



JCM Products Quick Reference Guide

WBA[®] Units



NOTE: Some of the information in this guide may change over time, depending on the software and possible modifications due to advancements in technology.

For further detailed information pertaining to procedures and troubleshooting methods, please contact our Technical Support Division of Customer Service at:

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Part No. 960-000027R_Rev. 3

QUICK REFERENCE TROUBLESHOOTING GUIDE

Table 1 Troubleshooting Descriptions

Description	Probable Cause	Possible Solutions	
Bill Rejection	DIP Switches not set properly	Set DIP Switches	
	Roller and/or Belts are excessively dirty	Clean head & rollers with a mild soap and water solution	
	Denomination disabled on game	Check game options	
	Credit limit not set properly on game	Set credit limit for proper acceptance	
	Cash Box is full, or not installed properly	Check and verify Cash Box contents/position	
	Sensors out of calibration, unit not calibrated following a software upgrade	Either: • Calibrate unit using proper procedures, or • Check for proper software/ID protocol.	
	No Activity	No power to the unit/No LEDs visible	Check power source, pins, wires & connector
		Will not start acceptance procedure/cycle	Check for proper software usage/ID protocol
Cycles, but will not accept bills		Check for proper DIP Switch and game settings	
Validator in an error status		Run stand-alone test to verify	
Bad CPU Board and/or No lights on CPU		Replace CPU Board, or change out unit	
Unit is out of calibration		Calibrate unit using proper procedures	
			Calibrate unit using proper procedures

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Table 2 WBA Diagnostic Tests

Test No.	Test Name	Function	Where Used
1	Transfer Motor Test (Forward)	Spins the motor in a forward direction	When conducting tests #8 and 9 and motor is not heard
2	Transfer Motor Test (Reverse)	Spins the motor in a reverse direction	When conducting tests #8 and 9 and motor is not heard
3	Stacker Mechanism Test	Determines if the mechanisms within the Cash Box are working properly	When conducting tests #4 & 9 a Stacker mechanism error is received
4	Entire-Unit Test	Repeatedly cycles the action of the Acceptor, Transport, and Cash Box	When the unit has intermittent errors that can not be detected
5	Solenoid Position Test	Activates the solenoid to determine if its mechanisms are working properly	When Solenoid lever problems are detected during tests #8 & 9
6	Sub-tests for the Acceptor's Sensors	Specifies any of the 8 sub-tests to check sensors within the Acceptor	When troubleshooting Acceptor problems
7	Sub-tests for Transport Sensors	Specifies any of the 8 sub-tests to check sensors in the Transport	When troubleshooting Transport problems
8	Bill Acceptance Test without Cash Box	Tests the ability to accept bills without the Cash Box attached	When troubleshooting a unit that is not accepting currency for verification
9*	Bill Acceptance Test with Cash Box	To test the ability to accept bills and stack using the Cash Box *	Troubleshooting a unit for acceptance, and testing the Cash Box
10	Transport and Cash Box Test	To test the Transport and Stacker mechanism of the Cash Box without the Acceptor Head installed	When testing the Transport and Stacker mechanism for proper functionality

* Do not perform Test #9 at the machine.

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How to Initiate the Standard Tests

- Perform the following steps to initiate the Standard Tests:
1. Set DIP Switch #8 to the **ON** position, and set all remaining switches to the **OFF** position.
 2. Attach the power connector. This action puts the unit into the Test Mode.
 3. Select a Test Mode from the Table list and set the DIP Switches accordingly.
 4. Move DIP Switch #8 to the **OFF** position. This action activates the particular Test Mode chosen.

Table 3 Standard Test Initiation

Test No.	Test Name	1	2	3	4	5	6	7	8
		DIP Switch an "X" = Switch ON & \updownarrow = ON & OFF							
1	Transfer Motor - Forward	X							
2	Transfer Motor -Reverse		X						
3	Stacker Mechanism			X					
4	Entire Unit Cycling				X				
5	Solenoid Position					X			
6	Sub-test for Head Sensors*						X		
7	Sub-test for Transport Sensors†							X	
8	Bill Receiving without Cash Box installed	X	X	X					
9	Bill Receiving with Cash Box in Place	X	X	X	X				
10	Transport and Cash Box	X							

* Refer to Table 4 to complete this test.

† Refer to Table 5 to complete this test.

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Table 4 Head Sensor Sub-Test DIP Switch Settings

Magnetic WBA-1x	Non-magnetic WBA-2x	DIP Switch [*] an "X" = Switch ON & ⇕ = ON & OFF							
		1	2	3	4	5	6	7	8
PLEV	FLEV	X							⇕
Reserved	PT-3		X						⇕
PT-1	PT-4			X					⇕
PT-2	PT-1				X				⇕
HPL	PT-2					X			⇕
HPR	UHPL/DHPL						X*		⇕
HPC	UHPR/DHPR							X	⇕
Reserved	UHPC/DHPC	X						X	⇕

* During these tests, DIP switch No. 6 becomes the enable/disable switch. On test 6, leave it on.

Table 5 Transport Sub-Sensor Test DIP Switch Settings

Troubleshooting Tests	DIP Switch [*] an "X" = Switch ON & ⇕ = ON & OFF							
	1	2	3	4	5	6	7	8
Transport Entrance Sensor	X							⇕
Solenoid Lever Sensor		X						⇕
Feed-out Sensor			X					⇕
Stacker Home Sensor				X				⇕
No Cash Box Sensor					X			⇕
Validator Encoder Sensor						X		⇕
Stacker Encoder Sensor							X*	⇕
Acceptor Head Detached	X	X						⇕

* During these tests, DIP switch No. 7 becomes the enable/disable switch. On test 7, leave it on.

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Abnormal Error Codes
Table 6 Abnormal Error Codes

Blink No.	Description	Possible Cause
1	Cash Box Full	Cash Box may be full Stack Motor not turning Sensor not working Stacker Encoder Gear blade split
2	Stacker Jam	Stacker may be jammed or blocked
3	Transport Error	Cover open Solenoid Lever problem
4	Blocked Bill Path Sensor Errors	Something blocking the sensors path Sensor problem
5	Acceptor Head Error	Acceptor Head not seated properly Communication problem
6	Transfer Motor Error	Motor not turning Encoder Gear split Encoder Sensor not monitoring the motor
7	NOT USED	
8	Solenoid Lever Error	Solenoid not working Sensor may not know the position of the Solenoid Lever
9	NOT USED	
10	No Cash Box	No Cash Box installed Cash Box Sensor error Broken optics flag

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Table 7 Entire Unit Test Error Codes

Error No.	Description	Possible Cause
2	Solenoid Lever Trouble	Solenoid Sensor or Lever Jam
3	Blocked Head Sensor	Clean and Calibrate Head Sensors (HPL, HPR, & HPC)
4	Blocked Transport Sensor	Transport/Validator Sensors (i.e., Bill path sensors)
5	Cash Box Full	Stacker Encoder
6	Pusher unit; Trouble in the Cash Box	Stacker Encoder or Pusher Home Sensor (S1)
7	Acceptor Head Detached, Not Calibrated or Wrong Type	Clean and Calibrate, Check All Head Sensors and Perform the Head Detached Test

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Bill Return Codes

Table 8 Bill Return With & Without Cash Box

Blink No.	Description	Possible Cause
1	Crooked insertion	WBA-10, 11, 12, 13 - Sensor PT1 or PT2 not working or Bill inserted crooked WBA-20, 21, 22, 23 - Sensor PT3 or PT4 not working or Bill inserted on an angle
2	Magnetic Pattern Error (Center)	Dirty rollers/belts Bad MAG Sensor PCB
3	Detected a Bill in Path at Idle	Sensor other than PT1 & PT2 or PT3 & PT4 detected the presence of the Bill/Note while in stand-by mode
4	Data Amplitude Error	Intra-Red (IR) sensors may not be working
5	Bill not detected/Timing Error	Bill/Note not detected by a sensor within a specified period HPC, HPL, HPR or Transport Entrance Sensor
6	UNUSED	
7	Photo Sensor Error	Bill/Note may have a pattern not programmed or recognized in memory
8	Photo Level Error	The Bill/Note may be dirty Overlapping Bill/Notes detected
9	Return Commanded by DIP Switch Setting	Check DIP Switch Settings
10	Return Command by Host	Check Machine Settings
11	Solenoid Lever problems	Solenoid not working Sensor may not detect position of the Solenoid Lever
12	Detected Bill Movement in the Wrong Direction	HPL, HPR, HPC Entrance Sensor Set for wrong time out
13	Bill/Note Length Error	Bill/Note is torn Registration on Bill/Note is too short
14	Color Pattern Error	Color pattern on the Bill/Note is incorrect
15	Magnetic Pattern Error (Right/Left)	Dirty Rollers/Belts, Bad MAG Sensor PCB

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PREVENTIVE MAINTENANCE

Head/Transport Area

To maintain the unit properly, the following actions must be periodically performed:

- Replace belts if frayed, slick and/or worn.
- Keep the bill path, rollers and belts clean.
- The sensor lenses are transparent and made of a polymer material. Handle them with care. To clean them, use a lint-free cloth and a mild, nonabrasive detergent, such as dish liquid soap mixed with water.



WARNING: Do not use alcohol, paint thinner or citrus based solutions for cleaning ANY surfaces!



IMPORTANT NOTE: After wiping, inspect lenses to ensure that none have been moved out of position, or are not flush with the transportation path.

See “Available Cleaning Card” on page 19 regarding the new JCM Waffletechnology cleaning card authorized for use on all WBA Gaming Validators.

Cash Box Preventive Maintenance (P/M)

The following Periodic Maintenance conditions must be periodically performed:

- Do Periodic P/M on the Cash Boxes to ensure proper operation.
- Use compressed air via pressurized can, or an air compressor jet to blow out paper fibers and any other debris that may have built-up over time.
- Clean the Idle Rollers and “O” Rings with a lint free cloth containing a mild soap/water solution.
- Check the belts and all moving parts for wear and proper positioning. If this assembly does not operate properly, it can cause bill jams.

After completing the Preventive Maintenance procedure, Recalibration is recommended.

AUTO-CALIBRATION
Sensor's Description

Calibration sets a starting reference point for all optical sensors within the unit. This can be done at the host unit or at the work bench with just a power source.

When to Calibrate

- After the Acceptor's components have been disassembled for repair.
- After a sensor board has been replaced.
- Whenever Bill/Note acceptance is degraded.
- During scheduled Preventive Maintenance.
- When upgrading, or downloading software.

Procedure

To calibrate the sensors, proceed as follows:

1. Remove Transport unit with the Head.
2. Clean the Acceptor Head Sensor Lens.
3. Set DIP Switches 5, 6, 7, and 8 to the **ON** position, and set all other switches to the **OFF** position.
4. Connect the Transport unit with Head to the power source - either from the host machine, or an adaptive power supply.
5. Listen for Transport Motor activation (i.e., runs forward and reverse for up to 2 seconds, then stops and goes to **READY**).
6. Insert the Black end of the Calibration Paper into the unit (See Figure 1). The unit will carry the paper forward and reverse several times. When the process is complete, the unit will return (eject) the paper.

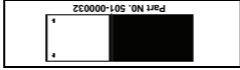


Figure 1 Black Calibration Paper

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7. Wait a few moments to allow for a complete transfer of the calibration data to be stored in memory. This is indicated via the LED on the Test Harness, or by the Bezel Light blinking fast (on some applications).

For Unsuccessful Calibrations:

1. Inspect the lenses for dirt, debris or mis-alignment.
2. Re-try calibration. If necessary, refer to the Error Conditions Chart Table 9 on page 12.
Additional testing/troubleshooting may be required.

Error Condition Chart

Look at the indicator LED connected to the test harness, or at the Bezel Light. If the LED blinks from 1 to 11 times at 1/2 second intervals, an error exists. Count the number of blinks and match the count with the list in Table 9. If you missed the count, the flash sequence will repeat again after a 1-second pause.

Table 9 Error Conditions

Blink No.	Calibration Error Detected
1	Entrance Lever Error
2	Solenoid Error
3	Entrance Sensor Error
4	Transport Jam
5	Gain Error - White or Black Level
6	Digital/Analog Error
7	Bar Code Sensor Error
8	Acceptor Head Error
9	Magnetic Setting Error
10	Write-in Error
11	Black Level Error

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WBA IN-FIELD

Stand Alone Test Mode

Accomplish this function by applying power to the unit's Transport and Head only.



NOTE: Perform this test outside the game using an extension harness, or an externally connected power supply.

Proceed as follows:

1. Remove power from the unit.
2. Prior to starting, set DIP Switches 1, 2, 3 and 8 to the **ON** position.
3. Apply power to the unit.
4. Turn DIP Switch #8 **OFF**. The unit should cycle briefly.
5. The unit is now ready to run the test.
6. Insert a good Bill/Note. The Bill/Note will either be accepted by the unit, or will be rejected. If it is rejected, check calibration. Re-calibrate if necessary.
7. If the unit still rejects the Bill/Note following re-calibration, a possible sensor problem exists, or an incorrect software version is installed. Refer to the "Bill Return Codes" listed in Table 8 on page 8.

If the unit still does not accept the Bill/Note, check for proper AC power levels.



NOTE: While in this test mode, you can verify if the unit is working properly.

8. When the unit cycles on power up, it indicates the power and forward motor operation is functioning.
9. When various denominations of bills are inserted and accepted, it indicates the Bill/Note was successfully matched against its characteristics recorded in the software by flashing the Test LED or the Bezel light a number of times to indicate the bill denomination.

WBA - DT-004 DOWNLOADING

Using the JCM DT-004 Download Tool

WARNING: DO NOT USE the 2-pin connector as a power input.



This is an OUTPUT Power Port and can damage the DT-004!

- Perform the following to activate a download:
1. Make sure power is applied to the DT-004 via a 3-pin connector from a PS15-007 power supply using the adaptive harness (Part No. 400-100067R), or the power supply harness connection within the game.
 2. With power to the unit **OFF**, be sure the 4-MEG Program EPROM is properly installed.
 3. Set WBA DIP Switches 6, 7, and 8 to the **ON** position, and all other switches to their **OFF** position.
 4. Harnessing:

– For WBA-10/20 units:

- Use Part No. 400-100068R (Power from game to the DT-004), and Part No. 400-100069R (Data from DT-004 to the WBA unit).



NOTE: The PS15-007 can be used as a substitute power source instead of using the harness (Part No. 400-100068R) at the game. When an RS-232 board exists, disconnect the board and use its harness (Part No. 400-100042R) in conjunction with harness, Part No. 400-100069R.

– For WBA-12/22 units:

- Use Part No. 400-100070R (Power from game to DT-004), and Part No. 400-100071R (Data from DT-004 to WBA unit).



NOTE: The PS15-007 can be used as a substitute power source instead of using the harness (Part No. 400-100070R) at the game. When an RS-232 board exists, the WBA-12/22 can be flashed by passing the RS-232 board using the harness, Part No. 400-100071R.

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- Turn the DT-004 power switch to the **ON** position. The Power LED should light.
- 5. Verify the LEDs on the WBA CPU board are illuminated, and are blinking back and forth. This indicates the download mode is active.
- 6. To begin the download process, press the **“START”** button. The **“RDY”** LED will begin to blink.
- 7. While downloading, the download status LEDs on the DT-004 will illuminate, indicating status of the download.
- 8. When the downloading is complete, the **“OK”** LED will light and a buzzer will sound for about one second.
- 9. Press the **“RESET”** button once, then press the **“VERIFY”** button once. After approximately 10 seconds, a buzzer will sound for about one second, and the **“OK”** LED will illuminate.
- 10. Turn DT-004 power to the **OFF** position, remove the harness connectors from the unit, and return the DIP Switches to their normal operating positions.
- 11. To repeat the process with other units, follow the instructions from steps #3 through #10.



NOTE: After downloading or upgrading, re-calibrate the units using the calibration reference paper (Part No. 501-000032R) to ensure proper operation.

WBA - DT-104 DOWNLOADING

Perform the following steps to begin a DT-104 download:

1. Connect the data transfer cable to the WBA Comm Port.
2. Insert the proper Master EPROM into the DT-104 socket.
3. Turn the DT-104 power ON.
4. Scroll on the Screen that appears until "**Setup**" is visible, and verify that the correct download speed is set — change if required.
5. Ensure that "**Multimode**" is turned OFF.
6. Click on the Menu Button until the "Program Menu" is displayed.
- The WBA CPU lights should begin to alternately flash.
- Click on **GO**.



NOTE: If no error has occurred, "Device Ready" will be displayed.

- Click on **Start**.
- The WBA will display a download sequence on the CPU LEDs.
- The DT-104 display panel will count down from the highest memory location.
- "**Download Successful**" will display on the panel when the download has successfully completed.

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WBA - PC DOWNLOADING

Perform the following to start a PC download:

1. Load the PC Download program — **DOWNLOAD PROGRAM.EXE** and the Validator data file into a common directory.
2. Connect the Validator to a PC Comm Port using the 9-pin D cable connector on the PS15-006 power supply.
3. Set the DIP Switches for the appropriate download speed.
4. Connect the power supply to the Validator. Two LEDs on the WBA Processor should be alternately flashing.
5. Run the **DOWNLOAD PROGRAM.EXE** application then perform the following steps:
 - a. Select the PC Comm Port assigned to the WBA.
 - b. Set the Baud Rate to match the speed set on by the WBA DIP Switches.
6. Use the **BROWSE** function to select the program data file to be loaded into the WBA.
7. Click on **Start Download**.
When the download is complete, "**Download Successful**" will display on the PC Screen.

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EXAMPLES OF ID INTERFACE USAGE

Table 10 WBA Interface ID

ID Interface	OEM (Gaming Manufacturer)
ID-003	JCM Standard: Aristocrat, Atronics, Bally, CDS, Sigma, VLC, and WMS
ID-022/023	IGT: S-Slots, P.E., P.E. Plus
ID-024	IGT: Game King, I-Game, and Vision Series
ID-044C/0C3	Aristocrat

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AVAILABLE CLEANING CARD

A JCM Waffletechnology Bill Validator Cleaning Card is now available (JCM Part No. 501-000180R)(Manufacturer's Part No. KWJCM-B2B15M). The cleaning card is designed to be used as a supplemental part of a Preventive Maintenance program to help in reducing dirt and paper dust build-up within a unit. This will optimize performance between regular Preventive Maintenance intervals. This is the only cleaning card authorized for use on the WBA Gaming Validator (See Figure 2).



Figure 2 JCM Waffletechnology Cleaning Card

CARD FEATURES

- A unique Waffletechnology design that hugs all surfaces to insure complete surface cleaning
- Specially designed scrubber patterns insure that belts and O-ring rollers are cleaned and lubricated to prevent them from drying out.

DIRECTIONS FOR USE

1. Remove cleaning card from pouch and insert it into the Bill Validator.
2. The cleaning card will be accepted and rejected automatically.
3. Repeat this process several times to ensure build-up removal.
4. Insert and **HOLD** cleaning card while the Validator pulls on it to ensure proper belt cleaning.
5. Dispose of used card in an environmentally safe manner.

For more information and a list of Authorized Waffletechnology Distributors visit: <http://www.jcmwaffletechnology.com>.

WBA® Units

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