Utah Scientific

MC-40/400/402 System

Setup and Operations Guide

Award Winning Customer Service

Utah Scientific

10 Year Warranty

Est. 1977

Table of Contents

Introduction

The MC-400/402 HD/SD Channel Branding System is a high-end signal processing device for use in live and automated master control systems. The MC-400 can be used in a standalone system or as part of a multi-channel master control system under the control of an MCP-2020 network.

The MC-400/402 can be switched between SD and HD operation, allowing the channel to be re-purposed for operation with various signal formats during the course of normal operations.

External inputs are provided for all major signals. This is intended to accommodate signals such as key inputs, which may not be present in the router. The processor also maintains two fully independent keyers, each of which can be fed by internal or external signals, or by an internal logo store.

In addition, the 2RU control Panel for the MC-400/402 contains a full set of operational controls for all MC-400/402 functions. The panel also serves as the interface point for external signals such as automation interface, as well as tally and GPI/O's.

System Capabilities

The MC-400/402 system is a single channel Master Control Switcher that provides a standard set of features associated with On-Air Master Control Switchers. The base system is a A/B based mix-effects engine and provides for two external keys, a logo keyer, and a full range of audio effects including overs and playback of MP3 files.

Figure 1-1. MC-402 System – (MCP-400, MC-402 board, and UT-400/72)

Larger systems could consist of four MC-402's in a 144x144 router, for example, with a larger MCP-2020 control panel controlling each channel. This system could have automation interfaces for each channel, but a single manual control point in the MCP-2020.
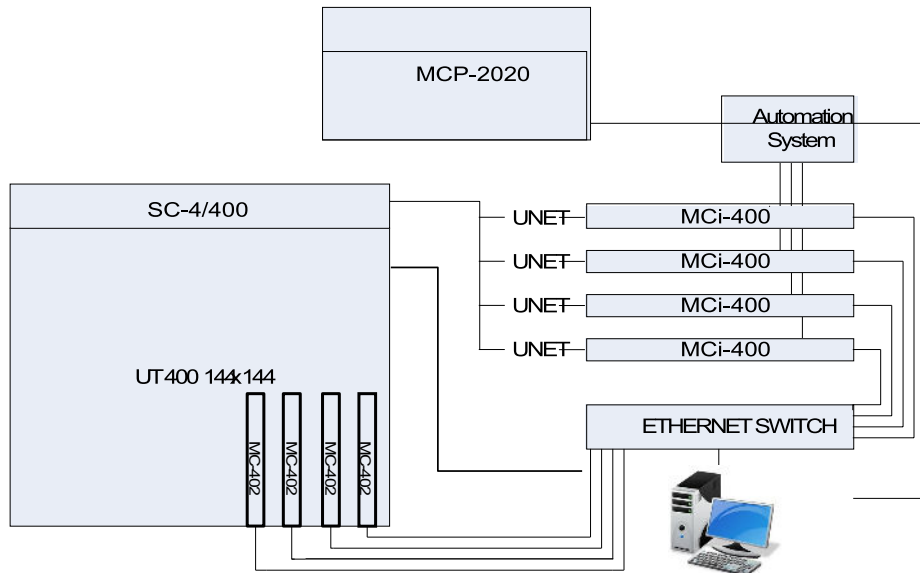
Figure 1-3.   **Four Channel MC-400 System with MCP-2020**

Systems can also be constructed with a hybrid of MC-4000 products and MC-402 products. The MCP-2020 control panels can control MC-4000 and 400/402 video processors, but MCP-400 panels cannot control multiple channels, they are limited to controlling a single MC-400 or MC-402 video processor.

Detailed View

Diagram of MC-400 card in a UT-400 Router
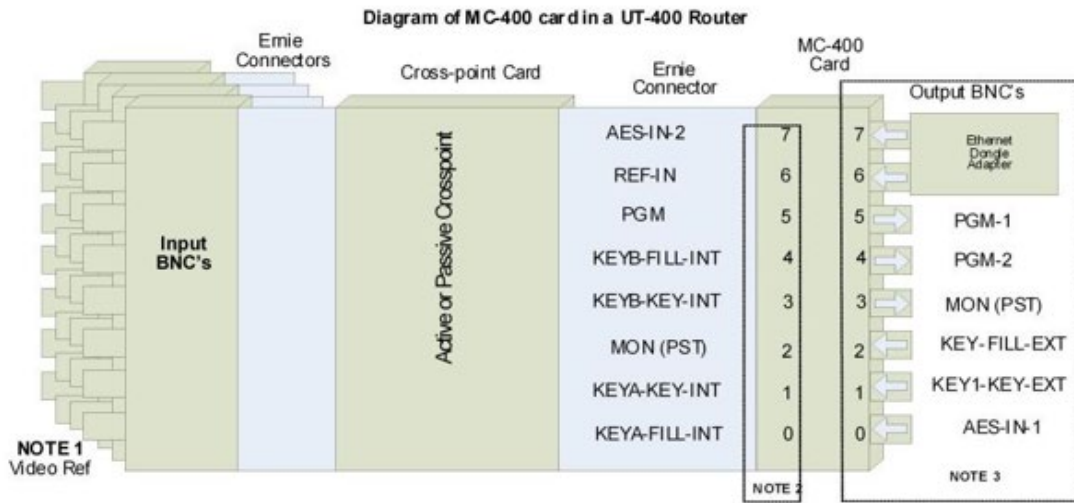
Note 1: The index number that represents the input BNC for the video reference will go into the configuration file of the MC-400/402 in the bottom of the input list.

Note 2: The numbers represent card slot numbers (not index numbers) for the Ernie connector. For example, if the MC-400 were in the 5th slot then it would be connector 32-39. This information will be used in the configuration file of the MC-400.

Note 3: The numbers represent card lot numbers for the BNC connector which will be used for cabling purposes. For example, if the MC-400 were in the 5th slot then it would be connector 32-39.

Note 4: The MC-400 card is used with the UT400 series 1 routers and is based on 8 output BNC's

Note 5: The MC-402 card is used with the UT400 series 2 routers and is based on 12 output BNC's. This model uses a direct Ethernet connection to the rear panel instead of the Ethernet Dongle shown in the chart above.

Note 6: The MC-402 uses the same method as notes 2 and 3 above, only each slot has 12 connectors instead of 8. Therefore, the 5th slot would actually be 48-59.

Note 7: Both MC-400 and MC-402 processors use the same output chart shown above, beginning at the lower number for that slot and proceeding to the 8th output. The MC-402 has an additional 4 outputs that are standard video router outputs. These are SD/HD/3G SDI outputs coming from the last 4 outputs of that slot.

The MC-400/MC-402 within the UTAH-400 Router
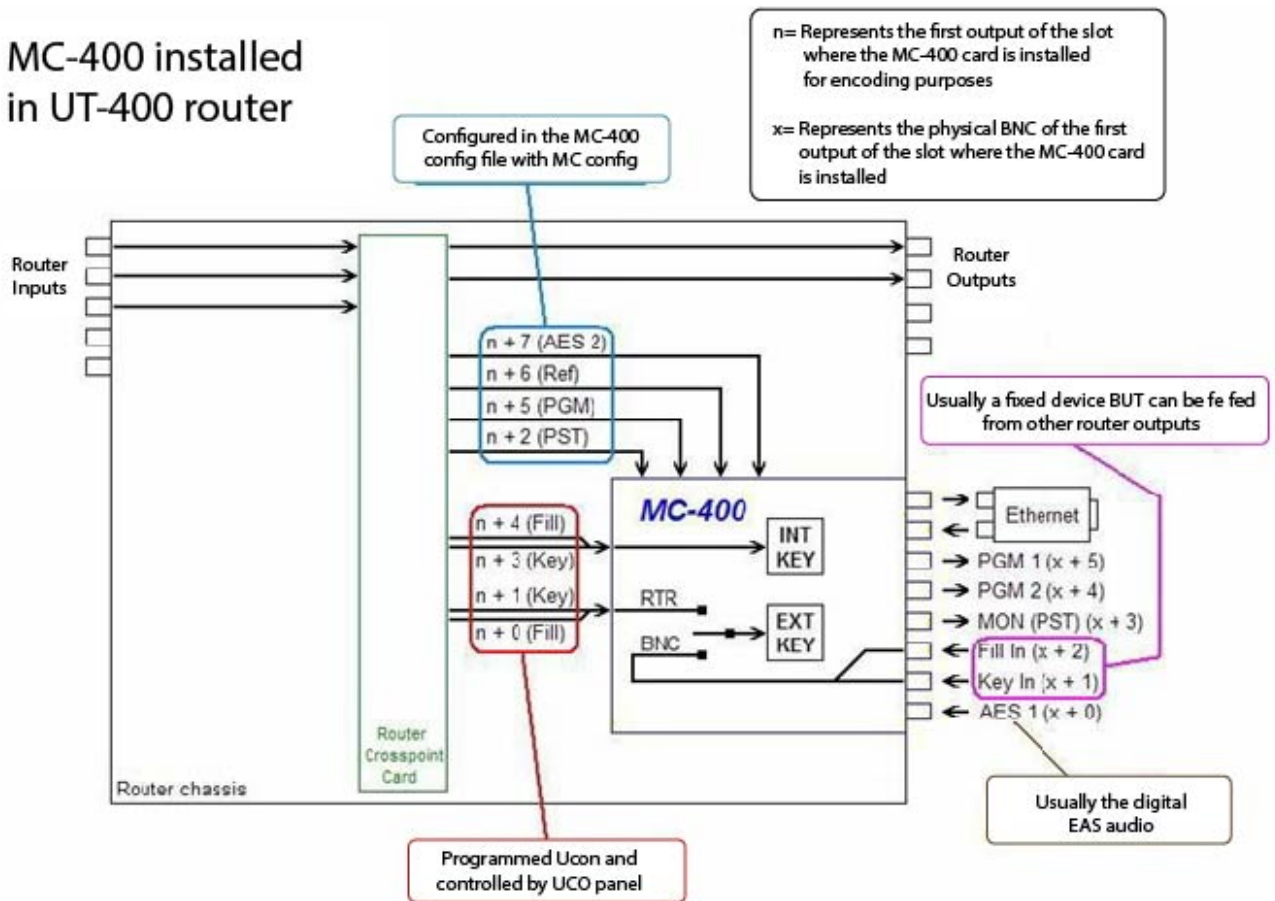
Rear Panel Overview

Figure 1-5.   MCP-400 Rear

- Ethernet – Control interconnect.

- The U-NET ports are required to control the associated UTSCI routing switcher.

- The station number is used to set the station address.

- The com ports are used for serial control.

- The serial port (immediate right of the E-NET port) functions the same as those found on the UCP panels – allows the option between U-NET, E-NET, or serial.

- Standard GPIO dipswitch and connectivity - 1-8

- Standard CAN Expansion and Diagnostic ports for system maintenance.

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MC-40/400/402

Rear Panel - Connection Detail

Note: Com 4 may be used as a time code input. If desired set port to RS-422 and use this pin out. 1=TC+, 2-4=Not used, 5=GND, 6-8=Not used, 9=TC-

GPI Connections
Top Row = +12v,
Bottom Row = GND

GPIO Selection Switch
This switch sets the mode for the GPI/GPO connector to the right. Switch 1 corresponds with GPIO 1 etc. Up fo GPO; down for GPI

GPO Connections
Relay closure between the upper pin and power pin when relay is closed.

When an expansion panel is used, this connection loops between the panels using a CAT-5 cable. When no expansion panel is used terminate this connection with the supplied U-Net terminator.

4)RS-422 or 232 Serial Ports & Pin#'s
RS-232: 1=CD, 2=RX, 3=TX, 4=DTR, 5=GND, 6=DSR, 7=RTS, 8=CTS, 9=Not used
RS-422: 1=Not used. 2=RX-, 3=TX+, 4=Not used, 5=GND, 6=Not used, 7=RX+, 8=TX-, 9=Not used
Note: To select RS-422 or RS-232 open the panel and locate the jumpers in the lower right hand corner of the panel as you view it from the top with the rear of the panel closest to you.

Station ID Dipswitch
Each panel needs a unique Binary ID number
Control panel cannot be assigned to station ID 000 or 255.

Power Connector

U-Net Terminator

U-Net connectors connect to a U-Net port on the SC-4/400 or to a loop-through from another panel via a typical CAT-5 cable. U-Net must be terminated at the end of the loop-through with the supplied U-Net terminators. Maximum cable length of 1000 feet per run.

Typical CAT5 Ethernet connection

Configuration port used for panel setup. Use RJ-45 to 9 pin adapter labeled MC-2020. Baud rate 19.2K baud, 8, None, 1

RJ-45

Serial Port for control via RCP-1 protocol.
Pin Outs: **RS-232**= 1-RI, 2-TXD, 3-RXD, 4-DSR, 5-GND, 6-DTR, 7-CTS, 8-RTS, 9-CD
RS-422= 2-TX-1, 3-RX+, 5-GND, 7-TX+, 8-RX-

RJ-45 Adaptor

17

MC-40/400/402

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The MCI-400: Connection Detail

Note: Com 4 may be used as a time code input. If desired set port to RS-422 and use this pin out. 1=TC+, 2-4=Not used, 5=GND, 6-8=Not used, 9=TC-

GPI Connections Top Row = +12v, Bottom Row = GND

4)RS-422 or 232 Serial Ports & Pin#'s
RS-232: 1=CD, 2=RX, 3=TX, 4=DTR, 5=GND, 6=DSR, 7=RTS, 8=CTS, 9=Not used
RS-422: 1=Not used. 2=RX-, 3=TX+, 4=Not used, 5=GND, 6=Not used, 7=RX+, 8=TX-, 9=Not used
Note: To select RS-422 or RS-232 open the panel and locate the jumpers in the lower right hand corner of the panel as you view it from the top with the rear of the panel closest to you.

GPIO Selection Switch
This switch sets the mode for the GPI/GPO connector to the right. Switch 1 corresponds with GPIO 1 etc. Up fo GPO; down for GPI

GPO Connections Relay closure between the upper pin and power pin when relay is closed.

When an expansion panel is used, this connection loops between the panels using a CAT-5 cable. When no expansion panel is used terminate this connection with the supplied U-Net terminator.

Station ID Dipswitch
Each panel needs a unique Binary ID number Control panel cannot be assigned to station ID 000 or 255.

COM1, COM2, COM3, COM4

U-NET   E-NET   SERIAL   DIAGNOSTIC PORT

Power Connector

U-Net Terminator

U-Net connectors connect to a U-Net port on the SC-4/400 or to a loop-through from another panel via a typical CAT-5 cable. U-Net must be terminated at the end of the loop-through with the supplied U-Net terminators. Maximum cable length of 1000 feet per run.

Typical CAT5 Ethernet connection

Configuration port used for panel setup. Use RJ-45 to 9 pin adapter labeled MC-2020. Baud rate 19.2K baud, 8, None, 1

RJ-45

1 2 3 4 5
6 7 8 9

Serial Port for control via RCP-1 protocol. Pin Outs: **RS-232**= 1-RI, 2-TXD, 3-RXD, 4-DSR, 5-GND, 6-DTR, 7-CTS, 8-RTS, 9-CD **RS-422**= 2-TX-1, 3-RX+, 5-GND, 7-TX+, 8-RX-

RJ-45 Adaptor

18

MC-400/MC-402 Encoding System Diagram

MC400 Network Names and Encoding Summary

July 17, 2008

Device	Encoded Sysname (From Encode File)	Network Names (published with nms -a)
MCP-400 PANEL (PANEL SOFTWARE)	KUSI-MCP40001	KUSI-MCP40001
MCP-400 PANEL (CHASSIS SOFTWARE)	KUSI-MC40001	KUSI-MC40001
MC-400 CHASSIS (CHASSIS SOFTWARE)	KUSI-MC40001	KUSI-MC40001_P

When you update CHASSIS encoding, you MUST burn it into both the MCP-400 Panel and the MC-400 Processor Card

Panel Encode Update
Purpose is to update encode information in MCP400 control panel
1. Open Folder C:\usi\kusi-mcp40001\encode
2. start update script burnenc-network.bat
3. enter PANEL IP 192.168.5.29
4. kusi-mcp40001.conf placed in IP address 192.168.5.29

Chassis Encode Update
Purpose is to update encode information in MCP400 and MC400 as they both use the same file
1. Open Folder C:\usi\kusi-mc40001\encode
2. start update script burnenc-network.bat
3. enter MC400 IP 192.168.5.150
4. kusi-mc40001.conf placed into IP Address 192.168.5.150
5. enter MCP400 IP 192.168.5.29
4. kusi-mc40001.conf placed in IP address 192.168.5.29

MCP 400 PANEL IP Address 192.168.5.29

ETHERNET

MC 400 Processor IP Address 192.168.5.150

MCP 400 PANEL Runs both PANEL and CHASSIS Software

MCP 400
Panel Encoding File (KUSI-MCP40001.conf)
Sysname MCP-40001
ChassisName MC-40001
Defines Button Functions and chassis to connect to

MC 400
CHASSIS Encoding File (KUSI-MC40001.conf)
Sysname MC-40001
ChassisName N/A
Defines Router Encoding, relays, optos, automation connection etc.

OPERATION

MCP-400 PANEL Connects to kusi-mcp40001.conf ChassisName.

Error shows NO MC400 on MC400 Panel or no NMS on MCP2020 Panel

MCP-400 CHASSIS Connects to kusi-mc40001.conf Sysname plus "_P"

Error Shows H/W Error No MC400 on MCP400 or NO VI/VO on MCP-2020

Note: All references for MC-400 are the same for the MC-402

MC-400/MC-402 Block Diagram

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MC-400/MC-402 Router/Master Control Block Diagram (Note: all references for MC-400 are the same for the MC-402)

Cable Specification

For U-Net operation, it is recommended that you use category 5 or category 6 cable terminated in RJ-45 connectors, with a maximum length of 1000 feet. Grounded and shielded cables are recommended.

Relay Optos Specification

Relay = Voltage should be less than 24 Volts, current not to exceed 1 Amp (maximum)
The use of series current limiting resistors in circuits involving relays and optos is required. A 1k current limiting resistor must be placed in line with the circuit above to prevent damage to the relay.

Optos = 10 milliamp (typical), 40 milliamp (maximum) - The voltage required to drive the opto must be between *5 to 12 volts.*

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GPIO's (8)

Labeled 'GPIO'

There is a 8 position dip switch labeled GPIO Select on the rear of the MCP-400. Placing the switches in the up position will produce a GPO setting, and placing them in the down position will produce a GPI setting. The 8 relays are for GPO's only, and require a pull up resistor of 1k to be attached in line with the external device (to be triggered by the relay).

NOTE: For GPI use, an additional 5-12 volt supply must be applied to the connection. Apply the positive side of the voltage source to one side of the external device's GPO. Apply the other side of the external device's GPO to one of the two connections on the GPI of the MCP-400. Apply the other side of the GPI on the MCP-400 to the negative side of the power source. Additional setup must still be done in the configuration file for the MCP-400 to enable the functionality for either use.

GPI Setup for the MC-400

External Gear with GPO
Internal N/O Dry Contact Relay

MC-400 HD or SD

5-12v Power Supply

+ → GPI 1-8
- → GPI 1-8
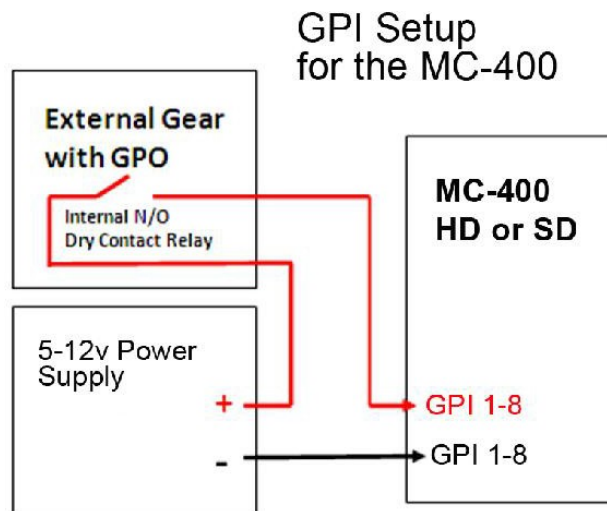
Figure 1-7. **GPI Setup for an MC-400**

MC-400/MC-402 Video Processor

Description

The MC-400/MC-402 video processor is a standalone Digital Master Control switcher that is designed to be installed in an output slot of the UT400 Video Routing switcher. MC-400 fits in the Series 1 routers; MC-402 fits in the Series 2 routers. It supports either SD-SDI (SMPTE-259) or HD-SDI (SMPTE-292) formats and has some discrete audio capabilities as well.
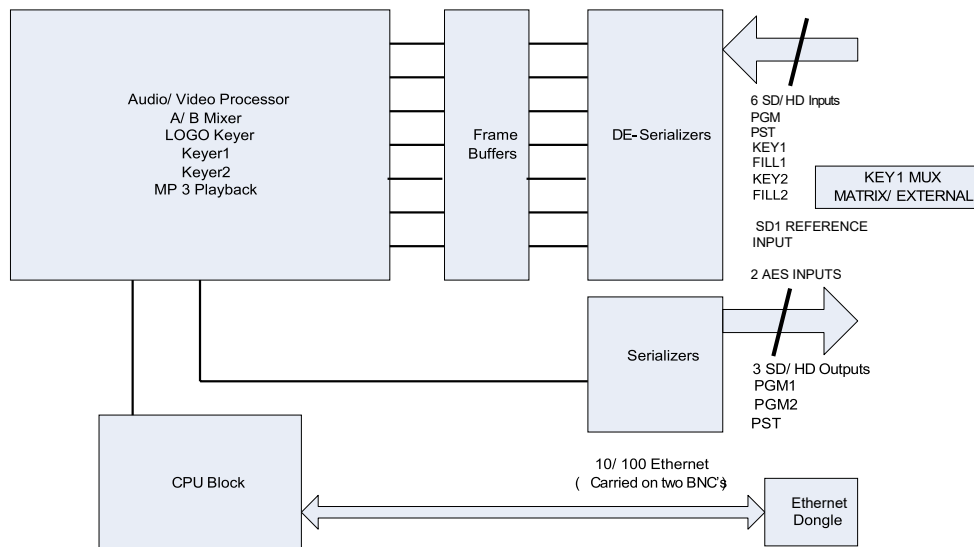
Figure 2-1. **MC-400/MC-402 Block Diagram**

Signal IO

The MC-400 and MC-402 accepts 8 inputs from the router crosspoint card through the internal connector, and has control, output, and some input connections on its 8 BNC's. Depending on the slot that it is installed in, the physical connections to the crosspoint will change. The table below shows the connection numbers if the card is installed in the output 0-7 (series 1) and output 0-11 (series 2) slot of a router. If the card is installed in a different slot, the crosspoint connections need to be indexed by the beginning output number in that slot.

XPT Output	Signal Name	Description
0 - EXT RTR FILL	KEYA - FILL - INT	KEY A Signal. Switchable with rear panel BNC
1 - EXT RTR KEY	KEYA - KEY - INT	Fill A Signal. Switchable with rear panel BNC
2 - PST	MON - PST	Preset Bus
3 - INT KEY	KEYB - KEY - INT	KEY B Video Signal
4 - INT FILL	KEYB - FILL - INT	Fill B Video Signal
5 - PGM	PGM	PGM Bus
6	REF-IN	SDI reference video signal, SD 259M or HD 292M
7	AES - IN - 2	Discrete AES In (internal)

In addition to the signals coming from the crosspoint of the router, the MC-400 has 8 BNC connectors that exit the back of the router and the MC-402 has 12 BNC's.
These are used for the following functions (Note that this order is shown as if the card were installed in a 144x144 router, with the signal farthest away from the midplane of the router on the bottom).

BNC #	Direction	Signal Name	Description
7	BI-DIR	ETHERNET	Connects to Ethernet Dongle (Series 1) – Ethernet port (S2)
6	BI-DIR	ETHERNET	Connects to Ethernet Dongle (Series 1) – Ethernet port (S2)
5	OUT	PGM 1	Program Video Out #2
4	OUT	PGM 2	Program Video Out #1
3	OUT	MON (PST)	Monitor / Time key video out
2	IN	KEY - FILL - EXT	Switchable Keyer input
1	IN	KEY - KEY - EXT	Switchable Fill Input
0	IN	AES - BNC	Discrete AES – BNC

The MC-400 cards Ethernet connections are unique in that there is no RJ-45 connection to the rear of a typical UT400 router output slot. To accommodate an Ethernet connection, an Ethernet dongle, USI part number 140000-11 is used. It converts the two BNC's to an RJ-45 connector for a connection to a standard 10/100 Ethernet network. It installs without impeding any coax connections to other BNC's.

The MC-402 card rear panel has a built in Ethernet port, which uses a direct connection from the network LAN.

There are two identical copies of the program out signal for signal fanout concerns.

MC-400/MC-402 LED's and Switches

There are several LED's on the front of the MC-400 to indicate status of various signals.
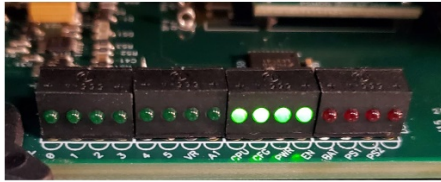
MC-400 Front board edge

MC-402 Front board edge

From Top to Bottom

- (MC-400 card) The LED's labeled '0-5' indicate the presence of valid SD or HD video when on, and lack of video when off.

- (MC-402 card) The LED's labeled '1-12' indicate the presence of valid SD or HD video when on, and lack of video when off.

- (MC-400) The 'VR' LED indicates presence of Video in the reference input.

- (MC-402) The 'REF' LED (labeled behind the LED labeled 7) indicates presence of Video in the reference input.

- (MC-400) The 'A1' LED indicates that there is a valid AES signal on the AES 1 input.

- (MC-402) The 'AUD' LED (labeled behind the LED labeled 8) indicates that there is a valid AES signal on the AES input.

- The 'CPU' Led indicates that the CPU has been brought out of reset.

- The 'CFG' LED indicates that all programmable devices on the board have been configured.

- The 'PWR' LED indicates that all 7 voltages on that card are operating within tolerance.

- The 'EN' LED is the link activity LED for the Ethernet connection. It should flash with network activity.

- The last four LED's are red to indicate errors.

  - The BAT LED indicates failure of the onboard battery for the Non-Volatile SRAM

  - The PS1 and PS2 LED's flash a code if one or more of the onboard power supplies is out of tolerance.

  - The last LED is unused.

Jumpers and Switches

LED's

NOTE—Users Should not adjust any other jumpers on the card.

Programming Header

Diagnostic Port

SW2 Mode Control

J18 Watch Dog Enable/ Disable

1 2 3 4 5 6 7 8

Place Between 1-2 for normal operation, 2-3 to disable the watchdog.

a S1—Do not run Linux if ON.
b S2—Use partition if OFF, partition if ON.
c S3 thru S5—No Function
d S6—Start Linux, but do not start application if ON.
e S7—Place Scan gate part in Bypass if ON.

Normal operation as all these switches set to OFF.

Figure 2-4. Jumper and Switch Positions

Installation

As stated earlier, the MC-400 and MC-402 are designed to be installed into an output card slot in a UT400 router. Familiarize yourself with the layout and type of router you plan to use prior to attempting to install the card.

NOTE: There are two limitations that may come into play when you attempt to install the card. The first limitation is power. The MC-400/MC-402 Video Processor consumes 23 Watts of power, about 5 times as much as a normal SD or HD output card. Due to this, loading MC-400/402 into fully populated chassis, or loading several MC-400/MC-402 into the same chassis can cause the router power supply system to become overworked. Because of this, it is recommended that you consult Utah Scientific's Service department if you plan to install an MC-400/MC-402 in an existing system.

Your system will be evaluated for the suitability of installing MC-400/MC-402's. System that ship new from the factory or with factory defined configurations need not consider this step. Another consideration for MC-400 cards is that due to their greater width, they should not be placed in adjacent slots. Standard output modules can be placed adjacent to MC-400 cards, but the MC-400's themselves must be separated by at least one slot. The MC-402 cards do not have this limitation and can be placed directly next to each other in the same frame.

For MC-400 cards only - Once it has been determined which slot(s) your MC-400 should be installed within, the rear panel location needs to be identified for proper Ethernet dongle
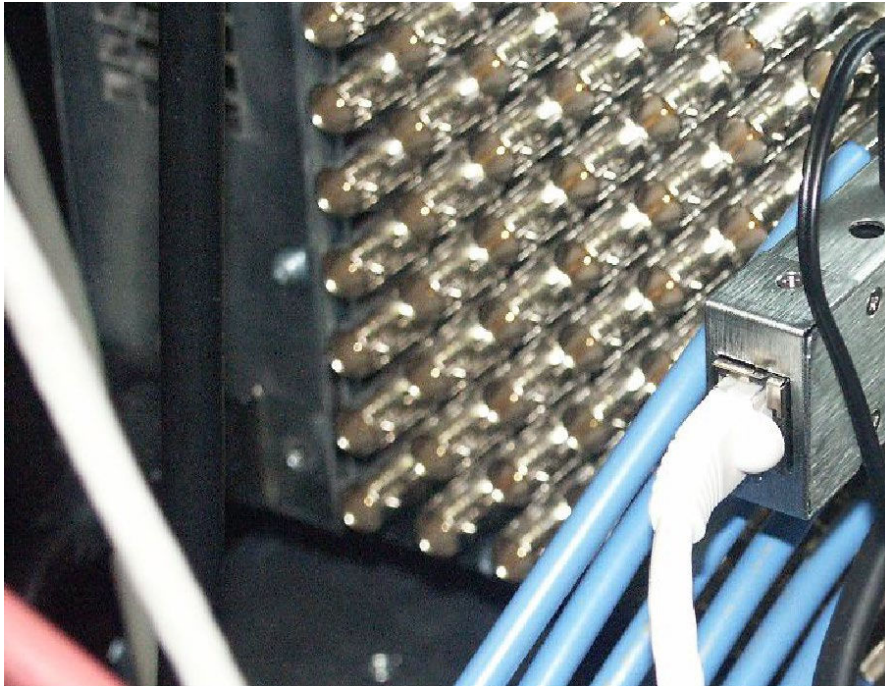
connection.

Figure 2-5. Ethernet dongle and Installation

The Ethernet dongle connects to the two BNC's closest to center of the panel, with the DC power jacks pointing toward the center of the router. Loosen the screw for the hold down bracket, swing it out of the way, seat the dongle on the two BNC's, and then align and tighten the hold down bracket.
Both power supplies for the Ethernet dongle should be connected, and then a cat5 cable from the RJ45 port to an Ethernet switch.

NOTE: This cable should be no longer than 50 feet. USI provides an Ethernet switch with its master control products that should be located close to the equipment.

Once the Ethernet connection is present and connected to a switch, it is time to install the MC-400 into the router. Slide it into the chosen slot until it seats fully, then lock down the ejector.

To verify functionality, look at the LEDs on the board front edge. The CPU, CFG and PWR LED's should be green, and the EN LED should flash if properly connected to the network.

Video Reference

The system reference video signal should be connected to an SDI video input on the router. (This can be any SMPTE 259M signal for SD or any SMPTE 292M signal for HD. **Not tri-level or Analog sync**.) This must be a constant, active video signal of the same format that feeds the MC-400/MC-402 reference. If the video passing through the card is 1080i, then the reference must be 1080i. And if the signal is 720p, then the reference must be 720p.

The VR/REF LED indicator on the front of the MC-400/MC-402 will show when the processor is locked to the video.

	ON (Red)	Good Reference
VR/REF LED	FLASHING	Wrong Reference
	OFF	No Signal

The Input should be connected to a Serial Digital Video Source (described above), which is IN-TIME and IN-PHASE with the HOUSE SYNC.

MCP-400 LCD Control Panel

The MCP-400 control panel utilizes LCD-based display technology along with a touch-screen control interface. This provides an expansion path to update and enhance MCP-400 operations in future releases.

The menu structure is made up of 3 items. Screens, pages, and buttons.
Menu screen operations are related to specific areas of the MCP-400 Master Control System. A menu *page* is part of a menu screen and allows more than eight operations per menu screen. Pages are accessed using the **Up** and **Down** LCD control buttons located to the left of the LCD touchscreen display.

A menu button is part of a menu page and allows the user control over MCP-400 operations. Operations are selected by pressing the area on the LCD display where the desired operation is displayed.

Basic Panel Navigation

Moving through the various MCP-400 menus is accomplished using the touch-screen interface and the four LCD Navigation (NAV) buttons located to the left side of the LCD display.

Figure 3-2. Main menu with button control

Home - This button is used to display the MAIN Menu Control Screen of the MCP-400 Menu control System. The button is illuminated whenever the menu system is displaying a screen other than the MAIN Menu Control Screen.

Up - This button is used to display menu pages located above the currently displayed page. The button is off if the page displayed is the top page of the current screen. It is illuminated otherwise.
Down - This button is used to display menu pages located below the currently displayed page. The button is off if the displayed page is the bottom most page or if there is only one page associated with the current menu screen. The button is illuminated otherwise.

Back - This button is used to display a menu screen one level higher up in the MCP-400 menu control structure. This button is *off* if the current page is either the MAIN screen or one of its direct selections. The button is illuminated otherwise.

MAIN Menu

This menu screen is the top of the MCP-400 Menu Control system. This appears when the HOME button (located to the left side of the LCD display) is pressed. Each screen typically contains eight buttons located beneath a banner that displays a summary of the control screen currently displayed.

The example below shows the MAIN screen. The banner indicates the current channel's designation as ENG75-MCP-40001. The buttons will display other menu screens when pressed.

Figure 3-3. Main menu

Descriptions

TRANS Menu

This button displays the TRANSITION CONTROL Menu Screen. This screen is used to control the type and speed of transitions performed when the TAKE button in the lower right hand side the MCP-400 control panel is pressed.

PST RTR

This button displays the preset router control menu screen, and is used to make takes on the PST output of the MCP-400 master control system. The controls are the same as the eight soft buttons when the display is Orange.

PGM RTR

This button displays the Program Router Control Menu Screen, and is used to make takes on the PGM output of the MCP-400 master control system. The controls are the same as the eight soft buttons when the display is Red.

SRC SEL

This button displays the Source Select Menu Screen. This screen is used to modify the sources assigned to the eight soft keys used to make takes on the PST and PGM outputs of the MCP-400 Master Control System.

SQZ T

This button displays the Squeeze Select Menu Screen. This screen is used to select the SqueezeMAX Preset that will be activated when the SQZ hard key (located at the bottom of the LCD display) is pressed.

KEYR CNTL

This button displays the Keyer Control Menu Screen, and is used to manage the many aspects of the MCP-400 Video Keyers.

AUDIO

This button displays the Audio Control Menu Screen, and is used to manage the many aspects of the MCP-400 Audio Processor.

MAINT

This button displays the Maintenance Control Menu Screen, and is used to manage the various utility and setup features of the MCP-400 Master Control System, including the Video Line Standard the MCP-400 will display.

TRANS Menu
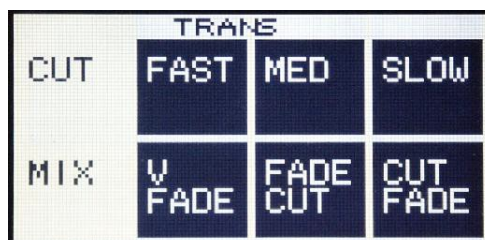
Figure 3-4.TRANS menu controls

Purpose

Selections made on this screen modify the transition style the MCP-400 will perform the next time the TAKE button is pressed. It is comprised of two major control groups; *Transition Rate* and *Transition Type*.

The CUT, FAST, MED, and SLOW buttons are collectively known as the Transition Rate buttons. The MIX, V FADE, FADE CUT, CUT FADE buttons are collectively known as the Transition Type buttons.

Navigation

Display   HOME->TRNS MENU
Active NAV[1] Keys   HOME

Descriptions

Transition Rates

Transition Rate buttons are used to modify the duration that a transition will take to complete. Typical durations for FAST, MEDIUM, and SLOW are 15, 30, and 60 frames respectively.

Transition Types

MIX

This button causes the MCP-400 to transition between sources doing a additive cross-fade between the PST and PGM sources. The current PGM source will fade off the screen while the current PST source will fade on the screen.

V FADE

This button causes the MCP-400 to transition the current PGM source to BLACK followed by a fade up to the new PST source. The duration for the fade up and down are ½ the total time of the current transition Rate.

FADE CUT

This button causes the MCP-400 to transition the current PGM source to black, then cut to the new PST source. The duration of the fade to black is the full *time* of the selected transition rate.

CUT FADE

This button causes the MCP-400 to transition the current PGM source to BLACK, immediately followed by the new PST source fading onto the PGM output. The duration of the FADE is the full time of the selected transition rate.

Preset Router Menu

Figure 3-5.   Preset Router sub menu

Purpose

Selections made on this screen select sources on the PST bus of the MCP-400.

Navigation

Display   HOME->PST RTR
 Active NAV Keys   HOME

Descriptions

A total of eight buttons are displayed with each containing a router source. Pressing a button causes the MCP-400 to select that source on the PST output of the router. This screen can be used in the same manner as the eight soft keys when the panel is displaying the PST bus controls. I.e. the eight soft keys are colored orange.

Program Router Menu
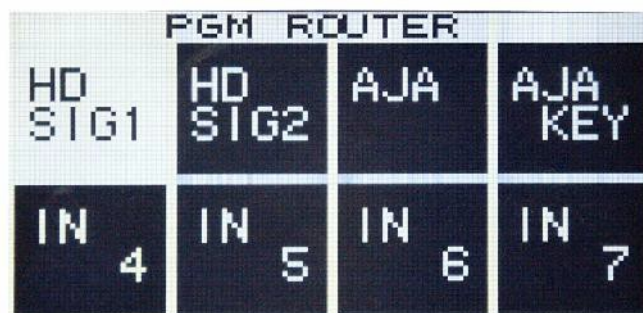
Figure 3-6.   Program Router sub menu

Purpose

Selections made on this screen will switch sources on the PGM bus of the MCP-400.

Navigation

Display   HOME->PGM RTR
 Active NAV Keys   HOME

Descriptions

A total of eight buttons are displayed, with each button containing the same router sources displayed on the panel LCD buttons. Pressing a button causes the MCP-400 to select that source on the Program output of the MCP-400. This screen can be used in the same manner as the eight soft keys when the panel is displaying the PGM bus controls. I.e. the eight soft keys are colored red. This allows the operator to switch PST sources while the panel LCD buttons are statusing/switching PGM sources.

Source Assign Menu

Figure 3-7.   Source Select sub menu

Purpose

To modify the sources located on the eight router soft-keys. User will select a router group, followed by a router source, place it in the ASSIGN display window, then assign it to a router soft-key.

Operation

This screen displays all possible router groups associated with sources programmed into the MCP-400 master control system. Multiple pages may exist if the number exceeds eight. Should this occur, use the UP/DOWN buttons to display other pages of router groups.

Once a router group has been selected a sub-screen, **ROUTER SOURCES** is displayed. This screen displays the individual sources associated with this router group, and multiple pages may exist if the number of sources exceeds eight.

Should this occur, use the UP/DOWN LCD NAV buttons to display other pages of router sources.
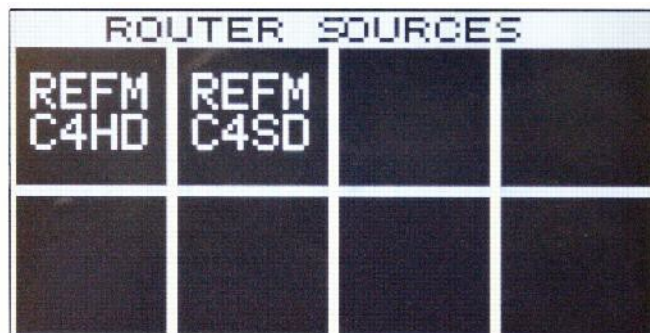
Figure 3-8.   Router Sources

Use the BACK LCD navigation button to move from a router source screen to the router groups menu screen.

Select the desired source once it is displayed. The source will now be displayed in the green eight-character display located above the ASSIGN hard-key. To assign the source to one of the eight LCD buttons, press and hold the ASSIGN hard-key, then press the desired LCD button. If the button's configuration is not a fixed source, the new source will be displayed in the LCD button window. The new source is now available for selection on either the PGM or PST.

Navigation

Display   HOME->SRC SEL
Active NAV Keys   HOME, [UP], [DOWN], [BACK]

Squeeze Select Menu

Figure 3-9.   SqueezeMAX Presets

Purpose

Selections made on this screen modify the SqueezeMAX Preset that will be controlled (placed on/taken off) the next time the SQUEEZE Hard-key is depressed.

Operation

This screen is comprised of 2 pages. The currently selected SqueezeMAX preset is displayed by a highlighted button. Display the desired SqueezeMAX Preset using the UP/DOWN LCD navigation keys if necessary. Select the desired preset when it is displayed. If the MCP-400 accepts the command, the button will change to an active state indicating it is ready to be placed on air.

Navigation

Display   HOME->SQZ
Active NAV Keys   HOME

Page 1 - Squeeze Presets 1 – 8
Page 2 - Squeeze Presets 9, 10, EAS

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Keyer Control Menu

Figure 3-10. Keyer Control menu

Purpose

Selections made on this screen collectively modify the operation of the two keyers located in the MCP-400.

Operation

Select which keyer you wish to control. Then modify the keyer operation using the supplied controls. These include the keyer type, keyer mode, keyersource, logo select, and logo position.

Navigation

Display   HOME->KEYER
Active NAV Keys   HOME, UP, DOWN

Page 1 - KEYR 1, KEYR 2, LIN KEY, ADD KEY, LOGO SEL,LOGO POS, LOGO KEY
Page 2 - EXT BNC, EXT RTR, CORS ADJ, UP ARROW, GAIN ADJ, CLIP ADJ, FINE ADJ,
          DOWN ARROW

Descriptions

KEYR 1

  While this button is active other selections made effect controls for KEYER 1.

KEYR 2

  While this button is active other selections made effect controls for KEYER 2.

LIN KEY

  Causes the keyer to process the inbound key sources as full amplitude signals. Meaning the source is providing a KEY signal that has not been pre-multiplied.

ADD KEY

  Causes the keyer to process the inbound KEY signal as a pre-multiplied signal. Meaning both clip and gain controls are not active.

LOGO SEL
Displays a sub-screen allowing the user to load one of the 16 logos stored locally into the internal logo generator.

LOGO POS
Displays a sub-screen allowing the user to modify the position of the logo in the video display. An option is also provided to save this location back to internal memory.

LUM KEY – detail to follow.

LOGO KEY
This control toggles between the logo and the Key B input of the MCP-400. It is activated when the INT button is selected on either KEYER 1 or KEYER 2.

EXT BNC
This control selects the external BNC key input which is activated when the EXT KEY (hard key) is activated on either KEYER 1 or KEYER 2. This selection replaces the EXT RTR selection.

EXT RTR
This control selects the Key A input which is activated when the EXT KEY (hard key) is activated on either KEYER 1 or KEYER 2. This selection replaces the EXT BNC selection.

CORS ADJ
Modifies the amount of change applied every time one of the arrow keys are pressed. Button operates as a toggle. Pressing it when OFF will activate it and the button will turn ON. Pressing again will turn the button OFF. The function can also be turned OFF by selecting the FINE ADJ button.

UP ARROW
Increases the value of either clip or gain (whichever is currently selected).

GAIN ADJ
When active, allows the current gain setting to be modified. The current value is displayed in the top half of the button.

CLIP ADJ
When active, allows the current clip setting to be modified. The current value is displayed in the top half of the button.

FINE ADJ
When active, decreases the amount of change applied every time one of the arrow keys are pressed. Button operates as a toggle. Pressing it when OFF will activate it and the button will turn ON. Pressing again will turn the button OFF. The function can also be turned OFF by selecting the CORS ADJ button.

DOWN ARROW
Decreases the value of either clip or gain (whichever is currently selected).

Keyer Control - Logo Select Sub-Menu

Figure 3-11. Logo Select sub menu

Purpose

To load one of 16 internal logos into the logo generator module.

Operation

This screen is comprised of two separate pages. The currently selected logo is displayed by highlighting the associated button. If the logo you wish to load is not displayed, use the UP/DOWN LCD navigation buttons to display other pages until the desired logo is displayed.

Navigation

Display HOME->KEYR CNTL->LOGO SEL
Active NAV Keys HOME, UP, DOWN, BACK

Page 1-LOGO 1, LOGO 2, LOGO 3, LOGO 4, LOGO 5, LOGO 6, LOGO 7, LOGO 8

Page 2-LOGO 9, LOGO 10, LOGO 11, LOGO 12, LOGO 13, LOGO 14, LOGO 15, LOGO 16

Keyer Control - Logo Position Sub-menu

Figure 3-12. Logo Position sub menu

Purpose

Manage the position of the logo in the video display.

Operation

Use the four arrow keys to move the logo to the desired position. Use the SAVE LOGO button (to save the position) if you wish to make the change permanent.

Navigation

Display   HOME->KEYR CNTL->LOGO POS
Active NAV Keys   HOME, BACK

Page 1-LOGO 1, LOGO 2, LOGO 3, LOGO 4, LOGO 5, LOGO 6, LOGO 7, LOGO 8

Page 2-LOGO 9, LOGO 10, LOGO 11, LOGO 12, LOGO 13, LOGO 14, LOGO 15, LOGO 16

Descriptions

FINE ADJ

When active, decreases the amount of change applied every time one of the arrow keys are pressed. The button operates as a toggle, and pressing the button when OFF will activate it and turn it ON. Pressing again will turn the button OFF. The function can also be turned OFF by selecting the CORS ADJ button.

CORS ADJ

Modifies the amount of change applied every time one of the arrow keys are pressed. This button also operates as a toggle. Pressing it when OFF will activate it and the button will turn ON. Pressing again will turn the button OFF. The function can also be turned OFF by selecting the FINE ADJ button.
ARROW KEYS UP, DOWN, LEFT, RIGHT, Moves the logo around in the video display.

SAVE LOGO

Modifies the stored logo data updating the position to the current values so the next time it is recalled it will be placed where it currently located.

Audio Menu

Figure 3-13. The Audio sub menus

Purpose

To manage the various aspects of the MCP-400 audio processor.

Operation

This screen is comprised of two separate pages. The first page is primarily level adjustments for either VARi-LEVEL or RATIO functions on PST and PGM Busses, while the second page is used to control the audio output mode for the source.

Navigation

Display   HOME->AUDIO
Active NAV Keys   HOME, UP, DOWN

Page 1- PGM, PST, CORS ADJ, UP ARROW, ADJ RATIO, ADJ VARI, FINE ADJ, DOWN ARROW

Page 2- PGM MONO, PGM STER, PGM SAP, PGM DLBY PST MONO, PST STER, PST SAP, PST DLBY

Descriptions

PGM

This button is used to select the PGM audio processor. Selections made when this button is active will affect the PGM audio processing signal chain. The button is paired with PST, and selecting this button when it is OFF will de-select PST and make PGM active. Pressing this button when already ON results in no change.

PST

This button is used to select the PST audio processor. Selections made when this button is active will effect the PST audio processing signal chain. The button is paired with PGM, and selecting this button when it is OFF will de-select PGM and make PST active. Pressing this button when already ON results in no change.

FINE ADJ

When active, this decreases the amount of change applied every time one of the arrow keys are pressed. This button operates as a toggle, and pressing it when OFF will activate it, turning the button will turn ON. Pressing again will turn the button OFF. The function can also be turned OFF by selecting the CORS ADJ button.

CORS ADJ

When active, increases the amount of change applied every time one of the arrow keys are pressed. The button operates as a toggle, and pressing it when OFF will activate it and the button will turn ON. Pressing again will turn the button OFF. The function can also be turned OFF by selecting the FINE ADJ button.

UP ARROW

Increases the value of either ratio or vari (whichever is currently selected).

DOWN ARROW

Decreases the value of either ratio or vari (whichever is currently selected).

PGM MODE

The PGM MONO, PGM STER, PGM SAP, and PGM DLBY buttons collectively make up the PGM audio mode controls. Making a selection here modifies how the audio processor routes individual audio signals through the PGM audio processor. This is sometimes termed audio shuffling.

PST MODE

The PST MONO, PST STER, PST SAP, and PST DLBY buttons collectively make up the PST audio mode controls. Making a selection here modifies how the audio processor routes individual audio signals through the PST audio processor. This is sometimes termed audio shuffling.

ADJ RATI

This button is used to modify the level of the RATIO related to the AUDIO OVER operation. The current value of ratio is placed on the top half the button when is it selected. The display is in db. Range is from 0 (unity) to -48 (off).

ADJ VARI

This button is used to modify the VARI-LEVEL setting related to the AUDIO LEVEL button (hard key). The current vari-level setting is displayed in the top half of the button when the function is active. The display is in db. 0 is unity, +12 is max increase, -48 is the max decrease.

MAINT Menu
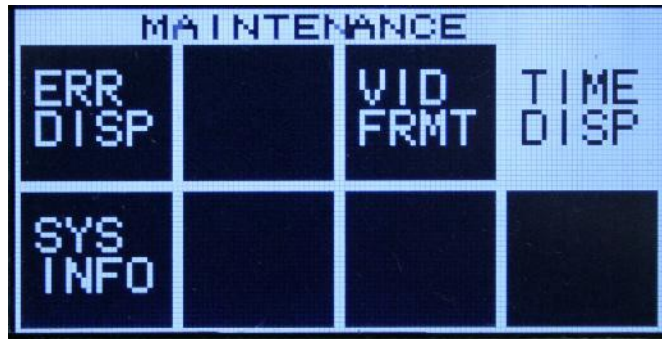
Figure 3-14. Maintenance sub menu

Purpose

To manage miscellaneous maintenance type operations in the MCP-400 master control system.

Operation

This screen would typically be accessed only to modify the video line standard the MCP-400 is outputting. Do this by selecting the VID FRMT button which displays the VIDEO STANDARD SEL sub-screen.

Navigation

Display   HOME->MAINT
Active NAV Keys   HOME

Descriptions

ERR DISP
This button is not used at this time.

AUTO TAKE
This button when active causes the MCP-400 system to alternately preset and take sources located on soft keys 1 and 3 at approximately 2 second intervals.

NOTE: This button is primarily for system tests and should never be used during normal on-air operations.

VID FRMT
Displays a sub-screen allowing the user to modify the video line standard output by the MCP-400.

MAINT Menu - Vid Format Sub-menu

Purpose

Manage the video line standard output by the MCP-400.

Operation

The screen initially displays the current Video Line Standard being output by the MCP-400. Selecting a different line standard causes the MCP-400 to modify the output format, modify the router, and update the router control soft-keys with sources associated with the new video line standard.

Navigation

Display   HOME->MAINT->VID FRMT
Active NAV Keys   HOME, BACK

Descriptions

1080HD
  This button selects the 1080i 60Hz Video Line Standard.

1080HD5
  This button selects the 1080 50Hz Video Line Standard.

720P
  This button selects the 720P 60Hz Video Line Standard.

720P 50
  This button selects the 720P 50Hz Video Line Standard.

SD 525
  This button selects the SD 525 60HzVideo Line Standard.

SD 625
  This button selects the SD 625 50Hz Video Line Standard.

MAIN MCP-400 PANEL BUTTONS - General Use

LCD MENU SYSTEM

The LCD menu system is made up of a series of screens, and each screen contains one or more pages of buttons. Screens with more than one page of buttons use the UP/DOWN menu control buttons to display the other pages of buttons.

Buttons perform actions and display status. A button can be configured to display a new screen of buttons, and when this occurs, the new screen is considered a sub-screen. When sub-screens are displayed, the BACK MENU CONTROL BUTTON turns ON to indicate the user can press this key, which in turn, displays the next higher screen in the menu system. The only exception to this is when the screen displayed is one *down* from the MAIN screen. In this case the BACK button will be turned OFF.

MCP-400 Panel Buttons

UP MENU CONTROL BUTTON

Displays the next higher set of buttons for a LCD screen that contains more than eight buttons. A button turns ON when the action is available.

DOWN MENU CONTROL BUTTON

Displays the next lower set of buttons for a LCD screen that contains more than eight buttons. The button turns ON when the action is available.

BACK MENU CONTROL BUTTON

Moves up one screen in the menu control system. The buttons turns ON when the current screen is asub-screen.

HOME (menu control button)

Displays the MAIN screen which is the top most screen in the menu control system.

INT (KEY 1)

This turns on the 1st key processor of the MCP-400. The key operates on either the PGM or PST channel of the MCP-400 as dictated by the PST/PGM select key.

INT (KEY 2)

This turns on the 2nd key processor of the MCP-400. The key operates in the same manner as KEY1 INT with the exception that it controls the second key processor of the MCP-400 rather than the first key processor.

EXT (KEY 1)

This controls the 1st key processor of the MCP-400. It selects one of two keyer sources. The first, called EXT BNC is the KEY and FILL signals connected to the two key inputs located on the back of the MCP-400. The second, called EXT RTR, is the router input. and routed to the local outputs 0 and 1.

NOTE: INT can display 1 of 2 separate key signals. The first is the set of key signals connected to regular router inputs, KEY and FILL (K/F B).

The second, called the LOGO KEY is a key signal generated internally by the MCP-400.

INT (Audio MIX)

This controls the AUDIO OVER processor on either PST or PGM as dictated by the PST/PGM select key. AUDIO INT is defined as the AES audio signal connected to a router input.

AUDIO EXTERNAL

The key controls the AUDIO OVER processor on either PST or PGM as dictated by the PST/PGM select key.

AUDIO EXTERNAL

The AES audio signal connected to the AES input BNC located on the back of the MCP-400 card

AUDIO LEVEL

This controls the AUDIO VARI-LEVEL processor on either PST or PGM as dictated by the PST/PGM select key.

SOURCE ASSIGN

This allows the user to change the source assigned to one of the eight router control buttons.

EXT (KEY 2)

This controls the 2nd key processor of the MCP-400. The key operates in the same manner as the KEY1 EXT with the exception that it controls the second key processor of the MCP-400 rather than the first key processor.

(ADJUST UP)

This key is used to increase values for AUDIO LEVEL, and RATIO. Including AUDIO LEVEL, RATIO, etc.

(ADJUST DOWN)

This key is used to reduce values for AUDIO LEVEL, and RATIO.

SQUEEZE

This button is used to control the USI SqueezeMAX device. When turned on it instructs the SqueezeMAX to air the Preset selected on the LCD menu.

AUTO ENABLE

This enables control of the MCP-400 by an external automation system.

PST/PGM RTR TOGGLE

Selects either PST or PGM - for button presses. PST MONITOR - not used at this time.

PGM MONITOR

Not used at this time.

TAKE

Performs a transition taking the current PST source and placing it on PGM.

MC-40 1 Rack Unit Processor

System Overview

The MC-40 HD/SD Master Control System is a high-end signal processing device for use in live and automated master control systems. The MC-40 can be used a standalone system or as part of a multi-channel master control system under the control of an MC-2020 network.

The MC-40 can be switched between SD and HD operation, allowing the channel to be re-purposed for operation with various signal formats during the course of normal operations.

The MC-40 chassis can be used as a system that resides down stream of a large router (MC-40E) or as a system that contains an 8x8 router and is completely self contained (MC40I).

The MC-40 contains two card slots; the lower slot for an MC-400 video processor, and the upper slot for either a VI-400 (MC-40E), or an XVI-400 (MC-40I).

The MC-40 chassis must have one of three companion control panels: the MCP-400 (2RU), the MCP-400i (1 rack unit with no front panel), or the MCP-40 (1 rack unit LCD based control panel).

An MCP-2020 Master Control Panel can be added as an additional control point. The MCP-2020 also contains multi-channel control capability.

![US Utah Scientific logo]

The MC-40 system is a single channel Master Control Switcher that provides a standard set of features associated with On-Air Master Control Switchers. The base system is a A/B based mix-effects engine and provides for two external keys, a logo keyer, and a full range of audio effects including overs and playback of MP3 files.

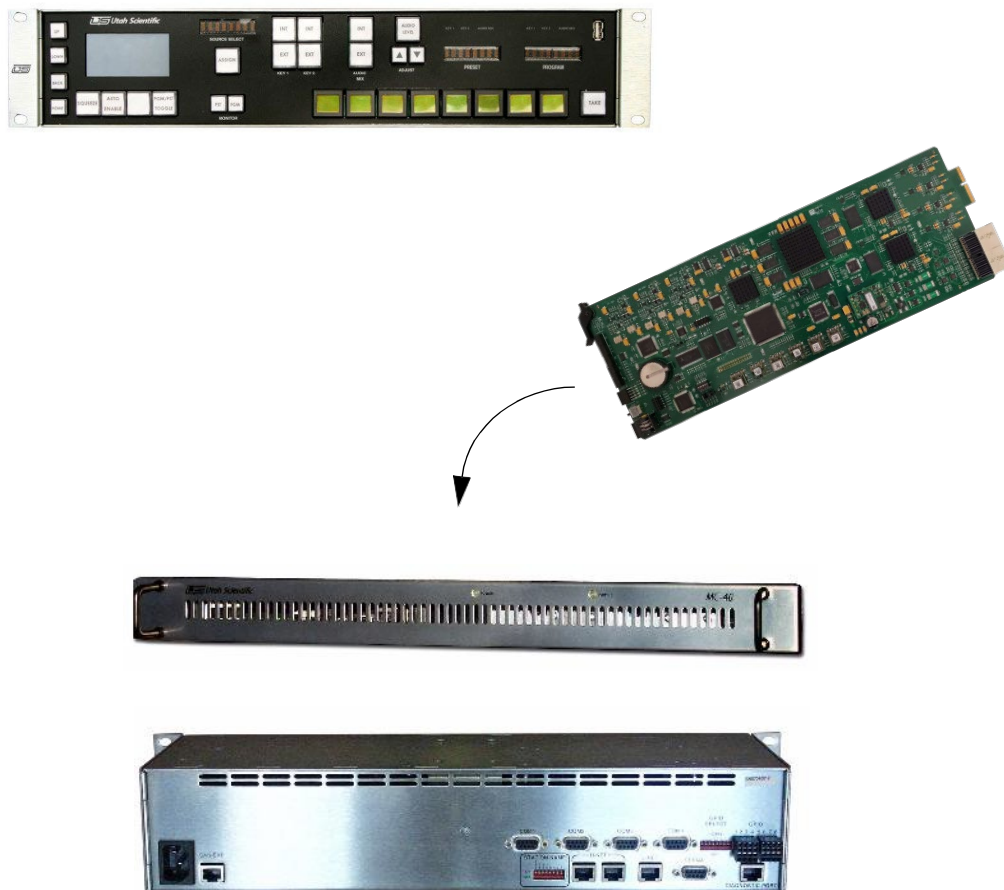**Figure 4-1.   MC-40 System - MCP-400 control panel (2RU), MC-400 board, MC-40 chassis (1RU), and MC-40 chassis (2RU)**

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MC-40 Frame View

Figure 4-2.   MC-40 Front

SERIAL PORT   AREF

ETHERNET

1 2 3 4 5

6 7 8 9

PIN 2 - TX-
PIN 3 - RX+
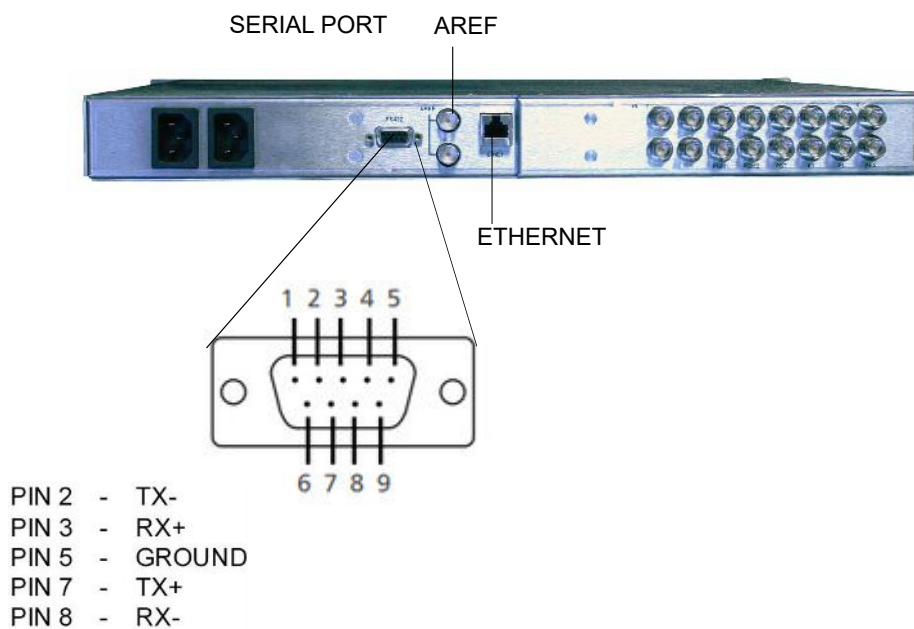PIN 5 - GROUND
PIN 7 - TX+
PIN 8 - RX-

**Figure 4-3.   MC-40 Rear with RS-422 pin outs**

Figure 4-4.   CAT 5 cabling

- Ethernet – for external control. (10/100)
- Serial Port - This port is used within the MC-40I system, connecting to the MCP control panel's COM 3. Cabling for this connection is provided with two 9-pin to RJ-45 adapters and a 10' CAT 5 cable. (The cable can be lengthened to 1000 feet if necessary.) This port is not used within the MC-40E system.)

- AREF - This loop thru video port is used as the vertical interval switching reference for a MC-40I system. The port is not used on an MC-40E system.
  - o   Apply analog black burst or tri-level sync to this port.

PINS	RS-232	RS-422
1	CD	Not Used
2	RX	RX-
3	TX	TX+
4	DTR	Not Used
5	Ground	Ground
6	DSR	Not Used
7	RTS	RX+
8	CTS	TX-
9	Not Used	Not Used

Table 4-1.

MC-40i - Router Input Connections
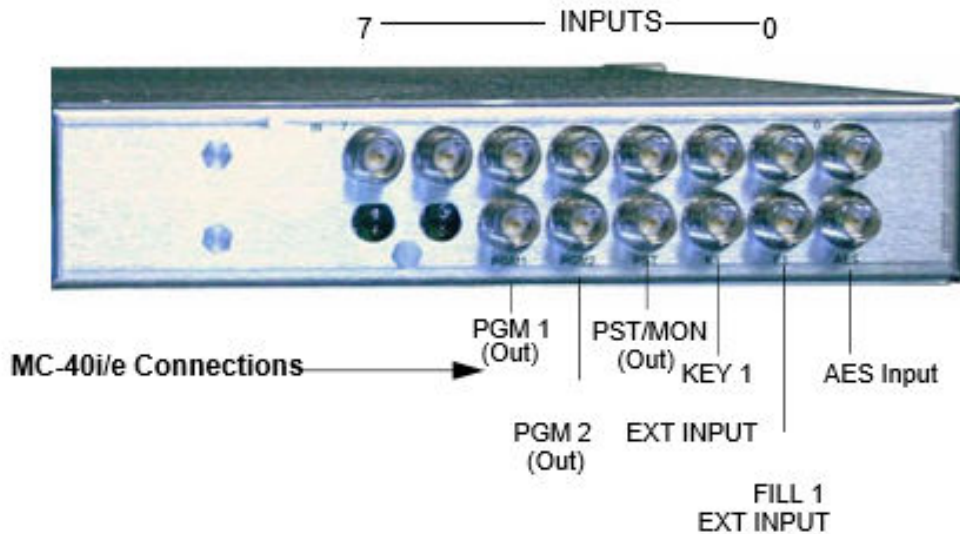
MC-400 Input Connections (used with MC-40i and MC-40e)

These are labeled just below the BNC's and display the exact connection detail.

MC-40i Input Connections

Inputs 0-7 can originate from any device that has the same video format issued with that MC-40. (Possible formats include SD525, SD625 PAL, HD720p, HD720p 50hz PAL, HD1080i, HD1080i) If there is only one video format to be used with the MC-40, any of the 8 inputs "must" be assigned as a dedicated solid video source, such as black or color bars, and must remain on that input connection. This is used for the video reference for that format and can also be used on the PST and PGM busses as a video source.
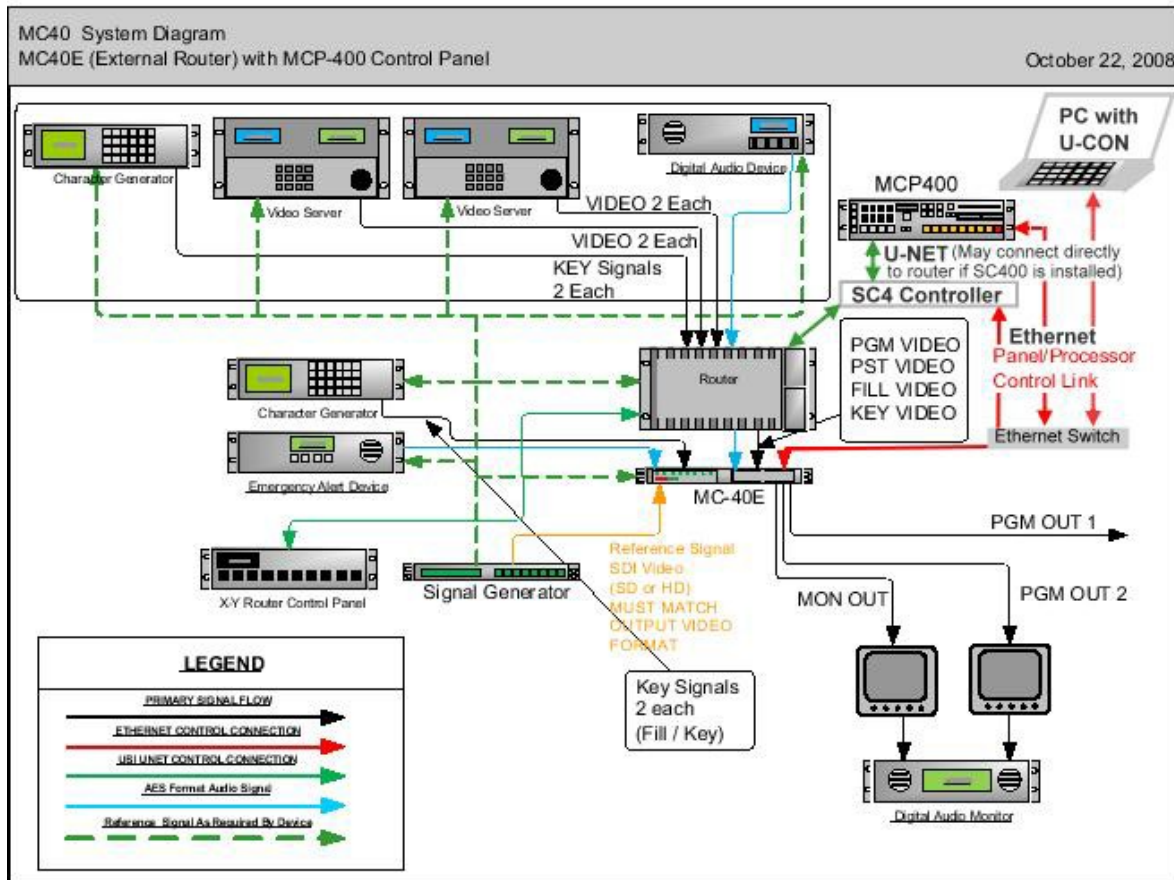
If there is more than one format that needs to be switched between the MC-40, any of the 8 inputs "must" be assigned as a dedicated solid video source, such as black or color bars for each of those formats, and must remain on those input connections. This is used for the video reference for that format and can also be used on the PST and PGM busses as a video source.

MC-40e External Router Input Connections

Inputs 0-7 are dedicated inputs, set up in the MC-400 config file, and must be cabled up as follows:

0 Key Fill A INT (direct, or from an external router level)

1 Key A Key INT (direct, or from an external router level)

2 PST (This is the PST input coming from external router)

3 Key B Key INT (direct, or from an external router level)

4 Key B Fill INT (direct, or from an external router level)

5 PGM (This is the PGM output coming from the external router)

6 REF-IN (This is coming from a reference device-router or direct source)

7 AES-IN 2 (direct, or from an external router level)

System Diagrams

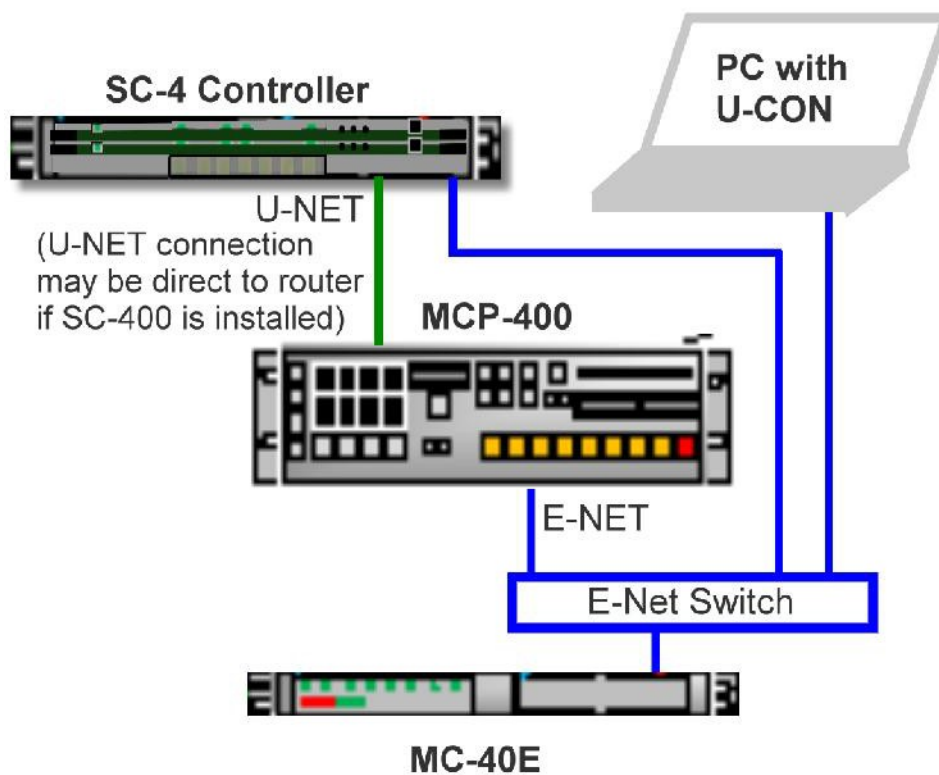MC40 System Diagram
MC40E (External Router) with MCP-400 Control Panel

October 22, 2008

US Utah Scientific

MC40 System Diagram
MC40I (Internal Router) with MCP-400 Control Panel

October 22, 2008

Character Generator

Video Server

Video Server

Digital Audio Device

VIDEO 2 Each

VIDEO 2 Each

KEY Signals
2 Each

*The Serial Connection replaces
U-NET as the "Source Selection"
Control Bus

Key Signals
2 each
(Fill / Key)

Character Generator

MCP-400

*Serial
(Instead of U-NET)

Ethernet

Emergency Alert Device

MC-40I

Panel/Processor
Control Link

Reference Signal
SDI Video
(SD or HD)
MUST MATCH
OUTPUT VIDEO
FORMAT

PGM OUT 1

Signal Generator

MON OUT

PGM OUT 2

LEGEND

PRIMARY SIGNAL FLOW

ETHERNET CONTROL CONNECTION

USI RCP-1 SERIAL CONNECTION (RS-422)

AES Format Audio Signal

Reference Signal As Required By Device

Digital Audio Monitor

Connectivity

MC-40E to MCP-400

Detailed Rear View

Note: Com 4 may be used as a time code input. If desired set port to RS-422 and use this pin out. 1=TC+, 2-4=Not used, 5=GND, 6-8=Not used, 9=TC-

GPI Connections
Top Row = +12v, Bottom Row = GND

When an expansion panel is used, this connection loops between the panels using a CAT-5 cable. When no expansion panel is used terminate this connection with the supplied U-Net terminator.

4)RS-422 or 232 Serial Ports & Pin#'s
RS-232: 1=CD, 2=RX, 3=TX, 4=DTR, 5=GND, 6=DSR, 7=RTS, 8=CTS, 9=Not used
RS-422: 1=Not used. 2=RX-, 3=TX+, 4=Not used, 5=GND, 6=Not used, 7=RX+, 8=TX-, 9=Not used
Note: To select RS-422 or RS-232 open the panel and locate the jumpers in the lower right hand corner of the panel as you view it from the top with the rear of the panel closest to you.

GPIO Selection Switch
This switch sets the mode for the GPI/GPO connector to the right. Switch 1 corresponds with GPIO 1 etc. Up fo GPO; down for GPI

GPO Connections
Relay closure between the upper pin and power pin when relay is closed.

Station ID Dipswitch
Each panel needs a unique Binary ID number
Control panel cannot be assigned to station ID 000 or 255.

Power Connector

U-Net Terminator

U-Net connectors connect to a U-Net port on the SC-4/400 or to a loop-through from another panel via a typical CAT-5 cable. U-Net must be terminated at the end of the loop-through with the supplied U-Net terminators. Maximum cable length of 1000 feet per run.

Typical CAT5 Ethernet connection

Configuration port used for panel setup. Use RJ-45 to 9 pin adapter labeled MC-2020. Baud rate 19.2K baud, 8, None, 1

RJ-45

Serial Port for control via RCP-1 protocol.
Pin Outs: **RS-232**= 1-RI, 2-TXD, 3-RXD, 4-DSR, 5-GND, 6-DTR, 7-CTS, 8-RTS, 9-CD
RS-422= 2-TX-1, 3-RX+, 5-GND, 7-TX+, 8-RX-

RJ-45 Adaptor

Relay Optos Specification

Relay

Voltage should be less than 24 Volts, current not to exceed 1 Amp (maximum)
The use of series current limiting resistors in circuits involving relays and optos is required. A 1k current limiting resistor must be placed in line with the circuit above to prevent damage to the relay.

Optos

10 milliamp (typical), 40 milliamp (maximum) - The voltage required to drive the opto must be between **5 to 12 volts.**

GPIO's (8)

Labeled 'GPIO'

There is a 8 position dip switch labeled GPIO Select on the rear of the MCP-400. Placing the switches in the up position will produce a GPO setting, and placing them in the down position will produce a GPI setting. The 8 relays are for GPO's only and require a pull up resistor of 1k to be attached in line with the external device to be triggered by the relay.

NOTE: For GPI use, an additional 5-12 volt supply must be applied to the connection. Apply the positive side of the voltage source to one side of the external device's GPO. Apply the other side of the external device's GPO to one of the two connections on the GPI of the MCP-40. Apply the other side of the GPI on the MCP-40 to the negative side of the power source. Additional setup must still be done in the configuration file for the MCP-40 to enable the functionality for either use.
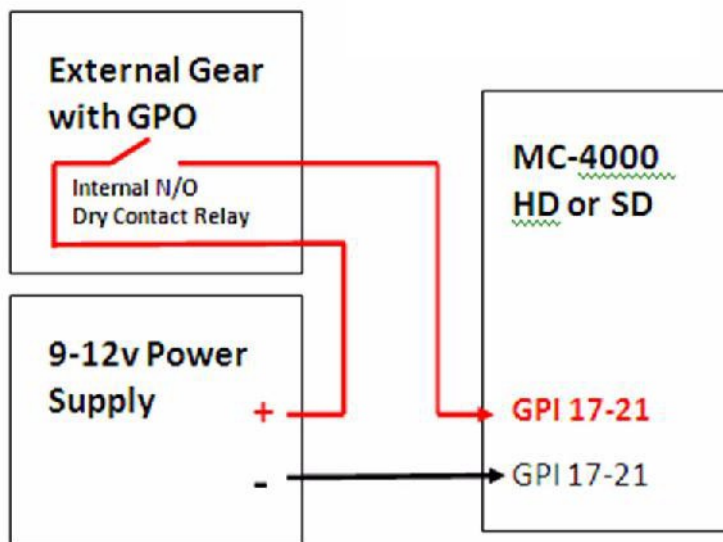
Figure 4-6.   **GPI Setup for an MCP-40**

MCP-40 Panel Operation

The MCP-40 control panel utilizes LCD-based display technology within a simple push-button control interface.

The button-controlled menu structure controls the individual 'page sets', which is equivalent to the screens and pages within the MCP-400 panel operation. This also provides an expansion path to update and enhance MC-40 operations in future releases.

Menu operations are related to specific areas of the MCP-400 master control system. A menu *page* is part of a menu screen and allows more than eight operations per menu screen. Pages are accessed using the **Up** and **Down** LCD control buttons located within the detailed menu structure.

Figure 5-1.   MCP-40 Front

Figure 5-2.   MCP-40 Rear

Basic Panel Navigation

Moving through the various MCP-40 menus is accomplished by navigating the button interface.

Home

Is accessed by pressing the two rightmost buttons *within any menu* on the MCP-40 panel.

All buttons are green whenever the menu system is at the 'HOME' location.
The **BACK** button (from any given location) is used to display a menu screen one level higher up in the MC-40 menu control structure.

The BACK button will not be present if the current page is either the MAIN screen or one of it's direct selections. The button is illuminated otherwise.

MAIN Menu

This menu is the top of the MCP-40 Menu Control system.

Figure 5-3.   Main menu

This appears when both rightmost buttons are pressed. Each menu typically contains eight buttons that display a summary of the control screen currently accessed.

Descriptions

PGM BUS

This button accesses the Program Bus control, and is used to make hot takes on the PGM output of the master control system. The sources will be displayed in red on the LCD button.

PST BUS

This button accesses the Preset Bus control, and is used to select sources on the PST output of the master control system. The sources will be displayed in orange on the LCD button.

AUDIO

This button displays the Audio Control Menu Screen, and is used to manage the many aspects of the master control Audio Processor.

KEYR CNTL

This button accesses the Keyer Control, and is used to manage the many aspects of the master control Video Keyers.

TRANS Menu

This button accesses the TRANSITION CONTROL, and is used to control the type and speed of transitions performed when the TAKE button is pressed.

EAS Alert

The button will flash (red) when an alert is present, and change to solid red when pushed (in an alert). If a different menu is active at the time of an alert, the right (2) buttons will flash (red) to indicate the presence of the EAS alert.

MAINT

This button accesses Maintenance, and is used to manage the various utility and setup features of the Master Control System, including the Video Line Standard the system will display.

TRANS Menu

Purpose

Selections made in this button set modify the transition style the master control will perform the next time the TAKE button is pressed. It is comprised of two major control groups; *Transition Rate* and *Transition Type*.

The CUT, FAST, MED, and SLOW buttons are collectively known as the Transition Rate buttons. The MIX, V FADE, FADE CUT, CUT FADE buttons are collectively known as the Transition Type buttons.

Descriptions

Transition Rates

Transition Rate buttons are used to modify the duration that a transition will take to complete. Typical durations for FAST, MEDIUM, and SLOW are 15, 30, and 60 frames respectively.

Transition Types

MIX

This button causes the master control to transition between sources doing a additive cross-fade between the PST and PGM sources. The current PGM source will fade off the screen while the current PST source will fade on the screen.

V FADE

This button causes the master control to transition the current PGM source to BLACK followed by a fade up to the new PST source. The duration for the fade up and down are ½ the total time of the current transition Rate.

FADE CUT

This button causes the master control to transition the current PGM source to black, then cut to the new PST source. The duration of the fade to black is the full *time* of the selected transition rate.

CUT FADE

This button causes the master control to transition the current PGM source to BLACK, immediately followed by the new PST source fading onto the PGM output. The duration of the FADE is the full time of the selected transition rate.

Preset Bus

Purpose

Selections made within this button set select sources on the master control's PST bus.
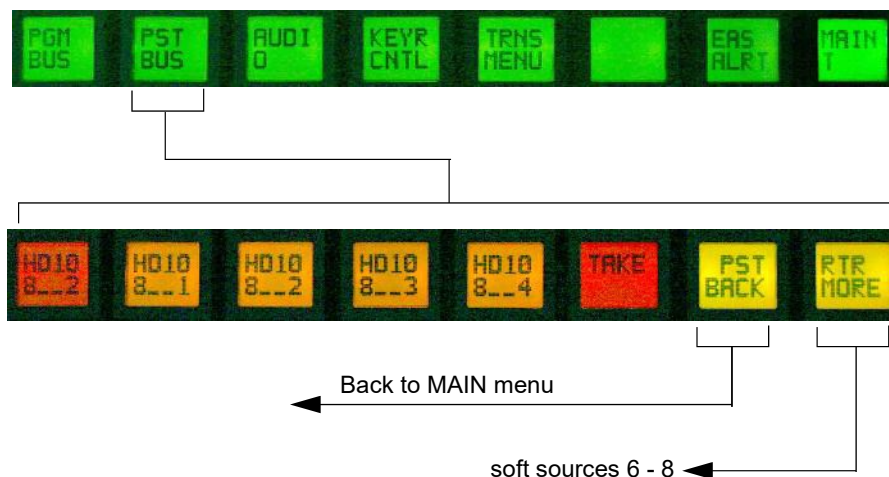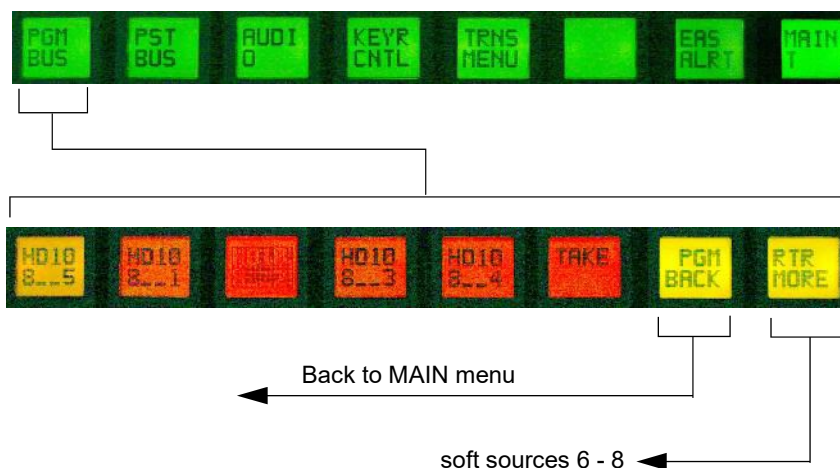

Figure 5-5.   Preset menu

Descriptions

A total of five buttons are displayed with each containing a router source name. Pressing a button causes the master control to select that source on the PST/MON output of the master control. The five soft keys are colored orange, and the selected source is colored red.
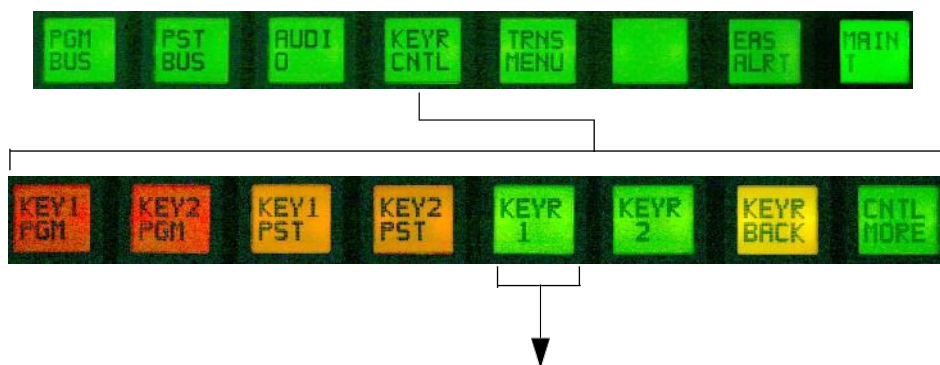
Program Bus

Purpose

Selections made within this button set select sources on the master control's PGM bus.

Figure 5-6.   Program menu

Descriptions

A total of five buttons are displayed, with each button containing a router source name. Pressing a button causes the master control to select that source on the Program output of the master control. The five soft keys are colored red, and the selected source is colored orange.

Keyer Control Menu

Purpose

Selections made within this button set collectively modify the operation of the master control's two keyers.

Operation

Select the keyer you wish to control, then modify the keyer operation using the supplied controls. These include the keyer type, keyer mode, keyersource, logo select, and logo position.

to additional keyer menu (next page)

Figure 5-7.   Keyer menu selection

Descriptions

KEY1 PGM
Activates the content of Key 1 on the program bus.

KEY2 PGM
Activates the content of Key 2 on the program bus.

KEY1 PST
Activates the content of Key 1 on the preset bus.

KEY2 PST
Activates the content of Key 2 on the preset bus.

KEYR 1
While this button is active other selections made effect controls for KEYER 1.

KEYR 2
While this button is active other selections made effect controls for KEYER 2.

to adjustment menu (next page)

Figure 5-8.   Keyer menu selection (more)

INT KEY
Accesses Key video content through the crosspoint card.

EXT KEY
Accesses Key video content through the panel's BNC connection.

LOGO KEY
This control selects between the logo generator and the master control's 2nd internal key input. It is activated when the INT KEY (hard key) is activated on either KEYER 1 or KEYER 2.

LIN KEY
Causes the keyer to process the inbound key sources as full amplitude signals. Meaning the source is providing a KEY signal that has not been pre-multiplied.

ADD KEY
Accesses the additive linear key signal.

To Logo Selection and Position menu (next page)
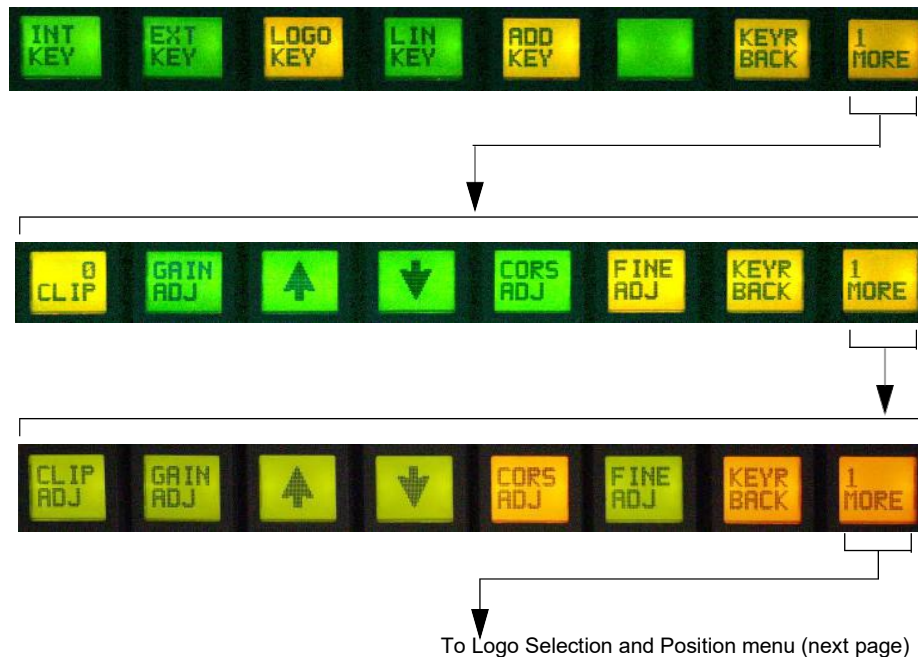
Figure 5-9.   Keyer menu selection (cont.)

0 CLIP
Activates the following sub-menus:

CLIP ADJ
When active, allows the current clip setting to be modified using the Up/Down alignment. The current value is displayed in the top half of the button.

GAIN ADJ
When active, allows the current gain setting to be modified using the Up/Down alignment. The current value is displayed in the top half of the button.

UP/DOWN ARROW
Increases or decreases the value of either clip or gain (whichever is currently selected).

CORS ADJ
Modifies the amount of change applied every time one of the arrow keys are pressed. Button operates as a toggle. Pressing it when OFF will activate it and the button will turn ON. Pressing again will turn the button OFF. The function can also be turned OFF by selecting the FINE ADJ button.

FINE ADJ
When active, decreases the amount of change applied every time one of the arrow keys are pressed. Button operates as a toggle. Pressing it when OFF will activate it and the button will turn ON. Pressing again will turn the button OFF. The function can also be turned OFF by selecting the CORS ADJ button.
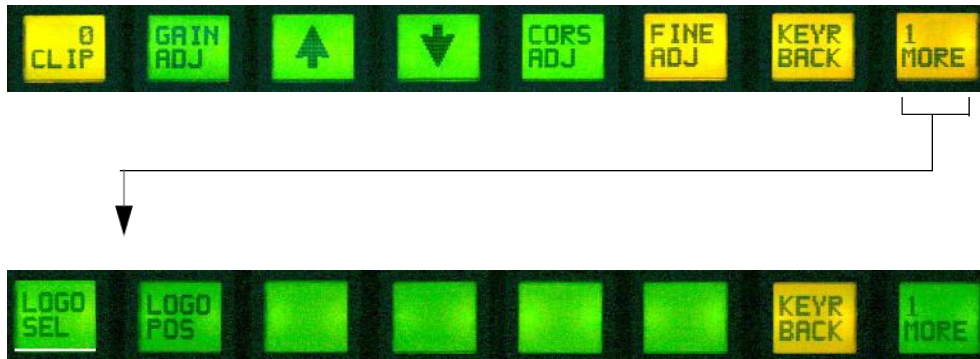
Figure 5-10. Keyer menu (logo selection and position)

LOGO SEL

Displays a sub-screen allowing the user to load one of the 16 logos stored locally into the internal logo generator.

LOGO POS

Displays a sub-screen allowing the user to modify the position of the logo in the video display. An option is also provided to save this location back to internal memory.
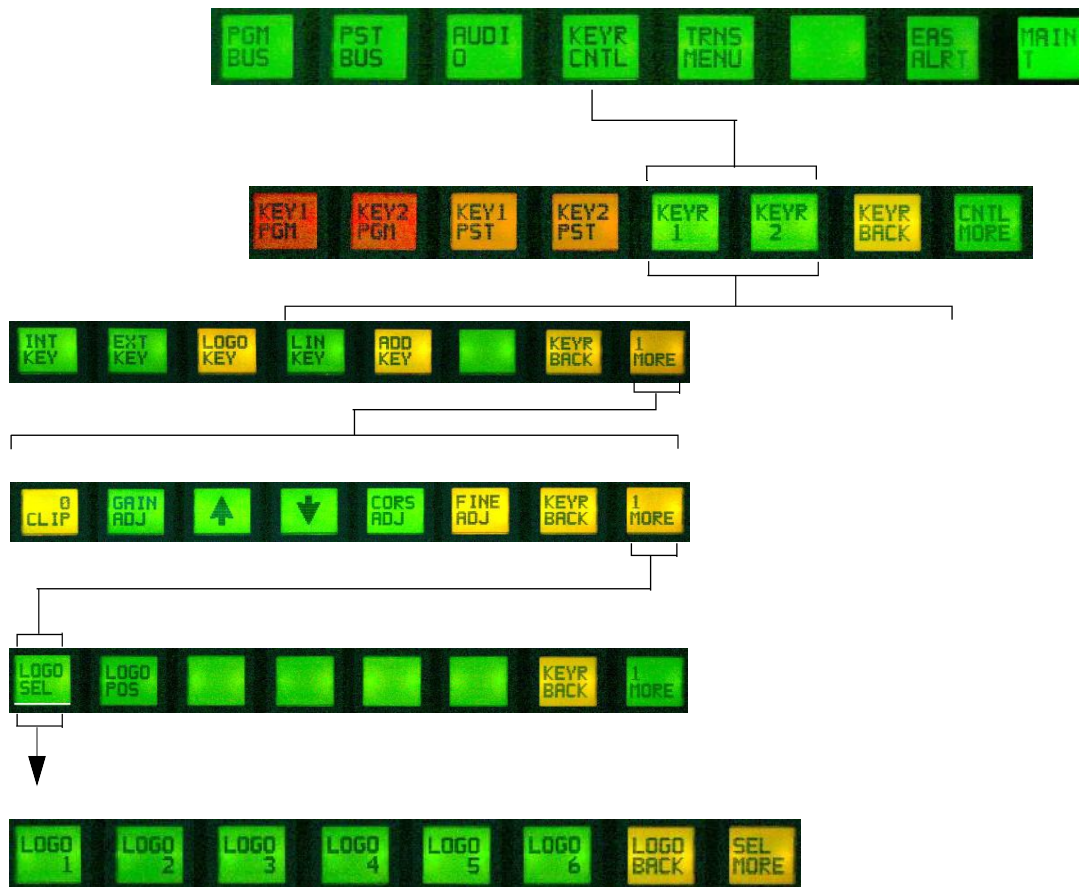
Keyer Control - Logo Select Sub-Menu

Purpose

To load one of 16 internal logos into the logo generator module.

Operation

This button set is comprised of two separate pages. The currently selected logo is indicated with the associated button. If the logo you wish to load is not displayed, use the UP/DOWN LCD navigation buttons to display other pages until the desired logo is displayed.

Select the logo to be displayed

Figure 5-11.   Logo Select

Keyer Control - Logo Position Sub-menu

Purpose

Manage the position of the logo in the video display.

Operation

Use the four arrow keys to move the logo to the desired position. Use the SAVE LOGO button (to save the position) if you wish to make the change permanent.

Descriptions

FINE ADJ

> When active, decreases the amount of change applied every time one of the arrow keys are pressed. The button operates as a toggle and pressing the button when OFF will activate it and turn it ON. Pressing again will turn the button OFF. The function can also be turned OFF by selecting the CORS ADJ button.

CORS ADJ

> Modifies the amount of change applied every time one of the arrow keys are pressed. This button also operates as a toggle. Pressing it when OFF will activate it and the button will turn ON. Pressing again will turn the button OFF. The function can also be turned OFF by selecting the FINE ADJ button.

ARROW KEYS UP, DOWN, LEFT, RIGHT

> moves the logo around in the video display.

SAVE LOGO

> Modifies the stored logo data updating the position to the current values so the next time it is recalled it will be placed where it currently located.

Audio Menu

Purpose

To manage the various aspects of the master control's audio processor.

Operation

This menu is comprised of two separate button sets. The first set is primarily level adjustments for either VARi-LEVEL or RATIO functions on PST and PGM busses, while the second set is used to control the audio output mode for the source.
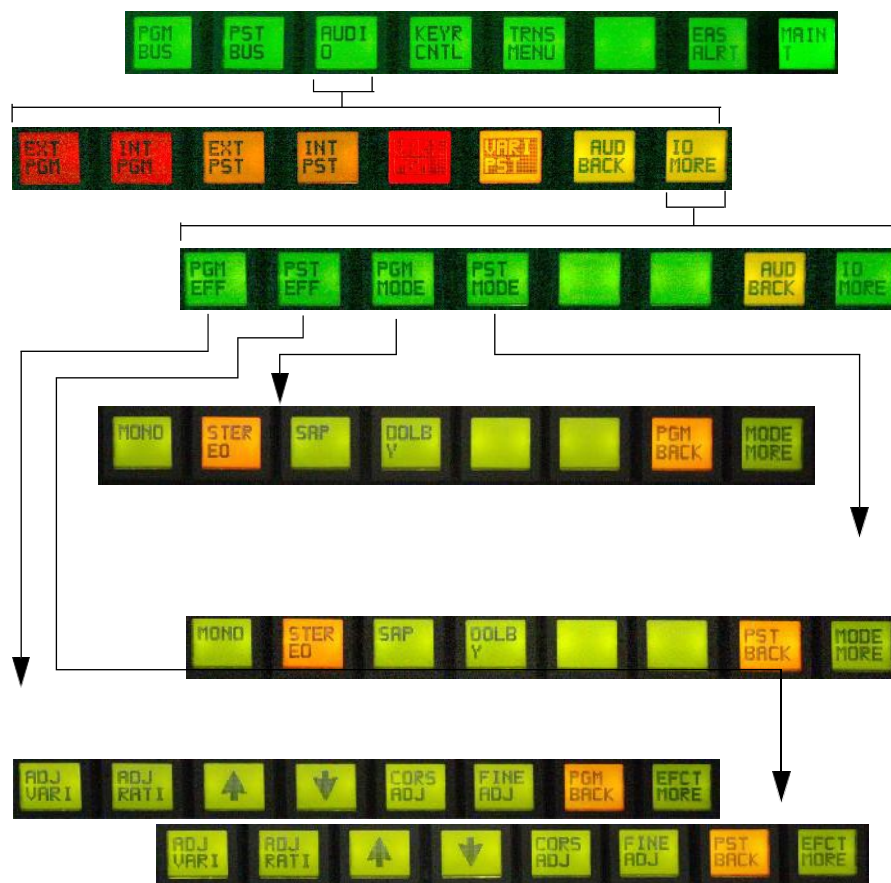
Figure 5-13. Audio menu selection

Descriptions

PGM

This button is used to select the PGM audio processor. Selections made when this button is active will affect the PGM audio processing signal chain. The button is paired with PST, and selecting this button when it is OFF will de-select PST and make PGM active. Pressing this button when already ON results in no change.

PST

This button is used to select the PST audio processor. Selections made when this button is active will effect the PST audio processing signal chain. The button is paired with PGM, and selecting this button when it is OFF will de-select PGM and make PST active. Pressing this button when already ON results in no change.

FINE ADJ

When active, this decreases the amount of change applied every time one of the arrow keys are pressed. This button operates as a toggle, and pressing it when OFF will activate it, turning the button will turn ON. Pressing again will turn the button OFF. The function can also be turned OFF by selecting the CORS ADJ button.

CORS ADJ

When active, increases the amount of change applied every time one of the arrow keys are pressed. The button operates as a toggle, and pressing it when OFF will activate it and the button will turn ON. Pressing again will turn the button OFF. The function can also be turned OFF by selecting the FINE ADJ button.

UP ARROW

Increases the value of either ratio or vari (whichever is currently selected).

DOWN ARROW

Decreases the value of either ratio or vari (whichever is currently selected).

PGM MODE

The PGM MONO, PGM STER, PGM SAP, and PGM DLBY
buttons collectively make up the PGM audio mode controls. Making a selection here modifies how the audio processor routes individual audio signals through the PGM audio processor. This is sometimes termed audio shuffling.

PST MODE

The PST MONO, PST STER, PST SAP, and PST DLBY buttons
collectively make up the PST audio mode controls. Making a selection here modifies how the audio processor routes individual audio signals through the PST audio processor. This is sometimes termed audio shuffling.

ADJ RATI

This button is used to modify the value of the RATIO function related to the AUDIO OVER operation. The function is used in conjunction with the Up/Down arrows and attenuates the level of the PST or PGM audio, while leaving the *audio over* source at unity.
The current value of ratio is placed on the top half the button when is it selected. The display is in db. Range is from 0 (unity) to -48 (PGM or PST audio off).

ADJ VARI

This button is used to modify the VARI-LEVEL setting of the PST/PGM audio. This function is used in conjunction with the Up/Down arrows and changes the level of the PST or PGM audio. The current vari-level setting is displayed in the top half of the button when the function is active. The display is in db. 0 is unity, +12 is max increase, -48 is the max decrease.

MAINT Menu

Purpose

To manage miscellaneous maintenance type operations in the master control system.

Operation

This screen would typically be accessed only to modify the video line standard the MC-40 is outputting. Do this by selecting the VID FRMT button which displays the VIDEO STANDARD SEL sub-screen.
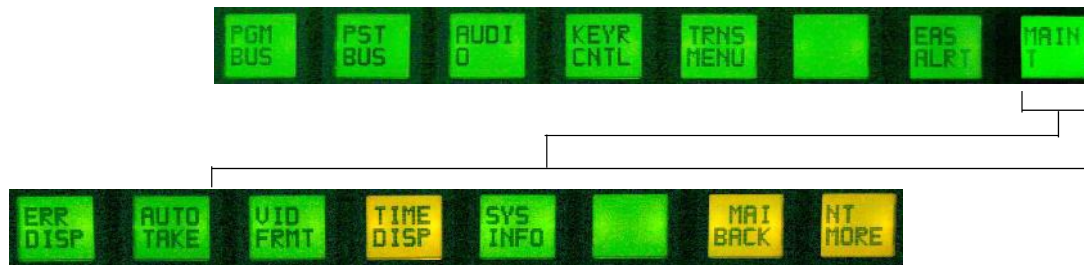

Figure 5-14.   Maintenance menu

Descriptions

ERR DISP

This button is not used at this time.

AUTO TAKE

This button when active causes the MC40 system to alternately preset and take sources located on soft keys 1 and 3 at approximately 2 second intervals.

NOTE: This button is primarily for system tests and should never be used during normal on-air operations.

VID FRMT

Displays a sub-screen allowing the user to modify the video line standard output by the master control.

MAINT Menu - Vid Format Sub-menu

Purpose

Manage the video line standard output of the master control.

Operation

The screen initially displays the current Video Line Standard being output by the MC-40. Selecting a different line standard causes the MC-40 to modify the output format, modify the router, and update the router control soft-keys with sources associated with the new video line standard.

Figure 5-15.   Video format sub-menu

Descriptions

1080HD
 This button selects the 1080i 60Hz video line standard.

1080HD50
 This button selects the 1080 HD50 video line standard.

720P
 This button selects the 720P video line standard.

525SD
 This button selects the SD 525 60Hz video line standard.

625SD50
 This button selects the PAL, 625 SD50 video line standard.
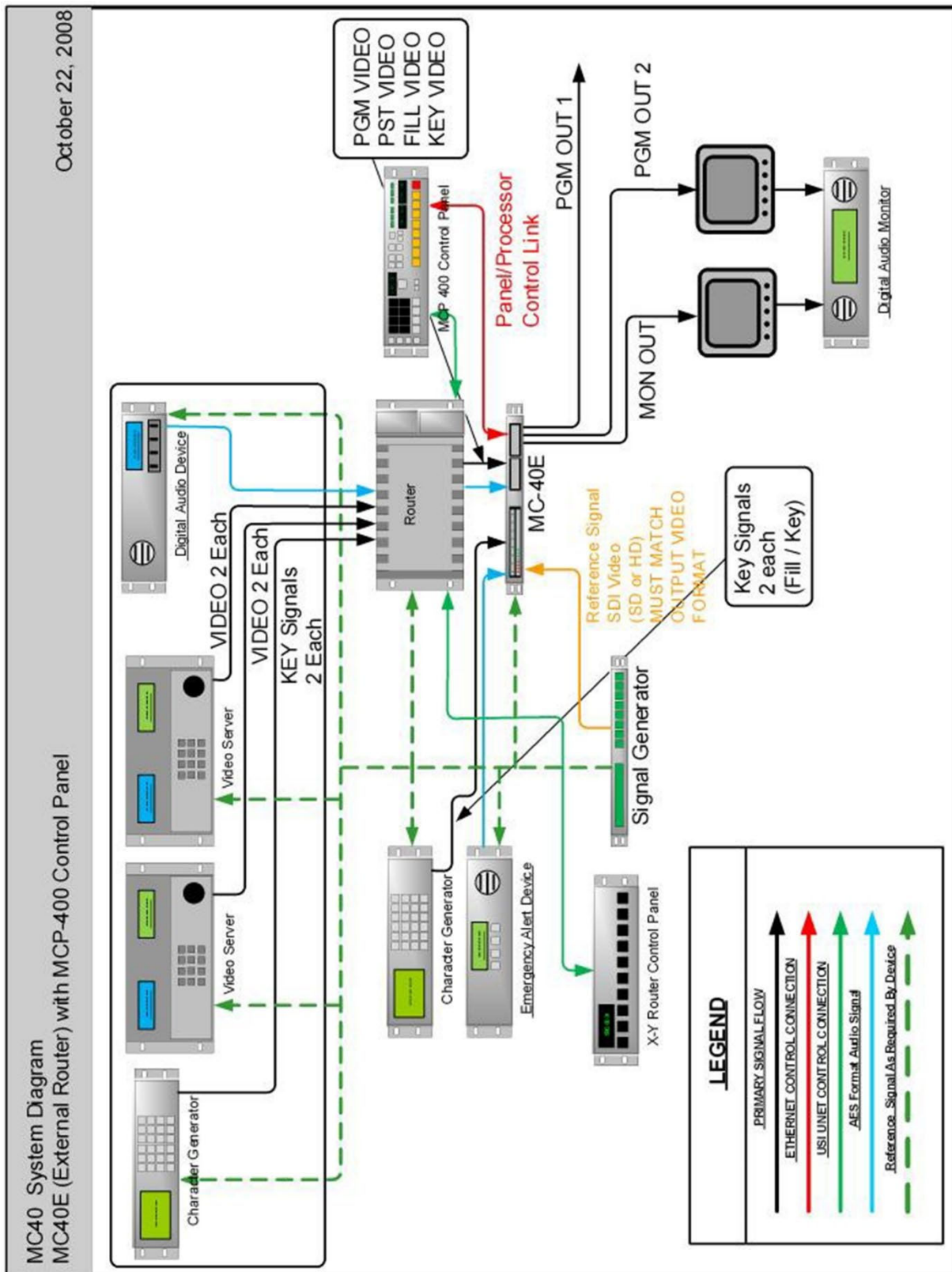
System Configurations

This appendix contains five operational configurations for the MC-40 System. Additionally, any combination of these systems can be used in multi-channel systems.
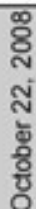
- MC40I with MCP-400 Control Panel.
- MC40I with MCI-400 Interface Panel.
- MC40E with MCP-40 Control Panel.
- MC40I with MCP-40 Control Panel.
- MC40E with MCP-400 Control Panel.
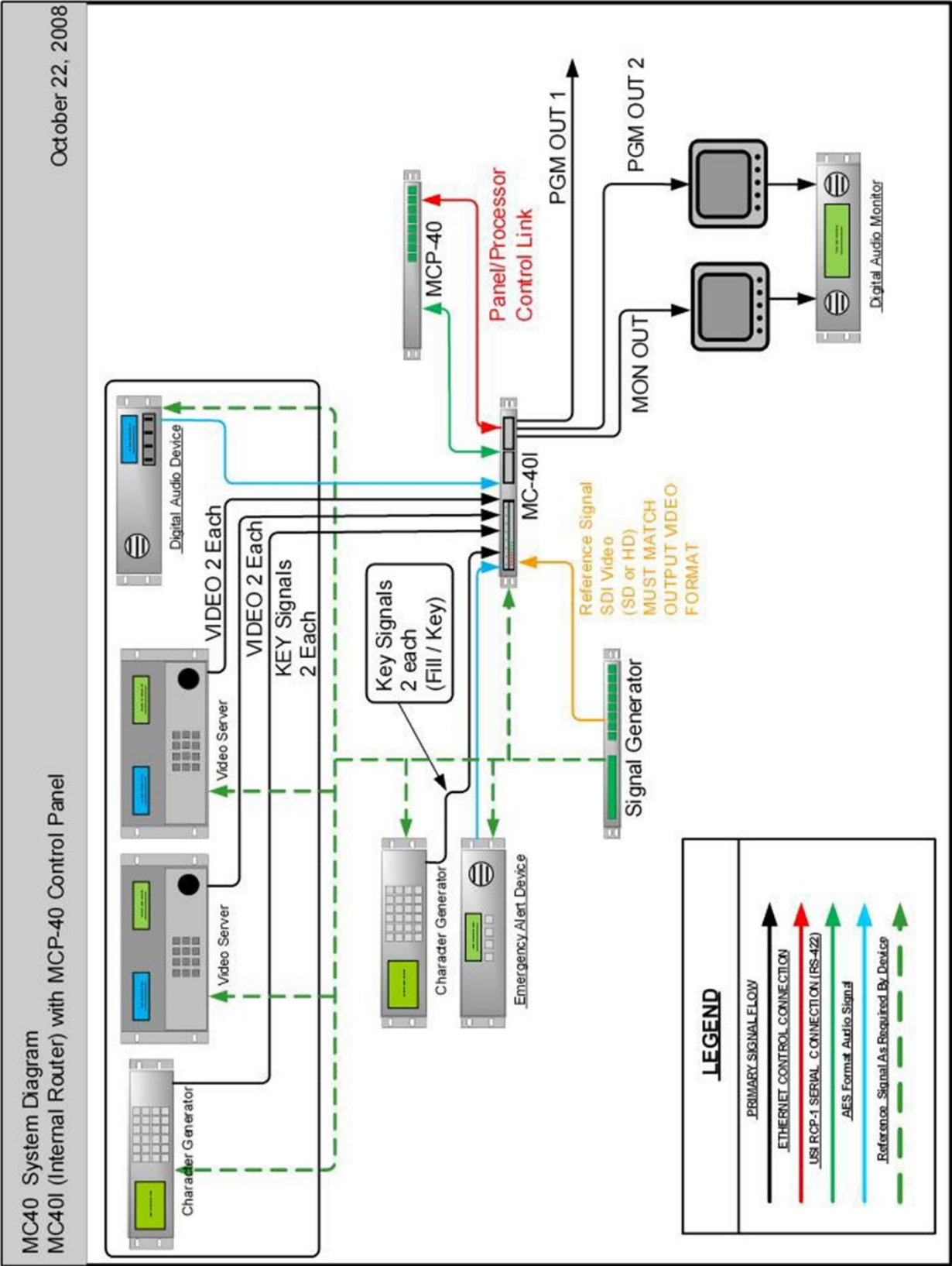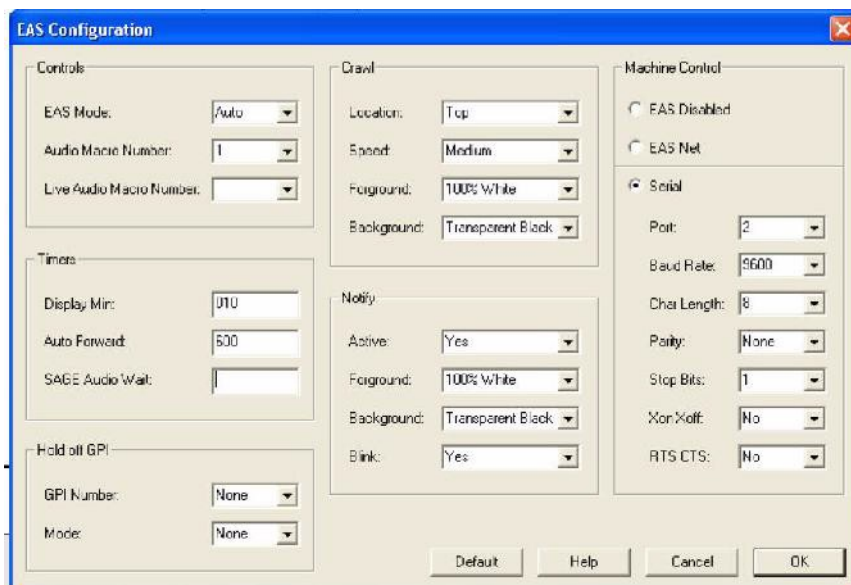- MC40E with MCI-400 Interface Panel.

MC40 System Diagram
MC40I (Internal Router) with MCP-400 Control Panel (MC40I-P)

October 22, 2008

MC40 System Diagram
MC40I (Internal Router) with MCP-400I Interface and MCP-2020 Control Panel

October 22, 2008

MC40 System Diagram
MC40E (External Router) with MCP-40 Control Panel

October 22, 2008

PGM VIDEO
PST VIDEO
FILL VIDEO
KEY VIDEO

MCP-40

Panel/Processor
Control Link

PGM OUT 1

PGM OUT 2

MON OUT

Digital Audio Monitor

Router

MC-40E

Digital Audio Device

VIDEO 2 Each

VIDEO 2 Each

KEY Signals
2 Each

Reference Signal
SDI Video
(SD or HD)
MUST MATCH
OUTPUT VIDEO
FORMAT

Key Signals
2 each
(Fill / Key)

Video Server

Video Server

Signal Generator

Character Generator

Emergency Alert Device

X-Y Router Control Panel

Character Generator

LEGEND

PRIMARY SIGNAL FLOW

ETHERNET CONTROL CONNECTION

US UNET CONTROL CONNECTION

AES Format Audio Signal

Reference Signal As Required By Device

Utah Scientific

MC40 System Diagram
MC40E (External Router) with MCP-400 Control Panel

October 22, 2008

US Utah Scientific

MC40 System Diagram
MC40E (External Router) with MCP-400I Interface Panel and MCP-2020 Control Panel

October 22, 2008

Utah Scientific

MC40 System Diagram
MC40I (Internal Router) with MCP-40 Control Panel

October 22, 2008

LEGEND

PRIMARY SIGNAL FLOW
ETHERNET CONTROL CONNECTION
USI RCP-1 SERIAL CONNECTION (RS-422)
AES Format Audio Signal
Reference Signal As Required By Device

Utah Scientific

MC-400/ MC-402 EAS Setup

Configuring System using MCConfig Application (for TFT, Sage and Dasdec TFT)

Click on 'EAS' in the top menu selection in MCConfig. Set all settings like these for TFT, Sage and Dasdec TFT.

EAS CONFIGURATION (set the following)

1. EAS MODE selects the mode for EAS operations. AUTO means we automatically forward an EAS Alert - MANUAL means we wait for operator command before we process- OFF means we ignore all inbound EAS commands/actions from the EAS device. Drop down menu and select mode.

2. Audio Macro Number selects the macro number for the audio to run when the EAS comes down. Default setting is 1. Drop down menu to choose correct one.

3. Live Audio Macro Number is used for National Alerts and unless your system runs this it is left at none.

4. DISPLAY MIN sets the minimum time an alert is displayed. Value is in seconds -Valid range is: 10 to 900. Usually a 10. Enter desired value in box.

5. AUTO FORWARD sets the max amount of time that will expire before the MC forces the EAS alert to be played. Valid range is: 10 to 900. Usually set to 600. Enter desired value in box.

6. SAGE AUDIO WAIT sets the max amount of time that will expire before the MC forces the EAS alert to be played. Valid range is: 5 to 900. Enter desired value in box. This is generally unused and defaults to none.

7. GPI NUMBER is set to the MISC RELAY FUNCTION Number encoded to control the relay attached to the HOLDOFF Function of the EAS device. Drop down menu and select relay number. This is generally unused and defaults to none.

8. GPI MODE Selects the type of HOLDOFF action used for the EAS device. The options are @, @NONE, @ACTIVE_CLOSED, @ACTIVE_OPEN. ACTIVE_OPEN means when we want to hold off the EAS device we OPEN a relay. ACTIVE_CLOSED means when we want to hold off the EAS device we CLOSE a relay. Drop down menu and select. This is generally unused and defaults to none.

SERIAL PORT SETUP (set the following – see figure above)

Select Serial button and then drop down and select each item for that port including the port number 1-4 on the MCP400 panel. Baud rate for TFT and SAGE is 9600 and is configurable for the Dasdec for desired setting. Default port is 2.

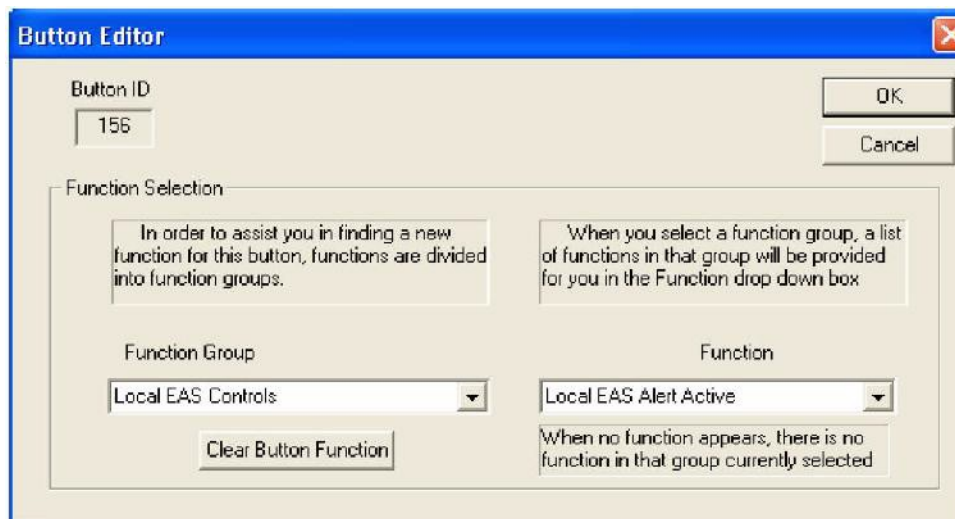## EAS CRAWL AND NOTIFY (set the following – see figure above)

NOTE: This is only used in Manual Mode setup.
Default settings for position, speed, foreground and background can be changed by dropping down menu items and selecting new entry.

The dropdown selection for 'Blink' allows the options of yes and no to be selected. This is whether or not you want the message that appears on the Preset monitor to blink continuously with the message "EAS ALERT COMING DOWN" or not.

In order to use this function you must set up a button in the MCP400 or MCP2020 control panel that can be pressed to run the crawl manually.

To have the EAS alert blink play manually from a button on the MCP-2020 do the following and drop down the selection arrows to assign:

Click on desired button where the manual EAS will be pressed. Then click on the Function Group and Function windows and select the items shown above.

1. Launch the MCPConfig application and click 'Communications' from the top menu item.

2. Click Select Target to Configure and choose the MCP2020.

3. Go to File and click 'Retrieve Configuration from Target'.

4. Click on the button you want to assign as manual EAS.

5. Pick Local EAS Controls from the function group.

6. Pick EAS Alert Active from the function selection.

7. Click OK. Then go to File and click 'Send Configuration to Target'.

To have the EAS play manually from a button on the MCP-400 do the following:

1. Perform the getencode.bat script file from c:\usi\xxxx-mcp40001 and open the xxxx-mcp40001.conf file.

2. Edit button 0116 line to be 0116,0046,0001, LOCAL EAS CONTROL and then save and close the file.

3. Perform the burnenc-network.bat script file to burn the config file back to the MCP-400.

MACRO SETUP for TFT and DASDEC Models
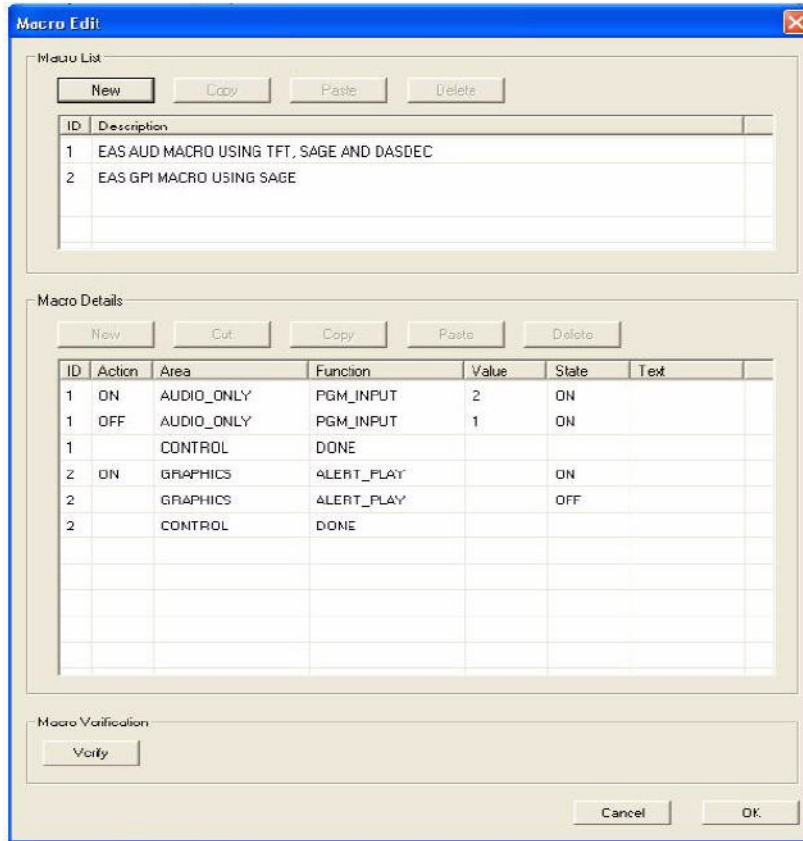
Click on 'MACRO' in the top menu selection in MCConfig and select Edit Macros. Set all settings like these for TFT and DASDEC applications.

1. Create new Macro for audio play out by clicking on the button at the top of the table called 'New'. Each time New is clicked it adds a new macro in the description and details tables.

2. Macro 1 needs to be as seen above for the EAS configuration example to work properly. This can be any macro number but must also be changed in the EAS configuration table to correspond to this number.

3. Put a description name of your choice in the top table

4. Click on the different windows in the bottom table and enter them as seen above.
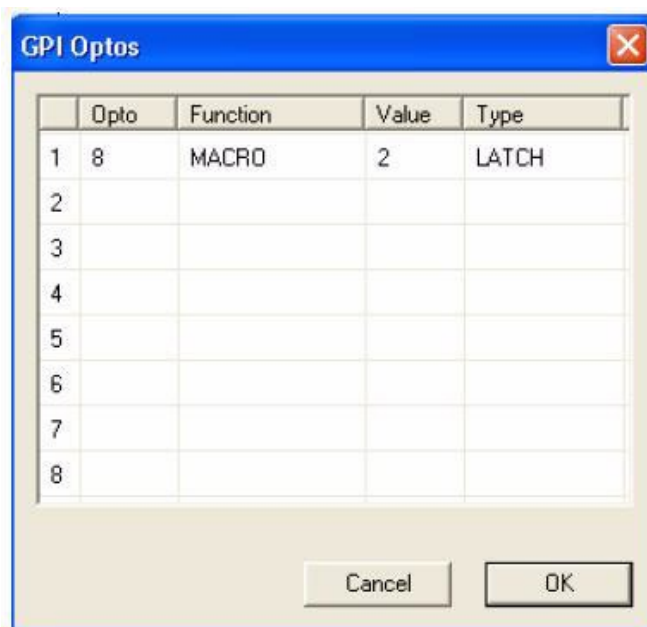
MACRO SETUP for Sage Models

Click on 'MACRO' in the top menu selection in MCConfig and select Edit Macros. Set all settings like these for Sage application.

1. Create new Macro for audio play out by clicking on the button at the top of the table called 'New'. Each time New is clicked it adds a new macro in the description and details tables.

2. Macro 1 needs to be as seen above for the EAS configuration example to work properly. This can be any macro number but must also be changed in the EAS configuration table to correspond to this number.

3. Put a description name for macro 1 of your choice in the top table

4. Click on the different windows in the bottom table and enter them as seen above.

5. Create new macro for Sage to play out properly. This is triggered by a GPI which is described in the next section.

6. Put a description name for macro 2 of your choice in the top table

7. Macro 2 needs to be as seen above for the EAS configuration example to work properly. This can be any macro number but must also be changed in the GPI configuration table to correspond to this number.

GPI (Sage setup only)

	Opto	Function	Value	Type
1	8	MACRO	2	LATCH
2				
3				
4				
5				
6				
7				
8				

Click on 'Relay/Opto' in the top menu selection in MCConfig and select GPI Optos. Set all settings like these for Sage application.

1. Select GPI Optos from the Relay/Opto menu item.
2. Choose input Opto 1-8 from dropdown menu. Default is 8.
3. Choose Macro function from dropdown as seen above.
4. Enter Macro number for value – default 2 but can be any macro but must make sure the number corresponds to the macro table.
5. Select Latch in the Type dropdown menu.

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AES INPUT PORT (for TFT, Sage and Dasdec TFT)

Edit Audio Only Sources

	Name	Input Group	L1	L2	L3
1	AESRTR	EXT1	2	3	
2	AESBNC	EXT1	0	1	
3		PGM			
4		PGM			

Click on 'Audio' in the top menu selection in MCConfig and select Edit Audio Only Sources. Set all settings like these.

1. From the Audio Only sources make sure the name for AESRTR is set for level numbers 2 and 3 and that AESBNC is set for numbers 0 and 1.

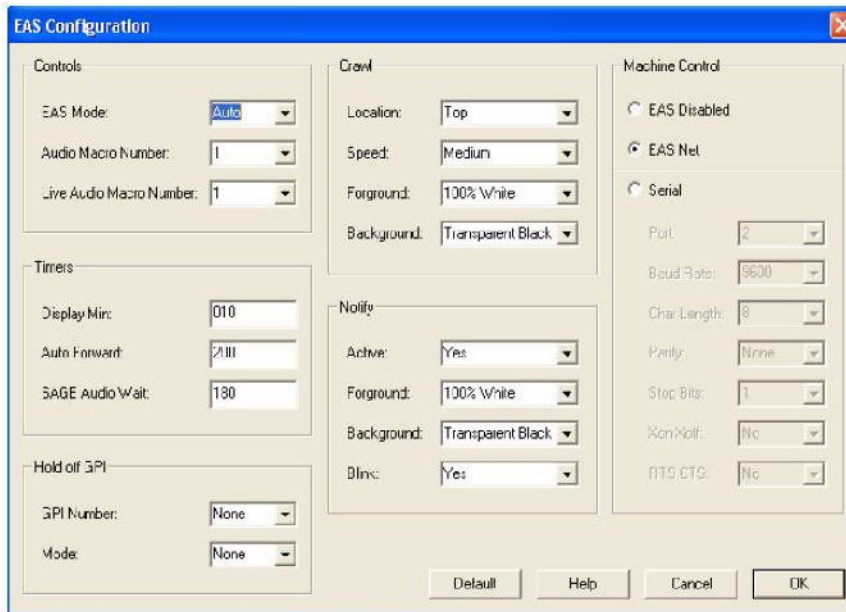2. Choose the input group connector EXT 1 for both.

AES AUDIO ONLY BUTTONS (for TFT, Sage and Dasdec TFT)

Click on 'Buttons' in the top menu selection in MCConfig and select Edit Button Assignments. Set all settings like these.

1. Make sure that the AESBNC is on button 2 and if not then click in the Name window and drop down the menu item and select it from the list. AESRTR should be on button 3.

2. Leave assignments Soft.

Configuring DASDEC for EAS Net using MCConfig Application (Currently only DASDEC uses this and only MC400 models)

Click on 'EAS' in the top menu selection in MCConfig. Set all settings like these for EAS Net.

EAS CONFIGURATION (set the following)

1. EAS MODE selects the mode for EAS operations. AUTO means we automatically forward an EAS Alert - MANUAL means we wait for operator command before we process- OFF means we ignore all inbound EAS commands/actions from the EAS device. Drop down menu and select mode.

2. Audio Macro Number selects the macro number for the audio to run when the EAS comes down. Default setting is 1. Drop down menu to choose correct one.

3. Live Audio Macro Number is used for National Alerts and unless your system runs this it is left at none.

4. DISPLAY MIN sets the minimum time an alert is displayed. Value is in seconds -Valid range is: 10 to 900. Usually a 10. Enter desired value in box.

5. AUTO FORWARD sets the max amount of time that will expire before the MC forces the EAS alert to be played. Valid range is: 10 to 900. Usually set to 600. Enter desired value in box.

6. SAGE AUDIO WAIT sets the max amount of time that will expire before the MC forces the EAS alert to be played. Valid range is: 5 to 900. Enter desired value in box. This is generally unused and defaults to none.

7. GPI NUMBER is set to the MISC RELAY FUNCTION Number encoded to control the relay attached to the HOLDOFF Function of the EAS device. Drop down menu and select relay number. This is generally unused and defaults to none.

8. GPI MODE Selects the type of HOLDOFF action used for the EAS device. The options are @, @NONE, @ACTIVE_CLOSED, @ACTIVE_OPEN. ACTIVE_OPEN means when we want to hold off the EAS device we OPEN a relay. ACTIVE_CLOSED means when we want to hold off the EAS device we CLOSE a relay. Drop down menu and select. This is generally unused and defaults to none.

9. Select EAS NET button. This will disable the serial port and set it up for network use.

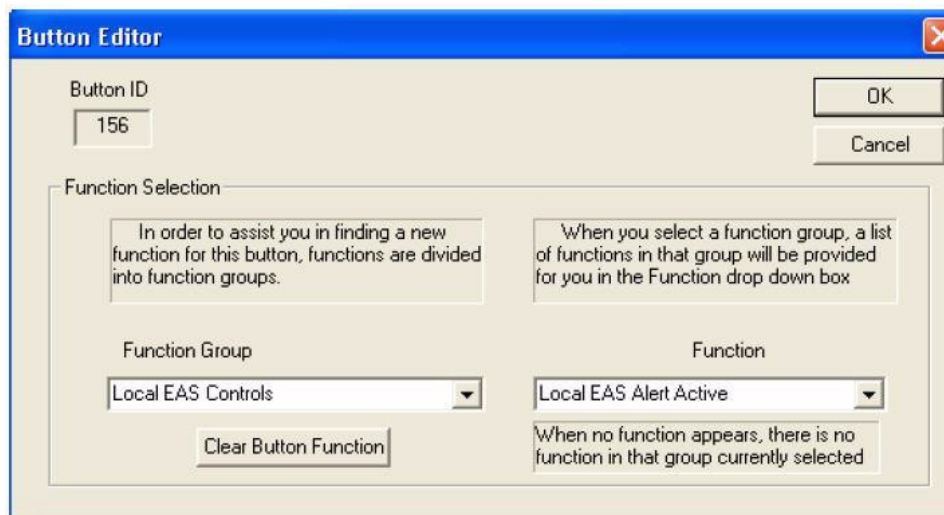## EAS CRAWL AND NOTIFY (set the following – see figure above)

NOTE: This is only used in Manual Mode setup.

Default settings for position, speed, foreground and background can be changed by dropping down menu items and selecting new entry.

The dropdown selection for 'Blink' allows the options of yes and no to be selected. This is whether or not you want the message that appears on the Preset monitor to blink continuously with the message "EAS ALERT COMING DOWN" or not.

In order to use this function you must set up a button in the MCP400 or MCP2020 control panel that can be pressed to run the crawl manually.

To have the EAS alert blink play manually from a button on the MCP-2020 do the following and drop down the selection arrows to assign:

Click on desired button where the manual EAS will be pressed. Then click on the Function Group and Function windows and select the items shown above.

1. Launch the MCPConfig application and click 'Communications' from the top menu item.

2. Click Select Target to Configure and choose the MCP2020.

3. Go to File and click 'Retrieve Configuration from Target'.

4. Click on the button you want to assign as manual EAS.

5. Pick Local EAS Controls from the function group.

6. Pick EAS Alert Active from the function selection.

7. Click OK. Then go to File and click 'Send Configuration to Target'.

To have the EAS play manually from a button on the MCP-400 do the fol- lowing:

1. Perform the getencode.bat script file from c:\usi\xxxx-mcp40001 and open the xxxx-mcp40001.conf file.

2. Edit button 0116 line to be 0116,0046,0001, LOCAL EAS CONTROL and then save and close the file.

3. Perform the burnenc-network.bat script file to burn the config file back to the MCP-400.

MACRO SETUP for DASDEC EAS Net

Click on 'MACRO' in the top menu selection in MCConfig and select Edit Macros. Set all settings like these for EAS Net applications.

1. Create new Macro for audio play out by clicking on the button at the top of the table called 'New'. Each time New is clicked it adds a new macro in the description and details tables.

2. Macro 1 needs to be as seen above for the EAS configuration example to work properly. This can be any macro number but must also be changed in the EAS configuration table to correspond to this number.

3. Put a description name of your choice in the top table

4. Click on the different windows in the bottom table and enter them as seen above.

AES INPUT PORT for Dasdec - (setup in Audio source and btns)

	Name	Input Group	L1	L2	L3
1	AESRTR	EXT1	2	3	
2	AESBNC	EXT1	0	1	
3	_MP_ 3	PVWE	0	1	
4		PGM			

Click on 'Audio' in the top menu selection in MCConfig and select Edit Audio Only Sources. Set all settings like these.

1. From the Audio Only sources make sure the name _MP_ 3 is set with numbers 0 and 1 in the L1 and L2 columns.

2. Choose the input group connector PVWE.

Audio Only

	Name	Assignment
2	AESBNC	Soft
3	AESRTR	Soft
4	_MP_ 3	Soft

AES AUDIO ONLY BUTTONS (for TFT, Sage and Dasdec TFT)

Click on 'Buttons' in the top menu selection in MCConfig and select Edit Button Assignments. Set all settings like these.

1. Make sure that the _MP_ 3 is on button 2 and if not then click in the Name window and drop down the menu item and select it from list.
2. Leave assignment Soft.

MANUAL CONFIGURATION

Follow the steps for MANUAL SETUP using raw config file.

1. Follow page 2-12 in the System Installation Guide for retrieving config file from the MC400 encode folder.

2. Open the Config File xxxx.conf from step 3 and locate the section titled [macro_definitions_start]

3. If interfacing to TFT, use the example files below for the TFT macro settings. Note: The default for the audio to play out is macro 1. The button for the audio to run is on button 3.

4. Overwrite the macro section in step 4 with the macro from step 5 for use with a TFT.

5. If interacting to a SAGE use the example file below for the SAGE macro and GPI settings. (GPI can be 1-8 -see SAGE setup below). Note: The default for the audio to play out is macro 1. The button for the audio to run is on button 3.

6. Overwrite the macro and GPI section in step 4 with the macro and GPI settings from step 7 for use with a SAGE.

7. For both TFT and SAGE, enter the Macro number for the EAS_Auto_Action in Misc Parameters section. This section is at the top of the config file from step 4 above. The number to use is whatever the Macro is from steps 5 or 7 above. The default number is 01. See example below titled "Sample EAS Auto Action". Use the Macro number in the macro_definition_start.

8. For TFT use the Manual or Auto mode for the Operation Mode in the Misc Parameters Section. For SAGE use Manual mode only for the Operation Mode in the Misc Parameters section.

9. You will also need to set the serial port settings in the MC400 config file to match the TFT or SAGE serial settings. Locate the [Machine_Control_Serial_Port_Definition_Start] section in the config file and use the sample below to make the changes to the config file from step 4.

10. Save & close the config file from step 4 and then run the burn-network.bat file to send changes to both the MC400 and MCP400 devices. CAUTION: This will cause a reset to the MC400 system. Loss of video and audio will occur for up to ten seconds. Proper bypass prior to this step is recommended.

11. Refer to TFT Manual for how to set up TFT. A short "how to" is provided below.

12. Refer to Sage Manual for how to set up SAGE. A short "how to" is provided below.

TO ENABLE MANUAL ALERT and trigger from MCP-400 PANEL

To have the EAS alert blink a button on the MCP-400 and to Manual Trig- ger the alert do the following:

1. Perform the getencode.bat script file from c:\usi\xxxx-mcp40001 and open the xxxx-mcp40001.conf file.

2. Edit button 0116 line to be 0116,0046,0001, LOCAL EAS CONTROL and then save and close the file.

3. Perform the burnenc-network.bat script file to burn the config file back to the MCP-400.

TFT EAS SETUP FOR MC400/MC402

1. There is only one serial port that can be used on the TFT unit. It needs to be set to 9600, 8 N 1. (see TFT manual for this info or how to set port to these setting if they are not defaults)

2. Run a cross over RS232 cable (pins 2-3, 3-2, 5-5) from the port in step one to serial port 1 on the rear of the MCP400 or MCP400i unit.

3. In the TFT menu you will need to set the CG type to TFT Standard.

SAGE EAS SETUP FOR MC400/MC402

1. Choose one of the Sage serial ports that defaults to 9600, 8 N 1. (see SAGE manual for this info or how to set port to these setting if they are not defaults)

2. Run a cross over RS232 cable (pins 2-3, 3-2, 5-5) from the port in step one to serial port 1 on the rear of the MCP400 or MCP400i unit.

3. Locate the Relays/Optos connector on the rear of the MCP400 or MCP400i and refer to the MC40/400 for proper pin numbers to be used. The Optos are 1 - 8 on the rear of the panel. The default below is set to use GPI 8.

4. Run one wire from one side of the GPO on the SAGE connector to one side of the desired GPI in step 3 on the rear of the MCP400.

5. You will need to attach a 5v – 12v supply source between the other side of the GPO on the SAGE and to the other side of the GPI in step 3 on the MCP400.

6. In the SAGE menu you will need to locate the serial ports and make sure step 1 above is correct.

7. In the SAGE menu you will need to locate the CG type and make it Generic CG.

8. In the SAGE menu you will need to locate the GPO you are using and set it to PTT.

Wiring diagram from Utah Masters to Sage
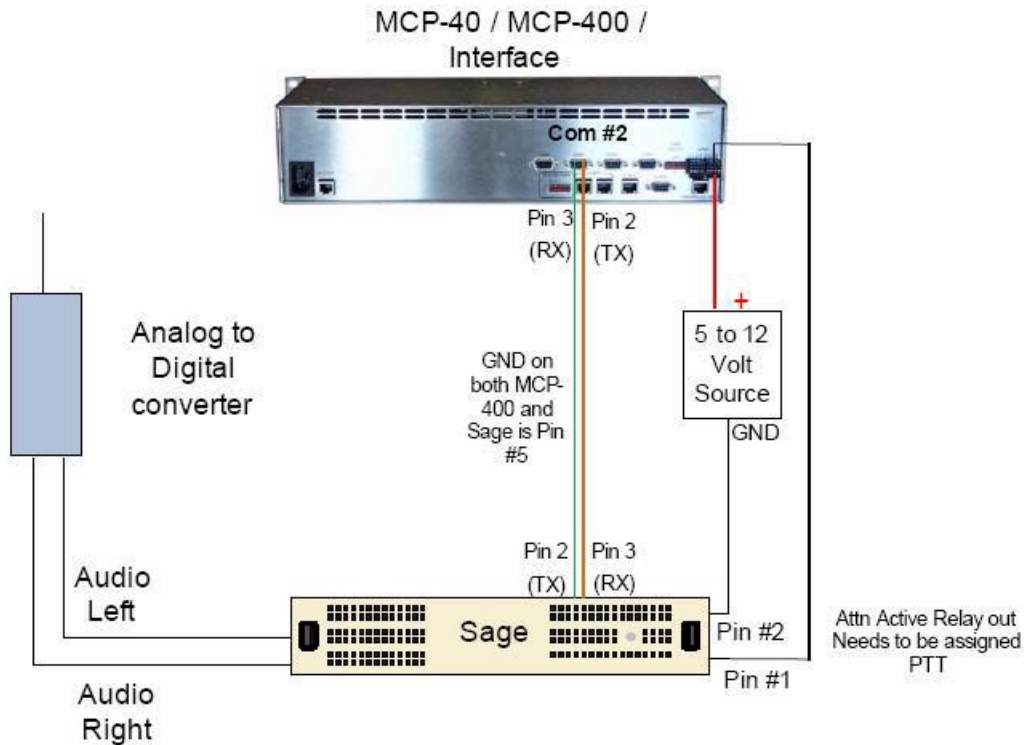
CONFIG SECTION REQUIREMENTS SUMMARY

1. The TFT interface in the MC config file requires 4 sections to be set.

    a. EAS Auto Action in section [MISC_START]

    b. Serial Port configuration in section
       [MACHINE_CONTROL_SERIAL_PORT_DEFINITIONS_START]

    c. EAS Audio Macro in section [MACRO_DEFINTIONS_START]

    d. EAS Display Options in section
       [EAS_DISPLAY_CONFIG_DEFINITIONS_START]

2. The SAGE interface in the MC config requires 6 sections to be set

    a. EAS Auto Action in section [MISC_START] (Must be Manual mode)

    b. Serial Port configuration in section [MACHINE_CONTROL_SERIAL_PORT_DEFINITIONS_ START]

    c. EAS Audio Macro in section [MACRO_DEFINTIONS_START]

    d. EAS Display Options in section [EAS_DISPLAY_CONFIG_DEFINITIONS_START]

    e. EAS Macro for SAGE GPI

    f. GPI for inbound connection from SAGE GPO programmed as PTT relay.

Sample TFT Macro

```
[MACRO_DEFINTIONS
_START] #
# This section defines the macros the system can
perform. # See macro-definitions.txt in the
software release
# directory for detailed instructions on using macros
#
#NUMBER 1-??
# ,ACTION ON/OFF
#  ,
NUMBER          1-10 # ,  ,AREA
#  ,  ,         ,FCN
#  ,  ,        ,         ,VALUE
#  ,  ,       ,        ,      ,STATE
#  ,  ,      ,       ,     , ,TEXT8
#4  ,4 ,  12   , 12    , 12   ,4    8
#---,----,-----------,-----------,-----------,----,-------
1 ,DESC,EAS AUD MACRO USING TFT
1  ,ON  ,AUDIO_ONLY ,PGM_INPUT  ,2       ,ON ,
1  ,OFF ,AUDIO_ONLY ,PGM_INPUT  ,1       ,ON ,

1 ,  ,CONTROL   ,DONE      ,       , ,
```

Sample SAGE Macro and GPI Section Config

```
[MACRO_DEFINTIONS
_START] #
# This section defines the macros the system can
perform. # See macro-definitions.txt in the
software release
# directory for detailed instructions on using macros
#
#NUMBER 1-??
# ,ACTION ON/OFF
#  ,
NUMBER          1-10 # ,  ,AREA
#  ,   ,          ,FCN
#  ,   ,          ,        ,VALUE
#  ,   ,          ,        ,        ,STATE
#  ,   ,          ,        ,        ,  ,TEXT8
#4 , 4 , 12      , 12      , 12      , 4     8
#---,----,-----------,-----------,-----------,----,-------
1 ,DESC,EAS AUD MACRO
1  ,ON  ,AUDIO_ONLY ,PGM_INPUT  ,2        ,ON  ,
1  ,OFF ,AUDIO_ONLY ,PGM_INPUT  ,1        ,ON  ,
1  ,    ,CONTROL        ,DONE  ,          , ,
2  ,DESC,EAS GPI MACRO USING SAGE
2  ,ON  ,GRAPHICS   ,ALERT_PLAY ,         ,ON  ,
2  ,OFF ,GRAPHICS   ,ALERT_PLAY ,         ,OFF ,
2  ,    ,CONTROL    ,DONE       ,         , ,
[GPI_DEFINITIONS_ST
ART] #NUMBER 1-32
# ,AREA
#  ,        ,FCN
#  ,        ,        ,VALUE

#  ,        ,        ,
#  ,        ,        ,        ,TYPE
(LATCH/PULSE) #4 , 12        , 12
            , 12 , 8
#......,..............,...........,.................,.........
8  ,PANEL_MISC ,MACRO      ,2         ,LATCH
```

Sample EAS Auto Action and Operation Mode

[MISC_START]

#Example

EAS_AUTOMATIC_ACTI

ON: @01 #AUDIO_CHANNELS:@000F

AUDIO_DIM_ADJUST:@-15

VIDEO_MIX_POSITION:@08

KEY_LEVEL_RESET_MASK:@0f

KEY_LEVEL_XFER_MASK:@00

TRANS_SPEED_FAST:@30

TRANS_SPEED_MEDIUM:@60

TRANS_SPEED_SLOW:@120

SYSLOG_SERVER_ID:@

AUX_OUT_XPOINT_SEL:@PVW

EAS_AUTOMATIC_ACTION:@01 (ENTER THE NUMBER FOR THE MACRO)

CLEANSWITCH_ENABLED:@NO

INDIVIDUAL_RATIOS:@NO

MC400_LINE_STANDARD:@SD_525

EAS_OPERATION_MODE:@MANUAL(SAGE must be MANUAL,TFT AUTO or MAN- UAL)

EAS_DISPLAY_TIME_MIN:@015

EAS_FORWARD_TIMEOUT:@600

Sample Serial Port Setup for MC400 Interface to TFT or Sage

```
[MACHINE_CONTROL_SERIAL_PORT_DEFINITIONS
_START] #
# Example config a machine using port 3
# SQZMAX 1,PORT_02 ,38400   ,8     ,NONE   ,1     ,DISABLE ,DISABLE
# The system device name is not used pragmatically. Just as a
reference when # looking at this file
#
# SYSTEM DEVICE NAME (Don't Care at this time 5/22/2004)

#  |  , SERIAL COMMUNICATIONS PORT NUMBER
#  |     | ,BAUD RATE
#  |     |    | ,BITS PER CHARACTER
#  |     |    |     | , PARITY TYPE (ODD, EVEN, NONE)
#  |     |    |     |    | ,STOP BITS PER CHARACTER
#  |     |    |     |    |          ,XONN/OFF FLOW CONTROL (ENABLE/DIS-
ABLE)
#  |     |    |     |    |                  ,RTS/CTS FLOW CONTROL
(ENABLE/DIS- ABLE/RS485???)
#-------,-------,-------,-------,-------,-------,-------,-------
EAS_STD ,PORT_01 ,9600   ,8     ,NONE   ,1     ,DISABLE ,DISABLE
```

Sample EAS Display Configuration for TFT

```
[EAS_DISPLAY_CONFIG_DEFINITIONS
_START] #
# COLORS.  3 sets of colors are
available. #      1 normal color
bars values @ 75% #     2
normal color bars values @ 100%
#       3 custom colors set by
USI
#
# BLACK, WHITE, YELLOW, CYAN, GREEN, MAGENTA, RED, BLUE

# BLACK_100, WHITE_100, YELLOW_100, CYAN_100, GREEN_100,
MAGENTA_100,
# RED_100, BLUE_100
# TIMEKEY_FG, TIMEKEY_BG, NONE, more to come
```

```
#
#       ### EAS_CRAWL ###
#
# This line sets the display mode for the crawl
messages # that appear on the PGM output of
the MC2020.
#
# EAS_CRAWL ,YES ,1 ,2 ,1 ,WHITE_100 ,TIMEKEY_BG ,NO
#
#       ### EAS_NOTIFY ###
#
# This line sets the display mode for the text
messages # that appear on the MON output of
the MC-2020
#
# EAS_NOTIFY,YES ,1  ,2  ,1   ,WHITE_100
,TIMEKEY_BG  ,YES #
#
#Item (EAS_CRAWL, EAS_NOTIFY)
#       ,Active (YES/NO)
#       , ,Display Line (1 or 8 <1 is top, 8 is bottom>)
#       ,   ,Column (1-40)      <<SPEED 4
CRAWL 1,2,3>> #                , , ,Length (1-40)
#       , , , ,  ,FORGROUND COLOR (See
above)  #                , , , , ,
       ,BACKGROUND COLOR... #        ,
, , , ,                 ,       ,BLINK
(YES/NO)
#  10   , 4  , 4  , 4  , 4 ,  12     ,
12                              , 4
#--------,----,----,----,----,-----------,----
--------,----
EAS_CRAWL ,YES ,1  ,2  ,1  ,WHITE_100  ,TIMEKEY_BG ,NO
EAS_NOTIFY,YES ,1  ,2  ,1  ,WHITE_100  ,TIMEKEY_BG ,YES
```

Sample EAS Display Configuration for Sage

```
[EAS_DISPLAY_CONFIG_DEFINITIONS
_START] #
# COLORS.  3 sets of colors are
available. #       1 normal color
bars values @ 75% #       2
normal color bars values @ 100%
#           3 custom colors set by
USI
#
# BLACK, WHITE, YELLOW, CYAN, GREEN, MAGENTA, RED, BLUE
# BLACK_100, WHITE_100, YELLOW_100, CYAN_100, GREEN_100,
MAGENTA_100,
# RED_100, BLUE_100
# TIMEKEY_FG, TIMEKEY_BG, NONE, more to come
#
#         ### EAS_CRAWL  ###
#
# This line sets the display mode for the crawl
messages # that appear on the PGM output of
the MC2020.
#
# When the background is set to SAGE_AUTO_BG, the
background # color of the crawl will be either GREEN,
YELLOW, or RED based # on the type of alert the SAGE
has received.
#
# EAS_CRAWL ,YES ,1 ,2 ,1 ,WHITE_100 ,SAGE_AUTO_BG,NO
#
# This line uses a single color for the background
which can # be used as an alternative to the multi-
color background
# if desired by the user.
#
# EAS_CRAWL ,YES ,1 ,2 ,1 ,WHITE_100 ,TIMEKEY_BG ,NO

#
# NOTE: Only one EAS_CRAWL Line can be active at a time.
#
```

```
#       ### EAS_NOTIFY  ###
#
# This line sets the display mode for the text
messages # that appear on the MON output of
the MC-2020
#
# EAS_NOTIFY,YES ,1 ,2 ,1 ,WHITE_100 ,TIMEKEY_BG ,YES
#
#Item (EAS_CRAWL, EAS_NOTIFY)
#       ,Active (YES/NO)
#       , ,Display Line (1 or 8 <1 is top, 8 is bottom>)
#       ,   ,Column (1-40)      <<SPEED 4
CRAWL 1,2,3>> #               , , ,Length (1-40)
#       , ,  ,  ,FORGROUND COLOR (See
above)   #                 ,   ,   ,   ,
       ,BACKGROUND COLOR... #         ,
,   ,   ,   ,                 ,         ,BLINK
(YES/NO)
#  10    , 4  , 4  , 4  , 4  ,  12      ,
12                          , 4
#--------,----,----,----,----,-----------,----
--------,----
EAS_CRAWL ,YES ,1 ,2 ,1 ,WHITE_100 ,SAGE_AUTO_BG,NO
EAS_NOTIFY,YES ,1 ,2 ,1 ,WHITE_100 ,TIMEKEY_BG ,YES
```

MC-400/402/40 Configuration and Programming

For a complete video demonstration related to setting up and configuring the MC-400 system, please go to **www.utahscientific.com**, click 'Resources' drop down menu, then click 'Training Videos' to access the library of online video instruction.

The MC-400 Programming video training material includes:

- Video 1 = Introduction to System CD, Manuals, Quick Start and MC400 attributes.

- Video 2 = Encoding retrieval procedure

- Video 3 = Setting miscellaneous parameters

- Video 4 = Logical to physical table functionality and set up.

- Video 5 = Configuring source and attribute tables.

- Video 6 = Setting video formats, outputs, reference input and buttons

- Video 7 = Setting serial port parameters for automation

- Video 8 = Setting tallies and gpi's

- Video 9 = Emergency Alert System set up

- Video 10 = Changing IP addresses and chassis ID configuration

- Video 11 = Retrieving and sending config files to the MC-400 and MCP-400

- Video 12 = Connection MC-400 channel to MCP-400 Part 1

- Video 13 = Connection MC-400 channel to MCP-400 Part 2

MC-Series Logo Generation Utility with Program Installation

This Appendix covers the program installation for the MC-Series Logo Generation utility. This process presumes the general system installation (described earlier in this guide) has taken place. Logo Generation will allow you to import previously created .PNG files and convert them to the file format used by the UTSCI operating system.

NOTE: Though the MC-2020 is referenced in this appendix, the functionality is the same for MC-40/400/402 operation.

## Installation of the Microsoft™ .net Framework

Locate the release-logogen directory, then open the net-1.1 directory and double-click the dotnetfx.exe application.
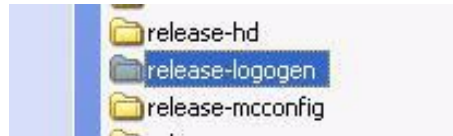
Depending on your equipment, this installation could take several minutes to complete. (Newer systems will allow the install to complete quickly.)

 Next, launch the NDP1.1sp1-KB867460-x86.exe application by double-clicking the icon (same directory as above). This process is the Service Pack 1 installation, and will ask you to confirm and accept before continuing.[1]
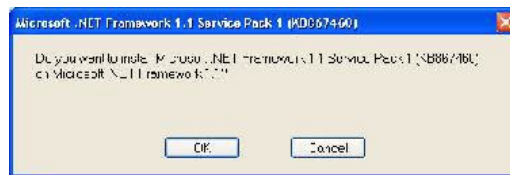

When the installation is complete, the following dialog will appear.

In a few isolated instances, some systems have reported the installation as "Already Complete". This has not affected the proper installation however.

Installing the 2020 Logo Conversion Application

Create a new sub-directory within your USI directory called 'logogen', then copy the MC2020LogoGen.exe application, along with all other files in the original folder, to this location.
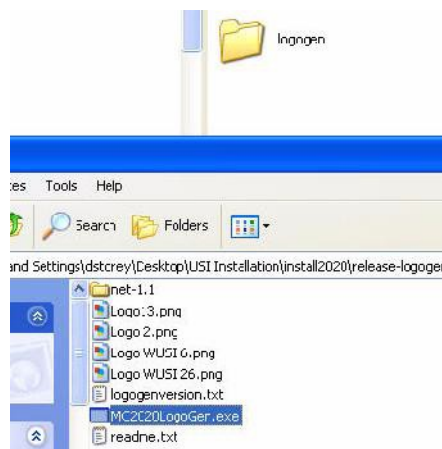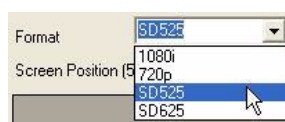

Once you have done this, make a short cut for this program to your desktop.
Now copy any .PNG files you have created to the new logogen directory.
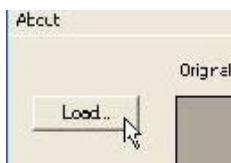
Creating a USI Format Logo File

Launch the MC-2020 LogoGen utility.

Select the Video format using the format pick list. The default is SD525.
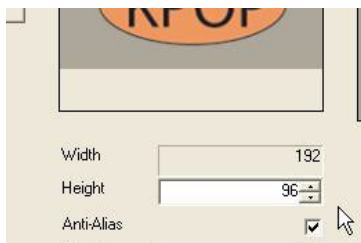

Click the **Load** button.

Now select the image you would like to read in.

NOTE: This must be in the .PNG format.

Use the height control to reduce the size of the logo (if desired). The width value will adjust automatically to keep the aspect ratio correct.

You must click the **Apply** button to see the resulting modification.

Use the vertical and horizontal adjustments to set the default location of the logo. *Note that in this case, you will not see immediate, on-the-fly changes.*
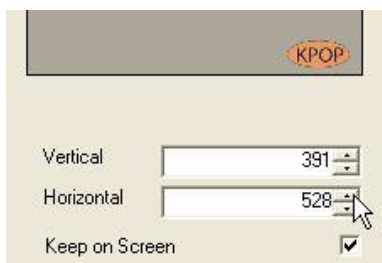
NOTE: This location is used by the MC-400/MC-402 when it loads the logo into the MC-400/MC-402 Keyer. If necessary, the location can be further modified using the controls on either the MCP-2020 or MCP-400 control panel.
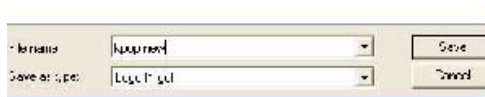
Unless instructed otherwise, it is best to leave the 'Anti-Alias', 'Algorithm', and 'Keep on Screen' controls in their default setting.
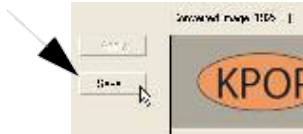
Click the **Save** button.

Provide a filename for the save. The extension will default to .lgo.

NOTE: Do not change the extension name.

This completes the conversion process.

What is 'Background On' ?

If the logo you are converting is semi-transparent or contains transparent edges, **Background On** (when checked) will allow you to see the effects of the transparency on a patterned background.

Creating PNG Files Prior to Conversion

Logogen can only convert files that have been built as png formats. The Logo- gen application converts the png file into an lgo format. Logogen will only resize the Logo to a maximum of 128x192 pixel size. The png file should be built as close to this size and saved as a png file prior to bringing it into the Logogen converter.

TIP: when creating the graphic for the desired Logo you should make the graphic as close to the 128x192 size as possible. You should not create a full transparent size and then add the graphic to the size you want it to be seen. If you do this then the Logogen will resize the entire file (full screen with trans- parent and graphic) to 128x192 which will make the graphic very small.

Converting PNG Files Using LogoGen

1. Launch the Logogen application from the Logogen folder found in the c:\usi folder or the shortcut you have created pointing to it by double clicking the following executable.

2. Click the Load button and search for the png file that you would like to bring in and convert.
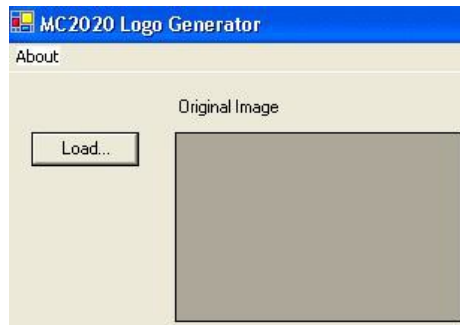
3. Drop down the format type and choose the video format that this logo will be used with.

4. The top display is how the file looks in its original raw form.
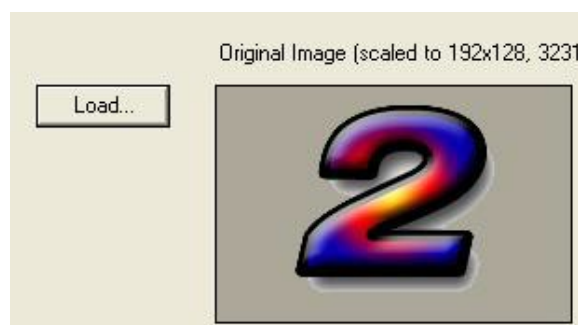
Top Left Display

5. The bottom left display is what it will look like if size changes are made below that window and applied. It will show the new numbers above the display.
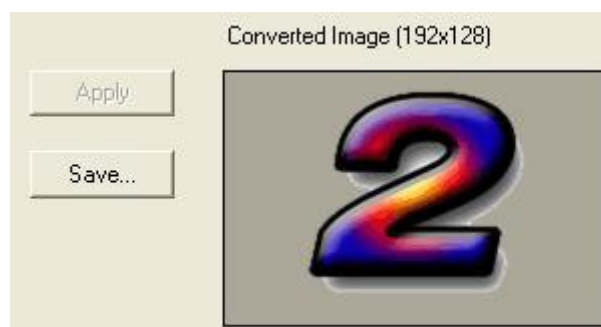
Bottom Left Display

6. The lower right display is how the logo will appear on the output of the MC when it is converted. Although the logo can be positioned and saved from the MC panel you can adjust the position of the logo in the logogen application to a permanent spot. Click on the Vertical and Horizontal arrows to move the Logo around. Leave a check mark in the Keep on Screen button to keep the logo from moving out of view.
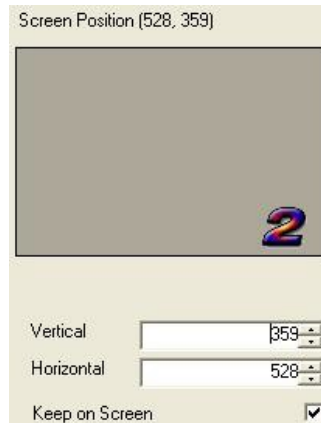
Bottom Right Display

7. To change the size of the logo use the arrows in the height window and remember that you can only go as large as 128. NOTE: if the file was made smaller than the 128 height then it will not be able to go any larger than its original creation. Click apply when you are satisfied w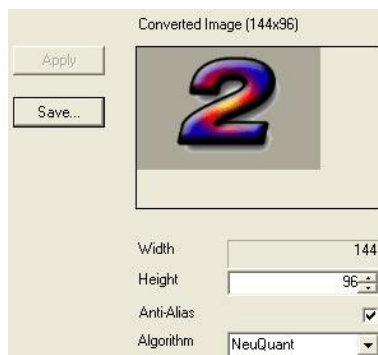ith the size. Leave the Anti Alias button checked as this will keep crisper edges. Notice how it makes the image smaller in the display and it will also make the output display change as you watch it.


Converted Image

8. When you are satisfied then click on the Save button and then navigate to the c:\usi\folder and find the folder for the MC channel you are going to send the file to and then open the folder called logos. An example of this would be c:\usi\kusi-hd01\logos for an MC2020 or c:\usi\test-mc40001\logos for and MC400.

![US Utah Scientific logo]

9. Save the file with whatever name you will remember it to be, along with the number of the Logo that you would like it to be used for. And give it the extension of lgo. An example of this would be TEST 3.lgo.

10. There are 16 logos that can be used by the MC. In order for the MC to use the new logo file it must be named using only the numbers 1-16 followed by a period and the extension of logo. The number it is saved and burned with is the actual logo that will be shown in the MC display as 1-16. So, after you have saved the file in step 9 then go to that folder where the file has been saved. Then copy and paste the file in the same folder and then rename the copied file with the number of the logo only that will be used. So from the example in step 9 it would be renamed as 3.lgo, dropping the name TEST. The reason for both files is only to keep a file with a name that is recognized for future use. This is not required for any other reason so you could simply save all logos with just the logo number as this is how they are used. NOTE: The logos must be named with only the number in order to be burned into the master control. The picture below shows a few examples in the logos folder. It also shows the other files found in the logo folder.

US Utah Scientific
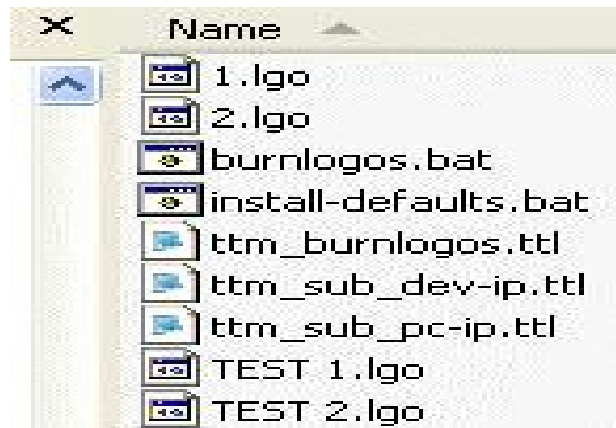
Burning Logos to the MC

The MC-4000, MC-2020, MC402 and the MC400 are capable of storing a total of 16 different logos. Each logo occupies 1 of 16 storage locations inside the MC. To place a logo into a master control system it must first be converted to the USI format (.lgo) using the steps above and then burned into the MC itself. The following steps will complete the installation of a logo in the first of the 16 location within the MC-2020. (There is a working assumption here that the USI format file has already been created.)

1. Open Windows Explorer.

2. Navigate to c:\usi\[system]-name]\logos

3. Double-click burn-logos.bat and follow the on-screen prompts.

4. This process updates the MC-2020 with up to 16 new logo files that are present in the c:\usi\[system-name]\logos directory. Note: Files not present in the logos directory are not changed in the MC-2020 or MC400. And conversely all files that are in the directory will be burned even if they have not been changed. If this is not desired then the files that are not desired to be burned will need to be renamed prior to running the batch file.

Logo Operation from the Panel

From the MCP-2020 (Used with MC4000, MC2020, MC402, MC400 and MC40)

- At the MCP-2020 Master Control Panel, select the HOME button immediately below and to the left of the main LCD display.

- Select the KEY button on the LCD touch screen. This displays the key summary screen.

- Select the KEY-1 button on the LCD touch screen. This displays the logo select screen.

- Select the LOGO-1 button on the LCD touch screen. Any of the but- tons can be selected if they have been loaded with a #.lgo file.

- Turn on the PST KEY button for keyer 1 in the key section on the right hand side of the MCP-2020 control panel.

- Select the LOGO key input button, located to the right of the EXT button and directly below the PST KEY button for the keyer 3. Note: The Logo button must be enabled in the MCP-2020 encoding file.

- Adjust the logo position using the bottom 2 knobs located directly to the right of the LCD display screen. The middle knob adjusts hori- zontal position, the bottom knob adjusts vertical position.

- The logo position can only be changed with the logo select screen displayed. When you are satisfied with the location, press the BACK button, located just below and to the right of the LCD display. If you need to make adjustments at a future time, go to the logo key select screen in the LCD and adjust the knobs as necessary. Each Logo is independently positioned. If you have a need for the same logo to be placed in 1 or more predefined positions, install the same logo in 1 or more keyer card slots and position each per your adjustments. A specific logo can actually be loaded in all the remaining keyer cards in your system. All internal logos should be displayed in the LIN MULT (or LIN) Keyer Mode.

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(Used with MC400, MC402 and MC40 only)

- At the MCP-400 Master Control Panel, select the HOME button immediately below and to the left of the main LCD display.

- Select the KEYR CNTL button on the LCD touch screen. This displays the key summary screen.

- Select the LOGO KEY button on the LCD touch screen. This will not change screens but will highlight the button after it is pressed.

- Select the LIN KEY button on the LCD touch screen. This will not change screens but will highlight the button after it is pressed.

- Select the LOGO SEL button on the LCD touch screen. This will go to the Logo 1-8 screen. Select the desired Logo by pressing it on the screen. To see Logo 9-16 press the physical button labeled down which is located to the left of the LCD display.

- At this point you should see the Key on the Video Preset Monitor.

- Select the physical button labeled BACK just to the left of the LCD dis- play until you get back to the key summary screen.

- Select the LOGO POS button on the LCD touch screen and you will see 4 direction arrows and a course and fine adjust button.

- Touch each of the arrows to move the Logo to the desired position on the monitor and turn on the course or fine adjust and then the arrows as needed.

- When you are satisfied with the position of the Logo and wish for it to go to the same location the next time it is selected then press the SAVE button on the LCD Touch screen.

- From here you can either press the take button which will transition the Logo to the Program bus or you can press the PGM/PST Toggle button just below the LCD display and then go through the steps above to select the Logo manually and put it on the Program bus.

- Each Logo is independently positioned. If you have a need for the same logo to be placed in 1 or more predefined positions, install the same logo in 1 or more keyer card slots and position each per your adjust- ments. A specific logo can actually be loaded in all the remaining keyer cards in your system.

- All internal logos should be displayed in the LIN MULT (or LIN) Keyer Mode.

Clearing Existing Logos

This must be completed from the diagnostics port either using a serial connection to the card or by telnetting into the IP address of the card. (Refer to Appendix D in the system installation guide). This will erase all logos at one time, and not individually. After all are removed, resend wanted logos back to the card.

Type the following at the prompt once you have established a connection:

mem (lower case and then press return)

r 6e0000 (these are zeros -- pressing return displays the current logos) ef 6e0000 (these are zeros -- pressing return erases all logos in flash).

The following is an example of what is displayed after these commands are typed. You should see the actual name of the logos in each location at the end of the line in table one (below). This was extracted from a 2020, and as you can see, there are two logos enabled. The second table shows the table with all ffff, indicating the address showing logos is empty.

/> mem

```
**********************************************

*              Utah Scientific          *

*              Hardware Test Utility*
*                                        *

*              Use "?" for help          *

*              Motorola M5307C3 boot Version: V1.1          *
**********************************************
>>r 6e0000
006e0000: face0001 000000ff 00010800 20050412
006e0010: 00000164 0000026d 00000000 deaddead        d m
006e0020: 00000100 00000001 00000000 deaddead
006e0030: deaddead deaddead deaddead deaddead
006e0040: 77757369 362e6c67 6f000000 00000000      wusi6.lgo
006e0050: 00000000 00000000 00000000 00000000
006e0060: 00000000 00000000 00000000 00000000
006e0070: 00000000 00000000 00000000 00000000
006e0080: 4c6f676f 20362057 55534920 636f7079      Logo 6
WUSI
copy
006e0090: 2e706e67 00000000 00000000 00000000      .png
006e00a0: 00000000 00000000 00000000 00000000
006e00b0: 00000000 00000000 00000000 00000000
006e00c0:  deaddead  deaddead  deaddead
deaddead  006e00d0:  deaddead  deaddead
deaddead  deaddead  006e00e0:  deaddead
deaddead  deaddead  deaddead  006e00f0:
deaddead deaddead deaddead deaddead
>>
```

```
>>ef 6e0000
Man id: 1, dev id: 22d7
>>r 6e0000
006e0000:      ffffffff      ffffffff
ffffffff      ffffffff      006e0010:
ffffffff  ffffffff  ffffffff  ffffffff
006e0020:      ffffffff      ffffffff
ffffffff      ffffffff      006e0030:
ffffffff  ffffffff  ffffffff  ffffffff
006e0040:      ffffffff      ffffffff
ffffffff      ffffffff      006e0050:
ffffffff  ffffffff  ffffffff  ffffffff
006e0060:      ffffffff      ffffffff
ffffffff      ffffffff      006e0070:
ffffffff  ffffffff  ffffffff  ffffffff
006e0080:      ffffffff      ffffffff
ffffffff      ffffffff      006e0090:
ffffffff  ffffffff  ffffffff  ffffffff
006e00a0: ffffffff ffffffff ffffffff
ffffffff      006e00b0:      ffffffff
ffffffff ffffffff ffffffff 006e00c0:
ffffffff  ffffffff  ffffffff  ffffffff
006e00d0:      ffffffff      ffffffff
ffffffff ffffffff 006e00e0: ffffffff
ffffffff ffffffff ffffffff 006e00f0:
ffffffff ffffffff ffffffff ffffffff
>>
```

MC-40/400/402 Operations Guide

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US Utah Scientific

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FCC Compliance (USA) and Digital Equipment Compliance (Canada)

This equipment has been tested and found to comply with the limits for a Class A, digital device, pursuant to Part 15, Subpart B of the FCC Rules and the Canadian EMC Requirement (ICES-003). These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference, in which case, the user will be required to correct the interference at their own expense. Shielded cables must be used to ensure compliance with the FCC Class A limits.

Utah Scientific

Declaration of Conformity

Utah Scientific, Inc.
4750 Wiley Post Way, Suite 150
Salt Lake City, Utah 84116-2878 U.S.A.
We declare our sole responsibility that the Utah-400 Digital Routing Switcher is in conformance with the following standards:

Emission

- EN55022:1994+A1&A2

Immunity

- EN55024:1998

- EN61000-3-2

- EN61000-3-3

Safety

- IEC 60950-1:2001 /EN 60950-1:2001

Following the provisions of the Directive(s) of the Council of the European Union:

- EMC Directive 89/336/EED

- Low Voltage Electrical Directive 72/23/EEC

Utah Scientific, Inc. hereby declares that the product specified above conforms to the above Directive(s) and Standard(s).

$C\epsilon$

Important Safeguards and Notices

This section provides important safety guidelines for the Operator and Service Personnel. Specific warnings and cautions are found throughout the guide where they apply, but may not appear here. Please read and follow the important safety information, specifically those instructions related to risk of fire, electric shock, or injury to persons.

Safety Symbols

Hazardous Voltage symbol

Caution symbol.

The product is marked with this symbol when it is necessary to refer to the manual to prevent damage to the product.

Warnings

Please observe the following important warnings:

- Any instructions in this guide that require opening the chassis, changing a power supply, or removing a board, should be performed by qualified personnel only. To reduce the risk of electric shock, do not perform any service unless you are qualified to do so.

- Heed all warnings on the unit and in the operating instructions.

- Do not use this product in or near water. Disconnect AC power before installing any options or servicing the unit unless instructed to do so by this manual.

- This product is grounded through the power cord ground conductor. To avoid electric shock, plug the power cord into a properly wired receptacle before connecting the product inputs or outputs.

- Route power cords and other cables so they won't be damaged.

- The AC receptacle (socket) should be located near the equipment and be easily accessible.

- Disconnect power before cleaning. Do not use any liquid or aerosol cleaner use only a damp cloth.

- Dangerous voltages exist at several points in this product. To avoid personal injury, do not touch exposed conductors and components while power is on. Do not insert anything into

either of the systems two-power supply cavities with power connected.

- Do not wear hand jewelry or watches when troubleshooting high current circuits, such as power supplies. During installation, do not use the door handles or front panels to lift the equipment as they may open abruptly and injure you.

- To avoid fire hazard when replacing fuses, use only the specified correct type, voltage and current rating as referenced in the appropriate parts list for this product. Always refer fuse replacement to qualified service personnel.

- Have qualified personnel perform safety checks after any service.

Cautions

Please observe the following important cautions:

- When installing this equipment do not install power cords to building surfaces. To prevent damage when replacing fuses, locate and correct the problem that caused the fuse to blow, before reconnecting power.

- Use only specified replacement parts

Notices

Please observe the following important notes:

- When the adjacent symbol is indicated on the chassis, please refer to the manual for additional information.

- For the HD-2020 Chassis and Master Control Panel, refer to "Connecting and Disconnecting Power" - Chapter 2 (Hardware Installation).

Company Information

Utah Scientific, Incorporated
4750 Wiley Post Way, Suite 150
Salt Lake City, Utah 84116-2878 U.S.A.

Telephone: +1 (801) 575-8801
FAX: +1 (801) 537-3098
Technical Services (voice): +1 (800) 447-7204
Technical Services (FAX): +1 (801) 537-3069
E-Mail -General Information: info@utsci.com
E-Mail -Technical Services: service@utsci.com
World Wide Web: http://www.utahscientific.com
After Hours Emergency: +1 (800) 447-7204. Follow the menu instructions for Emergency

Service.

Warranty Policies

Hardware Warranty

Utah Scientific, Inc. warrants to the original purchaser that the Utah Scientific hardware is free from defects in materials and workmanship and will perform substantially in accordance with the accompanying written materials under normal use and service for a period of ten (10) years from the date of shipment. Any implied warranties on hardware are limited to ten (10) years. Some states/jurisdictions do not allow limitations on duration of an implied warranty, so the above limitation may not apply to certain specific purchasers.

Software Warranty

Utah Scientific warrants that the software will perform substantially in accordance with the accompanying written materials for a period of one (1) year from the date of shipment.

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For the first one (1) year after purchase of the software and the first ten (10) years after the date of purchase of the hardware, Utah Scientific's and its suppliers' entire liability and purchaser's exclusive remedy shall be, at Utah Scientific's option, either:

- Return of the price paid, or

- Repair or replacement of the software or hardware that does not meet the above warranties and is returned to Utah Scientific under the returned materials authorization (RMA) process with freight and forwarding charges paid.

After the initial warranty periods, purchaser's exclusive remedy is the repair or replacement of the hardware upon payment of a fixed fee to cover handling and service costs based on Utah Scientific's then-current price schedule. The above warranties are void if failure of the software or hardware has resulted from an accident, abuse, or misapplication. Any replacement software or hardware will be warranted for the remainder of the original warranty period or thirty (30) days, whichever is longer.

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