Music Quest

Diagnostics and Utilities

User's Guide

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Overview

The Diagnostics and Utilities program (MQDIAG) is design to meet several goals. First, it is designed to enable owners of Music Quest MIDI interfaces to access features which are not available through your software. A good example is the MQX-32M's SMPTE feature. MQDIAG can set up the MQX-32M so that you can use SMPTE as a basic sync source with any sequencer that supports ordinary MIDI sync.

Second, the Diagnostics and Utilities program provides many utility functions that are not found in ordinary MIDI products. For example, MQDIAG can show you a trace of all MIDI data being received. The trace utility can be used to locate problems in your MIDI set-up, or it can be used to learn about one of your MIDI devices.

Finally, the Diagnostics and Utilities program provides a way for you to check out the operation of your Music Quest product. In this capacity, MQDIAG serves as a diagnostic tool so that Music Quest technical support personnel can provide you with better service.

The capabilities of MQDIAG can be broken down into the following categories:

1. Basic sequencer utilities for record and playback using various different sync modes.

2. Trace utilities to examine incoming MIDI data.

3. Chase Lock Sync utilities to allow you to verify correct operation of the MQX-32M and MQX-16(S) CLS feature. These utilities include a unique function which enables you to write a Chase Lock Sync track under control of another MIDI device. One application of this function is to transfer a Chase Lock Sync track from one tape to another.

4. SMPTE utilities to allow you to gain limited access to the MQX-32M and MQX-16S's SMPTE facility without special software. With these utilities you can do things like read or write a SMPTE track or activate the MQX-16S and MQX-32M's SMPTE to MIDI sync conversion feature.

5. Set Up options to control MIDI channel remapping and the programmable metronome.

Starting MQDIAG

To start MQDIAG type the following command at the DOS prompt:

```
MQDIAG [/Aport_address] [/Iirq_number] [/S]
```

MQDIAG recognizes two command line options that you can use to specifically identify the I/O port address and IRQ number of your interface. If you installed your MIDI interface at the factory default I/O address (330), then you can omit the port address. If you changed the base I/O address, be sure to include the port address as a command option. For example:


```
MQDIAG /A300
```

would start MQDIAG for an interface installed at I/O address 300.

In most PCs, MQDIAG can automatically determine which interrupt your interface is using. However, some devices like mice, interfere with MQDIAGs ability to find the correct IRQ. As a result, you can tell MQDIAG to look at a specific IRQ number by specifying it on the command line. For example:

```
MQDIAG /I7
```

would tell MQDIAG to look for the interface at IRQ 7. You can specify both address and IRQ options, so:

```
MQDIAG /A330 /I2
```

would be a valid set of options specifying port address 0x330 and IRQ 2.

Additionally, the /S option can be used to allow MQDIAG to search all possible addresses for the MIDI interface, instead of only searching 330 and 300. This may be useful with the MQX-32 or MQX-32M.

Diagnostics

Start Up Diagnostics

When you start MQDIAG, it runs through a set of diagnostic routines. These

routines perform the following actions.

1. Attempt to locate and identify your MIDI interface. The goal is to determine the I/O address, interrupt level and interface type.

2. Determine if interrupt conflicts exist. One of the most frequently encountered problems is the interrupt conflict.

After these diagnostics complete, MQDIAG will display a screen showing you the results of its analysis. The results include the interface type, firmware revision, IRQ level, I/O address, potential interrupt conflict status, and interrupt level use status.

The "IRQ Summary" reflects how MQDIAG sees IRQ utilization (it does not identify specific I/O devices). For each IRQ, MQDIAG will report:

AVAIL — This IRQ is not currently in use. This does not imply the absence of a card that may be using the IRQ. It merely reports that at this instant the given IRQ is not enabled for interrupts. For example, if you have a printer port (LPT1), you might expect IRQ 7 to be in use. However, very few if any programs use interrupts with printers. Therefore, you are apt to always see IRQ 7 marked "AVAIL", even if you have a printer port. This situation also applies to COM ports (COM1 and COM2). Unless you have a resident communication program, such as a mouse driver, the IRQ(s) for COM ports will always appear "AVAIL", even though the COM ports are installed.

In Use — The IRQ is currently enabled. This means that the IRQ is being used by the basic machine or by an adapter card. IRQs marked as "In Use" are not available for use by your MIDI interface.

MQX-32 — An MQX-32 interface card was found to be using this IRQ.

MQX-32M — An MQX-32M interface card was found to be using this IRQ.

MQX-16 — An MQX-16 interface card was found to be using this IRQ.

MQX-16S — An MQX-16S interface card was found to be using this IRQ.

MCC — A MIDI Coprocessor Card was found to be using this IRQ.

PCMIDI — A PC MIDI Card was found to be using this IRQ.

Diagnostic Messages

The diagnostic routines may report one of several outcomes. Here are the

different messages and how to interpret each message.

"MQX-32M found at IRQ n, I/O address xxx"

This message indicates that the diagnostics found your interface and that communication with the interface was successful. If you do not see this message, there may be a problem. The MQX-32M designator shown above will be replaced by the type of card that you have installed, such as a PCMIDI or MQX-16.

"Interface found, but unable to determine IRQ level"
"Interrupt levels checked: 2, 3, 5, 7"
"I/O address checked: 330"

This set of messages informs you that the interface was found, but that full communication could not be established. The most likely cause of this situation is an interrupt conflict. That is, you have another card in your system that is using the same interrupt level as your MIDI interface. The corrective action is to change the interface card to another interrupt level and rerun MQDIAG. The best way to approach this problem is to try IRQ 2 first, then IRQ 7, IRQ 3, and finally, IRQ 5. Before trying a different IRQ, consult the "IRQ Summary". The IRQ must be marked "AVAIL" or else it is not available for use.

"No interface found"
"Interrupt levels checked: 2, 3, 5, 7"
"I/O address checked: 330"

This set of messages tells you that the diagnostic routines could not locate your MIDI interface. The most probable cause of this error is that you installed your interface at an alternate I/O address. MQDIAG only checks for your interface at address 330 and 300, unless you start MQDIAG with the /S command. Try running the program again with the /S command.

"Installed MIDI interface is not a Music Quest product"

This message indicates that MQDIAG has found a MIDI interface, but it is not a Music Quest product. MQDIAG only works with Music Quest interface cards.

Determining Firmware Level

If you need to know the firmware revision level of your MIDI interface, there are two ways to obtain it. First, the start up diagnostics show the firmware level as part of the diagnostic summary (see above). Second, you can use the Program EPROM Level function at any time.

Trace Utilities

Three different trace functions are provided. The interpreted trace displays incoming MIDI data in "English". The hex trace displays incoming MIDI data in "raw" hexadecimal notation. The hex trace + pass through function not only shows data in hexadecimal notation, it passes the data "thru" to MIDI-out. This gives the capability of placing your computer in the middle of a MIDI cable where it can act as a data analyzer.

Basic Sequencer Functions

Record and Playback

MQDIAG includes a very basic one track sequencer which is capable of recording and playing back MIDI data. These basic functions are intended to verify that your interface's sequencing features are operational. The basic record/play capability can be used with all of the MQX-16 and MQX-32M's sync facilities (internal sync, Chase Lock/MIDI sync, and SMPTE). For example, you can record under internal sync and play back your recording using Chase Lock sync.

Please note that these basic functions ARE NOT intended to be used in place of a separate sequencer.

Sequencer Set Up

The Sequencer menu contains a Set Up item. The Set Up window gives you the capability to adjust tempo, set the metronome meter (beats/measure), enable/disable the metronome, enable/disable the MIDI Thru feature, and enable/disable the sending of MIDI Time Code messages.

Chase Lock Sync Utilities

How to Verify a CLS Track

The Chase Lock SPP Trace menu item gives you a way to quickly verify a CLS track. After calling up the SPP Trace function, shuttle the tape to different points and let it play. When play starts, display should reflect a new Song Position Pointer followed by a MIDI Continue. When you stop the tape, you should see a MIDI Stop. If you start the tape from the beginning, you will see a MIDI Start instead of a MIDI Continue.

This type of test verifies that the sync track is in fact Chase Lock that the MQX-16 or MQX-32M can lock on to.

Writing a Chase Lock Sync Track

If you need to stripe a tape with Chase Lock sync, you can use the Write Tape function on the ChaseLock menu. Be sure to use the Set Up function to establish the tempo you want.

Transferring (Writing) a Chase Lock Sync Track

If you have an external sync box such as an Roland SBX-80, J.L. Cooper PPS-1, or Synhance MTS, you might want to "transfer" the sync information from the external box to the MQX-16 or MQX-32M. In essence, you want to translate a tape from one sync format to another:

```
Tape (Sync Box format) --> Sync Box --> MQX-32M --> Tape (CLS format)
                                        MQX-16
```

You can accomplish this by using the ChaseLock Transfer CLS function. Follow these steps.

1. Call up the Transfer CLS function.
2. Start the "output" tape (the one receiving the CLS track) recording.
3. Start the "input" tape and associated sync box playing.
4. As sync track transfer proceeds, the beat counter will advance one beat for every 24 MIDI clocks transferred.

SMPTE Utilities

Verifying a SMPTE Track

There are two functions on the SMPTE menu that you can use to check a SMPTE track.

The Frame Trace function reads a SMPTE track, displaying the format and current location. As the tape spins, so does the location (frame address). You can use this function to verify the format and determine the address range.

The Cue Point function is similar to the Frame Trace. It allows you to look for a specific frame address. If the target cue point is hit, the program gives you an audible notification.

Writing a SMPTE Track

The SMPTE Write Tape function provides a simple way for you to stripe a tape with SMPTE. You can specify the origin address (sometimes referred to as the SMPTE offset), frame format, and duration of the sync track. For

routine audio work an origin address of 00:00:00:00 and 30 frame non-drop format will work nicely.

Controlling MIDI Time Code Messages

MIDI Time Code Messages are produced when SMPTE is written or read. Typically, these messages are transmitted to MIDI-out so that other devices in a MIDI system can use them as a synchronization source.

Unfortunately, MIDI Time Code is a more recent addition to the MIDI Specification. As a result, there are a number of MIDI devices that do not recognize the MTC messages. Some will not tolerate MTC messages, meaning that they can go into various "undefined" states. If you suspect that your MIDI device does not correctly handle MTC messages, be sure to consult the synthesizer manufacturer.

If you suspect that you have such a problem, you can disable the sending of MTC messages. Select the "Set Up" menu item on the SMPTE menu. Find the "MTC messages to MIDI-out" switch and set if to Off. Press ENTER to disable further sending of MTC messages.

Activating SMPTE to MIDI Sync Conversion Mode

The MQX's SMPTE facility was designed to encourage a wide range of SMPTE based applications. Thus, without an application the SMPTE feature can not be used. However, the MQX-16S and MQX-32M include a special SMPTE mode that allows you to use SMPTE with an sequencer that supports MIDI sync.

This special mode is called "SMPTE to MIDI sync conversion". If you are familiar with the Roland SBX-80, you might call this mode of operation "SBX-80 emulation" mode.

To use SMPTE to MIDI sync conversion, you need to stripe a tape with SMPTE. Then, call up the SMPTE to MIDI function under the SMPTE menu. The program will ask you for a cue point. This cue point represents where you want your sequencer to begin operation. If you are doing routine audio work, and you have striped a tape starting at 00:00:00:00, it is suggested that you use 00:00:03:00 as the starting cue point. This means that your sequencer will start at 3 seconds into the SMPTE track.

After you set the cue point and activate conversion mode, run your sequencer. Put it into MIDI sync mode and prepare it for record/play. Then, rewind the tape to the beginning of the sync track and start the tape. When the tape reaches the cue point, it will send your sequencer a MIDI Start command, which in turn causes your sequencer to run. You can stop your sequencer by stopping the tape or by sequencer command.

In summary, SMPTE to MIDI sync conversion mode allows you to use SMPTE as a clock source, while your sequencer thinks it is being driven by an external MIDI device.

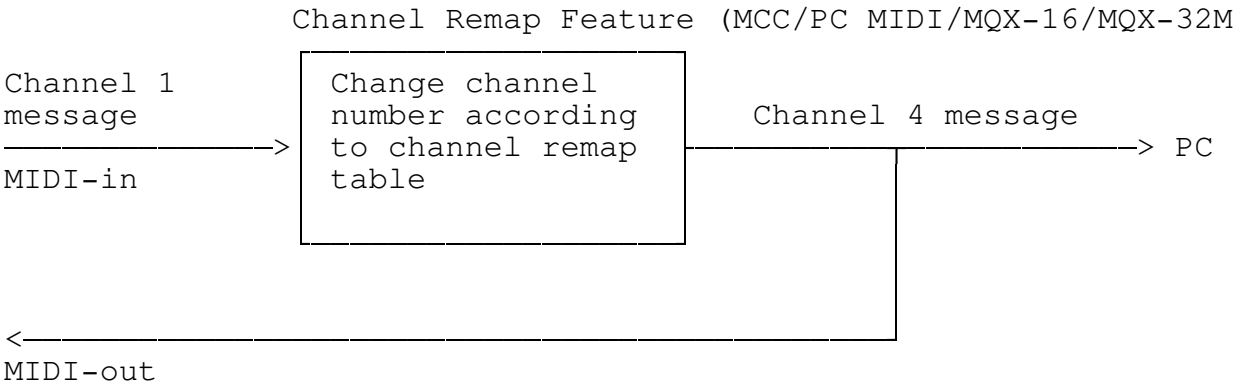
NOTE: When SMPTE to MIDI sync conversion mode is active, all other SMPTE capabilities of the MQX-16S and MQX-32M are disabled. If you want to

deactivate the conversion mode, use the utilities program's SMPTE to MIDI function.

Using the Channel Remapping Facility

MQDIAG gives you the capability to set up the MIDI Channel Remapping feature of the PC MIDI Card, MQX-16(S) and MQX-32M. The remapping feature performs a "channel transposition" of MIDI-in messages.

An example will illustrate the function. Suppose you have a keyboard that only produces messages for MIDI channel 1. You have a multi-timbral sound module that supports multiple channels, and you would like to have your keyboard drive MIDI channel 4. Pull down the Program menu and and select Channel Remap. For MIDI-in channel 1, set the remap value to 4 and press ENTER. From now on, all channel 1 messages will be changed into channel 4 messages. This includes messages that go "thru" your interface as well as those that you record.



Controlling the Programmable Metronome

The Music Quest PCMIDI and MQX-32M interfaces feature a unique programmable metronome. The programmable metronome triggers an external MIDI device by sending it an appropriate note-on/note-off message when the metronome is supposed to sound. This feature allows you to have a metronome whose sound is totally under your control. The power-on state of the interface card provides for two separate metronome sounds (MIDI messages). One message is sent for the downbeat, while the second is sent for all other beats. The default messages are:

Downbeat - channel 10, note number 36, with a velocity of 64. This corresponds to a bass drum in the Roland percussion assignments found on products such as the MT-32.

Other beats - channel 10, note number 56, with a velocity of 64. This corresponds to a cowbell in the Roland percussion assignments found on products such as the MT-32.

If you want to change the metronome messages after installation, you can do so by using the MQDIAG program.

NOTE: If you did not install your interface by using the INSTALL batch file, you must do so before using MQDIAG to modify the metronome. Be sure to consult the Installation Guide for instructions.

Using MQDIAG to Change the Programmable Metronome

The programmable metronome is changed through the Options Metronome menu item. When you select the Options Metronome function, MQDIAG shows you a window containing all of the metronome parameters. After adjusting the parameters, press ENTER to audition the changes. When you are finished, press ESC or CTRL-D to pull down the Done menu. Press ENTER to select the "Done with metronome" action.

Setting the Programmable Metronome through Your AUTOEXEC.BAT File

When you turn your computer off, any changes you made to the metronome parameters will be lost (remember, they were saved in the metronome control file). When you turn your computer on, you can easily return the metronome parameters to your preferences. This is done by running the MQSETUP program from your AUTOEXEC.BAT file.

The MQSETUP program requires one argument, the name of the metronome control file (MQSETUP.PRO) For example, if you add the following line to your AUTOEXEC.BAT file, it will set up the metronome according to the parameters saved in the file MQSETUP.PRO.

```
MQSETUP MQSETUP.PRO
```

If the file is in a subdirectory, be sure to include the full path so that MQSETUP knows where to look for the file.

NOTE: The INSTALL batch file will set up all of this for you. Be sure to consult your Installation Guide.

Channel Splitting Feature

Newer and upgraded versions of the MQX-32M provide a unique MIDI-out channel splitting feature. This feature is designed to maximize the value of the MQX-32M's two MIDI-out ports when used with software that does not have specific support for the MQX-32M.

This feature allows you to designate which MIDI-out port(s) you want messages to be routed through. For example, you might want to have all

channel 1-8 messages routed to MIDI-out port 1, while all channel 9-16 messages are routed to MIDI-out port 2.

The channel split feature can be customized during installation or through MQDIAG (Options menu, Channel split item).