MCS-3000 Series
Media Command Stations
User Reference Manual
Second Edition

MCS-3800 Controller

MCS-3400 Controller

MCS-3000X Expander

JLCOOPER ELECTRONICS

Important:

Certain audio and video systems have been engineered to specifically support the MCS-3000 series. The MCS-3000 series was selected by the manufacturers of those systems to be their ideal, de facto control station.

Please review the owners manuals and "read me" files that came with your audio or video system for references to the JLCooper MCS-3000 series.

MCS-3000, MCS-3800, MCS-3400, MCS-3000X, Media Control Station, and Media Command Station are trademarks of JLCooper Electronics. All other brand names are the property of their respective holders.

About this Manual
This manual tends toward a pyramidal structure.

Essential concepts are presented first, followed by instructions with increasing amounts of detail. This allows the user to read as much as he or she needs, and then bail out and get back to work.

This manual is also intentionally repetitious.
The same basic concepts about programming and operation tend to be repeated in every chapter, and sometimes more than once within a chapter where appropriate.

This re-enforces the concepts, but more importantly lets the user work with the MCS-3000 series controller with only one page of the manual open at a time, while minimizing having to hold the manual open to ten different places at the same time.

Introduction

The MCS-3000 series of control stations are the most advanced control products ever from JLCooper Electronics. This family of products includes the 8 fader MCS-3800 Controller, the 4 fader MCS-3400 Controller, the MCS-3000X 8 fader Expander, and the Surround Panner Module.

MCS-3800 and MCS-3400 Media Command Stations are moving fader control surfaces, expandable to sixty-four faders. Capable of controlling digital workstations for music and video production and post production, the MCS-3000 series is fully assignable and simple to operate.

MIDI I/O is standard. In addition, the MCS-3400 and MCS-3800 feature two expansion slots for optional cards which support other hardware interfaces and protocols. These include RS-232, RS-422, RS-485, P2 (9 Pin), ADB, and GPI.

This manual deals primarily with the MCS-3400 and MCS-3800 Controllers, and the MCS-3000X Expander, with standard MIDI I/O. The Surround Panner, and Option Cards are discussed in their own manuals.

Sending your product registration card allows us to notify you of any updates or related products as they become available.

Important: There is a "Quick Operation Reference" found on the last 7 pages of this manual. This is a brief summary of the whole manual.

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Getting Started

This chapter discusses the MCS-3000 Series hardware, describing the front and rear panel controls, viewing the front panel in "sections", the displays and connectors, and how to interconnect it into your system.

Front Panel Displays and Controls

The illustrations show the MCS-3800, which is operationally the same as the MCS-3400.

It is helpful when considering the front panel layout to view the MCS-3800 or MCS-3400 in sections.

Some of the sections "overlap", there are controls that can be used for more than one purpose. But viewing the unit in sections makes it easier to understand.

The displays and controls within the section under discussion are shown in the following illustrations by "graying out" the controls that are not part of the section under discussion.
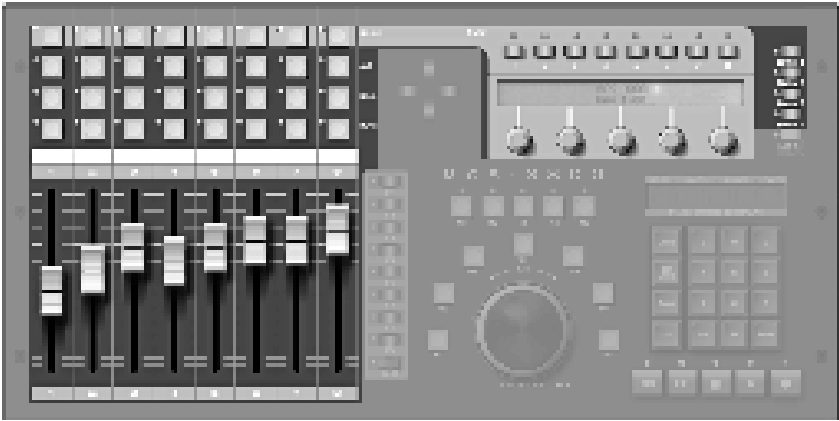
The Mixer Section

The Mixer Section is comprised of the motorized, touch sensitive faders, the buttons above the faders, the five rotary encoders, and the Page and Bank Switches.

The Function Buttons Section

This is comprised of the buttons F1 through F8, Shift, W1 through W5, M1 through M5, the Cursor Buttons.

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The Transport Section

The Transport Section is comprised primarily of the Transport Controls: Rewind, Fast Forward, Stop, Play and Record, and also the Jog / Shuttle mechanism.

Other controls that can be considered part of the Transport Section include the Keypad, since once of its functions is to send Locate commands.

The M buttons may be used to turn machines on and off, to determine, for example, which machines will go into Play when Play is pressed.

The Shift button is included, because the Transport and M buttons have Shifted functions as well.

For example, Play can start a hard disk recorder, while Shift Play starts a VTR.

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The System Section

The System Section is comprised of the Cursor Buttons, the Rotary Encoders, and the Assign Button.

The Shift button is included, because Shift Assign puts the unit into Utility mode, and Shift Locate changes the function of the Keypad from Locates to Program Changes.

The LCD is used to primarily to display the names of controls and their parameters, locates and system settings.

The LED Display is used primarily for displaying time code. Time code is displayed as SMPTE time (with or without frames) or Feet and Frames. The right most decimal point lights when drop frame code is received.

The display also shows Program Change, Bank, and Channel number when in Program Change mode.

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Rear Panel

MCS-3800 is shown, the MCS-3400 is similar.

From left to right we have:
• MIDI In, MIDI Out

• LCD Contrast Control

• MCS-3000X Expander Connector

• Time Code Input
The input jack is 1/4", unbalanced, that is, tip & sleeve.

• Card Slot #1 and Card Slot #2
Accepts optional, user installable plug in cards for additional control.

• Power Jack
This supply is 12 Volts DC, at least 3A.
The strain relief clip adjacent to the jack may be used to loop the power cord through to prevent accidental unplugging.

• Power Switch
Flip up (red showing) to turn power on.

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Expander Connection

The MCS-3000X Expanders may be physically attached to the MCS-3400 or MCS-3800 Controller, forming a continuous control surface.

(MCS-3800 shown with 3 MCS-3000X Expanders attached)

Alternately, the Expander can stand apart from the MCS Controller. In that case, an optional set of simulated stone end-bells may be purchased to make the Expander more attractive.

(MCS-3000X shown with Optional End Bells attached.)

The instructions for physical interconnection, and electrical hookup are on the following pages.

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Mounting MCS-3000X Expander to Controller

Important: Make All Connections with the Power Off.
Turn the power off of all MCS-3000 units before proceeding.

Plan Work Area
You will want to work at a spacious, well lit surface.
Spread a cloth on the surface to avoid scratching units.

Remove Top of MCS-3400 or MCS-3800 Controller
Using the allen key provided with the Expander, remove the six top panel screws of the Controller. Remove any optional Cards from the card slots. Remove one screw under front center. Lift the whole top panel, a little forward and up. Invert and lay control-side down on a soft surface. (Circuit side up.)

Remove Top of MCS-3000X
Remove the six top panel screws of the Controller.
Lift top panel, a little forward and up. Invert and lay control-side down on a soft surface. (Circuit side up.)

Move Left End Bell
Remove the two screws that secure Controller's left end bell. (These screws will be tight). Attach the left end bell to the left side of the Expander.

Connect Controller to Expander with Plates Provided
Place the Expander to the left of the Controller, side by side.
Attach the thicker plate to the bottom of both units.
Lay thin (spring steel) plate on top of both units.

Replace top panels of the Controller, guiding in the Time Code jack and the LCD Contrast control into their holes. Replace the top panel of the Expander. Replace top screws. Replace Controller bottom screw. Replace any optional Cards in their card slots.

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3000X Expander Electrical Hookup

Important: Make All Connections with the Power Off.
Turn the power off of all MCS-3000 units before proceeding.

The 3000X (8 moving fader controller) can be used either:
(1) Connected to an MCS-3800 (or 3400) or
(2) "Stand Alone", as a self contained control surface.

On the rear of the Expander is a small cluster of four switches, known as DIP switches.

(1) To connect to an MCS-3800 or, an MCS-3400
Set the rear DIP switch position #4 up (= off).

When the rear dip switch number 4 is up, that is, off, the MCS-3000X is connected to the MCS-3800 via its Modular "telephone-type" connectors. The MCS-3000X's are connected by chaining them together with the supplied 4-conductor modular cables.

Connect Expander to Expander in a similar manner, using the cables provided.

The system is engineered so that it does not matter which of the two connectors you use, nor in what order you chain the expanders.

Warning: Use the cable provided with the 3000X. Do not use a standard "telephone handset" cable. If you use a standard "telephone handset" cable, you will short out and possibly damage the MCS-3800 or MCS-3000X. (Note that pin 1 always goes to pin 1.)

The data comes out of the *MCS-3800*, not the 3000X MIDI input and MIDI output.

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Set the Expander ID#

On the rear of the Expander is a small cluster of four switches, known as DIP switches.

When the rear dip switch number 4 is up, that is, off, the 3 remaining switches are used to set the "ID" number of the 3000X Expander.

These switches set the ID# of each Expander, so the system knows which Expander represents channels 1 through 8, which is 9 through 16, etc.

Set the left-most Expander for ID#1 by making sure that all four switches are up, that is, off.

Follow this chart to set the ID# of multiple units. Off = Up

#4	#3	#2	#1	ID#	Fader Numbers
off	off	off	off	1	9 - 16
off	off	off	on	2	17- 24
off	off	on	off	3	25- 32
off	off	on	on	4	33- 40
off	on	off	off	5	41- 48
off	on	off	on	6	49- 56
off	on	on	off	7	57- 64

Important: Be Sure Each Expander has a Unique ID#

A multiple expander system will not operate correctly if two or more units are set to the same ID#.

On power-up, turn the Expanders on before the MCS-3800. The MCS-3800 LCD will display the number of 3000X units connected.

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(2) To Use 3000X "Stand Alone" without an MCS-3800
Set the rear DIP switch position #4 down (= ON)

When the rear dip switch number 4 is down, that is, on, you will use the MCS-3000X's MIDI input and MIDI output.

(The MCS-3000X's modular "telephone-type" connectors are not used in this modes)

When the rear dip switch number 4 is down, that is, on, the 3 remaining switches are used to select the protocol, that is, the input and output MIDI commands.

Information about the stand-alone protocols is covered in a separate document.

DIP Switch Setttings for Protocol Selection
Note that the switches are mounted upside down.
Switch #4 is the left most switch, when viewed from the rear.
Up = off.

#4	#3	#2	#1	Mode
on	off	off	off	0
on	off	off	on	1
on	off	on	off	2
on	off	on	on	3
on	on	off	off	4
on	on	off	on	5

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System Connections

Power
Make sure the power switch is off before connecting the external power supply.

Power should be turned off of every MCS-3000X Expander.

There is a strain relief clip on the back of the unit, to prevent accidental unplugging.

Pass the small plug end of the power supply through this clip. Loop it around and pass it through again..

Then plug it in.

Time Code
The MCS-3400 and MCS-3800 have a built in time code reader and display.

If you wish to display time code, connect a source of SMPTE ("LTC") to the Sync In jack.

The input jack is 1/4", unbalanced, that is, tip and sleeve.

While the time code reader responds to a fairly wide range of input levels, -10 dBm is the recommended nominal level.

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MIDI In and Out
Connect the MIDI Out to the MIDI In of the System you are controlling.

Connect the MIDI In to the MIDI Out of the System you are controlling.

If a computer-based system, this will be connected to the computer's MIDI Interface.

If a non-computer based system, you may want to connect the MIDI In and MIDI Out to a MIDI Patch Bay (Such as the JLCooper Synapse) to distribute the commands throughout the system.

(The Synapse is a Assignable MIDI Patch Bay / Processor, with 16 MIDI Inputs and 20 MIDI Outputs.)

Card Slots #1 and #2
Connection of Optional Cards are covered in their own manual.

OMS or Free MIDI Definitions

If your computer system requires OMS or FreeMIDI, it will also require that you edit your studio setup to include the MCS.

The MCS-3400 and MCS-3800 are defined in the same way: MIDI Controllers that transmit on all MIDI Channels. They send MIDI Machine Control and can also receive MIDI Time Code.

Typical devices descriptions are shown here.
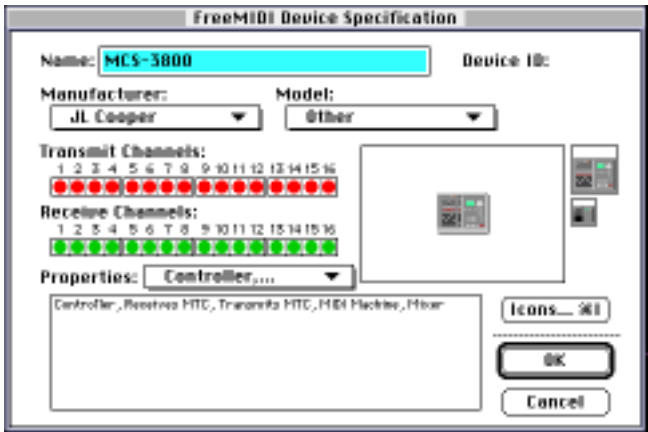
(FreeMIDI Device Specifications Window)
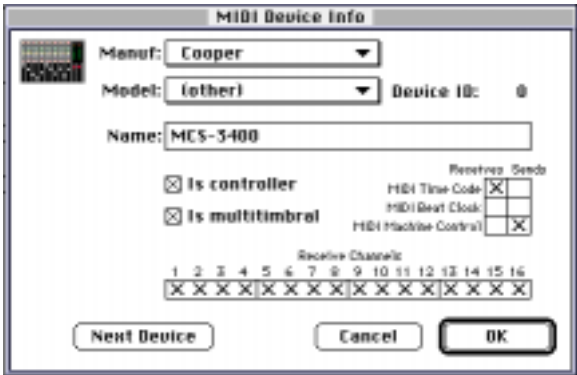
(OMS Device Info Window)

Basic Operation

This chapter discusses some fundamental characteristics of the MCS-3000 Series, what it does when powered up, operating modes, and the ever-popular wave demo.

Power Up

Turn the power switch on.
The LCD briefly shows the product name and firmware version.

The LCD then shows either the current Bank name, or the name and value of the 5 encoders. If the user has not yet named the encoders, the display is VKNOB1, VKNOB2, etc.,

After about 2 seconds, the faders will quickly move to the last position that they held on the previous power down.

Entering and Exiting Assign Mode

The MCS Controller is ready to transmit commands.

While the procedure for assigning a control is described in detail later, it is important to notice that the unit will not transmit data while it is in "Assign Mode".

To enter Assign mode, press the yellow Assign button.
The yellow LED lights.

To exit Assign mode, without any changes to memory, press Assign again. The yellow LED turns off.

To exit Assign mode, and keep any changes, press Enter on the numeric Keypad. Then press Assign.

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LCD and Page Buttons

If the already selected Page button is pressed, its LED will turn off and the LCD shows the Bank name. Press any Page button to restore the LCD to a display of the encoder names and values.

If connected to an audio or video host system, developed to communicate directly the MCS Controller, the LCD may also change when the host system is launched.
The display is then taken over by the host.
In that case, refer to the documentation of the host system for information about what appears in the display.

Modes of Operation

The MCS-3000 Series Controllers feature MIDI I/O standard. There are two fundamentally different modes of MIDI operation.

(1) The MCS Controller is "user-assignable", with local control ON. We'll call this ***User Assignable Mode***.

(2) The MCS Controller is not "user-assignable", and local control is OFF. We'll call this ***Special Mode***.

When in **User Assignable Mode**, you can assign each control yourself. You chose what MIDI command the controls send.

When in **Special Mode**, you cannot program the unit.
The MCS Controller relies on the implementation of the host system. The MCS Controller sends special, proprietary commands to the software host system. The host system determines what each control will do.

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More About User Assignable Mode

The MCS Controller normally powers up in User Assignable mode. The expression, "local control on" simply means that you can push a button and generally expect its LED to turn on.

The LED can be assigned by the user to be either momentary, or latched.

Momentary means the LED is lit only while the button is pressed. It turns off when you release the button.

Latched means that the LED turns on with the first button press, and then turns off with the second button press.

More About Special Mode

The MCS Controller normally first powers up in User Assignable mode. For Special Modes to be engaged, the host system has to have been specifically developed to support Special Mode. Assuming that two way communication is established, when the host system is launched, it sends a command into the MCS, which switches it into Special Mode.

The host system then determines what appears in the LCD and LED displays, and what each control does.

The expression "local control off", simply means that the buttons are no longer "tied to" their LEDs. **Pressing a button does not necessarily turn on the LED.**

Rather, pressing a button sends a command to the host system. The host system then is responsible for sending a command back into the MCS controller, to light up the LEDs.

That way, depending upon the mode of the host system, the host system may cause an LED to appear to be controlled by the switch.

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LED Behavior in Special Mode

The LED can appear to behave either momentary, or latched. Momentary means the LED is lit only while the button is pressed. It turns off when you release the button. Latched means that the LED turns on with the first button press, and then turns off with the second button press. Alternately, the LED can flash, or do nothing. **It is up to the host system**.

The most important thing to understand about the Special Mode, and the fact that the Special Mode turns Local Control Off, is that two way communication with the host system is required for a special mode to operate. In other words, special mode will not work unless there are (in the case of MIDI I/O) two MIDI cables connected, or a 422 connection.

If only one way communication is established, and the MCS is in Special Mode, then it is possible that the unit will appear to not work. Either the displays will light, but the MCS will not control the software, or, the MCS will control the software but none of the LEDs or LCD will light.

Manually Exiting Special Mode

A host software system, engineered to support the MCS Controller using Special Mode, will send a command which switches the unit into Special Mode.

At this point, the MCS is no longer user-programmable.

The user may choose, however, to manually exit the Special Mode and return to User Assignable mode, without having to turn the hardware off and on.

This is done by entering Utility Mode by pressing Shift and Assign. Above the first encoder is the word MODE. The encoder is turned to select either User or Host.

Selecting User returns the unit to User Assignable Mode. Selecting Host returns the unit to the Special Mode.

Note that this function is only available if the MCS has already been switched into Special Mode by an external host system.

If the unit has not received any command from a Host system, since its last power-up, then this feature is not accessible.

User Assignable vs. Pre-Defined Functionality

User Assignable Mode means the unit is User Assignable: The MCS Controller's MIDI Commands sent are chosen by the user. You can add a 422 card, and also have 9 Pin control, this relates to the Transports, Jog/Shuttle, and Locates. You can also add an ADB card, (Apple Desktop Bus) for Macintosh, and again the controls are fully assignable.

Special Mode means the unit has a Pre-Defined Functionality: When communicating via MIDI, RS422, and RS485, the people who designed your audio and video host system decided how the MCS Controller behaves. They take over all the controls and displays, and determine how each control will behave.

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Wave Demo

For the fader wave demo, hold the UP cursor button while powering up the unit. Continue to hold it for about 3 seconds, until the demo starts. Turn the power off to stop the demo.

The Mixer Section

This chapter discusses how to assign and use the motorized, touch sensitive faders, their associated channel switches above the faders, their associated Select buttons and Rotary Encoders. Page buttons and Bank buttons.

Before proceeding, it is important to briefly restate the Basic Modes of Operation: User Assignable Mode vs. Special Mode.

In the User Assignable Mode, (the way the unit normally powers-up), you, the user, can set it up how you want, determining what kind of commands the controls send, and how it controls your audio or video system.

In Special Mode, the audio or video system "takes over" the MCS controller. The designers of the system (that is, the makers of your audio or video system) have pre-determined how the MCS works with your system.

This chapter relates to User Assignable Mode Only.
If your system switches the MCS Controller into Special Mode, you will need to refer to the documentation included with the system for operation instructions.

Attributes of the Mixer Section

The eight faders, their touch sensors, the encoders, and the buttons above the faders, are all ***Bank Switchable***.

There are four banks, selected with the Bank Switches.

The most obvious use for bank switching is to control software with more audio channels than there are hardware faders.
That is, with Bank 1 selected, faders and mutes 1 through 8 control audio channels 1 through 8.
With Bank 2 selected, the same faders and mutes control audio channels 9 through 16, etc.

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Basic Bank Switching and Encoder Selection

Prior to moving a fader, pressing a button above the faders, or turning an encoder knob, choose a Bank.

Press one of the four **Bank** switches to the right of the LCD.

The actual effect of the Bank switch is also dependent upon the number of MCS-3000X Expanders connected.

For example, with 3 Expanders connected, there are a total of 32 hardware fader channels. In that case, there are only two Banks available, Banks 1 and 2, for a total of 64 channels.

If there are 7 Expanders connected, you already have a total of 64 hardware faders. In that case, the Bank switch has no function and remains on Bank 1.

Indeed, one reason for adding Expanders is to reduce the necessity of Bank switching.

Encoder Selection

Prior to turning an encoder knob,
Press one of the four **Bank** switches to the right of the LCD.

Press a **Select** button at the top of a fader channel.
The Select button selects a set of 40 virtual encoders associated with that channel.

Press a **Page** button above the LCD.
The Page button selects one of the 8 Pages of 5 Encoders.

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Fader Output

Moving a fader sends a range of MIDI commands. Typically, this will be a controller or a note, with the controller or note number specified by the user.

(If the MCS is still in its initialized state, refer to the Initialized Settings section of the Technical Information chapter, page xx, for a detailed listing of commands and channels.)

Faders can be grouped to another fader. And any fader can be made a Grand Master for all the faders in all four Banks.

Fader Input

The fader motors move when the unit receives a MIDI command that is equivalent to the fader's current assignment.

In other words, move a fader, and record the data that is output as a result of the fader movement. Play back that same data into the MCS, and the fader will automatically move to repeat the move you recorded.

For example, from the factory, Fader 1 in Bank 1 sends MIDI Controller #0 on MIDI Channel 14.

When your host system software sends MIDI Controller #0 on MIDI Channel 14 into the MCS Controller, the fader will move.

The position of the fader will be equal to the Controller value, which typically ranges from 0 to 127.

The faders will also "remember" their position for each Bank. Pressing the Bank button will cause the faders to move to their last position within the Bank.

Touch Sensor

A single command is sent every time a fader is touched, and the same command is sent when the fader is released.

A user assigned value is sent when the fader is touched, a different value is sent when the fader is released.

A typical application is to use the touch sensor to arm a fader for writing automation moves, within software that supports automation and also support MIDI control of on-screen buttons.

Channel Switches

The Mute, Solo, Aux, and Select are user assignable, and bank switchable.

The labels, "Mute, Solo, and Aux" are purely for convenience, since those are designators of commonly used mix related functions.

You can program these switches to send MIDI Controller and MIDI Note commands.

A typical application is to use these switches for controlling software that supports mixer related functions and also support MIDI control of on-screen buttons.

These switches can be assigned to behave in two different ways, either momentary or latched.
Momentary means the switch is on only as long as you hold down the button. Latched means that the switch is press once for on, again for off.

The LEDs for each of these switches can be remotely controlled. For example, a sequencer can turn them on or off.

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Encoders, Select and Page

The top row of Channel buttons are the Select buttons 1 - 8.

The Select buttons are user assignable, and pressing them can result in transmitting a MIDI command. But they also have an important function relating to the operation of the 5 rotary encoders.

Select a channel by pressing a Select button. This makes the LCD indicate the names and values of 5 rotary encoders associated with that channel.

For a given selected channel, the user can also press 1 of 8 Page buttons above the LCD. Each button selects a different "Page" of rotary encoders associated with that channel.

Since there are 5 encoders, times 8 pages, that means each channel can have 40 independently named and assigned "virtual" encoders.

The encoders are also bank switchable. For each bank there are 40 times 8 or 320 virtual encoders.

Since there are four banks, the MCS-3800 presents a control surface with 1280 virtual encoders, providing convenient "hands-on" control of knobs to adjust DSP parameters in real time, while using a compact control surface.

(Please note: If an already selected Page button is pressed, the LED will turn off and the LCD will blank. In the release version, the LCD will show the Bank name and possibly additional information. Press any Page button to restore the LCD.)

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Assigning Mixer Controls

An Overview
The general procedure to change (edit) what a control sends or change its name, is to enter Assign Mode by pressing Assign. then do the following:

1. Select the control by moving it. This control is "held" in the LCD display, and you cannot at this point decide to edit a different control.

If you meant to edit a different control, press Assign twice to exit and re-enter Assign mode.

2. Make the desired edit, by turning the rotary encoders below the parameters shown the LCD.

3. Use the right-most encoder to change pages, to see and edit more parameters for a single control.

4. To keep the changes, and store them to memory, press Enter on the Keypad.

5. You may then proceed to select another control to edit.

6. To discard the changes, do not press Enter. Simply press Assign to exit Assign mode.

7. When you are done editing, be sure that you have exited Assign mode. Yellow LED off.

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To Assign a Fader or a Touch Sensor

Since the faders and touch sensors are Bank-switchable, select the desired Bank before entering Assign mode.

In other words, if assigning the first fader, the Bank switch will determine if the first fader is channel 1, or 9, or 17, or 25.

Press Assign to enter Assign mode. The yellow LED is lit. After entering Assign mode,

Touching a fader selects the touch sensor only. You are now able to assign the command sent when the fader is touched.

Moving the same fader selects the fader itself. You are now able to assign the command sent when the fader is moved.

At that point, the display "holds" the currently selected control.

If you change your mind and wish to edit a different control instead, press Assign to exit assign mode. Press Assign again to re-enter Assign mode and select a different control.

Use the LCD and rotary encoder knobs to edit the control. Turn the right-most encoder knob to reveal additional editable parameters.

After making the edit, press Enter on the Keypad to store the changes to memory.

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Editable Parameters for the Faders and Touch Sensors

Name
Press the Cancel/Clear key in the Keypad to clear the name.
Use the Cursor buttons to the left of the LCD to move the
cursor. Turn the first encoder to dial in the letters and numbers.
The top row of the LCD show the control's real (permanent)
name. The bottom row of the LCD is the user editable name.

Command
Faders and Touch Sensors send either Controllers or Notes.
Any control can be turned off.

Number
Selects the Controller or Note number.

Channel
Selects MIDI Channel 1 through 16.

Minimum
Minimum controller or note velocity value.
The value sent when the fader is in its lowest position.

Maximum
Maximum controller or note velocity value.
The value sent when the fader is in its highest position.

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Group

The selected control that you are currently editing can be made a group member.

By rotating the encoder under the word Group, the LCD prompts you to select which fader will be the Master for that control.

Faders that are grouped can still be moved individually.

When the master is moved, the group member faders' positions and output values are said to be "scaled".

This means that when the group master is moved down, all group members reach minimum at the same time.

GMaster

Turning GMaster on makes that one fader the Grand Master. Moving this fader moves the other 7 faders. Data is sent as if all 4 Banks of faders (32 faders) were being moved.

If MCS-3000X Expanders are part of the system, then moving the Grand Master fader causes data to be sent for as many faders and banks are available.

To use the Grand Master feature, you will also make one function button (F, M, or W) into a Grand Master On Off button.

This allows one switch to instantly turn on or off the grand Master function. In brief, the procedure for doing this is to select the button in assign mode, and set the command type to GMaster.

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To Assign the Rotary Encoders

First switch to the desired Bank. Then, select a channel by pressing a Select button at the top of the fader channel. Finally, select one of the 8 Page buttons.

Press Assign to enter Assign mode. The yellow LED is lit.

After entering Assign mode, ***rotating an Encoder knob selects which one of the five encoders you will be assigning.***

At that point, the display "holds" the currently selected control.

If you change your mind and wish to edit a different control instead, press Assign to exit assign mode. Press Assign again to re-enter Assign mode and select a different control.

Use the LCD and rotary encoder knobs to edit the control.

Turn the right-most encoder knob to reveal additional editable parameters.

After making the edit, press Enter on the Keypad to store the changes to memory.

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Editable Parameters for the Rotary Encoders

Name
The 40 encoders per channel and the switches share the same name as the fader.

Press the Cancel/Clear key in the Keypad to clear the name. Use the Cursor buttons to the left of the LCD to move the cursor. Turn the first encoder to dial in the letters and numbers.

Command
Rotary Encoders send either Controllers or Notes. Any control can be turned off.

Number
Selects the Controller or Note number.

Channel
Selects MIDI Channel 1 through 16.

Minimum
Minimum controller or note velocity value.

Maximum
Maximum controller or note velocity value.

37

To Assign Mute, Solo, Aux and Select Buttons

Since the Mute, Solo, Aux, and Select buttons are Bank-switchable, select the desired Bank before entering Assign mode.

Keep in mind that the Select buttons have two functions. (1) They are used to select a set of 40 virtual encoders associated with each channel. (2) For maximum user-flexibility, they may also be programmed to send a command. If you wish to reserve the Select buttons to only select Encoders, and not to send a command, they may be assigned to send no command.

Press Assign to enter Assign mode. The yellow LED is lit.

After entering Assign mode, press a button to select it.

At that point, the display "holds" the currently selected control. If you change your mind and wish to edit a different control instead, press Assign to exit assign mode. Press Assign again to re-enter Assign mode and select a different control.

Use the LCD and rotary encoder knobs to edit the control. Turn the right-most encoder knob to reveal additional editable parameters.

After making the edit, press Enter on the Keypad to store the changes to memory.

38

Editable Parameters for Mute, Solo, Aux, and Select

Name
The 40 encoders per channel and the switches share the same name as the fader.

Press the Cancel/Clear key in the Keypad to clear the name. Use the Cursor buttons to the left of the LCD to move the cursor. Turn the first encoder to dial in the letters and numbers.

Command
Mute, Solo, Aux and Sel can send Controllers, Notes, or Program Change. Any control can be turned off, so no command is sent when pressed.

These switches can also be assigned enable a feature called Query. When a switch is set to Query, it will not send a command. When pressed, it puts the whole unit into Query mode. In Query mode, no commands are sent, but the LCD will display all the assignment parameters for the last control activated.

Number
Selects the Controller or Note number.

Channel
Selects MIDI Channel 1 through 16.

Minimum (or Release Velocity)
Minimum controller or note off velocity value.

If the switch is Latch Off (see below), this is the value sent when the switch is released.

If the switch is Latch On (see below), this is the value sent every other press, when the LED turns off.

39

Maximum (or Velocity)
Maximum controller or note velocity value.

If the switch is Latch Off (see below), this is the value sent when the switch is pressed.

If the switch is Latch On (see below), this is the value sent every other press, when the LED turns On.

Group
The selected control that you are currently editing can be made a group member.

By rotating the encoder under the word Group, the LCD prompts you to select which fader will be the Master for that control.

Buttons that are grouped can still be pressed individually.

Latch
When Latch is on, the button will activate "push once for on, push again for off". When Latch is off, the button is momentary, that means its only on for as long as you hold down the button.

40

Mixer Operation Notes

Banks Remember Last Fader Position

When a Bank switch is pressed, the faders snap to their last position in that bank.

The fader position may have been established by the user manually moving the fader. For example, move Fader 1 up to the top in the first bank. Switch banks. Switch back to the first bank, and fader 1 jumps back to the top.

The position may have been established by a received command. For example, move Fader 1 up to the top in the first bank. Switch banks. Send a command into the input of the MCS Controller, telling it to move fader 1 down. You will not see the fader move, because the unit is set to a different Bank, In other words, fader 1 is not currently visible.
Switch back to the first bank, and fader 1 jumps down to the bottom, reflecting the last command received.

Touch Inhibits Motor

When a fader is touched, the touch sensor turns off the motor, so the motor does not fight the user.

However, if commands to move the fader are received during the time that the fader is being touched, the MCS Controller remembers those commands.

So when the fader is released, the fader will jump to the position corresponding to the last command received.

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Touch May Interfere with Mapping Faders to Host

Some software applications require that the user "map" the MCS faders to the host computer's on-screen faders. Sometimes this procedure is called "capturing" or "learning" the fader commands.

Some software applications achieve this by instructing the user to move a fader on their controller, while the software is prepared to read the command type sent by the controller.

Remember, however, that simply touching a fader on the MCS Controller may result in sending a command. If you accidently program your host system to read the touch sensor command, instead of the fader command, the result will likely be that moving the MCS fader will not move the on screen fader. Rather, you will have the strange symptom of touching the fader causes the on screen fader to jump to its maximum position.

There are two ways to correct this. First, prior to mapping the MCS faders to your host system, you may go into Assign mode and set each touch sensor to "Off". Then proceed with mapping, following your software host systems instructions. When finished, turn the touch sensors back on if you need them.

Encoders

The Rotary Encoders rotate freely in either direction, they have no physical "end-stops", the way most pots do.

There are 24 positions per revolution, which are felt as a soft "detent" or bump.

The Encoders are automatically accelerated. The faster you turn them, the bigger the jump in values.

Encoders cannot be grouped.

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Fader Groups Traverse Banks

A fader or channel switch may be made into a Group Master. Activating the control (moving a fader, pressing a button) results in data being sent for that control, and all members of the group.

A Group Master may have members that are in different Banks than the Group Master. For example, Fader 8 can be a Group Master, and "Fader 9" can be a group member.

If no Expanders are present, it is easy to see that Fader 9 is really the first fader, but in the second Bank.

Moving Fader 8 sends data as if Faders 8 and 9 were moved. You would not see Fader 9 actually move, because Bank 1 is selected while Fader 8 is being moved.

Group Members are Automatically Scaled

When a Group Master is moved down, the group members values are scaled so that all the faders reach the bottom at the same time.

When the group master is at the top of its throw, the current position of the group members are taken as their starting position.

Any movement of the group master downwards moves the group members down from this starting position.

If a group member is moved individually, the next time the master is moved, the group member will first immediately jump down to its scaled position.

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Grand Masters Require Grand Master On Switch
The Grand Master feature is designed in such a way to permit you to turn the grand master feature on and off with a single button press. This allows you to use the fader individually or as a Grand Master.

To use the Grand Master feature, you also assign one button (F, M, W) to be the "Grand Master On/Off" switch.

This switch must be on for the designated Grand Master fader to act as a Grand Master.

When the Grand Master switch is off, the designated Grand Master fader simply operates as an individual fader.

Grand Masters Traverse All Banks.
When the Grand Master is moved, all faders move and data is sent out for all the faders in all the Banks.

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Moving Faders with MIDI Data Created Off Line

To produce smooth, continuous movement, the MCS must receive a series of controller commands with consecutive, up-counting or down-counting values with respect to time.

This becomes important should your software allow the provision of recording events "off line." You might wish to manually enter these commands to produce a precise move.

For example,

MCS Receives MIDI Command	Hex Representation
Controller #0 on Channel 14, value 0	$BD 00 00
Controller #0 on Channel 14, value 1	$BD 00 01
Controller #0 on Channel 14, value 2	$BD 00 02
Controller #0 on Channel 14, value 3	$BD 00 03
Controller #0 on Channel 14, value 4	$BD 00 04
Controller #0 on Channel 14, value 5	$BD 00 05
Controller #0 on Channel 14, value 6	$BD 00 06
Controller #0 on Channel 14, value 7	$BD 00 07
etc.	

This will make fader 1 first jump to its lowest position, and then start to move up. The time it takes to complete the move is dependent upon the rate at which the data is received. For example, to make the fader fade in over a period of 10 seconds, send 127 controller commands spaced at approximately 1/12 second intervals.

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MCS-3000X Expanders and Bank Switching Scenarios

The maximum number of fader channels that can be controlled by a single MCS-3800 is 64, including the 8 faders on the 3800 itself.

Understand that the addition of 8 faders also adds 8 Select buttons. Since each Select button allows access to 40 virtual encoders, a single MCS-3000X Expander adds 320 virtual encoders.

Due to the huge amount of programming memory this requires, there are certain restrictions on the number of Banks and channels that are available, dependent upon the number of MCS-3000X Expanders connected.

This table shows the total number of Banks and Channels that are available, depending upon the number of Expanders connected to a single MCS-3800.

MCS-3800
+ 0 Expanders X 4 Banks = 32 Channels.
+ 1 Expanders X 3 Banks = 48 Channels.
+ 2 Expanders X 2 Banks = 48 Channels.
+ 3 Expanders X 2 Banks = 64 Channels.
+ 4 Expanders X 1 Banks = 40 Channels.
+ 5 Expanders X 1 Banks = 48 Channels.
+ 6 Expanders X 1 Banks = 56 Channels.
+ 7 Expanders X 1 Banks = 64 Channels.

The Transport Section

This chapter discusses how to assign and use the transport controls (that is, Play Stop etc.), the Jog Wheel and Shuttle Ring, the Machine Enable ("M") buttons, and the Keypad Locates.

Before proceeding, it is important to briefly restate the Basic Modes of Operation: User Assignable Mode vs. Special Mode.

In the User Assignable Mode, (the way the unit normally powers-up), you, the user, can set it up how you want, determining what kind of commands the controls send, and how it controls your audio or video system.

In Special Mode, the audio or video system "takes over" the MCS controller. The designers of the system (that is, the makers of your Audio or Video system) have pre-determined how the MCS works with your system.

This chapter relates to User Assignable Mode Only.
If your system switches the MCS Controller into Special Mode, you will need to refer to the documentation included with the system for operation instructions.

Attributes of Transport Section
The Transports and the M buttons can have an alternate assignment using the Shift button.

For example, pressing Play can send a controller command to start a sequencer. Pressing Shift and Play can send an MMC command to start a hard disk recorder.

The commands sent by the Transport Section are not affected by the Bank switch.

M Buttons

There are two completely different purposes for the M Buttons.

(1) Like other buttons, they can be assigned to send a command when pressed.

(2) They can serve as instant Machine Enable-Disable buttons. They control which machine will respond to Transport, Locate, and Jog / Shuttle commands.

For example, in the initialized (Factory preset) state, M1 through M4 are programmed to represent MMC ID numbers 1 through 4.

Suppose M1 is lit, and the rest of the M buttons are not. The next time Play is pressed, only MIDI machines with an ID# of 1 will go into play.

Suppose M1 through M4 are lit. The next time Play is pressed, MIDI machines with ID# 1 through 4 will go into play.

This concept doesn't just apply to Play, all the Transport, Locate, and Jog / Shuttle controls will behave this way. The M buttons are "targeting" which machines will respond.

It is as though the transport, locate, and jog / shuttle controls "look at" which M buttons are lit, so they "know" which machines to control.

The M buttons do not have to be used in this manner. As stated at the top of this page, they can be assigned like any other button, to simply send or not sent a MIDI command.

If the M buttons have not been set up to act as Machine Enable buttons, then the Transport, Locate, and Jog / Shuttle commands will be sent out to all machines, using MMC "ID All" commands.

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Transports

The Transports consist of Rewind, Fast Forward, Stop, Play, and Record. The i.d. number that they transmit can be made to be dependent upon the state of the M buttons. Refer to the previous page.

The LEDs behave "exclusively", that is, pressing Play turns on the Play LED while turning off the Stop LED.

Record cannot be engaged unless Play is pressed and held down first.

Jog Wheel and Shuttle Ring

Jog and Shuttle transmit MIDI Machine Control and MIDI Controllers (CS-10 protocol), depending on the state of the M buttons. When the optional 9 pin card is installed, Jog and Shuttle can also send 9 Pin commands, for controlling professional VTRs.

The Shuttle Ring features a center detent, and direction LEDs.

The Speed of the Jog Wheel and the Shuttle Ring can be user-adjusted in the Utility Mode.

To enter Utility Mode, press Shift Assign. Turn the right-most encoder, and go to the page where you see "Jog" and 'Shuttle".

The Jog Speed range is 1 through 100.

Shuttle Speed range is 1X through 32X.
That is, when the Shuttle Ring is rotated as far as its goes, the machine will play up to 32 time Play Speed.

Any Transport or Function button can be made into a master "On / Off" control for the Jog / Shuttle mechanism.

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Locates

The MCS-3800 and MCS-3400 can store 100 locate points. You can enter them manually, and name them, or capture them on the fly, while time code is being received.

Locates may be displayed in SMPTE time (H:M:S:F) or in Feet and Frames. There is also a "Last" button to instantly recall and re-transmit the most recently transmitted locate command.

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Assigning Transport Controls

An Overview

The general procedure to change (edit) what a control sends or change its name, is to enter Assign Mode by pressing Assign. then do the following:

1. Select the control by moving it. This control is "held" in the LCD display, and you cannot at this point decide to edit a different control.

If you meant to edit a different control, press Assign twice to exit and re-enter Assign mode.

2. Make the desired edit, by turning the rotary encoders below the parameters shown the LCD.

3. Use the right-most encoder to change pages, to see and edit more parameters for a single control.

4. To keep the changes, and store them to memory, press Enter on the Keypad.

5. You may then proceed to select another control to edit.

6. To discard the changes, do not press Enter. Simply press Assign to exit Assign mode.

7. When you are done editing, be sure that you have exited Assign mode. Yellow LED off.

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To Assign a Transport or M Button

Since the Transports and the M buttons are Shift-able, first check the state of the Shift button, before entering Assign mode.

If you want to assign Play only, make sure Shift is off.
If you want to assign the command to be sent when Shift Play is pressed, make sure Shift is on.

Press Assign to enter Assign mode. The yellow LED is lit.

After entering Assign mode, pressing a Transport or M Button will select that control for editing.

At that point, the display "holds" the currently selected control. If you change your mind and wish to edit a different control instead, press Assign to exit assign mode. Press Assign again to re-enter Assign mode and select a different control.

Use the LCD and rotary encoder knobs to edit the control. Turn the right-most encoder knob to reveal additional editable parameters.

After making the edit, press Enter on the Keypad to store the changes to memory.

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Editable Parameters for Transport and M Buttons

Name
Press the Cancel/Clear key in the Keypad to clear the name. Use the Cursor buttons to the left of the LCD to move the cursor. Turn the first encoder to dial in the letters and numbers.

The top row of the LCD show the control's real (permanent) name.

The bottom row of the LCD is the user editable name.

Command
The Transports and the M Buttons have a similar menu of commands.

The only difference is that the M Buttons can also be assigned to act as Machine Enable / Disable buttons.

From the Factory, the Transports are set to their standard functions, that is, Play is programmed to send Play (MMC or 9 Pin.). You would need to edit this if you want play to send, for example, a Controller command.

From the Factory, the M Buttons 1 through 4 are set to MMC Enable Machines 1 through 4.
M5 is set to enable CS-10 Emulation.

The Command Menu is on the following page.

Transport and M Button Command Types
- Off (that is, sends no command)
- Note
- Ctrl (Controller)
- P Change (Program Change)
- Query (Puts MCS Controller nto Query Mode.)
- Jog (Turns Jog /Shuttle Wheel On and Off)
- GMaster (Turns Grand Master Fader On and Off)
- Play (MMC and or 9 Pin Play)
- Stop (MMC and or 9 Pin Stop)
- REW (MMC and or 9 Pin Rewind)
- FF (MMC and or 9 Pin Fast Forward)
- REC (MMC and or 9 Pin Record)
- RTZ (MMC and or 9 Pin Return to Zero)
- SLOPLAY (MMC and or 9 Pin 1/2 speed play)
- RV PLAY (MMC and or 9 Pin Reverse Play)
- EJECT (MMC EJECT)
- CHASE (Puts MMC or 9 Pin machine into Chase Mode.)

In addition, the M Button menu is a little longer, to allow for assigning an M Button to its Machine Enable feature.

In one of these settings, the M Buttons do not actually send commands. Rather, they modify the commands sent by the Transports, Jog / Shuttle, and Locates.

Additional M Buttons Command Menu Items:
- MMC (that is, turn MMC Commands on or off)
- CS-10 (that is, turn CS-10 Emulation on or off.)

If 9 Pin or GPI cards are present
- 9 Pin 1 (that is, turn 9 Pin card in Slot 1 on or off.)
- 9 Pin 2 (that is, turn 9 Pin card in Slot 2 on or off.)
- GPI 1 (that is, turn GPI card in Slot 1 on or off.)
- GPI 2 (that is, turn GPI card in Slot 2 on or off.)

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About Query Mode
When a switch is set to Query, it will not send a command. When pressed, it puts the whole unit into Query mode. In Query mode, no commands are sent, but the LCD will display all the assignment parameters for the last control activated.

Notice
In the initialized state, from the factory, the M buttons have "MMC" selected, which is one of the last menu items.

If you want to assign an M button to send a Note or Controller, for example, you will be rotating the encoder significantly counter-clockwise to select and earlier menu item.

Number
Selects the Controller, Note, or Program number. For M Buttons, when set to MMC, number is the targeted Machine ID number.

Channel
Selects MIDI Channel 1 through 16.

Minimum (or Release Velocity)
Minimum controller or note off velocity value.

If the switch is Latch Off (see below), this is the value sent when the switch is released.

If the switch is Latch On (see below), this is the value sent every other press, when the LED turns off.

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Maximum (or Velocity)
Maximum controller or note velocity value.

If the switch is Latch Off (see below), this is the value sent when the switch is pressed.

If the switch is Latch On (see below), this is the value sent every other press, when the LED turns On.

Group
The selected control that you are currently editing can be made a group member.

By rotating the encoder under the word Group, the LCD prompts you to select which button will be the Master for that control.

(Use the right most Encoder for Changing Pages)

Latch
Turning Latch off or on allows the user to set the behavior or "action" of a switch.

When Latch is off, the switch is said to be "momentary". Its only on for as long as you hold down the button.

When Latch is on, the switch is said to be "push-on, push on". You push it once to turn it on. Push it again to turn it off.

Transport Operation

Record Safety Feature
To use the Record button, hold Play and Record at the same time.

Initialized State of Transports and M Buttons
In the units initialized state from the factory, (assuming that the control assignment have not been edited), the Transports and Jog / Shuttle have been pre-assigned to send commands dependent upon the state of the M buttons.

M1 enables MMC Machine #1.
M2 enables MMC Machine #2.
M3 enables MMC Machine #3.
M4 enables MMC Machine #4.

If you are controlling machines that respond to MIDI Machine Control, you will want to make sure that the machines are set to the correct ID#, and the MMC is enabled. The procedures for doing this vary widely, and you will need to consult the documentation accompanying the machine.

M5 enables CS-10 Emulation.
The CS-10 and CS-10^2 are widely used MIDI Controllers from JLCooper. They are supported by most disk-based audio editing systems.

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Example of Machine Enable

For example, say that the MIDI Out of the MCS Controller goes to a modular digital multitrack, a hard disk recorder, and a computer based workstation.

The modular digital multitrack is set to MMC ID#1.
The hard disk recorder is set to MMC ID#2.
The computer based audio workstation responds to CS-10 Controller commands.

To put all three into Play, make sure that M1, M2, and M5 are on, prior to pressing Play.

To send MMC Shuttle Commands to the hard disk recorder only, make sure that M2 is on, (and the other M buttons are off) prior to using the Shuttle Ring.

To send CS-10 Jog commands into the computer based audio workstation only, make sure that M5 is on, (and the other M buttons are off) prior to using the Jog Wheel

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Jog and Shuttle Operation

The Jog / Shuttle mechanism can send MMC and Controller commands. If an optional 9 Pin card has been installed, 9 Pin commands are sent to control professional VTRs.

Jog On / Off Feature

Any Transport or Function button can be turned into a master On / Off button for Jog and Shuttle. Being able to turn Jog and Shuttle on and off instantly means that you do not have to worry about accidently engaging Jog or Shuttle at the wrong time.

You can choose which button is the most convenient for you. For example, to make "W5" the master Jog and Shuttle enable button,
Press Assign to enter Assign Mode.
Press W5 to select it.
Under "Command", dial up "Jog"
Press Enter.

Now W5 will turn on and off the Jog and Shuttle mechanism.
When Off the shuttle direction LEDs turn off.
When On, the shuttle direction LEDs are on.

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Jog Controller Commands

The MIDI Controller commands are the same commands as those sent by the JLCooper CS-10^2 Control Station. These commands are recognized by many software based digital audio workstations.

Look in the documentation of the system that you are controlling to see if CS-10 or CS-10^2 support is mentioned

MMC and 9 Pin Commands
Jog

Playback speed and direction is proportional to the speed and direction that the wheel is rotated.

Rotate the wheel clockwise for forward playback.
Rotate the wheel counter clockwise for reverse playback.

In jog mode, continuously rotating the wheel results in 1X play speed, either forward or backward.

To stop playback, simply stop turning the wheel.

PLease note that there is no true "Jog" command in the MMC specification, but the MCS Controller has the unique ability to produce the same effect as Jog in MMC machines.

Shuttle

Playback speed is related to the extent of rotation away from the center detent position of the ring.

Rotate the ring clockwise for forward shuttle.
Rotate the ring counter clockwise for reverse shuttle.

In shuttle mode, the machine continues to shuttle until the ring is returned to its center position.

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Jog and Shuttle Speed
The Speed of the Jog Wheel and the Shuttle Ring can be user-adjusted in the Utility Mode.

The Speed of the Jog Wheel and the Shuttle Ring can be user-adjusted in the Utility Mode.

To enter Utility Mode, press Shift Assign. Turn the right-most encoder, and go to the page where you see "Jog" and 'Shuttle".

The Jog Speed range is 1 through 100.
Shuttle Speed range is 1x, 2x, 4x, 16x, and 32x. For example, when the Shuttle Ring is rotated as far as its goes, the machine will play up to 32 time play speed.

When controlling a digital audio workstation, there are several factors that will affect the responsiveness of the wheel, in addition to the Speed.

Some software applications feature a view of the audio waveform, allowing the user to "zoom in" and "zoom out" of the waveform. When "zoomed in", some applications produce a slower and finer Jog. While "zoomed out", these applications jog at a faster rate.

In addition (very important), your application may also have some kind of software preference file for setting Jog responsiveness.

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Locate Operation

The MCS-3800 and MCS-3400 can store 100 locate points. You can enter them manually, and name them, or capture them on the fly, while time code is being received.

Locates may be displayed in SMPTE time (H:M:S:F) or in Feet and Frames.

Locate commands may be sent by entering a 2 digit locate number. Alternately, a locate time may be entered on the keypad. There is also a "Last" button to instantly recall and re-transmit the most recently transmitted locate command.

Locate Mode versus Program Change Mode

The Keypad has two modes of operation:
Locate Mode and Program Change Mode.

Press Shift and Locate to alternately change from Locate Mode to Program Change Mode.

In Locate Mode, the LED display shows time code.

In Program Change Mode, the LED display shows either Program Change (Pch), Bank (ban), or Channel (Chan)

SMPTE Mode vs Feet and Frames

The MCS Controller can display time code in either SMPTE time (with or without frames) or Feet : Frames.

To change the display mode, go into Utility mode by pressing Shift and Assign.
Turn the encoder under "SHOWTC" to set the display mode.

If working in Feet : Frames, and you wish to set an offset, turn the right most encoder to go to the next page. Turn the first encoder to dial in an offset, up to 24 hours. Press Shift assign to exit assign mode.

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Storing a Locate Manually with Set Locate
Press Set Locate to store a Locate time, press Enter.
Next, give the a two digit number, from 00 to 99, and press
Enter. The cursor moves to the name field.

When editing a name, use the right and left cursor buttons (to
the left of the LCD to move the cursor. Use the encoder that is
below the locate name (the second from the right-most) to dial
in the name. Press Enter.

Storing a Locate by Capturing on the Fly
Simply press Set Locate while time code is coming in.
The Locate Number will automatically increment.
The Locate will automatically be named.

Sending a Locate Command
To send a Locate, do not press Locate.
**Just type the two digit locate number, and press Enter to
send the Locate command.**

The command is not sent until you press Enter.

More About Sending Locate Commands

At each keypad number press, the locate name and locate time automatically are updated.

That is, press 1, the display shows Loc 01 "Locate 01"
Press 3, the display show Loc 13 "Locate 13".

When Enter is pressed on Keypad, the following happens:
(1) The locate time in LCD is sent via MMC (and 9 Pin)
(2) The locate time is shown in the 7-segment display.
(3) If time code is being received, the locate time is held momentarily before the display is released to display either tally or current time code.
(4) The locate number field is reset. Pressing another numbered key on the keypad causes the number to appear in the LCD with a leading zero.
For example, if you press 3, 7, 2, Enter, and 3, the display shows LOC:03, LOC:37, LOC:72 (Enter), LOC:03

When time code is not being received, the 7 segment display holds the last time displayed, whether it is the result of incoming time code, incoming tally, or a sent locate time.

Locating by Direct Address

To send a Locate by specifying a time code, press Locate and enter the time. Press Enter to validate the entry.

Last function

Press Last to re-send the last locate.

The Last key instantly (that is, without pressing Enter) does the following:
(1) The locate time in LCD is sent via MMC (and 9 Pin).
(2) Locate time is shown in 7-segment display.
(3) If time code is being received, the locate time is held momentarily before the display is released to display either tally or current time code.

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The Function Buttons Section

This chapter discusses how to assign and use the F buttons, W Buttons, the Cursor Buttons and M buttons.

Before proceeding, it is important to briefly restate the Basic Modes of Operation: User Assignable Mode vs. Special Mode.

In the User Assignable Mode, (the way the unit normally powers-up), you, the user, can set it up how you want, determining what kind of commands the controls send, and how it controls your audio or video system.

In Special Mode, the audio or video system "takes over" the MCS controller. The designers of the system (that is, the makers of your Audio or Video system) have pre-determined how the MCS works with your system.

This chapter relates to User Assignable Mode Only.
If your system switches the MCS Controller into Special Mode, you will need to refer to the documentation included with the system for operation instructions.

Attributes of the Function Buttons
The Function Buttons can have an alternate assignment using the Shift button.

For example,
Pressing F1 can send an MMC command to Eject a tape.
Pressing Shift and F1 can send a Note command to play a sampled sound.

The commands sent by the Function Buttons are not affected by the Bank switch.

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Remote Control of the LEDs
The F and M buttons can have their LEDs turned on and off remotely.

The LED are controlled by the same commands that the buttons send.

That means that if a MIDI Sequencer is recording the output of the MCS Controller, the LEDs on the MCS Controller can be automated

The M Buttons Have More Than One Purpose
The user can assign an M button to send a command, just like any other function button.

The user can also choose instead to use the M buttons as Machine Enable buttons.

This was discussed in detail in the last chapter.
To briefly restate here, when assigning a button in Assign Mode, you dial through a menu of available commands. Selecting "MMC" or "CS-10" will cause the M button to act as a Machine Enable button. (Additional choices include or 9 Pin or GPI if optional interface cards are installed.)

The Cursor Buttons Have More Than One Purpose
The user can assign a Cursor button (one of the four buttons to the left of the LCD) to send commands, just like any other function button.

Be aware that, once the MCS Controller has been put into Assignment Mode, and you are editing a Control, the left and right Cursor buttons are used to move the LCD cursor while editing the names of the controls.

The F and M Buttons have LEDs
While the F, M, W, and Cursor buttons can all be user assigned in a similar manner, the F and the M Buttons also have LEDs.

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Assigning Function Buttons

An Overview

The general procedure to change (edit) what a control sends or change its name, is to enter Assign Mode by pressing Assign. then do the following:

1. Select the control by moving it. This control is "held" in the LCD display, and you cannot at this point decide to edit a different control.

If you meant to edit a different control, press Assign twice to exit and re-enter Assign mode.

2. Make the desired edit, by turning the rotary encoders below the parameters shown the LCD.

3. Use the right-most encoder to change pages, to see and edit more parameters for a single control.

4. To keep the changes, and store them to memory, press Enter on the Keypad.

5. You may then proceed to select another control to edit.

6. To discard the changes, do not press Enter. Simply press Assign to exit Assign mode.

7. When you are done editing, be sure that you have exited Assign mode. Yellow LED off.

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To Assign an F or M Button

Since the F and the M buttons are Shift-able, first check the state of the Shift button, before entering Assign mode.

That is, if you want to assign F1 only, make sure Shift is off. If you want to assign the command to be sent when Shift F1 is pressed, make sure Shift is on.

Press Assign to enter Assign mode. The yellow LED is lit.

After entering Assign mode, pressing an F or M Button will select that control for editing.

At that point, the display "holds" the currently selected control. If you change your mind and wish to edit a different control instead, press Assign to exit assign mode. Press Assign again to re-enter Assign mode and select a different control.

Use the LCD and rotary encoder knobs to edit the control. Turn the right-most encoder knob to reveal additional editable parameters.

After making the edit, press Enter on the Keypad to store the changes to memory.

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Editable Parameters for the Function Buttons (F and M)

Name
Press the Cancel/Clear key in the Keypad to clear the name.
Use the Cursor buttons to the left of the LCD to move the
cursor. Turn the first encoder to dial in the letters and numbers.

The top row of the LCD show the control's real (permanent)
name.

The bottom row of the LCD is the user editable name.

Command
The F and the M Buttons have a similar menu of commands.
The only difference is that the M Buttons can also be assigned
to act as Machine Enable / Disable buttons.

From the Factory, the M Buttons 1 through 4 are set to MMC
Enable Machines 1 through 4.
M5 is set to enable CS-10 Emulation.

The Command menu is on the following page.

F and M Button Command Types
- Off (that is, sends no command)
- Note
- Ctrl (Controller)
- P Change (Program Change)
- Query (Puts MCS Controller nto Query Mode.)
- Jog (Turns Jog /Shuttle Wheel On and Off)
- GMaster (Turns Grand Master Fader On and Off)
- Play (MMC and or 9 Pin Play)
- Stop (MMC and or 9 Pin Stop)
- REW (MMC and or 9 Pin Rewind)
- FF (MMC and or 9 Pin Fast Forward)
- REC (MMC and or 9 Pin Record)
- RTZ (MMC and or 9 Pin Return to Zero)
- SLOPLAY (MMC and or 9 Pin 1/2 speed play)
- RV PLAY (MMC and or 9 Pin Reverse Play)
- EJECT (MMC EJECT)
- CHASE (Puts MMC or 9 Pin machine into Chase Mode.)

In addition, the M Buttons menu is a little longer, to allow for assigning the M Buttons to their Machine Enable feature.

In one of these settings, the M Buttons do not actually send commands. Rather, they modify the commands sent by the Transports, Jog / Shuttle, and Locates.

Additional M Buttons Command Menu Items:
- MMC (that is, turn MMC Commands on or off)
- CS-10 (that is, turn CS-10 Emulation on or off.)

If 9 Pin or GPI cards are present
- 9 Pin 1 (that is, turn 9 Pin card in Slot 1 on or off.)
- 9 Pin 2 (that is, turn 9 Pin card in Slot 2 on or off.)
- GPI 1 (that is, turn GPI card in Slot 1 on or off.)
- GPI 2 (that is, turn GPI card in Slot 2 on or off.)

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About Query Mode
When a switch is set to Query, it will not send a command.
When pressed, it puts the whole unit into Query mode.
In Query mode, no commands are sent, but the LCD will
display all the assignment parameters for the last control
activated.

Notice
In the initialized state, from the factory, the M buttons have
"MMC" selected, which is one of the last menu items.

If you want to assign an M button to send a Note or Controller,
for example, you will be rotating the encoder significantly
counter-clockwise to select and earlier menu item.

Number
Selects the Controller, Note, or Program number.
For M Buttons, when set to MMC, number is the targeted
Machine ID number.

Channel
Selects MIDI Channel 1 through 16.

Minimum (or Release Velocity)
Minimum controller or note off velocity value.

If the switch is Latch Off (see below), this is the value sent
when the switch is released.

If the switch is Latch On (see below), this is the value sent
every other press, when the LED turns off.

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Maximum (or Velocity)
Maximum controller or note velocity value.

If the switch is Latch Off (see below), this is the value sent
when the switch is pressed.

If the switch is Latch On (see below), this is the value sent
every other press, when the LED turns On.

Group
The selected control that you are currently editing can be made
a group member.

By rotating the encoder under the word Group, the LCD
prompts you to select which button will be the Master for that
control.

Latch
Turning Latch off or on allows the user to set the behavior or
"action" of a switch.

When Latch is off, the switch is said to be "momentary". Its
only on for as long as you hold down the button.

When Latch is on, the switch is said to be "push-on, push on".
You push it once to turn it on. Push it again to turn it off.

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To Assign a W or Cursor Button

Since the W and the Cursor buttons are Shift-able, first check the state of the Shift button, before entering Assign mode.

In other words, to assign W1 only, make sure Shift is off. If you want to assign the command to be sent when Shift W1 is pressed, make sure Shift is on.

Press Assign to enter Assign mode. The yellow LED is lit.

After entering Assign mode, pressing a W or Cursor Button will select that control for editing.

At that point, the display "holds" the currently selected control. If you change your mind and wish to edit a different control instead, press Assign to exit assign mode. Press Assign again to re-enter Assign mode and select a different control.

Use the LCD and rotary encoder knobs to edit the control. Turn the right-most encoder knob to reveal additional editable parameters.

After making the edit, press Enter on the Keypad to store the changes to memory.

Editable Parameters for Function Buttons (Cursor & W)

Name
Press the Cancel/Clear key in the Keypad to clear the name. Use the Cursor buttons to the left of the LCD to move the cursor. Turn the first encoder to dial in the letters and numbers.

The top row of the LCD show the control's real (permanent) name.

The bottom row of the LCD is the user editable name.

Transport and M Button Commands
• Off (that is, sends no command)
• Note
• Ctrl (Controller)
• P Change (Program Change)
• Query (Puts MCS Controller nto Query Mode.)
• Jog (Turns Jog /Shuttle Wheel On and Off)
• GMaster (Turns Grand Master Fader On and Off)
• Play (MMC and or 9 Pin Play)
• Stop (MMC and or 9 Pin Stop)
• REW (MMC and or 9 Pin Rewind)
• FF (MMC and or 9 Pin Fast Forward)
• REC (MMC and or 9 Pin Record)
• RTZ (MMC and or 9 Pin Return to Zero)
• SLOPLAY (MMC and or 9 Pin 1/2 speed play)
• RV PLAY (MMC and or 9 Pin Reverse Play)
• EJECT (MMC EJECT)
• CHASE (Puts MMC or 9 Pin machine into Chase Mode.)

About Query Mode
When a switch is set to Query, it will not send a command. When pressed, it puts the whole unit into Query mode. In Query mode, no commands are sent, but the LCD will display all the assignment parameters for the last control activated.

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Number
Selects the Controller, Note, or Program number.
For M Buttons, when set to MMC, number is the targeted
Machine ID number.

Channel
Selects MIDI Channel 1 through 16.

Minimum (or Release Velocity)
Minimum controller or note off velocity value.

If the switch is Latch Off (see below), this is the value sent
when the switch is released.

If the switch is Latch On (see below), this is the value sent
every other press, when the LED turns off.

Maximum (or Velocity)
Maximum controller or note velocity value.

If the switch is Latch Off (see below), this is the value sent
when the switch is pressed.

If the switch is Latch On (see below), this is the value sent
every other press, when the LED turns On.

Group
The selected control that you are currently editing can be made
a group member.

By rotating the encoder under the word Group, the LCD
prompts you to select which button will be the Master for that
control.

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Function Button Operation Notes

Switch Grouping

The Function Buttons may be grouped. The grouping is one-layer only, not nested grouping. That is pressing one button (a group master) can perform the equivalent of pressing several buttons (group members). The individual group members cannot also be group masters.

The grouping feature is sophisticated enough to allow grouping of shifted and non-shifted controls together.

For example, F1 can be grouped to Shift F1. When F1 is pressed, two commands will be sent. The F1 command, and the Shift F1 command.

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The System Section

This chapter discusses the Utility Mode, the
Time Code Display, and Program Change Mode.

Utility Mode is used to control certain basic operating
conditions, including such things as Memory Protect, Bank
Names, and Memory Bulk Dump, etc.

The Time Code Display features a Drop Frame indicator.
Time can be displayed in either SMPTE Time in
hours : minutes : seconds: frames, or simply in
hours : minutes : seconds.

Alternately, the display can be set to Feet : Frames, with an
Offset.

Program Change Mode allows the Keypad to be used to send
MIDI Program and Bank Change commands.

Entering Utility Mode

Enter Utility Mode by pressing Shift and Assign.
Utility has three pages, selected with the right-most encoder.

Exiting Utility Mode

Exit Utility Mode by pressing Assign.

Mode: Manually Exiting Special Mode
A host software system, engineered to support the MCS using Special Mode, will send a command into the MCS, which switch the unit into Special Mode.

At this point, the MCS is no longer user-programmable.

The user may choose, however, to manually exit the Special Mode and return to User Assignable mode, without having to turn the hardware off and on.

This feature is only available if the MCS has already been switched into Special Mode by an external host system.

Above the first encoder is the word MODE. The encoder is used select wither User or Host. Selecting User returns the unit to User Assignable Mode. Selecting Host returns the unit to the Special Mode.

If the unit has not received any command from a Host system, since its last power-up, then this feature is not accessible.

Protect
When On, user cannot enter Assign Mode. Display alerts user memory is protected when attempting to enter Assign Mode.

Dump
Rotate encoder to initiate MIDI System Exclusive bulk data dump. The data dump takes about 20 seconds.

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SHOWTC

Selects the mode in which incoming time code is displayed in the 7 -segment LED display.

H:M:S:F means hours : minutes : seconds : frames.
`01.32.52.20`

H:M:S, means hours : minutes : seconds. Frames are turned off.
`01.21.11`

Ft :Frm, means Feet and Frames, for film work.
`0020.. 00`

Bank Name

Allows you to enter a name for each Bank.

When not in Assign Mode, the LCD will normally displays either the Bank Name or the Encoder names, depending on whether or not a Page LED is lit.

Press Cancel/ Clear to clear a name.
Use Cursor buttons to move the cursor.
Use the Encoders under each name to dial in a new name.

After exiting Utility Mode, the Bank Name is displayed whenever the Page LEDs are all off.

OFFSET

For Feet and Frame display mode (see above). A number entered in hours which is subtracted from the incoming time code.

For example, if the reel you are working with has time code that starts at 1 hour, enter 1 hour so feet frame display will start at 0 feet.

Jog

Sets responsiveness of Jog Wheel. Range is 1 to 100.

When controlling a digital audio workstation, there are several factors that will affect the responsiveness of the wheel, in addition to the Speed.

Some software applications feature a view of the audio waveform, allowing the user to "zoom in" and "zoom out" of the waveform. When "zoomed in", some applications produce a slower and finer Jog. While "zoomed out", these applications jog at a faster rate.

In addition (very important), your application may also have a software preference file for setting Jog responsiveness.

Shuttle

Shuttle Speed range is 1x, 2x, 4x, 16x, and 32x.

That is, when the Shuttle Ring is rotated as far as its goes, the machine will play up to 32 times normal play speed.

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Program Change Mode

The Keypad has two modes of operation:
Locate Mode and Program Change Mode.

**Press Shift and Locate (Mode) to alternately change from
Locate Mode to Program Change Mode.**

In Locate Mode, the LED display shows time code.

In Program Change Mode, the LED display shows either
Program Change (Pch), Bank (ban), or Channel (Chan).

Program Change Mode

Pressing Mode cycles the display through Program Change
(Pch), Bank (ban), or Channel (Chan).

Type a channel number, press Enter to store.
Type a Bank number, press Enter to send it.
Type a Program Change number, press Enter to send it.

Time Code Display

The time code display responds to incoming SMPTE or MTC. If the incoming Time Code is drop frame, the Drop Frame indicator ("DF") will be lit.

It also displays the last locate command sent. The time can also be displayed in Feet and Frames.

It is also used for displaying Program Change and Bank Change commands.

Display Locates or Display Program Changes

Press Shift and Locate (Mode) to change the Keypad and Time Code display alternately to either Locate Mode to Program Change Mode.

Display SMPTE, No Frames, or Feet and Frames

Enter Utility Mode by pressing Shift and Assign.

Under "SHOWTC", dial in either "H:M:S:F", or "H:M:S" if you do not want to see the frames.

Select "Ft: Frm" for film work.

Turn the right-most encoder to select the next page.

Under the word, "OFFSET", use the first encoder to dial in an offset in hours.

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Technical Information

Dimensions

MCS-3800, without wrist rest and end bells:
20.15" x 9.75" x 2.00"

MCS-3400, without wrist rest and end bells:
16.15" x 9.75" x 2.00"

MCS-3000X, without wrist rest and end bells:
9.26" x 9.75" x 2.00"

MCS Surround Panner, without wrist rest and end bells:
4.63" x 9.75" x 2.00"

Initialization

To clear the memory of the MCS-3800, and restore the Factory Preset settings, hold both the
UP and DOWN cursor buttons while powering up the unit.

Initialized Settings

From JLCooper, the MCS-3800 or MCS-3400's user-assignable memory is initialized to a "Factory Preset" set of (mainly) Controller messages on MIDI Channels 2 through 16.

The exceptions are the Transport switches, which are initialized to send MIDI Machine messages and (if option card is installed) Sony 9-pin messages.

The initialized values are as follows:
(MIDI Channel is shown in base 10, Controller # is in Hex)

Switch	MIDI Channel	Controller #
F1	16	00
Shifted F1	"	01
F2	"	02, etc.
Shifted F8	"	0F
W1	"	10
Shifted W1	"	11, etc.
Shifted W7	"	1D
M1	"	1E
Shifted M1	"	1F, etc.
Shifted M5	"	27

Switch	MIDI Chan	Controller#
up	16	30
Shifted up	16	31
down	16	32
Shifted down	16	33
left	16	34
Shifted left	16	35
right	16	36
Shifted right	16	37
Mute Chan 1, Bank 1	15	00, etc.
Mute Chan 8, Bank 1	"	07
Solo Chan 1, Bank 1	"	08, etc.
Solo Chan 8, Bank 1	"	0F
Aux Chan 1, Bank 1	"	10, etc.
Aux Chan 8, Bank 1	"	17
Sel Chan 1, Bank 1	"	18, etc.
Sel Chan 8, Bank 1	"	1F
Mute Chan 1, Bank 2	"	20, etc.
Mute Chan 1, Bank 3	"	40, etc.
Mute Chan 1, Bank 4	"	60, etc.
Sel Chan 8, Bank 4	"	7F

Encoders	MIDI Chan	Controller#
#1, Chan 1, Page 1, Bank 1	2	00, etc.
#5, Chan 1, Page 1, Bank 1	"	04
#1, Chan 1, Page 2, Bank 1	"	05, etc.
#5, Chan 1, Page 8, Bank 1	"	27
#1, Chan 2, Page 1, Bank 1	"	28, etc.
#5, Chan 2, Page 8, Bank 1	"	4F
#1, Chan 3, Page 1, Bank 1	"	50, etc.
#5, Chan 3, Page 8, Bank 1	"	77
#1, Chan 4, Page 1, Bank 1	3	00, etc.
#5, Chan 6, Page 8, Bank 1	"	77
#1, Chan 7, Page 1, Bank 1	4	00, etc.
#5, Chan 8, Page 8, Bank 1	"	4F
#1, Chan 1, Page 1, Bank 2	"	50, etc.
#5, Chan 1, Page 8, Bank 2	"	77
#1, Chan 2, Page 1, Bank 2	5	00, etc.
#5, Chan 4, Page 8, Bank 2	"	77
#1, Chan 5, Page 1, Bank 2	6	00, etc.
#5, Chan 7, Page 8, Bank 2	"	77
#1, Chan 8, Page 1, Bank 2	7	00, etc.
#5, Chan 8, Page 8, Bank 2	"	27
#1, Chan 1, Page 1, Bank 3	"	28, etc.
#5, Chan 2, Page 8, Bank 3	"	77
#1, Chan 3, Page 1, Bank 3	8	00, etc.
#5, Chan 5, Page 8, Bank 3	"	77
#1, Chan 6, Page 1, Bank 3	9	00, etc.
#5, Chan 8, Page 8, Bank 3	"	77
#1, Chan 1, Page 1, Bank 4	10	00, etc.
#5, Chan 3, Page 8, Bank 4	"	77
#1, Chan 4, Page 1, Bank 4	11	00, etc.
#5, Chan 6, Page 8, Bank 4	"	77
#1, Chan 7, Page 1, Bank 4	12	00, etc.
#5, Chan 8, Page 8, Bank 4	"	4F

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Fader	MIDI Chan	Controller #
Chan 1, Bank 1	14	00, etc.
Chan 8, Bank 1	"	07
Chan 1, Bank 1	"	08, etc.
Chan 8, Bank 2	"	0F
Chan 1, Bank 3	"	10, etc.
Chan 8, Bank 4	"	3F

Touch	MIDI Chan	Controller #
Chan 1, Bank 1	13	00, etc.
Chan 8, Bank 1	"	07
Chan 1, Bank 1	"	08, etc.
Chan 8, Bank 2	"	0F
Chan 1, Bank 3	"	10, etc.
Chan 8, Bank 4	"	3F

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Warranty

JLCooper Electronics ("JLCooper") warrants this product to be free of defects in materials or workmanship for a period of 12 months from the date of purchase.

This warranty is non-transferable and the benefits apply to the original owner. Proof of purchase in the form of an itemized sales receipt is required for warranty coverage.

To receive service under this warranty, customers in the United States should contact the JLCooper factory and talk to a service technician. If necessary, a Return Authorization number may be issued.

For our customers outside the United States, it is recommended that you first contact your Dealer or Distributor, since they may offer their own service or support policy.

If local support is not obtainable, please send a FAX to JLCooper's Service Department at 310-335-0110, with a detailed description of the service required.

Upon issuance of return authorization, the product should be properly packed and shipped to Service Department, JLCooper Electronics, 142 Arena St., El Segundo, CA 90245.

Please include the following: copy of the sales receipt, your name and address (no P.O. Boxes, please), a brief description of the problem, and any other related items discussed with the service department and considered necessary to evaluate the product or effect a repair. The return authorization number must be clearly written on the outside of the package.

JLCooper will, without charge for parts or labor, either repair or replace the defective part(s). Shipping costs are not covered by this warranty.

JLCooper's normal repair turn around time at the factory is approximately 15 business days, from receipt of product to shipping. Your actual turn around time will include return shipping.

Actual turn around time will vary depending upon many factors including the repeatability of the customer's reported complaint, the availability of parts required for repair, the availability of related products needed to evaluate the product if necessary.

Priority services are available. These should be discussed with the service technician at the time the return authorization is issued.

This warranty provides only the benefits specified and does not cover defects or repairs needed as result of acts beyond the control of JLCooper including but not limited to: abuse, damage by accident/negligence, modification, alteration, improper use, unauthorized servicing, tampering, or failure to operate in accordance with the procedures outlined in the owner's manual; nor for acts of God such as flooding, lightning, tornadoes, etc.

THE DURATION OF ANY OTHER WARRANTIES, WHETHER IMPLIED OR EXPRESS, INCLUDING BUT NOT LIMITED TO THE IMPLIED WARRANTY OF MERCHANTABILITY, IS LIMITED TO THE DURATION OF THE EXPRESS WARRANTY HEREIN. JLCOOPER HEREBY EXCLUDES INCIDENTAL AND CONSEQUENTIAL DAMAGES, INCLUDING BUT NOT LIMITED TO: LOSS OF TIME, INCONVENIENCE, DELAY IN PERFORMANCE OF THIS WARRANTY, THE LOSS OF USE OF THE PRODUCT OR COMMERCIAL LOSS, AND FOR BREACH OF ANY EXPRESS OR IMPLIED WARRANTY OF MERCHANTABILITY, APPLICABLE TO THIS PRODUCT. JLCOOPER SHALL NOT BE LIABLE FOR DAMAGES OR LOSS RESULTING FROM THE NEGLIGENT OR INTENTIONAL ACTS OF THE SHIPPER OR HIS CONTRACT AFFILIATES. THE CUSTOMER SHOULD CONTACT THE SHIPPER FOR PROPER CLAIMS PROCEDURES IN THE EVENT OF DAMAGE OR LOSS RESULTING FROM SHIPMENT.

Quick Operation Reference

Fader Wave Demo
Hold the UP cursor button while powering up the unit.
Continue to hold it for about 3 seconds, until the demo starts.
Turn the power off to stop the demo.

Memory Initialization
To clear the memory and restore the Factory Preset settings,
hold both the UP and DOWN cursor buttons while powering
up the unit.

Two Basic Modes of Operation
The unit powers up in "User Assignable Mode."
Some audio and video host systems automatically switch the
unit into "Special Mode."

When in User Assignable Mode, you chose what command the
controls send.

When in Special Mode, you cannot program the unit.
The host system determines what each control will do and
what appears in the displays.
You then need to rely upon documentation included with the
host system.

Manually Switching Modes
Enter Utility Mode by pressing Shift and Assign.
Above the first encoder is the word MODE.
The encoder is turned to select wither User or Host.

Selecting User returns the unit to User Assignable Mode.
Selecting Host returns the unit to the Special Mode.

This function is only available if the unit has already been
switched into Special Mode by an external host system.
Otherwise, this feature is not available.

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Quick Operation Reference

LCD Displays Encoder Names or Bank Name
If a Page button is lit, the LCD shows the names of the five "Virtual Encoders". If these names have not edited, they are "VKNOB1, VKNOB2, VKNOB3, VKNOB4, VKNOB5."
If no Page button is lit, the LCD show the Bank Name.

Bank Switchable Controls
The faders, their touch sensors, the encoders, and the buttons above the faders, are all Bank switchable.

Shiftable Controls
The F, M, W, Cursor, and Transport Buttons can have an alternate Shifted assignment.

Encoder Selection
For each channel, there are 8 Pages of 5 encoders.
Prior to turning an encoder knob,
Press 1 of the 4 Bank switches to select the Bank.
Press 1 of the 8 Select buttons at the top of a fader channel.
Press 1 of the 8 Page buttons above the LCD.
You have the equivalent of over 1200 independantly programmable rotary encoders.

To Assign A Control
1. Press Assign to enter Assign mode. The yellow LED is lit.

2. Select a control for editing.

At that point, the display "holds" the currently selected control. If you change your mind and wish to edit a different control instead, press Assign to exit assign mode. Press Assign again to re-enter Assign mode and select a different control.

3. Use the LCD and rotary encoder knobs to edit the control. Turn the right-most encoder knob to reveal other parameters.

4. After making the edit, press Enter on the Keypad to store the changes to memory. Either select another control, or press Assign to exit Assign Mode.

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Quick Operation Reference

Editable Parameters
Name
Press the Cancel/Clear key in the Keypad to clear the name.
Use the Cursor buttons to the left of the LCD to move the
cursor. Turn the first encoder to dial in the letters and numbers.

The top row of the LCD show the control's real (permanent)
name. The bottom row of the LCD is the user editable name.

Command Types
Any Control can be turned off, so no command is sent.
Faders and Touch Sensors send either Controllers or Notes.
The Channel Buttons above the faders send Controllers, Notes,
or put the unit into Query Mode.

The F, W, M, Cursor, and Transport Buttons can be set to:
• Off (that is, sends no command)
• Note
• Ctrl (Controller)
• P Change (Program Change)
• Query (Puts MCS Controller nto Query Mode.)
• Jog (Turns Jog /Shuttle Wheel On and Off)
• GMaster (Turns Grand Master Fader On and Off)
• Play (MMC and or 9 Pin Play)
• Stop (MMC and or 9 Pin Stop)
• REW (MMC and or 9 Pin Rewind)
• FF (MMC and or 9 Pin Fast Forward)
• REC (MMC and or 9 Pin Record)
• RTZ (MMC and or 9 Pin Return to Zero)
• SLOPLAY (MMC and or 9 Pin 1/2 speed play)
• RV PLAY (MMC and or 9 Pin Reverse Play)
• EJECT (MMC EJECT)
• CHASE (Puts MMC or 9 Pin machine into Chase Mode.)

The M Buttons Command Menu Also Includes
• MMC (that is, turn MMC Commands on or off)
• CS-10 (that is, turn CS-10 Emulation on or off.)

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Quick Operation Reference

If 9 Pin or GPI Cards are Present, M Commands Include:
- 9 Pin 1 (that is, turn 9 Pin card in Slot 1 on or off.)
- 9 Pin 2 (that is, turn 9 Pin card in Slot 2 on or off.)
- GPI 1 (that is, turn GPI card in Slot 1 on or off.)
- GPI 2 (that is, turn GPI card in Slot 2 on or off.)

M Buttons Have Two Uses
The M Buttons can send commands like any other button. Alternately, they determine which machines will be controlled by the Transports, Jog / Shuttle, and Locates.

Query
When a switch is set to Query, it will not send a command. When pressed, it puts the whole unit into Query mode. In Query mode, no commands are sent, but the LCD will display all the parameters for the last control activated.

Number
Selects the Controller, Note, or Program Change number.

Channel
Selects MIDI Channel 1 through 16.

Minimum (or Release Velocity)
Minimum controller or note off velocity value.

Maximum (or Velocity)
Maximum controller or note velocity value.

Group
The selected control that you are currently editing can be made a group member.

By rotating the encoder under the word Group, the LCD prompts you to select which control will be the group master.

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Quick Operation Reference

More About Groups
When a master fader is moved down, all member faders reach minimum at the same time.

GMaster
Turning GMaster on makes that one fader the Grand Master. Moving this fader moves the other faders.
Data is sent as if all faders in all Banks were being moved.

To use this feauture, make one button (F, M, W, Transport, or Cursor) into a Grand Master On Off button. This allows one switch to instantly turn on or off the grand Master function.

Jog Wheel and Shuttle Ring
Jog and Shuttle transmit MIDI Machine Control and MIDI Controllers (CS-10 protocol), depending on the state of the M buttons. When an optional 9 Pin card is installed, Jog and Shuttle can also send 9 Pin commands, for controlling professional VTRs.

The Speed of the Jog Wheel and the Shuttle Ring can be user-adjusted in the Utility Mode.

Any button (F, M, W, Transport, Cursor) can be made into a master "On / Off" control for the Jog / Shuttle mechanism.

Locate Mode versus Program Change Mode
The Keypad has two modes of operation:
Locate Mode and Program Change Mode.
Press Shift and Locate to alternately change from Locate Mode to Program Change Mode.

In Locate Mode, the LED display shows time code.

In Program Change Mode, the LED display shows either Program Change (Pch), Bank (ban), or Channel (Chan).

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Quick Operation Reference

Locate Mode
Storing a Locate by Capturing on the Fly.
Simply press Set Locate while time code is coming in.
The Locate Number will automatically increment.
The Locate will automatically be named.

Sending a Locate Command By Two Digit Locate Number
To send a Locate, do not press Locate.
Just type the two digit locate number, and press Enter to send
the Locate command.
(The Locate command is not sent until you press Enter.)

Locating by Direct Address
To send a Locate by specifying a time code, press Locate and
enter the time on the Keypad. Press Enter to send the Locate.

Last function
Press Last to re-send the last locate.

Program Change Mode
Pressing Mode cycles the display through Program Change
(Pch), Bank (ban), or Channel (Chan).

Type a channel number, press Enter to store.
Type a Bank number, press Enter to send it.
Type a Program Change number, press Enter to send it.

Time Code Display
The time code display responds to incoming SMPTE or MTC.
If the incoming Time Code is drop frame, the Drop Frame
indicator ("DF") will be lit.

The Time Code Display also shows the last locate command
sent. The time can also be displayed in Feet and Frames.
This is selected in Utility Mode.

The Display is also used for displaying Program Change and
Bank Change commands.

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Quick Operation Reference

Entering and Exiting Utility Mode
Enter Utility Mode by pressing Shift and Assign.
Utility has three pages, selected with the right-most encoder.

Exit Utility Mode by pressing Assign.

Protect
When On, user cannot enter Assign Mode. Display alerts user memory is protected when attempting to enter Assign Mode.

Dump
Rotate encoder to initiate MIDI System Exclusive bulk data dump. The data dump takes about 20 seconds.

SHOWTC
Selects the mode in which incoming time code is displayed in the 7 -segment LED display. H:M:S:F, H:M:S, or Ft :Frm

Bank Name
Allows you to enter a name for each Bank.

OFFSET (Feet and Frame)
A number entered in hours which is subtracted from the incoming time code.

Jog
Sets responsiveness of Jog Wheel. Range is 1 to 100.

Shuttle
Sets responsiveness of Shuttle Ring.
Range is 1X, 2X, 4X, 8X, 16X, 32X.

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920394 Ethernet Interface Card Installation and Configuration

This document covers the installation, initialization, and operation of the 920394 Ethernet Interface Card.

Once installed, Ethernet becomes the only possible communications method with the MCS-3800, MCS-3400 or MCS-3000. It is not possible at this time to have a 920394 Ethernet Interface Card and an RS-232 Interface Card, RS-422/9-Pin Interface Card, or USB Interface Card installed at the same time. In addition, the firmware installed in the MCS-3800, MCS-3400 or MCS-3000 is specific for Ethernet operation.

The 920394 Ethernet Interface Card performs the function of TCP server with fixed IP address. At this time, UDP, client, and DHCP operations are not supported.

I. Installation

1. Updated firmware (v2.00 or later) must be installed into the MCS-3800, MCS-3400 or MCS-3000 in order to operate with the 920394 Ethernet Interface Card. You may check the firmware currently in the MCS-3800, MCS-3400 or MCS-3000 by powering it up. The message:

   ```
   JLCooper Electronics MCS-3x00
   Version 2.xx
   ```

   should appear, depending on model and firmware revision.

   a. If this message appears, proceed to step 2
   b. If the Ethernet message does not appear, you must install updated firmware
   c. Please contact the factory for ordering or obtaining service for firmware installation.

2. The Ethernet MAC address is printed on a label attached to the card. In the unlikely event that this address is needed, you might want to copy it down before installing.

3. Install the Card into the "Slot 1" position using the screws previously attaching the blank plate or other interface card

II. **Initialization**

1. First-time initialization.
   Certain internal memory locations must be initialized before operation may proceed.
   Hold down the Up and Down arrow keys.
   a. Turn on the power. Continue holding the keys until the display blanks.
   b. This initializes the unit as follows:
      IP Address= 192.168.254.101
      Gateway   = 192.168.254.198
      Mask   = 255.255.255.000
      Port   = 00023

2. Modifying the IP Address and/or Port.
   If it is desired to change the default IP address or Port number, this needs to be done just once. The results are saved to nonvolatile memory.

   a. While the unit is powered, hold down the SHIFT key and momentarily push the UTILITY button.
   b. The current IP Address will be shown in the display. If you do not wish to change this address, press ENTER.
   c. If you wish to change this, press numeric pad keys. This does not scroll. If you make a mistake, press the CLEAR button once, and the current number will reappear.
   d. When satisfied with the displayed value, press the ENTER key. The display will then display the Gateway value. If you don't wish to change this, press ENTER again. Press ENTER again to step past the Mask value.

e. The Port number will now appear as a five-digit number. If you do not wish to change it, press ENTER. If you do wish to change it, it must be entered as a five-digit number. For instance, if you wish for port #80, you must enter 00080. If a mistake is made, press the CLEAR button once.

f. After the ENTER key is pressed this last time, the changes will be made to internal non-volatile memory, and a message will appear.

g. As the message indicates, the changes will not take place until the power has been turned off and back on.

III.   **Operation**

In operation, the MCS-3800, MCS-3400 or MCS-3000 with a 920394 Ethernet Interface Card behaves as a TCP server, operating on the set IP address and port number. It is necessary for a client to establish a TCP connection with the MCS-3800, MCS-3400 or MCS-3000 before anything else can take place. Once a connection has taken place, operating a control will cause a packet to be sent to the client. A message from the client will be reflected by fader position, LED state, or LCD message on the MCS-3800, MCS-3400 or MCS-3000. All messages within the TCP packet are the standard MCS-3800, MCS-3400 or MCS-3000 messages as published in the developer documents.

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