



IBM 7870 Model 2000

## Specifications

### Standard Features

- Bi-Optical (12/12 line) Scan Zone
- Label Configuration Control
- Speaker Volume
- Voice Processor for messages
- Soft power down mode
- 9 pin RS-232 for POS terminals
- NCR Pacesetter plus electronics decoding logic
- Auto-discriminate symbology
- Sealed load cell for scale
- High can reading- 8" above lower glass

### Optional Features

- Multiple glass options

### Symbologies

- UPC-A,D,E -Universal product code
- EAN - International Article Numbering
- JAN - Japanese Article Numbering
- Code 39 -- Code 3 of 9
- Code 128
- I2 of 5 - Interleaved 2 of 5
- Add-On codes (2 and 5)
- NOF -- Not on file

### Programmable Functions

- Scanner Reset Symbol
- Scanner Test Mode Enable/Disable
- Good Tone Frequency and Length Adjust
- Volume Adjustment
- Add-On Code Enable/Disable
- Code 39,128 And Interleave 2 Of 5 Enable/Disable
- Tag Lockout Time Increase/Decrease
- Same Tag Lockout Re-Trigger
- Inactivity Time Or Immediate To Soft Power Down
- Dual Versus Single Cable Communications
- Toggle NCR/Non-NCR Format
- Interface Selection Or Disable Scale Usage
- Slow Power Up For Scale
- Scale Display Zero After Five Seconds
- Weight Timeout Enable/Disable

### Dimensions

- 17" h x 19" w x 24" d

## Specifications (Continued)

### Weight

- Installed: 34 lb.
- Shipping: 40 lb.

### Power Supply

- External AC adapter @ 43 watts providing +12VDC, +5VDC, -12VDC with a 5 Amp maximum.

## Tools Requirements

- Flat-Blade Screwdriver
- Certified Calibration Weight Set
- Anti-Static Strap

## Special Notes:

- **DANGER:-** Due to the fact that this is a Class Ila laser product it is strongly advised to "**Avoid long-term viewing of direct laser light**" at all times.
- Scale calibration is generally done after the following: scale installation, load cell or board replacement, scale will not zero, calibration error occurs, changing weight formats from pounds to metric.
- Scale calibration gives better results if the scale is warmed up prior to the calibration by placing and removing weights on the scale from 5 to 30 pounds and then removing them.
- The NCR7870 Model 2000 should not be placed back in service after it has been repaired or for its initial operation until a certified field engineer has performed a weight calibration based on the state and national government specifications. If the calibration can not be performed then an "Out of order" must be placed on the unit. A seal may be also be required in order to validate the calibration procedure based on government standards in your area.
- NCR Pacesetter *Plus* has three modes: Inquiry mode allows scanner to track various information about labels scanned, Real-Time mode allows off-line tally and checkly of labels for searching and determining the bad labels within a given stock of items, Mode 3 is just like Inquiry mode but it appends the tracking information to the barcode information so the terminal can extract this information and add it to a database for reports or for other tracking needs.

## Scale Error Codes

Code	Description	To Fix It
1- 3	Calibration Failure	Chg. Scale Brd/Cell
4	Scale error / vibs in calibrate	Reset / Recalibrate
5	Scale drifting or object in it.	Clr. obj. /Reset/ Cal.
6	EEPROM Failure	Chg. Scale Board
7	Board Replaced	Recalibrate
8	Weight Constants Failed	Chg. Digital Brd.
9	Interference in calibration	Recalibrate
Blank	Object in or on it in calibrate	Clear object / Reset

## Procedures

### Removing Top-Plate and Sub-Plate

- Turn 7870-2000 off, remove power cord and Top-plate
- Lift the scanner cover, then with flat-blade screwdriver remove attaching screw, which is located on the front-right face of the Sub-plate assembly.
- Insert screwdriver into slot next to the retaining tab at the front-left edge of Sub-plate and release the tab.
- Push-up the front-end of the Sub-plate to a vertical position then pull the back-end out from under the edge of the Tower Cabinet and lift up and off.
- Remove thumb screw and Scale board shield which is located just in front and left of the scanning area

### Installing Top-Plate and Sub-Plate

- While holding the Sub-plate in a vertical position place the rear edge under the edge of the Tower Cabinet then bring the front-edge down until it contacts the mounting brackets in a horizontal position and retaining tab snaps into place in the slot within the mounting bracket's front-left edge.
- Place scanner's cover back on Sub-plate assembly and reinsert the attaching screw into the Sub-plate.
- Place Top-plate back on scale and apply power to verify the display indicates "Ready 0.00 lb."
- Reinsert the Scale Board Shield by aligning the shield's tabs and attaching the thumb screw again.

### Calibrate Scanner

- Do Procedure (Removing Top-Plate and Sub-Plate)
- Temporarily set the Top-plate back on the rubber bumpers of the scale hinge assembly so the bumpers reenter the locating sockets
- Apply power to the unit again and perform the following weight placements on the scale, however, make sure no vibrations or movements are near scale during this process.
- Depress and hold Scale Zero switch on panel and note the CAL and PAR readings then release switch.
- Lift up the top-plate briefly and replace after depressing the SW1 calibration switch, located underneath the just removed scale board shield.
- Verify display reads "Ready 0.00 lb."
- Press Scale Zero switch, display says Ready 5.00 lb.
- Place 5.00 lb. weight on top-plate
- Press Scale Zero switch, display says Ready 15.00 lb.
- Add 10.00 lb. weight on top-plate
- Press Scale Zero switch, display says Ready 30.00 lb.
- Add 15.00 lb. weight on top-plate
- Press Scale Zero switch, display says Ready 0.00 lb.
- Remove all weights and press Scale Zero switch, display says Scale Ready 0.00 lb.
- Depress and hold Scale Zero switch on panel and record the CAL and PAR readings then release switch.
- Turn off power to unit and remove the top-plate.
- Do Procedure (Installing Top-Plate and Sub-Plate)
- To verify place three weights separately in the center of the Top-plate, verify weights are within a .02 offset.
- Place the same weight on 4 different areas on the Top-plate, verify the weight is within a .02 offset.

## Procedures (Continued)

### Front Bezel Removal

- Turn 7870-2000 off and remove power cord.
- Locate tower cabinet at rear of scale
- Locate two releases on each side of clear bezel glass
- Pull bezels top edge out and down by pivoting on base
- Disconnect cables to the status LED's
- Lift Bezel up and out of the tower cabinet.

### Front Bezel Installation

- Reinsert new or existing Bezel's bottom in first.
- Reconnect the status LED's
- Push back Bezel in place, verify it snapped in position
- Reinsert power cord and restart the 7870 device

### Scale Board Replacement

- Do Procedure (Removing Top-Plate and Sub-Plate)
- Disconnect the load cell (J1) and scale (J2) cable.
- Remove the board screw and carefully pry three boards retainers to release the Scale Board.
- Insert the new board and reapply the board screw.
- Do Procedure (Calibrate Scanner) starting on 2nd step

### Digital Board Replacement

- Do Procedure (Front Bezel Removal)
- Jumpers stated are (Digital Board / LC-Digital Board).
- Remove 4 screws from the sides of tower and lift straight up, disconnect display cable (J5 / J4) if used.
- Remove Indicator cable (J2), Speaker (J4 / J1), Scale Cable (J3), Video Board (J1 / J5)
- Pull out the digital board in its connector and swap the firmware in these areas (U19, U22, U26 / U15, U18).
- Reinsert a new Digital or LC-Digital Board.
- Install the Video Brd. cable (J1 / J5), Scale Cable (J3), Speaker (J4 / J1), and Indicator cable (J2).
- Reconnect any display cables to the tower before placing tower case back on, tighten the 4 tower screws to hold it in place.
- Do Procedure (Front Bezel Installation) & (Calibrate)

### Fan Replacement

- Do Procedure (Removing Top-Plate and Sub-Plate)
- Do Procedure (Front Bezel Removal)
- Remove 4 screws from the sides of tower and lift straight up, disconnect display cable (J5 / J4) if used
- Remove ground wire to optics assembly, lift forward, up and out of unit and place upside-down on table.
- Unplug cable (J6) from video board.
- Squeeze output end of duct and detach then release duct clips on video board and lift duct over (J6).
- Slide fan out and new fan back in the same position and make sure cable (J6) is not between duct and fan.
- Reapply the duct clips and connect the end of the duct to video board by squeezing it in place.
- Reconnect (J6) to video board and place optics assembly back in unit and tighten ground wire.
- Reconnect any display cables to tower cabinet before placing it back on then tighten the 4 tower screws.
- Do Procedure (Front Bezel Installation)
- Do Procedure (Installing Top-Plate and Sub-Plate)

## Field Replaceable Units

### Top Plates

Description	OEM Part	IBM Part
Platter Glass Window	497-0300058	20H7833
Plexiglass Window	497-0300220	20H7835

### Cables

Description	OEM Part	IBM Part
IBM 4683 Interface Cable	497-0300400	20H7854
Indicator Reset Cable	497-0300887	20H7838
Load Cell CD To Main	003-0022869	22H4153
Scale Display Cable	497-0300777A	20H7852
Scale Interface Cable	497-0300207	20H7841
Video / Digital Board Cable	497-0300878	20H7847

### Printed Circuit Boards

Description	OEM Part	IBM Part
Digital Board	497-0301692	20H7848
Display - Scale Board	497-0301070	20H7836
IC Chip, PCB Digital Board	006-2005205	22H4154
Interface Board	497-0300723	20H7850
Scale Board	497-0301486	20H7840
Video Board	497-0301675	20H7845

### Assemblies

Description	OEM Part	IBM Part
Complete Unit 7870-2000	7870-2000	20H7760
Laser Cooling Fan Assembly	006-8600435	20H7844
Laser Diode Assembly	497-0300805	20H7846
Optics Assembly	497-0301601	20H7842
Scale Platter Without Glass	497-0301069	20H7832
Spinner Motor	250-0054218	20H7843
Tower Cabinet	497-0900797	20H7837

### Miscellaneous

Description	OEM Part	IBM Part
Front Bezel	497-0300222	20H7834
Inner Platen Cover	497-0300998	20H7855
Load Cell	006-8600466	20H7839
Power Cord	006-1002021	20H7853
Power Supply	006-8700416	20H7851
Pullout Lift Handle	497-0301261	20H7856
Remote Pole Video Display	7870-7825	20H7857
Speaker	006-1010870	20H7849

## LED Error Definitions

### Power-On LED's

# Green Flashes - Repeats	# Beeps - then Repeats	Description of Errors	Replace To Fix
1 - Yes	1 - Yes	7870 Ready	None
2 - Yes	2 - Yes	RAM Failure	Digital Board
3 - Yes	3 - Yes	Motor stays on	Video Board
4 - No	4 - No	No Daughter Board Detected	Digital Brd. or Daughter Brd or Interface Cable
5 - Yes	5 - Yes	Wrong Motor Speed	Spinner Motor or Video Brd.
6 - No	6 - No	EEPROM Load Failure	Digital Brd
7 - Yes	7 - Yes	No +/- 12V	Power Supply
8 - Yes	8 - Yes	Laser stays ON	Digital Brd. or Video Brd.
10 - Yes	10 - Yes	ASIC Test Fail	Digital Brd
11 - Yes	11 - Yes	Laser stays OFF	Digital Brd or Video Brd or Laser Diode
12 - Yes	12 - Yes	ROM Failure	Digital Brd
13 - Yes	13 - Yes	Video Turn Around	Video Brd

### Single Operational LED's

# Green Flashes - Repeats	# Beeps - then Repeats	Description of Errors	Replace To Fix
3 - Yes	3 - Yes	Motor stays on	Video Board
5 - Yes	5 - Yes	Wrong Motor Speed	Spinner Motor or Video Brd.
8 - Yes	8 - Yes	Laser stays ON	Digital Brd. or Video Brd.
11 - Yes	11 - Yes	Laser stays OFF	Digital Brd or Video Brd or Laser Diode

### Dual Operational LED's

# Green Flashes - Repeats	# Red Flashes - Repeats	Description of Errors	Replace To Fix
1 - Yes	1 - Yes	Sleep Mode	Scan Something