

# Changing Six-Trak Parameters Over MIDI

David Barnhart

1. The Six-Trak must be ready to receive parameter changes. On power-up, this ability is disabled. Press and hold the Control Record and Number 4

2. The parameter changes may be sent over sys-ex or by MIDI continuous controllers. See point "a" for CC information and "b" for system-exclusive information.

a. Most sequencers send CCs in a format similar to "control *a,b*" where *a* is the controller number (usually in decimal) and *b* is the particular value assigned (not always in decimal). Determine which number system the sequencer uses, and translate accordingly by the Parameter Translation Table. For example, a sequencer which sends the controller number in decimal and controller values in hexadecimal would turn Unison on by sending "control 37, 40". A sequencer that sends both the controller number and values in decimal would send "control 37, 64".

b. A system-exclusive opening string must be sent that serves to alert the Six-Trak that sys-ex is about to be sent. On some systems, this opening string is not needed. It contains the generic sys-ex identifier, plus Sequential Circuit's ID, the Six-Trak's ID, and the Parameter Change command. It follows:

|             |   |
|-------------|---|
| Hexadecimal | F0 01 05 B0                             |
| Binary      | 1111 0000 0000 0001 0000 0101 1011 0000 |
| Decimal     | 240 1 5 176                             |

Next, using the parameter table on the next page, the parameter number is sent. Once again, either binary, hexadecimal or the decimal may be used, according to the sequencer's method.

Finally, the parameter's new value is sent. The parameter values' resolutions range from 1-bit to 7-bit. The parameter resolution must match up with the correct table for the value to be received correctly (i.e. since the "oscillator fine frequency" is a 5-bit number, the hexadecimal, decimal, or binary can be converted only in the 5-bit table).

On systems that required the sys-ex opening string, the sys-ex "End of Line" must be sent:

|             |           |
|-------------|-----------|
| Hexadecimal | F7        |
| Binary      | 1111 0111 |
| Decimal     | 247       |

3. Parameter changes made over MIDI are all defaulted once the patch is reloaded. If patch nine was selected, and parameter changes were made over MIDI, they were all be lost if patch nine was selected again. This is a convenient way to restore the patch back to normal instead of undoing each change.

| Parameter Translation Table |                      |         |     |           |            |
|-----------------------------|----------------------|---------|-----|-----------|------------|
| Parameter Number (on synth) | Name                 | Decimal | Hex | Binary    | Resolution |
| -                           | MOD WHEEL            | 1       | 01  | 0000 0001 | 5          |
| 0                           | OSC COARSE FREQ      | 2       | 02  | 0000 0010 | 6          |
| 1                           | OSC FINE FREQ        | 3       | 03  | 0000 0011 | 5          |
| 2                           | OSC GLIDE RATE       | 4       | 04  | 0000 0100 | 4          |
| 3                           | OSC LFO              | 5       | 05  | 0000 0101 | 1          |
| 4                           | OSC ENVELOPE AMOUNT  | 6       | 06  | 0000 0110 | 4          |
| 5                           | OSC ENV INVERT       | 7       | 07  | 0000 0111 | 1          |
| 6                           | OSC ENV ATTACK       | 8       | 08  | 0000 1000 | 4          |
| 7                           | OSC ENV DECAY        | 9       | 09  | 0000 1001 | 4          |
| 8                           | OSC ENV SUSTAIN      | 10      | 0A  | 0000 1010 | 4          |
| 9                           | OSC ENC RELEASE      | 11      | 0B  | 0000 1011 | 4          |
| 10                          | OSC SAWTOOTH WAVE    | 12      | 0C  | 0000 1100 | 1          |
| 11                          | OSC TRIANGLE WAVE    | 13      | 0D  | 0000 1101 | 1          |
| 12                          | OSC PULSE WAVE       | 14      | 0E  | 0000 1110 | 1          |
| 13                          | OSC PULSE WIDTH      | 15      | 0F  | 0000 1111 | 6          |
| 14                          | OSC PULSE LFO-MOD    | 16      | 10  | 0001 0000 | 1          |
| 15                          | LFO FREQUENCY        | 17      | 11  | 0001 0001 | 4          |
| 16                          | LFO PROGRAM AMOUNT   | 18      | 12  | 0001 0010 | 5          |
| 17                          | LFO TRI/SQUARE WAVE  | 19      | 13  | 0001 0011 | 1          |
| 18                          | OSC/NOISE MIXER      | 20      | 14  | 0001 0100 | 5          |
| 19                          | FILT CUTOFF FREQ     | 21      | 15  | 0001 0101 | 7          |
| 20                          | FILT RESONANCE       | 22      | 16  | 0001 0110 | 6          |
| 21                          | FILT ENVELOPE AMOUNT | 23      | 17  | 0001 0111 | 4          |
| 22                          | FILT ENV INVERT      | 24      | 18  | 0001 1000 | 1          |
| 23                          | FILT ENV ATTACK      | 25      | 19  | 0001 1001 | 4          |
| 24                          | FILT ENV DECAY       | 26      | 1A  | 0001 1010 | 4          |
| 25                          | FILT ENV SUSTAIN     | 27      | 1B  | 0001 1011 | 4          |
| 26                          | FILT ENV RELEASE     | 28      | 1C  | 0001 1100 | 4          |
| 27                          | FILT LFO-MODULATION  | 29      | 1D  | 0001 1101 | 1          |
| 28                          | FILT KEYBOARD AMT    | 30      | 1E  | 0001 1110 | 2          |
| 29                          | FILT OSC TRI MOD AMT | 31      | 1F  | 0001 1111 | 6          |
| 30                          | AMP ATTACK           | 32      | 20  | 0010 0000 | 4          |
| 31                          | AMP DECAY            | 33      | 21  | 0010 0001 | 4          |
| 32                          | AMP SUSTAIN          | 34      | 22  | 0010 0010 | 4          |
| 33                          | AMP RELEASE          | 35      | 23  | 0010 0011 | 4          |
| 34                          | VOICE VOLUME         | 36      | 24  | 0010 0100 | 4          |
| 35                          | UNISON               | 37      | 25  | 0010 0101 | 1          |

| 1-bit      |         |             |           |
|------------|---------|-------------|-----------|
| Resolution | Decimal | Hexadecimal | Binary    |
| 0          | 0       | 00          | 0000 0000 |
| 1          | 64      | 40          | 0100 0000 |

| 2-bit      |         |             |           |
|------------|---------|-------------|-----------|
| Resolution | Decimal | Hexadecimal | Binary    |
| 0          | 0       | 00          | 0000 0000 |
| 1          | 32      | 20          | 0010 0000 |
| 2          | 64      | 40          | 0100 0000 |
| 3          | 96      | 60          | 0110 0000 |

| 4-bit      |         |             |           |
|------------|---------|-------------|-----------|
| Resolution | Decimal | Hexadecimal | Binary    |
| 0          | 0       | 00          | 0000 0000 |
| 1          | 8       | 08          | 0000 1000 |
| 2          | 16      | 10          | 0001 0000 |
| 3          | 24      | 18          | 0001 1000 |
| 4          | 32      | 20          | 0010 0000 |
| 5          | 40      | 28          | 0010 1000 |
| 6          | 48      | 30          | 0011 0000 |
| 7          | 56      | 38          | 0011 1000 |
| 8          | 64      | 40          | 0100 0000 |
| 9          | 72      | 48          | 0100 1000 |
| 10         | 80      | 50          | 0101 0000 |
| 11         | 88      | 58          | 0101 1000 |
| 12         | 96      | 60          | 0110 0000 |
| 13         | 104     | 68          | 0110 1000 |
| 14         | 112     | 70          | 0111 0000 |
| 15         | 120     | 78          | 0111 1000 |

| 5-bit      |         |             |           |
|------------|---------|-------------|-----------|
| Resolution | Decimal | Hexadecimal | Binary    |
| 0          | 0       | 00          | 0000 0000 |
| 1          | 4       | 04          | 0000 0100 |
| 2          | 8       | 08          | 0000 1000 |
| 3          | 12      | 0C          | 0000 1100 |
| 4          | 16      | 10          | 0001 0000 |
| 5          | 20      | 14          | 0001 0100 |
| 6          | 24      | 18          | 0001 1000 |
| 7          | 28      | 1C          | 0001 1100 |
| 8          | 32      | 20          | 0010 0000 |
| 9          | 36      | 24          | 0010 0100 |
| 10         | 40      | 28          | 0010 1000 |
| 11         | 44      | 2C          | 0010 1100 |
| 12         | 48      | 30          | 0011 0000 |
| 13         | 52      | 34          | 0011 0100 |
| 14         | 56      | 38          | 0011 1000 |
| 15         | 60      | 3C          | 0011 1100 |
| 16         | 64      | 40          | 0100 0000 |
| 17         | 68      | 44          | 0100 0100 |
| 18         | 72      | 48          | 0100 1000 |
| 19         | 76      | 4C          | 0100 1100 |
| 20         | 80      | 50          | 0101 0000 |
| 21         | 84      | 54          | 0101 0100 |
| 22         | 88      | 58          | 0101 1000 |
| 23         | 92      | 5C          | 0101 1100 |
| 24         | 96      | 60          | 0110 0000 |
| 25         | 100     | 64          | 0110 0100 |
| 26         | 104     | 68          | 0110 1000 |
| 27         | 108     | 6C          | 0110 1100 |
| 28         | 112     | 70          | 0111 0000 |
| 29         | 116     | 74          | 0111 0100 |
| 30         | 120     | 78          | 0111 1000 |
| 31         | 124     | 7C          | 0111 1100 |

| 6-bit      |         |             |           |
|------------|---------|-------------|-----------|
| Resolution | Decimal | Hexadecimal | Binary    |
| 0          | 0       | 00          | 0000 0000 |
| 1          | 2       | 02          | 0000 0010 |
| 2          | 4       | 04          | 0000 0100 |
| 3          | 6       | 06          | 0000 0110 |
| 4          | 8       | 08          | 0000 1000 |
| 5          | 10      | 0A          | 0000 1010 |
| 6          | 12      | 0C          | 0000 1100 |
| 7          | 14      | 0E          | 0000 1110 |
| 8          | 16      | 10          | 0001 0000 |
| 9          | 18      | 12          | 0001 0010 |
| 10         | 20      | 14          | 0001 0100 |
| 11         | 22      | 16          | 0001 0110 |
| 12         | 24      | 18          | 0001 1000 |
| 13         | 26      | 1A          | 0001 1010 |
| 14         | 28      | 1C          | 0001 1100 |
| 15         | 30      | 1E          | 0001 1110 |
| 16         | 32      | 20          | 0010 0000 |
| 17         | 34      | 22          | 0010 0010 |
| 18         | 36      | 24          | 0010 0100 |
| 19         | 38      | 26          | 0010 0110 |
| 20         | 40      | 28          | 0010 1000 |
| 21         | 42      | 2A          | 0010 1010 |
| 22         | 44      | 2C          | 0010 1100 |
| 23         | 46      | 2E          | 0010 1110 |
| 24         | 48      | 30          | 0011 0000 |
| 25         | 50      | 32          | 0011 0010 |
| 26         | 52      | 34          | 0011 0100 |
| 27         | 54      | 36          | 0011 0110 |
| 28         | 56      | 38          | 0011 1000 |
| 29         | 58      | 3A          | 0011 1010 |
| 30         | 60      | 3C          | 0011 1100 |
| 31         | 62      | 3E          | 0011 1110 |
| 32         | 64      | 40          | 0100 0000 |
| 33         | 66      | 42          | 0100 0010 |
| 34         | 68      | 44          | 0100 0100 |
| 35         | 70      | 46          | 0100 0110 |
| 36         | 72      | 48          | 0100 1000 |
| 37         | 74      | 4A          | 0100 1010 |
| 38         | 76      | 4C          | 0100 1100 |
| 39         | 78      | 4E          | 0100 1110 |
| 40         | 80      | 50          | 0101 0000 |
| 41         | 82      | 52          | 0101 0010 |

| 6-bit      |         |             |           |
|------------|---------|-------------|-----------|
| Resolution | Decimal | Hexadecimal | Binary    |
| 42         | 84      | 54          | 0101 0100 |
| 43         | 86      | 56          | 0101 0110 |
| 44         | 88      | 58          | 0101 1000 |
| 45         | 90      | 5A          | 0101 1010 |
| 46         | 92      | 5C          | 0101 1100 |
| 47         | 94      | 5E          | 0101 1110 |
| 48         | 96      | 60          | 0110 0000 |
| 49         | 98      | 62          | 0110 0010 |
| 50         | 100     | 64          | 0110 0100 |
| 51         | 102     | 66          | 0110 0110 |
| 52         | 104     | 68          | 0110 1000 |
| 53         | 106     | 6A          | 0110 1010 |
| 54         | 108     | 6C          | 0110 1100 |
| 55         | 110     | 6E          | 0110 1110 |
| 56         | 112     | 70          | 0111 0000 |
| 57         | 114     | 72          | 0111 0010 |
| 58         | 116     | 74          | 0111 0100 |
| 59         | 118     | 76          | 0111 0110 |
| 60         | 120     | 78          | 0111 1000 |
| 61         | 122     | 7A          | 0111 1010 |
| 62         | 124     | 7C          | 0111 1100 |
| 63         | 126     | 7E          | 0111 1110 |

| 7-bit      |         |             |           |
|------------|---------|-------------|-----------|
| Resolution | Decimal | Hexadecimal | Binary    |
| 0          | 0       | 00          | 0000 0000 |
| 1          | 1       | 01          | 0000 0001 |
| 2          | 2       | 02          | 0000 0010 |
| 3          | 3       | 03          | 0000 0011 |
| 4          | 4       | 04          | 0000 0100 |
| 5          | 5       | 05          | 0000 0101 |
| 6          | 6       | 06          | 0000 0110 |
| 7          | 7       | 07          | 0000 0111 |
| 8          | 8       | 08          | 0000 1000 |
| 9          | 9       | 09          | 0000 1001 |
| 10         | 10      | 0A          | 0000 1010 |
| 11         | 11      | 0B          | 0000 1011 |
| 12         | 12      | 0C          | 0000 1100 |
| 13         | 13      | 0D          | 0000 1101 |
| 14         | 14      | 0E          | 0000 1110 |
| 15         | 15      | 0F          | 0000 1111 |
| 16         | 16      | 10          | 0001 0000 |
| 17         | 17      | 11          | 0001 0001 |
| 18         | 18      | 12          | 0001 0010 |
| 19         | 19      | 13          | 0001 0011 |
| 20         | 20      | 14          | 0001 0100 |
| 21         | 21      | 15          | 0001 0101 |
| 22         | 22      | 16          | 0001 0110 |
| 23         | 23      | 17          | 0001 0111 |
| 24         | 24      | 18          | 0001 1000 |
| 25         | 25      | 19          | 0001 1001 |
| 26         | 26      | 1A          | 0001 1010 |
| 27         | 27      | 1B          | 0001 1011 |
| 28         | 28      | 1C          | 0001 1100 |
| 29         | 29      | 1D          | 0001 1101 |
| 30         | 30      | 1E          | 0001 1110 |
| 31         | 31      | 1F          | 0001 1111 |
| 32         | 32      | 20          | 0010 0000 |
| 33         | 33      | 21          | 0010 0001 |
| 34         | 34      | 22          | 0010 0010 |
| 35         | 35      | 23          | 0010 0011 |
| 36         | 36      | 24          | 0010 0100 |
| 37         | 37      | 25          | 0010 0101 |
| 38         | 38      | 26          | 0010 0110 |
| 39         | 39      | 27          | 0010 0111 |
| 40         | 40      | 28          | 0010 1000 |
| 41         | 41      | 29          | 0010 1001 |

| 7-bit      |         |             |           |
|------------|---------|-------------|-----------|
| Resolution | Decimal | Hexadecimal | Binary    |
| 42         | 42      | 2A          | 0010 1010 |
| 43         | 43      | 2B          | 0010 1011 |
| 44         | 44      | 2C          | 0010 1100 |
| 45         | 45      | 2D          | 0010 1101 |
| 46         | 46      | 2E          | 0010 1110 |
| 47         | 47      | 2F          | 0010 1111 |
| 48         | 48      | 30          | 0011 0000 |
| 49         | 49      | 31          | 0011 0001 |
| 50         | 50      | 32          | 0011 0010 |
| 51         | 51      | 33          | 0011 0011 |
| 52         | 52      | 34          | 0011 0100 |
| 53         | 53      | 35          | 0011 0101 |
| 54         | 54      | 36          | 0011 0110 |
| 55         | 55      | 37          | 0011 0111 |
| 56         | 56      | 38          | 0011 1000 |
| 57         | 57      | 39          | 0011 1001 |
| 58         | 58      | 3A          | 0011 1010 |
| 59         | 59      | 3B          | 0011 1011 |
| 60         | 60      | 3C          | 0011 1100 |
| 61         | 61      | 3D          | 0011 1101 |
| 62         | 62      | 3E          | 0011 1110 |
| 63         | 63      | 3F          | 0011 1111 |
| 64         | 64      | 40          | 0100 0000 |
| 65         | 65      | 41          | 0100 0001 |
| 66         | 66      | 42          | 0100 0010 |
| 67         | 67      | 43          | 0100 0011 |
| 68         | 68      | 44          | 0100 0100 |
| 69         | 69      | 45          | 0100 0101 |
| 70         | 70      | 46          | 0100 0110 |
| 71         | 71      | 47          | 0100 0111 |
| 72         | 72      | 48          | 0100 1000 |
| 73         | 73      | 49          | 0100 1001 |
| 74         | 74      | 4A          | 0100 1010 |
| 75         | 75      | 4B          | 0100 1011 |
| 76         | 76      | 4C          | 0100 1100 |
| 77         | 77      | 4D          | 0100 1101 |
| 78         | 78      | 4E          | 0100 1110 |
| 79         | 79      | 4F          | 0100 1111 |
| 80         | 80      | 50          | 0101 0000 |
| 81         | 81      | 51          | 0101 0001 |
| 82         | 82      | 52          | 0101 0010 |
| 83         | 83      | 53          | 0101 0011 |

| 7-bit      |         |             |           |
|------------|---------|-------------|-----------|
| Resolution | Decimal | Hexadecimal | Binary    |
| 84         | 84      | 54          | 0101 0100 |
| 85         | 85      | 55          | 0101 0101 |
| 86         | 86      | 56          | 0101 0110 |
| 87         | 87      | 57          | 0101 0111 |
| 88         | 88      | 58          | 0101 1000 |
| 89         | 89      | 59          | 0101 1001 |
| 90         | 90      | 5A          | 0101 1010 |
| 91         | 91      | 5B          | 0101 1011 |
| 92         | 92      | 5C          | 0101 1100 |
| 93         | 93      | 5D          | 0101 1101 |
| 94         | 94      | 5E          | 0101 1110 |
| 95         | 95      | 5F          | 0101 1111 |
| 96         | 96      | 60          | 0110 0000 |
| 97         | 97      | 61          | 0110 0001 |
| 98         | 98      | 62          | 0110 0010 |
| 99         | 99      | 63          | 0110 0011 |
| 100        | 100     | 64          | 0110 0100 |
| 101        | 101     | 65          | 0110 0101 |
| 102        | 102     | 66          | 0110 0110 |
| 103        | 103     | 67          | 0110 0111 |
| 104        | 104     | 68          | 0110 1000 |
| 105        | 105     | 69          | 0110 1001 |
| 106        | 106     | 6A          | 0110 1010 |
| 107        | 107     | 6B          | 0110 1011 |
| 108        | 108     | 6C          | 0110 1100 |
| 109        | 109     | 6D          | 0110 1101 |
| 110        | 110     | 6E          | 0110 1110 |
| 111        | 111     | 6F          | 0110 1111 |
| 112        | 112     | 70          | 0111 0000 |
| 113        | 113     | 71          | 0111 0001 |
| 114        | 114     | 72          | 0111 0010 |
| 115        | 115     | 73          | 0111 0011 |
| 116        | 116     | 74          | 0111 0100 |
| 117        | 117     | 75          | 0111 0101 |
| 118        | 118     | 76          | 0111 0110 |
| 119        | 119     | 77          | 0111 0111 |
| 120        | 120     | 78          | 0111 1000 |
| 121        | 121     | 79          | 0111 1001 |
| 122        | 122     | 7A          | 0111 1010 |
| 123        | 123     | 7B          | 0111 1011 |
| 124        | 124     | 7C          | 0111 1100 |
| 125        | 125     | 7D          | 0111 1101 |

| 7-bit      |         |             |           |
|------------|---------|-------------|-----------|
| Resolution | Decimal | Hexadecimal | Binary    |
| 126        | 126     | 7E          | 0111 1110 |
| 127        | 127     | 7F          | 0111 1111 |