HM-400
Harvest Data System
HCGG User's Manual

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Rugged Field Computers and Mobile GIS/GPS
HarvestMaster™ Brand Products for Agriculture

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Chapter 1
Introduction

This manual guides you through the step-by-step process for using your High Capacity Grain Gage (HCGG) system. The system is employed on combines to record the weight and moisture content of grains. A HCGG System aids research scientists by automating data collection. It is designed for use by seed researchers, chemical treatment researchers, and combine operators.

Begin with *Chapter 2 Software and Setups* if the HCGG system has already been installed. If the HCGG has not been installed proceed to *Chapter 7 Installation* and follow the instructions there.

Features

The HCGG System is a custom-built weigh system. Software for the HCGG has multiple options allowing you to customize your own applications. The following are major features are for the HCGG:

- Simplified menu structure and menu control, with *ESC* key backing through menus one level at a time.
- Function keys invoke pop-up menu.
- Range/Row and standard field map generator.

- Display positional X-Y relocation upon entry of harvest mode, or with hot key during harvest.
- Menu selection for renaming field maps.
- Flexible setups for bucket and hopper operation including door actuator signal timers.
- Automatic enable/disable of field printer.
- Weigh bucket retare margins are set by the user.
- Upload/download of system setup parameters to/from a host computer (IBM PC Compatible).
- Diagnostics menu to assist in system checkout and troubleshooting.
- Choice of language (English, French, German, Spanish) for prompts, selectable from the INSTALL menu when the program is loaded to the Allegro.
- Keyboard entry of visual observations or notes, in addition to taking harvest data.
- Temperature compensation for zero drift of the moisture sensor.
- Moisture sensor curve editing.
- User selection of moisture curve when entering harvest mode with ability to change selection part way through the field map.
- Settable *freeze reading* timer for the moisture sensor.
- *Rename* (moisture) *Curve* menu selection.
- Menu selection for moisture curve printing on the field printer.

The HCGG System is comprised of many essential components. In the paragraphs that follow is a brief description of each of these components.

The Field Computer

The Allegro, when not in use with the HCGG System, functions as a general purpose electronic data recorder/field notebook. Applications include Field Notes Plus and connection to bar code wands for inventory control or electronic calipers for diameter or length measurements.

When the combine is running, the Allegro is powered externally from the electrical system of the combine. This prevents draining the Allegro's battery during long usage on the combine.

Manual Override Switches

HCGG System's override switches allow manual bucket control. Four switches are used for individual control of the bucket actuator(s). The fifth switch enables either the manual override switches or the Allegro to control bucket movement.

Electrical Transient Protection

HCGG System's electrical transient protectors protect against voltage surges. They also protect the system from transient voltage spikes.

Dust-Resistant Enclosure

The placement of the electronics and the printer in an enclosed environment provides a dust-resistant design for the system's components. This provides protection from dust and grain particles, which could cause malfunctions to electrical and mechanical components.

How to Use this Manual

This manual is written and organized in a way to help you find and understand information easily.

Keyboard commands are indicated using italics for the key or keys to be pressed. For example, *Enter* prompts you to press the Enter key

To execute any single-key command, simply press the designated key and release it. To execute commands that designate more than one key, press the first key; release it, and then press the next designated key. For example, to execute a *Blue, Right* command, press the blue key once, release it, and then press the right arrow key.

S*elect* means to scroll to an option using the arrow keys, highlight it and then press *Enter*, unless otherwise instructed. You are then be prompted on what to do next in the directions.

To move forward to the next screen or backward to the previous screen, press *Enter* to make a selection and take you to the next screen, or press *ESC* to take you back to the previous screen.

All direct instructions to the user are in a numbered sequence with the directions following the number. This process is illustrated by the instruction below:

1. Follow instructions in their numeric order.

Keyboard Commands

The following list gives definitions of the key commands and sequences available in the HCGG System. The pictures of the keys at the left are modeled after the Allegro Field PC.

ENTER: Accept individual value and move to the next item or step.

ESC: Escape to next higher menu, or back up to previous screen.

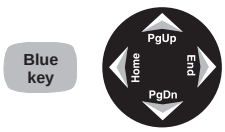
SPACE: Enter a space or blank in text.

UP ARROW: Move cursor to previous entry/selection item within a screen.

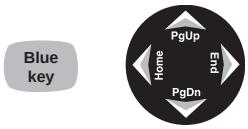
DOWN ARROW: Move cursor to next entry/selection item within a screen.

LEFT ARROW: Delete previous character or step backward through available entries for a selection item.

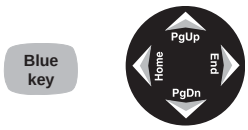
RIGHT ARROW: Step forward through available entries for a selection item.



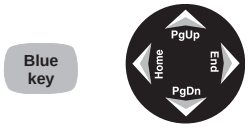
BLUE, LEFT ARROW: Move to the first of the available entries for a selection item. (Press the *Blue* key once, release it, then press the *Left* Arrow key).



BLUE, RIGHT ARROW: Move to the last of the available entries for a selection item. (Press the *Blue* key once, release it, then press the *Right* Arrow key).



BLUE, UP ARROW: Move to the top of the menu item list.



BLUE, DOWN ARROW: Move to the bottom of the menu item list.

Function 1 (F1): Reserved - currently not available in the HCGG System.

Function 2 (F2): Reserved - currently not available in the HCGG System.

Function 3 (F3): Reserved - currently not available in the HCGG System.

Function 4 (F4): Reserved - currently not available in the HCGG System.

Function 5 (F5): View Identifiers - displays any extra identifiers for the plot during harvest.

Blue, Function 6 (F6): Retare Bucket - when in harvest mode, selection of this function cycles the plot bucket and records a new tare weight measurement for the weigh bucket and test chamber and a new moisture of zero.

Blue, Function 7 (F7): Reserved - currently not available in the HCGG System.

Blue, Function 8 (F8): Show Version Info - shows current version of the Harvest Data System software.

Blue, Function 9 (F9): Set Backlight - allows the user to turn the backlight on or off. Press *Y* for yes or *N* for no to turn the backlight on or off.

Blue, Function 10 (F10): In Harvest mode - Functions Menu - This will bring up the functions menu options that have just been described. In the Menus mode it shows the bucket weights.

Chapter 2
Loading Software & Creating Setups

Loading Software

The distribution diskette (MS-DOS, IBM PC compatible format) contains the programs to install DataLink for Windows on your desktop PC and the Harvest Data software on your Allegro CE/DOS. The whole installation process takes between 5 and 15 minutes, depending on your level of familiarity with computers.

Before installing the software you need to complete the following:

1. Make sure that your Allegro is adequately charged.

2. Have your communication cable available. The cable connects your Allegro to your PC and allows them to communicate.

3. Locate the Harvest Data application and Data Link for Windows Install diskette.

Introduction to DataLink

Before installing the High Capacity Grain Gage (HCGG) on your Allegro, you must first install DataLink for Windows. DataLink is a communications program that allows your PC and Allegro to exchange information. You may upload data (transfer data from the Allegro to the PC) or download data (transfer data from the PC to the Allegro) using DataLink.

This program is specifically written for Windows 95, 98, 2000, Me, NT, or XP operating systems. A copy of this program can be found on a 3 ½ inch disk included in your HCGG packet.

Note: HCGG requires DataLink for Windows version 2.11 or later in order to function correctly. If you have DataLink already installed, make sure it is version 2.11 or later. If not, uninstall DataLink and reinstall it from the diskette that came with the HCGG package.

DataLink Installation

To install DataLink, complete the following steps:

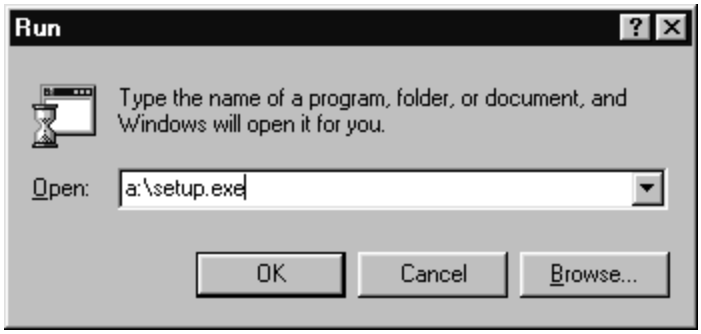
1. Insert the DataLink for Windows diskette into the 3 ½ inch disk drive in your PC.

2. Click on *Start* to open the Start menu and select the *Run* option (see Figure 2-1).

Figure 2-1: Select Run Application in Start Menu

3. Type the 3 ½ inch disk drive location and *Setup.exe* (i.e. A:\Setup.exe) and click *Ok* (see Figure 2-2).

Figure 2-2: Drive Location and Program to Run



4. Read and follow the Windows installation wizard. It guides you through the remaining procedures for this installation.

The next few pages of this section explain how to use DataLink to install the HCGG software on your desktop PC and your Allegro CE/DOS.

Installing the HCGG Software to Your Desktop PC

Follow the steps below to install the HCGG software on your desktop PC:

1. Insert the HCGG diskette into the 3 ½ inch disk drive on your PC.

2. Click on *Start* to open the Start menu.

3. Go to the *Programs* folder to open its directory window.

4. Go to the *DataLink for Windows* directory.

5. Click on the *DataLink for Windows* program.

6. Click on the *Application Install* tab in DataLink.

7. Select the location where your application diskette is located (e.g. A:\ or B:\ drive) in the *Select Location* (Explorer) window.

8. Click on *Load Application from DISK* and wait as the files are copied to your PC.

9. High Capacity Grain Gage should now be displayed in the *Select Application* pull down menu.

Installing HCGG Software on the Field Computer

To transfer the HCGG software from your PC to your Allegro CE/DOS, complete the following steps:

1. Connect the PC to the Allegro using the communication cable. Plug the communication cable into one of the serial ports on your Allegro (preferably COM1).

Figure 2-3: PC to Field Computer Connection

DataLink defaults to communicating via the PC's COM1 port. If you have a mouse or other external device connected to COM1, you need to use COM2.

If you choose to use COM2 on your PC, go to the DataLink for Windows Comm Port Setup tab and change the Comm Port setting (see Comm Port Setup in Appendix G).

Note: If there are no serial ports on your PC, a USB to serial converter works. We recommend using one that has software to automatically configure your PC to use the next available COM port.

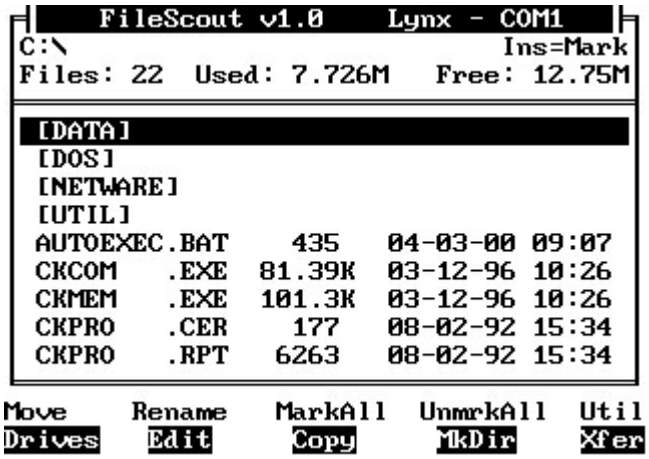
2. Turn on your Allegro.

3. Boot Allegro to DOS mode by selecting *Start*| *Programs* and tapping on *Boot to DOS*.

   Note: Windows CE does not run DOS programs. Do not attempt to run this application in Windows CE.

4. Type *FS* at the DOS prompt (e.g. C:\) to run FileScout and press *Enter*. Figure 2-4 shows and example of the FileScout main screen.

Figure 2-4: FileScout Main Screen



Refer to the Allegro CE/DOS User's Manual for detailed information about FileScout.

5. Press *F4* to create a new directory.

6. Type *HCGG* (for High Capacity Grain Gage) in the highlighted space after the *Name:* prompt in the top left corner of your Allegro's screen (this is the location of the application software) and press *Enter*.

Note: You can install the application on a PC Card if you would like. To do this, press F1 to change to drive D, then create the directory as previously outlined.

7. Use the arrows key to scroll down and highlight the *HCGG* directory you have just created and press *Enter*.

8. Check your PC to make sure HCGG is displayed in the *Select Application* box in *DataLink for Windows*. If it is not there, click on the *Select Application* box and select it.

9. Click on *Send Application to Handheld*.

10. Wait while the software is transferred to your Allegro. Once it stops, the HCGG program is installed on your Allegro CE/DOS.

Booting Directly to HCGG

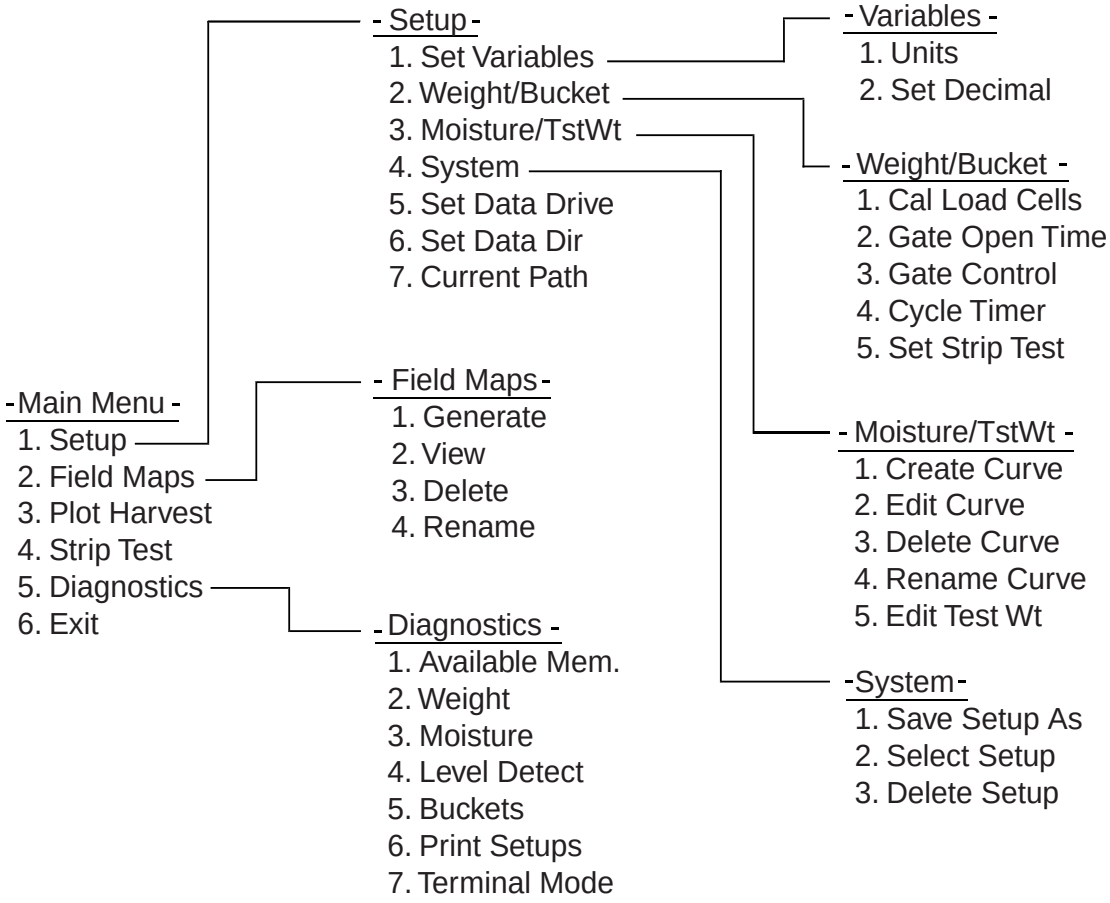
To boot directly to the HCGG program when you turn on your Allegro, highlight the *setbat.exe* file and press *Enter* twice. This updates your Allegro's *autoexec.bat* file so it automatically runs the HCGG application when the Allegro is rebooted.

Reboot the Allegro CE/DOS. The Allegro should run the application automatically on boot-up. After a few seconds the Allegro displays this message: *SCCU terminal not found. Turn power OFF and connect SCCU remote.*

Do not be alarmed. This message is normal when the Allegro is not connected to the SCCU. Press *ESC* to go to the Main Menu.

HCGG Menu Structure

The menu shown below presents the various menu options used to set up your HCGG System and acquire harvest data with it. Notice that the menu structure is set up in levels of priority. For example it is recommended to complete the *Setup* menu (option 1) first, and then work from the first sub-menu to the last. When all of the menu options are completed under *Setup*, then go to *Field Maps*, etc.



Moving through the Menu

UP ARROW - causes the previous menu option to be marked.

DOWN ARROW - causes the next menu option to be marked.

ENTER - causes the selection or activation of the marked menu option, or display of a lower level of menu.

ESC - causes exit from current activity, or transition to a higher level of menu.

Answering Yes or No

In certain places during adjustment of system setups, you may be requested to answer *Y* for Yes, or *N* for No. There is no need to spell out the whole word.

Note: Depending on the language of the prompts, which you selected when you loaded the program, the Y for Yes may be changed as indicated in the table below:

Letter	Meaning	Language
Y	Yes	English
O	Oui	Francais
J	Ja	Deutsch
S	Si	Español
N	No	All Languages

HCGG Setup Menu

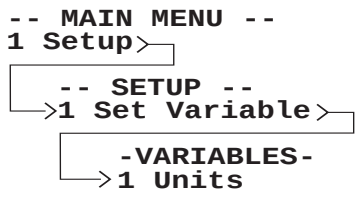
Before proceeding with the set up, make sure that the DataLink software has been installed as explained in the beginning of this chapter. Also, familiarize yourself with the menu structure to give you an overview of the procedures, activities, and diagnostic functions available.

Set Variables

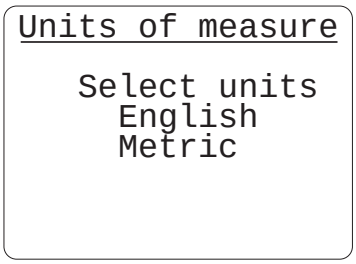
Before harvesting or taking field notes, set up the variables that you are going to record.

Units

To set up the variables complete the following steps:



1. Select from the *Main Menu* screen *Setup* / *Set Variables* / *Units*.

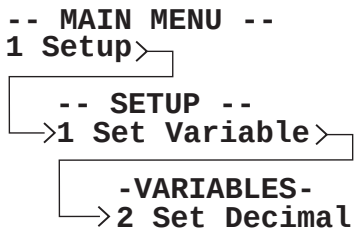


2. Scroll up and down to select English or Metric units of measurements, and press *Enter*.

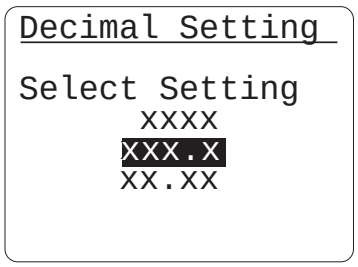
The volumetric weight reads in cubic inches if you choose *English* measurement units, or in cubic centimeters if you choose *Metric* measurement units.

Set Decimal

The next menu selection allows you to set the decimal position of your harvest data. To do this complete the following steps:



1. Select from the *Main Menu* screen *Setup* / *Set Variables* / *Set Decimal*.



2. Select the decimal point setting you desire, and press *Enter*.

You are given the following choices:

xxxx	no decimal point
xxx.x	one digit after the decimal point (default)
xx.xx	two digits after the decimal point

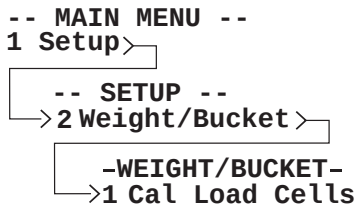
3. You can press *ESC* to return to the *Set Variables* menu.

Weight/Bucket

In order to precisely calibrate the plot bucket and test weight load cells, you need a known weight that you can use to calibrate the weigh bucket. It's best to use a weight of 25 to 30 lbs, or a weight roughly equal to the largest plot weight that is harvested (each of the plot and test weights).

Calibrating Load Cells

The accuracy of weight measurement of the plot weight depends on the performance of the following steps:

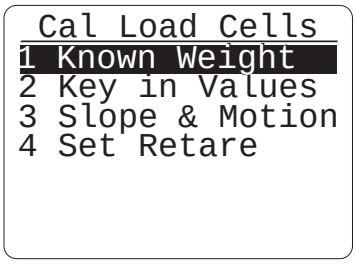


1. Select from the *Main Menu* screen *Setup* / *Weight/ Bucket* / *Cal Load Cells*.

   At the *Set Load Cells* screen you have the following options to select to complete the load cell calibration:
   Know Weight
   Key in Values
   Slope & Motion
   Set Retare

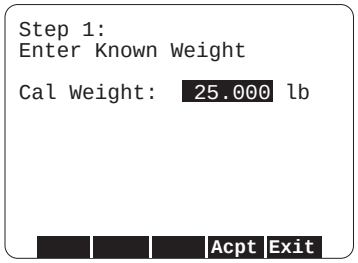
Known Weight

To set the load cells with a known weight, complete the following steps:



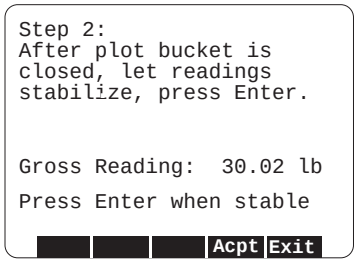
1. Select *Known Weight* option and press *Enter*.

   A screen message appears, *Begin Tare, Process* and then proceed to the *Step 1* screen.

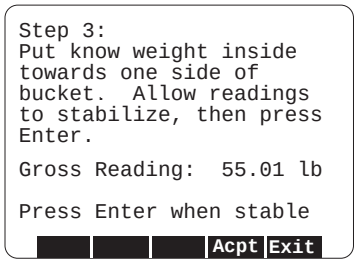


2. Enter the known values for the calibration weight, and press *F4* to accept the entered weights.

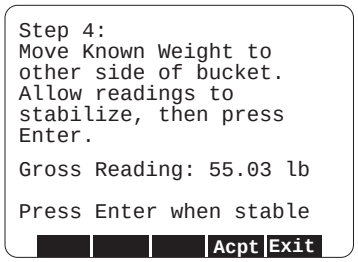
   Note: It is best to use a weight between 90 to 100% of the average plot size.



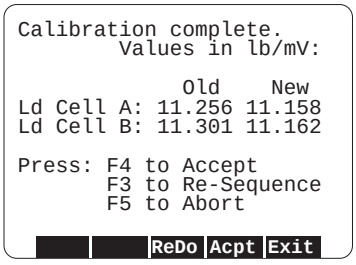
3. Follow the prompts given on the Step 2 screen: Wait for Plot Buckets to cycle and readings to stabilize, press *Enter*.



4. Follow the prompts given on the Step 3 screen: Put known weight inside towards one side of bucket. Allow readings to stabilize, then press *Enter*.



5. Follow the prompts given on the Step 4 screen: Move known weight to other side of bucket. Allow readings to stabilize, then press *Enter*.



6. Calibration is now complete.
   Press *F3* to re-Sequence
   Press *F4* to Accept
   Press *F5* to Abort

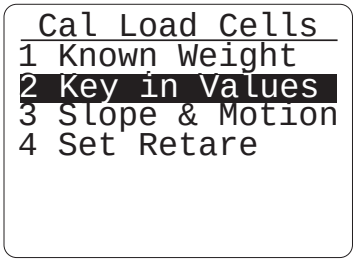
After accepting the calibrations, the new settings are saved.

Note: The nominal value under the Key in Values is commonly between 11.000 and 11.450.

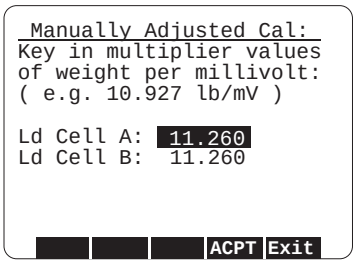
This completes the *Known Weight* procedures.

Key in Values

The *Key in Values* option is primarily for Juniper Systems' technicians. We recommend not using this option unless instructed by a Juniper Systems authorized service technician. To set the load cells by keying in the values, complete the following steps:



1. Select *Key in Values* option and press *Enter*.

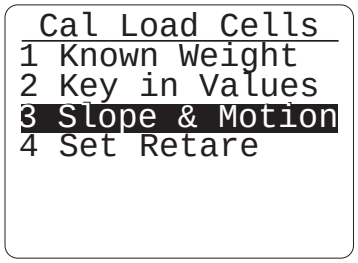


2. Follow the screen prompts given and key in multiplier values of weight per millivolt. Press *F4* to accept or *F5* to exit.

Note: To check the weights select through Main Menu / Diagnostics, select Load Cells screens, and press Enter.

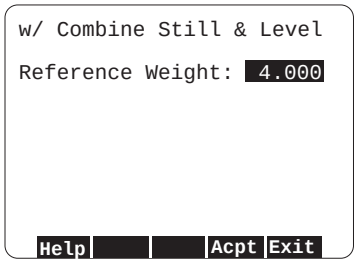
Slope & Motion

Your HCGG system is equipped with a slope and motion compensator. This sensor compensates for error induced by movement. To set the slope and motion and key in the reference weight, complete the following steps:



1. Select *Slope & Motion* option and press *Enter*.

Note: Be sure the shipping stop on the slope and motion sensor is disabled and the combine is on a level surface with the thresher turned off.



2. Follow the screen prompts given and key in reference weight when the combine is still and level.

   Enter 0.000 in the *Reference Weight* to disable the slope and motion.

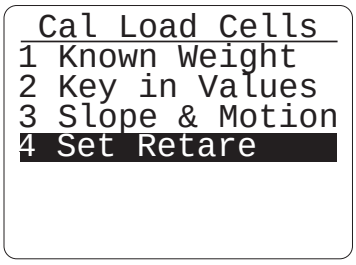
   Enter 4.000 U.S. units (1.815 metric units) in the *Reference Weight* to enable the slope and motion for normal HCGG usage.
   Press *F4* to accept or *F5* to exit.

Note: Lighter weights are available for some applications. If the sensor is equipped with a lighter weight, be sure to enter the weight written on the front of the box.

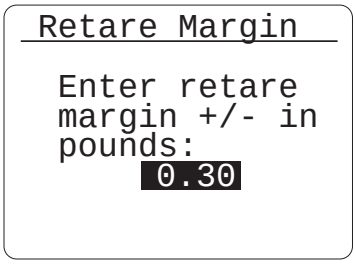
Set Retare

During the harvest activity, the HCGG software checks that the bucket has returned to its tare weight before closing the plot bucket door. In case it does not return to tare weight (indicating that perhaps grain or trash has lodged in the plot bucket) it prompts you with a message indicating system status, and asks for user input to resolve the problem.

The retare margin adjusts the sensitivity of the system for this stop-and-check sequence. To do this, complete the following steps:



1. Select *Set Retare* option and press *Enter*.



2. Follow the screen prompts given and key in retare margin for the load cells. Press *Enter* to save your retare setting and return you to the *Set Load Cells* menu.

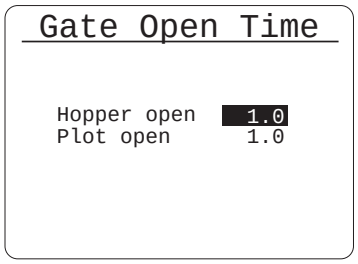
Note: The common retare setting for the HCGG ranges from .30 to .75 lbs.

Gate Open Time

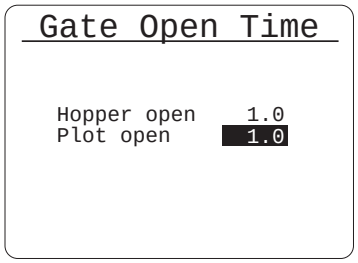
The *Gate Open Time* option allows you to set the amount of time (in seconds) you need the hopper bucket and plot bucket to stay open. To do this complete the following steps:

```
-- MAIN MENU --
1 Setup>
  -- SETUP --
 >2 Weight/Bucket>
    -WEIGHT/BUCKET-
   >2 Gate Open Time
```

1. Select from the *Main Menu* screen *Setup* / *Weight/ Bucket* / *Gate Open Time*.



2. Select your desired *Hopper open* time and press *Enter*.



3. Select your desired *Plot open* time and press *Enter*.

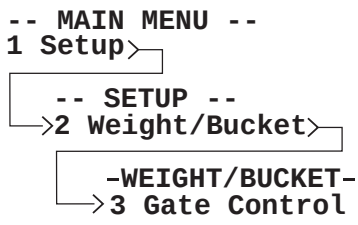
Note: Wetter grains commonly need longer time with the bucket door open since the grain falls slower. The time setting usually ranges from .5 to 1.5 seconds(depending on sample moisture).

Gate Control

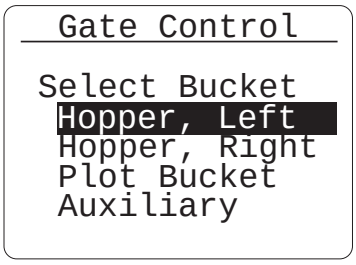
The Gate Control menu allows you to change the bucket setup. The bucket setup controls how the SCCU opens and closes the buckets on the combine. Since different types of bucket actuators require different signals, the software can control the following actuator types:

- Pneumatic
- Hydraulic
- Electromechanical
- Windshield Wiper
- Pneumatic HCGG

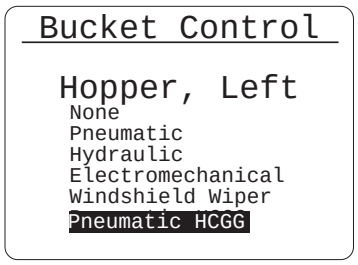
The HCGG uses pneumatic actuators by default. The steps below verify the bucket settings are correct. Changes should not be needed unless there are other actuators used with the HCGG. Verify that your HCGG System actuator is configured correctly by completing the following steps:



1. Select from the *Main Menu* screen *Setup* / *Weight/ Bucket* / *Gate Control*.



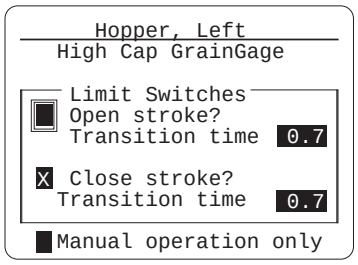
2. Select one of the four bucket selections Hopper (left or right), Plot (bottom), or Auxiliary and press *Enter* to change a particular bucket's setup, or press *ESC* to save the bucket setup and return to the menu.



3. Use the arrow keys to select one of the five actuator selections (None, Pneumatic, Hydraulic, Electromechanical, Windshield Wiper, and Pneumatic HCGG) and press *Enter* to choose an actuator type for the currently selected bucket or press *ESC* to back up to the bucket selection screen.

Now the HCGG system needs to know whether or not the actuator for the selected bucket uses a limit switch to end the actuator travel. The HCGG uses a limit switch on the close stroke for each bucket. The Aux gates (isolation gates), however, use timers only.

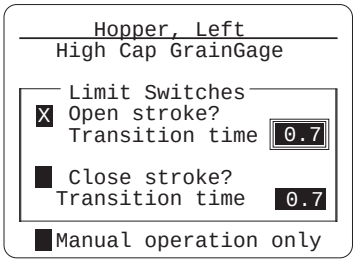
Note: Open limit switchs are typically not used with the HCGG. However, this option can be added if desired (order part number 13158).



Use the arrows key to move through this screen. Pressing the *Space Bar* enables (X in box) or disables (blank in box) the limit switch Open or Closed setting.

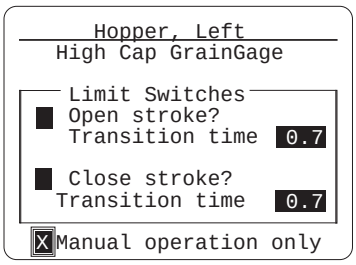
Example: An X appears in the box when a Limit Switch is installed and disappears when it is not installed.

Note: If a limit switch is enabled, a transition time is not necessary. If a limit switch fails or malfunctions during harvest operation, it can be temporarily disabled. If timers are used, the system no longer detects obstructions or bucket door malfunctions. The system should be repaired as soon as possible.



4. If limit switches are disabled, select the *Transition time* option of the activated stroke and enter the amount of time, in seconds, it takes your actuator to completely open the selected bucket.

Selecting *Manual operation only* allows the SCCU to open or close the selected bucket when the front panel switch for that bucket is activated, regardless of the position of the Auto/Manual switch on the SCCU.



5. Select the *Manual operation only* option and press *Space Bar* to activate or deactivate the option.

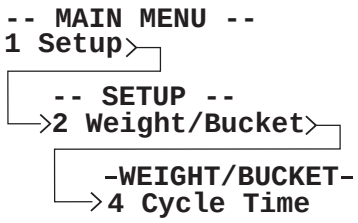
After entering these options, you return to the bucket selection screen to continue the bucket setup. Repeat steps 1 - 5 step for each actuator.

Cycle Timer

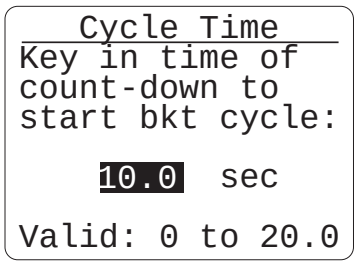
The Cycle Timer can be used as a combine clean-out timer. This allows you to be more consistent from plot to plot. As the timer reaches zero, the hopper doors are cycled and the weight readings are taken for each side.

This timer is used to match the time it takes for the last ears of corn to leave the head and when it reaches the hoppers of the HCGG. Pressing the *Enter* key activates the timer cycle.

To adjust the cycle timer, complete the following steps:



1. Select from the *Main Menu* screen *Setup* / *Weight/ Bucket* / *Cycle Timer*.

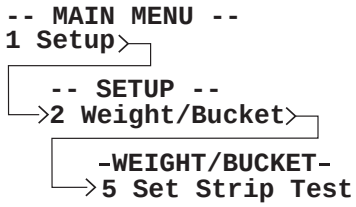


2. Key in the time (in seconds) of countdown to start for the cycle and press *Enter*.

Note: For most auger and paddle elevators, the typical clean out time is between 8 to 15 seconds. Air delivery systems may be adjusted slightly lower than this range, but is dependant on the time the grain is delivered to the hopper.

Set Strip Test

The Set Strip Test option is used when harvesting plots yielding over 30 to 40 lbs. Longer plots fill the buckets more than once and must be divided into multiple bucket loads. The Set Strip Test function takes the data from multiple bucket loads and compiles that information for a single plot reading. To set up the Set Strip Test complete the following steps:

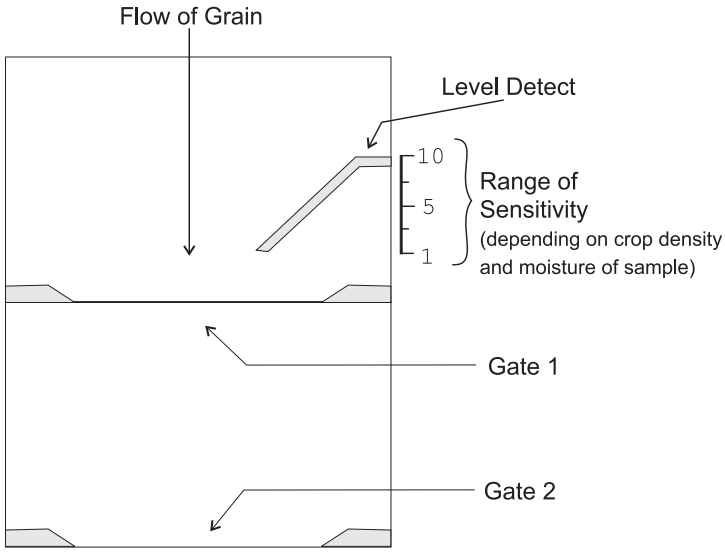


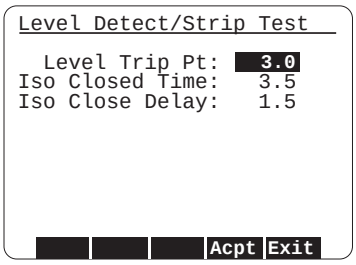
1. Select from the *Main Menu* screen *Setup* / *Weight/ Bucket* / *Set Strip Test*.

Level Trip Pt

If the Strip option is enabled, the level trip point indicates the sensitivity of the level sensor. A higher value corresponds to a less sensitive operation, which allows more grain to fill the top bucket before beginning a measurement sequence.

The cut-away diagram below helps explain the *Level Trip Pt* more.





For most grains, the level sensor should be set to 3.0. If needed this number can be lowered for less dense grains (such as sunflower, oats, etc.).

Note: Setting the Level Trip Pt to less than 1 may cause the system to periodically cycle before the grain level touches the probes (False Trip). When this happens, the moisture and test weight may register abnormally low. Setting the value too high causes the system to not cycle, allowing the grain to backup into the grain elevator. It can also cause the weigh bucket to be over-filled when the hopper door is opened.

ISO Closed Time

Isolation gate close time (ISO Closed Time) is the maximum time the isolation gate remains closed. Setting the time to more than 3.5 seconds increases the risk of plugging the grain delivery auger (or paddles).

ISO Close Delay

Isolation gate close delay (ISO Close Delay) is the amount of time that must pass before the isolation gate can close again. It acts as a safety timer that requires the grain delivery auger to empty enough grain before the isolation gate closes again.

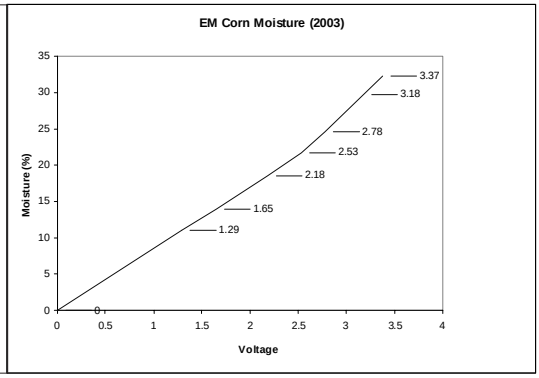
Moisture Curve and Test Weight

Before you proceed with this exercise, the entire system must be fully operational with the workings of the moisture sensor completely checked out (see *Moisture Sensor Verification* in *Chapter 2* of this manual).

Moisture Curve

A grain moisture sensor curve is a set of known data points, which the system refers to when doing a measurement of moisture on a sample of grain. Graphically, it would appear like the graph below. In the memory of the Allegro, and presented to you for editing, it appears as a table of data, as shown at the left.

Moist %	MV
0%	0
11.00%	1.29
14.00%	1.65
18.60%	2.18
21.70%	2.53
24.60%	2.78
29.80%	3.18
32.20%	3.37



Note: Different grain types should each have their own moisture curves. Information on pre-calibrated moisture curves is available. If you would like this information check the Support section on our website at www.junipersys.com or contact our Customer Service department.

Preparation

Here is a checklist to follow in preparing to create the moisture curve:

1. Have at least three samples of different moisture content grain available (the Harvest Data software accepts up to 20 samples for each moisture curve). Mark each sample.

Note: Moisture samples must be at the same ambient temperature as the combine. Creating a moisture curve with warmer or colder samples adversely affects the calibration.

The GrainGage requires sample sizes of at least 6 lbs for the large chamber and at least 3 lbs for the small chamber. We recommended using approximately the same sample size as at the time of harvest. The samples should be as equally spread over the expected range of measurement as possible.

Ideally, the samples are measured with a bench top grain moisture tester within about an hour of the current time and are sealed in a container between that calibration measurement time and now. The samples must be large enough to fill the test chamber completely.

After recording the sensor reading for each sample, place the sample back in its sealed container to minimize exchange of sample moisture with atmospheric moisture.

2. Plug the Allegro into the Harvest Data system console.

3. Turn on the combine and run the engine and thresher at the speed it is going to run at during harvest.

4. Turn the SCCU power on.

5. Select the *Moist Volts* option in the *Diagnostics* menu to view the raw moisture sensor reading.

Warning:
To prevent serious injury, turn the air supply valve, located on the right side of the GrainGage, OFF before reaching inside the Grain Gage.

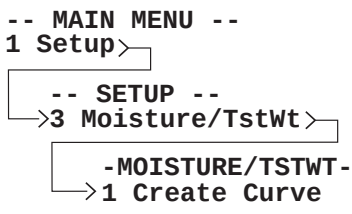
With a moisture sensor present on the system, the relative volts should be stable, and should settle on 0 with an empty test chamber. This reading should increase as you cover the blade completely with your sample. If the reading is not 0, check that the chambers are empty, then press *F6* to retare the system. After retaring, the reading should be 0.

Note: Touching the moisture sensor blade should cause the relative volt reading to be +15 volts (± 3 volts).

6. Press *ESC* twice to get back to the Main Menu.

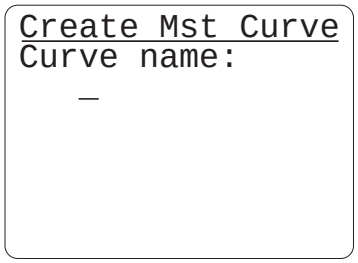
Create Curve

After completing the checklist for preparation in the *Operation Test* section of this chapter, the next step is to create and calibrate the moisture sensor curve, to do this complete the following steps:



1. Select from the *Main Menu* screen *Setup* / *Moisture/ TstWt* / *Create*.

   Note: If you change moisture sensors on a Harvest Data System, you must check the calibration for the new sensor.



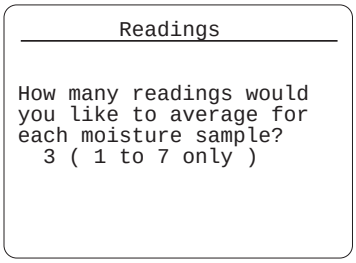
2. Type in the name for the moisture curve you are creating. Moisture curve names can be up to 8 characters long.

Note: Use a name that is similar to the type of grain that the moisture calibration curve is being calculated for; such as CORN, WHEAT, or WET-CORN. We recommend adding the year to the end of the curve name (i.e. CORN01).

Make sure the combine is throttled up with the thresher running at harvest speed. It is very important when creating a moisture curve that you simulate what actually happens in the field. The more consistent your calibration procedures are the more accurate are the moisture calibrations.

When entering points of the curve you just named, you are asked to select one of the moisture curves you have entered (provided that you have included the grain moisture variable in your setups and that it is active when you enter the *Harvest* menu option). If you key in a name, which is already in use, the Allegro asks whether you wish to overwrite the existing file.

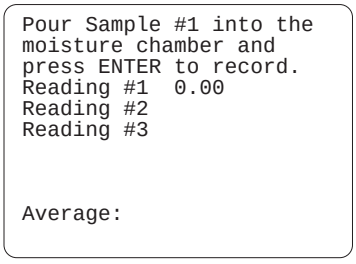
3. Switch the SCCU console to *MANUAL*, so that you can operate the buckets.



4. Select the number of readings you averaged.

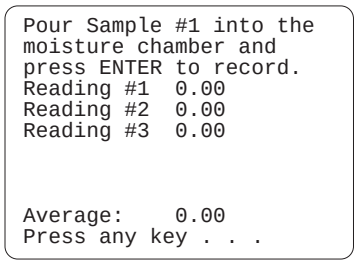
   Note: You need to catch the sample and repeat the cycle process for each number of readings you do.

The first reading should show a voltage reading. With an empty chamber, it should be *0*. If it is not *0* you need to retare your bucket by pressing *F6*. When the voltage reading is *0* with an empty chamber, you are ready to proceed with your calibration.



5. Follow the prompt to pour the sample in the moisture chamber. Pour your entire sample into a hopper bucket then open the hopper. Allow the sample to drop into the plot bucket then close the hopper.

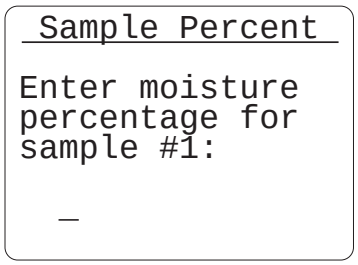
If you are using the *Moisture timer* option:



5. Wait the amount of time that has been entered and press *Enter* to capture the reading.

Repeat this process as many times as you are prompted to.

The lower left corner of the display shows the average percent of moisture full scale reading produced by this sample of grain. This reading is the same as the reading displayed in the *Diagnostics* | *Moisture* menu.



6. Type in the moisture content of this sample, in percent moisture wet weight basis (pct moisture = $MOIST_{wet}$) / ($MOIST_{dry}$ + $MOIST_{wet}$) and press *Enter*.

This is the standard of measure of bench top grain moisture measurement systems.

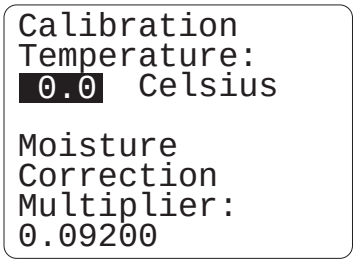
7. Use the manual switches to open the plot bucket to pass the sample through. Catch the sample, and store it back in a sealed container.

8. Repeat steps 6 - 8 for each different moisture sample you have.

Use an empty bucket for one of the samples, corresponding to 0 percent moisture.

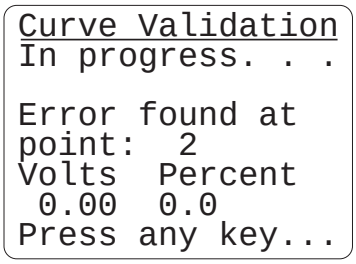
It does not matter what order you enter the moisture sample. The system automatically sorts them when you are finished.

9. Press *ESC* when all of the samples are entered.

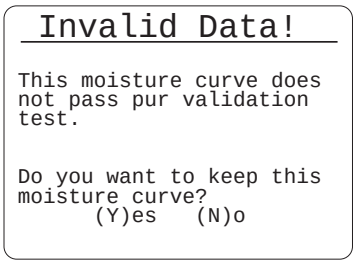


10. Enter the Calibration Temperature and press *Enter*, then enter the Moisture Correction Multiplier and press *Enter*.

This is discussed in greater detail in the *Setting the Grain Moisture Temperature* section found later in this chapter.



If you get this screen, it means that an error is in your curve data and the moisture data may be adversely affected if you continue. By graphing the curve you see the points that do not make sense.

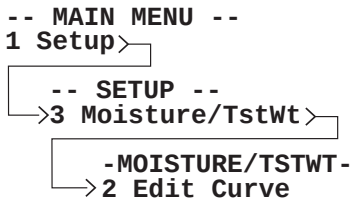


After pressing any key, the Invalid Data screen appears. Press *Y* to save the invalid curve or *N* to return to the *Moisture/TstWt* menu screen without saving it.

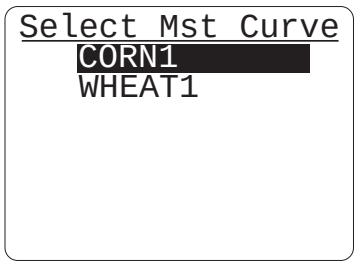
This completes the moisture sensor calibration.

Edit Curve

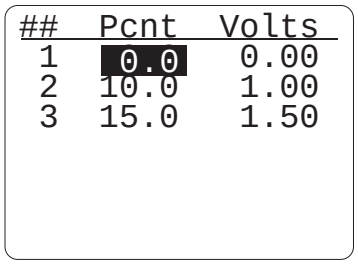
The moisture sensor curve must exist before it is available to edit. If it does not already exist, create it using the steps in the previous sections. If it does exist, you can edit it using the following steps:



1. Select from the *Main Menu* screen *Setup* / *Moisture/ TstWt* / *Edit Curve*.

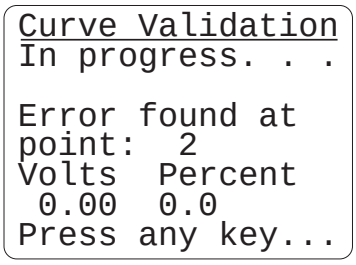


2. Select the moisture curve for editing and press *Enter*.

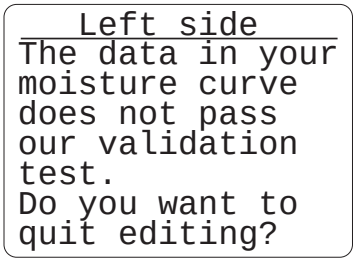


3. Select the percent or volts you are changing, and enter your new sample moisture percent or moisture volts. Press ESC to save your changes to the moisture curve.

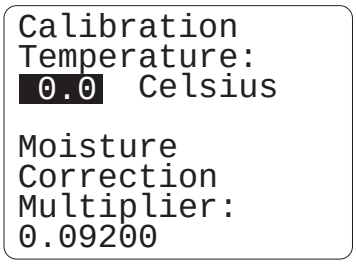
A successful save returns you to the *Moisture/TstWt* menu screen.



If there are errors in your moisture curve editing you are notified with this screen. Press any key to continue.



Exit from the editing process by pressing *Y* when the following screen prompts you.



Pressing *Y* brings you to this screen. Press *Enter* twice to return to the *Moisture/TstWt* menu screen. Or key in the *Calibration Temperature* and press *Enter*, then enter the *Moisture Correction Multiplier* and press *Enter*.

This is discussed in greater detail in the *Setting the Grain Moisture Temperature* section found later in this chapter.

Creating a Trial Moisture Sensor Curve

If you have moisture data that you wish to enter through the *Edit Curve* menu option, but do not have a moisture curve name assigned, you still need to use the *Create Curve* menu option to create a trial moisture sensor curve to edit.

Warning:
If you change moisture sensors on a Harvest Data System, you must check your calibrations and adjust if necessary as outlined in the *Setting the Grain Moisture Temp Comp* section of this manual.

To create a trial curve, complete the following steps:

This step is only needed to record the current temperature reading.

1. Proceed with the steps for *Creating a Moisture Sensor Curve*, under the *Calibration* option, earlier in this section using an empty bucket and 0% moisture for all entries.

2. Refer to *Editing a Moisture Curve* later in this chapter to edit your data.

Note: You need at least two sets of points in order for the curve name to be saved.

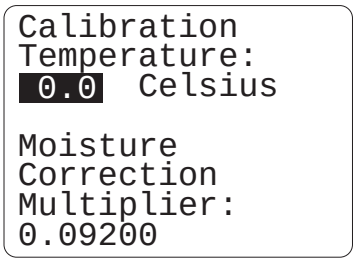
Setting the Grain Moisture Temperature

When grain moisture readings are taken at temperatures different from the temperature that the calibration curve was calibrated, it needs to be corrected back to the calibration temperature. The HCGG System can do this correction automatically. However, you may wish to adjust the correction coefficient.

If you do not want to use temperature compensation set the correction multiplier to 0.0 and press *ESC* to return to the *Moisture* menu.

The temperature compensation screen automatically appears after pressing *ESC* in the *Create Curve* and *Edit Moisture* screen. *Cal Temp:* displays the temperature (in degrees Celsius) at which the system was calibrated.

Mstr Correction Multiplier displays the % moisture change for each degree Celsius difference between the calibration temperature and the current temperature.



1. Select and edit the *Calibration Temp* or *Moisture Correction Multiplier*.

2. Press *Enter* to save the number that has been typed in. Press *ESC* to exit the compensation screen.

Here is an example to illustrate how the moisture compensation works:

For each degree Celsius that the sample is below the temperature at which the system was calibrated, the moisture sensor reads about .092% less moisture. Assuming the calibrations were done at 30° C and the current corn temperature is 10° C, .092 *20, or 1.84%, moisture needs to be added to the measurement to correct for the cooler temperature.

Likewise, if the sample corn temperature is higher than the calibration temperature, a correction would need to be subtracted from the measured value.

The HCGG software does this correction automatically if the moisture correction multiplier has been set correctly.

Changing the calibration temperature from what it was when you did the calibrations shift your entire curve up or down, depending on if you increase or decrease it.

Adjusting the Mositure Curve

If your curve is consistently high over the whole range, after harvesting a few plots, you can lower the calibration temperature, or you can raise the calibration temperature if your moisture is consistently too low. This is an easy way to fine-tune the moisture curve after calibration.

$$\frac{\text{(Actual Moisture - Bucket Moisture)}}{\text{Mstr. Correction Multiplier}} = \text{Change in Temperature}$$

Add or subtract this volume to/from your existing temperature depending on the sign.

The Moisture Correction Multiplier (MCM) is roughly .092 for corn. This may vary slightly for other grains and you may wish to adjust it based on your experience with other grains.

The equation for the moisture correction value for temperature is:

Corr. Moist. = MCM * (Cal Temp - Actual Temp)

From our previous example:

Corr. Moist. = .092 * (30.0 -10.0) = 1.84% moisture

Suppose that the system measured 19.5% moisture before the correction. The final recorded and displayed moisture content would be 19.5 + 1.84 = 21.34% moisture.

Temperature Compensation Summary

Completing the moisture curve calibration includes:

1. Creating and editing the moisture curve (as described earlier in this section).

2. After having entered the moisture curve, press *ESC* to view the moisture compensation parameters. Make sure the correct temperature setting (°C) is showing for *Cal. Temp*:

3. Adjust the Moisture Correction Multiplier as needed for your crop. In the absence of any further information, use 0.092 (corn).

   Note: When checking your moisture over a range of temperature, you may need to adjust this correction coefficient up (more compensation) or down (less compensation) accordingly. Remember that the sample and HCGG monitor has to be at the same ambient temperature to get accurate moisture.

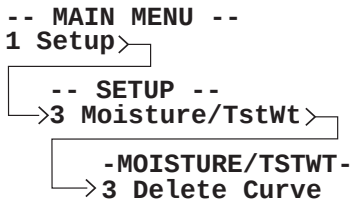
4. Make a note of your numbers for future reference in a field notebook, save and upload your setup file, and print the moisture curve on the Harvest Data printer from the Diagnostics menu.

Moisture Compensation Diagnostics

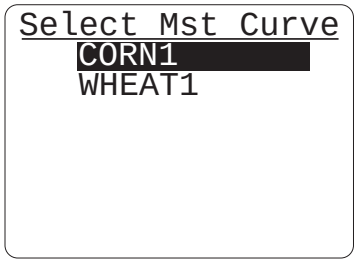
Moisture compensation diagnostics allow you to view the current temperature, the corrected moisture percentage, and the amount of moisture compensation. For the step-by-step instruction on this process go to Chapter 5 page 5 - 2.

Delete Curve

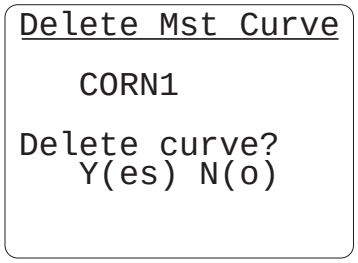
The *Delete* option in the *Moisture/TstWt* screen is for removing unwanted moisture curves on your Allegro. To delete moisture curves from your Allegro, complete the following steps:



1. Select from the *Main Menu* screen *Setup* / *Moisture/ TstWt* / *Delete Curve*.



2. Select the moisture curve you are deleting and press *Enter*.

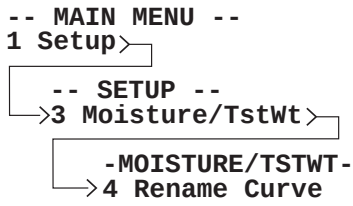


3. Press *Y* for yes to delete the curve, or *N* for no to cancel the deletion process.

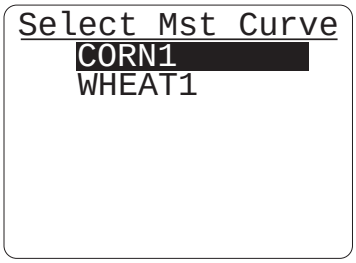
You return to the Select Mst Curve screen after you press *Y* or *N*.

Rename Curve

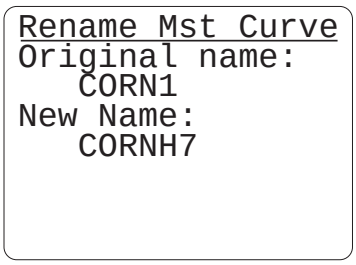
The *Rename* option in the *Moisture/TstWt* screen is for renaming moisture curves on your Allegro. To do this, complete the following steps:



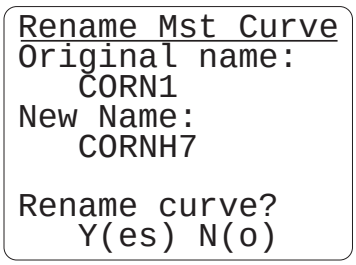
1. Select from the *Main Menu* screen *Setup* / *Moisture/ TstWt* / *Rename Curve*.



2. Select the moisture curve you are renaming and press *Enter*.



3. Type in the new name of the moisture curve (up to 8 characters long) and press *Enter*.



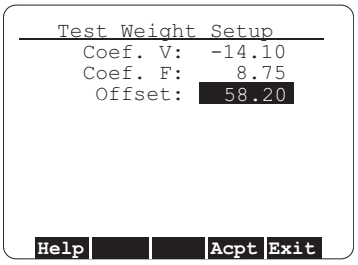
4. Press *Y* for yes to rename the curve, or *N* for no to cancel the renaming process or press *ESC* to return to the *Select Moisture Curve* screen.

Edit Test Weight

The *Edit Test Wt* option in the *Moisture/TstWt* screen is for editing the test weight on your Allegro. To do this, complete the following steps:

```
-- MAIN MENU --
1 Setup>
  -- SETUP --
 >3 Moisture/TstWt>
    -MOISTURE/TSTWT-
   >5 Edit Test Wt
```

1. Select from the *Main Menu* screen *Setup* / *Moisture/ TstWt* / *Edit Test Wt*.



2. Key in the offset if needed. Example: If the known test weight is 55 pounds per bushel and the measured weight equals 51 pounds per bushel, increase the offset by four.

   The coefficients V and F are used to set the output so it is directly proportional to the input. Do not change these settings unless directed by a register HarvestMaster technician.

3. Press *F4* to accept and save the test weight adjustments or *F5* to exit.

System

The *System* option in the *Setup* menu is currently under reconstruction and is not available with this version of the HCGG.

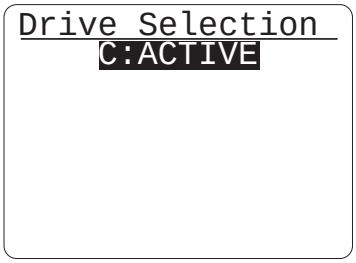
Set Data Drive

The *Set Data Drive* option allows you to choose which drive stores your data. To do this complete the following steps:

```
-- MAIN MENU --
1 Setup>
  -- SETUP --
 >5 Set Data Drive
```

1. Select from the *Main Menu* screen *Setup* / *Set Data Drive*.

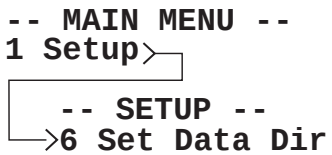
The HCGG software automatically seeks out the available drives on your Allegro and displays them in the *Drive Selection* screen.



2. Select the desired storage drive and press *Enter*.

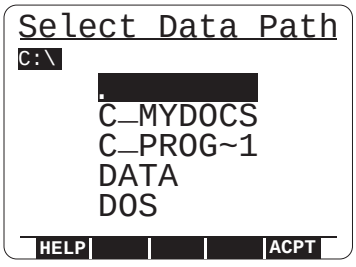
Set Data Directory

The *Set Data Dir* option allows you to choose which directory on that drive your data is stored. To do this complete the following steps:



1. Select from the *Main Menu* screen *Setup* / *Set Data Dir*.

Note: If a directory name is shorter than 8 characters, the entire name is displayed. If a directory name is longer than 8 characters, the first 6 characters are displayed followed by ~1.



2. Use the arrow keys to navigate through and select the desired directory.

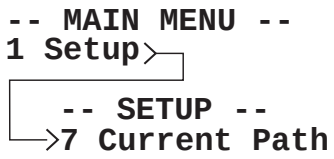
The directory you are in is highlighted in the upper left area of the *Select Data Path* screen.

3. Press *F5* to accept the selected directory.

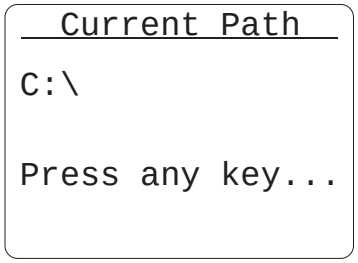
Pressing *Enter* and / or *ESC* without pressing *F5* does not save the directory.

Current Path

The *Current Path* option allows you to check which drive and directory your data is being stored on. To do this complete the following steps:



1. Select from the *Main Menu* screen *Setup* / *Current Path*.



2. Make sure you have selected the correct drive and directory, and press any key to return to the *Setup* menu.

If the data path is too long to fit on the screen, only the drive and destination directory are shown with intermediate directories represented by three dots. An example is shown below.

C:\...\NAME

Chapter 3
Creating Field Maps

This chapter explains how to prepare field maps for harvesting and how to record harvest data and other user observations.

Field Maps

Field maps are used for note taking and recording data. The *Field Maps* option in the *Main Menu* screen is used to create and manipulate maps of plots within the Allegro.

Field Maps can also be created on your desktop PC and downloaded to your Allegro (see *Appendix F* for more details). For best results, we recommend creating the field map directly in HCGG.

Before you begin to generate field maps, please make sure you have done the following:

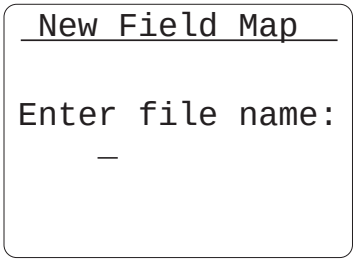
- Defined all variables you wish to have associated with the field map you are about to generate.
- Calibrated load cells.
- Generated moisture curves.

For instruction on generating field maps using your PC, see *Appendix E, Field Maps Generated from ASCII.*

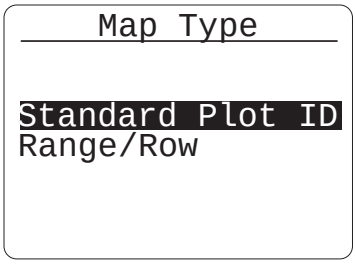
Generate

To generate a field map complete the following steps:

1. Select through the *Main Menu* / *Field Maps* screen, select the *Generate* option, and press *Enter*.



2. Type in a name for the map (up to 8 characters long) and press *Enter*.



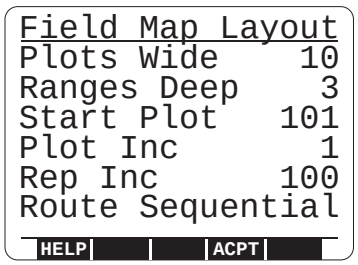
3. Select the *Standard Plot ID* or *Range/Row* option in the *Map Type* screen and press *Enter*.

4. Select the areas that you need to change. Press *F4* to accept all changes and begin generating the map.

See the following two sections, *Standard Plot ID Field Map Layout Options* and *Range/Row Field Map Layout Options* for definitions to these options.

Standard Plot ID Option

When you select the Standard Plot ID map type, a map layout screen is displayed with prompts for the number of plots wide as well as ranges deep. Use the arrows key to move between fields.



The following are definitions of each map parameter.

Plots Wide

Plots wide are the number of plots, from left to right, to be represented in the map.

Ranges Deep

Ranges deep defines the number of plots from top to bottom that are in the field.

Start Plot

Start plot is the plot number to be placed in the lower left corner of the map. The default is usually 101.

Plot Inc

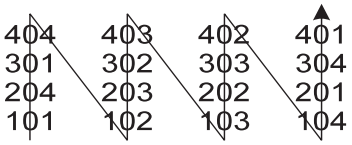
Plot Increment, typically 1, is the counting increment applied to the ones place as the sequencing advances from one entry to the next in a single replication (e.g. 101, 102, 103, etc.).

Rep Inc

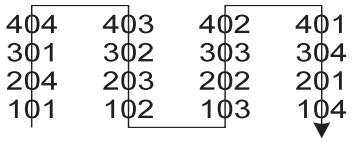
The Replication Increment, which is typically 100, uses the hundreds place for denoting replication in the plot number. For example, a Start Value of 101 and Replication Increment of 100 would begin the next replication at 201. However, the Replication Increment may be 1000 if there are more than 99 entries per replication.

Route

Route implies the sequencing of plot numbers sideways across the study field, in the order that plots are usually rated (90 degrees orientation to harvest order, usually). *Sequential* or *Serpentine* are your choices for route patterns.

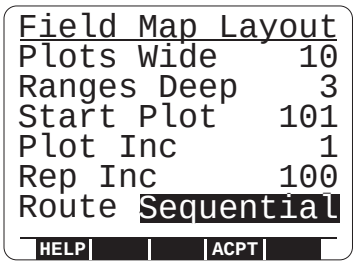


Sequential



Serpentine

To select the desired route pattern complete the following steps:

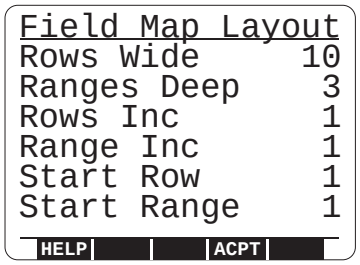


1. Select the *Route* option on the Standard Plot ID *Field Map Layout* screen.

2. Select *Sequential* or *Serpentine* and press *Enter* or *F4* to accept the map layout.

Range/Row Option

When you select the Range/Row map type, a map layout screen is displayed with prompts for the number of rows wide as well as ranges deep. Use the arrows key to move between fields.



The following are definitions of each map parameter.

Rows Wide

Rows wide defines how many plots wide the field is from left to right.

Ranges Deep

Ranges deep defines the number of plots from top to bottom that are in the field.

Row Inc

Row Increment defines the counting increment of the Field Row. Should always be 1.

Range Inc

Range Increment defines the counting increment of the Field Ranges. It should always be 1.

Start Row

Start row is the row number the map begins with. It should always be 1.

Start Range

Start range is the range number the map begins with. It should always be 1.

Note: HCGG notifies you if the map to be generated is too large for the Allegro. If this happens, try again with smaller dimensions.

```
308  307  306   305  304 303
205  206  207   208  301 302
204  203  202   201  108 107

├──6 plots per range──┤
```

Here is a map resulting from 8 entries, 3 replications, and a layout of 6 plots per range.

```
  Map Creation

In progress. . .

Plot ID:
```

You are shown a *Map Creation* screen while the map generates, which is usually only a few seconds; even for a fairly large sized map.

```
 Map Generation

Map Generation
was Successful!

Press any key...
```

When the field map is generated, you are shown the *Map Generation* screen.

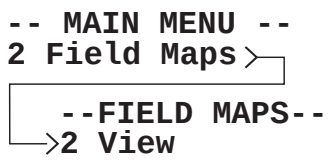
If you try to generate a field map that is too large for the memory available on the Allegro, you are shown the *Not enough space* screen. Please try again using smaller dimensions.

Note: For instruction on downloading field maps from your desktop PC using DataLink for Windows, refer to Appendix F and G in the back of this manual.

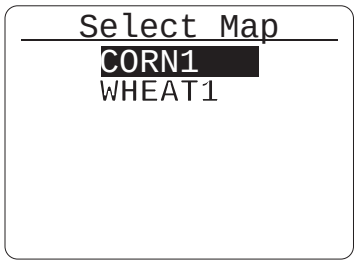
You don't have to pre-generate or download a field map. Once you have defined the harvest, or rating variables, you can go directly to option 3 Harvest on the menu.

View

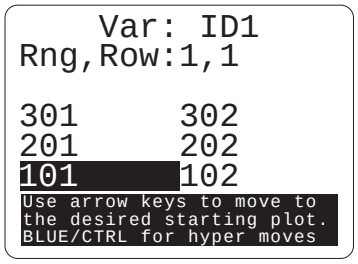
This option produces an X-Y configuration of the selected field map. To view a map complete the following steps:



1. Select through the *Main Menu* / *Field Maps* screen, select the *View* option, and press *Enter*.

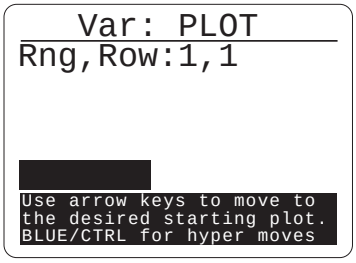


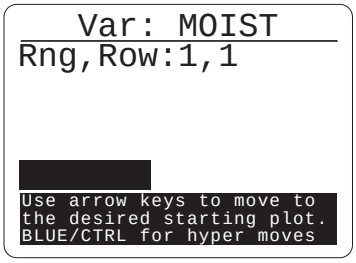
2. Select the field map you want to view and press *Enter*.

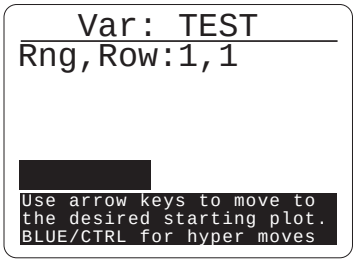


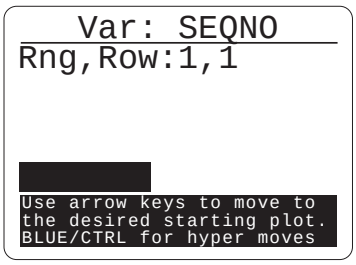
3. Select the portion of the map you wish to see (you may also use *Ctrl* + arrow keys to move all the way to the edges, or *Blue* key + arrow keys to move twenty plots at a time).

Note: Pressing Enter allows you to cycle through each variable in your map.









4. Use the arrow keys to scroll through the harvest variable data (e.g. *Var: PLOT, MOIST, TEST,* and *SEQNO*) as shown to the left.

Note: If the identifier is more than 8 alphanumeric characters, when downloading a field map, then the identifier is broken into groups of 8 characters and placed in multiple identifier holders in the data file.

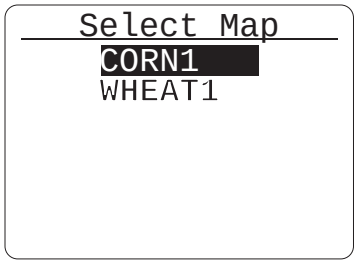
The block on the display points to the current plot position. As you move the arrow right and up to see the other plots, the display windows over the set of available plots in the map. The *Enter* key allows you to view any other identifiers associated with the maps as well as all note variables. A label on the bottom of the screen identifies what is being displayed.

If the identifier is more than 8 alphanumeric characters it is broken into groups of 8 characters and placed in multiple identifier holders in the data file.

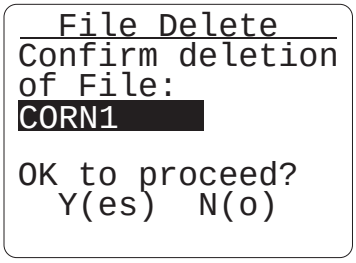
Delete

The *Delete* option permanently removes generated maps from your Allegro. To delete maps from your Allegro, complete the following steps:

1. Select through the *Main Menu* / *Field Maps* screen, select the *Delete* option, and press *Enter*.



2. Select the field map you want to delete in the *Select Map* screen and press *Enter*.



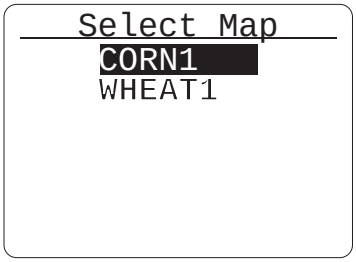
3. Press *Y* for yes to proceed with, or *N* for no to cancel the deletion process in the *File Delete* screen.

You then return to the *Field Maps* menu screen.

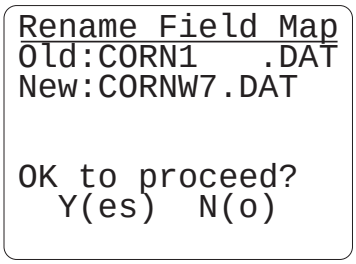
Rename

The *Rename* option allows you to rename any selected map in your Allegro. To rename maps stored in your Allegro, complete the following steps:

1. Select through the *Main Menu* / *Field Maps* screen, select the *Rename* option, and press *Enter*.



2. Select the field map you want to rename in the *Select Map* screen and press *Enter*.



3. Type in the new map name (the name can be up to 8 characters long) and press *Enter*.

```
Rename Field Map
Old:CORN1   .DAT
New:CORNW7.DAT


OK to proceed?
  Y(es)  N(o)
```

4. Press *Y* for yes to proceed with, or *N* for no to cancel the renaming process.

Downloading Maps

You can also download maps from your PC. To download a map, complete the following steps:

1. Type in the plot numbers and any associated identifiers in Microsoft Excel or a text editor. Type the numbers in either the 2-D Text format or Harvest Order Space Delimited format.

2. Save the map file in Microsoft Excel or the text editor.

3. Make sure your Allegro is connected to your PC.

4. Check that you are running the HCGG software on the Allegro.

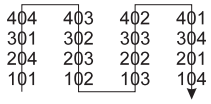
5. Open DataLink for Windows on your PC and click on the *Transfer Files* tab.

6. Click *OK* on the *Locating Remote* window.

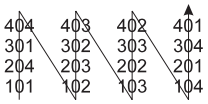
7. Select the proper map file, then click on the right-pointing arrow to begin downloading.

   Note: If you have already selected the Transfer Files tab, press the refresh button to connect to the remote without exiting and reentering.

8. If you are downloading a *Harvest Order Space Delimited* map, the *Select Harvest Order* window allows you to set up the width of the field, the number of ranges in the field, and the harvest direction or route you are using when the field is harvested.



Serpentine



Sequential

9. If you are downloading a 2-D map, the *2-D Map Parameter* window allows you to specify which corner of the map corresponds to range 1, row 1 of the field.

10. Select the appropriate option and click on *Ok*.

11. Click the right-pointing arrow , to begin downloading.

Note: Always view your maps to ensure that they were downloaded correctly.

Refer to *Appendix F* for more detail about downloading Maps.

Chapter 4
Harvest

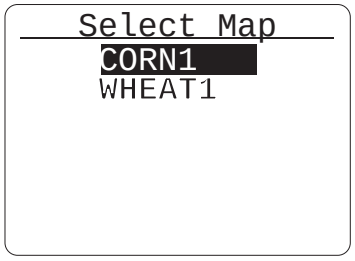
The Plot Harvest Operation

This chapter explains harvest procedure for gathering data and other user observations.

To begin the Harvest operation complete the following steps:

```
-- MAIN MENU --
3 Plot Harvest
```

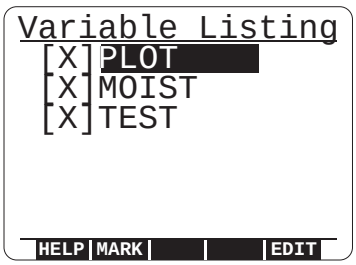
1. Select *Plot Harvest* option on the *Main Menu* screen, and press *Enter*.



2. Select the field map you want to Harvest in the *Select Map* screen and press *Enter*.

Note: If no maps are available, the system gives you a message that, No map files were found. If this occurs you must create (or download) a map file, or you must change the Data Drive location to where the map files are located, refer to Chapter 3.

The *Variable Listing* screen displays all the defined variables and whether each variable is active or not.



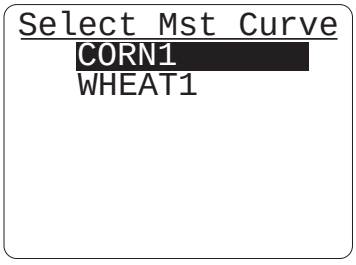
3. Select *PLOT*, *MOIST*, and/or *TEST* and press *F2* to activate or deactivate the selected variable. An X next to the variable means that the variable is active.

Note: Variables (e.g. from FieldNotes) cannot be activated during harvest when using the HCGG software application.

4. Select *PLOT*, *MOIST*, or *TEST* and press *Enter*.

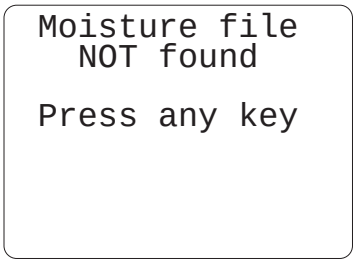
Selecting the Moisture Curve for Harvest

After you have selected the map you are harvesting from, select the moisture curve to use for the harvest. The moisture curve you use is based on which moisture curve you set (TDR or Capacitance) in the *Main Menu* / *Setup* / *Moisture/TstWt* in the *Set Sensor* option.

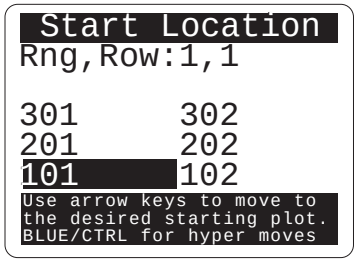


5. Select the moisture curve you want to harvest with.

This can be re-selected each time you enter a field map.



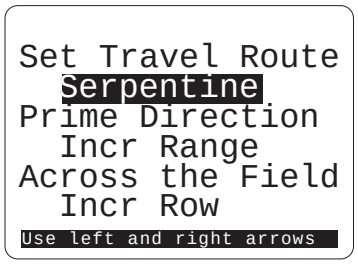
If no moisture curve has been created an error message appears. You need to go back and define a moisture curve (refer to *Chapter 2* of this manual).



6. Select the *Start Location* plot and press *Enter*.

Selecting Harvest Routes (or Rating Routes)

Select a travel pattern to follow as you harvest.



7. Set the *Travel Routes*, *Prime Direction*, and *Travel Across the Field* direction. Use *Enter* or the down arrow key to move to the next travel pattern. Use the left and right arrow keys to choose between options for each travel pattern, and press *Enter* to save your settings.

Set Travel Route

Set Travel Route defines the route through the field that you are harvesting.

Standard Plot ID

Row				
401	402	403	404	Single Plot ID
301	302	303	304	
201	202	203	204	
101	102	103	104	Range

Range/Row

Row				
4,1	4,2	4,3	4,4	
3,1	3,2	3,3	3,4	
2,1	2,2	2,3	2,4	
1,1	1,2	1,3	1,4	Range

Prime Direction

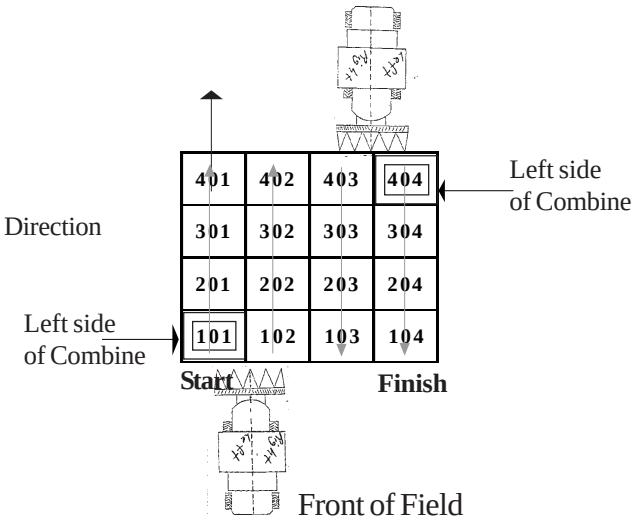
Prime Direction is the primary direction that is traveled through the field. These choices are increase range, increase row, decrease range, or decrease row.

Across the Field

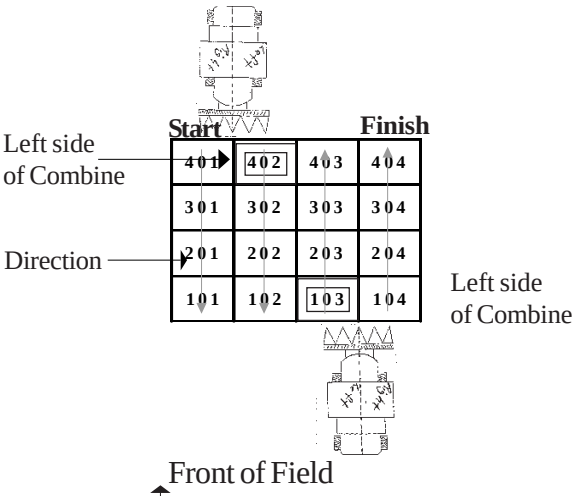
Across The Field is the secondary direction that is traveled through the field. These choices increase range, increase row, decrease range, or decrease row.

For a freshly defined field map, the system defaults to the lower left corner of the field. This is normally the starting location.

The diagram below shows a typical starting location relative to the combine's left and right sides.



The diagram below demonstrates starting into the field with the starting location at 402 (the lined box around plot# 402) and selecting the harvesting directions as *Prime Direction: Decrease Range* and *Across the Field: Increase Row*. Notice that the right side of the combine harvests plot# 401.



Harvesting

You are now ready to begin harvesting. After selecting your Harvest Routes and pressing *Enter*, the Harvest screen appears.

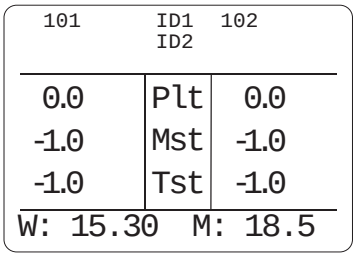
Press ENTER when Head is CLEAR...		
0.0	Plt	0.0
-1.0	Mst	-1.0
-1.0	Tst	-1.0
W: 15.30		M: 18.5

1. The *Press ENTER when Head is CLEAR...* message briefly appears. You can now harvest the first set of plots.

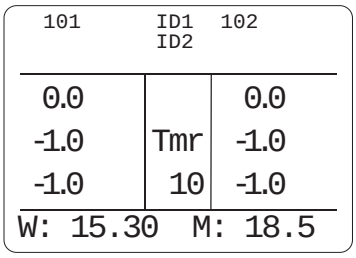
The *Harvest* screen is split to show information for the left and right bucket. The plot id numbers are displayed on the screen as you begin to harvest. *F5* allows you to toggle ID3 between Range/Row, ID3, or None.

The bottom of the *Harvest* screen displays real time weight and moisture readings from the plot bucket. This gives you a visual check to see that the bucket is empty.

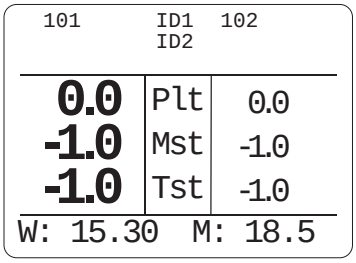
Data is recorded as the buckets cycle. You can exit the harvest at any time by pressing *ESC*.



2. Press *Enter* as soon as the last of the sample leaves the head of the combine.

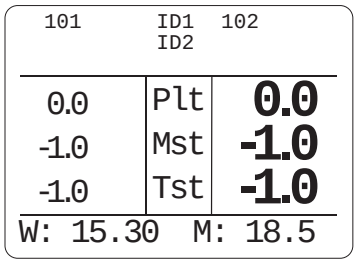


A timer appears in the center section of the screen. This timer corresponds to the amount of time it takes the sample to move through the combine and reach the hopper.



As the bucket takes a reading the plot, moisture, and test setting increases in size on the *Harvest* screen indicating active readings. Once it has taken a reading the numbers on the harvest screen return to the normal size and the buckets are emptied.

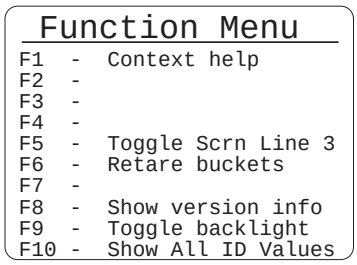
The numbers for the previous plot are displayed until the next plot is weighed.



The bucket readings are done for both the right and left side of the HCGG.

Function Keys

The function keys provide several useful benefits. These functions are especially useful during the collection of data.



Press *F10* to bring up the *Function Menu*.

The various functions are selected by pressing their respective function keys at any menu.

F1 - Context Help F1 displays a context help screen.

F2 - F2 is not available in the HCGG system.

F3 - F3 is not available in the HCGG system.

F4 - F4 is not available in the HCGG system.

F5 - Toggle Scrn Line 3 F5 Toggles line 3 identifiers between range/row and the third identifier.

F6 - Retare Buckets

F6 selects a bucket (Left or Right) that you can retare.

The next screen shows for a few seconds while the bucket doors open and close and a new tare weight is being sampled and recorded.

Note: When using F6 to retare bucket, the buckets empty and the moisture voltage also returns to zero. Do not use F6 when grain is in the moisture chamber.

F7 -

F7 is not available in the HCGG system.

F8 - Show Version Info

F8 displays the current HCGG-DOS software version, the current Fixed Operating System (FOS) version, and the current injected operating system (IOS) version.

The FOS is the operating system that is resident on the HM-400 SCCU. The IOS is on the Allegro and is injected into the FOS on the SCCU when the two are connected. The IOS essentially tells the FOS how to interact with the Allegro and other hardware.

An IOS of FOS version are not displayed unless the Allegro is attached to the controller and is communicating properly.

F9 - Toggle Backlight

F9 turns the backlight on and off.

When you run the HCGG software, the backlight is automatically turned on.

1. Press *F9* to turn the backlight on or off.

When using the Allegro CE/DOS Field Computer press the *Gold* key then *F3* key to toggle the backlight on and off from anywhere in the program.

When using the Pro4000 Field Computer press the *Green* key then the *BS* key to toggle the backlight on and off from anywhere in the program.

Note: When using the Allegro away from the Harvest Data System Console, turn the backlight off to conserve power, since it creates a significant increase on system power drain.

Viewing Data

Now that you have collected and entered the data onto your Allegro you can now view that information on your PC. This procedure requires the use of DataLink. Refer to *Appendix G: DataLink* for information on retrieving data from the Allegro.

Viewing Data on your Field Computer

You can view collected data on plotted field maps by viewing created field maps on your Allegro. To do this, complete the process in the *View* section of *Chapter 3: Creating Field Maps*.

Chapter 5
Diagnostics and Exit

Diagnostics

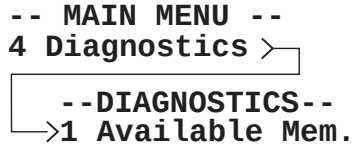
```
  Diagnostics
1 Available Mem.
2 Moisture
3 Load Cells
4 Level Detect
5 Buckets
6 Print Setups
7 Terminal Mode
```

Diagnostics are provided to aid in troubleshooting.

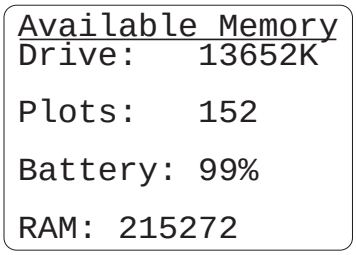
These are the options available in Diagnostics Menu.

Available Memory

This screen allows you to monitor the memory remaining on the active drive.



1. Select through the *Main Menu* / *Diagnostics* screen, select the *Available Memory* option, and press *Enter*.



The *Available Memory* screen gives you the information for drive, plots, battery, and RAM.

Drive: The available memory remaining on the active drive.

Plots: The number of plots that can be created with the remaining available memory.

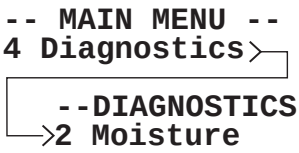
Battery: The remaining power left in the battery.

RAM: The amount of RAM on your Allegro.

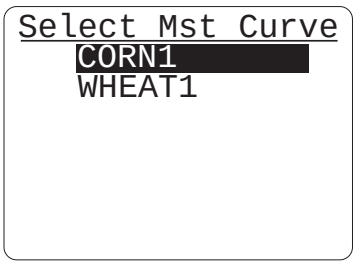
2. Press any key to return to the *Diagnostics* menu.

Moisture

The *Moisture* option displays readings for moisture, relative volts, absolute volts, and temperature.

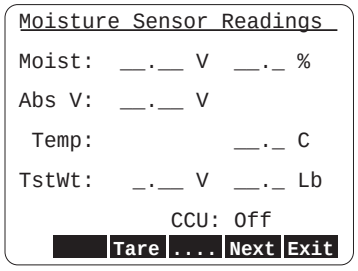


1. Select through the *Main Menu* / *Diagnostics* screen, select the *Moisture* option, and press *Enter*.



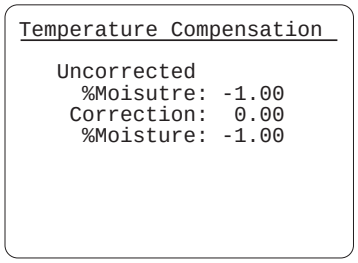
2. Select the moisture curve that you want to look at and press *Enter*.

Note: If no moisture curve is defined, the system does NOT give a moisture percentage.



The first *Moisture Volts* screen displays the current compensated percent moisture reading along with the current temperature (in degrees C). The relative voltage information is a *tarred* voltage, which can be used in creating or editing a moisture curve. The absolute voltage information is direct voltage from the sensor and is only used for troubleshooting purposes.

3. Press *Enter.*



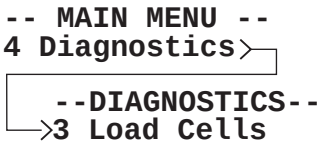
The next *Moisture Volts* screen displays the uncorrected percent moisture reading, the correction factor, and the corrected percent moisture reading (moisture reading that has compensated for temperature differential).

*Corr. Factor = Corr. Coef. * (Cal Temp - Actual Temp)*

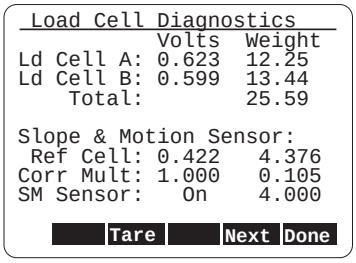
4. Press *Enter* to toggle back and forth between the two moisture diagnostic screens or press *ESC* to exit.

Load Cells

The *Load Cells* option displays the plot and test volts and weights.



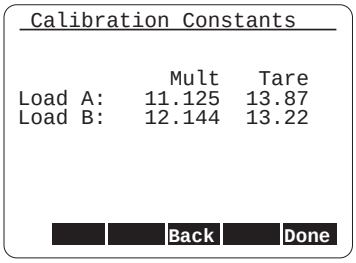
1. Select through the *Main Menu* / *Diagnostics* screen, select the *Load Cells* option, and press *Enter*.



Load Cells Diagnostics screen displays the volts and calibrated weights of the load cells. It also displays Slope and Motion Sensor readings. Running a known weight over each reveals the accuracy of a load cell.

If the Load Cell is not reading correctly press *F6* to retare or select *Setup* / *Weight/Bucket* screens, select the *Calibrate* option and press *Enter* to calibrate.

2. Press *F4* to view the *Calibration Constants* screen, or press *F5* when you are done to return to the *Diagnostics* menu screen..

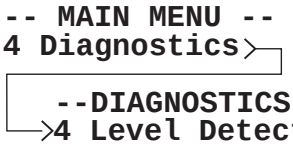


Calibration Constants screen displays the multiple and tare of the load cells.

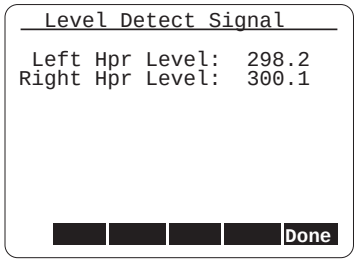
3. Press *F5* when done, or press *ESC* to return to the *Diagnostics* menu screen.

Level Detect

Use this option to test each bucket's actuation. You can test the Hopper, Plot, Test, Auxiliary, or all of these.



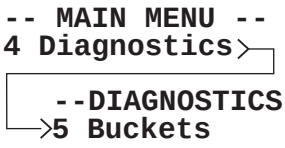
1. Select through the *Main Menu* / *Diagnostics* screen, select *Level Detect*, and press *Enter*.



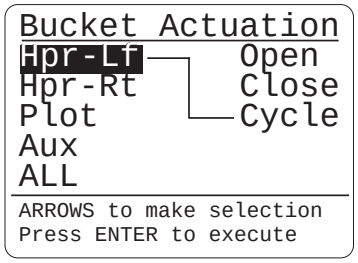
2. View the left and right hopper levels. Press *F5* when done, or press *ESC*, to return to the *Diagnostics* menu screen.

Buckets

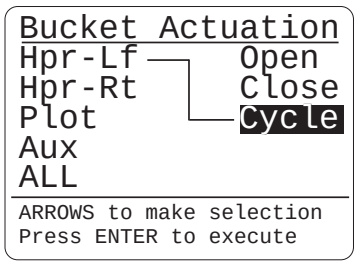
Use this option to test each bucket's actuation. You can test the Hopper, Plot, Test, Auxiliary, or all of these.



1. Select through the *Main Menu* / *Diagnostics* screen, select *Load Cells*, and press *Enter*.



2. Select one of the options in the left-hand column that you would like to test.



3. Select one of the options in the right-hand column that you would like to test.

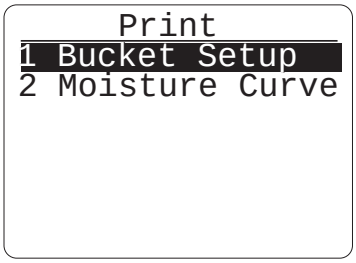
4. Press *Enter* to execute the test, once you have selected the desired selections in both columns, or press *ESC* to return to the *Diagnostics* menu screen.

Print Setups

The *Print* option allows you to print the Bucket Setup and/or the Moisture Curve for each bucket.

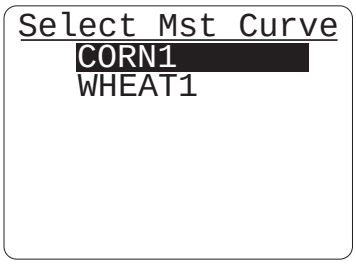
```
-- MAIN MENU --
4 Diagnostics>
  --DIAGNOSTICS--
  6 Print Setups
```

1. Select through the *Main Menu* / *Diagnostics* screen, select the *Print* option, and press *Enter*.



2. Select the option, which you want to print and press *Enter*.

If you selected *Moisture Curve* you have this extra step.



3. Select the moisture curve you want to print and press *Enter*.

Terminal Mode

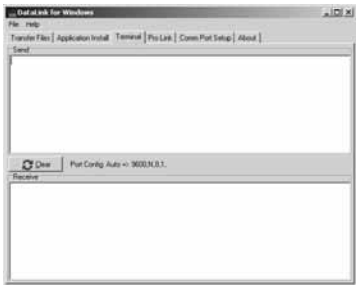
Terminal is a diagnostic tool used mainly for troubleshooting communication problems between the PC and the Allegro. To test communication between the Allegro and the PC complete the following steps:

```
-- MAIN MENU --
4 Diagnostics>
  --DIAGNOSTICS--
  7 Terminal Mode
```

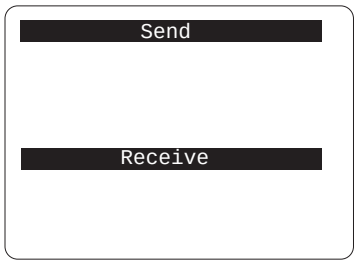
1. Connect the Allegro to the appropriate COM Port on the PC.

2. Using your PC, open *DataLink* and set it to *Terminal Mode,* or use *Windows Hyper Terminal*.

3. Using your Allegro select through the *Main Menu* / *Diagnostics* screen, select the *Terminal Mode* option, and press *Enter*.



4. Type a test message on your PC. The message should appear in the *Send* window in DataLink and in the *Receive* window on the Allegro.



5. Type a test message on the Allegro The message should appear in the *Send* window of the Allegro and in the *Receive* window of DataLink.

6. If steps 3 through 6 are accomplished successfully, then the Allegro and PC are communicating.

7. If these messages do not appear, as they should, make sure of the connections to the PC and Allegro. Make sure the Allegro is plugged into the same Comm Port as shown on the *Comm Setup* screen. You may also refer to the Troubleshooting chapter of your Allegro's manual. Then repeat steps 2 - 6 to test if the Allegro and PC are communicating.

See *Appendix G* for more information.

Exit

The *Exit* option gets you out of the HCGG-DOS program. To exit the HCGG-DOS program complete the following step:

```
-- MAIN MENU --
6 Exit
```

1. Select through the *Main Menu* / *Exit* screen and press *Enter*.

```
Exit Program?
  Y(es) N(o)
```

2. Press *Y* for yes to exit the program, or press *N* for no to cancel the exit process.

Chapter 6
Troubleshooting

If you believe you have determined the reason for a problem, refer to *Chapter 2, Software* or *Chapter 7, Installation* for guidance. If it is apparent that your equipment needs to be returned to the factory for repair, an Return Material Authorization (RMA) number needs to be authorized. To receive your RMA number call our customer service department at 435-753-1881 (8 am - 5 pm MST, Monday - Friday).

Symptoms

The following sections in this chapter covers possible problems you may encounter with your HarvestMaster equipment.

SCCU Power Failure (No Power LED)

If you are having problems with power getting to your SCCU complete the following:

- Check the power cord connection to see that it is plugged into the SCCU correctly.
- Check the power cord connections and polarity to the battery.

- Check the 6 AMP circuit breaker on the back of the SCCU controller. Reset if needed.

- Check the battery voltage (should be no less than 14.0 V with the combine running).

Allegro Communication Failure with the PC

If you are having problems with your Allegro connecting to your PC complete the following procedures:

- Check to make sure that you are using the CA-2009 communications cable from HarvestMaster. Any standard RS-232 communications cable doesnot work. You need a Null Modem cable to communicate with the Allegro.

- Check the communications port that has been selected on the PC and/or Allegro, and make sure it matches the communication port that the Null Modem cable is plugged into.

- Make sure there is no other program installed that is disabling the use of the COM port. For example, when using the Allegro F/PC, Active Sync needs to be disabled so other program can use the COM port. This is done by opening the *ActiveSync* file, selecting *Connection Settings...* and unchecking the *Allow serial cable...to this com port*.

- Make sure that you are following the communication procedures correctly for the Allegro. Refer to the Allegro User's Manual, if necessary.

- Try the other communication port on the Allegro to eliminate a possible hardware problem with the Allegro.

- Try another PC to verify a possible hardware problem with the PC.

Allegro Communication Failure with the SCCU

If you are having problems with your Allegro communicating with your SCCU complete the following procedures:

- Check to see that the SCCU and the Allegro are off. Then turn on the SCCU and make sure that the Allegro is powered up with it. When the HCGG program runs, the system should come to the *Main Menu* automatically without pressing any keys. Pressing *F8* should display 3 versions of software. If there are any problems with the above outlined procedures, continue with the following instructions.

- Check to see if the LED's (red and green lights) on the front panel of the SCCU are flashing in the same sequence as when it is first powered up. If they are, the Injected Operating System (IOS) did not load.

  Note: If LED's are not flashing at all, and the power LED is the only one that is illuminated, the problem is in the SCCU HM-401 console. Please call HarvestMaster's customer service department for an RMA.

- Check to make sure that the Allegro communication cable is securely plugged into the SCCU console.

- Check to make sure that the cable is securely plugged into the communications port #1 on the Allegro.

- Transfer files from the PC to the Allegro through the communications port #1 to insure that the port on the Allegro is operational.

- Make sure your communication ports are turned on in the setup mode on the Allegro, do this by typing *setup* at DOS C: prompt.

Inaccurate Moisture and Weight Readings

If you are receiving inaccurate moisture and weight readings complete the following procedures:

- Check to see that the Injected Operating System (IOS) is loaded correctly by pressing *F8* to show its version.

- Check the software versions on the Allegro by pressing *F8*. Make sure that the first number on the Fixed Operating System (FOS) is the same as the first number on the IOS.

  e.g. FOS ver. 3.xxx Dy-Mon-Yr
  IOS ver. 3.xxx Dy-Mon-Yr

  These numbers, FOS 3.3 or IOS 3.2, must match on both the IOS and FOS.

  Note: After turning the system on, it should come to the Main Menu automatically.

- Recalibrate the load cells.

- Check the points in the moisture curve.

- Try retaring your system.

- Check the system control cable connection between the SCCU and the HM-420BF filter box. Inspect the pins on the SCCU and HM-420BF ends for damage or corrosion.

Inaccurate Weight Readings (Moisture and Test Weight is Fine)

If you are receiving inaccurate weight readings complete the following procedures:

- Check the weight calibration as outlined in *Chapter 2, Software, Weight Calibration*.
- Check each individual load cell by selecting *Load Cell* from the *Diagnostics* menu.
- Check the control cable connections for bent, broken, or dirty pins and sockets. Clean with an electrical parts cleaner or tuner cleaner as needed.
- Check cables and hoses for weigh pan interference (must be very loose).
- Select the *Load Cells* option in the *Diagnostics* menu and recod the total load cell voltage readings with an empty weigh bucket. When a weight is placed on the weigh bucket, this voltage should increase to a certain point and stabilize. When the weight is removed, the voltage should return to the original voltage level.

To verify which load cell is malfunctioning, place a 10 to 20 lb. weight above each load cell (one at a time) and watch the total voltage. The problem load cell does not yield readings consistent with the other load cell.

No Plot Weight (Moisture is Fine)

If you are not receiving any test-weight or plot-weight weight readings, but the moisture registers as fine, complete the following procedures:

- Check the system control cable connection between the SCCU and the HM-420BF break-out-box. Inspect the pins on the SCCU and HM-420BF ends for damage or corrosion.

- Using a DC volt-meter, check the load cell excitation at the HM-420BF break-out-box. To do this, disconnect the load cell and insert the red probe of the volt-meter into pin 1 (+5V) and the black probe into pin 5 (Ground). With the SCCU on, the voltage should be approximately 5V. If it is not, proceed with the next step, if not skip the next step.

- Using the DC volt-meter, check the load cell excitation at the HM-401 SCCU. To do this, disconnect the Control Cable from the HM-420BF break-out-box. Insert the red probe into pin 11 and the black probe into pin 15 of the female connector of the System Control Cable. With the SCCU on, the voltage should be approximately 12V.

  Note: If either voltage is not present, please call HarvestMaster Customer Service for further instruction.

- Replace the load cells with known good ones.

Inaccurate Moisture and Test Weight Readings (Weight Readings are Fine)

There are three LED's (light emitting diodes) mounted (inside of the case) on the side of the Electro-magnetic Moisture (EM) sensor. When they are *ON*, you will see a green, yellow, or red LED shining through the plastic housing. These LED's are very useful in diagnosing a problem with the sensor. Each LED has a different function, as described below:

Green: On when + 12 VDC is applied to the sensor.

Yellow: Blinks when a message is transmitted from the sensor. This LED will blink when activated (e.g. Diagnostics, Harvest Mode, etc.).

Red: Indicates sensor error conditions. With no error codes, the red alternates one second on, then one second off. Error codes are represented by pairs of rapid blinking. The number of blinks corresponding to the first and second digit of an error code.

Even though you may not understand all the error codes as outlined below, they are useful to Juniper Systems technicians. Please note the error code on the sensor before calling technical support.

The error code list consists of the following:

11. Sensor has recently been RESET
12. Timed Task Buffer overflow detected
13. Low memory alert (M < 50 bytes)
21. Input buffer overrun
22. Checksum error detected
23. Unrecognized command received by sensor
24. RS-485 busy encountered
25. Sensor response message aborted
32. Frequency measurement zero error (no oscillation counts)
33. Frequency measurement range error (over 3 Mhz)
41. Blade voltage range error
42. Temperature sensor zero error (reading at or below -15 C (5 F)
43. Temperature sensor range error (reading above +60 C)
44. System supply voltage below + 10.0 Volts
45. System voltage above + 18.0 Volts
55. Invalid error code reported

If you are receiving inaccurate moisture readings, complete the following procedures:

- Check all cable connections from the moisture sensor to the SCCU for dirt or damage.

- Make sure all of the calibration points are entered correctly and that they produce a near linear line when graphed (refer to *Calibrating Moisture* in *Chapter 2* of this manual).

  Note: The combine should be running at the same RPM when calibrating as it is in the field when harvesting. This insures that there are greater than 13V supplied to the SCCU, which insures a regulated voltage to the moisture sensor.

- With an empty weigh bucket, make sure the sensor always reads zero volts before calibration. If not, do a retare by pressing *F6*. When calibrating, an empty weigh bucket should always produce 0% moisture (which corresponds to 0 volts).

- With an ohm meter, check to see that the sensor weigh bucket has a good ground connection to the back plate of the moisture blade. The two mounting screws threaded into it ground the weigh bucket. If needed, run a ground strap from the back of the moisture blade to the weigh bucket housing.

- Select the *Moisture* option in the *Diagnostics* menu and check the relative moisture volts of each sample to see that they are stable and consistent with the calibration samples.

Bucket Doors Do Not Operate Correctly

If the bucket doors do not open correctly, complete the following procedures:

- Check the System Control Cable connections for bent, broken, or dirty pins. Clean as needed.

- Check the bucket actuator setup in the *Controls* option in the *Weight/Bucket* menu. Disable the Limit Switches on the Open and Close stroke. Enable one at a time until the probelm occurs again. Refer to *Control* in the *Weight/Bucket* section of this manual.

- Adjust limit switches on pneumatic actuators if needed. Refer to the *Connecting the Actuator Control Lines*, in *Chapter 7* of this manual for a description of panel light indications.

- Check the Auto/Manual switch to make sure that it is in the manual mode. Run the actuators in manual mode.

- Make sure the Auto/Manual switch on the front of the SCCU is in Auto mode. In the *Diagnostics* menu run the actuators automatically, one at a time, to see if they operate correctly.
- Check to see that the air pressure is normal (50-85 PSI).
- Check for leaks in the air system.
- Check the compressor for efficiency.
- Check the air filters and coalescing filters to see that they are not restricting airflow.
- With a DC Volt-Meter, check the voltage at the solenoid to make sure that it is approximately 12V when the actuator is enabled.
- Release air pressure using the air supply safety valve and check the gates for binding by sliding them back and forth with your hand.
- Make sure the LEDs on the limit switches correspond to those on the SCCU.
- Check to make sure that the chassis ground is connected correctly, when using a windshield wiper motors.

Printer Does not Respond (Power LED is OFF)

If printer is not responding and the power LED is off, complete the following procedures:

- Make sure the SCCU power is turned on.
- Check the cable connections to the SCCU to make sure they are not loose or damaged.

- Check the printer mounting screws to make sure that they are tight.

Printer Does not Respond (Power LED is ON)

If printer is not responding and the power LED is on, complete the following procedures:

- Run the self test and check the parameter settings as outlined in *Chapter 7, Installation, Printer Test and Setup*.

- This is a sign of a printer hardware failure and may need to be sent in for repair.

If you have performed all of the necessary troubleshooting steps and your system is still not operating correctly, please contact our customer service department at 435-753-1881 (8 am - 5 pm MST, Monday - Friday).

Chapter 7
Installation

Requirements for Installation

This chapter explains in detail how to assemble your High Capacity GrainGage (HCGG) and install it for the first time. It is important to follow the assembly and installation procedures in the order they are presented. If you purchased the system already installed, you can skip this chapter.

HCGG Hopper Assembly

If you are installing the HCGG you will first need to assemble the HCGG hopper. If you purchased the HCGG directly from Juniper Systems, Inc. you (or your contractor) are responsible for the following setups and installations:

HCGG Mounting Area
Pneumatic Actuated Isolation Gate
HM-400 SCCU
HM-420LFG

HCGG Mounting Area

You must construct and prepare the mounting area on the combine to hold the HCGG. This includes both the grain delivery section and grain evacuation section.

At your request, Juniper Systems, Inc. provides drawings of the HCGG to help with the construction and installation.

The installation needs to allow you access to the bottom of the HCGG for service and calibration. Access is made through either a swing-down panel under the HCGG, or by mounting the HCGG on slides.

If you create your own mounting drawings we highly recommend that Juniper Systems, Inc. approve the mounting drawings before you begin to use them.

Pneumatic Actuated Isolation Gate

You must construct and prepare the pneumatically actuated isolation gate at the top of each elevator delivering grain to the HCGG. The purpose of the isolation gate is to cut off the trickle of grain at the end of a plot pair so that the equal bias from the trickle is present on both sides of the HCGG.

The actuators of the isolation gate must be fitted to receive 1/4" OD plastic pneumatic tubing, from the HCGG. The HCGG has the pneumatic valves and controls to run these gates.

HM-400 SCCU and HM-420LFG

You must install the HM-400 SCCU and the HM-420LFG inside the cab of the combine. These components are to be wired to a 12 VDC power supply. These wiring instructions are found in the HCGG User's Manual.

The 37-pin system control cable must be installed from the HM-400 SCCU to the outside of the cab next to the mounted base of the HCGG.

Tools Needed

You need the following tools for the assembly of the HCGG hopper:

Small flat-head screwdriver
English Allen wrench set

HCGG Unpacking and Inspecting

After receiving your HCGG unpack and inspect it by completing the following:

1. Open the boxes that the HCGG is shipped in.
2. Remove the two halves of the HCGG from the packaging.
3. Place the bottom half of the HCGG on the floor and the top half on a table in the "right side up" position.
4. Remove the installation kit from the hopper.
5. Cut the tie that is holding the cables inside the hopper assembly.
6. Remove the cables from the hopper bucket, and inspect the cables, connector ends, and appearance of the system for any damage that might have occurred during shipping.

HCGG Hopper Assembly

Now that you have unpacked and inspected your HCGG, you are now ready to put it together. Juniper Systems, Inc. strongly advises that you have two people to complete the first two steps. Complete the following steps to fully assemble the HCGG hopper.

Part 1: Remove Panel Covers

There are two removable panels located on the bottom half of the HCGG. Four large screws attach each panel. These screws have a large flat surface so you can unscrew them by hand. Remove these front and back panels by completing the following:

1. Turn each of the four screws counter clockwise until the screws are loose.
2. Pull the panel off of the bottom half of the HCGG.

3. Repeat steps 2 and 3 for the other panel on the bottom half of the HCGG.

Part 2: HCGG Assembly of Top and Bottom Halves

Placing the top half of the HCGG on the bottom half is the next step. Juniper Systems strongly advises that you have two people to complete this assembly process because the top half needs to be tilted back and not fully resting on the bottom half, until the power cables are correctly installed.

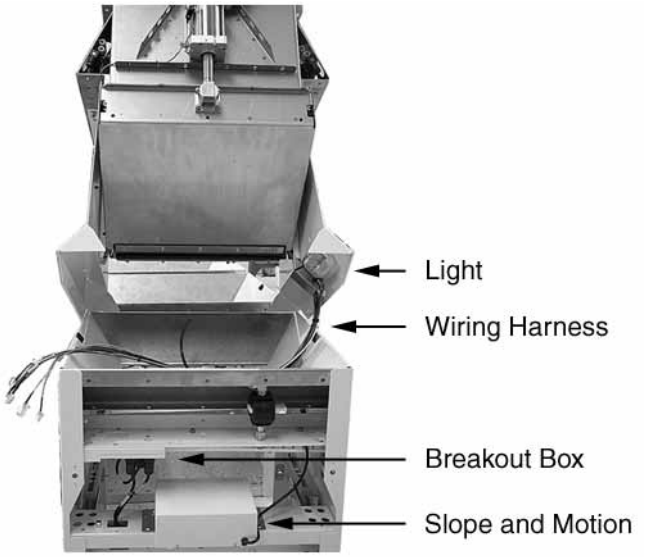
Note: Do not place the top of the HCGG flat on the bottom or you will damage the cable assembly.

Assemble the top and bottom of the HCGG by completing the following:

1. Position the bottom half of the HCGG so that the Slope and Motion box and Breakout box are facing you.

2. Place the top half of the HCGG on top of the bottom half with the light and wiring harness on the right. Tilt it back so the top is balanced on only one edge, as shown below.

Top half of High Capacity GrainGage tipped and balanced on the bottom half

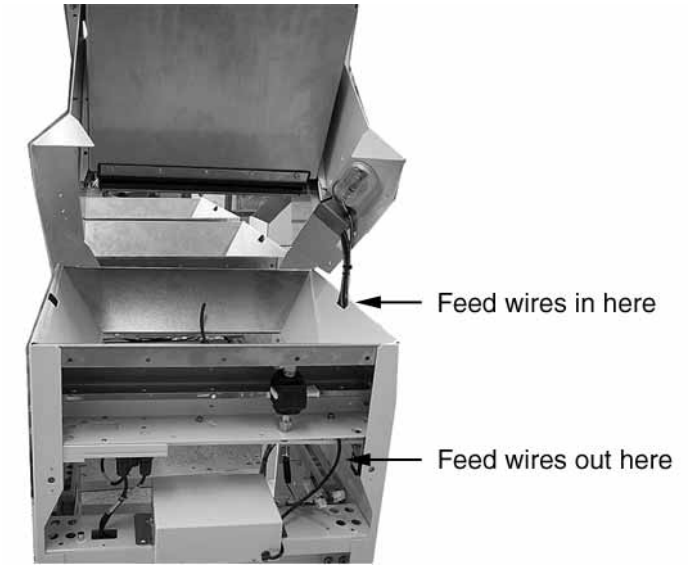


2. Feed the group of wiring cables, or wiring harness, through the access hole located directly below the wires. Feed the largest wires first and the smaller wires last.

3. Feed the wiring harness out of the HCGG by the Slope and Motion box, making sure none of the wires are wedged by the bottom half of the HCGG.

   Once completed, the placement of the group of wires should resemble the picture below.

Wire Harness feed in and feed out points



4. Lower the top half of the HCGG slowly until it rests flat on the bottom half while watching the wiring harness, making sure they do not get between the top and bottom sections of the HCGG.

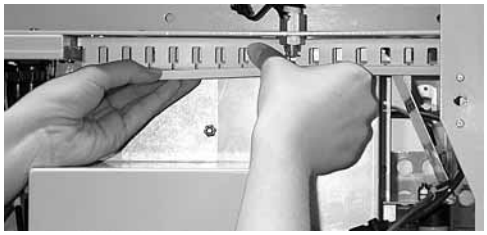
Part 3: Wiring Connections and Installation

Now that the two halves of HCGG are combined into one unit, connecting and installing all of the internal wiring is the next step.

To connect and install the wiring of the HCGG complete the following:

1. Remove the cover from the wire duct by pushing the front side section with one hand and pulling down on the bottom cover with the other hand. Note the photo below:

Removal of the Wire Duct



2. Place the wiring harness into the wire duct.

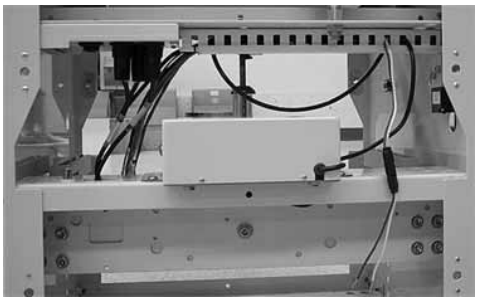
3. Feed the air hose from the wiring harness, between the top member where the wiring duct is mounted to it and to the stainless steel deflector plate.

4. Connect the air hose to the NPT “Y” fitting that is located below the wiring duct.

5. Feed the red and white night light pigtail through the wiring duct and out the back 3 to 4 holes from the side.

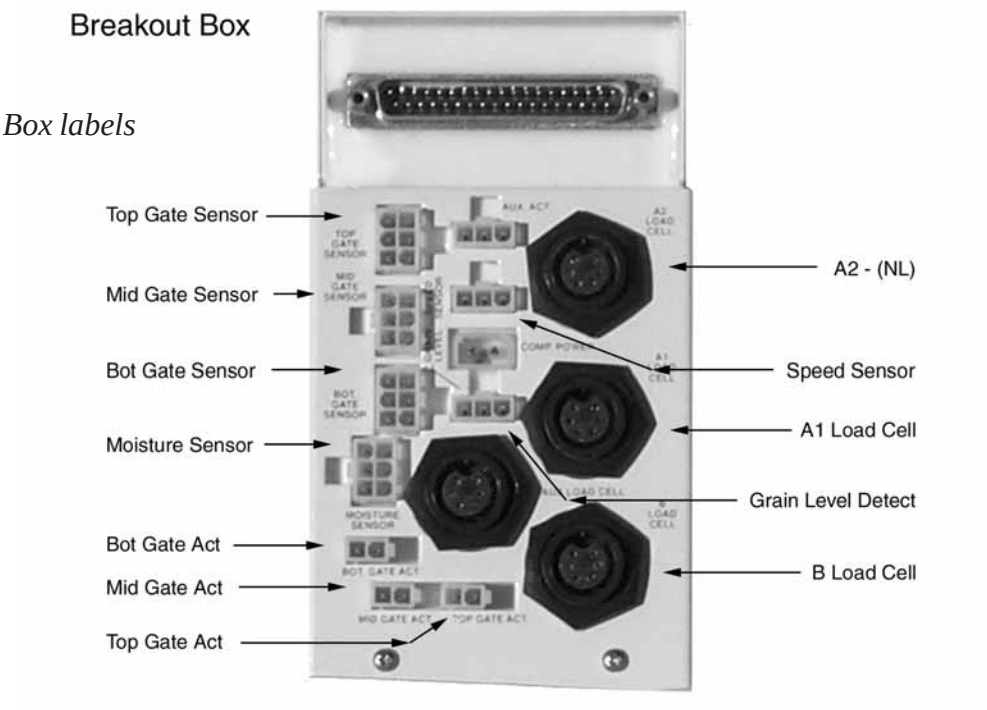
6. Feed the wire harness through the duct and push the removed bottom piece of the wire duct up against the wiring duct until it snaps and locks into place. Be careful not to pinch any wires. From the backside, the wire harness should look like the photo below:

Wire Harness running through wire duct



7. Plug each cable into the appropriate connector ports on the break out box.

Breakout Box labels



Note: Each cable is labeled with two descriptions. One is the exact same label that is on the break out box.

Install Cables from Wiring Harness Table

Breakout Box	Cable Function
Top Gate Sensor	Top RT Sensor
Mid Gate Sensor	Top Left Sensor
Bot Gate Sensor	Plot BKT Sensor
Aux Actuator	Isolation Gate Act
Speed Sensor	Left Hopper Level
Grain Level Detect	RT Hopper Level
Moisture Sensor	Moisture Sensor
Bot Gate Act	Plot BKT Act
Mid Gate Act	Top Left Act
Top Gate Act	Top RT Act

8. Return each panel cover to the bottom half of the HCGG and screw clockwise until each screw is tightened. Do this for each panel.

Requirements for Combine Installation

Your HCGG is now wired and ready for installation onto your combine.

Now that the HCGG has been joined into one unit and has all its wiring installed, attaching the HCGG to your combine is the next step. The estimated time for this part of the HCGG System installation ranges from 10 to 20 hours. This depends on which of the following type of combine modifications are necessary:

- What materials and equipment you have on hand to build brackets and make modifications.
- Whether the grain delivery and removal systems are in place or have to be added.

Tools Needed

For ease of installation, make sure you have the following tools on hand:

- A Phillips-head screwdriver
- A flat-blade screwdriver
- A 1/2" open-ended wrench
- A 9/16" wrench and a 9/16" socket with a 12" (30 cm) extension
- Mounting hole diagram for Harvest Data System Console (see *Appendix C*)
- A power drill with 7/32" and 13/32" bits
- A sharp utility knife
- Connectors and a crimping tool for electrical connections (specified by the type of actuator used)
- Black "ultraviolet resistant" cable ties
- A carpenter level
- Two #28 x 1/4” eye bolts for each load cell
- A 1/2” black wire loom (approx. 20 feet)

Components

Your HCGG System uses the control and conditioner unit (SCCU) with its console base as its basic controller.

Electronics Group

The console base accommodates the removable Allegro data acquisition computer and (optionally) a Harvest Data System FieldPrinter. Together, these components are referred to as the Harvest Data System console. You should have these system components:

- One system control cable (beige cable with a 37-pin connector on both ends)

- One power cable (black two-conductor cable with a two-pin connector on one end and bare wires on the other end)

- Four #10-32 x 1/2 threaded mounting bolts and nuts
- An Allegro CD/DOS Field PC

Optional Components

The following optional components may include:

- FieldPrinter
- Remote ENTER cable
- Bar Code Wand

Allegro Inventory

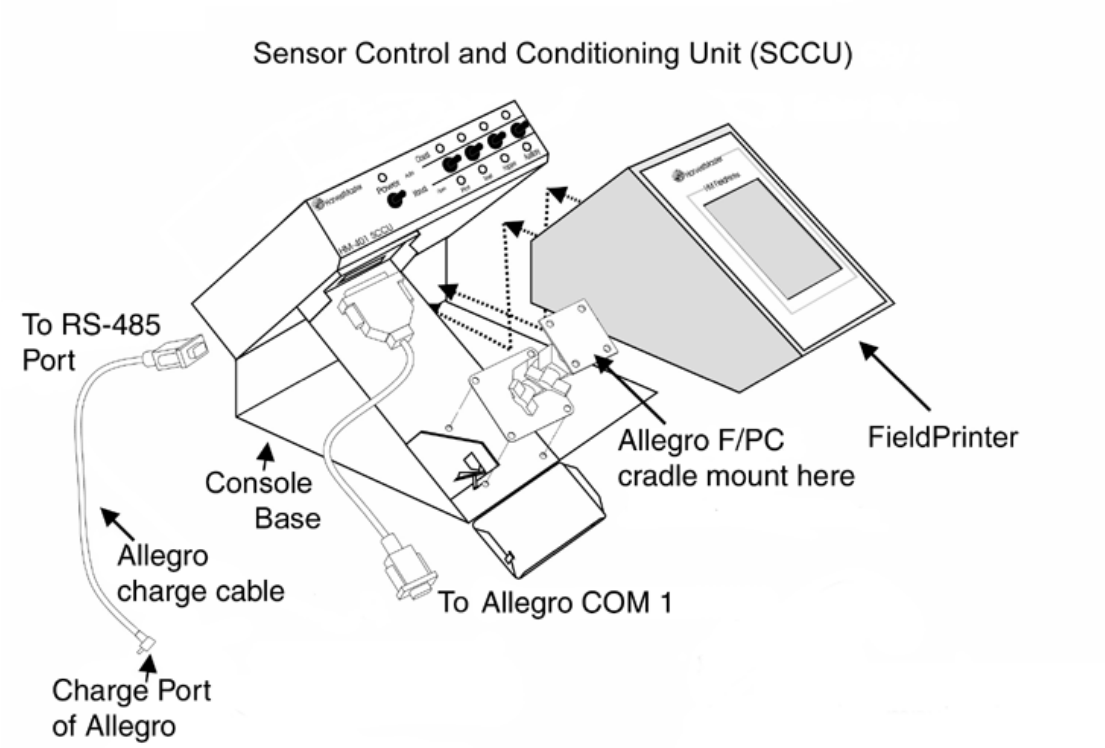
With your Allegro, you should have the following items:

- Harvest Data System manual and a diskette with the HCGG Harvest Data Application software to be loaded onto the Allegro.
- DataLink for Windows PC communications program
- Allegro CE/DOS Owners's Manual
- CA-2009 RS-232 communications cable
- AC wall mount charger

Inventory the items to be installed.

You should have, at a minimum, all the items shown in *The Harvest Data System Console* figure on the next page (with the possible exception of the optional Harvest Data System FieldPrinter and remote ENTER cable).

The Harvest Data System Console.

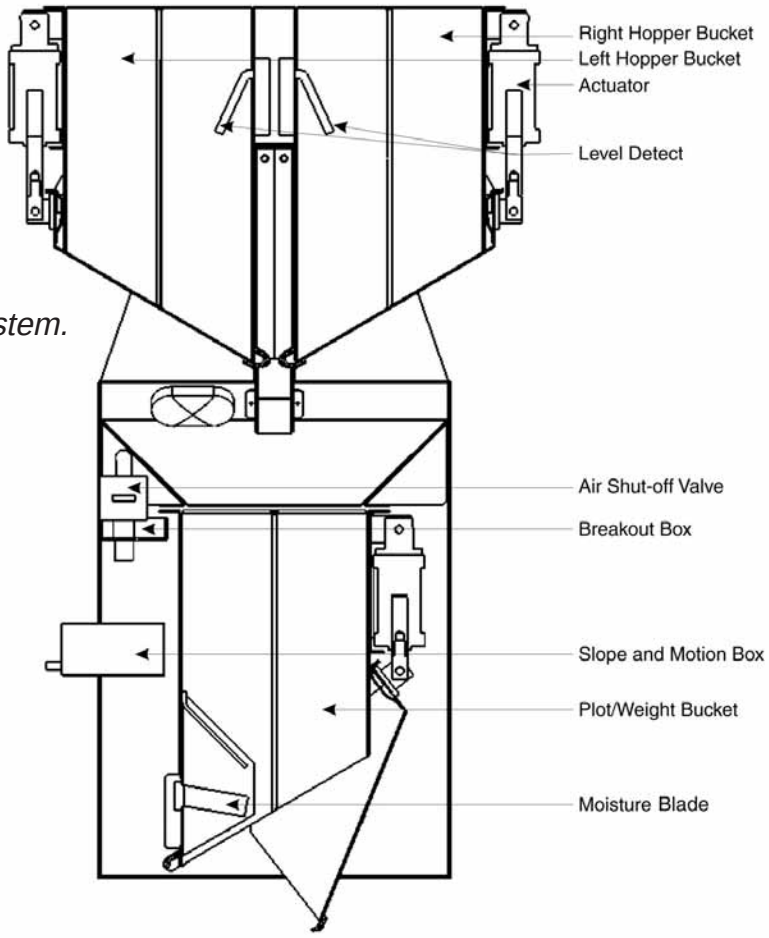


The Allegro and Harvest Data System FieldPrinter fit into the Harvest Data System console base.

The FieldPrinter is an optional component for convenient field use.

Supporting Hardware

The High Capacity GrainGage is composed of the following hardware:



A Basic HCGG System.

Left and Right Hopper Buckets

Left and Right Hopper Buckets collect the initial harvest loads for reading.

Actuator

Actuator runs the mechanical functions of the hopper buckets.

Level Detect

Level Detect is used to measure grain level within each of the holding hoppers of the High Capacity GrainGage. The Level Detect sets the point that the hoppers cycle at during harvest of longer strip tests. The Level Detect is not used with normal Plot Harvest.

Air Shut-off Valve

Air Shut-off Valve shuts off the airflow in the HCGG.

Breakout Box

Breakout Box connects to the SCCU enabling the harvesting functions of the HCGG.

Slope and Motion Box

Slope and Motion Box is a patented sensor used to decrease errors caused by combine vibrations or when harvesting on slopes. This results in increased accuracy of the weight readings. The Slope and Motion box is enabled via software and has a hardware-shipping stop.

Plot/Weight Bucket

Plot/Weight Bucket contains a moisture blade for collecting weight and moisture readings from the hopper buckets, which are filled during harvesting.

Moisture Blade

Moisture Blade is a sensor used to measure moisture and density (test weight) on the High Capacity GrainGage.

Mounting the Components

We recommend that you mount your Harvest Data System console on a flat surface. The location should be within arm's reach at a convenient height for the operator. The Allegro screen needs to be positioned at an easily visible angle. The mounting hardware provided is designed for mounting to a surface that is 1/4" thick or less. To mount the Harvest Data System console on the combine, complete the following steps:

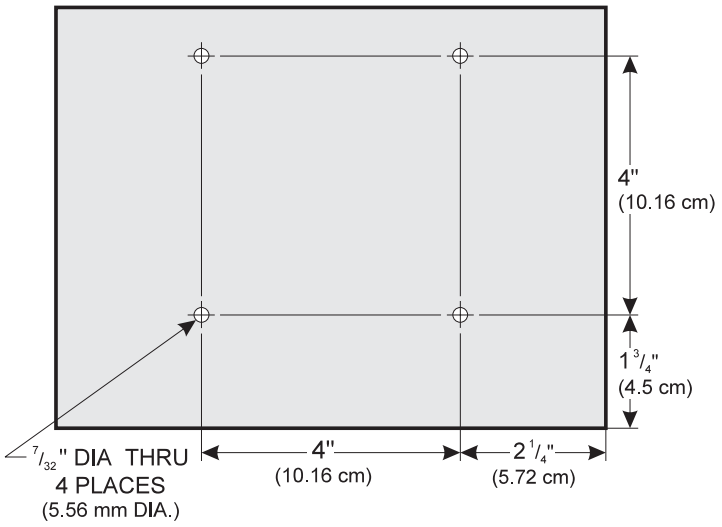
1. Select the location for the Harvest Data System console.

2. Mark where you want the holes drilled on the equipment surface. (Please refer to the dimensioned mounting diagram in Figure 7-3 or Appendix C.)

3. Drill four 7/32" mounting holes on the desired mounting surface.

4. Position the Harvest Data System console over the holes and securely tighten the mounting screws.

Bottom of the HarvestMaster Console



Secure the Harvest Data System console base directly to the mounting surface using the four screw holes. The threaded mounting screws are #10-32 x 1/2. Nuts are included. Screw holes on the mounting surface should be 7/32" DIA.

Cable Connection to the SCCU

Connecting the system control cable and the power cable is the next step. The system control cable connects to the breakout box inside the HCGG.

System Control Cable Connection

The system control cable ends in a 37-pin connector on both ends. Plug one end into the back of the SCCU and the other end into the top of the breakout box.

1. Using wire ties, tie the cable in place on the combine to help protect them from possible damage.

2. Twist the thumbscrews on the connectors to secure the 37-pin connectors to the SCCU and the breakout box.

Power Cable Connection

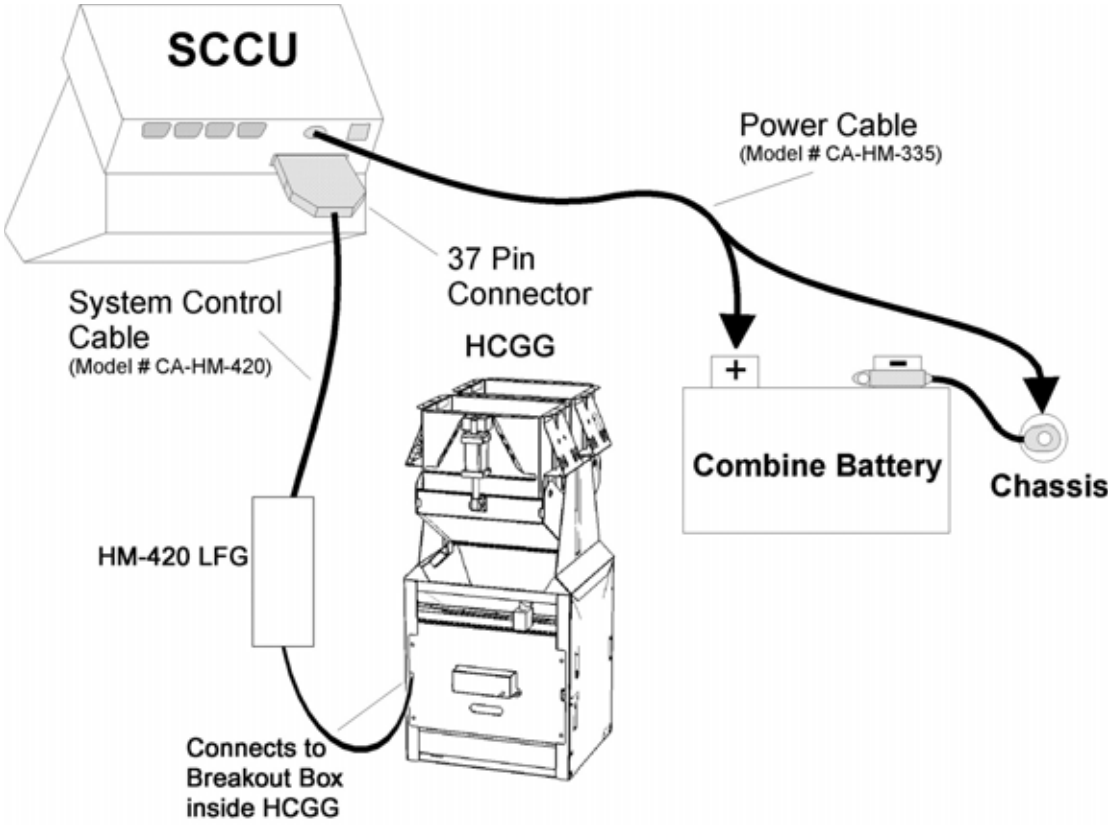
To connect the power cable, complete the following steps:

1. Attach the pigtail end of the power cable to the combine battery (12V power supply). It is recommended to connect the negative side of the power cable to the end of the ground cable furthest away from the battery (connected to the chassis--refer to figure on the next page). If your system is equipped with a lockout system, this eliminates any potential problems.

2. Plug the power supply cable into the SCCU, and twist the locking ring to secure the connector to the SCCU.

3. If you haven't done so already, attach the Allegro DC power plug to the Allegro's charge port.

You need to make sure the polarity of the positive and negative battery terminal are wired correctly. Reversing the polarity could cause possible hardware damage. Also, the 12V power supply wire is red or white (+). The ground wire is black (-).



Cable Connectors for the SCCU. This shows the connector for the system control cable and the plug for the power cable.

For additional information about the installation of the printer, proceed to *Appendix H Printer, Ribbon, and Paper Installation* at the end of this manual.

Chapter 8
Maintenance

Maintaining your HCGG

This chapter explains in detail how to maintenance your High Capacity Grain Gage (HCGG) after it is installed on your combine. It is important to follow the step-by-step maintenance procedures as outlined in this chapter. The maintenance procedures include the following:

Pneumatic Conditioning Center
Wilkerson Lubricator Set Screw Replacement
Solenoid Air Flow Adjustment
Cylinder Removal and Installation
Limit Switch Adjustment
Weigh Bucket Removal

Pneumatic Conditioning Center

The Pneumatic Conditioning Center is a necessary component for using your High Capacity Grain Gage. Installing the conditioning center and maintaining it helps ensure your HCGG runs smoothly and ensures the longevity of your HCGG.

Installation and Maintenance Tips

We suggest the following tips when installing and maintaining the Pneumatic Conditioning Center:

- Mount the Pneumatic Conditioning Center as close to the GrainGage as possible.
- Install the Pneumatic Conditioning Center with the air flowing in the direction of the lubricator. The air should be coming into the pre-filter and exiting the lubricator.
- Replace the white pre-filter yearly or after every 20,000 to 30,000 plots (more frequently if the filter turns grey or black).
- Replace the red coalescing filter every 50,000 to 60,000 plots.
- Replace the oil in the lubricator if contaminants collect in the bottom of the lubricator bowl or yearly. Contaminates from dirty oil may collect at the siphon tube filter, requiring the filter to be washed in kerosene and blown off with an air blow gun.
- Replace the plastic filter assemblies and lubricator bowls or wipe them clean with a clean dry cloth (or dampened with water) when the bowls become dirty. Certain compressor oils, chemicals, household cleaners, solvents, paints, and fumes attack these plastic bowls.
- The operation of the oil delivery rate drops after an extended period of use. If this happens, clean the lubricator and all its air and oil distribution tubes with kerosene. We recommend replacing the lubricator every five years.
- Set the drip rate on the lubricator as explained in *Chapter 8* of this manual.
- Use #10 (90 SSU) or lighter oil in your lubricator. We recommend using non-detergent, semi-synthetic or non-synthetic air-tool oil.
- Do not over fill the lubricator bowl.

- Use special anti-freeze lubricant if you are using the system in temperatures below freezing. This oil is a special blend that can be purchased from Juniper Systems or most retail stores. The anti-freeze oil is not an additive and must not be mixed with other oils.
- Check the lubricator bowls periodically to see that the oil level is up. Replace the oil yearly, or if the color becomes white or cloudy.

Operating Specifications

The following operation specifications show the maximum pressure and temperature ratings for the conditioning center:

Bowl Type	Pound per Square Inch Gauge (PSIG)	Temperature
Transparent Plastic	150 (10.3 bar)	125° F (52° C)
Metal	200 (14 bar)	175° F (79° C)

Filters

If you are using the Solberg compressor air filter, you need to check this filter daily. We recommend replacing this filter rather than blowing it out. Replace the filter yearly or as needed.

Note: A dirty air filter can cause premature compressor failure and loss of efficiency. When available, we recommend running the air intake from your compressor to the combine filter.

The pre-filter element is located to the far left of the pneumatic conditioning center when facing it. This filter should be replaced when discolored or yearly (whichever comes first).

The coalescing filter is located to the right of the pre-filter. This filter should last much longer if the other filters are maintained properly. It is recommended to replace this filter once every 2-4 years.

Removing Pre-Filter or Coalescing Filter

To remove the pre-filter or coalescing filter, follow the steps below:

1. Drain the air pressure.
2. Turn the housing bowl 1/4 turn counter clockwise (when looking at the bowl from the bottom up).
3. Wiggle the bowl back and forth while pulling down on it until the bowl pops off.
4. Unscrew the filter and remove it from the assembly. The plastic nut on the pre-filter assembly needs to be reused.

Note: Be careful not to use too much force when pulling off the bowl. This may crack or break the fins on the pre-filter housing. When reassembling, you may want to apply a thin coat of grease to the O-ring and plastic tabs for ease of installation.

Installing New Filter

When installing the new filters, be careful not to over-tighten them, but make sure they are secure. To insert a new filter, follow the steps below:

1. Clean the bowl assembly thoroughly and check the auto drain piston for functionality (replace if necessary).
2. Push the bowl on securely.
3. Turn the bowl a 1/4 turn clockwise to lock the bowl into place.

Air Regulator

The regulator should be adjusted between 50 and 85 PSI. Colder temperatures may require higher pressures.

To adjust the pressure, complete the following steps:

1. Unlock the regulator by pulling down on the adjusting valve.

2. Turn the regulator clockwise to increase the pressure and counter clockwise to decrease the pressure.

Lubricator

The lubricator is located to the right side of the pneumatic conditioning center.

Changing the Oil

To change the oil, complete the following steps:

1. Release the air pressure from the air lines (through the HM-1020 Pneumatic Conditioning Center).

2. Pull down on the plastic lock and turn it counter clockwise ¼ turn.

3. Gently pull down on the bowl while gradually tipping the bowl back and forth until it is removed.

Note: Be careful not to drop the plastic bowl from the metal bowl guard when emptying the oil.

4. Inspect the plastic bowl for deterioration or cracks. Replace as necessary.

5. Clean with a dry or water dampened cloth.

6. Refill the bowl to the level as indicated on the metal bowl guard. Do not overfill the lubricator. This causes it to malfunction and results in not providing the proper lubrication to the cylinders.

Note: To minimize the danger of flying fragments, the metal bowl guard MUST be installed. Please ensure that the lubricator has a metal bowl guard before pressurizing the system.

Adjusting the Lubricator

The lubricator must be adjusted before operation. To adjust the lubricator, complete the following steps:

1. The air system must be pressurized to operating pressure (approximately 50 – 80 PSI).

2. Turn the HM-401 SCCU controller on and boot to the main menu on the Allegro.

3. Switch the *Auto/Manual* switch to *Manual* mode and open all the gates.

4. While watching the dropper in the oil viewing dome on top of the lubricator, cycle one of the gates (*Open* and *Close*) 15 times every 1-2 seconds. The gates can be cycled while standing by the GrainGage by pressing the red button on the top of the control solenoid (mounted to the right inside wall of the GrainGage).

Note: If the lubricator is not mounted close enough to the GrainGage to cycle the door and watch the site dome, find a helper to set the oil delivery drop rate.

5. Using a short handled flat-head screwdriver, adjust the set screw so that a drop of oil falls inside the oil viewing dome every 10-15 cycles (cycle one door at a rate of one complete cycle ever 1-2 seconds).

Component Replacements

To replace the lubricator or filter assemblies:

1. Release the air pressure from the air lines (through the HM-1020 Pneumatic Conditioning Center) by either opening the relief valve on the HCGG or opening the drain valve on the air tank.

2. Remove the plastic hose from the self locking quick fittings on each end of the assembly. Remove the hose by pushing the plastic lock on the quick fittings towards the conditioning center while pulling on the air hose.

3. Remove the six mounting screws that secure the filter and lubricator assemblies to the base.

4. Remove the two clamps from each side of the filter assemblies using a Phillips Head screwdriver. The regulator is secured by one clamp (on left side) and a brass nipple on the right side.

Note: Be careful not to lose the rubber o-ring between the assemblies.

5. Replace the part of the Pneumatic Conditioning Center that is not operating correctly and reassemble in reverse order.

Wilkerson Lubricator Set Screw Replacement

The Wilkerson Lubricator is a component used with the High Capacity Grain Gage used to evenly distribute lubrication to various locations on the HCGG. The lubricator is adjusted by using the set screw.

If the lubricator cannot be properly adjusted using the set screw, it is possible that it has been tightened too much and has caused the needle on the end of the screw to bind. Once bound, the tip breaks off when the screw is loosened. If this has occurred, the set screw needs to be replaced.

Tools Needed

Tools needed to replace the set screw:
Standard flat-head screwdriver
Socket set with 3/8" socket
3/32" Allen wrench (or similar sized object)

To replace the set screw, complete the following steps:

Step 1: Draining the Air Pressure

The air-lines on the HCGG may still contain a high level of air pressure which could cause serious bodily injury if not released. To release the air pressure for the air-lines, complete the following:

1. Open the air release valve on the air tank. The air tank is located on the combine. The air release valve is commonly located on the bottom of the air tank and is used to drain water.

2. Wait for all of the built up air pressure from the air-lines to drain.

Step 2: Removing the Lubricator

To replace the set screw of the lubricator, the lubricator must be removed from the Pneumatic Conditioning Center. This assists in the access to and ease of removing the broken set screw. To remove the lubricator from the Pneumatic Conditioning Center, complete the following:

1. Locate the lubricator in the pneumatic conditioning center on your combine.

2. Pull down on the lock on the black lubricator body.

3. Turn the bowl counterclockwise ¼ turn.

4. Work the bowl back and forth gently while pulling it away from the black lubricator body.

5. Set the oil bowl in an upright position to keep any oil from spilling out.

Note: The glass oil bowl attached to the lubricator contains the oil that is distributed through the HCGG. Remove the glass oil bowl to avoid having oil leak on to you or your work area while replacing the set screw.

Step 3: Removing the Set Screw

To remove the set screw from the black lubricator body, complete the following:

1. Use a standard flat-head screwdriver to unscrew the oil filler cap from the top of the lubricator body.

2. Use a standard flat-head screwdriver to unscrew the set screw from beside the oil filler cap was removed on top of the lubricator body.

3. Look at the needle-valve on the end of the set screw. If the needle end has broken off, the broken piece needs to be removed before a new set screw is installed.

(Example of a new set screw.)

4. Remove the clear plastic tube with the tube-filter from the brass nipple on the bottom of the lubricator by working the tube back and forth as you are pulling it away from the black lubricator body.

5. Use a 3/8" socket to unscrew and remove the hex-shaped brass nipple from the lubricator.

6. Remove the small thick black o-ring, and the ball bearing from the hole where you removed the nipple by holding the black lubricator body upside down and tapping the on the side as the O-ring and ball bearing fall out.

Note: Be careful not to lose the small steel ball bearing. It rolls out as soon as the O-ring is removed.

7. Look into the hole you removed the O-ring and ball bearing from and locate the tip of the broken set screw stuck in a small hole.

8. Place the long end of a 3/32" Allen wrench (or similar sized object) against the broken off set screw tip and gently tap on the end of the Allen wrench. The broken tip should pop right out of the top of the black lubricator body.

9. Install a good set screw and reassemble the lubricator in reverse order from which it was removed.

Note: Be careful not to break off the tip of the new set screw. Tightening the set screw too tight may cause the tip of the new set screw to become wedged into the same location that you just removed the broken tip from.

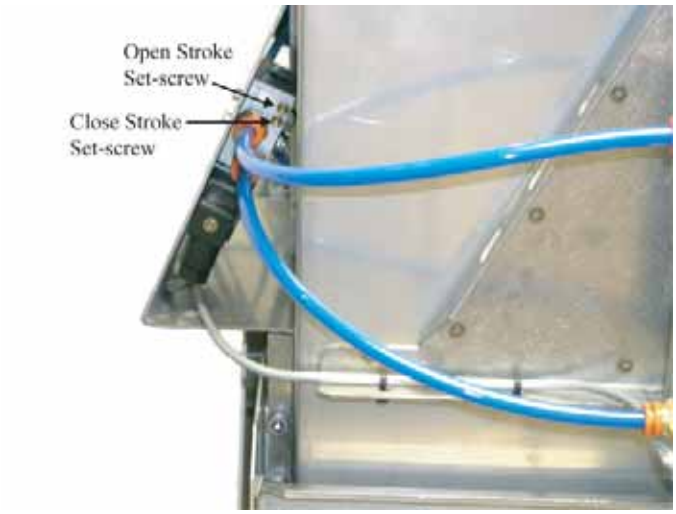
10. Adjust the lubricator as outlined in the *Lubricator Adjustment* section of this chapter.

Solenoid Air Flow Adjustment

The Solenoid air flow adjustment is used to set the amount of air that passes through the cylinder attached to the bucker door. The air flow adjustment screws are located on the solenoid. There is a solenoid air flow adjustment component for each cylinder and is located close to its specific cylinder.

The air flow is adjusted by using a flathead screwdriver and screwing the screwing the set-screw in or out. By adjusting the set-screw out, the valve allows more air flow to pass through the cylinder causing it to increase its open /close speed. Adjusting the set-screw in, the valve allows less air flow to pass through the cylinder causing it to decrease its open/close speed.

The upper set-screw controls the Open stroke and the lower set-screw controls the Close stroke.



If the set-screws do not affect the speed of the cylinder, the solenoid may have dirt or oil plugging the air hose attachment that is restricting the air flow. The solenoid either needs to be cleaned or replaced.

For directions on cleaning or replacing the solenoid, please contact one of Technical Service Representatives at (435) 753-1881 or email them at techsupport@junipersys.com.

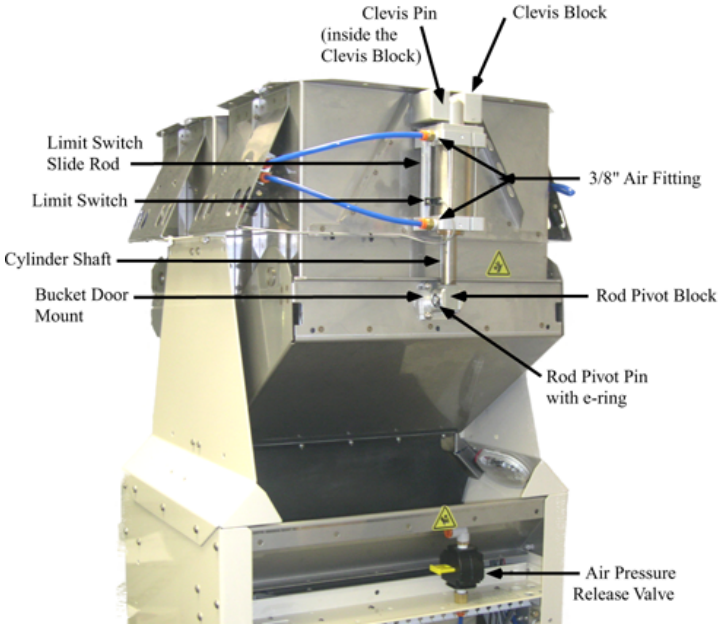
Cylinder Removal and Installation

The cylinders on the High Capacity Grain Gage (HCGG) can become worn from constant use and eventually wear out. As the cylinder wears out it leaks air, or responds slowly to the open and close command of the Serial Control and Conditioning Unit (SCCU). When this starts happening, its time to remove your old cylinders and install new ones.

Tools Needed

Tools needed for cylinder removal:
Small Flathead Screwdriver
5/32" Allen wrench
3/8" Socket wrench
7/16" Socket wrench
Crescent wrench
Vise-grip
Thick cotton cloth

The following picture locates the cylinder and identifies the components you needing to be removed or replaced throughout this process.



Removing the Cylinder

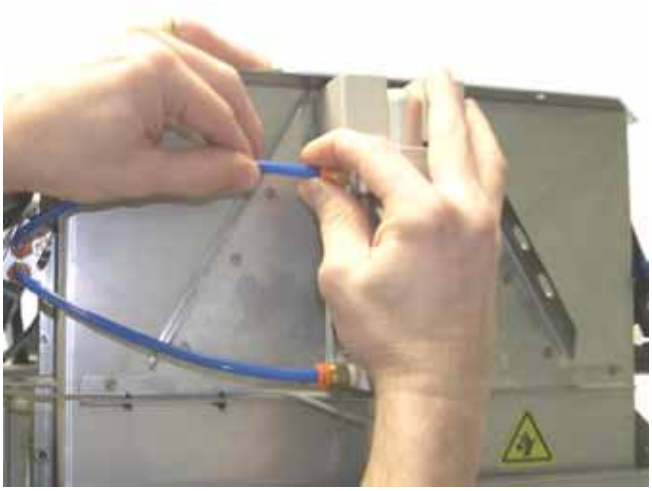
To remove the cylinder from the HCGG, complete the following steps:

1. Locate the air source shut off valve on the back of the HCGG.

2. Release the air pressure by sliding air valve to the center position.

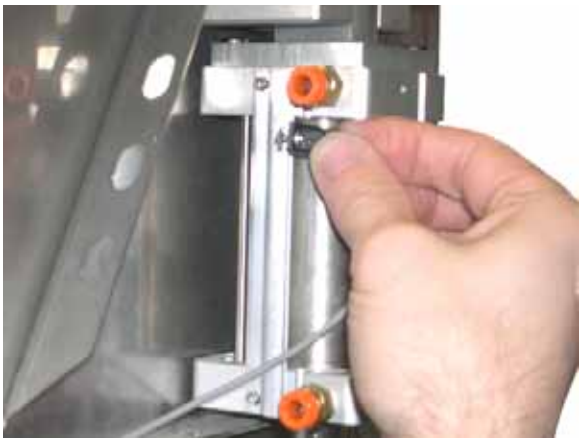
3. Using a permanent marker, mark which air hose is the attached to the top 3/8" air fitting and which air hose is the attached to the bottom 3/8" air fitting. This ensures that the air hoses are connected properly when the new cylinder is installed.

4. Remove the air hoses from the cylinder by pushing on the plastic ring around the 3/8" air fitting (commonly red or orange) while pulling the air hose out of the fitting.



5. Using a small flathead screwdriver, loosen the limit switch screw enough so that it slides up and down freely. Do not remove the limit switch screw.

6. Slide the limit switch toward the top of the cylinder and pull the limit switch out of the small notch opening in the top of the limit switch mounting slide.



7. Using a small flathead screwdriver, pry one locking e-ring from the end of the Rod Pivot Pin. The Rod Pivot Pin is used to secure the cylinder to the bucket door.

8. Slide the Rod Pivot Pin out of the Rod Pivot Block.

9. Using a 5/32" Allen wrench, unscrew and remove the four 1/4" pan head screws located inside the bucket. These screws hold the left and right Clevis Blocks to the bucket.

10. Pull one Clevis Block off the top side of the cylinder, and then slide the cylinder off the Clevis Block Pin.

11. Use a 7/16" socket to unscrew and remove the two 3/8" air fittings from the cylinder.

12. Pull the Cylinder Shaft out of the cylinder enough to wrap some thick cotton cloth around it and clamp it with a pair of vise-grips. The cloth helps protect the Cylinder Shaft from the jaws of the vise-grip.

13. Using a crescent wrench, grab hold of the Rod Pivot Block. Turn the block counter clockwise while using the vise-grips to hold to the Cylinder Shaft.

Now that the defective cylinder is removed from your HCGG bucket, you are ready to install the new one.

Installing the Cylinder

To install the new cylinder, complete the following steps:

1. Using your fingers, remove the locking nut from the end of the new cylinder shaft and discard it.

2. Pull the Cylinder Shaft out of the cylinder enough to wrap some thick cotton cloth around it and clamp it with a pair of vise-grips. The cloth helps protect the Cylinder Shaft from the jaws of the vise-grip.

3. Using a crescent wrench, grab hold of the Rod Pivot Block. Turn the block clockwise to attach it to the cylinder while using the vise-grips to hold to the Cylinder Shaft.

4. Using a 7/16" socket, tighten the two 3/8" air fittings onto the new cylinder.

Note: As an addition air tight precaution, we recommend putting Teflon tape on the threads that the air fittings screw on to, ensuring an air tight seal.

5. Slide the top of the new cylinder on to Clevis Block Pin and place the other side of the Clevis block onto the pin, clamping the cylinder in the middle.

6. Place the Clevis Blocks to their mounting locations at the top of the bucket and tighten the four 1/4" pan head screws into place using a 5/32" Allen wrench.

Note: Do not tighten the 1/4" pan head screws all the way, the cylinder need to be adjusted first.

7. Adjust the Clevis Blocks so there is a 1/4" clearance between the top of the Clevis blocks and the bottom of the bucket lip. You can place a 5/32" Allen wrench between the mounting block and bucket lip to set the clearance.

8. Using a 5/32" Allen wrench, securely tighten the 1/4" pan head screws into place.

9. Adjust the Rod Pivot Block lining it up with the bucket door mounts.

10. Slide the Rod Pivot Pin through the bucket door mounts and Rod Pivot Block pin hole. This connects the cylinder shaft to the bucket door.

11. Attach the e-ring to its proper location by pushing it until it snaps into place. An attached e-ring on each end of the pin secures the Rod Pivot Pin place.

12. Reconnect each air hose to its correct location (top to top, bottom to bottom) on the cylinder by pushing the air hose into the fitting then pulling on it to ensure it is securely attached.

13. Slide the limit switch back through the small notch opening in the top of the slide rod but do not tighten it.

14. Turn on the air source to the HCGG.

15. Turn on the power supply to the HCGG.

The new cylinder is installed but the limit switch still needs to be adjusted. Refer to the *Limit Switch Adjustment* section of this chapter to complete the installation process.

Limit Switch Adjustment

On the High Capacity GrainGage (HCGG), each cylinder has a small black limit switch to detect the position of the bucket door. If the limit switch is not set correctly for each bucket door it can result in the doors not opening or closing completely. Each limit switch is located by the cylinder for each bucket door.

Tools Needed

Tools needed for adjusting a limit switch:

Flat-head screwdriver
Permanent marker

Adjusting the Limit Switch

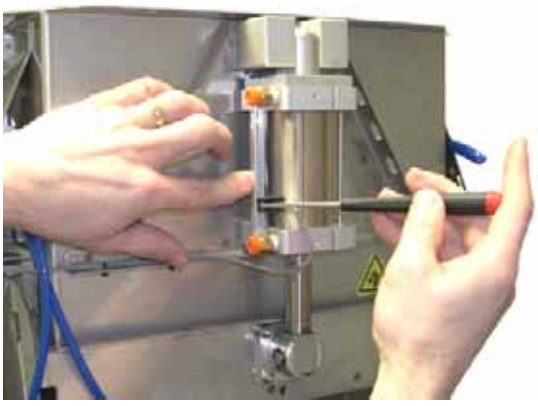
To adjust a limit switch, complete the follow steps:

1. Check that the air source and power to the HCGG are turned on.

2. Check that the bucket door is completely closed.

3. Locate the first limit switch needing adjustment.

4. If not already loosened (for those who have just installed a new cylinder) use a flat head screwdriver to loosen the small screw holding the limit switch in place.



5. Slide the loosened magnetic limit switch up or down on the channel until the LED located on the limit switch lights up.

6. Use a flat head screwdriver to tighten limit switch screw.

7. Mark the top edge of the limit switch, on the side of the actuator, with a permanent marker.

8. Follow the previous steps for each bucket door limit switch.

Testing the Limit Switch Adjustment

After the limit switch has been adjusted, we recommend testing the adjustment. To do this, complete the following steps:

1. Set the *Auto/Manual* switch on the SCCU to *Manual*.

2. Set switch to *Open*, making sure the specified door opens all the way, in the correct direction at the actuation of the manual switch.

3. Set switch to *Close*, making sure the specified door closes all the way, in the correct direction at the actuation of the manual switch.

4. Check the SCCU for the light to stop blinking for the bucket door you just closed.

Note: If the light on the SCCU continues to blink the limit switch needs to be readjusted. If the SCCU light stops blinking and stays on, the limit switch is correctly set.

5. Complete the previous steps for each limit switch on your HCGG.

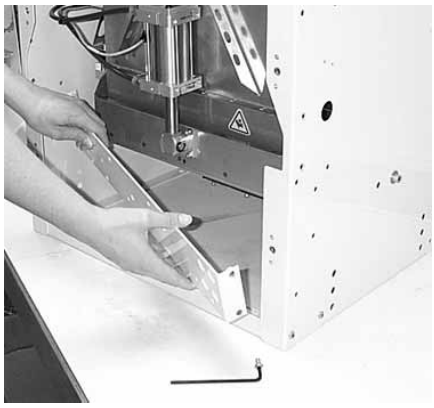
The limit switches on your HCGG are now adjusted and tested.

Weigh Bucket Removal

There are rare situations that require the removal of the weigh bucket. If you find yourself in a situation that requires the weigh buckets removal, complete the following steps to correctly remove the weigh bucket.

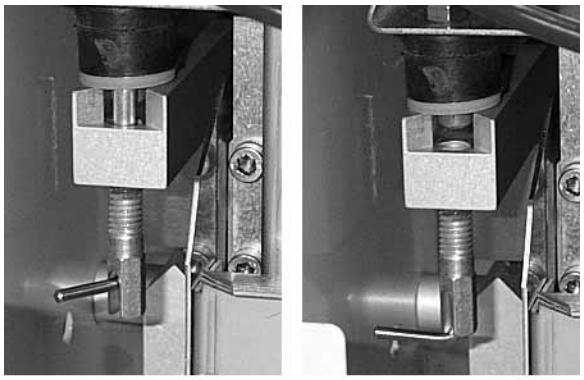
1. Unscrew and remove the front brace of the bottom half of the HCGG, allowing you access to the inside of the HCGG.

Removing the front brace



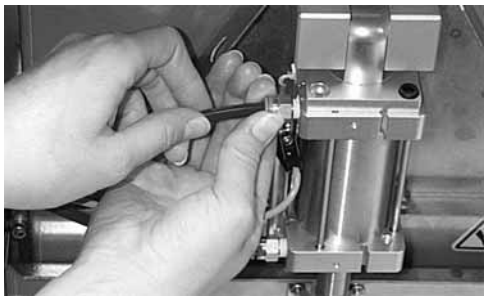
2. Push down the arms on the retractable locks and turn them forward so the locks are held in the “unlocked” position.

Unlocking retractable locks



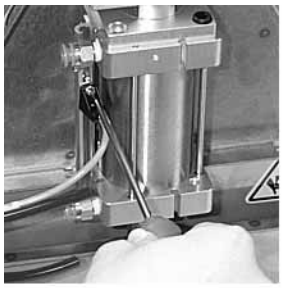
3. Remove the two air hoses by pushing in the “plastic locks” and at the same time, pulling on the hoses in the opposite direction.

Removing the air hose



4. Remove the limit switch by loosening the mounting screw and sliding the limit switch up and out of the mounting bracket.

Removing the Limit Switch



Loosen Screw

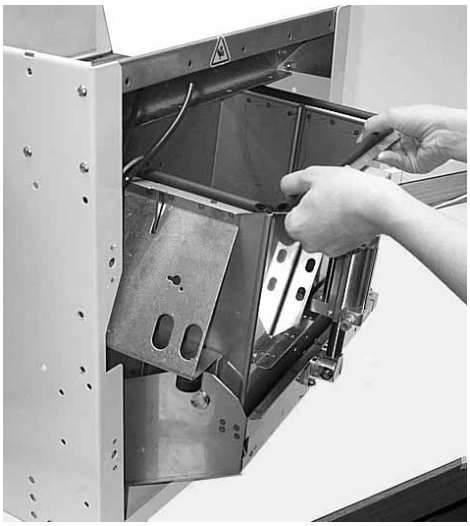
Slide Out Limit Switch

5. Disconnect the "Moisture Sensor" connector from the break out box.

Note: There is a plastic lock that allows the Moisture Sensor connector to be released. This lock must be pushed before pulling on the connector.

6. Remove the weigh bucket by pulling it towards you carefully and watching the hoses and limit switch so they are not caught as you pull it outward.

Removing the weigh bucket



Reinstalling the Weigh Bucket

Now that the all of the wiring is installed, the weigh bucket and air hoses are ready for reinstallation. To do this, complete the following steps:

1. Replace the bucket by carefully pushing it into the bottom half of the HCGG and watching the hoses and limit switch so they are not caught as you push it in.

2. Connect the *Moisture Sensor* connector to the break out box.

3. Connect the coaxial cable connector to the coaxial bulkhead fitting on the lower cross member brace.

4. Return the limit switch by sliding the loosened mount screw into the Mounting bracket and slide it down. Use a flathead screwdriver and tighten the screw.

5. Return the two air hoses by pushing on the *plastic locks* and at the same time, pushing on the hoses into the air hose holes until they cannot go in any further.

6. Push down the arms on the retractable locks and turn them so the locks slide back up into the "locked" position.

7. Return the front brace of the bottom half of the HCGG, and screw it back into place.

Your weigh bucket is now reinstalled into your HCGG.

If you have any maintenance questions, please contact a Juniper Systems Technical Service Representative at (435) 753-1881 or email them at techsupport@junipersys.com.

Appendix A
Specifications

Measurement Performance

This chapter provides specifications for the components of the HCGG System. For specifications on your Allegro, refer to the Allegro CE/DOS Owners's Manual.

Load Cell Capacities

Plot weight load cell: two 30Kg (66lb)

System Power Requirement

12 volts DC (automotive)
.5 amp typical
6 amp maximum (depends on actuators being driven)

Physical Dimensions

SCCU Size: 12" x 8.75" x 7.75"

Environmental

Operating Temperature Range

System: 0 to +50° C (+32 to +122° F)
Printer: +5 to +45° C (+41 to +113° F)

Storage Temperature Range

System: -20 to +70° C (-4 to +158° F)
Printer: -20 to +70° C (-4 to +158° F)

Humidity Range

0-95% relative, non-condensing

Accessories

Load Cells

Temperature range: -18 to +66° C
(-0.4 to +151° F)

Moisture Sensor

Temperature range: 0 to +45° C
(+32 to +113° F)

Pneumatic Tool Lubricant

Ingersoll-Rand:
Class I air tool lubricant / non-synthetic
Petroleum based
CAS# 64742-65-0
SAE-10 (90SSU)
Safety Data Sheet available upon request

Kil Frost Pneumatic Anti-Freeze Lubricant:
SAE-10 (90SSU)
Safety Data Sheet available upon request

Note: Kil Frost is not an additive. It should not be mixed with ordinary tool oils and the tool reservoir must be emptied before use so that its de-icing & extreme pressure properties are not impaired.

Printer

Interface-Serial

BAUD rate - 2400 (300, 600, 1200, 2400, 4800, 9600, 19200 available)
Voltage Levels - RS-232C: -9 to 9V
Busy Signal - Clear to Send (CTS)
20mA current loop

Character Buffering

1.5 Kb

Print Method	Impact dot matrix
Character Spacing	24 Column: 12.8 Characters/inch 32 Column: 17 Characters/inch 40 Column: 21 Characters/inch
Print Speed	130 lines per minute for 24 column 110 lines per minute for 32 and 40 column
Paper	Tabletop: 2.25”Wx2.75”D; 0.44” I.D. Large Roll - 12,500 lines Small Roll - 3,000 lines
Power	1.5 Watts (idle), 15 Watts maximum while printing
DC Voltage	Optional 9-12 VDC 140 mA idle, 1 amp with 100% printing, 5.5 Amp peak with 100% printing
Operating Temperature	+5 Deg C to +40 Deg C, or +41 Deg F to +104 Deg F
Print Head Life	1,500,000 lines mean character before failure.
Ribbon Life	Black - 200,000 characters Purple - 250,000 characters

Communications

Wiring Diagram

Pin #	Signal	DTE Direction	Description
2	Transmitted Data (TD)	From Printer	Printer data output line.
5	Clear To Send (CTS)	From Printer	Signal (equivalent to BUSY) indicating that the printer is ready for operation and can receive data.
7	Signal Ground (SG)	----------	Signal Ground
9	Paper Take-up Volt. (PTG)	From Printer	Paper Take-up solenoid supply voltage.
10	Digital Out (DO1)	From Printer	Digital output pulse to control the paper take-up.
12	Paper Take-up Grnd. (PTG)	----------	Pins 12,19, and 22 are Paper Take-up Ground.
19	Paper Take-up Grnd. (PTG)	----------	
22	Paper Take-up Grnd. (PTG)	----------	
25	+12 Volt Print Supp. (VSB)	From Printer	Printer Supply Voltage (12 VDC).

Appendix B
Printer, Ribbon, and Paper Installation

Printer, Ribbon, and Paper Installation

This appendix is for the installation of the printer, printer ink ribbon and printer paper for your SCCU unit. It also gives you options on how to customize your printer from its default settings.

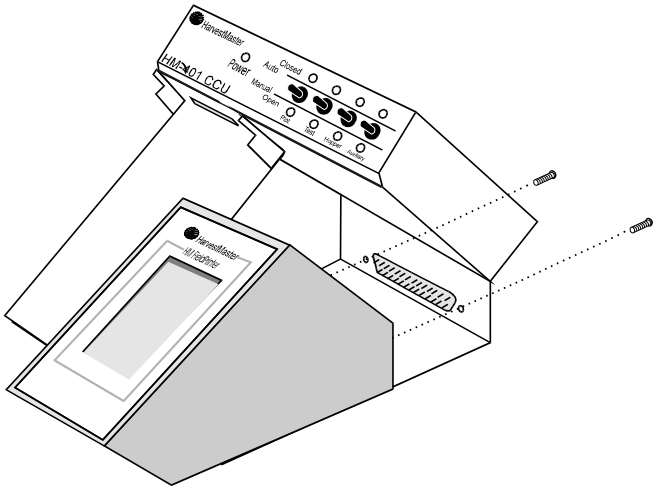
Installing the Printer

To mount the FieldPrinter in the console, complete the follow steps:

1. Set the FieldPrinter on the right side of the console and slide it back until it mates with the 25-pin sub-D connector (see Figure B-1).

2. Install two #6-32 x 3/8" screws to secure the FieldPrinter to the console as shown in Figure B-1.

Figure B-1 Installing the Harvest Data System FieldPrinter.



Note: Make sure the 25-pin connector is seated properly before the mounting screws are tightened.

Installing a Printer Ribbon

The FieldPrinter comes with an Epson ERC-09 ribbon cartridge installed. This ribbon cartridge is available from business supply stores or HarvestMaster. Replace it when the printing becomes difficult to read or after using one complete roll of paper with one ribbon cartridge.

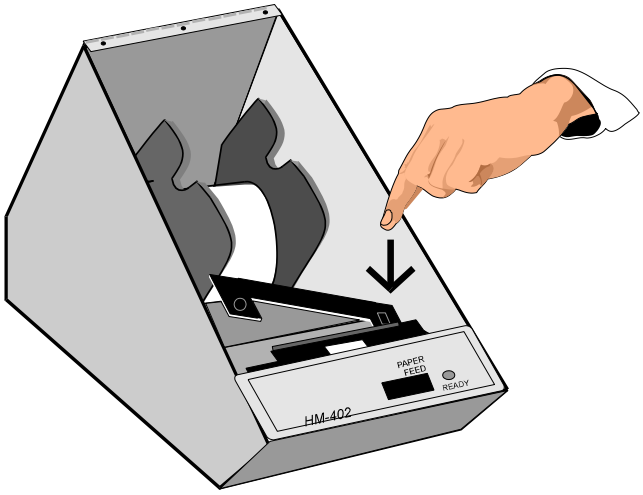
Avoid changing the ribbon cartridge while collecting data since damage could occur to the printhead if the ribbon cartridge is changed during printing. To install a ribbon cartridge into the FieldPrinter, complete the following steps:

1. Make sure the SCCU power switch is in the OFF position.

2. Remove the paper from the printer .

3. Notice the word *Push* on the right side of the ribbon cartridge. Push down to remove a used cartridge (see Figure B-2).

Figure B-2
Ribbon placement in the Harvest Data System FieldPrinter.



To prevent weak or irregular printing, make sure the ribbon cartridge is firmly inserted. If ribbon ink gets on the printer's case, immediately wipe it off with a cloth.

4. Situate the replacement ribbon cartridge in the same position as the old one. After making sure the ribbon cartridge is properly aligned, press down gently to seat.

Inserting a Paper Roll

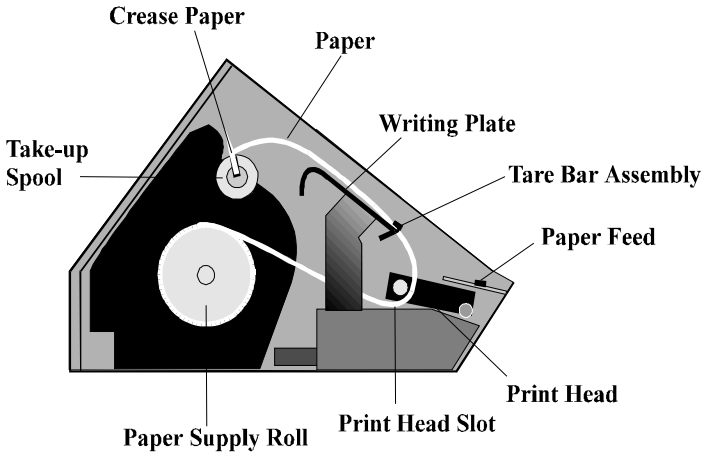
You may have to turn the ribbon slightly to get the gears to mesh as you push down on the new ribbon.

To insert the paper roll, complete the following steps:

1. Make sure the SCCU power switch is in the ON position. The HM-402 does not have a power ON feature. If you are not using it with the HM-400 SCCU, connect it to a 12V power source.

2. Insert the paper roll onto the supply spool.

Figure B-3
Paper Path in the FieldPrinter.



Note: The paper supply roll is rolling toward you as you are facing the front of the printer.

3. Unroll several inches of the paper and cut the edge diagonally to a point on one side.

Note: Be careful not to slide the paper under he print head. There is a V shaped slot the paper must be inserted into in order for it to feed correctly.

4. Slide the end of the paper into the print head slot and gently pull the diagonal point up until the full width of the paper is through the print head.

5. Carefully pull the paper through, or press the *Paper Feed* switch until there is a sufficient amount to start on the take-up spool.

6. Place the excess paper out of the way.

7. Insert the right side of the writing plate under the two screws and then squeeze the left side until it slides under the screw on the left.

8. Feed the end of the paper through the tare bar assembly (see Figure B-3).

9. Cut the point off of the end of the paper. Fold the end of the paper and crease it, then insert it into the slot in the take-up spool.

10. Roll the take-up spool a few turns to hold the paper in the slot and place the spool into its position in the take-up assembly with the gear on the left side.

11. Turn the take-up spool manually until there are several wraps around the take-up spool.

12. Close the printer's enclosure cover and secure it with the latch.

Removing a Paper Roll

To remove the printed paper roll before the supply roll is empty, complete the following steps:

1. Advance the paper through the FieldPrinter until all printing clears the printhead by using the line feed switch on the printer or press *F5* on the Allegro.

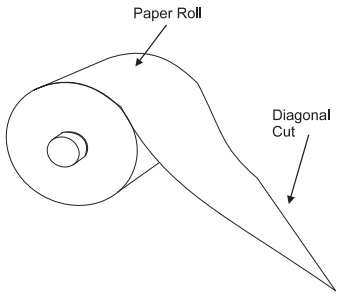
Warning:

Do not pull the paper out of the print head backwards. This could cause damage to the print head.

2. Tear off the printed paper above the printhead.

3. Re-insert the paper on the take-up spool as shown on page B-4.

Figure B-4
Cut the paper diagonally to a point on one side before feeding it through the print head.



Make sure the writing plate is locked into place.

To replace the supply roll, complete the following steps:

1. Proceed with steps 1 & 2 above.
2. Grab the writing plate with one hand and squeeze the left side until it pops free of the fastening screws.
3. Take the writing plate out of the printer and set it aside.
4. Tear the paper between the supply roll and the printer.
5. Pull the remaining paper through the printer mechanism or advance it with the paper feed switch or press *F5*.
6. Insert a new supply roll as shown by Figure B-3.

Printer Test and Setup

The HM-402 Printer is tested and set up at the factory. You should not have to make any changes to the setups. However, we have included the following for your information. Using the rocker switch on the printer performs printer tests and setups.

Printer Test

With the power to the HM-402 printer OFF, (the main power switch on the HM-401 controls the power to the printer) press and hold the right side of the rocker switch as you turn the power ON. The printer prints out a list of the configuration as it currently exists and then do a continuous print test. To stop the print test, press either side of the rocker switch.

Accessing the Setup Menu

To access the setup menu, follow these steps:

With the power to the HM-402 printer OFF, (the main power switch on the HM-401 controls the power to the printer) press and hold down the left side of the rocker switch and turn the power to the printer back ON.

Note: Changing the default setups may cause undesirable print formatting when used with the Harvest Data System. Please take note of the current setups before you make any changes.

The printer advances the paper. After the paper advance has stopped, count 3-5 seconds and release the switch. The following is printed:

***** SETUP MENU *****
CONFIGURE. . . [NEXT/OK]

If you wait less than 3 or more than 5 seconds, *Ready....* may be printed and you have to start over.

After you access the setup menu, if you press *NEXT* (left side of switch) repeatedly, you see the following list printed. If you keep pressing *NEXT* (left side) this list repeats itself.

Configure

The setup menu contains the following items:

- CONFIGURE menu
- CUSTOM menu
- SET CLOCK menu
- RESET SEQ#

The following pages explain these items and how to customize the printer to your needs.

The first setup menu item reads:

CONFIGURE. . . [NEXT/OK]

[NEXT/OK] is a visual clue so you know that pressing the left side of the rocker switch goes to the *NEXT* part of the menu and that pressing the right side of the rocker switch accepts (or say *OK* to) what this line of the setup menu says.

With the printer in the setup menu and with *CONFIGURE . . .* *[NEXT/OK]* as the last item printed, press OK (right side) to access the configure menu. The following is printed:

```
      *** SETUP MENU ***
CONFIGURE. . .          [NEXT/OK]
*** CONFIGURE MENU ***
LOAD DEFAULTS           [NEXT/OK]
```

Load Defaults

Load Defaults gives you the opportunity to reset the printer to all default settings (shown below).

```
  *** CONFIGURATION MENU ***
  LOAD DEFAULTS         [NEXT/OK]
  BAUD=1200             [NEXT/OK]
  DATA BITS=8           [NEXT/OK]
* STOP BITS=1           [NEXT/OK]
* HSHAKE=BUSY-BUFF      [NEXT/OK]
* COLS=32               [NEXT/OK]
* INVERT=NO             [NEXT/OK]
  FONT=5X7              [NEXT/OK]
  MAG=NONE              [NEXT/OK]
  Ready...
```

** The parallel interface does not have these selections.*

Choose *OK* to do this or *NEXT* to go to the next parameter. The following is printed:

```
*** SETUP MENU ***
CONFIGURE. . .          [NEXT/OK]
*** CONFIGURATION MENU ***
LOAD DEFAULTS           [NEXT/OK]
BAUD=1200               [NEXT/OK]
```

Baud Rate

Baud Rate is the first parameter you can set in the configure menu. The complete list of parameters and their possible values is shown below.

The sample list above shows the current baud rate is 1200. To accept this, press *OK* (right side) or view the next baud rate value by pressing *NEXT* (left side). Press *OK* when the baud rate you want is displayed.

Choose from these baud rates:

300, 600, 1200, 2400, 4800, 9600, 19200

Data Bits

Data Bits is the next parameter. Choose the date bit value the same way baud rate was chosen. Choices are 7 or 8 data bits. If you choose 7 data bits you can select *EVEN* or *ODD* parity. If you choose 8 data bits parity defaults to *NONE*.

Stop Bits

Stops Bits is the third parameter. Choose 1 or 2 stop bits.

Handshake

Handshake is the fourth parameter. Choose from the following settings:

BUSY-LINE
BUSY-BUFFER
XON/XOFF-LINE
XON/XOFF-BUFFER
NONE

Columns

Column is the fifth parameter. Select the number of characters per line (columns) for this parameter. The choices you have are 24, 32, or 40. Below are samples of each:

24 Column Text
32 Column Text
40 Column Text

Invert

Invert is the sixth parameter. Choose *YES* if you want inverted text (upside down) or *NO* if you want non-inverted text (right side up) in your printouts. Below is an example of inverted text:

Inverted Type Sample

Font

Font is the seventh parameter. Choose from a 5 x 5, 5 x 7, or 5 x 8 dot matrix print pattern. The 5 x 5 dot pattern produces only upper case (capital) letters. The other two fonts can output upper and lower case letters.

5 x 5 TYPE IS ALWAYS CAPITALS

5 x 8 Upper and Lower Case

Magnification

Magnification is the last parameter. This refers to the size of printed type from your printer. Your choices (with examples) are:

NONE

NONE

DOUBLE WIDE

DOUBLE WIDE

DOUBLE HIGH

D O U B L E H I G H

DOUBLE WIDE/HIGH

D O U B L E W I D E / H I G H

After you choose one of the magnifications the printer prints *READY*... to show the printer is out of the configuration menu and the setup menu and is ready to print.

Custom

The next setup menu item after *CONFIGURE. . .* is *CUSTOM. . .*. With the printer in the setup menu and with *CUSTOM. . .* as the last item printed, if you press *OK* (right side) the printer prints the following:

```
*** SETUP MENU ***
CONFIGURE. . .                [NEXT/OK]
CUSTOM. . .                   [NEXT/OK]
***** CUSTOM MENU *******
PRINT CUSTOM SETUP  [NEXT/OK]
```

If you press *OK* the printer prints the current custom setup. A sample is shown below:

```
*** SETUP MENU ***
CONFIGURE. . .                [NEXT/OK]
CUSTOM. . .                   [NEXT/OK]
****** CUSTOM MENU *******
PRINT CUSTOM SETUP            [NEXT/OK]
MM/DD/YY  hh:mm ?M DOW        [NEXT/OK]
AUTO T&D=NO                   [NEXT/OK]
AUTO SEQ=NO                   [NEXT/OK]
ZERO=0                        [NEXT/OK]
POUND SIGN=#                  [NEXT/OK]
_(underscore)                 [NEXT/OK]
BUSY INVERT=NO                [NEXT/OK]
ONLINE/OFFLINE=YES            [NEXT/OK]
EXT CH SET=NO                 [NEXT/OK]
PRINT READY=YES               [NEXT/OK]
Ready. . .
```

This manual assumes the time and date option is installed and operation. If you do not have this option you cannot see the references to the clock or date listed in most menus.

This printout shows you how each item is currently set. Following is an explanation of each item and the choices you can make for each.

Time/Date Format

Time/Date Format is the first parameter. Choose from the following formats:

This feature is available only on units with the time/date option installed.

MM/DD/YY hh:mm ?M
MM/DD/YY hh:mm ?M DOW
MM/DD/YY hh:mm
MM/DD/YY hh:mm DOW
DD-MM-YY hh:mm ?M
DD-MM-YY hh:mm ?M DOW
DD-MM-YY hh:mm
DD-MM-YY hh:mm DOW
DD/MON/YY hh:mm ?M
DD/MON/YY hh:mm ?M DOW
DD/MON/YY hh:mm
DD/MON/YY hh:mm DOW
NONE

Auto Time and Date

Auto Time and Date is the next parameter. Your choices are:

YES auto print after *CR* (carriage return)
NO do not auto print after *CR*

Auto print of the time and date does not occur unless three seconds has elapsed since the printer has stopped printing.

Auto Sequence Number

Auto Sequence Number is the third parameter. Your choices are:

NO do not auto print sequence number after *CR*
YES do auto print sequence number after *CR*

Auto print of the sequence number does not occur unless three seconds has elapsed since the printer has stopped printing.

Zero

Zero is the fourth parameter. Choose how you want the zero character to look in you printouts. Choose between *0 and 0*.

Pound Sign

Pound Sign is the fifth parameter. Choose to show pound as # or as the British pound symbol

_Underscore

Underscore is the sixth parameter. Choose which symbol the same ASCII code prints, an _underscore or a left arrow.

Busy Invert

Busy Invert is seventh parameter. Your choices are:

NO voltage is in a high state until the unit is busy then voltage level goes low.
YES voltage is in a low state until the unit is busy then voltage level goes high.

Online/Offline

Online/Offline is eighth. Your choices are:

YES enables the rocker switch to turn the printer offline.
NO disables the ONLINE/OFFLINE ability.

Ext Ch Set

Ext Ch Set is the ninth parameter. This stands for Extended Character Set. Your choices are:

YES Allows you to use hexadecimal numbers above 80 (true only for 8 data bits).
NO Disables the Extended Character Set ability.

Print Ready

Print Ready is the last parameter. Your choices are:

YES Prints *Ready. . .* upon power up.
NO Disables printing *Ready. . .*

Note: If you choose NO, hold the left side of the rocker switch down for 4-6 seconds to access the setup menu. Begin timing when you connect power to the unit and the red light comes on. The paper feed motor does not run upon power up when Ready. . . is disabled.

Set Clock

Set Clock . . .is the next item in the setup menu.

With the printer in the setup menu and with *SET CLOCK*.. as the last item printed, if you press *OK* (right side) the printer prints the following:

SET CLOCK. . . [NEXT/OK]
***** SET DATE *** [NEXT/OK]**
Set Year: 01. . . . . [NEXT/OK]

The printer shows the year currently in memory. The 0 is underlined to show the position of the cursor. This is the number which is incremented if *NEXT* (left side) is pressed. If the number is correct press *OK* (right side) and the following is printed:

SET CLOCK. . . [NEXT/OK]
***** SET DATE *****
Set Year: 01. . . . . .[NEXT/OK]

The cursor now appears over the 2nd position. Press *NEXT* (left side) to increment this number if needed and *OK* if it is right. Continue this sequence of accepting or changing the year, month, day, and DOW (Day Of Week).

```
SET CLOCK                          [NEXT/OK]
*** SET DATE ***                   [NEXT/OK]
Set Year:  01. . . . . . . . . . . . . . .[NEXT/OK]
Set Year:  01. . . . . . . . . . . . . . .[NEXT/OK]
Set Mon:   08. . . . . . . . . . . . . . .[NEXT/OK]
Set Mon:   08. . . . . . . . . . . . . . .[NEXT/OK]
Set Day:   17. . . . . . . . . . . . . . .[NEXT/OK]
Set Day:   17. . . . . . . . . . . . . . .[NEXT/OK]
Set DOW:   4. . . . . . . . . . . . . . . [NEXT/OK]
```

When you have completed the *Set Date* menu the following is printed automatically:

```
*** SET TIME ***
Set Hour:  16. . . . . . . . . . . .[NEXT/OK]
```

Choose *NEXT* (left side) to increment the number or *OK* (right side) to accept the *1*. Repeat this same procedure for hours and minutes as shown below.

```
*** SET TIME ***
Set Hour:  16. . . . . . . . . . .[NEXT/OK]
Set Hour:  16. . . . . . . . . . .[NEXT/OK]
Set Min :  36. . . . . . . . . . . [NEXT/OK]
Set Min :  36. . . . . . . . . . . [NEXT/OK]
Start Clock. . . . . . . . . . . . . . . . . [OK]
Ready. . .
```

When everything is as you want it, press *OK* and *Start Clock* is printed. Press *OK* (right side) to start the clock. The printer then prints *Ready. . .* showing you that it is out of the setup menu and ready to print.

Reset SEQ#

Reset SEQ # is the last setup menu item. This menu item lets you reset the sequence number. This number is the number of print transactions since the last reset.

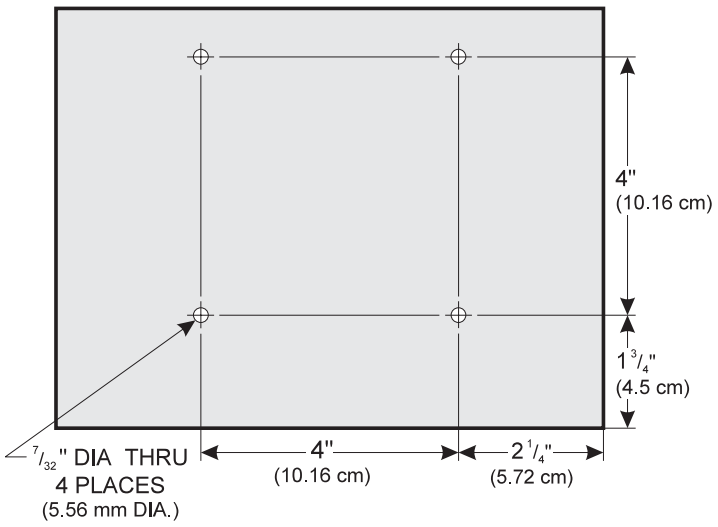
With the printer in the setup menu and with *Reset SEQ#* as the last item printed, if you press *OK* (right side) the sequence number is reset to zero and the printer prints *Ready. . .* showing it is no longer in the setup menu and that the printer is ready to print.

To skip resetting the sequence number to zero, press *NEXT* (left side). ***CONFIGURE. . .*** is printed. Unplug then plug in the printer to return to printing mode. *Ready. . .* is then printed.

Appendix C
Mounting Diagrams

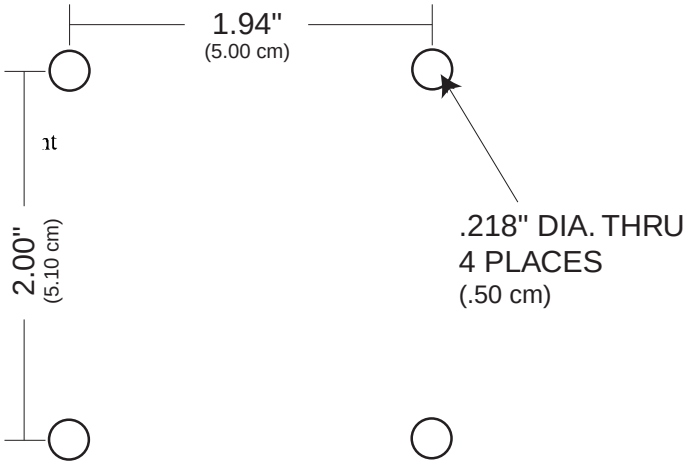
Console Mounting Diagram

This drawing shows hole placement for mounting the Harvest Data System console to the mounting base on a combine.



Field Computer Cradle Mounting Diagram

This drawing shows placement for mounting the Field Computer cradle away from the SCCU.



Actual Size

Appendix D
General Care and Warranty

Maintenance

It is important to protect your HarvestMaster hardware from constant battering of the elements. They are built sturdy to withstand abuse from the elements but with constant battering from the elements your HarvestMaster products do need to be taken care of. Here are some general care tips.

Harsh Weather

If your Harvest Data System console is mounted in a location that is exposed to the elements, we recommend removing or covering the Harvest Data System console during inclement weather. If the winter in your area is quite cold, remove the Harvest Data System console during cold months. It is best to store your system in a warm, dry environment.

We recommend that the Harvest Data System be returned to the factory once every two or three years (depending on field usage) for recalibration and a system check up.

SCCU

The electronics console can be left on the combine if it is enclosed in a cab; however, we recommended the SCCU console be stored at a temperature above freezing. For combines that are stored outside, it is recommended that you remove the console and store it inside. You should cover any open connectors that are exposed to the outside elements.

Printer

The printer mechanism should last about three years under heavy usage. When the printer mechanism fails, you will need to have a new print head installed. Contact HarvestMaster's Customer Service Department for a Return Materials Authorization (RMA) number before sending the printer in for repair.

Be sure to mount the printer on a flat surface (no greater than 10 degrees of angle) to avoid failure of the take-up assembly.

The printer's cartridge ribbon needs to be replaced when the printing becomes faint or difficult to read. For instructions on replacing the cartridge ribbon, refer to *Appendix H, Installing a Ribbon*.

Allegro

The Allegro is a factory-sealed unit. There are no internal, user-serviceable parts. If the Allegro is opened or tampered with in any other way, the system should be sent back to the factory for inspection.

The PC card cover and battery door (Allegro Field PC only) allow the unit to be exposed to the elements. Operation without these doors or with these doors not properly fastened will void all warranties associated with the unit. Make sure all doors remain intact and secure during operation or storage.

The plastic keyboard cover can be removed from the Allegro F/PC for periodic cleaning. Please see the Allegro CE/DOS Owner's Manual for more detailed instructions.

During the off season, we recommend you store the Allegro in a clean, dry environment.

Return for Repair Procedure

In the event that your Harvest Data System needs repairs, contact HarvestMaster's Customer Service Department for a Returned Materials Authorization (RMA) number. Please have the following information ready when you call:

- Serial Number
- Model Number
- Name and Company/University/Agency
- Phone and Fax Numbers
- Clear description of problem
- Purchase Order Number and Billing Address

Under the *Premium Support Agreement*, HarvestMaster will ship you a replacement loaner Next Day Federal Express or UPS Red. To avoid any problems in the return procedure, complete the following steps:

1. Once you receive the loaner unit, package your equipment (if the existing box is still good) in the same box and ship it Federal Express, Next Day Air Mail, or UPS Red.

2. Fill out the shipping and RMA forms that were included with your loaner equipment and include a description of the failure. The more information you can supply concerning the malfunction and the circumstances under which it occurred, the quicker our technicians can complete the repair.

3. Package the unit properly to avoid shipping damage.

4. Write the RMA# on the package you ship.

Your equipment will be repaired and returned to you. After receiving your repaired equipment, you will be authorized a period in which to return the loaner unit before you will be billed for it. There is an annual *service and support* fee that allows you to have this service. Please call for detailed information and pricing.

Limited Warranty

Hardware

All products manufactured by Juniper Systems, Inc. (Juniper Systems) when properly installed, calibrated, and operated in accordance with instruction manuals accompanying the hardware and used for the purpose for which the hardware was designed shall be free from defects in materials and workmanship for a period of one (1) year from the date of shipment.

In the event a defect in materials or workmanship is discovered and reported to Juniper Systems within the one-year period, Juniper Systems will at its option repair the defect or replace the defective product. Juniper Systems' obligation hereunder will be limited to such repair or replacement.

The customer shall have the responsibility to ship the defective equipment to Juniper Systems with all cost of shipment prepaid. After repair or replacement Juniper Systems will, at their own expense, ship the replacement or repaired item back to the customer using the same type of carrier.

Software

Software products which are designed by Juniper Systems for use with a hardware product, when properly installed on that hardware product, are warranted to the end user not to fail to execute their programming instructions due to defects in materials or workmanship for a period of one year from date of delivery.

If Juniper Systems receives notice of such defects during the one year warranty period, Juniper Systems shall, at its option, repair or replace the defective software media.

The warranties provided herein do not apply in the case of improper or inadequate maintenance or in the case of repair by any person not previously authorized in writing by Juniper Systems to do such maintenance or make such repairs.

These warranties likewise do not apply where the products have been operated outside the environmental specification of the product, where software products other than those specified by Juniper Systems have been used, or where attempts at software interface have been made by any person not previously authorized by HarvestMaster to perform such interfacing operations.

Disclaimer of Warranties

The warranties set forth herein are in lieu of all other warranties of Juniper Systems, whether written, oral or implied. Juniper Systems makes no warranties regarding its products (hardware or software), including without limitation warranties as to merchantability, fitness for a particular purpose, any warranty arising from course of performance, course of dealing or usage of trade whether any of the foregoing warranties are either expressed or implied.

Juniper Systems specifically makes no warranties as to the suitability of its products for any particular application. Juniper Systems shall in no event be liable for special, incidental, or consequential damages in connection with or arising out of the furnishing, performance or use of any product covered by this agreement whether such claim is based upon warranty (express or implied), contract, strict liability, negligence or otherwise.

Updates or Modifications

Juniper Systems shall be under no obligation to update or modify its products except as herein noted to correct program errors. Furthermore, the customer agrees that all representations and warranties contained herein shall be immediately null and void in the event of any modification, alteration or change in or to any product affected by or on behalf of the customer except for a change made by Juniper Systems or other direction supervision thereof.

Removal of Serial Number

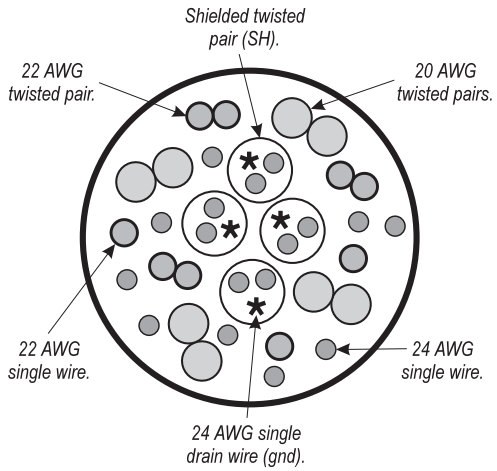
Removal of the Juniper Systems serial number label from an instrument will void any warranty on the said instrument. Juniper Systems will not repair or update an instrument and return it to an individual if the instrument is without the said serial number label.

Extended Warranties

Juniper Systems offers a variety of warranty options to extend coverage beyond the standard warranty. You can contact Juniper Systems Customer Service Department for details at (435) 753-1881 (8 am - 5 pm MST, Monday - Friday).

Appendix E
Cable Wiring

HM-420 37-pin System Control Cable



In a standard system control cable there are:

- Four pairs of shielded cables
- Four 20 AWG twisted pairs
- Nine 24 AWG single wires
- Three 22 AWG twisted pairs
- Two 22 AWG single wires
- Four 24 AWG single drain wires for the shielded twisted pairs

Connector Wire Codes - Standard

Pin	Wire Name
1	bottom gate actuator (+)
2	bottom gate actuator (-)
3	right hopper actuator (+)
4	right hopper actuator (-)
5	left hopper actuator (+)
6	left hopper actuator (-)
7	bottom gate “open” sense
8	bottom gate “closed” sense
9	right hopper “open” sense
10	right hopper “closed” sense
11	moisture sensor excitation (12V reg.)
12	moisture sensor control
13	moisture sensor shield
14	load cell signal (B+)
15	load cell signal (B-)
16	load cell “B” shield
17	load cell “B” excitation (+)
18	load cell “A1” shield
19	load cell “A1” excitation (+)
20	left grain level sense input
21	right grain level sense input
22	sensor ground

Pin	Wire Name
23	auxiliary output or compressor relay (+)
24	auxiliary output or compressor relay (-)
25	slope and motion sensor ground (-)
26	slope and motion sensor excitation (+)
27	left hopper “open” sense
28	left hopper “closed” sense
29	slope and motion sensor signal (+)
30	slope and motion sensor shield
31	slope and motion sensor signal (-)
32	moisture sensor signal (+)
33	moisture sensor signal (-)
34	load cell “B” ground
35	load cell signal + (A1)
36	load cell signal - (A1)
37	load cell “A1” ground

Helps

- Pins 1-6 and 23-24 are 20-gauge outer wires for actuator drivers.
- Shielded pairs for sensors are on pins 14 and 15, 32 and 33, 35 and 36, and 29 and 31.

Load Cell Connector Wiring

These cables come pre-wired. The following information on wiring configurations are included for reference only.

"A1" Load Cell

System Control Cable Pin #	Signal Name	Break-Out Box Pin #
35	load cell "A1" signal (+)	3
36	load cell "A1" signal (-)	4
19	load cell "A1" excitation (+)	1
37	load cell "A1" ground (-)	5
18	load cell "A1" shield	6
	no connection	2

"B" Load Cell

System Control Cable Pin #	Signal Name	Break-Out Box Pin #
14	load cell "B" signal (+)	3
15	load cell "B" signal (-)	4
17	load cell "B" excitation (+)	1
34	load cell "B" ground	5
16	load cell "B" shield	6
	no connection	2

Auxiliary Load Cell

System Control Cable Pin #	Signal Name	Break-Out Box Pin #
29	aux load cell signal (+)	3
31	aux load cell signal (-)	4
26	aux load cell excitation (+)	1
25	aux load cell excitation (-)	5
30	aux load cell shield	6
	no connection	2

Left Hopper Level Detect Wiring

System Control Cable Pin #	Signal Name	Molex Connector Pin #
11	level detect excitation	1
22	level detect ground	2
21	level detect signal	3

Right Hopper Level Detect Wiring

System Control Cable Pin #	Signal Name	Molex Connector Pin #
11	speed sense excitation	1
22	speed sense ground	2
20	speed sense signal	3

Moisture Sensor Wiring

System Control Cable Pin #	Signal Name	Molex Connector Pin #
32	moisture sensor signal (+)	3
33	moisture sensor signal (-)	4
12	moisture sensor control	5
11	moisture sensor excitation (12V reg.)	1
13	moisture sensor shield & ground	6
	no connection	2

Slope and Motion Connector Wiring

System Control Cable Pin #	Signal Name	Molex Connector Pin #
29	slope & motion signal (+)	3
31	slope & motion signal (-)	4
26	slope & motion excitation	1
25	slope & motion ground	5
30	slope & motion shield	6
	no connnection	2

25-pin Host Port

This cable comes pre-wired. The following information on wiring configurations are included for reference only.

9-pin Socket	Signal Name	25-pin Socket
1	N/C	
2	RXD (red)	2
3	TXD (green)	3
4	DTR	20
5	GND	7
6	DSR	6
7	RTS	
8	CTS	
9	N/C	

RS-232 Expansion Ports

These cable come pre-wired. The following information on wiring configurations are included for reference only.

Barcode Wand

SCCU 9-pin Socket	Signal Name
1	External Switch Input
2	Wand RXD
3	TXD
4	DTR
5	Ground
6	N/C
7	Wand RTS
8	Wand CTS
9	+5VM

Printer

SCCU 9-pin Socket	Signal Name	25-pin Socket
1	N/C	1
2	RXD	3
3	TXD	2
4	12 VSB	9
4	12 VSB	25
5	Printer Ground	7
5	Printer Ground	12
6	Printer Take-up	10
7	RTS	4
8	CTS	5
9	N/C	

HVD

SCCU 9-pin Socket	Signal Name
1	N/C
2	RXD
3	TXD
4	+12VBSP
5	Ground
6	N/C
7	N/C
8	CTS
9	+5VM

RS-485

SCCU 9-pin Socket	Signal Name
1	N/C
2	RS485 Low
3	RS485 High
4	+12VBSP
5	Ground
6	N/C
7	N/C
8	N/C
9	N/C

Appendix F
Fieldmaps Generated from ASCII

A field map to be downloaded to the Allegro and into the Harvest Data software consists of an ASCII file. An ASCII file is simply a DOS text file. It is created on a PC with a text editor, a word processor in non-document mode or DOS text mode, or it may be created in a spreadsheet and saved in tab delimited, space delimited, or CSV (comma delimited) format.

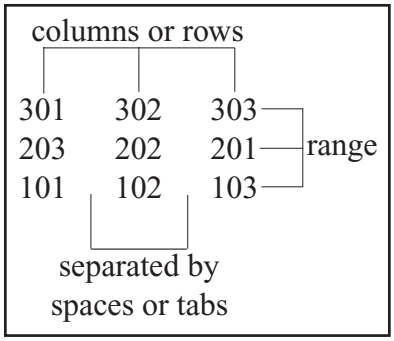
ASCII File Formats

The Harvest Data software version 3.x accepts two distinct ASCII file formats to load as maps to the Allegro: Two-Dimensional Text Representation and Harvest Order Space Delimited format. Both of these formats are discussed in this section.

Two-Dimensional Text Representation

A two-dimensional (2-D) text map consists of rows and columns of plot identifiers separated by spaces or tabs (see Figure F-1).

Figure F-1
Two-Dimensional Text File



The identifiers consist of up to 8 alphanumeric characters. If the identifier is more than 8 alphanumeric characters, it is broken into groups of 8 characters and placed in multiple identifier holders in the data file.

There is no header information included in the file and each row ends with an ASCII carriage return/line feed pair. Each plot may have one or more identifiers (see either Figure F-2 or F-3). The map to be downloaded should be entered into a text file.

Figure F-2
Field Map with only one Identifier per Plot

310	309	308	307	306
301	302	303	304	305
210	209	208	207	206
201	202	203	204	205
110	109	108	107	106
101	102	103	104	105

Figure F-3
Field Map with more than one Identifier per Plot

304,study1	303,study1	302,study1	000,study2
203,study1	204,study1	301,study1	303,study2
202,study1	201,study1	104,study1	302,study2
101,study1	102,study1	103,study1	204,study2
304,study3	303,study3	302,study3	203,study2
203,study3	204,study3	301,study3	105,study2
202,study3	201,study3	104,study3	104,study2
101,study3	102,study3	103,study3	101,study2

These maps can be generated using a spreadsheet program such as Microsoft Excel. To do this, place each plot ID in a separate cell, separating more than one ID with a comma. Save the file as a *Tab Delimited* file. Use a text editor (such as NotePad) to check the layout before downloading it.

After downloading the field map and collecting field data, you can upload the data file back to your PC. When viewed in the text editor on the PC (see Figure F-4).

Figure F-4
Uploaded Field Map as viewed in a text editor

[ID1	ID2	Plot	Moist…]
101	study3	14.2	5.4
102	study3	14.4	5.8
103	study3	12.8	4.5
101	study3	17.4	6.5

If there are portions of a field that have border rows or rocks, these should be marked with an easily identified word or group of words (see Figure F-5). Do not leave holes or unfinished rows in the map.

Figure F-5
Complete Map File with Associated Identifiers

xxxx	xxxx	xxxx	xxxx	xxxx	xxxx
border	301	302	303	304	border
border	201	202	rocks	204	border
border	101	102	rocks	104	border
xxxx	xxxx	xxxx	xxxx	xxxx	xxxx

The incomplete map causes abnormal behavior if loaded (see Figure F-6).

Figure F-6
Incomplete Map File Identification

301	304			
201	202	203	204	
101		103	104	border
001		003		

Harvest Order Space Delimited

The second type of map file is the Harvest Order Space Delimited. It may be generated in Microsoft Excel or a DOS text editor. To do this enter the plot numbers (and any associated identifiers) in the order that they are harvested (see Figure F-7).

Figure F-7
Downloaded Field Map from a Harvest Order Space Delimited file

310	309	308	307	306
301	302	303	304	305
210	209	208	207	206
201	202	203	204	205
110	109	108	107	106
101	102	103	104	105

The Harvest Order Space Delimited file could be generated by typing each plot in sequential order into Microsoft Excel or a text editor. When using Microsoft Excel, enter each identifier into a separate cell. If any identifiers are missing, fill in the empty cells with Xs. After creating your map in harvest order (from top to bottom), save the file in CSV format. Use a text editor to check the layout before downloading. Figure F-8 shows the order that the field map in the figure before was entered.

Figure F-8
Harvest order Space Delimited Map as entered into Microsoft Excel or a text editor

101
110
201
201
301
310
102
109
202
209
etc.

If you are walking in a field that has more than one study, enter the plots with a comma, separating the study identifier (see Figure F-9 and F-10).

Figure F-9
Field Map with more than one Identifier per Plot

Study 611123

304	303	302	000	305
203	204	301	303	304
202	201	104	302	301
101	102	103	204	205

Study 845223

304	303	302	203	202
203	204	301	105	201
202	201	104	104	103
101	102	103	101	102

Study 799971

Figure F-10
Map with Multiple Plot Identifiers as entered into Microsoft Excel or a text editor

Plot# Identifier, Study Identifier
101,799971
202,799971
203,799971
304,799971
101,611123
202,611123
203,611123
304,611123
303,611123
204,611123
201,611123
102,611123
303,799971 (etc.)

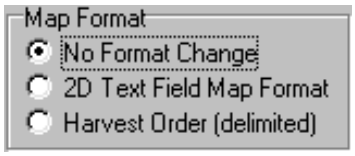
No Format Change

The *No Format Change* option directly transfers a file to the Allegro. This is generally only used when downloading setup files.

The Allegro must be running the HCGG software and connected to the PC through the communication cable before you can download maps.

You must select a format before downloading a map file into the Allegro. This tells the HCGG software how to interpret the field map file you are about to download (see Figure F-11).

Figure F-11
Map Format Selections



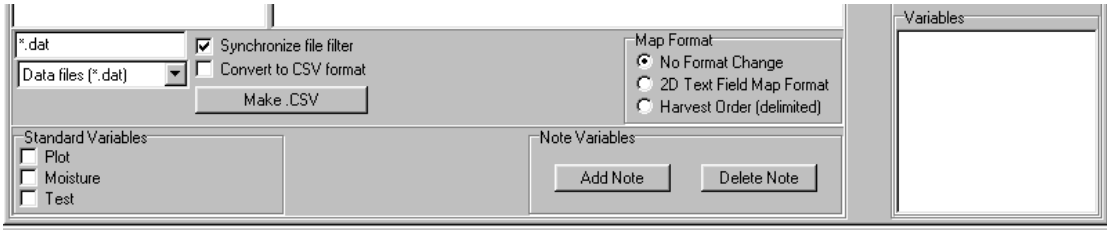
Downloading Maps

The active variables set on the Allegro, such as Plot Wt, Moisture, Test Wt, and any note variables are used to set up the map file during the transfer process to the Allegro. Any variables that you would like associated with the map need to be set up before the transfer begins. Make sure the remote field corp. is hooked up properly. To select variables complete the following steps:

1. Open DataLink and select the *Transfer Files* tab.

2. Select the standard variables you wish to record. If you would like to add note variables (such as stand counts), select *Add Note* then type in the name of the desired note. The variable options are shown in the bottom half of your screen (see Figure F-12).

Figure F-12
Variable Options Location



The variables that you have selected are displayed in the *Variables* box at the bottom right of your screen. To download a map, complete the following steps:

1. Type in the plot numbers and any associated identifiers in Microsoft Excel or a text editor. Type the numbers in either the 2-D Text format or Harvest Order Space Delimited format.

2. Save the map file as ASCII/Tab Delimited in Microsoft Excel or the text editor.

3. Make sure your Allegro is connected to your PC.

4. Check that you are running the HCGG software on the Allegro.

5. Open DataLink for Windows on your PC and click on the *Transfer Files* tab.

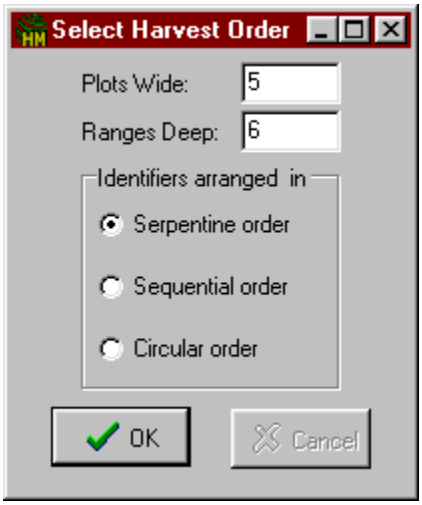
6. Click OK on the *Locating Remote* window.

7. Select the proper map file, then click on the right-pointing arrow to begin downloading.

   Note: If you have already selected the Transfer Files tab, press the refresh button to connect to the remote without exiting and reentering.

8. If you are downloading a *Harvest Order Space Delimited* map, you are shown the window in Figure F-13.

Figure F-13
Select Harvest Order window



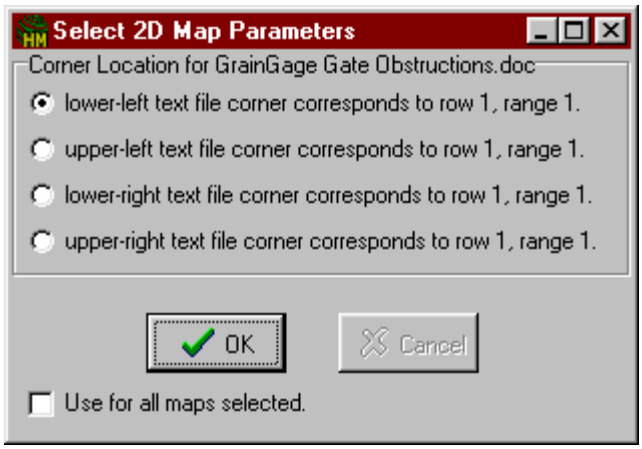
The *Select Harvest Order* window allows you to set up the width of the field, the number of ranges in the field, and the harvest direction or route that you take when the field is harvested. The two available harvest routes are shown in Figure F-14.

Figure F-14
Available harvest routes

Serpentine Sequential

9. If you are downloading a 2-D map, you are shown the window in Figure F-15. The *2-D Map Parameter* window allows you to specify which corner of the map corresponds to range 1, row 1 of the field.

Figure F-15
Select 2-D Map Parameter window



10. Select the appropriate option and click on *Ok*.

11. Click the right-pointing arrow, to begin downloading.

Note: Always view your maps to ensure that they were downloaded correctly.

Appendix G
Additional DataLink Information

Other Functions of DataLink

DataLink can be used with a number of other HarvestMaster programs. This section offers additional information about DataLink functions that are both associated and not associated with HCGG.

Registry Error

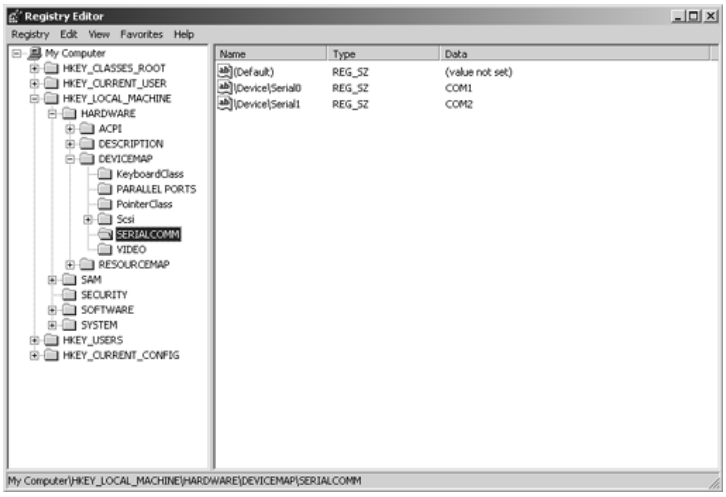
If, after running DataLink, you receive the following message: *Serial Port Information Not Available in Registry*, you need to update the registry on your PC. To update the registry complete the following steps:

1. Click on *Start* to open the Start menu and select *Run....*

2. Type in *regedit* in the *Open* text box. Click on *Ok* to run the *Registry Editor*.

3. Navigate to the following path: *Hardware* / *Devicemap* / *Serialcomm*. Figure G-1 shows how your registry should look. Make sure the items shown on the right side of the screen are listed in your registry.

Figure G-1
Registry Edit Navigation Path



4. If you do not see these items, select the *Hardware* folder, go to the *Edit* menu and click on it. Go to *New* and then click on *Key*. Name the new key *Devicemap* and press *Enter*.

5. Select the new *Devicemap* folder and go to *Edit*, then to *New,* and then to *Key* again. Name this key *Serialcomm*.

6. Open the *Serialcomm* folder then go to the *Edit* menu and choose *New*, then *String Value*. Name the new string *COM1*.

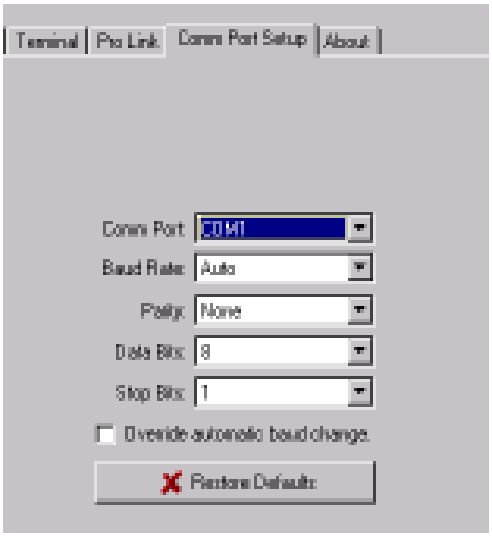
7. Select *COM1* and go to the Edit menu. Choose *Modify* and type in *COM1* as your value data.

8. Your registry looks like Figure G-1.

Communication Port Setup

If the PC and the Allegro did not communicate, the communication port settings may need to be changed. To change the communication port settings, click the *Comm Port Setup* tab in DataLink to open the Comm Port Setup window (see Figure G-2).

Figure G-2
Comm Port Setup: Default Setting



To make the correct selection for your communication setup, change the settings in the *Comm Port Setup* window. For example, if the Allegro is connected to COM2, select *COM2* from the *Comm Port* pull down window.

DataLink automatically sets the optimum baud rate for data and map transfers (9600) and ProLink transfers (115k). If you must use a different baud rate, click the box beside *Override automatic baud change* so a check appears. DataLink now exclusively uses whichever baud rate you select. Click on the arrow at the right end of the *Baud Rate* box to reveal the pull-down menu. Then select your desired setting.

Note: Changing the baud rate from Auto may adversely affect the system communication performance. Use the Restore Defaults button to reset customized settings to their original values.

For additional help on diagnosing communication problems, refer to *Help* option in your *DataLink for Windows* program.

The ProLink and Terminal sections of this appendix are not associated with HCGG but are functions of DataLink. We have included this information for your benefit as a DataLink user manual in case you desire to use these options with other HarvestMaster software you have purchased.

Transferring Files

Using DataLink, you can transfer map files and data files between the PC and the Allegro with a click of a button. To transfer files to and from the Allegro complete the following the steps:

1. Make sure your Allegro is on and in the HCGG *Main Menu* screen.

2. Click on *Start* to open the Start menu on your PC.

3. Go to the *Programs* folder.

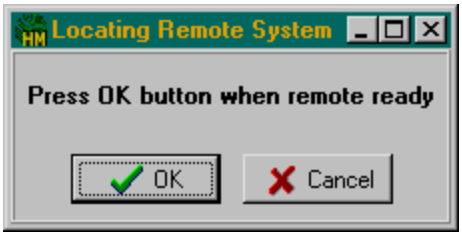
4. Select the *DataLink for Windows* directory.

5. Click on the *DataLink for Windows* program.

6. Click on the *Transfer Files* tab if it is not already in the foreground.

7. Click *Ok* in the *Locating Remote System* box (see Figure G-3) if the Allegro is on, connected, and running the application software.

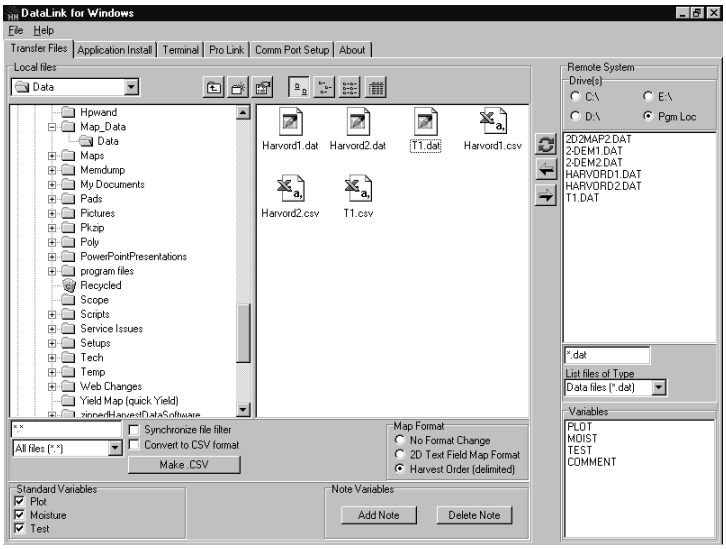
Figure G-3
Locating Remote System OK/Cancel Box



Note: If you are having problems with communication, check your COM Port setting and communication cables.

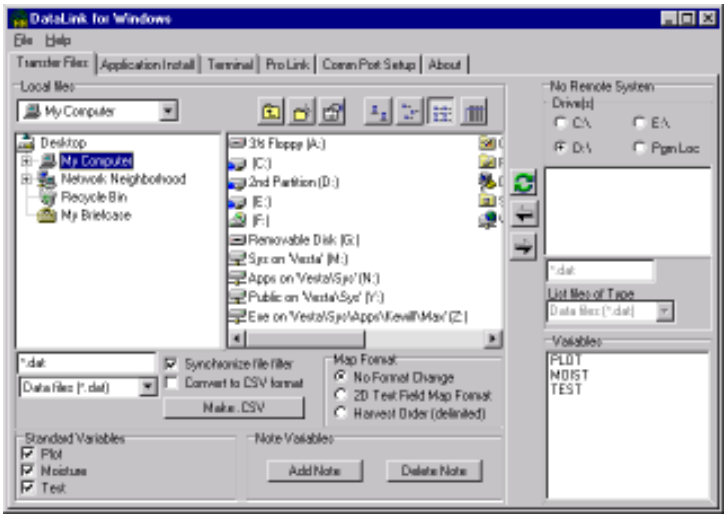
If the Allegro is connected correctly and the communication setups are set correctly, the files from your Allegro are displayed in the *Remote System* box on the right side of the DataLink screen, and your PC directory and files are displayed on the left side (see Figure G-4).

Figure G-4
DataLink Transfer Files Tab Connected to the Field Computer



If it does not connect, *No Remote System* is the title of the box on the right side of the DataLink window (see Figure G-5). Double check to make sure your Allegro is running in HCGG.

Figure G-5
DataLink Transfer Files Tab Not Connected to the Field Computer



The *Synchronize File Filter* option makes one file filter active. Disabling this option allows two filters to be active, one for your PC (left side of screen) and one for your Allegro (right side of screen).

8. Select the download format (*Map Format*) to correspond with the type of file you are downloading. See Section 4 of this manual for details on the map download options (i.e. *2-D Text Field Map* format and *Harvest Order (delimited)* format).

   Note: The option, Convert to CSV format converts data files to a comma-separated format which is best used when importing into programs such as Microsoft Excel.

9. Make sure all the variables you desire are displayed in the *Variables* box in the lower right corner of DataLink's *Transfer Files* window, for example Plot, Moist, and Test. If they are not displayed, complete the steps in the following paragraphs:

   Go to the *Standard Variables* section in the bottom left corner of DataLink's *Transfer Files* window to select your desired variables.

   Click on the empty white box, in front of the variable you desire, so that a check mark appears. The selected variable(s) appears in the *Variables* box in the lower right corner of DataLink's *Transfer File*s window.

   Note: When downloading maps, it is required that you download the variables with it. Once downloaded, you are not allowed to add or modify any variables associated with that map.

Transferring Files from the PC to the Allegro

10. Highlight the file(s) you would like to transfer to the Allegro and click on the right-pointing arrow  to start the download process.

Transferring Files from the Allegro to the PC

11. Make sure the correct drive is selected in the *Remote System* box of DataLink's *Transfer Files* window (for example C:\, E:\, D:\, or Pgm Loc). If you have not changed your current drive in the HCGG program, the default setting is the program location. To change the drive, complete the following step:

    Click on the white circle in front of your desired drive in the *Remote System* section. A dot appears in the circle of the drive you have selected. Your data files are viewed in the *Remote System* box on the right side of your screen.

12. Highlight the file(s) to be transferred to your PC, and click on the left pointing arrow  to start the upload process. A file that has been uploaded to your PC can be viewed or edited by highlighting the file and right-clicking on it. This sends the file to your preferred editor.

13. To upload more than one file, highlight the first file, then hold down the *Shift* key and select the last, or use the *Ctrl* key to highlight separate files.

Note: Refer to the Help option in DataLink for Windows for specific information on transferring files.

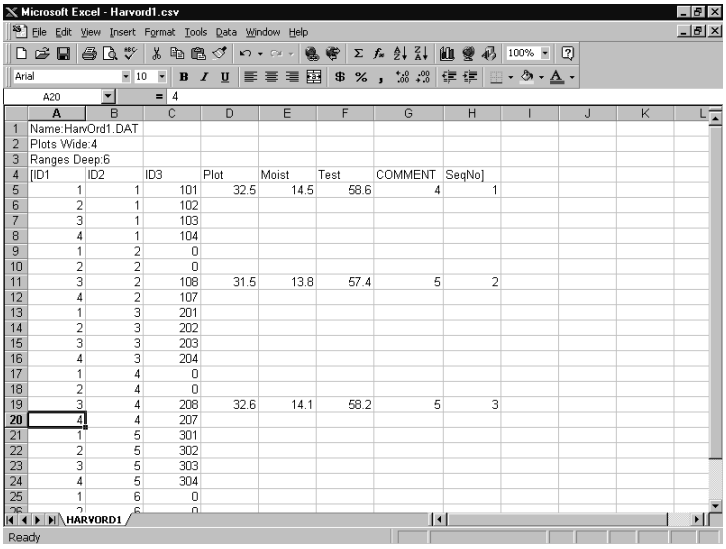
Convert to CSV Option

For additional *Transfer Files* window options go to the *ProLink* section on page 5-10 of this chapter. DataLink When the *Convert to CSV* option is not selected, the system uploads the data in a standard *Tab delimited Text* format. When the *Convert to CSV* option is selected, the system automatically opens the file with any program you would like.

Note: Comma separated format files can automatically be imported to Excel. Using My Computer, it is possible to change the file types (under VIEW) to allow your system to automatically open the file with any program you would like.

When you double click on the file that you would like to open, the system should automatically start the program and import the data for you (see Figure G-6).

Figure G-6
Automatic Start and Import to Microsoft Excel



Viewing data lets you scroll back through a set of collected data using the arrow keys to move from range to range and row to row within the selected field.

To transfer CSV files from your PC to your Allegro select either *2-D Text Field Map Format* or *Harvest Order (delimited)*, located in the *Map Format* of DataLink's *Transfer Files* window.

ProLink

ProLink is a file transfer program generally used for files not associated with the HCGG application software (e.g. custom DOS programs). To start ProLink, choose the ProLink tab in DataLink for Windows (see Figure G-7).

Note: This utility can only be used with DOS Field Computers such as the Allegro CE/DOS. FileScout must be running on the Allegro (refer to your Allegro's User's Manual for details).

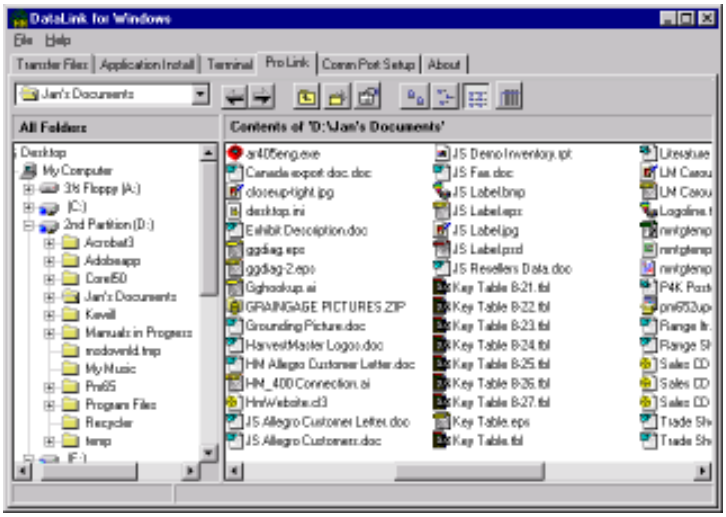


Figure G-7
DataLink for Windows
ProLink Tab

Sending Files from the PC to the Allegro

To send files to the Allegro make sure your Allegro is running FileScout or ProShell, and complete the following steps:

1. Select the appropriate drive, on your PC, by clicking on the pull-down menu located above the *All Folders* box.

2. Navigate through the folders in the left-hand *All Folders* box.

3. Double-click on the folder you want to open. Files within that folder appears in the right-hand window.

4. Select the file(s) you wish to send. To send more than one file, highlight the first file, then hold down the *Shift* key and select the last, or use the *Ctrl* key to highlight separate files.

5. Click the Right Arrow  to open the *Transmission Progress* window.

6. Click *Send* to initiate communication.

7. The *Transmission Progress* window shows the current file in transit, its progress, and the overall progress. Click *Cancel* to stop the transfer. When finished the *Transmission Progress* exits and you are back at DataLink's *ProLink* window.

Receiving Files from the Allegro to the PC

To receive files from the Allegro complete the following steps:

1. On the PC, select the appropriate drive from the pull-down menu at the top of the screen.

2. Navigate through the folders in the left-hand *All Folders* box.

3. Double-click on the folder you want to open. Files within that folder appears in the right-hand window. A received file is placed in the lowest-ranking open folder.

   Mark multiple files, in FileScout or ProShell, on your Allegro by using the INS key. On your Allegro press *F5* to transfer or send files.

4. Click the Left Arrow  . The *Receive File Progress* window appears.

5. Click *Receive* to initiate communication. (If the files are not sent within 10 seconds, DataLink times out and the communication transfer needs to be restarted.)

6. The *Transmission Progress* window shows the current file in transit, its progress, and the overall progress. Click Cancel to stop the transfer.

Note: Make sure the entire file was uploaded before deleting the file on your Allegro.

Terminal

Terminal is a diagnostic tool used mainly for troubleshooting communication problems between the PC and the Allegro. In DataLink, select the *Terminal* tab (see Figure G-8). For this option to work, both DataLink and the Allegro must be in terminal mode. (Refer to your Allegro User's Manual for information on how to set it to terminal mode.)

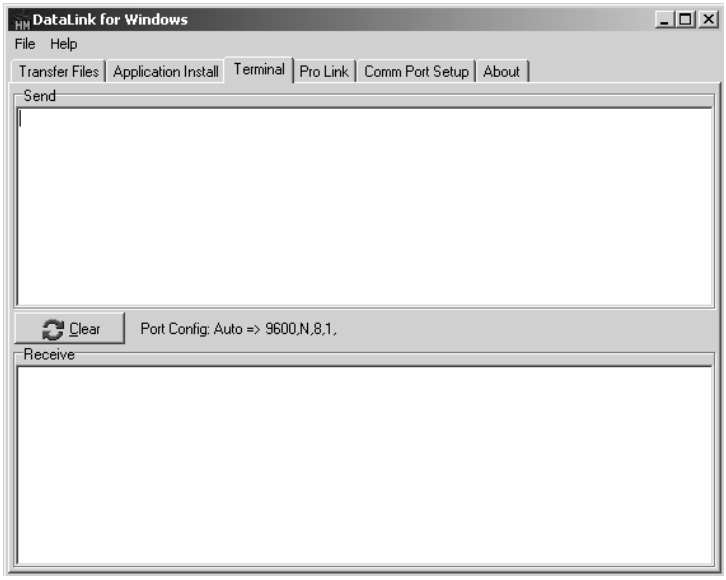


Figure G-8
DataLink for Windows
Terminal Tab

Communication between PC and Allegro

To test communication between the Allegro and the desktop PC complete the following the steps:

1. Connect the Allegro to the appropriate COM port on the PC using a communication cable.

2. Set DataLink your Allegro and PC to terminal mode.

3. Type a test message on your PC. The message should appear in the Send window in DataLink and in the Receive screen on the Allegro.

4. Type a test message on the Allegro. The message should appear in the Send screen of the Allegro and in the Receive window of DataLink.

5. If steps 3 and 4 are accomplished successfully, then the Allegro and desktop PC are communicating.

6. If these messages do not appear, as they should, make sure the connections to the PC and Allegro are correct. Make sure the Allegro is plugged into the same COM port as shown on the *Comm Port Setup* screen. You may also refer to your Allegro CE/DOS Owner's Manual, and then repeat steps 2 through 4 to check communication.

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