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J.L.Cooper Electronics

MIDI

ChromaFace

Owners Manual

Rev 1.3

Welcome to the family of J.L.Cooper Electronics MIDI Interface Box users. We spend a lot of time and energy trying to come up with solutions to interfacing problems, both within and outside the MIDI scene. We encourage you to contact us with any problems you come across; perhaps we already have a solution, perhaps we will have one soon.

Who, What, Why MIDI?

As an attempt to answer the cries of musicians for a universal interface among synthesizers and related equipment, the Musical Instrument Digital Interface (MIDI) was born. All MIDI really is is a standard, or agreement on a piece of paper that describes the type of connector, electrical levels, speed of data transfer and the format that the data will have to send and receive certain information from one piece of equipment to another. The advent and adoption of the MIDI by an exploding number of synthesizer and synthesizer accessory manufacturers marks the start of an exciting era for musicians. At least three outstanding aspects of this standard come to mind:

1) Lessening of fear of obsolescence.

Due to the previous lack of interconnection standard, there has always been a strong fear of ending up with equipment that could become useless in the context of future sequencer/computer hook-ups. Now, with the MIDI, you have some security knowing that your new synth is part of a large family of compatible synths. At least, until a new standard comes along, you are safe. (And knowing how glacial such things are, it will probably be a long, long time.)

2) Immediate gradification.

Just by plugging in a cable, you can attach two or more different brands of synthesizers to each other and have the rich overlay effect. Also, attaching a brand X sequencer to a brand Y synth is also immediate. (Actually, there have been some notable exceptions to this Shan-gri-la world, but at least the "fix" is just the replacement of the microcomputer program chip.)

3) Small company participation.

Before the MIDI, a small company would be very hesitant to invest the time and money in an accessory such as a sequencer to control a synthesizer. If you had a brand Y synthesizer, you had better like the features of the brand Y sequencer or else. The problem was that there was a different interface "standard" for each brand, and that the small company had to either design practically from ground up for each different brand, or had to settle on just one market. And of course, with few exceptions, assistance from the synth manufacture was non-existent, leading to the chance of surprise "bugs" or sudden design obsolescence. MIDI standards are well documented and can be relied on by a small company to lead to design agreement (with above noted exceptions.) We at J.L.Cooper Electronics obviously support the notion of MIDI and will offer an increasing line of interface products to either solve problems of interfacing MIDI to MIDI or MIDI to non-MIDI devices.

The main purpose of the Chromaface is to act as a translator of information between the MIDI standard and the Chroma interface.

The Chroma uses a bi-directional parallel interface. That is, information passes both directions and takes place with a full 8 bit data word being passed at the same instant. Just before a data word is sent from the Chroma to an attached unit, it test to see if a "ready" signal from the attached unit says that it is ok to send. This "ready" signal immediately goes to the "busy" condition when the attached unit gets the data word, indicating that no more information should be sent until that first word is digested. As soon as the attached unit has safely stored the word away, the "ready" signal will go back to the ready condition. This system of information handling is called "Handshake" operation.

In exactly the same way, the Chroma informs an external unit whether or not it is ready to receive any information with a separate handshake signal.

MIDI information is sent and received using serial transmission, in which the data is sent one bit at a time, one after another. There is no equivalent of the handshake principle in the Chroma. Instead, the receiving device is expected to be able to handle input information whenever the transmitter wants to send.

Not only is the type of information transmission totally different between the MIDI method and the Chroma method, but the actual data content is different as well, so a translation process must take place each time data is sent.

The Chromaface has separate interfacing electronics for the MIDI and the Chroma methods, and has a microprocessor inside that takes care of the translation necessary for the protocols.

Chromaface \_\_\_\_\_ Features

The following functions are converted from MIDI to the Chroma:

- 1) Note On- with velocity
- 2) Note Off
- 3) Program Change- the program change takes place to the desired number, but unfortunately the Chroma doesn't display the new number in its readout.
- 4) After-touch- this conversion only takes place if you have the most recent (rev 1.4) Chroma software.
- 5) Pitch Bend- this enters as "Lever 2" information- depending on your Chroma patch, this may be used as pitch bend or ?
- 6) Modulation- this enters as "Lever 1" information- again, the results depend on the Chroma patch.
- 7) Sustain Pedal- this recognizes the "64" code used by the DX-7 and the T-8.

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 \* MULTI-CHANNEL vs ONE CHANNEL RECEIVING \*  
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The Chromaface is capable of allowing the Chroma to be split up into up to 8 mono-phonic instruments, each on its own MIDI channel. To go into this mode, press Set Split, then 46. When in this mode, the reception of a Program Change command on any of 8 continuous channels, starting on the channel set by the DIP switch, will result in an instrument with that program number being defined within the Chroma. For instance, if the Chromaface receives Program Change #3 on channel 1 and Program Change #4 on channel 2, (assuming that the DIP switch is set to channel 1!) then the Chroma will have two instruments defined from then on, one assigned to channel 1 and having the sound of patch #3, and one assigned to channel 2 having the sound of patch #4. By sending a series of eight program change commands, each with its own channel number attached, to the Chromaface, eight separate instruments will result.

\*\*\* Your Chroma will only send the proper code to the Chromaface when you push the Set Split 46 if it has the Rev 1.4 software (most recent) software installed. If you don't have this software, or you are trying to use the Chroma Expander, you will need to enable this mode of operation by switching the internal DIP switch #5 to the ON position. This switch is only "looked at" when the power to the Chromaface is first applied, so throw the switch with the power off, then turn the power back on. \*\*\*\*\*

To defeat this mode, or to restore the instrument to have polyphony on just one channel, press Set Split 47 if you have the Rev 1.4 software. Otherwise, turn off the power to the Chromaface and switch DIP #5 to the OFF position.

What has not been stated here is just how you manage to get the program change commands with channel numbers attached into your sequencer. If you have another synth that can send on any selected channel, then the job is simple-- just select a channel, then punch the desired program number for that channel. If you have a synth like a DX-7 that only sends on channel 1, you would need to use a J.L.Cooper Channelizer to change the channel number. If you are only going to use the Chroma, unfortunately you are going to need to get inside the ChromFace each time to change the setting of the DIP switch to a new channel, then push a program number, then change the DIP switch again and so forth. If you do this, remember to return back to your starting channel number before trying to play back the whole thing. This, of course assumes that your sequencer is capable of handling multi-channel recording; contact that manufacture for the info- we have a hard time keeping track of all that. ( A hint for this- make up a dummy sequence that only has these program change commands in it and run it before running the real sequence. The Chroma/Chromaface will stay in the proper mode. Then, during the sequence, any further program changes may be inserted as normal.

The following functions are translated from the Chroma to MIDI if the "Performance On" command is made on the Chroma- Set Split 17. Any time the unit is turned off or reset (Set Split 50) you must hit Set Split 17 again. Set Split 16 turns it off.

- 1) Note attack- with velocity.
- 2) Note release
- 3) Lever 1- this is sent out as a MIDI modulation command.
- 4) Lever 2- this is sent out as a MIDI pitch bend command.
- 5) Sustain Pedal- this is sent out as MIDI control 64, which is used by the DX-7, the T-8 and the Oberheim Expander. This is only a de-facto MIDI standard, so some future unit may not necessarily recognize this code.

The following command is translated from Chroma to MIDI if Set Split 19 is pressed first. Set Split 18 turns it off.

- 1) Program Change

- 1) Attach the inclosed ribbon connector from the 25 pin connector on the Chroma to the 25 pin connector on the ChromaFace.
- 2) If you want to play on the Chroma and have MIDI information sent, attach a cable from the MIDI OUT connector on the ChromaFace to the MIDI IN jack on your other device (synth or sequencer.)
- 3) If you want to have the Chroma play in response to external MIDI information, attach a cable from the MIDI OUT connector on the other device (synth or sequencer) to the MIDI IN connector on the Chromaface.
- 4) Attach the plug from the Wall Transformer to the small jack on the rear of the ChromaFace.
- 5) Plug the Wall Transformer into the wall outlet (120 Volts AC).
- 6) If you want to play on the Chroma, and send out MIDI information, Press Set Split 17 on the Chroma. If you want to be able to send MIDI Program Change commands, press Set Split 19 on the Chroma.
- 7) DO NOT ATTEMPT TO CONNECT THE CHROMA TO THE CHROMAFACE AND A CHROMA-APPLE INTERFACE AT THE SAME TIME VIA SOME SORT OF "Y" CONNECTOR. IT WON'T WORK!

#### Channel Number

The ChromaFace may be set to send on any channel number 1 thru 16 by changing the setting of an internal DIP switch. See the chart for the different settings.

If you have a patch on the Chroma that uses a Link, and if you have a "LINK LOWER" set, then the right half of the split will be sent on the MIDI channel set on the switch and the left half of the keyboard will go out on that channel plus 1. For instance, if the internal DIP switch is set for channel 4, then the right half of the keyboard will be sent on channel 4 and the right half will be sent on channel 5. If you have "LINK UPPER" set, it will reverse this pair of channel numbers.

When receiving MIDI data, data for only the non-link sound will be received on the unit's basic channel (the channel set on the DIP switch) UNLESS you put the Chromaface in the MULTI-CHANNEL MODE, using the SetSplit 46 function. In this case, the Chromaface will not need to receive a Program Change command in order to define the extra instrument within the Chroma, you have already done this by selecting a link program.

Channel No.	Switch 1	Switch 2	Switch 3	Switch 4
1	off	off	off	off
2	on	off	off	off
3	off	on	off	off
4	on	on	off	off
5	off	off	on	off
6	on	off	on	off
7	off	on	on	off
8	on	on	on	off
9	off	off	off	on
10	on	off	off	on
11	off	on	off	on
12	on	on	off	on
13	off	off	on	on
14	on	off	on	on
15	off	on	on	on
16	on	on	on	on

Switch 5, when ON, enables the Multi-Channel mode of operation.

Switch 6, when ON, DISABLES the receiving of program change commands by the CHRCMA. This is useful when just linking two synths together with the CHROMA as the slave unit. Then, you may change program number on the master unit without the CHROMA following.

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