

MIDI FOR MULTISYSTEM

MIDI For MultiSystem Operation Guide For software Revision L

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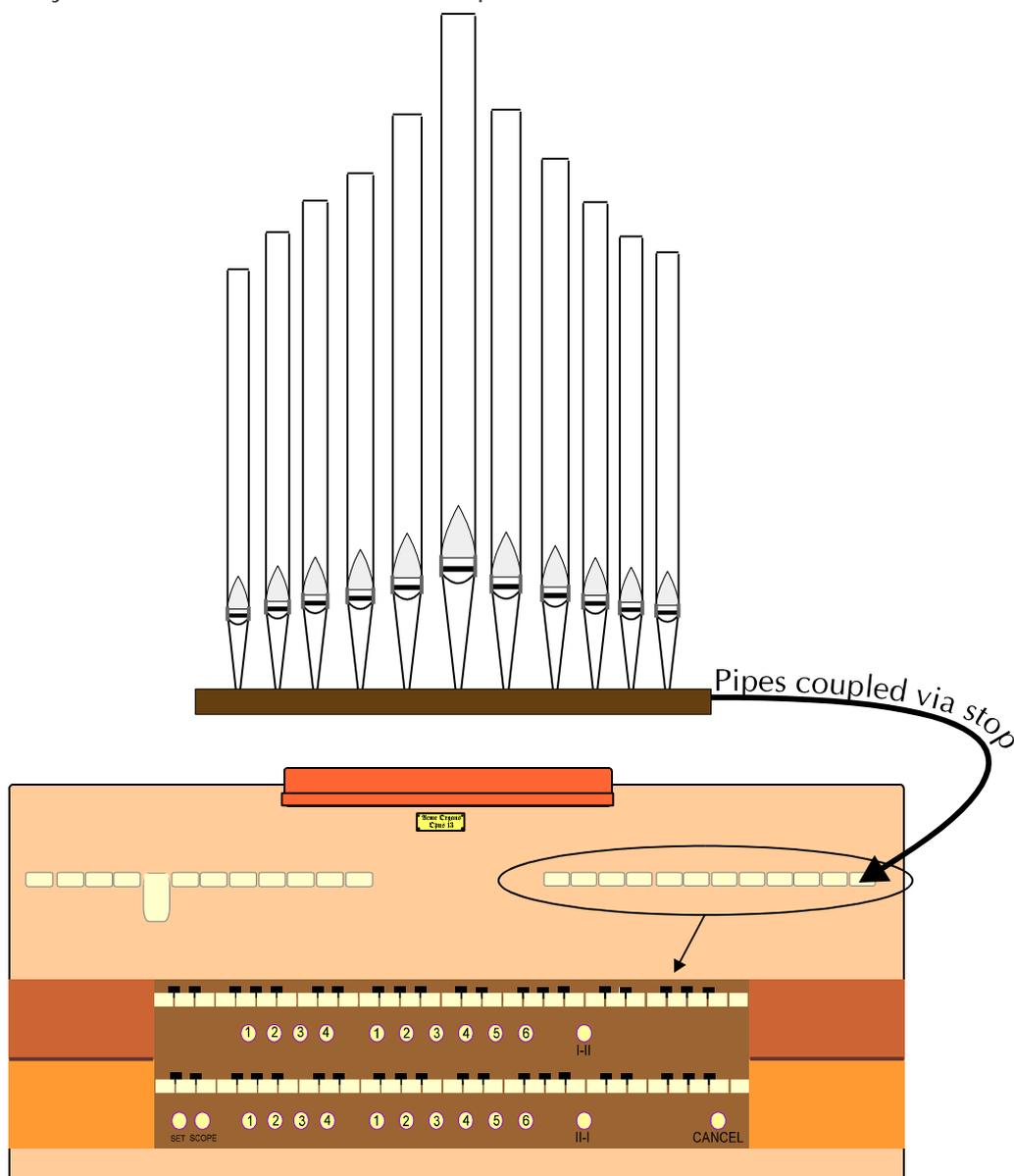
INTRODUCTION

This Organ is equipped with a system which allows you to connect electronic devices that may be played from the Organ keyboards, or allow you to couple stops on the organ to electronic keyboards.

You may know a great deal or be a beginner, this booklet is written assuming little or no prior knowledge of electronic instruments.

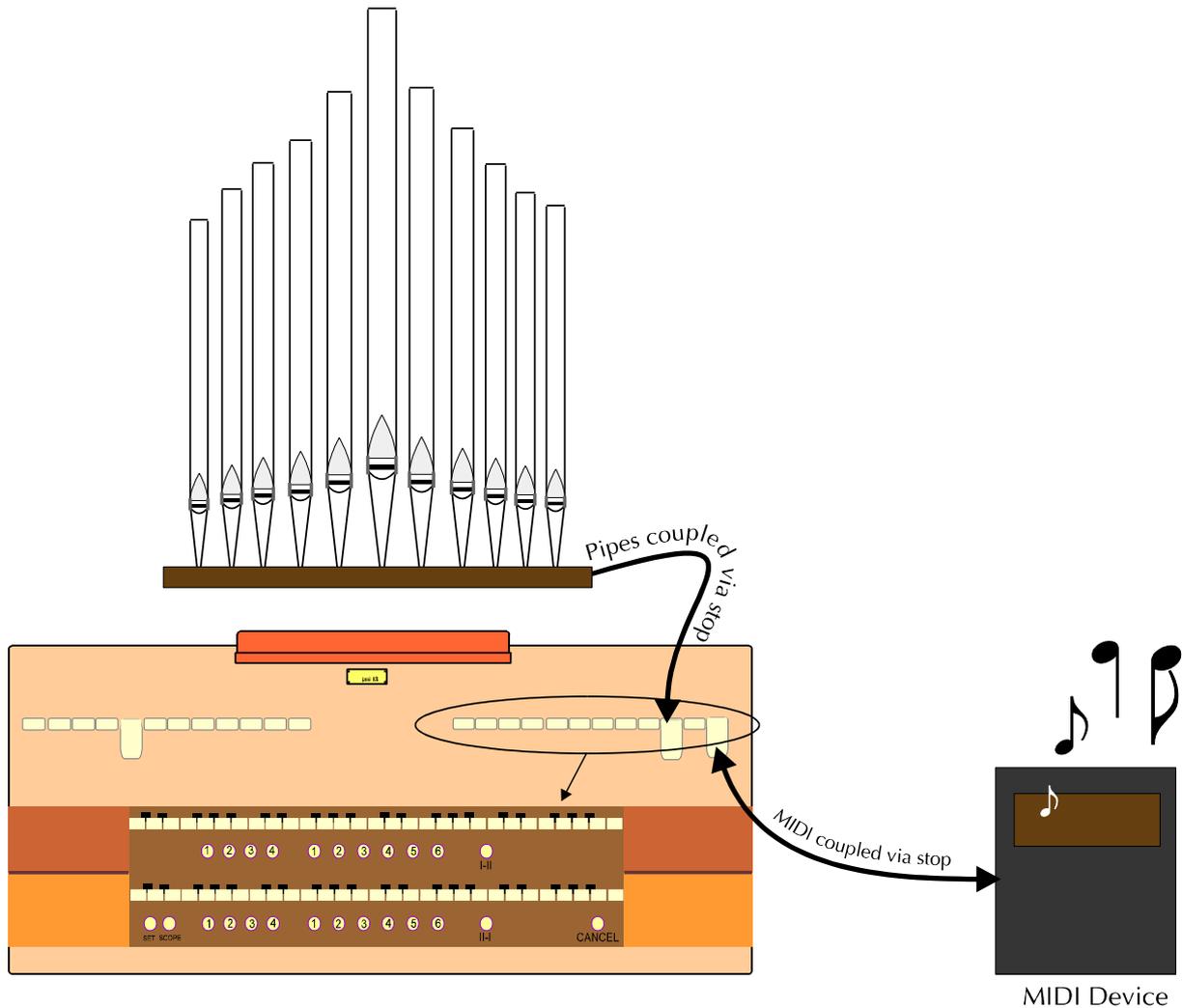
SO WHAT IS MIDI AND WHAT CAN I DO?

MIDI is a way of connecting musical instruments together. A rank of pipes is coupled to the keyboard via a stop. MIDI is an acronym for **M**usical **I**nstrument **D**igital **I**nterface and was developed to allow instruments of different manufacturers to "speak" a common language. It has been further developed to allow non-digital instruments (such as pipe organs) to control, or be controlled, by MIDI based instruments or sequencers.



To allow the signals to reach the pipes the relevant stop must be open. MIDI allows the same connection to be applied for instruments that support the MIDI language.

An organ equipped for MIDI usually has stops assigned to the MIDI connections, by simply drawing these stops we can open a connection to a MIDI device.

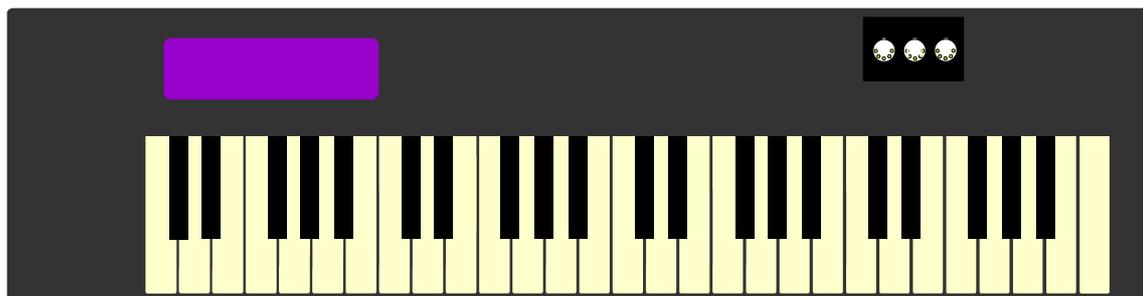


The picture above shows a MIDI based electronic sound generator connected to a stop on the console playable from the top manual.

Unlike the connections to the pipes the MIDI connection operates in both directions. In the example above, the MIDI produces sounds played on the top manual. It is also possible to play a keyboard connected to the organ with MIDI as if it was a keyboard on the console complete with the full complement of stops.

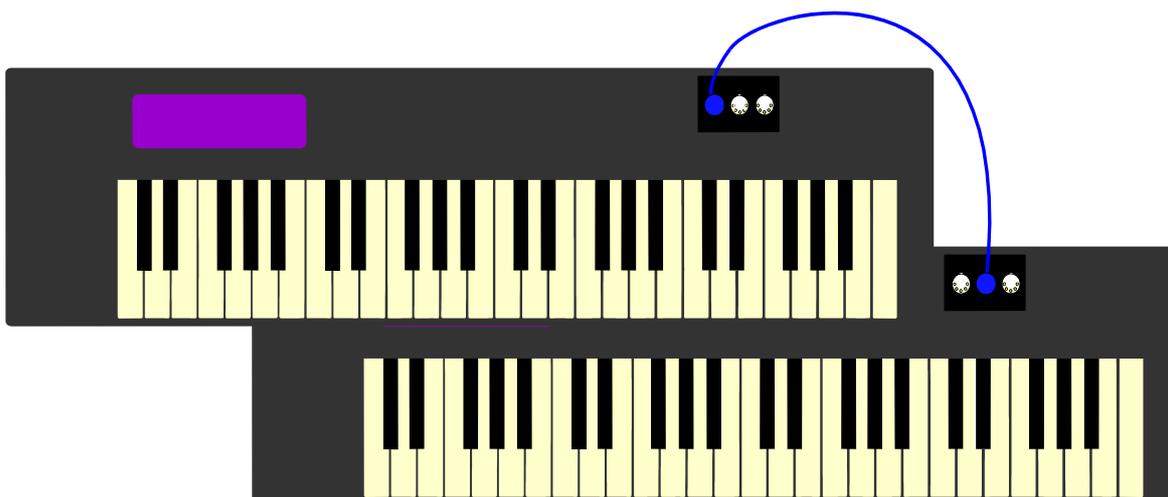
To understand the possibilities in more detail it is best to explore some MIDI products that are already well established.

MIDI KEYBOARDS



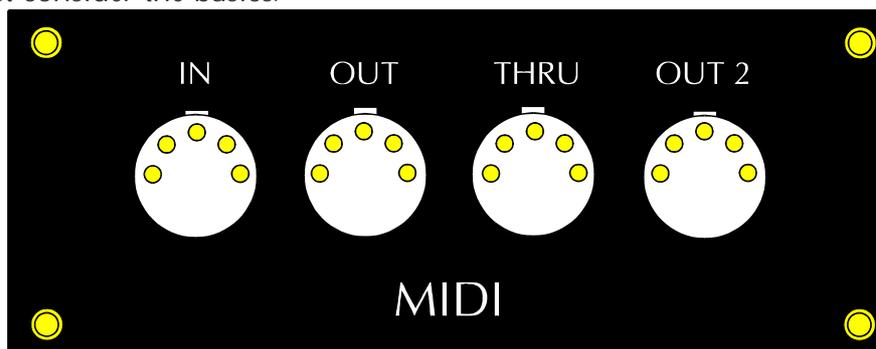
MIDI keyboards are probably the most common of the MIDI devices in use today. They have evolved from simple electronic keyboards and vary in price and facilities enormously. Typically, the keyboard has internal electronic sounds that may be synthesised from a combination of pure tones or recalling "sampled" sounds from a digital memory.

Early in the development of the electronic keyboard, it became desirable to couple sounds from other keyboards in much the same way as we do in the organ. Initially it became possible to connect keyboards of a similar manufacturer together. However, the obvious solution was to be able to couple any keyboard from any manufacturer, and MIDI was born.



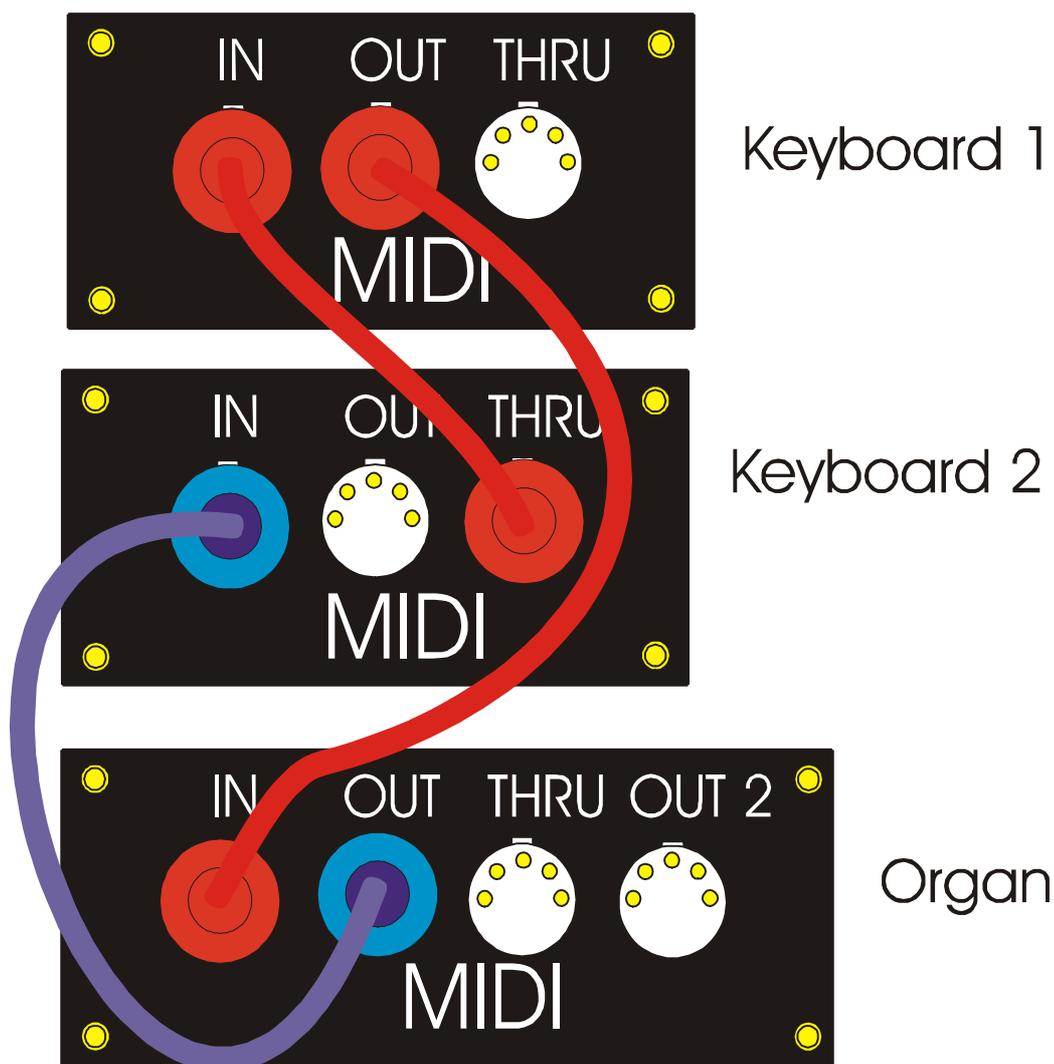
CONNECTING UP

MIDI systems may be connected together in two basic ways, although as you become more involved and introduce a larger selection of equipment there are still more methods to be considered. For starters let us just consider the basics.



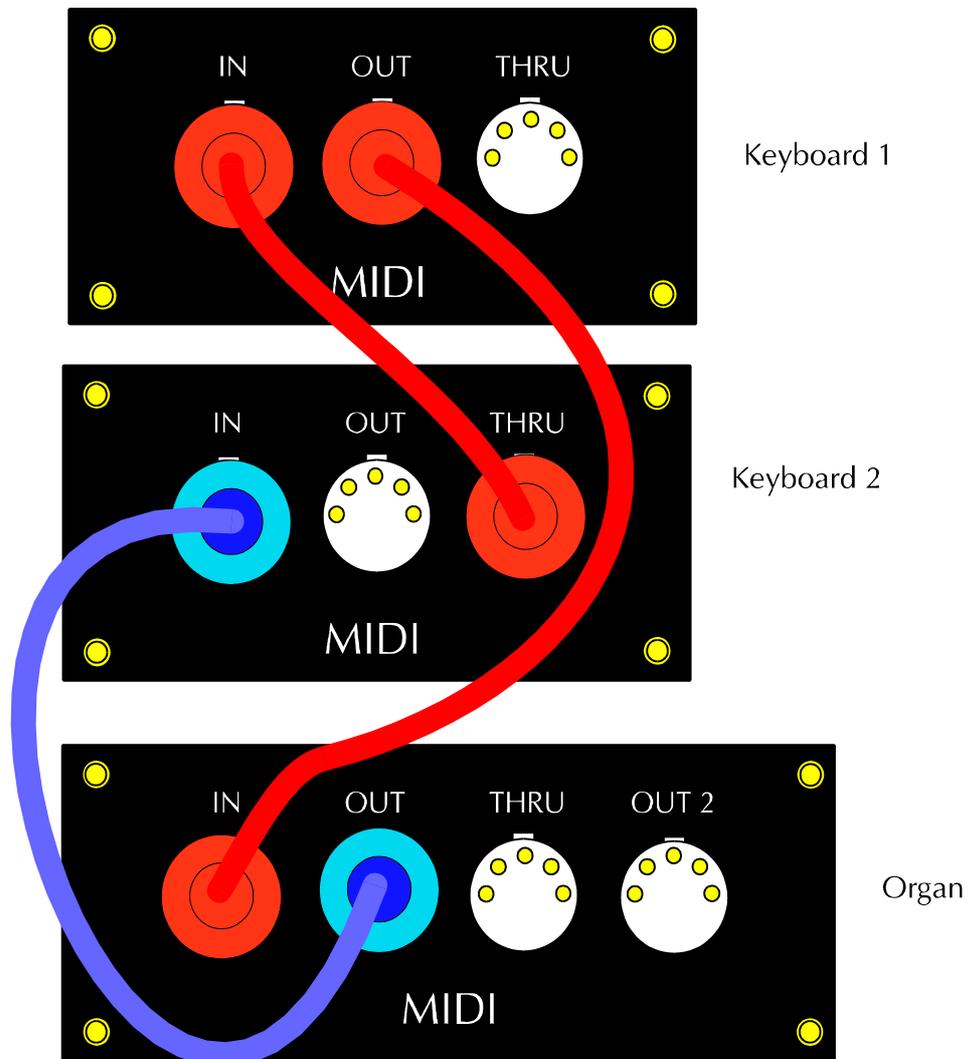
The picture above shows the connector panel that is used with the system. MIDI systems standardise on three basic connections, IN, OUT & THRU, we also add another called OUT2, which will be covered later.

Each MIDI device has a connector panel with connectors labelled IN, OUT & THRU, and a variety of standard cables are available from your local music store to connect from one device to another.

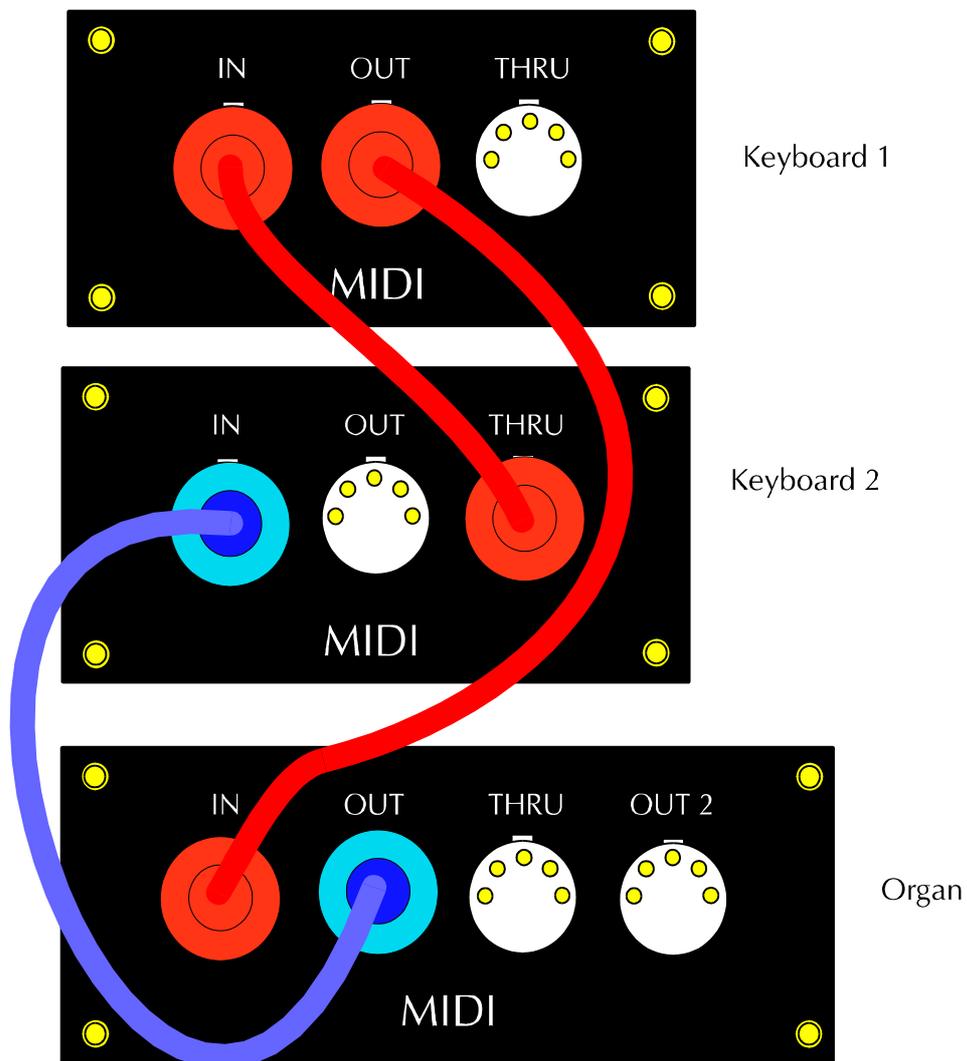


When connecting the devices together it is important to use the correct connections. Each device has one input called IN and two outputs OUT & THRU, THRU being an abbreviation for Through. In the example above two devices are linked together so that each keyboard can play the sounds on the other. Please note it is important to connect an OUT to an IN, do not connect similar named connections together. MIDI sends information OUT to other devices that receive it at the IN connection.

When connecting three devices there are two alternatives. The first alternative is to connect each IN and OUT together as shown below.



Another alternative suggestion uses the THRU connection on Keyboard 2. If this method of connection is used, Keyboard 1 will receive the same data as Keyboard 2; there will be no additional information from Keyboard 2.



OUT 2

The second OUT connector is used to connect the MFM system to a sequencer. Stop changes not normally associated with MIDI are sent and received here in addition to normal key information. This allows a direct connection to a MIDI sequencer or disk recorder such as the Yamaha MDF3 that may be used to record and replay performances.

SUMMARY

IN receives MIDI data from another device.

THRU is used to pass on a copy of the MIDI information received at the IN connection. The THRU output does not contain information generated by the device.

OUT passes data from the current device to the next one in the chain. Music played on the current keyboard is added to the data received on the IN connection and passed OUT.

SITTING AT THE CONSOLE

Sitting at the console of an organ equipped with MFM you will notice that extra stops have been added to the organ. These will typically be labelled MIDI on Swell I, MIDI on Great II etc.

Each stop opens a channel on the MIDI output from the console; there are 16 possible channels available in any MIDI system. The limit of 16 is set by the MIDI specification and effects all MIDI devices.

The stops on each organ obviously vary depending upon the instrument. Each system is installed to a simple formula to allow you to establish which MIDI stop selects which MIDI channel.

MIDI stops are assigned from the top manual downward, hence on a three manual organ with 2 MIDI stops per division the stop assignment would look like this.

Stop Name	Channel #
MIDI on Swell I	1
MIDI on Swell II	2
MIDI on Great I	3
MIDI on Great II	4
MIDI on Choir I	5
MIDI on Choir II	6
MIDI on Pedal I	7
MIDI on Pedal II	8

But on a two manual organ with 3 MIDI stops per division the stop assignment would look like this.

Stop Name	Channel #
MIDI on Swell I	1
MIDI on Swell II	2
MIDI on Swell III	3
MIDI on Great I	4
MIDI on Great II	5
MIDI on Great III	6
MIDI on Pedal I	7
MIDI on Pedal II	8
MIDI on Pedal III	9

CHECKING WHICH MIDI CHANNEL IS ASSIGNED TO A STOP

Select a MIDI device that you are familiar with, or has a well written instruction book. Discover how to alter the receive MIDI channel of the device.

Check that the MIDI device is connected correctly as explained earlier in this guide.

Cancel all the stops on the console and then draw the first MIDI stop. Remember that the sequence of stop assignment is from the top manual down. See above.

Select MIDI Channel one on the receiving device, and play a few notes on the top manual. If you have set the receiving device correctly you will now hear a response.

Repeat the process, changing the channel each time until you reach the last stop on the pedal.

PLAYING FROM THE MIDI KEYBOARD

If you wish to play stops on the organ from the MIDI keyboard, you must first select the correct division, by selecting a MIDI channel that corresponds to the division you wish to play.

Confused? Let's go through an example.

Say we have a three manual console as described above. The MIDI output channel assignments will look like this.

Stop Name	Channel #
MIDI on Swell I	1
MIDI on Swell II	2
MIDI on Great I	3
MIDI on Great II	4
MIDI on Choir I	5
MIDI on Choir II	6
MIDI on Pedal I	7
MIDI on Pedal II	8

However the organ divisions are assigned slightly differently.

Division Name	Channel #
Swell	1
Great	2
Choir	3
Pedal	4

If you wish to play the Swell Bourdon from the MIDI keyboard, you can send MFM data on MIDI channel 1 (see table above). Be sure to draw the Bourdon on the Swell division.

- Select transmit on MIDI channel 1 on the MIDI device
- Draw the Swell Bourdon

The Swell Bourdon will now play any notes played from the MIDI keyboard, functions such as transpose may be accomplished from the MIDI device set-up.

It is possible to play on the Swell keyboard simultaneously. Any stops drawn on the Swell division will play from either the Swell manual or the MIDI device.

RECORDING AND REPLAYING THE ORGAN

MFM has an extra connector on the MIDI connector panel labelled MIDI OUT2. This connector provides all the standard features of MIDI but with one important difference.

To record an organ, MFM must transmit all of the actions of the organist to a MIDI recording device. Information such as top changes would be confusing to a MIDI keyboard and so are not provided on the normal MIDI OUT signal. However, we must record stop changes in order to reproduce the organ on replay. MIDI OUT2 transfers this information.

HOW DO WE RECORD?

You will need a recording device. This may be a simple "direct to disk" MIDI recorder or a personal computer with MIDI compatibility.

We recommend the Yamaha MDF3 Data Filer that is easily obtainable from Yamaha dealers around the world, or direct from us. The MDF3 is capable of recording approximately 80,000 "notes" worth of MIDI data on a single 3.5" floppy disk. It is not capable of recording a whole recital on one disk, but changing disks is a simple and quick process that may be performed during natural breaks in the recital.

The operation guide of the MDF3 is clear and concise. Basic operation is no more complicated than a cassette recorder.

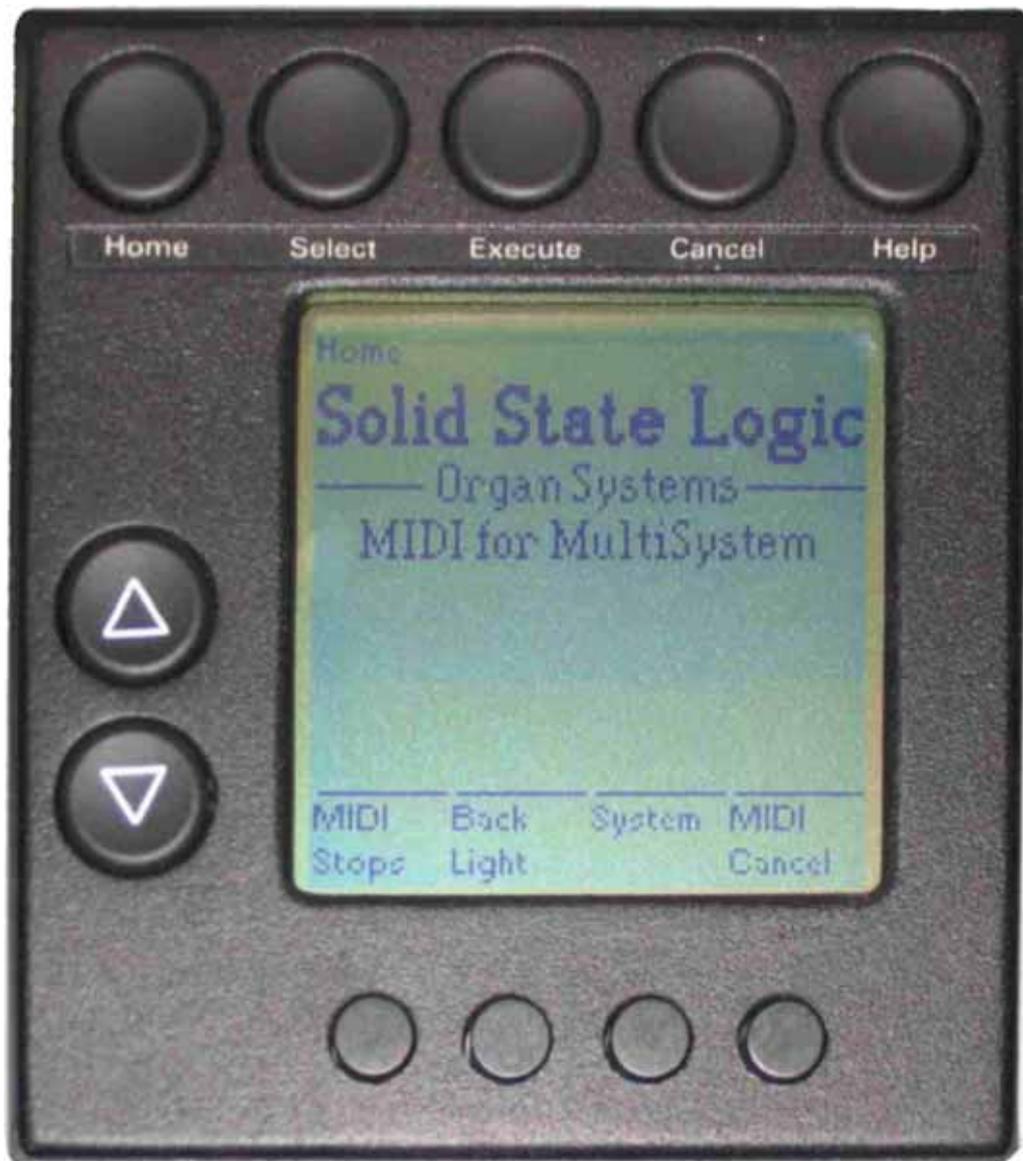
For greater flexibility it is possible to connect MFM to a personal computer, Atari computers have established themselves in music systems although the more expensive IBM and Apple computers may also be made to be MIDI compatible and can run very sophisticated music scoring and editing software.

It is possible to record yourself on the organ, edit the detail (and mistakes!) print the music and replay the modified recording.

IMPORTANT THINGS TO WATCH FOR WHEN RECORDING

1. Always remember to set the MDF3 Data Filer for SEQ.
2. General Cancel before starting.
3. Start the recorder before drawing any stops using any pistons; otherwise they will not be recorded.
4. Never stop a playback before the end, if you do the stops will remain on in the console and can only be cancelled by switching off the console.
5. It is best to always hit general cancel before stopping the recorder after a recording.
6. Make sure the MDF3 is connected to the MIDI connector panel OUT 2.
7. Make sure if you have an MFM Display version that MIDI IN is set ON in the SYSTEM menu.

MIDI FOR MULTISYSTEM - DISPLAY OPTION



Welcome to the Midi for MultiSystem, Display option.

Adding the display option to your MFM system greatly increases the control you have over the stop assignments with MIDI. The MFM-D system prompts you with options to choose, after a few minutes I am sure you will feel confident to program the MIDI system.

THE MENU STRUCTURE

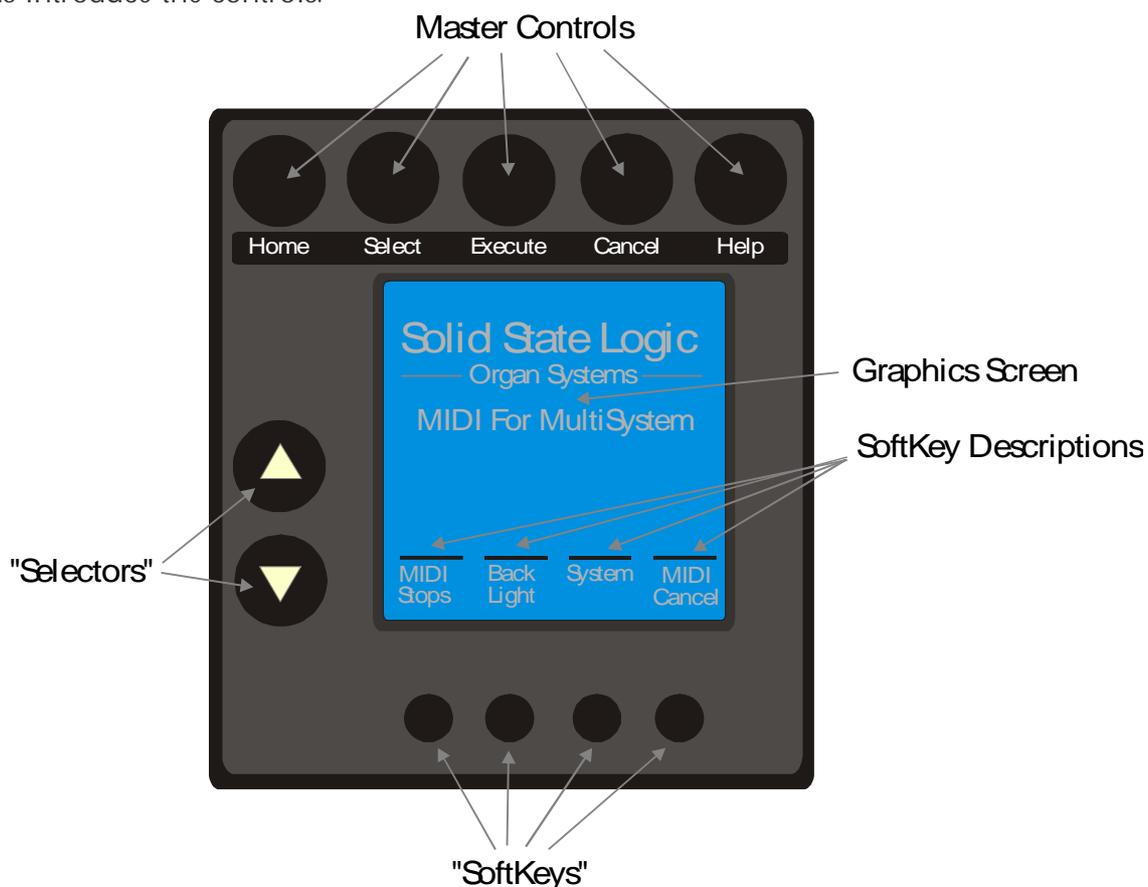
MFM-D takes the existing Midi for MultiSystem and allows you to choose the assignments between the stops on the organ and the information passed onto the MIDI devices. It is possible to alter a large variety of MIDI set-ups to suit your particular style that will automatically be saved in the backup memory for future use. Each time the system is switched on, the previous settings will be displayed.

In the previous section, we discussed the associations between stops, divisions and MIDI channels. In this section we expand this to include the control panel and how the settings may be altered.

MFM-D is based on a series of "menus", guiding you through the set-up of each MIDI channel.

A TOUR OF THE CONTROL PANEL

Firstly let us introduce the controls.



SOFTKEYS

When designing MFM-D it was very important to provide the maximum power for the musician in the smallest space. One way to achieve this was to use "SoftKeys". A SoftKey does not always operate in the same way. Instead of having an engraved label fixing its function, the SoftKey has a label on the Graphics Screen that changes for each screen display, offering you the choice of control in the smallest possible space.

MASTER CONTROLS

At the top of the screen are five keys known as the master controls. These keys each have a fixed function that covers a wide range of general duties.

Home: If you push Home from any menu MFM-D returns you to the home menu, this serves as a quick jump method.

Select: Select moves you through the screen. Each screen presents a list of functions; the select key moves you through the functions. It is necessary to select a function before being able to change it with the selectors or Softkeys.

Execute: Execute actions the changes you have selected.

Cancel: Cancel is used to cancel the help screen..

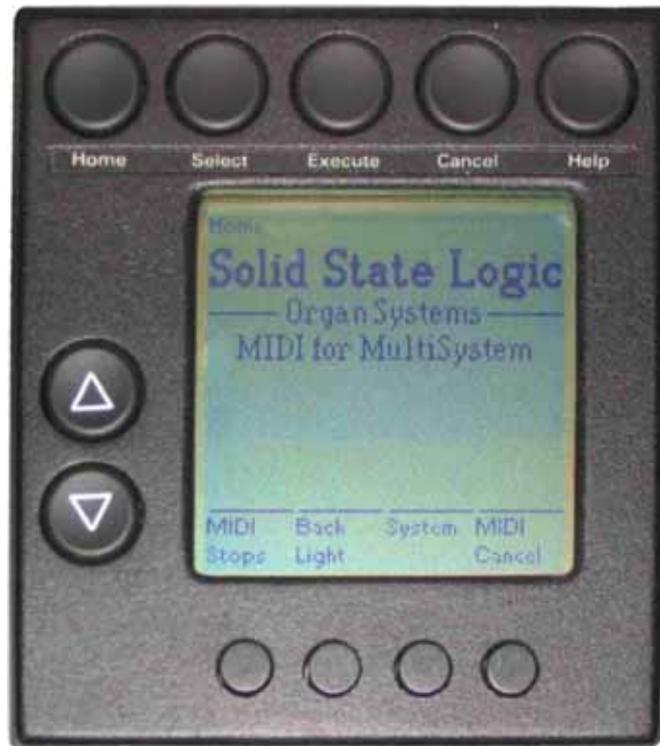
Help: Pushing help at any point in the menus will activate the help screen. To get help on using help, press help twice. Pushing Cancel clears the help screen.

SELECTORS

Changes to the MIDI Settings are usually made with the selectors, the SoftKeys may also be programmed to make changes but these will be different to the Selectors.

HOME

Each time the wind is switched on, MFM-D starts up with the home screen. This is the starting point for all of the other menus and may be easily reached at any time by pushing the Home key in the top left corner of the control panel.



The Home screen is the point from where all the other menus start. It is effectively the top of the menu tree. The home screen also contains another very important control.

SoftKey- MIDI Cancel: MIDI keyboards and other devices may occasionally become confused and effectively cipher. It is of course possible to stop the cipher by switching off the instrument, however MFM-D offers an alternative on the Home screen. Pushing MIDI Cancel will cancel all previous key commands and normally cancel unwanted notes.

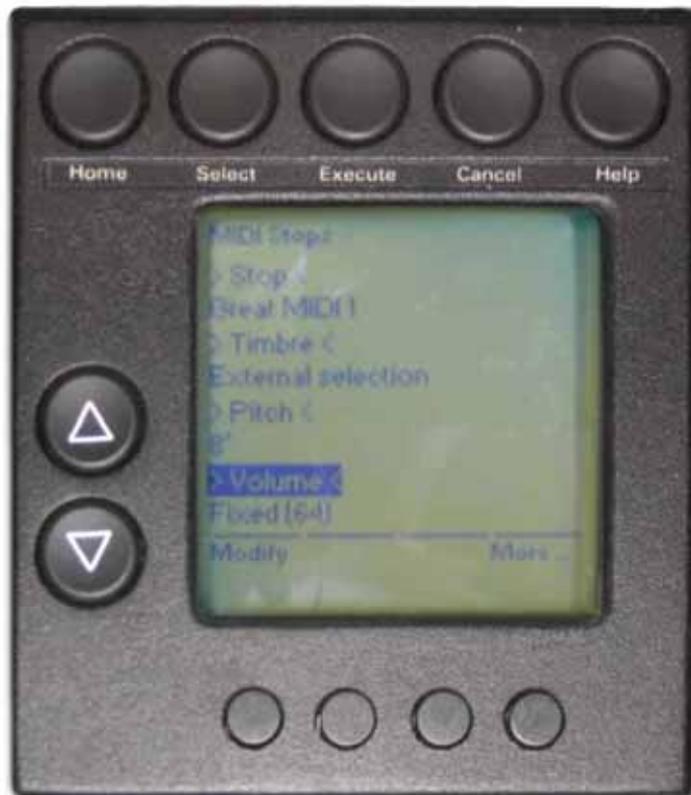
SoftKey - Back Light: The Graphics Screen is fitted with a light behind the screen. In normal lighting conditions it is easily possible to read the screen by using its reflective properties. However in low light conditions the backlight becomes necessary. The SoftKey that is only available on the Home screen reverses the current setting with each push. The current setting is automatically saved and will be used the next time system is started.

To move to the Stops Screen push the SoftKey marked MIDI Stops.

STOPS

The stops editing screen is probably the most widely used. At the top of the screen is an identifier of MIDI Stops, telling you where you are in the system. With this screen MFM-D controls the associations between the stops on the console and the activity on the MIDI channels.

Pushing Select moves you through the main menu items of Stop, Timbre, Pitch & Volume.



>STOP<

Move the cursor to highlight the Stop menu using the Select key. The SoftKeys will now be set as follows.

Prev Stop	Next Stop		More..
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The left-hand pair of SoftKeys scrolls you through the MIDI stops for the organ. The system will have been configured so that these names are the same as the engraved stops.

Once a stop has been selected it can be edited using the following controls.

>TIMBRE<

The SoftKeys will now appear as follows:

Timbre Group	Timbre step -	Timbre stop +	More..
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SoftKey1 selects timbre Groups. There are three groups.

1. **General MIDI** - A group of 128 pre-defined sounds that are understood by all General MIDI compatible systems. The "Selectors" may be used to scroll through the General MIDI codes individually. Alternatively SoftKey2 and 3 may be used to step through the selection in blocks of 8.
2. **External Selection** - Uses the current selection on the receiving device.
3. **Program Change** - A group of 128 pre-defined sounds that are available by number on the receiving device. The "Selectors" may be used to scroll through the codes individually. Alternatively SoftKey2 and 3 may be used to step through the selection in blocks of 8.

>PITCH<

The SoftKeys will now appear as follows:

Octave step-	Octave step+		More..
--------------	--------------	--	--------

The pitch is displayed in organ terms as feet length based around 8' as standard. Pitch may be adjusted in two ways.

1. The pitch of the MIDI stop may be altered in semitones using the "Selectors".
2. The pitch may also be altered using the SoftKeys in Octaves.

>VOLUME<

Volume changes are made using a separate screen in this revision of the software.

The SoftKeys will now appear as follows:

Modify			More..
--------	--	--	--------

Press the SoftKey for Modify to make changes to the volume information this stop transmits.



The Softkeys will now appear as follows:

Prev Source	Next Source	Reset	Back
----------------	----------------	-------	------

>SOURCE<

The SoftKeys will now appear as follows:

Prev Source	Next Source	Reset	Back
----------------	----------------	-------	------

Use the SoftKeys to browse through the selections available.

The control of the loudness may come from one of several sources selectable from the SoftKey Mode.

1. **Fixed:** It is possible to fix the loudness of a MIDI stop at a preset level between 0 and 127. The Selectors provide a fine adjustment for the Volume setting moving the volume 1 position per push. 0 is off and 127 is full volume.
2. **Expression Shoes:** If the Expression shoes are selected using Next Source then control of the volume is taken from the shoe. Initially the number of stages of expression are automatically recalculated to provide an even control over the entire range of volume. This may be modified with the remaining controls on this screen.

>Minimum<

The Softkeys will now appear as follows:

-10	+10	Reset	Back
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Minimum has a possible value between 0 and 127. When set to 0 the MIDI device will be silent when the expression shoe selected in "Source Selection" above is closed. This may not be desirable. Minimum has no effect when volume is set to fixed.

If the MIDI device is working together with the swell organ then it would often be more desirable to match the sound level of the swell organ when the shades are closed. To do this adjust the value of the minimum setting with the shoe closed until the volume matches the swell organ.

When the Minimum setting is set to the maximum level of 127 the swell shoe will no longer have any affect on the MIDI volume. 127 is full volume.

>EMPHASIS<

The Softkeys will now appear as follows:

-10	+10	Reset	Back
-----	-----	-------	------

Emphasis is used to tailor the response of the swell pedal to the swell shades. It has no effect when volume is set to fixed.

Emphasis changes the relationship between shoe position and volume level. The value may be set between -100 and 100. When set at the default of zero the shoe controls the volume linearly. The greater the emphasis value the more effect the shoe has at the early stages of opening. So if emphasis is set to 100 almost all of the volume control is in the first few steps of travel. Setting the value to -100 will shift the control to the last stages of travel.

>TRANSMIT AS<

The Softkeys will now appear as follows:

Volume	Expression	Reset	Back
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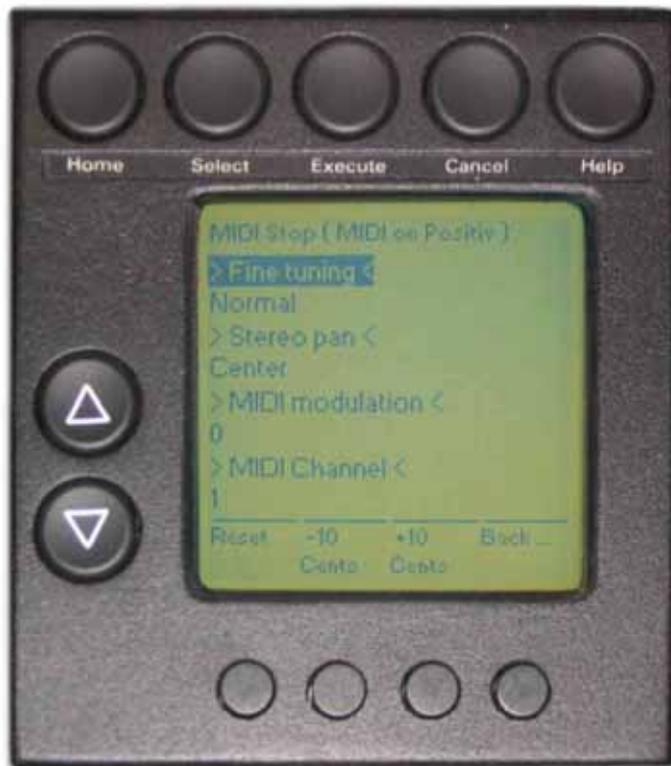
The information transmitted for this stop can also be selected to be one of two types. Volume is best used for sustained sounds such as the organ. With volume set the MIDI for MultiSystem transmits controller 7 to the MIDI equipment alters only the volume of the sound.

Expression changes the timbre as the volume changes and so more closely represents sounds such as brass, piano and many others. When expression is selected the MIDI for MultiSystem transmits controller 11 to the MIDI equipment.

Lastly the Softkey More appears on each of the Stop screens. When More is displayed there is a further set of menus available. This we will now explore!

STOPS - MORE... SCREEN

Further control of the MIDI stops is available by firstly selecting the Stops screen and then pushing the SoftKey More..



The stop selected in the main Stop Menu is repeated at the top of the screen as a check that the correct one is selected.

>FINE TUNING<

Move the cursor to highlight the Fine Tuning menu using the Select key. The SoftKeys will now be set as follows.

Reset	-10 cents	+10 cents	Back..
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Fine tuning alters the pitch that the remote MIDI device controlled by the displayed stop will play at. It enables you to retune the device to the pitch of the organ.

SoftKey Reset: Returns the Fine Tuning offset to zero.

Once again a fine and coarse adjustment is available. The Selectors provide an adjustment in cents (1/100 of a semitone) and the SoftKeys provide a coarse adjustment in tenths of a semitone.

>STEREO PAN<

Move the cursor to highlight the Stereo Pan menu using the Select key. The SoftKeys will now be set as follows.

Pan step			Back..
-------------	--	--	--------

If the output of the MIDI device is stereo then it is possible to adjust the position of the sound in the stereo image. Stereo controls range from 100% Left to 100% Right.

Fine control is provided by the Selectors and coarse control by the SoftKey Pan step, which cycles through the settings of; 100% Left, 50% Left, Center, 50% Right, 100% Right.

>MIDI MODULATION<

Move the cursor to highlight the MIDI Modulation menu using the Select key. The SoftKeys will now be set as follows.

Mod step -	Mod step +		Back..
---------------	---------------	--	--------

Modulation operates a low frequency oscillator to produce a vibrato effect.. Once again a fine and coarse adjustment is available. The Selectors provide an adjustment in single units and the SoftKeys provide a coarse adjustment in tens of units.

>MIDI CHANNEL<

Move the cursor to highlight the MIDI Channel menu using the Select key. The SoftKeys will now be set as follows.

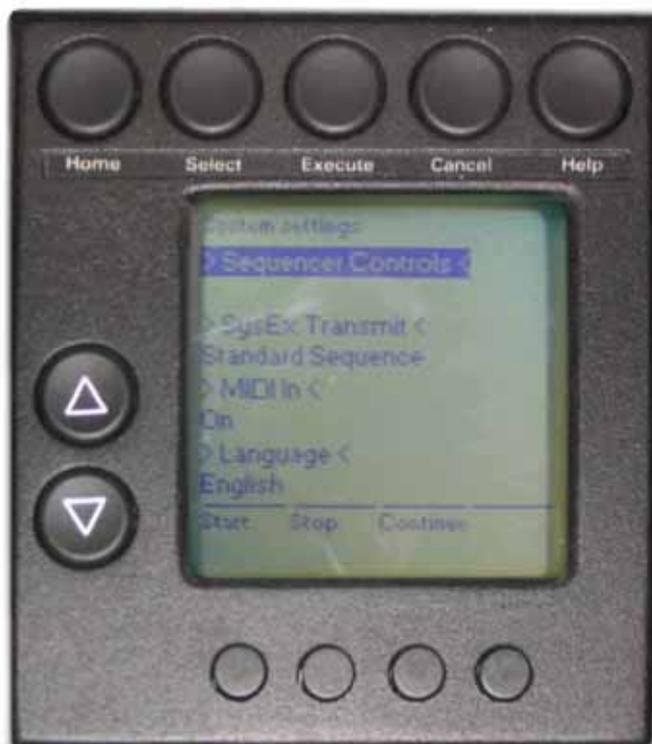
Channel step -	Channel step +		Back..
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The MIDI channel number selector assigns a channel for the information to be passed in and out of the organ. The available range is 1 to 16 although 15 and 16 are often used by other pieces of equipment, 10 should be avoided as it is commonly used for percussion. The system should be set up so that each stop is on a separate channel and that each channel is compatible with the MIDI set-up of the external equipment.

More detail on the use of channels is available from an earlier section titled Sitting at the Console.

Fine control (1 channel per press) is provided by the Selectors and coarse control (5 channels per press) by the SoftKey Channel step.

SYSTEM



>SEQUENCER CONTROLS<

Softkeys will now be set as follows.

Start	Stop	Continue	
-------	------	----------	--

MIDI for MultiSystem transmits control information to the MIDI sequencer directly from the control panel. However, although the SSOS system conforms to MIDI specification not all sequencers support these functions.

>SYSEX TRANSMIT<

Sys Ex Transmit allows you to control the type of information stored during record. Sys Ex is short for System Exclusive and is message information exclusive to SSOS that can be recorded or passed to other equipment. It does not normally affect the external instrument that will simply pass this information on unchanged. It is, however, important for a record/replay situation.

There are several possible menu options.

For normal operation the "Sys Ex Transmit" setting should be set to Standard Sequence.

Disabled. In this mode only keying information is sent out of the OUT2 connector. All stop changes are stripped out of this.

If you select Disabled, on the "Sys Ex Transmit" function the stop movements will not be recorded, but all the keying will. Playing back this recording will allow different registrations to be selected at will.

Standard Sequence. This is the normal setting. Allowing the stop changes to be passed out of the system and recorded.

Stop Move Sequence. Transmits more complex information related to the combination settings if you have a CFM combination action. This setting uses more disk space and is currently not used for systems.

>MIDI IN<

Allows you to disable the MIDI inputs to the organ. It may be necessary to prevent divisions playing from unwanted MIDI data. For record and playback this must be set to ON.

>LANGUAGE<

Softkeys will now be set as follows.

English	Français	Deutsch	
---------	----------	---------	--

Use the Softkeys to change the menu language. Returning to the home screen will then update the system in the new chosen language. If you can't read another language be careful here! You must return to this screen to change it back. The position of all the controls remains the same so it is possible to navigate using the same buttons even if the text is not understandable.