

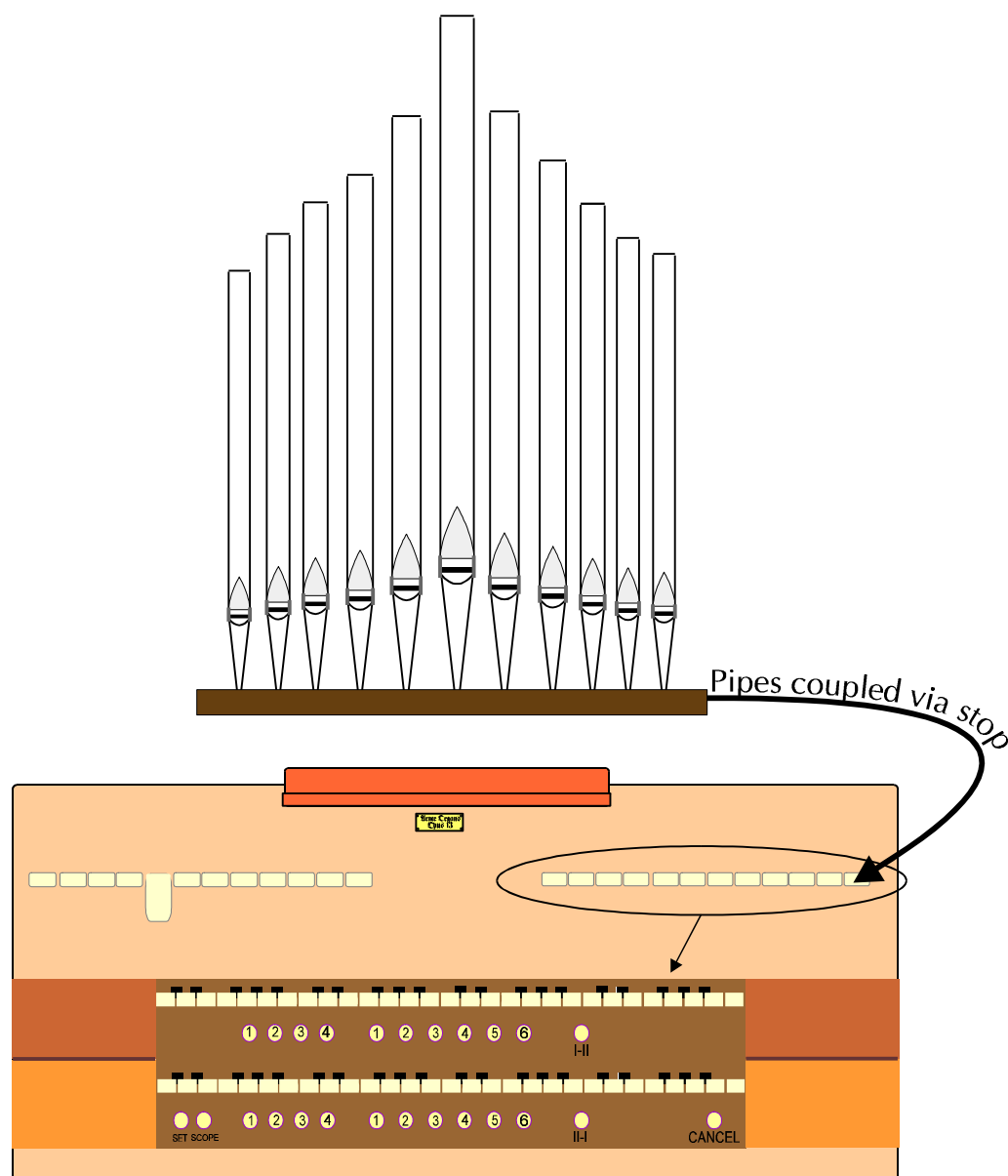
## Introduction.

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.

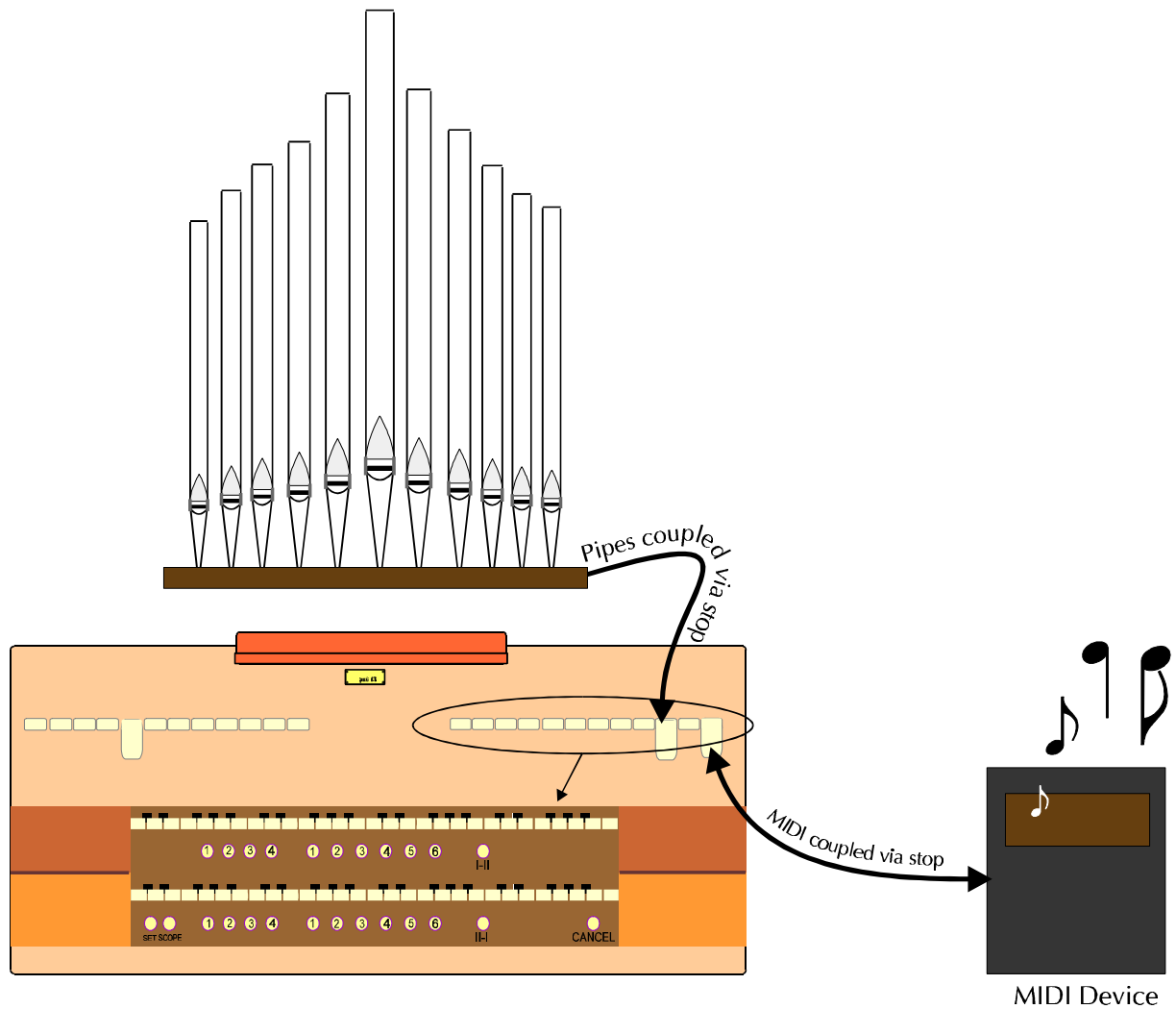
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MIDI is a way of connecting musical instruments together. A rank of pipes is coupled to the keyboard via a stop. MIDI is an acronym for **M**usical **I**nstrument **D**igital **I**nterface and was developed to allow instruments of different manufacturers 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.

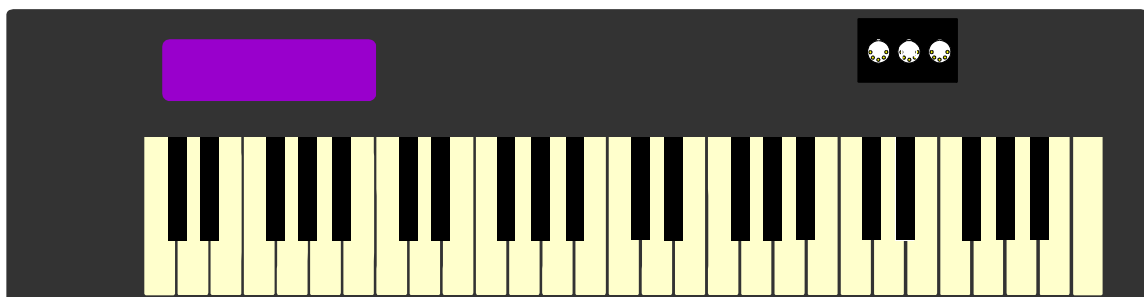


The picture above shows a MIDI based electronic sound generator connected to a stop on the console playable from the top manual.

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.

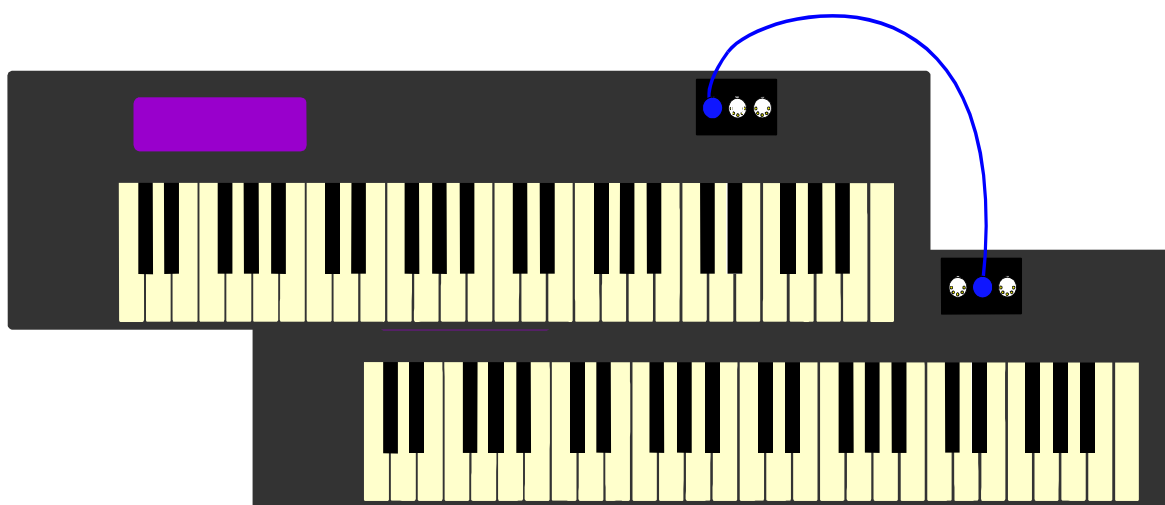
To understand the possibilities in more detail it is best to explore some MIDI products that are already well established.

#### MIDI Keyboards:

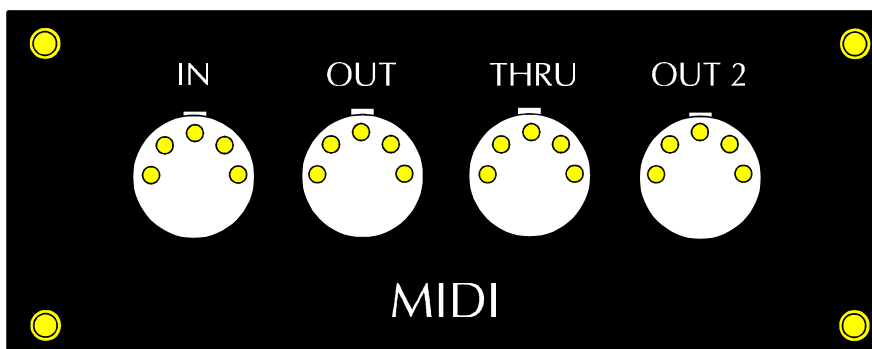


MIDI keyboards are probably the most common of the MIDI devices in use today. They have evolved from simple electronic keyboards and vary in price and facilities enormously. Typically, the keyboard has internal electronic sounds that may be synthesised from a combination of pure tones or recalling "sampled"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

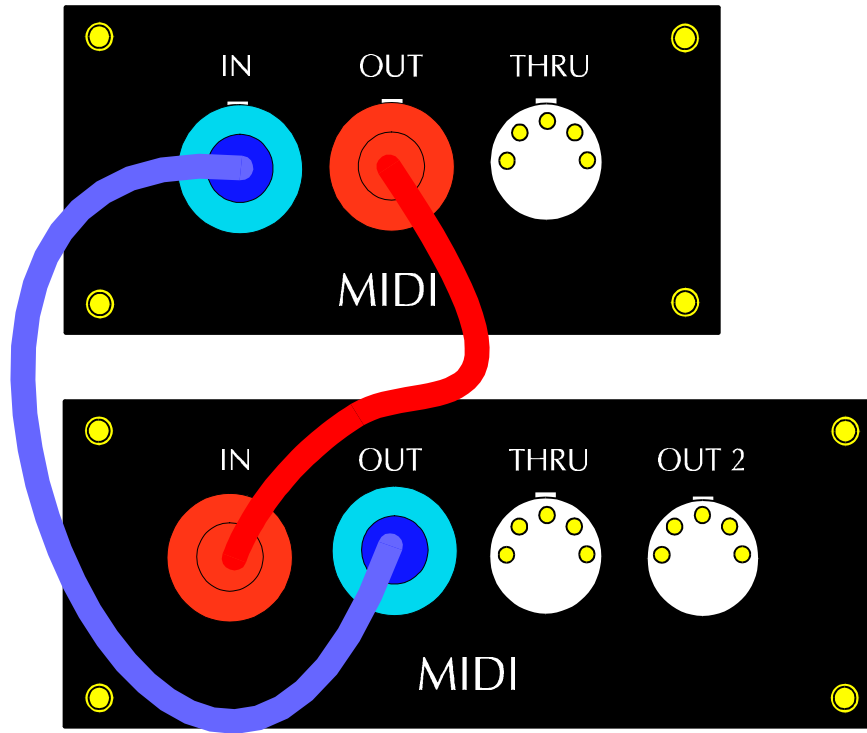


MIDI systems may be connected together in two basic ways, although as you become more involved and introduce a larger selection of equipment there are still more methods to be considered. For starters let us just consider the basics.



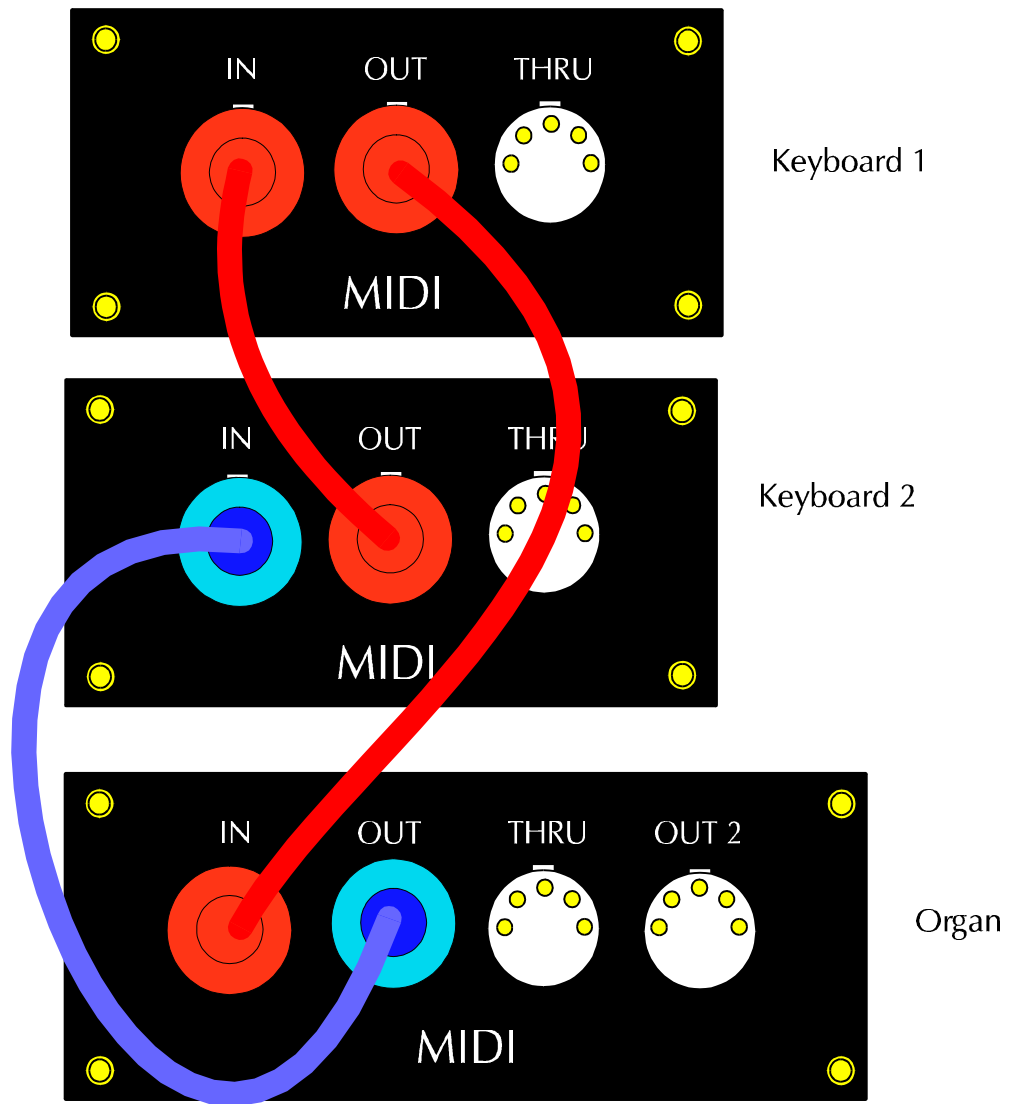
The picture above shows the connector panel that is used with the system. MIDI systems standardise on three basic connections, IN, OUT & THRU, we also add another called OUT2 which will be covered later.

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.

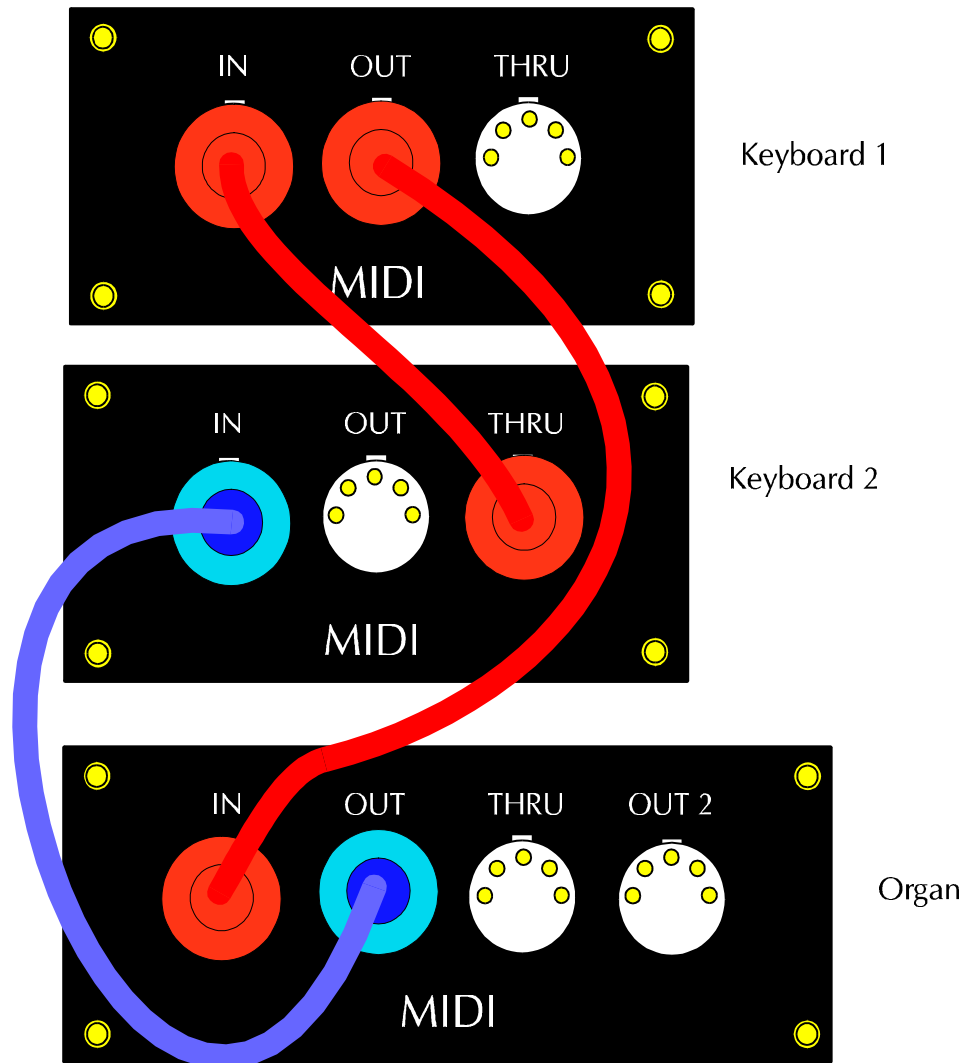


When connecting the devices together it is important to use the correct connections. Each device has one input called IN and two outputs OUT & THRU, THRU being an abbreviation for Through. In the example above two devices are linked together so that each keyboard can play the sounds on the other. Please 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 who 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.




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#### OUT2:

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 MDF2 which may be used to record and replay performances.

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 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 affects 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.

| <b>Stop Name</b> | <b>Channel #</b> |
|------------------|------------------|
| 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.

| <b>Stop Name</b>  | <b>Channel #</b> |
|-------------------|------------------|
| 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                |

Select a MIDI device which 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, 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.

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.

| <b>Stop Name</b> | <b>Channel #</b> |
|------------------|------------------|
| 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.

| <b>Division Name</b> | <b>Channel #</b> |
|----------------------|------------------|
| 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.

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 MDF2 Data Filer which is easily obtainable from Yamaha dealers around the world, or direct from us. The MDF2 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 MDF2 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 MDF2 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 MDF2 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.