Hamilton Manufacturing Corporation

HVX7 Operational Manual

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ABOUT THIS MANUAL

This manual will enable the operator to complete basic maintenance, identify error codes, and perform basic troubleshooting.

There are no user serviceable parts inside the Validator. Further technical assistance can be obtained by calling (800) 837-5561 or (419) 867-4858.

When calling for service, it is important to have the serial number readily available. Please take the time to record this number in the space provided.

VALIDATOR SERIAL #_____

I. Introduction

The HV-X7 VALIDATOR is a bill acceptor capable of validating one, five, ten or twenty dollar bills. The HV-X7 can also accept the new patented Hamilton paper Tokenotes® designed for use with the HV-X Validator.

> NOTE: Tokenotes for the HV-X Validator have been printed using improved techniques for code generation and acceptance. Because of this step forward in Tokenote technology, these new Tokenotes, and Tokenotes purchased for use with previous Validators, are not interchangeable.

FEATURES OF THE HV-X7 INCLUDE:

- Bill acceptance in both directions
- Self-diagnostics
- The ability to clear jammed bills
- Operates with a separating stacker in certain changers

An upgradeable EPROM allows the software to be updated as new software becomes available.

II. Switch Settings

HVX7 Validator Switch Settings

SWITCH	OFF	ON
	HV-X7 VALIDATOR **SWITCH SETTINGS**	
1	Normal Operating Mode	Diagnostic Mode
2	Accepts Tokenotes®	Rejects Tokenotes®
3	Not Used	Not Used
4	Not using Dual Stacker	Dual Stacker being used
5	Accepts in Both Directions	Black Seal First
6	For HOPPER type machines # of $1 RELAY 1 for $1 # of $5 RELAY pulses- 1 for $5 2 for $10 4 for $20	For Tube type Machines # of $1 RELAY pulses. 1 pulse per dollar
7	ACCEPTS $1	REJECTS $1
8	ACCEPTS $5	REJECTS $5
9	ACCEPTS $10	REJECTS $10
10	ACCEPTS $20	REJECTS $20

When programming Tokenotes® with the HV-X7, all switches must be set to the "ON" position. The switches should be turned "ON" from BOTTOM to TOP, starting with Switch 10. When programming is complete, the switches should be turned "OFF" from TOP to BOTTOM, starting with Switch 1. This will prevent accidental entry into any diagnostic modes. It is possible to get [9.4] error codes and total reject by entering certain diagnostic modes. To clear these errors, cycle power to the machine.

Switch 1: Switch #1 should ALWAYS be in the OFF position. The validator will not function properly otherwise.

Switch 2: Switch #2 should be in the ON position unless the new Hamilton Tokenotes® are being used. If the new Tokenotes® are being used, this switch should be moved to the OFF position. When the #2 Switch is ON, the validator will reject all Tokenotes already programmed.

Switch 4: Switch #4 should be in the OFF position unless the Hamilton Separating Stacker is being used.

Switch 5: Switch #5 selects which direction the validator will accept an inserted bill. If this switch is OFF, the validator will accept bills face up in either direction. If this switch is ON, the validator will only accept bills face up and the end with the black seal inserted first.

Switch 6: Switch #6 selects how the validator signals the dispensing equipment after accepting a bill. If this switch is OFF, the Validator will activate the $1 Relay once for an accepted $1 bill, the $5 Relay once for an accepted $5 bill, the $5 Relay twice for an accepted $10 bill, and the $5 Relay four times for an accepted $20 bill. If switch #6 is ON, the validator will activate the $1

Relay once for an accepted $1 bill, the $1 Relay five times for an accepted $5 bill, the $1 Relay ten times for an accepted $10 bill, and the $1 relay twenty times for an accepted $20 bill.

NOTE: SWITCH #6 DOES NOT WORK WITH TUBE TYPE CHANGERS.

Switch 7:   Switch #7 selects whether the validator will accept or reject $1 bills. If the switch is in the OFF position, the validator will accept $1 bills. If the switch is ON, the validator will reject $1 bills.

Switch 8:   Switch #8 selects whether the validator will accept or reject $5 bills. If the switch is in the OFF position, the validator will accept $5 bills. If the switch is ON, the validator will reject all $5 bills.

Switch 9:   Switch #9 selects whether the validator will accept or reject $10 bills. If the switch is in the OFF position, the validator will accept $10 bills. If the switch is ON, the validator will reject all $10 bills.

Switch 10:   Switch #10 selects whether the validator will accept or reject $20 bills. If the switch is in the OFF position, the validator will accept $20 bills. If the switch is ON, the validator will reject all $20 bills.

III. Electrical Connections

The electrical connections are made via a 9-pin connector located on the rear panel of the unit.

The following diagram and chart have been included for custom installation.

9-PIN CONNECTOR

EXTERNAL VIEW

3	2	1
6	5	4
9	8	7

WIRE VIEW

PIN #	COLOR	NAME
1	Yellow	Inhibit
2	White	120VAC Neutral
3	Brown	Vend Common
4	Orange	Stacker Output
5	Gray	Vend Normally Closed
6	Green	Ground
7	Blue	$1 Vend Contact Closure
8	Violet	$5 Vend Contact Closure
9	Black	120VAC Hot

IV. Testing

After installation, a short test may be performed to verify correct installation.

For testing, be sure Switch #1 is off.

Test	Desired Result
Turn on unit.	Decimal point flashing.
Insert bill.	Payout proper change for each bill type.
Test with a quality of bills.	May reject the first couple of bills with a 0.6 error code while the Validator adjusts the motor to the optimum motor speed.

NOTE: Should this unit fail to operate accordingly, check for an error code and refer to the troubleshooting section of this manual.

V. Maintenance

MONTHLY - Depending on use

1.   The platen assembly should be opened and cleaned regularly.

2.   To open the platen assembly:

- Unplug the changer.

- Disconnect the 9-pin plug.

- Remove the Validator from the holder.

- Loosen the 2 thumbscrews on both sides of the Validator.

- Carefully lift to open from the bill insert end of the Validator.

3.   Clean rollers, heads and sensors with cotton swabs and rubbing alcohol. DO NOT ALLOW ALCOHOL TO CONTAMINATE THE BELTS.

4.   Close the Platen Assembly and re-tighten the LATCH STUDS. Loose LATCH STUDS may cause false error codes.

YEARLY

The HV-X7 Validator should be serviced annually to maintain maximum performance. THIS WORK SHOULD ONLY BE DONE BY A TRAINED TECHNICIAN.

VI. Parts

HV-X7 VALIDATOR PARTS LIST		
PART #	**DESCRIPTION**	**QTY**
46-1012D	Assembly, HV-X7 Cover	1
46-1062A	Platen Assembly	1
46-1067A	Guide Assembly	1
46-1072C	Chassis, Assembly HV-7	1
46-1290C	P.C.B. Assembly Complete, HV-X	1
96-0080C	Decal Assembly, HV-X	1

VII. Error Codes

The HV-X7 provides a diagnostic code for most problems. Upon any problem, the error code should be checked first.

The display is only a single digit; therefore, to obtain the 2-digit error code the first digit is displayed WITH THE DECIMAL POINT (5.) and the second digit is displayed WITHOUT THE DECIMAL POINT (3). The display will continue to flash the 2-digit error code, one digit at a time, until the failure is corrected or power is removed.

During normal operation only the decimal point should flash. Do not be concerned if one of the segments flashes once upon power-up or upon passing a valid bill.

TROUBLESHOOTING FOR TOKENOTE® PROGRAMMING ERRORS

ERROR	PROBLEM	POSSIBLE CAUSE	POSSIBLE SOLUTION
0.1	No marker found on Tokenote®	• Weak Tokenote® • Weak mag head signal	• If error continues, return for service with a sampling of Tokenotes®
0.2	Too many bars found on Tokenote®	• Noisy Tokenote® signal	• If error continues, return to the manufacturer for service with a sampling of Tokenotes®
0.3	Unable to store Tokenote® - "Storage Full"	• Tokenote storage memory is full	• Clear out of memory at least one Tokenote® and then program in new Tokenote®
0.4	Tokenote® not found	• Tokenote® is not stored into memory	• Program Tokenote® into memory
0.5	Primary < > Secondary	• Primary and secondary Tokenote® signals do not match	• Clear Tokenote® from memory and reprogram • Return for service
0.6	Serial ram chip corrupted	• Tokenote® stored, memory has been corrupted • Defective PCB	• Clear all Tokenotes® from memory and reprogram • Return for service
0.7	12 coupon limit reached	• 12 training coupons have already been stored into memory	• Clear Tokenote® and reprogram with a maximum of 12 training coupons

TROUBLESHOOTING FOR STANDARD BILL OPERATION

The following troubleshooting guide is based on standard bill operation. A separate guide for troubleshooting Tokenote® Errors is on the previous page.

Always note the error code before attempting any service or before contacting the manufacturer.

ERROR	PROBLEM	POSSIBLE CAUSES	POSSIBLE SOLUTIONS
0	All bill types disabled	· Switches for all bill types are set to the on position	· Turn switches off for types of bills to be accepted
0.1- 0.8	Bill Validator error	· Rejected bill · Bill not touching head	· These errors can be displayed intermittently on bill rejects. This is a normal condition. · If you continuously get these errors with total reject condition, check rollers to insure a good flat contacting point between head and roller is established · Return for service
0.6	Motor speed out of range	· Initial power up	· Insert at least 6-10 bills while the Validator determines optimum motor speed · Return for service
1/2 of 1.	Unit inhibited	· No ENABLE signal	· Check Controller reset · Check for open harness · Return for service
1.0	Bill allowed flack seal first only	· Switch 5 is in the ON position · A new style bill was inserted green seal first	
1.1	Missing tach pulse	· Bad tach circuit	· Return for service
1.3	Motor jammed	· Obstruction in bill path or jammed drive train	· Remove obstruction · Return for service
1.6	Motor creeping	· Board problem	· Return for service
1.8	Bill type turned OFF	· A bill was inserted that is turned OFF via switches 7, 8, 9 or 10	

ERROR	PROBLEM	POSSIBLE CAUSES	POSSIBLE SOLUTIONS
2.2	Front sensor blocked	· Obstruction blocking front sensor on power-up	· Remove obstruction, clean sensor, cycle power
3.3	No rear sensor	· Defective sensor	· Return for service
4.3	Secondary head noise too high	· Noisy frame, head, or PCB	· Clean heads and rollers · Return for service
4.4	Head signal missing	· Open head circuit	· Return for service
5.3	Primary head noise too high	· Noisy frame, head, or PCB	· Clean heads and rollers · Return for service
5.4	Head signal missing	· Open head circuit	· Return for service
6.3, 6.4, 6.5, 6.7	Cheating attempt	· Rejected bill	· Open head circuit
		· Bill not touching heads	· These errors can be displayed intermittently on bill rejects. This is a normal condition. · If you continuously get these errors with total reject condition, check rollers to ensure a good, flat contacting point between head and roller is established. · Return for service
6.8	Magnetic pattern error too low		
6.9	Magnetic pattern does not match optic pattern		
8.1	Optic pattern average too high	· Rejected bill	· These errors can be displayed intermittently on bill rejects. This is a normal condition. · If you continuously get these errors with total reject condition, check rollers to ensure a good, flat contacting point between head and roller is established. · Return for service
8.2	Optic pattern average too low	· Front sensor dirty	
8.3	Optic pattern too flat		
8.4	Optic error pattern too low		
8.5	Rear sensor blocked on an accepted bill	· Obstruction blocking rear sensor. This will shut down the Validator and Controller causing a $1 input stuck on the Controller or a Validator shutdown error on a C2000 v1.5 or an Audit Pro v3.4 or greater	· Remove obstruction, clean sensor, cycle power, reset Controller

ERROR	PROBLEM	POSSIBLE CAUSES	POSSIBLE SOLUTIONS
8.6	Rear sensor blocked on a rejected bill	· **Obstruction blocking rear sensor. This will shut down the Validator and Controller causing a $1 input stuck on the Controller or a Validator shutdown error on a C2000 v1.5 or an Audit Pro v3.4 or greater**	· **Remove obstruction, clean sensor, cycle power, reset Controller**
8.7	Front sensor blocked	· **Obstruction blocking rear sensor. This will shut down the Validator and Controller causing a $1 input stuck on the Controller or a Validator shutdown error on a C2000 v1.5 or an Audit Pro v3.4 or greater**	· **Remove obstruction, clean sensor, cycle power, reset Controller**
9.0	Cheating attempt	· **A cheating attempt has been detected**	· **Check inventory, cycle power to remove error** · **Assure latch studs are tightened completely**
9.3	Cheating attempt	· **Possible counterfeit** · **Defective head / motor circuit**	· **If this error continues to be displayed, return for service**
9.4	Front sensor failure	· **Initial power up** · **Possible counterfeit attempt** · **Defective front sensor**	· **Insert at least 6-10 bills while the Validator determines the optimum front sensor bias** · **If this error continues to be displayed, return for service**
9.7	Cheating attempt	· **A cheating attempt has previously been detected. On an HV-X7 v3.19 and earlier, this will shut down the Validator and Controller causing a $1 input stuck on the Controller or a Validator shutdown error on a C2000 v1.6 or an Audit Pro v3.4 or greater** · **Defective head / motor circuit**	· **Check inventory, check for obstruction and remove. Cycle power, reset Controller** · **If this error continues to be displayed, return for service**
9.8	Cheating Attempt	· **A cheating attempt has been detected**	· **Check inventory, cycle power to remove error** · **Assure latch studs are tightened completely**

ERROR	PROBLEM	POSSIBLE CAUSES	POSSIBLE SOLUTIONS
P.	Tokenote® programming mode	· All switches are turned ON.	· Turn switches back to normal positions.
E.E	5 bills rejected in a row. Validator shuts down for approx. 10 seconds. If next bill is rejected, Validator will shut down for another 10 seconds until a valid bill is accepted, then CPU resets to normal mode.	· Bad bill · Validator board or bill guide problem	· Run several bills · Return for service
J	Jammed bill	· Will be displayed for 2 minutes if the obstruction is not removed. After the 2 minutes, either an 8.5 or 8.7 will be displayed for the blocked sensor and the Validator and Controller will shut down causing a $1 input stuck on the Controller or a Validator shutdown error on a C2000 v1.5 or an Audit Pro v3.4 or greater	· Remove obstruction, clean sensor, cycle power, reset Controller

Always run a minimum of 6-10 bills through the validator on initial power up. You may receive some rejects with a 0.6 error code. This is a normal condition. The validator is adjusting the motor to the optimum motor speed. Once the optimum motor speed is reached, the 0.6 error should stop and normal operation will occur.

Any time the C2000 Controller flashes a 3 followed by 4 flashes (a $1 input stuck error), or a 6 followed by 4 flashes (time-out for Validator to advance bill (Dual Stacker)), or a 6 followed by 5 flashes (validator shutdown error), the validator must be looked at to see if an error code is displayed. Error codes such as 7.2, 8.5, 8.6, 8.7, or 9.7 represent a Dual Stacker malfunction, a jammed bill, or a possible cheating attempt. Always refer to this section for a solution to the error.

Always assure that the latch studs are tightened completely. Loose latch studs could possibly cause false errors or jamming bills.

If using a Hamilton Single Stacker with the HV-X7 Validator, the Stacker serial number must end with the letters "MP".

LIMITED WARRANTY AGREEMENT
OF HAMILTON MANUFACTURING CORP.

Hamilton Manufacturing Corp., an Ohio Corporation, ("Seller") warrants to Purchaser that all new equipment shall be free from defects in material and factory workmanship for a period of one (1) year from the original shipping date. Hamilton Manufacturing Corp. further warrants if any part of said new equipment in Seller's sole opinion, requires replacement or repair due to a defect in material or factory workmanship during said period, Seller will repair or replace said new equipment. Purchaser's remedies and the liabilities and obligations of Seller herein shall be limited to repair or replacement of the equipment as Seller may choose, and Seller's obligation to remedy such defects shall not exceed the Purchaser's original cost for the equipment. Purchaser EXPRESSLY AGREES this is the EXCLUSIVE REMEDY under this warranty. There are no other express or implied warranties which extend beyond the face hereof. All warranty repair service must be performed by either a Factory Trained Service Representative or **HAMILTON MANUFACTURING CORP., 1026 Hamilton Drive, Holland, Ohio 43528 PHONE (419) 867-4858 or (800) 837-5561, FAX (419) 867-4867.**

The limited warranty for new equipment is conditioned upon the following:

1. The subject equipment has not, in the Seller's sole opinion, been subjected to: accident, abuse, misuse, vandalism, civil disobedience, riots, acts of God, natural disaster, acts of war or terrorism.
2. The Seller shall not be liable for any expense incurred by Purchaser incidental to the repair or replacement of equipment and Purchaser shall assume full responsibility for any freight or shipping charges.
3. The coverage of this warranty shall not extend to expendable parts.
4. Purchaser shall have a warranty registration card on file with Seller prior to any claim in order for warranty protection to apply.
5. No warranty coverage is applicable to any equipment used for currency other than that specified at the time of the purchase.
6. Seller expressly disclaims any warranty that counterfeit currency will not activate said equipment.
7. Seller expressly disclaims any warranty for any losses due to bill manipulation or theft or loss of cash under any circumstances.

Seller further warrants all repair or service work performed by a factory trained representative or Hamilton Manufacturing Corp. for a period of ninety (90) days from the date the repair or service work was performed. Purchaser's remedies and the liabilities and obligations of Seller herein shall be limited to repair or replacement of equipment as Seller may choose, and Seller's obligation to remedy such defects shall not exceed the Purchaser's depreciated value of the equipment. Purchaser EXPRESSLY AGREES this is an EXCLUSIVE REMEDY under this warranty. There are no other express or implied warranties on repair or service work performed by a factory trained representative or Hamilton Manufacturing Corp. which extend beyond the face hereof.

(See next page for additional provisions)

The limited warranty for repair and service work is conditioned upon the following:

1.   The subject equipment has not, in the Seller's sole opinion, been subjected to: accident, abuse, misuse, vandalism, civil disobedience, riots, acts of God, natural disaster, acts of war or terrorism.
2.   The Seller shall not be liable for any expense incurred by Purchaser incidental to the repair or replacement of equipment and Purchaser shall assume full responsibility for any freight or shipping charges.
3.   The coverage of this warranty shall not extend to expendable parts.
4.   Purchaser shall have a warranty registration card on file with Seller prior to any claim in order for warranty protection to apply.
5.   No warranty coverage is applicable to any equipment used for currency other than that specified at the time of the purchase.
6.   Seller expressly disclaims any warranty that counterfeit currency will not activate said equipment.
7.   Seller expressly disclaims any warranty for any losses due to bill manipulation or theft or loss of cash under any circumstances.
8.   No person or entity other than a factory trained representative or Hamilton Manufacturing Corp. has performed or attempted to perform the subject repair or service.

THIS AGREEMENT IS MADE WITH THE EXPRESS UNDERSTANDING THAT THERE ARE NO IMPLIED WARRANTIES THAT THE EQUIPMENT SHALL BE <u>MERCHANTABLE,</u> OR THAT THE GOODS SHALL BE <u>FIT FOR ANY PARTICULAR PURPOSE</u>. PURCHASER HEREBY ACKNOWLEDGES THAT IT IS NOT RELYING ON THE SELLER'S SKILL OR JUDGMENT TO SELECT OR FURNISH EQUIPMENT SUITABLE FOR ANY PARTICULAR PURPOSE AND THAT THERE ARE NO WARRANTIES WHICH EXTEND BEYOND THAT WHICH IS DESCRIBED HEREIN.

The Purchaser agrees that in no event will the Seller be liable for direct, indirect, or consequential damages or for injury resulting from any defective or non-conforming new, repaired or serviced equipment, or for any loss, damage or expense of any kind, including loss of profits, business interruption, loss of business information or other pecuniary loss arising in connection with this Limited Warranty Agreement, or with the use of, or inability to use the subject equipment regardless of Sellers knowledge of the possibility of the same.

Hamilton Manufacturing Corporation

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