

USER BULLETIN

ZETA-THREE USER BULLETIN #8

Version 3.50 Software

Aug 22, 1989

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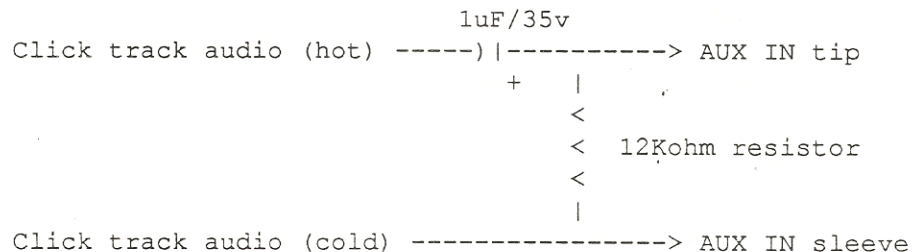
1. MASTER and SLAVE

- 1.1 Master and slave tape end LIMIT's now work a little better. The transport will be stopped only when passing forwards through the limit point, and this will take place regardless of the current operating mode.
- 1.2 In previous software releases, a small jump in time could occur at the first tach pulse after loading a PRESET time value into either of the TIME CODE READERS. This was usually encountered when running with tach only (no time code present), and has now been corrected.
- 1.3 Varispeed play capability has been added to the slave transport. This is available only through the Zeta Remote or the serial port.
- 1.4 Minor changes have been made to the Master and Slave constants (please refer to the updated version of Appendix E).

2. MIDI

- 2.1 The Zeta Three will now learn a tempo from an audio click track. This option appears in the "D03 LEARN MODE" menu list as ".5 AUX IN AUDIO".

To use this mode, the click track output should be connected to the Zeta's AUX IN jack through a small AC coupled pad, which will be available from Adams-Smith, but which may also be very easily constructed using one capacitor and one resistor . .



It is recommended that the gain of the audio click be externally adjusted (possibly fed through a console), so that a reliable threshold level may be established. If the level is too low, then the Zeta may not trigger at all. If too high, then triggering may occur on background noise or cross talk.

- 2.2 Multiple Tempo Map Banks are now supported - up to seven in the maximum configuration. New Zeta Three's will be shipped with three non-volatile (NV) banks as a standard feature.

A non-volatile RAM expansion kit will be available from Adams-Smith, and will provide the following configurations . .

	<u>Unexpanded</u>	<u>1 RAM kit</u>	<u>2 RAM kits</u>
Existing Zeta:	1 bank (volatile)	4 banks (NV)	7 banks (NV)
New Zeta:	3 banks (NV)	7 banks (NV)	[unnecessary]

Tempo Map banks may be switched using the ".2 TEMPO MAP BANK=1" menu, which appears under the menu heading "D02 SONG SETUP".

- 2.3 Uploading and downloading of the Zeta Tempo Map through the MIDI port has been implemented in 3.50 software. These actions are accomplished using two new choices ".3 SAVE MFILE SYSEX" and ".4 LOAD MFILE SYSEX" under the "D14 MAP LOAD/SAVE" menu.

To save a map, first prepare your sequencer or computer to receive a Sysex, then hit Capture while ".3 SAVE MFILE SYSEX" appears in the Zeta display.

Similarly, to load a map, prepare the Zeta for reception by pressing Capture while ".4 LOAD MFILE SYSEX" appears in the display (Zeta will say "----- WAITING -----"), then initiate Sysex transmission from the sequencer/computer.

The format used by the Zeta Three for its Tempo Map upload and download fully conforms to the MMA specification for "MIDI Files". Furthermore, as "MIDI Files" themselves are not directly transmissible over MIDI, the data is encoded as outlined in the proposed "MIDI File Dump" specification.

The enormous advantage of this encoding will gradually become apparent as more and more sequencers and MIDI software packages support it. A sequencer with this capability will be able to download sequence and tempo data to the Zeta Three, which will simply extract that tempo data for use in its internal Tempo Map. Conversely, tempos entered or learned in the Zeta may be uploaded to a sequencer in a form which the sequencer understands.

Four new constants have been created to handle MIDI File transfer options:

Constant "49 - /FILE DF 00" deals with the relationship between MIDI File timings and the Drop Frame rate. Most of the time, MIDI File times and tempos will be expressed in "ticks per quarter note", and Constant 49 will be totally irrelevant. However, if timings are expressed in terms of frames and subframes, and if Drop Frame rate is specified in the MIDI File header, then the Zeta will only honour this drop frame request if Constant 49 is set to "01".

While this may at first appear to be a backwards approach, it is more often the case that ignoring such a Drop Frame request (Constant 49 = "00") will in fact produce correct synchronization. A sequence which has been created based on frame counts as opposed to absolute (stop-watch) times, should use "00" in Constant 49, regardless of

the Drop/Non-drop frame status of the main production time code. On the other hand, if a sequence has been created from stop-watch times, then Constant 49 will likely need to be "01".

As a rule of thumb, if the MIDI File header calls for frame type measurements, **and** if the frame rate is 30 Drop Frame, **and** if the sequenced material appears to drift in time relative to its intended position, then reverse the setting of Constant 49.

Constant "50 AUTOFILE RX/TX 00" controls automatic MIDI File uploads and downloads:

If the LSD (Least Significant or right hand Digit) is set to a "1", then the Zeta will automatically transmit the contents of its own Tempo Map, in MIDI File format, whenever requested to do so by a "File Dump Request" message received at the MIDI In port.

If the MSD (Most Significant or left hand Digit) is set to a "1", then the Zeta will automatically accept any MIDI File which is transmitted to it, without the operator first having to initiate such action through the ".4 LOAD MFILE SYSEX" menu.

Constant 50 MSD also controls the automatic transmission of "File Dump Request" messages from the Zeta. If constant 50 MSD is set to a 2 and the operator initiates a MIDI File Load, then the Zeta-Three will immediately transmit a "File Dump Request" message on its MIDI Out, with the expectation that some other device will respond with the requested MIDI File.

The automatic "File Dump Request" mode may be combined with the "automatic receive" mode, described above, by setting constant 50 MSD to a 3.

Constant "47 FILE SAVE TO 7F" specifies the device address to which the Zeta's MIDI File will be transmitted. The default setting is "7F", which is defined as a MIDI "all-call", or "this file is for anyone who's listening" address. Normally this will not need to be changed.

Constant "48 FILE LOAD FROM 7F" specifies the device address to which the Zeta will send its "File Dump Request", described above, **if File Dump Requests are enabled in Constant 50 MSD**. The default setting is "7F", and will not normally need to be changed.

- 2.4 Start Time is now stored with the MIDI Tempo Map when the Map is saved to tape, or loaded out in a MIDI Sysex.

- 2.5 Start Time calculations for the MIDI section Tempo Map have been reworked. (The Start Time sub-menu ".1 START 00000000.00" may be found under the menu "D02 SONG SETUP").
Previous software versions showed the Start Time as a Master number when the MIDI section was chasing the Master, and as a Slave number when the Slave was being chased.

This action, however, can be problematic when the Map is being transferred between the Zeta and a computer using a MIDI File Sysex. Normally, the computer will know nothing of the Zeta's master/slave relationship, and will prefer that the Start Time always be expressed relative to the Master, as the Master very likely carries the time code of the original production. Thus, the Zeta's Start Time now defaults to being a Master number.

On the other hand (!), if it is necessary to express Start Time as a Slave number, this

can be achieved by adjusting the new menu: ".5 START TIME=MASTER/SLAVE" (also under "D02 SONG SETUP"). Note that changing this assignment will not affect the Start Time itself, but rather the MIDI Offset will reflect the new condition.

- 2.6 "Direct Time Lock" (as used by Mark of the Unicorn's "Performer") is now implemented in the Zeta Three, and is called up in place of standard MIDI clocks by using the menu "D07 MIDI CLK=DT LOCK"
- 2.7 The default operation mode for MIDI Time Code, as defined by MIDI Constant number 15, has been slightly modified. Constant 15 now reads "10", meaning that 1/4 frame messages are transmitted only when new time data is available i.e. when the source transport is moving.
- 2.8 By attaching a drum machine to the Zeta MIDI Out port, a MIDI Metronome can be created which operates in parallel with the Zeta Remote beeper. Various combinations of Remote beeper and MIDI Metronome can be selected in the following MIDI section menu:

```
D15 BEEP=OFF
      RMT
      RMT COUNT
      MIDI
      MIDI COUNT
      RMT+MIDI
      RMT+MIDI CT
```

Two new MIDI Constants set the MIDI channel and note number for the metronome note on and note off messages (default values shown):

```
54 CLICK MIDI CH 10
55 CLICK NOTE VAL 37
```

- 2.9 Adams-Smith Serial Protocols may now be transmitted and received via the MIDI In and Out ports. This is selected by the ".4 ADAMSSMITH *MIDI*" option under the "Z08 COMPUTER PORT" menu.

Three types of Adams-Smith system exclusives are used for this purpose: a COMMAND sysex (received by the Zeta), a "BREAK" sysex (also received), and a RESPONSE sysex (transmitted by the Zeta).

COMMANDS (from Controller to Zeta Three):

F0 17 <chan> 01 <Immediate chars . . > <Commands . . > F7

17h	Adams-Smith sysex id
<chan>	Destination Zeta system address or All-Call (7Fh)
01	Command sub-ID#1
<Immediate chars>	X-ON, X-OFF etc (if any)
<Commands>	Adams-Smith commands or data requests (if any)

BREAK (from Controller to Zeta):

F0 17 <chan> 03 F7

17h	Adams-Smith sysex id
<chan>	Destination Zeta system address or All-Call (7F)
03	Special BREAK sub-ID#1

RESPONSES (from Zeta to Controller):

F0 17 <chan> 02 <Immediate chars . . > <Responses . . > F7

17h	Adams-Smith sysex id
<chan>	Source Zeta system address
02	Response sub-ID#1
<Immediate chars>	X-ON, X-OFF etc (if any)
<Responses>	Adams-Smith responses (if any)

NOTES:

1. All Adams-Smith commands and responses are defined in Chapter 13 of the Zeta Three Operating Manual.
2. <Immediate Characters> in a Command message consist of X-ON and X-OFF, as defined in Manual section 13.2.1, and should be placed in front of any other commands.
3. <Immediate Characters> in a Response will **always** be placed at the beginning of the message. These consist of the Serial Control characters X-ON and X-OFF as well as the Special characters NAK and <FRAME> as defined in sections 13.3.1 and 13.3.2 respectively. Serial Metronome characters (defined below) will also be placed here.
4. The BREAK message will produce exactly the same results as a serial break. Execution is immediate.
5. The Zeta system address is set up using the "Z12 SYS ADDR=0/8282" menu. Only the first address digit (before the "/") is relevant.

2.10 The Zeta Three will now respond to a standard MIDI Inquiry Message (see MIDI 1.0, Document Rev 4.0). The inquiry format is *F0 7E <channel> 06 01 F7*. The response format is:

F0 7E <channel> 06 02 17 5A 33 20 20 ss ss ss ss F7

<i>F0 7E</i>	Universal sysex Non-real time header
<i><channel></i>	Channel = Zeta system address, or All-call (7Fh)
<i>06</i>	General Information (sub-ID #1)
<i>02</i>	Device id message (sub-ID #2)
<i>17</i>	Adams-Smith system exclusive id
<i>5A 33</i>	Device family code (ASCII 'Z3')
<i>20 20</i>	Device family member code (two ASCII spaces)
<i>ss ss ss ss</i>	Software revision level: four ASCII characters 'x.xx'
<i>F7</i>	EOX

3. ZETA SYSTEM

- 3.1 The RECORD key on the Zeta Remote can now be directed exclusively to the Slave transport as opposed to whichever transport is the current Master. This means that a record punch in can easily be performed on the slave (typically a multitrack), even when it is synchronized to the master. The switchover is made in the menu:

```
Z16 RMT REC'D=SYSTEM
      SLAVE
```

- 3.2 When the Zeta Remote is operating with more than a single Zeta Three, it is often necessary to transfer changes made in one Zeta to the registers of the other Zeta(s). This capability, described in more detail in the Zeta Remote literature, is enabled through the menu:

```
Z17 RMT Z_ECHO=OFF
      ON
```

- 3.3 The Zeta Three time code generator is often used to create a time code link between multiple Zeta's by patching the generator output of one Zeta into the master time code input of a second Zeta. This works very well, but some setup is required: the generator must be set to "transfer" mode, must copy Zetatime, and must always be running in copy mode. A new Zeta menu takes care of all this setup automatically:

```
Z18 ZETA TC LINK=OFF
      ON
```

- 3.4 A new menu allows a FULL SYSTEM RESET to be performed from the front panel:

```

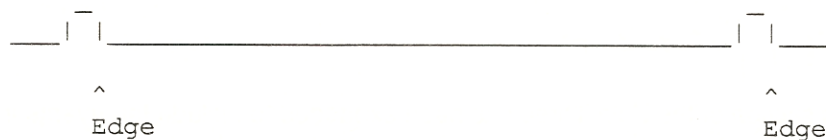
Z20 SYSTEM RESET ->
  FOR FACTORY SETUP ->
    HIT SHIFT/SHIFT/CAPT
  
```

The reset may be achieved **only** by holding down **both** shift keys and pressing the **Capture** key and **only** when "HIT SHIFT/SHIFT/CAPT" is being displayed. At all other times, the Shift/Shift/Capture key combination will simply produce a "restart", which is equivalent to a power down and power up sequence. Note that the original system reset method (holding Shift/Cursor/Capture while powering up) still works normally.

- 3.5 A hardware frame edge reference signal, formerly reserved for future use and held in a disabled state, has been permanently enabled in version 3.50 software. This signal, known as "AUXP", produces a falling edge at the boundary of every Zeta internal master time code frame.

AUXP always appears on pin 5 of the CONTROL port, and also on pin 5 of the COMPUTER port when the latter is set up for RS-422 communication. The output is open collector, switches to digital ground, and has a 10K internal pull-up.

The duration of the "high" portion of the AUXP signal is one time code bit length (min. 416 usec) when derived from master time code:



When derived from the video reference (system resolved), the AUXP duty cycle is 50 percent:



- 3.6 The Auto-Edit function has been expanded to include a very basic talent cueing facility, made possible by the larger number of available Event triggers (described below). The menu options are:

```
Z02 AUTO EDIT=OFF
      ON
      ON+CUE
```

A typical talent cueing requirement is that the system emit a number of beeps, at regular intervals, leading up to the actual record punch in time. In its default configuration, whenever the Z_IN register is captured or changed, the new "ON+CUE" option will set up Z_GO, Z_IN, and selected Events as follows:

<----- 5 sec ----->	<-25 frm->	<-25 frm->	<-25 frm->	
Z_GO	EV_8	EV_9	EV_10	Z_IN
goto point	beep #1	beep #2	beep #3	record

Events 8, 9, and 10 may therefore be used to trigger an external beeper (directed, by default, via the AUX-OUT Ring), or to trigger a MIDI device using the Events MIDI Note arming option described in section 4.2(b). In either case, **the appropriate events must be armed by the operator** before talent cueing beeps will be triggered.

The number of beeps, and the spacing between them, may be adjusted using two new Events Constants described in section 4.3.

4. EVENTS

- 4.1 The Events section of the Zeta Three has been expanded to include ten events instead of just two. All Events displays and Events Constants displays have been adjusted accordingly.
- 4.2 The arming choices for each event trigger have also been expanded:
- (a) As before, any event trigger may be assigned to either or both of the AUX 1 and 2 outputs (AUX OUT connector), and either momentary (pulsed) or continuous closures may be specified. These assignments are handled by Events Constants. In addition, if no Master transport is being controlled by the Zeta, the Master transport connector may be used as AUX outputs 3 thru 10 (set up in menu "M03 OUTPUT=AUX3-10"). This allows each of the 10 event triggers to be individually assigned to its own hardware output pin.
 - (b) An event trigger may now be used to trigger a MIDI note on / note off sequence. Channel, note number and velocity are specified for each event trigger under the menu heading "E11 MIDI TRIGGERS ->"
 - (c) Alternatively, an event may simply trigger a MIDI Program change. The program number is specified under the same menu.

(d) If a Zeta Remote is connected, an event may also be used to trigger a timed Function Key sequence (see the Remote literature for more details).

The Event Arming menu now reads (xx = Event number):

```

Exx EV_xx=DISARMED '
      ARMED
      MIDI NOTE
      MIDI PROG
      REMOTE FN

```

An extra menu has been added to allow all events to be quickly disarmed by pressing the Capture key:

```
E11 EV_ALL DISARM
```

For MIDI Event triggers, the MIDI Channel, Program and Note numbers, together with Note Velocities, are specified for each Event by a new menu (default values shown):

```

E12 MIDI TRIGGERS ->
      _01 CHAN=001 PRG=000
      _01 NOTE=035 VEL=127
      _02 CHAN=001 PRG=001
      _02 NOTE=038 VEL=127
      _03 CHAN=001 PRG=002
      _03 NOTE=041 VEL=127
      _04 CHAN=001 PRG=003
      _04 NOTE=045 VEL=127
      _05 CHAN=001 PRG=004
      _05 NOTE=048 VEL=127
      _06 CHAN=001 PRG=005
      _06 NOTE=037 VEL=127
      _07 CHAN=001 PRG=006
      _07 NOTE=042 VEL=127
      _08 CHAN=001 PRG=007
      _08 NOTE=046 VEL=127
      _09 CHAN=001 PRG=008
      _09 NOTE=049 VEL=127
      _10 CHAN=001 PRG=009
      _10 NOTE=051 VEL=127

```

- 4.3 Two extra Events Constants have been added to control the Talent Cueing operation described in section 3.6. They are:

```

35 CUES/PULSE DUR 36
36 CUE DLY FRAMES 25

```

The number of talent cueing beeps is controlled by Constant 35 MSD (left hand digit), which is set to 3 by default. The last beep in the sequence will always be set up in Event 10, with preceeding beeps working backwards through the Event list. For example, if Constant 35 MSD is a 5, then beep #1 will be in Event 6, beep #2 in Event 7, and so on, up to beep #5 in Event 10.

Constant 35 LSD "PULSE DUR" is not new, and is described in Appendix H.
Constant 36 specifies the number of frames which separate the beeps from each other and the last beep from the IN point (1 to 99 frames).

5. REMOTE

See USER BULLETIN #10, "ZETA-REMOTE Version R1.20 Software".

6. SERIAL COMMANDS

The following changes should be made to the Zeta Three Operations Manual, Chapter 13.

6.1 Add to 13.3.2 SPECIAL CHARACTERS:

<BEAT>	04h	SERIAL METRONOME BEAT
<BAR>	05h	SERIAL METRONOME BEAT AT BAR LINE
<BEAT-PRE>	06h	SERIAL METRONOME BEAT BEFORE START OF SONG
<BAR-PRE>	07h	SERIAL METRONOME BEAT AT BAR LINE, BEFORE SONG

These special characters, based on the progress of the MIDI section Tempo Map, are transmitted whenever enabled to do so by Serial Interface constant number 2.

6.2 Modify 13.6 SERIAL INTERFACE CONSTANTS:

Constant 2 MSD:

- 8 bit : 1=Enable BREAK character recognition by the Serial Interface.
- 4 bit : 0
- 2 bit : 1=Enable automatic transmission of Special Frame Edge character at every "System Master" frame edge.
- 1 bit : 1=Enable transmission of Special Serial Metronome characters (see 13.3.2).

6.3 Correct error in 13.6 SERIAL INTERFACE CONSTANTS:

Constant 1 LSD:

- 8 bit : 0
- 4 bit : 1=Include 'extra status' in all transmissions of status data (commands 'S','s'). This will replace the last four digits, normally all zeroes, with further bus status.
- 2 bit : 0
- 1 bit : 1=Disable transmission of LINE FEED character.

6.4 Modify 13.10.11 MIDI CHASE (address J) / STATUS:

<i>ssss</i>	Currently attached bank number (0 thru 6)
<i>tttt</i>	Number of available map banks (1,3,4 or 7)
<i>uuuu</i>	bit 8 = not tight locked (narrow window)
	bit 4 = 1
	bit 2 = resolve mode
	bit 1 = chase mode
<i>vvvv</i>	bit 8 = 0
	bit 4 = 0
	bit 2 = map positioned after end of song
	bit 1 = map positioned before beginning of song
<i>wwwwxxxx</i>	ASCII tally of most recent transport command ('P'=play, etc.)
<i>yyyyzzzz</i>	Most recent map edit error code

6.5 Replace 13.10.12 GENERATOR (Upper: address K) / USER BITS:

<i>aaaabbbb</i>	ASCII tally of current generator action
	'P'=run
	'S'=stop
	'R'=run reverse
<i>ccccdddd</i>	ASCII UPPERCASE representation of lower case ident of data currently loaded into the multiplexed time code area.
<i>eeee</i>	bit 8 = 1
	bit 4 = 0
	bit 2 = 1
	bit 1 = 1
<i>ffff</i>	bit 8 = not frame locked
	bit 4 = master disabled when gen=master only
	bit 2 = stopped
	bit 1 = same as bit 2

6.6 Replace 13.10.12 GENERATOR (Upper: address K) / STATUS:

<i>sssstttt</i>	not used
<i>uuuu</i>	bit 8 = not frame locked
	bit 4 = 0
	bit 2 = system resolve mode
	bit 1 = generator frame lock mode
<i>vvvv-zzzz</i>	not used

6.7 Add to 13.10.14 SLAVE TRANSPORT (address M) / TIME:**Transport Identification: 'x' [78h]**(User Bits *gggghhhh* = 00)

<i>HHMM</i>	0000
<i>SSFF</i>	0ddd=Transport code (ddd=000 thru 999)
or	100n=User area code (n=0 thru 9)

6.8 Add to 13.10.14 SLAVE TRANSPORT (address M) / STATUS:

<i>wwwxxxxx</i>	ASCII tally of most recent transport command ('P'=play, etc.)
<i>yyyy-zzzz</i>	not used

6.9 Add to 13.10.15 MASTER TRANSPORT (address N) / TIME:**Transport Identification: 'x' [78h]**(User Bits *gggghhhh* = 00)

<i>HHMM</i>	0000
<i>SSFF</i>	0ddd=Transport code (ddd=000 thru 999)
or	100n=User area code (n=0 thru 9)

6.10 Add to 13.10.15 MASTER TRANSPORT (address N) / STATUS:

<i>wwwxxxxx</i>	ASCII tally of most recent transport command ('P'=play, etc.)
<i>yyyy-zzzz</i>	not used

6.11 Add to 13.10.16 ZETA SYSTEM (address Z) / TIME:**Bar/Beat**

'r'	[72h]	BAR/BEAT CUE POINT (read only - calc'd when Cue point loaded)
-----	-------	---

<i>HHMM</i>	4 digit bar number
<i>SS</i>	Beat number (within bar)
<i>FF</i>	1/16 note number (within beat)
<i>gggghhhh</i>	00

6.12 Replace 13.10.16 ZETA SYSTEM (address Z) / USER BITS:

aaaa Hardware AUX-IN Tip assignment:
 0 = AUX 1
 1 = TIMEBASE OUTPUT
 2 = OFF

bbbb Hardware AUX-IN Ring assignment:
 0 = AUX 2
 1 = OFF

ccccdddd ASCII UPPERCASE representation of lower case ident of data currently loaded into the multiplexed time code area.

eeeeffff not used

6.13 Replace 13.10.16 ZETA SYSTEM (address Z) / STATUS:

ssss Current system Enables (this status goes hand in hand with the 'Z' command):

z	<u>Mast</u>	<u>Slv</u>	<u>Midi</u>	<u>System</u>
0	-	-	-	Master
1	-	-	x	Midi
2	-	x	-	Slave
3	-	x	x	Slave
4	x	-	-	Master
5	x	-	x	Master
6	x	x	-	Master
7	x	x	x	Master

tttt Current system Solos (this status corresponds to the 'XZ' command). Uses the same bit pattern as system Enables, but the only valid combinations are 0,1,2,4.

uuuu Master Address:
 4=master transport
 7=generator

vvvv Resolve Mode Reference (if system resolved):
 2=external
 5=video

wwww bit 8 = system resolved
 bit 4 = rehearse mode
 bit 2 = master transport controls disassigned
 bit 1 = master transport connector = AUX-OUT 3-10

xxxxx bit 8 = system under remote control
 bits 4,2,1 = system time code count mode and rate:
 0 = 30 frames/sec
 2 = 29.97 frames/sec NON-DROP-FRAME
 3 = 29.97 frames/sec DROP-FRAME
 4 = 24 frames/sec
 5 = 25 frames/sec

yyyy

Cycle mode:

- 0 = OFF
- 1 = CYCLE
- 2 = AUTO REWIND
- 3 = AUTO STOP

zzzz

Auto-Edit mode:

- 0 = OFF
- 1 = AUTO-EDIT
- 2 = AUTO-EDIT WITH TALENT CUEING

6.14 Add to and/or modify 13.11.11 MIDI CHASE (address J):

[n] @B

REMOTE BEEPER AND MIDI METRONOME ENABLES

- n : 0=OFF
- 1=REMOTE BEEPER (INCLUDING COUNT IN)
 - 2=REMOTE BEEPER COUNT IN ONLY
 - 3=MIDI METRONOME (INCLUDING COUNT IN)
 - 4=MIDI METRONOME COUNT IN ONLY
 - 5=REMOTE AND MIDI (INCLUDING COUNT IN)
 - 6=REMOTE AND MIDI COUNT IN ONLY

[nn] @E

MIDI TX/MERGE ENABLES

- nn : Bits . .
- 01h=DISABLE SYNC,CONT/STOP,SONG PTR
 - 02h=ENABLE SONG SELECT TRANSMISSION
 - 04h=MERGE REAL TIME BYTES (EXCEPT F8)
 - 08h=MERGE CHANNEL, SYSTEM COMMON DATA
 - 10h=THRU IS OUT2
 - 20h=MIDI TIME CODE ENABLED
 - 40h=PERFORMER DIRECT TIME LOCK ENABLED

[nn] @L

LOAD LEARN SOURCE

- nn : 00=CAPTURE Tap - override avrg
- 01=CAPTURE Tap - direct to Map
 - 02=MIDI Clock
 - 03=AUX IN Frequency (Timebase)
 - 04=AUDIO AUX IN ADAPTOR

[n] @N

BANK SWITCH
n = Bank number (0 thru 6)

[nn] @T

SAVE/LOAD MAP TO TAPE, SAVE/LOAD CANCEL
nn : 00 = Save to Tape
01 = Load from Tape
04 = Cancel Save/Load (Tape or MIDI File Dump)

[aa aa aa aa dd nn] @T

SAVE/LOAD MAP VIA MIDI FILE DUMP
aa aa aa aa = File type consisting of four ASCII characters.
Temporarily MIDI types only i.e. transmit 'MIDI' or 4XD
49 44 49
dd = Destination/Source device (0-7E, 7F=All/Any)
nn : 02 = Transmit (save) file
03 = Receive (load) file

[hhmmssffxx] Q

LOAD CUE POINT (and calculate bar/beat register 'r')

[bbbbttssnn] R

LOAD BAR/BEAT CUE POINT (and back calculate 'Q' point)
bbbb : Bar number
tt : Beat number
ss : Sixteenth note
nn : 00

6.15 Modify 13.11.14 SLAVE TRANSPORT (address M):

[nddd] @X

LOAD/SAVE TRANSPORT CONSTANTS
n: 0 = Load from EPROM
1 = Load from User-Area
2 = Save to User-Area
ddd: Transport/User-Area Ident

User-Area Idents . .
000 thru 009

Transport Ident's . .

000	AEG M-15A (38 cm/s)
001	AEG M-15A (76 cm/s)
002	AEG M-20
003	AKAI MG-1212
004	AKAI MG-1214
005	AKAI MG-14D
006	AMPEX ATR-100/104
007	AMPEX ATR-116/124
008	AMPEX MM-1200
009	AMPEX VPR-2/80
010	AMPEX VPR-6
011	AMPEX VPR-6 (Master only)
012	FOSTEX B16 (DC)
013	FOSTEX B16D (FM)
014	same as 013
015	FOSTEX 20,80 (DC)
016	FOSTEX E-Series
017	JVC CR-5550/6650
018	JVC BR-8600U
019	JVC CR-850
020	not used
021	JVC BR-7700
022	not used
023	not used
024	JVC CR-8250
025	not used
026	JVC BR-6400U
027	not used
028	MCI/SONY JH-16/24/114
029	MCI/SONY JH-110 A/B/C
030	MITSUBISHI X-80/X-80A
031	MITSUBISHI X-800
032	MITSUBISHI X-850
033	MITSUBISHI X-86
034	MITSUBISHI X-400
035	MITSUBISHI X-850 'D'
036	MITSUBISHI X-86 'D'
037	MITSUBISHI X-400 'D'
038	NAGRA T ("TAERP")
039	OTARI MTR-10,12
040	OTARI MTR-10II,12II
041	OTARI MTR-90I
042	OTARI MTR-90II
043	OTARI 5050 (34 pin)
044	OTARI 5050 (16 pin)
045	OTARI MX-7800
046	OTARI DTR-900
047	OTARI MTR-20
048	OTARI MX-70
049	OTARI MX-80
050	OTARI DTR-900 'D'
051	PANASONIC AG-6300 (Zeta cable 024)

052	PANASONIC NV-8500
053	PANASONIC AU-650
054	SONY VO-2850 (Master)
055	SONY VO-5850
056	SONY BVU-800/820/850
057	SONY BVW-10/40
058	SONY PCM-3324 (44.1KHz)
059	SONY APR-5000/5002/5003
060	SONY VO-5600
061	SONY VO-5600 (Search w/Pict)
062	SONY VO-5630 - same as 060
063	SONY VO-5630 (SwP) - same as 061
064	SONY VO-5800
065	SONY PCM-3202 (44.1KHz)
066	SONY SLO-325 (Master)
067	SONY PCM-3202 (48KHz)
068	SOUNDCRAFT 760MK-III/762MK-III
069	SOUNDCRAFT SATURN/ Series 20
070	STUDER A80 (DC)
071	STUDER A80 (FM)
072	STUDER A800 MK-II
073	STUDER A800 MK-III
074	STUDER A810
075	STUDER B67
076	STUDER A80 2" (DC)
077	STUDER A80 2" (FM)
078	STUDER A820
079	TASCAM 40/50 Series
080	TASCAM 85-16B
081	TASCAM 388/STUDIO 8
082	TASCAM 60 Series
083	TASCAM MS-16
084	TASCAM ATR-80
085	3M M-79
086	not used
087	not used
088	not used
089	AMPEX VPR-3
090	not used
091	not used
092	not used
093	not used
094	not used
095	not used
096	not used
097	not used
098	not used
099	not used
100	SONY PCM-3324 (48KHz)
101	SONY VP-7000/7600
102	not used
103	not used
104	not used
105	STELLAVOX TD-9 (w/TC)

106	not used
107	not used
108	not used
109	not used
110	not used
111	AKAI DR-1200
112	LYREC TR-533
113	OTARI MTR-100A
114	OTARI MX-50
115	OTARI MX-55
116	SONY APR-24
117	SONY PCM-3402 (44.1KHz)
118	SONY PCM-3402 (48KHz)
119	SONY VP-9000/VO-9600
120	SONY VO-9800
121	SONY VO-9850
122	not used
123	STUDER A807
124	STUDER A812
125	STUDER A820 2"
126	STUDER C270
127	TASCAM MSR-16
128	TASCAM 60-16
129	FOSTEX D-20 DAT
130	JVC BR-S810U/S610U
131	PANASONIC AG-7500/7300/6500/6300
132	SONY BVU-950 (PARALLEL, MAST ONLY)
133	STUDER C278
134	FOSTEX D-20 DAT 'D'
135	JVC KR-M800U

[ddd] XP

VARIABLE PLAY

ddd: Percent of playspeed, (100=play)
 Limited to 050 thru 150 (+/- 50%),
 and may be further limited by Constant 44.

6.15 Add to 13.11.13 EVENTS (address L):

[v] @D

DISARM EVENT

v: Event number (0 thru 9)
 Disarm **all** events with v=0Ah

[nv] @V

LOAD EVENT ENABLE TYPE

n: 0 = Normal trigger to selected AUX-OUT
 1 = MIDI Note On
 2 = MIDI Program Change
 3 = Remote Function Key trigger
 v: Event number (0 thru 9)

[ccpptyynv] @W

LOAD MIDI EVENT PARAMETERS

cc = channel (0-0Fh)
 pp = program change (0-7Fh)
 tt = note value (0-7Fh)
 yy = velocity (0-7Fh)
 n: 0 = Load
 v: Event number (0 thru 9)

[iaanv] @W

ADJUST MIDI EVENT PARAMETERS

i: 0 = channel
 1 = program change
 2 = note value
 3 = velocity
 aa = increment/decrement amount (hex)
 n: 1 = increment
 2 = decrement
 v: Event number (0 thru 9)

[v] N

FIRE EVENT MIDI NOTE ON/OFF SEQUENCE

v: Event number (0 thru 9)

[v] P

FIRE EVENT MIDI PROGRAM CHANGE

v: Event number (0 thru 9)

6.16 Add to 13.11.16 ZETA SYSTEM (address Z):

[n] H

GENERATOR TIME CODE LINK ON/OFF

n: 0=Off
 1=On
 F=reserved

U

SYSTEM PAUSE

(Non-pause transports will be issued a STOP command)

[z] Y

MASTER/SLAVE RECORD/REHEARSE ENABLE

<u>z</u>	<u>Mast</u>	<u>Slv</u>	
0	-	-	Disable both
2	-	x	Master disable, Slave enable
4	x	-	Master enable, Slave disable
6	x	x	Enable both

Note: For each specified enable, this command will transfer the system in and out points to the local transport registers (at addresses M and/or N), and arm the transport for record or rehearse according to system setting (see the @I SELECT RECORD/REHEARSE command).

If enable is not specified, then a "disarm all" local command will be issued.

[hhmmssffxx] Q

LOAD SYSTEM CUE (GOTO) POINT

(Also calculates read only bar/beat register 'r')

[nzhmmssffxx] XQ

LOAD SYSTEM CUE POINT - DEV. SPECIFIC

(See XI command for details)

(Also calculates read only bar/beat register 'r')