COIN MECHANISMS INC.

Where The Money Meets The Machine

INTELLIGENT COMPARITOR SYSTEM PLUS CUSTOMER PROGRAMMING MODULE INSTRUCTION MANUAL
Rev 5
6/8/04

This manual supercedes all previous version of CPM manuals. If you need a copy
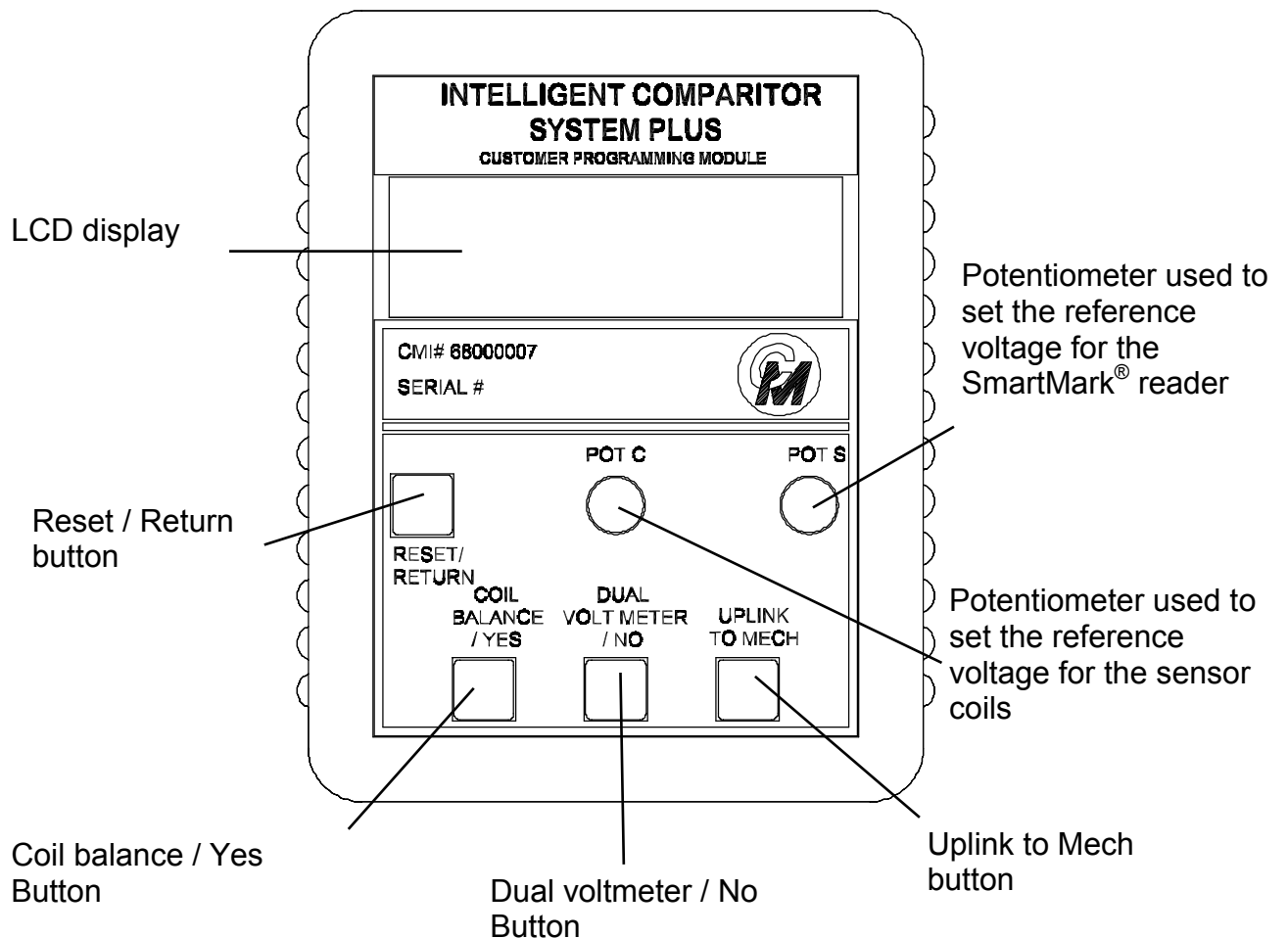of the original CPM manual contact Coin Mechanism Sales department.

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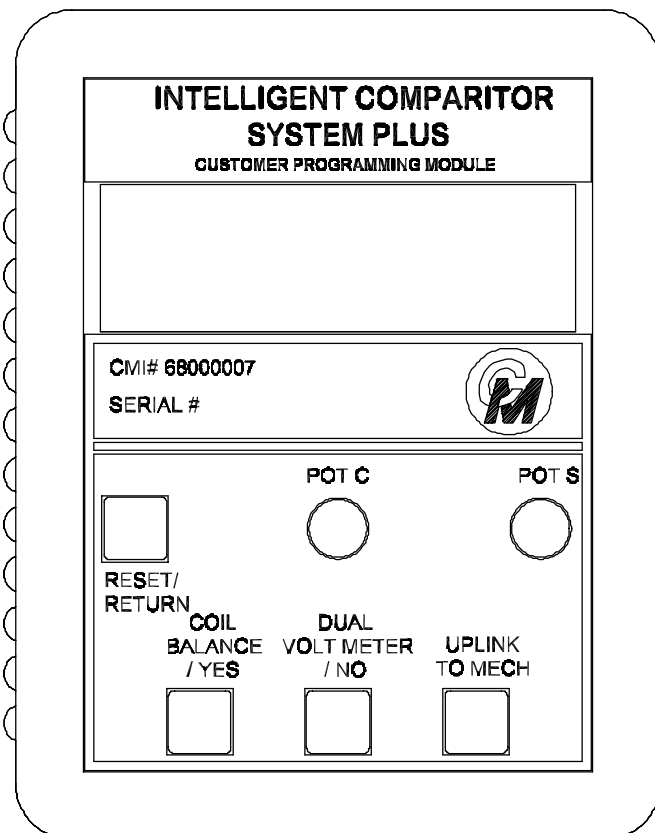
THE CUSTOMER PROGRAMMING MODULE

The Customer Programming Module (CPM) allows the user the ability to:

- Program the **Intelligent Comparitor** ® for your casino's SmartMark® tokens
- Update the coin data file for any denomination of your casino's tokens
- Check and adjust the reference voltages of pot "C" and pot "S"
- Check and adjust sensor coil balance

The illustration below will familiarize you with the **CPM's** functions:

FUNCTION OF BUTTONS

LCD display

Potentiometer used to set the reference voltage for the SmartMark® reader

Reset / Return button

Potentiometer used to set the reference voltage for the sensor coils

Coil balance / Yes Button

Dual voltmeter / No Button

Uplink to Mech button

INTELLIGENT COMPARITOR SYSTEM PLUS
CUSTOMER PROGRAMMING MODULE

CMI# 68000007

SERIAL #

POT C   POT S

RESET/
RETURN

COIL
BALANCE
/ YES

DUAL
VOLT METER
/ NO

UPLINK
TO MECH

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PROGRAMMING OR UPDATING THE INTELLIGENT COMPARITOR USING THE CPM

Programming the Intelligent Comparitor ® for your casino's SmartMark ® tokens

If you are purchasing a new gaming machine, you can specify that it comes from the manufacturer with the Intelligent Comparitor ® already installed. Coin Mechanisms programs all Intelligent Comparitors ® that are supplied to gaming machine manufacturers to accept a 'Manufacturer's Test Token' . The MTT token is supplied to the various machine manufacturers so they can test the Intelligent Comparitor ® after they install it in the machine. When the machine arrives at your casino, it will be necessary to program the Intelligent Comparitor ® for your casino's SmartMark® tokens

Updating the coin data file for any denomination of your casino's tokens

It may be necessary at some point in time to update the coin data file for one or more denominations of your casinos tokens for the following reasons:
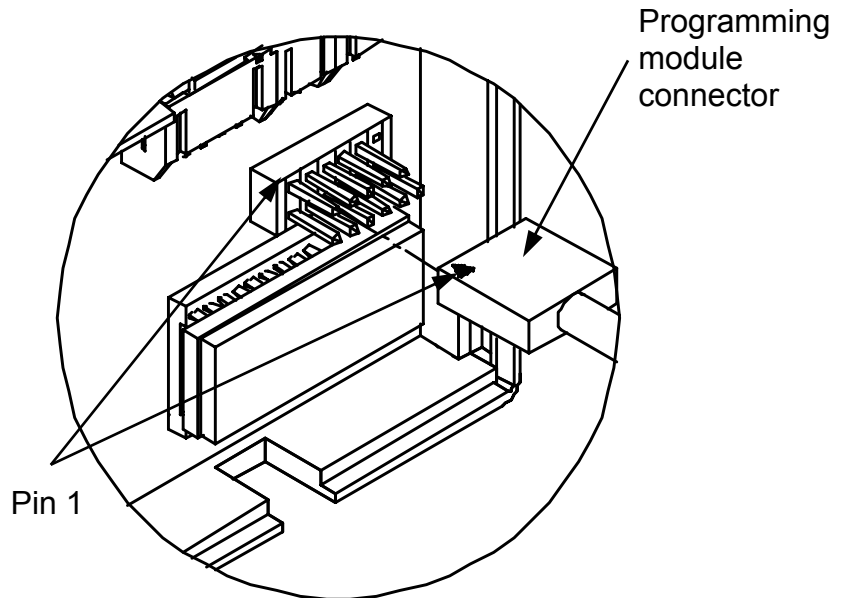
- Improve accept rate of tokens which may have diminished due to wear or to a refill
- Reject an unwanted cross-play token or fraud

To update a coin data file, you must first update your CPM. (see updating your CPM section in the Intelligent Comparitor ® users manual)

The CPM holds all of the coin data files for your casino. The Intelligent Comparitor® is programmed to interrogate the CPM to look for the appropriate coin data file. This feature prevents accidental uplinking of the wrong denomination or from uplinking coin data files from another casinos' CPM.

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HOOKING UP THE CPM TO THE IC

Remove the snap-on cover of the Intelligent Comparitor ®, locate the (12) pin dual-row header located just above the microcontroller and plug in the **CPM** connector as shown at right. Be sure that the pin 1 arrow on the **CPM's** connector lines up with pin 1 of the 12-pin dual-row header.

Programming module connector

Pin 1

The Intelligent Comparitor must be powered by either your machine or an external power source. The **CPM** derives its power from the Intelligent Comparitor. Upon power-up, the system goes through a self test. The 2 line, 16 character LCD screen will momentarily display "Intelligent Comparitor Test" followed by the *Home Screen* - your casino name, and a version identification of the **CPM**.

Note: Pressing the *Reset/ Return* button at any time reinitializes self test and returns the *Home Screen*

➡

> **Intelligent Comparitor Test**

> **—Your Casino Name— POD VERSION and ARRAY REVISION**

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# PROGRAMMING OR UPDATING
USING A CPM

Your casino has been assigned a 3 digit alpha acronym.

The 3 digit alpha acronym is part of the coin data file name. (e.g. ACH—1.0), where **ACH** is the casinos 3 digit acronym, **1** is the denomination of the coin and **.0** is the revision level.

Press the *Uplink to Mech* button. If the Intelligent Comparitor® locates the appropriate coin data file, the LCD screen will display the file that is currently programmed into the validator on line one, and the file for the corresponding denomination that is in the CPM on line two.

Note: Before proceeding, be sure that the revision of the coin data file of the **CPM** is the same or later than the revision of the coin data file of the mech.

The gate timing reference (e.g. c2) is displayed at the end of line one.
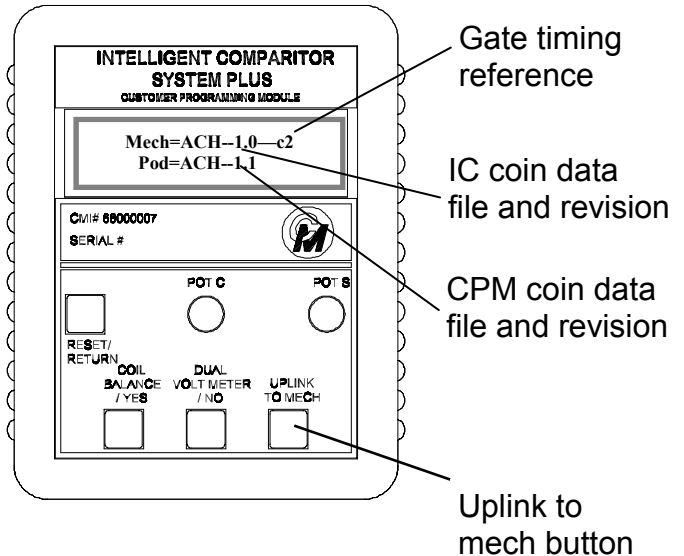
Gate timing reference

IC coin data file and revision

CPM coin data file and revision

Uplink to mech button

Press the *Uplink to Mech* button a second time and the LCD screen will display a prompt to confirm that you want to uplink the coin data file contained in the **CPM** to the validator.

MechRev0-PodRev1
Press to Uplink

Procedure for PCB with Pots

If your pcb looks like the picture at the right follow the next two steps. If your pcb does not look like the picture at the right turn to page 6 - **Procedure for PCB without Pots**

POT "C"

POT "S"
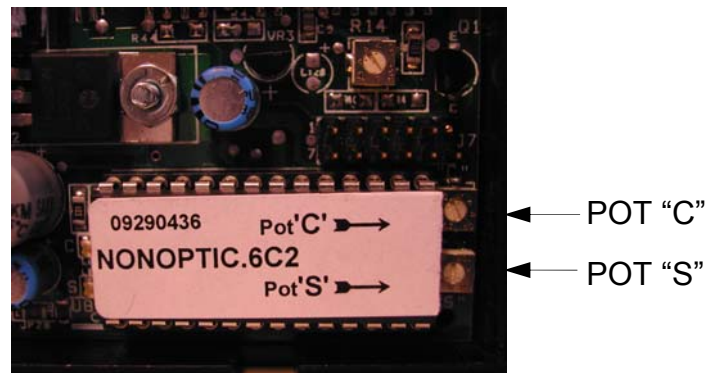
Press the *Uplink to Mech* button a third time. If your pcb has potentiometers the display will confirm that the uplink is completed

MechRev1-PodRev1
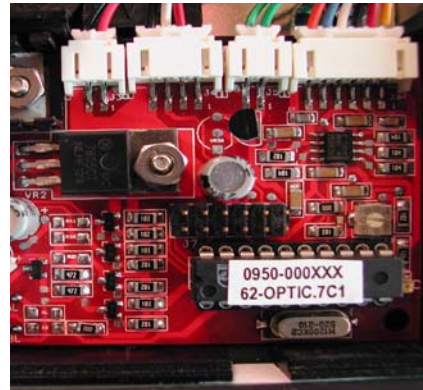**Uplink Completed**

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Press the *Uplink to Mech* button again to show that Mech and Pod contain the same coin data file. The process is now complete.

➡️

Mech=ACH- -1.1
-Pod=ACH- -1.1

Procedure for PCB without Pots

If your pcb looks like the picture at the right follow the next three steps. If your pcb does not look like the picture at the right turn to page 5.

➡️

← No pots

If you press the *Uplink to Mech* button a third time and your pcb does **not** have potentiometers, the CPM asks if you want to uplink the factory pot settings.

➡️

Uplink Factory
Pots ? (Y)   (N)

If token acceptance on your floor is good and you haven't previously made adjustments to the reference voltages, press the *Coil Balance/ Yes* button. The display will confirm that the coin data file with the factory setting has been uplinked.

➡️

MechRev1-PodRev1
Uplink Completed

Press the *Uplink to Mech* button again to show that Mech and Pod contain the same coin data file. The process is now complete.

➡️

Mech=ACH- -1.1
-Pod=ACH- -1.1

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PROGRAMMING OR UPDATING
USING A CPM - CONTINUED

If your token acceptance on your floor is poor at the factory settings, press the *Dual Voltmeter/No* button. The display will ask you if the potentiometers on the CPM are set properly and show the voltage settings that the potentiometers on the CPM are set to.

➡

> **Are pots set?   (Y)**
> **Pot C= 1.8V Pot S= 1.2V**

Turn over your CPM and refer to the denomination information on the label.

➡

Example Only

Denomination	Pot 'S'	Pot 'S'	Pot 'C'
	New Token	Worn Token	+/- 0.4volt
50 Cent	1.7 volts	0.8 volts	2.3 volts
1 Dollar	1.9 volts	0.5 volts	1.2 volts
2 Dollar	2.5 volts	0.8 volts	2.0 volts
5 Dollar	2.5 volts	0.8 volts	3.2 volts
10 Dollar	1.6 volts	1.1 volts	1.8 volts

As you adjust the potentiometers on the **CPM** you will notice the voltage readings change on the LCD display. When reference voltages are set the way that you want, press the *Coil Balance/Yes* button. The display will confirm that the coin data file with the new settings has been uplinked.
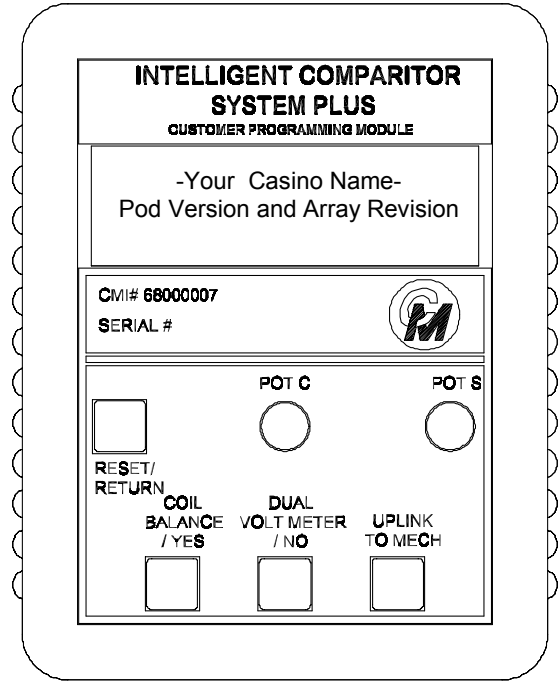
➡

> **MechRev1-PodRev1**
> **Uplink Completed**

Press the *Uplink to Mech* button to show that Mech and Pod contain the same coin data file. The process is now complete.

➡

> **Mech=ACH- -1.1**
> **-Pod=ACH- -1.1**

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TO CHECK OR ADJUST POT "C" AND POT "S" IF YOUR PCB HAS POTENTIOMETERS

INTELLIGENT COMPARITOR SYSTEM PLUS
CUSTOMER PROGRAMMING MODULE

-Your Casino Name-
Pod Version and Array Revision

CMI# 68000007
SERIAL #

POT C   POT S

RESET/
RETURN

COIL   DUAL
BALANCE   VOLT METER   UPLINK
/ YES   / NO   TO MECH

From the *Home Screen*, press the **Dual Voltmeter** button

➤

When the **Dual Voltmeter** Button is pressed the LCD will display the reference voltage levels that pot "C" and pot "S" on the control pcb are set to.
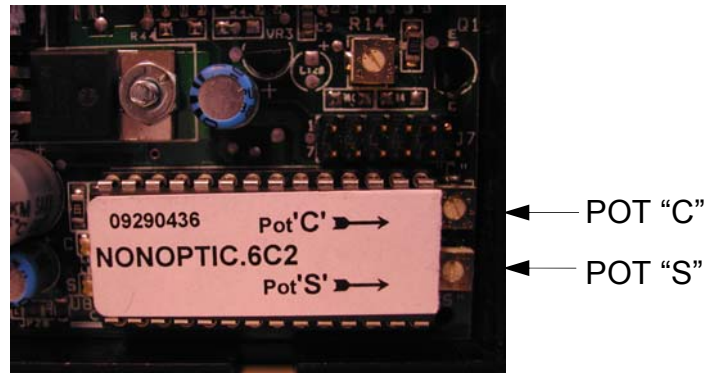
➤

Use pots on Mech
pot C= 1.8V pot S= 1.2V

Example Only

Denomination	Pot 'S'	Pot 'S'	Pot 'C'
	New Token	Worn Token	+/- 0.4volt
50 Cent	1.7 volts	0.8 volts	2.3 volts
1 Dollar	1.9 volts	0.5 volts	1.2 volts
2 Dollar	2.5 volts	0.8 volts	2.0 volts
5 Dollar	2.5 volts	0.8 volts	3.2 volts
10 Dollar	1.6 volts	1.1 volts	1.8 volts

Turn over your **CPM** and refer to the denomination information on the label.

➤

As you adjust the potentiometers on the pcb you will notice the voltage readings change on the LCD display.

➤

09290436   Pot'C' ➤
NONOPTIC.6C2
Pot'S' ➤

◄ —— POT "C"

◄ —— POT "S"

TO ADJUST POT "C" AND POT "S" IF YOUR PCB
DOES NOT HAVE POTENTIOMETERS

**INTELLIGENT COMPARITOR
SYSTEM PLUS**
CUSTOMER PROGRAMMING MODULE

-Your Casino Name-
Pod Version and Array Revision

CMI# 68000007

SERIAL #

POT C   POT S

RESET/
RETURN

COIL	DUAL	UPLINK
BALANCE	VOLT METER	TO MECH
/ YES	/ NO	

From the *Home Screen*, press the **Dual Voltmeter** button

➡
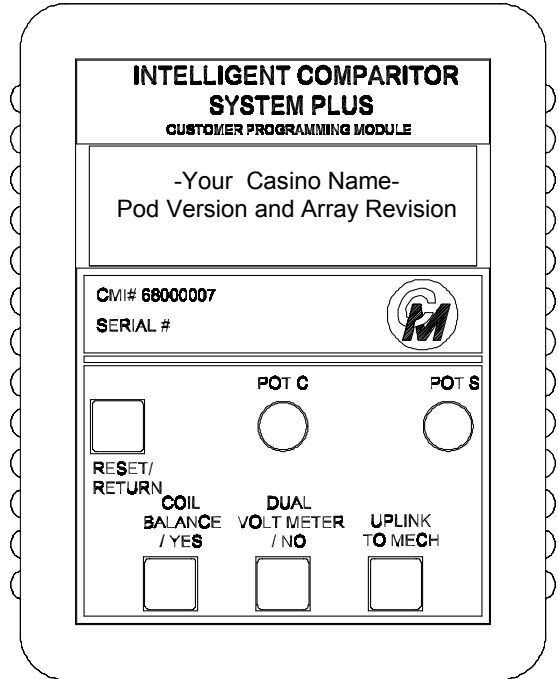
When the **Dual Voltmeter** Button is pressed the LCD will indicate that the potentiometers on the CPM are to be used and that you are to press the **Uplink To Mech** button.

➡

**Use pots on Mech
Press to Uplink**

Pressing the **Uplink to Mech** button takes you through the same steps as if you were programming or updating . If the Intelligent Comparitor® locates the appropriate coin data file, the LCD screen will display the file that is currently programmed into the validator on line one, and the file for the corresponding denomination

➡

**Mech=ACH--1.0—c2
Pod=ACH--1.1**

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Press the *Uplink to Mech* button a second time and the LCD screen will display a prompt to confirm that you want to uplink the coin data file contained in the **CPM** to the validator.

➡

**MechRev0-PodRev1
Press to Uplink**

Press the *Uplink to Mech* button a third time and the screen at the right is displayed. Press the *Dual Voltmeter/No* button.

➡

**Uplink Factory
Pots ? (Y)   (N)**

The display will ask you if the potentiometers on the **CPM** are set properly and show the voltage settings that the potentiometers on

➡

**Are pots set?   (Y)
Pot C= 1.8V Pot S= 1.2V**

Example Only

Denomination	Pot 'S'	Pot 'S'	Pot 'C'
	New Token	Worn Token	+/- 0.4volt
50 Cent	1.7 volts	0.8 volts	2.3 volts
1 Dollar	1.9 volts	0.5 volts	1.2 volts
2 Dollar	2.5 volts	0.8 volts	2.0 volts
5 Dollar	2.5 volts	0.8 volts	3.2 volts
10 Dollar	1.6 volts	1.1 volts	1.8 volts

Turn over your **CPM** and refer to the denomination information on the label.

➡

As you adjust the potentiometers on the **CPM** you will notice the voltage readings change on the LCD display. When reference voltages are set the way that you want, press the *Coil Balance/Yes* button. The display will confirm that the coin data file with the new settings has been uplinked.

➡

**MechRev1-PodRev1
Uplink Completed**

Press the *Uplink to Mech* button to show that Mech and Pod contain the same coin data file. The process is now complete.
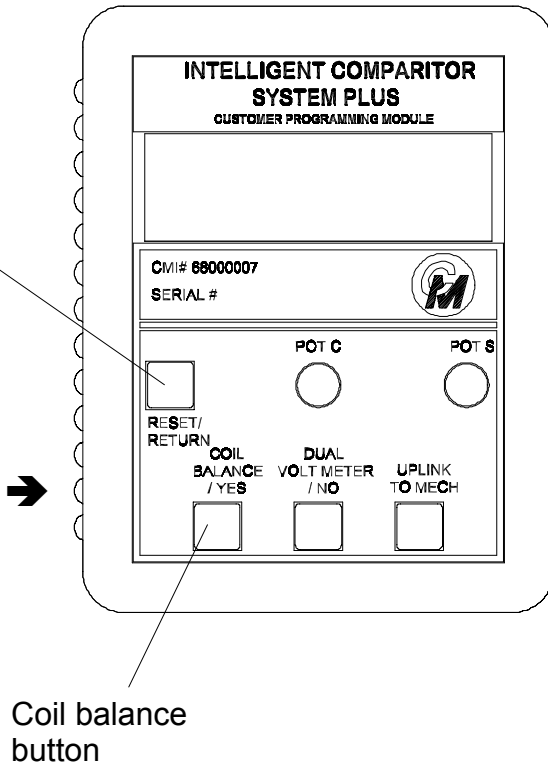
➡

**Mech=ACH- -1.1
-Pod=ACH- -1.1**

CHECKING AND ADJUSTING THE SENSOR COIL

Note: Coil balancing is done without a resident coin in token holder. The token holder must be in place.

Note: The Coil balancing button operates the same for boards using the 87C752 or the 87C767 micro.

Press the *Reset / Return* button in the upper left corner of the **CPM.**

Press the *Coil Balance/Yes* button in the lower left hand corner of the **CPM.**

➡

INTELLIGENT COMPARITOR SYSTEM PLUS
CUSTOMER PROGRAMMING MODULE

CMI# 66000007
SERIAL #

POT C   POT S

RESET/
RETURN
COIL   DUAL
BALANCE   VOLT METER   UPLINK
/ YES   / NO   TO MECH

Coil balance button

If the sensor coil assembly is balanced, the LCD screen will display between three to six bars (LO), the lowest number of bars is most desirable.

➡

COIL BALANCE -LO
■■■

If the sensor coil requires balancing the LCD screen will display more than six bars and if > 0.7 volts a "HI" voltage value will display. Refer to **SENSOR COIL BALANCING SECTION** to adjust coil balance into the "LO" region.

➡

COIL BALANCE - HI
■■■■■■■■■■   1.2
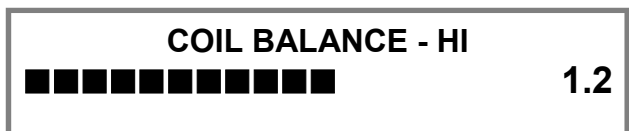
Example Voltage

SENSOR COIL MECHANICAL BALANCING

1. Use a 1/16 in. hex drive bit and loosen both coil adjustment screws. (see fig. 1 & 2)
2. Use a torque driver set to 4 in.-lbs. With a 3/32 in. hex drive bit, torque each of the (2) screws that hold the sensor coil stack together. (see fig. 1)
3. Use a 1/16 in. hex drive bit to loosen the spring retainer adjustment screw. (see fig. 2)
4. Using a torque driver set to 3 in.-lbs. with a 1/4 in. hex socket, torque on the Keps nuts. (see fig. 2)
5. Slide the coil assembly to the right. (see fig. 3) Holding the coil assembly open, slide the token holder up until it is held captive due to the gap between the #2 and #3 coils.
6. Using the 1/16 in. hex drive bit, turn front coil adjustment screw clockwise, just until the token holder falls. (see fig. 1) There should be no more than 0.2mm (0.008") of clearance between the token holder and the #3 coil or between the coin and the #3 coil if the coin thickness is greater than the token holder web.
7. Using the 1/16 in. Hex drive bit, turn the spring retainer adjustment screw clockwise until it just touches the mainplate.
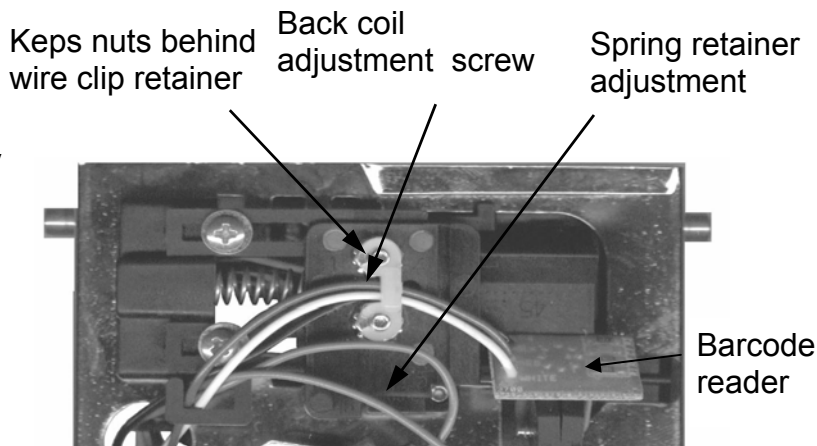
- If you are using an oscilloscope see document #00300001 or go to next page.
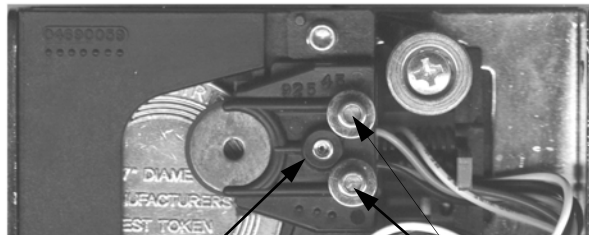
Front coil adjustment screw
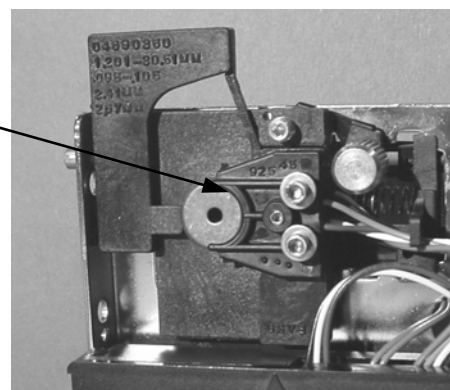
Torque screws

Fig. 1

Keps nuts behind wire clip retainer
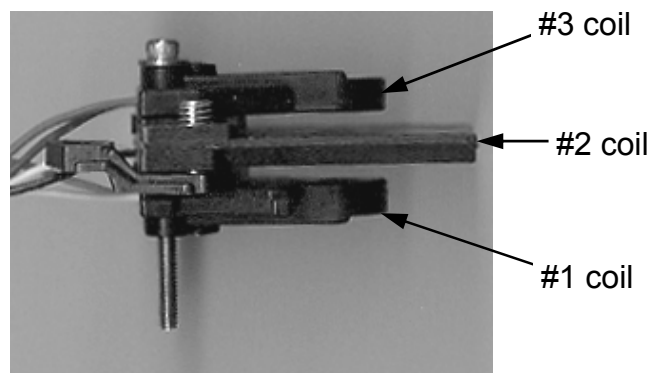
Back coil adjustment screw

Spring retainer adjustment

Barcode reader

Fig. 2

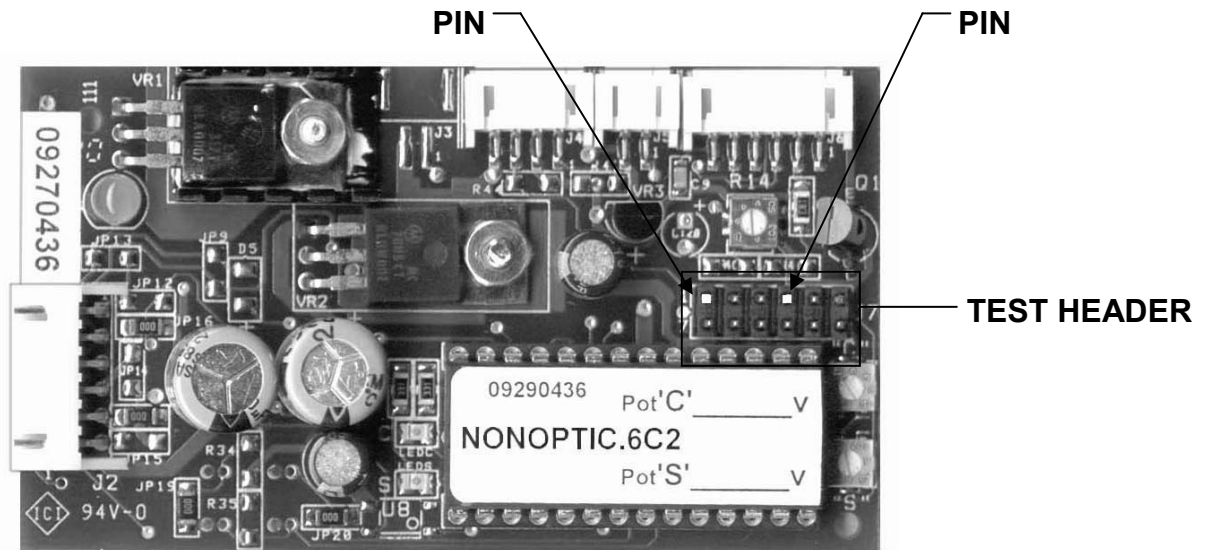Slide coil assembly

Fig. 3

#3 coil

#2 coil

#1 coil

Fig. 4

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SENSOR COIL ELECTRONIC BALANCING

CONNECT OSCILLOSCOPE OR mV AC METER TO PIN 1 (TEST POINT)

Scenario 1

▶ Turn the back coil adjustment screw clockwise until the null amplitude is smallest.

   Note: Once the front adjustment screw bottoms (amplitude begins to decrease), it should not take more than a quarter turn before the smallest amplitude has been reached. If more than a quarter turn is required, replace the assembly.

▶ Slide the proper token into the drop gap between the number #1 coil and the number #2 coil. The clearance should be 0.2mm (0.008"). (If the token population varies significantly in thickness, use thickest token)

▶ If it is not, continue to turn the back coil adjustment screw clockwise until the clearance is 0.2mm (0.008"). Then insert the 1/16 in. hex drive bit back into the front coil adjusting screw and turn the screw with 1/16 in. hex drive wrench clockwise until the smallest amplitude has again been reached.

▶ If the clearance is greater, turn the spring retainer adjustment screw clockwise until the gap is reduced to 0.2mm (0.008"). Then insert the 1/16 in. hex drive bit back into the number (3) coil adjusting screw and turn it clockwise until the smallest amplitude has again been reached.

Scenario 2

▶ If, while adjusting the front coil adjusting screw, the amplitude (for oscilloscope this is voltage amplitude, for CPM this would be number of bars) decreases, slide the proper token into the gap between the #1 coil and the #2 coil, and turn the back coil adjusting screw clockwise until the clearance is 2mm (0.008").

▶ Insert the 1/16 in. Hex drive bit back into the front coil adjusting screw again and turn the screw clockwise until the smallest amplitude is reached.

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ERROR MESSAGES

Note: The following are the explanations for each respective error message(s). If your CPM displays any of these messages, contact Coin Mechanisms customer service for assistance. These messages are the same regardless of which micro is used

If the validator is programmed for a different casino, the LCD screen will display the error:	**POD & Mech Have Different Names**

If the coin data file for the denomination of the validator is not contained in the **CPM**, the LCD will display:	**Mech Denomination Not in this POD**

If the validator memory is empty, incorrect or corrupted, the LCD screen will display these alternating messages:	**Data in CoinMech E2RAM is Corrupt**
	Special Pod Reqd See RepairManual

If there is a communication problem between the validator and the **CPM**, the LCD screen will display these alternating messages: Try plugging in the **CPM** into another validator to isolate which device may be malfunctioning.	**Special Pod Reqd See Repair Manual**
	I2C Bus Failure! See RepairManual

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