BASIC Irrigation Controller

"BIC"

Version A.09

CHEAT SHEET

Main Menu:

1= AUTO 2= MANUAL
3= DIAG 4=
5= 6= SETUP
BIC A.09 23:59:59

Definitions:

FPM: Feet-Per-Minute; the speed that the Boom uses as a reference.
Idler Diameter: Diameter of the wheel that is used for the speed and motion sensing.
Acceleration: Speed setting that the Boom will "take off" when starting a programmed irrigation cycle, or as the Boom turns around to initiate another pass.
Pass: The setting that will tell the Boom what a "Pass" is and can be set to either 1 or 2. By default, the Boom goes from Home to Away, then back Home as ONE pass. If you change this setting to 1 pass, then the Boom will go from Home to Away and stop.
Proximity Sensor: Sensor used to read Speed & Motion using tics.
SW-IN: Switch Inputs. There are 4 Switch Inputs for the BIC.
Home Sensor: The external switch (magnet sensor) which when triggered by a magnet sends input to the BIC that the boom has reached the Home or Start position.
Away Sensor: The external switch (magnet sensor) which when triggered by a magnet sends input to the BIC that the boom has reached the Away or End position.
Remote Start: The BIC has the capability of being Started Remotely using a 24VAC Relay (EX16) that is linked to an Environmental Control System of the users choosing. The System can be set to start the Boom given certain parameters programmed into the Environmental System (RH, RAD SUM, TEMP., VPD, etc.).

External Switch Definitions

- **SW1** – **Home** magnetic sense switch. **(mandatory)**

The Boom will stop at the Home position or turn around and head in the Away direction once the sensor detects this magnet.

- **SW2** – **Away** magnetic sense switch. **(mandatory)**

The Boom will stop at the Away position or turn around and head in the Home direction once the sensor detects this magnet.

- **SW3** – **Skip** magnetic sense switch. **(mandatory)**

This switch will be used to "sense" the Skip magnets and tell the controller when to toggle the Booms Solenoids operation On & Off. This is best used for "skipping" walkways or empty areas that the Boom will travel over.

- **SW4** – **Collision Switch**. This switch input must be closed at all times to allow the Boom to run. The inputs may be connected to an object detection (IR Sensor) or Collision Switch that will open the normally closed circuit when an object is detected in the path of the boom. A simple jumper wire between the SW4 & GRD terminal connections may be used keep the switch permanently closed which will allow the boom to run.

Operations

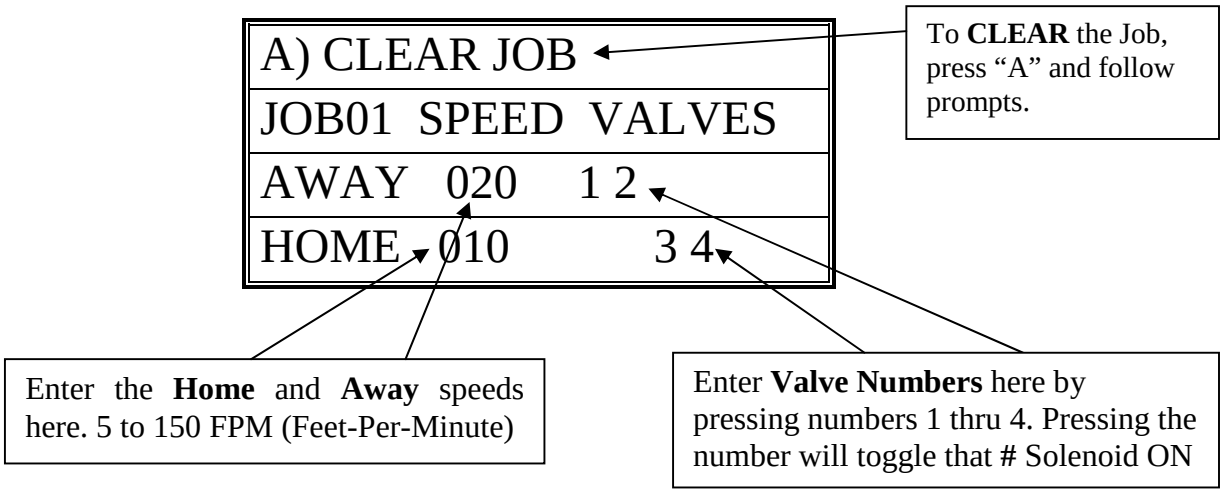
Manual Mode Programming

1. From the Main Menu press 2 for Manual. The following screen will appear:

MANUAL MODE:
ENTER 1 FOR JOBS
ENTER 7 TO BEGIN
ENTER E TO EXIT

2. Press "1" to enter the Job Programming screen.
3. The black cursor will scroll thru the screen by pressing "F" to move forward, and "D" to move back.

*Exploded view of the **Manual Mode Programming** Screen:*



4. Program the Job as desired per the user application and press "F" to scroll thru the screen, changing Speed and Valves as needed. Then **press "E" to go to the Pass Count** menu.

ENTER PASS COUNT
THEN PRESS THE
F KEY TO ENTER
TOTAL PASS COUNT 005

5. Enter the Number of ***Passes*** that the Boom needs to run over the crop. Remember that a Pass is defined by the user in the Set-Up menu. The actual number of Passes that the Boom will make back and forth is effected by the users definition of a "PASS".
   The ***Pass Count*** can be set from 001 to 099 passes. Depending on the application, it is common to assign 2 to 10 passes to saturate the crop below the Boom.
6. Press "F" to Save and Exit back to the Manual Mode main menu.

Manual Mode Run

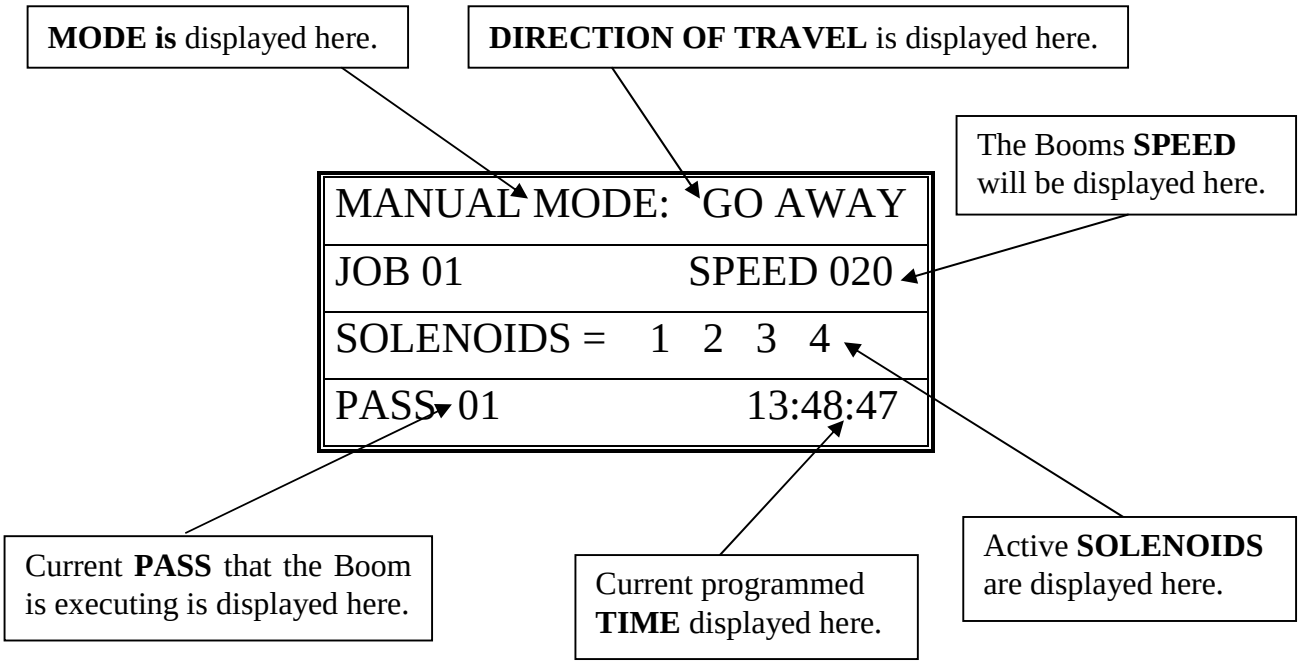
1. From Main menu press 2 for Manual. The following screen will appear:

MANUAL MODE:
ENTER 1 FOR JOBS
ENTER 7 TO BEGIN
ENTER E TO EXIT

2. Make sure that the Boom is started (BEGIN) when the ***Home Magnet Reader*** is under the Home Magnet. To locate the boom at the home position, go into the Diagnostics menu and send the Boom Home, the Boom will stop under the Home magnet, ready for its next command.

3. Press ***"7" to BEGIN the Manual Mode Run***. The screen will show the following information during the Irrigation Cycle:

*Exploded view of the **Manual Mode Run** Screen:*



4. ***Press "0" to SUSPEND*** the Booms Manual Mode Run.
   Press "0" again to RESUME the Booms operation.
5. ***Press "E" to STOP*** the Boom and Exit to the Manual Mode menu.

Auto Zones (Time Activated Programming)

Auto Zone = A specific period of time that will activate the Booms operation as programmed.

Job = What the programmed Auto Zone will execute.

Start Time = Time that the Boom will Start this Zones Auto Program execution.
.
Stop Time = Time that the Boom will Stop this Zones Auto Program execution.

Interval = Amount of minutes between Pass execution.

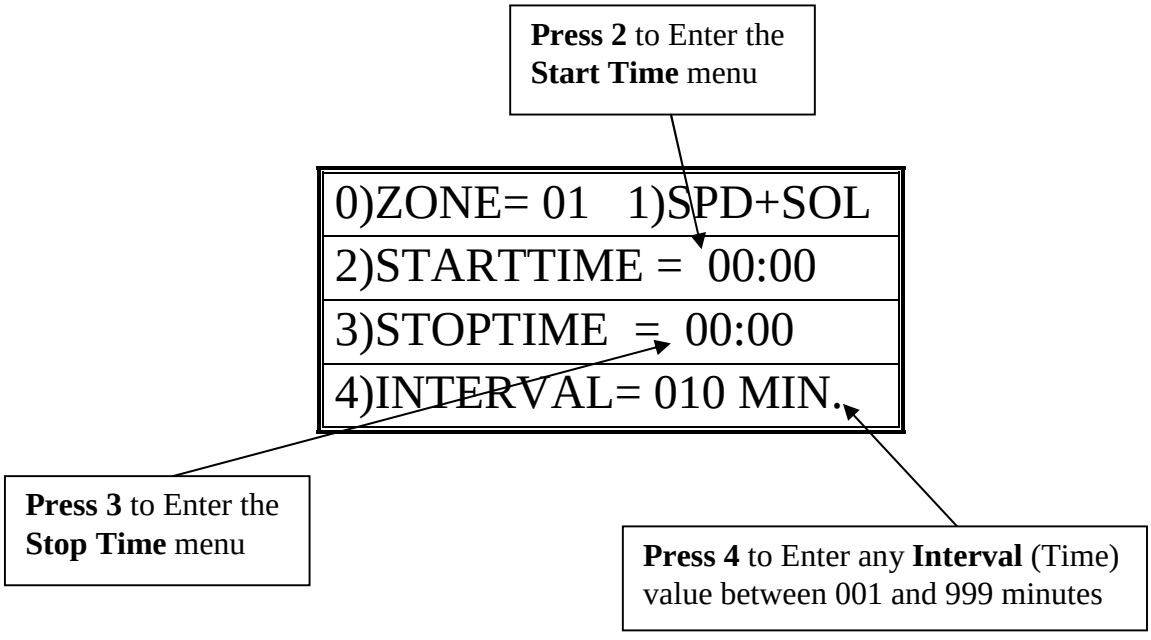
Pass = Starts at Home, goes to Away, then turns around and comes back Home.
** Unless programmed differently by the user under the Set-Up menu.*

1. From the Main Menu Press 1 (AUTO)

ENTER AUTO ZONE NUMB
1 THRU E TIME ZONE #
TO ENTER AUTO MODE
PRESS THE F KEY

2. Enter the Auto Zone Number 1 thru E (14 Zones total) to be programmed.
The following screen will appear:

*Exploded view of the **Auto Zone** Main Menu:*



3. Press “2” to program a Start Time and then press “3” to program a Stop Time for this Auto Zone. Program time in 24 hour format.

   The following programming screen will appear:

TIME VARIABLE = 00:00
ENTER 24 HOUR FORMAT
F = ENTER NEW TIME
NEW TIME VAR. = 17:43

4. Press “F” to Save and Exit to the Auto Zone menu.
5. Press “4” to enter the *Interval Menu*. The user will program the ***Interval Time and the Pass Count*** in this menu.

   The following programming screen will appear:

PASS INTERVAL = 000 MIN
CHANGE TIME = 0 TO 9
ENTER TIME = F KEY
NEW INTERVAL = 045 MIN

6. Enter needed *Interval Time* (001 to 255 min.). Press “F” to Save and Exit.

ENTER THE PASS COUNT
THEN PRESS THE F
KEY TO ENTER TOTAL
PASS COUNT 002

7. Enter the *Pass Count* desired for this Auto Zone (000 to 099 passes).
8. Press “F” to Save and Exit to the *Auto Zone Menu*. Press “0” to enter another Auto Zone program (1-E).

ENTER AUTO ZONE NUMB
1 THRU E TIME ZONE #
TO ENTER AUTO MODE
PRESS THE F KEY

9. Press “0” to enter another Auto Zone program (1-E).
10. Once all needed Auto Zones are programmed, press “F” in Auto Zone Main Menu to enter the ***Auto Mode Run*** *Menu*.

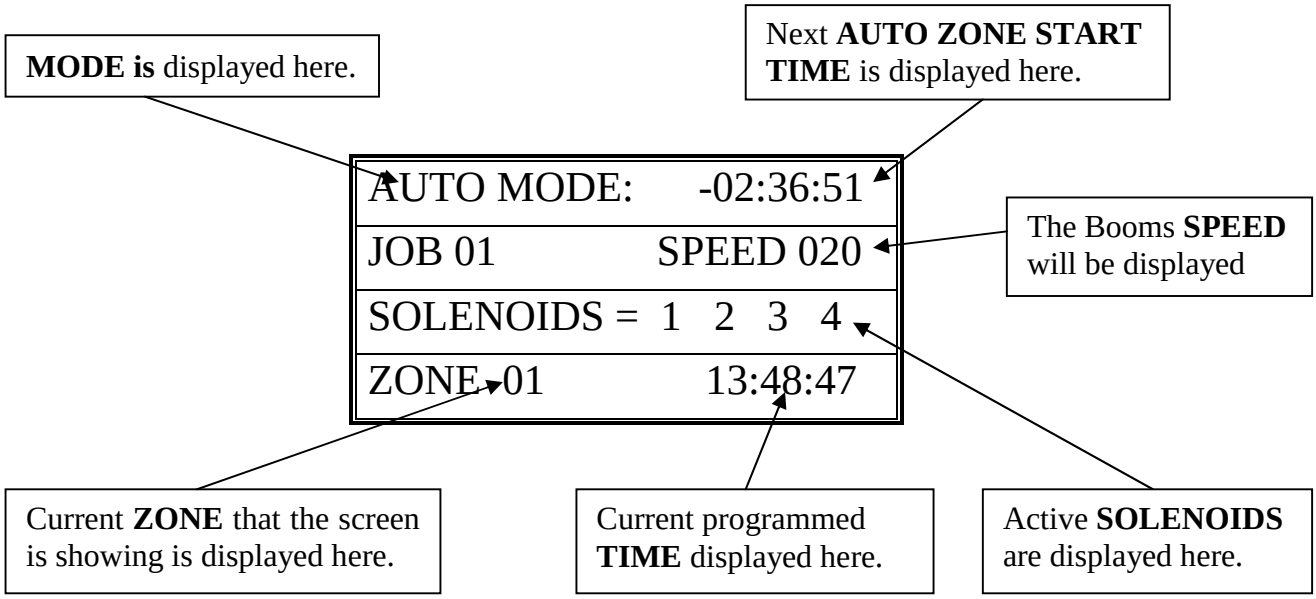
TO CHANGE ACTIVE
ZONES 1 3 56 8 ABC E
PRESS KEYS 1 THRU E
0 KEY EXIT, F KEY RUN

Toggle the **ACTIVE AUTO ZONES** On & Off by pressing the 1 thru E keys

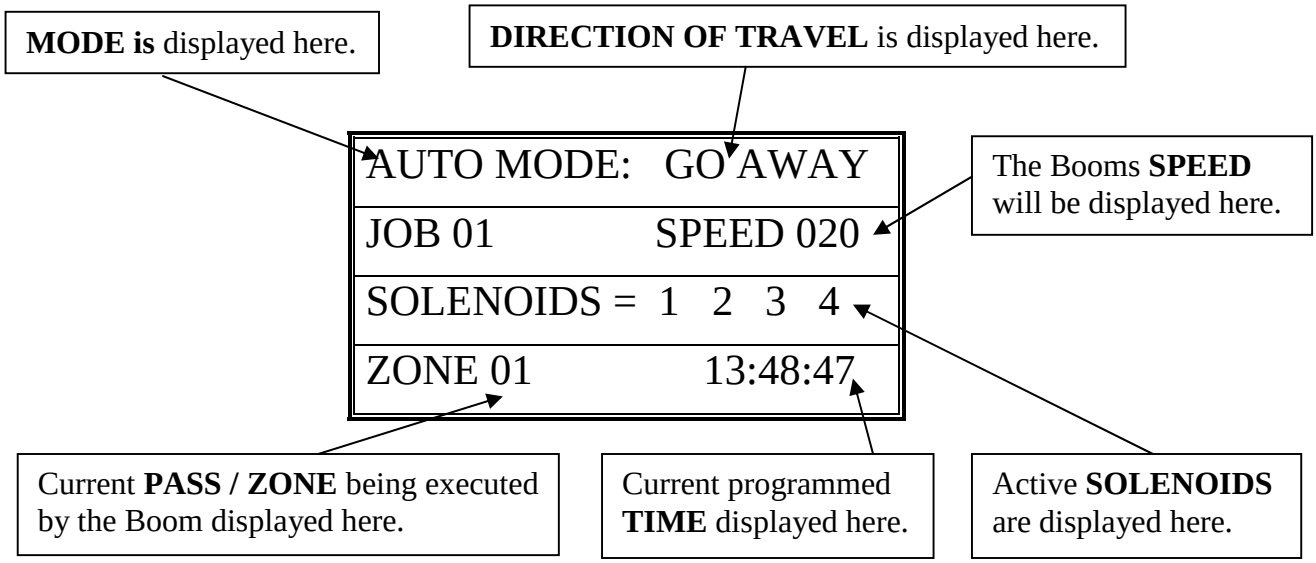
******Program all needed Auto Zones before***
Pressing "F" to enter the Auto Mode Menu***

11. Enter the number of Auto Zones desired (1 thru E) and press "F" to ***RUN***.

*Exploded view of the **Auto Mode <u>Idle</u>** Screen:*



*Exploded view of the **Auto Mode <u>Run</u>** Screen:*



12. ***Press "0" to SUSPEND*** the Booms Auto Mode Run.
    Press "0" again to RESUME the Booms operation.
13. ***Press "E" to STOP*** the Boom and Exit to the Auto Mode menu.

TECHNICAL ASSISTANCE: ***If you have any questions regarding the use of this program or any other Cherry Creek Systems Product please call us at ……..***

(719) 380-8373 ext. 206

OR

ccs@cherrycreeksystems.com

OR

info@cherrycreeksystems.com

OR

www.cherrycreeksystems.com

BASIC Irrigation Controller

"BIC"

Version A.09

USER MANUAL

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Dear Customer:

We would like to thank you for purchasing our "Basic Irrigation" program! The greatest possible care went into making this program as user friendly as possible while still keeping all the functionality that you have come to expect.

We would welcome and encourage you to make suggestions as to how we can improve this Users Manual. It is our intent to provide you with the highest quality equipment and state-of-the-art watering systems, as well as first rate technical follow up support.

If it is the 1st time setting up the Boom, then it is advisable that you follow this order in working through the manual:

1. *Key Concepts*
2. *Initial Power Up*
3. *Diagnostics*
4. *Setup*

Again, thank you for your business and we look forward to assisting you in any way we can. Please feel free to give us a call, or contact us via email.

Sincerely,

Cherry Creek Systems Team

Getting Started

!!! MAKE SURE THAT THE AC LINE IS WIRED TO L1 AND L2 BEFORE APPLYING POWER!!!

Manually move the boom away from walls and other objects.

The controller has an onboard power backup that will keep the last operation stored when power was removed. If the motor was running when power was removed the motor will start when power is reapplied, assuming also that the backup power is still active.

- Apply Power to the Boom.
- If it starts to move, press the **E-key** on the keypad to stop the motor and operation.
- **If this has no affect then the controller may have to be RESET**. *See Reset below*.

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ANY KEY TO CONTINUE

- Press any key on the keypad to continue. If the display does not respond then check that the keyboard connector ribbon is securely connected to the circuit board keypad pins.

***** If this message is not displayed then the controller should be RESET *****

RESET: To RESET the controller remove the Cover and Keypad, find the 2 gold pins or a small white button marked "RESET" located to the left of the LCD Display on the Main Circuit Board. Using a small flat-head screwdriver or other similar device, jump these two pins together, or press the RESET button. While the pins are shorted and the Reset condition is active the 4-line display will light up and if an alarm is connected it will sound. The above message should now be displayed.

Main Menu:

1= AUTO 2= MANUAL
3= DIAG 4=
5= 6= SETUP
BIC A.09 23:59:59

Upon starting the Boom for the first time, go thru the ***Diagnostics 1st*** by **pressing "3".** After going thru the Diagnostics Menu, go thru the ***Set-Up Menu***.

Definitions:

FPM: Feet-Per-Minute; the speed that the Boom uses as a reference.
Idler Diameter: Diameter of the wheel that is used for the speed and motion sensing.
Acceleration: Speed setting that the Boom will "take off" when starting a programmed irrigation cycle, or as the Boom turns around to initiate another pass.
Pass: The setting that will tell the Boom what a "Pass" is and can be set to either 1 or 2. By default, the Boom goes from Home to Away, then back Home as ONE pass. If you change this setting to 1 pass, then the Boom will go from Home to Away and stop.
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This switch will be used to "sense" the Skip magnets and tell the controller when to toggle the Booms Solenoids operation On & Off. This is best used for "skipping" walkways or empty areas that the Boom will travel over.

- **SW4** – **Collision Switch**. This switch input must be closed at all times to allow the Boom to run. The inputs may be connected to an object detection (IR Sensor) or Collision Switch that will open the normally closed circuit when an object is detected in the path of the boom. A simple jumper wire between the SW4 & GRD terminal connections may be used keep the switch permanently closed which will allow the boom to run.

Diagnostics

Pressing **3** from the Main Menu enters the Diagnostic Menu:

1= KEY	2= SW-IN
3= SOL	4= MOTOR
5=	6=
7=	E= EXIT

*** Pressing the **E key** will exit and return to the Main Menu ***

Pressing **1** from the Diagnostic Menu enters the Key Pad Menu:

KEYPAD DIAGNOSTIC
TO END PRESS E TWICE
KEY NUMBER = F

1. Press a key on the keypad and the corresponding key position will be displayed after the text “KEY NUMBER =”.
2. To end this display menu press the **E key** ***twice in succession*** and return to the Diagnostic Menu.

Pressing **2** from the Diagnostic Menu enters the External Switch Menu:

INPUT SWITCH TEST
PRESS ANY KEY,EXIT
SWITCH ID S 1 2 3 4
0 1 0 0 1

Sensors
1 = Home
2 = Away
3 = Skip
4 = Collision (optional; always on)
S = Speed (Proximity Sensor)

1. Five input switches and sensors are tested in this screen. When a switch or sensor contact is closed (by putting a magnet by the reader; or by passing a sprocket tooth by the proxy sensor) a 1 will be displayed below the appropriate switch ID. The ‘S’ represents the Speed (Proximity) sensor. The ‘1’ is SW1 input, the Home sensor. The ‘2’ is SW2 input, the Away sensor. The ‘3’ is SW3, the Skip sensor. The ‘4’ is SW4, the Collision Detector, which should normally be closed.
2. Pressing any key on the keypad will return to the Diagnostic Menu.

Pressing **3** from the Diagnostic Menu enters the Solenoid Menu:

SOLENOID OUT TEST
PRESS E KEY TO EXIT
TO SET/RESET KEY 1-4
SOLENOIDS = 1 2 3 4

1. Press keys 1 through 4 alternately to turn the Solenoids On & Off.

However, the Solenoids will remain in the state that they were in when the E key was pressed. ***This will allow the boom to be moved, with watering solenoids on, in the Diagnostic Mode.***

2. Pressing the E key will exit and return to the Diagnostic Menu.

The Solenoids will be shut-off upon exiting the Diagnostic Menu.

Pressing **4** from the Diagnostic Menu enters the Motor Run Menu:

MOTOR MOTION TEST
PRESS E KEY TO EXIT BOOM MOVING AWAY BOOM MOVING HOME
PRESS A=HOME B=AWAY STOP – PRESS ANY KEY
SPEED(5-150) = 020

1. Enter the desired Speed in FPM (Feet-Per-Minute) with keys 0 through 9.
   - Valid speeds are 5 to 150 feet per minute.
   - If less than 5 feet per minute is entered then the controller will default to 20 feet per minute, when the Boom begins to move.
2. Press the **A key** to move the Boom in the **Away direction**.
3. Press the **B key** to move in the Boom in the **Home direction**.
4. Once the boom is moving ***pressing any key*** will **STOP** the boom.
   - When the boom is moving in the programmed direction, it will be displayed in the second line of the screen.
5. Press the **E key** while the Boom is stopped to go to the Diagnostic Menu.

Set-Up

Pressing **6** from the Main Menu enters the Setup Menu:

1= CLOCK 2= IDLER
3= ACCEL 4= PARK
5= 6= INFO
7= REMOTE E= EXIT

*** There are two options for the real time clock source. If the first line begins with **"1 – CLOCK…"** then the clock source comes from the BIC Real Time Clock Module and will continue to keep time for a minimum of 3 days without external power. If the first line begins with **"1 = CLOCK…"** the clock source is the internal clock of the controller *(note the dash; minus sign or equals sign)*. This clock does not run without AC power but it will hold the time that power was lost and will continue to increment once the AC power is restored. The internal clock serves as a backup clock if the BIC Real Time Clock Module should be removed or becomes defective. ***

*To exit the Setup Menu and return to the **Main Menu** press the **E key***

Press **1** from the Setup Menu to enter the Clock Menu:

TIME VARIABLE= 23:59
ENTER 24 HOUR FORMAT
F = ENTER NEW TIME
NEW TIME VAR.= 00:00

1. Use keys **0 through 9** to enter the current time in hours and minutes.
2. Press the **F key** to exit and return to the **Main Menu.**

Pressing **2** in the Setup Menu enters the Idler Menu:

IDLER SIZE SELECTION
F = EXIT 1 = 1.0
0 = 2.0 OR 5 = 2.5
DIAMETER IS 2.5 INCH

Cherry Creek Booms
Tower Boom = 2.5 inch idler
Double Rail Boom = 2.0 inch idler
Single Rail Boom = 1.0 inch idler
*** Tic Counter on all CCS Booms = 10 or 12 tooth sprocket ***

1. Set the diameter or the idler wheel, which is used to measure the speed of the boom. By default the diameter is 2.5 inches. Press 1 to select 1.0-inch, press 0 to select 2.0-inch and 5 to select the 2.5-inch diameter idler (reference list).
2. Press the **F key** to exit and return to the **Main Menu.**

Pressing **3** in the Setup Menu enters the Acceleration Menu:

ACCELERATION FACTOR
PRESS F = EXIT OR
0 THRU E TO CHANGE
ACCEL FACTOR IS 14

Recommended Factors:

Tower Boom:	5 to 10
Double Rail:	2 to 8
Single Rail:	1 to 5

1. The Acceleration factor is a *positive numeric constant* that applies more power to the motor when the Boom starts up. The default value is 00, but can be changed to a value as high as 14 (E key).
2. Use the **0 through E keys** to select the desired acceleration factor. The purpose of the acceleration factor is to compensate for different weight booms so that all will start up and turn around smoothly and quickly.
3. Press the **F key** to **EXIT** and return to the **Main Menu**

Pressing **4** in the Setup Menu enters the Park Select Menu:

THE PARK POSITION IS
HOME FOR AUTO/MANUAL AWAY FOR AUTO/MANUAL
PRESS KEY 0 TO SET
PRESS KEY F TO SAVE

1. This menu selects where the Boom will End its Auto and Manual watering cycles. The default position is at the **Home magnet**, when watering begins the boom will move away and stop at the Away magnet. It will then reverse and return back to the Home position (that is considered *one pass)*.
2. If the **Away option** is selected, the boom starts at Home, goes to the **Away position and stops after it** completes its watering cycle.
3. Press the **4 key** to toggle the home and away park position.
4. Press the **F key** to save the park position and return to the Main Menu.

Pressing **6** in the Setup Menu displays the web site where the latest documentation can be obtained on this and other controllers.

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ANY KEY TO CONTINUE

*** Press any key to return to the Main Menu ***

Pressing **7** in the Setup Menu enters the Remote Control Menu:

0 = NO REMOTE AC IN 0 = ENABLE REMOTE AC
4 = NO REMOTE SWITCH 4 = ENABLE SWITCH IN
8 = NO ALARM SWITCH 8 = ENABLE ALARM SW
E = EXIT AND SAVE

****** The Menu will offer 1 of 2 Options ******

1. If the Remote Control Board is plugged in & found, the following message will be displayed:

BIC/NIC OPTION BOARD
WAS FOUND.
RETURN TO MAIN MENU
PRESS ANY KEY = EXIT

2. The default mode is for no options to be selected. Pressing the associated key will alternately enable and disable the respective option.
3. The first line enables the 24VAC input option. That is, if enabled, applying 24VAC will permit a remote device to start the manual-watering mode.
4. The second line enables the passive switch input option. That is, if enabled, closing the two-connector terminals with a switch, relay, or other similar device will also start the manual-watering mode.
5. The third line when enabled will close the onboard relay contacts when an error occurs. Errors are usually caused by motion errors due to a lack of rotation of the idler and sensed by the speed sensor. Or, by the collision switch opening, if it is wired up.
6. Pressing the E key will exit and return to the Main Menu.
7. If one (or both) of the two input options are selected then the Remote LED on the option board will flash once per second to indicate that the BIC is in the Remote Input Mode and is looking for the enabled remote input to start the preprogrammed Manual Mode operation. When the enabled input is active for an minimum of 2 seconds and the controller is in the **Main Menu** (*Remote LED on the Remote Option Board will flash*), the controller will start watering in the manual mode. There is a status LED for each of the two inputs and output, which will be lit when the respective lines are active.

   Note: *The Manual Mode must be programmed for Boom Speed, Solenoid Valves, and the Number of Passes.*

8. If the Remote Control Board Option is not found then the following message will be displayed.

BIC/NIC OPTION BOARD
WAS NOT FOUND.
PRESS ANY KEY = EXIT

9. Press any key to return back to the Main Menu.

   Note: *The BIC Real Time Clock Module cannot be used with the Remote Control Board at the same time.*

Operations

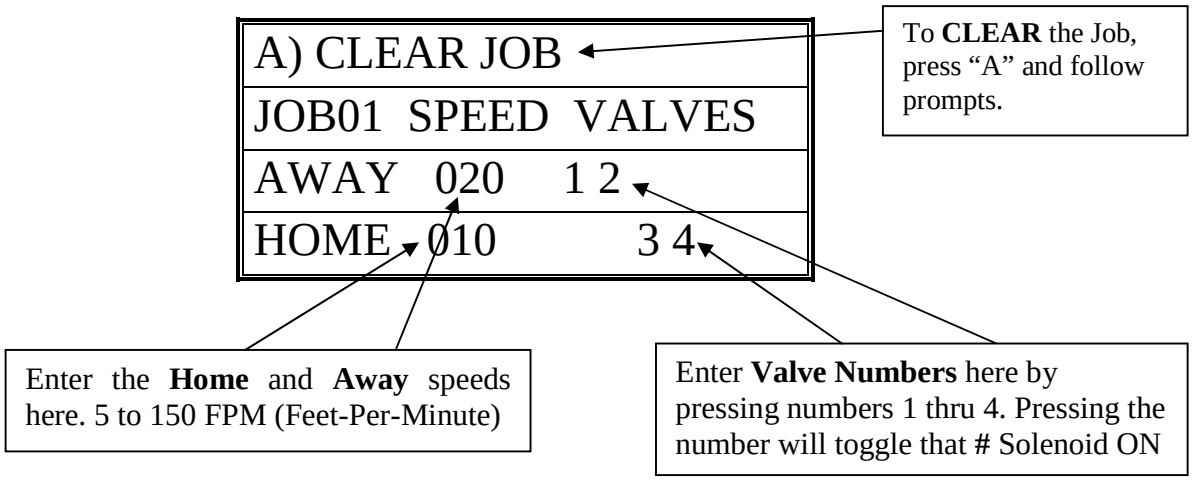
Manual Mode Programming

1. From the Main Menu press 2 for Manual. The following screen will appear:

MANUAL MODE:
ENTER 1 FOR JOBS
ENTER 7 TO BEGIN
ENTER E TO EXIT

2. Press “1” to enter the Job Programming screen.
3. The black cursor will scroll thru the screen by pressing “F” to move forward, and “D” to move back.

*Exploded view of the **Manual Mode Programming** Screen:*



4. Program the Job as desired per the user application and press “F” to scroll thru the screen, changing Speed and Valves as needed. Then **press “E” to go to the Pass Count** menu.

ENTER PASS COUNT
THEN PRESS THE
F KEY TO ENTER
TOTAL PASS COUNT 005

5. Enter the Number of ***Passes*** that the Boom needs to run over the crop. Remember that a Pass is defined by the user in the Set-Up menu. The actual number of Passes that the Boom will make back and forth is effected by the users definition of a “PASS”.
   The ***Pass Count*** can be set from 001 to 099 passes. Depending on the application, it is common to assign 2 to 10 passes to saturate the crop below the Boom.
6. Press “F” to Save and Exit back to the Manual Mode main menu.

Manual Mode Run

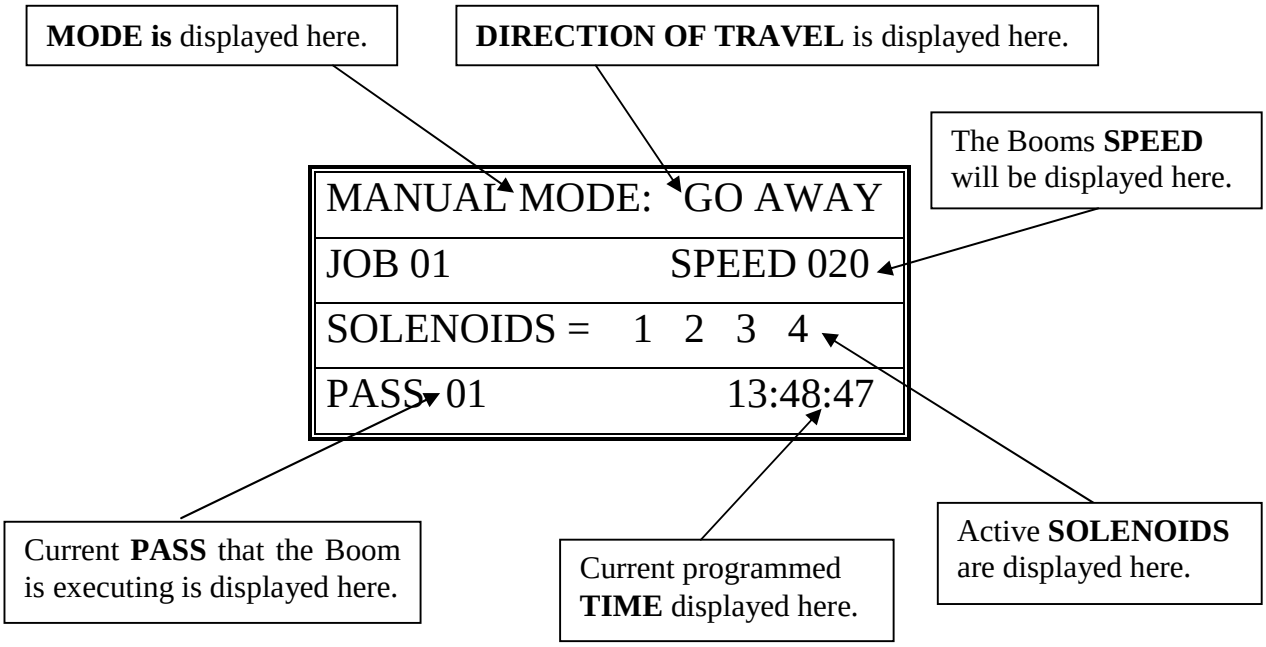
1. From Main menu press 2 for Manual. The following screen will appear:

MANUAL MODE:
ENTER 1 FOR JOBS
ENTER 7 TO BEGIN
ENTER E TO EXIT

2. Make sure that the Boom is started (BEGIN) when the ***Home Magnet Reader*** is under the Home Magnet. To locate the boom at the home position, go into the Diagnostics menu and send the Boom Home, the Boom will stop under the Home magnet, ready for its next command.

3. Press ***"7" to BEGIN the Manual Mode Run***. The screen will show the following information during the Irrigation Cycle:

*Exploded view of the **Manual Mode Run** Screen:*



4. ***Press "0" to SUSPEND*** the Booms Manual Mode Run.
   Press "0" again to RESUME the Booms operation.
5. ***Press "E" to STOP*** the Boom and Exit to the Manual Mode menu.

Auto Zones (Time Activated Programming)

Auto Zone = A specific period of time that will activate the Booms operation as programmed.

Job = What the programmed Auto Zone will execute.

Start Time = Time that the Boom will Start this Zones Auto Program execution.
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Interval = Amount of minutes between Pass execution.

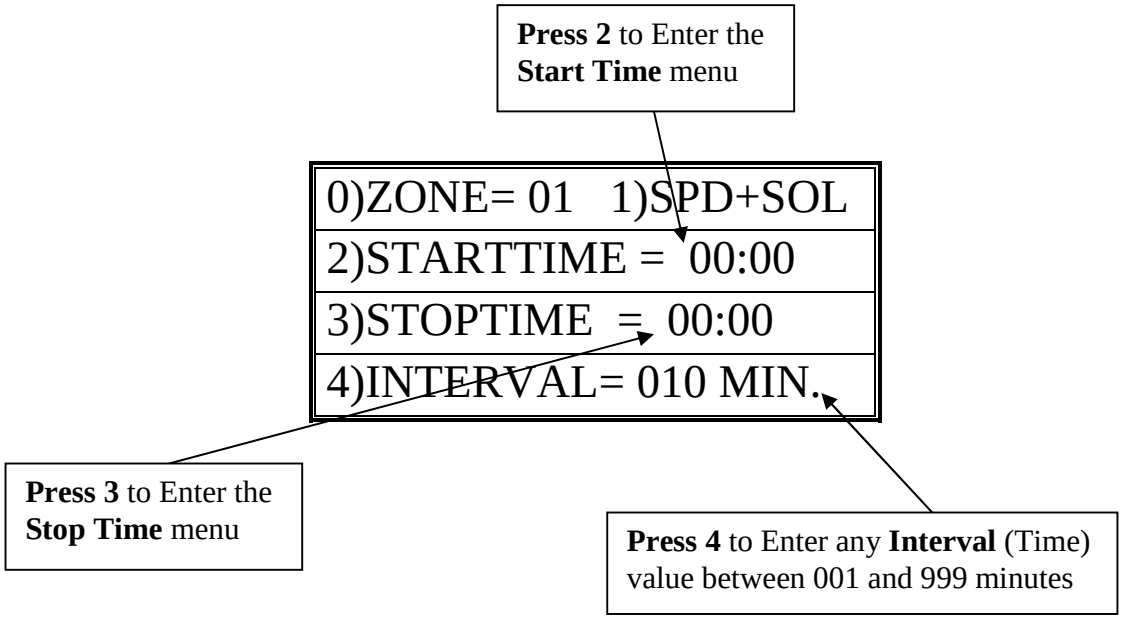
Pass = Starts at Home, goes to Away, then turns around and comes back Home.
** Unless programmed differently by the user under the Set-Up menu.*

1. From the Main Menu Press 1 (AUTO)

ENTER AUTO ZONE NUMB
1 THRU E TIME ZONE #
TO ENTER AUTO MODE
PRESS THE F KEY

2. Enter the Auto Zone Number 1 thru E (14 Zones total) to be programmed.
The following screen will appear:

*Exploded view of the **Auto Zone** Main Menu:*



3. Press “2” to program a Start Time and then press “3” to program a Stop Time for this Auto Zone. Program time in 24 hour format.

   The following programming screen will appear:

TIME VARIABLE = 00:00
ENTER 24 HOUR FORMAT
F = ENTER NEW TIME
NEW TIME VAR. = 17:43

4. Press “F” to Save and Exit to the Auto Zone menu.
5. Press “4” to enter the *Interval Menu*. The user will program the ***Interval Time and the Pass Count*** in this menu.

   The following programming screen will appear:

PASS INTERVAL = 000 MIN
CHANGE TIME = 0 TO 9
ENTER TIME = F KEY
NEW INTERVAL = 045 MIN

6. Enter needed *Interval Time* (001 to 255 min.). Press “F” to Save and Exit.

ENTER THE PASS COUNT
THEN PRESS THE F
KEY TO ENTER TOTAL
PASS COUNT 002

7. Enter the *Pass Count* desired for this Auto Zone (000 to 099 passes).
8. Press “F” to Save and Exit to the *Auto Zone Menu*. Press “0” to enter another Auto Zone program (1-E).

ENTER AUTO ZONE NUMB
1 THRU E TIME ZONE #
TO ENTER AUTO MODE
PRESS THE F KEY

9. Press “0” to enter another Auto Zone program (1-E).
10. Once all needed Auto Zones are programmed, press “F” in Auto Zone Main Menu to enter the ***Auto Mode Run*** *Menu*.

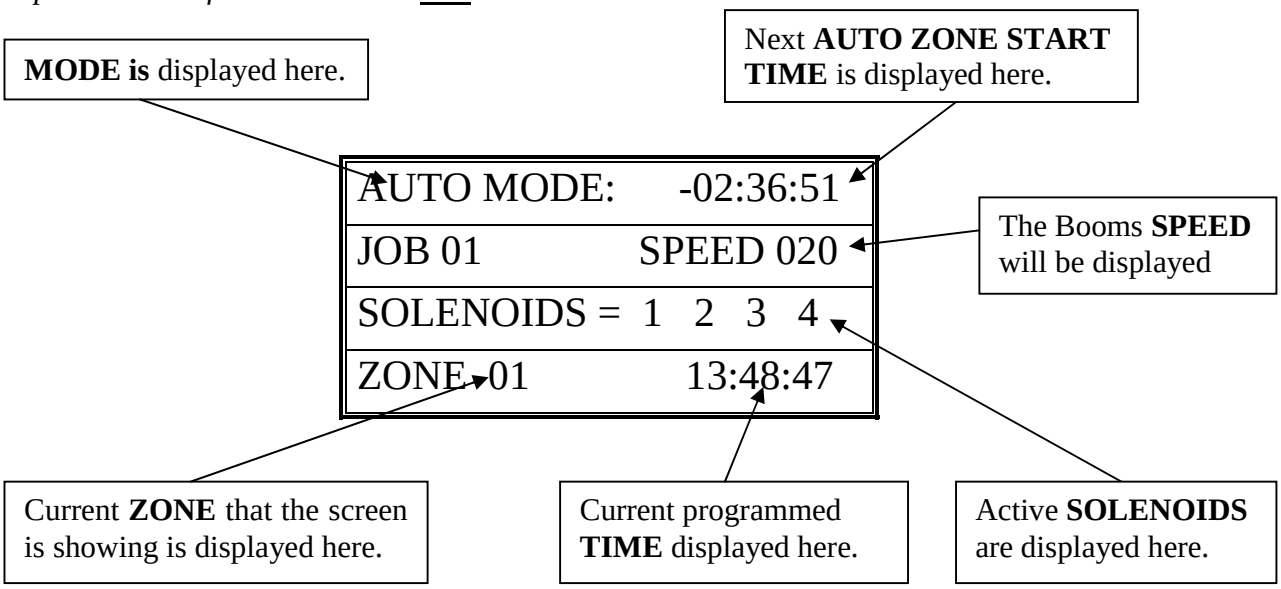
TO CHANGE ACTIVE
ZONES 1 3 56 8 ABC E
PRESS KEYS 1 THRU E
0 KEY EXIT, F KEY RUN

Toggle the **ACTIVE AUTO ZONES** On & Off by pressing the 1 thru E keys

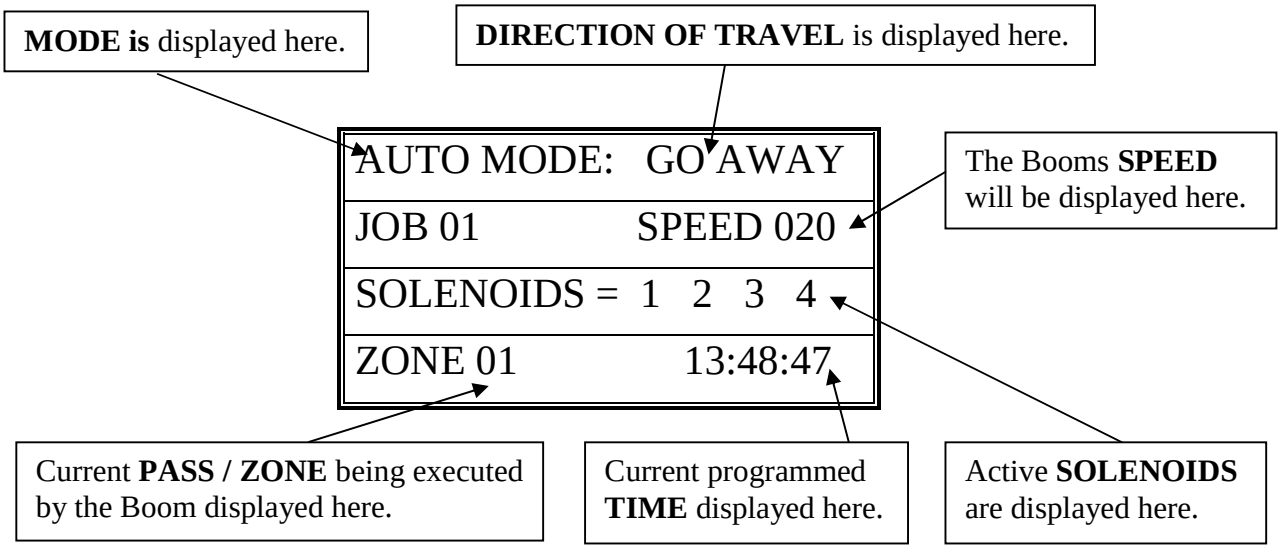
******Program all needed Auto Zones before***
Pressing "F" to enter the Auto Mode Menu***

11. Enter the number of Auto Zones desired (1 thru E) and press "F" to ***RUN***.

*Exploded view of the **Auto Mode <u>Idle</u** Screen:*



*Exploded view of the **Auto Mode <u>Run</u** Screen:*



12. ***Press "0" to SUSPEND*** the Booms Auto Mode Run.
    Press "0" again to RESUME the Booms operation.
13. ***Press "E" to STOP*** the Boom and Exit to the Auto Mode menu.

Trouble Shooting

Motion Error:

- Check Proximity (Motion) Sensor for damage and function.
- There will be a yellow light (located at the base of the sensor body) that should turn on when the sprocket teeth pass the sensor head. If there is no light fluctuation, then check that the sensor is within 3 mm. (millimeters) of the sprocket teeth as they pass.
- If the sprockets teeth are within 3mm, check the functionality of the Proximity (Motion) Sensor. *Refer to the Diagnostics part of this manual for testing sensor inputs.* If the sensor is not functional or broken, please call Cherry Creek to purchase a new sensor.

Collision Error:

- The NIC has the option of using a Collision Sensor to stop the boom if it runs into any objects that might be in the bay (carts, shelves, trash cans, people, etc.). This is an *Option* that can be purchased from CCS at any time. Call Cherry Creek for more info.
- If the boom is not equipped with the Collision Sensor option, there needs to be a jumper wire in Switch #4. To check this, open the NIC lid, pull the keypad ribbon and set the lid aside. Look at the Terminal Blocks that run down the left side of the Main Board (black "blocks" with colored wires running into them). Pull the second-from-the-top 6 pin Terminal Block from the board (labeled J2 or JT2). There will be writing on the Main Board for the switch #. Make sure the jumper wire is in place in the Block. The jumper wire should connect to Switch #4 and the Ground (GRD) that is directly above SW4.
- *If the Boom* ***is*** *equipped with the Collision Sensor Option*, then:
    - Check the Collision Sensor for damage and function.
    - *Refer to the Diagnostics part of this manual for testing sensor inputs*. If the sensor is not functional or broken, please call Cherry Creek to purchase a new sensor.

****** Before calling Tech Service, please try to RESET the Controller first. This will sometimes solve problems and is an easy step to correcting the problem before calling Tech Service. If the NIC is "locked-up", this will usually work to get the Controller functional again. Otherwise contact CCSI. ******

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Note: ***Resetting this way is helpful if you are having difficulty making the remote keypad respond.***

TECHNICAL ASSISTANCE: ***If you have any questions regarding the use of this program or any other Cherry Creek Systems Product please call us at ……..***

(719) 380-8373 ext. 206

OR

ccs@cherrycreeksystems.com

OR

info@cherrycreeksystems.com

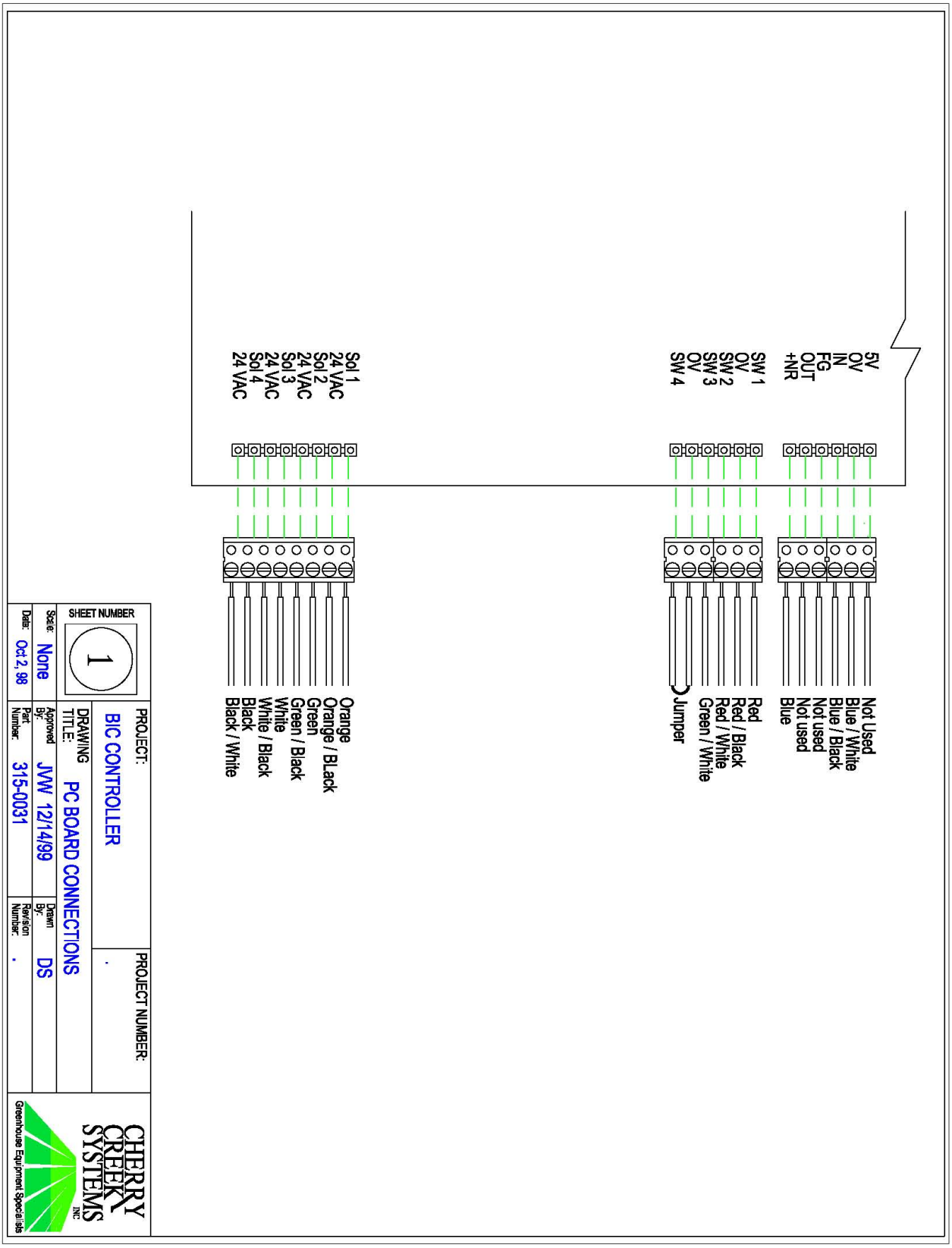
OR

www.cherrycreeksystems.com

Connections

LCD - LIQUID CRYSTAL DISPLAY, 16 pins connects to the 4 line x 20 character LCD
RESET - RESET SHORTING TERMINALS, 2 pins, short pins together to perform a hard reset.
J1 - EXPANSION CONNECTOR, 3 pins, currently not used.
J2 - KEYPAD CONNECTOR, 8 pins, for the 4 x 4 membrane keypad.
J3 - OPTIONAL BATTERY BACKUP CONNECTOR, 3 pins for 4.5V alkaline battery pack.
**** Normal program retention is expected for at least 3 days without power applied.****
J4 - SPEED AND ALARM CONNECTOR - dual 3 position mini screw terminal.
Speed - +NR /+NRV, output to proximity sensor, brown wire on sensor.
0V, output to proximity sensor, blue wire on sensor.
IN, input from proximity sensor, black wire on sensor.
Alarm - FG, Frame Ground, currently not used.
Out, to negative side of audio alarm transducer.
+NR, to positive side of audio alarm transducer.
J5 - EXTERNAL SWITCH CONNECTOR - 6 position mini screw terminal.
SW1, Home Switch, magnetic.
0V, Common for SW1 and SW2
SW2, Away Switch, magnetic.
SW3, Skip Switch, magnetic.
0V, Common for SW3 and SW4
SW4, Collision Switch, magnetic. Must be closed for controller to operate motor.
J6 - WATER SOLENOID CONNECTOR - 8 position mini screw terminal.
SOL1, Solenoid #1.
24VAC, Return for Solenoid #1.
SOL2, Solenoid #2.
24VAC, Return for Solenoid #2.
SOL3, Solenoid #3.
24VAC, Return for Solenoid #3.
SOL4, Solenoid #4.
24VAC, Return for Solenoid #4.
J7 - POWER IN AND MOTOR OUT CONNECTOR - 6 position screw terminal.
LI - Power Line #1, normally 120VAC in HOT, BLACK. Max Fuse 5 amp at 120VAC.
L2 - Power Line #2, normally 120VAC in NEUTRAL, WHITE. Max Fuse 5 amp at 120VAC.
FG - Power Line Ground, GREEN GROUND.
FG - Motor Ground, GREEN GROUND.
M1 - Motor Power #1, swap with M2 for correct motor direction.
M2 - Motor Power #2, swap with M1 for correct motor direction.

NOTE: **CONNECT ONLY 110-120VAC TO L1 AND L2 UNLESS BOARD HAS BEEN ADAPTED FOR 220-240VAC OPERATION. DO NOT CONNECT AC LINE TO MOTOR OUTPUT CONNECTIONS, M1 AND M2. THIS CAN DESTROY THE CIRCUIT BOARD!!!**


5V
0V
IN
FG
OUT
+NR
SW 1
0V
SW 2
SW 3
0V
SW 4
Sol 1
24 VAC
Sol 2
24 VAC
Sol 3
24 VAC
Sol 4
24 VAC
Not Used
Blue / White
Blue / Black
Not used
Not used
Blue
Red
Red / Black
Red / White
Green / White
Jumper
Orange
Orange / BLack
Green
Green / Black
White
White / Black
Black
Black / White
CHERRY CREEK SYSTEMS INC
Greenhouse Equipment Specialists
PROJECT:
BIC CONTROLLER
PROJECT NUMBER:
.
DRAWING TITLE:
PC BOARD CONNECTIONS
SHEET NUMBER
1
Scale:
None
Approved By:
JVW 12/14/99
Drawn By:
DS
Date:
Oct 2, 98
Part Number:
315-0031
Revision Number:
.

Network Irrigation Controller
"NIC"
Jobbing w/ Magnets
Version A.28
CHEAT SHEET

Key Concepts
*** Read this First! ***

It is advisable that this order is followed when working through the manual and setting up your boom:

1. Key Concepts
2. Initial Power Up
3. Diagnostics
4. Setup

The ***Network Irrigation Controller*** (hereafter NIC) was designed to provide flexibility and control while maintaining a simple menu-based programming system. While still sophisticated, the NIC still attempts to tailor to the grower. Through the various programmable speeds along with left and right solenoid control, the NIC allows operators to manipulate water usage and time needed when watering crops. The controller's advanced memory features allow an array of customized options for programming. Growers will find the ease of use and the accuracy of the controller reassuring, as it can be taught to anyone with very little training.

The NIC can hold up to ***14 different Time Zones***, each containing a specific start and end time. These Time Zones can all be run simultaneously or separately and can be programmed with individual, customized time delays (*Intervals*).

After the time zones are established each one may be programmed with "***Jobs"***. The NIC is able to store up to 60 "Jobs" for each direction, in each Time Zone. Each job within a Time Zone can have its own speed as well as solenoid valve pattern giving you a vast array of watering options.

As you set up your NIC for the first time, read through each section of this manual before implementing the steps described therein. This will help eliminate unnecessary confusion and frustration. If you need help with terms, please refer to the definitions section at the end of this manual.

Time Zone:

This is a given period of time. Your NIC uses a 24 hour format:

1:00 PM = 13:00	10:00 AM = 10:00
12:00 AM = 00:00	10:00 PM = 22:00

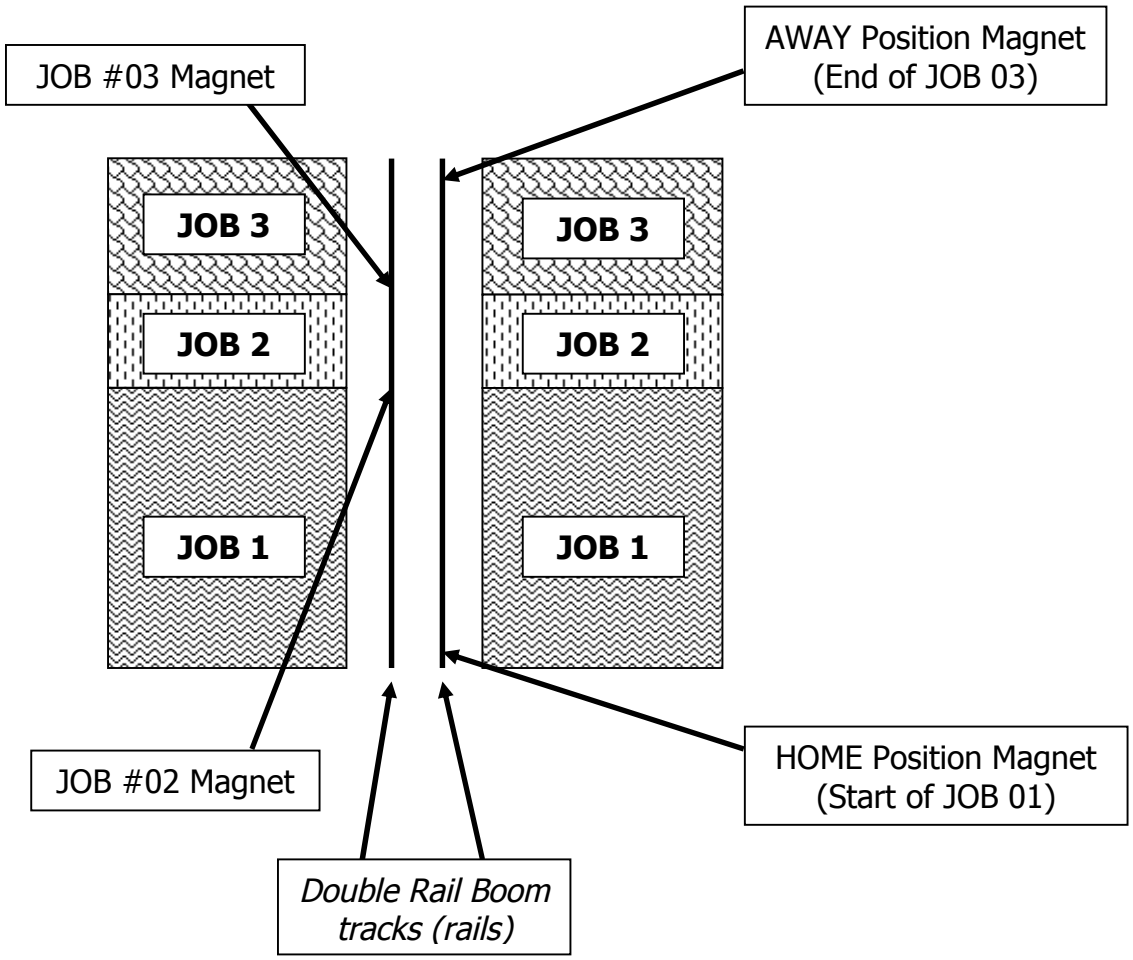
Keypad:

0-9 = Data Entry
E = Enter or Exit
B = Up / Increase
F = Down / Decrease
C = Left / Forward
D = Right / Back

Jobbing:

Basically, there are 4 steps:

1. Set-up Home Position (Home stop)
2. Set-up Away Position (Away stop)
3. Set-up the number of Jobs to be executed (number of Job magnets)
4. Give the Boom the Crop watering instructions



Operations

Manual Mode Programming (Jobs)

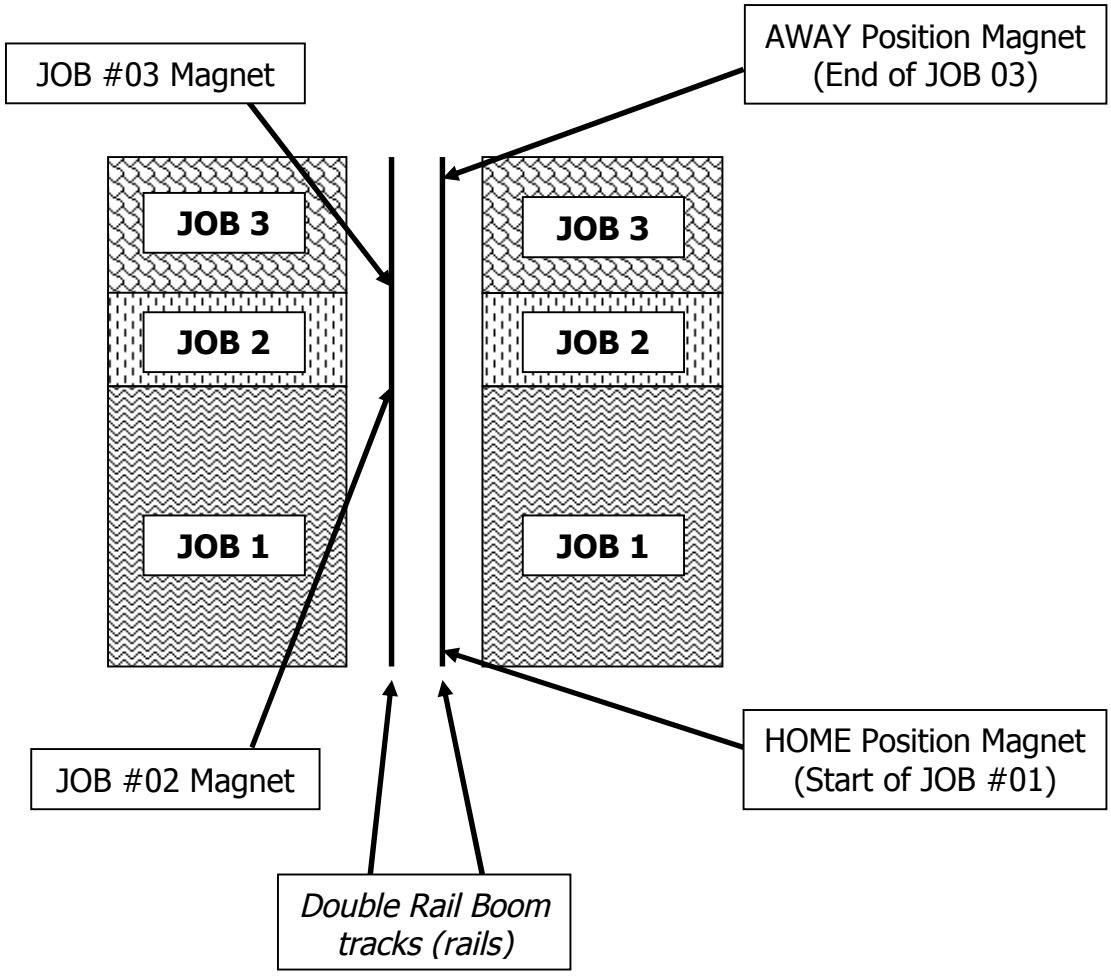
(Main, 2, 1)

Quick Menu/ Keypad Number Reference

** There are up to **60 JOBS** that can be programmed in the **Manual Mode** **

In order to function properly, the Number of JOBS programmed must correspond with the Number of Job magnets on the rail. If this is not done, the "JOB COUNT ERROR" will appear on the screen and stop the Booms operation until corrected. JOB 01 starts at the Home Magnet and end when the Boom sees the first JOB Magnet (JOB 02 Magnet). JOB 02 starts at the first JOB magnet and ends at the next JOB Magnet…..et cetera…..

As shown in drawing below:

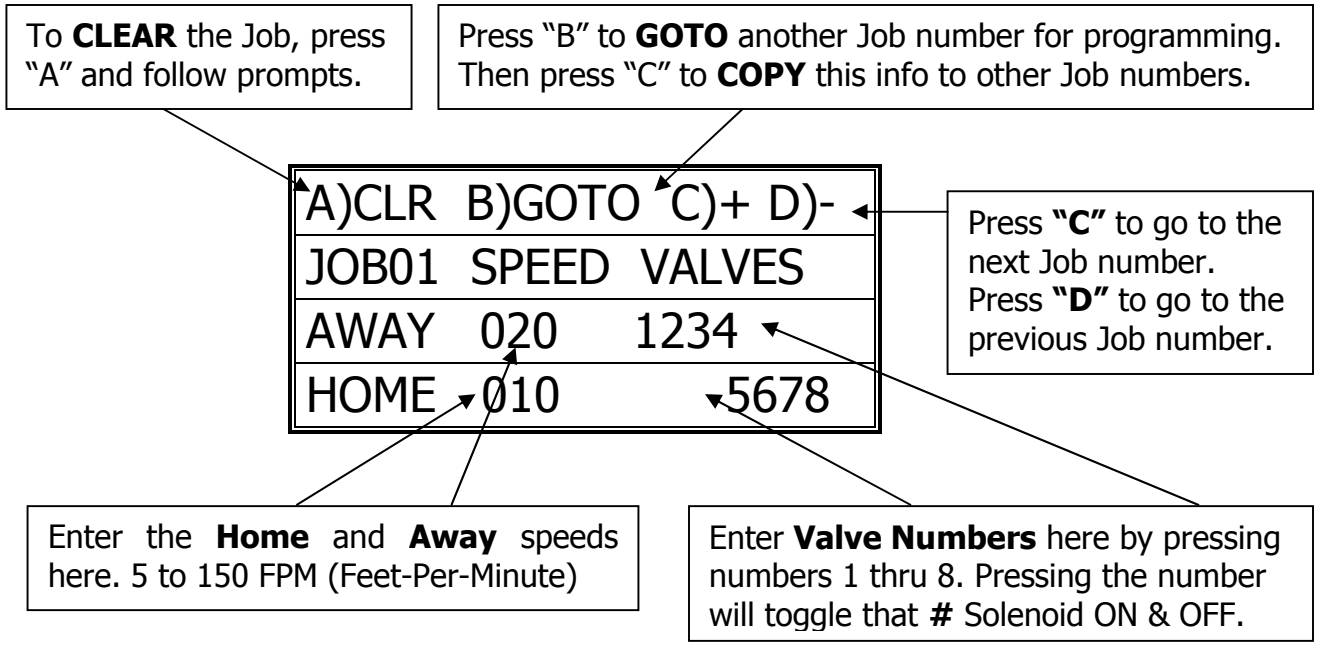


1. From the Main Menu press 2 for Manual. The following screen will appear:

MANUAL MODE:
ENTER 1 FOR JOBS
ENTER 7 TO BEGIN
ENTER E TO EXIT

2. Press "1" to enter the Jobs Programming screen.
3. The black cursor will scroll thru the screen by pressing "F" to move forward, and "D" to move back.

*Exploded view of the **Manual Mode Programming** Screen:*



4. Program the Job as desired per the user application and press "F" to scroll to the next Job for programming. If, for example, only JOB #01 is needed, the cursor must toggle to the next Job (DO NOT program that next Job), then **press "E" to go to the Pass Count** menu. If the cursor is not toggled to the next Job screen, that last Job programmed will not be saved and will not run. This will also result in a "JOB COUNT ERROR" and stop the operation of the Boom until the problem is fixed.

NUMBER OF JOBS 03
ENTER THE PASS COUNT
THEN F KEY TO ENTER
TOTAL PASS COUNT 005

5. Enter the Number of ***Passes*** that the Boom needs to run over the crop. Remember that a Pass is defined by the user in the Set-Up menu. The actual number of Passes that the Boom will make back and forth is effected by the users definition of a "PASS".
   The ***Pass Count*** can be set from 001 to 099 passes. Depending on the application, it is common to assign 2 to 10 passes to saturate the crop below the Boom.
6. Press "F" to Save and Exit back to the Manual Mode main menu.

Manual Mode Run (Jobs)

(Main, 2, 7)

1. From Main menu press 2 for Manual. The following screen will appear:

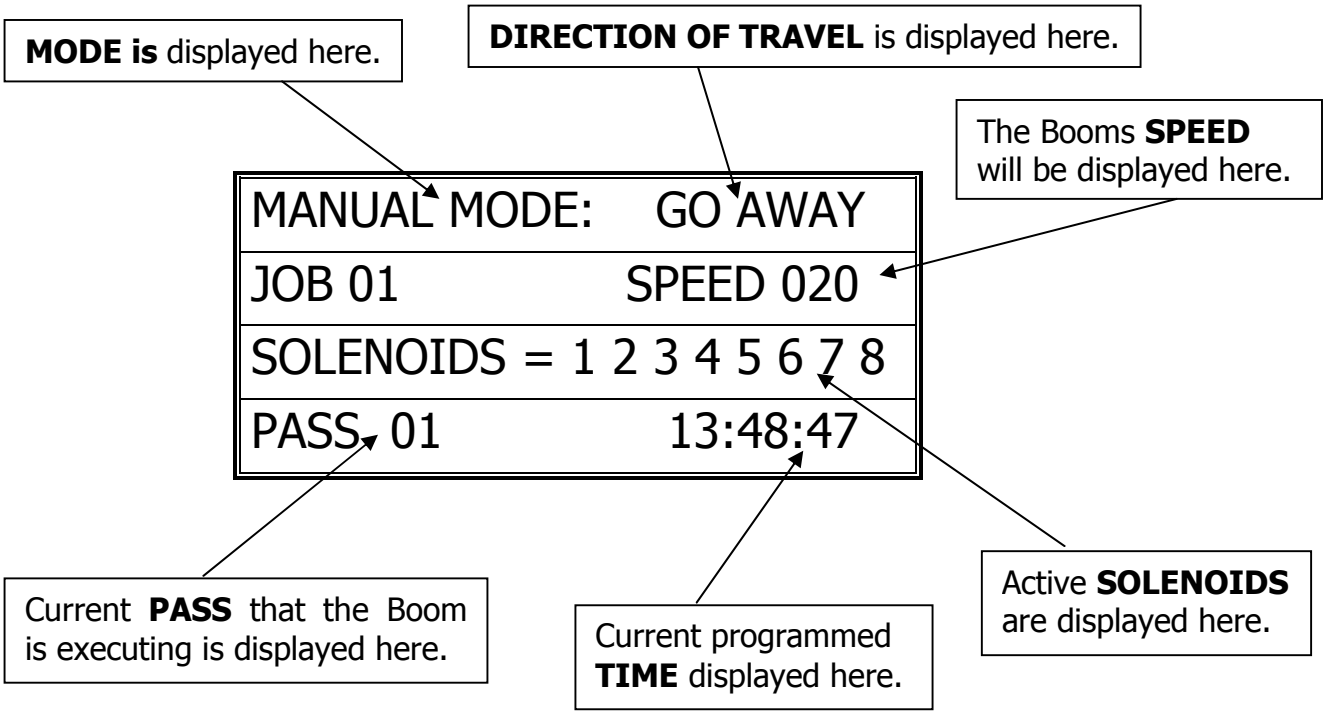
MANUAL MODE:
ENTER 1 FOR JOBS
ENTER 7 TO BEGIN
ENTER E TO EXIT

2. Make sure that the Boom is started (BEGIN) when the ***Home Magnet Reader*** is under the Home Magnet. To locate the boom at the home position, go into the Diagnostics menu and send the Boom Home, the Boom will stop under the Home magnet, ready for its next command.

3. Press ***"7" to BEGIN the Manual Mode Run***. The screen will show the following information during the Irrigation Cycle:

(NEXT PAGE)

*Exploded view of the **Manual Mode Run** Screen:*



7. ***Press "0" to SUSPEND*** the Booms Manual Mode Run.
   Press "0" again to RESUME the Booms operation.
8. ***Press "E" to STOP*** the Boom and Exit to the Manual Mode menu.

Auto Zones (Time Activated Programming)

(Main, 1, enter 1-E)

Auto Zone = A specific period of time that will activate the Booms operation as programmed.

Jobs = Number of Jobs that the programmed Auto Zone will execute.

Start Time = Time that the Boom will Start this Zones Auto Program execution.

.

Stop Time = Time that the Boom will Stop this Zones Auto Program execution.

Interval = Amount of minutes between Pass execution.

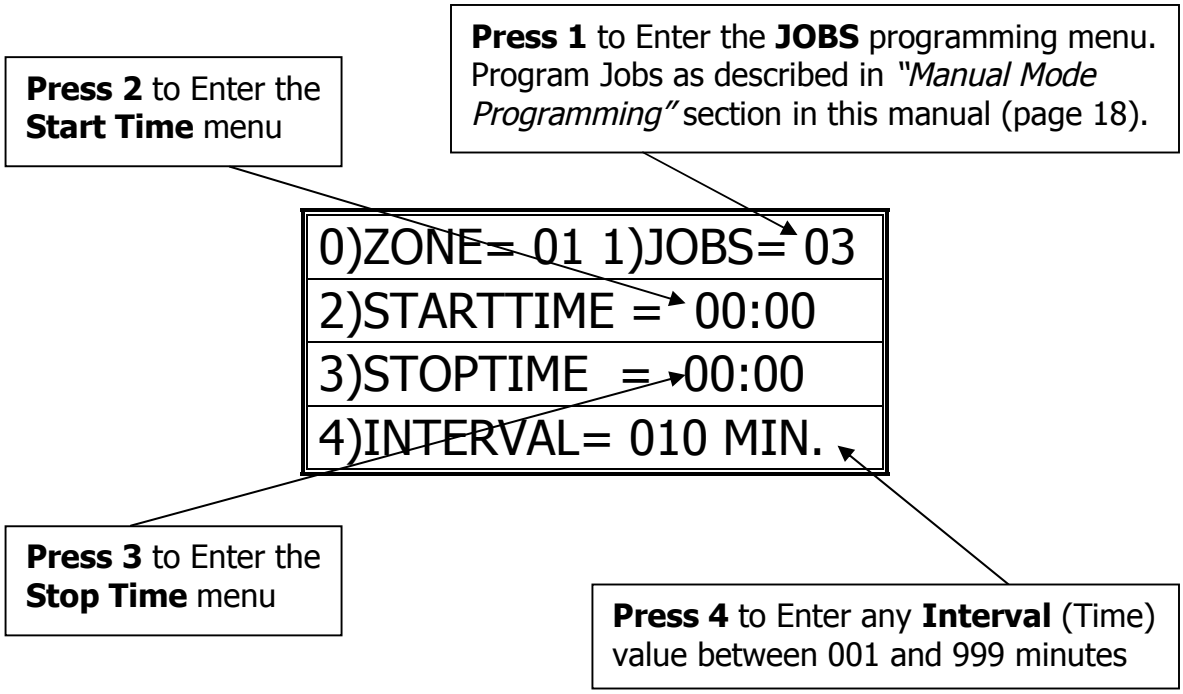
Pass = Starts at Home, goes to Away, then turns around and comes back Home.
* *Unless programmed differently by the user under the Set-Up menu.*

1. From the Main Menu Press 1 (AUTO)

ENTER AUTO ZONE NUMB
1 THRU E TIME ZONE #
TO ENTER AUTO MODE
PRESS THE F KEY

2. Enter the Auto Zone Number 1 thru E (14 Zones total) to be programmed.
   The following screen will appear:

*Exploded view of the **Auto Zone** Main Menu:*



3. Press "1" to Enter the *"Job Programming"* menu. Program Jobs as described in *"Manual Mode Programming"* section in this manual (page 18).
4. Press "2" to program a Start Time and then press "3" to program a Stop Time for this Auto Zone. Program time in 24 hour format.
   The following programming screen will appear:

TIME VARIABLE = 00:00
ENTER 24 HOUR FORMAT
F = ENTER NEW TIME
NEW TIME VAR. = 17:43

5. Press "F" to Save and Exit to the Auto Zone menu.

6. Press "4" to enter the *Interval Menu*. The user will program the ***Interval Time and the Pass Count*** in this menu.
   The following programming screen will appear:

PASS INTERVAL = 000 MIN
CHANGE TIME = 0 TO 9
ENTER TIME = F KEY
NEW INTERVAL = 045 MIN

7. Enter needed *Interval Time* (001 to 255 min.). Press "F" to Save and Exit.

NUMBER OF JOBS 03
ENTER THE PASS COUNT
THEN F KEY TO ENTER
TOTAL PASS COUNT 002

8. Enter the *Pass Count* desired for this Auto Zone (000 to 099 passes).
9. Press "F" to Save and Exit to the *Auto Zone Menu*. Press "0" to enter another Auto Zone program (1-E).

ENTER AUTO ZONE NUMB
1 THRU E TIME ZONE #
TO ENTER AUTO MODE
PRESS THE F KEY

10. Press "0" to enter another Auto Zone program (1-E).

11. Once all needed Auto Zones are programmed, press "F" in Auto Zone Main Menu to enter the ***Auto Mode Run*** *Menu*.

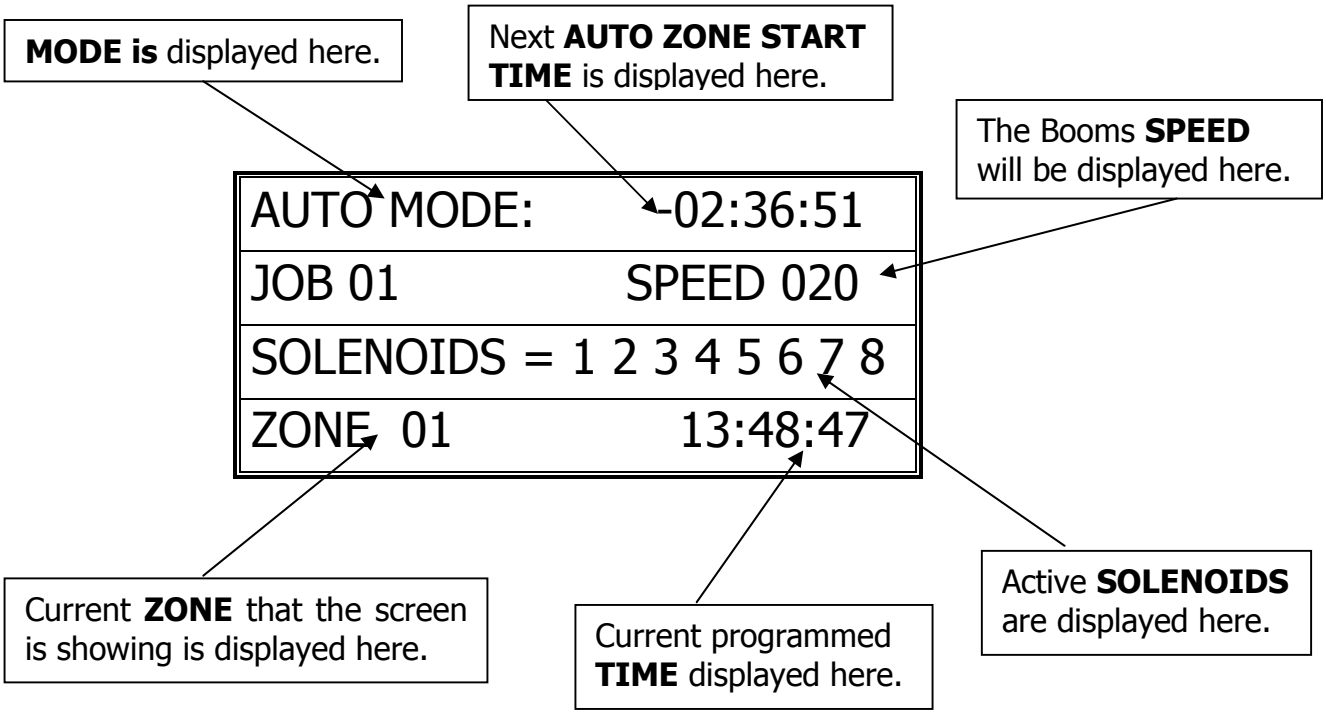
TO CHANGE ACTIVE
ZONES 1 3 56 8 ABC E
PRESS KEYS 1 THRU E
0 KEY EXIT, F KEY RUN

Toggle the **ACTIVE AUTO ZONES** On & Off by pressing the 1 thru E keys

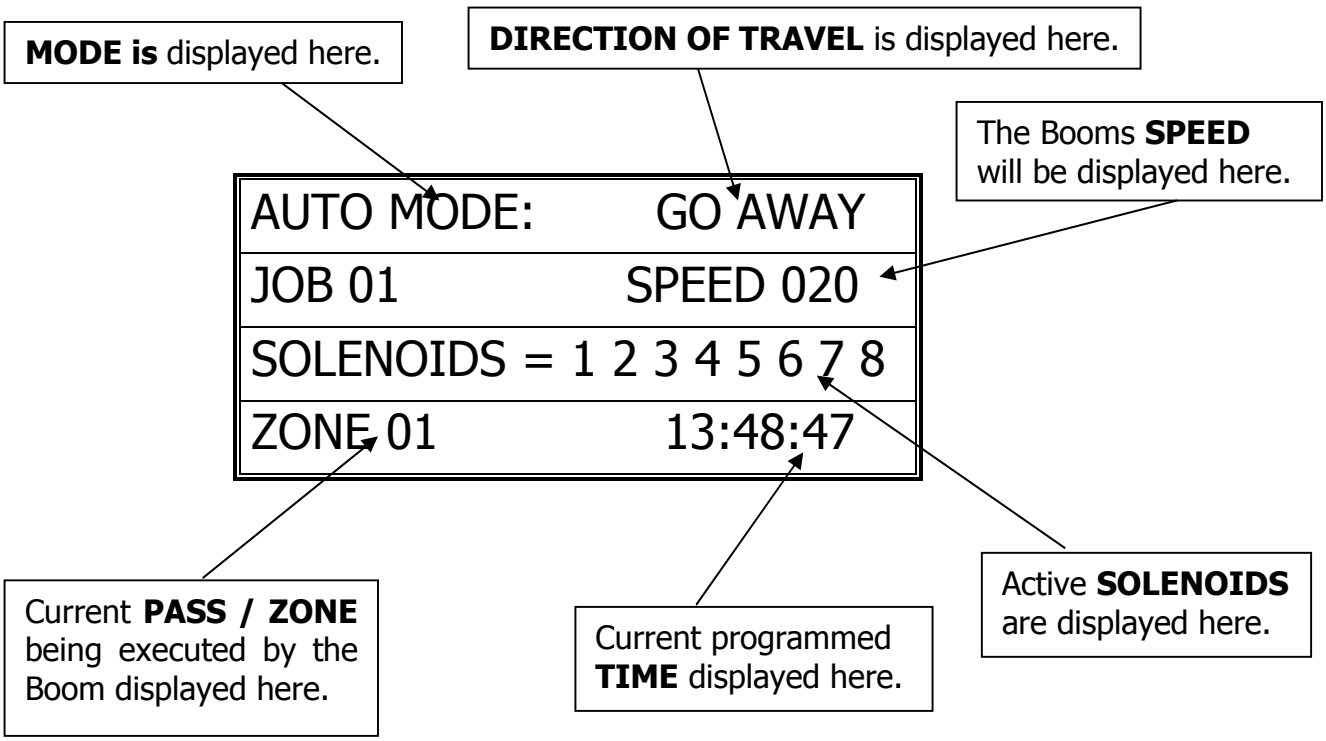
******Program all needed Auto Zones before Pressing "F" to enter the Auto Mode Menu******

12. Enter the number of Auto Zones desired (1 thru E) and press "F" to ***RUN***.

*Exploded view of the **Auto Mode <u>Idle</u>** Screen:*



*Exploded view of the **Auto Mode <u>Run</u>** Screen:*



13. ***Press "0" to SUSPEND*** the Booms Auto Mode Run.
    Press "0" again to RESUME the Booms operation.
14. ***Press "E" to STOP*** the Boom and Exit to the Auto Mode menu.

****** Before calling Tech Service, please try to RESET the Controller first. This will sometimes solve problems and is an easy step to correcting the problem before calling Tech Service. If the NIC is "locked-up", this will usually work to get the Controller functional again. Otherwise contact CCSI. ******

One way to RESET the controller is to press the RESET button on the board (shown in the Mother Board diagram on the "Wiring Diagrams" pages). If there is not a button, there will be two pins; jump them together with the tip of a flathead screwdriver and that will RESET the controller as well. Another way of resetting it is by pressing 0 and F simultaneously. The NIC will stop the present operation and ask for a four-digit code. If you press (7638), the NIC will perform a software reset. All information will be lost, including all setup information. If you press (4273), the NIC will perform a hardware reset. Again, all information will be lost. If the wrong code is entered or E is pressed, the NIC will resume operation where it left off.

Note: ***Resetting this way is helpful if you are having difficulty making the remote keypad respond.***

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Network Irrigation Controller
"NIC"
Jobbing w/ Magnets
Version A.28

USERS MANUAL

CHERRY CREEK SYSTEMS
Greenhouse Equipment Specialists

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Cherry Creek Systems
2675 Akers Drive
Colorado Springs, CO 80922
Toll Free 877-558-3246
www.cherrycreeksystems.com

Dear Customer:

We would like to thank you for purchasing our "Magnet Jobbing" program! The greatest possible care went into making this program as user friendly as possible while still keeping all the functionality that you have come to expect.

We would welcome and encourage you to make suggestions as to how we can improve this Users Manual. It is our intent to provide you with the highest quality equipment and state-of-the-art watering systems, as well as first rate technical follow up support.

If it is the 1st time setting up the Boom, then it is advisable that you follow this order in working through the manual:

1. ***Key Concepts***
2. ***Initial Power Up***
3. ***Diagnostics***
4. ***Setup***

Again, thank you for your business and we look forward to assisting you in any way we can. Please feel free to give us a call, or contact us via email.

Sincerely,

Cherry Creek Systems Team

Key Concepts
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C = Left / Forward
D = Right / Back

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Basically, there are 4 steps:

1. Set-up Home Position (Home stop)
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3. Set-up the number of Jobs to be executed (number of Job magnets)
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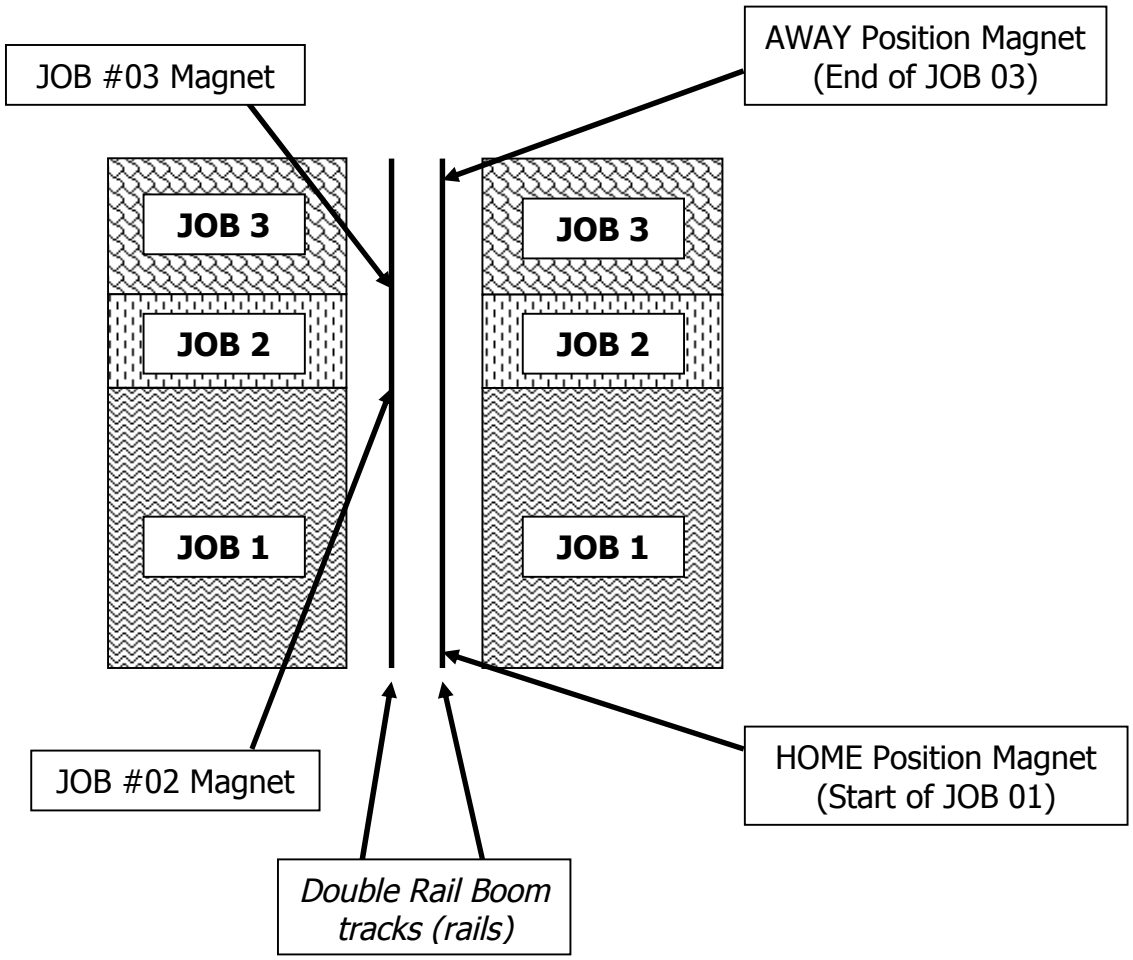


Main Menu:

**** To get to the main menu from almost anywhere, press "E" repeatedly. This manual starts from the main menu to get to the other menus. ****

1=AUTO	2=MANUAL
3=DIAG	4=
5=	6=SETUP
NIC-A.28	23:59:59

Other Definitions:

FPM: Feet-Per-Minute; the speed that the Boom uses as a reference.
Idler Diameter: Diameter of the wheel that is used for the speed and motion sensing.
Acceleration: Speed setting that the Boom will "take off" when starting a programmed irrigation cycle, or as the Boom turns around to initiate another pass.
Pass: The setting that will tell the Boom what a "Pass" is and can be set to either 1 or 2. By default, the Boom goes from Home to Away, then back Home as ONE pass. If you change this setting to 1 pass, then the Boom will go from Home to Away and stop.
Proximity Sensor: Sensor used to read Speed & Motion using tics.
SW-IN: Switch Inputs. There are 8 Switch Inputs for the NIC.
Home Sensor: The external switch (magnet sensor) which when triggered by a magnet sends input to the NIC that the boom has reached the Home or Start position.
Away Sensor: The external switch (magnet sensor) which when triggered by a magnet sends input to the NIC that the boom has reached the Away or End position.
Job: A growing "Area" or "Zone". This Area can be a bench, tray, flood floor, etc. The NIC can manage up to 60 Jobs in a bay. The controller can recognize up to 59 magnets in a bay and effectively change speed and which solenoid outputs are active at each magnet.
Remote Start: The NIC has the capability of being Started Remotely using a 24VAC Relay (EX16) that is linked to an Environmental Control System of the users choosing. The System can be set to start the Boom given certain parameters programmed into the Environmental System (RH, RAD SUM, TEMP., VPD, etc.).

External Switch Definitions

- **SW1** – **Home** magnetic sense switch. **(mandatory)**

The Boom will stop at the Home position or turn around and head in the Away direction once the sensor detects this magnet.

- **SW2** – **Away** magnetic sense switch. **(mandatory)**

The Boom will stop at the Away position or turn around and head in the Home direction once the sensor detects this magnet.

- **SW3** – **Jobbing** magnetic sense switch. **(mandatory)**

This switch will be used to "sense" the Job magnets and tell the controller when to change the Booms operation as programmed by the user.

- **SW4** – **Collision Switch**. This switch input must be closed at all times to allow the Boom to run. The inputs may be connected to an object detection (IR Sensor) or Collision Switch that will open the normally closed circuit when an object is detected in the path of the boom. A simple jumper wire between the SW4 & GRD terminal connections may be used keep the switch permanently closed which will allow the boom to run.

- **SW5 & SW6** – **Remote Auto Start Switches.** Used in conjunction w/ a 24VAC Relay to start the Boom "Jobs" via an Environmental Control System (Priva, Argus, Wadsworth, etc.).

- **SW7** – **Remote Home Switch.** Used to move the Boom in the Home direction with a remote switch. The remote away switch (SW8) is required to operate the boom in the remote mode. Refer to SW8 description for the operation and function of SW7.

- **SW8** - **Remote Away Switch.** Used to move the boom in the away direction with a remote switch. If the boom is in the main or manual menu the boom may be moved using the remote home and away switch option. When the boom is stopped, pressing the home or away switch will start the boom moving at 10 Feet Per Minute (FPM) in the respective direction. Pressing the same switch again will increase the speed by 10FPM. If the switch is pressed repetitively the speed may be increased up to 150FPM. To stop the boom, press the other switch once.

Updates and Features

Network Irrigation Controller A.28 "Jobbing"

MODULAR DESIGN: Two circuit boards, a processor and a power board, for increased flexibility and maintenance.

UPGRADEABLE: As processing requirements increase over time, the base can be upgraded with faster processors and larger memory.

REDUCED POWER CONSUMPTION: Advanced CMOS design and LCD backlight control will keep unit running cooler during the hottest days.

EXPANDED OUTPUT CONTROL: 8 water solenoids are standard. A ninth 115 volt AC switch output can be used to control high voltage devices directly, such as lights.

EXPANDED INPUTS: 8 switch inputs are available. Currently 3 inputs are used for: home, away, and job.

SOLENOID SHORT PROTECTION: Resettable fuses protect solenoid power or other power out from the controller. Once the short is removed the controller will operate normally.

NETWORK INTERFACE: Built in serial network gives the option to communicate to remote locations.

REMOTE NETWORK KEYPAD/DISPLAY: An optional keypad and LCD display is available to operate the controller from a remote location, such as the aisle.

PROXIMITY SPEED SENSOR: A proximity sensor monitors the precise speed. Closed loop ensures precise speed control.

ACCURATE SPEED CONTROL: Boom speed is specified in feet per minute. Each boom will run at the same speed as another boom operating at the same set speed, providing there is no slippage of the wheel, which is used for speed sensing.

WIDE SPEED RANGE: Accurate speed control from 5 to 150 feet per minute with an 11:1 gear ration for all modes. A new speed control formula provides increased power to the boom with smooth startup and slows down modes. An acceleration mode has been added to increase the startup torque for larger booms.

MENU DRIVEN: Multiple menu levels to permit easy selection of options. Each menu prompts the operator with the options available in that menu.

14 INTERLEAVED AUTO TIME ZONES: Up to 14 time zones can be selected to run at separate times or simultaneously. When running simultaneously a scheduler will sequentially scan each zone for active periods (with 1 being of greatest priority). Time zones have a start time and a stop time with up to 225 minutes between beginning of watering cycles. Up to 60 jobs may be set in each direction for each time zone.

MANUAL MODE: Up to 60 jobs in each direction. Up to 99 passes may be selected.

DIAGNOSTIC MODE: Test the keypad, external switches and proximity sensor, the 24-volt solenoid drivers, the 115-volt switch, the motor, and network.

SELECTABLE IDLER WHEEL DIAMETER: To maintain accurate speed control the diameter of the idler wheel may be selected as 1.0", 2.0" or 2.5" in diameter.

Diagnostics

If it is the 1st time setting up the Boom, it is highly recommended that you go through the diagnostic menu, BEFORE YOU SET-UP YOUR BOOM. This process will insure all of the inputs are functioning properly and that nothing was damaged during shipping.

Note: From most any menu on the NIC, you can get back to the Main Menu by pressing the "E" key repeatedly.

1. From Main menu, press 3 for DIAG

Diagnostics Menu:

1= KEY	2 = SW-IN
3= SOL	4 = MOTOR
5=	6 =
7=	E = EXIT

Quick Menu/ Keypad Number Reference

Keypad test

(Main, 3, 1)

In this menu you can press each key to check if all the keys are working.

1. From the Main menu press 3
2. From the Diagnostics menu press 1 (KEY):

KEYPAD DIAGNOSTIC.
TO END PRESS E TWICE
KEY NUMBER = F

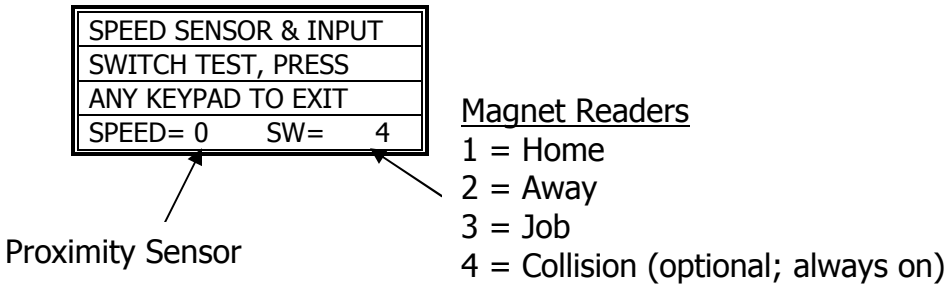
3. Press any keys on the keypad to see them displayed on the display.
4. Press the "E" key repeatedly to return to Main menu.

Testing your inputs (sensors)

(Main, 3, 2)

In this menu you can check to see if the booms Proximity (speed) Sensor and Magnet Readers are working properly.

1. From the Main menu press 3
2. From the Diagnostics menu press 2 (SW-IN):



3. **Proximity Sensor** – For the speed sensor, gently push the boom. As you are pushing, look behind the "SPEED=0" and you should see it alternate between "1" and "0".

4. **Magnet Readers** – You should have 3 magnet readers on your boom. Home, Away & Jobs. The Home & Away will be on one side of the boom (pointed at the rail) and the Job Sensor will be on the other side (again, pointed at the rail). To check readers 1, 2 or 3 wave a magnet in front of each one. You should see the display show a "1", "2" or "3". Switch "4" will always appear, unless the Collision Sensor is used.

   ** For more information on the switch failures please reference the "Trouble Shooting" page for more info **

5. Press the "E" key repeatedly to return to Main menu

Solenoids

(Main, 3, 3)

1. From the Main menu press 3
2. From the Diagnostics menu press 3 (SOL):

SOLENOID OUT TEST
PRESS E KEY TO EXIT
TO SET/RESET KEY 1-8
SOLENOIDS = 12345678

3. Press the "1" through "8" keys to alternately turn on and off the respective solenoid valves.
4. Press the "E" key repeatedly to return to Main menu

Motor Test

(Main, 3, 4)

1. From the Main menu press 3
2. From the Diagnostics menu press 4 (MOTOR):

MOTOR MOTION TEST
PRESS A=HOME B=AWAY
PRESS E KEY TO EXIT
SPEED(5-150) = 020

3. Use the "0" through "9" keys to enter a speed from 5 – 150 FPM (Feet-Per-Minute). * Recommended Speed: 25-50 FPM for testing *
4. Press the "A" or "B" key to move the boom either home or away**.**

NORM DIAG MOTOR MOVE
NORMAL A=HOME B=AWAY
PRESS E KEY TO EXIT
SPEED (5-150) = 020

5. Press the "E" key repeatedly to return to Main menu

Set-Up

If you are setting up for the first time, please go through your *diagnostics* menu first, before proceeding with Setup.

Clock

(Main, 6, 1)

1. From Main menu press 6
2. From Setup menu press 1 (CLOCK)

TIME VARIABLE= 23:59
ENTER 24 HOUR FORMAT
E = ENTER NEW TIME
NEW TIME VAR.= 00:00

3. To zero the time, press the "0" key several times.
4. Use the "0" through "9" keys to enter the current time on the bottom row.
5. Press the "E" several times to return to main menu.

Idler Diameter Menu

(Main, 6, 2)

1. From Main menu press 6
2. From Setup menu press 2 (IDLER)
3. The Idler Menu will appear.

DIAMETER IS 2.5 INCH
PRESS F = EXIT OR
0=2.0 1=1.0 OR 5=2.5
SET MOTION ERROR = B

Cherry Creek Booms

Tower Boom	= 2.5 inch idler
Double Rail Boom	= 2.0 inch idler
Single Rail Boom	= 1.0 inch idler

*** Tic Counter on all CCS Booms = 10 or 12 tooth sprocket ***

4. Pressing numbers 0, 1, or 5 will change the boom type (idler diameter). Please note that the correct size for your particular Cherry Creek Systems boom is shown in the table above. *Call CCS for clarification of your system.*
5. Select the correct type of boom press "F" to Save and Exit.
6. While in the Idler Diameter screen, press "B" to change the Motion Error time out (the amount of time the Boom will increase power before going into Motion Error).

SET MOTION ERR. TIME
VALID DEL = 0.1 --> 6.0
DELAY IS 2.0 SECONDS
SAVE & EXIT PRESS F

7. The Motion Error will be set to 2.0 seconds by default. But the time can be changed to any value between 0.1 and 6.0 seconds. If the boom is experiencing "Motion Errors" without just cause, then increase the timeout. If it is necessary that the boom stops easier, decrease the timeout. Typical applications call for 2.0 to 3.0 seconds.
8. Press "F" to exit and save.

Acceleration

(Main, 6, 3)

**** It is recommended that the Acceleration factor is increased if the Boom is having trouble when it changes direction of travel. ****

1. From Main menu press 6
2. From Setup menu press 3 (ACCEL)

ACCELERATION FACTOR
F = SAVE AND EXIT
ENTER 0 THROUGH 14
ACCEL FACTOR IS 00

3. Set Acceleration factor from 0 to 14 (0 being NO Acceleration and 14 being Full Power). Trial and error will give the user an idea of what will work for their situation.
4. Press "E" to Save and Exit.

Pass Mode

(Main, 6, 4)

1. From Main menu press 6
2. From Setup menu press 4 (PASS)

PRESS 0, SOLENOID ON
PRESS F, CHANGE PASS
PRESS E TO END
NORM. 2 PASS, SOL OFF

Norm. 2 Pass, Sol. OFF = Home to Away, then back to Home w/ Solenoids Off
Two Pass and Sol. ON = Home to Away, then back to Home w/ Solenoids On
One Pass and Sol. OFF = Home to Away w/ Solenoids Off. Will STOP @ Away
One Pass and Sol. ON = Home to Away w/ Solenoids On. Will STOP @ Away

3. By default the NIC will be set to Normal 2 Passes. This will mean that the Boom will start its irrigation cycle at Home, run the length of the bay to the Away point, then turn around and run the length of the bay back to Home. If the user wants the Boom to see a "Pass" as Home to Away and stop, then it should be changed to read "One Pass Sol. ON".
4. Press "0" to toggle the Solenoids on and off; note the bottom line on the screen will change. Press "F" to toggle the Pass Mode from 1 Pass to 2 Passes.
5. Press "E" to Save and Exit.

Power Setting

(Main, 6, 5)

**** It is recommended that the Power Factor (60HZ) is not changed. The Boom may not function as designed if this is changed. Call CCS for info. ****

1. From Main menu press 6
2. From Setup menu press 5 (POWER)

POWER BOARD ID STAT
AC LINE FREQ = 60HZ
POWER BOARD IS TRANS
PRESS ANY KEY TO END

3. This screen (setting) is for reference only. To change, please contact CCS for recommendations.
4. Press "E" to Save and Exit.

Network Enable

(Main, 6, 6)

*** Contact Cherry Creek to better understand the ***Network*** feature ***

1. From Main menu press 3
2. Press 6 to enter Network Menu

NETWORK ENABLED
PRESS F KEY TO STEP
THRU NETWORK/DISPLAY
PRESS E KEY TO EXIT

3. Press "F" to scroll thru the Network options.
4. There are 3 settings to choose from:
   - o No Network or Display, Network Enabled, External Display On

NETWORK ADDRESS MENU
ENTER NEW ADDRESS, &
PRESS F KEY, CONTINUE
NETWORK ADDRESS= 001

5. If enabled, the next screen will prompt the user to assign a 3-digit address to each Boom (for use with the Cherry Creek Network Accumulator). *Call CCS for details.*
6. Press "F" to Save and Exit.

Global Networking Feature

(Main)

* Contact Cherry Creek to better understand the ***Global Network*** feature *

Before this step, the Networking Feature needs to be enabled
Refer to "Network Enable"

1. After setting up the Network Enable, the Main screen will show the Boom Network Address on the screen as shown below.

1 = AUTO	2 = MANUAL
3 = DIAG	4 =
5 =	6 = SETUP
NIC A.28	102 23:45:09

Boom Network Address
** NO (2) Booms can have the same Network Address **

2. The NIC will then search for the Network signal and await Commands.
3. Press any key to Exit.

Remote Start (Environmental Controlled Start)

(Main, 6, 7)

* Contact Cherry Creek for info on wiring the ***Remote Start*** feature *

1. From Main menu press 6
2. From Setup menu press 7 (REMOTE)

BIC/NIC OPTION BOARD
WAS NOT FOUND.
PRESS E KEY = EXIT
F KEY = ALT. E X. SW.

3. By default the NIC will be set to NO Remote Start. The NIC will automatically search for a "Option Board" (a separate Remote Control that will enable the user to access any Boom from a central control station). By pressing "F" the NIC will be set to accept a Remote Start signal from the Environmental Control System. The following screen will appear:

SW5: ALTERN. REMOTE
OPTION HAS BEEN SET
PRESS ANY KEY TO EXIT

4. Press any key to Exit. The next screen will be the Remote Run Screen. This will show the Booms current function and scroll thru the awaiting Remote Start Jobs. The following screen will appear:

ALTERNATE REMOTE
JOB 01 SPEED 000
SOLENOIDS = 12345678
PASS 01 12:42:30

5. Press "0" to suspend the Remote Start until it is prompted to start again. Press "0" again to resume Remote operation.
6. Press "E" to Save and Exit.

Operations

Manual Mode Programming (Jobs)

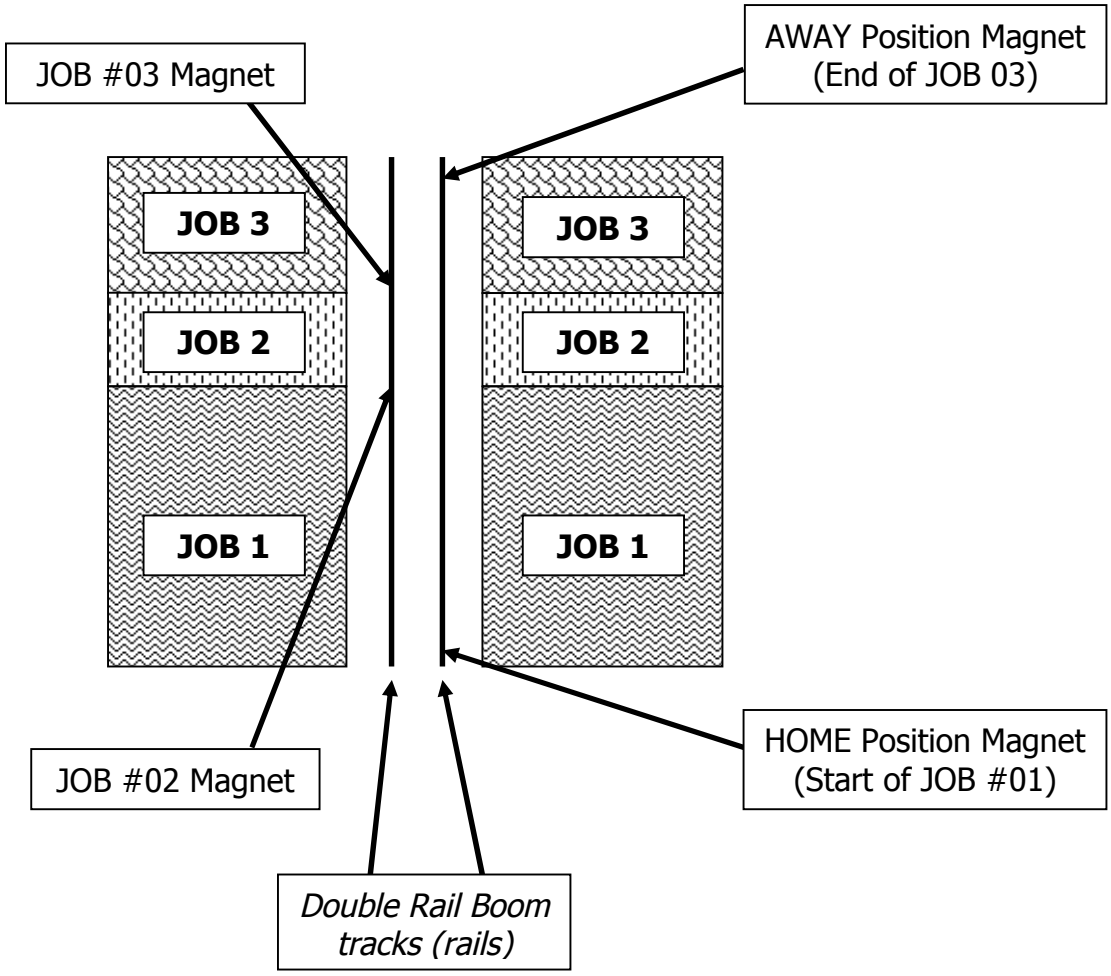
(Main, 2, 1)

Quick Menu/ Keypad Number Reference

** There are up to **60 JOBS** that can be programmed in the **Manual Mode** **

In order to function properly, the Number of JOBS programmed must correspond with the Number of Job magnets on the rail. If this is not done, the "JOB COUNT ERROR" will appear on the screen and stop the Booms operation until corrected. JOB 01 starts at the Home Magnet and end when the Boom sees the first JOB Magnet (JOB 02 Magnet). JOB 02 starts at the first JOB magnet and ends at the next JOB Magnet…..et cetera…..

As shown in drawing below:

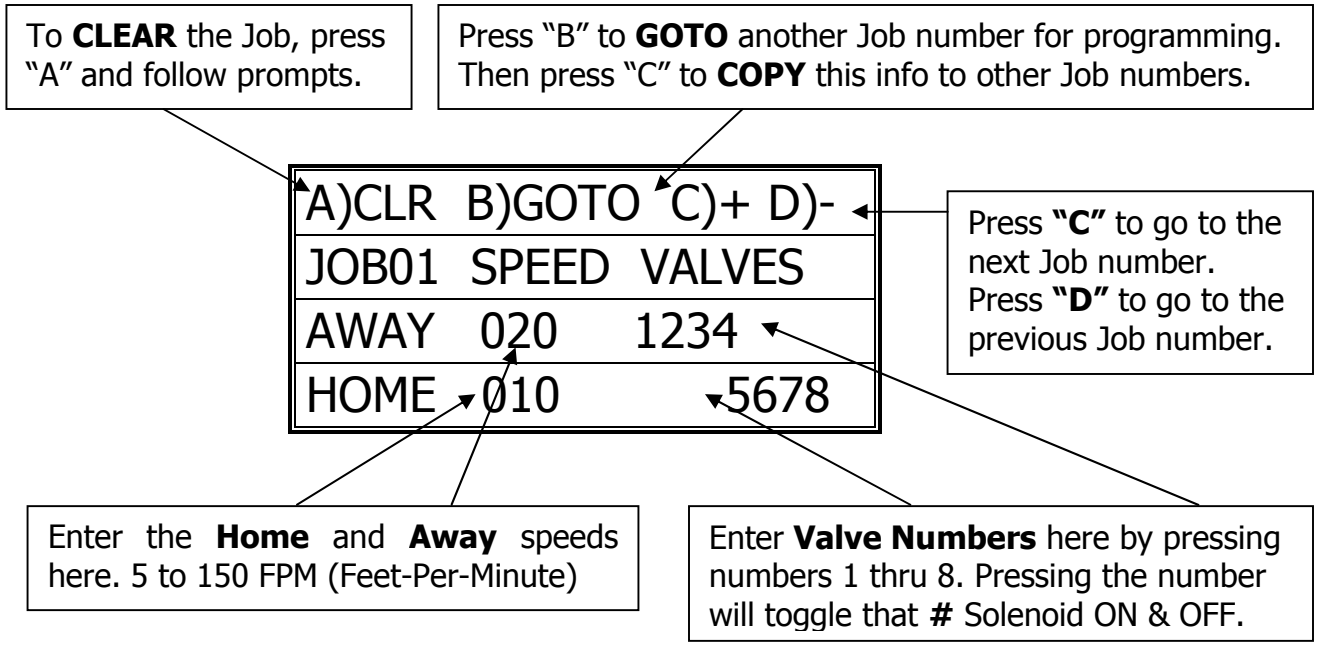


1. From the Main Menu press 2 for Manual. The following screen will appear:

MANUAL MODE:
ENTER 1 FOR JOBS
ENTER 7 TO BEGIN
ENTER E TO EXIT

2. Press "1" to enter the Jobs Programming screen.
3. The black cursor will scroll thru the screen by pressing "F" to move forward, and "D" to move back.

*Exploded view of the **Manual Mode Programming** Screen:*



4. Program the Job as desired per the user application and press "F" to scroll to the next Job for programming. If, for example, only JOB #01 is needed, the cursor must toggle to the next Job (DO NOT program that next Job), then **press "E" to go to the Pass Count** menu. If the cursor is not toggled to the next Job screen, that last Job programmed will not be saved and will not run. This will also result in a "JOB COUNT ERROR" and stop the operation of the Boom until the problem is fixed.

NUMBER OF JOBS 03
ENTER THE PASS COUNT
THEN F KEY TO ENTER
TOTAL PASS COUNT 005

5. Enter the Number of ***Passes*** that the Boom needs to run over the crop. Remember that a Pass is defined by the user in the Set-Up menu. The actual number of Passes that the Boom will make back and forth is effected by the users definition of a "PASS".
   The ***Pass Count*** can be set from 001 to 099 passes. Depending on the application, it is common to assign 2 to 10 passes to saturate the crop below the Boom.
6. Press "F" to Save and Exit back to the Manual Mode main menu.

Manual Mode Run (Jobs)

(Main, 2, 7)

1. From Main menu press 2 for Manual. The following screen will appear:

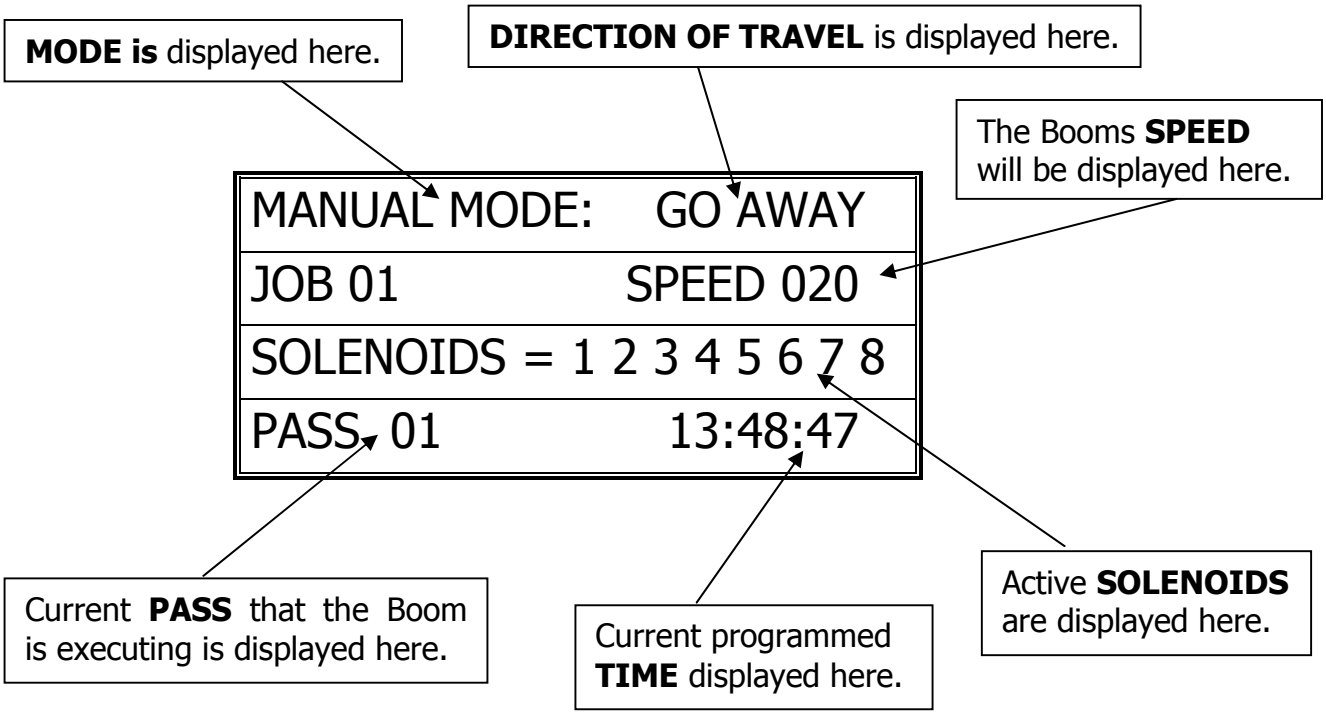
MANUAL MODE:
ENTER 1 FOR JOBS
ENTER 7 TO BEGIN
ENTER E TO EXIT

2. Make sure that the Boom is started (BEGIN) when the ***Home Magnet Reader*** is under the Home Magnet. To locate the boom at the home position, go into the Diagnostics menu and send the Boom Home, the Boom will stop under the Home magnet, ready for its next command.

3. Press ***"7" to BEGIN the Manual Mode Run***. The screen will show the following information during the Irrigation Cycle:

(NEXT PAGE)

*Exploded view of the **Manual Mode Run** Screen:*



7. ***Press "0" to SUSPEND*** the Booms Manual Mode Run.
   Press "0" again to RESUME the Booms operation.
8. ***Press "E" to STOP*** the Boom and Exit to the Manual Mode menu.

Auto Zones (Time Activated Programming)

(Main, 1, enter 1-E)

Auto Zone = A specific period of time that will activate the Booms operation as programmed.

Jobs = Number of Jobs that the programmed Auto Zone will execute.

Start Time = Time that the Boom will Start this Zones Auto Program execution.

.

Stop Time = Time that the Boom will Stop this Zones Auto Program execution.

Interval = Amount of minutes between Pass execution.

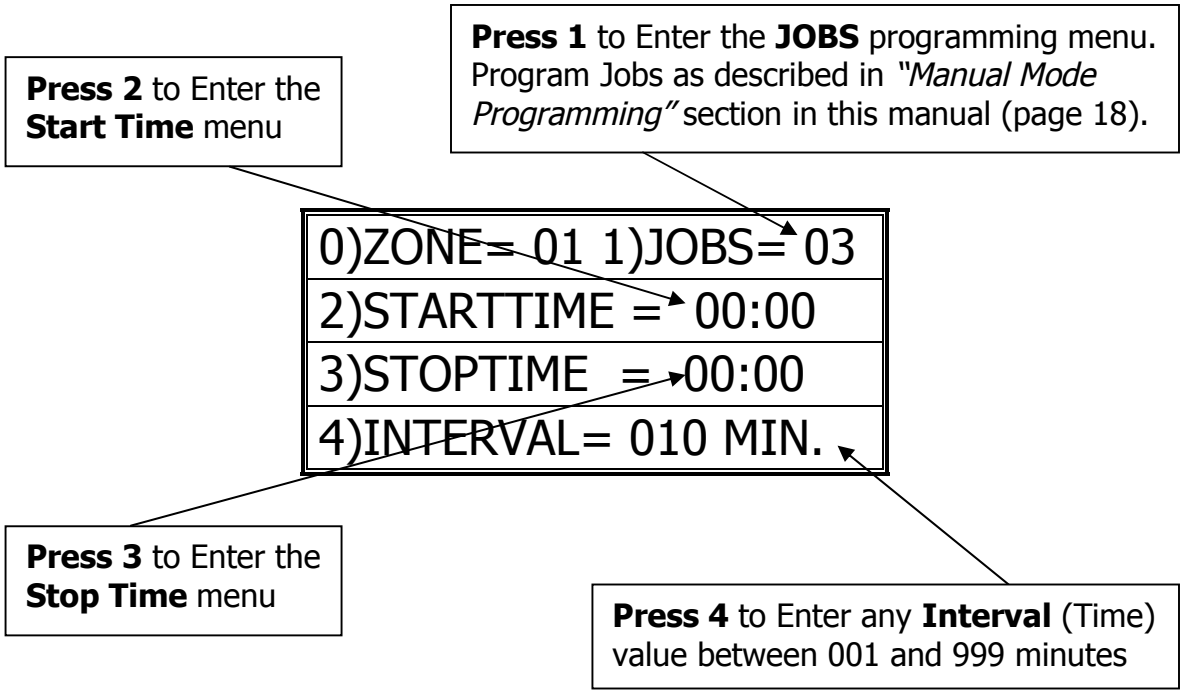
Pass = Starts at Home, goes to Away, then turns around and comes back Home.
* *Unless programmed differently by the user under the Set-Up menu.*

1. From the Main Menu Press 1 (AUTO)

ENTER AUTO ZONE NUMB
1 THRU E TIME ZONE #
TO ENTER AUTO MODE
PRESS THE F KEY

2. Enter the Auto Zone Number 1 thru E (14 Zones total) to be programmed.
   The following screen will appear:

*Exploded view of the **Auto Zone** Main Menu:*



3. Press "1" to Enter the *"Job Programming"* menu. Program Jobs as described in *"Manual Mode Programming"* section in this manual (page 18).
4. Press "2" to program a Start Time and then press "3" to program a Stop Time for this Auto Zone. Program time in 24 hour format.
   The following programming screen will appear:

TIME VARIABLE = 00:00
ENTER 24 HOUR FORMAT
F = ENTER NEW TIME
NEW TIME VAR. = 17:43

5. Press "F" to Save and Exit to the Auto Zone menu.

6. Press "4" to enter the *Interval Menu*. The user will program the ***Interval Time and the Pass Count*** in this menu.
   The following programming screen will appear:

PASS INTERVAL = 000 MIN
CHANGE TIME = 0 TO 9
ENTER TIME = F KEY
NEW INTERVAL = 045 MIN

7. Enter needed *Interval Time* (001 to 255 min.). Press "F" to Save and Exit.

NUMBER OF JOBS 03
ENTER THE PASS COUNT
THEN F KEY TO ENTER
TOTAL PASS COUNT 002

8. Enter the *Pass Count* desired for this Auto Zone (000 to 099 passes).
9. Press "F" to Save and Exit to the *Auto Zone Menu*. Press "0" to enter another Auto Zone program (1-E).

ENTER AUTO ZONE NUMB
1 THRU E TIME ZONE #
TO ENTER AUTO MODE
PRESS THE F KEY

10. Press "0" to enter another Auto Zone program (1-E).

11. Once all needed Auto Zones are programmed, press "F" in Auto Zone Main Menu to enter the ***Auto Mode Run*** *Menu*.

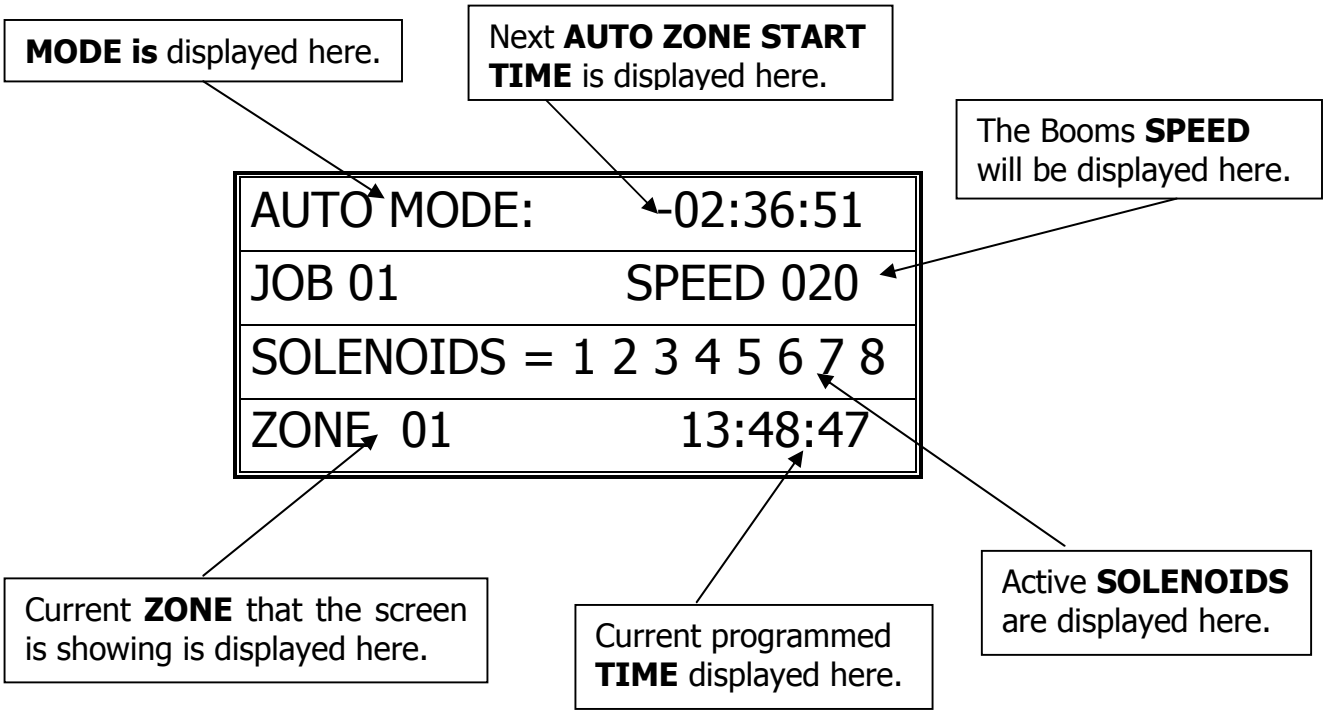
TO CHANGE ACTIVE
ZONES 1 3 56 8 ABC E
PRESS KEYS 1 THRU E
0 KEY EXIT, F KEY RUN

Toggle the **ACTIVE AUTO ZONES** On & Off by pressing the 1 thru E keys

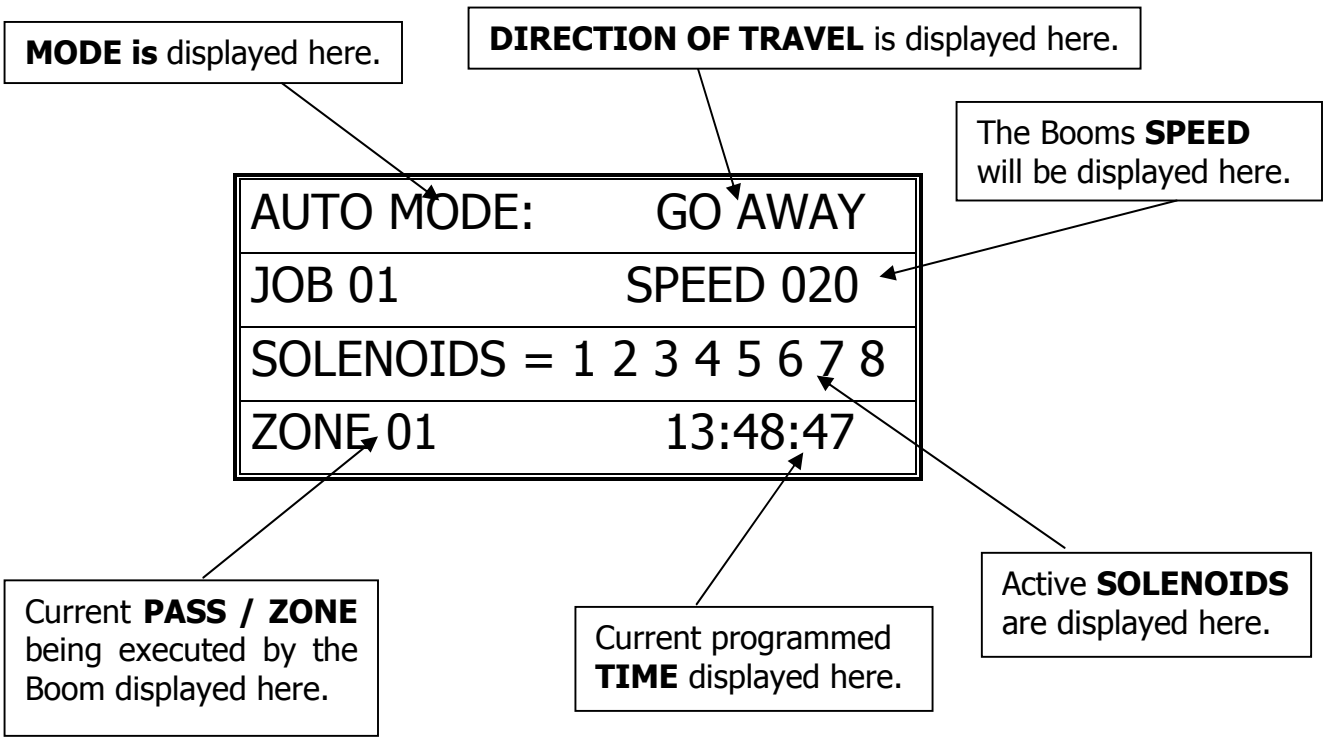
******Program all needed Auto Zones before Pressing "F" to enter the Auto Mode Menu******

12. Enter the number of Auto Zones desired (1 thru E) and press "F" to ***RUN***.

*Exploded view of the **Auto Mode <u>Idle</u>** Screen:*



*Exploded view of the **Auto Mode <u>Run</u>** Screen:*



13. ***Press "0" to SUSPEND*** the Booms Auto Mode Run.
    Press "0" again to RESUME the Booms operation.
14. ***Press "E" to STOP*** the Boom and Exit to the Auto Mode menu.

Troubleshooting and Support

Motion Error:

- Check Proximity (Motion) Sensor for damage and function.
- There will be a yellow light (located at the base of the sensor body) that should turn on when the sprocket teeth pass the sensor head. If there is no light fluctuation, then check that the sensor is within 3 mm. (millimeters) of the sprocket teeth as they pass.
- If the sprockets teeth are within 3mm, check the functionality of the Proximity (Motion) Sensor. *Refer to the Diagnostics part of this manual for testing sensor inputs.* If the sensor is not functional or broken, please call Cherry Creek to purchase a new sensor.

Collision Error:

- The NIC has the option of using a Collision Sensor to stop the boom if it runs into any objects that might be in the bay (carts, shelves, trash cans, people, etc.). This is an *Option* that can be purchased from CCS at any time. Call Cherry Creek for more info.
- If the boom is not equipped with the Collision Sensor option, there needs to be a jumper wire in Switch #4. To check this, open the NIC lid, pull the keypad ribbon and set the lid aside. Look at the Terminal Blocks that run down the left side of the Main Board (black "blocks" with colored wires running into them). Pull the second-from-the-top 6 pin Terminal Block from the board (labeled J2 or JT2). There will be writing on the Main Board for the switch #. Make sure the jumper wire is in place in the Block. The jumper wire should connect to Switch #4 and the Ground (GRD) that is directly above SW4.
- *If the Boom **is** equipped with the Collision Sensor Option*, then:
    - Check the Collision Sensor for damage and function.
    - *Refer to the Diagnostics part of this manual for testing sensor inputs.* If the sensor is not functional or broken, please call Cherry Creek to purchase a new sensor.

Job Count Error: *(Actual Jobs Exceeded Stored Programmed #)*

- Check Jobbing Magnet Reader for damage and function.
- Check to make sure that all the Job magnets are in the correct placement as to the programmed amount of Jobs.
- Also check to make sure that the *Number* of Jobs programmed is the same as the amount of Job magnets on the rail (minus the first Home Magnet).
- Test the functionality of the Marker Magnet Sensor. *Refer to the Diagnostics part of this manual for testing sensor inputs.* If the sensor is not functional or broken, please call Cherry Creek to purchase a new sensor.

****** Before calling Tech Service, please try to RESET the Controller first. This will sometimes solve problems and is an easy step to correcting the problem before calling Tech Service. If the NIC is "locked-up", this will usually work to get the Controller functional again. Otherwise contact CCSI. ******

One way to RESET the controller is to press the RESET button on the board (shown in the Mother Board diagram on the "Wiring Diagrams" pages). If there is not a button, there will be two pins; jump them together with the tip of a flathead screwdriver and that will RESET the controller as well. Another way of resetting it is by pressing 0 and F simultaneously. The NIC will stop the present operation and ask for a four-digit code. If you press (7638), the NIC will perform a software reset. All information will be lost, including all setup information. If you press (4273), the NIC will perform a hardware reset. Again, all information will be lost. If the wrong code is entered or E is pressed, the NIC will resume operation where it left off.

Note: ***Resetting this way is helpful if you are having difficulty making the remote keypad respond.***

TECHNICAL ASSISTANCE: ***If you have any questions regarding the use of this program or any other Cherry Creek Systems Product please call us at .....***

(719) 380-8373 ext. 206

OR

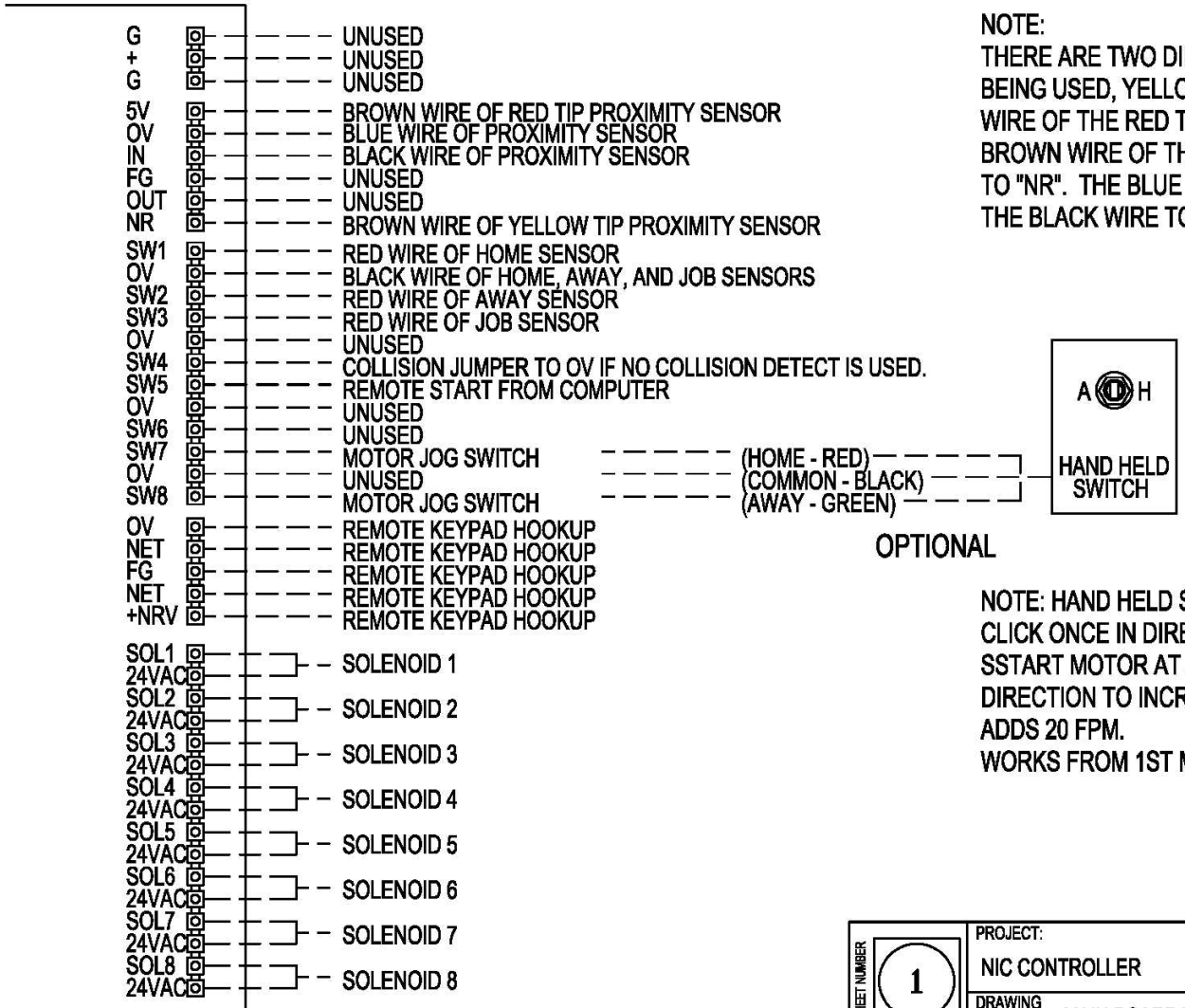
ccs@cherrycreeksystems.com

OR

info@cherrycreeksystems.com

OR

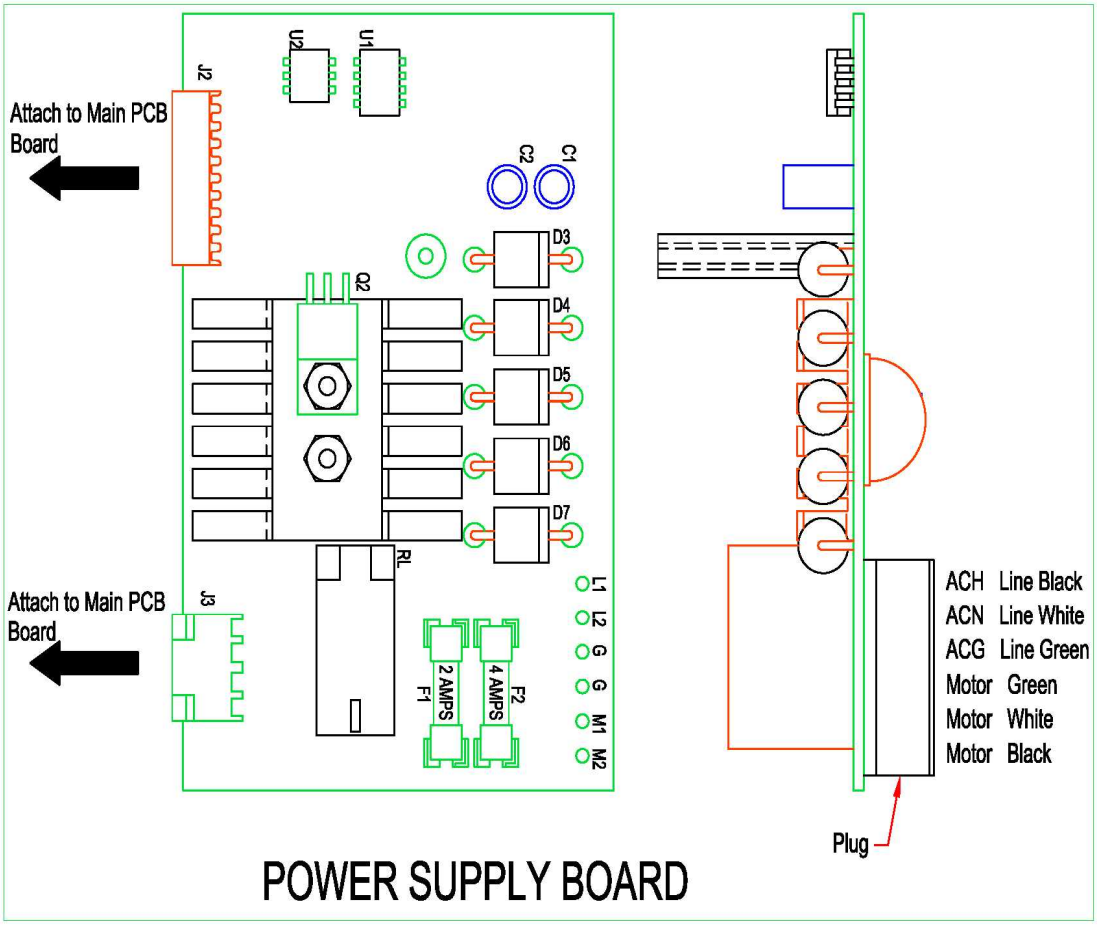
www.cherrycreeksystems.com



NOTE:
THERE ARE TWO DIFFERENT PROXIMITY SENSORS BEING USED, YELLOW TIP AND RED TIP. THE BROWN WIRE OF THE RED TIP IS CONNECTED TO "5V" AND THE BROWN WIRE OF THE YELLOW TIP IS CONNECTED TO "NR". THE BLUE WIRE IS ALWAYS TO "OV" AND THE BLACK WIRE TO "IN".

NOTE: HAND HELD SWITCH OPERATION -
CLICK ONCE IN DIRECTION (HOME OR AWAY) TO SSTART MOTOR AT SLOW SPEED. CLICK IN SAME DIRECTION TO INCREASE SPEED, EACH CLICK ADDS 20 FPM.
WORKS FROM 1ST MENU.

SHEET NUMBER 1	PROJECT: NIC CONTROLLER	CUSTOMER .	CHERRY CREEK SYSTEMS INC Greenhouse Equipment Specialists
	DRAWING TITLE: MAIN BOARD WIRING DIAGRAM		
Scale: NONE	Approved By: JVW 12/14/99	Drawn By: DJS	
Date: Jun 1, 98	Part Number: 315-0035	Revision Number: .	


Attach to Main PCB Board
Attach to Main PCB Board
J2
J3
U2
U1
C2
C1
D3
D4
D5
D6
D7
Q2
RL
L1
L2
G
G
M1
M2
F1
2 AMPS
F2
4 AMPS
ACH Line Black
ACN Line White
ACG Line Green
Motor Green
Motor White
Motor Black
Plug
POWER SUPPLY BOARD

Options and Upgrades

Remote Keypad and Display

An optional keypad and LCD display is available to operate the NIC from a remote location, such as the aisle.

To connect the remote keypad to the NIC:

Use shielded 22 gauge / 4-conductor wire. The NIC has a five-pin connector (on the lower, right side of the circuit board), that reads from top to bottom: **OV, NET, FG, NET, +NRV**. Likewise the remote keypad has a five-pin connector located below the LCD display that reads from left to right: **OV, NET, FG, NET, +NRV**. These connections should be made straight across with the **shield being used for the FG** connection. In other words, wires should run from *OV to OV, from NET to NET, from FG to FG* (with the shield), etc. You will find a small jumper at **J1** on the remote keypad (**J1** is the eight-pin keypad connector located directly below and behind the LCD). Remove this jumper and connect the keypad's ribbon to **J1**. The jumper should be placed on pins 4 and 5 at **J2** on the NIC (**J2** is the eight-pin keypad connector on the NIC located directly below and behind the LCD display. To toggle between the two displays (the remote display and the NIC display), select setup from the *Main Menu* and press "**6"** to enter the *Display Menu*. Press "**F**" to toggle the display and **E** to Exit to the *Main Menu*. If the jumper is not placed on J2, both displays can be viewed at the same time.

Note: **If you are having difficulty re-routing control to the remote keypad, refer to the section of this manual marked Resetting the NIC.**

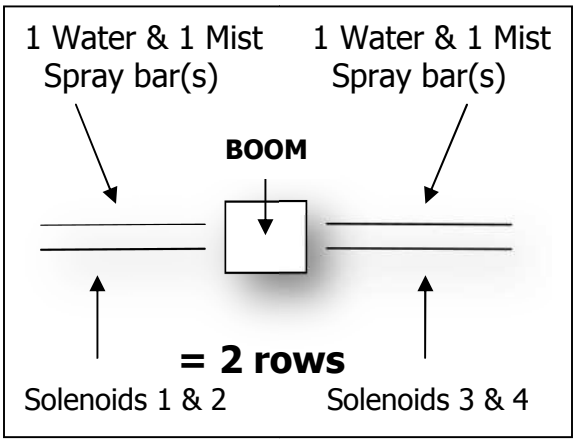
Network Irrigation Controller
"NIC"
Cropping & Areas
Version EM.6
CHEAT SHEET

CHERRY CREEK SYSTEMS
Greenhouse Equipment Specialists

Key Concepts
*** Read this First! ***

Row:

A run in the greenhouse; usually left or right of the center aisle. It can also be defined as the number of solenoid "groupings" that are in the bay. If there are 4 bench runs across the width of the bay, then each bench could be assigned its own row (1 mist & 1 water solenoid per row). In the example on the right, there are two rows in the bay with an end walkway.



Area:

An Area is a given distance within the bay (example: 0.00 Ft to 110.00 Ft) that needs to be watered or misted by the boom. Areas are programmed by the user depending on the needed requirements. See example below, page 5:

Crop:

Just as the name suggests! This allows the user to combine multiple "Areas" into one "Crop" to minimize information input. In the Example, Areas 1 and 3 on the right side (Row 1) might be a crop.

Time Zone:

This is a given period of time. Your NIC uses a 24 hour format:

1:00 PM = 13:00
12:00 AM = 00:00
10:00 AM = 10:00
10:00 PM = 22:00

Keypad:

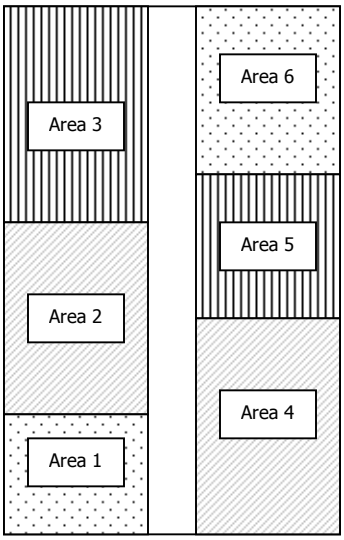
0-9 = Data Entry
E = Enter or Exit
B = Up / Increase
F = Down / Decrease
C = Left / Forward
D = Right / Back

Set Up and Cropping:

Basically, there are 4 steps:

1. Set up how many rows you have
2. Set up areas in each row
3. Assign a crop to each area
4. Give the boom crop watering instructions

It's easy!



= Crop 1 (areas 3 and 5)

= Crop 2 (areas 2 and 4)

= Crop 3 (areas 1 and 6)

Let's say you have 3 Crops, as laid out in the greenhouse above. *Even though Crop 1 is in 2 different areas, you don't have to input 2 different programs*. You simply give Crop 1 watering instructions, and both programmed areas under Crop 1 will be receiving the same watering regimens!

Operations

Crops

(Main, 3, 1, 1, Crop #)

Quick Menu/ Keypad Number Reference

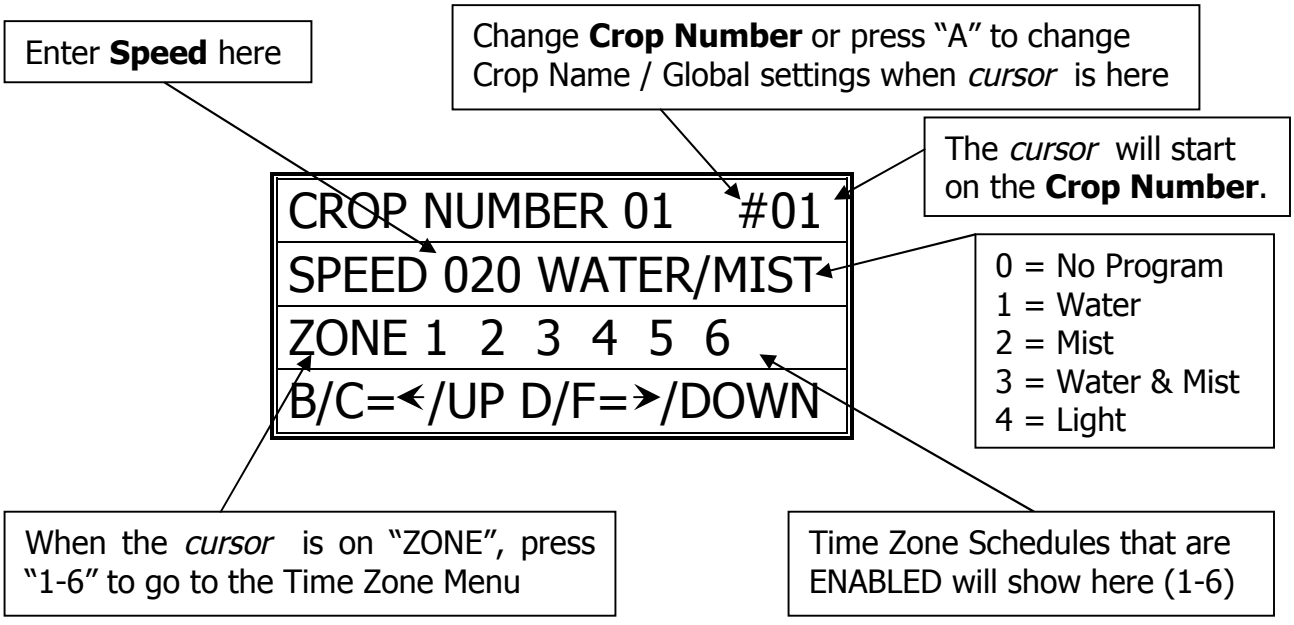
**** The Bay Length and Rows (Configuration) must be programmed before you can set up any **Crops** (see previous sections) ****

1. From the Main Menu press 3
2. From the Setup Menu press 1
3. From the Crops menu press 1
4. Enter the Crop Number (#1-16) to change any of the Crop information.

ENTER CROP NUM. 1-16
'A' KEY TO EDIT CROP
NAME/GLOBAL OR S-S-W
WHEN CURSOR ON ITEM

1. Enter the Crop Number (1-16) to be modified.
2. Use the "B/C" & the "D/F" keys to scroll through the Crop Menu.
3. To change the Crop Name, press "A" when the cursor is on the Crop Number to enter the Crop Name / Global Menu. Use the "C/D" keys to scroll, use the "B/F" keys to change the Crop Name. Press "A" to enter the "Global Solenoid Menu".

*Exploded view of the **Crop** Screen:*



4. Press "E" to Save and Exit.

Global Solenoids

(Main, 3, 1, 1, Crop #, A)

**** The normal operation of the boom is to water one Area at a time. Even if those Areas are next to each other. For example, the same Crop is under 2 rows from end to end. Instead of watering row 1 and then row 2, enabling the Global Solenoid feature will water both sides at once. ****

1. From the Main Menu press 3
2. From the Setup Menu press 1
3. From the Crops menu press 1
4. Enter the Crop Number (#1-16)
5. Press A when cursor is over the Crop Number

CHANGE CROP NAME #1
A=GLOBAL SOL. B/F=CHAR
C/D = CURSOR E = EXIT
CROP NUMBER 01

6. Press "A" to enter the Global Solenoids Menu.

CROP NUMBER 01
#01 G SOL = 1 2 3 4 5 6 7 8
ALL G SOL =
B/C/D/F = SEL E = EXIT

7. Press the 1-8 keys to toggle the solenoids on and off of Global.
8. Scrolling to All Global (ALL G SOL) and enabling solenoids 1-8 will activate those solenoids to Global for all Crop Numbers.
9. Press "E" to Exit and Save

Time Zones (Auto Programming)

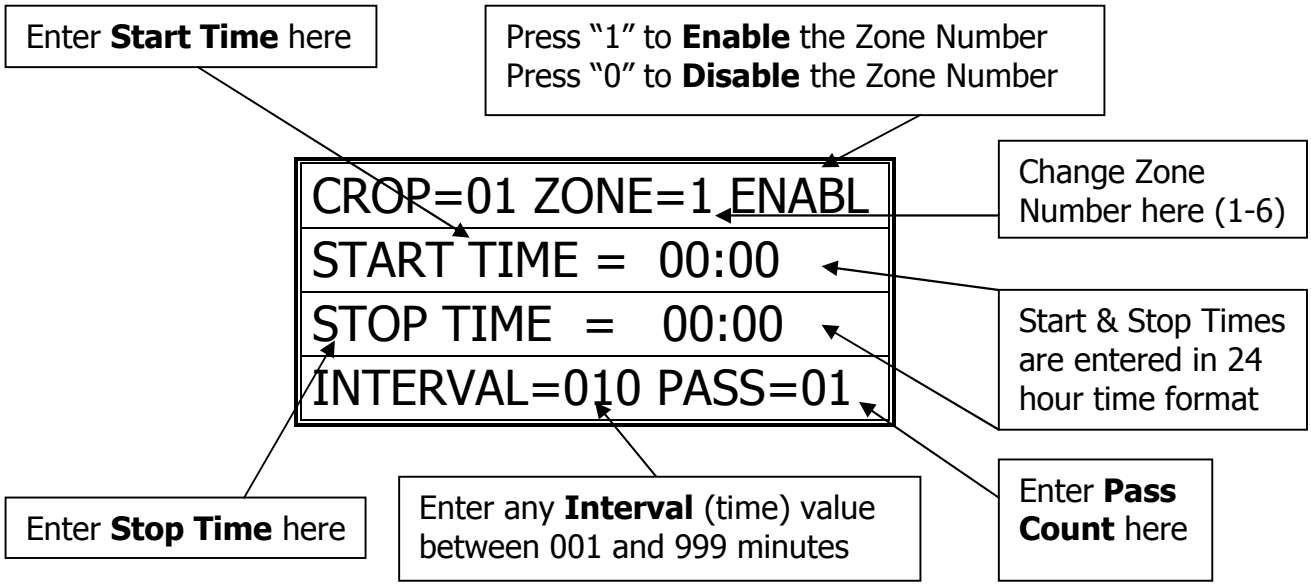
(Main, 3, 1, 2, Crop #, Curser over Zone, 1-6)

Time Zone = A time zone is a specific period of time.
Each Crop can have up to 6 different time zones.
Interval = How many minutes between passes.
Pass = 1 time over Crop.

1. From the Main Menu press 3
2. From the Setup Menu press 1
3. From the Crops Menu press 1
4. Enter the Crop Number (1-16)

5. Move curser over Zone and press 1-6 to scroll through the 6 Time Zones

*Exploded view of the **Time Zone** Screen:*



6. Cherry Creek recommends that the User press' "00" on Crop and clear out the information that appears on the screen, in Zones 1-6. This is a "bug".
7. Press "E" to Save and Exit.

Areas (Distances)

(Main, 3, 1, 3, Row #)

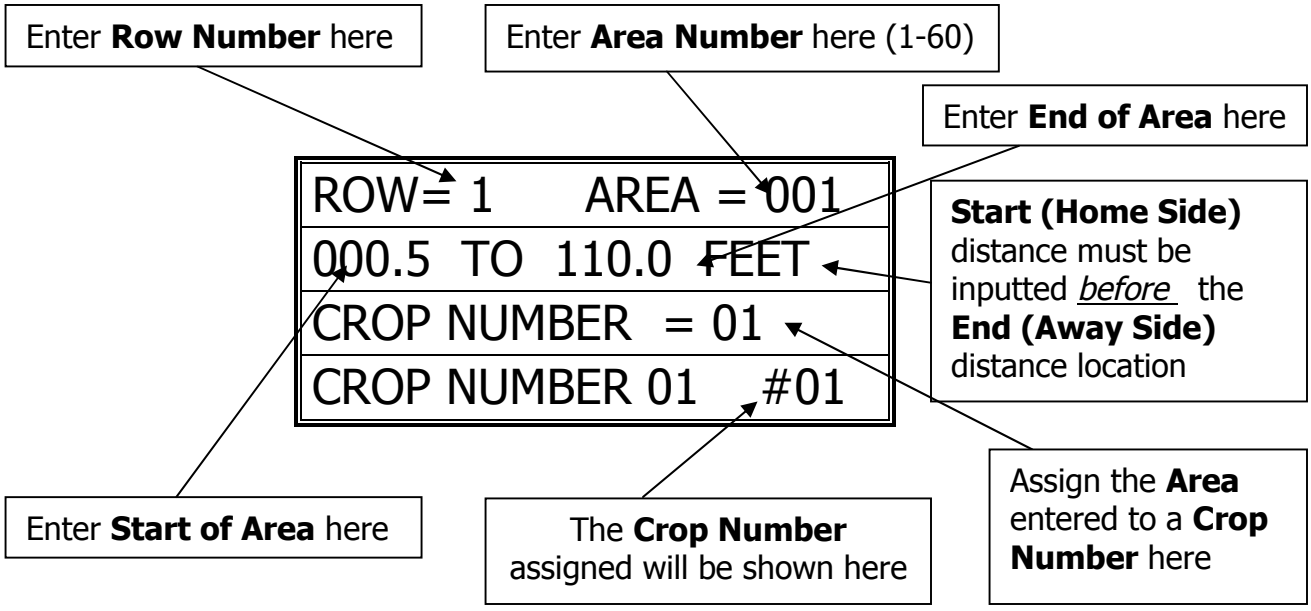
**** The Bay Length and Rows (Configuration) must be programmed before you can set up any **Areas** (see previous sections) ****

1. From the Main Menu press 3
2. From the Setup Menu press 1
3. From the Crops Menu press 1
4. Enter the Row Number (1-4)

PRESS KEY 0 THRU 9
TO SELECT A ROW
THEN SELECT AREA TO
VIEW OR CHANGE DATA

5. The Area Assignment screen will appear:

*Exploded view of the **Area Assignment** Screen:*



6. Each Row has 60 Areas that can be assigned to any of the 16 Crop Numbers. This gives the ability to program up to 240 Areas!
7. Press "E" to Save and Exit.

Manual Run

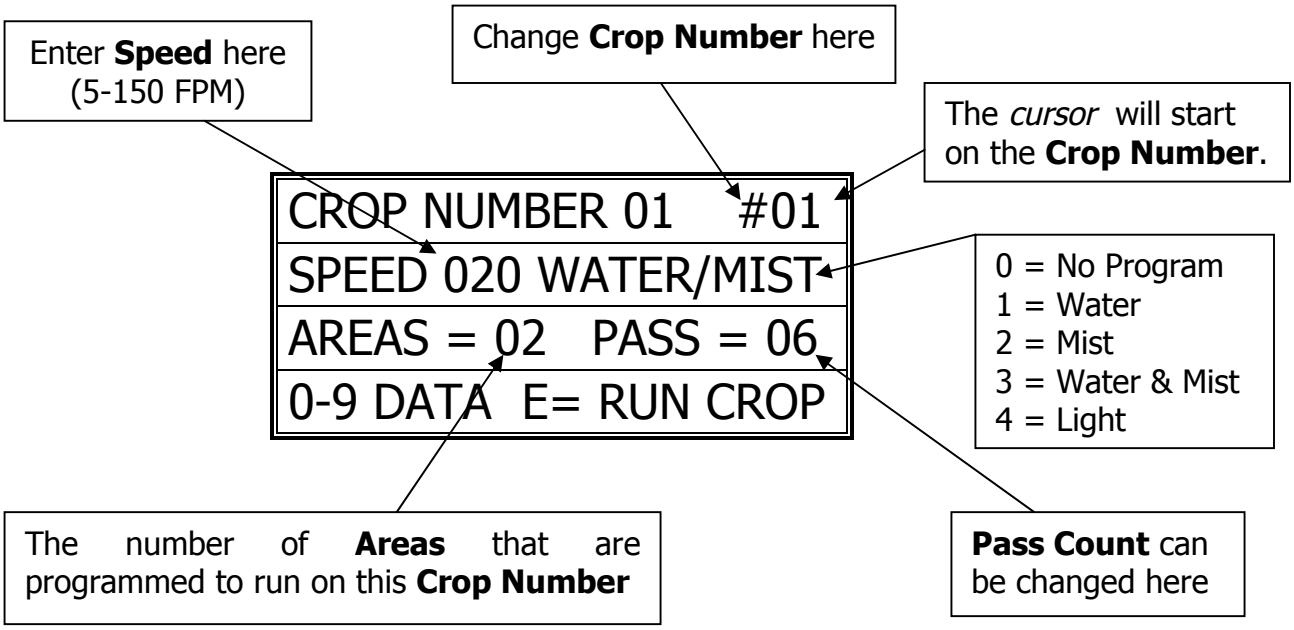
(Main, 2, Crop#)

1. From the Main Menu press 2.
2. From the Manual Menu enter crop #
3. The Manual screen will appear:

ENTER CROP NUMBER 01
A = WALK & WATER
C = CROP AREA VIEWER
E = EXIT MENU

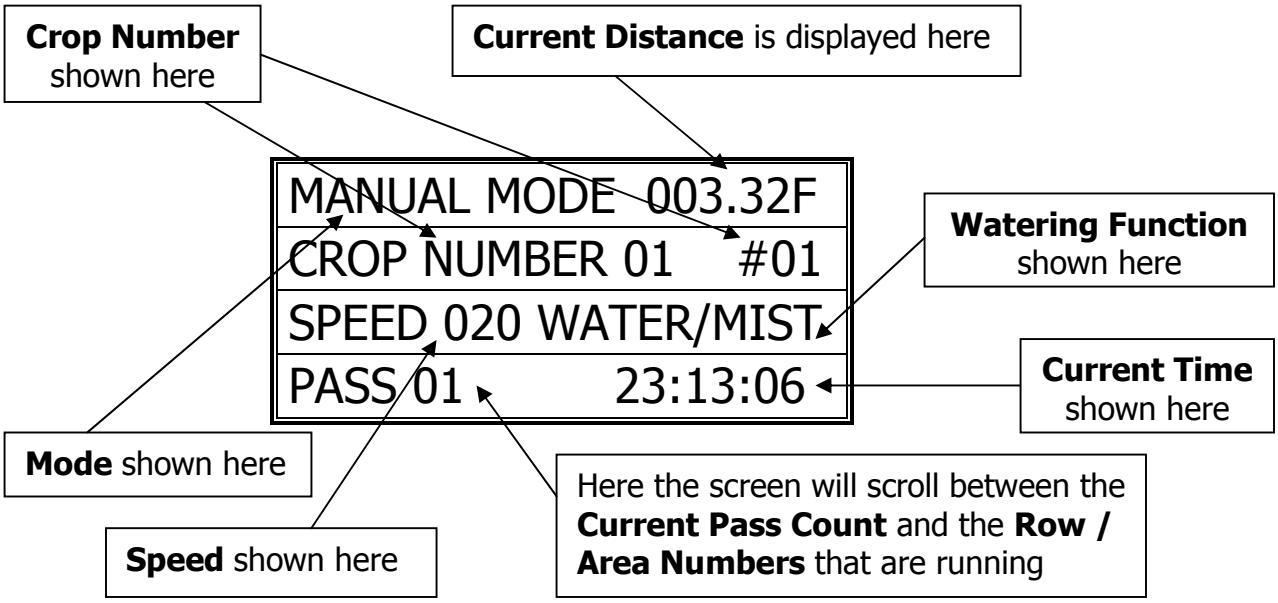
4. Enter the Crop Number to be Manually Started
5. The Manual Start screen will appear:
6. Use the "B/C" & the "D/F" keys to scroll through the Manual Start Menu. Use 0-9 keys to input the necessary data.
7. The Crop Number, Speed, Watering Function, and Pass Count can be changed before Pressing "E" to Run Crop. Changing any of these factors will *only* take effect on this Manual Run. To make permanent changes to the Crop factors, go to Crop Set-Up Menu, reprogram factors, then exit and save.

*Exploded view of the **Manual Start** Screen:*



8. Press "E" to Run Crop.
9. The "Manual Run" screen will appear:

*Exploded view of the **Manual Run** Screen:*



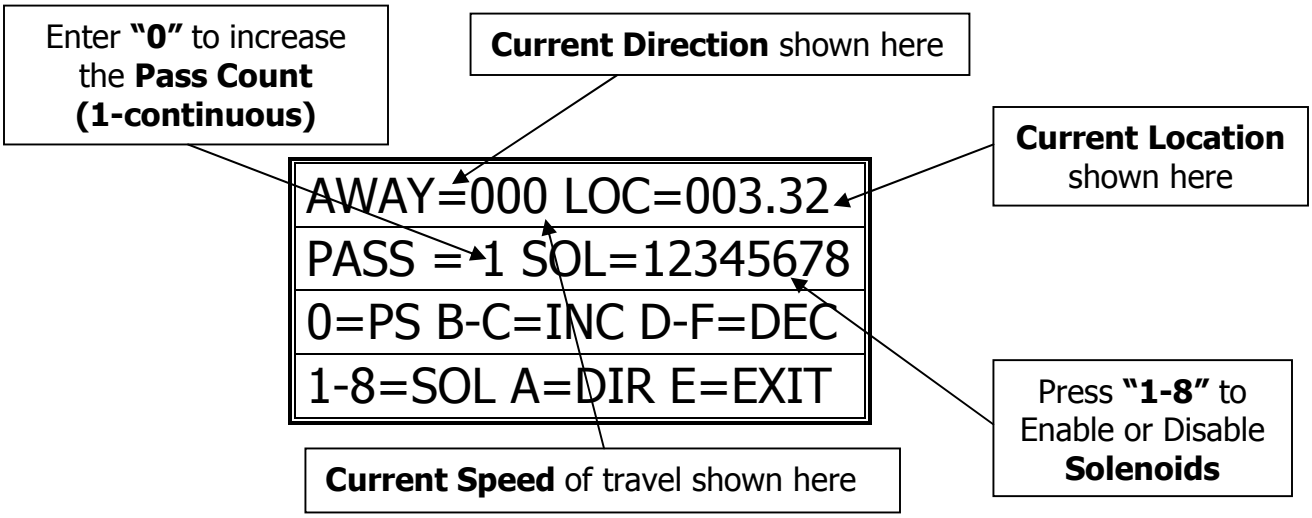
10. The Boom will Run the Manual Program, stop, and await its next command. The Boom will stop at the Start Distance.

Walk and Water

(M, 2, A)

1. From the Main menu press 2
2. Press A for Walk & Water

*Exploded view of the **Manual Start** Screen:*



3. Press "0" to increase the Pass Count (1-countinuous).
    i. Continuous Mode will run the whole length of the bay, back and forth, from Home & Away, until the user stops the boom
4. Press "A" to change Direction. Press "B/C" to increase speed and "D/F" to decrease speed and come to a stop. Press 1-8 to enable/disable solenoids.
5. Press "E" to Exit to the Main Menu.

Crop Area Viewer

(Main, 2, C)

1. From the Main Menu press 2
2. From the Manual Menu press C

ENTER CROP NUMBER
A = WALK & WATER
C = CROP AREA VIEWER
E = EXIT MENU

3. Enter the Crop Number (1-16) to View the Areas & Rows assigned:

CROP #=01 #AREAS=02
R1 A001 000.5 – 110.0F
R2 A002 005.0 – 078.8F
R4 A005 072.3 – 110.0F

4. Press "E" twice to Exit and go back to the Main screen.

Auto Run (Time Based)

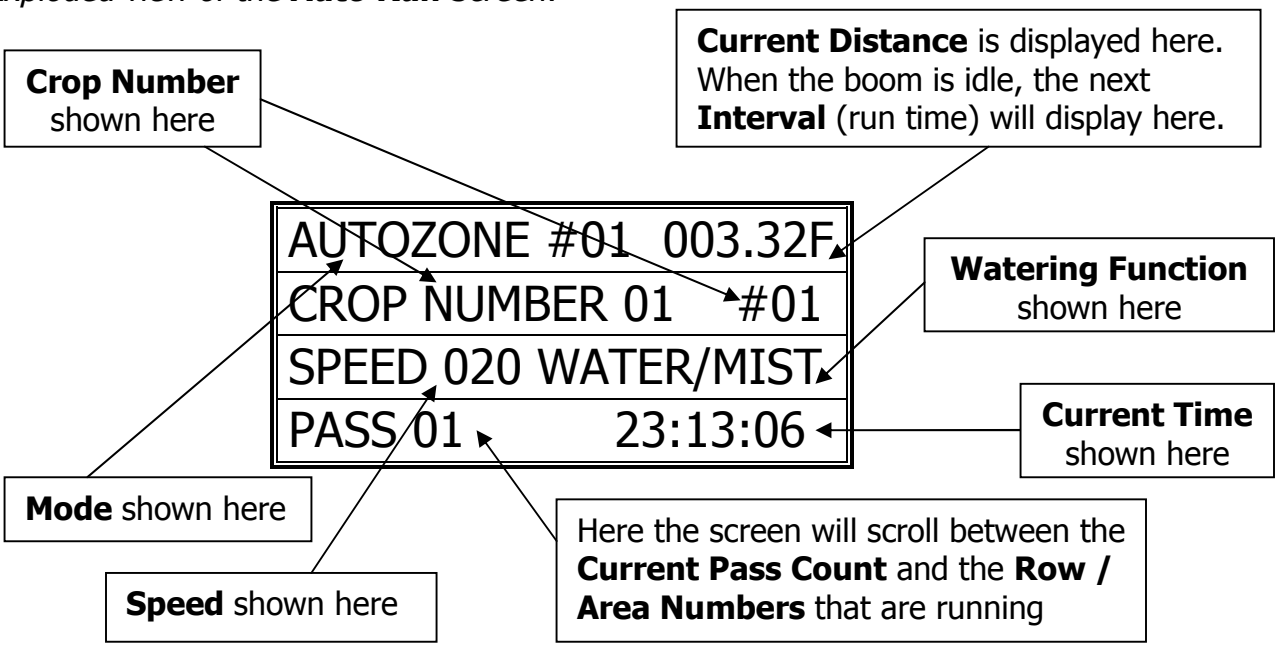
(Main, 1)

**** If not already done, set up Time Zones and Enable the Zones as needed.*
*See **"Time Zones (Auto Program)"** section ****

1. To start Auto programs go to **Main Menu & press 1**
2. Press "E" while in the Auto Mode to Exit

1=AUTO 2=MANUAL
3=SETUP CROPS & SITE
4=GLOBAL NET CROPS
NIC-EM.6 23:59:59

*Exploded view of the **Auto Run** Screen:*



Step / Stop / Water

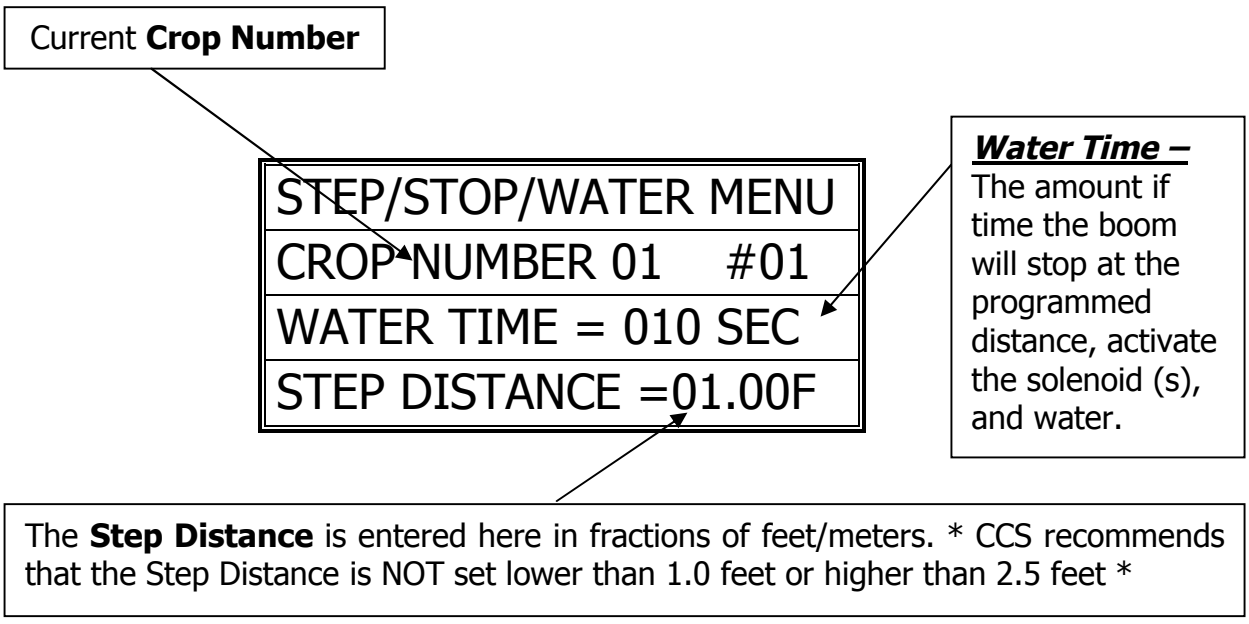
(Main, 3, 1, 1, Crop #, 00 when cursor is on Speed)

1. From the Main Menu press 3
2. From the Setup Menu press 1
3. From the Crops menu press 1
4. Enter the Crop Number (#1-16) to change any of the Crop information.

ENTER CROP NUM. 1-16
'A' KEY TO EDIT CROP
NAME/GLOBAL OR S-S-W
WHEN CURSOR ON ITEM

5. Enter the Crop Number (1-16) to be modified.
6. Use the "B/C" & the "D/F" keys to scroll through the Crop Menu.
7. To enable the Step / Stop / Water feature press "00" when the cursor is on the Speed.
8. Press "A" when the cursor is on the Step/Stop/Water to change the S/S/W settings. Use the "B/F" keys to scroll through the Menu and change info.

*Exploded view of the **Step / Stop / Water** Screen:*



9. Change the Water Time and the Step Distance the desired settings.
10. Press "E" to Exit, Save and Return to the Crop Menu.

****** Before calling Tech Service, please try to RESET the Controller by pressing the RESET button on the board (shown in the Mother Board diagram on the "Wiring Diagrams" pages). If there is not a button, there will be two pins; jump them together with the tip of a flathead screwdriver and that will RESET the controller as well. This will sometimes solve problems and is an easy step to correcting the problem before calling Tech Service. If the NIC is "locked-up", this will typically take care of it and get the Controller functional again. Otherwise contact CCSI. ******

TECHNICAL ASSISTANCE: ***If you have any questions regarding the use of this program or any other Cherry Creek Systems Product please call us at .....***

(719) 380-8373 ext. 206

OR

ccs@cherrycreeksystems.com

OR

info@cherrycreeksystems.com

OR

www.cherrycreeksystems.com

Network Irrigation Controller
"NIC"
Cropping & Areas
Version EM.6

USERS MANUAL

CHERRY CREEK SYSTEMS
Greenhouse Equipment Specialists

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Cherry Creek Systems
2675 Akers Drive
Colorado Springs, CO 80922
Toll Free 877-558-3246
www.cherrycreeksystems.com

Dear Customer:

We would like to thank you for taking a bold step in greenhouse irrigation by purchasing our "Area Cropping" program! Although it might appear to be very complex: the greatest possible care went into making this program as user friendly as possible while still keeping all the functionality that you have come to expect.

There have been many changes to our new program for our Network Irrigation Controller. We believe that once you become familiar with all that this new program has to offer you will be extremely pleased with how easily manageable irrigating your crops has become.

We would welcome and encourage you to make suggestions as to how we can improve this Users Manual. It is our intent to provide you with the highest quality equipment and state-of-the-art watering systems, as well as first rate technical follow up support.

If it is the 1st time setting up the Boom, then it is advisable that you follow this order in working through the manual:

1. ***Key Concepts***
2. ***Initial Power Up***
3. ***Diagnostics***
4. ***Setup***

Again, thank you for your business and we look forward to assisting you in any way we can. Please feel free to give us a call, or contact us via email.

Sincerely,

Cherry Creek Systems Team

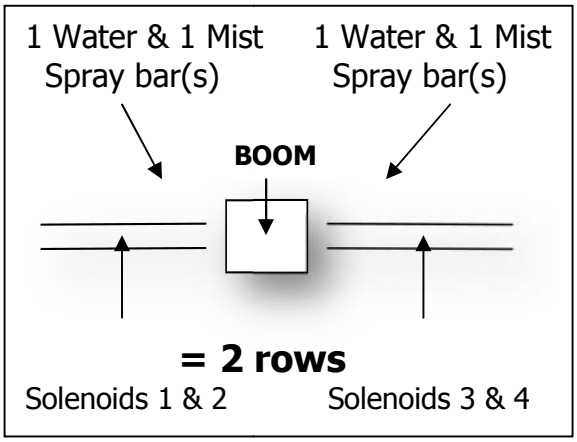
Key Concepts
*** Read this First! ***

It is advisable that this order is followed when working through the manual and setting up your boom:

1. Key Concepts
2. Initial Power Up
3. Diagnostics
4. Setup

Row:

A run in the greenhouse; usually left or right of the center aisle. It can also be defined as the number of solenoid "groupings" that are in the bay. If there are 4 bench runs across the width of the bay, then each bench could be assigned its own row (1 mist & 1 water solenoid per row). In the example on the right, there are two rows in the bay with an end walkway.



Area:

An Area is a given distance within the bay (example: 0.00 Ft to 110.00 Ft) that needs to be watered or misted by the boom. Areas are programmed by the user depending on the needed requirements. See example below, page 5:

Crop:

Just as the name suggests! This allows the user to combine multiple "Areas" into one "Crop" to minimize information input. In the Example, Areas 1 and 3 on the right side (Row 1) might be a crop.

Time Zone:

This is a given period of time. Your NIC uses a 24 hour format:

1:00 PM = 13:00
12:00 AM = 00:00
10:00 AM = 10:00
10:00 PM = 22:00

Keypad:

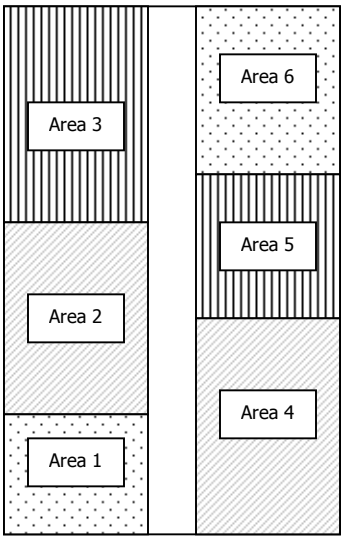
0-9 = Data Entry
E = Enter or Exit
B = Up / Increase
F = Down / Decrease
C = Left / Forward
D = Right / Back

Set Up and Cropping:

Basically, there are 4 steps:

1. Set up how many rows you have
2. Set up areas in each row
3. Assign a crop to each area
4. Give the boom crop watering instructions

It's easy!



= Crop 1 (areas 3 and 5)

= Crop 2 (areas 2 and 4)

= Crop 3 (areas 1 and 6)

Let's say you have 3 Crops, as laid out in the greenhouse above. *Even though Crop 1 is in 2 different areas, you don't have to input 2 different programs*. You simply give Crop 1 watering instructions, and both programmed areas under Crop 1 will be receiving the same watering regimens!

Main Menu:

**** To get to the main menu from almost anywhere, press "E" repeatedly. This manual starts from the main menu to get to the other menus. ****

1=AUTO	2=MANUAL
3=SETUP CROPS & SITE	
4=GLOBAL NET CROPS	
NIC-EM.6	23:59:59

Other Definitions:

FPM: Feet-Per-Minute; the speed that the Boom uses as a reference.
Acceleration: Speed setting that the Boom will "take off" when starting a programmed irrigation cycle, or as the Boom turns around to initiate another pass.
Deceleration: The setting that will allow the Boom to slow down as it approaches the end of the bay or the programmed turn-around point.
Go-To Speed: Speed that the Boom will travel to its programmed destination.
End Speed: Speed that the boom will travel at the last few feet of the "CROP".
SSW: Step / Stop / Water (described on page 4)
SSW Speed: Speed that the Boom will travel between "stop points" when using the Step / Stop / Water feature.
Markers: "Checkpoints" in the bay that will help to maintain the Booms calibration (there is a menu that will allow the user to see the number of Markers and their distance).
Idler Diameter: Diameter of the wheel that is used for the speed and motion sensing.
Configuration: Defined as "Rows", this set-up will allow each series of solenoids to be assigned to a function
(ex: solenoids 1 & 3 = WATER; solenoids 2 & 4 = MIST; etc.)
Global Solenoids: Allows for multiple solenoids to be turned on in unison without having to assign the valves to a function.
Walk & Water: Allows user to walk with Boom and turn on and off solenoid valves at needed distances and water without having to program a "Crop".

External Switch Definitions

- **SW1** – **Home / Away / Marker** magnetic sense switches **(mandatory)**.

The Boom will stop at the programmed distance after the home or away sensor detects a magnet. This keeps the calibration of the Home & Away positions.
Used to save the position in which the Markers magnet(s) are detected. The stored position will define a "checkpoint" for the controller to keep its position accurate if it ever gets lost between Markers.

- **SW2** – **Absolute End-of-Bay** magnetic sense switch.

The Boom will stop after this sensor detects a magnet. This is used as a safety so that the Boom cannot overshoot the ends of the bay.

- **SW3** – **Unused** Switch input. *Call Cherry Creek for clarification*

- **SW4** – **Collision Switch**. This switch input must be closed at all times to allow the Boom to run. The inputs may be connected to an object detection (IR Sensor) or Collision Switch that will open the normally closed circuit when an object is detected in the path of the boom. A simple jumper wire between the SW4 & GRD terminal connections may be used keep the switch permanently closed which will allow the boom to run.

- **SW5 & SW6** – **Remote Auto Start Switches.** Used in conjunction w/ a 24VAC Relay to start the Boom "Remotely" via an Environmental Control System (Priva, Argus, Wadsworth, etc.).

- **SW7** – **Remote Home Switch.** Used to move the Boom in the Home direction with a remote switch. The remote away switch (SW8) is required to operate the boom in the remote mode. Refer to SW8 description for the operation and function of SW7.

- **SW8** - **Remote Away Switch.** Used to move the boom in the away direction with a remote switch. If the boom is in the main or manual menu the boom may be moved using the remote home and away switch option. When the boom is stopped, pressing the home or away switch will start the boom moving at 10 Feet Per Minute (FPM) in the respective direction. Pressing the same switch again will increase the speed by 10FPM. If the switch is pressed repetitively the speed may be increased up to 150FPM. To stop the boom, press the other switch once.

- **IN / GRD / +NRV - Proximity sensor.** Used for the Booms Speed, Distance and Motion sensing. Gets its 18V+ power from +NRV.

Updates and New Features

Network Irrigation Controller EM.6 "Areas"

AREAS vs. JOBS:
One of our best features of this new program is the change in the architecture. Instead of "Jobs" (magnets that need to constantly be moved and readjusted when a crop moves or gets replaced by another crop) we now use "Areas" and "Rows" (a programmed distance that can be changed and rearranged at any time, easily and trouble-free).

SMART BOOM MOVEMENT:
The booms move only to the areas that need to be watered. It no longer has to go from one end of the bay to another (Home to Away, then back to Home) every time it makes one pass. It no longer has to rest at the "Home" position. This saves wear and tear on the Boom and its parts.

STEP/STOP/WATER:
Another very useful tool is the Step, Stop & Water function. It has the ability to move the boom to a user defined distance, then stop & water for a programmed amount of time, then move onto the next user defined distance and continue. For example: you can set-up large 12" pots in a checker-board pattern @ 18" centers, have the boom start at the first row of pots and start the irrigation "Area", then move to every row of pots and continue watering in the same fashion.

WALK AND WATER:
We have added the possibility to walk beside your boom and water your crops by the press of a button (optional remote hand-held controller). You can simply walk the boom to the Area that needs to be watered and turn on the solenoid(s).

MULTIPLE CROP ACTIVATION BY COMPUTER:
It is now possible to start irrigating your crops using inputs from *ARGUS™, PRIVA™ or OGLEVEE™* or any other environmental controls. Please talk to your Cherry Creek representative for more details on our Network Accumulator.

MULTIPLE TIMES PERIODS (ZONES) FOR CROPS:
You now have the option of assigning each crop up to Six (6) time periods or "Zones" for irrigation. For example you can have Crop #1 water from 7:00 – 10:00 then again at 13:00 – 15:00 without reprogramming every time.

Initial Power Up

Some Basic site information must be entered into the controller before you can begin irrigating crops. Pressing keys "1" through "F" will take you through the setup menus. When the Network Irrigation Controller (NIC) is first plugged in or after it is RESET you will be prompted to do an ***initial setup.***
The opening screen shows the version of NIC and the website address.

NIC-EM.6 http://www
.cherrycreeksystems.com
FOR INFORMATION.
ANY KEY TO CONTINUE

Configuration

*** At Initial Start-up (first time plugging in the controller), it is best to go thru the Diagnostics Menu ***first*** to test all of the functions of the Boom, then move to Set-up (Configuration) ***

Configuration will have to be done after a Reset. Reset by pressing "0" and "F" at the same time and then entering the reset code **4273;** or by pressing Reset button labeled Reset inside the controller box, located on the Main Board to the left of the Display.

Press any key "1-F" to continue. "0" bypasses the Configuration Set-up

CONTROLLER HAS TO BE
CONFIGURED FOR SITE
BEFORE USE. PRESS
1-F KEY TO CONFIGURE

Pressing "0" once will bypass the Configuration Menus.
Pressing "F" repeatedly will scroll thru the Set-Up menus until the main menu is reached, where Diagnostics and Set-Up can be completed.

Diagnostics

If it is the 1st time setting up the Boom, it is highly recommended that you go through the diagnostic menu, BEFORE YOU CONFIGURE YOUR BOOM. This process will insure all of the inputs are functioning properly and that nothing was damaged during shipping.

Note: From most any menu on your new NIC, you can get back to the Main Menu by pressing the "E" key repeatedly.

1. From Main menu, press 3
2. From Setup menu press 2

Diagnostics Menu:

1= KEY	2 = SW-IN
3= SOL	4 = MOTOR
5=MARKERS	6 =STOP SW
7=	E = EXIT

Keypad test

(Main Menu, Press 3, Press 2, Press 1)

Quick Menu/ Keypad Number Reference

In this menu you can press each key to check if all the keys are working.

1. From the Main menu press 3
2. From the Setup menu press 2
3. From the Diagnostics menu press 1 (KEY):

KEYPAD DIAGNOSTIC.
TO END PRESS E TWICE
KEY NUMBER = F

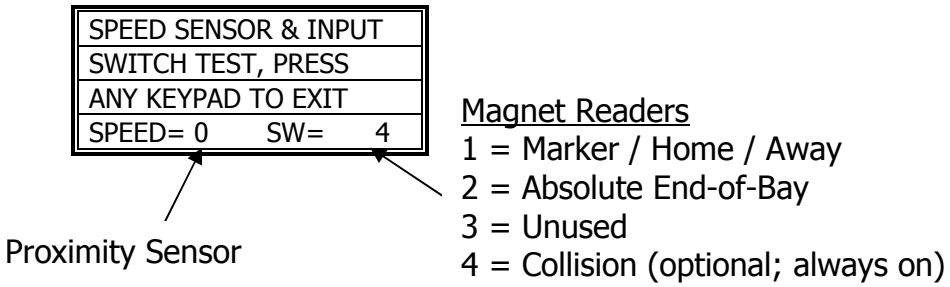
4. Press any keys on the keypad to see them displayed on the display.
5. Press the "E" key repeatedly to return to Main menu.

Testing your inputs (sensors)

(Main, 3, 2, 2)

In this menu you can check to see if the booms Proximity (speed) Sensor and Magnet Readers are working properly.

1. From the Main menu press 3
2. From the Setup menu press 2
3. From the Diagnostics menu press 2 (SW-IN):



4. **Proximity Sensor** – For the speed sensor, gently push the boom. As you are pushing, look behind the "SPEED=0" and you should see it alternate between "1" and "0".

5. **Magnet Readers** – You should have 2 magnet readers on your boom. Marker / Home / Away & the Emergency End-of Bay. The Marker / Home / Away will be on one side of the boom (pointed at the rail) and the End-of-Bay Sensor will be on the other side (again, pointed at the rail). To check readers 1 & 2 wave a magnet in front of each one. You should see the display show a "1" or "2". Switch "4" will always appear, unless the Collision Sensor is used.

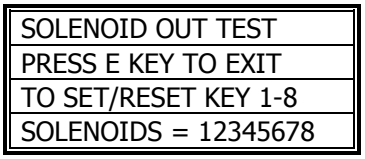
   ** For more information on the switch failures please reference the "Trouble Shooting" page for more info **

6. Press the "E" key repeatedly to return to Main menu

Solenoids

(Main, 3, 2, 3)

1. From the Main menu press 3
2. From the Setup menu press 2
3. From the Diagnostics menu press 3 (SOL):



4. Press the "1" through "8" keys to alternately turn on and off the respective solenoid valves.
5. Press the "E" key repeatedly to return to Main menu

Motor test

(Main, 3, 2, 4)

1. From the Main menu press 3
2. From the Setup menu press 2
3. From the Diagnostics menu press 4 (MOTOR):

MOTOR MOTION TEST
PRESS A=HOME B=AWAY
PRESS E KEY TO EXIT
SPEED(5-150) = 020

4. Use the "0" through "9" keys to enter a speed from 5 – 150 FPM (Feet Per Minute). * Recommended Speed: 25-50 FPM for testing *
5. Press the "A" or "B" key to move the boom either home or away**.**

NORM DIAG MOTOR MOVE
NORMAL A=HOME B=AWAY
PRESS E KEY TO EXIT
SPEED (5-150) = 020

6. Press the "E" key repeatedly to return to Main menu

Markers

(Main, 3, 2, 5)

1. From the Main menu press 3
2. From the Setup menu press 2
3. From the Diagnostics menu press 5 (MARKERS):

MARKER RECALIBRATION
BOOM WILL SEARCH IN
DIRECTION = AWAY
E =FIND F =CHANGE DIR

4. Press "F" to change direction of travel. The boom will search for the nearest "Marker" in that direction.
5. Press "E" and send the boom to search for the nearest "Marker". The screen will display the following:

MARKER RECALIBRATION
CAUTION!
BOOM IS LOOOKING FOR
NEXT MARKER

6. The boom will travel in the assigned direction and search for the nearest "Marker". This will enable the boom to see a "Marker" checkpoint and find its bearings and get back into calibration with the bay.

MARKER RECALIBRATION
MOVING AT 30 FPM
ANY NUMBER = PAUSE
B = FASTER F= SLOWER

7. Pressing "B" will increase speed (it is highly recommended that during calibration, the boom doesn't travel faster than 80 FPM). Pressing "F" will decrease speed.
8. Pressing any number key will pause the Marker Recalibration. This is used once calibration has been started, and it needs to be paused, without starting over.

BAY LENGTH AT 030FPM
--*- PAUSED -*-*-*
CONTINUE = ANY KEY
EXIT = F KEY

9. When the boom hits the first "Marker" that it sees, in which ever direction it was told to travel, it will prompt this screen:

ENTER CORRECT MARKER
AT MARKER NUMBER 01
PRESS E TO EXIT AND
SET CURRENT LOCATION

10. Enter the correct "Marker" number that the boom should be seeing, and press "E" to enter and save to "Marker" number.
11. The screen will return to the Diagnostics menu.

Emergency "Absolute End-of-Bay" Stop Switch

(Main, 3, 2, 6)

1. From the Main menu press 3
2. From the Setup menu press 2
3. From the Diagnostics menu press 6 (STOP SW):

USE SW2 TO DETECT
ABSOLUTE END-OF-BAY
EMERGANCY STOPS? NO
E = ACCEPT F = CHANGE

4. The "End of Bay Emergency Stop" prompt will appear. Press "E" to leave as programmed (NO, by default) or press "F" to change. Then "E" to Enter.
    - *This function will enable SW-2 (switch input #2), which will stop the boom at a set magnet if it over shoots its target stop points.*

Setup

If you are setting up for the first time, please go through your *diagnostics* menu first, before proceeding with Setup.

Clock

(Main, 3, 3, 1)

1. From Main menu press 3
2. From Setup menu press 3
3. Enter Pass Code (0000 by Default)
4. From the Site, Rows, and Bay, menu, press 1 (CLOCK)

TIME VARIABLE= 23:59
ENTER 24 HOUR FORMAT
E = ENTER NEW TIME
NEW TIME VAR.= 00:00

5. To zero the time, press the "0" key several times.
6. Use the "0" through "9" keys to enter the current time on the bottom row.
7. Press the "E" several times to return to main menu.

Idler Diameter Menu

(Main, 3, 3, 2, 1)

1. From Main menu press 3
2. From Setup menu press 3
3. Enter Pass Code (0000 by Default)
4. From the Site, Rows, and Bay menu press 2 (SITE)

** This screen will appear, press any key to continue **

WARNING!!! CHANGING
IDLER OR DISTANCE
WILL RESULT IN LOSS
OF CROP PROGRAM DATA

5. The Site Menu will appear.

1 =IDLER 2 =CONFIGER
3 =INITIAL 4 =BAY LENGTH
5 =LOCATE 6 =
7 = MORE E = EXIT

6. Press "1" for Idler.
7. The Idler Menu will appear.

F = SELECT BOOM TYPE
A=ALT-TYPE B=MOT-ERR
E = SINGLE RAIL BOOM
1.0IN -IDLER 10-TOOTH

Cherry Creek Booms
Tower / Truss Boom = 2.5 inch idler
Double Rail Boom = 2.0 inch idler
Single Rail Boom = 1.0 inch idler
*** Tic Counter on all CCS Booms = 10 or 12 tooth sprocket ***

8. Pressing "F" will change the boom type (idler diameter). Please note that the correct size for your particular Cherry Creek Systems boom is shown in the table above. *Call CCS for clarification of your system.*
9. When pressing "F", the bottom 2 lines will change to read the following:
    a. Single Rail Boom:
       1.0 in. idler 10 tooth (sprocket)
    b. Double Rail Boom:
       2.0 in. idler 10 tooth (sprocket)
    c. Tower Boom:
       2.5 in. idler 12 tooth / 1 in. axle (sprocket)
    d. Tower Boom:
       2.5 in. idler 10 tooth / 0.75 in. axle (sprocket)
10. Select the type of boom that is being used and press "E" to save and exit.
11. The next screen will state the following:

THIS CONFIGURATION
HAS A MAX BAY LENGTH
SPEED OF **90**
ANY KEY = CONTINUE

** This is for Calibration ONLY. Do not take this into account on the actual FPM **

12. Press "A" for Alternate Idler type. *This is not recommended; please contact Cherry Creek Tech Support before trying to use this feature.*
13. Press "B" to change the Motion Error timeout.

SET MOTION ERR. TIME
VALID DEL = 0.1 --> 4.0
DELAY IS 2.0 SECONDS
SAVE & EXIT PRESS E

14. The Motion Error will be set to 2.0 seconds by default. But the time can be changed to any value between 0.1 and 4.0 seconds. If the boom is experiencing "Motion Errors" without just cause, then increase the timeout. If it is necessary that the boom stops easier, decrease the timeout. Typical applications call for 2.0 to 3.0 seconds.
15. Press "E" to exit and save.

Configuration (Row Assignment)

(Main, 3, 3, 2, 2)

**** "Rows" are defined in detail on the Key Concepts page (page 4) ****

1. From Main menu press 3
2. From Setup menu press 3
3. Enter Pass Code (0000 by Default)
4. From the Site, Rows, and Bay menu press 2 (SITE)

** This screen will appear, press any key to continue **

WARNING!!! CHANGING
IDLER OR DISTANCE
WILL RESULT IN LOSS
OF CROP PROGRAM DATA

5. The Site Menu will appear.

1 =IDLER 2 =CONFIGER
3 =INITIAL 4 =BAY LENGTH
5 =LOCATE 6 =
7 = MORE E = EXIT

6. Press "2" for Configuration. This screen will appear:

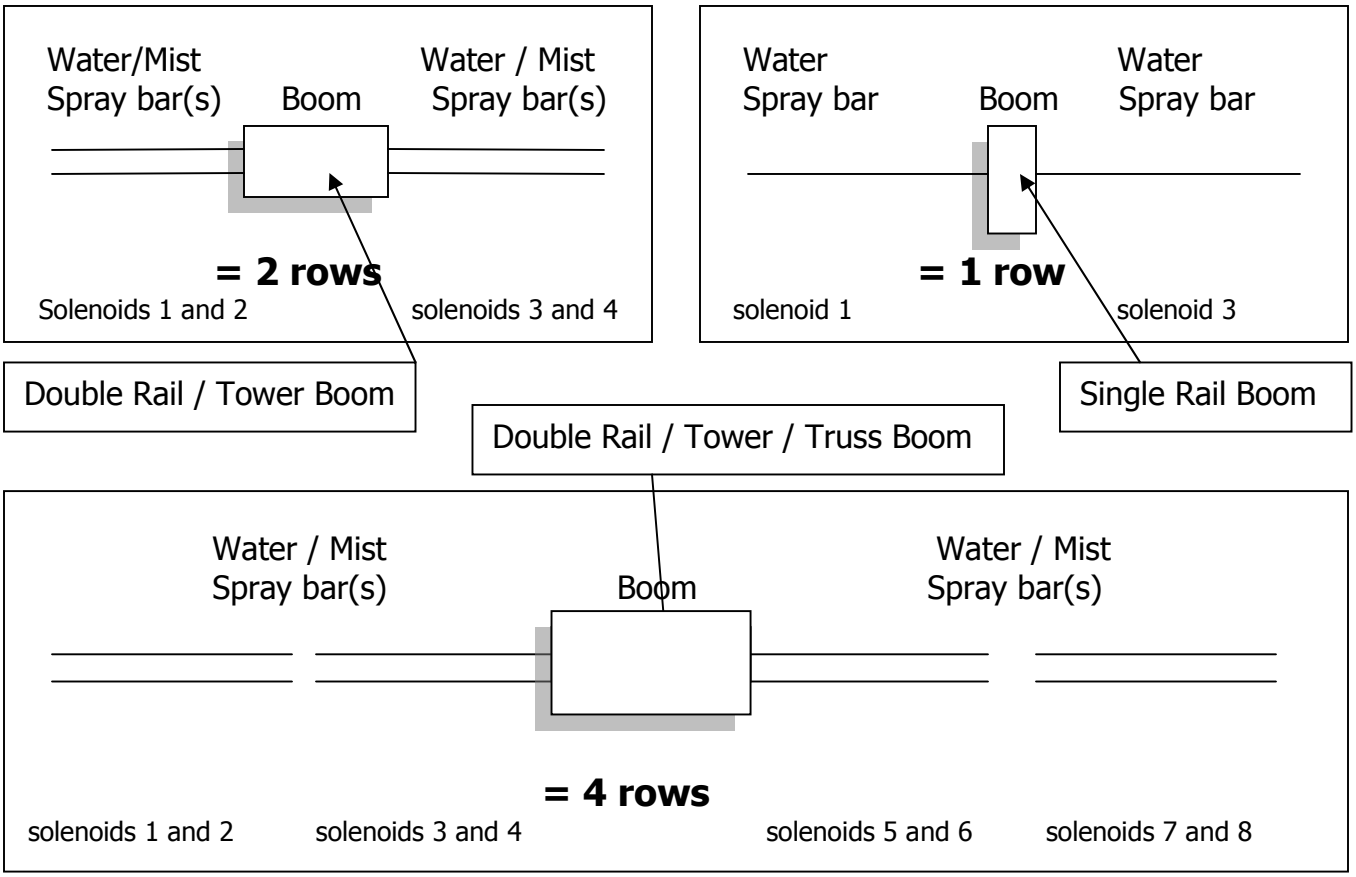
SELECT THE NUMBER OF
ROWS UNDER THE BOOM
ROWS UNDER BOOM = 4
PRESS E TO CONTINUE

7. Select the number of Rows that will be used by the boom and press the corresponding number on the keypad (in this case press "4" to utilize all 4 rows under the boom).
8. Next, assign each solenoid to a row and assign each row to a function. For example, by default all odd numbered solenoids are assigned to the "water" function and all even numbered solenoids are assigned to the "mist" function. Each one of the four rows can be assigned up to two functions each. Example screen shown below:

SOL – 1 ROW – 1 WATER
SOL – 2 ROW – 1 MIST
SOL – 3 ROW – 2 WATER
SOL – 4 ROW – 2 MIST

9. Press "F" or "B" to scroll thru and change the Row numbers, and press "C" or "D" to scroll thru and change the functions (water, mist or none). When the cursor is on the proper function, press "1" for the Water function, press "2" for the Mist function and press "3" for None.
10. Press "E" to exit and save.

*** *A row is a strip that runs the length of the bay. It has to be the same as the spray/mist bars under the boom. Each row can have a Water and/or Mist spray bar(s). Each spray bar has its own solenoid.* ***
Below are a few examples:



Initialization

(Main, 3, 3, 2, 3)

*** *Used to erase and reset your Crop and Area settings* ***

1. From Main menu press 3
2. From Setup menu press 3
3. Enter Pass Code (0000 by Default)
4. From the Site, Rows, and Bay menu press 2 (SITE)

** This screen will appear, press any key to continue **

WARNING!!! CHANGING
IDLER OR DISTANCE
WILL RESULT IN LOSS
OF CROP PROGRAM DATA

5. The Site Menu will appear.

1 =IDLER 2 =CONFIGER
3 =INITIAL 4 =BAY LENGTH
5 =LOCATE 6 =
7 = MORE E = EXIT

6. Press "3" for Initialize. This screen will appear:

CLEAR / INITIALIZE MENU
1 = INITIALIZE CROPS
2 = CLEAR SELECT AREA
F = EXIT

7. Press "1" for Initialize Crops. This will allow for the user to erase all **Crops** currently programmed into the NIC controller. After pressing "1", this screen will appear:

INITIALIZE CROPS MENU
STARTING CROP # = 01
ENDING CROP # = 16
E = INITIALIZE A = EXIT

8. Enter the Crop numbers that need to be erased, and press "E" to initialize and exit back to the Set-up screen.

CLEAR / INITIALIZE MENU
1 = INITIALIZE CROPS
2 = CLEAR SELECT AREA
F = EXIT

9. To erase all of the **Areas** stored in the NIC's memory, get back to the "Clear / Initialize" menu and press "2", Clear Select Area.

SELECTED ROW # = 1
STARTING AREA # = 001
ENDING AREA # = 060
E = INITIALIZE A = EXIT

10. Enter the Row number and the Area numbers that need to be erased, and press "E" to initialize and exit back to the Set-Up screen.

Bay Length

(Main, 3, 3, 2, 4)

1. From Main menu press 3
2. From Setup menu press 3
3. Enter Pass Code (0000 by Default)
4. From the Site, Rows, and Bay menu press 2 (SITE)

** This screen will appear, press any key to continue **

WARNING!!! CHANGING
IDLER OR DISTANCE
WILL RESULT IN LOSS
OF CROP PROGRAM DATA

5. Press "4" for "B-LENGTH" (Bay Length)

1 =IDLER 2 =CONFIGER
3 =INITAL 4 =B-LENGTH
5 =LOCATE 6 =
7 =MORE E = EXIT

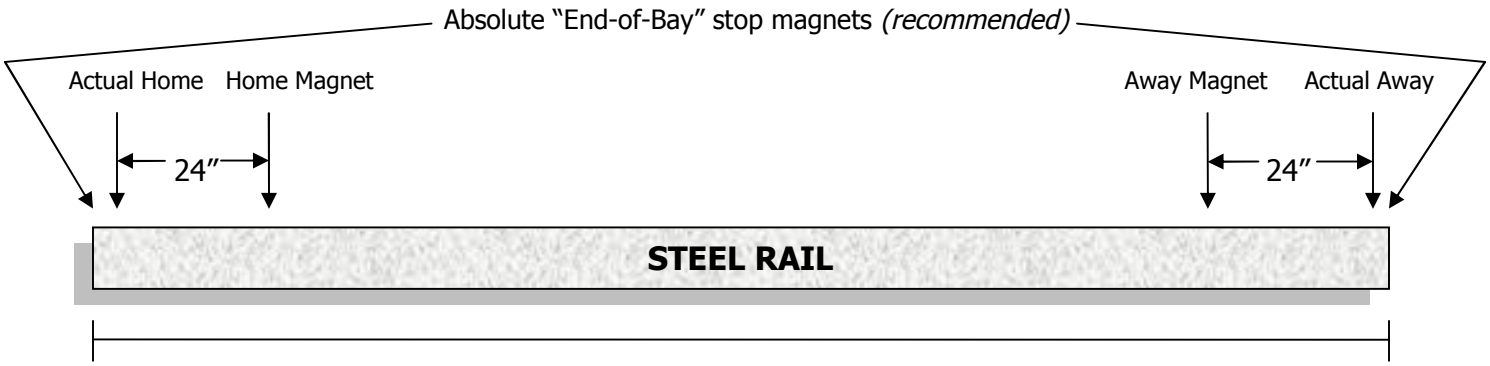
6. The "End of Bay Emergency Stop" prompt will appear. Press "E" to leave as programmed (NO, by default) or press "F" to change. Then "E" to Enter

** This function will enable SW-2 (switch input #2), which will stop the boom at a set magnet if it over shoots its target Home/Away stop points **

USE SW2 TO DETECT
ABSOLUTE END-OF-BAY
EMERGANCY STOPS? NO
E = ACCEPT F = CHANGE

7. The Home / Away / Marker magnets should be placed on the rail at this time. The Home & Away Magnets and should be placed 24" ahead of where you actually want the actual Home and Away to be. This allows the boom time to slow down to a stop. But the distance can be any number between 24" and the 5'. Any number over 5' may allow the booms calibration to get lost.

The Marker magnets should be placed at the programmed distance to assure proper calibration. **** It is recommended that a Marker magnet is placed on the rail at every (or even every other) Rail Mount Bracket in order to have the best performance and results from the Boom. If this is done, then the Marker distance should be your post spacing; typically 10 to 12 feet for US and Canadian made greenhouses. ****



8. After setting up the magnets, get back to the controller to finish the Calibration process. After the "Absolute End-of Bay" screen, the Marker Configuration screen will appear. Enter the number of Markers in the bay (as explained above). Then enter the Distance between the Markers. Then enter the Home Distance (the distance between the Home magnet and absolute Home). Then enter the Away Distance (the distance between the Away magnet and absolute Away).
   **** The distance must be consistent between the markers or Calibration will not function properly. ****

   - **Example:** if the bay is 210 feet long and there are 3 Markers (more are recommended; but this will make for an easy example) and the Home Marker is at 5 feet from absolute home and the Away Marker is 5 feet from the actual away, then the 3rd Marker should go in the middle of the bay and the Marker distance would be 100 feet (there is 100 feet between Markers).

MARKER CONFIGURATION
MARKS=03 DIST.=100.00
HM= 005.00 AW= 005.00
B =PREV F=NEXT E = EXIT

9. Next the "Locate" screen will appear. This will enable the user to move the boom between the first and second marker to initiate Calibration.

LOCATE BOOM BETWEEN
FIRST & SECOND MARKS
PRESS ANY TO ENTER
LOCATE BOOM FUNCTION

10. Press any key to move to the next screen.
11. Press "A" to change the booms direction if necessary. The boom needs to be positioned between the 1st and 2nd marker in order to initiate the calibration process. Locate the boom between the 1st and 2nd markers.

LOCATE HOME OR AWAY
MOVE AWAY AT 000 FPM
SPEED BC =INC DF =DEC
A = DIRECTION E = EXIT

12. Pressing "B" or "C" will start motor and pressing again will increase speed. Pressing "D" or "F" will slow boom down and pressing "E" will stop boom when it is in the right location (anywhere between the 1st and 2nd markers).

LOCATE LOC = 020.77 FT
MOVE AWAY AT 020 FPM
SPEED BC =INC DF =DEC
A = DIRECTION E = EXIT

13. Once the boom is between the 1st and 2nd Markers, press the "E" key. The boom is ready to start the calibration process. This screen will appear:

BAY LENGTH AT 030FPM
LOOK FOR 1ST MARK, TO
AWAY TO HOME, E = RUN
A = ENTER KEYB. F = EXIT

14. Press "E" to run the calibration. The boom will travel towards Home until it sees the 1st Marker magnet (Home), then travel toward the Away point until it sees the Away Marker magnet. The boom will also pick up Marker distances as the boom travels up and down the bay.

BAY LENGTH AT 030FPM
GO TO DISTANCE = 109.98FT
DISTANCE = 009.78 FT
PAUSE = ANY NUMBER KEY

15. After seeing the Away Marker magnet, the boom will turn around and travel back toward the Home Marker magnet and stop at the actual Home position. The boom Calibration is now complete. If the screen appears as below, then the Marker magnets or the Home / Away magnets were not seen properly and may need to be adjusted.
    ** If there are problems with Calibration, call Tech Support for help **

To review; the boom will:

- **Move towards the Home position until it locates the 1st Marker magnet (Home magnet)…**
- **Move to locate the Away magnet at the other end of your bay…**
- **Move to locate the Home magnet and stop.**

16. If the Calibration was successful, the screen will display:

ALL MARKERS FOUND
PRESS ANY KEY TO
VIEW LOCATIONS

** If this screen does not appear, the calibration was not successful **

17. Press any key to view the Marker Locations.
18. The screen will display the bay length and the number of markers that it found during Calibration.

BAY LENGTH = 109.98FT
NUMBER OF MARKERS = 10
MARKER 1 OF 10 = 04.89 FT
B =PREV F =NEXT E =EXIT

19. Press ”F” or “B” to scroll thru the Marker’s Location.
20. When the boom has been calibrated and the bay length registered, press “E” to go back to “Set-Up Menu”.

Locate Boom

(Main, 3, 3, 2, 4)

This Feature is a "short-cut" for use when the boom has gotten lost between two Markers and there is a need to manually enter the booms location. It is not to be used as a substitute for Calibration. If the boom continues to get lost, the boom needs to either be recalibrated, or diagnosed for any functional problems

1. From Main menu press 3
2. From Setup menu press 3
3. Enter Pass Code (0000 by Default)
4. From the Site, Rows, and Bay menu press 2 (SITE)

** This screen will appear, press any key to continue **

WARNING!!! CHANGING
IDLER OR DISTANCE
WILL RESULT IN LOSS
OF CROP PROGRAM DATA

5. Press "5" for "LOCATE" (Locate Boom):

1 =IDLER 2 =CONFIGER
3 =INITAL 4 =B-LENGTH
5 =LOCATE 6 =
7 =MORE E = EXIT

6. The "Locate" screen will appear. This will enable the user to move the boom to the nearest Marker or to a known Location (distance).

LOCATE BOOM BETWEEN
FIRST & SECOND MARKS
PRESS ANY TO ENTER
LOCATE BOOM FUNCTION

7. Press any key to move to the next screen.
8. Press "A" to change the booms direction if necessary.

LOCATE HOME OR AWAY
MOVE AWAY AT 000 FPM
SPEED BC =INC DF =DEC
A = DIRECTION E = EXIT

9. Pressing "B" or "C" will start motor and pressing again will increase speed. Pressing "D" or "F" will decrease the speed and pressing "E" will stop boom when it is in the necessary location.
10. Press "E" to exit and program a Location.

C URRENT LOC = 020.77 F
0 TO 9 = CHANGE
CHANGE LOCATION IF NOT
CORRECT E = SAVE&EXIT

11. Enter the correct Location and press "E" to Save and Exit.

Pass-code

(Main, 3, 3, 2, 7, 1)

1. From Main menu press 3
2. From Setup menu press 3
3. Enter Pass Code (0000 by Default)
4. From the Site, Rows, and Bay menu press 2 (SITE)

** This screen will appear, press any key to continue **

WARNING!!! CHANGING
IDLER OR DISTANCE
WILL RESULT IN LOSS
OF CROP PROGRAM DATA

5. Press "7" for "MORE"

1 =IDLER 2 =CONFIGER
3 =INITAL 4 =B-LENGTH
5 =LOCATE 6 =
7 =MORE E = EXIT

6. Press "1" for Pass-code (P-CODE)

1 =P-CODE 2 =UNITS
3 =GOTO SP 4 =DECELER.
5 =END SPD 6 =SSW SPD.
7 = E = EXIT

7. Enter any 4-digit Pass-code and press "E" to Exit & Save.

**** Write the pass-code down on the inside of the cover of this Manual ****

Units (Feet or Meters)

(Main, 3, 3, 2, 7, 2)

1. From Main menu press 3
2. From Setup menu press 3
3. Enter Pass Code (0000 by Default)
4. From the Site, Rows, and Bay menu press 2 (SITE)

** This screen will appear, press any key to continue **

WARNING!!! CHANGING
IDLER OR DISTANCE
WILL RESULT IN LOSS
OF CROP PROGRAM DATA

5. Press "7" for "MORE"

1 =IDLER 2 =CONFIGER
3 =INITAL 4 =B-LENGTH
5 =LOCATE 6 =
7 =MORE E = EXIT

6. Press "2" for "UNITS"

1 =P-CODE 2 =UNITS
3 =GOTO SP 4 =DECELER.
5 =END SPD 6 =SSW SPD.
7 = E = EXIT

7. Press the "0" key to toggle and change the Unit that the boom will use for its distance display and press "E" to Exit & Save.

Go-To Speed

(Main, 3, 3, 2, 7, 3)

**** Check Definitions for explanation of this feature ****

1. From Main menu press 3
2. From Setup menu press 3
3. Enter Pass Code (0000 by Default)
4. From the Site, Rows, and Bay menu press 2 (SITE)

** This screen will appear, press any key to continue **

WARNING!!! CHANGING
IDLER OR DISTANCE
WILL RESULT IN LOSS
OF CROP PROGRAM DATA

5. Press "7" for "MORE"

1 =IDLER 2 =CONFIGER
3 =INITAL 4 =B-LENGTH
5 =LOCATE 6 =
7 =MORE E = EXIT

6. Press "3" for "GOTO SP" (Go-To Speed)

1 =P-CODE 2 =UNITS
3 =GOTO SP 4 =DECELER.
5 =END SPD 6 =SSW SPD.
7 = E = EXIT

GOTO SPEED = 100
ENTER NEW VALUE THEN
KEY E TO SAVE & EXIT
SPEED RANGE 30–150FPM

7. By Default, the Go-To Sped will be set to 100 FPM. If this seems to fast or the boom has been programmed too low, enter a value between 30 FPM to 150FPM and press "E" to Exit & Save.

   **** It's recommended that the Go-To Speed is **NOT** set higher than 120FPM ****

Deceleration

(Main, 3, 3, 2, 7, 4)

1. From Main menu press 3
2. From Setup menu press 3
3. Enter Pass Code (0000 by Default)
4. From the Site, Rows, and Bay menu press 2 (SITE)

** This screen will appear, press any key to continue **

WARNING!!! CHANGING
IDLER OR DISTANCE
WILL RESULT IN LOSS
OF CROP PROGRAM DATA

5. Press "7" for "MORE"

1 =IDLER 2 =CONFIGER
3 =INITAL 4 =B-LENGTH
5 =LOCATE 6 =
7 =MORE E = EXIT

6. Press "4" for "DECELER." (Deceleration)

1 =P-CODE 2 =UNITS
3 =GOTO SP 4 =DECELER.
5 =END SPD 6 =SSW SPD.
7 = E = EXIT

7. Set the Deceleration by entering a value from 1 to 5, then press "E" to Exit & Save. *Check Definitions for explanation of this feature.*

SET DECELERATION
DECELERATION = 1
ENTER RATE OF 1 TO 5
E = SAVE AND EXIT

End Speed

(Main, 3, 3, 2, 7, 5)

1. From Main menu press 3
2. From Setup menu press 3
3. Enter Pass Code (0000 by Default)
4. From the Site, Rows, and Bay menu press 2 (SITE)

** This screen will appear, press any key to continue **

WARNING!!! CHANGING
IDLER OR DISTANCE
WILL RESULT IN LOSS
OF CROP PROGRAM DATA

5. Press "7" for "MORE"

1 =IDLER 2 =CONFIGER
3 =INITAL 4 =B-LENGTH
5 =LOCATE 6 =
7 =MORE E = EXIT

6. Press "5" for "END SPD" (End Speed)

1 =P-CODE 2 =UNITS
3 =GOTO SP 4 =DECELER.
5 =END SPD 6 =SSW SPD.
7 = E = EXIT

7. Set the End Speed by entering a value from 5 to 40 FPM, then press "E" to Exit & Save. *Check Definitions for explanation of this feature.*

SET END SPEED
END SPEED = 1
ENTER 5 TO 40 FPM
E = SAVE AND EXIT

Step / Stop / Water Speed

(Main, 3, 3, 2, 7, 6)

1. From Main menu press 3
2. From Setup menu press 3
3. Enter Pass Code (0000 by Default)
4. From the Site, Rows, and Bay menu press 2 (SITE)

** This screen will appear, press any key to continue **

WARNING!!! CHANGING
IDLER OR DISTANCE
WILL RESULT IN LOSS
OF CROP PROGRAM DATA

5. Press "7" for "MORE"

1 =IDLER 2 =CONFIGER
3 =INITAL 4 =B-LENGTH
5 =LOCATE 6 =
7 =MORE E = EXIT

6. Press "6" for "SSW SPD." (Step/Stop/Water Speed)

1 =P-CODE 2 =UNITS
3 =GOTO SP 4 =DECELER.
5 =END SPD 6 =SSW SPD.
7 = E = EXIT

7. Set the SSW Speed by entering a value from 10 to 20 FPM, then press "E" to Exit & Save. *Check Definitions for explanation of this feature.*

SET STEP-STOP-WATER
STEP SPEED = 20
ENTER 10 TO 20 FPM
E = SAVE AND EXIT

Acceleration

(Main, 3, 3, 0000, 3)

**** It is recommended that the Acceleration factor is increased if the Boom is having trouble when it changes direction of travel. ****

1. From Main menu press 3
2. From Setup menu press 3
3. Enter Pass Code (0000 by Default)
4. Press 3 to enter ACCEL (Acceleration)

ACCELERATION FACTOR
ACCEL FACTOR IS 05
ENTER 0 THROUGH 14
E = SAVE AND EXIT

5. Press "E" to Save and Exit.

Marker Location

(Main, 3, 3, 0000, 4)

**** It is recommended that the Acceleration factor is increased if the Boom is having trouble when it changes direction of travel. ****

1. From Main menu press 3
2. From Setup menu press 3
3. Enter Pass Code (0000 by Default)
4. Press 4 to enter MARKER LOC (Marker Location)

BAY LENGTH = 110.00FT
FOUND 10 MARKERS
MARKER 01 AT 004.96FT
B=NEXT F=PREV E=EXIT

5. Press "B" and "F" to scroll thru the Marker Locations.
6. Press "E" to Exit.

Network Enable

(Main, 3, 3, 0000, 5)

*** Contact Cherry Creek to better understand the ***Network*** feature ***

1. From Main menu press 3
2. From Setup menu press 3
3. Enter Pass Code (0000 by Default)
4. Press 5 to enter Network Menu

NETWORK ENABLED
PRESS F KEY TO STEP
THRU NETWORK/DISPLAY
PRESS E KEY TO EXIT

5. Press "F" to scroll thru the Network options.
6. There are 3 settings to choose from:
   - No Network or Display, Network Enabled, External Display On

NETWORK ADDRESS MENU
ENTER NEW ADDRESS, &
PRESS E KEY, CONTINUE
NETWORK ADDRESS= 001

7. If enabled, assign a 3-digit address to each Boom (for use with the Cherry Creek Network Accumulator). *Call CCS for details.*
8. Press "E" to Save and Exit.

Operations

Crops

(Main, 3, 1, 1, Crop #)

Quick Menu/ Keypad Number Reference

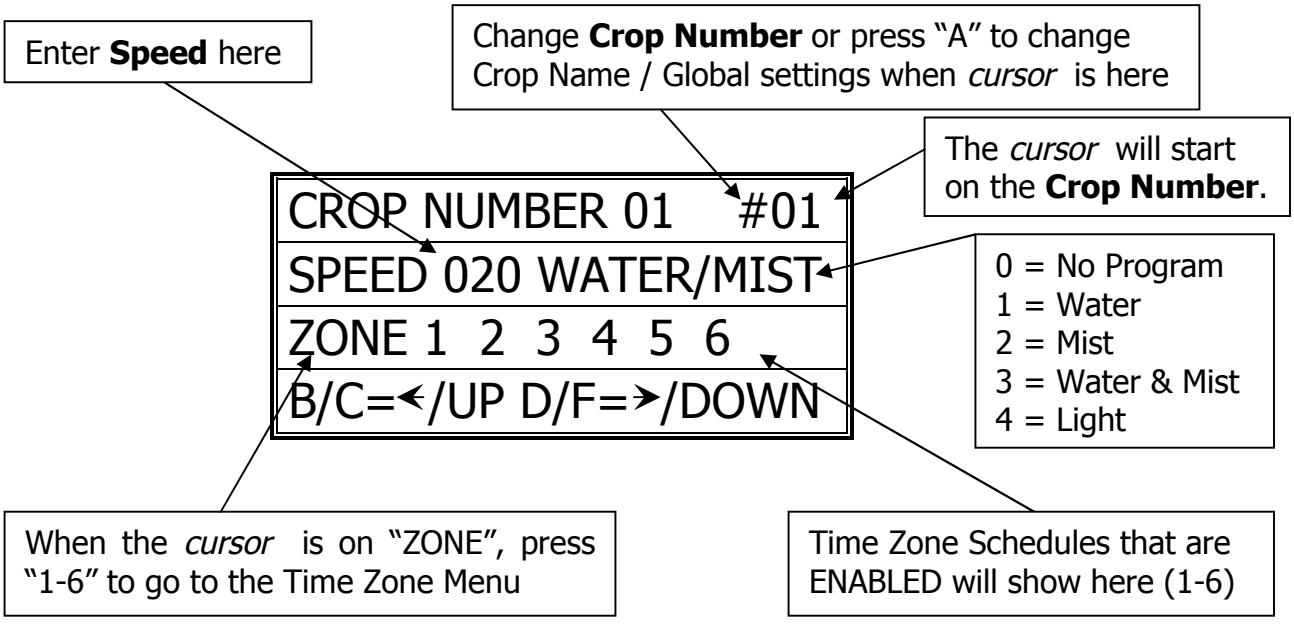
**** The Bay Length and Rows (Configuration) must be programmed before you can set up any **Crops** (see previous sections) ****

1. From the Main Menu press 3
2. From the Setup Menu press 1
3. From the Crops menu press 1
4. Enter the Crop Number (#1-16) to change any of the Crop information.

ENTER CROP NUM. 1-16
'A' KEY TO EDIT CROP
NAME/GLOBAL OR S-S-W
WHEN CURSOR ON ITEM

1. Enter the Crop Number (1-16) to be modified.
2. Use the "B/C" & the "D/F" keys to scroll through the Crop Menu.
3. To change the Crop Name, press "A" when the cursor is on the Crop Number to enter the Crop Name / Global Menu. Use the "C/D" keys to scroll, use the "B/F" keys to change the Crop Name. Press "A" to enter the "Global Solenoid Menu".

*Exploded view of the **Crop** Screen:*



4. Press "E" to Save and Exit.

Global Solenoids

(Main, 3, 1, 1, Crop #, A)

**** The normal operation of the boom is to water one Area at a time. Even if those Areas are next to each other. For example, the same Crop is under 2 rows from end to end. Instead of watering row 1 and then row 2, enabling the Global Solenoid feature will water both sides at once. ****

1. From the Main Menu press 3
2. From the Setup Menu press 1
3. From the Crops menu press 1
4. Enter the Crop Number (#1-16)
5. Press A when cursor is over the Crop Number

CHANGE CROP NAME #1
A=GLOBAL SOL. B/F=CHAR
C/D = CURSOR E = EXIT
CROP NUMBER 01

6. Press "A" to enter the Global Solenoids Menu.

CROP NUMBER 01
#01 G SOL = 1 2 3 4 5 6 7 8
ALL G SOL =
B/C/D/F = SEL E = EXIT

7. Press the 1-8 keys to toggle the solenoids on and off of Global.
8. Scrolling to All Global (ALL G SOL) and enabling solenoids 1-8 will activate those solenoids to Global for all Crop Numbers.
9. Press "E" to Exit and Save

Time Zones (Auto Programming)

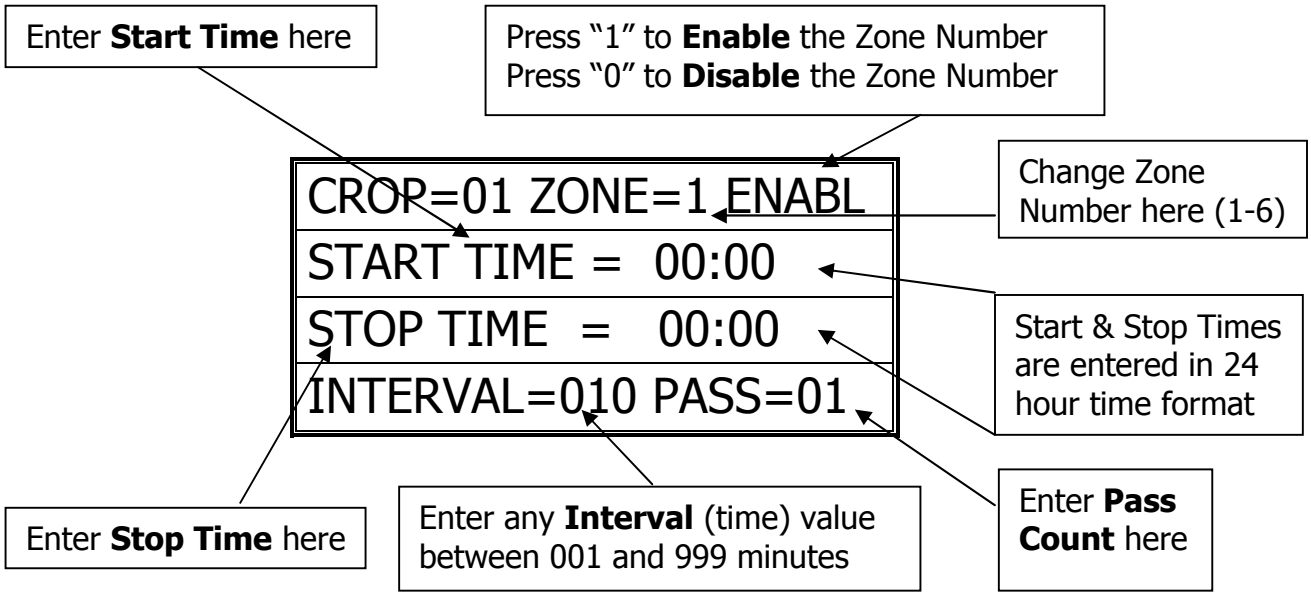
(Main, 3, 1, 2, Crop #, Curser over Zone, 1-6)

Time Zone = A time zone is a specific period of time.
Each Crop can have up to 6 different time zones.
Interval = How many minutes between passes.
Pass = 1 time over Crop.

1. From the Main Menu press 3
2. From the Setup Menu press 1
3. From the Crops Menu press 1
4. Enter the Crop Number (1-16)

5. Move curser over Zone and press 1-6 to scroll through the 6 Time Zones

*Exploded view of the **Time Zone** Screen:*



6. Cherry Creek recommends that the User press' "00" on Crop and clear out the information that appears on the screen, in Zones 1-6. This is a "bug".
7. Press "E" to Save and Exit.

Areas (Distances)

(Main, 3, 1, 3, Row #)

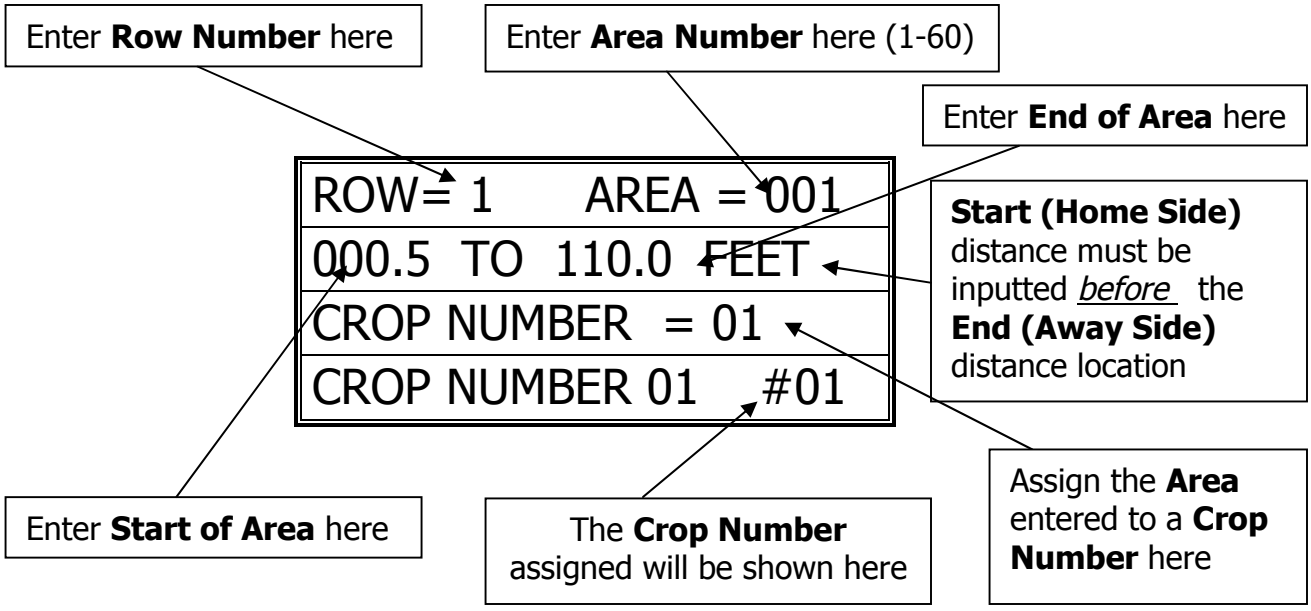
**** The Bay Length and Rows (Configuration) must be programmed before you can set up any **Areas** (see previous sections) ****

1. From the Main Menu press 3
2. From the Setup Menu press 1
3. From the Crops Menu press 1
4. Enter the Row Number (1-4)

PRESS KEY 0 THRU 9
TO SELECT A ROW
THEN SELECT AREA TO
VIEW OR CHANGE DATA

5. The Area Assignment screen will appear:

*Exploded view of the **Area Assignment** Screen:*



6. Each Row has 60 Areas that can be assigned to any of the 16 Crop Numbers. This gives the ability to program up to 240 Areas!
7. Press "E" to Save and Exit.

Manual Run

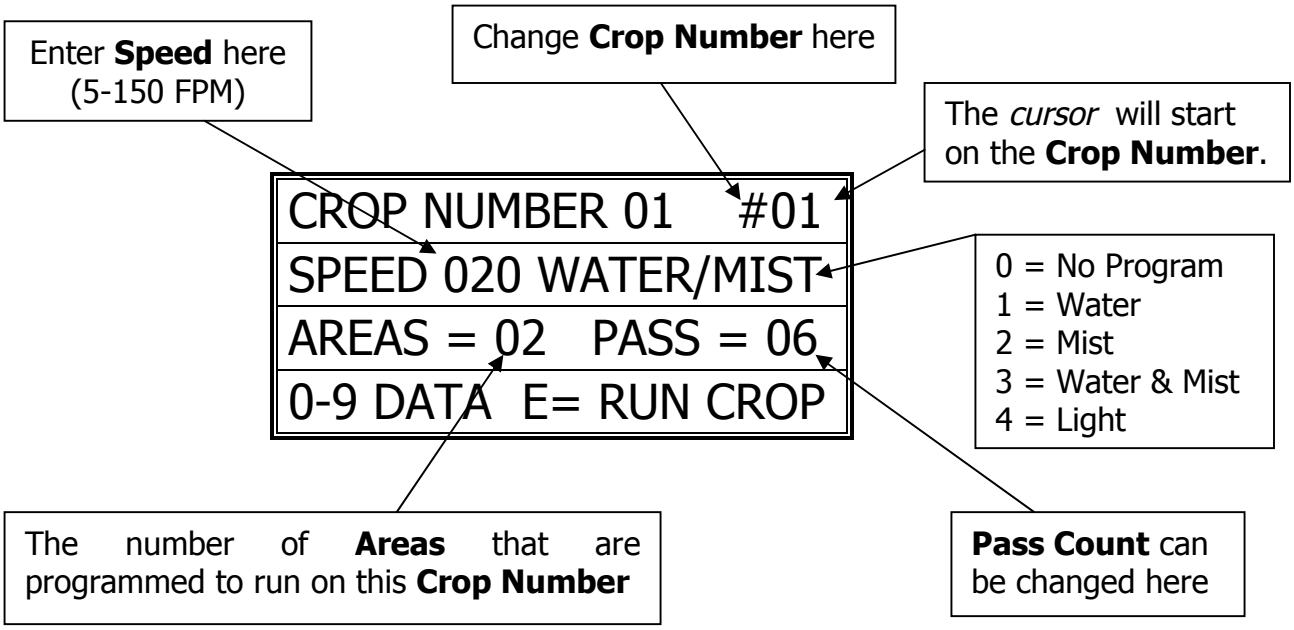
(Main, 2, Crop#)

1. From the Main Menu press 2.
2. From the Manual Menu enter crop #
3. The Manual screen will appear:

ENTER CROP NUMBER 01
A = WALK & WATER
C = CROP AREA VIEWER
E = EXIT MENU

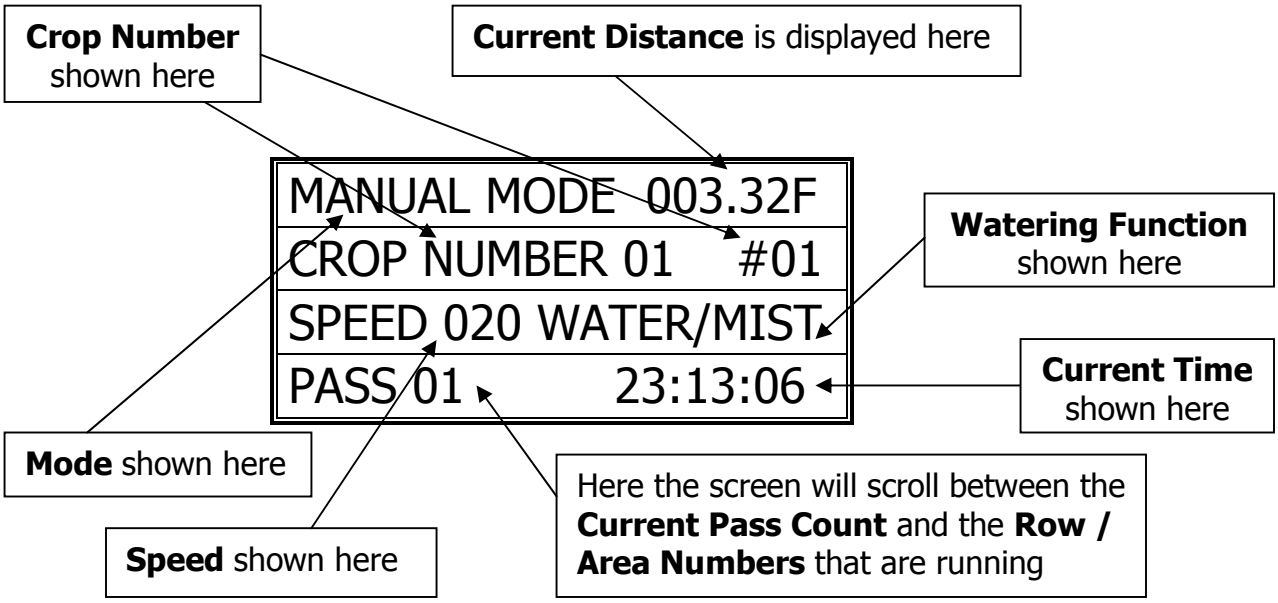
4. Enter the Crop Number to be Manually Started
5. The Manual Start screen will appear:
6. Use the "B/C" & the "D/F" keys to scroll through the Manual Start Menu. Use 0-9 keys to input the necessary data.
7. The Crop Number, Speed, Watering Function, and Pass Count can be changed before Pressing "E" to Run Crop. Changing any of these factors will *only* take effect on this Manual Run. To make permanent changes to the Crop factors, go to Crop Set-Up Menu, reprogram factors, then exit and save.

*Exploded view of the **Manual Start** Screen:*



8. Press "E" to Run Crop.
9. The "Manual Run" screen will appear:

*Exploded view of the **Manual Run** Screen:*



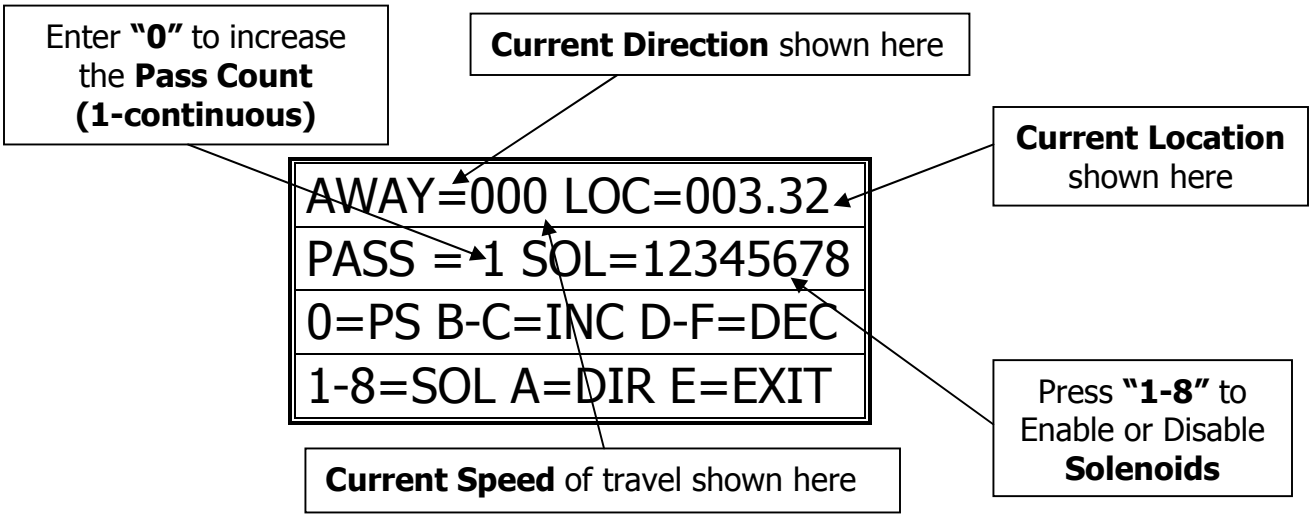
10. The Boom will Run the Manual Program, stop, and await its next command. The Boom will stop at the Start Distance.

Walk and Water

(M, 2, A)

1. From the Main menu press 2
2. Press A for Walk & Water

*Exploded view of the **Manual Start** Screen:*



3. Press "0" to increase the Pass Count (1-countinuous).
    i. Continuous Mode will run the whole length of the bay, back and forth, from Home & Away, until the user stops the boom
4. Press "A" to change Direction. Press "B/C" to increase speed and "D/F" to decrease speed and come to a stop. Press 1-8 to enable/disable solenoids.
5. Press "E" to Exit to the Main Menu.

Crop Area Viewer

(Main, 2, C)

1. From the Main Menu press 2
2. From the Manual Menu press C

ENTER CROP NUMBER
A = WALK & WATER
C = CROP AREA VIEWER
E = EXIT MENU

3. Enter the Crop Number (1-16) to View the Areas & Rows assigned:

CROP #=01 #AREAS=02
R1 A001 000.5 – 110.0F
R2 A002 005.0 – 078.8F
R4 A005 072.3 – 110.0F

4. Press "E" twice to Exit and go back to the Main screen.

Auto Run (Time Based)

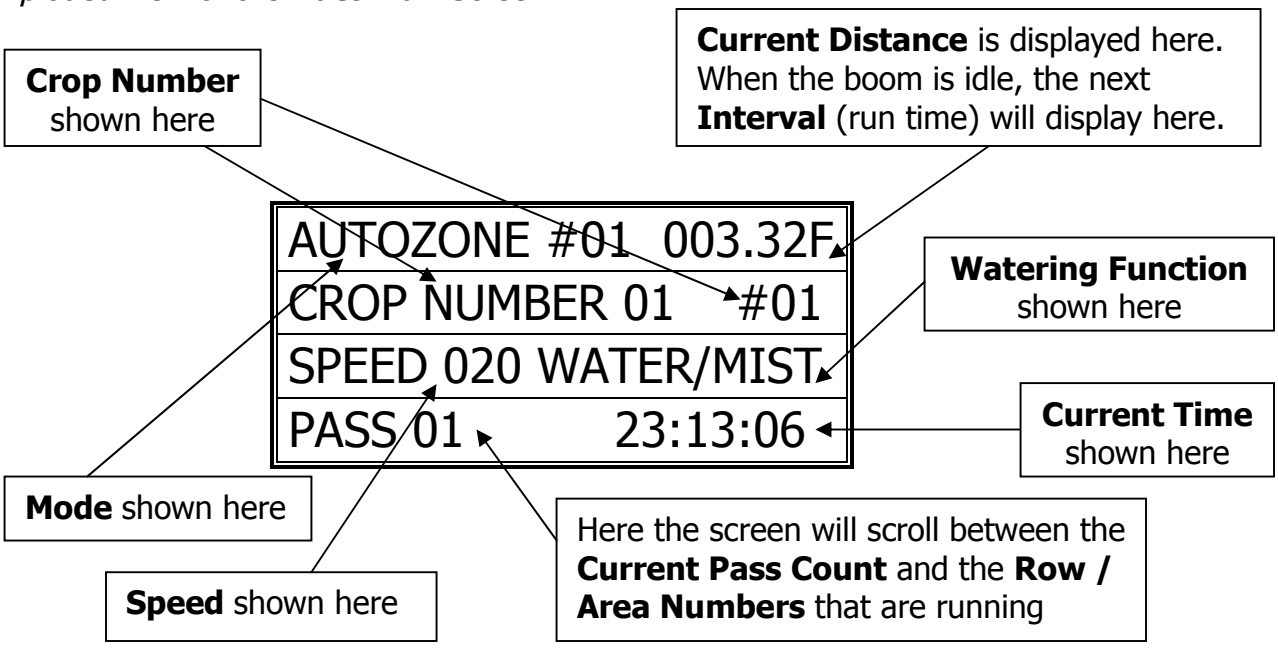
(Main, 1)

**** If not already done, set up Time Zones and Enable the Zones as needed.*
*See **"Time Zones (Auto Program)"** section ****

1. To start Auto programs go to **Main Menu & press 1**
2. Press "E" while in the Auto Mode to Exit

1=AUTO 2=MANUAL
3=SETUP CROPS & SITE
4=GLOBAL NET CROPS
NIC-EM.6 23:59:59

*Exploded view of the **Auto Run** Screen:*



Step / Stop / Water

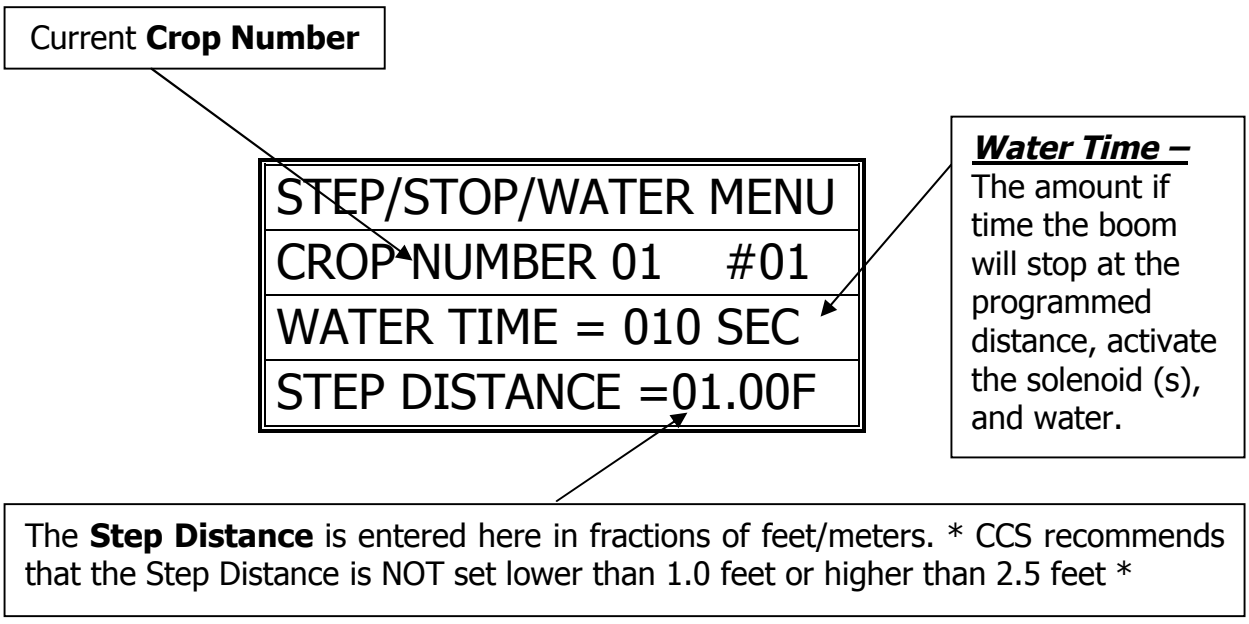
(Main, 3, 1, 1, Crop #, 00 when cursor is on Speed)

1. From the Main Menu press 3
2. From the Setup Menu press 1
3. From the Crops menu press 1
4. Enter the Crop Number (#1-16) to change any of the Crop information.

ENTER CROP NUM. 1-16
'A' KEY TO EDIT CROP
NAME/GLOBAL OR S-S-W
WHEN CURSOR ON ITEM

5. Enter the Crop Number (1-16) to be modified.
6. Use the "B/C" & the "D/F" keys to scroll through the Crop Menu.
7. To enable the Step / Stop / Water feature press "00" when the cursor is on the Speed.
8. Press "A" when the cursor is on the Step/Stop/Water to change the S/S/W settings. Use the "B/F" keys to scroll through the Menu and change info.

*Exploded view of the **Step / Stop / Water** Screen:*



9. Change the Water Time and the Step Distance the desired settings.
10. Press "E" to Exit, Save and Return to the Crop Menu.

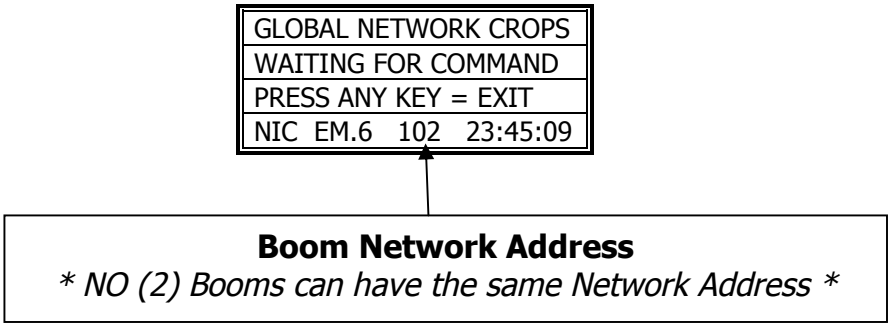
Global Networking Feature

(Main, 4)

* Contact Cherry Creek to better understand the ***Global Network*** feature *

Before this step, the Networking Feature needs to be enabled
Refer to "Network Enable" (page 29)

1. From Main menu press 4
2. This will enter the Global Network screen:



3. The NIC will then search for the Network signal and await Commands.
4. Press any key to Exit.

Troubleshooting and Support

Motion Error:

- Check Proximity (Motion) Sensor for damage and function.
- There will be a yellow light (located at the base of the sensor body) that should turn on when the sprocket teeth pass the sensor head. If there is no light fluctuation, then check that the sensor is within 3 mm. (millimeters) of the sprocket teeth as they pass.
- If the sprockets teeth are within 3mm, check the functionality of the Proximity (Motion) Sensor. *Refer to the Diagnostics part of this manual for testing sensor inputs.* If the sensor is not functional or broken, please call Cherry Creek to purchase a new sensor.

Collision Error:

- The NIC has the option of using a Collision Sensor to stop the boom if it runs into any objects that might be in the bay (carts, shelves, trash cans, people, etc.). This is an *Option* that can be purchased from CCS at any time. Call Cherry Creek for more info.
- If the boom is not equipped with the Collision Sensor option, there needs to be a jumper wire in Switch #4. To check this, open the NIC lid, pull the keypad ribbon and set the lid aside. Look at the Terminal Blocks that run down the left side of the Main Board (black "blocks" with colored wires running into them). Pull the second-from-the-top 6 pin Terminal Block from the board (labeled J2 or JT2). There will be writing on the Main Board for the switch #. Make sure the jumper wire is in place in the Block. The jumper wire should connect to Switch #4 and the Ground (GRD) that is directly above SW4.
- *If the Boom **is** equipped with the Collision Sensor Option*, then:
    - Check the Collision Sensor for damage and function.
    - *Refer to the Diagnostics part of this manual for testing sensor inputs.* If the sensor is not functional or broken, please call Cherry Creek to purchase a new sensor.

Marker Count Error:

- Check Marker Magnet Sensor for damage and function.
- Check to make sure that all the Marker magnets are in the correct placement as to the programmed distance (set when programming the Bay Length).
- Also check to make sure that the *Number* of "Markers" programmed the same as the amount of Marker magnets on the rail.
- Check the functionality of the Marker Magnet Sensor. *Refer to the Diagnostics part of this manual for testing sensor inputs.* If the sensor is not functional or broken, please call Cherry Creek to purchase a new sensor.

****** Before calling Tech Service, please try to RESET the Controller by pressing the RESET button on the board (shown in the Mother Board diagram on the "Wiring Diagrams" pages). If there is not a button, there will be two pins; jump them together with the tip of a flathead screwdriver and that will RESET the controller as well. This will sometimes solve problems and is an easy step to correcting the problem before calling Tech Service. If the NIC is "locked-up", this will typically take care of it and get the Controller functional again. Otherwise contact CCSI. ******

TECHNICAL ASSISTANCE: ***If you have any questions regarding the use of this program or any other Cherry Creek Systems Product please call us at .....***

(719) 380-8373 ext. 206

OR

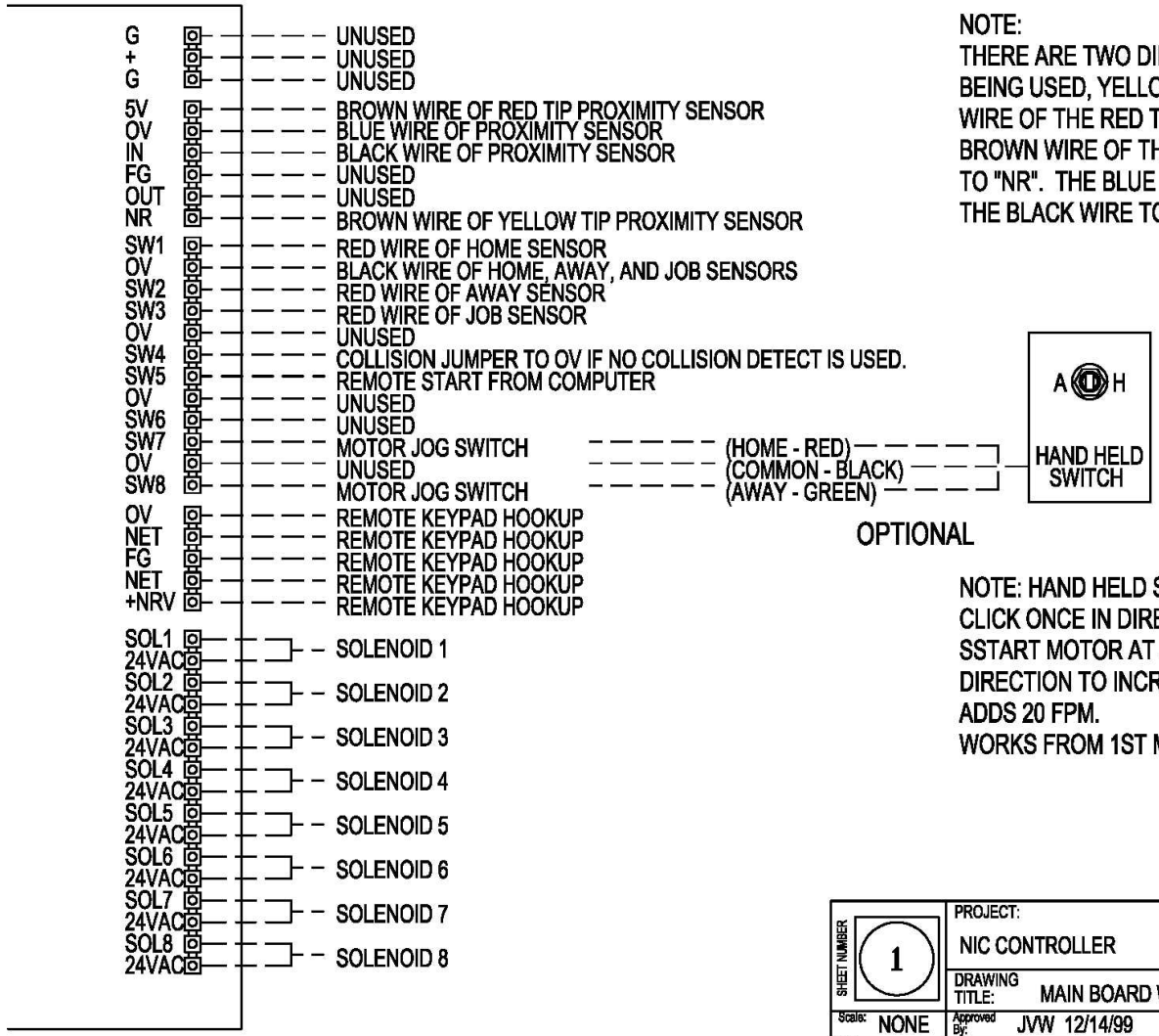
ccs@cherrycreeksystems.com

OR

info@cherrycreeksystems.com

OR

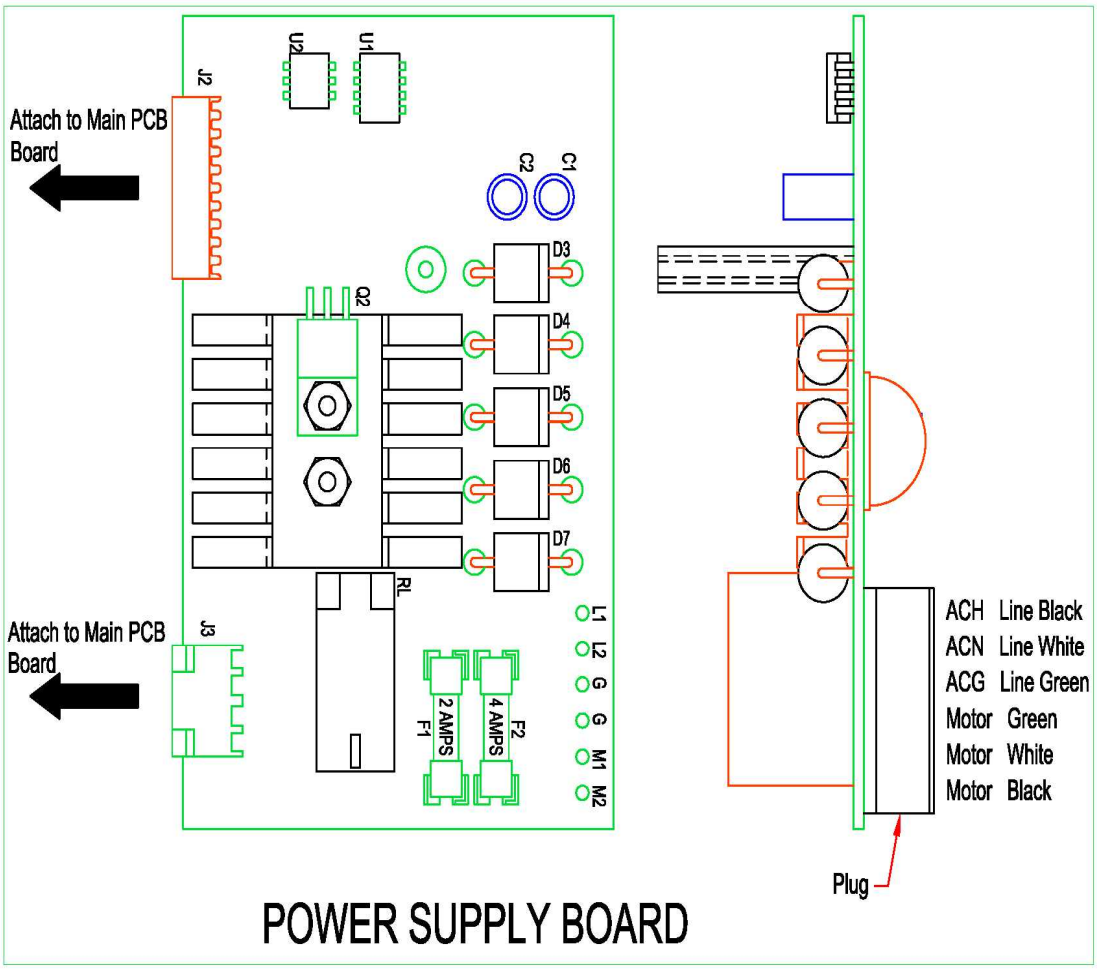
www.cherrycreeksystems.com



NOTE:
THERE ARE TWO DIFFERENT PROXIMITY SENSORS BEING USED, YELLOW TIP AND RED TIP. THE BROWN WIRE OF THE RED TIP IS CONNECTED TO "5V" AND THE BROWN WIRE OF THE YELLOW TIP IS CONNECTED TO "NR". THE BLUE WIRE IS ALWAYS TO "OV" AND THE BLACK WIRE TO "IN".

NOTE: HAND HELD SWITCH OPERATION -
CLICK ONCE IN DIRECTION (HOME OR AWAY) TO SSTART MOTOR AT SLOW SPEED. CLICK IN SAME DIRECTION TO INCREASE SPEED, EACH CLICK ADDS 20 FPM.
WORKS FROM 1ST MENU.

SHEET NUMBER: 1	PROJECT: NIC CONTROLLER	CUSTOMER: .	CHERRY CREEK SYSTEMS INC
	DRAWING TITLE: MAIN BOARD WIRING DIAGRAM		Greenhouse Equipment Specialists
Scale: NONE	Approved By: JVW 12/14/99	Drawn By: DJS	
Date: Jun 1, 98	Part Number: 315-0035	Revision Number: .	


Attach to Main PCB Board
J2
U2
U1
C2
C1
D3
D4
D5
D6
D7
Q2
RL
Attach to Main PCB Board
J3
L1
L2
G
G
M1
M2
2 AMPS
F1
4 AMPS
F2
ACH Line Black
ACN Line White
ACG Line Green
Motor Green
Motor White
Motor Black
Plug
POWER SUPPLY BOARD

Options and Upgrades

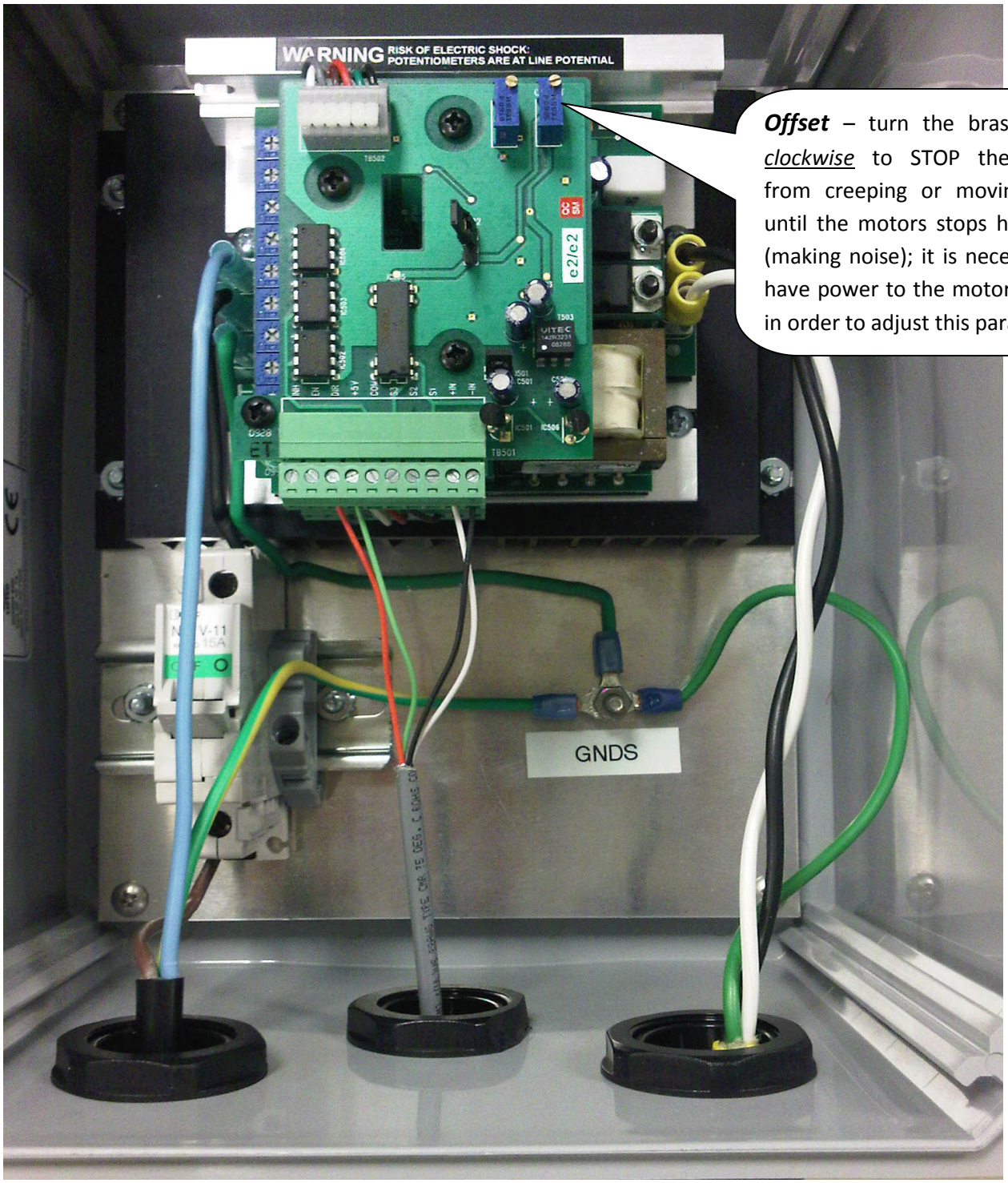
Remote Keypad and Display

An optional keypad and LCD display is available to operate the NIC from a remote location, such as the aisle.

To connect the remote keypad to the NIC:

Use shielded 22 gauge / 4-conductor wire. The NIC has a five-pin connector (on the lower, right side of the circuit board), that reads from top to bottom: **OV, NET, FG, NET, +NRV**. Likewise the remote keypad has a five-pin connector located below the LCD display that reads from left to right: **OV, NET, FG, NET, +NRV**. These connections should be made straight across with the **shield being used for the FG** connection. In other words, wires should run from *OV to OV, from NET to NET, from FG to FG* (with the shield), etc. You will find a small jumper at **J1** on the remote keypad (**J1** is the eight-pin keypad connector located directly below and behind the LCD). Remove this jumper and connect the keypad's ribbon to **J1**. The jumper should be placed on pins 4 and 5 at **J2** on the NIC (**J2** is the eight-pin keypad connector on the NIC located directly below and behind the LCD display. To toggle between the two displays (the remote display and the NIC display), select setup from the *Main Menu* and press "**6"** to enter the *Display Menu*. Press "**F**" to toggle the display and **E** to Exit to the *Main Menu*. If the jumper is not placed on J2, both displays can be viewed at the same time.

Note: **If you are having difficulty re-routing control to the remote keypad, refer to the section of this manual marked Resetting the NIC.**



Offset – turn the brass screw *clockwise* to STOP the motor from creeping or moving; turn until the motors stops humming (making noise); it is necessary to have power to the motor control in order to adjust this parameter.

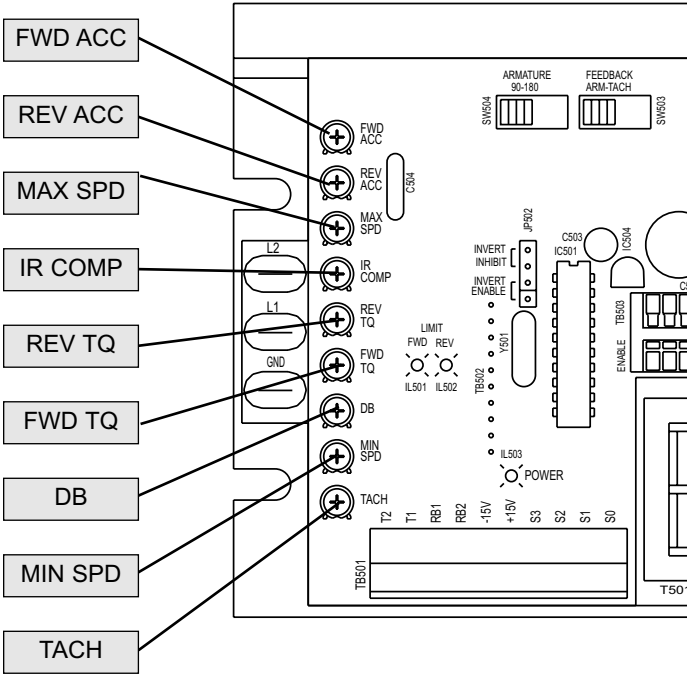


Figure 17. RG60U Calibration Trimpot Locations

MINIMUM SPEED (MIN SPD)

The MIN SPD trimpot setting determines the minimum speed when the speed adjust potentiometer is turned full CCW. It is factory set to zero speed. The minimum speed feature applies only when the drive is operating in unidirectional mode.

To calibrate MIN SPD:

1. Set the speed adjust potentiometer to full CCW.
2. Adjust the MIN SPD trimpot until the desired minimum motor speed is reached.

MAXIMUM SPEED (MAX SPD)

The MAX SPD trimpot setting determines the maximum forward and reverse speed. It is factory set for maximum rated motor speed.

To calibrate MAX SPD:

1. Set the MAX SPD trimpot full CCW.
2. Turn the speed adjust potentiometer CW so that the motor is running at full speed.
3. Adjust the MAX SPD trimpot until the desired maximum motor speed is reached.

Caution! Do not attempt to run motor above 90 VDC on 115 VAC or above 180 VDC on 230 VAC.

FORWARD TORQUE (FWD TQ)

> ⚠ **Warning**
>
> Although FWD TQ can be set to 120% of motor nameplate current rating, continuous operation beyond this rating may damage the motor. If you intend to operate beyond this rating, contact your Minarik representative for assistance.

The FWD TQ setting determines the maximum current limit for accelerating and driving the motor in the forward direction. It is factory set at 120% of maximum rated drive current.
See Figure 19 (page 39) for typical FWD TQ calibration settings or use the following procedure to recalibrate FWD TQ:

1. With the power disconnected from the drive, connect a DC ammeter in series with the armature.
2. Set the FWD TQ trimpot to minimum (full CCW).
3. Set the speed adjust potentiometer to maximum (full CW).
4. Carefully lock the motor armature. Be sure that the motor is firmly mounted.
5. Apply line power. The motor should be stopped.
6. Slowly adjust the FWD TQ trimpot CW slowly until the armature current is 120% of motor rated armature current.
7. Set the speed adjust potentiometer to minimum.
8. Remove the power from the drive.
9. Unlock the motor shaft.
10. Remove the ammeter in series with the motor armature if it is no longer needed and re-apply power to the drive.

REVERSE TORQUE (REV TQ)

> **Warning**
>
> Although REV TQ can be set to 120% of motor nameplate curren rating, continuous operation beyond this rating may damage the motor. If you intend to operate beyond this rating, contact your Minarik representative for assistance.

The REV TQ setting determines the maximum current limit for accelerating and driving the motor in the reverse direction. It is factory set at 120% of maximum rated drive current.
See Figure 19 (page 39) for typical REV TQ calibration settings or use the following procedure to recalibrate REV TQ:

1. With the power disconnected from the drive, connect a DC ammeter in series with the armature.
2. Set the REV TQ trimpot to minimum (full CCW).
3. Set the speed adjust potentiometer to maximum (full CW).
4. Carefully lock the motor armature. Be sure that the motor is firmly mounted.
5. Apply line power. The motor should be stopped.
6. Slowly adjust the REV TQ trimpot CW slowly until the armature current is 120% of motor rated armature current.
7. Set the speed adjust potentiometer to minimum.
8. Remove the power from the drive.
9. Unlock the motor shaft.
10. Remove the ammeter in series with the motor armature if it is no longer needed and re-apply power to the drive.

IR COMPENSATION (IR COMP)

The IR COMP trimpot setting determines the degree to which motor speed is held constant as the motor load changes. It is factory set for optimum motor regulation.

See Figure 19 (page 39) for typical IR COMP calibration settings or use the following procedure to recalibrate the IR COMP setting:

1. Set the IR COMP trimpot to minimum (full CCW).
2. Rotate the speed adjust potentiometer until the motor runs at mid-speed without load (for example, 900 RPM for an 1800 RPM motor). A hand held tachometer may be used to measure motor speed.
3. Load the motor armature to its full load armature current rating. The motor should slow down.
4. While keeping the load on the motor, rotate the IR COMP trimpot until the motor runs at the speed measured in step 2. If the motor oscillates (overcompensation), the IR COMP trimpot may be set too high (CW). Turn the IR COMP trimpot CCW to stabilize the motor.
5. Unload the motor.

FORWARD ACCELERATION (FWD ACC)

The FWD ACC setting determines the time the motor takes to ramp to either a higher speed in the forward direction or a lower speed in the reverse direction, within the limits of available torque. The FWD ACC setting is factory set for its fastest forward acceleration time.

Turn the FWD ACC trimpot CW to increase the forward acceleration time, and CCW to decrease the forward acceleration time.

REVERSE ACCELERATION (REV ACC)

The REV ACC setting determines the time the motor takes to ramp to either a higher speed in the reverse direction or a lower speed in the forward direction, within the limits of available torque. The REV ACC setting is factory set for its fastest reverse acceleration time.

Turn the REV ACC trimpot CW to increase the reverse acceleration time, and CCW to decrease the reverse acceleration time.

DEADBAND (DB)

The deadband trimmer potentiometer determines the time that will elapse between the application of current in one direction before current is applied in the opposite direction.

The deadband trimmer potentiometer affects the resistance that a motor has to changes in shaft position at zero speed. It does this by applying AC voltage to the motor armature.

Deadband is factory calibrated with the notch at approximately the 3 o'clock position for 60 Hz AC line operation. Recalibrate the deadband with the notch at the 9 o'clock position for 50 Hz AC line operation. If you hear motor noise (humming), the deadband might be set too high. Turn the deadband trimpot CCW until the motor noise ceases.

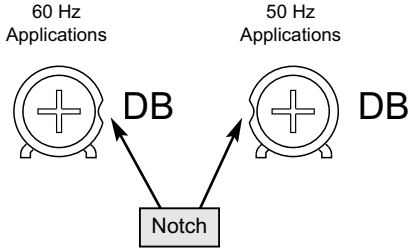


Figure 18. Deadband Settings

TACH GENERATOR (TACH)

Calibrate the TACH setting only when a tachogenerator is used. The TACH setting, like the IR COMP setting, determines the degree to which motor speed is held constant as the motor load changes.

To calibrate the TACH trimpot:

1. Connect the tachogenerator to T1 and T2. The polarity is positive (+) for T1 and negative (-) for T2 with the motor running in forward direction.
2. Set SW503 to ARM for armature feedback.
3. Set the speed adjust potentiometer full CW. Measure the armature voltage across A1 and A2 using a voltmeter.
4. Set the speed adjust potentiometer to 0 (zero speed).
5. Set SW503 to TACH for tachogenerator feedback.
6. Set the IR COMP trimpot to full CCW.
7. Set the TACH trimpot to full CW.
8. Apply line power.
9. Set the speed adjust potentiometer to full CW.
10. Adjust the TACH trimpot until the armature voltage is the same value as the voltage measured in step 3.

Check that the tachogenerator is properly calibrated. The motor should run at the same speed when SW503 is set to either armature or tachogenerator feedback.

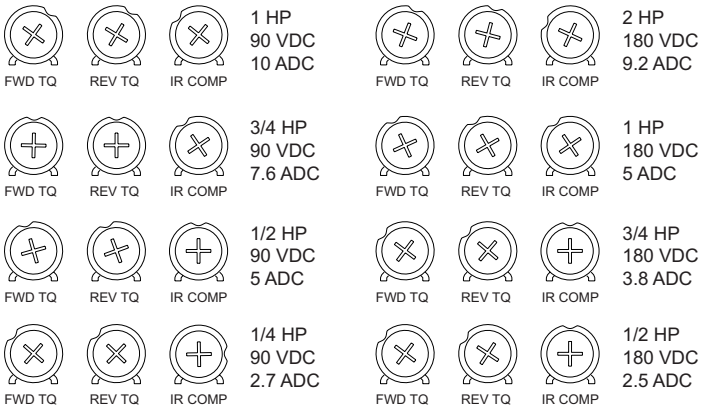


Figure 19. Typical FWD TQ, REV TQ, and IR COMP Trimpot Settings

MAX (-PCM isolation card)

Determines the motor speed when the speed adjust potentiometer is turned to full CW, or voltage signal is set to maximum. It is factory set for maximum rated speed.

To calibrate, set the MAX trimpot to full CCW, or voltage signal to maximum. Turn the main speed adjust potentiometer to full CW. Adjust the MAX trimpot until the desired maximum motor speed is reached. See Figure 20 for MAX trimpot location.

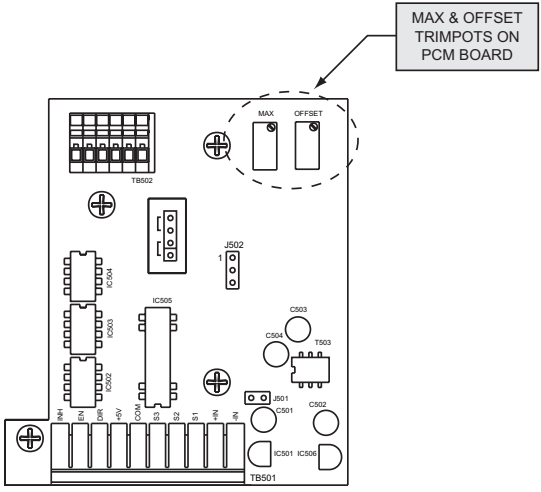


Figure 20. PCM Calibration Trimpot Locations

OFFSET (-PCM isolation card)

> **Warning**
>
> This trimpot is set at the factory and should not need adjustment. Do not adjust this trimpot unless you are experiencing drift problems. Contact your Minarik representative before attempting adjustment.

The RG60U-PCM has a factory-set offset to guarantee stability in a stopped motor. To calibrate the OFFSET trimpot:

1. Ensure that the input power is turned OFF.
2. Set the input signal to zero.
3. Set the OFFSET trimpot to the approximate midrange or 50%. Note: This is a 25-turn potentiometer. After setting the trimpot to zero full CCW, make 5 full rotations to reach midrange, or 50%.
4. Apply power and observe the motor.
5. If the motor shaft drifts, or slowly rotates with no signal applied, adjust the OFFSET trimpot until the motor shaft stops. The direction and amount of trimpot adjustment depends on the direction of the shaft rotation and connection of the motor leads.

See Figure 20 on page 40 for OFFSET trimpot location.

Troubleshooting

> **Warning**
>
> Dangerous voltages exist on the drive when it is powered. When possible, disconnect the drive while troubleshooting. High voltages can cause serious or fatal injury.

Before applying power

Check the following steps before proceeding:

1. The AC line voltage must be connected to the proper terminals.
2. Check that the voltage switches and jumpers are set correctly.
3. The motor must be rated for the drive's rated armature voltage and current.
4. Check that all terminal block connections are correct.

For additional assistance, contact your local Minarik distributor, or the factory direct:

1-800-MINARIK (646-2745) or Fax: 1-800-394-6334

Problem	Possible Causes	Suggested Solutions
Line fuse blows.	1. Line fuse is the wrong size. 2. Motor cable or armature is shorted to ground. 3. Nuisance tripping caused by a combination of ambient conditions and high-current spikes (i.e. reversing).	1. Check that the line fuse is correct for the motor size. 2. Check motor cable and armature for shorts. 3. Add a blower to cool the drive components; decrease FWD TQ and REV TQ settings, **or** resize motor and drive for actual load demand, **or** check for incorrectly aligned mechanical components or “jams”.

Problem	Possible Causes	Suggested Solutions
Line fuse does not blow, but the motor does not run.	1. Speed adjust potentiometer or speed reference voltage is set to zero speed.	1. Increase the speed adjust potentiometer setting or speed reference voltage.
	2. Speed adjust potentiometer or speed reference voltage is not connected to drive input properly; connections are open.	2. Check connections to input. Verify that connections are not open.
	3. INHIBIT terminals are shorted.	3. Remove the short from the INHIBIT terminals.
	4. S2 is shorted to S0.	4. Remove short.
	5. Drive is in current limit.	5. Verify that motor is not jammed. Increase FWD TQ or REV TQ setting if they are set too low.
	6. Drive is not receiving AC line voltage.	6. Apply AC line voltage to L1 and L2.
	7. Motor is not connected.	7. Connect motor to A1 and A2.

Problem	Possible Causes	Suggested Solutions
Motor runs too fast.	MAX SPD not calibrated.	Calibrate MAX SPD.
Motor will not reach the desired speed.	1. MAX SPD setting is too low. 2. IR COMP setting is too low. 3. Motor is overloaded. 4. Drive is in current limit.	1. Increase MAX SPD setting. 2. Increase IR COMP setting. 3. Check motor load. Resize the motor if necessary. 4. Verify torque settings.
Motor pulsates or surges under load.	1. IR COMP is set too high. 2. Motor bouncing in and out of current limit.	1. Adjust the IR COMP setting slightly CCW until the motor speed stabilizes. 2. Make sure motor is not undersized for load; adjust FWD TQ and REV TQ trimpot CW.

Wireless Irrigation Controller
"WIC"
Area Capture

Version 2.50
[Final Release Revision]

USER'S MANUAL

CHERRY CREEK SYSTEMS
Greenhouse Equipment Specialists

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Cherry Creek Systems
2675 Akers Drive
Colorado Springs, CO 80922
Toll Free 877-558-3246
www.cherrycreeksystems.com

Dear Customer:

We would like to thank you for taking a bold step in greenhouse irrigation by purchasing our "Area Capture" program! Although it might appear to be very complex: the greatest possible care went into making this program as user friendly as possible while still keeping all the functionality that you have come to expect.

There have been many changes to our new program for our Wireless Irrigation Controller. We believe that once you become familiar with all that this new program has to offer you will be extremely pleased with how easily manageable irrigating your crops has become.

We would welcome and encourage you to make suggestions as to how we can improve this User's Manual. It is our intent to provide you with the highest quality equipment and state-of-the-art watering systems, as well as first rate technical follow up support.

If this is the 1st time setting up the Boom, please follow this order in working through the manual:

1. ***Key Concepts***
2. ***Diagnostics***
3. ***Setup***

Again, thank you for your business and we look forward to assisting you in any way we can. Feel free to give us a call, or contact us via email (see above).

Sincerely,

Cherry Creek Systems Team

Updates & New Features for WIC 2.50

Wireless Irrigation Controller - 2.50 "Area Capture"

AREAS vs. JOBS*:*

One of our best features of this new program is the change in the architecture. Instead of using **Jobs**; *magnets that constantly need to be moved and readjusted when a crop moves or gets replaced by another crop*.

We now utilize **Areas**; *user programmed distance/measurement, allowing greater control over the various crops in a Bay.*

SMART BOOM MOVEMENT:

The Boom only moves to the areas that need to be watered & parks where it's programmed. It no longer has to go from one end of the bay to another (Home to Away, then back to Home) every time it makes one pass and doesn't have to rest at the "Home" position. This reduces wear and tear on the Boom and its moving parts, saving time and money.

STEP/STOP/WATER:

Another very useful tool is the Step, Stop & Water function. It has the ability to move the Boom to a user defined distance, then stop & water for a programmed amount of time, then move onto the next user defined distance and continue. For example: you can set-up large 12" pots in a checker-board pattern @ 18" centers, have the Boom start at the first row of pots in the irrigation "Area", then water every row of pots down the Bay, all while continuing this same pattern.

WALK & WATER:

We have added the possibility to walk beside your Boom and water your crops by the press of a button (optional remote hand-held controller). You can simply walk the Boom to the Area that needs to be watered and turn on the solenoid(s).

MULTIPLE REMOTE CROP ACTIVATION VIA COMPUTER:

It is now possible to irrigate individual *Crop Numbers* using inputs from *ARGUS™, PRIVA™ or* any other environmental controls. Please talk to your Cherry Creek representative for more details on our Wireless Network System.

MULTIPLE TIMES PERIODS (ZONES) FOR CROPS:

You now have the option of assigning each crop up to Six (6) time periods or "Zones" for irrigation. For example you can have Crop #1 water from 7:00 – 10:00 then again at 13:00 – 15:00 without reprogramming every time.

Key Concepts
*** Read this First! ***

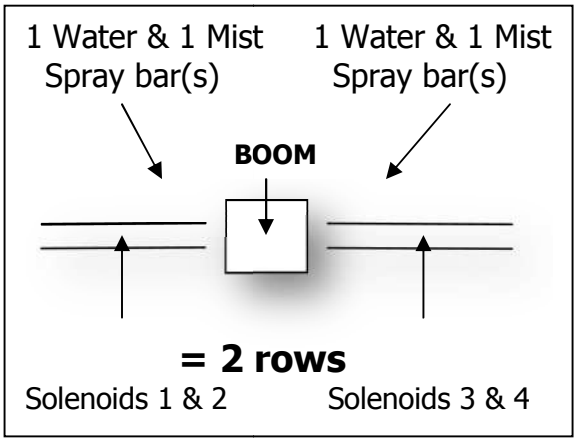
Please follow this order when working through the manual and setting up your Boom for the first time:

1. Key Concepts
2. Diagnostics
3. Setup

Row:

A run in the greenhouse; usually left or right of the center aisle. It can also be defined as the number of solenoid "groupings" that are in the bay. If there are 4 bench runs across the width of the bay, then each bench could be assigned its own row (1 mist & 1 water solenoid per row). In ***figure 1*** on the right, there are 2 rows with a walkway running down the middle.

figure 1



Area:

An Area is a given distance within the bay (example: 0.00 Ft to 110.00 Ft) that needs to be watered or misted by the Boom. Areas are programmed by the user depending on the needed requirements. *See **figure 2** pg. 5*

Crop:

Just as the name suggests! This allows the user to combine multiple "Areas" into one "Crop" to minimize information input. In the example *(fig. 2),* Areas 1 and 3 on the right side (Row 1) would be a "Crop". *See **figure 2** pg. 5*

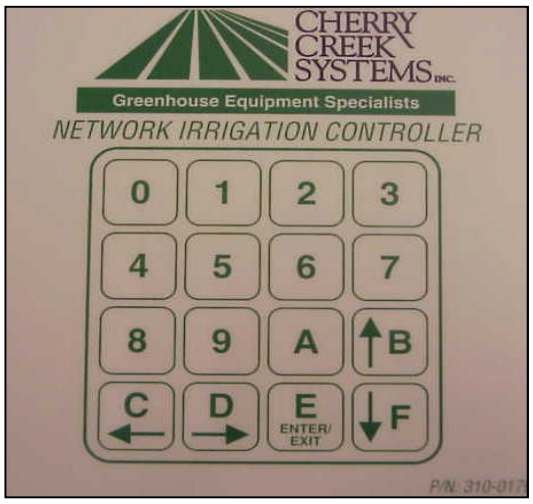
Time Zone:

This is a given period of time. The WIC uses a 24 hour format (military time):

1:00 PM = 13:00
12:00 AM = 00:00
10:00 AM = 10:00
10:00 PM = 22:00

Keypad:

0-9 = Data Entry
E = Enter or Exit
B = Up / Increase
F = Down / Decrease
C = Left / Forward
D = Right / Back

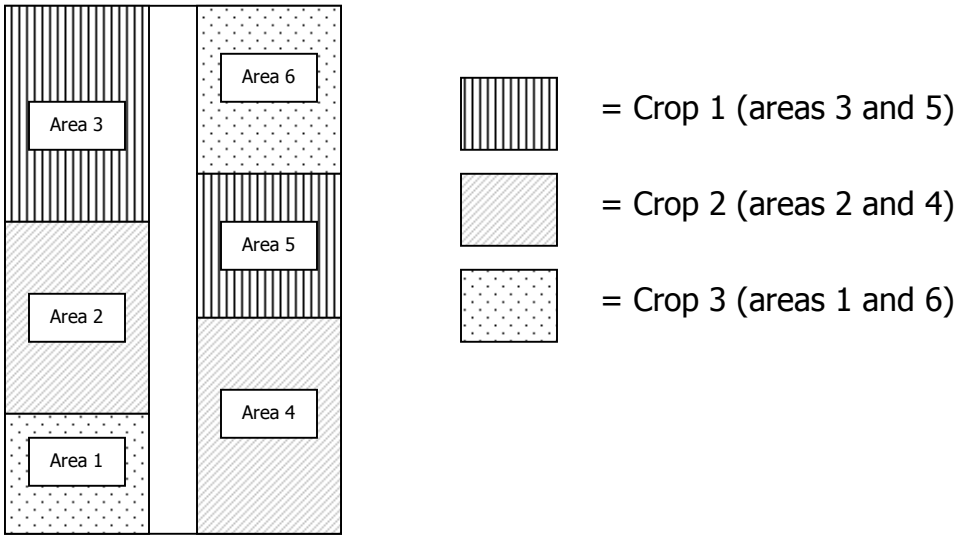


Set Up and Cropping:

Basically, there are 4 steps:

1. Set up how many rows you have
2. Set up areas in each row
3. Assign a crop to each area
4. Give the Boom crop watering instructions

figure 2:



Let's say you have 3 Crops, as laid out in the greenhouse above. *Even though Crop 1 is in 2 different areas, you don't have to input 2 different programs*. You simply give Crop 1 watering instructions, and both programmed areas under Crop 1 will receive the same watering regimens.

Terms & Definitions:

Acceleration: Speed setting that controls how the Boom will initiate or "take off" when starting a programmed irrigation cycle, as well as when the Boom turns around to initiate another pass.
Area: The programmed Distance(s) that the Boom will execute the needed task.
Area Viewer: A list showing the *Crops* and their Rows & Areas for reference.
Auto Schedule: Uses *Time Zones* to start the appropriately programmed *Crops*.
Auto Run: The state the Boom is in when Auto Schedules are being executed.
Bay Calibration: The Boom needs to be calibrated to the length of the Bay in order for the Boom to use distances to travel. ** See Bay Calibration section **
Crop: This is a Group of *Areas* that will have the same water/spray treatment.
Deceleration: The setting that will allow the Boom to slow down as it approaches the ends of the bay or the programmed sop/turn-around point.
FPM: Feet-Per-Minute; the speed that the Boom uses as a reference.
Go-To Speed: Speed that the Boom will travel to its programmed destination.
Idler Diameter: Diameter of the wheel that contacts the rail and spins the Encoder Cog; used for speed, direction of motion and distance sensing.
Interval: Amount of time that the Boom waits in between Passes when using *Auto Schedules & Time Zones* to initiate *Crops*.
Learn: Function allows the user to walk alongside the Boom using the keypad to toggle the controller to *"Learn"* the starts/ends to the Areas under the Boom.
Markers: "Checkpoints" in the bay that will help to maintain the Boom's *Calibration* (the *Crop Area Viewer* allows the user to see the number of Markers & their distance). ** This can be a Limit Switch or Magnet Reader **
Manual Run: After *Crops* have been assigned the necessary *Areas*, the user can run the *Crops* manually by using this menu. There are 2 ways to use Manual Run: one *Crop* at a time or by using the Manual List feature.
Manual List: Allowing the user to program a *List* of Manual *Crops* that need to run. The *List* will run in sequential order from Crop 1 thru 16.
Parking Location: The Boom can be set to *Park* at any location within the bay; parking after the programs are finished, or the user presses *Park.*
Passes & Watering: The screen where the *Crop* functions are programmed.
Quick Water: Allows for a single *Area* to be programmed to water/spray.
Remote Start Function: Each *Crop* can be programmed to start using an external signal source, such as an Environmental Control System, allowing the system to initiate the Boom to execute the enabled *Crops.*
Row Configuration: Defined as "Rows", this function will allow a Solenoid or series of Solenoids to be assigned to an Area.
SSW: Step / Stop / Water (described in *Updates & Features* section)
Start from Home: Developed for the propagation grower. The Boom will *Start from Home* on every *Pass* programmed to run in that *Crop*. This allows the user full control over the amount of water/spray that the cuttings or plugs in that *Crop* are receiving. This works well when using the *Automatic Start* feature to water/spray at different *Time Intervals*.
Time Zones: The programmed times that *Auto Schedules* will start and stop.
Walk & Water: Allows user to Walk with Boom and turn on and off solenoid valves at needed distances and Water/spray without having to program a "Crop".
Water Time (step/stop/water): The amount of time that the Boom will stop & water (activate solenoids) when using the Step/Stop/Water feature.
Wireless Networking Function: Allows the WIC to be controlled by a Network Accumulator via any available WIFI signal. ** Ask a CCS team member for more details **

External Switch Definitions

- **SW1** –**Marker** Whisker limit (or magnetic) sense switch **(mandatory)**.

Used to save the position in which the Bay Markers are detected. The stored position will define a "checkpoint" for the controller to keep its position accurate if it ever gets lost between Markers.

- **SW2** – **Home** magnetic sense switch **(mandatory)**.

The Boom will stop at the programmed distance after the Home point sensor detects a magnet. This keeps the calibration of the Home position.

- **SW3** – **Away** magnetic sense switch **(mandatory)**.

The Boom will stop at the programmed distance after the Away point sensor detects a magnet. This keeps the calibration of the Away position.

- **SW4** – **Jobbing** magnetic sense switch.

****** Used for the JOBBING Program Only; NOT Area Capture ******

This switch will be used to "sense" the JOB magnets and tell the controller when to change the Boom's operation as programmed by the user.

- **SW5 - Collision Switch**.

This switch input must be *closed at all times* to allow the Boom to run. The inputs may be connected to an object detection (IR Sensor) or Collision Switch that will open the normally closed circuit when an object is detected in the path of the Boom. A simple jumper wire between the SW5 & GRD terminal connections may be used to keep the switch permanently closed which will allow the Boom to run.

- **SW6** – **Remote Auto Start Switch.**

Used in conjunction with a 24VAC Relay to start the Boom "Remotely" via an Environmental Control System (Priva, Argus, Wadsworth, etc.)

- **SW7** – **Remote Home Switch.**

Used to move the Boom in the **Home direction** with a ***Boom Walk Switch***. The remote away switch (SW8) is required to operate the Boom in the remote mode. Refer to SW8 description for the operation and function of SW7.

- **SW8** - **Remote Away Switch.**

Used to move the Boom in the **Away direction** with a ***Boom Walk Switch***. The Boom can be moved using the remote home and away switch option. When the Boom is stopped/idle, pressing the switch in either direction will start the Boom moving at 10 Feet Per Minute (FPM) in the respective direction. Pressing the switch in this direction again will increase the speed by 10FPM. If the switch is pressed repetitively, the speed may be increased up to 150FPM. To slow down the Boom, press the switch in the other direction and the boom will slow down by 10FPM until it comes to a stop.

- **IN 1 / IN 2 / GRD / +NRV - Proximity sensor.**

Used for the Boom's Encoder to detect Speed, Distance and Motion. The sensors get their power from the 18V+ power that comes from +NRV.

WIC Parts List:

330-0001
– WIC Controller - Complete Assembly
- w/ display, keypad & DC power supply; mounted in box w/ lid & screws

330-0006
– WIC DC Power Supply Board – Internal (Standard)
- Used to power the motor that the WIC is controlling

330-0008
– WIC Main Board only w/out display
- NO display, keypad, DC power supply or box/lid

330-0010
– WIC External DC Motor Control Board Assembly – Minarik
- Mounted in Watertight Plastic Box w/ lid

330-0016
– WIC 4-20mA Interface Board
- Necessary for use w/ Minarik External MCB

330-0017
– WIC Main Board w/ display
- NO keypad, DC power supply or box/lid

330-0018
– WIC LCD Display Enhancer
- Brightens the screen on the display if the screen has black blocks behind the characters/digits

330-0019
– WIC EZ Downloader Device
- Allows the user to install upgrades on the WIC

330-0020
– WIC Keypad
- Used to interface w/ the WIC

Main Menu:

**** To get to the Main Menu from almost any screen, press **"E"** repeatedly. ****

BOOM NAME	02:16:01
WIC – 2.50	
1= MANUAL	3= SETUP
2= AUTO	4= DIAGS

Diagnostics

If it is the first time setting up the Boom, it is highly recommended that you go through the diagnostic menu, BEFORE YOU SET-UP YOUR BOOM. This process will insure all of the inputs are functioning properly and that nothing was damaged during shipping.

*** The best way to get thru the Diagnostics process is to work backwards through the menu. Starting with the Keypad test, and ending with the Motor & Motion tests. ***

**** To get to the Main Menu from almost any screen, press **"E"** repeatedly. ****

1. From Main menu press 4 (DIAGS)

Diagnostics Menu:

DIAG MENU E = EXIT
1= MOTOR & MOTION
2=SWITCHES/SOLENOIDS
3=MARKERS 4=KEYPAD

Keypad test

(Main Menu, Press 4, Press 4)

Quick Menu/ Keypad Number Reference

In this menu you can press each key to check if all the keys are working.

1. From Main menu press 4 (DIAGS)
2. From the Diagnostics menu press 4 (KEYPAD):

KEYPAD TEST E=EXIT
KEY =

3. Press any keys on the keypad to see them displayed on the screen.
4. Press the "E" key repeatedly to return to Main menu.

Markers (Calibration Check-Points)

(Main, 4, 3) ** Described in the **Definitions** section **

**** **Skip this menu until the Boom is Calibrated;** numbers will automatically show up on the screen after Calibration. Use this screen for reference & diagnostics ****

1. From the Main menu press 4
2. From the Diagnostics menu press 3 (MARKERS):

MARKER TABLE 1 (AWAY)
M01: ---.-- FT (0)
M02: ---.-- FT (0)
M03: ---.-- FT (0)

3. Press "C" or "D" to switch between the Home & Away. Press "B" or "F" to scroll between Marker numbers. After Calibration, both tables should contain the same number of Markers, even if they're different distances.
4. Press "E" to Exit and Save.

Input Switches (sensors)

(Main, 4, 2, 2)

** In this menu you can check to see if the Boom's Proximity (speed) Sensors for the Encoder and Magnet Readers are working properly. **

1. From the Main menu press 4
2. From the Diagnostics menu press 2 (SWITCHES/SOLENOIDS):
3. Press 2 for Input Switches

SWITCH TEST E=EXIT								
SW	1	2	3	4	5	6	7	8
SW =	0	0	0	0	1	0	0	0
MARKER			000		003			

<u>Sensors / Switches</u>
1 = Marker
2 = Home
3 = Away
4 = Job *(NOT for use with "Areas")*
5 = Collision (optional; always on)
6 = Remote Start (Environmental Control)
7 = Go Home (Walk Switch)
8 = Go Away (Walk Switch)

4. **Magnet Readers** – You should have 2 magnet readers on your Boom. Home & Away. The Home Sensor will be on one side of the Boom (pointed at the rail) and the Away Sensor will be on the other side (also pointed at the rail). To check readers #2 & #3 wave a magnet in front of each one. You should see the display show a "1" under Switch #2 or "1" under Switch #3.

5. The "1" under Switch "5" will always appear, unless the Collision Sensor is used. When a "0" appears under the Switch # this indicates that the switch is either inactive or not functional.

   ** For more information on the switch failures please reference the "Trouble Shooting" page for more info **

6. **Marker Whisker Limit Switch** – There will be a "Whisker" Limit switch on one side of the Boom. This is used to save the position in which the Bay Markers are detected. The stored position will define a "checkpoint" for the controller to keep its position accurate if it ever gets lost between Markers. Clicking the "Whisker" on the Limit switch will show a number "1" under Switch #1 if it is functional. This switch is VERY important for the Calibration Process and must be functional.
7. Press the "E" key repeatedly to return to Main menu

Solenoids

(Main, 4, 2, 1)

1. From the Main menu press 4 (DIAGS)
2. From the Diagnostics menu press 2 (SWITCHES/SOLENOIDS):
3. Press "1" to go to the ***Solenoid Test*** screen:

SOLENOID TEST E=EXIT
SOL 1 2 3 4 5 6 7 8
SOL = 1 0 0 0 1 0 0 0
SOL 1 = ROWS 01

4. Press the "1" through "8" keys to alternately turn on and off the respective solenoid valves; water should appear as the keys are pressed.
5. Press the "E" key repeatedly to return to Main menu.

Motor & Motion Tests

(Main, 4, 1)

1. From the Main menu press 4 (DIAGS)
2. From the Diagnostics menu press 1 (MOTOR & MOTION):

MOTION TESTS E=EXIT
1 = BOOM GO TO TEST
2 = BASIC MTR 3 = PARK
4 = POSITION ENCODER

1. Press "1" to go into ***BOOM GO-TO TEST***

*** The Boom Go-To test is a good way to check if the Boom is calibrated and accurate. When the Go-To Test is executed, the Boom will travel to the programmed distance and stop. ***

BOOM GO TO TEST
A = GO E = EXIT
000.0 FPM HOM 000F 00IN
GOTO: 010.00 B/F = SPD

2. Program the distance that the Boom needs to "Go-To" and press A to Go. The Boom will travel to that distance and stop.
3. Press "E" to Exit back to the Motor & Motion menu.

---

1. Press "2" to enter the ***BASIC MOTOR TEST***.

***** The Basic Motor Test (diagnostics) is a good way to check the Motor function. When the Basic Motor Test is executed, the Boom will travel in the programmed direction, at the programmed speed until the user either changes direction and speed or stops the Boom. ****

MOTOR DIAG: 044.36FT
PWR: 10.0% DIR: HOME
C=+.5 D= -.5% EXIT=E
B=+10 F= -10% DIR=A

2. Press "A" to change direction.
3. Rress "B" to increase speed by 10.0% or "C" to increase speed by 0.5%.
4. Press "F" to decrease speed by 10.0% or "D" to decrease speed by 0.5%.
5. Press "E" to stop and Exit back to the Motor & Motion menu.

---

1. Press "3" to enter the ***BOOM PARK.***
2. If a **PARK** location is set under "BOOM SETTINGS" then the Boom will park at the programmed distance and return the Main menu.

THE BOOM IS PARKING
AT 005.00 FEET
100.00FPM HOM 046F 07IN
0,E = EXIT

3. If a PARK function is not desired, press "E" to exit and return to the Motor & Motion menu.

1. Press "4" to enter the ***POSITION ENCODER***.

   *** The Position Encoder test (diagnostics) is a good way to check the Boom's Encoder function. When the Position Encoder Test is executed, the Boom will travel in the programmed direction, at the programmed speed until the user either changes direction and speed or stops the Boom. ***

   ****** Motion Errors and/or Sensor Inputs will NOT function in this menu. This is NOT a good way to move the Boom within of the Bay; this is ONLY to test the function of the Encoder and its Position (tic & error count). ******

ENCODER DIAGNOSTICS
PWR: 10.0% DIR=HOME
025.0FPM AWY 005F 01IN
TICS: 00265 ERRS: 0001

2. Press "A" to change direction. Then press "B" or "C" to increase speed and press "F" or "D" to decrease speed.
3. When running in the Boom in the Home direction, the bottom left "TICS" number should decrease, or go into a negative number. When the Boom is going in the Away direction, the TICS should increase. If this is NOT the case, then the Encoder must be reversed in "ENCODER REVERSING" menu under "MOTOR SETUP".
4. Also when running the Boom under the "Encoder Position" menu, the bottom right of the screen will show "ERRS" (errors), which means that the Encoder is not counting Tics correctly. If this is the case, the Proximity Sensors need to be adjusted closer to the Encoder Cog.

   Please contact CCS to further understand the Encoder and its function.
5. Press "E" to Exit and return to the Main Menu.

Set-Up

If you are setting up for the first time, please go through your *diagnostics* menu first, before proceeding with Setup.

*There are **4 items** under the SET-UP menu.*

1. *Crop Settings*
2. *Boom Settings*
3. *System*
4. *Motor*

*In this "Set-Up" section, we will start with the **System Set-Up** and work our way through the other sections as they apply. This is the easiest way to "Initialize" the WIC Controller.*

From the Main Menu press 3 for SETUP MENU

SETUP MENU E=EXIT
1= CROP SETTINGS
2= BOOM SETTINGS
3= SYSTEM 4= MOTOR

Press 3 for SYSTEM Settings, the Controller will prompt a Pass-code to be inputted by the user. The factory set default Pass-code is **0000** (four Zeros).

**** To change the Pass-code, refer to the "Pass-code" section of the "System Set-Up" menu ****

ENTER PASS CODE:
E = EXIT
* * * *

System Set-Up

Boom Name (for use with Wireless Accumulator)

(Main, 3, 3, 1)

1. From Main Menu press 3
2. From Set-Up Menu press 3 (SYSTEM)
3. Enter Pass Code (0000 by Default)
4. From the System Set-up menu press 1 (NAME)

ENTER WIC NAME
NAME: BOOM – 001
S/N: NI060356
WIC – W2.XX E= EXIT

5. The default name will be the WIC Serial Number.
6. To change, use the "B" & "F" keys to scroll through the characters, and use the "C" & "D" keys to move to the next character.
7. Press "E" to Save and Exit.

Date / Clock (used for Time-Based Auto Start)

(Main, 3, 3, 2)

1. From Main menu press 3
2. From Setup menu press 3
3. Enter Pass Code (0000 by Default)
4. From the System Set-up menu press 2 (DATE)

SET SYSTEM DATE/TIME
C/D=MOVE 0-9=CHANGE
A=CANCEL E=SAVE
12/22/2010 04:12:26

5. Using a 24 hour clock (Military time), input the Actual Date/Time using the "0" through "9" keys. To zero the digits, press the "0" key several times. Notice the last line of text will change as numbers are entered.
6. Press the "E" to Save the Actual Date/Time & to go to System Set-Up.

Network Mask (for use with Wireless Accumulator)

(Main, 3, 3, 2, 1)

1. From Main menu press 3
2. From Setup menu press 3
3. Enter Pass Code (0000 by Default)
4. From the System Set-up menu press 3 (NETWORK)

SET NETWORK MASK
CURRENT: 255
NEW: 020
0-9, B/F= CHANGE E=SAVE

5. This menu is for setting a "Network Mask" (a value from 1 to 255) that will identify this particular Boom to the given Network Accumulator.
   Please contact CCS for further details and clarification.
6. Press "E" to Save and the Network Speed Menu will appear.

SET NETWORK SPEED
1 = 19200 LONG RANGE
2 = 38400 MID RANGE
CURRENT = 38400 E=SAVE

7. Press necessary key for Wireless Baud rate that applies to your Wireless Systems "Stream-Card".
   Please contact CCS for further details and clarification.
8. Press "E" to Save and the Network Repeat Menu will appear.

SET NETWORK REPEAT
0 = DISABLE REPEATER
1 = ENABLE REPEATER
REPEAT = OFF E=SAVE

9. If multiple systems exist in a Network, it may be necessary to use the *"Repeater Function"* to assure that all the systems in the Network have wireless coverage. This function is required in most installations of a Wireless-Multi-System configuration.
   Please contact CCS for further details and clarification.
10. Press "E" to Save and Exit.

Pass-code

(Main, 3, 3, 4)

Pass-code Master Reset: **8B9A**

1. From Main menu press 3
2. From Setup menu press 3
3. Enter Pass Code (0000 by Default)
4. From System Setup menu press 4 (PASSCODE)

ENTER PASSCODE
NEW: 1234
CURRENT: 0000
F =CANCEL E =SAVE

5. Enter any 4-digit Pass-code and press "E" to Exit & Save.

**** Write the pass-code down on the inside of the cover of this Manual ****

6. Press "E" to Save and Exit.

Initialization

** Described in the **Definitions** section **

(Main, 3, 3, 5)

**** Used to **erase and reset** your Crop and Area settings ****

1. From Main menu press 3
2. From Setup menu press 3
3. Enter Pass Code (0000 by Default)
4. From System Setup menu press 5 (INITIALIZE)

INITIALIZE CROPS E=EXIT
1= RESET CROPS
2= RESET BOOM SETTINGS
3= REBOOT CONTROLLER

1. Press "1" to **Reset CROPS**. This screen will appear:

INITIALIZE E =EXIT
RESET CROPS
CROP NUMBER 01

2. All Crops (1 thru 16) will be reset to Zero.

INITIALIZE CROPS E=EXIT
1= RESET CROPS
2= RESET BOOM SETTINGS
3= REBOOT CONTROLLER

1. Press "2" to **Reset BOOM SETTINGS**. This screen will appear:

RESET BOOM E =EXIT
1=INIT BOOM SETTINGS
2=RESET BOOM SETTNGS
3=REBOOT CONTROLLER

2. Press "1" to Initialize the Booms settings back to factory defaults.
3. Press "E" to Exit & Save.

INITIALIZE CROPS/AREAS
1= RESET CROPS
2= RESET AREAS
3= REBOOT CONTROLLER

1. Press "3" to **REBOOT Controller**. This screen will appear:

- SOFT RESET -

CHECKING BOOM SETUP
BAY SETUP - OK
CROP SETUP - OK

2. The Controller will be Reset and will return to the Main menu.

Motor Set-Up

*In this section, the user will go over the **Motor Set-Up** and work through the corresponding sections as they apply.*

1. From the Main Menu press 3 for SETUP MENU

SETUP MENU E=EXIT
1= CROP SETTINGS
2= BOOM SETTINGS
3= SYSTEM 4= MOTOR

2. Press 4 for MOTOR Setup, the Controller will prompt a Pass-code to be inputted by the user. The factory set default Pass-code is **0000**.

MOTOR SETUP E=EXIT
1= ACCEL 2=TIMEOUT
2= MOTOR REVERSING
4= ENCODER REVERSING

Acceleration

** Described in the **Definitions** section **

(Main, 3, 4, 1)

1. From Main Menu press 3
2. From Set-Up Menu press 4 (MOTOR)
3. Enter Pass Code (0000 by Default)
4. From the Motor Set-Up menu press 1 (ACCEL)

SET ACCELERATION
POWER: 5%
NEW: 5% A= TEST
0-9, B/F=CHNG E=SAVE

5. Enter desired Acceleration Rate. This function will be very specific to the user and their application, as well as to each System.
   CCS recommends the following systems be set to (%):
   a. Tower / Walk Boom: 10-20%
   b. Double Rail Boom: 5-15%
   c. Single Rail Boom: 0-10%

   Acceleration can be set accordingly so that when the Boom turns around at the ends, it does not struggle to get in motion again. If the Boom is having trouble turning around or goes into "Motion Error" when starting a programmed Crop & Area, then turn the Acceleration UP. If the Boom seems to lurch forward at an undesired rate, then slow the Acceleration DOWN.

6. To change, use the "0-9" keys to enter the desired percentage of Acceleration. The "B" & "F" keys can be used to increase and decrease the Acceleration by 1% at a time. Press "A" to Test if necessary.
7. Press "E" to Save and go to the Deceleration Menu.

Deceleration ** Described in the **Definitions** section **

(Main, 3, 4, 1, E)

1. From Main Menu press 3
2. From Set-Up Menu press 4 (MOTOR)
3. Enter Pass Code (0000 by Default)
4. From the Motor Set-Up menu press 1 (ACCEL)
5. Press "E" in the Acceleration Menu to go to the Deceleration Menu

SET DECELERATIONS
000-025FPM = 1.0F
RANGE 1 A= TEST
0-9, B/F=CHNG E=SAVE

6. Deceleration Rates are set up so that there can be 4 different "Ranges" of Speeds and coordinating Distances. These "Ranges" will be very specific to the user and their application, as well as to each System.
   By pressing "C" in this menu, the Deceleration Ranges will be set to the factory default settings. This will bring up all 4 Ranges and assign them the following settings:
   Range 1: 0-25FPM = 1.0 feet of Deceleration
   Range 2: 25-50FPM = 2.0 feet of Deceleration
   Range 3: 50-100FPM = 4.0 feet of Deceleration
   Range 4: 100-150FPM = 6.0 feet of Deceleration
7. To change, use the "B" & "F" keys to scroll the cursor to the setting that needs to be changed; note the cursor will move to the next Range when "F" is pressed and back when "B" is pressed. Use the "0-9" keys to enter the desired Speeds and coordinating Distances for Deceleration. Press "A" to Test if necessary.
8. If the plants media is too wet or too dry at the end of the bay, then the Deceleration can be set accordingly so that when the Boom starts to slow down at the end of the programmed Crop or Area, the user can compensate for either condition. If the ends are too dry, then extend the Deceleration distance at the desired Watering speed to be longer. If the edges are too saturated (wet) then shorten the Deceleration distance at the desired Watering speed to be shorter. This function is very useful when growing cuttings or plugs where dry edges are unacceptable.
9. Press "E" to Save and go back to the Motor Setup menu.

Timeout (Motion Error timing)

(Main, 3, 4, 2)

1. From Main menu press 3
2. From Setup menu press 4 (MOTOR)
3. Enter Pass Code (0000 by Default)
4. From the System Set-up menu press 2 (TIMEOUT)

SET MOTION ERR TIME
CURRENT: 04 SECONDS
NEW: 05 SECONDS
0-9, B/F=CHNG E=SAVE

5. Timeout is used to increase or decrease the amount of time that the Boom will increase power to the Motor before "timing-out" and going into "Motion Error". This is useful for getting the Boom past objects on the rails, such as a weld. The user must be careful not to extend the time-out too far, as this can cause damage to the Motors and the Motor function on controller. A CCS preferred range is between 4 to 6 seconds. If any other range is desired, please contact CCS TechWICal Support to discuss the necessary end result.
   **** CCS will **not guarantee** the Motors / Drivers if the timeout is set too high; please use caution and/or call CCS for clarification****
6. To change, use the "0-9" keys to enter the desired range in Seconds. "B" & "F" keys can be used to increase and decrease the Timeout by 1 second at a time.
7. Press "E" to Save and go back to the Motor Setup menu.

Motor Reversing

(Main, 3, 4, 3)

1. From Main menu press 3
2. From Setup menu press 4 (MOTOR)
3. Enter Pass Code (0000 by Default)
4. From the System Set-up menu press 3 (MOTOR REVERSING)

SET MOTOR REVERSING
CURRENTLY: OFF
SET TO: ON A= TEST
0/1, B/F =CHNG E=NEXT

5. This function is used to change the Motor direction to the desired Home and Away as specified by the user. If the Boom is installed and is going "Home", when in fact it is supposed to be going in the "Away" direction (or vice-versa), then the Motor needs to be reversed.
6. To check the current Motor directions, as set by the factory, press "A" to go into the Test menu. The user can come back and change the setting to the desired direction after it is tested. The following Warning screen will be seen. Wait 3 seconds & this will automatically disappear.

ENCODER DIAGNOSTICS
WARNING
NO AUTO STOP AT
ENDS OF BAY

ENC T1: 63 T2: 63
PWR: .0% DIR: HOME
000.0FPM HOM 000.0F
TICS: 00000 ERRS: 0000

Note: The 4th line will flash back and forth between Tics & Errors and Keypad options

7. Press "A" to change direction of travel and press "B" to increase speed and "F" to decrease speed. If the Boom is traveling in the Home direction (as stated by the screen) and it is the same as the User's desired direction of Home, then no change needs to be made. If the Boom is NOT traveling in the proper direction as desired, then press "E" to Exit and go back into the Motor Reversing menu.
8. Press 0 to turn the Motor Reversing OFF, and press 1 to turn the Motor Reversing ON. *For clarification, call CCS Tech Support.*
9. Press "E" to Save and return to the Motor Setup menu.

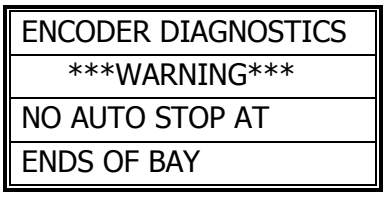
Encoder Reversing

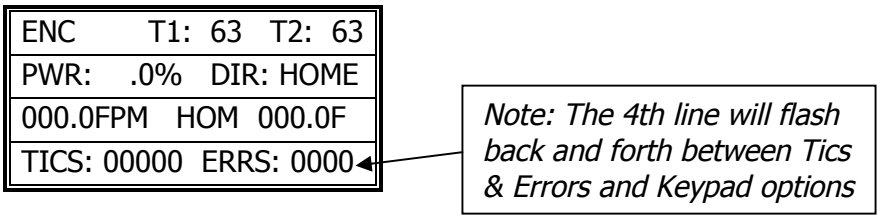
(Main, 3, 4, 4)

1. From Main menu press 3
2. From Setup menu press 4 (MOTOR)
3. Enter Pass Code (0000 by Default)
4. From the System Set-up menu press 4 (ENCODER REVERSING)

SET ENCODR REVERSING
CURRENTLY: OFF
SET TO: ON A= TEST
0/1, B/F =CHNG E=NEXT

5. This function is used to change the Encoder direction to correspond to the Motor direction. This is vital as it will impact the function of the Encoder and will assure a proper Calibration process.
6. To check the current Encoder direction, press "A" to go into the Test menu. The user can come back and change the setting to the desired direction after it is tested. The following Warning screen will be seen. Wait 3 seconds & this will automatically disappear.





7. Press "0" three times to Zero-out the Tics and Errors. Press "A" to change direction of travel and press "B" to increase speed and "F" to decrease speed. If the Boom is traveling in the **Home direction** (as stated by the screen), then the "Tics" (shown on the last line of text) should be **decreasing**. If the Boom is traveling in the **Away direction**, then the "Tics" should be **increasing**. Note: when starting from Zero & the Boom is traveling in the Home direction, a *negative sign* should appear in front of the Tics and they will start increasing toward the negative side. If the Tics are NOT DECREASING when traveling in the Home direction and NOT INCREASING when traveling in the Away direction, then the Encoder needs to be reversed. Press "E" to Exit and go back into the Encoder Reversing menu.
8. If the line that shows "ERRS" (Errors) has any numerical factor to it, then something in the Encoder need attention.
   For clarification, call CCS Tech Support.
9. Press 0 to turn the Encoder Reversing OFF, and press 1 to turn the Encoder Reversing ON.
   For clarification, call CCS Tech Support.
10. Press "E" to Save and return to the Motor Setup menu.
11. Press "E" again to Exit to the Main menu.

Boom Settings

*In this section, the user will go over the **Boom Settings** and work through the corresponding sections as they apply.*

From the Main Menu press 3 for SETUP MENU

SETUP MENU E=EXIT
1= CROP SETTINGS
2= BOOM SETTINGS
3= SYSTEM 4= MOTOR

Press 2 for BOOM Settings, the Controller will prompt a Pass-code to be inputted by the user. The factory –set default Pass-code is **0000** (four Zeros).

**** To change the Pass-code, refer to the "Pass-code" section of the "System Set-Up" menu (pg. 19) ****

ENTER PASS CODE:
E = EXIT
* * * *

Boom Set-Up Screen:

BOOM SETUP E=EXIT
1=LENGTH 2=SET POS
3=PARKING 4=SPEED
5=ROWS 6=CALIBRATE

Bay Length

(Main, 3, 2, 1)

1. From Main Menu press 3
2. From Set-Up Menu press 2 (BOOM SETTINGS)
3. Enter Pass Code (0000 by Default)
4. From the BOOM Set-Up menu press 1 (LENGTH)

SET BAY LENGTH
0-9= DATA
E= SAVE
LENGTH: 144.00 FEET

5. "Bay Length" is the total length that the Boom will travel on the rails to irrigate/move in the bay. This factor is set-up from ***Absolute Home to Absolute Away***. It is important that this factor is as close to the actual bay length as possible, so that the Boom knows what to travel as a true "foot" (or Meter) in length.
6. Press "B" or "F" to change the Unit of Measure from Feet to Meters.
7. Enter the Bay Length using the "0-9" keys for input.
8. Press "E" to go to the ***Set Home Position*** screen.

SET HOME POSITION
0-9= DATA
E= SAVE
HOME: 002.00 FEET

9. Enter the **Home Position** using the 0-9 keys for input.

** Follow the directions for Home & Away Magnet placement section (pg. 32) **

10. Press "E" to go to the ***Set Away Position*** screen.

SET AWAY POSITION
0-9= DATA
E= SAVE
HOME: 142.00 FEET

11. Enter the **Away Position** using the 0-9 keys; the Away Position input is the total distance (in feet) from Zero to the Away magnet.

** Follow the directions for Home & Away Magnet placement section (pg. 32) **

12. Press "E" to go to the ***Bay Length Display*** screen.

NEW LENGTH: 144.00 F
HOME MARK: 002.00 F
AWAY MARK: 142.00 F
028.64 TICS/FT E=SAVE

If the ***Bay Length*** is inputted properly, then the math will work out from top to bottom and vice-versa.
Ex: 144 – 2 = 142

13. Press "E" to Save and Exit back to Boom Setup menu.

Set Position

(Main, 3, 2, 2)

****** This function is not needed on Set-up, but more for re-positioning the Booms distance reading if it gets out of Calibration. ******

1. From Main Menu press 3
2. From Set-Up Menu press 2 (BOOM SETTINGS)
3. Enter Pass Code (0000 by Default)
4. From the BOOM Set-Up menu press 2 (SET POS)

SET POSITION E=SAVE
0-9= DATA B,F=MOVE
CURRENT POS: 042.09
TICS: 06780 IN BAY

5. ***Set Position*** is one way to get the Boom back on track if the Boom somehow losses it Position in the Bay. (*i.e.;* has to be picked off the rails and moved)
6. Use the "0-9" keys to input the Boom's Position in the bay.
7. Press "E" to go to the ***Bay Length Display*** screen.

NEW LENGTH: 144.00 F
HOME MARK: 002.00 F
AWAY MARK: 142.00 F
028.64 TICS/FT E=SAVE

**** After re-setting the Position in the Bay, go to **Motor Motion Test** and move Boom 3' (feet) in either direction to ensure the Boom's Encoder is counting Tics ****

8. Press "E" again to Save and Exit.

Parking Location

** Described in the **Definitions** section **

(Main, 3, 2, 3)

1. From Main Menu press 3
2. From Set-Up Menu press 2 (BOOM SETTINGS)
3. Enter Pass Code (0000 by Default)
4. From the BOOM Set-Up menu press 3 (PARKING)

SET PARKING LOCATION
PARK AFTER
CROP RUN? NO
0/1= CHANGE E= NEXT

5. If the Parking Function is NOT desired, leave the prompt on "NO".
6. To set Parking Location, press "1" to scroll to "YES".
7. Press "E" to go to the ***Set Parking*** screen:

SET PARKING LOCATION
CURRENT LOC: 000.00
NEW LOC: 098.00
0-9= CHANGE E= NEXT

8. Use the "0-9" keys to input a desired Parking Location.
9. Press "E" to Save and Exit back to Boom Setup menu.

Go-To Speed

** Described in the **Definitions** section **

(Main, 3, 2, 4)

1. From Main Menu press 3
2. From Set-Up Menu press 2 (BOOM SETTINGS)
3. Enter Pass Code (0000 by Default)
4. From the BOOM Set-Up menu press 4 (SPEED)

SET GO-TO SPEED
CURRENT: 075 PFM
NEW: 085 FPM
0/9, B/F=CHNG E=SAVE

5. Use the "0-9" keys to input a desired Go-To Speed.
6. Press "E" to Save and Exit back to Boom Setup menu.

Row Configuration

** Described in the **Definitions** section **

(Main, 3, 2, 5)

1. From Main Menu press 3
2. From Set-Up Menu press 2 (BOOM SETTINGS)
3. Enter Pass Code (0000 by Default)
4. From the BOOM Set-Up menu press 5 (ROW)

SET THE NUMBER OF
ROWS UNDER THE BOOM
ROWS: 4
PRESS E TO CONTINUE

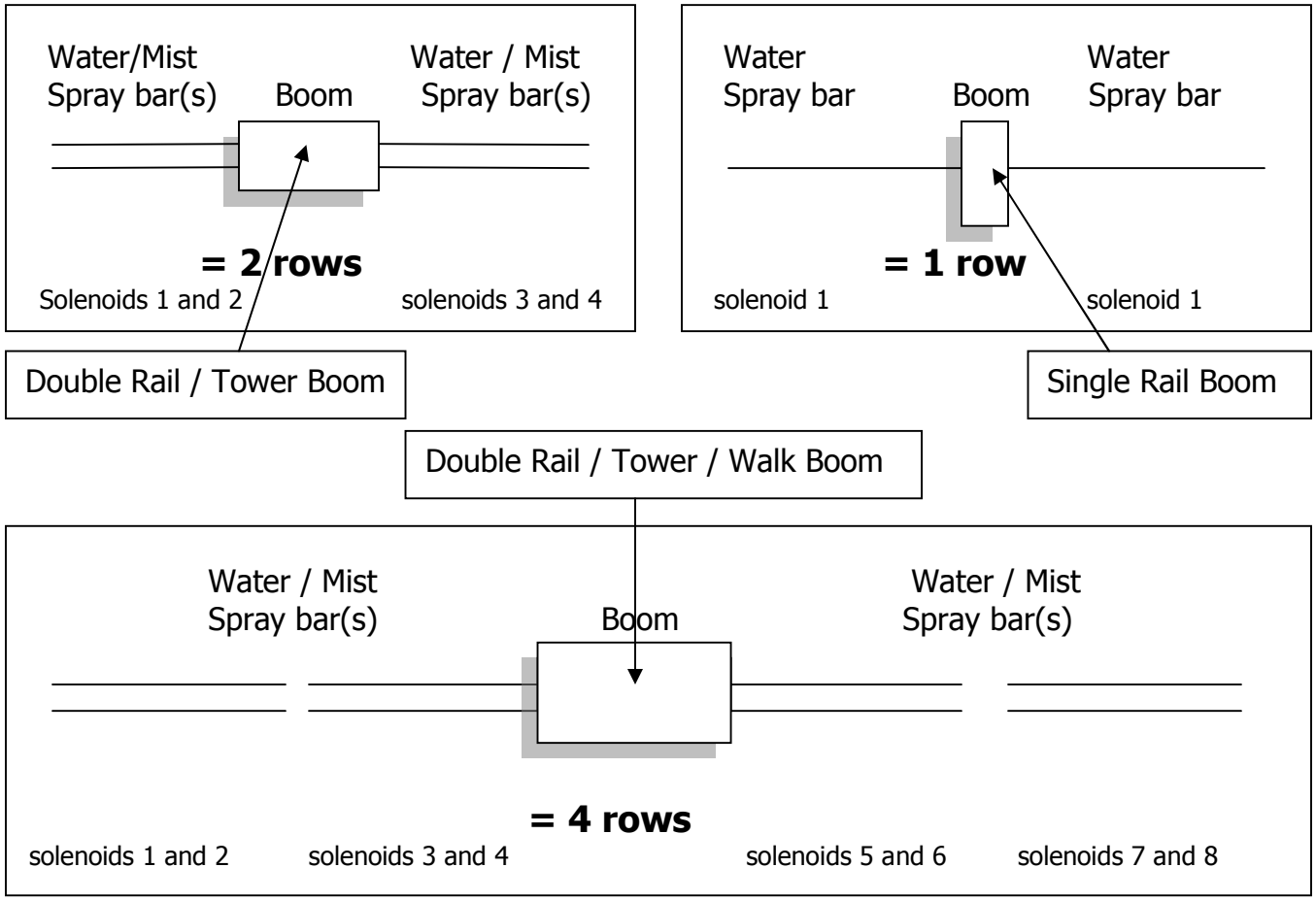
5. Use the "1-8" keys to input a desired Number of Rows.
6. Press "E" to continue to the ***Solenoid/Row Assignment*** screen:

SOLENOID/ROW E=EXIT
B/F SCROLL 1-8=CHNG
SOL 1 2 3 4 5 6 7 8
ROW1 =1 0 1 0 0 0 0 0

7. Press the "1" through "8" keys to alternately turn on and off the respective Solenoid valves. Press "F", go to the next Row Assignment. Press "B" to go to the previous Row Assignment.
8. Press "E" to Save and Exit back to Boom Setup menu.

**** A **Row** is a strip of plants/benches that runs the length of the bay. The Row Assignment has to be set up in conjunction with the spray/mist bars under the Boom. Each Row can have any solenoid configuration assigned to it. ****

Below are a few examples:



****** Before beginning the Bay Calibration Process, it is necessary to move the Boom between the Home magnet and the first Marker ******

Bay Calibration

** Described in the **Definitions** section **

(Main, 3, 2, 6)

* There are 2 types of Bay Calibration; Manual & Auto. ***Auto Calibration is recommended*** under "Normal" circumstances. Manual Calibration not recommended; as results can vary. *

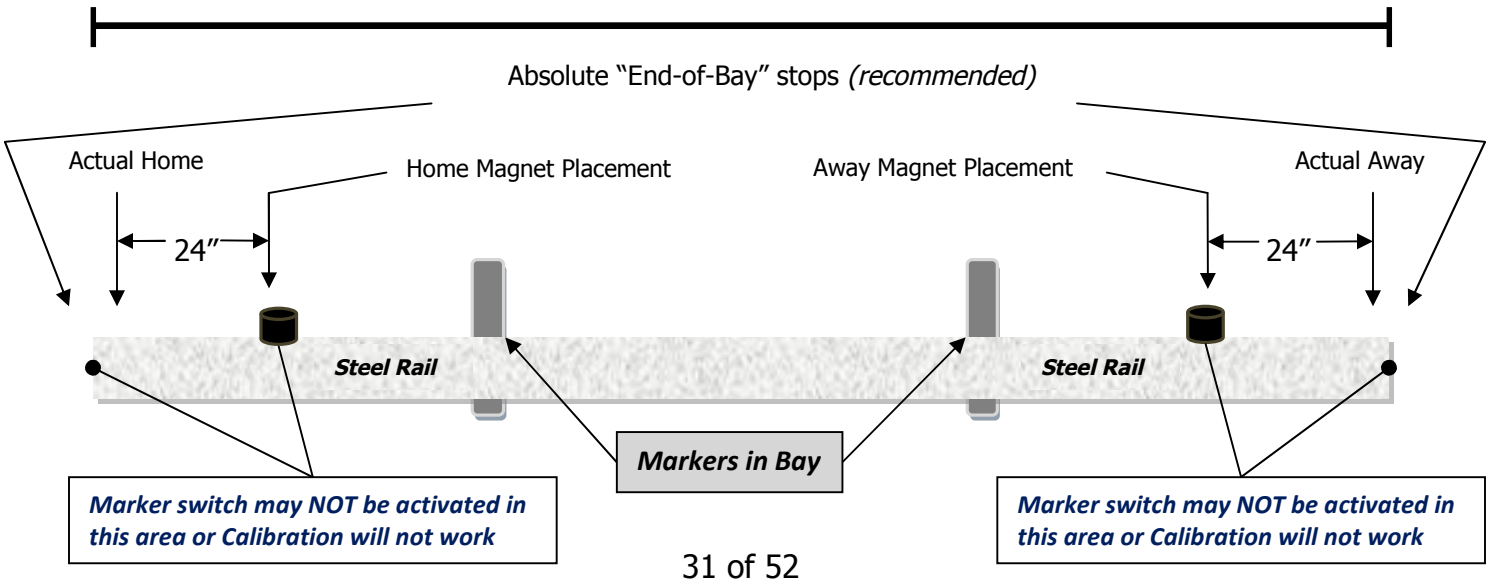
1. From Main Menu press 3
2. From Set-Up Menu press 2 (BOOM SETTINGS)
3. Enter Pass Code (0000 by Default)
4. From the BOOM Set-Up menu press 6 (CALIBRATE)

SELECT CAL TYPE
1=MANUAL CALIBRATION
2=AUTO CALIBRATION
E= CANCEL

5. The Home & Away (& Marker; if used) magnets should be placed on the rail at this time. The Home & Away Magnets and should be placed no more than 24" ahead of where you want the actual Home and Away to be. But the distance can be any number between 6" (0.5 FT) & 24" (2.0 FT). This allows the Boom time to slow down to a stop. Any number over 24" (2.0 FT) may allow the Boom's calibration to get off. The Home & Away magnets should be placed at the programmed distance from ***Absolute*** Home & Away to ensure proper calibration.

**** It is necessary that the Marker (Whisker) Switch contacts every Marker as the Boom travels up and down the bay. The Marker Switch **cannot** hit a Marker on the outside of Home or Away magnets. This will cause the Calibration to work improperly. ****

The Boom's Total Travel Distance (Length)



After setting up the magnets, get back to the controller to finish the Calibration process.

6. Press "2" for ***Auto Calibration.*** Next screen will prompt for the ***Encoder Idler Wheel Size***:

AUTO BOOM CALIBRATE
SELECT BOOM WHEEL SIZE
1= 1-2.5 INCH WHEELS
2= 3-6 INCH WHEELS

7. Press the **"1" key for 1 to 2.5 inch** Idler wheel diameter
   - (Single & Double Rail Boom; 1st WIC Tower Boom [2006-2008])

   Press the **"2" key for 3 to 6 inch** Idler wheel diameter
   - (Tower / Walkthrough / Truss Boom's)

   Upon pressing the proper Idler Size key, the Boom will travel towards Home until it sees the ***Home Marker magnet***. The screen will show:

THE BOOM IS PARKING
AT 000.00 FEET
075 FPM HOME 006.77
0, E = EXIT

8. After seeing the **Home Marker magnet**, the Boom will reverse direction and travel toward the Away Marker Position. The screen will show:

AWAY BOOM CALIBRATE
E=EXIT
TIC: 026589 023.60 T/S
HOME MK:0 AWAY MK:15

9. Once the Boom sees the **Away Marker magnet** the Boom will stop for a moment, reverse direction and return back to the Home position, the following screen should appear:

HOME BOOM CALIBRATE
E=EXIT
TIC: 032659 023.60 T/S
HOME MK:3 AWAY MK:15

<u>To review, the Boom will:</u>

- **Move towards Home position until it locates the Home magnet…**
- **Move to locate the Away magnet at the other end of your bay…**
- **Move to locate the Home magnet again and stop.**

10. After seeing the Home Marker magnet again, the Boom will stop. The Boom Calibration is now complete and the following screen should appear:

CALIBRATION COMPLETE

** If this screen does not appear, the calibration was not successful **

11. The WIC will return back to the Boom Setup screen automatically.
12. CCS recommends that the User goes into the ***Marker Viewer Menu*** to view the Markers and their placement. *Note: "Markers" section*.

13. If "E" is pressed during the Calibration process, the Boom will Pause and prompt the user on their decision to cancel Calibration. If cancelation is desired, press "E" again and Calibration will cease. If it is necessary to resume Calibration, press "A" to resume.

AUTO BOOM CALIBRATE	
USER CANCELLED	
A=RESUME	E=EXIT

** If there are problems with Calibration, call CCS Tech Support **

Operations (Crop Settings)

Passes & Watering

(Main, 3, 1, 1) ←

Quick Menu/ Keypad Number Reference

**** The Bay Length and Rows (Configuration) must be programmed before you can set up any **Crops or Areas** (see previous sections) ****

*In this section, the user will go over the **Crop Settings** and work through the corresponding sections as they apply.*

1. From the Main Menu press 3 for SETUP MENU

SETUP MENU E=EXIT
1= CROP SETTINGS
2= BOOM SETTINGS
3= SYSTEM 4= MOTOR

2. From the Setup Menu press 1 (CROP SETTINGS)

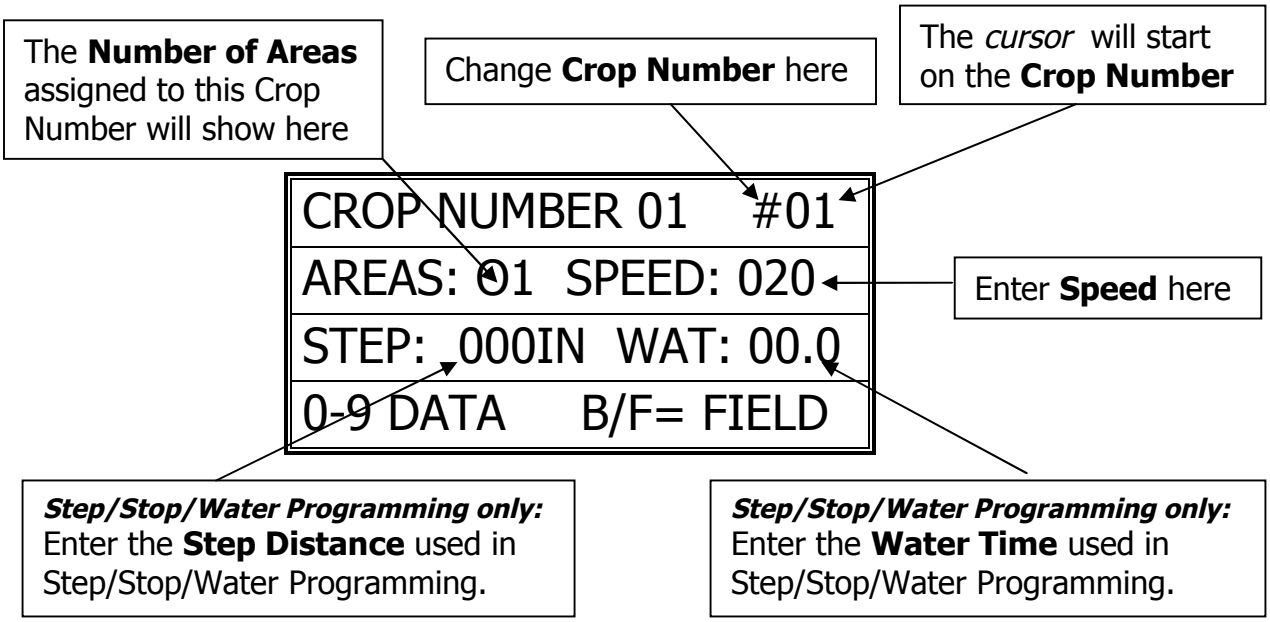
CROP SETUP E=EXIT
1= PASSES & WATERING
2= AUTO SCHEDULES
3= AREAS 4= CAPTURE

3. Press "1" for Passes and Watering. ** Described in the Definitions section **

CROP NUMBER 01 #01
AREAS: 00 SPEED: 000
STEP: 000 IN WAT: 00.0
0-9 DATA B/F= FIELD

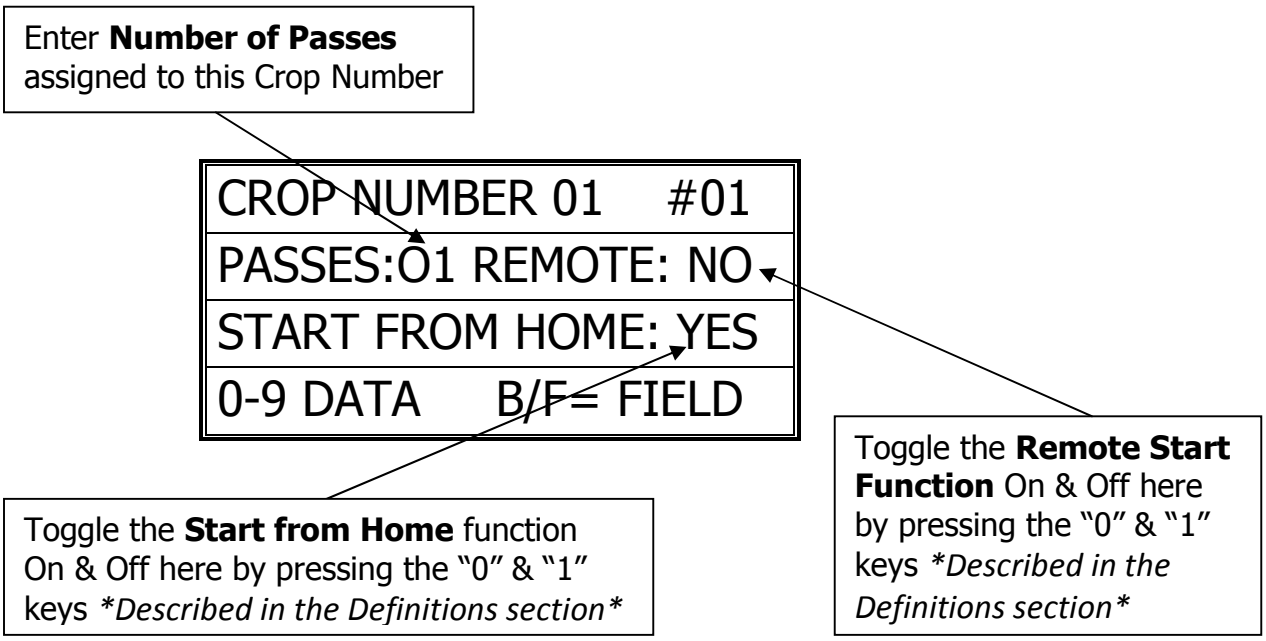
4. Use the "B & F" keys to scroll through the **Crop Menu** & the "0-9" keys to input the desired data values. Press the "A" key to advance to the next menu.

*Exploded view of the **Crop** (Passes & Watering) Screen #1:*



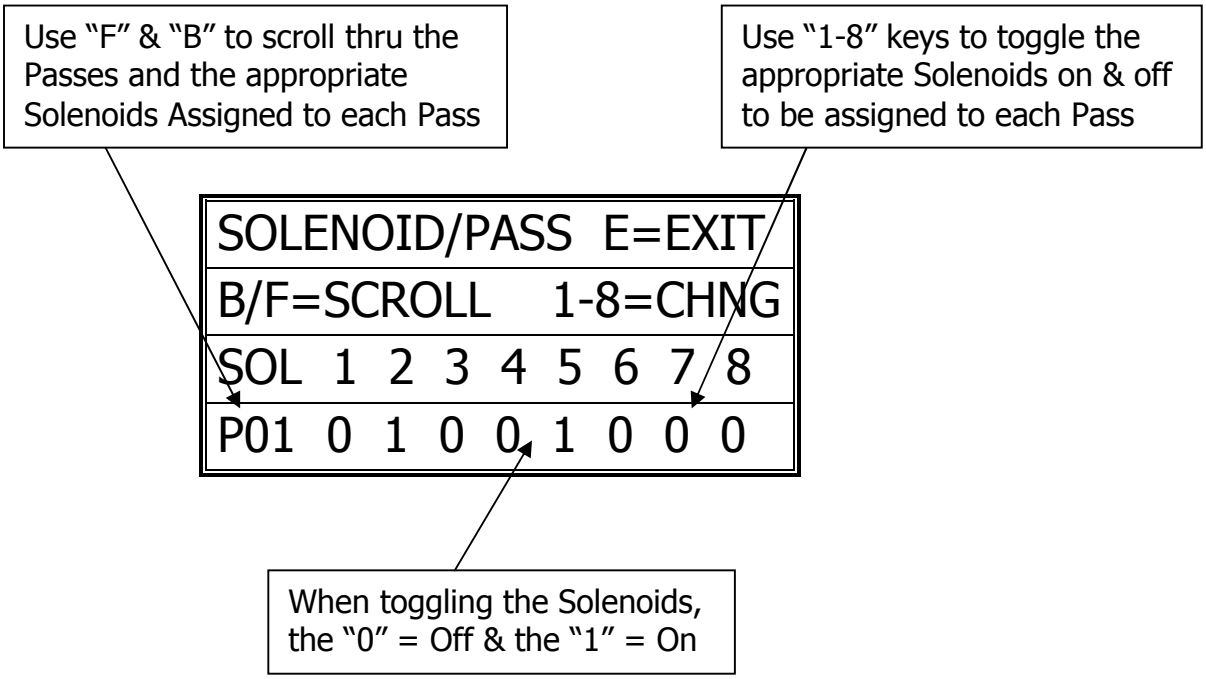
5. Press the "A" key to advance to the Passes screen.

*Exploded view of the **Crop** (Passes & Watering) Screen #2:*



6. Press the "A" key to advance to the Solenoid Assignment screen.

*Exploded view of the **Solenoid Assignment menu** Screen #3:*



7. Press "E" twice to Exit and Save the **Crop Settings.**

Auto Scheduling (Time Zones)

(Main, 3, 1, 2, Crop #, Curser over Zone, 1-6)

Time Zone = A specific interlude of time, within a 24 hour period. Each *Crop* can have up to 6 different *Time Zones* (ZONE).

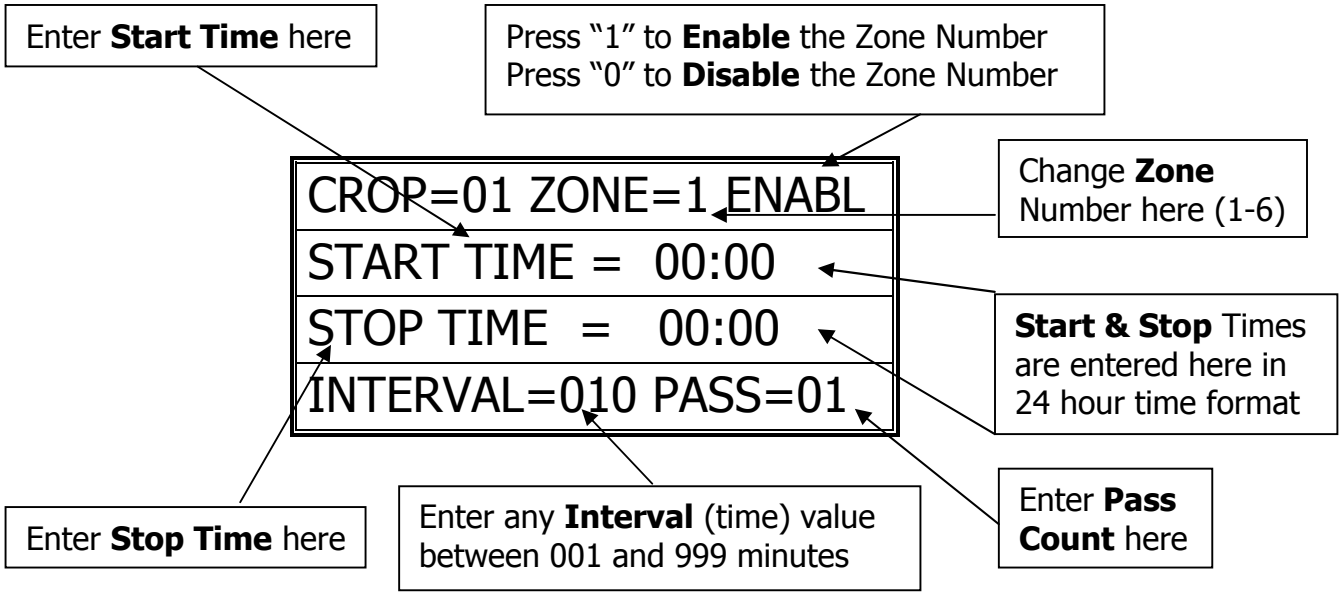
Interval = Amount of time, in minutes, the Boom will pause between passes.

Pass = 1 pass over the Crop.

1. From the Main Menu press 3
2. From the Setup Menu press 1
3. From the Crops Menu press 1
4. Enter the Crop Number (1-16)
5. Move curser over Zone and press 1-6 to scroll through the 6 Time Zones

CROP=01 ZONE=1 DISAB
START TIME = HH:MM
STOP TIME = HH:MM
INTERVAL=001 PASS=01

*Exploded view of the **Time Zone** Screen:*



6. Press "E" to Save and Exit.
7. To start the ***Auto Time Zone Programs***, refer to pg. 44.

Areas (Distances)

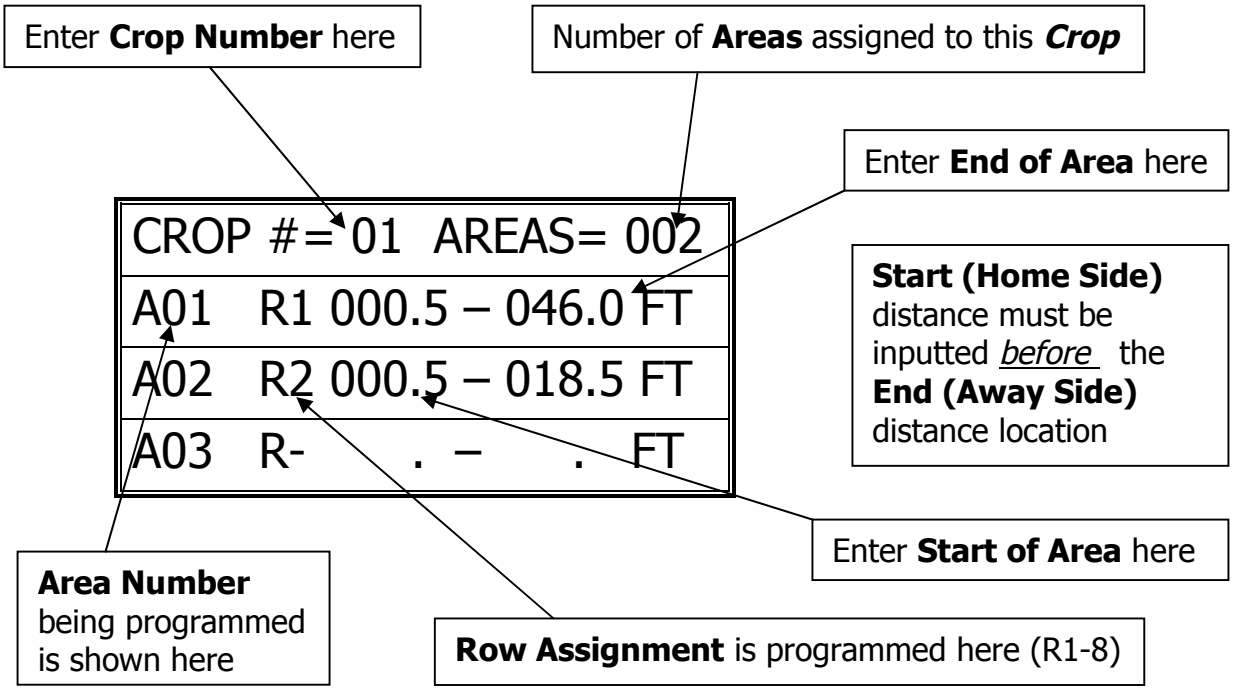
(Main, 3, 1, 3)

**** The Bay Length and Rows (Configuration) must be programmed before you can set up any **Areas** (see previous sections) ****

1. From the Main Menu press 3
2. From the Setup Menu press 1
3. From the Crops Menu press 3 (AREAS)
4. The **Area Assignment** screen will appear:

CROP #= 01 AREAS= 002
A01 R1 000.5 – 046.0 FT
A02 R2 000.5 – 018.5 FT
A03 R1 . – . FT

*Exploded view of the **Area Assignment** Screen:*



5. Scroll the cursor to the Area Number (1-16) to assign that Area to a Row. Use the "0-9" keys to input the desired Row that needs to be assigned to that Area.
6. Input the desired distances using the "0-9" keys, using "B" & "F" to scroll up and down thru the Area Setup Menu.
7. Press "E" to Save & Exit back to the Crop Setup menu.

Area Capture Mode

(Main, 3, 1, 4)

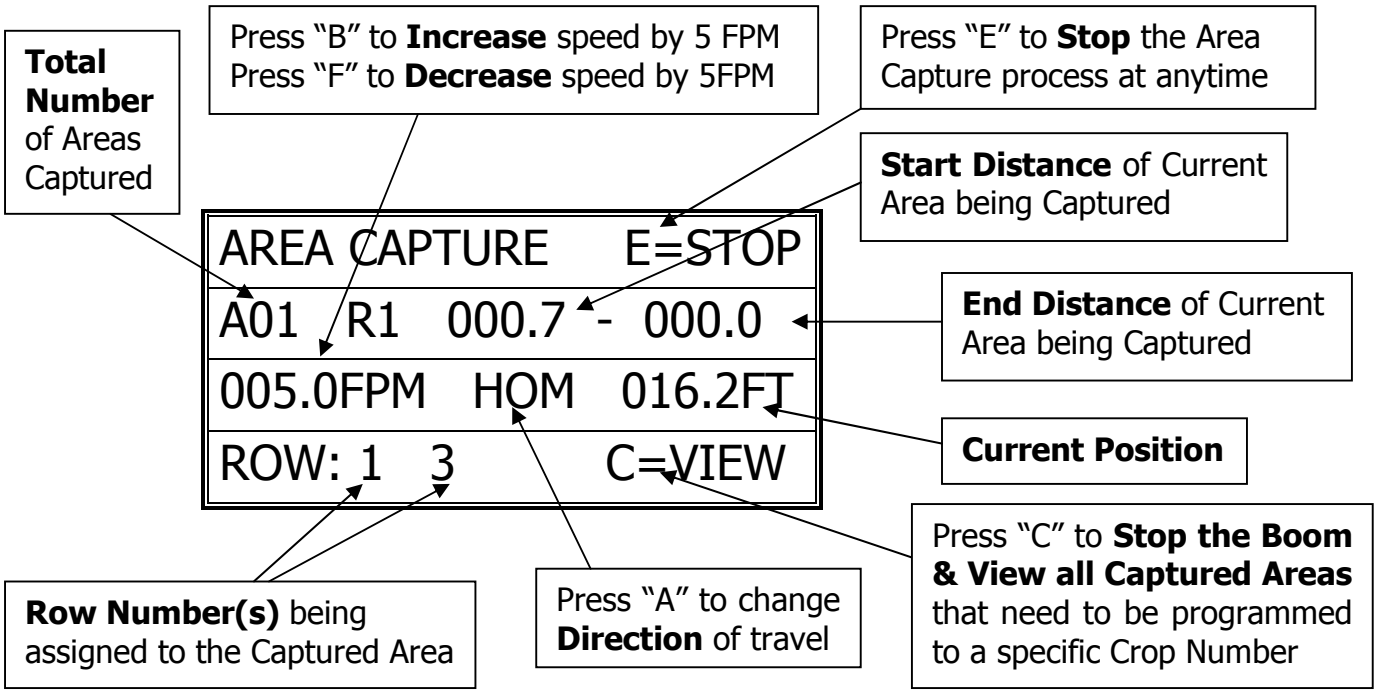
Rows need to be assigned to Solenoids prior to using the Area Capture Mode; see pg. 30

1. From the Main Menu press 3
2. From the Setup Menu press 1
3. From the Crops Menu press 4 (CAPTURE)
4. The **Area Capture** screen will appear:

AREA CAPTURE		E=STOP
000.0FPM	HOM	000.0FT
ROW:		C=VIEW

It is recommended the Boom is started at the Home position when Capturing new Areas

*Exploded view of the **Area Capture Mode** Run Screen:*



1. Note the screen shot above; the 1st screen in the Area Capture Mode.
   Press "A" to toggle **Direction**.
   Press "B" to **Increase** speed 5 FPM.
   Press "F" to **Decrease** speed 5 FPM.
   Press "E" to **Stop** and start over.
   Press "C" to **View** Areas being Captured.
2. To **Start** Area Capture Mode, press "A" to toggle to the desired direction. Then press "B" to start the Boom moving, pressing "B" repeatedly will increase speed by 5 FPM. Press "F" repeatedly to decrease speed 5 FPM.
3. While the Boom is in motion, pressing "1 thru 8" will toggle the corresponding Row's desired Start & Stop points.

Manual Operations Screen:

1= MANUAL RUN 2= LIST
2= WALK & WATER
3= QUICK WATER 4= PARK
5= CROP VIEWER E= EXT

Manual Run Mode

** Described in the **Definitions** section **

(Main, 1, 1)

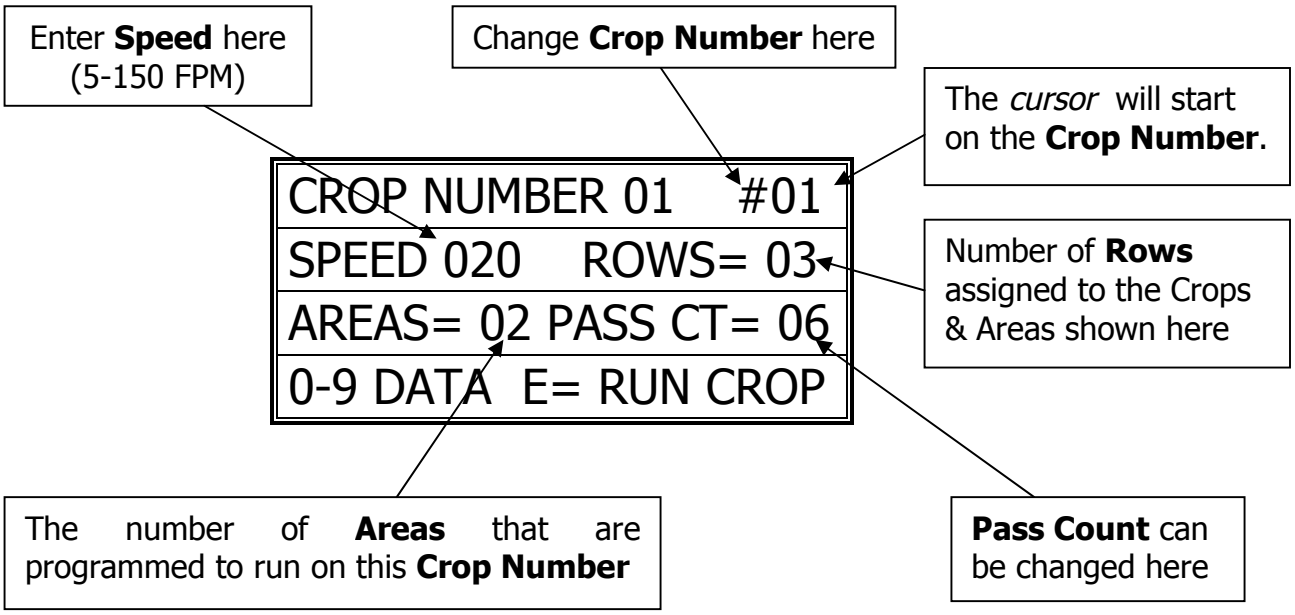
1. From the Main Menu press 1
2. From the Manual Menu press 1 (MANUAL RUN)
3. The ***Manual Run*** screen will appear:

CROP NUMBER 01 #01
SPEED 020 ROWS= 03
AREAS= 02 PASS CT= 06
0-9 DATA E= RUN CROP

4. Enter the **Crop Number** to be Manually Started.
5. Use the "B/C" & the "D/F" keys to scroll through the Manual Start Menu. Use "0-9" keys to input the necessary data.
6. The Crop Number, Speed, and Pass Count can be changed before Pressing "E" to Run Crop. Changing any of these factors will *only* take effect on this Manual Run. To make permanent changes to the Crop factors, go to Crop Set-Up Menu, reprogram factors, then Exit and Save.

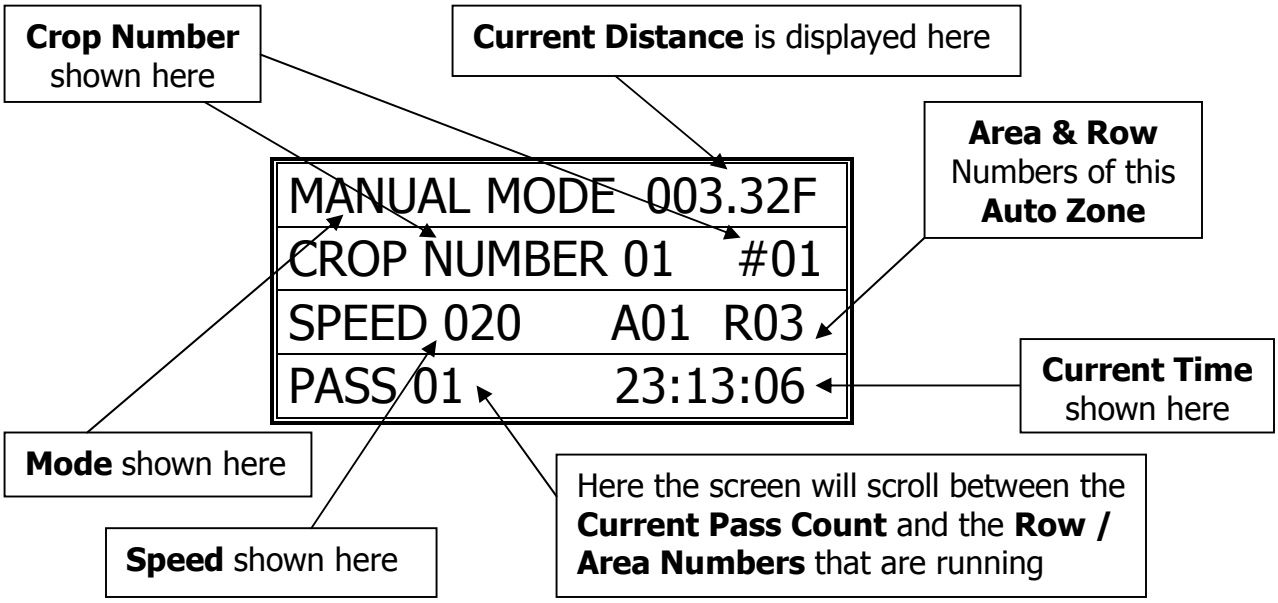
- Manual Run menu shown on Next Page -

*Exploded view of the **Manual Run** Screen:*



7. Press "E" to Run Crop.
8. The "Manual Run" screen will appear:

*Exploded view of the **Manual Run** [in progress] Screen:*



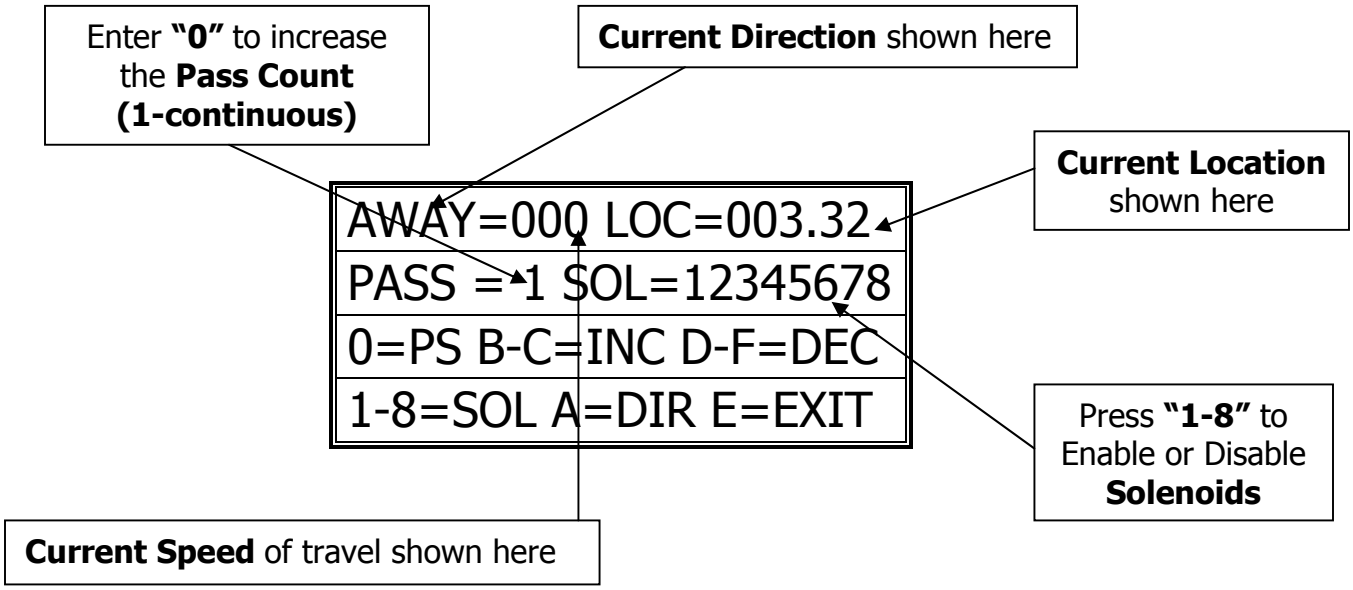
9. The Boom will run the Manual Program, stop, and await its next command. The Boom will stop at the Area Start Distance.

Walk and Water ** Described in the **Definitions** section **

(Main, 1, 2)

1. From the Main Menu press 1 (MANUAL)
2. From the Manual Menu press 2 (WALK & WATER)

*Exploded view of the **Manual Start** Screen:*



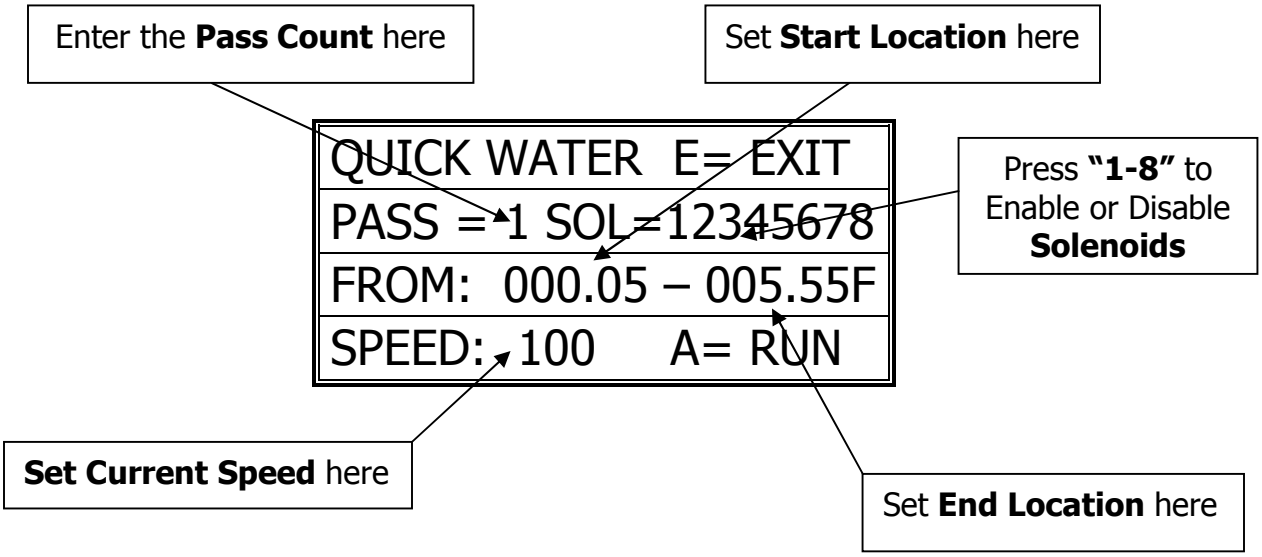
3. Press "0" to increase the Pass Count (1 pass - continuous mode). **Continuous Mode** will run the whole length of the bay, back and forth from Home to Away, until the user stops the Boom by pressing "E".
4. Press "A" to change Direction. Press "B/C" to increase speed and "D/F" to decrease speed and come to a stop. Press 1-8 to enable/disable solenoids.
5. Press "E" to Exit to the Main Menu.

Quick Water

(Main, 1, 3)

1. From the Main Menu press 1 (MANUAL)
2. From the Manual Menu press 3 (QUICK WATER)

*Exploded view of the **Quick Water Run** Screen:*



3. Use "B" & "F" keys to scroll through the menu. Use the "1-9" keys to input desired settings.
4. Press "A" to Run **Quick Water**.

Park Boom

(Main, 1, 4)

** If a **Park Location** is set, pressing 4 (PARK) in the Manual menu will send the Boom to that location and will "Park" there **

Area Viewer ** Described in the **Definitions** section **

(Main, 1, 5)

1. From the Main Menu press 1 (MANUAL)
2. From the Manual Menu 5 (VIEWER)
3. Enter the Crop Number (1-16) to View the Areas & Rows assigned.
4. Use the "B" & "F" keys to scroll thru the 16 Areas in each Crop.

CROP#= 01 AREAS= 002
A01 R1 000.5 – 110.0F
A02 R2 005.0 – 078.8F
A03 R4 072.3 – 110.0F

5. Press "E" to Exit and go back to the Manual menu.

Manual List Mode ** Described in the **Definitions** section **

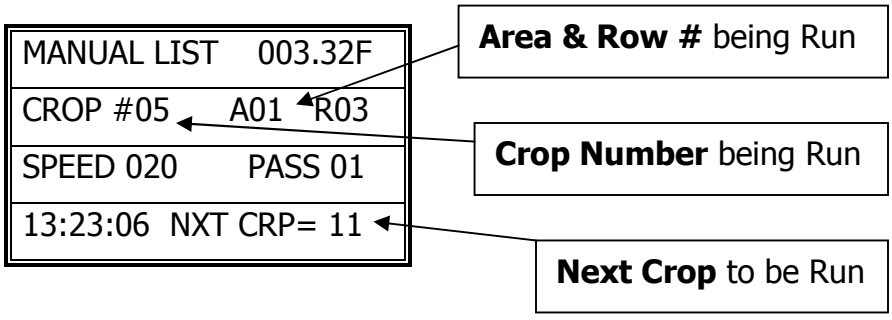
(Main, 1, 6)

1. From the Main Menu press 1
2. From the Manual Menu press 6 (LIST)
3. The ***Manual List*** screen will appear:

CROP NUMBERS ON LIST
1 2 3 4 5 6 7 8 9
10 11 12 13 14 15 16
B/F=MV 0/1=CHNG E=RUN

4. Use the "B" & "F" keys to scroll through the 16 Crops that can be toggled On & Off in the **Manual List Menu**.
5. Press "E" to Run the Crops on the **Manual List**. The Crops will run in numerical order from 1 to 16. Run all Passes programmed for each Crop, and return back to where the Manual List Run was initiated.

Manual Run screen while Boom is Running Program:



Auto Run (Time Based)

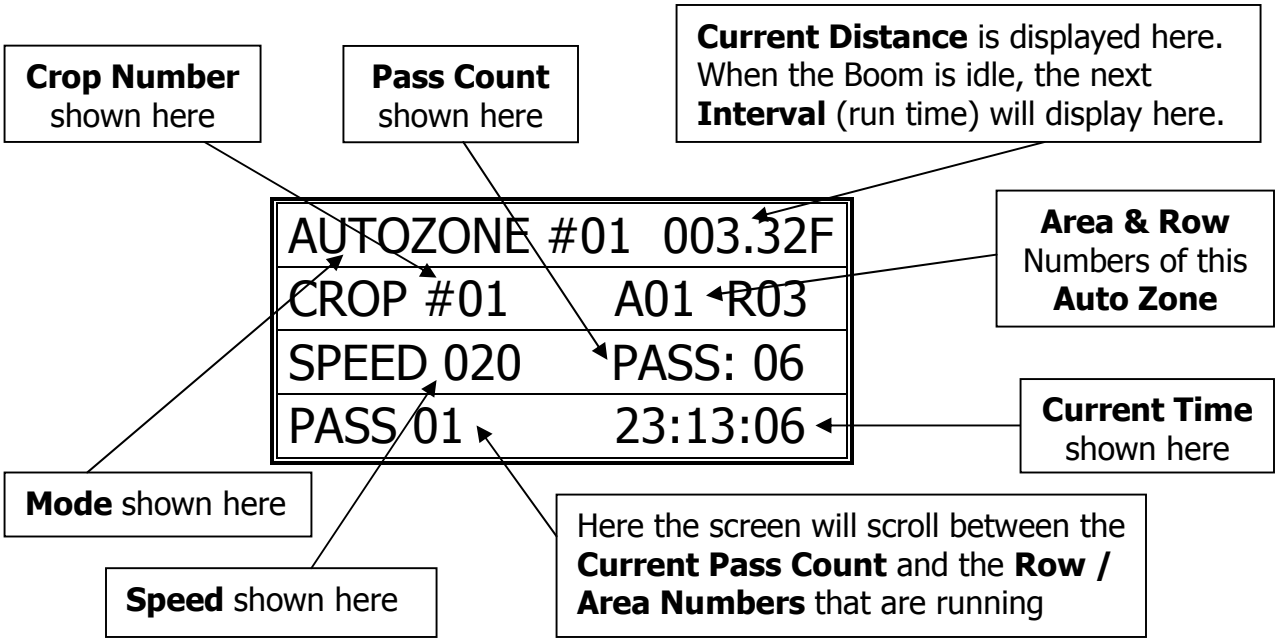
(Main, 1) **** Described in the** Definitions **section ****

**** If not already done, set up Time Zones and Enable the Zones as needed. See **"Auto Schedule Programming"** section ****

1. To start Auto programs go to **Main Menu & press 2**
2. The **Auto Run** menu will scroll thru all of the programmed Crops and their settings as they will run. Note that all of the "Enabled" Auto Crops should show. If there is an **Auto Run Schedule** that is supposed to be running and does not appear, then check to make sure that it is properly "Enabled" in the *Auto Schedule* section.
   * Press "E" to Exit at anytime while in the Auto Mode *

NI1090843 10:54:09
WIC-W2.XX
1= MANUAL 3= SETUP
2= AUTO 4= DIAGS

*Exploded view of the **Auto Run** [in progress] Screen:*
**** Screen will scroll thru all Enabled Auto Zones ****



Step / Stop / Water ** Described in the **Definitions** section **

(Main,)

1. From the Main Menu press 3 for SETUP MENU
2. From the Setup Menu press 1 (CROP SETTINGS)

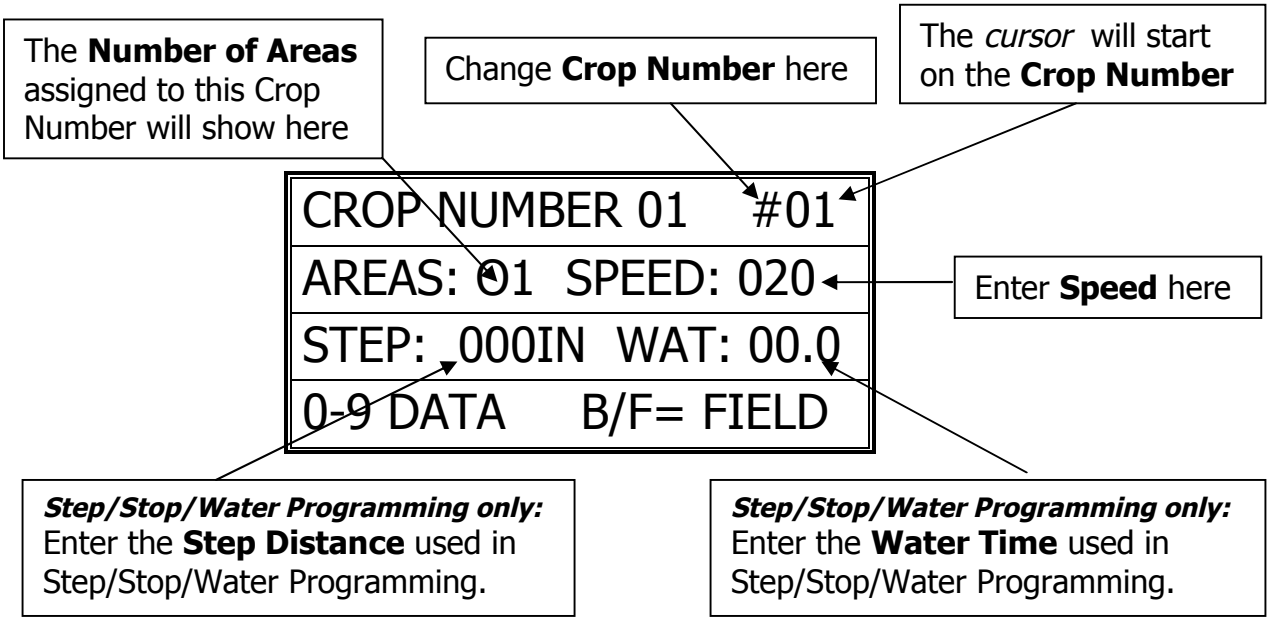
CROP SETUP E=EXIT
1= PASSES & WATERING
2= AUTO SCHEDULES
3= AREAS 4= CAPTURE

3. Press "1" for Passes and Watering. ** Described in the Definitions section **

CROP NUMBER 01 #01
AREAS: 00 SPEED: 000
STEP: 000 IN WAT: 00.0
0-9 DATA B/F= FIELD

4. Use the "B & F" keys to scroll through the **Crop Menu**.
   Use "0-9" keys to input the desired data values.

*Exploded view of the **Crop** (Passes & Watering) Screen #1:*



5. Press "E" key twice to Exit & Save.

Wireless Networking Function

** Described in the **Definitions** section **

Troubleshooting and Support

Motion Error:

- Check Proximity (Motion) Sensor for damage and function.
- There will be a yellow light (located at the base of the sensor body) that should turn on when the sprocket teeth pass the sensor head. If there is no light fluctuation, then check that the sensor is within 3 mm. (millimeters) of the sprocket teeth as they pass.
- If the encoder's teeth are within 3mm, check the functionality of the Proximity (Motion) Sensor. *Refer to the Diagnostics part of this manual for testing sensor inputs (pg.12).* If the sensor is broken or not functional, please call Cherry Creek to purchase a new sensor.

Collision Error:

- The WIC has the option of using a Collision Sensor to stop the Boom if it runs into any objects that might be in the bay (carts, shelves, trash cans, people, etc.). This is an option that can be purchased from CCS at any time. Call Cherry Creek for more info.
- If the Boom is not equipped with the Collision Sensor option, there needs to be a jumper wire in Switch #5. To check this, open the WIC lid, pull the keypad ribbon and set the lid aside. Look at the Terminal Blocks that run down the left side of the Main Board (black "blocks" with colored wires running into them). Pull the bottom black 6 pin Terminal Block from the board (labeled J14). There will be writing on the Main Board for the switch #. Make sure the jumper wire is in place in the Block. The jumper wire should connect to Switch #5 and the Ground (GRD) that is directly below SW5.
- *If the Boom **is** equipped with the Collision Sensor Option*, then:
    - Check the Collision Sensor for damage and function.
    - *Refer to the Diagnostics part of this manual for testing sensor inputs.* If the sensor is broken or not functional, please call Cherry Creek to purchase a new sensor.

Marker Count Error:

- Check Marker Magnet Sensor for damage and function.
- Check to make sure that all the Marker magnets are in the correct placement as to the programmed distance (set when programming the Bay Length).
- Also check to make sure that the number of "Markers" programmed the same as the amount of Marker magnets on the rail.
- Check the functionality of the Marker Magnet Sensor. *Refer to the Diagnostics part of this manual for testing sensor inputs.* If the sensor is broken or not functional, please call Cherry Creek to purchase a new sensor.

TECHNICAL ASSISTANCE: *If you have any questions regarding the use of this program or any other Cherry Creek Systems product, please call:*

(719) 380-8373

OR

Toll Free:

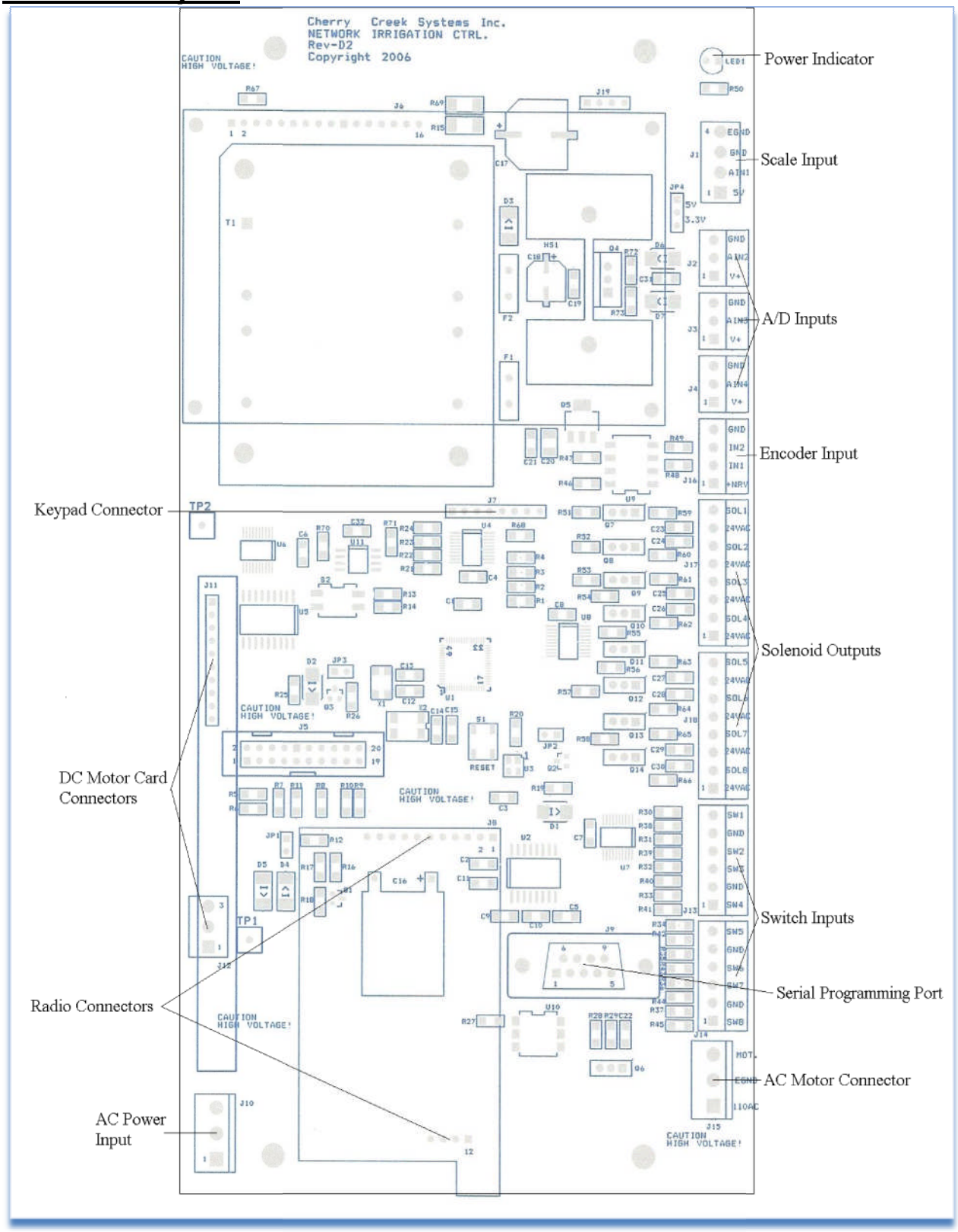
(877) 558-3246

Before calling Tech Service, please try Resetting the Controller by pressing the RESET button on the board (shown on the Main Board layout in the "Wiring Diagrams" section). In most cases, this solves the problem and is an easy step to perform before calling Tech Service. If the WIC is "locked-up", this will typically fix it, getting the Controller functional again.

techsupport@cherrycreeksystems.com
www.cherrycreeksystems.com

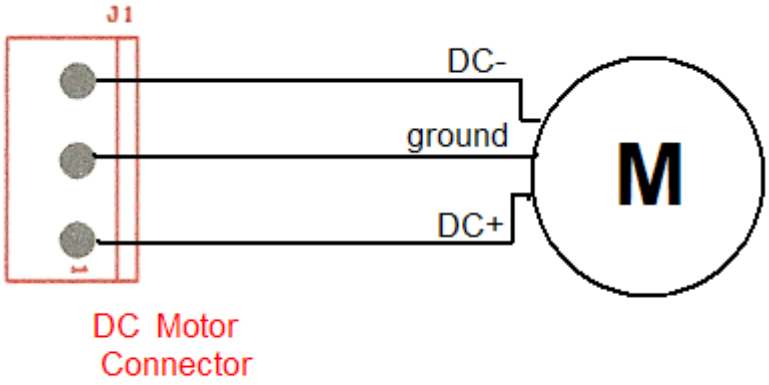
Wiring Diagrams & Layouts:

Main Board Layout:

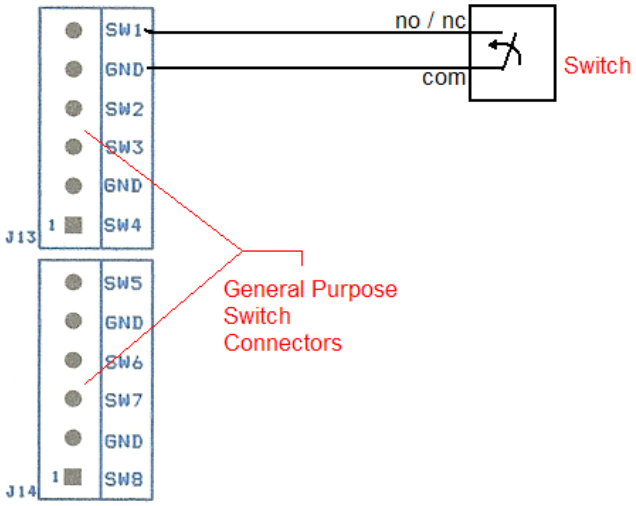


Motor Wiring - 90Volt DC Variable Speed

For Speed Control of the DC Motor, the WIC uses a DC Motor control board needs to be installed on the WIC. As with all other power connectors, the center pin of the DC Motor connection is Ground.



DC Motor Connector



All WIC switch inputs are designed to work with any general-purpose contact or magnetic switch. All switches should be normally open except SW5, which should be normally closed. If a COLLISION switch is not installed on the Boom, SW5 should have a jumper.

****** Note that adjacent switches share a common ground ******

Options and Upgrades

WIC / Minarik External MCB Installation

Power Cable Connection:

Power Supply 110VAC, Single Phase input power.

The Supply side of the input power connects to the terminal labeled ‘Hot’ on the diagram on page 2. This is then fed to the drive via a 15A Breaker.

The neutral side of the AC supply is connected to terminal labeled ‘Neutral’ on the diagram on page 2.

Earth (Ground) goes to ‘Earth’

Motor Cable Installation:

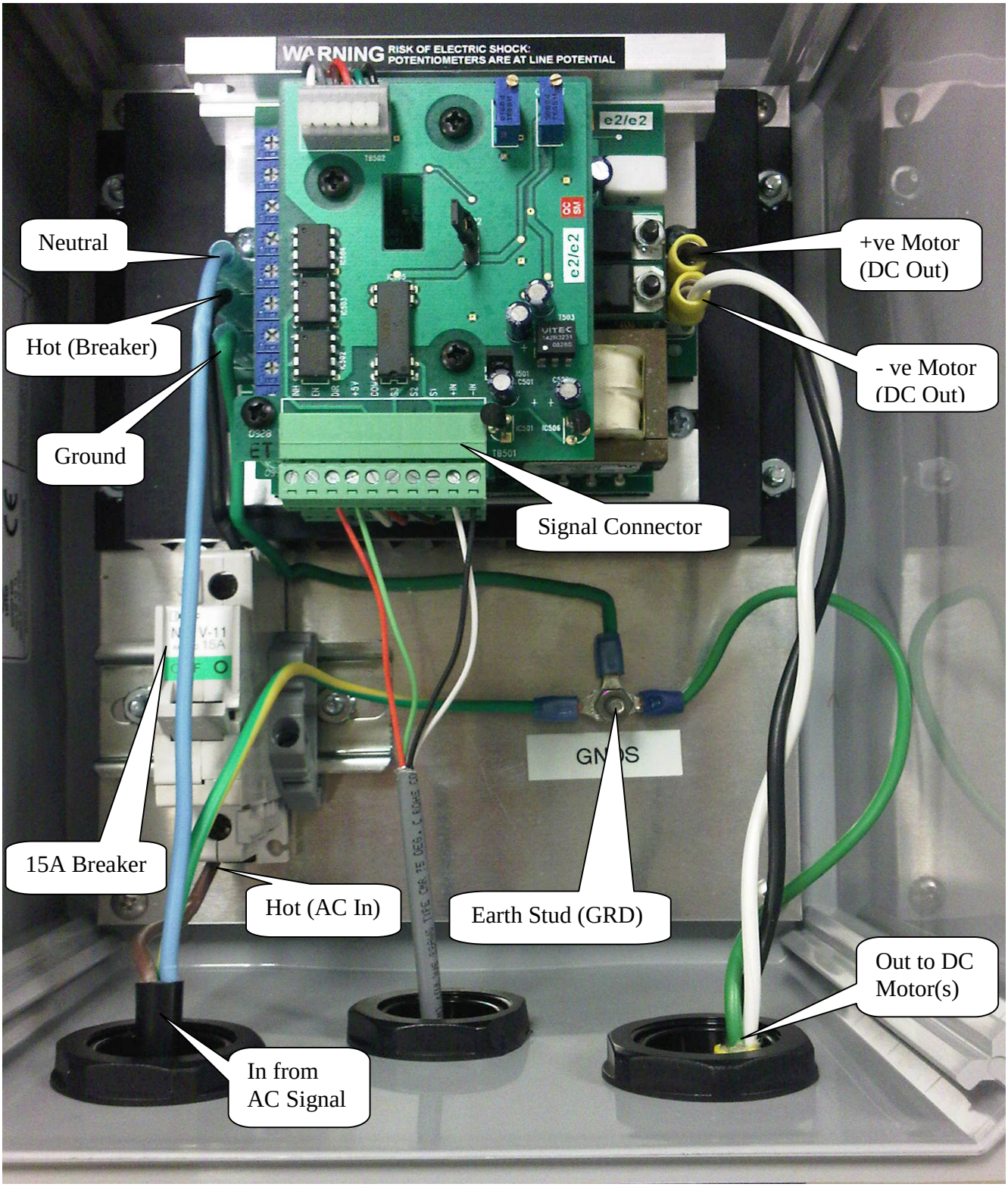
There are terminals for connection of the motor to the drive

Earth – connect the motor earth wire to the Earth stud using a ringlet connector.

Motor Positive - connect to the terminals marked ‘+ve’ on the diagram on page 2. There are 3 positions available.

Motor Negative -connect to the terminals marked ‘–ve’ on the diagram on page 2. There are 3 possible connection points.

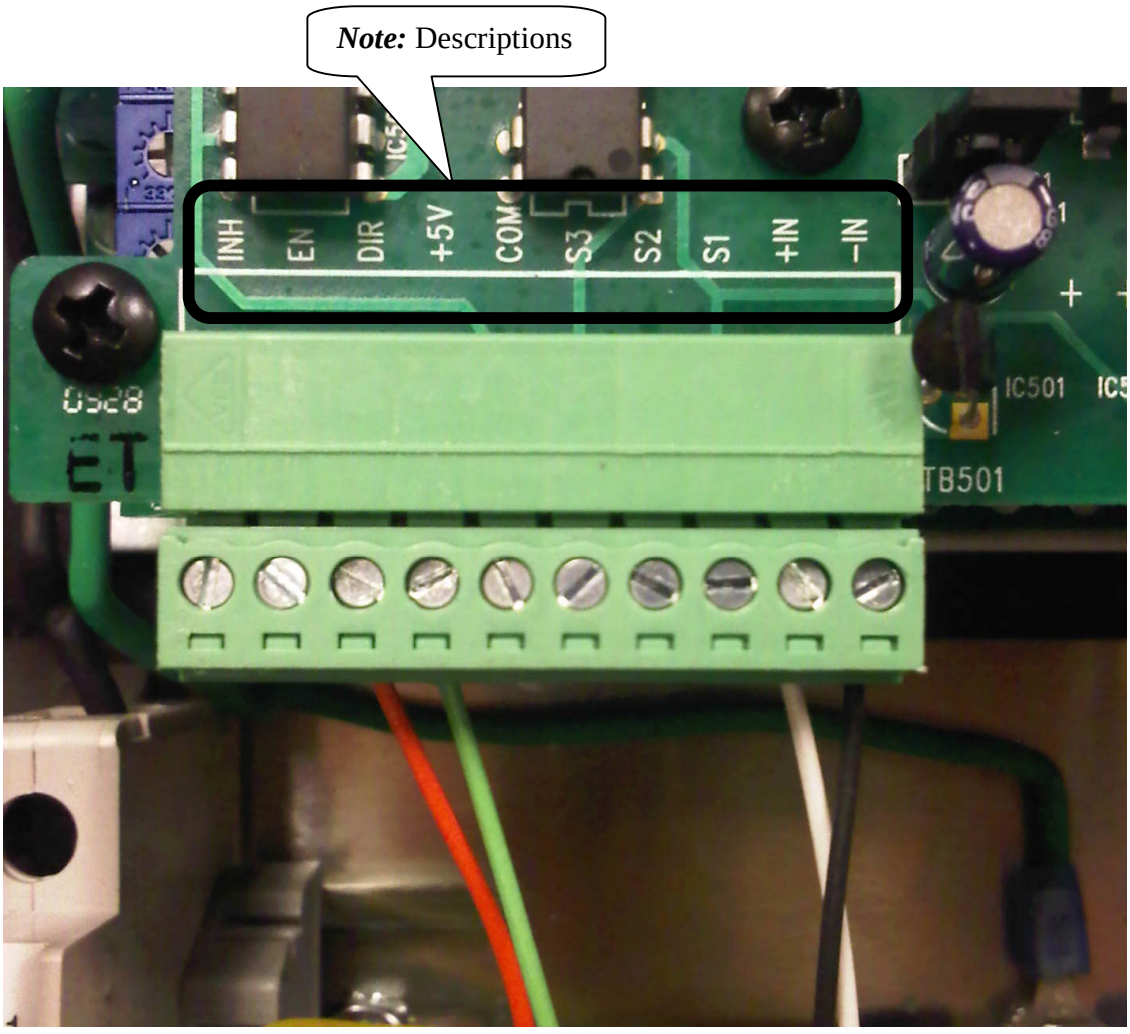
If the direction of the motors needs to be reversed, swap the individual motor + and – wire positions. If both motors need to be reversed swap the A1 & A2 connections on the drive.


WARNING RISK OF ELECTRIC SHOCK: POTENTIOMETERS ARE AT LINE POTENTIAL
Neutral
Hot (Breaker)
Ground
+ve Motor (DC Out)
- ve Motor (DC Out)
Signal Connector
15A Breaker
Hot (AC In)
Earth Stud (GRD)
Out to DC Motor(s)
In from AC Signal

Signal Connections:

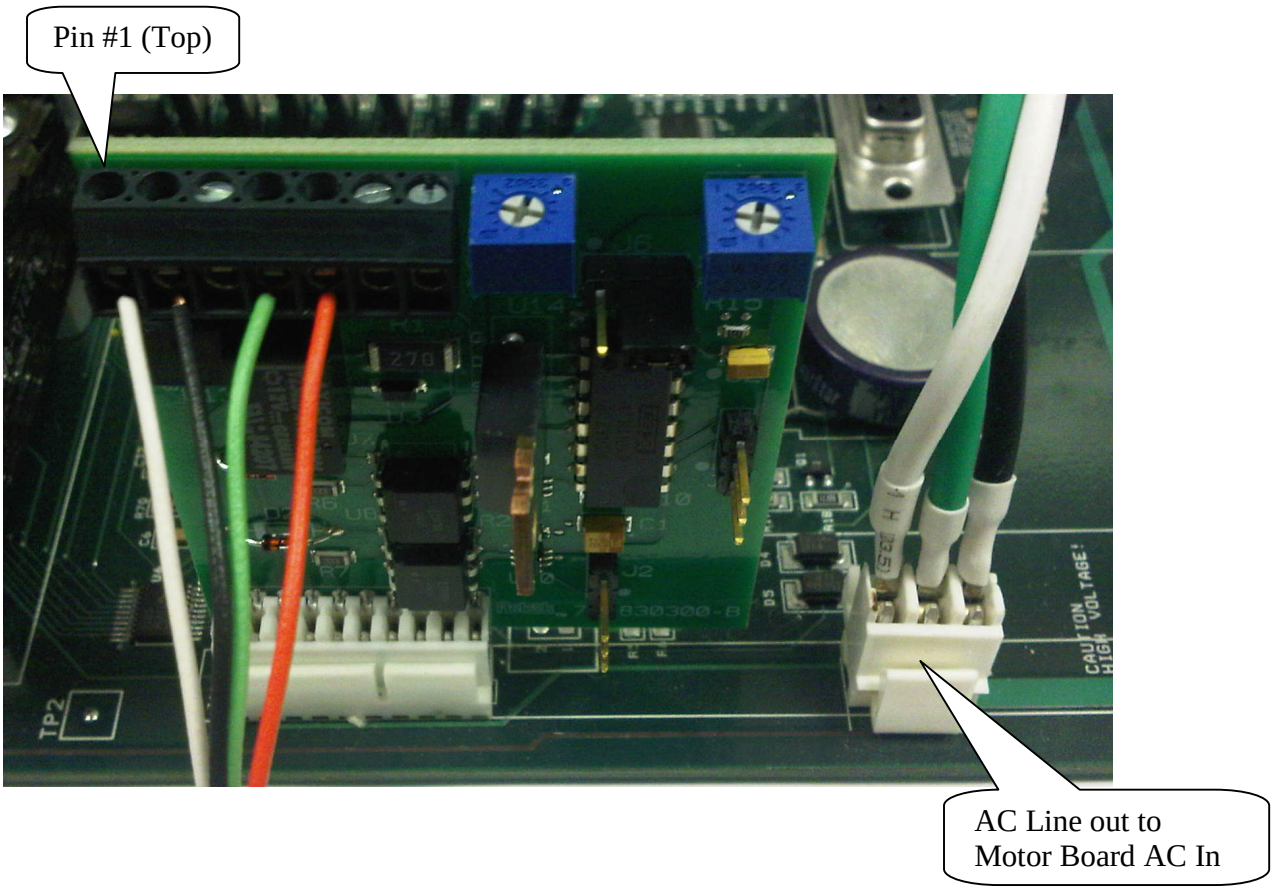
Minarik board connections:

Green terminal strip on top board of Drive			
Pin Marking	***Function***		***Incoming Wire Color***
IN-	4-20mA Low		Black
IN+	4-20mA High		White
S1	N/A		
S2	N/A		
S3	N/A		
COM	N/A		
+5V	Signal Supply		Green
DIR	Direction Signal		Red
EN	N/A		
INH	N/A		



Cherry Creek WIC board connections:

7 pin connector on left side of board – J11			
Pin Number (from Top)	***Function***		***Outgoing Wire Color***
1	4-20mA High		White
2	4-20mA Low		Black
3	N/A		---
4	Signal Supply (+5V)		Green
5	Direction Signal		Red
6	N/A		---
7	N/A		---



Drive Settings:

Drive performance

See RG60U/RG61U manual for details.

Upper board

Offset

When the system is on, but not running, the offset can be adjusted to settle the motor at zero speed, turn the pot to eliminate motion, and remove any motor hum.

Span

This is used to match the motor speed to the required system Controller speed. Adjust so that the speed set by the system matches the speed (voltage signal) of the motors. ***This will probably not need to be changed***. Note that changing this may require adjusting the offset afterwards.

Settings on the middle board

Fwd/Rev Accel	Set to Max (Default)
Fwd/Rev Trq Limits	Set to Max (Default)
DB	Set to Max (Default)
Min/Max Speeds	Set to Max & just shy of Min (Default)
IR Comp	This will need to be changed to suit the load (Motor Amperage). As a guide turning CCW will settle the system when moving.

Jumper Settings

To enable 4-20mA control, insert jumper J501 and J502, pins 1 to 2