



**JCM Products**  
**Quick Reference Guide**  
**“WBA™ Units”**

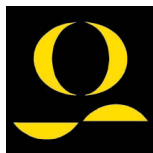
**Note:** Some of the information in this guide may change over time, depending on the software and possible modifications with advancements in technology.

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

**Technical Support**  
**(702) 651-3444                      (800) 683-7248**

**Parts Sales                                      Service Department**  
**(702) 651-3445                      (702) 651-3446**

**E-Mail: [techsupport@jcm-american.com](mailto:techsupport@jcm-american.com)**



**[www.jcm-american.com](http://www.jcm-american.com)**

# “WBA™ Units”

## Quick Reference Troubleshooting Guide

Description	Probable Cause	Possible Solutions
<b>Bill Rejection</b>	Dip switches not set properly	Set Dip switches
	Roller and/or belts are excessively dirty	Clean head & rollers with 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
	Cashbox is full, or not installed properly	Check and verify cashbox condition
	Sensors out of calibration, unit not calibrated after software upgrade	<ul style="list-style-type: none"> <li>• Calibrate unit using proper procedures</li> <li>• Check for proper software/ID protocol</li> </ul>
<b>No Activity</b>	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. No lights on CPU board	Replace CPU board, or change out unit
	Unit out of calibration	Calibrate unit using proper procedures

# WBA™ Diagnostic Tests

Test No.	Test Name	Function	When to Use
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	Same as above
3	Pusher Mechanism Test	Determine if mechanisms in the cashbox are working properly	When conducting tests #4 & #9 you receive a Pusher mechanism error
4	Entire-Unit Test	Repeatedly cycles the action of the Acceptor, Transport, and Cashbox	When the unit has intermittent errors that can't be detected
5	Solenoid Position Test	Activates the solenoid to determine if the mechanisms are working properly	When Stacker lever problems are detected during Tests #8 & #9
6	Sub-tests for Acceptor Sensors	Specifies any of the 8 sub-tests to check sensors in the Acceptor	When trouble-shooting Acceptor problems
7	Sub-tests for Transport Sensors	Specifies any of the 8 sub-tests to check sensors in the Transport	When trouble-shooting Transport problems
8	Bill Receiving Test without Cashbox	To test the ability to accept bills without using the cashbox attached	When troubleshooting a unit that is not accepting currency for verification
9	Bill Receiving Test with Cashbox	To test the ability to accept bills and stack using the cashbox*	Troubleshooting a unit for acceptance, and test the cashbox.
10	Transport and Cashbox Test	To test the Transport and Pusher mechanism of the cashbox without the head installed	When testing the Transport and Pusher mechanism for proper functionality

**\*Do not perform Test #9 at the machine**

# “WBA™ Units”

## How to Initiate the Standard Tests

1. Set Dip switch #8 to the “ON” position, all others to the “OFF” position. This puts the unit in Test Mode.
2. Apply power connector.
3. Select a Test Mode from the list below, and set the Dip switches accordingly.
4. Move Dip switch #8 to the “OFF” position. This activates that particular Test Mode.

Test #	Test Name	Dip Switches							
		1	2	3	4	5	6	7	8
1.	Transfer Motor - Forward	X							
2.	Transfer Motor - Reverse		X						
3.	Pusher Mechanism			X					
4.	Entire Unit Cycle				X				
5.	Solenoid Position					X			
6.	Sub-test for Head Sensors*						X		
7.	Sub-test for Transport Sensors*							X	
8.	Bill Receiving w/o Cashbox	X	X	X					
9.	Bill Receiving with Cashbox	X	X	X	X				
10.	Transport and Cashbox	X			X				

\* See next page

(“X” in a Column = Switch ON)

## “WBA™ Units”

### Dip Switch Settings for Head Sensor Sub-Test

Magnetic WBA-1x	Non-magnetic WBA 2x	1	2	3	4	5	6	7	8
PLEV	FLEV	X							
Reserved	PT-1/PT-3		X						
PT-1	PT-2/PT-4			X					
PT-2	PT-1/3				X				
HPL	PT-2/4					X			
HPR	UHPL/DHPL						X		
HPC	UHPR/DHPR							X	
Reserved	UHPC/DHPC		X						X

(“X” in a Column = Switch ON)

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

### Dip Switch Settings for Transport Sub-Sensor Test

Troubleshooting Tests	1	2	3	4	5	6	7	8
Feed-in Sensor	X							
Solenoid Lever Sensor		X						
Feed-out Sensor			X					
Stacker Home Sensor				X				
No Cashbox Sensor					X			
Validator Encoder Sensor						X		
Stacker Encoder Sensor							X	
Acceptor Head Detached	X	X						

(“X” in a Column = Switch ON)

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

# “WBA™ Units”

## Unit Error Codes:

### Bill Receiving Test

# of Blinks	Description	Possible Cause
1	Cashbox full	<ul style="list-style-type: none"><li>• Cashbox may be full</li><li>• Stack motor not spinning</li><li>• Sensor not working</li><li>• Stacker encoder gear blade split</li></ul>
2	Stacker jam	<ul style="list-style-type: none"><li>• Stacker may be jammed or blocked</li></ul>
3	Transport error	<ul style="list-style-type: none"><li>• Cover open</li><li>• Stacker lever problem</li></ul>
4	Head-Sensor error	<ul style="list-style-type: none"><li>• Something blocking the sensors</li><li>• Sensor problem</li></ul>
5	Acceptor head error	<ul style="list-style-type: none"><li>• Acceptor head not seated properly</li><li>• Communication problem</li></ul>
6	Transfer motor error	<ul style="list-style-type: none"><li>• Motor not spinning</li><li>• Encoder gear split</li><li>• Encoder sensor not monitoring the the motor</li></ul>
8	Stacker lever error	<ul style="list-style-type: none"><li>• Solenoid not working</li><li>• Sensor may not know the position of the Stacker level</li></ul>
10	No cashbox	<ul style="list-style-type: none"><li>• No cashbox installed</li><li>• Cashbox sensor error</li><li>• Broken optics flag</li></ul>

Error 7 and 9 are not used

## “WBA™ Units”

### Bill Return Codes with and without cashbox

# of Blinks	Description	Possible Cause
1	Crooked insertion	<ul style="list-style-type: none"><li>• WBA-10, 11, 12, 13 Sensor PT1 or PT2 not working</li><li>• WBA-20, 21, 22, 23 Sensor PT3 or PT4 not working</li><li>• Bill inserted crooked</li></ul>
2	Magnetic pattern error	<ul style="list-style-type: none"><li>• Dirty rollers/belts</li><li>• Bad mag sensor PCB</li></ul>
3	Entrance sensors by-passed	<ul style="list-style-type: none"><li>• Sensor other than PT1 &amp; PT2 or PT3 &amp; PT4 detected the presence of the bill/note while in stand-by</li></ul>
4	Dark-light ratio is below the fixed value	<ul style="list-style-type: none"><li>• Reflective sensors may not be working</li></ul>
5	Bill not detected	<ul style="list-style-type: none"><li>• Bill/note not detected by a sensor within a specified period</li><li>• HPC, HPL, HPR or feed in sensor</li></ul>
7	Photo sensor error	<ul style="list-style-type: none"><li>• Bill/note may have a pattern not programmed or recognized in memory</li></ul>
8	Photo level error	<ul style="list-style-type: none"><li>• The bill/note may be dirty</li><li>• Overlapping bill/notes detected</li></ul>
9	Illegal bill/note	<ul style="list-style-type: none"><li>• The bill/note does not fall into the range of acceptable bill/notes in program</li></ul>

(Cont'd)

## Bill Return Codes (con't.)

# of Blinks	Description	Possible Cause
11	Stacker lever problems	<ul style="list-style-type: none"><li>• Solenoid not working</li><li>• Sensor may not know position of the Stacker lever</li></ul>
12	Timing error	<ul style="list-style-type: none"><li>• The timing is degraded between the sensors that track the bill/note movement</li></ul>
13	Bill/Note length error	<ul style="list-style-type: none"><li>• Bill/note is torn</li><li>• Registration on bill/note is too short</li></ul>
14	Color pattern error	<ul style="list-style-type: none"><li>• Color pattern on the bill/note is incorrect</li></ul>

### Preventive Maintenance (Head/Transport)

- Replace belts if frayed, slick and/or worn.
- It is important to 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, we suggest using a lint-free cloth and a mild, nonabrasive detergent, such as dish liquid soap mixed with water.

**Do Not use alcohol for cleaning**

**Note: JCM does not recommend - cleaning cards, cleaning pads, or cleaning solutions of any kind.**

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

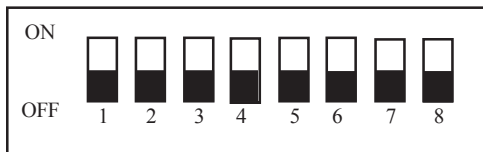
### Cashbox Preventive Maintenance (P/M):

Do Periodic P/M on the Cashboxes to ensure proper operation. Use compressed air via can, or air compressor to blow out paper fibers and any other debris that may build up over time. 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 P/M, we recommend Calibration.**



# WBA™ - Basic Operations: US “\$” Dollar Dip Switch Settings



## WBA-10/11/12/13 ID-003

Sw-1	Sw-2	Sw-3	Sw-4	Sw-5	Sw-6	Sw-7	Sw-8
Dir	\$1	\$5	\$10	\$20	\$50	\$100	Off

(Dir) “On” :2-way acceptance {if within firmware}  
 “Off” :4-way acceptance {if within firmware}

## WBA-10/11/12/13 ID-022/023 (IGT)

Sw-1	Sw-2	Sw-3	Sw-4	Sw-5	Sw-6	Sw-7	Sw-8
Dir	I/F	\$1	\$5	\$10	\$20	\$50 100	Off

(Dir) “On” :2-way acceptance {if within firmware}  
 “Off” :4-way acceptance {if within firmware}  
 (I/F) “On” : ID-022  
 “Off” : ID-023

## WBA-10/11/12/13 ID-024 (IGT)

Sw-1	Sw-2	Sw-3	Sw-4	Sw-5	Sw-6	Sw-7	Sw-8
Dir	Off	\$1	\$5	\$10	\$20	\$50 100	Off

(Dir) “On” :2-way acceptance {if within firmware}  
 “Off” :4-way acceptance {if within firmware}

# Auto-Calibration - Sensors

## 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, downloading software.

## Procedures

1. Remove Transport unit w/head.
2. Set Dip switches 5, 6, 7, & 8 to the "ON" position, all others to the "OFF" position.
3. Connect Transport unit w/head to power source - either host machine, or adaptive power supply.
4. Listen for activation of transport motor - forward and reverse for up to 2 seconds, then stop - READY.
5. After inserting the calibration paper, black paper first, the unit will carry the paper forward/reverse several times. When the process is complete, the unit will return the paper.
6. Wait a few moments to allow for complete transfer of calibration data to be stored in memory. This is indicated via the LED on the test harness, or the bezel light on some applications with fast blinks.
7. Unsuccessful Calibrations - Check the lenses. Re-try calibration. If necessary, refer to Error Conditions Chart on the next page. Additional testing/troubleshooting may be required.



Part #501-000032

**Note:** When installing a new CPU, you must recalibrate.

## **Auto-Calibration Error Conditions Chart**

Look at the indicator LED connected to the test harness, or 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 with the list below. If you missed the count, it will repeat after a 1-second pause.

<b># of Blinks</b>	<b>Error Found During Calibration</b>
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

# **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 power supply hook-up.**

- Remove power.
- Prior to starting, set the Dip switches. Place Dip switches 1,2,3 & 8 in the "ON" position.
- Apply power.
- Turn Dip switch 8 "OFF." The unit should cycle briefly.
- The unit is now ready for the test.
- Insert a known bill/note.
- The bill/note will either go completely through, or be rejected.
- If it rejects, check calibration. Re-calibrate if necessary. If the unit still rejects, there is a possible sensor problem, or incorrect software version. Go to "Bill Return Tests" page.
- If it does not take the bill/note in, check for power.

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

- When the unit cycles on power up, this indicates power and forward motor operation.
- When you insert a plain piece of paper and it is rejected, this indicates reverse motor operation.
- When you insert various denominations of bills, and they are accepted, this indicates the bill was successfully matched against the characteristics of the software.

# **WBA™ - DT-004 Downloading**

## **Using the JCM DT-004 Download Tool**

**DO NOT USE the 2-pin connector for power input.  
This is output power and can damage the DT-004.**

1. Make sure power is applied to the DT-004 via a 3-pin connector from the PS15-007 power supply with the adaptive harness, Part No. 400-100067, or the power supply harness connection in the game.
2. With the power “OFF”, be sure the 4MEG Program EPROM is installed properly.
3. Dip switches on WBA:  
Set Dip switches 6, 7, and 8 to the “ON” position, and all others to the “Off” position.
4. Harnessing
  - For WBA-10/20: Use Part No. 400-10068 (Power from game to DT-004), Part No. 400-100069 (Data from DT-004 to WBA unit).

Note: The PS15-007 can be used to substitute for a power source instead of using the harness, Part No. 400-100068 at the game. When there is an RS-232 board, disconnect the board and use the harness, Part No. 400-100042 in conjunction with harness, Part No. 400-100069

  - For WBA-12/22: Use Part No. 400-100070 (Power from game to DT-004), Part No. 400-100071 (Data from DT-004 to WBA unit).

Note: The PS15-007 can be used to substitute for a power source instead of using the harness, Part No. 400-100070 at the game. When there is an RS-232 board, the WBA-12/22 can be flashed through the RS-232 board using the harness, Part No. 400-100071.
5. Turn the power switch on the DT-004 to the “ON” position. The Power LED should light.
6. Verify the LEDs on the WBA CPU board are illuminated, and are blinking back and forth. This indicates download mode.

**(Continued)**

# **WBA™ - DT-004 Downloading (con't)**

7. To begin the download process, press the “START” button. The “RDY” LED will begin to blink.
8. While downloading, the download status LEDs on the DT-004 will illuminate, indicating status of the download.
9. When the downloading is complete, the “OK” LED will light and a buzzer will sound for about a second.
10. Press the “RESET” button once, then press the “VERIFY” button once. After approximately 10 seconds, a buzzer will sound for about a second, and the “OK” LED will illuminate.
11. Turn power on the DT-004 to the “OFF” position, remove the harness connectors from the unit, and return the Dip switches to their normal operating positions.
12. To repeat the process with other units, follow these instructions from #3 through #10.

**NOTE:** After downloading/upgrading, recalibrate the units using the calibration/reference paper, Part No. 501-00032 to ensure proper operation.

## Examples of ID Interface Usage

This is an example of the various usages for JCM interfaces

### WBA - I/F

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

### DBV - I/F

ID Interface	OEM (Gaming Manufacturer)
ID-004/Bar	JCM Standard: CDS and VLC
ID-011/015	Sigma and Videotronic
ID-022/023	IGT: S-Slots, P.E., P.E. Plus
ID-024	IGT: Game King, I-Game, and Vision Series
ID-044P/045P	Bally
ID-044/045W	WMS

# **JCM American Corp.**

## **Regional Offices**

### **Western Region: Main**

925 Pilot Road

Las Vegas, NV 89119

(800) 683-7248      Office (702) 651-0000

Fax (702) 651-0214

### **Mid-Western Region**

3000 Dundee Road, Ste. #402

Northbrook, IL 60062

Office (847) 418-3354      Fax (847) 418-3357

### **Eastern Region**

3 Canale Drive, Ste. #4

Egg Harbor, NJ 08234

Office (609) 677-8909      Fax (609) 677-8820

### **Southern Region**

4063 Ginger Dr., Ste. B

Biloxi, MS 39532

Office (228) 354-8600      Fax (228) 354-8608

