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***EXCELLA***  
**MICR CHECK READER  
AND DUAL-SIDED SCANNER  
INSTALLATION AND OPERATION MANUAL**

**Manual Part Number: 99875310 Rev 4**

**FEBRUARY 2005**

**MAGTEK®**

**REGISTERED TO ISO 9001:2000**

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### REVISIONS

Rev Number	Date	Notes
1	12 Aug 04	Initial Release
2	22 Sep 04	Section 1, Specifications: changed hopper capacity to 70. Section 3, Operation, Multiple checks: Changed capacity to 70 Checks.
3	9 Nov 04	Throughout: removed access cover on six illustrations; Added loading zone mark, modified text, in Figs 1-1, 2-1, 2-2, 2-3, 2-6, 2-7, 2-8, 3-1, 3-3, 3-4, 3-6 and changed position of hand in Fig 3-3, and added callouts. Added Appendix C: License and Copyright.
4	17 Feb 05	Updated Figures 1-1, 2-1, 2-2, 2-3, 2-6, 2-7, 2-8, 3-1, 3-3, 3-4, 3-5, 3-6 and accompanying text to reflect new parts.

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Le présent appareil numérique n'émet pas de bruits radioélectriques dépassant les limites applicables aux appareils numériques de la classe A prescrites dans le Règlement sur le brouillage radioélectrique édicté par le ministère des Communications du Canada.

### **UL/CSA**

This product is listed per Underwriter Laboratories and Canadian Underwriter Laboratories 1950.



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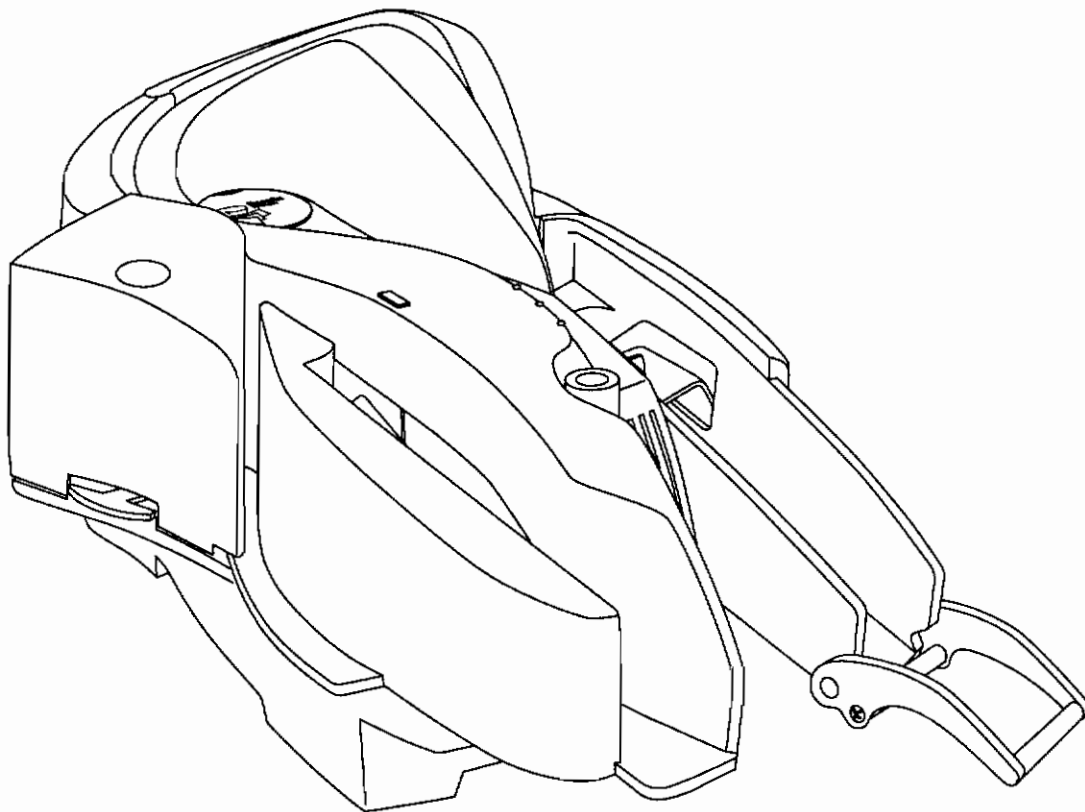
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**Figure 1-1. Excella Check Reader and Dual-Sided Scanner**

## SECTION 1. OVERVIEW

The Excella™ Check Reader is a MICR check reader (Magnetic Ink Character Recognition) and dual-sided scanner with endorsement printer. Checks can be entered into the Excella with an automatic feeder or by a separate manual feed for single checks. The Excella reads the MICR character set (E13B or CMC7 fonts) on the front face and bottom of a check and scans both sides of the check in a single pass, producing high-quality, grayscale or black/white images in the most common file formats used in the industry. The characters and the image are then transmitted to a Host device.

Excella will communicate with the Host system using a standard USB 2.0 interface (contact the factory for other interfaces).

### CONFIGURATIONS

The current configurations is as follows:

Part Number	Description
22310102	MICR Excella, USB/Ethernet

### FEATURES

The following is a list of features of the Excella Reader:

- Reads E13B and CMC7 MICR fonts
- Captures front and back image of check in a single pass
- Endorsement printer prints horizontal message on back of the check
- Endorsement message is programmable
- Message height: 1/8" consisting of 12 pixels
- Resolution: 200 dpi (scaling to 100 dpi); black/white and grayscale images
- Image compression: CCITT G4 or JPEG
- Image files: TIFF 6.0 (other formats can be made available)
- Optional image storage memory available with multi-media memory cards installed at the factory

## **Excella MICR Check Reader**

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- Manual feed - single check
- Automatic feeder with capacity for up to 70 documents
- Output hopper/stacker with capacity for up to 70 documents
- USB 2.0 and Ethernet 100Base-T
- USB 1.1 compatible
- Auxiliary interface port: RS232 serial
- Smart cable management

### **ACCESSORIES**

Accessories available for the Excella Reader include:

- Host Interface Cable (See Table 1-1)
- Power Supply, 24 VDC Regulated, Switcher 5.5 x 2.1 mm, Right Angle Plug
- Sample Checks, Part Number 96530005
- Cleaning Swabs, P/N 97200078
- Print Cartridge, P/N 93600132

## CABLES

The cables and power supply available are as follows:

**Table 1-1. Excella Cables and Power Supply**

Part Number	Description
22310301	Cable Assy, USB A – USB B Right Angle, 8'
22310302	Cable Assy, Ethernet RJ45P A/A, 8'
22310303	Cable Assy, RS232 PC DB9F–RJ6P Right Angle, 8'
22310304	Cable Assy, Ethernet (Crossover) RJ45P/RJ45P Right Angle 8'
71100001	Cable, Power Cord-AC, US 18/3 Blade Non-Polarized, IEC C7
64300098	Power Supply, 24 VDC Regulated, Switcher, 5.5 x 2.1 mm, Right Angle Plug

## SPECIFICATIONS

Table 1-2 lists the specifications for the Excella Reader.

**Table 1-2. Specifications**

OPERATING	
Reference Standards	ANSI X9.27
Power Input	24 VDC, 2.5 Amps
Document Size	4"x 8.5" Maximum
Printer/Cartridge	
Image Resolution:	200 dpi (scaling to 100 dpi); Black/white and grayscale images
Image compression:	CCITT G4 or JPEG
Check Feed and Hoppers:	Manual feed of a single check Automatic feeder with capacity for up to 70 documents Output hopper/stacker with capacity for up to 70 documents
MICR fonts supported	E13-B CMC-7
Interface Options	RS-232, USB 2.0, USB 1.1 compatible Ethernet 100 Base-T,
MECHANICAL	
Dimensions	L 13 ¼ inches x W 7 ½ inches; H 7 inches
Weight	3.59 lbs.

**Excella MICR Check Reader**

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## SECTION 2. INSTALLATION

The installation for the Excella Check Reader is described below.

### REQUIREMENTS

The following items are required for the Installation:

- Excella, Check Reader and Dual-Sided Scanner, P/N 22310001
- USB Interface Cable (see Cabling below) and/or
- Ethernet Cables (see Cabling below)
- Power Supply, 24 VDC Regulated, Switcher, 5.5 x 2.1 mm, Right Angle Plug, P/N 64300098 (see Cabling below)
- Sample Checks, P/N 96530005

### COMPONENTS

Figure 2-1 shows the top view of Excella and lists some of the components used for installation and operation.

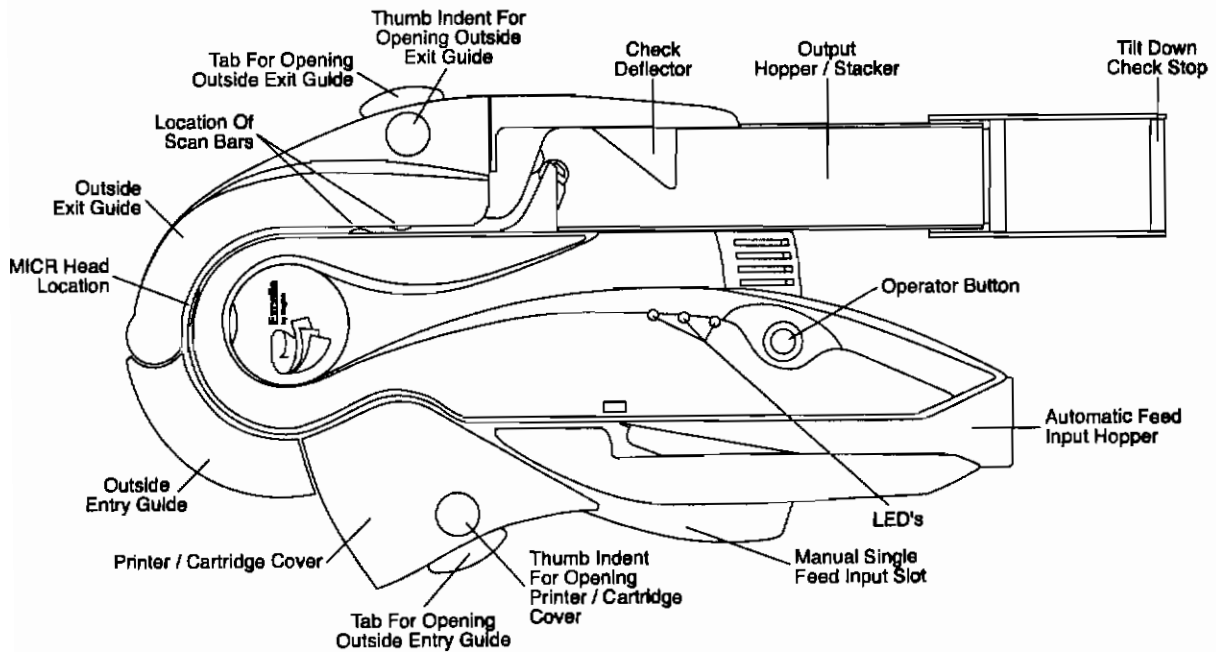


Figure 2-1. Top View, Excella Components

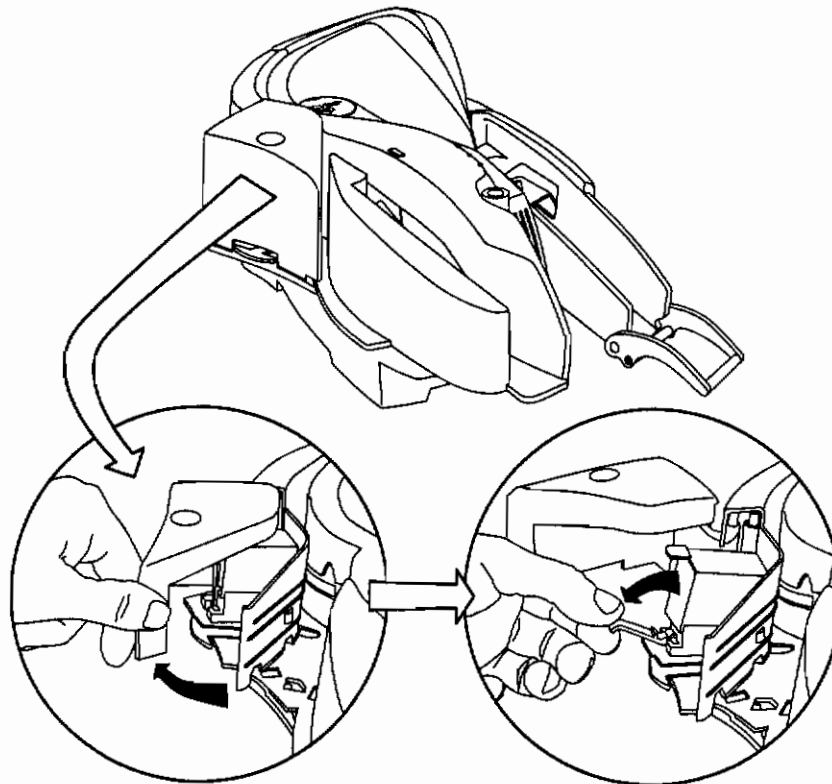
## UNPACKING

Check the list under “Requirements” above and the packing sheet to insure all items have been received.

The Printer/Cartridge is shipped separately and must be unpacked. Remove all packing material (such as tape and tabs), and prepare to install the Printer/Cartridge first.

## INSTALLING OR REPLACING THE PRINTER/CARTRIDGE

To install or replace the **Printer/Cartridge**, refer to Figure 2-2.



**Figure 2-2. Installing or Replacing the Printer/Cartridge**

1. Pull the **Printer/Cartridge** cover open to expose the **Printer/Cartridge** as shown in the left bubble.
2. Push the **Printer/Cartridge Tab** down as indicated in the right bubble.
5. Remove the cartridge by pulling the handle on the **Printer/Cartridge** up.

6. Replace the **Printer/Cartridge** by inserting it into position shown in the illustration.
7. Close the **Tab** holding the **Printer/Cartridge** in position.
8. Close the **Printer/Cartridge** cover.

## OPENING THE UNIT

The **Outside Entry Guide**, the **Outside Exit Guide** and the **Printer/Cartridge Cover**, shown in Figure 2-1, can be opened to provide access to the check path and both scan bars. Open the unit as described below:

1. Open the **Outside Entry Guide** by placing the thumb on the **Indent** and the finger(s) on the **Tab** as shown in Figure 2-3 and squeezing, and then gently pull the Guide open.

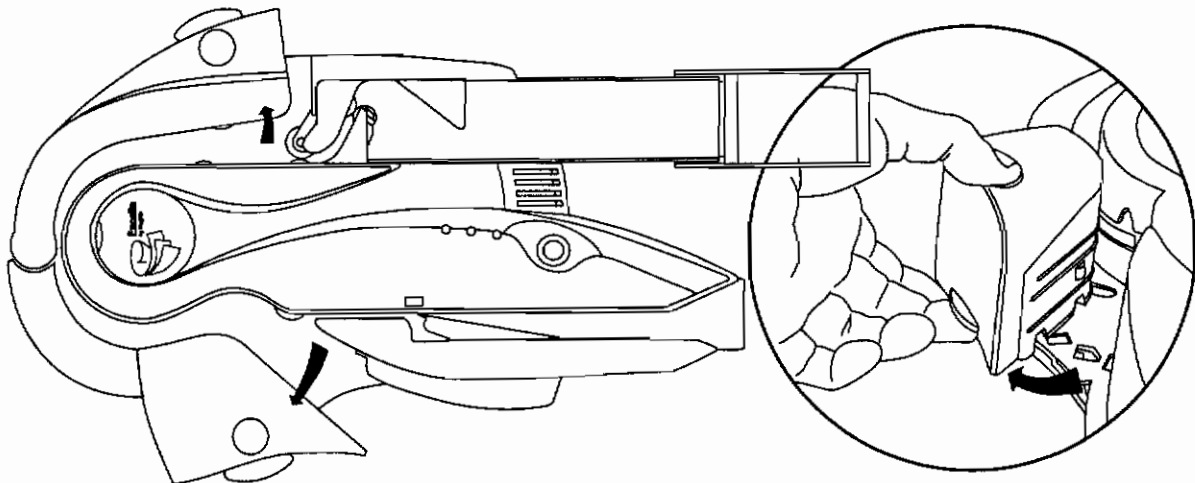
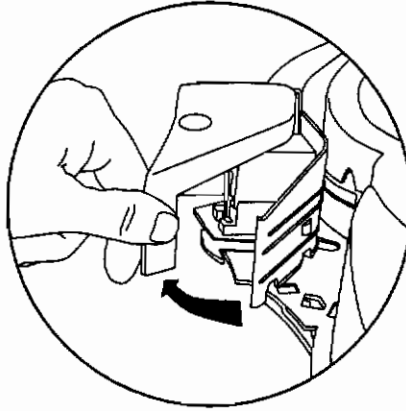


Figure 2-3. Opening the Entry and Exit Guides

2. Open the **Outside Exit Guide**, in the same manner, by placing the thumb on the **Indent** and the finger(s) on the **Tab**, and squeezing and then gently pull the Guide open.



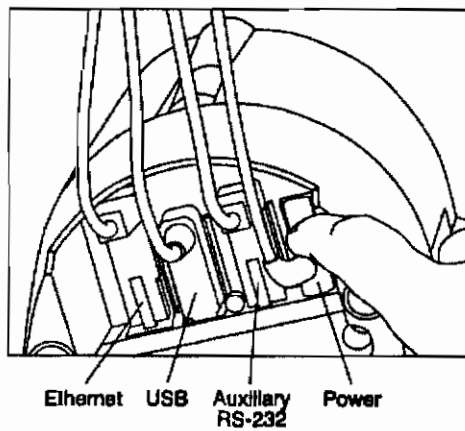
3. Open the **Printer/Cartridge Cover** by pulling the Cover from the Inside Guide as shown in Figure 2-4.



**Figure 2-4. Separating the Cover from the Outside Entry Guide**

## **CABLE CONNECTIONS**

The cable connections are shown in Figure 2-5.

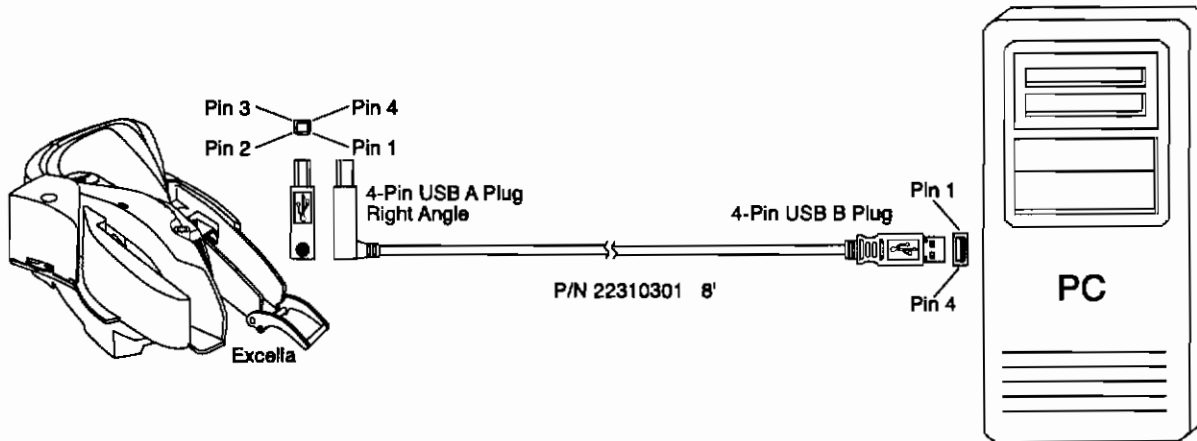


**Figure 2-5. Cable Connections**

**CABLING**

Available cabling is as follows:

- USB – A-plug, 4-pin, right angle, P/N 22310301 shown in Figure 2-6 with pin list in Table 2-1
- Ethernet – RJ 45P, 8-pin, right angle, P/N 22310302 shown in Figure 2-7 with pin list in Table 2-2
- Ethernet Cross-Over – RJ 45P, 8-pin, right angle, P/N 22310304 shown in Figure 2-7 with pin list in Table 2-3
- Power Supply and Cords – Power Supply, Input 100-240 VAC, 1.5A, 60-50 Hz, P/N 64300098 and  
Power Cord-AC – US 3 Blade Non-Pol, IEC C7, P/N 71100001 shown in Figure 2-8



**Figure 2-6. Cabling, USB, 4-pin, Right Angle, P/N 22310301**

**Table 2-1. USB Pin List**

USB Cable Pin List		
USB B Plug, Right Angle	Signal Name	USB A Plug
1	5V	1
2	- Data	2
3	+ Data	3
4	Gnd	4
Shell (Braid Shield)		Shell (Braid Shield)

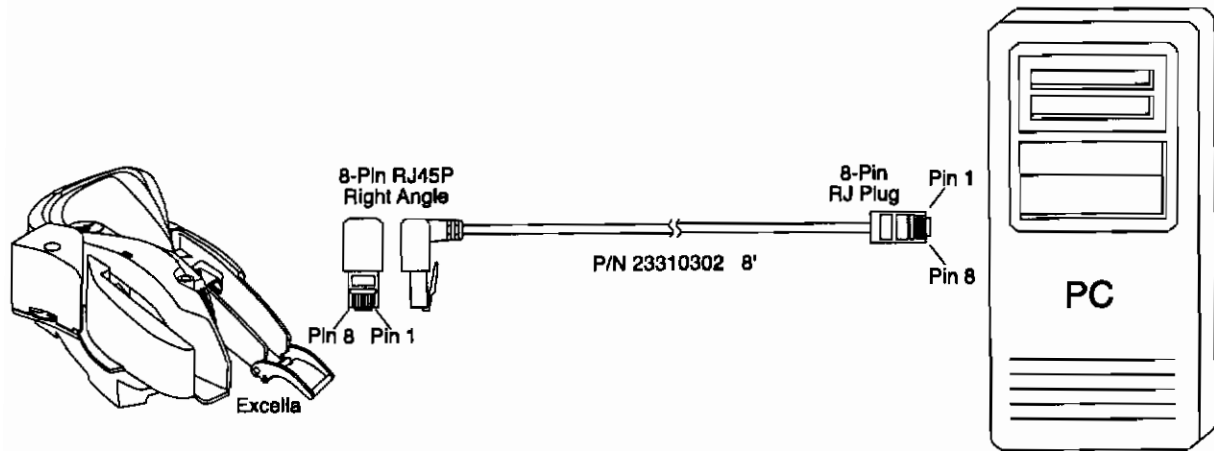


Figure 2-7. Cabling, Ethernet, 8-pin RJ45P, Right Angle, P/N 23310302 or 22310304

Table 2-2. Ethernet Cable Pin List, P/N 22310302

Ethernet Pin List		
8-pin RJ Plug, Right Angle	Signal Name	8-Pin RJ Plug
1	Transmit +	1
2	Transmit -	2
3	Receive +	3
4 NC	NC	4 NC
5 NC	NC	5 NC
6	Receive -	6
7 NC	NC	7 NC
8 NC	NC	8 NC

NC = No Connection

Table 2-3. Ethernet Crossover Cable Pin List, P/N 22310304

Ethernet Pin List		
8-pin RJ Plug, Right Angle	Signal Name	8-Pin RJ Plug
1	Transmit +	3
2	Transmit -	6
3	Receive +	1
4 NC	NC	4 NC
5 NC	NC	5 NC
6	Receive -	2
7 NC	NC	7 NC
8 NC	NC	8 NC

NC = No Connection

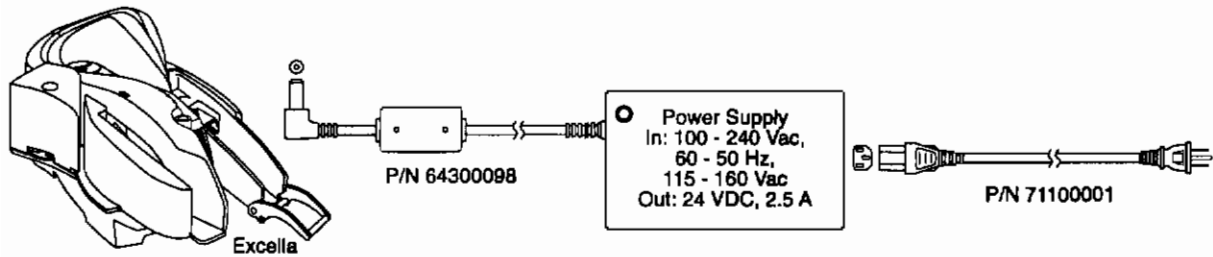


Figure 2-8. Power Supply and Cords. P/N 64300098 and 71100001

## LED INDICATORS

The LED indicator locations are shown in Figure 2-1.

All three LEDs are able to show three colors: green, red, or yellow

Current LED functions:

First LED (closest to the front of the unit): green when power on.

Second LED (middle LED): green when everything is OK; red when paper jam.

Third LED (closest to center of unit): green when power on.

All Three LEDs: amber when powered up, then green.



## SECTION 3. OPERATION AND MAINTENANCE

This section contains powering, operating, and maintenance procedures. Ensure the Excella is installed and cabling and power are connected as described in Section 2.

### POWER UP

Plug the power supply, P/N 64300098P/N, and cord 71100001, into wall power, and press the start button. The green LED closest to the front of the unit should light.

### TILT-DOWN CHECK STOP

The **Tilt-Down Check Stop**, shown in Figure 2-1, is used for both single and multiple check feed. For business size checks (long), place the Tilt Stop in the down position. For personal size checks (short), place the Tilt Stop in the up position. (See Appendix B for check sizes.)

### OPERATOR BUTTON

The **Operator Button** signals the Excella that it is reset. For example, if there is a paper jam, the middle LED flashes red. The jam is then cleared, and the operator presses the **Operator Button**, and the Excella resumes operation.

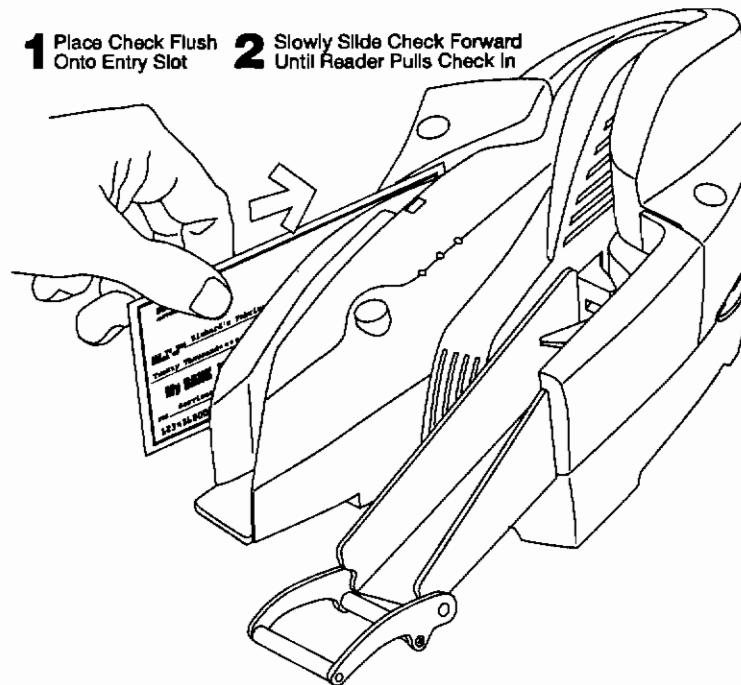
### OPERATION

Checks may be entered manually (one check at a time) or automatically (up to 70 checks at a time). Consult Section 2, Figure 2-1, for locations of the components described here.

### Single Check – Manual Feed

For single checks perform the following steps:

1. With the front of the check facing the center of the unit and the MICR line closer to the bottom, feed the check into the **Manual Single Feed Input Slot**, as shown in Figure 3-1.

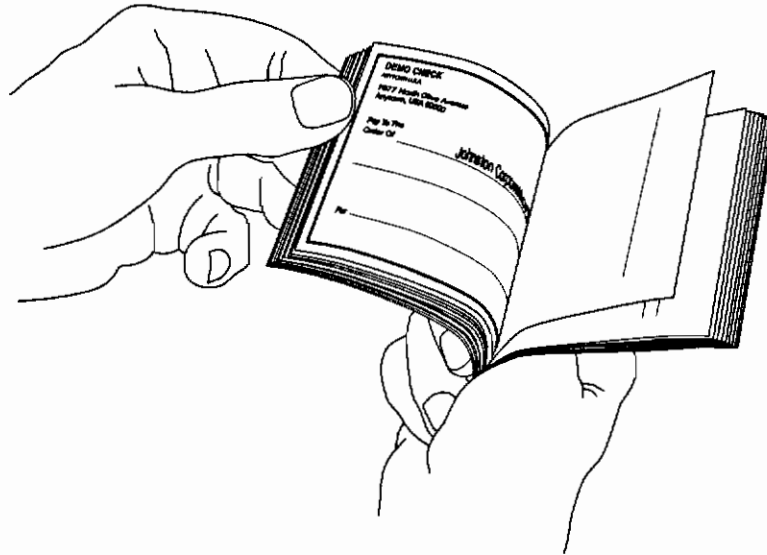


**Figure 3-1. Check Orientation - Insertion**

3. The check then winds around the **Printer/Cartridge** where a programmable endorsement is printed horizontally on the check.
4. The face and back of the check are then scanned at the two **Scan Bars**.
5. Next, the **Check Deflector** guides the check into the Exit Hopper.

### Multiple Checks – Automatic Feed

The **Automatic Feed Input Hopper** can hold up to 70 checks. Separate the checks by fanning as indicated in Figure 3-2 and stack as shown in Figure 3-3.

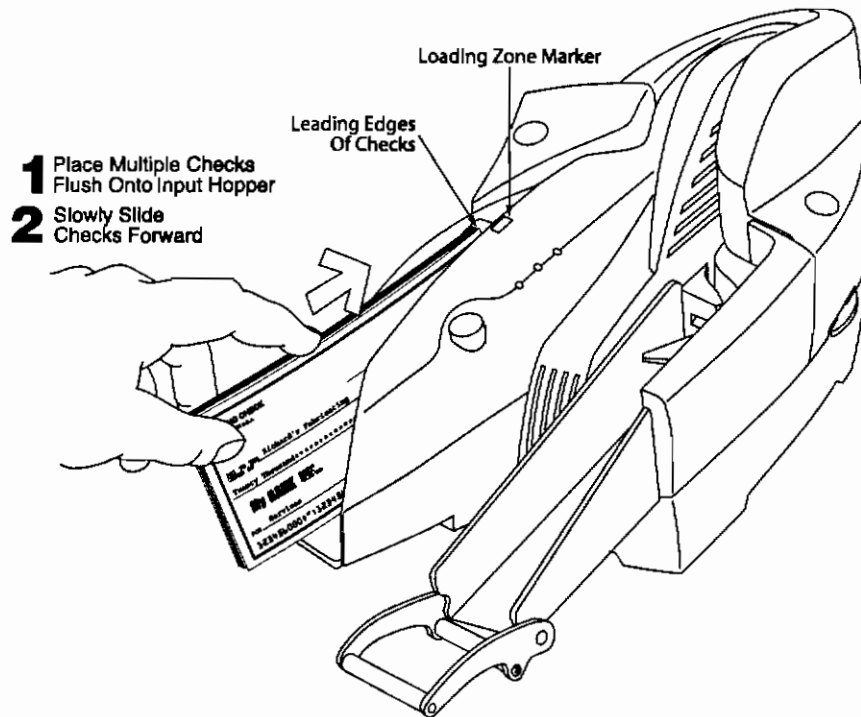


**Figure 3-2. Separate Checks by Fanning**

Proceed as follows:

1. Stack the checks in the **Automatic Feed Input Hopper** as shown in Figure 3-3.
2. Slide the deck forward to the **Loading Zone Marker** so that all leading edges are within the length of the loading zone as shown in Figure 3-3.
3. The checks will follow the same path as the single (manually entered) checks.





**Figure 3-3. Stacking Checks in Input Hopper**

**CLEANING**

Consult Section 2, Figure 2-1, for locations of the components described here.

Clean the outside of the Excella Reader unit with a soft, damp cloth and wipe with a dry cloth. Open the unit. When the unit is open, as shown in Figure 3-4, check the path for debris. Clean with a soft, damp cloth and wipe with a dry cloth.

**Caution**

*To avoid damaging the read head, do not get the inside of the check path wet.*

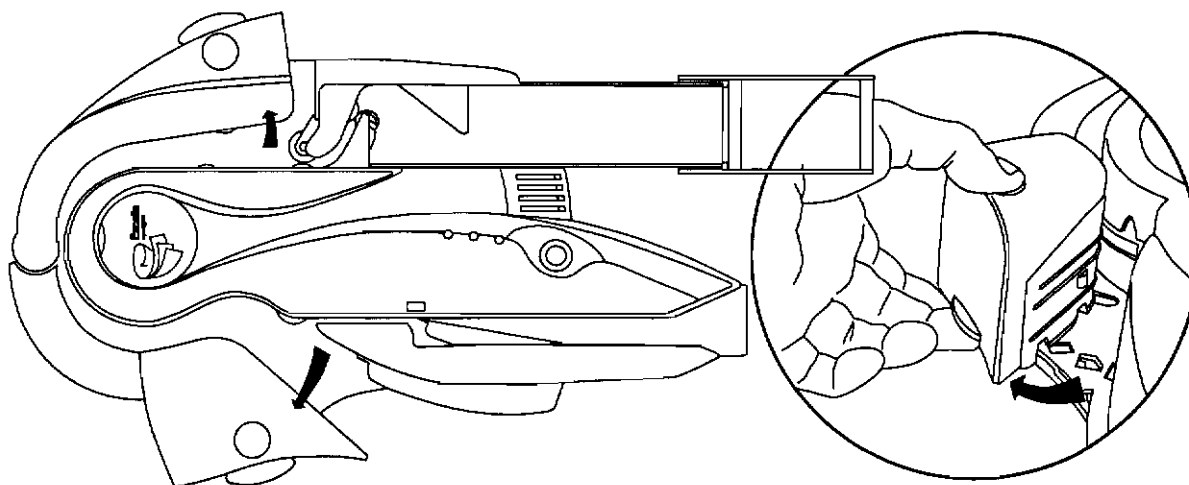


Figure 3-4. Opening the Unit for Cleaning

### Printer

The **Printer/Cartridge** should be taken out when cleaned. See Section 2, Installing or Replacing the **Printer/Cartridge**. There are two methods of cleaning the nozzles on the **Printer/Cartridge**, dry wiping and damp wiping. Use the dry wiping method first, and if more cleaning is required, use the damp wiping method.

#### Dry Wiping Nozzles

Gently wipe the nozzle plate area with a clean, lint-free cloth or tissue.

#### *Caution*

*Do not wipe ink over the electrical contact area.*

#### Damp Wiping Nozzles

Perform the following steps:

1. Dampen a clean, lint-free cloth or tissue with water.
2. Hold the dampened cloth or tissue in contact with the nozzles for a few seconds.
3. Then gently wipe the nozzle plate.

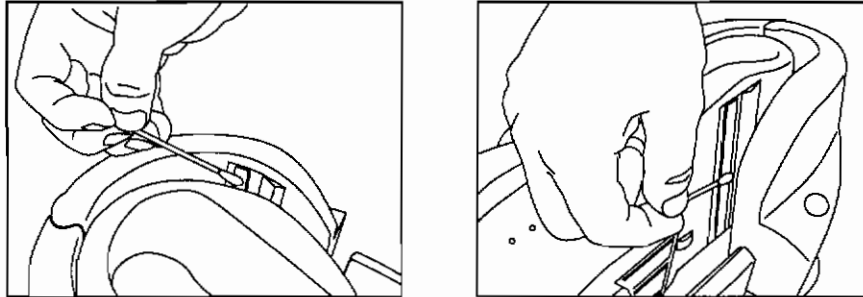
#### *Caution*

*Do not wipe the electrical contact area.*

4. If ink remains on the nozzle plate, wipe again with a clean dry tissue.

### **Scan Bars and Card Path**

Check the Excella paper path to ensure there is no build-up of ink or paper debris, and clean. To clean the **Scan Bars**, use the Cleaning Swab, P/N 97200078, as shown in Figure 3-5.

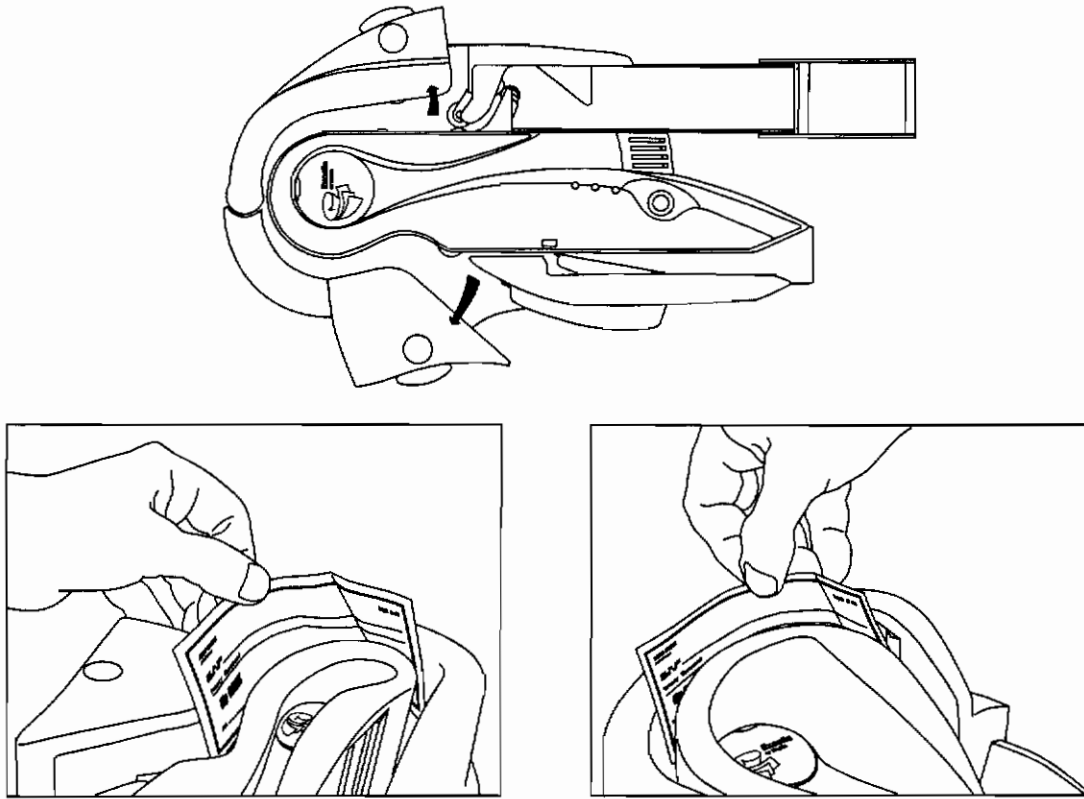


**Figure 3-5. Cleaning Scan Bars**

### **Clearing the Check Path**

Clear debris or remove a check from the path as follows:

1. Open both **Outside Entry and Exit Guides** as shown in Figure 3-6.
2. Clear debris or pull out the checks from the path.
3. Examine the check path to ensure there is no additional debris, dust or other extraneous material in the path.



**Figure 3-6. Clearing Debris or Removing Checks**

**Excella MICR Check Reader**

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## APPENDIX A. ASCII CODES

The following is a listing of the ASCII (American Standard Code for Information Interchange) codes. ASCII is a 7-bit code, which is represented here with a pair of hexadecimal digits.

ASCII Hex value	ASCII Hex Value	ASCII Hex Value	ASCII Hex Value
NUL 00	SP 20	@ 40	` 60
SOH 01	! 21	A 41	a 61
STX 02	" 22	B 42	b 62
ETX 03	# 23	C 43	c 63
EOT 04	\$ 24	D 44	d 64
ENQ 05	% 25	E 45	e 65
ACK 06	& 26	F 46	f 66
BEL 07	' 27	G 47	g 67
BS 08	( 28	H 48	h 68
HT 09	) 29	I 49	i 69
LF 0A	* 2A	J 4A	j 6A
VT 0B	+ 2B	K 4B	k 6B
FF 0C	, 2C	L 4C	l 6C
CR 0D	- 2D	M 4D	m 6D
SO 0E	. 2E	N 4E	n 6E
SI 0F	/ 2F	O 4F	o 6F
DLE 10	0 30	P 50	p 70
DC1 11	1 31	Q 51	q 71
DC2 12	2 32	R 52	r 72
DC3 13	3 33	S 53	s 73
DC4 14	4 34	T 54	t 74
NAK 15	5 35	U 55	u 75
SYN 16	6 36	V 56	v 76
ETB 17	7 37	W 57	w 77
CAN 18	8 38	X 58	x 78
EM 19	9 39	Y 59	y 79
SUB 1A	: 3A	Z 5A	z 7A
ESC 1B	; 3B	[ 5B	{ 7B
FS 1C	< 3C	\ 5C	7C
GS 1D	= 3D	] 5D	} 7D
RS 1E	> 3E	^ 5E	~ 7E
US 1F	? 3F	_ 5F	DEL 7F



## APPENDIX B. CHECK READING

The characters printed on the bottom line of commercial and personal checks are special. They are printed with magnetic ink to meet specific standards. These characters can be read by a Excella Reader at higher speeds and with more accuracy than manual data entry. Two MICR character sets are used world wide; they are: E13-B and CMC-7. The E13-B set is used in the US, Canada, Australia, United Kingdom, Japan, India, Mexico, Venezuela, Colombia, and the Far East. The CMC-7 set is used in France, Spain, other Mediterranean countries, and most South American countries.

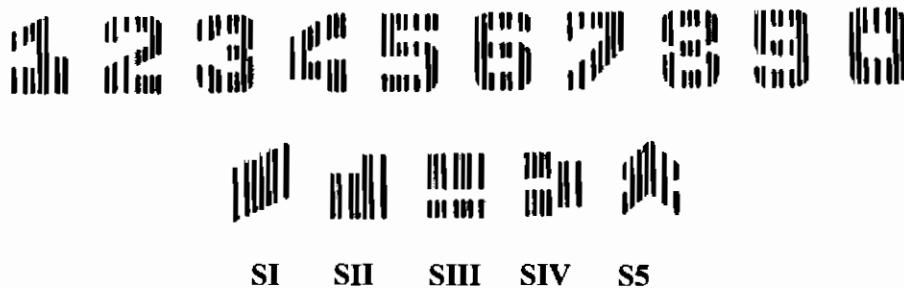
### E13-B CHARACTER SET

The MICR font character set E13-B includes digits 0 through 9 and four symbols. The numbers found on U.S. checks are of the E13-B character set. The numbers and symbols of E13-B are as follows:

1	6	
2	7	┆┆ Transit symbol
3	8	... Dash Symbol
4	9	"┆ On-Us Symbol
5	0	.┆ Amount Symbol

### CMC-7 CHARACTER SET

The numbers and symbols of the CMC-7 character set are as follows:





## Excella MICR Check Reader

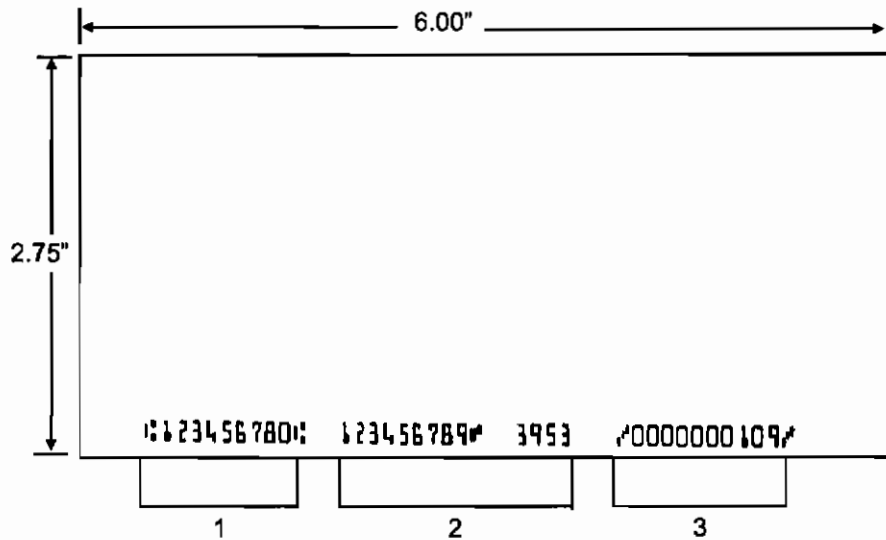
The nonnumeric CMC-7 characters are translated by the Excella Reader as shown in Table B-1.

**Table B-1. CMC-7 Nonnumeric Characters**

CMC-7 Character	MICR Image Reader Output
SI	A
SII	B
SIII	C
SIV	D
SV	E

## CHECK LAYOUTS

Personal checks with MICR fields are shown in Figure C-1. Business checks are shown in Figure C-2. The digits 1 through 4 in the illustrations are described below under MICR Fields.



**Figure B-1. Personal Checks**

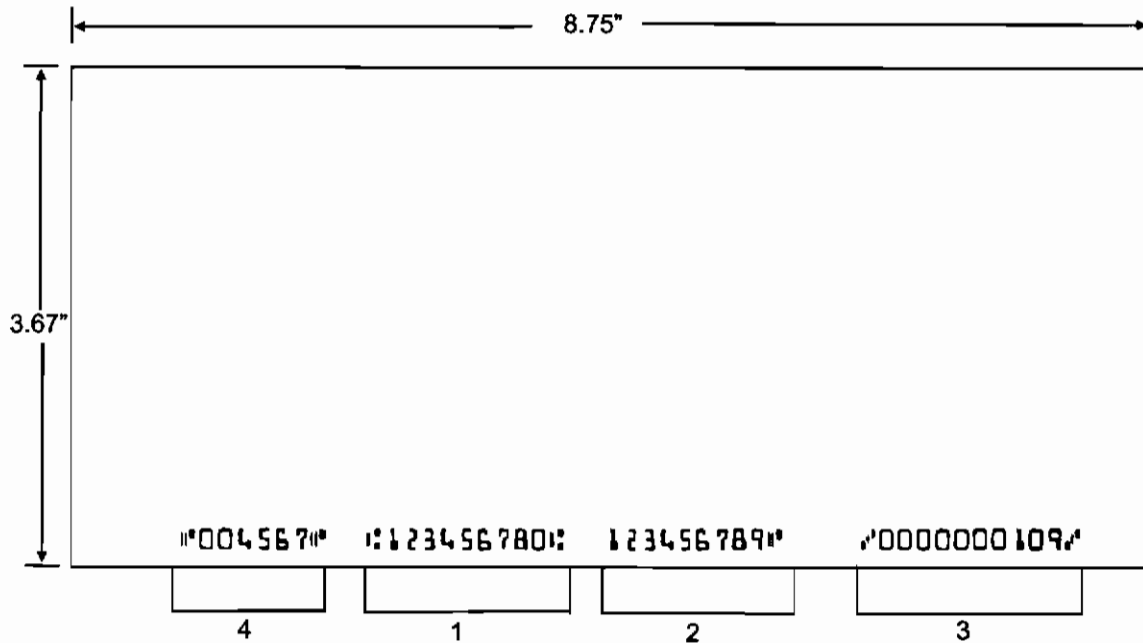


Figure B-2. Business Checks

### MICR FIELDS

The numbers 1 through 4 refer to the numbers below the checks on the illustration and represent the 4 MICR fields.

#### 1-Transit Field

The Transit field is a 9-digit field bracketed by two Transit symbols. The field is subdivided as follows:

- Digits 1-4            Federal Reserve Routing Number
- Digits 5-8           Bank ID Number (American Banking Association)
- Digit 9                Check Digit

**2-On-Us Field**

The On-Us field is variable, up to 19 characters (including symbols). Valid characters are digits, spaces, dashes, and On-Us symbols. The On-Us field contains the account number and may also contain a serial number (Check number) and/or a transaction code. Note that an On-Us symbol must always appear to the right of the account number.

**3-Amount Field**

The Amount field is a 10-digit field bracketed by Amount symbols. The field is always zero-filled to the left.

**4-Auxiliary On-Us Field**

The Auxiliary On-Us field is variable, 4-10 digits, bracketed by two On-Us symbols. This field is not present on personal checks. On business checks, this field contains the check serial number.

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