TASCAM

TEAC Professional Division

MX-2424

24-Bit 24-Track Hard Disk Recorder

> **MX-2424 Manual Updates**
> **MX-View 1.00 – 1.40**
> **MX-OS 1.10 – 3.11**

Changes in Version 1.10

- FAT-32 and Broadcast .WAV file (BWF) support
  - Support for Volumes Larger than 9 GB on FAT-32 formatted hard drives
  - Menu 710 and FAT-32 Initializing of Disks on the MX-2424
  - Menu 702 Displays HFS or FAT-32 Disk Status
  - Menu 700 Supports 16 bit and 24 bit WAV Encoding
  - Ability to Smart Copy from FAT-32 to Mac HFS and Vice Versa with automatic file format conversion
  - Projects Containing Mixed Disk Formats
  - FAT-32 Formatting DVD Disks.
  - Formatting Fat-32 Discs on the PC
  - Windows 98 Compatibility
- Support for New "TL Imports" Folder
- Support for Multi-Travan Tape Backup/Restore
- New "Busy LED" Feature
- ViewNet 1.15 Update
- Miscellaneous ViewNet maintenance

FAT-32 and Broadcast .WAV file (BWF) Support

The MX-2424 Version 1.10 supports disks formatted in the FAT-32 file format. In this format, a project consists of an OpenTL EDL referencing 16 or 24 bit Broadcast WAV files. Broadcast WAV files (.BWF) can be imported into any audio software that utilizes the WAV format. Like their SDII counterparts, Broadcast WAV files contain a time stamp that can be utilized by any software that takes advantage of this feature. Version 1.10, as with Version 1.0, supports SDII audio files on Macintosh HFS volumes as well.

Support for Volumes Larger than 9GB (FAT-32)

Volumes larger than 9GB can be used when recording on a FAT-32 formatted disk.
The following drives are approved for use with FAT-32 formatted disks and Version 1.10:

Approved Drives

Drive manufacturer	model	Size
Seagate	ST318436LW	18 GB
Seagate	ST318404LW	18 GB
IBM	DDYS-T18350	18 GB
Quantum	QM309100XC-LW	9 GB
Seagate	ST39236LW	9 GB
Seagate	ST39204LW	9 GB
IBM	DDYS-T09170	9 GB
IBM	DPSS-309170	9 GB

Note: that when using MacHFS formatted disks, volumes larger than 9GB are not supported. A future release implementing Macintosh HFS+ will support volumes larger than 9GB.
Please check the TASCAM website for the most recent list of approved SCSI drives.

Menu 710 and FAT-32 Initializing of Disks on the MX-2424

Menu 710 has been changed to allow for HFS and FAT-32 disk initializing.
To initialize a disk:
1. Press SHIFT then MOUNT (UNMOUNT) to unmount all drives
2. Access menu 710
3. Use TRIM to select the correct disk ID number then press YES (STORE).
4. Press TRIM and use the arrow keys to toggle between HFS and FAT-32 formats, then press STORE.
5. The MX2424 will the ask "are you sure?" Press YES (STORE) to confirm and initialize the disk in the selected format, or press NO (RCL) to go back to selecting between the two formats.

Menu 702 displays HFS or FAT-32 disk status

Menu 702 will display either HFS or FAT-32 to reflect the status of the currently selected record disk.

Menu 700 supports 16 bit and 24 bit WAV encoding

Menu 700 will display the appropriate disk encoding for the currently selected record disk. If an HFS disk is selected, the user can toggle between SDII 16-bit and SDII 24-bit. If a FAT-32 disk is selected, the user can toggle between WAV 16-bit and WAV 24-bit.

Ability to Smart Copy from FAT-32 to Mac HFS and vice versa

When a Smart Copy (or TapeMode Convert) from a FAT-32 disk to an HFS disk is performed, all Broadcast WAV files automatically get converted into SDII files. Likewise, when a Smart Copy (or TapeMode Convert) from an HFS disk to a FAT-32 disk is performed, all SDII files automatically get converted to Broadcast WAV files. This feature allows MX-2424 projects to move to both Macintosh and Windows audio software with ease during various stages of a project. When restoring a backup (bu) project from DVD-RAM or Travan Tape, the destination disk can be either HFS or FAT-32.

Projects Containing Mixed Disk Formats

A project cannot contain audio on both FAT-32 and HFS disks. Once a project has been recorded on an HFS volume, you cannot adjust menu 701 to a FAT-32 volume and resume recording new tracks. You can, however, switch record drives to a new volume type if the current project is still blank (no tracks are recorded or defined in the current project). Tracks from a different disk format can, however, be imported and loaded into a project since those tracks will reference the original audio files.

Formatting Fat-32 Discs on the PC

A disk can be formatted and initialized as a FAT-32 volume on the MX-2424 as well as on a PC. To format a disk on the PC using a Windows 98 system:

1) Connect drive to a Windows-98 machine (via SCSI card).
2) Run FDISK, and create a DOS partition on the desired disk. **Be sure you have the correct disk selected.**
3) Format the drive.
4) In the Device Manager, select the drive properties for the drive
   just formatted, and check the box labeled "removable".
5) Restart the system as instructed.
6) When removing a drive from the Windows desktop (pulling it out
   of the Kingston carrier) always hit the refresh button in the Device Manager so that Windows
   knows the drive was removed.
7) The drive can now be mounted onto the MX-2424.
8) When bringing back a FAT-32 volume from the MX-2424 onto your PC, hit the
   refresh button in the Device Manager again to make the drive appear on your desktop.

When mounting a removable FAT-32 disk from the MX-2424 onto the Windows, it is best to completely reboot the PC after mounting the drive. It is also best to reboot Windows after the removable disk has been unmounted. This is due to issues with Windows 98's disk memory, and will perform more reliably than the "refresh" command in Windows Device Manager.

Windows Compatibility

FAT-32 disks used on the MX-2424 have been qualified to work with Windows 98, but not with Windows 2000.   ViewNet MX is compatible with Windows 2000.

Support for "TL Imports" Folder

In previous versions of MX-2424 software, a "disk cleanup" would delete any audio files on a disk not referenced by a project. With Version 1.10, the user can mount a drive on a computer and create a folder at the root level of the drive called "TL_Imports". This folder will not be affected during a disk cleanup performed on the MX2424 (will not delete files in this folder).

It is often useful to have certain files on a disk that can always be available to import into a project and never be deleted.

Support for Multi-Travan Tape Backup/Restore

MX-2424 Version 1.10 adds support for spanning Travan tapes during a large backup and restore. This is similar to performing multi-DVD-RAM backups, where the MX-2424 will request for another Travan tape ("insert next tape") when the end of the tape is reached. Only a single project can span across multiple Travan or DVD-RAM media.

New "Busy LED" feature

The "Busy" light will illuminate whenever downloading or saving software. All transport functions are stopped while during this process as well.

ViewNet 1.15 Update

To ensure compatibility between MX-2424 version 1.10 and ViewNet, ViewNet 1.15 software should be installed to reflect the MX-2424's new FAT-32 capabilities.

ViewNet 1.15 Additions

- ➢ In tab 700 of Machine Settings, the Disk Encoding window has added settings for 16-bit and 24-bit Broadcast WAV files on FAT-32 volumes.
- ➢ In tab 700 of Machine Settings, the Record Disk Status will display PC FAT-32 when a FAT-32 disk is selected as the record disk
- ➢ Pressing CONTROL + number will select the like-numbered machine when multiple units are on the network. This allows the user to quickly toggle through multiple machines.

Miscellaneous ViewNet Maintenance

- ➢ In tab 400 of Machine Settings, the ability to select Analog 1-8 and Digital In 1-8 options to Inputs 9-16 and Inputs 17-24 was added.
- ➢ The 2 channel out select now works properly.

Notes on DVD-Backup

When using DVD-RAM drives, there are two types of Smart Copy operations possible:
- ➢ Smart Copy to a FAT-32 or HFS initialized DVD-RAM
  DVD-RAM disks may be initialized to FAT-32 using the MX-2424 menu 710. Using Software Architects software on the PC http://www.softarch.com , a FAT-32 initialized DVD-RAM disk can be mounted on a PC. Initializing a DVD-RAM disk to HFS must be done on a Mac using Software Architects software http://www.softarch.com These DVD-RAM disks **DO NOT** support multi-disk spanning for backup and restore. The advantage to using this method is that such a disk may be mounted on a computer in case disk repairs are necessary.

- ➢ Smart Copy to a DVD-RAM in Backup (BU) format
  DVD-RAMs that have never been initialized to FAT-32 or HFS may be used for the MX-2424 BU format. This is a proprietary backup format used on both DVD-RAM and Travan Tapes and **CANNOT** be mounted on a PC or Mac. These DVD-RAMs support multi-disk spanning for backup and restore.

It is recommended that any Smart Copy of a project to DVD-RAM, which does not require spanning (and thus under 2.3GB in size), be backed up to a FAT-32 or Mac HFS initialized DVD-RAM. A DVD-RAM that can be mounted on a personal computer can take advantage of disk utilities in the event that any file corruption occurs. File corruption can occur if a SCSI bus is improperly set. This also allows the user to import individual audio files into an audio application on the PC or Mac.

Changes in Version 1.53

The following functional and maintenance changes have been made to MX-2424 software in Version 1.53. These changes are explained in detail in this document:

• Verify Option on Smart Copy
• Locate points stored with Projects
• New Menu 205 Punch to In/Out (Front Panel Only)
• ViewNet Import Audio Menu
• Maintenance change for using duplicate project names
• Maintenance change for Smart Copying of TapeMode projects
• Maintenance change for updating projects on FAT-32 disks
• Improved FAT-32 Performance
• Ethernet project backup and audio file transfer removed
• Removed the "Reverse" edit function (SHIFT+UNDO) from the front panel. This key combination will access a different edit function in a future revision of MX-OS.
• The following illegal characters will be filtered out by MX-OS:
  * / \ : <>| "

Note: ViewNet MX 1.53 must be installed for some of these features to be used.

Verify Option on Smart Copy

The MX-2424 now has an option to verify a Smart Copy. When initiating a copy, perform all functions as done previously. There will now be a prompt that displays "Verify?" At this point "NO" can be pressed to skip the verify function, and the copy will perform without verification. If YES is pressed the copy will be made in its entirety, followed by a verification process that compares the new copy and the original material, bit for bit. If they match exactly, the MX-2424 will display the message "Verify Successful!" If, the message "Verify Failed!" appears, the copy will abort, and material being copied to the destination drive will be deleted.

If failed verifies are occurring, make sure to identify and fix your configuration before continuing.

Note to DVD-RAM Users: We have seen some DVD-RAM media failure when the disk inside the cartridge is dusty. Make sure to keep DVD-RAM media in a clean environment and do not open the cartridge. Possible failures include corrupt projects and failed Smart Copies/Verifies.

Note about queuing up Smart Copies and other disk operations: When queuing up Smart Copies always let the copying process begin (getting through all confirmation requests) before queuing up further copies. This is especially important when using the verify function or queuing up Smart Copies from ViewNet MX.

Additionally, on large projects or higher capacity drives, Disk Cleanup may take up to several minutes. Always allow the MX-2424 to complete its operations and the BUSY LED to go out before initiating any further operations.

Locate Points Stored with Projects

Locate points are now automatically saved with the project. These locate points will remain with the project when it is backed up in any manner. Additionally, locate points are stored with user settings. Thus, if there are a group of locate points that need to be called up at various times, they can be stored in a user setting for immediate access.

New Menu 205 Punch to In/Out (Front Panel Only)

Menu 205 adds the ability to disable auto updating of the In and Out Points when manually punching. When set to "On", the In and Out points will automatically be updated to the most recently recorded event, following a recording. When set to "Off", In and Out points can only be stored manually via the Capture key or using the |◁▷ cursor in ViewNet MX.

NOTE: ViewNet version 1.53 does not support this menu yet. Menu 205 can only be adjusted via the MX-2424 front panel or the RC-2424. The next version of ViewNet MX will add support for this menu item.

Import Audio Menu

ViewNet MX 1.53 now allows for the import of individual audio files into a project. Select "File" from the ViewNet MX pull down menus, then select "Import Audio". The Import Audio features and options are explained below.

Display Files - Allows you to select where you wish to import audio files from. The three options are "All sounds on disk", "Imports Folder", and "Current Project". This option acts like a display filter for the audio files.
1. *All sounds on disk* - Will display every audio file on the currently selected SCSI device ID of the window below.
2. *Imports Folder* - Will display any tracks you have put in the specially created "TL Imports" folder (see Release Notes for software 1.13).
3. *Current Project* -Will display the tracks for whatever project is currently loaded into the MX-2424's memory.

Device - Allows you to select the SCSI ID of the MX-2424 disk. To change the selected device, enter the desired device number and press ENTER or RETURN on the computer keyboard.

Import - The main area of the "Import Audio" menu displays sound files that are available for import into the current project. A file may be selected here and will appear highlighted. Under the main area is the "Import" button, which initiates the importing of an audio file into the current project to the selected Import Destination.

Import Destination - Next to the "Import" button is the "Import Destination" selector. This selects the destination of the imported audio with the ability to import to Clipboard, Original Time, and Selected Event.
> • *Clipboard* - will copy the audio file to the clipboard memory, where it can be pasted to a location like any other copied file.
> • *Original Time* - will place the file on the timeline according to the time stamp embedded into the file. (Sound Designer II and Broadcast Wave audio files only)
> • *Selected Event* - will take the file and put it in place of any selected tracks in the current MX-2424 project.

You must first select an Audio file, then choose its destination, and finally click on the "Import" button to initiate the audio import. An "Import" operation may be undone.

Important Note: You cannot choose "Original Time" as the method of importing audio files that do not have time stamps embedded in the file. In these situations choose to import to the Clipboard and paste the audio file manually in the desired location.

Fix for using duplicate project names

In previous software versions, if the user gave a new project an existing project's name, the MX-2424 would not always prompt that the project already exists. This is now fixed. When a new project is given an existing project name, any active tracks from the existing project will become unloaded virtual tracks in the newly created project.

Fix for Smart Copying of TapeMode projects

In previous software versions, if the user performed a Smart Copy of a TapeMode project to Travan tape or a DVD-RAM using the Backup (.BU) format, the project would be converted to a non-destructive project. The copy will now stay a TapeMode Project during the backup and restore when used with FAT-32 formatted drives.

Fix for updating projects on FAT-32 disks

In previous software versions, if the user changed the frame rate or the sample rate for an existing project on a FAT-32 disk (and no other edits or changes are done), the project would not get updated on the disk.
This is now fixed.

Improved FAT-32 Performance

Changes in the FAT-32 file system have been made to accommodate long files with improved performance. This affects long TapeMode FAT-32 projects in particular. Other fixes and enhancements to FAT-32 include corrected DOS alias names, optimized FAT-32 file system disk initializing, fixes for FAT-32 Date/Time stamps, and overall FAT-32 reliability.

Ethernet Backup and Audio File Transfer Removed

The Ethernet communication capabilities of Version 1.51 have been removed in this release due to incompatibilities with the Java programming language. Work is presently being done to overcome these incompatibilities.

Known Issues

ViewNet Import Audio Files at Original Time: Performing an Import at "Original Time" of a non-time-stamped audio file may not function properly.

Workaround: In order to import a non time-stamped audio file into a project, Import via the "Clipboard" or "Select Event" settings.

Import Time Stamped Audio May Appear Off By A Few Frames: When importing audio files (recorded using the MX) via "Original Time", audio files may appear earlier by a few frames. This is because the MX-2424 starts and ends recordings on sector boundaries. The actual audio is being placed in the correct time stamp position. The audio file is simply a few frames longer on each end. The silence can be trimmed in the EDL. If the silence is undesirable, then using the Render command (for individual tracks) or converting to TapeMode will rewrite the audio and remove the silence at the beginning and end of the file.

Changes in Version 1.54

The following changes have been made to MX-2424 software in Version 1.54.

• Improved FAT-32 Performance and Reliability
• Maintenance Change to ViewNet Import Audio Files at Original Time
• Improved Network Reliability

Improved FAT-32 Performance and Reliability

Maintenance changes have been made to increase FAT-32 performance and reliability. With Version 1.54, playing back imported WAV audio created on a PC as well as TapeMode projects on a FAT-32 disk now works properly. On rare occasions, previous versions of software could have caused white noise on playback. Version 1.54 also further prevents parse and write errors from occurring on FAT-32 disks. Other enhancements have been made to accommodate fragmentation of track files and more reliable unmounting and remounting of volumes.

Maintenance change to ViewNet Import Audio Files at Original Time

Performing an Import at "Original Time" of a non-time-stamped audio file now works properly.

Improved Network Reliability

Maintenance changes have been made to the MX-2424 networking functions for increased reliability with ViewNet.

Known Version 1.54 Issues

Using ViewNet 1.51 for Audio File Transfers and Project Smart Copies: Whenever performing audio file transfers or project backups and restores, make sure to close all other applications. The transfer of audio files and project using Ethernet is an intensive operation for the Java run time engine.

Performing a Smart Copy of a TapeMode Project: When performing a Smart Copy of a TapeMode project from a MacHFS disk to a FAT-32 disk, or from a FAT-32 disk to a MacHFS disk, do not use the Verify function. Due to the nature of a TapeMode project, certain bits will change when the project is copied from one disk to another. Verify will identify these changes and will fail. *Workaround:* You can either perform a Smart Copy with Verify Off or perform a TapeMode convert of the TapeMode project (the latter will be more time consuming).

MX-2424 2.0 and Viewnet 2.0 Release Notes

- 96k/88.2k high sample rate recording on 12 tracks
- Support for HFS+ Volumes
- Miscellaneous Enhancements
- Miscellaneous Software Maintenance
- Miscellaneous Notes

Remember to update to Viewnet 2.0 when updating to MX-OS Version 2.0.

96k/88.2k High Sample Rate Recording on 12 Tracks

With version 2.0, the MX-2424 can now record and play at sample rates of 88.2kHz, 96kHz, as well as their associated pull-up and pull-down rates.

When operating at high sample rates, all activity takes place on tracks 1 through 12.

There are several new menus that incorporate the new high sample rate features:

Menu 005: Sample Rate

Sample rate options have been added for 88112, 88200, 88288, 95904, 96000, and 96096. When selecting any of these sample rates, the "2X" LED will illuminate on the front panel of the MX-2424.

This light combines with the "base" sample rate setting to indicate the operating sample rate. For example, if the 48k and the 2x lights are both lit, the MX-2424 is set to record at 96k.

NOTE: Whenever the MX-2424 is switched between a sample rate in the base ("1X") range and one of the high sample rates in the ("2X") range, it will mute all of its audio outputs for the duration of the switchover. If the Analog I/O option is installed, the Analog input converters are reset during the rate switch, and are automatically re-calibrated when the switchover has completed. The entire process may take up to ¾ of a second.

Menu 115: TL Bus Rate Mult

This menu determines whether a TL Bus slave machine will follow the sample rate setting of the TL-Bus master machine. This makes it possible for a master to run at 96k and the slave at 48k, and vice versa.

When set to "Use Master 1x,2x", the slave machine's sample clock will automatically be set to the sample rate of the master machine. This is the way the MX-2424 has always operated. When set to "Use Local 1x,2x", the slave machine will not switch to or from the double sample rate ("2X") range of the master. **It will however switch its "base" sample rate setting to match the master**. The slave rate can only be exactly equal to, exactly double, or exactly half that of the master.
Examples (Menu 115 on slave MX-2424 set to "Use Local 1x,2x" in all cases):
(i)   If both master and slave are at 48000, and the master's rate is changed to 96000, then the slave rate will stay at 48000.
(ii)   If both master and slave are at 96000, and the master's rate is changed to 48000, then the slave rate will stay at 96000.
(iii)   If both master and slave are at 48000, and the master's rate is changed to 88200, then the slave rate will change to 44100. The slave has matched the "base" sample rate of the master, but has not switched to the "2X" range of the master. Both master and slave will have their "44100" LED's illuminated, but the master will also have the "2X" LED lit up.
(iv)   If both master and slave are at 96000, and the master's rate is changed to 44056, then the slave rate will change to 88112.

Menu 410: Inputs 1-12   /2x

This menu selects the input source used when a high sample rate is used. Available choices are "2Ch In", "Analog" and "Dig In".

NOTE: When using the Dig In setting of this menu and clocking to the digital input it is necessary to set the Sample Reference in Menu 005 to Dig In 1,2.

Menu 450: Dig I/O 2X mode

This menu determines the transmission method used when working with high sample rates.
NOTE: Menu 450 only applies to the AES/EBU multi-channel option module.

When set to "High Speed", each pair of odd/even tracks is transmitted on a single balanced connection. In this case, tracks one through twelve would be transmitted on the first six digital audio connections to the AES/EBU multi-channel option module.

When set to "1/2 Spd, 2 Line", one track is transmitted on a single balanced connection. In this case, tracks one through twelve would be transmitted on the first twelve digital audio connections to the AES/EBU multi-channel option module. *This mode is also known as "Dual Line" and/or "2 Wire" mode.*

The TDIF digital option card does not support the "High Speed" mode, being constrained to the "1/2 Spd, 2 Line" Dual Line mode. Attempting to set "High Speed" mode on a TDIF board will produce the error message "No Dig High Speed".

The ADAT option card does not support 96k
.
NOTE: Different manufacturers use different methods for transmitting high sample rates. Check your product's manual to determine the correct method for interfacing your MX-2424 with digital consoles, outboard converters, etc. A mismatch of transmission method will result in clock noise or lack of audio altogether.

Menu 460: 2Ch I/O 2X Mode (TEST SPDIF)

This menu determines the transmission method used when a working with high sample rates. Menu 460 applies specifically to the AES/EBU and S/PDIF 2 channel inputs and outputs.

When set to "High Speed", the MX-2424 sends and receives a stereo pair of audio tracks through the 2 channel connection.

When set to "1/2 Spd, Mono", the MX-2424 sends and receives a single track of audio through the 2 channel connection. *This mode is also known as "Dual Line" and/or "2 Wire" mode.*

Menu 465: 2 Ch Out Select

New text has been added to Menu 465 to reflect the output assignments if "1/2 Spd, Mono" has been selected in Menu 460. The new menu reads:

1,2	[Mono:1]	Tracks 1&2 at a base sample rate	Track 1 at a high sample rate
3,4	[Mono:2]	Tracks 3&4 at a base sample rate	Track 2 at a high sample rate
5,6	[Mono:3]	Tracks 5&6 at a base sample rate	Track 3 at a high sample rate
7,8	[Mono:4]	Tracks 7&8 at a base sample rate	Track 4 at a high sample rate
9,1	[Mono:5]	Tracks 9&10 at a base sample rate	Track 5 at a high sample rate
11,12	[Mono:6]	Tracks 11&12 at a base sample rate	Track 6 at a high sample rate
13,14	[Mono:7]	Tracks 13&14 at a base sample rate	Track 7 at a high sample rate
15,16	[Mono:8]	Tracks 15&16 at a base sample rate	Track 8 at a high sample rate
17,18	[Mono:9]	Tracks 17&18 at a base sample rate	Track 9 at a high sample rate
19,20	[Mono:10]	Tracks 19&20 at a base sample rate	Track 10 at a high sample rate
21,22	[Mono:11]	Tracks 21&22 at a base sample rate	Track 11 at a high sample rate
23,24	[Mono:12]	Tracks 23&24 at a base sample rate	Track 12 at a high sample rate
Silent Clock			

Support for HFS+ Volumes

The MX-2424 can now initialize disks in the HFS+ format. This allows for the use of Macintosh formatted disks larger than 9 gigabytes.

To initialize a disk as HFS+:
1. Unmount all drives by pressing <SHIFT> then MOUNT<UNMOUNT>
2. Go to menu 710. Press TRIM to select the SCSI ID of the drive to be initialized.
3. Press STORE
4. Press TRIM and use the Arrow Keys to select " HFS+". Press STORE
5. Press STORE again when prompted "Are you sure?

WARNING: Initializing a disk will delete the entire contents of the disk.

NOTE: As with HFS formatted disks, it will be necessary to add a driver from FWB Hard Disk Toolkit version 3.0 or higher in order to mount an HFS+ disk on the Macintosh. Addition of this driver can be done without erasing the contents of the disk, so the driver can be added after the MX-2424 initializes the disk and records program material to it.

For the current hard drive requirement specification please check the TASCAM web site at http://www.TASCAM.com

Miscellaneous Enhancements

New Menu 000 "Theatre Play" mode

The MX-2424 can now be set to a special mode where it steps through location points as a series of "cues". This can be useful when triggering material and sound effects for Theatre, Radio Stations, etc.

To enter this mode, access Menu 000 "Control Mode", press TRIM, and scroll to "Theatre Play" then press STORE.

In this mode, it is possible to play and navigate through a series of "cues". Each cue is defined by the times contained in a pair of memory locations. Cue number 1 starts at the time in Memory location #00, and finishes at the time specified by Memory #01. Cue #2 goes from Memory #02 to Memory #03, and so on.

The desired locate points must already exist in the project before using Theatre Play mode.

To begin, select "Theatre Play" mode then load the appropriate project (with the desired locate points already stored within that project). Theatre Play mode may be selected after loading the desired project.

These actions will result in the MX-2424 locating automatically to the start of the first cue, the location contained in Memory #00. The project must contain an even number of memory locations, ie. #00 through #07 (#00 counts as one). If the project contains an odd number of memory locations, a "Loop Points Inverted" message will be displayed when attempting to play the last cue.

Once the project has been loaded the lower line of the display will show: "CUE 01 [Mem00-01]". This indicates that "cue" number 1 is ready to play and will play from Mem00 to Mem01. **NOTE**: If a project is loaded that has no memory locations stored, with Theatre Play mode enabled, a "No cues" message will be displayed in the LCD.

Pressing PLAY will cause the MX to play from the start of the first cue (Memory #00) to its end (Memory #01), and then immediately locate to the beginning of the next cue and stop, (Memory #02) awaiting another Play command.

When a footswitch is inserted into the back panel "Footswitch" jack, each cue can be triggered, one at a time, by pressing on the footswitch. In other words, in "Theatre Play" mode, a footswitch is another PLAY key.

When there are no more cues to be played, the lower line of the LCD will display: "CUE   End of cues"

The Rewind and Fast Forward buttons may be used to locate to the next or previous cue, much like on a CD player. The usual double-hit "Head" and "Tail" functions of these keys are disabled. The LOCATE key is used to return to the beginning of Cue #1.

Pressing STOP in the middle of a cue will cause the MX to stop as expected. However, if the PLAY key is subsequently pressed, the MX will locate back to the start of the current cue and commence playing.

Recording is disabled in Theatre Play mode, and the machine is placed in "All Safe" mode.

Many other front panel functions are also disabled, including editing, capturing and locating to IN and OUT points, TO/FROM functions, and the LOOP function.

The ONLINE button remains active so that an MX-2424 in "Theatre Play" mode may become a master on the TL-Bus and thus expand the number of available "Theatre Play" tracks. When operating in "Theatre Play" mode only the master device needs to have the cue times loaded in its memory locations, and only the master device needs to be in "Theatre Play" mode.

NOTE: If Theatre Play mode is enabled on a TL-Bus slave, that machine will automatically become the TL-Bus master.

Menu 020: Auto Chase

The MX-2424 has a new chase mode that allows for synchronization convenience.

When set to "Off", chase mode acts as it has in the past. If the MX is online and a transport key is pressed, then the machine is taken offline and the transport function is executed. This is true for all forms of chase including Longitudinal Time Code (LTC), MIDI Time Code (MTC), or when chasing an MX-2424 master via the TL-Bus.

When set to "On" there are two possible conditions:
1. If theMX-2424 is is online with the transport stopped, then a slave transport key is pressed, the slave machine will be placed into a "semi online" state, and the transport function executed. This semi online state is indicated by a flashing Online LED.
In this state as soon as the MX detects that the master is in motion, it will automatically put itself online again, and will resume following the master.

2. If the MX-2424 is online/chasing with the transport in motion, then a slave transport key is pressed, the slave machine will temporarily suspend transport motion before immediately re-chasing.

NOTE: Auto Chase On/Off is currently available from the front panel only.

Menu 030: Timecode Muting Options

Some console automation systems and MIDI sequencers have an adverse reaction to incoming SMPTE time code or MIDI Time Code at a non-standard speed. With version 2.0, Menu 030 offers different "muting" options when shuttling at speeds other than playspeed.

- "Normal"-operates as it always has. MX-2424 will transmit time code when it is shuttling at fast and slow speeds.
- "Mute High Speed"-MX-2424 will mute the time code outputs when shuttling at high speed, but will still output code when shuttling at a low speed.
- "Mute Low Speed"-MX-2424 will mute the time code outputs when shuttling at low speed, but will still output code when shuttling at a high speed.
- "Mute High and Low"-MX-2424 will mute the time code outputs at low and high speeds.

To complement these muting options, the MX-2424 will now transmit the MIDI Time Code Full Message when the normal MTC Quarter Frame message stream has otherwise been muted. This will allow MIDI controllers to track the current MX position at all times. The MTC Full Message is by definition for display purposes only, and an MTC transmitter (here the MX-2424) is not considered to be "running" unless the standard MTC Quarter Frame messages are being issued. Full Messages will be transmitted at a maximum rate of one per 5 time code frame periods, and will not be sent if the time code position has not changed.

For Example: If set to mute time code, the MX-2424 will still send MTC positional information that can be read by a mixer's time code display. However, the MX-2424 will not send MTC information that the mixer's automation would chase. This would also be true of a MIDI sequencer.

Menu 060: Word->AES Phase

If you use AES/EBU as an input source and ALSO use Word Clock for your clock source, there is now an option to switch the polarity of the incoming Word Clock.

There are currently no standards which define the phase relationship between an AES/EBU digital audio signal and a standard TTL word clock. This can cause clock discrepancies between various digital audio devices.

To reduce this possibility, the MX-2424 can now "flip" the polarity of its word clock 180 degrees.

"Low-High" describes the word clock polarity that the MX-2424 has always used.
"High-Low" describes the "phase-inverted" method.

[In technical terms: the "Low-High" word clock has its falling edge aligned with the AES3 "X" preamble, while the "High-Low" form has its rising edge so aligned.]

If the TDIF option is installed, then the TDIF bus phase will "flip" along with the word clock signals, thus preserving the correct phase relationship between word clock and TDIF.

If you experience trouble locking the MX-2424's clock to other gear, experimentation with Menu 060 can often help. This problem is most likely to occur when some devices in the system are locking to word clock, while others are locking to an AES/EBU or S/PDIF input.

Menu 206: Track Key Punch

Menu 206 has been added to provide additional recording and punching options.

The "On" position of this menu causes the track record ready buttons to behave as they have in previous software versions: Pressing a track arm key, while in record, will take that track straight into record (remember that in Tape Mode, there is no UNDO). Pressing the track arm key again will take the track out of record.

When Menu 206 is set to "Off", all recording (or rehearsing) is initiated by the REC (or REH) buttons only.

For example, if tracks 1 and 2 are already recording, pressing the track 3 record arm button will **not** put track 3 into record, but only into the "record ready" state, as indicated by a flashing red "rec" indicator at the bottom of the track indicator. To initiate actual recording on track 3, the main transport REC button must be pressed (or REC+PLAY buttons, depending on the REC key mode set in Menu 202).

Similarly, once track 3 is recording, pressing the track 3 record arm button will **not** take it immediately out of record. The track "rec" indicator will begin flashing very quickly to indicate that the track is still recording, but no longer armed. In other words a punch out is pending. Pressing the main transport REC button (or REC+PLAY) will complete the punch out of track 3 only. Pressing PLAY will punch all tracks out of record as normal.

Menu 290 "More Edits" Commands

Previously, there were certain edit commands that were only accessible from the Viewnet application. Menu 290 has been added to allow these operations from the front panel. To enable these edit commands, access Menu 290, then press TRIM to scroll up to the edit you wish to perform. Press STORE to execute the desired edit. Keep in mind you must have tracks "edit enabled" from the front panel and edit In/Out points defined for this to work correctly.

The edits available in menu 290 are:
- Left Cut
- Left Local Cut
- Multi Insert
- Multi Paste
- Paste Left
- Render
- Reverse

Menu 300: MIDI Device ID

The text in this menu has been modified to display both the decimal and hexadecimal versions of the Device ID value. The hexadecimal version is often used by TASCAM consoles.
The decimal ID range is 1 thru 127, while the hexadecimal range is 0 thru 7E.
The default setting of the menu is decimal 74 [Hex 49].

Menu 301: MMC Tracks/ID

Many consoles with MIDI Machine Control (MMC) capability have been designed to control banks of 8-track machines, such as the DA-88. While transport commands such as PLAY and STOP are sent to the first 8-track machine, with the others synchronized to the first, MMC track "record-ready" commands need to be sent to each machine individually.

Menu "301 MMC Tracks/ID" allows the MX-2424 to support this track arming arrangement.

When this menu is set to "24 [one ID]", the MX-2424 behaves as it has in the past, and all 24 tracks may be armed via the MIDI Device ID specified in Menu 300.

However, when "MMC Tracks/ID" is set to "8 [three ID's]", the 24 tracks of the MX-2424 are split into three groups of 8, with each group of 8 assigned its own MIDI device ID. Tracks 1 thru 8 are armed using the Device ID specified in Menu 300. Tracks 9 thru 16 are armed at the same address plus 1. Tracks 17 thru 24 are armed using the same base address plus 2.

Example: Setting up the TASCAM TMD-4000 console to record arm tracks on the MX-2424. This example assumes a "closed loop" MMC connection with both MIDI In and Out connected between the MX-2424 and the TM-D4000.
1. On the MX-2424: Set Menu "301 MMC Tracks/ID" to "8 [three ID's]".
2. On the MX-2424: Confirm that Menu "300 MIDI Device ID" reads "74 [Hex 49]".
3.   On the TMD-4000: Set up a "closed loop" device at address "49". This device should be enabled for transport commands as well as for the first 8 tracks to be armed.
4.   On the TMD-4000: Set up an "open loop" device at address "4A" (the next hexadecimal number after 49). This device should be enabled for the second group of 8 tracks to be armed.
5.   On the TMD-4000: Set up a second "open loop" device at address "4B". This device should be enabled for the third group of 8 tracks to be armed.

Note that, on the TMD-4000, the first group of 8 tracks which can be armed is attached to faders 9 thru 16; the second group to faders 17 thru 24; and the third group to faders 25 thru 32.

Menu 501 "Post Production" input mode

Menu 501 adds a "post production" mode of input monitoring. When in this mode, armed tracks will monitor input only when recording, but not when the transport is stopped.

NOTE: The front panel auto input key can be used to toggle between the two "original" input mode choices. Access to the new "Post Production" input mode can only be done through Menu 501.

New front panel "Multi-Paste" edit function

The "Multi-Paste" edit function is now available as the shifted function of the UNDO key.

With In and Out edit points defined and track(s) enabled for editing, Multi-Paste may be activated. The display will ask "How many times?", and any number may be entered up to 99 using the numeric keypad and/or the jog wheel. Pressing STORE will complete the action.

The result of the action is that audio is copied from between the In and Out points, on edit-enabled tracks, and pasted the required number of times (minus one to account for the original), beginning at the Out point. At the end of the operation, the Out point will be updated to point to the end of the last paste, while the In point will remain unchanged.

NOTE: In previous software versions, Shift + UNDO caused execution of the "Reverse" edit function. The "Reverse" function may now be accessed via Menu 290 "More Edits" (see below).

Implementation of the MIDI Machine Control "STEP" Command

The addition of this command allows the MX-2424 to respond correctly to the Jog Wheel on the Mackie Digital 8-Bus Console, which issues STEP commands when the wheel is turned. (This change has been tested satisfactorily with D8B software version 3.0).

Front panel alphanumeric entry of characters

A front panel alphanumeric entry mode has been added for all data entry areas.

NOTE: The latest hardware will have the letter layout silk screened onto the front panel, the older hardware will not. If you have older hardware, please contact your local TASCAM Parts distributor for a sticker that can be applied to the front panel.

To use this feature:

Access the display of the project, track, etc. that you wish to rename.

Press TRIM, and a cursor will appear under the first character.

Press the number key that has the group of desired letters. Repeat pressing the number key until the desired letter in that group appears on the display. The numeric value of the key also appears in the rotation (for example: A, B, C, 7).

To capitalize a letter, press SHIFT and then press the desired number key

To move the cursor, use the shuttle ring.

When finished, press STORE to exit alphanumeric mode and save the new data. Press TRIM or CLEAR to exit without saving.

If desired, the original entry method of using the UP and DOWN arrows or Jog Dial can still be used.

Character Legend

```
7       A, B, C, 7
8       D, E, F, 8
9       G, H, I, 9
4       J, K, L, 4
5       M, N, O, 5
6       P, Q, R, 6
1       S, T, U, 1
2       V, W ,X, 2
3       Y, Z, _(underscore), 3
0       0, -(minus), &, .(period)
SHIFT + 0    0, #, (,)
CAPT         Inserts a space
SHIFT + CLEAR   Deletes the current character
```

New MASTER selection method for RC-2424

For systems with multiple MX-2424's connected via the TL-Bus, the method for changing masters from the RC-2424 has been changed. It is now accomplished by first selecting the machine which is to become master, then pressing SHIFT + MAST (labeled "NEW" on recent RC-2424's). The old method of changing masters by pressing MAST + one of the machine SELECT keys 1 thru 6 has been discontinued.

(This change will allow a consistent method of selecting masters for both the MX-2424 and the TL-Sync Synchronizer module.)

"TL_Imports" Folder now automatically created

When you initialize a disk on the MX-2424 in any format, and create at least one project, the "TL_Imports" folder will now automatically be created on that disk. It is no longer necessary to manually create this folder when the disk is mounted on a computer.

The TL_Imports Folder is used to create a folder that can hold files that are "immune" to a disk cleanup, even if they are not currently being used in a project. This allows the creation of a folder of files that are "on hand" to use whenever needed. Additionally, audio files may be placed in this folder while the disk is mounted on a computer for later import to an MX-2424 project.

Change in project delete and rename sequence

To help prevent accidental deletion of additional projects, the project menu is now exited after a track or project is deleted. It is now necessary to re-enter the project menu to delete more items.

The project menu is also exited after a project in renamed.

Smart Copy and Tape Mode Convert Safety Features

If a project is in the process of being Smart Copied or Tape Mode Converted, the MX-2424 will no longer allow that project to be renamed or deleted during the process.

New error message "Can't Verify TapeMode to Non-Destr"

Due to the nature of a TapeMode project, certain bits will change when the project is copied from one disk format to another. Therefore a verify request on a SmartCopy of a Tape Mode project will display this error message, because the copy is being performed from one file format to another.

Below is a table of "to" and "from" Tape Mode project formats that will "retain" a project's Tape Mode status.

HFS	HFS
HFS+	HFS+
FAT-32	FAT-32
.BU	.BU
HFS+	FAT-32
HFS+	.BU
FAT-32	.BU
HFS	.BU *****

***** If a Tape Mode project is backed up from an HFS disk to a .BU format DVD or tape, it must be restored onto an HFS disk to retain its Tape Mode status. During such copies, a verify request will be ignored.

New error message "Zero Length Edit"

In previous versions, the software would allow the selection of two edit points that were the same time value, creating an edit of "zero length". Attempting to copy or paste a "zero length edit" has no meaning.

If an attempt is made to copy a region that contains a length of zero, the display will then read "Zero Length Edit".

Miscellaneous Software Maintenance

Improved lock to "bad" time code in Timecode or MTC Chase modes

Previously, the MX-2424 could have difficulty sustaining a satisfactory lock when the input Longitudinal Time Code (LTC) or Midi Time Code (MTC) was of inferior quality. The allowed time code "dropout" period has been increased to 10 frames. In other words, the input timecode has to drop out for more than 10 frames before the MX-2424 will interpret the condition as a stopped master.

Improved record performance in Timecode and MTC Chase modes

The allowed amount of source time code playspeed variation has been relaxed, and once recording is underway the MX-2424 will tolerate variations in master playspeed of up to approximately 5 percent. Stable master playspeed is still required in order to enter record mode in the first place.

AUTO INPUT behavior

With AUTO INPUT enabled, the switch from playback to input mode on record enabled tracks was not taking place on transitions from PLAY directly to FAST FORWARD or REWIND. This has been corrected.

"Overload" indicators on RC-2424

Previously, the "overload" indicators on the RC-2424 would not illuminate. The overload indicators now work properly.

"All Safe" command on TL-Bus slave

Previously, the "All Safe" command would not latch on MX-2424s that were slave machines on the TL-Bus. The "All Safe" command now latches locally on any MX-2424, on the TL-Bus.

Midi Machine Control Device ID recognition

Previously, the MX-2424 would respond to MIDI messages from devices set to any MIDI Device ID, even if it was not the same MIDI Device ID as the MX-2424. The MX-2424 will now only respond to MMC messages sent from a device transmitting on the device ID set in Menu 300 of the MX-2424.

"All Online" Command on Remote

Previously the "All Online" command on the RC-2424 would not put all machines connected to remote online. The "All Online" function of the RC-2424 is now functional.
NOTE: This command will not take all machines offline.

Longitudinal Time Code (LTC) reader and "Drop Frame" flag

Previously, the Longitudinal Time Code (LTC) reader, as well as the Midi Time Code (MTC) reader, would not recognize changes in the drop frame status of incoming drop frame time code, if the incoming code was at a fast forward or rewind speed. This has been corrected.

NON-STD LED

The NON-STD light will now flash when the MX-2424 is set to a Varispeeded in Menu 000.

Remote MIDI LED

Previously, the MIDI led would not illuminate on the RC-2424 when MIDI activity was detected by the MX-2424's MIDI ports. This has been corrected.

TL-Bus Offset Captures

Previously, when using a TL-Bus slave, the CAPTURE key could be used to establish an MX Offset (MXOFS) by taking the slave offline, moving it to a new position, and hitting CAPT then OFFSET.

However, if the master was still moving while the slave was offline, then its NEW position would not be used for the offset calculation.

The slave now correctly tracks the master position, even while it is itself offline.

It remains necessary for the master to be online.

Miscellaneous Notes:

The following are some MX-2424 behaviors to keep in mind:

- The Timecode display of the MX-2424 has a "24 hour time limit". Values above 23:59:59:29 cannot be displayed. When using Menu 703 "Free Disk Space" with larger hard drives, it is possible that there will be more than 24 hours of free disk space. If that occurs, the MX's time display will "wrap around" from 24 hours. For example, if a disk provides 25 and 1/2 hours of recording time with 4 tracks armed, the MX will display it as 01:30:00:00 of free disk space.

- When performing multiple Smart Copy operations from the front panel or Viewnet, please wait until the "busy" light on the front panel goes out before performing the next smart copy command in the queue. This will allow the MX-2424 to properly "queue" up the intended copies.

- When choosing the start time of a Tape Mode project, the start time is "tied" to the 1st group of tracks that were recorded in that project. As long as those tracks are loaded, the project's start time can not be changed. To change the start time in the same Tape Mode project, unload the original tracks. Once these tracks are unloaded a start time can be selected for the current Tape Mode project and the tracks re-loaded.

- The MX-2424 can synchronize its sample clock to a multiple or divisible of the chosen clock rate. For example, if you are working on a project with a 96KHz sample rate, you can lock the MX-2424 to an external word clock of 48KHz or 96KHz.

- When operating at a high sample rate, you can only use 12 tracks. However, ViewNet will allow you to "load" audio files into tracks 13 through 24, even though you will not be able to hear these tracks or access them. This behavior will corrected in Version 3.0 with MXView. Do not attempt to load audio into tracks thirteen through twenty-four, even though Viewnet will allow you to.

- The timecode calculator in ViewNet does not offer calculations based on high sample rates. It will still work for calculations based on the base sample rates of 48k and 44.1k.

MX-OS 2.1 and Viewnet 2.1 Release Notes

- Support for 9-pin Control Protocol
- Enhancements
- Maintenance Changes
- Known Issues

Support for 9-pin Control Protocol

With version 2.1 software, the MX-2424 can now use the Sony P2 (9-Pin) machine control protocol. Four new menus have been added to allow the new functions:

Menu 340: Remote Assign.

> Menu 340 selects the function of the rear-panel Remote connector. To use the MX-2424 with the RC-2424 remote control unit, select "RC-2424". To use the MX-2424 as a 9-pin device, select "P2 In".

Menu 360: P2 Device

> Menu 360 determines the type of P2 device the MX-2424 will "respond as" when polled by a controller.
>
> The available settings of this menu are:
>   TASCAM MX-2424   (default)
>   Sony PCM-3324S
>   Sony PCM-7030
>   Sony BVU-950
>
> These selections are not machine "emulations" in the strictest sense of the word. The P2 implementation in the MX-2424 is a generic one, and is designed to behave correctly under many different conditions.
>
> A P2 controller, upon detecting a device connected to it will poll that device for identification. This menu determines how the MX-2424 will acknowledge.
>
> Some P2 controllers will not operate at all unless they receive a response from the controlled machine that they recognize. Changing this menu may make the difference between whether the controller can operate with the MX-2424 or not.

Menu 361: P2 Track Arm

Digital Audio   (default)
Analog A1-A4
Local
Local [enbl=A1]
Local [enbl=A2]
Local [enbl=A3]
Local [enbl=A4]

Menu 361 controls the P2 track arming interface.

The original P2 protocol supported up to 4 analog tracks, which was considered sufficient for the P2 controlled video machines of the time. Setting Menu 361 to Analog A1-A4 will allow the first four tracks of the MX-2424 to be record enabled from a controller limited to this P2 implementation.

With the introduction of digital video machines the P2 protocol was extended to include a larger number of digital audio tracks. The default setting, Digital Audio, accounts for this implementation of P2.

The "Local" option disconnects the MX-2424 from any track arming commands received via the P2 port, and assumes that the operator will arm tracks at the front panel or with ViewNet.

"Local [enbl=A1]", "Local [enbl=A2]", "Local [enbl=A3]" and "Local [enbl=A4]" also use "Local" track arming. The difference is that before any recording or rehearsing can take place, the P2 controller must first arm the specified analog track (A1 thru A4). That analog track therefore serves as a record/rehearse enable. This feature is only useful where (a) the P2 controller has limited track arming capability and cannot access all 24 tracks, and (b) the operator wishes the P2 controller's EDL to document MX-2424 punch in and out activity.

Menu 362: P2 Punch Delay

The available choices are:
Off
1 frame
2 frames
3 frames   (default)
4 frames
5 frames
6 frames

Menu 362 determines the delay in frames after the MX-2424 receives a command and the actual execution of that command. The menu applies only to record, rehearse, or track arming commands.

The "Off" setting means that the commands will be executed immediately, with no frame delay.

Video decks have always had a fixed and predictable delay between the receipt of a punch command and the execution of that command. Traditional P2 controllers expect such a delay. This menu allows the operator to set the MX-2424 delay to match that expected by the controller.

P2 controllers designed for manual, unsynchronized operation may have no notion of this delay, and for these controllers the best menu setting may be "Off". Audio consoles would fall into this category.

Enhancements

Menu 703:

Previously, the "Free Disk Space" Menu could be confusing when displaying available disk space beyond 24 hours. This has been modified to represent available disk space in an Hours/Minutes format.

Menu 004:

Two new frame rates have been added to Menu 704:
23.976 (The "pull down" variant of 24 frames per second)
24.975 (The "pull-down" variant of 25 frames per second)

These new time code rates will allow the MX-2424 to synchronize with formats that use these rates, such as video for High Definition Television.

New Macro Tool:

Hitting the CLEAR key plus one of the following: "REC SEL", "INPUT", or "EDIT" will clear the corresponding track selections. For example, CLEAR + REC SEL will disarm all record enabled tracks.

This function aids macro recording on the RC-2424. Macro sequences often rely on the track arm, edit, or input status to be in a known state (e.g. all tracks unarmed). Previously, there was no command an operator could give to specifically "de-select" the arm, edit, or input status of a key; They could only be toggled on and off.

With this new macro tool, the operator can have an initial step in the macro that specifically ensures track arm/edit/input status of all tracks.

Capture Track:

A new edit operation has been added called "Capture Track". This operation places the In and Out points around all the audio on an edit-enabled track. If no tracks are edit-enabled the In and Out points will be placed at the head and tail of the project.

Capture Track is accessed by pressing SHIFT + SETUP. This function is also accessible from Menu 290.

Spotting SDII Audio Files with Pro Tools 5.1

Previously, MX-2424 generated SDII audio files would not spot correctly into a Pro Tools 5.1 session. With version 2.1 software, the MX-2424's SDII files will now spot correctly into a Pro Tools 5.1 session.

Maintenance Changes

Time Code generator at 29.97 frames per second.

MX-2424 Version 2.0 contained a bug in the internal timecode generator. The MX-2424 generated faulty 29.97 drop frame and non-drop frame SMPTE time code. This has been corrected.

Capture Key When Programming Macros from the RC-2424

Previously, the CAPT key would not always work reliably when programming a Macro using the RC-2424. This has been corrected.

Fix for HFS+ formatted DVD-RAM disks

Previously, the MX-2424 would not always work reliably with DVD-RAM disks that had been formatted as HFS+ on a Macintosh computer. This has been corrected.

Fix for Uploading Nuendo Generated Files in ViewNet MX

Previously, Nuendo generated sound files would not import correctly via Ethernet, using Viewnet's "transfer sound files" function. This has been corrected with Viewnet version 2.1.

Known Issues

Smart Copy of TapeMode Projects

A project Smart Copied on the MX-2424 can only maintain TapeMode status when the two drives have the same block size. Therefore, in addition to following the "To/From" Smart Copy chart below, the source and destination drives must be the same model when the BU format is not used (as in the first 4 scenarios below).

HFS	HFS
HFS+	HFS+
FAT-32	FAT-32
HFS+	FAT-32
HFS+	.BU
.BU	.BU
FAT-32	.BU
HFS	.BU

Switching Between HFS and HFS+ Drives

The MX-2424 must be rebooted before switching between HFS and HFS+ for the same SCSI ID.

MX-2424 3.01 Release Notes

- Menu 280: Mix Mode
- New "Auto" Modes
- Menu 005: New Sample Rates
- Menu 522 Meter Clip Mode
- Support for 256MB of RAM
- Menu 570: Waveform Record
- Menu 211: New Title & Function for "Auto Unload On/Off"
- Menu 035: MTC Full Mode
- Menu 364: P2 Chase Control
- Automatic Audio File Prefixes
- Faster "Catch Up" Times for Long Recordings

- Miscellaneous Enhancements
- Miscellaneous Maintenance Items
- User Notes

Menu 280 Mix Mode / Menu 801 Mixdown Project Name

The MX-2424 can now record (up to 24 tracks) via its inputs while simultaneously playing back audio (up to 24 tracks). This new feature is called Mix Mode, and is selected in Menu 280.

This new feature allows you to play back a project through a mixing console, then record the console's output back into the MX-2424's inputs. You can play back up to 24 tracks and mix down to as many 24 tracks, all at the same time. It is also possible to play back a 24-bit project while recording back to a 16-bit project, for 16-bit CD mastering. The MX performs real time dithering when recording in 16-bit mode instead of simple truncation.

Mix Mode has 3 states of operation: Off, Record, Playback.

When set to "Off" the MX-2424 acts as it always has. Mix mode is not available.

Record Mode

When set to *Record*, the MX-2424 will play the currently loaded project out of its outputs, as it usually does. However, the MX-2424's inputs will simultaneously record any incoming signal to a separate, "Mix Project". The MX-2424 will indicate it is in Mix Record mode by horizontally cycling the meters' "Signal Present" light across all 24 meters, at a rapid pace.

The new menu #801 lets you specify the name of the mixdown project. If no unique name is specified, the default generated mixdown project name would be the original project's name with a "-1" added. The mixdown project is a normal project just like any other, so it can be loaded at a later time for editing, etc.

For an example of some of the benefits of Mix Mode, consider the following scenario: You have a 24 track project that is routed to a mixer and you want to mix down to a stereo pair of tracks. The console's stereo output would usually be routed to a DAT deck, stand-alone CD recorder, or stand-alone HD mixdown machine.

With Mix Mode, using an external mixdown machine is no longer necessary. The stereo mix is routed back to the MX-2424 and recorded onto 2 channels. You now have two mono digital audio files that are the left and right side of your mix. These files can then be taken to a Macintosh or PC through removable hard drives or via an Ethernet file transfer for CD mastering.

The value of this feature becomes even more apparent because Mix Mode will record up to 24 tracks easily making 6-track surround sound mixes for authoring DVD-Video and DVD-Audio projects.

Playback Mode

Setting the Mix Mode to *Playback* lets the user hear the mixdown project without having to load it. This provides a quick method of listening and checking the mixdown project without unloading the multitrack "source" project. The MX-2424 will indicate it is in Mix Playback mode by horizontally cycling the meters' "Signal Present" light across all 24 meters, at a less rapid pace than in Mix Record mode.

When mix mode is turned off, menus 700, 701, and 702 reflect disk settings for any loaded project, just as they always have. However, in Mix Record mode, they reflect the settings for the unique mix project that will be generated. Specifically:
- Menu 701 will choose the SCSI ID of the destination disk for the mix project
- Menu 702 will show the disk status of the mix project's destination disk
- Menu 703 will show the available free space for the mix project's destination disk

Keep in mind that the loaded source project and the mix project can be at different bit depths, and if the two projects reside on different hard disks, they can also be in different disk formats. It is possible to mix a project containing SDII files on an HFS+ disk down to two Broadcast Wave files on a FAT-32 disk. Also, the source files could be 24 bit while the mix project can be set to 16-bit. This is because the MX-2424 dithers the signal in real time while recording at 16-bit from a 24-bit input. The only aspect that must remain the same between the two projects is the sample rate, because the MX-2424 uses a global sample rate for the entire machine.

Front panel editing of the Mix project can be performed in Mix Play mode. When the MX-2424 is in Mix Play mode, the relevant front panel edit operations are directed at the mix project. In addition, future versions of MX-View will offer support for editing the Mix Project.

Metering during Mix record mode will display the signal present at the inputs of the MX-2424. This allows you to ascertain that the console's output is not overloading the MX-2424's inputs.

Mix Mode Tutorial

You have a 24-track project that is ready to play on the internal SCSI disk at ID 0. It is a 44.1kHz / 24-bit project on an HFS+ drive. The mixdown files need to be recorded on an external removable FAT-32 drive to be taken to a PC for mastering.

1. Connect the 24 outputs of the MX-2424 to an analog console to mix the 24 tracks down to stereo.
2. Connect the main stereo outputs of the console to inputs 1 & 2 of the MX-2424.
3. Set menu 280 to "Record".
4. Set menu 701 to the removable disc's SCSI ID 1 so that mix project can be removed and taken to the PC.
5. Set menu 700 to "WAVE 16-bit" so that the final mix project will record 16-bit audio files.
6. Mix the project in console normally.
7. Record enable tracks 1 and 2 on MX-2424 and hit "record" at beginning of project.
8. As the song plays, the console's stereo output is recorded as a new 2 track, 16 bit, 44.1kHz project onto the removable disk at SCSI ID1.
9. Take the removable disk to computer and mount it. The disk contains two mono audio files that represent the left and right side of the mix.
10. Use your favorite mastering/CD burning software to complete an audio CD.

New "Auto" Project Names

When specific project names are used, the MX-2424 can automatically load, play, or loop play a project immediately upon powering up, with no intervention necessary. The MX-2424 can now be used in areas like kiosks, theme parks, installed sound, etc. Simply by flipping the power switch, the MX-2424 can automatically load a predetermined project and can even play it repeatedly, over and over. If there is a power failure, the machine will boot back up when power returns, and begin playing again. This feature works as follows:

Autoloop

If a project is created or renamed with the title "autoloop.tl", the MX will load and start playing the project, in loop mode, as soon as the machine powers up. The loop points will be defined by the IN and OUT point stored in the machine as the "user default" setting.

However, under the following conditions:
*   The IN and OUT points are equal
*   The IN is greater than the OUT
*   The loop is less than 2 seconds long
The Head and Tail of the project will be loaded into the IN and OUT registers and used.

Autoplay

If a project is created or renamed with the title "autoplay.tl", the MX-2424 will load and start playing the project, as soon as the machine powers up.

Autoload

If a project is created or renamed with the title "autoload.tl", the MX-2424 will load (but not play) the project, as soon as the machine powers up.

Auto Project Name Priorities

The MX-2424 will look for "autoloop" first, then "autoplay", then "autoload" and act on the first one found. The project name can contain either upper or lower case character, because project names are not case sensitive.

Drive Read Only Status

If any of these Auto Projects are found upon boot-up, the SCSI volume containing the project is set in software to Read Only to prevent any accidental records or deletions. This Read Only status does not affect the drive itself, only how the MX-2424 sees it.

If you wish to delete or edit a project on a drive set to Read Only, unmount the drive, then remount it. Once remounted, the drive will lose it's Read Only status.

Menu 005 Sample Rates

With version 3.01, the MX-2424's available sample rates has been expanded to accommodate more post-production requirements: The available rates now are:

42294 (44x23/25)	84587 (88x23/25)
42336 (44x24/25)	84672 (88x24/25)
44056 (44100-)	88112 (88200-)
44100 (default)	88200
44144 (44100+)	88288 (88200+)
45938 (44x25/24)	91875 (88x25/24)
45983 (44x25/23)	91967 (88x25/23)
46034 (48x23/25)	92068 (96x23/25)
46080 (48x24/25)	92160 (96x24/25)
47952 (48000-)	95904 (96000-)
48000	96000
48048 (48000+)	96096 (96000+)
50000 (48x25/24)	100000 (96x25/24)
50050 (48x25/23)	100100 (96x25/23)

- The terminology "42336 (44x24/25)" means a 44.1K rate pulled down by the 24 frame to 25 frame ratio.
- The number "23" is used to denote the NTSC pull-down version of the 24 frame rate, 23.976 frames per second. Hence the display "42294 (44x23/25)" means a 44.1K rate pulled down by the 23.976 to 25 frame ratio.
- The terminology "44056 (44100-)" indicates the 44.1K rate with the standard NTSC pull-down. Similarly, "44144 (44100+)" implies an NTSC pull-up.

Menu 522 Meter Clip Mode

Menu 522 now allows for options regarding how the MX-2424 will display digital "overs" on its meters. When set to "Input Only, overs will display when played back but will disappear a moment later. When set to "Input and Play" any digital overs will display when played back, and

then remain lit until the play key is pushed again (after initiating a stop command). This allows any digital overs that have occurred to be seen, even if they occurred earlier in the project.

New Expanded RAM Options

With software version 3.01, the MX-2424 is able to take advantage of 256 megabytes of installed RAM. For dense editing with the MX-View graphical interface you should upgrade your MX-2424 to 256 megabytes of RAM. Contact TASCAM Sales at 323 726-0303 to order the specific RAM required by the MX-2424. Other types of RAM may not perform reliably.

Menu 988 will display the amount of installed memory in the MX-2424

If unsupported RAM that is not compatible with the MX-2424 is installed, the machine will not power up in a normal manner. The following message will be displayed: "Mounting Drives, Unsupported RAM". At that point the machine must be powered down and the unsupported RAM removed. Either the stock RAM or the proper TASCAM RAM upgrade module would have to be installed.

A New "Ram Low" message has been added to help you determine if you need to purchase the expanded RAM. You can try your normal working habits with the stock 128 megabytes of RAM, and determine if you encounter this message. If you encounter this message, you can unmount the drives and cycle the power, with no risk to the audio data.

If you encounter this message, your working habits require the expanded RAM.

Comment: This one is a hornets nest because we will be shipping new machines with 256 so old users will want free RAM. Since you mentioned how to see how much is installed I'd just leave it at that.

Menu 570-Waveform Record

With the 3.01 release, it will be possible to use your MX-2424 recorder with the new graphical user interface, "MX-View", which among other things, will display audio waveform data of MX-2424 recordings.

Turning Menu 570 to "on" allows the MX-2424 to record waveform data along with the audio files. Thus, when a project is loaded into MX-View and its waveforms are displayed, there is minimal delay since the waveform data was already "computed" when the recording took place.

It is important to understand that creating and drawing waveforms uses RAM. In general, Waveform Recording should be set to "off" if you are experiencing "Memory Low" messages and the machine's RAM has not been upgraded to the 256 megabyte module. You could also leave Waveform record turned off if you do not plan to use MX-View at any stage of your recording process.

After loading MX-2424 software version 3.01 the MX-2424 will default to "off" for waveform recording. However, when MX-View software is launched for the first time, MX-View will automatically turn waveform recording on.

Menu 211: New Title & Function for "Auto Unload On/Off"

In previous software versions, menu 211 was titled "Auto Unload On/Off ". If Auto Unload was turned on and the MX-2424 was in "Loop record" mode, it would unload each new track it recorded to be manually loaded at a later time.

With version 3.01, Menu 211 has been re-titled to "Auto V Track On/Off" and its function has been changed as follows:
If MX-View is not being used, Loop recording with Menu 211 set to "On" will work the same as it has previously. If MX-View is being used and menu 211 is set to "On", the MX-2424 will automatically create a new virtual track with each record pass, and place the recorded audio in the new virtual track. Virtual tracks with MX-View are not the same as unloaded tracks. Please refer to the MX-View Operations manual for details of the new Virtual Track operation using MX-View.

Menu 035: MTC Full Message

This new menu enables/disables the presence of MIDI Time Code "Full Messages". These are periodically transmitted messages that occur when the generator output is muted (using menu 030),

The presence of these messages is normally intended to provide a display update in a connected MTC device, as opposed to synchronization information. Disable these messages if the MTC receiving device, such as a digital mixer, is unable to handle them correctly.

Menu 364: P2 Chase Control

The MX-2424's P2 section now allows for receiving the P2 "chase" command from an appropriate P2 9-pin controller.

If the MX-2424's menu 340 is set to "P2 In", and an attached P2 controller sends a "chase" command the MX-2424 will go online and menu 000 will change to "Timecode Chase"

Menu 364 has 4 settings to allow for different situations:

Disabled (default): When set to "disabled" the MX-2424 will ignore the P2 "Chase" command from any device that issues it. In addition, when the MX is chasing LTC or MTC, the only P2 commands accepted will be track arming and punch commands.

"Enabled: LTC": With this setting, the P2 Chase command will be accepted, as well as the P2 Offset preset command. P2 commands will be honored regardless of whether the MX is in LTC chase.

"Enabled: MTC": With this setting, the P2 Chase command will be accepted, as well as the P2 Offset preset command. P2 commands will be honored regardless of whether the MX is in MTC chase.

"Enabled" Auto": With this setting, the MX-2424 will be enabled for whatever timecode source it was last set to chase in menu 000, either LTC or MTC.

New Audio File Prefixes

Previously, the MX-2424 would assign names to a project's recorded audio files which were only related to the track an audio file was recorded on. In version 3.01 software, the audio file prefix is given the same name as the currently loaded project.

For example, if the project is called "Rock Song", then recorded audio files would follow the pattern of (ProjectName)_(Track #)_(Sequence #). The sequence numbers would increase with each new audio file in the project. An example of some audio files might look like:

(Rock Song_1_35)
(Rock Song_1_36)
(Rock Song_1_37)

This "auto-naming" function can still be overridden at any time by using menu 820 "File Prefix". If the setting of Menu 820 is changed, all files generated from that point on while the project is loaded will use the new file name.

When a new project is loaded or created, the audio files will again take the name of the project unless changed in Menu 820.

Faster "Catch Up" Times for Long Recordings

In previous software versions, the MX-2424 would require a long time to "process" the audio it had recorded during a very long take. After recording a long concert event in one long pass, the machine would be in a "busy" state for several minutes while it finished writing all the data to disk.

With version 3.01 software, the "busy" time in these situations has been dramatically reduced. You will notice as much as a tenfold improvement in post-record processing times.

Miscellaneous Enhancements

Tape Mode Now Stored In User Default Settings

With version 3.01 software, the MX-2424 can now store Tape Mode Status (Menu 200) as part of a User Default setting. The machine can now automatically boot up into TapeMode.

Negative and "Double Positive" Timecode Locations

Previously, when rolling back over the SMPTE number of 00:00:00:00, the MX-2424 would incorrectly increment backwards from 24 hours.

With version 3.01, the MX-2424 will now display timecode as a negative number rather than a positive number when it rolls backwards over 00:00:00:00

By using the +/- key (Shift 0), it is possible to enter and locate to a negative timecode position directly. Such values may also be captured and stored in any of the timecode registers (In, Out, etc) or in a memory location.

NOTE: The MX-2424 does not permit recording or editing prior to zero. If the playhead is currently in the "negative region" and the machine is put into record, the MX-2424 will wait until it reaches zero before actually recording. The record LED will flash quickly to indicate this special "record-pending" state.

When rolling past 23:59:59:29, the MX-2424 will now attach a "+" sign to the beginning of the timecode display to indicate that the transport position has moved into the next 24 hour period. These "+" numbers may be captured, located to, and stored in a memory location. Unlike the negative numbers, it is not possible to enter them manually.

Although the MX-2424 will allow recording beyond 24 hours, you can not do any editing or MX-View automation before or after the 24-hour range.

Larger File Lengths in HFS+ mode

Version 3.01 software now allows the user to record single files as large as 12 gigabytes, if the record disk is in the HFS+ format. This allows a single file to be approximately 12 Hours at 96K / 24-bit, and approximately 24 hours long at 48k/24- bit.

Increased Functionality of Sony P2 protocol

Menu 361 adds a new "console" track arming interface that allows new options for track arming through the Sony P2 protocol.

With menu 361 set to "Console" the MX-2424, if it is a TL-Bus slave, will now respond ONLY to P2 track arming commands, and will do so whether it is online or not.

Example: A studio uses two MX-2424 recorders, locked via the TL-Bus as a single 48 track system. The engineer wishes to connect both MX-2424 machines to two individual P2 output ports on the console, so that the console can arm all 48 tracks with its track arm buttons.

By having the slave only respond to P2 track arming commands and not transport commands, the slave is able to have it's tracks armed remotely, yet still stay synchronized with the master machine.

NOTE: When controlling the MX-2424 with the TASCAM DM-24 digital mixer via P2, set Menu 361 to Console in order to have track arming status displayed on the console when tracks are armed locally on the MX-2424.

New Behavior for Tape Mode Projects

Previously, when working in a Tape Mode project, it was possible to change the project to "Non-Destructive" status by setting the machine to non-destructive in Menu 200 while the project is loaded. However, if no edits or recordings were performed on the project before unloading, the project would still load as a Tape Mode project the next time

With version 3.01, it is no longer necessary the user to record some audio, after changing a project to non-destructive, to "preserve" the non-destructive status. The project will load the next time as a non-destructive project, whether or not additional audio has been recordeds.

Default disk format is now HFS+

Previously, the default disk format was HFS. Since most hard disk drives sold today are larger than 9 gigabytes and would require FAT-32 or HFS+ formatting, the HFS formatting option no longer the default.

Mandatory HFS+ formatting for drives larger than 9 gigabytes

Drives larger than 9 gigabytes must always be formatted as HFS+ as opposed to HFS to be used on the MX-2424. Operators unaware of this would often format large drives as HFS, which would cause immediate problems upon recording. With version 3.01 if it is attempted to format a drive larger than 9 gigabyte as HFS, the MX-2424 will not allow it, prompting to format the disk as HFS+

Miscellaneous Maintenance Items

Special Characters on HFS+/HFS Volumes

Previously, the MX-2424 would have trouble mounting disks that contained special characters such as the German "Umlaut". This has been corrected with version 3.01

Previously, the RC-2424's ALL SAFE key would not put all attached machines into "record safe" mode. This has been corrected with version 3.01

Previously, the subframe display was not available for the LENGTH register on the MX-2424's front panel. This has been corrected with version 3.01

Previously, the RC-2424 remote would not correctly display digital overs on its clip LED's if the selected MX-2424 was not the one physically plugged into the RC-2424. This has been corrected with version 3.01

Previously, the RC-2424 remote would not always store user-created Macros correctly. This has been corrected with version 3.01

Previously, the MX-2424 would very rarely switch to a frame rate of 30FPS when a rate of 29.97 was chosen. This has been corrected with version 3.01

User Notes

Pro Tools users should make sure to use the latest version of the Pro Tools software. If you are inserting MX-2424 generated sound files into a Pro Tools session, make sure to set the Pro Tools "Session Start Time" to within 12 hours of the imported files' time stamp. For example, if importing files with a time stamp of 15:00:00:00, assign a session start time of 14 hours.

Ethernet backup/restore of projects larger than approximately 500MB is currently unreliable in the Macintosh version of MX-View only. The PC version is working correctly. This will be corrected in an update as soon as possible.

MX-OS 3.05 / MX-View 1.30 Release Notes

Markers Window

A Markers window is associated with a particular Edit Window. Load a project, open the edit window for that machine, then select Markers from the Window menu. As usual, window selections can be done with keyboard shortcuts also, but note that an Edit Window or User Groups Window must be the front window or the Markers window will not be accessible.

The Markers window displays the marker number and marker name of all location markers for the loaded project. If the Edit window is in multi-machine mode, the Markers window will display a separate list of markers for each machine; click the disclosure triangle next to the machine name to see the list of markers for that machine.

Closing the Edit window will also close its associated Markers window.

Click on a marker to select that marker. Double clicking on a marker will cause the transport to move to the marker location.

Selecting a marker will enable the Markers menu items in the menubar. Shift-selecting and Command-selecting (Mac) or Shift-selecting and CTRL-selecting (Win) work for contiguous or non-contiguous multiple selections. The menu items are for renaming or deleting markers. With single or multiple markers selected, pressing the delete or backspace key will delete the selected marker(s).

User Groups

Implementation of User groups entailed changes to many pieces of the Edit Window as well as adding the User Groups window itself.

Overview of changes:
- 12 User Groups
- User Groups window
- New track/waveform colors
- New "User Group" track menu item
- User Group track buttons are now active
- Input, Record and Edit select track button function changes
- Edit drag-select changes

12 User Groups

When a new project is created, there are no User Groups and all project tracks are considered as not belonging to any user group. Note that this means that the project file format does not really change until after user groups are specifically added to a project, so creating a new project is exactly like starting out with a pre-existing project; neither has any user group information.

In order to use groups, groups must be created and then tracks assigned to groups. The user can create one group at a time and does not have to create any groups if none are desired. The MX software allows up to 12 user groups to be created. All tracks that are not grouped can be viewed as the 13th group, but there are only 12 user defined groups.

User Groups window

A User Groups window is associated with a particular Edit Window. Load a project, open the edit window for that machine, then select User Groups from the window menu. As usual, window selections can be done with keyboard shortcuts also, but note that an Edit Window or Markers Window must be the front window or the User Groups window will not be accessible.

The user groups window displays the group color, number and group name of all groups for the loaded project. If the Edit window is in multi-machine mode, the User Groups window will display a separate list

of groups for each machine; click the disclosure triangle next to the machine name to see the list of groups for that machine.

Closing the edit window will also close the user groups window.

Click on a group (anywhere on the group's row) to select that group. Shift-selecting and Command-selecting (Mac) or Shift-selecting and CTRL-selecting (Win) work for contiguous or non-contiguous multiple selections. (Exactly the same as other list views in MX-View.) Double clicking on a group will activate that group (see "User Group track buttons are now active" below).

With the user groups window active (frontmost), a Groups menu will be
displayed with items to:
- Create a new group
- Rename an existing group
- Delete group(s)

Creating a new group (From the User Groups Window)

Activate the user groups window.
- If in single machine mode, the New Group menu item will be enabled:
  - ➢ If there are less than 12 groups already existing for the current project.
- If in multi-machine mode, the New Group menu item will be enabled if:
  - ➢ Only machine item(s) are selected (no user groups can be selected).
  - ➢ Each machine selected must have fewer than 12 groups created.

Looking at this another way: If the user groups window does not have multiple machines, then it does not matter what is selected in the list and the New Group menu item will be enabled as long as there are fewer

than 12 groups already created. If the user groups window represents the user groups for multiple machines, then the user must designate which machine to create a new group for by selecting that machine and the selected machine must have fewer than 12 groups already created. As a convenience, the user is allowed to select multiple machine items (but still no user group items) and is allowed to create a new group in each selected machine as long as all of the selected machines have fewer than 12 groups each (not total).

Once these criteria are satisfied, select New Group from the Groups menu and a new group(s) will be created. The new group will be automatically numbered and named with the next available group number.

For example, if groups 1, 2, 4 and 5 already exist, then selecting New Group will result in group number 3 (named "Group 3") being added to the group list for the current project. If in multi-machine mode and with
multiple machines selected, each machine will have the next available group created, so the first machine might get a new group ("Group 2") and a second machine might get a different group ("Group 4"). Each machine in a multi-machine display is treated separately in terms of creating groups.

Creating a new group (From the Edit Window)

A new user group can be created with one or more tracks automatically added to the new group by creating the group directly from the edit window. New groups created in this manner may be named and the group color selected at the time the group is created.

Activate the edit window.

Click on a blank group button (the group button of a track that is not currently in a group). Multiple tracks may be selected for inclusion in the group by shift-clicking on multiple blank group buttons. The multiple tracks may be non-contiguous.

Select "New User Group…" from the "Edit" menu (on the main menubar) or type Command-G (Mac) or CTRL-G (Windows) to create a new group with the selected tracks.

A "New User Group" dialog will appear, allowing the group to be named and the group color selected. Click on "OK" to create the group.

The selected track's group buttons will all change to reflect the new group number and color and the new group will appear in the User Groups Window (if it was open).Rename an existing group
1. Activate the user groups window.
2. Select the group to be renamed (only one single group may be selected and renamed at a time). Select the Rename Group menu item from the Groups menu.
3. A dialog window will appear, allowing the group to be renamed. Group names can be up to 100 characters long.

Delete group(s)

Activate the user groups window.
1. Select the groups to be deleted. Note that anything can be selected in the list, even machine items in multi-machine mode. Any group items that are selected will be deleted and machine items will be ignored.
2. Select Delete Group from the Groups menu or press the backspace or delete keys to delete all selected groups.

New track/waveform colors

There are now effectively 13 groups per project/machine in the Edit Window. By default, no tracks are grouped. Black waveforms represent tracks that are not grouped. All tracks that are assigned to a particular user group:
➢ Have the track's group button marked "G"
➢ Have the track's group button show a color representing the assigned group
➢ Have the track's waveform drawn in the assigned group's color.

New "User Group" track menu item

Once User Groups have been created, tracks may be added to a User Group by selecting the User Group from the track pop-up menu. With User Groups created, a new menu item "User Group" will become enabled in the track menu, from which the track can be assigned to any of the available user groups.

Select the "none" item to remove a track from a user group .

Select a different user group to move a track from one user group to another. Doing this will immediately cause the track's group button to change the new group's color and the waveforms to be shown in the new color.

User Group track buttons are now active

Note: In the following, clicking on a group means to click any track's group button belonging to a particular group (since they are all the same group and color).

In the Edit Window, clicking on a group will toggle that group between active and not active. Multiple groups can be activated by shift-clicking on any group, which will add or remove the clicked group from all active groups. Single clicking on a group will toggle the selected group while de-activating all other groups.

The User Groups window can also be used to activate groups. In the User Groups window, double clicking on a group item will activate that group, just as if a group button had been clicked in the edit window. In addition, the User Groups window has a special "group" item that is not really a group, but acts to de-activate all groups in the edit window. This item is labeled as "None" and when double clicked with deactivate all active groups.

If there are virtual tracks visible for any track that is assigned to a group, the group buttons for all virtual tracks associated with a physical track will activate/deactivate together and will always be in the same state.

In multi-machine mode, any groups whose group number and group name are identical will be treated as the same group. This means that activating a group on one machine can potentially activate that same group on another machine as long as the names match.

Input, Record and Edit select track button function changes

With no groups activated, the Input, Record and Edit select track buttons function exactly the same as in previous versions of MX-View.

With one or more groups activated, these track buttons work as follows:

With one or more groups activated, click on the track Input, Record or Edit buttons of ANY track belonging to ANY group to toggle Input, Record Enable or Edit Enable for ALL tracks of ALL selected groups.

Control-clicking (Mac or PC) on a track Input, Record or Edit button will override the active user groups to allow enabling that mode for individual tracks.

In multi-machine mode, any groups whose group number and group name are identical will be treated as the same group. This means that enabling input, record or edit for any active groups on one machine will automatically enable the same function for all active groups with the same group number and group name on all machines.

Edit drag-select changes

With no groups activated, using the Cross-Hair Tool to drag-select an area in the Edit window will activate edit mode for those tracks exactly the same as in previous versions of MX-View.

With one or more groups activated, drag-selecting track EDL edit areas will only effect those tracks belonging to the active group(s).

The same notes about multi-machine mode apply here. Groups on multiple machines are treated as the same if their number and name match.

Maintenance Items

- Changes implemented to avoid various types of waveform database corruption
- Missing sound file problem upon Render fixed
- Display of Mix Mode bit depth is now correct
- Improvements to the FAT-32 file system for improved Disk Cleanup performance and handling of larger files
- Meter problem on bootup from MX-OS 3.04 fixed
- Changes implemented to eliminate rare occurrences of clicking/popping
- Changes implemented to further reduce the possibility of a parse error
- New Ethernet module implemented for increased speed & reliability of network connections
- Change implemented to not automatically set Menu 570 (Waveform Record) to On when MX-View connects
- Change implemented to prevent action (Load, Rename or Delete) with a TapeMode project that is in the middle of being created from a TapeMode convert. The following error message will now be displayed: "Proj in Backup Queue"
- Drive space is now pre-allocated for the waveform database
- Changes implemented for correct performance of MX-View Virtual Tracks in a TapeMode project
- Fixed Windows return to playhead problem
- Fixed Windows font problem. Windows large/custom font sizes now work
- Net backup verify option is now enabled in the File menu

Important Note About This Release

- In order to take advantage of waveform database and file system improvements, hard drives must be reformatted under 3.05 before use. Backup your projects, reformat/initialize then restore your projects.

Known Issues

- When smart copying to an HFS+ destination drive where many audio files (in the thousands) already exist, the smart copy process may slow considerably or even stop. The workaround is to use FAT-32 as the destination drive format.

MX-View 1.4 and MX-OS 3.10

New Features

Pencil Tool

The pencil tool provides the ability to repair audio events that suffer from a pop or click.
In order to use the pencil tool, the following criteria must be met:

1. The waveform zoom level must be fully zoomed in (+) so that the audio waveform is displayed down to the sample level. Attempting to alter the waveform data at any zoom level other than the sample level will have no effect.

2. The entire audio event, which contains the waveform to be edited, must be set to full gain. Attempting to alter the waveform data of an event that has gain less than maximum will have no effect. This applies to any portion of the event waveform.

3. No portion of the audio event that has an applied fade will be editable. This includes any portion of the event that is ramped up/down or cross-faded. Attempting to alter the waveform data in the region of an event where fade is applied will have no effect. This applies only to the region where fade is applied.

4. No portion of overlapping audio events will be editable. This applies even if both events are at full gain and there is no fade. Overlapping audio events are mixed whether there is fade or not and mixed waveform data cannot be edited.

To use the pencil tool, click and drag on the portion of the waveform that you wish to change. As you drag, the waveform will be altered and redrawn as you move the pencil, much the same as with a pencil tool in a graphics drawing program. However, unlike a drawing program the pencil tool will always draw over the waveform as you move it left and right so that there is always just one value per sample.

If pencil tool editing is first applied in a valid portion of the waveform and the pencil tool is then moved over a faded region, the tool will affect only that portion of the waveform that is not faded.

When the mouse button is released, the altered waveform data is sent to the MX-2424 as a single unit.

This action is undoable and redoable. If you make 2 pencil edits (2 mouse ups) and then select undo twice, the waveform will be back to what it was originally.

To cancel a pencil edit in progress, press the escape key; the waveform data will be reverted to the original form.

When using the pencil tool, the result is that the original audio sample data from the sound file is altered each time you release the mouse. Note that this may actually affect more than one track or clip if you have made any copies of the audio event.

Because the pencil tool alters the original sound file, you can take advantage of this if you need to get around limitations 2-4 above. Just copy the portion of the audio event that you wish to edit to a blank area of a track, adjust the gain to maximum, remove any fades or overlaps and then zoom in to the sample level and edit the waveform. All audio events that reference the affected sound file will then reference the altered data.

Reverse play keyboard shortcuts

The reverse play button on the Transport Window now has a shortcut key.
On Mac it is Opt-Spacebar and on Windows it is Alt-Spacebar.

Selection Tool Changes

Hand Tool (pointer) operations:
- With any active user group(s), clicking (on mouse down) on an audio event will not select that event if the track is not in the active group(s) unless the shift key or ctrl key is held down.
- With any active user group(s), drag selecting audio events outside of tracks in active user groups is disabled unless the shift key is held down.
- With any active user group(s), drag selecting an audio event in a track where the track belongs to an active user group will cause all tracks belonging to any active user group to be editable (edit status on).
- With any active user group(s), clicking on a track without dragging the mouse with the ctrl or shift keys (but not both) held down and where the clicked track belongs to a active user group will likewise alter the edit state for all tracks in all active user groups.
- With any active user group(s), dragging an audio event from one track and dropping it on another track will account for user groups. If the track the event was dropped on belongs to an active user group, all tracks for all active user groups will become edit enabled.

Selector Tool (crosshair) operations:

- With any active user group(s), clicking on a track without dragging the mouse with the shift key held down and where the clicked track belongs to a active user group will likewise alter the edit state for all tracks in all active user groups.

Track Numbering with multiple machines

With multiple machines in a edit window, track numbers are displayed in increasing order beginning with track 1 at the top and with the first track of additional machines beginning at one greater than the last track of the previous machines.

Default Download File Type

MX-View now remembers the last selection made for download file type and uses that as the default until the user specifically chooses a different download file type. This applies only to the download audio file dialog.

Batch download

With the Import/Export Audio window open, select multiple files and then select "Batch Download" from the File Menu. In the batch download dialog, select the location and file type for the downloaded audio files. The progress of each download will be shown in the Import/Export Audio window.

Halting the download will cancel only the download of the file in progress and any remaining files.

Virtual Track Present Indicator

Any track that has virtual tracks created has the expander triangle colored blue.

Logarithmic and Exponential Fade Types

Fade Changes

Multitrack Selections and the Fade Command

With selector tool (arrow cursor), it is now required that multi-track selections must be such that the resulting fade will be the same on all selected tracks or the Fade command will not be enabled.

THIS IS A CHANGE - previously, the requirement for the Fade command was just that for each track, the selection in/out points had to be such that an audio event (or audio events for crossfades) was correctly positioned around in/out so that a valid fade could be calculated. In other words, the affected sound event on track 1 could have been ramped up, the affected event on track 2 could have been ramped down and 2 events on track 3 could have been cross faded.

NOW - All tracks contained within the selection must have events positioned such that they all would be ramped up, ramped down or cross faded. No combinations allowed! Note that the reason for this is that the UI has changed to allow the user to select the type of fade curves. This cannot be done unless all fades for multiple tracks are of the same type.

Summary of Fade operations:
Create fade with Selector tool (crosshair) selected
- Create an edit selection, then select the Fade command from the Edit Menu (cmd-F / ctrl-F).
- Select the desired fade curve from the dialog box.
- If the selection covers the right end of one event and the left end of another event, this will create a cross-fade, and a cross-fade dialog will be shown.
- If the selection only covers the left or right end (but not both) of a single event, this will create a ramp-up or ramp-down (fade in / fade out), and the appropriate ramp dialog will be shown.

Edit fade with Selector tool (crosshair) selected
- Double click on an existing fade (either a cross-fade or a ramp up/down). The appropriate fade dialog will be shown. Select the new fade shapes and click OK.

Event copy/paste for non-contiguous selections

Using the Hand tool (arrow pointer), changes have been made to MX and MX-View software to allow for non-contiguous audio event selections.

With non-contiguous selections, the clear command will only clear the selected events, leaving any non-selected events in place (previously, the clear command would clear everything on the track from the first selected event to the last).

Copy and Paste work just like they did previously, however a new item has been added to the Edit Menu to allow for transparent pasting. With normal Copy/Paste and non-contiguous selections, the Paste location will be overwritten with the copied audio events, INCLUDING any blank space.

If two events are selected with an intervening event, only the 2 selected events are copied but the intervening space is also copied. Doing a normal paste results in the blank space being pasted over the top of anything existing at the paste location. When this is not desired, select the new "Paste Transparent" menu item from the Edit Menu. The result will be that only the copied audio events will be pasted at the past location. The intervening blank space will not be pasted.

Track locking

A new item has been added to the track pop-up menu, "Lock Track" / "Unlock Track". A locked track cannot be edited and cannot be selected for recording. A locked track will also disable other track pop-up menu items so that the locked track cannot be deleted or renamed. Audio events on the locked track cannot be selected, dragged, copied, deleted or renamed.

- Select the "Unlock Track" item to unlock a locked track.

Zero crossing centerline

A new audio event 0db centerline is now available. It is selectable on/off in view menu.

Keystroke forwarding from Markers and Groups windows

The markers and user groups windows now pass most keystrokes to the edit window. This enables most keyboard shortcuts in the edit window (all transport commands for example).

The only keys that are intercepted by the markers and groups windows (and not sent to the edit window) are:
Markers Window
- Up arrow
- Down arrow
- Enter/return key
- Shift-cmd-N (Mac) or shift-ctrl-N (Windows)
- Cmd-W (Mac) or Ctrl-W (Windows)
- Cmd-Q (Mac) or Ctrl-Q (Windows)
- Opt-Cmd-R (Mac) or Ctrl-Alt-R (Windows)

<u>Groups Window</u>
- Up arrow
- Down arrow
- Enter/return key
- Shift-cmd-N (Mac) or shift-ctrl-N (Windows)
- Cmd-W (Mac) or Ctrl-W (Windows)
- Cmd-Q (Mac) or Ctrl-Q (Windows)
- Opt-Cmd-R (Mac) or Ctrl-Alt-R (Windows)
- Cmd-G (Mac) or Ctrl-G (Windows)

Keyboard shortcuts for jump to Head/Tail

The Head and Tail buttons on the Transport Window now have shortcut keys.

Mac:
   Head = Opt + Shift + left arrow
   Tail = Opt + Shift + right arrow

Windows:
   Head = Alt + Shift + left arrow
   Tail = Alt + Shift + right arrow

Timecode Chase menus added to Settings Menu 000 (Basic Settings)

The MX has added 4 new machine settings menus to the basic settings (000). The new items are menus 021 (Chase Sample Ref), 022 (Chase Freewheel), 023 (Chase Relock), and 024 (Relock Threshold). These menus are also now available in MX-View on the Basic Settings (000) dialog.

```
021 Chase Sample Ref
    Frame [LTC only](default)
    Internal
```
This is a new feature, and is relevant only to LTC chase. When the previous version of the MX was chasing timecode, the sample clock was locked to the frame edges of the incoming Longitudinal Time Code, unless some other specific clock source had been selected. This new menu allows the user to opt out of this scheme, and to continue running the MX from its internal clock.
Exceptions: This selection will be overridden if another frame or clock reference has been specifically selected e.g. Video, Ext Wordclock, etc.

```
022 Chase Freewheel
    5 frames
    10 frames          (default)
    20 frames
    50 frames
    100 frames
```
This menu allows the user to select the number of frames of "bad" master timecode through which the MX will "freewheel". If the master continues issuing bad timecode beyond this number of frames, then the MX will decide that the master is no longer playing, and will exit play mode.

```
023 Chase Relock
    On
    Off If Recording (default)
    Off Always
```
This menu allows the user to control the behavior of the MX when it detects that its position has drifted away from that of the master either because the MX and the master are running at slightly different rates or because the master has jumped to a new position. In previous versions, the MX would simply "relock", which meant jumping to a new position to be synchronous with the master. Two new options allow the user either to inhibit the relocking action when the MX is recording, or to inhibit it altogether.

```
024 Relock Threshold
    Automatic        (default)
    1/3 frame
    1 frame
    2 frames
    5 frames
    10 frames
```

This menu determines the size of the error between the MX and the master which must be detected before a "relock" will take place [see above]. In the "Automatic" mode, the threshold is set to 1/3 frame for LTC chase and 10 frames for MTC chase.

Note: If menu "023 Chase Relock" has inhibited the relock action, and if the lock error has exceeded the threshold specified in this menu, then the front panel "CHASE LOCK" LED will flash to indicate that condition.

Lock Error Display

A new lock error display has been installed which will show the amount of deviation of the MX's position from that of the LTC or MTC chase master. The format of the display is:

```
    ERR    00:00:00:00
```

If the MX is not specifically chasing LTC or MTC then this display will show all zero's. However, if the MX is chasing and locked, but with the "relock" function disabled, then this "ERR" display is useful for monitoring the current amount of drift.

The ERR display is accessed from the front panel by pressing Shift + ONLINE, and from the RC-2424 by pressing Shift + LOOP. (Circumstances did not permit the use of the same keystrokes in both environments.) It is neither necessary nor prohibited to preceed these keystrokes with the RCL key.

Timecode Lock Deviation display added to Edit & Transport Windows (MX-View)

A new lock error display has been added to the edit menu machine info bar which will show *the amount of deviation of the MX's position from that of the LTC or MTC chase master.* The chasing MX must be selected as the current transport focus in the Transport window. If the MX is not specifically chasing LTC or MTC then this display will show all zeros. However, if the MX is chasing and locked, but with the "relock" function disabled, then this display is useful for monitoring the current amount of drift. Note that when chase locked, a yellow circle with the letter "L" is displayed in the timecode display of the chasing machine in the Transport window.

When the MX determines that drift is excessive, it will begin to flash the "CHASE LOCK" LED on the chasing MX's front panel. This can also now be seen as the chase lock indicator flashes in the Transport Window.

More MEMORY Registers

- The number of memory registers in the MX-2424 has been increased to 255, all of which will be accessible from MX-View.
- The number of memory registers displayed at the front panel (and RC-2424) may be controlled by a new menu, with selections for 100 or 255 Memory Registers. The setting of this menu does not affect the number of internal registers, only the number that can be viewed at the front panel (or RC-2424).

```
272 Memory Registers
      100              (default)
      255
```

- For 100 Memories, each may be accessed by **STO/RCL/CAPT** plus two digits: **00** thru **99**. When 255 are selected, three digits will be required to specify the memory number: **000** thru **254**. [If a number larger than 254 is entered the error message `MEM Out of Range` will be displayed.]

MEMORY Register Scrolling

- Once a MEMory register has been displayed on the LCD, the **Up/Down Arrow** keys may be used to scroll through all memory registers. Upon reaching the highest or lowest location the MEMory number will "wrap around" and keep incrementing/decrementing. Holding an arrow key down will invoke key repeat. The **JOG** wheel may also be used.

Marker Capture

- A front panel (and RC-2424) Marker/MEMory Capture with Auto-Increment function has been implemented using the **Up Arrow** key.
- To capture a Marker and automatically increment the MEMory number, press **CAPT** then **Up Arrow**. The targeted MEMory register will be displayed, and will contain the captured transport timecode value. It is not necessary to be displaying the MEMory location prior to pressing this key sequence. [If no more Marker/MEMory locations are available, the error message `End of MEM Markers` will appear.]
- An internal counter keeps track of the "Next Marker" register, and its current setting may be viewed by pressing **RCL** then **Up Arrow**. The display will show `MEMxx   Next Marker`.
- To begin marking at a new MEMory location, display the desired MEMory, then press **STO** then **Up Arrow**. The same `MEMxx   Next Marker` display will appear. [If a MEMory register is not on display prior to pressing these keys, then the error message `Needs MEM Display` will appear.]
- When a new project is loaded, or initiated, the MX will scan the MEMory registers to find the lowest numbered register which contains a timecode value of zero. That register will become the "Next Marker" register, and will be the target of the next Marker capture. If none of the loaded MEMories have a zero value, then register **00** will be the "Next Marker" register.

Memory Register Changes (MX-View)

The MX now has 255 memory registers. The following changes were also made to MX-View.

- Changed the image for the memory register on the Time Ruler (wider to accommodate 3 digits).
- Always display up to 255 registers (even if MX is set to only display 100). The MX always has 255, it just limits the front panel to 100 (2 keystrokes) or 255 (3 keystrokes).
- To capture or navigate to a marker, always enter 3 digits (Marker 2 requires entry of 002).
- The markers window has been expanded to allow for 255 markers.
- When capturing or navigating to a marker in multi-machine mode and without using TL bus or Timecode chase, the only machine affected is the one with transport focus. i.e. - the machines are treated individually.
- Changed the logical rotation order when capturing markers to match the MX. When a new marker is captured, the current list of markers is searched for the first empty marker. If markers 0 through 10 are created, then markers 3 and 7 are deleted, then next marker created will be 3, then 7, then 11. Basically, the holes in the marker list are always filled first before adding to the end of the list. Once all marker numbers have been used up (0 to 254 on the MX), the next marker number will rotate to 0.

Edit Enable (MX-View)

Applies to multi-machine mode only (multiple machines in one edit window).
Note that in the following, "undo" is used for undo or redo (they are affected the same by this change).

A new machine level button (undo Enable) has been added in the machine buttons area. The button is an "E" within a circle, very similar to the online button ("O" inside circle). This button is both a control and an indicator. If ON, when an edit is performed (from the edit menu, the keyboard, or the toolbar), the edit command is sent to that machine.

If this indicator is off, that machine is disabled for editing. In other words, with multiple machines, only those machines that have the "Edit Enable" button ON (enabled) will receive edit commands.

Clicking on the button will toggle it to the opposite state, allowing the user to actively control the enabling of Undo/Redo for that machine.

MX-View is now more "smart" about sending Undo/Redo to multiple machines in an edit window. Whenever an Undoable command is sent to the MX, the "Edit Enable" status for that machine is turned on (enabled). Likewise, if a global command is given (e.g. - "Cut" is selected from the Edit Menu), but only one machine has edit enabled tracks with selected events, then only that machine's "Edit Enable" button status will be turned on, and all other machines will have their Edit Enable buttons disabled. The end result is that for normal workflow, Undo and Redo commands will now be sent selectively to the correct machines.

It is no longer necessary (or even possible) to control which machine the Undo/Redo commands will be sent by changing the transport focus in the transport window.

In the Transport Window, a new "Edit" button will be visible when there are multiple machines in an edit window. This button works the same as the "Online" button in that it will control the "Edit Enable" button of the machine that has the transport focus.

This is for convenience only. Each machine's undo Enable button can always be directly controlled regardless of the transport focus.

Maintenance Items

Numerical entries can be made without placing a new Marker

Pressing the Enter/Return key after entering digits into timecode displays was creating a new Marker Location (memory register). This has been fixed – Markers are only created when the focus is on the edit window.

Multi-machine mode event dragging

In previous versions of MX-View, in multi-machine mode (single edit window with multiple machines) and with the machines connected on the TLBus and Online, selecting and moving an event resulted in undefined behavior on the MX. This has been corrected.

Edit window behavior with missing/offline machines

If MX-View is quit while an edit window with multiple machines is open, when MX-View is next started it will attempt to reconnect to those machines and restore the edit window to the same state. If any of the previously connected machines cannot be found (they were either shutdown or disconnected from the network), MX-View will now attempt to restart the connection with only those machines that it can find.

Timecode Chase Update

The MX-2424 will now better detect the current state of the time code master. More specifically, there have been improvements in the method by which it distinguishes between a master, which is no longer at play speed, and one that is still playing but has either drifted or jumped to a new position. Previous versions of the software could mistake either one of these conditions for the other.

Disk Command Menu Behavior

The disk formatting menus will now always retain the most recently selected disk number when the STO key is pressed, whether the resulting action produced an error or not.
Affected Menus:

710   Disk Initialize
711   Disk Low Format
720   Disk Cleanup
730   Backup Erase

Memory handling of the Undo History

As of MX-OS version 3.10, 256MB of RAM will be required for 100 levels of Undo. An MX-2424 with 128MB of RAM will be limited to 50 levels of Undo in order to prevent out of memory conditions during loop record.

MX-OS 3.11 Release Notes

This version of MX-OS Requires Version 1.40 of MX-View

File System Maintenance

Changes were made to improve file system reliability and reduce rare instances of data corruption reported from the field. Technical details follow:

- Fix for HFS sort order. Fixes opening and mounting drives that contained file names containing chars greater than 7f and that are not accented vowels which had been fixed in a prior version.

- Fix for opening Mac files that reside in directories whose directory Id is larger than 2 to the 31st power.

- Fix for properly loading projects and sound files on HFS+ volumes that begin with or use an underscore in the name or use the ASCII characters 0xa5, oxc9, oxbd. Also fixes a problem when creating projects on HFS+ volumes that have an '_' or '^' or '[' or ']' or '`' in the project name.

  NOTE: For anyone who was previously experiencing any problems with HFS+ or HFS disks when taken to the Mac, or for anyone experiencing any problems with previously formatted HFS or HFS+ disks after loading the new software, follow these instructions:

  1. Load MX OS 3.10.
  2. Backup all the projects from the HFS/HFS+ disk to either a BU format or a FAT-32 formatted disk.
  3. Install the new software (3.11).
  4. Re-Initialize the original HFS/HFS+ disk.
  5. Restore the projects to the freshly initialized disk from the backup.

Miscellaneous Maintenance

- Fix for Smart Copying projects that contain tracks with muted clips. Muted clips can only be created from an SX-1 or an OpenTL Export created from a PT Session containing muted clips (export performed on an MMR).

- Fix for reliable Ethernet Upload/Download of files.

- Fix for a volume automation problem. Now, editing rules for a track that has all the automation points cleared will be treated the same as a track that never had volume automation to begin with. Previously, a track that had been cleared of all automation and played correctly would end up with zero volume automation points if it were copied/pasted.

- Fix for correct operation of Menu #211 Auto V Track ON.