Network Irrigation Controller "NIC"
Jobbing w/ Magnets

Version A.28

USERS MANUAL

CHERRY
CREEK
SYSTEMS
Greenhouse Equipment Specialists

Table of Contents

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
*** 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
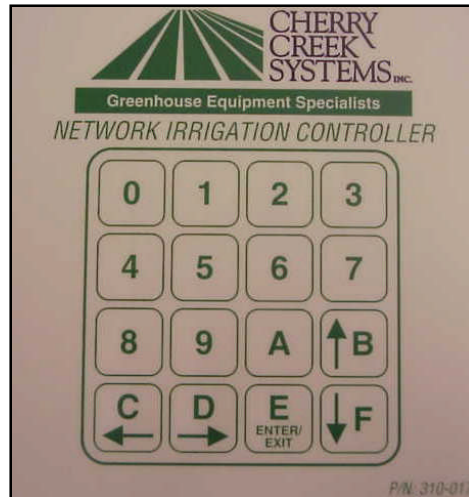
Jobbing:

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

JOB #03 Magnet

AWAY Position Magnet
(End of JOB 03)

JOB 3   JOB 3

JOB 2   JOB 2

JOB 1   JOB 1

JOB #02 Magnet

HOME Position Magnet
(Start of JOB 01)

Double Rail Boom
tracks (rails)
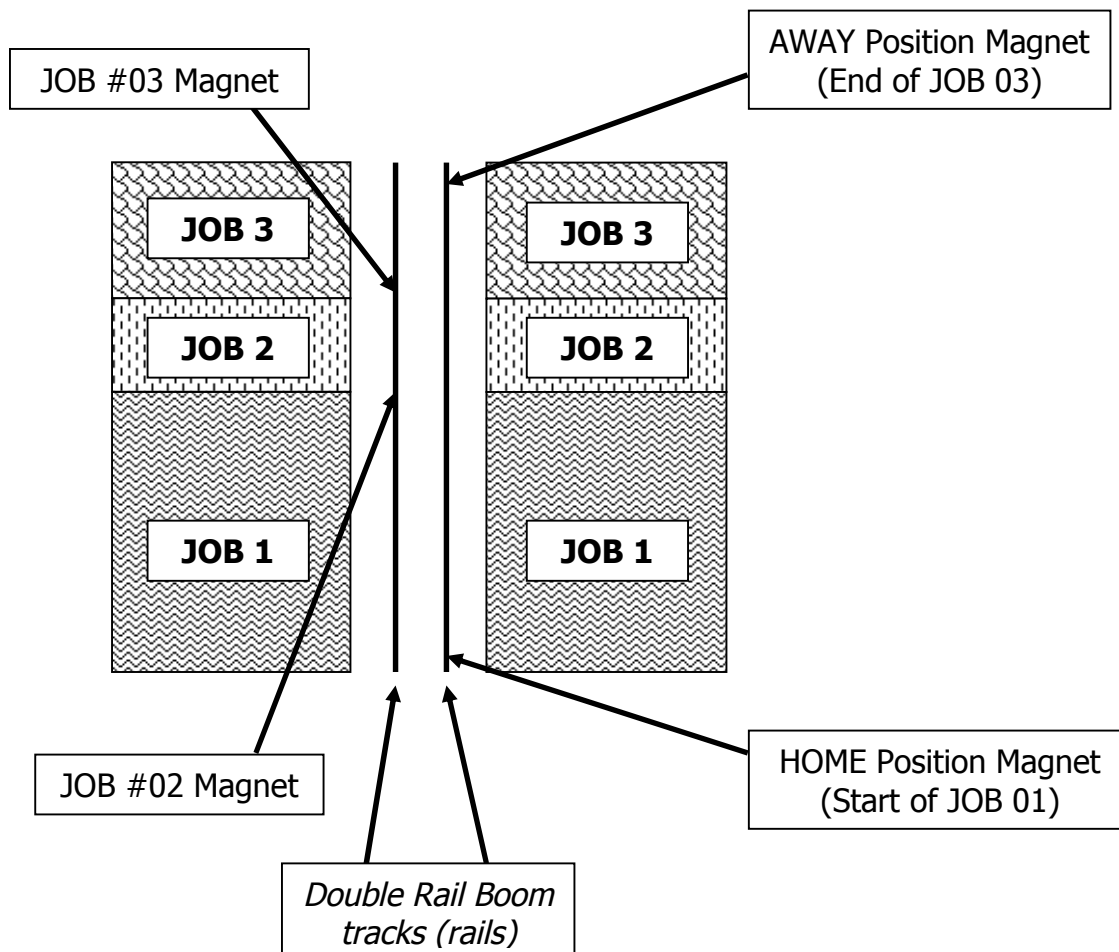
Main Menu:

*** 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

Keypad test
(Main, 3, 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 Diagnostics menu press 1 (KEY):

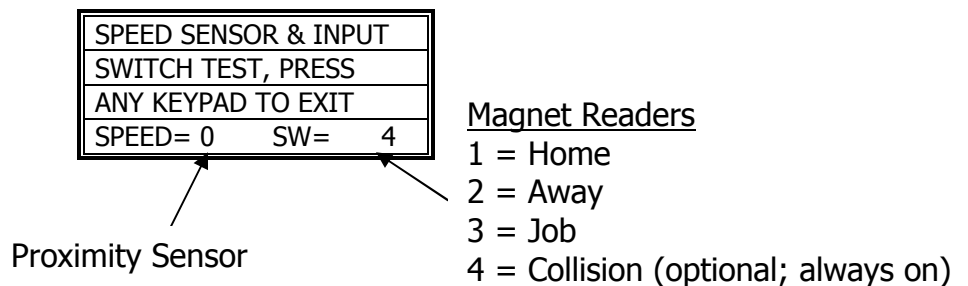| |
|---|
| KEYPAD DIAGNOSTIC. |
| TO END PRESS E TWICE |
| |
| KEY NUMBER = F |

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.

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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):

| SPEED SENSOR & INPUT |
| SWITCH TEST, PRESS |
| ANY KEYPAD TO EXIT |
| SPEED= 0   SW=   4 |

Proximity Sensor

Magnet Readers
1 = Home
2 = Away
3 = Job
4 = Collision (optional; always on)

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

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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.

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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)

* 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:

JOB #03 Magnet

AWAY Position Magnet
(End of JOB 03)

JOB 3   JOB 3

JOB 2   JOB 2

JOB 1   JOB 1

JOB #02 Magnet

HOME Position Magnet
(Start of JOB #01)

Double Rail Boom tracks (rails)
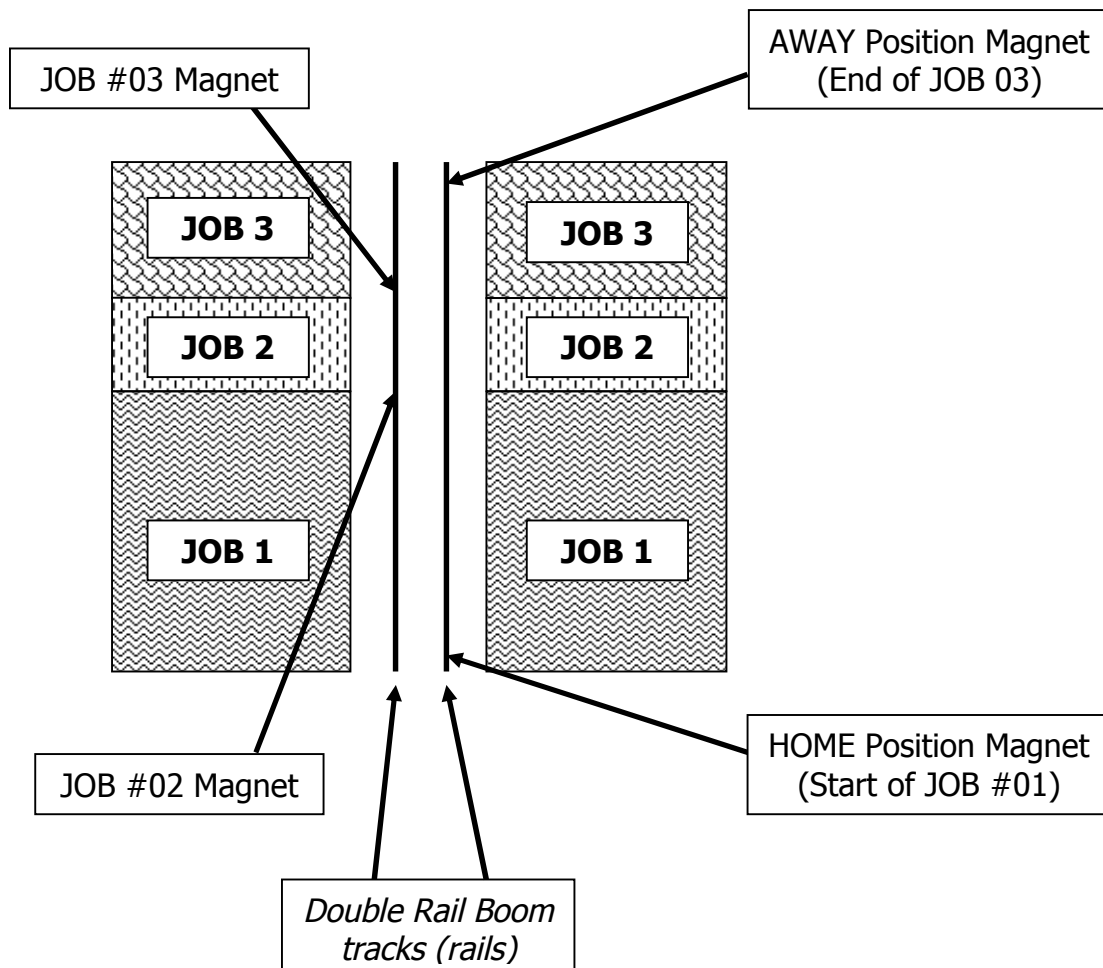
1. From the Main Menu press 2 for Manual. The following screen will appear:

| 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:*

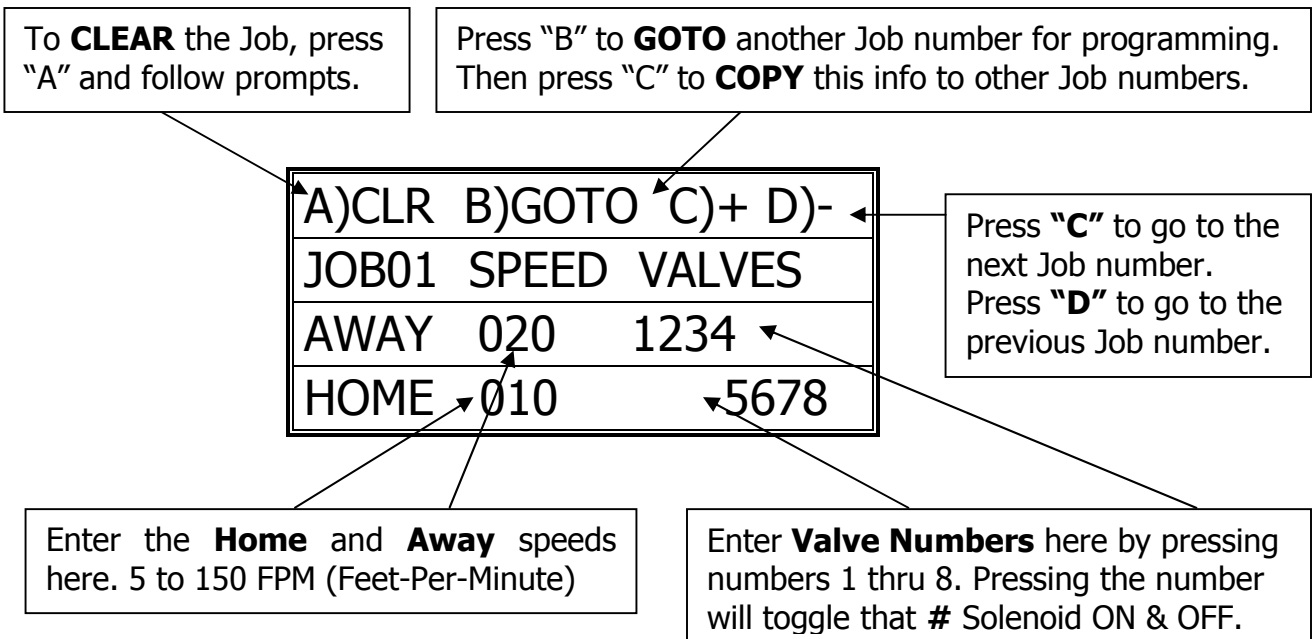To **CLEAR** the Job, press "A" and follow prompts.

Press "B" to **GOTO** another Job number for programming. Then press "C" to **COPY** this info to other Job numbers.

```
A)CLR  B)GOTO  C)+ D)-
JOB01  SPEED  VALVES
AWAY   020      1234
HOME   010         5678
```

Press **"C"** to go to the next Job number.
Press **"D"** to go to the previous Job number.

Enter the **Home** and **Away** speeds here. 5 to 150 FPM (Feet-Per-Minute)

Enter **Valve Numbers** here by pressing numbers 1 thru 8. Pressing the number will toggle that **#** Solenoid ON & OFF.

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.
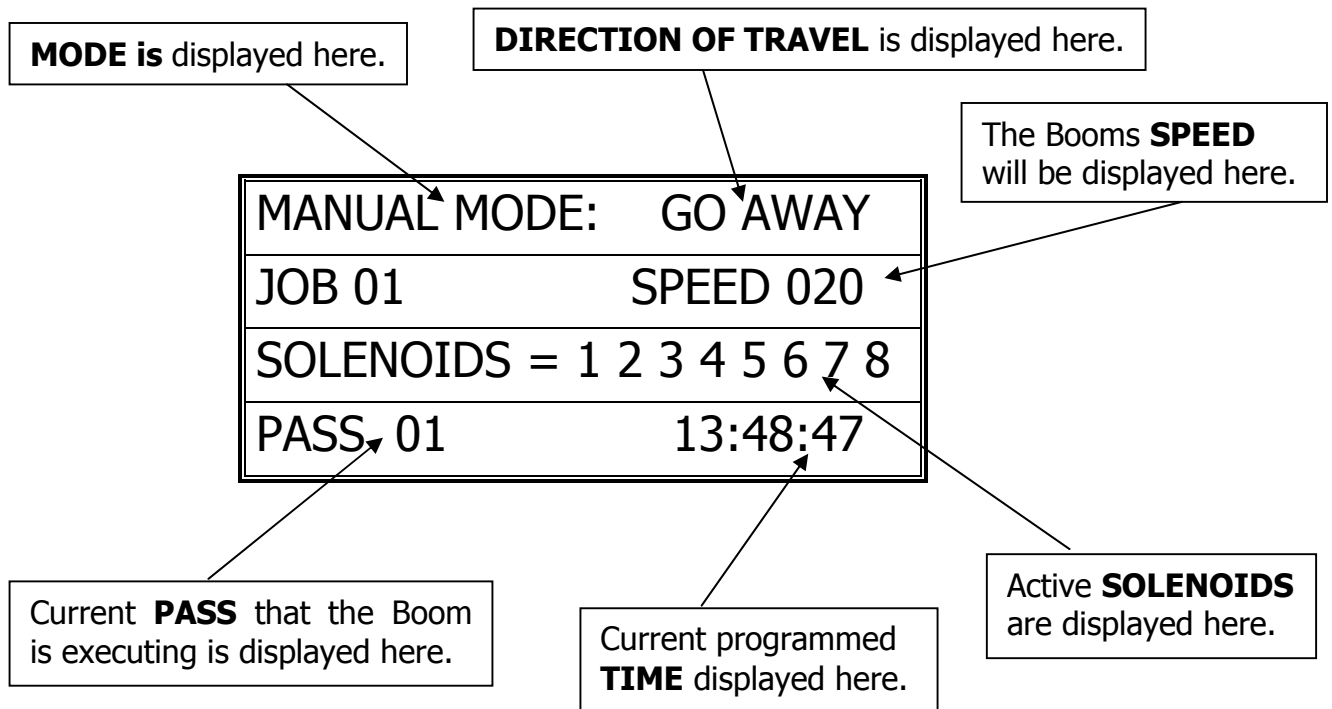
_____

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:*

MODE is displayed here.	DIRECTION OF TRAVEL is displayed here.

The Booms **SPEED** will be displayed here.

```
MANUAL MODE:    GO AWAY
JOB 01              SPEED 020
SOLENOIDS = 1 2 3 4 5 6 7 8
PASS 01              13:48:47
```

Current **PASS** that the Boom is executing is displayed here.

Current programmed **TIME** displayed here.

Active **SOLENOIDS** are displayed here.

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.

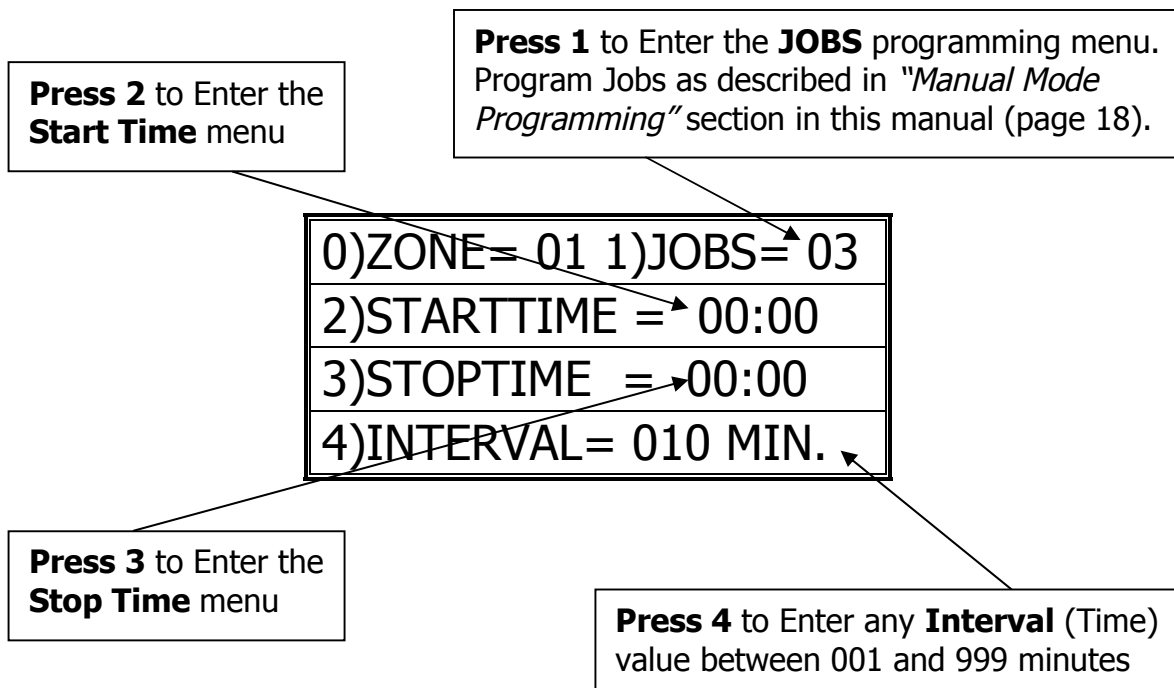*Pass* = Starts at Home, goes to Away, then turns around and comes back Home.
   * *Unless programmed differently by the user under the Set-Up menu.*

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:*

Press 1 to Enter the **JOBS** programming menu. Program Jobs as described in *"Manual Mode Programming"* section in this manual (page 18).

Press 2 to Enter the **Start Time** menu

```
0)ZONE= 01 1)JOBS= 03
2)STARTTIME = 00:00
3)STOPTIME  = 00:00
4)INTERVAL= 010 MIN.
```

Press 3 to Enter the **Stop Time** menu

Press 4 to Enter any **Interval** (Time) value between 001 and 999 minutes

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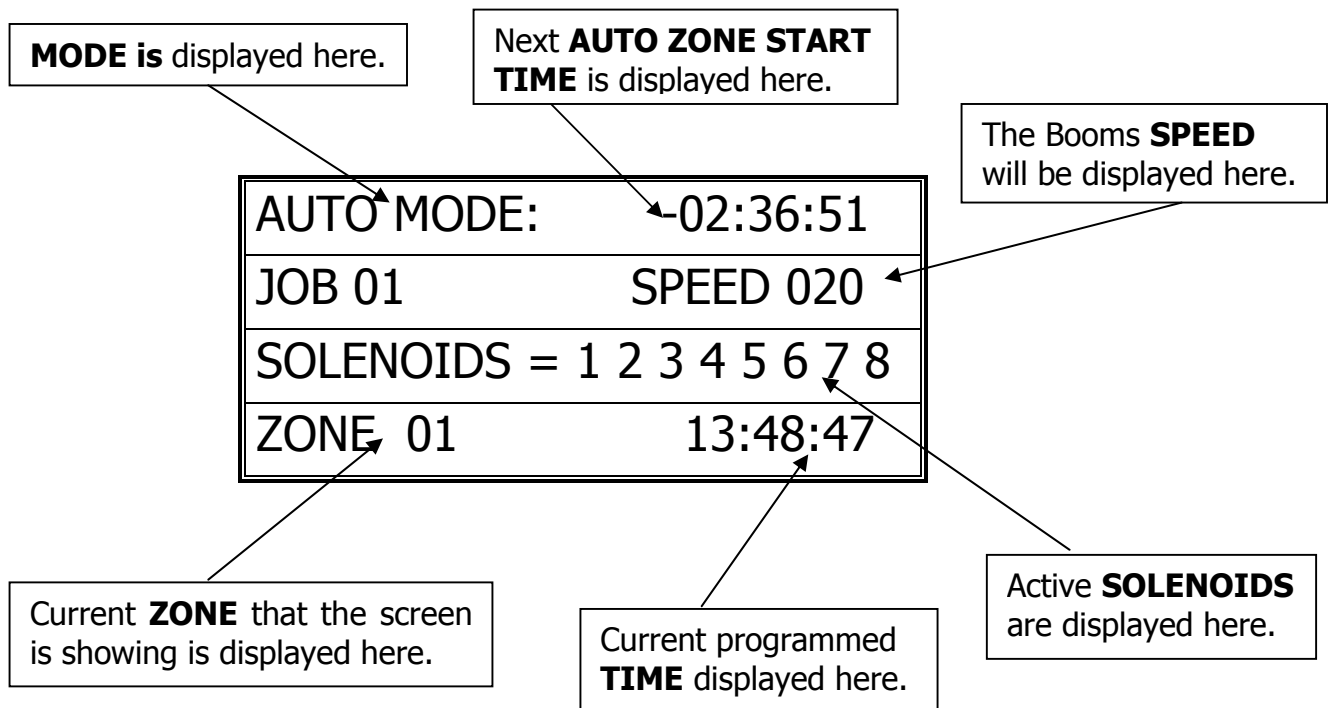
TO CHANGE ACTIVE
ZONES 1 3 56 8 ABC E
PRESS KEYS 1 THRU E
0 KEY EXIT, F KEY RUN

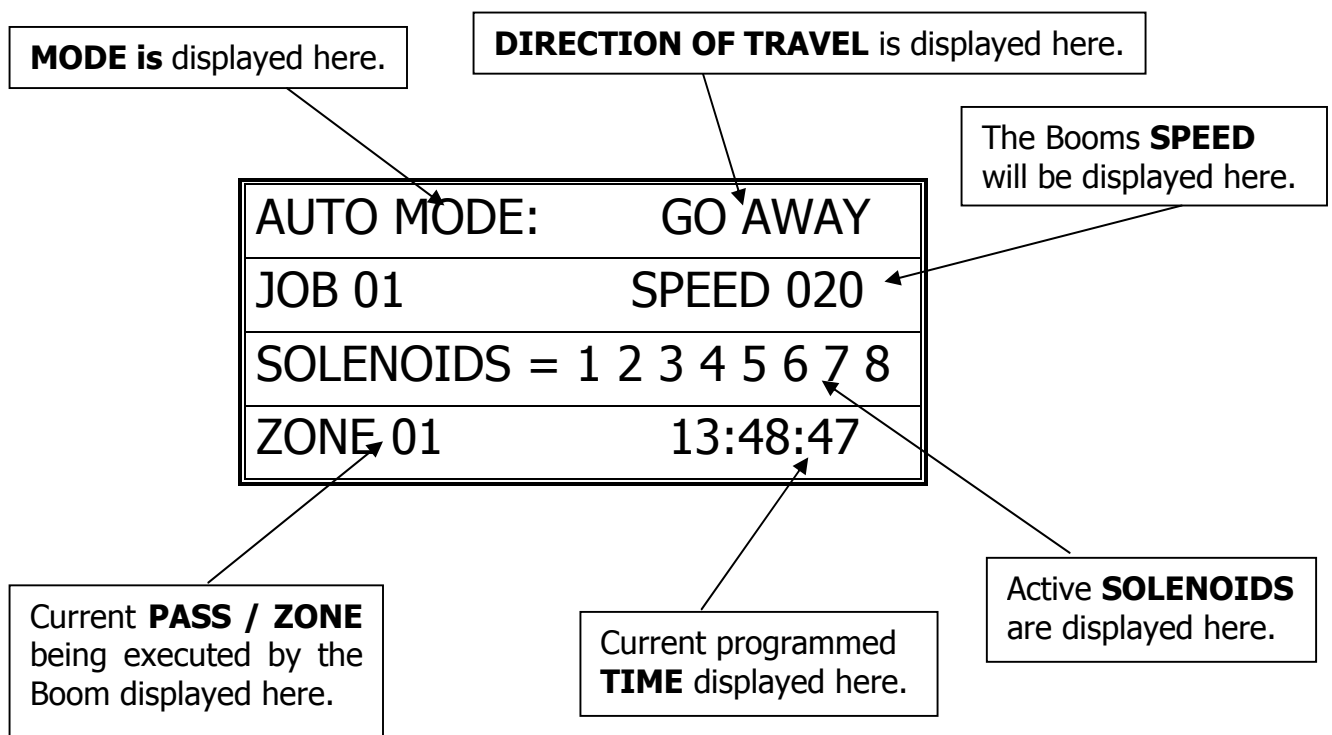Toggle the **ACTIVE AUTO ZONES** On & Off by pressing the 1 thru E keys

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 Idle** Screen:*

MODE is displayed here.

Next **AUTO ZONE START TIME** is displayed here.

The Booms **SPEED** will be displayed here.

```
AUTO MODE:      -02:36:51
JOB 01            SPEED 020
SOLENOIDS = 1 2 3 4 5 6 7 8
ZONE 01            13:48:47
```

Current **ZONE** that the screen is showing is displayed here.

Current programmed **TIME** displayed here.

Active **SOLENOIDS** are displayed here.

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

MODE is displayed here.

DIRECTION OF TRAVEL is displayed here.

The Booms **SPEED** will be displayed here.

```
AUTO MODE:       GO AWAY
JOB 01            SPEED 020
SOLENOIDS = 1 2 3 4 5 6 7 8
ZONE 01            13:48:47
```

Current **PASS / ZONE** being executed by the Boom displayed here.

Current programmed **TIME** displayed here.

Active **SOLENOIDS** are displayed here.

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:
  o Check the Collision Sensor for damage and function.
  o *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.*

<u>**Note:**</u> *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

G		UNUSED
+		UNUSED
G		UNUSED
5V		BROWN WIRE OF RED TIP PROXIMITY SENSOR
0V		BLUE WIRE OF PROXIMITY SENSOR
IN		BLACK WIRE OF PROXIMITY SENSOR
FG		UNUSED
OUT		UNUSED
NR		BROWN WIRE OF YELLOW TIP PROXIMITY SENSOR
SW1		RED WIRE OF HOME SENSOR
0V		BLACK WIRE OF HOME, AWAY, AND JOB SENSORS
SW2		RED WIRE OF AWAY SENSOR
SW3		RED WIRE OF JOB SENSOR
0V		UNUSED
SW4		UNUSED
SW5		COLLISION JUMPER TO 0V IF NO COLLISION DETECT IS USED.
0V		REMOTE START FROM COMPUTER
SW6		UNUSED
SW7		UNUSED
0V		MOTOR JOG SWITCH
SW8		MOTOR JOG SWITCH
0V		UNUSED
NET		REMOTE KEYPAD HOOKUP
FG		REMOTE KEYPAD HOOKUP
NET		REMOTE KEYPAD HOOKUP
+NRV		REMOTE KEYPAD HOOKUP
SOL1		SOLENOID 1
24VAC		
SOL2		SOLENOID 2
24VAC		
SOL3		SOLENOID 3
24VAC		
SOL4		SOLENOID 4
24VAC		
SOL5		SOLENOID 5
24VAC		
SOL6		SOLENOID 6
24VAC		
SOL7		SOLENOID 7
24VAC		
SOL8		SOLENOID 8
24VAC		

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 "0V" AND
THE BLACK WIRE TO "IN".

(HOME - RED)
(COMMON - BLACK)
(AWAY - GREEN)

A H

HAND HELD
SWITCH

OPTIONAL

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:		CUSTOMER
NIC CONTROLLER		
DRAWING TITLE:	MAIN BOARD WIRING DIAGRAM	
Approved By:	JVW 12/14/99	Drawn By: DJS
Scale: NONE	Part Number: 315-0035	Revision Number: -
Date: Jun 1, 98		

CHERRY CREEK SYSTEMS INC.
Greenhouse Equipment Specialists

POWER SUPPLY BOARD
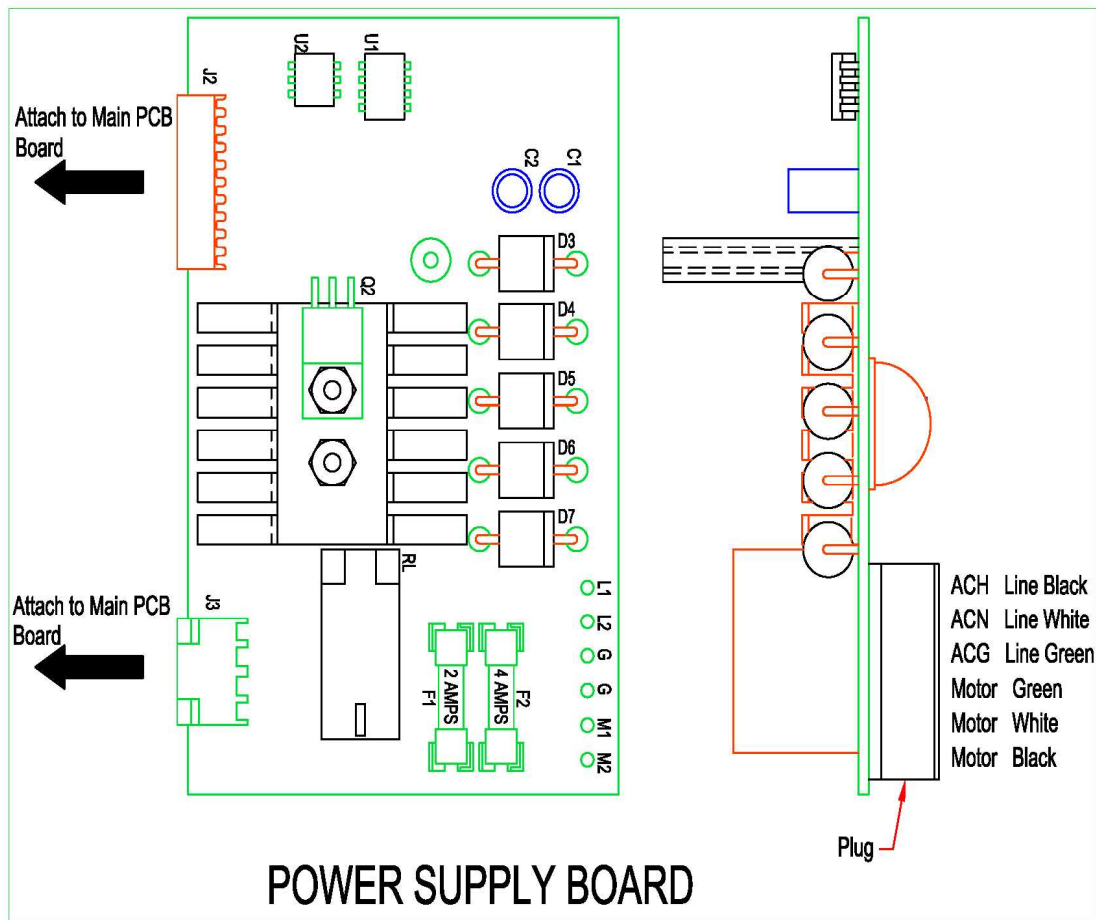
Options and Upgrades

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.**