

# AN1X



**CONTROL SYNTHESIZER  
ANALOG PHYSICAL MODELING**

## Data List

**Daten-Liste  
Liste de données**



## CONTENTS

|  |          |
|--|----------|
| <b>Factory-set Voice List</b>                          | ..... 2  |
| <b>Tone Generator And Effect Signal Flow</b>           | ..... 5  |
| <b>Arpeggiator Type List</b>                           | ..... 5  |
| <b>Effect Type List</b>                                | ..... 6  |
| <b>Effect Parameter List</b>                           | ..... 6  |
| <b>Effect Parameter Table</b>                          | ..... 8  |
| <b>Common Control Matrix</b>                           | ..... 9  |
| <b>Control Change Modes</b>                            | ..... 9  |
| <b>Free EG Track Parameter List</b>                    | ..... 9  |
| <b>Control Matrix And Free EG Track Parameter List</b> | ..... 10 |
| <b>MIDI Data Format</b>                                | ..... 11 |
| <b>MIDI Implementation Chart</b>                       | ..... 19 |

**YAMAHA**



## Factory-set Voice List

The following voices are preset at the factory. Each voice has different settings which you can change by moving the CONTROL knobs and other controllers. Each controller is assigned with its own unique settings. In general, AEG or FEG is assigned to knobs 1 and 2, VCF Cutoff to knob 5, Resonance to knob 6, and Effects-related parameters to knobs 7 and 8, respectively. Parameters assigned to other knobs were carefully selected for maximum effect. Depending on the settings for each parameter, changes you make may not be distinctive.

| No. | Cat. | Voice Name | Description   |
|-----|------|------------|---|
| 1   | Co   | Relaxx     | Combination of arpeggio synth & synthpad. Use [ASSIGN] knobs to control the arpeggio voice.   |
| 2   | Sq   | Terraform  | Hard sequence voice with pattern select. Keys C#1 to B2 correspond to User Patterns No. 1 to 23.  |
| 3   | Ba   | Celluloid  | Dual voice layered with full-bodied bass and metallic sounds. SINGLE mode is suitable for original tunes. Also try MONO and LEGATO. Also good for Synth lead in the upper register. |
| 4   | Br   | MajorBrass | Powerful analog brass sound. Use [RIBBON] controller to change VCF Cutoff (horizontal) and Resonance (pressure).  |
| 5   | Pd   | Soar       | Ethereal pad sound using arpeggiator.   |
| 6   | Ba   | Hardcore   | Hard core acid sound. Use [RIBBON] controller for distortion control.   |
| 7   | Ba   | Uni-Bass   | Fat bass sound using DUAL UNISON with Legato.   |
| 8   | Ld   | MegaDrone  | Fat lead sound with moving filter.  |
| 9   | Ld   | SyncLead   | Lead sound using "Sync." Try the [RIBBON] controller for effect.  |
| 10  | St   | Legato     | Pad strings sound with slow attack.   |
| 11  | Sq   | Alan       | Standard British progressive rock sound.  |
| 12  | Ba   | Mini       | Classic analog synth bass with various sequence patterns. Keys C#1 to B2 are correspond to User Patterns No. 25 to 47.  |
| 13  | Se   | Chemical   | Diving sweep sound. The rhythm in Scene 1 is created with the FreeEG. This is disabled for Scene 2.   |
| 14  | Pd   | SyncSweep  | Use [RIBBON] or [MODULATION] wheel for sync pitch control.  |
| 15  | Sc   | Caner      | Fat hook-line voice for dance & techno music. Try scene 2 with [MODULATION] wheel.  |
| 16  | Pf   | MorphEP    | Continuously changes between electric piano sound and pad sound using "Sync" by Scene Control function.   |
| 17  | Sq   | Doves      | Spacey sequence voice. Use [RIBBON] controller and [ASSIGN] knobs for effect.   |
| 18  | Sq   | BPF Morph  | Sequence voice with band pass filter for special atmosphere.  |
| 19  | Sq   | Seismic    | Step Sequencer plays a combination of analog drum and analog bass sounds. Free EG adds modulation for unique atmosphere.  |

| No. | Cat. | Voice Name | Description   |
|-----|------|------------|---|
| 20  | Fx   | Earth      | Sound effect layered with arpeggiated melody line and human voice-type pad.   |
| 21  | Co   | Vinnie     | Nice Split of vintage arpeggio & synth lead.  |
| 22  | Co   | Detroit    | Combination analog bass and analog effect sound.  |
| 23  | Co   | Plastik    | Combination synth sound layered with analog drum sound and its perfect fourth. Step Sequencer plays only while you hold the keys since the Hold function is set to OFF. |
| 24  | Co   | ChinaTech  | Combination synth sound layered with analog drum sound and its perfect fourth. Step Sequencer plays only while you hold the keys since the Hold function is set to OFF. |
| 25  | Co   | Silence    | Combination analog pad and analog lead sound.   |
| 26  | Ba   | Dog Bass   | Fat hip hop saw bass. Slide the edge back with the [MODULATION] wheel.  |
| 27  | Ba   | Slum       | Heavy analog bass with a characteristic attack. Select Scene 2 for a variation.   |
| 28  | Ba   | Loud       | Hybrid analog and FM bass sound.  |
| 29  | Ba   | MiniLow    | Analog bass sound with short filter decay. Use [ASSIGN] knobs to change the envelope and filter settings.   |
| 30  | Ba   | Kickbass   | Bass sound with a characteristic attack. Select Scene 2 to produce a sharp bass drum attack.  |
| 31  | Ba   | Sub Sub    | Hollow sub bass sound.  |
| 32  | Ba   | Hardstep   | Slippery drum and bass sound. Use the [RIBBON] to control the slip.   |
| 33  | Ba   | Wonder     | Analog bass sound suitable for melodic riffs.   |
| 34  | Ba   | Duck Bass  | Analog bass sound with wide dynamic range created by velocity.  |
| 35  | Ba   | Prophetic  | Vintage analog style bass sound.  |
| 36  | Ba   | Harmosync  | Contemporary acid sound. In Scene 2 the compressor drive is on the [RIBBON]. Try Scene1 for a more harmonic effect.   |
| 37  | Ba   | Kangaroo   | Bouncey soft acid sound. Get happy with this one.   |
| 38  | Ba   | Acid 1     | Hard acid sound number 1. Note that the feedback parameter (knob 7) interacts with the resonance (knob 6).  |

| No. | Cat. | Voice Name | Description   |
|-----|------|------------|---|
| 39  | Ba   | Acid 2     | Acid sound number 2. Twiddle those knobs for ultimate experience.   |
| 40  | Ba   | Acid 3     | Harder acid sound. [RIBBON] controls distortion amount. Watch the resonance.  |
| 41  | Br   | Soft Brass | Soft analog brass sound. Try the [RIBBON] controller.   |
| 42  | Br   | Hard Brass | Bright & fat analog sawtooth synth sound. Scene 2 is a square wave variation.   |
| 43  | Br   | Bronze     | Unison brass sound with short decay changes. Open filter brass with the [MODULATION] wheel. The same voice with the oscillators in octaves is in Scene 2. |
| 44  | Br   | Fatty      | Fat 70s style synth brass.  |
| 45  | Br   | Quincy     | Gentle and cool synth brass sound. Use velocity to control brightness.  |
| 46  | Br   | CS80 Brass | Emulation of classic CS80 brass patch.  |
| 47  | Br   | Tangiers   | Brass sound with fast attack. Great for house stabs.  |
| 48  | Br   | Brassmorph | [MODULATION] wheel gradually changes the sound between filtrated brass sound (Scene 1) and projected brass sound (Scene 2).                               |
| 49  | St   | Analog     | Bright analog synth strings. Use [MODULATION] wheel or [RIBBON] for dark strings.   |
| 50  | St   | Lush       | Rich PWmod string pad. Use the [RIBBON] to control brightness. A slight variation, up an octave in pitch, is in Scene 2.                                  |
| 51  | St   | Chocolate  | Orchestral sound layered with strings in different octaves.   |
| 52  | St   | Stringz    | Analog PWmod synth string pad. Scene 2 is a square wave variation, with pulse width controlled by the [RIBBON].   |
| 53  | St   | String Pad | Soft pad great for backing.   |
| 54  | Sc   | Billy      | 70s style poly synth sound. Use [ASSIGN] knobs for neat sound variations.   |
| 55  | Sc   | Fetish     | Wasp-like sound for soundtracks with the sweet pleasure of pain.  |
| 56  | Sc   | P-5 Compy  | Emulation of the classic Prophet 5 sound.   |
| 57  | Sc   | Stakka     | Voice stacked with a major third.   |
| 58  | Sc   | Dust       | Pizzicato synth sound.  |
| 59  | Sc   | WarmPoly   | 70s style poly synth. Use [ASSIGN] knobs for sound variations.  |
| 60  | Sc   | Rhubarb    | Fat portamento hook-voice for dance & techno.   |
| 61  | Ld   | Susy       | Warm vintage "mini" synth lead voice.   |

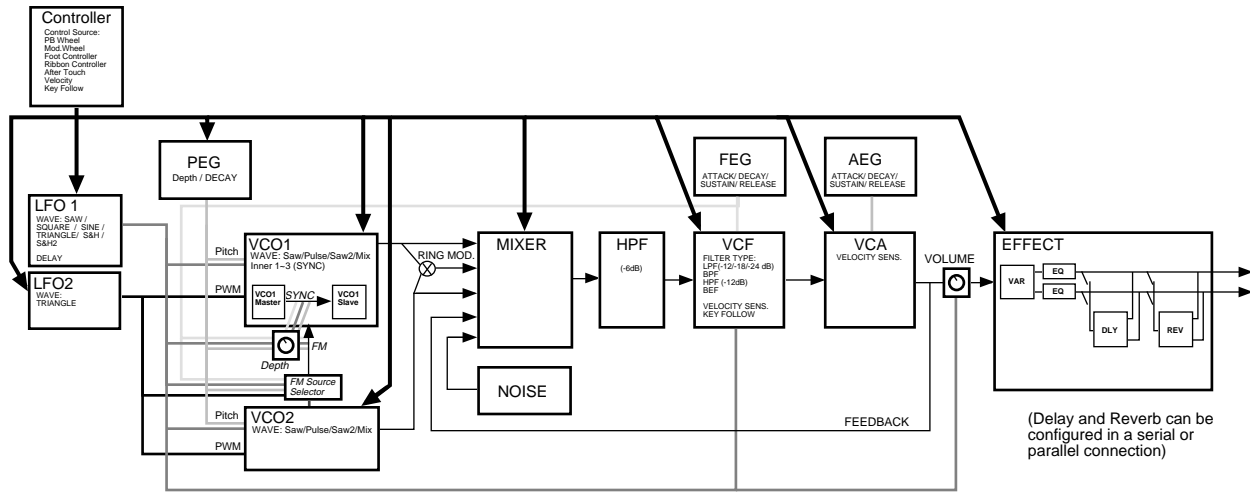
| No. | Cat. | Voice Name | Description  |
|-----|------|------------|--|
| 62  | Ld   | OB-8       | Thick detuned wave.  |
| 63  | Ld   | Lucky      | Portamento lead sound created with a typical square wave. Turn knob 3 to change the pulse width.   |
| 64  | Ld   | Earth Lead | Sensitive synth lead voice. Use [RIBBON], [PITCH] wheel and [MODULATION] wheel.  |
| 65  | Ld   | HardSync   | Fat synth lead sound with sync-envelope.   |
| 66  | Ld   | Chick      | Dark analog synth lead. Turning knob 5 makes the sound brighter.   |
| 67  | Ld   | Stevie     | Typical 80s Stevie Winwood type lead sound.  |
| 68  | Ld   | Floyd75    | Stacked over 4 octaves! Pink Floyd's "Wish You Were Here" revisited.   |
| 69  | Ld   | Synchromes | Dangerous lead sound also great for percussive sequence lines.   |
| 70  | Pd   | High Sweep | Soft sweep with tons of resonance.   |
| 71  | Pd   | Ice Pad    | Synth pad using Free EG for subtle trembles. A typical example of how easy it is to create a voice by using Edge and Ring Modulator.   |
| 72  | Pd   | Sprinkler  | Layered sound with fast arpeggiated sound and soft pad. The soft pad can be changed drastically with [MODULATION] wheel and [RIBBON] controller.   |
| 73  | Pd   | GreatMorph | Powerful pad sound suitable for progressive rock. Check the drastic changes between Scene 1 and 2 using the [MODULATION] wheel.  |
| 74  | Pd   | Church Bel | Pad with arpeggiated bells on top. Use the [RIBBON] to control the volume of the bells.  |
| 75  | Pd   | Deep Blue  | Synth pad sound with great sound projection.   |
| 76  | Pd   | Da Padd    | Dark and thick analog synth pad sound. Scene 2 is an LFO sweep with BEF variation. The [RIBBON] controls LFO sweep speed in Scene 2 over a wider range than knob 3 for a "watery" effect.  |
| 77  | Pd   | Water Pad  | Pad with upward BPF sweep. Use the [MODULATION] wheel to change between the original version of the pad and a variation. Use the [RIBBON] to control the brightness.   |
| 78  | Pd   | Night Sky  | Modulated pluck sound with high string pad fading in over it. Use the [MODULATION] wheel to change the pitch of the pluck sound. Middle positions include great voice variations. Use the [RIBBON] to control volume of the strings. |
| 79  | Pd   | Oberweich  | Clear portamento pad sound.  |
| 80  | Pd   | PolyTen    | Analog strings pad sound with chorus effect.   |
| 81  | Pd   | PortPad    | Powerful synth pad sound.  |
| 82  | Pd   | Sacred     | Vocal type pad sound.  |
| 83  | Pd   | Sweep&S/H  | Sweep pad which can morph to Sample & Hold using the [MODULATION] wheel.   |
| 84  | Pd   | Slip       | Thin pad which sits behind fat drums.  |

| No. | Cat. | Voice Name | Description   |
|-----|------|------------|---|
| 85  | Pd   | Polyswell  | Warm and wide poly synth sound with long filter attack.   |
| 86  | Co   | Padbells   | Combination of bells with pad. Use [RIBBON] to fade the bells in or out.  |
| 87  | Pf   | DX E.Piano | Bright FM electric piano sound.   |
| 88  | Pf   | Condenser  | Condenser piano sound.  |
| 89  | Pf   | WhitneyEP  | Electric piano with clean Whitney Houston sound.  |
| 90  | Or   | DrawOrgans | Clean organ with 4 drawbars. Use [MODULATION] wheel for rotary speed and [ASSIGN] knobs for tone control.   |
| 91  | Or   | 16+2.2/3   | Many organ sounds available with controllers.   |
| 92  | Or   | Garage     | Garage and ragga type small synth organ. Scene 2 has a more percussive version.   |
| 93  | Or   | House      | House organ ideal for bouncy basslines.   |
| 94  | Or   | Pipes      | Chiffer pipe organ sound that transforms into full organ when the [MODULATION] wheel is increased. The [RIBBON] controls the volume of the upper octave.                    |
| 95  | Pc   | Hi Q Reso  | The immortal Kraftwerk invention.   |
| 96  | Pc   | Koan       | Ring modulation style wind chimes.  |
| 97  | Pc   | Woob       | Ambient percussion effect by ring modulation.   |
| 98  | Fx   | WelcomBk   | Great space pad sound. Use the [MODULATION] wheel to add pitch modulation effects. Hold note A4 to recreate the beginning of ELP's "Welcome Back My Friends" (Karn Evil 9). |
| 99  | Fx   | Magic      | Spacey pad with soft sync modulation.   |
| 100 | Fx   | Hypno      | Notes in the bottom octave of the keyboard play a sequence and determine its pitch. Play single or double note melodies in the upper keyboard. The Free EG does the rest.   |
| 101 | Fx   | Soundtrack | Synth voice great for film music.   |
| 102 | Fx   | Morphyum   | FX voice with pitch attack & sync.  |
| 103 | Fx   | WindString | FX pad sound expressing fast bowed sound of a violin using the Arpeggiator.   |
| 104 | Fx   | Vangelizm  | Combination synth and analog pad sound using Arpeggiator.   |
| 105 | Fx   | Chandelier | Bright analog sound effect using Arpeggiator.   |
| 106 | Fx   | FreeEGRthm | Free EG and Arpeggiator extravaganza which procudes unusual rhythms.  |

| No. | Cat. | Voice Name | Description   |
|-----|------|------------|---|
| 107 | Fx   | Heaven     | Sound effect which creates rhythms by matching the delay length to the Arpeggiator tempo.   |
| 108 | Fx   | Mars       | Typical vintage synth with high pass sweep.   |
| 109 | Fx   | Porpoise   | Sound which creates animal squeakings using the Free EG.  |
| 110 | Fx   | Jack       | Filter LFO sound effect great for trance music.   |
| 111 | Fx   | Microdot   | Pointy strobe-ish techno sound.   |
| 112 | Fx   | Polaris    | Thick pad sound with creamy effect. Adjust knobs 2 and 7 if it's too slow for ya.   |
| 113 | Fx   | RhythmCity | A sequenced voice is triggered from B2 and below. Try using single notes or octaves in the lower range of the keyboard. Play chords from C3 and above. Change chords in time. The [RIBBON] controls the brightness of the sequence. |
| 114 | Fx   | CyberBag   | Sound effect created with the FreeEG.   |
| 115 | Se   | CyberClock | Sound effect combined with Arpeggiator and PEG.   |
| 116 | Se   | Flutter    | Soundd with special sweeping effect.  |
| 117 | Se   | Industrial | Use all controllers and go crazy!   |
| 118 | Se   | Moment     | Sound effect producing completely different sounds in all pitches by applying FM modulation.  |
| 119 | Se   | We All Die | Whimsical special effect sound using sync to create vocal formants.   |
| 120 | Sq   | Cactus     | Analog sequence with complex Free EG modulations. Hold the key for a long time.   |
| 121 | Sq   | Overdrive  | Distorted analog sequence great for techno music. Use the [RIBBON] to control the filter.   |
| 122 | Sq   | Omega      | Analog sequence with complex Free EG modulations. Hold the key for a long time.   |
| 123 | Sq   | Csus4      | Automatically plays with C sus 4. Get into it!  |
| 124 | Sq   | TekkLine   | Free EG adds radically changing long cycle to the sequences of typical phrases.   |
| 125 | Sq   | Highway    | Spacey sequence with strong phasing effect.   |
| 126 | Sq   | Saturn     | Typical percussive type analog synth great for arpeggios.   |
| 127 | Sq   | Poptart    | Percussive chill-out effect. Be cool.   |
| 128 | Sq   | VirtlScene | Play a tune along with the typical sequence line while changing voices using the [MODULATION] wheel.  |

**NOTE** When Step Sequencer Keyboard Mode is set to "sel&norm" or "sel&shift", User Patterns can be played to the left of the Split point. User Patterns can also be selected by playing a note. In this case, when you press the C1 key, the current Voice Pattern will be accessed. (See page 86.)

# Tone Generator And Effect Signal Flow



# Arpeggiator Type List

| No. | Param Name | Comments   |
|-----|------------|--|
| 1   | UpOct1     | The chord (or phrase) ascends up 1 Octave.   |
| 2   | UpOct2     | The chord (or phrase) ascends up 2 Octaves.  |
| 3   | UpOct4     | The chord (or phrase) ascends up 4 Octaves.  |
| 4   | DwOct1     | The chord (or phrase) descends down 1 Octave.  |
| 5   | DwOct2     | The chord (or phrase) descends down 2 Octaves.   |
| 6   | DwOct4     | The chord (or phrase) descends down 4 Octaves.   |
| 7   | UpDwAOct1  | The chord (or phrase) ascends up 1 Octave, then descends.  |
| 8   | UpDwAOct2  | The chord (or phrase) ascends up 2 Octaves, then descends.   |
| 9   | UpDwAOct4  | The chord (or phrase) ascends up 4 Octaves, then descends.   |
| 10  | UpDwBOct1  | The chord (or phrase) ascends up 1 Octave, then descends. (This is slightly different from type UpDwAOct1.)  |
| 11  | UpDwBOct2  | The chord (or phrase) ascends up 2 Octaves, then descends. (This is slightly different from type UpDwAOct2.) |
| 12  | UpDwBOct4  | The chord (or phrase) ascends up 4 Octaves, then descends. (This is slightly different from type UpDwAOct4.) |
| 13  | RandmOct1  | Plays up and down randomly over 1 Octave, based on the chord you play.                                       |
| 14  | RandmOct2  | Plays up and down randomly over 2 Octaves, based on the chord you play.                                      |
| 15  | RandmOct4  | Plays up and down randomly over 4 Octaves, based on the chord you play.                                      |
| 16  | Techno-A   | Typical techno sequence TYPE A. (Euro techno type.)  |
| 17  | Techno-B   | Typical techno sequence TYPE B. (UK type with Velocity.)   |
| 18  | Techno-C   | Typical techno sequence TYPE C. (Japan techno type.)   |
| 19  | Techno-D   | Typical techno sequence TYPE D. (German techno type.)  |
| 20  | DAHouse    | Backing sequence with House music feel. (Bass for left hand, Chord play for right hand.)                     |
| 21  | SyncopaA   | Syncopation type sequence TYPE A.  |
| 22  | SyncopaB   | Syncopation type sequence TYPE B. (Octave moves considerably.)   |
| 23  | SyncoEcho  | Syncopated type echo.  |
| 24  | TekkEchoA  | Echo with moving filter A.   |
| 25  | TekkEchoB  | Echo with moving filter B.   |
| 26  | PulseLine  | Sequence mixed with bass line and sequence line.   |
| 27  | BassLineA  | Arpeggio phrase TYPE A for bass.   |
| 28  | BassLineB  | Arpeggio phrase TYPE B for bass. (With Velocity.)  |
| 29  | BassLineC  | Arpeggio phrase TYPE C for bass.   |
| 30  | BassLineD  | Arpeggio phrase TYPE D for bass.   |

# Effect Type List

| VARIATION EFFECT |              | Wet:Dry                             | 3-BAND EQUALIZER     |             |
|------------------|--------------|-------------------------------------|----------------------|-------------|
| 1                | Chorus 1     | D63>W ~ D=W ~ D<W63                 | 3-Band EQ            |             |
| 2                | Chorus 2     | D63>W ~ D=W ~ D<W63                 | <b>DELAY EFFECT</b>  |             |
| 3                | Flanger      | D63>W ~ D=W ~ D<W63                 | 1                    | Delay L,C,R |
| 4                | Symphonic    | D63>W ~ D=W ~ D<W63                 | 2                    | Delay L,R   |
| 5                | Phaser       | D63>W ~ D=W ~ D<W63                 | 3                    | Echo        |
| 6                | Auto PAN     | D63>W ~ D=W ~ D<W63                 | 4                    | Cross Delay |
| 7                | Rotary Sp.   | D63>W ~ D=W ~ D<W63                 | 5                    | Tempo Delay |
| 8                | Pitch Change | D63>W ~ D=W ~ D<W63                 | <b>REVERB EFFECT</b> |             |
| 9                | Aural Exc    | Dry (1-63), Wet (64-127)            | 1                    | Hall1       |
| 10               | Comp         | Dry (1-63), Wet (64-127)            | 2                    | Hall2       |
| 11               | Wah          | D63>W ~ D=W ~ D<W63                 | 3                    | Hall3       |
| 12               | Distortion   | Dry (1-63), Both (64), Wet (65-127) | 4                    | Room1       |
| 13               | Over Drive   | Dry (1-63), Both (64), Wet (65-127) | 5                    | Room2       |
| 14               | Amp Sim.     | Dry (1-63), Both (64), Wet (65-127) | 6                    | Stage1      |
|                  |              |                                     | 7                    | Stage2      |
|                  |              |                                     | 8                    | Plate       |

# Effect Parameter List

## Variation Effect

### CHORUS1, 2

| No. | Parameter  | Display             | Ctrl Matrix | Value | Table   |
|-----|------------|---------------------|-------------|-------|---------|
| 1   | Mod Freq   | 0.00-41.70Hz        | Common      | 0-159 | table#1 |
| 2   | PM Depth   | 0-100               |             | 0-100 |         |
| 3   | AM Type    | off-RndHrd          |             | 0-15  | table#4 |
| 4   | Dly Offset | 0-50.0ms            |             | 0-500 |         |
| elm | Dry:Wet    | D63>W ~ D=W ~ D<W63 | Scene       | 1-127 |         |

### FLANGER1

| No. | Parameter  | Display             | Ctrl Matrix | Value | Table   |
|-----|------------|---------------------|-------------|-------|---------|
| 1   | Mod Freq   | 0.00-41.70Hz        | Common      | 0-159 | table#1 |
| 2   | Mod Depth  | 0-100               |             | 0-100 |         |
| 3   | Dly Offset | 0-15.5ms            |             | 0-155 |         |
| 4   | FB Level   | -99-+99             |             | 0-198 |         |
| elm | Dry:Wet    | D63>W ~ D=W ~ D<W63 | Scene       | 1-127 |         |

### SYMPHONIC

| No. | Parameter  | Display             | Ctrl Matrix | Value | Table   |
|-----|------------|---------------------|-------------|-------|---------|
| 1   | Mod Freq   | 0.00-41.70Hz        | Common      | 0-159 | table#1 |
| 2   | Mod Depth  | 0-100               |             | 0-100 |         |
| 3   | Dly Offset | 0-45.0ms            |             | 0-450 |         |
| elm | Dry:Wet    | D63>W ~ D=W ~ D<W63 | Scene       | 1-127 |         |

### PHASER

| No. | Parameter          | Display             | Ctrl Matrix | Value | Table   |
|-----|--------------------|---------------------|-------------|-------|---------|
| 1   | Mod Freq           | 0.00-41.70Hz        | Common      | 0-159 | table#1 |
| 2   | Mod Depth          | 0-100               |             | 0-100 |         |
| 3   | Phase Shift Offset | 0-100               |             | 0-100 |         |
| 4   | FB Level           | -99-+99             |             | 0-198 |         |
| 5   | Stage              | 4, 6, 8             |             | 0-2   |         |
| 6   | Diffusion          | stereo, mono        |             | 0-1   |         |
| elm | Dry:Wet            | D63>W ~ D=W ~ D<W63 | Scene       | 1-127 |         |

### AUTO PAN

| No. | Parameter     | Display                         | Ctrl Matrix | Value | Table   |
|-----|---------------|---------------------------------|-------------|-------|---------|
| 1   | Speed         | 0.00-41.70Hz                    | Common      | 0-159 | table#1 |
| 2   | L/R Depth     | 0-100                           |             | 0-100 |         |
| 3   | F/R Depth     | 0-100                           |             | 0-100 |         |
| 4   | PAN Direction | L->R, L<-R, L<->R, Lturn, Rturn |             | 0-4   |         |
| elm | Dry:Wet       | D63>W ~ D=W ~ D<W63             | Scene       | 1-127 |         |

### ROTARY SPEAKER

| No. | Parameter | Display             | Ctrl Matrix | Value | Table   |
|-----|-----------|---------------------|-------------|-------|---------|
| 1   | Speed     | 0.00-41.70Hz        | Common      | 0-159 | table#1 |
| 2   | Depth     | 0-100               |             | 0-100 |         |
| 3   | HPP       | Thru-8.0kHz         |             | 0-52  | table#2 |
| 4   | LPF       | 1.0k-Thru           |             | 34-60 | table#2 |
| elm | Dry:Wet   | D63>W ~ D=W ~ D<W63 | Scene       | 1-127 |         |

## PITCH CHANGE

| No. | Parameter | Display             | Ctrl Matrix | Value | Table |
|-----|-----------|---------------------|-------------|-------|-------|
| 1   | Pitch     | -24-+24             | Common      | 0-48  |       |
| 2   | Fine 1    | -50-+50             |             | 0-100 |       |
| 3   | Pan 1     | L63-R63             |             | 1-127 |       |
| 4   | Fine 2    | -50-+50             |             | 0-100 |       |
| 5   | Pan 2     | L63-R63             |             | 1-127 |       |
| elm | Dry:Wet   | D63>W ~ D=W ~ D<W63 | Scene       | 1-127 |       |

## AURAL EXCITER

| No. | Parameter | Display          | Ctrl Matrix | Value | Table |
|-----|-----------|------------------|-------------|-------|-------|
| 1   | HPF       | 500Hz-16.0kHz    |             | 28-58 |       |
| 2   | Drive     | 0-100            | Comn        | 0-100 |       |
| 3   | Mix Level | 0-100            |             | 0-100 |       |
| elm | Dry:Wet   | dry(1), wet(127) | ---         |       |       |

\*Limit -63:dry(1), 64--:wet(127)

## COMPRESSOR

| No. | Parameter | Display          | Ctrl Matrix | Value | Table   |
|-----|-----------|------------------|-------------|-------|---------|
| 1   | Attack    | 1-40ms           |             | 0-19  | table#5 |
| 2   | Release   | 10-680ms         |             | 0-15  | table#6 |
| 3   | Threshold | -48--6dB         | Comn        | 0-42  |         |
| 4   | Ratio     | 1.0-20.0         |             | 0-7   | table#7 |
| 5   | Out Level | 0-100            |             | 0-100 |         |
| elm | Dry:Wet   | dry(1), wet(127) | ---         |       |         |

\*Limit -63:dry(1), 64--:wet(127)

## WAH

| No. | Parameter          | Display             | Ctrl Matrix | Value | Table   |
|-----|--------------------|---------------------|-------------|-------|---------|
| 1   | Sensitivity        | 0-100               |             | 0-100 |         |
| 2   | Cutoff Freq Offset | 20Hz-14.0kHz        | Comn        | 0-39  | table#8 |
| 3   | Resonance          | 1.0-10.0            |             | 0-90  |         |
| elm | Dry:Wet            | D63>W ~ D=W ~ D<W63 | Scene       | 1-127 |         |

## DISTORTION, OVERDRIVE

| No. | Parameter | Display                    | Ctrl Matrix | Value | Table   |
|-----|-----------|----------------------------|-------------|-------|---------|
| 1   | Drive     | 0-100                      | Comn        | 0-100 |         |
| 2   | Mid Freq  | 100Hz-10.0kHz              |             | 14-54 | table#2 |
| 3   | Mid Gain  | -12-+12dB                  |             | 52-76 |         |
| 4   | High Freq | 500Hz-16.0kHz              |             | 28-58 | table#2 |
| 5   | High Gain | -12-+12dB                  |             | 52-76 |         |
| 6   | Out Level | 0-100                      |             | 0-100 |         |
| elm | Dry:Wet   | dry(1), both(64), wet(127) | ---         | 1-127 |         |

\*Limit -63:dry(1), 65--:wet(127)

## GUITAR AMP SIMULATOR

| No. | Parameter | Display                    | Ctrl Matrix | Value | Table   |
|-----|-----------|----------------------------|-------------|-------|---------|
| 1   | Drive     | 0-100                      | Comn        | 0-100 |         |
| 2   | AMP Type  | Off,Stack,Combo,Tube       |             | 0-3   |         |
| 3   | LPF       | 1.0k-Thru                  |             | 34-60 | table#2 |
| 4   | Out Level | 0-100                      |             | 0-100 |         |
| elm | Dry:Wet   | dry(1), both(64), wet(127) | ---         | 1-127 |         |

\*Limit -63:dry(1), 65--:wet(127)

### 3-BAND EQ

| No. | Parameter | Display       | Ctrl Matrix | Value  | Table   |
|-----|-----------|---------------|-------------|--------|---------|
| 1   | Low Freq  | 32Hz~2.0kHz   |             | 4-40   | table#2 |
| 2   | Low Gain  | -12~+12dB     |             | 52-76  |         |
| 3   | Mid Freq  | 100Hz~10.0kHz |             | 14-54  | table#2 |
| 4   | Mid Gain  | -12~+12dB     |             | 52-76  |         |
| 5   | Mid Reso  | 1.0-12.0      |             | 10-120 |         |
| 6   | High Freq | 500Hz~16.0kHz |             | 28-58  | table#2 |
| 7   | High Gain | -12~+12dB     |             | 52-76  |         |

### DELAY EFFECT

#### DELAY L,C,R

| No. | Parameter | Display                    | Ctrl Matrix | Value  | Table   |
|-----|-----------|----------------------------|-------------|--------|---------|
| 1   | Lch Dly   | 0.1~660.0ms / 0.1~1360.0ms |             | 0-6599 |         |
| 2   | Rch Dly   | 0.1~660.0ms / 0.1~1360.0ms |             | 0-6599 |         |
| 3   | Cch Dly   | 0.1~660.0ms / 0.1~1360.0ms |             | 0-6599 |         |
| 4   | Cch Level | 0~100                      |             | 0-100  |         |
| 5   | FB Level  | -99~+99                    |             | 0-198  |         |
| 6   | HPF       | Thru~8.0kHz                |             | 0-52   | table#2 |
| 7   | LPF       | 1.0k~Thru                  |             | 34-60  | table#2 |
|     | Return    | 0~127                      | Comn        |        |         |

#### DELAY L,R

| No. | Parameter | Display                    | Ctrl Matrix | Value  | Table   |
|-----|-----------|----------------------------|-------------|--------|---------|
| 1   | Lch Dly   | 0.1~660.0ms / 0.1~1360.0ms |             | 0-6599 |         |
| 2   | Rch Dly   | 0.1~660.0ms / 0.1~1360.0ms |             | 0-6599 |         |
| 3   | FB Dly 1  | 0.1~660.0ms / 0.1~1360.0ms |             | 0-6599 |         |
| 4   | FB Dly 2  | 0.1~660.0ms / 0.1~1360.0ms |             | 0-6599 |         |
| 5   | FB Level  | -99~+99                    |             | 0-198  |         |
| 6   | HPF       | Thru~8.0kHz                |             | 0-52   | table#2 |
| 7   | LPF       | 1.0k~Thru                  |             | 34-60  | table#2 |
|     | Return    | 0~127                      | Comn        |        |         |

#### ECHO

| No. | Parameter    | Display                   | Ctrl Matrix | Value  | Table   |
|-----|--------------|---------------------------|-------------|--------|---------|
| 1   | Lch Dly      | 0.1~330.0ms / 0.1~680.0ms |             | 0-3299 |         |
| 2   | Lch FB Level | -99~+99                   |             | 0-198  |         |
| 3   | Rch Dly      | 0.1~330.0ms / 0.1~680.0ms |             | 0-3299 |         |
| 4   | Rch FB Level | -99~+99                   |             | 0-198  |         |
| 5   | HPF          | Thru~8.0kHz               |             | 0-52   | table#2 |
| 6   | LPF          | 1.0k~Thru                 |             | 34-60  | table#2 |
|     | Return       | 0~127                     | Comn        |        |         |

#### CROSS DELAY

| No. | Parameter     | Display                   | Ctrl Matrix | Value  | Table   |
|-----|---------------|---------------------------|-------------|--------|---------|
| 1   | L->R Dly      | 0.1~330.0ms / 0.1~680.0ms |             | 0-3299 |         |
| 2   | L->R FB Level | -99~+99                   |             | 0-198  |         |
| 3   | R->L Dly      | 0.1~330.0ms / 0.1~680.0ms |             | 0-3299 |         |
| 4   | R->L FB Level | -99~+99                   |             | 0-198  |         |
| 5   | Input Select  | L,R,L&R                   |             | 0-2    |         |
| 6   | HPF           | Thru~8.0kHz               |             | 0-52   | table#2 |
| 7   | LPF           | 1.0k~Thru                 |             | 34-60  | table#2 |
|     | Return        | 0~127                     | Comn        |        |         |

#### TEMPO DELAY

| No. | Parameter     | Display  | Ctrl Matrix | Value | Table   |
|-----|---------------|--|-------------|-------|---------|
| 1   | Reference Dly | specified: 1/2, 3/8, 1/4, 3/16, 1/6, 1/8, 3/32, 1/12, 1/16, 1/24, 1/32 |             |       |         |
| 2   | Lch Diffusion | -20 - 20%  |             | 44-84 |         |
| 3   | Rch Diffusion | -20 - 20%  |             | 44-84 |         |
| 4   | FB Level      | -99~+99  |             | 0-198 |         |
| 5   | HPF           | Thru~8.0kHz  |             | 0-52  | table#2 |
| 6   | LPF           | 1.0k~Thru  |             | 34-60 | table#2 |
|     | Return        | 0~127  | Comn        |       |         |

### REVERB EFFECT

#### HALL1, HALL2, ROOM1, ROOM2, ROOM3, STAGE1, STAGE2, PLATE

| No. | Parameter   | Display             | Ctrl Matrix | Value | Table   |
|-----|-------------|---------------------|-------------|-------|---------|
| 1   | Reverb Time | 0.3~30.0s           |             | 0-69  | table#3 |
| 2   | High Damp   | 0.1~1.5             |             | 0-14  |         |
| 3   | Diffusion   | 0~10                |             | 0-10  |         |
| 4   | Initial Dly | 0.1~100.0ms         |             | 0-999 |         |
| 5   | Er:Rev      | E63>R ~ E=R ~ E<R63 |             | 1-127 |         |
| 6   | HPF         | Thru~8.0kHz         |             | 0-52  | table#2 |
| 7   | LPF         | 1.0k~Thru           |             | 34-60 | table#2 |
|     | Return      | 0~127               | Comn        |       |         |

# Effect Parameter Tables

Table#1  
LFO Frequency

| Data | Value | Data | Value | Data | Value |
|------|-------|------|-------|------|-------|
| 0    | 0     | 64   | 5.39  | 128  | 20.85 |
| 1    | 0.08  | 65   | 5.47  | 129  | 21.52 |
| 2    | 0.17  | 66   | 5.56  | 130  | 22.2  |
| 3    | 0.25  | 67   | 5.64  | 131  | 22.87 |
| 4    | 0.34  | 68   | 5.72  | 132  | 23.54 |
| 5    | 0.42  | 69   | 5.81  | 133  | 24.21 |
| 6    | 0.51  | 70   | 5.89  | 134  | 24.89 |
| 7    | 0.59  | 71   | 5.98  | 135  | 25.56 |
| 8    | 0.67  | 72   | 6.06  | 136  | 26.23 |
| 9    | 0.76  | 73   | 6.15  | 137  | 26.9  |
| 10   | 0.84  | 74   | 6.23  | 138  | 27.58 |
| 11   | 0.93  | 75   | 6.31  | 139  | 28.25 |
| 12   | 1.01  | 76   | 6.4   | 140  | 28.92 |
| 13   | 1.09  | 77   | 6.48  | 141  | 29.59 |
| 14   | 1.18  | 78   | 6.57  | 142  | 30.27 |
| 15   | 1.26  | 79   | 6.65  | 143  | 30.94 |
| 16   | 1.35  | 80   | 6.74  | 144  | 31.61 |
| 17   | 1.43  | 81   | 6.82  | 145  | 32.28 |
| 18   | 1.52  | 82   | 6.9   | 146  | 32.96 |
| 19   | 1.6   | 83   | 6.99  | 147  | 33.63 |
| 20   | 1.68  | 84   | 7.07  | 148  | 34.3  |
| 21   | 1.77  | 85   | 7.16  | 149  | 34.97 |
| 22   | 1.85  | 86   | 7.24  | 150  | 35.65 |
| 23   | 1.94  | 87   | 7.32  | 151  | 36.32 |
| 24   | 2.02  | 88   | 7.41  | 152  | 36.99 |
| 25   | 2.1   | 89   | 7.49  | 153  | 37.67 |
| 26   | 2.19  | 90   | 7.58  | 154  | 38.34 |
| 27   | 2.27  | 91   | 7.66  | 155  | 39.01 |
| 28   | 2.36  | 92   | 7.75  | 156  | 39.68 |
| 29   | 2.44  | 93   | 7.83  | 157  | 40.36 |
| 30   | 2.53  | 94   | 7.91  | 158  | 41.03 |
| 31   | 2.61  | 95   | 8     | 159  | 41.7  |
| 32   | 2.69  | 96   | 8.08  |      |       |
| 33   | 2.78  | 97   | 8.17  |      |       |
| 34   | 2.86  | 98   | 8.25  |      |       |
| 35   | 2.95  | 99   | 8.33  |      |       |
| 36   | 3.03  | 100  | 8.42  |      |       |
| 37   | 3.12  | 101  | 8.5   |      |       |
| 38   | 3.2   | 102  | 8.59  |      |       |
| 39   | 3.28  | 103  | 8.67  |      |       |
| 40   | 3.37  | 104  | 8.76  |      |       |
| 41   | 3.45  | 105  | 8.84  |      |       |
| 42   | 3.54  | 106  | 8.92  |      |       |
| 43   | 3.62  | 107  | 9.01  |      |       |
| 44   | 3.7   | 108  | 9.09  |      |       |
| 45   | 3.79  | 109  | 9.18  |      |       |
| 46   | 3.87  | 110  | 9.26  |      |       |
| 47   | 3.96  | 111  | 9.68  |      |       |
| 48   | 4.04  | 112  | 10.11 |      |       |
| 49   | 4.13  | 113  | 10.61 |      |       |
| 50   | 4.21  | 114  | 11.44 |      |       |
| 51   | 4.29  | 115  | 12.11 |      |       |
| 52   | 4.38  | 116  | 12.78 |      |       |
| 53   | 4.46  | 117  | 13.45 |      |       |
| 54   | 4.55  | 118  | 14.13 |      |       |
| 55   | 4.63  | 119  | 14.8  |      |       |
| 56   | 4.71  | 120  | 15.47 |      |       |
| 57   | 4.8   | 121  | 16.14 |      |       |
| 58   | 4.88  | 122  | 16.82 |      |       |
| 59   | 4.97  | 123  | 17.49 |      |       |
| 60   | 5.05  | 124  | 18.16 |      |       |
| 61   | 5.14  | 125  | 18.83 |      |       |
| 62   | 5.22  | 126  | 19.51 |      |       |
| 63   | 5.3   | 127  | 20.18 |      |       |

Table#2  
EQ Frequency

| Data | Value       |
|------|-------------|
| 0    | THRU(20)    |
| 1    | 22          |
| 2    | 25          |
| 3    | 28          |
| 4    | 32          |
| 5    | 36          |
| 6    | 40          |
| 7    | 45          |
| 8    | 50          |
| 9    | 56          |
| 10   | 63          |
| 11   | 70          |
| 12   | 80          |
| 13   | 90          |
| 14   | 100         |
| 15   | 110         |
| 16   | 125         |
| 17   | 140         |
| 18   | 160         |
| 19   | 180         |
| 20   | 200         |
| 21   | 225         |
| 22   | 250         |
| 23   | 280         |
| 24   | 315         |
| 25   | 355         |
| 26   | 400         |
| 27   | 450         |
| 28   | 500         |
| 29   | 560         |
| 30   | 630         |
| 31   | 700         |
| 32   | 800         |
| 33   | 900         |
| 34   | 1.0k        |
| 35   | 1.1k        |
| 36   | 1.2k        |
| 37   | 1.4k        |
| 38   | 1.6k        |
| 39   | 1.8k        |
| 40   | 2.0k        |
| 41   | 2.2k        |
| 42   | 2.5k        |
| 43   | 2.8k        |
| 44   | 3.2k        |
| 45   | 3.6k        |
| 46   | 4.0k        |
| 47   | 4.5k        |
| 48   | 5.0k        |
| 49   | 5.6k        |
| 50   | 6.3k        |
| 51   | 7.0k        |
| 52   | 8.0k        |
| 53   | 9.0k        |
| 54   | 10.0k       |
| 55   | 11.0k       |
| 56   | 12.0k       |
| 57   | 14.0k       |
| 58   | 16.0k       |
| 59   | 18.0k       |
| 60   | THRU(20.0k) |

Table#3  
Reverb time

| Data | Value |
|------|-------|
| 0    | 0.3   |
| 1    | 0.4   |
| 2    | 0.5   |
| 3    | 0.6   |
| 4    | 0.7   |
| 5    | 0.8   |
| 6    | 0.9   |
| 7    | 1.0   |
| 8    | 1.1   |
| 9    | 1.2   |
| 10   | 1.3   |
| 11   | 1.4   |
| 12   | 1.5   |
| 13   | 1.6   |
| 14   | 1.7   |
| 15   | 1.8   |
| 16   | 1.9   |
| 17   | 2.0   |
| 18   | 2.1   |
| 19   | 2.2   |
| 20   | 2.3   |
| 21   | 2.4   |
| 22   | 2.5   |
| 23   | 2.6   |
| 24   | 2.7   |
| 25   | 2.8   |
| 26   | 2.9   |
| 27   | 3.0   |
| 28   | 3.1   |
| 29   | 3.2   |
| 30   | 3.3   |
| 31   | 3.4   |
| 32   | 3.5   |
| 33   | 3.6   |
| 34   | 3.7   |
| 35   | 3.8   |
| 36   | 3.9   |
| 37   | 4.0   |
| 38   | 4.1   |
| 39   | 4.2   |
| 40   | 4.3   |
| 41   | 4.4   |
| 42   | 4.5   |
| 43   | 4.6   |
| 44   | 4.7   |
| 45   | 4.8   |
| 46   | 4.9   |
| 47   | 5.0   |
| 48   | 5.5   |
| 49   | 6.0   |
| 50   | 6.5   |
| 51   | 7.0   |
| 52   | 7.5   |
| 53   | 8.0   |
| 54   | 8.5   |
| 55   | 9.0   |
| 56   | 9.5   |
| 57   | 10.0  |
| 58   | 11.0  |
| 59   | 12.0  |
| 60   | 13.0  |
| 61   | 14.0  |
| 62   | 15.0  |
| 63   | 16.0  |
| 64   | 17.0  |
| 65   | 18.0  |
| 66   | 19.0  |
| 67   | 20.0  |
| 68   | 25.0  |
| 69   | 30.0  |

Table#4  
AM Type  
(Chorus)

| Data | Value |
|------|-------|
| 0    | off   |
| 1    | 1xSft |
| 2    | 1xMid |
| 3    | 1xHrd |
| 4    | 2xSft |
| 5    | 2xMid |
| 6    | 2xHrd |
| 7    | 4xSft |
| 8    | 4xMid |
| 9    | 4xHrd |
| 10   | 8xSft |
| 11   | 8xMid |
| 12   | 8xHrd |
| 13   | RdSft |
| 14   | RdMid |
| 15   | RdHrd |

Table#5  
Compressor  
Attack Time

| Data | Value |
|------|-------|
| 0    | 1     |
| 1    | 2     |
| 2    | 3     |
| 3    | 4     |
| 4    | 5     |
| 5    | 6     |
| 6    | 7     |
| 7    | 8     |
| 8    | 9     |
| 9    | 10    |
| 10   | 12    |
| 11   | 14    |
| 12   | 16    |
| 13   | 18    |
| 14   | 20    |
| 15   | 23    |
| 16   | 26    |
| 17   | 30    |
| 18   | 35    |
| 19   | 40    |

Table#6  
Compressor  
Release Time

| Data | Value |
|------|-------|
| 0    | 10    |
| 1    | 15    |
| 2    | 25    |
| 3    | 35    |
| 4    | 45    |
| 5    | 55    |
| 6    | 65    |
| 7    | 75    |
| 8    | 85    |
| 9    | 100   |
| 10   | 115   |
| 11   | 140   |
| 12   | 170   |
| 13   | 230   |
| 14   | 340   |
| 15   | 680   |

Table#7  
Compressor  
Ratio

| Data | Value |
|------|-------|
| 0    | 1.0   |
| 1    | 1.5   |
| 2    | 2.0   |
| 3    | 3.0   |
| 4    | 5.0   |
| 5    | 7.0   |
| 6    | 10.0  |
| 7    | 20.0  |

Table#8  
Wah Cutoff  
Freq.

| Data | Value |
|------|-------|
| 0    | 20    |
| 1    | 32    |
| 2    | 45    |
| 3    | 63    |
| 4    | 80    |
| 5    | 100   |
| 6    | 125   |
| 7    | 160   |
| 8    | 200   |
| 9    | 250   |
| 10   | 280   |
| 11   | 315   |
| 12   | 350   |
| 13   | 400   |
| 14   | 500   |
| 15   | 560   |
| 16   | 630   |
| 17   | 700   |
| 18   | 800   |
| 19   | 1.0k  |
| 20   | 1.2k  |
| 21   | 1.4k  |
| 22   | 1.6k  |
| 23   | 1.8k  |
| 24   | 2.0k  |
| 25   | 2.2k  |
| 26   | 2.5k  |
| 27   | 2.8k  |
| 28   | 3.2k  |
| 29   | 3.6k  |
| 30   | 4.0k  |
| 31   | 5.0k  |
| 32   | 5.6k  |
| 33   | 6.3k  |
| 34   | 7.0k  |
| 35   | 8.0k  |
| 36   | 9.0k  |
| 37   | 10.0k |
| 38   | 12.0k |
| 39   | 14.0k |



# Common Control Matrix

| Parameter Name |            | Ctrl Matrix : Param | Ctrl Matrix : Calc | Ctrl Matrix : Source |               |               |               |        |               |
|----------------|------------|---------------------|--------------------|----------------------|---------------|---------------|---------------|--------|---------------|
| Group          | Param Name | Data Value          | Multiplyor Add     | CC<br>AT             | Data Range    | Vel<br>KeyRnd | Data Range    | KeyTrk | Data Range    |
| ---            | off        | 0                   | ---                | ---                  |               | ---           |               | ---    |               |
|                | ComnVolume | 1                   | add                | O                    | (-64) - (+63) | O             | (-64) - (+63) | O      | (-64) - (+63) |
|                | Comn Pan   | 2                   | add                | O                    | (-64) - (+63) | O             | (-64) - (+63) | O      | (-64) - (+63) |
|                | Vari Param | 3                   | add                | O                    | (-64) - (+63) | O             | (-64) - (+63) | O      | (-64) - (+63) |
|                | Dly Return | 4                   | add                | O                    | (-64) - (+63) | O             | (-64) - (+63) | O      | (-64) - (+63) |
|                | Rev Return | 5                   | add                | O                    | (-64) - (+63) | O             | (-64) - (+63) | O      | (-64) - (+63) |

## Control Change Modes

| CC    | MODE1                                   | MODE2                                   |
|-------|---|---|
| 1     | MODULATION                              | MODULATION                              |
| 2     |   |   |
| 3     |   | SCENE SELECT                            |
| 4     | FOOT CONTROLLER                         | FOOT CONTROLLER                         |
| 5     | PORTAMENTO TIME                         | PORTAMENTO TIME                         |
| 6     | DATA ENTRY MSB                          | DATA ENTRY MSB                          |
| 7     | MAIN VOLUME                             | MAIN VOLUME                             |
| 8     |   | LAYER MODE                              |
| 9     |   | POLY/MONO MODE                          |
| 10    | PANPOT                                  | PANPOT                                  |
| 11    | EXPRESSION                              | EXPRESSION                              |
| 12    | RIBBON Z CONTROLLER                     | RIBBON Z CONTROLLER                     |
| 13    | RIBBON X CONTROLLER                     | RIBBON X CONTROLLER                     |
| 14    |   | LFO RESET MODE                          |
| 15    |   | LFO1 WAVE                               |
| 16    |   | LFO1 SPEED                              |
| 17    |   | LFO2 SPEED                              |
| 18    |   | VCO1 PITCH MOD DEPTH                    |
| 19    |   | VCF FILTER MOD DEPTH                    |
| 20    |   | LFO1 DELAY                              |
| 21    |   | VCO1 PITCH COARSE TUNE                  |
| 22    |   | VCO SYNC PITCH                          |
| 23    |   | VCO SYNC PITCH DEPTH                    |
| 24    |   | VCO SYNC PITCH SOURCE                   |
| 25    |   | PEG DEPTH                               |
| 26    |   | PEG SWITCH                              |
| 27    |   | PEG DECAY                               |
| 28    |   | PEG SUSTAIN LEVEL                       |
| 29    |   | FEG RELEASE                             |
| 30    |   | VCF CUTOFF KBD TRACK                    |
| 31    |   | AMP EG SUSTAIN LEVEL                    |
| 32    |   |   |
| 33    |   | VCO ALGORITHM                           |
| 34    |   | VCO SYNC PITCH MOD SW                   |
| 35    |   | FM DEPTH                                |
| 36    |   | FM SOURCE1                              |
| 37    |   | FM SOURCE2                              |
| 38    | DATA ENTRY LSB                          | DATA ENTRY LSB                          |
| 39    |   | MIXER NOISE LEVEL                       |
| 40    |   |   |
| 41    |   |   |
| 42    |   |   |
| 43    |   |   |
| 44    |   |   |
| 45    |   |   |
| 46    |   |   |
| 47    |   |   |
| 48    |   |   |
| 49    |   |   |
| 50    |   | VCO1 WAVE TYPE                          |
| 51    |   | VCO2 WAVE TYPE                          |
| 52    |   | VCO2 PITCH COARSE TUNE                  |
| 53    |   | VCO2 PITCH FINE TUNE                    |
| 54    |   | VCO2 EDGE                               |
| 55    |   | VCO2 PULSE WIDTH                        |
| 56    |   | VCO2 PWM DEPTH                          |
| 57    |   | VCO2 PITCH MOD DEPTH                    |
| 58    |   | VCF HPF CUTOFF                          |
| 59    |   | VCF FILTER TYPE                         |
| 60    |   | FILTER EG VELOCITY SENS                 |
| 61    |   | AMP EG VELOCITY SENS                    |
| 62    |   | VCA VOLUME                              |
| 63    |   | VCA FEEDBACK LEVEL                      |
| 64    | SUSTAIN SWITCH                          | SUSTAIN SWITCH                          |
| 65    | PORTAMENTO SWITCH                       | PORTAMENTO SWITCH                       |
| 66    |   |   |
| 67    |   |   |
| 68    |   | MIXER VCO1 LEVEL                        |
| 69    |   | MIXER VCO2 LEVEL                        |
| 70    |   | RING MODULATOR LEVEL                    |
| 71    | HARMONIC CONTENT (VCF FILTER RESONANCE) | HARMONIC CONTENT (VCF FILTER RESONANCE) |
| 72    | RELEASE TIME (AMP EG RELEASE TIME)      | RELEASE TIME (AMP EG RELEASE TIME)      |
| 73    | ATTACK TIME (AMP EG ATTACK TIME)        | ATTACK TIME (AMP EG ATTACK TIME)        |
| 74    | BRIGHTNESS (VCF FILTER CUTOFF)          | BRIGHTNESS (VCF FILTER CUTOFF)          |
| 75    | DECAY TIME (AMP EG DECAY TIME)          | DECAY TIME (AMP EG DECAY TIME)          |
| 76    |   | VCO1 EDGE                               |
| 77    |   | VCO1 PITCH FINE TUNE                    |
| 78    |   | VCO1 PULSE WIDTH                        |
| 79    |   | VCO1 PWM DEPTH                          |
| 80    |   | VCA AMP MOD DEPTH                       |
| 81    |   | FILTER EG DEPTH                         |
| 82    |   | FILTER EG ATTACK                        |
| 83    |   | FILTER EG DECAY                         |
| 84    |   |   |
| 85    |   | PORTAMENTO MODE                         |
| 86    |   | VCO1 PWM SOURCE                         |
| 87    |   | VCO2 PWM SOURCE                         |
| 88    |   |   |
| 89    |   |   |
| 90    |   | ARPEGGIO/STEP SEQ SW                    |
| 91    | REVERB DEPTH                            | REVERB DEPTH                            |
| 92    |   |   |
| 93    | CHORUS (VARIATION) DEPTH                | CHORUS (VARIATION) DEPTH                |
| 94    | DELAY DEPTH                             | DELAY DEPTH                             |
| 95    |   |   |
| 96    | DATA ENTRY INC                          | DATA ENTRY INC                          |
| 97    | DATA ENTRY DEC                          | DATA ENTRY DEC                          |
| 00.95 | ASSIGNABLE CONTROLLER                   | ASSIGNABLE CONTROLLER                   |

## Free EG Track Parameter List

| Param (LCD) | Param (LCD) |
|-------------|-------------|
| off         | FM Source1  |
| VCF Type    | FM Source2  |
| VCF Cutoff  | LFO1 Wave   |
| Resonance   | LFO1 Speed  |
| FEG Depth   | LFO1 Delay  |
| FEG Attack  | LFO2 Speed  |
| FEG Decay   | Scene Tune  |
| FEG Sustin  | PEG Decay   |
| FEG Releas  | PEG Depth   |
| VCF Mod Dp  | PEG Sw      |
| FEG VelSns  | Port Time   |
| VCF KeyTrk  | VCO1 Wave   |
| HPF Cutoff  | VCO1 Pitch  |
| AEG Attack  | VCO1 Fine   |
| AEG Decay   | VCO1 Edge   |
| AEG Sustin  | VCO1 PW     |
| AEG Releas  | VCO1PWM Dp  |
| VCA Mod Dp  | VCO1PWMSrc  |
| AEG VelSns  | VCO1PmodDp  |
| VCA Feedbk  | VCO2 Wave   |
| VCA Volume  | VCO2 Pitch  |
| VCO1 Level  | VCO2 Fine   |
| VCO2 Level  | VCO2 Edge   |
| Ring Mod    | VCO2 PW     |
| NoiseLevel  | VCO2PWM Dp  |
| Algorithm   | VCO2PWMSrc  |
| Sync Pitch  | VCO2PmodDp  |
| SyncPit Dp  | VarEF D:W   |
| SyncPitSrc  | Pitch Up    |
| SyncPmodSw  | Pitch Down  |
| FM Depth    |             |

# Control Matrix List And Free EG Track Parameter List

| Parameter Name |              | Ctrl Matrix : Param | Ctrl Matrix : Calc | Ctrl Matrix : Source |               |                   |                             |        |               | Free EG : Trk Param |
|----------------|--------------|---------------------|--------------------|----------------------|---------------|-------------------|-----------------------------|--------|---------------|---------------------|
| Group          | Param Name   | Data Value          | Multiply or Add *1 | CC AT                | Data Range    | Vel KeyRnd        | Data Range                  | KeyTrk | Data Range    | Data Value          |
| ---            | off          | 0                   | ---                | ---                  |               | ---               |                             | ---    |               | 0                   |
| ---            | Scene Tune   | 1                   | add                | x                    |               | O                 | (-64) - (+63)               | x      |               |                     |
|                | Pitch Up     | 2                   | add                | O                    | (-24) - (+24) | x                 |                             | x      |               |                     |
|                | Pitch Down   | 3                   | add                | O                    | (-24) - (+24) | x                 |                             | x      |               |                     |
| PEG            | PEG Decay    | 4                   | add *2             | O                    | (-64) - (+63) | O                 | (-64) - (+63)               | O      | (-64) - (+63) | 1                   |
|                | PEG Depth    | 5                   | mul                | O                    | (-64) - (+63) | O                 | (-64) - (+63)               | O      | (-64) - (+63) | 2                   |
|                | PEG Sw       |                     |                    | x                    |               | x                 |                             | x      |               | 3                   |
|                | Port Time    | 6                   | add                | O                    | (-64) - (+63) | O                 | (-64) - (+63)               | O      | (-64) - (+63) | 4                   |
| LFO            | LFO1 Wave    |                     |                    | x                    |               | x                 |                             | x      |               | 5                   |
|                | LFO1 Speed   | 7                   | add                | O                    | (-64) - (+63) | O                 | (-64) - (+63)               | O      | (-64) - (+63) | 6                   |
|                | LFO1 Delay   | 8                   | add                | O                    | (-64) - (+63) | O                 | (-64) - (+63)               | O      | (-64) - (+63) | 7                   |
|                | LFO2 Speed   | 9                   | add                | O                    | (-64) - (+63) | O                 | (-64) - (+63)               | O      | (-64) - (+63) | 8                   |
| SYNC/FM        | Algorithm    |                     |                    | x                    |               | x                 |                             | x      |               | 9                   |
|                | Sync Pitch   | 10                  | add                | O                    | (-64) - (+63) | O                 | (-64) - (+63)               | O      | (-32) - (+32) | 10                  |
|                | SyncPit Dp   | 11                  | mul                | O                    | (-64) - (+63) | O                 | (-64) - (+63)               | O      | (-64) - (+63) | 11                  |
|                | SyncPitSrc   |                     |                    | x                    |               | x                 |                             | x      |               | 12                  |
|                | SyncPmodSw   |                     |                    | x                    |               | x                 |                             | x      |               | 13                  |
|                | FM Depth     | 12                  | mul                | O                    | (-64) - (+63) | O                 | (-64) - (+63)               | O      | (-64) - (+63) | 14                  |
|                | FM Source1   |                     |                    | x                    |               | x                 |                             | x      |               | 15                  |
|                | FM Source2   |                     |                    | x                    |               | x                 |                             | x      |               | 16                  |
| VCO1           | VCO1 Wave    |                     |                    | x                    |               | x                 |                             | x      |               | 17                  |
|                | VCO1 Pitch   | 13                  | add                | x                    |               | x                 |                             | O      | (-64) - (+63) | 18                  |
|                | VCO1 Fine    | 14                  | add                | x                    |               | x                 |                             | O      | (-64) - (+63) | 19                  |
|                | VCO1 Edge    | 15                  | add                | O                    | (-64) - (+63) | O                 | (-64) - (+63)               | O      | (-64) - (+63) | 20                  |
|                | VCO1 PW      | 16                  | add                | O                    | (-64) - (+63) | x                 |                             | x      |               | 21                  |
|                | VCO1PWM Dp   | 17                  | mul                | O                    | (-64) - (+63) | O                 | (-64) - (+63)               | O      | (-64) - (+63) | 22                  |
|                | VCO1PWMSrc   |                     |                    | x                    |               | x                 |                             | x      |               | 23                  |
|                | VCO1PmodDp   | 18                  | add                | O                    | (-63) - (+63) | x                 |                             | x      |               | 24                  |
| VCO2           | VCO2 Wave    |                     |                    | x                    |               | x                 |                             | x      |               | 25                  |
|                | VCO2 Pitch   | 19                  | add                | x                    |               | x                 |                             | O      | (-64) - (+63) | 26                  |
|                | VCO2 Fine    | 20                  | add                | x                    |               | x                 |                             | O      | (-64) - (+63) | 27                  |
|                | VCO2 Edge    | 21                  | add                | O                    | (-64) - (+63) | O                 | (-64) - (+63)               | O      | (-64) - (+63) | 28                  |
|                | VCO2 PW      | 22                  | add                | O                    | (-64) - (+63) | x                 |                             | x      |               | 29                  |
|                | VCO2PWM Dp   | 23                  | mul                | O                    | (-64) - (+63) | O                 | (-64) - (+63)               | O      | (-64) - (+63) | 30                  |
|                | VCO2PWMSrc   |                     |                    | x                    |               | x                 |                             | x      |               | 31                  |
|                | VCO2PmodDp   | 24                  | add                | O                    | (-63) - (+63) | x                 |                             | x      |               | 32                  |
| MIX            | VCO1 Level   | 25                  | mul                | O                    | (-64) - (+63) | O                 | (-64) - (+63)               | O      | (-64) - (+63) | 33                  |
|                | VCO2 Level   | 26                  | mul                | O                    | (-64) - (+63) | O                 | (-64) - (+63)               | O      | (-64) - (+63) | 34                  |
|                | Ring Mod     | 27                  | mul                | O                    | (-64) - (+63) | O                 | (-64) - (+63)               | O      | (-64) - (+63) | 35                  |
|                | NoiseLevel   | 28                  | mul                | O                    | (-64) - (+63) | O                 | (-64) - (+63)               | O      | (-64) - (+63) | 36                  |
| VCF            | FEG Attack   | 29                  | add *2             | O                    | (-64) - (+63) | O                 | (-64) - (+63)               | O      | (-64) - (+63) | 37                  |
|                | FEG Decay    | 30                  | add *2             | O                    | (-64) - (+63) | O                 | (-64) - (+63)               | O      | (-64) - (+63) | 38                  |
|                | FEG Sustin   | 31                  | add                | O                    | (-64) - (+63) | x                 |                             | x      |               | 39                  |
|                | FEG Releas   | 32                  | add *2             | O                    | (-64) - (+63) | O                 | (-64) - (+63)               | O      | (-64) - (+63) | 40                  |
|                | HPF Cutoff   | 33                  | add                | O                    | (-64) - (+63) | O                 | (-64) - (+63)               | O      | (-64) - (+63) | 41                  |
|                | VCF Type     |                     |                    | x                    |               | x                 |                             | x      |               | 42                  |
|                | VCF Cutoff   | 34                  | add                | O                    | (-64) - (+63) | O                 | (-64) - (+63)               | (x)    | VCF KeyTrk    | 43                  |
|                | Resonance    | 35                  | add                | O                    | (-64) - (+63) | O                 | (-64) - (+63)               | O      | (-64) - (+63) | 44                  |
|                | FEG Depth    | 36                  | mul                | O                    | (-64) - (+63) | (Vel x)<br>KeyRnd | FEG VelSns<br>(-64) - (+63) | O      | (-64) - (+63) | 45                  |
|                | FEG VelSns   |                     |                    | x                    |               | x                 |                             | x      |               | 46                  |
|                | VCF KeyTrk   |                     |                    | x                    |               | x                 |                             | x      |               | 47                  |
|                | VCF Mod Dp   | 37                  | add                | O                    | (-64) - (+63) | x                 |                             | x      |               | 48                  |
| VCA            | AEG Attack   | 38                  | add *2             | O                    | (-64) - (+63) | O                 | (-64) - (+63)               | O      | (-64) - (+63) | 49                  |
|                | AEG Decay    | 39                  | add *2             | O                    | (-64) - (+63) | O                 | (-64) - (+63)               | O      | (-64) - (+63) | 50                  |
|                | AEG Sustin   | 40                  | add                | O                    | (-64) - (+63) | x                 |                             | x      |               | 51                  |
|                | AEG Releas   | 41                  | add *2             | O                    | (-64) - (+63) | O                 | (-64) - (+63)               | O      | (-64) - (+63) | 52                  |
|                | VCA Feedbk   | 42                  | mul                | O                    | (-64) - (+63) | x                 |                             | x      |               | 53                  |
|                | VCA Volume   | 43                  | mul                | O                    | (-64) - (+63) | (Vel x)<br>KeyRnd | AEG VelSns<br>(-64) - (+63) | O      | (-64) - (+63) | 54                  |
|                | AEG VelSns   |                     |                    | x                    |               | x                 |                             | x      |               | 55                  |
|                | VCA Mod Dp   | 44                  | add                | O                    | (-64) - (+63) | x                 |                             | x      |               | 56                  |
| EF             | VarEF D:W *3 | 45                  | add                | O                    | (-64) - (+63) | O                 | (-64) - (+63)               | O      | (-64) - (+63) | ---                 |

\*1. Adds or multiplies Control Matrix setting. Also does so when the same parameter is selected for multiple Control Matrix setting.

\*2. Adds the value calculated in "Rate"(positive setting makes the EG faster), while the value is calculated in "Time" for the Knob parameters.

\*3. No effect for the Aural Exciter, Compressor, Distortion, Over Drive and Guitar Amp Simulator. However, Direct Control functions even for these effects.

# MIDI Data Format

Many MIDI messages listed in the MIDI Data Format section are expressed in hexadecimal or binary numbers. Hexadecimal numbers may include the letter "H" as a suffix. The letter "n" indicates a certain whole number. The chart below lists the corresponding decimal number for each hexadecimal/binary number.

| Decimal | Hexadecimal | Binary    |
|---------|-------------|-----------|
| 0       | 00          | 0000 0000 |
| 1       | 01          | 0000 0001 |
| 2       | 02          | 0000 0010 |
| 3       | 03          | 0000 0011 |
| 4       | 04          | 0000 0100 |
| 5       | 05          | 0000 0101 |
| 6       | 06          | 0000 0110 |
| 7       | 07          | 0000 0111 |
| 8       | 08          | 0000 1000 |
| 9       | 09          | 0000 1001 |
| 10      | 0A          | 0000 1010 |
| 11      | 0B          | 0000 1011 |
| 12      | 0C          | 0000 1100 |
| 13      | 0D          | 0000 1101 |
| 14      | 0E          | 0000 1110 |
| 15      | 0F          | 0000 1111 |
| 16      | 10          | 0001 0000 |
| 17      | 11          | 0001 0001 |
| 18      | 12          | 0001 0010 |
| 19      | 13          | 0001 0011 |
| 20      | 14          | 0001 0100 |
| 21      | 15          | 0001 0101 |
| 22      | 16          | 0001 0110 |
| 23      | 17          | 0001 0111 |
| 24      | 18          | 0001 1000 |
| 25      | 19          | 0001 1001 |
| 26      | 1A          | 0001 1010 |
| 27      | 1B          | 0001 1011 |
| 28      | 1C          | 0001 1100 |
| 29      | 1D          | 0001 1101 |
| 30      | 1E          | 0001 1110 |
| 31      | 1F          | 0001 1111 |
| 32      | 20          | 0010 0000 |
| 33      | 21          | 0010 0001 |
| 34      | 22          | 0010 0010 |
| 35      | 23          | 0010 0011 |
| 36      | 24          | 0010 0100 |
| 37      | 25          | 0010 0101 |
| 38      | 26          | 0010 0110 |
| 39      | 27          | 0010 0111 |
| 40      | 28          | 0010 1000 |
| 41      | 29          | 0010 1001 |
| 42      | 2A          | 0010 1010 |
| 43      | 2B          | 0010 1011 |
| 44      | 2C          | 0010 1100 |
| 45      | 2D          | 0010 1101 |
| 46      | 2E          | 0010 1110 |
| 47      | 2F          | 0010 1111 |
| 48      | 30          | 0011 0000 |
| 49      | 31          | 0011 0001 |
| 50      | 32          | 0011 0010 |
| 51      | 33          | 0011 0011 |
| 52      | 34          | 0011 0100 |
| 53      | 35          | 0011 0101 |
| 54      | 36          | 0011 0110 |
| 55      | 37          | 0011 0111 |
| 56      | 38          | 0011 1000 |
| 57      | 39          | 0011 1001 |
| 58      | 3A          | 0011 1010 |
| 59      | 3B          | 0011 1011 |
| 60      | 3C          | 0011 1100 |
| 61      | 3D          | 0011 1101 |
| 62      | 3E          | 0011 1110 |
| 63      | 3F          | 0011 1111 |

## Additional Notes

- For example, 144 - 159(Decimal)/9nH/1001 0000 - 1001 1111(Binary) indicate the note-on messages for the channels 1 through 16 respectively. 176 - 191(BnH/1011 0000 - 1011 1111 indicate the control change messages for the channels 1 through 16 respectively. 192 - 207(CnH/1100 0000 - 1100 1111 indicate the program change messages for the channels 1 through 16 respectively. 240/FOH/1111 0000 is positioned at the beginning of data to indicate a system exclusive message. 247/F7H/1111 0111 is positioned at the end of the system exclusive message.
- aaH(Hexadecimal)/0aaaaaa(Binary) indicates the data addresses. The data address consists of High, Mid and Low.
- bbH/0bbbbbb indicates byte counts.
- ccH/0cccccc indicates tcheck sums.
- ddH/0dddddd indicates data/value.

## Synthesizer Section

### (1) TRANSMIT FLOW

```

SW1
MIDI <- [N]->NN-NOTE ON/OFF          9nH
OUT |
| +NN-CONTROL CHANGE                *1
| | MODULATION                       BnH,01H
| | FOOT CONTROLLER                  BnH,04H
| | MAIN VOLUME                       BnH,07H
| | SUSTAIN SWITCH                     BnH,40H
| | RIBBON Z CONTROLLER                BnH,0CH
| | RIBBON X CONTROLLER                BnH,0DH
| | HARMONIC CONTENT                   BnH,47H
| | RELEASE TIME                       BnH,48H
| | ATTACK TIME                        BnH,49H
| | BRIGHTNESS                         BnH,4AH
| | DECAY TIME                         BnH,4BH
| | ASSIGNABLE                         BnH,00H...5FH
|
| +NN-PROGRAM CHANGE                  CnH
|
| +NN-CHANNEL AFTER TOUCH              DnH
|
| +NN-PITCH BEND CHANGE                EnH
|
|SW2
+[-]>NN-NOTE ON/OFF                    9nH
|SW4
+[-]>NN-CONTROL CHANGE                  BnH,00H...5FH
|SW4 ASSIGNABLE                         BnH,00H...5FH
+[-]>NN-CHANNEL AFTER TOUCH              DnH

|SW3
+[-]>NN-SYSTEM EXCLUSIV MESSAGE
| <BULK DUMP>
| | NN-SYSTEM                         FOH 43H 0nH 5CH bBH bBH 00H 00H dDH....dDH cCH F7H
| | NN-USER SEQ                        FOH 43H 0nH 5CH bBH bBH 01H aAH 00H dDH....dDH cCH F7H
| | NN-CURRENT VOICE                    FOH 43H 0nH 5CH bBH bBH 10H 0EH 00H dDH....dDH cCH F7H
| | NN-CURRENT SEQ                      FOH 43H 0nH 5CH bBH bBH 10H 0EH 00H dDH....dDH cCH F7H
| | NN-CURRENT SCENE1                   FOH 43H 0nH 5CH bBH bBH 10H 10H 00H dDH....dDH cCH F7H
| | NN-CURRENT SCENE2                   FOH 43H 0nH 5CH bBH bBH 10H 11H 00H dDH....dDH cCH F7H
| | [SW5]NN-CURRENT SCENE_CTRL          FOH 43H 0nH 5CH bBH bBH 10H 12H 00H dDH....dDH cCH F7H
| | NN-USER VOICE                       FOH 43H 0nH 5CH bBH bBH 11H aAH 00H dDH....dDH cCH F7H
|
| <PARAMETER CHANGE>
| | NN-SYSTEM                         FOH 43H 1nH 5CH 00H 00H aAH dDH....dDH F7H
| | NN-CURRENT VOICE                    FOH 43H 1nH 5CH 10H 00H aAH dDH....dDH F7H
| | NN-CURRENT SEQ                      FOH 43H 1nH 5CH 10H 0EH aAH dDH....dDH F7H
| | NN-CURRENT SCENE1                   FOH 43H 1nH 5CH 10H 10H aAH dDH....dDH F7H
| | NN-CURRENT SCENE2                   FOH 43H 1nH 5CH 10H 11H aAH dDH....dDH F7H
| | [SW5]NN-CURRENT SCENE_CTRL          FOH 43H 1nH 5CH 10H 12H aAH dDH....dDH F7H

|N-NNNN-SYSTEM EXCLUSIV MESSAGE
| IDENTITY REPLY                       FOH 7EH 7FH 06H 02H 43H 00H 41H dDH dDH
|                                         00H 00H 00H 7EH F7H

+NNNN-ACTIVE SENSING                    FEH
    
```

- SW1 [] MIDI Transmit Channel  
Depends on Keyboard Transmit Channel Set in System Data
- SW2 [] MIDI Transmit Channel (ARPEGGIO/STEP SEQ)  
Depends on Arpeggio/Step SEQ Transmit Channel in System Data
- SW3 [] MIDI Device Number  
If Device Number=all, then transmit Device Number=1
- SW4 [] ARPEGGIO/STEP SEQ SELECT  
Available only when Step Sequencer is selected.
- SW5 [] SCENE SELECT  
Available only when Scene Select is set to "Scene Control".

\*1 If Control Change Mode is "mode2", then additional Control Change numbers are transmitted. (See 3-1-6.)

### (2) RECEIVE FLOW

```

MIDI -> N-NNNN
IN |
| +N- |
| | +NNNN- |
| | |SW6 |
| | |[-]>NN-NOTE OFF                    8nH
|
| | +NN-NOTE ON/OFF                    9nH
|
| | +NN-CONTROL CHANGE                *1
| | | MODULATION                       BnH,01H
| | | FOOT CONTROLLER                  BnH,04H
| | | PORTAMENTO TIME                   BnH,05H
| | | DATA ENTRY MSB                   BnH,06H
| | | DATA ENTRY LSB                   BnH,26H
| | | MAIN VOLUME                       BnH,07H
| | | PANPOT                            BnH,0AH
| | | EXPRESSION                         BnH,0BH
| | | SUSTAIN SWITCH                     BnH,40H
| | | PORTAMENTO SWITCH                  BnH,41H
| | | HARMONIC CONTENT                   BnH,47H
| | | RELEASE TIME                       BnH,48H
| | | ATTACK TIME                        BnH,49H
| | | BRIGHTNESS                         BnH,4AH
| | | PORTAMENTO CONTROL                 BnH,54H
| | | REVERB DEPTH                       BnH,5BH
| | | CHORUS(VARIATION) DEPTH            BnH,5DH
| | | DELAY DEPTH                       BnH,5EH
| | | DATA ENTRY INC                    BnH,60H
| | | DATA ENTRY DEC                    BnH,61H
| | | ASSIGNABLE CONTROLLER             BnH,00H...5FH
| | | RPN                                BnH,64H,00H,65H,00H,06H,mmH
| | | PITCH BEND SENS                    BnH,64H,7FH,65H,7FH
| | | RPN RESET                          BnH,78H,00H
| | | RESET ALL CONTROLLERS              BnH,79H,00H
| | | ALL NOTE OFF                       BnH,7BH
| | | OMNI MODE OFF                      BnH,7CH
| | | OMNI MODE ON                       BnH,7DH
| | | MONO MODE                           BnH,7EH
| | | POLY MODE                           BnH,7FH
|
| | +NN-PROGRAM CHANGE                  CnH
|
| | +NN-CHANNEL AFTER TOUCH              DnH
|
| | +NN-PITCH BEND CHANGE                EnH
|
|SW3
+[-]>NN-SYSTEM EXCLUSIV MESSAGE
| <BULK DUMP>
| | NN-SYSTEM                         FOH 43H 0nH 5CH bBH bBH 00H 00H dDH....dDH cCH
    
```

```

| | USER SEQ                F0H 43H 0nH 5CH bbH bbH 01H aaH 00H ddH....dH cch F7H
| | CURRENT VOICE           F0H 43H 0nH 5CH bbH bbH 10H 00H ddH....dH cch F7H
| | CURRENT SEQ            F0H 43H 0nH 5CH bbH bbH 10H 00H ddH....dH cch F7H
| | CURRENT SCENE1        F0H 43H 0nH 5CH bbH bbH 10H 10H ddH....dH cch F7H
| | CURRENT SCENE2        F0H 43H 0nH 5CH bbH bbH 10H 11H ddH....dH cch F7H
| | [SMS]-CURRENT_SCENE_CTRL F0H 43H 0nH 5CH bbH bbH 10H 12H ddH....dH cch F7H
| | USER VOICE             F0H 43H 0nH 5CH bbH bbH 11H aaH 00H ddH....dH cch F7H
| |
| | <PARAMETER CHANGE>
| | NXX1 MASTER TUNING     F0H 43H 1nH 04H 40H ddH F7H
| | NXX SYSTEM             F0H 43H 1nH 5CH 00H 00H aaH ddH....dH F7H
| | NXX CURRENT VOICE      F0H 43H 1nH 5CH 10H 00H aaH ddH....dH F7H
| | NXX CURRENT VOICE_SEQ  F0H 43H 1nH 5CH 10H 00H aaH ddH....dH F7H
| | NXX CURRENT SCENE1    F0H 43H 1nH 5CH 10H 10H aaH ddH....dH F7H
| | NXX CURRENT SCENE2    F0H 43H 1nH 5CH 10H 11H aaH ddH....dH F7H
| | [SMS]-CURRENT_SCENE_CTRL F0H 43H 1nH 5CH 10H 12H aaH ddH....dH F7H
| |
| | <BULK DUMP REQUEST>
| | NXX SYSTEM             F0H 43H 2nH 5CH 00H 00H 00H F7H
| | NXX USER SEQ          F0H 43H 2nH 5CH 01H aaH 00H F7H
| | NXX CURRENT VOICE      F0H 43H 2nH 5CH 10H 00H 00H F7H
| | NXX CURRENT VOICE_SEQ  F0H 43H 2nH 5CH 10H 00H 00H F7H
| | NXX CURRENT SCENE1    F0H 43H 2nH 5CH 10H 10H 00H F7H
| | NXX CURRENT SCENE2    F0H 43H 2nH 5CH 10H 11H 00H F7H
| | [SMS]-CURRENT_SCENE_CTRL F0H 43H 2nH 5CH 10H 12H 00H F7H
| | NXX USER VOICE        F0H 43H 2nH 5CH 11H aaH 00H F7H
| |
| | NXX SYSTEM EXCLUSIV MESSAGE
| | MIDI MASTER VOLUME     F0H 7FH 7FH 04H 01H 11H mmH F7H
| | IDENTITY REQUEST       F0H 7EH 0nH 06H 01H F7H
| |
| | NXX SYSTEM EXCLUSIV MESSAGE
| | TEST ENTRY             F0H 43H 10H 18H 5AH 00H F7H
| | LCD HARD COPY          F0H 43H 10H 18H 5AH 01H F7H
| |
| | NXX TIMING CLOCK        F7H
| | NXX ACTIVE SENSING     F7H

```

```

SW3 [] MIDI Device Number
SW4 [] ARPEGGIO/STEP SEQ SELECT
      Available only when Step Sequencer is selected.
SW5 [] SCENE SELECT
      Available only when Scene Select is set to "Scene Control".
SW6 [] MIDI Receive Channel
      Depends on Receive Channel set in System Data.

```

\*1 If Control Change Mode is "mode2", then additional Control Change numbers are received. (See (3-1-6).)

### (3) TRANSMIT/RECEIVE DATA

#### (3-1) CHANNEL VOICE MESSAGES

##### (3-1-1) NOTE OFF

|             |               |   |
|-------------|---------------|---|
| STATUS      | 1000nnnn(8nH) | n = 0 ~ 15: MIDI TRANSMIT/RECEIVE CHANNEL |
| NOTE NUMBER | 0kkkkkkk      | k = 0(C-2)-127(G8)                        |
| VELOCITY    | 0vvvvvvv      | ignores 0,0                               |

Reception only.

##### (3-1-2) NOTE ON/OFF

|             |               |  |
|-------------|---------------|--|
| STATUS      | 1001nnnn(9nH) | n = 0 ~ 15: MIDI TRANSMIT/RECEIVE CHANNEL                                  |
| NOTE NUMBER | 0kkkkkkk      | k = 0(C-2)-127(G8): when receiving<br>k = 36(C1)-96(C6): when transmitting |
| VELOCITY    | 0vvvvvvv      | (v>0) NOTE ON<br>(v=0) NOTE OFF  |

##### (3-1-3) PROGRAM CHANGE

|                |               |   |
|----------------|---------------|---|
| STATUS         | 1100nnnn(CnH) | n = 0 ~ 15: MIDI TRANSMIT/RECEIVE CHANNEL |
| PROGRAM NUMBER | 0ppppppp      | p = 0 ~ 127                               |

##### (3-1-4) CHANNEL AFTER TOUCH

|        |               |   |
|--------|---------------|---|
| STATUS | 1101nnnn(DnH) | n = 0 ~ 15: MIDI TRANSMIT/RECEIVE CHANNEL |
| VALUE  | 0vvvvvvv      | v = 0 ~ 127 AFTER TOUCH VALUE             |

##### (3-1-5) PITCH BEND CHANGE

|        |               |   |
|--------|---------------|---|
| STATUS | 1110nnnn(EnH) | n = 0 ~ 15: MIDI TRANSMIT/RECEIVE CHANNEL |
| LSB    | 0vvvvvvv      | PITCH BEND CHANGE LSB                     |
| MSB    | 0vvvvvvv      | PITCH BEND CHANGE MSB                     |

Transmitted with a resolution of 7 bits.

##### (3-1-6) CONTROL CHANGE

|                |               |   |
|----------------|---------------|---|
| STATUS         | 1011nnnn(BnH) | n = 0 ~ 15: MIDI TRANSMIT/RECEIVE CHANNEL |
| CONTROL NUMBER | 0ccccccc      |   |
| CONTROL VALUE  | 0vvvvvvv      |   |

###### \* TRANSMITTED CONTROL NUMBERS

|            |                     |                              |    |
|------------|---------------------|------------------------------|----|
| c = 1      | MODULATION          | ; v = 0 ~ 127                | *1 |
| c = 4      | FOOT CONTROLLER     | ; v = 0 ~ 127                | *1 |
| c = 7      | MAIN VOLUME         | ; v = 0 ~ 127                | *1 |
| c = 12     | RIBBON Z CONTROLLER | ; v = 0 ~ 127                | *1 |
| c = 13     | RIBBON X CONTROLLER | ; v = 01-64 - 64:0 - 127:+63 | *1 |
| c = 64     | SUSTAIN SWITCH      | ; v = 0-63:OFF, 64-127:ON    | *1 |
| c = 71     | HARMONIC CONTENT    | ; v = 0 ~ 127                |    |
| c = 72     | RELEASE TIME        | ; v = 0 ~ 127                |    |
| c = 73     | ATTACK TIME         | ; v = 0 ~ 127                |    |
| c = 74     | BRIGHTNESS          | ; v = 0 ~ 127                |    |
| c = 75     | DECAY TIME          | ; v = 0 ~ 127                |    |
| c = 00..95 | ASSIGNABLE CONT     | ; v = 0 ~ 127                |    |

###### \* RECEIVED CONTROL NUMBER

|        |                     |                              |    |
|--------|---------------------|------------------------------|----|
| c = 1  | MODULATION          | ; v = 0 ~ 127                |    |
| c = 4  | FOOT CONTROLLER     | ; v = 0 ~ 127                | *1 |
| c = 5  | PORTAMENTO TIME     | ; v = 0 ~ 127                |    |
| c = 6  | DATA ENTRY MSB      | ; v = 0 ~ 127                | *2 |
| c = 38 | DATA ENTRY LSB      | ; v = 0 ~ 127                | *2 |
| c = 7  | MAIN VOLUME         | ; v = 0 ~ 127                |    |
| c = 10 | EXPRESSION          | ; v = 0 ~ 127                |    |
| c = 12 | RIBBON Z CONTROLLER | ; v = 0 ~ 127                | *1 |
| c = 13 | RIBBON X CONTROLLER | ; v = 01-64 - 64:0 - 127:+63 | *1 |
| c = 64 | SUSTAIN SWITCH      | ; v = 0-63:OFF, 64-127:ON    |    |
| c = 65 | PORTAMENTO SWITCH   | ; v = 0-63:OFF, 64-127:ON    |    |
| c = 71 | HARMONIC CONTENT    | ; v = 0 ~ 127                |    |

|            |                         |               |    |
|------------|-------------------------|---------------|----|
| c = 72     | (VCF FILTER RESONANCE)  | ; v = 0 ~ 127 |    |
|            | RELEASE TIME            | ; v = 0 ~ 127 |    |
| c = 73     | (AMP EG RELEASE TIME)   | ; v = 0 ~ 127 |    |
|            | ATTACK TIME             | ; v = 0 ~ 127 |    |
| c = 74     | (AMP EG ATTACK TIME)    | ; v = 0 ~ 127 |    |
|            | BRIGHTNESS              | ; v = 0 ~ 127 |    |
|            | (VCF FILTER CUTOFF)     | ; v = 0 ~ 127 |    |
| c = 75     | DECAY TIME              | ; v = 0 ~ 127 |    |
| c = 91     | REVERB DEPTH            | ; v = 0 ~ 127 |    |
| c = 93     | CHORUS(VARIATION) DEPTH | ; v = 0 ~ 127 |    |
| c = 94     | DELAY DEPTH             | ; v = 0 ~ 127 |    |
| c = 96     | DATA ENTRY INC          | ; v = 127     | *2 |
| c = 97     | DATA ENTRY DEC          | ; v = 127     | *2 |
| c = 00..95 | ASSIGNABLE CONTROLLER   | ; v = 0 ~ 127 |    |

\*1 Preset CONTROL CHANGE NUMBER at the factory. Can be changed.  
\*2 Used only when assigning the parameter with RPN numbers.

In addition, the following CONTROL NUMBERS will be transmitted/received when Control Change Mode 2 is selected. (These are unique to the AN1x and therefore not in accordance with the MIDI 1.0 standard.)

|        |                         |               |
|--------|-------------------------|---------------|
| c = 3  | SCENE SELECT            | ; v = 0 ~ 127 |
| c = 8  | LAYER MODE              | ; v = 0 ~ 127 |
| c = 9  | POLY/MONO MODE          | ; v = 0 ~ 127 |
| c = 14 | LFO RESET MODE          | ; v = 0 ~ 127 |
| c = 15 | LFO1 WAVE               | ; v = 0 ~ 127 |
| c = 16 | LFO1 SPEED              | ; v = 0 ~ 127 |
| c = 17 | LFO2 SPEED              | ; v = 0 ~ 127 |
| c = 18 | VCO1 PITCH MOD DEPTH    | ; v = 0 ~ 127 |
| c = 19 | VCF FILTER MOD DEPTH    | ; v = 0 ~ 127 |
| c = 20 | LFO1 DELAY              | ; v = 0 ~ 127 |
| c = 21 | VCO1 PITCH COARSE TUNE  | ; v = 0 ~ 127 |
| c = 22 | VCO SYNC PITCH          | ; v = 0 ~ 127 |
| c = 23 | VCO SYNC PITCH DEPTH    | ; v = 0 ~ 127 |
| c = 24 | VCO SYNC PITCH SOURCE   | ; v = 0 ~ 127 |
| c = 25 | PEG DEPTH               | ; v = 0 ~ 127 |
| c = 26 | PEG SWITCH              | ; v = 0 ~ 127 |
| c = 27 | PEG DECAY               | ; v = 0 ~ 127 |
| c = 28 | PEG SUSTAIN LEVEL       | ; v = 0 ~ 127 |
| c = 29 | PEG RELEASE             | ; v = 0 ~ 127 |
| c = 30 | VCF CUTOFF KBD TRACK    | ; v = 0 ~ 127 |
| c = 31 | AMP EG SUSTAIN LEVEL    | ; v = 0 ~ 127 |
| c = 33 | VCO ALGORITHM           | ; v = 0 ~ 127 |
| c = 34 | VCO SYNC PITCH MOD SW   | ; v = 0 ~ 127 |
| c = 35 | FM DEPTH                | ; v = 0 ~ 127 |
| c = 36 | FM SOURCE1              | ; v = 0 ~ 127 |
| c = 37 | FM SOURCE2              | ; v = 0 ~ 127 |
| c = 39 | MIXER NOISE LEVEL       | ; v = 0 ~ 127 |
| c = 50 | VCO1 WAVE TYPE          | ; v = 0 ~ 127 |
| c = 51 | VCO2 WAVE TYPE          | ; v = 0 ~ 127 |
| c = 52 | VCO2 PITCH COARSE TUNE  | ; v = 0 ~ 127 |
| c = 53 | VCO2 PITCH FINE TUNE    | ; v = 0 ~ 127 |
| c = 54 | VCO2 EDGE               | ; v = 0 ~ 127 |
| c = 55 | VCO2 PULSE WIDTH        | ; v = 0 ~ 127 |
| c = 56 | VCO2 PWM DEPTH          | ; v = 0 ~ 127 |
| c = 57 | VCO2 PITCH MOD DEPTH    | ; v = 0 ~ 127 |
| c = 58 | VCF HPF CUTOFF          | ; v = 0 ~ 127 |
| c = 59 | VCF FILTER TYPE         | ; v = 0 ~ 127 |
| c = 60 | FILTER EG VELOCITY SENS | ; v = 0 ~ 127 |
| c = 61 | AMP EG VELOCITY SENS    | ; v = 0 ~ 127 |
| c = 62 | VCA VOLUME              | ; v = 0 ~ 127 |
| c = 63 | VCA FEED BACK LEVEL     | ; v = 0 ~ 127 |
| c = 68 | MIXER VCO1 LEVEL        | ; v = 0 ~ 127 |
| c = 69 | MIXER VCO2 LEVEL        | ; v = 0 ~ 127 |
| c = 70 | RING MODULATOR LEVEL    | ; v = 0 ~ 127 |
| c = 76 | VCO1 EDGE               | ; v = 0 ~ 127 |
| c = 77 | VCO1 PITCH FINE TUNE    | ; v = 0 ~ 127 |
| c = 78 | VCO1 PULSE WIDTH        | ; v = 0 ~ 127 |
| c = 79 | VCO1 PWM DEPTH          | ; v = 0 ~ 127 |
| c = 80 | VCA AMP MOD DEPTH       | ; v = 0 ~ 127 |
| c = 81 | FILTER EG DEPTH         | ; v = 0 ~ 127 |
| c = 82 | FILTER EG ATTACK        | ; v = 0 ~ 127 |
| c = 83 | FILTER EG DECAY         | ; v = 0 ~ 127 |
| c = 85 | PORTAMENTO MODE         | ; v = 0 ~ 127 |
| c = 86 | VCO1 PWM SOURCE         | ; v = 0 ~ 127 |
| c = 87 | VCO2 PWM SOURCE         | ; v = 0 ~ 127 |
| c = 90 | ARPEGGIO/STEP SEQ SW    | ; v = 0 ~ 127 |

MODULATION is used to control vibrato depth.

PORTAMENTO TIME sets the time it takes for the pitch to reach the next note played when PORTAMENTO SWITCH (CONTROL #65) is set to on. 0 is the minimum time and 127 is the maximum.

PANPOT position relatively changes according to the preset value for each voice.

REVERB DEPTH controls reverb send level.  
CHORUS DEPTH overwrites the Dry: Wet value of the Variation Effect directly for each voice.  
DELAY DEPTH controls delay send level.

HARMONIC CONTENT adjusts the resonance preset for each voice. Setting a value adds to or subtracts from the center value 64 since it is an offset parameter. Higher values produce more resonance. The effective range may be narrower than the range you can designate depending on the selected voice.

RELEASE TIME adjusts the envelop release time preset for each voice. Setting a value adds to or subtracts from the center value 64 since it is an offset parameter.

ATTACK TIME adjusts the envelop attack time preset for each voice. Setting a value adds to or subtracts from the center value 64 since it is an offset parameter.

BRIGHTNESS adjusts the cutoff frequency preset for each voice. Setting a value adds to or subtracts from the center value 64 since it is an offset parameter. Lower values produce a warmer sound. The effective range may be narrower than the range you can designate depending on the selected voice.

#### (3-2) CHANNEL MODE MESSAGES

|                |               |                                  |
|----------------|---------------|----------------------------------|
| STATUS         | 1011nnnn(BnH) | n = 0 ~ 15 :MIDI RECEIVE CHANNEL |
| CONTROL NUMBER | 0ccccccc      | c = CONTROL NUMBER               |
| CONTROL VALUE  | 0vvvvvvv      | v = DATA VALUE                   |

(3-2-1) ALL SOUND OFF (CONTROL NUMBER = 78H , DATA VALUE = 0)

All the sounds currently played including the channel messages such as note-on and hold-on in a certain channel are canceled when receiving this message.

(3-2-2) RESET ALL CONTROLLERS (CONTROL NUMBER = 79H , DATA VALUE = 0)

Resets the values set for the following controllers.

|                   |               |
|-------------------|---------------|
| PITCH BEND CHANGE | 0 (Center)    |
| AFTER TOUCH       | 0 (Minimum)   |
| MODULATION        | 0 (Minimum)   |
| EXPRESSION        | 127 (Maximum) |
| SUSTAIN SWITCH    | 0 (Off)       |

RPN Not assigned; no change

|                          |                |
|--------------------------|----------------|
| PORTAMENTO SWITCH        | 0 (Off)        |
| FOOT CONTROLLER          | 0 (Minimum)    |
| RIBBON X CONTROLLER      | 64 (No effect) |
| RIBBON Z CONTROLLER      | 0 (Minimum)    |
| VOLUME                   | 127 (Maximum)  |
| PAN                      | 64 (No effect) |
| REVERB DEPTH             | 127 (Maximum)  |
| CHORUS (VARIATION) DEPTH | No change      |
| DELAY DEPTH              | 127 (Maximum)  |

(3-2-3) ALL NOTE OFF (CONTROL NUMBER = 7BH , DATA VALUE = 0)

All the notes currently set to on in a certain channel are muted when receiving this message. However, if Hold 1 or Sostenute is on, notes will continue sounding until these are turned off.

(3-2-4) OMNI MODE OFF (CONTROL NUMBER = 7CH , DATA VALUE = 0)

Performs the same function as when receiving ALL NOTES OFF.

(3-2-5) OMNI MODE ON (CONTROL NUMBER = 7DH , DATA VALUE = 0)

Performs the same function as when receiving ALL NOTES OFF. Not to change to OMNI ON.

(3-2-6) MONO (CONTROL NUMBER = 7EH , DATA VALUE = 0)

Performs the same function as when receiving ALL SOUNDS OFF. If the 3rd byte (mono) is within 0 through 16, the channel will be Mode4 (m = 1).

(3-2-7) POLY (CONTROL NUMBER = 7FH , DATA VALUE = 0)

Performs the same function as when receiving ALL SOUNDS OFF. The channel will be Mode3.

**(3-3) REGISTERED PARAMETER NUMBER**

|                |               |                                  |
|----------------|---------------|----------------------------------|
| STATUS         | 1011nnnn(BnH) | n = 0 ~ 15; MIDI RECEIVE CHANNEL |
| LSB            | 01100100(64H) |                                  |
| RPN LSB        | 0ppppppp      | p = RPN LSB(See chart below)     |
| MSB            | 01100101(65H) |                                  |
| RPN MSB        | 0qqqqqqq      | q = RPN MSB(See chart below)     |
| DATA ENTRY MSB | 00000110(06H) |                                  |
| DATA VALUE     | 0mmmmmm       | m = Data Value                   |
| DATA ENTRY LSB | 00100110(26H) |                                  |
| DATA VALUE     | 01111111      | l = Data Value                   |

First, designate the parameter using RPN MSB/LSB numbers. Then, set its value with data entry MSB/LSB.

|         |          |                        |                                     |
|---------|----------|------------------------|-------------------------------------|
| RPN     | D. ENTRY | PARAMETER NAME         | DATA RANGE                          |
| LSB MSB | MSB LSB  | PITCH BEND SENSITIVITY | 00H - 18H (0 - 24 semitones)        |
| 00H 00H | mmH ---  | PITCH BEND SENSITIVITY | Cancel RPN numbers                  |
| 7FH 7FH | --- ---  | RPN RESET              | The internal value is not affected. |

**(3-4) SYSTEM REAL TIME MESSAGES**

**(3-4-1) ACTIVE SENSING**

STATUS 11111110 (FBH)

Transmitted every 260 msec.

Once this code is received, the AN1x starts sensing. When no status data is received for over approximately 360 ms, MIDI receiving buffer will be cleared, and the sounds currently played and the sustain switch are forcibly turned off. In this case, each control data will be reset to a certain value.

**(3-4-2) TIMING CLOCK(Receive only)**

STATUS 11111000 (FBH)

Selects whether the tempo clock of the Arpeggiator, Step Sequencer and FreeEG is controlled by internal clock or the timing clock of an external device via MIDI.

**(3-5) SYSTEM EXCLUSIVE MESSAGE**

**(3-5-1) UNIVERSAL NON REALTIME MESSAGE**

**(3-5-1-1) IDENTITY REQUEST (Receive only)**

F0H 7EH 0nH 06H 01H F7H

**(3-5-1-2) IDENTITY REPLY (Transmit only)**

F0H 7EH 7FH 06H 02H 43H 00H 41H ddH ddH 00H 00H 00H vvH F7H  
 dd:Device Number Code @AN1x: 1A 02  
 vv:TG Support Level AN1x: 7E

**(3-5-2) UNIVERSAL REALTIME MESSAGE**

**(3-5-2-1) MIDI MASTER VOLUME**

F0H 7FH 7FH 04H 01H 11H mmH F7H  
 Sets the MASTER VOLUME value.  
 The value 0mm0 is used to set the master volume (the value 0110 will be ignored).

**(3-5-3) PARAMETER CHANGE**

**(3-5-3-1) DX1 MASTER TUNING**

F0H 43H 1nH 04H 40H ddH F7H

When AN1x receives the DX1 compatible format, MASTER TUNE in the System Data will be changed. The value "dd" is used to set the master tuning.

dd = -64(00H) ~ 0(40H) ~ +63(7FH)

**(3-5-3-2) PARAMETER CHANGE**

|          |         |                  |
|----------|---------|------------------|
| 11110000 | F0      | Exclusive status |
| 01000011 | 43      | YAMAHA ID        |
| 0001nnnn | ln      | device Number    |
| 01011100 | 5C      | Model ID         |
| 0aaaaaaa | aaaaaaa | Address High     |
| 0aaaaaaa | aaaaaaa | Address Mid      |
| 0aaaaaaa | aaaaaaa | Address Low      |
| 0ddddd   | ddddd   | Data             |

11110111 F7 End of Exclusive

For parameters with data size of 2, transmit the appropriate number of data bytes. See MIDI Data Table for Address and Byte Count.

The following six types of data are transmitted/received.

System Data  
 Current Voice Common Data  
 Current Voice Scenel Data  
 Current Voice Scene2 Data  
 Current Voice Scene Ctrl Data  
 Current Step SEQ Data

**(3-5-4) BULK DUMP**

|          |         |                  |
|----------|---------|------------------|
| 11110000 | F0      | Exclusive status |
| 01000011 | 43      | YAMAHA ID        |
| 0001nnnn | ln      | device Number    |
| 01011100 | 5C      | Model ID         |
| 0bbbbbbb | bbbbbbb | ByteCount        |
| 0bbbbbbb | bbbbbbb | ByteCount        |
| 0aaaaaaa | aaaaaaa | Address High     |
| 0aaaaaaa | aaaaaaa | Address Mid      |
| 0aaaaaaa | aaaaaaa | Address Low      |
| 00000000 | 00      | Data             |
|          |         |                  |
| 0ccccccc | ccccccc | Check-sum        |
| 11110111 | F7      | End of Exclusive |

See MIDI Data Table for Address and Byte Count.

The Check sum is the value that results in a value of 0 for the lower 7 bits when the Byte Count, Start Address, Data and Check sum itself are added.

The following eight types of data are transmitted/received.

System Data  
 Current Voice Common Data  
 Current Voice Scenel Data  
 Current Voice Scene2 Data  
 Current Voice Scene Ctrl Data  
 Current Step SEQ Data  
 User Voice Data  
 User Step SEQ Data

**(3-5-5) DUMP REQUEST**

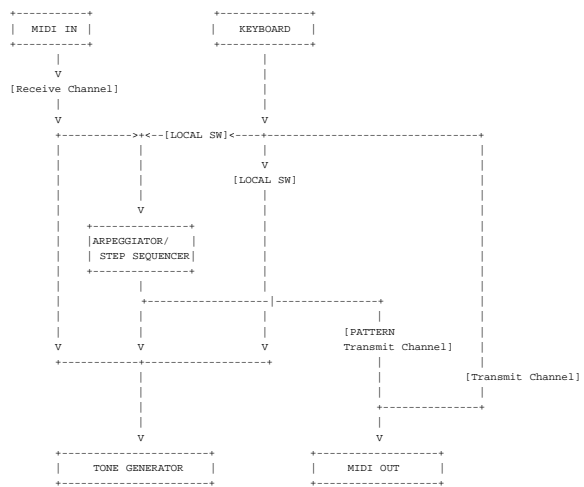
|          |         |                  |
|----------|---------|------------------|
| 11110000 | F0      | Exclusive status |
| 01000011 | 43      | YAMAHA ID        |
| 0010nnnn | 2n      | device Number    |
| 01011100 | 5C      | Model ID         |
| 0aaaaaaa | aaaaaaa | Address High     |
| 0aaaaaaa | aaaaaaa | Address Mid      |
| 0aaaaaaa | aaaaaaa | Address Low      |
| 11110111 | F7      | End of Exclusive |

See MIDI Data Table for Address and Byte Count.

The following eight types of data are received.

System Data  
 Current Voice Common Data  
 Current Voice Scenel Data  
 Current Voice Scene2 Data  
 Current Voice Scene Ctrl Data  
 Current Step SEQ Data  
 User Voice Data  
 User Step SEQ Data

**(4) CONFIGURATION OF KEYBOARD, ARPEGGIATOR AND TONE GENERATOR**



The tone generator will respond to both note data received via MIDI and the data generated by the AN1x such as note data and control data.

ALL SOUNDS OFF clears all the sounds in the specific channel played by both the keyboard and the data via MIDI.

**MIDI Data Table <1-1>**

| Parameter Change | Address (H) (M) (L) | Description                       |
|------------------|---------------------|-----------------------------------|
| SYSTEM           | 00 00 00            | System                            |
| USER PATTERN     | 01 00 00            | User Pattern 1 (only Bulk Dump)   |
|                  | :                   |                                   |
|                  | 01 7F 00            | User Pattern 128 (only Bulk Dump) |
| CURRENT VOICE    | 10 00 00            | Current Voice Common Buffer       |
|                  | 10 10 00            | Current Voice Scene 1 Buffer      |
|                  | 10 11 00            | Current Voice Scene 2 Buffer      |

|                 |    |    |    |                                 |
|-----------------|----|----|----|---------------------------------|
| CURRENT PATTERN | 10 | 12 | 00 | Current Voice Scene Ctrl Buffer |
| USER VOICE      | 10 | 0E | 00 | Current Pattern Buffer          |
|                 | 11 | 00 | 00 | User Voice 1 (only Bulk Dump)   |
|                 | 11 | 7F | 00 | User Voice 128 (only Bulk Dump) |

### MIDI Data Table <1-2>

MIDI Parameter Change Table (System)

| Address (H) | Size (H) | Data (H) | Parameter Name                                  | Description                            | Default value(H) |
|-------------|----------|----------|---|--|------------------|
| 00          | 00       | 00       | 2 0AA...356 Master tune                         | -100.0(0AA)...+100.0 cent(356)         | 200(+0)          |
| 02          | 1        | 0C...64  | Keyboard Transpose                              | -36(1C)...+36(64)                      | 40(+0)           |
| 03          | 1        | 00...05  | Keyboard Velocity Curve easy(3),wide(4),hard(5) | normal(0),soft1(1),soft2(2),           | 04(wide)         |
| 04          | 1        | 00...7F  | Keyboard Fixed Velocity                         | off(0),1...127                         | 00(off)          |
| 05          | 1        | 00...04  | Effect Bypass                                   | off(0),rev(1),dly(2),rev&dly(3),all(4) | 00(off)          |
| 06          | 1        | 00...7F  | Keyboard Transmit Channel                       | 1(0)...16(0F),off(7F)                  | 00(1)            |
| 07          | 1        | 00...7F  | Arpeggio/Step Seq Transmit Channel              | 1(0)...16(0F),off(7F)                  | 00(1)            |
| 08          | 1        | 00...7F  | Receive Channel1                                | 1(0)...16(0F),off(7F)                  | 00(1)            |
| 09          | 1        | 00...7F  | Receive Channel2                                | 1(0)...16(0F),off(7F)                  | 00(1)            |
| 0a          | 1        | 00...11  | Midi Device Number                              | 1(0)...16(0F),all(10),off(11)          | 10(all)          |
| 0b          | 1        | 00...01  | Midi Local                                      | off(0),on(1)                           | 01(on)           |
| 0c          | 1        | 00...60  | Scene Ctrl Number                               | off(0),1...95,AT(60)                   | 01(1)            |
| 0d          | 1        | 00...60  | MW Ctrl Number                                  | off(0),1...95,AT(60)                   | 01(1)            |
| 0e          | 1        | 00...60  | FV Ctrl Number                                  | off(0),1...95,AT(60)                   | 07(7)            |
| 0f          | 1        | 00...60  | FC Ctrl Number                                  | off(0),1...95,AT(60)                   | 04(4)            |
| 10          | 1        | 00...60  | FS Ctrl Number                                  | off(0),1...95,AT(60)                   | 40(64)           |
| 11          | 1        | 00...60  | Ribbon X Ctrl Number                            | off(0),1...95,AT(60)                   | 04(13)           |
| 12          | 1        | 00...60  | Ribbon Z Ctrl Number                            | off(0),1...95,AT(60)                   | 0c(12)           |
| 13          | 1        | 00...62  | Assainable Knob 1 Number                        | off(0),1...95,AT(60),                  | 28(41)           |
| 14          | 1        | 00...62  | Assainable Knob 2 Number                        | Data Entry(61),Tempo(62)               | 29(42)           |
| 15          | 1        | 00...62  | Assainable Knob 3 Number                        | Data Entry(61),Tempo(62)               | 2a(43)           |
| 16          | 1        | 00...62  | Assainable Knob 4 Number                        | Data Entry(61),Tempo(62)               | 2b(44)           |
| 17          | 1        | 00...62  | Assainable Knob 5 Number                        | Data Entry(61),Tempo(62)               | 2c(45)           |
| 18          | 1        | 00...62  | Assainable Knob 6 Number                        | Data Entry(61),Tempo(62)               | 2d(46)           |
| 19          | 1        | 00...62  | Assainable Knob 7 Number                        | Data Entry(61),Tempo(62)               | 2e(47)           |
| 1a          | 1        | 00...62  | Assainable Knob 8 Number                        | Data Entry(61),Tempo(62)               | 2f(48)           |
| 1b          | 1        | 00...00  | reserved  | 0...0                                  | 00               |

Total size 1C

### MIDI Data Table <1-3>

MIDI Parameter Change Table (Current Voice Common Buffer)

| Address (H) | Size (H) | Data (H) | Parameter Name             | Description   | Default value(H)        |
|-------------|----------|----------|----------------------------|---|-------------------------|
| 10          | 00       | 00       | 1 20...7F Voice Name 1     | Ascii Code  | I                       |
| 01          | 1        | 20...7F  | Voice Name 2               | Ascii Code  | n                       |
| 02          | 1        | 20...7F  | Voice Name 3               | Ascii Code  | t                       |
| 03          | 1        | 20...7F  | Voice Name 4               | Ascii Code  | c                       |
| 04          | 1        | 20...7F  | Voice Name 5               | Ascii Code  | t                       |
| 05          | 1        | 20...7F  | Voice Name 6               | Ascii Code  | o                       |
| 06          | 1        | 20...7F  | Voice Name 7               | Ascii Code  | m                       |
| 07          | 1        | 20...7F  | Voice Name 8               | Ascii Code  | x                       |
| 08          | 1        | 20...7F  | Voice Name 9               | Ascii Code  | a                       |
| 09          | 1        | 20...7F  | Voice Name 10              | Ascii Code  | 1                       |
| 0a          | 1        | 00...54  | Voice Category             | N,PF...wv   | N                       |
| 0b          | 1        | 01...03  | Common Scene Select        | Scene1(1),Scene2(2), Scene Ctrl(3)                                    | 40(+0)                  |
| 0c          | 1        | 00...05  | Layer Mode                 | single(0),unison(1),dual(2), dual-unison(3),split(4), split-unison(5) | 00(single)              |
| 0d          | 1        | 00...02  | Layer Pan                  | off(0),alternate(1),random(2)   | 00(off)                 |
| 0e          | 1        | 00...32  | Layer Separation           | 0...32  | 00                      |
| 0f          | 1        | 00...32  | Unison Detune              | 0...32  | 06                      |
| 10          | 2        | 27...F0  | Common Tempo               | midi(27),40(28)...240(F0)   | 78(120)                 |
| 11          | 1        | 00...01  | Common Split Point         | C-2(0)...G8(7F)   | 3c(C3)                  |
| 12          | 1        | 00...01  | Common Portamento Switch   | off(0)...on(1)  | 00(off)                 |
| 13          | 1        | 00...72  | Common Ctrl Matrix Source1 | off(0)...Assign Knob8(72)   | *1 00                   |
| 14          | 1        | 00...05  | Common Ctrl Matrix Param 1 | off(0)...Rev Return(5)  | *1 00                   |
| 15          | 1        | 00...05  | Common Ctrl Matrix Source2 | off(0)...Assign Knob8(72)   | *1 00                   |
| 16          | 1        | 00...05  | Common Ctrl Matrix Param 2 | off(0)...Rev Return(5)  | *1 00(+0)               |
| 17          | 1        | 00...72  | Common Ctrl Matrix Source2 | off(0)...Assign Knob8(72)   | *1 00                   |
| 18          | 1        | 00...05  | Common Ctrl Matrix Param 2 | off(0)...Rev Return(5)  | *1 00                   |
| 19          | 1        | 00...7F  | Common Ctrl Matrix Depth 2 | -64...+63   | *1 40(+0)               |
| 1a          | 1        | 00...0D  | Vari-Ef Type               | See Effect Type List  | 00(=chorus 1)           |
| 1b          | 1        | 00...00  | reserved                   | 00  | 00                      |
| 1c          | 2        | 00...7F  | Vari-Ef Param 1 MSB        | See Effect Parameter List   | Depends On Vari-Ef Type |
|             |          | 00...7F  | Vari-Ef Param 1 LSB        | See Effect Parameter List   | Depends On Vari-Ef Type |
| 1e          | 2        | 00...7F  | Vari-Ef Param 2 MSB        | See Effect Parameter List   | Depends On Vari-Ef Type |
|             |          | 00...7F  | Vari-Ef Param 2 LSB        | See Effect Parameter List   | Depends On Vari-Ef Type |
| 20          | 2        | 00...7F  | Vari-Ef Param 3 MSB        | See Effect Parameter List   | Depends On Vari-Ef Type |
|             |          | 00...7F  | Vari-Ef Param 3 LSB        | See Effect Parameter List   | Depends On Vari-Ef Type |
| 22          | 2        | 00...7F  | Vari-Ef Param 4 MSB        | See Effect Parameter List   | Depends On Vari-Ef Type |
|             |          | 00...7F  | Vari-Ef Param 4 LSB        | See Effect Parameter List   | Depends On Vari-Ef Type |
| 24          | 2        | 00...7F  | Vari-Ef Param 5 MSB        | See Effect Parameter List   | Depends On Vari-Ef Type |
|             |          | 00...7F  | Vari-Ef Param 5 LSB        | See Effect Parameter List   | Depends On Vari-Ef Type |
| 26          | 2        | 00...7F  | Vari-Ef Param 6 MSB        | See Effect Parameter List   | Depends On Vari-Ef Type |
|             |          | 00...7F  | Vari-Ef Param 6 LSB        | See Effect Parameter List   | Depends On Vari-Ef Type |
| 28          | 1        | 04...28  | 3-Band EQ Low Freq         | 32Hz(04)...2.0kHz(28)   | 14(200Hz)               |
| 29          | 1        | 34...4C  | 3-Band EQ Low Gain         | 12dB(34)...0(40)...+12dB(4C)  | 40(+0dB)                |
| 2a          | 1        | 0E...36  | 3-Band EQ Mid Freq         | 10Hz(0E)...10.0kHz(36)  | 28(2.0kHz)              |
| 2b          | 1        | 34...4C  | 3-Band EQ Mid Gain         | -12dB(34)...0(40)...+12dB(4C)   | 40(+0dB)                |
| 2c          | 1        | 0A...78  | 3-Band EQ Mid Resonance(Q) | 1.0(0A)...12.0(78)  | 0A(1.0)                 |
| 2d          | 1        | 3C...3A  | 3-Band EQ High Freq        | 50kHz(1C)...16.0kHz(38)   | 34(8.0kHz)              |
| 2e          | 1        | 34...4C  | 3-Band EQ High Gain        | -12dB(34)...0(40)...+12dB(4C)   | 40(+0dB)                |
| 2f          | 1        | 00...01  | Dly-Rev Connection         | seri(0),para(1)   | 00(seri)                |
| 30          | 1        | 00...0D  | Dly-Ef Type                | See Effect Type List  | 00(=delay L,C,R)        |
| 31          | 1        | 00...00  | Dly-Ef Return              | 0...127   | 00                      |
| 32          | 2        | 00...7F  | Dly-Ef Param 1 MSB         | See Effect Parameter List   | Depends On Dly-Ef Type  |
|             |          | 00...7F  | Dly-Ef Param 1 LSB         | See Effect Parameter List   | Depends On Dly-Ef Type  |
| 34          | 2        | 00...7F  | Dly-Ef Param 2 MSB         | See Effect Parameter List   | Depends On Dly-Ef Type  |
|             |          | 00...7F  | Dly-Ef Param 2 LSB         | See Effect Parameter List   | Depends On Dly-Ef Type  |
| 36          | 2        | 00...7F  | Dly-Ef Param 3 MSB         | See Effect Parameter List   | Depends On Dly-Ef Type  |
|             |          | 00...7F  | Dly-Ef Param 3 LSB         | See Effect Parameter List   | Depends On Dly-Ef Type  |
| 38          | 2        | 00...7F  | Dly-Ef Param 4 MSB         | See Effect Parameter List   | Depends On Dly-Ef Type  |
|             |          | 00...7F  | Dly-Ef Param 4 LSB         | See Effect Parameter List   | Depends On Dly-Ef Type  |
| 3a          | 2        | 00...7F  | Dly-Ef Param 5 MSB         | See Effect Parameter List   | Depends On Dly-Ef Type  |
|             |          | 00...7F  | Dly-Ef Param 5 LSB         | See Effect Parameter List   | Depends On Dly-Ef Type  |
| 3c          | 2        | 00...7F  | Dly-Ef Param 6 MSB         | See Effect Parameter List   | Depends On Dly-Ef Type  |
|             |          | 00...7F  | Dly-Ef Param 6 LSB         | See Effect Parameter List   | Depends On Dly-Ef Type  |

|         |                            |  |  |                        |
|---------|----------------------------|--|--|------------------------|
| 3e2     | 00...7F                    | Dly-Ef Param 7 MSB   | See Effect Parameter List  | Depends On Dly-Ef Type |
| 00...7F | Dly-Ef Param 7 LSB         | See Effect Parameter List  | Depends On Dly-Ef Type   |                        |
| 401     | 00...0D                    | Rev-Ef Type  | See Effect Type List   | 00(=Hall 1)            |
| 411     | 00...00                    | Rev-Ef Return  | 0...127  | 00                     |
| 422     | 00...7F                    | Rev-Ef Param 1 MSB   | See Effect Parameter List  | Depends On Rev-Ef Type |
| 00...7F | Rev-Ef Param 1 LSB         | See Effect Parameter List  | Depends On Rev-Ef Type   |                        |
| 442     | 00...7F                    | Rev-Ef Param 2 MSB   | See Effect Parameter List  | Depends On Rev-Ef Type |
| 00...7F | Rev-Ef Param 2 LSB         | See Effect Parameter List  | Depends On Rev-Ef Type   |                        |
| 462     | 00...7F                    | Rev-Ef Param 3 MSB   | See Effect Parameter List  | Depends On Rev-Ef Type |
| 00...7F | Rev-Ef Param 3 LSB         | See Effect Parameter List  | Depends On Rev-Ef Type   |                        |
| 482     | 00...7F                    | Rev-Ef Param 4 MSB   | See Effect Parameter List  | Depends On Rev-Ef Type |
| 00...7F | Rev-Ef Param 4 LSB         | See Effect Parameter List  | Depends On Rev-Ef Type   |                        |
| 4a2     | 00...7F                    | Rev-Ef Param 5 MSB   | See Effect Parameter List  | Depends On Rev-Ef Type |
| 00...7F | Rev-Ef Param 5 LSB         | See Effect Parameter List  | Depends On Rev-Ef Type   |                        |
| 4c2     | 00...7F                    | Rev-Ef Param 6 MSB   | See Effect Parameter List  | Depends On Rev-Ef Type |
| 00...7F | Rev-Ef Param 6 LSB         | See Effect Parameter List  | Depends On Rev-Ef Type   |                        |
| 4e2     | 00...7F                    | Rev-Ef Param 7 MSB   | See Effect Parameter List  | Depends On Rev-Ef Type |
| 00...7F | Rev-Ef Param 7 LSB         | See Effect Parameter List  | Depends On Rev-Ef Type   |                        |
| 501     | 00...01                    | Arpeggio/Step Seq on/off   | off(0),on(1)   | 00(off)                |
| 511     | 00...01                    | Arpeggio/Step Seq Select   | Arpeggio(0),Step Seq(1)  | 00(Arpeggio)           |
| 521     | 00...1D                    | Arpeggio Type/   | Step Seq Pcn No  | 00                     |
| 00...7F | Step Seq Pcn No            | UpDwn1(0)...BassLineIn(1D)   |  | +2 00(UpDwn1)          |
| 00...7F | Step Seq Pcn No            | Ch1Hnar01(0)...Har128(7F)  |  | +3 00                  |
| 531     | 00...01                    | Arpeggio/Step Seq Kbd Mode   | chord(0),chordNormal(1), normal(0),note-shift(normal(1), ptn-sel&normal(2), pt-sel&note-shift(3)             | +4 00(chord)           |
| 00...03 | Arpeggio/Step Seq Kbd Mode | chord(0),chordNormal(1), normal(0),note-shift(normal(1), ptn-sel&normal(2), pt-sel&note-shift(3) |  | +5 00                  |
| 541     | 00...01                    | Arpeggio/Step Hold   | off(0),on(1)   | *6 00(off)             |
| 00...02 | Arpeggio/Step Hold         | off(0),on(1)   |  |                        |
| 551     | 00...02                    | Arpeggio/Step Seq Scene Sw   | Scene1(1),Scene2(2),both(3)  | 03(both)               |
| 561     | 00...09                    | Arpeggio Subdivide   | 3/8(0)...1/32(9)   | 04(1/8)                |
| 571     | 32...53                    | Play Effect Swing  | 508(32)...838(53)  | *8 32(50%)             |
| 582     | 00...C8                    | Play Effect Velocity   | realtime(0),14(1)...2008(C8)   | 64(100%)               |
| 5A2     | 01...C8                    | Play Effect Gate Time  | 14(1)...2008(C8)   | *8 64(100%)            |
| 5c1     | 00...02                    | Free EG Trigger  | free(0),keyboard&midi(1),all(2)  | 01(kbd&midi)           |
| 5d1     | 00...04                    | Free EG Loop Type  | off(0),fwd(1),fwd-half(2), alternate(3),alternate-half(4)  | 01(fwd)                |
| 5e1     | 02...60                    | Free EG Length   | 1/2bar(2),1bar(3),3/2bar(4), 2bar(5),3bar(6),4bar(7),6bar(8), 8bar(9),1.0sec(0A)...8.0sec(50) ...16.0sec(60) | 28(4.0sec)             |
| 5f1     | 00...7F                    | Free EG Keyboard Track   | -64...+63  | 40(+0)                 |
| 601     | 00...38                    | Free EG Trk Param 1  | off(0)...VCA Mod Depth(38)   | *9 00(off)             |
| 611     | 00...0F                    | Free EG Trk Scene Switch 1   | off(0),Scene1(1),Scene2(2),both(3) bit2..3+track sw0 back up   | 00(off)                |
| 621     | 00...38                    | Free EG Trk Param 2  | off(0)...VCA Mod Depth(38)   | *9 00(off)             |
| 631     | 00...0F                    | Free EG Trk Scene Switch 2   | off(0),Scene1(1),Scene2(2),both(3) bit2..3+track sw0 back up   | 00(off)                |
| 641     | 00...38                    | Free EG Trk Param 3  | off(0)...VCA Mod Depth(38)   | *9 00(off)             |
| 651     | 00...0F                    | Free EG Trk Scene Switch 3   | off(0),Scene1(1),Scene2(2),both(3) bit2..3+track sw0 back up   | 00(off)                |
| 661     | 00...38                    | Free EG Trk Param 4  | off(0)...VCA Mod Depth(38)   | *9 00(off)             |
| 671     | 00...0F                    | Free EG Trk Scene Switch 4   | off(0),Scene1(1),Scene2(2),both(3) bit2..3+track sw0 back up   | 00(off)                |
| 00682   | 00...01                    | Free EG Trk1 Data1 MSB   | 0...1  | *10 01                 |
| 00...7F | Free EG Trk1 Data1 LSB     | 0...127  |  |                        |
| 006a2   | 00...01                    | Free EG Trk1 Data2 MSB   | 0...1  | *10 01                 |
| 00...7F | Free EG Trk1 Data2 LSB     | 0...127  |  |                        |
| 03662   | 00...01                    | Free EG Trk1 Data192 MSB   | 0...1  | *10 01                 |
| 00...7F | Free EG Trk1 Data192 LSB   | 0...127  |  |                        |
| 03682   | 00...01                    | Free EG Trk2 Data1 MSB   | 0...1  | *10 01                 |
| 00...7F | Free EG Trk2 Data1 LSB     | 0...127  |  |                        |
| 036a2   | 00...01                    | Free EG Trk2 Data2 MSB   | 0...1  | *10 01                 |
| 00...7F | Free EG Trk2 Data2 LSB     | 0...127  |  |                        |
| 06662   | 00...01                    | Free EG Trk2 Data192 MSB   | 0...1  | *10 01                 |
| 00...7F | Free EG Trk2 Data192 LSB   | 0...127  |  |                        |
| 06682   | 00...01                    | Free EG Trk3 Data1 MSB   | 0...1  | *10 01                 |
| 00...7F | Free EG Trk3 Data1 LSB     | 0...127  |  |                        |
| 066a2   | 00...01                    | Free EG Trk3 Data2 MSB   | 0...1  | *10 01                 |
| 00...7F | Free EG Trk3 Data2 LSB     | 0...127  |  |                        |
| 09662   | 00...01                    | Free EG Trk3 Data128 MSB   | 0...1  | *10 01                 |
| 00...7F | Free EG Trk3 Data128 LSB   | 0...127  |  |                        |
| 09682   | 00...01                    | Free EG Trk3 Data1 MSB   | 0...1  | *10 01                 |
| 00...7F | Free EG Trk3 Data1 LSB     | 0...127  |  |                        |
| 096a2   | 00...01                    | Free EG Trk4 Data2 MSB   | 0...1  | *10 01                 |
| 00...7F | Free EG Trk4 Data2 LSB     | 0...127  |  |                        |
| 09662   | 00...01                    | Free EG Trk4 Data128 MSB   | 0...1  | *10 01                 |
| 00...7F | Free EG Trk4 Data128 LSB   | 0...127  |  |                        |

TOTAL SIZE 668

- \*1 : see other table (Ctrl Matrix Parameter List)
- \*2 : see other table (Arpeggio Type List)
- \*3 : become available only when Step Seq is selected and Kbd Mode = 'ptn-sel&norm' or 'ptn-sel&note-shift'
- \*4 : only when Arpeggio is selected
- \*5 : only when Step Seq is selected
- \*6 : except \*7
- \*7 : only when Step Seq is selected and Kbd Mode = 'ptn-sel&norm' or 'ptn-sel&note-shift'
- \*8 : become available only when Step Seq is selected
- \*9 : see other table (Free EG Track Parameter List)
- \*10 : only Bulk Dump (not transmitted and received as parameter change)

### MIDI Data Table <1-4>

MIDI Parameter Change Table (Current Voice Scene Buffer)

| Address (H) | Size (H) | Data (H) | Parameter Name        | Description   | Default Value(H)          |          |
|-------------|----------|----------|-----------------------|---|---------------------------|----------|
| 10          | 1S       | 00       | 0                     | Poly Mode   | poly(0),mono(1),legato(2) | 00(poly) |
| 01          | 1        | 2C...54  | Pch Up (PB Range +)   | -24(2C)...+24(54)   | 42(+2)                    |          |
| 02          | 1        | 2C...54  | Pch Down (PB Range -) | -24(2C)...+24(54)   | 38(-2)                    |          |
| 03          | 1        | 00...7F  | PEG Decay             | -64...+63   | 40(+0)                    |          |
| 04          | 1        | 00...7F  | PEG Depth             | -64...+63 semitones   | 40(+0)                    |          |
| 05          | 1        | 01...03  | PEG Switch            | VC01(1),VC02(2),both(3)   | 03(both)                  |          |
| 06          | 1        | 00...01  | Portamento Mode       | normal(0),sustain-key(1) full-time(0),finger(1)   | *1 00(normal)             |          |
| 07          | 1        | 00...7F  | Portamento Time       | 0...127   | 20(32)                    |          |
| 08          | 1        | 00...01  | LFO Reset Mode        | off(0),key-on(1)  | 00(off)                   |          |
| 09          | 1        | 00...14  | LFO1 Wave             | sine(0)...offset-s/h2(14)   | *3 00(sine)               |          |
| 0a          | 2        | 00...FF  | LFO1 Speed            | 1(0)...256(FF)  | 1F(32)                    |          |
| 0c          | 1        | 00...7F  | LFO1 Speed            | 0...127   | 00                        |          |
| 0d          | 2        | 00...FF  | LFO2 Speed            | 1(0)...256(FF)  | 1F(32)                    |          |
| 0f          | 1        | 00...3   | VCO Algorithm         | Sync-off&FM-on(0), Sync-on&FM-both(1), (oscillator Sync & FM) Sync-on&FM-master(2), Sync-on&FM-slave(3) | 00(Sync-off&FM-both)      |          |

10 1 00...7F Sync Pitch -64...+63 40(+0)
11 1 00...7F Sync Pitch Depth -64...+63 40(+0)
12 1 00...04 Sync Pitch Source fixed(0),PEG(1),FEG(2),LFO1(3), LFO2(4) 00(fixed)

\*4 : Oscillator Sync = off
\*5 : Oscillator Sync = on
\*6 : Vari-Ef Type = except \*7,\*8
\*7 : Vari-Ef Type = Actual Exciter Compressor
\*8 : Vari-Ef Type = Distortion, Over Drive, Amp.Simulator
\*9 : see other table (Ctrl Matrix Parameter List) and not exist in scene-ctrl buffer

MIDI Data Table <1-5>

MIDI Parameter Change Table ( Current Step SEQ Buffer)

Table with columns: Address (H), Size (H), Data (H), Parameter Name, Description, Default value(H). Contains MIDI parameter settings for steps 0 to 37.

TOTAL SIZE 46

MIDI Data Table <1-6>

MIDI Parameter Change Table ( User Voice: Only Bulk Dump )

Table with columns: Address (H), Size (H), Data (H), Parameter Name, Description, Default value(H). Contains MIDI parameter settings for voice bulk dump.

Total size 74 : Scene 1, 2 Edit Buffer
Total size 44 : Scene Ctrl Buffer

S#0 : Scene 1 Edit Buffer
1 : Scene 2 Edit Buffer
2 : Scene Ctrl Buffer (\* effective only when Scene Ctrl is active)

\*1 : Poly Mode = poly
\*2 : Poly Mode = mono/legato
\*3 : see other table (LFO1 Wave Type List)

|          |                            |   |                         |    |  |          |                        |   |                      |
|----------|----------------------------|---|-------------------------|----|--|----------|------------------------|---|----------------------|
| 1 00..00 | reserved                   | 00  |                         | 00 |  | 1 00..7F | PEG Depth              | -64...+63 semitones   | 40(+0)               |
| 2 00..7F | Vari-Ef Param 1 MSB        | See Effect Parameter List   | Depends On Vari-Ef Type |    |  | 1 01..03 | PEG Switch             | VC01(1),VC02(2),both(3)   | 03(both)             |
| 2 00..7F | Vari-Ef Param 1 LSB        | See Effect Parameter List   | Depends On Vari-Ef Type |    |  | 1 00..01 | Portamento Mode        | normal(0),sustain-key(1)  | *11 00(normal)       |
| 2 00..7F | Vari-Ef Param 2 MSB        | See Effect Parameter List   | Depends On Vari-Ef Type |    |  |          |                        | fill-time(0),fingerd(1)   | *12                  |
| 2 00..7F | Vari-Ef Param 2 LSB        | See Effect Parameter List   | Depends On Vari-Ef Type |    |  | 1 00..7F | Portamento Time        | 0...127   | 20(32)               |
| 2 00..7F | Vari-Ef Param 3 MSB        | See Effect Parameter List   | Depends On Vari-Ef Type |    |  | 1 00..01 | LFO Reset Mode         | off(0),key-on(1)  | 00(off)              |
| 2 00..7F | Vari-Ef Param 3 LSB        | See Effect Parameter List   | Depends On Vari-Ef Type |    |  | 1 00..14 | LF01 Wave              | sine(0)...offset-s/h2(14)   | *13 00(sine)         |
| 2 00..7F | Vari-Ef Param 4 MSB        | See Effect Parameter List   | Depends On Vari-Ef Type |    |  | 2 00..FF | LF01 Speed             | 1(0)...256(Ff)  | 1F(32)               |
| 2 00..7F | Vari-Ef Param 4 LSB        | See Effect Parameter List   | Depends On Vari-Ef Type |    |  | 1 00..7F | LF01 Speed             | 0...127   | 00                   |
| 2 00..7F | Vari-Ef Param 5 MSB        | See Effect Parameter List   | Depends On Vari-Ef Type |    |  | 2 00..FF | LF02 Speed             | 1(0)...256(Ff)  | 1F(32)               |
| 2 00..7F | Vari-Ef Param 5 LSB        | See Effect Parameter List   | Depends On Vari-Ef Type |    |  | 1 00..03 | VCO Algorithm          | Sync-off&FM-on(0),<br>Sync-on&FM-both(1),<br>Sync-on&FM-master(2),<br>Sync-on&FM-slave(3) | 00(Sync-off&FM-both) |
| 2 00..7F | Vari-Ef Param 6 MSB        | See Effect Parameter List   | Depends On Vari-Ef Type |    |  |          |                        | (Oscillator Sync & FM)  |                      |
| 1 04..28 | 3-Band EQ Low Freq         | See Effect Parameter List   | Depends On Vari-Ef Type |    |  | 1 00..7F | Sync Pitch             | -64...+63   | 40(+0)               |
| 1 34..4C | 3-Band EQ Low Gain         | See Effect Parameter List   | Depends On Vari-Ef Type |    |  | 1 00..7F | Sync Pitch Depth       | -64...+63   | 40(+0)               |
| 1 0E..36 | 3-Band EQ Mid Freq         | See Effect Parameter List   | Depends On Vari-Ef Type |    |  | 1 00..04 | Sync Pitch Source      | fixed(0),PEG(1),PEG(2),LF01(3)<br>LF02(4)   | 00(fixed)            |
| 1 34..4C | 3-Band EQ Mid Gain         | See Effect Parameter List   | Depends On Vari-Ef Type |    |  |          |                        |   |                      |
| 1 0A..78 | 3-Band EQ Mid Resonance(Q) | See Effect Parameter List   | Depends On Vari-Ef Type |    |  | 1 01..03 | Sync Pitch Mod Switch  | master(1),slave(2),both(3)  | 03(both)             |
| 1 3C..3A | 3-Band EQ High Freq        | See Effect Parameter List   | Depends On Vari-Ef Type |    |  | 1 00..7F | FM Depth               | -64...+63   | 40(+0)               |
| 1 34..4C | 3-Band EQ High Gain        | See Effect Parameter List   | Depends On Vari-Ef Type |    |  | 1 00..04 | FM Source 1            | fixed(0),PEG(1),PEG(2),LF01(3),<br>LF02(4)  | 00(fixed)            |
| 1 00..01 | Dly-Rev Connection         | See Effect Type List  | 00                      |    |  | 1 00..06 | FM Source 2            | VC02(0),VC01(1),VC01-sub(2),<br>FEG(3),FEG(4),LF01(5),LP02(6)                             | 00(VC02)             |
| 1 00..0D | Dly-Ef Type                | See Effect Parameter List   | Depends On Dly-Ef Type  |    |  |          |                        |   |                      |
| 1 00..7F | Dly-Ef Return              | See Effect Parameter List   | Depends On Dly-Ef Type  |    |  | 1 00..03 | VC01 Wave              | saw(0),pulse(1),saw2(2),mix(3)  | *14 00(saw)          |
| 2 00..7F | Dly-Ef Param 1 MSB         | See Effect Parameter List   | Depends On Dly-Ef Type  |    |  | 1 00..04 | VC01 Wave              | saw(0),pulse(1),inner1(2),<br>inner2(3),inner3(4)   | *15 00               |
| 2 00..7F | Dly-Ef Param 1 LSB         | See Effect Parameter List   | Depends On Dly-Ef Type  |    |  | 1 00..7F | VC01 Pitch Coarse      | -64...+63 semitones   | 40(+0)               |
| 2 00..7F | Dly-Ef Param 2 MSB         | See Effect Parameter List   | Depends On Dly-Ef Type  |    |  | 1 0E..72 | VC01 Pitch Fine        | -50...+50 cent  | 40(+0)               |
| 2 00..7F | Dly-Ef Param 2 LSB         | See Effect Parameter List   | Depends On Dly-Ef Type  |    |  |          |                        |   |                      |
| 2 00..7F | Dly-Ef Param 3 MSB         | See Effect Parameter List   | Depends On Dly-Ef Type  |    |  | 1 00..7F | VC01 Edge              | 0...127   | 127                  |
| 2 00..7F | Dly-Ef Param 3 LSB         | See Effect Parameter List   | Depends On Dly-Ef Type  |    |  | 1 00..7F | VC01 Pulse Width       | 0%(0)...50%(40)...99%(7F)   | 40(50%)              |
| 2 00..7F | Dly-Ef Param 4 MSB         | See Effect Parameter List   | Depends On Dly-Ef Type  |    |  | 1 01..7F | VC01 PWM Depth         | -64...+63   | 40(+0)               |
| 2 00..7F | Dly-Ef Param 4 LSB         | See Effect Parameter List   | Depends On Dly-Ef Type  |    |  | 1 00..06 | VC01 PWM Source        | fixed(0),PEG(1),PEG(2),<br>LF01(3),LF02(4),LF02-phase(5),<br>LF02-fast(6)                 | 00(fixed)            |
| 2 00..7F | Dly-Ef Param 5 MSB         | See Effect Parameter List   | Depends On Dly-Ef Type  |    |  | 2 01..FF | VC01 Pitch Mod Depth   | -127...+127   | 80(+0)               |
| 2 00..7F | Dly-Ef Param 5 LSB         | See Effect Parameter List   | Depends On Dly-Ef Type  |    |  |          |                        |   |                      |
| 2 00..7F | Dly-Ef Param 6 MSB         | See Effect Parameter List   | Depends On Dly-Ef Type  |    |  | 1 00..03 | VC02 Wave              | saw(0),pulse(1),saw2(2),mix(3)  | 00(saw)              |
| 2 00..7F | Dly-Ef Param 6 LSB         | See Effect Parameter List   | Depends On Dly-Ef Type  |    |  | 1 00..7F | VC02 Pitch Coarse      | -64...+63 semitone  | 40(+0)               |
| 2 00..7F | Dly-Ef Param 7 MSB         | See Effect Parameter List   | Depends On Dly-Ef Type  |    |  | 1 0E..72 | VC02 Pitch Fine        | -50(0E)...+50 cent(72)  | 40(+0)               |
| 2 00..7F | Dly-Ef Param 7 LSB         | See Effect Parameter List   | Depends On Dly-Ef Type  |    |  |          |                        |   |                      |
| 1 00..0D | Rev-Ef Type                | See Effect Type List  | 00                      |    |  | 1 00..7F | VC02 Edge              | 0...127   | 127                  |
| 1 00..7F | Rev-Ef Return              | See Effect Parameter List   | Depends On Rev-Ef Type  |    |  | 1 00..7F | VC02 Pulse Width       | 0%(0)...50%(40)...99%(7F)   | 40(50%)              |
| 2 00..7F | Rev-Ef Param 1 MSB         | See Effect Parameter List   | Depends On Rev-Ef Type  |    |  | 1 00..7F | VC02 PWM Depth         | -64...+63   | 40(+0)               |
| 2 00..7F | Rev-Ef Param 1 LSB         | See Effect Parameter List   | Depends On Rev-Ef Type  |    |  | 1 00..06 | VC02 PWM Source        | fixed(0),PEG(1),PEG(2),<br>LF01(3),LF02(4),LF02-phase(5),<br>LF02-fast(6)                 | 00(fixed)            |
| 2 00..7F | Rev-Ef Param 2 MSB         | See Effect Parameter List   | Depends On Rev-Ef Type  |    |  | 2 01..FF | VC02 Pitch Mod Depth   | -127...+127   | 80(+0)               |
| 2 00..7F | Rev-Ef Param 2 LSB         | See Effect Parameter List   | Depends On Rev-Ef Type  |    |  |          |                        |   |                      |
| 2 00..7F | Rev-Ef Param 3 MSB         | See Effect Parameter List   | Depends On Rev-Ef Type  |    |  | 1 00..7F | Mixer VC01 Level       | 0...127   | 7F                   |
| 2 00..7F | Rev-Ef Param 3 LSB         | See Effect Parameter List   | Depends On Rev-Ef Type  |    |  | 1 00..7F | Mixer VC02 Level       | 0...127   | 00                   |
| 2 00..7F | Rev-Ef Param 4 MSB         | See Effect Parameter List   | Depends On Rev-Ef Type  |    |  | 1 00..7F | Mixer Ring Mod Level   | 0...127   | 00                   |
| 2 00..7F | Rev-Ef Param 4 LSB         | See Effect Parameter List   | Depends On Rev-Ef Type  |    |  | 1 00..7F | Mixer Noise Level      | 0...127   | 00                   |
| 2 00..7F | Rev-Ef Param 5 MSB         | See Effect Parameter List   | Depends On Rev-Ef Type  |    |  |          |                        |   |                      |
| 2 00..7F | Rev-Ef Param 5 LSB         | See Effect Parameter List   | Depends On Rev-Ef Type  |    |  | 1 00..7F | FilterEG Attack Time   | 0...127   | 00                   |
| 2 00..7F | Rev-Ef Param 6 MSB         | See Effect Parameter List   | Depends On Rev-Ef Type  |    |  | 1 00..7F | FilterEG Decay Time    | 0...127   | 40                   |
| 2 00..7F | Rev-Ef Param 6 LSB         | See Effect Parameter List   | Depends On Rev-Ef Type  |    |  | 1 00..7F | FilterEG Sustain Level | 0...127   | 7F                   |
| 2 00..7F | Rev-Ef Param 7 MSB         | See Effect Parameter List   | Depends On Rev-Ef Type  |    |  | 1 00..7F | FilterEG Release Time  | 0...127   | 7F                   |
| 2 00..7F | Rev-Ef Param 7 LSB         | See Effect Parameter List   | Depends On Rev-Ef Type  |    |  |          |                        |   |                      |
| 1 00..01 | Arpeggio/Step Seq on/off   | off(0),on(1)  | 00(off)                 |    |  | 1 00..7F | VCF HPF Cutoff Freq    | 0...127   | 00                   |
| 1 00..01 | Arpeggio/Step Seq Select   | Arpeggio(0),Step Seq(1)   | 00(Arpeggio)            |    |  | 1 00..05 | VCF Filter Type        | LFF-24dB(0),LFP-18dB(1),<br>LFF-12dB(2),BFP(3),HPF-12dB(4),<br>BHF(5)                     | 00(LFF-24dB)         |
| 1 00..1D | Arpeggio Type/             |   |                         |    |  |          |                        |   |                      |
| 1 00..7F | Step Seq Ptn No            | UpDwn1(0)...BassLineD(1D)   | *2 00(UpDwn1)           |    |  | 1 00..7F | VCF Filter Cutoff      | 0...127   | 7F                   |
| 1 00..7F | Arpeggio/Step Seq Kbd Mode | CH1:User01(0)...User128(7F)   | *3 00                   |    |  | 1 00..7F | VCF Filter Resonance   | -12(0D)...0(19)...+102(7F)  | 19(+0)               |
| 1 00..03 | Arpeggio/Step Seq Kbd Mode | chord(0),chordsnormal(1)  | *4 00(chord)            |    |  | 2 00..FF | FilterEG Depth         | -128...+127   | 94(+20)              |
| 1 00..03 | Arpeggio/Step Seq Kbd Mode | normal(0),note-shift&normal(1),<br>ptn-sel&normal(2),<br>pt-sel&note-shift(3)   | *5 00                   |    |  | 1 00..7F | FilterEG Velocity Sens | -64...+63   | 40(+0)               |
| 1 01..03 | Arpeggio/Step Hold         | off(0),mode1(1),mode2(2)  | *6 00(off)              |    |  | 1 20..7F | VCF Keyboard Track     | -32...+63   | 40(+0)               |
| 1 00..02 | Arpeggio/Step Scene Sw     | Scene1(1),Scene2(2),both(3)   | 03(both)                |    |  | 1 00..7F | VCF Filter Mod Depth   | -64...+63   | 40(+0)               |
| 1 00..09 | Arpeggio Subdivide         | 3/8(0)...1/32(9)  | 04(1/8)                 |    |  | 1 00..7F | AmpEG Attack Time      | 0...127   | 00                   |
| 1 32..53 | Play Effect Swing          | 50%(32)...83%(53)   | *8 32(50%)              |    |  | 1 00..7F | AmpEG Decay Time       | 0...127   | 40                   |
| 2 00..C8 | Play Effect Velocity       | realtime(0),1%(1)...200%(C8)  | 64(100%)                |    |  | 1 00..7F | AmpEG Sustain Level    | 0...127   | 7F                   |
| 2 01..C8 | Play Effect Gate Time      | 1%(1)...200%(C8)  | *8 64(100%)             |    |  | 1 00..7F | AmpEG Release Time     | 0...127   | 00                   |
| 1 00..02 | Free EG Trigger            | free(0),keyboard&midi(1),all(2)   | 01(kbd&midi)            |    |  | 1 00..7F | VCA Feedback Level     | 0...127   | 00                   |
| 1 00..04 | Free EG Loop Type          | off(0),fwd(1),fwd-half(2),<br>alternate(3),alternate-half(4)  | 01(fwd)                 |    |  | 1 00..7F | VCA Volume             | 0...127   | 00                   |
| 1 02..60 | Free EG Length             | 1/2bar(2),1bar(3),3/2bar(4),<br>2bar(5),3bar(6),4bar(7),6bar(8),<br>8bar(9),1.0sec(0A)...8.0sec(50)<br>...16.0sec(60) | 28(4.0sec)              |    |  | 1 00..7F | AmpEG Velocity Sens    | -64...+63   | 40(+0)               |
| 1 00..7F | Free EG Keyboard Track     | -64...+63   | 40(+0)                  |    |  | 1 00..7F | VCA Amp Mod Depth      | -64...+63   | 40(+0)               |
| 1 00..3F | Free EG Trk Param 1        | off(0)...VCA Mod Depth(38)  | *9 00(off)              |    |  | 1 01..7F | Vari-Ef Dry:Wet        | D<63>W(1)...D<w(40)...D<w63>(7F)  | *17 01(D<63>W)       |
| 1 00..3F | Free EG Trk Scene Switch 1 | off(0),Scene1(1),Scene2(2),both(3)  | *9 00(off)              |    |  | 1 00..00 | Reserve                | dry(0-3F),wet(40-7F)<br>dry(0-3F),both(40),wet(41-7F)                                     | *18 00               |
| 1 00..38 | Free EG Trk Param 2        | bit12..3+track sw0 back up  | 00(off)                 |    |  |          |                        |   |                      |
| 1 00..0F | Free EG Trk Scene Switch 2 | off(0)...VCA Mod Depth(38)  | *9 00(off)              |    |  | 1 00..72 | Ctrl Matrix Source1    | off(0)...Assign Knob(72)  | *19 00               |
| 1 00..38 | Free EG Trk Param 3        | bit2..3+track sw0s back up  | 00(off)                 |    |  | 1 00..24 | Ctrl Matrix Param 1    | off(0)...Vari-Ef Dry:Wet(24)  | *19 00               |
| 1 00..0F | Free EG Trk Scene Switch 3 | off(0),Scene1(1),Scene2(2),both(3)  | 00(off)                 |    |  | 1 00..7F | Ctrl Matrix Depth 1    | Depends on Ctrl Matrix Param  | *19 40(+0)           |
| 1 00..38 | Free EG Trk Param 4        | bit2..3+track sw0s back up  | 00(off)                 |    |  | 1 00..72 | Ctrl Matrix Source2    | off(0)...Assign Knob(72)  | *19 00               |
| 1 00..0F | Free EG Trk Scene Switch 4 | off(0)...VCA Mod Depth(38)  | *9 00(off)              |    |  | 1 00..24 | Ctrl Matrix Param 2    | Depends on Ctrl Matrix Param  | *19 40(+0)           |
| 1 00..38 | Free EG Trk Param 5        | bit2..3+track sw0s back up  | 00(off)                 |    |  | 1 00..72 | Ctrl Matrix Source3    | off(0)...Assign Knob(72)  | *19 00               |
| 2 00..01 | Free EG Trk1 Data1 MSB     | 0...1   | *10 01                  |    |  | 1 00..24 | Ctrl Matrix Param 3    | off(0)...Vari-Ef Dry:Wet(24)  | *19 00               |
| 2 00..7F | Free EG Trk1 Data1 LSB     | 0...127   | *10 00                  |    |  | 1 00..7F | Ctrl Matrix Depth 3    | Depends on Ctrl Matrix Param  | *19 40(+0)           |
| 2 00..01 | Free EG Trk1 Data2 MSB     | 0...1   | *10 01                  |    |  | 1 00..72 | Ctrl Matrix Source4    | off(0)...Assign Knob(72)  | *19 00               |
| 2 00..7F | Free EG Trk1 Data2 LSB     | 0...127   | *10 00                  |    |  | 1 00..24 | Ctrl Matrix Param 4    | off(0)...Vari-Ef Dry:Wet(24)  | *19 00               |
| :        | :                          | :   | :                       |    |  | 1 00..7F | Ctrl Matrix Depth 4    | Depends on Ctrl Matrix Param  | *19 40(+0)           |
| 2 00..01 | Free EG Trk1 Data192 MSB   | 0...1   | *10 01                  |    |  | 1 00..72 | Ctrl Matrix Source5    | off(0)...Assign Knob(72)  | *19 00               |
| 2 00..7F | Free EG Trk1 Data192 LSB   | 0...127   | *10 00                  |    |  | 1 00..24 | Ctrl Matrix Param 5    | off(0)...Vari-Ef Dry:Wet(24)  | *19 00               |
| 2 00..01 | Free EG Trk2 Data1 MSB     | 0...1   | *10 01                  |    |  | 1 00..7F | Ctrl Matrix Depth 5    | Depends on Ctrl Matrix Param  | *19 40(+0)           |
| 2 00..7F | Free EG Trk2 Data1 LSB     | 0...127   | *10 00                  |    |  | 1 00..72 | Ctrl Matrix Source6    | off(0)...Assign Knob(72)  | *19 00               |
| 2 00..01 | Free EG Trk2 Data2 MSB     | 0...1   | *10 01                  |    |  | 1 00..24 | Ctrl Matrix Param 6    | off(0)...Vari-Ef Dry:Wet(24)  | *19 00               |
| 2 00..7F | Free EG Trk2 Data2 LSB     | 0...127   | *10 00                  |    |  | 1 00..7F | Ctrl Matrix Depth 6    | Depends on Ctrl Matrix Param  | *19 40(+0)           |
| :        | :                          | :   | :                       |    |  | 1 00..72 | Ctrl Matrix Source7    | off(0)...Assign Knob(72)  | *19 00               |
| 2 00..01 | Free EG Trk2 Data192 MSB   | 0...1   | *10 01                  |    |  | 1 00..24 | Ctrl Matrix Param 7    | off(0)...Vari-Ef Dry:Wet(24)  | *19 00               |
| 2 00..7F | Free EG Trk2 Data192 LSB   | 0...127   | *10 00                  |    |  | 1 00..7F | Ctrl Matrix Depth 7    | Depends on Ctrl Matrix Param  | *19 40(+0)           |
| :        | :                          | :   | :                       |    |  | 1 00..72 | Ctrl Matrix Source8    | off(0)...Assign Knob(72)  | *19 00               |
| 2 00..01 | Free EG Trk3 Data1 MSB     | 0...1   | *10 01                  |    |  | 1 00..24 | Ctrl Matrix Param 8    | off(0)...Vari-Ef Dry:Wet(24)  | *19 00               |
| 2 00..7F | Free EG Trk3 Data1 LSB     | 0...127   | *10 00                  |    |  | 1 00..7F | Ctrl Matrix Depth 8    | Depends on Ctrl Matrix Param  | *19 40(+0)           |
| 2 00..01 | Free EG Trk3 Data2 MSB     | 0...1   | *10 01                  |    |  | 1 00..72 | Ctrl Matrix Source9    | off(0)...Assign Knob(72)  | *19 00               |
| 2 00..7F | Free EG Trk3 Data2 LSB     | 0...127   | *10 00                  |    |  | 1 00..24 | Ctrl Matrix Param 9    | off(0)...Vari-Ef Dry:Wet(24)  | *19 00               |
| :        | :                          | :   | :                       |    |  | 1 00..7F | Ctrl Matrix Depth 9    | Depends on Ctrl Matrix Param  | *19 40(+0)           |
| 2 00..01 | Free EG Trk3 Data128 MSB   | 0...1   | *10 01                  |    |  | 1 00..72 | Ctrl Matrix Source10   | off(0)...Assign Knob(72)  | *19 00               |
| 2 00..7F | Free EG Trk3 Data128 LSB   | 0...127   | *10 00                  |    |  | 1 00..24 | Ctrl Matrix Param 10   | off(0)...Vari-Ef Dry:Wet(24)  | *19 00               |
| 2 00..01 | Free EG Trk4 Data1 MSB     | 0...1   | *10 01                  |    |  | 1 00..7F | Ctrl Matrix Depth 10   | Depends on Ctrl Matrix Param  | *19 40(+0)           |
| 2 00..7F | Free EG Trk4 Data1 LSB     | 0...127   | *10 00                  |    |  | 1 00..72 | Ctrl Matrix Source11   | off(0)...Assign Knob(72)  | *19 00               |
| 2 00..01 | Free EG Trk4 Data2 MSB     | 0...1   | *10 01                  |    |  | 1 00..24 | Ctrl Matrix Param 11   | off(0)...Vari-Ef Dry:Wet(24)  | *19 00               |
| 2 00..7F | Free EG Trk4 Data2 LSB     | 0...127   | *10 00                  |    |  | 1 00..7F | Ctrl Matrix Depth 11   | Depends on Ctrl Matrix Param  | *19 40(+0)           |
| :        | :                          | :   | :                       |    |  | 1 00..72 | Ctrl Matrix Source12   | off(0)...Assign Knob(72)  | *19 00               |
| 2 00..01 | Free EG Trk4 Data128 MSB   | 0...1   | *10 01                  |    |  | 1 00..24 | Ctrl Matrix Param 12   | off(0)...Vari-Ef Dry:Wet(24)  | *19 00               |
| 2 00..7F | Free EG Trk4 Data128 LSB   | 0...127   | *10 00                  |    |  | 1 00..7F | Ctrl Matrix Depth 12   | Depends on Ctrl Matrix Param  | *19 40(+0)           |
|          |                            |   |                         |    |  | 1 00..72 | Ctrl Matrix Source13   | off(0)...Assign Knob(   |                      |



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1 00...24 Ctrl Matrix Param 15 off(0)...Vari-Ef Dry:Wet(24) *19 00
1 00...7F Ctrl Matrix Depth 15 Depends on Ctrl Matrix Param *19 40(+0)
1 00...72 Ctrl Matrix Source16 off(0)...Assign Knob8(72) *19 00
1 00...24 Ctrl Matrix Param 16 off(0)...Vari-Ef Dry:Wet(24) *19 00
1 00...7F Ctrl Matrix Depth 16 Depends on Ctrl Matrix Param *19 40(+0)

(from Here : Scene2's Data)
1 00...02 Poly Mode poly(0),mono(1),legato(2) 00(poly)
1 2C...54 Pich Up (PB Range +) -24(2C)...+24(54) 42(+2)
1 2C...54 Pich Down (PB Range -) -24(2C)...+24(54) 3E(+2)
1 00...7F PEG Decay -64...+63 40(+0)
1 00...7F PEG Depth -64...+63 semitones 40(+0)
1 01...03 PEG Switch VCO1(1),VCO2(2),both(3) 03(both)
1 00...01 Portamento Mode normal(0),sustain-key(1) *11 00(normal)
1 00...7F Portamento Time full-time(0),finger(1) *12 20(32)
1 00...01 LFO Reset Mode off(0),key-on(1) 00(off)
1 00...14 LFO1 Wave sine(0)...offset-s/h2(14) *13 00(sine)
2 00...FF LFO1 Speed 1(0)...256(FF) 1F(32)
1 00...7F LFO1 Speed 0...127 00
2 00...FF LFO2 Speed 1(0)...256(FF) 1F(32)
1 00...3 VCO Algorithm Sync-off&FM-on(0), Sync-on&FM-both(1), Sync-on&FM-master(2), Sync-on&FM-slave(3) 00(sync-off&FM-both)
(Oscillator Sync & FM)
1 00...7F Sync Pitch -64...+63 40(+0)
1 00...7F Sync Pitch Depth -64...+63 40(+0)
1 00...04 Sync Pitch Source fixed(0),PEG(1),FEG(2),LFO1(3), LFO2(4) 00(fixed)
1 01...03 Sync Pitch Mod Switch master(1),slave(2),both(3) 03(both)
1 00...7F PM Depth -64...+63 40(+0)
1 00...04 PM Source 1 fixed(0),PEG(1),FEG(2),LFO1(3), LFO2(4) 00(fixed)
1 00...06 PM Source 2 VCO2(0),VCO1(1),VCO1-sub(2), PEG(3),FEG(4),LFO1(5),LFO2(6) 00(VCO2)
1 00...03 VCO1 Wave saw(0),pulse(1),saw2(2),mix(3) *14 00(saw)
1 00...04 VCO1 Wave saw(0),pulse(1),inner1(2), inner2(3),inner3(4) *15 40(+0)
1 00...7F VCO1 Pitch Coarse -64...+63 semitones 40(+0)
1 0E...72 VCO1 Pitch Fine -50...+50 cent 40(+0)
1 00...7F VCO1 Edge 0...127 127
1 00...7F VCO1 Pulse Width 08(0)...508(40)...998(7F) 40(508)
1 01...7F VCO1 PWM Depth -64...+63 40(+0)
1 00...06 VCO1 PWM Source fixed(0),PEG(1),FEG(2), LFO1(3),LFO2(4),LFO2-phase(5), LFO2-fast(6) 00(fixed)
2 01...FF VCO1 Pitch Mod Depth -127...+127 80(+0)
1 00...03 VCO2 Wave saw(0),pulse(1),saw2(2),mix(3) 00(saw)
1 00...7F VCO2 Pitch Coarse -64...+63 semitones 40(+0)
1 0E...72 VCO2 Pitch Fine -50(0E)...+50 cent(72) 40(+0)
1 00...7F VCO2 Edge 0...127 127
1 00...7F VCO2 Pulse Width 08(0)...508(40)...998(7F) 40(508)
1 01...7F VCO2 PWM Depth -64...+63 40(+0)
1 00...06 VCO2 PWM Source fixed(0),PEG(1),FEG(2), LFO1(3),LFO2(4),LFO2-phase(5), LFO2-fast(6) 00(fixed)
2 01...FF VCO2 Pitch Mod Depth -127...+127 80(+0)
1 00...7F Mixer VCO1 Level 0...127 7F
1 00...7F Mixer VCO2 Level 0...127 00
1 00...7F Mixer Ring Mod Level 0...127 00
1 00...7F Mixer Noise Level 0...127 00
1 00...7F FilterEG Attack Time 0...127 00
1 00...7F FilterEG Decay Time 0...127 40
1 00...7F FilterEG Sustain Level 0...127 7F
1 00...7F FilterEG Release Time 0...127 7F
1 00...7F VCF HPF Cutoff Freq 0...127 00
1 00...05 VCF Filter Type LFF-24dB(0),LFF-18dB(1), LFF-12dB(2),BPF(3),HPF-12dB(4), BPF(5) 00(LFF-24dB)
1 00...7F VCF Filter Cutoff 0...127 7F
1 0D...7F VCF Filter Resonance -12(0D)...0(19)...+102(7F) 19(+0)
2 00...FF FilterEG Depth -128...+127 94(+20)
1 00...7F FilterEG Velocity Sens -64...+63 40(+0)
1 20...7F VCF Keyboard Track -32...+63 40(+0)
1 00...7F VCF Filter Mod Depth -64...+63 40(+0)
1 00...7F AmpEG Attack Time 0...127 00
1 00...7F AmpEG Decay Time 0...127 7F
1 00...7F AmpEG Sustain Level 0...127 00
1 00...7F AmpEG Release Time 0...127 00
1 00...7F VCA Feedback Level 0...127 00
1 00...7F VCA Volume 0...127 00
1 00...7F AmpEG Velocity Sens -64...+63 40(+0)
1 00...7F VCA Amp Mod Depth -64...+63 40(+0)
1 01...7F Vari-Ef Dry:Wet D63>M(1)...D>W(40)...D<W63(7F) *16 01(D63>M)
dry(0-3F),wet(40-7F) *17
dry(0-3F),both(40),wet(41-7F) *18
0...0 00
1 00...00 Reserve
1 00...72 Ctrl Matrix Source1 off(0)...Assign Knob8(72) *19 00
1 00...24 Ctrl Matrix Param 1 off(0)...Vari-Ef Dry:Wet(24) *19 00
1 00...7F Ctrl Matrix Depth 1 Depends on Ctrl Matrix Param *19 40(+0)
1 00...72 Ctrl Matrix Source2 off(0)...Assign Knob8(72) *19 00
1 00...24 Ctrl Matrix Param 2 off(0)...Vari-Ef Dry:Wet(24) *19 00
1 00...7F Ctrl Matrix Depth 2 Depends on Ctrl Matrix Param *19 40(+0)
1 00...72 Ctrl Matrix Source3 off(0)...Assign Knob8(72) *19 00
1 00...24 Ctrl Matrix Param 3 off(0)...Vari-Ef Dry:Wet(24) *19 00
1 00...7F Ctrl Matrix Depth 3 Depends on Ctrl Matrix Param *19 40(+0)
1 00...72 Ctrl Matrix Source4 off(0)...Assign Knob8(72) *19 00
1 00...24 Ctrl Matrix Param 4 off(0)...Vari-Ef Dry:Wet(24) *19 00
1 00...7F Ctrl Matrix Depth 4 Depends on Ctrl Matrix Param *19 40(+0)
1 00...72 Ctrl Matrix Source5 off(0)...Assign Knob8(72) *19 00
1 00...24 Ctrl Matrix Param 5 off(0)...Vari-Ef Dry:Wet(24) *19 00
1 00...7F Ctrl Matrix Depth 5 Depends on Ctrl Matrix Param *19 40(+0)
1 00...72 Ctrl Matrix Source6 off(0)...Assign Knob8(72) *19 00
1 00...24 Ctrl Matrix Param 6 off(0)...Vari-Ef Dry:Wet(24) *19 00
1 00...7F Ctrl Matrix Depth 6 Depends on Ctrl Matrix Param *19 40(+0)
1 00...72 Ctrl Matrix Source7 off(0)...Assign Knob8(72) *19 00
1 00...24 Ctrl Matrix Param 7 off(0)...Vari-Ef Dry:Wet(24) *19 00
1 00...7F Ctrl Matrix Depth 7 Depends on Ctrl Matrix Param *19 40(+0)
1 00...72 Ctrl Matrix Source8 off(0)...Assign Knob8(72) *19 00
1 00...24 Ctrl Matrix Param 8 off(0)...Vari-Ef Dry:Wet(24) *19 00
1 00...7F Ctrl Matrix Depth 8 Depends on Ctrl Matrix Param *19 40(+0)
1 00...72 Ctrl Matrix Source9 off(0)...Assign Knob8(72) *19 00
1 00...24 Ctrl Matrix Param 9 off(0)...Vari-Ef Dry:Wet(24) *19 00
1 00...7F Ctrl Matrix Depth 9 Depends on Ctrl Matrix Param *19 40(+0)
1 00...72 Ctrl Matrix Source10 off(0)...Assign Knob8(72) *19 00
1 00...24 Ctrl Matrix Param 10 off(0)...Vari-Ef Dry:Wet(24) *19 00
1 00...7F Ctrl Matrix Depth 10 Depends on Ctrl Matrix Param *19 40(+0)
1 00...72 Ctrl Matrix Source11 off(0)...Assign Knob8(72) *19 00
1 00...24 Ctrl Matrix Param 11 off(0)...Vari-Ef Dry:Wet(24) *19 00

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1 00...7F Ctrl Matrix Depth 11 Depends on Ctrl Matrix Param *19 40(+0)
1 00...72 Ctrl Matrix Source12 off(0)...Assign Knob8(72) *19 00
1 00...24 Ctrl Matrix Param 12 off(0)...Vari-Ef Dry:Wet(24) *19 00
1 00...7F Ctrl Matrix Depth 12 Depends on Ctrl Matrix Param *19 40(+0)
1 00...72 Ctrl Matrix Source13 off(0)...Assign Knob8(72) *19 00
1 00...24 Ctrl Matrix Param 13 off(0)...Vari-Ef Dry:Wet(24) *19 00
1 00...7F Ctrl Matrix Depth 13 Depends on Ctrl Matrix Param *19 40(+0)
1 00...72 Ctrl Matrix Source14 off(0)...Assign Knob8(72) *19 00
1 00...24 Ctrl Matrix Param 14 off(0)...Vari-Ef Dry:Wet(24) *19 00
1 00...7F Ctrl Matrix Depth 14 Depends on Ctrl Matrix Param *19 40(+0)
1 00...72 Ctrl Matrix Source15 off(0)...Assign Knob8(72) *19 00
1 00...24 Ctrl Matrix Param 15 off(0)...Vari-Ef Dry:Wet(24) *19 00
1 00...7F Ctrl Matrix Depth 15 Depends on Ctrl Matrix Param *19 40(+0)
1 00...72 Ctrl Matrix Source16 off(0)...Assign Knob8(72) *19 00
1 00...24 Ctrl Matrix Param 16 off(0)...Vari-Ef Dry:Wet(24) *19 00
1 00...7F Ctrl Matrix Depth 16 Depends on Ctrl Matrix Param *19 40(+0)

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```

(from Here : Step Seq Pattern Data)
1 00...09 Step Seq Base Unit 3/8(0)...1/32(9) 04(1/8)
1 01...10 Step Seq Length lsteps(1)...16steps(10) 08
1 00...03 Step Seq Loop Type fwd(0),backwd(1),alternateA(2), alternateB(3) 00(fwd)
1 00...00 reserved off(0)...95,AT(60) 00(off)
1 00...00 reserved 00 00
1 00...00 reserved 00 00
1 00...7F Step Seq Note No 1 C-2(0)...G8(7F) C3(3C)
1 00...7F Step Seq Note No 2 C-2(0)...G8(7F) C3(3C)
1 00...7F Step Seq Note No 3 C-2(0)...G8(7F) C3(3C)
1 00...7F Step Seq Note No 4 C-2(0)...G8(7F) C3(3C)
1 00...7F Step Seq Note No 5 C-2(0)...G8(7F) C3(3C)
1 00...7F Step Seq Note No 6 C-2(0)...G8(7F) C3(3C)
1 00...7F Step Seq Note No 7 C-2(0)...G8(7F) C3(3C)
1 00...7F Step Seq Note No 8 C-2(0)...G8(7F) C3(3C)
1 00...7F Step Seq Note No 9 C-2(0)...G8(7F) C3(3C)
1 00...7F Step Seq Note No 10 C-2(0)...G8(7F) C3(3C)
1 00...7F Step Seq Note No 11 C-2(0)...G8(7F) C3(3C)
1 00...7F Step Seq Note No 12 C-2(0)...G8(7F) C3(3C)
1 00...7F Step Seq Note No 13 C-2(0)...G8(7F) C3(3C)
1 00...7F Step Seq Note No 14 C-2(0)...G8(7F) C3(3C)
1 00...7F Step Seq Note No 15 C-2(0)...G8(7F) C3(3C)
1 00...7F Step Seq Note No 16 C-2(0)...G8(7F) C3(3C)
1 00...7F Step Seq Velocity 1 rest(0)...1...127 100(64)
1 00...7F Step Seq Velocity 2 rest(0)...1...127 100(64)
1 00...7F Step Seq Velocity 3 rest(0)...1...127 100(64)
1 00...7F Step Seq Velocity 4 rest(0)...1...127 100(64)
1 00...7F Step Seq Velocity 5 rest(0)...1...127 100(64)
1 00...7F Step Seq Velocity 6 rest(0)...1...127 100(64)
1 00...7F Step Seq Velocity 7 rest(0)...1...127 100(64)
1 00...7F Step Seq Velocity 8 rest(0)...1...127 100(64)
1 00...7F Step Seq Velocity 9 rest(0)...1...127 100(64)
1 00...7F Step Seq Velocity 10 rest(0)...1...127 100(64)
1 00...7F Step Seq Velocity 11 rest(0)...1...127 100(64)
1 00...7F Step Seq Velocity 12 rest(0)...1...127 100(64)
1 00...7F Step Seq Velocity 13 rest(0)...1...127 100(64)
1 00...7F Step Seq Velocity 14 rest(0)...1...127 100(64)
1 00...7F Step Seq Velocity 15 rest(0)...1...127 100(64)
1 00...7F Step Seq Velocity 16 rest(0)...1...127 100(64)
1 00...7F Step Seq Gate Time 1 18(0)...1008(40)...2008(7F) 948(3C)
1 00...7F Step Seq Gate Time 2 18(0)...1008(40)...2008(7F) 948(3C)
1 00...7F Step Seq Gate Time 3 18(0)...1008(40)...2008(7F) 948(3C)
1 00...7F Step Seq Gate Time 4 18(0)...1008(40)...2008(7F) 948(3C)
1 00...7F Step Seq Gate Time 5 18(0)...1008(40)...2008(7F) 948(3C)
1 00...7F Step Seq Gate Time 6 18(0)...1008(40)...2008(7F) 948(3C)
1 00...7F Step Seq Gate Time 7 18(0)...1008(40)...2008(7F) 948(3C)
1 00...7F Step Seq Gate Time 8 18(0)...1008(40)...2008(7F) 948(3C)
1 00...7F Step Seq Gate Time 9 18(0)...1008(40)...2008(7F) 948(3C)
1 00...7F Step Seq Gate Time 10 18(0)...1008(40)...2008(7F) 948(3C)
1 00...7F Step Seq Gate Time 11 18(0)...1008(40)...2008(7F) 948(3C)
1 00...7F Step Seq Gate Time 12 18(0)...1008(40)...2008(7F) 948(3C)
1 00...7F Step Seq Gate Time 13 18(0)...1008(40)...2008(7F) 948(3C)
1 00...7F Step Seq Gate Time 14 18(0)...1008(40)...2008(7F) 948(3C)
1 00...7F Step Seq Gate Time 15 18(0)...11008(40)...2008(7F) 948(3C)
1 00...7F Step Seq Gate Time 16 18(0)...11008(40)...2008(7F) 948(3C)
1 00...7F Step Seq Ctrl Change Value 1 0...127 0(00)
1 00...7F Step Seq Ctrl Change Value 2 0...127 0(00)
1 00...7F Step Seq Ctrl Change Value 3 0...127 0(00)
1 00...7F Step Seq Ctrl Change Value 4 0...127 0(00)
1 00...7F Step Seq Ctrl Change Value 5 0...127 0(00)
1 00...7F Step Seq Ctrl Change Value 6 0...127 0(00)
1 00...7F Step Seq Ctrl Change Value 7 0...127 0(00)
1 00...7F Step Seq Ctrl Change Value 8 0...127 0(00)
1 00...7F Step Seq Ctrl Change Value 9 0...127 0(00)
1 00...7F Step Seq Ctrl Change Value 10 0...127 0(00)
1 00...7F Step Seq Ctrl Change Value 11 0...127 0(00)
1 00...7F Step Seq Ctrl Change Value 12 0...127 0(00)
1 00...7F Step Seq Ctrl Change Value 13 0...127 0(00)
1 00...7F Step Seq Ctrl Change Value 14 0...127 0(00)
1 00...7F Step Seq Ctrl Change Value 15 0...127 0(00)
1 00...7F Step Seq Ctrl Change Value 16 0...127 0(00)
TOTAL SIZE 796

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```

mm = 00 ~ 7F : User Voice 1 ~ User Voice 128
*1 : see other table (Ctrl Matrix Paramter List)
*2 : see other table (Arpeggio Type List)
*3 : become available only when Step Seq is selected and Kbd Mode = 'pfn-sel&nomr' or 'pfn-sel&note-shift'
*4 : only when Arpeggio is selected
*5 : only when Step Seq is selected
*6 : except *7
*7 : only when Step Seq is selected and Kbd Mode = 'pfn-sel&nomr' or 'pfn-sel&note-shift'
*8 : become available only when Step Seq is selected
*9 : see other table (Free EG Track Parameter List)
*10 : only Bulk Dump (not transmitted and received as parameter change)
*11 : Poly Mode = poly
*12 : Poly Mode = mono,legato
*13 : see other table (LFO1 Wave Type List)
*14 : Oscillator Sync = off
*15 : Oscillator Sync = on
*16 : Vari-Ef Type = except *7,*8
*17 : Vari-Ef Type = Aural Exciter, Compressor
*18 : Vari-Ef Type = Distortion, Over Drive, Amp.Simulator
*19 : see other table (Ctrl Matrix Paramter List) and not exist in scene-ctrl buffer

```

**MIDI Data Table <1-7>**

**MIDI Parameter Change Table ( User Step SEQ Pattern : Only Bulk Dump )**

| Address | Size Data | Parameter Name | Description             | Default value(H)                              |
|---------|-----------|----------------|-------------------------|---|
| (H)     | (H)       | (H)            |                         |   |
| 01      | mm 00     | 00...09        | Step Seq Base Unit      | 3/8(0)...1/32(9)                              |
| 01      | 1         | 01...10        | Step Seq Length         | lsteps(1)...16steps(10)                       |
| 02      | 1         | 00...03        | Step Seq Loop Type      | fwd(0),backwd(1),alternateA(2), alternateB(3) |
| 03      | 1         | 00...60        | Step Seq Ctrl Change No | off(0)...95,AT(60)                            |
| 04      | 1         | 00...00        | reserved                | 00  |

|    |   |         |                               |                             |         |
|----|---|---------|-------------------------------|-----------------------------|---------|
| 05 | 1 | 00...00 | reserved                      | 00                          | 00      |
| 06 | 1 | 00...7F | Step Seq Note No 1            | C-2(0)...G8(7F)             | C3(3C)  |
| 07 | 1 | 00...7F | Step Seq Note No 2            | C-2(0)...G8(7F)             | C3(3C)  |
| 08 | 1 | 00...7F | Step Seq Note No 3            | C-2(0)...G8(7F)             | C3(3C)  |
| 09 | 1 | 00...7F | Step Seq Note No 4            | C-2(0)...G8(7F)             | C3(3C)  |
| 0a | 1 | 00...7F | Step Seq Note No 5            | C-2(0)...G8(7F)             | C3(3C)  |
| 0b | 1 | 00...7F | Step Seq Note No 6            | C-2(0)...G8(7F)             | C3(3C)  |
| 0c | 1 | 00...7F | Step Seq Note No 7            | C-2(0)...G8(7F)             | C3(3C)  |
| 0d | 1 | 00...7F | Step Seq Note No 8            | C-2(0)...G8(7F)             | C3(3C)  |
| 0e | 1 | 00...7F | Step Seq Note No 9            | C-2(0)...G8(7F)             | C3(3C)  |
| 0f | 1 | 00...7F | Step Seq Note No 10           | C-2(0)...G8(7F)             | C3(3C)  |
| 10 | 1 | 00...7F | Step Seq Note No 11           | C-2(0)...G8(7F)             | C3(3C)  |
| 11 | 1 | 00...7F | Step Seq Note No 12           | C-2(0)...G8(7F)             | C3(3C)  |
| 12 | 1 | 00...7F | Step Seq Note No 13           | C-2(0)...G8(7F)             | C3(3C)  |
| 13 | 1 | 00...7F | Step Seq Note No 14           | C-2(0)...G8(7F)             | C3(3C)  |
| 14 | 1 | 00...7F | Step Seq Note No 15           | C-2(0)...G8(7F)             | C3(3C)  |
| 15 | 1 | 00...7F | Step Seq Note No 16           | C-2(0)...G8(7F)             | C3(3C)  |
| 16 | 1 | 00...7F | Step Seq Velocity 1           | rest(0),1...127             | 100(64) |
| 17 | 1 | 00...7F | Step Seq Velocity 2           | rest(0),1...127             | 100(64) |
| 18 | 1 | 00...7F | Step Seq Velocity 3           | rest(0),1...127             | 100(64) |
| 19 | 1 | 00...7F | Step Seq Velocity 4           | rest(0),1...127             | 100(64) |
| 1a | 1 | 00...7F | Step Seq Velocity 5           | rest(0),1...127             | 100(64) |
| 1b | 1 | 00...7F | Step Seq Velocity 6           | rest(0),1...127             | 100(64) |
| 1c | 1 | 00...7F | Step Seq Velocity 7           | rest(0),1...127             | 100(64) |
| 1d | 1 | 00...7F | Step Seq Velocity 8           | rest(0),1...127             | 100(64) |
| 1e | 1 | 00...7F | Step Seq Velocity 9           | rest(0),1...127             | 100(64) |
| 1f | 1 | 00...7F | Step Seq Velocity 10          | rest(0),1...127             | 100(64) |
| 20 | 1 | 00...7F | Step Seq Velocity 11          | rest(0),1...127             | 100(64) |
| 21 | 1 | 00...7F | Step Seq Velocity 12          | rest(0),1...127             | 100(64) |
| 22 | 1 | 00...7F | Step Seq Velocity 13          | rest(0),1...127             | 100(64) |
| 23 | 1 | 00...7F | Step Seq Velocity 14          | rest(0),1...127             | 100(64) |
| 24 | 1 | 00...7F | Step Seq Velocity 15          | rest(0),1...127             | 100(64) |
| 25 | 1 | 00...7F | Step Seq Velocity 16          | rest(0),1...127             | 100(64) |
| 26 | 1 | 00...7F | Step Seq Gate Time 1          | 1%(0)...100%(40)...200%(7F) | 94%(3C) |
| 27 | 1 | 00...7F | Step Seq Gate Time 2          | 1%(0)...100%(40)...200%(7F) | 94%(3C) |
| 28 | 1 | 00...7F | Step Seq Gate Time 3          | 1%(0)...100%(40)...200%(7F) | 94%(3C) |
| 29 | 1 | 00...7F | Step Seq Gate Time 4          | 1%(0)...100%(40)...200%(7F) | 94%(3C) |
| 2a | 1 | 00...7F | Step Seq Gate Time 5          | 1%(0)...100%(40)...200%(7F) | 94%(3C) |
| 2b | 1 | 00...7F | Step Seq Gate Time 6          | 1%(0)...100%(40)...200%(7F) | 94%(3C) |
| 2c | 1 | 00...7F | Step Seq Gate Time 7          | 1%(0)...100%(40)...200%(7F) | 94%(3C) |
| 1d | 1 | 00...7F | Step Seq Gate Time 8          | 1%(0)...100%(40)...200%(7F) | 94%(3C) |
| 2e | 1 | 00...7F | Step Seq Gate Time 9          | 1%(0)...100%(40)...200%(7F) | 94%(3C) |
| 2f | 1 | 00...7F | Step Seq Gate Time 10         | 1%(0)...100%(40)...200%(7F) | 94%(3C) |
| 30 | 1 | 00...7F | Step Seq Gate Time 11         | 1%(0)...100%(40)...200%(7F) | 94%(3C) |
| 31 | 1 | 00...7F | Step Seq Gate Time 12         | 1%(0)...100%(40)...200%(7F) | 94%(3C) |
| 32 | 1 | 00...7F | Step Seq Gate Time 13         | 1%(0)...100%(40)...200%(7F) | 94%(3C) |
| 33 | 1 | 00...7F | Step Seq Gate Time 14         | 1%(0)...100%(40)...200%(7F) | 94%(3C) |
| 34 | 1 | 00...7F | Step Seq Gate Time 15         | 1%(0)...100%(40)...200%(7F) | 94%(3C) |
| 35 | 1 | 00...7F | Step Seq Gate Time 16         | 1%(0)...100%(40)...200%(7F) | 94%(3C) |
| 36 | 1 | 00...7F | Step Seq Ctrl Change Value 1  | 0...127                     | 0(00)   |
| 37 | 1 | 00...7F | Step Seq Ctrl Change Value 2  | 0...127                     | 0(00)   |
| 38 | 1 | 00...7F | Step Seq Ctrl Change Value 3  | 0...127                     | 0(00)   |
| 39 | 1 | 00...7F | Step Seq Ctrl Change Value 4  | 0...127                     | 0(00)   |
| 3a | 1 | 00...7F | Step Seq Ctrl Change Value 5  | 0...127                     | 0(00)   |
| 3b | 1 | 00...7F | Step Seq Ctrl Change Value 6  | 0...127                     | 0(00)   |
| 3c | 1 | 00...7F | Step Seq Ctrl Change Value 7  | 0...127                     | 0(00)   |
| 3d | 1 | 00...7F | Step Seq Ctrl Change Value 8  | 0...127                     | 0(00)   |
| 3e | 1 | 00...7F | Step Seq Ctrl Change Value 9  | 0...127                     | 0(00)   |
| 3f | 1 | 00...7F | Step Seq Ctrl Change Value 10 | 0...127                     | 0(00)   |
| 40 | 1 | 00...7F | Step Seq Ctrl Change Value 11 | 0...127                     | 0(00)   |
| 41 | 1 | 00...7F | Step Seq Ctrl Change Value 12 | 0...127                     | 0(00)   |
| 42 | 1 | 00...7F | Step Seq Ctrl Change Value 13 | 0...127                     | 0(00)   |
| 43 | 1 | 00...7F | Step Seq Ctrl Change Value 14 | 0...127                     | 0(00)   |
| 44 | 1 | 00...7F | Step Seq Ctrl Change Value 15 | 0...127                     | 0(00)   |
| 45 | 1 | 00...7F | Step Seq Ctrl Change Value 16 | 0...127                     | 0(00)   |

TOTAL SIZE 46

mm = 00 - 7F : User Pattern 1 - User Pattern

| Function...  | Transmitted  | Recognized  | Remarks  |
|--|--|---|--|
| Basic Channel<br>Default Changed   | 1 - 16<br>1 - 16   | 1 - 16<br>1 - 16  | Memorizd   |
| Mode Messages<br>Default Altered   | 3<br>X<br>* * * * *  | 3 - 4(m=1) *1<br>3 - 4(m=1)<br>X                              | Memorizd   |
| Note Number<br>: True voice  | 0 - 127<br>* * * * *   | 0 - 127<br>0 - 127  | Transpose  |
| Velocity<br>Note on<br>Note off  | ○ 9nH,v=1-127<br>X 9nH,v=0   | ○ v=1-127<br>○  |  |
| After Touch<br>Key's<br>Ch's   | X<br>○   | X<br>○  |  |
| Pitch Bend   | ○  | ○ 0-24 semi   |  |
| Control Change   | 0,32 X<br>1,4,7,12,13,64 ○<br>5,10,11,65 X<br>6,38 X<br>66,67,84 X<br>71-74 ○<br>0-95 ○<br>91,93,94 X<br>96-97 X<br>98-99 X<br>100-101 X<br>120 X<br>121 X | X<br>○<br>○<br>○<br>X<br>○<br>○<br>○<br>○<br>X<br>○<br>○<br>○ | Bank Select<br><br>Data Entry<br><br>Sound Controller<br>Assignable Control<br>Effect Send Level<br>Data Inc, Dec<br>NRPN LSB,MSB<br>RPN LSB,MSB<br>All Sounds Off<br>Reset All Controls |
| Program Change<br>: True number  | ○ 0 - 127<br>* * * * *   | ○ 0 - 127<br>0 - 127  |  |
| System Exclusive   | ○  | ○   |  |
| System Common<br>: Song Position<br>: Song Select<br>: Tune                    | X<br>X<br>X  | X<br>X<br>X   |  |
| System Real Time<br>: Clock<br>: Commands                                      | X<br>X   | ○<br>○  |  |
| Aux Messages<br>: Local On/Off<br>: All Notes Off<br>: Active Sense<br>: Reset | X<br>X<br>○<br>X   | X<br>○ ( 123 - 127 )<br>○<br>X                                |  |

Notes : \*1: m is always treated as "1" regardless of its value.

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