

NCR 7870 Scanner/Scale

Release 1.0

User's Guide



BST0-2121-90

Issue G

The product described in this book is a licensed product of NCR Corporation.

Trademark Information

It is the policy of NCR Corporation (NCR) to improve products as new technology, components, software, and firmware become available. NCR, therefore, reserves the right to change specifications without prior notice.

All features, functions, and operations described herein may not be marketed by NCR in all parts of the world. In some instances, photographs are of equipment prototypes. Therefore, before using this document, consult with your NCR representative or NCR office for information that is applicable and current.

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

Address correspondence to:

Retail Solutions Group–Atlanta
NCR Corporation
2651 Satellite Blvd.
Duluth, GA 30096

Copyright © 1999
By NCR Corporation
Dayton, Ohio U.S.A.
All Rights Reserved

Table of Contents

Chapter 1: Introduction

About the NCR 7870 Scanner/Scale.....	1-2
Models.....	1-2
Reading the Product Number	1-3
Common Features	1-3
7870-1000-9090	1-4
7870-2000-9090	1-4
7870-3000-9090	1-4
7870-4000-9090	1-4
7870-4500-9090	1-4

Chapter 2: Features, Functions, and Kits

General Features and Functions.....	2-1
Bar Code Recognition.....	2-1
Bi-Optic Scanning.....	2-2
Decode Features	2-2
PACESETTER <i>Plus</i>	2-2
Displays.....	2-3
NCR 7825 Remote Display	2-3
Integrated Display.....	2-4
No Display	2-5
Interface Types	2-5
Laser Scanner	2-5
Power Supply	2-5
Programming the 7870.....	2-6
Scale Certifications	2-7
Scan Zone.....	2-8

Scanner Power Requirements.....	2-8
Soft Power Down.....	2-8
Top Plates and Scan Windows	2-9
Top Plates.....	2-9
Slot Scanner Window.....	2-9
Side Scanner Window.....	2-10
Scale Features and Functions.....	2-11
Scale Functions and Features.....	2-11
Kits	2-12

Chapter 3: Site Preparation

Getting Started.....	3-2
About Site Preparation.....	3-4
Customer Responsibilities.....	3-6
Environmental Requirements.....	3-7
Operating Range	3-7
Extreme Operating Range	3-7
Storage Range.....	3-8
Transit Range.....	3-8
Checkstand Power and Wiring Considerations	3-9
Power Considerations	3-9
Power Applications.....	3-9
Power Transients Protection.....	3-9
Wiring Considerations.....	3-10
U.S., Canadian, and Japanese Checkstand Wiring	3-10
European Checkstand Wiring	3-11
International Checkstand Wiring.....	3-12
Wiring Instructions	3-13
Running Feeder Lines from Main Service Panel.....	3-13
Circuit A.....	3-13

Circuit B	3-14
Circuit C	3-14
Checkstand Considerations	3-15
Ventilation Requirements	3-15
Service Clearance.....	3-16
Display Clearance.....	3-17
Item Diverter.....	3-17
Checkstand Hole	3-18
Checkstand Hole - Models 1000 & 2000	3-19
Checkstand Hole - Models 3000, 4000, & 45003-20	
Cable Lengths and Hole Sizes	3-21
Cable Hole Diameters	3-21
DC Power Cable – Power Supply to 7870.....	3-21
AC Power Cords – Outlet to Power Supply.....	3-22
Remote Display Cables	3-22
Interface Cables - NCR Host Terminals.....	3-23
Interface Cables – NCR Host Terminals (cont.) .	3-24
Interface Cables – NCR Host Terminals (cont.) .	3-25
Interface Cables - Casio Host Terminals.....	3-25
Interface Cables – Data Checker Host Terminals	3-26
Interface Cables – Epson Host Terminals.....	3-26
Interface Cables – Gilbarco Host Terminals	3-26
Interface Cables – IBM Host Terminals	3-27
Interface Cables – ICL Host Terminals	3-27
Interface Cables – ICL Host Terminals (cont.)....	3-28
Interface Cables – Microbilt Host Terminals.....	3-28
Interface Cables – NEC Host Terminals	3-28
Interface Cables – SASI Host Terminals	3-29
NCR 7870 Dimensions.....	3-30
NCR 7870-1000 & 2000 Models	3-30
NCR 7870-3000 Model.....	3-31

NCR 7870-4000 & 4500 Models 3-32

Chapter 4: Installation

Getting Started 4-1
 Reporting a Damaged Unit..... 4-1
 What's in the Box..... 4-1
 Cable Verification 4-2
 Checkstand Verification..... 4-2
Installing Unit in Checkstand 4-3
 Instructions 4-3
 Install Cables..... 4-3
Determining if the Unit is Operational 4-8
 NCR 7870-1000 and 3000 Scanners..... 4-8
 NCR 7875-2000, 4000, and 4500 Scanner/Scales .. 4-8
 If the NCR 7870 Does Not Pass Level O
 Diagnostics..... 4-8
 Checkout Reading Operation..... 4-9
 Programming..... 4-9
Determining Communications Protocol 4-10
Scale Address for IBM 4-11

Chapter 5: Calibration

General 5-1
Calibration Procedure 5-3
 Section 1: Exercising the Scale 5-3
 Section 2: Accessing the Calibration Switch 5-4
 Section 3: Connecting the Field Service
 Calibration Display 5-7
 Section 4: Performing the Calibration..... 5-9
Verifying Calibration..... 5-11
 Procedure 1: Increasing Load Test 5-12
 Procedure 2: Over-Capacity Test..... 5-13

Procedure 3: Decreasing Load Test	5-14
Instructions	5-14
Procedure 4: Shift Test	5-15
Securing the Calibration Switch	5-16

Chapter 6: Operation

About Using the Operator Controls.....	6-2
Scan Windows	6-2
Status Indicators	6-2
Motion Detector.....	6-3
Reset / Scale Zero Button	6-3
Audible Tone	6-3
Voice Messages.....	6-3
About Using the Scanner	6-4
Proper Label Orientation	6-4
Active Scan Zone.....	6-5
Multiple Reads.....	6-5
Bar Code Quality	6-6
Operating Instructions	6-7
Power Up	6-7
Scanner Only Models.....	6-7
Scanner/Scale Models	6-7
Scanning Procedure.....	6-8
Instructions	6-8
Not-On-File Error	6-8
Weighting Procedure	6-9
Instructions	6-9
Changing the Good Read Tone	6-10
Instructions	6-10
Routine Maintenance.....	6-11
Instructions	6-11

Chapter 7: Programming

General	7-1
How to Program the NCR 7870	7-3
Creating the Program	7-3
Step 1. Writing the Program	7-3
Step 2. Entering the Program	7-3
Step 3. Save the Program	7-4
Programming Mode	7-5
Programming Tags	7-6
Abort	7-6
Default	7-7
End	7-7
Hex 0 – Hex F	7-7
Programming Mode	7-8
Save and Reset	7-8
Program Entry Example	7-9
Programming Tips	7-12
Program Parameter Descriptions	7-13
Communications Protocol	7-13
Defaults	7-13
Specific Program Parameters	7-13
Programming Example	7-17
Good Read Tone	7-18
Defaults	7-18
Specific Program Parameters	7-18
Program Example	7-19
Timers	7-20
Defaults	7-20
Specific Program Parameters	7-20
Program Example	7-21
Bar Codes – 1	7-22

Defaults	7-22
Specific Program Parameters.....	7-22
Program Example.....	7-24
Bar Codes – 2	7-25
Defaults	7-25
Specific Program Parameters.....	7-25
Program Example.....	7-27
Bar Codes – 3	7-28
Defaults	7-28
Specific Program Parameters.....	7-28
Program Example.....	7-30
Bar Codes – 4	7-31
Defaults	7-31
Specific Program Parameters.....	7-31
Program Example.....	7-32
Label Identifiers.....	7-33
Defaults	7-33
Specific Program Parameters.....	7-34
Program Example.....	7-37
RS-232 Parameters – 1	7-39
Defaults	7-39
Specific Program Parameters.....	7-39
Program Example.....	7-41
RS-232 Parameters – 2	7-42
Defaults	7-42
Specific Program Parameters.....	7-42
Program Example.....	7-44
RS-232 Prefix Byte	7-45
Defaults	7-45
Specific Program Parameters.....	7-45
Program Example.....	7-46

RS-232 Terminator Byte	7-47
Defaults	7-47
Specific Program Parameters.....	7-47
Program Example.....	7-48
RS-232 Communications Options	7-49
Defaults	7-49
Specific Program Parameters.....	7-49
Program Example.....	7-52
Scale Parameters	7-53
Defaults	7-53
Specific Program Parameters.....	7-53
Program Example.....	7-54
Miscellaneous Parameters	7-55
Defaults	7-55
Specific Program Parameters.....	7-55
Program Example.....	7-57
PACESETTER <i>Plus</i> Information	7-59
Mode 1 - Inquiry	7-59
Mode 2 - Real Time.....	7-60
Mode 3 - Normal.....	7-62
Host Access to Tallies.....	7-64
Examples of Host Access to Tallies.....	7-64
Host Reset of Tallies.....	7-67
Special Programming	7-68
Delay Weight Data to IBM Host Terminal	7-68
EAN/JAN/UPC Multi-Symbol Scanning Parameters	7-69
Label Construction	7-69
Single Label Restriction.....	7-69
Transmitting Label Data.....	7-69
Early Beep Disable.....	7-72
Good Read Tone Presets	7-73

Good Weigh Tone When Transmitting Data.....	7-74
Terminal Coupon Interface Parameters.....	7-75
ASCII Code Chart.....	7-77

Chapter 8: Troubleshooting

Fault Identification	8-1
Scanner Troubleshooting Chart.....	8-2
Scale Troubleshooting Chart.....	8-3
Voice Messages Troubleshooting Chart.....	8-5

Appendix A: Programming Worksheets

General	A-1
Purpose.....	A-1
Format	A-1
Shortcuts.....	A-1
Defaults	A-2
Hex Characters	A-2
Program Entry	A-2
Programming Parameter Defaults	A-3
Worksheets.....	A-6

Revision Record

Issue	Date	Remarks
A	Oct 92	First Issue
B	Dec 92	Miscellaneous Changes
C	Feb 93	Miscellaneous Changes
D	Jan 94	Miscellaneous Changes
E	Oct 94	Miscellaneous Changes
F	Feb 99	Complete Revision
G	Nov 99	Miscellaneous Changes

Radio Frequency Interference Statements

Federal Communications Commission (FCC)

Information to User

This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to Part 15 of 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 interference in which case the user will be required to correct the interference at his own expense.

NCR 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 interference caused by such unauthorized modification, substitution or attachment will be the responsibility of the user. The user is cautioned that changes or modifications not expressly approved by NCR may void the user's authority to operate the equipment.

Canadian Department of Communications

This digital apparatus does not exceed the Class A limits for radio noise emissions from digital apparatus set out in the Radio Interference Regulations of the Canadian Department of Communications.

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 radioélectriques édicté par le ministère des Communications du Canada.

Voluntary Control Council For Interference (VCCI)

この装置は、情報処理装置等電波障害自主規制協議会（VCCI）の基準に基づくクラスA情報技術装置です。この装置を家庭環境で使用すると電波妨害を引き起こすことがあります。この場合には使用者が適切な対策を講ずるよう要求されることがあります。

C E Mark Applicability

This product conforms to European Union (EU) Directives:

Council Directive 90/384/EEC

Non-Automatic Weighing Instruments

Scale Regulatory

Notification of country, state, and local regulatory agencies of weighing device installation is required. Failure to comply with can result in criminal prosecution and jeopardize the ability to conduct normal business. The NCR 7870 Scanner/Scale has been certified in many countries. Contact the NCR Office of Weights & Measures and Laser Safety for specific country approvals.

NCR Office of Weights & Measures and Laser Safety

Dennis A. Krueger

2651 Satellite Boulevard

Duluth, GA 30096-5810

Phone: 770-623-7743

Fax: 770-623-7827

E-Mail: Dennis.Krueger@AtlantaGA.NCR.COM

Web Site: <http://gedwards.AtlantaGA.NCR.Com/kruegd>

Declaration of Conformity

Manufacturer's Name	NCR Corporation
Manufacturer's Address	NCR Corporation Retail Solutions Group – Atlanta 2651 Satellite Boulevard Duluth, GA 30096-5810
Type of Equipment	Information Technology Equipment – Bar Code Scanner
Model Number	Class NCR 7870-1000, NCR 7870-2000, NCR 7870-3000, NCR 7870-4000, NCR 7870-4500

NCR Corporation, 1700 South Patterson Boulevard, Dayton, OH 45459, USA, declares that the equipment specified conforms to the referenced EU Directives and Harmonized Standards.

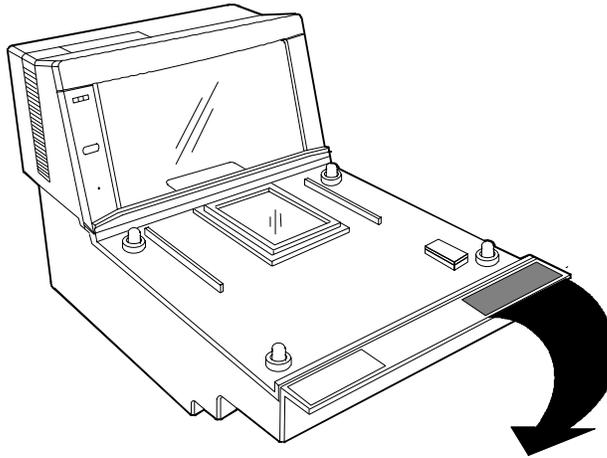
EU Directive	Harmonized Standard(s)
89/336/EEC (EMC)	EN 55022: 1987 (CISPR 22) EN 50082-1, Part 1: 1992 IEC 801-2: 1984 IEC 801-3: 1984 IEC 801-4: 1988
*90/384/EEC (Weights & Measures)	EN45501

This Directive is not applicable to NCR 7870-1000 or NCR 7870-3000

Director of Quality Assurance
NCR Corporation
Retail Solutions Group — Atlanta
2651 Satellite Boulevard
Duluth, GA 30096-5810

European Contact:
International IP Counsel
915 High Road, North Findlex
London N12 8QJ
United Kingdom

Scale Identification Label



NCR CORPORATION (III)		
Model 7875-2000		
Max 13.995 kg	Min 0.1 Kg	ID
e = d = 0.005 kg	.	Approval
Lim 19.990 kg	+10 C /+40 C	Serial No

13.995 Kilogram (kg) Label

NCR CORPORATION (III)		
Model 7875-2000		
Max 9.995 kg	Min 0.1 Kg	ID
e = d = 0.005 kg	.	Approval
Lim 19.990 kg	+10 C /+40 C	Serial No

9.995 Kilogram (kg) Label

NCR CORPORATION (III)		
Model 7875-2000		
Max 30.00 lb	Min 0.2 lb	ID
e = d = 0.01 lb	Nmax3000	Approval
Lim 44.00 lb	+10 C /+40 C	Serial No

Pound (lb) Label

VOID VOID VOID VOID VOID VOID		
NCR CORPORATION (III)		
Model 7875-2000		
Max 30.00 lb	Min 0.2 lb	ID
e = d = 0.01 lb	Nmax3000	Approval
Lim 44.00 lb	+10 C /+40 C	Serial No

Removing Label causes VOID Indication

Note: e = scale interval; d = scale division;
 Max 30.00 lb = maximum weight permitted on scale
 Min 0.2 lb = minimum weight that should be measured on scale
 Nmax3000 = maximum scale divisions

Laser Safety

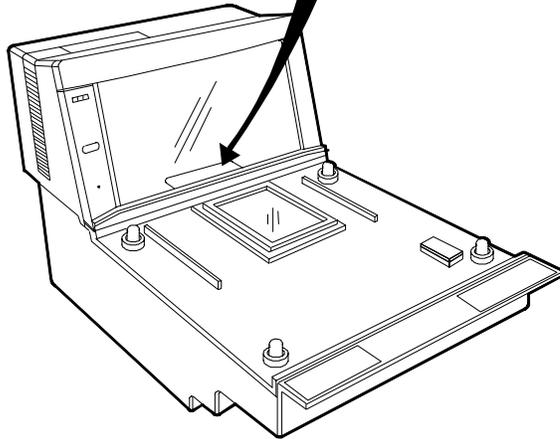
The NCR 7870 Scanner is not intended for long-term viewing of the direct laser light. However, the unit is safe if used as it was intended.

Laser Safety Label

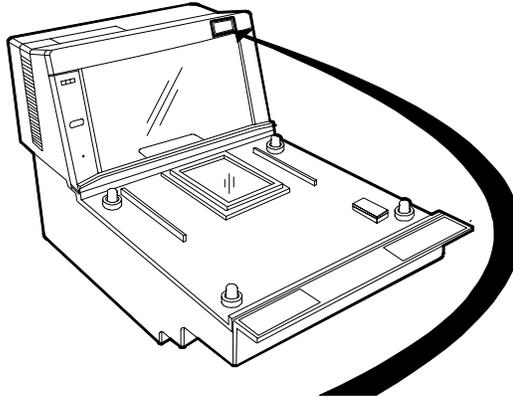
Class IIa Laser Product. Avoid Long-Term Viewing of Direct Laser Light.

Appareil à laser de classe IIa Éviter toute exposition prolongée de la vue à la lumière laser directe.

Clase IIa Producto Laser. Traté de no ver directamente el Rayo Laser por mucho tiempo. (IEC CLASS 1 LASER PRODUCT)



Country Language Specific IEC Class 1 Laser Labels



CLASS 1 LASER
PRODUCT (IEC 825)

PRODUCTO LASER
CLASE 1

APPAREIL A LASER
DE CLASS 1

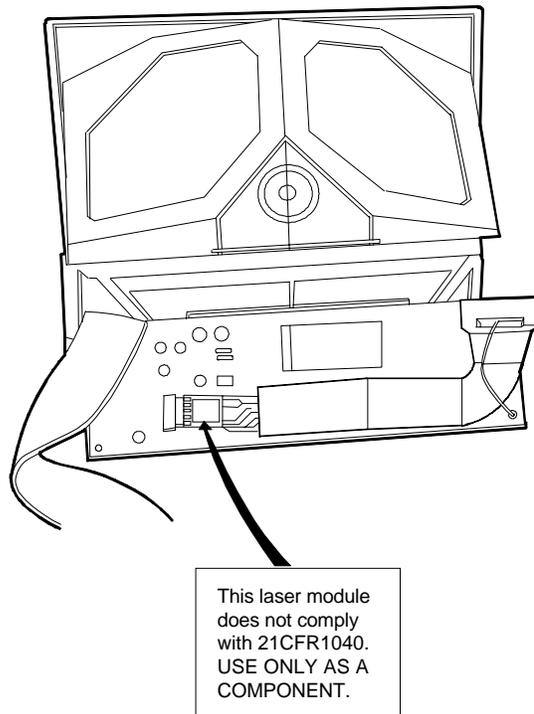
LUOKAN 1
LASERELAITE

クラス1 レーザ製品

KLASS 1
LASER APPARAT

LASER KLASS 1
Zeitbasis 1000 s

Laser Module Label



R0132A

Laser Power

The NCR 7870 Scanner meets the following laser power requirements.

- Class IIa CDRH (Center for Devices and Radiological Health)
- Class 1 EN60-825 (Europäische Norm)
- Class 1 IEC 825-1 1993 (International Electrotechnical Commission)

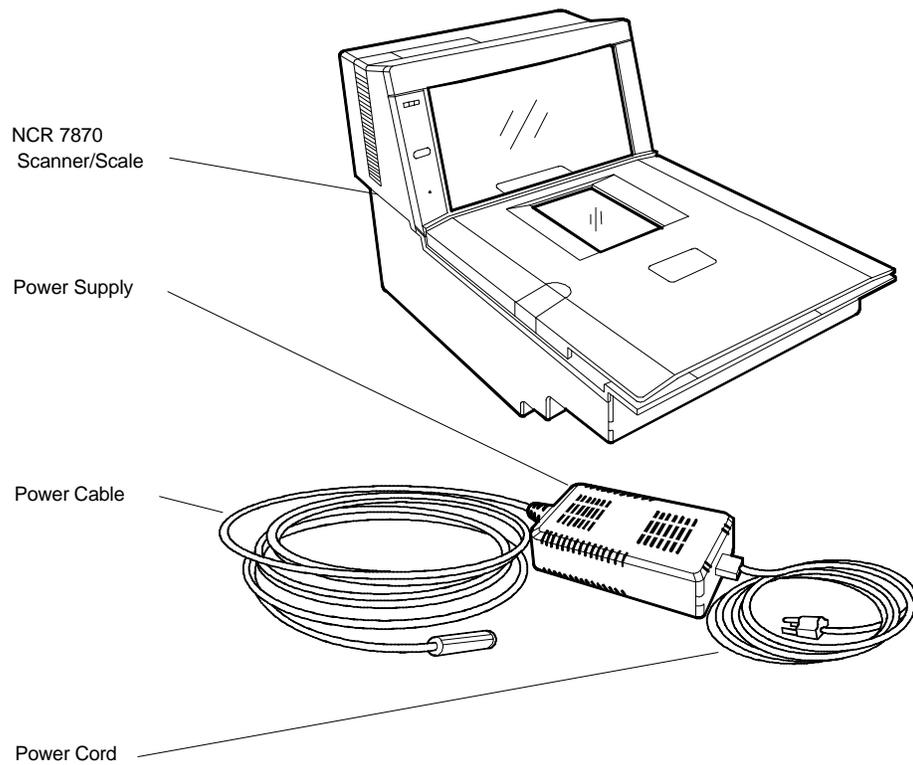
Following is the radiant energy of the laser light as applied to each of the specified requirements.

Maximum Average Radiant Power (CDRH Calculation)	0.87 microwatts
Accessible Emission Limit (CDRH Calculation)	3.9 microwatts
Maximum Radiant Power (EN60825-1 / IEC 825-1 Calculation)	0.45 milliwatts
Accessible Emission Limit (EN60825-1 / IEC 825-1 Calculation)	0.59 milliwatts

Caution: Use of controls or adjustments or performance of procedures other than specified herein may result in hazardous radiation exposure.

Chapter 1: Introduction

This chapter describes the models, features, and kits available for the 7870 line of scanner/scales. To familiarize you with the 7870, there is a general overview on the unit, the models, and major components.



About the NCR 7870 Scanner/Scale

The NCR 7870 is used in high-performance scanning applications in food distribution, mass merchandise, warehouse clubs, and large drug store chains. It is a bi-optic scanner/scale that combines the characteristics of a slot (horizontal) scanner and a side (vertical) scanner into a single cabinet.

Bi-optical scanning creates a larger, four-sided scan zone which allows the 7870 to read bar codes faster and with less orientation effort from the checker. Scan line speeds of 2,400 lines per second permit continuous item speeds of 2 meters per second. A good checker operates in the range of 0.8 to 1.0 meters per second.

The PACESETTER *Plus* technology, available as an upgrade over the Standard Decode feature, analyses and corrects information from defective labels. PACESETTER *Plus* also keeps track of bad labels so you can identify products and manufacturers with poor label quality.

The scale will weight items less five pounds (2.27 kg) in 0.9 seconds. The weight plate is offset toward the checker, allowing the checker to do what is natural when lifting heavy objects – pull the weight closer to the body. This lessens operator lower back strain.

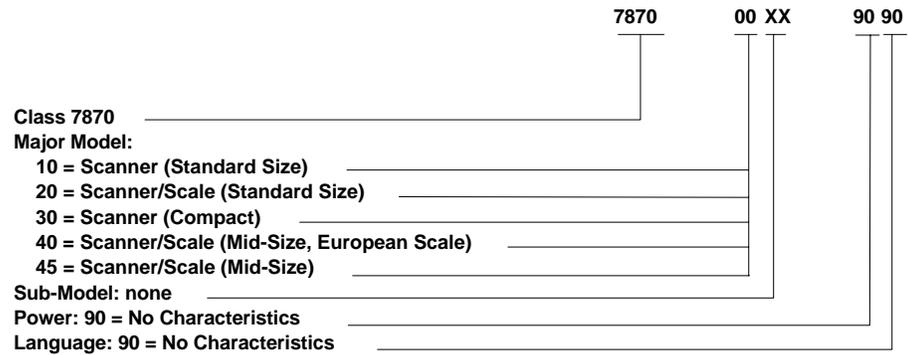
The overall result of these and many other design qualities is an ergonomic scanner/scale with a very high first-pass read rate.

Models

The NCR 7870 is available in five models:

- 7870 - 1000 - 9090 – scanner only, standard length
- 7870 - 2000 – 9090 - scanner and scale, standard length
- 7870 - 3000 – 9090 - compact scanner only
- 7870 - 4000 – 9090 - compact scanner/scale (third party scale, European market)
- 7870 - 4500 – 9090 - compact scanner/scale (NCR scale)

Reading the Product Number



14943

Common Features

- Standard Decode or PACESETTER *Plus* and Standard Decode
- Interfaces for popular host terminals
- Large selection of power cords to meet custom and regional needs while providing flexible configurations with the universal power supply
- Data cables ordered separate or as part of a kit
- For Scanner/Scale models -- NCR 7825 Remote Display (standard for current models), Integrated Display, or No Display
- Print or on-line documentation
- Choice of Stainless Steel Top Plate equipped with either Sapphire or Diamond-Coated Glass Scan Window
- Custom labels for the scanner and scale to meet local requirements for laser safety and/or weights and measures

7870-1000-9090

This is the standard bi-optic scanner only model. It is full-sized, designed to fit in a 20+ inch (51+ cm) wide checkstand. It can be configured with a variety of top plates and glass options. The 7870-1000 will fit into the counter hole for the NCR 7820.

7870-2000-9090

This is the standard bi-optic scanner/scale model. It is identical to the 7870-1000 with the addition of a scale unit. The 7870-2000 can be ordered with the post-mounted NCR 7825 Remote Display (standard), an integrated display, or no display. The 7870-2000 will fit into the counter hole for the NCR 7820.

7870-3000-9090

This is the compact, bi-optic, scanner only model. With the scale bed removed, the length is reduced to 34.3 cm (13.5 in.) to fit in European checkstands where space is tight and the checker is often seated.

7870-4000-9090

This is the subcompact scanner/scale model. With a length of 43 cm (17 in.), the 7870-4000 has a footprint between that of the full-sized 1000/2000 models and the compact 3000 model.

The 4000 model uses a price-computing scale to meet European requirements. This scale uses information obtained from the host terminal and the measured weight to calculate the price internally. The price computing function makes the 4000 model different from all other 7870 model scales which measure item weight and transmit the data to the host terminal for price calculation.

7870-4500-9090

The 4500 model is identical to the 4000 model except the scale has no internal price-computing function and is manufactured by NCR.

Chapter 2: Features, Functions, and Kits

This chapter describes the features, functions, and kits. Specification and performance data on the 7870 unit and its major components is also provided.

General Features and Functions

Bar Code Recognition

The 7870 can recognize and read a number of bar codes including:

- UPC-A
- UPC-E
- UPC-D (limited set)
- EAN-8/13
- JAN-8/13
- Code 39 (Code 3 of 9)
- Code 128
- Interleaved 2 of 5
- Add-On Codes

It is possible that in some situations, the 7870 may be able to read more types of bar codes than the host terminal's application program. In such a case, either the application program must be upgraded to read these bar codes or the 7870 must be told, using the Programming Tags (BST0-2121-74), to ignore the particular bar code type.

Bi-Optic Scanning

The NCR 7870 combines horizontal and vertical scan patterns. Having two active scan windows allows the checker to bring a product into the scan zone without having to orient it to a single scan window. Portions of the bar code are read by each scanner, assembled into a complete code by the digital board and sent to the host terminal.

Decode Features

Standard Decode and PACESETTER *Plus* are available for bar code label decoding. Standard Decode is the standard feature and PACESETTER *Plus* is the upgrade. Please note that the PACESETTER *Plus* upgrade includes the Standard Decode.

PACESETTER *Plus*

Bar code labels in a retail environment are occasionally unreadable. Labels can be overprinted, underprinted, or truncated. Others may have missing margins or be placed around corners. PACESETTER *Plus* determines what is wrong with a label, compensates and fixes the data, and transfers the information to the host terminal. Voice messages can be used to describe what is wrong with a label.

There are three modes of operation in PACESETTER *Plus*.

- Mode 1 – Inquiry Mode
- Mode 2 – Real-Time Mode
- Mode 3 – Operations Mode

Mode 1 – Inquiry Mode

Inquiry mode keeps a tally count of label readability. Labels are judged as:

Good reads	No reads (incomplete labels)
Good reads with overprinted bars	Missing margins
Good reads with underprinted bars	

In Mode 1 the tally counts are displayed on the integrated display or the NCR 7825 remote display. The percentage of each error type to the good reads tally is also displayed. All the tally counts can be reset to zero.

Mode 2 – Real-Time Mode

In Mode 2 the scanner is off-line and the scale is disabled. The scanner reads bar codes and indicates label readability, whether labels are missing bars, overprinted, underprinted, missing margins, or are “no read.”

Mode 3 – Operations Mode

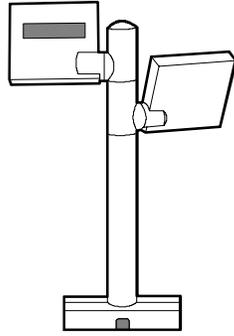
Mode 3 is the normal operating mode. While in this mode, the scanner can be programmed to add trailer information about label readability to the UPC/EAN data. The host terminal must be capable of receiving the trailer and configured appropriately.

Displays

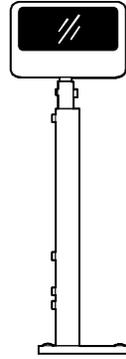
A display separate from the host terminal is useful and sometimes required for use with NCR 7870 Scanner/Scales -- the 2000, 4000, and 4500. These models are available with a remote post-mounted display, an integrated display, or no display.

NCR 7825 Remote Display

The post-mounted NCR 7825 is the standard display and is available as a user-installable kit to upgrade older units in the field. Early versions of the NCR 7825 Remote Display are mounted on a post that attaches to the checkstand. The current NCR 7825 is a compact design available with a single or dual display, one for the customer and one for the checker. The following illustration shows the current model with dual displays and the earlier model.



**NCR 7825 Remote
Compact Display**



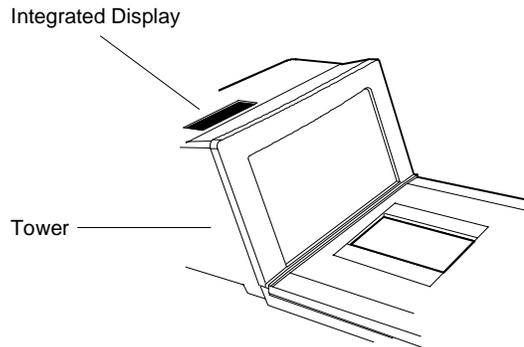
**NCR 7825 Remote
Post Display**

16345

Depending on the checkstand construction, a keyboard may be mounted above the 7870, which will obstruct the view of the integrated display. In this case, it may be advantageous to install an NCR 7825 Post Mounted Display, which can be used with or without an integrated display.

Integrated Display

The integrated display is an inset, LCD located on the top surface of the tower. Depending on the checkstand design, the integrated design may or may not be appropriate.



16819

No Display

If the 7870 is ordered with no display, the scale information is usually displayed on the host terminal display. Please note, the host terminal must be approved to perform a live/gross scale weight. This arrangement is not available in all host terminals and some Weight and Measures authorities do not permit this arrangement.

Interface Types

The NCR 7870 communicates with the host terminal through various types of interfaces. The 7870 Scanner always uses one interface cable. However, some host terminals require dual cables for and NCR 7870 Scanner/Scale. See the *Interface Cables* section in **Chapter 3: Site Preparation** for available interface cables.

Laser Scanner

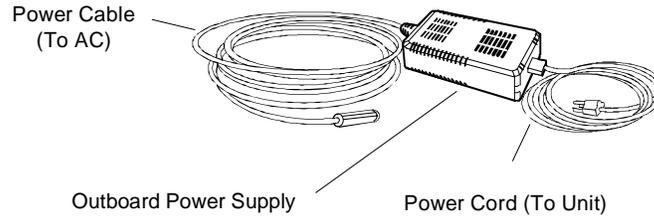
The 7870 operates with the performance of two scanners yet the bi-optic scan pattern is created by a single laser and spinner motor. A 24 - line convergent scan pattern (12 lines per scan window) is generated by the laser diode. A 3-Phase, DC, brushless motor spins a tetrahedral mirror at 6000 RPMs. The laser beam is reflected onto the stationary mirrors in the Optics Assembly and then out the Scan Windows. The Spinner Motor provides a scan speed of 2400 scan lines (100 scan frames) per second. This enables the 7870 to read at a continuous item speed of 2.0 meters per second. An experienced checker scans at a rate of 0.8 to 1.0 meters per second, so the 7870 is able to keep up with high volumes and fast checkers.

Power Supply

A universal, switching Power Supply is used to provide DC voltage. It has a replaceable, 3 m (10 foot) cord for connection to the power outlet or source. A low voltage power cable connects the Power Supply to the unit. The Power Supply can be fixed to the unit's chassis or located on the floor or checkstand in the NCR 7870-1000 and 2000. For other models, the Power Supply must be installed in the checkstand.

An outboard power supply permits the 7870 to operate without checkstand ventilation. The Power Supply accepts input line voltages from 90 to 260 VAC at a frequency range of 47 to 63 Hz.

For a list of Power Cables and Cords, see the *Cables Lengths and Hole Sizes* section in **Chapter 3: Site Preparation**.



16822

Programming the 7870

The NCR 7870 is featurized to fit a customer's needs by using programming tags which alter the unit's operating parameters. Following are some of the more common parameters which may be adjusted:

- Communications Protocol
- Good Read Tone
- Not-On-File Tone Volume
- Timers
- UPC/EAN
- Add-On Code
- Code 39
- Code 128
- RS-232
- Interleaved 2 of 5
- PACESETTER *Plus*
- Label Identifiers

Scale Certifications

Scale certifications are available for these markets:

Market	9.95 kg	13.995 kg	30 lb.
Argentina	•		
Australia	•	•	
Brazil	•		
California			•
Canada	•	•	•
Czech Republic	•		
Europe	•		
Hong Kong	•	•	
Indonesia	•		
International	•		
Mexico	•		
New Zealand	•	•	
People's Republic of China	•		
Russia Federation	•		
United Kingdom			•
U.S.			•
Venezuela	•		
Vietnam	•		

Scan Zone

The scan lines are dispersed in a forward and backward direction from both windows. This allows the scanner to read a) on four sides, b) from left-to-right or right-to-left, and c) inverted labels. If the scan zone is thought of as a cube resting on the horizontal scan window, the scanner is able to read the leading, trailing, bottom, and far surfaces. Another way of describing the scan zone is – if the checker can't see the bar code label, then the scanner can. The scan zone extends to 20.3 cm (8 in.) high off the horizontal window. Bi-optical scanning makes the scan zone large enough to allow a label to be read off of a tall soup can even when upside-down

Scanner Power Requirements

The laser diode occupies little space, draws low current, and produces little heat. The light produced by the scanners in current models has been shifted toward the edge of the visual spectrum so it is not possible to see the scan pattern in normal lighting. When active, the laser uses 22 watts. A soft power down feature allows major portions of the 7870 to shut down when no motion is detected. While in sleep mode, the scanner's power requirements drop to 10 watts, a 65% reduction. A more valuable advantage of the soft power down feature is the run time reduction of critical components which translates directly into extending the life of the scanner. The scanner automatically powers up after detecting motion in approximately two seconds.

Soft Power Down

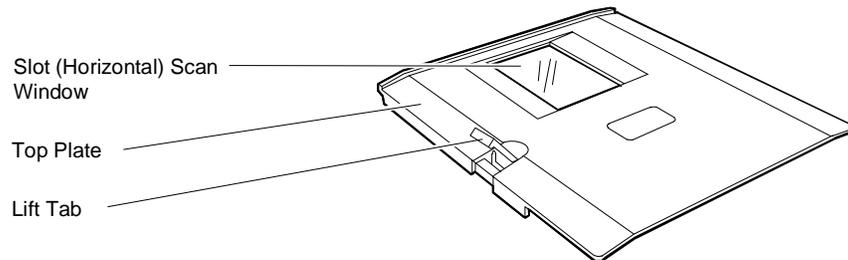
During periods of inactivity, components of the scanner and scale shut down to conserve power, reduce wear, and extend product life. A motion sensor detects activity and signals the unit to power up from sleep mode. The power up takes less than two seconds.

Top Plates and Scan Windows

Top Plates

A Top Plate provides a snag-free place to scan items and protects the internal components from contamination and liquid spills. It has an inset Lift Tab (older units may have two) which permit the Top Plate to be quickly removed or replaced with no tools. The scan window inset in the Top Plate is either diamond-coated (replaceable) or sapphire glass (permanent). When a unit has a scale, the Top Plate becomes a part of the scale system – the scale must be recalibrated when the Top Plate or any of its components, such as the scan window, are replaced.

The current line of 7870 Scanners and Scanner/Scales have been upgraded to come with the Stainless Steel Top Plate as a standard feature. Older 7870 units may have the painted steel Top Plate which is no longer available.

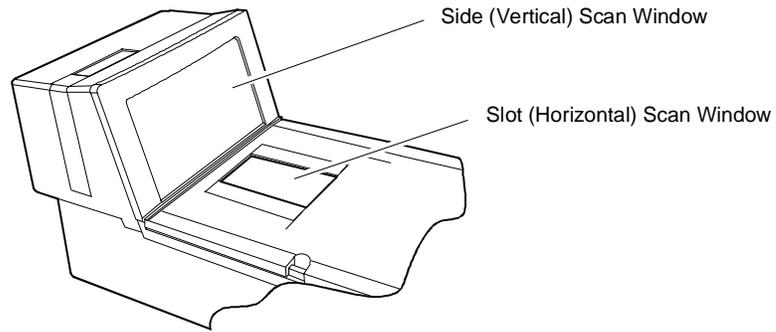


Slot Scanner Window

The (horizontal) scan window is mounted in the Top Plate. The window (if diamond-coated) is replaced by removing the Top Plate, snapping out the old window, and snapping the new window in place. The slot scanner window is available as diamond-coated glass or sapphire glass. Diamond-coated glass was formerly known as “scratch-resistant” glass. Sapphire glass is the upgrade and was formerly known as “scratch-proof” glass. Other glass options such as “hardened” and “armor” glass have been discontinued.

Side Scanner Window

The NCR 7870 vertical scan window is mounted in a tower that rises above the checkstand surface. The scan window can be removed from the unit for cleaning. The upper console containing the scan window is designed to withstand occasional impacts.



Scale Features and Functions

The scale is used in the 2000, 4000, and 4500 models. It can be manufactured by NCR or by a vendor for a specialized market such as the price-computing scale in the 4500 model to meet European standards.

Scale Functions and Features

Load Cell

The NCR 7870 uses a single load cell rather than four, which is more typical, to increase reliability. The scale has a settling time of 0.9 seconds for items weighing less than 2.3 kg (5 lbs.) It is sealed to avoid damage from spills around the unit. There are three basic types of load cells:

- For weighing in pounds. Capacity: 30 lbs.
- For weighing in kilograms. Capacity: 9.995 kg
- For weighing in kilograms. Capacity: 13.995 kg

Reset / Scale Zero

A front-mounted Scale Reset button is located on the front bezel, to the left of the vertical scan window. This flush membrane switch will reset the scale due to fluctuation from extreme temperature drift, impact, or scale tare up to:

1. 0.3 kg (0.6 lbs.) relative to the zero established during the most recent power-on sequence

or

2. 0.6 kg (1.2 lbs.) relative to the calibration zero, whichever is less.

The scale reset function is completed in less than a second.

Auto-Zero

Scale electronics automatically tracks out stable shifts due to temperature changes and compensates in 3 g (0.006 lb.) increments up to a maximum of 0.3 kg (0.6 lbs.).

Kits

Kit Name	Kit Type	Available for
Enhanced Scratch Resistant Window 7870-K002-V001	Hardware	7870-1000 7870-2000
Upper Windows (Qty: 5) 7870-K003-V001	Hardware	All
Stainless Steel Top Plate 7870-K005-V002	Hardware	7870-1000 7870-2000
Scale Shell Model 7870-K007-V001	Hardware	N/A
Digital Board Upgrade (Board, Firmware) 7870-K100-V001	Hardware, Firmware	All
Requirements: For units with S/Ns below 50-28901727, adds Speech and Coupon Add-On Code.		
PACESETTER <i>Plus</i> Upgrade (OCIA/IBM) 7870-K401-V001, -V002	Firmware	All
Requirements: V001 supports units with S/Ns 50-28901727 or lower. V002 supports units with S/Ns 50-00000000 and higher.		

Kit Name	Kit Type	Available for
PACESETTER <i>Plus</i> Upgrade (RS-232/Datachecker) 7870-K402-V003, -V002, -V003	Firmware	All
Requirements: V001 supports units with S/Ns 50-28901727 or lower. V002 supports units with S/Ns 50-00000000 and higher. V003 has a PACESETTER <i>Plus</i> trailer fix.		
Multi-Symbol Upgrade 7870-K404-V002	Firmware	All
Requirements: For units with S/Ns 50-28901727 and higher. If upgrading a unit with a lower S/N, install kit 7870-K100.		
13.995 kg Upgrade 7870-K440-V001	Firmware, Hardware	7870-2000
Requirements: For upgrade from 9.995 kg to 13.995 kg on units with S/Ns 50-28901727 and higher. To upgrade a unit with a lower S/N, install kit 7870-K100.		
OCIA/IBM Interface – Single Cable 7870-K450-V001, -V002	Hardware, Firmware	All
Requirements: V001 supports units with S/Ns 50-28901727 or lower. V002 supports units with S/Ns 50-00000000 and higher.		
OCIA/Interface – Dual Cable 7870-K451-V001, -V002	Hardware, Firmware	7870-2000
Requirements: V001 supports units with S/Ns 50-28901727 or lower. V002 supports units with S/Ns 50-00000000 and higher.		

Kit Name	Kit Type	Available for
RS-232 Interface (Board, Firmware) 7870-K452-V003	Hardware, Firmware	All
Requirements: V001 supports units with S/Ns 50-28901727 or lower. V002 supports units with S/Ns 50-00000000 and higher. V003 enhances the old digital board firmware.		
Datachecker, 2170, ICL MDL, ICL 9518/9535, SASI Interface 7870-K455-V001, -V002, -V003	Hardware, Firmware	All
Requirements: Kit is for interfacing with these host terminals: NCR 2170 (RS-232, Weightronix Emulation), Avery Emulation (RS-232), Datachecker (RS-422), ICL MDL, ICL 9518, ICL 9535 (ICL Team POS 5000), SASI. V001 supports only ICL T2001, V002 supports units with S/Ns 50-28901727 or lower. V003 supports units with S/Ns 50-00000000 and higher.		
Non NCR OCIA 7870-K457-V002	Hardware, Firmware	All
Requirements: V001 supports units with S/Ns 50-28901727 or lower. V002 supports units with S/Ns 50-00000000 and higher.		
Casio and TEC Scale Interface 7870-K458-V003	Hardware, Firmware	7870-2000
Requirements: V001 supports units with S/Ns 50-28901727 or lower. V002 supports units with S/Ns 50-00000000 and higher. V003 supports the same as V002 plus TEC.		

Kit Name	Kit Type	Available for
IBM 4682/4693/4694 Standard Interface and IBM 4682-4B Full ASCII Interface 7870-K459-V002	Hardware, Firmware	All
Requirements: V001 supports units with S/Ns 50-28901727 or lower. V002 supports units with S/Ns 50-00000000 and higher.		
Datachecker 2000 Interface 7870-K463-V001	Hardware	All
Requirements: 7870 must be configured for Single-Cable, OCIA.		
Dual Cable RS-232 Interface for I/F 1 7870-K465-V001	Hardware, Firmware	7870-2000
Requirements: 7870 must be configured for OCIA or IBM communications. Avery Emulation (RS-232), Weightronix Emulation (RS-232) for scanners with an I/F 1 Interface Board.		
Australia with I/F 1 Interface to 2126 Dual Cable 13.995 kg (Coles) 7870-K466-V001	Hardware, Firmware	7870-2000, kg units only
Requirements: For upgrading units with a) S/Ns 50-28901727 and higher and b) I/F 1 Interface Board from 9.995 kg to 13.995 kg. To upgrade units with lower S/Ns, kit 7870-K100 must also be installed. If the unit has an I/F 2 Interface Board, kit 7870-K450 must also be installed.		
Integrated Display 7870-K480-V001	Hardware	All

Kit Name	Kit Type	Available for
Top Plate with Scratch-Proof Window (Standard size) 7870-K601-V001	Hardware	7870-1000 7870-2000
Top Plate with Scratch-Proof Window (Compact) 7870-K605-V001	Hardware	7870-3000
WalMart/ Argentina Upgrade 7870-K846-V001	Hardware, Firmware	7870-2000
Requirements: To upgrade a 9.995 kg scanner/scale to Argentina requirements, unit must have a) S/N 50-28901727 or higher and b) an NCR 7825 Remote Display.		
Coupon Add-On Code Upgrade 7870-K850-V001	Firmware	All
Requirements: For units with S/Ns between 50-28901727 and 50-31148616. For units with S/Ns 50-2891727, use kit 7870-K100. For units with S/Ns 50-31148616 and larger, no kit is needed – enable feature through programming options.		
Checkpoint Scanner Bezel 7870-K896-V001	Hardware	7870-1000 7870-3000
Requirements: A Checkpoint representative must make the final connection from the 7870 to the Checkpoint equipment after kit installation.		

Kit Name	Kit Type	Available for
Checkpoint Scanner/Scale Bezel 7870-K898-V002, -V003	Hardware	
<p>Requirements: Kit is mandatory for upgrading to Checkpoint on units with S/N 50-32573274 or lower. For units with higher S/Ns, may use this kit or kit 7870-K899-V001. V002 is for use in U.S. and Mexico only. A Checkpoint representative must make the final connection from the 7870 to the Checkpoint equipment after kit installation.</p>		
Checkpoint Scanner/Scale Bezel 7870-K899-V001	Hardware	
<p>Requirements: For units with a S/N 50-32573274 and higher. For units with a lower S/N, install kit 7870-KK898-V003. A Checkpoint representative must make the final connection from the 7870 to the Checkpoint equipment after kit installation.</p>		

Chapter 3: Site Preparation

For the NCR 7870 to operate efficiently and safely, the selected installation site must meet certain requirements. Ensuring that these conditions are met and maintained will protect the 7870 from unnecessary wear and potential damage as well as easing installation. This chapter covers

- Getting Started
- About Site Preparation
- Customer Responsibilities
- Environmental Requirements
- Checkstand Power and Wiring Considerations
- Checkstand Considerations
- Cable Lengths and Hole Sizes
- 7870 Dimensions

Getting Started

The first step to preparing the selected site is to read the following two sections – ***About Site Preparation*** and ***Customer Responsibilities***.

These sections provide important information about NCR's and your responsibilities to keep the NCR 7870 safe and in good working order.

The next step is to evaluate the chosen site for its suitability. As a minimum, these conditions need to be accessed:

- Is the environment controlled within the 7870's operational range for temperature, temperature change, relative humidity, barometric pressure, ambient light, acoustic noise, vibration, and shock?
- Will other electronics be placed in checkstand which could necessitate use of forced air to regulate the temperature?
- Will the power circuit to supply the 7870 be
 - dedicated to NCR equipment only and so labeled,
 - equipped with an isolated, insulated ground,
 - providing the required input to the Power Supply,
 - equipped with a recessed, 15-amp circuit breaker convenient to the checker, and
 - equipped with protection against voltage transients?
- Is the checkstand
 - able to securely support the weight of the 7870 and
 - properly ventilated?
- Has the plan for the checkstand design considered
 - use of a diverter or an adjustable plate,
 - clearance needed for service and customer viewing of display,
 - location and size of hole for cable routing, and
 - providing enough slack in cables so 7870 may be removed from checkstand for service without disconnection?

The following sections contain the NCR 7870's requirements. These specifications will allow you to evaluate the site for installation.

The last step is to implement the necessary changes before beginning the installation process described in **Chapter 4: Installation**.

About Site Preparation

This chapter contains the information necessary for the preparation of a site conforming to NCR specifications. It is very important that the site complies with the requirements in this document because, once the equipment has been installed, deficiencies in site preparation or the problems caused by these deficiencies are much more difficult to detect or correct. Further, failure to comply with these requirements or to take proper steps to protect equipment against risks identified in this document may cause serious damage to the equipment and to the customer's business.

In addition to the need to comply with the requirements specified, electrical wiring and mechanical systems must also comply with all relevant codes, laws, and regulations.

It is important that the site be prepared by a customer or a customer agent who is fully conversant with the special requirements of electronic equipment. The responsibility of ensuring that the site is prepared in compliance with this document remains with the customer.

For information and guidance purposes only, a list is provided, in general terms, of these matters for which the customer is responsible. This list is not intended to be comprehensive, and in no way modifies, alters, or limits the responsibility of the customer for all aspects of adequate site preparation.

NCR staff is available to answer questions relating to the contents of this document, but except where:

- a) the customer has been notified that a full or partial consultancy service is available and/or that NCR is willing to undertake a preliminary or final site survey and
- b) the customer shall have entered into a formal contract with NCR for provision of the same.

No comment, suggestion, or advice offered or not offered about preparation of the site nor any inspection of the site whether before or after preparation is to be taken as approval of the location of the site and equipment or of its preparation, and NCR is not liable in respect of any comment, suggestion, or advice given by its staff or in respect of any failure to give advice.

Finally, only the customer can know the full extent of damage which may be caused to his business by reason of failure of the equipment which is to be installed. For this reason, it is the customer's responsibility to ascertain the extent of any such possible damage to his existing or planned business, and to effect full insurance in respect of it.

Customer Responsibilities

The customer must do or provide the following.

- When required by NCR, provide the NCR Customer Services Representative with appropriate drawings that indicate
 - location of equipment,
 - site wiring (power and signal, paths, and lengths),
 - Location of other equipment capable of generating large amounts of electrical noise, electromagnetic interference, heat, and so on.
- Provide floor coverings and environmental systems that prevent static electricity build-up and discharge.
- Provide and install necessary power distribution boxes, conduits, grounds, lightening arrestors, and associated hardware.
- Make sure clear space and environmental requirements of the unit are met.
- Make all building alterations necessary to meet wiring and other site requirements.
- Make sure all applicable codes, regulations, and laws (including, but not limited to, electrical, building, safety, and health) are met.
- Provide and install all communication cables, wall jacks, special connectors, and associated hardware.
- Provide and install auxiliary power or other equipment as required.

Environmental Requirements

Operating Range

Condition	Range
Temperature	10° C – 40° C (50° F – 104° F)
Temperature Change	10° C per hour (18° F per hour)
Relative Humidity	5% to 95%, Non-Condensing
Barometric Pressure	79.5 x 10 ³ Pa to 105 x 10 ³ Pa
Ambient Light	200 Foot-candles max (2152 Lux) on both scanner windows
Acoustical Noise	55 dBa or less
Vibration and Shock	1 to 10 Hz with a double amplitude of 0.127 cm (0.05 in.) 10 to 300 Hz with a maximum of 0.25 gee

Extreme Operating Range

Condition	Range
Temperature	-15° C to 45° C (5° F to 113° F) one hour max
Temperature Change	20° C per hour (36° F per hour)
Relative Humidity	5% to 95%, Non-Condensing

Storage Range

Condition	Range
Temperature	-15° C to 50° C (5° F to 120° F)
Temperature Change	20° C per hour (36° F per hour)
Relative Humidity	5% to 95%, Non-Condensing

Transit Range

Condition	Range
Temperature	-40° C to 60° C (-40° F to 140 F)
Temperature Change	20° C per hour (36° F per hour)
Relative Humidity	5% to 95%, Non-Condensing
Barometric Pressure	74 x 10 ³ Pa to 105 x 10 ³ Pa

Checkstand Power and Wiring Considerations

Power Considerations

In the 1000 and 2000 models, the 7870 receives power from an external supply which is normally mounted to the exterior surface of the unit's chassis. The power supply may be mounted near the 7870 rather than on it, if advantageous.

In the 3000, 4000, and 4500 models, the power supply is mounted on the checkstand.

It is a 40-watt switching power supply with the following inputs.

Voltage	Frequency	Input Power
90 to 260 Vac	47 to 63 Hz	55 Watts

Power Applications

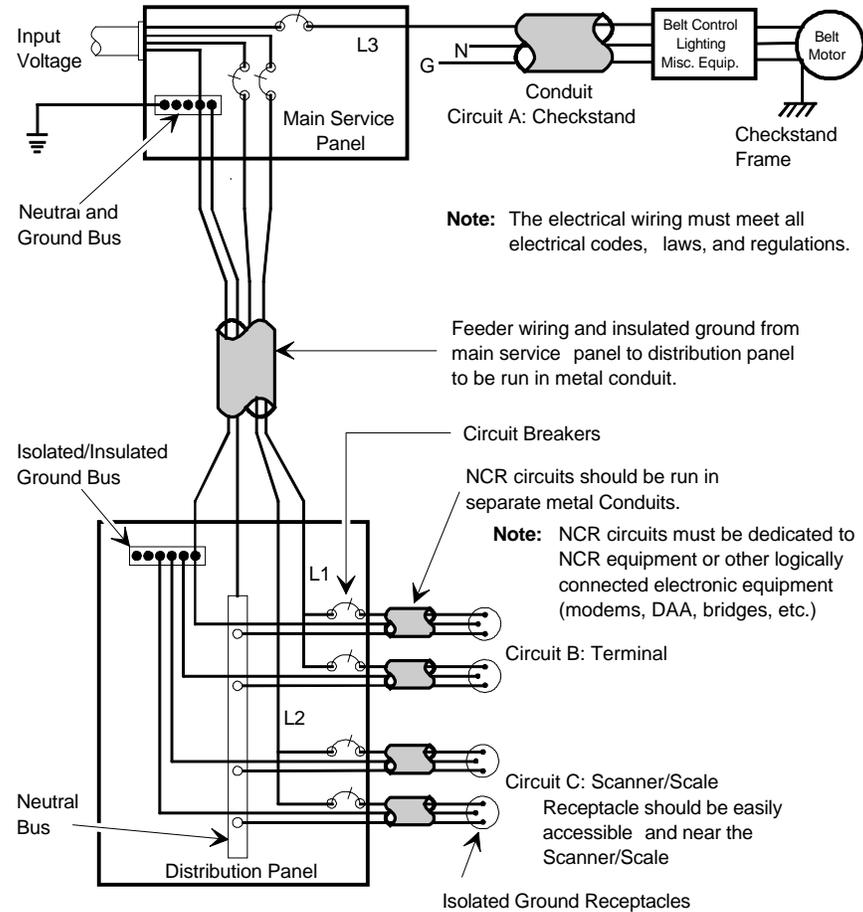
The 7870 has no ON/OFF switch. A recessed, 15 amp circuit breaker must be wired in the checkstand. This circuit breaker must be accessible to the operator so the unit may be powered off and on. It will also be needed to reset the unit during programming.

Power Transients Protection

Voltage transients -- surges, sags, impulses, and spikes -- may be experienced routinely or sporadically. When such conditions exist, the use of protective devices may be required to ensure proper operation.

Wiring Considerations

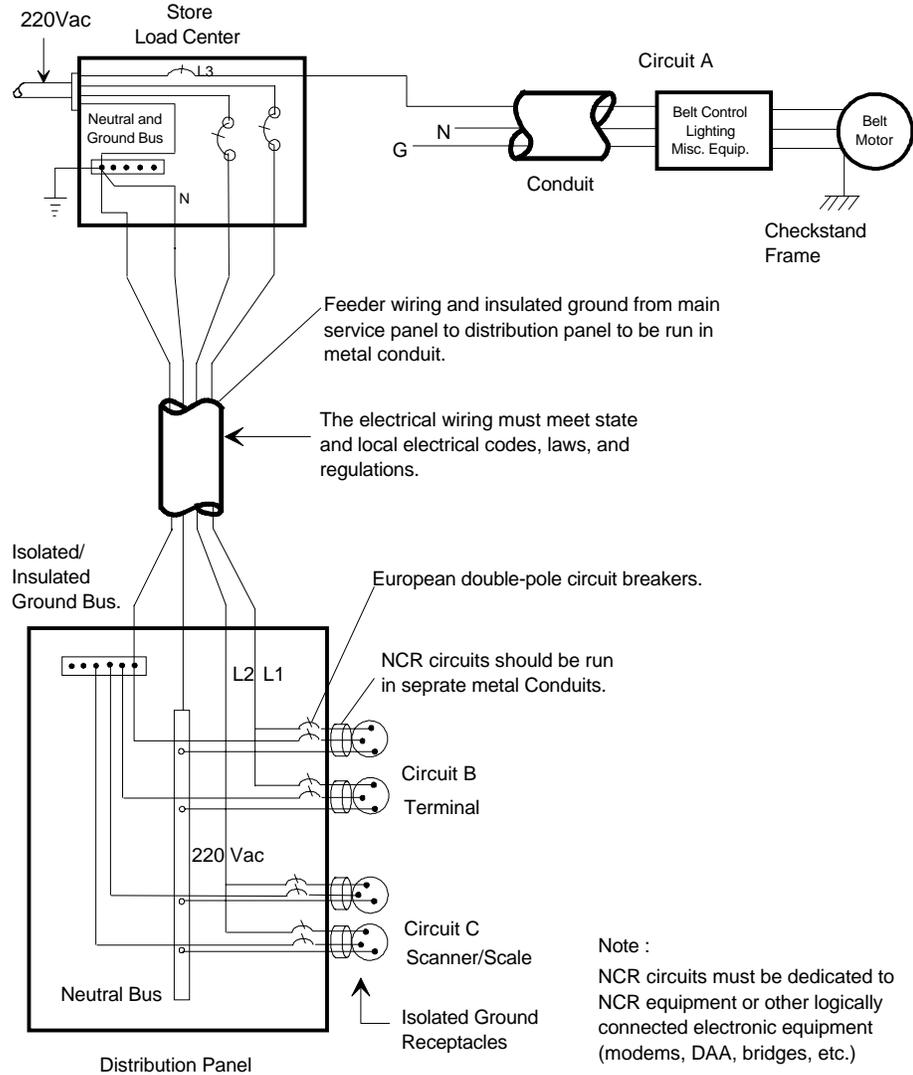
U.S., Canadian, and Japanese Checkstand Wiring



Installation Type	Input Voltage	L1, L2	Circuit Breakers
U.S., Canada, & Japan	100Vac to 120Vac	100Vac to 120Vac	Standard single-pole; value determined by type of device branch and by electrical code.
International	220Vac to 240Vac	220Vac to 240Vac	
European	220Vac	220Vac	European double-pole.

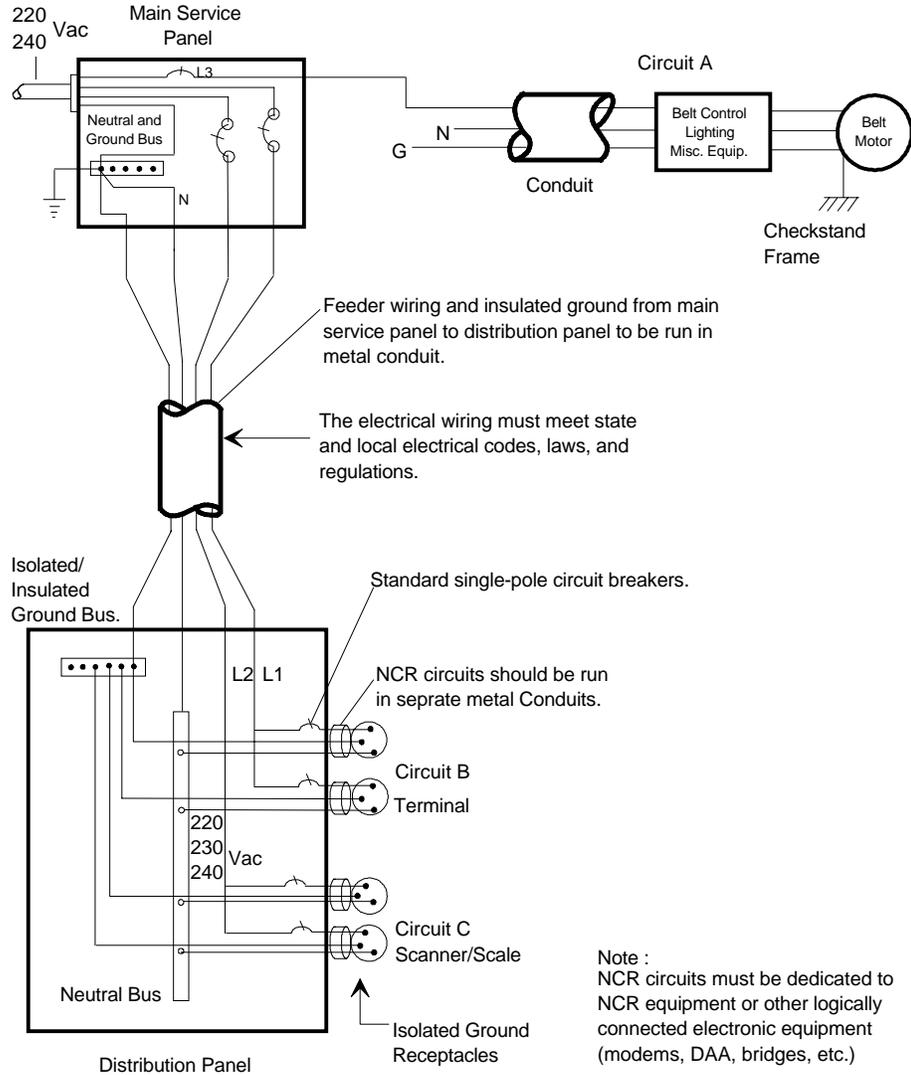
European Checkstand Wiring

Use this diagram when line voltage to the Service Panel is 220 Vac and European double-pole circuit breakers are used in the Distribution Panel.



International Checkstand Wiring

Use this diagram when the line voltage to the Service Panel is 220 or 240 Vac and standard single pole circuit breakers are used in the Distribution Panel.



Wiring Instructions

Running Feeder Lines from Main Service Panel

1. Select the most appropriate wiring diagram as a guide.
2. Run two separate feeder lines in conduit from the Main Service Panel in the checkstand to the customer equipment and to the NCR Distribution Panel.
 - Line 1 services Circuit A which is for customer equipment such as checkstand belt motor, counter lighting, and cooling fans.
 - Line 2 is dedicated to service the NCR equipment, typically Circuit B and Circuit C.

Circuit A

3. Electrically connect the grounding conductor in Circuit A to Store Ground.
4. Electrically connect conduit and checkstand junction box to the frame of the checkstand, if conductive, or to a common tie point if not conductive.
5. Connect to the grounding conductor in Circuit A (which is Store Ground) any
 - conduit,
 - metal parts,
 - store ground devices
 - counter belt motor ground, and
 - other counter equipment grounds.

Circuit B

The ground conductor in Circuit B (to the host terminal) is an isolated, insulated ground – it must be isolated from the outlet box for the host terminal. The circuit breaker in the power conductor of Circuit B is optional. If used, it should be near the operator and recessed.

Circuit C

The power conductor in Circuit C (to the NCR 7870) should include a 15 Amp circuit breaker located near the operator. The circuit breaker should be recessed to prevent being accidentally switched on or off.

Note: The outlet boxes for the NCR equipment must be isolated and insulated from the ground conductor, convenient to the equipment, readily accessible, and labeled as exclusively for use with NCR equipment.

Checkstand Considerations

Careful planning of how the checkstand and 7870 work together can improve flow and ergonomics. An evaluation of the checkstand should take into consideration:

- weight of the 7870,
- ventilation,
- service clearance to the 7870,
- display clearance,
- power on and off,
- secure fit and mounting in the cutout for the 7870,
- item diverter (optional),
- adjustable plate (optional),

Ventilation Requirements

The NCR 7870 Scanner/Scale does not need an exhaust fan in the checkstand provided

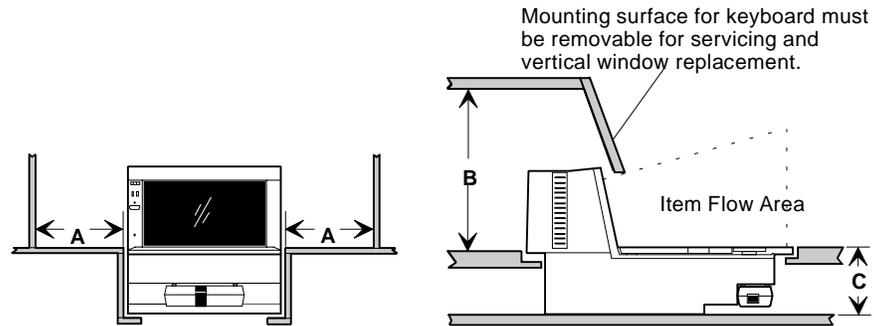
- there is adequate convection air flow,
- no other equipment in the checkstand raises the temperature in the checkstand to more than 7° C (12.6° F) above the ambient temperature, and
- the temperature inside the checkstand does not exceed 40° F.

If the checkstand contains other heat producing equipment, forced air may be needed to keep the temperature within the 7870's operating range. If forced air is used, air coming into or leaving the checkstand **MUST NOT** enter or exit past the 7870.

Service Clearance

The 7870 is designed to allow servicing without removal from the checkstand. This includes component removal and replacement, scale calibration, and installation of the Weights and Measures seal. To take advantage of this design feature, an area for service clearance must be provided.

Note: Access to the Power Supply may require removal of the 7870 from the checkstand.



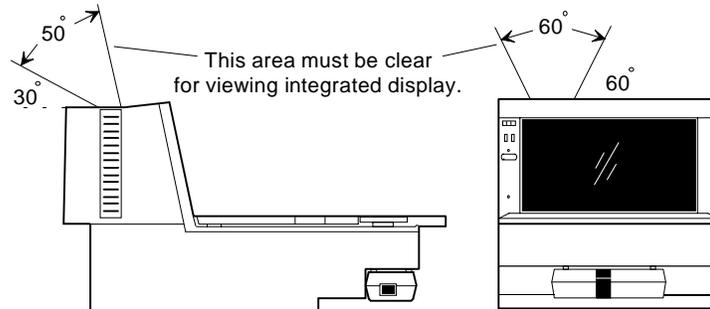
A = 20.3 cm (8.0 in.) minimum if checkstand structure is not removable for servicing.
2.5 cm (1.0 in.) minimum if checkstand structure is removable for servicing.

B = 33.0 cm (13.0 in.) minimum if checkstand structure is not removable for servicing.
17.8 cm (7.0 in.) minimum if checkstand structure is removable for servicing.

C = 13.0 cm (5.1 in.) minimum clearance to closest checkstand panel. The 7870-1000 or 2000 must not be supported by this panel.

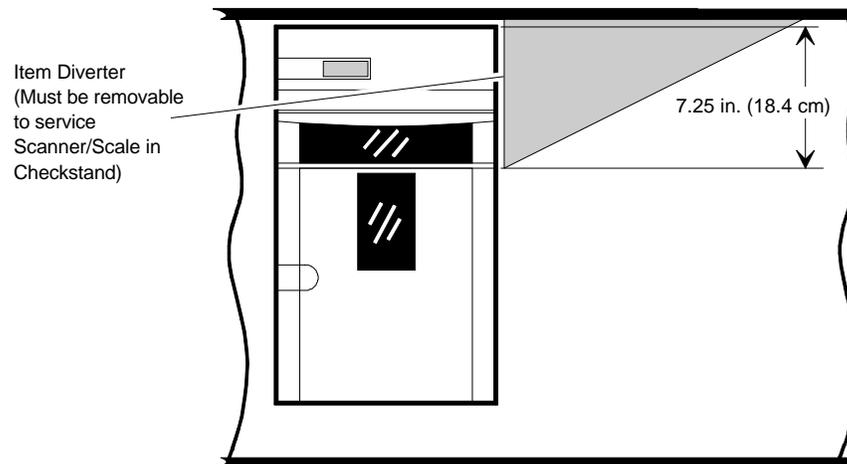
Display Clearance

If the 7870 Scanner/Scale has an integrated display, there must be adequate clearance for viewing by the customer. In the U.S., this is a Weights and Measurements requirement. International countries should check with their appropriate local or government agency. If the checkstand design restricts viewing, the NCR 7825 Remote Display may be used to meet visibility requirements.



R0118

Item Diverter

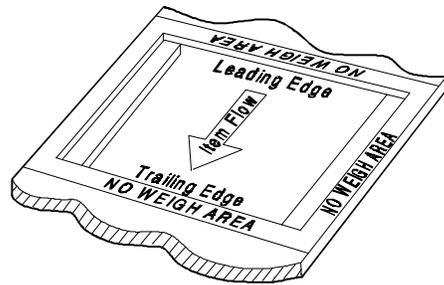


R0131

Checkstand Hole

When cutting the checkstand hole, also called a cutout, take care to maintain the specified dimensions. While this is essential for all models, it is critical for units with a scale.

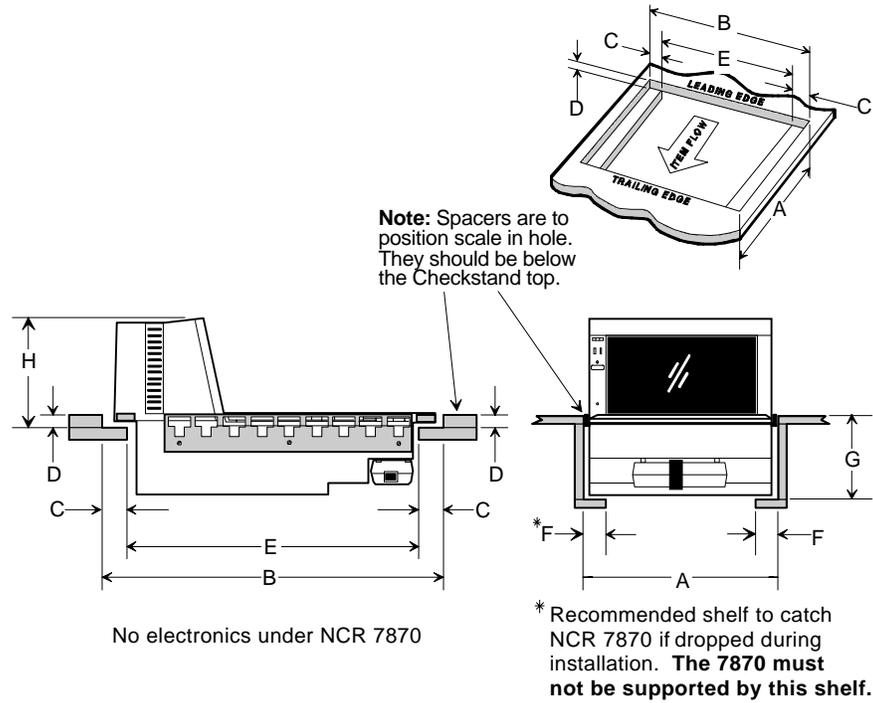
- For all models, the leading edge of the Top Plate must be flush or no more than 15 cm (0.06 in.) below the top of the checkstand. The trailing edge of the Top Plate must be flush with the top of the checkstand.
- For proper scale operation, the clearance between leading and trailing edges of the Top Plate and the checkstand must be maintained.
- For European installations, a 5.1 cm (2 in.) border must be provided around the leading edge, trailing edge, and operator side of the scanner scale. This border must contain the words “NO WEIGH AREA.”



99999

An NCR 7870-1000 may be placed in an existing cutout for an NCR 7820 and an NCR 7870-2000 may go into a cutout for the NCR 7824. Before utilizing an existing cutout, you **MUST** ensure that the cutout has the correct dimensions before installing the 7870.

Checkstand Hole - Models 1000 & 2000



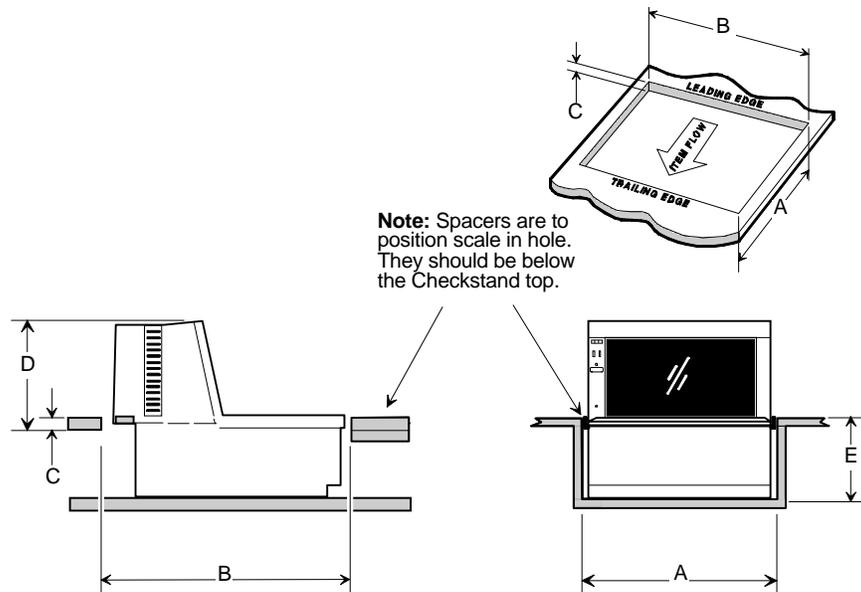
NCR 7870-1000 Scanner

A	B	C	D	E	F	G	H
29.51 cm	50.95 cm	3.49 cm	0.95 cm	43.97 cm	3.49 cm	13.0 cm	15.88 cm
11 5/8 in.	20 1/16 in.	1 3/8 in.	3/8 in.	17 5/16 in.	1 3/8 in.	5 1/8 in.	6 1/4 in.

NCR 7870-2000 Scanner/Scale

A	B	C	D	E	F	G	H
30.48 cm	50.95 cm	3.49 cm	1.27 cm	43.97 cm	3.49 cm	13.0 cm	15.88 cm
12 in.	20 1/16 in.	1 3/8 in.	1/2 in.	17 5/16 in.	1 3/8 in.	5 1/8 in.	6 1/4 in.

Checkstand Hole - Models 3000, 4000, & 4500



No electronics under the 7870

NCR 7870 - 3000 Scanner

A	B	C	D	E
29.51 cm	34.50 cm	0.95 cm	15.88 cm	12.54 cm
11 5/8 in.	13 5/8 in.	3/8 in.	6 1/4 in.	4 15/16 in.

NCR 7870 - 4000 & 4500 Scanner/Scale

A	B	C	D	E
30.48 cm	43.97 cm	1.27 cm	15.88 cm	12.54 cm
12.00 in.	17 3/8 in.	1/2 in.	6 1/4 in.	4 15/16 in.

Note: The 7870-3000, 4000, and 4500 **must** sit on a shelf below the checkstand surface. It cannot be suspended like the other units. Also, the shelf should be open at the front and back.

Cable Lengths and Hole Sizes

When selecting a cable, take care to choose one with enough length for easy routing to the NCR 7870. Also, include enough slack to allow the unit to be lifted from the cutout without disconnecting the cables. This will be beneficial while servicing the unit.

Minimum hole size data is provided for making openings to pass cables through the checkstand. Ensure after drilling that there are no sharp edges which may damage the cable.

The following charts provide cable length and hole size data for AC Power Cords, DC Power Cables, Interface Cables, and Remote Display Cables. The NCR 7870 can connect to any NCR Retail Terminal as well as many competitive host terminals so a comprehensive list of interface cables has been provided.

Cable Hole Diameters

Cable	Minimum Hole Size
Power Cord – Outlet to Power Supply	3.18 cm (1.25 in.)
Power Cable – Power Supply to 7870	1.52 cm (0.60 in.)
Interface Cable	1.90 cm (0.75 in.)
Remote Display Cable	1.90 cm (0.75 in.)

DC Power Cable – Power Supply to 7870

Minimum Hole Diameter: 1.52 cm (0.60 in.)

Cable	Cable Length
DC Power Cable	1.22 Meters (4 Feet)

Note: DC Power Cable length is not a factor if the Power Supply is mounted on the chassis of the 7870 (Models 1000 and 2000 only).

AC Power Cords – Outlet to Power Supply

Minimum Hole Diameter: 3.18 cm (1.25 in.)

Cable	Cable Length
US Standard	3.05 Meters (10 Feet)
US Twist-Lock	3.05 Meters (10 Feet)
International Pig-Tail	3.05 Meters (10 Feet)
Japan Standard	3.05 Meters (10 Feet)
Japan Twist-Lock	3.05 Meters (10 Feet)
Australia	3.05 Meters (10 Feet)
UK, Argentina	3.05 Meters (10 Feet)
Swiss	3.05 Meters (10 Feet)

Remote Display Cables

Minimum Hole Diameter: 1.90 cm (0.75 in.)

Display	Cable Corporate ID	Cable Length
7825	1416-C022-0040	4 m (13.1 ft.)
	1416-C022-0080	8 m (26.2 ft.)
2552, 2557	1416-C068-0040	4 m (13.1 ft.)
	1416-C068-0080	8 m (26.2 ft.)

Interface Cables - NCR Host Terminals

Minimum Hole Diameter: 1.90 cm (0.75 in.)

Host Terminal	Interface	Cable	Corporate ID	Part Number	Length
1255	OCIA	Dual-Cable Scanner	1416-C026-0040	497-0300521	4 m (13.1 ft.)
		Dual-Cable Scanner	1416-C026-0080	497-0300522	8 m (26.2 ft.)
		Dual Cable Scale	1416-C027-0040	497-0300533	4 m (13.1 ft.)
		Dual Cable Scale	1416-C027-0080	497-0300534	8 m (26.2 ft.)
2113	OCIA	Scanner Only	1416-C230-0050	497-0302099	5 m (16.4 ft.)
2123	OCIA	Dual-Cable Scanner	2123-K315	230-0113973	
		Dual-Cable Scale	2123-K315	230-0113973	
2126	OCIA	Dual-Cable Scanner	1416-C014-0040	497-0300361	4 m (13.1 ft.)
		Dual-Cable Scanner	1416-C014-0080	497-0300362	8 m (26.2 ft.)
		Dual-Cable Scale	1416-C015-0040	497-0300371	4 m (13.1 ft.)
		Dual-Cable Scale	1416-C015-0080	497-0300372	8 m (26.2 ft.)
2127	OCIA	Single-Cable	1416-C016-0040	497-0300310	4 m (13.1 ft.)
		Single-Cable	1416-C016-0080	497-0300311	8 m (26.2 ft.)
2151, 2152	OCIA	Scanner Only	1416-C234-0040	497-0402970	4 m (13.1 ft.)
2154, 2155	OCIA	Single-Cable	1416-C012-0040	497-0300340	4 m (13.1 ft.)
2156, 2157		Single-Cable	1416-C012-0080	497-0300341	8 m (26.2 ft.)
		Dual-Cable Scanner	1416-C012-0040	497-0300340	4 m (13.1 ft.)
		Dual-Cable Scanner	1416-C012-0080	497-0300341	8 m (26.2 ft.)
		Dual-Cable Scale	1416-C013-0040	497-0300350	4 m (13.1 ft.)
		Dual-Cable Scale	1416-C013-0080	497-0300351	8 m (26.2 ft.)

Interface Cables – NCR Host Terminals (cont.)

Host Terminal	Interface	Cable	Corporate ID	Part Number	Length
2170	RS-232	Scanner Only	1416-C069-0040	497-0301380	4 m (13.1 ft.)
		Scanner Only	1416-C069-0080	497-0301381	8 m (26.2 ft.)
		Dual-Cable Scanner	1416-C069-0040	497-0301380	4 m (13.1 ft.)
		Dual-Cable Scanner	1416-C069-0080	497-0301381	8 m (26.2 ft.)
		Dual-Cable Scale	1416-C233-0040	497-0302149	4 m (13.1 ft.)
		Dual-Cable Scale	1416-C233-0080	497-0302161	8 m (26.2 ft.)
2552	OCIA	Dual-Cable Scanner	1416-C026-0040	497-0300521	4 m (13.1 ft.)
		Dual-Cable Scanner	1416-C026-0080	497-0300522	8 m (26.2 ft.)
		Dual-Cable Scale	1416-C028-0040	497-0300543	4 m (13.1 ft.)
		Dual-Cable Scale	1416-C028-0080	497-0300544	8 m (26.2 ft.)
2557	OCIA	Dual-Cable Scanner	1416-C026-0040	497-0300521	4 m (13.1 ft.)
		Dual-Cable Scanner	1416-C026-0080	497-0300522	8 m (26.2 ft.)
		Dual-Cable Scale	1416-C027-0040	497-0300533	4 m (13.1 ft.)
		Dual-Cable Scale	1416-C027-0080	497-0300534	8 m (26.2 ft.)
2760	OCIA	Single-Cable	1416-C011-0040	497-0300170	4 m (13.1 ft.)
		Dual-Cable Scanner	1416-C011-0040	497-0300170	4 m (13.1 ft.)
		Dual-Cable Scale	1416-C061-0040	497-0301144	4 m (13.1 ft.)
2950	OCIA	Scanner Only	1416-C234-0040	497-0402970	4 m (13.1 ft.)
5932	RS-232	Scanner Only	1416-C239-0040	497-0407723	4 m (13.1 ft.)
7050, 7051	OCIA	Single-Cable	1416-C012-0040	497-0300340	4 m (13.1 ft.)
		Single-Cable	1416-C012-0080	497-0300341	8 m (26.2 ft.)
		Dual-Cable Scanner	1416-C012-0040	497-0300340	4 m (13.1 ft.)
		Dual-Cable Scanner	1416-C012-0080	497-0300341	8 m (26.2 ft.)
		Dual-Cable Scale	1416-C013-0040	497-0300350	4 m (13.1 ft.)
		Dual-Cable Scale	1416-C013-0080	497-0300351	8 m (26.2 ft.)

Interface Cables – NCR Host Terminals (cont.)

Host Terminal	Interface	Cable	Corporate ID	Part Number	Length
7052, 7053, 7054	OCIA	Single-Cable	1416-C011-0040	497-0300170	4 m (13.1 ft.)
		Dual-Cable Scanner	1416-C011-0040	497-0300170	4 m (13.1 ft.)
		Dual-Cable Scale	1416-C061-0040	497-0301144	4 m (13.1 ft.)
7058	OCIA	Scanner Only	1416-C230-0050	497-0302099	5 m (16.4 ft.)
7070	OCIA	Single-Cable	1416-C012-0040	497-0300340	4 m (13.1 ft.)
		Single-Cable	1416-C012-0080	497-0300341	8 m (26.2 ft.)
		Dual-Cable Scanner	1416-C012-0040	497-0300340	4 m (13.1 ft.)
		Dual-Cable Scanner	1416-C012-0080	497-0300341	8 m (26.2 ft.)
		Dual-Cable Scale	1416-C013-0040	497-0300350	4 m (13.1 ft.)
		Dual-Cable Scale	1416-C013-0080	497-0300351	8 m (26.2 ft.)
7445	RS-232	Single-Cable	1416-C019-0040	497-0300422	4 m (13.1 ft.)
		Single-Cable	1416-C019-0080	497-0300423	8 m (26.2 ft.)
7450	OCIA	Single-Cable	1416-C011-0040	497-0300170	4 m (13.1 ft.)
		Dual-Cable Scanner	1416-C011-0040	497-0300170	4 m (13.1 ft.)
		Dual-Cable Scale	1416-C061-0040	497-0301144	4 m (13.1 ft.)
7452, 7453	RS-232	Single-Cable	1416-C019-0040	497-0300422	4 m (13.1 ft.)
		Single-Cable	1416-C019-0080	497-0300423	8 m (26.2 ft.)

Interface Cables - Casio Host Terminals

Minimum Hole Diameter: 1.90 cm (0.75 in.)

Host Terminal	Interface	Cable	Corporate ID	Part Number	Length
2100	OCIA	Dual-Cable Scanner	1416-C072-0040	497-0301403	4 m (13.1 ft.)
	4-Bit Parallel	Dual-Cable Scale	1416-C073-0040	497-0301404	4 m (13.1 ft.)

Interface Cables – Data Checker Host Terminals

Minimum Hole Diameter: 1.90 cm (0.75 in.)

Host Terminal	Interface	Cable	Corporate ID	Part Number	Length
2200	MDL/ Datachecker	Single-Cable	1416-C144-0040	497-0301889	4 m (13.1 ft.)
T2001	MDL/ Datachecker	Single-Cable	1416-C062-0040	497-0301152	4 m (13.1 ft.)

Interface Cables – Epson Host Terminals

Minimum Hole Diameter: 1.90 cm (0.75 in.)

Host Terminal	Interface	Cable	Corporate ID	Part Number	Length
Epson PC	RS-232	Single-Cable	1416-C357-0040	497-0408212	4 m (13.1 ft.)

Interface Cables – Gilbarco Host Terminals

Minimum Hole Diameter: 1.90 cm (0.75 in.)

Host Terminal	Interface	Cable	Corporate ID	Part Number	Length
TCR-15	RS-232	Scanner Only	1416-C237-0040	497-0303139	4 m (13.1 ft.)

Interface Cables – IBM Host Terminals

Minimum Hole Diameter: 1.90 cm (0.75 in.)

Host Terminal	Interface	Cable	Corporate ID	Part Number	Length
4683, 4684	IBM 4683 Port 17	Single-Cable	1416-C020-0040	497-0300402	4 m (13.1 ft.)
		Single-Cable	1416-C020-0080	497-0300403	8 m (26.2 ft.)
4682, 4683, 4684, 4693	IBM Port 9B	Single-Cable	1416-C070-0040	497-0301390	4 m (13.1 ft.)
		Single-Cable	1416-C070-0080	497-0301391	8 m (26.2 ft.)
4683, 4684	OCIA Port 5B	Single-Cable	1416-C142-0040	497-0301751	4 m (13.1 ft.)
4694	IBM Port 9E	Single-Cable	1416-C070-0040	497-0301390	4 m (13.1 ft.)
		Single-Cable	1416-C070-0080	497-0301390	8 m (26.2 ft.)
PC	RS-232 9-pin	Single-Cable	1416-C019-0040	497-0300422	4 m (13.1 ft.)
		Single-Cable	1416-C019-0080	497-0300423	8 m (26.2 ft.)

Interface Cables – ICL Host Terminals

Minimum Hole Diameter: 1.90 cm (0.75 in.)

Host Terminal	Interface	Cable	Corporate ID	Part Number	Length
9518-01, 9518-21, 9518-61, 9518-62, 9518-71	OCIA	Scanner Only	1416-C264-0040	497-0404882	4 m (13.1 ft.)
		Scanner Only	1416-C264-0080	497-0404883	8 m (26.2 ft.)
		Dual-Cable Scanner	1416-C264-0040	497-0404882	4 m (13.1 ft.)
		Dual-Cable Scanner	1416-C264-0080	497-0404883	8 m (26.2 ft.)
	RS-232	Dual-Cable Scale	1416-C265-0040	497-0404918	4 m (13.1 ft.)
		Dual-Cable Scale	1416-C265-0080	497-0404919	8 m (26.2 ft.)

Interface Cables – ICL Host Terminals (cont.)

Host Terminal	Interface	Cable	Corporate ID	Part Number	Length
9518-200	RS-232 9-Pin D Shell	Dual-Cable Scanner	1416-C140-0040	497-0301711	4 m (13.1 ft.)
		Dual-Cable Scale	1416-C146-0040	497-0301931	4 m (13.1 ft.)
9520-150	MDL/ Datachecker	Single-Cable	1416-C144-0040	497-0301889	4 m (13.1 ft.)
		Single-Cable	1416-C144-0080	497-0301890	8 m (26.2 ft.)
9520-150 MDL	MDL 9-Pin	Single-Cable	1416-C260-0040	497-0404767	4 m (13.1 ft.)
		Single-Cable	1416-C260-0080	497-0404766	8 m (26.2 ft.)
9520/ RS-232	RS-232 9-Pin D Shell	Dual-Cable Scanner	1416-C227-0040	497-0301031	4 m (13.1 ft.)
		Dual-Cable Scale	1416-C226-0040	497-0302021	4 m (13.1 ft.)
Team POS 5000	RS-232	Single-Cable	1416-C019-0040	497-0300422	4 m (13.1 ft.)
		Single-Cable	1416-C019-0080	497-0300423	8 m (26.2 ft.)

Interface Cables – Microbilt Host Terminals

Minimum Hole Diameter: 1.90 cm (0.75 in.)

Host Terminal	Interface	Cable	Corporate ID	Part Number	Length
8010	RS-232 6-Pin	Scanner Only	1416-C326-0040	497-0407181	4 m (13.1 ft.)

Interface Cables – NEC Host Terminals

Minimum Hole Diameter: 1.90 cm (0.75 in.)

Host Terminal	Interface	Cable	Corporate ID	Part Number	Length
NEC Terminal	RS-232	Scanner Only	1416-C274-0040	497-0405139	4 m (13.1 ft.)

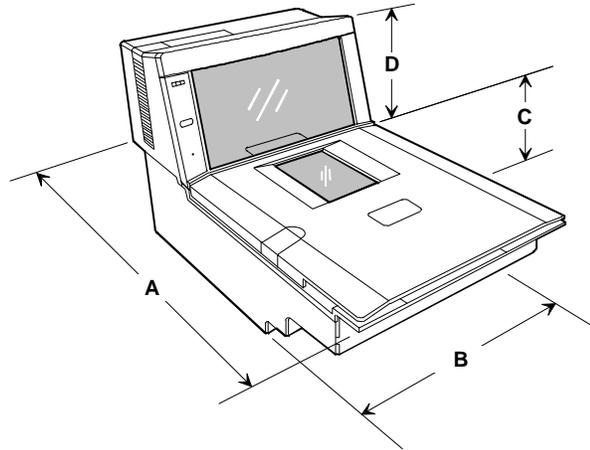
Interface Cables – SASI Host Terminals

Minimum Hole Diameter: 1.90 cm (0.75 in.)

Host Terminal	Interface	Cable	Corporate ID	Part Number	Length
1028	RS-232	Dual-Cable Scanner	1416-C342-0040	497-0407544	4 m (13.1 ft.)
		Dual-Cable Scale	1416-C343-0040	497-4070545	4 m (13.1 ft.)
ex-10	RS-232	Dual-Cable Scanner	1416-C341-0040	497-0407543	4 m (13.1 ft.)
		Dual-Cable Scale	1416-C343-0040	497-0407545	4 m (13.1 ft.)
ex-10 RXD Enable	RS-232	Dual-Cable Scanner	1416-C377-0040	497-0409575	4 m (13.1 ft.)
		Dual-Cable Scale	1416-C343-0040	497-0407545	4 m (13.1 ft.)

NCR 7870 Dimensions

NCR 7870-1000 & 2000 Models



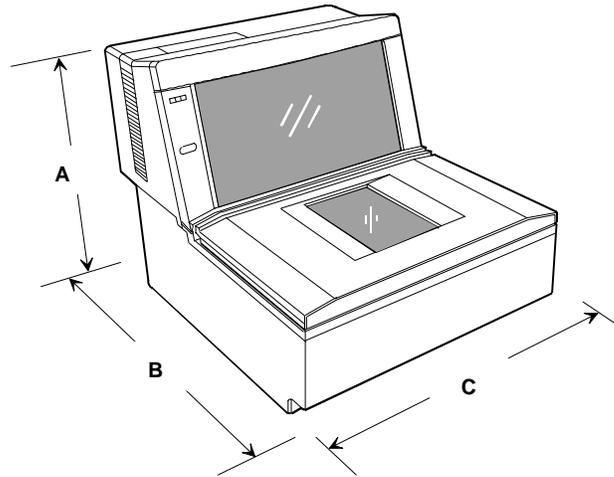
NCR 7870 - 1000 Dimensions

A	B	C	D
51 cm	28.3 cm	13 cm	15.3 cm
20"	11 1/2"	5"	6"

NCR 7870 - 2000 Dimensions

A	B	C	D
43.8 cm	30.5 cm	13 cm	15.3 cm
17 1/4"	12"	5"	6"

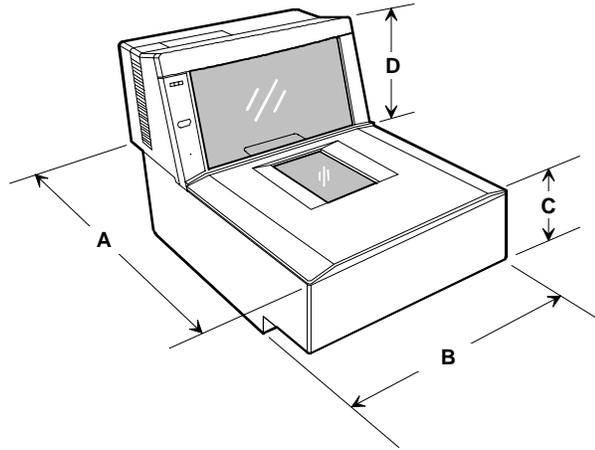
NCR 7870-3000 Model



NCR 7870 - 3000 Dimensions

A	B	C
28 cm	28.8 cm	28.2 cm
11"	11 5/16"	11 1/2"

NCR 7870-4000 & 4500 Models



NCR 7870 - 4000 & 4500 Dimensions

A	B	C	D
43.8 cm	30.5 cm	13 cm	15.3 cm
17 1/4"	12"	5"	6"

Chapter 4: Installation

Getting Started

This chapter describes the installation process for the NCR 7870. Before installation, prepare the site in accordance to the requirements in **Chapter 2 – Site Preparation**.

The first step is to perform an inspection to verify that the unit and checkstand are ready.

Reporting a Damaged Unit

Upon receiving an NCR 7870, inspect the shipping for damage. If the carton is damaged, open it in the presence of the shipping carrier before signing the bill of lading. If the scanner/scale has been damaged due to shipping, notify the carrier and an NCR representative. If the unit was not purchased directly from NCR, notify your supplier.

What's in the Box

Unpack the unit according to the instructions on the box. Inventory the contents to ensure you have received the following components.

- NCR 7870
- Top Plate
- Country Language Specific IEC Class 1 Laser Labels (International Units)
- Power Cord Documents (International Units)
- Power Cord
- Documentation
- Metal Foil Stamping Plate (200x Model International Units)
- Interface Cable (when cable feature requested with order)

Cable Verification

The NCR 7870 can be used with many different host terminals. Verify that you have received the correct interface cable (some set-ups require two cables). A list of available interface cables is provided in the **NCR 7870 Repair Guide** (BD20-0966-A).

Checkstand Verification

Verify, as a minimum, that the checkstand is prepared according to the following.

- Checkstand cutout is correct size.
- Display and service clearances are adequate.
- Checkstand is properly wired.
- Power cord is correct for unit and electrical outlet.

Installing Unit in Checkstand

The NCR 7870 is fully assembled at the factory and requires no operator assembly. The laser module is an integral part of the factory assembled device and does not have any controls that can increase the level of laser light or collateral radiation from the NCR 7870.

Instructions

Install Cables

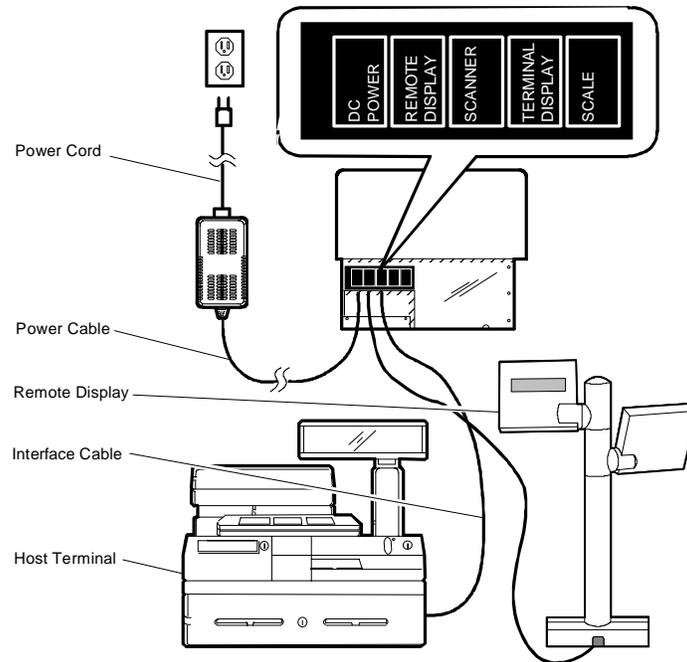
1. Verify power receptacle switch is off.
2. Turn NCR 7870 on its side.
3. Route power cable through groove on bottom of unit.
4. Return unit to upright position.
5. Place unit so a portion of the tower is directly over the cutout in the checkstand counter.
6. Pass Power Cord down through cutout and plug into dedicated NCR power receptacle.
7. Connect communication interface cables to host terminal or PC. Because installation varies from one terminal to another, refer to your host terminal's documents for specific information on interface cable connection.

Note: A trained service technician may be required to open some host terminals to connect the interface cables.

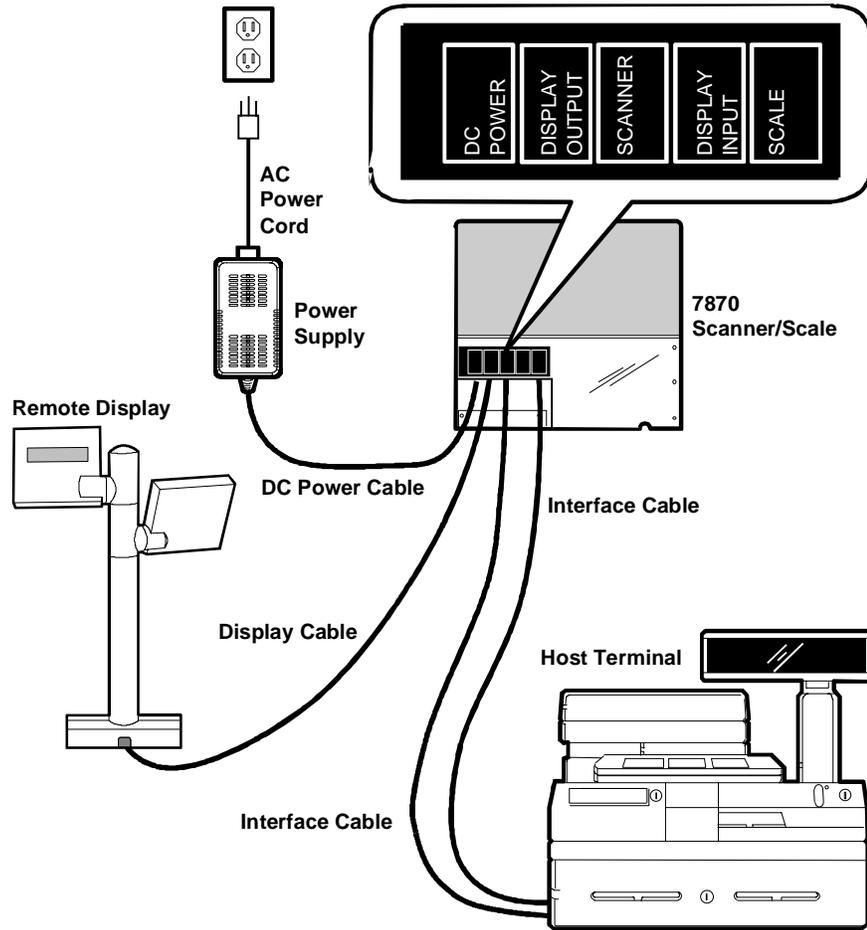
8. Connect interface cables to NCR 7870. Four interface connectors are located on the rear side of the Tower Cabinet. These are for the
 - REMOTE DISPLAY – used to connect the NCR 7825 Remote Display, which is for price and weight information.
 - SCANNER (or RS-232) – used to connect interface cable on single cable installations or the scanner.

- TERMINAL DISPLAY – Not used.
 - SCALE (or Datachecker) – used to connect the scale interface cable on dual cable installations.
9. See following diagrams for installation information for single, dual cable, and Datachecker/RS-232 set-ups.

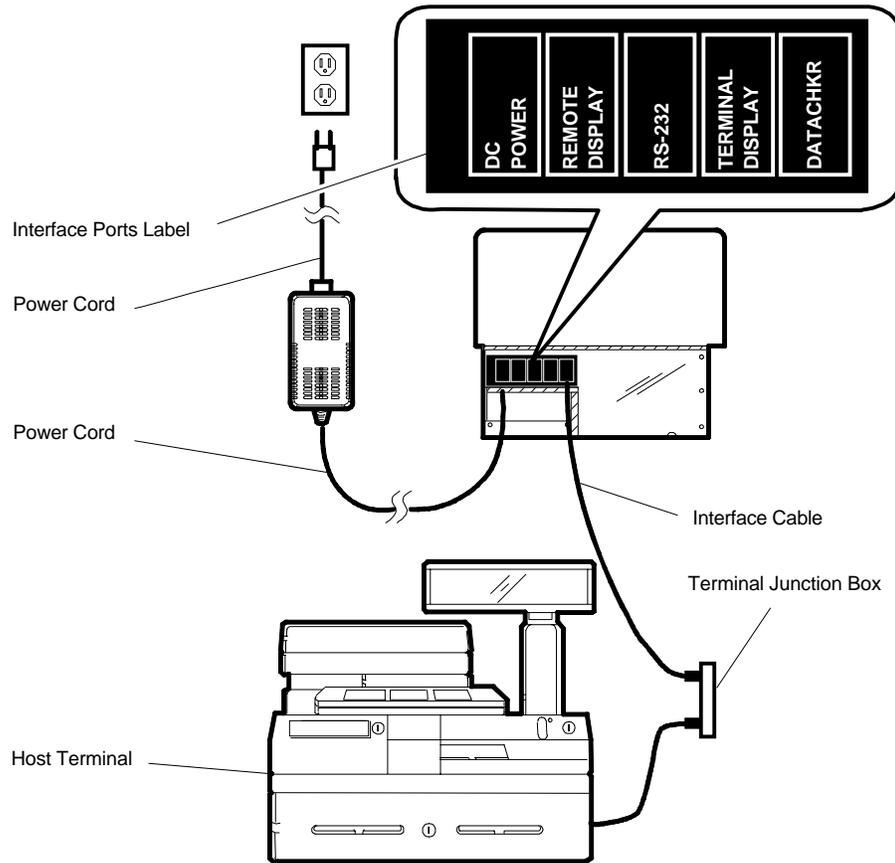
Single Cable Set-Up



Dual Cable Set-Up



Datachecker or RS-232 Cable Set-Up



11628

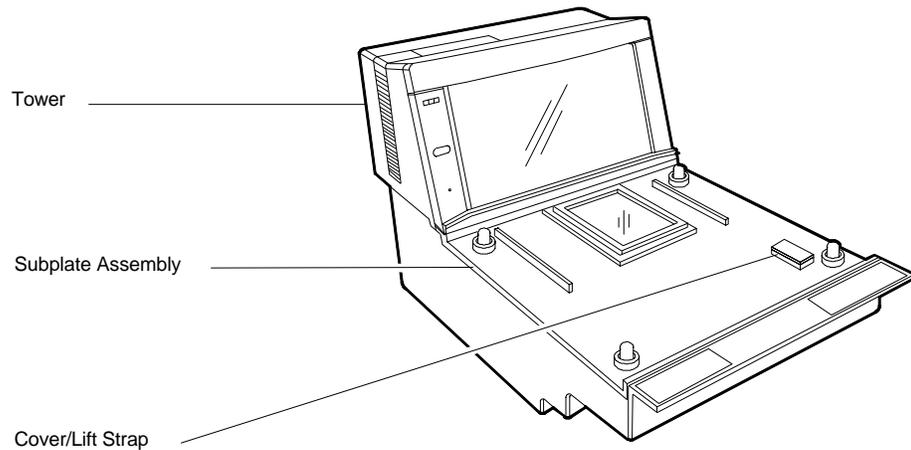
Note: Use the Terminal Junction Box as needed to provide additional ports. Contact your terminal vendor for ordering information.

10. If the checkstand counter has adjustable posts to support the NCR 7870, set to the following:

- Scanner Only Models: 0.95 cm (0.375 in.) deep
- Scanner/Scale Models: 1.27 cm (0.50 in.)

If fixed flanges are used, ensure they are at the appropriate height.

11. Locate small plastic Cover inset in Subplate Assembly. Carefully release Cover.



11189

12. Use Cover/Lift Strap to lift the unit.
13. Position unit over checkstand cutout.
14. Lower unit into cutout.

For proper operation, the NCR 7870 must be level. It should have support within two inches of each corner to prevent rocking. Also, the leading edge of the Top Plate must be flush or up to 0.15 cm (0.06 in.) below the counter top. The trailing edge of the Top Plate must be flush with the checkstand.

Note: The four adjustable support posts on the Scale Hinge Assembly are set at the factory. Do **NOT** attempt to adjust the Top Plate by using these posts.

15. Replace Cover.
16. Place Top Plate on the four supports (plastic caps for scanners, rubber bumpers for scanner/scales).
17. Turn ON the unit using the circuit breaker switch.

End of Procedure

Determining if the Unit is Operational

When power is applied to the NCR 7870 Scanner/Scale, it automatically performs Level 0 Diagnostics to check various components.

NCR 7870-1000 and 3000 Scanners

After passing Level 0 diagnostics the Status indicator flashes green, a tone sounds, then the Status indicator turns red. The NCR 7870 is now operational.

NCR 7875-2000, 4000, and 4500 Scanner/Scales

After passing Level 0 diagnostics the NCR 7870 runs scale diagnostics. During this time, all segments on the integrated or remote display are turned ON so the operator can verify the display works correctly. Then the display reads Ready 0.000 kg (Ready 0.00 lb). The Status Indicator flashes red for five seconds, then the Status indicator flashes green momentarily, a tone sounds, and the Status indicator turns red. The NCR 7870 is now operational.

If the NCR 7870 Does Not Pass Level 0 Diagnostics

If an error occurs during Level 0 diagnostics, the integrated or remote display (if the unit has one) displays an error code, and if enabled, the NCR 7870 emits an audible description of the error and what action to take. There may be some simple steps you can take to correct the problem. See **Chapter 8: Troubleshooting**. If you cannot correct the problem, contact NCR for warranty information.

Checkout Reading Operation

To check the tag reading operation of the NCR 7870, attempt to read a good tag on an item. The Status indicator turns red when the NCR 7870 is ready to scan a label. A good read is indicated when the Status indicator turns green and a tone sounds (if enabled).

Programming

Your NCR 7870 comes from the factory with the programming parameters set to default values. The Communications Protocol is set to the specifications on your order. However, you may want to make some parameter changes for your particular installation. See **Chapter 7: Programming**.

Determining Communications Protocol

Use the following procedure to determine the communications protocol programmed in your NCR 7870.

1. Apply power to the NCR 7870.
2. Scan the **Diagnostic Mode** tag -- must be first tag scanned after applying power.
3. Scan the **Hex 3** tag. The good read tone for this tag sounds (three beeps).

If the NCR 7870 has the Voice feature enabled, the communications protocol is given audibly. If the Voice feature is not enabled, the Status Indicator flashes green and the tone beeps, identifying the communication protocol.

Tone	Communications Protocol	Hex Code
1 short, high-pitched beep	OCIA NCR Short	100
1 beep	OCIA NCR Long	101
2 beeps	IBM 468x/9x Port 4A (Slot Scanner)	102
3 beeps	IBM 468x/9x Port 4B (HHBRC)	103
4 beeps	IBM 468x/9x Port 4B (HHBCR)	104
6 beeps	RS-232	105
7 beeps	OCIA Single Cable	106
8 beeps	OCIA NCR Dual Cable	107
11 beeps	Casio 4-Bit, Parallel, Dual Cable	10A
12 beeps	IBM 1520 (BRC)	10B
13 beeps	TEC 4-Bit, Parallel, Dual Cable	10C

4. Remove power from 7870.

Scale Address for IBM

Most IBM systems have software called Integrated Scanner/Scale that permits a single-cable installation. You can check the terminal configuration at the controller to be sure this IBM option is activated. Once chosen, the scale address is 6E (default setting), and no other action is required other than plugging the NCR 7870 interface cable into port 17 (468x). This is the preferred and most common configuration. For the 4682/469x series IBM terminals, the NCR 7870 interface cable plugs into port 9B. This series has no port 17.

Some older 468x systems require a dual-cable system, where one cable connects to the scanner and the other connects to the scale. The scale cable usually plugs into port 21 of a "B" or "C" feature card. It is possible to preserve the existing terminal configuration and still use the single-cable feature of the NCR 7870. If there are no other ports used on the "B" or "C" feature card, you can remove the feature card from the terminal even though it is configured to be installed.

- If the card was in slot 2A, program the NCR 7870 scale address to 6A and plug the NCR 7870 Interface Cable into port 17.
- If the card was in slot 2B, program the NCR 7870 scale address to 6B and plug the NCR 7870 Interface Cable into port 17.
- If other ports beside port 21 are used on the "B" or "C" card and the other card slot is empty (2A or 2B), you can still use this procedure but the terminal configuration must be changed to define that there is a card in the empty slot and that its port 21 is connected to a scale. Program the scale to the empty slot address (2A = 6A, 2B = 6B). The existing card port 21 must be configured as not used and must not be removed from the terminal.
- If both card slots are used on the terminal, the terminal software must be a version that can be configured to support an integrated scanner/scale. This may require upgrading the software.

Chapter 5: Calibration

General

This chapter describes when and how to calibrate the NCR 7870 scanner/scale models and how to verify that the calibration is correct.

Please note, this chapter pertains to the NCR 7870-2000 and 4500 **ONLY**. The NCR 7870-4000 does not require calibration. In the event calibration is needed, contact the NCR Service Center. The 7870-4000 has **NO** user serviceable scale parts or calibration procedure.

During factory testing, the scale is calibrated one or more times to test the scale calibrating function. This calibration test is not sufficient to make the scale ready for weighing in commerce. To be in compliance with governmental Weights and Measures regulations, you must be certified to perform the scale calibration procedure and place the scale into service for trade.

You **MUST** calibrate the scale when any of the following occurs.

- Initial installation of an NCR 7870 Scanner/Scale
- When scale cannot be zeroed even after a power down/up sequence
- When the diagnostics indicate a calibration error that persists after a power down/up sequence
- When the Load Cell or Scale Board have been replaced

Note: Your scanner/scale may or may not have an Integrated Display or an NCR 7825 Remote Display when connected to some host terminals. If this is the case, a Field Service Calibration Display (NCR part number 250-0029750) is required unless your NCR 7870 has the optional Voice Messaging feature enabled. Calibration information is **NOT** sent to the host terminal.

The calibration procedure sets the Load Cell and the electronics to interpret the weight of an item accurately. You can calibrate the scale after power has been supplied for 30 minutes if the ambient air conditions have been 20° C (68° F) for at least 24 hours. If the ambient air conditions have not been met, then the scale must be on for at least 6 hours before you can calibrate it. One or more certified weight sets are required to calibrate and certify the scale.

- Whole Pound Weight Set: NCR Part Number 998-0633009
- Fractional Pound Weight Set: NCR Part Number 998-0633012
- Kilogram Weight Set: Obtain locally

The EEPROM on the Scale Board maintains an audit trail of scale calibration and weigh parameter setting. The audit trail consists of two event counters. You can display the audit trail count by pressing and holding the Scale Zero button on the Operator Display Panel. The display alternates between **Cal xxx** and **PAr xxx**. The **Cal** value is the number of times the scale has been calibrated. The **PAr** value is associated with the weigh parameter setting and should never change.

Note: The audit trail can be displayed only on units with the Integrated Display or with the NCR 7825 Remote Display.

Calibration Procedure

Section 1: Exercising the Scale

Tools

One of the following:

Whole Pound Weight Set	(P/N 998-0633009)
Fractional Pound Weight Set	(P/N 998-0633012)
Kilogram Weight Set	Obtain locally

Instructions

You must exercise the scale before performing a calibration.

1. Select appropriate Weight Feature for your Scanner/Scale.

Weight Feature	Total Weight on Top Plate						
9.995 kg	0.0 kg	2.5 kg	5.0 kg	10.0 kg	5.0 kg	2.5 kg	0.0 kg
13.995 kg	0.0 kg	2.5 kg	5.0 kg	15.0 kg	5.0 kg	2.5 kg	0.0 kg
30.0 lb.	0.0 lb.	5.0 lb.	15.0 lb.	30.0 lb.	15.0 lb.	5.0 lb.	0.0 lb.

2. Add and remove weights to your scale in order given in chart.
This is a building procedure in which you start with no weight (0) and sequentially add and remove weight to obtain the values shown in the chart.
3. Go through procedure four times.
4. Go to Section 2: *Accessing the Calibration Switch*.

Section 2: Accessing the Calibration Switch

Tools

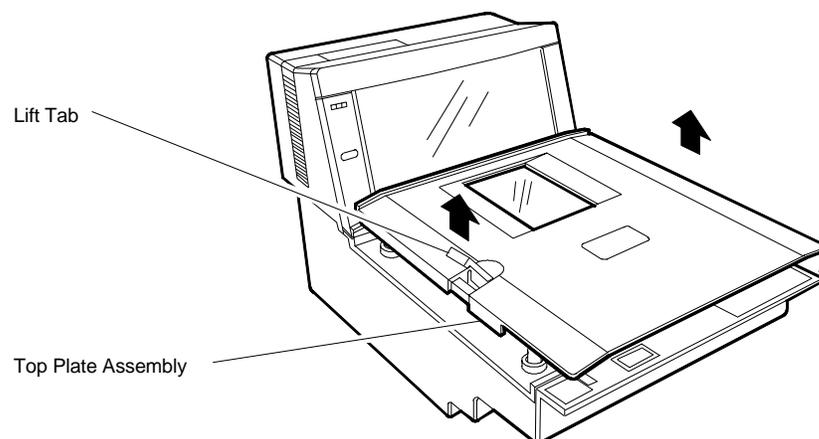
Screwdriver, flat blade

Needle-nosed pliers (optional)

The Scale Calibration Switch is located on the Scale Board. For security this switch is not readily accessible and may be secured with a lead/wire seal or seal sticker.

Instructions

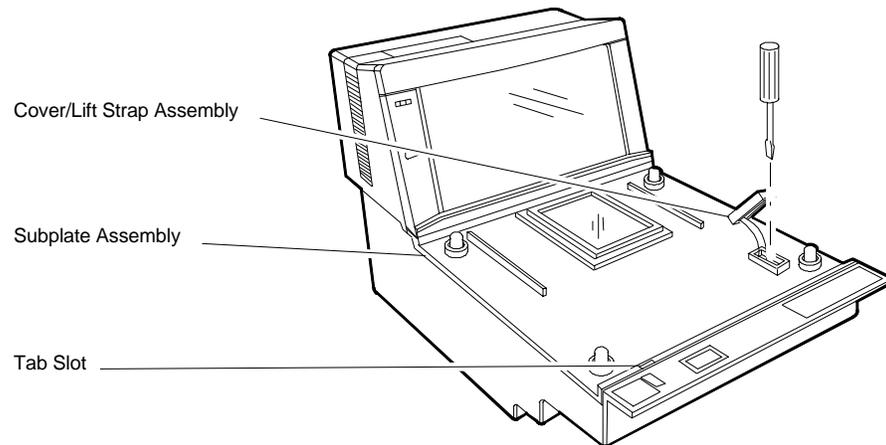
1. Remove power from unit.
2. Remove Top Plate:
 - a) Press lift tab in.
 - b) Grasp lift tab and lift Top Plate off unit.



11041

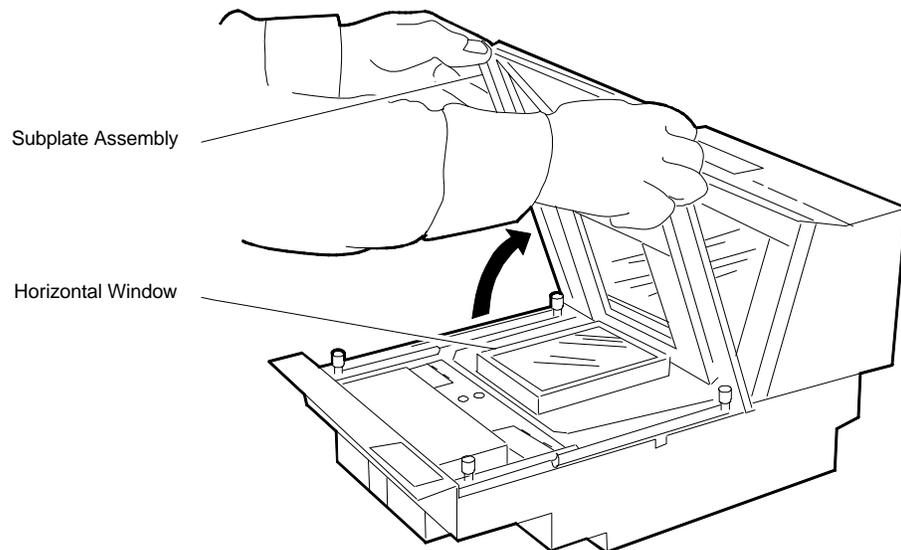
3. Remove Subplate Assembly.
 - a) Pop cover off of Lift Strap Assembly.

b) Remove screw securing Lift Strap to unit.



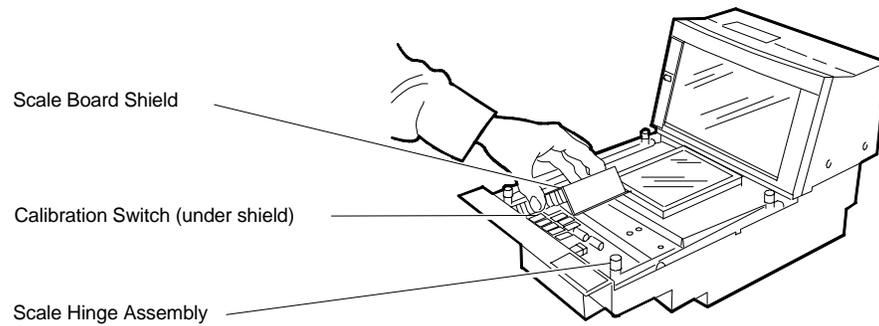
11053

- c) Insert screwdriver blade into Tab Slot. Twist to free tab.**
- d) Lift the front of Subplate Assembly into a nearly vertical position. Pull the back edge from under the Tower Cabinet and remove the Subplate Assembly.**



11039

4. Remove the Scale Board Shield.
 - a) Break seal wire and seal sticker if present.
 - b) Remove thumbscrew. Use needle-nosed pliers to loosen if thumbscrew is tight.
 - c) Remove Shield.



11040

5. Set Top Plate on rubber bumpers of Scale Hinge Assembly. Make sure bumpers fit into corresponding sockets on bottom of Top Plate.
6. Apply power to 7870.
7. Does the unit have any of the following: an Integrated Display, a 7825 Remote Display, or the Voice Messaging Feature (must be enabled)?
 - NO** → Go to Section 3 - *Connecting the Field Service Calibration Display*
 - YES** → Go to Section 4 - *Performing the Calibration*

Section 3: Connecting the Field Service Calibration Display

Tools

Field Service Calibration Display (P/N 250-0029750)
Philips screwdriver

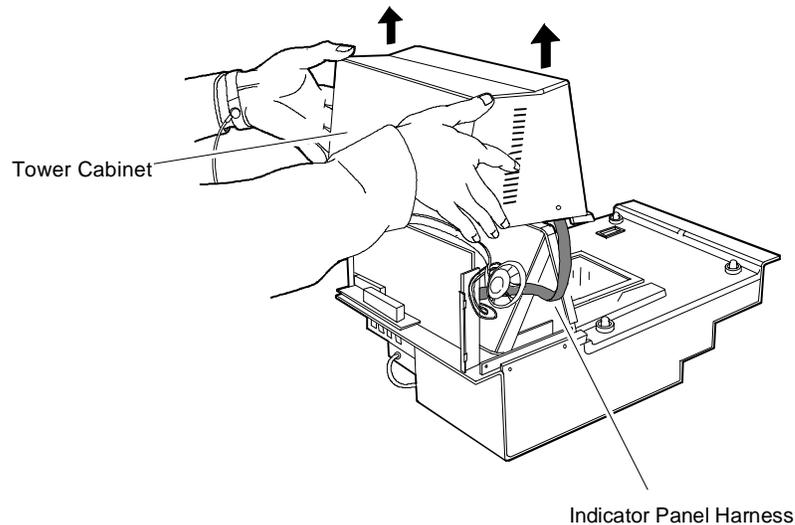
The Field Service Calibration Display provides calibration information when no other display is available. To connect the Field Service Calibration Display, perform the following.

Instructions

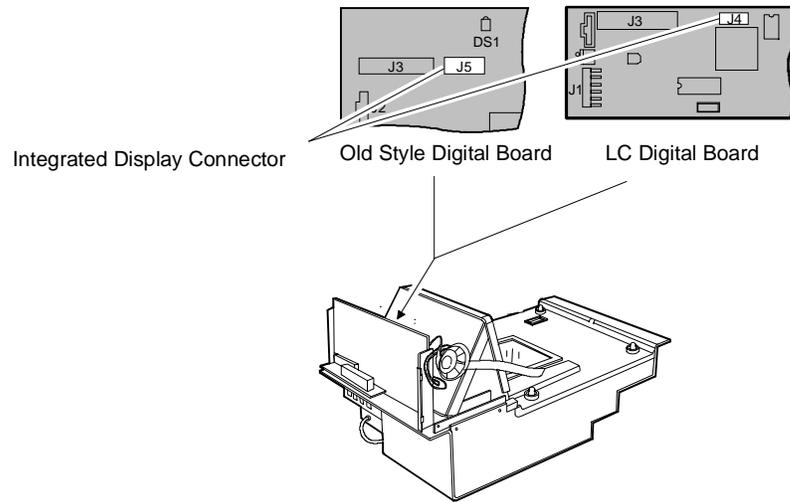
1. Remove Tower Cabinet.

Note: On some models, taking the Top Plate off first may make Tower Cabinet removal easier.

- a) Remove four (4) screws from Tower Cabinet base.
- b) Carefully lift Tower Cabinet straight off unit. Check Indicator Panel harness to ensure it is still connected.



- c) Connect the Field Service Calibration Display to J-4 on the LC-Digital Board (J-5 on the old Digital Board).



11279

- d) Apply power to NCR 7870.
- e) Go to Section 4: *Performing the Calibration*

Section 4: Performing the Calibration

The scale firmware controls calibration. It waits for you to respond to the prompt before going to the next step. When you have placed the weight on the Top Plate and pressed the Scale Zero button, the firmware sounds a single tone and changes the display to the next prompt. If voice is enabled, the scale tells you which weight to put on next. You can end the procedure before you have completed the calibration function by turning the unit off. However, if you do this, you must still calibrate the scale before placing it into service.

Note: the pound and kilogram weights used for calibration are not equivalent values. They are the actual weights the firmware needs to perform the calibration.

Instructions

For the purpose of this procedure, a scale set-up to weigh pounds is used. Kilogram scales follow the same instructions but use the appropriate weights (shown in parentheses).

1. Press the Reset/Scale Zero button to display the **Cal** and **PAr** values. Record these values.
2. Remove Top Plate and press the Calibration Switch on the Scale Board.
3. Immediately reinstall Top Plate. Ensure that rubber bumpers of Scale Hinge Assembly are properly seated in sockets of Top Plate.
4. Display should show **Ready C 0.00 lb** (0.000 kg).
5. The calibration process consists of sequentially adding and then removing a series of weights. This sequence is shown in the following table.

Display	Add Weight	Remove Weight
Ready C-5.00 lb (2.500 kg)	5.00 lb. (2.500 kg)	
Ready C-15.00 lb (5.000 kg)	10.00 lb. (2.500 kg)	
Ready C-30.00 lb (10.000 kg)	15.00 lb. (5.00 kg)	
Ready C-0.00 lb (0.000 kg)		30.00 lb. (10.000 kg)
Ready 0.00 lb (0.000 kg)		

Note: Use the same kilogram weights for both 9.995 kg and 13.995 kg scale units.

6. Press Reset/Scale Zero button. Display will indicate **Ready C 5.00 lb** (or 2.500 kg).
7. Place a 5.00 lb (or 2.500 kg) weight in center of Top Plate.
8. Press Reset/Scale Zero button. Display will indicate **Ready C 15.00 lb** (5.000 kg).
9. Add a 10.00 lb (2.500 kg) weight in center of Top Plate. Total weight on scale should be 15 lbs. (5.00 kg).
10. Press Reset/Scale Zero button. Display will indicate **Ready C 30.00 lb** (10.000 kg).
11. Add a 15.00 lb (5.000 kg) weight in center of Top Plate. Total weight on scale should be 30.00 lbs (10.000 kg).
12. Press Reset/Scale Zero button. Display will indicate **Ready C 0.00 lb** (0.000 kg).
13. Remove all weights.
14. Press Reset/Scale Zero button. Verify display indicates **Scale Ready 0.00 lb** (0.000 kg).
15. Press and hold Reset/ Scale Zero button. Record **Cal** and **Par** values.
16. The **Cal** value should be incremented by one, indicating that a calibration has been performed. The **PAR** value should remain unchanged.

Verifying Calibration

This section describes how to verify that the 7870 has been properly calibrated.

No error codes should appear during calibration. The codes are shown in the table below. If a code is displayed, the calibration is invalid and a corrective action must be undertaken before attempting recalibration.

Error Code	Problem	Suspect Component
1 - - - -	Calibration error A/D output below 000h at digital to analog converter	Scale Board Load Cell
2 - - - -	Calibration error A/D output below 280h at digital to analog converter	Scale Board Load Cell
3 - - - -	Calibration error Analog to digital converter output too high at 15 kg (30.0 lb.)	Scale Board Load Cell
4 - - - -	Vibration to scale during calibration	Motors in checkstand
9 - - - -	Interference detected during calibration	Top Plate is touching checkstand, scale was jarred, or overload screw is misadjusted.

If no error codes occur during calibration, four test procedures must be performed to verify calibration. These procedures are, in order,

- Increasing Load Test ,
- Over-Capacity Test,
- Decreasing Load Test, and
- Shift Test.

Procedure 1: Increasing Load Test

This test checks the scale's accuracy by incrementally adding weight to the center of the Top Plate. Use weights that correspond to the NCR 7870 weight feature. If this test fails, recalibrate scale.

Instructions

1. Select the appropriate weight feature from the table below.

Step	Weight Feature	Add Weight	Remove Weight	Display
1	9.995 kg	0.1 kg		0.1 ± 0.00 kg
	13.995 kg	0.1 kg		0.1 ± 0.00 kg
	30.0 lb.	0.2 lb.		0.2 ± 0.00 lb.
2	9.995 kg	2.5 kg	0.01 kg	2.5 ± 0.00 kg
	13.995 kg	2.5 kg	0.01 kg	2.5 ± 0.00 kg
	30.0 lb.	5.0 lb.	0.2 lb.	5.0 ± 0.00 lb.
3	9.995 kg	2.5 kg		5.0 ± 0.005 kg
	13.995 kg	4.5 kg		7.0 ± 0.005 kg
	30.0 lb.	5.0 lb.		10.0 ± 0.01 lb.
4	9.995 kg	2.5 kg		7.5 ± 0.005 kg
	13.995 kg	3.0 kg		10.0 ± 0.005 kg
	30.0 lb.	10.0 lb.		20.0 ± 0.01 lb.
5	9.995 kg	2.495 kg		9.995 ± 0.005 kg
	13.995 kg	3.995 kg		13.995 ± 0.005 kg
	30.0 lb.	10.0 lb.		30.0 ± 0.01 lb.

2. Follow steps shown in table for the weight feature of your scale.
3. Check readout after completing each step and verify the measured value falls within the acceptable limits.
4. If a measured value does not fall within limits, recalibrate scale. If all measured values are acceptable, the scale has passed the Increasing Load Test. Go to Procedure 2: *Over-Capacity Test*.

Note: Do NOT remove any weights from the Top Plate.

Procedure 2: Over-Capacity Test

This test checks for the proper indication from the scale when too much weight is placed on the Top Plate. An over-capacity is indicated by dashes appearing on the display. If a failure occurs during this test, the scale must be recalibrated.

Note: This test must immediately follow the Increasing Load Test. Do not remove any of the weights prior to running this test.

Instructions

1. Use the following chart to select the correct weight.
2. Follow steps on chart for adding and removing weights. Weight must be placed in center of Top Plate.

Step	Weight Feature	Add Weight	Remove Weight	Display
1	9.995 kg	0.04 kg		- . - -
	13.995 kg	0.04 kg		- . - -
	30.0 lb.	0.08 lb.		- . - -
2	9.995 kg		0.04 kg	9.995 ± 0.005 kg
	13.995 kg		0.04 kg	13.995 ± 0.005 kg
	30.0 lb.		0.08 lb.	30.0 ± 0.01 lb.

3. If a series of dashes are not shown, then the scale has failed and must be recalibrated.
4. The scale passes the test if a series of dashes is displayed and all measured values fall within the acceptable limits. Continue to Procedure 3: *Decreasing Load Test*

Procedure 3: Decreasing Load Test

This test checks the scale's accuracy when incrementally removing weight from the Top Plate. Use weights that correspond to the NCR 7870 weight feature. If a failure occurs during this test, you must calibrate the scale again.

Note: This test must immediately follow the Over-Capacity Test; do not remove any of the weights prior to running this test.

Instructions

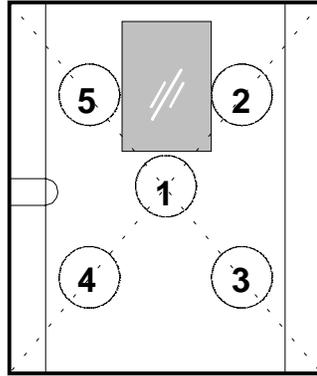
1. Select appropriate Weight Feature for your Scanner/Scale.
2. Follow the four steps shown in chart.

Step	Weight Feature	Add Weight	Remove Weight	Display
1	9.995 kg		2.495 kg	7.5 ± 0.005 kg
	13.995 kg		3.995 kg	10.0 ± 0.005 kg
	30.0 lb.		10.0 lb.	20.0 ± 0.01 lb.
2	9.995 kg		5.0 kg	2.5 ± 0.00 kg
	13.995 kg		7.5 kg	2.5 ± 0.00 kg
	30.0 lb.		15.0 lb.	5.0 ± 0.00 lb.
3	9.995 kg	0.1 kg	2.5 kg	0.1 ± 0.00 kg
	13.995 kg	0.1 kg	2.5 kg	0.1 ± 0.00 kg
	30.0 lb.	0.2 lb.	5.0 lb.	0.2 ± 0.00 lb.
4	9.995 kg		0.1 kg	0.0 ± 0.00 kg
	13.995 kg		0.1 kg	0.0 ± 0.00 kg
	30.0 lb.		0.2 lb.	0.0 ± 0.00 lb.

4. If display does not read within limits shown, the scale has failed and must be recalibrated.
5. If the displayed measurements fall within the acceptable limits, the scale has passed. Go to Procedure 4: *Shift Test*

Procedure 4: Shift Test

This test consists of measuring a weight in the center and four positions on the Top Plate.



11033

Instructions

1. Place a 15.00 lb (or 5.000 kg) weight in Position 1 and record measured weight.
2. Move sequentially to Positions 2, 3, 4, and 5. Record measured weight for each position.
3. Move weight back to Position 1 and record measured value.
4. All measurements should fall within
 - 15.00 lb \pm 0.01 lb (for 30.00 lb scales)
 - 5.000 kg \pm 0.005 kg (for 9.995 and 13.995 kg scales)
5. If any measured weight does not fall within acceptable range, scale has failed test and must be recalibrated.
6. If the scale passes all four tests, the calibration is successful.
7. Now the calibration seals, if required by local laws, can be placed and the Calibration Switch secured before reassembling the unit.

Securing the Calibration Switch

Most countries require that the Calibration Switch and Scale Board be secured before a unit can be put into operation.

Some states and jurisdictions permit the use of the Audit Trail in place of the physical seals. Check with your local inspector or governmental agency about using the Audit Trail.

This procedure begins with the unit already disassembled with Tower Cabinet in place and access to the Calibration Switch.

Prior Steps

Calibration Switch accessible. See **Section 2: Accessing the Calibration Switch**.

Tools

Needle-nosed Pliers

Lead/Wire Seal P/N: 603-8001097

Lead/Wire Seal Press P/N: 603-9000157

Film/Paper Seal Obtain locally – must meet local government requirements

Instructions

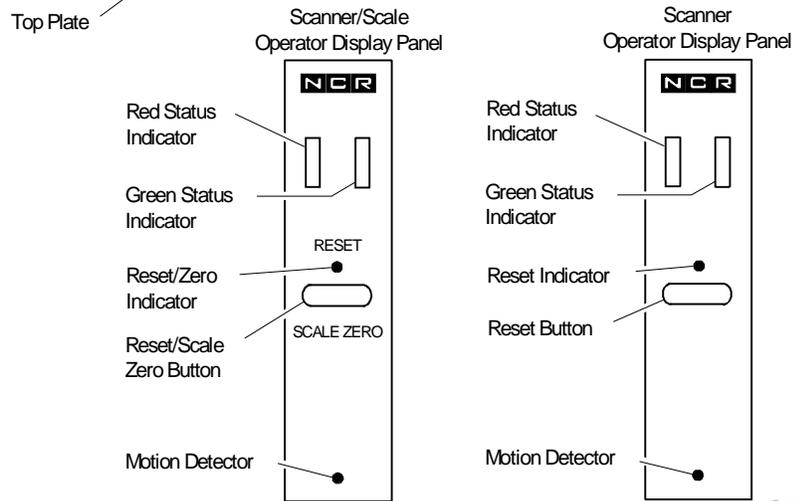
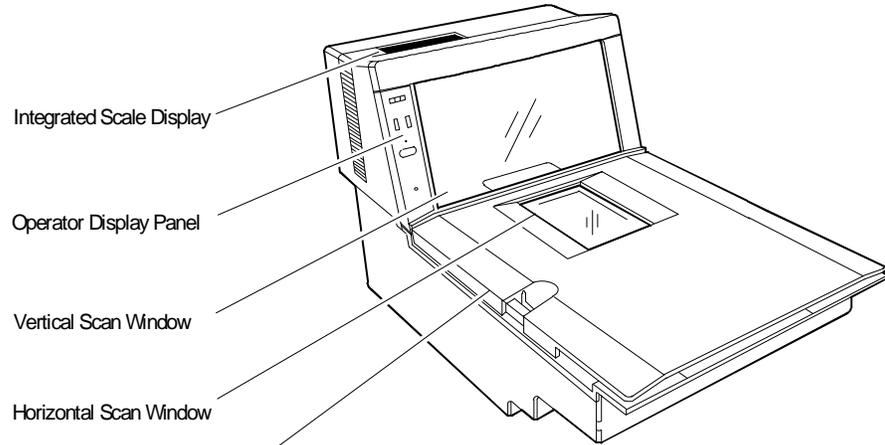
1. Install Scale Board Shield.
 - a) Position Shield so it encloses edge of Load Cell Shield, if present.
 - b) Insert tabs of Shield into slots.
 - c) Place Shield into position and attach thumbscrew. Tighten with pliers if necessary.
2. Attach seal and/or wire tag to control access to Calibration Switch.

Note: When you perform a scale certification, someone must attach a seal to the Calibration Switch Security Cover. Depending on your local laws, Weights and Measures officials may be required to attach the seal.

3. Install Subplate Assembly.
 - a) Position Subplate with front end up to near vertical.
 - b) Push back edge of Subplate under edge of Tower Cabinet.
 - c) Gently press Subplate into position on unit chassis. Ensure Retaining Tab snaps into slot.
 - d) Install Cover/Lift Strap in access hole. Tighten screw and snap cover into place.
4. Set Top Plate on rubber bumpers of Scale Hinge Assembly. Verify bumpers are seated in sockets.
5. Apply power to 7870.
6. Verify that display indicates **Scale Ready 0.00 lb** (0.000 kg).
7. Record the **Cal** and **PAr** values, shown on the display, on the **Placed Into Service** form if required by your local Weights and Measures regulations.

Chapter 6: Operation

This chapter describes how to operate the NCR 7870. Following is a diagram of the NCR 7870.



About Using the Operator Controls

Scan Windows

The NCR 7870 contains a vertical and horizontal scan window. The vertical scan window is mounted in a Tower Cabinet that rises above the checkstand surface. The horizontal scan window is flush-mounted in the Top Plate.

Status Indicators

Status Indicator	Function	Occurs
Red (Steady)	Indicates unit is in standby mode to read next label.	Between scanning.
Green	Flashes once to indicate a successful bar code read.	After scanning.
Yellow	Indicates scale has been reset/zeroed. Signals a scale error code may be on display.	When Scale Zero button is pressed. Primarily during Power Up.
Red (Slow Flash)	Indicates unit is off-line. Host terminal may be off or interface cable is not connected.	When IBM 468x communication is used.
Red-Green Flashing	Indicates Failure Mode. A scanner error code will be repeated.	During Power Up.
Red-Red- Red	Three red flashes indicate an item is not on record in price lookup file.	After scanning an item.
Red-Green Alternate	Sleep Mode	During operator inactivity.

Motion Detector

The Motion Detector is used to detect operator inactivity and power down critical components of the NCR 7870 to reduce wear and extend product operational life

Reset / Scale Zero Button

This button is used to

- re-zero the scale if not performed automatically,
- set a tare weight, and
- awaken the unit from Sleep Mode.

Audible Tone

A tone can be programmed to sound to indicate a successful bar code read. This may be easier for the checker than watching the Status Indicators. The tone's frequency, volume, and duration can also be set via programming. The NCR 7870 comes from the factory with the tone enabled.

See **Chapter 7: Programming** for more information on the *Good Read* programming parameter.

Voice Messages

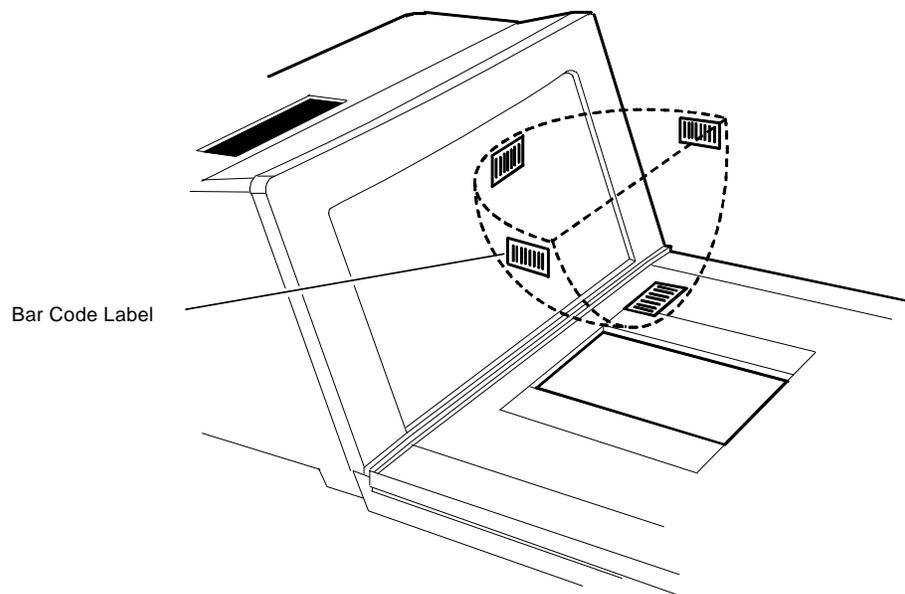
If equipped, this feature provides a voice message when

- the scanner/scale goes on-line or off-line,
- the communication protocol is checked,
- item tags are checked using *PACESETTER Plus*,
- certain error conditions exist,
- there is interference with the scale, and
- when the scanner windows may be dirty.

About Using the Scanner

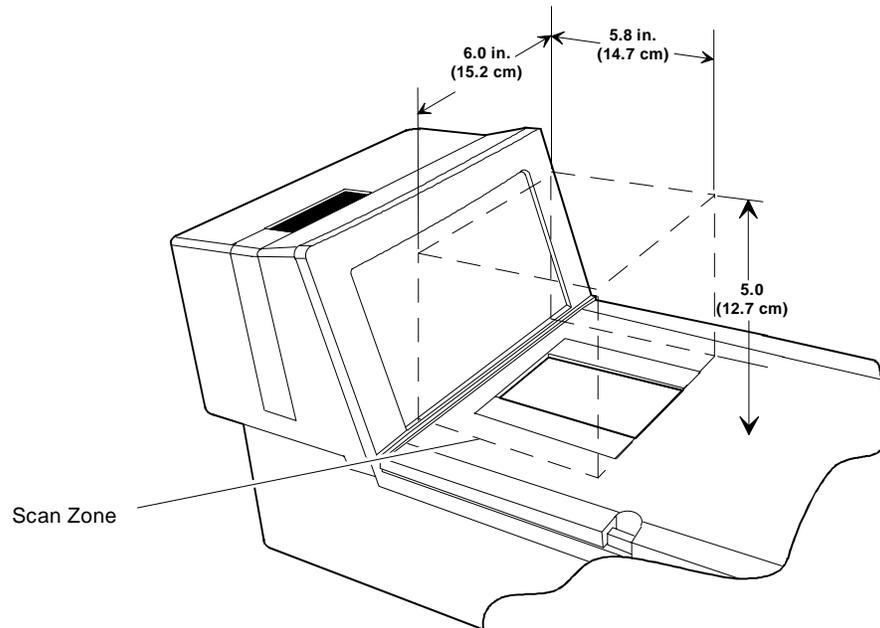
Proper Label Orientation

Because the NCR 7870 uses bi-optic scanning, labels can be read from many angles. Labels can be read from the leading, trailing, bottom, and opposite sides of a package. Bar code labels can be scanned from left-to-right or right-to-left. A good rule of thumb is – if you can't see the label, the NCR 7870 can read it.



Active Scan Zone

The active scan window is shown in the following diagram. The 7870 can read labels presented within the cube.



R0127

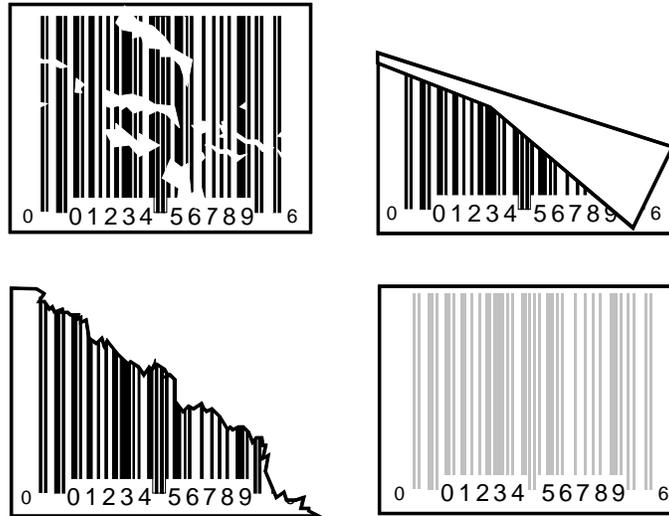
Multiple Reads

Only one good read is reported if a label is placed within the scan zone and left there. Scanner firmware prevents a second read of the same label if it occurs within a preset time of a good read.

The preset time is tag-programmable from 250 to 1500 milliseconds in 50 millisecond increments. The factory default is 900 milliseconds. To scan a label a second time, remove the item from the scan zone and then scan it again after the preset time has elapsed.

Bar Code Quality

Many labels in a typical retail environment are unreadable. The illustration shows some of the common problems. Vendors and printers regularly supply products to the market with bar codes that are overprinted, underprinted, or truncated. Some labels have missing margins. Others may be printed around the corners of packages, or on media not likely to remain flat when picked up.



R0026

The readability of a label depends on variables such as size, placement, color, paper type, ink viscosity, and package coatings. The middle of a printing run can yield erroneous labels due to the many variants involved. In particular, poor color contrast and marginal print quality can make a label hard to read.

A label should be considered readable if it meets or exceeds the requirements set forth in the UPC Symbol Specification published by the UPC Council, Inc. (March 1982), and the General Specification for Article Symbol Marking, Copyright EAN-1977.

Operating Instructions

Power Up

The 7870 has no ON/OFF switch. The checkstand should be equipped with a circuit breaker switch during site preparation. The switch should be easily accessible and near the operator.

Power up the NCR 7870 on by turning the circuit breaker switch to ON. The NCR 7870 performs diagnostic checks during the power up procedure. If a scale error occurs, the yellow Status Indicator will light and an error code will appear on the NCR 7825 Remote Display or Integrated Display. If a scanner error is detected, an error tone will sound and the red and green Status Indicator lights will flash a code.

In the event of a problem in the power up process, call a supervisor, service company, or the NCR Customer Service Center for assistance.

Scanner Only Models

For the 1000 and 3000 models, if no error occurs during power up the unit will enter Startup Mode. The red Status Indicator will flash, the green Status Indicator will flash, and a tone will sound. The red Status Indicator will then light. The unit is ready for use.

Scanner/Scale Models

For the 2000, 4000, and 4500 models, if no errors occur during power up the unit will enter Startup Mode. The red Status Indicator will flash and all segments on the display (remote or integrated) will be turned on for five seconds. The green Status Indicator light will flash, a tone will sound, and the display will show **SCALE READY 0.000 kg** or **SCALE READY 0.00 lb**. The red Status Indicator will light. The unit is ready for use.

The Scanner/Scale models should warm up for five minutes before being put into use.

Scanning Procedure

To use the NCR 7870, the item must pass through the active scan region. Item orientation, motion, and sequential handling are required for proper label reading.

Instructions

1. Verify scanner is operable. The red Status Indicator must be lit.
2. Locate label on item.
3. Orient item so label faces away from you.
4. Pass item across the lower scan window.
5. If a good read occurs, the green Status Indicator will flash. A tone will sound if the Good Tone parameter has been enabled. The red Status Indicator will light indicating the unit is ready to read another bar code.
6. If a good read does not occur, scan the item again.
7. If a good read still does not occur, manually enter information for the item. Continue to scan.

Not-On-File Error

The Not-On-File feature is available on the NCR 7870 only if the host terminal has this capability. If a label is not in the price lookup file, a special tone sounds three times a second and the red Status Indicator flashes repeatedly. The volume of the Not-On-File tone is programmable.

The unit becomes disabled from reading additional labels until the error is cleared. To clear, press the host terminal's **CLEAR** key and manually enter the information.

Weighing Procedure

The NCR 7870 has a settling time of 0.9 seconds for items five pounds or less and 2 seconds for items over five pounds. The scale will not weigh items exceeding its weight class – 9.995 kg, 13.995 kg, and 30 lbs.

The scale can be operated in Mode 1 or Mode 2, depending on your terminal and the type of NCR 7870. In Mode 1, the weight is displayed. In Mode 2, the weight and price are displayed.

Instructions

1. Verify display reads **SCALE READY 0.000kg** or **SCALE READY 0.001b** and red Status Indicator is lit.
2. If display or Status Indicator is not on, press Reset/Scale Zero button. If this does not work, power unit off and on.
3. Place an item on center of Top Plate. Ensure item does not overhang. Item must rest completely on the Top Plate.
4. Item weight is displayed. Press Weight Request key on host terminal.
5. If a bad weigh occurs, re-weigh item.
6. If red Status Indicator is still lit, remove the item from Top Plate. Remove Top Plate and check for obstructing material or debris.
7. Replace Top Plate. Press Reset/Scale Zero button.
8. Wait for **SCALE READY 0.000kg** or **SCALE READY 0.001b**. Weigh item again.
9. If no weight is displayed and/or the red Status Indicator is still lit, contact your supervisor, service company, or the NCR Customer Service Center.

Changing the Good Read Tone

The volume of the Good Read Tone can be changed while in normal operating mode. This is the only characteristic of the tone that can be changed without being in Programming Mode.

Instructions

1. Scan the **Volume Adjustment** tag and listen to the tone.
2. If the tone is not loud enough, scan the tag again. Repeat if necessary.
3. If the tone is too loud, scan the tag repeatedly until the volume resets to the lowest level. Now scan to the desired level.
4. When the volume is acceptable, scan the **Save and Reset** tag to end. If the **Save and Reset** tag is not scanned, the unit will not operate.

Routine Maintenance

Routine maintenance is needed at least once a day to keep the NCR 7870 in good operating condition. These parts of the 7870 can be cleaned with a soft cloth, lukewarm water, and mild soap:

- Scanner body
- Top Plate and Scan Window
- Exterior surface of Subplate Assembly
- Optics Assembly Window
- Horizontal Scan Window
- Tower Cabinet

If a scan window becomes excessively scratched, replace it. If the unit becomes wet due to a spill, clean and dry as soon as possible.

Instructions

Clean the Top Plate and Scan Windows with a soft cloth and a non-abrasive liquid window cleanser as follows.

1. Power unit down.
2. Remove Top Plate. Clean Top Plate and the inset Scan Window.
3. Clean window inset in Optics Assembly.

Note: Do not spray the cleanser directly on plastic cover or scale mechanism holes.

4. Clean vertical Scan Window in Tower Cabinet.
5. Wipe surfaces with a soft, dry cloth.
6. Replace Top Plate.
7. Restore power to the NCR 7870.

Chapter 7: Programming

General

This chapter is intended to acquaint you with programming the NCR 7870. It covers the overall programming process for the NCR 7870.

The NCR 7870 Scanner/Scale is fully programmable to meet your system requirements and is already programmed with the factory-set default values when shipped. However, if programming changes are needed, the procedure is very simple.

This chapter is divided into five sections.

- *How to Program the NCR 7870* which describes
 - Creating the Program,
 - Programming Mode,
 - Programming Tags,
 - Programming Entry Example, and
 - Programming Tips.
- *Program Parameter Descriptions* covers the properties and uses of the programmable features that make the NCR 7870 flexible and user-friendly. This section describes
 - Specific Parameters,
 - Programming Instructions for each Parameter
 - Default Parameter Settings, and
 - Programming Example using a Programming Worksheet.

- *PACESETTER Plus Information* covers the use, programming, and interpretation of *PACESETTER Plus* including
 - Modes – Inquiry, Real-Time, and Normal
 - Host Access to Tallies, and
 - Host Reset of Tallies.
- *Special Programming* discusses functions that fall outside of normal programming such as
 - Delay Weight Data to IBM Host Terminal,
 - EAN/JAN/UPC Multi-Symbol Scanning Parameters,
 - Early Beep Disable,
 - Good Read Tone Presets,
 - Good Weigh Tone When Transmitting Data, and
 - Terminal Coupon Interface Parameters.
- *ASCII Code Chart*, which is referenced several times, is the last section in this chapter.

How to Program the NCR 7870

Creating the Program

Creating a program consists of three basic steps.

Step 1. Writing the Program

a) Identify Your Requirements.

The first thing you need to do is to determine the requirements of your NCR 7870 installation. This includes information about the communications protocol, the types of bar codes you scan, the use of Good Read tones, and scanner time-outs.

b) Complete the Programming Worksheets.

Using the descriptions contained in this document, complete each programming worksheet. Write the entries of your program in the space provided. Refer to Programming Modes for specific information about each parameter.

Step 2. Entering the Program

a) Enter the Base Programming State.

Scan the **Programming Mode** tag. This must be the first tag scanned after supplying power to the NCR 7870.

b) Enter the Parameters for each Specific Programming Mode.

Scan the two Hex tags to select a Specific Programming Mode, then enter all parameter data for it. After you have entered all the information, the NCR 7870 returns to the Base Programming State. Repeat this procedure for each Specific Programming Mode that needs changed. You do not need to enter a specific programming mode if its associated programming is already correct.

Step 3. Save the Program

- a) Scan the **Save and Reset Tag**.

When you scan the **Save and Reset** tag, the scanner saves all programming parameters that you entered. This becomes the new scanner program. The scanner goes through initial startup and operates using the new program.

- b) Save your Programming Worksheets.

Be sure to save your programming worksheets that contain the scanner program. It is much easier to reenter the program, or change some of it, if you have a written record of the existing program.

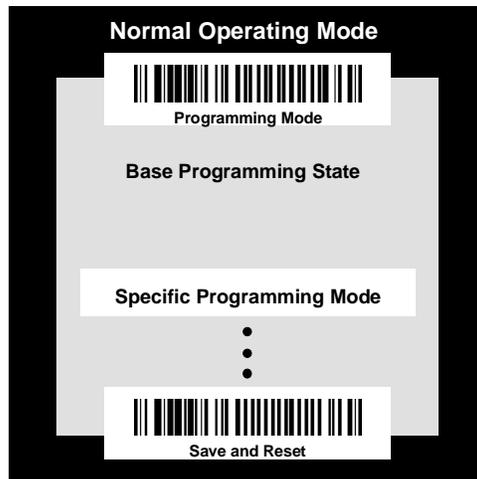
Programming Mode

The NCR 7870 Scanner/Scale is programmed in the Programming Mode. You enter this mode by scanning the Programming Mode tag as the first tag scanned immediately after applying power to the NCR 7870. This puts the NCR 7870 in the Base Programming State. As a result, the NCR 7870 produces a long and then a short beep, and the status indicator stays off.

From the Base Programming State you select Specific Programming Modes by scanning the proper combination of two hexadecimal tags. The program parameters that you can enter in a Specific Programming Mode are identified on the associated programming worksheet.

In each Specific Programming Mode you can enter all the information contained on the worksheet by scanning the proper tags in the sequence shown on the worksheet. However, you can also use parameter shortcuts to enter only specific parameters. Program entry then goes directly to a specific parameter when you scan the proper Hex tag.

The NCR 7870 accepts programming tags only in the Programming Mode. If you scan a programming tag during normal operation, nothing happens.



Programming Tags

After completing the worksheets, enter the information using the special programming tags contained in the **NCR 7800, 7870, 7875, 7880, and 7890 Programming Tags** book (BST0-2121-74). You do not need a large number of special programming tags, only 5 unique tags and 16 hexadecimal (Hex) character tags. The following identifies each programming tag, its function, and the associated indicators.

Abort

Function – In Base Programming State

If this tag is scanned in the Base Programming State, programming is terminated and no previously entered parameters are saved.

Indication – In Base Programming State

- Short beep as soon as tag is read – Good Read tone
- Status indicator flashes red twice
- Four quick beeps from low to high frequency

Function – In Specific Programming Mode

If this tag is scanned in a Specific Programming Mode, all parameters entered are saved and the NCR 7875 goes to the Base Programming State.

Indication – In Specific Programming Mode

- Short beep as soon as tag is read – Good Read tone
- Status indicator flashes green once
- Programming returns to Base Programming State.

Default

Function

This tag causes most parameters to go to default values. However, scanning this tag does not change a few parameters, including the Communications Protocol. The Default tag must be the first tag scanned after applying power to the NCR 7870.

Indication

Performs power-up sequence.

End

Function

This tag ends certain input sequences. Since the programming mode determines the end of most sequences, this tag is not used often.

Indication

- Short beep as soon as tag is read – Good Read tone
- Status indicator flashes green once

Hex 0 – Hex F

Function

These 16 tags enter the selections for each of the parameters in the Specific Programming Modes. They also select the Specific Programming Mode.

Indication

- Hex 0 – Short beep, different frequency from Good Read tone
- Hex 1 through Hex F – Beeps tag value. Multiples of 4 short beeps grouped together. Others are longer

Example – Hex D is indicated by 12 short beeps (3 sets of 4) followed by 1 longer beep, for a total of 13.

Programming Mode

Function

This tag puts the NCR 7870 in the Base Programming State. It must be the first tag scanned after applying power to the NCR 7870, or after scanning the Default tag.

Indication

- Short beep as soon as tag is read – Good Read tone
- Long and short beep – in Base Programming State
- Status indicator – off

Save and Reset

Function

This tag causes the NCR 7870 to save and start using the programming data. It is used in the Base Programming State.

Indication

- Short beep as soon as tag is read – Good Read tone
- Status indicator flashes red twice
- Four quick beeps from low to high frequency

Program Entry Example

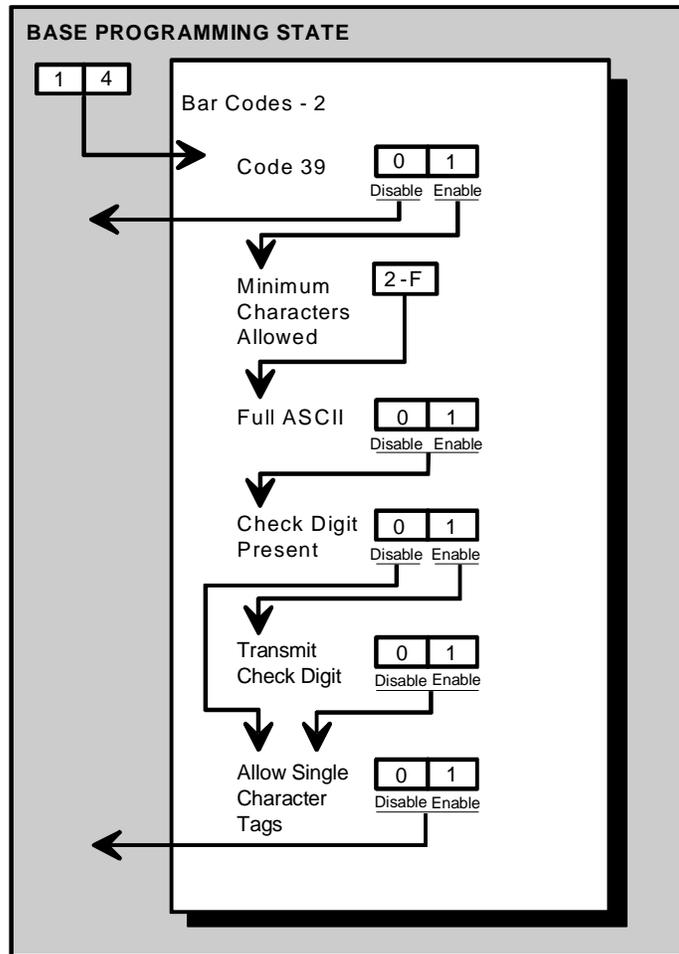
The following example is a typical program entry procedure.

1. Apply power to the NCR 7870 Scanner/Scale.
2. Scan the **Programming Mode** tag.
3. Scan the two Hex tags corresponding to the worksheet number.
4. Scan appropriate Hex tags to enter parameters. Two methods are available:

a) **Enter All Parameters**

To enter all parameters in a Specific Programming Mode, scan the two Hex codes that put the NCR 7870 in the specific mode, and then make parameter changes in the order described on the programming worksheet for that mode. In programming all parameters in a specific mode, you proceed linearly through the work sheet. When you make a change in a parameter, the scanner moves to the next parameter to be changed or it goes back to the Base Programming State if your selection ends programming in that particular Specific Programming Mode.

The following figure shows how to proceed through a Specific Programming Mode where you choose to enter all parameters. This figure presents the Specific Programming Mode for the Bar Codes 2 program parameters. The figure shows how you proceed through the specific mode by entering all available parameters. Notice that if you choose to disable Code 39 bar codes, programming immediately return to the Base Programming State. However, if you select to enable Code 39 bar codes, the scanner directs you to continue entering parameter information.



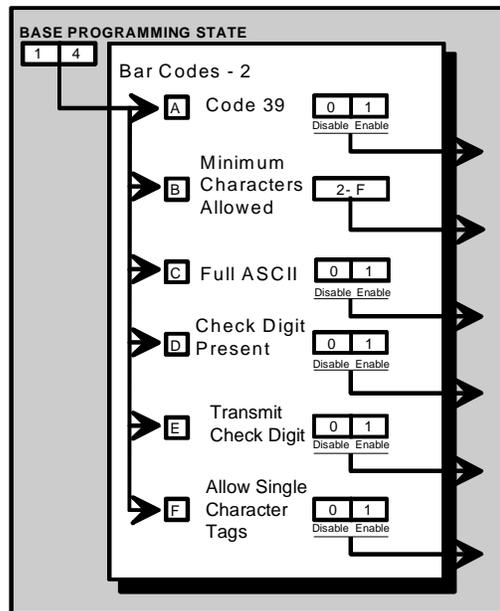
11722

b) Enter Specific Parameters

To enter only one particular parameter in a Specific Programming Mode, scan the two numbered Hex tags that correspond to that specific mode. However, once you have entered the specific programming mode instead of immediately changing parameters with numbered Hex tags, use the lettered Hex tags to choose the one particular parameter that you want to change. After you have selected the new parameter setting, the scanner immediately returns to the Base Programming State. If you decide to do additional programming with these

parameter options, you have to re-enter the Specific Programming Mode by scanning the two Hex tags again.

The following figure shows how to proceed through a Specific Programming Mode where you change only one of the parameters. This figure presents the specific programming mode for Bar Codes 2 program parameters. Notice that once you have entered the Specific Programming Mode, if you scan the **Hex A**, **Hex B**, **Hex C**, **Hex D**, **Hex E**, or **Hex F** tag, you can enter the specific parameters that correspond to that tag. After you record the parameters, the scanner immediately returns to the Base Programming State. To return to programming, you scan the **Hex 1** and **Hex 4** tags again and re-enter the Specific Programming Mode. From this point, you can enter either all parameters or another specific parameter.



For example:
Full ASCII is programmed by scanning, in sequence, the Hex 1, Hex 4, Hex C, and Hex 1 tags. The other parameters are left in original state.

11723

- Repeat step 3 and step 4 until all parameters are entered.
- Scan the **Save and Reset** tag. All parameter changes are saved and NCR 7870 is reset (goes through initial power-up sequence). The NCR 7870 now operates using the new program.

Programming Tips

- Turn the host terminal off or disconnect all interface cables to the NCR 7870 before entering your program. Some host terminals can corrupt your program if they are running and are connected to the NCR 7870 while you are entering the program.
- To exit a Specific Programming Mode without entering all the parameters, scan the **Abort** tag. All parameters entered are retained and the NCR 7870 returns to the Base Programming State. To save the changed parameters, you must scan the **Save and Reset** tag.
- To exit the programming mode without saving any parameter changes, scan the **Abort** tag while in the Base Programming State. The NCR 7870 goes through initial startup and operates using the old program.
- If you do not know how your NCR 7870 is programmed, set all parameters to default values, then enter any required changes. Do this by scanning the **Default** tag as the first tag after applying power to the NCR 7870. Next, scan the **Programming Mode** tag to enter the Base Programming State and enter your programming changes.
- After completing a programming sequence, wait for the tone or Voice Message to indicate the unit is back in Programming Mode before beginning the next programming sequence.

Note: Some parameters do not have default values and are not changed when you scan the **Default** tag.

Program Parameter Descriptions

Within the Base Programming State are several Specific Programming Modes. Each of these have specific programming parameters.

Communications Protocol

The Communications Protocol programming mode selects the protocol that the NCR 7870 Scanner/Scale uses to communicate with the host terminal.

Note: The factory sets the Communications Protocol according to the specifications on your order. Before changing the Communications Protocol, the NCR 7870 must contain the correct Communications Interface Board. Also, since there is no default Communications Protocol, the **Default** tag does not change this parameter.

Defaults

Parameter	Default Value
Protocol	No Default

Specific Program Parameters

OCIA NCR Short (Datachecker) – Hex 0 tag

NCR short format OCIA is the scanner only (NCR 7870-1000/3000) protocol used in older NCR terminal systems such as 2557 and 2126 systems. Later model terminals may also use this format for scanner only configurations. If the scale is enabled (NCR 7870-2000/4000/4500), a system using the short format OCIA protocol uses the OCIA Dual-Cable setting as explained under OCIA Dual-Cable. This format accommodates only 5 data bits per character and supports only UPC/EAN bar code data.

A scanner or scanner/scale that uses the Datachecker Interface should be programmed using this format. If the protocol information is lost, the scanner/scale defaults to RS-232. It then must be reprogrammed to OCIA NCR Short. Use the **Hex 0** tag to enable this protocol.

OCIA NCR Long – Hex 1

OCIA Long (Alternate Codes Long Format) is used on the NCR 7852 Alternate Codes Scanner and the NCR 7890 Presentation Scanner. This format originally supported only single byte commands from the host terminal due to scanner limitations. The OCIA NCR Long format sends ASCII tag data to the host terminal. Since this format supports 8 data bits, it can accommodate the alphanumeric data found in the Code 128 and Code 39 bar codes, provided the system software supports those codes. This data format cannot accommodate scale communications and is not the same as the data format used in Single Cable OCIA, even though both formats use long format OCIA hardware. Use the **Hex 1** to enable this protocol.

OCIA Non NCR Dual Cable – Hex 2

The Non NCR Dual Cable configuration uses two separate cables for the scanner and the scale. The scanner data protocol is the same as in the OCIA Non NCR protocol. The scale data protocol is the same as is used on OCIA Dual Cable scale communications (OCIA NCR Short). Use the **Hex 2** tag to enable this protocol.

IBM 468x/9x Port 4A (Slot Scanner) – Hex 3 tag

All models of the NCR 7870 support the IBM 468x/9x format and use the same protocol found on IBM terminals. The scanner uses terminal port 17 and the select address is set to 4A.

If your unit is a scanner/scale, the IBM address default setting is 6E, but can be programmed to 6A or 6B. The IBM terminal integrated scanner/scale driver normally uses address 6E. However, if the scanner works but the scale does not, try using the other two scale addresses. Use the **Hex 3** tag to enable this protocol.

IBM 468x/9x Port 4B (HHBCR) – Hex 4 tag

All models of the NCR 7870 support the IBM 468x/9x format and use the same protocol found on IBM terminals. The scanner uses terminal port 17 and the select address is set to 4B. Use this protocol with the hand held bar code reader.

If your unit is a scanner/scale, the IBM address default setting is 6E, but can be programmed to 6A or 6B. The IBM terminal integrated scanner/scale driver normally uses address 6E. However, if the scanner works but the scale does not, try using the other two scale addresses. Use the **Hex 4** tag to enable this protocol.

RS-232 – Hex 5 tag

RS-232 is used to connect the scanner or scanner/scale to almost any RS-232 type of communications device. This protocol uses 7-bit ASCII to send tag and scale data to the device. Use the **Hex 5** tag to enable this protocol.

OCIA Single Cable – Hex 6 tag

The OCIA Single-Cable scanner/scale format is the format normally used in supermarkets to talk to an NCR 7870 Scanner/Scale. Since this format supports 7-bit data, it can accommodate the alphanumeric data found in the Code 128 and Code 39 bar codes, provided the system software also support those codes. Use the **Hex 6** tag to enable this protocol.

OCIA NCR Dual Cable – Hex 7 tag

The OCIA NCR Dual Cable configuration uses two separate cables for the scanner and scale. The data protocol is the same as in OCIA NCR Short. This dual cable communications scheme is used on older NCR terminal systems such as 2557 and 2126 systems. This format can accommodate only 5 data bits per character and supports only UPC/EAN bar code data. Use the **Hex 7** tag to enable this protocol.

Casio 4-Bit, Parallel, Dual Cable – Hex A tag

Non-NCR short format is used on some older competitive terminal systems. This format is sometimes called 6-bit ASCII since it can accommodate only 6 data bits per character. It cannot support Code 128 or Code 39 bar code data. This format is normally not used on NCR systems. Use the **Hex A** tag to enable this protocol.

IBM 1520 (BRC, IBM 468x/9x Port 4B) – Hex B tag

All models of the NCR 7870 support the IBM 468x/9x format and use the same protocol found on IBM terminals. The scanner uses terminal port 17 and the select address is set to 4B.

If your unit is a scanner/scale, the IBM address default setting is to 6E, but can be programmed to 6A or 6B. The IBM terminal integrated scanner/scale driver normally uses address 6E. However, if the scanner works but the scale does not, try using the other two scale addresses. Use the **Hex B** tag to enable this protocol.

TEC, 4-Bit, Parallel, Dual Cable – Hex C tag

The TEC 4-Bit Parallel protocol is used when connecting the NCR 7870 Scanner/Scale to a TEC M-XXXX host terminal. This configuration uses two cables. The scanner uses an OCIA interface and the scale uses a 4-bit parallel interface. Use the **Hex C** tag to enable this protocol.

Communications Protocol Hex Tag Summary

Communications Protocol Type	Hex Tag
OCIA NCR Short (Datachecker)	0
OCIA NCR Long	1
OCIA Non-NCR Dual Cable	2
IBM 468x/9x Address 4A	3
IBM 468x/9x Address 4B (HHBCR)	4
RS-232	5
OCIA Single Cable	6
OCIA NCR Dual Cable	7
Casio 4-Bit, Parallel, Dual Cable	A
IBM 1520 (BRC, IBM 468x/9x Port 4B)	B
TEC, 4-Bit, Parallel, Dual Cable	C

Programming Example

Following is an example of a completed Communications Protocol worksheet. In this example, RS-232 is the selected protocol.

Your Program

1	0
---	---

Communications
Protocol

5

Protocol

Good Read Tone

The Good Read Tone programming mode selects the parameters for sounding a tone each time the NCR 7870 Scanner/Scale successfully reads a bar code. It also controls the volume of the Not-On-File tone. This mode contains five shortcuts: A, B, C, D, and E. After entering this programming mode, you normally go directly to a specific parameter by scanning the appropriate shortcut Hex tag. This eliminates the need to enter all parameters when only one needs changing.

Defaults

Parameter	Default Value
Tone On/Off	On
Tone Frequency	No Default
Tone Length	No Default
Tone Volume	No Default
Not-on-File Tone	No Default

Specific Program Parameters

Not On File Tone Volume

The **Hex E** tag permits you to select the volume of the Not On File Tone by listening to it as you repeatedly scan the **Hex E** tag. The new tone sounds for two seconds. End this mode by scanning the **End** tag or another valid Hex tag.

Tone Frequency (Hertz)

The **Hex B** tag permits you to set the frequency of the Good Read Tone by listening to it. Each time the **Hex B** tag is scanned, the tone increments one unit. After reaching the highest frequency (1250 Hertz), the sequence starts over with the lowest frequency (524 Hertz). End this mode by scanning the **End** tag or another valid Hex tag.

Tone Length (Milliseconds)

The **Hex C** tag permits you to set the length of the Good Read Tone by listening to it. Each time you scan the **Hex C** tag, the tone length changes from a minimum of 25 milliseconds to a maximum of 250, and then back again. End this mode by scanning the **End** tag or another valid Hex tag.

Tone On/Off

The **Hex A** tag sets the Tone On/Off programming mode, which offers two options, On and Off. The **Hex 0** tag turns the Good Read tone off and the **Hex 1** tag turns the Good Read Tone on. The default is to turn the Good Read Tone on.

Tone Volume

The **Hex D** tag permits you to select the volume of the Good Read tone by listening to it as you repeatedly scan the **Hex D** tag. End this mode by scanning the **End** tag or another valid Hex tag.

Program Example

Following is an example of a completed Good Read Tone programming worksheet. In this example, the only selection that can be made beforehand is the tone on/off, which is selected to be on. The other adjustments are selected by listening to the tone as you repeatedly scan the appropriate Hex tag.

Your Program

		A	B	C	D	E
1	1	1	B*	C*	D*	E*
Good Read Tone		Tone On/Off	Tone Frequency	Tone Length	Tone Volume	Not-On-File Tone Volume

* Scan Hex tag repeatedly for desired setting.

Timers

The Timers programming mode controls the two NCR 7875 Scanner/Scale timers: Lockout Time and Active Time.

Defaults

Parameter	Default Value
Lockout Time	900 milliseconds
Restart Lockout Timer	Off
Active Time	15 seconds

Specific Program Parameters

Lockout Timer (Milliseconds)

The lockout timer prevents the scanner/scale from repeatedly reading the same bar code. After reading a bar code, it must be removed from the scan pattern and the time programmed in the lockout timer must elapse before the scanner/scale can read the same bar code again. The Lockout Time parameter selects the lockout time.

There are 8 different times ranging from 450 milliseconds to 1500 milliseconds in increments of 150 milliseconds. Select these times using the **Hex 0** through **Hex 7** tags. The default time is 900 milliseconds.

Restart Lockout Timer

The Restart Lockout Timer parameter controls restarting the lockout timer each time the scanner/scale reads the same bar code. Turning on the Restart Lockout Timer option has the following effect. After reading a bar code, if the bar code moves out of the scan pattern and then back into the scan pattern before the lockout timer times out, the lockout timer restarts. The **Hex 0** tag turns off this option and the **Hex 1** tag turns it on. The default is off.

Active Time (Minutes)

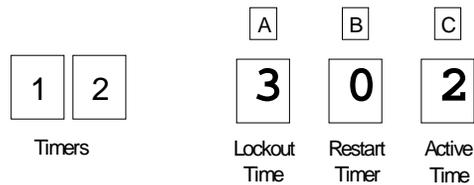
You can program specific lengths of time that your NCR 7870 Scanner/Scale stays on after the last good read. There are four options in the Active Time parameter: no shut down, shut down after 15 minutes, shut down after 30 minutes, and shut down after 60 minutes. Select these times using the **Hex 0** through **Hex 3** tags, respectively. The default time is 15 minutes. Selecting no shut down results in the scanner/scale being active all the time.

Note: NCR suggests that you do not set the Active Time parameter to “no shut down.” Leaving the laser light on all the time reduces its life expectancy.

Program Example

Following is an example of a completed Timer programming worksheet. In this example the time-outs are programmed for the following.

- Lockout Time – 900 milliseconds
- Restart Lockout Timer – off
- Active Time – 30 minutes

Your Program

Bar Codes – 1

The Bar Codes 1 programming mode contains programming parameters for UPC/EAN bar codes.

Defaults

Parameter	Default Value
UPC/EAN	Enable
Version D	None
Extend UPC-A to EAN-13	Disable
Extend UPC-E to UPC-A	Disable
Periodic Codes	Disable
Periodic Codes Extension	2-Digit & 5-Digit
Send Data	Data as Decoded

Specific Program Parameters

UPC/EAN

The UPC/EAN parameter controls reading UPC/EAN bar codes. Disable reading UPC/EAN bar codes by scanning the **Hex 0** tag and enable reading by scanning the **Hex 1** tag. The default is to enable reading.

If you choose to disable reading UPC/EAN bar codes, there are no other entries allowed for this parameter. However, if you enable reading UPC/EAN bar codes, you can program the remaining parameters.

Version D

The Version D parameter permits you to enable or disable reading UPC Version D bar codes. There are six choices: None, D-1, D-2, D-3, D-4, and D-5. Scan the appropriate **Hex 0** through **Hex 5** tag to input

this parameter. The default is None and scanning a valid Hex tag ends the input for this parameter option.

Extend UPC-A to EAN-13

The Extend UPC-A to EAN-13 parameter determines whether to pad the tag data, changing 12-digit UPC tags to 13-Character EAN tags. The program does this by putting a zero (0) at the front of the tag data. Scan the **Hex 0** tag to disable this option or the **Hex 1** tag to enable it. The default is Disable and scanning a valid Hex tag ends the input for this parameter option.

Extend UPC-E to UPC-A

The Extend UPC-E to UPC-A parameter determines whether to pad the tag data, changing 6-digit truncated UPC tags to 12-Character UPC-A tags. Scan the **Hex 0** tag to disable this option or the **Hex 1** tag to enable it. The default is Disable and scanning a valid Hex tag ends the input for this parameter option.

Periodic Codes

The Periodical Codes parameter controls the processing of Periodical Codes. Disable Periodical Codes by scanning the **Hex 0** tag and enable them by scanning the **Hex 1** tag. The default is to disable Periodical Codes.

If you choose to disable Periodical Codes, there are no other entries allowed for this parameter. Scanning the **Hex 0** tag also causes the scanner/scale to go back to the Base Programming State. However, if you enable Periodical Codes, you must also program the Periodical Code Extension and Send Data parameters.

Note: Use of optional add-on bar codes may require additional programming. See Early Beep Disable and Terminal Coupon Interface Parameters in the *Special Programming* section of this chapter.

Periodic Code Extension

The Periodical Code Extension parameter has three selections: 2-digit extension only, 5-digit extension only, and either 2- or 5-digit extensions. Scan the **Hex 0** tag for 2-digit extension only, the **Hex 1** tag for 5-digit extension only, or the **Hex 2** tag for both the 2- and 5-digit

extension. The default is 2- and 5-digit extensions and scanning a valid Hex tag causes the program to go to the next parameter option.

Send Data

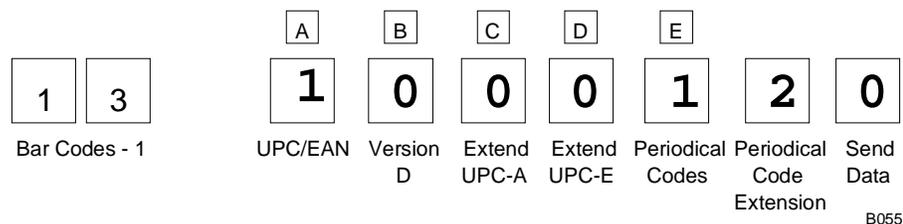
The Send Data parameter has three selections: Data As Decoded, Periodical Code Data Only, and CF Hex If Periodical Data Not Decoded. If you scan the **Hex 0** tag, the data is sent as decoded, whether or not there are extension digits. If you scan the **Hex 1** tag, only valid periodical codes are sent. If you scan the **Hex 2** tag, a hexadecimal CF is sent as the extension if the scanner/scale could not read a 2- or 5-digit code. The default is Data as Decoded. Scanning a valid Hex tag causes the program to go to the Base Programming State.

Program Example

In this example the UPC/EAN bar codes are programmed to have:

- UPC/EAN – enabled
- Version D tags – not read
- Extend UPC-A to EAN-13 – disabled
- Extend UPC-E to UPC-A – disabled
- Periodical Codes – enabled
- Periodical Code Extensions – 2- and 5-digit extensions
- Send data data – as decoded

Your Program



Bar Codes – 2

The Bar Codes 2 programming mode contains programming parameters for Code 39.

Defaults

Parameter	Default Value
Code 39	Disable
Minimum Characters Allowed	8
Full ASCII	Disable
Check Digit Present	Disable
Transmit Check Digit	Disable
Allow 1-or-2 Character Tags	Disable

Specific Program Parameters

Code 39

The Code 39 parameter controls reading Code 39 bar codes. Disable reading Code 39 bar codes by scanning the **Hex 0** tag and enable reading by scanning the **Hex 1** tag. The default is to disable reading.

If you choose to disable reading Code 39 bar codes, there are no other entries allowed for this parameter. However, if you enable reading Code 39 bar codes, you can program the rest of the parameters.

Minimum Characters Allowed

The Minimum Characters Allowed parameter defines how many characters in a bar code must be read the same by two separate scans before determining a valid read has occurred. You should set this option to the number of characters in a typical tag. This ensures that the scanner/scale reads typical tags with at least two complete good scans before sending the tag data to the host terminal.

There are 15 selections for this parameter option (2 through 16 characters). Scan the proper Hex tag (**Hex 2** through **Hex F**) to enter your selection. The default is 4 characters.

Full ASCII

Code 39 permits full ASCII capability by encoding the additional characters. Disable this function by scanning the **Hex 0** tag, and scan the **Hex 1 tag** to enable this function. Disable is the default.

Check Digit Present

The Check Digit Present parameter permits you to determine if the bar code must contain a correct check digit to be identified as valid. If this function is enabled, the bar code is ignored if a check digit is not present. Scan the **Hex 0** tag to disable this option, or the **Hex 1 tag** to enable it. Disable is the default.

Transmit Check Digit

The Transmit Check Digit parameter selects whether to send the check digit to the host terminal. Scan the **Hex 0** tag to disable this option, or the **Hex 1 tag** to enable it. The default is to disable sending the check digit.

Allow 1- or 2-Character Tags

The Allow One- or Two-Character Tags parameter selects whether or not to permit the scanner to read a one- or two-character Code 39 label. If your application does not require that the scanner read a one- or two-character Code 39 label, scan the **Hex 0** tag to disable this option. If your application requires this capability, scan the **Hex 1 tag** to enable it. The default is to disable reading a one- or two-character Code 39 label.

Program Example

Following is an example of a completed Bar Codes 2 programming worksheet. In this example, Code 39 is enabled with the following options.

- Code 39 – enabled
- Minimum Characters Allowed – 5
- Full ASCII – disabled
- Check Digit Present – enabled
- Transmit Check Digit – enabled
- Allow One- or Two-Character Tags – disabled

Your Program

	A	B	C	D	E	F		
	1	4	1	5	0	1	1	0
Bar Codes - 2	Code 39	Minimum Characters Allowed	Full ASCII	Check Digit Present	Transmit Check Digit	Allow Single Character Tags		

R0068

Bar Codes – 3

The Bar Codes 3 programming mode contains programming parameters for Interleaved 2 of 5.

Defaults

Parameter	Default Value
Interleaved 2 of 5	Disable
Bar Code Length	Range Check
Value 1	04
Value 2	16
Check Digit Present	Disable
Transmit Check Digit	Disable

Specific Program Parameters

Interleaved 2 of 5

The Interleaved 2 of 5 parameter controls reading Interleaved 2 of 5 bar codes. Disable reading Interleaved 2 of 5 bar codes by scanning the **Hex 0** tag and enable reading by scanning the **Hex 1** tag. The default is to disable reading.

If you choose to disable reading Interleaved 2 of 5 bar codes, there are no other entries allowed for this parameter. However, if you enable reading Interleaved 2 of 5 bar codes, you can program the remaining parameters.

Bar Code Length

The Bar Code Length parameter selects the method for determining if an Interleaved 2 of 5 bar code is a valid length. The Range Check method identifies a length range by specifying the minimum and maximum number of characters. The Specific Check method identifies two specific bar code lengths by specifying the number of characters in each. With this option, the number of characters in all Interleaved 2 of 5 bar codes must be one of the two numbers. Scan the **Hex 0** tag to use the Range Check method, scan the **Hex 1** tag to use the Specific Check method. The default is the Range Check method.

Value 1 and 2

The Value 1 and Value 2 parameter specifies the valid Interleaved 2 of 5 bar code lengths. Use this option with the Bar Code Length parameter option described in *Bar Code Length*. If you select the Range Check method, Value 1 specifies the minimum number of characters in a valid Interleaved 2 of 5 bar code and Value 2 specifies the maximum number of characters. If you select the Specific Check method, Value 1 contains one specific number of characters and Value 2 contains another.

Accepted values for Value 1 and Value 2 are 4 to 38 readable characters. The number of readable characters must be an even number; if you specify an odd number, it is rounded down one. Each value is input using two Hex tags. The first can be **Hex 0** through **Hex 3** and the second can be **Hex 0** through **Hex 9**. The default for Value 1 is 08 and for Value 2 is 16

Check Digit Present

The Check Digit Present parameter permits you to determine if the bar code must contain a correct check digit to be identified as valid. If this function is enabled, the bar code is ignored if a check digit is not present. Scan the **Hex 0** tag to disable this option, or the **Hex 1** tag to enable it. Disable is the default.

Transmit Check Digit

The Transmit Check Digit parameter selects whether to send the check digit to the host terminal. Scan the **Hex 0** tag to disable this option, or the **Hex 1** tag to enable it. The default is to disable sending the check digit.

Program Example

Following is an example of a completed Bar Codes - 3 programming worksheet. In this example Interleaved 2 of 5 is programmed for the following.

- Interleaved 2 of 5 – enabled
- Bar Code Length – range check method
- Minimum bar code length – 4 characters
- Maximum bar code length – 10 characters
- Check Digit Present – enabled
- Transmit Check Digit – enabled

Your Program

Bar Codes - 3									
		A	B			C	D		
1	5	1	0	0	4	1	0	1	1
Bar Codes - 3	Interleaved 2 of 5	Bar Code Length	Value 1	Value 2	Check Digit Present	Transmit Check Digit			

Bar Codes – 4

The Bar Codes 4 programming mode contains programming parameters for Code 128 bar codes.

Defaults

Parameter	Default Value
Code 128	Disable
Minimum Data Characters Allowed	3
UCC 128	Disable

Specific Program Parameters

Code 128

The Code 128 parameter contains two selections: Disable and Enable. Disable reading Code 128 bar codes by scanning the **Hex 0** tag and enable reading by scanning the **Hex 1** tag. However, selecting the disable option does not prevent reading the programming tags that are Code 128. The default is to disable reading Code 128 bar codes.

Minimum Data Characters Allowed

The Minimum Data Characters Allowed refers to the Code 128 characters on a numeric-only Code 128 symbol. For example, given a numeric-only Code 128 symbol of 12 34 56 78, the Minimum Data Characters Allowed would be 4; each Code 128 character is composed of two numeric data characters. Enter your selection by scanning the appropriate hex tag (**Hex 1** through **Hex 5**). The default is three.

UCC 128

The UCC 128 option refers to the Uniform Code Council Code 128 Data Formatter Start Code. Scan the **Hex 0** tag to disable this function, or the **Hex 1** tag to enable it. The default is disable.

Program Example

Following is an example of a completed Bar Codes 4 programming worksheet. In this example the Code 128 bar codes are programmed for the following.

- Code 128 – enabled
- Minimum Data Characters Allowed – 3
- UCC 128 – disabled

Your Program

	A	B	C
1 7	1	3	0
Bar Codes - 4	Code 128	Minimum Data Characters Allowed	UCC 128

Label Identifiers

The Label Identifiers programming mode selects the parameters for adding label identifiers to communication messages. If used with RS-232 or OCIA NCR Long or OCIA NCR Short when reading UPC Version D bar codes, the identifiers go before the bar code data. Label identifiers for the other modes of communication are determined by the firmware and are not programmable.

Defaults

Parameter	Default Value
Identifier Type	Default Prefix
Common Byte 1	5D
Common Byte 2	42
Bar Code Type	No Default
Common Byte	Common Byte 2 as a suffix for Code 39, Code 128, and Interleaved 2 of 5. UPC and EAN do not use common bytes.
Unique Identifier	UPC-A-41 (ASCII A) UPC-D-44 (ASCII D) UPC-E-45 (ASCII E) EAN-8-46 (ASCII F) EAN-13-47 (ASCII G) Code 39-31 (ASCII 1) Code 128-33 (ASCII 3) Interleaved 2 of 5 – 32 (ASCII 2)
Version Number (UPC-D)	Do Not Include

Specific Program Parameters

Identifier Type

The Identifier Type parameter defines the type and placement of label identifiers. You can select default identifiers that prefix the message data, unique prefix identifiers, or no identifiers.

Select the Identifier Type parameter by scanning the appropriate tag (**Hex 0**, **Hex 2**, or **Hex 3**). If you select default identifiers, you do not enter any other parameter in this programming mode. The factory set default is Default Prefix.

Identifier Types

1. Default Prefix - Scan the Hex 0 tag to use the default prefix. The default label identifiers vary depending on the type of bar code read. Following are the default identifiers for each bar code type.
 - a) UPC-A
41H NS X1 X2 X3 X4 X5 X6 X7 X8 X9 X10 CK
 - b) UPC-E
45H 30H X1 X2 X3 X4 X5 X6
 - c) EAN-8
46H 46H X1 X2 X3 X4 X5 X6 X7 CK
 - d) EAN-13
46H X1 X2 X3 X4 X5 X6 X7 X8 X9 X10 X11 X12 CK
 - e) Code 39
42H 31H X1 X2 X3 X4 X5 X6 X7 X8 X9 X10 X11 X12 X13 X14 X15 X16 X17 X18 X19 X20 X21 X22 X23 X24 X25 X26 X27 X28 X29 CK
 - f) Interleaved 2 of 5
42H 32H X1 X2 X3 X4 X5 X6 X7 X8 X9 X10 X11 X12 X13 X14 X15 X16 X17 X18 X19 X20 X21 X22 X23 X24 X25 X26 X27 X28 X29 CK
 - g) Code 128
42H 33H X1 X2 X3 X4 X5 X6 X7 X8 X9 X10 X11 X12 X13 X14 X15 X16 X17 X18 X19 X20 X21 X22 X23 X24 X25 X26 X27 X28 X29 CK

2. None -- Scan the **Hex 2** tag to select none. No label identifiers are added to the message data.

3. Unique Prefix -- To use a unique prefix, scan the **Hex 3**. A Unique Identifier is associated with each bar code type. Also, you may use one, two, or no Common Bytes. The figure shows the possible message formats when using a unique prefix. The formats do not show other elements programmed in the other RS-232 programming modes.

Unique Prefix - All Bar Codes

Unique Identifier	Bar Code Data		
Common Byte 1	Unique Identifier	Bar Code Data	
Common Byte 2	Unique Identifier	Bar Code Data	
Common Byte 1	Common Byte 2	Unique Identifier	Bar Code Data

Unique Prefix - UPC Version D

Unique Identifier	Bar Code Data			
Common Byte 1	Unique Identifier	Bar Code Data		
Common Byte 2	Unique Identifier	Bar Code Data		
Common Byte 1	Common Byte 2	Unique Identifier	Bar Code Data	
Unique Identifier	Version Number	Bar Code Data		
Common Byte 1	Unique Identifier	Version Number	Bar Code Data	
Common Byte 2	Unique Identifier	Version Number	Bar Code Data	
Common Byte 1	Common Byte 2	Unique Identifier	Version Number	Bar Code Data

R0147

Common Byte 1 and Common Byte 2

The Common Byte 1 and Common Byte 2 parameters permit you to specify the data sent to the host terminal in the Common Byte fields. Enter this information as two Hex characters for each Common Byte.

Note: Refer to the *ASCII Code Chart* for the Hex Characters; however, values of 20 to 7E are recommended. Do not use the same characters as the Terminator Byte or the message may terminate too soon. Also, a Common Byte cannot be 00.

If you are not going to use a Common Byte, you can scan any Hex tag twice except Hex 0 or the Terminator Byte value. The default for Common Byte 1 is 5D (ASCII I) and the default for Common Byte 2 is 42 (ASCII B). You must scan four tags to go to the next parameter.

Bar Code Type

The Bar Code Type parameter selects the bar code type for entering its associated label identifier information. After entering a Bar Code Type, enter the Common Byte, Unique Identifier, and Version Number if applicable. This procedure repeats until the label identifiers are specified for each bar code type. Scan the **Hex 0** through **Hex 7** tag to enter the appropriate Bar Code Type. Since you must select each of these individually for your application, there is no default for this parameter.

Common Byte

The Common Byte parameter selects which common bytes, if any, to add to the bar code data message. Each entry is unique to the previously specified Bar Code Type. Scan the **Hex 0** tag for no Common Bytes, the **Hex 1** tag for Common Byte 1, the **Hex 2** tag for Common Byte 2, or the **Hex 3** tag for both Common Bytes. The default for this parameter uses Common Byte 2 as a suffix for Code 39, Code 128, and Interleaved 2 of 5 bar code data. UPC and EAN bar codes do not use Common Bytes.

Unique Identifier

The Unique Identifier parameter permits you to specify the data sent to the host terminal in the Unique Identifier field. Each entry is unique to the previously specified Bar Code Type. Enter this data as two Hex characters using recommended values of 20 to 7E (Refer to the *ASCII Code Chart*). The following are the default values.

Parameter	Default Value
UPC – A	41 (ASCII A)
UPC – D	44 (ASCII D)
UPC – E	45 (ASCII E)
EAN – 8	46 (ASCII F)
EAN – 13	47 (ASCII G)
Code 39	31 (ASCII 1)
Code 128	33 (ASCII 3)
Interleaved 2 of 5	32 (ASCII 2)

Note: If you use the same characters as in the Terminator Byte, the message may terminate too soon.

Version Number (UPC-D Only)

The Version Number parameter can be used only if you specified UPC-D as the bar code type. To include the Version Number in ASCII, scan the **Hex 1** tag; scan the **Hex 0** tag if you do not want to include the Version Number. The default is not to include it.

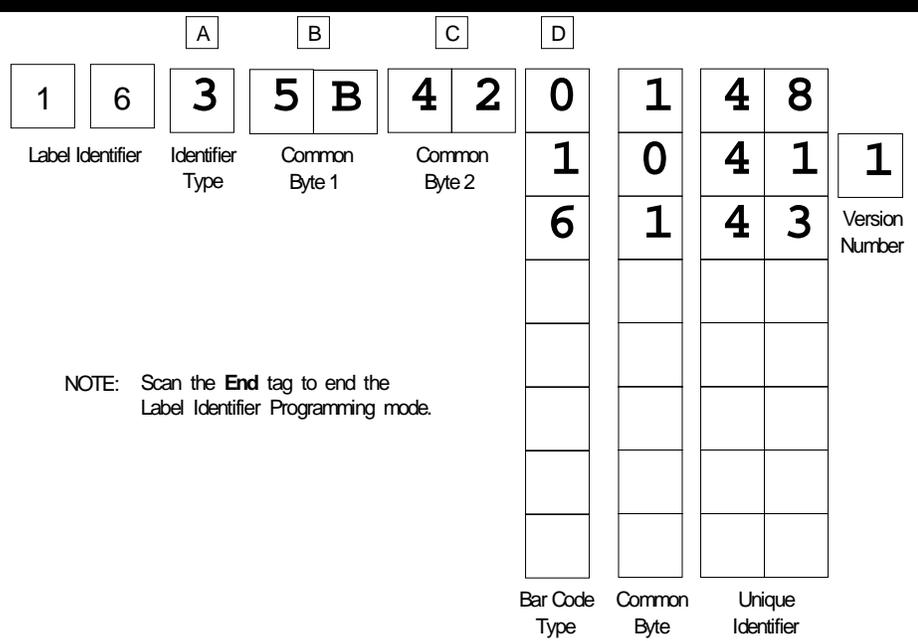
Program Example

Following is an example of a completed Label Identifiers programming worksheet. This example shows the following programmed selections.

- Identifier Type – Unique Prefix added to all bar code data messages
- Common Byte 1 – 5B (I)
- Common Byte 2 – 42 (B)
- Bar Code Type UPC-A
 - Common Bytes – Common Byte 1
 - Unique Identifier – 48 (H)

- Bar Code Type UPC-D
 - Common Bytes – No Common Bytes
 - Unique Identifier – 41 (A)
 - Version Number – included
- Bar Code Type Code 128
 - Common Bytes – Common Byte 1
 - Unique Identifier – 43 (C)

Your Program



RS-232 Parameters – 1

The RS-232 Parameters 1 programming mode contains four of the parameters required for RS-232 communications. From this programming mode you can select the Baud Rate, Parity, Stop Bits and Character Length, and Handshake Options.

Defaults

Parameter	Default Value
Baud Rate	9600
Parity	Odd
Stop Bits and Character Length	1 Stop Bit, 7-Bit Character
Handshake	RTS High, Wait for CTS

Specific Program Parameters

Baud Rate

The Baud Rate parameter contains seven selections: 300 Baud, 600 Baud, 1200 Baud, 2400 Baud, 4800 Baud, 9600 Baud, and 19200 Baud. Scan the appropriate **Hex 0** through **Hex 6** tag to set the desired Baud rate. The default is 9600 Baud.

Parity

The Parity parameter contains three selections: Odd, Even, and None. For 7-bit characters, bit 8 is the parity bit; for 8-bit characters, bit 9 is the parity bit. Choosing no parity and 7-bit character length causes the scanner/scale to send two stop bits; the scanner/scale must also receive two stop bits. Scan the appropriate **Hex 0**, **Hex 1**, or **Hex 4** tag to select the desired Parity. The default is Odd.

When you apply power to an NCR 7875-2000, the reset function checks the RS-232 Communications Parity programming. If the selection is None, it is ignored and Odd parity is used. If Odd or Even is selected, that selection is used.

Stop Bits and Character Length

The Stop Bits and Character Length parameter contains four selections: 1 Stop Bit and 7-Bit Character Length, 1 Stop Bit and 8-Bit Character Length, 2 Stop Bits and 7-Bit Character Length, and 2 Stop Bits and 8-Bit Character Length. Choosing no parity and 7-Bit Character Length causes the scanner/scale to send two stop bits; the scanner/scale must also receive two stop bits. If you select 8-Bit Character length and parity, only one stop bit is sent. Scan the appropriate **Hex 0** through **Hex 3** tag to set the Stop Bits and Character Length. The default is 1 Stop Bit and 7-Bit Character Length.

Handshake

The Handshake parameter contains six selections. When considering these, note that the scanner/scale controls only RTS, it can monitor CTS. The following list identifies each Handshake option.

- RTS is always low, CTS is ignored (**Hex 0** tag).
- RTS is always high, CTS is ignored (**Hex 1** tag).
- Scanner/scale raises RTS and waits for CTS to go high before transmitting (**Hex 2** tag).
- Scanner/scale raises RTS before transmitting and ignores the state of CTS (**Hex 3** tag).
- RTS is always low and scanner/scale waits for CTS to go high before transmitting (**Hex 4** tag).
- RTS is always high and scanner/scale waits for CTS to go high before transmitting (**Hex 5** tag).

Scan the appropriate **Hex 0** through **Hex 5** tag to set the Handshake option. The default is RTS High Wait for CTS.

Program Example

Following is an example of a completed RS-232 Parameters 1 programming worksheet. In this example the following are selected.

- Baud Rate – 9600 Baud
- Parity – Even
- Stop Bits and Character Length – 1 stop bit and 8 data bit character length
- Handshake – Raise RTS and Wait For CTS

Your Program

<input type="text" value="2"/>	<input type="text" value="0"/>	<input type="text" value="A"/>	<input type="text" value="B"/>	<input type="text" value="C"/>	<input type="text" value="D"/>
<input type="text" value="5"/>	<input type="text" value="1"/>	<input type="text" value="1"/>	<input type="text" value="2"/>		
RS-232 Parameters - 1	Baud Rate	Parity	Stop Bits And Character Length	Handshake	

R0072

RS-232 Parameters – 2

The RS-232 Parameters 2 programming mode contains some of the parameters required for RS-232 communications. From this mode you can select BCC Options, Interface Control, and Check Digit.

Defaults

Parameter	Default Value
BCC Options	7870-1000 & 3000 – Disable 7870-2000, 4000, & 4500 – Enable
Interface Control	None
Check Digit	Enable UPC-A Enable EAN-8 Enable EAN-13 Disable UPC-E

Specific Program Parameters

BCC Options

The BCC Option parameter permits you to enable or disable the use of BCC at the end of a message. When enabled, the BCC is the last character sent and is the Exclusive OR of each byte sent prior to the BCC, except the prefix byte. Scan the **Hex 0** tag to disable the BCC Option, or scan the **Hex 1** tag to enable it. The default is disable for NCR 7870-1000/3000 and enable for NCR 7870-2000/4000/4500.

Interface Control

The Interface Control parameter permits you to select how to control the transfer of data between the scanner/scale and the host terminal. The options are None, enable ACK/NAK, enable XOn/XOff, and enable both ACK/NAK and XOn/XOff.

If you enable ACK/NAK, each message sent to the host terminal must be acknowledged before sending the next message. Receiving the message properly causes an ACK to be sent, and if there are any errors, a NAK is sent instead and the scanner/scale sends the message again. Also, any valid message other than NAK or XOn/XOff, if enabled, serves as an ACK as long as the message from the scanner/scale is completed before the host terminal starts sending the valid message to the scanner/scale.

An XOff message turns the scanner transmitter off until the scanner/scale receives an XOn message. An XOn message can be received at any time. If the scanner/scale is sending a message when it receives an XOff, since these messages can be received any time, data transmission stops after sending the current byte. When the scanner/scale receives the next XOn it sends the remainder of the message. The scanner/scale does not acknowledge XOff and XOn messages with ACK or NAK messages.

You select the interface by scanning the appropriate **Hex 0** through **Hex 3** tag. The default is None.

Check Digit

The Check Digit parameter permits you to control the transmission of UPC-A, UPC-E, EAN-8, and EAN-13 check digits. Scan the appropriate **Hex 0** through **Hex 3** tags to enable or disable UPC-A, UPC-E, EAN-8, and EAN-13 check digits. The default is enable UPC-A, EAN-8, and EAN-13 and disable UPC-E.

Note: Although this is an RS-232 Parameters worksheet, the Check Digit parameter also applies to UPC-E when using OCIA communications.

Program Example

Following is an example of a completed RS-232 Parameters 2 programming worksheet. This example shows the following program selections.

- BCC Option – enabled
- Interface Control – ACK/NAK
- Check Digit – enable UPC-A, UPC-E, EAN-8, and EAN-13

Your Program

		A	B	C
2	1	1	1	3
RS-232 Parameters - 2		BCC Options	Interface Control	Check Digit

RS-232 Prefix Byte

The RS-232 Prefix Byte programming mode controls the use of prefix bytes. If you use an RS-232 Prefix Byte, it is the leading character in each message sent to the host terminal. Following it is the message data.

Defaults

Parameter	Default Value
Prefix Byte	Disable
ASCII Code	02

Specific Program Parameters

Prefix Byte

The Prefix Byte parameter contains two selections: Disable and Enable. Scan the **Hex 0** tag to disable the Prefix Byte, or the **Hex 1** tag to enable it. The default is Disable.

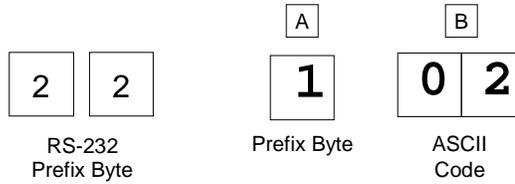
ASCII Code

The ASCII Code parameter permits you to specify what ASCII code to use for the Prefix Byte. Enter your selection by scanning the appropriate two Hex tags (shown in the *ASCII Code Chart*). You can select any value from 01 through 0F; however, the recommendation is that you use the Start Of Text (STX) ASCII Code which is 02 Hex. Scan the two appropriate Hex tags (**Hex 0** through **Hex 7** for the first character and **Hex 0** through **Hex F** for the second). The default for this parameter is 02.

Program Example

Following is an example of a completed RS-232 Prefix Byte programming worksheet. This example shows the Prefix Byte enabled, and ASCII Code STX (02 Hex) transmits as the leading character of each message sent to the host terminal.

Your Program



R0074

RS-232 Terminator Byte

The RS-232 Terminator Byte programming mode controls the use of terminator bytes. If you use an RS-232 Terminator Byte, it goes at the end of the message sent to the host terminal. If you included a BCC, it follows the Terminator Byte and includes the Terminator Byte in the calculation.

When you apply power to an NCR 7875-2000, the reset function checks the RS-232 Communications Terminator Byte programming. If the selection is Disable, it is ignored and an ETX (03) is automatically sent with each message. If you select Enable, the ASCII code you programmed is sent.

Defaults

Parameter	Default Value
Terminator Byte	Disable
ASCII Code	03

Specific Program Parameters

Terminator Byte

The Terminator Byte parameter contains two selections: Disable and Enable. Scan the **Hex 0** tag to disable the Terminator Byte, or the **Hex 1** tag to enable it. The default is Disable.

ASCII Code

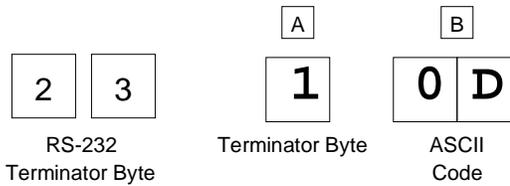
The ASCII Code parameter permits you to specify what ASCII code to use for the Terminator Byte. Enter your selection by scanning the appropriate two Hex tags (shown in the *ASCII Code Chart*). You can select any value from 01 through 7F; however, the recommendation is that you use the End Text (ETX) ASCII Code which is 03 Hex or Carriage Return (CR) which is 0D. Scan the two appropriate Hex tags

(Hex 0 through Hex 7 for the first character and Hex 0 through Hex F for the second). The default for this parameter is 03.

Program Example

Following is an example of a completed RS-232 Terminator Byte programming worksheet. This example shows the Terminator Byte enabled and ASCII code CR (0D Hex) transmitted as the Terminator Byte.

Your Program



R0075

RS-232 Communications Options

The RS-232 Communications Options parameters control the delay between messages, and the format in which the scanner and host terminal exchange tag data messages. The firmware is programmed to accept one parameter at a time and then leave this programming mode. Therefore, each of the parameters must be programmed separately.

Defaults

Parameter	Default Value
Message Delay	10 millisecond Delay
Scanner or Scanner/Scale Format	Determined by Model
Normal or Eavesdrop Mode	Normal Mode
Beep at Scale Weight Transmission	No Beep

Specific Program Parameters

Normal or Eavesdrop Mode

The normal mode is used for most RS-232 connections. However, an eavesdrop mode is available to permit another device to monitor the communications between the NCR 7875 and the host terminal. Scan the **Hex 6** tag to select the normal mode or the **Hex 7** tag to select the eavesdrop mode.

Message Delay

The Message Delay option permits you to choose the minimum time the firmware waits before sending the next message. This permits lowering CTS by the host terminal to inhibit data from the scanner. On previous scanners this option was not available.

Previous to firmware numbered 497-0301951 the delay between messages was zero milliseconds. This did not permit the terminal to lower CTS to prevent a second message from being sent to the scanner.

With 497-0301951 and higher, the default is 10 milliseconds minimum delay between messages.

Messages can be delayed by the following times.

- 0 for no delay
- 1 for a 10 ms delay
- 2 for a 50 ms delay

Scanner or Scanner/Scale Format

The Scanner or Scanner/Scale Format option permits you to force the data format to either scanner only format or scanner/scale format to accommodate the host terminal. For example, in a dual-cable system, the scanner data and the scale data are normally sent over separate cables in a format designed for each device (scanner or scale). In some circumstances a host terminal may not be able to handle the normal format sent to it. In that case, selecting one of these options permits you to use the other format.

The Model Number option in the Scale Parameters section overrides this option. If you program this option, do it after the other parameter or return here and change it again. This option effects the address and function code in the message, but not the BCC. The choices for this option are as follows.

- 4 for Scanner Only format
- 5 for Scanner/Scale format

The normal (default) format for scanner only tag data messages is as follows.

- Scanner-Only Tag Data
- Message Format

Prefix Byte	Label Identifier	Tag Data	PPD	Terminator Byte	BCC Byte
-------------	------------------	----------	-----	-----------------	----------

Shading indicates optional information.

Following is the normal (default) format for scanner/scale tag data messages.

- Scanner/Scale Tag Data
- Message Format

Prefix Byte	30	38	Label Identifier	Tag Data	PPD	Terminator Byte	BCC Byte
	Adl	FC					

Shading indicates optional information.

16565

The difference between the scanner only and the scanner/scale format is that the scanner/scale format has an address and a function code following the optional Prefix Byte. For more detailed information on message formats refer to the **NCR Scanner/Scale Interface Programmer's Guide** (BD20-1074-A).

Beep at Scale Weight Transmission

This parameter allows the scanner to signal the transmission of a scale weight that was requested by the host terminal. Scanning the **Hex 9** tag activates this feature and causes the unit to sound a Good Read tone as the weight information is sent to the terminal.

Program Example

Following is an example of a completed RS-232 Communications Options programming worksheet. This example shows the following programming selections.

- Message delay – 10 ms
- Format – Scanner only
- Normal or Eavesdrop – Normal Mode
- Scale Weight Transmission - Beep

Your Program

	A	B	C	D
2 4	1	4	6	9
RS-232 Communications Options	Message Delay	Scanner or Scanner/Scale Format	Normal or Eavesdrop Mode	Beep/No Beep Scale Weight Transmission

Scale Parameters

The Scale Parameters programming mode controls specific parameters associated with the NCR 7870-2000, 4000, 4500 Scales. You can use it to identify if the NCR 7870 includes a scale, and to define the address if the scale is connected to an IBM terminal.

Defaults

Parameter	Default Value
Model Number	No Default
9.995 kg/13.995 kg	No Default
IBM Address	Address 6E set by selecting IBM 468x on Communications Protocol Worksheet

Specific Program Parameters

Model Number

The Model Number parameter specifies if your unit is an NCR 7870-1000/3000 Scanner or an NCR 7870-2000, 4000, or 4500 Scanner/Scale. This parameter is set at the factory and should not need changing under normal circumstances. Scan the **Hex 3** tag to specify that the unit is an NCR 7875-2000, 4000, or 4500 (scanner and scale), or scan the **Hex 4** tag to specify the unit as being an NCR 7875-1000 or 3000 (scanner only). If you disable the scale on an NCR Scanner/Scale unit by scanning the **Hex 4** tag, the BCC option also changes to the appropriate state.

IBM Address

When programming an NCR 7870-2000, 4000, or 4500 Scanner/Scale for IBM communications, you must select the proper scale communications address. Selecting the IBM 468x communications

protocol sets the scale address to 6E; however, it may need to be changed to 6A or 6B, depending on the IBM configuration in the particular IBM customer retail application. Scan the **Hex 5** tag for address 6A, the **Hex 6** tag for address 6B, or the **Hex 7** tag for address 6E.

The IBM terminal integrated scanner/scale driver normally uses address 6E. However, if the scanner works but the scale does not, you should try using the other two scale addresses.

9.995 kg / 13.995 kg

The 9.995 kg / 13.995 kg parameter toggles between a maximum weight of either 9.995 kg or 13.995 kg. Use the **Hex B** tag to toggle between the two weights.

Program Example

Following is an example of a completed Scale Parameters programming worksheet. This example shows the following programming selections.

- Weight – displayed in kilograms
- Unit – NCR 7870-2000 Scanner/Scale
- IBM address – 6B
- 9.995 kg / 13.995 kg – the **Hex B** tag toggles this parameter

Your Program

3	0
---	---

Scale
Parameters

3

Model
Number

6

IBM
Address

B

9.995 kg /
13.995 kg

Miscellaneous Parameters

The Miscellaneous Parameters programming mode controls parameters associated with the NCR 7870-2000, 4000, and 4500 Scales that do not fit easily into any of the other categories. The NCR 7870 firmware is programmed to accept one parameter at a time and then leave this programming mode. Therefore, each of the parameters must be programmed separately.

Defaults

Parameter	Default Value
5-Second Weight Display Timer	Enabled
IBM Tone Control	Enabled
OCIA Price Display	Enabled
IBM Rexmit Control	Permanently Enabled
OCIA Blank Display in Price Mode	Disabled
Enable/Disable Voice Messages	No Default
IBM Tag Data Format	Hex

Specific Program Parameters

5-Second Weight Display Timer

This timer controls how long a price is shown on the integrated or remote display. The 5-Second Weight Display Timer will only work if the NCR 7870 is in OCIA Price Display Mode. The OCIA Blank Display may or may not be enabled -- it is optional.

When the 5-Second Weight Display Timer is enabled (which is the default setting), the display will show a weight until the host terminal sends a price. The price is displayed for no more than five seconds before returning back to weight. The weight value will remain on the display until new information is sent to the display, e.g. – an item is

scanned or a weight change is registered by the scale. Use the **Hex 2** tag to enable the timer.

When the 5-Second Weight Timer is disabled, the display will show a weight value until the host terminal sends price information. The price will remain on the display until new weight or price information is sent to the display. Use the **Hex 1** tag to disable the timer.

IBM Tone Control (Good Read Tone)

When you use an IBM terminal, this parameter determines what device controls the tone. Scanning the **Hex 4** tag enables this option and the IBM terminal controls the tone. Scanning the **Hex 3** tag disables this option and the scale controls the tone.

OCIA Price Display

When you use an OCIA terminal, this parameter controls the price display. If you select enable by scanning the **Hex 6** tag, the scale accepts and displays price information from the terminal. If you select disable by scanning the **Hex 5** tag, the scale does not accept or display any price information.

IBM Reremit Control

When you use an IBM terminal and the scale detects a bad message from the terminal, this parameter controls how the original message gets retransmitted. If you select enable by scanning the **Hex 7** tag, the scale retransmits the original message three times, and then terminates the sequence. If you select forever by scanning the **Hex 8** tag, the scale retransmits the original message until it is accepted, or until the scale is told to reset by the terminal. You should not use the enable selection unless advised to do so by NCR to solve a problem.

OCIA Blank Display In Price Mode

When Price Display mode is enabled, the OCIA Blank Display in Price Mode parameter controls how the scale reacts to blank screen commands. If you select enable by scanning the **Hex A** tag, the scale blanks the screen when it receives the command. If you select disable by scanning the **Hex 9** tag, the scale ignores the command.

Enable/Disable Voice Messages

When you have the voice messages feature on your scanner/scale, the Voice Messages Enabled/Disabled parameter toggles to enable or disable the feature. If voice messages are enabled, you hear them at the appropriate time. If they are disabled, you hear the beep tones instead. The **Hex D** tag toggles this parameter between enabled and disabled.

There is no indication, visual or otherwise, of the state of the enable/disable condition. If you do not hear the voice messages when you expect to hear them, toggle this parameter. If you still do not hear them, the problem could be in the programming ROM, the speaker chip, or elsewhere.

IBM Tag Data Format

This option is included because most IBM devices that have a select address of 4B require the bar code data to be transmitted as ASCII characters. (For hand-held bar code readers, see Communications Protocol Programming Mode.) Therefore, when selecting Communications Protocol choice 4B, NCR recommends that you set the tag format to ASCII. Use the **Hex E** tag to select hex and use the **Hex F** tag to select ASCII. The hex format is the default.

Program Example

Following is an example of a completed Miscellaneous Parameters programming worksheet showing the following programming selections.

- 5-Second Weight Display Timer – disabled
- IBM Tone Control – disabled
- OCIA Price Display – enabled
- IBM Rexmit Control – 3 times
- OCIA Blank Display in Price Mode – enabled
- Enable/Disable Voice Messages – the Hex D tag toggles this parameter
- IBM Tag Data Format – ASCII

Your Program

3	2
---	---

Miscellaneous
Parameters

1

5-Second Weight Display Timer

3

IBM Tone Control

6

OCIA Price Display

7

IBM Rexmit Control

A

OCIA Blank Display in Price Mode

D

Toggle Enable/Disable of Voice Messages

F

IBM Tag Data Format

PACESETTER *Plus* Information

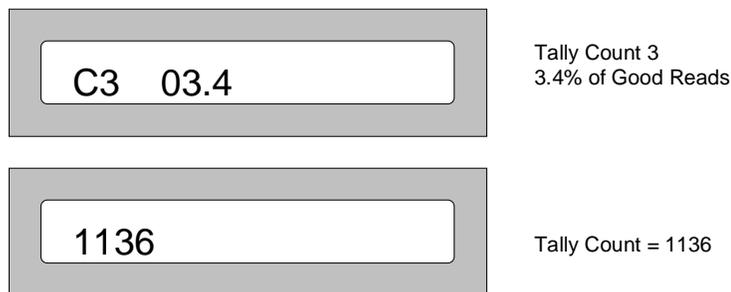
The PACESETTER Plus optional feature of the NCR 7870 Scanner/Scale determines what is wrong with a bar code label, fixes it, and then transfers the information to the host terminal. In addition, the scanner keeps track of what is wrong with the labels.

Mode 1 - Inquiry

Mode 1 keeps the following tallies. Included are the maximum counts.

Tally Count Type	Description	Maximum Count
C1	Good Reads	1,000,000
C2	No reads due to lack of a full label (bars missing, folded label, etc.)	65,535
C3	Good reads with very highly overprinted bars	65,535
C4	Good reads with very highly underprinted bars	65,535
C5	Missing margins	65,535

Enter Mode 1 by scanning the **Mode 1** tag. Tally counts are displayed on the Integrated Display or the NCR 7825 Remote Display. First the display shows the tally count number and the percentage of that count to the number of good reads. Three seconds later the actual tally count is displayed. This cycle continues every three seconds.



Note: These displays alternate every three seconds.

16566

Scanning the **Mode 1** tag again changes the display sequence to the next tally count. Continue to scan the **Mode 1** tag to view all tally counts. The tally count information is displayed in order according to the tally count number (C1 – C5).

Exit Mode 1 by pressing the Scale Zero Button on the Operator Display Panel or by scanning the **Mode 2** tag.

Mode 2 - Real Time

Enter Mode 2 by scanning the **Mode 2** tag.

The scanner goes off-line and disables the scale so that the integrated display or the NCR 7825 Remote Display can show **Ready 4 label**. Every subsequent scan until the scanner is powered off (or the Scale Zero Button is pressed) causes the scanner to indicate the status of label readability. The scanner can recognize missing bars in labels, highly over/under printed labels, missing margins, or a no-read condition.

If you scan a UPC/EAN label for analysis, the display shows **label** followed in one second by the display of the first half of the UPC/EAN label. If the label is a version E, no second half is displayed, since the E label is only six digits in length. After another two-second pause, the display shows **CODE xx** where "xx" is a code number to indicate one of the following.

Codes	Description
Code 00	Label was decoded without major problems.
Code x1	Label appears to be highly underprinted.
Code x2	Label appears to be highly overprinted.
Code x4	Label appears to have missing bars or margins.
Code x5	Label appears to be highly underprinted and to have missing bars or margins.
Code x6	Label appears to be highly overprinted and to have missing bars or margins.
Code 1x	Decoding was difficult. May be due to inconsistent printing.
Code 2x	Fragmented or folded label or inconsistent printed.
Code 3x	Decoding was difficult due to fragmented, folded, or inconsistently printed label.
Code 98	Label cannot be decoded due to missing print lines.
Code 99	Label cannot be decoded. If a particular label shows this code it should be analyzed more closely for out-of-specification conditions, even though the label may show a Code 00 when it does scan (printing may be inconsistent).

Note: If a label displays a code other than Code 00, the label should be tested further for being out of specification by using a symbol verifier.

Note: To exit Mode 2 and return to Normal Mode, press the Scale Zero Button on the Operator Display Panel. To go from Mode 2 to Mode 1, scan the **Mode 1** tag.

Mode 3 – Normal

Mode 3 is the normal operating mode. You can program the scanner to add *PACESETTER Plus* information to the decoded UPC/EAN data that is sent to the host terminal. Perform the following procedure to enable or disable *PACESETTER Plus* information.

1. Scan the **Programming Mode** tag (must be first tag scanned after power-up).
2. Scan the **Hex 3** tag.
3. Scan the **Hex 1** tag.
4. Scan the **Hex 3** tag.
5. Scan the **Hex 1** tag to disable *PACESETTER Plus* information, or the **Hex 2** tag to enable *PACESETTER Plus* information.
6. Scan the **Save and Reset** tag.

The *PACESETTER Plus* information describes the label readability much the same way as described in Mode 2. However, the host software must be capable of receiving the extra data being sent to it.

With OCIA and RS-232 communications, *PACESETTER Plus* information is sent as trailer information. With IBM communications, *PACESETTER Plus* information is sent as header information that is located between the last Status byte and the first tag data byte in the message. The *PACESETTER Plus* format is defined as the normal UPC/EAN format with the following added.

OCIA	RS-232	IBM
OCH, xyH, xzH	43H, 3yH, 3zH	OCH, 0yH, 0zH

x = High nibble containing character parity depending on communication format (or 0).

yz = Decoding code

The EOM bit, if applicable, is in the last byte sent, not the last byte of the label data. The Decoding Codes are specified in the following table.

Decoding Codes		Description
Y	Z	
1	z	Decoding was difficult. May be due to inconsistent printing.
2	z	Fragmented or folded label or inconsistent printing.
3	z	Decoding was difficult due to fragmented, folded, or inconsistently printed label.
y	1	Label appears to be highly underprinted.
y	2	Label appears to be highly overprinted.
y	4	Label appears to have missing bars or margins.
y	5	Label appears to be highly underprinted and to have missing bars or margins.
y	6	Label appears to be highly overprinted and to have missing bars or margins.
0	0	Label was decoded without major problems.
9	9	If a particular label intermittently shows this code, the label should be analyzed more closely for out-of-specification conditions, even though the label may show a Code 00 when it does scan (printing may be inconsistent).

Host Access to Tallies

The host can send Long Format Codes, Short Format Codes, RS-232 Format Codes, and IBM 4683 Format Codes to read the scanner tallies. The following table shows the Long Format Codes and the RS-232 Format Codes to use.

Tally	Long Format Codes: OCIA and Single-Cable Scanner/Scale OCIA	RS-232 Codes
C1	00H, 33H, 3DH, 32H, 31H	33H, 3dH, 32H, 31H
C2	00H, 33H, 3DH, 32H, 32H	33H, 3dH, 32H, 32H
C3	00H, 33H, 3DH, 32H, 33H	33H, 3dH, 32H, 33H
C4	00H, 33H, 3DH, 32H, 34H	33H, 3dH, 32H, 34H
C5	00H, 33H, 3DH, 32H, 35H	33H, 3dH, 32H, 35H

Note: Parity, BCC, and so on, appropriate to the communication protocol must be added.

Examples of Host Access to Tallies

Example 1

Host requesting tally C3 through single-cable OCIA.

30H	b3H	3dH	32H	b3H	8fH
-----	-----	-----	-----	-----	-----

The NCR 7870 response to the host request.

30H	33H	3yH	3xH	BCC (with EOM Bit)							
-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	--------------------

x = Decimal digit with high order digit sent first

y = Tally count number

BCC = Block Check Character - an exclusive OR of all previous bytes

Presence of BCC specified by protocol

Example 2

Host requesting tally C3.

30H	b3H	3dH	32H	b3H	8fH
-----	-----	-----	-----	-----	-----

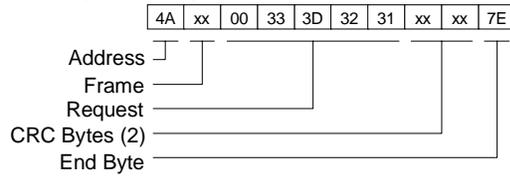
The NCR 7870 response to the host request (tally count = 23,456)

30H	33H	33H	30H	30H	32H	33H	34H	35H	36H	BCC (with EOM Bit)
-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	--------------------

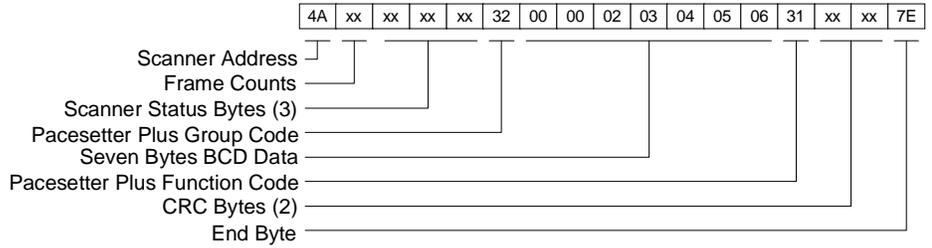
16824

Example 3

An IBM host terminal request for tally C1.



The NCR 7870 response to the host request.



16825

Host Terminal request using short format codes:

Send Tally Count	NCR OCIA	Non-NCR OCIA
C1: 03H 0dH 01H	03H 4DH 21 H With Parity & EOM	83H 0DH C1H With Parity & EOM
C2: 03H 0dH 02H	03H 4DH E3H 03H 4DH 21H	83H 0DH C2H With Parity & EOM
C3: 03H 0dH 03H	03H 4DH A3H With Parity & EOM	83H 0DH 43H With Parity & EOM
C4: 03H 0dH 04H	03H 4DH 65H With Parity & EOM	83H 0DH 24H With Parity & EOM
C5: 03H 0dH 05H	03H 4DH 65H With Parity & EOM	83H 0DH 45H With Parity & EOM

The NCR 7870 response to the host request.

00H	03H	0yH	0xH	Parity & EOM bits added.							
-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	--------------------------

x = Decimal digit with high order digit sent first

y = Tally count number

16826

Example 4

Host request for tally C5 using short format codes:

Send Tally Count	NCR OCIA	Non-NCR OCIA
C5: 03H 0dH 05H	03H 4DH 65H With Parity & EOM	83H 0DH 45H With Parity & EOM

The NCR 7870 response to the host request (tally count = 23,456):

Send Tally Count	NCR OCIA	Non-NCR OCIA
00H 03H 00H 00H	C0H 03H C5H C0H	80H 83H 85H 80H
02H 03H 04H 05H	C0H 42H 03H 84H	80H 02H 83H 04H
06H	C5H A6H C0H 03H	85H 46H
	C0H C0H 42H 03H	With Parity & EOM
	84H C5H A6H C0H	
	03H C0H C0H 42H	
	03H 84H C5H A6H	
	With Parity & EOM	

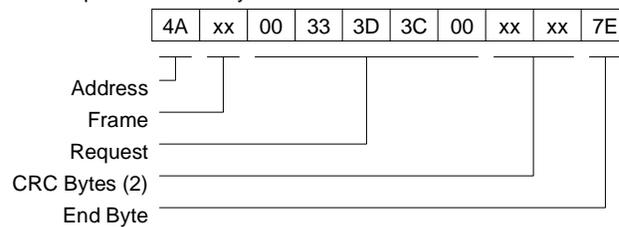
Host Reset of Tallies

The host terminal can reset the tally counts using the Long Format OCIA, Short Format OCIA, Single-Cable Scanner/Scale OCIA (parity bits, EOM bits or BCC bytes are not shown), RS-232, and IBM 4683 formats. The OCIA and RS-232 command is given in the following chart:

Host terminal request to reset tally counts (OCIA & RS-232)

OCIA	RS-232
00H 03H 0DH xxH	44H 43H
XxH = 00H or BBC (where protocol calls for BBC)	

An IBM host terminal request to reset tally counts



Special Programming

Some of the NCR 7870 features require programming that is somewhat different than the normal programming.

Delay Weight Data to IBM Host Terminal

A timing condition is possible when the NCR 7870 Scanner/Scale communicates with an IBM host terminal. The condition occurs when the IBM Host is requesting weight data, but the scale is not settled. To prevent the problem, you can enable a scale data delay function that gives the scale more time to settle. The default for this parameter is to disable the Scale Data Delay. Enable or disable the Scale Data Delay by scanning the following sequence of programming tags as the first tags scanned after applying power to the NCR 7870.

Enable – Programming Mode, Hex 4, Hex C, Hex E, Hex 2, Hex 9, Hex 4, Hex E, Hex 8, Hex 0, and Save and Reset.

Disable – Programming Mode, Hex 4, Hex C, Hex E, Hex 2, Hex 9, Hex 4, Hex E, Hex 0, Hex 0, and Save and Reset.

EAN/JAN/UPC Multi-Symbol Scanning Parameters

The optional Multi-Symbol programming feature permits you to scan bar code labels containing two or three EAN-13, JAN-13, or UPC-A symbols.

Label Construction

A multi-symbol label must consist of any combination of two or three EAN-13, JAN-13, or UPC-A symbols, each with different flag digits. Flag digits are the first two digits of the symbol on EAN-13/JAN-13 symbols. Flag digits for UPC-A symbols always have a zero (0) for the first digit with the number system character being the second digit. There is NO restriction on which flag digits may be used except that any flag digits used in a 3-symbol combination cannot be used in any of the 2-symbol combinations, and any flag digits used in a 2-symbol combination cannot be used in any of the 3-symbol combinations. A mixture of 2-symbol and 3-symbol combinations is allowed. A total of five multi-symbol combinations can be programmed.

Single Label Restriction

A single-symbol with the same flag digits as programmed for any 2-symbol or 3-symbol labels cannot be scanned as a single-symbol label.

Transmitting Label Data

Transmission of a multi-symbol label consists of a separate message for each of the symbols. The symbol with the lower numbered flag digits is transmitted first. For example, for the 3-symbol combination of JAN-13 flag 21, JAN-13 flag 29, and JAN-13 flag 96, the symbol with flag digits 21 is transmitted first, the symbol with flag digits 29 is transmitted second, and the symbol with flag digits 96 is transmitted third.

Perform the following to program the NCR 7870 for multi-symbol scanning.

1. Disconnect the communications cable from the scanner or the terminal.
2. Apply power to the NCR 7870.
3. To enter the Multi-Symbol program parameters mode, scan the following tags: **Programming Mode**, **Hex 1**, **Hex 3**, and **Hex F**.
4. Choose an option:

Option A: Clear multi-symbol programming by scanning the **Hex A** tag and the **Save and Reset** tag.

Result: All previously programmed combinations are cleared from permanent memory. The scanner goes through a sequence similar to the power up sequence.

Option B: Program a 2-symbol label by scanning the **Hex 2** tag.

Result: The scanner sounds two beeps followed by a 1-second pause. After the pause, the scanner beeps to indicate the number of labels that are currently in the scanner memory. Five beeps indicate a full multi-symbol memory.

Option C: Program a 3-symbol label by scanning the **Hex 3** tag.

Result: The scanner sounds three beeps followed by a 1-second pause. After the pause, the scanner beeps to indicate the number of labels that are currently in the scanner memory. Five beeps indicate a full multi-symbol memory.

Option D: Scan a multi-symbol label (2-symbol label if you scanned the **Hex 2** tag or 3-symbol label if you scanned the **Hex 3** tag).

Result: The scanner sounds the Good Read tone one time to indicate that the scanner accepted the multi-symbol label. If the multi-symbol label is already in the scanner's memory, the scanner then beeps twice for a 2-symbol label or three times for a 3-symbol label. A long, loud tone (error tone) indicates that the scanner's memory already has the maximum of five multi-symbol label combinations.

5. To program more labels, repeat Options C or D until a maximum of 5 label types (in any combination) have been scanned into memory.
6. Scan the **Save and Reset** tag to save the multi-symbol programming. The scanner should go through a sequence similar to a power up sequence.
7. Remove power from the NCR 7870 and connect the communications cable.

Early Beep Disable

When optional add-on bar codes are programmed, the Early Beep function may need to be disabled. The Early Beep function should not be used on systems, including many IBM host terminals, that sends “scanner disable” commands during the scanning operation.

The optional add-on bar codes which may require disabling the Early Beep are:

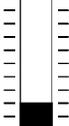
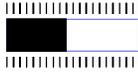
Optional Add-On Bar Code	Parameter Type
Coupon with P5 optional	Coupon Select 1
Coupon with 128 add-on optional	Coupon Select 1
Markdown with 128 add-on optional	Coupon Select 1
Program 1 with 128 add-on optional	Coupon Select 1
Program 2 with 128 add-on optional	Coupon Select 1
Coupon & P5 or 128 optional (EAN-99)	Coupon Select 2

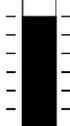
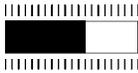
Use the following programming sequence to disable Early Beep in systems that are programmed with any optional add-on bar codes AND which use “scanner disable” commands.

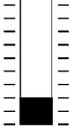
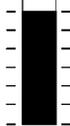
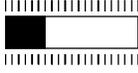
Programming Mode (Programming Mode)
Hex 3, Hex D (Terminal Coupon Interface Select 2 parameter)
Hex 6 (disables Early Beep)
Hex 3
Hex 5
Hex 1
Hex 1 (sets delay timer to 100 milliseconds)
Save & Reset

Good Read Tone Presets

The Good Read tone is composed of three elements: volume, frequency (tone), and length. Three different presets, each with a different combination of volume, tone, and tone length settings, are available that permit you to set the Good Read tone by scanning just one sequence of Programming Tags. Preset 0 is the default for this parameter.

Preset 0 Programming Mode Hex 4 Hex 3 Hex 0 Save and Reset			
			
	Volume	Tone	Length

Preset 1 Programming Mode Hex 4 Hex 3 Hex 1 Save and Reset			
			
	Volume	Tone	Length

Preset 2 Programming Mode Hex 4 Hex 3 Hex 2 Save and Reset			
			
	Volume	Tone	Length

Good Weigh Tone When Transmitting Data

A Good Weigh tone normally sounds when an item is weighed. If the Good Weigh Tone When Transmitting Data option is enabled the Good Weigh tone sounds when the weight data is just starting to be transmitted to the host terminal when using single cable RS-232 communications. The **Default** tag disables this option. Scan the following programming tags to enable or disable this option. These must be the first tags scanned after applying power to the NCR 7870.

Enable – **Programming Mode, Hex 2, Hex 4, Hex 9, and Save and Reset.**

Disable – **Programming Mode, Hex 2, Hex 4, Hex 8, and Save and Reset.**

Terminal Coupon Interface Parameters

Certain parameters must be set to permit the unit to transmit coupon data to the host terminal. These are in addition to the general parameters that are required for other scanner/scale functions.

Note: Selection of optional add-on bar codes may require additional programming. See Early Beep Disable in the *Special Programming* section for more information.

The first part of setting the Coupon Interface Parameters is **Programming Multi-Symbol Scanning**.

1. Scan the **Programming Mode** tag.
2. Scan the **Hex 3** and **Hex 8** tags to select this parameter.
3. Scan a **Hex 0** through **Hex F** tag to set a Coupon Select 1 parameter.

Coupon Select 1 Parameter	Disable	Enable
Coupon with P5 optional	Hex 0	Hex 1
Coupon with 128 add-on optional	Hex 2	Hex 3
Coupon with 128 add-on mandatory	Hex 4	Hex 5
Markdown with 128 add-on optional	Hex 6	Hex 7
Program 1 with 128 add-on optional	Hex 8	Hex 9
Program 1 with 128 add-on mandatory	Hex A	Hex B
Program 2 with 128 add-on optional	Hex C	Hex D
Program 2 with 128 add-on mandatory	Hex E	Hex F

4. Scan the **Save and Reset** tag to save the program (required).

- Repeat steps 1 through 4 to set the second Coupon Select 1 parameter.

Suggested Programming Sequence

- **Programming Mode**
- **Hex 3 and Hex 8**
- **Hex 1**
- **Save and Reset**
- **Programming Mode**
- **Hex 3 and Hex 8**
- **Hex 3**

Note: Scanning the Default tag disables all options.

The second part is to **Set Terminal Coupon Select 2 Parameter**.

- Scan the **Programming Mode** tag.
- Scan the **Hex 3** and **Hex D** tags to select this parameter.
- Scan a **Hex 0** through **Hex 7** tag to set a Coupon Select 2 parameter.

Coupon Select 2 Parameter	Disable	Enable
Coupon & P5 or 128 optional (EAN-99)	Hex 0	Hex 1
Coupon & 128 mandatory (EAN-99)	Hex 2	Hex 3
Markdown Tone	Hex 4	Hex 5
Early Tone for Optional Add-On	Hex 6	Hex 7

- Scan the **Save and Reset** tag to save the program.
- Repeat steps 1 through 4 to set the other option, if needed.

Note: Scanning the **Default** tag disables all options.

ASCII Code Chart

ASCII Code Chart															
00	NULL	10	DLE	20	SP	30	0	40	@	50	P	60		70	p
01	SOH	11	DC1	21	!	31	1	41	A	51	Q	61	a	71	q
02	STX	12	DC2	22	"	32	2	42	B	52	R	62	b	72	r
03	ETX	13	DC3	23	#	33	3	43	C	53	S	63	c	73	s
04	EOT	14	DC4	24	\$	34	4	44	D	54	T	64	d	74	t
05	ENQ	15	NAK	25	%	35	5	45	E	55	U	65	e	75	u
06	ACK	16	SYN	26	&	36	6	46	F	56	V	66	f	76	v
07	BEL	17	ETB	27	'	37	7	47	G	57	W	67	g	77	w
08	BS	18	CAN	28	(	38	8	48	H	58	X	68	h	78	x
09	HT	19	EM	29	)	39	9	49	I	59	Y	69	i	79	y
0A	LF	1A	SUB	2A	*	3A	:	4A	J	5A	Z	6A	j	7A	z
0B	VT	1B	ESC	2B	+	3B	;	4B	K	5B	[	6B	k	7B	{
0C	FF	1C	FS	2C	,	3C	<	4C	L	5C	\	6C	l	7C	|
0D	CR	1D	GS	2D	-	3D	=	4D	M	5D	]	6D	m	7D	}
0E	S0	1E	RS	2E	.	3E	>	4E	N	5E	^	6E	n	7E	
0F	S1	1F	US	2F	/	3F	?	4F	O	5F	_	6F	o	7F	DEL

R0040

Chapter 8: Troubleshooting

This chapter discusses the troubleshooting a user may perform to diagnose problems which may occur during use of the NCR 7870. For more comprehensive repair and service information, refer to **the NCR 7870 Scanner/Scale Repair Guide (D2-0966-A)**.

Fault Identification

The NCR 7870 Scanner/Scale performs internal diagnostic checks upon various functions during operation and the power-up sequence.

Scanner operational problems are signaled by

- a series of tones,
- Voice Messages (if available), and
- Status Indicator light flashing.

Scale operational problems are signaled by an error code displayed on the NCR 7825 Remote Display or the integrated display. Like the scanner, the scale unit performs diagnostic checks during the power-up sequence and while in operation.

Troubleshooting consists of troubleshooting charts that are designed for locating and correcting certain problems without the aid of a trained technician. If the problem cannot be corrected by using these charts, a trained technician can then use the on-board diagnostics to help identify a faulty component.

Scanner Troubleshooting Chart

Problem	Status Indicator	Tone	Possible Cause	Corrective Action
Scanner does not operate	Red Off Green Off	Off	No power	Check outlet for proper power
Scanner does not operate	Red Flashing Green Flashing	Off	Sleep mode	Pass anything in front of Motion Detector
Scanner does not operate	Red Flashing	Off	Communication is IBM 468x and scanner is off-line Host terminal has sent a "disable scanner" command	<ol style="list-style-type: none"> 1. Verify the IBM terminal is off. 2. Verify the IBM terminal is recognizing the 7870. 3. Verify the Interface Cable is properly connected.
Scanner does not read tags	Red On	Off	Internal failure	<ol style="list-style-type: none"> 1. Turn off circuit breaker to the 7870 then turn back on. 2. If problem remains, have the 7870 repaired.
Scanner reads only two tags	Red On	Off	7870 is not communicating with host terminal	<ol style="list-style-type: none"> 1. Check host terminal for proper operation. 2. Verify the Interface Cable is properly connected.

Scale Troubleshooting Chart

Note: This information does not apply to the NCR 7870-4000 which uses a Bizerba scale. For information on troubleshooting or servicing an NCR 7870-4000 scale unit, refer to the Bizerba documentation or contact the Bizerba representative.

Problem	Possible Cause	Corrective Action
Error code 5 - - - - displays	Scale drift	<ol style="list-style-type: none"> 1. Verify nothing is on scale. 2. Lift Top Plate and verify no objects are under it. 3. Push Reset/Scale Zero button. 4. Power down/up unit. 5. If error code persists, have unit repaired.
Error code 4 - - - - displays	Possible scale error	<ol style="list-style-type: none"> 1. Press Scale Zero button and retry. 2. If error code persists, have unit repaired.
Error code 4 - - - - displays during calibration	Slight vibration to scale during calibration	Calibrate scale. Ensure there is no external scale movement while weights are on scale.
Scale display is blank	Top Plate prevented from moving down	<ol style="list-style-type: none"> 1. Remove any interference around edge of Top Plate and checkstand. 2. Remove any foreign objects from under Top Plate. 3. Push Reset/Scale Zero button.
Intermittent error codes	+12 VDC is unstable	Have 7870 repaired.

Voice Messages Troubleshooting Chart

Problem	Possible Cause	Corrective Action
No Voice Messages	Firmware does not have voice capability.	<p>Check firmware on the Digital Board.</p> <ul style="list-style-type: none"> • Power unit OFF and then ON. • Scan the Diagnostic Mode tag. • Scan Hex 4 and Hex A tags. <p>Firmware version should appear in display. Version must be 497-0301951 or higher to have Voice Messaging feature.</p>
	Voice Messages option turned off.	<p>Toggle Voice Messages Option.</p> <ul style="list-style-type: none"> • Power unit OFF and then ON. • Scan Programming Mode tag. • Scan Hex 3, Hex 2, and Hex D tags. <p>This will turn option on if it were off.</p>

Appendix A: Programming Worksheets

General

The programming worksheets provide a convenient method of defining your NCR 7870 program before loading it into the unit. Each worksheet relates to a Specific Programming Mode.

Purpose

The programming worksheets permit you to determine the exact sequence of tags to scan for each programming parameter. It also provides you with a hard copy of the program for possible future use.

Format

The top half of each worksheet identifies the programming parameters and the specific tags for each one. Most of the worksheets contain arrows that guide you through the proper sequence. The bottom half of each worksheet provides a place for you to write in each of your selections.

Shortcuts

Most of the worksheets contain shortcuts that permit you to enter specific parameters without entering the entire worksheet. These parameters have an alpha character in a box just left of the parameter name. Scanning the Hex tag that corresponds to the alpha character enables input for that parameter. You then scan the tags that pertain to that parameter. After entering the specified parameter, the program returns to the Base Programming State.

Defaults

Most of the programming parameters have defaults that are determined at the factory. A heavy box around an entry specifies it as a default value. Scanning the **Default** tag as the first tag after applying power to the 7870 sets the parameters to these values.

Hex Characters

Some of the programming parameters require Hex characters. Refer to the *ASCII Code Chart* for the proper selections.

Program Entry

Some host terminals can corrupt your program if they are running and are connected to the 7870 while a program is being entered. Either turn the host terminal off or disconnect all interface cables to the 7870 before entering the program.

1. Enter the Base Programming state by scanning the **Programming Mode** tag. This must be the first tag scanned after powering up the 7870.
2. Select a Programming Worksheet and enter its parameter data by scanning the Hex tags identified in *Your Program* at the bottom of the Programming Worksheet. Repeat this for each Worksheet.
3. Save the program by scanning the **Save and Reset** tag.

Programming Parameter Defaults

Programming Mode	Default
Communications Protocol	
Protocol	No Default
Good Read Tone	
Tone On/Off	On
Tone Frequency	No Default
Tone Length	No Default
Tone Volume	No Default
Not-on-File Tone Volume	No Default
Timers	
Lockout Time	900 milliseconds
Restart Lockout Timer	Off
Active Time	15 seconds
Bar Codes-1	
UPC/EAN	Enable
Version D	None
Extend UPC-A to EAN-13	Disable
Extend UPC-E to UPC-A	Disable
Periodic Codes	Disable
Periodic Codes Extension	2-Digit & 5-Digit
Send Data	Data as Decoded
Bar Codes-2	
Code 39	Disable
Min. Characters Allowed	8
Full ASCII	Disable
Check Digit Present	Disable
Transmit Check Digit	Disable
Allow 1-or-2 Character Tag	Disable

Programming Mode	Default
Bar Codes-3	
Interleaved 2 of 5	Disable
Bar Code Length	Range Check
Value 1	04
Value 2	16
Check Digit Present	Disable
Transmit Check Digit	Disable
Bar Codes-4	
Code 128	Disable
Min. Data Characters Allowed	3
UCC 128	Disable
Label Identifiers	
Identifier Type	Default Prefix
Common Byte 1	5D
Common Byte 2	42
Bar Code Type	No Default
Common Byte	See Chapter 7
Unique Identifier	See Chapter 7
Version Number (UPC-D)	Not Included
RS-232 Parameters-1	
Baud Rate	9600
Parity	Odd
Stop Bits and Character Length	1 Stop Bit, 7-Bit Character
Handshake	RTS High, Wait for CTS
RS-232 Parameters-2	
BCC Options	Scale Only – Disable Scanner/Scale – Enable
Interface Control	None
Check Digit	Enable UPC-A Enable EAN-8 Enable EAN-13 Disable UPC-E

Programming Mode	Default
RS-232 Prefix Byte	
Prefix Byte	Disable
ASCII Code	02
RS-232 Terminator Byte	
Terminator Byte	Disable
ASCII Code	03
RS-232 Communications Options	
Message Delay	10 ms Delay
Scanner or Scanner/Scale Format	Determined by Model
Normal or Eavesdrop Mode	Normal Mode
Beep at Scale Weight Transmission	No Beep
Scale Parameters	
Model Number	No Default
9.995 kg/13.995 kg	No Default
IBM Address	Address 6E set by selecting IBM 468x on Communications Protocol Worksheet
Miscellaneous Parameters	
5-Second Weight Display Timer	Enabled
IBM Tone Control (Good Read Tone)	Enabled
OCIA Price Display	Enabled
IBM Rexmit Control	Permanently Enabled
OCIA Blank Display in Price Mode	Disabled
Enable/Disable Voice Messages	No Default
IBM Tag Data Format	Hex
Dual Cable Interface	
Scale Type	Avery

Worksheets

COMMUNICATIONS PROTOCOL

<input type="text" value="0"/> OCIA NCR Short (Datachecker)	<input type="text" value="1"/> OCIA NCR Long	<input type="text" value="2"/> OCIA Non NCR Dual Cable	<input type="text" value="3"/> IBM Slot Scanner	<input type="text" value="4"/> IBM Hand-Held Bar Code Reader	<input type="text" value="5"/> RS-232
<input type="text" value="6"/> OCIA Single Cable	<input type="text" value="7"/> OCIA NCR Dual Cable	<input type="text" value="A"/> Casio Dual Cable	<input type="text" value="B"/> IBM 1520 Bar Code Reader	<input type="text" value="C"/> TEC Dual Cable	

Your Program

<input type="text" value="1"/>	<input type="text" value="0"/>	<input type="text"/>
Communications Protocol		Protocol

1 1 GOOD READ TONE

A Tone On/Off 0 **1**
 Off On



B Tone Frequency (Hertz) **B** When entering Tone Frequency, the adjustment can be incremented upward by scanning the **Hex B** tag. Each time you scan the **Hex B** tag, the tone frequency increases one unit. Scan the **End** tag or a valid Hex tag to end this mode.



C Tone Length (Milliseconds) **C** When entering Tone Length, the adjustment can be incremented upward by scanning the **Hex C** tag. Each time you scan the **Hex C** tag, the tone length increases one unit. Scan the **End** tag or a valid Hex tag to end this mode.



D Tone Volume **D** When entering Tone Volume, the adjustment can be incremented upward by scanning the **Hex D** tag. Each time you scan the **Hex D** tag, the tone Volume increases one unit. Scan the **End** tag or a valid Hex tag to end this mode.



E Not-On-File Tone Volume **E** When entering Not-On-File Tone Volume, the adjustment can be incremented upward by scanning the **Hex E** tag. Each time you scan the **Hex E** tag, the tone Volume increases one unit. Scan the **End** tag or a valid Hex tag to end this mode.

Your Program

1 1

Good Read Tone

A	B	C	D	E
	B*	C*	D*	E*

Tone On/Off Tone Frequency Tone Length Tone Volume Not-On-File Tone Volume

* Scan Hex tag repeatedly for desired setting.

1 2 **TIMERS**

A **Lockout Time (Milliseconds)**
 450 600 750 900 1050 1200 1350 1500

B **Restart Lockout Timer**
 Off On

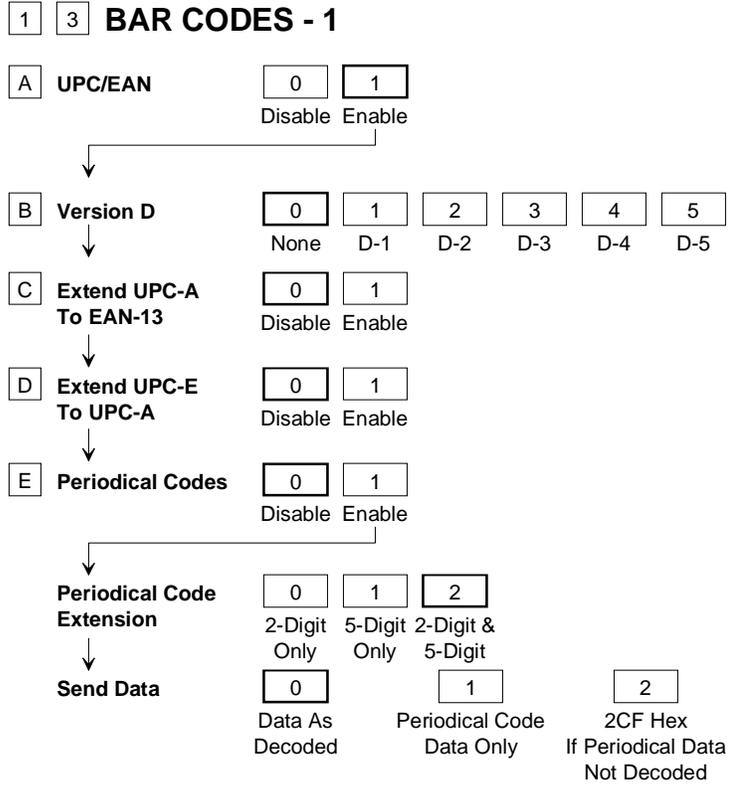
C **Active Time (Minutes)**
 0 15 30 60
 L No Time-out (Always Active)

Note: NCR suggests that you do not set the Active Time parameter to 0. Leaving the laser light on all the time reduces its life expectancy.

Your Program

Timers

<input type="text" value="A"/>	<input type="text" value="B"/>	<input type="text" value="C"/>
<input type="text"/>	<input type="text"/>	<input type="text"/>
Lockout Time	Restart Lockout Timer	Active Time



Your Program

	<input type="checkbox"/> A	<input type="checkbox"/> B	<input type="checkbox"/> C	<input type="checkbox"/> D	<input type="checkbox"/> E		
<input type="checkbox"/> 1 <input type="checkbox"/> 3	<input type="checkbox"/>	<input type="checkbox"/>					
Bar Codes - 1	UPC/ EAN	Version D	Extend UPC-A	Extend UPC-E	Periodical Codes	Periodical Code Extension	Send Data

1 4 BAR CODES - 2

A Code 39 0 1
Disable Enable

B Minimum Characters Allowed Default:

C Full ASCII 0 1
Disable Enable

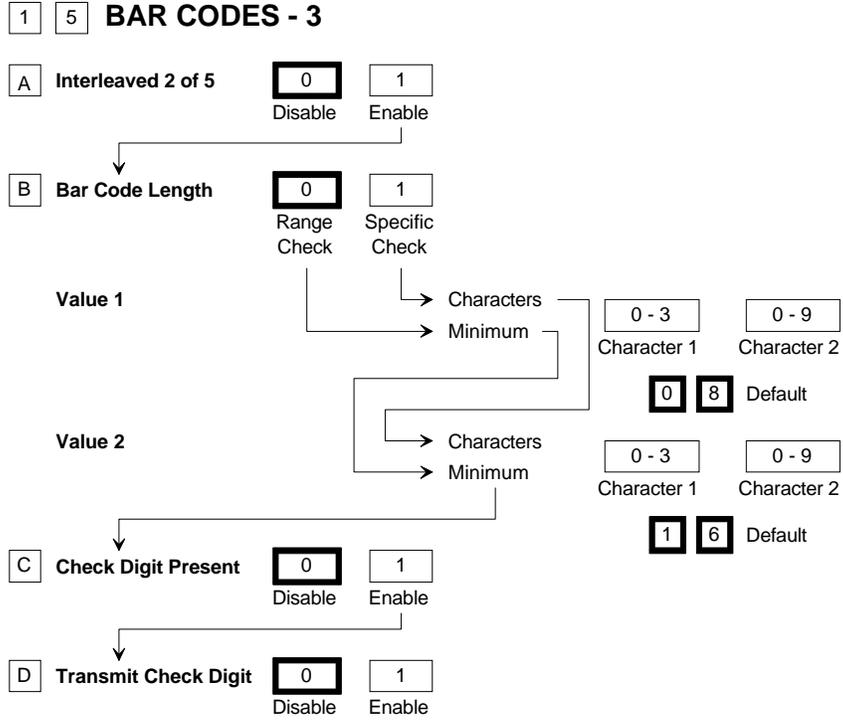
D Check Digit Present 0 1
Disable Enable

E Transmit Check Digit 0 1
Disable Enable

F Allow Single Character Tags 0 1
Disable Enable

Your Program

	A	B	C	D	E	F
1 4	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
Bar Codes - 2	Code 39	Minimum Characters Allowed	Full ASCII	Check Digit Present	Transmit Check Digit	Allow Single Character Tags



Your Program

		A	B			C	D
1	5						
Bar Codes - 3	Interleaved 2 of 5	Bar Code Length	Value 1	Value 2	Check Digit Present	Transmit Check Digit	

RS-232 PARAMETERS - 2

A BCC Options Default: 7870-1000, 3000 - Disable
 Disable Enable 7870-2000, 4000, 4500 - Enable

B Interface Control
 None ACK/NAK XOn/XOff ACK/NAK & XOn/XOff

C Check Digit
 Disable UPC-A Enable UPC-A Disable UPC-A Enable UPC-A
 Disable EAN-8 Enable EAN-8 Disable EAN-8 Enable EAN-8
 Disable EAN-13 Enable EAN-13 Disable EAN-13 Enable EAN-13
 Disable UPC-E Disable UPC-E Enable UPC-E Enable UPC-E

Note: Check Digit parameter also applies to UPC-E when using for OCIA communications.

Your Program

	<input type="text" value="A"/>	<input type="text" value="B"/>	<input type="text" value="C"/>
<input type="text" value="2"/> <input type="text" value="1"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
RS-232 Parameters - 2	BCC Options	Interface Control	Check Digit

2 3 RS-232 TERMINATOR BYTE

A Terminator Byte 0 1
Disable Enable

↓

B ASCII Code Default: 0 3
Hex Character (ASCII Code Chart) Hex Character (ASCII Code Chart)

NOTE: On a 7870 scale unit, a Terminator Byte is required.
 If you select **Disable**, it is ignored and an ETX (03) is sent.

Your Program

RS-232 Terminator Byte

A

Terminator Byte

B

|

ASCII Code

2 4 RS-232 COMMUNICATIONS OPTIONS

Message Delay	<input type="text" value="0"/> No Delay	<input checked="" type="text" value="1"/> 10ms Delay	<input type="text" value="2"/> 50ms Delay
Scanner or Scanner/Scale Format	<input type="text" value="4"/> Scanner Only	<input type="text" value="5"/> Scanner/Scale	
Normal or Eavesdrop Mode	<input checked="" type="text" value="6"/> Normal Mode	<input type="text" value="7"/> Eavesdrop Mode	

Your Program

<input type="text" value="2"/>	<input type="text" value="4"/>	<input type="text" value="A"/>	<input type="text" value="B"/>	<input type="text" value="C"/>
		<input type="text"/>	<input type="text"/>	<input type="text"/>
RS-232 Communications Options		Message Delay	Scanner or Scanner/Scale Format	Normal or Eavesdrop Mode

3 0 SCALE PARAMETERS

Model Number
Scanner/Scale Scanner Only

IBM Address
Address 6A Address 6B Address 6E

10 kg / 13.995 kg
Toggle Between
10 kg and
13.995 kg

Your Program

Scale Model IBM 10 kg /
Parameters Number Address 13.995 kg

3 2 MISCELLANEOUS PARAMETERS

5-Second Weight Display Timer	<input type="text" value="1"/> Disable	<input type="text" value="2"/> Enable
IBM Tone Control (Good Read Tone Control)	<input type="text" value="3"/> Disable	<input type="text" value="4"/> Enable
OCIA Price Display	<input type="text" value="5"/> Disable	<input type="text" value="6"/> Enable
IBM Rexmit Control	<input type="text" value="7"/> 3 Times	<input type="text" value="8"/> Forever
OCIA Blank Display in Price Mode	<input type="text" value="9"/> Disable	<input type="text" value="A"/> Enable
Enable/Disable Voice Messages	<input type="text" value="D"/> Toggle	Default: Enabled
IBM Tag Data Format	<input type="text" value="E"/> Hex	<input type="text" value="F"/> ASCII

3 2

Miscellaneous
Parameters

- 5-Second Weight Display Timer
- IBM Tone Control
- OCIA Price Display
- IBM Rexmit Control
- OCIA Blank Display in Price Mode
- Toggle Enable/Disable of Voice Messages
- IBM Tag Data Format

ASCII Code Chart															
00	NULL	10	DLE	20	SP	30	0	40	@	50	P	60		70	p
01	SOH	11	DC1	21	!	31	1	41	A	51	Q	61	a	71	q
02	STX	12	DC2	22	"	32	2	42	B	52	R	62	b	72	r
03	ETX	13	DC3	23	#	33	3	43	C	53	S	63	c	73	s
04	EOT	14	DC4	24	\$	34	4	44	D	54	T	64	d	74	t
05	ENQ	15	NAK	25	%	35	5	45	E	55	U	65	e	75	u
06	ACK	16	SYN	26	&	36	6	46	F	56	V	66	f	76	v
07	BEL	17	ETB	27	'	37	7	47	G	57	W	67	g	77	w
08	BS	18	CAN	28	(	38	8	48	H	58	X	68	h	78	x
09	HT	19	EM	29	)	39	9	49	I	59	Y	69	i	79	y
0A	LF	1A	SUB	2A	*	3A	:	4A	J	5A	Z	6A	j	7A	z
0B	VT	1B	ESC	2B	+	3B	;	4B	K	5B	[	6B	k	7B	{
0C	FF	1C	FS	2C	,	3C	<	4C	L	5C	\	6C	l	7C	|
0D	CR	1D	GS	2D	-	3D	=	4D	M	5D	]	6D	m	7D	}
0E	S0	1E	RS	2E	.	3E	>	4E	N	5E	^	6E	n	7E	
0F	S1	1F	US	2F	/	3F	?	4F	O	5F	_	6F	o	7F	DEL

R0040

Index

—A—

Abort Tag, 7-6
Accessing Calibration Switch, 5-4-5-6
ASCII Code Chart, 7-77
Auto-Zero, 2-11

—B—

Bar Codes
 Quality, 6-6
 Recognition, 2-1
Bar Codes - 1 Parameters, 7-22-7-24
Bar Codes - 2 Parameters, 7-25-7-27
Bar Codes - 3 Parameters, 7-28-7-30
Bar Codes - 4 Parameters, 7-31-7-32
Bi-Optic Scanning, 2-2

—C—

C E Mark Applicability, xii
Cables, 3-21-3-26
 AC Power, 3-22
 DC Power, 3-21
 Hole Diameters, 3-21
 Interface, Casio, 3-25
 Interface, Data Checker, 3-26
 Interface, Epson, 3-26
 Interface, Gilbarco, 3-26
 Interface, IBM, 3-27
 Interface, ICL, 3-27
 Interface, Microbilt, 3-28

 Interface, NCR, 3-23-3-25
 Interface, NEC, 3-28
 Interface, SASI, 3-29
 Remote Display, 3-22

Calibration

 Displaying audit trail, 5-2
 General, 5-1

Procedures

 Accessing the Calibration Switch, 5-4
 Connecting the Field Service Calibration
 Display, 5-7
 Exercising the Scale, 5-3
 Performing the Calibration, 5-9

 Securing the Calibration Switch, 5-16

 Verifying, 5-11-5-15

 Weight Sets, 5-2

 When to perform, 5-1

 Which models, 5-1

Checkstand

 Considerations, 3-15

 Display Clearance, 3-17
 Item Diverter, 3-17
 Service Clearance, 3-16
 Ventilation, 3-15

 Hole (Cutout, Bucket), 3-18

 Dimensions (Models 1000 & 2000), 3-19
 Dimensions (Models 3000, 4000, 4500), 3-20

 Power Requirements, 3-9

 Wiring Considerations, 3-2, 3-10

 Europe, 3-11
 Instructions, 3-13
 International, 3-12
 U.S., Canada, Japan, 3-10

 Communications Protocol Parameters, 7-13-7-17

—D—

- Declaration of Conformity, xiii
- Decode Features, 2-2
- Default Tag, 7-7
- Diagnostics
 - Determining Communications Protocol, 4-10
- Digital Board
 - Kit for upgrade, 2-12
- Dimensions
 - Checkstand Hole
 - Models 1000 & 2000, 3-19
 - Models 3000, 4000, & 4500, 3-20
 - Scanner/Scale
 - Models 4000 & 4500, 3-32
 - Scanner/Scale, Model 3000, 3-31
 - Scanner/Scale, Models 1000 & 2000, 3-30
- Displays, 2-3–2-5
 - Clearance. *See* Checkstand
 - Field Service Calibration Display, 5-7
 - Integrated Display, 2-4
 - NCR 7825 Remote Display, 2-3
 - No Display, 2-5

—E—

- End Tag, 7-7
- Environmental Requirements, 3-7
 - Extreme Operating Range, 3-7
 - Operating Range, 3-7
 - Storage Range, 3-8
 - Transit Range, 3-8
- Exercising the Scale, 5-3

—F—

- Fault Identification, 8-1
- Field Service Calibration Display, 5-7

—G—

- Good Read Tone
 - Changing, 6-10
 - Presets, 7-73
- Good Read Tone Parameters, 7-18–7-19
- Good Weight Tone, 7-74

—H—

- Hex 0 - Hex F Tags, 7-7

—I—

- Installation, 4-1–4-11
 - Getting Started, 4-1
 - Instructions, 4-3–4-7
 - Setting Scale Address for IBM, 4-11
 - Shipping Contents, 4-1
 - Verifying a Successful Installation, 4-8

—K—

- Kits, 2-12

—L—

- Label Orientation, 6-4
- Labels
 - Country Language Specific, xvi
 - Laser Module, xvii
 - Laser Safety, xv
 - Scale Identification, xiv
- Laser, xvii
 - Power Requirements, xvii
- Load Cell, 2-11, 5-1

—M—

- Maintenance, 6-11
- Miscellaneous Parameters, 7-55–7-58

Motion Detector, 6-3

—N—

NCR 7870 Scanner/Scale

About, 1-2

Available Models, 1-2

Common Features, 1-3

Dimensions, 3-30

7870-1000 & 2000, 3-30

7870-3000, 3-31

7870-4000 & 4500, 3-32

Model Descriptions, 1-4

Not-On-File Error, 6-8

—O—

Operation

Changing Good Read Tone, 6-10

Not-On-File Error, 6-8

Power Up, 6-7

Scanning Procedure, 6-8

Weighing Procedure, 6-9

—P—

PACESETTER *Plus*, 2-2-2-3, 7-59

Host Access to Tallies, 7-64

Kit for upgrade (OCIA/IBM), 2-12

Kit for upgrade (RS-232/Datachecker),
2-13

Mode 1, 2-2, 7-59

Mode 2, 2-3, 7-60

Mode 3, 2-3, 7-62

Power Supply, 2-5-2-6

Cables and Cords. *See* Cables

Description, 2-5-2-6

Power Up, 6-7

Programming

ASCII Code Chart, 7-77

General, 7-2

How to Program the NCR 7870, 7-3

Parameters, 7-25-7-27

Bar Codes - 1, 7-22-7-24

Bar Codes - 3, 7-28-7-30

Bar Codes - 4, 7-31-7-32

Communications Protocol, 7-17

Good Read Tone, 7-18-7-19

Label Identifiers, 7-33-7-38

Miscellaneous Parameters, 7-55-7-58

RS-232 Communications Options, 7-49-7-52

RS-232 Parameters - 2, 7-42-7-44

RS-232 Parameters- 1, 7-39-7-41

RS-232 Prefix Byte, 7-45-7-46

RS-232 Terminator Byte, 7-47-7-48

Scale Parameters, 7-53-7-54

Timers, 7-20-7-21

Program Entry Example, 7-9-7-11

Programming Mode, 7-5

Programming Tags, 7-6

Quick Reference Defaults Table, A-3-
A-5

Special Programming, 7-68-7-76

Tips, 7-12

Programming Mode Tag, 7-8

Programming Parameters, 2-6

Programming Worksheets

Quick Reference Defaults Table, A-3-
A-5

Worksheets, A-3-A-5

—R—

Radio Frequency Interference Statements,
xi

Reading the Product (Model) Number, 1-
3

Reset / Scale Zero, 2-11, 6-3

Revision Record, x

RS-232 Communications Options

Parameters, 7-49-7-52

RS-232 Parameters - 2, 7-42-7-44

RS-232 Parameters -1, 7-41
 RS-232 Prefix Byte Parameters, 7-45–7-46
 RS-232 Terminator Byte Parameters, 7-47–7-48

—S—

Save and Reset Tag, 7-8

Scale

Functions and Features, 2-11

Auto-Zero, 2-11

Load Cell, 2-11

Reset / Scale Zero, 2-11

Market Certifications, 2-7

Regulatory, xii

Troubleshooting, 8-3

Weighting Procedure, 6-9

Scale Calibration, 5-1, 5-2

Scale Parameters, 7-53–7-54

Scan Windows, 6-2

Maintenance, 6-11

Side Scan Window

Kit for, 2-12

Slot Scan Window

Kit for, 2-12

Scanner

Active Scan Zone, 6-5

Bar Code Quality, 6-6

Bioptic, 2-2

Description, 2-5

Multiple Reads, 6-5

Power Requirements, 2-8

Scan Zone, 2-8

Scanning Procedure, 6-8

Troubleshooting, 8-2

Use of, 6-4

Scanner Windows

Side Scanner Window

Description, 2-10

Slot Scanner Window

Description, 2-9

Securing the Calibration Switch, 5-16–5-17, 5-16–5-17

Site Preparation, 3-1–3-20

Cable Lengths and Hole Diameters.

See Cables

Checkstand Power and Wiring

Considerations. See Checkstand

Customer Responsibilities, 3-6

Environmental Requirements. See

Environmental Requirements

Legal Considerations, 3-4–3-5

Site Preparations

Assessing Local Conditions, 3-2–3-3

Soft Power Down, 2-8

Special Programming, 7-68–7-76

Delay Weight Data to IBM, 7-68

EAN/JAN/UPC Multi-Symbol

Scanning Parameters, 7-69

Early Beep Disable, 7-72

Good Read Tone Presets, 7-73

Good Weight Tone, 7-74

Terminal Coupon Interface

Parameters, 7-75–7-76

Standard Decode, 2-2

—T—

Tallies, 7-64

Terminal Coupon Interface Parameters,
7-75–7-76

Timers Parameters, 7-20–7-21

Tone, 6-3

Top Plate

Description, 2-9

Kit for Scratch-Proof (Sapphire)

Window, Model 3000, 2-16

Kit for Scratch-Proof (Sapphire)

Window, Models 1000 & 2000, 2-16

Kit for Stainless Steel, 2-12
Maintenance, 6-11
Troubleshooting, 8-1-8-5
Fault Identification, 8-1
Scale, 8-3
Scanner, 8-2
Voice Messages, 8-5

—V—

Verifying Calibration, 5-11-5-15
Voice Messages, 6-3
Troubleshooting, 8-5

—W—

Worksheets, A-3-A-5

Cut Please answer the questions and mail the form.

READER COMMENTS

How do you rate the technical accuracy of this document?

1 2 3 4 5

How do you rate the organization of this document?

1 2 3 4 5

How easy is it for you to locate specific information in this document?

Very Difficult 1 2 3 4 5 Very Easy

How well did this document help you perform your job?

Not Well 1 2 3 4 5 Extremely Well

Additional comments - use space below or back of form as necessary.

If we may contact you concerning your comments, please provide the following.

Name _____ Phone _____
Address _____ Fax _____
_____ E-Mail _____

BST0-2121 Issue G

Fold



NO POSTAGE
NECESSARY
IF MAILED
IN THE
UNITED STATES

Cut

BUSINESS REPLY MAIL
FIRST CLASS MAIL PERMIT NO. 3 DAYTON, OH

POSTAGE WILL BE PAID BY ADDRESSEE

NCR Corporation
Information Products
2651 Satellite Boulevard
Duluth, GA 30096-5810

Cut

BST0-2121-90

Nov. 1999



Printed on recycled paper