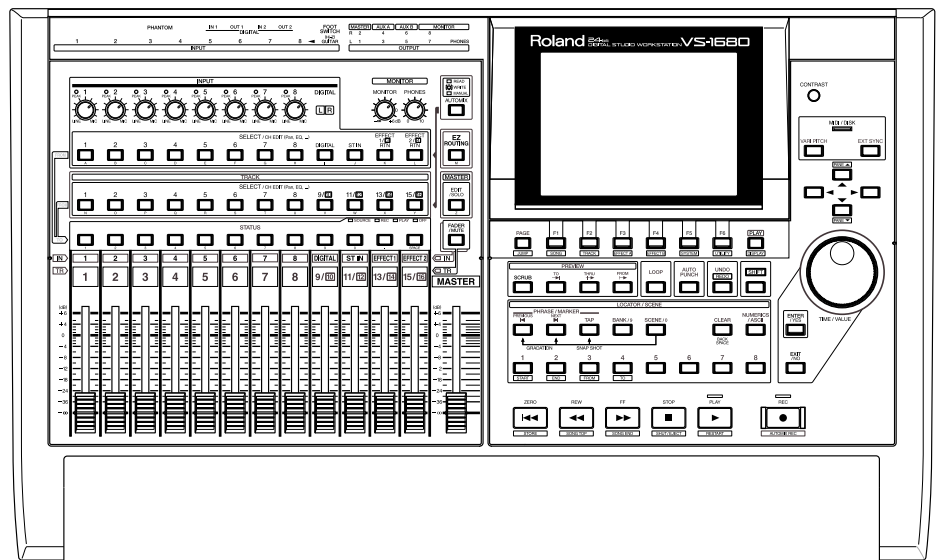# Roland®

24-bit DIGITAL STUDIO WORKSTATION
VS-1680

APPENDICES

Before using this unit, carefully read the sections entitled: "IMPOR-TANT SAFETY INSTRUCTIONS" (p. 2), "USING THE UNIT SAFELY" (p. 3, 4), and "IMPORTANT NOTES" (p. 5). These sections provide impor-tant information concerning the proper operation of the unit. Additionally, in order to feel assured that you have gained a good grasp of every feature provided by your new unit, Quick Start, Owner's Manual, and Appendices should be read in its entirety. The manual should be saved and kept on hand as a convenient reference.

Contents

About MIDI

This section explains the basic concepts of MIDI, and how the VS-1680 handles MIDI messages.

What is MIDI

MIDI stands for **Musical Instrument Digital Interface**. It is a worldwide standard that allows electronic musical instruments and personal computer to exchange musical performance data and messages such as sound selections. Any MIDI-compatible device can transmit musical data (as appropriate for the type of device) to any other MIDI-compatible device, regardless of its manufacturer or model type.

MIDI connectors

MIDI messages (the data handled by MIDI) are transmitted and received using the following three types of connectors. On the VS-1680, MIDI OUT and MIDI THRU are handled by a single connector, which can be switched to act as the desired connector. (Owner's Manual p. 129)

MIDI IN: This receives MIDI messages from external MIDI devices.

MIDI OUT: This transmits MIDI messages from the VS-1680.

MIDI THRU: This re-transmits all MIDI messages that were received at MIDI IN, without modifying them.

MIDI channels

MIDI is able to send information over a single MIDI cable independently to two or more MIDI devices. This is made possible by the concept of MIDI channels. You can think of MIDI channels as being somewhat similar in function to the channels on a television. By changing the channel of a TV set, you can view a variety of programs being transmitted by different broadcast stations. This is because data is received only from the transmitter whose channel is selected on the receiver.

In the same way, a MIDI device whose receive channel is set to "1" will receive only the data being transmitted by another MIDI device whose transmit channel is also set to "1."

MIDI messages

The VS-1680 uses the following types of MIDI message.

Note messages:
These messages are used to play notes. On a keyboard, these message transmit the key (note number) that was pressed, and how strongly it was pressed (velocity). On the VS-1680, these messages are used when you use a MIDI sound source to play the metronome sound.

Program Change messages:
These messages are for the purpose of selecting sounds, and contain a program number of 1–128. The VS-1680 uses these messages to select scenes and effects. (Owner's Manual p. 138, 139)

Control Change messages:
In general, these messages are used to transmit information such as vibrato, hold, and volume etc., that makes a performance more expressive. The various functions are differentiated by a controller number from 0–127, and the controller number is defined for each function. The functions that can be controlled on any given device will depend on that device.
On the VS-1680, these messages are used in a completely different way than on most instruments; they are used to control mixer parameters.

Exclusive messages:
Unlike note messages and control change messages, exclusive messages are used to transmit settings that are unique to a particular device. On the VS-1680, exclusive messages can be used to control mixer parameters (in the same way as control change messages). Normally, control change messages are easier to handle, so they should be used rather than exclusive messages. Exclusive messages intended for different units are distinguished by their Device ID, rather than by MIDI channel. When exclusive messages are to be transmitted or received, you must set the Device ID of both units to a matching setting.

MIDI implementation chart

MIDI allows a variety of electronic musical instruments to communicate with each other. However it is not necessarily the case that all devices will be able to communicate using all types of MIDI message. They can only communicate using those types of MIDI message that they have in common.

Each owner's manual for a MIDI device includes a MIDI Implementation Chart. This chart shows you at a glance the types of MIDI message that can be transmitted and received. By comparing the implementation charts of two devices, you will be able to see the types of message with which they will be able to communicate.

About SCSI

SCSI stands for **Small Computer System Interface**. It is a data transfer standard that allows large amounts of data to be sent and received. The VS-1680 comes prepared with a SCSI connectors allowing you to connect external SCSI devices such as hard disks and Zip drives. This section describes the procedures and precautions taken when using these devices.

Disk drives are precision devices. If they are connected or used incorrectly, not only may they fail to operate correctly, but the data on the disk can be lost or, in the worst case, the disk drive itself may be damaged. Please be sure to read the manual for your disk drive.

* *A disk drive being used for the first time with the VS-1680 must be initialized by the VS-1680 (Owner's Manual p. 111). When a disk drive is initialized, all data on that disk drive is lost. Before using a disk drive that has been used by another device, make sure that it is all right to erase the data.*

About Connections

Up to 7 disk drives can be connected to the SCSI connector of the VS-1680. Use SCSI cable to connect the disk drives, connecting as shown below. SCSI connectors are not distinguished by input and output ends, so you may attach either end of the cable to the devices. Devices connected in this fashion are referred to as a **SCSI chain** or **daisy chain**.

VS-1680   Disk Drive1 (Zip Drive, etc)   Disk Drive2 (Zip Drive, etc)   Disk Drive7 (CD-R Drive, etc)
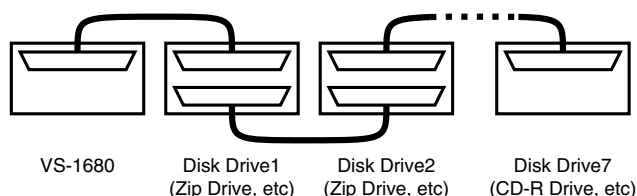
● The VS-1680 features a DB-25 type connector (female). After checking your disk drive to see what kind of SCSI connector it uses, connect it with the appropriate cable.

● Keep SCSI cables as short as possible, and use only cables which have an impedance that is compatible with the SCSI standard (110Ω +/-10%), and that are completely shield.

● Do not allow the total length of all SCSI cables connecting the chain of disk drives to exceed 6.5 meters.

● Do not connect or disconnect SCSI cables when the power of any device is turned on.

About Terminators

To protect against return noise, the device at each end of a SCSI chain must have a terminating resistance. This is referred to as a **terminator**. Since the VS-1680 is one end of the SCSI chain, its internal terminator is normally in effect. Connect a terminator only to the last external drive in the chain. There are two types of terminators, those that can be switched on and off (internal) and those that are attached using SCSI connections (externally attached). Select the method appropriate for the disk drive you are using.

● Your disk drive may feature a terminator switch that is normally left in the "On" position (i.e., the terminator is usually in effect). Use this type of device as the last piece in a daisy chain.

● Do not use double terminators. For example, don't attach an external terminator to a disk drive that already has and internal terminator.

Active Terminators

If you are using an external terminator, we recommend that you make it an **active terminator**. In this case, if you are using a disk drive that allows you to turn the power to the terminator on and off, be sure to turn this power on. For details on attaching an active terminator, refer to the owner's manual for your disk drive.

About SCSI ID Numbers

Each disk drive is distinguished by its SCSI ID number (0–7). This means that when two or more disk drives are connected, you must make settings so that the SCSI ID numbers of the disk drives do not conflict (coincide). If the SCSI ID numbers conflict, the VS-1680 will not be able to correctly recognize the disk drives. With the factory settings, the VS-1680 is set to SCSI ID number 7. Set the disk drives you are connected to ID numbers other than 7.

Troubleshooting

When the VS-1680 does not perform the way you expect, check the following points before you suspect a malfunction. If this does not resolve the problem, contact servicing by your dealer or qualified Roland Service Center.

Recording and Playback

No Sound

● The power of the VS-1680 and the connected devices is not turned on.

● The audio cables are not connected correctly.

● The audio cables are broken.

● The volume is turned down on the connected mixer or amp.

● The master fader of the VS-1680 is turned down.

> Channel faders
> Master fader
> MONITOR knob
> PHONES knob

● The output jacks which are connected are different than the output jacks selected in the master section of the mixer (Owner's Manual p. 175).

● Short phrases less than 0.5 seconds cannot be played back.

A specific channels does not sound

● The volume level of the channel is turned down.

→ When switching between the input mixer and track mixer, recalling Scenes, using Auto Mix, or in other such situation, the actual volume levels may not match the position of the faders. In such cases, bring the faders up or down to match the settings.

● The track is off (the STATUS indicator is off).

● The Master Send switch (Owner's Manual p. 62) is set to "Off."

● The Solo or Mute function (Owner's Manual p. 162) is being used.

● "Cntrl Local" is set to "Off."

→ In this case, fader movements have no effect.

Cannot record

● The recording track has not been selected (the STATUS indicator is not blinking red).

● Recording source tracks, playback tracks, or effects have not been assigned.

● The disk drive has insufficient capacity.

● The song has an insufficient number of events.

Cannot record digitally

● The CD player's digital connection is not accepted.

● The master clock is set to "INT" (Owner's Manual p. 75).

● The DIGITAL IN connector (optical or coaxial) was not properly selected.

● The sampling rate of the recording destination song is different than the sampling rate of the digital audio device.

→ Match the sample rate setting of the digital audio device to the setting of the song. If it is not possible to change the sample rate of the digital audio device, create a new song with that sample rate.

● The digital signal is not being transmitted from the digital audio device.

→ Some digital audio devices do not output a digital signal unless they are in play mode. If this is the case, put your digital audio device in standby (pause) mode before putting the VS-1680 into record mode.

● The digital signal format is different.

→ Some digital audio devices may use a special digital signal format. Please connect to a digital audio device that is compatible with S/P DIF.

Noise and distortion appear in the recorded sound

● Input sensitivity settings are incorrect.

→ If input sensitivity settings are too high, the recorded sound will be distorted. Conversely, if they are too low, the recorded sound will be obscured by noise. Adjust the INPUT knobs so that the level meters move at as high a level as possible, within the range of -12 dB to 0 dB.

● The equalizer is being used with the input mixer.

→ Some equalizer settings may cause the sound to distort even if the PEAK indicator does not light. Readjust the equalizer.

● "ATT" (Attenuation) setting is incorrect. (Owner's Manual p. 174)

→ If noise or distortion occurred as a result of track bouncing, the track output levels were too high.

The playback pitch is strange

● The Vari-Pitch function is turned on (the VARI PITCH indicator is lit).

● The time compression/expansion function is being used (Owner's Manual p. 90).

Disk drive problems

The internal hard disk is not being recognized

● The hard disk has not been installed correctly.

● "IDE Drive" is set to "Off" (Owner's Manual p. 189).

● The "Partition" settings are not right.

→ When a high-capacity hard disk is installed in the VS-1680, we recommend setting the partition size to "2000MB."

The Zip drive is not recognized

● The Zip drive is not connected correctly.

● The same device ID number is assigned to two or more SCSI devices (Zip drives , CD-R drives, etc.).

● The Zip drive has not been initialized (Owner's Manual p. 111).

● No Zip disk is inserted in the drive.

→ When switching Zip disks, be sure to select the newly inserted disk as the current drive.

● An archives copy Zip disk is inserted.

Internal Effects

Effects cannot be used

● The VS8F-2 has not been installed correctly.

● Only one VS8F-2 has been installed (when EFFECT B cannot be used).

● You are attempting to select the algorithm for Reverb, Gated Reverb, Vocoder 2, or Voice Transformer with EFX2 or EFX4.

● You are attempting to select the algorithm for Vocoder 2 or Voice Transformer with EFX1 or EFX3 (p. 105, 106).

CD-R Drive Problems

The CD-R drive is not being recognized

● The CD-R drive is not connected correctly.

● The same device ID number is assigned to two or more SCSI devices (Zip drives , CD-R drives, etc.).

● No CD-R disc is inserted in the drive.

● A CD-R drive that is not designated by Roland.

Cannot write to CD-R discs

● The song's sample rate is set to something other than 44.1 kHz (Owner's Manual p. 58).

● No IDE hard disk is installed.

● The internal IDE hard disk does not have sufficient free disk space (Owner's Manual p. 169).

● The CD-R disc does not have sufficient free space.

● You are trying to write to a commercial CD software disc.

● You are trying to write to a CD-R disc that has been finalized.

MIDI Devices

With the VS-1680 as master, the sequencer does not respond to commands

● The MIDI cable is not connected correctly.

● The MIDI cable is broken.

● The MIDI Thru switch is not set to "Out" (Owner's Manual p. 129).

● "Sync Gen." (the sync generator) is not set to the appropriate synchronization method (MTC, MIDI Clock, Sync Track) (Owner's Manual p. 133).

● The EXT indicator is blinking ("Sync Source" is set to "EXT").

● The two devices are not set to the same type of MTC (during MTC synchronization).

● The MIDI clock data has not been recorded on the sync track (if you are using the sync track for synchronization).

● The settings of the MIDI sequencer are not correct.

● The MIDI sequencer is not ready to playback.

When synchronizing using a MIDI sequencer as the master, the VS-1680 does not respond to the sequencer messages

● The MIDI cable is not connected correctly.

● The MIDI cable is broken.

● You are trying to synchronize using the MIDI clock.

→ The VS-1680 cannot be run in slave mode using a method other than MTC.

● The EXT indicator is off ("Sync Source" is set to "INT").

● The two devices are not set to the same type of MTC (during MTC synchronization).

● The settings of the MIDI sequencer are not correct.

● The MIDI sequencer is not in playback standby mode (with the PLAY indicator blinking).

● MTC reception is in poor condition.

→ Setting the Sync Error Level to "5" or higher may improve conditions.

With a video device as the master, the VS-1680 does not respond

● The cable connected to the L-connector or the MIDI cable is not properly connected.

● The MIDI cable is broken.

● The EXT indicator is off ("Sync Source" is set to "INT").

● "SysEX.Rx." (System Exclusive Receive Switch) is not set to "On."

● "MMC" (MMC mode) is not set to "SLAVE."

The MTC frame rate of the video device differs from that of the SI-80S (Roland Video MIDI Sync Interface), or the video and the VS-1680 are not set to the same type of MTC.

● MTC reception is in poor condition.

→ Setting the Sync Error Level to "5" or higher may improve conditions.

Other problems

Data on the disk drive was not saved properly

The VS-1680's power was turned off without performing the shutdown process.

● The power was turned off while the disk drive was operating.

● A strong shock was applied to the disk drive.

● The disk drive or SCSI cable was connected or disconnected while the power was still turned on.

→ Reinitialize the disk drive (and also execute physical formatting) (Owner's Manual p. 111). Also, we recommend that you execute Surface Scan as well (Owner's Manual p. 113).

Q&A

I just got the VS-1680. Can I use it right away?

The VS-1680 is an audio recording device. Please first prepared the following items.

• Internal hard disk (HDP-88 series)

• Audio device to take the Master output, or stereo headphones

• Instruments and mics, as well as a CD player and other devices for recording

Furthermore, by setting up the following pieces of equipment, you can get even greater performance from the VS-1680.

• Effect expansion board (VS8F-2)

• Zip drive

• CD-R Drive (which is designated by Roland)

• DAT Recorder

  Etc.

Can I use my computer's internal Zip drive to play VS-1680 song data saved on a Zip disk?

The VS-1680 song data format is particular to the VS-1680. Other than VS-880 data ported (Song Export) to the VS-1680, the data cannot be handled by other devices.

How long can I record for?

This size (capacity) of the hard disk, sample rate, and recording mode all have an effect. For example, using a 2.1 GB hard disk (HDP88-2100), the following guideline shows the approximate recording time (in track minutes, calculated for one track).

	Sample Rate		
Recording Mode	48.0 kHz	44.1 kHz	32.0 kHz
Multi-Track Pro	742 mins.	808 mins.	1114 mins.
Mastering	370 mins.	404 mins.	556 mins.
Multi-Track 1	742 mins.	808 mins.	1114 mins.
Multi-Track 2	990 mins.	1078 mins.	1484 mins.
Live 1	1188 mins.	1292 mins.	1782 mins.
Live 2	1484 mins.	1616 mins.	2228 mins.

(All times approximate)

How many tracks can I record at the same time?

You can record up to 8 tracks simultaneously, regardless of recording mode and sample rate.

How many tracks can I play back at the same time?

You can play back up to 16 tracks simultaneously. One of the 16 V-tracks on each track is selected for playback. However, when "MAS" is designated as the recording mode, the VS-1680 functions as an 8-track recorder (on Tracks 1–8).

What's the difference between regular scrub and the VS-1680's scrub function?

Scrub in traditional tape format multi-track recording scrub and the VS-1680's scrub function are not the same thing. Traditionally, scrub emulates rotating the tape reels by hand. Therefore, it is necessary to slow the tape down to the appropriate speed to allow accuracy in finding the beginning of a sound. This slows the playback speed, resulting in a big pitch drop, making it difficult to determine the actually spot on the tape. Thus, the VS-1680 features "Scrub Preview," allowing looped playback of very short segments.

I tried to record a commercial audio CD by connecting the player to the DIGITAL IN connector, but "Can't REC CD" appeared in the display, and I couldn't continue with the procedure.

When new, the VS-1680 cannot make digital connections with CD players.
Please refer to "Recording Digital Signals" (Owner's Manual p. 74).

When I tried to execute Track Copy on a very short segment of a song, nothing sounded, neither the source data nor the sound of the copy.

Phrases shorter than 0.5 seconds cannot be played on the VS-1680. If you happen to create extremely short Phrases using Track Edit or Phrase Edit, it may seem that the audible sound up to that point sound has been deleted. When you cut and paste this kind of short phrase, it is treated like sampled percussion sounds or a sound effect. As a rule of thumb, make phrases at least one second long.

After track bouncing I erased the source track using Track Erase, but the free capacity on the hard disk didn't increase.

When you carry out Track Cut, Track Erase, or Phrase Delete, the apparent performance data disappears. However, due to the Undo function, the erased performance data is not deleted from the hard disk. When you want to increase hard disk free space, use Song Optimize. (Owner's Manual p. 169)

How long does time compression take?

For each track, it takes about nine times the playback time. For example, if you have a five-minute song that uses eight tracks, then compression takes 8 (tracks) x 5 (minutes) x 9 = 360 minutes.

I tried to start making a new song, but "Song Protected" appeared in the display, and I couldn't continue with the procedure.

This is because the demo song that is saved on the internal hard disk has Song Protect on it. When "STORE Current?" appears in the display, press [NO]. Alternatively, remove Song Protect (Owner's Manual p. 82). However, doing this may result in changes to the content of the demo song.

The PLAY indicator just blinks green. I can't record or play back, even when I press the [PLAY] button.

When the EXT SYNC indicator is on, the VS-1680 is receiving MTC receive standby messages from the external MIDI device. Operate the external MIDI device or press [STOP]. When "PowerOFF/RESTART" appears in the display it means that the shutdown procedure is being performed. Hold down [SHIFT] and press [PLAY (RESTART)]. This restarts the VS-1680.

All of the tracks have something recorded on them. How can I bounce these tracks?

With the VS-1680, you can perform track bouncing on the same track. However, when you do this, each record or playback track is counted as a single track, with a limit of 16 tracks in total. For example, when you set the routing so that Track 1 is bounced to Track 1, then the STATUS indicator for Track 15/16 goes off, indicating the Track 16 is now not being played back.

Effects

I'd like to change the order of an effect algorithm.

The connection orders cannot be altered. They can only be turned on or off. For more detailed information on what goes on with the algorithm orders, please refer to the "Algorithm List" (p. 81).

To use the mic simulator effectively, what kind of mic do you recommend?

We recommend using the Roland DR-20 mic. As input for the mic simulator, with the DR-20, you can select small dynamic mic input, headset type dynamic mic input, ultra-compact condenser mic input, or line input. In addition, as an effect preset Patch, an effective mic emulator is set up assuming that the DR-20 will be used as input.

Can a different mic simulator Patch be assigned to each of the sounds being input to INPUT 1–4?

Yes. For example, assign the main vocal to INPUT 1, electric guitar to INPUT 2, bass to INPUT 3 and so on, and if you want to create the atmosphere available when recording with a studio mic setup, set "LINK" to "Off" (p. 121).

Zip Drives

Can I connect and disconnect SCSI cables while the power is turned on?

Never do this. Terminator power is supplied to SCSI connectors. Connecting and disconnecting SCSI cables while the power is turned on may result in malfunctioning, so when connecting SCSI cables, always be sure to turn off the power to all connected devices.

How long does it take to copy to Zip disks?

Below is a chart that roughly shows the time it takes (in track minutes) to make a playable or archive copy to one Zip disk (100 MB), calculated for one track. However, with archive copies, you can also back up songs that contain more than 100 MB of memory, dividing the song onto multiple Zip disks.

	Sample Rate		
Recording Mode	48.0 kHz	44.1 kHz	32.0 kHz
Multi-Track Pro	34 mins.	37 mins.	52 mins.
Mastering	17 mins.	18 mins.	26 mins.
Multi-Track 1	34 mins.	37 mins.	52 mins.
Multi-Track 2	46 mins.	50 mins.	69 mins.
Live 1	55 mins.	60 mins.	83 mins.
Live 2	68 mins.	75 mins.	103 mins.

(All times approximate)

I can't initialize the Zip disk.

If initialization is cancelled, with error messages such as "Medium Error," "Not 512 bytes/sector," "Function Failed!" or other messages appearing in the display, the cause is likely one of the following.

- The Zip disk may scratched or be otherwise damaged. Try another (new) disk to check whether or not the same condition reappears.

- The Zip drive may be broken. Connect the Zip drive to a device other than the VS-1680 (e.g., your computer) to see if the drive can initialize disks, read files, and perform other operations normally.

- When there is nothing wrong with either the Zip disk or the Zip drive, contact your Roland Service Center or your dealer.

I initialized an archive copy Zip disk. Is there any way I can restore the data?

Unfortunately, there is no way to restore this data. Playable copies and archive copies have different disk formats. Take precautions such as sticking labels on disks saved as archive type data disks to distinguish the from other disks.

When I tried to initialize a Zip disk, "WRITE PROTECTED" appeared in the display, and I was unable to continue with the procedure.

That Zip disk may have been write-protected on another device (such as your computer). Insert a different disk.

With "Physical Format" set to "On," you can then initialize the disk on the VS-1680. However, in this case, all data on the disk is lost. Check the disk on another device to be absolutely sure there is no necessary data already deleted.

The **Tools DISK** that is included with the Zip drive is also write protected. This Tools DISK is necessary when you want to use Zip disks on computers and other devices, so we recommend that this disk be left as is. Furthermore, the VS-1680 cannot add or delete the protect on the Tools DISK.

MIDI

When I synchronized the VS-1680 with a MIDI sequencer, the VS-1680 mixer level and pan settings changed by themselves.

The VS-1680 receives Control Change messages as well as System Exclusive messages. When set to receive Control Change messages transmitted by a MIDI sequencer, the VS-1680's mixer can be controlled by external devices. When this feature is not needed, set the "Control Type" to "Off" (Owner's Manual p. 195).

DAT

When I connected a DAT recorder to the VS-1680's DIGITAL IN and DIGITAL OUT, the sound was noisy.

The digital signals are travelling in a loop. When you connect a DAT recorder's DIGITAL OUT connector to the DIGITAL IN connector on the VS-1680, the VS-1680 is synchronized to the DAT recorder's digital clock. Then, if while in this condition you connect a the VS-1680's DIGITAL OUT connector to the DIGITAL IN connector on the DAT recorder, the DAT recorder then becomes synchronized to the VS-1680's digital clock. In other words, having no single reference cock to synchronize everything causes instability and loss of synchronization. When you want to record using the VS-1680, set the DAT recorder's input to analog. Conversely, if you want to use the DAT recorder to record, set the VS-1680's Master Clock to "Internal."

Instead of using DAT, can I back up songs on MDs?

You cannot back up data on MDs. As data on MDs is compressed before being recorded, the VS-1680's song data would also be compressed before recording, making it unrecoverable. DCC also cannot be used in backing up data for the same reason.

CD-R Drives

Can't I use a CD-R drive other than the CD-R drive that is designated by Roland?

The VS-1680 can use the CD-R drive that is designated by Roland only. Other CD-R drives cannot be used.

What kind of disks does it use?

Any CD-R disc can be used, regardless of recording length. However, CD-RW discs cannot be used.

Can song data be written to the discs in Macintosh AIFF File format?

No. Only audio CDs and CD-Rs for backup are supported by the VS-1680.

I made an audio CD on the CD-R drive, but it doesn't play on my consumer CD player.

The finalized process was not carried out. When making audio CDs, set "Finalize" to "On" or "OnlyFin." (Owner's Manual p. 122).

Error Messages

Aborted Command!
Illegal Request!
This disk drive cannot be used by the VS-1680.

Already Selected
The currently selected disk drive was selected. If you wish to switch to another disk drive, re-select the disk drive.

Arbitration Failed!
Busy Status!
Check Condition!
Status Error!
Normal communication with the disk drive could not be accomplished. Make sure that the disk drive is connected correctly.

Blank Disc
You have tried to run the CD player function using a disc that has no performance data on it. Insert a commercial CD or CD-R with material already recorded on it.

Can't Communicate!
Drive Time Out!
Message Error!
Phase Mismatch!
Undefined Sense!
Drive Unknown Error!
There is a problem with the connections to the disk drive. Make sure that the disk drive is connected correctly.

Can't REC CD!
With the factory setting, digital connections cannot be made with a CD player. Please read "To Recording Digital Signals" (Owner's Manual p. 74).

Can't Recover
The drive check Recover procedure could not be executed because there was insufficient free space on the disk. Delete unneeded songs. Alternatively, perform the Song Optimize procedure.

Can't Set Marker
No more than two track number mark points can be set within a four-second interval.

Change Int CLK?
No digital signal is being received at the DIGITAL IN connector. Select whether or not to switch the sample rate reference clock to the internal clock. Pressing [YES] switches the VS-1680 to the internal clock. After checking to make sure that all digital devices are properly connected and those sample rates for all devices match, carry out the operation once more.

Digital In Lock
The sample rate reference clock is set to the digital signal coming from the DIGITAL IN connector. You can record using the digital connection.

Digital In Unlock
The digital signal is not being input through the DIGITAL IN connector, or the sample rate set for the song and the sample rate of the digital device connected to the DIGITAL IN connector are different. In this state, you cannot record using the digital connection.
The sample rate specified for the song is different than the sample rate of the digital device connected to the DIGITAL IN connector. Press [YES], and set the sample rates of both devices to match.

Disk Memory Full!
There is insufficient free area on the disk. Erase unneeded data. Or, select a different disk drive.
The maximum number of songs that can be recorded on one partition (200) has been exceeded. Delete unneeded songs. Or, select a different disk drive.

Drive Busy!
If this message appears when you first begin using a disk drive with the VS-1680, the disk drive is not fast enough. When using this disk, create a new song with a lower sample rate or recording mode, and record using this song.
If this message appears after you have been using the disk drive with the VS-1680, the data on the disk drive has become fragmented, causing delays in reading and writing data. Either use the track bouncing operation to re-record playback data to another track, or use the optimize operation. If the same message appears even after these measures have been taken, copy the song data to another disk drive and initialize the disk drive that produced the problem.

Event Memory Full!
The VS-1680 has used up all the events that can be handled by one song. Delete unneeded auto mix data. Alternatively, perform the Song Optimize operation.

Error Messages

Finalized CD!
This message appears when an attempt is made to write to a commercial CD or a finalized CD-R disc. Replace the disc with a blank disc or one that has not been finalized.

Hardware Error!
There is a problem with the disk drive. Contact the manufacturer or dealer of the disk drive.

Lack of CD-R Memory!
There is insufficient free space to write the songs to the CD-R disc.

Lack of EVENT!!
You have tried to record AutoMix data in realtime, when the remaining number of EVENT is less than 1000. Or, You have tried to UNDO or REDO when the remaining number of Event is less than 200. You cannot continue the current operation.

Lack of IDE Memory!
There is insufficient free space on the internal IDE hard disk to make the image data file.

MARKER Memory Full!
The VS-1680 has used up all Marker Memory (1000 Markers) that can be handled by one song. Delete unneeded Marker.

Medium Error!
There is a problem with the disk drive media. This disk cannot be used by the VS-1680. In some case's recovery can be achieved by executing Drive Check (Owner's Manual p. 178).

No CD-R Drive!
Either no CD-R drive is connected, or the power is not turned on.

No Data to Write
The track that you have selected to write to CD-R disc contains no song data.

No Disc
There is no disc in the CD-R drive. Please insert a disc.

No Drive Ready
No disk drive is connected. Or, an internal hard disk is not installed. Make sure that the disk drive is connected correctly.

No Effect Board A
No Effect Board B
A VS8F-2 effect expansion board (sold separately) is not installed. This operation can be performed only if a VS8F-2 is installed.

No IDE Drive!
The unit has no IDE-type disk drive. Install an internal hard disk.

No Target Selected!
The tracks or the phrases are not selected for edit.

Not 44.1k Song!
The sample rate of the song is not 44.1 kHz, so the data cannot be written to the CD-R disc.

Not 512byte/sector
The disk that you are using is not 512 bytes/sector. This disk cannot be used by the VS-1680.

Not Ready!
The disk drive is not ready. Wait a short time.

Obey Condition?
This message asks if you agree to the terms and conditions regarding the reproduction, broadcast, and sale of the software. Please carefully read the License Agreement.

Please Insert CD-R Disc!
Either the CD-R drive loading tray is still open, there is no CD-R disc loaded, or the CD-R drive is otherwise not ready. Insert CD-R disc.

Please Wait...
Operation is in progress. Please wait momentarily.

SCSI ID Error!
The SCSI ID numbers of two or more disk drives are conflicting. Make settings so that the SCSI ID numbers do not conflict.

SPC Not Available!
The SCSI components of the VS-1680 have malfunctioned. Contact servicing by your dealer or qualified Roland service personnel.

Song Protected!
Since Song Protect is ON, the operation cannot be executed.

TOC Read Error!
An error occurred in reading from the CD-R disc.
There is a problem with the CD-R drive or the CD-R disc.

Too Many Markers!
You have tried to set track number mark points in excess of the maximum (98) you can set for one disc.

Unformatted!
The disk drive has not been initialized by the VS-1680. Initialize the disk drive.
If this appears for a disk drive that has been initialized by the VS-1680, there is a problem with the connections to the disk drive. Make sure that the disk drive is connected correctly.

User Aborted!
The procedure has canceled by pressing [EXIT(NO)].

Write Another?
Writing to the disc is complete. Select whether or not you want to write the same data to a new disc. Press [YES] or [NO].

Write Protected!
The disk drive is protected.

Special Key Operations

Here is a list of the functions that can be performed by pressing multiple buttons, or using the TIME/VALUE dial in conjunction with a button.

SELECT/CH EDIT buttons

[SHIFT] + Input Channel [SELECT 1]:	To the Pan setting page (Input Mixer, PRM.V)
[SHIFT] + Input Channel [SELECT 2]:	To the Attenuation setting page (Input Mixer, PRM.V)
[SHIFT] + Input Channel [SELECT 3]:	To the equalizer low setting page (Input Mixer, PRM.V)
[SHIFT] + Input Channel [SELECT 4]:	To the equalizer mid setting page (Input Mixer, PRM.V, 3bandEQ)
[SHIFT] + Input Channel [SELECT 5]:	To the equalizer high setting page (Input Mixer, PRM.V)
[SHIFT] + Input Channel [SELECT 6]:	To the EFX1 setting page (Input Mixer, PRM.V)
[SHIFT] + Input Channel [SELECT 7]:	To the link setting page (Input Mixer, PRM.V)
[SHIFT] + Track Channel [SELECT 1]:	To the Pan setting page (Track Mixer, PRM.V)
[SHIFT] + Track Channel [SELECT 2]:	To the Attenuation setting page (Track Mixer, PRM.V)
[SHIFT] + Track Channel [SELECT 3]:	To the equalizer low setting page (Track Mixer, PRM.V)
[SHIFT] + Track Channel [SELECT 4]:	To the equalizer mid setting page (Track Mixer, PRM.V, 3bandEQ)
[SHIFT] + Track Channel [SELECT 5]:	To the equalizer high setting page (Track Mixer, PRM.V)
[SHIFT] + Track Channel [SELECT 6]:	To the EFX1 setting page (Track Mixer, PRM.V)
[SHIFT] + Track Channel [SELECT 7]:	To the link setting page (Track Mixer, PRM.V)
[SHIFT] + Track Channel [SELECT 8]:	To the v-track setting page (Track Mixer, PRM.V)

[STATUS] + SELECT buttons : **(1–8, DIGITAL, 1–15/16)**	Select source to be recorded on the track
[ST IN] + Input Channel SELECT buttons: **(1–8, DIGITAL)**	Select source to Stereo In function
[EFFECT 1/3 RTN] + SELECT buttons: **(1–8, DIGITAL, 1–15/16)**	Select the Send switch setting to EFX1 bus (off/pre/post)
[EFFECT 2/4 RTN] + SELECT buttons: **(1–8, DIGITAL, 1–15/16)**	Select the Send switch setting to EFX2 bus (off/pre/post)
[SHIFT] + [EFFECT 1/3 RTN] + SELECT buttons: **(1–8, DIGITAL, 1–15/16)**	Select the Send switch setting to EFX3 bus (off/pre/post)
[SHIFT] + [EFFECT 2/4 RTN] + SELECT buttons: **(1–8, DIGITAL, 1–15/16)**	Select the Send switch setting to EFX4 bus (off/pre/post)
[SHIFT] + [SOLO(EDIT)]:	Solo mode on/off
[SOLO(EDIT)] + SELECT buttons: **(1–8, DIGITAL, 1–15/16)**	Solo function on/off (each channel)
[CLEAR] + [SOLO(EDIT)]:	Solo function off (all channel)
[MUTE(FADER)] + SELECT buttons: **(1–8, DIGITAL, 1–15/16)**	Mute function on/off (each channel)
[CLEAR] + [MUTE(FADER)]:	Mute function off (all channel)
[AUTOMIX] + SELECT buttons: **(1–8, DIGITAL, 1–15/16)**	Automix setting of each channel (when Automix is "on")

Transport Control buttons

[SHIFT] + [STORE(ZERO)]:	Store song data to the disk drive
[SHIFT] + [SONG TOP(REW)]:	Move to the time where the first sound of the song is recorded
[SHIFT] + [SONG END(FF)]:	Move to the time where the last sound of the song is recorded
[SHIFT] + [SHUT/EJECT(STOP)]:	Shut down
[SHIFT] + [RESTART(PLAY)]:	Restart (after shut down)
[REC] + STATUS buttons:	Switch the status to REC (indicator blinks red)
[STOP] + STATUS buttons:	Switch the status to PLAY(indicator lights green)

LOCATOR/SCENE buttons

[CLEAR] + LOCATOR buttons(1–8):	Clear the setting of locators
[CLEAR] + [TAP]:	Erase a marker
[SHIFT] + [CLEAR] + [TAP]'[YES]:	Erase all markers
[BANK] + LOCATOR buttons(1–8):	Switch the locator bank
[SCENE] + [TAP]:	Execute snapshot (When Automix is "on")
[SCENE] + [PREVIOUS]:	Gradation to mixer setting of previous marker (when Automix is "on")
[SCENE] + [NEXT]:	Gradation to mixer setting of next marker (when Automix is "on")
[SCENE] + [REC]:	Automix Realtime recording (when Automix is "on.")
[SHIFT] + [SCENE]:	Transmit the condition of the digital mixer as MIDI data from MIDI OUT connector
[SHIFT] + [START(1)]:	Enter the current time as track edit start point. If it has been already set, move to that time (except track condition).
[SHIFT] + [END(2)]:	Enter the current time as track edit end point. If it has been already set, move to that time (except track condition).
[SHIFT] + [FROM(3)]:	Enter the current time as track edit from point. If it has been already set, move to that time (except track condition).
[SHIFT] + [TO(4)]:	Enter the current time as track edit to point. If it has been already set, move to that time (except track condition).
[SHIFT] + [CLEAR] + [START(1)]:	Clear the track edit start point (except track condition)
[SHIFT] + [CLEAR] + [END(2)]:	Clear the track edit end point (except track condition)
[SHIFT] + [CLEAR] + [FROM(3)]:	Clear the track edit from point (except track condition)
[SHIFT] + [CLEAR] + [TO(4)]:	Clear the track edit to point (except track condition)
[SHIFT] + [PREVIOUS]:	If there is a phrase on current time, move to the beginning of that phrase. If not, move to the end of the previous phrase (when PREVIOUS/NEXT Sw is "MARKER"). Move to the previous marker (when PREVIOUS/NEXT Sw is "PHRASE")

Special Key Operations

[SHIFT] + [NEXT]:	If there is a phrase on current time, move to the end of that phrase. If not, move to the beginning of the next phrase (when PREVIOUS/NEXT Sw is "MARKER"). Move to the next marker (when PREVIOUS/NEXT Sw is "PHRASE")
[PLAY (DISPLAY)] + [TAP]:	Register a marker for audio CD track number

FUNCTION buttons

[SHIFT] + [F1]:	To Song condition
[SHIFT] + [F2]:	To Track condition
[SHIFT] + [F3]:	To Effect condition (EFFECT A)
[SHIFT] + [F4]:	To Effect condition (EFFECT B)
[SHIFT] + [F5]:	To System condition
[SHIFT] + [F6]:	To Utility condition

Other

[SHIFT] + [PAGE]:	Popup the Jump setting page
[SHIFT] + [PLAY]:	Switch the Graphic display
[SHIFT] + [SCRUB]:	Popup the Scrub length setting page
[SHIFT] + [TO]:	Popup the Preview to length setting page
[SHIFT] + [FROM]:	Popup the Preview from length setting page
[SHIFT] + [VARI PITCH]:	Popup the Vari pitch setting page
[SHIFT] + [UNDO]:	Popup the Redo setting page (when the UNDO indicator is lit)
[SHIFT] + [TAP]:	To the Tempo map setting page
[SHIFT] + [EXT SYNC]:	To the Sync source setting page
[SHIFT] + [LOOP]:	To the loop start/end point setting page
[SHIFT] + [AUTO PUNCH]:	To the punch in/out point setting page
[SHIFT] + [▲] [▼]:	Move the range of display to edit (Pane)
[SHIFT] + TIME/VALUE dial:	Modify the value at 10 times the usual speed. In Play condition when the cursor is displayed at the sub frame of the time code display, move the current time in units of approximately 1/100 frame.
STATUS button + [CLEAR]:	Cancel the all routing of mixer section.

Parameter List

* If Stereo Link is On, the "Pan" parameter will change to the balance parameter.

* If two VS8F-2 (s) are installed in your VS-1680, the "AUX1" will change to the "EFX1," the "AUX2" will change to the "EFX2," the "AUX3" will change to the "AUX."

Parameter name	Display	Value	Initial value
Master Send Pan/Balance	Pan	L63–0–R63	0
Equalizer Switch	EQ Sw	Off, On	Off
Equalizer Select	-	2 Band EQ, 3 Band EQ	2 Band EQ
Equalizer Low Gain	Low G	-12–12 dB	0 dB
Equalizer Low Frequency	Low F	40 Hz–1.5 kHz	300 Hz
Equalizer Mid Gain	Mid G	-12–12 dB	0 dB (*1)
Equalizer Mid Frequency	Mid F	200 Hz–8 kHz	1.4 kHz (*1)
Equalizer Mid Q	Mid Q	0.5–16	0.5 (*1)
Equalizer High Gain	High G	-12–12 dB	0 dB
Equalizer High Frequency	High F	500 Hz–18 kHz	4 kHz
Effect Switch (1–2)	EFX* (1–2)	Off, Pre, Pst	Off
Effect Send Level	-	0–127	100 (*2)
Effect Pan/Balance	-	L63–0–R63	0 (*2)
AUX Switch	AUX* (1–3)	Off, Pre, Pst	Off
AUX Level	-	0–127	100 (*3)
AUX Pan/Balance	-	L63–0–R63	0 (*3)
Effect Insert Switch (1–4)	EFXIns (1–4)	Off, Ins, InsL, InsR, InsS	Off
Effect Insert Send Level (1–4)	Snd	-42–6 dB	0 dB (*4)
Effect Insert Return Level (1–4)	Rtn	-42–6 dB	0 dB (*4)
Stereo Link	Link	Off, On	Off
Attenuation	ATT	-42–6 dB	0 dB
Phase	Phase	NRM, INV	NRM
Level Meter	Meter	Pre, Pst	Pre
Solo	Solo	Off, On	Off
Mute	Mute	Off, On	Off
Fader	Fader	0–127	100

*1 Valid when Equalizer Select is "3 Band EQ."

*2 Valid when Effect Switch is except "Off."

*3 Valid when AUX Switch is except "Off."

*4 Valid when Effect Insert Switch is except "Off."

Parameter List

Stereo In/Effect Return

Parameter name	Display	Value	Initial value
Stereo In Select	StereoIn Select	Off, Input 1/2, Input 3/4, Input 5/6, Input 7/8, Digital	Off
Stereo In Level	-	0–127	100 (*1)
Stereo In Balance	-	L63–0–R63	0 (*1)
Effect Return Level	-	0–127	100
Effect Return Balance	-	L63–0–R63	0
Solo	Solo	Off, On	Off
Mute	Mute	Off, On	Off

*1 Valid when Stereo In Select is except "Off."

Track Mixer

* If Stereo Link is On, the "Pan" parameter will change to the balance parameter.

* If two VS8F-2 (s) are installed in your VS-1680, the "AUX1" will change to the "EFX1," the "AUX2" will change to the "EFX2," the "AUX3" will change to the "AUX."

Parameter name	Display	Value	Initial value
Master Send Pan/Balance	Pan	L63–0–R63	0
Equalizer Switch	EQ Sw	Off, On	Off
Equalizer Select	-	2 Band EQ, 3 Band EQ	2 Band EQ
Equalizer Low Gain	Low G	-12–12 dB	0 dB
Equalizer Low Frequency	Low F	40 Hz–1.5 kHz	300 Hz
Equalizer Mid Gain	Mid G	-12–12 dB	0 dB (*1)
Equalizer Mid Frequency	Mid F	200 Hz–8 kHz	1.4 kHz (*1)
Equalizer Mid Q	Mid Q	0.5–16	0.5 (*1)
Equalizer High Gain	High G	-12–12 dB	0 dB
Equalizer High Frequency	High F	500 Hz–18 kHz	4 kHz
V-track	V.Trk	1–16	1
Effect Switch (1–2)	EFX* (1–2)	Off, Pre, Pst	Off
Effect Send Level	-	0–127	100 (*2)
Effect Pan/Balance	-	L63–0–R63	0 (*2)
AUX Switch	AUX* (1–3)	Off, Pre, Pst	Off
AUX Level	-	0–127	100 (*3)
AUX Pan/Balance	-	L63–0–R63	0 (*3)
Effect Insert Switch(1–4)	EFXIns (1–4)	Off, Ins, InsL, InsR, InsS	Off
Effect Insert Send Level (1–4)	Snd	-42–6 dB	0 dB (*4)
Effect Insert Return Level (1–4)	Rtn	-42–6 dB	0 dB (*4)
Stereo Link	Link	Off, On	Off
Attenuation	ATT	-42–6 dB	0 dB
Phase	Phase	NRM, INV	NRM
Level Meter	Meter	Pre, Pst	Pre
Solo	Solo	Off, On	Off
Mute	Mute	Off, On	Off
Fader	Fader	0–127	100

*1 *Valid when Equalizer Select is "3 Band EQ."*

*2 *Valid when Effect Switch is except "Off."*

*3 *Valid when AUX Switch is except "Off."*

*4 *Valid when Effect Insert Switch is except "Off."*

Marterblock

* *If two VS8F-2 (s) are installed in your VS-1680, the "AUX1" will change to the "EFX1," the "AUX2" will change to the "EFX2," the "AUX3" will change to the "AUX."*

Parameter name	Display	Value	Initial value
Master Level	MASTER	0–127	current Master Fader setting
Master Balance	MASTER	L63–0–R63	0
Monitor Level	MONITOR	0–127	current MONITOR knob setting
Monitor Balance	MONITOR	L63–0–R63	0
AUX A	AUX.A	EFX1, EFX2, AUX1, AUX2, AUX3	AUX1 (*1), AUX (*2)
AUX B	AUX.B	EFX1, EFX2, AUX1, AUX2, AUX3	EFX1
Monitor	MON	MST, EFX1, EFX2,AUX1, AUX2, AUX3, REC, ST IN	MST
Digital Out 1	DOUT1	MST, MON, EFX1, EFX2, AUX1, AUX2, AUX3	MST
Digital Out 2	DOUT2	MST, MON, EFX1, EFX2, AUX1, AUX2, AUX3	MST
Effect Insert Switch(1–4)	EFXIns (1–4)	Off, Ins	Off
Effect Insert Send Level (1–4)	Snd	-42–6 dB	0 dB (*3)
Effect Insert Return Level (1–4)	Rtn	-42–6 dB	0 dB (*3)
Direct Out	DIR OUT	Off, 1–8, 9–16	Off
Effect Send Level	-	0–127	100
Effect Send Balance	-	L63–0–R63	0
AUX Send Level	-	0–127	100
AUX Send Balance	-	L63–0–R63	0

*1 *Valid when any VS8F-2 is not installed, or only one VS8F-2 is installed.*

*2 *Valid when two VS8F-2 effect expansion boards are installed.*

*3 *Valid when Effect Insert Switch is "Ins."*

Parameter List

Parameter name	Display	Value	Initial value
Master clock	Master Clock	DIGIN1, INT, DIGIN2	INT
Time Display Format	Time Display Format	ABS, REL	ABS
Offset	Offset	00h00m00s00–23h59m59s29	00h00m00s00 (*)
Fader Match	Fader Match	Null, Jump	Jump
Undo Message	UNDO Message	Off, On	On
Peak Hold Switch	Peak Hold Sw	Off, On	Off
Scene Mode	Scene Mode	All, KeepF	All
Remaining Display	Remain Display	Time, CapaMB, Capa %, Event	Time
Foot Switch Assign	Foot Sw	Play/Stop, Record, TapMarker, Next, Previous, GPI	Play/Stop
Digital Copy Protect Switch	Digital Copy Protect	Off, On	Off

The settable value for Offset will change slightly depending on the MTC type.

Global Parameter

Parameter name	Display	Value	Initial value
IDE Drive	IDE Drive	Off, On	On
SCSI Self ID	SCSI Self ID	0–7	7
Shift Lock	Shift Lock	Off, On	Off
Measure Display	Measure Display	Always, Auto	Always
Numerics Type	NUMERICS Type	Up, Down	Up
Previous/Next Switch	PREVIOUS/NEXT Sw	PHRASE, MARKER	PHRASE
Input Peak Level	Input Peak Level	CLIP, -3 dB, -6 dB	-6 dB
Switching Time	Switching Time	0.3–2.0 s	0.5 s
CD Digital Recording Switch	CD Digital REC	Off, On	Off
Fan Control	Fan Control	Off, Play, Rec&Play	Off

Play/Rec Parameter

Parameter name	Display	Value	Initial value
Record Monitor	Record Monitor	AUTO, SOURCE	AUTO
Marker Stop	Marker Stop	Off, On	Off
Vari Pitch	Vari Pitch	22.05–50.43 kHz (44.1 kHz) 22.05–50.41 kHz (32 kHz) 22.00–50.48 kHz (48 kHz)	44.10 kHz 32.00 kHz 48.00 kHz
Fade Length	Fade Length	2, 10, 20, 30, 40, 50 ms	10 ms
Scrub Length	Scrub Length	25–100 ms	70 ms
Preview To Length	PREVIEW TO Length	1.0–10.0 s	1.0 s
Preview From Length	PREVIEW FROM Length	1.0–10.0 s	1.0 s

MIDI Parameter

Parameter name	Display	Value	Initial value
Device ID	Device ID	1–32	17
MIDI through Switch	MIDI Thru	Out, Thru	Out
System Exclusive Receive Switch	SysEx.Rx	Off, On	Off
System Exclusive Transmit Switch	SysEx.Tx	Off, On	Off
Control Local Switch	Cntrl Local	Off, On	On
MMC Mode	MMC	Off, MASTER, SLAVE	MASTER
Control Type	Cntrol Type	Off, C.C., Excl	Off
Program Change Scene	P.C.Scene	Off, On	Off
Program Change Effect	P.C.Eff	Off, On	Off
Control Change Effect	C.C.Eff	Off, On	Off

Metronome Parameter

Parameter name	Display	Value	Initial value
Metronome Out	Metronome Out	Off, INT, MIDI	Off
Metronome Mode	Metronome Mode	Rec Only, Rec&Play	Rec Only
Metronome Level	Metro Level	0–127	100
Metronome Channel	MID:MetroCh	1–16	10 (*)
Accent Note	MID:Acc.Note	C_0–G_9	C#2 (*)
Accent Velocity	MID:Acc.Velo	1–127	100 (*)
Normal Note	MID:Nrm.Note	C_0–G_9	C#2 (*)
Normal Velocity	MID:Nrm.Velo	1–127	60 (*)

* Valid when Metronome Out is "MIDI."

Sync/tempo Parameter

Parameter name	Display	Value	Initial value
Sync Source	Sync Source	INT, EXT	INT
Sync Generator	Sync Gen.	Off, MTC, MIDIclk, SyncTr	Off
Error Level	Sync Error Level	0–10	5
Offset	Sync Offset	00h00m00s00–23h59m59s29	00h00m00s00
MTC Type	Sync MTC Type	30, 29N, 29D, 25, 24	30

Sync Track Convert

Parameter name	Display	Value	Initial value
Beat	Beat	1/1–8/1, 1/2–8/2, 1/4–8/4, 1/8–8/8	4/4
Tap Beat	Tap Beat	1–8	4
Sync Track Beat	Sync Trk Beat	1/1–8/1, 1/2–8/2, 1/4–8/4, 1/8–8/8	4/4
Start Time	Start Time	00h00m00s00–23h59m59s29	00h00m00s00
End Time	End Time	00h00m00s00–23h59m59s29	00h00m00s00
Measure	Measure	1–999	1

Tempo Map

Parameter name	Display	Value	Initial value
Tempo Map Number	MAP#	1–50	1
Tempo	♩ =	25.0–250.0	120.0
Measure	MEAS	1–999	1
Beat	BEAT	1/1–8/1, 1/2–8/2, 1/4–8/4, 1/8–8/8	4/4

Drive Initialize

Parameter name	Display	Value	Initial value
Initialize Drive	Init. Drive	IDE, SCSI0–SCSI7	-
Partition	Partition	500, 1000, 2000 MB	2000 MB
Physical Format	Physical Format	Off (Quick), On	Off (Quick)
Surface Scan	Surface Scan	Off, On	Off

Automix

Parameter name	Display	Value	Initial value
Snap Mode	Snap Mode	ALL, MaskFader	ALL
Erase Mode	Erase Mode	Event, Marker	Event
Erase From	Erase From	0–999	-
Erase To	Erase To	0–999	-

MIDI Implementation

Model VS-1680 Version 1.00 Feb. 12 1998

1. TRANSMITTED DATA AND RECOGNIZED RECEIVE DATA

■ Channel Voice Message

● Note On/Off

When "Metronome Out Mode(*1)" in the SYSTEM parameters is "MIDI", MIDI note number/velocity of MIDI channel number which is assigned to the Metronome is transmitted. Received when the effect patch Voice Transformer (algorithm 27) is selected in EFX1 or EFX3, and MIDI Control SW is On.

Status	Second	Third
9nH	mmH	llH

n = MIDI Channel No. : 0H - FH (ch.1-ch.16) (*2)
  0H - 3H (ch.1-ch.4) (*3)
mm = Note No. : 00H - 7FH (0 - 127) (*3)
ll = Velocity : 01H - 7FH (1 - 127) / 00H = NOTE OFF

(*1) See '2. Address Map for Data Transfer' section.
(*2) Only when transmitting Metronome.
(*3) Only when receiving with MIDI Control SW of Voice Transformer is On.
  n = 0, 2 (ch.1, ch 3) : Voice Transformer : Chromatic Pitch
  mm = 24H - 54H (C2 - C6)
  ll = ignored

  n = 1, 3 (ch.2, ch 4) : Voice Transformer : Chromatic Formant
  mm = 24H - 3CH (C2 - C4)
  ll = ignored

● Polyphonic Key Pressure

Transmits the level meter value of VS-1680 according to the value of "Level Meter Tx. via MIDI" (see "2. Data Transfer Address Map"). (MIDI ch. is fixed to 16.)
Ignored when received.
When VS-1680 is booted up, "Level Meter Tx. via MIDI" is set to Off. Level meter value is not transmitted until is it set to On with Data Set (DT1).

Status	Second	Third
AFH	mmH	llH

mm = Note No. : 00H - 27H (0 - 39) (*1)
ll = Level Meter Value : 00H - 36H (0 - 54) (*2)

Level Meter and Note No. (*1)

Level Meter Ch.	Note No.	Level Meter Ch.	Note No.
TRACK MIX CH. 1	0	EFFECT-1 BUS Lch	26
TRACK MIX CH. 2	1	EFFECT-1 BUS Rch	27
TRACK MIX CH. 3	2		
TRACK MIX CH. 4	3	EFFECT-2 BUS Lch	28
TRACK MIX CH. 5	4	EFFECT-2 BUS Rch	29
TRACK MIX CH. 6	5		
TRACK MIX CH. 7	6	EFFECT-3 BUS Lch	30
TRACK MIX CH. 8	7	EFFECT-3 BUS Rch	31
TRACK MIX CH. 9	8		
TRACK MIX CH.10	9	EFFECT-4 BUS Lch	32
TRACK MIX CH.11	10	EFFECT-4 BUS Rch	33
TRACK MIX CH.12	11		
TRACK MIX CH.13	12	AUX BUS Lch	34
TRACK MIX CH.14	13	AUX BUS Rch	35
TRACK MIX CH.15	14		
TRACK MIX CH.16	15	MONITOR Lch	36
		MONITOR Rch	37
INPUT MIX CH. 1	16		
INPUT MIX CH. 2	17	MASTER Lch	38
INPUT MIX CH. 3	18	MASTER Rch	39
INPUT MIX CH. 4	19		
INPUT MIX CH. 5	20		
INPUT MIX CH. 6	21		
INPUT MIX CH. 7	22		
INPUT MIX CH. 8	23		
INPUT MIX CH. 9	24		
INPUT MIX CH.10	25		

Level Meter Value and Level (*2)

Val	Level	Val	Level	Val	Level	Val	Level	Val	Level
0	-∞ dB	11	-30.0dB	22	-17.0dB	33	-8.00dB	44	-2.50dB
1	-51.0dB	12	-28.0dB	23	-16.0dB	34	-7.50dB	45	-2.25dB
2	-48.0dB	13	-26.0dB	24	-15.0dB	35	-7.00dB	46	-2.00dB
3	-46.0dB	14	-25.0dB	25	-14.0dB	36	-6.50dB	47	-1.75dB
4	-44.0dB	15	-24.0dB	26	-13.0dB	37	-6.00dB	48	-1.50dB
5	-42.0dB	16	-23.0dB	27	-12.5dB	38	-5.50dB	49	-1.25dB
6	-40.0dB	17	-22.0dB	28	-12.0dB	39	-5.00dB	50	-1.00dB
7	-38.0dB	18	-21.0dB	29	-11.0dB	40	-4.50dB	51	-0.75dB
8	-36.0dB	19	-20.0dB	30	-10.0dB	41	-4.00dB	52	-0.50dB
9	-34.0dB	20	-19.0dB	31	-9.00dB	42	-3.50dB	53	-0.25dB
10	-32.0dB	21	-18.0dB	32	-8.50dB	43	-3.00dB	54	-0.00dB

● Control Change

Parameters on the Mixer section can be received and transmitted by the control change messages when 'MIDI Mixer Control Type (*1)' in the SYSTEM parameter is set to 'C.C.'

Status	Second	Third
BnH	mmH	llH

n = MIDI Channel No. : 0H - FH (ch.1-ch.16 : see below)
mm = Mixer Parameter No. : (see below)
ll = Mixer Parameter Value : 00H - 7FH (0 - 127) (*1)

Mixer Parameter and MIDI Channel/Control Change No.

<Channel Strip>

TRACK MIX CH.	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
MIDI ch. ->	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
TRACK STATUS(*3)	3	->	->	->	->	->	->	->	->	->	->	->	->	->	->	->
MST Send Level	7	->	->	->	->	->	->	->	->	->	->	->	->	->	->	->
MST Send Pan	10	->	->	->	->	->	->	->	->	->	->	->	->	->	->	->
EQ L Freq.	12	->	->	->	->	->	->	->	->	->	->	->	->	->	->	->
EQ L Gain	13	->	->	->	->	->	->	->	->	->	->	->	->	->	->	->
EQ M Freq.	14	->	->	->	->	->	->	->	->	->	->	->	->	->	->	->
EQ M Gain	15	->	->	->	->	->	->	->	->	->	->	->	->	->	->	->
EQ M Q	16	->	->	->	->	->	->	->	->	->	->	->	->	->	->	->
EQ H Freq.	17	->	->	->	->	->	->	->	->	->	->	->	->	->	->	->
EQ H Gain	18	->	->	->	->	->	->	->	->	->	->	->	->	->	->	->
EFX1 SND Level	19	->	->	->	->	->	->	->	->	->	->	->	->	->	->	->
EFX1 SND Pan/Bal	20	->	->	->	->	->	->	->	->	->	->	->	->	->	->	->
EFX2 SND Level	21	->	->	->	->	->	->	->	->	->	->	->	->	->	->	->
EFX2 SND Pan/Bal	22	->	->	->	->	->	->	->	->	->	->	->	->	->	->	->
EFX3 SND Level	23	->	->	->	->	->	->	->	->	->	->	->	->	->	->	->
EFX3 SND Pan/Bal	24	->	->	->	->	->	->	->	->	->	->	->	->	->	->	->
EFX4 SND Level	25	->	->	->	->	->	->	->	->	->	->	->	->	->	->	->
EFX4 SND Pan/Bal	26	->	->	->	->	->	->	->	->	->	->	->	->	->	->	->
AUX Send Level	27	->	->	->	->	->	->	->	->	->	->	->	->	->	->	->
AUX Send Pan/Bal	28	->	->	->	->	->	->	->	->	->	->	->	->	->	->	->
MST Offset Level	29	—	->	—	->	—	->	—	->	—	->	—	->	—	->	—
MST Offset Balance	30	—	->	—	->	—	->	—	->	—	->	—	->	—	->	—

INPUT MIX	CH.	1	2	3	4	5	6	7	8	9	10
MIDI ch. ->		1	2	3	4	5	6	7	8	9	10
MST Send Level		68	->	->	->	->	->	->	->	->	->
MST Send Pan/Bal		70	->	->	->	->	->	->	->	->	->
EQ L Freq.		71	->	->	->	->	->	->	->	->	->
EQ L Gain		72	->	->	->	->	->	->	->	->	->
EQ M Freq.		73	->	->	->	->	->	->	->	->	->
EQ M Gain		74	->	->	->	->	->	->	->	->	->
EQ M Q		75	->	->	->	->	->	->	->	->	->
EQ H Freq.		76	->	->	->	->	->	->	->	->	->
EQ H Gain		77	->	->	->	->	->	->	->	->	->
EFX1 SND Level		78	->	->	->	->	->	->	->	->	->
EFX1 SND Pan/Bal		79	->	->	->	->	->	->	->	->	->
EFX2 SND Level		80	->	->	->	->	->	->	->	->	->
EFX2 SND Pan/Bal		81	->	->	->	->	->	->	->	->	->
EFX3 SND Level		82	->	->	->	->	->	->	->	->	->
EFX3 SND Pan/Bal		83	->	->	->	->	->	->	->	->	->
EFX4 SND Level		84	->	->	->	->	->	->	->	->	->
EFX4 SND Pan/Bal		85	->	->	->	->	->	->	->	->	->
AUX Send Level		86	->	->	->	->	->	->	->	->	->
AUX Send Pan/Bal		87	->	->	->	->	->	->	->	->	->
MST Offset Level		88	—	->	—	->	—	->	—	->	—
MST Offset Balance		89	—	->	—	->	—	->	—	->	—

stereo in & effect return

	ST IN	Eff1	Eff2	Eff3	Eff4
MIDI ch. ->	11	12	13	14	15
		->	->	->	->
MST Send Level	68	->	->	->	->
MST Send Balance	70	->	->	->	->

<MASTER Block> MIDI ch.=16

Master Level	68
Master Balance	70
EFX1 SND Level	78
EFX1 SND Balance	79
EFX2 SND Level	80
EFX2 SND Balance	81
EFX3 SND Level	82
EFX3 SND Balance	83
EFX4 SND Level	84
EFX4 SND Balance	85
AUX Level	86
AUX Balance	87
Monitor Level	102
Monitor Balance	103

MIDI Implementation

(*1) See '2. Address Map for Data Transfer' section.

(*2) Control Change of the odd number of channel is transmitted and received when Channel Link is On.

(*3) Value and switching Track status corresponds as follows.

(1) While VS-1680 stops

```
Value :   0-31          32-63          64-95          96-127
Status:  MUTE->MUTE    MUTE->PLAY     MUTE->REC       MUTE->SOURCE
         PLAY->MUTE    PLAY->PLAY     PLAY->REC       PLAY->SOURCE
         REC->MUTE     REC->PLAY      REC->REC        REC->SOURCE
         SOURCE->MUTE  SOURCE->PLAY   SOURCE->REC     SOURCE->SOURCE
```

(2) While playback/recording

```
Value :   0-31          32-63          64-95          96-127
Status:  MUTE->X       MUTE->PLAY     MUTE->X         MUTE->X
         PLAY->MUTE    PLAY->PLAY     PLAY->X         PLAY->X
         REC->X        REC->X         REC->REC        REC->SOURCE(*)
         SOURCE->MUTE  SOURCE->X      SOURCE->REC(*)  SOURCE->SOURCE
```

(*) Impossible to switch while recording.
(*) X = ignored

❍ Bank select (MSB/LSB)

Switches the effect bank of Preset/User.
VS-1680 never transmits this message.

Status	Second	Third
BnH	00H	mmH
BnH	20H	llH

n = MIDI Channel No. :   0H - 3H (ch.1 = Effect1 ch.2 = Effect2
                                      ch.3 = Effect3 ch.4 = Effect4)

mm = upper byte of bank number : 00H

ll = lower byte of bank number :   00H - 04H (0 - 4)

Bank Select		Program Change	Patch Number
MSB	LSB		
00H	00H	00H - 63H (0 - 99)	Preset #000 - #099
00H	01H	00H - 63H (0 - 99)	Preset #100 - #199
00H	02H	00H - 09H (0 - 9)	Preset #200 - #209
00H	03H	00H - 63H (0 - 99)	User #000 - #099
00H	04H	00H - 63H (0 - 99)	User #100 - #199

❍ NRPN(MSB/LSB)

Selects a parameter of the effect to be controlled.
VS-1680 never transmits this message.

Status	Second	Third
BnH	62H	llH
BnH	63H	mmH

n = MIDI Channel No. : 0H - 3H
(ch.1 = Effect1 ch.2 = Effect2 ch.3 = Effect3 ch.4 = Effect4)
mm = upper byte of the parameter number to be assigned with NRPN : 00H
ll = lower byte of the parameter number to be assigned with NRPN :   00H - 2EH (0 - 46)

❍ Data Entry (MSB/LSB)

Controls effect parameter assigned with NRPN.
VS-1680 never transmits this message.

Status	Second	Third
BnH	06H	mmH
BnH	26H	llH

n = MIDI Channel No. : 0H - 3H
(ch.1 = Effect1 ch.2 = Effect2 ch.3 = Effect3 ch.4 = Effect4)
mm = upper byte corresponding to the parameter assigned with NRPN
ll = lower byte corresponding to the parameter assigned with NRPN

```
<Ex>   mmH llH = 40H 00H = -8192
                = 7FH 7FH = -1
                = 00H 00H = 0
                = 3FH 7FH = +8191
```

❍ Data Increment

Increments the effect parameter selected with NRPN.
VS-1680 never transmits this message.

Status	Second	Third
BnH	60H	00H

n = MIDI Channel No.   : 0H - 3H
(ch.1 = Effect1 ch.2 = Effect2 ch.3 = Effect3 ch.4 = Effect4)

Increment the effect parameter selected with NRPN.

❍ Data Decrement

Decrement the effect parameter selected with NRPN.
VS-1680 never transmits this message.

Status	Second	Third
BnH	61H	00H

n = MIDI Channel No. : 0H - 3H
(ch.1 = Effect1 ch.2 = Effect2 ch.3 = Effect3 ch.4 = Effect4)

Decrement the effect parameter selected with NRPN.

NRPN and Effect parameters

✧ Algorithm 0 Reverb (EFX1 or EFX3)

NRPN	Data Entry	
00H 00H	mmH llH	EQ SW 0,1 = Off,On
00H 01H	mmH llH	EQ: Low EQ Type 0,1 = Shelving, Peaking
00H 02H	mmH llH	EQ: Low EQ Gain -12,,,12dB
00H 03H	mmH llH	EQ: Low EQ Frequency 2,,,200 = 20,,,2000Hz
00H 04H	mmH llH	EQ: Low EQ Q 3,,,100 = 0.3,,,10.0
00H 05H	mmH llH	EQ: Mid EQ Gain -12,,,12dB
00H 06H	mmH llH	EQ: Mid EQ Frequency 20,,,800 = 200,,,8000Hz
00H 07H	mmH llH	EQ: Mid EQ Q 3,,,100 = 0.3,,,10.0
00H 08H	mmH llH	EQ: High EQ Type 0,1 = Shelving, Peaking
00H 09H	mmH llH	EQ: High EQ Gain -12,,,12dB
00H 0AH	mmH llH	EQ: High EQ Frequency 14,,,200 = 1.4,,,20.0kHz
00H 0BH	mmH llH	EQ: High EQ Q 3,,,100 = 0.3,,,10.0
00H 0CH	mmH llH	EQ: Out Level 0,,,100
00H 0DH	mmH llH	Reverb: Room Size 5,,,40m
00H 0EH	mmH llH	Reverb: Reverb Time 1,,,320 = 0.1,,,32.0s
00H 0FH	mmH llH	Reverb: Pre Delay 0,,,200 = 0,,,200ms
00H 10H	mmH llH	Reverb: Diffusion 0,,,100
00H 11H	mmH llH	Reverb: Density 0,,,100
00H 12H	mmH llH	Reverb: Early Reflection Level 0,,,100
00H 13H	mmH llH	Reverb: LF Damp Frequency 5,,,400 = 50,,,4000Hz
00H 14H	mmH llH	Reverb: LF Damp Gain -36,,,0dB
00H 15H	mmH llH	Reverb: HF Damp Frequency 10,,,200 = 1.0,,,20.0kHz
00H 16H	mmH llH	Reverb: HF Damp Gain -36,,,0dB
00H 17H	mmH llH	Reverb: HI Cut Frequency 2,,,200 = 0.2,,,20.0kHz
00H 18H	mmH llH	Reverb: Effect Level -100,,,100
00H 19H	mmH llH	Reverb: Direct Level -100,,,100
00H 1AH : 00H 7FH	00H 00H : 00H 00H	(Reserved)

✧ Algorithm 1 Delay

NRPN	Data Entry	
00H 00H	mmH llH	Delay SW 0,1 = Off,On
00H 01H	mmH llH	EQ SW 0,1 = Off,On

```
+----------+----------+-----------------------------------------------+
| 00H 02H  | mmH llH  | Delay: Delay Time                 0,,,1200ms  |
+----------+----------+-----------------------------------------------+
| 00H 03H  | mmH llH  | Delay: Shift                                  |
|          |          |          -1200,,,1200 = L1200,,,R1200ms       |
+----------+----------+-----------------------------------------------+
| 00H 04H  | mmH llH  | Delay: Lch Feedback Level        -100,,,100   |
+----------+----------+-----------------------------------------------+
| 00H 05H  | mmH llH  | Delay: Rch Feedback Level        -100,,,100   |
+----------+----------+-----------------------------------------------+
| 00H 06H  | mmH llH  | Delay: Lch Level                 -100,,,100   |
+----------+----------+-----------------------------------------------+
| 00H 07H  | mmH llH  | Delay: Rch Level                 -100,,,100   |
+----------+----------+-----------------------------------------------+
| 00H 08H  | mmH llH  | Delay: LF Damp Frequency                      |
|          |          |              5,,,400 = 50,,,4000Hz            |
+----------+----------+-----------------------------------------------+
| 00H 09H  | mmH llH  | Delay: LF Damp Gain                -36,,,0dB  |
+----------+----------+-----------------------------------------------+
| 00H 0AH  | mmH llH  | Delay: HF Damp Frequency                      |
|          |          |             10,,,200 = 1.0,,,20.0kHz          |
+----------+----------+-----------------------------------------------+
| 00H 0BH  | mmH llH  | Delay: HF Damp Gain                -36,,,0dB  |
+----------+----------+-----------------------------------------------+
| 00H 0CH  | mmH llH  | Delay: Direct Level              -100,,,100   |
+----------+----------+-----------------------------------------------+
| 00H 0DH  | mmH llH  | EQ: Low EQ Type      0,1 = Shelving, Peaking  |
+----------+----------+-----------------------------------------------+
| 00H 0EH  | mmH llH  | EQ: Low EQ Gain                   -12,,,12dB  |
+----------+----------+-----------------------------------------------+
| 00H 0FH  | mmH llH  | EQ: Low EQ Frequency   2,,,200 = 20,,,2000Hz  |
+----------+----------+-----------------------------------------------+
| 00H 10H  | mmH llH  | EQ: Low EQ Q         3,,,100 = 0.3,,,10.0     |
+----------+----------+-----------------------------------------------+
| 00H 11H  | mmH llH  | EQ: Mid EQ Gain                   -12,,,12dB  |
+----------+----------+-----------------------------------------------+
| 00H 12H  | mmH llH  | EQ: Mid EQ Frequency                          |
|          |          |            20,,,800 = 200,,,8000Hz            |
+----------+----------+-----------------------------------------------+
| 00H 13H  | mmH llH  | EQ: Mid EQ Q         3,,,100 = 0.3,,,10.0     |
+----------+----------+-----------------------------------------------+
| 00H 14H  | mmH llH  | EQ: High EQ Type     0,1 = Shelving, Peaking  |
+----------+----------+-----------------------------------------------+
| 00H 15H  | mmH llH  | EQ: High EQ Gain                  -12,,,12dB  |
+----------+----------+-----------------------------------------------+
| 00H 16H  | mmH llH  | EQ: High EQ Frequency                         |
|          |          |            14,,,200 = 1.4,,,20.0kHz           |
+----------+----------+-----------------------------------------------+
| 00H 17H  | mmH llH  | EQ: High EQ Q        3,,,100 = 0.3,,,10.0     |
+----------+----------+-----------------------------------------------+
| 00H 18H  | mmH llH  | EQ: Out Level                       0,,,100   |
+----------+----------+-----------------------------------------------+
| 00H 19H  | 00H 00H  | (Reserved)                                    |
|    :     |    :     |                                               |
| 00H 7FH  | 00H 00H  |                                               |
+----------+----------+-----------------------------------------------+
```

* (Delay Time) + (Absolute value of Shift) should be 1200 or less.

✧ **Algorithm 2 Stereo Delay Chorus**

```
+----------+----------+-----------------------------------------------+
|   NRPN   |   Data   |                                               |
|          |  Entry   |                                               |
|==========+==========+===============================================|
| 00H 00H  | mmH llH  | Delay SW                      0,1 = Off,On    |
+----------+----------+-----------------------------------------------+
| 00H 01H  | mmH llH  | Chorus SW                     0,1 = Off,On    |
+----------+----------+-----------------------------------------------+
| 00H 02H  | mmH llH  | EQ SW                         0,1 = Off,On    |
+----------+----------+-----------------------------------------------+
| 00H 03H  | mmH llH  | Delay: Delay Time                 0,,,500ms   |
+----------+----------+-----------------------------------------------+
| 00H 04H  | mmH llH  | Delay: Shift        -500,,,500 = L500,,,R500ms|
+----------+----------+-----------------------------------------------+
| 00H 05H  | mmH llH  | Delay: Lch Feedback Level        -100,,,100   |
+----------+----------+-----------------------------------------------+
| 00H 06H  | mmH llH  | Delay: Rch Feedback Level        -100,,,100   |
+----------+----------+-----------------------------------------------+
| 00H 07H  | mmH llH  | Delay: Lch Cross Feedback Level  -100,,,100   |
+----------+----------+-----------------------------------------------+
| 00H 08H  | mmH llH  | Delay: Rch Cross Feedback Level  -100,,,100   |
+----------+----------+-----------------------------------------------+
| 00H 09H  | mmH llH  | Delay: Effect Level              -100,,,100   |
+----------+----------+-----------------------------------------------+
| 00H 0AH  | mmH llH  | Delay: Direct Level              -100,,,100   |
+----------+----------+-----------------------------------------------+
| 00H 0BH  | mmH llH  | Chorus: Rate        1,,,100 = 0.1,,,10.0Hz    |
+----------+----------+-----------------------------------------------+
| 00H 0CH  | mmH llH  | Chorus: Depth                       0,,,100   |
+----------+----------+-----------------------------------------------+
| 00H 0DH  | mmH llH  | Chorus: Pre Delay                 0,,,50ms    |
+----------+----------+-----------------------------------------------+
| 00H 0EH  | mmH llH  | Chorus: Effect Level             -100,,,100   |
+----------+----------+-----------------------------------------------+
| 00H 0FH  | mmH llH  | Chorus: Direct Level             -100,,,100   |
+----------+----------+-----------------------------------------------+
| 00H 10H  | mmH llH  | Chorus: Lch Feedback Level       -100,,,100   |
+----------+----------+-----------------------------------------------+
| 00H 11H  | mmH llH  | Chorus: Rch Feedback Level       -100,,,100   |
+----------+----------+-----------------------------------------------+
| 00H 12H  | mmH llH  | Chorus: Lch Cross Feedback Level -100,,,100   |
+----------+----------+-----------------------------------------------+
| 00H 13H  | mmH llH  | Chorus: Rch Cross Feedback Level -100,,,100   |
+----------+----------+-----------------------------------------------+
| 00H 14H  | mmH llH  | EQ: Low EQ Type      0,1 = Shelving, Peaking  |
+----------+----------+-----------------------------------------------+
| 00H 15H  | mmH llH  | EQ: Low EQ Gain                   -12,,,12dB  |
+----------+----------+-----------------------------------------------+
| 00H 16H  | mmH llH  | EQ: Low EQ Frequency   2,,,200 = 20,,,2000Hz  |
+----------+----------+-----------------------------------------------+
| 00H 17H  | mmH llH  | EQ: Low EQ Q         3,,,100 = 0.3,,,10.0     |
+----------+----------+-----------------------------------------------+
| 00H 18H  | mmH llH  | EQ: Mid EQ Gain                   -12,,,12dB  |
+----------+----------+-----------------------------------------------+
```

```
+----------+----------+-----------------------------------------------+
| 00H 19H  | mmH llH  | EQ: Mid EQ Frequency                          |
|          |          |            20,,,800 = 200,,,8000Hz            |
+----------+----------+-----------------------------------------------+
| 00H 1AH  | mmH llH  | EQ: Mid EQ Q         3,,,100 = 0.3,,,10.0     |
+----------+----------+-----------------------------------------------+
| 00H 1BH  | mmH llH  | EQ: High EQ Type     0,1 = Shelving, Peaking  |
+----------+----------+-----------------------------------------------+
| 00H 1CH  | mmH llH  | EQ: High EQ Gain                  -12,,,12dB  |
+----------+----------+-----------------------------------------------+
| 00H 1DH  | mmH llH  | EQ: High EQ Frequency                         |
|          |          |            14,,,200 = 1.4,,,20.0kHz           |
+----------+----------+-----------------------------------------------+
| 00H 1EH  | mmH llH  | EQ: High EQ Q        3,,,100 = 0.3,,,10.0     |
+----------+----------+-----------------------------------------------+
| 00H 1FH  | mmH llH  | EQ: Out Level                       0,,,100   |
+----------+----------+-----------------------------------------------+
| 00H 20H  | 00H 00H  | (Reserved)                                    |
|    :     |          |    :                                          |
| 00H 7FH  | 00H 00H  |                                               |
+----------+----------+-----------------------------------------------+
```

* (Delay Time) + (Absolute value of Shift) should be 500 or less.

✧ **Algorithm 3 Stereo Pitch Shifter Delay**

```
+----------+----------+-----------------------------------------------+
|   NRPN   |   Data   |                                               |
|          |  Entry   |                                               |
|==========+==========+===============================================|
| 00H 00H  | mmH llH  | P.ShifterDelay SW             0,1 = Off,On    |
+----------+----------+-----------------------------------------------+
| 00H 01H  | mmH llH  | EQ SW                         0,1 = Off,On    |
+----------+----------+-----------------------------------------------+
| 00H 02H  | mmH llH  | P.ShifterDelay: Lch Chromatic Pitch           |
|          |          |                                  -12,,,12     |
+----------+----------+-----------------------------------------------+
| 00H 03H  | mmH llH  | P.ShifterDelay: Lch Fine Pitch   -100,,,100   |
+----------+----------+-----------------------------------------------+
| 00H 04H  | mmH llH  | P.ShifterDelay: Lch Pre Delay     0,,,50ms    |
+----------+----------+-----------------------------------------------+
| 00H 05H  | mmH llH  | P.ShifterDelay: Lch Feedback Delay Time       |
|          |          |                                  0,,,500ms    |
+----------+----------+-----------------------------------------------+
| 00H 06H  | mmH llH  | P.ShifterDelay: Lch Feedback Level            |
|          |          |                                 100,,,100     |
+----------+----------+-----------------------------------------------+
| 00H 07H  | mmH llH  | P.ShifterDelay: Lch Cross Feedback Level      |
|          |          |                                 -100,,,100    |
+----------+----------+-----------------------------------------------+
| 00H 08H  | mmH llH  | P.ShifterDelay: Rch Chromatic Pitch           |
|          |          |                                  -12,,,12     |
+----------+----------+-----------------------------------------------+
| 00H 09H  | mmH llH  | P.ShifterDelay: Rch Fine Pitch   -100,,,100   |
+----------+----------+-----------------------------------------------+
| 00H 0AH  | mmH llH  | P.ShifterDelay: Rch Pre Delay     0,,,50ms    |
+----------+----------+-----------------------------------------------+
| 00H 0BH  | mmH llH  | P.ShifterDelay: Rch Feedback Delay Time       |
|          |          |                                  0,,,500ms    |
+----------+----------+-----------------------------------------------+
| 00H 0CH  | mmH llH  | P.ShifterDelay: Rch Feedback Level            |
|          |          |                                 -100,,,100    |
+----------+----------+-----------------------------------------------+
| 00H 0DH  | mmH llH  | P.ShifterDelay: Rch Cross Feedback Level      |
|          |          |                                 -100,,,100    |
+----------+----------+-----------------------------------------------+
| 00H 0EH  | mmH llH  | P.ShifterDelay: Effect Level     -100,,,100   |
+----------+----------+-----------------------------------------------+
| 00H 0FH  | mmH llH  | P.ShifterDelay: Direct Level     -100,,,100   |
+----------+----------+-----------------------------------------------+
| 00H 10H  | mmH llH  | EQ: Low EQ Type      0,1 = Shelving, Peaking  |
+----------+----------+-----------------------------------------------+
| 00H 11H  | mmH llH  | EQ: Low EQ Gain                   -12,,,12dB  |
+----------+----------+-----------------------------------------------+
| 00H 12H  | mmH llH  | EQ: Low EQ Frequency   2,,,200 = 20,,,2000Hz  |
+----------+----------+-----------------------------------------------+
| 00H 13H  | mmH llH  | EQ: Low EQ Q         3,,,100 = 0.3,,,10.0     |
+----------+----------+-----------------------------------------------+
| 00H 14H  | mmH llH  | EQ: Mid EQ Gain                   -12,,,12dB  |
+----------+----------+-----------------------------------------------+
| 00H 15H  | mmH llH  | EQ: Mid EQ Frequency                          |
|          |          |            20,,,800 = 200,,,8000Hz            |
+----------+----------+-----------------------------------------------+
| 00H 16H  | mmH llH  | EQ: Mid EQ Q         3,,,100 = 0.3,,,10.0     |
+----------+----------+-----------------------------------------------+
| 00H 17H  | mmH llH  | EQ: High EQ Type     0,1 = Shelving, Peaking  |
+----------+----------+-----------------------------------------------+
| 00H 18H  | mmH llH  | EQ: High EQ Gain                  -12,,,12dB  |
+----------+----------+-----------------------------------------------+
| 00H 19H  | mmH llH  | EQ: High EQ Frequency                         |
|          |          |            14,,,200 = 1.4,,,20.0kHz           |
+----------+----------+-----------------------------------------------+
| 00H 1AH  | mmH llH  | EQ: High EQ Q        3,,,100 = 0.3,,,10.0     |
+----------+----------+-----------------------------------------------+
| 00H 1BH  | mmH llH  | EQ: Out Level                       0,,,100   |
+----------+----------+-----------------------------------------------+
| 00H 1CH  | 00H 00H  | (Reserved)                                    |
|    :     |          |    :                                          |
| 00H 7FH  | 00H 00H  |                                               |
+----------+----------+-----------------------------------------------+
```

✧ **Algorithm 4 Vocoder**

```
+----------+----------+-----------------------------------------------+
|   NRPN   |   Data   |                                               |
|          |  Entry   |                                               |
|==========+==========+===============================================|
| 00H 00H  | mmH llH  | Chorus SW                     0,1 = Off,On    |
+----------+----------+-----------------------------------------------+
| 00H 01H  | mmH llH  | Vocoder: Voice Character 1        0,,,100     |
+----------+----------+-----------------------------------------------+
```

NRPN	Data Entry		
00H 02H	mmH llH	Vocoder: Voice Character 2	0,,,100
00H 03H	mmH llH	Vocoder: Voice Character 3	0,,,100
00H 04H	mmH llH	Vocoder: Voice Character 4	0,,,100
00H 05H	mmH llH	Vocoder: Voice Character 5	0,,,100
00H 06H	mmH llH	Vocoder: Voice Character 6	0,,,100
00H 07H	mmH llH	Vocoder: Voice Character 7	0,,,100
00H 08H	mmH llH	Vocoder: Voice Character 8	0,,,100
00H 09H	mmH llH	Vocoder: Voice Character 9	0,,,100
00H 0AH	mmH llH	Vocoder: Voice Character 10	0,,,100
00H 0BH	mmH llH	Chorus: Rate	1,,,100 = 0.1,,,10.0Hz
00H 0CH	mmH llH	Chorus: Depth	0,,,100
00H 0DH	mmH llH	Chorus: Pre Delay	0,,,50ms
00H 0EH	mmH llH	Chorus: Feedback Level	-100,,,100
00H 0FH	mmH llH	Chorus: Effect Level	-100,,,100
00H 10H	mmH llH	Chorus: Direct Level	-100,,,100
00H 11H : 00H 7FH	00H 00H : 00H 00H	(Reserved)	

✧ Algorithm 5 2CH RSS

NRPN	Data Entry		
00H 00H	mmH llH	2CH RSS: Ach Azimuth	-30,,,30 = -180,,,180
00H 01H	mmH llH	2CH RSS: Ach Elevation	-15,,,15 = -90,,,90
00H 02H	mmH llH	2CH RSS: Bch Azimuth	-30,,,30 = -180,,,180
00H 03H	mmH llH	2CH RSS: Bch Elevation	-15,,,15 = -90,,,90
00H 04H : 00H 7FH	00H 00H : 00H 00H	(Reserved)	

✧ Algorithm 6 Delay RSS

NRPN	Data Entry		
00H 00H	mmH llH	Delay RSS: Delay Time	0,,,1200ms
00H 01H	mmH llH	Delay RSS: Shift	-1200,,,1200 = L1200,,,R1200ms
00H 02H	mmH llH	Delay RSS: Center Delay Time	0,,,1200ms
00H 03H	mmH llH	Delay RSS: RSS Level	0,,,100
00H 04H	mmH llH	Delay RSS: Center Level	0,,,100
00H 05H	mmH llH	Delay RSS: Feedback Level	-100,,,100
00H 06H	mmH llH	Delay RSS: LF Damp Frequency	5,,,400 = 50,,,4000Hz
00H 07H	mmH llH	Delay RSS: LF Damp Gain	-36,,,0dB
00H 08H	mmH llH	Delay RSS: HF Damp Frequency	10,,,200 = 1.0,,,20.0kHz
00H 09H	mmH llH	Delay RSS: HF Damp Gain	-36,,,0dB
00H 0AH	mmH llH	Delay RSS: Effect Level	-100,,,100
00H 0BH	mmH llH	Delay RSS: Direct Level	-100,,,100
00H 0CH : 00H 7FH	00H 00H : 00H 00H	(Reserved)	

✧ Algorithm 7 Chorus RSS

NRPN	Data Entry		
00H 00H	mmH llH	Chorus RSS: Chorus Rate	1,,,100 = 0.1,,,10.0Hz
00H 01H	mmH llH	Chorus RSS: Chorus Depth	0,,,100
00H 02H	mmH llH	Chorus RSS: Effect Level	-100,,,100
00H 03H	mmH llH	Chorus RSS: Direct Level	-100,,,100
00H 04H : 00H 7FH	00H 00H : 00H 00H	(Reserved)	

✧ Common for Algorithm 8,9,10 Guitar Multi 1, 2, 3

NRPN	Data Entry		
00H 00H	mmH llH	Compressor SW	0,1 = Off,On
00H 01H	mmH llH	Metal/Distortion/Over Drive SW	0,1 = Off,On
00H 02H	mmH llH	Noise Suppressor SW	0,1 = Off,On
00H 03H	mmH llH	Auto Wah SW	0,1 = Off,On
00H 04H	mmH llH	Guitar Amp Simulator SW	0,1 = Off,On
00H 05H	mmH llH	Flanger SW	0,1 = Off,On
00H 06H	mmH llH	Delay SW	0,1 = Off,On
00H 07H	mmH llH	Compressor: Attack	0,,,100
00H 08H	mmH llH	Compressor: Level	0,,,100
00H 09H	mmH llH	Compressor: Sustain	0,,,100
00H 0AH	mmH llH	Compressor: Tone	-50,,,-50
00H 0BH	mmH llH	Noise Suppressor: Threshold	0,,,100
00H 0CH	mmH llH	Noise Suppressor: Release	0,,,100
00H 0DH	mmH llH	Auto Wah: Mode	0,1 = LPF,BPF
00H 0EH	mmH llH	Auto Wah: Polarity	0,1 = Down,Up
00H 0FH	mmH llH	Auto Wah: Frequency	0,,,100
00H 10H	mmH llH	Auto Wah: Level	0,,,100
00H 11H	mmH llH	Auto Wah: Peak	0,,,100
00H 12H	mmH llH	Auto Wah: Sens	0,,,100
00H 13H	mmH llH	Auto Wah: Rate	1,,,100 = 0.1,,,10.0Hz
00H 14H	mmH llH	Auto Wah: Depth	0,,,100
00H 15H	mmH llH	Guitar Amp Simulator: Mode	0,,,3 = Small,BultIn,2Stack,3Stack
00H 16H	mmH llH	Flanger: Rate	1,,,100 = 0.1,,,10.0Hz
00H 17H	mmH llH	Flanger: Depth	0,,,100
00H 18H	mmH llH	Flanger: Manual	0,,,100
00H 19H	mmH llH	Flanger: Resonance	0,,,100
00H 1AH	mmH llH	Delay: Delay Time	0,,,1000ms
00H 1BH	mmH llH	Delay: Shift	-1000,,,1000 = L1000,,,R1000ms
00H 1CH	mmH llH	Delay: Feedback Time	0,,,1000ms
00H 1DH	mmH llH	Delay: Feedback Level	-100,,,100
00H 1EH	mmH llH	Delay: Effect Level	-100,,,100
00H 1FH	mmH llH	Delay: Direct Level	-100,,,100

* (Delay Time) + (Absolute value of Shift) should be 1000 or less.

✧ Individual for Algorithm 8 Guitar Multi1

00H 20H	mmH llH	Metal: Gain	0,,,100
00H 21H	mmH llH	Metal: Level	0,,,100
00H 22H	mmH llH	Metal: Hi Gain	-100,,,100
00H 23H	mmH llH	Metal: Mid Gain	-100,,,100
00H 24H	mmH llH	Metal: Low Gain	-100,,,100
00H 25H : 00H 7FH	00H 00H : 00H 00H	(Reserved)	

✧ Individual for Algorithm 9 Guitar Multi 2

00H 20H	mmH llH	Distortion: Gain	0,,,100
00H 21H	mmH llH	Distortion: Level	0,,,100
00H 22H	mmH llH	Distortion: Tone	0,,,100
00H 23H : 00H 7FH	00H 00H : 00H 00H	(Reserved)	

◇ **Individual for Algorithm 10 Guitar Multi 3**

00H 20H	mmH llH	Over Drive: Gain	0,,,100
00H 21H	mmH llH	Over Drive: Level	0,,,100
00H 22H	mmH llH	Over Drive: Tone	0,,,100
00H 23H : 00H 7FH	00H 00H : 00H 00H	(Reserved)	

◇ **Algorithm 11 Vocal Multi**

NRPN	Data Entry		
00H 00H	mmH llH	Noise Suppressor SW	0,1 = Off,On
00H 01H	mmH llH	Limiter/De-esser SW	0,1 = Off,On
00H 02H	mmH llH	Enhancer SW	0,1 = Off,On
00H 03H	mmH llH	EQ SW	0,1 = Off,On
00H 04H	mmH llH	P.Shifter SW	0,1 = Off,On
00H 05H	mmH llH	Delay SW	0,1 = Off,On
00H 06H	mmH llH	Chorus SW	0,1 = Off,On
00H 07H	mmH llH	Limiter/De-esser Mode 0,1 = Limiter,De-esser	
00H 08H	mmH llH	Noise Suppressor: Threshold	0,,,100
00H 09H	mmH llH	Noise Suppressor: Release	0,,,100
00H 0AH	mmH llH	Limiter: Threshold	0,,,100
00H 0BH	mmH llH	Limiter: Release	0,,,100
00H 0CH	mmH llH	Limiter: Level	0,,,100
00H 0DH	mmH llH	De-esser: Sens	0,,,100
00H 0EH	mmH llH	De-esser: Frequency 10,,,100 = 1.0,,,10.0kHz	
00H 0FH	mmH llH	Enhancer: Sens	0,,,100
00H 10H	mmH llH	Enhancer: Frequency 10,,,100 = 1.0,,,10.0kHz	
00H 11H	mmH llH	Enhancer: MIX Level	0,,,100
00H 12H	mmH llH	Enhancer: Level	0,,,100
00H 13H	mmH llH	EQ: Low EQ Type	0,1 = Shelving, Peaking
00H 14H	mmH llH	EQ: Low EQ Gain	-12,,,12dB
00H 15H	mmH llH	EQ: Low EQ Frequency	2,,,200 = 20,,,2000Hz
00H 16H	mmH llH	EQ: Low EQ Q	3,,,100 = 0.3,,,10.0
00H 17H	mmH llH	EQ: Mid EQ Gain	-12,,,12dB
00H 18H	mmH llH	EQ: Mid EQ Frequency 20,,,800 = 200,,,8000Hz	
00H 19H	mmH llH	EQ: Mid EQ Q	3,,,100 = 0.3,,,10.0
00H 1AH	mmH llH	EQ: High EQ Type	0,1 = Shelving, Peaking
00H 1BH	mmH llH	EQ: High EQ Gain	-12,,,12dB
00H 1CH	mmH llH	EQ: High EQ Frequency 14,,,200 = 1.4,,,20.0kHz	
00H 1DH	mmH llH	EQ: High EQ Q	3,,,100 = 0.3,,,10.0
00H 1EH	mmH llH	EQ: Out Level	0,,,100
00H 1FH	mmH llH	P.Shifter: Chromatic Pitch	-12,,,12
00H 20H	mmH llH	P.Shifter: Fine Pitch	-100,,,100
00H 21H	mmH llH	P.Shifter: Effect Level	-100,,,100
00H 22H	mmH llH	P.Shifter: Direct Level	-100,,,100
00H 23H	mmH llH	Delay: Delay Time	0,,,1000
00H 24H	mmH llH	Delay: Feedback Level	-100,,,100
00H 25H	mmH llH	Delay: Effect Level	-100,,,100
00H 26H	mmH llH	Delay: Direct Level	-100,,,100
00H 27H	mmH llH	Chorus: Rate	1,,,100 = 0.1,,,10.0Hz
00H 28H	mmH llH	Chorus: Depth	0,,,100
00H 29H	mmH llH	Chorus: Pre Delay	0,,,50ms
00H 2AH	mmH llH	Chorus: Effect Level	-100,,,100
00H 2BH	mmH llH	Chorus: Direct Level	-100,,,100
00H 2CH : 00H 7FH	00H 00H : 00H 00H	(Reserved)	

◇ **Algorithm 12 Rotary**

NRPN	Data Entry		
00H 00H	mmH llH	Noise Suppressor SW	0,1 = Off,On
00H 01H	mmH llH	Over Drive SW	0,1 = Off,On
00H 02H	mmH llH	Noise Suppressor: Threshold	0,,,100
00H 03H	mmH llH	Noise Suppressor: Release	0,,,100
00H 04H	mmH llH	Over Drive: Gain	0,,,100
00H 05H	mmH llH	Over Drive: Level	0,,,100
00H 06H	mmH llH	Rotary: Low Rate	1,,,100 = 0.1,,,10.0Hz
00H 07H	mmH llH	Rotary: Hi Rate	1,,,100 = 0.1,,,10.0Hz
00H 08H : 00H 7FH	00H 00H : 00H 00H	(Reserved)	

◇ **Algorithm 13 Guitar AMP Simulator**

NRPN	Data Entry		
00H 00H	mmH llH	Noise Suppressor SW	0,1 = Off,On
00H 01H	mmH llH	Pre Amp SW	0,1 = Off,On
00H 02H	mmH llH	Speaker SW	0,1 = Off,On
00H 03H	mmH llH	Noise Suppressor: Threshold	0,,,100
00H 04H	mmH llH	Noise Suppressor: Release	0,,,100
00H 05H	mmH llH	Pre Amp: Mode 0,,,13 = JC-120,Clean Twin, Match Drive,BG Lead, MS1959(I), MS1959(II), MS1959(I+II),SLDN Lead, Metal 5150, Metal Lead, OD-1, OD-2Turbo, Distortion, Fuzz	
00H 06H	mmH llH	Pre Amp: Volume	0,,,100
00H 07H	mmH llH	Pre Amp: Bass	0,,,100
00H 08H	mmH llH	Pre Amp: Middle	0,,,100
00H 09H	mmH llH	Pre Amp: Treble	0,,,100
00H 0AH	mmH llH	Pre Amp: Presence	0,,,100
00H 0BH	mmH llH	Pre Amp: Master	0,,,100
00H 0CH	mmH llH	Pre Amp: Bright	0,1 = Off,On
00H 0DH	mmH llH	Pre Amp: Gain	0,1,2 = Low,Middle,High
00H 0EH	mmH llH	Speaker: Type 0,,,11 = Small. Middle, JC-120, Built In 1,Built In 2, Built In 3, Built In 4, BG Stack 1, BG Stack 2, MS Stack 1, MS Stack 2, Metal Stack	
00H 0FH	mmH llH	Speaker: MIC Setting	0,1,2 = 1,2,3
00H 10H	mmH llH	Speaker: MIC Level	0,,,100
00H 11H	mmH llH	Speaker: Direct Level	0,,,100
00H 12H : 00H 7FH	00H 00H : 00H 00H	(Reserved)	

* Pre Amp Middle is invalid when the Mode = Match Drive.
* When the Mode = Match Drive, Pre Amp Presence works counter to the value (-100,,,0).
* Pre Amp Bright is available only when the Mode = JC-120, Clean Twin, or BG Lead.

◇ **Algorithm 14 Stereo Phaser**

NRPN	Data Entry		
00H 00H	mmH llH	Phaser SW	0,1 = Off,On
00H 01H	mmH llH	EQ SW	0,1 = Off,On
00H 02H	mmH llH	Phaser: Mode	0,,,3 = 4.8.12.16stage
00H 03H	mmH llH	Phaser: Rate	1,,,100 = 0.1,,,10.0Hz
00H 04H	mmH llH	Phaser: Depth	0,,,100
00H 05H	mmH llH	Phaser: Polarity	0,1 = Inverse,Synchro
00H 06H	mmH llH	Phaser: Manual	0,,,100
00H 07H	mmH llH	Phaser: Resonance	0,,,100

NRPN	Data Entry	
00H 08H	mmH llH	Phaser: Cross Feedback 0,,,100
00H 09H	mmH llH	Phaser: Effect Level -100,,,100
00H 0AH	mmH llH	Phaser: Direct Level -100,,,100
00H 0BH	mmH llH	EQ: Low EQ Type 0,1 = Shelving, Peaking
00H 0CH	mmH llH	EQ: Low EQ Gain -12,,,12dB
00H 0DH	mmH llH	EQ: Low EQ Frequency 2,,,200 = 20,,,2000Hz
00H 0EH	mmH llH	EQ: Low EQ Q 3,,,100 = 0.3,,,10.0
00H 0FH	mmH llH	EQ: Mid EQ Gain -12,,,12dB
00H 10H	mmH llH	EQ: Mid EQ Frequency 20,,,800 = 200,,,8000Hz
00H 11H	mmH llH	EQ: Mid EQ Q 3,,,100 = 0.3,,,10.0
00H 12H	mmH llH	EQ: High EQ Type 0,1 = Shelving, Peaking
00H 13H	mmH llH	EQ: High EQ Gain -12,,,12dB
00H 14H	mmH llH	EQ: High EQ Frequency 14,,,200 = 1.4,,,20.0kHz
00H 15H	mmH llH	EQ: High EQ Q 3,,,100 = 0.3,,,10.0
00H 16H	mmH llH	EQ: Out Level 0,,,100
00H 17H : 00H 7FH	00H 00H : 00H 00H	(Reserved)

NRPN	Data Entry	
00H 07H	mmH llH	Comp/Limit A: Attack 0,,,100
00H 08H	mmH llH	Comp/Limit A: Release 0,,,100
00H 09H	mmH llH	Comp/Limit A: Ratio 0,,,3 = 1.5:1,2:1,4:1,100:1
00H 0AH	mmH llH	Noise Suppressor A: Detect 0,1,2 = A,B,Link
00H 0BH	mmH llH	Noise Suppressor A: Threshold 0,,,100
00H 0CH	mmH llH	Noise Suppressor A: Release 0,,,100
00H 0DH	mmH llH	Comp/Limit B: Detect 0,1,2 = A,B,Link
00H 0EH	mmH llH	Comp/Limit B: Level -60,,,12dB
00H 0FH	mmH llH	Comp/Limit B: Thresh -60,,,0dB
00H 10H	mmH llH	Comp/Limit B: Attack 0,,,100
00H 11H	mmH llH	Comp/Limit B: Release 0,,,100
00H 12H	mmH llH	Comp/Limit B: Ratio 0,,,3 = 1.5:1,2:1,4:1,100:1
00H 13H	mmH llH	Noise Suppressor B: Detect 0,1,2 = A,B,Link
00H 14H	mmH llH	Noise Suppressor B: Threshold 0,,,100
00H 15H	mmH llH	Noise Suppressor B: Release 0,,,100
00H 16H : 00H 7FH	00H 00H : 00H 00H	(Reserved)

✧ Algorithm 15 Stereo Flanger

NRPN	Data Entry	
00H 00H	mmH llH	Flanger SW 0,1 = Off,On
00H 01H	mmH llH	EQ SW 0,1 = Off,On
00H 02H	mmH llH	Flanger: Rate 1,,,100 = 0.1,,,10.0Hz
00H 03H	mmH llH	Flanger: Depth 0,,,100
00H 04H	mmH llH	Flanger: Polarity 0,1 = Inverse,Synchro
00H 05H	mmH llH	Flanger: Manual 0,,,100
00H 06H	mmH llH	Flanger: Resonance 0,,,100
00H 07H	mmH llH	Flanger: Cross Feedback Level 0,,,100
00H 08H	mmH llH	Flanger: Effect Level -100,,,100
00H 09H	mmH llH	Flanger: Direct Level -100,,,100
00H 0AH	mmH llH	EQ: Low EQ Type 0,1 = Shelving, Peaking
00H 0BH	mmH llH	EQ: Low EQ Gain -12,,,12dB
00H 0CH	mmH llH	EQ: Low EQ Frequency 2,,,200 = 20,,,2000Hz
00H 0DH	mmH llH	EQ: Low EQ Q 3,,,100 = 0.3,,,10.0
00H 0EH	mmH llH	EQ: Mid EQ Gain -12,,,12dB
00H 0FH	mmH llH	EQ: Mid EQ Frequency 20,,,800 = 200,,,8000Hz
00H 10H	mmH llH	EQ: Mid EQ Q 3,,,100 = 0.3,,,10.0
00H 11H	mmH llH	EQ: High EQ Type 0,1 = Shelving, Peaking
00H 12H	mmH llH	EQ: High EQ Gain -12,,,12dB
00H 13H	mmH llH	EQ: High EQ Frequency 14,,,200 = 1.4,,,20.0kHz
00H 14H	mmH llH	EQ: High EQ Q 3,,,100 = 0.3,,,10.0
00H 15H	mmH llH	EQ: Out Level 0,,,100
00H 16H : 00H 7FH	00H 00H : 00H 00H	(Reserved)

✧ Algorithm 16 Dual Compressor/Limiter

NRPN	Data Entry	
00H 00H	mmH llH	Comp/Limit A SW 0,1 = Off,On
00H 01H	mmH llH	Noise Suppressor A SW 0,1 = Off,On
00H 02H	mmH llH	Comp/Limit B SW 0,1 = Off,On
00H 03H	mmH llH	Noise Suppressor B SW 0,1 = Off,On
00H 04H	mmH llH	Comp/Limit A: Detect 0,1,2 = A,B,Link
00H 05H	mmH llH	Comp/Limit A: Level -60,,,12dB
00H 06H	mmH llH	Comp/Limit A: Thresh -60,,,0dB

✧ Algorithm 17 Gate Reverb (EFX1 or EFX3)

NRPN	Data Entry	
00H 00H	mmH llH	G.Reverb SW 0,1 = Off,On
00H 01H	mmH llH	EQ SW 0,1 = Off,On
00H 02H	mmH llH	G.Reverb: Gate Time 10,,,400ms
00H 03H	mmH llH	G.Reverb: Pre Delay 0,,,300ms
00H 04H	mmH llH	G.Reverb: Effect Level -100,,,100
00H 05H	mmH llH	G.Reverb: Mode 0,,,4 = Normal,L->R,R->L, Reverse1,Reverse2
00H 06H	mmH llH	G.Reverb: Thickness 0,,,100
00H 07H	mmH llH	G.Reverb: Density 0,,,100
00H 08H	mmH llH	G.Reverb: Accent Delay 0,,,200ms
00H 09H	mmH llH	G.Reverb: Accent Level 0,,,100
00H 0AH	mmH llH	G.Reverb: Accent Pan 1,,,127 = L63,,,R63
00H 0BH	mmH llH	G.Reverb: Direct Level -100,,,100
00H 0CH	mmH llH	EQ: Low EQ Type 0,1 = Shelving, Peaking
00H 0DH	mmH llH	EQ: Low EQ Gain -12,,,12dB
00H 0EH	mmH llH	EQ: Low EQ Frequency 2,,,200 = 20,,,2000Hz
00H 0FH	mmH llH	EQ: Low EQ Q 3,,,100 = 0.3,,,10.0
00H 10H	mmH llH	EQ: Mid EQ Gain -12,,,12dB
00H 11H	mmH llH	EQ: Mid EQ Frequency 20,,,800 = 200,,,8000Hz
00H 12H	mmH llH	EQ: Mid EQ Q 3,,,100 = 0.3,,,10.0
00H 13H	mmH llH	EQ: High EQ Type 0,1 = Shelving, Peaking
00H 14H	mmH llH	EQ: High EQ Gain -12,,,12dB
00H 15H	mmH llH	EQ: High EQ Frequency 14,,,200 = 1.4,,,20.0kHz
00H 16H	mmH llH	EQ: High EQ Q 3,,,100 = 0.3,,,10.0
00H 17H	mmH llH	EQ: Out Level 0,,,100
00H 18H : 00H 7FH	00H 00H : 00H 00H	(Reserved)

✧ Algorithm 18 Multi Tap Delay

NRPN	Data Entry	
00H 00H	mmH llH	EQ SW 0,1 = Off,On
00H 01H	mmH llH	M.Tap Delay: Time 1 0,,,1200ms
00H 02H	mmH llH	M.Tap Delay: Level 1 0,,,100

NRPN	Data Entry	
00H 03H	mmH llH	M.Tap Delay: Pan 1 1,,,127 = L63,,,R63
00H 04H	mmH llH	M.Tap Delay: Time 2 0,,,1200ms
00H 05H	mmH llH	M.Tap Delay: Level 2 0,,,100
00H 06H	mmH llH	M.Tap Delay: Pan 2 1,,,127 = L63,,,R63
00H 07H	mmH llH	M.Tap Delay: Time 3 0,,,1200ms
00H 08H	mmH llH	M.Tap Delay: Level 3 0,,,100
00H 09H	mmH llH	M.Tap Delay: Pan 3 1,,,127 = L63,,,R63
00H 0AH	mmH llH	M.Tap Delay: Time 4 0,,,1200ms
00H 0BH	mmH llH	M.Tap Delay: Level 4 0,,,100
00H 0CH	mmH llH	M.Tap Delay: Pan 4 1,,,127 = L63,,,R63
00H 0DH	mmH llH	M.Tap Delay: Time 5 0,,,1200ms
00H 0EH	mmH llH	M.Tap Delay: Level 5 0,,,100
00H 0FH	mmH llH	M.Tap Delay: Pan 5 1,,,127 = L63,,,R63
00H 10H	mmH llH	M.Tap Delay: Time 6 0,,,1200ms
00H 11H	mmH llH	M.Tap Delay: Level 6 0,,,100
00H 12H	mmH llH	M.Tap Delay: Pan 6 1,,,127 = L63,,,R63
00H 13H	mmH llH	M.Tap Delay: Time 7 0,,,1200ms
00H 14H	mmH llH	M.Tap Delay: Level 7 0,,,100
00H 15H	mmH llH	M.Tap Delay: Pan 7 1,,,127 = L63,,,R63
00H 16H	mmH llH	M.Tap Delay: Time 8 0,,,1200ms
00H 17H	mmH llH	M.Tap Delay: Level 8 0,,,100
00H 18H	mmH llH	M.Tap Delay: Pan 8 1,,,127 = L63,,,R63
00H 19H	mmH llH	M.Tap Delay: Time 9 0,,,1200ms
00H 1AH	mmH llH	M.Tap Delay: Level 9 0,,,100
00H 1BH	mmH llH	M.Tap Delay: Pan 9 1,,,127 = L63,,,R63
00H 1CH	mmH llH	M.Tap Delay: Time 10 0,,,1200ms
00H 1DH	mmH llH	M.Tap Delay: Level 10 0,,,100
00H 1EH	mmH llH	M.Tap Delay: Pan 10 1,,,127 = L63,,,R63
00H 1FH	mmH llH	M.Tap Delay: Feedback Delay Time 0,,,1200ms
00H 20H	mmH llH	M.Tap Delay: Feedback Level -100,,,100
00H 21H	mmH llH	M.Tap Delay: Effect Level -100,,,100
00H 22H	mmH llH	M.Tap Delay: Direct Level -100,,,100
00H 23H	mmH llH	EQ: Low EQ Type 0,1 = Shelving, Peaking
00H 24H	mmH llH	EQ: Low EQ Gain -12,,,12dB
00H 25H	mmH llH	EQ: Low EQ Frequency 2,,,200 = 20,,,2000Hz
00H 26H	mmH llH	EQ: Low EQ Q 3,,,100 = 0.3,,,10.0
00H 27H	mmH llH	EQ: Mid EQ Gain -12,,,12dB
00H 28H	mmH llH	EQ: Mid EQ Frequency 20,,,800 = 200,,,8000Hz
00H 29H	mmH llH	EQ: Mid EQ Q 3,,,100 = 0.3,,,10.0
00H 2AH	mmH llH	EQ: High EQ Type 0,1 = Shelving, Peaking
00H 2BH	mmH llH	EQ: High EQ Gain -12,,,12dB
00H 2CH	mmH llH	EQ: High EQ Frequency 14,,,200 = 1.4,,,20.0kHz
00H 2DH	mmH llH	EQ: High EQ Q 3,,,100 = 0.3,,,10.0
00H 2EH	mmH llH	EQ: Out Level 0,,,100
00H 2FH : 00H 7FH	00H 00H : 00H 00H	(Reserved)

✧ **Algorithm 19 Stereo Multi**

NRPN	Data Entry	
00H 00H	mmH llH	Noise Suppressor SW 0,1 = Off,On
00H 01H	mmH llH	Comp/Limit SW 0,1 = Off,On
00H 02H	mmH llH	Enhancer SW 0,1 = Off,On
00H 03H	mmH llH	EQ SW 0,1 = Off,On
00H 04H	mmH llH	Noise Suppressor: Threshold 0,,,100
00H 05H	mmH llH	Noise Suppressor: Release 0,,,100

NRPN	Data Entry	
00H 06H	mmH llH	Comp/Limit: Level -60,,,12dB
00H 07H	mmH llH	Comp/Limit: Thresh -60,,,0dB
00H 08H	mmH llH	Comp/Limit: Attack 0,,,100
00H 09H	mmH llH	Comp/Limit: Release 0,,,100
00H 0AH	mmH llH	Comp/Limit: Ratio 0,,,3 = 1.5:1,2:1,4:1,100:1
00H 0BH	mmH llH	Enhancer: Sens 0,,,100
00H 0CH	mmH llH	Enhancer: Frequency 10,,,100 = 1.0,,,10.0kHz
00H 0DH	mmH llH	Enhancer: MIX Level 0,,,100
00H 0EH	mmH llH	Enhancer: Level 0,,,100
00H 0FH	mmH llH	EQ: Low EQ Type 0,1 = Shelving, Peaking
00H 10H	mmH llH	EQ: Low EQ Gain -12,,,12dB
00H 11H	mmH llH	EQ: Low EQ Frequency 2,,,200 = 20,,,2000Hz
00H 12H	mmH llH	EQ: Low EQ Q 3,,,100 = 0.3,,,10.0
00H 13H	mmH llH	EQ: Mid EQ Gain -12,,,12dB
00H 14H	mmH llH	EQ: Mid EQ Frequency 20,,,800 = 200,,,8000Hz
00H 15H	mmH llH	EQ: Mid EQ Q 3,,,100 = 0.3,,,10.0
00H 16H	mmH llH	EQ: High EQ Type 0,1 = Shelving, Peaking
00H 17H	mmH llH	EQ: High EQ Gain -12,,,12dB
00H 18H	mmH llH	EQ: High EQ Frequency 14,,,200 = 1.4,,,20.0kHz
00H 19H	mmH llH	EQ: High EQ Q 3,,,100 = 0.3,,,10.0
00H 1AH	mmH llH	EQ: Out Level 0,,,100
00H 1BH : 00H 7FH	00H 00H : 00H 00H	(Reserved)

✧ **Algorithm 20 Reverb 2**

NRPN	Data Entry	
00H 00H	mmH llH	Reverb SW 0,1 = Off,On
00H 01H	mmH llH	EQ SW 0,1 = Off,On
00H 02H	mmH llH	Reverb 2: Reverb Type 0,,,4 = Room1,Room2,Hall1,Hall2,Plate
00H 03H	mmH llH	Reverb 2: Reverb Time 1,,,100 = 0.1,,,10.0sec
00H 04H	mmH llH	Reverb 2: Pre Delay 0,,,200msec
00H 05H	mmH llH	Reverb 2: Density 0,,,100
00H 06H	mmH llH	Reverb 2: High Pass Filter 1,,,200 = Thru,20,,,2000Hz
00H 07H	mmH llH	Reverb 2: Low Pass Filter 10,,,201 = 1.0,,,20,0kHz,Thru
00H 08H	mmH llH	Reverb 2: Effect Level 0,,,100
00H 09H	mmH llH	Reverb 2: Direct Level 0,,,100
00H 0AH	mmH llH	Reverb 2: Gate SW 0,1 = Off,On
00H 0BH	mmH llH	Reverb 2: Gate Mode 0,1 = Gate,Ducking
00H 0CH	mmH llH	Reverb 2: Gate Threshold 0,,,100
00H 0DH	mmH llH	Reverb 2: Gate Attack Time 1,,,100
00H 0EH	mmH llH	Reverb 2: Gate Release Time 1,,,100
00H 0FH	mmH llH	Reverb 2: Gate Hold Time 1,,,100
00H 10H	mmH llH	EQ: Low EQ Type 0,1 = Shelving, Peaking
00H 11H	mmH llH	EQ: Low EQ Gain -12,,,12dB
00H 12H	mmH llH	EQ: Low EQ Frequency 2,,,200 = 20,,,2000Hz
00H 13H	mmH llH	EQ: Low EQ Q 3,,,100 = 0.3,,,10.0
00H 14H	mmH llH	EQ: Mid EQ Gain -12,,,12dB
00H 15H	mmH llH	EQ: Mid EQ Frequency 20,,,800 = 200,,,8000Hz
00H 16H	mmH llH	EQ: Mid EQ Q 3,,,100 = 0.3,,,10.0
00H 17H	mmH llH	EQ: High EQ Type 0,1 = Shelving, Peaking
00H 18H	mmH llH	EQ: High EQ Gain -12,,,12dB
00H 19H	mmH llH	EQ: High EQ Frequency 14,,,200 = 1.4,,,20.0kHz

00H 1AH	mmH llH	EQ: High EQ Q 3,,,100 = 0.3,,,10.0
00H 1BH	mmH llH	EQ: Out Level 0,,,100
00H 1CH : 00H 7FH	00H 00H : 00H 00H	(Reserved)

❖ Algorithm 21 Space Chorus

NRPN	Data Entry	
00H 00H	mmH llH	Chorus SW 0,1 = Off,On
00H 01H	mmH llH	Chorus: Input Mode 0,1 = Mono,Stereo
00H 02H	mmH llH	Chorus: Mode 0,,,6 = 1,2,3,4,1+4,2+4,3+4
00H 03H	mmH llH	Chorus: Mix Balance 0,,,100
00H 04H : 00H 7FH	00H 00H : 00H 00H	(Reserved)

❖ Algorithm 22 Lo-Fi Processor

NRPN	Data Entry	
00H 00H	mmH llH	Lo-Fi Processor SW 0,1 = Off,On
00H 01H	mmH llH	Realtime Modify Filter SW 0,1 = Off,On
00H 02H	mmH llH	Lo-Fi Processor: Pre Filter SW 0,1 = Off,On
00H 03H	mmH llH	Lo-Fi Processor: Rate 0,,,31 = 0ff,1/2,,,1/32
00H 04H	mmH llH	Lo-Fi Processor: Number of Bit 0,,,15 = Off,15,,,1bit
00H 05H	mmH llH	Lo-Fi Processor: Post Filter SW 0,1 = Off,On
00H 06H	mmH llH	Lo-Fi Processor: Effect Level 0,,,100
00H 07H	mmH llH	Lo-Fi Processor: Direct Level 0,,,100
00H 08H	mmH llH	Realtime Modify Filter: Filter Type 0,,,2 = LPF,BPF,HPF
00H 09H	mmH llH	Realtime Modify Filter: Cut 0,,,100
00H 0AH	mmH llH	Realtime Modify Filter: Resonance 0,,,100
00H 0BH	mmH llH	Realtime Modify Filter: Gain 0,,,24dB
00H 0CH	mmH llH	Noise Suppressor: Threshold 0,,,100
00H 0DH	mmH llH	Noise Suppressor: Release 0,,,100
00H 0EH : 00H 7FH	00H 00H : 00H 00H	(Reserved)

❖ Algorithm 23 4 Band Parametric EQ

NRPN	Data Entry	
00H 00H	mmH llH	Parametric EQ Link SW 0,1 = Off,On
00H 01H	mmH llH	Parametric EQ Ach SW 0,1 = Off,On
00H 02H	mmH llH	Parametric EQ Bch SW 0,1 = Off,On
00H 03H	mmH llH	EQ Ach: Input Gain -60,,,12dB
00H 04H	mmH llH	EQ Ach: Low EQ Type 0,1 = Shelving, Peaking
00H 05H	mmH llH	EQ Ach: Low EQ Gain -12,,,12dB
00H 06H	mmH llH	EQ Ach: Low EQ Frequency 2,,,200 = 20,,,2000Hz
00H 07H	mmH llH	EQ Ach: Low EQ Q 3,,,100 = 0.3,,,10.0
00H 08H	mmH llH	EQ Ach: Low Mid EQ Gain -12,,,12dB
00H 09H	mmH llH	EQ Ach: Low Mid EQ Frequency 20,,,800 = 200,,,8000Hz
00H 0AH	mmH llH	EQ Ach: Low Mid EQ Q 3,,,100 = 0.3,,,10.0
00H 0BH	mmH llH	EQ Ach: High Mid EQ Gain -12,,,12dB
00H 0CH	mmH llH	EQ Ach: High Mid EQ Frequency 20,,,800 = 200,,,8000Hz
00H 0DH	mmH llH	EQ Ach: High Mid EQ Q 3,,,100 = 0.3,,,10.0

00H 0EH	mmH llH	EQ Ach: High EQ Type 0,1 = Shelving, Peaking
00H 0FH	mmH llH	EQ Ach: High EQ Gain -12,,,12dB
00H 10H	mmH llH	EQ Ach: High EQ Frequency 14,,,200 = 1.4,,,20.0kHz
00H 11H	mmH llH	EQ Ach: High EQ Q 3,,,100 = 0.3,,,10.0
00H 12H	mmH llH	EQ Ach: Output Level -60,,,12dB
00H 13H	mmH llH	EQ Bch: Input Gain -60,,,12dB
00H 14H	mmH llH	EQ Bch: Low EQ Type 0,1 = Shelving, Peaking
00H 15H	mmH llH	EQ Bch: Low EQ Gain -12,,,12dB
00H 16H	mmH llH	EQ Bch: Low EQ Frequency 2,,,200 = 20,,,2000Hz
00H 17H	mmH llH	EQ Bch: Low EQ Q 3,,,100 = 0.3,,,10.0
00H 18H	mmH llH	EQ Bch: Low Mid EQ Gain -12,,,12dB
00H 19H	mmH llH	EQ Bch: Low Mid EQ Frequency 20,,,800 = 200,,,8000Hz
00H 1AH	mmH llH	EQ Bch: Low Mid EQ Q 3,,,100 = 0.3,,,10.0
00H 1BH	mmH llH	EQ Bch: High Mid EQ Gain -12,,,12dB
00H 1CH	mmH llH	EQ Bch: High Mid EQ Frequency 20,,,800 = 200,,,8000Hz
00H 1DH	mmH llH	EQ Bch: High Mid EQ Q 3,,,100 = 0.3,,,10.0
00H 1EH	mmH llH	EQ Bch: High EQ Type 0,1 = Shelving, Peaking
00H 1FH	mmH llH	EQ Bch: High EQ Gain -12,,,12dB
00H 20H	mmH llH	EQ Bch: High EQ Frequency 14,,,200 = 1.4,,,20.0kHz
00H 21H	mmH llH	EQ Bch: High EQ Q 3,,,100 = 0.3,,,10.0
00H 22H	mmH llH	EQ Bch: Output Level -60,,,12dB
00H 23H : 00H 7FH	00H 00H : 00H 00H	(Reserved)

*   When Link SW = On, Bch corresponds to Ach.

❖ Algorithm 24 10 Band Graphic EQ

NRPN	Data Entry	
00H 00H	mmH llH	Graphic EQ Link SW 0,1 = Off,On
00H 01H	mmH llH	Graphic EQ Ach SW 0,1 = Off,On
00H 02H	mmH llH	Graphic EQ Bch SW 0,1 = Off,On
00H 03H	mmH llH	EQ Ach: Input Level -60,,,12dB
00H 04H	mmH llH	EQ Ach: 31.25Hz Gain -12,,,12dB
00H 05H	mmH llH	EQ Ach: 62.5Hz Gain -12,,,12dB
00H 06H	mmH llH	EQ Ach: 125Hz Gain -12,,,12dB
00H 07H	mmH llH	EQ Ach: 250Hz Gain -12,,,12dB
00H 08H	mmH llH	EQ Ach: 500Hz Gain -12,,,12dB
00H 09H	mmH llH	EQ Ach: 1.0kHz Gain -12,,,12dB
00H 0AH	mmH llH	EQ Ach: 2.0kHz Gain -12,,,12dB
00H 0BH	mmH llH	EQ Ach: 4.0kHz Gain -12,,,12dB
00H 0CH	mmH llH	EQ Ach: 8.0kHz Gain -12,,,12dB
00H 0DH	mmH llH	EQ Ach: 16.0kHz Gain -12,,,12dB
00H 0EH	mmH llH	EQ Ach: Output Level -60,,,12dB
00H 0FH	mmH llH	EQ Bch: Input Level -60,,,12dB
00H 10H	mmH llH	EQ Bch: 31.25Hz Gain -12,,,12dB
00H 11H	mmH llH	EQ Bch: 62.5Hz Gain -12,,,12dB
00H 12H	mmH llH	EQ Bch: 125Hz Gain -12,,,12dB
00H 13H	mmH llH	EQ Bch: 250Hz Gain -12,,,12dB
00H 14H	mmH llH	EQ Bch: 500Hz Gain -12,,,12dB
00H 15H	mmH llH	EQ Bch: 1.0kHz Gain -12,,,12dB
00H 16H	mmH llH	EQ Bch: 2.0kHz Gain -12,,,12dB
00H 17H	mmH llH	EQ Bch: 4.0kHz Gain -12,,,12dB
00H 18H	mmH llH	EQ Bch: 8.0kHz Gain -12,,,12dB

00H 19H	mmH llH	EQ Bch: 16.0kHz Gain -12,,,12dB
00H 1AH	mmH llH	EQ Bch: Output Level -60,,,12dB
00H 1BH : 00H 7FH	00H 00H : 00H 00H	(Reserved)

* When Link SW = On, Bch corresponds to Ach.

✧ Algorithm 25 Hum Canceler

NRPN	Data Entry	
00H 00H	mmH llH	Hum Canceler SW 0,1 = Off,On
00H 01H	mmH llH	Noise Suppressor SW 0,1 = Off,On
00H 02H	mmH llH	Hum Canceler: Freq 200,,,8000 = 20.0,,,800.0Hz
00H 03H	mmH llH	Hum Canceler: Width 10,,,40%
00H 04H	mmH llH	Hum Canceler: Depth 0,,,100
00H 05H	mmH llH	Hum Canceler: Threshold 0,,,100
00H 06H	mmH llH	Hum Canceler: Range Low 1,,,200 = Unlimit,20,,,2000Hz
00H 07H	mmH llH	Hum Canceler: Range High 10,,,201 = 1.0,,,20,0kHz,Unlimit
00H 08H	mmH llH	Noise Suppressor: Threshold 0,,,100
00H 09H	mmH llH	Noise Suppressor: Release 0,,,100
00H 0AH : 00H 7FH	00H 00H : 00H 00H	(Reserved)

✧ Algorithm 26 Vocal Canceler

NRPN	Data Entry	
00H 00H	mmH llH	Vocal Canceler SW 0,1 = Off,On
00H 01H	mmH llH	EQ SW 0,1 = Off,On
00H 02H	mmH llH	Vocal Canceler: Balance 0,,,100
00H 03H	mmH llH	Vocal Canceler: Range Low 1,,,200 = Unlimit,20,,,2000Hz
00H 04H	mmH llH	Vocal Canceler: Range High 10,,,201 = 1.0,,,20,0kHz,Unlimit
00H 05H	mmH llH	EQ: Low EQ Type 0,1 = Shelving, Peaking
00H 06H	mmH llH	EQ: Low EQ Gain -12,,,12dB
00H 07H	mmH llH	EQ: Low EQ Frequency 2,,,200 = 20,,,2000Hz
00H 08H	mmH llH	EQ: Low EQ Q 3,,,100 = 0.3,,,10.0
00H 09H	mmH llH	EQ: Mid EQ Gain -12,,,12dB
00H 0AH	mmH llH	EQ: Mid EQ Frequency 20,,,800 = 200,,,8000Hz
00H 0BH	mmH llH	EQ: Mid EQ Q 3,,,100 = 0.3,,,10.0
00H 0CH	mmH llH	EQ: High EQ Type 0,1 = Shelving, Peaking
00H 0DH	mmH llH	EQ: High EQ Gain -12,,,12dB
00H 0EH	mmH llH	EQ: High EQ Frequency 14,,,200 = 1.4,,,20.0kHz
00H 0FH	mmH llH	EQ: High EQ Q 3,,,100 = 0.3,,,10.0
00H 10H	mmH llH	EQ: Out Level 0,,,100
00H 11H : 00H 7FH	00H 00H : 00H 00H	(Reserved)

✧ Algorithm 27 Voice Transformer (EFX1 or EFX3)

NRPN	Data Entry	
00H 00H	mmH llH	Voice Transformer SW 0,1 = Off,On
00H 01H	mmH llH	Reverb SW Off,On
00H 02H	mmH llH	Fader Edit SW 0,1 = Off,On
00H 03H	mmH llH	MIDI Control SW 0,1 = Off,On
00H 04H	mmH llH	Voice Transformer: Robot SW 0,1 = Off,On

00H 05H	mmH llH	Voice Transformer: Chromatic Pitch -12,,,36
00H 06H	mmH llH	Voice Transformer: Fine Pitch -100,,,100
00H 07H	mmH llH	Voice Transformer: Chromatic Formant -12,,,12
00H 08H	mmH llH	Voice Transformer: Fine Formant -100,,,100
00H 09H	mmH llH	Voice Transformer: Mix Balance 0,,,100
00H 0AH	mmH llH	Reverb: Reverb Time 1,,,100 = 0.1,,,10.0sec
00H 0BH	mmH llH	Reverb: Pre Delay 0,,,200msec
00H 0CH	mmH llH	Reverb: Density 0,,,100
00H 0DH	mmH llH	Reverb: Effect Level 0,,,100
00H 0EH	mmH llH	MIDI Control: Bend Range 0,,,12 = 0ff,1,,,12
00H 0FH	mmH llH	MIDI Control: Portamento 0...100 = Off,1,,,100
00H 10H : 00H 7FH	00H 00H : 00H 00H	(Reserved)

✧ Algorithm 28 Vocoder 2 (EFX1 or EFX3)

NRPN	Data Entry	
00H 00H	mmH llH	Chorus SW 0,1 = Off,On
00H 01H	mmH llH	Vocoder: Envelope Mode 0,,,2 = Sharp,Soft,Long
00H 02H	mmH llH	Vocoder: Pan Mode 0,,,3 = Mono,Stereo,L->R,R->L
00H 03H	mmH llH	Vocoder: Hold 0,1 = Off,MIDI
00H 04H	mmH llH	Vocoder: Mic Sens 0,,,100
00H 05H	mmH llH	Vocoder: Synth Input Level 0,,,100
00H 06H	mmH llH	Vocoder: Voice Char Level 1 0,,,100
00H 07H	mmH llH	Vocoder: Voice Char Level 2 0,,,100
00H 08H	mmH llH	Vocoder: Voice Char Level 3 0,,,100
00H 09H	mmH llH	Vocoder: Voice Char Level 4 0,,,100
00H 0AH	mmH llH	Vocoder: Voice Char Level 5 0,,,100
00H 0BH	mmH llH	Vocoder: Voice Char Level 6 0,,,100
00H 0CH	mmH llH	Vocoder: Voice Char Level 7 0,,,100
00H 0DH	mmH llH	Vocoder: Voice Char Level 8 0,,,100
00H 0EH	mmH llH	Vocoder: Voice Char Level 9 0,,,100
00H 0FH	mmH llH	Vocoder: Voice Char Level 10 0,,,100
00H 10H	mmH llH	Vocoder: Voice Char Level 11 0,,,100
00H 11H	mmH llH	Vocoder: Voice Char Level 12 0,,,100
00H 12H	mmH llH	Vocoder: Voice Char Level 13 0,,,100
00H 13H	mmH llH	Vocoder: Voice Char Level 14 0,,,100
00H 14H	mmH llH	Vocoder: Voice Char Level 15 0,,,100
00H 15H	mmH llH	Vocoder: Voice Char Level 16 0,,,100
00H 16H	mmH llH	Vocoder: Voice Char Level 17 0,,,100
00H 17H	mmH llH	Vocoder: Voice Char Level 18 0,,,100
00H 18H	mmH llH	Vocoder: Voice Char Level 19 0,,,100
00H 19H	mmH llH	Vocoder: Mic High Pass Filter 9,,,200 = Thru,1.0,,,20.0kHz
00H 1AH	mmH llH	Vocoder: Mic High Pass Filter Pan 1,,,127 = L63,,,R63
00H 1BH	mmH llH	Vocoder: Mic Mix 0,,,100
00H 1CH	mmH llH	Vocoder: Noise Suppressor Threshold 0,,,100
00H 1DH	mmH llH	Chorus: Rate 1,,,100 = 0.1,,,10.0Hz
00H 1EH	mmH llH	Chorus: Depth 0,,,100
00H 1FH	mmH llH	Chorus: Pre Delay 0,,,50ms
00H 20H	mmH llH	Chorus: Mix Balance 0,,,100
00H 21H : 00H 7FH	00H 00H : 00H 00H	(Reserved)

◇ Algorithm 29 Mic Simulator

NRPN	Data Entry	
00H 00H	mmH llH	Link SW 0,1 = Off,On
00H 01H	mmH llH	Mic Converter Ach SW 0,1 = Off,On
00H 02H	mmH llH	Bass Cut Ach SW 0,1 = Off,On
00H 03H	mmH llH	Distance Ach SW 0,1 = Off,On
00H 04H	mmH llH	Limiter Ach SW 0,1 = Off,On
00H 05H	mmH llH	Mic Converter Bch SW 0,1 = Off,On
00H 06H	mmH llH	Bass Cut Bch SW 0,1 = Off,On
00H 07H	mmH llH	Distance Bch SW 0,1 = Off,On
00H 08H	mmH llH	Limiter Bch SW 0,1 = Off,On
00H 09H	mmH llH	Mic Converter Ach: Input 0,,,4 = DR-20,SmlDy,HedDy,MinCn,Flat

00H 0AH	mmH llH	Mic Converter Ach: Output
		        0,,,6 = SmlDy,VocDy,LrgDy,
		        SmlCn,LrgCn,VntCn,Flat

00H 0BH	mmH llH	Mic Converter Ach: Phase 0,1 = Normal,Inverse
00H 0CH	mmH llH	Bass Cut Ach: Bass Cut Frequency 1,,,200 = Thru,20,,,2000Hz
00H 0DH	mmH llH	Distance Ach: Proximity Effect -12,,,+12
00H 0EH	mmH llH	Distance Ach: Timelag 0,,,1000 = 0,,,3000cm
00H 0FH	mmH llH	Limiter Ach: Detect HPF Frequency 1,,,200 = Thru,20,,,2000Hz
00H 10H	mmH llH	Limiter Ach: Level -60,,,24dB
00H 11H	mmH llH	Limiter Ach: Threshold -60,,,0dB
00H 12H	mmH llH	Limiter Ach: Attack 0,,,100
00H 13H	mmH llH	Limiter Ach: Release 0,,,100
00H 14H	mmH llH	Mic Converter Bch: Input 0,,,4 = DR-20,SmlDy,HedDy,MinCn,Flat

00H 15H	mmH llH	Mic Converter Bch: Output
		        0,,,6 = SmlDy,VocDy,LrgDy,
		        SmlCn,LrgCn,VntCn,Flat

00H 16H	mmH llH	Mic Converter Bch: Phase 0,1 = Normal,Inverse
00H 17H	mmH llH	Bass Cut Bch: Bass Cut Frequency 1,,,200 = Thru,20,,,2000Hz
00H 18H	mmH llH	Distance Bch: Proximity Effect -12,,,+12
00H 19H	mmH llH	Distance Bch: Timelag 0,,,1000 = 0,,,3000cm
00H 1AH	mmH llH	Limiter Bch: Detect HPF Frequency 1,,,200 = Thru,20,,,2000Hz
00H 1BH	mmH llH	Limiter Bch: Level -60,,,24dB
00H 1CH	mmH llH	Limiter Bch: Threshold -60,,,0dB
00H 1DH	mmH llH	Limiter Bch: Attack 0,,,100
00H 1EH	mmH llH	Limiter Bch: Release 0,,,100
00H 1FH : 00H 7FH	00H 00H : 00H 00H	(Reserved)

*   When Mic Converter Input = MinCn, Output is fixed to SmlDy or LrgCn.
*   When Link SW = On, Bch corresponds to Ach.

◇ Algorithm 30 3 Band Isolator

NRPN	Data Entry	
00H 00H	mmH llH	Isolator SW 0,1 = Off,On
00H 01H	mmH llH	Isolator High Volume -60,,,+4dB
00H 02H	mmH llH	Isolator Middle Volume -60,,,+4dB
00H 03H	mmH llH	Isolator Low Volume -60,,,+4dB
00H 04H	mmH llH	Isolator Anti Phase Middle Switch 0,1 = Off,On
00H 05H	mmH llH	Isolator Anti Phase Middle Level 0,,,100
00H 06H	mmH llH	Isolator Anti Phase Low Switch 0,1 = Off,On
00H 07H	mmH llH	Isolator Anti Phase Low Level 0,,,100

00H 08H : 00H 7FH	00H 00H : 00H 00H	(Reserved)

◇ Algorithm 31 Tape Echo 201

NRPN	Data Entry	
00H 00H	mmH llH	Tape Echo SW 0,1 = Off,On
00H 01H	mmH llH	Tape Echo Mode Select 0,,,6 = 1,,,7
00H 02H	mmH llH	Tape Echo Repeat Rate 0,,,100
00H 03H	mmH llH	Tape Echo Intensity 0,,,100
00H 04H	mmH llH	Tape Echo Effect Level 0,,,100
00H 05H	mmH llH	Tape Echo Direct Level 0,,,100
00H 06H	mmH llH	Tape Echo Tone Bass -100,,,100
00H 07H	mmH llH	Tape Echo Tone Treble -100,,,100
00H 08H	mmH llH	Tape Echo Tape Head S Pan 1,,,127 = L63,,,R63
00H 09H	mmH llH	Tape Echo Tape Head M Pan 1,,,127 = L63,,,R63
00H 0AH	mmH llH	Tape Echo Tape Head L Pan 1,,,127 = L63,,,R63
00H 0BH	mmH llH	Tape Echo Tape Distortion 0,,,100
00H 0CH	mmH llH	Tape Echo Wah Flutter Rate 0,,,100
00H 0DH	mmH llH	Tape Echo Wah Flutter Depth 0,,,100
00H 0EH : 00H 7FH	00H 00H : 00H 00H	(Reserved)

◇ Algorithm 32 Analog Flanger

NRPN	Data Entry	
00H 00H	mmH llH	Analog Flanger SW 0,1 = Off,On
00H 01H	mmH llH	Analog Flanger Mode 0,,,3 = FL1,FL2,FL3,CHO
00H 02H	mmH llH	Analog Flanger Feedback 0,,,100
00H 03H	mmH llH	Analog Flanger Modulation Rate 0,,,100
00H 04H	mmH llH	Analog Flanger Modulation Depth 0,,,100
00H 05H	mmH llH	Analog Flanger Modulation Frequency 0,,,100
00H 06H	mmH llH	Analog Flanger Channel B Modulation 0,1 = Nor,Inv
00H 07H	mmH llH	Analog Flanger Channel A Phase 0,1 = Nor,Inv
00H 08H	mmH llH	Analog Flanger Channel B Phase 0,1 = Nor,Inv
00H 09H : 00H 7FH	00H 00H : 00H 00H	(Reserved)

◇ Algorithm 33 Analog Phaser

NRPN	Data Entry	
00H 00H	mmH llH	Analog Phaser SW 0,1 = Off,On
00H 01H	mmH llH	Analog Phaser Mode 0,1 = 4STAGE,8STAGE
00H 02H	mmH llH	Analog Phaser Frequency 0,,,100
00H 03H	mmH llH	Analog Phaser Resonance 0,,,100
00H 04H	mmH llH	Analog Phaser LFO 1 Rate 0,,,100
00H 05H	mmH llH	Analog Phaser LFO 1 Depth 0,,,100
00H 06H	mmH llH	Analog Phaser LFO 1 Channel B Mod 0,1 = Nor,Inv
00H 07H	mmH llH	Analog Phaser LFO 2 Rate 0,,,100
00H 08H	mmH llH	Analog Phaser LFO 2 Depth 0,,,100
00H 09H	mmH llH	Analog Phaser LFO 2 Channel B Mod 0,1 = Nor,Inv
00H 0AH : 00H 7FH	00H 00H : 00H 00H	(Reserved)

● Program Change

Works as program change for the effects when MIDI channel number is set to 0H, 1H, 2H or 3H.
Works as scene switch when channel number is set to FH.
VS-1680 never transmits this message.

Status	Second
CnH	ppH

n = MIDI Channel No. : 0H - 3H, FH
(ch.1 = Effect1 ch.2 = Effect2ch.3 = Effect3 ch.4 = Effect4)
(ch.16 = Scene Memory (*1))
pp = Program No. : 00H - 63H (0 - 99) n = 0H, 1H
pp = Program No. : 00H - 07H (0 - 7) n = EH

(*1) If received while VS-1680 is playing, playback stops, and then restarts after the scene switched. Never receives while recording.

● Pitch Bend Range

Receives when effect algorithm 27(Voice Transformer) is selected and MIDI Control SW is On.

Status	Second	Third
EnH	llH	mmH

n = MIDI Channel No. : 0H - 3H (ch.1-ch.4)
     n = 0, 2 (ch.1, ch 3) : Voice Transformer : Chromatic Pitch
     n = 1, 3 (ch.2, ch 4) : Voice Transformer : Chromatic Formant
mm,ll = value : 00H,00H - 40H,00H - 7FH,7FH(-8192 - 0 - +8191)

■ System Common Messages
● MIDI Time Code Quarter Frame Messages

MIDI Time Code Quarter Frame Messages can be transmitted while the VS-1680 is running (Playing or Recording) if the SYSTEM parameter "Syn:Source" is "INT" and "Syn:Gen." is "MTC" in the SYSTEM parameter. The transmitted time counts are summed to "SMPTE(MTC) Offset Time" as the song top is "00:00:00:00".
The VS-1680 synchronizes with the time counts which are summed to "SMPTE (MTC) Offset Time" as the song top is "00:00:00:00" if the SYSTEM parameter "Syn:Source" is "EXT"

Status	Second
F1H	mmH (= 0nnndddd)

nnn = Message type :   0 = Frame count LS nibble
                        1 = Frame count MS nibble
                        2 = Seconds count LS nibble
                        3 = Seconds count MS nibble
                        4 = Minutes count LS nibble
                        5 = Minutes count MS nibble
                        6 = Hours count LS nibble
                        7 = Hours count MS nibble
dddd = 4 bit nibble data : 0H - FH (0 - 15)

If the upper and lower 4 bits of the count are combined, these bit fields are assigned as follows.

Frame Count xxxyyyyy
     xxx   Reserved (000)
     yyyyy   Frame No. (0-29)

Seconds Count xxyyyyyy
     xx   Reserved (00)
     yyyyyy   Seconds Count (0-59)

Minutes Count xxyyyyyy
     xx   Reserved (00)
     yyyyyy   Minutes Count (0-59)
Hours Count xyyzzzzz
     x   Reserved (0)
     yy   Time Code type
                0 = 24 Frames / Sec
                1 = 25 Frames / Sec
                2 = 30 Frames / Sec (Drop Frame)

                3 = 30 Frames / Sec (Non Drop Frame
     zzzzz   Hours

● Song Position Pointer

The current position is transmitted with the Song Position Pointer Message before the VS-1680 starts to run or after the locate operation, when "Syn:Source" is "INT" and "Syn:Gen." is "MIDIclk" or "SyncTr".

Status	Second	Third
F2H	mmH	nnH

mm,nn = Song Position Point : 00H 00H - 7FH 7FH

■ System Realtime Message
Transmitted when "Syn:Source" is "INT" and "Syn:Gen." is "MIDIclk" or "SyncTr".

● Timing Clock
Status
F8H

● Start
Status
FAH

● Continue
Status
FBH

● Stop
Status
FCH

■ System Exclusive Message

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

Byte	Description
F0H	Status of System Exclusive Message
iiH	Manufacturer ID
	41H: Roland's Manufacturer ID
	7EH: Universal Non Realtime Message
	7FH: Universal Realtime Message
ddH	Data : 00H - 7FH (0-127)
:	:
eeH	Data
F7H	EOX (End of System Exclusive Message)

The VS-1680 can transfer and receive the internal parameters information using system exclusive messages, and also can be controlled by the external devices using system exclusive messages.
The VS-1680 can transmit and receive Universal System Exclusive messages, Data Request(RQ1) and Data set(DS1) as the System Exclusive message.

❍ About Model ID
For Data Request (RQ1) and Data Set (DT1), VS-1680 uses 00H 0EH as a Model ID.

❍ About Device ID
System Exclusive messages are not assigned to any particular MIDI channel. Instead, they have their own special control parameter called device ID.
The Roland system exclusive messages use device IDs to specify multiple VS-1680 units.
The VS-1680 sends system exclusive messages using 00H - 1FH, and receives the system exclusive messages whose device ID is same as its device ID and 7FH.
The value of the device ID is the value set on the SYSTEM parameter "MID:DeviceID" minus one.

MIDI Implementation

● **Universal System Exclusive Message**
❍ **INQUIRY MESSAGE**
✧ **Identity Request**

Status	Data Byte	Status
F0H	7EH,Dev,06H,01H	F7H

Byte	Description
F0H	Status of System Exclusive Message
7EH	Universal System Exclusive Message Non Realtime Header
Dev	Device ID (or 7FH)
06H	General Information (sub ID #1)
01H	Identify Request (sub ID #2)
F7H	EOX (End of System Exclusive Message)

The message is used to request the particular information of the VS-1680.
The VS-1680 does not transmit the message.
If the VS-1680 received the message and the device ID of the message is same as its device ID or 7FH, the VS-1680 transmits the following Identity Reply message.

✧ **Identity Reply**

Status	Data Bytes	Status
F0H	7EH,Dev,06H,02H,41H,7CH,00H,00H,00H,00H,00H,ssH,ssH	F7H

Byte	Description
F0H	Status of System Exclusive Message
7EH	Universal System Exclusive Message Non Realtime Header
Dev	Device ID
06H	General Information (sub ID #1)
02H	Identify Request (sub ID #2)
41H	Manufacturer ID (Roland)
0EH 01H	Device Family Code (VS-1680)
00H 00H	Device Family No.
00H	
00H	
ssH ssH	Software Revision Level
F7H	EOX (End of System Exclusive Message)

✧ **MIDI Machine Control Commands**

Status	Data Bytes	Status
F0H	7FH,Dev,06H,aaH, ..., bbH	F7H

Byte	Description
F0H	Status of System Exclusive Message
7FH	Universal System Exclusive Message Realtime Header
Dev	Device ID (or 7FH)
06H	MMC Command Message
aaH	Command
:	:
bbH	Command
F7H	EOX (End of System Exclusive Message)

(*) see '3. MIDI Machine Control' section

✧ **MIDI Machine Control Responses**

Status	Data Bytes	Status
F0H	7FH,Dev,07H,aaH, ..., bbH	F7H

Byte	Description
F0H	Status of System Exclusive Message
7FH	Universal System Exclusive Message Realtime Header
Dev	Device ID
07H	MMC Response Message
aaH	Response
:	:
bbH	Response
F7H	EOX (End of System Exclusive Message)

(*) see '3. MIDI Machine Control' section

● **Data Transfer (RQ1, DT1)**

❍ **Data Request (RQ1)**

Status	Data Bytes	Status
F0H	41H,Dev,00H, 0EH,11H,aaH,bbH,ccH,ssH,ssH,ssH,Sum	F7H

Byte	Description
F0H	Status of System Exclusive Message
41H	Manufacturer ID (Roland)
Dev	Device ID
00H 0EH	ModelID (VS-1680)
11H	Command ID (RQ1)
aaH	Address MSB
bbH	Address
ccH	Address LSB
ssH	Size MSB
ssH	Size
ssH	Size LSB
Sum	Check Sum
F7H	EOX (End of System Exclusive Message)

The message is used to request data to the VS-1680.
The VS-1680 does not transmit this message.
The VS-1680 transmits the requested data using Data Set(DT1) under following condition when it received the message.

1. The requested address correspond to the specified parameter base address of the VS-1680.
2. The requested size is over 1 byte.

❍ **Data Set (DT1)**

Status	Data Bytes	Status
F0H	41H,Dev,00H,0EH,12H,aaH,bbH,ccH,ddH, ..., eeH,Sum	F7H

Byte	Description
F0H	Status of System Exclusive Message
41H	Manufacturer ID (Roland)
Dev	Device ID
00H 0EH	Model ID (VS-1680)
12H	Command ID (DT1)
aaH	Address MSB
bbH	Address
ccH	Address LSB
ddH	Data
:	:
eeH	Data
Sum	Check Sum
F7H	EOX (End of System Exclusive Message)

✧ **The message is received under the following condition.**
If the device ID on the message is same as that of the receive device, and the address on the message correspond to the specified parameter base address, the received data are stored from the specified parameter base address. If the interval of received messages is shorter than 25 msec, the VS-1680 can not work the receive message procedure correctly.

✧ **The message is transmitted under the following condition.**
When the VS-1680 transmit the data on the requested parameter after receiving the Data Request message(RQ1).

see '2. Data Transfer Address Map' for more details of the transfer parameters.

✧ **The message is transmitted under the following condition.**
When the VS-1680 transmit the data on the requested parameter after receiving the Data Request message(RQ1).

see '2. Data Transfer Address Map' for more details of the transfer parameters.

2. Data Transfer Address Map

Address		MSB			LSB
Binary	|	0aaa aaaa	|	0bbb bbbb |	0ccc cccc
7 Bit Hex	|	AA	|	BB |	CC

■ Parameter Address Block

<Model ID = 00H 0EH>

Start address	Contents and remarks
00 00 00	System Parameter
01 00 00	Song Parameter
02 00 00	Mixer Parameter
03 00 00	Locate Parameter
04 00 00	Effect Parameter
05 00 00 06 00 00 07 00 00	(Reserved)
08 00 00 09 00 00 0A 00 00 0B 00 00 0C 00 00 0D 00 00 0E 00 00 0F 00 00	Sync Track Data
10 00 00 : 7F 7F 7F	(Reserved)

● System Parameter

Start address	Data	Contents and remarks
00 00 00 00 00 01# 00 00 02# 00 00 03#	0aaaaaaa 0bbbbbbb 0ccccccc 0ddddddd	SMPTE(MTC) Offset Time aaaaaaabbbbbbbccccccddddddd = 0,,,268435455block (1block=16sample)
00 00 04 00 00 05# 00 00 06# 00 00 07#	0aaaaaaa 0bbbbbbb 0ccccccc 0ddddddd	Vari Pitch
00 00 08 00 00 09#	0aaaaaaa 0bbbbbbb	(Reserved)
00 00 0A	00 - 01	Vari Pitch Switch Off,On
00 00 0B	00 - 01	Marker Stop Switch Off,On
00 00 0C	00 - 05	Fade Length 2,10,20,30,40,50mS
00 00 0D	0A - 64	Preview From Length 1.0,,,10.0S
00 00 0E	0A - 64	Preview To Length 1.0,,,10.0S
00 00 0F	00 - 05	Foot Switch Assign Play/Stop,Record, TapMarker,Next,Previous
00 00 10	00 - 02	Metronome Out Mode Off,INT,MIDI
00 00 11	00 - 01	Metronome Out Type REConly,AnyTime
00 00 12	00 - 01	Master Clock DIGITAL1,INT,DIGITAL2
00 00 13	00 - 1F	MIDI System Exclusive Device ID (*1) 1,,,32
00 00 14	00 - 01	MIDI OUT/THRU Switch (*1) Out,Thru
00 00 15	00 - 01	MIDI System Exclusive RX Switch (*1) Off,On
00 00 16	00 - 01	MIDI System Exclusive TX Switch (*1) Off,On
00 00 17	00 - 0F	MIDI Metronome Channel 1,,,16
00 00 18	0C - 7F	MIDI Metronome Accent Note 12,,,127
00 00 19	01 - 7F	MIDI Metronome Accent Velocity 1,,,127
00 00 1A	0C - 7F	MIDI Metronome Normal Note 12,,,127
00 00 1B	01 - 7F	MIDI Metronome Normal Velocity 1,,,127
00 00 1C	00 - 01	MIDI Mixer Control Local Switch Off,On
00 00 1D	00 - 02	MIDI Mixer Control Type Off,C.C.,Excl
00 00 1E	00 - 0A	Sync. Error Level 0,,,10
00 00 1F	00 - 01	Sync. Source INT,EXT

Start address	Data	Contents and remarks
00 00 20	00 - 03	Sync. Generate Off,MTC,MIDIclk,SyncTr
00 00 21	00 - 03	Sync. SMPTE Format 24,25,29D,29N,30
00 00 22	01 - 1F	(Reserved)
00 00 23	01 - 1F	(Reserved)
00 00 24	00 - 01	Recording Monitor Auto,Source
00 00 25	00 - 01	Time Disply ABS,REL
00 00 26	00 - 7f	Internal Metronome Level 0-127
00 00 27	00 - 01	Undo Message Off,On
00 00 28 00 00 29# 00 00 2A# 00 00 2B#	0aaaaaaa 0bbbbbbb 0ccccccc 0ddddddd	Tempo Map-1 Tempo Map Time
00 00 2C 00 00 2D# 00 00 2E# 00 00 2F#	0aaaaaaa 0bbbbbbb 0ccccccc 0ddddddd	Tempo Map-1 Sync Track Time
00 00 30 00 00 31#	0aaaaaaa 0bbbbbbb	Tempo Map-1 Tempo 250 - 2500 = 25.0 - 250.0
00 00 32 00 00 33#	0aaaaaaa 0bbbbbbb	Tempo Map-1 Meas 1 - 999
00 00 34 00 00 35#	00 00 - 1F	Tempo Map-1 Beat 0 - 31 = 1/1, 1/2, ..., 7/8, 8/8
00 00 36 00 00 37#	00 00	Tempo Map-1 (Reserved)
00 00 38 : 00 06 47#		Tempo Map-2 (See Tempo Map-1, 16bytes each) : Tempo Map-50
00 06 48	01 - 32	Total Tempo Map Num (*2) 1 - 50
00 06 49	00 - 4B	Scrub Loop Length 25 - 100 mS
00 06 4A	00 - 02	MMC Mode Off, Master, Slave
00 06 4B	00 - 01	(Reserved)
00 06 4C	00 - 01	Digital Output Copy Protect Off,On
00 06 4D	00 - 01	Auto Mix Mode Off,On
00 06 4E	00 - 01	Auto Mix Snap Shot Mode ALL,MaskF
00 06 4F	00 - 03	Display Type of Remaining Time,CapaMB,Capa%,Event
00 06 50	00 - 01	Fader Match Mode Null,Jump
00 06 51	00 - 01	Peak Hold Off,On
00 06 52	00 - 01	Scene Change by PG# Off,On
00 06 53	00 - 01	Effect Change by PG# Off,On
00 06 54	00 - 01	Effect Ctrl by Control Change Off,On
00 06 55	00 - 01	Level Meter Tx. via MIDI Off,On,Interval
00 06 56	00 - 01	Effector Board Available (*3) Off,On(=01 or 03)

(*) The address marked by "#" are invalid. Transmit the Data Set(DT1) or Data Request(RQ1) message with the specified size to the address without "#" mark.

(*1) These parameters are read only. The setting is a panel operation only.
(*2) You must write to the parameter whenever you rewrite the Tempo Map Data. The calculation will be begun when to write the parameter.
(*3) The flag shows that the Effect Board exists or not. It is a read only.

● Song Parameter

Start address	Data	Contents and remarks
01 00 00 : 01 00 0B	20 - 7E 20 - 7E	Current Song Name -1 (ASCII) : Current Song Name -12
01 00 0C	00 - 02	Current Song Sampling Frequency 48K,44.1K,32KHz
01 00 0D	00 - 03 05 - 06	Current Song R-DAC Mode MTP(5),MAS(3),MT1(0),MT2(1),LIV1(2),LIV2(6)
01 00 0E 01 00 0F 01 00 10 01 00 11 01 00 12 01 00 13 01 00 14 01 00 15#	00 - 3B 00 - 3B 00 - 17 00 - 07 00 - 1F 00 - 0C 0aaaaaaa 0bbbbbbb	Current Song Created (second) (minute) (hour) (a day of week) (day) (month) (year)
01 00 16	00 - 3B	Current Song Saved (second)

```
01 00 17 | 00 - 3B |                                     (minute)
01 00 18 | 00 - 17 |                                     (hour)
01 00 19 | 00 - 07 |                               (a day of week)
01 00 1A | 00 - 1F |                                     (day)
01 00 1B | 00 - 0C |                                     (month)
01 00 1C | 0aaaaaaa |
01 00 1D#| 0bbbbbbb |                                    (year)
---------+----------+------------------------------------------------
01 00 1E | 00       | (Reserved)
---------+----------+------------------------------------------------
01 00 1F | 00       | (Reserved)
---------+----------+------------------------------------------------
01 00 20 | 00 - xx  | Current Song Protect    Off, On(=01 or 81)
---------+----------+------------------------------------------------
01 00 21 | 00       | (Reserved)
---------+----------+------------------------------------------------
01 00 22 | 0000000a | Song List Length        abbbbbbb = 1,,,200
01 00 23#| 0bbbbbbb |
---------+----------+------------------------------------------------
01 00 24 | 00       | (Reserved)
   :     |   :      |    :
01 00 7F | 00       | (Reserved)
---------+----------+------------------------------------------------
01 01 00 | 20 - 7E  | Current Song Comment - 1         (ASCII)
   :     |   :      |    :
01 01 63 | 20 - 7E  | Current Song Comment -100        (ASCII)
---------+----------+------------------------------------------------
01 01 64 | 00       | (Reserved)
   :     |   :      |    :
01 01 7D | 00       | (Reserved)
---------+----------+------------------------------------------------
01 02 00 | 00 -     | Song- 1 (similar to 01 00 00 - 01 00 1F)
   :     |   :      |    :
01 02 1F | 00 -     |
---------+----------+------------------------------------------------
   :     |   :      |    :
01 33 60 | 00 -     | Song-200 (similar to 01 00 00 - 01 00 1F)
   :     |   :      |    :
01 33 7F | 00 -     |
---------+----------+------------------------------------------------
```

(*) The address marked by "#" are invalid. Request to Data Request (RQ1) message with the specified size to the address without "#" mark.

(*) Only the Data Set (DT1) message to the song nameand song comment is acceptable.

● Mixer Parameter

```
Start    |          |
address  |  Data    |              Contents and remarks
=========+==========+==================================================
02 00 00 | 00 -     | Track Status -1
         |          |     00=SOURCE,01=PLAY,02=REC
         |          |     40=SOURCE_MUTE,41=PLAY_MUTE,
         |          |     22=REC_SOURCE
   :     |   :      |    :
02 00 0F | 00 -     | Track Status -16
---------+----------+------------------------------------------------
02 00 10 | 00 - 0f  | V.Track -1                              1,,,16
   :     |   :      |    :
02 00 1F | 00 - 0f  | V.Track -16
---------+----------+------------------------------------------------
02 00 20 | 00 -     | (Reserved)                                  0
   :     |   :      |
02 00 3F | 00 -     |
---------+----------+------------------------------------------------
02 00 40 | 00 - 08  | Track Channel ATT -1
         |          |     -42,-36,-30,-24,-18,-12,-6,0,+6dB
   :     |   :      |    :
02 00 4F | 00 - 08  | Track Channel ATT -16
---------+----------+------------------------------------------------
02 00 50 | 00 - 08  | Input Channel ATT -1
         |          |     -42,-36,-30,-24,-18,-12,-6,0,+6dB
   :     |   :      |    :
02 00 59 | 00 - 08  | Input Channel ATT -10
---------+----------+------------------------------------------------
02 00 5A | 00 -     | (dummy)
   :     |   :      |
02 00 5F | 00 -     |
---------+----------+------------------------------------------------
02 00 60 | 00 - 01  | Track Channel Phase -1                Nor,Inv
   :     |   :      |    :
02 00 6F | 00 - 01  | Track Channel Phase -16
---------+----------+------------------------------------------------
02 00 70 | 00 - 01  | Input Channel Phase -1                Nor,Inv
   :     |   :      |    :
02 00 79 | 00 - 01  | Input Channel Phase -10
---------+----------+------------------------------------------------
02 00 7A | 00 -     | (dummy)
   :     |   :      |
02 00 7F | 00 -     |
---------+----------+------------------------------------------------
02 01 00 | 00 -     | (Reserved)                                  0
   :     |   :      |
02 01 1F | 00 -     |
---------+----------+------------------------------------------------
02 01 20 | 00 - 01  | Track Channel EQ Switch -1             Off,On
   :     |   :      |    :
02 01 2F | 00 - 01  | Track Channel EQ Switch -16
---------+----------+------------------------------------------------
02 01 30 | 00 - 01  | Input Channel EQ Switch -1             Off,On
   :     |   :      |    :
02 01 39 | 00 - 01  | Input Channel EQ Switch -10
---------+----------+------------------------------------------------
02 01 3A | 00 -     | (dummy)
   :     |   :      |
02 01 3F | 00 -     |
---------+----------+------------------------------------------------
02 01 40 | 00 - 7F  | Track Channel EQ L Freq.-1
         |          |     40,50,60,70,80,90,100,120,140,
         |          |     160,180,200,300,400,500,
         |          |     600,700,800,900,1K,1.1K,
```

```
         |          |     1.2K,1.3K,1.4K,1.5KHz
   :     |   :      |    :
02 01 4F | 00 - 7F  | Track Channel EQ L Freq.-16
---------+----------+------------------------------------------------
02 01 50 | 00 - 7F  | Input Channel EQ L Freq.-1
         |          |     40,50,60,70,80,90,100,120,
         |          |     140,160,180,200,300,400,500,
         |          |     600,700,800,900,1K,1.1K,
         |          |     1.2K,1.3K,1.4K,1.5KHz
   :     |   :      |    :
02 01 59 | 00 - 7F  | Input Channel EQ L Freq.-10
---------+----------+------------------------------------------------
02 01 5A | 00 -     | (dummy)
   :     |   :      |
02 01 5F | 00 -     |
---------+----------+------------------------------------------------
02 01 60 | 00 - 7F  | Track Channel EQ L Gain -1        12,,,+12dB
   :     |   :      |    :
02 01 6F | 00 - 7F  | Track Channel EQ L Gain -16
---------+----------+------------------------------------------------
02 01 70 | 00 - 7F  | Input Channel EQ L Gain -1        12,,,+12dB
   :     |   :      |    :
02 01 79 | 00 - 7F  | Input Channel EQ L Gain -10
---------+----------+------------------------------------------------
02 01 7A | 00 -     | (dummy)
   :     |   :      |
02 01 7F | 00 -     |
---------+----------+------------------------------------------------
02 02 00 | 00 - 7F  | Track Channel EQ M Freq.-1
         |          |     200,300,400,500,600,700,800,
         |          |     900,1K,1.1K,1.2K,1.3K,1.4K,
         |          |     1.5K,1.6K,1.7K,1.8K,1.9K,2K,
         |          |     3K,4K,5K,6K,7K,8KHz
   :     |   :      |    :
02 02 0F | 00 - 7F  | Track Channel EQ M Freq.-16
---------+----------+------------------------------------------------
02 02 10 | 00 - 7F  | Input Channel EQ M Freq.-1
         |          |     200,300,400,500,600,700,800,
         |          |     900,1K,1.1K,1.2K,1.3K,1.4K,
         |          |     1.5K,1.6K,1.7K,1.8K,1.9K,2K,
         |          |     3K,4K,5K,6K,7K,8KHz
   :     |   :      |    :
02 02 19 | 00 - 7F  | Input Channel EQ M Freq.-16
---------+----------+------------------------------------------------
02 02 1A | 00 -     | (dummy)
   :     |   :      |
02 02 1F | 00 -     |
---------+----------+------------------------------------------------
02 02 20 | 00 - 7F  | Track Channel EQ M Gain -1        12,,,+12dB
   :     |   :      |    :
02 02 2F | 00 - 7F  | Track Channel EQ M Gain -16
---------+----------+------------------------------------------------
02 02 30 | 00 - 7F  | Input Channel EQ M Gain -1        12,,,+12dB
   :     |   :      |    :
02 02 39 | 00 - 7F  | Input Channel EQ M Gain -10
---------+----------+------------------------------------------------
02 02 3A | 00 -     | (dummy)
   :     |   :      |
02 02 3F | 00 -     |
---------+----------+------------------------------------------------
02 02 40 | 00 - 7F  | Track Channel EQ M Q -1        0.5,1,2,4,8,16
   :     |   :      |    :
02 02 4F | 00 - 7F  | Track Channel EQ M Q -16
---------+----------+------------------------------------------------
02 02 50 | 00 - 7F  | Input Channel EQ M Q -1        0.5,1,2,4,8,16
   :     |   :      |    :
02 02 59 | 00 - 7F  | Input Channel EQ M Q -10
---------+----------+------------------------------------------------
02 02 5A | 00 -     | (dummy)
   :     |   :      |
02 02 5F | 00 -     |
---------+----------+------------------------------------------------
02 02 60 | 00 - 7F  | Track Channel EQ H Freq.-1
         |          |     500,600,700,800,900,1K,1.2K,
         |          |     1.4K,1.6K,1.8K,2K,3K,4K,5K,
         |          |     6K,7K,8K,9K,10K,11K,12K,
         |          |     13K,14K,16K,18KHz
   :     |   :      |    :
02 02 6F | 00 - 7F  | Track Channel EQ H Freq.-16
---------+----------+------------------------------------------------
02 02 70 | 00 - 7F  | Input Channel EQ H Freq.-1
         |          |     500,600,700,800,900,1K,1.2K,
         |          |     1.4K,1.6K,1.8K,2K,3K,4K,5K,
         |          |     6K,7K,8K,9K,10K,11K,12K,
         |          |     13K,14K,16K,18KHz
   :     |   :      |    :
02 02 79 | 00 - 7F  | Input Channel EQ H Freq.-10
---------+----------+------------------------------------------------
02 02 7A | 00 -     | (dummy)
   :     |   :      |
02 02 7F | 00 -     |
---------+----------+------------------------------------------------
02 03 00 | 00 - 7F  | Track Channel EQ H Gain -1        12,,,+12dB
   :     |   :      |    :
02 03 0F | 00 - 7F  | Track Channel EQ H Gain -16
---------+----------+------------------------------------------------
02 03 10 | 00 - 7F  | Input Channel EQ H Gain -1        12,,,+12dB
   :     |   :      |    :
02 03 19 | 00 - 7F  | Input Channel EQ H Gain -10
---------+----------+------------------------------------------------
02 03 1A | 00 -     | (dummy)
   :     |   :      |
02 03 1F | 00 -     |
---------+----------+------------------------------------------------
02 03 20 | 00 - 04  | Track Channel Effect 1 Insert Switch -1
         |          |              Off,Ins,InsL,InsR,InsS
   :     |   :      |    :
02 03 2F | 00 - 04  | Track Channel Effect 1 Insert Switch -16
---------+----------+------------------------------------------------
02 03 30 | 00 - 04  | Input Channel Effect 1 Insert Switch -1
         |          |              Off,Ins,InsL,InsR,InsS
   :     |   :      |    :
02 03 39 | 00 - 04  | Input Channel Effect 1 Insert Switch -10
---------+----------+------------------------------------------------
02 03 3A | 00 -     | (dummy)
   :     |   :      |
02 03 3F | 00 -     |
---------+----------+------------------------------------------------
```

Address	Value	Description
02 03 40	00 - 08	Track Channel Effect 1 Insert Send Level -1 -42,-36,-30,-24,-18,-12,-6,0,+6dB
: 02 03 4F	: 00 - 08	: Track Channel Effect 1 Insert Send Level -1
02 03 50	00 - 08	Input Channel Effect 1 Insert Send Level -1 -42,-36,-30,-24,-18,-12,-6,0,+6dB
: 02 03 59	: 00 - 08	: Input Channel Effect 1 Insert Send Level -10
02 03 5A	00 -	(dummy)
02 03 5F	00 -	
02 03 60	00 - 08	Track Channel Effect 1 Insert ReturnLevel-1 -42,-36,-30,-24,-18,-12,-6,0,+6dB
: 02 03 6F	: 00 - 08	: Track Channel Effect 1 Insert ReturnLevel-16
02 03 70	00 - 08	Input Channel Effect 1 Insert ReturnLevel-1 -42,-36,-30,-24,-18,-12,-6,0,+6dB
: 02 03 79	: 00 - 08	: Input Channel Effect 1 Insert ReturnLevel-10
02 03 7A	00 -	(dummy)
02 03 7F	00 -	
02 04 00	00 - 04	Track Channel Effect 2 Insert Switch -1 Off,Ins,InsL,InsR,InsS
: 02 04 0F	: 00 - 04	: Track Channel Effect 2 Insert Switch -16
02 04 10	00 - 04	Input Channel Effect 2 Insert Switch -1 Off,Ins,InsL,InsR,InsS
: 02 04 19	: 00 - 04	: Input Channel Effect 2 Insert Switch -10
02 04 1A	00 -	(dummy)
02 04 1F	00 -	
02 04 20	00 - 08	Track Channel Effect 2 Insert Send Level-1 -42,-36,-30,-24,-18,-12,-6,0,+6dB
: 02 04 2F	: 00 - 08	: Track Channel Effect 2 Insert Send Level-16
02 04 30	00 - 08	Input Channel Effect 2 Insert Send Level-1 -42,-36,-30,-24,-18,-12,-6,0,+6dB
: 02 04 39	: 00 - 08	: Input Channel Effect 2 Insert Send Level-10
02 04 3A	00 -	(dummy)
02 04 3F	00 -	
02 04 40	00 - 08	Track Channel Effect 2 Insert ReturnLevel-1 -42,-36,-30,-24,-18,-12,-6,0,+6dB
: 02 04 4F	: 00 - 08	: Track Channel Effect 2 Insert ReturnLevel-16
02 04 50	00 - 08	Input Channel Effect 2 Insert ReturnLevel-1 -42,-36,-30,-24,-18,-12,-6,0,+6dB
: 02 04 59	: 00 - 08	: Input Channel Effect 2 Insert ReturnLevel-10
02 04 5A	00 -	(dummy)
02 04 5F	00 -	
02 04 60	00 - 04	Track Channel Effect 3 Insert Switch -1 Off,Ins,InsL,InsR,InsS
: 02 04 6F	: 00 - 04	: Track Channel Effect 3 Insert Switch -16
02 04 70	00 - 04	Input Channel Effect 3 Insert Switch -1 Off,Ins,InsL,InsR,InsS
: 02 04 79	: 00 - 04	: Input Channel Effect 3 Insert Switch -10
02 04 7A	00 -	(dummy)
02 04 7F	00 -	
02 05 00	00 - 08	Track Channel Effect 3 Insert Send Level -1 -42,-36,-30,-24,-18,-12,-6,0,+6dB
: 02 05 0F	: 00 - 08	: Track Channel Effect 3 Insert Send Level-16
02 05 10	00 - 08	Input Channel Effect 3 Insert Send Level -1 -42,-36,-30,-24,-18,-12,-6,0,+6dB
: 02 05 19	: 00 - 08	: Input Channel Effect 3 Insert Send Level-10
02 05 1A	00 -	(dummy)
02 05 1F	00 -	
02 05 20	00 - 08	Track Channel Effect3 Insert ReturnLevel-1 -42,-36,-30,-24,-18,-12,-6,0,+6dB
: 02 05 2F	: 00 - 08	: Track Channel Effect3 Insert ReturnLevel-16
02 05 30	00 - 08	Input Channel Effect3 Insert ReturnLevel-1 -42,-36,-30,-24,-18,-12,-6,0,+6dB
: 02 05 39	: 00 - 08	: Input Channel Effect3 Insert ReturnLevel-10
02 05 3A	00 -	(dummy)
02 05 3F	00 -	
02 05 40	00 - 04	Track Channel Effect 4 Insert Switch -1 Off,Ins,InsL,InsR,InsS
: 02 05 4F	: 00 - 04	: Track Channel Effect 4 Insert Switch -16

Address	Value	Description
02 05 50	00 - 04	Input Channel Effect 4 Insert Switch -1 Off,Ins,InsL,InsR,InsS
: 02 05 59	: 00 - 04	: Input Channel Effect 4 Insert Switch -10
02 05 5A	00 -	(dummy)
02 05 5F	00 -	
02 05 60	00 - 08	Track Channel Effect 4 Insert Send Level -1 -42,-36,-30,-24,-18,-12,-6,0,+6dB
: 02 05 6F	: 00 - 08	: Track Channel Effect 4 Insert Send Level-16
02 05 70	00 - 08	Input Channel Effect 4 Insert Send Level -1 -42,-36,-30,-24,-18,-12,-6,0,+6dB
: 02 05 79	: 00 - 08	: Input Channel Effect 4 Insert Send Level -10
02 05 7A	00 -	(dummy)
02 05 7F	00 -	
02 06 00	00 - 08	Track Channel Effect4 Insert Return Level-1 -42,-36,-30,-24,-18,-12,-6,0,+6dB
: 02 06 0F	: 00 - 08	: Track Channel Effect4 Insert Return Level-1
02 06 10	00 - 08	Input Channel Effect4 Insert Return Level-1 -42,-36,-30,-24,-18,-12,-6,0,+6dB
: 02 06 19	: 00 - 08	: Input Channel Effect4 Insert Return Level-10
02 06 1A	00 -	(dummy)
02 06 1F	00 -	
02 06 20	00 - 7F	Track Channel Level -1 0,,,127
: 02 06 2F	: 00 - 7F	: Track Channel Level -16
02 06 30	00 - 7F	Input Channel Level -1 0,,,127
: 02 06 39	: 00 - 7F	: Input Channel Level -10
02 06 3A	00 -	(dummy)
02 06 3F	00 -	
02 06 40	00 -	(Reserved) 2
: 02 06 5F	: 00 -	: (Reserved)
02 06 60	01 - 7F	Track Channel MST Send Pan -1 L63 ,,, R63
: 02 06 6F	: 01 - 7F	: Track Channel MST Send Pan -16
02 06 70	01 - 7F	Input Channel MST Send Pan -1 L63 ,,, R63
: 02 06 79	: 01 - 7F	: Input Channel MST Send Pan -10
02 06 7A	00 -	(dummy)
02 06 7F	00 -	
02 07 00	00 - 02	Track Channel MST Send Switch -1 Off,On
: 02 07 0F	: 00 - 02	: Track Channel MST Send Switch -16
02 07 10	00 - 02	Input Channel MST Send Switch -1 Off,On
: 02 07 19	: 00 - 02	: Input Channel MST Send Switch -10
02 07 1A	00 -	(dummy)
02 07 1F	00 -	
02 07 20	00 - 01	Track Channel BUS Send Switch -1 -1 Off,On
: 02 07 2F	: 00 - 01	: Track Channel BUS Send Switch -1 -16
02 07 30	00 - 01	Track Channel BUS Send Switch -2 -1 Off,On
: 02 07 3F	: 00 - 01	: Track Channel BUS Send Switch -2 -16
02 07 40	00 - 01	Track Channel BUS Send Switch -3 -1 Off,On
: 02 07 4F	: 00 - 01	: Track Channel BUS Send Switch -3 -16
02 07 50	00 - 01	Track Channel BUS Send Switch -4 -1 Off,On
: 02 07 5F	: 00 - 01	: Track Channel BUS Send Switch -4 -16
02 07 60	00 - 01	Track Channel BUS Send Switch -5 -1 Off,On
: 02 07 6F	: 00 - 01	: Track Channel BUS Send Switch -5 -16
02 07 70	00 - 01	Track Channel BUS Send Switch -6 -1 Off,On
: 02 07 7F	: 00 - 01	: Track Channel BUS Send Switch -6 -16
02 08 00	00 - 01	Track Channel BUS Send Switch -7 -1 Off,On
: 02 08 0F	: 00 - 01	: Track Channel BUS Send Switch -7 -16
02 08 10	00 - 01	Track Channel BUS Send Switch -8 -1 Off,On

02 08 1F	00 - 01	Track Channel BUS Send Switch -8 -16
02 08 20	00 - 01	Track Channel BUS Send Switch -9 -1 Off,On
02 08 2F	00 - 01	Track Channel BUS Send Switch -9 -16
02 08 30	00 - 01	Track Channel BUS Send Switch -10 -1 Off,On
02 08 3F	00 - 01	Track Channel BUS Send Switch -10 -16
02 08 40	00 - 01	Track Channel BUS Send Switch -11 -1 Off,On
02 08 4F	00 - 01	Track Channel BUS Send Switch -11 -16
02 08 50	00 - 01	Track Channel BUS Send Switch -12 -1 Off,On
02 08 5F	00 - 01	Track Channel BUS Send Switch -12 -16
02 08 60	00 - 01	Track Channel BUS Send Switch -13 -1 Off,On
02 08 6F	00 - 01	Track Channel BUS Send Switch -13 -16
02 08 70	00 - 01	Track Channel BUS Send Switch -14 -1 Off,On
02 08 7F	00 - 01	Track Channel BUS Send Switch -14 -16
02 09 00	00 - 01	Track Channel BUS Send Switch -15 -1 Off,On
02 09 0F	00 - 01	Track Channel BUS Send Switch -15 -16
02 09 10	00 - 01	Track Channel BUS Send Switch -16 -1 Off,On
02 09 1F	00 - 01	Track Channel BUS Send Switch -16 -16
02 09 20	00 - 01	Input Channel BUS Send Switch -1 -1 Off,On
02 09 2F	00 - 01	Input Channel BUS Send Switch -1 -16
02 09 30	00 - 01	Input Channel BUS Send Switch -2 -1 Off,On
02 09 3F	00 - 01	Input Channel BUS Send Switch -2 -16
02 09 40	00 - 01	Input Channel BUS Send Switch -3 -1 Off,On
02 09 4F	00 - 01	Input Channel BUS Send Switch -3 -16
02 09 50	00 - 01	Input Channel BUS Send Switch -4 -1 Off,On
02 09 5F	00 - 01	Input Channel BUS Send Switch -4 -16
02 09 60	00 - 01	Input Channel BUS Send Switch -5 -1 Off,On
02 09 6F	00 - 01	Input Channel BUS Send Switch -5 -16
02 09 70	00 - 01	Input Channel BUS Send Switch -6 -1 Off,On
02 09 7F	00 - 01	Input Channel BUS Send Switch -6 -16
02 0A 00	00 - 01	Input Channel BUS Send Switch -7 -1 Off,On
02 0A 0F	00 - 01	Input Channel BUS Send Switch -7 -16
02 0A 10	00 - 01	Input Channel BUS Send Switch -8 -1 Off,On
02 0A 1F	00 - 01	Input Channel BUS Send Switch -8 -16
02 0A 20	00 - 01	Input Channel BUS Send Switch -9 -1 Off,On
02 0A 2F	00 - 01	Input Channel BUS Send Switch -9 -16
02 0A 30	00 - 01	Input Channel BUS Send Switch -10 -1 Off,On
02 0A 3F	00 - 01	Input Channel BUS Send Switch -10 -16
02 0A 40 : 02 0B 1F	00 - : 00 -	(dummy)
02 0B 20	00 - 02	Track Channel Effect 1 Switch -1 Off,Pre,Post
02 0B 2F	00 - 02	Track Channel Effect 1 Switch -16
02 0B 30	00 - 02	Input Channel Effect 1 Switch -1 Off,Pre,Post
02 0B 39	00 - 02	Input Channel Effect 1 Switch -10
02 0B 3A : 02 0B 3F	00 - : 00 -	(dummy)
02 0B 40	00 - 7F	Track Channel Effect 1 Level -1 0,,,127
02 0B 4F	00 - 7F	Track Channel Effect 1 Level -16
02 0B 50	00 - 7F	Input Channel Effect 1 Level -1 0,,,127

02 0B 59	00 - 7F	Input Channel Effect 1 Level -10
02 0B 5A : 02 0B 5F	00 - : 00 -	(dummy)
02 0B 60	01 - 7F	Track Channel Effect 1 Pan -1 L63,,,R63
02 0B 6F	01 - 7F	Track Channel Effect 1 Pan -16
02 0B 70	01 - 7F	Input Channel Effect 1 Pan -1 L63,,,R63
02 0B 79	01 - 7F	Input Channel Effect 1 Pan -10
02 0B 7A : 02 0B 7F	00 - : 00 -	(dummy)
02 0C 00	00 - 02	Track Channel Effect 2 Switch -1 Off,Pre,Post
02 0C 0F	00 - 02	Track Channel Effect 2 Switch -16
02 0C 10	00 - 02	Input Channel Effect 2 Switch -1 Off,Pre,Post
02 0C 19	00 - 02	Input Channel Effect 2 Switch -10
02 0C 1A : 02 0C 1F	00 - : 00 -	(dummy)
02 0C 20	00 - 7F	Track Channel Effect 2 Level -1 0,,,127
02 0C 2F	00 - 7F	Track Channel Effect 2 Level -16
02 0C 30	00 - 7F	Input Channel Effect 2 Level -1 0,,,127
02 0C 39	00 - 7F	Input Channel Effect 2 Level -10
02 0C 3A : 02 0C 3F	00 - : 00 -	(dummy)
02 0C 40	01 - 7F	Track Channel Effect 2 Pan -1 L63,,,R63
02 0C 4F	01 - 7F	Track Channel Effect 2 Pan -16
02 0C 50	01 - 7F	Input Channel Effect 2 Pan -1 L63,,,R63
02 0C 59	01 - 7F	Input Channel Effect 2 Pan -10
02 0C 5A : 02 0C 5F	00 - : 00 -	(dummy)
02 0C 60	00 - 02	Track Channel AUX 1 Switch -1 Off,Pre,Post
02 0C 6F	00 - 02	Track Channel AUX 1 Switch -16
02 0C 70	00 - 02	Input Channel AUX 1 Switch -1 Off,Pre,Post
02 0C 79	00 - 02	Input Channel AUX 1 Switch -10
02 0C 7A : 02 0C 7F	00 - : 00 -	(dummy)
02 0D 00	00 - 7F	Track Channel AUX 1 Level -1 0,,,127
02 0D 0F	00 - 7F	Track Channel AUX 1 Level -16
02 0D 10	00 - 7F	Input Channel AUX 1 Level -1 0,,,127
02 0D 19	00 - 7F	Input Channel AUX 1 Level -10
02 0D 1A : 02 0D 1F	00 - : 00 -	(dummy)
02 0D 20	01 - 7F	Track Channel AUX 1 Pan -1 L63,,,R63
02 0D 2F	01 - 7F	Track Channel AUX 1 Pan -16
02 0D 30	01 - 7F	Input Channel AUX 1 Pan -1 L63,,,R63
02 0D 39	01 - 7F	Input Channel AUX 1 Pan -10
02 0D 3A : 02 0D 3F	00 - : 00 -	(dummy)
02 0D 40	00 - 02	Track Channel AUX 2 Switch -1 Off,Pre,Post
02 0D 4F	00 - 02	Track Channel AUX 2 Switch -16
02 0D 50	00 - 02	Input Channel AUX 2 Switch -1 Off,Pre,Post
02 0D 59	00 - 02	Input Channel AUX 2 Switch -10
02 0D 5A : 02 0D 5F	00 - : 00 -	(dummy)
02 0D 60	00 - 7F	Track Channel AUX 2 Level -1 0,,,127
02 0D 6F	00 - 7F	Track Channel AUX 2 Level -16
02 0D 70	00 - 7F	Input Channel AUX 2 Level -1 0,,,127
02 0D 79	00 - 7F	Input Channel AUX 2 Level -10
02 0D 7A	00 -	(dummy)

: 02 0D 7F	00 -		
02 0E 00 : 02 0E 0F	01 - 7F : 01 - 7F	Track Channel AUX 2 Pan -1 : Track Channel AUX 2 Pan -16	L63,,,R63
02 0E 10 : 02 0E 19	01 - 7F : 01 - 7F	Input Channel AUX 2 Pan -1 : Input Channel AUX 2 Pan -10	L63,,,R63
02 0E 1A : 02 0E 1F	00 - : 00 -	(dummy)	
02 0E 20 : 02 0E 2F	00 - 02 : 00 - 02	Track Channel AUX 3 Switch -1 : Track Channel AUX 3 Switch -16	Off,Pre,Post
02 0E 30 : 02 0E 39	00 - 02 : 00 - 02	Input Channel AUX 3 Switch -1 : Input Channel AUX 3 Switch -10	Off,Pre,Post
02 0E 3A : 02 0E 3F	00 - : 00 -	(dummy)	
02 0E 40 : 02 0E 4F	00 - 7F : 00 - 7F	Track Channel AUX 3 Level -1 : Track Channel AUX 3 Level -16	0,,,127
02 0E 50 : 02 0E 59	00 - 7F : 00 - 7F	Input Channel AUX 3 Level -1 : Input Channel AUX 3 Level -10	0,,,127
02 0E 5A : 02 0E 5F	00 - : 00 -	(dummy)	
02 0E 60 : 02 0E 6F	01 - 7F : 01 - 7F	Track Channel AUX 3 Pan -1 : Track Channel AUX 3 Pan -16	L63,,,R63
02 0E 70 : 02 0E 79	01 - 7F : 01 - 7F	Input Channel AUX 3 Pan -1 : Input Channel AUX 3 Pan -10	L63,,,R63
02 0E 7A : 02 0E 7F	00 - : 00 -	(dummy)	
02 0F 00 : 02 0F 1F	00 - : 00 -	(Reserved)	0
02 0F 20 : 02 0F 2F	00 - 01 : 00 - 01	Track Channel Solo Switch -1 : Track Channel Solo Switch -16	Off,On
02 0F 30 : 02 0F 39	00 - 01 : 00 - 01	Input Channel Solo Switch -1 : Input Channel Solo Switch -10	Off,On
02 0F 3A : 02 0F 3F	00 - : 00 -	(dummy)	
02 0F 40 : 02 0F 4F	00 - 01 : 00 - 01	Track Channel Mute Switch -1 : Track Channel Mute Switch -16	Off,On
02 0F 50 : 02 0F 59	00 - 01 : 00 - 01	Input Channel Mute Switch -1 : Input Channel Mute Switch -10	Off,On
02 0F 5A : 02 0F 5F	00 - : 00 -	(dummy)	
02 0F 60 : 02 0F 6F	00 - 01 : 00 - 01	Track Channel Link Switch -1 : Track Channel Link Switch -16	Off,On
02 0F 70 : 02 0F 79	00 - 01 : 00 - 01	Input Channel Link Switch -1 : Input Channel Link Switch -10	Off,On
02 0F 7A : 02 0F 7F	00 - : 00 -	(dummy)	
02 10 00 : 02 10 07	00 - 7F : 00 - 7F	Track Channel Ofset Level -a : Track Channel Ofset Level -h	0,,,127
02 10 08 : 02 10 0C	00 - 7F : 00 - 7F	Input Channel Ofset Level -a : Input Channel Ofset Level -e	0,,,127
02 10 0D : 02 10 0F	00 - : 00 -	(dummy)	
02 10 10 : 02 10 17	00 - 7F : 00 - 7F	Track Channel Ofset Pan -a : Track Channel Ofset Pan -h	L63,,,R63
02 10 18 : 02 10 1C	00 - 7F : 00 - 7F	Input Channel Ofset Pan -a : Input Channel Ofset Pan -e	L63,,,R63
02 10 1D : 02 10 1F	00 - : 00 -	(dummy)	

02 10 20 : 02 10 27	00 - : 00 -	(Reserved)	
02 10 28	00 - 05	Stereo In Select	Off,Input12,Input34, Input56,Input78,DigitalIn
02 10 29	00 - 7F	Stereo In Level	0,,,127
02 10 2A	01 - 7F	Stereo In Balance	L63,,,R63
02 10 2B	00 -	(Reserved)	
02 10 2C : 02 10 3B	00 - 01 : 00 - 01	Stereo In Bus Send Switch -1 : Stereo In Bus Send Switch -16	Off,On
02 10 3C	00 - 01	Stereo In Solo Switch	Off,On
02 10 3D	00 - 01	Stereo In Mute Switch	Off,On
02 10 3E	00 - 02	Effect 1 Return Switch	Off,On
02 10 3F	00 - 7F	Effect 1 Return Level	0,,,127
02 10 40	01 - 7F	Effect 1 Return Balance	L63,,,R63
02 10 41	00 -	(Reserved)	
02 10 42 : 02 10 51	00 - 01 : 00 - 01	Effect 1 Return Bus Send Switch -1 : Effect 1 Return Bus Send Switch -16	Off,On
02 10 52	00 - 01	Effect 1 Return Solo Switch	Off,On
02 10 53	00 - 01	Effect 1 Return Mute Switch	Off,On
02 10 54	00 - 02	Effect 2 Return Switch	Off,On
02 10 55	00 - 7F	Effect 2 Return Level	0,,,127
02 10 56	01 - 7F	Effect 2 Return Balance	L63,,,R63
02 10 57	00 -	(Reserved)	
02 10 58 : 02 10 67	00 - 01 : 00 - 01	Effect 2 Return Bus Send Switch -1 : Effect 2 Return Bus Send Switch -16	Off,On
02 10 68	00 - 01	Effect 2 Return Solo Switch	Off,On
02 10 69	00 - 01	Effect 2 Return Mute Switch	Off,On
02 10 6A	00 - 02	Effect 3 Return Switch	Off,On
02 10 6B	00 - 7F	Effect 3 Return Level	0,,,127
02 10 6C	01 - 7F	Effect 3 Return Balance	L63,,,R63
02 10 6D	00 -	(Reserved)	
02 10 6E : 02 10 7D	00 - 01 : 00 - 01	Effect 3 Return Bus Send Switch -1 : Effect 3 Return Bus Send Switch -16	Off,On
02 10 7E	00 - 01	Effect 3 Return Solo Switch	Off,On
02 10 7F	00 - 01	Effect 3 Return Mute Switch	Off,On
02 11 00	00 - 02	Effect 4 Return Switch	Off,On
02 11 01	00 - 7F	Effect 4 Return Level	0,,,127
02 11 02	01 - 7F	Effect 4 Return Balance	L63,,,R63
02 11 03	00 -	(Reserved)	
02 11 04 : 02 11 13	00 - 01 : 00 - 01	Effect 4 Return Bus Send Switch -1 : Effect 4 Return Bus Send Switch -16	Off,On
02 11 14	00 - 01	Effect 4 Return Solo Switch	Off,On
02 11 15	00 - 01	Effect 4 Return Mute Switch	Off,On
02 11 16	00 - 01	Effect 1 Master Insert Sw	Off,Ins
02 11 17	00 - 08	Effect 1 Master Send Level	-42,-36,-30,-24,-18,-12,-6,0,+6dB
02 11 18	00 - 08	Effect 1 Master Return Level	-42,-36,-30,-24,-18,-12,-6,0,+6dB
02 11 19	00 - 01	Effect 2 Master Insert Sw	Off,Ins
02 11 1A	00 - 08	Effect 2 Master Send Level	-42,-36,-30,-24,-18,-12,-6,0,+6dB
02 11 1B	00 - 08	Effect 2 Master Return Level	-42,-36,-30,-24,-18,-12,-6,0,+6dB
02 11 1C	00 - 01	Effect 3 Master Insert Sw	Off,Ins
02 11 1D	00 - 08	Effect 3 Master Send Level	-42,-36,-30,-24,-18,-12,-6,0,+6dB
02 11 1E	00 - 08	Effect 3 Master Return Level	-42,-36,-30,-24,-18,-12,-6,0,+6dB
02 11 1F	00 - 01	Effect 4 Master Insert Sw	Off,Ins
02 11 20	00 - 08	Effect 4 Master Send Level	-42,-36,-30,-24,-18,-12,-6,0,+6dB

02 11 21	00 – 08	Effect 4 Master Return Level -42,-36,-30,-24,-18,-12,-6,0,+6dB
02 11 22	00 – 7F	Master Out Level 0,,,127
02 11 23	01 – 7F	Master Out Balance L63,,,R63
02 11 24	00 – 7F	Master Effect 1 Send Level 0,,,127
02 11 25	01 – 7F	Master Effect 1 Send Balance L63,,,R63
02 11 26	00 – 7F	Master Effect 2 Send Level 0,,,127
02 11 27	01 – 7F	Master Effect 2 Send Balance L63,,,R63
02 11 28	00 – 7F	Master AUX 1 Send Level 0,,,127
02 11 29	01 – 7F	Master AUX 1 Send Balance L63,,,R63
02 11 2A	00 – 7F	Master AUX 2 Send Level 0,,,127
02 11 2B	01 – 7F	Master AUX 2 Send Balance L63,,,R63
02 11 2C	00 – 7F	Master AUX 3 Send Level 0,,,127
02 11 2D	01 – 7F	Master AUX 3 Send Balance L63,,,R63
02 11 2E	00 – 07	Monitor Mode Master,RecBus,Effect1, Effect2,Aux1,Aux2,Aux3,StereoIn
02 11 2F	00 – 7F	Monitor Out Level 0,,,127
02 11 30	01 – 7F	Monitor Out Balance L63,,,R63
02 11 31	00 –	(Reserved)
02 11 32	00 – 04	AUX A Output Select Effect1,Effect2, Aux1,Aux2,Aux3
02 11 33	00 – 04	AUX B Output Select Effect1,Effect2, Aux1,Aux2,Aux3
02 11 34	00 – 06	Digital 1 Output Select Master,Effect1,Effect2, Aux1,Aux2,Aux3,Monitor
02 11 35	00 – 06	Digital 2 Output Select Master,Effect1,Effect2, Aux1,Aux2,Aux3,Monitor
02 11 36	00 – 01	EQ Mode 2Band,3Band
02 11 37	00 –	(Reserved)
02 11 38	00 –	(Reserved)
02 11 39	00 – 01	Digital Input Select 0,1
02 11 3A	00 – 01	Direct Output Switch Off,On

● Locate Parameter

Start address	Data	Contents and remarks
03 00 00 03 00 01# 03 00 02# 03 00 03#	0aaaaaaa 0bbbbbbb 0ccccccc 0ddddddd	LOCATE-1 (*1) aaaaaaaabbbbbbbcccccccdddddddd = 0,,,268435455block (1block=16sample)
03 00 04 03 00 05# 03 00 06# 03 00 07#	0aaaaaaa 0bbbbbbb 0ccccccc 0ddddddd	LOCATE-2 (*1) aaaaaaaabbbbbbbcccccccdddddddd = 0,,,268435455block (1block=16sample)
03 00 08 03 00 09# 03 00 0A# 03 00 0B#	0aaaaaaa 0bbbbbbb 0ccccccc 0ddddddd	LOCATE-3 (*1) aaaaaaaabbbbbbbcccccccdddddddd = 0,,,268435455block (1block=16sample)
03 00 0C 03 00 0D# 03 00 0E# 03 00 0F#	0aaaaaaa 0bbbbbbb 0ccccccc 0ddddddd	LOCATE-4 (*1) aaaaaaaabbbbbbbcccccccdddddddd = 0,,,268435455block (1block=16sample)
03 00 10 03 00 11# 03 00 12# 03 00 13#	0aaaaaaa 0bbbbbbb 0ccccccc 0ddddddd	LOCATE-5 (*1) aaaaaaaabbbbbbbcccccccdddddddd = 0,,,268435455block (1block=16sample)
03 00 14 03 00 15# 03 00 16# 03 00 17#	0aaaaaaa 0bbbbbbb 0ccccccc 0ddddddd	LOCATE-6 (*1) aaaaaaaabbbbbbbcccccccdddddddd = 0,,,268435455block (1block=16sample)
03 00 18 03 00 19# 03 00 1A# 03 00 1B#	0aaaaaaa 0bbbbbbb 0ccccccc 0ddddddd	LOCATE-7 (*1) aaaaaaaabbbbbbbcccccccdddddddd = 0,,,268435455block (1block=16sample)
03 00 1C 03 00 1D# 03 00 1E# 03 00 1F#	0aaaaaaa 0bbbbbbb 0ccccccc 0ddddddd	LOCATE-8 (*1) aaaaaaaabbbbbbbcccccccdddddddd = 0,,,268435455block (1block=16sample)
03 00 20 03 00 21# 03 00 22# 03 00 23#	0aaaaaaa 0bbbbbbb 0ccccccc 0ddddddd	Loop Start Point (*1,2) aaaaaaaabbbbbbbcccccccdddddddd = 0,,,268435455block (1block=16sample)
03 00 24 03 00 25#	0aaaaaaa 0bbbbbbb	Loop End Point (*1,2) aaaaaaaabbbbbbbcccccccdddddddd =

03 00 26# 03 00 27#	0ccccccc 0ddddddd	0,,,268435455block (1block=16sample)
03 00 28 03 00 29# 03 00 2A# 03 00 2B#	0aaaaaaa 0bbbbbbb 0ccccccc 0ddddddd	Punch In Point (*1,2) aaaaaaaabbbbbbbcccccccdddddddd = 0,,,268435455block (1block=16sample)
03 00 2C 03 00 2D# 03 00 2E# 03 00 2F#	0aaaaaaa 0bbbbbbb 0ccccccc 0ddddddd	Punch Out Point (*1,2) aaaaaaaabbbbbbbcccccccdddddddd = 0,,,268435455block (1block=16sample)
03 01 00 03 01 01# 03 01 02# 03 01 03#	0aaaaaaa 0bbbbbbb 0ccccccc 0ddddddd	Marker Time or Marker Number (*1,3) aaaaaaaabbbbbbbcccccccdddddddd = 0,,,268435455block (1block=16sample) or 0,,,999 Marker Number, >=1000 All
03 01 04	00 – 04	Marker/Locator Command 00=Marker Read (*3) 01=Marker Write (*3) 02=Marker Clear (*3) 03 = Get Locate Bank (*4) 04 = Set Locate Bank (*4)

(*) The address marked by "#" are invalid. Transmit the Data Set(DT1) or Data Request(RQ1) message with the specified size to the address without "#" mark.

(*) Time parameters are set to the relocated time(REL) that the time of song top is "00:00:00:00"

(*1) The VS-1680 treats the 16 samples as 1 block for managing internal time. Pay attention to the expression of the internal time changes respond to the sampling frequency of each song. And time parameter can not be set to over 24 hours.

Example 1) Set the time 00:01:00:00 (30 Non-Drop)
        Sampling Frequency is 48 kHz :
        2880000 sample = 180000 block = 00 0A 7E 20 (7bit Hex)

        Sampling Frequency is 44.1 kHz :
        2646000 sample = 165375 block = 00 0A 0B 7F (7bit Hex)

        Sampling Frequency is 32 kHz :
        1920000 sample = 120000 block = 00 07 29 40 (7bit Hex)

Example 2) Set the time 23:59:59:29 (30 Non-Drop)
        Sampling Frequency is 48 kHz :
        4147198400 sample = 259199900 block = 7B 4C 27 1C (7bit Hex)

        Sampling Frequency is 44.1 kHz :
        3810238530 sample = 238139908 block = 71 46 74 04 (7bit Hex)

        Sampling Frequency is 32 kHz :
        2764798933 sample = 172799933 block = 52 32 6F 3D (7bit Hex)

(*2) The Loop Start point must be before the Loop Stop point. The Auto Punch In point must be before the Auto Punch Out point. If the interval of each point is shorter than 1 sec, the VS-1680 does not work correctly.

(*3) Read/Write/Erase of the Mark points are done by writing operation mode to the Marker command. Set the value of the Marker Time and Marker Number, before setting the value of the Marker command.

Example 1) Delete all mark points (DeviceID = 10)
(HOST) => F0 41 10 00 0E 12 03 01 00 7F 7F 7F 7F 7A F7   => (VS-1680)
(HOST) => F0 41 10 00 0E 12 03 01 04 02 74 F7   => (VS-1680)
(HOST) <= F0 41 10 00 0E 12 03 01 00 00 00 00 00 ss F7   <= (VS-1680)

        The return value "00000000" is a sum of mark points.

Example 2) Write the mark point (DeviceID = 10)
(HOST) => F0 41 10 00 0E 12 03 01 00 aa aa aa aa ss F7   => (VS-1680)
        aaaaaaaa = time of Marker
(HOST) => F0 41 10 00 0E 12 03 01 04 01 75 F7   => (VS-1680)
(HOST) <= F0 41 10 00 0E 12 03 01 00 nn nn nn nn ss F7   <= (VS-1680)
        nnnn = total marker number, ss = check sum

        If the total of mark point is over 1000, the VS-1680 ignores the writing and returns the total numbers of the mark points. If the mark point already exists 0.1 msec near the new mark point, the VS-1680 ignores the writing and returns the total numbers of the mark points.

Example 3) Read the mark point #3 (DeviceID = 10)
(HOST) => F0 41 10 00 0E 12 03 01 00 00 00 00 03 75 F7   => (VS-1680)
(HOST) => F0 41 10 00 0E 12 03 01 04 00 76 F7   => (VS-1680)
(HOST) <= F0 41 10 00 0E 12 03 01 00 nn nn nn nn ss F7   <= (VS-1680)
        nnnnnnnn = total marker number, ss = check sum

(HOST) <= F0 41 10 00 0E 12 03 01 00 aa aa aa aa ss F7   <= (VS-1680)
          aaaaaaaa = time of Marker #3

If the mark point is less than 3, the VS-1680 does not return the block of "aaaaaaaa".

Example 4) Read all mark points (DeviceID = 10)
(HOST) => F0 41 10 00 0E 12 03 01 00 7F 7F 7F 7F 7A F7   => (VS-1680)
          7F7F7F7F(>= 1000) means All marker
(HOST) => F0 41 10 00 0E 12 03 01 04 00 76 F7   => (VS-1680)
(HOST) <= F0 41 10 00 0E 12 03 01 00 nn nn nn nn ss F7   <= (VS-1680)
          nnnnnnnn = total marker number, ss = check sum
(HOST) <= F0 41 10 00 0E 12 03 01 00 aa aa aa aa ss F7   <= (VS-1680)
          aaaaaaaa = time of Marker #1
(HOST) <= F0 41 10 00 0E 12 03 01 00 bb bb bb bb ss F7   <= (VS-1680)
          bbbbbbbb = time of Marker #2
                  :
(HOST) <= F0 41 10 00 0E 12 03 01 00 xx xx xx xx ss F7   <= (VS-1680)
          xxxxxxxx = time of the last Marker#

If the mark point does not exist, the VS-1680 does not return blocks under "aaaaaaaa".

Example 5) Delete the mark point (DeviceID = 10)

(HOST) => F0 41 10 00 0E 12 03 01 00 aa aa aa aa ss F7   => (VS-1680)
          aaaaaaaa = time of Marker
(HOST) => F0 41 10 00 0E 12 03 01 04 02 74 F7   => (VS-1680)
(HOST) <= F0 41 10 00 0E 12 03 01 00 nn nn nn nn ss F7   <= (VS-1680)
          nnnn = total marker number, ss = check sum

The VS-1680 deletes the mark point which includes specified time, and returns the total numbers of the mark points.

(*4) Write Locate data into a bank memory (Set Locate Bank), and read from a bank memory (Get Locate Bank), according to the Locate Bank number (0-3) set in Marker Number.

● **Effect parameters**

✧ **Basic Address**

```
+----------+---------+------------------------------------------------+
| Start    |         |                                                |
| address  |         |            Contents and remarks                |
|==========+=========+================================================|
| 04 00 00 |0aaaaaaa | Effector - 1 Algorithm      aaaaaaaabbbbbbb =   |
| 04 00 01#|0bbbbbbb | ( 0:Reverb       *1)                           |
|          |         |   1:Delay                                      |
|          |         |   2:Stereo Delay Chorus                        |
|          |         |   3:Stereo Pitch Shifter Delay                 |
|          |         |   4:Vocoder                                    |
|          |         |   5:2ch RSS                                    |
|          |         |   6:Delay RSS                                  |
|          |         |   7:Chorus RSS                                 |
|          |         |   8:Guitar Multi 1                             |
|          |         |   9:Guitar Multi 2                             |
|          |         |  10:Guitar Multi 3                             |
|          |         |  11:Vocal Multi                                |
|          |         |  12:Rotary                                     |
|          |         |  13:Guitar Amp Simulator                       |
|          |         |  14:Stereo Phaser                              |
|          |         |  15:Stereo Flanger                             |
|          |         |  16:Dual Comp/Limiter                          |
|          |         | (17:Gate Reverb   *1)                          |
|          |         |  18:Multi Tap Delay                            |
|          |         |  19:Stereo Multi                               |
|          |         |  20:Reverb 2                                   |
|          |         |  21:Space Chorus                               |
|          |         |  22:Lo-Fi Processor                            |
|          |         |  23:4Band Parametric Equalizer                 |
|          |         |  24:10Band Graphic Equalizer                   |
|          |         |  25:Hum Canceler                               |
|          |         |  26:Vocal Canceler                             |
|          |         | (27:Voice Transfomer    *1,*2)                 |
|          |         | (28:Vocoder 2       *1,*2)                     |
|          |         |  29:Mic Simulater                              |
|          |         |  30:3Band Isolator                             |
|          |         |  31:Tape Echo 201                              |
|          |         |  32:Analog Flanger                             |
|          |         |  33:Analog Phaser                              |
+----------+---------+------------------------------------------------+
| 04 00 02 | 20 - 7E | Effector - 1 Name -1            (ASCII)         |
|    :     |    :    |               :                                |
| 04 00 0D | 20 - 7E | Effector - 1 Name -12                          |
+----------+---------+------------------------------------------------+
| 04 00 0E | 00 - 7F | Effector - 1 Parameter Area (See Below)        |
|    :     |    :    |               :                                |
| 04 00 7F | 00 - 7F |                                                |
+----------+---------+------------------------------------------------+
| 04 01 00 |0aaaaaaa | Effector - 2 Algorithm      aaaaaaaabbbbbbb =   |
| 04 01 01#|0bbbbbbb | ( 0:Reverb       *1)                           |
|          |         |   1:Delay                                      |
|          |         |   2:Stereo Delay Chorus                        |
|          |         |   3:Stereo Pitch Shifter Delay                 |
|          |         |   4:Vocoder                                    |
|          |         |   5:2ch RSS                                    |
|          |         |   6:Delay RSS                                  |
|          |         |   7:Chorus RSS                                 |
|          |         |   8:Guitar Multi 1                             |
```

```
|          |         |   9:Guitar Multi 2                             |
|          |         |  10:Guitar Multi 3                             |
|          |         |  11:Vocal Multi                                |
|          |         |  12:Rotary                                     |
|          |         |  13:Guitar Amp Simulator                       |
|          |         |  14:Stereo Phaser                              |
|          |         |  15:Stereo Flanger                             |
|          |         |  16:Dual Comp/Limiter                          |
|          |         | (17:Gate Reverb   *1)                          |
|          |         |  18:Multi Tap Delay                            |
|          |         |  19:Stereo Multi                               |
|          |         |  20:Reverb 2                                   |
|          |         |  21:Space Chorus                               |
|          |         |  22:Lo-Fi Processor                            |
|          |         |  23:4Band Parametric Equalizer                 |
|          |         |  24:10Band Graphic Equalizer                   |
|          |         |  25:Hum Canceler                               |
|          |         |  26:Vocal Canceler                             |
|          |         | (27:Voice Transfomer     *1,*2)                |
|          |         | (28:Vocoder 2       *1,*2)                     |
|          |         |  29:Mic Simulater                              |
|          |         |  30:3Band Isolator                             |
|          |         |  31:Tape Echo 201                              |
|          |         |  32:Analog Flanger                             |
|          |         |  33:Analog Phaser                              |
+----------+---------+------------------------------------------------+
| 04 01 02 | 20 - 7E | Effector - 2 Name -1            (ASCII)         |
|    :     |    :    |               :                                |
| 04 01 0D | 20 - 7E | Effector - 2 Name -12                          |
+----------+---------+------------------------------------------------+
| 04 01 0E | 20 - 7E | Effector - 2 Parameter Area (See Below)        |
|    :     |    :    |               :                                |
| 04 01 7F | 20 - 7E |                                                |
+----------+---------+------------------------------------------------+
| 04 02 00 |0aaaaaaa | Effector - 3 Algorithm      aaaaaaaabbbbbbb =   |
| 04 02 01#|0bbbbbbb | ( 0:Reverb       *1)                           |
|          |         |   1:Delay                                      |
|          |         |   2:Stereo Delay Chorus                        |
|          |         |   3:Stereo Pitch Shifter Delay                 |
|          |         |   4:Vocoder                                    |
|          |         |   5:2ch RSS                                    |
|          |         |   6:Delay RSS                                  |
|          |         |   7:Chorus RSS                                 |
|          |         |   8:Guitar Multi 1                             |
|          |         |   9:Guitar Multi 2                             |
|          |         |  10:Guitar Multi 3                             |
|          |         |  11:Vocal Multi                                |
|          |         |  12:Rotary                                     |
|          |         |  13:Guitar Amp Simulator                       |
|          |         |  14:Stereo Phaser                              |
|          |         |  15:Stereo Flanger                             |
|          |         |  16:Dual Comp/Limiter                          |
|          |         | (17:Gate Reverb   *1)                          |
|          |         |  18:Multi Tap Delay                            |
|          |         |  19:Stereo Multi                               |
|          |         |  20:Reverb 2                                   |
|          |         |  21:Space Chorus                               |
|          |         |  22:Lo-Fi Processor                            |
|          |         |  23:4Band Parametric Equalizer                 |
|          |         |  24:10Band Graphic Equalizer                   |
|          |         |  25:Hum Canceler                               |
|          |         |  26:Vocal Canceler                             |
|          |         | (27:Voice Transfomer    *1,*2)                 |
|          |         | (28:Vocoder 2       *1,*2)                     |
|          |         |  29:Mic Simulater                              |
|          |         |  30:3Band Isolator                             |
|          |         |  31:Tape Echo 201                              |
|          |         |  32:Analog Flanger                             |
|          |         |  33:Analog Phaser                              |
+----------+---------+------------------------------------------------+
| 04 02 02 | 20 - 7E | Effector - 3 Name -1            (ASCII)         |
|    :     |    :    |               :                                |
| 04 02 0D | 20 - 7E | Effector - 3 Name -12                          |
+----------+---------+------------------------------------------------+
| 04 02 0E | 20 - 7E | Effector - 3 Parameter Area (See Below)        |
|    :     |    :    |               :                                |
| 04 02 7F | 20 - 7E |                                                |
+----------+---------+------------------------------------------------+
| 04 03 00 |0aaaaaaa | Effector - 4 Algorithm      aaaaaaaabbbbbbb =   |
| 04 03 01#|0bbbbbbb | ( 0:Reverb       *1)                           |
|          |         |   1:Delay                                      |
|          |         |   2:Stereo Delay Chorus                        |
|          |         |   3:Stereo Pitch Shifter Delay                 |
|          |         |   4:Vocoder                                    |
|          |         |   5:2ch RSS                                    |
|          |         |   6:Delay RSS                                  |
|          |         |   7:Chorus RSS                                 |
|          |         |   8:Guitar Multi 1                             |
|          |         |   9:Guitar Multi 2                             |
|          |         |  10:Guitar Multi 3                             |
|          |         |  11:Vocal Multi                                |
|          |         |  12:Rotary                                     |
|          |         |  13:Guitar Amp Simulator                       |
|          |         |  14:Stereo Phaser                              |
|          |         |  15:Stereo Flanger                             |
|          |         |  16:Dual Comp/Limiter                          |
|          |         | (17:Gate Reverb   *1)                          |
|          |         |  18:Multi Tap Delay                            |
|          |         |  19:Stereo Multi                               |
|          |         |  20:Reverb 2                                   |
|          |         |  21:Space Chorus                               |
|          |         |  22:Lo-Fi Processor                            |
|          |         |  23:4Band Parametric Equalizer                 |
|          |         |  24:10Band Graphic Equalizer                   |
|          |         |  25:Hum Canceler                               |
|          |         |  26:Vocal Canceler                             |
|          |         | (27:Voice Transfomer    *1,*2)                 |
|          |         | (28:Vocoder 2       *1,*2)                     |
|          |         |  29:Mic Simulater                              |
|          |         |  30:3Band Isolator                             |
|          |         |  31:Tape Echo 201                              |
|          |         |  32:Analog Flanger                             |
|          |         |  33:Analog Phaser                              |
+----------+---------+------------------------------------------------+
| 04 03 02 | 20 - 7E | Effector - 4 Name -1            (ASCII)         |
| 04 03 0D | 20 - 7E | Effector - 4 Name -12                          |
```

```
+--------+---------+------------------------------------------+
| 04 03 0E | 20 - 7E | Effector - 4 Parameter Area (See Below)  |
| :       | :       |                    :                     |
| 04 03 7F | 20 - 7E |                                          |
+--------+---------+------------------------------------------+
```

(*1) can not select "0:Reverb", "17:Gate Reverb", "27:Voice Transformer" or "28:Vocoder2" on EFX2 or EFX4.

(*2) If "27:Voice Transformer" or "28:Vocoder2" is selected at EFX1, EFX2 is invalid. If "27:Voice Transformer" or "28:Vocoder2" is selected at EFX3, EFX4 is invalid.

(*) Two same parameters exist with two system Effects.

(*) A meaning of the parameter area changes correspond with the top of parameter of Effect Algorithm. See the following tables. The address shows at Effect-1.

(*) If select the different Algorithm type from current one, all parameters will be copied from the preset patch data which selected Algorithm.

◇ Algorithm 0 Reverb (EFX1 or EFX3)

Address	Data	Parameter	Value
04 00 0E 04 00 0F#	0aaaaaaa 0bbbbbbb	EQ SW	0,1 = Off,On
04 00 10 04 00 11#	0aaaaaaa 0bbbbbbb	EQ: Low EQ Type	0,1 = Shelving, Peaking
04 00 12 04 00 13#	0aaaaaaa 0bbbbbbb	EQ: Low EQ Gain	-12,,,12dB
04 00 14 04 00 15#	0aaaaaaa 0bbbbbbb	EQ: Low EQ Frequency	2,,,200 = 20,,,2000Hz
04 00 16 04 00 17#	0aaaaaaa 0bbbbbbb	EQ: Low EQ Q	3,,,100 = 0.3,,,10.0
04 00 18 04 00 19#	0aaaaaaa 0bbbbbbb	EQ: Mid EQ Gain	-12,,,12dB
04 00 1A 04 00 1B#	0aaaaaaa 0bbbbbbb	EQ: Mid EQ Frequency	20,,,800 200,,,8000Hz
04 00 1C 04 00 1D#	0aaaaaaa 0bbbbbbb	EQ: Mid EQ Q	3,,,100 = 0.3,,,10.0
04 00 1E 04 00 1F#	0aaaaaaa 0bbbbbbb	EQ: High EQ Type	0,1 = Shelving, Peaking
04 00 20 04 00 21#	0aaaaaaa 0bbbbbbb	EQ: High EQ Gain	-12,,,12dB
04 00 22 04 00 23#	0aaaaaaa 0bbbbbbb	EQ: High EQ Frequency	14,,,200 = 1.4,,,20.0kHz
04 00 24 04 00 25#	0aaaaaaa 0bbbbbbb	EQ: High EQ Q	3,,,100 = 0.3,,,10.0
04 00 26 04 00 27#	0aaaaaaa 0bbbbbbb	EQ: Out Level	0,,,100
04 00 28 04 00 29#	0aaaaaaa 0bbbbbbb	Reverb: Room Size	5,,,40m
04 00 2A 04 00 2B#	0aaaaaaa 0bbbbbbb	Reverb: Reverb Time	1,,,320 = 0.1,,,32.0s
04 00 2C 04 00 2D#	0aaaaaaa 0bbbbbbb	Reverb: Pre Delay	0,,,200 = 0,,,200ms
04 00 2E 04 00 2F#	0aaaaaaa 0bbbbbbb	Reverb: Diffusion	0,,,100
04 00 30 04 00 31#	0aaaaaaa 0bbbbbbb	Reverb: Density	0,,,100
04 00 32 04 00 33#	0aaaaaaa 0bbbbbbb	Reverb: Early Reflection Level	0,,,100
04 00 34 04 00 35#	0aaaaaaa 0bbbbbbb	Reverb: LF Damp Frequency	5,,,400 = 50,,,4000Hz
04 00 36 04 00 37#	0aaaaaaa 0bbbbbbb	Reverb: LF Damp Gain	-36,,,0dB
04 00 38 04 00 39#	0aaaaaaa 0bbbbbbb	Reverb: HF Damp Frequency	10,,,200 = 1.0,,,20.0kHz
04 00 3A 04 00 3B#	0aaaaaaa 0bbbbbbb	Reverb: HF Damp Gain	-36,,,0dB
04 00 3C 04 00 3D#	0aaaaaaa 0bbbbbbb	Reverb: HI Cut Frequency	2,,,200 = 0.2,,,20.0kHz
04 00 3E 04 00 3F#	0aaaaaaa 0bbbbbbb	Reverb: Effect Level	-100,,,100
04 00 40 04 00 41#	0aaaaaaa 0bbbbbbb	Reverb: Direct Level	-100,,,100
04 00 42 : 04 00 7F	00 : 00	(Reserved)	

◇ Algorithm 1 Delay

Address	Data	Parameter	Value
04 00 0E 04 00 0F#	0aaaaaaa 0bbbbbbb	Delay SW	0,1 = Off,On
04 00 10 04 00 11#	0aaaaaaa 0bbbbbbb	EQ SW	0,1 = Off,On
04 00 12 04 00 13#	0aaaaaaa 0bbbbbbb	Delay: Delay Time	0,,,1200ms
04 00 14 04 00 15#	0aaaaaaa 0bbbbbbb	Delay: Shift	-1200,,,1200 = L1200,,,R1200ms
04 00 16 04 00 17#	0aaaaaaa 0bbbbbbb	Delay: Lch Feedback Level	-100,,,100
04 00 18 04 00 19#	0aaaaaaa 0bbbbbbb	Delay: Rch Feedback Level	-100,,,100
04 00 1A 04 00 1B#	0aaaaaaa 0bbbbbbb	Delay: Lch Level	-100,,,100
04 00 1C 04 00 1D#	0aaaaaaa 0bbbbbbb	Delay: Rch Level	-100,,,100
04 00 1E 04 00 1F#	0aaaaaaa 0bbbbbbb	Delay: LF Damp Frequency	5,,,400 = 50,,,4000Hz
04 00 20 04 00 21#	0aaaaaaa 0bbbbbbb	Delay: LF Damp Gain	-36,,,0dB
04 00 22 04 00 23#	0aaaaaaa 0bbbbbbb	Delay: HF Damp Frequency	10,,,200 = 1.0,,,20.0kHz
04 00 24 04 00 25#	0aaaaaaa 0bbbbbbb	Delay: HF Damp Gain	-36,,,0dB
04 00 26 04 00 27#	0aaaaaaa 0bbbbbbb	Delay: Direct Level	-100,,,100
04 00 28 04 00 29#	0aaaaaaa 0bbbbbbb	EQ: Low EQ Type	0,1 = Shelving, Peaking
04 00 2A 04 00 2B#	0aaaaaaa 0bbbbbbb	EQ: Low EQ Gain	-12,,,12dB
04 00 2C 04 00 2D#	0aaaaaaa 0bbbbbbb	EQ: Low EQ Frequency	2,,,200 = 20,,,2000Hz
04 00 2E 04 00 2F#	0aaaaaaa 0bbbbbbb	EQ: Low EQ Q	3,,,100 = 0.3,,,10.0
04 00 30 04 00 31#	0aaaaaaa 0bbbbbbb	EQ: Mid EQ Gain	-12,,,12dB
04 00 32 04 00 33#	0aaaaaaa 0bbbbbbb	EQ: Mid EQ Frequency	20,,,800 = 200,,,8000Hz
04 00 34 04 00 35#	0aaaaaaa 0bbbbbbb	EQ: Mid EQ Q	3,,,100 = 0.3,,,10.0
04 00 36 04 00 37#	0aaaaaaa 0bbbbbbb	EQ: High EQ Type	0,1 = Shelving, Peaking
04 00 38 04 00 39#	0aaaaaaa 0bbbbbbb	EQ: High EQ Gain	-12,,,12dB
04 00 3A 04 00 3B#	0aaaaaaa 0bbbbbbb	EQ: High EQ Frequency	14,,,200 = 1.4,,,20.0kHz
04 00 3C 04 00 3D#	0aaaaaaa 0bbbbbbb	EQ: High EQ Q	3,,,100 = 0.3,,,10.0
04 00 3E 04 00 3F#	0aaaaaaa 0bbbbbbb	EQ: Out Level	0,,,100
04 00 40 : 04 00 7F	00 : 00	(Reserved)	

* (Delay Time) + (Absolute Shift) should be 1200 or less.

◇ Algorithm 2 Stereo Delay Chorus

Address	Data	Parameter	Value
04 00 0E 04 00 0F#	0aaaaaaa 0bbbbbbb	Delay SW	0,1 = Off,On
04 00 10 04 00 11#	0aaaaaaa 0bbbbbbb	Chorus SW	0,1 = Off,On
04 00 12 04 00 13#	0aaaaaaa 0bbbbbbb	EQ SW	0,1 = Off,On
04 00 14 04 00 15#	0aaaaaaa 0bbbbbbb	Delay: Delay Time	0,,,500ms
04 00 16 04 00 17#	0aaaaaaa 0bbbbbbb	Delay: Shift	-500,,,500 = L500,,,R500ms
04 00 18 04 00 19#	0aaaaaaa 0bbbbbbb	Delay: Lch Feedback Level	-100,,,100
04 00 1A 04 00 1B#	0aaaaaaa 0bbbbbbb	Delay: Rch Feedback Level	-100,,,100
04 00 1C 04 00 1D#	0aaaaaaa 0bbbbbbb	Delay: Lch Cross Feedback Level	-100,,,100
04 00 1E 04 00 1F#	0aaaaaaa 0bbbbbbb	Delay: Rch Cross Feedback Level	-100,,,100

04 00 20 04 00 21#	0aaaaaaa 0bbbbbbb	Delay: Effect Level	-100,,,100
04 00 22 04 00 23#	0aaaaaaa 0bbbbbbb	Delay: Direct Level	-100,,,100
04 00 24 04 00 25#	0aaaaaaa 0bbbbbbb	Chorus: Rate	1,,,100 = 0.1,,,10.0Hz
04 00 26 04 00 27#	0aaaaaaa 0bbbbbbb	Chorus: Depth	0,,,100
04 00 28 04 00 29#	0aaaaaaa 0bbbbbbb	Chorus: Pre Delay	0,,,50ms
04 00 2A 04 00 2B#	0aaaaaaa 0bbbbbbb	Chorus: Effect Level	-100,,,100
04 00 2C 04 00 2D#	0aaaaaaa 0bbbbbbb	Chorus: Direct Level	-100,,,100
04 00 2E 04 00 2F#	0aaaaaaa 0bbbbbbb	Chorus: Lch Feedback Level	-100,,,100
04 00 30 04 00 31#	0aaaaaaa 0bbbbbbb	Chorus: Rch Feedback Level	-100,,,100
04 00 32 04 00 33#	0aaaaaaa 0bbbbbbb	Chorus: Lch Cross Feedback Level	-100,,,100
04 00 34 04 00 35#	0aaaaaaa 0bbbbbbb	Chorus: Rch Cross Feedback Level	-100,,,100
04 00 36 04 00 37#	0aaaaaaa 0bbbbbbb	EQ: Low EQ Type	0,1 = Shelving, Peaking
04 00 38 04 00 39#	0aaaaaaa 0bbbbbbb	EQ: Low EQ Gain	-12,,,12dB
04 00 3A 04 00 3B#	0aaaaaaa 0bbbbbbb	EQ: Low EQ Frequency	2,,,200 = 20,,,2000Hz
04 00 3C 04 00 3D#	0aaaaaaa 0bbbbbbb	EQ: Low EQ Q	3,,,100 = 0.3,,,10.0
04 00 3E 04 00 3F#	0aaaaaaa 0bbbbbbb	EQ: Mid EQ Gain	-12,,,12dB
04 00 40 04 00 41#	0aaaaaaa 0bbbbbbb	EQ: Mid EQ Frequency	20,,,800 = 200,,,8000Hz
04 00 42 04 00 43#	0aaaaaaa 0bbbbbbb	EQ: Mid EQ Q	3,,,100 = 0.3,,,10.0
04 00 44 04 00 45#	0aaaaaaa 0bbbbbbb	EQ: High EQ Type	0,1 = Shelving, Peaking
04 00 46 04 00 47#	0aaaaaaa 0bbbbbbb	EQ: High EQ Gain	-12,,,12dB
04 00 48 04 00 49#	0aaaaaaa 0bbbbbbb	EQ: High EQ Frequency	14,,,200 = 1.4,,,20.0kHz
04 00 4A 04 00 4B#	0aaaaaaa 0bbbbbbb	EQ: High EQ Q	3,,,100 = 0.3,,,10.0
04 00 4C 04 00 4D#	0aaaaaaa 0bbbbbbb	EQ: Out Level	0,,,100
04 00 4E : 04 00 7F	00 : 00	(Reserved)	

* (Delay Time) + (Absolute Shift) should be 500 or less.

✧ Algorithm 3 Stereo Pitch Shifter Delay

04 00 0E 04 00 0F#	0aaaaaaa 0bbbbbbb	P.ShifterDelay SW	0,1 = Off,On
04 00 10 04 00 11#	0aaaaaaa 0bbbbbbb	EQ SW	0,1 = Off,On
04 00 12 04 00 13#	0aaaaaaa 0bbbbbbb	P.ShifterDelay: Lch Chromatic Pitch	-12,,,12
04 00 14 04 00 15#	0aaaaaaa 0bbbbbbb	P.ShifterDelay: Lch Fine Pitch	-100,,,100
04 00 16 04 00 17#	0aaaaaaa 0bbbbbbb	P.ShifterDelay: Lch Pre Delay	0,,,50ms
04 00 18 04 00 19#	0aaaaaaa 0bbbbbbb	P.ShifterDelay: Lch Feedback Delay Time	0,,,500ms
04 00 1A 04 00 1B#	0aaaaaaa 0bbbbbbb	P.ShifterDelay: Lch Feedback Level	-100,,,100
04 00 1C 04 00 1D#	0aaaaaaa 0bbbbbbb	P.ShifterDelay: Lch Cross Feedback Level	-100,,,100
04 00 1E 04 00 1F#	0aaaaaaa 0bbbbbbb	P.ShifterDelay: Rch Chromatic Pitch	12,,,12
04 00 20 04 00 21#	0aaaaaaa 0bbbbbbb	P.ShifterDelay: Rch Fine Pitch	-100,,,100
04 00 22 04 00 23#	0aaaaaaa 0bbbbbbb	P.ShifterDelay: Rch Pre Delay	0,,,50ms
04 00 24 04 00 25#	0aaaaaaa 0bbbbbbb	P.ShifterDelay: Rch Feedback Delay Time	0,,,500ms

04 00 26 04 00 27#	0aaaaaaa 0bbbbbbb	P.ShifterDelay: Rch Feedback Level	-100,,,100
04 00 28 04 00 29#	0aaaaaaa 0bbbbbbb	P.ShifterDelay: Rch Cross Feedback Level	-100,,,100
04 00 2A 04 00 2B#	0aaaaaaa 0bbbbbbb	P.ShifterDelay: Effect Level	-100,,,100
04 00 2C 04 00 2D#	0aaaaaaa 0bbbbbbb	P.ShifterDelay: Direct Level	-100,,,100
04 00 2E 04 00 2F#	0aaaaaaa 0bbbbbbb	EQ: Low EQ Type	0,1 = Shelving, Peaking
04 00 30 04 00 31#	0aaaaaaa 0bbbbbbb	EQ: Low EQ Gain	-12,,,12dB
04 00 32 04 00 33#	0aaaaaaa 0bbbbbbb	EQ: Low EQ Frequency	2,,,200 = 20,,,2000Hz
04 00 34 04 00 35#	0aaaaaaa 0bbbbbbb	EQ: Low EQ Q	3,,,100 = 0.3,,,10.0
04 00 36 04 00 37#	0aaaaaaa 0bbbbbbb	EQ: Mid EQ Gain	-12,,,12dB
04 00 38 04 00 39#	0aaaaaaa 0bbbbbbb	EQ: Mid EQ Frequency	20,,,800 = 200,,,8000Hz
04 00 3A 04 00 3B#	0aaaaaaa 0bbbbbbb	EQ: Mid EQ Q	3,,,100 = 0.3,,,10.0
04 00 3C 04 00 3D#	0aaaaaaa 0bbbbbbb	EQ: High EQ Type	0,1 = Shelving, Peaking
04 00 3E 04 00 3F#	0aaaaaaa 0bbbbbbb	EQ: High EQ Gain	-12,,,12dB
04 00 40 04 00 41#	0aaaaaaa 0bbbbbbb	EQ: High EQ Frequency	14,,,200 = 1.4,,,20.0kHz
04 00 42 04 00 43#	0aaaaaaa 0bbbbbbb	EQ: High EQ Q	3,,,100 = 0.3,,,10.0
04 00 44 04 00 45#	0aaaaaaa 0bbbbbbb	EQ: Out Level	0,,,100
04 00 46 : 04 00 7F	00 : 00	(Reserved)	

✧ Algorithm 4 Vocoder

04 00 0E 04 00 0F#	0aaaaaaa 0bbbbbbb	Chorus SW	0,1 = Off,On
04 00 10 04 00 11#	0aaaaaaa 0bbbbbbb	Vocoder: Voice Character 1	0,,,100
04 00 12 04 00 13#	0aaaaaaa 0bbbbbbb	Vocoder: Voice Character 2	0,,,100
04 00 14 04 00 15#	0aaaaaaa 0bbbbbbb	Vocoder: Voice Character 3	0,,,100
04 00 16 04 00 17#	0aaaaaaa 0bbbbbbb	Vocoder: Voice Character 4	0,,,100
04 00 18 04 00 19#	0aaaaaaa 0bbbbbbb	Vocoder: Voice Character 5	0,,,100
04 00 1A 04 00 1B#	0aaaaaaa 0bbbbbbb	Vocoder: Voice Character 6	0,,,100
04 00 1C 04 00 1D#	0aaaaaaa 0bbbbbbb	Vocoder: Voice Character 7	0,,,100
04 00 1E 04 00 1F#	0aaaaaaa 0bbbbbbb	Vocoder: Voice Character 8	0,,,100
04 00 20 04 00 21#	0aaaaaaa 0bbbbbbb	Vocoder: Voice Character 9	0,,,100
04 00 22 04 00 23#	0aaaaaaa 0bbbbbbb	Vocoder: Voice Character 10	0,,,100
04 00 24 04 00 25#	0aaaaaaa 0bbbbbbb	Chorus: Rate	1,,,100 = 0.1,,,10.0Hz
04 00 26 04 00 27#	0aaaaaaa 0bbbbbbb	Chorus: Depth	0,,,100
04 00 28 04 00 29#	0aaaaaaa 0bbbbbbb	Chorus: Pre Delay	0,,,50ms
04 00 2A 04 00 2B#	0aaaaaaa 0bbbbbbb	Chorus: Feedback Level	-100,,,100
04 00 2C 04 00 2D#	0aaaaaaa 0bbbbbbb	Chorus: Effect Level	-100,,,100
04 00 2E 04 00 2F#	0aaaaaaa 0bbbbbbb	Chorus: Direct Level	-100,,,100
04 00 30 : 04 00 7F	00 : 00	(Reserved)	

◇ Algorithm 5 2CH RSS

04 00 0E 04 00 0F#	0aaaaaaa 0bbbbbbb	2CH RSS: Ach Azimuth	-30,,,30 = -180,,,180
04 00 10 04 00 11#	0aaaaaaa 0bbbbbbb	2CH RSS: Ach Elevation	-15,,,15 = -90,,,90
04 00 12 04 00 13#	0aaaaaaa 0bbbbbbb	2CH RSS: Bch Azimuth	-30,,,30 = -180,,,180
04 00 14 04 00 15#	0aaaaaaa 0bbbbbbb	2CH RSS: Bch Elevation	-15,,,15 = -90,,,90
04 00 16 : 04 00 7F	00 : 00	(Reserved)	

◇ Algorithm 6 Delay RSS

04 00 0E 04 00 0F#	0aaaaaaa 0bbbbbbb	Delay RSS: Delay Time	0,,,1200ms
04 00 10 04 00 11#	0aaaaaaa 0bbbbbbb	Delay RSS: Shift	-1200,,,1200 = L1200,,,R1200ms
04 00 12 04 00 13#	0aaaaaaa 0bbbbbbb	Delay RSS: Center Delay Time	0,,,1200ms
04 00 14 04 00 15#	0aaaaaaa 0bbbbbbb	Delay RSS: RSS Level	0,,,100
04 00 16 04 00 17#	0aaaaaaa 0bbbbbbb	Delay RSS: Center Level	0,,,100
04 00 18 04 00 19#	0aaaaaaa 0bbbbbbb	Delay RSS: Feedback Level	-100,,,100
04 00 1A 04 00 1B#	0aaaaaaa 0bbbbbbb	Delay RSS: LF Damp Frequency	5,,,400 = 50,,,4000Hz
04 00 1C 04 00 1D#	0aaaaaaa 0bbbbbbb	Delay RSS: LF Damp Gain	-36,,,0dB
04 00 1E 04 00 1F#	0aaaaaaa 0bbbbbbb	Delay RSS: HF Damp Frequency	10,,,200 = 1.0,,,20.0kHz
04 00 20 04 00 21#	0aaaaaaa 0bbbbbbb	Delay RSS: HF Damp Gain	-36,,,0dB
04 00 22 04 00 23#	0aaaaaaa 0bbbbbbb	Delay RSS: Effect Level	-100,,,100
04 00 24 04 00 25#	0aaaaaaa 0bbbbbbb	Delay RSS: Direct Level	-100,,,100
04 00 26 : 04 00 7F	00 : 00	(Reserved)	

◇ Algorithm 7 Chorus RSS

04 00 0E 04 00 0F#	0aaaaaaa 0bbbbbbb	Chorus RSS: Chorus Rate	1,,,100 = 0.1,,,10.0Hz
04 00 10 04 00 11#	0aaaaaaa 0bbbbbbb	Chorus RSS: Chorus Depth	0,,,100
04 00 12 04 00 13#	0aaaaaaa 0bbbbbbb	Chorus RSS: Effect Level	-100,,,100
04 00 14 04 00 15#	0aaaaaaa 0bbbbbbb	Chorus RSS: Direct Level	-100,,,100
04 00 16 : 04 00 7F	00 : 00	(Reserved)	

◇ Common for Algorithm 8,9,10 Guitar Multi 1, 2, 3

04 00 0E 04 00 0F#	0aaaaaaa 0bbbbbbb	Compressor SW	0,1 = Off,On
04 00 10 04 00 11#	0aaaaaaa 0bbbbbbb	Metal/Distortion/Over Drive SW	0,1 = Off,On
04 00 12 04 00 13#	0aaaaaaa 0bbbbbbb	Noise Suppressor SW	0,1 = Off,On
04 00 14 04 00 15#	0aaaaaaa 0bbbbbbb	Auto Wah SW	0,1 = Off,On
04 00 16 04 00 17#	0aaaaaaa 0bbbbbbb	Guitar Amp Simulator SW	0,1 = Off,On
04 00 18 04 00 19#	0aaaaaaa 0bbbbbbb	Flanger SW	0,1 = Off,On
04 00 1A 04 00 1B#	0aaaaaaa 0bbbbbbb	Delay SW	0,1 = Off,On
04 00 1C 04 00 1D#	0aaaaaaa 0bbbbbbb	Compressor: Attack	0,,,100
04 00 1E 04 00 1F#	0aaaaaaa 0bbbbbbb	Compressor: Level	0,,,100

04 00 20 04 00 21#	0aaaaaaa 0bbbbbbb	Compressor: Sustain	0,,,100
04 00 22 04 00 23#	0aaaaaaa 0bbbbbbb	Compressor: Tone	-50,,,-50
04 00 24 04 00 25#	0aaaaaaa 0bbbbbbb	Noise Suppressor: Threshold	0,,,100
04 00 26 04 00 27#	0aaaaaaa 0bbbbbbb	Noise Suppressor: Release	0,,,100
04 00 28 04 00 29#	0aaaaaaa 0bbbbbbb	Auto Wah: Mode	0,1 = LPF,BPF
04 00 2A 04 00 2B#	0aaaaaaa 0bbbbbbb	Auto Wah: Polarity	0,1 = Down,Up
04 00 2C 04 00 2D#	0aaaaaaa 0bbbbbbb	Auto Wah: Frequency	0,,,100
04 00 2E 04 00 2F#	0aaaaaaa 0bbbbbbb	Auto Wah: Level	0,,,100
04 00 30 04 00 31#	0aaaaaaa 0bbbbbbb	Auto Wah: Peak	0,,,100
04 00 32 04 00 33#	0aaaaaaa 0bbbbbbb	Auto Wah: Sens	0,,,100
04 00 34 04 00 35#	0aaaaaaa 0bbbbbbb	Auto Wah: Rate	1,,,100 = 0.1,,,10.0Hz
04 00 36 04 00 37#	0aaaaaaa 0bbbbbbb	Auto Wah: Depth	0,,,100
04 00 38 04 00 39#	0aaaaaaa 0bbbbbbb	Guitar Amp Simulator: Mode	0,,,3 = Small,BultIn,2Stack,3Stack
04 00 3A 04 00 3B#	0aaaaaaa 0bbbbbbb	Flanger: Rate	1,,,100 = 0.1,,,10.0Hz
04 00 3C 04 00 3D#	0aaaaaaa 0bbbbbbb	Flanger: Depth	0,,,100
04 00 3E 04 00 3F#	0aaaaaaa 0bbbbbbb	Flanger: Manual	0,,,100
04 00 40 04 00 41#	0aaaaaaa 0bbbbbbb	Flanger: Resonance	0,,,100
04 00 42 04 00 43#	0aaaaaaa 0bbbbbbb	Delay: Delay Time	0,,,1000ms
04 00 44 04 00 45#	0aaaaaaa 0bbbbbbb	Delay: Shift	-1000,,,1000 = L1000,,,R1000ms
04 00 46 04 00 47#	0aaaaaaa 0bbbbbbb	Delay: Feedback Time	0,,,1000ms
04 00 48 04 00 49#	0aaaaaaa 0bbbbbbb	Delay: Feedback Level	-100,,,100
04 00 4A 04 00 4B#	0aaaaaaa 0bbbbbbb	Delay: Effect Level	-100,,,100
04 00 4C 04 00 4D#	0aaaaaaa 0bbbbbbb	Delay: Direct Level	-100,,,100

*   (Delay Time) + (Absolute Shift) should be 1000 or less.

◇ Individual : Algorithm 8 Guitar Multi 1

04 00 4E 04 00 4F#	0aaaaaaa 0bbbbbbb	Metal: Gain	0,,,100
04 00 50 04 00 51#	0aaaaaaa 0bbbbbbb	Metal: Level	0,,,100
04 00 52 04 00 53#	0aaaaaaa 0bbbbbbb	Metal: Hi Gain	-100,,,100
04 00 54 04 00 55#	0aaaaaaa 0bbbbbbb	Metal: Mid Gain	-100,,,100
04 00 56 04 00 57#	0aaaaaaa 0bbbbbbb	Metal: Low Gain	-100,,,100
04 00 58 : 04 00 7F	00 : 00	(Reserved)	

◇ Individual : Algorithm 9 Guitar Multi 2

04 00 4E 04 00 4F#	0aaaaaaa 0bbbbbbb	Distortion: Gain	0,,,100
04 00 50 04 00 51#	0aaaaaaa 0bbbbbbb	Distortion: Level	0,,,100
04 00 52 04 00 53#	0aaaaaaa 0bbbbbbb	Distortion: Tone	0,,,100
04 00 54 : 04 00 7F	00 : 00	(Reserved)	

◇ **Individual : Algorithm 10 Guitar Multi 3**

04 00 4E 04 00 4F#	0aaaaaaa 0bbbbbbb	Over Drive: Gain	0,,,100
04 00 50 04 00 51#	0aaaaaaa 0bbbbbbb	Over Drive: Level	0,,,100
04 00 52 04 00 53#	0aaaaaaa 0bbbbbbb	Over Drive: Tone	0,,,100
04 00 54 : 04 00 7F	00 : 00	(Reserved)	

◇ **Algorithm 11 Vocal Multi**

04 00 0E 04 00 0F#	0aaaaaaa 0bbbbbbb	Noise Suppressor SW	0,1 = Off,On
04 00 10 04 00 11#	0aaaaaaa 0bbbbbbb	Limiter/De-esser SW	0,1 = Off,On
04 00 12 04 00 13#	0aaaaaaa 0bbbbbbb	Enhancer SW	0,1 = Off,On
04 00 14 04 00 15#	0aaaaaaa 0bbbbbbb	EQ SW	0,1 = Off,On
04 00 16 04 00 17#	0aaaaaaa 0bbbbbbb	P.Shifter SW	0,1 = Off,On
04 00 18 04 00 19#	0aaaaaaa 0bbbbbbb	Delay SW	0,1 = Off,On
04 00 1A 04 00 1B#	0aaaaaaa 0bbbbbbb	Chorus SW	0,1 = Off,On
04 00 1C 04 00 1D#	0aaaaaaa 0bbbbbbb	Limiter/De-esser Mode	0,1 = Limiter,De-esser
04 00 1E 04 00 1F#	0aaaaaaa 0bbbbbbb	Noise Suppressor: Threshold	0,,,100
04 00 20 04 00 21#	0aaaaaaa 0bbbbbbb	Noise Suppressor: Release	0,,,100
04 00 22 04 00 23#	0aaaaaaa 0bbbbbbb	Limiter: Threshold	0,,,100
04 00 24 04 00 25#	0aaaaaaa 0bbbbbbb	Limiter: Release	0,,,100
04 00 26 04 00 27#	0aaaaaaa 0bbbbbbb	Limiter: Level	0,,,100
04 00 28 04 00 29#	0aaaaaaa 0bbbbbbb	De-esser: Sens	0,,,100
04 00 2A 04 00 2B#	0aaaaaaa 0bbbbbbb	De-esser: Frequency	10,,,100 = 1.0,,,10.0kHz
04 00 2C 04 00 2D#	0aaaaaaa 0bbbbbbb	Enhancer: Sens	0,,,100
04 00 2E 04 00 2F#	0aaaaaaa 0bbbbbbb	Enhancer: Frequency	10,,,100 = 1.0,,,10.0kHz
04 00 30 04 00 31#	0aaaaaaa 0bbbbbbb	Enhancer: MIX Level	0,,,100
04 00 32 04 00 33#	0aaaaaaa 0bbbbbbb	Enhancer: Level	0,,,100
04 00 34 04 00 35#	0aaaaaaa 0bbbbbbb	EQ: Low EQ Type	0,1 = Shelving, Peaking
04 00 36 04 00 37#	0aaaaaaa 0bbbbbbb	EQ: Low EQ Gain	-12,,,12dB
04 00 38 04 00 39#	0aaaaaaa 0bbbbbbb	EQ: Low EQ Frequency	2,,,200 = 20,,,2000Hz
04 00 3A 04 00 3B#	0aaaaaaa 0bbbbbbb	EQ: Low EQ Q	3,,,100 = 0.3,,,10.0
04 00 3C 04 00 3D#	0aaaaaaa 0bbbbbbb	EQ: Mid EQ Gain	-12,,,12dB
04 00 3E 04 00 3F#	0aaaaaaa 0bbbbbbb	EQ: Mid EQ Frequency	20,,,800 = 200,,,8000Hz
04 00 40 04 00 41#	0aaaaaaa 0bbbbbbb	EQ: Mid EQ Q	3,,,100 = 0.3,,,10.0
04 00 42 04 00 43#	0aaaaaaa 0bbbbbbb	EQ: High EQ Type	0,1 = Shelving, Peaking
04 00 44 04 00 45#	0aaaaaaa 0bbbbbbb	EQ: High EQ Gain	-12,,,12dB
04 00 46 04 00 47#	0aaaaaaa 0bbbbbbb	EQ: High EQ Frequency	14,,,200 = 1.4,,,20.0kHz
04 00 48 04 00 49#	0aaaaaaa 0bbbbbbb	EQ: High EQ Q	3,,,100 = 0.3,,,10.0
04 00 4A 04 00 4B#	0aaaaaaa 0bbbbbbb	EQ: Out Level	0,,,100
04 00 4C 04 00 4D#	0aaaaaaa 0bbbbbbb	P.Shifter: Chromatic Pitch	-12,,,12

04 00 4E 04 00 4F#	0aaaaaaa 0bbbbbbb	P.Shifter: Fine Pitch	-100,,,100
04 00 50 04 00 51#	0aaaaaaa 0bbbbbbb	P.Shifter: Effect Level	-100,,,100
04 00 52 04 00 53#	0aaaaaaa 0bbbbbbb	P.Shifter: Direct Level	-100,,,100
04 00 54 04 00 55#	0aaaaaaa 0bbbbbbb	Delay: Delay Time	0,,,1000
04 00 56 04 00 57#	0aaaaaaa 0bbbbbbb	Delay: Feedback Level	-100,,,100
04 00 58 04 00 59#	0aaaaaaa 0bbbbbbb	Delay: Effect Level	-100,,,100
04 00 5A 04 00 5B#	0aaaaaaa 0bbbbbbb	Delay: Direct Level	-100,,,100
04 00 5C 04 00 5D#	0aaaaaaa 0bbbbbbb	Chorus: Rate	1,,,100 = 0.1,,,10.0Hz
04 00 5E 04 00 5F#	0aaaaaaa 0bbbbbbb	Chorus: Depth	0,,,100
04 00 60 04 00 61#	0aaaaaaa 0bbbbbbb	Chorus: Pre Delay	0,,,50ms
04 00 62 04 00 63#	0aaaaaaa 0bbbbbbb	Chorus: Effect Level	-100,,,100
04 00 64 04 00 65#	0aaaaaaa 0bbbbbbb	Chorus: Direct Level	-100,,,100
04 00 66 : 04 00 7F	00 : 00	(Reserved)	

◇ **Algorithm 12 Rotary**

04 00 0E 04 00 0F#	0aaaaaaa 0bbbbbbb	Noise Suppressor SW	0,1 = Off,On
04 00 10 04 00 11#	0aaaaaaa 0bbbbbbb	Over Drive SW	0,1 = Off,On
04 00 12 04 00 13#	0aaaaaaa 0bbbbbbb	Noise Suppressor: Threshold	0,,,100
04 00 14 04 00 15#	0aaaaaaa 0bbbbbbb	Noise Suppressor: Release	0,,,100
04 00 16 04 00 17#	0aaaaaaa 0bbbbbbb	Over Drive: Gain	0,,,100
04 00 18 04 00 19#	0aaaaaaa 0bbbbbbb	Over Drive: Level	0,,,100
04 00 1A 04 00 1B#	0aaaaaaa 0bbbbbbb	Rotary: Low Rate	1,,,100 = 0.1,,,10.0Hz
04 00 1C 04 00 1D#	0aaaaaaa 0bbbbbbb	Rotary: Hi Rate	1,,,100 = 0.1,,,10.0Hz
04 00 1E : 04 00 7F	00 : 00	(Reserved)	

◇ **Algorithm 13 Guitar AMP Simulator**

04 00 0E 04 00 0F#	0aaaaaaa 0bbbbbbb	Noise Suppressor SW	0,1 = Off,On
04 00 10 04 00 11#	0aaaaaaa 0bbbbbbb	Pre Amp SW	0,1 = Off,On
04 00 12 04 00 13#	0aaaaaaa 0bbbbbbb	Speaker SW	0,1 = Off,On
04 00 14 04 00 15#	0aaaaaaa 0bbbbbbb	Noise Suppressor: Threshold	0,,,100
04 00 16 04 00 17#	0aaaaaaa 0bbbbbbb	Noise Suppressor: Release	0,,,100
04 00 18 04 00 19#	0aaaaaaa 0bbbbbbb	Pre Amp: Mode	0,,,13 = JC-120,Clean Twin,Match Drive,BG Lead,MS1959(I), MS1959(II), MS1959(I+II), SLDN Lead, Metal 5150, Metal Lead,OD-1, OD-2Turbo, Distortion, Fuzz
04 00 1A 04 00 1B#	0aaaaaaa 0bbbbbbb	Pre Amp: Volume	0,,,100
04 00 1C 04 00 1D#	0aaaaaaa 0bbbbbbb	Pre Amp: Bass	0,,,100
04 00 1E 04 00 1F#	0aaaaaaa 0bbbbbbb	Pre Amp: Middle	0,,,100
04 00 20 04 00 21#	0aaaaaaa 0bbbbbbb	Pre Amp: Treble	0,,,100
04 00 22 04 00 23#	0aaaaaaa 0bbbbbbb	Pre Amp: Presence	0,,,100

04 00 24 04 00 25#	0aaaaaaa 0bbbbbbb	Pre Amp: Master 0,,,100
04 00 26 04 00 27#	0aaaaaaa 0bbbbbbb	Pre Amp: Bright 0,1 = Off,On
04 00 28 04 00 29#	0aaaaaaa 0bbbbbbb	Pre Amp: Gain 0,1,2 = Low,Middle,High
04 00 2A 04 00 2B#	0aaaaaaa 0bbbbbbb	Speaker: Type 0,,,11 = Small. Middle, JC-120, Built In 1,Built In 2, Built In 3, Built In 4, BG Stack 1, BG Stack 2, MS Stack 1, MS Stack 2, Metal Stack
04 00 2C 04 00 2D#	0aaaaaaa 0bbbbbbb	Speaker: MIC Setting 0,1,2 = 1,2,3
04 00 2E 04 00 2F#	0aaaaaaa 0bbbbbbb	Speaker: MIC Level 0,,,100
04 00 30 04 00 31#	0aaaaaaa 0bbbbbbb	Speaker: Direct Level 0,,,100
04 00 32 : 04 00 7F	00 : 00	(Reserved)

(*) The "Pre Amp Middle" is invalid when "Mode" is "Match Drive".

(*) The "Pre Amp Presence" works counter to the Value(-100,,,0) when "Mode" is "Match Drive".

(*) The "Pre Amp Bright" is valid when "Mode" is "JC-120", "Clean Twin" or "BG Lead".

◇ **Algorithm 14 Stereo Phaser**

04 00 0E 04 00 0F#	0aaaaaaa 0bbbbbbb	Phaser SW 0,1 = Off,On
04 00 10 04 00 11#	0aaaaaaa 0bbbbbbb	EQ SW 0,1 = Off,On
04 00 12 04 00 13#	0aaaaaaa 0bbbbbbb	Phaser: Mode 0,,,3 = 4.8.12.16stage
04 00 14 04 00 15#	0aaaaaaa 0bbbbbbb	Phaser: Rate 1,,,100 = 0.1,,,10.0Hz
04 00 16 04 00 17#	0aaaaaaa 0bbbbbbb	Phaser: Depth 0,,,100
04 00 18 04 00 19#	0aaaaaaa 0bbbbbbb	Phaser: Polarity 0,1 = Inverse,Synchro
04 00 1A 04 00 1B#	0aaaaaaa 0bbbbbbb	Phaser: Manual 0,,,100
04 00 1C 04 00 1D#	0aaaaaaa 0bbbbbbb	Phaser: Resonance 0,,,100
04 00 1E 04 00 1F#	0aaaaaaa 0bbbbbbb	Phaser: Cross Feedback 0,,,100
04 00 20 04 00 21#	0aaaaaaa 0bbbbbbb	Phaser: Effect Level -100,,,100
04 00 22 04 00 23#	0aaaaaaa 0bbbbbbb	Phaser: Direct Level -100,,,100
04 00 24 04 00 25#	0aaaaaaa 0bbbbbbb	EQ: Low EQ Type 0,1 = Shelving, Peaking
04 00 26 04 00 27#	0aaaaaaa 0bbbbbbb	EQ: Low EQ Gain -12,,,12dB
04 00 28 04 00 29#	0aaaaaaa 0bbbbbbb	EQ: Low EQ Frequency 2,,,200 = 20,,,2000Hz
04 00 2A 04 00 2B#	0aaaaaaa 0bbbbbbb	EQ: Low EQ Q 3,,,100 = 0.3,,,10.0
04 00 2C 04 00 2D#	0aaaaaaa 0bbbbbbb	EQ: Mid EQ Gain -12,,,12dB
04 00 2E 04 00 2F#	0aaaaaaa 0bbbbbbb	EQ: Mid EQ Frequency 20,,,800 = 200,,,8000Hz
04 00 30 04 00 31#	0aaaaaaa 0bbbbbbb	EQ: Mid EQ Q 3,,,100 = 0.3,,,10.0
04 00 32 04 00 33#	0aaaaaaa 0bbbbbbb	EQ: High EQ Type 0,1 = Shelving, Peaking
04 00 34 04 00 35#	0aaaaaaa 0bbbbbbb	EQ: High EQ Gain -12,,,12dB
04 00 36 04 00 37#	0aaaaaaa 0bbbbbbb	EQ: High EQ Frequency 14,,,200 = 1.4,,,20.0kHz
04 00 38 04 00 39#	0aaaaaaa 0bbbbbbb	EQ: High EQ Q 3,,,100 = 0.3,,,10.0
04 00 3A 04 00 3B#	0aaaaaaa 0bbbbbbb	EQ: Out Level 0,,,100
04 00 3C : 04 00 7F	00 : 00	(Reserved)

◇ **Algorithm 15 Stereo Flanger**

04 00 0E 04 00 0F#	0aaaaaaa 0bbbbbbb	Flanger SW 0,1 = Off,On
04 00 10 04 00 11#	0aaaaaaa 0bbbbbbb	EQ SW 0,1 = Off,On
04 00 12 04 00 13#	0aaaaaaa 0bbbbbbb	Flanger: Rate 1,,,100 = 0.1,,,10.0Hz
04 00 14 04 00 15#	0aaaaaaa 0bbbbbbb	Flanger: Depth 0,,,100
04 00 16 04 00 17#	0aaaaaaa 0bbbbbbb	Flanger: Polarity 0,1 = Inverse,Synchro
04 00 18 04 00 19#	0aaaaaaa 0bbbbbbb	Flanger: Manual 0,,,100
04 00 1A 04 00 1B#	0aaaaaaa 0bbbbbbb	Flanger: Resonance 0,,,100
04 00 1C 04 00 1D#	0aaaaaaa 0bbbbbbb	Flanger: Cross Feedback Level 0,,,100
04 00 1E 04 00 1F#	0aaaaaaa 0bbbbbbb	Flanger: Effect Level -100,,,100
04 00 20 04 00 21#	0aaaaaaa 0bbbbbbb	Flanger: Direct Level -100,,,100
04 00 22 04 00 23#	0aaaaaaa 0bbbbbbb	EQ: Low EQ Type 0,1 = Shelving, Peaking
04 00 24 04 00 25#	0aaaaaaa 0bbbbbbb	EQ: Low EQ Gain -12,,,12dB
04 00 26 04 00 27#	0aaaaaaa 0bbbbbbb	EQ: Low EQ Frequency 2,,,200 = 20,,,2000Hz
04 00 28 04 00 29#	0aaaaaaa 0bbbbbbb	EQ: Low EQ Q 3,,,100 = 0.3,,,10.0
04 00 2A 04 00 2B#	0aaaaaaa 0bbbbbbb	EQ: Mid EQ Gain -12,,,12dB
04 00 2C 04 00 2D#	0aaaaaaa 0bbbbbbb	EQ: Mid EQ Frequency 20,,,800 = 200,,,8000Hz
04 00 2E 04 00 2F#	0aaaaaaa 0bbbbbbb	EQ: Mid EQ Q 3,,,100 = 0.3,,,10.0
04 00 30 04 00 31#	0aaaaaaa 0bbbbbbb	EQ: High EQ Type 0,1 = Shelving, Peaking
04 00 32 04 00 33#	0aaaaaaa 0bbbbbbb	EQ: High EQ Gain -12,,,12dB
04 00 34 04 00 35#	0aaaaaaa 0bbbbbbb	EQ: High EQ Frequency 14,,,200 = 1.4,,,20.0kHz
04 00 36 04 00 37#	0aaaaaaa 0bbbbbbb	EQ: High EQ Q 3,,,100 = 0.3,,,10.0
04 00 38 04 00 39#	0aaaaaaa 0bbbbbbb	EQ: Out Level 0,,,100
04 00 3A : 04 00 7F	00 : 00	(Reserved)

◇ **Algorithm 16 Dual Compressor/Limiter**

04 00 0E 04 00 0F#	0aaaaaaa 0bbbbbbb	Comp/Limit A SW 0,1 = Off,On
04 00 10 04 00 11#	0aaaaaaa 0bbbbbbb	Noise Suppressor A SW 0,1 = Off,On
04 00 12 04 00 13#	0aaaaaaa 0bbbbbbb	Comp/Limit B SW 0,1 = Off,On
04 00 14 04 00 15#	0aaaaaaa 0bbbbbbb	Noise Suppressor B SW 0,1 = Off,On
04 00 16 04 00 17#	0aaaaaaa 0bbbbbbb	Comp/Limit A: Detect 0,1,2 = A,B,Link
04 00 18 04 00 19#	0aaaaaaa 0bbbbbbb	Comp/Limit A: Level -60,,,12dB
04 00 1A 04 00 1B#	0aaaaaaa 0bbbbbbb	Comp/Limit A: Thresh -60,,,0dB
04 00 1C 04 00 1D#	0aaaaaaa 0bbbbbbb	Comp/Limit A: Attack 0,,,100
04 00 1E 04 00 1F#	0aaaaaaa 0bbbbbbb	Comp/Limit A: Release 0,,,100
04 00 20 04 00 21#	0aaaaaaa 0bbbbbbb	Comp/Limit A: Ratio 0,,,3 = 1.5:1,2:1,4:1,100:1
04 00 22 04 00 23#	0aaaaaaa 0bbbbbbb	Noise Suppressor A: Detect 0,1,2 = A,B,Link
04 00 24 04 00 25#	0aaaaaaa 0bbbbbbb	Noise Suppressor A: Threshold 0,,,100
04 00 26 04 00 27#	0aaaaaaa 0bbbbbbb	Noise Suppressor A: Release 0,,,100

Address	Data	Parameter
04 00 28 04 00 29#	0aaaaaaa 0bbbbbbb	Comp/Limit B: Detect 0,1,2 = A,B,Link
04 00 2A 04 00 2B#	0aaaaaaa 0bbbbbbb	Comp/Limit B: Level -60,,,12dB
04 00 2C 04 00 2D#	0aaaaaaa 0bbbbbbb	Comp/Limit B: Thresh -60,,,0dB
04 00 2E 04 00 2F#	0aaaaaaa 0bbbbbbb	Comp/Limit B: Attack 0,,,100
04 00 30 04 00 31#	0aaaaaaa 0bbbbbbb	Comp/Limit B: Release 0,,,100
04 00 32 04 00 33#	0aaaaaaa 0bbbbbbb	Comp/Limit B: Ratio 0,,,3 = 1.5:1,2:1,4:1,100:1
04 00 34 04 00 35#	0aaaaaaa 0bbbbbbb	Noise Suppressor B: Detect 0,1,2 = A,B,Link
04 00 36 04 00 37#	0aaaaaaa 0bbbbbbb	Noise Suppressor B: Threshold 0,,,100
04 00 38 04 00 39#	0aaaaaaa 0bbbbbbb	Noise Suppressor B: Release 0,,,100
04 00 3A : 04 00 7F	00 : 00	(Reserved)

✧ Algorithm 17 Gate Reverb (EFX1 or EFX3)

Address	Data	Parameter
04 00 0E 04 00 0F#	0aaaaaaa 0bbbbbbb	G.Reverb SW 0,1 = Off,On
04 00 10 04 00 11#	0aaaaaaa 0bbbbbbb	EQ SW 0,1 = Off,On
04 00 12 04 00 13#	0aaaaaaa 0bbbbbbb	G.Reverb: Gate Time 10,,,400ms
04 00 14 04 00 15#	0aaaaaaa 0bbbbbbb	G.Reverb: Pre Delay 0,,,300ms
04 00 16 04 00 17#	0aaaaaaa 0bbbbbbb	G.Reverb: Effect Level -100,,,100
04 00 18 04 00 19#	0aaaaaaa 0bbbbbbb	G.Reverb: Mode 0,,,4 = Normal,L->R,R->L,Reverse1,Reverse2
04 00 1A 04 00 1B#	0aaaaaaa 0bbbbbbb	G.Reverb: Thickness 0,,,100
04 00 1C 04 00 1D#	0aaaaaaa 0bbbbbbb	G.Reverb: Density 0,,,100
04 00 1E 04 00 1F#	0aaaaaaa 0bbbbbbb	G.Reverb: Accent Delay 0,,,200ms
04 00 20 04 00 21#	0aaaaaaa 0bbbbbbb	G.Reverb: Accent Level 0,,,100
04 00 22 04 00 23#	0aaaaaaa 0bbbbbbb	G.Reverb: Accent Pan 1,,,127 = L63,,,R63
04 00 24 04 00 25#	0aaaaaaa 0bbbbbbb	G.Reverb: Direct Level -100,,,100
04 00 26 04 00 27#	0aaaaaaa 0bbbbbbb	EQ: Low EQ Type 0,1 = Shelving, Peaking
04 00 28 04 00 29#	0aaaaaaa 0bbbbbbb	EQ: Low EQ Gain -12,,,12dB
04 00 2A 04 00 2B#	0aaaaaaa 0bbbbbbb	EQ: Low EQ Frequency 2,,,200 = 20,,,2000Hz
04 00 2C 04 00 2D#	0aaaaaaa 0bbbbbbb	EQ: Low EQ Q 3,,,100 = 0.3,,,10.0
04 00 2E 04 00 2F#	0aaaaaaa 0bbbbbbb	EQ: Mid EQ Gain -12,,,12dB
04 00 30 04 00 31#	0aaaaaaa 0bbbbbbb	EQ: Mid EQ Frequency 20,,,800 = 200,,,8000Hz
04 00 32 04 00 33#	0aaaaaaa 0bbbbbbb	EQ: Mid EQ Q 3,,,100 = 0.3,,,10.0
04 00 34 04 00 35#	0aaaaaaa 0bbbbbbb	EQ: High EQ Type 0,1 = Shelving, Peaking
04 00 36 04 00 37#	0aaaaaaa 0bbbbbbb	EQ: High EQ Gain -12,,,12dB
04 00 38 04 00 39#	0aaaaaaa 0bbbbbbb	EQ: High EQ Frequency 14,,,200 = 1.4,,,20.0kHz
04 00 3A 04 00 3B#	0aaaaaaa 0bbbbbbb	EQ: High EQ Q 3,,,100 = 0.3,,,10.0
04 00 3C 04 00 3D#	0aaaaaaa 0bbbbbbb	EQ: Out Level 0,,,100
04 00 3E : 04 00 7F	00 : 00	(Reserved)

✧ Algorithm 18 Multi Tap Delay

Address	Data	Parameter
04 00 0E 04 00 0F#	0aaaaaaa 0bbbbbbb	EQ SW 0,1 = Off,On
04 00 10 04 00 11#	0aaaaaaa 0bbbbbbb	M.Tap Delay: Time 1 0,,,1200ms
04 00 12 04 00 13#	0aaaaaaa 0bbbbbbb	M.Tap Delay: Level 1 0,,,100
04 00 14 04 00 15#	0aaaaaaa 0bbbbbbb	M.Tap Delay: Pan 1 1,,,127 = L63,,,R63
04 00 16 04 00 17#	0aaaaaaa 0bbbbbbb	M.Tap Delay: Time 2 0,,,1200ms
04 00 18 04 00 19#	0aaaaaaa 0bbbbbbb	M.Tap Delay: Level 2 0,,,100
04 00 1A 04 00 1B#	0aaaaaaa 0bbbbbbb	M.Tap Delay: Pan 2 1,,,127 = L63,,,R63
04 00 1C 04 00 1D#	0aaaaaaa 0bbbbbbb	M.Tap Delay: Time 3 0,,,1200ms
04 00 1E 04 00 1F#	0aaaaaaa 0bbbbbbb	M.Tap Delay: Level 3 0,,,100
04 00 20 04 00 21#	0aaaaaaa 0bbbbbbb	M.Tap Delay: Pan 3 1,,,127 = L63,,,R63
04 00 22 04 00 23#	0aaaaaaa 0bbbbbbb	M.Tap Delay: Time 4 0,,,1200ms
04 00 24 04 00 25#	0aaaaaaa 0bbbbbbb	M.Tap Delay: Level 4 0,,,100
04 00 26 04 00 27#	0aaaaaaa 0bbbbbbb	M.Tap Delay: Pan 4 1,,,127 = L63,,,R63
04 00 28 04 00 29#	0aaaaaaa 0bbbbbbb	M.Tap Delay: Time 5 0,,,1200ms
04 00 2A 04 00 2B#	0aaaaaaa 0bbbbbbb	M.Tap Delay: Level 5 0,,,100
04 00 2C 04 00 2D#	0aaaaaaa 0bbbbbbb	M.Tap Delay: Pan 5 1,,,127 = L63,,,R63
04 00 2E 04 00 2F#	0aaaaaaa 0bbbbbbb	M.Tap Delay: Time 6 0,,,1200ms
04 00 30 04 00 31#	0aaaaaaa 0bbbbbbb	M.Tap Delay: Level 6 0,,,100
04 00 32 04 00 33#	0aaaaaaa 0bbbbbbb	M.Tap Delay: Pan 6 1,,,127 = L63,,,R63
04 00 34 04 00 35#	0aaaaaaa 0bbbbbbb	M.Tap Delay: Time 7 0,,,1200ms
04 00 36 04 00 37#	0aaaaaaa 0bbbbbbb	M.Tap Delay: Level 7 0,,,100
04 00 38 04 00 39#	0aaaaaaa 0bbbbbbb	M.Tap Delay: Pan 7 1,,,127 = L63,,,R63
04 00 3A 04 00 3B#	0aaaaaaa 0bbbbbbb	M.Tap Delay: Time 8 0,,,1200ms
04 00 3C 04 00 3D#	0aaaaaaa 0bbbbbbb	M.Tap Delay: Level 8 0,,,100
04 00 3E 04 00 3F#	0aaaaaaa 0bbbbbbb	M.Tap Delay: Pan 8 1,,,127 = L63,,,R63
04 00 40 04 00 41#	0aaaaaaa 0bbbbbbb	M.Tap Delay: Time 9 0,,,1200ms
04 00 42 04 00 43#	0aaaaaaa 0bbbbbbb	M.Tap Delay: Level 9 0,,,100
04 00 44 04 00 45#	0aaaaaaa 0bbbbbbb	M.Tap Delay: Pan 9 1,,,127 = L63,,,R63
04 00 46 04 00 47#	0aaaaaaa 0bbbbbbb	M.Tap Delay: Time 10 0,,,1200ms
04 00 48 04 00 49#	0aaaaaaa 0bbbbbbb	M.Tap Delay: Level 10 0,,,100
04 00 4A 04 00 4B#	0aaaaaaa 0bbbbbbb	M.Tap Delay: Pan 10 1,,,127 = L63,,,R63
04 00 4C 04 00 4D#	0aaaaaaa 0bbbbbbb	M.Tap Delay: Feedback Delay Time 0,,,1200ms
04 00 4E 04 00 4F#	0aaaaaaa 0bbbbbbb	M.Tap Delay: Feedback Level -100,,,100
04 00 50 04 00 51#	0aaaaaaa 0bbbbbbb	M.Tap Delay: Effect Level -100,,,100
04 00 52 04 00 53#	0aaaaaaa 0bbbbbbb	M.Tap Delay: Direct Level -100,,,100
04 00 54 04 00 55#	0aaaaaaa 0bbbbbbb	EQ: Low EQ Type 0,1 = Shelving, Peaking
04 00 56 04 00 57#	0aaaaaaa 0bbbbbbb	EQ: Low EQ Gain -12,,,12dB
04 00 58 04 00 59#	0aaaaaaa 0bbbbbbb	EQ: Low EQ Frequency 2,,,200 = 20,,,2000Hz

04 00 5A 04 00 5B#	0aaaaaaa 0bbbbbbb	EQ: Low EQ Q	3,,,100 = 0.3,,,10.0
04 00 5C 04 00 5D#	0aaaaaaa 0bbbbbbb	EQ: Mid EQ Gain	-12,,,12dB
04 00 5E 04 00 5F#	0aaaaaaa 0bbbbbbb	EQ: Mid EQ Frequency	20,,,800 = 200,,,8000Hz
04 00 60 04 00 61#	0aaaaaaa 0bbbbbbb	EQ: Mid EQ Q	3,,,100 = 0.3,,,10.0
04 00 62 04 00 63#	0aaaaaaa 0bbbbbbb	EQ: High EQ Type	0,1 = Shelving, Peaking
04 00 64 04 00 65#	0aaaaaaa 0bbbbbbb	EQ: High EQ Gain	-12,,,12dB
04 00 66 04 00 67#	0aaaaaaa 0bbbbbbb	EQ: High EQ Frequency	14,,,200 = 1.4,,,20.0kHz
04 00 68 04 00 69#	0aaaaaaa 0bbbbbbb	EQ: High EQ Q	3,,,100 = 0.3,,,10.0
04 00 6A 04 00 6B#	0aaaaaaa 0bbbbbbb	EQ: Out Level	0,,,100
04 00 6C : 04 00 7F	00 : 00	(Reserved)	

✧ Algorithm 19 Stereo Multi

04 00 0E 04 00 0F#	0aaaaaaa 0bbbbbbb	Noise Suppressor SW	0,1 = Off,On
04 00 10 04 00 11#	0aaaaaaa 0bbbbbbb	Comp/Limit SW	0,1 = Off,On
04 00 12 04 00 13#	0aaaaaaa 0bbbbbbb	Enhancer SW	0,1 = Off,On
04 00 14 04 00 15#	0aaaaaaa 0bbbbbbb	EQ SW	0,1 = Off,On
04 00 16 04 00 17#	0aaaaaaa 0bbbbbbb	Noise Suppressor: Threshold	0,,,100
04 00 18 04 00 19#	0aaaaaaa 0bbbbbbb	Noise Suppressor: Release	0,,,100
04 00 1A 04 00 1B#	0aaaaaaa 0bbbbbbb	Comp/Limit: Level	-60,,,12dB
04 00 1C 04 00 1D#	0aaaaaaa 0bbbbbbb	Comp/Limit: Thresh	-60,,,0dB
04 00 1E 04 00 1F#	0aaaaaaa 0bbbbbbb	Comp/Limit: Attack	0,,,100
04 00 20 04 00 21#	0aaaaaaa 0bbbbbbb	Comp/Limit: Release	0,,,100
04 00 22 04 00 23#	0aaaaaaa 0bbbbbbb	Comp/Limit: Ratio	0,,,3 = 1.5:1,2:1,4:1,100:1
04 00 24 04 00 25#	0aaaaaaa 0bbbbbbb	Enhancer: Sens	0,,,100
04 00 26 04 00 27#	0aaaaaaa 0bbbbbbb	Enhancer: Frequency	10,,,100 = 1.0,,,10.0kHz
04 00 28 04 00 29#	0aaaaaaa 0bbbbbbb	Enhancer: MIX Level	0,,,100
04 00 2A 04 00 2B#	0aaaaaaa 0bbbbbbb	Enhancer: Level	0,,,100
04 00 2C 04 00 2D#	0aaaaaaa 0bbbbbbb	EQ: Low EQ Type	0,1 = Shelving, Peaking
04 00 2E 04 00 2F#	0aaaaaaa 0bbbbbbb	EQ: Low EQ Gain	-12,,,12dB
04 00 30 04 00 31#	0aaaaaaa 0bbbbbbb	EQ: Low EQ Frequency	2,,,200 = 20,,,2000Hz
04 00 32 04 00 33#	0aaaaaaa 0bbbbbbb	EQ: Low EQ Q	3,,,100 = 0.3,,,10.0
04 00 34 04 00 35#	0aaaaaaa 0bbbbbbb	EQ: Mid EQ Gain	-12,,,12dB
04 00 36 04 00 37#	0aaaaaaa 0bbbbbbb	EQ: Mid EQ Frequency	20,,,800 = 200,,,8000Hz
04 00 38 04 00 39#	0aaaaaaa 0bbbbbbb	EQ: Mid EQ Q	3,,,100 = 0.3,,,10.0
04 00 3A 04 00 3B#	0aaaaaaa 0bbbbbbb	EQ: High EQ Type	0,1 = Shelving, Peaking
04 00 3C 04 00 3D#	0aaaaaaa 0bbbbbbb	EQ: High EQ Gain	-12,,,12dB
04 00 3E 04 00 3F#	0aaaaaaa 0bbbbbbb	EQ: High EQ Frequency	14,,,200 = 1.4,,,20.0kHz
04 00 40 04 00 41#	0aaaaaaa 0bbbbbbb	EQ: High EQ Q	3,,,100 = 0.3,,,10.0
04 00 42 04 00 43#	0aaaaaaa 0bbbbbbb	EQ: Out Level	0,,,100

04 00 44 : 04 00 7F	00 : 00	(Reserved)	

✧ Algorithm 20 Reverb 2

04 00 0E 04 00 0F#	0aaaaaaa 0bbbbbbb	Reverb SW	0,1 = Off,On
04 00 10 04 00 11#	0aaaaaaa 0bbbbbbb	EQ SW	0,1 = Off,On
04 00 12 04 00 13#	0aaaaaaa 0bbbbbbb	Reverb 2: Reverb Type	0,,,4 = Room1,Room2,Hall1,Hall2,Plate
04 00 14 04 00 15#	0aaaaaaa 0bbbbbbb	Reverb 2: Reverb Time	1,,,100 = 0.1,,,10.0sec
04 00 16 04 00 17#	0aaaaaaa 0bbbbbbb	Reverb 2: Pre Delay	0,,,200msec
04 00 18 04 00 19#	0aaaaaaa 0bbbbbbb	Reverb 2: Density	0,,,100
04 00 1A 04 00 1B#	0aaaaaaa 0bbbbbbb	Reverb 2: High Pass Filter	1,,,200 = Thru,20,,,2000Hz
04 00 1C 04 00 1D#	0aaaaaaa 0bbbbbbb	Reverb 2: Low Pass Filter	10,,,201 = 1.0,,,20,0kHz,Thru
04 00 1E 04 00 1F#	0aaaaaaa 0bbbbbbb	Reverb 2: Effect Level	0,,,100
04 00 20 04 00 21#	0aaaaaaa 0bbbbbbb	Reverb 2: Direct Level	0,,,100
04 00 22 04 00 23#	0aaaaaaa 0bbbbbbb	Reverb 2: Gate SW	0,1 = Off,On
04 00 24 04 00 25#	0aaaaaaa 0bbbbbbb	Reverb 2: Gate Mode	0,1 = Gate,Ducking
04 00 26 04 00 27#	0aaaaaaa 0bbbbbbb	Reverb 2: Gate Threshold	0,,,100
04 00 28 04 00 29#	0aaaaaaa 0bbbbbbb	Reverb 2: Gate Attack Time	1,,,100
04 00 2A 04 00 2B#	0aaaaaaa 0bbbbbbb	Reverb 2: Gate Release Time	1,,,100
04 00 2C 04 00 2D#	0aaaaaaa 0bbbbbbb	Reverb 2: Gate Hold Time	1,,,100
04 00 2E 04 00 2F#	0aaaaaaa 0bbbbbbb	EQ: Low EQ Type	0,1 = Shelving, Peaking
04 00 30 04 00 31#	0aaaaaaa 0bbbbbbb	EQ: Low EQ Gain	-12,,,12dB
04 00 32 04 00 33#	0aaaaaaa 0bbbbbbb	EQ: Low EQ Frequency	2,,,200 = 20,,,2000Hz
04 00 34 04 00 35#	0aaaaaaa 0bbbbbbb	EQ: Low EQ Q	3,,,100 = 0.3,,,10.0
04 00 36 04 00 37#	0aaaaaaa 0bbbbbbb	EQ: Mid EQ Gain	-12,,,12dB
04 00 38 04 00 39#	0aaaaaaa 0bbbbbbb	EQ: Mid EQ Frequency	20,,,800 = 200,,,8000Hz
04 00 3A 04 00 3B#	0aaaaaaa 0bbbbbbb	EQ: Mid EQ Q	3,,,100 = 0.3,,,10.0
04 00 3C 04 00 3D#	0aaaaaaa 0bbbbbbb	EQ: High EQ Type	0,1 = Shelving, Peaking
04 00 3E 04 00 3F#	0aaaaaaa 0bbbbbbb	EQ: High EQ Gain	-12,,,12dB
04 00 40 04 00 41#	0aaaaaaa 0bbbbbbb	EQ: High EQ Frequency	14,,,200 = 1.4,,,20.0kHz
04 00 42 04 00 43#	0aaaaaaa 0bbbbbbb	EQ: High EQ Q	3,,,100 = 0.3,,,10.0
04 00 44 04 00 45#	0aaaaaaa 0bbbbbbb	EQ: Out Level	0,,,100
04 00 46 : 04 00 7F	00 : 00	(Reserved)	

✧ Algorithm 21 Space Chorus

04 00 0E 04 00 0F#	0aaaaaaa 0bbbbbbb	Chorus SW	0,1 = Off,On
04 00 10 04 00 11#	0aaaaaaa 0bbbbbbb	Chorus: Input Mode	0,1 = Mono,Stereo
04 00 12 04 00 13#	0aaaaaaa 0bbbbbbb	Chorus: Mode	0,,,6 = 1,2,3,4,1+4,2+4,3+4
04 00 14 04 00 15#	0aaaaaaa 0bbbbbbb	Chorus: Mix Balance	0,,,100
04 00 16 : 04 00 7F	00 : 00	(Reserved)	

◇ Algorithm 22 Lo-Fi Processor

Address	Data	Parameter	Value
04 00 0E 04 00 0F#	0aaaaaaa 0bbbbbbb	Lo-Fi Processor SW	0,1 = Off,On
04 00 10 04 00 11#	0aaaaaaa 0bbbbbbb	Realtime Modify Filter SW	0,1 = Off,On
04 00 12 04 00 13#	0aaaaaaa 0bbbbbbb	Lo-Fi Processor: Pre Filter SW	0,1 = Off,On
04 00 14 04 00 15#	0aaaaaaa 0bbbbbbb	Lo-Fi Processor: Rate	0,,,31 = 0ff,1/2,,,1/32
04 00 16 04 00 17#	0aaaaaaa 0bbbbbbb	Lo-Fi Processor: Number of Bit	0,,,15 = Off,15,,,1bit
04 00 18 04 00 19#	0aaaaaaa 0bbbbbbb	Lo-Fi Processor: Post Filter SW	0,1 = Off,On
04 00 1A 04 00 1B#	0aaaaaaa 0bbbbbbb	Lo-Fi Processor: Effect Level	0,,,100
04 00 1C 04 00 1D#	0aaaaaaa 0bbbbbbb	Lo-Fi Processor: Direct Level	0,,,100
04 00 1E 04 00 1F#	0aaaaaaa 0bbbbbbb	Realtime Modify Filter: Filter Type	0,,,2 = LPF,BPF,HPF
04 00 20 04 00 21#	0aaaaaaa 0bbbbbbb	Realtime Modify Filter: Cut Off	0,,,100
04 00 22 04 00 23#	0aaaaaaa 0bbbbbbb	Realtime Modify Filter: Resonance	0,,,100
04 00 24 04 00 25#	0aaaaaaa 0bbbbbbb	Realtime Modify Filter: Gain	0,,,24dB
04 00 26 04 00 27#	0aaaaaaa 0bbbbbbb	Noise Suppressor: Threshold	0,,,100
04 00 28 04 00 29#	0aaaaaaa 0bbbbbbb	Noise Suppressor: Release	0,,,100
04 00 2A : 04 00 7F	00 : 00	(Reserved)	

◇ Algorithm 23 4 Band Parametric EQ

Address	Data	Parameter	Value
04 00 0E 04 00 0F#	0aaaaaaa 0bbbbbbb	Parametric EQ Link SW	0,1 = Off,On
04 00 10 04 00 11#	0aaaaaaa 0bbbbbbb	Parametric EQ Ach SW	0,1 = Off,On
04 00 12 04 00 13#	0aaaaaaa 0bbbbbbb	Parametric EQ Bch SW	0,1 = Off,On
04 00 14 04 00 15#	0aaaaaaa 0bbbbbbb	EQ Ach: Input Gain	-60,,,12dB
04 00 16 04 00 17#	0aaaaaaa 0bbbbbbb	EQ Ach: Low EQ Type	0,1 = Shelving, Peaking
04 00 18 04 00 19#	0aaaaaaa 0bbbbbbb	EQ Ach: Low EQ Gain	-12,,,12dB
04 00 1A 04 00 1B#	0aaaaaaa 0bbbbbbb	EQ Ach: Low EQ Frequency	2,,,200 = 20,,,2000Hz
04 00 1C 04 00 1D#	0aaaaaaa 0bbbbbbb	EQ Ach: Low EQ Q	3,,,100 = 0.3,,,10.0
04 00 1E 04 00 1F#	0aaaaaaa 0bbbbbbb	EQ Ach: Low Mid EQ Gain	-12,,,12dB
04 00 20 04 00 21#	0aaaaaaa 0bbbbbbb	EQ Ach: Low Mid EQ Frequency	20,,,800 = 200,,,8000Hz
04 00 22 04 00 23#	0aaaaaaa 0bbbbbbb	EQ Ach: Low Mid EQ Q	3,,,100 = 0.3,,,10.0
04 00 24 04 00 25#	0aaaaaaa 0bbbbbbb	EQ Ach: High Mid EQ Gain	-12,,,12dB
04 00 26 04 00 27#	0aaaaaaa 0bbbbbbb	EQ Ach: High Mid EQ Frequency	20,,,800 = 200,,,8000Hz
04 00 28 04 00 29#	0aaaaaaa 0bbbbbbb	EQ Ach: High Mid EQ Q	3,,,100 = 0.3,,,10.0
04 00 2A 04 00 2B#	0aaaaaaa 0bbbbbbb	EQ Ach: High EQ Type	0,1 = Shelving, Peaking
04 00 2C 04 00 2D#	0aaaaaaa 0bbbbbbb	EQ Ach: High EQ Gain	-12,,,12dB
04 00 2E 04 00 2F#	0aaaaaaa 0bbbbbbb	EQ Ach: High EQ Frequency	14,,,200 = 1.4,,,20.0kHz
04 00 30 04 00 31#	0aaaaaaa 0bbbbbbb	EQ Ach: High EQ Q	3,,,100 = 0.3,,,10.0
04 00 32 04 00 33#	0aaaaaaa 0bbbbbbb	EQ Ach: Output Level	-60,,,12dB
04 00 34 04 00 35#	0aaaaaaa 0bbbbbbb	EQ Bch: Input Gain	-60,,,12dB
04 00 36 04 00 37#	0aaaaaaa 0bbbbbbb	EQ Bch: Low EQ Type	0,1 = Shelving, Peaking
04 00 38 04 00 39#	0aaaaaaa 0bbbbbbb	EQ Bch: Low EQ Gain	-12,,,12dB
04 00 3A 04 00 3B#	0aaaaaaa 0bbbbbbb	EQ Bch: Low EQ Frequency	2,,,200 = 20,,,2000Hz
04 00 3C 04 00 3D#	0aaaaaaa 0bbbbbbb	EQ Bch: Low EQ Q	3,,,100 = 0.3,,,10.0
04 00 3E 04 00 3F#	0aaaaaaa 0bbbbbbb	EQ Bch: Low Mid EQ Gain	-12,,,12dB
04 00 40 04 00 41#	0aaaaaaa 0bbbbbbb	EQ Bch: Low Mid EQ Frequency	20,,,800 = 200,,,8000Hz
04 00 42 04 00 43#	0aaaaaaa 0bbbbbbb	EQ Bch: Low Mid EQ Q	3,,,100 = 0.3,,,10.0
04 00 44 04 00 45#	0aaaaaaa 0bbbbbbb	EQ Bch: High Mid EQ Gain	-12,,,12dB
04 00 46 04 00 47#	0aaaaaaa 0bbbbbbb	EQ Bch: High Mid EQ Frequency	20,,,800 = 200,,,8000Hz
04 00 48 04 00 49#	0aaaaaaa 0bbbbbbb	EQ Bch: High Mid EQ Q	3,,,100 = 0.3,,,10.0
04 00 4A 04 00 4B#	0aaaaaaa 0bbbbbbb	EQ Bch: High EQ Type	0,1 = Shelving, Peaking
04 00 4C 04 00 4D#	0aaaaaaa 0bbbbbbb	EQ Bch: High EQ Gain	-12,,,12dB
04 00 4E 04 00 4F#	0aaaaaaa 0bbbbbbb	EQ Bch: High EQ Frequency	14,,,200 = 1.4,,,20.0kHz
04 00 50 04 00 51#	0aaaaaaa 0bbbbbbb	EQ Bch: High EQ Q	3,,,100 = 0.3,,,10.0
04 00 52 04 00 53#	0aaaaaaa 0bbbbbbb	EQ Bch: Output Level	-60,,,12dB
04 00 54 : 04 00 7F	00 : 00	(Reserved)	

* When Link SW = On, Bch corresponds to Ach.

◇ Algorithm 24 10 Band Graphic EQ

Address	Data	Parameter	Value
04 00 0E 04 00 0F#	0aaaaaaa 0bbbbbbb	Graphic EQ Link SW	0,1 = Off,On
04 00 10 04 00 11#	0aaaaaaa 0bbbbbbb	Graphic EQ Ach SW	0,1 = Off,On
04 00 12 04 00 13#	0aaaaaaa 0bbbbbbb	Graphic EQ Bch SW	0,1 = Off,On
04 00 14 04 00 15#	0aaaaaaa 0bbbbbbb	EQ Ach: Input Level	-60,,,12dB
04 00 16 04 00 17#	0aaaaaaa 0bbbbbbb	EQ Ach: 31.25Hz Gain	-12,,,12dB
04 00 18 04 00 19#	0aaaaaaa 0bbbbbbb	EQ Ach: 62.5Hz Gain	-12,,,12dB
04 00 1A 04 00 1B#	0aaaaaaa 0bbbbbbb	EQ Ach: 125Hz Gain	-12,,,12dB
04 00 1C 04 00 1D#	0aaaaaaa 0bbbbbbb	EQ Ach: 250Hz Gain	-12,,,12dB
04 00 1E 04 00 1F#	0aaaaaaa 0bbbbbbb	EQ Ach: 500Hz Gain	-12,,,12dB
04 00 20 04 00 21#	0aaaaaaa 0bbbbbbb	EQ Ach: 1.0kHz Gain	-12,,,12dB
04 00 22 04 00 23#	0aaaaaaa 0bbbbbbb	EQ Ach: 2.0kHz Gain	-12,,,12dB
04 00 24 04 00 25#	0aaaaaaa 0bbbbbbb	EQ Ach: 4.0kHz Gain	-12,,,12dB
04 00 26 04 00 27#	0aaaaaaa 0bbbbbbb	EQ Ach: 8.0kHz Gain	-12,,,12dB
04 00 28 04 00 29#	0aaaaaaa 0bbbbbbb	EQ Ach: 16.0kHz Gain	-12,,,12dB
04 00 2A 04 00 2B#	0aaaaaaa 0bbbbbbb	EQ Ach: Output Level	-60,,,12dB
04 00 2C 04 00 2D#	0aaaaaaa 0bbbbbbb	EQ Bch: Input Level	-60,,,12dB
04 00 2E 04 00 2F#	0aaaaaaa 0bbbbbbb	EQ Bch: 31.25Hz Gain	-12,,,12dB
04 00 30 04 00 31#	0aaaaaaa 0bbbbbbb	EQ Bch: 62.5Hz Gain	-12,,,12dB
04 00 32 04 00 33#	0aaaaaaa 0bbbbbbb	EQ Bch: 125Hz Gain	-12,,,12dB
04 00 34 04 00 35#	0aaaaaaa 0bbbbbbb	EQ Bch: 250Hz Gain	-12,,,12dB
04 00 36 04 00 37#	0aaaaaaa 0bbbbbbb	EQ Bch: 500Hz Gain	-12,,,12dB

04 00 38 04 00 39#	0aaaaaaa 0bbbbbbb	EQ Bch: 1.0kHz Gain -12,,,12dB
04 00 3A 04 00 3B#	0aaaaaaa 0bbbbbbb	EQ Bch: 2.0kHz Gain -12,,,12dB
04 00 3C 04 00 3D#	0aaaaaaa 0bbbbbbb	EQ Bch: 4.0kHz Gain -12,,,12dB
04 00 3E 04 00 3F#	0aaaaaaa 0bbbbbbb	EQ Bch: 8.0kHz Gain -12,,,12dB
04 00 40 04 00 41#	0aaaaaaa 0bbbbbbb	EQ Bch: 16.0kHz Gain -12,,,12dB
04 00 42 04 00 43#	0aaaaaaa 0bbbbbbb	EQ Bch: Output Level -60,,,12dB
04 00 44 : 04 00 7F	00 : 00	(Reserved)

* When Link SW = On, Bch corresponds to Ach.

✧ Algorithm 25 Hum Canceler

04 00 0E 04 00 0F#	0aaaaaaa 0bbbbbbb	Hum Canceler SW 0,1 = Off,On
04 00 10 04 00 11#	0aaaaaaa 0bbbbbbb	Noise Suppressor SW 0,1 = Off,On
04 00 12 04 00 13#	0aaaaaaa 0bbbbbbb	Hum Canceler: Freq 200,,,8000 = 20.0,,,800.0Hz
04 00 14 04 00 15#	0aaaaaaa 0bbbbbbb	Hum Canceler: Width 10,,,40%
04 00 16 04 00 17#	0aaaaaaa 0bbbbbbb	Hum Canceler: Depth 0,,,100
04 00 18 04 00 19#	0aaaaaaa 0bbbbbbb	Hum Canceler: Threshold 0,,,100
04 00 1A 04 00 1B#	0aaaaaaa 0bbbbbbb	Hum Canceler: Range Low 1,,,200 = Unlimit,20,,,2000Hz
04 00 1C 04 00 1D#	0aaaaaaa 0bbbbbbb	Hum Canceler: Range High 10,,,201 = 1.0,,,20,0kHz,Unlimit
04 00 1E 04 00 1F#	0aaaaaaa 0bbbbbbb	Noise Suppressor: Threshold 0,,,100
04 00 20 04 00 21#	0aaaaaaa 0bbbbbbb	Noise Suppressor: Release 0,,,100
04 00 22 : 04 00 7F	00 : 00	(Reserved)

✧ Algorithm 26 Vocal Canceler

04 00 0E 04 00 0F#	0aaaaaaa 0bbbbbbb	Vocal Canceler SW 0,1 = Off,On
04 00 10 04 00 11#	0aaaaaaa 0bbbbbbb	EQ SW 0,1 = Off,On
04 00 12 04 00 13#	0aaaaaaa 0bbbbbbb	Vocal Canseler: Balance 0,,,100
04 00 14 04 00 15#	0aaaaaaa 0bbbbbbb	Vocal Canseler: Range Low 1,,,200 = Unlimit,20,,,2000Hz
04 00 16 04 00 17#	0aaaaaaa 0bbbbbbb	Vocal Canseler: Range High 10,,,201 = 1.0,,,20,0kHz,Unlimit
04 00 18 04 00 19#	0aaaaaaa 0bbbbbbb	EQ: Low EQ Type 0,1 = Shelving, Peaking
04 00 1A 04 00 1B#	0aaaaaaa 0bbbbbbb	EQ: Low EQ Gain -12,,,12dB
04 00 1C 04 00 1D#	0aaaaaaa 0bbbbbbb	EQ: Low EQ Frequency 2,,,200 = 20,,,2000Hz
04 00 1E 04 00 1F#	0aaaaaaa 0bbbbbbb	EQ: Low EQ Q 3,,,100 = 0.3,,,10.0
04 00 20 04 00 21#	0aaaaaaa 0bbbbbbb	EQ: Mid EQ Gain -12,,,12dB
04 00 22 04 00 23#	0aaaaaaa 0bbbbbbb	EQ: Mid EQ Frequency 20,,,800 = 200,,,8000Hz
04 00 24 04 00 25#	0aaaaaaa 0bbbbbbb	EQ: Mid EQ Q 3,,,100 = 0.3,,,10.0
04 00 26 04 00 27#	0aaaaaaa 0bbbbbbb	EQ: High EQ Type 0,1 = Shelving, Peaking
04 00 28 04 00 29#	0aaaaaaa 0bbbbbbb	EQ: High EQ Gain -12,,,12dB
04 00 2A 04 00 2B#	0aaaaaaa 0bbbbbbb	EQ: High EQ Frequency 14,,,200 = 1.4,,,20.0kHz
04 00 2C 04 00 2D#	0aaaaaaa 0bbbbbbb	EQ: High EQ Q 3,,,100 = 0.3,,,10.0

04 00 2E 04 00 2F#	0aaaaaaa 0bbbbbbb	EQ: Out Level 0,,,100
04 00 30 : 04 00 7F	00 : 00	(Reserved)

✧ Algorithm 27 Voice Transfomer (EFX1 or EFX3)

04 00 0E 04 00 0F#	0aaaaaaa 0bbbbbbb	Voice Transfomer SW 0,1 = Off,On
04 00 10 04 00 11#	0aaaaaaa 0bbbbbbb	Reverb SW 0,1 = Off,On
04 00 12 04 00 13#	0aaaaaaa 0bbbbbbb	Fader Edit SW 0,1 = Off,On
04 00 14 04 00 15#	0aaaaaaa 0bbbbbbb	MIDI Control SW 0,1 = Off,On
04 00 16 04 00 17#	0aaaaaaa 0bbbbbbb	Voice Transfomer: Robot SW 0,1 = Off,On
04 00 18 04 00 19#	0aaaaaaa 0bbbbbbb	Voice Transfomer: Chromatic Pitch -12,,,36
04 00 1A 04 00 1B#	0aaaaaaa 0bbbbbbb	Voice Transfomer: Fine Pitch -100,,,100
04 00 1C 04 00 1D#	0aaaaaaa 0bbbbbbb	Voice Transfomer: Chromatic Formant -12,,,12
04 00 1E 04 00 1F#	0aaaaaaa 0bbbbbbb	Voice Transfomer: Fine Formant -100,,,100
04 00 20 04 00 21#	0aaaaaaa 0bbbbbbb	Voice Transfomer: Mix Balance 0,,,100
04 00 22 04 00 23#	0aaaaaaa 0bbbbbbb	Reverb: Reverb Time 1,,,100 = 0.1,,,10.0sec
04 00 24 04 00 25#	0aaaaaaa 0bbbbbbb	Reverb: Pre Delay 0,,,200msec
04 00 26 04 00 27#	0aaaaaaa 0bbbbbbb	Reverb: Density 0,,,100
04 00 28 04 00 29#	0aaaaaaa 0bbbbbbb	Reverb: Effect Level 0,,,100
04 00 2A 04 00 2B#	0aaaaaaa 0bbbbbbb	MIDI Control: Bend Range 0,,,12 = 0ff,1,,,12
04 00 2C 04 00 2D#	0aaaaaaa 0bbbbbbb	MIDI Control: Portamento 0...100 = Off,1,,,100
04 00 2E : 04 00 7F	00 : 00	(Reserved)

✧ Algorithm 28 Vocoder 2 (EFX1 or EFX3)

04 00 0E 04 00 0F#	0aaaaaaa 0bbbbbbb	Chorus SW 0,1 = Off,On
04 00 10 04 00 11#	0aaaaaaa 0bbbbbbb	Vocoder: Envelope Mode 0,,,2 = Sharp,Soft,Long
04 00 12 04 00 13#	0aaaaaaa 0bbbbbbb	Vocoder: Pan Mode 0,,,3 = Mono,Stereo,L->R,R->L
04 00 14 04 00 15#	0aaaaaaa 0bbbbbbb	Vocoder: Hold 0,1 = Off,MIDI
04 00 16 04 00 17#	0aaaaaaa 0bbbbbbb	Vocoder: Mic Sens 0,,,100
04 00 18 04 00 19#	0aaaaaaa 0bbbbbbb	Vocoder: Synth Input Level 0,,,100
04 00 1A 04 00 1B#	0aaaaaaa 0bbbbbbb	Vocoder: Voice Char Level 1 0,,,100
04 00 1C 04 00 1D#	0aaaaaaa 0bbbbbbb	Vocoder: Voice Char Level 2 0,,,100
04 00 1E 04 00 1F#	0aaaaaaa 0bbbbbbb	Vocoder: Voice Char Level 3 0,,,100
04 00 20 04 00 21#	0aaaaaaa 0bbbbbbb	Vocoder: Voice Char Level 4 0,,,100
04 00 22 04 00 23#	0aaaaaaa 0bbbbbbb	Vocoder: Voice Char Level 5 0,,,100
04 00 24 04 00 25#	0aaaaaaa 0bbbbbbb	Vocoder: Voice Char Level 6 0,,,100
04 00 26 04 00 27#	0aaaaaaa 0bbbbbbb	Vocoder: Voice Char Level 7 0,,,100
04 00 28 04 00 29#	0aaaaaaa 0bbbbbbb	Vocoder: Voice Char Level 8 0,,,100
04 00 2A 04 00 2B#	0aaaaaaa 0bbbbbbb	Vocoder: Voice Char Level 9 0,,,100

Address	Data	Description	Value
04 00 2C 04 00 2D#	0aaaaaaa 0bbbbbbb	Vocoder: Voice Char Level 10	0,,,100
04 00 2E 04 00 2F#	0aaaaaaa 0bbbbbbb	Vocoder: Voice Char Level 11	0,,,100
04 00 30 04 00 31#	0aaaaaaa 0bbbbbbb	Vocoder: Voice Char Level 12	0,,,100
04 00 32 04 00 33#	0aaaaaaa 0bbbbbbb	Vocoder: Voice Char Level 13	0,,,100
04 00 34 04 00 35#	0aaaaaaa 0bbbbbbb	Vocoder: Voice Char Level 14	0,,,100
04 00 36 04 00 37#	0aaaaaaa 0bbbbbbb	Vocoder: Voice Char Level 15	0,,,100
04 00 38 04 00 39#	0aaaaaaa 0bbbbbbb	Vocoder: Voice Char Level 16	0,,,100
04 00 3A 04 00 3B#	0aaaaaaa 0bbbbbbb	Vocoder: Voice Char Level 17	0,,,100
04 00 3C 04 00 3D#	0aaaaaaa 0bbbbbbb	Vocoder: Voice Char Level 18	0,,,100
04 00 3E 04 00 3F#	0aaaaaaa 0bbbbbbb	Vocoder: Voice Char Level 19	0,,,100
04 00 40 04 00 41#	0aaaaaaa 0bbbbbbb	Vocoder: Mic High Pass Filter	9,,,200 = Thru,1.0,,,20.0kHz
04 00 42 04 00 43#	0aaaaaaa 0bbbbbbb	Vocoder: Mic High Pass Filter Pan	1,,,127 = L63,,,R63
04 00 44 04 00 45#	0aaaaaaa 0bbbbbbb	Vocoder: Mic Mix	0,,,100
04 00 46 04 00 47#	0aaaaaaa 0bbbbbbb	Vocoder: Noise Suppressor Threshold	0,,,100
04 00 48 04 00 49#	0aaaaaaa 0bbbbbbb	Chorus: Rate	1,,,100 = 0.1,,,10.0Hz
04 00 4A 04 00 4B#	0aaaaaaa 0bbbbbbb	Chorus: Depth	0,,,100
04 00 4C 04 00 4D#	0aaaaaaa 0bbbbbbb	Chorus: Pre Delay	0,,,50ms
04 00 4E 04 00 4F#	0aaaaaaa 0bbbbbbb	Chorus: Mix Balance	0,,,100
04 00 50 : 04 00 7F	00 : 00	(Reserved)	:

◇ Algorithm 29 Mic Simulator

Address	Data	Description	Value
04 00 0E 04 00 0F#	0aaaaaaa 0bbbbbbb	Link SW	0,1 = Off,On
04 00 10 04 00 11#	0aaaaaaa 0bbbbbbb	Mic Converter Ach SW	0,1 = Off,On
04 00 12 04 00 13#	0aaaaaaa 0bbbbbbb	Bass Cut Ach SW	0,1 = Off,On
04 00 14 04 00 15#	0aaaaaaa 0bbbbbbb	Distance Ach SW	0,1 = Off,On
04 00 16 04 00 17#	0aaaaaaa 0bbbbbbb	Limiter Ach SW	0,1 = Off,On
04 00 18 04 00 19#	0aaaaaaa 0bbbbbbb	Mic Converter Bch SW	0,1 = Off,On
04 00 1A 04 00 1B#	0aaaaaaa 0bbbbbbb	Bass Cut Bch SW	0,1 = Off,On
04 00 1C 04 00 1D#	0aaaaaaa 0bbbbbbb	Distance Bch SW	0,1 = Off,On
04 00 1E 04 00 1F#	0aaaaaaa 0bbbbbbb	Limiter Bch SW	0,1 = Off,On
04 00 20 04 00 21#	0aaaaaaa 0bbbbbbb	Mic Converter Ach: Input	0,,,4 = DR-20,SmlDy,HedDy,MinCn,Flat
04 00 22 04 00 23#	0aaaaaaa 0bbbbbbb	Mic Converter Ach: Output	0,,,6 = SmlDy,VocDy,LrgDy,SmlCn, LrgCn,VntCn,Flat
04 00 24 04 00 25#	0aaaaaaa 0bbbbbbb	Mic Converter Ach: Phase	0,1 = Normal,Inverse
04 00 26 04 00 27#	0aaaaaaa 0bbbbbbb	Bass Cut Ach: Bass Cut Frequency	1,,,200 = Thru,20,,,2000Hz
04 00 28 04 00 29#	0aaaaaaa 0bbbbbbb	Distance Ach: Proximity Effect	-12,,,+12
04 00 2A 04 00 2B#	0aaaaaaa 0bbbbbbb	Distance Ach: Timelag	0,,,1000 = 0,,,3000cm
04 00 2C 04 00 2D#	0aaaaaaa 0bbbbbbb	Limiter Ach: Detect HPF Frequency	1,,,200 = Thru,20,,,2000Hz
04 00 2E 04 00 2F#	0aaaaaaa 0bbbbbbb	Limiter Ach: Level	-60,,,24dB
04 00 30 04 00 31#	0aaaaaaa 0bbbbbbb	Limiter Ach: Threshold	-60,,,0dB
04 00 32 04 00 33#	0aaaaaaa 0bbbbbbb	Limiter Ach: Attack	0,,,100
04 00 34 04 00 35#	0aaaaaaa 0bbbbbbb	Limiter Ach: Release	0,,,100
04 00 36 04 00 37#	0aaaaaaa 0bbbbbbb	Mic Converter Bch: Input	0,,,4 = DR-20,SmlDy,HedDy,MinCn,Flat
04 00 38 04 00 39#	0aaaaaaa 0bbbbbbb	Mic Converter Bch: Output	0,,,6 = SmlDy,VocDy,LrgDy,SmlCn, LrgCn,VntCn,Flat
04 00 3A 04 00 3B#	0aaaaaaa 0bbbbbbb	Mic Converter Bch: Phase	0,1 = Normal,Inverse
04 00 3C 04 00 3D#	0aaaaaaa 0bbbbbbb	Bass Cut Bch: Bass Cut Frequency	1,,,200 = Thru,20,,,2000Hz
04 00 3E 04 00 3F#	0aaaaaaa 0bbbbbbb	Distance Bch: Proximity Effect	-12,,,+12
04 00 40 04 00 41#	0aaaaaaa 0bbbbbbb	Distance Bch: Timelag	0,,,1000 = 0,,,3000cm
04 00 42 04 00 43#	0aaaaaaa 0bbbbbbb	Limiter Bch: Detect HPF Frequency	1,,,200 = Thru,20,,,2000Hz
04 00 44 04 00 45#	0aaaaaaa 0bbbbbbb	Limiter Bch: Level	-60,,,24dB
04 00 46 04 00 47#	0aaaaaaa 0bbbbbbb	Limiter Bch: Threshold	-60,,,0dB
04 00 48 04 00 49#	0aaaaaaa 0bbbbbbb	Limiter Bch: Attack	0,,,100
04 00 4A 04 00 4B#	0aaaaaaa 0bbbbbbb	Limiter Bch: Release	0,,,100
04 00 4C : 04 00 7F	00 : 00	(Reserved)	:

* When Mic Converter Input = MinCn, Output is fixed to SmlDy or LrgCn.
* When Link SW = On, Bch corresponds to Ach.

◇ Algorithm 30 3 Band Isolator

Address	Data	Description	Value
04 00 0E 04 00 0F#	0aaaaaaa 0bbbbbbb	Isolator SW	0,1 = Off,On
04 00 10 04 00 11#	0aaaaaaa 0bbbbbbb	Isolator High Volume	-60,,,+4dB
04 00 12 04 00 13#	0aaaaaaa 0bbbbbbb	Isolator Middle Volume	-60,,,+4dB
04 00 14 04 00 15#	0aaaaaaa 0bbbbbbb	Isolator Low Volume	-60,,,+4dB
04 00 16 04 00 17#	0aaaaaaa 0bbbbbbb	Isolator Anti Phase Middle Switch	0,1 = Off,On
04 00 18 04 00 19#	0aaaaaaa 0bbbbbbb	Isolator Anti Phase Middle Level	0,,,100
04 00 1A 04 00 1B#	0aaaaaaa 0bbbbbbb	Isolator Anti Phase Low Switch	0,1 = Off,On
04 00 1C 04 00 1D#	0aaaaaaa 0bbbbbbb	Isolator Anti Phase Low Level	0,,,100
04 00 1E : 04 00 7F	00 : 00	(Reserved)	:

◇ Algorithm 31 Tape Echo 201

Address	Data	Description	Value
04 00 0E 04 00 0F#	0aaaaaaa 0bbbbbbb	Tape Echo SW	0,1 = Off,On
04 00 10 04 00 11#	0aaaaaaa 0bbbbbbb	Tape Echo Mode Select	0,,,6 = 1,,,7
04 00 12 04 00 13#	0aaaaaaa 0bbbbbbb	Tape Echo Repeat Rate	0,,,100
04 00 14 04 00 15#	0aaaaaaa 0bbbbbbb	Tape Echo Intensity	0,,,100
04 00 16 04 00 17#	0aaaaaaa 0bbbbbbb	Tape Echo Effect Level	0,,,100
04 00 18 04 00 19#	0aaaaaaa 0bbbbbbb	Tape Echo Direct Level	0,,,100
04 00 1A 04 00 1B#	0aaaaaaa 0bbbbbbb	Tape Echo Tone Bass	-100,,,100
04 00 1C 04 00 1D#	0aaaaaaa 0bbbbbbb	Tape Echo Tone Treble	-100,,,100
04 00 1E 04 00 1F#	0aaaaaaa 0bbbbbbb	Tape Echo Tape Head S Pan	1,,,127 = L63,,,R63
04 00 20 04 00 21#	0aaaaaaa 0bbbbbbb	Tape Echo Tape Head M Pan	1,,,127 = L63,,,R63

04 00 22 04 00 23#	0aaaaaaa 0bbbbbbb	Tape Echo Tape Head L Pan 1,,,127 = L63,,,R63
04 00 24 04 00 25#	0aaaaaaa 0bbbbbbb	Tape Echo Tape Distortion 0,,,100
04 00 26 04 00 27#	0aaaaaaa 0bbbbbbb	Tape Echo Wah Flutter Rate 0,,,100
04 00 28 04 00 29#	0aaaaaaa 0bbbbbbb	Tape Echo Wah Flutter Depth 0,,,100
04 00 2A : 04 00 7F	00 : 00	(Reserved)

✧ **Algorithm 32 Analog Flanger**

04 00 0E 04 00 0F#	0aaaaaaa 0bbbbbbb	Analog Flanger SW 0,1 = Off,On
04 00 10 04 00 11#	0aaaaaaa 0bbbbbbb	Analog Flanger Mode 0,,,3 = FL1,FL2,FL3,CHO
04 00 12 04 00 13#	0aaaaaaa 0bbbbbbb	Analog Flanger Feedback 0,,,100
04 00 14 04 00 15#	0aaaaaaa 0bbbbbbb	Analog Flanger Modulation Rate 0,,,100
04 00 16 04 00 17#	0aaaaaaa 0bbbbbbb	Analog Flanger Modulation Depth 0,,,100
04 00 18 04 00 19#	0aaaaaaa 0bbbbbbb	Analog Flanger Modulation Frequency 0,,,100
04 00 1A 04 00 1B#	0aaaaaaa 0bbbbbbb	Analog Flanger Channel B Modulation 0,1 = Nor,Inv
04 00 1C 04 00 1D#	0aaaaaaa 0bbbbbbb	Analog Flanger Channel A Phase 0,1 = Nor,Inv
04 00 1E 04 00 1F#	0aaaaaaa 0bbbbbbb	Analog Flanger Channel B Phase 0,1 = Nor,Inv
04 00 20 : 04 00 7F	00 : 00	(Reserved)

✧ **Algorithm 33 Analog Phaser**

04 00 0E 04 00 0F#	0aaaaaaa 0bbbbbbb	Analog Phaser SW 0,1 = Off,On
04 00 10 04 00 11#	0aaaaaaa 0bbbbbbb	Analog Phaser Mode 0,1 = 4STAGE,8STAGE
04 00 12 04 00 13#	0aaaaaaa 0bbbbbbb	Analog Phaser Frequency 0,,,100
04 00 14 04 00 15#	0aaaaaaa 0bbbbbbb	Analog Phaser Resonance 0,,,100
04 00 16 04 00 17#	0aaaaaaa 0bbbbbbb	Analog Phaser LFO 1 Rate 0,,,100
04 00 18 04 00 19#	0aaaaaaa 0bbbbbbb	Analog Phaser LFO 1 Depth 0,,,100
04 00 1A 04 00 1B#	0aaaaaaa 0bbbbbbb	Analog Phaser LFO 1 Channel B Mod 0,1 = Nor,Inv
04 00 1C 04 00 1D#	0aaaaaaa 0bbbbbbb	Analog Phaser LFO 2 Rate 0,,,100
04 00 1E 04 00 1F#	0aaaaaaa 0bbbbbbb	Analog Phaser LFO 2 Depth 0,,,100
04 00 20 04 00 21#	0aaaaaaa 0bbbbbbb	Analog Phaser LFO 2 Channel B Mod 0,1 = Nor,Inv
04 00 22 : 04 00 7F	00 : 00	(Reserved)

● **Sync Track Data**

Start address	Data	Contents and remarks
08 00 00 08 00 01 08 00 02 08 00 03	0000aaaa 0000bbbb 0000cccc 0000dddd	Sync Track Data 1 aaaabbbbccccdddd
08 00 04 08 00 05 08 00 06 08 00 07	0000aaaa 0000bbbb 0000cccc 0000dddd	Sync Track Data 2 aaaabbbbccccdddd
08 00 08 : 0F 7f 7B	0000aaaa : 0000dddd	Sync Track Data 3 : Sync Track Data 32767

0F 7F 7C 0F 7F 7D 0F 7F 7E 0F 7F 7F	0000aaaa 0000bbbb 0000cccc 0000dddd	Sync Track Data 32768 aaaabbbbccccdddd

3. MIDI Machine Control
■ MIDI Machine Control Details
● STOP(MCS)

Status	Data Byte	Status
F0H	7FH,Dev,06H,01H	F7H

Byte	Description
F0H	Status of System Exclusive Message
7FH	Universal System Exclusive Message Realtime Header
Dev	Device ID (or 7FH)
06H	MMC Command Message
01H	STOP (MCS)
F7H	EOX (End of System Exclusive Message)

If the device ID on the message was as same as that of the receiving device or 7FH, the VS-1680 stops immediately. If the transport switch [STOP] was pressed, the VS-1680 transmits as the device ID 7FH.

● PLAY(MCS)

Status	Data Byte	Status
F0H	7FH,Dev,06H,02H	F7H

Byte	Description
F0H	Status of System Exclusive Message
7FH	Universal System Exclusive Message Realtime Header
Dev	Device ID (or 7FH)
06H	MMC Command Message
02H	PLAY (MCS)
F7H	EOX (End of System Exclusive Message)

If the device ID on the message was as same as that of the receiving device or 7FH, the VS-1680 goes into the playback condition. The VS-1680 does not transmit this message.

● DEFERRED PLAY(MCS)

Status	Data Bytes	Status
F0H	7FH,Dev,06H,03H	F7H

Byte	Description
F0H	Status of System Exclusive Message
7FH	Universal System Exclusive Message Realtime Header
Dev	Device ID (or 7FH)
06H	MMC Command Message
03H	DEFERRED PLAY (MCS)
F7H	EOX (End of System Exclusive Message)

If the device ID on the message was as same as that of the receiving device or 7FH, the VS-1680 goes into the playback condition after the locate operation. If the transport switch [PLAY] was pressed, the VS-1680 transmits as the device ID 7FH.

● FAST FORWARD(MCS)

Status	Data Bytes	Status
F0H	7FH,Dev,06H,03H	F7H

Byte	Description
F0H	Status of System Exclusive Message
7FH	Universal System Exclusive Message Realtime Header
Dev	Device ID (or 7FH)
06H	MMC Command Message
03H	DEFERRED PLAY (MCS)
F7H	EOX (End of System Exclusive Message)

If the device ID on the message was as same as that of the receiving device or 7FH, the VS-1680 goes into the fast forward condition. The VS-1680 does not transmit the message.

● REWIND (MCS)

Status	Data Bytes	Status
F0H	7FH,Dev,06H,05H	F7H

Byte	Description
F0H	Status of System Exclusive Message
7FH	Universal System Exclusive Message Realtime Header
Dev	Device ID (or 7FH)
06H	MMC Command Message
05H	REWIND (MCS)
F7H	EOX (End of System Exclusive Message)

If the device ID on the message was as same as that of the receiving device or 7FH, the VS-1680 goes into the rewind condition. The VS-1680 does not transmit the message.

● RECORD STROBE

Status	Data Bytes	Status
F0H	7FH,Dev,06H,06H	F7H

Byte	Description
F0H	Status of System Exclusive Message
7FH	Universal System Exclusive Message Realtime Header
Dev	Device ID (or 7FH)
06H	MMC Command Message
06H	RECORD STROBE
F7H	EOX (End of System Exclusive Message)

If the device ID on the message was as same as that of the receiving device or 7FH, the VS-1680 goes into the following condition.

1. The VS-1680 is in the playback condition.
   Start Recording the tracks that status are the record standby mode.

2. The VS-1680 is in the stop condition.
   Start Playing back, and Start Recording the track that status are the record standby mode.

If the transport switch [REC] was pressed out of the recording condition, the VS-1680 transmits as the device ID 7FH.

● RECORD EXIT

Status	Data Bytes	Status
F0H	7FH,Dev,06H,07H	F7H

Byte	Description
F0H	Status of System Exclusive Message
7FH	Universal System Exclusive Message Realtime Header
Dev	Device ID (or 7FH)
06H	MMC Command Message
07H	RECORD EXIT
F7H	EOX (End of System Exclusive Message)

If the device ID on the message was as same as that of the receiving device or 7FH, the VS-1680 exits from the record condition. If the transport switch [REC] was pressed while recording, the VS-1680 transmits as the device ID 7FH.

● MMC RESET

Statu	Data Bytes	Status
F0H	7FH,Dev,06H,0DH	F7H

Byte	Description
F0H	Status of System Exclusive Message
7FH	Universal System Exclusive Message Realtime Header
Dev	Device ID (or 7FH)
06H	MMC Command Message
0DH	MMC RESET
F7H	EOX (End of System Exclusive Message)

If the device ID on the message was as same as that of the receiving device or 7FH, the VS-1680 resets all communication channels related with MMC. When powered on the VS-1680 transmits as the device ID 7FH.

● WRITE

Status	Data Bytes	Status
F0H	7FH,Dev,06H,40H,ccH,ddH,eeH,,,ffH,,,	F7H

Byte	Description
F0H	Status of System Exclusive Message
7FH	Universal System Exclusive Message Realtime Header
Dev	Device ID (or 7FH)
06H	MMC Command Message
40H	WRITE
ccH	Information Bytes follows the command
ddH	The name of the writable Information Field
eeH	Information Field Format
:	:
ffH	Field names and data
:	:
F7H	EOX (End of System Exclusive Message)

If the device ID on the message was as same as that of the receiving device or 7FH, the VS-1680 writes the data to the specified information field. The VS-1680 does not transmit the message.

● MASKED WRITE

Status	Data Bytes	Status
F0H	7FH,Dev,06H,41H,04H,ddH,eeH,ffH,ggH	F7H

Byte	Description
F0H	Status of System Exclusive Message
7FH	Universal System Exclusive Message Realtime Header
Dev	Device ID (or 7FH)
06H	MMC Command Message
41H	MASKED WRITE
04H	Number of Bytes follows the command
ddH	The name of the masked type writable Information Field
eeH	Byte number to write in the Bit Map
ffH	Bit location of the bit map byte to change
ggH	New data to write to the specified bit map byte
F7H	EOX (End of System Exclusive Message)

If the device ID on the message was as same as that of the receiving device or 7FH, the VS-1680 writes the data to the specified bit map byte. The VS-1680 does not transmit the message.

● LOCATE(MCP)

❍ Format 1 - LOCATE[I/F]

Status	Data Bytes	Status
F0H	7FH,Dev,06H,44H,02H,00H,nnH	F7H

Byte	Description
F0H	Status of System Exclusive Message
7FH	Universal System Exclusive Message Realtime Header
Dev	Device ID (or 7FH)
06H	MMC Command Message
44H	LOCATE(MCP)
02H	Number of Bytes
00H	"I/F" sub command
nnH	Information Field (08H, 09H, 0AH, 0BH, 0CH, 0DH, 0EH, 0FH)
F7H	EOX (End of System Exclusive Message)

If the device ID on the message was as same as that of the receiving device or 7FH, the VS-1680 locates the selected time location stored to the specified information field. The VS-1680 does not transmit the message.

MIDI Implementation

❍ **Format 2 - LOCATE[TARGET]**

Status	Data Bytes	Status
F0H	7FH,Dev,06H,44H,06H,01H,hrH,mnH,scH,frH,ffH	F7H

Byte	Description
F0H	Status of System Exclusive Message
7FH	Universal System Exclusive Message Realtime Header
Dev	Device ID (or 7FH)
06H	MMC Command Message
44H	LOCATE(MCP)
06H	Number of Bytes
01H	"TARGET" sub command
hrH, mnH, scH, frH, ffH	Standard Time with Sub Frame
F7H	EOX (End of System Exclusive Message)

If the device ID on the message was as same as that of the receiving device or 7FH, the VS-1680 locates the specified time location received from the command.
If the efficient locate switch [LOC?] or Marker switch [PREVIOUS][NEXT] is pressed, the VS-1680 transmits as the device ID 7FH.

● **MOVE**

Status	Data Bytes	Status
F0H	7FH,Dev,06H,4CH,02H,ddH,ssH	F7H

Byte	Description
F0H	Status of System Exclusive Message
7FH	Universal System Exclusive Message Realtime Header
Dev	Device ID (or 7FH)
06H	MMC Command Message
4CH	MOVE
02H	Number of Bytes
ddH	Name of the Efficient Destination Information Field
	(08H,09H,0AH,0BH,0CH,0DH,0EH,0FH)
ssH	Name of the Efficient Source Information Field (01H)
F7H	EOX (End of System Exclusive Message)

If the device ID on the message was as same as that of the receiving device or 7FH, the VS-1680 transfers the data on the selected source information field to the destination Information Field, if the name of both information fields is efficient. The VS-1680 does not transmit the message.

● **The efficient Information Field**

The followings are the efficient Information Field on the VS-1680.

The name of the efficient destination Information Field :

01H	SELECTED TIME CODE
08H	GP0 / LOCATE POINT
09H	GP1
0AH	GP2
0BH	GP3
0CH	GP4
0DH	GP5
0EH	GP6
0FH	GP7
4FH	TRACK RECORD READY

4. Appendices
● Decimal and Hexadecimal table
(Hexadecimal number is shown with H.)
In MIDI documentation, data values and addresses/sizes of system exclusive messages etc. are expressed as hexadecimal values for each 7 bits. The following table shows how these correspond to decimal numbers.

dec	hex	dec	hex	dec	hex	dec	hex
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

* Decimal values such as MIDI channel, bank select, and program change are listed as one (1) greater than the values given in the above table.
* A 7-bit byte can express data in the range of 128 steps. For data where greater precision is required, we must use two or more bytes. For example, two hexadecimal numbers aa bbH expressing two 7-bit bytes would indicate a value of aa x 128 + bb.
* In the case of values which have a ± sign, 00H = -64, 40H = ±0, and 7FH = +63, so that the decimal expression would be 64 less than the value given in the above chart. In the case of two types, 00 00H = -8192, 40 00H = ±0, and 7F 7FH = +8191.
* Data marked "nibbled" is expressed in hexadecimal in 4-bit units. A value expressed as a 2-byte nibble 0a 0bH has the value of a x 16 + b.

<Ex.1> What is 5AH in decimal system?
5AH = 90 according to the above table.

<Ex.2>What in decimal system is 12034H in hexadecimal of every 7 bit?
12H = 18, 34H = 52 according to the above table. So 18 x 128 + 52 = 2356.

<Ex.3> What in decimal system is 0A 03 09 0D in nibble system?
0AH = 10, 03H = 3, 09H = 9, 0DH = 13 according to the table.
So ((10 x 16 + 3) x 16 + 9) x 16 + 13 = 41885.

<Ex. 4> What in nibble system is 1258 in decimal system?

```
     16)1258
     16)  78 ... 10
     16)   4 ... 14
          0 ... 4
```

0 = 00H, 4 = 04H, 14 = 0EH, 10 = 0AH according to the table. So it is 00 04 0E 0AH.

● **Example of system exclusive message and Checksum calculation**

On Roland system exclusive message (DT1), checksum is added at the end of transmitted data (in front of F7) to check the message is received correctly. Value of checksum is defined by address and data (or size) of the system exclusive message to be transmitted.

✧ **How to calculate checksum (Hexadecimal number is shown with H.)**
Checksum is a value which lower 7 bit of the sum of address, size and checksum itself turns to be 0. If the address of the system exclusive message to be transmitted is aa bb ccH and data or size is dd ee ffH,

aa + bb + cc + dd + ee + ff = sum
sum / 128 = quotient and odd
When odd is 0, 0 = checksum
When odd is other than 0, 128 - odd = checksum

MIDI Machine Control (MMC) Command, Information Field / Response Reference

● Commands Recognized

Command	Action
01H STOP	STOP
02H PLAY	PLAY
03H DEFERRED PLAY	PLAY
04H FAST FORWARD	FF
05H REWIND	REW
06H RECORD STROBE	REC / PUNCH IN
07H RECORD EXIT	PUNCH OUT
0DH MMC RESET	RESET
40H WRITE	Write to Information Fields
41H MASKED WRITE	Set Track Status Information Fields
44H 00H LOCATE I/F	LOCATE (Read Locator)
44H 01H LOCATE TARGET	LOCATE (Designated Time)
4CH MOVE	Move between Information fields

● Commands Transmitted

Command	Action
01H STOP	STOP
03H DEFERRED PLAY	PLAY
06H RECORD STROBE	REC / PUNCH IN
07H RECORD EXIT	PUNCH OUT
0DH MMC RESET	RESET
44H 01H LOCATE TARGET	LOCATE

● Valid Information Fields / Response

Information Field	Interpret	Valid Commands
01H SELECTED TIME CODE	Current Time	MOVE(FROM)
08H GP0 / LOCATE POINT	Locator 1	MOVE(FROM), MOVE(TO), WRITE
09H GP1	Locator 2	MOVE(FROM), MOVE(TO), WRITE
0AH GP2	Locator 3	MOVE(FROM), MOVE(TO), WRITE
0BH GP3	Locator 4	MOVE(FROM), MOVE(TO), WRITE
0CH GP4	Locator 5	MOVE(FROM), MOVE(TO), WRITE
0DH GP5	Locator 6	MOVE(FROM), MOVE(TO), WRITE
0EH GP6	Locator 7	MOVE(FROM), MOVE(TO), WRITE
0FH GP7	Locator 8	MOVE(FROM), MOVE(TO), WRITE
4FH TRACK RECORD READY	Track Status	MASKED WRITE, WRITE

Digital Studio Workstation
Model VS-1680

Date : Jan. 27 1998
Version : 1.00

MIDI Implementation Chart

Function ...		Transmitted		Recognized		Remarks	
Basic Channel	Default	1 - 16		1 - 16			
	Changed	1 - 16	*1	*****************			
Mode	Default	Mode 3		Mode 3			
	Messages	x		x			
	Altered	*****************		x			
Note Number :		0 - 127	*1	o	*10		
	True Voice	*****************		36 - 84, 36 - 60			
Velocity	Note On	1 - 127	*1	x			
	Note Off	x 9n, v = 0		x			
After Touch	Key's	o	*12	x			
	Ch's	x		x			
Pitch Bender		x		o	*10		
Control Change	0, 32	x		o		Bank Select	*2
	3	o		o		Track Status	*2
	6, 38	x		o		Data Entry LSB, MSB	*2
	7, 68	o		o		Mix Send/Master Level	*2
	10, 70	o		o		Mix Send/Master Pan	*2
	12, 71	o		o		EQ L Freq.	*2
	13, 72	o		o		EQ L Gain	*2
	14, 73	o		o		EQ M Freq.	*2
	15, 74	o		o		EQ M Gain	*2
	16, 75	o		o		EQ M Q	*2
	17, 76	o		o		EQ H Freq.	*2
	18, 77	o		o		EQ H Gain	*2
	19, 78	o		o		EFX1 Send Level	*2
	20, 79	o		o		EFX1 Send Pan	*2
	21, 80	o		o		EFX2 Send Level	*2
	22, 81	o		o		EFX2 Send Pan	*2
	23, 82	o		o		EFX3 Send Level	*2
	24, 83	o		o		EFX3 Send Pan	*2

Function		Transmitted	Recognized	Remarks
25, 84	EFX4 Send Level	o	o	*2
26, 85	EFX4 Send Pan	o	o	*2
27, 86	AUX Send Level	o	o	*2
28, 87	AUX Send Pan	o	o	*2
29, 88	Mix Offset Level	o	o	*2
30, 89	Mix Offset Bal	o	o	*2
30	Hold	x	o	*2 *11
96, 97	Data Inc, Dec	x	o	*2
98, 99	NRPN LSB, MSB	x	o	*2
102	Monitor Level	o	o	*2
103	Monitor Bal	o	o	*2
Program Change		x	o	*3
: True #		*****************	0 - 99	Effect #0 - #99
		*****************	0 - 7	Scene #1 - #8
System Exclusive		o *4	o *5	*6
Common : Quarter Frame		o *7	o *7	
: Song Position		o *8	x	
: Song Select		x	x	
: Tune		x	x	
Real Time : Clock		o *8	o *9	
: Commands		o	o	
Aux : All Sound Off		x	x	
: Reset All Controllers		x	x	
: Local ON/OFF		x	x	
: All Note Off		x	x	
: Active Sense		x	x	
: System Reset		x	x	

Notes

*1 MIDI Metronome Only
*2 MID:CtrType=C.C. Only
*3 Effect when MIDI CH=1, 2, 3, 4, Scene when MIDI CH=16.
*4 MID:SysEx.Tx=On Only
*5 MID:SysEx.Rx=On Only
*6 When MID:CtrlType=Excl, MIXER Set and MMC.
*7 Syn:Gen.=MTC Only
*8 Syn:Gen.=MIDIclk or SyncTr Only
*9 When Recording Sync Track Only
*10 When Algorithm27 (Voice Transfomer) is selected, and MIDI Control Sw=ON
*11 When Algorithm28 (Vocoder2) is selected, and HOLD=MIDI
*12 Transmits Level Meter Value according to the value of Level Meter Tx. via MIDI. MIDI CH=16 (fixed)

Mode 1 : OMNI ON, POLY	Mode 2 : OMNI ON, MONO
Mode 3 : OMNI OFF, POLY	Mode 4 : OMNI OFF, MONO

o : Yes
x : No

The mixer operation is transmitted and received through the MIDI Control Change. Therefore, general MIDI Sequencers can record or play the mixer operation simply. The VS-1680 uses some Control Change Number in order to original parameter controls which is different from the MIDI standard.

Input Mixer

Input Channel 1–8

INPUT 1

Pre level

ATT (-42–+6 dB)

Phase (NRM, INV)

EQ (2band, 3band)

EQ Sw

EFX Ins

EFX Insert Return
EFX Insert Send

Solo/Mute Sw

Level (Fader)

Post level

AUX3 Sw
AUX2 Sw
AUX1 Sw
EFX2 Sw
EFX1 Sw

Send Level
Send Level
Send Level
Send Level
Send Level

Pan
Pan
Pan
Pan
Pan
Pan

MIX Sw

Digital Input L/R

DIGITAL IN

Pre level

ATT (-42–+6 dB)

Phase (NRM, INV)

EQ (2band, 3band)

EQ Sw

EFX Ins

EFX Insert Return
EFX Insert Send

Solo/Mute Sw

Level (Fader)

Post level

AUX3 Sw
AUX2 Sw
AUX1 Sw
EFX2 Sw
EFX1 Sw

Send Level
Send Level
Send Level
Send Level
Send Level

Pan
Pan
Pan
Pan
Pan
Pan

MIX Sw

Internal BUS

REC BUS
1 2 3 4 5 6 7 8

MIX L R
EFX1 L R
EFX2 L R
AUX1 L R
AUX2 L R
AUX3 L R

Track Mixer

Track Channel 9–16

REC BUS (1–8)

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

Pre level

ATT (–42—+6 dB)

Phase (NRM, INV)

EQ (2band, 3band)

EQ Sw

EFX Ins

EFX Send

EFX Return

DIR OUT

Solo/Mute Sw

Level (Fader)

Post level

AUX3 Sw — Send Level — Pan
AUX2 Sw — Send Level — Pan
AUX1 Sw — Send Level — Pan
EFX2 Sw — Send Level — Pan
EFX1 Sw — Send Level — Pan
Pan

MIX Sw

Track Channel 1–8

REC BUS (1–8)

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

Pre level

ATT (–42—+6 dB)

Phase (NRM, INV)

EQ (2band, 3band)

EQ Sw

EFX Ins

EFX Send

EFX Return

DIR OUT

Solo/Mute Sw

Level (Fader)

Post level

AUX3 Sw — Send Level — Pan
AUX2 Sw — Send Level — Pan
AUX1 Sw — Send Level — Pan
EFX2 Sw — Send Level — Pan
EFX1 Sw — Send Level — Pan
Pan

MIX Sw

Internal BUS

REC BUS 1 2 3 4 5 6 7 8
MIX L R
EFX1 L R
EFX2 L R
AUX1 L R
AUX2 L R
AUX3 L R

Master Block

Glossary

Active Terminator

A type of terminator (a terminating resistance) place at each end of a SCSI chain. A new addition to SCSI-2 specifications, compared with ordinary terminators, it provides greater operating stability for SCSI devices, thus improving signal transmission performance.

CD-R

Short for **Compact Disc Recordable**. This is a system for reading and writing discs in the same format as that used for CDs (CD-ROMs and music CDs). A specialized CD-R drive allows one-time only writing of discs.

However, as long as the data has not been finalized and there is sufficient capacity remaining on the disc, the CD-R drive can be used for multiple additions to, and changes in the material.

Sometimes they are referred to as "Write Once CD," "CD-Write Once," or something similar.

CD-RW

Short for **Compact Disc ReWritable**. This is a system allowing creation of discs that can be read using the same format as regular CDs (CD-ROMs and Music CDs). While resembling the CD-R system in that it uses a special CD-RW drive, these discs can be rewritten any number of times. However, CD-RW discs cannot be used with the CDR-88.

COSM

Stands for **Composite Object Sound Modeling**. This is "a technology which combines multiple sound models to create new sounds," which was first used on the Roland's VG-8 V-Guitar System. For example, sounds created on the VG-8 are the result of a variety of sound models (elements) such as the pickup, the body of the guitar, the guitar amp, mic, and speaker etc.

Current Song

The song currently being recorded, played back, or edited is referred to as the current song.

DAT

Short for **Digital Audio Tape**. This refers both to the system of recording digitized sound to magnetic tape, as well as to the tapes themselves. Besides digital audio signals, all song information is recorded on the tape, including starts and track data, information to allow or prevent copying, etc.

Finalize

This is the operation that writes the TOC to a prepared audio disc. Whereas additions and changes can be made to discs that have not yet been finalized, such discs are not playable on regular CD players.

Formants

A formant is an important element which determine the character of a vocal sound. It is a fixed overtone whose location is determined by the size of the vocal chords.

Conventional pitch shifters modify the pitch in a way that changes even the location of the formants (which by nature do not change). For example when a conventional pitch shifter raises the pitch, a "duck voice" is produced as if the vocal chords had shrunk, and when the pitch is lowered a "giant voice" is produced as if the vocal chords had expanded.

The Voice Transformer modifies the basic pitch and the formant separately, allowing a variety of voice characters to be created.

Frame

Similar to the individual frames in a roll of movie film, the numerous still pictures that are displayed in rapid succession to create a moving video image are also known as "frames." About thirty of these frames are shown each second. When hard disk recorders, sequencers, and other such equipment are synchronized with video, it is generally assumed that there should be one frame every 1/30th of a second.

GPI

GPI stands for **General Purpose Interface**. This is a contorol jack provided on professional and consumer video devices such as video editors and title superimpoters. By connecting this contorol jack to the foot switch jack of the VS-1680 and setting the Foot Switch Assign to "GPI," the connected device will be able to playback/stop the VS-1680.

GUITAR (Hi-Z)

A high-impedance input jack for directly connecting electric guitars.

IDE

IDE stands for **Integrated Device and Electronics**. This is the standard data transmission method used by the hard disk drives of recent personal computers. The HDP88 series hard disk drives (sold separately) that can be installed in the VS-1680 are IDE compatible.

MMC

MMC is an acronym for **MIDI Machine Contorol**. This is rule that defines how MIDI system exclusive message can be used to contorol multiple recording devices from a single device. The VS-1680 supports MMC. In addition to song playback, stop and fast-dorward, you can also select the tracks for recording, etc.

MTC

MTC stands for **MIDI Time Code**. This is a group of messages which are transmitted and received between MIDI devices to synchronize their operation. Unlike MIDI Clock messages, MTC specifies an absolute time. Like SMPTE time code, MTC also supports a variety of frame rates. If you wish to use MTC to synchronize the operation of two devices, both devices must be set to the same frame rate.

NTSC Format

Color television format used in Japan, the United States, and other countries. Tapes recorded in the NTSC format cannot be played back on video decks utilizing the SECAM/PAL formats.

Phantom Power

This is a method of providing electric power to condenser mics via the mic cables. Generally, a mixer's internal phantom power source supplies 6–48 volts (DC). Supplying phantom power to dynamic mics, audio playback devices, or other such equipment may result in damage to the equipment. Turn the phantom power switch on only when connecting condenser mics which need phantom power; otherwise, leave it switched off.

Removable Disk Drives

Disk drives that have been able to remove the disk, such as a Zip drive, are referred to as the "removable disk drives."

RSS

RSS stands for **Roland Sound System**. This is an effect which allows a sound source to be placed in three-dimensional space when played back on a conventional stereo system. The sound can be placed not only in front of the listener, but also directly to the side, above, below, and behind the listener.

S/P DIF

S/P DIF stands for **Sony/Philips Digital Interface Format**. This is a specifications for transmitting and receiving stereo digital audio signals between digital audio devices. The VS-1680 provides coaxial connectors which support S/P DIF.

SCMS

SCMS stands for Serial Copy Management System. This is a function that protects the rights of copyright holders by prohibiting recording via a digital connection for more than two generations. When digital connections are made between digital recorders that implement this function, SCMS data will be recorded along with the audio data. Digital audio data which contains this SCMS data cannot again be recorded via a digital connection.

SCSI

SCSI stands for **Small Computer System Interface**. This is a data transmission method that can transmit large amounts of data in a short time. Since the VS-1680 has a SCSI connector, external SCSI devices such as hard disks or removable disk drive etc. can be connected.

SECAM/PAL Formats

Color television formats used in Europe and other areas. Tapes recorded in the SECAM or PAL formats cannot be played back on video decks designed for the NTSC format.

Shutdown

In order to turn the power off safely, you must first make sure that the performance has been saved to hard disk, and that the hard disk heads are parked. This procedure is referred to as Shutdown.

SMPTE time code

This is a signal format defined by the American organization SMPTE (Society of Motion Picture and Television Engineers) which is used to synchronize the operation of video or audio devices. SMPTE specifies "hours:minutes:seconds:frames" to indicate the address of each frame of a video image. For this reason, there are a variety of frame rates.

Terminator Power

This refers to the power supplied to external type active terminators.

TOC

Short for **Table of Contents**. This is the region on the CD-R disc that handles information such as song times, end times, sequence, and so on. Although the songs on a disc and their playing time can be displayed when an audio CD is placed in a CD player, this is because they can be read automatically from the TOC. The TOC is recorded differently than music data, with its main characteristic being disc access, such as the ability to go to the start of any song instantly.

Track Minutes

The amount of available recording time that is called for a standard unit corresponding to the time of one continuous monaural signal recorded to one track.

Zip Drive

A magnetic disk drive format standardized by Iomega Corporation. Disks that can be used for reading and writing data with Zip drives are call Zip disks. Similar to 3.5-inch floppy disks in size and usage, one Zip disk can store 100 MB of data.

Specifications

VS-1680
24 bit Digital Studio Workstation

Tracks

Tracks: 16
V-Tracks: 256 (16 V-Tracks per each Track)

*   *Up to 8 tracks can be recorded simultaneously, and up to 16 tracks can be played back simultaneously.*

Maximum Useful Capacity

128 G bytes:
2 G bytes (capacity)x 8 (Partition) x 8 (Disk Drive)

Internal Memory

Songs: 200 (each partition)

Equalizer

HI, MID, LOW (16 channels)
HI, LOW (26 channels)

Recording Mode

Multitrack Pro (MTP)
Mastering (MAS)
Multitrack 1 (MT1)
Multitrack 2 (MT2)
Live 1 (LIV1)
Live 2 (LIV2)

Signal Processing

AD Conversion: 20 bits, 64 times oversampling
DA Conversion: 20 bits, 128 times oversampling
Internal Processing: 24 bits (mixer section)

Sample Rate

48.0 kHz, 44.1 kHz, 32.0 kHz

*   *Sample rate can be adjusted around 22.00–50.48 kHz (maximum) by using vari-pitch function.*

Frequency Response

Sample Rate
48.0 kHz: 20 Hz–22 kHz (+0.2 dB/-0.2 dB)
44.1 kHz: 20 Hz–20 kHz (+0.2 dB/-0.2 dB)
32.0 kHz: 20 Hz–14 kHz (+0.2 dB/-0.2 dB)

Total Harmonic Distortion (INPUT SENS: 0 dBu, 1 kHz at nominal output level)

0.005 % or less (recording mode: MTP)

Recording Time (at 2 G bytes, 1 track)

| Recording | Sample Rate | | |
Mode	48.0 kHz	44.1 kHz	32.0 kHz
MTP	742 min.	808 min.	1114 min.
MAS	370 min.	404 min.	556 min.
MT1	742 min.	808 min.	1114 min.
MT2	990 min.	1078 min.	1484 min.
LIV1	1188 min.	1292 min.	1782 min.
LIV2	1484 min.	1616 min.	2228 min.

*   *The above-listed recording times are approximate. Times may be slightly depending on the specifications of the disk drive and on the number of songs that were created.*

Nominal Input Level (variable)

Input1–2:   -50– +4 dBu
              maximum +26 dBu:Balanced,
              maximum +20 dBu:Unbalanced
Input3–8:   -50– +4 dBu
              maximum +26 dBu:Balanced,
              maximum +20 dBu:Unbalanced
Guitar (Hi-Z):   -50– +4 dBu
              maximum +26 dBu:Balanced,
              maximum +20 dBu:Unbalanced

Input Impedance

Input1–2:   30 k ohms
Input3–8:   30 k ohms
Guitar (Hi-Z):   500 k ohms

Nominal Output Level

Master Out: 0 dBu
AUX A (L, R):   0 dBu
AUX B (L, R):   0 dBu
Monitor Out: 0 dBu

Output Impedance

Master Out: 1 k ohm
AUX A (L, R):   1 k ohm
AUX B (L, R):   1 k ohm
Monitor Out: 1 k ohm
Headphones: 22 ohms

Recommended load Impedance

Master Out: 10 k ohms or greater
AUX A (L, R): 10 k ohms or greater
AUX B (L, R): 10 k ohms or greater
Monitor Out: 10 k ohms or greater
Headphones: 8–50 ohms

Residual Noise Level (input terminated with 1 k ohm, INPUT SENS = LINE, IHF-A, typ.)

Master Out: -82 dBu or less
AUX A (L, R): -82 dBu or less
AUX B (L, R): -82 dBu or less
Monitor Out: -82 dBu or less

Interface Connectors

SCSI: DB-25 type
Digital I/O: Coaxial, Optical (conforms to S/P DIF)

Display

320 x 240 dots, Graphic LCD (with backlit)

Connectors

SCSI Connector (DB-25 type)
MIDI Connectors (IN, OUT/THRU)
Input Jack 1–2 (XLR type, balanced, phantom power)
Input Jack 3–8 (1/4 inch phone type, TRS balanced)
Guitar (Hi-Z) Jack (1/4 inch phone type)
Digital In Connectors (Coaxial type, Optical type)
Digital Out Connectors (Coaxial type, Optical type)
Foot Switch Jack (1/4 inch phone type)
Headphones Jack (Stereo 1/4 inch phone type)
AUX A Send Jack L/R (RCA phono type)
AUX B Send Jack L/R (RCA phono type)
Master Out Jack L/R (RCA phono type)
Monitor Out Jack L/R (RCA phono type)

Power Supply

AC 117 V, AC 230 V or AC 240 V

Power Consumption

33 W (Including internal hard disk)

Dimension

554 (W) x 336 (D) x 109 (H) mm
21-13/16 (W) x 13-1/4 (D) x 4-5/16 (H) inches

Weight

6.3 kg (Excluding internal hard disk)
13 lbs 15 oz

Accessories

AC Cord
Quick Start
Owner's Manual
Appendices

Options

Internal Hard Disk Drive Unit: HDP88 Series
Effect Expansion Board: VS8F-2

(0 dBu = 0.775 V rms)

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

MEMO...

MEMO...

MEMO...

MEMO...

Roland® VS-1680
Track Sheet (1)

Project ——————   Artist ——————   Client ——————
Song Name ——————   Date ——————
☐ Internal   ☐ Removable   Backing up to ——————

Tracks

V-Tracks

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

V-Tracks

LOCATOR

SCENE

Roland® VS-1680
Track Sheet (2)

	Tracks							
	9	10	11	12	13	14	15	16

V-Tracks

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

V-Tracks

NOTES

VS8F-2 Preset Patch List

By installing VS8F-2(s) on the VS-1680, you can access the range of effects listed below.

* TYPE

Snd/Rtn: Direct Level is set to "0." Connect this Patch to the effects bus.
Insert: This Patch mixes the direct sound and effected sound. Insert it into a channel.

* You cannot select preset Patches P000 through P021, P080 and P097 for EFX2 and EFX4. These Patches must be used for EFX1 or EFX3.

Reverb (18 presets)

No.	Patch Name	Algorithm	Type	Input	Comment
P000	RV:LargeHall	Reverb	Snd/Rtn	Mono	Large concert hall reverberation.
P001	RV:SmallHall	Reverb	Snd/Rtn	Mono	Small hall reverberation.
P002	RV:Strings	Reverb	Snd/Rtn	Mono	Reverberation optimized for delicate highs of strings.
P003	RV:PianoHall	Reverb	Snd/Rtn	Mono	Rich and warm reverberation optimized for pianos.
P004	RV:Orch Room	Reverb	Snd/Rtn	Mono	Reverberation of large-capacity rooms such as big banquet halls.
P005	RV:VocalRoom	Reverb	Snd/Rtn	Mono	Room reverb suitable for vocals and chorus.
P006	RV:MediumRm	Reverb	Snd/Rtn	Mono	Warm and naturally spacious room reverb.
P007	RV:LargeRoom	Reverb	Snd/Rtn	Mono	Simulated acoustics of wide rooms with lots of reverberation.
P008	RV:CoolPlate	Reverb	Snd/Rtn	Mono	Distinctive bright plate reverb.
P009	RV:Short Plt	Reverb	Snd/Rtn	Mono	Shorter plate reverb.
P010	RV:Vocal Plt	Reverb	Snd/Rtn	Mono	Crystal-clear reverb optimized for vocals.
P011	RV:Soft Amb.	Reverb	Snd/Rtn	Mono	Simulated reverberation of a room with minimal wall reflections.
P012	RV:Room Amb.	Reverb	Snd/Rtn	Mono	Natural reverberation of rooms with good acoustics, suitable for drums and guitars.
P013	RV:Cathedral	Reverb	Snd/Rtn	Mono	Acoustics of a very large, high-ceilinged church.
P014	RV:Long Cave	Reverb	Snd/Rtn	Mono	Simulated reverberation of deep caves.
P015	RV:GarageDr.	Reverb	Snd/Rtn	Mono	Natural reverb that enhances unique drum sounds.
P016	RV:Rock Kick	Reverb	Snd/Rtn	Mono	Reverb with many low-frequency components, suitable for rock kicks.
P017	RV:RockSnare	Reverb	Snd/Rtn	Mono	Rich and thick sounding reverb suitable for rock snares.

Gate Reverb (4 presets)

No.	Patch Name	Algorithm	Type	Input	Comment
P018	RV:BriteGate	Gate Reverb	Snd/Rtn	Mono	Slightly brighter gate reverb.
P019	RV:Fat Gate	Gate Reverb	Snd/Rtn	Mono	Dynamic reverb sound with powerful mids and lows.
P020	RV:ReverseGt	Gate Reverb	Snd/Rtn	Mono	A reverse gate commonly used as a special effect.
P021	RV:PanningGt	Gate Reverb	Snd/Rtn	Mono	A special effect with gate reverb shifting from left to right.

Delay (9 presets)

No.	Patch Name	Algorithm	Type	Input	Comment
P022	DL:Short Dly	Delay	Snd/Rtn	Mono	An ambience effect that adds depth to the sound by doubling.
P023	DL:MediumDly	Delay	Snd/Rtn	Mono	Natural echo optimized for vocals.
P024	DL:LongDelay	Delay	Snd/Rtn	Mono	Long delay suited for brass and analog synth solos.
P025	DL:AnalogDly	Delay	Snd/Rtn	Mono	Analog sound with gradually diminishing feedbacking highs.
P026	DL:Tape Echo	Stereo Delay Chorus	Snd/Rtn	Stereo	Simulated tape echo with distinctive wow flutter.
P027	DL:Karaoke	Stereo Delay Chorus	Snd/Rtn	Stereo	Intense reverberation that effectively enhances karaoke vocals.
P028	DL:Multi-Tap	Stereo Delay Chorus	Snd/Rtn	Stereo	Spacious reflections using positioning delay at any point along the stereo soundfield.
P029	DL:MltTapAmb	Multi Tap Delay	Snd/Rtn	Mono	An ambience effect using 10 short delay units.
P030	DL:Ping Pong	Multi Tap Delay	Snd/Rtn	Mono	A special effect using tap delay.

Vocal (10 presets)

No.	Patch Name	Algorithm	Type	Input	Comment
P031	VO:Vocal Efx	Vocal Multi	Insert	Mono	Basic setup for recording/mixdown of vocals.
P032	VO:JazzVocal	Vocal Multi	Insert	Mono	A natural sounding jazz club-like ambience for warm reverb well-suited for vocals.
P033	VO:RockVocal	Vocal Multi	Insert	Mono	Sound featuring limiter/enhancer processing as well as a unison effect.
P034	VO:Narration	Vocal Multi	Insert	Mono	An effect with heavy compression, used for narration.
P035	VO:BigChorus	Vocal Multi	Insert	Mono	A spacious-sounding stereo effect similar to increasing the number of vocalists.
P036	VO:Club DJ	Vocal Multi	Insert	Mono	A club DJ-tailored effect that uses a pitch shifter to make voices lower.
P037	VO:AM-Radio	Vocal Multi	Insert	Mono	Sound featuring hard compression and narrower frequency range.
P038	VO:PlusTwo	Stereo Pitch Shifter Delay	Insert	Stereo	A special effect that adds two more voices using a pitch shifter.
P039	VO:Robot Efx	Stereo Pitch Shifter Delay	Insert	Stereo	SF movie-like effect using a pitch shifter.
P040	VO:Bull Horn	Guitar Multi 3	Insert	Mono	Simulated effect of sound produced from a Bull Horn or old radio.

Guitar (11 presets)

No.	Patch Name	Algorithm	Type	Input	Comment
P041	GT:Rock Lead	Guitar Multi 2	Insert	Mono	Straight distortion sound with delay.
P042	GT:LA Lead	Guitar Multi 2	Insert	Mono	Lead guitar sound with tasty compression and chorus applied.
P043	GT:MetalLead	Guitar Multi 1	Insert	Mono	Metal sound with dynamic, ultrahigh gain distortion.
P044	GT:Metal Jet	Guitar Multi 1	Insert	Mono	Distortion together with a metallic effect achieved by flanging.
P045	GT:CleanRthm	Guitar Multi 1	Insert	Mono	Clean sound with compression and chorus applied.
P046	GT:DIedClean	Vocal Multi	Insert	Mono	Superclean sound like line recording directly into the console.
P047	GT:Delay Rif	Guitar Multi 2	Insert	Mono	Delay sounds at dotted eighth note intervals when a 120 BPM riff is played.
P048	GT:Acoustic	Vocal Multi	Insert	Mono	Optimized for electroacoustic guitars.
P049	GT:BluesDrv.	Guitar Multi 3	Insert	Mono	Crunchy overdrive sound suited to blues and R&R.
P050	GT:Liverpool	Guitar Multi 3	Insert	Mono	Crunchy sound often heard on '60s British rock.
P051	GT:Country	Guitar Multi 3	Insert	Mono	Clean sound featuring distinctive compression and delay.

Guitar Amp Simulator (9 presets)

No.	Patch Name	Algorithm	Type	Input	Comment
P052	GA:JazChorus	Guitar Amp Simulator	Insert	Mono	Roland JC-120 amp. Sounds more authentic when used with chorus for mixdown.
P053	GA:CleanTwin	Guitar Amp Simulator	Insert	Mono	U.S. tube combo amp circa "black panel."
P054	GA:Vin.Tweed	Guitar Amp Simulator	Insert	Mono	'50s U.S. tube amp overdrive.
P055	GA:BluesDrv.	Guitar Amp Simulator	Insert	Mono	Old British amp crunchy overdrive.
P056	GA:MatchLead	Guitar Amp Simulator	Insert	Mono	Hot-rodded British combo amp.
P057	GA:StudioCmb	Guitar Amp Simulator	Insert	Mono	Favourite late '70s amp of studio musicians.
P058	GA:JMP-Stack	Guitar Amp Simulator	Insert	Mono	Late '60s British stacks.

VS8F-2 Preset Patch List

No.	Patch Name	Algorithm	Type	Input	Comment
P059	GA:SLDN Lead	Guitar Amp Simulator	Insert	Mono	An '80s amp known for versatile distortion.
P060	GA:5150 Lead	Guitar Amp Simulator	Insert	Mono	Big tube amp standard for American heavy metal.

Bass (5 presets)

No.	Patch Name	Algorithm	Type	Input	Comment
P061	BS:DI'edBass	Vocal Multi	Insert	Mono	Slight limiting and equalization optimized, ideal for line recording applications.
P062	BS:MikedBass	Guitar Amp Simulator	Insert	Mono	A miked speaker box with four 12"s.
P063	BS:CompBass	Stereo Multi	Insert	Stereo	Hard-compressed sound optimized for slaps.
P064	BS:Auto Wah	Guitar Multi 2	Insert	Mono	Synth bass like sound added with auto wah essential for '70s funk.
P065	BS:EFX Bass	Stereo Delay Chorus	Insert	Stereo	Solo-optimized sound with depth and spaciousness added through delay and chorus.

Stereo Multi (5 presets)

No.	Patch Name	Algorithm	Type	Input	Comment
P066	CL:Comp	Stereo Multi	Insert	Stereo	Stereo type compression optimized for broadcast mixing.
P067	CL:Limiter	Stereo Multi	Insert	Stereo	A convenient effect for analog mastering because it can limit peak signals.
P068	EQ:Loudness	Stereo Multi	Insert	Stereo	Applies EQ curve with slightly boosted lows and highs.
P069	EQ:Fat Dance	Stereo Multi	Insert	Stereo	Hard compression plus equalizing for dance music.
P070	EQ:ThinJingl	Stereo Multi	Insert	Stereo	Limiter and EQ processing for FM radio and TV broadcasting.

Chorus/Flanger/Phaser/Pitch Shifter (9 presets)

No.	Patch Name	Algorithm	Type	Input	Comment
P071	CH:Lt Chorus	Stereo Delay Chorus	Insert	Stereo	Natural stereo chorus with shallow depth for spacious, crystal-clear sound.
P072	CH:Deep Cho	Stereo Delay Chorus	Insert	Stereo	Intense stereo chorus that adds depth and spaciousness to the sound.
P073	CH:DetuneCho	Stereo Pitch Shifter Delay	Insert	Stereo	Chorus with left and right channels separately pitch shift-detuned up and down.
P074	FL:LtFlanger	Stereo Flanger	Insert	Stereo	Stereo flanger with slight modulation.
P075	FL:Deep Fl	Stereo Flanger	Insert	Stereo	Deeper stereo flanger for metallic jet swooshing sound.
P076	PH:Lt Phaser	Stereo Phaser	Insert	Stereo	Lighter 4-stage stereo phaser suitable for synth strings.
P077	PH:DeepPhase	Stereo Phaser	Insert	Stereo	Deep phaser effective for electronic piano and clavinet sounds.
P078	PS:-4thVoice	Vocal Multi	Insert	Mono	Adds sound down a fourth to the direct sound.
P079	PS:ShimmerUD	Stereo Pitch Shifter Delay	Insert	Stereo	A special effect with left channel pitch rising and right channel pitch dropping over time.

Same as Algorithm (20 presets)

No.	Patch Name	Algorithm	Type	Input	Comment
P080	Reverb	Reverb	Snd/Rtn	Mono	(p. 81)
P081	Delay	Delay	Snd/Rtn	Mono	(p. 82)
P082	StDly-Chorus	Stereo Delay Chorus	Insert	Stereo	(p. 83)
P083	StPS-Delay	Pitch Shifter Delay	Insert	Stereo	(p. 84)
P084	Vocoder	Vocoder	Insert	Mono	(p. 85)
P085	2ch RSS	2ch RSS	Insert	2ch	(p. 85)
P086	Delay RSS	Delay RSS	Insert	Mono	(p. 86)
P087	Chorus RSS	Chorus RSS	Insert	Mono	(p. 86)

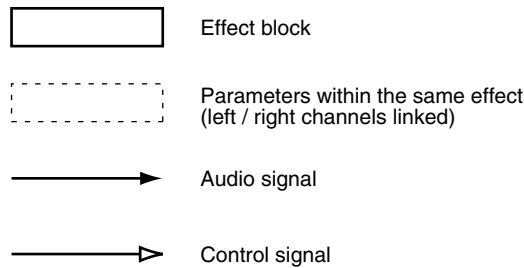| No.	Patch Name	Algorithm	Type	Input	Comment
P088	GuitarMulti1	Guitar Multi 1	Insert	Mono	(p. 87)
P089	GuitarMulti2	Guitar Multi 2	Insert	Mono	(p. 88)
P090	GuitarMulti3	Guitar Multi 3	Insert	Mono	(p. 89)
P091	Vocal Multi	Vocal Multi	Insert	Mono	(p. 90)
P092	Rotary	Rotary	Insert	Mono	(p. 91)
P093	GuitarAmpSim	Guitar Amp Simulator	Insert	Mono	(p. 92)
P094	St Phaser	Stereo Phaser	Insert	Stereo	(p. 93)
P095	St Flanger	Stereo Flanger	Insert	Stereo	(p. 94)
P096	DualComp/Lim	Dual Compressor/Limiter	Insert	2ch	(p. 95)
P097	Gate Reverb	Gate Reverb	Snd/Rtn	Mono	(p. 96)
P098	MultiTapDly	Multi Tap Delay	Insert	Mono	(p. 97)
P099	Stereo Multi	Stereo Multi	Insert	Stereo	(p. 98)

Reverv2 (20 presets)

No.	Patch Name	Algorithm	Type	Input	Comment
P100	R2:LargeHall	Reverb2	Snd/Rtn	Mono	Large concert hall reverberation.
P101	R2:SmallHall	Reverb2	Snd/Rtn	Mono	Small hall reverberation.
P102	R2:Strings	Reverb2	Snd/Rtn	Mono	Reverberation optimized for delicate highs of strings.
P103	R2:PianoHall	Reverb2	Snd/Rtn	Mono	Rich and warm reverberation optimized for pianos.
P104	R2:Orch Room	Reverb2	Snd/Rtn	Mono	Reverberation of large-capacity rooms such as big banquet halls.
P105	R2:VocalRoom	Reverb2	Snd/Rtn	Mono	Room reverb suitable for vocals and chorus.
P106	R2:MediumRm	Reverb2	Snd/Rtn	Mono	Warm and naturally spacious room reverb.
P107	R2:LargeRoom	Reverb2	Snd/Rtn	Mono	Simulated acoustics of wide rooms with lots of reverberation.
P108	R2:CoolPlate	Reverb2	Snd/Rtn	Mono	Distinctive bright plate reverb.
P109	R2:Short Plt	Reverb2	Snd/Rtn	Mono	Shorter plate reverb.
P110	R2:Vocal Plt	Reverb2	Snd/Rtn	Mono	Crystal-clear reverb optimized for vocals.
P111	R2:Soft Amb.	Reverb2	Snd/Rtn	Mono	Simulated reverberation of a room with minimal wall reflections.
P112	R2:Room Amb.	Reverb2	Snd/Rtn	Mono	Natural reverberation of rooms with good acoustics, suitable for drums and guitars.
P113	R2:Cathedral	Reverb2	Snd/Rtn	Mono	Acoustics of a very large, high-ceilinged church.
P114	R2:Long Cave	Reverb2	Snd/Rtn	Mono	Simulated reverberation of deep caves.
P115	R2:GarageDr.	Reverb2	Snd/Rtn	Mono	Natural reverb that enhances unique drum sounds.
P116	R2:Rock Kick	Reverb2	Snd/Rtn	Mono	Reverb with many low-frequency components, suitable for rock kicks.
P117	R2:RockSnare	Reverb2	Snd/Rtn	Mono	Rich and thick sounding reverb suitable for rock snares.
P118	R2:BriteGte2	Reverb2	Snd/Rtn	Mono	A high-density and bright sounding gated reverb. Adjust Threshold.
P119	R2:Fat Gate2	Reverb2	Snd/Rtn	Mono	A high-density and warm sounding gated reverb. Adjust Threshold.

Mic Simulator (22 presets)

No.	Patch Name	Algorithm	Type	Input	Comment
P120	MS:57→58	Mic Simulator	Insert	2ch	Converts a general-purpose D. mic to a vocal D. mic. Rich mid/low range.
P121	MS:57→421	Mic Simulator	Insert	2ch	Converts a general-purpose D. mic to a large D. mic. For drums and guitar amp.
P122	MS:57→451	Mic Simulator	Insert	2ch	Converts a general-purpose D. mic to a small C. mic. For acoustic guitar and cymbals.
P123	MS:57→87	Mic Simulator	Insert	2ch	Converts a general-purpose D. mic to a large C. mic. For vocals and acoustic inst.
P124	MS:57→47	Mic Simulator	Insert	2ch	Converts a general-purpose D. mic to a vintage C. mic. For vocals and acoustic inst.

VS8F-2 Preset Patch List

No.	Patch Name	Algorithm	Type	Input	Comment
P125	MS:57→Line	Mic Simulator	Insert	2ch	Cancels the characteristics of D.mic, giving the sound a flat frequency response.
P126	MS:DR20→421	Mic Simulator	Insert	2ch	Converts a Roland DR-20 to an instrumental D. mic. For drums and guitar amp.
P127	MS:DR20→451	Mic Simulator	Insert	2ch	Converts a Roland DR-20 to a small C. mic. For acoustic guitar and cymbals.
P128	MS:DR20→87	Mic Simulator	Insert	2ch	Converts a Roland DR-20 to a large C. mic. For vocals and acoustic inst.
P129	MS:10→58	Mic Simulator	Insert	2ch	Converts a headset mic to a vocal D. mic.
P130	MS:10→87	Mic Simulator	Insert	2ch	Converts a headset mic to a large C. mic.
P131	MS:Mini→57	Mic Simulator	Insert	2ch	Converts a miniature C. mic to a general-purpose D. mic.
P132	MS:Mini→87	Mic Simulator	Insert	2ch	Converts a miniature C. mic to a large C. mic.
P133	MS:Kick&Snr1	Mic Simulator	Insert	2ch	For the bass drum (L channel) and snare drum (R channel) of a drum set (1).
P134	MS:Kick&Snr2	Mic Simulator	Insert	2ch	For the bass drum (L channel) and snare drum (R channel) of a drum set (2).
P135	MS:H.Hat&Tom	Mic Simulator	Insert	2ch	For the hi-hat (L channel) and tom (R channel) of a drum set.
P136	MS:Dr.OvrTop	Mic Simulator	Insert	2ch	A patch for placing mics above the drums mainly to mic the cymbals.
P137	MS:Dr.OvrAll	Mic Simulator	Insert	2ch	A patch for placing mics above the front of the drums to mic the entire set.
P138	MS:Ac.Guitar	Mic Simulator	Insert	2ch	For acoustic guitar. InsertL: brighter, InsertR: warmer.
P139	MS:StudioVcl	Mic Simulator	Insert	2ch	For vocals. InsertL: natural, InsertR: Rock.
P140	MS:StereoMic	Mic Simulator	Insert	2ch	Gives time-lag to a sound miked in stereo, emphasizing spaciousness.
P141	MS:Ambience	Mic Simulator	Insert	2ch	Simulates ambience mics. Add reverb and mix with original source.

* D. mic: dynamic microphone
* C. mic: condenser microphone

Parametric Equalizer (26 presets)

No.	Patch Name	Algorithm	Type	Input	Comment
P142	PEQ:BassDrum	Parametric Equalizer	Insert	Stereo	For bass drum. Adjust LowQ and HiG.
P143	PEQ:RockBD	Parametric Equalizer	Insert	Stereo	For bass drum. A sound suitable for rock with mid-lows emphasized.
P144	PEQ:RockSD	Parametric Equalizer	Insert	Stereo	For snare drum. Drops the mid-lows and emphasizes the attack and snares.
P145	PEQ:RimShot	Parametric Equalizer	Insert	Stereo	For rim shot. Emphasizes the feeling of attack unique to a rim shot.
P146	PEQ:Toms	Parametric Equalizer	Insert	Stereo	For toms. Adjust LowF and LowMidF.
P147	PEQ:Hi Hat	Parametric Equalizer	Insert	Stereo	For the crisper hi-hat. Adjust bell sound with HiMidG.
P148	PEQ:Cymbals	Parametric Equalizer	Insert	Stereo	For cymbals. Emphasizes the difference in tone between cymbals and their clarity.
P149	PEQ:Overhead	Parametric Equalizer	Insert	Stereo	For drum kit. Use when miking the sound of the entire kit.
P150	PEQ:Bass 1	Parametric Equalizer	Insert	Stereo	For electric bass. Wide-range and tight bass sound.
P151	PEQ:Bass 2	Parametric Equalizer	Insert	Stereo	For electric bass. Fatter and with more punch than B50. For rock.
P152	PEQ:SlapBass	Parametric Equalizer	Insert	Stereo	For electric bass. Settings that emphasize the accent of pulled notes with slap technique.

No.	Patch Name	Algorithm	Type	Input	Comment
P153	PEQ:Sax	Parametric Equalizer	Insert	Stereo	For alto/soprano sax. Lower HiG for mellow sound.
P154	PEQ:Bari.Sax	Parametric Equalizer	Insert	Stereo	For baritone sax. Adjust LoMidF.
P155	PEQ:ElecGtr	Parametric Equalizer	Insert	Stereo	Settings that keep the lead guitar from being buried in the mix.
P156	PEQ:NylonGtr	Parametric Equalizer	Insert	Stereo	Emphasize the tone of nylon strings. Adjust fret sound with HiG.
P157	PEQ:BluesGtr	Parametric Equalizer	Insert	Stereo	Adds a delicate nuance suitable when playing blues on an acoustic guitar.
P158	PEQ:SlideGtr	Parametric Equalizer	Insert	Stereo	Adds a rich feel to acoustic slide guitar. Adjust HiF.
P159	PEQ:LineGtr	Parametric Equalizer	Insert	Stereo	For piezo pickups. Adjust brightness with HiG.
P160	PEQ:Male	Parametric Equalizer	Insert	Stereo	Improves the tone quality of a male vocal. Adjust HiG.
P161	PEQ:RockMale	Parametric Equalizer	Insert	Stereo	Equalizer that adds energy to a male vocal. Best for rock. Try with Comp.
P162	PEQ:Female	Parametric Equalizer	Insert	Stereo	Improves the tone quality of a female vocal. Adjust LoMidG.
P163	PEQ:RockFeml	Parametric Equalizer	Insert	Stereo	Equalizer that adds energy to a female vocal. Best for rock. Try with Comp.
P164	PEQ:Narrator	Parametric Equalizer	Insert	Stereo	Standard equalizer for male narration. Brings out the character of the voice.
P165	PEQ:Organ	Parametric Equalizer	Insert	Stereo	Settings to bring out the character of a church organ.
P166	PEQ:St.Piano	Parametric Equalizer	Insert	Stereo	For miking piano in stereo. Left: low range, right: high range.
P167	PEQ:SmallCho	Parametric Equalizer	Insert	Stereo	Settings that bring out the chorus without letting it conflict with the main vocal.

Graphic Equalizer (3 presets)

No.	Patch Name	Algorithm	Type	Input	Comment
P168	GEQ:TotalEQ1	Graphic Equalizer	Insert	Stereo	Boosts the low and high ranges.
P169	GEQ:TotalEQ2	Graphic Equalizer	Insert	Stereo	Attenuates the lows and highs to narrow the range, tightening up the sound.
P170	GEQ:Space EQ	Graphic Equalizer	Insert	Stereo	Special settings that turn a monaural source into stereo.

Space Chorus (3 presets)

No.	Patch Name	Algorithm	Type	Input	Comment
P171	SPCHO:MODE 1	Space Chorus	Insert	Stereo	Simulates MODE1 of the classic SDD-320 ambience processor.
P172	SPCHO:MODE 2	Space Chorus	Insert	Stereo	Simulates MODE2 of the classic SDD-320 ambience processor.
P173	SPCHO:MODE 3	Space Chorus	Insert	Stereo	Simulates MODE3 of the classic SDD-320 ambience processor.

Special Effects(16 presets)

No.	Patch Name	Algorithm	Type	Input	Comment
P174	LFP:BreakBts	Lo-Fi Processor	Insert	Stereo	Reproduces the tonal change produced by lowering the bit/rate of a sampled sound.
P175	LFP:1bitDist	Lo-Fi Processor	Insert	Stereo	Extreme distortion sound produced by lowering the number of bits.
P176	LFP:TeknoFlt	Lo-Fi Processor	Insert	Stereo	Emphasizes the out-of-band noise that occurs with low sampling rates.

VS8F-2 Preset Patch List

No.	Patch Name	Algorithm	Type	Input	Comment
P177	LFP:Reso Flt	Lo-Fi Processor	Insert	Stereo	Filter with resonance as found on synthesizers. Adjust CutOff.
P178	LFP:FatBotom	Lo-Fi Processor	Snd/Rtn	Stereo	Add heavy low-range for the groove. Mix with original source.
P179	VT:M to Fm	Voice Transformer	Insert	Mono	Converts a male voice into a female voice.
P180	VT:Fm to M	Voice Transformer	Insert	Mono	Converts a female voice into a male voice.
P181	VT:Male Duo	Voice Transformer	Insert	Mono	Turns a single male voice into a duet (by adding a female voice).
P182	VT:FemaleDuo	Voice Transformer	Insert	Mono	Turns a single female voice into a duet (by adding a male voice).
P183	VT:Robot	Voice Transformer	Insert	Mono	Special effect like a robot speaking.
P184	VOC2:M19Band	Vocoder2	Insert	Mono	Clear and crisp vocoder.
P185	VOC2:S19Band	Vocoder2	Insert	Mono	Special stereo vocoder with long decay.
P186	HC:Quiet60Hz	Hum Canceler	Insert	Stereo	Cancels 60 Hz hum noise.
P187	HC:Quiet50Hz	Hum Canceler	Insert	Stereo	Cancels 50 Hz hum noise.
P188	VC:Vocal Cnl	Vocal Canceler	Insert	Stereo	Cancels a vocal located in the center.
P189	VC:CenterCnl	Vocal Canceler	Insert	Stereo	Cancel all sound located in the center.

Same as Algorithm (14 presets)

No.	Patch Name	Algorithm	Type	Input	Comment
P190	Reverb2	Reverb2	Snd/Rtn	Mono	(p. 99)
P191	Space Chorus	Space Chorus	Insert	Stereo	(p. 100)
P192	Lo-Fi Proces	Lo-Fi Processor	Insert	Stereo	(p. 100)
P193	ParametricEQ	Parametric Equalizer	Insert	2ch	(p. 101)
P194	Graphic EQ	Graphic Equalizer	Insert	2ch	(p. 102)
P195	Hum Canceler	Hum Canceler	Insert	Stereo	(p. 103)
P196	Vocal Cancel	Vocal Canceler	Insert	Stereo	(p. 104)
P197	Voice Trans	Voice Transformer	Insert	Mono	(p. 105)
P198	Vocoder2 (19)	Vocoder2	Insert	Mono	(p. 106)
P199	MicSimulator	Mic Simulator	Insert	2ch	(p. 107)
P200	3BndIsolator	3BandIsolator	Insert	Stereo	(p. 108)
P201	TapeEcho201	Tape Echo 201	Snd/Rtn	Mono	(p. 108)
P202	AnalogFlnger	Analog Flanger	Insert	Stereo	(p. 109)
P203	AnalogPhaser	Analog Phaser	Insert	Stereo	(p. 109)

Tape Echo 201 (4 presets)

No.	Patch Name	Algorithm	Type	Input	Comment
P204	TE:ShortEcho	Tape Echo 201	Snd/Rtn	Mono	Simulates short type tape echo.
P205	TE:LongEcho	Tape Echo 201	Snd/Rtn	Mono	Simulates long type tape echo.
P206	TE:OldTape	Tape Echo 201	Snd/Rtn	Mono	Simulates tape echo using an old tape.
P207	TE:PanEcho	Tape Echo 201	Snd/Rtn	Mono	Simulates tape echo in stereo.

Analog Flanger (1 preset)

No.	Patch Name	Algorithm	Type	Input	Comment
P208	AF:SBF-325	Analog Flanger	Insert	Stereo	Simulates Roland SBF-325 analog flanger.

Analog Phaser (1 preset)

No.	Patch Name	Algorithm	Type	Input	Comment
P209	AP:FB-Phaser	Analog Phaser	Insert	Stereo	Simulates analog phaser with oscillation on purpose.

VS8F-2 Algorithm List

This section contains explanations of each algorithm. In the "Preset Patch list sheet," check the algorithm used by the Patch that you are starting with, and refer to this section for an explanation of the algorithm. For details on the function of each parameter, refer to the section "Function of Each Effect Parameter" (p. 110).

☐ Effect block

┈┈┈ Parameters within the same effect
(left / right channels linked)

⟶ Audio signal

⟶▷ Control signal

Reverb

This algorithm adds reverberation to simulate an acoustic space such as a hall or room. A three-band equalizer is provided on the input.
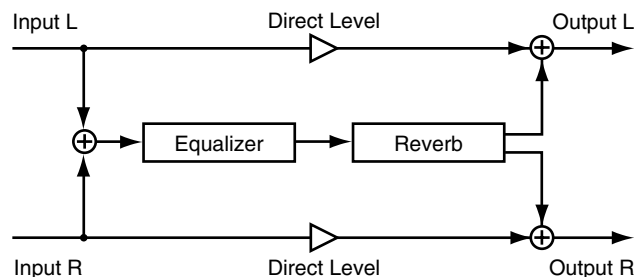
EQ (Equalizer) (p. 110)

Sw	Off, On
Low Gain	-12–12 dB
Low Freq	20–2000 Hz
Low Q	0.3–10.0
Low Type	Shlv, Peak
Mid Gain	-12–12 dB
Mid Freq	200–8000 Hz
Mid Q	0.3–10.0
High Gain	-12–12 dB
High Freq	1.4–20.0 kHz
High Q	0.3–10.0
Hi Type	Shlv, Peak
Level	0–100

Reverb (p. 110)

Room Size	5–40 m
Time	0.1–32.0 sec
PreDLY	0–200 ms
Difusi	0–100
Densty	0–100
ERLvl	0–100
LF Damp Gain	-36–0 dB
LF Damp Freq	50–4000 Hz
HF Damp Gain	-36–0 dB
HF Damp Freq	1.0–20.0 kHz
HiCF	0.2–20.0 kHz
EfxLvl	-100–100
DirLvl	-100–100

Delay

♪⟩⟩⟩ This algorithm is a mono-input stereo-output delay. A three-band equalizer is provided on the output.
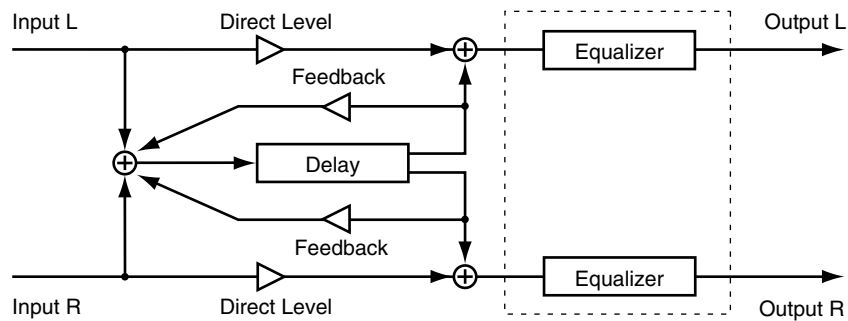
Delay (p. 111)

Sw	Off, On
Time	0–1200 ms
Shift	L1200–0–R1200 ms
Lch FeedbackLvl	-100–100
Rch FeedbackLvl	-100–100
LF Damp Gain	-36–0 dB
LF Damp Freq	50–4000 Hz
HF Damp Gain	-36–0 dB
HF Damp Freq	1.0–20.0 kHz
Lch EfxLvl	-100–100
Rch EfxLvl	-100–100
DirLvl	-100–100

EQ (Equalizer) (p. 110)

Sw	Off, On
Low Gain	-12–12 dB
Low Freq	20–2000 Hz
Low Q	0.3–10.0
Low Type	Shlv, Peak
Mid Gain	-12–12 dB
Mid Freq	200–8000 Hz
Mid Q	0.3–10.0
High Gain	-12–12 dB
High Freq	1.4–20.0 kHz
High Q	0.3–10.0
Hi Type	Shlv, Peak
Level	0–100

StDly-Chorus (Stereo Delay Chorus)

This algorithm connects a stereo delay and a stereo chorus in series. A three-band equalizer is provided on the output.
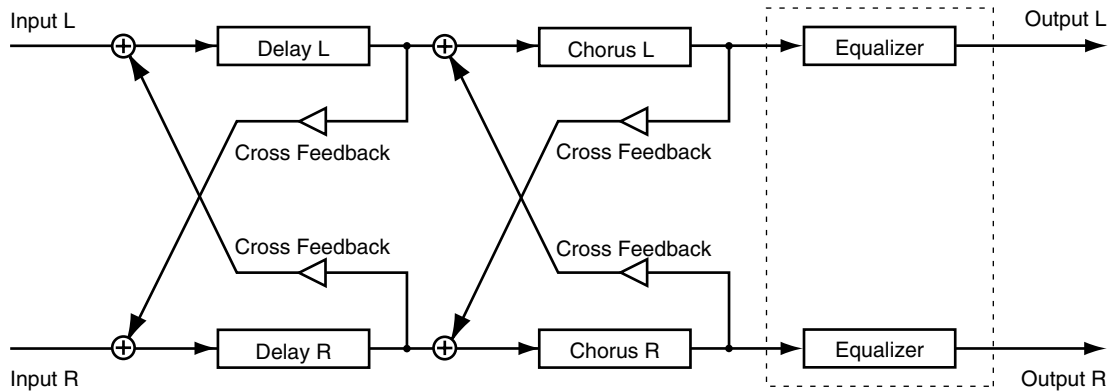
Delay (p. 111)

Sw	Off, On
Time	0–500 ms
Shift	L500–0–R500 ms
Lch FeedBackLvl	-100–100
Rch FeedBackLvl	-100–100
Lch CrossFeedbackLvl	-100–100
Rch CrossFeedback Lvl	-100–100
EfxLvl	-100–100
DirLvl	-100–100

Chorus (p. 112)

Sw	Off, On
Rate	0.1–10.0 Hz
Depth	0–100
PreDLY	0–50 ms
Lch FeedbackLvl	-100–100
Rch FeedbackLvl	-100–100
Lch CrossFeedbackLvl	-100–100
Rch CrossFeedbackLvl	-100–100
EfxLvl	-100–100
DirLvl	-100–100

EQ (Equalizer) (p. 110)

Sw	Off, On
Low Gain	-12–12 dB
Low Freq	20–2000 Hz
Low Q	0.3–10.0
Low Type	Shlv, Peak
Mid Gain	-12–12 dB
Mid Freq	200–8000 Hz
Mid Q	0.3–10.0
High Gain	-12–12 dB
High Freq	1.4–20.0 kHz
High Q	0.3–10.0
Hi Type	Shlv, Peak
Level	0–100

StPS-Delay (Stereo Pitch Shifter Delay)

This algorithm is a stereo pitch shifter with feedback delay. A three-band equalizer is provided on the output.
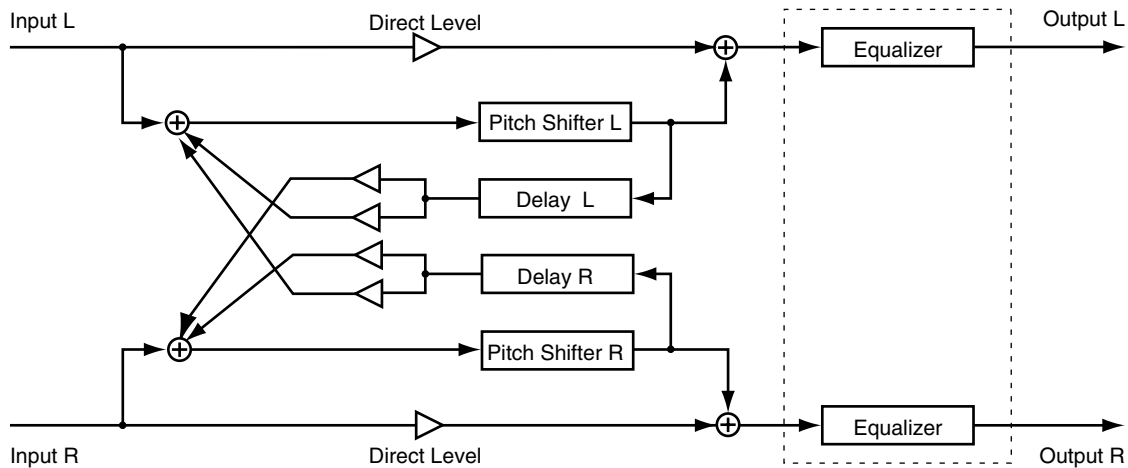
PShift (Pitch Shifter Delay) (p. 113)

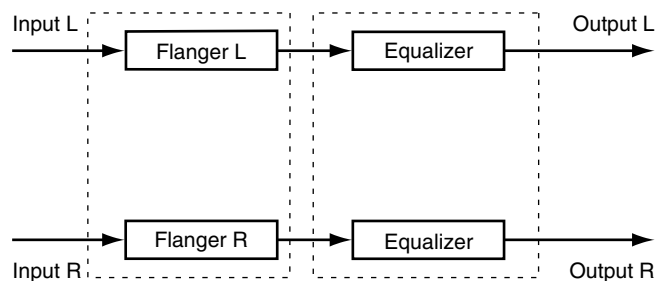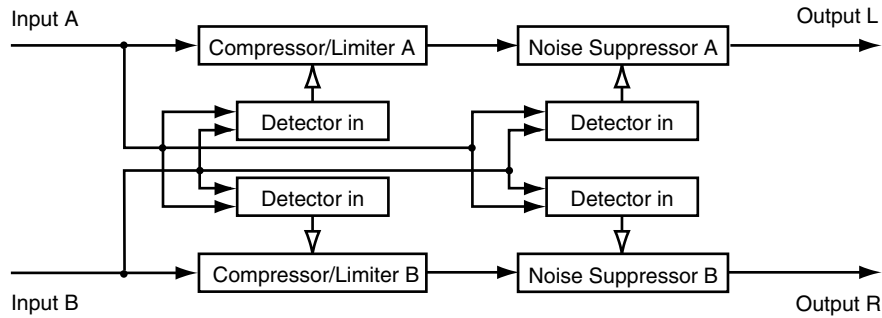|	
Sw	Off, On
Lch Croma Pitch	-12–12
Lch Fine Pitch	-100–100
Rch Croma Pitch	-12–12
Rch Fine Pitch	-100–100
Lch PreDly	0–50 ms
Rch PreDly	0–50 ms
Lch FBDly	0–500 ms
Rch FBDly	0–500 ms
Lch FeedBackLvl	-100–100
Rch FeedBackLvl	-100–100
Lch CrossFeedBackLvl	-100–100
Rch CrossFeedBackLvl	-100–100
EfxLvl	-100–100
DirLvl	-100–100

EQ (Equalizer) (p. 110)

Sw	Off, On
Low Gain	-12–12 dB
Low Freq	20–2000 Hz
Low Q	0.3–10.0
Low Type	Shlv, Peak
Mid Gain	-12–12 dB
Mid Freq	200–8000 Hz
Mid Q	0.3–10.0
High Gain	-12–12 dB
High Freq	1.4–20.0 kHz
High Q	0.3–10.0
Hi Type	Shlv, Peak
Level	0–100

Vocoder

This algorithm is a ten-band vocoder. The instrumental sound will be split into ten frequency bands, and processed according to the frequency characteristics of the audio signal.

To use the vocoder, Effect Pan for the instrument channel should be set to "L63" (send/return) or select "insL" (insert) so that input an instrumental sound into the left channel. Similarly, Effect Pan for the vocal channel should be set to "R63" (send/return) or select "insR" (insert) so that input a vocal sound into the right channel.
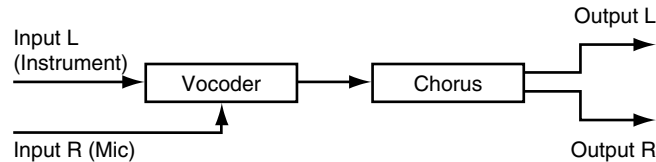
Voc (Vocoder) (p. 113)

Char 1	0–100
Char 2	0–100
Char 3	0–100
Char 4	0–100
Char 5	0–100
Char 6	0–100
Char 7	0–100
Char 8	0–100
Char 9	0–100
Char 10	0–100

Cho (Chorus) (p. 112)

Sw	Off, On
Rate	0.1–10.0 Hz
Depth	0–100
PreDLY	0–50 ms
FBLvl	-100–100
EfxLvl	-100–100
DirLvl	-100–100

2ch RSS (2-channel RSS)

This algorithm lets you specify the spatial placement of each of the input channels. When using this algorithm, do not allow the direct sound to be output.

To use INPUT A for the input, Effect Pan for the channel should be set to "L63" (send/return) or select "InsL" (insert). To use INPUT B for the input, Effect Pan for the channel should be set to "R63" (send/return) or select "InsR" (insert).

?   **RSS** (p. 64)
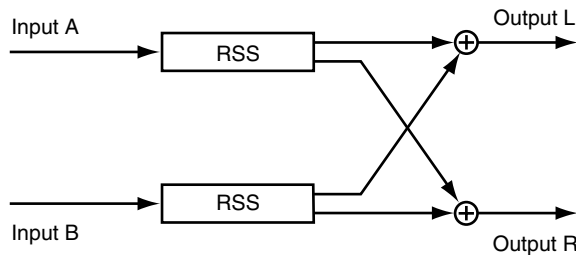
RSS A/RSS B (p. 113)

Azimuth	-180–180°
Elevation	-90–90°

Delay RSS

This algorithm is a delay with three independent delay sounds. RSS is connected to each output, left and right, and the sound of the left channel is placed 90 degrees left, and the sound of the right channel is placed 90 degrees right. Feedback can be applied to the output of the center delay.
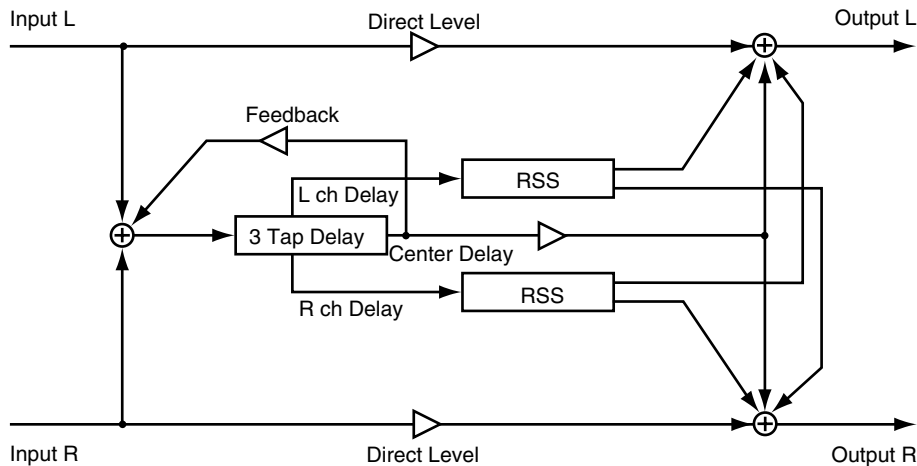
DlyRSS (Delay RSS) (p. 113)

Time	0–1200 ms	LF Damp Gain	-36–0 dB
Shift	L1200–0–R1200 ms	LF Damp Freq	50–4000 Hz
C.Time	0–1200 ms	HF Damp Gain	-36–0 dB
RSSLvl	0–100	HF Damp Freq	1.0–20.0 kHz
C-Lvl	0–100	FBLvl	-100–100
		EfxLvl	-100–100
		DirLvl	-100–100

Chorus RSS

This algorithm is a chorus with RSS connected to the output. The sound of the left channel is placed 90 degrees left, and the sound of the right channel is placed 90 degrees right.
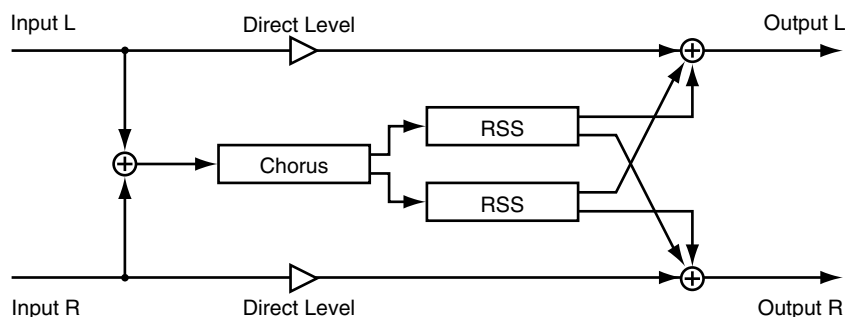
ChoRSS (Chorus RSS) (p. 113)

Rate	0.1–10.0 Hz
Depth	0–100
EfxLvl	-100–100
DirLvl	-100–100

GuitarMulti1 (Guitar Multi 1)

This algorithm is a multi-effect for guitar.

Input L → ⊕ → Compressor → Metal → Noise Suppressor → Auto Wah → Guitar Amp Simulator → Flanger → Delay → Output L / Output R

Input R
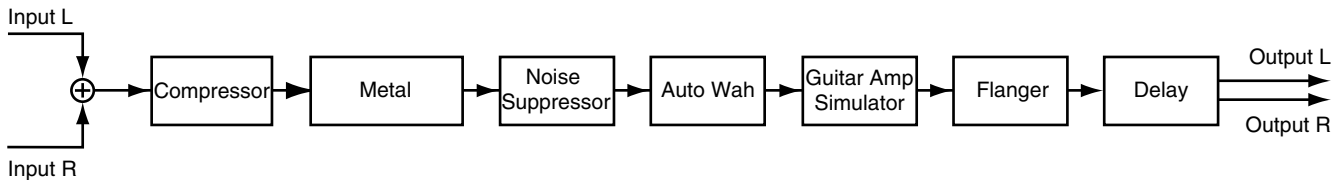
Comp (Compressor) (p. 114)

Sw	Off, On
Sustain	0–100
Attack	0–100
Tone	-50–50
Level	0–100

Metal (p. 114)

Sw	Off, On
Low Gain	-100–100
Mid Gain	-100–100
Hi Gain	-100–100
Level	0–100

NS (Noise Suppressor) (p. 115)

Sw	Off, On
Thresh	0–100
Release	0–100

Wah (Auto Wah) (p. 115)

Sw	Off, On
Mode	LPF, BPF
Pol	Down, Up
Sens	0–100
Freq	0–100
Peak	0–100
Rate	0.1–10.0 Hz
Depth	0–100
Level	0–100

Sim (Guitar Amp Simulator) (p. 115)

Sw	Off, On
Mode	Small, BuiltIn, 2Stack, 3Stack

Flg (Flanger) (p. 115)

Sw	Off, On
Rate	0.1–10.0 Hz
Depth	0–100
Manual	0–100
Reso	0–100

Dly (Delay) (p. 111)

Sw	Off, On
Time	0–1000 ms
Shift	L1000–0–R1000 ms
FBTime	0–1000 ms
FBLvl	-100–100
EfxLvl	-100–100
DirLvl	-100–100

GuitarMulti2 (Guitar Multi 2)

This algorithm is a multi-effect for guitar.

Input L → ⊕ → Compressor → Distortion → Noise Suppressor → Auto Wah → Guitar Amp Simulator → Flanger → Delay → Output L / Output R

Input R
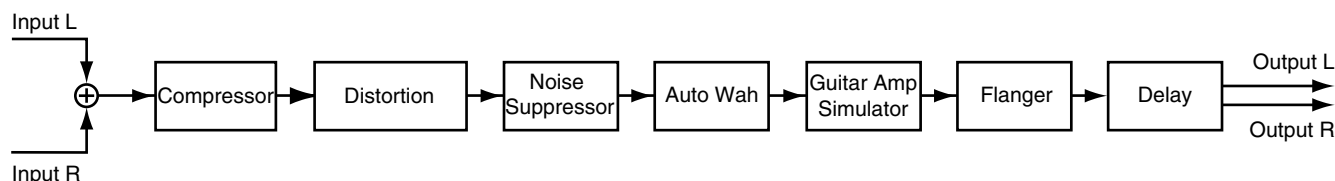
Comp (Compressor) (p. 114)

Sw	Off, On
Sustain	0–100
Attack	0–100
Tone	-50–50
Level	0–100

Dstr (Distortion) (p. 114)

Sw	Off, On
Gain	0–100
Tone	0–100
Level	0–100

NS (Noise Suppressor) (p. 115)

Sw	Off, On
Thresh	0–100
Release	0–100

Wah (Auto Wah) (p. 115)

Sw	Off, On
Mode	LPF, BPF
Pol	Down, Up
Sens	0–100
Freq	0–100
Peak	0–100
Rate	0.1–10.0 Hz
Depth	0–100
Level	0–100

Sim (Guitar Amp Simulator) (p. 115)

Sw	Off, On
Mode	Small, BuiltIn, 2Stack, 3Stack

Flg (Flanger) (p. 115)

Sw	Off, On
Rate	0.1–10.0 Hz
Depth	0–100
Manual	0–100
Reso	0–100

Dly (Delay) (p. 111)

Sw	Off, On
Time	0–1000 ms
Shift	L1000–0–R1000 ms
FBTime	0–1000 ms
FBLvl	-100–100
EfxLvl	-100–100
DirLvl	-100–100

GuitarMulti3 (Guitar Multi 3)

This algorithm is a multi-effect for guitar.
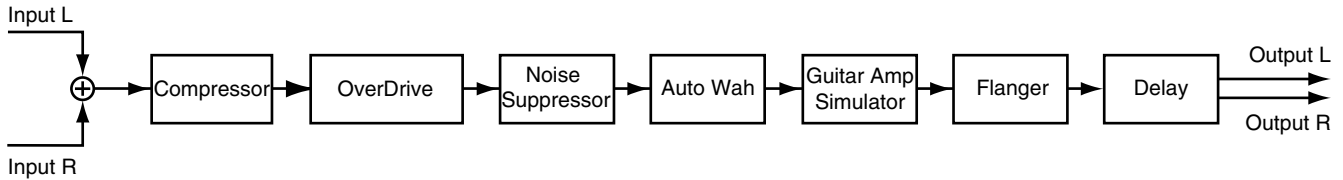
Comp (Compressor) (p. 114)

Sw	Off, On
Sustain	0–100
Attack	0–100
Tone	-50–50
Level	0–100

Ovd (OverDrive) (p. 114)

Sw	Off, On
Gain	0–100
Tone	0–100
Level	0–100

NS (Noise Suppressor) (p. 115)

Sw	Off, On
Thresh	0–100
Release	0–100

Wah (Auto Wah) (p. 115)

Sw	Off, On
Mode	LPF, BPF
Pol	Down, Up
Sens	0–100
Freq	0–100
Peak	0–100
Rate	0.1–10.0 Hz
Depth	0–100
Level	0–100

Sim (Guitar Amp Simulator) (p. 115)

Sw	Off, On
Mode	Small, BuiltIn, 2Stack, 3Stack

Flg (Flanger) (p. 115)

Sw	Off, On
Rate	0.1–10.0 Hz
Depth	0–100
Manual	0–100
Reso	0–100

Dly (Delay) (p. 111)

Sw	Off, On
Time	0–1000 ms
Shift	L1000–0–R1000 ms
FBTime	0–1000 ms
FBLvl	-100–100
EfxLvl	-100–100
DirLvl	-100–100

Vocal Multi

This algorithm is a multi-effect for vocals.

Input L → ⊕ → Noise Suppressor → Limiter/De-esser → Enhancer → Equalizer → Pitch Shifter → Delay → Chorus → Output L / Output R
Input R
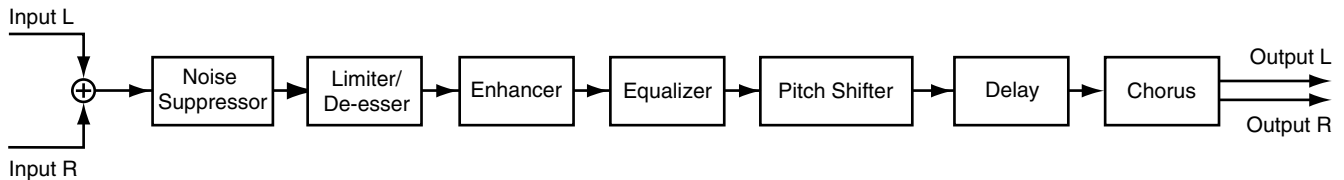
NS (Noise Suppressor) (p. 115)

Sw	Off, On
Thresh	0–100
Release	0–100

Lmt (Limiter/De-esser) (p. 116)

Sw	Off, On
Mode	Limiter, De-esser
Thresh	0–100
Release	0–100
Sens	0–100
Freq	1.0–10.0 kHz
Level	0–100

Enh (Enhancer) (p. 117)

Sw	Off, On
Sens	0–100
Freq	1.0–10.0 kHz
MixLvl	0–100
Level	0–100

EQ (Equalizer) (p. 110)

Sw	Off, On
Low Gain	-12–12 dB
Low Freq	20–2000 Hz
Low Q	0.3–10.0
Low Type	Shlv, Peak
Mid Gain	-12–12 dB
Mid Freq	200–8000 Hz
Mid Q	0.3–10.0
High Gain	-12–12 dB
High Freq	1.4–20.0 kHz
High Q	0.3–10.0
Hi Type	Shlv, Peak
Level	0–100

PShift (Pitch Shifter) (p. 113)

Sw	Off, On
Cromatic Pitch	-12–12
Fine Pitch	-100–100
EfxLvl	-100–100
DirLvl	-100–100

Dly (Delay) (p. 111)

Sw	Off, On
Time	0–1000 ms
FBLvl	-100–100
EfxLvl	-100–100
DirLvl	-100–100

Cho (Chorus) (p. 112)

Sw	Off, On
Rate	0.1–10.0 Hz
Depth	0–100
PreDLY	0–50 ms
EfxLvl	-100–100
DirLvl	-100–100

Rotary

This algorithm simulates a rotary speaker.

```
Input L
         ⊕ ──→  Noise Suppressor ──→  OverDrive ──→  Rotary ──→  Output L
                                                            ──→  Output R
Input R
```

NS (Noise Suppressor) (p. 115)

Sw   Off, On
Thresh   0–100
Release   0–100
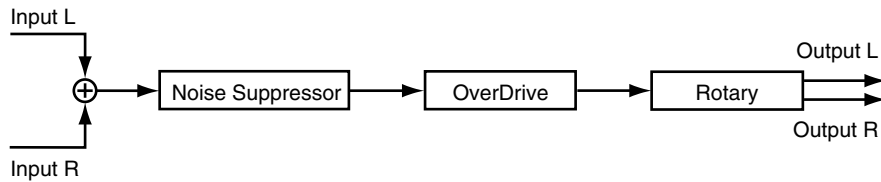
Ovd (OverDrive) (p. 114)

Sw   Off, On
Gain   0–100
Level   0–100

Rot (Rotary) (p. 117)

LRate   0.1–10.0 Hz
HRate   0.1–10.0 Hz

GuitarAmpSim (Guitar Amp Simulator)

This algorithm simulates a guitar amp.

Input L → ⊕ → Noise Suppressor → Pre Amp → Speaker Simulator → Output L / Output R

Input R
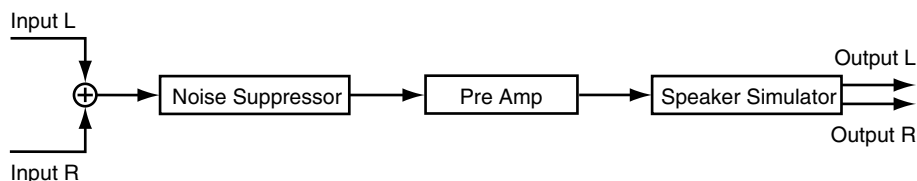
NS (Noise Suppressor) (p. 115)

Sw	Off, On
Thresh	0–100
Release	0–100

Amp (Pre Amp) (p. 118)

Sw	Off, On
Amp Type	JC-120, Clean Twin, Match Drive, BG Lead, MS1959 I, MS1959 II, MS1959 I+II, SLDN Lead, Metal 5150, Metal Lead, OD-1, OD-2 Turbo, Distortion, Fuzz
Gain	Low, Middle, High
Bright	Off, On
Volume	0–100
Bass	0–100
Middle	0–100
Treble	0–100
Presence	0–100(-100–0)
Master	0–100

Sp (Speaker Simulator) (p. 118)

Sw	Off, On
Sp Type	Small, Middle, JC-120, Built In 1, Built In 2, Built In 3, Built In 4, BG Stack 1, BG Stack 2, MS Stack 1, MS Stack 2, Metal Stack
MicSetting	1, 2, 3
MicLevel	0–100
DirLvl	0–100

St Phaser (Stereo Phaser)

This algorithm is a stereo phaser. A three-band equalizer is provided on the output.
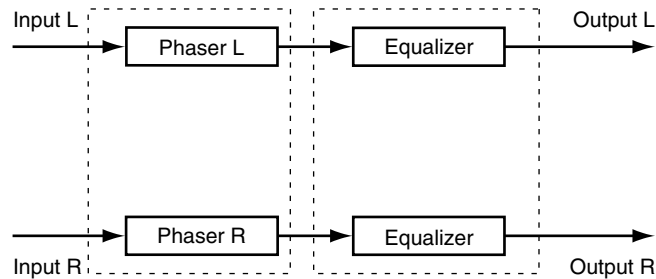
Phs (Phaser) (p. 116)

Sw	Off, On
Mode	4, 8, 12, 16
Pol	Inv, Sync
Rate	0.1–10.0 Hz
Depth	0–100
Manual	0–100
Reso	0–100
CrossFBLvl	0–100
EfxLvl	-100–100
DirLvl	-100–100

EQ (Equalizer) (p. 110)

Sw	Off, On
Low Gain	-12–12 dB
Low Freq	20–2000 Hz
Low Q	0.3–10.0
Low Type	Shlv, Peak
Mid Gain	-12–12 dB
Mid Freq	200–8000 Hz
Mid Q	0.3–10.0
High Gain	-12–12 dB
High Freq	1.4–20.0 kHz
High Q	0.3–10.0
Hi Type	Shlv, Peak
Level	0–100

St Flanger (Stereo Flanger)

This algorithm is a stereo flanger. A three-band equalizer is provided on the output.

```
Input L                                                    Output L
  ─────────►│ Flanger L │──────►│ Equalizer │──────►

Input R                                                    Output R
  ─────────►│ Flanger R │──────►│ Equalizer │──────►
```

Flg (Flanger) (p. 115)

Sw	Off, On
Pol	Inv, Sync
Rate	0.1–10.0 Hz
Depth	0–100
Manual	0–100
Reso	0–100
CrossFBLvl	0–100
EfxLvl	-100–100
DirLvl	-100–100

EQ (Equalizer) (p. 110)

Sw	Off, On
Low Gain	-12–12 dB
Low Freq	20–2000 Hz
Low Q	0.3–10.0
Low Type	Shlv, Peak
Mid Gain	-12–12 dB
Mid Freq	200–8000 Hz
Mid Q	0.3–10.0
High Gain	-12–12 dB
High Freq	1.4–20.0 kHz
High Q	0.3–10.0
Hi Type	Shlv, Peak
Level	0–100

DualCom/Lim (Dual Compressor/Limiter)

Two independent processors (A, B) for compressor/limiter and noise suppressor are connected in series in this algorithm.

To use INPUT A for the input, Effect Pan for the channel should be set to "L63" (send/return) or select "InsL" (insert). To use INPUT B for the input, Effect Pan for the channel should be set to "R63" (send/return) or select "InsR" (insert).

```
Input A                                              Output L
  ──────────────┬──→ ┌──────────────────┐     ┌──────────────────┐ ──────────→
                │    │ Compressor/Limiter A │──→│ Noise Suppressor A │
                │    └──────────────────┘     └──────────────────┘
                │         ↑                         ↑
                │  ┌──────────────┐           ┌──────────────┐
                ├─→│  Detector in │           │  Detector in │
                │  └──────────────┘           └──────────────┘
                │  ┌──────────────┐           ┌──────────────┐
                ├─→│  Detector in │           │  Detector in │
                │  └──────────────┘           └──────────────┘
                │         ↓                         ↓
                │    ┌──────────────────┐     ┌──────────────────┐
  ──────────────┴──→ │ Compressor/Limiter B │──→│ Noise Suppressor B │ ──────────→
Input B             └──────────────────┘     └──────────────────┘   Output R
```

CmpA/CmpB (Compressor/Limiter) (p. 117)

Sw	Off, On
Thresh	-60–0 dB
Ratio	1.5:1, 2:1, 4:1, 100:1
Attack	0–100
Release	0–100
Level	-60–12 dB
Detect	A, B, Link

NS (Noise Suppressor) (p. 115)

Sw	Off, On
Thresh	0–100
Release	0–100
Detect	A, B, Link

Gate Reverb

This algorithm is a gated reverb. A three-band equalizer is provided on the output.
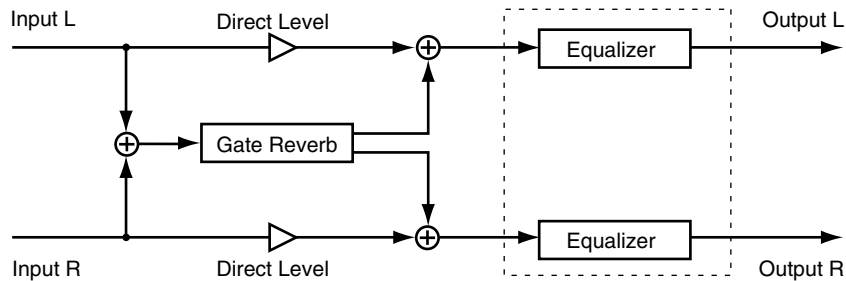
GRev (Gate Reverb) (p. 119)

Sw	Off, On
Mode	Normal, L→R, R→L, Revers1, Revers2
Time	10–400 ms
PreDLY	0–300 ms
Thick	0–100
Densty	0–100
AcDLY	0–200 ms
AcLvl	0–100
AcPan	L63–R63
EfxLvl	-100–100
DirLvl	-100–100

EQ (Equalizer) (p. 110)

Sw	Off, On
Low Gain	-12–12 dB
Low Freq	20–2000 Hz
Low Q	0.3–10.0
Low Type	Shlv, Peak
Mid Gain	-12–12 dB
Mid Freq	200–8000 Hz
Mid Q	0.3–10.0
High Gain	-12–12 dB
High Freq	1.4–20.0 kHz
High Q	0.3–10.0
Hi Type	Shlv, Peak
Level	0–100

MultiTapDly (Multi Tap Delay)

This algorithm is a delay in which ten delays can be set independently. A three-band equalizer is provided on the output.
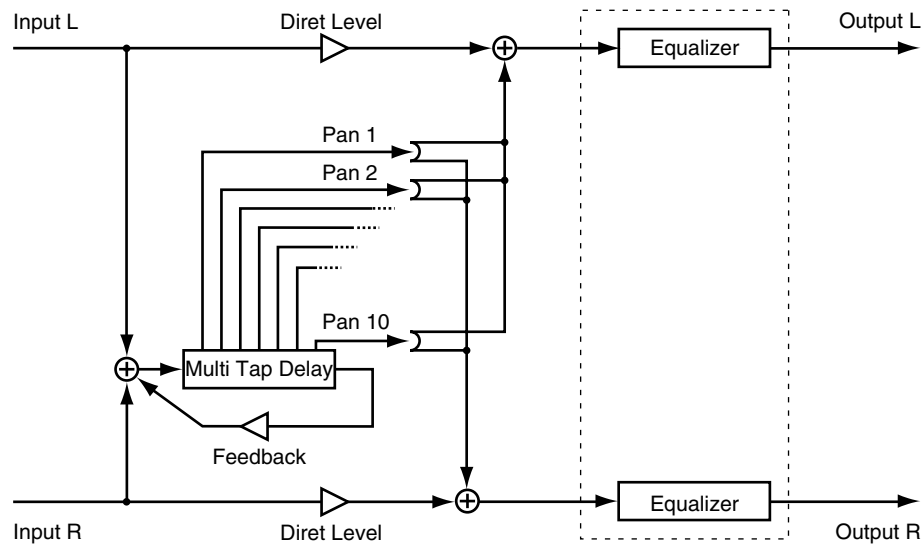
MTD (Multi Tap Delay) (p. 111)

Time Ch1–Ch10	0–1200 ms
Level Ch1–Ch10	0–100
Pan Ch1–Ch10	L63–R63
FBTim	0–1200 ms
FBLvl	-100–100
EfxLvl	-100–100
DirLvl	-100–100

EQ (Equalizer) (p. 110)

Sw	Off, On
Low Gain	-12–12 dB
Low Freq	20–2000 Hz
Low Q	0.3–10.0
Low Type	Shlv, Peak
Mid Gain	-12–12 dB
Mid Freq	200–8000 Hz
Mid Q	0.3–10.0
High Gain	-12–12 dB
High Freq	1.4–20.0 kHz
High Q	0.3–10.0
Hi Type	Shlv, Peak
Level	0–100

Stereo Multi

This algorithm connects a stereo noise suppressor, stereo compressor/limiter, stereo enhancer, and a stereo equalizer in series.
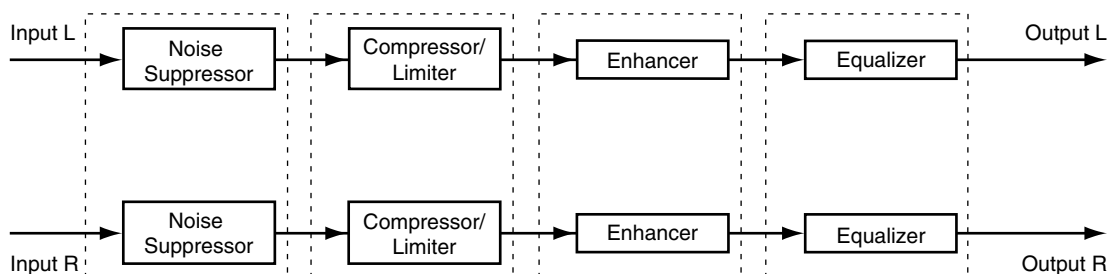
NS (Noise Suppressor) (p. 115)

Sw	Off, On
Thresh	0–100
Release	0–100

Cmp (Compressor/Limiter) (p. 114)

Sw	Off, On
Thresh	-60–0 dB
Ratio	1.5:1, 2:1, 4:1, 100:1,
Attack	0–100
Release	0–100
Level	-60–12 dB

Enh (Enhancer) (p. 117)

Sw	Off, On
Sens	0–100
Freq	1.0–10.0 kHz
MixLvl	0–100
Level	0–100

EQ (Equalizer) (p. 110)

Sw	Off, On
Low Gain	-12–12 dB
Low Freq	20–2000 Hz
Low Q	0.3–10.0
Low Type	Shlv, Peak
Mid Gain	-12–12 dB
Mid Freq	200–8000 Hz
Mid Q	0.3–10.0
High Gain	-12–12 dB
High Freq	1.4–20.0 kHz
High Q	0.3–10.0
Hi Type	Shlv, Peak
Level	0–100

Reverb 2

This is a reverb that provides a gating function and a ducking function. It can be used in whichever EFX1 to EFX4. You can use two reverbs with different settings, or use it in combination with a previous reverb.
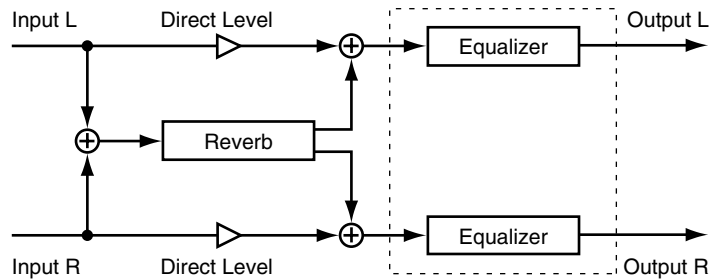
Rev (Reverb) (p. 120)

Sw	On, Off
Type	Room1, Room2, Hall1, Hall2, Plate
Gate	Off, On
Mode	Gate, Ducking
Time	0.1–10.0 sec
PreDLY	0–200 msec
Densty	0–100
HPF	Thru, 20–2000 Hz
LPF	1.0–20.0 kHz, Thru
Thresh	0–100
Attack	1–100
Releas	1–100
HoldT	1–100
EfxLvl	0–100
DirLvl	0–100

EQ (Equalizer) (p. 110)

Sw	Off, On
Low Gain	-12–12 dB
Low Freq	20–2000 Hz
Low Q	0.3–10.0
Low Type	Shlv, Peak
Mid Gain	-12–12 dB
Mid Freq	200–8000 Hz
Mid Q	0.3–10.0
High Gain	-12–12 dB
High Freq	1.4–20.0 kHz
High Q	0.3–10.0
Hi Type	Shlv, Peak
Level	0–100

Space Chorus

This is a chorus which simulates the Roland SDD-320.

Input L   Output L
⟶ ┌──────────────┐ ⟶
   │ Space Chorus │
⟶ └──────────────┘ ⟶
Input R   Output R
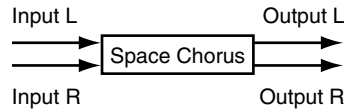
Spcho (Space Chorus) (p. 120)

Sw   Off, On
InMode Mono, Stereo
Mode   1, 2, 3, 4, 1+4, 2+4, 3+4
MixBal 0–100

Lo-Fi Proces (Lo-Fi Processor)

This allows you to create a "lo-fi" sound by lowering the sample rate and/or decreasing the number of bits. Realtime modify filters connected in series allow you to reshape the sound freely.

Input L ⟶ ┌──────────┐ ⟶ ┌──────────┐ ⟶ ┌──────────┐ ⟶ Output L
          │ Lo-Fi   │   │ Realtime │   │ Noise   │
          │Processor │   │ Modify Filter │ │ Suppressor │
          └──────────┘   └──────────┘   └──────────┘

Input R ⟶ ┌──────────┐ ⟶ ┌──────────┐ ⟶ ┌──────────┐ ⟶ Output R
          │ Lo-Fi   │   │ Realtime │   │ Noise   │
          │Processor │   │ Modify Filter │ │ Suppressor │
          └──────────┘   └──────────┘   └──────────┘
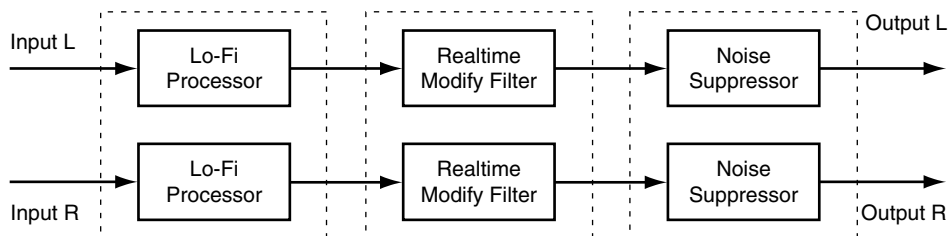
Lo-Fi (Lo-fi Processor) (p. 121)

Sw   Off, On
Pre Filter   Off, On
Rate   Off, 1/2–1/32
Bit   Off, 15–1 bit
Post Filter   Off, On
EfxLvl   0–100
DirLvl   0–100

RMF (Realtime Modify Filter) (p. 121)

Sw   Off, On
Type   LPF, BPF, HPF
CutOff   0–100
Reso   0–100
Gain   0–24 dB

NS (Noise Suppressor) (p. 115)

Thresh   0–100
Release   0–100

ParametricEQ (4-Band Parametric Equalizer)

This is a 4-band parametric equalizer. It can be used either as two monaural units or as one stereo unit.
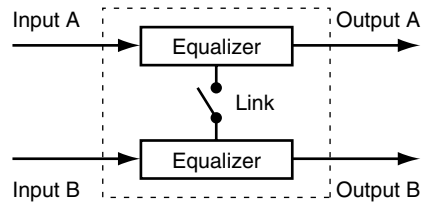
Lnk (Link) (p. 121)

Link   Off, On

PEQA/PEQB (Parametric Equalizer) (p. 122)

Sw	Off, On
Low Gain	-12–12 dB
Low Freq	20–2000 Hz
Low Q	0.3–10
Low Type	Shlv, Peak
LoMid Gain	-12–12 dB
LoMid Freq	200–8000 Hz
LoMid Q	0.3–10
HiMid Gain	-12–12 dB
HiMid Freq	200–8000 Hz
HiMid Q	0.3–10
High Gain	-12–12 dB
High Freq	1.4–20.0 kHz
High Q	0.3–10
High Type	Shlv, Peak
InputG	-60–12dB
Level	-60–12 dB

GraphicEQ (10-Band Graphic Equalizer)

This simulates a 10-band graphic equalizer. It can be used either as two monaural units or as one stereo unit.
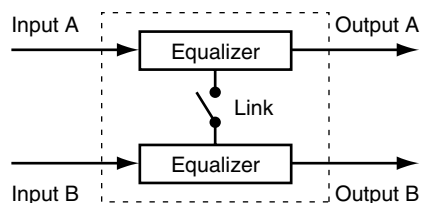
Lnk (Link) (p. 121)

Link Off, On

GEQA/GEQB (Graphic Equalizer) (p. 122)

Sw	Off, On
31.2	-12–12 dB
62.5	-12–12 dB
125	-12–12 dB
250	-12–12 dB
500	-12–12 dB
1k	-12–12 dB
2k	-12–12 dB
4k	-12–12 dB
8k	-12–12 dB
16k	-12–12 dB
InputG	-60–12 dB
Level	-60–12 dB

Hum Canceler

This removes unwanted hum (electrical "buzz" or "drone").
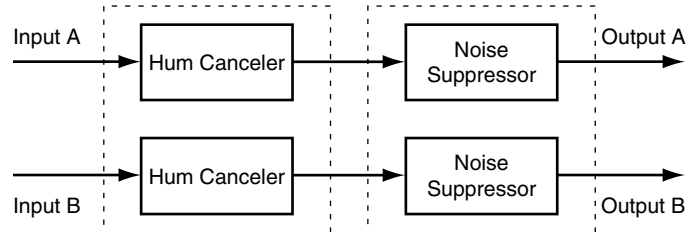
HC (Hum Canceller) (p. 123)

Sw	Off, On
Freq	20.0–800.0 Hz
Width	10–40 %
Depth	0–100
Thresh	0–100
RangeLo	Unlimit, 20–2000 Hz
RangeHi	1.0–20.0 kHz, Unlimit

NS (Noise Suppressor) (p. 115)

Sw	Off, On
Thresh	0–100
Release	0–100

Vocal Cancel

When a stereo source is being input from CD or DAT etc., this cancels the sound which is located in the stereo center, such as the vocal or bass.

*   *Depending on the musical source, sounds that you do not wish to be canceled may be canceled as well. In particular if the musical source has heavy reverb or if the sound that you wish to delete is not located in the center, the vocal canceller may not produce the desired result.*

```
                                         ┌ ─ ─ ─ ─ ─ ─ ─ ─ ─ ─ ─ ┐ Output L
                                         │       ┌──────────┐     │─────▶
   Input L                               │   ───▶│Equalizer │───────────▶
   ─────▶   ┌──────────────┐             │       └──────────┘     │
   ─────▶   │Vocal Canceler│─────────────┤                        │
   Input R  └──────────────┘             │       ┌──────────┐     │─────▶
                                         │   ───▶│Equalizer │───────────▶
                                         │       └──────────┘     │
                                         └ ─ ─ ─ ─ ─ ─ ─ ─ ─ ─ ─ ┘ Output R
```
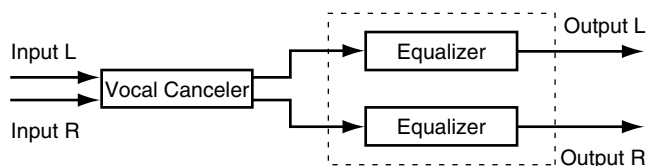
VC (Vocal Canceller) (p. 123)

Sw	Off, On
Balance	0–100
RangeLo	Unlimit, 20–2000 Hz
RangeHi	1.0–20.0 kHz, Unlimit

EQ (Equalizer) (p. 110)

Sw	Off, On
Low Gain	-12–12 dB
Low Freq	20–2000 Hz
Low Q	0.3–10.0
Low Type	Shlv, Peak
Mid Gain	-12–12 dB
Mid Freq	200–8000 Hz
Mid Q	0.3–10.0
High Gain	-12–12 dB
High Freq	1.4–20.0 kHz
High Q	0.3–10.0
Hi Type	Shlv, Peak
Level	0–100

Voice Trans (Voice Transformer)

This independently controls the basic pitch and the formants, allowing a variety of voice characters to be created.

?   **Formants** (p. 63)

    * *Voice Transformer can be used in EFX1 or EFX3. Also, EFX2 or EFX4 will not be available for use.*

Hints for voice input

- Input only a single voice. If several voices are input, the VS-1680 will not operate properly.

- Be sure that sound from a speaker does not enter the microphone you are using. This will have the same effect as if several voices were input to the unit (i.e. the VS-1680 will not function properly).

- We recommend that you to use a unidirectional microphone; speak or sing as close to the microphone as possible.

Input L

Output L

Voice
Transformer → Reverb

Output R

Input R
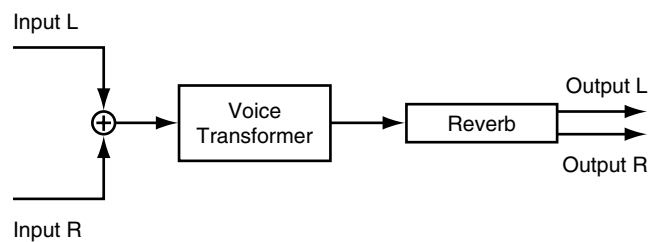
VT (Voice Transformer) (p. 123)

Sw	Off, On
Robot	Off, On
Cromatic Pitch	-12–36
Fine Pitch	-100–100
Cromatic Formant	-12–12
Fine Formant	-100–100
MixBal	0–100

FE (Fader Edit) (p. 124)

Sw	Off, On

MIDI (MIDI Control) (p. 124)

Sw	Off, On
PitchBend	Off, 1–12
Portament	Off, 1–100

Rev (Reverb) (p. 110)

Sw	Off, On
Time	0.1–10.0 sec
PreDLY	0–200 msec
Density	0–100
EfxLvl	0–100

Vocoder 2 (19)

This is a 19 band vocoder. A clear sound that was not possible with conventional vocoders can be obtained.

To use the vocoder, Effect Pan for the instrument channel should be set to "L63" (send/return) or select "insL" (insert) so that input an instrumental sound into the left channel. Similarly, Effect Pan for the vocal channel should be set to "R63" (send/return) or select "insR" (insert) so that input a vocal sound into the right channel.

* *Vocoder 2 (19) can be used in EFX1 or EFX3. Also, EFX2 or EFX4 will not be available for use.*
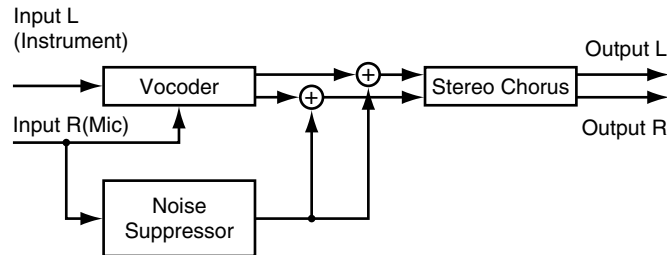
Voc (Vocoder2) (p. 124)

Envelope	Sharp, Soft, Long
PanMode	Mono, Stereo, L→R, R→L
Hold	Off, MIDI
MicSens	0–100
SynInLev	0–100
Character Ch1–19	0–100
Mic	0–100
MicHPF	Thru, 1.0–20.0 kHz
MicPan	L63–R63
NSThresh	0–100

Cho (Chorus) (p. 112)

Sw	Off, On
Rate	0.1–10.0 Hz
Depth	0–100
PreDLY	0–50.0 msec
MixBal	0–100

MicSimulator (Mic Simulator)

This modifies sound that was recorded by a conventional dynamic mic, lapel mic or direct line, causing it to sound as though it had been recorded by an expensive condenser mic or a special studio mic. The mic simulator can add effects of proximity or distance.

```
Input A ──────▶ ┌───────────────┐   ┌─────────────────┐   ┌──────────────┐   ┌──────────────┐ ──────▶ Output A
                │ Mic Converter │──▶│ Bass Cut Filter │──▶│   Distance   │──▶│   Limiter    │
                └───────────────┘   └─────────────────┘   └──────────────┘   └──────────────┘
                                              Link
Input B ──────▶ ┌───────────────┐   ┌─────────────────┐   ┌──────────────┐   ┌──────────────┐ ──────▶ Output B
                │ Mic Converter │──▶│ Bass Cut Filter │──▶│   Distance   │──▶│   Limiter    │
                └───────────────┘   └─────────────────┘   └──────────────┘   └──────────────┘
```
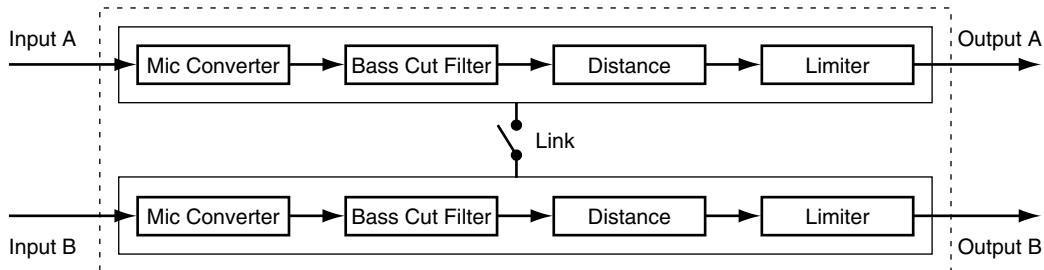
Lnk (Link) (p. 121)

Link	Off, On

CnvA/CnvB (Mic Converter) (p. 125)

Sw	Off, On
Input	DR-20, Sml.Dy, Hed.Dy, Min.Cn, Flat
Out	Sml.Dy, Voc.Dy, Lrg.Dy, Sml.Cn, Lrg.Cn, Vnt.Cn, Flat
Phase	Nor, Inv

BCutA/BCutB (Bass Cut Filter) (p. 126)

Sw	Off, On
Freq	Thru, 20–2000 Hz

DstnA/DstnB (Distance) (p. 126)

Sw	Off, On
Prox.Fx	-12–+12
Time	0–3000 cm

LmtA/LmtB (Limiter) (p. 117)

Sw	Off, On
Thresh	-60–0 dB
Attack	0–100
Release	0–100
Detect HPF Freq	Thru, 20–2000 Hz
Level	-60–24 dB

3BndIsolater (3-band Isolator)

The input sound is separated into three frequency ranges — high, mid, and low — each of which can be boost or cut.
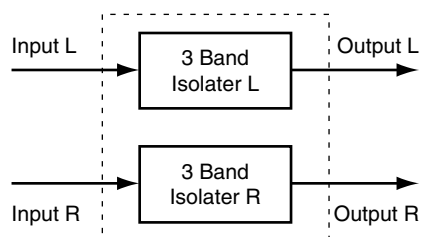
Iso (3-band Isolator) (p. 126)

Sw	Off, On
AntiPhase LoLev	0–100
AntiPhase MidLev	0–100
LoMixSw	Off, On
MidMixSw	Off, On
LowLvl	-60–+4 dB
MidLvl	-60–+4 dB
HiLvl	-60–+4 dB

TapeEcho201 (Tape Echo 201)

This is a tape echo which simulates the Roland RE-201.

Echo (Tape Echo 201) (p. 126)

Sw	Off, On
Mode	1–7
Repeat Rate	0–100
Intnsty	0–100
Tone Bass	-100–100
Tone Treble	-100–100
Pan HeadS	L63–R63
Pan HeadM	L63–R63
Pan HeadL	L63–R63
Tape Dist	0–100
WahFlutter Rate	0–100
WahFlutter Depth	0–100
EfxLvl	0–100
DirLvl	0–100

AnalogFlnger (Analog Flanger)

This is analog flanger which simulates the Roland SBF-325.

```
Input L ┌─────────────┐ Output L
   ──────┤   Analog    ├──────▶
        │  Flanger L  │
        └─────────────┘

        ┌─────────────┐
   ──────┤   Analog    ├──────▶
        │  Flanger R  │
Input R └─────────────┘ Output R
```
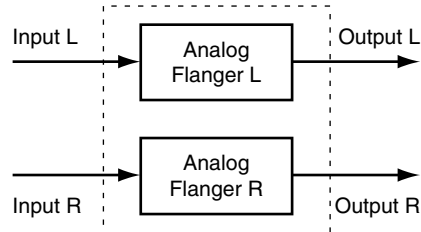
AnFl (Analog Flanger) (p. 127)

Sw	Off, On
Feedback	0–100
Modulation Freq	0–100
Modulation Rate	0–100
Modulation Depth	0–100
Mode	FL1, FL2, FL3, CHO
ChB	Nor, Inv
Phase ChA	Nor, Inv
Phase ChB	Nor, Inv

AnalogPhaser (Analog Phaser)

The VS-1680 features two analog phasers arranged in parallel, so they can be used in stereo.

```
Input L ┌─────────────┐ Output L
   ──────┤▶  Analog    ├──────▶
        │  Flanger L  │
        └─────────────┘

        ┌─────────────┐
   ──────┤▶  Analog    ├──────▶
        │  Flanger R  │
Input R └─────────────┘ Output R
```
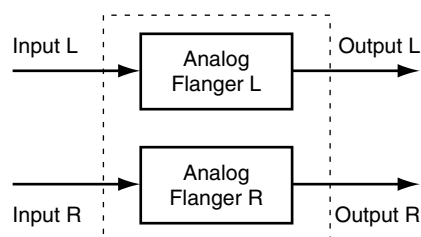
AnPh (Analog Phaser) (p. 127)

Sw	Off, On
Mode	4STAGE, 8STAGE
Freq	0–100
Reso	0–100
LFO1 Rate	0–100
LFO1 Depth	0–100
LFO1 ChB	Nor, Inv
LFO2 Rate	0–100
LFO2 Depth	0–100
LFO2 ChB	Nor, Inv

Function of Each Effect Parameter

This section explains the function of each effect parameter included in the algorithm.

EQ (Equalizer)

This is a three-band equalizer with low range (shelving /peaking type), mid range (peaking type), and high range (shelving/peaking type) bands.

Sw (Switch)

Turn the equalizer on/off.

Low Gain

Adjust the gain of the low range equalizer.

Low Freq (Low Frequency)

Adjust the frequency of the low range equalizer.

Low Q

Specify the width of the band centered on the low range equalizer center frequency in which the gain adjustment will occur. As this setting is raised, the width of the band affected will become narrower.

Low Type

Select the type of the low range equalizer.
Shlv: Shelving type
Peak: Peaking type

Mid Gain (Middle gain)

Specify the gain (amount of boost/cut) for the mid-range equalizer.

Mid Freq (Middle frequency)

Specify the center frequency of the mid-range equalizer.

Mid Q (Middle Q)

Specify the width of the band around the center frequency specified for the middle range equalizer in which the gain adjustment will occur. As this setting is raised, the width of the band affected will become narrower.

High Gain

Specify the gain (amount of boost/cut) for the high range equalizer.

High Freq (High frequency)

Specify the center frequency of the high range equalizer.

High Q (High Q)

Specify the width of the band around the center frequency specified for the high range equalizer in which the gain adjustment will occur. As this setting is raised, the width of the band affected will become narrower.

High Type

Select the type of high range equalizer.
Shlv: Shelving type
Peak: Peaking type

Level (Output level)

Adjust the volume level after the sound has passed through the equalizer.

Rev (Reverb)

Reverb refers to the reverberation that consists of many overlapping reflections. For example, if you clap your hands in a large room or auditorium, a lingering sound will follow the handclap itself. This lingering sound is called reverberation.

Types of reflection
The sound that normally enters our ear can be analyzed into three types of sound; direct sound, early reflections, and later reverberation. The direct sound is what reaches the listener directly from the sound source. Early reflections are what reach the listener after reflecting once or a few times off the walls or ceiling. Later reverberation is the "wash" of sound that is heard as a result of many reflections.
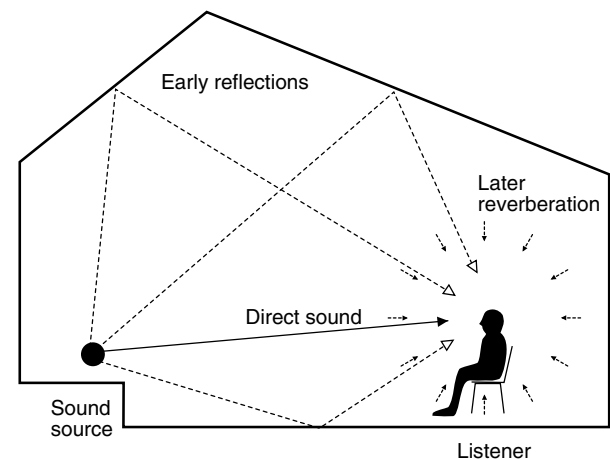
How reflections and time are related

Reflected sound reaches the listener in the following sequence. The Pre Delay is the time from when the direct sound is heard until the reverb is heard. The Reverb Time is the time over which the reverb decays to silence.

Level

Direct sound

Early reflections

Later reverberation

Time

Pre Delay

Reverb Time
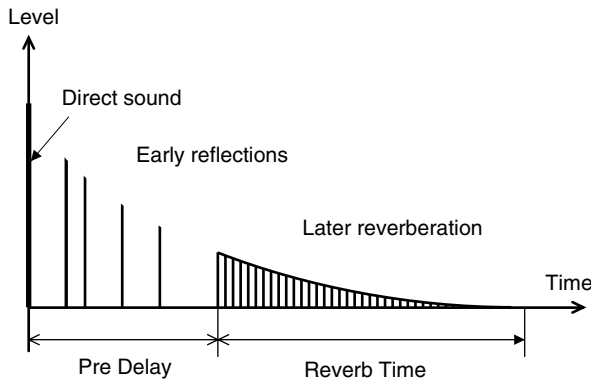
Other elements

The tonal characteristics of the reverb are affected by the materials of the surfaces (walls, etc.) off which the sound is reflected. The HF Damp and LF Damp parameters let you adjust the tonal quality as affected by such conditions.

HF Damp: The materials of the reflective surface will affect the way in which the high frequencies of the sound are attenuated. HF Damp adjusts the way in which the high frequencies are attenuated. Lower values will cause the high frequencies of the later reverberation to be attenuated more sharply.

LF Damp: The materials of the reflective surface will also affect the way in which the low frequencies of the sound are attenuated. LF Damp adjusts the way in which the low frequencies are attenuated. Lower values will cause the low frequencies of the later reverberation to be attenuated more sharply.

Room Size

Adjust the size of the room.

Time (Reverb Time)

Adjust the time over which the later reverberation will decay.

PreDLY (Pre Delay)

Adjust the time until the later reverberation appears.

Difusi (Diffusion)

Adjust the spread of the reverb sound.

Densty (Density)

Adjust the diffusive spaciousness of the early reflections.

ERLvl (Early Reflection Level)

Adjust the level of the early reflections.

LF Damp Gain

Adjust the degree of LF damping. With a setting of 0, there will be no damping. As the value is decreased, damping will become more pronounced.

LF Damp Freq (LF Damp Frequency)

Adjust the frequency at which LF damping will begin to take effect.

HF Damp Gain

Adjust the degree of HF damping. With a setting of 0, there will be no damping. As the value is decreased, damping will become more pronounced.

HF Damp Freq (HF Damp Frequency)

Adjust the frequency at which HF damping will begin to take effect.

HiCF (High Cut Frequency)

Adjust the frequency at which the high frequencies of the reverb sound will be cut.

EfxLvl (Effect Level)

Adjust the volume of the reverb.

DirLvl (Direct Level)

Adjust the volume of the direct sound.

Delay

Delay is an effect that adds delayed sound (s) to the direct sound, adding depth to the sound or creating special effects.

Sw (Switch)

Turn the delay on/off.

Time (Delay Time)

Adjust the delay time.

Shift (Delay shift)

Adjust the time difference between the delay times of the left and right channels. To delay the left channel delay, set this to a "L" value. To delay the right channel delay, set this to an "R" value. If you want the left and right channels to have the same delay time, set this to "0."

By shifting the delay times of the left and right channels, you can create a feeling of greater spaciousness.

* *It is not possible for the sum of the Delay Time and the Delay Shift values to exceed the possible range of Delay Time settings. For example if the Delay Time has a range of 0–1200 ms and the Delay Time is set to 1000 ms, the Delay Shift setting range will be L200–R200 ms.*

FeedbackLvl (Feedback Level)

Feedback is when the delayed sound is returned to the input of the delay. This setting adjusts the amount that is returned. Higher settings will result in a greater number of repeats. For negative (-) settings, the phase of the sound will be inverted. Excessively high settings may cause oscillation to occur.

CrossFeedback Lvl (Cross Feedback Level)

This adjusts the amount of the delayed sound that is returned (fed back) to the other channel. For negative (-) settings, the phase of the sound will be inverted. Excessively high settings may cause oscillation to occur.

FBTim (Feedback Delay Time)

This adjusts the time of repeats when feedback is used with Multi Tap Delay.

LF Damp Gain

Adjust the degree of LF Damping. With a setting of 0, there will be no damping. As the value is decreased, damping will become more pronounced.

LF Damp Freq (LF Damp Frequency)

Adjust the frequency at which LF Damping will begin to take effect.

HF Damp Gain

Adjust the degree of HF Damping. With a setting of 0, there will be no damping. As the value is decreased, damping will become more pronounced.

HF Damp Freq (HF Damp Frequency)

Adjust the frequency at which HF Damping will begin to take effect.

EfxLvl (Effect Level)

Adjust the volume of the delay.

DirLvl (Direct Level)

Adjust the volume of the direct sound.

Cho (Chorus)

Chorus is an effect that adds spaciousness and depth to the sound.

Sw (Switch)

Turn the chorus on/off.

Rate

Adjust the rate at which the chorus is modulated.

Depth

Adjust the depth at which the chorus is modulated.

PreDLY (Pre Delay)

Adjust the time from the direct sound until when the chorus sound is output.

FeedbackLvl (Feedback Level)

Feedback returns the chorused sound back to the input of the chorus. This setting adjusts the amount of chorused sound that is returned. For negative (-) settings, the phase will be inverted. Excessively high settings may cause oscillation to occur.

CrossFeedbackLvl (Cross Feedback Level)

Adjust the amount of the chorused sound that is fed back to the other channel. For negative (-) settings, the phase will be inverted. Excessively high settings may cause oscillation to occur.

EfxLvl (Effect Level)

Adjust the volume of the chorus.

DirLvl (Direct Level)

Adjust the volume of the direct sound.

MixBal (Mix Balance)

Adjust the balance between the chorus volume and the direct sound volume.

Shift (Pitch Shifter)

This effect changes the pitch of the original sound.

Sw (Switch)

Turn the Pitch Shifter on/off.

Croma Pitch (Chromatic Pitch)

Adjust the amount of pitch change in semitone steps.

Fine Pitch

Make fine adjustments to the amount of pitch change.

PreDly (Pre Delay)

Adjust the time from when the direct sound is output until when the pitch shifted sound is output.

FBDly (Feedback Delay Time)

This adjusts the time of repeats when feedback is used.

FeedBackLvl (Feedback Level)

Feedback returns the pitch-shifted sound back to the input of the pitch shifter. This setting adjusts the amount of pitch-shifted sound that is returned. For negative (-) settings, the phase will be inverted. Excessively high settings may cause oscillation to occur.

CrossFeedBackLvl (Cross Feedback Level)

Adjust the amount of the pitch-shifted sound that is fed back to the other channel. For negative (-) settings, the phase will be inverted. Excessively high settings may cause oscillation to occur.

EfxLvl(Effect Level)

Adjust the volume of the Pitch Shifter.

DirLvl (Direct Level)

Adjust the volume of the direct sound.

Voc (Vocoder)

The vocoder creates "talking instrument" effects. When using the vocoder, input an instrumental sound into the left channel, and a vocal sound into the right channel. The instrumental sound is divided into ten frequency bands, and processed according to the frequency characteristics of the vocal sound.

Char 1–10 (Voice Character 1–10)

Adjust the volume of each frequency band. These settings will affect the tone of the vocoder.

RSS

RSS (Roland Sound Space) is an effect that controls three-dimensional placement of the sound.

* *In the Delay RSS and Chorus RSS algorithms, the spatial placement is fixed, and it is not possible to adjust Azimuth and Elevation.*
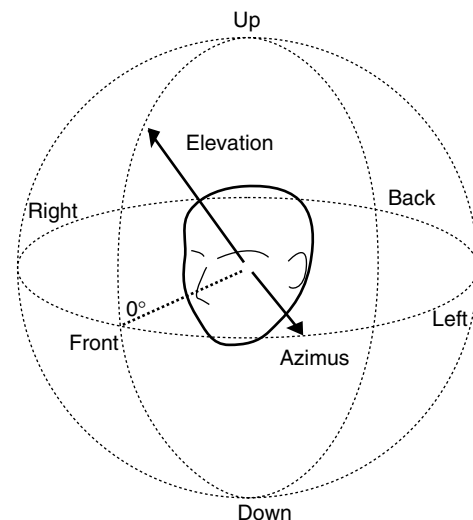
Azimuth

Set the front/back left/right position of the sound. A value of "0" is directly in front of the listener. Negative (-) values move to the left, and positive (+) values move to the right.

Elevation

Set the up/down position of the sound. A value of "0" is directly in front of the listener. Negative (-) values move downward, and positive (+) values move upward.

Cautions when using RSS

In order for RSS to be as effective as possible, note the following points.

• Acoustically "dead" rooms are most suitable.

• Single-way speakers are most suitable. However, coaxial or virtual coaxial multi-way speakers are also OK.

• The speakers should be distanced from the side walls as far as possible.

• Do not excessively separate the speakers to left and right.

• Monitor in the sweet spot shown below.
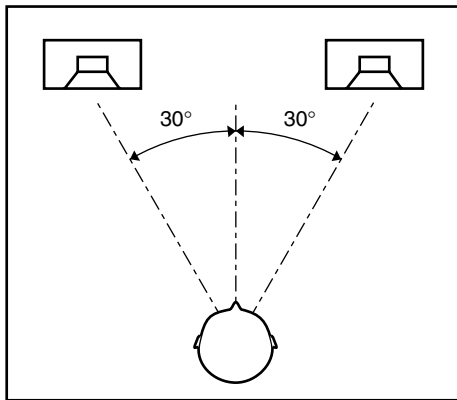
Product package notice for when RSS is used

RSS is an effect that places a sound source in a three-dimensional space when played back on a conventional stereo system. In order for the full RSS effect to be obtained, it is important to specify details of the listening environment. If a song using an RSS Patch is commercially released, we suggest placing the following notice on the package.

For Stereo Speakers

This sound is made to be played specifically through speakers.
The proper effect cannot be obtained if listened to through headphones.
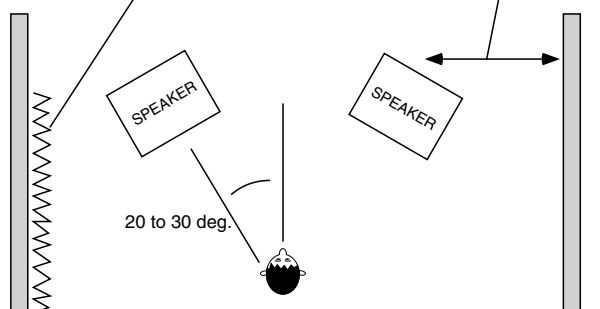
Comp (Compressor)

A compressor holds down high levels and boosts low levels to even out the volume.

Sw (Switch)

Turn the compressor on/off.

Sustain

Adjust the time over which low level signals are boosted to a constant volume.

Attack

Adjust the strength of the attack when a sound is input.

Tone

Adjust the tone color.

Level

Adjust the volume.

Dstr/Ovd/Metal (Distortion/OverDrive/Metal)

These effects distort the sound to create sustain.

Gain

Adjust the degree of distortion.

Low Gain

Adjust the gain of the low frequency range.

Mid Gain

Adjust the gain of the mid frequency range.

High Gain

Adjust the gain of the high frequency range.

Tone

Adjust the tone color.

Level

Adjust the volume of the effect sound.

NS (Noise Suppressor)

The noise suppressor leaves the original sound unmodified, but mutes only the noise during the silent intervals.

Sw (Switch)

Turn the Noise Suppressor on/off.

Thresh (Threshold)

Adjust the level at which the noise suppressor will begin to take effect. When the signal drops below the specified level, it will be muted.

Release

Adjust the time over which the volume will drop to 0 after the noise suppressor begins to take effect.

Wah (Auto Wah)

Wah is an effect that modifies the frequency characteristics of a filter over time, producing a unique tone. The wah effect can change in relation to the volume of the input signal, and/or cyclically.

Sw (Switch)

Turn the Auto Wah on/off.

Mode

Select either BPF (band pass filter) or LPF (low pass filter). When BPF is selected, the wah effect will be produced in a narrow frequency range. When LPF is selected, the wah effect will be produced in a wide frequency range.

Pol (Polarity)

When using the volume of the input signal to control the wah effect, this setting determines whether the frequency of the filter will be moved upward (Up) or downward (Down).

Sens (Sensitivity)

When using the volume of the input signal to control the wah effect, this adjusts the sensitivity. As this value is increased, the response to the input level will become stronger. If you do not want the volume of the input sound to affect the wah effect, set this to 0.

Freq (Frequency)

Adjust the frequency at which the wah effect will apply.

Peak

Adjust the degree to which the wah effect will apply to the region around the center frequency. With lower values, the wah effect will affect a broad area around the center frequency. With higher values, the wah effect will affect a narrow area around the center frequency.

Rate

Adjust the rate at which the wah effect will be cyclically modulated.

Depth

Adjust the depth at which the wah effect will be cyclically modulated. If you do not want the wah effect to be cyclically modulated, set this to 0.

Level

Adjust the volume.

Sim (Guitar Amp Simulator)

This effect simulates a guitar amp.

Sw (Switch)

Turn the Guitar Amp Simulator on/off.

Mode

Select the Guitar Amp
Small: small amp
Built In: a built-in type amp
2 Stack: a large two-level amp stack
3 Stack: a large three-level amp stack

Flg (Flanger)

A flanger produces a "sweeping" effect somewhat like the sound of a jet airplane taking off and landing.

Sw (Switch)

Turn the Flanger on/off.

Pol (Polarity)

Select whether the left and right phase of the modulation will be the same or the opposite.
Inv: The left and right phase will be opposite. When inputting a mono source, this spreads the sound.
Sync: The left and right phase will be the same. Select this when inputting a stereo source.

Rate

Adjust the rate at which flanger is modulated.

Depth

Adjust the depth of modulation for the flanger.

Manual

Adjust the center frequency at which the flanging effect will be applied.

Reso (Resonance)

Adjust the amount of resonance. Raising this value will produce a more characteristic effect. Excessive settings of this value may produce oscillation.

CrossFBLvL (Cross Feedback Level)

Adjust the amount of flanging sound which will be returned to the other channel. Excessively high settings may produce oscillation.

EfxLvl (Effect Level)

Adjust the volume of the Flanger.

DirLvl (Direct Level)

Adjust the volume of the direct sound.

Phs (Phaser)

Phaser is an effect that adds a phase-shifted sound to the direct sound, making the sound more spacious.

Sw (Switch)

Turn the Phaser on/off.

Mode

Select the number of stages in the phaser (4, 8, 12, 16).

Pol (Polarity)

Select whether the left and right phase of the modulation will be the same or the opposite.

Inv: The left and right phase will be opposite. When inputting a mono source, this spreads the sound.

Sync: The left and right phase will be the same. Select this when inputting a stereo source.

Rate

Adjust the rate at which the phaser will modulate.

Depth

Adjust the depth of the phaser effect.

Manual

Adjust the center frequency at which the phaser effect will apply.

Reso (Resonance)

Adjust the amount of resonance. Raising this value will produce a more distinctive tone. Excessively high settings may cause the sound to distort. When using a phaser with many stages, excessively high settings may produce oscillation.

CrossFBLvL (Cross Feedback Level)

Adjust the amount of phased sound which will be returned to the other channel. Excessively high settings may produce oscillation.

EfxLvl (Effect Level)

Adjust the volume of the Phaser.

DirLvl (Direct Level)

Adjust the volume of the direct sound.

Lmt (Limiter/De-esser)

This can be used either as a limiter or as a de-esser. A limiter holds down high signal levels to prevent distortion. A de-esser cuts the sibilant sounds of a voice, producing a gentler tone.

Sw (Switch)

Turn the Limiter/De-esser on/off.

Mode

Select whether the effect will function as a limiter or as a de-esser.

Thresh (Limitter Threshold)

Adjust the level (Threshold Level) at which the limiter will begin to operate.

Release (Limiter Release)

Adjust the time until when the limiter will turn off after the input level falls below the threshold level.

Level (Limiter Level)

Adjust the volume of the sound that passes through the limiter.

Sens (De-esser Sensitivity)

Adjust the degree to which the de-esser effect will affect the input signal.

Freq (De-esser Frequency)

Adjust the frequency at which the de-esser effect will apply. The effect will apply to frequencies above the specified value.

Lmt (Compressor/Limiter)

Depending on the setting of the parameters, this effect can be used as a compressor or as a limiter. A compressor holds down high-level signals and boosts low-level signals, evening out the volume. A limiter is used when you wish to hold down excessive input levels.

Sw (Switch)

Turn the Compressor/Limiter on/off.

Thrsh (Threshold)

Adjust the level at which the effect will begin to apply. To use this effect as a limiter, set a high Threshold Level.

Ratio

Select the compression ratio that will apply when the Threshold Level is exceeded. When using the effect as a limiter, you will normally set this to "100:1."

Attack (Attack Time)

Adjust the time from when the input level exceeds the threshold level to when the effect begins to apply. When using the effect as a limiter, set a short Attack Time.

Release

Adjust the time from when the input level drops below the threshold level to when the effect ceases to apply. When using the effect as a limiter, set a short Release Time.

Level

Adjust the output level.

Detect HPF Freq (Frequency)

Adjust the cutoff frequency of the level detection section. With a setting of Thru, this will operate as a conventional limiter.

Detect (Detector in)

This is used to select the input source which INPUT A or INPUT B that is to be used for controlling the effect. Set it to "Link" if you want the unit to detect which input source is of a higher level and automatically use that source for control.

Enh (Enhancer)

The enhancer is an effect that adds phase-shifted sound to the direct sound, sharpening the focus of the sound and bringing it to the front of the mix.

Sw (Switch)

Turn the Enhancer on/off.

Sens (Sensitivity)

Adjust the degree of the enhancer effect relative to the input volume.

Freq (Frequency)

Adjust the frequency at which the effect will begin to apply. The effect will apply to frequencies above the specified value.

MixLvl (Mix Level)

Adjust the amount of the phase-shifted sound that is mixed into the input.

Level

Adjust the level of the effect sound.

Rot (Rotary)

Rotary is an effect that simulates a rotary speaker. This produces the characteristic sound of two rotating speakers (a high rotor and a low rotor).

LRate (Low Rate)

Adjust the rotating rate of the low-range rotor.

HRate (High Rate)

Adjust the rotating rate of the high-range rotor.

Amp (Pre Amp)

This effect simulates the pre-amp section of a guitar amplifier.

Sw (Switch)

Turn the Pre Amp on/off.

Amp Type

Select the type of guitar amp.

JC-120:	The sound of a Roland JC-120.
Clean Twin:	The sound of a standard built-in type vacuum tube amp.
Match Drive:	The sound of a recent vacuum tube amp widely used in blues, rock, and fusion.
BG Lead:	The sound of a vacuum tube amp representative of the late 70's and the 80's.
MS1959 I:	The sound of the large vacuum tube amp stack that was indispensable to the British hard rock of the 70's, with input I connected.
MS1959 II:	The same amp as MS1959 (I), but with input II connected.
MS1959 I+II:	The same amp as MS1959 (I), but with inputs I and II connected in parallel.
SLDN Lead:	The sound of a vacuum tube amp usable in a wide variety of styles.
Metal 5150:	The sound of a large vacuum tube amp suitable for heavy metal.
Metal Lead:	A metal lead sound with a distinctive mid-range.
OD-1:	The sound of the BOSS OD-1 compact effector.
OD-2 Turbo:	The sound of the BOSS OD-2 compact effector with the Turbo switch on.
Distortion:	Distortion sound.
Fuzz:	Fuzz sound.

Gain

Switch the degree of pre-amp distortion between three levels (Low/Middle/High).

Bright

Turning this "On" will produce a sharper and brighter sound. This parameter can be set if the Type is set to "JC-120," "Clean Twin," or "BG Lead."

Volume

Adjust the volume and the degree of distortion of the amp.

Bass

Adjust the tone of the low range.

Middle

Adjust the tone of the mid range. If "Match Drive" is selected for the Type parameter, this parameter cannot be set.

Treble

Adjust the tone of the high range.

Presenc (Presence)

Adjust the tone of the ultra-high range. Normally the range will be 0–100, but when "Match Drive" is selected, the range will be -100–0.

Master

Adjust the volume of the entire pre-amp.

Sp (Speaker Simulator)

This effect simulates a speaker system.

Sw (Switch)

Turn the Speaker Simulator on/off.

Sp Type (Speaker Type)

Select the type of speaker. The specifications of each type are as follows. The speaker column indicates the diameter of each speaker unit (in inches) and the number of units.

Type	Cabinet	Speaker	Mic
Small	a	10	D
Middle	b	12 x 1	D
JC-120	b	12 x 2	D
Built In 1	b	12 x 2	D
Built In 2	b	12 x 2	C
Built In 3	b	12 x 2	C
Built In 4	b	12 x 2	C
BG Stack 1	c	12 x 2	C
BG Stack 2	d	12 x 2	C
MS Stack 1	d	12 x 4	C
MS Stack 2	d	12 x 4	C
Metal Stack	e	12 x 4	C

a: Small open-back enclosure
b: open back enclosure
c: sealed enclosure
d: large sealed enclosure
e: large double stack
C: condenser mic
D: dynamic mic

Recommended combinations of pre-amp and speaker

Pre-amp type	Speaker type
BG Lead	BG Stack 1, BG Stack 2, Middle
MS1959 (II)	BG Stack 1, BG Stack 2, Metal Stack
MS1959 (I+II)	BG Stack 1, BG Stack 2, Metal Stack
SLDN Lead	BG Stack 1, BG Stack 2, Metal Stack
Metal 5150	BG Stack 1, BG Stack 2, Metal Stack
Metal Lead	BG Stack 1, BG Stack 2, Metal Stack
OD-2 Turbo	Built In 1–4
Distortion	Built In 1–4
Fuzz	Built In 1–4

MicSetting (Mic Setting)

Specify the location of the mic that is recording the sound of the speaker. This can be adjusted in three steps, with the mic becoming more distant in the order of 1, 2, and 3.

MicLevel (Mic Level)

Adjust the volume of the mic sound.

DirLvl (Direct Level)

Adjust the volume of the direct sound.

GRev (Gate Reverb)

This is a reverb in which the reverberance is muted (gated) during its decay. Using the accent sound produces an interesting effect.
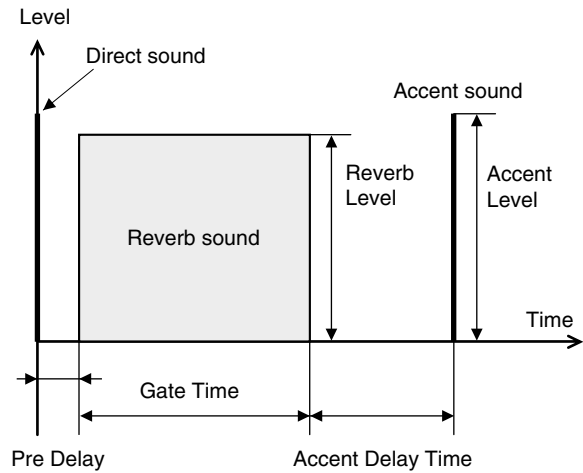
Sw (Switch)

Turn the Gate Reverb on/off.

Time (Gate Time)

Adjust the time from when the reverb sound begins until it is muted.

PreDLY (Pre Delay)

Adjust the time until the reverb sound appears.

Mode (Gate Mode)

Select how the gated reverb will apply.

Normal: A conventional gated reverb.
L→R: The gated reverb sound will move from left to right.
R→L: The gated reverb sound will move from right to left.
Revers1: This is a reverse gated reverb. (As if the reverb was played backward.)
Revers2: This is a reverse gated reverb in which the reverb decays mid-way.

Thick (Thickness)

Adjust the thickness of the reverb sound.

Density

Adjust the density of reverb sound.

AcDLY (Accent Delay Time)

Adjust the time from when the reverb sound is muted until the accent sound appears.

AcLvl (Accent Level)

Adjust the level of the accent sound.

AcPan (Accent Pan)

Adjust the pan of the accent sound.

EfxLvl(Effect Level)

Adjust the volume of the Gate Reverb.

DirLvl (Direct Level)

Adjust the volume of the direct sound.

Reverb2

This is a reverb that provides a gating function and a ducking function.

Sw (Switch)

Turn reverb on/off.

Type (Reverb Type)

Select the type of reverb.
Room1: Normal room reverb.
Room2: Room reverb with a softer tone than Room1.
Hall1: Normal hall reverb.
Hall2: Hall reverb with a softer tone than Hall1.
Plate: Plate reverb.

Gate

Turn the gate function on/off.

Mode (Gate mode)

Select the way in which the gate function will operate.
Gate: The gate will begin to open when the direct signal level exceeds the threshold level, and will begin to close when it falls below the threshold level.
Ducking: The function will be the opposite of the Gate setting. The gate will begin to close when the direct signal level exceeds the threshold level, and will begin to open when it falls below the threshold level.

Time (Reverb Time)

Adjust the length (time) of the reverberation.

PreDLY (Pre delay)

Adjust the time until the reverb is output.

Densty (density)

Adjust the density of the reverb.

HPF (High pass filter)

Adjust the frequency at which the high pass filter will begin to take effect. With a setting of Thru, the high pass filter will not function.

LPF (Low pass filter)

Adjust the frequency at which the low pass filter will begin to take effect. With a setting of Thru, the low pass filter will not function.

Thresh (Threshold)

Adjust the basic level at which opening and closing of the gate will be controlled.

Attack

Adjust the time from when the direct sound level exceeds the threshold level until when the gate is completely open.

Releas (Release)

Adjust the time from when the hold time has elapsed until the sound is completely muted.

HoldT (Hold Time)

Adjust the time from when the input falls below the threshold level until when the release begins.

EFLvl (Effect level)

Adjust the volume of the reverb.

DiLvl (Direct level)

Adjust the volume of the direct sound.

SpCho (Space Chorus)

This is a chorus which simulates the Roland SDD-320.

Sw (Switch)

Turn space chorus on/off.

InMod (Input mode)

Specify whether the input signal is stereo or mono.

Mode (Space mode)

Select the way in the chorus will change.

MixBal (Mix balance)

Adjust the balance between the chorus volume and the direct sound volume.

Lo-Fi (Lo-Fi Processor)

This allows you to create a "lo-fi" sound by lowering the sample rate and/or decreasing the number of bits.

Sw (Switch)

Turn the Lo-fi Processor on/off.

Pre Filter

This filter decreases digital distortion. By turning this off, you can create an extremely lo-fi sound that includes aliasing.

Rate

Modify the sample rate. If this is turned off, the sample rate will be the same as the sample rate of the currently selected song.

Bit

Modify the number of data bits. If this is turned off, the number of data bits will be unchanged.
If an extremely low number of bits is selected, loud noise may appear even when there is no sound, depending on the input source. In such cases, raise the threshold of the noise suppressor.

Post Filter

This filter decreases the digital distortion produced by lo-fi. By turning this off, you can create an extremely lo-fi sound.

EfxLvl (Effect level)

Adjust the volume of the lo-fi sound.

DirLvl (Direct level)

Adjust the volume of the direct sound.

RMF (Realtime Modify filter)

Realtime modify filters connected in series allow you to reshape the sound freely.

Sw (Switch)

Turn the realtime modify filter on/off.
Type (Filter type)
Select the filter type.
LPF: Low pass filter
BPF: Band pass filter
HPF: High pass filter

CutOff

Adjust the cutoff frequency.

Reso (Resonance)

Adjust the resonance.

Gain

Adjust the volume level of the sound that has passed through the realtime modify filter.

Link

This is a link switch for channels A and B.

Link

If this is turned off, the channels will function independently as two monaural channels. If this is turned on, both channels will be controlled simultaneously by the settings of channel A.

PEQA/PEQB
(Parametric Equalizer)

This is a 4-band parametric equalizer. It can be used either as two monaural units or as one stereo unit.
Sw (Switch)
Turn the equalizer on/off.

Low Gain

Specify the gain (amount of boost/cut) for the low range equalizer.

Low Freq (Low frequency)

Specify the center frequency of the low range equalizer.

Low Q

Specify the width of the band centered on the low range equalizer center frequency in which the gain adjustment will occur. As this setting is raised, the width of the band affected will become narrower.

Low Type

Select the type of low range equalizer.
Shlv:　Shelving type
Peak:　Peaking type

LoMid Gain (Low middle gain)

Specify the gain (amount of boost/cut) for the low middle range equalizer.

LoMid Freq (Low middle frequency)

Specify the center frequency of the low middle range equalizer.

LoMid Q (Low middle Q)

Specify the width of the band centered on the low middle range equalizer center frequency in which the gain adjustment will occur. As this setting is raised, the width of the band affected will become narrower.

HiMid Gain (High middle gain)

Specify the gain (amount of boost/cut) for the high middle range equalizer.

HiMid Freq (High middle frequency)

Specify the center frequency of the high middle range equalizer.

HiMid Q (High middle Q)

Specify the width of the band centered on the high middle range equalizer center frequency in which the gain adjustment will occur. As this setting is raised, the width of the band affected will become narrower.

High Gain

Specify the gain (amount of boost/cut) for the high range equalizer.

High Freq (High frequency)

Specify the center frequency of the high range equalizer.

High Q

Specify the width of the band centered on the high range equalizer center frequency in which the gain adjustment will occur. As this setting is raised, the width of the band affected will become narrower.

High Type

Select the type of high range equalizer.
Shlv:　Shelving type
Peak:　Peaking type

InputG (Input gain)

Adjust the overall volume level of the sound before it enters the equalizer.

Level (Output level)

Adjust the overall volume level of the sound that has passed through the equalizer.

GEQA/GEQB
(Graphic Equalizer)

This simulates a 10-band graphic equalizer. It can be used either as two monaural units or as one stereo unit.

Sw (Switch)

Turn the equalizer on/off.

31.2–16k (Gain)

Adjust the gain (amount of boost/cut) of the equalizer for each frequency.

InputG (Input gain)

Adjust the overall volume level of the sound before it passes through the equalizer.

Level (Output level)

Adjust the volume level of the sound which as passed through the equalizer.

HC (Hum canceller)

This removes unwanted hum (electrical "buzz" or "drone").

Sw (Switch)

Turn the hum canceller on/off.

Freq (Frequency)

Hum will be removed at the specified frequency and at multiples of that frequency. Set it to match the frequency of your power supply.

Width

Specify the width of the filter which will remove the hum.

Depth

Specify the depth of the filter which will remove the hum.

Thresh (Threshold)

Adjust the level at which the hum canceller will begin to take effect. If the signal falls below the specified level, only the hum will be removed from the signal. With the maximum setting, hum will always be removed regardless of the level of the signal.

RangeLo (Range low)

Specify the lower limit of the frequency range in which the hum canceler will operate. With a setting of Unlimit, the limit will be the lowest frequency that the VS-1680 is capable of playing back.

RangeHi (Range high)

Specify the upper limit of the frequency range in which the hum canceller will operate. With a setting of Unlimit, the limit will be the highest frequency that the VS-1680 is capable of Playing back.

VC (Vocal Canceller)

When a stereo source is being input from CD or DAT etc., this cancels the sound which is located in the stereo center, such as the vocal or bass.

Sw (Switch)

Turn the vocal canceller on/off.

Balance

If the sound that you wish to cancel is not located in the center, find the point at which it is most effectively canceled.

RangeLo (Range low)

Specify the lower limit of the frequency range from which you wish to cancel a sound. Use this setting when you wish to decrease the volume of the vocal without affecting a low-frequency instrument (such as bass) located in the center. With a setting of Unlimit, the lowest frequency which the VS-1680 is capable of Playing back will be the lower limit.

RangeHi (Range high)

Specify the upper limit of the frequency range from which you wish to cancel a sound. Use this setting when you wish to decrease the volume of the vocal without affecting a high-frequency instrument located in the center. With a setting of Unlimit, the highest frequency which the VS-1680 is capable of Playing back will be the upper limit.

VT (Voice Transformer)

This independently controls the basic pitch and the formants, allowing a variety of voice characters to be created.

Sw (Switch)

Turn the voice transformer on/off.

Robot

Turn the robot function on/off. When this is on, the audio will be output at a fixed pitch regardless of the pitch that is input, producing a voice character without inflection.

Cromatic Pitch

Adjust the pitch of the voice character in semitone steps. This can be adjusted over a range of 1 octave down to three octaves up.

Fine Pitch

Make fine adjustments to the pitch of the voice character.

Cromatic Formant

Adjust the formant of the voice character in semitone steps.

Fine Formant

Make fine adjustments to the formant of the voice character.

MixBal (Mix balance)

Adjust the balance between the voice character volume and the normal voice volume.

FE (Fader Edit)

This switch allows you to use the channel faders of the top panel to modify the various settings of the Voice Transformer.

Sw (Switch)

Turn the Feder Edit on/off. If this is on, channel faders will control the following settings.

Channel 1: EFX1:Robot (Moving the fader above the middle will turn this on, and downroad will turn it off.)

Channel 2: EFX1:C.Pitch+F.Pitch (Cromatic Pitch and Fine Pitch will change simultaneously to smoothly change the pitch.)

Channel 3: EFX1:C.Formant+F.Formant (Cromatic Formant and Fine Formant will change simultaneously to smoothly change the pitch.)

Channel 4: EFX1:MixBal

Channel 5: EFX1:EfxLev

Channel 8: EFX3:Robot (Moving the fader above the middle will turn this on, and downroad will turn it off.)

Channel 9/10: EFX3:C.Pitch+F.Pitch (Cromatic Pitch and Fine Pitch will change simultaneously to smoothly change the pitch.)

Channel 11/12: EFX3:C.Formant+F.Formant (Cromatic Formant and Fine Formant will change simultaneously to smoothly change the pitch.)

Channel 13/14: EFX3:MixBal

Channel 15/16: EFX3:EfxLev

* *Fader Edit is valid only when you are in Effect Edit condition. In other conditions, the faders will control the volume level of each channel as usual. Also, it will fail to operate in Auto Mix (Owner's Manual p. 156).*

MIDI (MIDI control)

* *The MIDI channels on which the pitch and formant are adjusted are fixed respectively as below. They cannot be changed to other channels.*

Sw (Switch)

Turn MIDI control on/off. When this is on, MIDI note on messages and pitch bend messages will adjust the pitch and formant. This is effective when a MIDI keyboard etc. is connected.

MIDI channel 1: EFX1:C.Pitch+F.Pitch (C2–C6, original key is C3)

MIDI channel 2: EFX1:C.Formant+F.Formant (C2–C4, original key is C3)

MIDI channel 3: EFX3:C.Pitch+F.Pitch (C2–C6, original key is C3)

MIDI channel 4: EFX3:C.Formant+F.Formant (C2–C4, original key is C3)

PitchBend (Pitch bend)

Specify the maximum change produced by pitch bend (bend range), in semitone steps.

Portament (Portamento)

Specify the speed at which the portamento effect will change.

Vocoder 2

This is a 19 band vocoder. A clear sound that was not possible with conventional vocoders can be obtained. Input an instrumental sound into the left channel, and a voice into the right channel.

Envelope (Envelope)

Sharp: The human voice will be emphasized.

Soft: The instrumental sound will be emphasized.

Long: A vintage sound with long decay will be produced.

PanMode

Select Mono, Stereo, L→R or R→L. With a setting of Mono, the components of each frequency band will be located in the center. With a setting of Stereo, the odd-numbered frequency bands will be located at the left, and the even-numbered components at the right. With a setting of L→R, the low frequency bands will be located increasingly toward the left, and the high frequency bands will be located increasingly toward the right. With a setting of R→L, the low frequency bands

will be located increasingly toward the right, and the high frequency bands will be located increasingly toward the left.

Hold

This turns the Hold function on/off. When MIDI is selected, the MIDI control change message Hold will be received. The MIDI channel is fixed at 1. If you turn Hold on while a voice is being input into the mic, the instrument will sound with the vocal formats that are fixed at that time.

MicSens (Mic sensitivity)

Adjust the input sensitivity of the mic.

SynInLev (Synthesizer in level)

Adjust the input level of the instrument.

Character Ch1–19 (Voice character)

Adjust the volume of each frequency band. This setting adjusts the tone of the vocoder. As the value is increased, the frequency will rise.

Mic (Mic mix)

Adjust the amount of the mic audio (R channel input) which has passed through the mic HPF that will be added to the output of the vocoder.

MicHPF (Mic HPF)

When mic mix is used, this adjusts the frequency at which the high pass filter (HPF) will begin to affect the mic audio. Higher values for this setting will allow you to mix only the consonants. With a setting of Thru, the HPF will not be applied.

MicPan (Mic pan)

Adjust the panning of the mic audio.

NSThresh
(Noise suppressor threshold)

Adjust the level at which the noise suppressor applied to the instrumental input (R channel input) will begin to function.

CnvA/CnvB (Mic Converter)

This converts the characteristics of an inexpensive general purpose mic into the characteristics of an expensive studio mic (Microphone → Microphone conversion). For an already-recorded sound, it can create the same tonal change as if the type or distance of the mic had been changed.

This adds a feeling of "air" to an instrumental sound that was recorded by direct line input, causing it to sound as though it had been recorded with a microphone (Line → Microphone conversion).

Sw (Switch)

Turn the mic converter on/off.

Input

Select the type of mic that was actually used to record.
DR-20: Roland DR-20
Sml.Dy: Small Dynamic Microphone
Hed.Dy: Head-worn Dynamic Microphone
Min.Cn: Miniature Condenser Microphone
Flat: Line Input

Out

Specify the mic that will be simulated.
Sml.Dy: General purpose dynamic mic for instruments or vocals. Ideal for guitar amp or snare drum.
Voc.Dy: A popular dynamic mic for vocals. Characterized by a tight mid-range. Use for vocals.
Lrg.Dy: Dynamic mic with extended low end. Use for bass drum or tom, etc.
Sml.Cn: Small condenser mic for instruments. Characterized by a sparkling high range. Use for metallic percussion or acoustic guitar.
Lrg.Cn: Condenser mic with flat response. Use for vocals, narration, or acoustic instruments etc.
Vnt.Cn: Vintage condenser mic. Use for vocals or acoustic instruments etc.
Flat: Mic with flat frequency response. For cancelling the characteristics of the mic used for recording.

* *When you select a condenser-type mic simulator, the low range response is strengthened. This may cause noise transmitted from the mic stand to be emphasized. In this case, either use a bass cut filter to cut the unwanted low range, or equip the mic stand that you use at the time of recording with an isolation mount (a mic holder that uses rubber etc. to absorb vibration).*

Phase

Normally you will set this to Normal.
In cases such as when mics are placed both in front of and behind the instrument for recording, setting one of them to Invert will produce a solid sound with a unified phase.
Nor: Same phase as the input
Inv: Opposite phase as the input

BCutA/BCutB (Bass cut filter)

This is a filter that cuts unwanted low range noise, such as pops. It simulates the bass cut switch that is found on some mics.

Sw (Switch)

Turn the bass cut on/off.

Freq (Frequency)

Normally you will select Thru, and you can adjust the frequency if the attack contains a section of low volume.

DstnA/DstnB (Distance)

Microphones have a characteristic which causes the low frequency range to be boosted when the sound source is nearby. This setting simulates this phenomenon.

Sw (Switch)

Turn Distance on/off.

Prox.Fx (Proximity effects)

Adjust the low frequency response that is affected by the mic distance from the sound source. Adjustment in the [+] direction will move the mic closer to the sound source, and in the [-] direction will move it away from the sound source.

Time

This simulates the time difference due to distance from the sound source.

Iso (3-Band Isolator)

The input sound is separated into three frequency ranges — high, mid, and low — each of which can be boost or cut. With ordinary equalizers, even when the gain control for any of the frequency ranges turned all the way down, some sound from that range remains, whereas the VS-1680's Isolator cuts it completely. You may find turning the Isolator on and off or adjusting the level in real time to be a very effective technique.

Sw (Switch)

This turns the 3-band Isolator on and off.

AntiPhase LoMixSw (Anti-Phase Low Mix Switch)
AntiPhase MidMixSw (Anti-Phase Middle Mix Switch)

These turn the low- and mid-range Anti-Phase function on and off. When turned on, the phases of opposite stereo channels are reversed and then added.

AntiPhase LoLev (Anti-Phase Low Level)
AntiPhase MidLev (Anti-Phase Middle Level)

These set the level of the Anti-Phase function. Adjusting these levels for certain frequencies allows you to lend emphasis to specific parts.

LowLvl (Low Level)
MidLvl (Middle Level)
HiLvl (High Level)

These boost and cut each of the Low, Mid, and High frequency ranges. Setting any of these to "-60 dB," the sounds in that range become inaudible. When set to "0 dB," the sound remains at the input level.

Echo (Tape Echo 201)

Sw (Switch)

This turns the Tape Echo on and off.

Mode (Mode Selector)

This is used to select the different delay times (short, middle, and long) combination of three playback heads. When set to "4," you can select short and middle delays.

Repeat Rate

This adjusts the "tape's" running speed. The higher the value, the shorter the interval of the repeated sound.

Intnsty (Intensity)

This sets the number of times the sound is repeated.

Tone Bass

This adjusts the volume of the low end of the Tape Echo sound.

Tone Treble

This adjusts the volume of the Tape Echo sound's high end.

Pan HeadS
Pan HeadM
Pan HeadL

These adjust the pan settings for each of the short, middle, and long delay playback heads individually. This function is not featured on Roland's RE-201.

WahFlutter Rate (Wah/Flutter Rate)

This adjusts the wavering of the pitch that occurs with deterioration or unevenness in the tape. The higher the value, the more intense the wavering effect.

EfxLvl (Effect Level)

This adjusts the volume level of the Tape Echo effect.

DirLvl (Direct Level)

This adjusts the volume level of the direct sound.

AnFl (Analog Flanger)

This is a stereo analog flanger effect that simulates Roland's SBF-325.

Sw (Switch)

This turns the analog flanger on and off.

Feedback

Feedback refers to returning the delayed signal (output) back to the delay . This control adjusts the amount of that signal that is returned. The flanger effect intensifies the higher the value is set. Setting the value too high can make lead to oscillation in the sound.

Modulation Freq
(Modulation Frequency)

This adjusts the center frequency to which the flanger effect is applied. This changes the pitch of the flanger effect's metallic sound.

Modulation Rate

This adjusts the flanger's modulation rate.

Modulation Depth

This adjusts the depth of the flanger modulation.

ChB (Channel B Modulation)

You should usually set this to "Nor." Setting this to "Inv" inverts the Channel B flanger effect.

Mode

This is used to select the flanger effect type.
FL1: A general monaural flanger
FL2: A stereo flanger that moves the sound around in the stereo field
FL3: Cross mix flanger that gives a more intense effect
CHO: Chorus effect

Phase ChA (Phase Channel A)
Phase ChB (Phase Channel B)

This is used in selecting phase when mixing the direct sound and flanger sound. Set to "Nor" for normal phase; select "Inv" to invert the phase. This changes the breadth of the sound, making sound "wider." Check the sound to assure you have the appropriate setting.

AnPh (Analog Phaser)

The VS-1680's features two analog phasers arranged in parallel, so they can be used in stereo.

Sw (Switch)

This turns the Analog Phaser on and off.

Mode

This selects the number of levels (4 or 8) for the phase effect.

Freq (Frequency)

This adjusts the center frequency to which the phase effect is applied. With larger values, the phase effect is applied to higher-frequency ranges.

Reso (Resonance)

This adjusts the amount of resonance. Raising the value makes the characteristic sound more prominent. Raising the value too much, though, may cause oscillation in the sound.

LFO1 Rate
LFO2 Rate

This adjusts the phase effect cycle length.

LFO1 Depth
LFO2 Depth

This adjusts the depth of the phase effect cycle.

LFO1 ChB
(LFO1 Channel B Modulation)
LFO2 ChB
(LFO2 Channel B Modulation)

You should usually set this to "Nor." Setting this to
"Inv" inverts the Channel B phase effect.

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