SECTION 1

INSTALLING THE SYSTEM SOFTWARE

Installing the software is not a difficult matter. In most cases the software will come pre-installed on the computer supplied with your system. If you need to install hardware, or re-install the software, these instructions will guide you the process.

The software diskettes that has been sent with your system boards contains all the system software and organ definition files and an initialization file specific to your installation. An automatic installation program (UINSTALL.BAT) creates all the directories and installs the proper files for you. The install program will also create a backup directory and copy all of the installation files plus your definition files to a safe place In case you accidentally erase or corrupt any of the relay system or definition files while you are getting used to the system. If this is a software upgrade from the Windows version or Dosrelay version, you may have to build some directories and copy some files manually. This information can be found in the readme.txt file that is included on the software diskettes, or separate special PRINTED instructions dictated by your needs or installation.

It is assumed that you have a working knowledge of the PC (the computer), and DOS (the Disk Operating System). If you do not feel comfortable working with the computer during the check-out phase, you should enlist the aid of someone who can guide you through the installation operations, or refer to the DOS manual(s) index to find more detailed instructions regarding the operations and topics discussed in the system checkout.

If on-site installation and check out of your system was included with the purchase of your relay system, all of the issues discussed below will be handled and explained to you by the company representative doing the checkout procedures.

We are listing all the check out steps here as a guide incase you need to do the procedure yourself.

Be Sure your computer is in working order before trying to install the software.

From the installation kit that came with your system, locate the metalized bag that contains the **System Option Device (the DONGLE).** This is an almost square gray plastic module that resembles a gender changer. Once located, remove it from the bag and plug it into the PRINTER port connector of the computer. Screw in and hand tighten the knurled knobs securing the SOD to the connector. The organ will NOT go into the **RUN** (play the organ) mode if the SOD is not attached to the printer port.

Note! Be sure the dongle is plugged into the PRINTER port and not some other port connector such as a 25-pin serial port. Plugging the dongle into the wrong port is difficult to do.

If you are not sure where the printer port is, check the operating manual of your computer and look for the port diagrams and find the connector labeled PRINTER. All computers supplied by Rickman Control Systems have all plugs and ports identified with labels, so there is no confusion.

Do NOT attempt to open the plastic cover of the SOD. You will destroy the device.

Do NOT attach any organ related cables to the computer at this time, and never plug or unplug peripherals, computer cables, the dongle, or organ interface cables into the computer chassis with the power on.

Do not plug in or turn on any of the organ or logic power supplies at this time.

The following test procedure will check out the software on the computer without any attachment to the organ console or pipe chambers.

System (Static) Check-Out

First, apply power and turn on the computer and monitor. In this test there will be no connection of cables or power to the organ. We simply want to insure that the computer is working OK.

Depending on how the system was set up, it may boot up to the C:\> prompt, the C:\UNIFLEX directory, or it may start the system automatically and bring you to either the RUN or STOPPED mode.

We'll assume here that the computer will bring you to the C:\UNIFLEX directory. and start the organ software automatically.

When the system is first turned on, the computer will boot up, start a countdown abort timer (this lets you abort the loading of the relay software), then loads the relay software and delivers you to the idle (organ is stopped) screen.

If your system was not set up this way, once the computer booted up, it may come up to the C:\> prompt, or it may come up to the C:\Uniflex directory.

To start the relay system, you type: UNIFLEX <enter> . You will see a countdown: 5..4..3..2..1 appear on the screen, counting DOWN in seconds. This is the sleep timer. Should you want to abort the relay from starting, you may press any key on the computer keyboard during this 5 second count down, and

the batch file that starts the relay system will be aborted. If you ignore the count down, the system will start normally. During the initial set up and testing of the system, the system should be set up to bring you to the STOPPED screen.
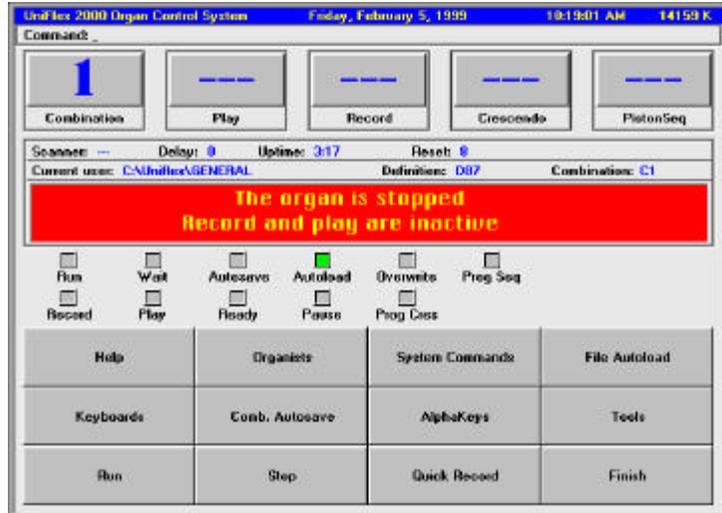
If you do not see this screen come up, i.e. the initialization process did not properly initialize the system. You will be prevented from going any further and something is setup wrong. Please give us a call and we'll talk you through the initialization error. Do not call us until you have set up a phone or extension at the computer as you will need to have access to the keyboard terminal and monitor during the call.

About the System Initialization:
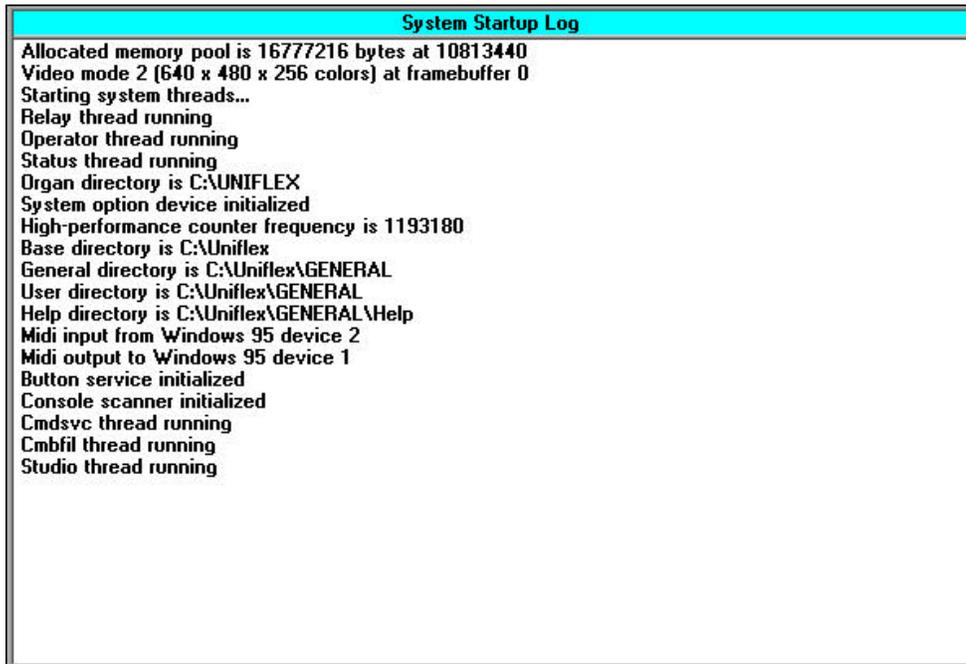
The UNIFLEX command, begins system Initialization and starts up and runs the unistart.exe file, located in the UNIFLEX directory. From here, unistart.exe looks for the Uniflex.exe and Uniflex.mon program files located in the C:\>root directory. This restarts the computer, throws away DOS and reloads a new operating system that runs the computer and the organ relay software. The screen will go black during this brief change in operating systems and then the system looks for the UNIFLEX.INI file located in the UNIFLEX directory. This file is unique to each organ. You can view this file with the DOSEDIT editor. The Appendix section of the manual gives the inside details on how to edit this file if necessary.

The UNIFLEX.INI file contains instructions telling the system which organ definition and combination action files to load, and whether it should just load them, or load them and to into RUN. Presently, your UNIFLEX.INI system file has been set up to load the organ definition file (**D1)** and take you to the STOPPED (idle) mode. Once the system goes into RUN, the system looks for the Combination Action file (**C1**) specified in the Uniflex.INI, and loads that file.

To shut down the relay software, type: **QUIT <enter>.** This will properly close down the relay and shut down the computer.

Turn the computer off.

COMPUTER SYSTEM CHECKOUT (for new and first time organ system starup)

Before connecting the organ to the computer, it is necessary to verify power supply voltages and polarity with the power supplies disconnected from the organ interface boards. There have been instances where power supplies right out of the box have polarity reversed, or the Red and Black terminal nuts on the wrong poles.

It is your responsibility to check that all power supplies are indeed putting out the correct voltages.

You will need a volt meter to verify voltages. If you don't have one yet, go out and get one before going any further.

POWER SUPPLY VOLTAGE READINGS:

The Logic Supply should indicate 13.0 to 13.8 volts on your meter.
The Organ Rectifier should indicate 14 to 17 volts on the meter.

When checking the voltages of supplies in the organ <u>for the first time</u>, you must remove both the **+** and **-** wires from the supplies. Once the voltages have been checked, turn the supplies OFF, wait 5 minutes for any capacitors to discharge and then re connect the + and – leads to the power supplies. Leave the power supplies OFF until instructed to turn them on for the first time.

Common Grounds:

Once the supplies have been wired back on line, you must insure that all the power supplies have the minus (-) sides hooked together, preferably at one junction point. This is called THE common ground, and the system requires that all power supplies see each other at this point. This includes:
1) the Logic Supply
2) the rectifier or rectifiers
3) the combination action power supply for the stop magnets, etc.

CONNECTING THE SYSTEM TO THE ORGAN

NOTE!: All power to the organ power supplies and to the computer MUST be shut OFF before you attempt to attach the ribbon cabling to the interface boards or to the computer! Serious damage to both the computer and the interface boards will result if you do not heed this warning.

1) Attach the ribbon cables to all the console and chamber input and output boards.

2) Check all the interface board ribbon cable connectors, to be sure they are squarely seated in their shrouded headers. If a connector is partially dislodged, you will experience false input sensing and false output latching.

3) Run the long ribbon cables from the chamber and console to the computer connectors. Be sure the console cable is connected to the console connector of the computer and the chamber cable is connected to chamber connector of the computer.

4) If you have any excess ribbon cable from the console or chambers, you must not coil it or roll it up. You may bundle up any slack, but don't roll it up into a spool. Rolling or spooling the excess cable creates an "inductor" and will cross couple the high speed signals sent out by the computer resulting in false keying, erratic swell shade operation, and general misbehavior of the organ.

<u>CONNECTING THE ORGAN AND CHECKING OUT THE SYSTEM</u>

Try to get the help of a friend to assist you while doing the system check out. Your assistant can help you with the visual tests if the monitor is away from the

console, and be on hand in case you get into trouble. If something happens to go wrong, it is a good idea to have someone who can get to the main switch in a hurry.

SOME PRECAUTIONS TO CONSIDER

1) Don't be in a hurry to play the organ. Take your time and _learn_ the proper operating procedures and command this instruction guild will introduce you to. This guide may appear to be lengthy, but what we are doing here is not only checking out the system, but walking you through and instructing you in how to use the system to find items, change items, and correct items and elements of the system. Later on when you want to add or change elements of the system, the steps we have taken you through here will become useful tools in guiding and helping you do things on your own.

2) _Read the manual first before you do your testing!!_ The manual should not be used as the last resort when **your** idea of how the system should be checked out has failed or caused board or system damage. In the long run, the information contained within the manual will save you a great deal of frustration and lost or corrupted file data.

3) When an instruction calls for you to perform a _test_, don't assume you or your installation is the exception. The tests and checks we ask you to do help you learn about the way the system works, and what to look for if you should experience any trouble with the system. You've connected a lot of wires, and you may have overlooked a few connections. We are not flawless either. We may have programmed something incorrectly, so a complete check out is essential to the proper operation of the system and the organ. The _tests_ we will ask you to perform are generally very simple visual inspections and a few voltage tests to assure that all the proper power supply voltages are present before you switch the system on for the first time. If you ignore the initial installation tests, and later have a problem, that problem my have been caused by _not_ performing the tests. It will also be embarrassingly apparent that you did not follow the directions when you call for help, and it may void your warranty.

4) If you do not understand an instruction, _call us._ Don't think your questions are inept. We understand that this system will be a new and foreign experience. The questions you generate also helps us in preparing a more complete installation and operation instruction manual.

5) Never us unorthodox practices ("the _hot_ wire") to activate a magnet, either at the magnet itself or from the output board until you know what the system can do for you. You should never have to use a "hot wire" with this system. Severe damage can occur to both the IC's and PC boards if a _hot_ wire is used carelessly. We recommend you use an LED voltage indicator, volt meter or signal tracer to check outputs; first at the output board, and then at the magnet.

If you need to check a magnet, use an ohm meter to measure the coil if you suspect a magnet coil is open. You do not have to disconnect the coil from the system when you use the ohm meter, as long as you check the coil for voltage first. If you are in doubt, please call us before your do something costly that you may later regret.

Never use a cheap "plug in" AC soldering iron on any input or output board connection. These irons are notorious for AC leakage. If the system gets a "whiff" of line voltage AC, serious damage will occur to your input and output boards. If you need to solder a connection to a wire connected to an input or output board, and you do not have a soldering station designed for electronic work, unplug the 8-pin wiring connector(s) from the input or output board **first**, then do your soldering. When you have finished soldering the connection(s) you can plug the connector(s) back on the interface boards.

You may want to consider purchasing a rechargeable battery operated soldering iron or propane powered soldering iron. These are great because they do not require a cord to drag around the chambers and they provide the maximum protection to the interface boards. If your interface boards are damaged by line AC leakage from a soldering iron, the damage is NOT covered by the warrantee.

The Organ Check Out Procedure:

STEP 1

Take the time to make a visual inspection of each INPUT and OUTPUT board in both the console and chambers to verify that the ribbon cables are all properly inserted in their board sockets. In other words, make sure there are no ribbon cables that are half on and half off, or unplugged.

Also check to see that the logic power and ground connections are correct.

Make sure that a common ground exists between all power supplies in the system. This is an often overlooked connection. There should be a reference common (#18 wire) between the logic supply (**-**), rectifier (**-**), console stop action power supply (**-**), etc... If this ground reference is missing, you can expect unpredictable results. (this could also "fry" some output boards). You must also insure that there is a (**-**) NEG. connection between *organ* chest common and the GND pins of the OUTPUT boards in each chamber. This is the diode common (spark suppression diode common) for the output boards. Refer to the system wiring instruction pictorials if you have any doubt.

You should also install any fuses into the fuse holders you may have installed for the I/O boards. The fuses supplied with your boards are 5A SLOW BLOW fuses.

STEP 2

Once the organ is connected to the computer, you should verify your electrical switching system so it switches power to the computer, monitor, and logic supply(s) simultaneously. The rectifier can come on with the organ blower if so desired, but the rectifier should be configured so it can be switched off without having to turn off either the computer system or the blower. If something goes wrong, you want to be able to disable the rectifier quickly. The rectifier must be wired so it CAN NOT be turned _**on**_ without the computer and logic supply being on _**FIRST.**_

STEP 3
For the first initial check of the system, you must disable the organ rectifier(s) feeding the chamber output boards. Either pull the plug, fuse, or turn off the circuit breaker(s).

If you have a separate *console stop action* power supply, or battery pack for the combination action magnets, this must be disabled as well.

For the first test, other than the computer and monitor, only the logic supply should be on.

Once you have the rectifier and stop action power supplies disabled, switch on the system power, and check to be sure the computer, monitor and logic supply are all on.

Take the time to check the logic voltage on one of the Input or Output boards in both in the Console and Chambers with your volt meter.

Logic voltage readings should be around 13 Volts. If there is no logic voltage, or it reads 7 Volts or less, you have a problem, and this must be corrected before you go any further.

The organ will not RUN properly (or at all) if logic power is not present at the console AND chamber interface boards.

If you see a voltage less than 8 volts, there is most likely a bad interface board, a bad logic supply, or a short in the wiring.

Turn the computer and the logic power supply OFF.

First you must determine where the problem is; CONSOLE or CHAMBER interface boards.

If you have a single logic supply for both console and chamber boards, disconnect the power lines (+ and -) connecting the chamber output boards so that just the console boards are powered from the logic supply.

Switch the logic power supply back on. Immediately read the voltage at the logic supply terminals. If the voltage is still low (previous reading) shut the logic power supply off.

Remove the logic power lines (+ and-) from the console boards. Reconnect the chamber logic power lines (+ and -). Turn the logic power supply on again. Immediately read the voltage. If the voltage is still low shut the logic power supply off.

If either the console logic boards or the chamber logic boards (isolated from each other) cause the logic voltage to be low, there is a more serious problem. Give us a call and we will work with you in further determining the problem.

If after isolating the console or chamber logic boards causes the logic voltage to return to normal (around 13 volts), then you know which set of boards is causing the power drain.

The easiest way to find the source of the problem is to first turn the power off, remove all the ribbon cables from the set of input or output boards that caused the power drain.

Once you have removed the ribbon cables from the console or chamber boards that caused the drain, turn the power back on and test the logic power supply voltage with all boards unplugged.

If the voltage reading is back to normal, around 13 to 13.8 volts, start plugging in the ribbon cables one at a time. Your helper should be at hand so one of you can plug the cables in and the other person can and immediately take a voltage reading. The logic voltage should remain constant. If you find that when you plug the ribbon cable onto a board and the voltage drops to 8 volts or so, you've found the bad board.

For now, leave that board un plugged and continue to check all the remaining boards.

Replace the bad board with the spare board that was included with your system. and test the voltage again with the new board installed.

If more than one board turns out bad, please call us so we can send you replacement boards. There have been very few incidents of "bad boards" cropping up in a system, but it can happen.

If you have removed all the ribbon cables from the boards and the logic supply is still low then more serious action must be taken.

Turn the logic supply off.

You must now remove the + logic connection to each of the boards. These are solder connections, so you must heat up your soldering iron to accomplish this.

Once you have removed the + logic power connection from each board, turn on the logic supply once again. Leave the common ground wires attached to the interface boards. Immediately take a voltage reading. It should be at 13 to 13.8 volts.

If it is still low with all boards un powered, check the wires from the logic supply to your power bus. You may have a short in this cable.

Shut the logic power supply off. Connect ONE of the interface boards to logic plus. Turn on the logic supply and immediately test the voltage.

If the voltage is normal, connect one end of the ribbon cable to the powered board.

Check the voltage again. If normal, use the ribbon cable to power the second logic board by plugging the ribbon cable onto the second board.

Check the voltage again.   If you have a helper, he can verify the voltage readings as you do this.

What you are looking for is the board or boards that when powered through the ribbon cable cause the voltage drop. If you find one, unplug the ribbon cable connection for that board and continue the testing of each individual board until all boards are powered through the ribbon cable.

If this turns out to be more than one board, call us so we can send you replacement boards.

Obviously, if you see smoke or hear crackling and popping noises followed by smoke when you power the system up, shut the system down immediately!

If everything checks out after your voltage checks, proceed with the next step.

STEP 4
When the system has booted up, the system has been configured to start the relay system automatically.

The system should initialize and the definition should load automatically and take you to the RELAY **STOPPED** screen.
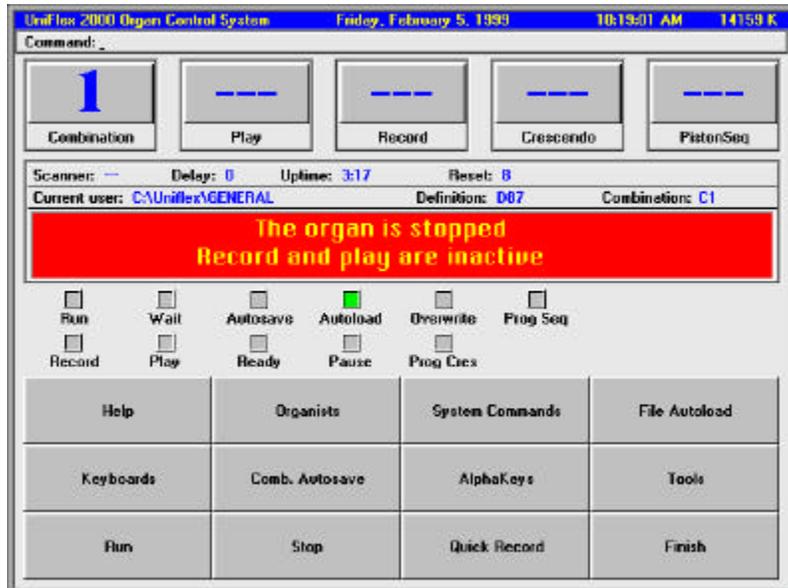
Access the system directory and check the files in the "general" user directory. To access the system directory, type DIR <enter>. This will show you what files you have on the disk to work with.

D# (# = number) files are organ definition files.
C# files are organ combination action files.

You should have a D1, a D2, and a C1 file in your directory. To leave the directory, press the ESC key. and you will be returned to the STOPPED screen.

STEP 5
 Type: **CONSOLE** and press the return.

The Console Scan screen overlay should appear.

Press a few keys, or turn on a few stops, and press a piston or two.

Looking at the monitor screen, you should see them register their input wiring address and corresponding programming element names and numbers; identified as either keys, stops, or pistons.

Press the **ESC** key to exit the Console Scan. This tells us the interface is receiving console data and processing it.

Turn off all the stops you just turned on while in the console scan mode.

Step 6
Type **ST** <enter>. This is the System Timing test. A pop up window will appear with some system timings. Your system timings should be somewhere around the values shown here:

```
┌─────────────────────────────────────────────┐
│              System Timings                   │
│                                               │
│   Delay reference:       10 nanoseconds       │
│   Output word:         1254 nanoseconds       │
│   Output byte:         1309 nanoseconds       │
│                                               │
│   Cable output:           9 microseconds      │
│   Read DAC:              38 microseconds       │
│                                               │
│   Console Scan:         669 microseconds       │
│   String Output:         80 microseconds       │
│   Formatted Output:     293 microseconds       │
│                                               │
│   DAC low value:          0 units             │
│   DAC mid value:        152 units             │
│   DAC high value:       255 units             │
│                                               │
└─────────────────────────────────────────────┘
```

TIMINGS DISPLAYED IN **TEST**

System Test is rather complex to explain, and if we did take the time to explain all of the parameters, you probably wouldn't understand them any better than you do now. System Times is a diagnostic that displays how fast the system is seeing inputs and how fast it is processing outputs. If you should have a problem, and contact us for help, the first thing we would have you do is run the system test and have you read back to us what the system was reporting. There is, however, one significant area of the system test that you should look at. This will tell you instantly if the computer bus interface card is malfunctioning. This information is at the bottom of the test screen.

If the bus interface board is operating normally, you will see:

DAC low value:	0 units
DAC mid value:	153 units
DAC high value:	255 units

Every time you run test, if the DAC values show as 0, 153 and 255 for low, mid, and high values, the bus interface is good. The MID value may be different on your System Time Test display. 153 is average, but it could go as high as 165 or as low as 140. These are acceptable differences.

If all three, Low, Mid, and High values indicate 255, there is a problem with the PC bus interface board.   If you see any thing way out of line give us a call.

Press the ESC key to close the test screen and bring you back to the STOPPED screen.

Step 7
Type RUN <enter>. The red STOPPED banner will go away, and the initial combination action file (C1) will load.
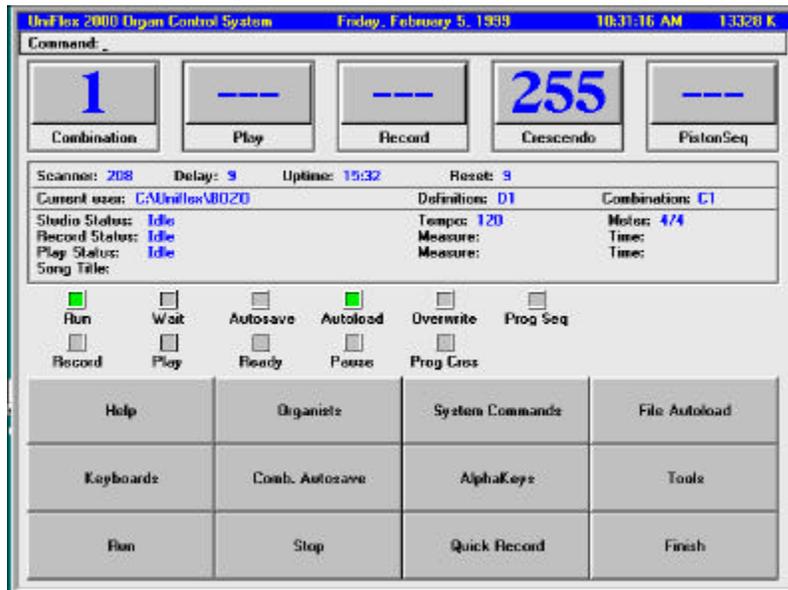
Type: **SS** <enter>.

This will bring up the SHOW *SIGNALS* test routine. Two windows will pop out and overlay part of the RUN screen. The window on the left is the RELAY INPUT window and the window on the right is the RELAY OUTPUT window.
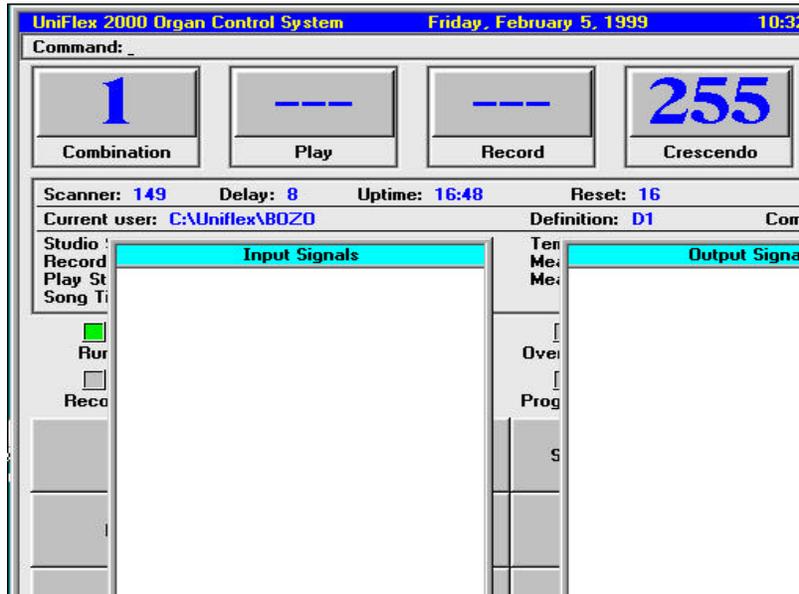
Note: When you enter the **SS** window, it should come up blank.

With ALL stops OFF, press ONE key on any keyboard. You should see an INPUT address appear in the INPUT window followed by an ON. When you release the key, you should see the same INPUT board address followed by an OFF. Each event listed in the RELAY INPUT window will consist of an address and ON, then an address and OFF corresponding to when the input was activated and when it was released. Nothing should appear in the RELAY OUTPUT window. If you press several keys or pistons, you should see the following:
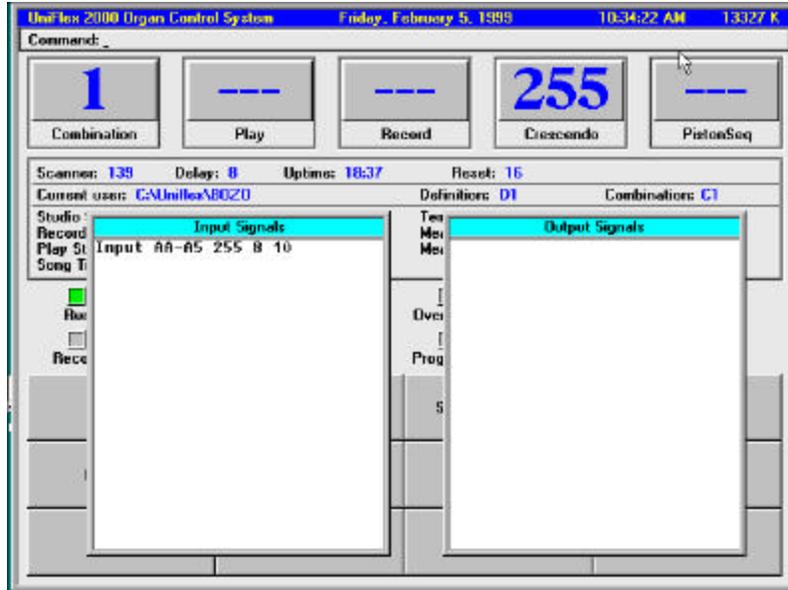
STEP 8
Turn on two or three stop switches. You should see the address and the word
ON should appear in the RELAY INPUT window for each stop.

Now press a key on the keyboard associated with the stop you just turned on.
You should see an output board address appear in the Relay Output window. It
should act just like the Relay Input window. You should see activity in BOTH the
Relay Input window and the Relay Output window when pressing a key with a
stop on.
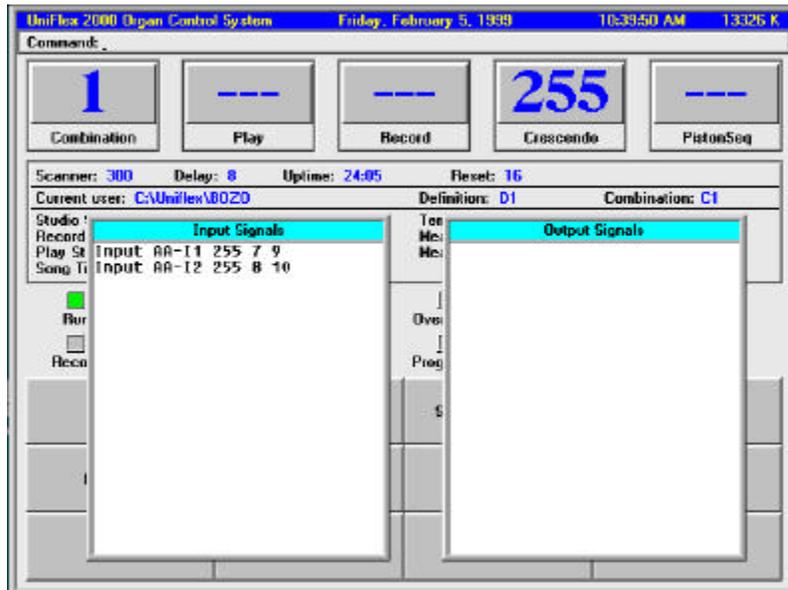
This *show signals* test indicates that the relay is accepting inputs, and sending
them to the chamber outputs, so we can assume that the relay and software are
indeed working correctly.

Press the **ESC** key. This will terminate the SHOW SIGNALS test and remove the two windows from the screen.

NOTE: We have recently discovered a "bug" that may cause your system to lock up when you escape from the show signals windows. If you system locks up, just press the reset button on the computer. When the system comes back up, you will be at the stopped screen and you will be able to resume the checkout.

STEP 9
Type **STOP** <enter>.

Once you type the stop command, you will see the following screen appear:
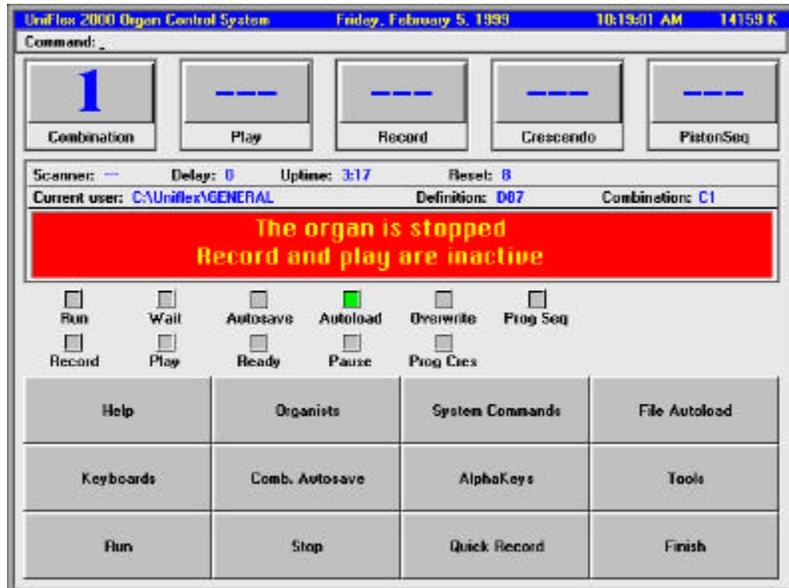
This is the STOPPED mode of the system. The organ will not play if you are in the stopped mode.

STEP 10
Start the Blower (without the rectifier). If there are pipe ciphers, fix them. The organ must be silent.

Make sure that all stop switches are OFF, and the expression shoes are fully closed.

Reconnect the organ chamber rectifier(s), but do not connect any console stop action power supplies at this time.

Type: RESET <enter> . This will send out a reset to all the output boards in the system.

Have your assistant turn on the chamber rectifiers.
NOTHING SHOULD HAPPEN and no pipes should play.

If all the pipes or a large number of pipes come on and begin to cipher, type
RESET <enter> again. This will send a reset to all the output boards in the
system. If this does not quiet the pipes, shut the rectifier(s) down immediately.

If only a few pipes begin to cipher, and the RESET command does not seem to
silence them, determine the output board(s) in question and remove the +
rectifier line to those boards. (This usually does not happen, but you should be
prepared, just in case.)

STEP 11
Reconnect the console combination action power supplies and switch them on.
Again, nothing should happen, no stops should come on by themselves.

Type: **RUN <enter>**.
The Screen will delete the red banner "The Organ Is Stopped" message and
change to a yellow banner with the words "Initializing the runtime system" briefly
appearing and then the screen will change to the RUN format:
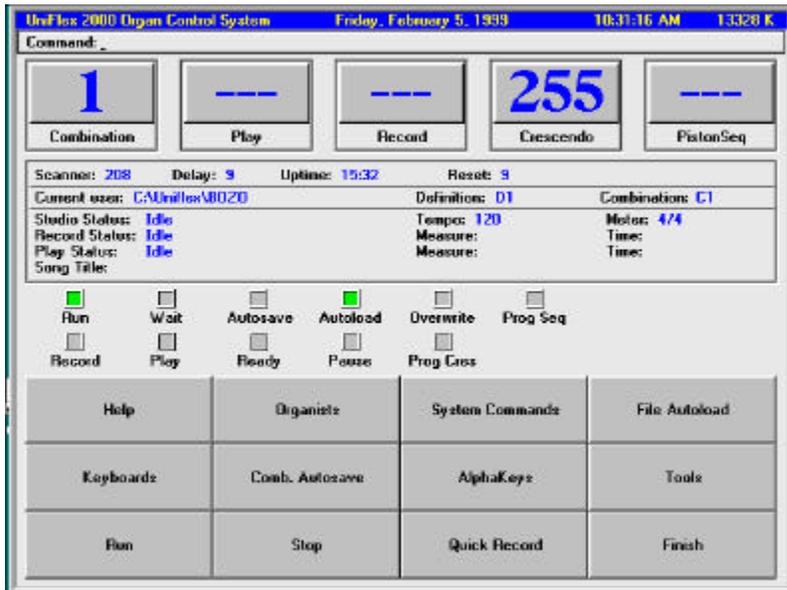
You should see a green banner at the bottom of the screen that says:
"Combination file C1 load time was "nnn" Milliseconds".

The organ should now be playable, so test a few stops and keys on the organ,
but be brief. There is still more check out procedures to complete.

STEP 12
Carefully check through the organ stops, keyboards, and other controls for obvious wiring or programming errors. Obvious errors would be turning on a flute stop and hearing a string or reed stop play. Other symptoms of wiring erros would be playing the keyboard and having C# play on the C key and C play on a C# key.

You should try each stop one at a time and play through the keyboards. Before you determine that an wiring or programming error exists when playing the ranks, remember that there could be a tuning problem as well.

Do not be alarmed if the combination action pistons don't do anything. The combination action still needs to be set up. This will be covered after the initial organ checkout.

If stop or key errors exist, jot them down on a note pad, making reference to the stop name and number or keyboard name and number, etc. You can use the Console Scan to identify the addresses and element numbers of any anomalies you find. The Console Scan test is next.

STEP 13
A thorough check out of the system must be done with the CONSOLE SCAN routine as previously discussed and demonstrated. This will take about 10 to 15 minutes. CONSOLE SCAN testing must be done in the STOPPED mode.

Type STOP <enter> and then type CONSOLE <enter>. If you attempt to run the console scan in the run mode, a red banner error message will appear at the bottom of the screen telling you that this routine must be run in the stopped mode.

The Screen STATUS Bar

The bottom area of the screen is called the status bar. Whenever you enter a command the system will echo back to you that in a green highlight that the command was received and processed, or in a red highlight that an error was detected.

The status bar also informs you of what condition the system is in. When the system is at the STOPPED screen, you will see the word IDLE at the far right.

When the system is stopped and scanning, IDLE will be replaced with a yellow highlighted SCANNING.

When the system is running, the word RUNNING will appear with a green highlight.

At the far right is a slow spinning computer status indicator. If the computer is operating normally, this little pie shaped icon will continue to spin. If the computer crashes or is locked up, the icon will appear frozen.

The Status bar also tells you what the system is doing when processing commands or requests.

Depending on the speed of your computer, some processing takes longer on slower machines than on faster machines. When the system is building large user lists, or long directory files, a yellow highlighted banner will appear telling you to please wait, processing is occurring.

Continuing with the console scan, you will want to Check all Keys, Stops Switches, Pistons, Swell Shoes, Toe Pistons, Control Switches, etc. that are wired to input boards on the console.

Verify everything. It would be helpful to have an assistant help you if you decide to do a complete checkout with the CONSOLE SCAN.   When you press a key, other input, the console scanner will identify the wiring address and the programmed function of the input you selected. What appears as the item NAME should resemble what you have activated.

Example; pressing the low C of the PEDAL board, the console scan should display a message that you have pressed KEYBOARD 1 (KBD-1) NOTE 1.

Turning on a stop; the 16' pedal Tuba, you should see that the item on console scan will read STP-1 16' Pedal Tuba.

If STP-4 16' Pedal Oboe Horn appeared, there is probably a wiring error. You should have your input wiring sheets nearby to refer to.

Remember, when you are in Console Scan, the playing operations of the console are suspended as long as the window is present on the screen. Don't be alarmed if the organ stops playing while you are in Console Scan, this is normal.

One person should work at the console and the other should watch the monitor. If you want to clear the screen at any time, press the ESC key, and the console scan screen will go away.

To re-start the Console scan again, with a clean screen, Type: **CONSOLE <enter>**. The console scan screen will overlay the stopped screen.

Start with the keyboards, including 2nd Touch. Go through all the keyboards note by note and check each note for proper order. The Console Scan screen

will list the keys as they are pressed, and you should see an orderly list from 1 to 61.

The order of the keyboards:

Keyboard 1 is always the PEDAL
Keyboard 2 is manual 1 (the lowest manual)
Keyboard 2 is manual 2
Keyboard 3 is manual 3
keyboard 4 is manual 4

If you have a pedal or manual 1 2T contacts, they will be the last keyboards defined.

If you are testing a keyboard with Second Touch, press the key until the first touch makes, verify its order, and then go into Second Touch and verify that it is in proper order.

Console scan will also show you visually and audibly when the key contact closes to ground. It will also display any 2nd touch contact bleed through. Every time a contact is made, you will hear a short "beep" as well as see the information about the contact closure on the screen.

If you are testing a 2nd touch keyboard, you can easily tell if and when the first touch and second touch contacts are making contact.

Make note of the wiring address and note number of any note that is out of order.

Once you have checked out the keyboards and pedal board, move to the stops, turning each one on and checking the stop name appearing on the screen with the stop name engraved on the tab.

Some stop names displayed in Console Scan may appear slightly different than what is engraved on the stop, like a 4' Diapason will appear on the screen when 4' Octave engraved on the tab. The same will apply with the Tibia. The screen may say 4' Tibia, when the stop is engraved 4' Piccolo. This is not an error. The computer generates these names from the programmed Rank *names.* Every stop associated with the Tibia will have the TIBIA designation when presented on the console scan.

Make note of the STP number of any stop that shows up incorrectly while using the Console Scan.

If the Stops check out O.K., move on to the Pistons. Piston names are not real critical. They are named only for list identification, and will be programmed specifically when you get to setting up the combination action system.

You should only be concerned if nothing happens when you press the piston. If it does not indicate on the console scan, it will not work with the combination action. Check for bad contacts or a broken wire.

Finally, check any and all effects buttons, piano levers, reversible pistons, etc. and you are through with the console input check out.

STEP 14
The important information to make note of when a wiring or programming error is found are the element numbers.

Example: from the Console Scan, you have found a problem on the Pedal board. Note the KEYBOARD NUMBER: KBD-1. as displayed by the Console Scan. Next note the KEY NUMBER: Note 13.

If an input address problem is found on STP-2, jot down the information the Console Scan is showing you. The important items are: Input Address, Stop Number, and Stop Name. Write these down on your note pad so you can later enter the editor and make all the corrections to the inputs at one time.

You may experience contact problems. Either the contact does not beep or display anything on the screen when activated, or it displays machine gun (rapidly repeating) address entries on the screen.

If you did not renew the key, stop or piston contacts when the system was installed, you may have what we call contact bounce. Generally, this is caused by contact oxidation. There is very little current drawn when an input is activated. Repeated contact activation usually clears the problem up by eventually breaking down the contact oxidation. Exercise the key contact 15 or 20 times. If it does not improve, you may have burned or pitted contacts or chopper bars from the previous keying system. Severe contact problems may require you to replace the key and piston contacts with new silver wires and channel silver choppers.

If you experience a contact that does not seem to make, (no beep on console scan) before you rip the console apart looking for a broken wire, check to see that the contact is not bent or touching the common ground bus, or being held ON (touching the com. ground bus) by some other means.

There is a very easy way to test this.

First, if you are in Console Scan, you must exit by pressing the ESC key.

Type: TI <enter>. This is the short cut command for Test Inputs. Test inputs will display a new screen with 128 individually addressed cells. Each cell represents

one INPUT of the input board. The default address when TI is called is board AA.
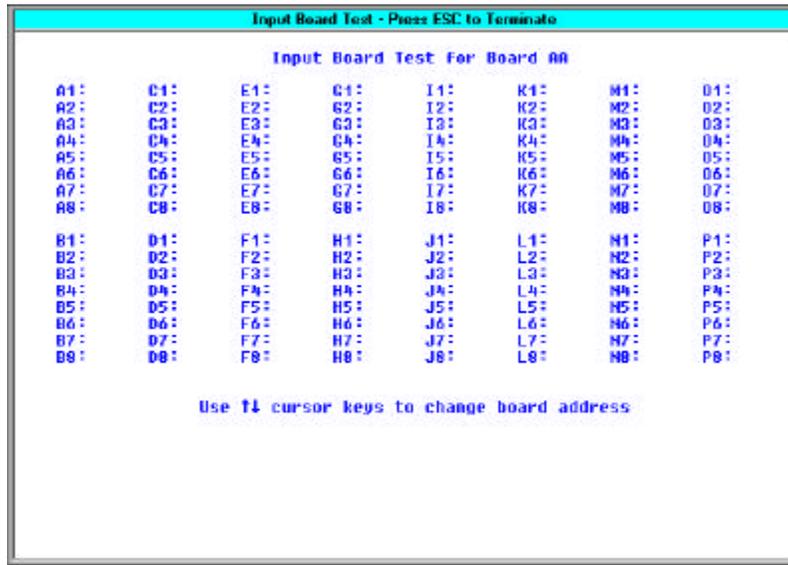
By pressing the UP arrow key, you can move forward through the input board addresses (AA through HP). Pressing the DOWN arrow key moves you backwards toward AA.

In order to test the input board, you must make sure that the input board ADDRESS for the board you wish to check is showing in the test input window. If you have board address AA selected on the screen, and you activate an input on board AB, the input will not show on the screen, because you have the wrong board selected. You would have to press the UP arrow to select board AB before you will see any results. You may only test one input board at a time, by selecting the input board address via the up and down arrow keys.

A solid input is represented by three zero's appearing in an address cell. If you are at input board AA and you turn on 8 stops wired to AA-I1 through I8, you should see three zero's in each input cell (I1-I8) as illustrated below:

```
┌─────────────────────────────────────────────────────────────┐
│            Input Board Test - Press ESC to Terminate          │
│                                                               │
│               Input Board Test for Board AA                   │
│                                                               │
│   A1:    C1:    E1:    G1:    I1: 000  K1:    M1:    O1:      │
│   A2:    C2:    E2:    G2:    I2: 000  K2:    M2:    O2:      │
│   A3:    C3:    E3:    G3:    I3: 000  K3:    M3:    O3:      │
│   A4:    C4:    E4:    G4:    I4: 000  K4:    M4:    O4:      │
│   A5:    C5:    E5:    G5:    I5: 000  K5:    M5:    O5:      │
│   A6:    C6:    E6:    G6:    I6: 000  K6:    M6:    O6:      │
│   A7:    C7:    E7:    G7:    I7: 000  K7:    M7:    O7:      │
│   A8:    C8:    E8:    G8:    I8: 000  K8:    M8:    O8:      │
│                                                               │
│   B1:    D1:    F1:    H1:    J1:      L1:    N1:    P1:      │
│   B2:    D2:    F2:    H2:    J2:      L2:    N2:    P2:      │
│   B3:    D3:    F3:    H3:    J3:      L3:    N3:    P3:      │
│   B4:    D4:    F4:    H4:    J4:      L4:    N4:    P4:      │
│   B5:    D5:    F5:    H5:    J5:      L5:    N5:    P5:      │
│   B6:    D6:    F6:    H6:    J6:      L6:    N6:    P6:      │
│   B7:    D7:    F7:    H7:    J7:      L7:    N7:    P7:      │
│   B8:    D8:    F8:    H8:    J8:      L8:    N8:    P8:      │
│                                                               │
│           Use ↑↓ cursor keys to change board address          │
└─────────────────────────────────────────────────────────────┘
```

If you browse through the input boards using the up and down arrow keys, as long as you see three zero's, the switch is ON and the contact is good. If you turn on a switch and you see a number larger than 000, there is a resistance input detected. A resistance input may be due to heavy oxidation on the contact, or an intermittent input.

```
┌─────────────────────────────────────────────────────────────┐
│            Input Board Test - Press ESC to Terminate          │
│                                                               │
│               Input Board Test for Board AA                   │
│                                                               │
│   A1:    C1:    E1:    G1:    I1:      K1:    M1:    O1:      │
│   A2:    C2:    E2:    G2:    I2:      K2:    M2:    O2:      │
│   A3:    C3:    E3:    G3:    I3:      K3:    M3:    O3:      │
│   A4:    C4:    E4:    G4:    I4:      K4:    M4:    O4:      │
│   A5:    C5:    E5:    G5:    I5:      K5:    M5:    O5:      │
│   A6:    C6:    E6:    G6:    I6:      K6:    M6:    O6:      │
│   A7:    C7:    E7:    G7:    I7:      K7:    M7:    O7:      │
│   A8:    C8:    E8:    G8:    I8:      K8:    M8:    O8:      │
│                                                               │
│   B1:    D1:    F1:    H1:    J1: 000  L1:    N1:    P1:      │
│   B2:    D2:    F2:    H2:    J2: 000  L2:    N2:    P2:      │
│   B3:    D3:    F3:    H3:    J3: 000  L3:    N3:    P3:      │
│   B4:    D4:    F4:    H4:    J4:      L4:    N4:    P4:      │
│   B5:    D5:    F5:    H5:    J5: 193  L5:    N5:    P5:      │
│   B6:    D6:    F6:    H6:    J6: 000  L6:    N6:    P6:      │
│   B7:    D7:    F7:    H7:    J7:      L7:    N7:    P7:      │
│   B8:    D8:    F8:    H8:    J8:      L8:    N8:    P8:      │
│                                                               │
│           Use ↑↓ cursor keys to change board address          │
└─────────────────────────────────────────────────────────────┘
```

As you can see, cell J5 has a value of 193. This is a bad stop switch with oxidized contacts. To verify this, unplug the 8 wire plug from the input board that is wired to the switch in question. Take a wire clip and clip one end to common ground, and touch the other end of the wire to Jack J Pin 5. If you see 000, then you know the switch contact is not making a good closure to ground.

If you have a stop that does not seem to work, the contacts may be shorted to common ground from contact damage, or by faulty wiring. If you see an input with 000 on all the time, remove the plug from the board and if the 000's go off, there is a short in the wiring or contact assembly. Test Input enables you to find all kinds of wiring problems.

The test input screen is also a good way to view the condition or quality of your switch contacts. As mentioned, a good positive switch closure will indicate three

zero's (000) appearing in the address cell. A poor switch closure will indicate with a number somewhere between 001 and 255. If you see 030, or 111 when you close a switch, the system is seeing a resistance value rather than a good switch closure. If you exercise the contact, you should see this number decrease to a value close to three zero's.

Potentiometers, when actuated from Test Input will show a variable reading from 000 (full off) to 255 (full on). You should use the TI screen to adjust your pots so they read 000 when the pedal is completely backed off (closed). This is important for the crescendo shoe, as the values that are output are used to set the stops the crescendo turns on and off.

Take a moment to find the input board your swell and crescendo potentiometers are wired to and run the Test Input scan on your pots. Adjust them to 000 for off. Your pots may NOT indicate a full ON value of 255 due to several mechanical factors. If they do not indicate to 255 (full on) see the appendix section on how to re map the pots for your individual installation.

Note: Pot values should be solid. Depending on the age and quality of the potentiometers there may be some jitter in the values. Normal jitter should indicate a fluctuating value from 100 to 101. If you see a value appearing as 100 and then experience a jitter value of 255, then back to 100, either the pot is very worn, or you may need to change the analog delay value in the uniflex.ini file to compensate for excessive pot jitter. See the appendix section for increasing the analog delay of the uniflex.ini file.

If the pots do not extend to full value (255) then you may need to map the potentiometers so you will be able to utilize the limited travel and extend the pots to full value. This will be covered in the appendix section under the Uniflex.ini appendix.

To exit the Test Input scan, press the ESC key. You can go back to the Console Scan test to finish your console check out testing by typing: CONSOLE <enter>

Once you have noted all the errors and their corresponding element numbers, press the **ESC** key to exit the Console Scan mode.

Now you can go to the System Definition EDITOR and correct the console errors.

If you find two keyboard notes or two stops that are backwards; C# before C or STP-39 before STP-38, you may opt to reverse the wires on the interface board plugs to keep the wiring charts correct, or you may change the address in the definition editor. It's up to you. Most installers prefer to keep their wiring in order, and the error is usually a simple reversal of the color coded wire attached to the interface input connector shell.