**Is everything listed here?**

No. This is just a subset of the messages I have cataloged. It takes some time to enter them here and format them.

**Update:** The data here is only valid for a single Unitor8 of a specific version. I don't recommend using this page for anything other that some minor understanding of the protocol involved.

**Do any of the messages have a checksum?**

I have not found any checksums in the messages so far.

**What types of messages does it receive?**

I have found two types of messages:

1. A message to a device controlling Unitor features.
    1. These are messages are characterized by the first 5 bytes F0 00 20 31 64
    2. 00 20 31 is the midi manufacturer ID for Emagic
    3. 64 is most likely an identifier specifying that it is a Unitor 8
    4. These messages all deal with setting that a specific to the Unitor, such as LED brightness, port mapping, message filters
2. A message to a device controlling timing features
    1. These messages are characterized by the first 4 bytes F0 00 00 33
    2. 00 00 33 is the midi manufacturer ID for S&S Research
    3. These messages all deal with the type and format of the clock that is generated

 

### How to change the messages to talk to Unitors that are chained together

```
F0 00 20 31 64 10 00 7F 00 F7
```

Right now this is just a guess, but I suspect that byte 7 is used to direct a message to Unitor further into the chain.

Since it seems to be zero in all of the messages so far and I am talking the first and only Unitor in my chain.

UPDATE: This is 100% correct

The format of this byte is 00bbb000B where Box Number (bbb) = 0 - 7

```
Some are in the format 0rbbbgggB   ;b: Box number, r=1:ROM, r=0:EEPROM
                                   ;g: Device 000=Unitor8, 001=AMT8
```

### Scan for a Unitor

```
F0 00 20 31 64 03 00 7F F7

F0 00 20 31 64 03 00 7F F7 sent
F0 00 20 31 64 04 00 40 F7 received

F0 00 20 31 64 0B 00 00 F7 sent
F0 00 20 31 64 7B 00 00 32 30 32 F7 received (32 30 32 is ASCII firmware
version 202 = 2.0.2)

F0 00 20 31 64 0B 00 40 F7 sent
F0 00 20 31 64 7B 00 40 32 30 32 F7 received (32 30 32 is ASCII firmware
version 202 = 2.0.2)

F0 00 20 31 64 0B 00 08 F7 sent (ping for chained unitor 1?)
F0 00 20 31 64 0B 00 10 F7 sent (ping for chained unitor 2?)
F0 00 20 31 64 0B 00 18 F7 sent (ping for chained unitor 3?)
F0 00 20 31 64 0B 00 20 F7 sent (ping for chained unitor 4?)
F0 00 20 31 64 0B 00 28 F7 sent (ping for chained unitor 5?)
F0 00 20 31 64 0B 00 30 F7 sent (ping for chained unitor 6?)
F0 00 20 31 64 0B 00 38 F7 sent (ping for chained unitor 7?)

F0 00 20 31 64 12 00 00 00 F7 sent (request patch 1)
F0 00 20 31 64 7A 00 00 00 00 0F 0E 0F 0D 0F 0B 0F 07 0E 0F 0D 0F 0B 0F
07 0F F7 received (this is patch 1)
F0 00 20 31 64 12 00 00 01 F7 sent (request patch 2)
F0 00 20 31 64 7A 00 00 01 00 00 01 00 01 00 01 00 01 00 01 00 01 00 01
00 01 F7 received (this is patch 2)
F0 00 20 31 64 12 00 00 02 F7 sent (request patch 3)
F0 00 20 31 64 7A 00 00 02 00 0F 0E 0F 0D 0F 0B 0F 07 0E 0F 0D 0F 0B 0F
07 0F F7 received (this is patch 3)
F0 00 20 31 64 12 00 00 03 F7 sent (request patch 4)
F0 00 20 31 64 7A 00 00 03 00 0F 0E 0F 0D 0F 0B 0F 07 0E 0F 0D 0F 0B 0F
07 0F F7 received (this is patch 4)
F0 00 20 31 64 12 00 00 04 F7 sent (request patch 5)
```

 

```
F0 00 20 31 64 7A 00 00 04 00 0F 0E 0F 0D 0F 0B 0F 07 0E 0F 0D 0F 0B 0F
07 0F F7 received (this is patch 5)
F0 00 20 31 64 12 00 00 05 F7 sent (request patch 6)
F0 00 20 31 64 7A 00 00 05 00 0F 0E 0F 0D 0F 0B 0F 07 0E 0F 0D 0F 0B 0F
07 0F F7 received (this is patch 6)
F0 00 20 31 64 12 00 00 06 F7 sent (request patch 7)
F0 00 20 31 64 7A 00 00 06 00 0F 0E 0F 0D 0F 0B 0F 07 0E 0F 0D 0F 0B 0F
07 0F F7 received (this is patch 7)
F0 00 20 31 64 12 00 00 07 F7
F0 00 20 31 64 7A 00 00 07 00 0F 0E 0F 0D 0F 0B 0F 07 0E 0F 0D 0F 0B 0F
07 0F F7 received (this is patch 8)
F0 00 20 31 64 12 00 00 08 F7
F0 00 20 31 64 7A 00 00 08 00 0F 0E 0F 0D 0F 0B 0F 07 0E 0F 0D 0F 0B 0F
07 0F F7 received (this is patch 9)
F0 00 20 31 64 12 00 00 09 F7
F0 00 20 31 64 7A 00 00 09 00 0F 0E 0F 0D 0F 0B 0F 07 0E 0F 0D 0F 0B 0F
07 0F F7 received (this is patch 10)
F0 00 20 31 64 12 00 00 0A F7
F0 00 20 31 64 7A 00 00 0A 00 0F 0E 0F 0D 0F 0B 0F 07 0E 0F 0D 0F 0B 0F
07 0F F7 received (this is patch 11)
F0 00 20 31 64 12 00 00 0B F7
F0 00 20 31 64 7A 00 00 0B 00 0F 0E 0F 0D 0F 0B 0F 07 0E 0F 0D 0F 0B 0F
07 0F F7 received (this is patch 12)
F0 00 20 31 64 12 00 00 0C F7
F0 00 20 31 64 7A 00 00 0C 00 0F 0E 0F 0D 0F 0B 0F 07 0E 0F 0D 0F 0B 0F
07 0F F7 received (this is patch 13)
F0 00 20 31 64 12 00 00 0D F7
F0 00 20 31 64 7A 00 00 0D 00 0F 0E 0F 0D 0F 0B 0F 07 0E 0F 0D 0F 0B 0F
07 0F F7 received (this is patch 14)
F0 00 20 31 64 12 00 00 0E F7
F0 00 20 31 64 7A 00 00 0E 00 0F 0E 0F 0D 0F 0B 0F 07 0E 0F 0D 0F 0B 0F
07 0F F7 received (this is patch 15)
F0 00 20 31 64 12 00 00 0F F7
F0 00 20 31 64 7A 00 00 0F 00 0F 0E 0F 0D 0F 0B 0F 07 0E 0F 0D 0F 0B 0F
07 0F F7 received (this is patch 16)
F0 00 20 31 64 12 00 00 10 F7
...
F0 00 20 31 64 12 00 00 1F F7
F0 00 20 31 64 7A 00 00 1F 00 0F 0D 0F 0D 0F 0B 0F 07 0E 0F 0D 0F 0B 0F
07 0F F7 received (this is patch 32)

F0 00 20 31 64 14 00 00 01 00 3F F7 - request sent computer mode

F0 00 20 31 64 79 00 00 01 00 3F 02 04 02 04 02 - received 140 bytes
04 02 04 02 04 02 04 02 04 02 04 02 04 02 04 02 - computer mode setup
04 02 04 02 04 02 04 02 04 02 04 00 00 0F 0F 02
00 00 01 00 0C 03 0F 00 0C 00 0E 00 03 00 00 00
00 00 00 00 00 00 00 00 00 00 00 00 06 00 05 00
08 00 01 04 08 06 0A 00 09 00 00 00 00 00 00 00
00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
00 00 00 00 00 00 00 00 00 00 00 F7
```

 

```
F0 00 20 31 64 14 00 00 02 00 3F F7 - request sent patch mode setup

F0 00 20 31 64 79 00 00 02 00 3F 02 04 02 04 02 - received 140 bytes
04 02 04 02 04 02 04 02 04 02 04 02 04 02 04 02 - patch mode setup
04 02 04 02 04 02 04 02 04 02 04 00 08 0F 0F 02
00 00 01 00 0C 03 0F 00 0C 00 0E 00 03 04 00 00
00 00 00 00 00 00 00 00 00 00 00 00 03 00 05 00
08 00 01 04 08 06 0A 00 09 00 00 00 00 00 00 00
00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
00 00 00 00 00 00 00 00 00 00 00 F7

F0 00 20 31 64 14 00 00 03 00 40 F7 - request tip & ring setup

F0 00 20 31 64 79 00 00 43 00 40 00 01 00 01 00 - received 142 bytes
00 00 00 00 00 00 00 00 00 00 00 00 00 00 01 00 - Click Tip & Ring setup
00 00 00 00 00 00 00 00 00 00 00 00 00 00 01 00
00 00 00 00 00 00 00 00 00 00 00 00 00 00 01 00
00 00 00 00 00 00 00 00 00 00 00 00 00 00 01 00
00 00 00 00 00 00 00 00 00 00 00 00 00 00 01 00
00 00 00 00 00 00 00 00 00 00 00 00 00 00 01 00
00 00 00 00 00 00 00 00 00 00 00 00 00 00 01 00
00 00 00 00 00 00 00 00 00 00 00 00 00 00 F7

F0 00 20 31 64 14 00 00 00 00 1F F7

F0 00 20 31 64 79 00 00 00 00 1F 0C 08 01 04 0A - received 76 byts
0A 0F 05 04 07 0F 05 04 08 04 00 01 00 04 03 04
04 04 05 04 06 04 01 04 02 00 00 00 00 00 00 00
00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
00 00 00 00 00 00 00 00 00 00 00 F7

F0 00 20 31 64 0F 00 7F F7 - sent and from what I can tell it never
causes a response
```

 

### Click Input Tip

```
F0 00 20 31 64 0D 00 00 40 1E
00 1F 00 00 00 00 00 00 00 00 00 00 00 00 00 00 switch phase 1
00 07 00 00 00 00 00 00 00 00 00 00 00 00 00 00 switch phase 2
00 07 00 00 00 00 00 00 00 00 00 00 00 00 00 00 switch phase 3
00 07 00 00 00 00 00 00 00 00 00 00 00 00 00 00 switch phase 4
F7
```

75 ($4B) bytes

Blue - SysEx device ID

Orange - action?

Purple - 0x60 0x00 = Tip analog, second byte is the hold time 0x00 to 0x7F
- 0x40 0x1E = Tip footswitch
- 0x00 0x00 = Ring setup

Magenta - mode of phase + # of bytes (stored additively / OR'd together)
18 = Patch Up
10 = Patch Down
08 = Panic
00 = MIDI 0 # of bytes
01 = MIDI 1 # of bytes
02 = MIDI 2 # of bytes
03 = MIDI 3 # of bytes
04 = MIDI 4 # of bytes
05 = MIDI 5 # of bytes
06 = MIDI 6 # of bytes
07 = MIDI 7 # of bytes

Green - Midi message data
Each byte of midi data is stored as two bytes where;
Most significant nibble in the first byte shifted right by 4 bits
Least significant nibble in the second byte

Brown - unused

 

### Click Input Ring

```
F0 00 20 31 64 0D 00 00 00 00
00 1F 00 00 00 00 00 00 00 00 00 00 00 00 00 00 switch phase 1
00 07 00 00 00 00 00 00 00 00 00 00 00 00 00 00 switch phase 2
00 07 00 00 00 00 00 00 00 00 00 00 00 00 00 00 switch phase 3
00 07 00 00 00 00 00 00 00 00 00 00 00 00 00 00 switch phase 4
F7
```

Blue - SysEx device ID

Orange - action?

Purple - 0x60 0x00 = Tip analog, second byte is the hold time 0x00 to 0x7F
- 0x40 0x1E = Tip footswitch
- 0x00 0x00 = Ring setup

Magenta - mode of phase + # of bytes (stored additively / OR'd together)
18 = Patch Up
10 = Patch Down
08 = Panic
00 = MIDI 0 # of bytes
01 = MIDI 1 # of bytes
02 = MIDI 2 # of bytes
03 = MIDI 3 # of bytes
04 = MIDI 4 # of bytes
05 = MIDI 5 # of bytes
06 = MIDI 6 # of bytes
07 = MIDI 7 # of bytes

Green - Midi message data
Each byte of midi data is stored as two bytes where;
Most significant nibble in the first byte shifted right by 4 bits
Least significant nibble in the second byte

Brown - unused

---

### Set Computer Mode

```
F0 00 20 31 64 0F 00 7F F7
```

Blue - SysEx device ID

Orange - action?

---

 

### Select a patch / Set patch mode

```
F0 00 20 31 64 10 00 7F 00 F7
F0 00 20 31 64 10 00 7F 02 F7 Select Patch 3
F0 00 20 31 64 10 00 7F 1F F7 Select Patch 32
```

Blue - SysEx device ID

Orange - action?

Green - patch number

 

### Configure the 32 Patches

F0 00 20 31 64 11 00 00 00 00 0F 0E 0F 0D 0F 0B
0F 07 0E 0F 0D 0F 0B 0F 07 0F F7

**NOTE: for some reason sound diver sends a patch select after every one of these configuration messages.**

Patch 1 - Initialized
F0 00 20 31 64 11 00 00 00 00 0F 0E 0F 0D 0F 0B
0F 07 0E 0F 0D 0F 0B 0F 07 0F F7

Patch 1 - input 1 to all outputs - everything else off
F0 00 20 31 64 11 00 00 **00** 00 **00 01** 00 01 **00 01**
00 01 **00 01** 00 01 **00 01** 00 01 F7

F0 00 20 31 64 11 00 00 **01** 00 **00 01** 00 01 **00 01**
00 01 **00 01** 00 01 **00 01** 00 01 F7

Byte Function
9 Patch# 0x00-0x1F (0-32)

The byte pairs are output settings
Bytes Function
**11 - 12 Output 1**
13 - 14 Output 2
**15 - 16 Output 3**
17 - 18 Output 4
**19 - 20 Output 5**
21 - 22 Output 6
**23 - 24 Output 7**
25 - 26 Output 8

00 01 - Input from port 1
00 02 - Input from port 2
00 04 - Input from port 3
00 08 - Input from port 4
01 00 - Input from port 5
02 00 - Input from port 6
04 00 - Input from port 7
08 00 - Input from port 8

 

### Request patch

F0 00 20 31 64 12 00 00 00 F7

Blue - patch number 0x00 to 0x1F

response:

F0 00 20 31 64 7A 00 00 00 00 **0F 0E** *0F 0D* **0F 0B** *0F 07* **0E 0F** *0D 0F* **0B 0F** *07 0F* F7

Byte Function
9 Patch# 0x00-0x1F (0-32)

The byte pairs are output settings
Bytes Function
**11 - 12 Output 1**
*13 - 14 Output 2*
**15 - 16 Output 3**
*17 - 18 Output 4*
**19 - 20 Output 5**
*21 - 22 Output 6*
**23 - 24 Output 7**
*25 - 26 Output 8*

The following bits are OR'd together to connect an input to an output
00 01 - Input from port 1
00 02 - Input from port 2
00 04 - Input from port 3
00 08 - Input from port 4
01 00 - Input from port 5
02 00 - Input from port 6
04 00 - Input from port 7
08 00 - Input from port 8

Same format message as configuring a patch

 

**RS/IO LED Brightness**

F0 00 20 31 64 13 00 00 00 08 00 00 00 F7

Blue - SysEx device ID

Orange - action?

Magenta - LED
07 00 IO LED
08 00 RS LED

Green - LED Brightness
00 00 OFF
00 01 Brightness 1
00 02 Brightness 2
00 04 Brightness 3
00 08 Brightness 4
01 00 Brightness 5
02 00 Brightness 6
04 00 Brightness 7
08 00 Brightness 8

 

### Global LED Brightness

```
F0 00 20 31 64 13 00 00 00 00 1F 0C 08 01 04 0A
0A 0F 05 04 07 0F 05 04 08 00 00 00 00 04 03 04
04 04 05 04 06 04 01 04 02 00 00 00 00 00 00 00
00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
00 00 00 00 00 00 00 00 00 00 00 F7

F0 00 20 31 64 13 00 00 00 00 1F 0C 08 01 04 0A
0A 0F 05 04 07 0F 05 04 08 00 08 00 00 04 03 04
04 04 05 04 06 04 01 04 02 00 00 00 00 00 00 00
00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
00 00 00 00 00 00 00 00 00 00 00 F7

F0 00 20 31 64 13 00 00 00 00 1F 0C 08 01 04 0A
0A 0F 05 04 07 0F 05 04 08 00 00 00 08 04 03 04
04 04 05 04 06 04 01 04 02 00 00 00 00 00 00 00
00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
00 00 00 00 00 00 00 00 00 00 00 F7
```

Red - IO LED Brightness

Brown - RS LED Brightness

- LED Brightness
00 00 OFF
00 01 Brightness 1
00 02 Brightness 2
00 04 Brightness 3
00 08 Brightness 4
01 00 Brightness 5
02 00 Brightness 6
04 00 Brightness 7
08 00 Brightness 8

*Both LED settings are sent at once with this message*

 

### Configure Patch Mode

```
F0 00 20 31 64 13 00 00 02 00 3F 02 04 02 04 02
04 02 04 02 04 02 04 02 04 02 04 02 04 02 04 02
04 02 04 02 04 02 04 02 04 02 04 00 00 0F 0F 02
05 00 01 00 0C 03 0F 00 0C 00 0E 00 03 04 00 00
00 00 00 00 00 00 00 00 00 00 00 00 03 00 05 00
08 00 01 04 08 06 0A 00 09 00 00 00 00 00 00 00
00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
00 00 00 00 00 00 00 00 00 00 00 F7

I need to track down what situation send this full message. I suspect
this is a Patches Mode dump, with msg filters etc.
```

---

### Setup patch phange (Patch Mode)

F0 00 20 31 64 13 00 00 02 11 00 00 0F F7 - sent to setup patch change

Green - 0x00 = OFF 0x08 = ON
Orange - Input where the program change message will come in on 0x00 to 0x07
Magenta - Channel of program change message 0x00 to 0x0F

NOTE: a patch select message is always sent after the above patch change configuration message.
F0 00 20 31 64 10 00 7F 01 F7

---

### Request computer mode setup

```
F0 00 20 31 64 14 00 00 01 00 3F F7 - request sent computer mode

F0 00 20 31 64 79 00 00 01 00 3F 02 04 02 04 02 - received 140 bytes
04 02 04 02 04 02 04 02 04 02 04 02 04 02 04 02 - computer mode setup
04 02 04 02 04 02 04 02 04 02 04 00 00 0F 0F 02
00 00 01 00 0C 03 0F 00 0C 00 0E 00 03 00 00 00
00 00 00 00 00 00 00 00 00 00 00 00 06 00 05 00
08 00 01 04 08 06 0A 00 09 00 00 00 00 00 00 00
00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
00 00 00 00 00 00 00 00 00 00 00 F7
```

---

 

### Request patch mode setup

```
F0 00 20 31 64 14 00 00 02 00 3F F7 - request sent patch mode setup

F0 00 20 31 64 79 00 00 02 00 3F 02 04 02 04 02 - received 140 bytes
04 02 04 02 04 02 04 02 04 02 04 02 04 02 04 02 - patch mode setup
04 02 04 02 04 02 04 02 04 02 04 00 08 0F 0F 02
00 00 01 00 0C 03 0F 00 0C 00 0E 00 03 04 00 00
00 00 00 00 00 00 00 00 00 00 00 00 03 00 05 00
08 00 01 04 08 06 0A 00 09 00 00 00 00 00 00 00
00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
00 00 00 00 00 00 00 00 00 00 00 F7
```

---

### Request click tip and ring setup

```
F0 00 20 31 64 14 00 00 03 00 40 F7 - request tip & ring setup

F0 00 20 31 64 79 00 00 43 00 40 00 01 00 01 00 - received 142 bytes
00 00 00 00 00 00 00 00 00 00 00 00 00 00 01 00 - Click Tip & Ring setup
00 00 00 00 00 00 00 00 00 00 00 00 00 00 01 00
00 00 00 00 00 00 00 00 00 00 00 00 00 00 01 00
00 00 00 00 00 00 00 00 00 00 00 00 00 00 01 00
00 00 00 00 00 00 00 00 00 00 00 00 00 00 01 00
00 00 00 00 00 00 00 00 00 00 00 00 00 00 01 00
00 00 00 00 00 00 00 00 00 00 00 00 00 00 01 00
00 00 00 00 00 00 00 00 00 00 00 00 00 00 F7
```

Green - analog hold time (bits 7-1) + input type (bit 0)
stored as high nibble and low nibble across 2 bytes

The rest of the data conforms to the Click Input Tip and Click Input Ring switch phase midi data.

---

### Computer Mode - Timing

```
F0 00 00 33 02 0D 00 27 01 03 00 3B 2D 00 17 3B 3B 17 01 00 10 F7

F0 00 00 33 02 0D 00 27 01 03 00 3B 2D 00 17 3B 3B 17 01 00 10 F7
F0 00 00 33 02 0D 00 25 01 03 00 3B 2D 00 17 3B 3B 17 01 00 10 F7 - Striping OFF
```

Blue - SysEx device ID : All timing messages have a device ID that corresponds to S&S Research

byte offset binary

8 00100101 Striping OFF
00100111 Striping ON

---

 