GS DAUGHTER BOARD
SCB-55
Owner's Manual

We'd like to take a moment to thank you for purchasing the SCB-55 GS Daughter Board. The SCB-55 is a daughterboard containing high-quality sounds compatible with the GM (General MIDI) System and GS Format.

In order to gain a thorough understanding of the SCB-55's many features, please take the time to read this manual carefully.

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FEATURES

Easy Installation

All you need to do is to mount the SCB-55 onto a sound card compatible with Sound Blaster, and you can enjoy high-quality sounds with music or game software.

16-part Multi-Timbral Sound Generator

The SCB-55 is a 16-part multi-timbral (including the drum part) sound generator. It can play up to 28 notes simultaneously, making possible ensembles of up to 16 parts.

Reverb and Chorus Effects

The onboard reverb enhances expressiveness by adding an expansive feeling, while chorus can be used to add fullness to the sound for majestic ensembles. These digital effects let you create music with virtually the same fidelity and acoustics as a concert hall.

Compatible with GM (General MIDI) System Level 1 and GS Format

General MIDI and GS-compatible sound generators can play identical MIDI data with very similar voicings, despite differences in the actual sounds that each device can play.

IMPORTANT NOTES

[Placement]

• Do not subject the unit to temperature extremes (e.g. direct sunlight in an enclosed vehicle). Avoid using or storing the unit in dusty or humid areas, or areas that are subject to high levels of vibration.
• Using the unit near power amplifiers (or other equipment containing large power transformers) may induce hum.
• This device may interfere with radio and television reception. Do not use this device in the vicinity of such receivers.

[Additional Precautions]

• Protect the unit from strong impact.
• Do not allow objects or liquids of any kind to penetrate the unit. In the event of such an occurrence, discontinue use immediately. Contact qualified service personnel as soon as possible.
• Should a malfunction occur, or if you suspect there is a problem, discontinue use immediately. Contact qualified service personnel as soon as possible.

GENERAL MIDI

General MIDI System

The General MIDI System is a set of recommendations which seek to provide a way for going beyond the limitations of proprietary designs, and standardize the MIDI capabilities provided by sound generating devices.
If you use a sound generating unit which carries the General MIDI logo, you will be able to faithfully reproduce any song data which also carries the General MIDI logo.

GS Format

The GS Format is Roland's universal set of specifications which were formulated in the interest of standardizing the way in which sound generating devices will operate when MIDI is used for the performance of music. If you use a sound generating unit which carries the GS logo, you will be able to faithfully reproduce any commercially available song data which also carries the GS logo.

This product supports both General MIDI and GS.
Song data which carries either of these logos can be accurately reproduced.

1. INSTALLING THE SCB-55

Compatible Sound Cards
Roland MPU-401AT
Any sound card with a Wave Blaster-compatible connector

1. Turn off your computer and all peripheral devices (such as printers and monitors connected to it) and unplug the power cable.

2. Remove the computer's cover. For more information, see the owner's manual for your computer.

3. Remove your sound card from the expansion slot of your computer.

4. Connect the Extension Connector (your sound card may call it "the MIDI Connector") of the SCB-55 to your sound card as shown below.
    Be sure to properly and securely attach the SCB-55.

SCB-55
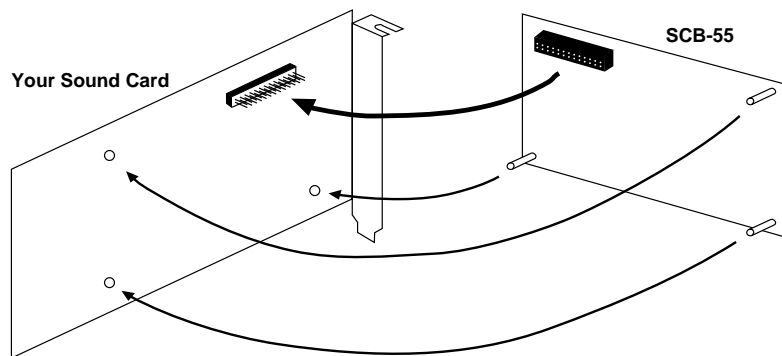
Your Sound Card

*   *Do not touch the printed circuit and terminals.*

*   *If a plastic spacer touches parts on your sound card (e.g. an IC socket), remove the unnecessary plastic spacer from the SCB-55.*

5. Install the sound card in your computer.

6. Replace the computer's cover.

2. THE GENERAL MIDI SYSTEM AND GS FORMAT

General MIDI System

The General MIDI System is a universal set of specifications for sound generating devices. These specifications seek to allow for the creation of music data which is not limited to equipment by a particular manufacturer or to specific models.
The General MIDI System defines things such as the minimum number of voices that should be supported, the MIDI messages that should be recognized, which sounds correspond to which Program Change numbers, and the layout of rhythm sounds on the keyboard. Thanks to these specifications, any device that is equipped with sound sources supporting the General MIDI System will be able to accurately reproduce General MIDI Scores (music data created for the General MIDI System), regardless of the manufacturer or model.

GS Format

The GS Format is a standardized set of specifications for Roland's sound generators which defines the manner in which multi-timbral sound generating units will respond to MIDI messages. The GS Format also complies with the General MIDI System.
The GS Format also defines a number of other details. These include unique specifications for sounds and the functions available for Tone editing and effects (chorus and reverb), and other specifications concerning the manner in which sound sources will respond to MIDI messages.
Any device that is equipped with GS Format sound sources can faithfully reproduce GS Music Data (music data created under the GS Format).

This product supports both General MIDI and GS.
Song data which carries either of these logos can be accurately reproduced.

3. STRUCTURE AND FUNCTION OF THE SCB-55

(1) Parts

The SCB-55 provides 16 Parts, and thus allows for a maximum of 16 different performance parts to be played at the same time. Part 10 is for playing percussive instrument.

A Part is something like an orchestral part; think of it as a group of musicians all playing a particular instrument. The big difference compared with a regular orchestra is that you are completely free to decide what kind of instrument they will be playing. In addition, you can change that instrument midway through a song (as many times as you want) for every different part. You could think of this group as being made up of incredible multi-instrumentalists who can play any instrument you give them.

There are many different kinds of performance data in MIDI, but probably the most basic is the note message determining which key to play, how hard, for how long, and when to start. Every part has its own MIDI channel over which it receives performance data and, unless you reset it for some reason, the channel number is the same as the part number.

Each part plays by following the instructions in the performance data on its own channel, and pays no attention to the data on other channels intended for other parts. So thanks to this MIDI channel scheme, you can play each Part completely independently of the others, like on a multitrack recorder.

As to MIDI, refer to "ABOUT MIDI." (p. 8)

(2) Voices and Polyphony

The SCB-55 contains 28 internal components (Voices), each of which is capable of generating sound. All 28 Voices can operate simultaneously. However, some sounds require 2 Voices to produce one note. For this reason, the number of notes actually available can be 28 or less. For example, if every sound you are using consists of 2 Voices, the maximum number of notes you could play at once would be 14.

To determine how many Voices the SCB-55 is using, add up the number of Voices used by all the Parts. Note that it is possible to have all 28 Voices working to produce the sound of only one Part.

For information on the number of Voices used by particular sounds, refer to the "TONE TABLE" (p. 14).

(3) Maximum Polyphony

When the number of Voices being used exceeds 28, some of the notes that should be played could be cut. To avoid 'loosing' important notes, there are two features you can use to insure that a particular Part has all the notes it is supposed to. The settings for the parameters which control these features are made using Exclusive messages (p. 26).

Part Priority

When the SCB-55 receives performance data which request it to produce more than the 28 Voices available, priority is given to producing the most recently received note messages. Those that have been sounding for a while will be cut, in order, starting with the oldest ones, and the ones that are assigned to the Parts with the lowest priority.

Part Priority Ordering:

10 > 1 > 2 > 3 > 4 > 5 > 6 > 7 > 8 > 9 > 11 > 12 > 13 > 14 > 15 > 16

For this reason, consider a Part's importance (bass, chords, melody etc.) carefully when assigning it to a Part on the SCB-55.

Voice Reserve

The Voice Reserve function allows you to specify a minimum number of Voices that will always be reserved and made available for certain Parts. This becomes effective in instances when the total number of Voices that have been requested exceeds the capacity of the unit.
When shipped, the following settings were made for Voice Reserve:

Part 1:	6
Parts 2-10:	2
Parts 11-16:	0

As Voice Reserve for Part 1 is set to "6," Part 1 will always have at least 6 Voices—even when all Parts combined are requesting more than 28 Voices. In other words, with Part 1 set this way, all the notes that it should play will be played faithfully (as long as the sounds assigned to it do not use more than 6 Voices).

(4) How to Change Tones
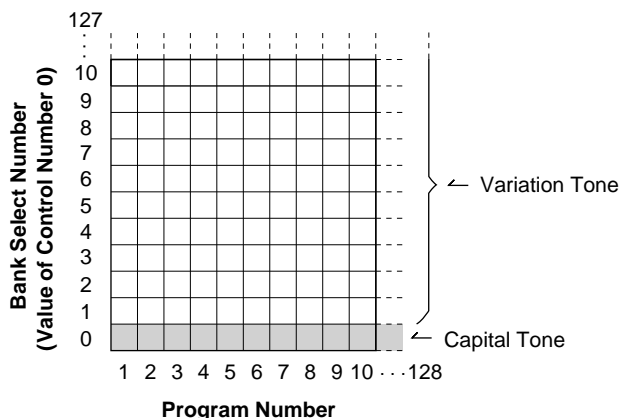
The SCB-55 has 128 basic sounds ("Capital Tones") that you can select using Program Change messages. Each Capital Tone also has "Variations," selectable using Bank Select messages.

* *There are some Variations that do not have a sound assigned to them. Check the TONE TABLE (p. 14) to make sure there is in fact a Tone at the location you are selecting with a Bank Select message (or else you will get no sound at all).*

* *The arrangement of the Capital Tones is the same as that for the 128 types of sounds in the General MIDI System.*

(5) Chorus and Reverb

Every Part in the SCB-55 can have chorus and reverb effects added to it, and the depth of effects can be controlled in real time using Control Change messages.

(6) Changing Between Drum Sets

Part 10 is exclusively for percussion, using the Drum Set sounds. Drum Set sounds differ from regular sounds in that a different instrument is assigned to each key. Say you have a violin Tone selected: no matter what key you press, you get a violin sound. It may be a different pitch but it's still a violin sound. However, in a Drum Set, one key plays the kick, one plays the snare, one the hi-hat, and so on. Percussion instruments don't generally carry the melody and don't need the pitch range of a violin, so we can arrange them one-per-key and handle them all in one channel.
Drum Sets can be switched using Program Change messages.
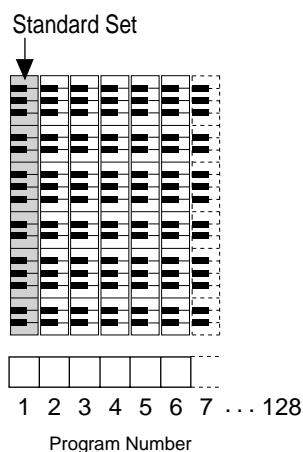
* *Although Program Numbers range from 1 to 128, there are nowhere near that many different Drum Sets on the SCB-55. If you try to select a Drum Set that doesn't exist, you'll get no sound when you try to play. Check the DRUM SET TABLE (p. 19) to make sure that the Program Change message you are sending corresponds to an actual Drum Set.*

* *The percussion instruments for Note Numbers 35-81 in the Standard Set (Program Number 1) all have the same key assignments as the 47 percussion instrument types in the General MIDI System.*

4. ABOUT MIDI

MIDI stands for Musical Instrument Digital Interface. MIDI is a world-wide standard that allows musical instruments and computers to exchange musical data. Most electronic musical instruments sold today are MIDI compatible. MIDI compatible devices have MIDI connectors which are used to physically link instruments (using special cables). MIDI does not transmit the sound of an instrument, but rather 'messages' in digital form that tell the receiving instrument to "do something." These are known as MIDI messages.

(1) MIDI Message Exchange

How the exchange of MIDI messages is carried out is explained in the following.

MIDI Connectors

In carrying out the exchange of MIDI messages, three connectors are used. MIDI cables are connected to these connectors in various ways depending on the desired result:
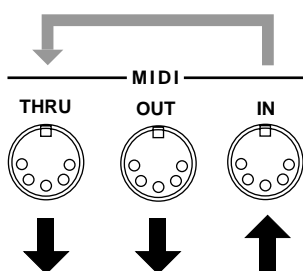
MIDI IN connector:
This connector receives incoming MIDI messages.

MIDI OUT connector:
This connector transmits outgoing MIDI messages to other devices.

MIDI THRU connector:
MIDI messages received at MIDI IN are re-transmitted by the MIDI THRU connector. (This connector does not transmit messages that originate inside the unit itself.)

MIDI Channels and Multi-Timbral Capabilities

With MIDI, a single cable can be used for carrying differing sets of performance information, for a number of MIDI devices. This is possible thanks to the concept of MIDI channels. MIDI channels are easy to understand if we use the analogy of television broadcasting.

Many television programs are broadcast from many TV stations and your TV antenna receives them all. By setting your television to a specific channel, you can watch only the desired program. The same idea applies to MIDI channels. The master device is somewhat like the broadcast station, and the slave device is like a television receiver. The MIDI messages carried by the MIDI cable are like the programs that are transmitted from the broadcast stations.

On a TV, the channel is selected to watch the station you want.
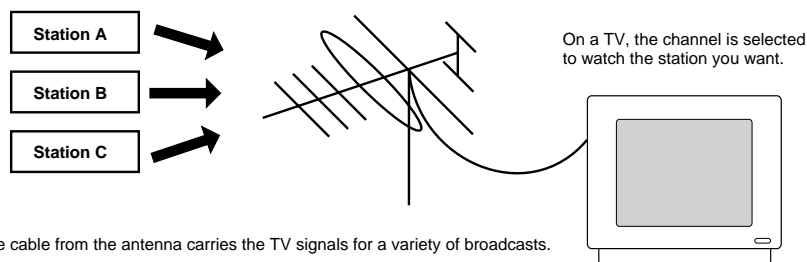
The cable from the antenna carries the TV signals for a variety of broadcasts.

MIDI provides sixteen channels (1—16). When the channel which the sending device (the master) is using to transmit on matches the channel which the receiving device (the slave) is using to receive on, the performance data is conveyed. When the MIDI channels are set as illustrated below and you play the keyboard, sound will be produced only by sound module B. Sound module A will not sound. This is because only sound module B is set to receive on the same channel that the keyboard is using to transmit on. Sound module A's channel doesn't match, so it won't sound.
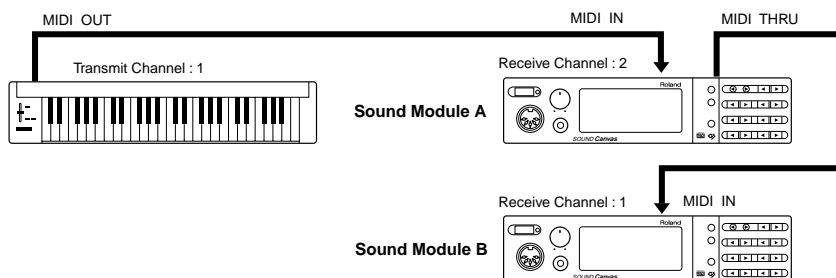
The SCB-55 is capable of simultaneously recognizing the MIDI messages on all 16 channels. In other words, it is capable of playing 16 different Parts at the same time. Of these, the Part which is set to receive on MIDI channel 10 is known as the Drum Part. This Part provides a collection of percussive instrument sounds, with a different sound for each Note Number (p. 19). The other Parts, those having a MIDI receive channel from 1-9 or 11-16, are known as Standard Parts, and are used for melody or bass, chords, etc. Sound modules such as the SCB-55 are multi-timbral, which means they can simultaneously receive data on a multiple number of MIDI channels, and can play the musical data for a number of Parts simultaneously.

(2) MIDI Messages Handled by the SCB-55

Various types of MIDI messages are used to convey a musical performance.

Channel messages are used to convey musical actions, such as "how hard a key was struck" (converted into a data format called a MIDI message). The action the device takes (how to produce the sound, etc.) when each MIDI message is received will depend on the specifications of the device. If the function requested by a message is not included in the device, the desired effect may not be achieved.

*   *MIDI messages required for responding to General MIDI System Level 1 specifications are marked with a ☆.*

Note Messages   ☆

These messages convey what is played on a keyboard or other instrument. The types of Note messages are as follows:

Note Number:	A number representing the position of a key on a keyboard.
Note On:	Indicates that a key has been pressed.
Note Off:	Indicates that a key has been released.
Note On Velocity:	The strength with which a key has been pressed.

Note Numbers range from 0—127 and correspond with the positions of keys on a keyboard. Middle C (C4) is number 60. In the Drum Part, a different percussive instrument sound is assigned to each Note Number.

Pitch Bend Change   ☆

This message conveys the operation of the bender lever (or pitch bend wheel) that is found on many synthesizers. The pitch will change when this message is received.

Bank Select (Controller Number: 0, 32)
Program Change Messages ☆

These messages are generally used to change tones. The tones are selected with Program Numbers 1 to 128. In the SCB-55, the Tone can be changed using Program Change messages. If a Bank Select (Control Change message) is used with a Program Change, more Variations can be selected.

Control Change Messages

These messages control the modulation and pan, etc. Each function is classified with a Control Change number.

•Modulation (Controller Number: 1) ☆

A vibrato effect is applied when this message is received.

•Volume (Controller Number: 7) ☆

This message conveys the volume level of the part. The part's volume will change when this message is received.

•Expression (Controller Number: 11) ☆

This message conveys the change in volume. This is used to lower or raise the volume during a song.

*   *The part volume will change with either the volume message (Controller Number: 7) or expression message (Controller Number: 11). Note that if a 0 value is received with either of the messages, the part volume will be 0, and the part's volume will not increase even with the other message.*

•Panpot (Controller Number: 10) ☆

This message provides adjustment for the sound location in the stereo field (L/R). Effective only when a stereo output is used.

Orientation	Left ——————— Center ——————— Right		
Pan	0	64	127

•Hold 1 (Controller Number: 64) ☆

This message conveys the pressing and releasing of the damper (sustain) pedal. Notes will be held when 'hold on' is received. Sounds which decay naturally (such as pianos) will decay more slowly when 'hold on' is received. Sustaining sounds (such as organs) will be held until 'hold off' is received.

•Sostenuto (Controller Number: 66)

The pedal that sustains notes only when it is stepped on is called the sostenuto pedal. This message conveys the action of pressing and releasing this pedal. When 'sostenuto on' is received, only notes played at the same time will be sustained. Sounds which decay naturally (such as pianos) will decay more slowly when 'sostenuto on' is received. Sustaining sounds (such as organs) will be held until 'sostenuto off' is received.

•Soft (Controller Number: 67)

The pedal that softens the sound of notes played is called the soft pedal. This message conveys the action of pressing and releasing this pedal. When 'soft on' is received, the cut off frequency is lowered, and a soft sound is achieved. When 'sostenuto off' is received, the original sound is restored.

- **Reverb Send Level (Controller Number: 91)**

   This message applies 'reverb' to a Part.

- **Chorus Send Level (Controller Number: 93)**

   This message applies 'chorus' to a Part.

- **Portamento   (Controller Number: 65)**
- **Portamento Time   (Controller Number: 5)**
- **Portamento Control (Controller Number: 84)**

   The portamento function smoothly changes the pitch from the last key pressed to the key currently being pressed. When portamento is received, the portamento effect is turned on or off. The speed of the pitch change is set with the portamento time. When portamento control is received, the Source Note number (key pressed last) is specified.

- **RPN LSB, RPN MSB   (Controller Number: 100, 101)**   ☆
- **Data Entry   (Controller Number: 6, 38)**   ☆

   RPN (Registered Parameter Number) functions are defined within the MIDI standards and can be used with different devices.
   The parameter to be changed is specified with RPN MSB and RPN LSB, and the parameter value is set with the following data entry. The pitch bend sensitivity, master coarse tune and master fine tune values can be changed with RPN.

   * *The values changed with RPN will not be initialized even if the tone is changed with a Program Change, etc.*

- **NRPN LSB, MSB   (Controller Number: 98, 99)**
- **Data Entry   (Controller Number: 6, 38)**

   The device's characteristic variation parameters can be changed with the NRPN (Non-Registered Parameter Number). The parameter to be changed is specified in NRPN MSB and NRPN LSB, and the parameter value is set with the following data entry.
   Common NRPN are set in the GS Format, and the variation parameter can be changed using application software, etc., that is GS Format compatible. The vibrato, cut off frequency, resonance, and envelope values can be changed with NRPN.

* *The values changed with NRPN will not be initialized even if the tone is changed with a Program Change, etc.*

* *The specifications for NRPNs differ depending on the manufacturer. If an NRPN included in song data does not conform to the GS Format, the data will not be played as expected. To play song data from a different manufacturer, set the "NRPN Reception Switch" to OFF. When the SCB-55 receives a "GM System ON," it will automatically turn the "NRPN Reception Switch" off.*

Aftertouch Messages (Channel Pressure   ☆)

   Aftertouch refers to additional pressure put on a key after playing a note. The variation in aftertouch pressure can create changes in the sound produced. There are two types of aftertouch messages: Channel and Polyphonic. Channel aftertouch affects all note numbers on the same MIDI channel. Polyphonic aftertouch affects only individual keys (note numbers) that are pressed with relatively more force than others.

* *Notes will not be affected when an aftertouch message is received while at the factory settings. Turn aftertouch message reception on with an Exclusive message, and specify what function aftertouch will control.*

All Sounds Off

This message turns off all sounds which are currently playing. The sounds in the corresponding channel will be turned off.

All Notes Off ☆

This message turns all 'note on' messages to 'note off' messages. However, if hold 1 or sostenuto is turned on, the sound will not stop until these are turned off.

Reset All Controllers ☆

When this message is received, the controllers will be set as follows:

Pitch bend change	+/-0 (median)
Polyphonic key pressure	0 (min.)
Channel pressure	0 (min.)
Modulation	0 (min.)
Expression	127 (max.)
Hold 1	0 (off)
Portamento	0 (off)
Soft	0 (off)
Sostenuto	0 (off)
RPN	No number selected; no change in internal data
NRPN	No number selected; no change in internal data

* Parameter values set with RPN and NRPN will not change even if a Reset All Controllers is received.

Active Sensing Messages

These messages monitor the integrity of MIDI connections. When the MIDI IN connector receives Active Sensing messages, it will enter the 'Active Sensing' mode. If Active Sensing messages (or other MIDI messages) are not received at 420 millisecond intervals, the device will judge that a cable is disconnected or there is a damaged connection. All sounds will be cut off, and a Reset All Controllers message will be processed. Monitoring for Active Sensing messages is terminated.

System Exclusive Messages

Exclusive messages are used to control a characteristic operation of the device. Universal System Exclusive messages can be used for all devices - regardless of the manufacturer. General Exclusive messages, however cannot convey data between different models.

Roland's Exclusive messages have a unique manufacturer ID, device ID, and model ID so that the type of data can be determined.

•GM System On (Universal Non-Realtime System Exclusive) ☆

When the 'GM System On' message is received, the unit will be set to correspond with the General MIDI basic settings. Reception of NRPNs will no longer be allowed after a 'GM System On' has been received.
The 'GM System On' MIDI message is included at the beginning of song data that carries the GM logo. When the song data is played from the beginning, the device will be automatically initialized to the basic settings.

•GS Reset (GS Format Common System Exclusive)

When the 'GS Reset' message is received, all the GS basic settings are restored on the unit. When a GS reset is received, the NRPNs specified with the GS Format can be received.
The GS reset MIDI message is included at the beginning of song data that carries the GS logo. When the song data is played from the beginning, the device will automatically be initialized to the basic settings.

- **Master Volume (Universal Realtime System Exclusive)**

   This is a common universal Exclusive message for controlling the master volume of all parts.

- **Other Exclusive Messages**

   The SCB-55 responds to GS Universal System Exclusive messages (as specified by the GS Format) so its settings can be controlled by software or external controllers that also conform to the GS Format.

(3) Default Settings

Part Settings

MIDI Channel/Part	1-9, 11-16	10 (Drum Part)
Tone	Piano 1 (#1)	Standard Set
Part Volume	100	100
Pan	64	64
Reverb Send	40	40
Chorus Send	0	0
Bend Sens.	2	2

Overall Part Settings

Master Volume	Reverb			Chorus						Key Shift
	Type	Level	Time	Type	Level	Feedback	Delay	Rate	Depth	
127	Hall2	64	64	Chorus3	64	8	80	3	19	0

(4) About the MIDI Implementation Chart

MIDI has made it possible for a wide variety of devices to exchange information, but it is not always true that all types of MIDI messages can be exchanged between all types of devices. For example, if you use a synthesizer as a master device to control a digital piano, the pitch bender (the lever or wheel that modifies the pitch) of the synthesizer will have no effect on the sound of the piano.

The important thing to keep in mind when using MIDI is that the slave device must be able to 'understand' what the master is 'saying.' In other words, the MIDI messages must be common to both master and slave.

To help you quickly determine what types of MIDI messages can be exchanged between master and slave, the Operation Manual for every MIDI device includes a MIDI Implementation chart. By looking at this chart, you can quickly see what messages the device is able to transmit and receive. The left side of the chart lists the names of a variety of MIDI messages, and the Transmission and Reception columns use "o" and "x" marks to indicate whether or not each of these messages can be transmitted or received. This means that a specific MIDI message can be exchanged only if there is an "o" in both the Transmission column of the master and the Reception column of the slave device. MIDI implementation charts are standardized, so you can place the charts from two manuals side-by-side and see at a glance how the two devices will communicate.

A detailed explanation concerning the data format used for Exclusive messages, and the implementation of MIDI used on the SCB-55 can be found starting on page 21.

5. TONE TABLE

	PC#	CC0	Tone name	V			PC#	CC0	Tone name	V
Piano	1	0	Piano 1	1	Organ	20	0	Church Org.1	1
		8	Piano 1w	2			8	Church Org.2	2
		16	Piano 1d	1			16	Church Org.3	2
	2	0	Piano 2	1		21	0	Reed Organ	1
		8	Piano 2w	2		22	0	Accordion Fr	2
	3	0	Piano 3	1			8	Accordion It	2
		8	Piano 3w	2		23	0	Harmonica	1
	4	0	Honky-tonk	2		24	0	Bandoneon	2
		8	Honky-tonk w	2	Guitar	25	0	Nylon-str. Gt.	1
	5	0	E.Piano 1	1			8	Ukulele	1
		8	Detuned EP 1	2			16	Nylon Gt.0	2
		16	E.Piano 1v	2			32	Nylon Gt.2	1
		24	60's E.Piano	1		26	0	Steel-str. Gt.	1
	6	0	E.Piano 2	1			8	12-str. Gt.	2
		8	Detuned EP 2	2			16	Mandolin	1
		16	E.Piano 2v	2		27	0	Jazz Gt.	1
	7	0	Harpsichord	1			8	Hawaiian Gt.	1
		8	Coupled Hps.	2		28	0	Clean Gt.	1
		16	Harpsi.w	2			8	Chorus Gt.	2
		24	Harpsi.o	2		29	0	Muted Gt.	1
	8	0	Clav.	1			8	Funk Gt.	1
Chromatic Percussion	9	0	Celesta	1			16	Funk Gt.2	1
	10	0	Glockenspiel	1		30	0	Overdrive Gt.	1
	11	0	Music Box	1		31	0	Distortion Gt.	1
	12	0	Vibraphone	1			8	Feedback Gt.	2
		8	Vib.w	2		32	0	Gt. Harmonics	1
	13	0	Marimba	1			8	Gt. Feedback	1
		8	Marinba w	2	Bass	33	0	Acoustic Bs.	1
	14	0	Xylophone	1		34	0	Fingered Bs.	1
	15	0	Tubular-bell	1		35	0	Picked Bs.	1
		8	Church Bell	1		36	0	Fretless Bs.	1
		9	Carillon	1		37	0	Slap Bass 1	1
	16	0	Santur	1		38	0	Slap Bass 2	1
Organ	17	0	Organ 1	1		39	0	Synth Bass 1	1
		8	Detuned Or.1	2			1	Synth Bass 101	1
		16	60's Organ 1	1			8	Synth Bass 3	1
		32	Organ 4	2		40	0	Synth Bass 2	2
	18	0	Organ 2	1			8	Synth Bass 4	2
		8	Detuned Or.2	2			16	Rubber Bass	2
		32	Organ 5	2					
	19	0	Organ 3	2					

PC# : Program number
CC0 : Value of controller number 0 (Variation number)
V : Number of Voices

	PC#	CC0	Tone name	V
Strings / orchestra	41	0	Violin	1
		8	Slow Violin	1
	42	0	Viola	1
	43	0	Cello	1
	44	0	Contrabass	1
	45	0	Tremolo Str	1
	46	0	PizzicatoStr	1
	47	0	Harp	1
	48	0	Timpani	1
Ensemble	49	0	Strings	1
		8	Orchestra	2
	50	0	Slow Strings	1
	51	0	Syn. Strings1	1
		8	Syn. Strings3	2
	52	0	Syn. Strings2	2
	53	0	Choir Aahs	1
		32	Choir Aahs 2	1
	54	0	Voice Oohs	1
	55	0	SynVox	1
	56	0	OrchestraHit	2
Brass	57	0	Trumpet	1
	58	0	Trombone	1
		1	Trombone 2	2
	59	0	Tuba	1
	60	0	MutedTrumpet	1
	61	0	French Horn	2
		1	French Horn 2	2
	62	0	Brass 1	1
		8	Brass 2	2
	63	0	Synth Brass1	2
		8	Synth Brass3	2
		16	AnalogBrass1	2
	64	0	Synth Brass2	2
		8	Synth Brass4	1
		16	AnalogBrass2	2

	PC#	CC0	Tone name	V
Reed	65	0	Soprano Sax	1
	66	0	Alto Sax	1
	67	0	Tenor Sax	1
	68	0	Baritone Sax	1
	69	0	Oboe	1
	70	0	English Horn	1
	71	0	Bassoon	1
	72	0	Clarinet	1
Pipe	73	0	Piccolo	1
	74	0	Flute	1
	75	0	Recorder	1
	76	0	Pan Flute	1
	77	0	Bottle Blow	2
	78	0	Shakuhachi	2
	79	0	Whistle	1
	80	0	Ocarina	1
Synth lead	81	0	Square Wave	2
		1	Square	1
		8	Sine Wave	1
	82	0	Saw Wave	2
		1	Saw	1
		8	Doctor Solo	2
	83	0	Syn. Calliope	2
	84	0	Chiffer Lead	2
	85	0	Charang	2
	86	0	Solo Vox	2
	87	0	5th Saw Wave	2
	88	0	Bass & Lead	2
Synth pad etc.	89	0	Fantasia	2
	90	0	Warm Pad	1
	91	0	Polysynth	2
	92	0	Space Voice	1
	93	0	Bowed Glass	2
	94	0	Metal Pad	2
	95	0	Halo Pad	2
	96	0	Sweep Pad	1

PC# : Program number
CC0 : Value of controller number 0 (Variation number)
V : Number of Voices

	PC#	CC0	Tone name	V
Synth SFX	97	0	Ice Rain	2
	98	0	Soundtrack	2
	99	0	Crystal	2
		1	Syn Mallet	1
	100	0	Atmosphere	2
	101	0	Brightness	2
	102	0	Goblin	2
	103	0	Echo Drops	1
		1	Echo Bell	2
		2	Echo Pan	2
	104	0	Star Theme	2
Ethnic	105	0	Sitar	1
		1	Sitar 2	2
	106	0	Banjo	1
	107	0	Shamisen	1
	108	0	Koto	1
		8	Taisho Koto	2
	109	0	Kalimba	1
	110	0	Bag Pipe	1
	111	0	Fiddle	1
	112	0	Shanai	1
Percussive	113	0	Tinkle Bell	1
	114	0	Agogo	1
	115	0	Steel Drums	1
	116	0	Woodblook *	1
		8	Castanets *	1
	117	0	Taiko *	1
		8	Concert BD *	1
	118	0	Melo. Tom 1 *	1
		8	Melo. Tom 2 *	1
	119	0	Synth Drum *	1
		8	808 Tom *	1
		9	Elec Perc *	1
	120	0	Reverse Cym. *	1

PC# : Program number
CC0 : Value of controller number 0 (Variation number)
V   : Number of Voices
*   : All tones marked by an * have an unreliable pitch.
       Please use a key around C4 (Note number 60).
       The unmarked tones use temperament and pitch
       of A4 (Note number 69) is tuned to be the same
       as the Master Tune.

	PC#	CC0	Tone name	V
SFX	121	0	Gt. FretNoise *	1
		1	Gt. Cut Noise *	1
		2	String Slap *	1
	122	0	Breath Noise *	1
		1	Fl. Key Click *	1
	123	0	Seashore *	1
		1	Rain *	1
		2	Thunder *	1
		3	Wind *	1
		4	Stream *	2
		5	Bubble *	2
	124	0	Bird *	2
		1	Dog *	1
		2	Horse-Gallop *	1
		3	Bird 2 *	1
	125	0	Telephone 1 *	1
		1	Telephone 2 *	1
		2	Door Creaking *	1
		3	Door *	1
		4	Scratch *	1
		5	Windchime *	2
	126	0	Helicopter *	1
		1	Car-Engine *	1
		2	Car-Stop *	1
		3	Car-Pass *	1
		4	Car-Crash *	2
		5	Siren *	1
		6	Train *	1
		7	Jetplane *	2
		8	Starship *	2
		9	Burst Noise *	2
	127	0	Applause *	2
		1	Laughing *	1
		2	Screaming *	1
		3	Punch *	1
		4	Heart Beat *	1
		5	Footsteps *	1
	128	0	Gun Shot *	1
		1	Machine Gun *	1
		2	Lasergun *	1
		3	Explosion *	2

CM-32P set (Variation : 126)

PC#	Tone name	V		PC#	Tone name	V
1	A. Piano 1	1		33	Choir 4	1
2	A. Piano 2	1		34	Strings 1	1
3	A. Piano 3	1		35	Strings 2	1
4	A. Piano 4	2		36	Strings 3	2
5	A. Piano 5	1		37	Strings 4	2
6	A. Piano 7	1		38	E. Organ 2	1
7	A. Piano 9	1		39	E. Organ 4	1
8	E. Piano 1	1		40	E. Organ 6	1
9	E. Piano 3	2		41	E. Organ 8	1
10	E. Piano 5	1		42	E. Organ 9	1
11	A. Guitar 1	1		43	E. Organ 10	1
12	A. Guitar 3	1		44	E. Organ 11	1
13	A. Guitar 4	2		45	E. Organ 12	1
14	E. Guitar 1	1		46	E. Organ 13	1
15	E. Guitar 2	1		47	Soft TP 1	1
16	Slap 3	1		48	Soft TP 3	1
17	Slap 4	1		49	TP/TRB 1	1
18	Slap 5	1		50	TP/TRB 2	1
19	Slap 6	1		51	TP/TRB 3	1
20	Slap 9	1		52	TP/TRB 4	1
21	Slap 10	1		53	TP/TRB 5	1
22	Slap 11	1		54	TP/TRB 6	1
23	Slap 12	1		55	Sax 1	1
24	Fingered 1	1		56	Sax 2	1
25	Fingered 2	1		57	Sax 3	1
26	Picked 1	1		58	Sax 5	1
27	Picked 2	1		59	Brass 1	1
28	Fretless 1	1		60	Brass 2	1
29	AC. Bass 1	1		61	Brass 3	2
30	Choir 1	1		62	Brass 4	2
31	Choir 2	1		63	Brass 5	1
32	Choir 3	1		64	Orche Hit	2

PC# : Program number
V   : Number of Voices

* *Variation 126 is set to the same sound arrangement of the CM-32P (Roland PCM Sound Module). The setting of the pitch bend range, modulation depth, etc. are however different from that of CM-32P. Pan directions are reversed from an actual CM-32P, so to rectify this situation, reverse the L/R connections of the Audio Output jacks.*

* *If Exclusive messages of the CM-32P are received by the SCB-55, the settings of the latter will not be changed.*

MT-32 set (Variation : 127)

PC#	Tone name	V	PC#	Tone name	V	PC#	Tone name	V	PC#	Tone name	V
1	Acou Piano 1	1	33	Fantasy	2	65	Acou Bass 1	1	97	Brs Sect 2	2
2	Acou Piano 2	1	34	Harmo Pan	2	66	Acou Bass 2	1	98	Vibe 1	1
3	Acou Piano 3	1	35	Chorale	1	67	Elec Bass 1	1	99	Vibe 2	1
4	Elec Piano 1	1	36	Glasses	2	68	Elec Bass 2	1	100	Syn Mallet	1
5	Elec Piano 2	1	37	Soundtrack	2	69	Slap Bass 1	1	101	Windbell	2
6	Elec Piano 3	1	38	Atmosphere	2	70	Slap Bass 2	1	102	Glock	1
7	Elec Piano 4	1	39	Warm Bell	2	71	Fretless 1	1	103	Tube Bell	1
8	Honkytonk	2	40	Funny Vox	1	72	Fretless 2	1	104	Xylophone	1
9	Elec Org 1	1	41	Echo Bell	2	73	Flute 1	1	105	Marimba	1
10	Elec Org 2	2	42	Ice Rain	2	74	Flute 2	1	106	Koto	1
11	Elec Org 3	1	43	Oboe 2001	2	75	Piccolo 1	1	107	Sho	2
12	Elec Org 4	1	44	Echo Pan	2	76	Piccolo 2	2	108	Shakuhachi	2
13	Pipe Org 1	2	45	Doctor Solo	2	77	Recorder	1	109	Whistle 1	2
14	Pipe Org 2	2	46	School Daze	1	78	Pan Pipes	1	110	Whistle 2	1
15	Pipe Org 3	2	47	Bellsinger	1	79	Sax 1	1	111	Bottleblow	2
16	Accordion	2	48	Square Wave	2	80	Sax 2	1	112	Breathpipe	1
17	Harpsi 1	1	49	Str Sect 1	1	81	Sax 3	1	113	Timpani	1
18	Harpsi 2	2	50	Str Sect 2	1	82	Sax 4	1	114	Melodic Tom	1
19	Harpsi 3	1	51	Str Sect 3	1	83	Clarinet 1	1	115	Deep Snare	1
20	Clavi 1	1	52	Pizzicato	1	84	Clarinet 2	1	116	Elec Perc 1	1
21	Clavi 2	1	53	Violin 1	1	85	Oboe	1	117	Elec Perc 2	1
22	Clavi 3	1	54	Violin 2	1	86	Engl Horn	1	118	Taiko	1
23	Celesta 1	1	55	Cello 1	1	87	Bassoon	1	119	Taiko Rim	1
24	Celesta 2	1	56	Cello 2	1	88	Harmonica	1	120	Cymbal	1
25	Syn Brass 1	2	57	Contrabass	1	89	Trumpet 1	1	121	Castanets	1
26	Syn Brass 2	2	58	Harp 1	1	90	Trumpet 2	1	122	Triangle	1
27	Syn Brass 3	2	59	Harp 2	1	91	Trombone 1	2	123	Orche Hit	1
28	Syn Brass 4	2	60	Guitar 1	1	92	Trombone 2	2	124	Telephone	1
29	Syn Bass 1	1	61	Guitar 2	1	93	Fr Horn 1	2	125	Bird Tweet	1
30	Syn Bass 2	2	62	Elec Gtr 1	1	94	Fr Horn 2	2	126	One Note Jam	1
31	Syn Bass 3	2	63	Elec Gtr 2	1	95	Tuba	1	127	Water Bell	2
32	Syn Bass 4	1	64	Sitar	2	96	Brs Sect 1	1	128	Jungle Tune	2

PC# : Program number

V   : Number of Voices

* *Variation 127 is set to the same sound arrangement of the MT-32 (Roland Multi-Timbral Sound Module). The setting of the pitch bend range, modulation depth, etc. are however different from that of MT-32. Pan directions are reversed from an actual MT-32, so to rectify this situation, reverse the L/R connections of the Audio Output jacks.*

* *If Exclusive messages of the MT-32 are received by the SCB-55, the settings of the latter will not be changed.*

6. DRUM SET TABLE

Note Number	PC#1: STANDARD Set (61 tones)	PC#9: ROOM Set (61 tones)	PC#17: POWER Set (61 tones)	PC#25: ELECTRONIC Set (61 tones)	PC#26: TR-808 Set (61 tones)	PC#33: JAZZ Set (61 tones)	PC#41: BRUSH Set (61 tones)	PC#49: ORCHESTRA Set (62 tones)
27	High Q							Closed HH [E1]
28	Slap							Pedal HH [E1]
29	Scratch Push [E7]							Open HH [E1]
30	Scratch Pull [E7]							Ride Cymbal
31	Sticks							
32	Square Click							
33	Metronome Click							
34	Metronome Bell							
35	Kick Drum 2					Jazz BD 2	JAZZ BD 2	Concert BD 2
36	Kick Drum 1		MONDO Kick	Elec BD	808 Bass Drum	Jazz BD 1	JAZZ BD 1	Concert BD 1
37	Side Stick				808 Rim Shot			
38	Snare Drum 1		Gated SD	Elec SD	808 Snare Drum		Brush Tap	Concert SD
39	Hand Clap						Brush Slap	Castanets
40	Snare Drum 2			Gated SD			Brush Swirl	Concert SD
41	Low Tom 2	Room Low Tom 2	Room Low Tom 2	Elec Low Tom 2	808 Low Tom 2	Jazz Low Tom 2	Jazz Low Tom 2	Timpani F
42	Closed Hi-Hat [E1]				808 CHH [E1]			Timpani F#
43	Low Tom 1	Room Low Tom 1	Room Low Tom 1	Elec Low Tom 1	808 Low Tom 1	Jazz Low Tom 1	Jazz Low Tom 1	Timpani G
44	Pedal Hi-Hat [E1]				808 CHH [E1]			Timpani G#
45	Mid Tom 2	Room Mid Tom 2	Room Mid Tom 2	Elec Mid Tom 2	808 Mid Tom 2	Jazz Mid Tom 2	Jazz Mid Tom 2	Timpani A
46	Open Hi-Hat [E1]				808 OHH [E1]			Timpani A#
47	Mid Tom 1	Room Mid Tom 1	Room Mid Tom 1	Elec Mid Tom 1	808 Mid Tom 1	Jazz Mid Tom 1	Jazz Mid Tom 1	Timpani B
48	High Tom 2	Room Hi Tom 2	Room Hi Tom 2	Elec Hi Tom 2	808 Hi Tom 2	Jazz Hi Tom 2	Jazz Hi Tom 2	Timpani c
49	Crash Cymbal 1				808 Cymbal			Timpani c#
50	High Tom 1	Room Hi Tom 1	Room Hi Tom 1	Elec Hi Tom 1	808 Hi Tom 1	Jazz Hi Tom 1	Jazz Hi Tom 1	Timpani d
51	Ride Cymbal 1							Timpani d#
52	Chinese Cymbal			Reverse Cymbal				Timpani e
53	Ride Bell							Timpani f
54	Tambourine							
55	Splash Cymbal							
56	Cowbell				808 Cowbell			
57	Crash Cymbal 2							Concert Cymbal2
58	Vibra-slap							
59	Ride Cymbal 2							Concert Cymbal1
60	High Bongo							
61	Low Bongo							
62	Mute High Conga				808 Hi Conga			
63	Open High Conga				808 Mid Conga			
64	Low Conga				808 Low Conga			
65	High Timbale							
66	Low Timbale							
67	High Agogo							
68	Low Agogo							
69	Cabasa							
70	Maracas				808 Maracas			
71	Short Hi Whistle [E2]							
72	Long Low Whistle [E2]							
73	Short Guiro [E3]							
74	Long Guiro [E3]							
75	Claves				808 Claves			
76	High Wood Block							
77	Low Wood Block							
78	Mute Cuica [E4]							
79	Open Cuica [E4]							
80	Mute Triangle [E5]							
81	Open Triangle [E5]							
82	Shaker							
83	Jingle Bell							
84	Belltree							
85	Castanets							
86	Mute Surdo [E6]							
87	Open Surdo [E6]							
88	– – – – –	– – – – –	– – – – –	– – – – –	– – – – –	– – – – –	– – – – –	Applause *

PC#   : Program number
*   : Tones which are created by using two Voices. (All other tones are created by one Voice.)

Blank   : Same as the percussion sound of "STANDARD"
- - - - -   : No Sound
[E#]   : Percussion sound of the same number will not be heard at the same time.

SFX set (Program number: 57)

Note Number	PC#57:SFX Set (46 tones)
39	High Q
40	Slap
41	Scratch Push [E7]
42	Scratch Pull [E7]
43	Sticks
44	Square Click
45	Metronome Click
46	Metronome Bell
47	Guitar sliding finger
48	Guitar cutting noise (down)
49	Guitar cutting noise (up)
50	String slap of double bass
51	Flute Key click
52	Laughing
53	Screaming
54	Punch
55	Heartbeat
56	Footsteps 1
57	Footsteps 2
58	Applause *
59	Door Creaking
60	Door
61	Scratch
62	Windchime *
63	Car-Engine
64	Car-Stop
65	Car-Pass
66	Car-Crash *
67	Siren
68	Train
69	Jetplane *
70	Helicopter
71	Starship *
72	Gunshot
73	Machine Gun
74	Lasergun
75	Explosion *
76	Dog
77	Horse-Gallop
78	Birds *
79	Rain *
80	Thunder
81	Wind
82	Seashore
83	Stream *
84	Bubble *

(Octave markers: C3, C4, C5, C6)

* : Tones which are created by using two Voices. (All other tones are created by one Voice.)

– – – – – : No sound

[E#] : Percussion sounds of the same number cannot be heard at the same time.

* The CM-64/32L set is the MT-32 drum set with SFX sounds added to it.

CM-64/32L set (Program number: 128)

Note Number	PC#128:CM-64/32L Set (67 tones)
34	– – – – –
35	Acoustic Bass Drum
36	Acoustic Bass Drum
37	Rim Shot
38	Acoustic Snare Drum
39	Hand Clap
40	Electronic Snare Drum
41	Acoustic Low Tom
42	Closed High Hat [E1]
43	Acoustic Low Tom
44	Open High Hat 2
45	Acoustic Middle Tom
46	Open High Hat 1 [E1]
47	Acoustic Middle Tom
48	Acoustic High Tom
49	Crash Cymbal
50	Acoustic High Tom
51	Ride Cymbal
52	– – – – –
53	– – – – –
54	Tambourine
55	– – – – –
56	Cowbell
57	– – – – –
58	– – – – –
59	– – – – –
60	High Bongo
61	Low Bongo
62	Mute High Conga
63	High Conga
64	Low Conga
65	High Timbale
66	Low Timbale
67	High Agogo
68	Low Agogo
69	Cabasa
70	Maracas
71	Short Whistle
72	Long Whistle
73	Quijada
74	– – – – –
75	Claves
76	Laughing
77	Screaming
78	Punch
79	Heartbeat
80	Footsteps 1
81	Footsteps 2
82	Applause *
83	Creaking
84	Door
85	Scratch
86	Windchime *
87	Engine
88	Car-stop
89	Car-pass
90	Crash *
91	Siren
92	Train
93	Jet *
94	Helicopter
95	Starship *
96	Pistol
97	Machinegun
98	Lasergun
99	Explosion *
100	Dog
101	Horse
102	Birds *
103	Rain *
104	Thunder
105	Wind
106	Waves
107	Stream *
108	Bubble *

(Octave markers: C2, C3, C4, C5, C6, C7, C8)

MIDI IMPLEMENTATION

1. RECEIVE DATA

* MIDI messages required for responding to General MIDI System Level 1 specifications are marked with a ☆.

[Channel Voice Messages]

<1> NOTE OFF   ☆

Status	Second	Third
8nH	kkH	vvH
9nH	kkH	00H

n=MIDI channel number   : 0H - FH (ch.1 - ch.16)
kk=Note number   : 00H - 7FH (0 - 127)
vv=Velocity   : 00H - 7FH (0 - 127)

* In the drum part, recognized when "Rx.NOTE OFF = ON" for each instrument.
* Velocity is ignored.

<2> NOTE ON   ☆

Status	Second	Third
9nH	kkH	vvH

n=MIDI channel number   : 0H - FH (ch.1 - ch.16)
kk=Note number   : 00H - 7FH (0 - 127)
vv=Velocity   : 01H - 7FH (1 - 127)

* Ignored when "Rx.NOTE MESSAGE = OFF."
* In the drum part, ignored when "Rx.NOTE ON = OFF" for each instrument.

<3> POLYPHONIC KEY PRESSURE

Status	Second	Third
AnH	kkH	vvH

n=MIDI channel number   : 0H - FH (ch.1 - ch.16)
kk=Note number   : 00H - 7FH (0 - 127)
vv=Value   : 00H - 7FH (0 - 127)

* Ignored when "Rx.POLY PRESSURE (PAf) = OFF."
* Effect to the parameter set on System Exclusive Messages. The default setting has no effect.

<4> CONTROL CHANGE

* Ignores all control change messages (other than channel mode messages) when "Rx.CONTROL CHANGE = OFF."
* The values set by Control change messages won't be reset by receiving new Program change messages.

(1) Bank select   (Controller number 0, 32)

Status	Second	Third
BnH	00H	mmH
BnH	20H	llH

n=MIDI channel number   : 0H - FH (ch.1 - ch.16)
mm,ll=Bank number   : 00H,00H - 7FH,7FH (bank1 - bank16384)
    Default Value = 00 00H (bank.1)

* Ignored when "Rx.BANK SELECT = OFF."
"Rx.BANK SELECT" is set to OFF by "Turn General MIDI System On," and set to ON by "GS RESET." (Power-on default value is ON.)
* The LSB 7-bits are ignored (always regards as llH=00H) in this Model. However, when sending Bank Select messages, you have to send both the MSB (mm) and LSB (ll) together.
* "Bank select" is suspended until receiving "Program change." To select a Tone of another bank, you have to send a Bank select (mm,ll) before sending the Program change.
* The "Variation number" of GS Format is defined as the decimal expression of the MSB value (Control change number 00H) of the Bank select.

(2) Modulation   (Controller number 1)   ☆

Status	Second	Third
BnH	01H	vvH

n=MIDI channel number   : 0H - FH (ch.1 - ch.16)
vv=Modulation depth   : 00H - 7FH (0 - 127)

* Ignored when "Rx.MODULATION = OFF."
* Effect to the parameter set on System Exclusive Messages. The default setting is pitch modulation depth.

(3) Portamento time (Controller number 5)

Status	Second	Third
BnH	05H	vvH

n=MIDI channel number   : 0H - FH (ch.1 - ch.16)
vv=Portamento time   : 00H - 7FH (0 - 127)
    Default Value = 00H (0)

* The Portamento time value changes the rate of pitch change when Portamento is ON or when using portamento control messages. Value 0 is the fastest.

(4) Data entry   (Controller number 6, 38)   ☆

Status	Second	Third
BnH	06H	mmH
BnH	26H	llH

n=MIDI channel number   : 0H - FH (ch.1 - ch.16)
mm,ll=Value of the parameter specified with RPN and/or NRPN

(5) Volume   (Controller number 7)   ☆

Status	Second	Third
BnH	07H	vvH

n=MIDI channel number   : 0H - FH (ch.1 - ch.16)
vv=Volume   : 00H - 7FH (0 - 127)
    Default Value = 64H (100)

* Volume messages control the volume level of the specified channel (part). Use Volume messages to control volume balance of each part.
* Ignored when "Rx.VOLUME = OFF."

(6) Panpot   (Controller number 10)   ☆

Status	Second	Third
BnH	0AH	vvH

n=MIDI channel number   : 0H - FH (ch.1 - ch.16)
vv=Panpot   : 00H - 40H - 7FH (Left - Center - Right)
    Default Value = 40H (64)

* 127 steps from Left to Center to Right.
* Within the Drum Part, the Panpot provides overall control of a stereophonic image.
* Ignored when "Rx.PANPOT = OFF."

(7) Expression   (Controller number 11)   ☆

Status	Second	Third
BnH	0BH	vvH

n=MIDI channel number   : 0H - FH (ch.1 - ch.16)
vv=Expression   : 00H - 7FH (0 - 127)
    Default Value = 7FH (127)

* Expression and Volume messages are cumulative, and the result will control the overall volume.
Use Expression messages for expression pedal, or creating expressive effects, such as crescendo, decrescendo, while playing.
* Ignored when "Rx.EXPRESSION = OFF."

(8) Hold1   (Controller number 64)   ☆

Status	Second	Third
BnH	40H	vvH

n=MIDI channel number   : 0H - FH (ch.1 - ch.16)
vv=Control Value   : 00H - 7FH (0 - 127)
                                  0 - 63 = OFF, 64 - 127 = ON

* Ignored when "Rx.HOLD1 = OFF."

(9) Portamento   (Controller number 65)

Status	Second	Third
BnH	41H	vvH

n=MIDI channel number   : 0H - FH (ch.1 - ch.16)
vv=Control Value   : 00H - 7FH (0 - 127)
                                  0 - 63 = OFF, 64 - 127 = ON

* Ignored when "Rx.PORTAMENTO = OFF."

(10) Sostenuto   (Controller number 66)

Status	Second	Third
BnH	42H	vvH

n=MIDI channel number   : 0H - FH (ch.1 - ch.16)
vv=Control Value   : 00H - 7FH (0 - 127)
                                  0 - 63 = OFF, 64 - 127 = ON

* Ignored when "Rx.SOSTENUTO = OFF."

(11) Soft   (Controller number 67)

Status	Second	Third
BnH	43H	vvH

n=MIDI channel number   : 0H - FH (ch.1 - ch.16)
vv=Control Value   : 00H - 7FH (0 - 127)

* Ignored when "Rx.SOFT = OFF."

(12) Portamento Control   (Controller number 84)

Status	Second	Third
BnH	54H	kkH

n=MIDI channel number   : 0H - FH (ch.1 - ch.16)
kk= source note number for pitch reference : 00H - 7FH (0 - 127)

* When a Note On message is received after a Portamento Control message,
the voice's pitch will glide from the pitch specified by the source note num-
ber of the Portamento Control message at the rate set by the portamento
time controller (regardless portamento on/off.)
If there is a currently sounding voice whose note number is coincident with
the source note number, the voice's pitch will glide to the new Note On's
pitch according to the portamento time without re-triggering (played in lega-
to). Then no new voice should be assigned.

Example 1.

On MIDI	Description	Result
90 3C 40	Note on C4	C4 on
B0 54 3C	Portamento Control from C4	no change
		(C4 voice still sounding)
90 40 40	Note on E4	glide from C4 to E4
80 3C 40	Note off C4	no change
80 40 40	Note off E4	E4 off

Example 2.

On MIDI	Description	Result
B0 54 3C	Portamento Control from C4	no change
90 40 40	Note on E4	E4 is played with glide
		from C4 to E4
80 40 40	Note off E4	E4 off

(13) Effect1 depth (Reverb send level)
(Controller number 91)

Status	Second	Third
BnH	5BH	vvH

n=MIDI channel number   : 0H - FH (ch.1 - ch.16)
vv=Reverb send level   : 00H - 7FH (0 - 127)
                               Default Value = 28H (40)

* Effect1 depth messages control the Send Level of the specified channel (part)
to the internal Reverb unit.

(14) Effect3 depth (Chorus send level)
(Controller number 93)

Status	Second	Third
BnH	5DH	vvH

n=MIDI channel number   : 0H - FH (ch.1 - ch.16)
vv=Chorus send level   : 00H - 7FH (0 - 127)
                               Default Value = 00H (0)

* Effect3 depth messages control the Send Level of the specified channel
(part) to the internal Chorus unit.

(15) NRPN MSB/LSB
(Controller number 98, 99)

Status	Second	Third
BnH	63H	mmH
BnH	62H	llH

n=MIDI channel number   : 0H - FH (ch.1 - ch.16)
mm=MSB of the NRPN
ll=LSB of the NRPN

* Recognized when "Rx.NRPN = ON."
"Rx.NRPN" is set to OFF by power-on reset or by receiving "Turn General
MIDI System On," and it is set to ON by "GS RESET."
* The values set by NRPN won't reset by receiving new Program Change
messages or Reset All Controllers.

NRPN
An NRPN (Non Registered Parameter Number) is an expanded control
change message.
Each function of an NRPN is described by the individual manufacturer.
To use NRPN, set NRPN number (MSB/LSB) before sending data. Then
send data by Data entry message (Controller number 6/38). And then, it is
recommended to send RPN null (RPN number = 7FH/7FH) to prevent the
data from being unexpectedly change.

SCB-55 recognizes the following RPN functions.

NRPN MSB LSB	Data entry MSB	Description
01H 08H	mmH	Vibrato rate relative change on specified channel mm: 0EH - 40H - 72H (-50 - 0 - +50)
01H 09H	mmH	Vibrato depth relative change on specified channel mm: 0EH - 40H - 72H (-50 - 0 - +50)
01H 0AH	mmH	Vibrato delay relative change on specified channel mm: 0EH - 40H - 72H (-50 - 0 - +50)
01H 20H	mmH	TVF cutoff frequency relative change on specified channel mm: 0EH - 40H - 72H (-50 - 0 - +50)
01H 21H	mmH	TVF resonance relative change on specified channel mm: 0EH - 40H - 72H (-50 - 0 - +50)
01H 63H	mmH	TVF&TVA Env. Attack time relative change on specified channel mm: 0EH - 40H - 72H (-50 - 0 - +50)
01H 64H	mmH	TVF&TVA Env. Decay time relative change on specified channel mm: 0EH - 40H - 72H (-50 - 0 - +50)
01H 66H	mmH	TVF&TVA Env. Release time relative change on specified channel mm: 0EH - 40H - 72H (-50 - 0 - +50)
18H rrH	mmH	Pitch coarse of drum instrument relative change on specified drum instrument rr: key number of drum instrument mm: 00H - 40H - 7FH (-64 - 0 - +63 semitone)
1AH rrH	mmH	TVA level of drum instrument absolute change on specified drum instrument rr: key number of drum instrument mm: 00H - 7FH (zero - maximum)
1CH rrH	mmH	Panpot of drum instrument absolute change on specified drum instrument rr: key number of drum instrument mm: 00H, 01H - 40H - 7FH (Random, Left-Center-Right)

1DH rrH	mmH	Reverb send level of drum instrument absolute change on specified drum instrument rr: key number of drum instrument mm: 00H - 7FH (zero - maximum)
1EH rrH	mmH	Chorus send level of drum instrument absolute change on specified drum instrument rr: key number of drum instrument mm: 00H - 7FH (zero - maximum)

* Data entry LSB is ignored.
* The relative change means that the parameter value (e.g. -50 - 0 - +50) will be added to the preset value.
* The absolute change means that the parameter value will be replaced by the received value.

(16) RPN MSB/LSB (Controller number 100, 101) ☆

Status	Second	Third
BnH	65H	mmH
BnH	64H	llH

n=MIDI channel number　　　 : 0H - FH (ch.1 - ch.16)
mm=MSB of the RPN
ll=MSB of the RPN

* Ignored when "Rx.RPN = OFF."
* The values set by an RPN won't be reset by receiving new Program Change messages or Reset All Controllers.

RPN
　An RPN (Registered Parameter Number) is an expanded control change message.
　Each function of an RPN is described by the MIDI Standard.
　To use an RPN, set the RPN number (MSB/LSB) before sending data.
　Then send data by Data entry message (Controller number 6/38).
　It is then recommended to send RPN null (RPN number = 7FH/7FH) to prevent the data from being unexpectedly change.

SCB-55 recognizes the following RPN functions.

RPN MSB LSB	Data entry MSB LSB	Description
00H 00H	mmH ---	Pitch bend sensitivity mm: 00H - 18H (0 - 24 semitone) Default value = 02H (two semitones) ll: ignored (value=00H) (Up to 2 octaves)
00H 01H	mmH llH	Master fine tuning mm,ll: 00 00H - 40 00H - 7F 7FH (-8192 x 100/8192 - 0 - +8191 x 100/8192 cents)
00H 02H	mmH ---	Master coarse tuning mm: 28H - 40H - 58H (-24 - 0 - +24 semitones) ll: ignored (value=00H)
7FH 7FH	--- ---	RPN null Return to disable condition. The parameter already set retains its value. mm, ll: ignored

<5> PROGRAM CHANGE ☆

Status	Second
CnH	ppH

n=MIDI channel number　　　 : 0H - FH (ch.1 - ch.16)
pp=Program number　　　　　 : 00H - 7FH (prog.1 - prog.128)

* Current active voices are not affected when receiving Program Change messages. New sounds will be played after receiving Program Change messages.
* Ignored when "Rx.PROGRAM CHANGE = OFF."
* In the drum part, Program change messages are ignored when the Bank is set at 129 - 16384 (i.e. the value of the control change number 0 is not 00H).

<6> CHANNEL PRESSURE ☆

Status	Second
DnH	vvH

n=MIDI channel number　　　 : 0H - FH (ch.1 - ch.16)
vv=Value　　　　　　　　　 : 00H - 7FH (0 - 127)

* Effect to the parameter set on System Exclusive Messages. The default setting has no effect.
* Ignored when "Rx.CH PRESSURE (CAf) = OFF."

<7> PITCH BEND CHANGE ☆

Status	Second	Third
EnH	llH	mmH

n=MIDI channel number　　　 : 0H - FH (ch.1 - ch.16)
mm,ll=Value　　　　　　　　 : 00 00H - 40 00H - 7F 7FH (-8192 - 0 - +8191)

* Effect to the parameter set on System Exclusive Messages. The default setting is pitch bend.
* Ignored when "Rx.PITCH BEND = OFF"

[Channel Mode Messages]

<1> ALL SOUNDS OFF (Controller number 120)

Status	Second	Third
BnH	78H	00H

n=MIDI channel number　　　 : 0H - FH (ch.1 - ch.16)

* When "All sounds off" is received, all sounds on a specified channel turn off immediately. However, the state of channel messages does not change. You must not use "All sounds off" message for "Note off."

<2> RESET ALL CONTROLLERS (Controller number 121) ☆

Status	Second	Third
BnH	79H	00H

n=MIDI channel number　　　 : 0H - FH (ch.1 - ch.16)

* When "Reset all controllers" is received, the controller value of a specified channel returns to the default values as follows.

Controller	Default Value
Pitch bend change	0 (Center)
Polyphonic key pressure	0 (off)
Channel pressure	0 (off)
Modulation	0 (off)
Expression	127 (maximum)
Hold1	0 (off)
Portamento	0 (off)
Sostenuto	0 (off)
Soft	0 (off)
RPN	disabled. The parameter already set retains its old value.
NRPN	disabled. The parameter already set retains its old value.

<3> ALL NOTES OFF (Controller number 123) ☆

Status	Second	Third
BnH	7BH	00H

n=MIDI channel number　　　 : 0H - FH (ch.1 - ch.16)

* When "All notes off" is received, all notes are turned off in the specified channel. However, sound continues while Hold1 or Sostenuto is on.

<4> OMNI OFF (Controller number 124)

Status	Second	Third
BnH	7CH	00H

n=MIDI channel number　　　 : 0H - FH (ch.1 - ch.16)

* OMNI OFF is only recognized as "All notes off"; the Mode doesn't change.

<5> OMNI ON (Controller number 125)

Status	Second	Third
BnH	7DH	00H

n=MIDI channel number　　　 : 0H - FH (ch.1 - ch.16)

* OMNI ON is only recognized as "All notes off"; the Mode doesn't change (OMNI OFF remains).

<6> MONO (Controller number 126)

Status	Second	Third
BnH	7EH	mmH

n=MIDI channel number   : 0H - FH (ch.1 - ch.16)
mm=number of mono   : 00H - 10H (0 - 16)

* MONO is recognized as "All sounds off." The specified channel turns to Mode4 (M=1), even if mm is not equal to 1 (mm is ignored).

<7> POLY (Controller number 127)

Status	Second	Third
BnH	7FH	00H

n=MIDI channel number   : 0H - FH (ch.1 - ch.16)

* POLY is recognized as "All sounds off." The specified channel turns to Mode3.

[System Realtime Message]

<1> ACTIVE SENSING

Status
FEH

* Having received an "Active sensing" message, GS expects to receive additional active sensing messages at 300ms intervals. If the interval is greater than 420ms, GS executes "All sounds off", "All notes off" and "Reset all controllers" and returns to normal operation. (Monitoring of active sensing messages will terminate.)

[System Exclusive Message]

Status	Data	Status
F0H	iiH,ddH,.....,eeH	F7H

F0H	: System Exclusive
ii=ID number	: The ID number identifies the manufacturer of a MIDI device that triggers an exclusive message. Value 7EH and 7FH are reserved to use as universal messages which are used for extension of the MIDI Standard.
41H	: Roland's Manufacturer-ID.
7EH	: Universal Non-Realtime Message
7FH	: Universal Realtime Message
dd,...,ee=data	: 00H-7FH (0-127)
F7H	: EOX (End of Exclusive/System common)

<1> SYSTEM EXCLUSIVE MESSAGES OF MODE CHANGE

System Exclusive Messages of Mode Change are the messages used to initialize the internal parameters of the device to General MIDI mode or GS default mode.
"GS reset" uses a form of Roland Exclusive Message. "Turn General MIDI System On" uses a form of Universal Non Realtime Message.

(1) GS reset

Status	Data Byte	Status
F0H	41H, 10H, 42H, 12H, 40H, 00H, 7FH, 00H, 41H	F7H

Byte	Description	
F0H	Exclusive status	
41H	ID number	(Roland)
10H	Device ID	
42H	Model ID	(GS)
12H	Command ID	(DT1)
40H	Address MSB	
00H	:	
7FH	Address LSB	
00H	Data	(GS reset)
41H	Checksum	
F7H	EOX	(End of exclusive)

* Upon receiving this message, all the internal parameters are set to the default settings of the GS Format. (Rx.NRPN SW will be turned ON by this message.)
* It takes about 50ms to execute this message.

(2) Turn General MIDI System On ☆

Status	Data Byte	Status
F0H	7EH, 7FH, 09H, 01H	F7H

Byte	Description	
F0H	Exclusive status	
7EH	ID number	(Universal Non-Realtime message)
7FH	ID of target device	(Broadcast)
09H	sub-ID#1	(General MIDI message)
01H	sub-ID#2	(General MIDI On)
F7H	EOX	(End of exclusive)

* Upon receiving this message, all the internal parameters are set to the default settings of General MIDI System Level 1. (Rx.NRPN SW will be turned OFF by this message.)
* It takes about 50ms to execute this message.

<2> UNIVERSAL REALTIME SYSTEM EXCLUSIVE MESSAGE

(1) Master Volume

Status	Data Byte	Status
F0H	7FH, 7FH, 04H, 01H, llH, mmH	F7H

Byte	Description	
F0H	Exclusive status	
7FH	ID number	(Universal Realtime message)
7FH	ID of target device	(Broadcast)
04H	sub-ID#1	(Device Control Message)
02H	sub-ID#2	(Master Volume)
mm,ll	Master Volume	00 00H - 7F 7FH (0 - 16383)
F7H	EOX	(End of exclusive)

* The LSB (llH) is ignored (value=0).

<3> DATA TRANSFER

SCB-55 can receive the various parameters using System Exclusive messages of the following data format.

GS Common Exclusive messages use Model ID = 42H and Device ID = 17 (10H).

SCB-55 has a unique Exclusive communication function which has it's own Model IDs in addition to the GS Common Exclusive messages.

(1) Data set 1 DT1

This message corresponds to the actual data transfer process.
On receiving a DT1 message, the device writes the data to internal memory according to the address.

Status	Data Byte	Status
F0H	41H, 10H, 42H, 12H, aaH, bbH, ccH, ddH, ... eeH, sum	F7H

Byte	Description	
F0H	Exclusive status	
41H	Manufacturer's ID	(Roland)
10H	Device ID	
42H	Model ID	(GS)
12H	Command ID	(DT1)
aaH	Address MSB	
bbH	:	
ccH	Address LSB	
ddH	Data	
:	:	
eeH	Data	
sum	Checksum	
F7H	EOX	(End of exclusive)

* SCB-55 only recognizes the DT1 messages whose address and size match the Parameter Address Map (Section 2).
* A DT1 message cannot include data more than 128 bytes. If the amount of data to send is large (more than 128 bytes), then send the data in separate packets at an interval of 40ms or more.
* The error checking process uses a Checksum. Refer to "Useful Information" (p. 30) to calculate a Checksum.

2. PARAMETER ADDRESS MAP (MODEL ID=42H)

This map indicates address, Data size, Data (range), Parameter, and Default Value of parameters which can be transferred using "Data set 1 (DT1)."
All the numbers of address, size, Data, and Default Value are indicated in 7-bit Hexadecimal-form.

<Example>
Address   : Top of parameter address
Size   : Data size (Ex. 01H means 1byte)
Data   : Available range of data value
Parameter   : Parameter name
Description   : Explanation of data value
Default value   : Initial data value
Description   : Explanation of default value

[ADDRESS BLOCK MAP]

An outlined address map of the Exclusive Communication is shown below.
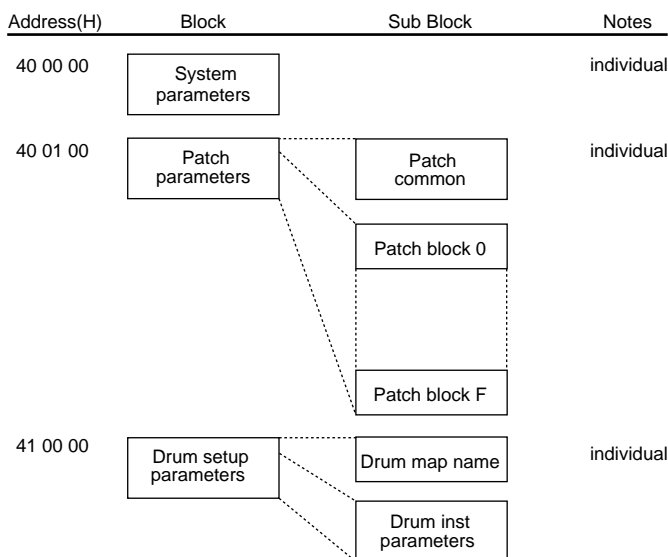
[INDIVIDUAL PARAMETERS]

You can use individual parameter communication to send or request an individual parameter value.
One packet of System Exclusive messages "F0 ..... F7" can only have one parameter (which may contain several bytes).
To send individual parameters, use the address and size indicated in the following map. You cannot use any address having "#" for the top address in a System Exclusive message.

<1> SYSTEM PARAMETERS

Address(H)	Size(H)	Data(H)	Parameter	Description	Default Value (H)	Description
40 00 00 40 00 01# 40 00 02# 40 00 03#	00 00 04	0018 - 07E8	MASTER TUNE	-100.0 - +100.0 [cent] Use nibblized data.	00 04 00 00	0 [cent]
40 00 04	00 00 01	00 - 7F	MASTER VOLUME (= F0 7F 7F 04 01 00 vv F7)	0 - 127	7F	127
40 00 05	00 00 01	28 - 58	MASTER KEY-SHIFT	-24 - +24 [semitones]	40	0 [semitones]
40 00 06	00 00 01	01 - 7F	MASTER PAN	-63 (LEFT) - +63 (RIGHT)	40	0 (CENTER)
40 00 7F	00 00 01	00, 7F	MODE SET (Rx Only)	00 = GS Reset		

Refer to "SYSTEM EXCLUSIVE MESSAGES OF MODE CHANGE" (Page 24)

<2> PATCH PARAMETERS

(1) Common Parameters

Patch Common Parameters include VOICE RESERVE, REVERB, and CHORUS parameters. These parameters are common to all the parts.

Address(H)	Size(H)	Data(H)	Parameter	Description	Default Value (H)	Description
40 01 10	00 00 10	00 - 18	VOICE RESERVE	Part 10 (Drum Part)	02	2
40 01 11#				Part 1	06	6
40 01 12#				Part 2	02	2
40 01 13#				Part 3	02	2
40 01 14#				Part 4	02	2
40 01 15#				Part 5	02	2
40 01 16#				Part 6	02	2
40 01 17#				Part 7	02	2
40 01 18#				Part 8	02	2
40 01 19#				Part 9	02	2
40 01 1A#				Part 11	00	0
40 01 : #				:		
40 01 1F#				Part 16	00	0

The sum total of voices in the voice reserve function must be equal to or less than the number of the maximum polyphony.
The maximum polyphony of the SCB-55 is 28.
For compatibility with other GS models, it is recommended that the maximum polyphony be equal or less than 24.

Address(H)	Size(H)	Data(H)	Parameter	Description	Default Value (H)	Description
40 01 30	00 00 01	00 - 07	REVERB MACRO	00: Room 1	04	Hall 2
				01: Room 2		
				02: Room 3		
				03: Hall 1		
				04: Hall 2		
				05: Plate		
				06: Delay		
				07: Panning Delay		
40 01 31	00 00 01	00 - 07	REVERB CHARACTER	0 - 7	04	4
40 01 32	00 00 01	00 - 07	REVERB PRE-LPF	0 - 7	00	0
40 01 33	00 00 01	00 - 7F	REVERB LEVEL	0 - 127	40	64
40 01 34	00 00 01	00 - 7F	REVERB TIME	0 - 127	40	64
40 01 35	00 00 01	00 - 7F	REVERB DELAY FEEDBACK	0 - 127	00	0
40 01 36	00 00 01	00 - 7F	REVERB SEND LEVEL TO CHORUS	0 - 127	00	0

REVERB MACRO is a parameter used to select the preset type of the effect.
When set to another REVERB MACRO, all other reverb parameters will be reset to the values set for each type of REVERB MACRO.

Address(H)	Size(H)	Data(H)	Parameter	Description	Default Value (H)	Description
40 01 38	00 00 01	00 - 07	CHORUS MACRO	00: Chorus 1	02	Chorus 3
				01: Chorus 2		
				02: Chorus 3		
				03: Chorus 4		
				04: Feedback Chorus		
				05: Flanger		
				06: Short Delay		
				07: Short Delay (FB)		
40 01 39	00 00 01	00 - 07	CHORUS PRE-LPF	0 - 7	00	0
40 01 3A	00 00 01	00 - 7F	CHORUS LEVEL	0 - 127	40	64
40 01 3B	00 00 01	00 - 7F	CHORUS FEEDBACK	0 - 127	08	8
40 01 3C	00 00 01	00 - 7F	CHORUS DELAY	0 - 127	50	80
40 01 3D	00 00 01	00 - 7F	CHORUS RATE	0 - 127	03	3
40 01 3E	00 00 01	00 - 7F	CHORUS DEPTH	0 - 127	13	19
40 01 3F	00 00 01	00 - 7F	CHORUS SEND LEVEL TO REVERB	0 - 127	00	0

CHORUS MACRO is a parameter used to select the preset type of effect.
When set to another CHORUS MACRO, then all other chorus parameters will be reset to the values set for each type of CHORUS MACRO.

(2) Part Parameters

SCB-55 has 16 parts. The parameters of each part are called Part Parameters.
To send or request Part Parameters, don't use not the part number (which is usually same as the MIDI channel number) but the BLOCK NUMBER in the message.

```
x...BLOCK NUMBER (0 - F),      Part 1  (default MIDI ch = 1)   x=1
                               Part 2  (default MIDI ch = 2)   x=2
                                 :           :          :
                               Part 9  (default MIDI ch = 9)   x=9
                               Part10  (default MIDI ch =10)   x=0
                               Part11  (default MIDI ch =11)   x=A
                               Part12  (default MIDI ch =12)   x=B
                                 :           :          :
                               Part16  (default MIDI ch =16)   x=F
```

n...MIDI channel number (0 - F) of the BLOCK.

Address(H)	Size(H)	Data(H)	Parameter	Description	Default Value (H)	Description
40 1x 00	00 00 02	00 - 7F	TONE NUMBER	CC#00 VALUE (0 - 127)	00	0
40 1x 01#		00 - 7F		P.C. VALUE (1 - 128)	00	1
40 1x 02	00 00 01	00 - 10	Rx. CHANNEL	1 - 16, OFF	Same as the Part Number	
40 1x 03	00 00 01	00 - 01	Rx. PITCH BEND	OFF / ON	01	ON
40 1x 04	00 00 01	00 - 01	Rx. CH PRESSURE(CAf)	OFF / ON	01	ON
40 1x 05	00 00 01	00 - 01	Rx. PROGRAM CHANGE	OFF / ON	01	ON
40 1x 06	00 00 01	00 - 01	Rx. CONTROL CHANGE	OFF / ON	01	ON
40 1x 07	00 00 01	00 - 01	Rx. POLY PRESSURE(PAf)	OFF / ON	01	ON
40 1x 08	00 00 01	00 - 01	Rx. NOTE MESSAGE	OFF / ON	01	ON
40 1x 09	00 00 01	00 - 01	Rx. RPN	OFF / ON	01	ON
40 1x 0A	00 00 01	00 - 01	Rx. NRPN	OFF / ON	00 (01*)	OFF (ON*)

* Rx. NRPN is set to OFF by power-on reset or by "Turn General MIDI System On," and it is set to ON by "GS RESET."

Address(H)	Size(H)	Data(H)	Parameter	Description	Default Value (H)	Description
40 1x 0B	00 00 01	00 - 01	Rx. MODULATION	OFF / ON	01	ON
40 1x 0C	00 00 01	00 - 01	Rx. VOLUME	OFF / ON	01	ON
40 1x 0D	00 00 01	00 - 01	Rx. PANPOT	OFF / ON	01	ON
40 1x 0E	00 00 01	00 - 01	Rx. EXPRESSION	OFF / ON	01	ON
40 1x 0F	00 00 01	00 - 01	Rx. HOLD1	OFF / ON	01	ON
40 1x 10	00 00 01	00 - 01	Rx. PORTAMENTO	OFF / ON	01	ON
40 1x 11	00 00 01	00 - 01	Rx. SOSTENUTO	OFF / ON	01	ON
40 1x 12	00 00 01	00 - 01	Rx. SOFT	OFF / ON	01	ON
40 1x 13	00 00 01	00 - 01	MONO/POLY MODE	Mono / Poly (=Bn 7E 01 / Bn 7F 00)	01	Poly
40 1x 14	00 00 01	00 - 02	ASSIGN MODE	0 = SINGLE 1 = LIMITED-MULTI 2 = FULL-MULTI	00 at x=0 01 at x≠0	SINGLE at x=0 LIMITED-MULTI at x≠0

ASSIGN MODE is a parameter used to select the voice assign manner when "Multiple Note Ons" occur (the same note number on the same channel at the same time).
The best assign modes (SINGLE (0) for the Drum part and LIMITED-MULTI (1) for the other parts) are selected automatically, so you need not reset this parameter.

Address(H)	Size(H)	Data(H)	Parameter	Description	Default Value (H)	Description
40 1x 15	00 00 01	00 - 02	USE FOR DRUM PART	0 = OFF 1 = MAP1 2 = MAP2	00 at x≠0 01 at x=0	OFF at x≠0 MAP1 at x=0

USE FOR DRUM PART is a parameter to define the part to be used as an ordinary part (0), as a drum part using DRUM MAP1 (1), or a drum part using DRUM MAP2 (2).
The default is MAP1 (1) for Part 10 (MIDI CH=10, x=0), and all other parts are set to ordinary parts (OFF(0)).

Address(H)	Size(H)	Data(H)	Parameter	Description	Default Value (H)	Description
40 1x 16	00 00 01	28 - 58	PITCH KEY SHIFT	-24 - +24 [semitones]	40	0 [semitones]
40 1x 17	00 00 02	08 - F8	PITCH OFFSET FINE	-12.0 - +12.0 [Hz]	08 00	0 [Hz]
40 1x 18#				Use nibblized data.		
40 1x 19	00 00 01	00 - 7F	PART LEVEL	0 - 127 (=Bn 07 vv)	64	100
40 1x 1A	00 00 01	00 - 7F	VELOCITY SENSE DEPTH	0 - 127	40	64
40 1x 1B	00 00 01	00 - 7F	VELOCITY SENSE OFFSET	0 - 127	40	64
40 1x 1C	00 00 01	00 - 7F	PART PANPOT	-64 (RANDOM), -63 (LEFT) - +63 (RIGHT) (=Bn 0A vv, except RANDOM)	40	0 (CENTER)
40 1x 1D	00 00 01	00 - 7F	KEY RANGE LOW	(C-1) - (G9)	00	C-1
40 1x 1E	00 00 01	00 - 7F	KEY RANGE HIGH	(C-1) - (G9)	7F	G9
40 1x 1F	00 00 01	00 - 5F	CC1 CONTROLLER NUMBER	0 - 95	10	16
40 1x 20	00 00 01	00 - 5F	CC2 CONTROLLER NUMBER	0 - 95	11	17
40 1x 21	00 00 01	00 - 7F	CHORUS SEND LEVEL	0 - 127 (=Bn 5D vv)	00	0
40 1x 22	00 00 01	00 - 7F	REVERB SEND LEVEL	0 - 127 (=Bn 5B vv)	28	40
40 1x 23	00 00 01	00 - 01	Rx. BANK SELECT	OFF / ON	01 (00*)	ON (OFF*)

*Rx. BANK SELECT is set to ON by power-on reset or by "GS RESET," and set to OFF by "Turn General MIDI System On."

Address(H)	Size(H)	Data(H)	Parameter	Description	Default Value (H)	Description
40 1x 30	00 00 01	0E - 72	TONE MODIFY 1 Vibrato rate	-50 - +50 (=Bn 63 01 62 08 06 vv)	40	0
40 1x 31	00 00 01	0E - 72	TONE MODIFY 2 Vibrato depth	-50 - +50 (=Bn 63 01 62 09 06 vv)	40	0
40 1x 32	00 00 01	0E - 72	TONE MODIFY 3 TVF cutoff freq.	-50 - +50 (=Bn 63 01 62 20 06 vv)	40	0
40 1x 33	00 00 01	0E - 72	TONE MODIFY 4 TVF resonance	-50 - +50 (=Bn 63 01 62 21 06 vv)	40	0
40 1x 34	00 00 01	0E - 72	TONE MODIFY 5 TVF&TVA Env.attack	-50 - +50 (=Bn 63 01 62 63 06 vv)	40	0
40 1x 35	00 00 01	0E - 72	TONE MODIFY 6 TVF&TVA Env.decay	-50 - +50 (=Bn 63 01 62 64 06 vv)	40	0
40 1x 36	00 00 01	0E - 72	TONE MODIFY 7 TVF&TVA Env.release	-50 - +50 (=Bn 63 01 62 66 06 vv)	40	0
40 1x 37	00 00 01	0E - 72	TONE MODIFY 8 Vibrato delay	-50 - +50 (=Bn 63 01 62 0A 06 vv)	40	0

Address(H)	Size(H)	Data(H)	Parameter	Description	Default Value (H)	Description
40 1x 40	00 00 0C	00 - 7F	SCALE TUNING C	-64 - +63 [cent]	40	0 [cent]
40 1x 41#		00 - 7F	SCALE TUNING C#	-64 - +63 [cent]	40	0 [cent]
40 1x 42#		00 - 7F	SCALE TUNING D	-64 - +63 [cent]	40	0 [cent]
40 1x 43#		00 - 7F	SCALE TUNING D#	-64 - +63 [cent]	40	0 [cent]
40 1x 44		00 - 7F	SCALE TUNING E	-64 - +63 [cent]	40	0 [cent]
40 1x 45#		00 - 7F	SCALE TUNING F	-64 - +63 [cent]	40	0 [cent]
40 1x 46#		00 - 7F	SCALE TUNING F#	-64 - +63 [cent]	40	0 [cent]
40 1x 47#		00 - 7F	SCALE TUNING G	-64 - +63 [cent]	40	0 [cent]
40 1x 48#		00 - 7F	SCALE TUNING G#	-64 - +63 [cent]	40	0 [cent]
40 1x 49#		00 - 7F	SCALE TUNING A	-64 - +63 [cent]	40	0 [cent]
40 1x 4A#		00 - 7F	SCALE TUNING A#	-64 - +63 [cent]	40	0 [cent]
40 1x 4B#		00 - 7F	SCALE TUNING B	-64 - +63 [cent]	40	0 [cent]

SCALE TUNING enables you to slightly raise or lower each note in the same octave range.
This setting can be enabled for all pitches of the same note name. 0 cent (40H) is equivalent to "Equal Temperament."

| Address(H)	Size(H)	Data(H)	Parameter	Description	Default Value (H)	Description
40 2x 00	00 00 01	28 - 58	MOD PITCH CONTROL	-24 - +24 [semitone]	40	0 [semitones]
40 2x 01	00 00 01	00 - 7F	MOD TVF CUTOFF CONTROL	-9600 - +9600 [cent]	40	0 [cent]
40 2x 02	00 00 01	00 - 7F	MOD AMPLITUDE CONTROL	-100.0 - +100.0 [%]	40	0 [%]
40 2x 03	00 00 01	00 - 7F	MOD LFO1 RATE CONTROL	-10.0 - +10.0 [Hz]	40	0 [Hz]
40 2x 04	00 00 01	00 - 7F	MOD LFO1 PITCH DEPTH	0 - 600 [cent]	0A	47 [cent]
40 2x 05	00 00 01	00 - 7F	MOD LFO1 TVF DEPTH	0 - 2400 [cent]	00	0 [cent]
40 2x 06	00 00 01	00 - 7F	MOD LFO1 TVA DEPTH	0 - 100.0 [%]	00	0 [%]
40 2x 07	00 00 01	00 - 7F	MOD LFO2 RATE CONTROL	-10.0 - +10.0 [Hz]	40	0 [Hz]
40 2x 08	00 00 01	00 - 7F	MOD LFO2 PITCH DEPTH	0 - 600 [cent]	00	0 [cent]
40 2x 09	00 00 01	00 - 7F	MOD LFO2 TVF DEPTH	0 - 2400 [cent]	00	0 [cent]
40 2x 0A	00 00 01	00 - 7F	MOD LFO2 TVA DEPTH	0 - 100.0 [%]	00	0 [%]
40 2x 10	00 00 01	40 - 58	BEND PITCH CONTROL	0 - 24 [semitone]	42	2 [semitones]
40 2x 11	00 00 01	00 - 7F	BEND TVF CUTOFF CONTROL	-9600 - +9600 [cent]	40	0 [cent]
40 2x 12	00 00 01	00 - 7F	BEND AMPLITUDE CONTROL	-100.0 - +100.0 [%]	40	0 [%]
40 2x 13	00 00 01	00 - 7F	BEND LFO1 RATE CONTROL	-10.0 - +10.0 [Hz]	40	0 [Hz]
40 2x 14	00 00 01	00 - 7F	BEND LFO1 PITCH DEPTH	0 - 600 [cent]	00	0 [cent]
40 2x 15	00 00 01	00 - 7F	BEND LFO1 TVF DEPTH	0 - 2400 [cent]	00	0 [cent]
40 2x 16	00 00 01	00 - 7F	BEND LFO1 TVA DEPTH	0 - 100.0 [%]	00	0 [%]
40 2x 17	00 00 01	00 - 7F	BEND LFO2 RATE CONTROL	-10.0 - +10.0 [Hz]	40	0 [Hz]
40 2x 18	00 00 01	00 - 7F	BEND LFO2 PITCH DEPTH	0 - 600 [cent]	00	0 [cent]
40 2x 19	00 00 01	00 - 7F	BEND LFO2 TVF DEPTH	0 - 2400 [cent]	00	0 [cent]
40 2x 1A	00 00 01	00 - 7F	BEND LFO2 TVA DEPTH	0 - 100.0 [%]	00	0 [%]
40 2x 20	00 00 01	28 - 58	CAf PITCH CONTROL	-24 - +24 [semitone]	40	0 [semitones]
40 2x 21	00 00 01	00 - 7F	CAf TVF CUTOFF CONTROL	-9600 - +9600 [cent]	40	0 [cent]
40 2x 22	00 00 01	00 - 7F	CAf AMPLITUDE CONTROL	-100.0 - +100.0 [%]	40	0 [%]
40 2x 23	00 00 01	00 - 7F	CAf LFO1 RATE CONTROL	-10.0 - +10.0 [Hz]	40	0 [Hz]
40 2x 24	00 00 01	00 - 7F	CAf LFO1 PITCH DEPTH	0 - 600 [cent]	00	0 [cent]
40 2x 25	00 00 01	00 - 7F	CAf LFO1 TVF DEPTH	0 - 2400 [cent]	00	0 [cent]
40 2x 26	00 00 01	00 - 7F	CAf LFO1 TVA DEPTH	0 - 100.0 [%]	00	0 [%]
40 2x 27	00 00 01	00 - 7F	CAf LFO2 RATE CONTROL	-10.0 - +10.0 [Hz]	40	0 [Hz]
40 2x 28	00 00 01	00 - 7F	CAf LFO2 PITCH DEPTH	0 - 600 [cent]	00	0 [cent]
40 2x 29	00 00 01	00 - 7F	CAf LFO2 TVF DEPTH	0 - 2400 [cent]	00	0 [cent]
40 2x 2A	00 00 01	00 - 7F	CAf LFO2 TVA DEPTH	0 - 100.0 [%]	00	0 [%]
40 2x 30	00 00 01	28 - 58	PAf PITCH CONTROL	-24 - +24 [semitone]	40	0 [semitones]
40 2x 31	00 00 01	00 - 7F	PAf TVF CUTOFF CONTROL	-9600 - +9600 [cent]	40	0 [cent]
40 2x 32	00 00 01	00 - 7F	PAf AMPLITUDE CONTROL	-100.0 - +100.0 [%]	40	0 [%]
40 2x 33	00 00 01	00 - 7F	PAf LFO1 RATE CONTROL	-10.0 - +10.0 [Hz]	40	0 [Hz]
40 2x 34	00 00 01	00 - 7F	PAf LFO1 PITCH DEPTH	0 - 600 [cent]	00	0 [cent]
40 2x 35	00 00 01	00 - 7F	PAf LFO1 TVF DEPTH	0 - 2400 [cent]	00	0 [cent]
40 2x 36	00 00 01	00 - 7F	PAf LFO1 TVA DEPTH	0 - 100.0 [%]	00	0 [%]
40 2x 37	00 00 01	00 - 7F	PAf LFO2 RATE CONTROL	-10.0 - +10.0 [Hz]	40	0 [Hz]
40 2x 38	00 00 01	00 - 7F	PAf LFO2 PITCH DEPTH	0 - 600 [cent]	00	0 [cent]
40 2x 39	00 00 01	00 - 7F	PAf LFO2 TVF DEPTH	0 - 2400 [cent]	00	0 [cent]
40 2x 3A	00 00 01	00 - 7F	PAf LFO2 TVA DEPTH	0 - 100.0 [%]	00	0 [%]
40 2x 40	00 00 01	28 - 58	CC1 PITCH CONTROL	-24 - +24 [semitone]	40	0 [semitones]
40 2x 41	00 00 01	00 - 7F	CC1 TVF CUTOFF CONTROL	-9600 - +9600 [cent]	40	0 [cent]
40 2x 42	00 00 01	00 - 7F	CC1 AMPLITUDE CONTROL	-100.0 - +100.0 [%]	40	0 [%]
40 2x 43	00 00 01	00 - 7F	CC1 LFO1 RATE CONTROL	-10.0 - +10.0 [Hz]	40	0 [Hz]
40 2x 44	00 00 01	00 - 7F	CC1 LFO1 PITCH DEPTH	0 - 600 [cent]	00	0 [cent]
40 2x 45	00 00 01	00 - 7F	CC1 LFO1 TVF DEPTH	0 - 2400 [cent]	00	0 [cent]
40 2x 46	00 00 01	00 - 7F	CC1 LFO1 TVA DEPTH	0 - 100.0 [%]	00	0 [%]
40 2x 47	00 00 01	00 - 7F	CC1 LFO2 RATE CONTROL	-10.0 - +10.0 [Hz]	40	0 [Hz]
40 2x 48	00 00 01	00 - 7F	CC1 LFO2 PITCH DEPTH	0 - 600 [cent]	00	0 [cent]
40 2x 49	00 00 01	00 - 7F	CC1 LFO2 TVF DEPTH	0 - 2400 [cent]	00	0 [cent]
40 2x 4A	00 00 01	00 - 7F	CC1 LFO2 TVA DEPTH	0 - 100.0 [%]	00	0 [%]
40 2x 50	00 00 01	28 - 58	CC2 PITCH CONTROL	-24 - +24 [semitone]	40	0 [semitones]
40 2x 51	00 00 01	00 - 7F	CC2 TVF CUTOFF CONTROL	-9600 - +9600 [cent]	40	0 [cent]
40 2x 52	00 00 01	00 - 7F	CC2 AMPLITUDE CONTROL	-100.0 - +100.0 [%]	40	0 [%]
40 2x 53	00 00 01	00 - 7F	CC2 LFO1 RATE CONTROL	-10.0 - +10.0 [Hz]	40	0 [Hz]
40 2x 54	00 00 01	00 - 7F	CC2 LFO1 PITCH DEPTH	0 - 600 [cent]	00	0 [cent]
40 2x 55	00 00 01	00 - 7F	CC2 LFO1 TVF DEPTH	0 - 2400 [cent]	00	0 [cent]
40 2x 56	00 00 01	00 - 7F	CC2 LFO1 TVA DEPTH	0 - 100.0 [%]	00	0 [%]
40 2x 57	00 00 01	00 - 7F	CC2 LFO2 RATE CONTROL	-10.0 - +10.0 [Hz]	40	0 [Hz]
40 2x 58	00 00 01	00 - 7F	CC2 LFO2 PITCH DEPTH	0 - 600 [cent]	00	0 [cent]
40 2x 59	00 00 01	00 - 7F	CC2 LFO2 TVF DEPTH	0 - 2400 [cent]	00	0 [cent]
40 2x 5A	00 00 01	00 - 7F	CC2 LFO2 TVA DEPTH	0 - 100.0 [%]	00	0 [%]

<3> DRUM SETUP PARAMETERS

m: Map number (0 = MAP1, 1 = MAP2)
rr: drum part note number (00H - 7FH)

Address(H)	SIZE(H)	Data(H)	Parameter	Description
41 m0 00	00 00 0C	20 - 7F	DRUM MAP NAME	ASCII Character
| #				
41 m0 0B#				
41 m1 rr	00 00 01	00 - 7F	PLAY NOTE NUMBER	Pitch coarse
41 m2 rr	00 00 01	00 - 7F	LEVEL	TVA level
				(=Bn 63 1A 62 06 rr vv)
41 m3 rr	00 00 01	00 - 7F	ASSIGN GROUP NUMBER	Non, 1 - 127
41 m4 rr	00 00 01	00 - 7F	PANPOT	-64 (RANDOM),
				-63(LEFT) - +63(RIGHT)
				(=Bn 63 1C 62 06 rr vv, except RANDOM)
41 m5 rr	00 00 01	00 - 7F	REVERB SEND LEVEL	0.0 - 1.0
				Multiplicand of the part reverb depth
				(=Bn 63 1D 62 06 rr vv)
41 m6 rr	00 00 01	00 - 7F	CHORUS SEND LEVEL	0.0 - 1.0
				Multiplicand of the part chorus depth
				(=Bn 63 1E 62 06 rr vv)
41 m7 rr	00 00 01	00 - 01	Rx. NOTE OFF	OFF / ON
41 m8 rr	00 00 01	00 - 01	Rx. NOTE ON	OFF / ON

When you change Drum Sets, all values of the DRUM SETUP PARAMETERS will be initialized.

BLOCK DIAGRAM
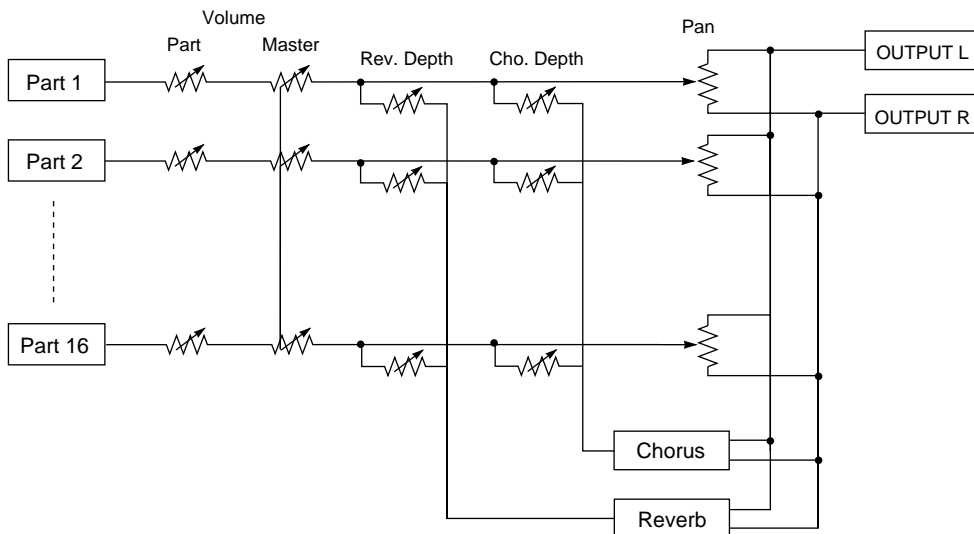
Useful Information

•Decimal and Hexadecimal

It is common to use 7-bit Hexadecimal numbers in MIDI communication. The following is a conversion table between decimal numbers and 7-bit Hexadecimal numbers.

Decimal	Hexa-decimal	Decimal	Hexa-decimal	Decimal	Hexa-decimal	Decimal	Hexa-decimal
0	00H	32	20H	64	40H	96	60H
1	01H	33	21H	65	41H	97	61H
2	02H	34	22H	66	42H	98	62H
3	03H	35	23H	67	43H	99	63H
4	04H	36	24H	68	44H	100	64H
5	05H	37	25H	69	45H	101	65H
6	06H	38	26H	70	46H	102	66H
7	07H	39	27H	71	47H	103	67H
8	08H	40	28H	72	48H	104	68H
9	09H	41	29H	73	49H	105	69H
10	0AH	42	2AH	74	4AH	106	6AH
11	0BH	43	2BH	75	4BH	107	6BH
12	0CH	44	2CH	76	4CH	108	6CH
13	0DH	45	2DH	77	4DH	109	6DH
14	0EH	46	2EH	78	4EH	110	6EH
15	0FH	47	2FH	79	4FH	111	6FH
16	10H	48	30H	80	50H	112	70H
17	11H	49	31H	81	51H	113	71H
18	12H	50	32H	82	52H	114	72H
19	13H	51	33H	83	53H	115	73H
20	14H	52	34H	84	54H	116	74H
21	15H	53	35H	85	55H	117	75H
22	16H	54	36H	86	56H	118	76H
23	17H	55	37H	87	57H	119	77H
24	18H	56	38H	88	58H	120	78H
25	19H	57	39H	89	59H	121	79H
26	1AH	58	3AH	90	5AH	122	7AH
27	1BH	59	3BH	91	5BH	123	7BH
28	1CH	60	3CH	92	5CH	124	7CH
29	1DH	61	3DH	93	5DH	125	7DH
30	1EH	62	3EH	94	5EH	126	7EH
31	1FH	63	3FH	95	5FH	127	7FH

* To indicate a decimal number for the MIDI channel, Bank number, and Program number, add one to the values in the table.
* The resolution of 7-bit Hexadecimal numbers is 128. Use several bytes for values which require higher resolution.
  i.e. The number "aa bbH" in 7-bit Hexadecimal is "aa x 128 + bb" in Decimal form.
* A signed number (with a sign +/-) is indicated as 00H = -64, 40H = 0, 7FH=+63.
  So the signed number "aaH" in 7-bit Hexadecimal is "aa - 64" in Decimal form.
  In the case of two bytes, it is regarded as 00 00H = 8192,
  40 00H = 0, 7F 7FH=+8191.
  So the signed number "aa bbH" in 7-bit Hexadecimal is "aa bbH - 40 00H = (aa x 128 + bb) - (64 x 128)" in Decimal form.
* The data indicated as "nibbled" is a 4-bit Hexadecimal number.
  i.e. "0a 0bH" is "a x 16 + b."

<Example 1> Convert "5AH" in Hexadecimal to a Decimal number.
(By using the table)   5AH = 90

<Example 2> Convert "12 34H" in 7-bit Hexadecimal to a Decimal number.
(By using the table)   12H = 18, 34H = 52
So,   18 x 128 + 52 = 2356

<Example 3> Convert "0A 03 09 0D" in nibblized form to a Decimal number.
(By using the table)   0AH = 10, 03H = 3, 09H = 9, 0DH = 13
So,   ((10 x 16 + 3) x 16 + 9) x 16 + 13 = 41885

•Example of actual MIDI messages

<Example 1> 92 3E 5F
"9n" is a status of a Note On message, and "n" is a MIDI channel number.
The second byte is the Note number, and the third is Velocity.
2H = 2, 3EH = 62, 5FH = 95
So, this is a Note On message of MIDI channel=3, Note number=62 (D4) and Velocity=95.

<Example 2> CE 49
"Cn" is a status of a Program change message, and "n" is a MIDI channel number.
The second byte is a Program number.
EH = 14, 49H = 73
So, this is a Program change message of MIDI channel=15,
Program number= 74 (Flute in GS).

<Example 3> EA 00 28
"EnH" is a status of a Pitch bend change message, and "n" is a MIDI channel number.
The second byte (00H) is an LSB and the third (28H) is an MSB of a Pitch bend value.
The Pitch bend value is :
28 00H - 40 00H = 40 x 128 + 0 - (64 x 128 + 0) = 5120 - 8192 = -3072
So, this is a Pitch bend change message of MIDI channel=11,
Pitch bend value = -3072

If the Pitch bend sensitivity is set to 2 semitones, and the Pitch bend value -8192 (00 00H) is defined as -200 cents,
The actual pitch bend value of this message is :
-200 x (-3072) / (-8192) = -75 cent

•Example of Roland System Exclusive messages and Checksum

Roland System Exclusive messages (DT1) have a Checksum at the end of the data (just before EOX) to be able to check for communication errors. The Checksum is determined by values of address and data (or size) included in the message.

<How to calculate Checksums>
("H" indicates Hexadecimal.)

The error checking process employs a sum-check error detection. It provides binary bit figures whose lower 7 bits are zero when values for an address, data (or size) and the Checksum are summed.

One practical equation to determine Checksum is;
If the address is "ad bb ccH" and the data (or the size) is "dd ee ffH"
ad + bb + cc + dd + ee + ff = sum
sum / 128 = quotient ⋯ remainder
128 - remainder = checksum

<Example 1> Set "REVERB MACRO" to "ROOM 3"
According to the Parameter Address Map, the Address of REVERB MACRO is 40 01 30H, and the Value corresponding to ROOM 3 is 02H.
So, the message should be :

F0 41 10 42 12 40 01 30 02 ?? F7
(1) (2) (3) (4) (5) address data checksum (6)

      (1) Exclusive Status   (4) Model ID (GS)
      (2) ID (Roland)   (5) Command ID (DT1)
      (3) Device ID (16)   (6) End of Exclusive

The Checksum is :
40H + 01H + 30H + 02H = 64 + 1 + 48 + 2 = 115 (sum)
115 (sum) / 128 = 0 (quotient) ⋯ 115 (remainder)
checksum = 128 - 115 (remainder) = 13 = 0DH

Therefore, the message to send is : F0 41 10 42 12 40 01 30 02 0D F7

<Example 2> Set "MASTER TUNE" to +23.4 cents by System Exclusive
The Address of "MASTER TUNE" is 40 00 00H. The Value should be nibblized data whose resolution is 0.1 cents, and which is a signed value (00 04 00 00H (= 1024) = 0).
+23.4[cents] = 234 + 1024 = 1258 = 04 EAH = 00 04 0E 0AH (nibblized)
So, the message should be :

F0 41 10 42 12 40 00 00 00 04 0E 0A ?? F7
(1) (2) (3) (4) (5) address data checksum (6)

      (1) Exclusive Status   (4) Model ID (GS)
      (2) ID   (Roland)   (5) Command ID (DT1)
      (3) Device ID (16)   (6) End of Exclusive

The Checksum is :
40H + 00H + 00H + 00H + 04H + 0EH + 0AH = 64 + 0 + 0 + 0 + 4 + 14 + 10 = 92 (sum)
92 (sum) / 128 = 0 (quotient) ⋯ 92 (remainder)
checksum = 128 - 92 (remainder) = 36 = 24H

Therefore, the message to send is :

F0 41 10 42 12 40 00 00 00 04 0E 0A 24 F7

SPECIFICATIONS

SCB-55 : GS Daughter Board

- **Sound Source**
  RS-PCM Sound Generation
  Compatible with GM System Level 1
  Compatible with Roland's GS Format

- **Number of Parts**
  16 parts

- **Maximum Polyphony**
  28 voices

- **Number of Sounds**
  Tones   : 354 tones (includes 41 SFX tones)
  Drum Sets : 9 Drum Sets and 1 SFX Set (total 184 tones)
               (Standard, Room, Power, Electronic, TR-808, Jazz, Brush, Orchestra, CM-64/32L and SFX Set)
  * This board contains a total of 184 different tones which are used in 9 drum sets and 1 SFX set of approx.
    60 tones each.

- **Effects**
  Reverb : 8 types with 6 parameters
     Type   : Room 1, Room 2, Room 3, Hall 1, Hall 2, Plate, Delay and Panning Delay
     Parameter : Character, Pre-LPF, Level, Time, Delay Feedback and Send Level to Chorus
  Chorus : 8 types with 7 parameters
     Type   : Chorus 1, Chorus 2, Chorus 3, Chorus 4, Feedback Chorus, Flanger, Short Delay and Short Delay (FB)
     Parameter : Pre-LPF, Level, Feedback, Delay, Rate, Depth and Send Level to Reverb

- **Connector**
  Extension Connector (Wave Blaster-compatible connector)

- **Available Sound Cards**
  Roland MPU-401AT
  Any sound card with a Wave Blaster-compatible connector

- **Power Supply**
  Supplied from the attached sound card

- **Current Draw**
  200 mA / +5V, 20 mA / +12V, 15 mA / -12V

- **Dimensions**
  138.4 (W) x 88.9 (D) x 19.5 (H) mm
  5-1/2 (W) x 3-1/2 (D) x13/16 (H) inches

- **Weight**
  65 g / 3 oz

* In the interest of product development, the specifications and/or appearance of this unit are subject to
  change without prior notice.

Information

When you need repair service, call your nearest EDIROL/Roland Service Center or authorized EDIROL/Roland distributor in your country as shown below.

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Roland

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