

Foot Distance Guide

Common Sense 2 Controller

Greenhouse Technology Inc.

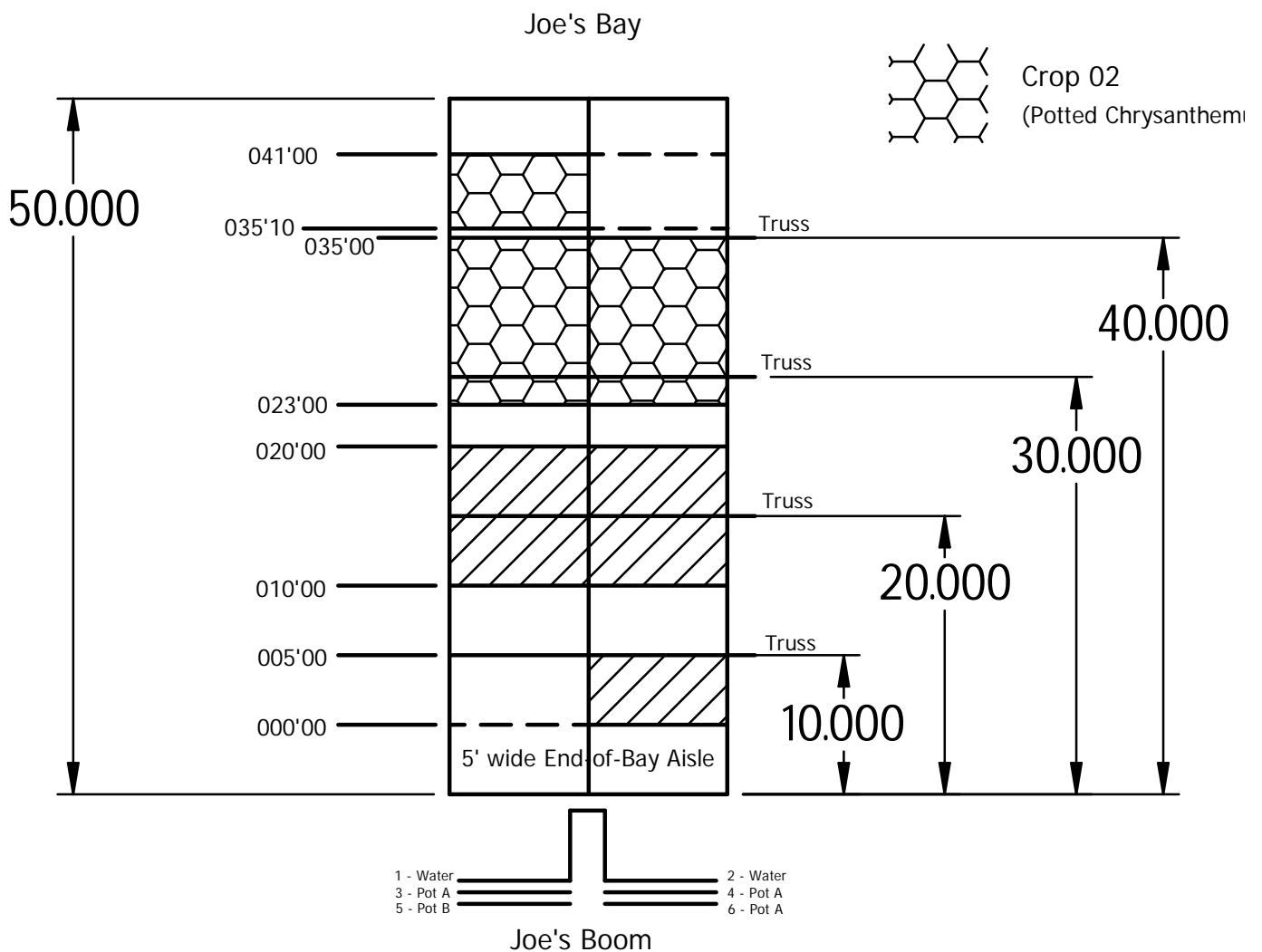
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Scenario

2 Crops - One Pots, One Not

Joe has 2 crops. Crop 01 is poinsettia cuttings, and crop 02 is chrysanthemums in 8" pots spaced in rows 14" apart. He's just installed a Foot Distance Kit on his Common Sense 2 boom and he's ready to grow!



He wants to water Crop 01 at speed 20 every 10 minutes between 7am and 7pm, and he wants to water Crop 02 only twice per day, 7:30 am and 6pm, 15 seconds per pot.

Configuration

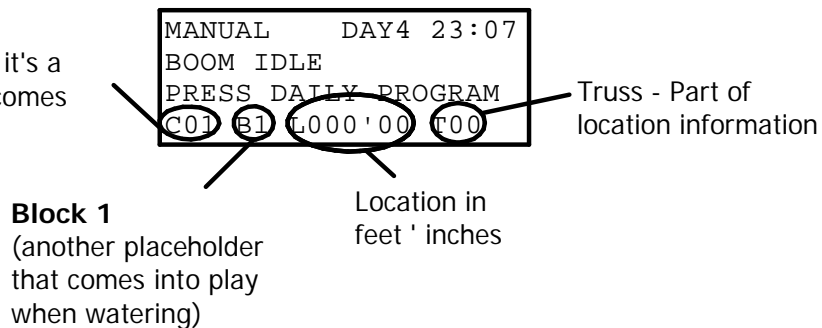
Starting at the Manual Mode base screen:

```
MANUAL    DAY4 23:07
BOOM IDLE
PRESS DAILY PROGRAM
C01 B1 L000'00 T00
```

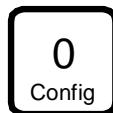
Joe notices a few things about the screen.

Crop 01

(on this screen, it's a placeholder - it comes into play when watering)



The 'Config' menu is a good place to start, so Joe presses

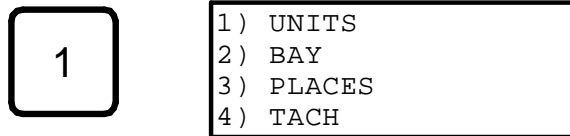


```
1) SET CLOCK
2) BOOM DEFAULTS
3) SYSTEM CONFIG
4) UPDATE FIRMWARE
```

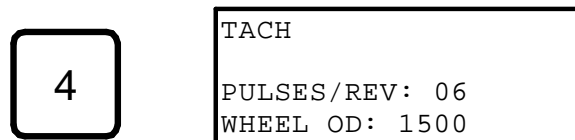
No changes here. In 2) BOOM DEFAULTS, though, there is a difference, in the first option:

```
1) FOOT DISTANCE
2) SPEED DEFAULTS
3) NUMBER OF CROPS
4) MISC SETUP
```

He presses "1" to see the Foot Distance menu:



Having been warned ahead of time by a GTI tech guy, Joe picks "4) Tach" first. Even though it's the last option in the list, it needs to be adjusted first. More on that in a second.



The magnet wheel and the magnet reader reading it form something called a "**Tachometer**" (pronounced "Takometer"). Each pulse from a magnet on the wheel passing the reader is called a "**Tach**" (pronounced "Tak"). The boom uses the number of pulses per revolution and the wheel diameter where it contacts the rail to calculate how much distance each tach pulse means.

- Note: **The boom "mentally" stores all distances and locations in Tach, so it's very important to get this number correct before you program anything else. Changing this number changes all distances and locations in the controller.**

Joe takes the time to measure the diameter of one of his idler wheels where it contacts the rail. It turns out to be 1.433 inches, as Joe's wheel is old and worn. His tach wheel has 6 magnets in it, so Joe enters the info he has:

```
TACH
PULSES/REV: 06
WHEEL OD: 1433
```

Entering this information works just like entering anything in the original zone-based Common Sense II controller, so Joe feels right at home.

He presses Escape to leave

Escape

```
1) UNITS
2) BAY
3) PLACES
4) TACH
```

and then presses "1" to configure his units:

1

```
UNITS
REF. OFFSET: FT
REF. SPACING: FT
EVERYTHING ELSE: FT
```

Joe doesn't have a metric greenhouse, and he's not a fan of metric in general, so he just keeps the default units.

Escape

```
1) UNITS
2) BAY
3) PLACES
4) TACH
```

He's ready to configure the bay:

2

```

BAY
GROW AREA: 999'00
1ST REF LOC: 005'00
REF SPACING: 010'00
    
```


Growing area isn't the same thing as the length of the bay - it's the area you can (or want to) water. In this case, It's about 41 feet long and starts 5 feet back from the first truss. Oh, and Joe's trusses are 10 feet apart.

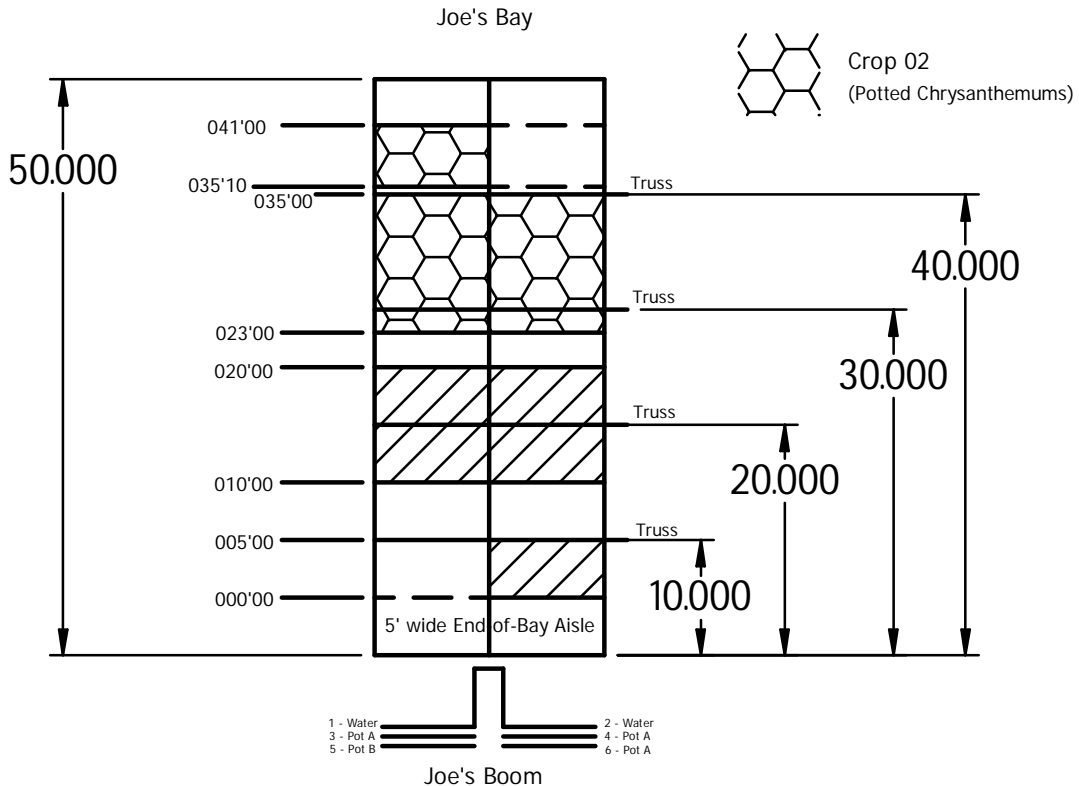
```

BAY
GROW AREA: 041'00
1ST REF LOC: 005'00
REF SPACING: 010'00
    
```

Enter

 Crop 01
(Poinsettia Cuttings)

 Crop 02
(Potted Chrysanthemums)



3	PLACES HOME: FLOATING PURGE: 000'00 AISLE: 000'00-000'00
---	---

Joe wants to have home be a particular location, so he exits to the config menu:

1) SET CLOCK 2) BOOM DEFAULTS 3) SYSTEM CONFIG 4) UPDATE FIRMWARE
--

3	SYSTEM CONFIG CONFIG--2----- PRESS ENTER
---	--

2 on is the setting to activate "no motion" alarming, just as in the zone-based Common Sense 2 controller, and that's crucial, so Joe keeps it. Joe presses

5	SYSTEM CONFIG CONFIG--2--5--- PRESS ENTER
---	---

Enter	1) SET CLOCK 2) BOOM DEFAULTS 3) SYSTEM CONFIG 4) UPDATE FIRMWARE
-------	--

Now the "Places" screen has a settable "Home" location!

```
PLACES
HOME: 000'00
PURGE: 000'00
AISLE: 000'00-000'00
```

Joe sets home to 001'00 (he wants it within arms' reach of the 5' aisle at the end of the bay. He doesn't set a purge (he doesn't plan to fertigate) or an aisle (his only aisle is at the end of the bay and isn't in his growing area).

```
PLACES
HOME: 001'00
PURGE: 000'00
AISLE: 000'00-000'00
```

Enter

Joe's almost finished configuring his boom. He goes back to the main config menu:

Escape Escape

```
1) SET CLOCK
2) BOOM DEFAULTS
3) SYSTEM CONFIG
4) UPDATE FIRMWARE
```

Then to the Boom Defaults menu

2

```
1) FOOT DISTANCE
2) SPEED DEFAULTS
3) NUMBER OF CROPS
4) MISC SETUP
```

and picks "Number of Crops"

3

```
TOTAL CROPS:01
TOTAL NUMBER OF
CROPS (1-16)
```

sets this to "02"

```
TOTAL CROPS:02
TOTAL NUMBER OF
CROPS (1-16)
```

Enter

Joe presses

Escape

a few times, until he ends up at the

manual mode base screen:

```
MANUAL    DAY4 23:19
BOOM IDLE
PRESS DAILY PROGRAM
C01 B1 L000'00 T00
```

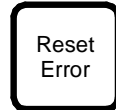
Finally, Joe tells the boom where it is. From the manual mode (or any mode) base screen, Joe presses

Reset
Error

```
SET BOOM LOCATION
085'11
```

```
SET BOOM LOCATION
010'00
```

Finally, Joe tells the boom where it is. From the manual mode (or any mode) base screen, he presses



```
SET BOOM LOCATION
_085'11
```

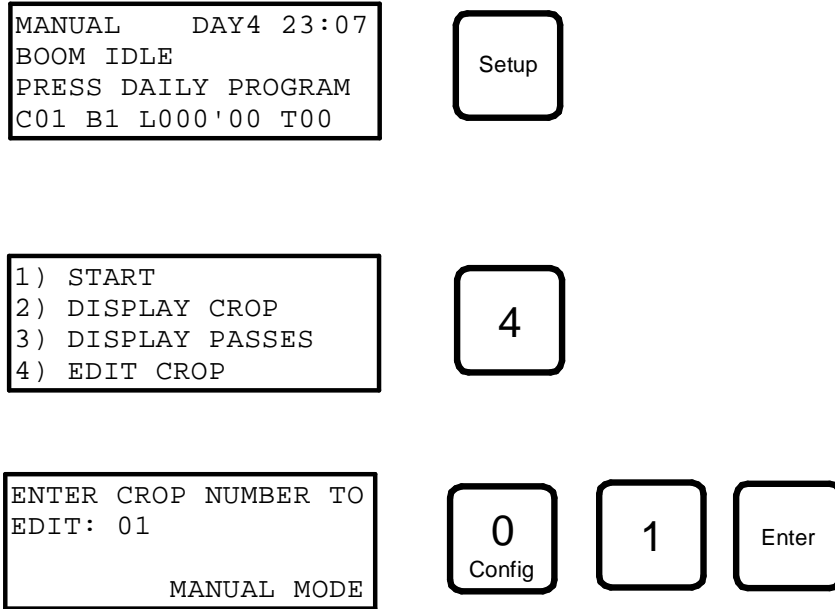
He doesn't have to get it exact - just within a foot or two. The boom should self-correct any major inaccuracies when it gets to its first truss:

```
SET BOOM LOCATION
_010'00
```

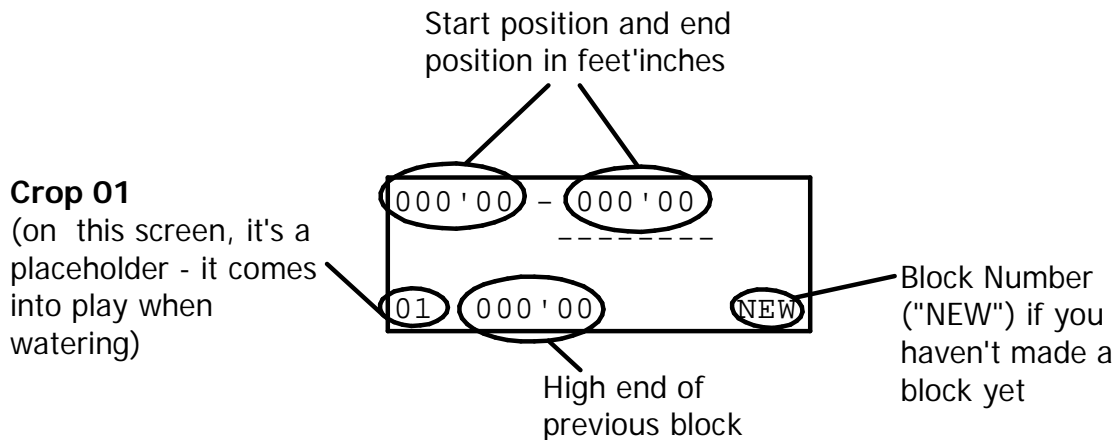
He's ready to set up his crops!

Manual Mode - Setup Crops

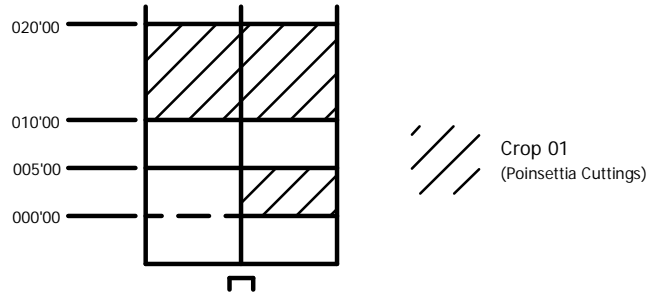
Joe is ready to set up his 2 crops. The menus are mostly the same as in all Common Sense booms:



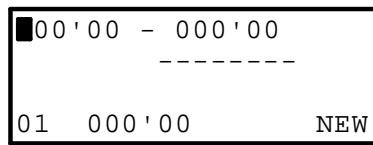
He immediately notices some differences with the old zone-based edit crop screens:



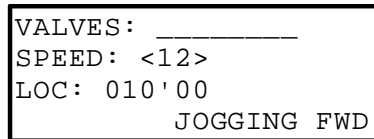
Crop 01 is in these two locations:



Joe could enter numbers (much like in the zone-based Common Sense Controller), but there's an even better option the GTI tech told him about - Boom Learning:



With the cursor on the "Start" position, Joe presses



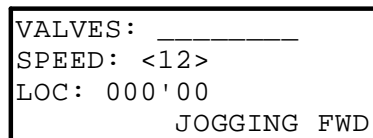
Joe presses



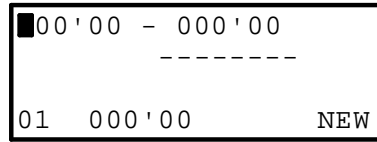
to start the boom jogging forward, and




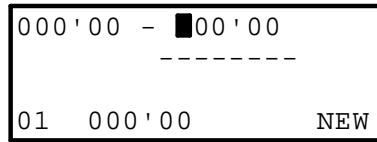
Joe jogs the boom until the spray bar is above the lower edge of the crop. Then he presses




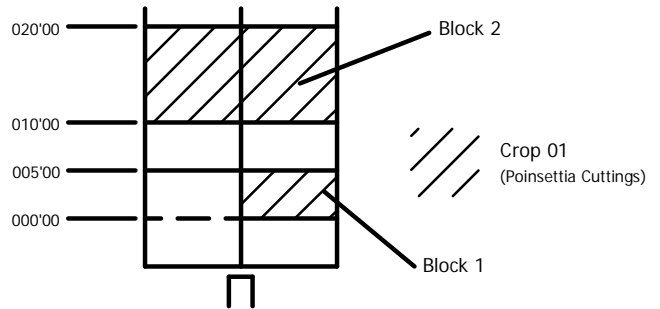
Since the first crop starts at 000'00, the screen still looks the same:




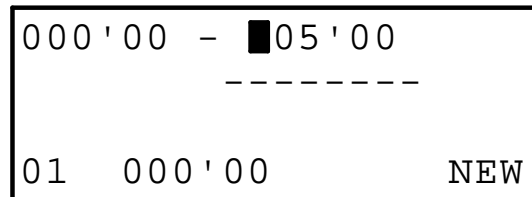
But now Joe presses  to move the cursor over to the end position:




He presses  again, and moves the boom to 005'00,



Stops it, and presses 



Joe presses  to move the cursor over to set valves for this block.

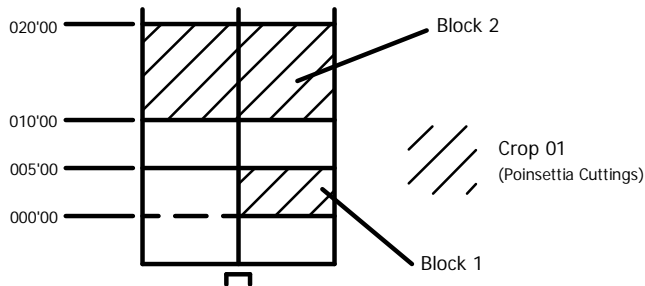
```

000'00 - 005'00
      ■-----
01  000'00      NEW
    
```

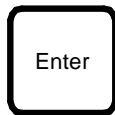
Joe presses "1". The block now matches his first crop's first block:

```

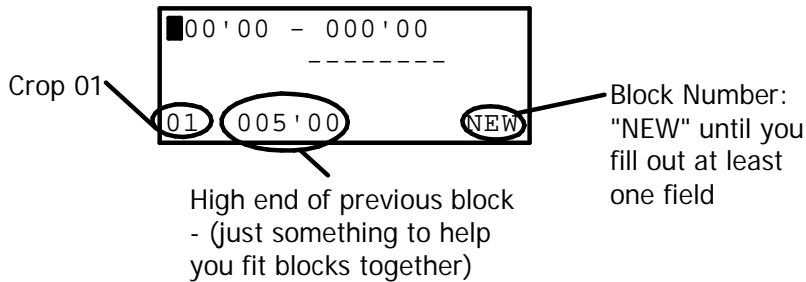
000'00 - 005'00
      1-----
01  000'00      NEW
    
```




He presses



to save this block and move to block 2



He fills out the start location using "Boom Learning",

and presses  to move to the "End Position" field.

He notices something odd:

```
010'00 - ■00'00
          -----
01  005'00      2 / 1
```

This block isn't finished yet. If it is, it becomes block 2 / 2

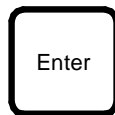
He's tired of jogging the boom, so he just enters "020'00" in the "End Position" field using the number keys.

```
010'00 - ■20'00
          -----
01  005'00      2 / 1
```

and fills in the valves for this block:

```
010'00 - 020'00
          12-----
01  005'00      2 / 1
```

and presses
block:



to save the block, which brings him to another new

```
■00'00 - 000'00
          -----
01  020'00      NEW
```


This crop has only 2 blocks. Joe presses



a few times to loop

around and look at his work so far:

```
000'00 - 005'00
      1-----
01  020'00      1 /2
```

```
010'00 - 020'00
      12-----
01  020'00      2 /2
```

Looks good! Joe presses



to leave the block-loop

Which, exactly as in the zone-based Common Sense controllers, lands him on the speed/passes screen:

```
PASSES: 0
DIRECTION: 2-WAY
SPEED: 12
01 MANUAL      WATER
```

New!

But the speed & passes screen is different now. It has a new parameter, "Direction". Direction is about how your boom waters.

Do you want to save time? Pick "**2-way**" to water passes **forward, reverse, forward, reverse**, etc.

Do you want each plant to have more even 'wait times' between waterings? pick "**1-way**" to water passes **forward, forward, forward**, or **reverse, reverse, reverse** depending on where you start relative to the crop.

Joe enters "02" for the number of passes, and arrows down to "Direction":

```
PASSES: 00
DIRECTION: ■-WAY
SPEED: 12
01 MANUAL      WATER
```

This is a toggle field. Joe presses once to toggle from "2-way" to "1-way"

```
PASSES: 02
DIRECTION: 1-WAY
SPEED: 12
01 MANUAL      WATER
```

then presses

again to toggle back because, on second thought, 2-way is a better fit.

```
PASSES: 02
DIRECTION: 2-WAY
SPEED: 12
01 MANUAL      WATER
```

He leaves the speed as is, and presses

to save the pass/direction/speed data.

He's finished programming crop 1 for Manual Mode. Telling the boom to water crop 01 works the same as it always has - from the manual mode base screen, use the Daily Program menu, go to "Quick Pass", pick crop 01, set speed and passes, and let it go.

Manual Mode - Run Crops

1. Run all crops with Setup > Start

Joe starts at the Manual Mode Boom Idle Screen:

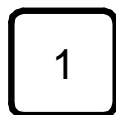
```
MANUAL      DAY4 23:19
BOOM IDLE
WAITING FOR NEXT CMD
C01 B1 L000'00 T00
```

he presses



```
1) START
2) DISPLAY CROP
3) DISPLAY PASSES
4) EDIT CROP
```

then



to start watering.

2. Run some crops with Quick Pass

Starting at the Manual Mode Boom Idle Screen:

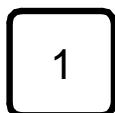
```
MANUAL      DAY4 23:19
BOOM IDLE
WAITING FOR NEXT CMD
C01 B1 L000'00 T00
```

Joe presses



```
1) RUN QUICK PASS
2) JOG BOOM
3) PURGE
```

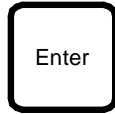
Then



```
ENTER CROP NUMBER TO
EDIT: █1

MANUAL MODE
```

Joe may pick any of his crops from this screen. So far only crop 01 is programmed, so he presses



```
PASSES: █0
DIRECTION: 2-WAY
SPEED: 12
04 MANUAL          WATER
```

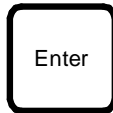
In quick pass, Joe can change any of these parameters, and the changes aren't saved and don't overwrite the values he programmed earlier. Instead, it's one-and-done. The boom waters with the changed parameters, then forgets them.

Joe enters:

3 passes
2-way
speed 23

```
PASSES: 03
DIRECTION: 2-WAY
SPEED: █3
01 MANUAL          WATER
```

He presses



```
ENTER CROP NUMBER TO
EDIT: █2

MANUAL MODE
```

The boom is asking if Joe would like to water Crop 02 during this Quick Pass. If Joe had a few crops programmed, he might have selected another couple of crops and tweaked them for this Quick Pass. But Joe doesn't have anything programmed for any crops other than Crop 01, so he presses



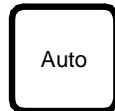
and the boom is off to water Crop 01

Auto Mode - Setup Crops

Joe wants to put crop 01 on a schedule. His boom is at the Manual Mode main screen:

```
MANUAL    DAY4 23:07
BOOM IDLE
PRESS DAILY PROGRAM
C01 B1 L000'00 T00
```

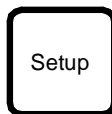
He presses



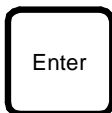
to put it in auto mode:

```
AUTO      DAY1 23:18
NO CROP REQUESTED
START DELAY: 03
C01 B- L000'09 T00
```

Then he presses



```
LEAVE AUTO MODE?
[ENTER]=YES
[ESC]=NO
```



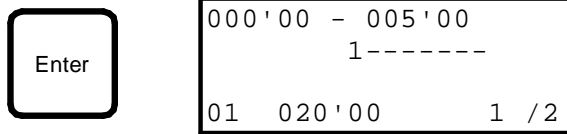
```
1) DISPLAY CROP
2) DISPLAY SCHEDULE
3) EDIT CROP
```



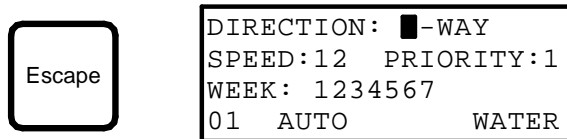
```
ENTER CROP NUMBER TO
EDIT: 01

AUTO MODE
```

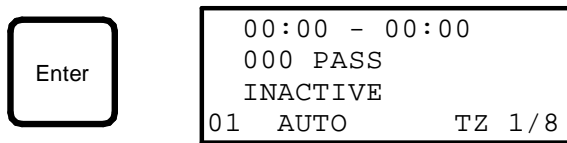
Finally he presses



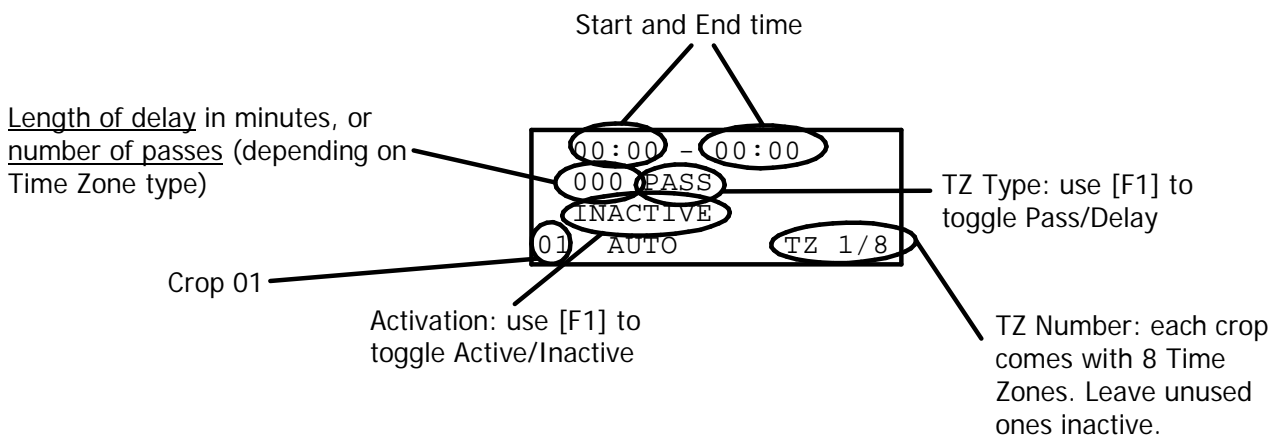
It's the same blocks from manual mode, so he skips them



He notices "Direction". It works the same way here, at least in Pass-based time zones. In Delay-based time zones, the boom does only one pass, and it can be from any direction at any time. Everything looks good, so he presses



This screen is pretty dense - A whole time zone has been distilled into one screen, but it's all the same stuff:



He fills it out to run every 10 minutes between 8am and 4pm

<pre> 08:00 - 16:00 010 DELAY ACTIVE 01 AUTO TZ 1/8 </pre>	<div style="border: 1px solid black; border-radius: 10px; padding: 5px; display: inline-block;">Enter</div>
---	---

<pre> 00:00 - 00:00 000 PASS INACTIVE 01 AUTO TZ 2/8 </pre>
--

But Joe only wants one time zone, so he leaves this screen and goes back to the Auto mode main screen:

<div style="border: 1px solid black; border-radius: 10px; padding: 5px; display: inline-block;">Escape</div>	<pre> AUTO DAY1 23:18 NO CROP REQUESTED START DELAY: 03 C01 B- L000'09 T00 </pre>
--	--

There's no "Copy Setup to Daily Program" screen anymore. Joe 's boom is good to go.

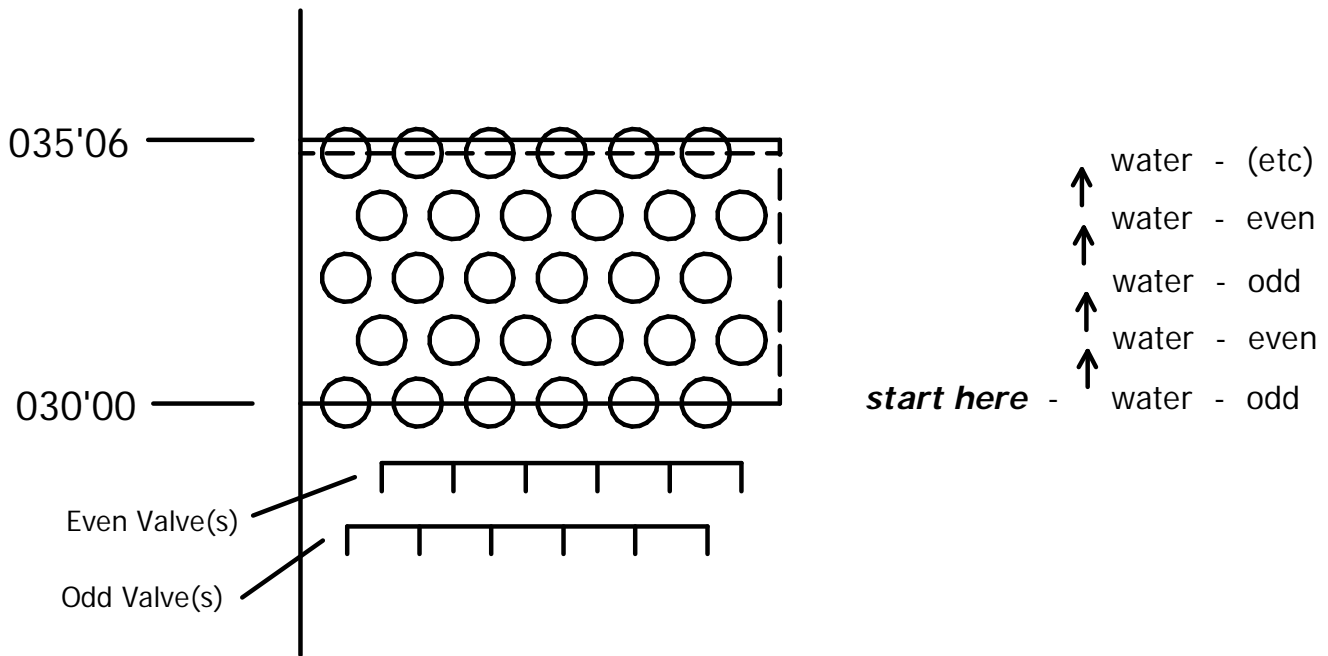
Auto Mode - Run Crops

To run his crops, Joe just puts/leaves the boom in the Auto Mode "No Crop Requested" Screen. Any crops with active time zones should run as soon as the Start Delay finishes counting down.

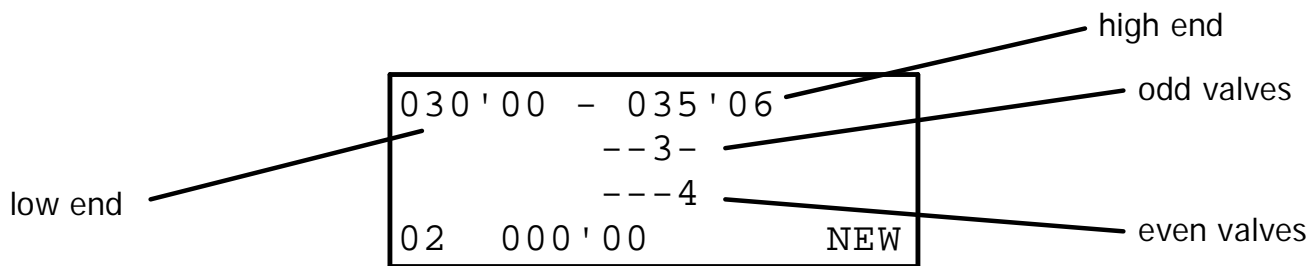
Pot Mode - Setup Crops

How Does Pot Watering Work?

1. The boom starts watering at the block's low end - the centerline of the first row of pots - with the odd valves.



2. The boom steps forward to each row center and waters alternating odd and even valves.

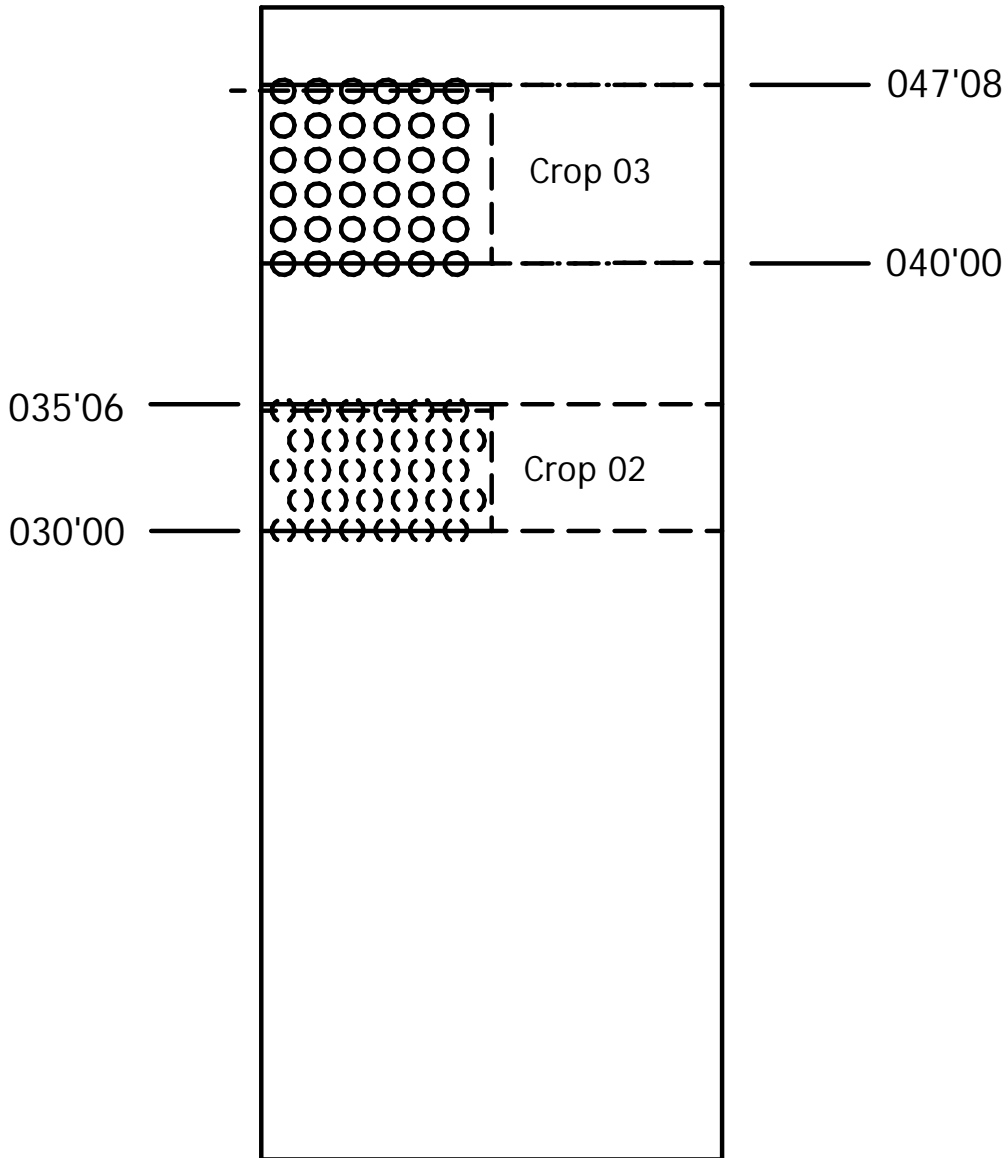


3. The high end *includes* the centerline of the last row of pots, but you want it to be a couple inches past. If you don't give the extra space, you might not water the last row!

Joe's Pots

It's later in the summer, and Joe has started growing pots in this bay. He has two pot crops, Crop 02 and 03. Crop 03 is already placed on the floor, but Crop 02 isn't yet, and Joe wants to use the boom to place Crop 02.

Joe's Bay



Joe doesn't need to change the configuration; everything is set up already. He jumps right ahead to Setup.

Starting at the Pot Mode idle screen:

```
POT          DAY4 23:19
BOOM IDLE
PRESS DAILY PROGRAM
C01 B1 L000'00 T00
```

Setup

```
1) START
2) DISPLAY CROP
3) DISPLAY PASSES
4) EDIT CROP
```

4

```
ENTER CROP NUMBER TO
EDIT: █2
POT MODE
```

0
Config

1

Enter

Unlike in Manual or Auto mode, in Pot mode, you see the Water screen before the Block screen. If you use step-learn to lay out a block, the 'Pot Spacing' number tells the boom how much to step between rows.

```
PASSES: █0
WATER TIME: 001
POT SPACING: 001'00
02 POT          WATER
```

Joe fills out the screen. He wants the boom to do 2 passes:

0
Config

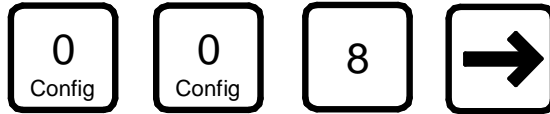
2

→

```

PASSES: 02
WATER TIME: █01
POT SPACING: 001'00
02 POT WATER
    
```

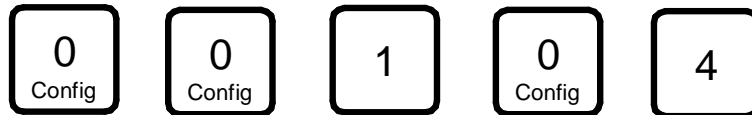
On each of the two passes, he wants the boom to water every row for 8 seconds:



```

PASSES: 02
WATER TIME: 008
POT SPACING: █01'00
02 POT WATER
    
```

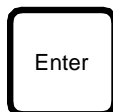
And although the center-to-center between pots in the same row is 1'06", he wants the rows to be offset, and the pot (row) spacing to be 16 inches, or 001'04.



```

PASSES: 02
WATER TIME: 008
POT SPACING: █01'04
02 POT WATER
    
```

Looks good! Joe presses



and now he's at the block screen:

```

█00'00 - 000'00
      ----
      ----
02  000'00      NEW
    
```

3 ways to program a Pot Block

1. How to Program a Pot Block by Step-Learn

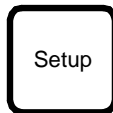
Use Step-Learn to place your pots and program your crop at the same time, using the boom as the pot-spacer. Here's how:

Joe is here, at an empty (new) Pot Block screen:

```

00'00 - 000'00
-----
-----
02  000'00          NEW
  
```

He presses



```

VALVES: _____
SPEED: < >
LOC: 000'00
  
```



```

VALVES: _____
SPEED: <12>
LOC: 002'05
          JOGGING FWD
  
```

Adjusting Speed as necessary:



He stops at 030'00:

```

VALVES: _____
SPEED: <12>
LOC: 030'00
  
```

and presses



to store the location as the block low end

(that's where his cursor is):

(that's where his cursor is):

```

■30'00 - 000'00
      ----
      ----
02  000'00          NEW
  
```

Joe presses



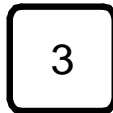
and the cursor moves to the 'odd' row valves:

```

030'00 - 000'00
      ■---
      ----
02  000'00          NEW
  
```

Ok, so this order is different from Auto or Manual or Remote mode - but there's a reason: you want to tell the boom what valves to use for each row before you start stepping.

He presses



to tell the boom to water odd rows

(the 1st, 3rd, 5th row etc.) with valve 3:

```

030'00 - 000'00
      ■-3-
      ----
01  000'00          NEW
  
```

Then



to tell the boom to water even rows

(the 2nd, 4th row etc.) with valve 4:

```

030'00 - 000'00
      --3-
      ■--4
01  000'00          NEW
  
```

The way the cursor moves is different from in Auto or Manual or Remote mode, and there's a reason:

you want to tell the boom what valves to use for each row before you start stepping.

Joe presses



again to move the cursor to the block high end.

```

030'00 - ■00'00
      --3-
      ---4
01  000'00          NEW
  
```

The boom is physically at the block low end right now (from when Joe saved the location). This is really important!

To Step-Learn, you have to start at the block low end (the centerline of the first row). Otherwise, it doesn't work!

Joe wants to place his first row of pots. He presses

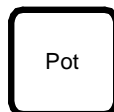


to spritz the valves for this row (This is the first row, so that's valve 3).

The boom spits out a little puff of water. Joe uses this as a guide to place his pots.

○○○○○○○

Then, Joe presses



to step to the next row:

```

030'00 - ■31'04
      --3-
      ---4
01  000'00          NEW
  
```

The boom steps, and comes to a stop. Joe presses



and the boom spritzes another puff of water. This is the second row, so the water comes from valve 4

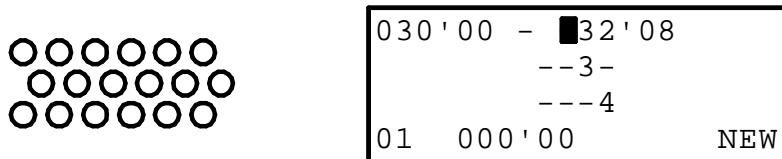
Joe uses the water spritz to place his pots. This row is offset from the first row. He lays pots using the watered spots as a guide.



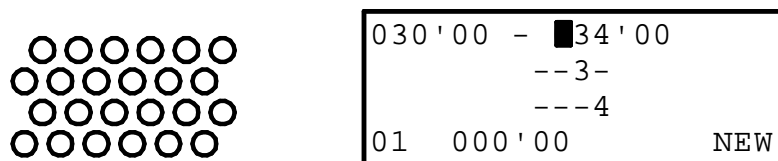
Note: Offset bars are typically forward and reverse of the center of the boom. If you center the pots exactly under the tips, you end up with closer-further-closer-further rows. Your tips are more of a guideline than a ruler in this case. Put your pot centers forward or reverse of the tips as needed.

Joe presses to step to the next row, to spritz

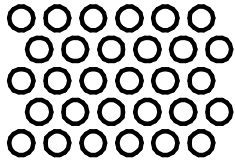
(we're back to an odd row, so valve 3 spritzes), and places pots:



He presses then (after the boom stops) again, and places pots:



Again, , , places pots:



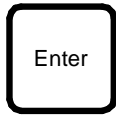
```
030'00 - █35'04
      --3-
      ---4
01  000'00          NEW
```

Joe has placed all of his pots for crop 02, so he's done. He adds a couple of inches to try and make sure the boom doesn't ever miss the last row (otherwise, that can definitely happen):



```
030'00 - █35'06
      --3-
      ---4
01  000'00          NEW
```

And he presses



```
000'00 - 000'00
      ----
      ----
02  035'06          NEW
```

Notice the number at the bottom (035'06). This is just a handy way to remind you where the last block for this crop ended, in case you need that for reference. Joe doesn't have any more pots to place, so he doesn't need to create any more blocks for this crop.

He presses



to leave this screen without creating a new block.

```
ENTER CROP NUMBER TO
EDIT: █3
                                POT MODE
```


2. How to Program a Pot-Block by Jog-Learn

Use "Jog-Learn" to program a pot block if you don't want to step it (maybe you use a spacer with your pots and would rather not use the boom to space them) or maybe if your pots are already there, and you are reprogramming the block.

This works just like block learning from Manual or Auto Mode. You basically use jogging to show the boom the low and high ends of the block. Starting here: (Pot Mode > Setup > Edit Crop):

```

ENTER CROP NUMBER TO
EDIT: █1

POT MODE
  
```

Joe presses

0 Config 3 Enter

```

PASSES: █0
WATER TIME: 001
POT SPACING: 001'00
03 POT WATER
  
```

And quickly enters parameters for crop 03: 1 pass, water time = 20 seconds, and pot [row] spacing of 18" (001'06):

```

PASSES: 01
WATER TIME: 020
POT SPACING: █01'06
03 POT WATER
  
```

He presses


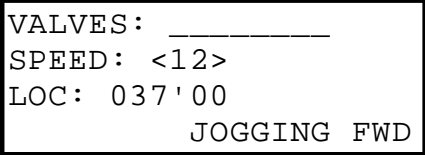
Enter


```

█00'00 - 000'00
      ----
      ----
03 000'00 NEW
  
```

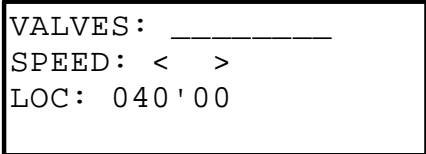
And this is the block that he wants to program using Jog-Learn.

He presses  


He presses  to jog forward. 

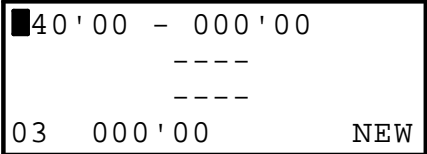
He stops the boom (by pressing 

when it's over the center of the first row of pots)



Cool, the first row of pots is centered at 040'00 exactly!

He presses  to store this location as the block low end



Since the pots are positioned on a square grid, the even and odd valves are the same:


    

```

040'00 - ■00'00
      --3-
      --3-
03  000'00      NEW

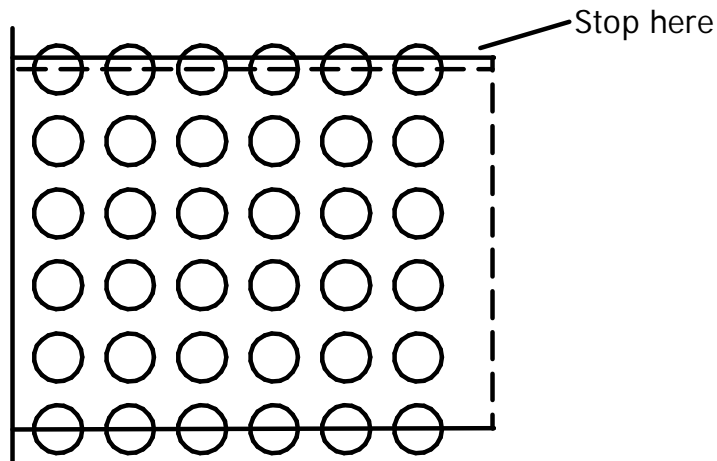
```


Joe presses  VALVES: _____
SPEED: < >
LOC: 040'00

Joe presses  to jog forward VALVES: _____
SPEED: <12>
LOC: 044'10
 JOGGING FWD

He presses 

to stop the boom a couple of inches past the centerline of the last row of pots



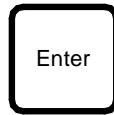
then  to store the location as the block high end:

```

040'00 - ■47'08
      --3-
      --3-
03  000'00      NEW

```

Joe presses



to save the block.

```
ENTER CROP NUMBER TO  
EDIT: █1  
  
POT MODE
```

3. How to Program a Pot Block by Key-Press Only

If Joe knows all the distances involved, and is confident that his boom is accurate, he can just enter a block in by typing everything directly

Pot Mode - Run Crops

You run crops exactly as in Manual Mode, whether via Setup > Start or Daily Program > Quick Pass.

Remote Mode - Setup Crops

Remote Mode is a lot like Manual mode, with a few differences:

1. There's a screen for entering a network address
2. The Daily Program button does nothing in Remote Mode
3. There's this thing called a "Stagger Delay"

Starting at the Remote Mode "Waiting for Remote Cmd" screen:

```
REMOTE    DAY4 23:19
BOOM IDLE
WAITING FOR NEXT CMD
C01 B1 L000'00 T00
```

Joe presses

Setup

```
1) DISPLAY CROP
2) EDIT CROP
3) EDIT ADDRESS
```

then

3

```
DEVICE ADDRESS: █1
SET DEVICE ADDRESS
```

The Common Sense 2 Foot Distance boom only works on a Spooler Network (not a Go-1 network) so it doesn't technically *have* to have a unique address. However, for alarms on the Spooler to work correctly, it helps for each boom to have a unique address. Joe gives this boom the address 02:

0
Config

2

```
DEVICE ADDRESS: █2
SET DEVICE ADDRESS
```

Enter

```
1) DISPLAY CROP
2) EDIT CROP
3) EDIT ADDRESS
```

2

```

ENTER CROP NUMBER TO
EDIT: █1

REMOTE MODE
  
```

0 Config 4

```

ENTER CROP NUMBER TO
EDIT: █4

REMOTE MODE
  
```

Enter

```

█00'00 - 000'00
-----
04 000'00 NEW
  
```

Joe fills out this block screen:

0 Config 3 8 → 0 Config 4 4 → 2

```

038'00 - 044'00
    █2--
04 000'00 NEW
  
```

then presses Enter

```

PASSES: █0
DIRECTION: 2-WAY
SPEED: 12
04 REMOTE WATER
  
```

0 Config 5 → F1 → 0 Config 8

```

PASSES: 05
DIRECTION: 1-WAY
SPEED: █8
04 REMOTE      WATER

```

Enter

```

STAGGER DELAY: █00
04 REMOTE      STAGGER

```

Stagger delay has to do with how a Spooler works. The spooler receives a 24 volt signal (from an environmental system, typically) and sends a command to all the booms on the network to water the corresponding crop. So if it receives a signal on input #4, it sends a message to all the booms to water crop 04, and any boom that has a valid Crop 04 (with blocks, passes, etc.) waters it.

If too many booms water at the same time, water pressure might drop. Stagger delay lets you tell the boom to delay by some number of minutes before watering the crop.


If water pressure loss is a problem in your greenhouse, keep things simple by giving each boom the same stagger delay across all of its crops. So one boom is the 'water right away' boom, another is the 5 minute delay boom, another the 10 minute delay boom, then the 15 minute delay boom, and so on.

Joe presses    for a 5 minute Stagger Delay.


```

STAGGER DELAY: █05
04 REMOTE      STAGGER


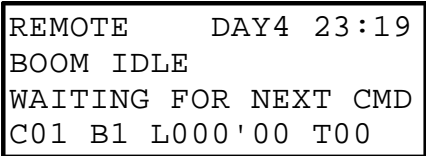
```

Joe presses  to save the Stagger Delay.

```
ENTER CROP NUMBER TO
EDIT: █1
REMOTE MODE
```

Since Crop 04 is his last crop, Joe presses 

```
1) DISPLAY CROP
2) EDIT CROP
3) EDIT ADDRESS
```

Then  

```
REMOTE    DAY4 23:19
BOOM IDLE
WAITING FOR NEXT CMD
C01 B1 L000'00 T00
```

Remote Mode - Run Crops

To test any crop on this boom, Joe finds the 24VAC output on the environmental system that corresponds to that crop, then manually switches it on for 1-2 seconds, then off again. The corresponding number on the Spooler 2-number display should flash quickly, then the boom should water this crop, or wait for the stagger delay, then water.

Another great idea is to use a VPD algorithm to determine which should water first.