
Ardac[®]
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Specification and Adjustment Manual **"USA" UpStack Acceptor**

MODEL USA and USA-15

Acceptor Part Number: 88x5000 Series

Manual Part Number 44x411

Revision D: November 9, 1998

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34000 Vokes Drive

Eastlake, Ohio USA 44095

Phone: (440) 946-3000 Fax: (440) 942-1835

440-946-9829

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SIRIUS TECHNOLOGY CORP.

7345 PRODUCTION DRIVE

MENTOR, OHIO 44060

PHONE: (440) 205-9200

FAX: 440-974-1648

WWW.SIRIUS-TECH-CORP.COM

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APPENDIX - USA³ ADDENDUM

CONVENTIONS USED IN THIS MANUAL

- This manual may duplicate figures, tables, or other information in different chapters. This is done purposely to make information readily available to the reader.
- In this manual, the terms "**note**", "**bank note**", and "**bill**" refer to paper currency or equivalent which is inserted into the note acceptor.
- In this manual, certain information will be set off from the main text for special consideration:

NOTE

A **NOTE** identifies additional information or instructions which may help clarify an operation or procedure.

CAUTION

A **CAUTION** identifies additional information or instructions which should be followed to avoid damage to the equipment.

WARNING

A **WARNING** identifies safety-related information or instructions which should be followed to avoid personal injury.

APPLICABLE MODELS

This manual describes several sub-models of the U.S.A. note acceptor which are designated "USA" or "USA-15". These acceptors have the following model numbers and features:

Model	Software	Features
88x5000	57x164-19	"USA" \$1. 115Vac power.
88x5000	57x267-19	"USA" \$1. 115Vac power.
88x5001	57x267-21	"USA-15" \$1. 115Vac power.
88x5003	57x300-20	"USA-15" \$1 with invertable control inputs. 115Vac power.
88x5005	57x300-20	"USA-15" \$1 with invertable control inputs. 24Vac power.
88x5006	57x322-05	"USA-15" \$1 and \$5 games with selectable vend pulses per \$1. 115Vac power.
88x5019	57x332-02	"USA-15" \$1 games with selectable vend pulses per \$1. 115Vac power.

Information in this manual applies generally to all acceptors listed above unless noted otherwise for a specific acceptor.

1

Introduction

1.1 Overview

The Ardac "USA" and "USA-15" Note Acceptors (collectively referred to as "USA") identify collect U.S. paper currency (referred to hereafter as "bills" or "notes"). Micro-processor control enables the USA-type acceptor to be interfaced to a variety of vending machines, amusement games, coin changers, and other change-making applications. See the specifications section for applicable USA models and accepted notes.

Individual sections of this manual give detailed explanations of how to install and maintain the USA note acceptor. Be sure to read the sections of this manual which describe installing and interfacing the acceptor to the host system.

1.2 Features

The USA note acceptor contains a number of features designed to simplify installation and use, and also minimize the need for maintenance:

- **STABLE, RELIABLE OPERATION:** The USA sensing devices are self-compensating and require minimal set-up and maintenance. Units are factory-adjusted and ready for immediate installation.
- **AUTOMATIC COMPATIBILITY WITH POPULAR COIN MECHANISMS:** A patented self-learning feature automatically configures the USA to operate with all coin changer protocols. Supplied harness permits the USA to be connected to "high-level", "low-level", and controller interfaces.
- **BUILT-IN STACKER:** Integral stacker will neatly stack up to approximately 290 mint-new bills; typical capacity is 250 circulated bills.
- **EASY ACCESS TO THE BILL PATH AND BILL BOX:** The acceptor opens to expose the bill path and bill box. This facilitates emptying, cleaning, clearing, and inspection of the sensors and drive components.

- **OPTIONAL NOTE COUNTER:** Plug-ready non-resettable, electro-mechanical counter tracks the intake of bills for more accurate auditing.
- **VISUAL INDICATORS FOR NOTE ENTRANCE:** Green flashing arrows on front direct customer to the bill slot.
- **ON-BOARD DIAGNOSTICS:** Flashing LEDs at rear of the machine provide diagnostic information in the event of a problem.

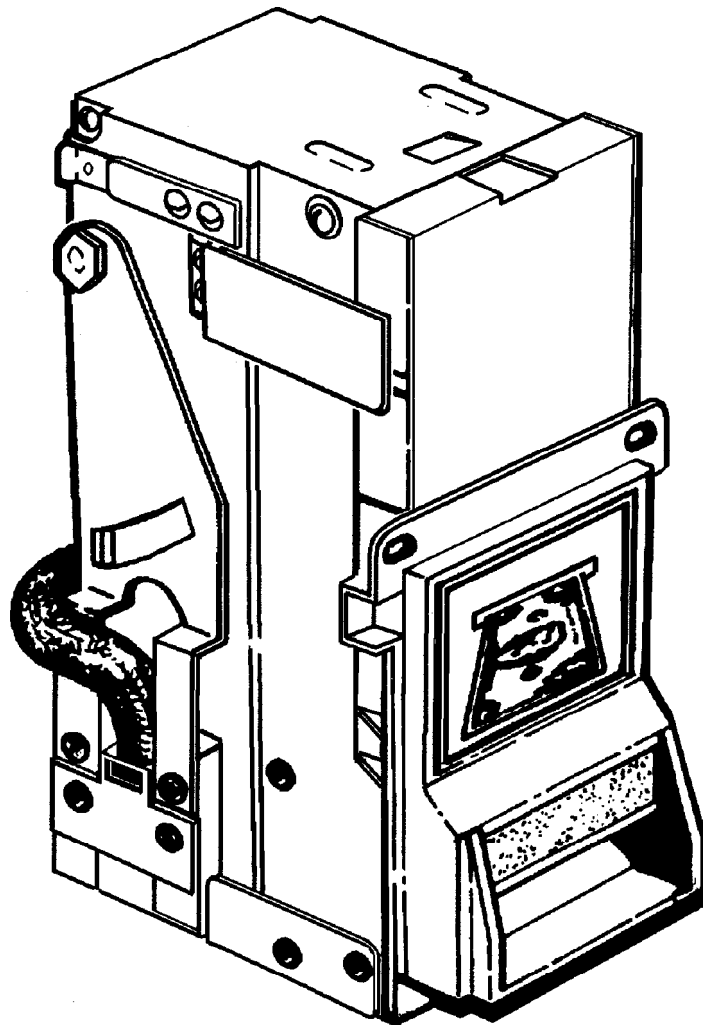


Figure 1-1. USA Note Acceptor

2

Specifications

2.1 Model: USA and USA-15 note acceptor with integral stacker for United States currency. Ardac part numbers 88x5000, 88x5001, 88x5003, 88x5005, 88x5006, and 88x5019.

2.2 Software Versions and Note Acceptance:

<u>MODEL</u>	<u>SOFTWARE</u>	<u>FEATURES (ALL 115VAC POWER EXCEPT 88X5005)</u>
88x5000	57x164-19	"USA" \$1, switch-selectable 1 or 2 directions.*
88x5000	57x267-19	"USA" \$1, switch-selectable 1 or 2 directions.*
88x5001	57x267-21	"USA-15" \$1, switch-selectable 1 or 2 directions.*
88x5003	57x300-20	"USA-15" \$1, switch-selectable 1 or 2 directions.* Invertable control inputs.
88x5005	57x300-20	"USA-15" \$1, switch-selectable 1 or 2 directions.* Invertable control inputs. 24VAC power.
88x5006	57x322-05	"USA-15" \$1 and \$5 games with selectable vend pulses per \$1.
88x5019	57x332-02	"USA-15" \$1 games with selectable vend pulses per \$1.

* 1 direction = Maximum security, bills inserted portrait up, black seal first.
2 direction = Normal security, bills inserted portrait up, either direction

2.3 Stacker Capacity

Typical: 250 circulated bills in average condition
Maximum: 290 bills in mint condition

2.4 Interface and Connectors

HIGH-LEVEL CHANGERS (uses T-Adapter)

MARS	MC5802, MC5807, MC6200 MC5920 ADH (4-PR) (Adapter No. 2x4653)
MAKA	US111, USP-121A-2C
COINTRON	525E, 525C 525CE (E and C require 5305-626 harness)
COINCO	S300E9240 F300E9210 (4-PR) (Adapter 406745), 9340S

HIGH- OR LOW-LEVEL CHANGERS (High with T-adapter; Low without T-adapter):

MARS	TRC6800DH
COINCO	9360S

LOW-LEVEL CHANGERS

MARS	MC5800DH, MC5805DH
------	--------------------

MATING CONNECTORS (AMP PART NUMBERS)

4-pin Counter:	Housing - 172330-1. Contacts - 170363-x, 170364-x, or 171638-1
12-pin Power/Control:	Housing - 172341-1. Contacts - 170365-x, 170366-x, or 171639-1

Pins in loose form; "-x" = finish. Consult vendor for available wire sizes and finishes.

2.5 Power and Electrical Specifications

115Vac @ 0.4A - 88x5000, 88x5001, 88x5003, 88x5006, 88x5019
24Vac @ 1.0A - 88x5005

2.6 Dimensions

Nominal dimensions:

Height: 8.5 in.

Width: 3.81 in.

Depth: 4.68 in.

Weight: 7.5 lb.

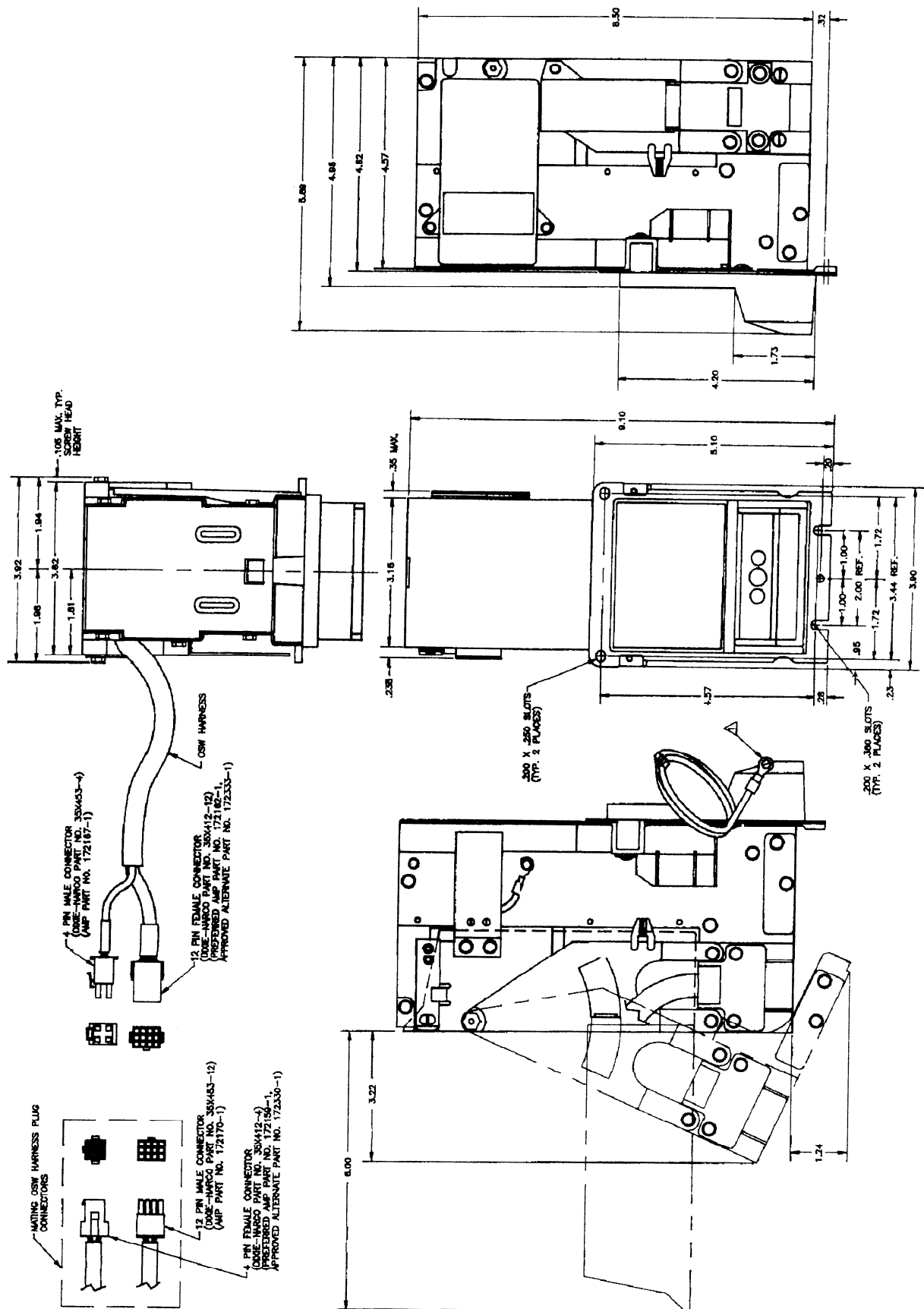


Figure 2-1. USA Outline Drawing

2.7 Warranty

New USA Acceptors are warranted to be free from defects in materials and workmanship under normal use and service for a period of 24 months from the date of manufacture, except transport and stacker motors which are covered for 60 months. This warranty applies to units operated from 110-120Vac, 60 Hz, installed in the U.S.A. or Canada, which have not been subjected to misuse, vandalism, neglect, unapproved alteration, etc. A copy of the complete warranty is available by contacting Ardac, Inc. at (440) 946-3000.

The month and year of manufacture are indicated by the first three digits of the serial number:

Digits 1 and 2 (01-12) Months 1 (January) through 12 (December)

Digit 3 (0 - 9) Last digit of the year. "8" = 1988, "9" = 1989,
"0" = 1990, "1" = 1991, etc.

3

I/O Protocol

3.1 Protocols

The USA acceptor can operate in a variety of high-level and low-level changer applications. Its exclusive "self-learning" Universal Input/Output (UIO) automatically senses the coin mechanism control voltages and protocol.

The following pages describe the protocols listed below:

<u>PROTOCOL</u>	<u>FEATURES</u>
"SPCC-AC"	High-level AC control, \$1 only, no escrow.
"DAP"	Low-level DC control, \$1 only, with escrow.
"\$1 GAMES"	Low-level DC control, \$1 only, no escrow, 4 pulses per dollar.
"\$1 / \$5 GAMES"	Low-level DC control, \$1 and \$5, no escrow. Switch-selectable pulses per dollar (57x322 and 57x332 software, only).
"PHONO"	Low-level DC control, \$1 only, no escrow, 1 vend pulse per dollar.

Specific operating features, compatibilities, accepted bills, and available options for a given USA model are determined by the software installed in the acceptor.

A 4-position DIP switch under the top cover of the USA permits the operating mode to be further defined for such features as 1- or 2-way acceptance, vend pulses per dollar, etc. To set the switches, remove the front cover by pressing the plastic tab downward as shown in Figure 3-1. Then swing the top of the cover away from the acceptor to reveal the circuit board and switches. Various switch combinations are described in the protocol charts.

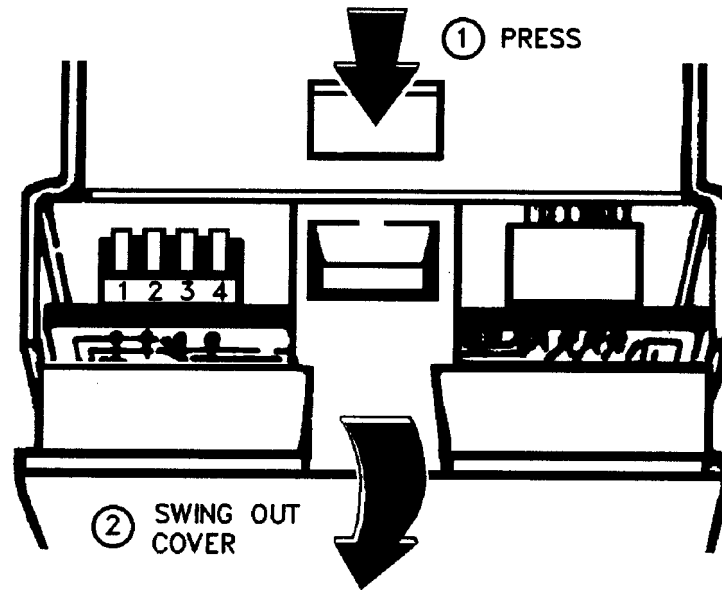
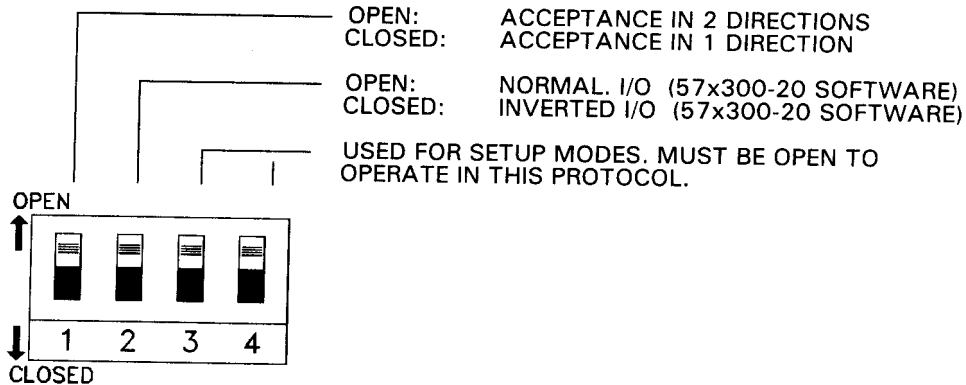


Figure 3-1. USA Switches

3.2 SPCC-AC (Single-price Coin Changer), No Escrow

SOFTWARE: \$1 MACHINES: 57x164, 57x267, 57x300

SWITCHES: Software 57x164, 57x267, and 57x300:



USAGE: HIGH-LEVEL COIN CHANGERS (T-BOX REQUIRED)
(SEE SPECIFICATIONS SECTION)

BILL(S) ACCEPTED: \$1, ONLY

CONTROL: HIGH-LEVEL. AC VOLTAGE APPLIED TO UIO COMMON INPUT. OTHER SIDE OF AC LINE APPLIED TO UIO1 AND/OR UIO2 AS NEEDED TO ACTIVATE DESIRED INPUT.

INPUTS UIO1/UIO2 (CONTROLLED BY HOST):

UIO1	UIO2	CONTROL FUNCTION
I	X	ACCEPTOR DISABLED (HOST OUT OF SERVICE).
A	I	ACCEPTOR ENABLED. HOST CONTAINS ADEQUATE COIN SUPPLY. "COINS ONLY" LAMP DISABLED (CHANGE CAN BE MADE).
A	A	ACCEPTOR DISABLED. "COINS ONLY" (EXACT CHANGE REQUIRED) LAMP ILLUMINATES WHEN BILL IS INSERTED.

I = "INACTIVE" - INPUT UNPOWERED OR FLOATING
A = "ACTIVE" - OTHER SIDE OF AC LINE APPLIED TO INPUT TO PROVIDE CURRENT FLOW THROUGH INPUT OPTO-ISOLATOR
X = DON'T CARE

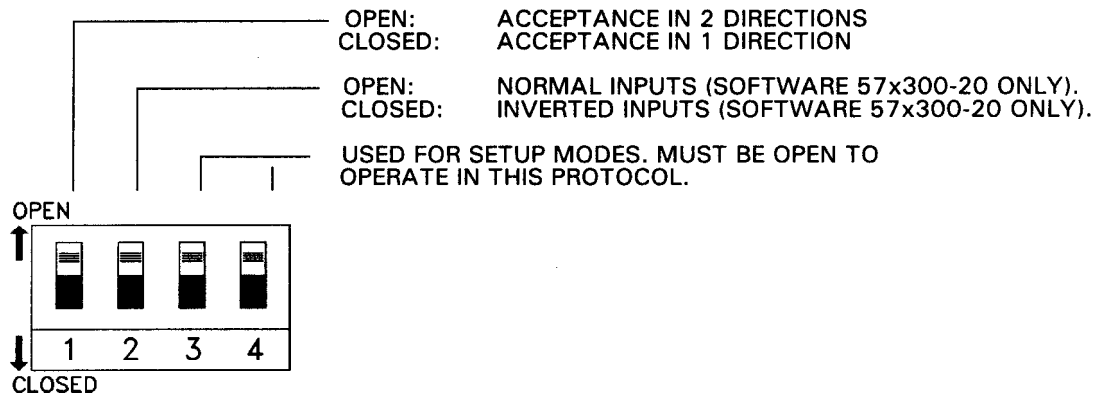
CREDIT/VEND: 1 VEND PULSE PER DOLLAR. PULSE = 100ms ON.

NOTE COUNTER: 1 PULSE PER DOLLAR. 100ms ON.

3.3 DAP with Escrow

SOFTWARE: \$1 MACHINES: 57x164, 57x267, 57x300

SWITCHES: Software 57x164, 57x267, and 57x300:



USAGE: LOW-LEVEL COIN MECHANISMS
CONTROLLER APPLICATIONS.
(SEE SPECIFICATIONS SECTION)

BILL(S) ACCEPTED: \$1, ONLY

CONTROL: LOW-LEVEL ISOLATED. 5-24Vdc APPLIED TO UIO COMMON INPUT. GROUND APPLIED TO UIO1 AND/OR UIO2 AS NEEDED TO ACTIVATE DESIRED INPUT.

INPUTS UIO1/UIO2 FROM STAND-BY, BEFORE BILL IS INSERTED (CONTROLLED BY HOST - SEE FIGURE 3-2):

UIO1	UIO2	CONTROL FUNCTION
I	X	ACCEPTOR IDLE: ACCEPTOR DISABLED (HOST OUT OF SERVICE).
A	I	ACCEPTOR IDLE: ACCEPTOR ENABLED, ESCROW DISABLED. (PHONO PROTOCOL)
A	A	ACCEPTOR IDLE: ACCEPTOR ENABLED, ESCROW ENABLED.

INPUTS UIO1/UIO2 ESCROW CONTROL, AFTER BILL IS INSERTED (CONTROLLED BY HOST - SEE FIGURE 3-2):

UIO1	UIO2	CONTROL FUNCTION
I	A	ACCEPTOR BUSY: BILL IN ESCROW. ACCEPTOR WAITING FOR HOST COMMAND.
A	A	ACCEPTOR BUSY: BILL COLLECTED FROM ESCROW. VEND ISSUED AFTER BILL IS STACKED.
I	I	ACCEPTOR BUSY: BILL RETURNED. NO VEND ISSUED TO HOST.

NOTE: WITH SOFTWARE 57x300-20, SW2 INVERTS INPUT CONTROL LEVELS.

I = "INACTIVE" - INPUT AT CONTROL VOLTAGE LEVEL, OR FLOATING
A = "ACTIVE" - GROUND APPLIED TO INPUT TO PROVIDE CURRENT FLOW THROUGH INPUT OPTO-ISOLATOR.
X = DON'T CARE

CREDIT/VEND: 1 CREDIT AND 1 VEND PULSE PER DOLLAR. PULSE = 30ms ON, 50ms OFF

NOTE COUNTER: 1 PULSE PER DOLLAR. 100ms ON, 100ms OFF.

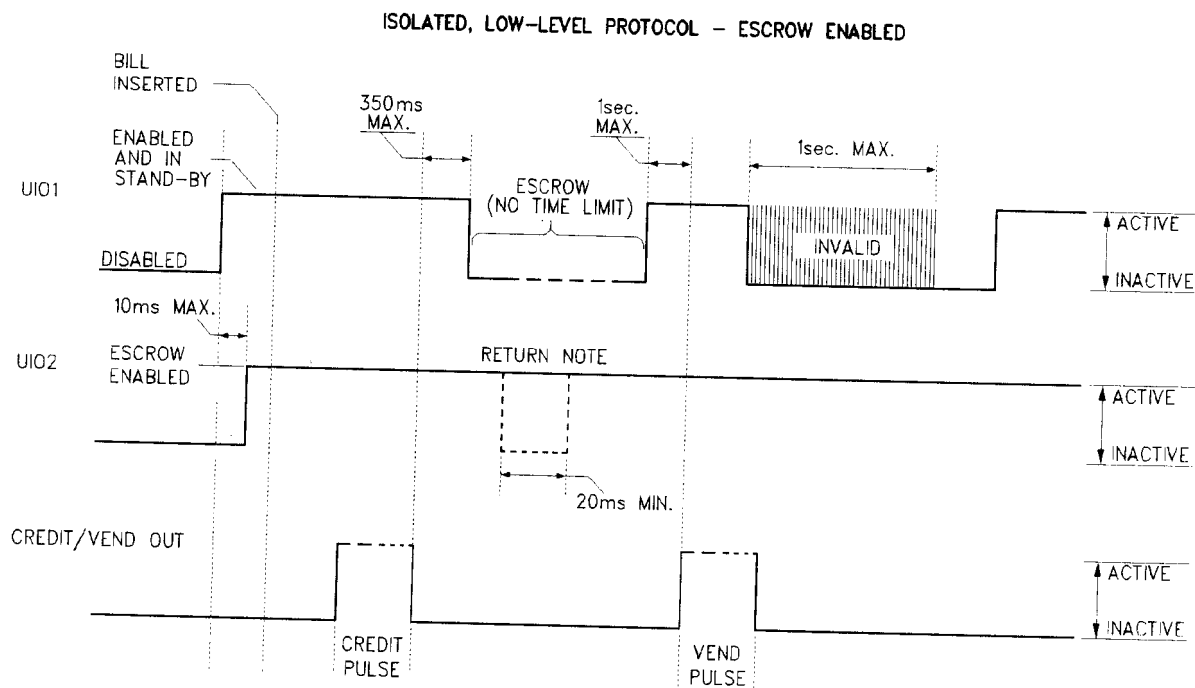
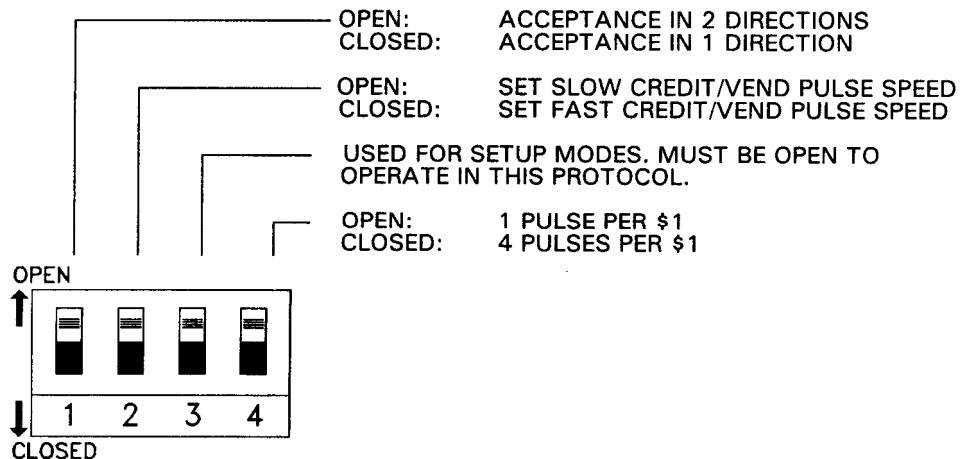


Figure 3-2. Isolated, Low-level Protocol "DAP", with Escrow (see text)

3.4 \$1 Game Retrofit, 4 Vend Pulses/\$1, No Escrow

SOFTWARE: \$1 MACHINES: 57x164, 57x267, 57x300

SWITCHES:



USAGE: GAME APPLICATIONS

BILL(S) ACCEPTED: \$1, ONLY

CONTROL: LOW-LEVEL 5-24VDC APPLIED TO UIO COMMON INPUT.
GROUND APPLIED TO UIO1 (ACTIVE)
UIO2 NOT USED - MUST BE INACTIVE

INPUTS UIO1/UIO2 (CONTROLLED BY HOST):

UIO1	UIO2	CONTROL FUNCTION
I	X	ACCEPTOR DISABLED (HOST OUT OF SERVICE).
A	I	ACCEPTOR ENABLED.

I = "INACTIVE" - INPUT AT CONTROL VOLTAGE LEVEL, OR FLOATING
A = "ACTIVE" - GROUND APPLIED TO INPUT TO PROVIDE CURRENT
FLOW THROUGH INPUT OPTO-ISOLATOR.
X = DON'T CARE

SLOW CREDIT/VEND: 4 VEND PULSES PER DOLLAR. 1ST PULSE = 75ms ON, 600ms OFF
2ND - 4TH PULSE = 75ms ON, 300ms OFF

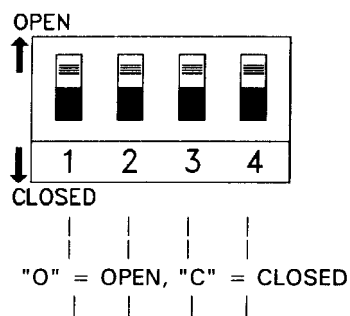
FAST CREDIT/VEND: 4 VEND PULSES PER DOLLAR. 1ST PULSE = 50ms ON, 375ms OFF
2ND - 4TH PULSE = 50ms ON, 75ms OFF

NOTE COUNTER: 1 PULSE PER DOLLAR. 100ms ON, 100ms OFF.

3.5 \$1 / \$5 Games, Selectable Vend Pulses/\$1, No Escrow

SOFTWARE: \$1 MACHINE: 57x332
 \$1 / \$5 MACHINE: 57x322 (SELECTIVE INHIBIT ON \$5)

SWITCHES:



1	2	3	4	REMARKS	PULSES FOR \$1	PULSES FOR \$5
O	O	O	O	SPCC OR DAP PROTOCOL	1	—
O	O	O	C		4	20
O	O	C	O	PHONO PROTOCOL	1	5
O	O	C	C	BURN-IN/CYCLE MODE (FACTORY USE)	—	—
O	C	O	O		2	10
O	C	O	C		3	15
O	C	C	O		5	25
O	C	C	C		6	30
C	O	O	O		7	35
C	O	O	C		8	40
C	O	C	O		9	45
C	O	C	C		10	50
C	C	O	O	RESERVED FOR FUTURE USE	1	5
C	C	O	C	RESERVED FOR FUTURE USE	1	5
C	C	C	O	RESERVED FOR FUTURE USE	1	5
C	C	C	C	RESERVED FOR FUTURE USE	1	5

USAGE: GAME APPLICATIONS

BILL(S) ACCEPTED: \$1, ONLY - SOFTWARE 57x332
\$1 AND \$5 - SOFTWARE 57x322 (SELECTIVE INHIBIT ON \$5)

CONTROL: LOW-LEVEL 5-24VDC APPLIED TO UIO COMMON INPUT. GROUND APPLIED TO UIO1 AND/OR UIO2 AS NEEDED TO ACTIVATE DESIRED INPUT. AC CURRENT APPLIED TO UIO1 CONFIGURES USA TO SPCC-AC PROTOCOL.

INPUTS UIO1/UIO2 (CONTROLLED BY HOST):

UIO1	UIO2	CONTROL FUNCTION
I	X	ACCEPTOR DISABLED (HOST OUT OF SERVICE).
A	I	SW 57x332 - ACCEPTOR ENABLED (\$1 ONLY).
A	I	SW 57x322 - ACCEPTOR ENABLED. \$1 ENABLED, \$5 DISABLED.
A	A	SW 57x322 - ACCEPTOR ENABLED. \$1 AND \$5 ENABLED.

I = "INACTIVE" - INPUT AT CONTROL VOLTAGE LEVEL, OR FLOATING
A = "ACTIVE" - GROUND APPLIED TO INPUT TO PROVIDE CURRENT FLOW THROUGH INPUT OPTO-ISOLATOR.
X = DON'T CARE

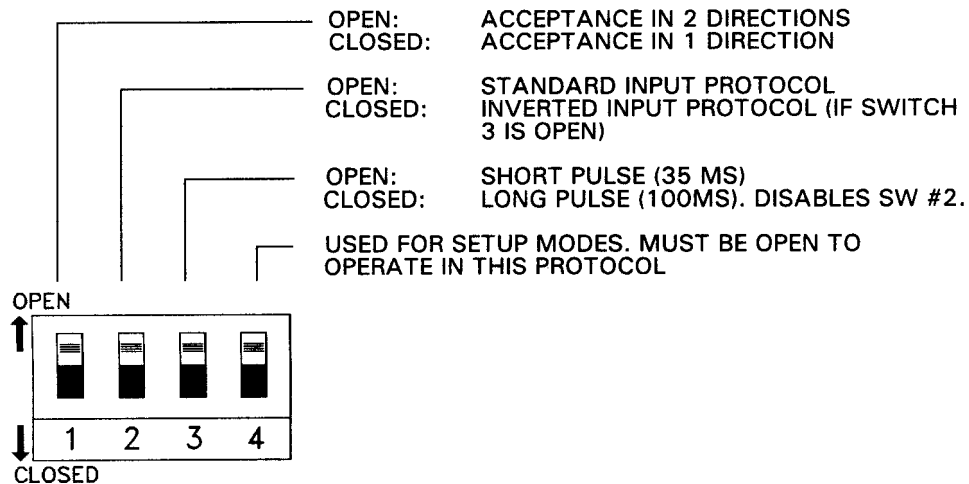
CREDIT/VEND: PULSES PER DOLLAR - SEE TABLE.
1ST PULSE = 50ms ON, 375ms OFF
2ND AND LATER PULSES = 50ms ON, 75ms OFF

NOTE COUNTER: 1 PULSE PER DOLLAR. 100ms ON, 100ms OFF.

3.6 Phono, No Escrow

SOFTWARE: §1 MACHINES: 57x164, 57x267, 57x300,

SWITCHES: Software 57x164, 57x267, and 57x300:



USAGE: PHONO MACHINE APPLICATIONS

BILL(S) ACCEPTED: §1

CONTROL: LOW-LEVEL. 5-24Vdc APPLIED TO UIO COMMON INPUT. GROUND APPLIED TO UIO1.
UIO2 MUST BE INACTIVE..

INPUTS UIO1/UIO2 (CONTROLLED BY HOST):

UIO1	UIO2	CONTROL FUNCTION
I	X	ACCEPTOR DISABLED (HOST OUT OF SERVICE).
A	I	ACCEPTOR ENABLED (\$1 ONLY).

I = "INACTIVE" - INPUT AT CONTROL VOLTAGE LEVEL, OR FLOATING
A = "ACTIVE" - GROUND APPLIED TO INPUT TO PROVIDE CURRENT
FLOW THROUGH INPUT OPTO-ISOLATOR.
X = DON'T CARE

CREDIT/VEND: 1 VEND PULSE PER DOLLAR.
PULSE = 35ms ON - SWITCH 3 OPEN.
PULSE = 100ms ON - SWITCH 3 CLOSED (DISABLES SWITCH 2).

NOTE COUNTER: NO PULSES.

Notes:

4

Installation

4.1 Mounting Interface Kits

The USA acceptor is designed to fit a large number of applications, both electrically and mechanically.

Table 4-1 describes the interface kits that have been developed to date for USA applications. These kits include all required mounting hardware and any extra wiring harnesses that may be needed. Kits ordered at the same time as the USA acceptor are shipped no-charge.

If you do not find your application among those listed, please contact Ardac, Inc. at (440) 946-3000 for assistance.

Table 4-1. USA Bill Acceptor Applications and Mounting Kits

MANUFACTURER AND MODEL	APPLICATION KIT	USA P.N.	EPROM	APPLICATION NOTES
Mendys Scandinavian	48x583	88x5003-1	57x321	System requires 2 \$1 bills to issue 1 credit.
MPC Pepsi & Others	48x610	88x5003	57x300	_____
MPC Coke	48x613	88x5003	57x300	_____
Dixie-Narco Coke Landscape	48x600-1	88x5003	57x300	Before run # 3075CM.
Dixie-Narco Coke Landscape	48x600-2	88x5003	57x300	Run # 3075 CM and later.
Automatic Products Glass Front 6000 & 7000 Series	48x600-3	88x5003	57x300	Machine requires coin changer swing plate - Automatic Products Part # 660347.
Automatic Products Glass Front 110 Series	48x600-4	88x5003	57x300	USA requires 120VAC.
Automatic Products Glass Front 103 Series	Vender obsolete	_____	_____	This vender is replaced by 110 Series.
Automatic Products Hot Drink RMI 203	48x600-5	88x5003	57x300	Vender must be from RMI with the RH side cabinet flange notched for the USA. USA stacker latch is on RH side.
Automatic Products Cold Drink RMI 303	48x600-6	_____	_____	Not available.
Automatic Products Smokeshop 850 Vender - Obsolete	48x600-7, Kit not available	_____	_____	_____
Music & Games \$1	48x600-8, 48x600-18	88x5019	57x332	Variable vend output 1 or 10 credits/1\$. 48x600-18 is without mounting plate.
Music & Games \$1 & \$5	48x600-8, 48x600-18	88x5006	57x322	Variable vend output 1 to 10 credits/1\$. 48x600-18 is without mounting plate.
Lektro Vend Glass Front VS-99 Models A, B, & C	48x600-9	88x5003	57x300	If vender is ordered "Ardac Ready" the mounting kit will be supplied by Lektro Vender.
Prebill acceptor can venders universal mounting ring	48x600-10	88x5003	57x300	For applications requiring a hole be cut into the machine. Single price only.
Kit discontinued - for reference only	48x600-11	_____	_____	Not available.
Rockola Can Vender Electronic	48x600-12	88x5003	57x300	_____
Vendo Can Vender Electronic	No DN kit - use Vendo kit	88x5003	57x300	Contact Vendo for Kit #1013467M.
Royal Venders Can Vender "Merlin" Electronic Version I	48x600-13	88x5003	57x300	Pre-Jan. '91 production.
Royal Venders Can Vender Standard	48x600-14	88x5003	57x300	_____
Dixie-Narco Can Venders - Generic	48x600-15-1	88x5003	57x300	Convert MBA stud pattern to USA.
Dixie-Narco Can Vender - Generic	48x600-15-2	88x5003	57x300	With USA stud pattern on vender.
Discontinued. See Automatic Products 6000 & 7000	48x600-16	_____	_____	Not available - See Automatic Products glass front 6000 & 7000 Series.
Copitronics for 24VAC USA	48x600-17	88x5005	57x300	USA requires 24VAC.
Music & Games Happ Game Doors	48x600-18	_____	_____	See music & games - interface kit has no mounting plate.
Vendo Coca Cola Circular	48x600-19	88x5003	57x300	_____
Royal Merlin II Version 5.0	48x600-20	88x5003	57x300	Produced after Jan. '91.
Royal G-2 Coke	48x600-21	88x5003	57x300	_____
RMI 211 Hot Drink	48x600-22	88x5003	57x300	Without EPROM. Function switch #2 must be on.
RMI 211 Retrofit	48x600-23	88x5003	57x300	With EPROM. Not available w/USA purchase.
AP C-Series	48x600-24	88x5005	57x300	USA requires 24VAC.
AP110 Series Glass Front	48x600-25	88x5005	57x300	USA requires 24VAC.
Dixie S-II Coke	48x600-26	88x5003	57x300	_____
Dixie S-II Non Coke	48x600-27	88x5003	57x300	_____
Williams Pinball	48x600-28	88x5003	57x300	Not available

4.2 Connection of USA to High-Level Changers

Figure 4-1 shows connection of the USA to high-level type changers. This connection scheme uses the supplied T-adapter.

Compatible Changers:

MARS	MC5802, MC5807, MC6200, MC5920 ADH (4-PR) (Ardac 2x4653 required)
MAKA	US111, USP-121A-2C
COINTRON	525E, 525C, 525CE (E and C require Cointron 5305-626 harness)
COINCO	S300E9240, F300E9210 (4-PR) (Coinco Adapter 406745 required), 9340S

4.3 Connection of USA to Low-Level Changers

Figure 4-2 shows connection of the USA to low-level type changers. The changer plugs directly into the USA. The T-adapter is not used, although it is suggested that the adapter be left in the machine in the event it is necessary to connect a spare high-level coin changer.

Compatible Changers:

MARS	MC5800DH, MC5805DH
------	--------------------

4.4 Connection of USA to High- or Low-Level Changers

Figure 4-3 shows connection of the USA to Mars TRC6800H or Coinco 9360S high-level changers using the supplied T-adapter. However, the "Low Level" connections are also on the changer. Therefore, the TRC and 9360 can be connected for high-level or low-level configurations. The TRC accessory harness has four plugs, two of which are for the bill acceptor. The TRC is factory set for low-level by a switch behind the electronic coin acceptor. Switch no. 4 of a six-switch bank selects low-level (switch off) or high-level (switch on). If this switch is in the wrong position, lost credits may result.

Compatible Changers:

MARS	TRC6800DH
COINCO	9360S

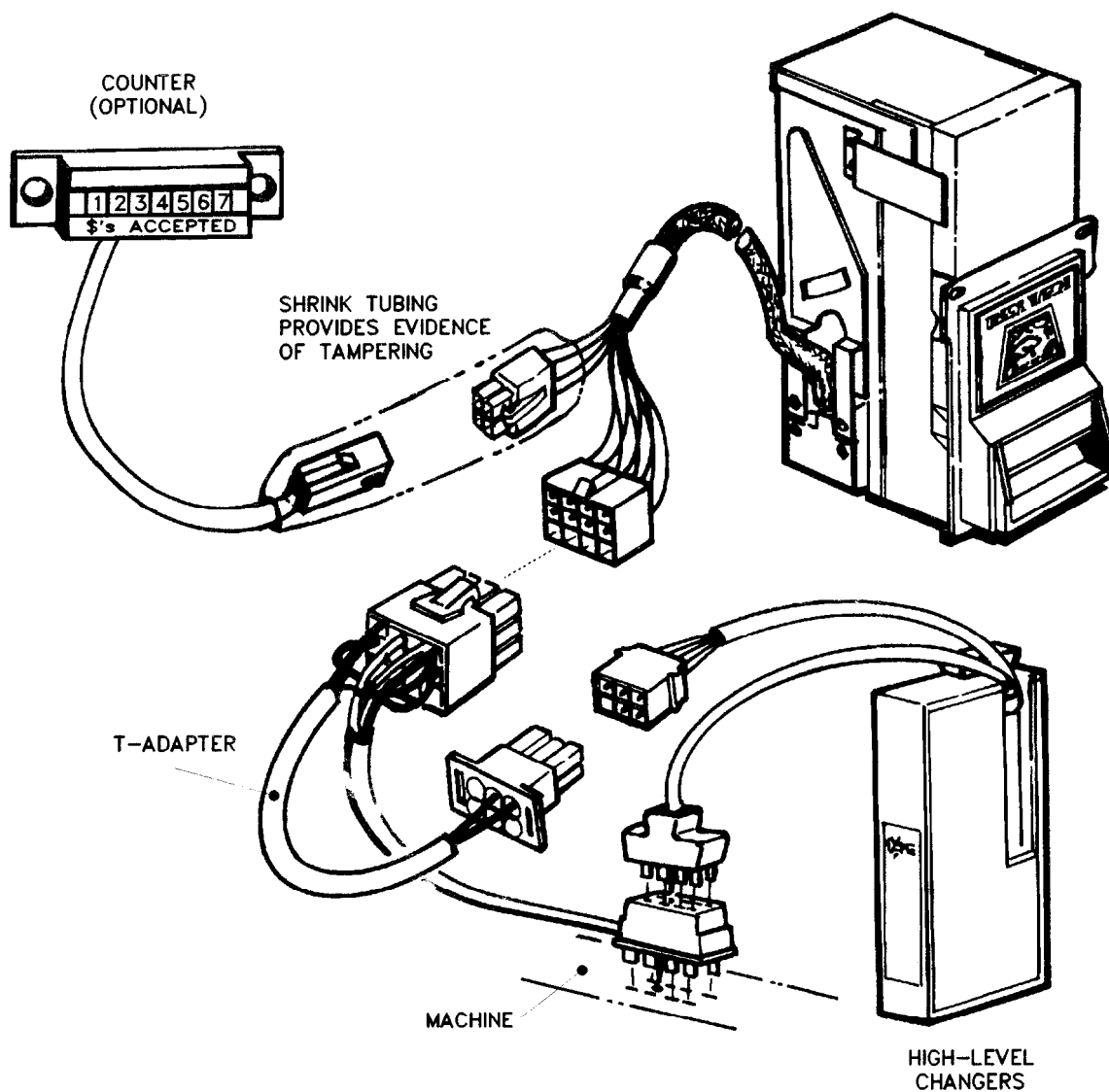


Figure 4-1. Connection for High-Level Changers

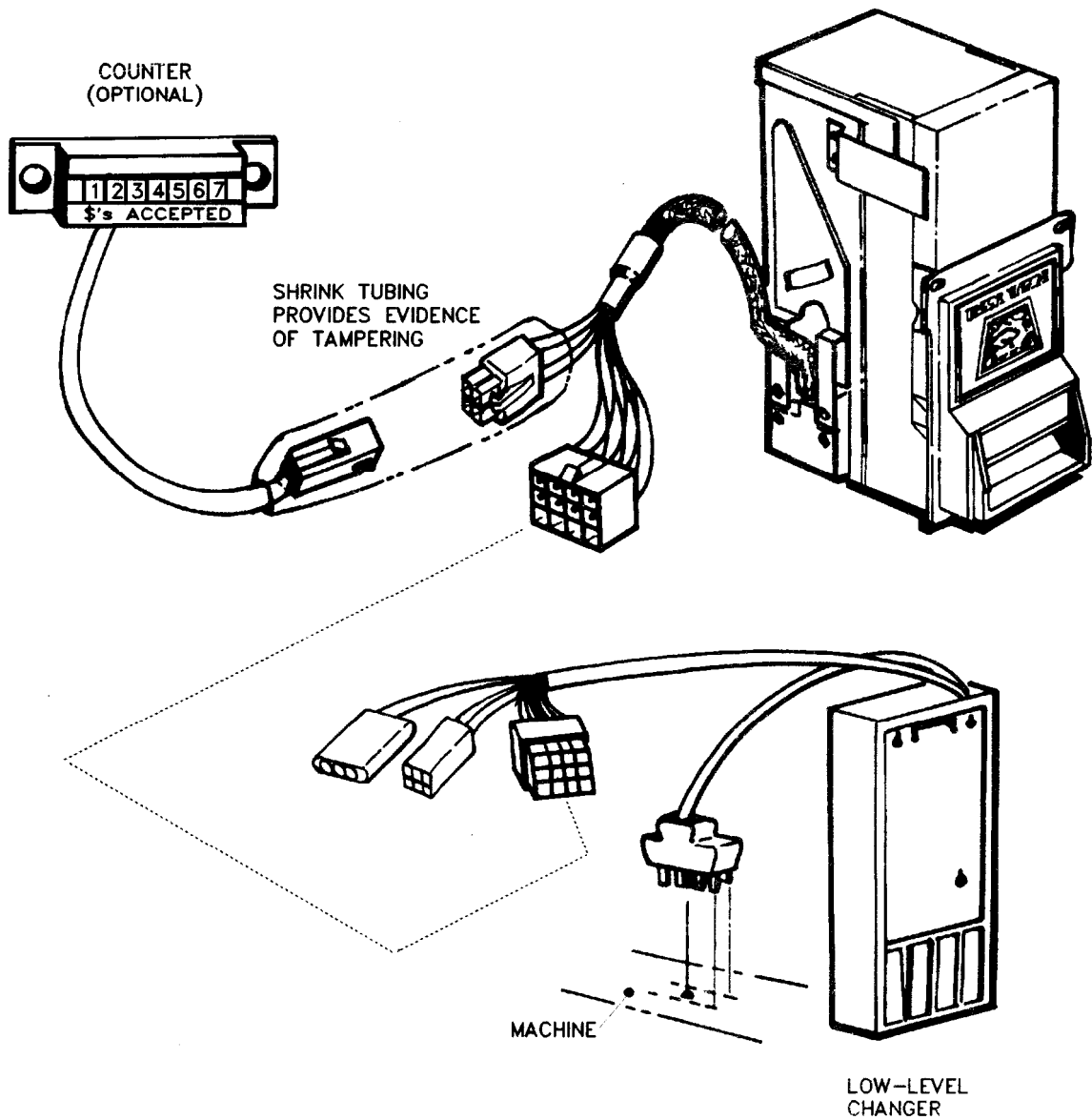


Figure 4-2. Connection for Low-Level Changers

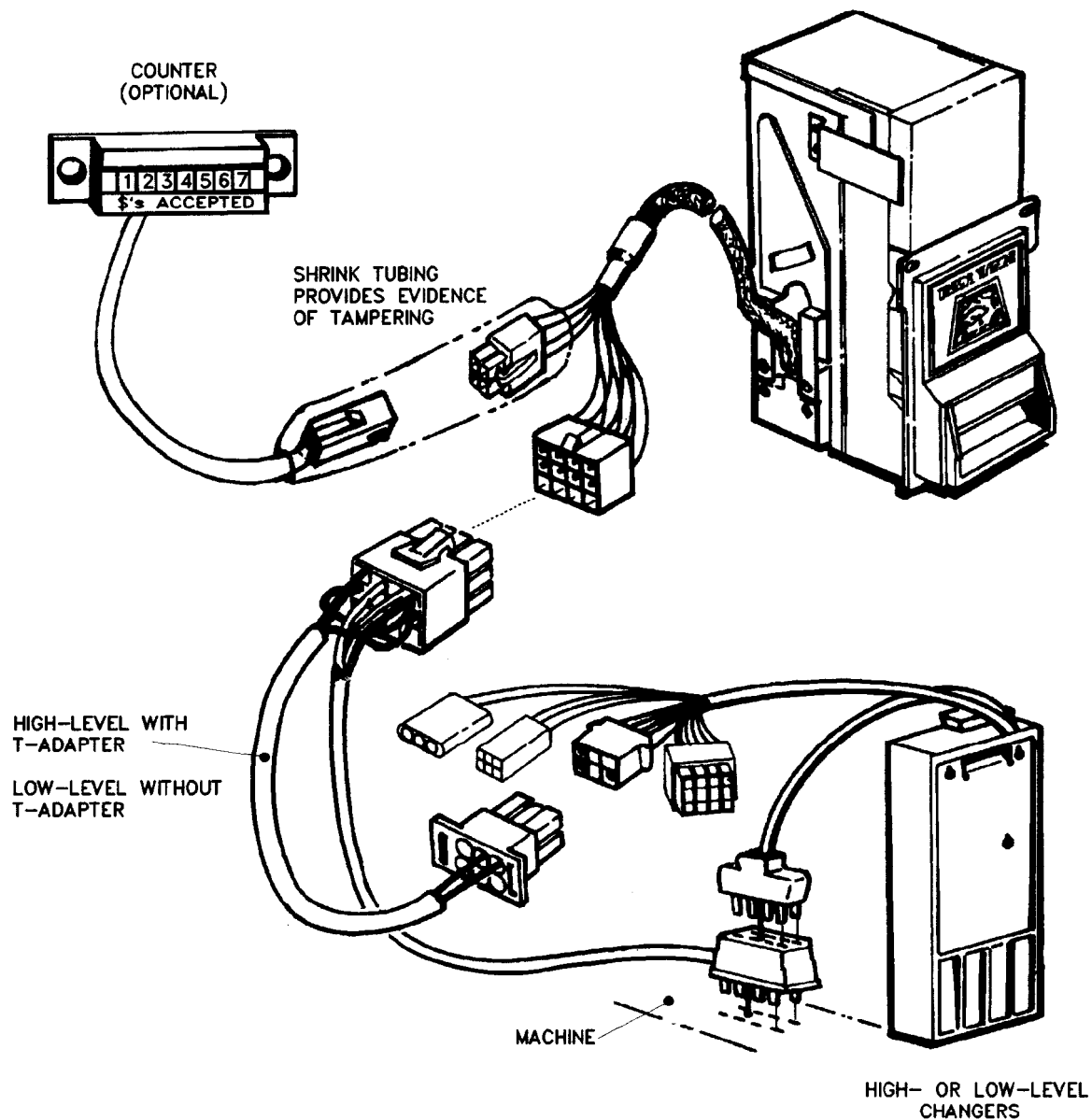
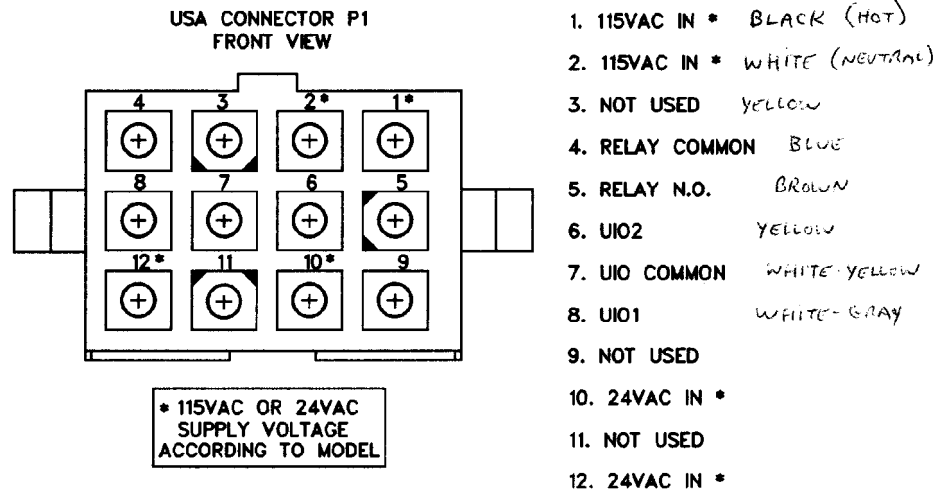


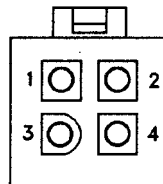
Figure 4-3. Connection for High- or Low-Level Changers

4.5 Setup

Electrical connections are made to the USA acceptor using industry-standard plugs. The pin identifications for acceptor plugs P1 and P2 are shown in Figure 4-4. P1 is the main I/O connector. Connector P2 is for the optional electro-mechanical counter.



OPTIONAL ACCESSORY
**USA CONNECTOR P2
FRONT VIEW**



- | | |
|----|---|
| 1. | COUNTER (OPTIONAL) |
| 2. | +5V OUT |
| 3. | GROUND |
| 4. | COINS ONLY
(OPTIONAL, FOR
LAMP ON VENDOR) |

MATING HOUSINGS AND CONTACTS (AMP PART NUMBERS):

TYPE/AMP CONNECTORS
MINI-UNIVERSAL MATE-N-LOCK

	<u>HOUSING</u>	<u>CONTACTS**</u>
P1 (4 PINS)	172330-1	170363-X, 170364-X, OR 171638-1
P2 (12 PINS)	172341-1	170365-X, 170366-X, OR 171639-1

** LOOSE FORM; "-X" = FINISH (1 or 3). CONSULT SUPPLIER FOR WIRE SIZES AND FINISHES.

Figure 4-4. USA P1 and P2 Connector Pinouts.

4.6 General Diagram - USA Control Circuit

The basic circuit for the various USA connection schemes is shown in Figure 4-5. This figure shows the UIO1/UIO2 COMMON input connected to 5Vdc. This is the "low-level" protocol configuration. If UIO1/UIO2 COMMON is connected to 115Vac, the acceptor automatically senses the control level and reconfigures itself for "high-level" protocol.

NOTES:

1. The acceptor protocol is selected by SW1, switches 1-4. SW1 controls which I/O's are active, and whether the control current is AC or DC. See the I/O Protocol section of this manual for available operating modes.
2. Configured as shown in Figure 4-5, the acceptor takes only \$1 bills, and produces a single 30 millisecond vend pulse per dollar.
3. The counter output (P2, pin 1) is for connection to an optional mechanical bill counter.
4. The +5V output (P2, pin 5) is supplied for situations where +5V is needed but not available from the host vendor.
5. The "Coins Only" output (P2, pin 4) is for connection to an external "COINS ONLY" indicator as may be used in the host machine. The USA acceptor also contains its own COINS ONLY lamp which is visible to the customer when the acceptor is full or unavailable.

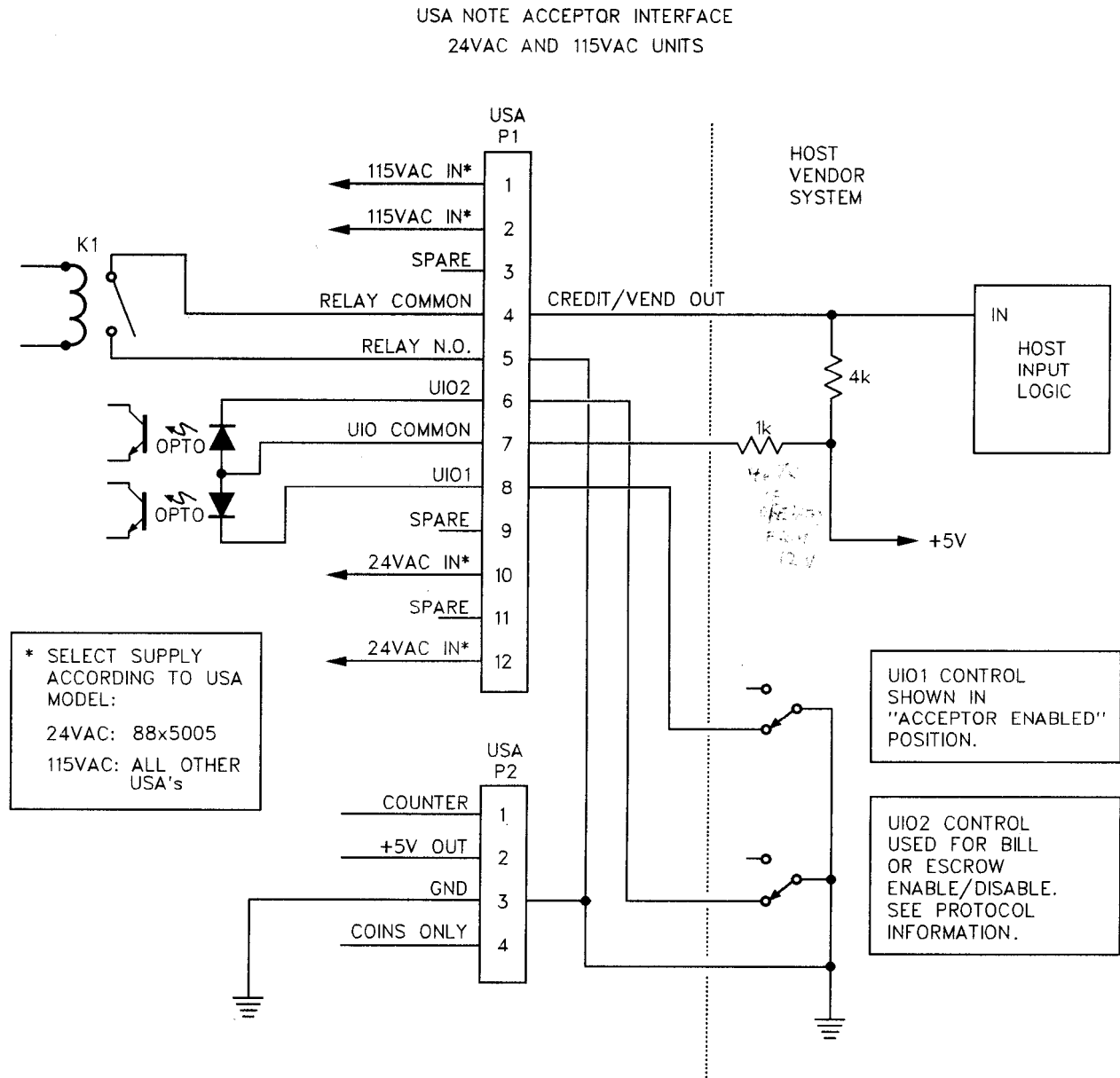


Figure 4-5. Typical Wiring of USA to Host Vendor System.

Notes:

5

Operation

5.1 Front LED Indicators

The area above the bill entrance includes two flashing arrows and a "COINS ONLY" indicator (Figure 5-1). The green arrows flash to indicate the acceptor and host vendor are operating properly, and also serve to direct the patron's attention to the bill entrance.

The COINS ONLY indicator illuminates when the patron inserts a bill into the acceptor but the acceptor cannot accept the bill. The acceptor may refuse the bill for a number of reasons, including:

1. USA bill stacker is full.
2. The USA acceptor has been disabled.
3. Vendor coin tubes are low or empty, so the system cannot make change.

5.2 Rear LED Indicators

The rear panel of the USA acceptor provides diagnostic information in the form of green "VEND" and red "STATUS" LED's which flash to indicate various conditions. See Figure 5-1 and Table 5-1.

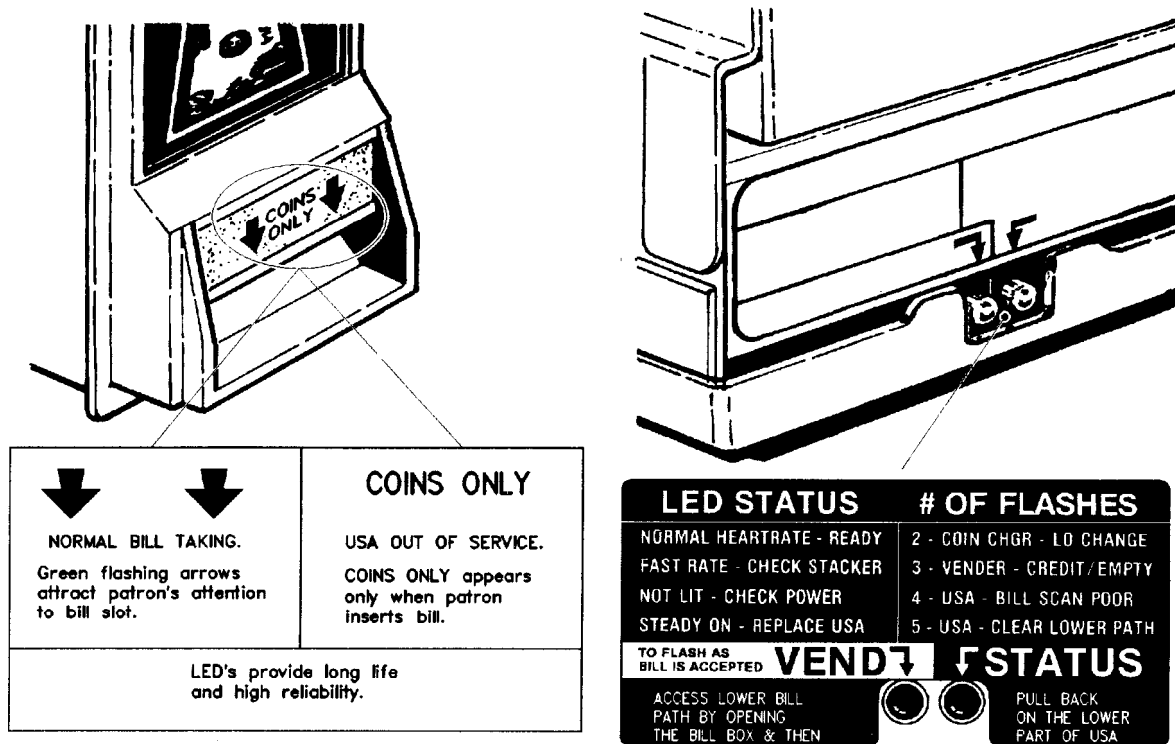


Figure 5-1. USA Front and Rear Indicators.

Table 5-1. USA Rear Panel VEND and STATUS Lamps.

VEND LAMP (GREEN)	ACTIVITY	MEANING
	Flash as bill is accepted	Indicates CREDIT has been issued.

STATUS LAMP (RED)	ACTIVITY	MEANING
	Normal flash	($\approx 1/\text{sec}$) Acceptor is ready.
	Fast flash	($\approx 3/\text{sec}$) Stacker requires service (empty, jam, etc.)
	Not Lit	No power to system.
	Steady On	Replace acceptor.
	2 flashes/pause	Coin changer is low on change.
	3 flashes/pause	Vender credit/empty
	4 flashes/pause	Poor scan of bill
	5 flashes/pause	USA jammed - clear lower path.

5.3 Mechanical Differences in USA Acceptors

There have been several variations of the USA acceptor. Mechanically, these machines are quite similar, the main difference being in the top and bottom latching mechanisms. These changes are summarized as follows:

Early USA	Top and bottom latches consist of spring-loaded, U-shaped metal bails which must be moved to permit opening of the bill box or to reveal the note path. Latches work independently of each other (see Figure 5-2). Discontinued style; may still be in service.
Intermediate USA	Same as early USA except top bail replaced by a spring clip (see Figures 5-2 and 5-3, item 1). Discontinued style; may still be in service.
Current USA	Single latch clip as shown in Figure 5-3, item 1. No separate bottom bail. Bill box must be opened before note path can be exposed.

5.4 Collection of Bills

Bills are collected into a built-in stacker and bill box in the USA acceptor. To remove bills, proceed as follows (refer to Figure 5-3):

1. Release top spring clip (item 1). For Early style acceptor, lift top bail.
2. Note the semi-circular cut-away area at the top of the bill box. Grasp the cut-away and pull the top of the bill box downward and outward (item 2).
3. Remove the bills (item 3).
4. Return the bill box to the upright, locked position (item 4).

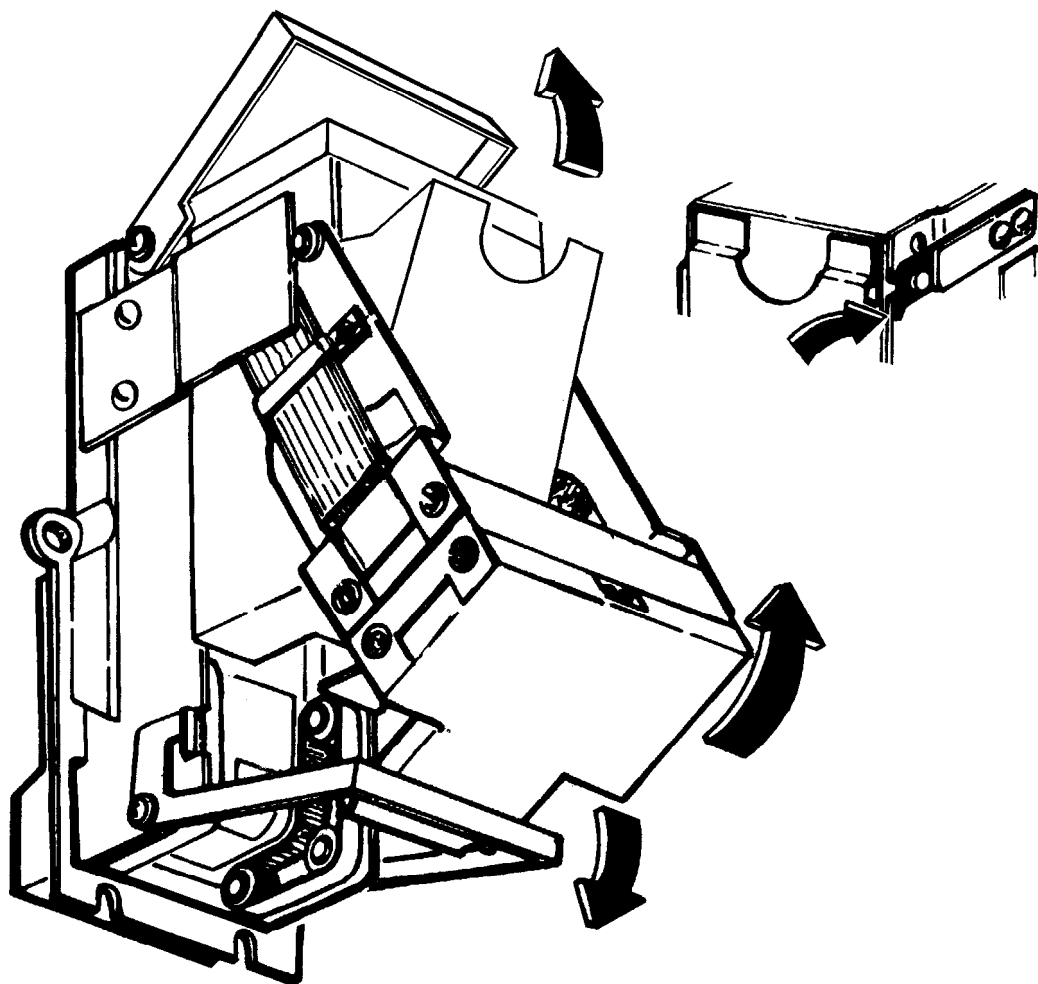


Figure 5-2. Early and Intermediate Style USA Acceptor.

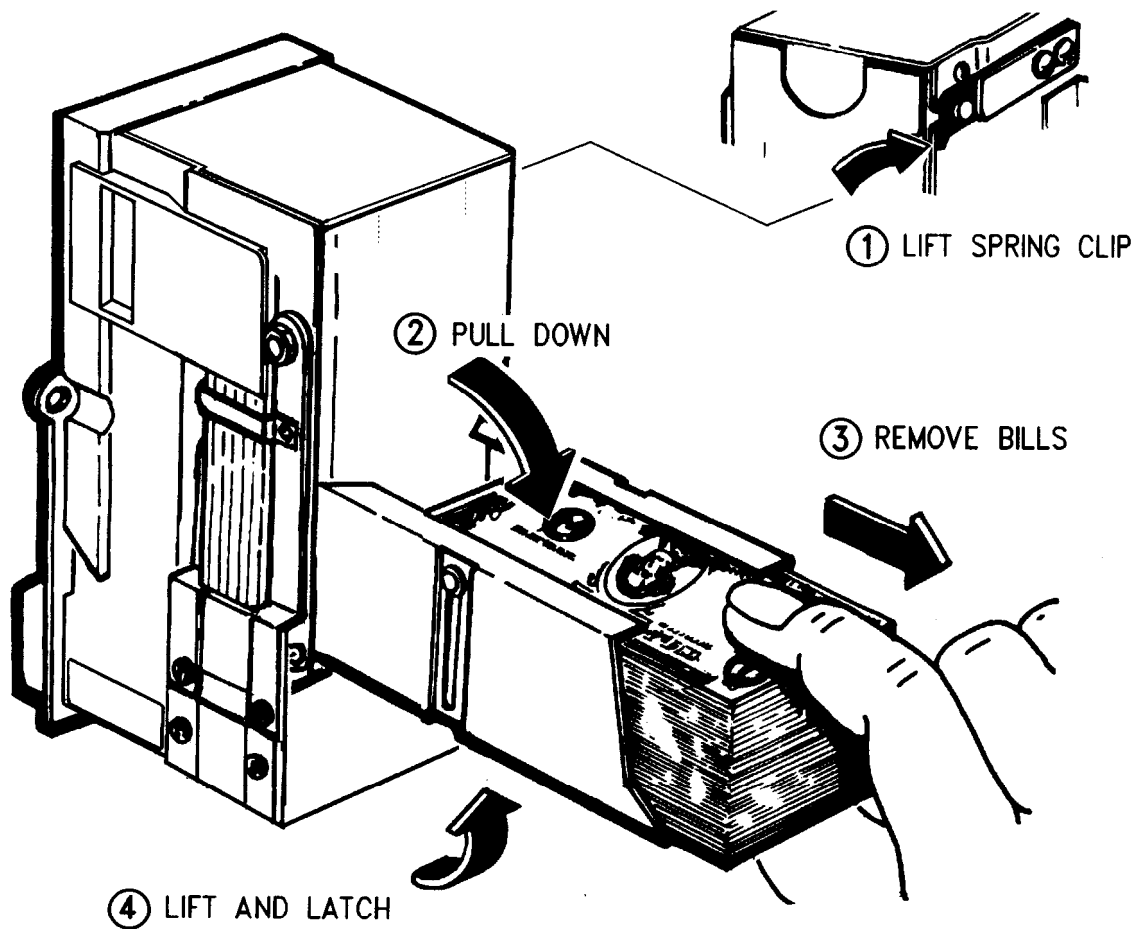


Figure 5-3. Removing Bills from Current USA Bill Box.

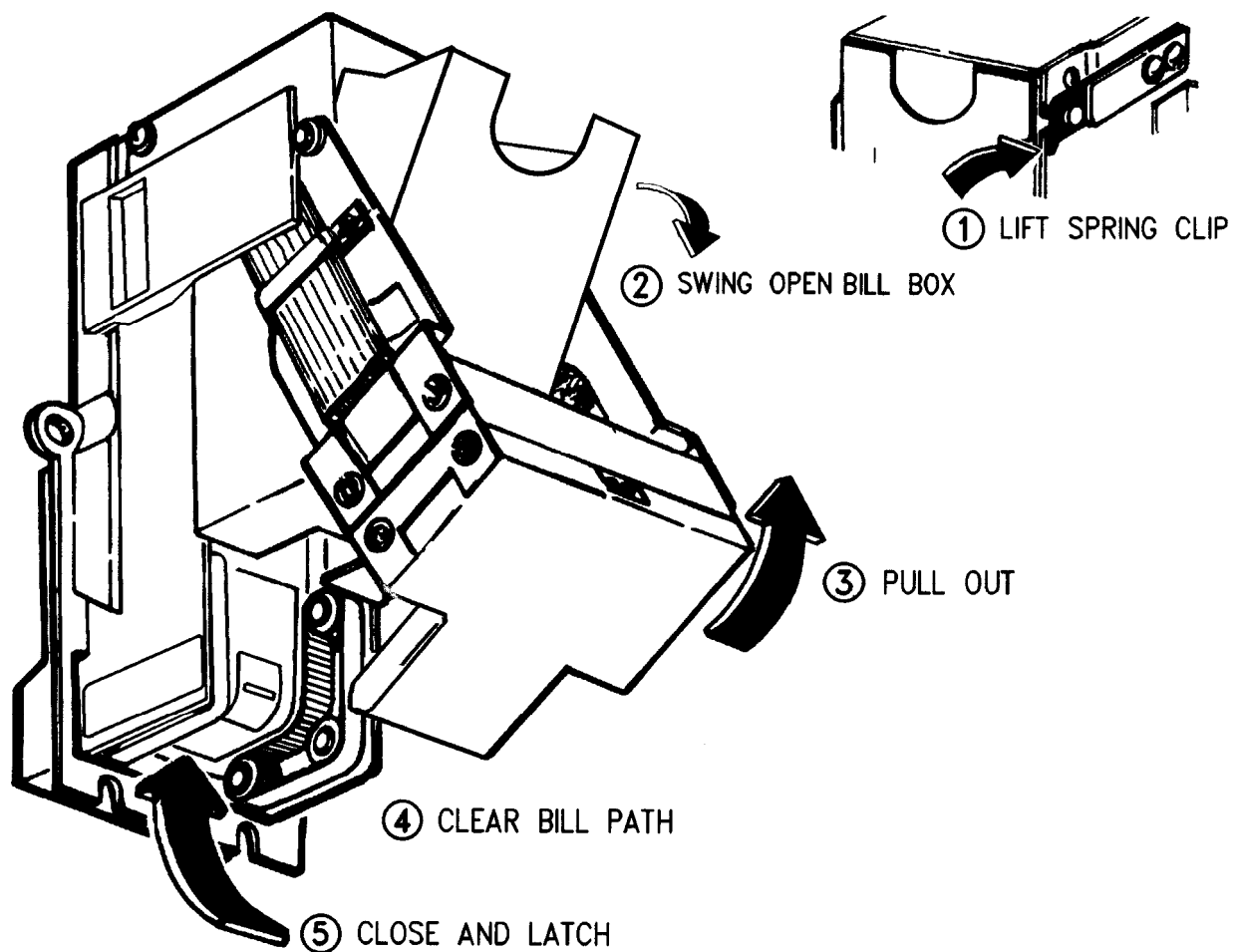


Figure 5-4. Clearing the USA Note Path.

5.5 Clearing the Bill Path

The USA acceptor can be opened to expose the bill path to facilitate cleaning or clearing of jams. To expose the note path, proceed as follows:

Early and Intermediate USA acceptors: (see Figure 5-2):

1. Pull down on bottom bail to release bill box (not shown).
2. Grasp the bottom rear of the USA and pull backward with an upward motion (item 2).
3. The lower bill path is now exposed (item 3). Clean or clear the acceptor as needed.
4. To close the acceptor, push the rear of the machine inward until the bottom bail returns to the locked position (item 4).
5. To access the upper bill path, open the acceptor as you would for normal emptying.

Late USA acceptors (see Figures 5-3 and 5-4):

1. Release top spring clip (item 1).
2. Note the semi-circular cut-away area at the top of the bill box. Grasp the cut-away and pull the top of the bill box downward and outward (Figure 5-3, item 2).
3. Grasp the bottom rear of the USA and pull backward with an upward motion (Figure 5-4, item 2).
4. The bill path is now exposed (Figure 5-4, item 3). Clean or clear the acceptor as needed.
5. To close the acceptor, push the rear of the machine inward (Figure 5-4, item 4). Then lift the bill box until it locks in position (Figure 5-3, item 4).

A page of condensed operating instructions showing how to empty the bill box and clear the note path is included at the end of this chapter. This page can be copied and left with the vending machine for reference by servicing personnel.

Notes:



"USA" BILL ACCEPTOR Note Collection Instructions

Emptying the USA Acceptor

Bills are stored in a built-in stacker/bill box (see Figure 1). To remove bills:

1. Note the semi-circular cut-away at the top rear of the bill box.
2. While holding the cut-away, move the spring clip away from the side of the USA acceptor to release the back (detail 1).
3. While maintaining pressure on the clip, pull the top of the bill box downward and outward (detail 2).
4. Remove the bills (detail 3).
5. Return the bill box to the upright, locked position (detail 4). Be sure that the spring clip has engaged to securely latch the back.

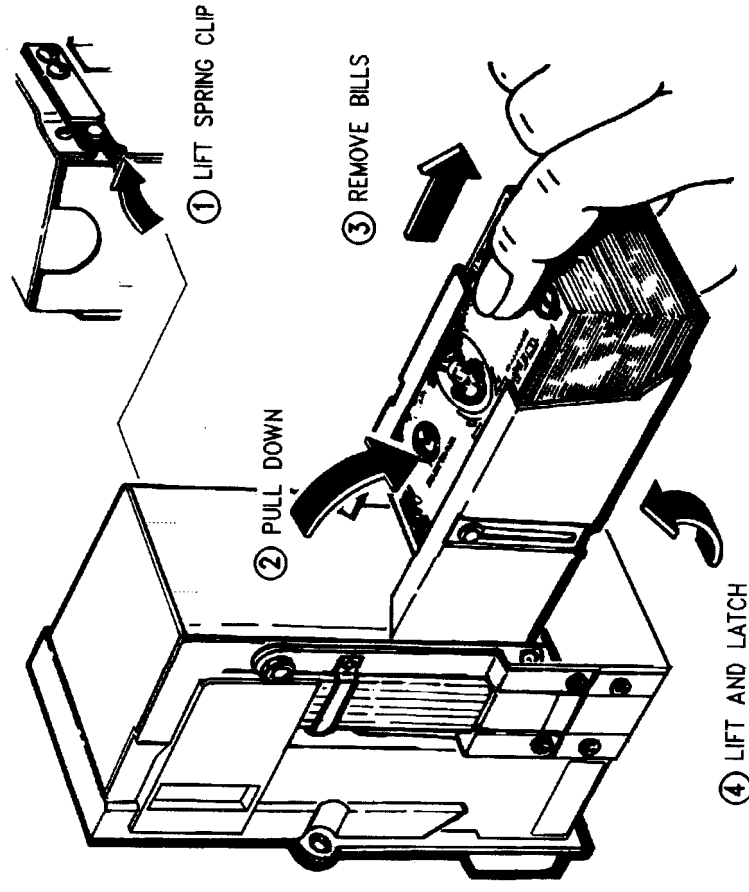


Figure 1. Removing Bills from the USA Bill Box.



"USA" BILL ACCEPTOR Bill Path Clearing Instructions

Clearing the Bill Path

The USA acceptor can be opened to expose the bill path for cleaning or clearing of jams (see Figure 2):

1. Note the semi-circular cut-away at the top rear of the bill box.
2. While holding the cut-away, move the spring clip away from the side of the USA acceptor to release the back (detail 1).
3. While maintaining pressure on the clip, pull the top of the bill box downward and outward approximately 30° (detail 2). This action releases the bottom of the acceptor.
4. Grasp the bottom rear of the USA and pull backward and upward (detail 3).
5. The lower bill path is now exposed (detail 4). Clean or clear the acceptor as needed.
6. To close the acceptor, perform steps 2-4 in reverse order. Return the bill box to the upright, locked position. Be sure that the spring clip has engaged to securely latch the back.

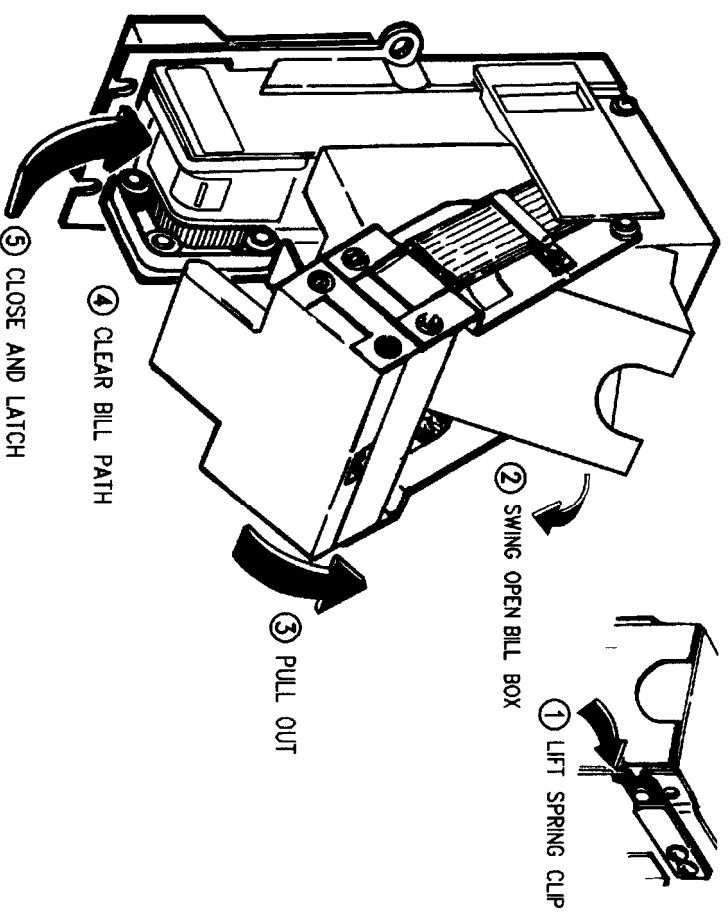


Figure 2. Clearing the USA Bill Path

6

Maintenance

6.1 Cleaning the Acceptor

Bill handling devices normally build up a film of oil and dirt from the bills themselves. Excess dirt can cause poor acceptance. The note path and drive belts should be cleaned at least once a year. More frequent cleaning may be required depending on the location and usage of the equipment and condition of the bills taken in.

CAUTION

Use only 99% isopropyl alcohol to clean the transport mechanism. Oil-based solvents will attack rubber parts, causing premature failure. Aggressive aromatic solvents will attack or melt plastic components and paint.

The following procedure assumes that the acceptor has been removed from service.

1. Make sure power has been removed from the acceptor.
2. Open the acceptor as described under "Clearing the Bill Path" in the "Operation" section of this manual.
3. Inspect for and remove any debris or foreign objects in the bill path. Also check the condition of the belts for wear.
4. If the acceptor is in good condition, continue with cleaning.
5. FOR 115VAC-POWERED ACCEPTORS: A simple power cable, Ardac part number 2X6557 is available. Attach the 12-pin connector of this cable into the mating connector on the acceptor. Plug the other end into a 115VAC outlet.

FOR 24VAC-POWERED ACCEPTORS: Contact the factory for information and availability of a test/power cable.

WARNING

TO AVOID THE RISK OF PERSONAL INJURY OR DAMAGE TO THE ACCEPTOR, DO NOT USE THE ARDAC POWER CABLE 2X6557 WITH 24VAC USA ACCEPTORS.

6. Remove the top cover from the acceptor to expose the configuration dip switches. Set all switches OFF (Figure 6-1).
7. If necessary, open the acceptor to expose the note path. Take the idler belts off their tension rollers.
8. Fold the idler belts back and close the acceptor. The green LED should flash.
9. Turn dip switches 3 and 4 ON. The motor should now run. It will run for approximately six minutes.
10. Clean the drive belts thoroughly using a lint-free rag and isopropyl alcohol.
11. Make sure the tension arms float freely on their pivots. Clean if necessary.
12. Remove the power cable.
13. Reinstall the idler belts. Return the dip switches to their original positions and replace the top cover.
14. Test the acceptor for proper operation before returning the acceptor to service.

6.2 Warranty

New USA Acceptors are warranted to be free from defects in materials and workmanship under normal use and service for a period of 24 months from the date of manufacture, except transport and stacker motors which are covered for 60 months. This warranty applies to units operated from 110-120Vac, 60 Hz, installed in the U.S.A. or Canada, which have not been subjected to misuse, vandalism, neglect, unapproved alteration, etc. A copy of the complete warranty is available by contacting Ardac, Inc. at (440) 946-3000.

The month and year of manufacture are indicated by the first three digits of the serial number:

Digits 1 and 2	(01-12)	Months 1 (January) through 12 (December)
Digit 3	(0 - 9)	Last digit of the year. "8" = 1988, "9" = 1989, "0" = 1990, "1" = 1991, etc.

6.3 Obtaining Service

Ardac, Inc. offers a service program for USA acceptor which provides out-of-warranty repair for a nominal fee. This service provides highly cost-effective, rapid repair of USA acceptors. Ardac recommends that you take advantage of factory service where possible.

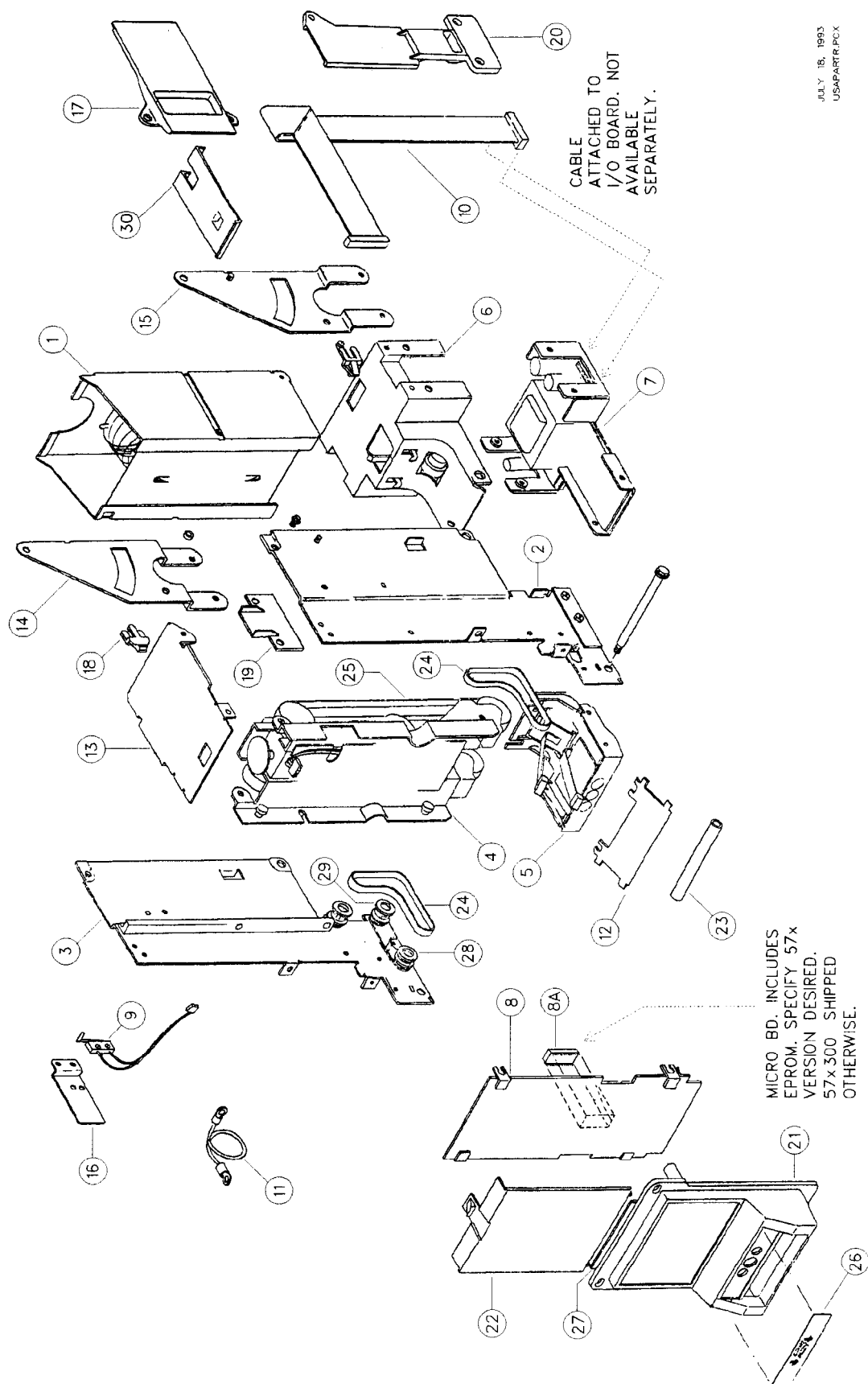
To obtain service on the USA acceptor, or to obtain a complete copy of the warranty, terms, contact:

Ardac, Inc.
34000 Vokes Drive
Eastlake, OH 44095
Phone (440)946-3000
Fax (440)942-1835

6.4 Replaceable Subassemblies - 88X5003

ITEM	PART NO.	DESCRIPTION	USAGE
1	2x4925	Cash Box	S.N. 04901450 - Present
2	2x5010-1	Side Plate Complete RH	S.N. 049xxxxx - Present
3	2x5010-2	Side Plate Complete LH	S.N. 049xxxxx - Present
4	2x5004	Drive Chassis Complete	S.N. 069xxxxx - Present
5	2x5014	Top Sensor Plate	S.N. 079xxxxx - Present
6	2x5869	Bottom Sensor Plate	S.N. 069xxxxx - Present
7	2x5965	Bottom I/O Board	S.N. 020xxxxx - Present
8	2x5000	Micro Control Board	S.N. 09901140 - Present
(8A with 57x300)	57x300-xx	EPROM	
9	2x4711	Cash Box Switch	S.N. 068xxxxx - Present
10	2x4824	Umbilical Cable	S.N. 108xxxxx - Present
11	2x4524	Grounding Strap	S.N. 068xxxxx - Present
12	17x1475	Bottom Note Entrance	S.N. 089xxxxx - Present
13	11x1482	Top Plate	S.N. 068xxxxx - Present
14	11x1505-1	Swing Arm L.H.	S.N. 068xxxxx - Present
15	11x1505-2	Swing Arm R.H.	S.N. 068xxxxx - Present
16	11x1532	Bracket Switch Mounting	S.N. 068xxxxx - Present
17	17x1008	Cable Clamp & Cover	S.N. 029xxxxx - Present
18	17x1049	Bottom Retainer	S.N. 079xxxxx - Present
19	17x1265	Cable Clamp OSW	S.N. 079xxxxx - Present
20	17x1007	Cover Ribbon Cable	S.N. 12902010 - Present
21	14x36	Escutcheon	S.N. 019xxxxx - Present
22	17x945	Cover Plate Upper Front	S.N. 068xxxxx - Present
23		Obsolete	S.N. 089xxxxx - Present
24*	29x121	Belt - Idler	S.N. 068xxxxx - Present
25*	29x174-0270	Belt - Drive	S.N. 068xxxxx - Present
26	80x770	Label Entrance	S.N. 108xxxxx - Present
27	37x29	Insulator - Escutcheon	
28	18x84	Wheel - Front	
29	18x84	Wheel - Back & Top	
30	12x817	Tines	S.N. 109xxxxx to present
Not Shown	80x772	Label Vend & Status	S.N. 128xxxxx - Present
Not Shown	80x813	Bottom Open Instruction Label	S.N. 089xxxxx - Present
Not Shown	2x5007	Drive Motor Assembly	S.N. 089xxxxx - Present
Not Shown	2x4598	Stacker Motor Assembly	S.N. 089xxxxx - Present

* Belts must be purchased and replaced in pairs.



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Figure 6-1. USA Subassemblies

Notes:

USA³

Addendum

General Information

This addendum provides the following information:

1. New models of the USA note acceptor designated "USA³", and how they differ from existing models.
2. Special de-salting instructions to be used on the USA³ note acceptor.
3. Differences in the part numbers of some subassemblies used in the USA³ note acceptor.

Differences Between USA and USA³ Acceptors

The USA³ acceptors differ from older USA acceptors in their use of plastic components in place of metal in some internal subassemblies. The use of plastic components facilitates cleaning with hot water in the event the acceptor has been salted.

Model No.	Main Features	Replaces/Refer to Information for
88x5011	Universal I/O. 12" I/O cable with 1 plug (no counter plug)	88x5003
88x5023	Universal I/O. 36" cable includes counter plug.	88x5003
88x5024	DC-only input, 2 plugs, AC power.	88x5006

The installation, operation, and configuration of the USA³ acceptors, consult the information for models 88x5003 or 88x5006 as shown above.

USA³ Cleaning (De-salting) Procedure

The following procedure can be used to remove salt or other water-soluble residue from a 88x5011, 88x5023, or 88x5024 USA³ acceptor which has been "salted" or otherwise vandalized.

This procedure does not replace the routine cleaning procedure described in the 44x441 manual, and will not clean oily dirt from belts and sensors. For this type of routine cleaning, use isopropyl alcohol as described in the manual.

Do not use this procedure for any other USA models.

1. Remove the USA³ from service.
2. Rinse the acceptor with hot tap water through the note entrance. This may be accomplished using an ordinary hose or a pressure-spray applicator. One half gallon of water is sufficient for the initial rinse.

CAUTION

To avoid possible water damage, do not open the acceptor or rinse the acceptor from behind.

3. Open the acceptor to expose the note path. With your fingers, exercise the rear-clear actuator, the magnetic head pressure wheel, and the tension arms (see Figures 1 and 2).
4. Rotate the idler belts (Figure 2) at least one revolution.
5. Wipe the top and bottom front sensors dry with a cotton swab (Figures 1 and 2).
6. Wipe the front sensors clean with a cotton swab and isopropyl alcohol.
7. Wipe the magnetic head (Figure 2) clean with a soft cloth and isopropyl alcohol.

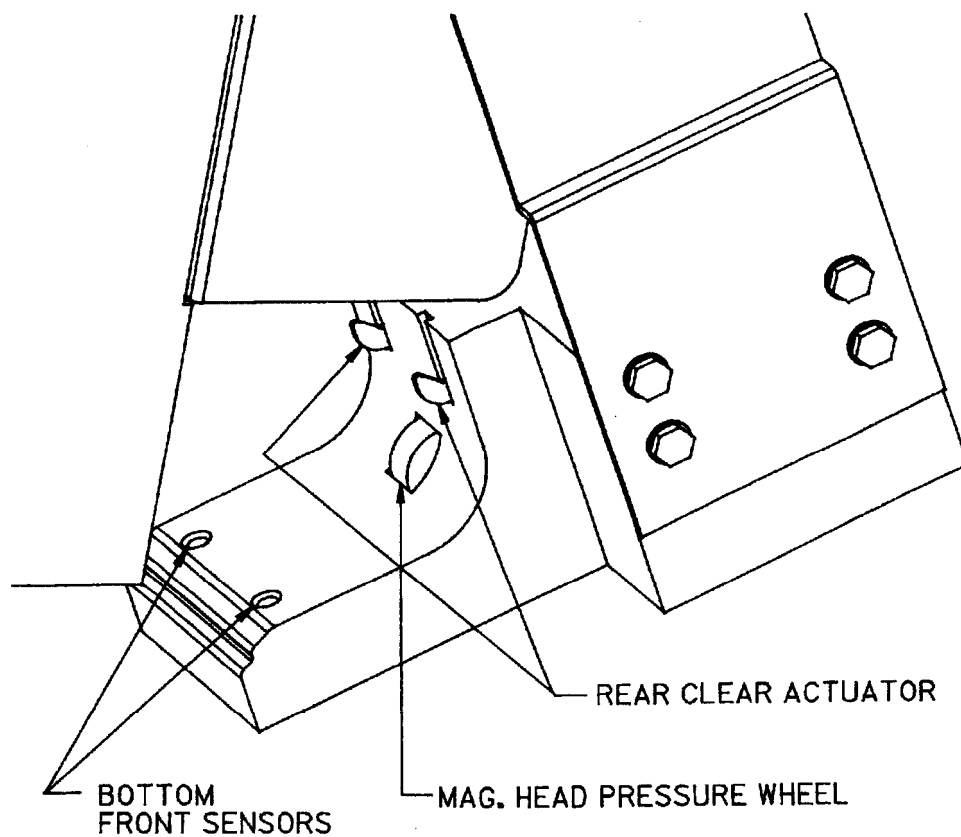


Figure 1. USA³ Cleaning Details #1.

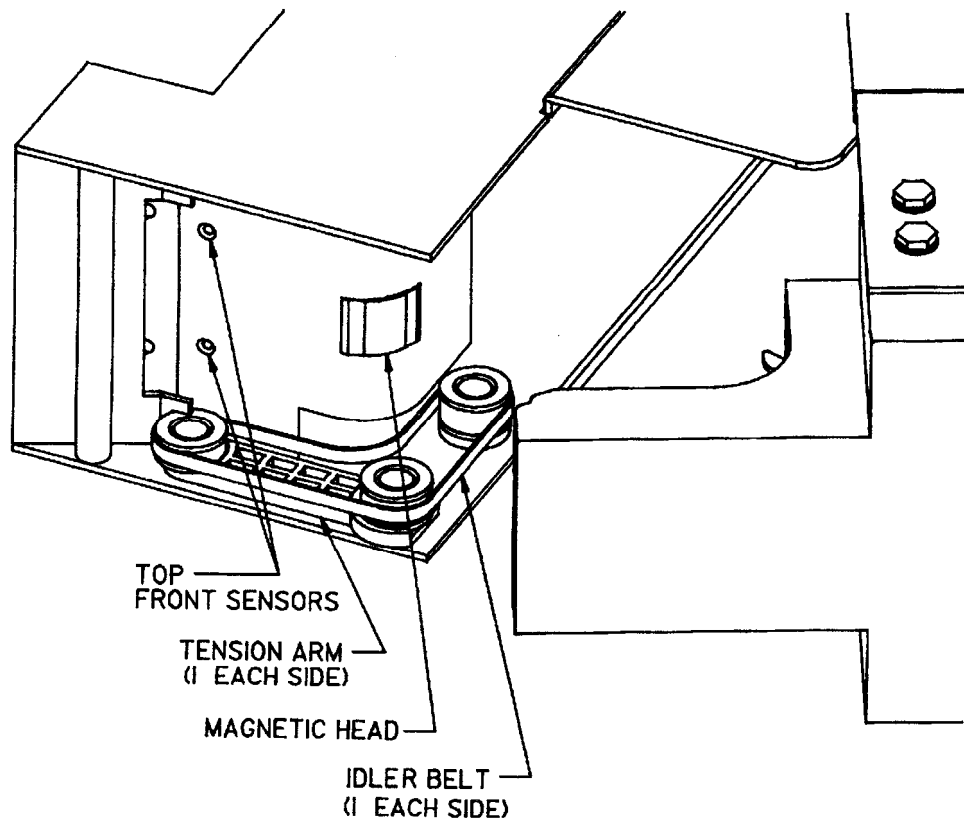


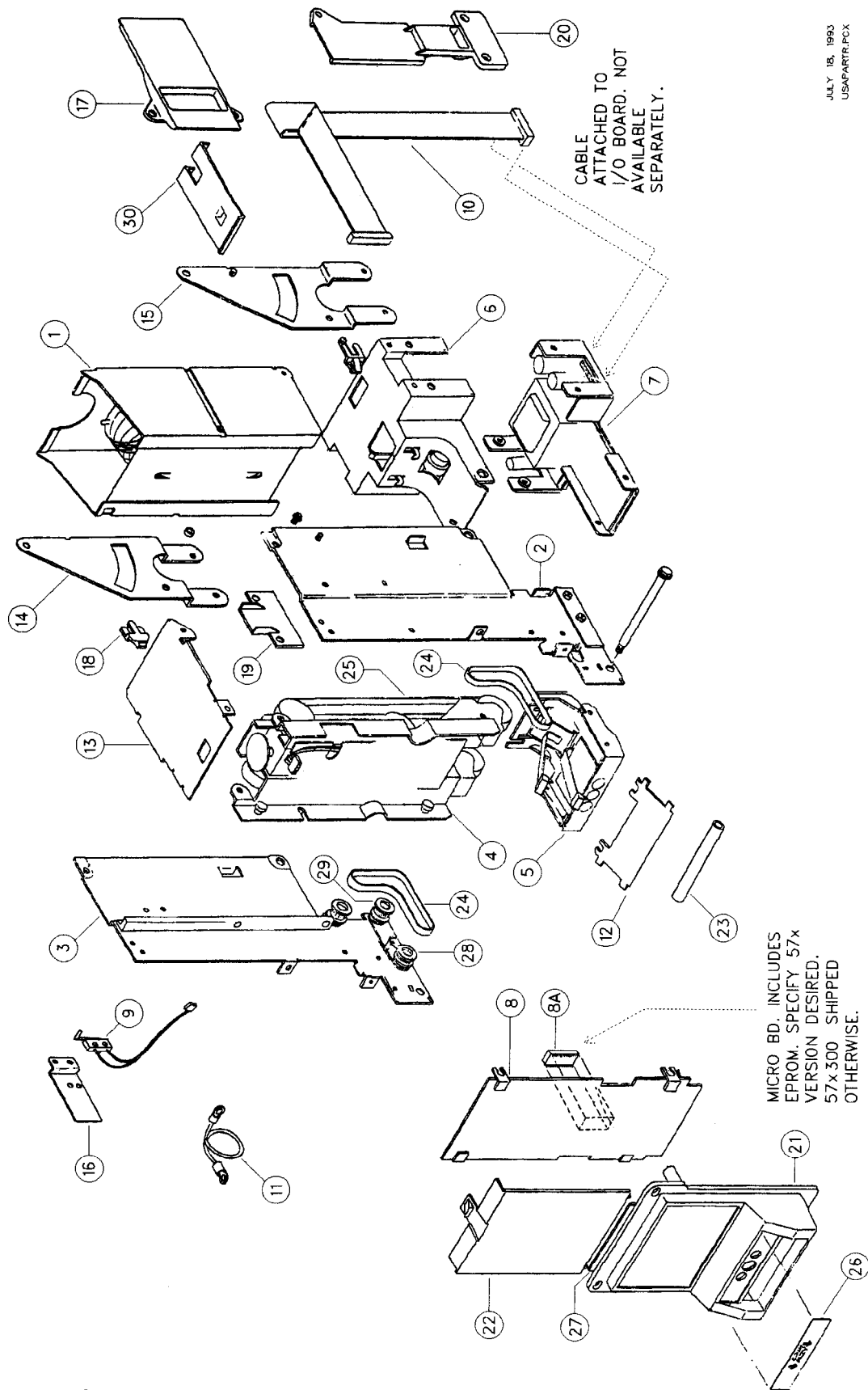
Figure 2. USA³ Cleaning Details #2.

Replaceable Subassemblies

The following part descriptions and part numbers apply the USA³ acceptors 88x5011, 88x5023, and 88x5024. These USA³ acceptors can be identified by the serial number 113xxxxx or later.

ITEM	DESCRIPTION	PART NO. (For 88x5011 / 88x5023 / 88x5024, if different)
1	Cash Box	2x4925
2	Side Plate Complete RH	2x5867-1
3	Side Plate Complete LH	2x5867-2
4	Drive Chassis Complete	2x5004
5	Top Sensor Plate	2x5014
6	Bottom Sensor Plate	2x5869
7	Bottom I/O Board	2x5965 / 2x5626 / 2x5626
8	Micro Control Board	2x5000-1
8A	EPROM	57x3xx-x
9	Cash Box Switch	2x4711
10	Umbilical Cable	2x4824
11	Grounding Strap	2x4524
12	Bottom Note Entrance	17x1475
13	Top Plate	11x1482
14	Swing Arm L.H.	11x1505-1
15	Swing Arm R.H.	11x1505-2
16	Bracket Switch Mounting	11x1532
17	Cable Clamp & Cover	17x1008
18	Bottom Retainer	17x1049
19	Cable Clamp OSW	17x1265
20	Cover Ribbon Cable	17x1007
21	Escutcheon	14x36
22	Cover Plate Upper Front	17x945
23	Obsolete	
24*	Belt - Idler	29x121
25*	Belt - Drive	29x174-0270
26	Label Entrance	80x770
27	Insulator - Escutcheon	37x29
28	Wheel - Front	18x84
29	Wheel - Back & Top	18x84
30	Tines	12x817
Not Shown	Label - Status & Instructions	80x827 / 80x827 / 80x1012
Not Shown	Drive Motor Assembly	2x5007
Not Shown	Stacker Motor Assembly	2x4598

* Belts must be purchased and replaced in pairs.



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Figure 3. USA³ Subassemblies



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