Connecting the Cables

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

- Power supply cable supplying power from the 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: Take caution of the following actions:

- Before disconnecting the Communication Cable and the Cash Drawer Cable from the printer, always disconnect the Power Cable from the power source.
- Before connecting the Power Cable to the power source, always connect the Communication Cable and the Cash Drawer Cable from the printer.

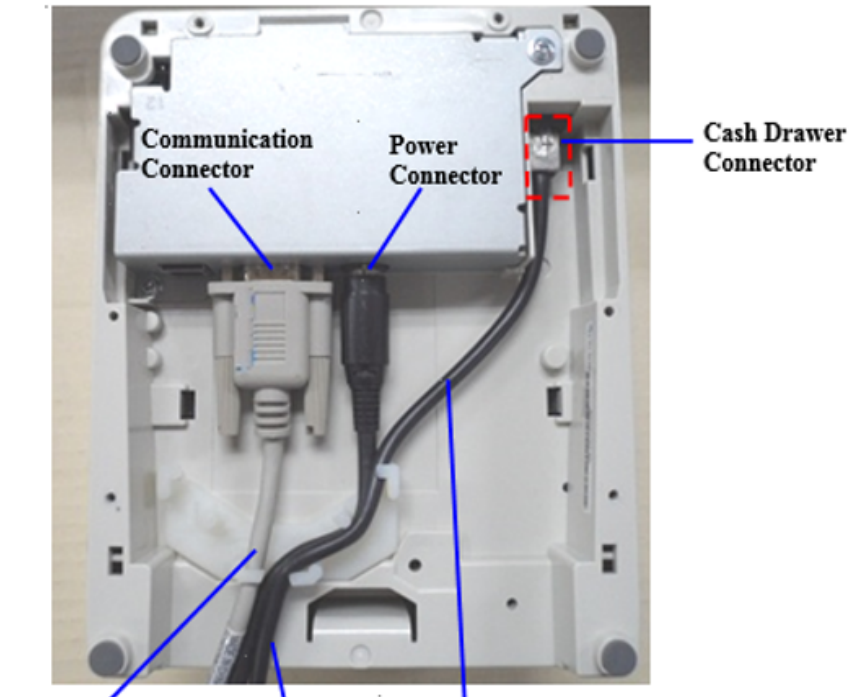
Follow these steps to connect the cables. Refer to the illustration in *RS-232 Cable Connection*.

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

Note: For the RS-232 Cable, be sure to screw the communication cable to the communication connector.

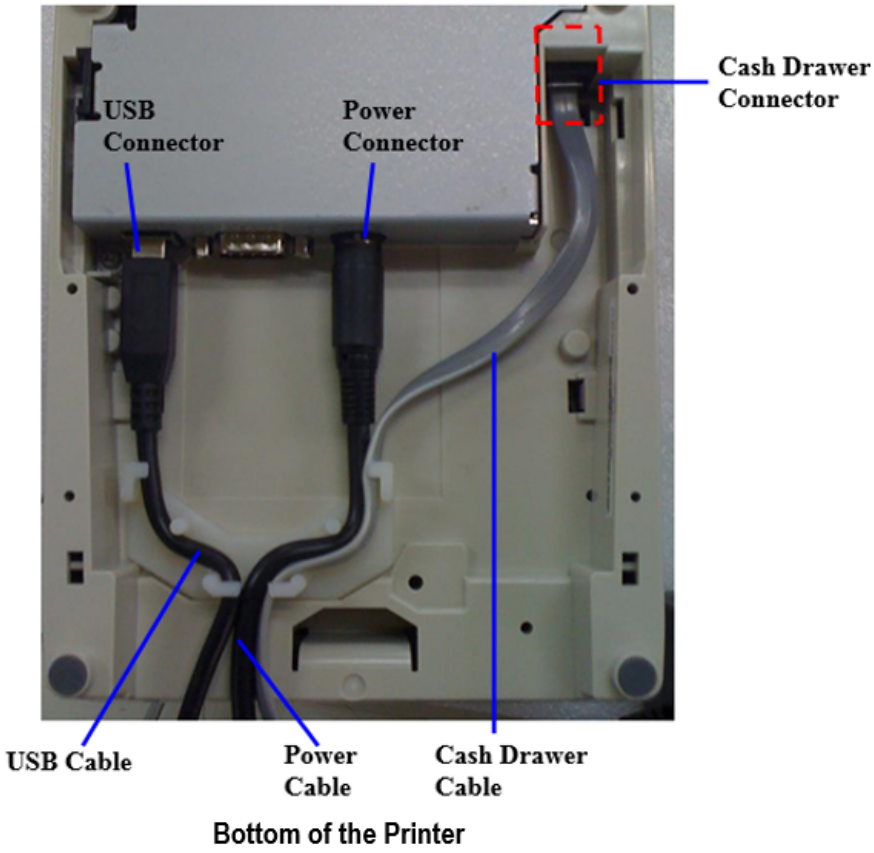
3. Route the cables through the cable strain relief on the bottom of the printer, then through the two slots in the cable access cover as shown in the illustration.
4. Connect the communication cable to the appropriate host computer connector.
5. Connect the cash drawer cable to the printer and cash drawer. The connector is a standard phone jack located at the rear of the printer.
6. 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 online. Otherwise, the printer is offline.
7. For host–powered installation, plug the DC cable into the POS terminal.

RS-232 Cable Connection



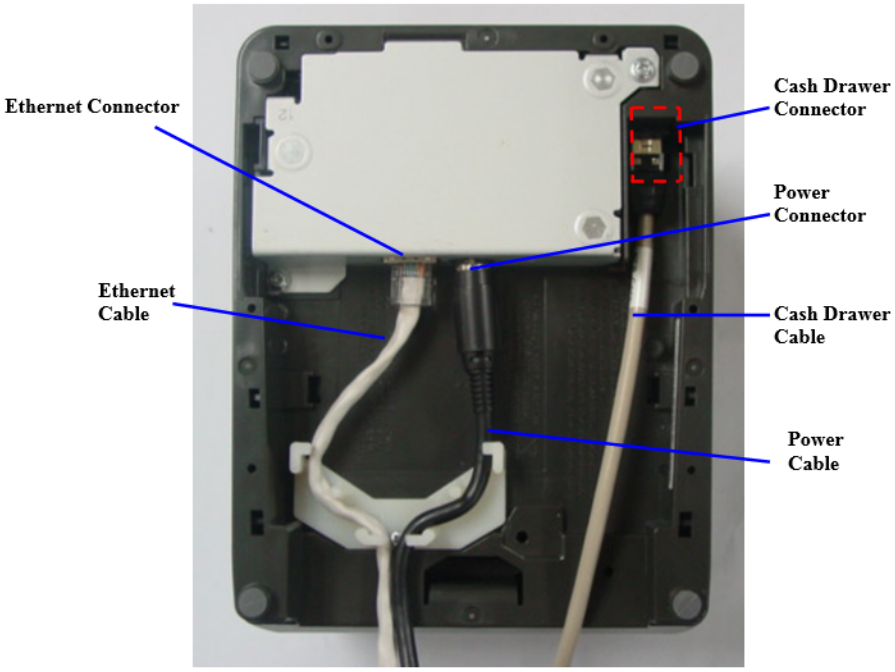
Bottom of the Printer

USB Cable Connection



Bottom of the Printer

Ethernet Cable Connection (Ethernet Model)



Bottom of the Printer

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, for example, 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 XP. 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 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 XP natively support plug-and-play USB with a built-in driver.

Note: Internet access is required 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 PC.

Windows XP

1. Open the Control Panel.
2. Click on System.
3. Click the Device Manager tab.
4. In the Device Manager window, scroll down through the list of installed hardware devices until you find an entry for *Universal Serial Bus Controllers*.

Note: If this entry exists, the host computer is set up for USB operation. If this entry does not appear, consult the computer documentation to see if USB must be enabled in the BIOS setup.

Windows 7, 8, and 10

1. From the Windows Search bar, search Computer Management, then select to open.
2. Select **System Tools→Device Manager**.
3. In the Device Manager window, scroll through the list of installed hardware devices until you find an entry for *Universal Serial Bus Controllers*.

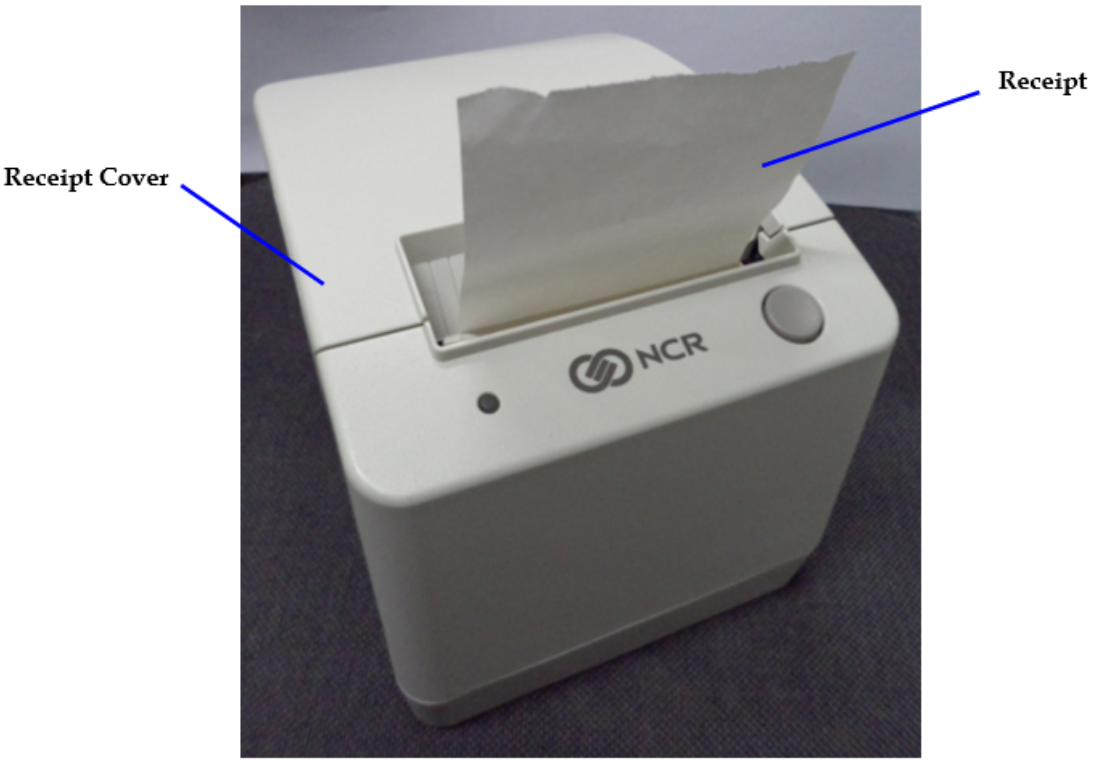
Note: If this entry exists, your host computer is set up for USB operation. If this entry is not in the list, consult your computer documentation to see if USB must be enabled in the BIOS setup.

Configuring the Printer

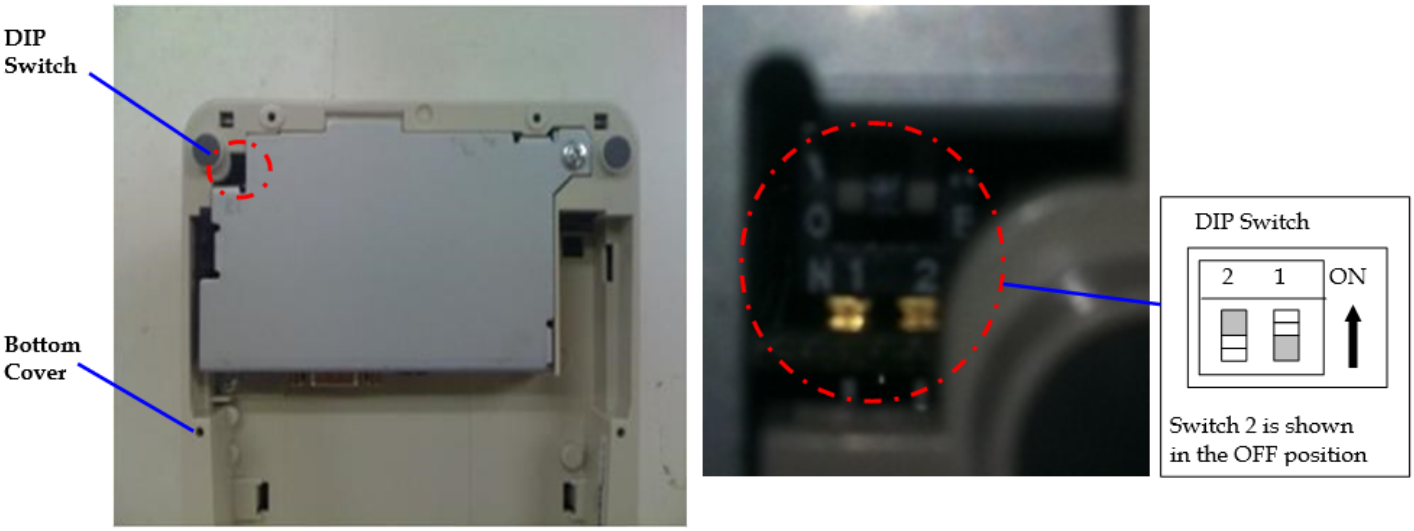
USB is a plug-and-play environment. As such, neither the printer nor the host requires user configuration to work. However, since the NCR solution simulates a serial communication interface, you must configure *handshaking* on the printer for proper operation. The printer can be configured to use hardware flow control (using *DTR/DSR*) or software flow control (using *XON/XOFF*). All other serial communication parameters, for example baud rate, parity, stop bits, and data bits, are ignored.

To define software or hardware handshaking, follow these steps:

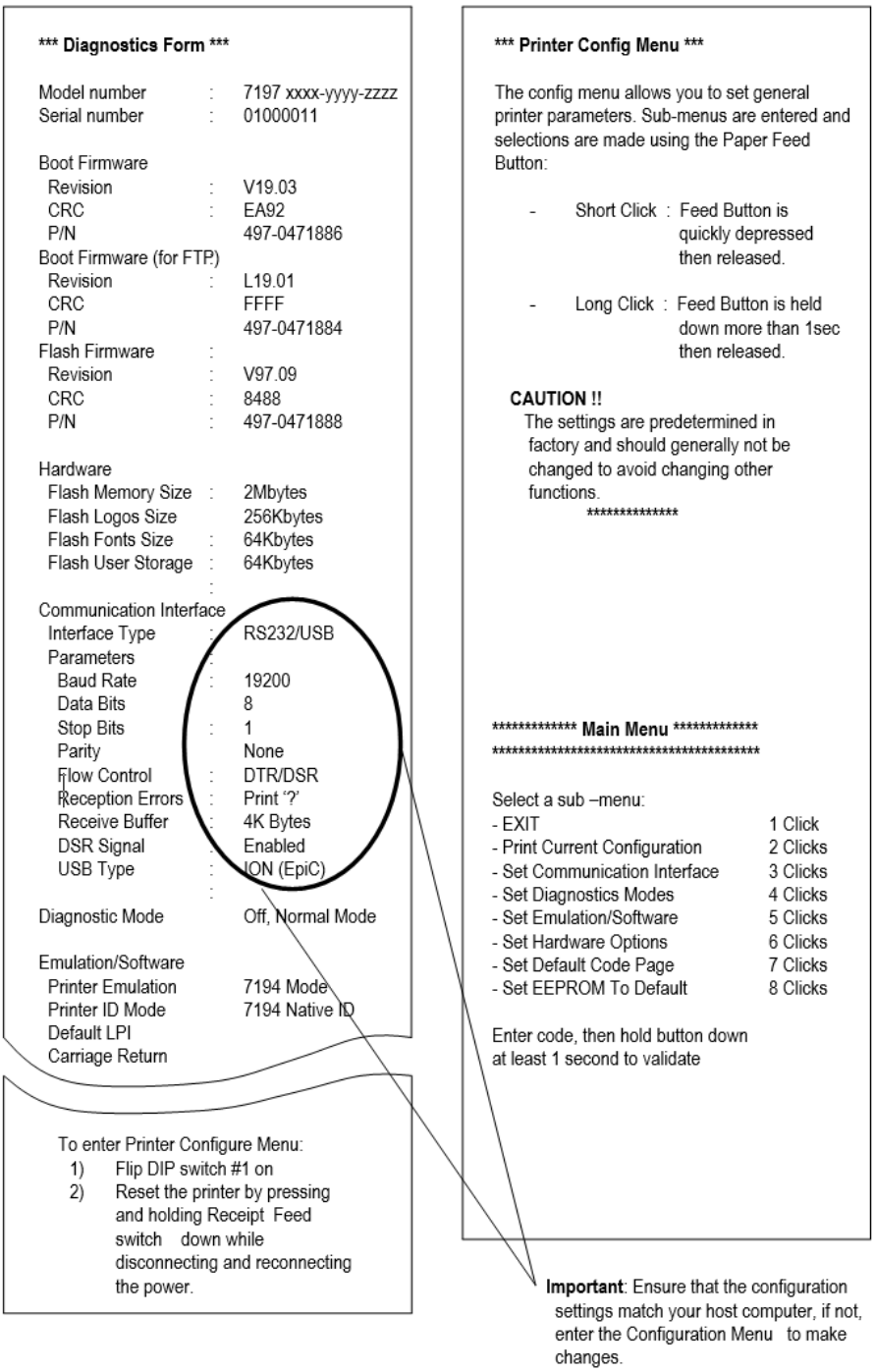
1. Open the Receipt Cover and check whether there is paper in the printer. If there is no paper, insert the paper roll, as described in the Owner's Manual.



2. Turn the printer around, so that the bottom side of the printer is facing you.
3. Set DIP switch 1 to the *On* position (up).



4. Reset the printer. See below for information on resetting the printer. The printer beeps, prints the current configuration, then waits for you to make a selection from the Main Menu on the printout.



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

Model number	:	7197 xxxx-yyyy-zzzz
Serial number	:	01000011
Boot Firmware		
Revision	:	V19.03
CRC	:	EA92
P/N		497-0471886
Boot Firmware (for FTP)		
Revision	:	L19.01
CRC		FFFF
P/N		497-0471884
Flash Firmware	:	
Revision	:	V97.09
CRC	:	8488
P/N	:	497-0471888
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	:	19200
Data Bits		8
Stop Bits	:	1
Parity		None
Flow Control	:	DTR/DSR
Reception Errors	:	Print '?'
Receive Buffer	:	4K Bytes
DSR Signal	:	Enabled
USB Type	:	ION (EpiC)
Diagnostic Mode		Off, Normal Mode
Emulation/Software		
Printer Emulation		7194 Mode
Printer ID Mode		7194 Native ID
Default LPI		
Carriage Return		

To enter Printer Configure Menu:
1) Flip DIP switch #1 on
2) Reset the printer by pressing and holding 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 down 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.

To access the sub-menus, follow the instructions on the scrolling menu. To select a sub-menu, press the Paper Feed button using one of the following actions:

- To indicate *Yes*, press and hold the Paper Feed button for at least one second for a long click.
- To indicate *No*, press the Paper Feed button quickly for a short click.

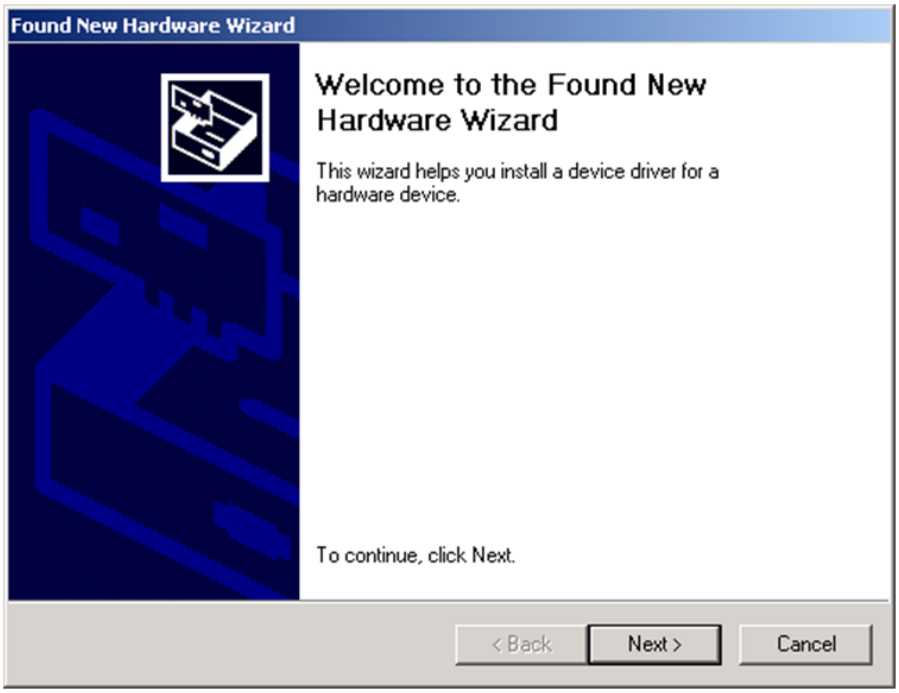
5. Select **Set Communication Interface** from the Main Menu. The printer scrolls to the first question.
6. Select **RS232/USB**.
7. Skip through the parameters with short clicks until *Set Flow Control Method* is displayed.
8. Follow the instructions to select either *XON/OFF* or *DTR/DSR*, then skip the remaining communications parameters.
9. When you have finished, set DIP switch 1 to *Off* (down).
10. Reset the printer. The printer resets with the new selection. To verify the new setting, press the Paper Feed button to print out a diagnostics form or by holding the Paper Feed button while closing the Top Cover.

Installing the USB Virtual COM Port Driver for Printers

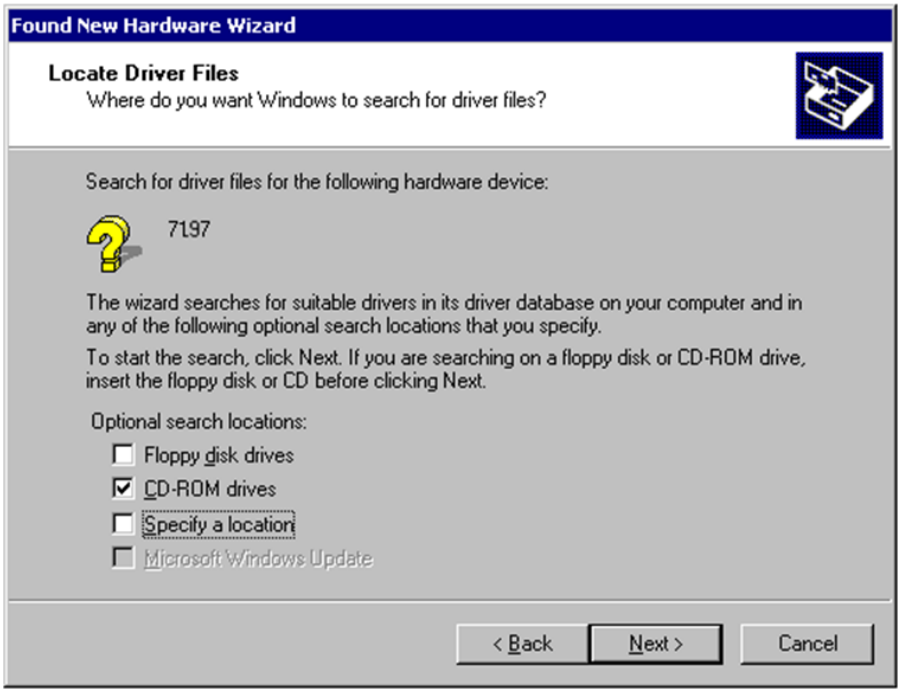
Windows XP

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

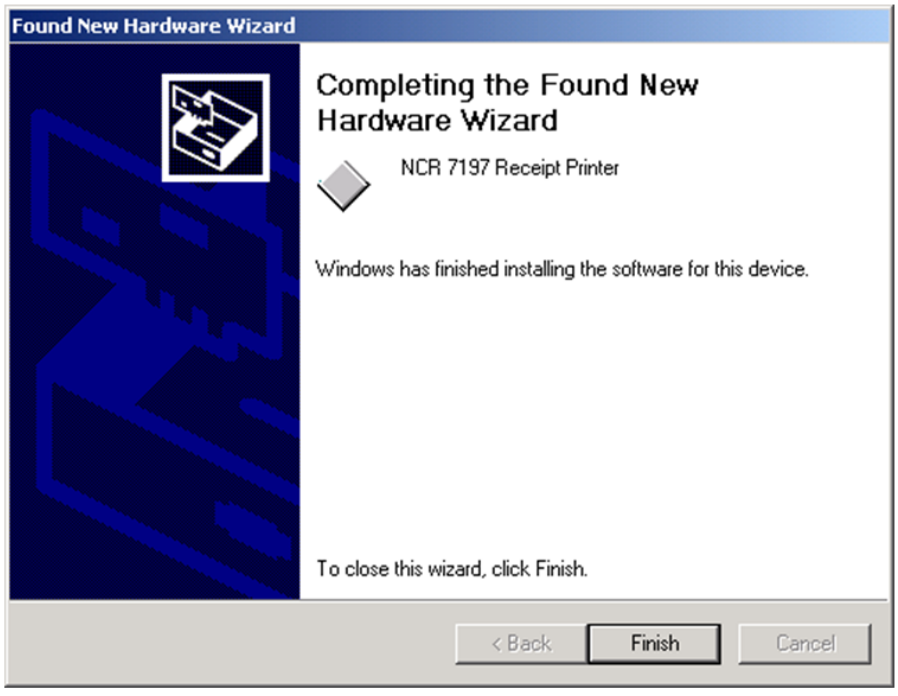
Note: The following images describe the on-screen instructions displayed on the Found New Hardware Wizard.




Found New Hardware Wizard
Install Hardware Device Drivers
A device driver is a software program that enables a hardware device to work with an operating system.
This wizard will complete the installation for this device:
7197
A device driver is a software program that makes a hardware device work. Windows needs driver files for your new device. To locate driver files and complete the installation click Next.
What do you want the wizard to do?
Search for a suitable driver for my device (recommended)
Display a list of the known drivers for this device so that I can choose a specific driver
< Back
Next >
Cancel

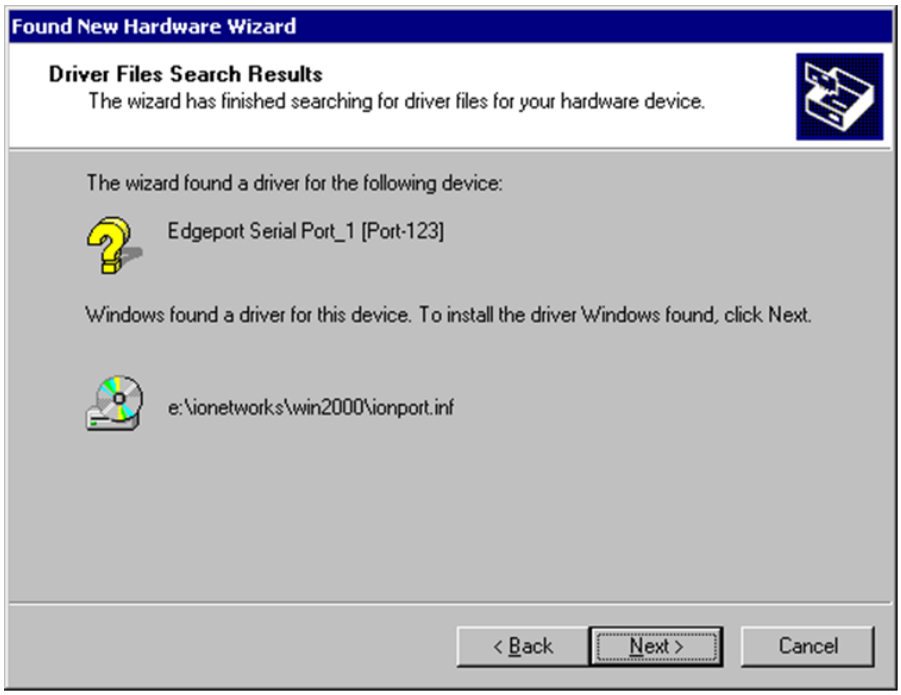

Found New Hardware Wizard
Locate Driver Files
Where do you want Windows to search for driver files?
Search for driver files for the following hardware device:
7197
The wizard searches for suitable drivers in its driver database on your computer and in any of the following optional search locations that you specify.
To start the search, click Next. If you are searching on a floppy disk or CD-ROM drive, insert the floppy disk or CD before clicking Next.
Optional search locations:
Floppy disk drives
CD-ROM drives
Specify a location
Microsoft Windows Update
< Back
Next >
Cancel

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




Found New Hardware Wizard
Welcome to the Found New Hardware Wizard
This wizard helps you install a device driver for a hardware device.
To continue, click Next.
< Back
Next >
Cancel


Found New Hardware Wizard
Install Hardware Device Drivers
A device driver is a software program that enables a hardware device to work with an operating system.
This wizard will complete the installation for this device:
Edgeport Serial Port_1 [Port-12]
A device driver is a software program that makes a hardware device work. Windows needs driver files for your new device. To locate driver files and complete the installation click Next.
What do you want the wizard to do?
Search for a suitable driver for my device (recommended)
Display a list of the known drivers for this device so that I can choose a specific driver
< Back
Next >
Cancel

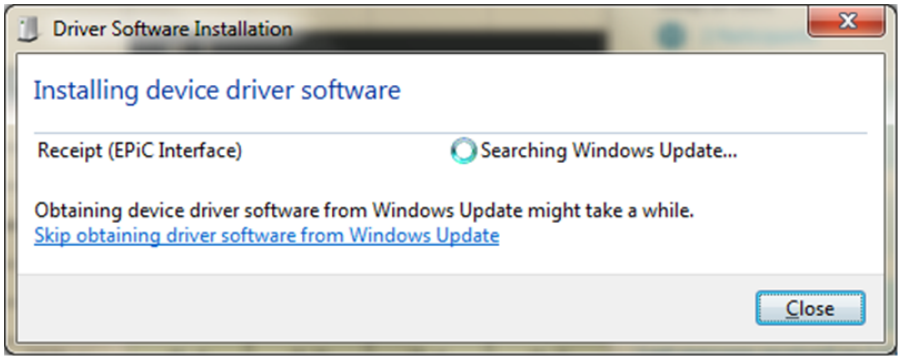


Note: Location of the IONetworks files on the CD–ROM may very depending on the version of the CD that is being used.

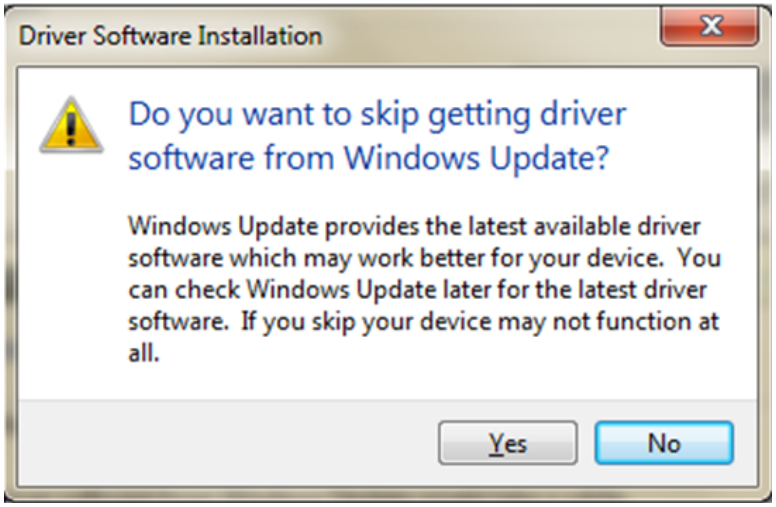
Windows POS Ready 7

To install the USB Virtual COM Port Driver on a Windows POSReady 7 system, follow these steps:

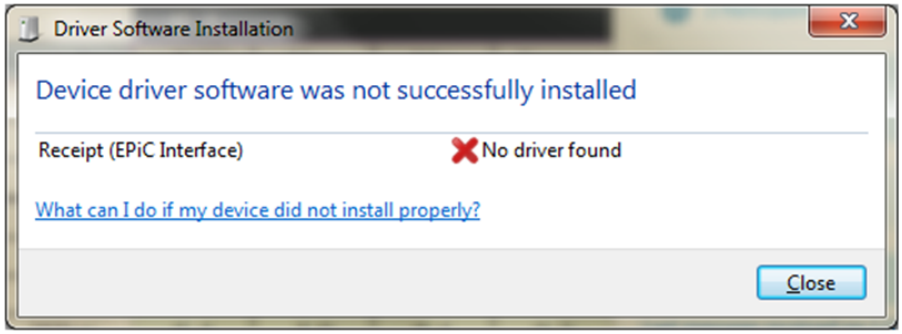
1. Plug the printer to the system USB port. The printer beeps when it is plugged in to show the USB device is recognized. The Driver Software Installation window is displayed.



2. Select **Skip obtaining driver software from Windows Update**. The system skips searching for the driver software information from Windows Update. The following window is displayed.

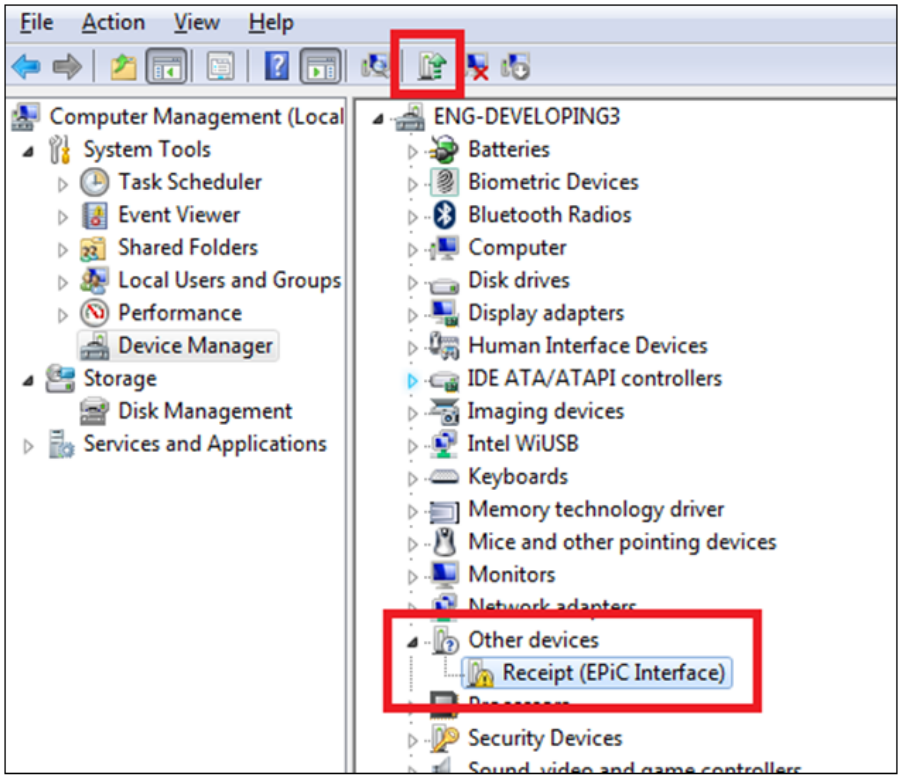


3. Select **Yes**. The following window is displayed.

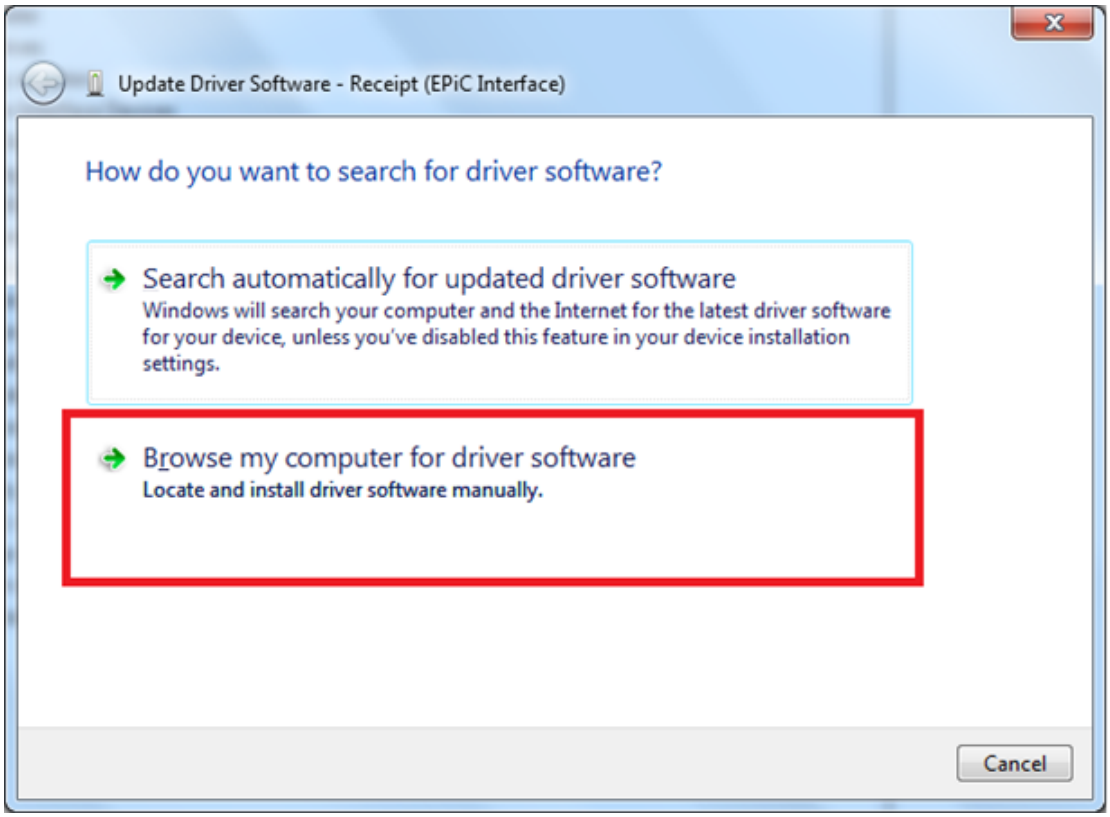


4. Select **Close** to exit the Driver Software Installation window.
5. From the Windows search bar, search for **Computer Management**, then select to open.

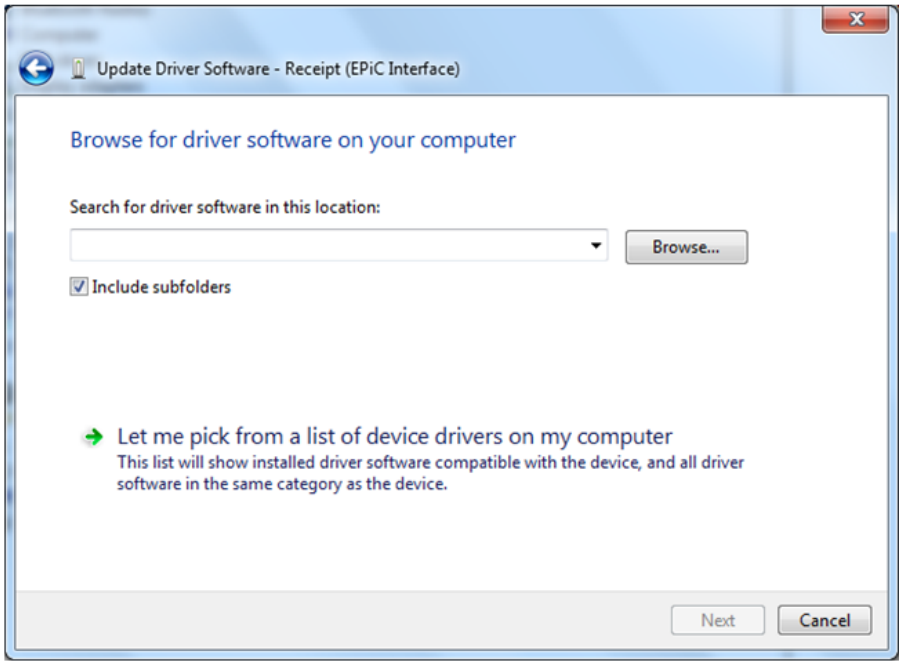
6. From the System Tools, select **Device Manager**. A list of devices is displayed on the right pane.



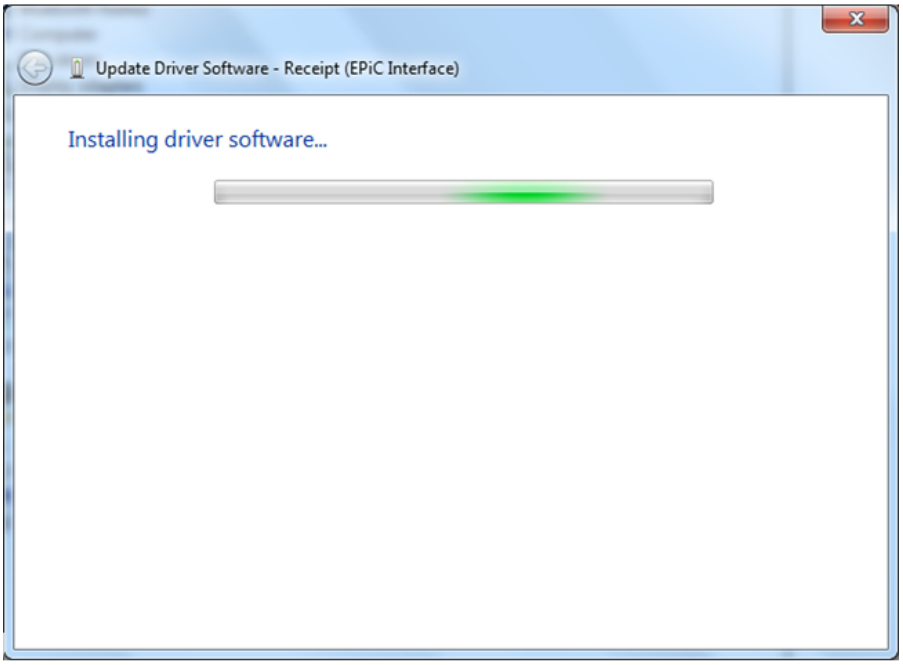
7. Select **Other devices→Receipt (EPiC Interface)**, then select **Update Driver Software**. The following window is displayed:



8. Select **Browse my computer for driver software**. The following window is displayed:



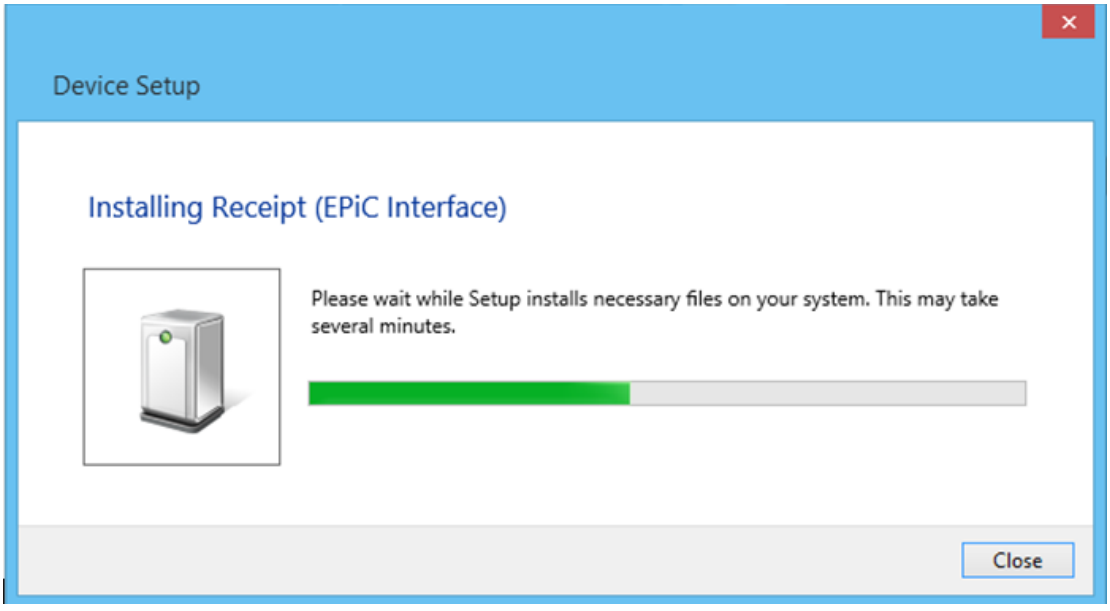
9. Select **Browse**, and then select the **Edgeport Driver** folder.
10. Select **Next**. The system starts installing the USB Virtual COM Port Driver.



Windows 8

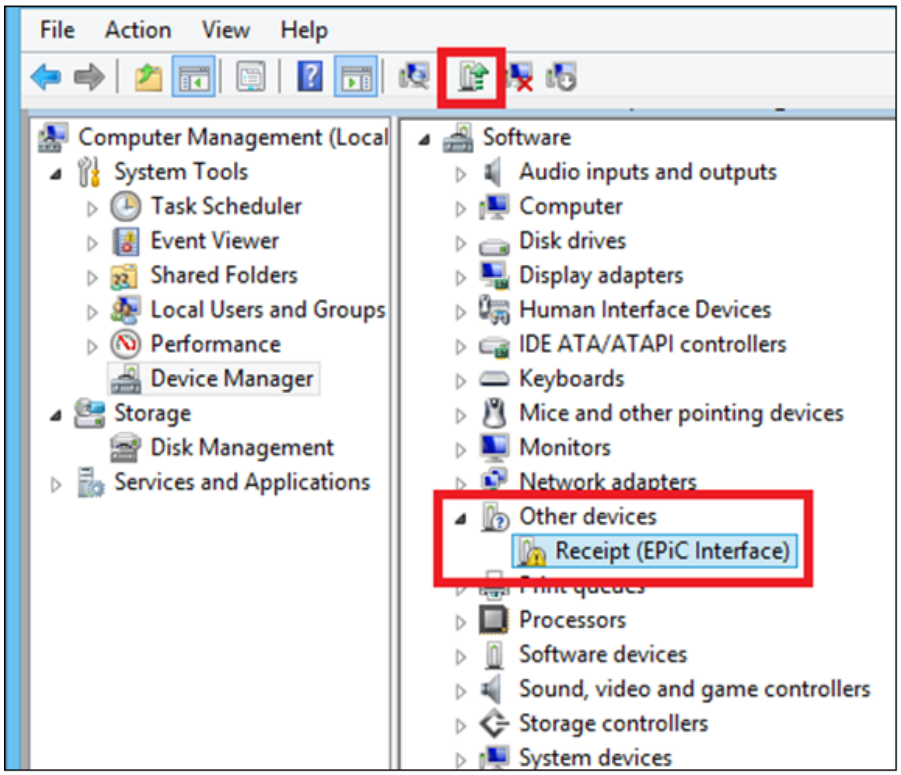
To install the USB Virtual COM Port Driver on a Windows 8 system, follow these steps:

1. Plug the printer to the system USB port. The printer then beeps to indicate that the USB device is recognized. The installation progress for the Receipt (EPiC Interface) process is displayed on the Device Setup window.

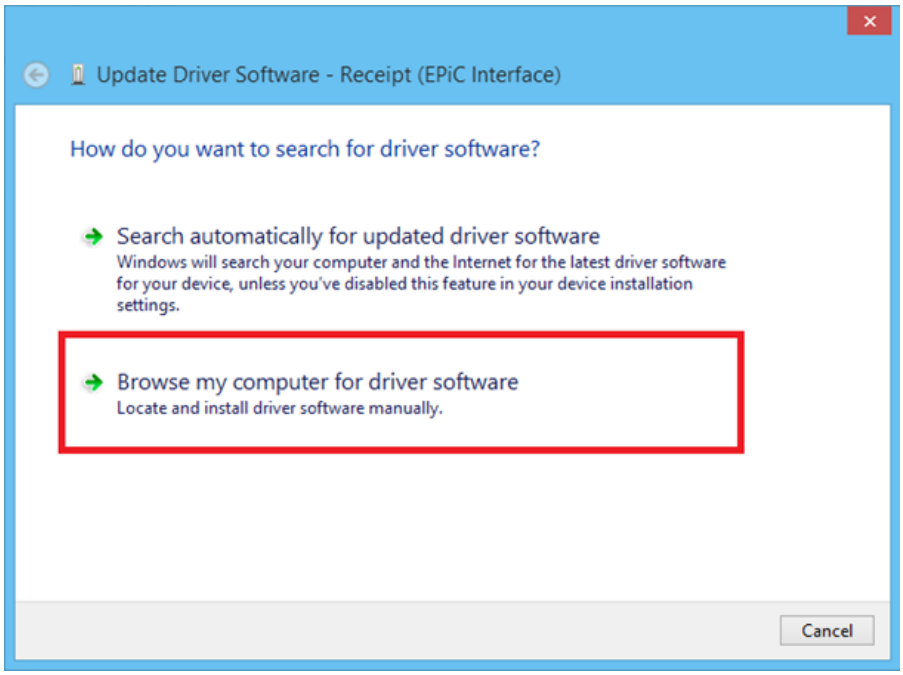


2. Select **Close** to exit the Device Setup window.

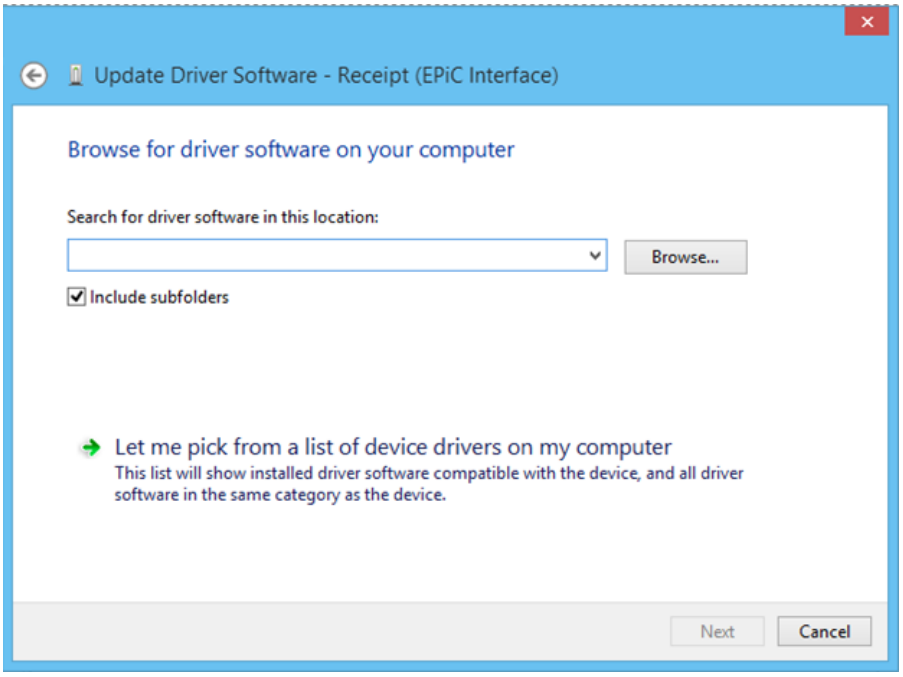
3. From the Windows search bar, search **Computer Management**, then select to open.
4. Open the Device Manager, select **Device Manager**, then select **Other devices→Receipt (EPiC interface)**.



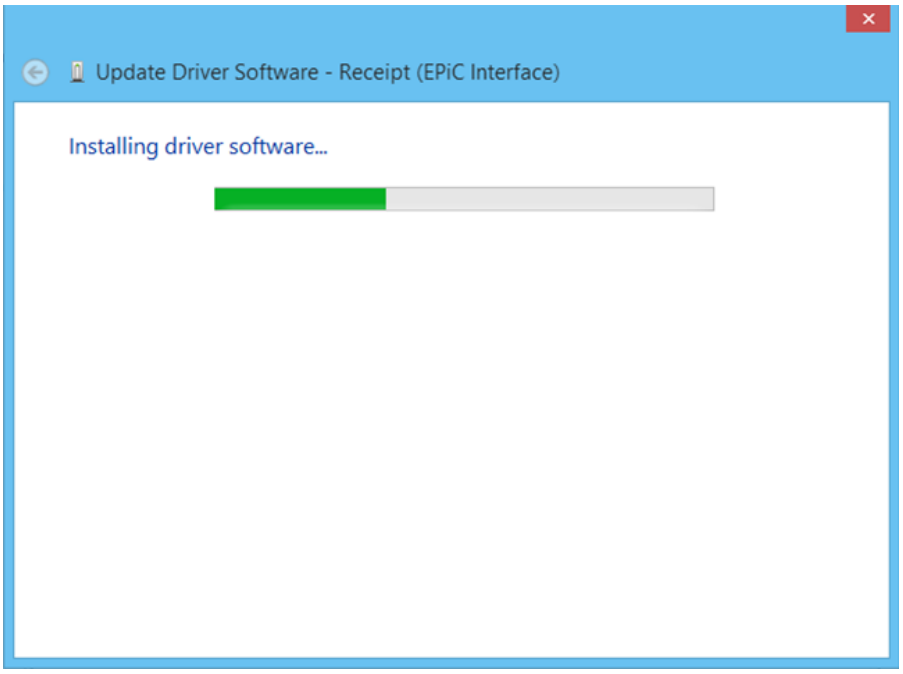
5. Select the **Update Driver Software** button.



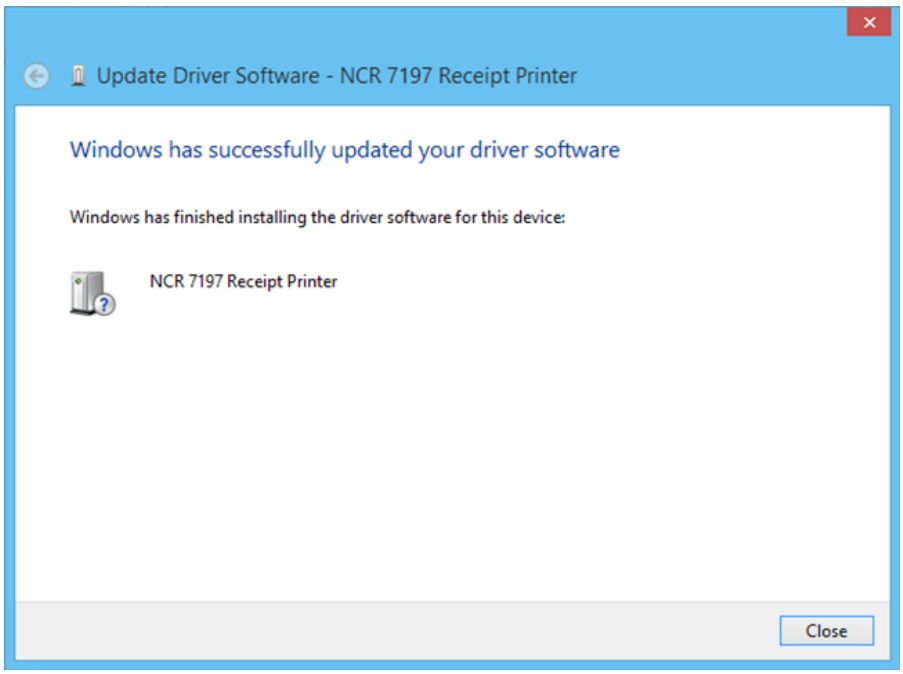
6. Select **Browse my computer for driver software**.



7. Select **Browse**, and then select the **Edgeport Driver** folder.
8. Select **Next**. The system starts installing the USB Virtual COM Port Driver.



When the installation is complete, the following window is displayed.

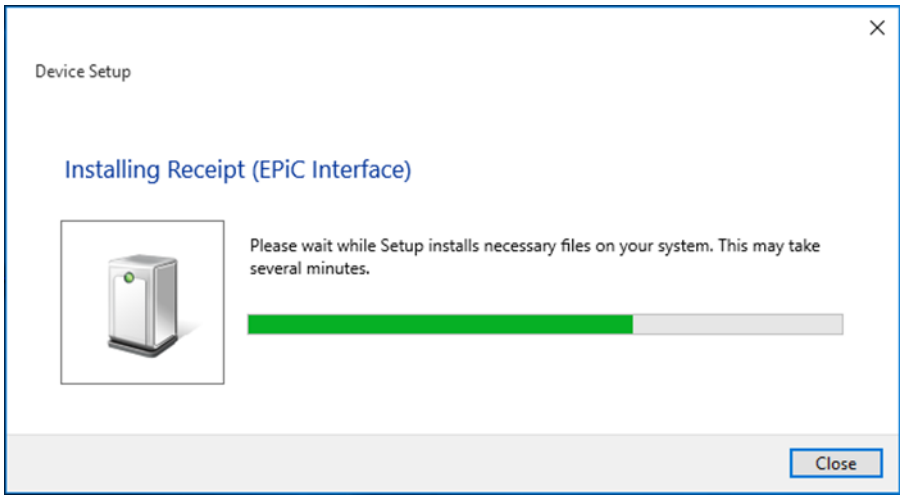


9. Select **Close** to close the window.

Windows 10

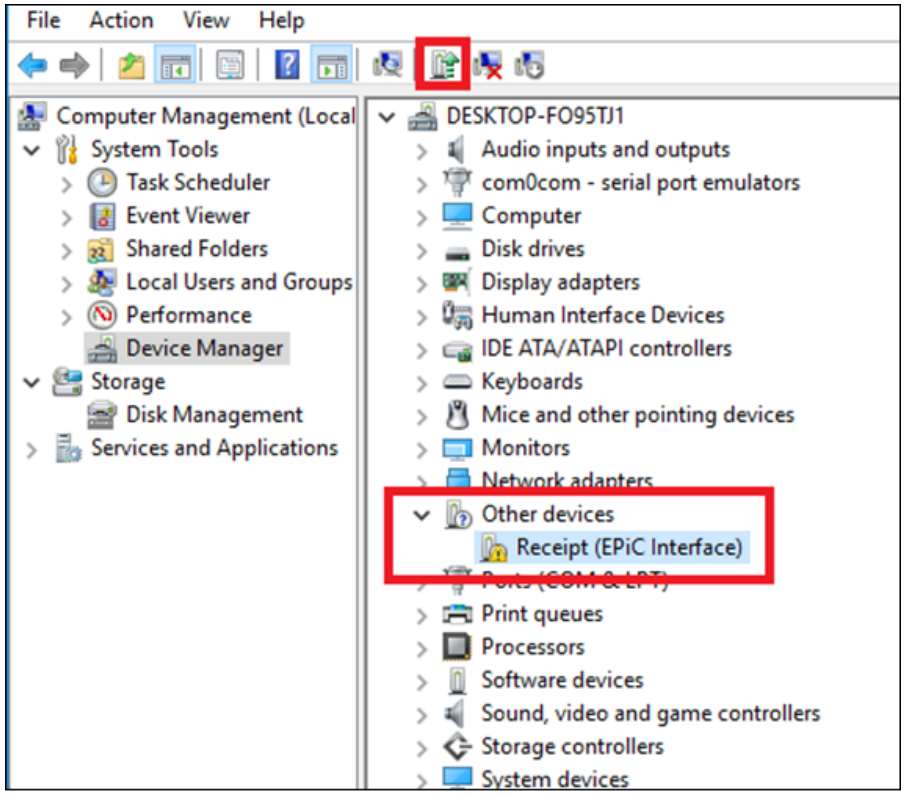
To install the USB Virtual COM Port Driver on a Windows 10 system, follow these steps:

1. Plug the printer to the system USB port. The printer then beeps to indicate that the USB device is recognized. The installation progress for the Receipt (EPiC Interface) process is displayed on the Device Setup window.

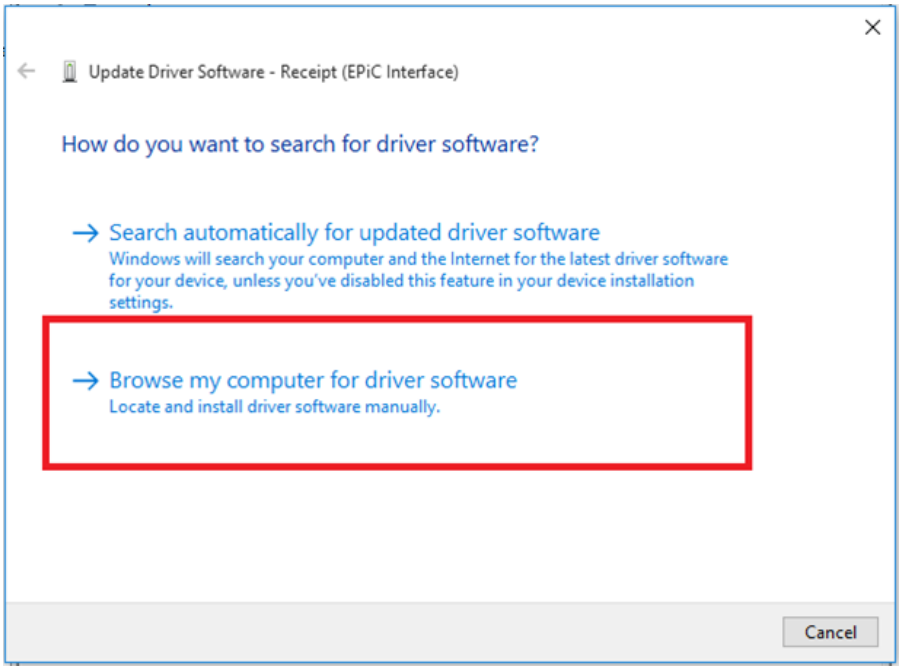


2. Select **Close** to exit the Device Setup window.

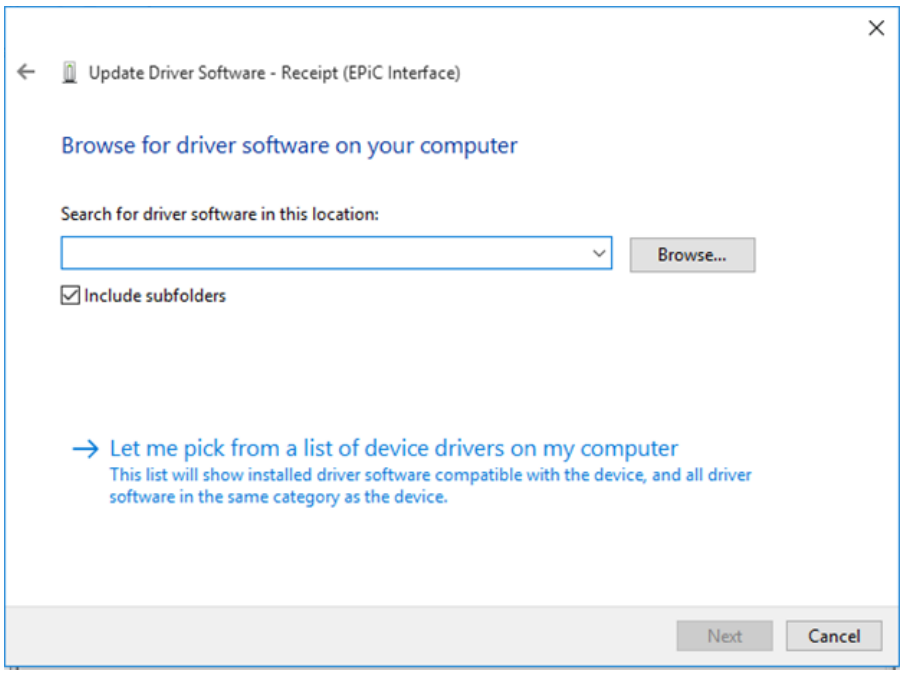
3. From the Windows search bar, search **Computer Management**, then select to open.
4. From the System Tools, select **Device Manager**, then select **Other devices→Receipt (EPiC interface)**.



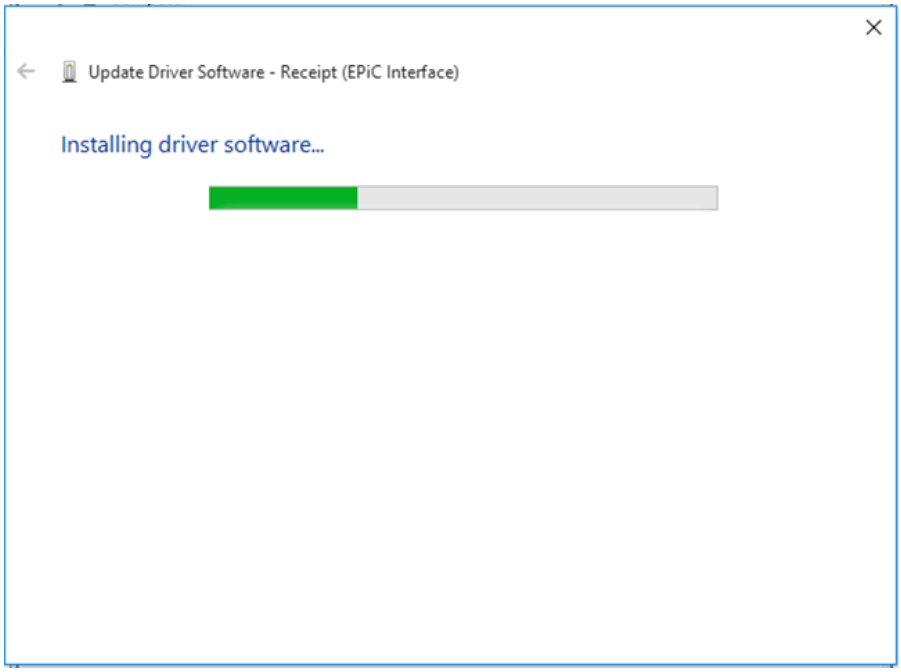
5. Select the **Update Driver Software** button. The following window is displayed.



6. Select **Browse my computer for driver software**.



7. Select **Browse**, and then select the **Edgeport Driver** folder.
8. Select **Next**. The system starts installing the USB Virtual COM Port Driver.



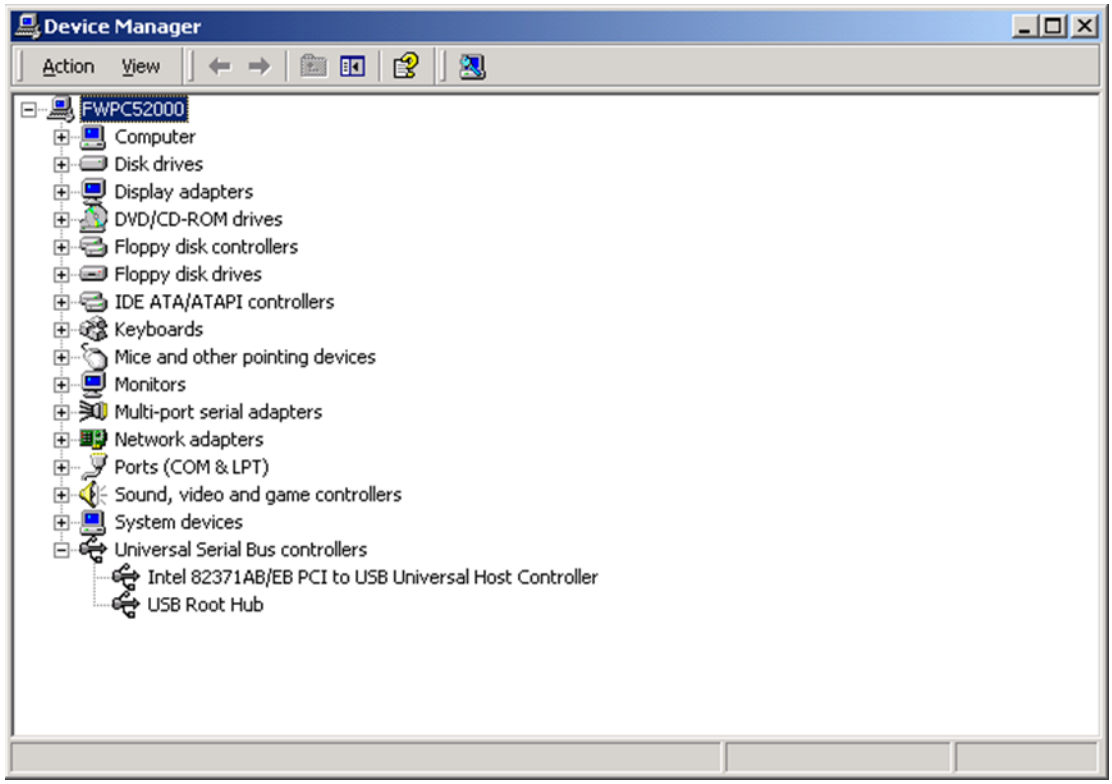
9. When the installation is complete, select **Close** to close the window.

Verifying the Installation

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

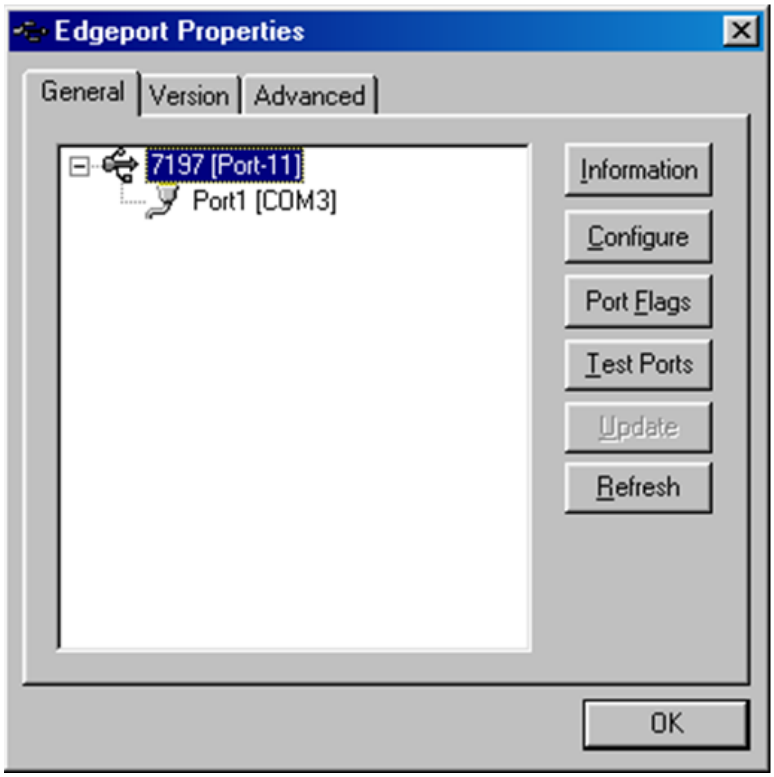
Windows XP

1. Open the Device Manager window. For more information, refer to *Checking for USB Support on the Host Computer* on page 20.
2. Scroll down to *Universal Serial Bus controllers*.



3. To check if EPiC Port is visible, 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.

4. Search for the Edgeport Drivers folder, then run `edgeport.exe`. The following window is displayed.



5. Double-click **7167 [Port number]** to view the Port number and COM number. The COM number should match the EPiC Port COM, which is under the available ports in Device Manager.

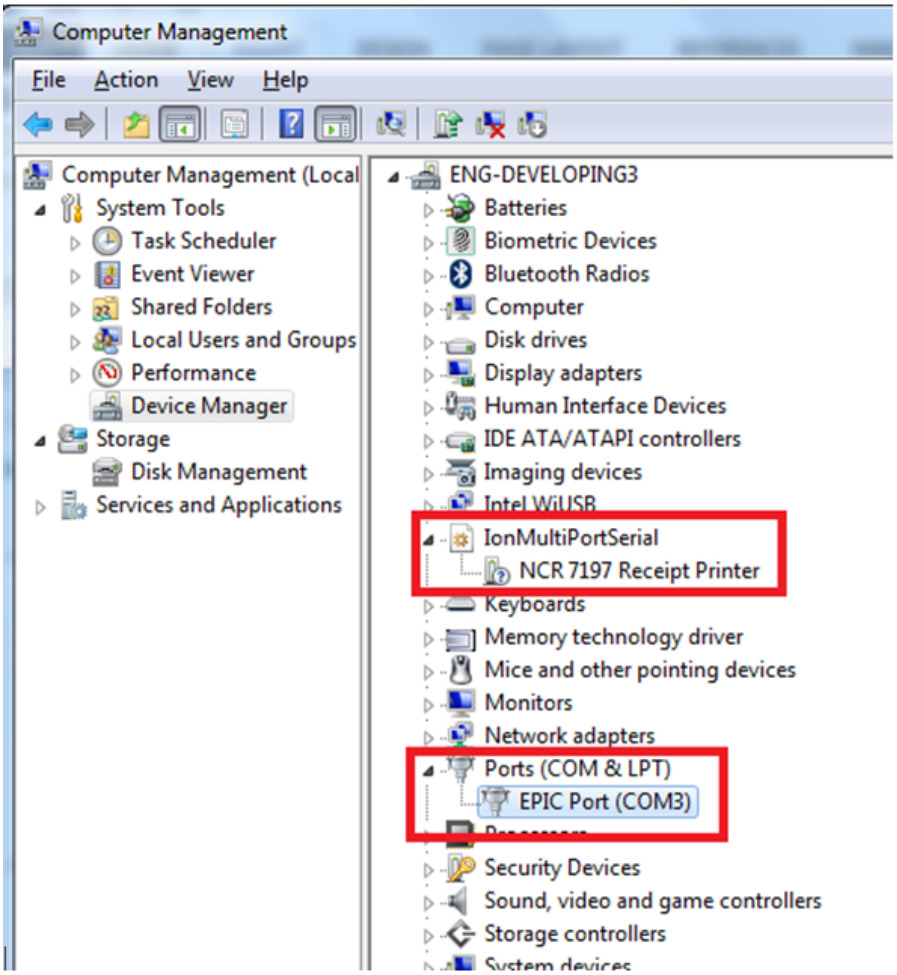
Note: Note: If the device is missing or is not listed correctly, the installation is unsuccessful. You will need to re-install the drivers.

Windows POS Ready 7

To verify the installation of the driver on a Windows POS Ready 7 system, follow these steps:

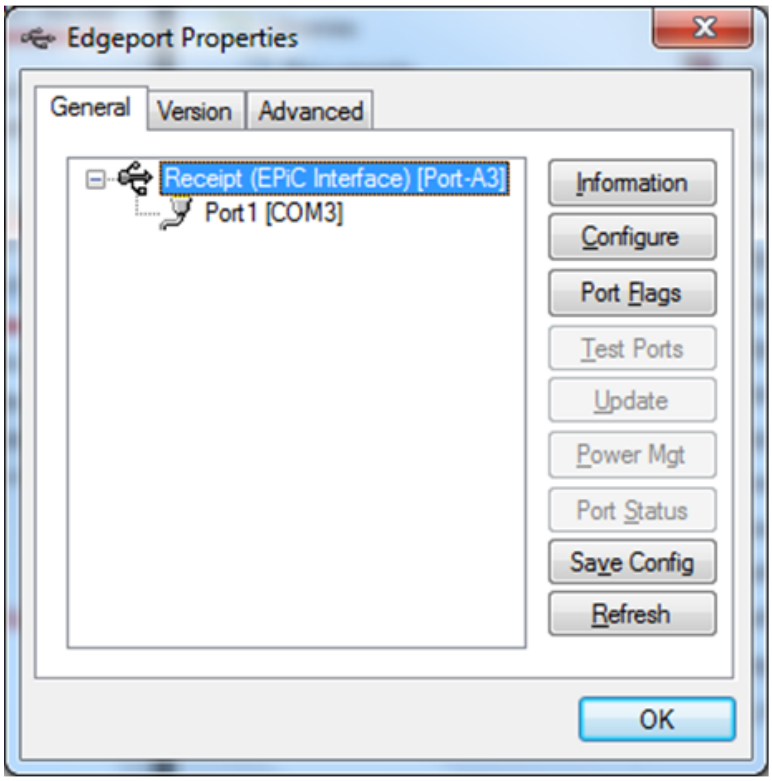
1. Open the Device Manager window.
2. Make sure that the *NCR 7197 Receipt Printer* and the *EPIC Port* are installed.

Note: The *NCR 7197 Receipt Printer* is the defined USB VID/PID (Vendor ID/Product ID) of the NCR Single-Station printers (7197, 7198, and 7199).



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

3. Open the Edgeport utility and make sure the *Port* is assigned.

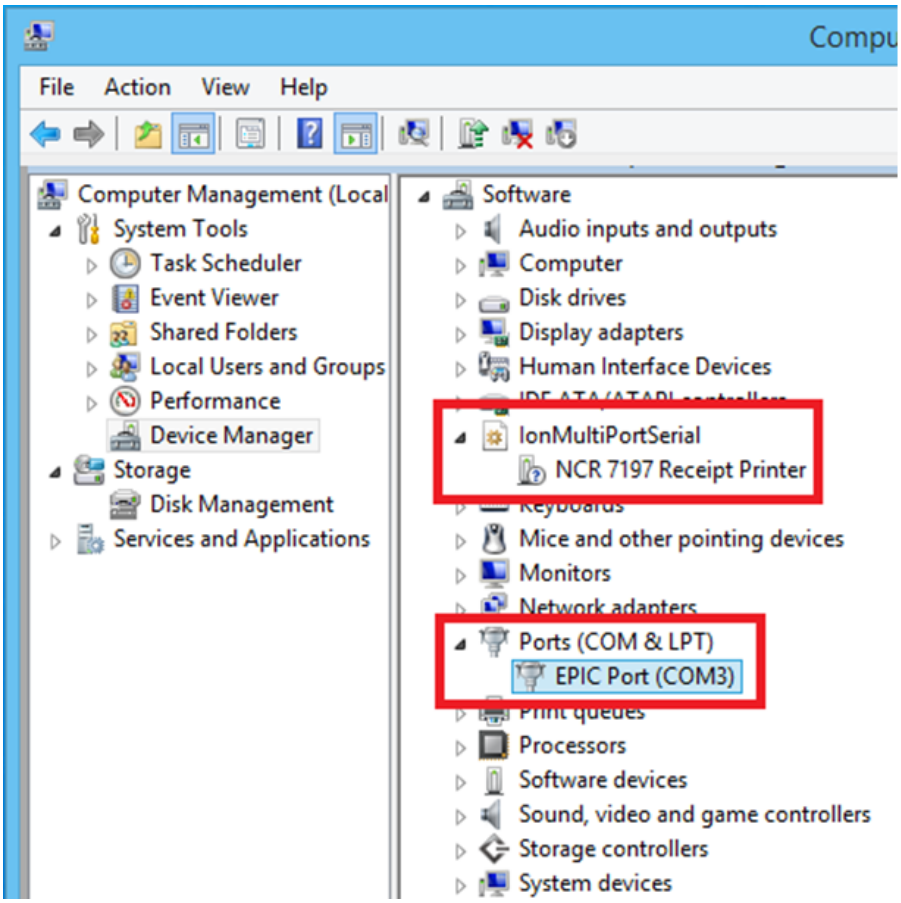


Windows 8

To verify the installation of the driver on a Windows 8 system, follow these steps:

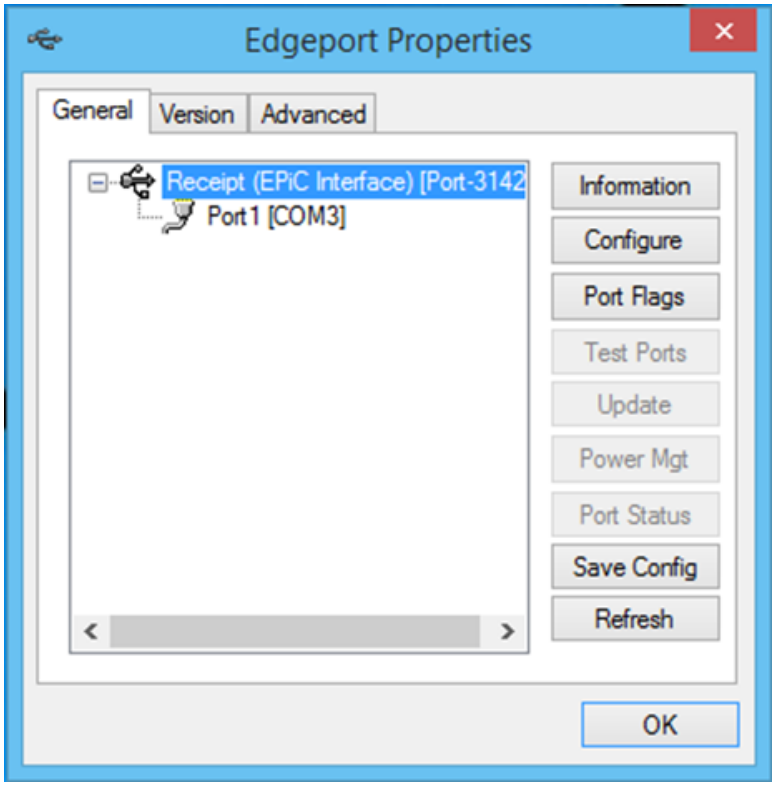
1. Open the Device Manager window.
2. Make sure that the *NCR 7197 Receipt Printer* and the *EPIC Port* are installed.

Note: The *NCR 7197 Receipt Printer* is the defined USB VID/PID (Vendor ID/Product ID) of the NCR Single Station printers (7197, 7198, and 7199).



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

3. Open the Edgeport utility and make sure the Port is assigned.

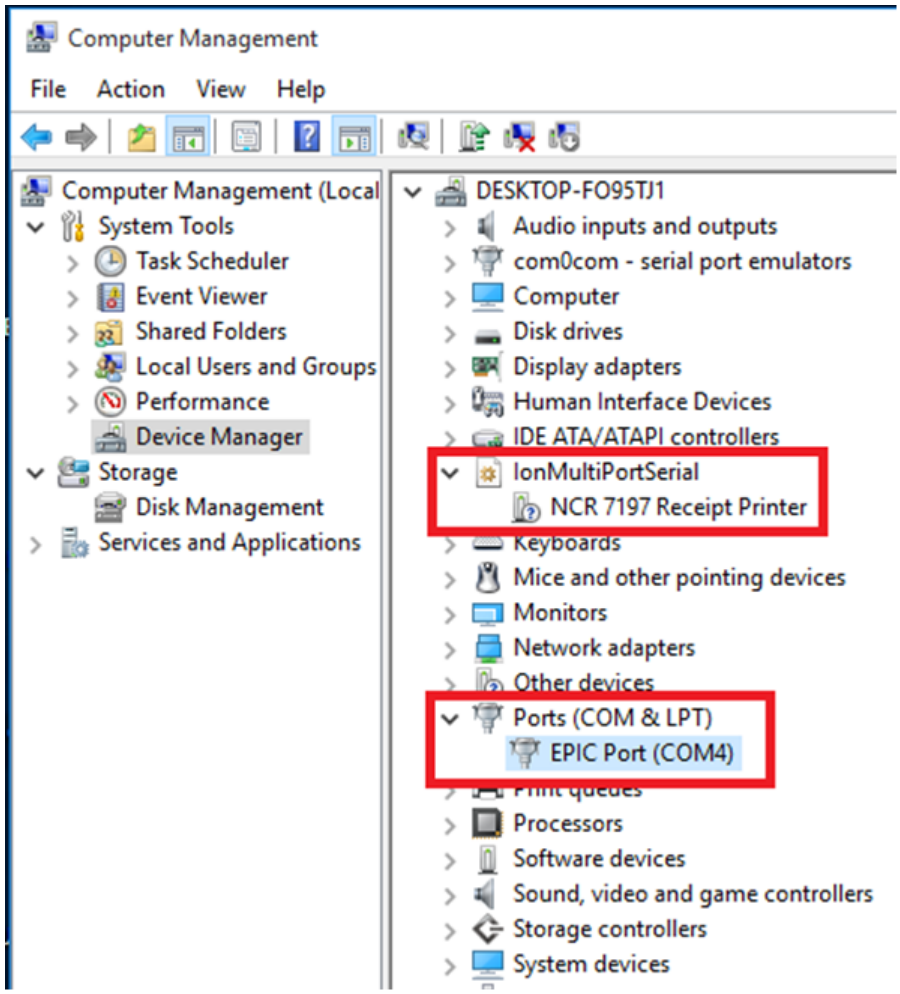


Windows 10

To verify the installation of the driver on a Windows 10 system, follow these steps:

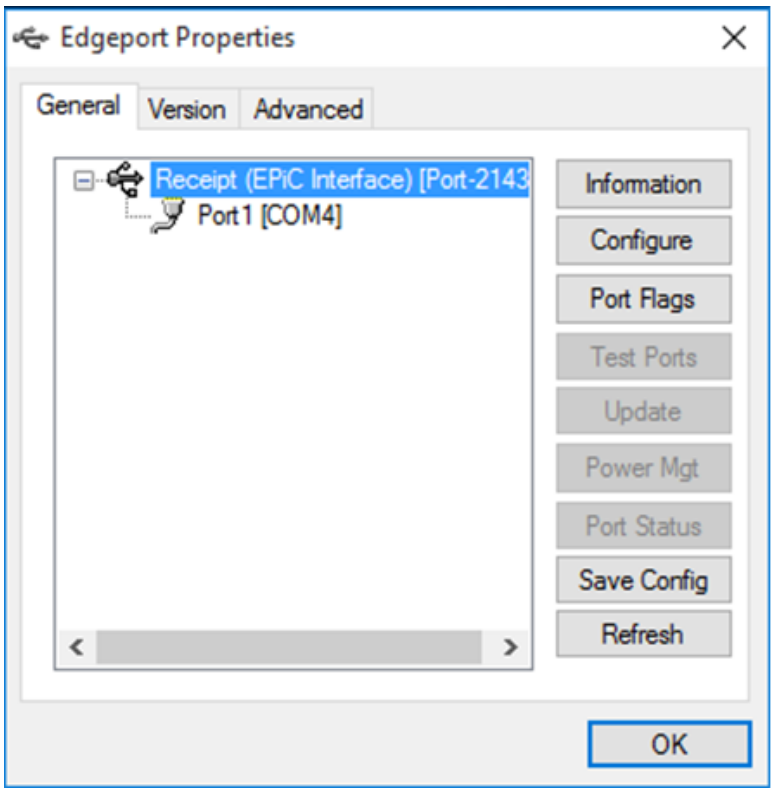
1. Open the Device Manager window.
2. Make sure that the *NCR 7197 Receipt Printer* and the *EPIC Port* are installed.

Note: The *NCR 7197 Receipt Printer* is the defined USB VID/PID (Vendor ID/Product ID) of the NCR Single Station printers (7197, 7198, and 7199).



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

3. Open the Edgeport utility and make sure the Port is assigned.



Uninstalling the Drivers

Windows XP

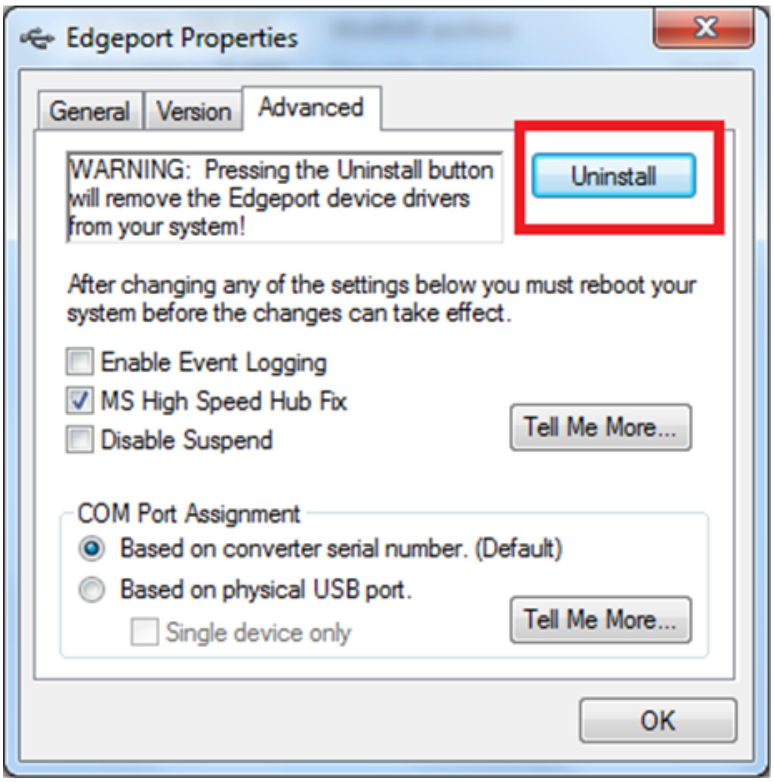
1. Open the Device Manager and make sure *View Devices by Type* is selected.
2. Scroll down to *Universal Serial Bus controllers*, and expand the list by pressing the **+** symbol. You should see two entries for your NCR printer.
3. Select the printer name and select **Properties**.
4. Select the **Details** tab, then press the **Details** button to start the Edgeport utility.
5. Select the **Advanced** tab.
6. Select the **Uninstall** button and follow the on-screen instructions.

Windows POS Ready 7

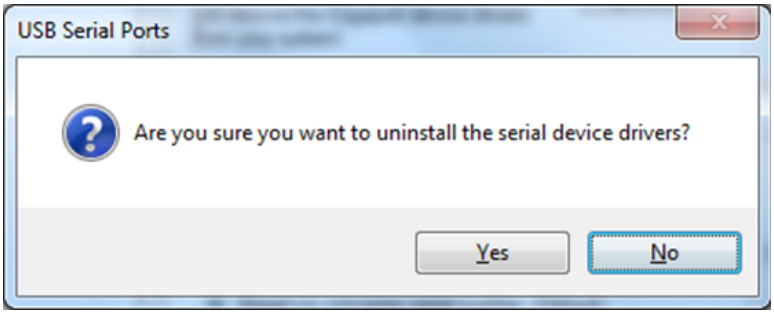
To uninstall the USB Virtual COM Port Driver on a Windows POS Ready 7 system, follow these steps:

1. Open the Edgeport utility.
2. Select the **Advanced** tab.

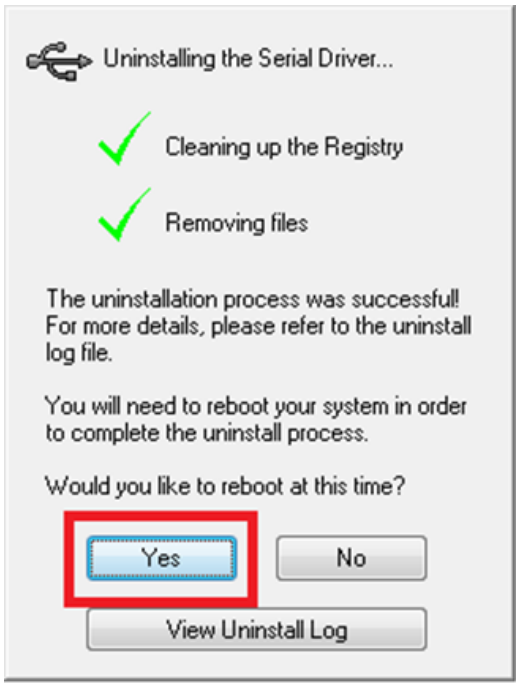
3. Select the **Uninstall** button, and then follow the on–screen instructions.



The following window is displayed.



4. Select **Yes**. The system uninstalls the driver, and then displays the following window.



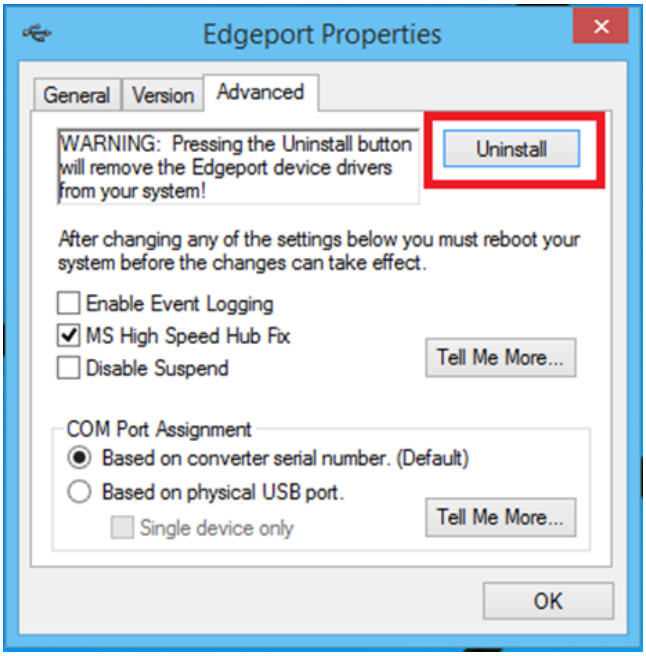
5. Select Yes to completely uninstall the driver and to restart the PC.

Windows 8

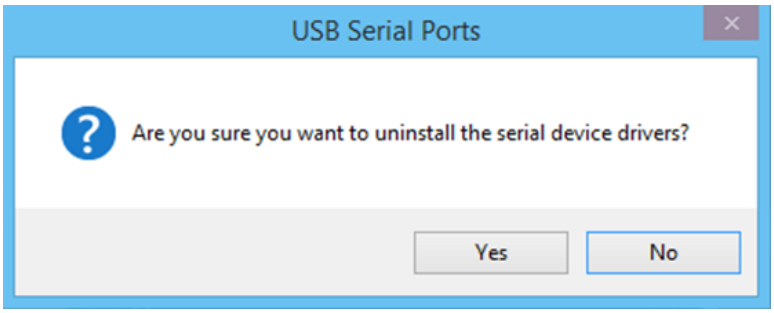
To uninstall the USB Virtual COM Port Driver on a Windows 8 system, follow these steps:

1. Open the Edgeport utility.
2. Select the **Advanced** tab.

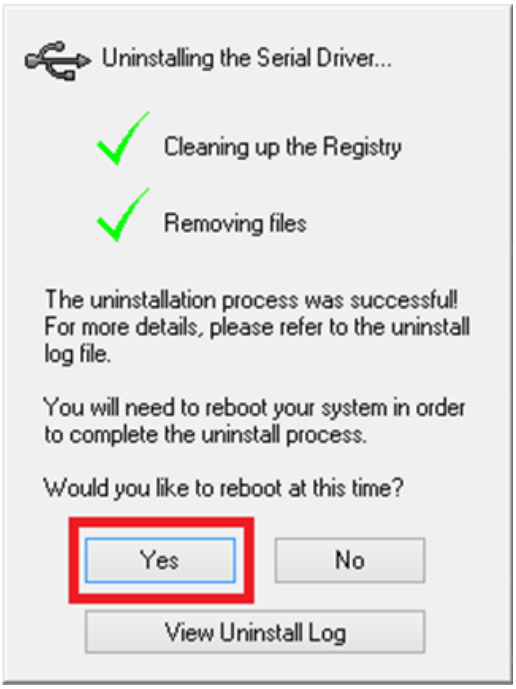
3. Select the **Uninstall** button, and then follow the on–screen instructions.



The following window is displayed.



4. Select **Yes**. The system uninstalls the driver, and then displays the following window.



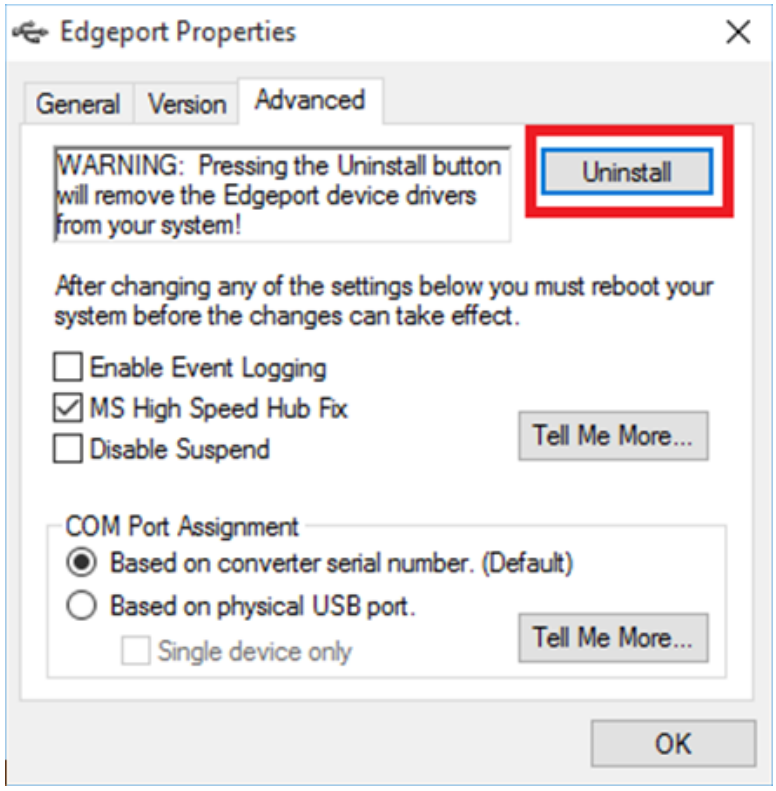
5. Select **Yes** to completely uninstall the driver and to restart the PC.

Windows 10

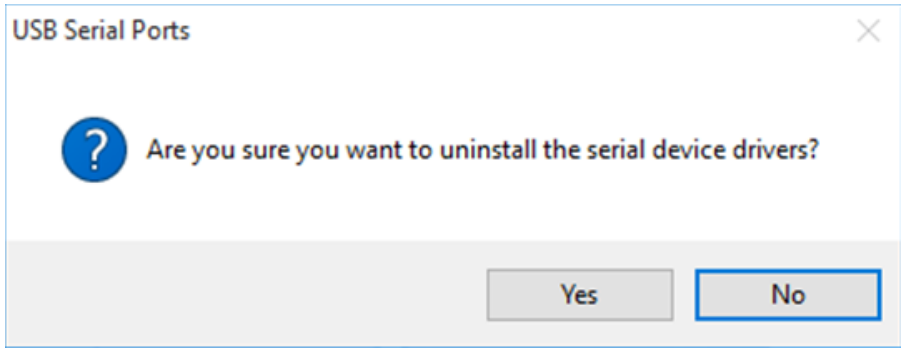
To uninstall the USB Virtual COM Port Driver on a Windows 8 system, follow these steps:

1. Open the Edgeport utility.
2. Select the **Advanced** tab.

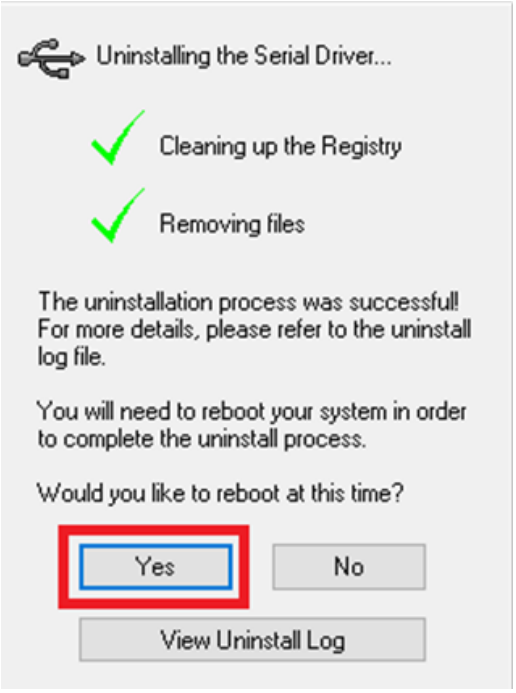
3. Select the **Uninstall** button, and then follow the on–screen instructions.



The following window is displayed.



4. Select **Yes**. The system uninstalls the driver, and then displays the following window.



5. Select **Yes** to completely uninstall the driver and to restart the PC.

Configuring Serial Port Number Assignments

This section described how the NCR USB solution assigns serial port numbers, for example, *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* below.

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 expected. To check the assigned serial port assignment, do the following:

1. Check the assigned serial port by selecting the *General* tab in the Edgeport utility. You see an entry for the NCR printer.
2. 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. Do the following:

1. From the General tab of the Edgeport utility, select the printer and then select **Configure**.
2. Follow the directions on the resulting form to assign a new port to the printer.

Using the Printer

Note: For instructions on setting the DIP switches, refer to *Setting Switches* on page 14.

1. Connect the power supply 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 *start up* cycle, it is ready to receive data.

Note: If the LED blinks, or the host computer indicates that there is a problem, refer to *Solving Problems* on page 61.

2. To perform an optional Configuration check, 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 once the printing begins.

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

Loading and Changing the Receipt Paper

These 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.

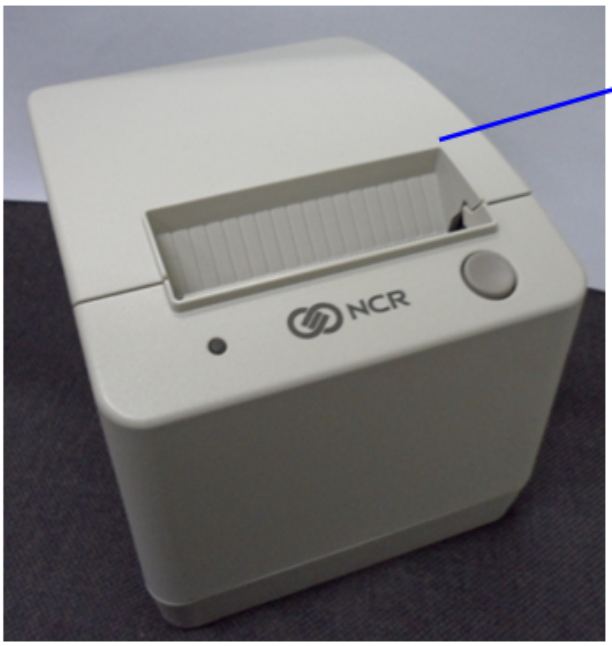
- **LED blinks (fast): the paper is out**

  Change the paper immediately or data may be lost.

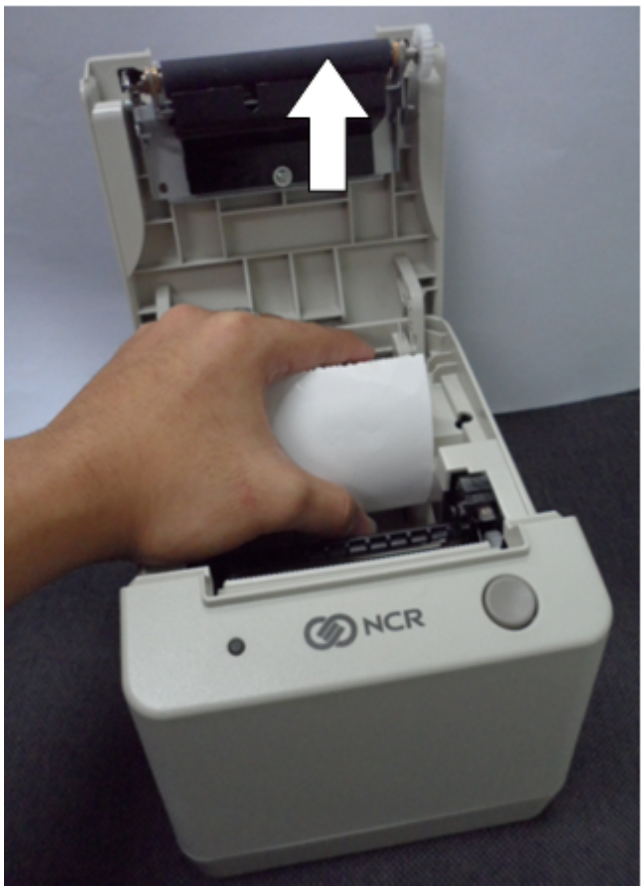
Caution: Do not operate the printer or host computer if the printer runs out of paper. The printer will not operate without paper, but it may continue to accept data from the host computer. Because the printer cannot print any transactions, the data may be lost.

Removing the Paper Roll

1. Open the receipt cover. Refer to the next two images for the illustrations on this step.



2. Remove the used roll.

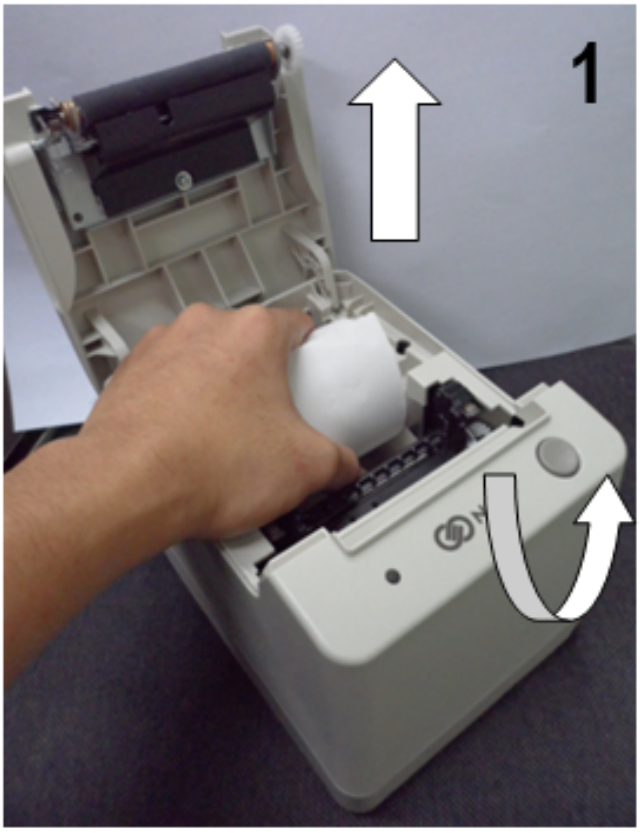


Loading the Paper Roll

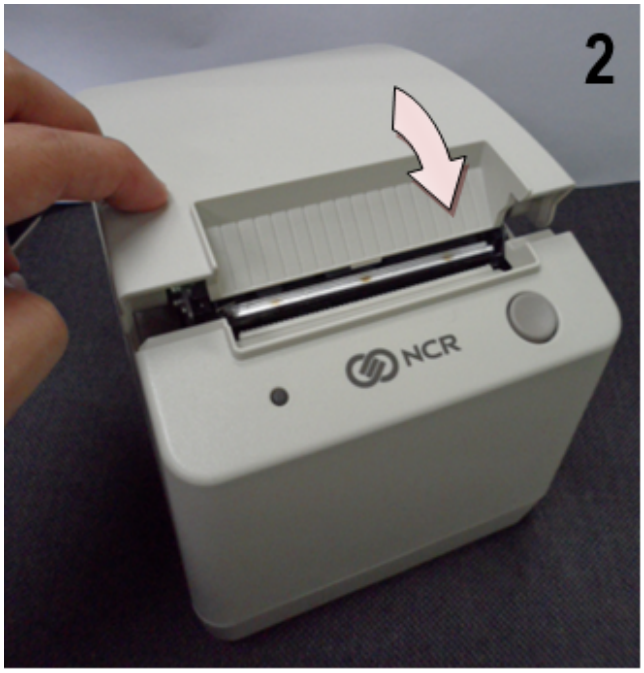
Note: Tear off the end of the new roll so that the edge is loose.

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

Note: Ensure 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.

Chapter 3: Solving Problems

The 7197 Series II printer is a simple, generally trouble-free printer. 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 in 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.

Note: 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. For more information, refer to *Contacting a Service Representative* on page 65.

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).	Refer to *Connecting the Cables* on page 15.
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.	Refer to *Ordering Other Supplies* on page 6.

Green LED Blinking (Slow)

Problem	What to Do	Where to Go
Receipt paper is low*	There are about **4.5 ± 3 meters** (15 ± 10 feet) of paper left. Change the paper soon to avoid running out of paper part way through a transaction.	Refer to *Loading and Changing the Receipt Paper* on page 56.

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.	Refer to *Loading and Changing the Receipt Paper* on page 56.
Receipt cover is open	Close the cover. The printer will not operate with the cover open.	

Problem	What to Do	Where to Go
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.	Refer to *Contacting a Service Representative* on page 65.
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. Contact a service representative if this does not resolve the problem.	Refer to *Contacting a Service Representative* on page 65.
Thermal print head temperature is out of range	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. If the temperature of the print head is too hot, adjust the room temperature or move the printer to a cooler location. If the print head is overheating because of printing high density graphics continuously, reduce the demand on the printer. If the printer continues to overheat, contact a service representative.	Refer to *Environmental Conditions* on page 293 for the recommended temperature range for operating the printer. If the printer continues to overheat, Refer to *Contacting a Service Representative* on page 65.

Problem	What to Do	Where to Go
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.	Refer to *Contacting a Service Representative* on the facing page.

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. **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.	Refer to *Cleaning the Printer* on page 8. Refer to *Contacting a Service Representative* on the facing page.
	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 Receipt Paper* on page 5 for the recommended paper.	

Other Serious Problems

The following problems all need to be corrected by a qualified service representative. Refer to *Contacting a Service Representative* below.

- Printer will not cycle or stop when required
- Illegible characters
- Paper will not feed
- Knife will not cycle or cut
- 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 guide listed below, other service–related materials may be available. Contact your NCR–authorized service representative to obtain the service guide.

- *7197 Series II Thermal Receipt Printer: Service Manual* (B005-000-2069) (includes the *Troubleshooting Guide and the Preventative Maintenance Guide*)
- *7197 Series II Thermal Receipt Printer: Parts Identification Manual* (B005-000-2070)
- *7197 Series II Thermal Receipt Printer: Owners Manual* (B005-000-2068)

Chapter 4: Diagnostics

The following diagnostic tests are available for the 7197 Series II:

- **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)**—enables the printer to check the status of these conditions during normal operation.
- **Level 3 Diagnostics (Remote)**—enables the printer to keep 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 flashes once if this action succeeds.

Note: Level 0 diagnostics stop if this action fails. Failure is indicated by the printer going dead: knife and slip print head do not home, the platen does not open, LEDs are not lit, and the printer is unable to communicate with the host computer.

- Knife 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 diagnostics. These values can be changed in level 1 diagnostics. Refer to *Level 1 Diagnostics* on the facing page 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

Use the Level 1 diagnostics or setup mode to change the settings for various printer functions and run certain tests. When changing the settings, keep the following information in mind:

- 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. Refer to *Contacting a Service Representative* on page 65.

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, when communication baud rate 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:

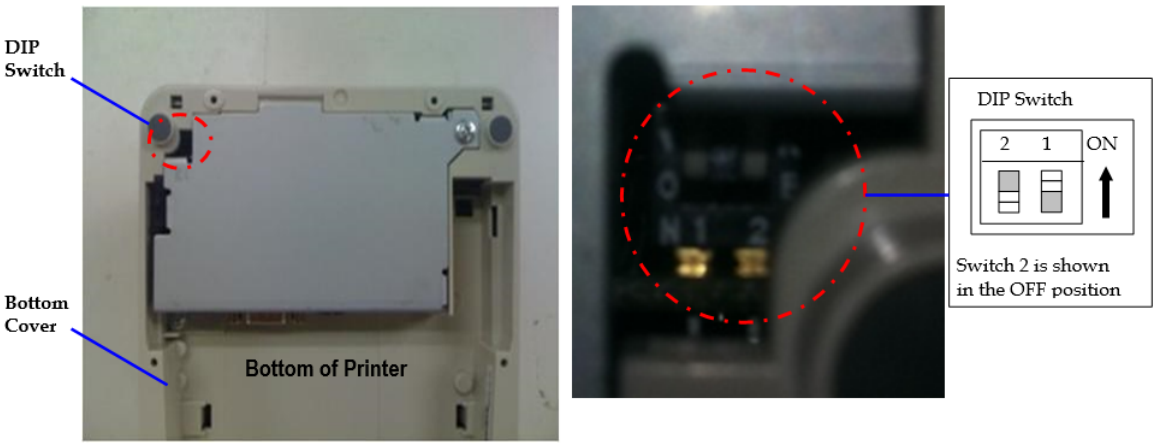
- Setting Communication Interface
- Interface Type
- Ethernet RTC Protocol(Ethernet model only)
- Baud Rate (RS232/USB model only)
- Data Bits
- Stop Bits
- Parity
- Flow Control
- Reception Errors
- Receive Buffer
- DSR Signal

- USB Type
- Setting Diagnostic Modes
- Setting Emulation/Software Options
- Printer Emulation
- Printer ID Mode
- Default Lines Per Inch
- Carriage Return Usage
- Asian Mode
- Receipt Synchronization
- PDF417 Max Columns
- Auto Reset
- Font Type
- Compatible Barcode Length
- Compress Pitch
- Setting Hardware Options
- Receipt Print Mode
- Print Density
- Power On Head Failure Detection
- Maximun Power Options
- Paper Low Sensor
- Paper Width
- Knife Option
- Color Paper Option
- Power LED Control
- Standby mode
- Shift to Power-off
- Setting Default Code Page
- Setting EEPROM to default settings

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:
   - Switch 1 to **On**.
   - Switch 2 to **Off**.
2. Reset the printer while holding the Paper Feed button. The printer will print the current configuration, then cuts the paper to print the Configuration Menu.

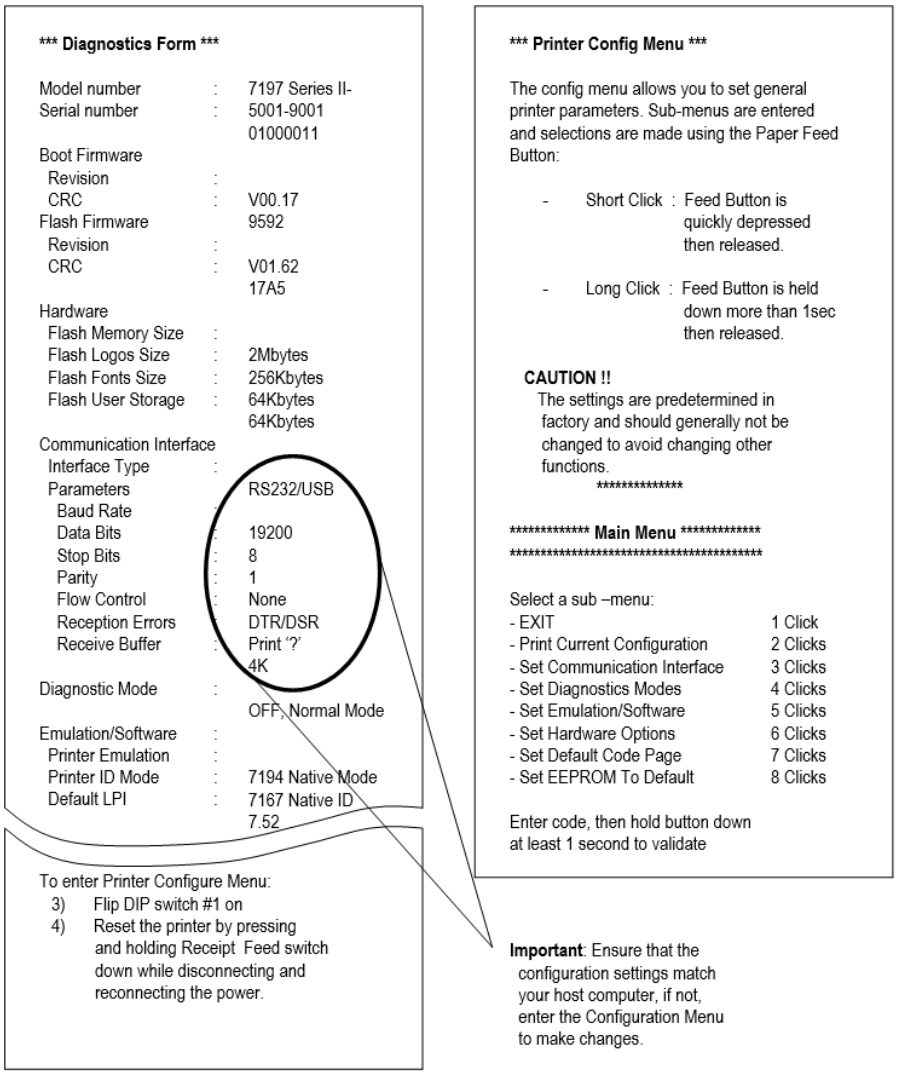
3. Press the paper feed for the configuration you want.

Note: Defaults are marked with asterisk (*).

```
******** Main Menu ********
*******************************
For Standard Model
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

For Ethernet  Model
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
   - Set Ethernet-info To Default      -> 9 Clicks

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



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

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

Note: 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, and *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

Use the Configuration Menu to set the printer to use an RS-232C serial port. Refer to *Configuring the Printer* on page 71 for more information on how to enter the Configuration Menu.

RS-232C/USB Interface Settings [Standard Model]

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

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

To configure the communications settings, press the paper feed button. Default values 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 Options       -> 5 Clicks
   Enter code, then hold Button DOWN
   At least 1 second to validate

      9600 Baud    -> 1 Click
      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


** SET RECEIVE BUFFER SIZE ?
  YES   -> Long Click
  NO    -> Short Click

  4K Bytes *  -> 1 Click
  One Line    -> 2 Clicks
  8K Bytes    -> 3 Clicks
  12K Bytes   -> 4 Clicks
  Enter code, then hold Button DOWN
  At least 1 second to validate

** SET DSR IGNORE FUNCTION?
  YES   -> Long Click
  NO    -> Short Click

  DR Enabled*       -> Long Click
  DR Disabled       -> Short Click


** SET USB INTERFACE TYPE ?
  YES   -> Long Click
  NO    -> Short Click

  ION (EpiC)*       -> 1 Click
  NonION (NHPI)*    -> 2 Clicks
  NonION (PRTR)     -> 3 Clicks
  Enter code, then hold Button DOWN
  At least 1 second to validate
```

Ethernet Interface Settings [Standard Model]

```
** Ethernet RTC Protocol OPTION ?
  YES   -> Long Click
  NO    -> Short Click

  TCP*  -> Long Click
  UDP   -> 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.

```
** SET RECEIVE BUFFER SIZE ?
  YES   -> Long Click
  NO    -> Short Click

  4K Bytes *  -> 1 Click
  One Line    -> 2 Clicks
  8K Bytes    -> 3 Clicks
  12K Bytes   -> 4 Clicks
  Enter code, then hold Button DOWN
  At least 1 second to validate
```

Save Parameters

This function allows saving 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**—the normal operating mode of the printer.
- **Datascope Mode**—the receipt printer prints incoming commands and data in hexadecimal format.
- **Receipt Test Mode**—the receipt printer prints two code pages.

The diagnostic modes are enabled or disabled by using the Configuration Menu. Refer to *Configuring the Printer* on page 71 for instructions on how to enter the Configuration Menu.

Note: To select a diagnostic mode, press the Paper Feed button.

```
** 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
```

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, follow these steps:

1. After enabling the Datascope 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 numbers as shown below.

```
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, follow these steps:

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.

Receipt Test Mode

To run the Receipt Test Mode, follow these steps:

1. Enable the Receipt Test Mode through the Configuration Menu. Refer to *Configuring the Printer* on page 71 for instructions on how to enter the Configuration Menu.

2. Push the Paper Feed Button and the receipt station will print all code pages. The test ends with a cut.

Note: Perform step 2 again to repeat the test.

To exit the Receipt Test Mode, follow these steps:

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

Note: 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.

- To select an option, press the Paper Feed button.

```
Save new parameters ?
YES                -> Long Click
NO, MODIFY         -> Short Click
```

Emulation/Software Options

Use the Emulation/Software menu for the following printer settings:

- Printer's emulation
- ID mode
- Lines per inch
- Carriage return usage
- Asian mode
- Receipt synchronization
- Sync configuration
- User Defined Area
- PDF417 max column print
- Auto reset
- Font type
- Compatibility barcode length
- Compress pitch CMD
- Model in 4610 emulation

For more information, refer to *Configuring the Printer* on page 71. To select an Emulation/Software setting, press the Paper Feed button. The number of clicks confirms the setting.

Note: Default settings are marked with asterisk (*).

Printer Emulation

This function determines the commands that are available to the printer.

To set an emulation, press the Paper Feed Button.

```
** SET PRINTER EMULATION ?
YES     -> Long Click
NO      -> Short Click

 7194 Mode*         -> 1 Click
 7193 Mode          -> 2 Clicks
 7197 Native Mode   -> 3 Clicks

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

Printer ID Mode

This function determines which printer ID is currently effective to the printer.

To select a printer ID, press the Paper Feed Button.

```
** SET PRINTER ID MODE ?
YES     -> Long Click
NO      -> Short Click

 7194 Native ID*          -> 1 Click
 Emulated Printer ID      -> 2 Clicks
 7197 Series II Native ID       -> 3 Clicks

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

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.

To select the lines per inch, press the Paper Feed Button.

```
** 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
```

Carriage Return Usage

This function allows the printer to ignore or use the Carriage Return (hexadecimal 0D) command depending on the application. Some applicatons expect the command to be ignored while others use the command as a print command.

To select a carriage return usage, press the Paper Feed Button.

```
** SET CARRIAGE RETURN USAGE ?
YES     -> Long Click
NO      -> Short Click

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

Asian Mode

This function permits user to select an Asian character for the printer.

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

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
```

Receipt Synchronization

This function permits user to select whether to enable or to disable receipt synchronization printing.

The following commands are the buffered status command:

```
1B 75 0 Transmit Peripheral Device Status
1B 76 Transmit Printer Status
1D 49 n Transmit Printer ID
1D 72 Transmit Status
```

- For Mode1 and Mode2, the command/status sequence is completely the same. The only difference is the printing speed.
  - The printing speed of Mode1 is same as normal printing (max. 12 ips).
  - The printing speed of Mode2 is 4 ips (max) in order to prevent the clatter print in the synchronized line mode.
- When Mode3 is selected, the following command will be available. For more information, refer to *Specifications* on page 289.

```
1F 0A n Get Print Completion
```

Note: When *Receipt synchronization* is disabled, printer returns the status for buffered status command immediately after decoding the status command.

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

To select the receipt synchronization, press the Paper Feed Button.

```
** SET RECEIPT SYNCHRONIZATION ?
YES     -> Long Click
NO      -> Short Click

Enable Receipt Sync (Mode1)     -> 1 Click
Enable Receipt Sync (Mode2)     -> 2 Clicks
Enable Receipt Sync (Mode3)     -> 3 Clicks
Disable Receipt Sync            -> 4 Clicks

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

Ignore Sync Configuration

This function permits user to enable or disable the sync configuration of the printer.

To select the Ignore Sync Configuration, press the Paper Feed Button.

```
** SET IGNORE SYNC CONFIGURATION?
YES      -> Long Click
NO       -> Short Click


Disable*       -> 1 Click
Enable         -> 2 Clicks
Enter code, then hold Button DOWN
At least 1 second to validate
```

Clear User Defined Area

This function permits user to reset the area defined, data storage or both.

To select Clear User Defined Area, press the Paper Feed Button.

```
** CLEAR USER DEFINED AREA?
YES      -> Long Click
NO       -> Short Click


Clear User Defined Area*  -> 1 Click
Clear User Data Storage   -> 2 Clicks
Clear Both Area           -> 3 Clicks
Cancel                    -> 4 Clicks

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

PDF417 Max Column Print

This function permits user to select the print columns for the PDF417 bar code printing. The selections are 9 or 14 columns. The end result is the height of the bar code printing. The default setting is 9 columns.

Note: RS485 does not support this function.

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

To select the pdf417 max column print, press the Paper Feed Button.

```
** SET PDF417 MAX COLUMN PRINT ?
YES      -> Long Click
NO       -> Short Click

9 Columns            -> 1 Click
14 Columns           -> 2 Clicks

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

Auto Reset

Set Auto Reset using the configuration menu.

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

To select the platen waiting time, press the Paper Feed Button.

```
** SET AUTO RESET ?

YES      -> Long Click
NO       -> Short Click

Disable *      -> 1 Click
10 Sec         -> 2 Clicks
20 Sec         -> 3 Clicks
30 Sec         -> 4 Clicks
40 Sec         -> 5 Clicks
50 Sec         -> 6 Clicks
60 Sec         -> 7 Clicks

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

Font Type

Set Font Type using the configuration menu.

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

To select the font type, press the Paper Feed Button.

```
** SET FONT TYPE ?
YES      -> Long Click
NO       -> Short Click

Font 1*        -> 1 Click
Font 2         -> 2 Clicks

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

Compatibility Barcode Length

Set Compatibility Barcode Length using the configuration menu.

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

To select the compatibility bar code length, press the Paper Feed Button.

```
** SET COMPATIBILITY BARCODE LENGTH?
YES      -> Long Click
NO       -> Short Click

Disable        -> 1 Click
Enable*        -> 2 Clicks
Enter code, then hold Button DOWN
At least 1 second to validate
```

Compress Pitch

Set Compress Pitch command using the configuration menu.

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

To select the compress pitch cmd, press the Paper Feed Button.

```
** SET COMPRESS PITCH CMD?
YES      -> Long Click
NO       -> Short Click

Enable *       -> Long Click
Ignore         -> Short Click
Enter code, then hold Button DOWN
At least 1 second to validate
```

Model in 4610 Emulation

This function permits user to set model in 4610 emulation.

To select the Model in 4610 Emulation, press the Paper Feed Button.

```
** SET IGNORE SYNC CONFIGURATION?
YES      -> Long Click
NO       -> Short Click

T14 Model*     -> 1 Click
T19 Model      -> 2 Clicks
2CR Model      -> 3 Clicks
Enter code, then hold Button DOWN
At least 1 second to validate
```

Save Parameters

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

To select an option, press the Paper Feed Button.

```
Save new parameters ?
YES            -> Long Click
NO, MODIFY     -> Short Click
```

Hardware Options

Receipt Print Mode

Set the receipt print mode using the configuration menu. Select Hardware Options in the Configuration Menu and answer the questions printed on the receipt.

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 select the receipt print mode, press the Paper Feed Button.

```
** SET RECEIPT PRINT MODE ?
YES      -> Long Click
NO       -> Short Click

High Speed Print*   -> Long Click
High Quality Print  -> Short Click

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

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.

To select the print density, press the Paper Feed Button.

```
** SET PRINT DENSITY ?
YES      -> Long Click
NO       -> Short Click

-11 ~ -15           -> 1 Click
-6 ~ -10            -> 2 Clicks
-1 ~ -5             -> 3 Clicks
0*                  -> 4 Clicks
+1 ~ +5             -> 5 Clicks
+6 ~ +10            -> 6 Clicks
+11 ~ +15           -> 7 Clicks

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

If 1 click was selected, it is printed as follows.
-11                 -> 1 Click
-12                 -> 2 Clicks
-13                 -> 3 Clicks
-14                 -> 4 Clicks
-15                 -> 5 Clicks

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

Power ON Head Failure Detection

This function permits user to enable or disable head failure detection.

To select the Power ON Head Failure Detection, press the Paper Feed Button.

```
** SET POWER ON HEAD FAILURE DETECTION?
YES      -> Long Click
NO       -> Short Click


On*      -> Long Click
Off      -> Short Click
```

Maximum Power

This function permits the user to set the maximum power for the printer to the available modes.

To select the maximum power, press the Paper Feed Button.

```
** SET MAX POWER ?
YES      -> Long Click
NO       -> Short Click

Term Pwr-High*            ->  1 Click
NCR 75W Ext Pwr           ->  2 Clicks
Term Pwr-Low              ->  3 Clicks
NCR 60W Ext Pwr           ->  4 Clicks
```

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

Paper Low Sensor

This function permits the user to enable or disable the paper low sensor for particular printer configurations.

To select the paper low sensor option, press the Paper Feed Button.

```
** SET PAPER LOW SENSOR OPTION ?
YES      -> Long Click
NO       -> Short Click

Enable PLSensor*     -> Long Click
Disable PLSensor     -> Short Click
```

Paper Width

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

To select the paper width, press the Paper Feed Button.

```
** 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
```

Set Knife Option

Set the Knife option using the configuration menu.

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

To select the knife option, press the Paper Feed Button.

```
** SET KNIFE OPTION ?
YES      -> Long Click
NO       -> Short Click

Enable Knife *                        -> 1 Click
Disable Knife                         -> 2 Clicks
Enable Knife with Buzzer (Low)        -> 3 Clicks
Enable Knife with Buzzer (High)       -> 4 Clicks

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

Color Paper Option

This function permits the user to set the color paper option to Monochrome or Color Paper.

To select the color paper option, press the Paper Feed Button.

```
** 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.

Power LED Control

Set the power LED control 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 select the Power LED Control option, press the Paper Feed Button.

```
** SET POWER LED CONTROL ?
YES      -> Long Click
NO       -> Short Click

Disable Control*     -> Long Click
Enable Control       -> Short Click
```

Shift to Standby

Enable or disable the standby mode using the configuration menu. If the standby mode is enabled, the printer shifts to the standby mode to save the power consumption in the idle mode when the printer is in the idle mode. As soon as standby mode is entered, the LED on the slip station is turned off.

The printer exits from standby mode to normal mode in the following situations:

- Printer receives any data
- Feed key is pressed
- Slip cover is opened / closed
- Receipt cover is opened / closed

Note: Flip cover open/close will not affect the standby mode.

After power-on, it will go to standby mode if it does not receive any transaction data in 60 seconds.

After one transaction, it will go to standby mode if it does not receive any transaction data in 1 second.

In disable setting, the printer does not shift to the standby mode. When going back from the standby mode, the response of the printer will be slightly delayed compared to the normal mode response.

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

To select the standby mode option, press the Paper Feed Button.

```
** SET  STANDBY MODE ?
YES     -> Long Click
NO      -> Short Click

Enable        -> Long Click
Disable *     -> Short Click
```

Shift Time To Power Off

Set the Shift Time to Power Off using the configuration menu. If the printer is in standby mode for the time that is defined by this setting, the printer automatically powers off. As soon as power off mode is entered, all LED lights are turned off. If the feed key is pressed, the printer exits from power off mode and enters normal mode.

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

To select the shift time option, press the Paper Feed Button.

```
** SET SHIFT TIME TO POWER OFF ?
YES     -> Long Click
NO      -> Short Click

Enabled (60min)           -> 1 Click
Enabled (120min)          -> 2 Clicks
Enabled (180min)          -> 3 Clicks
Enabled (240min)          -> 4 Clicks
Enabled (300min)          -> 5 Clicks
Disabled*                 -> 6 Clicks

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

Wi-Fi Date Sync Option

This option is only available for 7197 Wi-Fi printer. This permits user to sync the date to the Wi-Fi printer.

To select the Wi-Fi Date Sync Option press the Paper Feed Button.

```
** SET WIFI DATE SYNC OPTION?
YES     -> Long Click
NO      -> Short Click


No Validation*      -> 1 Click
SNTP Sync           -> 2 Clicks
Enter code, then hold Button DOWN
At least 1 second to validate
```

Save Parameters

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

To select an option, press the Paper Feed Button.

```
Save new parameters ?
YES           -> Long Click
NO, MODIFY    -> Short Click
```

Default Code Page

This function permits user to select the default code page.

The following are the code pages available for printing:

- Code page 437 (US English)
- Code page 850 (Multilingual)
- Code page 852 (Slavic)
- Code page 858 (with Euo 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 1256 (Windows Arabic)
- Code page Katakana
- Hungary
- Code page 866Mini
- Code page 932

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.

To select a code page option, press the Paper Feed Button.

```
** SET CODE PAGE ?
YES     -> Long Click
NO      -> Short Click
```

7158 Mode

```
Code Page 437*      -> 1 Click
Code Page 850       -> 2 Clicks
Code Page 852       -> 3 Clicks
Code Page 858       -> 4 Clicks
More                -> 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                -> 5 Clicks
Enter code, then hold Button DOWN
At least 1 second to validate

Code Page 865       -> 1 Click
Code Page 866       -> 2 Clicks
Code Page 874       -> 3 Clicks
Code Page 1252      -> 4 Clicks
More                -> 5 Clicks
Enter code, then hold Button DOWN
At least 1 second to validate

Code Page 1256      -> 1 Click
Code Page Katakana  -> 2 Clicks
Code Page Hungary   -> 3 Clicks
Code Page 866Mini   -> 4 Clicks
Code Page 932       -> 5 Clicks
Enter code, then hold Button DOWN
At least 1 second to validate
```

7156 Mode

```
Code Page 437*      -> 1 Click
Code Page 850       -> 2 Clicks
Enter code, then hold Button DOWN
At least 1 second to validate
```

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

Save Parameters

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

To select an option, press the Paper Feed Button.

```
Save new parameters ?
YES            -> Long Click
NO, MODIFY     -> Short Click
```

DHCP Mode

Set DIP switch 1 to ON, and DIP switch 2 to ON.

LAN Interface

Printer by default starts with DHCP address. *Get IP Address* will be *DHCP* in the Diagnostics Form. In the USB interface, this mode will be the same as online mode.

Note: Printer by default starts with Manual address in the online mode. *Get IP Address* will be *Manual* in the Diagnostics Form.

Mfg Adjustment

This selection provides Receipt Printing Test, only because adjustments are not necessary. To perform the printer test, use the Mfg Adjustment menu feature. This feature prints instructions on the receipt for selecting any type of print pattern needed.

Caution: Be extremely careful when changing any of the printer settings to avoid changing other settings that might affect 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 prints the current configuration, then cuts the paper to print the Mfg Adjustment Menu.

Note: If you do not hold the Paper Feed button while power up the printer, it goes to Online Mode.

This menu permits user to print different test patterns.

Selections are made using the Paper Feed button.

```
===== Vendor Adjustment Menu =====
Select a sub-menu:
-    EXIT                          -> 1 Click
-    Rolling ASCII Print Test      -> 2 Clicks
-    H Print Test                  -> 3 Clicks
-    Duty Check Print Test         -> 4 Clicks
-    Print Current Setting         -> 5 Clicks
-    Reset all EEPROM to Default   -> 6 Clicks
-    Ethernet-info to Default      -> 7 Clicks
Enter code then hold Button DOWN
at least 1 second to validate.
```

Note: This menu is only for the Ethernet model.

Rolling ASCII Print Test (Receipt)

This option permits users to run rolling ASCII printing test. The printer prints the resident character set in standard pitch continuously.

To start or stop the test, press the Paper Feed button.

```
** START ROLLING ASCII PRINT TEST?
Return Main Menu          -> Short Click
Start test                -> Long Click
```

Follow these steps:

1. Enter a short click to return to the Mfg Adjustment Menu.
2. Enter a long click to begin the Rolling ASCII Print Test.

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

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

H print test (Receipt)

This option permits users to run H printing test. The printer prints the *H* character in standard pitch continuously.

To start or stop the test, press the Paper Feed button.

```
** START H PRINT TEST?
Return Main Menu          -> Short Click
Start test                -> Long Click
```

Follow these steps:

1. Enter a short click to return to the Mfg Adjustment Menu.
2. Enter a long click to begin the H Print Test.

```
000000001
HHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHH
HHHHHHHHHHH
HHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHH
HHHHHHHHHHH
HHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHH
HHHHHHHHHHH
HHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHH
HHHHHHHHHHH
HHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHH
HHHHHHHHHHH
HHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHH
HHHHHHHHHHH
HHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHH
HHHHHHHHHHH
```

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

Duty check print test (Receipt)

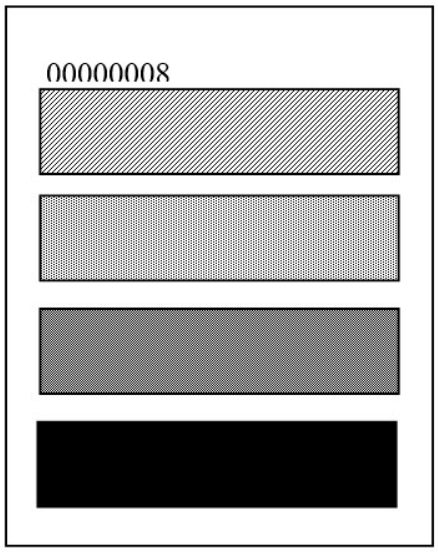
This option permits users to run duty check printing test. The printer prints the 12.5%, 25%, 50%, and 100% duty original pattern.

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
```

Follow these steps:

1. Enter a short click to return to the Mfg Adjustment Menu.
2. Enter a long click to begin the Duty Check Print Test.



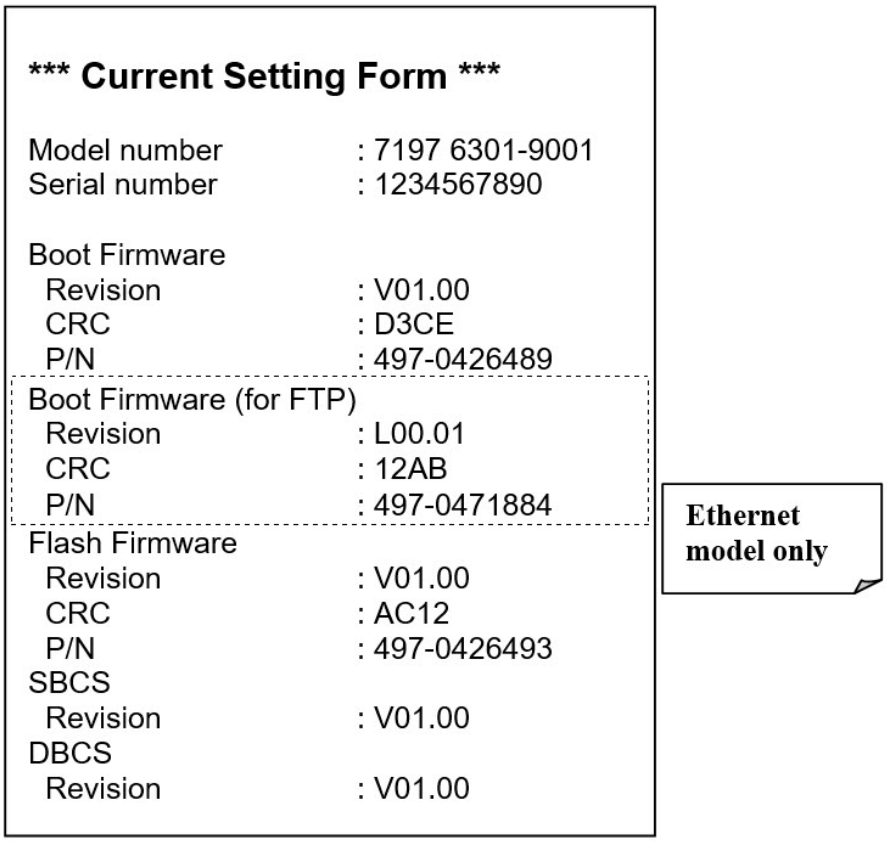

```
For Duty Check Print
Stop and exit test              -> Short Click
Continue Duty Check Print       -> Long Click
```

Print Current Setting

This option permits users to print the current setting on a receipt.

To start the test, press the Paper Feed button.

```
** START CURRENT SETTING PRINTING?
Return Main Menu          -> Short Click
Start Printing            -> Long Click
```



EEPROM to Default Setting

This selection resets the configuration and clears all input data to the default settings.

Caution: Do not perform this selection unless you want to clear all details in EEPROM to default value. Be extremely careful in 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
```

Ethernet-info to Default Setting

This selection resets the configuration to the default settings (Ethernet information).

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

When this setting is executed, the below values are cleared.

```
** RESET ETHERNET-INFO TO DEFAULT VALUE
YES                  -> Long Click
NO                   -> Short Click
```

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.

Note: The printer 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

Refer to *7197 Series II Thermal Receipt Printer: Service Manual* (B005-000-2069) for more information about other conditions that may occur and how to correct them.

Status	LED Behavior
Power Off	Off
Firmware Download	Fast Blink
Level 0 Diagnostics	Fast Blink
Paper Low	Slow Blink
Temperature Error	Fast Blink
Voltage Error	Fast Blink
Cover Open	Fast Blink
Paper Out	Fast Blink
Knife Jam	Fast Blink, then Slow 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.

- Serial number
- Model number
- CRC number
- Number of lines printed
- Number of knife cuts
- 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 7197 Series II Standard Model 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.

The host and the printer are able to communicate only when the interface parameters are matched and the proper protocol is used. Refer to *RS-232C Interface (Standard Model)* on page 107 for a description of the protocol associated with the RS-232C interface.

The 7197 Series II Ethernet Model supports the Ethernet communication 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 following command 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:

```
COPY CON: COM1:
```

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, the following command sends the hexadecimal number 0A to the printer, which causes the printer to print the contents of its print buffer:

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

Previously sent commands tell the printer exactly how this data should appear on the paper. For example, this command sends the Hex numbers 12 41 42 43 0A to the printer:

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

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). The communication link that the BASIC program outputs to must be matched to that of the printer.

RS-232C Interface (Standard Model)

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 7197 Series II offers the standard options which are selectable in the Diagnostic mode. Refer to *Diagnostics* on page 67.

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 following 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	1.2 seconds
20	40	2.8 seconds	2.4 seconds	2.4 seconds
44	20	1.88 seconds	1.44 seconds	1.2 seconds
44	40	3.76 seconds	2.88 seconds	2.4 seconds

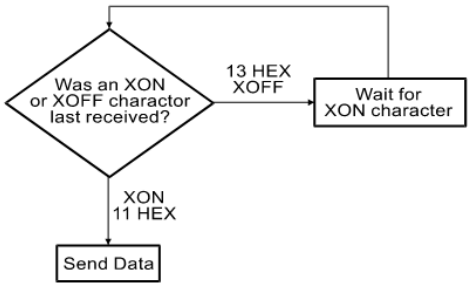
The following table shows that with no delay between lines, the transmit time is much less than the print time, allowing the printer to print at full speed.

Char./Line	Lines/Receipt	Transmit Time: (9600 Baud)	Transmit Time: (19.2 K Baud)	Print Time
20	20	0.4 seconds	0.2 seconds	1.2 seconds
20	40	0.8 seconds	0.4 seconds	2.4 seconds
44	20	0.88 seconds	0.44 seconds	1.2 seconds
44	40	1.76 seconds	0.88 seconds	2.4 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 monitors the communication link as shown in the following flowchart in order to send data at the appropriate times.

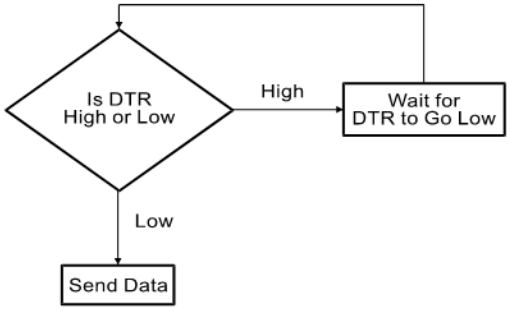
If XON/XOFF has been selected, the printer also toggles the DTR signal, as described in the next section, but it does not look at the DSR signal to transmit data.




```
XON character = Hex 11.
XOFF character = Hex 13.
```

DTR/DSR Protocol

The DTR signal is used to control data transmission to the printer. The signal is driven low when the printer is ready to recieve 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 can be selected in the Diagnostic mode. Refer to *Diagnostics* on page 67 for the position of the DIP switches. The RS-232C parameters must match the host parameters.

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

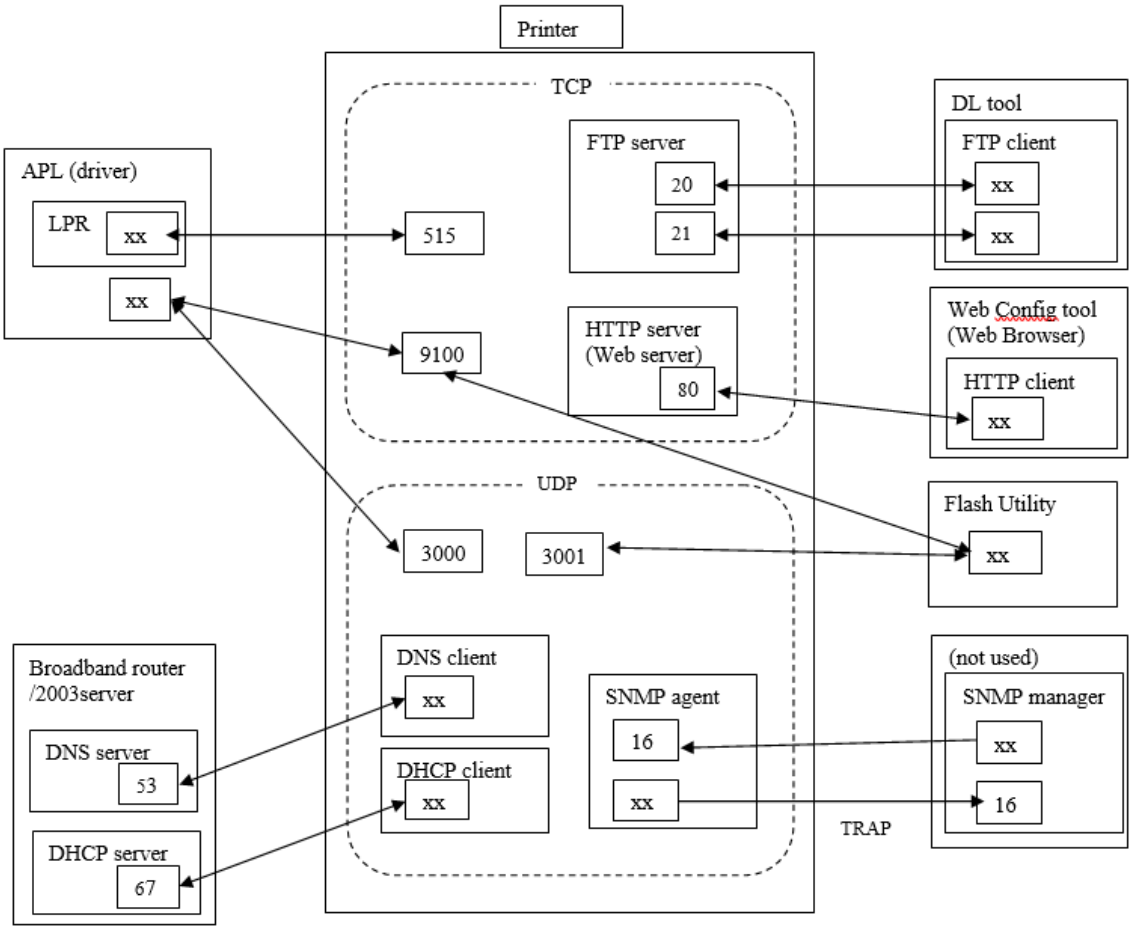
Ethernet Interface (Ethernet Model)

The Ethernet interface uses either `10BASE-t` or `100BASE-TX` protocol. The Ethernet version of the 7197 Series II offers the web configuration which configure the ethernet settings via Internet browser. Refer to *Communication Interface Modes* on page 74.

Protocol

Protocol			
- Physical layer		10BASE-t, 100BASE-TX (IEEE802.3 Conforming) Auto negotiation 10/100Mbps Full/Half Duplex	
- Data link layer		CSMA/CD	
- Network layer		IP, ICMP, ARP	
- Transport layer		TCP, IP	
- Application layer			
	- TCP SOCKET	Number of simultaneous sessions (Number of connections that can print)	1
	TCP (RAW)	Port type	TCP communication port for direct printing
		Port number	9100 (Default)
		Maximum simultaneous connections	3 clients
		Time out	120 seconds
	TCP (LPR)	Port type	TCP communication port by LPR
		Port number	515
		Maximum simultaneous connections	1 client
		Time out	120 seconds
	- UDP SOCKET	Number of simultaneous sessions	1
		Port type	UDP communication port for Real Time Command
		Port number	3000 (Default)
		Maximum simultaneous connections	1 client
	- SNMP Agent	SNMP version	SNMP v1 (RFC1157) compliant
		Transport protocol	UDP/IP
		MIB support	Part of MIB-II (RFC1213) Part of HOST Resource MIB Part of Printer MIB
		PDU support	Get Request Get Next Request Set RequestGet Response Trap
		Port number of Server	161
		Port number for Trap transmit	162
	- DHCP Client	Transport protocol	UDP/IP
		Items to acquire	IP address Subnet mask Gateway address
	- WEB Printer	HTTP version	1.1
		Transport protocol	TCP/IP
		Item that can be inspected/ changed	(Item concerning Ethernet) - IP address - Subnet mask - Default gateway - Get IP address - Community name1 Refer to the *Setting value* table.
Network Interface		Number of port	1
		Ethernet	10BASE-T, 100BASE-TX
		Connector	RJ45

Ethernet Connection Port



TCP Socket Communication

Communication Procedure

The TCP socket is used to send commands and data related to printing. The socket is also used to send and receive the batch status commands and its statuses.

When *Ethernet RTC Protocol* setting is TCP, it is used by sending and receiving of Real Time Command.

1. Client PC connects to the TCP socket via the defined port number of the printer.
2. Client PC transmits the commands and the data of the printer.
3. When the printer receives the batch status command, the response is transmitted to client PC.

UDP Socket Communication

The UDP socket is used to retrieve the printer information (e.g. printer status) immediately. This is effective in UDP port 3000 when *Ethernet RTC Protocol* setting is UDP.

1. Client PC connects to the UDP socket via the defined port number of the printer.
2. Client PC sends the status command and receives the status from the printe via UDP socket.

Multiple Connection

It is possible to connect with multiple clients at the same time. However, if the first connection doesn't finish, the next connection cannot transmit data to the printer by the session. It is possible to connect it with 4 connections—three for TCP(RAW) and one for TCP(LPR) at the same time. However, more than 5 connections will be rejected.

.

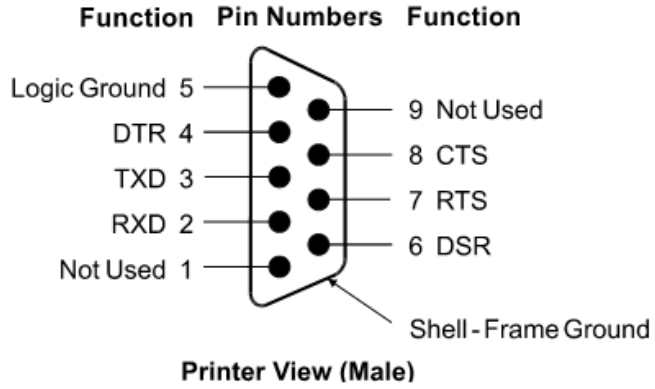
WiFi Interface (WiFi Model)

Protocol			
- **Physical layer**		2.4GHz single band IEEE 802.11 b/g/n, TCP/IP v4	
- **Data link layer**		CSMA/CD	
- **Network layer**		IP, ICMP, ARP	
- **Transport layer**		TCP, UDP	
- **Application layer**			
	- **TCP SOCKET**	Number of simultaneous sessions (Number of connections that can print)	1
	TCP (RAW)	Port type	TCP communication port for direct printing
		Port number	9100 (Default)
		Maximum simultaneous connections	1 clients
	- **UDP SOCKET**	Number of simultaneous sessions	1
		Port type	UDP communication port for Real Time Command
		Port number	3000 (Default)
		Maximum simultaneous connections	8 clients
	- **DHCP Client**	Transport protocol	UDP/IP
		Items to acquire	IP address Subnet mask Gateway address
	- **DHCP Server**	Items to acquire	IP address Subnet mask Gateway address
		Maximum IP can provide	32 clients

Connector

RS 232 Connector

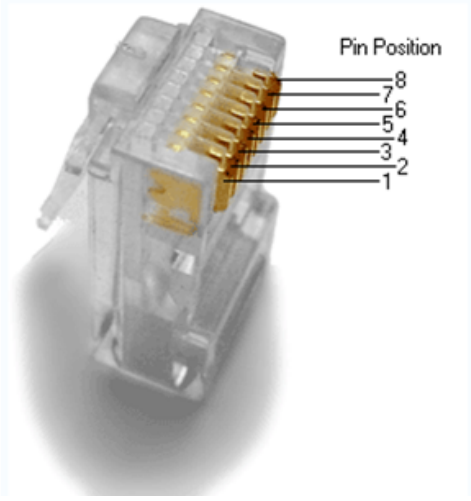
The illustration shows the RS-232C communication connector and pin assignments. The connector is a 9-pin male D-shell connector and is located in the hollow cavity under the printer at the rear.



Ethernet Connector

The Ethernet I/F connector is a 8P8C modular connector, usually called RJ45, with the following pin assignments:

- Pin Position 1 – TX+
- Pin Position 2 – TX-
- Pin Position 3 – RX+
- Pin Position 6 – RX-



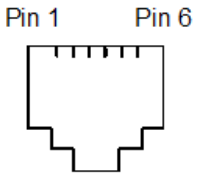
Power Cable Connector

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

The following illustration shows the pin out designation for the cash drawer connectors.



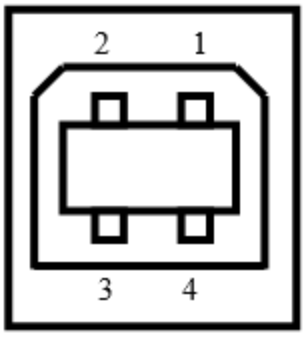
The following table provides the pinout assignments for cash drawers one and two. The cash drawer connectors are located at the rear of the printer.

Pin Number	Cash Drawer 1 Connector	Cash Drawer 2 Connector (Optional)
1	Frame Ground	Frame Ground
2	Drawer 1 Solenoid	Drawer 2 Solenoid (Optional by jumper: J13--2 to J14-2)
3	Drawer 1 Status Switch	Drawer 2 Status Switch
4	+24 Volts (to Solenoid +)	+24 Volts (to Solenoid+)
5	Drawer 2 Solenoid	Drawer 2 Solenoid
6	Ground (Status Switch Return)	Ground (Status Switch Return)

Note: For Cash Drawer 2, use the cash drawer Y-cable (1416-C372-0006).

USB Connector

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

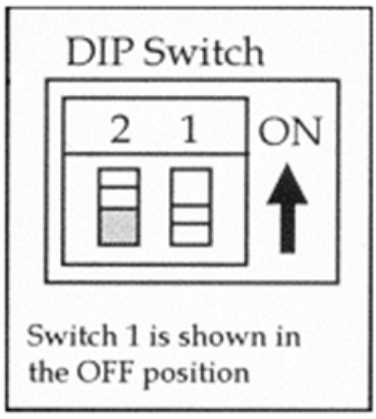


Pin No	Signal
1	+5 V – USB
2	Data -
3	Data +
4	Ground

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* on page 69. The switches are used to put the printer into various modes for printer configuration set up.

Printer End View



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

Set the switches to the expected settings shown in the table.

Caution: Do not set switch 1 to *On*. Setting switch 1 to *On* puts the printer in level 1 diagnostics (setup mode), where other functions and tests can be changed. This switching has to be done when the printer power is off.

RS232C/USB Interface card:

DIP SW1	DIP SW2	FEED KEY STATUS	(7197 SII) PRINTER MODE
OFF	OFF	Pressed	Printer starts as Standard Model and prints diagnostic form
		Not Pressed	Printer starts as Standard Model.
ON	OFF	Pressed	Printer starts as Configuration Mode by printing configuration setup printing
		Not Pressed	N/A
OFF	ON	Pressed	Printer starts as Mfg Adjustment mode.
		Not Pressed	Printer starts as IPL Mode.
ON	ON	Pressed	Printer starts as 4610 Model* and prints diagnostic form
		Not Pressed	Printer starts as 4610 Model*

Note: The specification of 4610 model is not described in this documentation. Refer to *[SPAA493] 4610 Emulation POS Printer FW Spec*.

LAN Interface card:

DIP SW1	DIP SW2	FEED KEY BUTTON	(7197 SII) PRINTER MODE
OFF	OFF	Pressed	Printer starts as TCP/IP Model and prints diagnostic form
		Not Pressed	Printer starts as TCP/IP Model.
ON	OFF	Pressed	Printer starts as Configuration Mode by printing configuration setup printing
		Not Pressed	N/A

DIP SW1	DIP SW2	FEED KEY BUTTON	(7197 SII) PRINTER MODE
OFF	ON	Pressed	Printer starts as Mfg Adjustment mode.
		Not Pressed	Printer starts as IPL Mode.
ON	ON	Pressed	Printer starts as DHCP Mode and prints diagnostic form
		Not Pressed	Printer starts as DHCP Mode

Note: In the above tables, *Pressed* means pressing the *FEED BUTTON* when Printer Power is *ON*.

Chapter 6: **Commands**

Command Conventions

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.

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

By Command Code

All items listed in **bold** are new or have additional functionality when compared to the NCR 7193.

Code (Hexadecimal)	Command
09	Horizontal Tab
0A	Print and Feed Paper One Line
0C	Print and Return to Standard Mode
0D	Print and Carriage Return
10	Clear Printer
10 04 *n*	Real Time Status Transmission (DLE Sequence)
10 05 *n*	Real Time Request to Printer (GS Sequence)
11 *n1... nk*	**Print Raster Graphics**
12	Select Double-Wide Characters
13	Select Single-Wide Characters
14 *n*	Feed *n* Print Lines
15 *n*	Feed *n* Dot Rows
16 *n*	Add *n* Extra Dot Rows
17	Print
18	**Cancel Print Data in Page Mode**
19	Perform Full Knife Cut

Code (Hexadecimal)	Command
1A	**Perform Partial Knife Cut**
1B (+ *.bmp)	**Download BMP Logo**
1B 07	Generate Tone
1B 0C	**Print Data in Page Mode**
1B 12	Select 90 Degree Counter-Clockwise Rotated Print
1B 14 *n*	Set Column
1B 16 *n*	Select Pitch (Column Width)
1B 20 *n*	Set Character Right-Side Spacing
1B 21 *n*	Select Print Modes
1B 24 *n1 n2*	Set Absolute Starting Position
1B 25 *n*	Select or Cancel User-Defined Character Set
1B 26 3 *c1 c2...dn*	Define User-Defined Characters
1B 27 *m a0 a1 a2 d1 ... dm*	Write to User Data Storage
1B 2A *m n1 n2 d1 ... dn*	Select Bit Image Mode
1B 2D *n*	**Select or Cancel Underline Mode**
1B 2E *m n rl rh d1...dn*	Print Advanced Raster Graphics
1B 32	Set Line Spacing to 1/6 Inch
1B 33 *n*	Set Line Spacing
1B 34 m a0 a1 a2	Read from User Data Storage
1B 3A 30 30 30	Copy Character Set from ROM to RAM

Code (Hexadecimal)	Command
1B 3F *n*	Cancel User-defined Characters
1B 40	Initialize Printer
1B 44 *n1,n2,... nk 00*	Set Horizontal Tabs
1B 45 *n*	Select or Cancel Emphasized Mode
1B 47	Select Double Strike (7193 Emulation)
1B 49 *n*	**Set or Cancel Italic Print**
1B 4A *n*	Print and Feed Paper
1B 4C	**Select Page Mode**
1B 52 *n*	**Select International Character Set**
1B 53	**Select Standard Mode**
1B 54 *n*	**Select Print Direction in Page Mode**
1B 56 *n*	Select or Cancel 90 Degrees Clockwise Rotated
1B 57 *n1, n2,...n8*	**Set Printing Area in Page Mode**
1B 59 *n1 n2 d1...dn*	Select Double Density Graphics
1B 5B 7D	Switch to Flash Download Mode
1B 5C *n1 n2*	Set Relative Print Position
1B 61 *n*	Select Justification
1B 63 34 *n*	Select Sensors to Stop Printing
1B 63 35 *n*	Enable or Disable Panel Buttons

Code (Hexadecimal)	Command
1B 64 *n*	Print and Feed *n* Lines
1B 69	Perform Full Knife Cut
1B 6D	Perform Partial Cut
1B 70 *n p1 p2*	Generate Pulse to Open Cash Drawer
1B 72 *n*	**Select Print Color**
1B 74 *n*	**Select International Character Set**
1B 75 0	Transmit Peripheral Device Status
1B 76	Transmit Paper Sensor Status
1B 7B *n*	Select or Cancel Upside Down Printing Mode
1C 21 *n*	Select print modes for Kanji characters
1C 2D *n*	Turn underline mode ON/OFF for Kanji
1C 32 *c1 c2 d1...dn*	Define user-defined Kanji characters
1C 53 *n1 n2*	Set Kanji character spacing
1c 57 *n*	Set quadruple mode ON/OFF for Kanji
1C 70 *m n*	Download Bit Image Registration/Print
1D 00	Request Printer ID
1D 01	Return Segment Number Status of Flash Memory
1D 02 *n*	Select Flash Memory Sector to Download

Code (Hexadecimal)	Command
1D 03 *n*	Real Time Request to Printer (DLE Sequence)
1D 04 *n*	Real Time Status Transmission (GS Sequence)
1D 05	Real Time Printer Status Transmission
1D 06	Get Firmware CRC
1D 07	Return Microprocessor CRC
1D 0E	Erase the Flash Memory
1D 0F	Return Main Program Flash CRC
1D 10 *n*	Erase Selected Flash Sector
1D 11 *al ah cl ch d1...dn*	Download to Active Flash Sector
1D 11 FF	Baseline State Request
1D 1F	Enable / Disable Unsolicited Status Update
1D 21 *n*	Select Character Size
1D 22 *n*	Select Memory Type (SRAM/Flash) Where to Save Logos or User-Defined Fonts
1D 22 55 *n1 n2*	**Flash Allocation**
1D 23 *n*	Select the Current Logo (Downloaded Bit Image)
1D 24 *nL nH*	**Set Absolute Vertical Print Position in Page Mode**
1D 2A *n1 n2 d1...d*n]	Define Downloaded Bit Image
1D 2F *m*	Print Downloaded Bit Image

Code (Hexadecimal)	Command
1D 3A	**Start or End Macro Definition**
1D 40 *n*	Erase User Flash Sector
1D 42 *n*	**Select or Cancel White/Black Reverse Print Mode**
1D 48 *n*	Select Printing Position for HRI Characters
1D 49 *n*	Transmit Printer ID
1D 49 40 *n*	Transmit Printer ID, Remote Diagnostics Extension
1D 4C *nL nH*	Set Left Margin
1D 50 *x y*	Set Horizontal and Vertical Minimum Motion Units
1D 56 *m*	Select Cut Mode and Cut Paper
1D 56 *m n*	Select Cut Mode and Cut Paper
1D 57 *nL nH*	Set Printing Area Width
1D 5C *nL nH*	**Set Relative Vertical Print Position in Page Mode**
1D 5E *r t m*	**Execute Macro**
1D 61 *n*	Determined if the device supports USU
1D 66 *n*	Select Pitch for HRI Characters
1D 68 *n*	Select Bar Code Height
1D 6B *m d1...*	**Print Bar Code**
1D 6B *m n d1...dn*	Print Bar Code
1D 72 *n*	Transmit Status
1D 77 *n*	Select Bar Code Width

Code (Hexadecimal)	Command
1D 28 6B *pL pH cn* 41	**QR Code: Select the model**
1D 28 6B *pL pH cn* 43	**QR Code: Set the size of module**
1D 28 6B *pL pH cn* 45	**QR Code: Select the error correction level**
1D 28 6B *pL pH cn* 50	**QR Code: Store the data in the symbol storage area**
1D 28 6B *pL pH cn* 51	**QR Code: Print the symbol data in the symbol storage area**
1D 28 6B *pL pH cn* 52	**QR Code: Transmit the size information of the symbol data in the symbol storage area**
1D FF	Reboot the Printer
1F 04 *n*	**Convert 6 Dots/mm Bitmap to 8 Dots/mm Bitmap**
1F 05 n	**Select Superscript or Subscript Modes**
IF *11 [m n],[m n]...[m n] 0FFH*	Printer Setting Change
1F 56	Send Printer Software Version
1F 74	**Print Test Form**
1B 2B	Select or Cancel Unicode(UTF)

By Function

All items in **bold** are new or have additional functionality when compared to the 7193.

Printer Function Commands

Code (Hexadecimal)	Command
10	Clear Printer

Code (Hexadecimal)	Command
19 or 1B 69	Perform Full Knife Cut
1A or 1B 6D	**Perform Partial Knife Cut**
1B 07	Generate Tone
1B 40	Initialize Printer
1B 63 34 *n*	Select Sensors to Stop Printing
1B 63 35 *n*	Enable or Disable Panel Buttons
1B 70 *n p1 p2*	Generate Pulse to Open Cash Drawer
1D 56 *m*	Select Cut Mode and Cut Paper
1D 56 *m n*	Select Cut Mode and Cut Paper
1F 74	**Print Test Form**

Vertical Positioning and Print

Code (Hexadecimal)	Command
0A	Print and Feed Paper One Line
0D	Print and Carriage Return
14 *n*	Feed *n* Print Lines
15 *n*	Feed *n* Dot Rows
16 *n*	Add *n* Extra Dot Rows
17	Print
1B 32	Set Line Spacing to 1/6 Inch
1B 33 *n*	Set Line Spacing
1B 4A *n*	Print and Feed Paper
1B 64 *n*	Print and Feed *n* Lines
1D 50 *x y*	Set Horizontal and Vertical Minimum Motion Units

Horizontal Positioning Commands

Code (Hexadecimal)	Command
09	Horizontal Tab

Code (Hexadecimal)	Command
1B 14 *n*	Set Column
1B 24 *n1 n2*	Set Absolute Starting Position
1B 44 *n1,n2,... nk 00*	Set Horizontal Tabs
1B 5C *n1 n2*	Set Relative Print Position
1B 61 *n*	Select Justification
1D 4C *nL nH*	Set Left Margin
1D 57 *nL nH*	Set Printing Area Width

Print Characteristic Commands

Code (Hexadecimal)	Command
12	Select Double-Wide Characters
13	Select Single-Wide Characters
1B 12	Select 90 Degree Counter-Clockwise Rotated Print
1B 16 *n*	Select Pitch (Column Width)
1B 20 *n*	Set Character Right-Side Spacing
1B 21 *n*	Select Print Modes
1B 25 *n*	Select or Cancel User-Defined Character Set
1B 26 *s c1 c2 d1...dn*	Define User-Defined Characters
1B 2D *n*	**Select or Cancel Underline Mode**
1B 3A 30 30 30	Copy Character Set from ROM to RAM
1B 3F *n*	Cancel User-Defined Characters
1B 45 *n*	Select or Cancel Emphasized Mode
1B 47 *n*	Select Double Strike
1B 49 *n*	**Select or Cancel Italic Print**
1B 52 *n*	**Select International Character Set**
1B 56 *n*	Select or Cancel 90 Degrees Clockwise Rotated Print
1B 72 *n*	Select Print Color

Code (Hexadecimal)	Command
1B 74 *n*	Select International Character Set
1B 7B *n*	Select or Cancel Upside Down Printing Mode
1D 21 *n*	**Select Character Size**
1D 42 *n*	**Select or Cancel White/Black Reverse Print Mode**
1F 05 *n*	**Select Superscript or Subscript Modes**

Graphics Commands

Code (Hexadecimal)	Command
11 *n1 ... nk*	**Print Raster Graphics**
1B (+*.bmp)	**Download BMP Logo**
1B 2A *m n1 n2 d1...dn*	Select Bit Image Mode
1B 2E *m n rl rh d1...dn*	Advanced Raster Graphics
1B 4B *n1 n2 d1...dn*	Select Single-Density Graphics
1B 59 *n1 n2 d1...dn*	Select Double-Density Graphics
1C 70 *n m*	Download Bit Image Registration/Print
1D 23 *n*	Select Current Logo (Downloaded Bit Image)
1D 2A *n1 n2 d1...dn*]	Define Downloaded Bit Image
1D 2F *m*	Print Downloaded Bit Image
1F 04 *n*	**Convert 6 Dots/mm Bitmap to 8 Dots/mm Bitmap**

Status Commands

Batch Mode

Code (Hexadecimal)	Command
1B 75 0	Transmit Peripheral Device Status
1B 76	Transmit Paper Sensor Status
1D 49 *n*	Transmit Printer ID
1D 49 40 *n*	Transmit Printer ID, Remote Diagnostics Extension

Code (Hexadecimal)	Command
1D 72 *n*	Transmit Status
1F 56 *n*	Send Printer Software Version
1F 1A 02 *n*	Execute Head Failure Detection
1F 0A *n*	Get Print Completion

Real Time Commands

Code (Hexadecimal)	Command
10 04 *n*	Real Time Status Transmission (DLE Sequence)
10 05 *n*	Real Time Request to Printer (GS Sequence)
1D 03 *n*	Real Time Request to Printer (DLE Sequence)
1D 04 *n*	Real Time Status Transmission (GS Sequence)
1D 05	Real Time Printer Status Transmission

Unsolicited Status Update

Code (Hexadecimal)	Command
1D 61	Determined if the device supports USU
1D 1F	Enable / Disable Unsolicited Status Update
1D 11 FF	Baseline State Request

Barcode Commands

Code (Hexadecimal)	Command
1D 48 *n*	Select Printing Position for HRI Characters
1D 66 *n*	Select Pitch for HRI Characters
1D 68 *n*	Select Bar Code Height

Code (Hexadecimal)	Command
1D 6B *m d1...dk* 00 or 1D 6B *m n d1...dn*	**Print Bar Code**
1D 77 *n*	Select Bar Code Width
1D 28 6B *pL pH cn* 41	**QR Code: Select the model**
1D 28 6B *pL pH cn* 43	**QR Code: Set the size of module**
1D 28 6B *pL pH cn* 45	**QR Code: Select the error correction level**
1D 28 6B *pL pH cn* 50	**QR Code: Store the data in the symbol storage area**
1D 28 6B *pL pH cn* 51	**QR Code: Print the symbol data in the symbol storage area**
1D 28 6B *pL pH cn* 52	**QR Code: Transmit the size information of the symbol data in the symbol storage area**

Page Mode Commands

Code (Hexadecimal)	Command
0C	**Print and Return to Standard Mode**
18	**Cancel Print Data in Page Mode**
1B 0C	**Print Data in Page Mode**
1B 4C	**Select Page Mode**
1B 53	**Select Standard Mode**
1B 54 *n*	**Select Print Direction in Page Mode**
1B 57 *n1, n2...n8*]	**Set printing Area in Page Mode**
1D 24 *nL nH*	**Set Absolute Vertical Print Position in Page Mode**
1D 5C *nL nH*	**Set Relative Vertical Print Position in Page Mode**

Macro Commands

Code (Hexadecimal)	Command
1D 3A	**Start or End Macro Definition**
1D 5E *r t m*	**Execute Macro**

User Data Storage Commands

Code (Hexadecimal)	Command
1B 27 *m* addr *d1...dm*	Write to User Data Storage
1B 34 *m* addr	Read from User Data Storage
1D 22 *n*	Select Memory Type (SRAM/Flash) Where to Save Logos or User-Defined Fonts
1D 22 55 *n1 n2*	**Flash Allocation**
1D 40 *n*	Erase User Flash Sector
IF 11 *[m n],[m n]... [m n]* 0FFH	Printer Setting Change

Asian Character Commands

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

Flash Download Commands

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

Comparison Chart

The following table details the list of commands whose behavior differs from the 7193 and the 7197 Series II because of the physical differences of a 6 dots/mm head (7193) versus an 8 dots/mm head (7197 Series II).

Command	Description	Difference between 7193 and 7197 Series II configured in 7193 Emulation Mode.
15 *n*	Feed *n* Dot Rows	This command will move the paper on the receipt in n/203 inch steps instead of n/152 inch steps.
16 *n*	Add *n* Extra Dot Rows	The dot rows will be measured in n/203 inches versus n/152 inches.
1B 20 *n*	Set Right-Side Character Spacing	This command sets the right side spacing to *n* horizontal motion units. By default, these units are in terms of 1/203 inches versus 1/152 inches.
1B 24 *n1 n2*	Set Absolute Starting Position	For graphics commands, the position is scaled to best 7193. In text mode, the equivalent character position is calculated.

Command	Description	Difference between 7193 and 7197 Series II configured in 7193 Emulation Mode.
1B 26 *s c1 c2 n1 d1...nn dn*]	Define User-Defined Character Set	Since the dots on the 7197 Series II print head are smaller, user-defined characters that were used on the previous printer will appear smaller on the 7197 Series II printer.
1B 2A *m n1 n2 d1...dn*	Select Bit Image Mode	In 7193 Emulation Mode, graphics are scaled to best match the size of the graphic in the 7193 printer.
1B 33 *n*	Set Line Spacing	This command uses n in terms of n/360 inches. Since the 7193 had a fundamental step of 1/152 inch and the 7197 Series II has a fundamental step of 1/203 inch, the actual line spacing will not exactly match the requested spacing.
1B 4A *n*	Print and Feed Paper	Same as above.
1B 59 *n1 n2 d1...dn*	Select Double-Density Graphics	In 7193 Emulation Mode, the printer scales the graphics to provide the best match.
1B 5C *n1 n2*	Set Relative Print Position	The parameter to this command is in units of dots. However, the command moves and aligns to character positions. In 7193 Emulation Mode, this command calculates how many character positions to move based on the 7193 character width in dots (10) versus the 7197 Series II (13).
1B 61 *n*	Select Justification	This command does true dot resolution alignment for centering versus character-aligned centering.
1D 2A *n1 n2 d1...dn*]	Define Downloaded Bit Image	In 7193 Emulation Mode, this command scales the incoming data to provide a best match to the size of the image as it printed on 7193.
1D 2F *m*	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 the communication interface, regardless of the 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.

Name	Name of 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, for example, incompatible commands.
Related Information and Notes	Describes related information and notes for this command, for example, 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. Resetting the printer
2. Cutting the paper
3. Opening the cash drawers

Clear Printer

ASCII	DLE
Hexadecimal	10
Decimal	16

This command clears the print line buffer without printing, and sets the printer to the following condition:

- Double-Wide command `(0x12)` is cancelled.
- Line Spacing, Pitch, and User-Defined Character Sets are maintained at current selections (RAM is not affected).
- Single-Wide, Single-High, Non-Rotated, and Left-Aligned characters are set.
- Printer is restarted and error status is cleared if a fault condition existed.

- Printing position is set to column one.
- Knife is homed.

Example:

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

Exceptions

A DLE command followed by a `04` or `05` is interpreted as a *real time command*. Refer to *Printer Function Commands* on the previous page.

Perform Partial Knife Cut

ASCII	EM or ESC i
Hexadecimal	19 or 1B 69
Decimal	25 or 27 105

This command cuts the receipt, leaving **0.20 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 print buffer is not empty.

Note: Previously, the command was *full knife cut*.

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

This command cuts the receipt, leaving **5 mm** (0.20 inch) of paper. This command is implemented the same as Full Knife Cut (`19, 1B 6D`), which results in a partial knife cut. There are two codes for this command and both perform the same function.

Example:

```
MSComm1.Output = Chr$(&H1A)
```
or
```
MSComm1.Output = Chr$(&H1B) & Chr$(&H6D)
```

Note: Line Feed is executed first if the buffer is not empty.

Generate Tone

ASCII	ESC BEL
Hexadecimal	1B 07
Decimal	27 7

This command generates an audible tone and allows the application to provide an audiable tone to the operator.

Example:

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

Initialize Printer

ASCII		ESC @
Hexadecimal		1B 40
Decimal		27 64
Default		
	Character Pitch	15.6 CPI
	Column Width	**44 characters** (80mm) **32 characters** (58mm)
	Extra Dot Rows	2
	Character Set	Code Page 437
	Printing Position	Column One

This command clears the print line buffer and resets the printer to the default settings for the startup configuration. Refer to the default settings above.

Note: 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.

Example:

```
MSComm1.Output = Chr$(&H1B) & Chr$(&H40)
```

Select Sensors to Stop Printing

ASCII	ESC c 4 *n*
Hexadecimal	1B 63 34 *n*
Decimal	27 99 52 *n*

Value of *n* :	
Bit	**Function**
0, 1	Stop Receipt on Receipt Low
2–7	Undefined
Default—0	

This command determines which sensor stops printing on the receipt 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:

```
MSComm1.Output = Chr$(&H1B) & Chr$(&H63) & Chr$(&H34) & Chr$(n)
```

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 (Default) • 1—Disable

This command 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)
```

Note: 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.

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

This commands 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.

- On time = *p1* x 2 msec

- Off time = *p2* x 2 msec

Example:

```
MSComm1.Output = Chr$(&H1B) & Chr$(&H70) & Chr$(n) & Chr$(n)
```

Note: The off-time is the delay before the printer performs the next operation. Refer to cash drawer specifications for required on and off times.

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.

m	Feed and Cut Mode
0, 48	Full cut (no extra feed). Partial cut on the Sam.
1, 49	Partial cut (no extra feed).
65	Feeds paper to cutting position + (*n* times vertical motion unit), and cuts the paper completely.
66	Feeds paper to cutting position + (*n* times vertical motion unit), and performs a partial cut.

Range of *m*	0, 48; 1, 49
	65, 66 (when used with *n*)
Range of *n*	0–255
Default of *n*	0
Default of *m*	0

This command 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)
```

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

Print Test Form

ASCII	US t
Hexadecimal	1F 74
Decimal	31 116

This command prints the current printer configuration settings on the receipt and is disabled in page mode.

Example:

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

Exception

This command is available in 7194 Native Mode and 7197 Series II Native Mode only.

Vertical Positioning and Print Commands

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

Print and Feed Paper One Line

ASCII	LF
Hexadecimal	0A
Decimal	10

This command prints one line from the buffer and feeds paper one line.

Example:

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

Note: *Carriage Return + Line Feed* prints and feeds only one line.

Print and Carriage Return

ASCII	CR
Hexadecimal	0D
Decimal	13

This command prints one line from the buffer and feeds paper. 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 a print command.

Example:

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

Note: Refer to Ignoring/Using the Carriage Return in *Diagnostics* on page 67 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 7193 Emulation Mode
	0–255 7194 Native Mode and 7197 Series II Native Mode

This commands feeds paper *n* lines at the current line height without printing, and is ignored 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	*n*/203 inch
Range of n	0–27 7193 Emulation Mode
	0–255 7194 Native Mode and 7197 Series II Native Mode

This command feeds paper *n* dot rows without printing, and the 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*	*n*/203 inch
Range of *n*	0–12
Default	3

This command 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 added.

Receipt Station		
Extra Rows	**Lines Per Inch**	**Dot Rows**
0	8.47	24
1	8.13	25
2	7.81	26
3	7.52	27
4	7.25	28
5	7.00	29
6	6.77	30
7	6.55	31
8	6.35	32
9	6.16	33
10	5.98	34

Receipt Station		
Extra Rows	**Lines Per Inch**	**Dot Rows**
11	5.81	35
12	5.64	36

Example:

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

Print

ASCII	ETB
Hexadecimal	17
Decimal	23

This command prints one line from the buffer, feeds paper on one line, and executes LF on the receipt.

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)

This command sets the default line spacing to **1/6 of an inch** (4.25 mm).

Example:

```
MSComm1.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 in 7194 Native Mode and 7197 Series II Native Mode
	n/360 inches in 7193 Emulation Mode
Range of *n*	0–255
Default	**0.13 inch** (3.37 mm or 7.52 lines per inch, 3 extra dot row)

This command sets the line spacing to *n*/406 inches. The minimum line spacing is 8.5 lines per inch. 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.

Note: For more information, refer to the description of the *Set Horizontal and Vertical Minimum Motion Units* on the facing page.

Print and Feed Paper

ASCII	ESC J *n*
Hexadecimal	1B 4A *n*
Decimal	27 74 *n*
Value of n	*n*/203 inches in 7194 Native Mode and 7197 Series II Native Mode
	n/360 inches in 7193 Emulation Mode
Range of n	0–255

This command prints one line from the buffer and feeds the paper. The line height equals the character height when *n* is too small.

Example:

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

Note: For more information, see the description of the commands in *Set Horizontal and Vertical Minimum Motion Units* on the facing page.

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)

This command 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)
```

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

This command 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)
```

Horizontal Positioning Commands

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

Horizontal Tab

ASCII	HT
Hexadecimal	09
Decimal	9

This command moves the print position to the next tab position set by the Set Horizontal Tab Positions `(1B 44 n1 n2 ... 00)` command. The print position is reset to column one after each line. The 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. HT has no effect in page mode. Printer initialization sets 32 tabs at column 9, 17, 25, or once 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*	• 1–44 (Standard, 80 mm) • 1–56 (Compressed, 80 mm)	• 1–32 (Standard, 58 mm) • 1–42 (Compressed, 58 mm)
Default of *n*	1	

This command 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:

```
MSComm1.Output = Chr$(&H1B) & Chr$(&H14) & Chr$(n)
```

Exceptions

The command cannot be used with Single-Density 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.

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

This command 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 (standard pitch) or 8 (compressed pitch). The example shows how to calculate column 29 (10 dots per column) as the absolute starting position.

28 x 10 = 280 dots (beginning of column 29)

280/256 = 1, remainder of 24

n1 = 24

n2 = 1

Example:

```
MSComm1.Output = Chr$(&H1B) & Chr$(&H24) & Chr$(n1) & Chr$(n2)
```

Note: This command is also used in the graphics mode. Refer to *Graphics Commands* on page 170 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* on page 147.

Set Horizontal Tabs

ASCII	ESC D *[n1,n2,... nk* NUL
Hexadecimal	1B 44 *n1,n2,... nk* 00
Decimal	27 68 *n1,n2,... nk* 0
Value of *n*	The number of columns from the left edge of the print area.
Range of *n*	1 ≤ *n*1 ≤ *n*2 ≤ ....≤ *n*k < 255
Value of *k*	The number of the horizontal tab position set by this command.
Range of *k*	0–32
Default	*n* = 8, 16, 24, 32, 40, ... , 232, 240, 248

This command sets up to 32 horizontal tab positions, *n* columns from column one, but does not move the print position. Refer to 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 are 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.

Exceptions

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

Example:

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

Set Relative Print Position

ASCII	ESC \ *n1 n2*
Hexadecimal	1B 5C *n1 n2*
Decimal	27 92 *n1 n2*

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 and 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 and high-byte word orientation.

This command moves the print starting position to 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 (standard pitch) or 10 (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 x 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 (standard pitch) or 8 (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 x 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)
```

Note: 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 *Set Horizontal and Vertical Minimum Motion Units* on page 147.

Compatibility Information (7194 Native Mode and 7197 Series II Native Mode receipt vs. 7193 receipt)

There is a difference in the normal behavior of this command in 7194 Native Mode and 7197 Series II Native Mode as compared to the original 7193. The difference exists when the command is used to move to the left. The 7193 processes the whole print string prior to putting it in the buffer for the print head. This method of processing allows the 7193 to back up 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 7197 Series II 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 the advantage of the application 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)

This command specifies the alignment of the characters, graphics, logos, and bar codes on the receipt station.

Example:

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

Execeptions

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

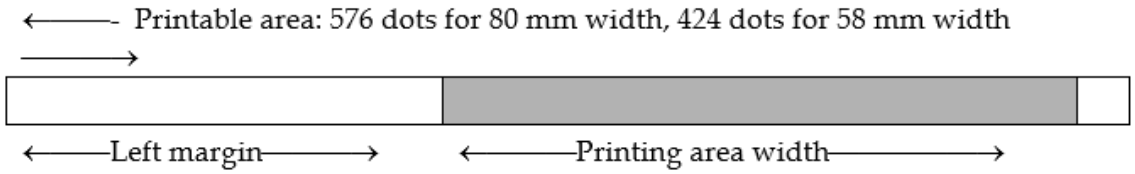
Set Left Margin

ASCII	GS L *nL nH*	
Hexadecimal	1D 4C *nL nH*	
Decimal	29 76 *nL nH*	
Range of *n*L	0–255	
Range of *n*H	0–255	
Default	80 mm width	576 dots (the maximum printable area)
	58 mm width	424 dots (the maximum printable area)

This command sets the left margin of the printing area. The left margin is set to (((*nH* x 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. Refer to *Set Printing Area Width* on the next page 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. Refer to the illustration below.



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 x 256) + 150.

Example:

```
MSComm1.Output = Chr$(&H1D) & Chr$(&H4C) & Chr$(nL) & Chr$(nH)
```

Exceptions

The command is effective only at the beginning of a line. This command is also ignored if the line buffer is not empty.

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)

This command 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* `x 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)`. Refer to *Set Left Margin* on the previous page for a description.

Formulas

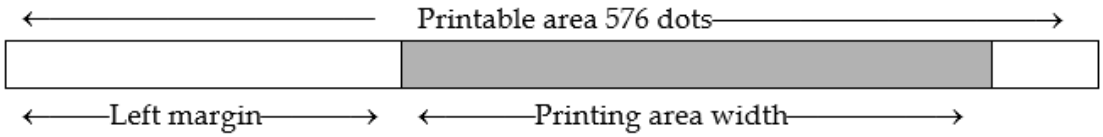
To set the width of the printing area to one inch at the default horizontal motion unit of 1/203 inches, send the four-byte string:

```
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 x 256) + 150.



Example:

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

Exception

This command is effective only at the beginning of a line. This command is ignored if the line buffer is not empty, and only affects 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. Refer to 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

This command 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

This command 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

This command 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. For more information, refer to 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 (Default) 1—Compressed Pitch

This command selects the character pitch for a print line.

Formulas

The following table provides the print characteristics for both pitches.

Pitch	Columns	CPI
Standard	44 for 80 mm paper 32 for 58 mm paper	15.6
Compressed	56 for 80 mm paper 42 for 58 mm paper	20.3

Example:

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

Note: Refer to *Printing Specifications* on page 289 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

This command 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.

Note: 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 7193 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 44 Col/Line, (80 mm) 32 Col/Line, (58 mm)	Compressed Pitch 20.3 CPI 56 Col/Line, (80 mm) 42 Col/Line, (58 mm)
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

Note: Bits 1, 2, 6 are not used.
[1]Standard and compressed pitch cannot be used together in the same line.

Default: 0 (for bits 0, 3, 4, 5, 7)

This command selects the print mode–standard, compressed, double high, or double wide.

Example:

```
MSComm1.Output = Chr$(&H1B) & Chr$(&H21) & Chr$(n)
```

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

Limitation

In Diagnostic setting, if *Compress Pitch* setting is *Ignore* then setting the Compressed pitch `(Bit 0)` using this command will be ignored.

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)

This command selects the character set. When an undefined RAM character is selected, the Code Page 437 character is used. Refer to *Printing Specifications* on page 289 for the character sets.

Example:

```
MSComm1.Output = Chr$(&H1B) & Chr$(&H25) & Chr$(n)
```

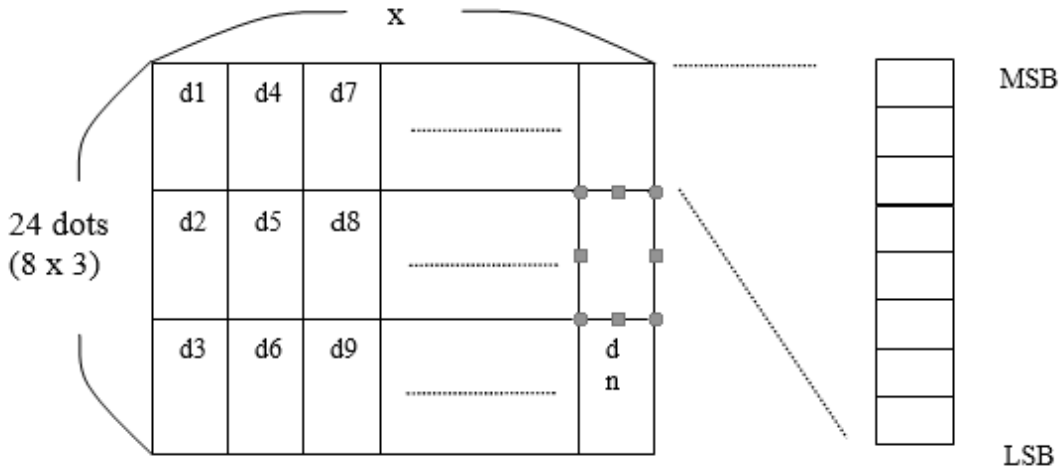
Define User-Defined Characters

ASCII	ESC & 3 *c*1 *c*2 *n*1 *d*1 ... *n*n *d*n
Hexadecimal	1B 26 3 *c*1 *c*2 *n*1 *d*1 ... *n*n *d*n
Decimal	*27 38 3 c1 c2 n1 d1 ... nn dn*

This command 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. The command clears bit image logo data from RAM. The illustration in the next section provides a sample of a character cell.

Defining User-Defined Characters

Defines and enters downloaded characters into RAM.



Values and Ranges

c = the ASCII codes of the first (*c*1) and last (*c*2) characters respectively

*c*1 = Hex 20-FF (Hex 20 is always printed as a space)

*c*2 = Hex 20-FF (Hex 20 is always printed as a space)

To define only one character, use the same code for both *c*1 and *c*2.

n = the number of dot columns for the nth character as specified by *n*1 ... *n*n

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 nth character as specified by *d*1 ... *d*n

The number of bytes for a particular character cell is 3 x *n*1. The bytes are printed down and across each cell.

Note: For more information, refer to `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 (Default) 1, 49—Select underline mode

This command 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 command `(1B 21)` turn underline on and off in the same way.

Example:

```
MSComm1.Output = Chr$(&H1B) & Chr$(&H2D) & Chr$(n)
```

Note: This command is ignored if *n* is out of the specified range. This command is only available in 7194 Native Mode and 7197 Series II 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

This command 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)
```

Note: 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

This command 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 (Default) • 1 (bit 0)—selected
Range of *n*	0–255

This command starts or stops emphasized printing.

Example:

```
MSComm1.Output = Chr$(&H1B) & Chr$(&H45) & Chr$(n)
```

Exception

Only the lowest bit of *n* is effective. Emphasized printing cannot be used with bit-images or downloaded bit-images. This command and the Select Print Mode command `(1B 21)` function identically.

Select or Cancel Double Strike

ASCII	ESC G *n*
Hexadecimal	1B 47 *n*
Decimal	27 71 *n*
Value of *n*	0—Off 1—On

This command turns double strike mode on or off and is identical to Emphasized mode command. 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 and the Select Print Mode command `(1B 21)` function identically. They should have the same setting when used together. In 7193 Emulation, this command is unrecognized and the parameter byte is put in to the printer buffer.

Select or Cancel Italic Print

ASCII	ESC I *n*
Hexadecimal	1B 49 *n*
Decimal	27 73 *n*
Value of *n*	• 0—Off (Default) • 1—On **Note:** When 0 and 1 are the Least Significant Bit, LSB

This command turns Italic print mode on or off. This command is only available in 7194 Native Mode and 7197 Series II Native Mode. Italic print mode is available for built-in, user-defined characters.

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 7194 Native Mode and 7197 Series II 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 or 27 116 *n*

Value of *n*	0—Code Page 437 US English (Default)
	1—Code Page 850 Multilingual
	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
	10—Code Page 1256 Windows Arabic
	20—Code Page Katakana
	21—Code Page 874 Thailand
	22—Code Page 864 Arabic
	127—Hungary
	128—Code Page 932
	129—Code Page 936
	130—Code Page 949
	131—Code Page 950
Default	0 (Code Page 437)

This command selects the character set to be used. See *Printing Specifications* on page 289 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)
```

Note: This command may also be known as Select Character Code Table.

Select Character Code Table

Refer to the previous command, *Select International Character Set* on the previous page.

Select or Cancel 90 Degrees Clockwise Rotated Print

This command rotates characters 90 degrees clockwise. The command remains in effect until the printer is reset or the Clear Printer (`0x10`) command is received. Refer to *Summary of Rotated Printing* on page 169.

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—Monochrome (Default) • 1—2nd Color

This command selects color printing. Color printing is valid for characters, graphics, logos and bar codes.

Example:

```
MSComm1.Output = Chr$(&H1B) & Chr$(&H72) & Chr$(n)
```

Select or Cancel Upside Down Printing Mode

ASCII	ESC { *n*
Hexadecimal	1B 7B *n*
Decimal	27 123 *n*
Value of *n*	• 0—Cancel (Default) • 1—Set

This command 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. Refer to *Summary of Rotated Printing* on page 169.

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

This command 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)

Character Height Selection		
Hex	**Decimal**	**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:

```
MSComm1.Output = Chr$(&H1D) & Chr$(&H21) & Chr$(n)
```

Note: If *n* is out of the defined range, this command is ignored and is only available in 7194 Native Mode and 7197 Series II 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 **Note:** Only the lowest bit is used.
Default of *n*	• 0–255 • 0 (Off)

This command turns on White/Black reverse printing mode. This command is only available in 7194 Native Mode and 7197 Series II 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:

```
MSComm1.Output = Chr$(&H1D) & Chr$(&H42) & Chr$(n)
```

Note: This is only available in 7194 Native Mode and 7197 Series II Native Mode.

Select or Cancel Smoothing Mode

ASCII	GS b *n*
Hexadecimal	1D 62 *n*
Decimal	29 98 *n*

This command is ignored.

Example:

```
MSComm1.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 (Default) • 1—Select subscript size • 2—Select superscript size

This command 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 7194 Native Mode and 7197 Series II 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 7194 Native Mode and 7197 Series II Native Mode.

Select or Cancel Unicode(UTF-16) Mode

ASCII	ESC + *n*
Hexadecimal	1B 2B *n*
Decimal	27 43 *n*
Value of *n*	• 0—not select (Normal code, Default) • 1—selected (Uni-code(UTF-16))

This command starts or stops as specified by Unicode(UTF-16).

Note: In Unicode mode, characters are specified as follows.

```
ESC + 1 <nL> <nH> ESC + 0
```

`<nL><nH>` can range in value from 0 to 65535; however, the character that can be specified is limited to an existing character.

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. They may also be mixed on the same line.

Upside Down (1B 7B n)	Rotated CW (1B 56 n)	Rotated CCW (1B 12)	Resulting Output
Canceled	Canceled	Cleared	A B C
Canceled	Set	X	∀ ᗺ Ↄ
Set	Canceled	X	Ↄ ᗺ ∀
Set	Set	X	C B A
X	X	Set	A B C

The following print modes cannot be mixed on the same line:

- Standard and compressed pitch
- Vertical (normal) and rotated
- Right-side up and upside down
- 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.

Print Raster Graphics

ASCII	DC1 *n1 ... nk*
Hexadecimal	11 *n1 ... nk*
Decimal	17 *n1 ... n72*
Value of *n*	*n1 ... nk*—Data bytes
Range of *n*	0–255
Value of *k*	k = 72 : 80mm, k = 53 : 58mm

This command prints one row of data, `N1 ... nk` bytes, describing the line to print.

Example:

```
MSComm1.Output = Chr$(&H11) & Chr$(05) & Chr$(255)
```

Note: Raster graphics is not available in Page Mode and is only available in 7194 Native Mode and 7197 Series II Native Mode.

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

This command 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 downloaded bit image. The downloaded BMP file can be printed by using the Print Downloaded Bit Image `(1D 2F m)` command.

Example:

```
MSComm1.Output = Chr$(&H1B)
Open bitmapfile For Binary As filehandle.
filecontent = Input(LOF(filehandle), filehandle)
MSComm1.Output = filecontent & vbLf
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 and only available in 7194 Native Mode and 7197 Series II Native Mode.

Note: For more information, refer to `1D 22 n` Select Memory Type to save logos.

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*

This command 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. Refer to the illustration graphic representation of the bit image.

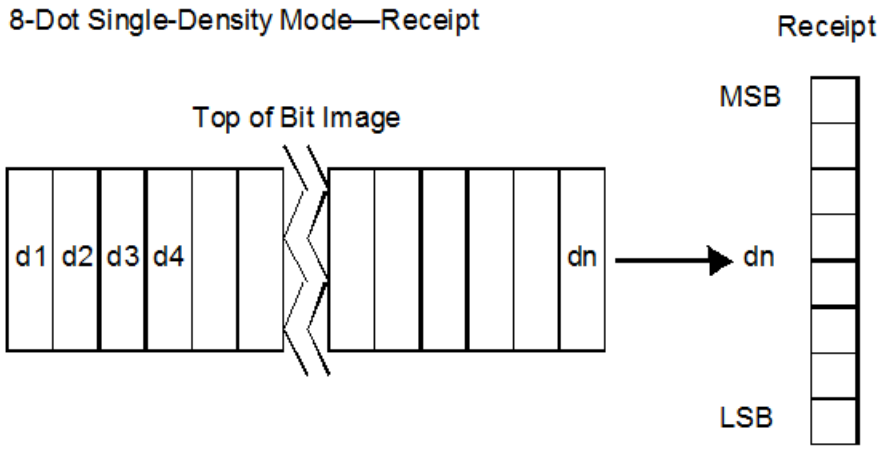
Values

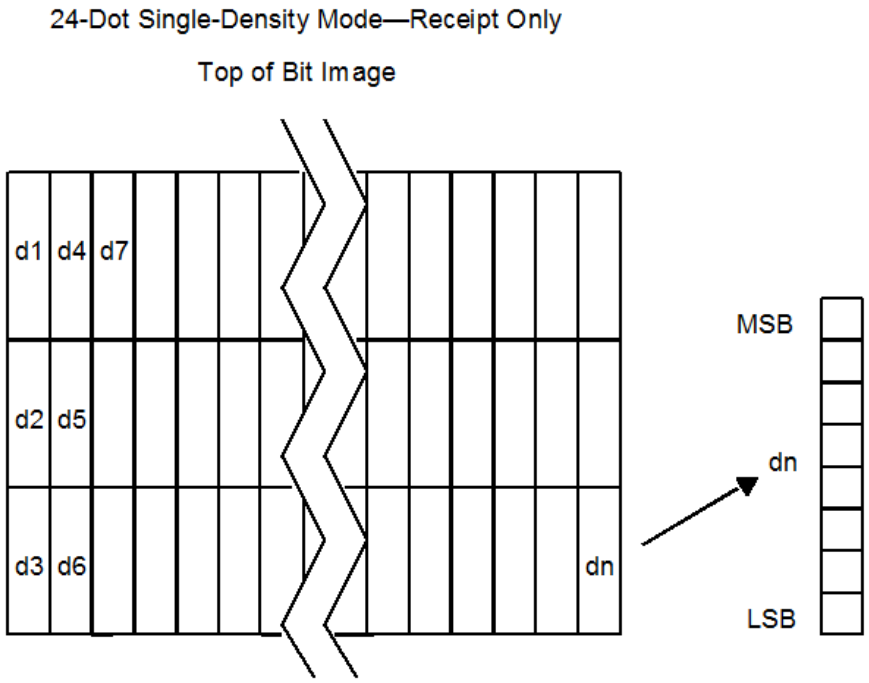
Value of m	Mode	No. of Dots (Vertical)	No. of Dots (Horizontal)	Number of Dots/Line
0	8 Dot Single Density	8 (68 DPI)	0-288 (101DPI, 80mm) 0-212 (101DPI, 58mm)	8x288 (80mm) 8x212 (58mm)
1	8 Dot Double Density	8 (68 DPI)	0-576 (203DPI, 80mm) 0-424 (203DPI, 58mm)	8x576 (80mm) 8x424 (58mm)
32	24 Dot Single 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 (203DPI, 80mm) 0-424 (203DPI, 58mm)	24x576 (80mm) 24x424 (58mm)

Formulas

8 Dot Single Density $n1 + (256 \times n2)$

24 Dot Single Density $3 \times [n1 + (256 \times n2)]$





Print Advanced Raster Graphics

ASCII	ESC . *m n rl rh d1 ... dn*
Hexadecimal	1B 2E *m n rl rh d1 ... dn*
Decimal	27 46 *m n rl rh d1 ... dn*
Value of *m*	Horizontal offset from left margin = 8 x *n* dots
Value of *n*	Number of data bytes that compose the raster
Value of *r*	Number of times the raster has to be printed = 256 x *rh* + *rl*
Value of *d*	*d1 ... dn* = Data bytes
Range	0 ≤ m, n ≤ 72 (80mm), 0 ≤ m, n ≤ 53 (58mm) 0 ≤ r ≤ 65536 0 ≤ d1 ... dn ≤ 255

This command prints a horizontal raster of graphics data one or multiple times. Horizontal offset and number of data bytes are variable and specified by parameters.

Example:

```
MSComm1.Output = Chr$(&H1B) & Chr$(&H2E) & Chr$(10) & Chr$(100) &
Chr$(2) & Chr$(10) & Chr$(&HFF). . . & Chr$(&HFF)
```

Exceptions

Advanced Raster graphics is not available in Page Mode.

Select Single-Density Graphics

ASCII	ESC K *n1 n2 d1 ... dn*
Hexadecimal	1B 4B *n1 n2 d1 ... dn*
Decimal	27 75 *n1 n2 d1 ... 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 x n2)	3 x [n1 + (256 x n2)]	Number of Bytes of Data (Printed Down, Then Across)

This command enters one line of 8-dot single-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.

Example:

```
MSComm1.Output = Chr$(&H1B) & Chr$(&H4B) & Chr$(10) & Chr$(100)
Chr$(&HFF). . . & Chr$(&HFF)
```

Select Double-Density Graphics

ASCII	ESC Y *n1 n2 d1 ... dn*
Hexadecimal	1B 59 *n1 n2 d1 ... dn*
Decimal	27 89 *n1 n2 d1 ... dn*

Value of *n*

Value of *n* (8-Dot Single Density Mode)	Value of *n* (24-Dot Single Density Mode)	Value of *d*
*n*1 + (256 x n2)	3 x [*n*1 + (256 x *n*2)]	Number of Bytes of Data (Printed Down, Then Across)

This command enters one line of 8-dot single-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.

Example:

```
MSComm1.Output = Chr$(&H1B) & Chr$(&H59) & Chr$(10) & Chr$(100)
Chr$(&HFF). . . & Chr$(&HFF)
```

Download Bit Image Registration/Printing

ASCII	FS *p n m*
Hexadecimal	1C 70 *m n*
Decimal	28 112 *n*
Range of *n*	0–255
Range of *n*	0–3

Value of *m*	Print Mode	Vertical DPI[1]	Horizontal DPI[1]
0	Normal	203	203
1	Double Width	203	101
2	Double Height	101	203
3	Quadruple	101	101

[1]Dot density measured in dots per inch

The parameter *n* is the downloaded bit image's ID which is selected by `1D 23 n` (Select the Current Logo) when the image was defined.

This command 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.

Note: Refer to `1D 22 n` (Select Memory Type to store logos), `1D 23 n` (Select the Current Logo) and `1D 2F m` (Print Downloaded Bit Image).

Select the Current Logo (Downloaded Bit Image)

ASCII	GS # *n*
Hexadecimal	1D 23 *n*
Decimal	29 35 *n*
Range of *n*	0–255

This command 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)
```

Note: By default, 7193 Emulation loads downloaded bit image to SRAM, while 7194 Native Mode and 7197 Series II Native Mode loads them to Flash.

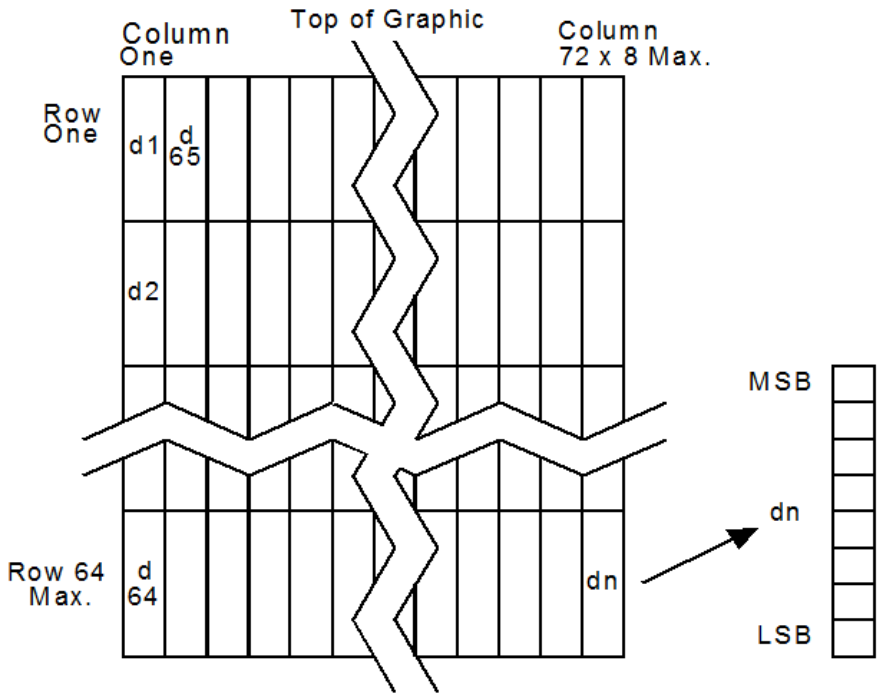
Define Downloaded Bit Image

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 *n*1	Value of *n*2	Value of *d*
1-72 (8 x *n*1 = 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 x *n*1 x *n*2 (*n*1 x *n*2 must be less than or equal to 4608).		

This command enters a downloaded bit image (such as a logo) into RAM or Flash with the number of dots specified by *n*1 and *n*2, 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.

Refer to the illustration for the Print Downloaded Bit Image command `(1D 2F)` for a representation of the bit image.



Note: Refer to `1D 22 n` (Select Memory Type to store logos) and `1D 23 n` (Select the Current Logo). For the 7194 Native Mode and 7197 Series II 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 reference.

Print Downloaded Bit Image

ASCII	GS / *m*
Hexadecimal	1D 2F *m*
Decimal	29 47 *m*

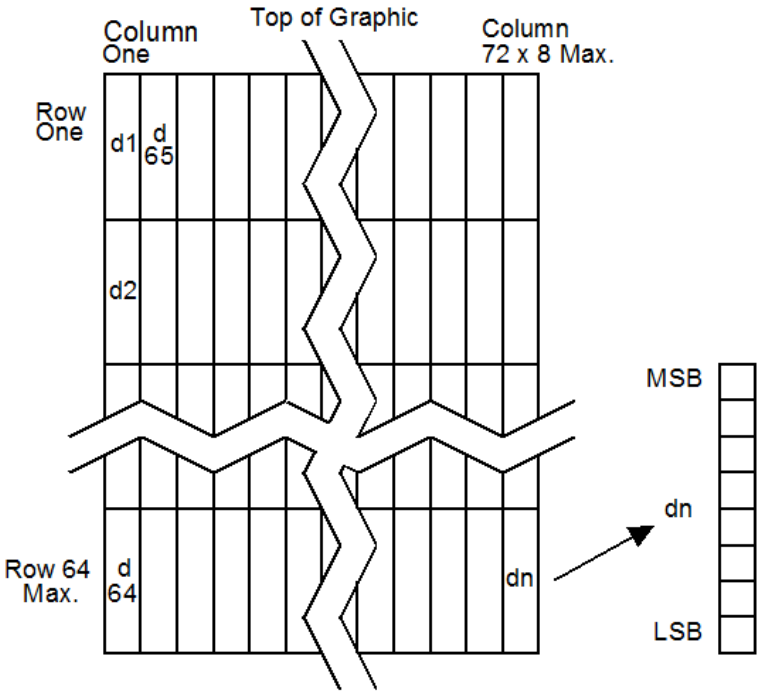
Value and range of *m*

Value of m	Print Mode	Vertical DPI1	Horizontal DPI*
0	Normal Wide	203	203
1	Double Wide	203	101
2	Double High	101	203
3	Quadruple	101	101

[1]Dot density measured in dots per inch

This command 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.

Refer to the illustration for a representation of the bit image.



Example:

```
MSComm1.Output = Chr$(&H1D) & Chr$(&H2F) & Chr$(m)
```

Note: Refer to `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 of *n*	• 0—Off (Default) • 1—On

This command selects or cancels the 6 dot/mm Emulation 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)
```

Note: This command is available in 7194 native mode only and 7197 Series II Native Mode.

Status Commands

Status Command Introduction

The 7197 Series II has three methods of providing status to the application. These methods are through Batch Status Commands, Real Time Status Commands, and Auto Status Back. An application may use one or more of these methods to understand the current status of the printer. The following are brief descriptions of each of these methods:

- **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 that 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. 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.

For more information on these status commands, refer to *Recognizing Data from the Printer* on page 193. This section describes which 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. The commands are stored in the data buffer of the printer as they are received, and are handled by the firmware in the order in which they are received.

When a fault occurs, the printer goes busy at the RS-232C interface and does 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 resumes processing the data in its receive buffer.

Transmit Peripheral Device Status

ASCII	ESC *u 0*
Hexadecimal	1B 75 0
Decimal	27 117 0

	Bit 0	**Bit 1**
Return Value	• 1—Drawer 1 closed • 0—Drawer 1 open **Note:** Bits 2-7 are not used	• 1—Drawer 2 closed • 0—Drawer 2 open

This command transmits the 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

This command 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 Position	Ok	Jam
4	Not Used	Fixed to Zero	Fixed to Zero
5	Temperature	In valid range	Too hot or too cold
6	Voltage	In valid range	Too high or too low
7	Not Used	Fixed to Zero	Fixed to Zero

Example:

```
MSComm1.Output = Chr$(&H1B) & Chr$(&H76)
```

Note: Refer to *Status Commands* on page 179 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

This command transmits the printer ID specified by *n* as follows:

N	Printer ID	Specification	ID (hexadecimal)
1, 49	Printer model ID	NCR 7194	0x24
1, 49	Printer model ID	NCR 7193	0x03
1, 49	Printer model ID	NCR 7197 Series II	0xA2
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	-	-	-	Undefined.
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.

Bit	Off/On	Hex	Decimal	Function
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:

```
MSComm1.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*
Value of *n*	Refer to table.
Range of *n*	32–255 (not all defined but reserved)

This command 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 in this section 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.

In Ethernet model, all the parameters are supported by TCP 9100 port and some of the parameters maked with underline are supported by UDP 3000.

When an application uses UDP 3000 port, adding 4 bytes of the sequence number before the command is required.

Example: For Flash Firmware version command, send:

```
xxh xxh xxh xxh 1Dh 49h 40h A3h
```

`xxh xxh xxh xxh` is the sequence number. The printer returns the response with the same sequence number.

Value of *n*			Remote Diagnostic Item	Function
ASC	Hex	Dec		
Space	20	32	Serial #, 10 digit ASCII	Write to NVRAM Example, send 14 bytes to printer: GS l @ 0x20 1234567890
!	21	33	Serial # , 10 digit ASCII	Write to NVRAM, and print on receipt to verify Example, send 14 bytes to printer: GS l @ ! 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 n 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

Value of *n*			Remote Diagnostic Item	Function
ASC	**Hex**	**Dec**		
;	3B	59	Boot firmware (FTP) version, 4 digit ASCII	Return boot firmware (FTP) version, a total of 6 bytes (Ethernet Model Only)
?	3F	63	Boot firmware (FTP) CRC, 4 digit ASCII	Return boot firmware (FTP) CRC, a total of 6 bytes (Ethernet Model Only)
K	4B	75	SBCS (for Receipt) version, 4 digit ASCII	Return SBCS (for Receipt) version, a total of 6 bytes
O	4F	79	SBCS (for Slip) version, 4 digit ASCII	Return SBCS (for Slip) version, a total of 6 bytes
S	53	83	DBCS (for Receipt) version, 4 digit ASCII	Return DBCS (for Receipt) version, a total of 6 bytes
W	57	87	DBCS (for Slip) version, 4 digit ASCII	Return DBCS (for Slip) version, a total of 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
â	83	131	Receipt lines tally	Return receipt lines tally, preceded by n 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

Value of *n*			Remote Diagnostic Item	Function
ASC	Hex	Dec		
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
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
a	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
¡	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

Value of *n*			Remote Diagnostic Item	Function
ASC	**Hex**	**Dec**		
|	B3	179	Max Temperature tally	Return Max Temperature tally, returns 10 bytes
	B8	184	Dot Failure Information(-2 Warning Dot) on tally, 3 digit ASCII numeric	Write to Flash Rom max 999
	B9	185	Dot Failure Information(-2 Warning Dot) on tally, 3 digit ASCII numeric	Write to Flash Rom and print on receipt to verify
	BA	186	Dot Failure Information(-2 Warning Dot) on tally, 3 digit ASCII numeric	Clear Dot Failure Information(-2 Warning Dot) on tally to 0.
	BB	187	Dot Failure Information(-2 Warning Dot) on tally, 3 digit ASCII numeric	Return Dot Failure Information(-2 Warning Dot) on tally, a total of 5 bytes.
	BC	188	Dot Failure Information(-1 Warning Dot) on tally, 3 digit ASCII numeric	Write to Flash Rom max 999
	BD	189	Dot Failure Information(-1 Warning Dot) on tally, 3 digit ASCII numeric	Write to Flash Rom and print on receipt to verify.
	BE	190	Dot Failure Information(-1 Warning Dot) on tally, 3 digit ASCII numeric	Clear Dot Failure Information(-1 Warning Dot) on tally to 0.

Value of *n*			Remote Diagnostic Item	Function
ASC	Hex	Dec		
	BF	191	Dot Failure Information(-1 Warning Dot) on tally, 3 digit ASCII numeric	Return Dot Failure Information(-1 Warning Dot) on tally, a total of 5 bytes.
	C0	192	Dot Failure Information(0 Warning Dot) on tally, 3 digit ASCII numeric	Write to Flash Rom max 999
	C1	193	Dot Failure Information(0 Warning Dot) on tally, 3 digit ASCII numeric	Write to Flash Rom and print on receipt to verify
	C2	194	Dot Failure Information(0 Warning Dot) on tally, 3 digit ASCII numeric	Clear Dot Failure Information(0 Warning Dot) on tally to 0.
	C3	195	Dot Failure Information(0 Warning Dot) on tally, 3 digit ASCII numeric	Return Dot Failure Information(0 Warning Dot) on tally, a total of 5 bytes.
	F1		Get Wi-Fi MAC address	Return Wi-Fi Printer MAC address (18 digit ASCII numeric colon separated)

Example:

```
MSComm1.Output = Chr$(&H1D) & Chr$(&H49) & Chr$(&H40) & Chr$(n)
```

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 • 4, 52—Flash Memory status • 5, 53—printer other status

This command 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 On	00 01	0 1	Paper present. Paper exhausted.
1	Off On	00 02	0 2	Cover closed. Cover open.
2	Off On	00 04	0 4	Paper present. Paper exhausted.
3	-	-	-	Undefined.
4	Off	00	0	Not used. Fixed to off.
5	-	-	-	Undefined.
6	-	-	-	Undefined.
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 On	00 01	0 1	One or both cash drawers open. Both cash drawers closed.
1	Off On	00 02	0 2	One or both cash drawers open. 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.

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	Not used. Fixed to off.
3	Off On	00 08	0 8	Flash logo area adequate. Definition stored. Flash logo area not adequate for recent definition.
4	Off	00	0	Not used. Fixed to off.
5	Off On	00 20	0 32	No thermal user-defined characters written to Flash. Thermal user-defined characters written to Flash.
6	Off	00	0	Not used. Fixed to off.
7	Off	00	0	Not used. Fixed to off.

Printer other status (*n* = 5 or *n* = 53)				
Bit	**Off/On**	**Hex**	**Decimal**	**Status for Transmit Status**
0	Off On	00 01	0 1	No Thermal Head Print Failure. Thermal Head Print Failure.

Printer other status (*n* = 5 or *n* = 53)				
Bit	**Off/On**	**Hex**	**Decimal**	**Status for Transmit Status**
1	Off	00	0	Not used. Fixed to off.
2	Off	00	0	Not used. Fixed to off.
3	Off	00	0	Not used. Fixed to off.
4	Off	00	0	Not used. Fixed to off.
5	Off	00	0	Not used. Fixed to off.
6	Off	00	0	Not used. Fixed to off.
7	Off	00	0	Not used. Fixed to off.

Range of *n*	• 1–5 • 49–53

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

This command allows the printer to return 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. For example, for 1.234.56 (8 bytes), the boot version is 1.23 and the Flash version is 4.56.

Example:

```
MSComm1.Output = Chr$(&H1F) & Chr$(&H56)
```

Execute Head Failure Detection

ASCII	US SUB 02 00
Hexadecimal	1F 1A 02 00
Decimal	31 26 02 00

Response: Result of the Head Failure Detection (3 bytes)

Response format table (3 bytes)

Description	Byte #1	Byte #2 and #3
No Error	0x06	0x00, 0x00
Head Failure	0x15	Counter for number of dots damaged. • First Byte—Lower byte of the counter • Second Byte—Higher byte of the counter

The printer executes the Head Failure Detection and the printer returns the result of the detection (3 bytes) after finishing the failure detection. The first byte shows the result (OK/NG) and the second and third bytes show the number of dots damaged in the error case. In no error case, those bytes are null.

Get Print Completion

ASCII:	US LF *n*
Hexadecimal:	1F 0A *n*
Decimal:	29 10 *n*
Value of *n*	Identifier of print data. **Example:** 0x00 for PFM and 0x01-0xFF for Print line identifier
Range of *n*	0x00 ≤ n ≤ 0xFF

This command sends the print completion status of the print data specified by *n* to the host computer.

Response: Print completion for specified print data (2 bytes)

Description	Byte #1	Byte #2
Print line status	0xAA	*n*: 0x01 – 0xFF: Identifier of print data
PFM—power failure message status	0xAA	0x00
Printer Error	0x66	*n*: 0x01 – 0xFF: Identifier of print data

The printer returns the print completion response when it finishes printing the data sent before this command. The printable data sent before this command is identified by the parameter of this command. This command specifies ID for print data sent before this command. And the printer returns the print completion status with ID. Therefore, a host can know which data was completed.

If the printer returns the `0x66` as the first byte response, it means the printer cannot print data due to an error condition. In this case, the printer erases all printable data. The printer does not return any response for the remaining commands for *Get Print Completion* on the previous page. Once it returns the error status for this command, it retains the plural *Get print completion* commands. The printer erases not only the print data but also the retained *Get print completion* commands in the printer when an error response is returned. If the printer receives this command when it retains printable data, it starts printing by force like receiving LF+CR.

Exceptions

If the printer powered OFF during the transaction then after the power on the printer will respond (`0xAA0x00`) to the PFM message.

Limitations

- This command is available when *Receipt Synchronization* setting is *Enabled (mode3)*.
- This command is effective in RS232c interface mode only.
- This command is effective in the line mode and is ignored in the page mode.

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 *n*	1D 49 n	0	x	x	0	x	x	x	x	Binary
GS r *n*	1D 72 n	0	x	x	0	x	x	x	x	Binary

Batch Mode Response		Response Recognized By:							
ASCII	HEX								
GS EOT *n*	1D 04 n	0	x	x	1	x	1	0	Binary
DLE EOT *n*	10 04 n	0	x	x	1	x	1	0	Binary
GS ENQ	1D 05	1	x	x	x	x	x	x	Binary
XON		0	0	0	1	0	0	1	Binary
XOFF		0	0	0	1	0	1	1	Binary

Real Time Commands

The following 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 data buffer of the printer 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, thermal print head overheat, and so forth.

The Real Time commands are implemented in two ways to correct these problems. Both implementations offer the same functionality; the choice if the user depends on the current usage of the 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 7193 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 7193 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

The following situations must be understood when using real time commands:

- The printer executes the Real Time command upon receiving it and will transmit status regardless of the condition of the DSR signal.
- 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.
- 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 cannot 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 be filled 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 as the second byte in its GS sequence.

Note: 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 buffer when it goes busy.

UDP Communication

In Ethernet model, the realtime transition is done by UDP (Standby/Ethernet model common information uses UDP port 3000 and Ethernet-related information uses UDP port 3001). When an application uses UDP port, adding 4 bytes of Sequence Number before command is required. The printer returns the response with the same Sequence Number.

Real Time Status Transmission

	GS Sequence Standard/Ethernet	DLE Sequence Standard/Ethernet	Non ION USB
ASCII	GS EOT *n*	DLE EOT *n*	DC4 SOH n (bRequest = DC4, wValue = SOH n)
Hexadecimal	1D 04 *n*	10 04 *n*	14 01 n (bRequest = 0x14, wValue = 0x01 n)
Decimal	29 4 *n*	16 4 *n*	20 1 n (bRequest = 20, wValue = 1 n)

	GS Sequence Standard/Ethernet	DLE Sequence Standard/Ethernet	Non ION USB
Value of *n*	GS/DLE Sequence		UDP port
	1 = Transmit printer status		3000
	2 = Transmit RS-232C busy status		3000
	3 = Transmit error status		3000
	4 = Transmit receipt paper status		3000
	6 = Transmit error other status		3000
	20 = Ethernet Information (34 bytes) Serial number (11 bytes) + Model number (17 bytes) + MAC address (6 bytes)		3001 Ethernet model only
	21 = Serial number (11 bytes)		3001 Ethernet model only
	22 = Model number (17 bytes)		3001 Ethernet model only
	23 = MAC address (6 bytes)		3001 Ethernet model only

According to *Ethernet RTC Protocol* setting `(1F 11)`, the using protocol and port number are different. When *Ethernet RTC Protocol* setting is TCP, this command (*n* = 1 to 6) is effective in TCP 9100 port. *Ethernet RTC Protocol* setting is UDP. This command is effective in UDP 3000 port.

When sending above command to the printer by Ethernet (UDP 3000 port), there is a need to add Sequence Number of 4 bytes before command.

In case of Transmit printer status command, send `xxh xxh xxh xxh 1Dh 04h 01h`. `xxh xxh xxh xxh` is the Sequence Number.

This command 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. Using either produces the same result.

Example:

```
MDComm1.Output = Chr$(&H1D) & Chr$(&H04) & Chr$(n)
```

Exceptions

This 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 On	00 04	0 4	One or both cash drawers open. Both cash drawers closed.
3	Off On	00 08	0 8	Not busy at the RS-232C interface. 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 On	00 04	0 4	Cover closed. Cover open.
3	Off On	00 08	0 8	Paper Feed Button is not pressed. Paper Feed Button is pressed.
4	On	10	16	Fixed to On.
5	Off On	00 20	0 32	Printing not stopped due to paper condition. Printing stopped due to paper condition.
6	Off On	00 40	0 64	No error condition. 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	Fixed to Off.
3	Off On	00 08	0 8	No knife error. Knife error occurred.
4	On	10	16	Fixed to On.
5	Off On	00 20	0 32	No unrecoverable error. Unrecoverable error occurred.
6	Off On	00 40	0 64	Thermal print head temp./power supply voltage are in range. 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 On	00 04	0 4	Receipt paper adequate. Receipt paper low.
3	Off On	00 08	0 8	Receipt paper adequate. Receipt paper low.
4	On	10	16	Fixed to On.
5	Off On	00 20	0 32	Receipt paper present. Receipt paper exhausted.
6	Off On	00 40	0 64	Receipt paper present. Receipt paper exhausted.
7	Off	00	0	Fixed to Off.

6 = Transmit Error Other Status

Bit	Status	Hex	Decimal	Function
0	Off	00	0	Fixed to Off.
1	On	02	2	Fixed to On.
2	Off On	00 04	0 4	No Thermal Head Print Failure. Thermal Head Print Failure.
3	Off	00	0	Not used. Fixed to off.
4	On	10	16	Not used. Fixed to on.
5	Off	00	0	Not used. Fixed to off.
6	Off	00	0	Not used. Fixed to off.
7	Off	00	0	Not used. Fixed to off.

Real Time Request to Printer

	GS Sequence Standard/Ethernet	DLE Sequence Standard/Ethernet	Non ION USB
ASCII	GS ETX *n*	DLE ENQ *n*	NAK STX *n* (bRequest = NAK, wValue = STX *n*)
Hexadecimal	1D 03 *n*	10 05 *n*	15 02 *n* (bRequest = 0x15, wValue = 0x02 *n*)
Decimal	29 3 *n*	16 5 *n*	21 2 *n* (bRequest = 21, wValue = 2 *n*)
Value of *n*	• 1—Recover and restart • 2—Recover and clear buffers		

According to *Ethernet RTC Protocol* setting `(1F 11)`, the using protocol and port number are different. When *Ethernet RTC Protocol* setting is TCP, this command *n*= 1 to 3) is effective in TCP 9100 port. When *Ethernet RTC Protocol* setting is UDP, this command is effective in UDP 3000 port.

When the above command is sent to the printer by Ethernet (UDP 3000 port), there is a need to add Sequence Number of 4 bytes before the command.

In case of Recover and restart command, send `xxh xxh xxh xxh 1Dh 03h 01h`. `xxh xxh xxh xxh` is the Sequence Number.

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**

This setting 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.

***n* = 2**

This setting ecovers 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.

Example:

```
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

RS232C / ION USB/Ethernet

ASCII	GS ENQ
Hexadecimal	1D 05
Decimal	29 5

According to *Ethernet RTC Protocol* setting `(1F 11)`, the using protocol and port number are different. When *Ethernet RTC Protocol* setting is TCP, this command is effective in TCP 9100 port. *Ethernet RTC Protocol* setting is UDP, this command is effective in UDP 3000 port.

When the command above is sent to the printer by Ethernet (UDP 3000 port), there is a need to add Sequence Number of 4 bytes before command.

Note: In case of the above command, send `xxh xxh xxh xxh 1Dh 05h`. `xxh xxh xxh xxh` is a Sequence Number. The printer responds with the same Sequence Number.

Non ION USB

ASCII	ENQ ENQ (bRequest = ENQ, wValue = ENQ NUL)
Hexadecimal	05 05 (bRequest = 0x05, wValue = 0x05 0x00)
Decimal	5 5 (bRequest = 5, wValue = 5 0)

This command transmits one byte status of the printer in real time.

Value of Byte

Bit	Status	Hex	Decimal	Function
0	Off On	00 01	0 1	Receipt paper adequate. Receipt paper low.
1	Off On	00 02	0 2	Receipt paper adequate. Receipt paper low.
2	Off On	00 04	0 4	Cover closed. Cover open.
3	Off On	00 08	0 8	Not busy at the RS-232C interface. Printer is busy at the RS-232C interface.
4	Off On	00 1	0 16	One or both cash drawers open. Both cash drawers closed.
5	Off	00	0	Fixed to off.
6	Off On	00 40	0 64	No error condition. Error condition exists in the printer.
7	On	00	0	Fixed to on.

Example:

```
MSComm1.Output = Chr$(&H1D) & Chr$(&H05)
```

Unsolicited Status Update Validation

Determine if Device Supports USU

The Host uses this command to determine if the device supports USU.

ASCII	GS *a x*
Hexadecimal	1D 61 *x*
Decimal	27 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

This request 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 —tells 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`

This 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 Series II (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 reached low threshold limit.
	RTC Response (10 04 04) – Bit 3	0	Paper has been replenished.

Identifier Value (Hex)	Description of sensor or state RTC Sensor Bit if Applicable for 7167 / 7197 Series II (Note: RTC might be different for other printers)	State Value	Meaning
3	Journal Paper Exhaust Sensor	1	No paper available for printing.
	(Reserved Not Used 7167 / 7197 Series II 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 Series II 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 determine drawer 2)	1	Drawer Open.
		0	Drawer Closed.

Identifier Value (Hex)	Description of sensor or state RTC Sensor Bit if Applicable for 7167 / 7197 Series II (Note: RTC might be different for other printers)	State Value	Meaning
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.
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.

Identifier Value (Hex)	Description of sensor or state RTC Sensor Bit if Applicable for 7167 / 7197 Series II (Note: RTC might be different for other printers)	State Value	Meaning
16	Power Supply Voltage	1	Out of operating range.
	RTC Response (10 04 03) – Bit 6	0	Normal operating range.
17	Thermal Print Head Failure	1	Thermal print head failure.
	RTC Response (10 04 03) – Bit 4	0	Normal operating range.
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.
1E	Flip Mechanism Door State	1	Door Open.
	No RTC equivalent	0	Door Closed.

Identifier Value (Hex)	Description of sensor or state RTC Sensor Bit if Applicable for 7167 / 7197 Series II (Note: RTC might be different for other printers)	State Value	Meaning
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

The following sections describe the commands for the printing of bar codes in the order of their hexadecimal codes.

Note: The 7193 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 (Default) • 1—Above the bar code • 2—Below the bar code • 3—Both above and below the bar code

This command 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 (Default) • 1—Compressed Pitch at 19 CPI on receipt

This command selects standard or compressed font for printing Bar Code characters.

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

This command sets the bar code height to *n* dots or ***n*/8 mm** (*n*/203 inch) for receipt. Select Bar Code Height is not available in GS1 databar.

Example:

```
MSComm1.Output = Chr$(&H1D) & Chr$(&H68) & Chr$(n)
```

Print Bar Code

	First Variation Second Variation
ASCII	GS k *m d1...dk* NUL or GS k *m n d1...dn*
Hexadecimal	1D 6B *m d1...dk* 00 or 1D 6B *m n d1...dn*
Decimal	29 107 *m d1...dk* 0 or 29 107 *m n d1...dn*
	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)

This command 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 bar code 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. 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 7193 Emulation.

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.

m	Bar Code	D	n, 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) *d1* = *dk* = 42 (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 (7194 Native Mode and 7197 Series II Native Mode)	1–255	Variable Length 7194 Native Mode and 7197 Series II Native Mode

Second Variation: Length of Byte Specified at Beginning of String

m = 65–73, 75–82 (refer to the table)

d = 0–127 (refer to the table)

n = 1–255 (refer to 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. Refer to 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) *d1* = *dn* = 42 (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 (A748 Native Mode only)
73	Code 128	0–105 *d1* = 103–105 (must be a Start code) *d2* = 0-102 (data bytes) (Stop code is provided by the printer)	Variable

M	Bar Code	D	n, Length
75	PDF417	0–255	Variable Length (A748 Native Mode only)
76	GS1 DataBar Omnidirectional	48–57	Fixed Length: 13
77	GS1 DataBar Truncated	48–57	Fixed Length: 13
78	GS1 DataBar Stacked	48–57	Fixed Length: 13
79	GS1 DataBar Stacked Omnidirectional	48–57	Fixed Length: 13
80	GS1 DataBar Limited	48–57 [However d1= 48, 49]	Fixed Length: 13
81	GS1 DataBar Expanded	32–34, 37–47, 48–57, 58–63, 65–90, 95, 97–122, 123 [However d1 = 40, 48 <= d2 <= 57, 48 <= d3 <= 57 when 48 <= d1 <= 57, 48 <= d2 <= 57]	Variable length (2–70)
82	GS1 DataBar Expanded Stacked	32–34, 37–47, 48–57, 58–63, 65–90, 95, 97–122, 123 [However d1 = 40, 48 <= d2 <= 57, 48 <= d3 <= 57 when 48 <= d1 <= 57, 48 <= d2 <= 57]	Variable length (2–70)

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* is specified.

Exceptions

- Illegal data cancels this command.
- The command is valid only at the beginning of a line.
- PDF417 and Code 93 are only available in 7194 Native Mode.

Note: For GS1 DataBar, in the case of barcode (except Expanded and Expanded Stacked), FW automatically adds the application as identifier(AI) & check digit(C/D). Then n (length) is 13 (fixed length).

Fig. about the addition of AI & C/D

Type of GS1 DataBar	Example	AI & C/D
GS1 DataBar Omnidirectional	Input data: 2001234567890 HRI print: (01)20012345678909	AI & C/D are added automatically. The AI is '(01)'.
GS1 DataBar Truncated		
GS1 DataBar Stacked		
GS1 DataBar Stacked Omnidirectional		
GS1 DataBar Limited		
GS1 DataBar Expanded	Input data: {(01{)15012345678907{(30{)23{1{(17{)950827 HRI print: (01)15012345678907 (30)23(17)950827	Neither AI nor C/D is added automatically.
GS1 DataBar Expanded Stacked		

In order to express AI in HRI, AI is surrounded by the bracket and printed. Because this parenthesis needs to distinguish from the usual data, it is necessary to use special data.

In the case of Expanded and Expanded stacked, C/D is used for only HRI characters printing. Even if the input data including wrong C/D is received, the printer prints the data without correction.

In the case of Expanded and Expanded stacked, when attaching the bracket to AI in HRI, it is necessary to transmit data as follows.

Fig. about special data

Special Data	Transmit data from HOST			Use
	ASCII	Hex	Decimal	
(	{ + (	7B + 28	123 + 40	to express AI in HRI
)	{ +)	7B + 29	123 + 41	to express AI in HRI
FNC1	{ + 1	7B + 31	123 + 49	to recognize the end of variable length data

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

This command sets the bar code width to *n* dots.

Formulas

n + **1/8 mm** (*n* + 1/203 inch) for receipt.

Example:

```
MSComm1.Output = Chr$(&H1D) & Chr$(&H77) & Chr$(n)
```

Caution: When selecting a bar code width of 1 the readability rate is impacted.

QR Code: Select the Model

ASCII	GS (k *pL pH cn fn n1 n2*)
Hexadecimal	1D 28 6B *pL pH cn fn n1 n2*
Decimal	29 40 107 *pL pH cn fn n1 n2*
Values of *pL,pH*	*pL, pH* specify (*pL* + *pH* × 256) as the number of bytes after *pH* (*cn, fn,* and *[parameters]*). (*pL* + *pH* × 256) = 4 So (*pL* = 4, *pH* = 0)
Value of *cn*	49
Value of *fn*	65
Value of *n1*	• 49—selects model 1 Code conversion processing • 50—selects model 2 conversion processing • 200—select Micro QR Code
Value of *n2*	0
Default	*n1* = 50, *n2* = 0

This command selects the model for QR Code.

QR Code: Set the Size of Module

ASCII	GS (k *pL pH cn fn n*
Hexadecimal	1D 28 6B *pL pH cn fn n*
Decimal	29 40 107 *pL pH cn fn n*
Values of *pL,pH*	*pL, pH* specify (*pL* + *pH* × 256) as the number of bytes after *pH* (*cn, fn,* and *[parameters]*). (*pL* + *pH* × 256) = 3; so (*pL* = 4, *pH* = 0)
Value of *cn*	49
Value of *fn*	67
Value of *n*	1–16
Default *n*	4

This command sets the size of the module for QR Code as n dots. The user must secure the quiet zone (left, right, upward, and downward space areas defined by the QR Code symbol specifications) for QR Code printing. Quiet zone is defined as 4 cells in standard and MicroQR code versions.

Note: The recommended module size is 4 dots and over. But if *n* = 4, this printer cannot print maximum data bar code because the bar code width will be over the printable width. So, the default value of *n* is defined to 3 in this version.

QR Code: Select the Error Correction Level

ASCII	GS (k *pL pH cn fn n*
Hexadecimal	1D 28 6B *pL pH cn fn n*
Decimal	29 40 107 *pL pH cn fn n*
Values of *pL,pH*	*pL*, *pH* specify (*pL* + *pH* × 256) as the number of bytes after *pH* (*cn*, *fn*, and *[parameters]*). (*pL* + *pH* × 256) = 3; so (*pL* = 3, *pH* = 0)
Value of *cn*	49
Value of *fn*	69
Value of *n*	• 48—Select error correction level L 7 % • 49—Select error correction level M 15 % • 50—Select error correction level Q 25 % • 51—Select error correction level H 30 % When model1 or model2 selected, *n* = 48, 49, 50, 51 When microQR selected n = 48, 49, 50
Default *n*	48

This command selects the error correction level for QR Code.

Note: In MicroQR, it is not printed error correction level = *H* at the time of the choice. *Symbol versionM1* in microQR. Choose error correction level=*L*.

QR Code: Store the Data in the Symbol Storage Area

ASCII	GS (k *pL pH cn fn m d1...dk*
Hexadecimal	1D 28 6B *pL pH cn fn m d1...dk*
Decimal	29 40 107 *pL pH cn fn m d1...dk*
Range of *pL*	4–255; here 4 ≤ (pL + pH × 256) ≤ 7092
Range of *pH*	0–27
Value of *cn*	49
Value of *fn*	80
Value of *m*	48
Range of *d*	0–255
Value of k	(*pL* + *pH* × 256) – 3

This command stores the QR Code symbol data (*d1...dk*) into the symbol storage area (RAM).

QR Code: Print the Symbol Data in the Symbol Storage Area

ASCII	GS (k *pL pH cn fn m*
Hexadecimal	1D 28 6B *pL pH cn fn m*
Decimal	29 40 107 *pL pH cn fn m*
Values of *pL, pH*	*pL, pH* specify (*pL* + *pH* × 256) as the number of bytes after *pH* (*cn, fn,* and *[parameters]*). (*pL* + *pH* × 256) = 3; so (*pL* = 3, *pH* = 0)
Value of *cn*	49
Value of *fn*	81
Value of *m*	48

This command encodes and prints the QR Code symbol data in the symbol storage area with GS (k

Note: User must secure the quiet zone (left, right, upward, and downward space areas defined by the QR Code symbol specifications) for QR Code printing. In case of 7167, QR Code format cannot be printed on the slip.

QR Code: Transmit the Size Information of the Symbol Data in the Symbol Storage Area

ASCII	GS (k *pL pH cn fn m*
Hexadecimal	1D 28 6B *pL pH cn fn m*
Decimal	29 40 107 *pL pH cn fn m*
Values of *pL, pH*	*pL, pH* specify (*pL* + *pH* ×256) as the number of bytes after *pH* (*cn, fn, and [parameters*]). (*pL* + *pH* × 256) = 3; so (*pL* = 3, *pH* = 0)
Value of *cn*	49
Value of *fn*	82
Value of *m*	48

This command allows the printer to transmit the size information for the encoded QR Code symbol data in the symbol storage area.

Description	Hex	Decimal	Data
Header	37	55	1 byte
Identifier	36	54	1 byte
Horizontal size	30–39	48–57	1–5 bytes
Separator	1F	31	1 byte
Vertical Size	30–39	48–57	1–5 bytes
Separator	1F	31	1 byte
Fixed Value	31	49	1 byte
Separator	1F	31	1 byte
Other information	30 or 31	48 or 49	1 byte
NULL	00	0	1 byte

Note: From the table above, *Other information* represents the possibility of printing the QR Code.

Other Information

- `0x30`—printing is possible.
- `0x31`—printing is impossible.

Horizontal and vertical sizes are specified as ASCII value of received byte. They can be obtained by following equations:

- Horizontal size—number of cells in *Horizontal Direction* × *Symbol size* specified by the command `1D 28 6B 03 00 31 43 n`.
- Vertical size—number of cells in *Vertical Direction* × *Symbol size* specified by the command `1D 28 6B 03 00 31 43 n`.

Example: If Symbol size is specified as *10* by the command of `1D 28 6B 03 00 31 43 n` and number of pixel in horizontal direction is *21*, then horizontal size will be *10* * *21* = *210*. So the output of the printer will be `37 36 32 31 30 1f 32 31 30 1f 31 1f 30 00`.

Page Mode Commands

Page Mode is one of two modes, which the 7194 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 7194 Native Mode only.

Print and Return to Standard Mode

ASCII	FF
Hexadecimal	0C
Decimal	12

In this mode, the processed data is printed and the printer returns to Standard Mode. The developed data is deleted after being printed.

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

This command 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

This command 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 is enabled only in Page Mode.

Select Page Mode

ASCII	ESC L
Hexadecimal	1B 4C
Decimal	27 76

This command 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:

- Set Right-Side Character Spacing (1B 20)
- Select 1/6-Inch Line Spacing (1B 32)
- Set Line Spacing (1B 33)

It is possible only to set values for the following commands in Page Mode. These commands are not executed.

- Select or Cancel 90 Degree Clockwise Rotation (1B 56)
- Select Justification (1B 61)
- Select or Cancel Upside Down Printing (1B 7B)
- Set Left Margin (1D 4C)
- Set Print Area Width (1D 57)

Example:

```
MSComm1.Output = Chr$(&H1B) & Chr$(&H4C)
```

Exceptions

The command is enabled only when it is entered at the beginning of a line. The command has no effect if Page Mode has previously been selected. In 7193 Emulation Mode, (1B 4C…) is used for double density graphics.

Select Standard Mode

ASCII	ESC S
Hexadecimal	1B 53
Decimal	27 83

This command 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:

- Set Right-Side Character Spacing `(1B 20)`
- Select 1/6 Inch Line Spacing `(1B 32)`
- 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.

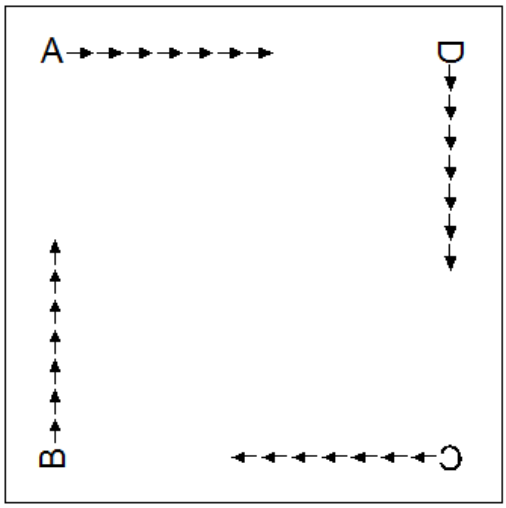
Select Print Direction in Page Mode

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)

Note: A, B, C and D note the direction of print.

This command selects the printing direction and start position in Page Mode. Refer to 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 Print and Return to Standard mode 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 and is ignored if the value of *n* is out of the specified range.

Set Printing Area in Page Mode

ASCII	ESC W *n1, n2 ...n8.]*
Hexadecimal	1B 57 *n1, n2 ...n8]*
Decimal	27 87 *n1,n2 ...n8*
Range	0–255
Value of *n*	• *n1–4* = 0 • *n5* = 64 • *n6* = 2 • *n7* = 64 • *n8* = 2

This command 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, and can be developed in the printer's page buffer before being printed by the Print and Return to Standard mode command (0C).

The defaults are equal to 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.

- x0 = [(n1 + n2 x 256) x (horizontal direction of the fundamental calculation pitch)]
- y0 = [(n3 + n4 x 256) x (vertical direction of the fundamental calculation pitch)]
- dx = [(n5 + n6 x 256) x (horizontal direction of the fundamental calculation pitch)]
- dy = [(n7 + n8 x 256) x (vertical direction of the fundamental calculation pitch)]

Note: Refer to 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).

Keep the following notes in mind for this command:

- The fundamental calculation pitch depends on the vertical or horizontal direction.
- The maximum printable area in the x direction is 576/203 inches.
- 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:

```
MSComm1.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*

Formula

[(nL + nH x 256) x (vertical or horizontal motion unit)] inches.

This command 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:

```
MSComm1.Output = Chr$(&H1D) & Chr$(&H24) & Chr$(nL) & Chr$(nH)
```

Exceptions

This command is effective only in Page Mode. If the [(nL + nH x 256) x (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*

This command 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` x 256) x 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 x 256 = n
```

When pitch n is specified to the movement upward (negative direction), use the complement of 65536.

When pitch *n* is specified to the movement upward:

```
nL + nH x 256 – 65536 – N
```

Note: 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

Macro 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

This command 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 7194 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.

This command 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 x 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:

```
MSComm1.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 7194 Native Mode only.

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*	Number of bytes to be written **Note:** 0 refers to 256 bytes
Range of *m*	0–255
Value of *a*	3-byte address **Note:** a0 is high byte address
Range of *a*	0–255
Value of *d*	Data to be written
Range of *a*	0–255

This command writes *m* bytes of data (*d1… dm*) to the User Data Storage Flash Page at the address specified. The printer waits for *m* bytes of data following the 3-byte address (a0 a1 a2), 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 command above 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*	Number of bytes to be read **Note:** 0 refers to 256 bytes
Range of *m*	0–255
Value of *a*	3-byte address **Note:** a0 is high byte address)
Range of *a*	0–255

This command reads *m* bytes of data from the User Data Storage Flash Page at the address (a0 a1 a2) specified.

Example:

```
MSComm1.Output = Chr$(&H1B) & Chr$(&H34) & Chr$(&H5) & Chr$(&H0) &
Chr$(&H0) & Chr$(&H0)
```

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 *m*	48–51

This command 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)

  This setting 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)

  This setting 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)

  This setting 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)

  This setting 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 of *n1*	1 (see below)
Default Value of *n2*	1 (see below)

- `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 saved across power cycles.

n1 + *n2* <= 6 (3M)

n1	n2	User Defined Character	Download Logo	User Storage Data
0	5	64 KB	0 KB	320 KB
1	4	64 KB	64 KB	256 KB
2	3	64 KB	128 KB	192 KB

The 7167 has been configured at the factory with 512K, 1M or 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 is command is available only in 7194 Native Mode

Erase User Flash Sector

ASCII	GS @ *n*
Hexadecimal	1D 40 *n*
Decimal	29 64 *n*
Value of *n*	49–50

This command 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.

Note: 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$(&H1B) & Chr$(&H3F) & 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*

m (Hex)	Function	*n* (Hex)	Function
10	Interface type	00 01 02	USB/RS232C RS232C USB
11	Baud rate	00 01 02 03 04 05 06 07	115200 bps 57600 bps 38400 bps 19200 bps 9600 bps 4800 bps 2400 bps 1200 bps
12	Number of data bit	00 01	8 data bits 7 data bits
13	Number of stop bit	00 01	1 stop bits 2 stop bits
14	Parity	00 01 02	No parity Even parity Odd parity
15	Flow control	00 01	Software (XON/XOFF) Hardware (DTR/DSR)
16	Data reception errors option	00 01	Ignore errors Print “?”
17	One line buffer option	00 01 02 03	Normal size receive buffer(4K) One line buffer(128 Bytes) 8K 12K
18	DSR signal option	00 01	Enable DSR signal Disable DSR signal

m	Function	*n*	Function
(Hex)		(Hex)	
19	Printer ID mode	00 01 02	7194 Native ID Emulated Printer ID 7197 Series II Native ID
20	Emulation	00 01 02	7194 mode 7193 mode 7197 Series II Native mode
21	Default lines per inch	00 01 02	8.13 lines per inch 7.52 lines per inch 6 lines per inch
22	Carriage return usage	00 01	Ignore CR Use CR as Print cmd.
23	Asian mode	00 01	Asian mode on Asian mode off
24	Power LED Control	00 01	Disable Enable
25	Receipt synchronization	00 01 02 03	Synchronization Mode2 enabled Synchronization disabled Synchronization Mode1 enabled Synchronization Mode3 enabled
27	PDF417 Print Column	00 01	9 Columns 14 Columns

m	Function	*n*	Function
(Hex)		(Hex)	
30	Print density	F1	-15
		F2	-14
		F3	-13
		F4	-12
		F5	-11
		F6	-10
		F7	-9
		F8	-8
		F9	-7
		FA	-6
		FB	-5
		FC	-4
		FD	-3
		FE	-2
		FF	-1
		00	0
		01	+1
		02	+2
		03	+3
		04	+4
		05	+5
		06	+6
		07	+7
		08	+8
		09	+9
		0A	+10
		0B	+11
		0C	+12
		0D	+13
		0E	+14
		0F	+15
31	Paper Low sensor option	00	Paper low sensor enable
		01	Paper low sensor disable

m	Function	*n*	Function
(Hex)		(Hex)	
32	Paper width	00 01	80 mm 58 mm
33	Knife option	00 01 02 03	Enable knife Disable knife Enable knife w / Buzzer(Low) Enable knife w / Buzzer(High)
36	Max Power option	00 01 02 03	Term Pwr-High NCR 75W Ext Pwr Term Pwr-Low NCR 60W Ext Pwr
37	Color Paper option	00 01	One Color Paper Two Color Paper
3C	Auto Reset timeout	00 01 02 03 04 05 06	Disable 10 Sec 20 Sec 30 Sec 40 Sec 50 Sec 60 Sec
3E	FONT TYPE	00 01	FONT1, use original font. (all code page) FONT2, use increased font size (CP473 and CP858 only. Other code page use original font.)

m	Function	*n*	Function
(Hex)		(Hex)	
40	Default code page	00 01 02 03 04 05 06 07 08 09 0A 0B 0C 0D 0E 0F	437 850 852 858 860 862 863 864 865 866 874 1252 Katakana 932 (or 936, 949, 950) Hungary 1256
46	Remove Upper Space in Eco utility	00 01	Disable Enable
47	Remove Lower Space in Eco utility	00 01	Disable Enable
48	Line Space Reduction in Eco utility	00 01	Disable Enable
49	Line Feed Reduction in Eco utility **Note:** If Line feed reduction setting is changed more than one times in one receipt, the last setting is valid.	00 01 02 03 04	Disable Reduce 100% Reduce 25% Reduce 50% Reduce 75%

m	Function	*n*	Function
(Hex)		(Hex)	
4A	Barcode Height Reduction in Eco utility	00 01 02 03	Disable Reduce 25% Reduce 50% Reduce 75%
4B	Registered Logo Removal in Eco utility	00 01	Disable Enable
4C	Force Single High Font in Eco utility	00 01	Disable Enable
4D	Bold Font Removal in Eco utility	00 01	Disable Enable
4E	Force Single Wide Font in Eco utility	0001	Disable Enable
4F	No White/Black Reverse Printing Reduction	0001	Disable Enable
50	EEPROM default setting	00	EEPROM default setting
55	Ethernet-info default setting	00	Ethernet information default setting (Ethernet Model, need HW reset)
56	Default setting for All	00	*EEPROM default setting* & *Ethernet-info default setting* (need HW reset)
57	ECO function disable/enable in Eco utility	00 01	Disable Enable
58	Space Character Line in Eco utility	00 01	Character Line Feed
68	USB Type	00 01 02	ION(Epic) NonION(NHPI) NonION(PRTR)
7E	Compress Pitch	00 01	Enable Ignore

m	Function	*n*	Function
(Hex)		(Hex)	
7F	Compatibility Barcode Length	00 01	Disable Enable
80	Receipt Print Mode	00 01 02	High Speed Print High Quality Print Eco Print
81	Power-On Thermal Head Failure Detection Mode	00 01	Off On
82	Standby mode	00 01	Disabled Enabled
83	Power-off mode	00 01 02 03 04 05	Disabled 60min 120min 180min 240min 300min
84	Ethernet RTC Protocol	00 01	TCP UDP

This command sets 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, but the printer waits for the data until terminator code `0FFH`.

Example:

```
MSComm1.Output = Chr$(&H1F) & Chr$(&H06)
```

Asian Character Commands

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
7	Off On	00 01	0 1	Standard Pitch (24H x 24V) Compress Pitch (20H x 24V)
1	Off	00	0	Undefined
2	Off On	00 01	0 1	Double width mode is not selected Double width mode is selected
3	Off On	00 01	0 1	Double height mode is not selected Double height mode is selected
4	-	-	-	Undefined
5	-	-	-	Undefined
6	-	-	-	Undefined
7	Off On	00 01	0 1	Underline mode is not selected Underline mode is selected

Default of *n*: 0

This command selects character attribute for Asian characters.

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 -`, but it does not relate to character size.

Example:

```
MSComm1.Output = Chr$(&H1C) & Chr$(&H21) & Chr$(n)
```

FS – Turn Underline Mode ON/OFF for Kanji

ASCII	FS - *n*
Hexadecimal	1C 2D *n*
Decimal	28 45 *n*
Value of *n*	• 0—Cancel (Default) • 1—1 dot height underline • 2—2 dot height underline

This command turns underline mode on or off for Asian characters.

All characters can be underlined, including character right side spacing. Underline can be selected by `FS !` and `ESC -` also, if the last received command is effective.

Example:

```
MSComm1.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*	Specifies the beginning Asian character code	
Value of *c2*	Specifies the end Asian character code	
Value of *d*	Image data	
Range of *c1*, *c2*	Japanese (CP932)	F0 ≤ c1 ≤ F9, 40 ≤ c2 ≤ 7E 80 ≤ c2 ≤ FC
	Simplified Chinese (CP936)	A1 ≤ c1 ≤ A7 40 ≤ c2 ≤ 7E 80 ≤ c2 ≤ A0 AA ≤ c1 ≤ AF A1 ≤ c2 ≤ FE F8 ≤ c1 ≤ FE A1 ≤ c2 ≤ FE
	Korean (CP949)	c1 = C9 c1 = FE A1 ≤ c2 ≤ FE
	Traditional Chinese (CP950)	81 ≤ c1 ≤ A0 FA ≤ c1 ≤ FE 40 ≤ c2 ≤ 7E 80 ≤ c2 ≤ FE C7 ≤ c1 ≤ C8 A1 ≤ c2 ≤ FE

This command defines and enters downloaded characters into RAM.

The user-defined character will be cleared by ESC @ or powering off the 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

This command sets the character right-side spacing for Asian characters.

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 (Default) • 1 (Bit 0)—Quadruple mode on

This command 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)
```

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:

- Powering the printer up with DIP Switch 2 up.
- While the printer is running normally. Use the command Switch to Flash Download Mode to leave normal operation and enter the Download Mode.
- 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

This command puts the printer in Flash Download Mode, to prepare the printer 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

This command returns `ACK (06 hex) + 12 bytes` ASCII string describing the Flash Memory Boot Sector Firmware part number, for example, 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

This command 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)
```

Exception

This command is 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)

This command 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)
```

Exception

This command is available only in Download Mode.

Get Firmware CRC

ASCII	GS ACK
Hexadecimal	1D 06
Decimal	29 6

This command 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, and transmits 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

This command 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

This command 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)
```

Note: This command is available only in Download Mode.

Return Main Program Flash CRC

ASCII	GS SI
Hexadecimal	1D 0F
Decimal	29 15

This command 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

This command 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)
```

Exception

This command is 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*

This 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 *n* (for number of data bytes)	Range of Address (*al ah*)	Range of Count (*cl ch*)
((ch * 256) + cl)	2000-FFFF (hexadecimal)	0001-0400 (hexadecimal)

Range

The addresses run from 0 to 64K.

Exception

This command is available only in Download Mode.

Reboot the Printer

ASCII	GS (SPACE)
Hexadecimal	1D FF
Decimal	29 255

This command 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)
```

Chapter 7: Reflashing the Printer Firmware

Flash Utility Information

The following instructions provide information on how to use the Flash Utilities provided for the NCR 7167, 7168, 7197, 7198, 7401-K590, 7342-F306, and 734X-F307 printers. These instructions cover the utilities provided for Windows XP GUI, Windows Command Line, and DOS.

The following files comprise the utilities:

- `TseFlash.exe`—Windows GUI version of the Flash Utility
- `TseFlash.com`—Windows Command Line Flash Utility
- `Aflash.exe`—DOS Command Line Flash Utility

File Configurations

The following kinds of firmware loads can be sent to the printer:

- Boot Firmware
- Boot Firmware for Ethernet
- Main Firmware
- Single Byte Font
- Two Byte Receipt Font
- Two Byte Slip Font

The Single Byte Font file has a file extension of `.sfn`. It is the font used for OEM Codepages such as 437, 850, 858, and so forth, which require only a single byte of data to define the character to be printed. The Two Byte Font files (Separately Defined for Slip & Receipt) have a file extension `.dfn`. These are used to define Code Pages 932 – Japanese, 936 – Simplified Chinese, 949 – Korean, and 950 – Traditional Chinese.

It is very rare for the Single Byte Font to have to be updated. Since there is only enough memory in the printer for one of the Two Byte Fonts to be loaded at any time, the Two Byte Font will typically need to be loaded prior to installation in the appropriate country.

Note: The Font files, both Single and Two byte, should be loaded into the printer after the Boot and Main firmware have been loaded.

Printer Languages Cross-Reference

Font Type	Print Station	File Name
ANK	Receipt	ank_V0009.sfn *
Japanese CP932	Receipt	CG932RC_V0004.dfn *
Korean CP949	Receipt	CG949RC_V0004.dfn *
Simple Chinese CP936	Receipt	CG936RC_V0003.dfn
Traditional Chinese CP950	Receipt	CG950RC_V0003.dfn

The following items need to be noted:

- The noted font files are included on LPIN A370-0050-0000 or are available from the NCR web site under Retail Solution Specific Printer Firmware.
- The ***** denotes that the printer is preloaded with these fonts from the factory.
- When Asian fonts are to be used, select the appropriate Asian Code Page in the diagnostic set and also enable the Asian Mode.
- The above file names are latest as on 23rd Feb 2012. Based on the new modification, the filenames may change.

DOS Flash Utility

The DOS flash utility is intended for use from a DOS Boot only. The utility is mainly provided for remote flash capabilities by providing a way to create a DOS Boot Image that will automatically load and flash update the printer firmware without user intervention. This utility supports RS232 interface only.

When typing `AFLASH.EXE` without any parameters, the following screen that describes the parameter usage is displayed:

```
Flash Memory Writer V2.13
Usage: AFLASH.EXE <model> <type> <port> <baud rate> <filename>
            <check model> <print/noprint>
Options:
                                : K590, 7402-K592, 7167, 7167-X035,
                                7167-X115, 7167-50X1/60X1,
                                7168, 7197, 7197-5X01/6X01, 7198, 7198-
                                1X41/2X41,
<model>                         7342-F306, 7346-F306, 734X-F307/7125,
                                734X-F308, 734X-F309

                                Note: For the 7125 printer, use the
                                734X-F307 selection
<type>
-m                              : Download main firmware program
```

```
-i                          : Download ipl firmware program
-b                          : Download boot firmware program (for
                              7168 models only)
-a                          : Download ANK font
-s                          : Download ASIAN font for K590/7402-
                              K592/7197/7342-F306/7346-F306
-rs                         : Download Receipt ASIAN font for 7167,
                              7168 , 7198 , 7167-50X1/60X1
-ss                         : Download Slip ASIAN font for 7167,
                              7168, 7167-50X1/60X1
-sb                         : Download SBCS Font for 734X-F307/7125,
                              734X-F309, 7197-5X01/6X01, 7198-
                              1X41/2X41, 734X-F308
-db                         : Download DBCS Font for 734X-F307/7125,
                              734X-F309, 7197-5X01/6X01, 7198-
                              1X41/2X41
-cp932                      : Download combined ANK & CP932 font for
                              7197/7342-F306/7346-F306
<port>                      :COM1, COM2
<baud rate>                 : 1200, 2400, 4800, 9600, 19200, 38400,
                              57600, 115200
<filename>                  : *.mfw | *.bot | *.ipl | *.sfn | *.dfn
<check model>
skip                        : Bypass checking printer model number
noskip                      : Check printer model number & exit when
                              there's a mismatch
<print/noprint>             (Optional)
print                       : Print diagnostics form after flashing
                              (default)
noprint                     : Not printing diagnostics form

Error                       : Too few parameters
```

An example of a command line for updating the Main Firmware on a 734X-F307 printer is the following:

```
AFLASH.EXE 7197-5X01/6X01 -m COM1 115200 SP2M0609.MFW noskip print
```

Note: The DOS version of the Flash Utility can only be used for printers that are connected on COM1 or COM2. The current version of the utility does not function for COM ports higher than 2. For the 7125 printer, use the 734X-F307 selection.

If an error is encountered, the usage information is dumped to the screen followed by a status line that displays information along, such as the following:

```
Error : Unable to open data file!
Error : Invalid parameter <com>!
```

Windows Command Line Firmware Update Utility

The Windows Command Line version of the Flash Utility is provided to allow batch mode of operation in a Windows XP environment. If you issue a call to **TseFlash.com** with no parameter, you will get the following output that explains the parameters.

Note: This utility requires the `TseFlash.exe` to be in the same directory. `TseFlash.com` is just a shell that sends the command line options to `TseFlash.exe` to process.

```
*** TseFlash.com Ver 3.1 ***
Thank you for using TseFlash Flash Memory Writer command line interface
utility!

TseFlash [model] [download type] [COM] [parameter] [file] [check model
(opt)] [pr int(opt)] [status(opt)] [ErrorTimeOut(opt)]

[model]--> Selections for the model:
      [7167] [7167-X115] [7167-X035] [7167-50X1/60X1] [7168] [7197]
      [7197-5X01/6X01] [7198] [7198-1X41/2X41] [7649-F301] [K8]
      [740X-K59X] [734X-F306] [734X-F307/7125] [734X-F308] [734X-F309]

[download type] --> Selections for the download type:

      /m - Download firmware main program.
      /i - Download firmware IPL program.
      /l - Download firmware IPL LAN program.
      /a - Download ANK font or combined ANK & CP932 font
            for 7167, 7167-X115, 7167-X035, 7167-50X1/60X1, 7168, 7197,
            7198, 740X-K59X, 734X-F306.
      /s - Download ASIAN font for 7197, 740X-K59X , 734X-F306,
      /rs - Download Receipt ASIAN Font for 7167 &
            Receipt 2 Byte for 7168, 7198
      /ss - Download Slip ASIAN font for 7167 & Slip 2 Byte for 7168
      /sb - Download SBCS font for 734X-F307/7125, 734X-F309,
            7649-F301, 7198-1X41/2X41, 7197-5X01/6X01, K8 , 734X-F308
      /db - Download DBCS font for 734X-F307/7125, 734X-F309,
            7649-F301, 7198-1X41/2X41, 7197-5X01/6X01 , 734X-F308

      [com] --> Selections for the COM port, CPMI, IBMUSB,
                  HID (Only K8) or LAN:
      /COMX Where X is any valid integer within 1-20.
      [parameter] --> Selections for interface parameter
            (Only for RS232 and Ethernet interface):
            For RS232 Only: Please key in the Baud Rate, Parity and
            Stop Bit - Baud Rate Selection: /[115200] | [57600] |
            [38400] | [19200] | [9600] | [48 00] | [2400] | [1200]
            - Parity Selection: /[none] | [even] | [odd]
            - Stop Bit Selection: /[1] | [2]
            For Ethernet Only: Please key in the IP Address
            - IP Address Selection:/[xxx.xxx.xxx.xxx]
            - xxx is a number from 0 to 255
            For CPMI, IBMUSB and HID is ignore

      [file] --> Selections for the filename:
            Any valid binary file with extension *.mfw | *.sfn | *.dfn |
```

```
            *.ipl | *.lan | *.bin (Only for K8)
      [check model(opt)] --> Selections for the check model
                              (Optional Parameter):
            /skip            Bypass checking printer model number.
            /noskip          (default) Check printer model number
                              & exit when there's a mismatch.

      [print(opt)] --> Selections for the print (Optional Parameter):
            /print           (default) Print printer
                              configuration form.
            /noprint          Bypass printing printer
                              configuration form.

      [status(opt)] --> Optional for Return Status
                              (Optional Parameter):
            /noretstat (default) Utility will not return status code.
            /retstat  Utility will return status code.

      [ErrorTimeOut(opt)] --> Failsafe: Max Time Allowed for
                        Called Exe (Optional Parameter):
            (ONLY USED BY TseFlash.COM
            /ErrorTimeOut=xxx (minimum=420) xxx is number of
            Seconds - limit 3600.
Information : Please use RS232 Interface, when switching
            from ION <=> NON ION
```

If you fail to use the correct parameters, an error message will be displayed similar to the following error:

```
Error: Too few / many command line parameters!
```

The following is an example of a command line:

```
TseFlash.com /7197-5X01/6X01 /m /COM1 /115200 /none /1 SP2M0609.MFW
/noskip /print /retstat
```

This command invokes the GUI interface shown in the next section and displays a progress bar indicator. The same is seen if you run the program through the GUI Windows GUI Printer Firmware Update Utility.

The printer firmware can be updated from the host terminal, a laptop, or a PC by running the `TSEFlash.exe` utility. The three file formats for the flash firmware are the following:

- IPL—Boot Firmware
- LAN—Boot Firmware for LAN
- MFW—Main Firmware

Examples of the firmware are the following:

- `7198RoL_V2001.ipl`—7198 RoL Printer Boot Firmware
- `7198RoL_V2001.lan`—7198 RoL Printer Boot Firmware for LAN
- `7198RoL_V5464.mfw`—7198 RoL Printer Main Firmware

Note: This is only an example. The firmware version varies based on the printer and as updates are provided.

To reflash a firmware into the printer, unzip the flash utility and the flash files being used into a directory on the hard disk.

Using TseFlash.exe Utility

On the host terminal or PC running Windows, run the utility `TSEFlash.exe***` to start the program.

Note: The flash utility shown is for demonstration purposes only. Visit the NCR Support Site for the latest release.

Chapter 8: Configuration Network

Summary

The Configuration Network setting page is controlled (respondent `HTTP/1.0` and `1.1`). This page opens by starting a browser, and inputting directly IP address of the printer.

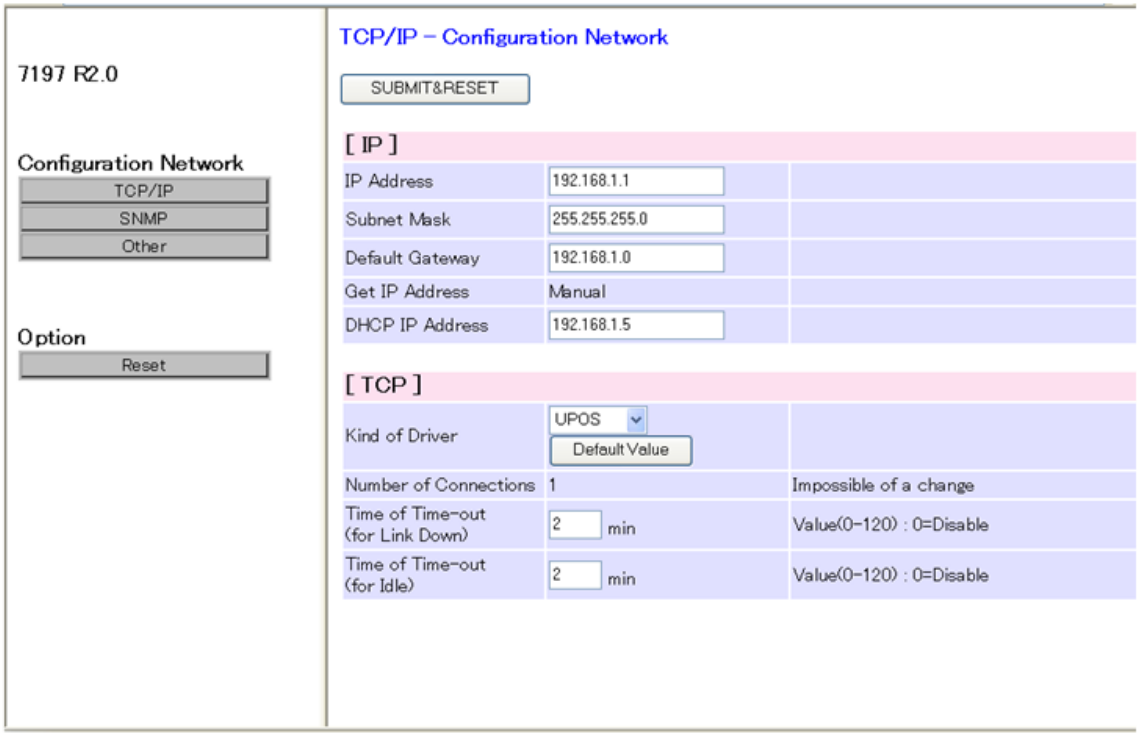
In this page, the settings of network of IP Addresses and others can be seen and be changed.

Format: `http ://(IP address for the printer)/`

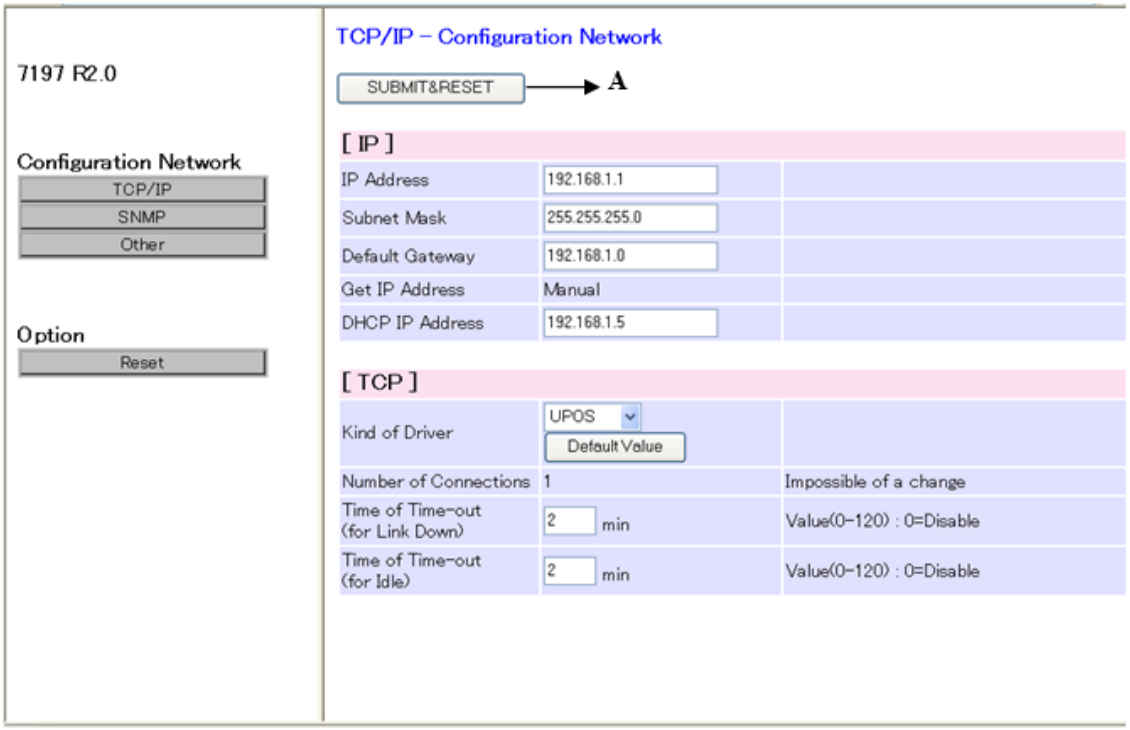
Display Format of Configuration Setting Page

On the top screen, the menu is displayed on the left frame, and information on TCP/IP is displayed on the right frame.

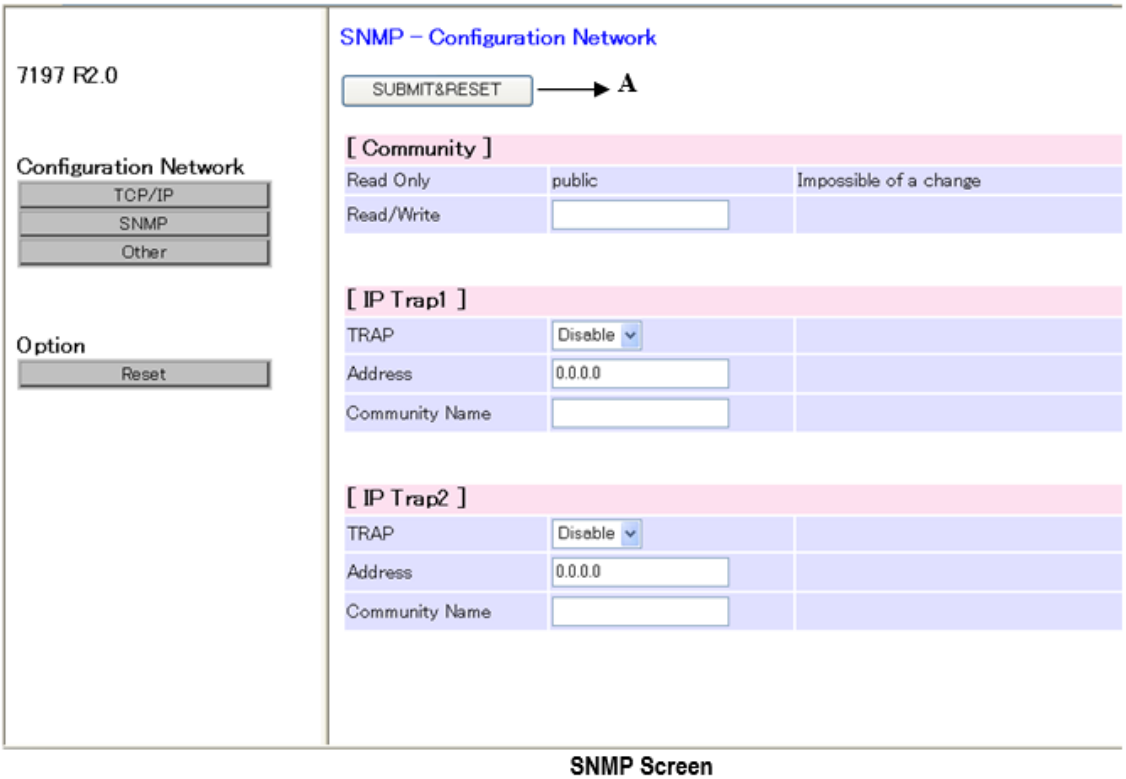
On the right frame of the screen, a set content is preserved in *FLASH* when the **SUBMIT&RESET** button is selected and the *RESET* processing is done. When another screen is displayed without selecting the **SUBMIT&RESET** button after it changes, a set content is annulled.



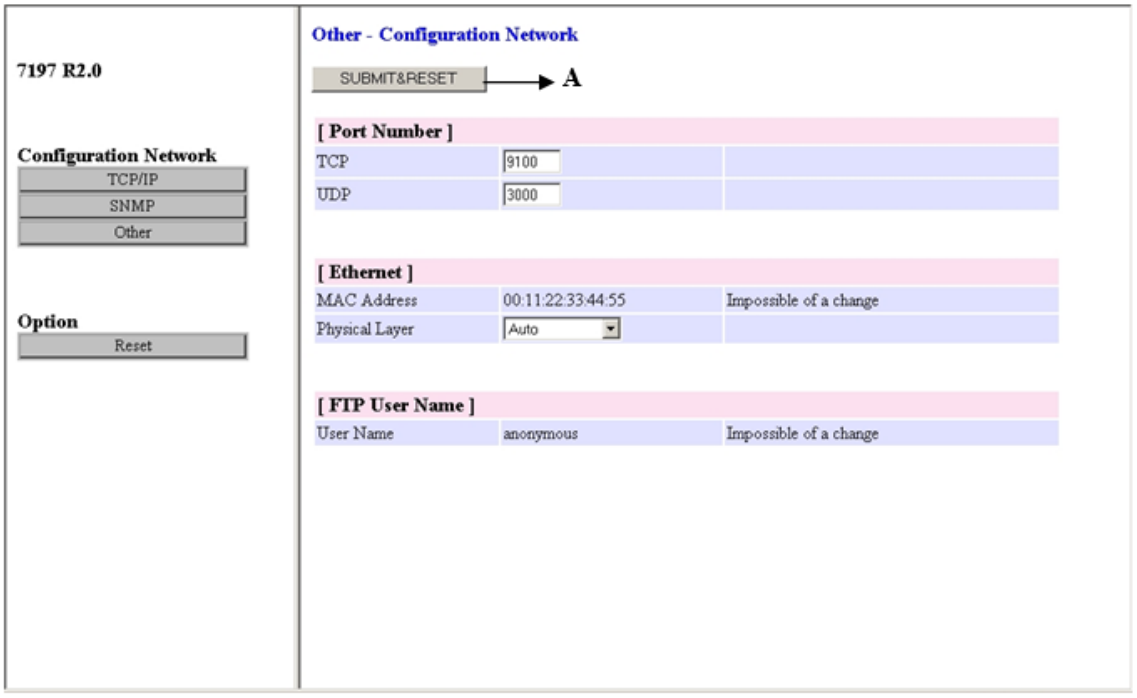
Top Screen



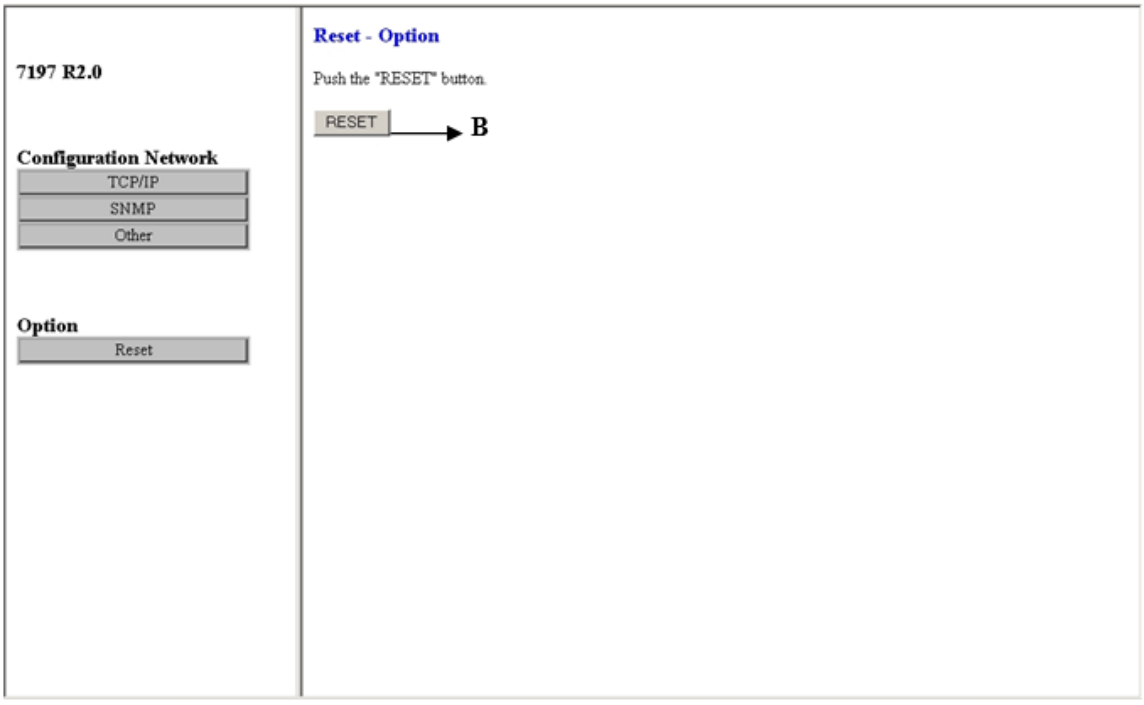
TCP/IP screen



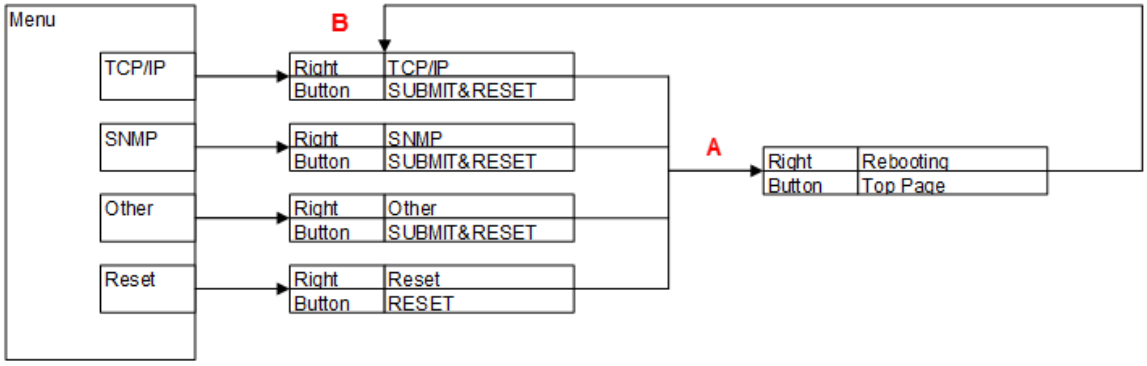
SNMP Screen



Other Screen

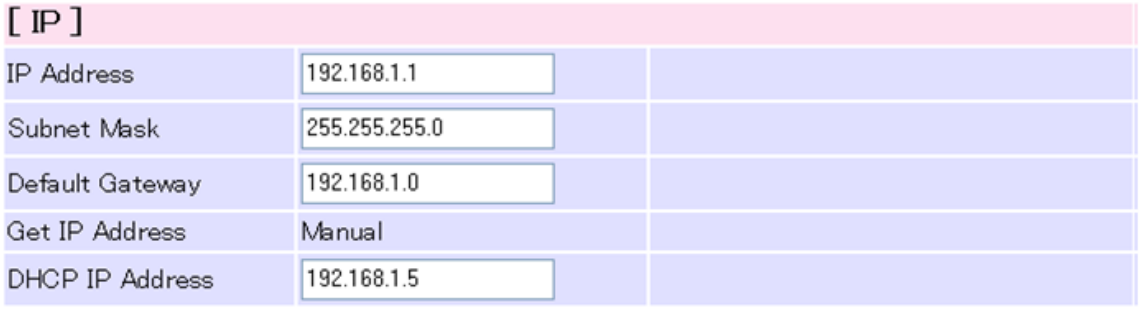


Reset Screen



Screen transition chart

TCP/IP Setting

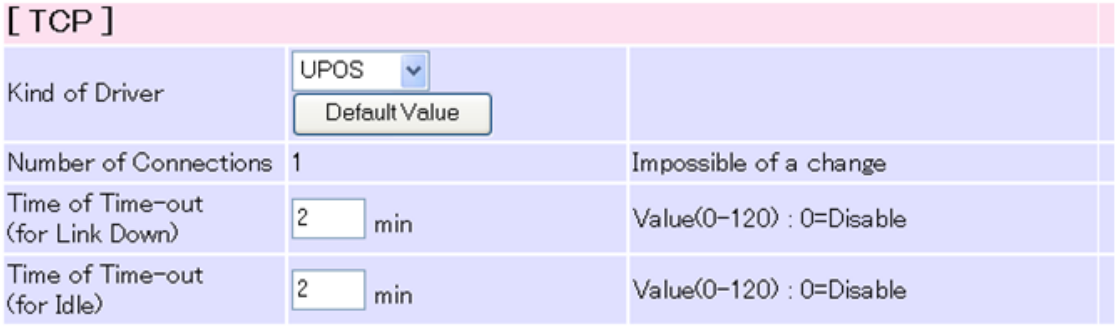


IP setting

Items	Default value	Detail
IP Address	`192.168.1.1`	Set Printer IP Address. This IP Address is effective when Get IP Address is Manual.
Subnet Mask	`255.255.255.0`	Set Printer Subnet Mask. This Subnet Mask Address is effective when Get IP Address is Manual.
Default Gateway	`0.0.0.0`	Set Printer Default Gateway. This Subnet Mask Address is effective when Get IP Address is Manual.
Get IP Address	Manual	Select method of acquiring IP Address. Selectable method is Manual or DHCP base on the Printer Dip Switch Setting. If Printer Dip Switch 1 OFF and Dip Switch 2 OFF, Manual mode selected If Printer Dip Switch 1 ON and Dip Switch 2 ON, DHCP mode selected
DHCP IP Address	`0.0.0.0`	Set requesting specific IP address to DHCP server. If set 0.0.0.0, DHCP sever allocates printer IP address automatically.

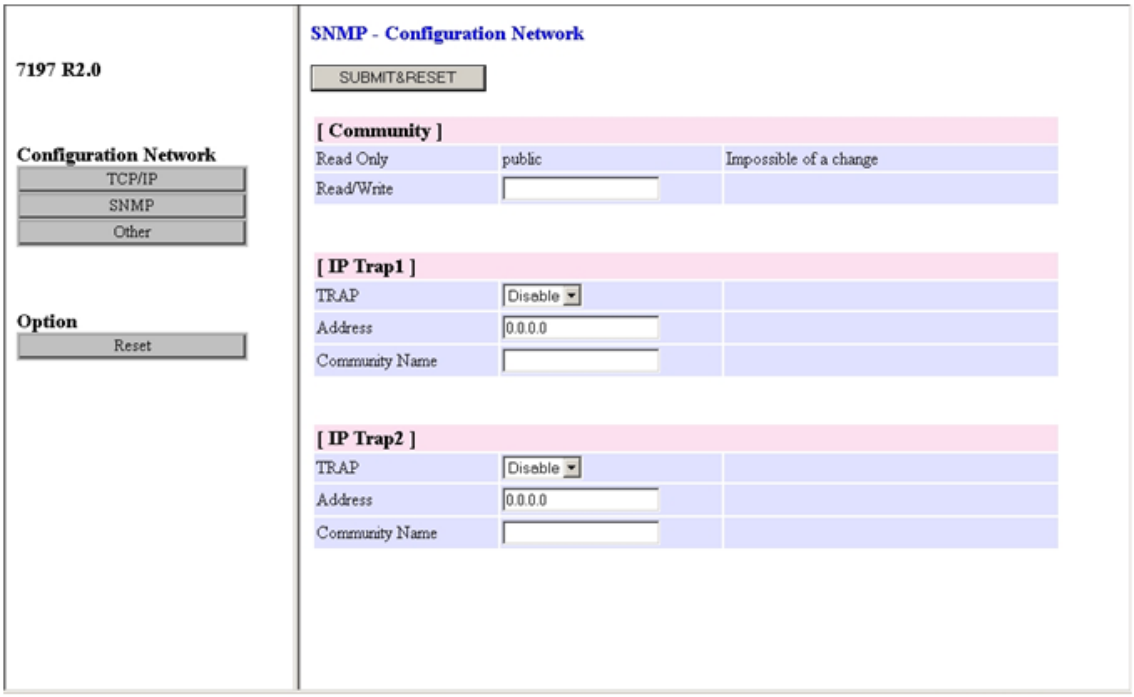
Note: IP addresses that cannot be set with Ethernet model printer are the following:

- `255.255.255.255` (Broad cast address)
- Local loopback address
  - `127.***.***.***`—this is the IP Address to send to oneself and ******* is any value from 0 to 255.



Items	Default value	Detail
Kind of Driver	UPOS	1. Select kind of driver type. 2. Click **Default Value** button. The TCP setting value is changed to default value of selected driver.
Number of Connections	1	Show the maximum number hosts that can be connected.
Time of Time-out (for Link Down)	2 min	Set time of time-out for link down (0–120 min). When this value is 0, Time-out disables.
Time of Time-out (for Idle)	2 min	Set time of time-out for Idle (0–120 min). When this value is 0, Time-out disables.

SNMP Setting



Community Setting

Items	Default value	Detail
Read Only	public	Show SNMP community read only name. Maximum length is 16 characters.
Read/Write		Set SNMP community read-write name. Maximum length is 16 characters.

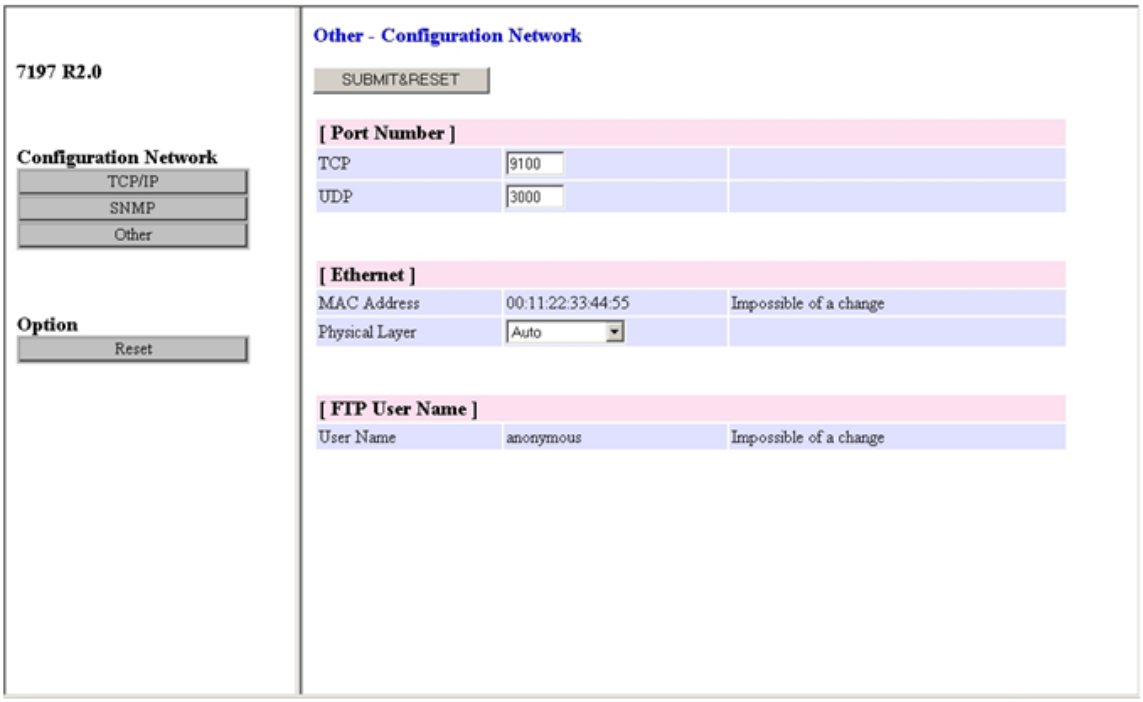
IP Trap1 setting

Items	Default value	Detail
TRAP	Disable	Select whether SNMP TRAP is “Enable” or “Disable”.
Address	0.0.0.0	Set address of host that receives SNMP TRAP.
Community Name		Set SNMP TRAP community name. Maximum length is 16 characters.

IP Trap2 setting

Items	Default value	Detail
TRAP	Disable	Select whether SNMP TRAP is “Enable” or “Disable”.
Address	0.0.0.0	Set address of host that receives SNMP TRAP.
Community Name		Set SNMP TRAP community name. Maximum length is 16 characters.

Other Settings



Port Number setting

Items	Default value	Detail
TCP	9100	Sets port number of TCP RAW. This port number range is 1024 to 65535 (expect 3001). When *Ethernet RTC Protocol* setting is TCP, it is used by sending and receiving of Real Time Command.
UDP	3000	Sets port number of UDP command. This port number range is 1024 to 65535 (expect 3001). This is effective when *Ethernet RTC Protocol* setting is UDP.

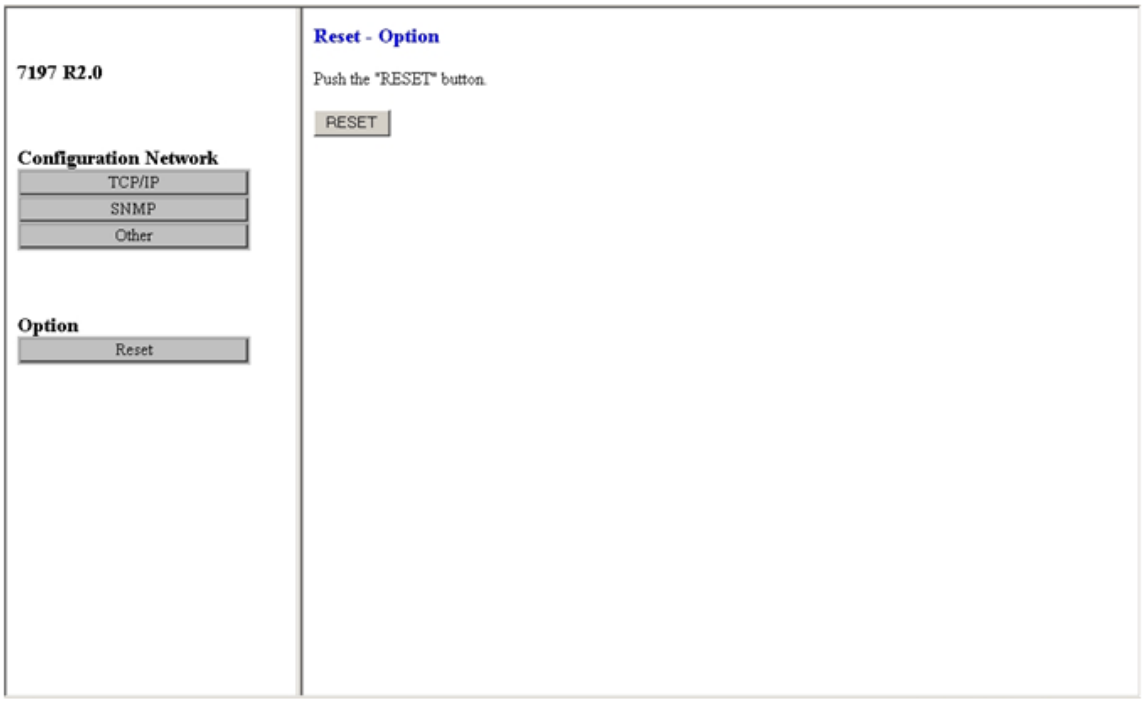
Ethernet setting

Items	Default value	Detail
MAC Address	---	Shows MAC Address of the printer Ethernet interface. This is the unique value for each Ethernet interface.
Physical Layer	Auto	Selects connection Speed and Duplex.

FTP User Name setting

Items	Default value	Detail
User Name	anonymous	Show FTP User name. This is fixed.

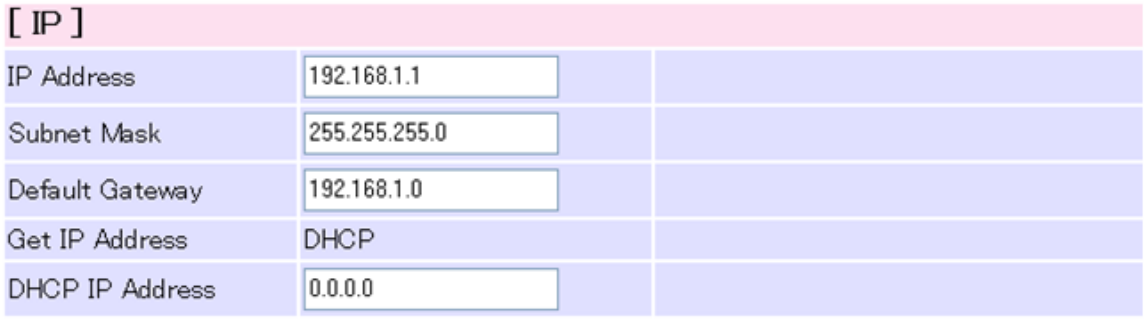
Reset Window



When the **RESET** button is pushed, the printer is reset. If the Configuration Network is changed before pushing **RESET**, the change is not reflected in the printer. When **RESET&SUBMIT** is pushed in each setting page, the change is reflected in the printer.

IP Address Automatic Acquisition

The printer supports DHCP.



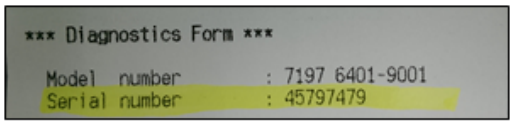
When *Get IP Address* is DHCP and *DHCP IP Address* is `0.0.0.0`, the printer automatically gets the *IP address*, *Subnet Mask* and *Default Gateway* from DHCP server. If the printer fails in the automatic acquisition of the IP address, the printer uses the same IP address as the Manual mode.

Note: The DHCP IP address can be seen in the Diagnostics Form of the connected printer.

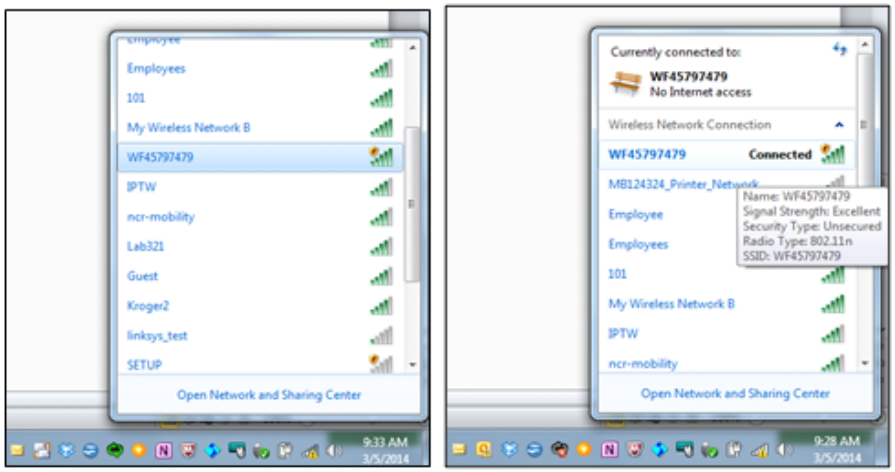
Chapter 9: Configuration Wi-Fi Network

Connect the Printer

1. Connect the printer to a 24 VDC power supply and wait for a beep after approximately 25 seconds.
2. Print a diagnostic page by closing the receipt cover while pressing the paper feed button.
3. Find printer S/N on the top of the diagnostic page. S/N is in 8–digit format as shown below.



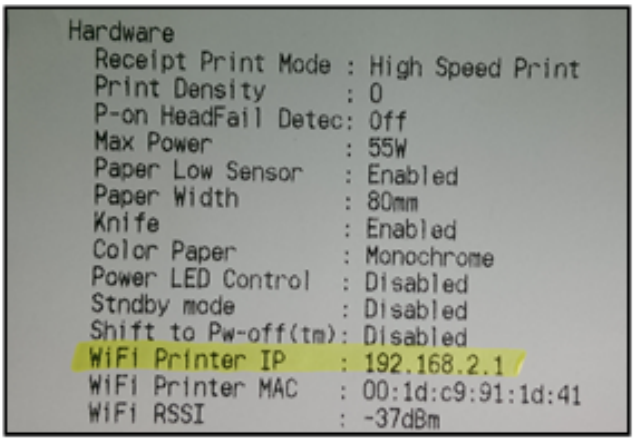
4. Through a Wi–Fi enabled device, look for printer SSID in the form of *WFxxxxxxxx* where *WF* part is fixed and *xxxxxxxx* is the printer S/N found above. Left–click on the SSID and select **Connect**. The example below shows available networks from a Windows laptop.

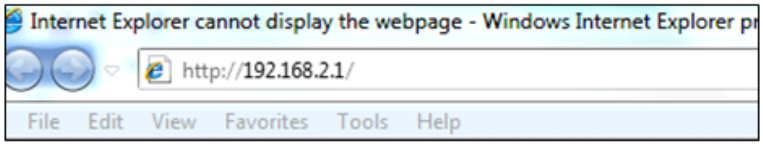


Display Format of Configuration Setting Page

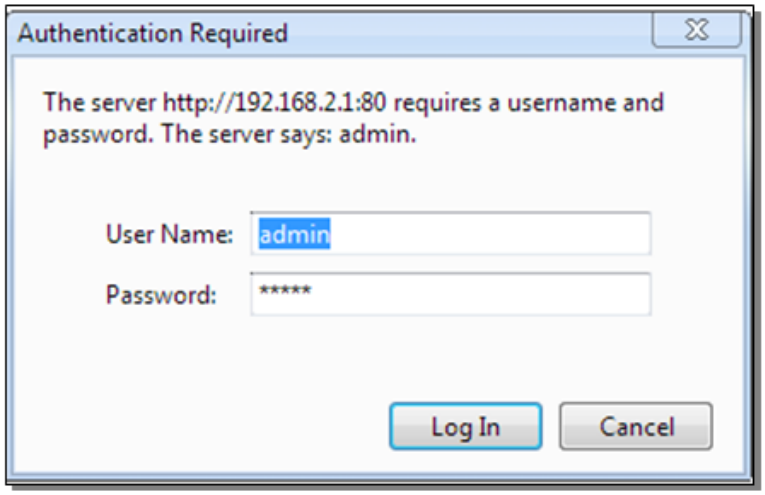
The setting page opens by starting a browser, and directly entering IP address of the printer. In this page, the setting of network of IP Address can be seen and changed.

1. Open an internet browser and enter the printer IP address and select **Enter**. The printer IP address can be found on the diagnostic page shown below.





2. Enter *admin* for both User Name and Password fields and select **Log In**.



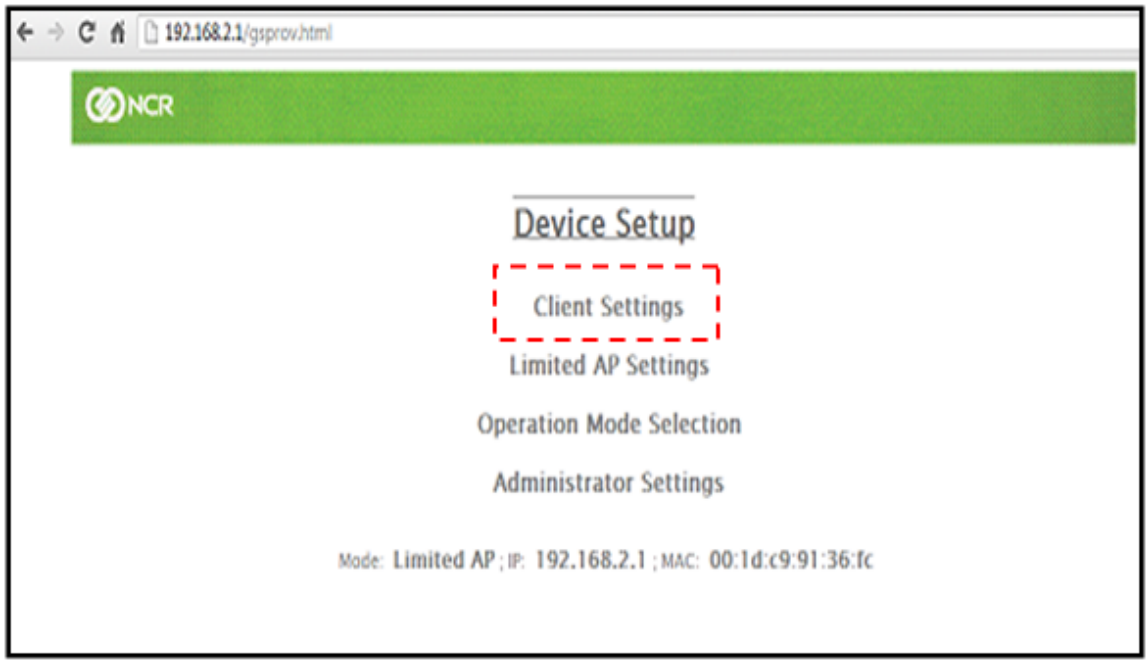
User Name: *admin*

Password: *admin*

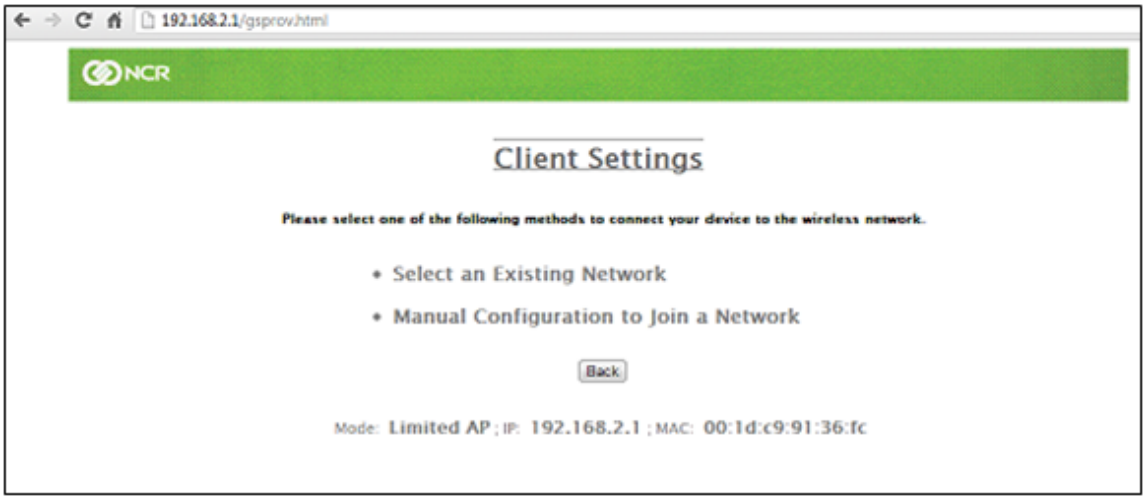
After entering the User Name and Password, the following menu is displayed.

Client Settings

This menu is used to configure the printer to the infrastructure mode according to existing network environment, like Access Point, Security, IP address, and so forth.

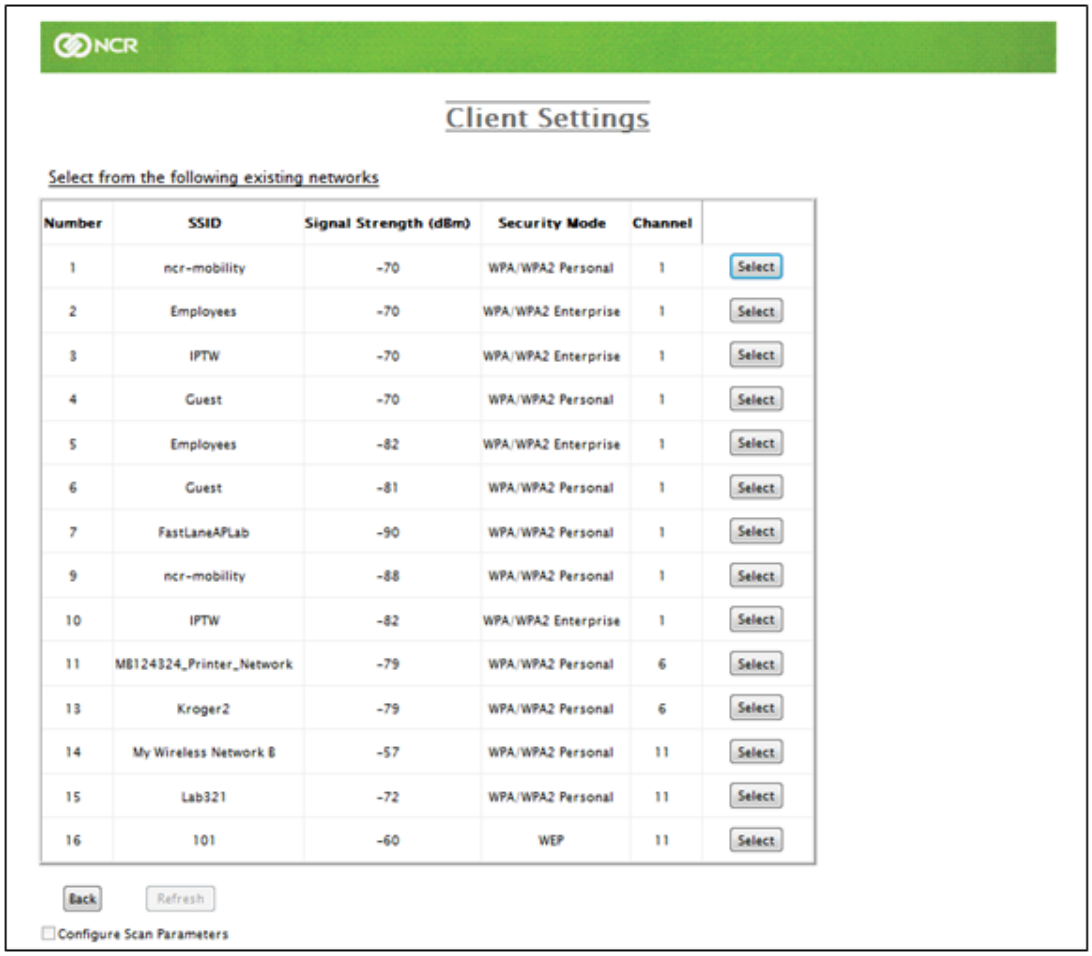


On the Client Settings menu, there are two options to configure the printer. *Select an Existing Network* is an option to select the access point from the list of current existing access points. *Manual Configuration to join a Network* is an option to manually fill in all the necessary information in terms of the client settings.

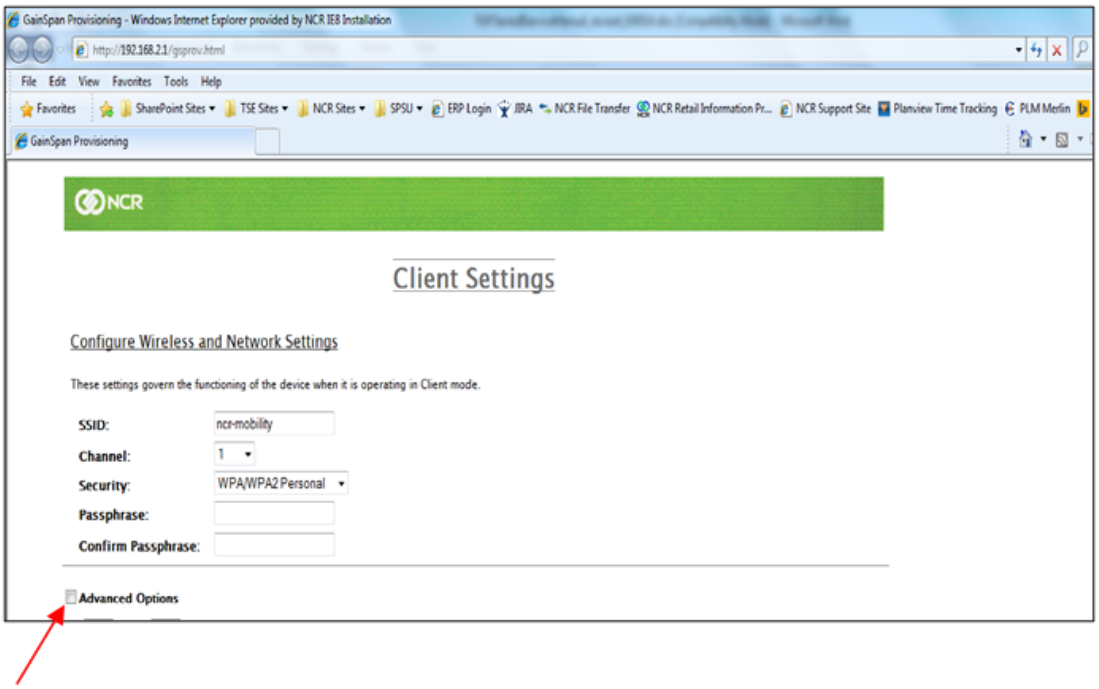


Select an Existing Network

1. Select **Select an Existing Network**. All the existing Access Points are listed in a table as shown below.
2. Choose an Access Point to connect to and select **Select**.



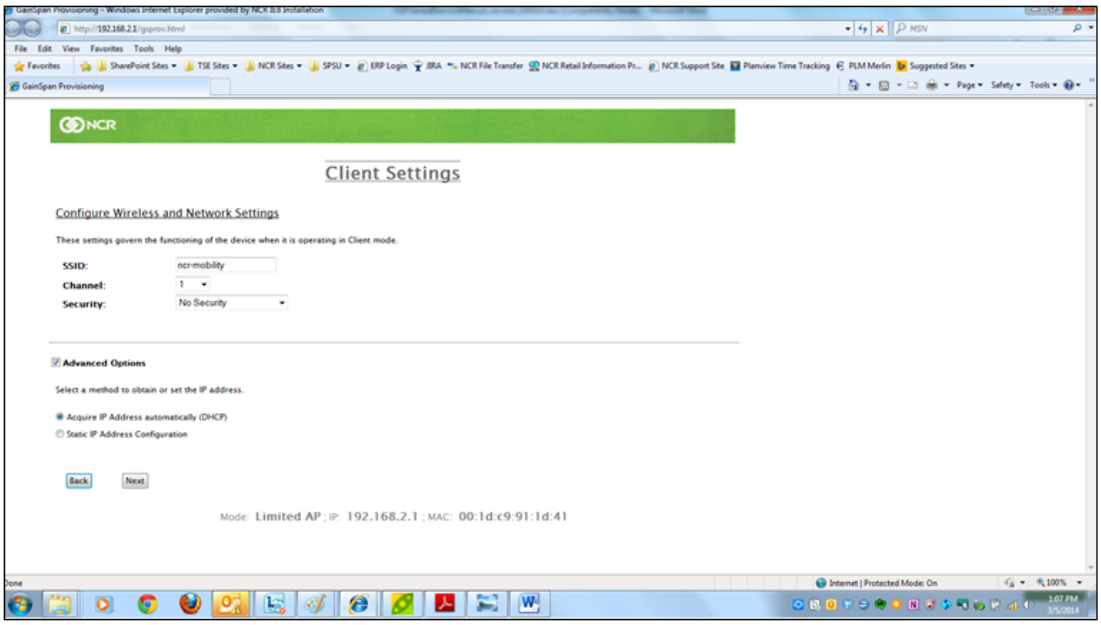
The following menu is shown. Select **Advanced Options** to specify how the printer IP address is to be assigned—DHCP or Static.



Depending on the type of security selected, various options will be displayed to allow the user to enter information required for a particular type of security.

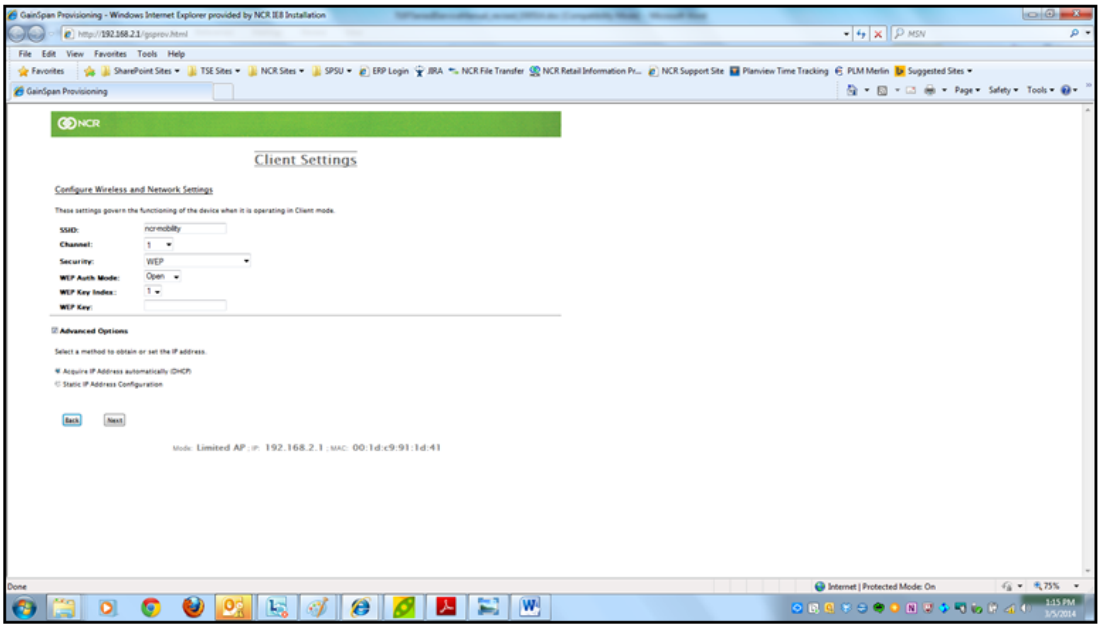
Note: Security information is obtained before setting up the printer.

- **No Security**—If *No Security* is selected, the following options are shown.



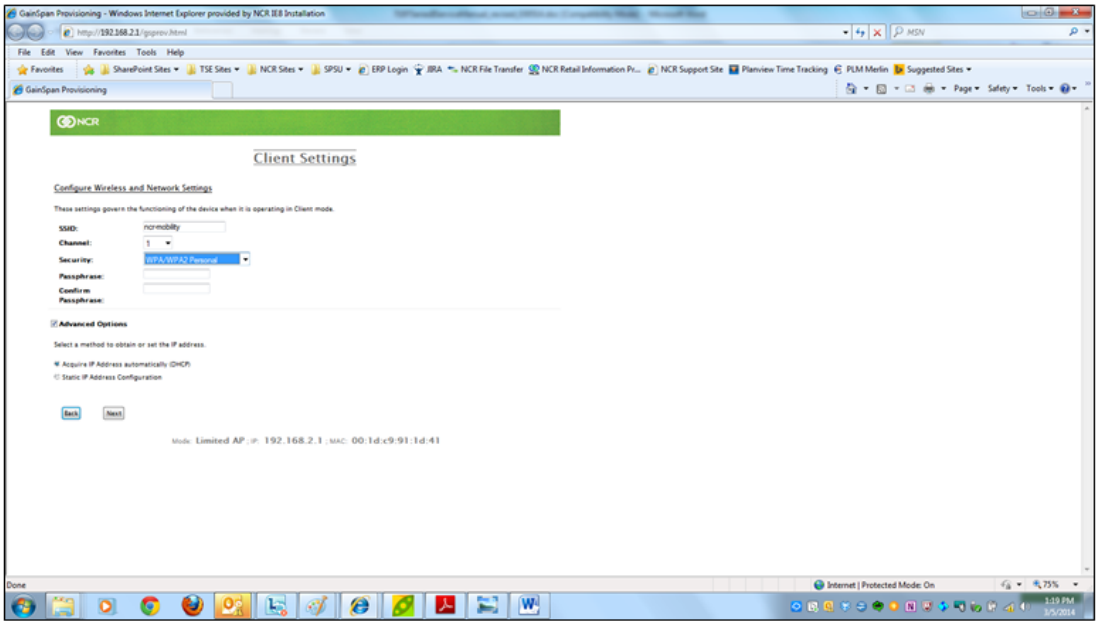
Security Information required: None

- **WEP Security**—If *WEP* is selected, the following options are shown.



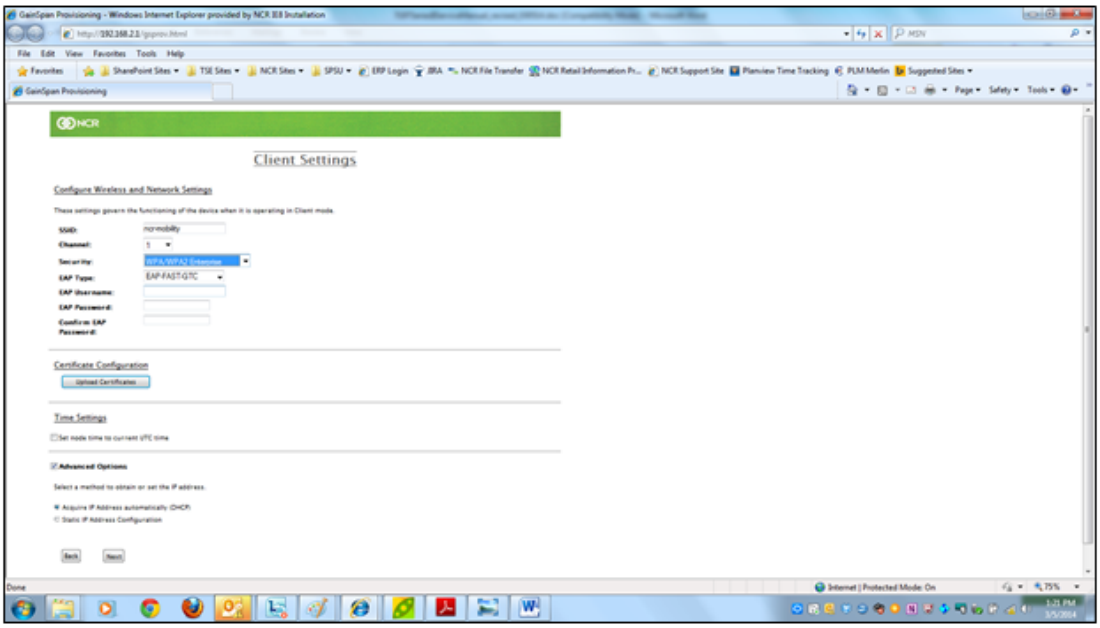
Security Information required: WEP key

- **WPA/WPA2 Personal**—If *WPA/WPA2 Personal* is selected, the following options are shown.



Security information required: Passphrase

- **WPA/WPA2 Enterprise**—If *WPA/WPA2 Enterprise* is selected, the following options are shown.

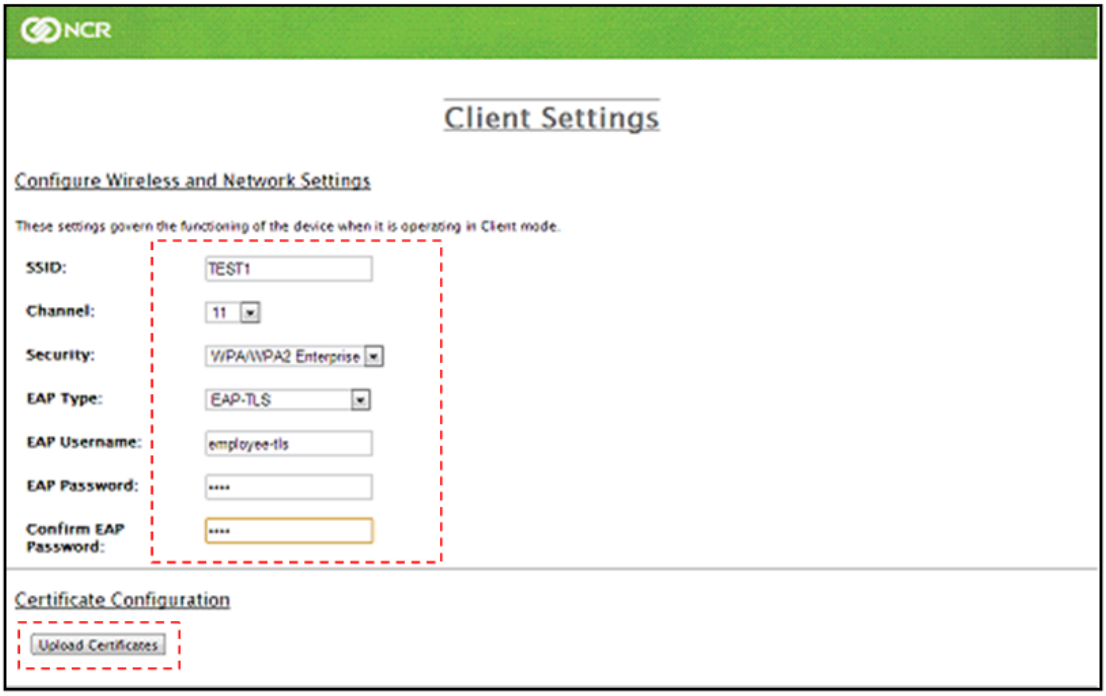


Security information required: EAP Type, EAP Username; EAP Password, Certificate

Configure the Enterprise Security

On the Detail Client Settings Window, there are several securities that can be configured. The following operation shows the steps on how to configure the enterprise security.

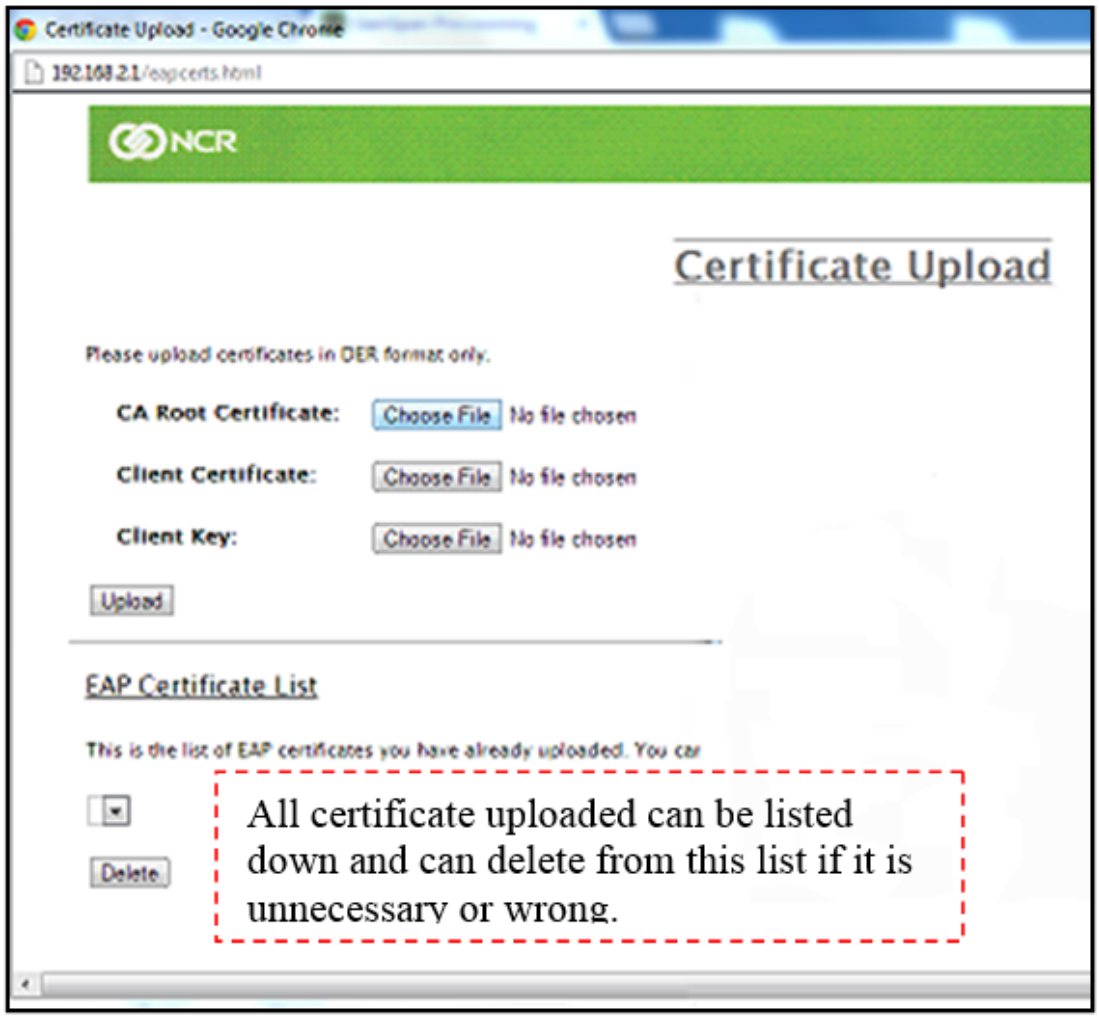
1. Fill in the necessary information indicated in the red rectangle and select **Upload Certificates**.



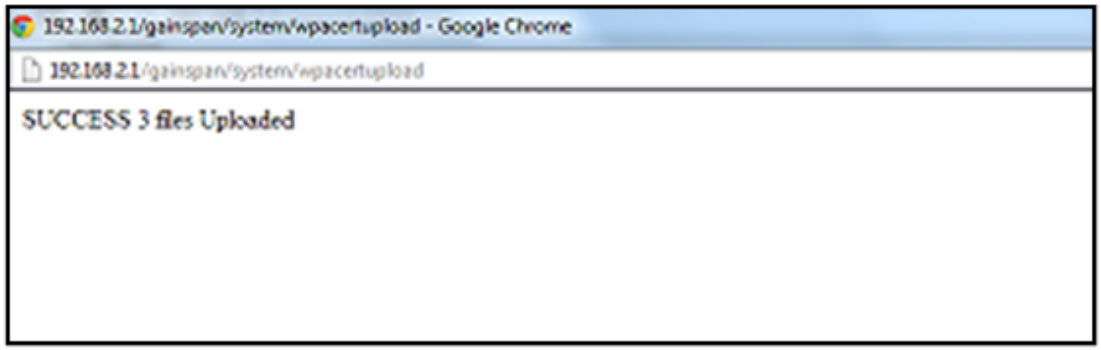
2. Choose each certificate and key file from the applicable folder and press **Upload**.

3. Fill in the necessary information indicated in the red rectangle and press **Upload Certificates**.

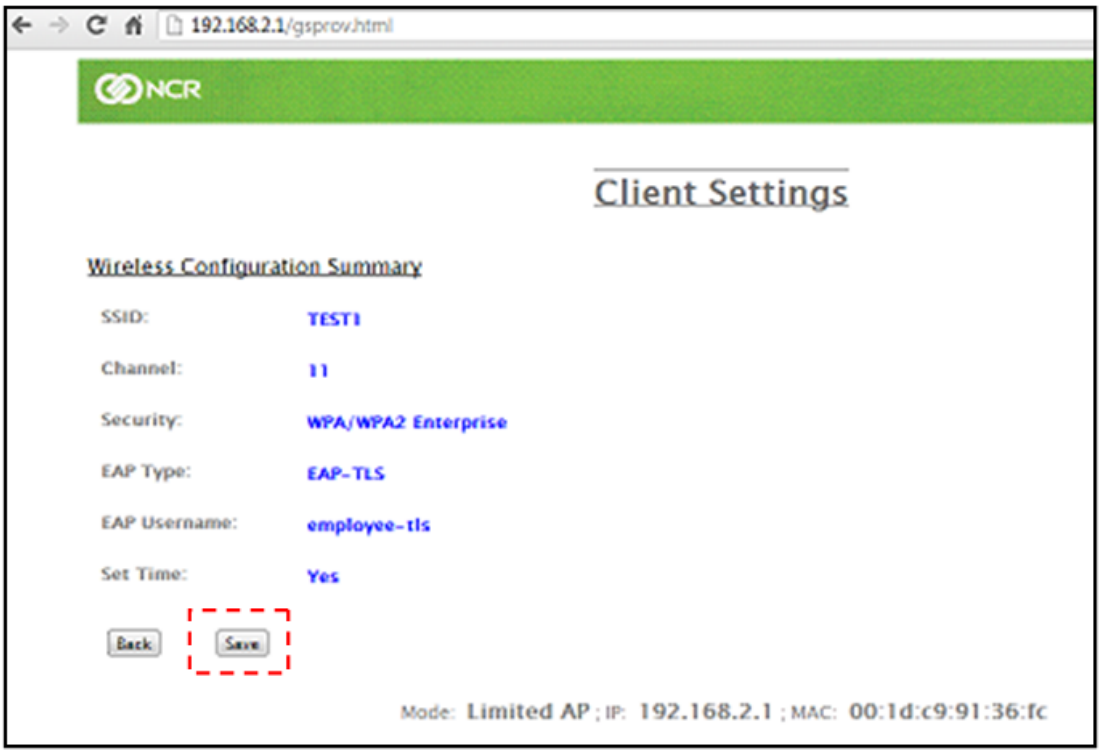
Note: The format of each certificate file must be `.der` and the file size must be less than 2 KB.



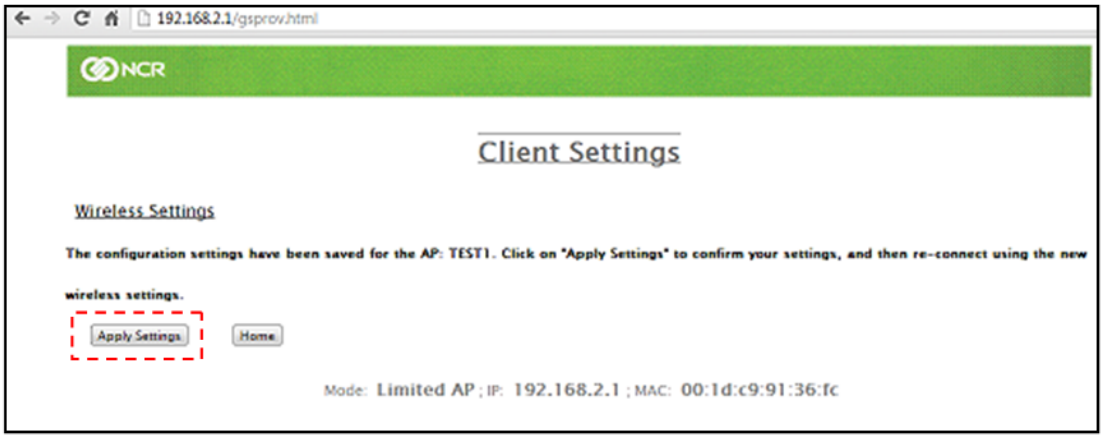
Once the certificate files are uploaded successfully, it pops up with a message that says *SUCCESS 3 files Uploaded*.



4. Select **Next** on the Detail Client Settings Window and select **Save** on the confirmation windows for all the settings.



5. Select **Apply Settings** to make new settings available at the end.

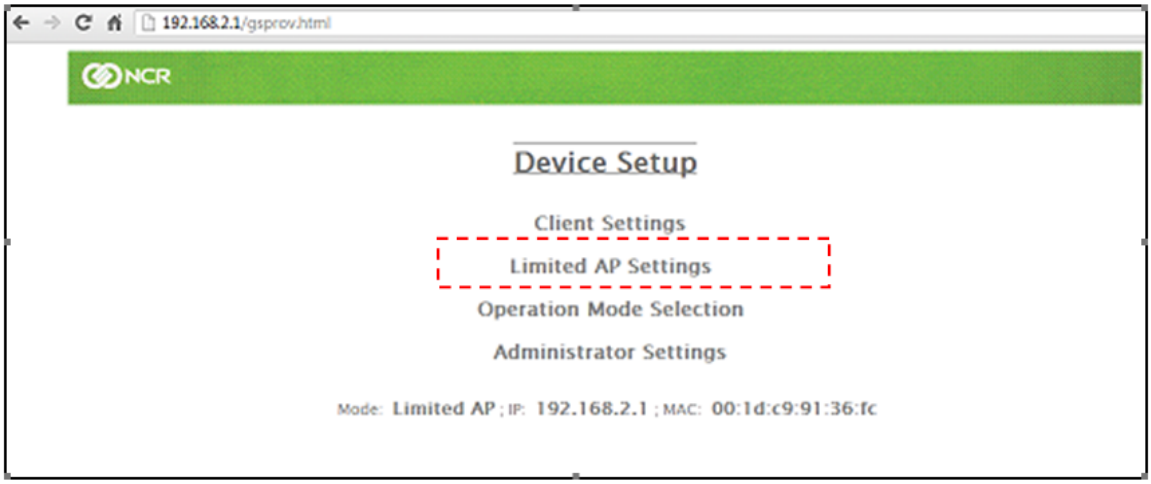


A message is displayed.

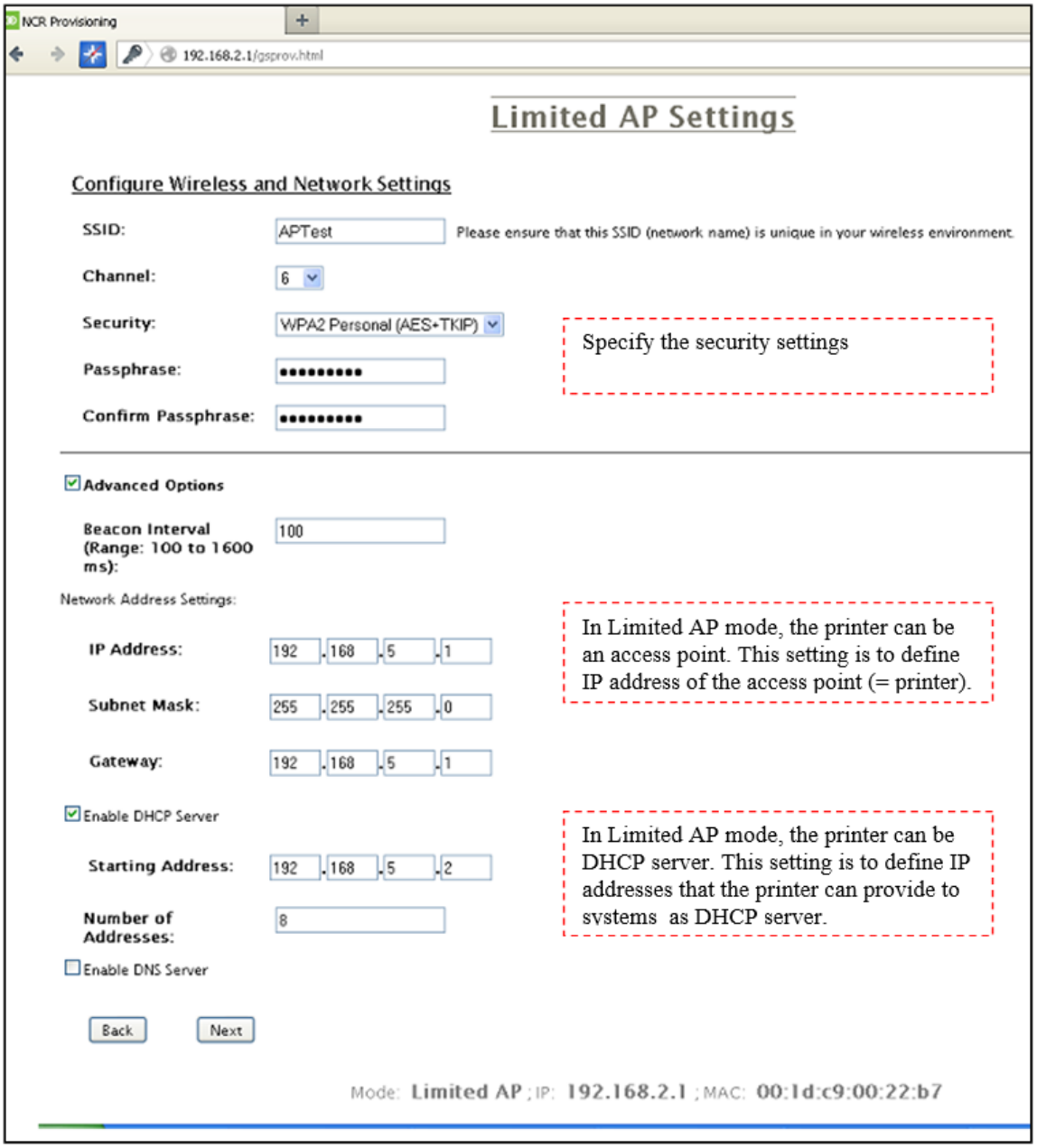
Rebooting the printer activates the new settings. The printer beeps once it connects to the network.

Setting Up in Limited AP mode

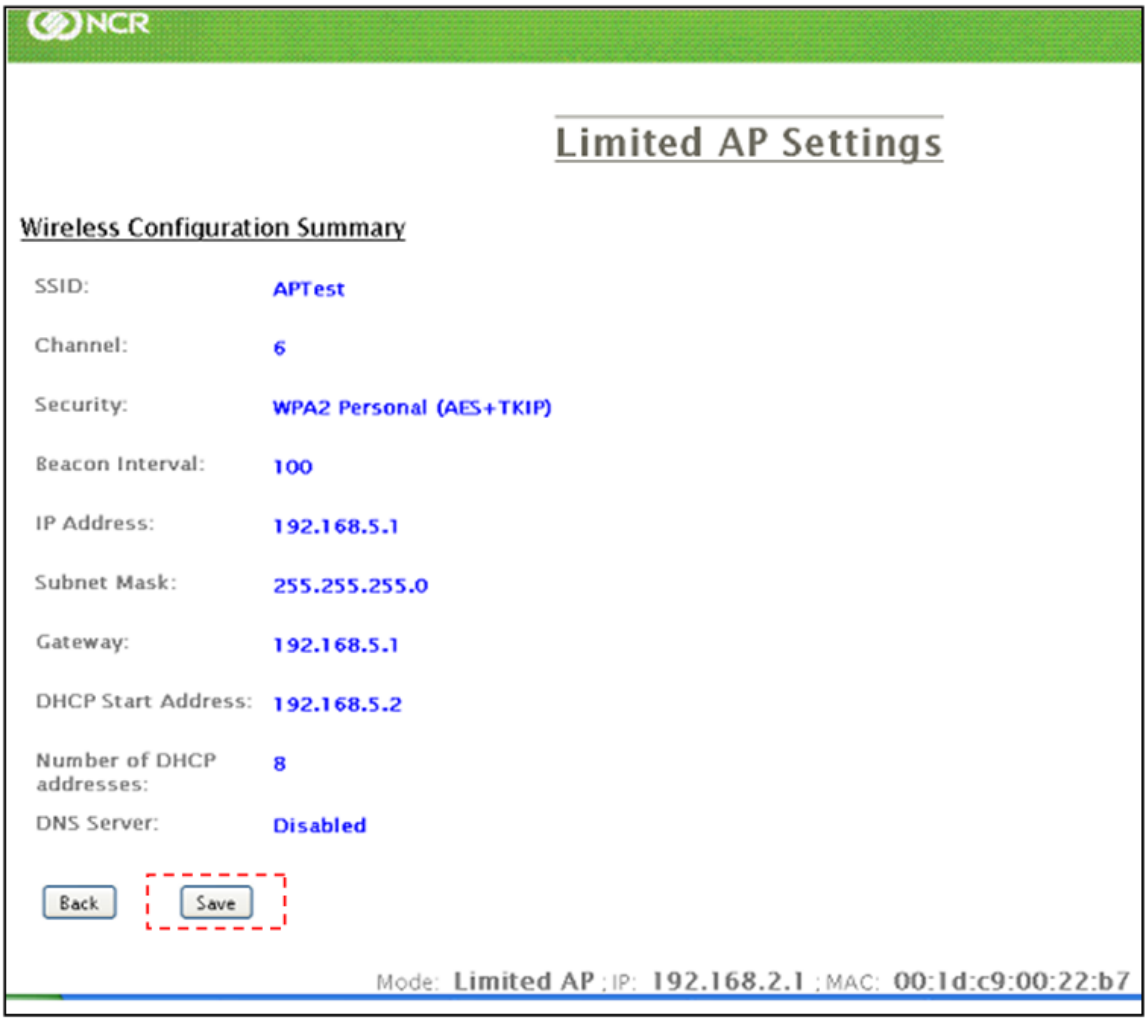
This menu is used to configure the printer to the limited access point mode which directly communicates to a system.

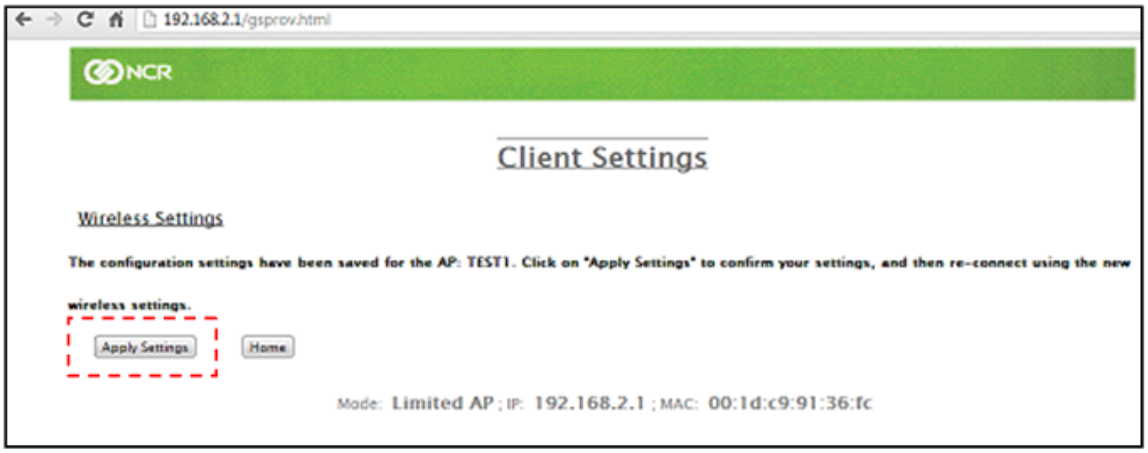


On Detail Client Settings Window, SSID, Channel, Security and DHCP setting are available to set.

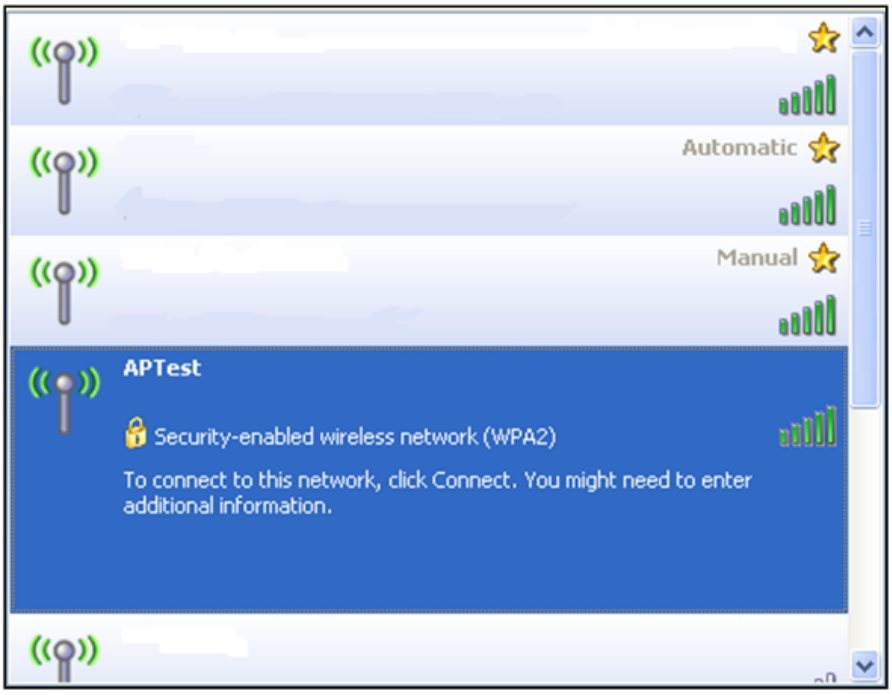


Once **Next** is selected on the Detail Client Settings Window, and after all the necessary information are filled in, select **Save** on the confirmation window if all the settings are correct. Select **Apply Settings** on the final window to apply the configuration.



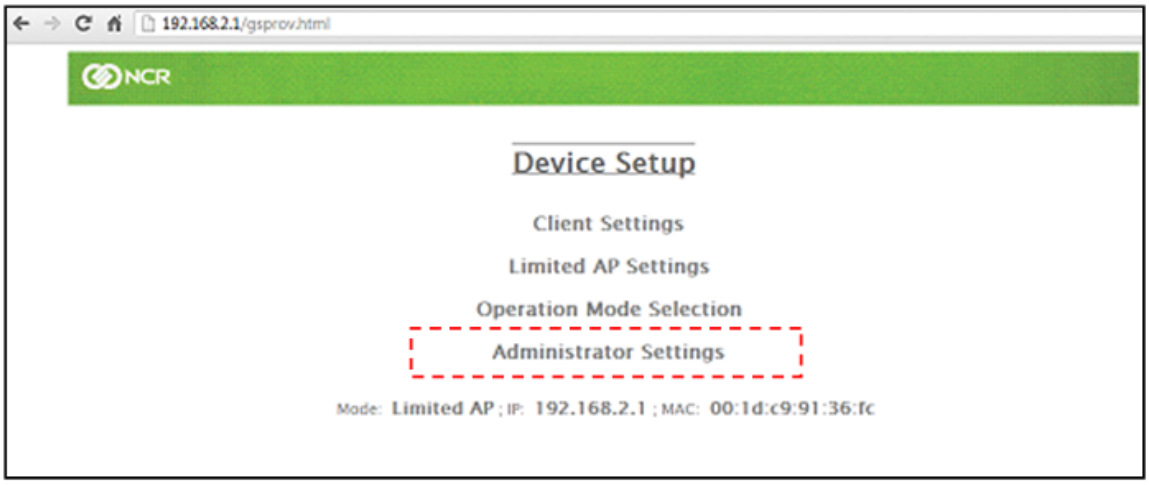


After this message, rebooting the printer activates the new settings. The printer beeps once it connects to the network. The printer SSID is configured as the access point.

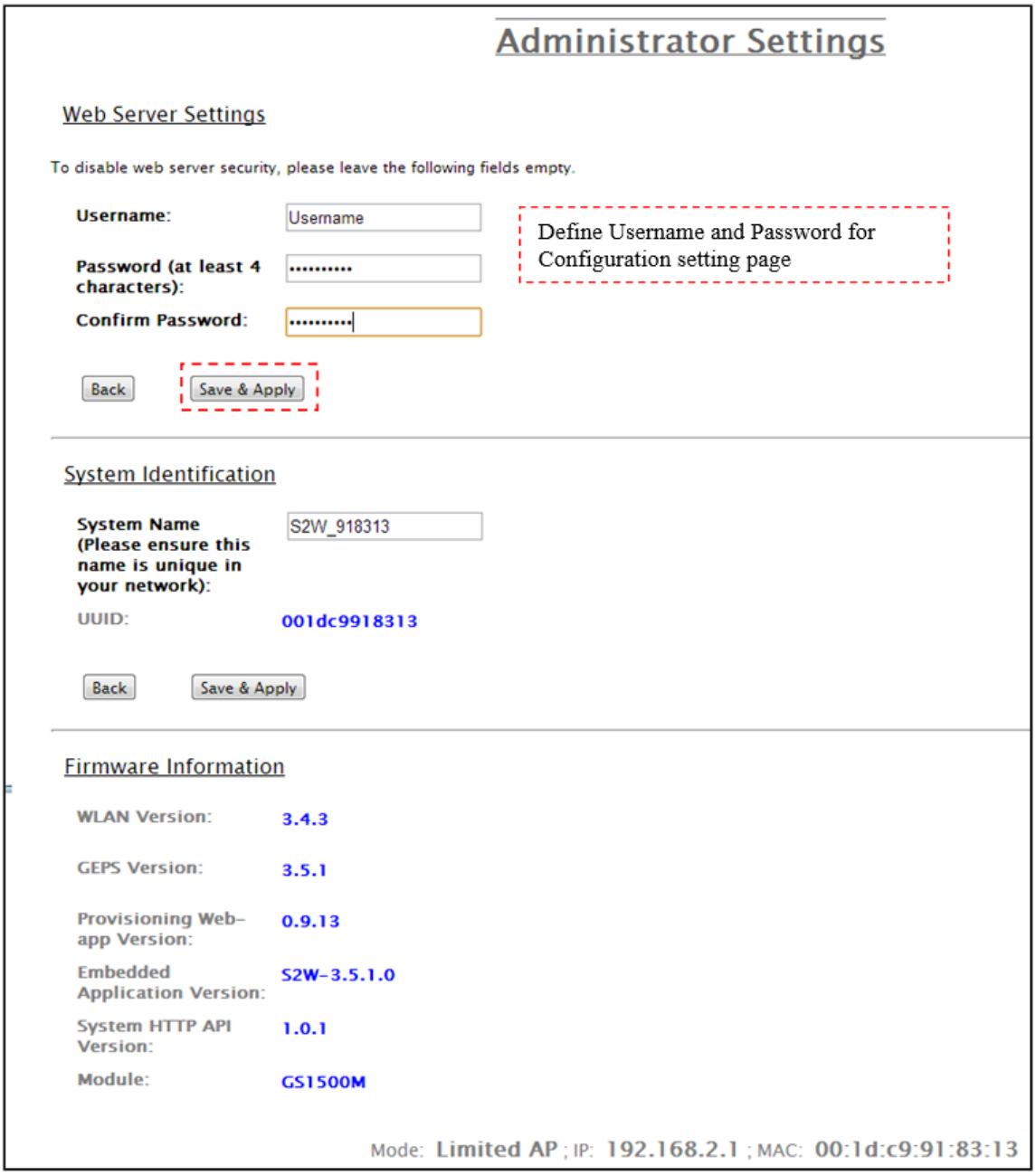


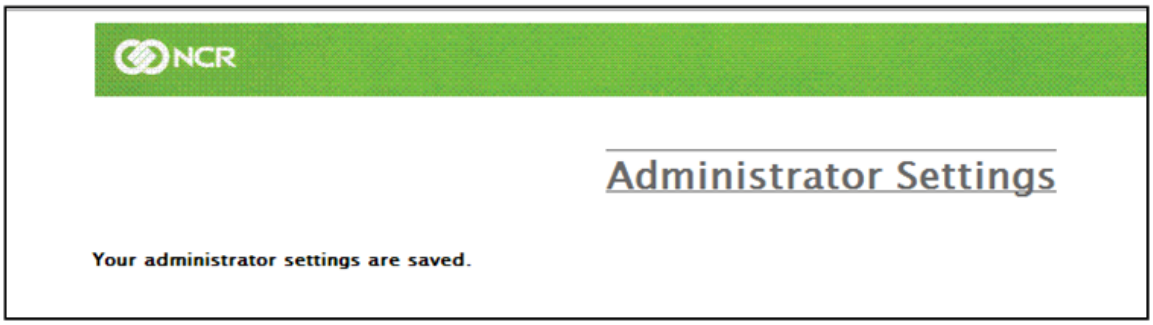
Change Provision Web-Page User Name and Password

This menu is used to define the user name and the password to change the printer setting.



Once Username and Password are filled in, **Save & Apply** makes the new settings available.



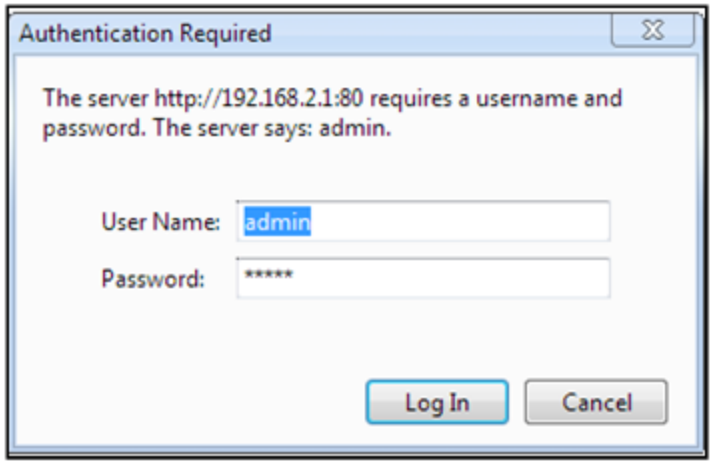


Wifi Firmware

The setting page opens by starting a browser, and entering the IP address of the printer. On this page, the Wifi module firmware can be updated.

Format: `http://(IP address for the printer)/otafu.html`

Before the Top Screen is displayed, User Name and Password are required.



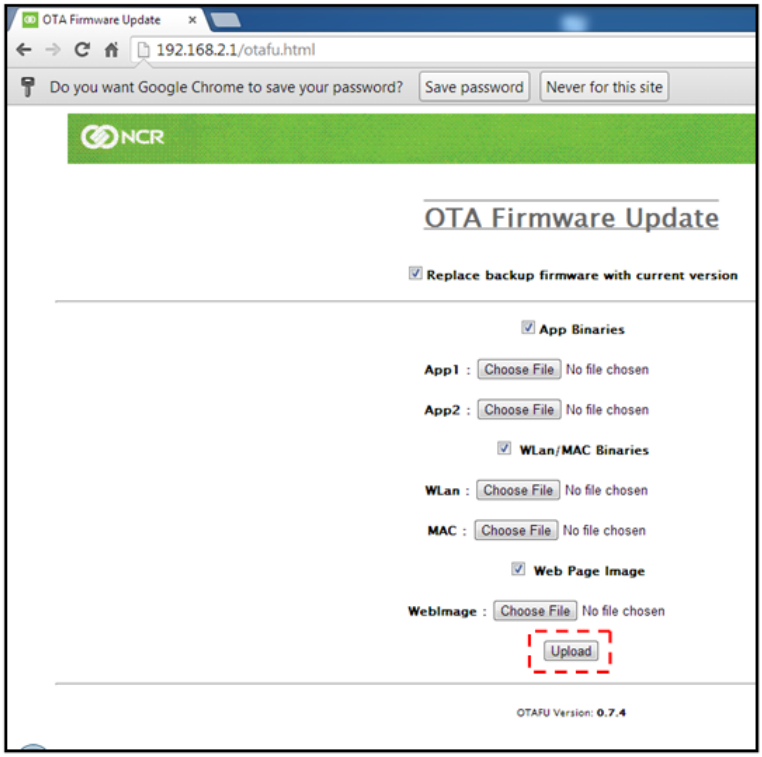
User Name: *admin*

Password: *admin*

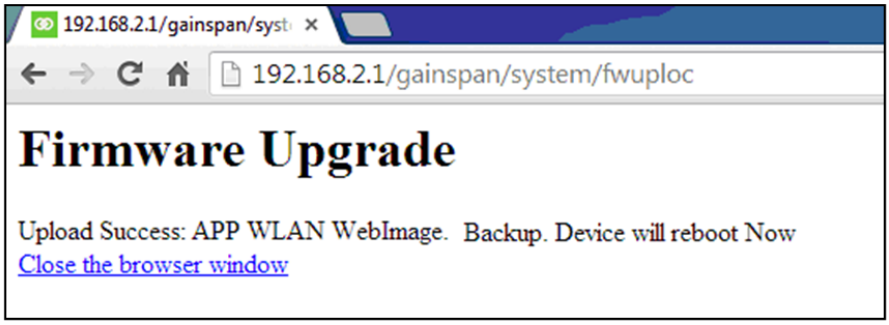
On the Top Screen, the following WiFi firmware can be selected to be updated.

- App Binaries
- WLan/MAC Binaries
- Web Page Image

In order to update the WiFi module, choose the relevant binary files and select **Upload**.



Once the update is successfully done, the following message is shown.



After this message, rebooting the printer activates the new firmware updated.

Appendix A: **Specifications**

Printing Specifications

	Thermal Receipt Station
Print head	• Fixed 576 Print Elements Direct • Thermal Fixed Head Line of Dots
Character Cell	Standard: 13 x 24 Dots Compressed: 10 x 24 Dots
Character Size	0.0525-inch wide by 0.092-inch high
Character Spacing	15.25 characters per inch (horizontal)
Character Pitch	15.6 characters/inch (Standard) 20.3 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)
Print Mode	Standard, Compressed, Double High, Double Wide, Upside Down, Rotated, Underline, Scalable, Bold, Superscript, Italic, Subscript
Resident Fonts	Code Page 437, 850, 852, 860, 863, 865, 858, 866, 1252, Katakana, 874, 862, 864, and Space page
Speed	5414 lines per minute (44 columns) maximum, Depend on Line Spacing
Print Order	Descending

	Thermal Receipt Station
Line Spacing	7.52 lines per inch (default) 8.47, 8.13, 7.81, 7.25, 7.00, 5.98 lines per inch and variable lines per inch.
Print Zone	2.83 inches maximum
Noise	57 dBA Sound Pressure (ISO 7779)
Graphics (Optional)	User-Defined Graphics, Logo
ECO	Paper reduction, Power reduction
Other	No Reverse Paper Feed
Paper Diameter	80 mm maximum
Paper Length	**83 meters** (273 feet)
Paper Width	• **80 mm +0.5 mm / -1.2 mm** (3.15 inches +0.02inches/-0.047 inches) • **58 mm +0.5 mm / -1 mm** (2.28 inches +0.02 inches/-0.039)
Paper Thickness	Not Applicable
Printable Area	2.83 inches maximum

Power Requirements

The 7197 Series II printer receives power either from a host computer (integrated) or from a separate in–line power supply (remote) which can be purchased separately. Models receiving power from a power supply use one cable for communication and a separate cable for power.

Power from Host

The host computer must provide a +24V supply to the printer.

Note: Voltage variation in the 24 V line may be within 21.6 V and 30.8 V.

Surge protection must be provided. To do this, place a 3.2-ampere time delay fuse on the +24V line. Based on the Host Terminal Series, a specific printer power mode must be selected.

NCR Terminal Power–Low Mode (Term Pwr–Low)—This mode must be selected when the printer is attached to an NCR terminal that is powered by an external power brick.

Example: 7600, 7601, 7610, 7611, and so forth.

		Maximum Current	
Voltage	**Station**	**Printing time (Peak)**	**Transaction Time (RMS)**
24 Volts Minimum: 21.6 Volts	Slip: 11.5 Dots/Character	6.4 A	1.8 A
	Slip: 15 Dots/Character	10.0 A	1.6 A
	Slip: Graphics	10.0 A	2.7 A
	Receipt: Graphics	8.7 A	3.0 A
	Receipt: 20% Character	5.2 A	1.7 A

NCR Terminal Power–High Mode (Term Pwr–High)–This mode can be selected when the printer is attached to an NCR terminal with an internal power supply.

Example: 7403, 7459, 7606, 7616, and so forth.

		Maximum Current	
Voltage	**Station**	**Printing time (Peak)**	**Transaction Time (RMS)**
24 Volts Minimum: 21.6 Volts	Slip: 11.5 Dots/Character	6.4 A	1.8 A
	Slip: 15 Dots/Character	10.0 A	1.6 A
	Slip: Graphics	10.0 A	2.7 A
	Receipt: Graphics	9.1 A	3.5 A
	Receipt: 20% Character	6.8 A	2.0 A

Power from External Power Supply

The external power supply must provide a +24V line of power to the printer. Surge protection must be provided. To do this, place a 2.0-ampere time delay fuse on the +24V line.

A specific power mode is selected based on available external power supply. When NCR 75W external power supply is used, select **(NCR 75W Ext Pwr)** mode.

Station	**Voltage**	**Maximum Current (RMS)**		**Peak Current**
		Printing	**Printing Cycle**	
Receipt	24 V ± 10%	4.5 A	3.5 A	9.1 A
Slip	24 V ± 10%	2.5 A	1.8 A	6.4 A

Station	**Voltage**	**Maximum Current (RMS)**		**Peak Current**
		Printing	**Printing Cycle**	
Receipt	24 V ± 10%	4.5 A	3.5 A	9.3 A
Slip	24 V ± 10%	2.5 A	1.8 A	6.4 A

When NCR 60W external power supply is used, select **(NCR 60W Ext Pwr)** mode.

Environmental Conditions

Operating Temperature	5°C to 20°C (40°F to 120°F), models with knife
Note: Actual maximum operating temperature of printer is subjected to external power supply adaptor unit used. If a power supply adaptor with a lower operating temperature is selected, the operating temperature of the printer will be limited to the operating temperature of that power supply.	
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
Electronics	1,800,000 On-time Hours
Communications Card (RS232/USB)	25,000,000 On-time Hours
Communications Card (Ethernet)	11,000,000 On-time Hours
Knife	1 Million Cuts
Power Supply	200,000 On-time Hours

Note: Reliability statistics are based on averages exhibited under lab conditions and do not constitute a warranty.

Dimensions and Weight

Height	**144.90 mm** (6.1 inches)
Height with Cover Open	**234.50 mm** (9.23 inches)
Width	**145.40 mm** (5.7 inches)
Depth	• **186.70 mm** (7.35 inches) For Standard model • **182.60 mm** (7.19 inches) For Aldl model
Weight	**1.70 kg** (3.7 lb)

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 occurence 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.

Ambient Temperature			
Amount of Solid Coverage	**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: Reflashing the Printer Firmware

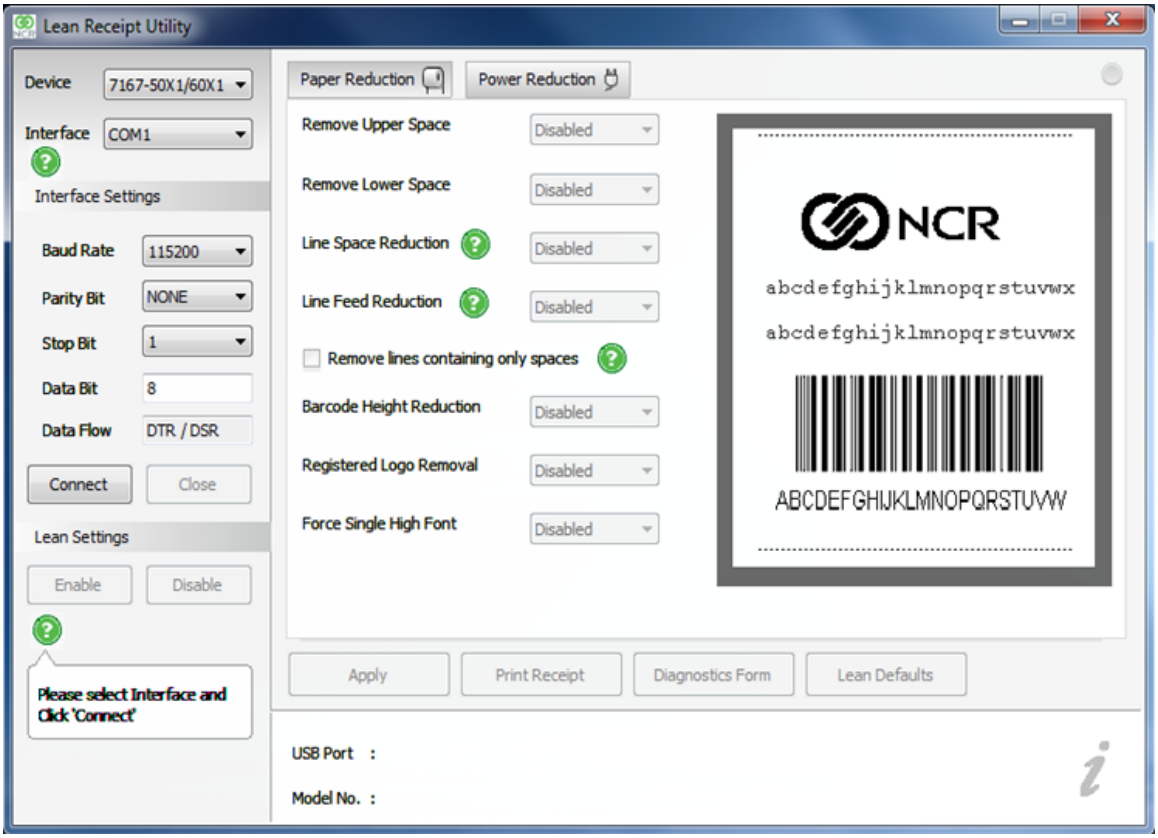
Flash Utility is used to flash the firmware and the font files to the printer.

Note: For the detailed procedure, please refer to the *NCR Printer Flash Utility Owners Guide* from the NCR web site, *http://www5.ncr.com/support/support_drivers_patches.asp?Class=External\Peripherals\Printer\FlashUtility\display*.

Appendix C: Lean Receipt Utility

Lean Receipt Utility is used to set the printer ECO setting from the utility.

Note: For the detailed procedure, please refer to the *NCR Printer Lean Receipt Utility Owners Guide* from the NCR web site, *http://www5.ncr.com/support/support_drivers_patches.asp?Class=External\Peripherals\Printer\LeanReceiptUtility\display*.



Appendix D: Print Characteristics

Character Size

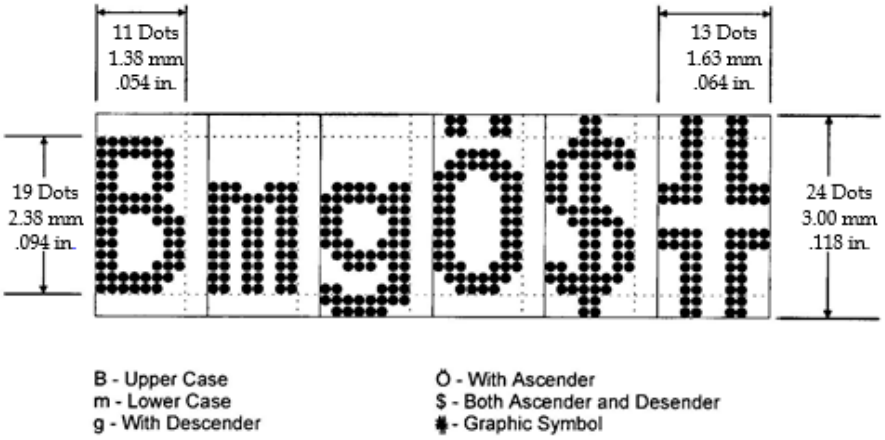
This section shows the dot pattern for characters printed on the receipt station.

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).

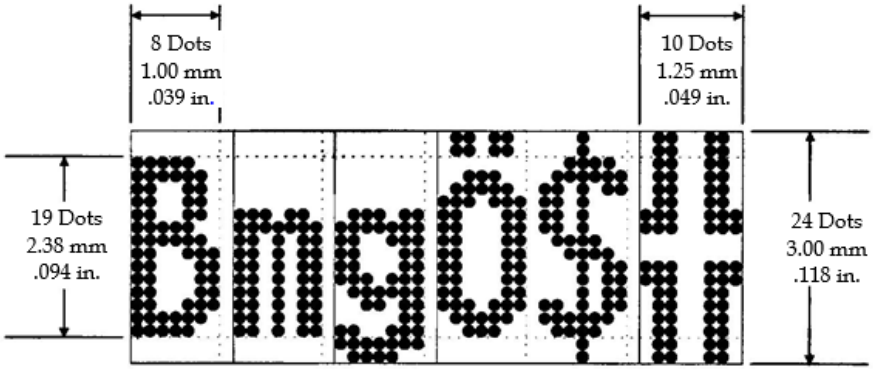
Note: Compressed pitch uses fewer dots horizontally than standard pitch.

Standard Pitch



203 DPI, 15.6 CPI Pitch (Standard)

Compressed Pitch



203 DPI, 19 CPI Pitch (Compressed)

Print Zones

This section shows the printable area for the receipt station.

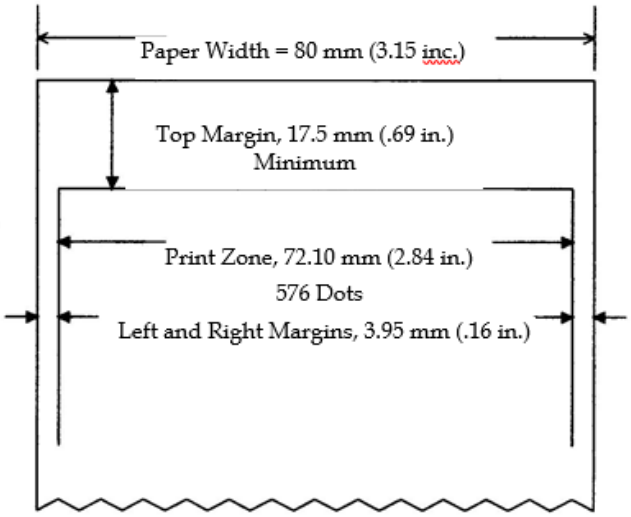
Receipt Station

For 80-mm Paper

The receipt station centers characters (standard pitch and compressed pitch) and graphics on a receipt with a width of 27 dots or **80 mm** (3.15 inches).

- 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 or **3.38 mm** (0.133 inches) for characters (with three extra dot rows). Refer to the illustration below (not to scale).

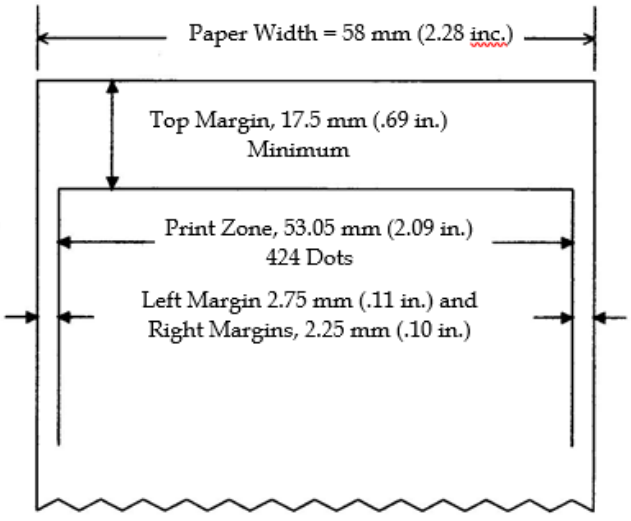


For 58-mm Paper

The receipt station centers characters (standard pitch and compressed pitch) and graphics on a receipt with a width of **58 mm** (2.28 inches).

- 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 or **3.38 mm** (0.133 inches) for characters (with three extra dot rows). Refer to the illustration below (not to scale).



Appendix E: Thai Code Page Function

Outline

7197 SII supports printing of Thai characters. Code Page 874 (Thai) supports Thai character, but, some characters of them define only a part of one character. Actual Thai character is made up of a combination of some characters (maximum 4 characters in CP 874) for one Thai character. 7197 SII printer supports the function which synthesizes Thai character from Code Page 874 characters.

Validate Thai Code Page Function

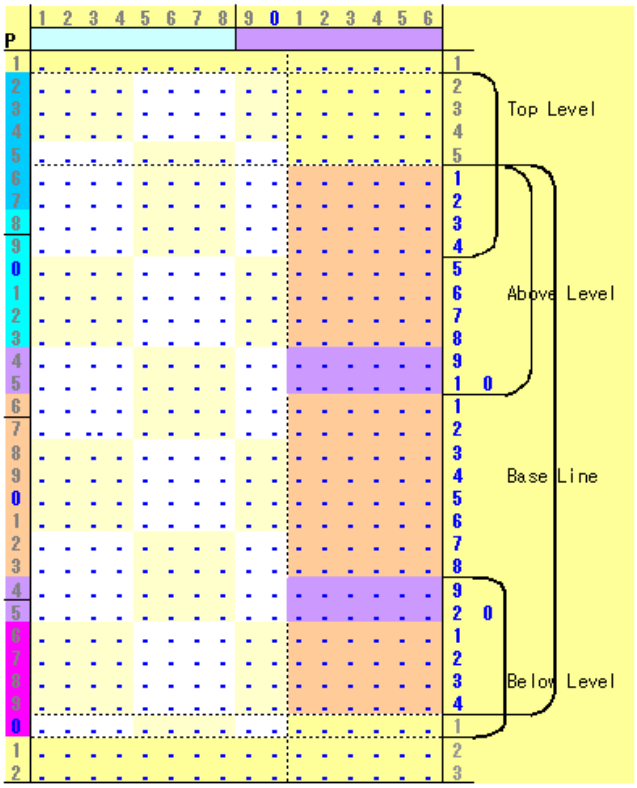
The Thai code page function is validated when the following conditions are selected.

- Online mode
- Asian Mode = OFF
- Code Page = 874

Thai Character Configuration

The character cell of Thai character is made up of a maximum 4 parts—Top level, Above level, Base line and Below level.)

- **Top Level**—places the Top level characters only. Top level character is placed on the Above characters.
- **Above Level**—places the Above level characters only. The Above level character is placed on the Base line characters.
- **Base Line**—places the Base level characters and Low code characters.
- **Below Level** –places the Below level characters. The Below level character is placed under the Base line character.



Character Types

Base line characters

- Base line characters are the characters encircled in red, purple, and pink.
- The characters encircled in purple will not have below level characters, but they are rarely used.
- The characters encircled in pink will not have top level and above level. Only the ฟcharacter is rarely used.
- Every character encircled in red and purple must have a top and below level.

Top level/Above level characters

- Characters encircled blue are Top level/Above level characters.
- Characters encircled in red and purple, and the ฟ character can be both top and above level.
- The characters encircled in blue on the fifth line can be top level when above level character exists. The fourth line characters encircled in blue can be above level only. The fifth line characters encircled in blue can be both top and above level.

Below level characters

- Characters encircled in green are Below level characters. It is impossible that the top, above and below characters are in one character.

Thai Character Data Procedure

Thai character data string uses the following format:

```
Base character, <Below character >, <Above character>, <Top character>,
Base character, ……
```

The printer checks whether the received character is the Base character. If the Top, Above, Below characters are sent before the Base character, these characters are ignored.

After receiving the Base character, the printer checks the next character until it receives the next Base character.

If next character is the Below character, the Above character or Top character, 7197 SII checks whether these Thai characters are valid for the current Base character. If valid, 7197 SII merges the characters images on the Base character image. If invalid, the characters are ignored.

Function Notes

This function supports standard pitch font and compressed pitch font. Thai character height is 34 dots. The below command functions change, and are different from other code pages.

SYN	Add *n* Extra Dot Rows. **Note:** When CP874 is selected, the line Pitch is 34 + *n* dot
ESC 2	Set Line Spacing to 1/6 inch. **Note:** When CP874 is selected, this command is ignored.
ESC 3	SetLine Spacing. **Note:** When CP874 is selected, valid parameter value is >= 34.

The line pitch is changed by below commands because the code page is changed.

ESC R	Select international character set.
ESC t	Select character code table. **Note:** Same as ESC R.
ESC %	Set/cancel the user–defined character set.
ESC L	Set page mode.
ESC S	Select standard mode.
FF	Form Feed in page mode.

Limitation

The unicode command is ignored under the Thai code page function. When the Asian mode = *ON*, the Thai character image is not synthesized. Each character is printed separately.

Appendix F: Arabic font support

Outline

7197 SII supports supports several features of Arabic font, such as the following:

- Contextual forms
- Word ligatures
- Reverse the Arabic strings

These features can be achieved based on the proportional font and if they are available according to the following conditions:

- Arabic Proportional font exist in DBCS font area.
- Asian Mode is disabled.
- Codepage 1256 is selected or Arabic characters (`0600–06FF`) are specified in Unicode mode.

If Arabic proportional font does not exist in the DBCS font area, the above–mentioned features are not available, and codepage1256 isolated characters are printed in fixed pitch.

Contextual Forms

Arabic letters have contextual forms, depending on surrounding letters in the same word: a typical–three letter word will start with a letter in initial form, followed by a letter in medial form and, finally, by a letter in final form

Curly writing is a way to write a word with connection to all the characters in that word. This feature is supported in contextual forms.

Word Ligatures

Arabic Presentation Forms-A has a few characters defined as *word ligatures* for terms frequently used in formulaic expressions in Arabic. By way of example, the common ampersand (**&**) represents the conjunctive word *and*. The ampersand symbol is a ligature.

Reverse the Arabic strings

Arabic writing is from right to left by aligning right margin. The data received by the printer will reverse the arabic string and print as per the Arabic format, which is right to left.

Proportional Font

The printer has the following resident proportional characters for Arabic functions (Unicode base).

Lower characters	0020–007F
Arabic (Basic)	0600–06FF, 225 characters
Arabic Supplement	0750–077F, 48 characters
Arabic Extended-A	08A0–08FF, 39 characters
Arabic Presentation Forms-A	FB50–FDFF, 535 characters
Arabic Presentation Forms-B	FE70–FEFF, 140 characters

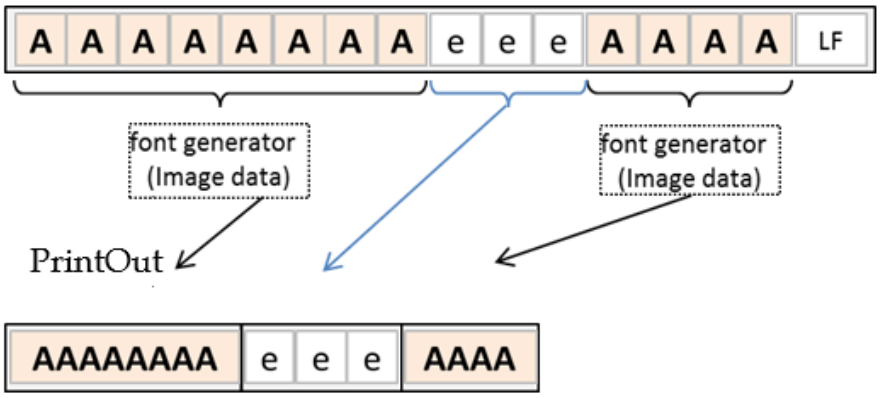
The characters of Codepage 1256 are covered by the above–mentioned characters.

Proportional Font Conversion Handling of Arabic

Express a code as follows:

Proportional font code of Arabic:  **Note:** Include Lower character.	Select Unicode Mode (ESC +) : 
Other codes:  	Cancel Unicode Mode (ESC +): 

Receiving data



Limitations

Due to the features of Arabic font, there are several limitations in terms of the character attributes. Refer to the command description of Print Characteristic Commands in detail.

Invalid command list

This is a list of commands which are not available if a new Arabic character is used.

Command	Command name	Remarks
ESC DC2	Select 90 Degree Counter-Clockwise Rotated Print	
ESC SYSN	Select Pitch (Column Width)	
ESC SP	Set Character Right-Side Spacing	
ESC !	Select Print Modes	Bit0, Bit3 Invalid
ESC %	Select or Cancel User-Defined Character Set	
ESC & 3	Define User-Defined Characters	
ESC :	Copy Character Set from ROM to RAM	
ESC ?	Cancel User-Defined Characters	
ESC E	Select or Cancel Emphasized Mode	
ESC G	Select Double Strike	
ESC H	Cancel Double Strike	
ESC I	Select or Cancel Italic Print	

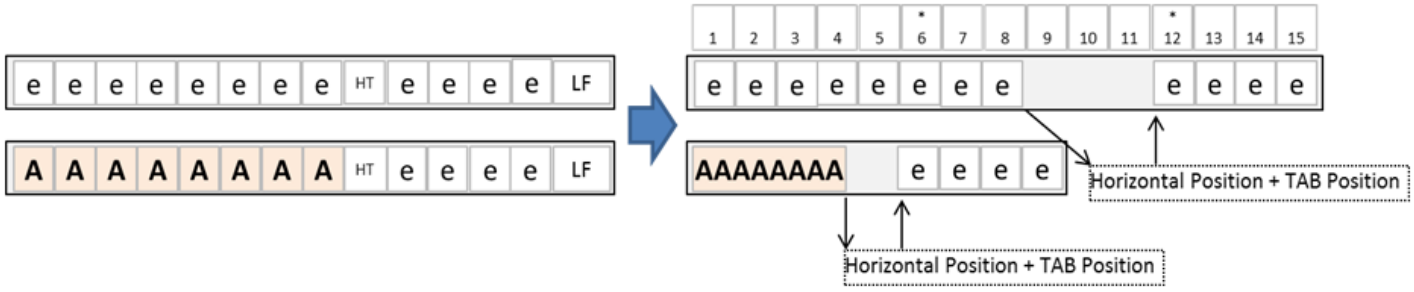
Command	Command name	Remarks
ESC V	Select or Cancel 90 Degrees Clockwise Rotated Print	
ESC {	Select or Cancel Upside Down Printing Mode	
US ENQ	Selects Superscript or Subscript Modes	

The following table contains a list of commands which are ignored if the command is sent in the middle of a line that includes an Arabic character.

Command	Command name	Remarks
DC2	Select Double-Wide Characters	
ESC -	Select or Cancel Underline Mode	
ESC r	Select Print Color	
GS !	Select Character Size	
GS B	Select or Cancel White/Black Reverse Printing Mode	
ESC !	Select Print Modes	Bit4, Bit5 Invalid

Horizontal Positioning Commands

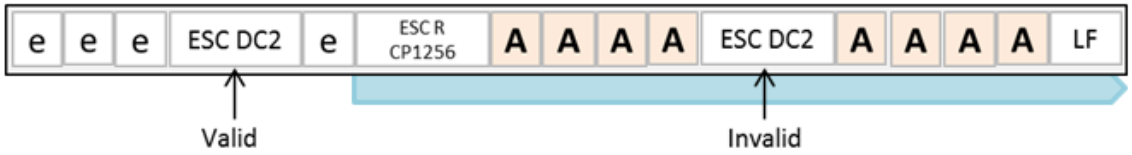
Ex) HT Horizontal Tab (6,12,18)



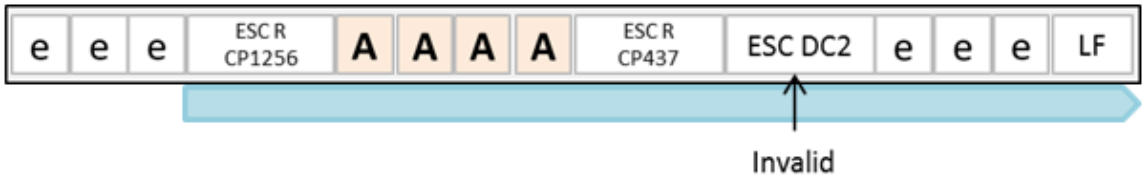
Invalid command (example)

Ex) ESC DC2 Select 90 Degree Counter-Clockwise Rotated Print

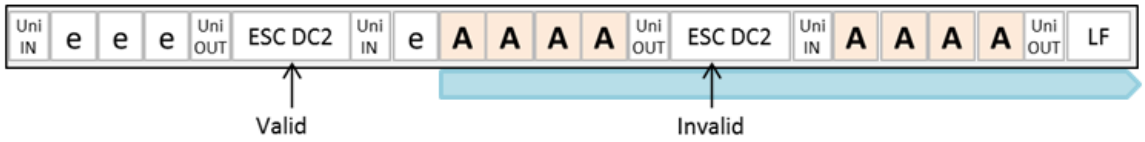
CodePage CP437 + Receive data



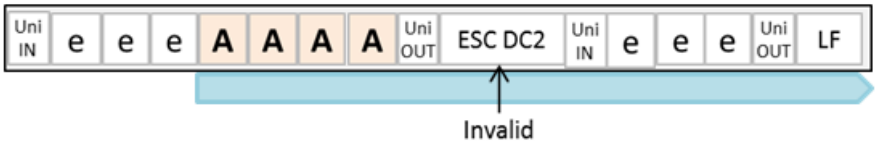
CodePage CP437 + Receive data



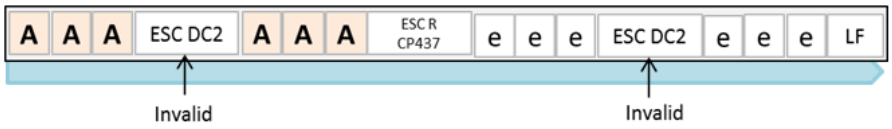
CodePage CP437 + Receive data(Unicode)



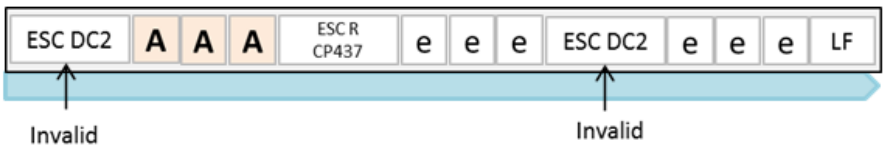
CodePage CP437 + Receive data(Unicode)



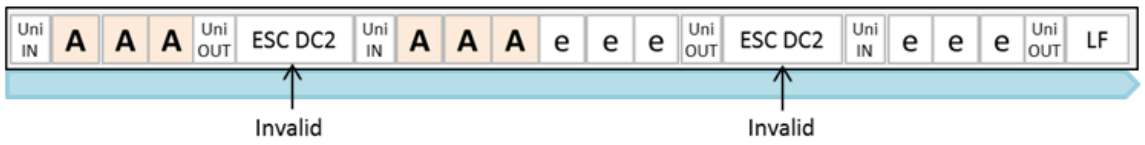
CodePage CP1256 + Receive data



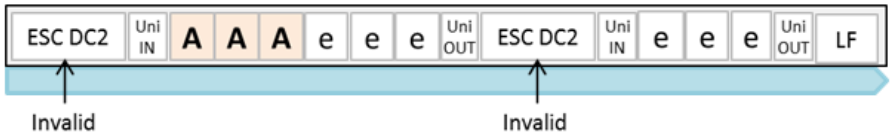
CodePage CP1256 + Receive data



CodePage CP1256 + Receive data(Unicode)



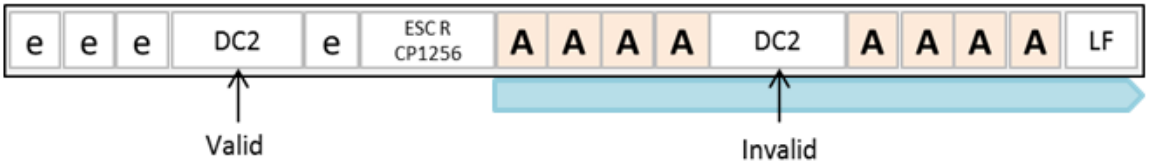
CodePage CP1256 + Receive data(Unicode)



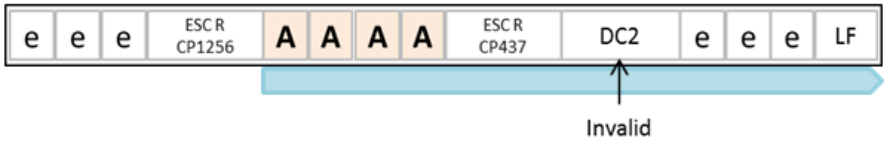
Invalid command in middle of the line (example)

It is invalid for the middle of the line Ex) DC2 Select Double-Wide Characters

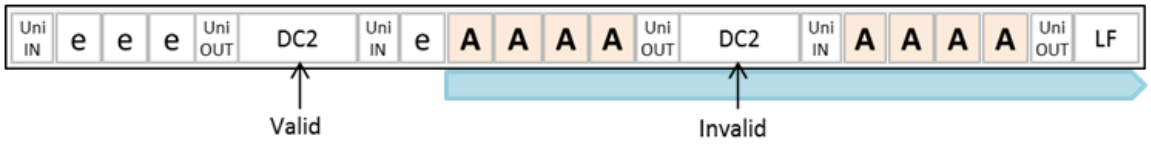
CodePage CP437 + Receive data



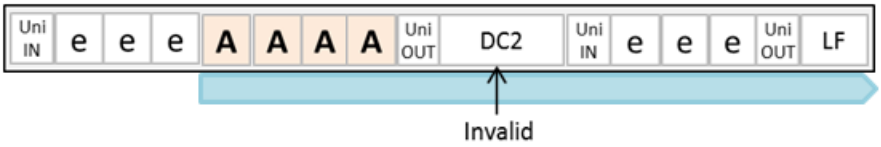
CodePage CP437 + Receive data



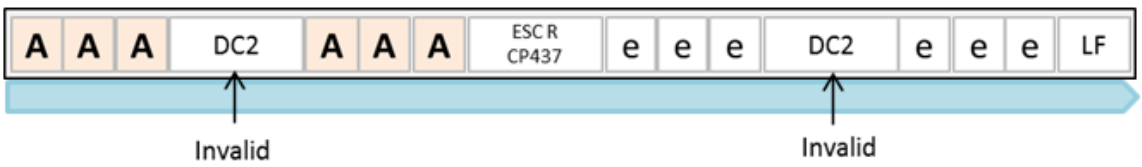
CodePage CP437 + Receive data(Unicode)



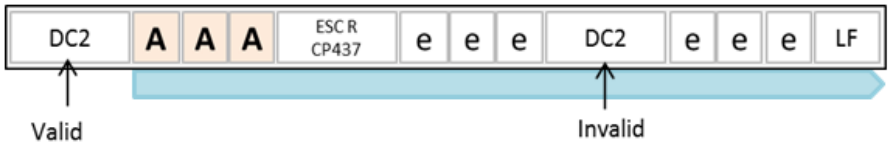
CodePage CP437 + Receive data(Unicode)



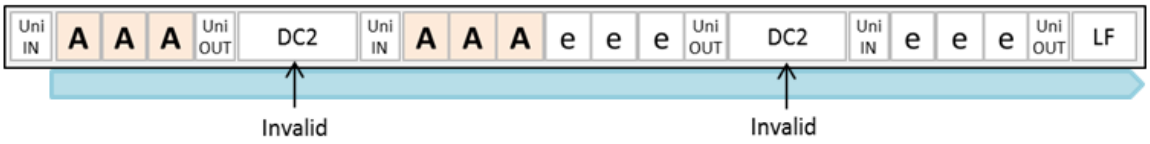
CodePage CP1256 + Receive data



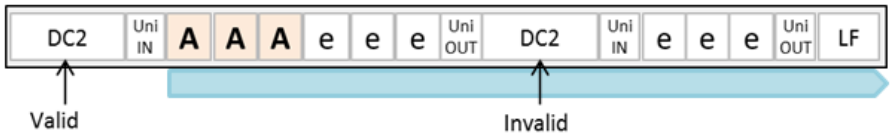
CodePage CP1256 + Receive data



CodePage CP1256 + Receive data(Unicode)



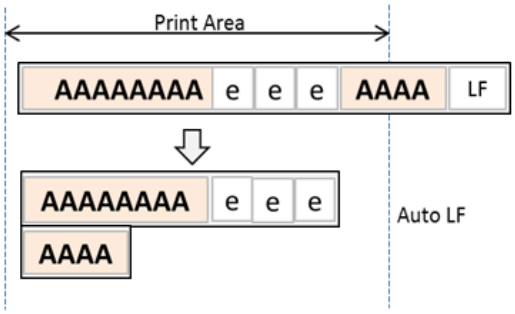
CodePage CP1256 + Receive data(Unicode)



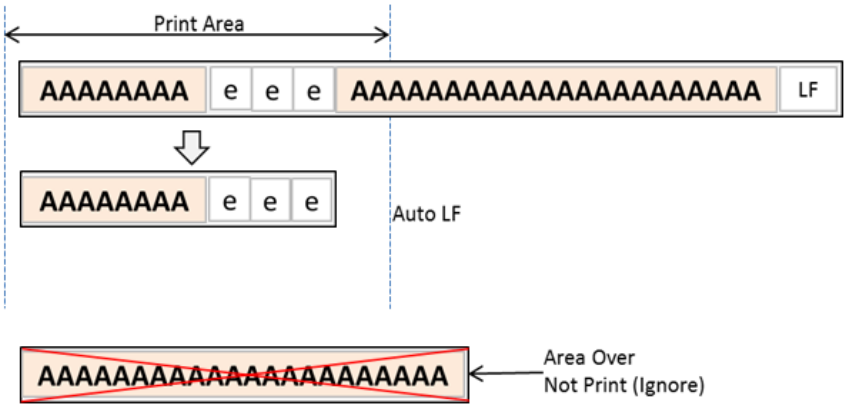
Printing Layout (Over the Area)

If the Arabic character line exceeds printable area, it will be printed as bellows.

Pattern 1



Pattern 2



Character Sets

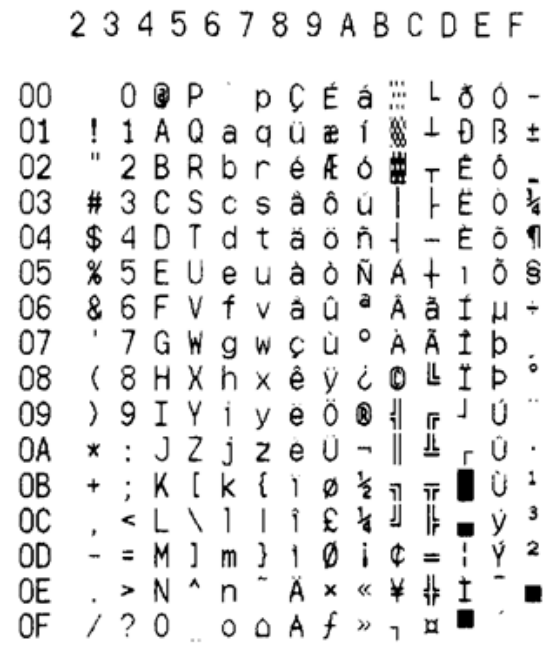
The following pages show the character sets.

- PC Code Page 437 (US)
- 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 1256 (Windows Arabic)
- PC Code Page Katakana
- Hungary
- PC Code Page 874 (Thai)
- Space Page
- Code Page 932
- Code Page 936
- Code Page 949
- Code Page 950

Code Page 950 Code Page 437, 850, 852 and 858

Code Page 437.

Code Page 850.



Code Page 852.

Code Page 858.

Code Page 860, 862, 863 and 864

Code Page 860.

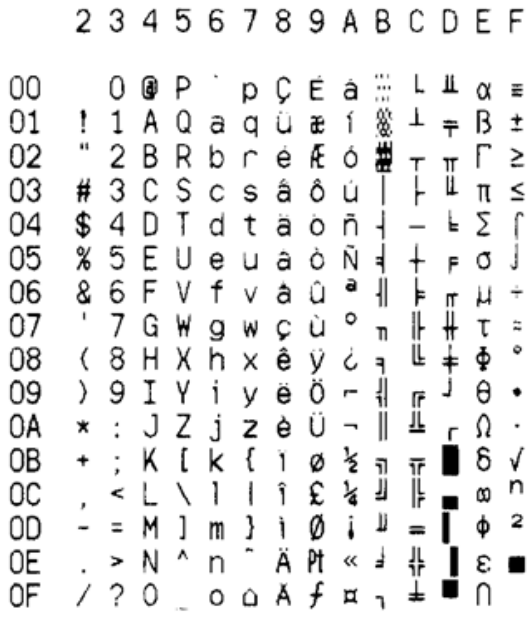
Code Page 862

Code Page 863.

Code Page 864

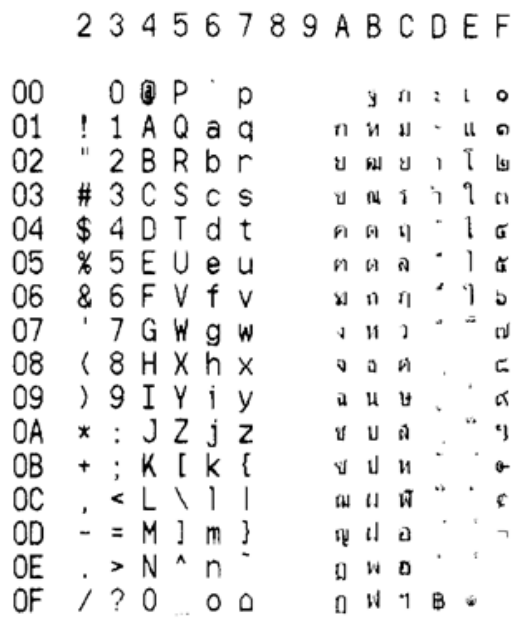
Code Page 865, 866, 874 and 1252

Code Page 865.

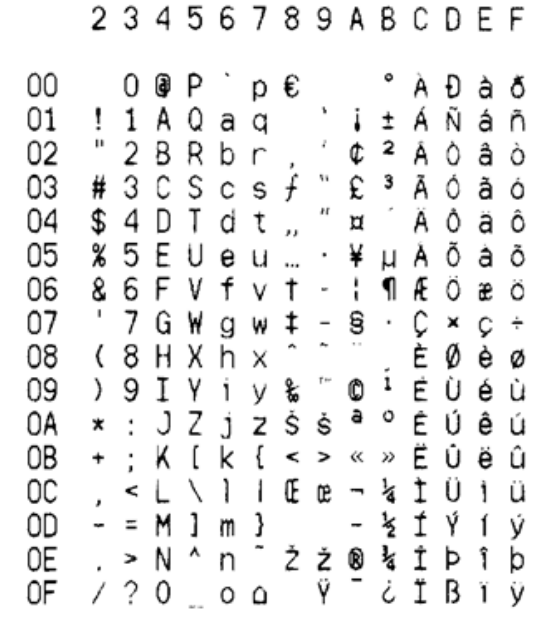


Code Page 866.

Code Page 874.



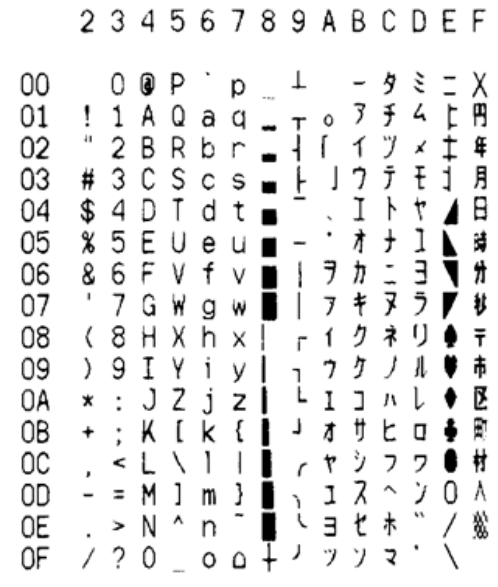
Code Page 1252.



Code Page 1256 and Katakana

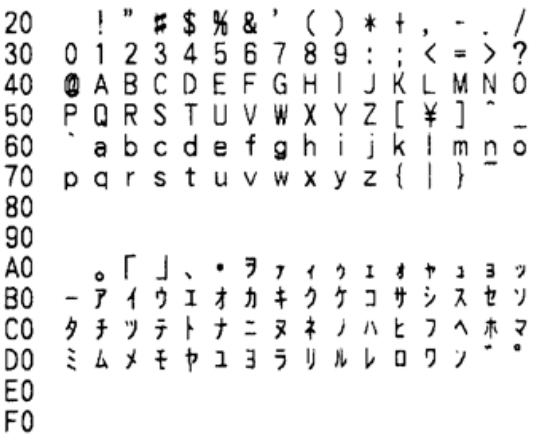
Code Page 1256

Code Page KATAKANA.



Code Page 932

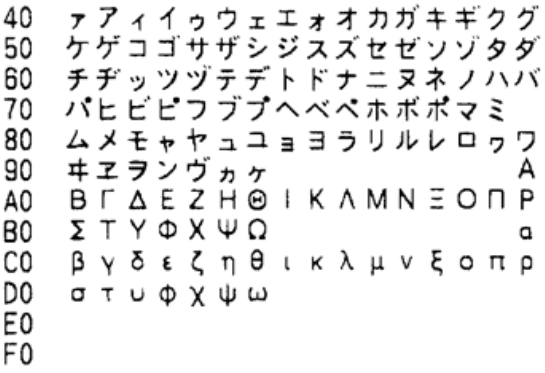
Code page 932



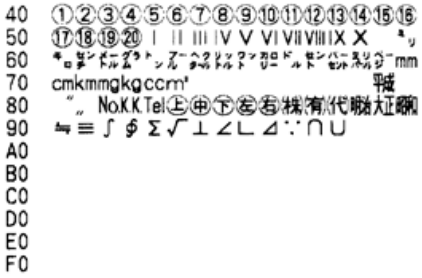
Code page 932-81

Code page 932-82

Code page 932-83



Code page 932-87



Code page 932-84

40	А	Б	В	Г	Д	Е	Ё	Ж	З	И	Й	К	Л	М	Н	О
50	П	Р	С	Т	У	Ф	Х	Ц	Ч	Ш	Щ	Ъ	Ы	Ь	Э	Ю
60	Я															
70	а	б	в	г	д	е	ё	ж	з	и	й	к	л	м	н	
80	о	п	р	с	т	у	ф	х	ц	ч	ш	щ	ъ	ы	ь	э
90	ю	я														—
A0	｜	┌	┐	┘	└	├	┬	┤	┴	┼	━	｜	┌	┐	┘	└
B0	├	┬	┤	┴	┼	├	┬	┤	┴	┼	├	┬	┤	┴	┼	
C0																
D0																
E0																
F0																

Code page 932-87

40	①	②	③	④	⑤	⑥	⑦	⑧	⑨	⑩	⑪	⑫	⑬	⑭	⑮	⑯
50	⑰	⑱	⑲	⑳	Ⅰ	Ⅱ	Ⅲ	Ⅳ	Ⅴ	Ⅵ	Ⅶ	Ⅷ	Ⅸ	Ⅹ	㍉	㌔
60	㌢	㍍	㌘	㌧	㌃	㌶	㍑	㍗	㌍	㌦	㌣	㌫	㍊	㌻	㎜	
70	㎝	㎞	㎎	㎏	㏄	㎡									平	成
80	㍻	〝	〟	№	㏍	℡	㊤	㊥	㊦	㊧	㊨	㈱	㈲	㈹	明	治	大	正	昭	和
90	≒	≡	∫	∮	Σ	√	⊥	∠	∟	⊿	∵	∩	∪			
A0																
B0																
C0																
D0																
E0																
F0																

Code page 932-88

40																
50																
60																
70																
80																
90																亜
A0	唖	娃	阿	哀	愛	挨	姶	逢	葵	茜	穐	悪	握	渥	旭	葦
B0	芦	鯵	梓	圧	斡	扱	宛	姐	虻	飴	絢	綾	鮎	或	粟	袷
C0	安	庵	按	暗	案	闇	鞍	杏	以	伊	位	依	偉	囲	夷	委
D0	威	尉	惟	意	慰	易	椅	為	畏	異	移	維	緯	胃	萎	衣
E0	謂	違	遺	医	井	亥	域	育	郁	磯	一	壱	溢	逸	稲	茨
F0	芋	鰯	允	印	咽	員	因	姻	引	飲	淫	胤	蔭			

Code page 932-89

40	院	陰	隠	韻	吋	右	宇	烏	羽	迂	雨	卯	鵜	窺	丑	碓
50	臼	渦	嘘	唄	鬱	蔚	鰻	姥	厩	浦	瓜	閏	噂	云	運	雲
60	荏	餌	叡	営	嬰	影	映	曳	栄	永	泳	洩	瑛	盈	穎	頴
70	英	衛	詠	鋭	液	疫	益	駅	悦	謁	越	閲	榎	厭	円	
80	園	堰	奄	宴	延	怨	掩	援	沿	演	炎	焔	煙	燕	猿	縁
90	艶	苑	薗	遠	鉛	鴛	塩	於	汚	甥	凹	央	奥	往	応	押
A0	旺	横	欧	殴	王	翁	襖	鴬	鴎	黄	岡	沖	荻	億	屋	憶
B0	臆	桶	牡	乙	俺	卸	恩	温	穏	音	下	化	仮	何	伽	価
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	霞	蚊	俄	峨	我	牙	画	臥	芽	蛾	賀	雅	餓	駕	介	会
F0	解	回	塊	壊	廻	快	怪	悔	恢	懐	戒	拐	改			

Code page 932-8A

40	魁	晦	械	海	灰	界	皆	絵	芥	蟹	開	階	貝	凱	劾	外
50	咳	害	崖	慨	概	涯	碍	蓋	街	該	鎧	骸	浬	馨	蛙	垣
60	柿	蛎	鈎	劃	嚇	各	廓	拡	撹	格	核	殻	獲	確	穫	覚
70	角	赫	較	郭	閣	隔	革	学	岳	楽	額	顎	掛	笠	樫	
80	橿	梶	鰍	潟	割	喝	恰	括	活	渇	滑	葛	褐	轄	且	鰹
90	叶	椛	樺	鞄	株	兜	竈	蒲	釜	鎌	噛	鴨	栢	茅	萱	粥
A0	刈	苅	瓦	乾	侃	冠	寒	刊	勘	勧	巻	喚	堪	姦	完	官
B0	寛	干	幹	患	感	慣	憾	換	敢	柑	桓	棺	款	歓	汗	漢
C0	潤	灌	環	甘	監	看	竿	管	簡	緩	缶	翰	肝	艦	莞	観
D0	諌	貫	還	鑑	間	閑	関	陥	韓	館	舘	丸	含	岸	巌	玩
E0	癌	眼	岩	翫	贋	雁	頑	顔	願	企	伎	危	喜	器	基	奇
F0	嬉	寄	岐	希	幾	忌	揮	机	旗	既	期	棋	棄			

Code page 932-8B

40	機	帰	毅	気	汽	畿	祈	季	稀	紀	徽	規	記	貴	起	軌
50	輝	飢	騎	鬼	亀	偽	儀	妓	宜	戯	技	擬	欺	犠	疑	祇
60	義	蟻	誼	議	掬	菊	鞠	吉	吃	喫	桔	橘	詰	砧	杵	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	拠	挙	渠	虚	許	距	鋸	漁	禦	魚	亨	享	京	供
A0	侠	僑	兇	競	共	凶	協	匡	卿	叫	喬	境	峡	強	彊	怯
B0	恐	恭	挟	教	橋	況	狂	狭	矯	胸	脅	興	蕎	郷	鏡	響
C0	饗	驚	仰	凝	尭	暁	業	局	曲	極	玉	桐	粁	僅	勤	均
D0	巾	錦	斤	欣	欽	琴	禁	禽	筋	緊	芹	菌	衿	襟	謹	近
E0	金	吟	銀	九	倶	句	区	狗	玖	矩	苦	躯	駆	駈	駒	具
F0	愚	虞	喰	空	偶	寓	遇	隅	串	櫛	釧	屑	屈			

Code page 932-8C

40	掘	窟	沓	靴	轡	窪	熊	隈	粂	栗	繰	桑	鍬	勲	君	薫
50	訓	群	軍	郡	卦	袈	祁	係	傾	刑	兄	啓	圭	珪	型	契
60	形	径	恵	慶	慧	憩	掲	携	敬	景	桂	渓	畦	稽	系	経
70	継	繋	罫	茎	荊	蛍	計	詣	警	軽	頚	鶏	芸	迎	鯨	
80	劇	戟	撃	激	隙	桁	傑	欠	決	潔	穴	結	血	訣	月	件
90	倹	倦	健	兼	券	剣	喧	圏	堅	嫌	建	憲	懸	拳	捲	検
A0	権	牽	犬	献	研	硯	絹	県	肩	見	謙	賢	軒	遣	鍵	険
B0	顕	験	鹸	元	原	厳	幻	弦	減	源	玄	現	絃	舷	言	諺
C0	限	乎	個	古	呼	固	姑	孤	己	庫	弧	戸	故	枯	湖	狐
D0	糊	袴	股	胡	孤	虎	誇	跨	鈷	雇	顧	鼓	五	互	伍	午
E0	呉	吾	娯	後	御	悟	梧	檎	瑚	碁	語	誤	護	醐	乞	鯉
F0	交	佼	侯	候	倖	光	公	功	効	勾	厚	口	向			

Code page 932-8D

40	后	喉	坑	垢	好	孔	孝	宏	工	巧	巷	幸	広	庚	康	弘
50	恒	慌	抗	拘	控	攻	昂	晃	更	杭	校	梗	構	江	洪	浩
60	港	溝	甲	皇	硬	稿	糠	紅	紘	絞	綱	耕	考	肯	肱	腔
70	膏	航	荒	行	衡	講	貢	購	郊	酵	鉱	砿	鋼	閤	降	
80	項	香	高	鴻	剛	劫	号	合	壕	拷	濠	豪	轟	麹	克	刻
90	告	国	穀	酷	鵠	黒	獄	漉	腰	甑	忽	惚	骨	狛	込	此
A0	頃	今	困	坤	墾	婚	恨	懇	昏	昆	根	梱	混	痕	紺	艮
B0	魂	些	佐	叉	唆	嵯	左	差	査	沙	瑳	砂	詐	鎖	裟	坐
C0	座	挫	債	催	再	最	哉	塞	妻	宰	彩	才	採	栽	歳	済
D0	災	采	犀	砕	砦	祭	斎	細	菜	裁	載	際	剤	在	材	罪
E0	財	冴	坂	阪	堺	榊	肴	咲	崎	埼	碕	鷺	作	削	咋	搾
F0	昨	朔	柵	窄	策	索	錯	桜	鮭	笹	匙	冊	刷			

Code page 932-8E

40	察	拶	撮	擦	札	殺	薩	雑	皐	鯖	捌	錆	鮫	皿	晒	三
50	傘	参	山	惨	撒	散	桟	燦	珊	産	算	纂	蚕	讃	賛	酸
60	餐	斬	暫	残	仕	仔	伺	使	刺	司	史	嗣	四	士	始	姉
70	姿	子	屍	市	師	志	思	指	支	孜	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	賜	雌	飼	歯	事	似	侍	児	字	寺	慈	持	時	次
A0	滋	治	爾	璽	痔	磁	示	而	耳	自	蒔	辞	汐	鹿	式	識
B0	鴫	竺	軸	宍	雫	七	叱	執	失	嫉	室	悉	湿	漆	疾	質
C0	実	蔀	篠	偲	柴	芝	屡	蕊	縞	舎	写	射	捨	赦	斜	煮
D0	社	紗	者	謝	車	遮	蛇	邪	借	勺	尺	杓	灼	爵	酌	釈
E0	錫	若	寂	弱	惹	主	取	守	手	朱	殊	狩	珠	種	腫	趣
F0	酒	首	儒	受	呪	寿	授	樹	綬	需	囚	収	周			

Code page 932-8F

40	宗	就	州	修	愁	拾	洲	秀	秋	終	繍	習	臭	舟	蒐	衆
50	襲	讐	蹴	輯	週	酋	酬	集	醜	什	住	充	十	従	戎	柔
60	汁	渋	獣	縦	重	銃	叔	夙	宿	淑	祝	縮	粛	塾	熟	出
70	術	述	俊	峻	春	瞬	竣	舜	駿	准	循	旬	楯	殉	淳	
80	準	潤	盾	純	巡	遵	醇	順	処	初	所	暑	曙	渚	庶	緒
90	署	書	薯	藷	諸	助	叙	女	序	徐	恕	鋤	除	傷	償	勝
A0	匠	升	召	哨	商	唱	嘗	奨	妾	娼	宵	将	小	少	尚	庄
B0	床	廠	彰	承	抄	招	掌	捷	昇	昌	昭	晶	松	梢	樟	樵
C0	沼	消	渉	湘	焼	焦	照	症	省	硝	礁	祥	称	章	笑	粧
D0	紹	肖	蔦	蒋	蕉	衝	裳	訟	証	詔	詳	象	賞	醤	鉦	鍾
E0	鐘	障	鞘	上	丈	丞	乗	冗	剰	城	場	壌	嬢	常	情	擾
F0	条	杖	浄	状	畳	穣	蒸	譲	醸	錠	嘱	埴	飾			

Code page 932-90

40	拭植殖燭織職色触食蝕辱尻伸信侵唇
50	娠寝審心慎振新晋森榛浸深申疹真神
60	秦紳臣芯薪親診身辛進針震人仁刃塵
70	壬尋甚尽腎訊迅陣靭笥諏須酢図厨
80	逗吹垂帥推水炊睡粋翠衰遂酔錐錘随
90	瑞髄崇嵩数枢趨雛据杉椙菅頗雀裾澄
A0	摺寸世瀬畝是凄制勢姓征性成政整星
B0	晴棲栖正清牲生盛精聖声製西誠誓請
C0	逝醒青静斉税脆隻席惜戚斥昔析石積
D0	籍績脊責赤跡蹟碩切拙接摂折設窃節
E0	説雪絶舌蝉仙先千占宣専尖川戦扇撰
F0	栓栴泉浅洗染潜煎煽旋穿箭線

Code page 932-91

40	繊羨腺舛船薦詮賎践選遷銭銑閃鮮前
50	善漸然全禅繕膳糧噌塑岨措曾曽楚狙
60	疏踈礎祖租粗素組蘇訴阻遡鼠僧創双
70	叢倉喪壮奏爽宋層匝惣想捜掃挿掻
80	操早曹巣槍槽漕燥争痩相窓糟総綜聡
90	草荘葬蒼藻装走送遭鎗霜騒像増憎臓
A0	蔵贈造促側則即息捉束測足速俗属賊
B0	族統卒袖其揃存孫尊損村遜他多太汰
C0	詑唾堕妥惰打柁舵楕陀駄騨体堆対耐
D0	岱帯待怠態戴替泰滞胎腿苔袋貸退逮
E0	隊黛鯛代台大第醍題鷹滝瀧卓啄宅托
F0	択拓沢濯琢託鐸濁諾茸凧蛸只

Code page 932-92

40	叩但達辰奪脱巽竪辿棚谷狸鱈樽誰丹
50	単嘆坦担探旦歎淡湛炭短端箪綻耽胆
60	蛋誕鍛団壇弾断暖檀段男談値知地弛
70	恥智池痴稚置致蜘遅馳築畜竹筑蓄
80	逐秩窒茶嫡着中仲宙忠抽昼柱注虫衷
90	註酎鋳駐樗瀦猪苧著貯丁兆凋喋寵帖
A0	帳庁弔張彫徴懲挑暢朝潮牒町眺聴脹
B0	腸蝶調諜超跳銚長頂鳥勅捗直朕沈珍
C0	賃鎮陳津墜椎槌追鎚痛通塚栂掴槻佃
D0	漬柘辻蔦綴鍔椿潰坪壷嬬紬爪吊釣鶴
E0	亭低停偵剃貞呈堤定帝底庭廷弟悌抵
F0	挺提梯汀碇禎程締艇訂諦蹄逓

Code page 932-93

40	邸鄭釘鼎泥摘擢敵滴的笛適鏑溺哲徹
50	撤轍迭鉄典填天展店添纏甜貼転顛点
60	伝殿澱田電兎吐堵塗妬屠徒斗杜渡登
70	蒐賭途都鍍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梼棟
90	盗淘湯涛灯燈当痘祷等答筒糖統到董
A0	蕩藤討謄豆踏逃透鐙陶頭騰闘働動同
B0	堂導憧撞洞瞳童胴萄道銅峠鴇匿得徳
C0	涜特督禿篤毒独読栃橡凸突椴届鳶苫
D0	寅酉瀞噸屯惇敦沌豚遁頓呑曇鈍奈那
E0	内乍凪薙謎灘捺鍋楢馴縄畷南楠軟難
F0	汝二尼弐迩匂賑肉虹廿日乳入

Code page 932-94

40	如尿韮任妊忍認濡禰祢寧葱猫熱年念
50	捻撚燃粘乃廼之埜嚢悩濃納能脳膿農
60	覗蚤巴把播覇杷波派琶破婆罵芭馬俳
70	廃拝排敗杯盃牌背肺輩配倍培媒梅
80	楳煤狽買売賠陪這蝿秤矧萩伯剥博拍
90	柏泊白箔粕舶薄迫曝漠爆縛莫駁麦函
A0	箱硲箸肇筈櫨幡肌畑畠八鉢溌発醗髪
B0	伐罰抜筏閥鳩噺塙蛤隼伴判半反叛帆
C0	搬斑板氾汎版犯班畔繁般藩販範釆煩
D0	頒飯挽晩番盤磐蕃蛮匪卑否妃庇彼悲
E0	扉批披斐比泌疲皮碑秘緋罷肥被誹費
F0	避非飛樋簸備尾微枇毘琵眉美

Code page 932-95

40	鼻柊稗匹疋髭彦膝菱肘弼必畢箆逼桧
50	姫媛紐百謬俵彪標氷漂瓢票表評豹廟
60	描病秒苗錨鋲蒜蛭鰭品彬斌浜瀕貧賓
70	頻敏瓶不付埠夫婦富冨布府怖扶敷
80	斧普浮父符腐膚芙譜負賦赴阜附侮撫
90	武舞葡蕪部封楓風葺蕗伏副復幅服福
A0	腹複覆淵弗払沸仏物鮒分吻噴墳憤扮
B0	焚奮粉糞紛雰文聞丙併兵塀幣平弊柄
C0	並蔽閉陛米頁僻壁癖碧別瞥蔑箆偏変
D0	片篇編辺返遍便勉娩弁鞭保舗鋪圃捕
E0	歩甫補輔穂募墓慕戊暮母簿菩倣俸包
F0	呆報奉宝峰峯崩庖抱捧放方朋

Code page 932-96

40 法泡烹砲縫胞芳萌蓬蜂褒訪豊邦鋒飽
50 鳳鵬乏亡傍剖坊妨帽忘忙房暴望某棒
60 冒紡肪膨謀貌貿鉾防吠頬北僕卜墨撲
70 朴牧睦穆釦勃没殆堀幌奔本翻凡盆
80 摩磨魔麻埋妹昧枚毎哩槙幕膜枕鮪柾
90 鱒桝亦俣又抹末沫迄侭繭麿万慢満漫
A0 蔓味未魅巳箕岬密蜜湊蓑稔脈妙粍民
B0 眠務夢無牟矛霧鵡椋婿娘冥名命明盟
C0 迷銘鳴姪牝滅免棉綿緬面麺摸模茂妄
D0 孟毛猛盲網耗蒙儲木黙目杢勿餅尤戻
E0 籾貰問悶紋門匁也冶夜爺耶野弥矢厄
F0 役約薬訳躍靖柳薮鑓愉愈油癒

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誉
60 輿預傭幼妖容庸揚揺擁曜楊様洋溶熔
70 用窯羊耀葉蓉要謡踊遥陽養慾抑欲
80 沃浴翌翼淀羅螺裸来莱頼雷洛絡落酪
90 乱卵嵐欄濫藍蘭覧利吏履李梨理璃痢
A0 裏裡里離陸律率立葎掠略劉流溜琉留
B0 硫粒隆竜龍侶慮旅虜了亮僚両凌寮料
C0 梁涼猟療瞭稜糧良諒遼量陵領力緑倫
D0 厘林淋燐琳臨輪隣鱗麟瑠塁涙累類令
E0 伶例冷励嶺怜玲礼苓鈴隷零霊麗齢暦
F0 歴列劣烈裂廉恋憐漣煉簾練聯

Code page 932-98

40 蓮連錬呂魯櫓炉賂路露労婁廊弄朗楼
50 榔浪漏牢狼篭老聾蝋郎六麓禄肋録論
60 倭和話歪賄脇惑枠鷲亙亘鰐詫藁蕨椀
70 湾碗腕
80
90 　　　　　　　　　　　　　　　弌
A0 丐丕个丱丶丼丿乂乖乘亂亅豫亊舒弍
B0 于亞亟亠亢亰亳亶从仍仄仆仂仗仞仭
C0 仟价伉佚估佛佝佗佇佶侈侏侘佻佩佰
D0 侑佯來侖儘俔俟俎俘俛俑俚俐俤俥倚
E0 倨倔倪倥倅伜俶倡倩倬俾俯們倆偃假
F0 會偕偐偈做偖偬偸傀傚傅傴傲

Code page 932-99

40 僉僊傳僂僖僞僥僭僣僮價僵儉儁儂儖
50 儕儔儚儡儺儷儼儻儿兀兒兌兔兢竸兩
60 兪兮冀冂囘册冉冏冑冓冕冖冤冦冢冩
70 冪冫决冱冲冰况冽凅凉凛几處凩凭
80 凰凵凾刄刋刔刎刧刪刮刳刹剏剄剋剌
90 剞剔剪剴剩剳剿剽劍劔劒剱劈劑辨辧
A0 劬劭劼劵勁勍勗勞勣勦飭勠勳勵勸勹
B0 匆匈甸匍匐匏匕匚匣匯匱匳匸區卆卅
C0 丗卉卍凖卞卩卮夘卻卷厂厖厠厦厥厮
D0 厰厶參簒雙叟曼燮叮叨叭叺吁吽呀听
E0 吭吼吮吶吩吝呎咏呵咎呟呱呷呰咒呻
F0 咀呶咄咐咆哇咢咸咥咬哄哈咨

Code page 932-9A

40 咫哂咤咾咼哘哥哦唏唔哽哮哭哺哢唹
50 啀啣啌售啜啅啖啗唸唳啝喙喀咯喊喟
60 啻啾喘喞單啼喃喩喇喨嗚嗅嗟嗄嗜嗤
70 嗔嘔嗷嘖嗾嗽嘛嗹噎噐營嘴嘶嘲嘸
80 噫噤嘯噬噪嚆嚀嚊嚠嚔嚏嚥嚮嚶嚴囂
90 嚼囁囃囀囈囎囑囓囗囮囹圀囿圄圉圈
A0 國圍圓團圖嗇圜圦圷圸坎圻址坏坩埀
B0 垈坡坿垉垓垠垳垤垪垰埃埆埔埒埓堊
C0 埖埣堋堙堝塲堡塢塋塰毀塒堽塹墅墹
D0 墟墫墺壞墻墸墮壅壓壑壗壙壘壥壜壤
E0 壟壯壺壹壻壼壽夂夊夐夛梦夥夬夭夲
F0 夸夾竒奕奐奎奚奘奢奠奧奬奩

Code page 932-9B

40 奸妁妝佞侫妣妲姆姨姜妍姙姚娥娟娑
50 娜娉娚婀婬婉娵娶婢婪媚媼媾嫋嫂媽
60 嫣嫗嫦嫩嫖嫺嫻嬌嬋嬖嬲嫐嬪嬶嬾孃
70 孅孀孑孕孚孛孥孩孰孳孵學斈孺宀
80 它宦宸寃寇寉寔寐寤實寢寞寥寫寰寶
90 寳尅將專對尓尠尢尨尸尹屁屆屎屓屐
A0 屏孱屬屮乢屶屹岌岑岔妛岫岻岶岼岷
B0 峅岾峇峙峩峽峺峭嶌峪崋崕崗嵜崟崛
C0 崑崔崢崚崙崘嵌嵒嵎嵋嵬嵳嵶嶇嶄嶂
D0 嶢嶝嶬嶮嶽嶐嶷嶼巉巍巓巒巖巛巫已
E0 巵帋帚帙帑帛帶帷幄幃幀幎幗幔幟幢
F0 幤幇幵并幺麼广庠廁廂廈廐廏

Code page 932-9C

40	廖廣廝廚廛廢廡廨廩廬廱廳廰廴廸廾
50	弃弉彝彜弋弑弖弩弭弸彁彈彌彎弯彑
60	彖彗彙彡彭彳彷徃徂彿徊很徑徇從徙
70	徘徠徨徭徼忖忻忤忸忱忝悳忿怡恠
80	怙怐怩怎怱怛怕怫怦怏怺恚恁恪恷恟
90	恊恆恍恣恃恤恂恬恫恙悁悍惧悃悚悄
A0	悛悖悗悒悧悋惡悸惠惓悴忰悽惆悵惘
B0	慍愕愆惶惷愀惴惺愃愡惻惱愍愎慇愾
C0	愨愧慊愿愼愬愴愽慂慄慳慷慘慙慚慫
D0	慴慯慥慱慟慝慓慵憙憖憇憬憔憚憊憑
E0	憫憮懌懊應懷懈懃懆憺懋罹懍懦懣懶
F0	懺懴懿懽懼懾戀戈戉戍戌戔戛

Code page 932-9D

40	戞戡截戮戰戲戳扁扎扞扣扛扠扨扼抂
50	抉找抒抓抖拔抃抔拗拑抻拏拿拆擔拈
60	拜拌拊拂拇抛拉挌拮拱挧挂挈拯拵捐
70	挾捍搜捏掖掎掀掫捶掣掏掉掟掵捫
80	捩掾揩揀揆揣揉插揶揄搖搴搆搓搦搶
90	攝搗搨搏摧摯摶摎攪撕撓撥撩撈撼據
A0	擒擅擇撻擘擂擱擧舉擠擡抬擣擯攬擶
B0	擴擲擺攀擽攘攜攅攤攣攫攴攵攷收攸
C0	畋效敖敕敍敘敞敝敲數斂斃變斛斟斫
D0	斷旃旆旁旄旌旒旛旙无旡旱杲昊昃旻
E0	杳昵昶昴昜晏晄晉晁晞晝晤晧晨晟晢
F0	晰暃暈暎暉暄暘暝曁暹曉暾暼

Code page 932-9E

40	曄暸曖曚曠昿曦曩曰曵曷朏朖朞朦朧
50	霸朮朿朶杁朸朷杆杞杠杙杣杤枉杰枩
60	杼杪枌枋枦枡枅枷柯枴柬枳柩枸柤柞
70	柝柢柮枹柎柆柧檜栞框栩桀桍栲桎
80	梳栫桙档桷桿梟梏梭梔條梛梃檮梹桴
90	梵梠梺椏梍桾椁棊椈棘椢椦棡椌棍棔
A0	棧棕椶椒椄棗棣椥棹棠棯椨椪椚椣椡
B0	棆楹楷楜楸楫楔楾楮椹楴椽楙椰楡楞
C0	楝榁楪榲榮槐榿槁槓榾槎寨槊槝榻槃
D0	榧樮榑榠榜榕榴槞槨樂樛槿權槹槲槧
E0	樅榱樞槭樔槫樊樒櫁樣樓橄樌橲樶橸
F0	橇橢橙橦橈樸樢檐檍檠檄檢檣

Code page 932-9F

40	檗蘗檻櫃櫂檸檳檬櫞櫑櫟檪櫚櫪櫻欅
50	蘖櫺欒欖鬱欟欸欷盜欹飮歇歃歉歐歙
60	歔歛歟歡歸歹歿殀殄殃殍殘殕殞殤殪
70	殫殯殲殱殳殷殼毆毋毓毟毬毫毳毯
80	麾氈氓气氛氤氣汞汕汢汪沂沍沚沁沛
90	汾汨汳沒沐泄泱泓沽泗泅泝沮沱沾沺
A0	泛泯泙泪洟衍洶洫洽洸洙洵洳洒洌浣
B0	涓浤浚浹浙涎涕濤涅淹渕渊涵淇淦涸
C0	淆淬淞淌淨淒淅淺淙淤淕淪淮渭湮渮
D0	渙湲湟渾渣湫渫湶湍渟湃渺湎渤滿渝
E0	游溂溪溘滉溷滓溽溯滄溲滔滕溏溥滂
F0	溟潁漑灌滬滸滾漿滲漱滯漲滌

Code page 932-E0

40	漾漓滷澆潺潸澁澀潯潛濳潭澂潼潘澎
50	澑濂潦澳澣澡澤澹濆澪濟濕濬濔濘濱
60	濮濛瀉瀋濺瀑瀁瀏濾瀛瀚潴瀝瀘瀟瀰
70	瀾瀲灑灣炙炒炯烱炬炸炳炮烟烋烝
80	烙焉烽焜焙煥煕熈煦煢煌煖煬熏燻熄
90	熕熨熬燗熹熾燒燉燔燎燠燬燧燵燼燹
A0	燿爍爐爛爨爭爬爰爲爻爼爿牀牆牋牘
B0	牴牾犂犁犇犒犖犢犧犹犲狃狆狄狎狒
C0	狢狠狡狹狷倏猗猊猜猖猝猴猯猩猥猾
D0	獎獏默獗獪獨獰獸獵獻獺珈玳珎玻珀
E0	珥珮珞璢琅瑯琥珸琲琺瑕琿瑟瑙瑁瑜
F0	瑩瑰瑣瑪瑶瑾璋璞璧瓊瓏瓔珱

Code page 932-E1

40	瓠瓣瓧瓩瓮瓲瓰瓱瓸瓷甄甃甅甌甎甍
50	甕甓甞甦甬甼畄畍畊畉畛畆畚畩畤畧
60	畫畭畸當疆疇畴疊疉疂疔疚疝疥疣痂
70	疳痃疵疽疸疼疱痍痊痒痙痣痞痾痿
80	痼瘁痰痺痲痳瘋瘍瘉瘟瘧瘠瘡瘢瘤瘴
90	瘰瘻癇癈癆癜癘癡癢癨癩癪癧癬癰癲
A0	癶癸發皀皃皈皋皎皖皓皙皚皰皴皸皹
B0	皺盂盍盖盒盞盡盥盧盪蘯盻眈眇眄眩
C0	眤眞眥眦眛眷眸睇睚睨睫睛睥睿睾睹
D0	瞎瞋瞑瞠瞞瞰瞶瞹瞿瞼瞽瞻矇矍矗矚
E0	矜矣矮矼砌砒礦砠礪硅碎硴碆硼碚碌
F0	碣碵碪碯磑磆磋磔碾碼磅磊磬

Code page 932-E2

Code page 932-E3

Code page 932-E4

Code page 932-E5

Code page 932-E6

Code page 932-E7

Code page 932-E8

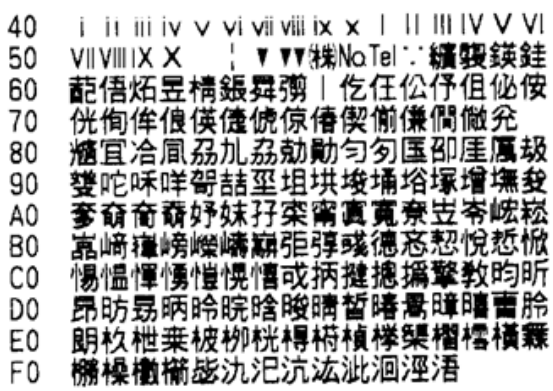
Code page 932-E9

Code page 932-EA

Code page 932-ED

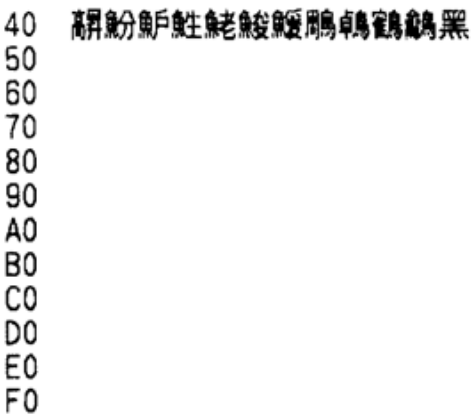
Code page 932-EE

Code page 932-FA



Code page 932-FB

Code page 932-FC

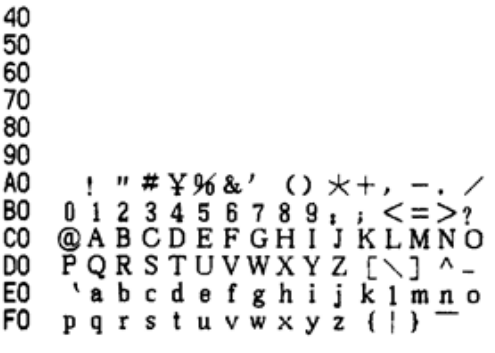


Code Page 936 Simple Chinese

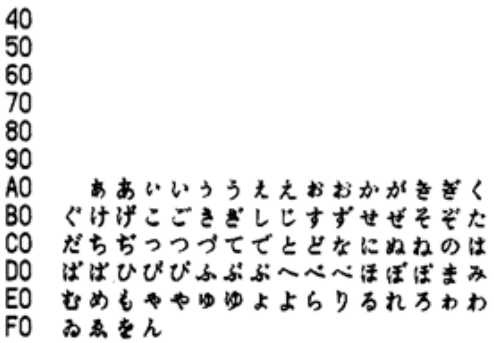
A140 - A1FF

A240 - A2FF

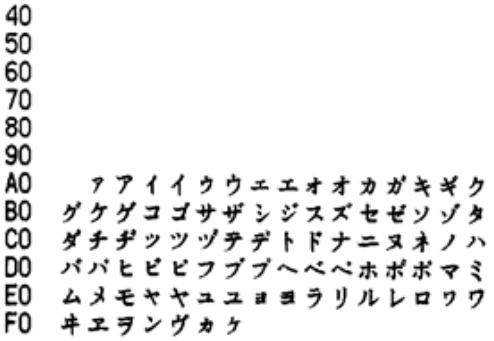
A340 - A3FF



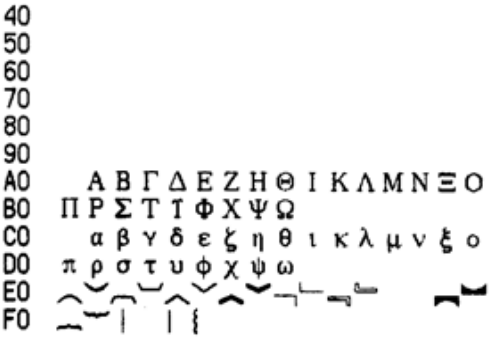
A440 - A4FF



A540 - A5FF

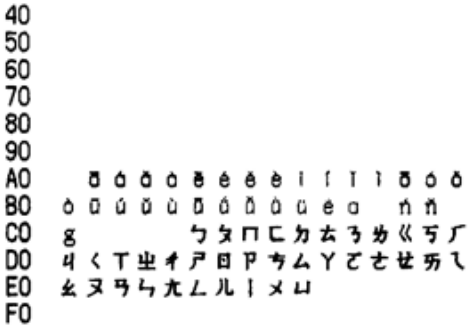


A640 - A6FF

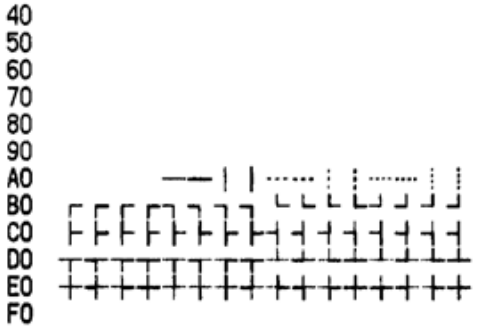


A740 - A7FF

A840 - A8FF



A940 - A9FF



AA40 - AAFF

AB40 - ABFF

AC40 - ACFF

AD40 - ADFF

AE40 - AEFF

AF40 - AFFF

B040 - B0FF

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A0	啊阿埃挨哎唉哀皑癌蔼矮艾碍爱隘
B0	鞍氨安俺按暗岸胺案肮昂盎凹敖熬翱
C0	袄傲奥懊澳芭捌扒叭吧笆八疤巴拔跋
D0	靶把耙坝霸罢爸白柏百摆佰败拜稗斑
E0	班搬扳般颁板版扮拌伴瓣半办绊邦帮
F0	梆榜膀绑棒磅蚌镑傍谤苞胞包褒剥

B140 - B1FF

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A0	薄雹保堡饱宝抱报暴豹鲍爆杯碑悲
B0	卑北辈背贝钡倍狈备惫焙被奔苯本笨
C0	崩绷甭泵蹦迸逼鼻比鄙笔彼碧蓖蔽毕
D0	毙毖币庇痹闭敝弊必辟壁臂避陛鞭边
E0	编贬扁便变卞辨辩辫遍标彪膘表鳖憋
F0	别瘪彬斌濒滨宾摈兵冰柄丙秉饼炳

B240 - B2FF

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A0	病并玻菠播拨钵波博勃搏铂箔伯帛
B0	舶脖膊渤泊驳捕卜哺补埠不布步簿部
C0	怖擦猜裁材才财睬踩采彩菜蔡餐参蚕
D0	残惭惨灿苍舱仓沧藏操糟槽曹草厕策
E0	侧册测层蹭插叉茬茶查碴搽察岔差诧
F0	拆柴豺搀掺蝉馋谗缠铲产阐颤昌猖

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郴臣辰尘晨
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驰耻齿侈尺
E0	赤翅斥炽充冲虫崇宠抽酬畴踌稠愁筹
F0	仇绸瞅丑臭初出橱厨躇锄雏滁除楚

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	蠢戳绰疵茨磁雌辞慈瓷词此刺赐次聪
D0	葱囱匆从丛凑粗醋簇促蹿篡窜摧崔催
E0	脆瘁粹淬翠村存寸磋撮搓措挫错搭达
F0	答瘩打大呆歹傣戴带殆代贷袋待逮

B540 - B5FF

40	
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A0	怠耽担丹单郸掸胆旦氮但惮淡诞弹
B0	蛋当挡党档裆刀捣蹈倒岛祷导到稻悼
C0	道盗德得的蹬灯登等瞪凳邓堤低滴迪
D0	敌笛狄涤翟嫡抵底地蒂第帝弟递缔颠
E0	掂滇碘点典靛垫电佃甸店惦奠淀殿碉
F0	叼雕凋刁掉吊钓调跌爹碟蝶迭谍叠

B640 - B6FF

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A0	丁盯叮钉顶鼎锭定订丢东冬董懂动
B0	栋侗恫冻洞兜抖斗陡豆逗痘都督毒犊
C0	独读堵睹赌杜镀肚度渡妒端短锻段断
D0	缎堆兑队对墩吨蹲敦顿囤钝盾遁掇哆
E0	多夺垛躲朵跺舵剁惰堕蛾峨鹅俄额讹
F0	娥恶厄扼遏鄂饿恩而儿耳尔饵洱二

B740 - B7FF

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A0	贰发罚筏伐乏阀法珐藩帆番翻樊矾
B0	钒繁凡烦反返范贩犯饭泛坊芳方肪房
C0	防妨仿访纺放菲非啡飞肥匪诽吠肺废
D0	沸费芬酚吩氛分纷坟焚汾粉奋份忿愤
E0	粪丰封枫蜂峰锋风疯烽逢冯缝讽奉凤
F0	佛否夫敷肤孵扶拂辐幅氟符伏俘服

B840 - B8FF

40															
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90															
A0		浮	涪	福	袱	弗	甫	抚	辅	俯	釜	斧	脯	腑	府	腐
B0	赴	副	覆	赋	复	傅	付	阜	父	腹	负	富	讣	附	妇	缚
C0	咐	噶	嘎	该	改	概	钙	盖	溉	干	甘	杆	柑	竿	肝	赶
D0	感	秆	敢	赣	冈	刚	钢	缸	肛	纲	岗	港	杠	篙	皋	高
E0	膏	羔	糕	搞	镐	稿	告	哥	歌	搁	戈	鸽	胳	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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80															
90															
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	剐	寡	挂	褂	乖	拐	怪	棺	关	官	冠	观	管	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	刽	辊	滚	棍	锅	郭	国	果	裹	过	哈	

BA40 - BAFF

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70															
80															
90															
A0		骸	孩	海	氦	亥	害	骇	酣	憨	邯	韩	含	涵	寒	函
B0	喊	罕	翰	撼	捍	旱	憾	悍	焊	汗	汉	夯	杭	航	壕	嚎
C0	豪	毫	郝	好	耗	号	浩	呵	喝	荷	菏	核	禾	和	何	合
D0	盒	貉	阂	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	蝴	狐	糊	湖	

BB40 - BBFF

40															
50															
60															
70															
80															
90															
A0		弧	虎	唬	护	互	沪	户	花	哗	华	猾	滑	画	划	化
B0	话	槐	徊	怀	淮	坏	欢	环	桓	还	缓	换	患	唤	痪	豢
C0	焕	涣	宦	幻	荒	慌	黄	磺	蝗	簧	皇	凰	惶	煌	晃	幌
D0	恍	谎	灰	挥	辉	徽	恢	蛔	回	毁	悔	慧	卉	惠	晦	贿
E0	秽	会	烩	汇	讳	诲	绘	荤	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

40															
50															
60															
70															
80															
90															
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	蓟	技	冀	季	伎
C0	祭	剂	悸	济	寄	寂	计	记	既	忌	际	妓	继	纪	嘉	枷
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	缄	茧	检	柬	碱	硷
F0	拣	捡	简	俭	剪	减	荐	槛	鉴	践	贱	见	键	箭	件	

BD40 - BDFF

40															
50															
60															
70															
80															
90															
A0		舰	舰	剑	饯	渐	溅	涧	建	僵	姜	将	浆	江	疆	蒋
B0	桨	奖	讲	匠	酱	降	蕉	椒	礁	焦	胶	交	郊	浇	骄	娇
C0	嚼	搅	铰	矫	侥	脚	狡	角	饺	缴	绞	剿	教	酵	轿	较
D0	叫	窖	揭	接	皆	秸	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

40															
50															
60															
70															
80															
90															
A0		尽	劲	荆	兢	茎	睛	晶	鲸	京	惊	精	粳	经	井	警
B0	景	颈	静	境	敬	镜	径	痉	靖	竟	竞	净	炯	窘	揪	究
C0	纠	玖	韭	久	灸	九	酒	厩	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	卷	绢	撅
F0	攫	抉	掘	倔	爵	觉	决	诀	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	砍	看	康	慷	糠	扛	抗	亢	炕	考	拷	烤	靠
C0	坷	苛	柯	棵	磕	颗	科	壳	咳	可	渴	克	刻	客	课	肯
D0	啃	垦	恳	坑	吭	空	恐	孔	控	抠	口	扣	寇	枯	哭	窟
E0	苦	酷	库	裤	夸	垮	挎	跨	胯	块	筷	侩	快	宽	款	匡
F0	筐	狂	框	矿	眶	旷	况	亏	盔	岿	窥	葵	奎	魁	傀	

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阑兰澜谰揽
C0 览懒缆烂滥琅榔狼廊郎朗浪捞劳牢老
D0 佬姥酪烙涝勒乐雷镭蕾磊累儡垒擂肋
E0 类泪棱楞冷厘梨犁黎篱狸离漓理李里
F0 鲤礼莉荔吏栗丽厉励砾历利傈例俐

C140 - C1FF

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A0 痢立粒沥隶力璃哩俩联莲连镰廉怜
B0 涟帘敛脸链恋炼练粮凉梁粱良两辆量
C0 晾亮谅撩聊僚疗燎寥辽潦了撂镣廖料
D0 列裂烈劣猎琳林磷霖临邻鳞淋凛赁吝
E0 拎玲菱零龄铃伶羚凌灵陵岭领另令溜
F0 琉榴硫馏留刘瘤流柳六龙聋咙笼窿

C240 - C2FF

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A0 隆垄拢陇楼娄搂篓漏陋芦卢颅庐炉
B0 掳卤虏鲁麓碌露路赂鹿潞禄录陆戮驴
C0 吕铝侣旅履屡缕虑氯律率滤绿峦挛孪
D0 滦卵乱掠略抡轮伦仑沦纶论萝螺罗逻
E0 锣箩骡裸落洛骆络妈麻玛码蚂马骂嘛
F0 吗埋买麦卖迈脉瞒馒蛮满蔓曼慢漫

C340 - C3FF

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A0 谩芒茫盲氓忙莽猫茅锚毛矛铆卯茂
B0 冒帽貌贸么玫枚梅酶霉煤没眉媒镁每
C0 美昧寐妹媚门闷们萌蒙檬盟锰猛梦孟
D0 眯醚靡糜迷谜弥米秘觅泌蜜密幂棉眠
E0 绵冕免勉娩缅面苗描瞄藐秒渺庙妙蔑
F0 灭民抿皿敏悯闽明螟鸣铭名命谬摸

C440 - C4FF

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A0 摹蘑模膜磨摩魔抹末莫墨默沫漠寞
B0 陌谋牟某拇牡亩姆母墓暮幕募慕木目
C0 睦牧穆拿哪呐钠那娜纳氖乃奶耐奈南
D0 男难囊挠脑恼闹淖呢馁内嫩能妮霓倪
E0 泥尼拟你匿腻逆溺蔫拈年碾撵捻念娘
F0 酿鸟尿捏聂孽啮镊镍涅您柠狞凝宁

C540 - C5FF

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A0 拧宁牛扭钮纽脓浓农弄奴努怒女暖
B0 虐疟挪懦糯诺哦欧鸥殴藕呕偶沤啪趴
C0 爬帕怕琶拍排牌徘湃派攀潘盘磐盼畔
D0 判叛乓庞旁耪胖抛咆刨炮袍跑泡呸胚
E0 培裴赔陪配佩沛喷盆砰抨烹澎彭蓬棚
F0 硼蓬膨朋鹏捧碰坯砒霹批披劈琵毗

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粕剖扑铺仆莆葡
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讫掐

C740 - C7FF

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A0 恰洽牵扦钎铅千迁签仟谦乾黔钱钳
B0 前潜遣浅谴堑嵌欠歉枪呛腔羌墙蔷强
C0 抢橇锹敲悄桥瞧乔侨巧鞘撬翘峭俏窍
D0 切茄且怯窃钦侵亲秦琴勤芹擒禽寝沁
E0 青轻氢倾卿清擎晴氰情顷请庆琼穷秋
F0 丘邱球求囚酋泅趋区蛆曲躯屈驱渠

C840 - C8FF

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A0		取	娶	龋	趣	去	圈	颧	权	醛	泉	全	痊	拳	犬	券
B0	劝	缺	炔	瘸	却	鹊	榷	确	雀	裙	群	然	燃	冉	染	瓤
C0	壤	攘	嚷	让	饶	扰	绕	惹	热	壬	仁	人	忍	韧	任	认
D0	刃	妊	纫	扔	仍	日	戎	茸	蓉	荣	融	熔	溶	容	绒	冗
E0	揉	柔	肉	茹	蠕	儒	孺	如	辱	乳	汝	入	褥	软	阮	蕊
F0	瑞	锐	闰	润	若	弱	撒	洒	萨	腮	鳃	塞	赛	三	叁	

C940 - C9FF

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A0		伞	散	桑	嗓	丧	搔	骚	扫	嫂	瑟	色	涩	森	僧	莎
B0	砂	杀	刹	沙	纱	傻	啥	煞	筛	晒	珊	苫	杉	山	删	煽
C0	衫	闪	陕	擅	赡	膳	善	汕	扇	缮	墒	伤	商	赏	晌	上
D0	尚	裳	梢	捎	稍	烧	芍	勺	韶	少	哨	邵	绍	奢	赊	蛇
E0	舌	舍	赦	摄	射	慑	涉	社	设	砷	申	呻	伸	身	深	娠
F0	绅	神	沈	审	婶	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	售	受	瘦	兽	蔬
E0	枢	梳	殊	抒	输	叔	舒	淑	疏	书	赎	孰	熟	薯	暑	曙
F0	署	蜀	黍	鼠	属	术	述	树	束	戍	竖	墅	庶	数	漱	

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	撕	嘶	思	私	司	丝
C0	死	肆	寺	嗣	四	伺	似	饲	巳	松	耸	怂	颂	送	宋	讼
D0	诵	搜	艘	擞	嗽	苏	酥	俗	素	速	粟	僳	塑	溯	宿	诉
E0	肃	酸	蒜	算	虽	隋	随	绥	髓	碎	岁	穗	遂	隧	祟	孙
F0	损	笋	蓑	梭	唆	缩	琐	索	锁	所	塌	他	它	她	塔	

CC40 - CCFF

40															
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A0		獭	挞	蹋	踏	胎	苔	抬	台	泰	酞	太	态	汰	坍	摊
B0	贪	瘫	滩	坛	檀	痰	潭	谭	谈	坦	毯	袒	碳	探	叹	炭
C0	汤	塘	搪	堂	棠	膛	唐	糖	倘	躺	淌	趟	烫	掏	涛	滔
D0	绦	萄	桃	逃	淘	陶	讨	套	特	藤	腾	疼	誊	梯	剔	踢
E0	锑	提	题	蹄	啼	体	替	嚏	惕	涕	剃	屉	天	添	填	田
F0	甜	恬	舔	腆	挑	条	迢	眺	跳	贴	铁	帖	厅	听	烃	

CD40 - CDFF

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A0		汀	廷	停	亭	庭	挺	艇	通	桐	酮	瞳	同	铜	彤	童
B0	桶	捅	筒	统	痛	偷	投	头	透	凸	秃	突	图	徒	途	涂
C0	屠	土	吐	兔	湍	团	推	颓	腿	蜕	褪	退	吞	屯	臀	拖
D0	托	脱	鸵	陀	驮	驼	椭	妥	拓	唾	挖	哇	蛙	洼	娃	瓦
E0	袜	歪	外	豌	弯	湾	玩	顽	丸	烷	完	碗	挽	晚	皖	惋
F0	宛	婉	万	腕	汪	王	亡	枉	网	往	旺	望	忘	妄	威	

CE40 - CEFF

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90															
A0		巍	微	危	韦	违	桅	围	唯	惟	为	潍	维	苇	萎	委
B0	伟	伪	尾	纬	未	蔚	味	畏	胃	喂	魏	位	渭	谓	尉	慰
C0	卫	瘟	温	蚊	文	闻	纹	吻	稳	紊	问	嗡	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	捂	午	舞	伍	侮	坞	戊	雾	晤	物
F0	勿	务	悟	误	昔	熙	析	西	硒	矽	晰	嘻	吸	锡	牺	

CF40 - CFFF

40															
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80															
90															
A0		稀	息	希	悉	膝	夕	惜	熄	烯	溪	汐	犀	檄	袭	席
B0	习	媳	喜	铣	洗	系	隙	戏	细	瞎	虾	匣	霞	辖	暇	峡
C0	侠	狭	下	厦	夏	吓	掀	锨	先	仙	鲜	纤	咸	贤	衔	舷
D0	闲	涎	弦	嫌	显	险	现	献	县	腺	馅	羡	宪	陷	限	线
E0	相	厢	镶	香	箱	襄	湘	乡	翔	祥	详	想	响	享	项	巷
F0	橡	像	向	象	萧	硝	霄	削	哮	嚣	销	消	宵	淆	晓	

D040 - D0FF

	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
40																
50																
60																
70																
80																
90																
A0		小	孝	校	肖	啸	笑	效	楔	些	歇	蝎	鞋	协	挟	携
B0	邪	斜	胁	谐	写	械	卸	蟹	懈	泄	泻	谢	屑	薪	芯	锌
C0	欣	辛	新	忻	心	信	衅	星	腥	猩	惺	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	墟	戌	需	虚	嘘	须	徐	许	蓄	酗
F0	叙	旭	序	畜	恤	絮	婿	绪	续	轩	喧	宣	悬	旋	玄	

D140 - D1FF

	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
40																
50																
60																
70																
80																
90																
A0		选	癣	眩	绚	靴	薛	学	穴	雪	血	勋	熏	循	旬	询
B0	寻	驯	巡	殉	汛	训	讯	逊	迅	压	押	鸦	鸭	呀	丫	芽
C0	牙	蚜	崖	衙	涯	雅	哑	亚	讶	焉	咽	阉	烟	淹	盐	严
D0	研	蜒	岩	延	言	颜	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	杨	扬
F0	佯	疡	羊	洋	阳	氧	仰	痒	养	样	漾	邀	腰	妖	瑶	

D240 - D2FF

	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
40																
50																
60																
70																
80																
90																
A0		摇	尧	遥	窑	谣	姚	咬	舀	药	要	耀	椰	噎	耶	爷
B0	野	冶	也	页	掖	业	叶	曳	腋	夜	液	一	壹	医	揖	铱
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

	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
40																
50																
60																
70																
80																
90																
A0		印	英	樱	婴	鹰	应	缨	莹	萤	营	荧	蝇	迎	赢	盈
B0	影	颖	硬	映	哟	拥	佣	臃	痈	庸	雍	踊	蛹	咏	泳	涌
C0	永	恿	勇	用	幽	优	悠	忧	尤	由	邮	铀	犹	油	游	酉
D0	有	友	右	佑	釉	诱	又	幼	迂	淤	于	盂	榆	虞	愚	舆
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	狱	育	誉	

D440 - D4FF

	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
40																
50																
60																
70																
80																
90																
A0		浴	寓	裕	预	豫	驭	鸳	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	郧	匀	陨	允	运	蕴	酝	晕	韵
D0	孕	匝	砸	杂	栽	哉	灾	宰	载	再	在	咱	攒	暂	赞	赃
E0	脏	葬	遭	糟	凿	藻	枣	早	澡	蚤	躁	噪	造	皂	灶	燥
F0	责	择	则	泽	贼	怎	增	憎	曾	赠	扎	喳	渣	札	轧	

D540 - D5FF

	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
40																
50																
60																
70																
80																
90																
A0		铡	闸	眨	栅	榨	咋	乍	炸	诈	摘	斋	宅	窄	债	寨
B0	瞻	毡	詹	粘	沾	盏	斩	辗	崭	展	蘸	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	蛰	辙	者
E0	锗	蔗	这	浙	珍	斟	真	甄	砧	臻	贞	针	侦	枕	疹	诊
F0	震	振	镇	阵	蒸	挣	睁	征	狰	争	怔	整	拯	正	政	

D640 - D6FF

	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
40																
50																
60																
70																
80																
90																
A0		帧	症	郑	证	芝	枝	支	吱	蜘	知	肢	脂	汁	之	织
B0	职	直	植	殖	执	值	侄	址	指	止	趾	只	旨	纸	志	挚
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	诌
E0	粥	轴	肘	帚	咒	皱	宙	昼	骤	珠	株	蛛	朱	猪	诸	诛
F0	逐	竹	烛	煮	拄	瞩	嘱	主	著	柱	助	蛀	贮	铸	筑	

D740 - D7FF

	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
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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	谆	准	捉	拙	卓
C0	桌	琢	茁	酌	啄	着	灼	浊	兹	咨	资	姿	滋	淄	孜	紫
D0	仔	籽	滓	子	自	渍	字	鬃	棕	踪	宗	综	总	纵	邹	走
E0	奏	揍	租	足	卒	族	祖	诅	阻	组	钻	纂	嘴	醉	最	罪
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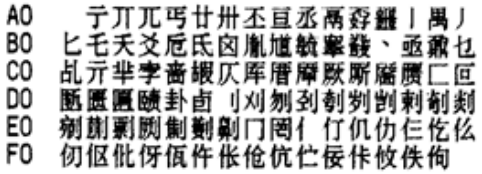
D840 - D8FF



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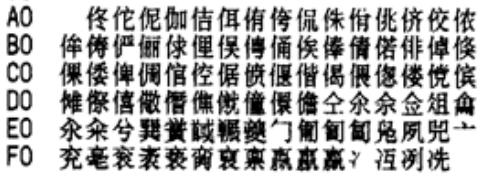
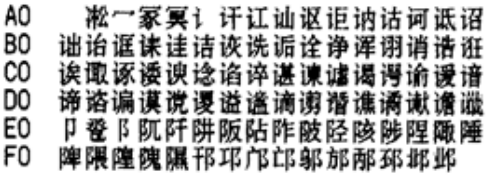


DA40 - DAFF



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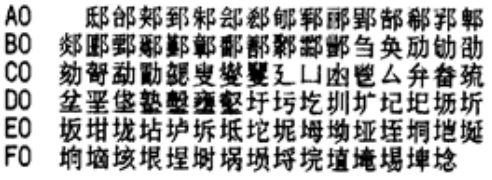
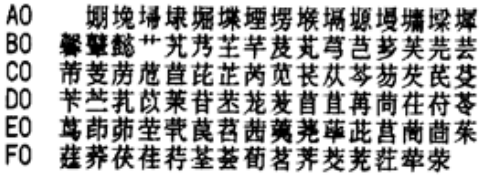


DC40 - DCFF



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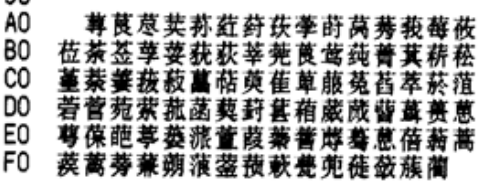
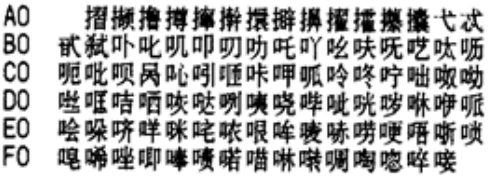


DE40 - DEFF

DF40 - DFFF



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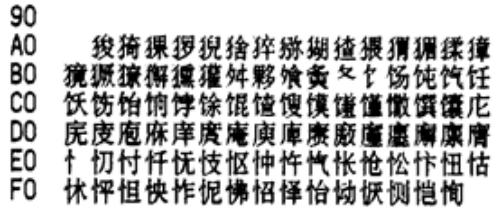
E140 - E1FF

E240 - E2FF



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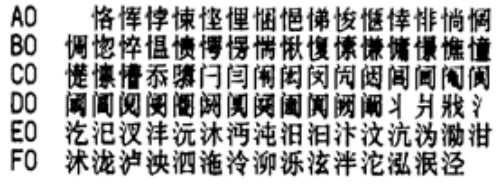

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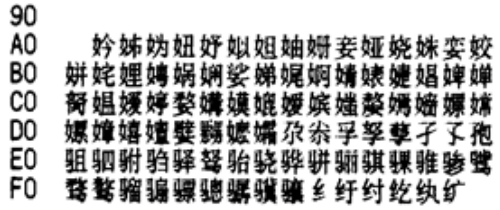
E540 - E5FF

E640 - E6FF



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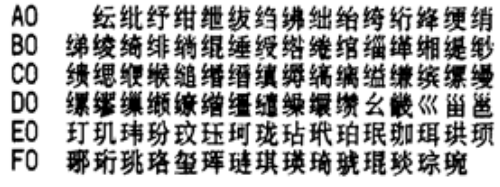

E840 - E8FF

E940 - E9FF

EA40 - EAFF

EB40 - EBFF

EC40 - ECFF

ED40 - EDFF

EE40 - EEFF

EF40 - EFFF

F040 - F0FF

F140 - F1FF

F240 - F2FF

F340 - F3FF

F440 - F4FF

F540 - F5FF

F640 - F6FF

F740 - F7FF

F840 - F8FF

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F940 - F9FF

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FA40 - FAFF

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FC40 - FCFF

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FE40 - FEFF

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FF40 - FFFF

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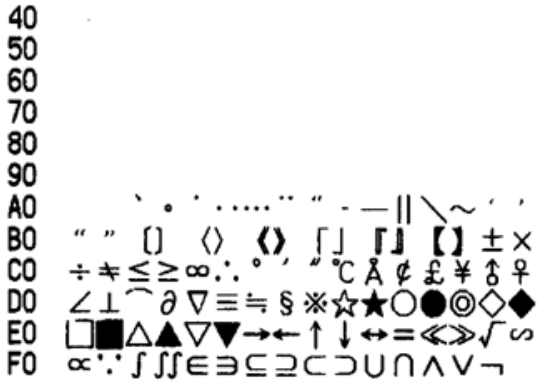
Code Page 949 Korean

A140 - A1FF



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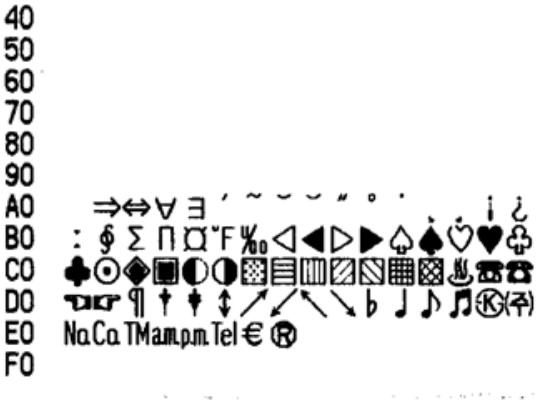

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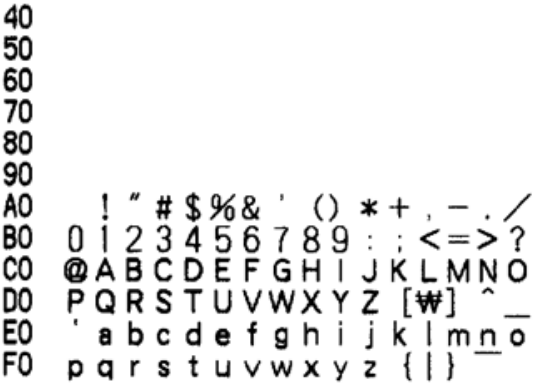

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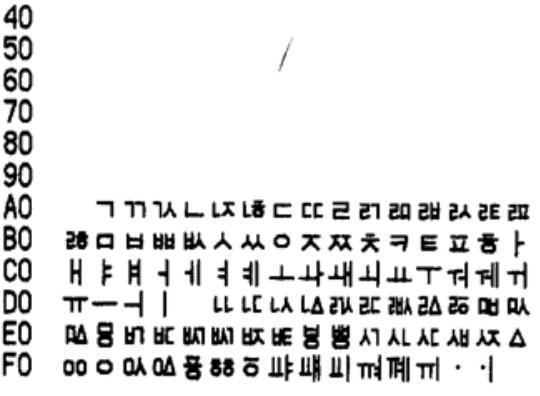

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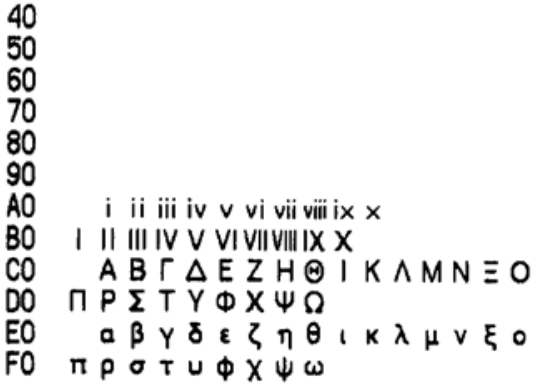

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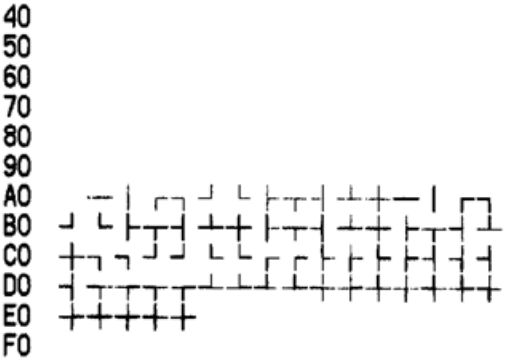

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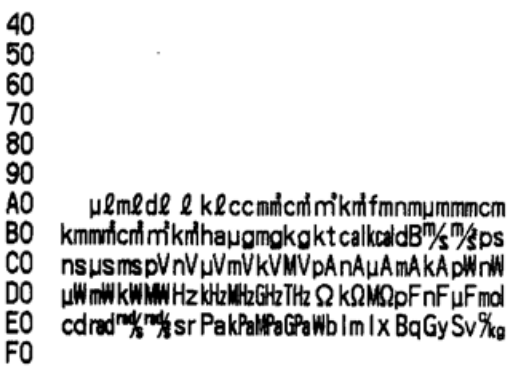

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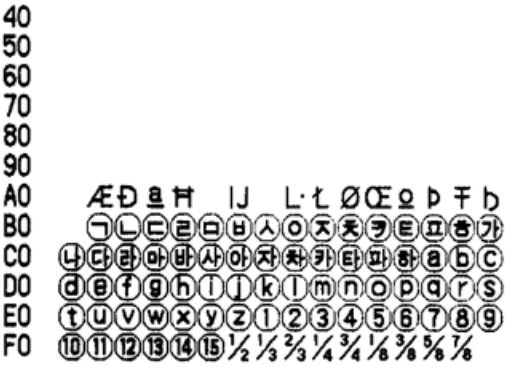
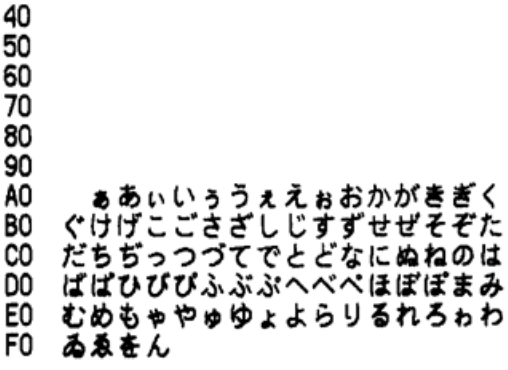
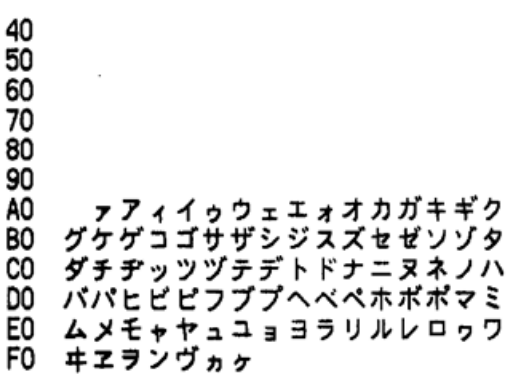


A940 - A9FF

AA40 - AAFF



AB40 - ABFF



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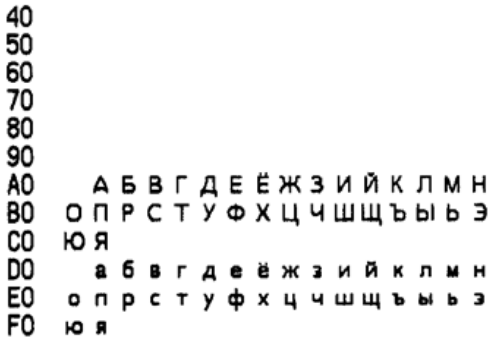

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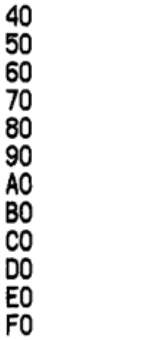

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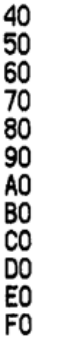

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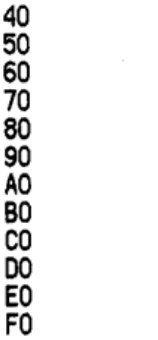
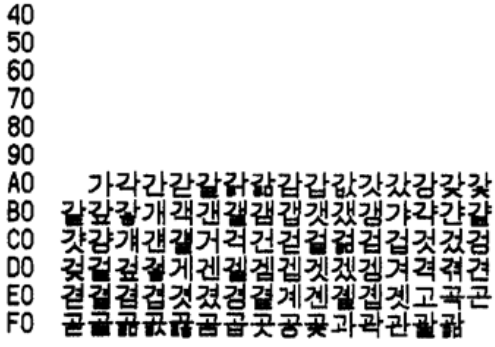


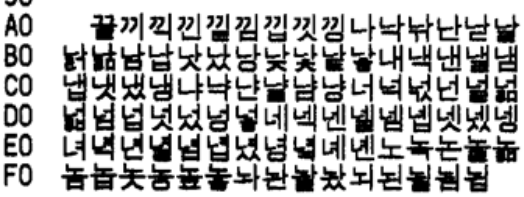
B040 - B0FF



B140 - B1FF

B240 - B2FF

B340 - B3FF



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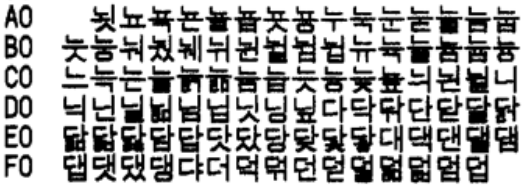

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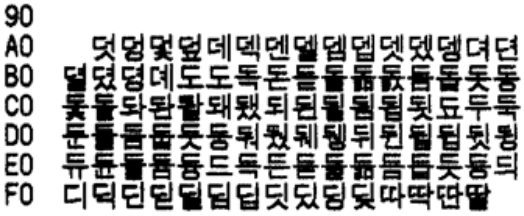

B640 - B6FF

B740 - B7FF

B840 - B8FF

B940 - B9FF

BA40 - BAFF

BB40 - BBFF

BC40 - BCFF

BD40 - BDFF

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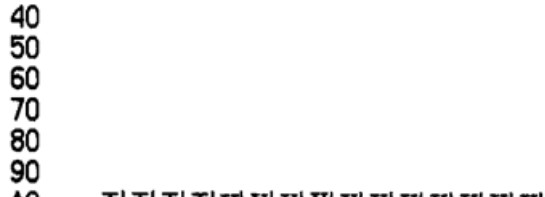
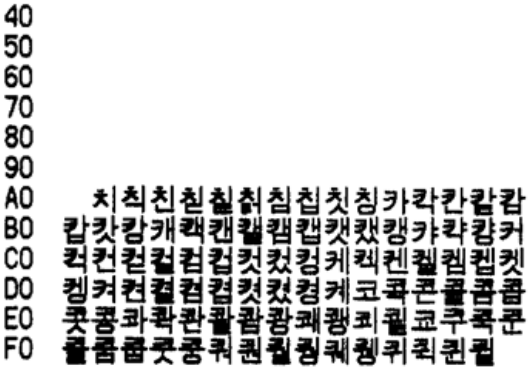
C140 - C1FF

C240 - C2FF



C340 - C3FF

C440 - C4FF



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C740 - C7FF

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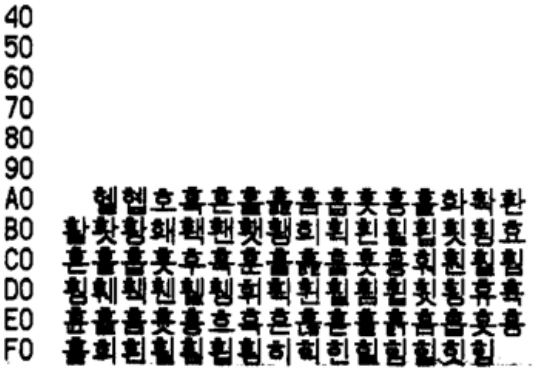

C940 - C9FF

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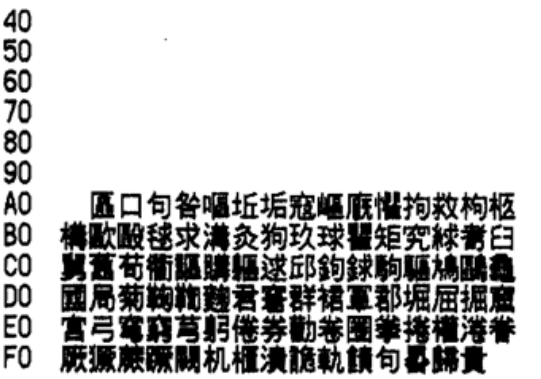
CB40 - CBFF

CC40 - CCFF

CD40 - CDFF

CE40 - CEFF

CF40 - CFFF



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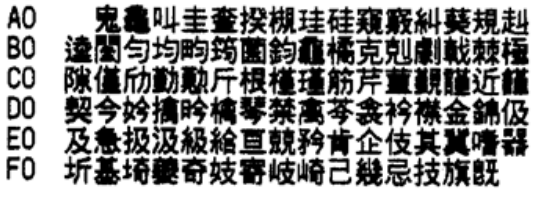


D140 - D1FF

D240 - D2FF

D340 - D3FF

D440 - D4FF

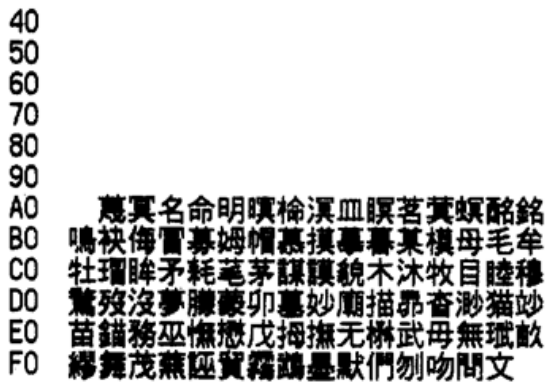
D540 - D5FF

D640 - D6FF

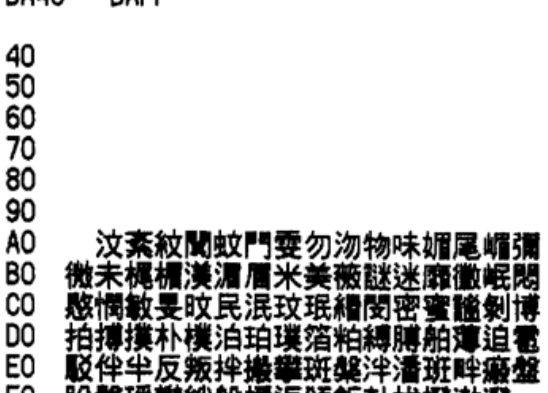
D740 - D7FF

D840 - D8FF

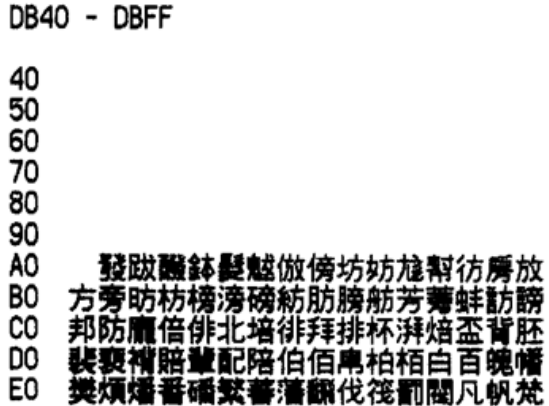
D940 - D9FF

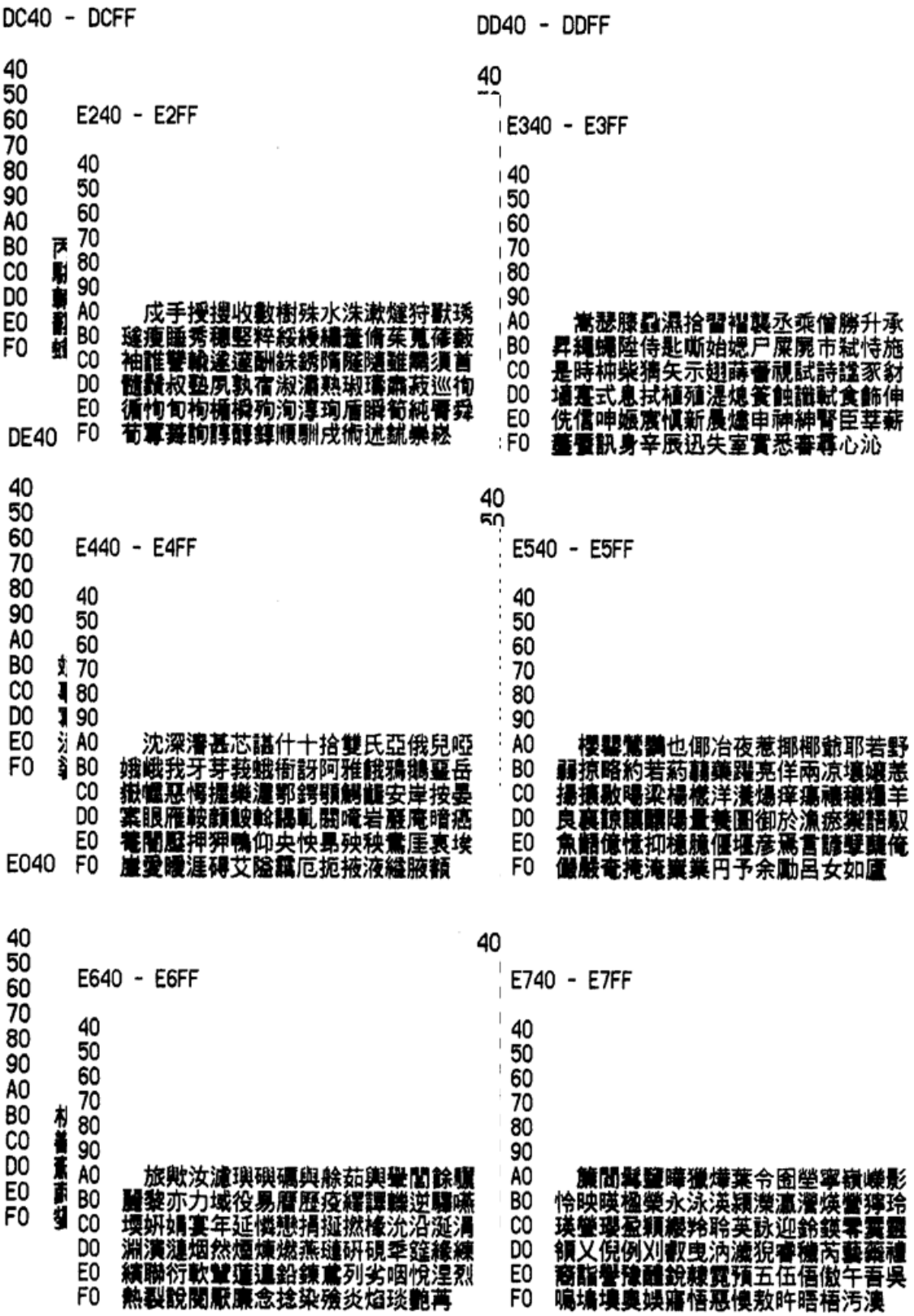


DA40 - DAFF



DB40 - DBFF




DC40 - DCFF
DD40 - DDFF
E240 - E2FF
E340 - E3FF
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E540 - E5FF
E640 - E6FF
E740 - E7FF
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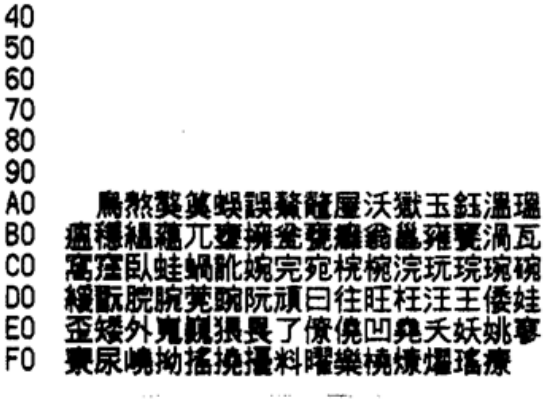
E840 - E8FF

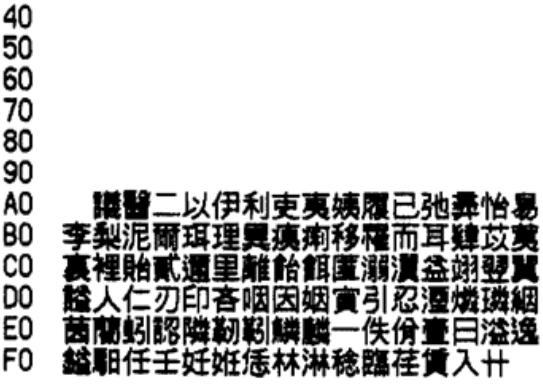


E940 - E9FF

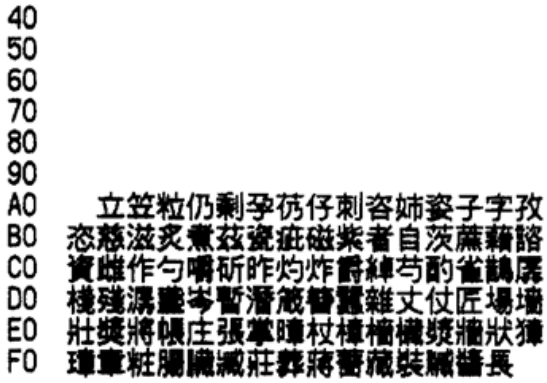
EA40 - EAFF

EB40 - EBFF

EC40 - ECFF



ED40 - EDFF



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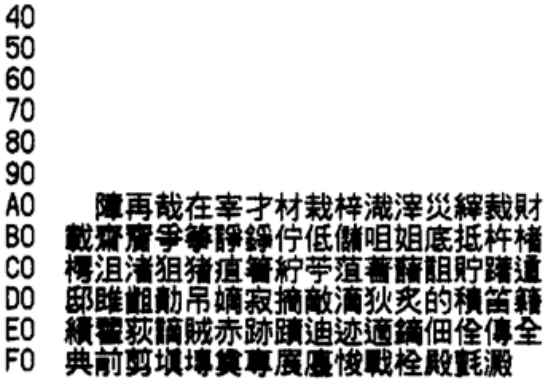
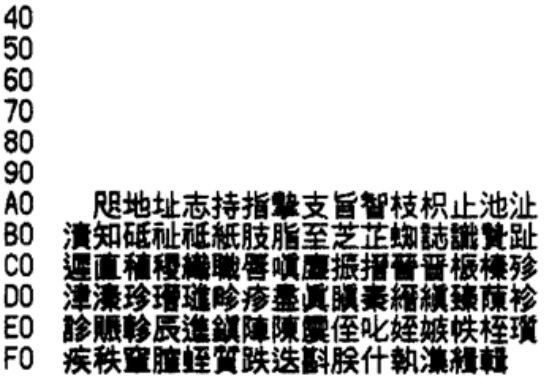


EF40 - EFFF

F040 - F0FF

F140 - F1FF

F240 - F2FF



F340 - F3FF

F440 - F4FF

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A0	覰淒萋悽處倜刺剔尺慽戚拓擲斥滌
B0	瘠脊蹠陟隻仟千喘天川擅泉淺玔穿舛
C0	薦賤踐遷釧闡阡韆凸哲喆徹撤澈綴輟
D0	轍鐵僉尖沾添甛瞻簽籤詹諂堞妾帖捷
E0	牒疊睫諜貼輒廳晴淸聽菁請靑鯖切剃
F0	替涕滯締諦逮遞體初剿哨憔抄招梢

F540 - F5FF

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A0	椒楚樵炒焦硝礁礎秒稍肖艸苕草蕉
B0	貂超酢醋醮促囑燭矗蜀觸寸忖村邨叢
C0	塚寵悤憁摠總聰蔥銃撮催崔最墜抽推
D0	椎楸樞湫皺秋芻萩諏趨追鄒酋醜錐錘
E0	鎚雛騶鰍丑畜祝竺筑築縮蓄蹙蹴軸逐
F0	春椿瑃出朮黜充忠沖蟲衝衷悴膵萃

F640 - F6FF

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90	
A0	贅取吹嘴娶就炊翠聚脆臭趣醉驟鷲
B0	側仄厠惻測層侈値嗤峙幟恥梔治淄熾
C0	痔痴癡稚穉緇緻置致蚩輜雉馳齒則勅
D0	飭親七柒漆侵寢枕沈浸琛砧針鍼蟄秤
E0	稱快他咤唾墮妥惰打拖朶楕舵陀馱駝
F0	倬卓啄坼度托拓擢晫柝濁濯琢琸託

F740 - F7FF

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A0	鐸呑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	汰泰笞胎苔跆邰颱宅擇澤撑攄兎吐土
D0	討慟桶洞痛筒統通堆槌腿褪退頹偸套
E0	妬投透鬪慝特闖坡婆巴把播擺杷波派
F0	爬琶破罷芭跛頗判坂板版瓣販辦鈑

F840 - F8FF

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A0	阪八叭捌佩唄悖敗沛浿牌狽稗覇貝
B0	彭澎烹膨愎便偏扁片篇編翩遍鞭騙貶
C0	坪平枰萍評吠嬖幣廢弊斃肺蔽閉陛佈
D0	包匍匏咆哺圃布怖抛抱捕暴泡浦疱砲
E0	胞脯苞葡蒲袍褒逋鋪飽鮑幅暴曝瀑爆
F0	輻俵剽彪慓杓標漂瓢票表豹飇飄驃

F940 - F9FF

40	
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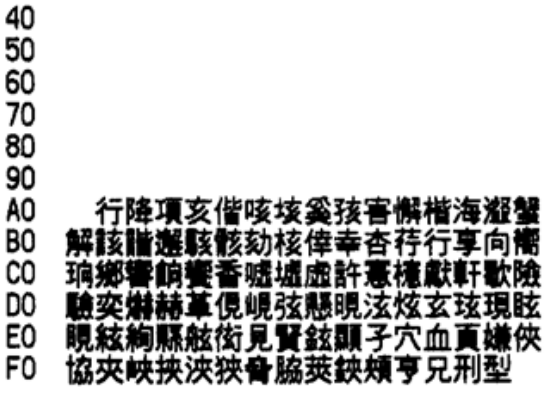
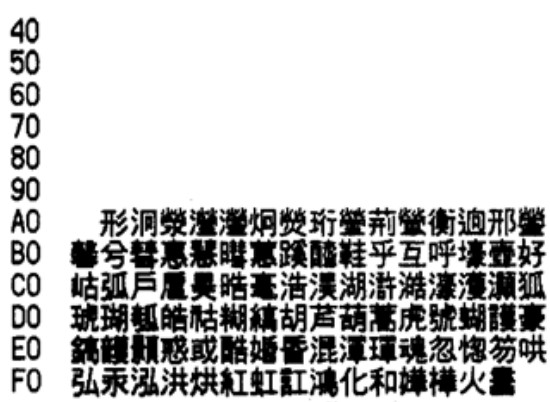
A0	品稟楓諷豊風馮彼披疲皮被避陂匹
B0	弼必泌珌畢疋筆苾馝乏逼下何厦夏廈
C0	昰河瑕荷蝦賀遐霞鰕壑學虐謔鶴寒恨
D0	悍旱汗漢澣瀚罕翰閑閒限韓割轄函含
E0	咸啣喊檻涵緘艦銜陷鹹合哈盒蛤閤闔
F0	陜亢伉姮嫦巷恒抗杭桁沆港缸肛航

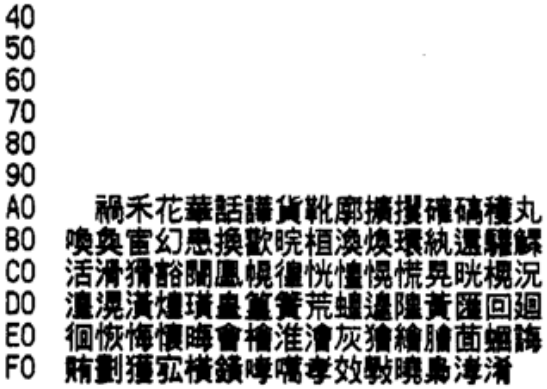
FA40 - FAFF



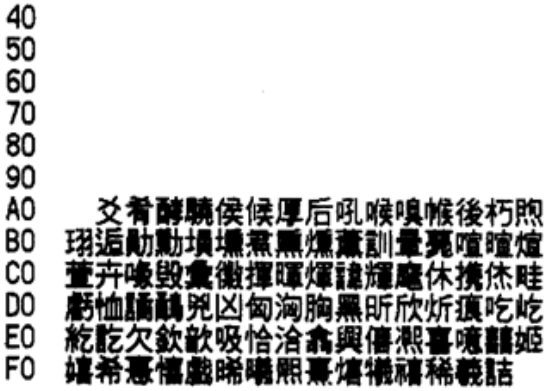
FB40 - FBFF



FC40 - FCFF



FD40 - FDFF

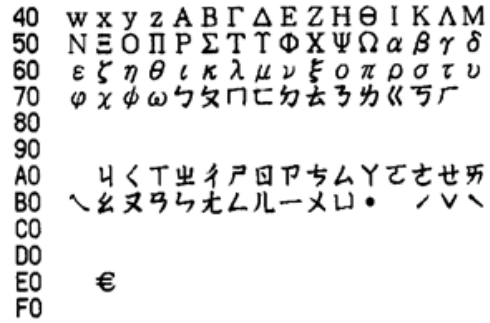


Code Page 950 Traditional Chinese

A140 - A1FF

A240 - A2FF

A340 - A3FF



A440 - A4FF

40	一乙丁七乃九了二人儿入八几刀刁力
50	匕十卜又三下丈上丫丸凡久么也乞于
60	亡兀刃勺千叉口土士夕大女子孑孓寸
70	小尢尸山川工己已巳巾干廾弋弓才
80	
90	
A0	丑丐不中丰丹之尹予云井互五亢仁
B0	什仃仆仇仍今介仄元允內六兮公冗凶
C0	分切刈勻勾勿化匹午升卅卞厄友及反
D0	壬天夫太夭孔少尤尺屯巴幻廿弔引心
E0	戈戶手扎支文斗斤方日曰月木欠止歹
F0	毋比毛氏水火爪父爻片牙牛犬王丙

A540 - A5FF

40	世丕且丘主乍乏乎以付仔仕他仗代令
50	仙仞充兄冉冊冬凹出凸刊加功包匆北
60	匝仟半卉卡占卯卮去可古右召叮叩叨
70	叼司叵叫另只史叱台句叭叻四囚外
80	
90	
A0	央失奴奶孕它尼巨巧左市布平幼弁
B0	弘弗必戊打扔扒扑斥旦旡本未末札正
C0	母民氏永汁汀汎犯玄玉瓜瓦甘生用甩
D0	田由甲申疋白皮皿目矛矢石示禾穴立
E0	丞丟乒乓乩亙交亦亥仿伉伙伊伕伍伐
F0	休伏仲件任仰仳份企伋光兇兆先全

A640 - A6FF

40	共再冰列刑划刎刖劣匈匡匠印危吉吏
50	同吊吐吁吋各向名合吃后吆吒因回囝
60	圳地在圭圬圯圩夙多夷夸妄奸妃好她
70	如妁字存宇守宅安寺尖屹州帆并年
80	
90	
A0	式弛忙忖戎戌戍成扣扛托收早旨旬
B0	旭曲曳有朽朴朱朵次此死氖汝汗汙江
C0	池汐汕污汎汍汎灰牟牝百竹米糸缶羊
D0	羽老考而耒耳聿肉肋肌臣自至臼舌舛
E0	舟艮色艾虫血行衣西阡串亨位住佇佗
F0	佞伴佛何估佐佑伽伺伸佃佔似但佣

A740 - A7FF

40	作你伯低伶余佝佈佚兌克免兵冶冷別
50	判利刪刨劫助努劬匣即卵吝吭吞吾否
60	呎吧呆呃吳呈呂君吩告吹吻吸吮吵吶
70	吠吼呀吱含吟听囪困囤囫坊坑址坍
80	
90	
A0	均坎圾坐坷垃垠壯夾妝妒妨妞妣妙妖
B0	妍妤妓妊妥孝孜孚孛完宋宏尬局屁尿
C0	尾岐岑岔岌巫希序庇床廷弄弟彤形彷
D0	役忘忌志忍忱快忸忪戒我抄抗抖技扶
E0	抉扭把扼找批扳抒扯折扮投抓抑抒改
F0	攻攸旱更束李杏材村杜杖杞杉杆杠

A840 - A8FF

40	杓杖步每求汞沙沁沈沉沅沛汪決沐汰
50	沌汨沖沒汽沃汲汾汴沆汶沍沔沘沂灶
60	灼災灸牢牡牠狄狂玖甬甫男甸皂盯矣
70	私秀禿究系罕肖肓肝肘肛肚育良芒
80	
90	
A0	芋芍見角言谷豆豕貝赤走足身車辛
B0	辰迂迆迅迄巡邑邢邪邦那酉釆里防阮
C0	阱阪阬並乖乳事些亞享京佯依侍佳使
D0	佬供例來侃佰併侈佩佻侖佾侏侑佺兔
E0	兒兕兩具其典冽函刻券刷刺到刮制剁
F0	劾劻卒協卓卑卦卷卸卹取叔受味呵

A940 - A9FF

40	咖呸咕咀呻呷咄咒咆呼咐呱呶和咚呢
50	周咋命咎固垃坷坪坩坡坦坤坼夜奉奇
60	奈奄奔妾妻委妹妮姑姆姐姍始姓姊妯
70	妳姒姅孟孤季宗定官宜宙宛尚屈居
80	
90	
A0	屆岷岡岸岩岫岱岳帘帚帖帕帛帑幸
B0	庚店府底庖延弦弧弩往征彿彼忝忠忽
C0	念忿怏怔怯怵怖怪怕怡性怩怫怛或戕
D0	房戾所承拉拌拄抿拂抹拒招披拓拔拋
E0	拈抨抽押拐拙拇拍抵拚抱拘拖拗拆抬
F0	拎放斧於旺昔易昌昆昂明昀昏昕昊

AA40 - AAFF

40	昇服朋杭枋枕東果杳杷枇枝林杯杰板
50	枉松析杵枚枓杼杪杲欣武歧歿氓氛泣
60	注泳沱泌泥河沽沾沼波沫法泓沸泄油
70	況沮泗泅泱沿治泡泛泊沬泯泜泖泠
80	
90	
A0	炕炎炒炊炙爬爭爸版牧物狀狎狙狗
B0	狐玩玨玟玫玥甽疝疙疚的盂盲直知矽
C0	社祀祁秉秈空穹竺糾罔羌羋者肺肥肢
D0	肱股肫肩肴肪肯臥臾舍芳芝芙芭芽芟
E0	芹花芬芥芯芸芣芰芾芷虎虱初表軋迎
F0	返近邵邸邱邶采金長門阜陀阿阻附

AB40 - ABFF

40	陂隹雨青非亟亭亮信侵侯便俠俑俏保
50	促侶俘俟俊俗侮俐俄係俚俎俞侷兗冒
60	冑冠剎剃削前剌剋則勇勉勃勁匍南卻
70	厚叛咬哀咨哎哉咸咦咳哇哂咽咪品
80	
90	
A0	哄哈咯咫咱咻咩咧咿囿垂型垠垣垢
B0	城垮垓奕契奏奎奐姜姘姿姣姨娃姥姪
C0	姚姦威姻孩宣宦室客宥封屎屏屍屋峙
D0	峒巷帝帥帟幽庠度建弈弭彥很待徊律
E0	徇後徉怒思怠急怎怨恍恰恨恢恆恃恬
F0	恫恪恤扁拜挖按拼拭持拮拽指拱拷

AC40 - ACFF

40	拯括拾拴挑挂政故斫施既春昭映昧是
50	星昨昱昤曷柿染柱柔某柬架枯柵柩柯
60	柄柑枴柚查枸柏柞柳枰柙柢柝柒歪殃
70	殆段毒毗氟泉洋洲洪流津洌洱洞洗
80	
90	
A0	活洽派洶洛泵洹洧洸洩洮洵洎洫炫
B0	為炳炬炯炭炸炮炤爰牲牯牴狩狠狡玷
C0	珊玻玲珍珀玳甚甭畏界畎畋疫疤疥疢
D0	疣癸皆皇皈盈盆盃盅省盹相眉看盾盼
E0	眇矜砂研砌砍祆祉祈祇禹禺科秒秋穿
F0	突竿竽籽紂紅紀紉紇約紆缸美羿耄

AD40 - ADFF

40	耐耍耑耶胖胥胚胃胄背胡胛胎胞胤胝
50	致舢苧范茅苣苛苦茄若茂茉苒苗英茁
60	苜苔苑苞苓苟苯茆虐虹虻虺衍衫要觔
70	計訂訃貞負赴赳趴軍軌述迦迢迪迥
80	
90	
A0	迭迫迤迨郊郎郁郃酋酊重閂限陋陌
B0	降面革韋韭音頁風飛食首香乘亳倌倍
C0	倣俯倦倥俸倩倖倆值借倚倒們俺倀倔
D0	倨俱倡個候倘俳修倭倪俾倫倉兼冤冥
E0	冢凍凌准凋剖剜剔剛剝匪卿原厝叟哨
F0	唐唁唷哼哥哲唆哺唔哩哭員唉哮哪

AE40 - AEFF

40	哦唧唇哽唏圃圄埂埔埋埃堉夏套奘奚
50	娑娘娜娟娛娓姬娠娣娩娥娌娉孫屘宰
60	害家宴宮宵容宸射屑展屐峭峽峻峪峨
70	峰島崁峴差席師庫庭座弱徒徑徐恙
80	
90	
A0	恣恥恐恕恭恩息悄悟悚悍悔悌悅悖
B0	扇拳挈拿捎挾振捕捂捆捏捉挺捐挽挪
C0	挫挨捍捌效敉料旁旅時晉晏晃晒晌晅
D0	晁書朔朕朗校核案框桓根桂桔栩梳栗
E0	桌桑栽柴桐桀格桃株桅栓栘桁殊殉殷
F0	氣氧氨氦氤泰浪涕消涇浦浸海浙涓

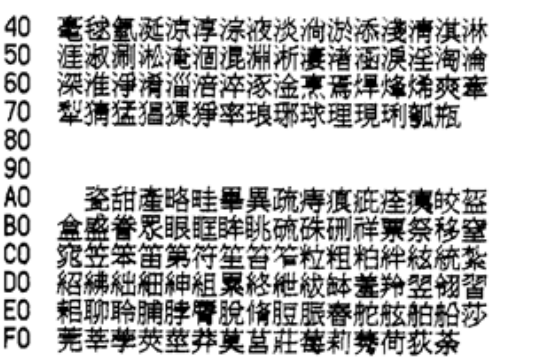
AF40 - AFFF

40	浬涉浮浚浴浩涌涊浹涅浥涔烊烘烤烙
50	烈烏爹特狼狹狽狸狷玆班琉珮珠珪珞
60	畔畝畜畚留疾病症疲疳疽疼疹痂疸皋
70	皰盆盍盎眩真眠眨矩砰砧砸砝破砷
80	
90	
A0	砥砭砠砟砲祕祐祠祟祖神祝祗祚秤
B0	秣秧租秦秩秘窄窈站笆笑粉紡紗紋紊
C0	素索純紐紕級紜納紙紛缺罟羔翅翁耆
D0	耘耕耙耗耽耿胱脂胰脅胭胴脆胸胳脈
E0	能脊胼胯臭臬舀舐航舫舨般芻茫荒荔
F0	荊茸荐草茵茴荏茲茹茶茗荀茱茨茭

B040 - B0FF

B140 - B1FF

B240 - B2FF



B340 - B3FF

B440 - B4FF

B540 - B5FF

B640 - B6FF

B740 - B7FF

B840 - B8FF

40	睹睪睽睜睥睨睢矮碎碰碗碘碌碉硼碑
50	碓硿祺祿禁萬禽稜稚稠稔稟稞窟窠筷
60	節筠筮筧粱粳粵經絹綑綁綏條置罩罪
70	署義羨群聖聘肆肄腱腰腸腥腮腳腫
80	
90	
A0	腹腺腦舅艇蒂葷落萱葵葦葫葉葬葛
B0	萼萵葡董葩葭葆虞虜號蛹蜓蜈蜇蜀蛾
C0	蛻蜂蜃蜆蜊衙裟裔裙補裘裝裡裊裕裒
D0	覜解詫該詳試詩詰誇詼詣誠話誅詭詢
E0	詮詬詹詻訾詨豢貊貉賊資賈賄貲賃賂
F0	賅跡跟跨路跳跺跪跤跦躲較載軾輊

B940 - B9FF

40	辟農運遊道遂達逼違遐遇遏過遍遑逾
50	遁鄒鄗酬酪酩釉鈷鉗鈸鈽鉀鈾鉛鉋鉤
60	鉑鈴鉉鉍鉅鈹鈿鉚閘隘隔隕雍雋雉雊
70	雷電雹零靖靴靶預頑頓頊頒頌飼飴
80	
90	
A0	飽飾馳馱馴髡鳩麂鼎鼓鼠僧僮僥僖
B0	僭僚僕像僑僱僎僩兢凳劃劂匱厭嗾嘀
C0	嘛嘗嗽嘔嘆嘉嘍嘎嗷嘖嘟嘈嘐嗶團圖
D0	塵塾境墓墊塹墅塽壽夥夢夤奪奩嫡嫦
E0	嫩嫗嫖嫘嫣孵寞寧寡寥實寨寢寤察對
F0	屢嶄嶇幛幣幕幗幔廓廖弊彆彰徹慇

BA40 - BAFF

40	愿態慷慢慣慟慚慘慵截撇摘摔撤摸摟
50	摺摑摧搴摭摻敲斡旗旖暢暨暝榜榨榕
60	槁榮槓構榛榷榻榫榴槐槍榭槌榦槃榣
70	歉歌氳漳演滾漓滴漩漾漠漬漏漂漢
80	
90	
A0	滿滯漆漱漸漲漣漕漫漯澈漪滬漁滲
B0	滌滷熔熙煽熊熄熒爾犒犖獄獐瑤瑣瑪
C0	瑰瑭甄疑瘧瘍瘋瘉瘓盡監瞄睽睿睡磁
D0	碟碧碳碩碣禎福禍種稱窪窩竭端管箕
E0	箋筵算箝箔箏箸箇箄粹粽精綻綰綜綽
F0	綾綠緊綴網綱綺綢綿綵綸維緒緇綬

BB40 - BBFF

40	罰翠翡翟聞聚肇腐膀膏膈膊腿膂臧臺
50	與舔舞艋蓉蒿蓆蓄蒙蒞蒲蒜蓋蒸蓀蓓
60	蒐蒼蓑蓊蜿蜜蜻蜢蜥蜴蜘蝕蜷蜩裳褂
70	裴裹裸製裨褚裯誦誌語誣認誡誓誤
80	
90	
A0	說誥誨誘誑誚誧豪貍貌賓賑賒赫趙
B0	趕跼輔輒輕輓辣遠遘遜遣遙遞遢遝遛
C0	鄙鄘鄞酵酸酷酴鉸銀銅銘銖鉻銓銜銨
D0	鉼銑閡閨閩閣閥閤隙障際雌雒需靼鞅
E0	韶頗領颯颱餃餅餌餉駁骯骰髦魁魂鳴
F0	鳶鳳麼鼻齊億儀僻僵價儂儈儉儅凜

BC40 - BCFF

40	劇劈劉劍劊勰厲嘮嘻嘹嘲嘿嘴嘩噓噎
50	噗噴嘶嘯嘰墀墟增墳墜墮墩墦奭嬉嫻
60	嬋嫵嬌嬈寮寬審寫層履嶝嶔幢幟幡廢
70	廚廟廝廣廠彈影德徵慶慧慮慝慕憂
80	
90	
A0	慼慰慫慾憧憐憫憎憬憚憤憔憮戮摩
B0	摯摹撞撲撈撐撰撥撓撕撩撒撮播撫撚
C0	撬撙撢撳敵敷數暮暫暴暱樣樟槨樁樞
D0	標槽模樓樊槳樂樅槭樑歐歎殤毅毆漿
E0	潼澄潑潦潔澆潭潛潸潮澎潺潰潤澗潘
F0	滕潯潠潟熟熬熱熨牖犛獎獗瑩璋璃

BD40 - BDFF

40	瑾璀畿瘠瘩瘟瘤瘦瘡瘢皚皺盤瞎瞇瞌
50	瞑瞋磋磅確磊碾磕碼磐稿稼穀稽稷稻
60	窯窮箭箱範箴篆篇篁箠篌糊締練緯緻
70	緘緬緝編緣線緞緩綞緙緲緹罵罷羯
80	
90	
A0	翩耦膛膜膝膠膚膘蔗蔽蔚蓮蔬蔭蔓
B0	蔑蔣蔡蔔蓬蔥蓿蔆螂蝴蝶蝠蝦蝸蝨蝙
C0	蝗蝌蝓衛衝褐複褒褓褕褊誼諒談諄誕
D0	請諸課諉諂調誰論諍誶誹諛豌豎豬賠
E0	賞賦賤賬賭賢賣賜質賡赭趟趣踫踐踝
F0	踢踏踩踟踡踞躺輝輛輟輩輦輪輜輞

BE40 - BEFF

40	輥適遮遨遭遷鄰鄭鄧鄱醇醉醋醃鋅銻
50	銷鋪銬鋤鋁銳銼鋒鋇鋰銲閭閱霄霆震
60	霉靠鞍鞋鞏頡頫頜颳養餓餒餘駝駐駟
70	駛駑駕駒駙骷髮髯鬧魅魄魷魯鴆鴉
80	
90	
A0	鴃麩麾黎墨齒儒儘儔儐儕冀冪凝劑
B0	劓勳噙噫噹噩噤噸噪器噥噱噯噬噢噶
C0	壁墾壇壅奮嬝嬴學寰導彊憲憑憩憊懍
D0	憶憾懊懈戰擅擁擋撻撼據擄擇擂操撿
E0	擒擔撾整曆曉暹曄曇暸樽樸樺橙橫橘
F0	樹橄橢橡橋橇樵機橈歙歷氅濂澱澡

BF40 - BFFF

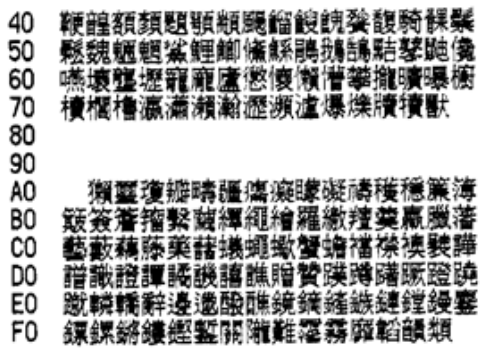
40	濃澤濁澧澳激澹澶澦澠澴熾燉燐燒燈
50	燕熹燎燙燜燃燄獨璜璣璘璟璞瓢甌甍
60	瘴瘸瘺盧盥瞠瞞瞟瞥磨磚磬磧禦積穎
70	穆穌穋窺篙簑築篤篛篡篩篦糕糖縊
80	
90	
A0	縑縈縛縣縞縝縉縐罹羲翰翱翮耨膳
B0	膩膨臻興艘艙蕊蕙蕈蕨蕩蕃蕉蕭蕪蕞
C0	螃螟螞螢融衡褪褲褥褫褡親覦諦諺諫
D0	諱謀諜諧諮諾謁謂諷諭諳諶諼豫豭貓
E0	賴蹄踱踴蹂踹踵輻輯輸輳辨辦遵遴選
F0	遲遼遺鄴醒錠錶鋸錳錯錢鋼錫錄錚

C040 - C0FF

C140 - C1FF

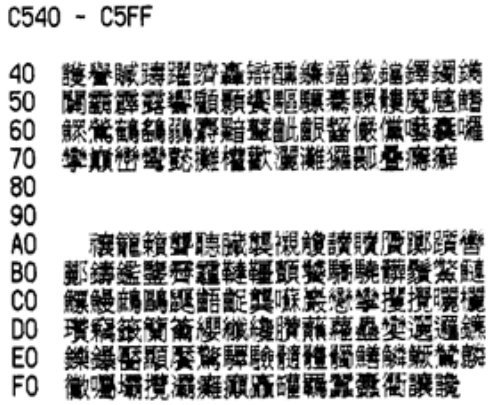
C240 - C2FF

C340 - C3FF

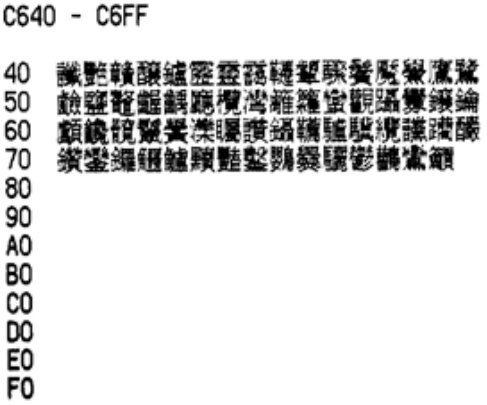


C440 - C4FF

C540 - C5FF



C640 - C6FF



C740 - C7FF

C840 - C8FF

40
50
60
70
80
90
A0
B0
C0
D0
E0
F0

C940 - C9FF

40 乂乜凵匚厂万丌乇亍囗兀屮彳丏冇与
50 丮亓仂仉仈冘勼卬厹圠夃夬尐巿旡殳
60 毌气爿丱丼仨仜仩仡仝仚刌匜卌圢圣
70 夗夯宁宄尒尻屴屳帄庀庂忉戉扐氕
80
90
A0 氶汃氿氻犮犰玊禸肊阞伎优伬仵伔
B0 仱伀价伈伝伂伅伢伓伄仴伒冱刓刉刐
C0 劦匢匟卍厊吇囡囟圮圪圴夼妀奼妅奻
D0 奾奷奿孖尕尥屼屺屻屾巟幵庄异弚彴
E0 忕忔忏扜扞扤扡扦扢扙扠扚扥旯旮朾
F0 朹朸朻机朿朼朳氘汆汒汜汏汊汔汋

CA40 - CAFF

40 汌灱牞犴犵玎甪癿穵网艸艼芀艽艿虍
50 襾邙邗邘邛邔阢阤阠阣佖伻佢佉体佤
60 伾佧佒佟佁佘伭伳伿佡冏冹刜刞刡劭
70 劮匉卣卲厎厏吰吷吪呔呅吙吜吥吘
80
90
A0 吽呏呁吨吤呇囮囧囥坁坅坌坉坋坒
B0 夆奀妦妘妠妗妎妢妐妏妧妡宎宒尨尪
C0 岍岏岈岋岉岒岊岆岓岕巠帊帎庋庉庌
D0 庈庍弅弝彸彶忒忑忐忭忨忮忳忡忤忣
E0 忺忯忷忻怀忴戺抃抌抎抏抔抇扱扻扺
F0 扰抁抈扷扽扲扴攷旰旴旳旲旵杅杇

CB40 - CBFF

40 杙杕杌杈杝杍杚杋毐氙氚汸汧汫沄沋
50 沏汱汯汩沚汭沇沕沜汦汳汥汻沎灴灺
60 牣犿犽狃狆狁犺狅玕玗玓玔玒町甹疔
70 疕皁礽耴肕肙肐肒肜芐芏芅芎芑芓
80
90
A0 芊芃芄豸迉辿邟邡邥邞邧邠阰阨阯
B0 阭丳侘佼侅佽侀侇佶佴侉侄佷佌侗佪
C0 侚佹侁佸侐侜侔侞侒侂侕佫佮冞冼冾
D0 刵刲刳剆刱劼匊匋匼厒厔咇呿咁咑咂
E0 咈呫呺呾呥呬呴呦咍呯呡呠咘呣呧呤
F0 囷囹坯坲坭坫坱坰坶垀坵坻坳坴坢

CC40 - CCFF

40 坨坽夌奅妵妺姏姎妲姌姁妶妼姃姖妱
50 妽姀姈妴姇孢孥宓宕屄屇岮岤岠岵岯
60 岨岬岟岣岭岢岪岧岝岥岶岰岦帗帔帙
70 弨弢弣弤彔徂彾彽忞忥怭怦怙怲怋
80
90
A0 怴怊怗怳怚怞怬怢怍怐怮怓怑怌怉
B0 怜戔戽抭抴拑抾抪抶拊抮抳抯抻抩抰
C0 抸攽斨斻昉旼昄昒昈旻昃昋昍昅旽昑
D0 昐曶朊枅杬枎枒杶杻枘枆构杴枍枌杺
E0 枟枑枙枃杽极杸杹枔欥殀歾毞氝沓泬
F0 泫泮泙沶泔沭泧沷泐泂沺泃泆泭泲

CD40 - CDFF

40 泒泝沴沊沝沀泞泀洰泍泇沰泹泏泩泑
50 炔炘炅炓炆炄炑炖炂炚炃牪狖狋狘狉
60 狜狒狔狚狌狑玤玡玭玦玢玠玬玝瓝瓨
70 甿畀甾疌疘皯盳盱盰盵矸矼矹矻矺
80
90
A0 矷祂礿秅穸穻竻籵糽耵肏肮肣肸肵
B0 肭舠芠苀芫芚芘芛芵芧芮芼芞芺芴芨
C0 芡芩苂芤苃芶芢虰虯虭虮豖迒迋迓迍
D0 迖迕迗邲邴邯邳邰阹阽阼阺陃俍俅俓
E0 侲俉俋俁俔俜俙侻侳俛俇俖侺俀侹俬
F0 剄剉勀勂匽卼厗厖厙厘咺咡咭咥哏

CE40 - CEFF

40 哃茍咷咮哖咶哅哆咠呰咼咢咾呲哞咰
50 垵垞垟垤垌垗垝垛垔垘垏垙垥垚垕壴
60 复奓姡姞姮娀姱姝姺姽姼姶姤姲姷姛
70 姩姳姵姠姾姴姭宨屌峐峘峌峗峋峛
80
90
A0 峞峚峉峇峊峖峓峔峏峈峆峎峟峸巹
B0 帡帢帣帠帤庰庤庢庛庣庥弇弮彖徆怷
C0 怹恔恲恞恅恓恇恉恛恌恀恂恟怤恄恘
D0 恦恮扂扃拏挍挋拵挎挃拫拹挏挌拸拶
E0 挀挓挔拺挕拻拰敁敃斪斿昶昡昲昵昜
F0 昦昢昳昫昺昝昴昹昮朏朐柁柲柈枺

CF40 - CFFF

40 柜枻柸柘柀枷柅柫柤柟枵柍枳柷柶柮
50 柣柂枹柎柧柰枲柼柆柭柌枮柦柛柺柉
60 柊柃柪柋欨殂殄殶毖毘毠氠氡洨洴洭
70 洟洼洿洒洊泚洳洄洙洺洚洑洀洝浂
80
90
A0 洁洘洷洃洏浀洇洠洬洈洢洉洐炷炟
B0 炾炱炰炡炴炵炩牁牉牊牬牰牳牮狊狤
C0 狨狫狟狪狦狣玅珌珂珈珅玹玶玵玴珫
D0 玿珇珃珆玸珋瓬旊瓮甮畇畈疧疪癹盄
E0 眈眃眄眅眊盷盻盺矧矨砆砑砒砅砐砏
F0 砎砉砃砓祊祌祋祅祄秕种秏秖秎窀

D040 - D0FF

40	穾竑笀笁籽籸籹籿粀粁紃紈紁罘羑羍
50	羾耇耎耏耔耷胘胇胠胑胈胂胐胅胣胙
60	胜胊胕胉胏胗胦胍臿舡芔苙苾苹茇苨
70	茀苕茺苫苖苴苬苡苲苵茌苻苶苰苪
80	
90	
A0	苤茠苺苳苭虷虴虼虳衁衎衧衪衩觓
B0	訄訇赲迣迡迮迠郱邽邿郕郅邾郇郋郈
C0	釔釓陔陏陑陓陊陎倞倅倇倓倢倰倛俵
D0	俴倳倷倬俶俷倗倜倠倧倵倯倱倎党冔
E0	冓凊凄凅凈凎剡剚剒剞剟剕剢勍匎厞
F0	唦哢唗唒哧哳哤唚哿唄唈哫唑唅哱

D140 - D1FF

40	唊唻唷唸唠唎唃唋圁圂埌堲埕埒垺埆
50	垽垼垸垶垿埇埐垹埁夎奊娙娖娭娮娕
60	娏娗娊娞娳孬宧宭宬尃屖屔峬峿峮峱
70	峷崀峹帩帨庨庮庪庬弳弰彧恝恚恧
80	
90	
A0	恁悢悈悀悒悁悝悃悕悛悗悇悜悎戙
B0	扆拲挐捖挬捄捅挶捃揤挹捋捊挼挩捁
C0	挴捘捔捙挭捇挳捚捑挸捗捀捈敊敆旆
D0	旃旄旂晊晟晇晑朒朓栟栚桉栲栳栻桋
E0	桏栖栱栜栵栫栭栯桎桄栴栝栒栔栦栨
F0	栮桍栺栥栠欬欯欭欱欴歭肂殈毦毤

D240 - D2FF

40	毨毣毢毧氥浺浣浤浶洍浡涒浘浢浭浯
50	涑涍淯浿涆浞浧浠涗浰浼浟涂涘洯浨
60	涋浾涀涄洖涃浻浽浵涐烜烓烑烝烋缹
70	烢烗烒烞烠烔烍烅烆烇烚烎烡牂牸
80	
90	
A0	牷牶猀狺狴狾狶狳狻猁珓珙珥珖珼
B0	珧珣珩珜珒珛珔珝珚珗珘珨瓞瓟瓴瓵
C0	甡畛畟疰痁疻痄痀疿疶疺皊盉眝眛眐
D0	眓眒眣眑眕眙眚眢眧砣砬砢砵砯砨砮
E0	砫砡砩砳砪砱祔祛祏祜祓祒祑秫秬秠
F0	秮秭秪秜秞秝窆窉窅窋窌窊窇竘笐

D340 - D3FF

40	笄笓笅笏笈笊笎笉笒粄粑粊粌粈粍粅
50	紞紝紑紎紘紖紓紟紒紏紌罜罡罞罠罝
60	罛羖羒翃翂翀耖耾耹胺胲胹胵脁胻脀
70	舁舯舥茳茭荄茙荑茥荖茿荁茦茜茢
80	
90	
A0	荂荎茛茪茈茼荍茖茤茠茷茯茩荇荅
B0	荌荓茞茬荋茧荈虓虒蚢蚨蚖蚍蚑蚞蚇
C0	蚗蚆蚋蚚蚅蚥蚙蚡蚧蚕蚘蚎蚝蚐蚔衃
D0	衄衭衵衶衲袀衱衿衯袃衾衴衼訒豇豗
E0	豻貤貣赶赸趵趷趶軑軓迾迵适迿迻逄
F0	迼迶郖郠郙郚郣郟郥郘郛郗郜郤酐

D440 - D4FF

40	酎酏釕釢釚陜陟隼飣髟鬯乿偰偪偡偞
50	偠偓偋偝偲偈偍偁偛偊偢倕偅偟偩偫
60	偣偤偆偀偮偳偗偑凐剫剭剬剮勖勓匭
70	厜啵啶唼啍啐唴唪啑啢唶唵唰啒啅
80	
90	
A0	唌唲啥啎唹啈唭唻啀啋圊圇埻堔埢
B0	埶埜埴堀埭埽堈埸堋埳埏堇埮埣埲埥
C0	埬埡堎埼堐埧堁堌埱埩埰堍堄奜婠婘
D0	婕婧婞娸娿婭婐婟婥婬婁婤婗婇婝婒
E0	婄婛婥婨婗婮婯婠婇婓婃婹婂婦婜媌
F0	孲孮寁寀屙崞崋崝崚崠崌崨崍崦崥崏

D540 - D5FF

40	崰崒崣崟崮帾帴庱庴庹庲庳弶弸徛徖
50	徟悊悐悆悾悰悺惓惔惏惤惙惝惈悱惛
60	悷惊悿惃惍惀挲捥掊掂捽掽掞掭掝掗
70	掫掎捯掇掐据掯捵掜捭掮捼掤挻掟
80	
90	
A0	捸掅掁掑掍捰敓旍晥晡晛晙晜晢朘桹
B0	梇梐梜桭桮梮梫楖桯梣梬梩桵桴梲梏
C0	桷梒桼桫桲梪梀桱桾梛梖梋梠梉梤桸
D0	梢桻梑梌梊桽欶欳欷欸殑殏殍殎殌氪
E0	淀涫淴涳涴淊淩淢涷淶淔淕淈淠淟淖
F0	涾淥淍淝淛淴淊涽淭淰涺淕淂淏淉

D640 - D6FF

40	淐淲淓淽淗淍淣涻烺焍烷焗烴焌烰焄
50	烳焐烼烿焆焓焀烸烶焋焂焎牾牻牼牿
60	猝猗猇猑猘猊猈狿猏猞玈珶珸珵琄琁
70	珽琇琀珺珼珿琌琋珴琈畤畣痎痒痏
80	
90	
A0	痋痌痑痐皏皉盓眹眯眭眱眲眴眳眽眥
B0	眻眵硈硒硉硍硊硌砦硅硐祤祧祩祪祣
C0	祫祡离秺秸秶秷窏窔窐笵筇笴笥笰笢
D0	笤笳笘笪笝笱笫笭笯笲笸笚笣粔粘粖
E0	粣紵紽紸紶紺絅紬紩絁絇紾紿絊紻紨
F0	罣羕翜翑翗翍翎翏翖聐聑聏聒翬翢

D740 - D7FF

40	耞耛聇聃聈脘脥脙脛脭脟脬脞脡脕脧
50	脝脢舑舸舳舺舴舲艴莐莣莨莍荺荳莤
60	荴莏莁莕莙荵莔莩荽莃莌莝莛莪莋荾
70	莥莯莈莗莰荿莦莇莮荶莚虙虖蚿蚷
80	
90	
A0	蛂蛁蛅蚺蚰蛈蚹蚳蚸蛌蚴蚻蚼蛃蚽
B0	蚾衒袉袕袨袢袪袚袑袡袟袘袧袙袛袗
C0	袤袬袌袓袎覂觖觙觕訰訧訬訞谹谻豜
D0	豝豽貥赽赻赹趼跂趹趿跁軘軞軝軜軗
E0	軠軡逤逋逑逜逌逡郯郪郰郴郲郳郔郫
F0	郬郩酖酘酚酓酕釬釴釱釳釸釤釹釪

D840 - D8FF

D940 - D9FF

DA40 - DAFF

DB40 - DBFF

DC40 - DCFF

DD40 - DDFF

DE40 - DEFF

DF40 - DFFF

E040 - E0FF

E140 - E1FF

E240 - E2FF

E340 - E3FF

E440 - E4FF

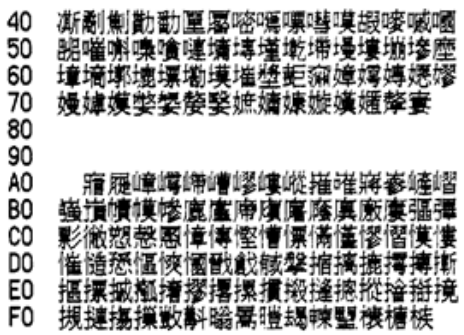
E540 - E5FF

E640 - E6FF

E740 - E7FF

E040 - E0FF

E140 - E1FF



E240 - E2FF

E340 - E3FF

E440 - E4FF

E540 - E5FF

E640 - E6FF

E740 - E7FF

E840 - E8FF

E940 - E9FF

EA40 - EAFF

EB40 - EBFF

EC40 - ECFF

ED40 - EDFF

EE40 - EEFF

EF40 - EFFF

F040 - F0FF

F140 - F1FF

F240 - F2FF

F340 - F3FF

F440 - F4FF

F540 - F5FF

F640 - F6FF

F740 - F7FF