Roland®

24 TR / 24-bit / 96 kHz
DIGITAL STUDIO WORKSTATION

VS-2480 Version 2.0
VS-2480CD

Appendices

Before using this unit, carefully read the sections entitled: “IMPORTANT SAFETY INSTRUCTIONS” (Owner’s Manual p. 2), “USING THE UNIT SAFELY” (Owner’s Manual p. 3), and “IMPORTANT NOTES” (Owner’s Manual p. 4). These sections provide important 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, User Guide, Owner’s Manual, and Appendices should be read in its entirety. These manuals should be saved and kept on hand as a convenient reference.

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Contents

About MIDI 3
About SCSI 4
Troubleshooting 5
Error Messages 9
Glossary 12
Shortcut Key Operations 16
Parameter List 18
Preset Patch List 27
Algorithm List 33
MIDI Implementation 88
Track Sheet 95
SPECIFICATIONS 98
Index 100

About MIDI

This section explains the basic concepts of MIDI, and how the VS-2480/2480CD 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-2480/2480CD, MIDI OUT and MIDI THRU are handled by a single connector, which can be switched to act as the desired connector.

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

MIDI OUT: This transmits MIDI messages from the VS-2480/2480CD.

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-2480/2480CD 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-2480/2480CD, these messages are used when you use a MIDI sound source to play the metronome sound.

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-2480/2480CD, these messages can be transmitted to external MIDI devices by V.Fader function.

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-2480/2480CD, they can be used to control VS-2480/2480CD mixer parameter, when it receives 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-2480 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.

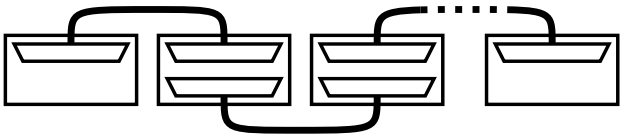
Disk drives are precision devices. If they are connected or used incorrectly, not only may they fail to operate correctly, but the data on the disk can be lost or, in the worst case, the disk drive itself may be damaged. Please be sure to read the manual for your disk drive.

NOTE

A disk drive being used for the first time with the VS-2480 must be formatted by the VS-2480. When a disk drive is formatted, 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-2480. 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-2480 | Disk Drive1 (Zip Drive, etc) | Disk Drive2 (Zip Drive, etc) | Disk Drive7 (CD-RW Drive, etc)

- The VS-2480 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-2480 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.

?

Active Terminator (p. 12), Terminator Power (p. 15)

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-2480 will not be able to correctly recognize the disk drives.

With the factory settings, the VS-2480 is set to SCSI ID number 7. Set the disk drives you are connected to ID numbers other than 7.

Troubleshooting

When the VS-2480/2480CD 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-2480/2480CD 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.
- Each Levels of the VS-2480/2480CD is turned down.

  Channel fader

  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.
- Short phrases less than 0.5 seconds cannot be played back.
- The volume level of the instrument connected to the VS-2480 is too low.

  → Could you be using a connection cable that contains a resistor? Use a connection cable that does not contain a resistor.
- I can't record or play back, even when I press **[PLAY]**.

  → Does the he PLAY indicator just blink green? When the EXT SYNC indicator is on, the VS-2480 is receiving MTC receive standby messages from the external MIDI device. Operate the external MIDI device or press **[STOP]**.

  → When "POWER OFF/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-2480/2480CD.

A specific channels does not sound

- The input mixer or the track mixer has not selected correctly.
- The volume level of the channel is turned down.
- The track status is off (the STATUS indicator is off).
- The Solo or Mute function is being used.
- The project with a recording mode of "M16" or "CDR" is selected.

  → When "M16" is selected, the VS-2480/2480CD will function as a 16 track recorder. When "CDR" is selected, the VS-2480/2480CD will function as a eight-pair stereo recorder (channel link is on: track 1/2, 3/4–). Track 17–24 cannot be used.

  For details refer to the "Main feature: Disk Recorder Section"(Owner's Manual).

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 project has an insufficient number of events.
- The number of tracks which can be simultaneously recorded will decrease.

  → Depending on the organization of the song data or the disk drive performance etc., the number of tracks which can be simultaneously recorded or played back may be limited.

  → When the recording mode is "M16" or "CDR," up to 16 tracks can be recorded simultaneously.

  → when set the Sample Rate to more than "64 kHz" or set the Vari Pitch to "On," the number of tracks which can be simultaneously recorded may be limited.

  For details refer to the "Main feature: Disk Recorder Section"(Owner's Manual).

Cannot record digitally

- The CD player's digital connection is not accepted.
- The **MASTER CLOCK** is set to "INT".
- The DIGITAL IN connector (optical / coaxial / R-BUS) was not properly selected.
- The sampling rate of the recording destination project 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 project. If it is not possible to change the sample rate of the digital audio device, create a new project 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-2480 / 2480CD 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 SENS 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 channel number of the peak indicator does not reverse. Readjust the equalizer.
- "ATT" (Attenuator) setting is incorrect.
  → 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 icon is appeared in the display).
- The time compression / expansion function is being used.

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".
- The "Partition" settings are not right.
  → We recommend setting the partition size to "10GB."
- Although the Region Erase operation is finished, the available recording time does not increased.
  → The audio data is erased by Region Cut, RegionErase or Phrase Delete etc., the data that is no longer played back is not actually erased from the hard disk. If you wish to increase the available recording time, please read "If "Disk Full!" appears in the display (Project Optimize)" .

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-RW drives, etc.).
- The Zip drive has not been initialized.
- No Zip disk is inserted in the drive.
  → When switching Zip disks, be sure to select the newly inserted disk as the current drive.
- A project backup Zip disk is inserted.
  → Project copies and project backup copies have different disk formats. Take precautions such as sticking labels on disks saved as project backup data disks to distinguish the from other disks.
- The VS-2480 / 2480CD project data saved on Zip disks cannot use the computer's internal Zip drive.
  → The VS-2480 / 2480CD project data format is particular to the VS-2480 / 2480CD. The data cannot be handled by other devices.
- Initialization is cancelled, with error messages such as "Medium Error!," "Unusable Sector!," "Operation Failed!" or other messages appearing in the display.
  → 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-2480 / 2480CD (e.g., your computer) to see if the drive can initialize disks, read files, and perform other operations normally.

Internal Effects

Effects cannot be used

- The VS8F-2 has not been installed correctly.
- Only one VS8F-2 has been installed (when EFFECT 3–8 cannot be used).
- You are attempting to select the algorithm for Reverb, Gated Reverb, Vocoder2 (19), Voice Transformer or Mastering Tool Kit with FX2, FX4, FX6 or FX8.
- You are already attempting to select the algorithm for Vocoder 2 (19), Voice Transformer or Mastering Tool Kit with FX1, FX3, FX5 or FX7.
- 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. 33).

CD-RW Drive Problems

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

- The finalized process was not carried out. When making audio CDs, set "FINALIZE" to "On" or "OnlyFin.".
- Audio CD's created using a CD-RW disc cannot be played on a conventional CD player. Please use a CD-R disc.

The CD-R drive is not being recognized

- The CD-RW drive is not connected correctly.
- The same device ID number is assigned to two or more SCSI devices (Zip drives , CD-RW drives, etc.).
- No CD-R/RW disc is inserted in the drive.
- A CD-RW drive that is not designated by Roland.

Cannot write to CD-R discs

- The project's sample rate is set to something other than 44.1 kHz.
- No IDE hard disk is installed.
- The internal IDE hard disk does not have sufficient free disk space.
- 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 Problems

With the VS-2480/2480CD as master, the MIDI sequencer does not respond to commands

- The MIDI cable is not connected correctly.
- The MIDI cable is broken.
- The MIDI OUT/THRU switch is not set to "Out".
- "MIDI OUT SYNC Gen." (the MIDI out sync generator) is not set to the appropriate synchronization method (MTC, MIDI Clock, Sync Track).
- The EXT indicator is blinking ("SYNC MODE" 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-2480 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-2480 cannot be run in slave mode using a method other than MTC.
- The EXT indicator is off ("SYNC MODE" 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 VS-2480/2480CD is not in playback standby mode (with the PLAY indicator blinking).
- MTC reception is in poor condition.
  → Setting the **ERROR LEVEL** to "5" or higher may improve conditions.

With a video device as the master, the VS-2480/2480CD does not respond

- The cable connected to the L-connector, the SYSTEM E connector or the MIDI cable is not properly connected.
- The MIDI cable is broken.
- The EXT indicator is off ("SYNC MODE" is set to "INT").
- "MMC MODE" (MMC mode) is not set to "SLAVE."
- The MTC frame rate of the video device differs from that of the SI-80SP (Roland Video MIDI Sync Interface), or the video and the VS-2480/2480CD are not set to the same type of MTC.
- MTC reception is in poor condition.
  → Setting the **ERROR LEVEL** to "5" or higher may improve conditions.

Other problems

Data on the disk drive was not saved properly

- The VS-2480/2480CD'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.
  → Remake partition the disk drive (and also execute physical formatting). Also, we recommend that you execute Surface Scan as well.

Error Messages

Aborted Command!

Illegal Request!

This disk drive cannot be used by the VS-2480/2480CD.

Already Selected

This disk drive you've chosen is already the selected drive.

Arbitration Failed!

Busy Status!

Check Condition!

Drive Status Error!

No Drive Found.

The disk drive could not be accessed. Make sure that the disk drive is connected correctly.

Blank Disc

The CD in your drive is blank. Insert a CD or CD-R/RW that contains recorded material.

Can't Communicate!

Drive Time-out!

Message Error!

Phase Mismatch!

Undefined Sense!

Unknown Drive Error!

There is a problem with your disk drive connection. Make sure the disk drive is connected correctly.

Cannot write in "Track at Once" format on CD-RW Disc!

You have tried to write the audio data in "Track at Once" format with a CD-RW disc in the drive.

Can't record CD!

Digital recording from a CD player is not enabled. Please read "CD Digital Parameter" and "Changing the Routing (EZ Routing Condition)" (Owner's Manual).

Can't Recover Project!

The drive check Recover procedure could not be executed because there was not enough free space on the disk. Delete unneeded projects or use the Project Optimize procedure.

Can't Set Marker!

Track number markers must be at least four seconds apart.

Change to Internal Clock?

No digital signal is being received by the DIGITAL IN connector. Switch the sample rate reference clock to the VS-2480/2480CD's internal clock by pressing **[ENTER/YES]**. After checking to make sure that all digital devices are properly connected and that the sample rates for all of the devices match, try this operation again.

COAXIAL In Lock

OPTICAL In Lock

R-BUS1 Lock

R-BUS2 Lock

WORD CLOCK In Lock

The sample rate reference clock is set by the digital signal received at the DIGITAL IN connector as shown above. You can now record the digital signal.

COAXIAL In Unlock

OPTICAL In Unlock

R-BUS1 Unlock

R-BUS2 Unlock

WORD CLOCK In Unlock

You cannot yet record the incoming digital audio because it is not being received by the DIGITAL IN connector as shown above, or because the project sample rate and the sample rate of the digital device connected to the DIGITAL IN are different.

Done!

The operation was a success.

Disk Memory Full!

There is insufficient free space on the disk. Erase unneeded data or select a different disk drive. The current disk partition already contains 200 projects, the maximum number of projects it can hold. Delete unneeded projects or select a different disk drive.

Drive Busy!

If this message appears when you first begin using a disk drive with the VS-2480/2480CD, the disk drive is not fast enough. You may still be able to use this disk with projects that have a lower sample rate or use a different recording mode.

If this message appears after you have been using a disk drive with the VS-2480/2480CD, the data on the disk drive has become fragmented. This will unacceptably slow down the reading and writing of data. Try bouncing the current track to re-record its data onto another track, or optimize your project. If this message still appears after these measures have been taken, copy the project data to another disk drive and initialize the disk drive that experienced the problem.

Event Memory Full!

The project already contains all of the events it can hold.

Delete unneeded automix data or perform a Project Optimize operation.

Finalized CD!

The CD is a commercial CD or a CD-R/RW disc you have already finalized. Replace the disc with a blank disc or one that has not yet been finalized.

Found Illegal Track Pair!

You are trying to Region Edit or Phase Edit (Copy, Move, or Exchange etc.) between a V-Track recorded using CDRRecMode and a V-Track recorded using some other recording mode. Use V-Tracks that were recorded using the same recording mode.

Operation Failed!

Processing was halted due to insufficient memory or due to an error that occurred in the disk drive itself. Check your connections and verify the reliability of your hard drive.

Hardware Error!

There is a problem with the disk drive. Contact the disk drive's manufacturer or dealer.

Illegal Track!

You are trying to create a new phrase using a V-Track recorded in CDRRecMode and a V-Track recorded using some other recording mode. Please use V-Tracks that were recorded using the same recording mode.

Lack of CD-R Memory!

There is not enough room on the CD-R/RW disc.

Not Enough Free Events!

You have tried to undo or redo when the remaining number of free project events is less than 200. This operation cannot be performed.

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 project already contains 1000 markers, the maximum number it can hold. Delete unneeded markers.

Medium Error!

There is a problem with the disk drive media. This disk cannot be used by the VS-2480/2480CD. In some cases, data can be recovered using the Drive Check operation.

No CD-R Drive!

Either no Roland CD recorder (CD-R/RW drive) is connected, or its power is not turned on.

No Data to Write

The project you have selected contains no data.

No Disc!

There is no disc in the Roland CD recorder (CD-R/RW drive). Please insert a disc.

No Disk Drive!

No disk drive is connected or an internal hard disk has not been installed. Make sure that your disk drive is properly connected.

No IDE Drive!

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

Not 44.1kHz Project!

The project's sample rate is not 44.1 kHz. Only 44.1 kHz audio can be written to a CD-R/RW disc.

Unusable Sector!

The disk that you are using is not 512 bytes/sector. This disk cannot be used by the VS-2480/2480CD.

Drive Not Ready!

The disk drive is not yet ready. Please wait a moment.

Obey Copyrights?

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 Roland CD recorder (CD-R/RW drive) loading tray is still open, there is no CD-R/RW disc in the drive, or the drive is otherwise not yet ready.

Please Wait...

The operation has not yet completed. Please wait a moment.

SCSI ID Error!

Two or more disk drives are set to the same SCSI ID number. Reset the hard drives so that each as its own SCSI ID number.

SCSI Not Available!

The SCSI components of the VS-2480/2480CD are not working. Contact your dealer or qualified Roland service personnel for service.

Project Protected!

Since Project Protect is on, the operation cannot be executed.

TOC Read Error!

An error occurred while reading the CD-R/RW disc. There is a problem with the Roland CD recorder (CD-R/RW drive) or the CD-R/RW disc.

Too Many Markers!

The CD already has 98 markers, the maximum number of markers it can hold.

Drive Unformatted!

The disk drive has not yet been initialized by the VS-2480/2480CD. Initialize the disk drive.

If the disk drive has already been initialized by the VS-2480/2480CD, there is a problem with its connections. Make sure that the disk drive is properly connected.

Operation Canceled!

You have aborted the procedure by pressing **[EXIT/NO]**.

Write Another CD?

The CD-writing operation is complete. If you want to write the same data to a new disc, press **[ENTER/YES]**. Otherwise, press **[EXIT/NO]**.

Write Protected!

The disk drive is write-protected.

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.

Analyzer

A device that divides the frequency spectrum into narrow bands, and displays a level meter for each function band to analyze the frequency distribution.

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.

Compressor

An effect that suppresses volume fluctuations. When the input signal exceeds a specified level (threshold), the gain is reduced as the input signal rises, thus suppressing signal overload. The same algorithm can also be used as a limiter (an effect that instantaneously suppresses peaks).

Of the effects in this system, only the compressor included in guitar multis 1–3 simulates a compact compressor for guitar, and works differently from a limiter. (It suppresses signal overloads, and also evens out the volume by raising low-level signals.)

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 Project

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

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.

Dynamics (effect)

Effects that compressor expand the range of volume changes. These effects are used to reduce noise when recording to tape, or to increase the dynamic range of a tape or wireless mic. Dynamics effects provided on this system include Enhancer, Expander, Compressor, and Limiter.

DSP

An abbreviation for **Digital Signal Processing**. Technology that uses dedicated circuitry or software calculations to process digitized audio or video signals in order to implement the functionality of a mixer, filter, or effect processor. By extension, DSP is also used to collectively refer to effect devices and effect functionality that uses such technology.

Expander

An effect that increases (by a fixed ratio) the difference in loud and soft volume levels, by making low-level signals softer, and high-level signals louder.

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.

GUITAR (Hi-Z)

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

GPI

GPI stands for **General Purpose Interface**. This is a control jack provided on professional and consumer video devices such as video editors and title superimpoters. By connecting this control jack to the foot switch jack of the VS-2480/2480CD and setting the Foot Switch Assign to “GPI,” the connected device will be able to playback/stop the VS-2480/2480CD.

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-2480/2480CD are IDE compatible.

Limiter

An effect that works similarly to a compressor. When the input signal rises beyond a specified level (threshold), a limiter instantly lowers the gain to limit the output level. The degree of compression is specified by the Ratio. In general, ratios of 1:10 or less are referred to as compression, in distinction to limiting.

MMC

MMC is an acronym for **MIDI Machine Control**. This is rule that defines how MIDI system exclusive message can be used to control multiple recording devices from a single device. The VS-2480/2480CD supports MMC. In addition to song playback, stop and fast-forward, 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.

Oscillator

A device that generates an alternating signal. On this system, the term refers to the internal oscillator used to sound a reference tone for measurement by the spectrum analyzer. It is able to produce a 20 Hz–20 kHz sine wave, pink noise and white noise.

- Analyzer
- Sine wave
- Pink noise
- White noise

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.

Pink noise

Noise that contains equal amounts of energy in each octave of the frequency spectrum. On this system, the internal oscillator can be used to generate pink noise in the audio bandwidth.

- → Oscillator
- → Analyzer

PS/2 Keyboard, PS/2 Mouse

This keyboard and mouse can be connected to the connectors furnished on PS/2 computers developed by IBM in the United States. The VS-2480/2480CD allows you to use a PS/2 keyboard, input names, and perform operations using the PS/2 mouse.

R-BUS

Roland's digital communication specification developed to allow audio and control data to be exchanged between devices. Multi-channel audio signals, word clock, and MIDI-compatible operation data and synchronization signals can be exchanged. A single R-BUS connector allows simultaneous bi-directional transfer of eight channels of digital audio data. The connector is a DB-25 type, and uses a special cable for connections. It should NOT be connected to other types of ports that use similar connectors!

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 Space**. 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-2480/2480CD 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-2480/2480CD has a SCSI connector, external SCSI devices such as hard disks or removable disk drive etc. can be connected.

SECAM Formats/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.

Sine wave

A sinuosity waveform. This is the simplest waveform, and contains only a specific frequency without no other frequency components. On this system, the internal oscillator can generate a sine wave at any desired frequency in the range of 20 Hz–20 kHz.

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.

VGA

Although developed by IBM in America as a graphics system with a resolution of 640 x 480 pixels able to display sixteen colors, various companies have further developed VGA-compatible modes, enabling high-resolution multi color displays. Today, rather than designating a particular graphics system, VGA has instead come to mean a standard of high-resolution graphics. The VS-2480 / 2480CD is equipped with a VGA output connector, allowing you to connect a VGA monitor and display the information with a resolution of 640 x 480 pixels in 256 colors.

White noise

Noise that contains equal energy at all frequencies. On this system, the internal oscillator can be used to generate white noise in the audio bandwidth. Perceptually, and when observed on a spectrum analyzer, the level will appear to rise as you move toward the higher range.

- → Analyzer
- → Oscillator

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 or 250 MB of data.

Shortcut 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.

CH EDIT/SELECT/PHRASE SEQ STATUS/AUTOMIX STATUS buttons

Hold [STATUS]:	To the select source to be recorded on the track (Quick louting) screen
[SHIFT] + [CH EDIT]:	Channel View screen
[SHIFT] + [SOLO (IN1-16)]:	Solo mode on / off
[CLEAR] + [SOLO (IN1-16)]:	Solo function off (all channel)
[SHIFT] + [MUTE (IN 17-24 AUX MST)]:	Mute mode on / off
[CLEAR] + [MUTE (IN 17-24 AUX MST)]:	Mute function on / off (each channel)
[TRACK STATUS] + [CLEAR]:	All track assign is canceled.
[AUTOMIX] + [AUTOMIX STATUS] (*1):	Switch the Automix status of each channel (when Automix is "on")
[SHIFT] + [MASTER EDIT (TR1-16)]:	To the Master block setting screen
[SHIFT] + [V.FADER] (TR17-24):	To the V.Fader Mode

(*1) INPUT1-16, INPUT17-24, AUX1-8 MST, TRACK1-16, TRACK17-24, FX1-8 RTN

Transport Control buttons

[SHIFT] + [STORE (ZERO)]:	Store current song data to the disk drive
[SHIFT] + [SHUT/EJECT (STOP)]:	Shut down
[SHIFT] + [RESTART (PLAY)]:	Restart (after shut down)
[REC] + [TRACK STATUS] (1–24):	Switch the status to REC (REC indicator blinks red)
[STOP] + [TRACK STATUS] (1–24):	Switch the status to PLAY (PLAY indicator lights green)

LOCATOR/MARKER/SCENE buttons

[LOCATOR (BANK)] → [CLEAR] + [0]—[9]:	Clear the setting of locators
[SHIFT] + [BANK (LOCATOR)] → [0]—[9]:	Switch the locator bank
[SCENE (BANK)] → [CLEAR] + [0]—[9]:	Clear the setting of scenes
[SHIFT] + [BANK (SCENE)] → [0]—[9]	Switch the scene bank
[CLEAR] + [TAP]:	Erase a marker
[SHIFT] + [CLEAR] + [TAP] → [ENTER/YES]:	Erase all markers
[AUTOMIX] + [SNAPSHOT (TAP)]:	Execute the snapshot (When Automix is "on")
[AUTOMIX] + [REC]:	Automix Realtime recording (when Automix is "on.")
[CLEAR] + [IN]:	Clear the track edit in point
[CLEAR] + [OUT]:	Clear the track edit out point
[CLEAR] + [FROM]:	Clear the track edit from point
[CLEAR] + [TO]:	Clear the track edit to point
[SHIFT] + [IN]:	Locate to the in point
[SHIFT] + [OUT]:	Locate to the out point
[SHIFT] + [FROM]:	Locate to the from point
[SHIFT] + [TO]:	Locate to the to point
[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 "PHRASE"). Move to the previous marker (when PREVIOUS / NEXT Sw is "MARKER")
[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 "PHRASE"). Move to the next marker (when PREVIOUS / NEXT Sw is "MARKER")
[CD-RW MASTERING] + [TAP]:	Register a marker for audio CD track number

■ Other

[SHIFT] + [MASTERING (CD-RW)]:	To Mastering Room setting screen
[SHIFT] + [DISPLAY (HOME)]:	Switch the Graphic display (Home Condition)
[SHIFT] + [REDO (UNDO)]:	Redo function (when the UNDO indicator is lit)
[SHIFT] + [TAP]:	To the Tempo map setting screen
[SHIFT] + [PROJECT TOP (PREVIEW TO)]:	Moves to the beginning sound is recorded of the project.
[SHIFT] + [PROJECT END (PREVIEW FROM)]:	Moves to the ending sound is recorded of the project.
[SHIFT] + [EXT SYNC]:	To the Sync parameter settings screen
[SHIFT] + [LOOP]:	To the loop start / end point setting screen
[SHIFT] + [AUTO PUNCH]:	To the punch in / out point setting page
[SHIFT] + [▲] [▼]:	Change of the simultaneous appear track number of the playlist.
[SHIFT] + [◄] [►]:	Change of the time axis display width of the playlist.
[SHIFT] + TIME/VALUE dial:	Modify the value at 10 times the usual speed. When adjusting the channel level and AUX Send level, value is changed per 0.1 dB. 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.
[SHIFT] + [MARKER]:	To the Marker setting screen
[SHIFT] + [EZ ROUTING]:	To the Patch Bay screen
[SHIFT] + [AUTOMIX]:	To the Automix screen
[SHIFT] + [CH EDIT]:	Adjust the each channel faders to set the “0 dB,” and the PAN knobs to set the “Center.”
[PHRASE PAD PLAY]:	Switch the Phrase Sequence PLAY / REC (when Phrase Sequence mode).
[SHIFT] + [PHRASE SEQ (PHRASE PAD PLAY)]:	Phrase Sequence Mode Off / On
[SHIFT] + [PHRASE/REGION/AUTOMIX]:	Edit Message parameter (Global Parameter) Off / On

■ Mouse Operation

[SHIFT] + Dropping:	Copy the data.

■ ASCII Keyboard

[SPACE]:	PLAY / STOP the project performance.

Parameter List

■ Input Mixer [IN 1-16] (or [IN 17-24 AUX MST]) → [CH EDIT] (IN 1–16, 17–24)]

Parameter name	Display	Value, Initial value
Patchbay	-	ANALOG INPUT 1–16, R-BUS1 1–8, R-BUS2 1–8, COAXIAL, OPTICAL (*1)
Channel Link	Link	**Off**, On
Attenuator	ATT	-42.0–**0.0**–+6.0 dB
Phase	Phase	**NRM**, INV
Fader Group	Group	**Off**, 1–16
Fader Link	F.LINK	**Off**, On
Level Meter	-	**Pre,** Pst
Solo	Solo	**Off**, On
Mute	Mute	**Off**, On
Offset Level	-	-∞–**0.0**–+6.0 dB (*2)
Fader	Fader	**-**∞–+6.0 dB
Mix Send Switch	MIX	Off, **On**
Offset Pan	PAN	L63–**C**–R63 (*3)
Mix Send Pan	PAN	L63–**0**–R63
Dynamics Switch	DYN Sw	**Off**, On
Dynamics Type	DYN Type	**COMPRESSOR**, EXPANDER, EXP+COMP (*4)
Compressor Auto Gain Switch	AutoGain	Off, **On** (*5) (*6)
Compressor Key In	KeyIn	IN1–24 (Initial value is the current channel)(*5)
Compressor Threshold Level	Threshold	**-24.0**–0.0 dB (*5) (*6)
Compressor Ratio	Ratio	1.00:1–**2.00:1**–∞:1 (*5) (*6)
Compressor Attack	Attack	0.0–**10.0**–800.0ms (*5) (*6)
Compressor Release	Release	0–**500**–8000 ms (*5) (*6)
Compressor Level	Level	-24.0–**0.0**–+24.0 dB (*5) (*6) (*7)
Expander Key In	KeyIn	IN1–24 (Initial value is the current channel)(*8)
Expander Threshold Level	Threshold	-80.0–**-40.0**–0.0 dB (*6) (*8)
Expander Ratio	Ratio	1.00:1–**2.00:1**–∞:1 (*6) (*8)
Expander Attack	Attack	**0.0**–800.0ms (*6) (*8)
Expander Release	Release	0–**500**–8000 ms (*6) (*8)
Equalizer Switch	EQ Sw	Off, **On**
Filter Switch	Filter Sw	**Off,** LPF, HPF, BPF, BEF (*9)
Filter Frequency	Filter F	20Hz–**2.00 kHz**–20.0 kHz (*9) (*10)
Filter Q	Filter Q	0.36–**0.71**–16.0 (*9) (*10)
Equalizer Low Gain	EQ Low G	-15.0–**0.0**–15.0 dB (*9)
Equalizer Low Frequency	EQ Low F	20 Hz–**80 Hz**–1.0 kHz (*9)
Equalizer Low Mid Gain	EQ Lo-Mid G	-15.0–**0.0**–15.0 dB (*9)
Equalizer Low Mid Frequency	EQ Lo-Mid F	20 Hz–**400 Hz**–20.0 dB (*9)
Equalizer Low Mid Q	EQ Lo-Mid Q	0.36–**2.00**–16.0 (*9)
Equalizer High Mid Gain	EQ Hi-Mid G	-15.0–**0.0**–15.0 dB (*9)
Equalizer High Mid Frequency	EQ Hi-Mid F	20 Hz–**2.00 kHz**–20.0 kHz (*9)
Equalizer High Mid Q	EQ Hi-Mid Q	0.36–**2.00**–16.0 (*9)
Equalizer High Gain	EQ High G	-15.0–**0.0**–15.0 dB (*9)
Equalizer High Frequency	EQ High F	1.0 kHz–**10.0 kHz**–20.0 kHz (*9)
AUX Send Switch	AUX (1–8)	Off, Pre / **Pst** (*11)
AUX Send Level	-	**-**∞–+6.0 (*12)
AUX Send Pan	-	L63–**C**–R63 (*13)
Direct Path Switch	DIR (1–8)	1, ..., 8 (INPUT MIXER CH 1), Off, On
Effect Insert Switch	FX1–8	**Off**, Ins, InsL, InsR, InsS (*14)
Effect Insert Send Level	Snd	-∞–**0.0**–+6.0 dB (*15)
Effect Insert Return Level	Rtn	-∞–**0.0**–+6.0 dB (*15)
Surround Pan	SURROUND PAN	L63–**C**–R63 (*16)
Surround Depth	SURROUND DEPTH	F63–**C**–R63 (*16)
Surround LR:C Rate	SURROUND LR:C	0–**50**–100 % (*16) (*17)
Surround Sub Woofer Level	SURROUND Sub.W	-∞–**0.0**–+6.0 dB (*16) (*18)

*1 Patchbay works in pairs. Odd-numbered channel can select an odd-numbered input or Lch, and even-numbered channel can select an even-numbered input or Rch.
Selectable area of the patchbay varies by the select settings of R-BUS2 COAXIAL and R-BUS2 OPTICAL in the Project parameters.
*2 Valid when Channel Link is “On.”
*3 If Channel Link is On, the “Pan” parameter will change to the offset pan parameter.
*4 When the dynamics type is "EXP+COMP," dynamics on the track mixer cannot be used.
*5 Valid when Dynamics Type is “COMPRESSOR.”

*6 Valid when Dynamics Type is “CEXP+COMP.”
*7 Max +6.0dB when compressor auto gain switch is "On."
*8 Valid when Dynamics Type is “EXPANDER.”
*9 Valid when Equalizer Switch is “On.”
*10 Valid when Filter Switch is except “Off.”
*11 Pre / Pst is switched at the same time by each bus in MASTER EDIT.
*12 Valid when AUX Switch is except “Off.”
*13 Valid when AUX Bus Link is “On.”
*14 “Off” or “Ins” are valid when Channel Link is “On.”
*15 Valid when Effect Insert Switch is except “Off.”
*16 Valid when Surround Mix Switch is “On.”
*17 Valid when Surround Mix Mode is except “2+2.”
*18 Valid when Surround Mix Mode is “3+2+1.”

■ Track Mixer [TR 1-16] (or [TR 17-24 FX RTN] → [CH EDIT] (TR 1–16, 17–24)

Parameter name	Display	Value, Initial value
V-track	V.Track	**1**–16
Phrase Pad Switch	PhrPAD	**Off**, On
Play Mode	PlyMod	**Gate**, Trg, oneS
Channel Link	Link	**Off**, On
Attenuator	ATT	-42.0–**0.0**–+6.0 dB
Phrase	Phase	**NRM**, INV
Fader Group	Group	**Off**, 1–8
Level Meter	Meter	**Pre,** Pst
Solo	Solo	**Off**, On
Mute	Mute	**Off**, On
Offset Level	-	-∞–**0.0**–+6.0 (*1)
Fader	Fader	-∞–**0.0**–+6.0 dB
Mix Send Switch	MIX	**Off**, On
Offset Pan	Pan	L63–**C**–R63 (*2)
Mix Send Pan	Pan	L63–**C**–R63
Dynamics Switch	DYN Sw	**Off**, On
Dynamics Type	DYN Type	**COMPRESSOR**, EXPANDER, EXP+COMP (*3)
Compressor Auto Gain Switch	AutoGain	Off, **On** (*4) (*5)
Compressor Key In	KeyIn	TR1–24 (Initial value is the current channel)(*4)
Compressor Threshold Level	Threshold	**-24.0**–0.0 dB (*4) (*5)
Compressor Ratio	Ratio	1.00:1–**2.00:1**–∞:1 (*4) (*5)
Compressor Attack	Attack	0.0–**10.0**–800.0ms (*4) (*5)
Compressor Release	Release	0–**500**–8000 ms (*4) (*5)
Compressor Level	Level	-24.0–**0.0**–+24.0 dB (*4) (*5) (*6)
Expander Key In	KeyIn	TR1–24 (Initial value is the current channel)(*7)
Expander Threshold Level	Threshold	-80.0–**-40.0**–0.0 dB (*5) (*7)
Expander Ratio	Ratio	1.00:1–**2.00:1**–∞:1 (*5) (*7)
Expander Attack	Attack	**0.0**–800.0ms (*5) (*7)
Expander Release	Release	0–**500**–8000 ms (*5) (*7)
Equalizer Switch	EQ Sw	Off, **On**
Filter Switch	Filter Sw	**Off,** LPF, HPF, BPF, BEF (*8)
Filter Frequency	Filter F	20Hz–2**.00 kHz**–20.0 kHz (*8) (*9)
Filter Q	Filter Q	0.36–**0.71**–16.0 (*8) (*9)
Equalizer Low Gain	EQ Low G	-15.0–**0.0**–15.0 dB (*8)
Equalizer Low Frequency	EQ Low F	20 Hz–**80 Hz**–1.0 kHz (*8)
Equalizer Low Mid Gain	EQ Lo-Mid G	-15.0–**0.0**–15.0 dB (*8)
Equalizer Low Mid Frequency	EQ Lo-Mid F	20 Hz–**400 Hz**–20.0 dB (*8)
Equalizer Low Mid Q	EQ Lo-Mid Q	0.36–**2.00**–16.0 (*8)
Equalizer High Mid Gain	EQ Hi-Mid G	-15.0–**0.0**–15.0 dB (*8)
Equalizer High Mid Frequency	EQ Hi-Mid F	20 Hz–**2.00 kHz**–20.0 kHz (*8)
Equalizer High Mid Q	EQ Hi-Mid Q	0.36–**2.00**–16.0 (*8)
Equalizer High Gain	EQ High G	-15.0–**0.0**–15.0 dB (*8)
Equalizer High Frequency	EQ High F	1.0 kHz–**10.0 kHz**–20.0 kHz (*8)
AUX Send Switch	AUX (1–8)	Off, Pre / **Pst** (*10)
AUX Send Level	-	**-**∞–+6.0 (*11)
AUX Send Pan	-	L63–**0**–R63 (*12)
Direct Path Switch	DIR (1–8)	**Off**, On
Effect Insert Switch	FX (1–8)	**Off**, Ins, InsL, InsR, InsS (*13)

Effect Insert Send Level	Snd	-∞–**0.0**–6.0 dB (*14)
Effect Insert Return Level	Rtn	-∞–**0.0**–6.0 dB (*14)
Surround Pan	SURROUND PAN	L63–**C**–R63 (*15)
Surround Depth	SURROUND DEPTH	F63–**C**–R63 (*15)
Surround LR:C Rate	SURROUND LR:C	0–**50**–100 % (*15) (*16)
Surround Sub Woofer Level	SURROUND Sub.W	-∞–**0.0**–+6.0 dB (*15) (*17)

*1 Valid when Channel Link is “On.”
*2 If Channel Link is On, the “Pan” parameter will change to the offset pan parameter.
*3 When the dynamics type is "EXP+COMP," dynamics on the track mixer cannot be used.
*4 Valid when Dynamics Type is “COMPRESSOR.”
*5 Valid when Dynamics Type is “CEXP+COMP.”
*6 Max +6.0dB when compressor auto gain switch is "On."
*7 Valid when Dynamics Type is “EXPANDER.”
*8 Valid when Equalizer Switch is “On.”
*9 Valid when Filter Switch is except “Off.”
*10 Pre / Pst is switched at the same time by each bus in MASTER EDIT.
*11 Valid when AUX Switch is except “Off.”
*12 Valid when AUX Bus Link is “On.”
*13 “Off” or “Ins” are valid “Off” or “Ins” when Channel Link is “On.”
*14 Valid when Effect Insert Switch is except “Off.”
*15 Valid when Surround Mix Switch is “On.”
*16 Valid when Surround Mix Mode is except “2+2.”
*17 Valid when Surround Mix Mode is “3+2+1.”

■ Effect Return [TR 17-24 FX RTN] → [CH EDIT] (FX 1–8 RTN)

Parameter name	Display	Value, Initial value
Assign	ASSIGN	**AUX1**–AUX8, DIR1–DIR8
Fader Group	GROUP	**Off**, On
Mono Switch	MONOSw	**Off**, On
Level Meter	-	**Pre**, Post
Solo	Solo	**Off**, On
Mute	Solo	**Off**, On
Effect Return Level	FADER	-∞–**0.0**–+6.0 dB
Effect Return Balance	BAL	L63–**C**–R63
Mix Send Switch	MIX	**Off**, On
AUX Send Switch	AUX (1–8)	Off, **On**
AUX Send Level	-	**-**∞–+6.0 dB
AUX Send Pan	-	L63–**C**–R63
Direct Path	DIR (1–8)	**Off**, On
Surround Pan	SURROND PAN	L63–**C**–R63 (*1)
Surround Depth	SURROND DEPTH	F63–**C**–R63 (*1)
Surround LR:C Rate	SURROUND LR:C	0–**50**–100 % (*1) (*2)
Surround Sub Woofer Level	SURROUND Sub.W	-∞–**0.0**–+6.0 dB (*1) (*3)

*1 Valid when Surround Mix Switch is “Off.”
*2 Valid when Surround Mix Mode is except “2+2.”
*3 Valid when Surround Mix Mode is “3+2+1.”

■ Master Block [MASTER EDIT (TR 1-16)]

Parameter name	Display	Value, Initial value
Master Level	MST	-∞–**0.0**–6.0 dB
Master Balance	-	L63–**C**–R63
Monitor Level	MON	-∞–6.0 dB
Monitor Balance	-	L63–**C**–R63
AUX Master Position	AUX (1–8)	Pre, **Pst**
AUX Master Level	AUX (1–8)	-∞–**0.0**–6.0 dB
AUX Bus Link	LINK	**Off,** On
AUX Master Balance	AUX	L63–**C**–R63 (*1)
DIR Master Position	DIR (1–8)	Pre, **Pst**
DIR Master Level	DIR (1–8)	-∞–**0.0**–6.0 dB
DIR Master Balance	DIR (1–8)	L63–**C**–R63 (*2)
Rec Bus Attenuator	REC ATT	-42–**6.0**–0.0 dB
Monitor Source	MONITOR	**MASTER**, REC BUS, AUX1, ..., AUX8, DIR1, ..., DIR8
AUX A	AUX A L/R	MASTER, MONITOR, **AUX1/2**, ..., AUX7/8, DIR1/2, ..., DIR7/8
AUX B	AUX B L/R	MASTER, MONITOR, AUX1/2, **AUX3/4**, ..., AUX7/8, DIR1/2, ..., DIR7/8
ANALOG MULTI OUTPUT	A.MULTI (1/2–7/8)	TR1/2, ..., TR23/24, MONITOR (*3), MASTER, MONITOR, AUX1/2, AUX3/4, L/R, Ls/Rs, DIR1/2, ..., DIR7/8 (*4), MASTER, MONITOR, AUX1/2, AUX3/4, L/R, C/RC, DIR1/2, ..., DIR7/8 (*5), MASTER, MONITOR, AUX1/2, L/R, C/Sub.W, Ls/Rs, DIR1/2, ..., DIR7/8 (*6)
R-BUS1 1/2	R-BUS1 1/2	MASTER, MONITOR, **AUX1/2**, ..., AUX7/8, DIR1/2, ..., DIR7/8
R-BUS1 3/4	R-BUS1 3/4	MASTER, MONITOR, AUX1/2, **AUX3/4**, ..., AUX7/8, DIR1/2, ..., DIR7/8
R-BUS1 5/6	R-BUS1 5/6	MASTER, MONITOR, AUX1/2, ..., **AUX5/6**, AUX7/8, DIR1/2, ..., DIR7/8
R-BUS1 7/8	R-BUS1 7/8	MASTER, MONITOR, AUX1/2, ..., **AUX7/8**, DIR1/2, ..., DIR7/8
R-BUS2 1/2	R-BUS2 1/2	MASTER, MONITOR, AUX1/2, ..., AUX7/8, **DIR1/2**, ..., DIR7/8
R-BUS2 3/4	R-BUS2 3/4	MASTER, MONITOR, AUX1/2, ..., AUX7/8, DIR1/2, **DIR3/4**, ..., DIR7/8
R-BUS2 5/6	R-BUS2 5/6	MASTER, MONITOR, AUX1/2, ..., AUX7/8, DIR1/2, ..., **DIR5/6**, DIR7/8
R-BUS2 7/8	R-BUS2 7/8	MASTER, MONITOR, AUX1/2, ..., AUX7/8, DIR1/2, ..., **DIR7/8**
COAXIAL L/R	COAXIAL L/R	**MASTER**, MONITOR, AUX1/2, ..., AUX7/8, DIR1/2, ..., DIR7/8
OPTICAL L/R	OPTICAL L/R	**MASTER**, MONITOR, AUX1/2, ..., AUX7/8, DIR1/2, ..., DIR7/8
PHONES1 L/R	PHONES1 L/R	MASTER, **MONITOR**, AUX1/2, ..., AUX7/8, DIR1/2, ..., DIR7/8
PHONES2 L/R	PHONES2 L/R	MASTER, **MONITOR**, AUX1/2, ..., AUX7/8, DIR1/2, ..., DIR7/8
Effect Insert Switch (1–8)	FX (1–8)	**Off**, Ins
Effect Insert Send Level	Snd	-∞–**0.0**–6.0 dB (*7)
Effect Insert Return Level	Rtn	-∞–**0.0**–6.0 dB (*7)
Track Direct Out	TRACK DIRECT OUT	**Off**, On
Track Direct Source	TRACK DIRECT SOURCE	PostFader, **PreFader**

*1 Valid when AUX Bus Link is “On.”
*2 Valid when DIR is selected by the linked channel or FX RTN channel
*3 Valid when Track Direct Out is “On.”
*4 Valid when Surround Mix Switch is “On,” and Surround Mix Mode is “2+2.”
*5 Valid when Surround Mix Switch is “On,” and Surround Mix Mode is “3+1.”
*6 Valid when Surround Mix Switch is “On,” and Surround Mix Mode is “3+2+1.”
*7 Valid when Effect Insert Switch is “3+2+1.”

Parameter List

■ System Parameter [UTILITY] → [(Page1) F1 (SYSTEM)]

Parameter name	Display	Value, Initial value
Analog Input Phantom Switch	ANALOG INPUT	**Off**, On
External Level Meter Display Section	DISPLAY SECTION	**Off**, ANALOG INPUT 1-16, R-BUS / COAX / OPT IN, AUX1-8 / DIR1-8, ANALOG OUTPUT, R-BUS / COAX / OPT OUT
Meter Position	METER POSITION	**Pre**, Post
MB-24 Time Display	TIME DISPLAY	MEASURE / BEAT, **TIME CODE**, CLOCK / SCENE
MB-24 Meter Scale	METER SCALE	**X1**, X1 / 2
IDE Drive	IDE DRIVE	**Off**, On
SCSI Self ID	SCSI SELF ID	0–**7**
VGA Out	VGA OUT	Off, **On**
Refresh Rate	REFRESH RATE	**60 Hz**, 66Hz, 70Hz, 75Hz
Holizontal Position	H.POSITION	-5–0–+5
Vertical Position	V.POSITION	When "REFRESH RATE" is 60 Hz: -47–**0**–+47 When "REFRESH RATE" is 66 Hz: -15–**0**–+16 When "REFRESH RATE" is 70 Hz: -37–**0**–+37 When "REFRESH RATE" is 75 Hz: -11–**0**–+11
Operation Target	OPERATION TARGET	**LCD**, VGA
PS / 2 Mouse	PS / 2 MOUSE	Off, **On**
Pointer Speed	POINTER SPEED	1, 2, **3**, 4, 5
PS / 2 Keyboard	PS / 2 KEYBOARD	**Off**, On
Mouse Button Swap Switch	MOUSE BUTTON SWAP Sw.	**Off**, On
Keyboard Type	KEYBOARD TYPE	**101/104**, 106 / 109

■ Global Parameter [UTILITY] → [(Page1) F2 (GLOBAL)]

Parameter name	Display	Value, Initial value
Input Peak Level	INPUT PEAK LEVEL	0 dB, -3 dB, **-6 dB**
Foot Switch Assign	FOOT SWITCH ASSIGN	**Play/Stop**, Record, TapMarker, Next, Previous, GPI
CD Digital Recording	CD DIGITAL REC	**Off**, On
Shift Lock	SHIFT LOCK	**Off**, On, Once
Switching Time	SWITCHING TIME	0.3–**0.5**–2.0 sec
Knob / Fader Assign Switch	KNOB / FDR ASSIGN Sw	**Knob**, Fader
Previous / Next Switch	PREVIOUS / NEXT Sw	**PHRASE**, MARKER
Locator / Scene Type	LOCATOR / SCENE TYPE	Safe, **Quick**
Numerics Type	NUMERICS TYPE	**Up**, Down
Return to Locate Switch	RETURN TO LOCATE Sw	Off, **On**
Edit Point Switch Type	EDIT POINT Sw TYPE	**OVERWRITE**, Same as LOCATOR
Undo Message	UNDO MESSAGE	Off, **On**
Edit Message	EDIT MESSAGE	Off, **On**
Pan Knob Auto Display	PAN KNOB AUTO Disp	**Off**, CH VIEW
Parameter Knob Auto Display	PRM KNOB AUTO Disp	Off, **CH VIEW**
AUX Knob Auto Display	AUX KNOB AUTO Disp	**Off**, CH VIEW
Date / Remain Switch	DATE / REMAIN Sw	**Date**, Remain
Remaining Display Type	REMAIN DISP TYPE	**Time**, CapaMB, Capa %, Event

■ Project Parameter [UTILITY] → [(Page1) F3 (Proj)]

Parameter name	Display	Value, Initial value
Master Clock	MASTER CLOCK	**INT**, R-BUS1, R-BUS2, COAXIAL IN, OPTICAL IN, WORD CLOCK, EXT TIME CODE (Sync=MIDI IN, R-BUS1, R-BUS2, SMPTE IN)
Dither	DITHER	**Off**, 24bit, 23bit, ... , 8bit
Digital Copy Protect	DIGITAL COPY PROTECT	**Off**, On
R-BUS2 COAXIAL Select	R-BUS2 COAXIAL Sel	R-BUS2-1 / 2, 5 / 6, **COAX, R-BUS2-1/2**, COAX, R-BUS2-5 / 6,
R-BUS2 OPTICAL Select	R-BUS2 OPTICAL Sel	R-BUS2-3 / 4, 7 / 8, **OPTI, R-BUS2-3/4**, OPTI R-BUS2-7 / 8,
Display Offset Time	DISPLAY OFFSET TIME	**00:00:00:00.00**–23:59:59:29.99 (*)
Time Display Format	TIME DISPLAY FORMAT	**ABS**, REL
Peak Hold Switch	PEAK HOLD Sw	**Off**, On

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

■ Play/Recording Parameter [UTILITY] → [(Page1) F4 (PlyRec)]

Parameter name	Display	Value, Initial value
Record Monitor	RECORD MONITOR	**Auto**, Source
Marker Stop	MARKER STOP	**Off**, On
Fade Curve	FADE CURVE	**Linear**, Exp
Fade Length	FADE LENGTH	2, **10**, 20, 30, 40, 50 ms
Vari Pitch Switch	VARI PITCH Sw	**Off**, On
Vari Pitch	Vari Pitch	16.00 kHz–**96.00 kHz**–98.00 kHz (fs=96.0 kHz)
		16.00 kHz–**88.20 kHz**–98.00 kHz (fs=88.2 kHz)
		16.00 kHz–**64.00 kHz**–98.00 kHz (fs=64.0 kHz)
		16.00 kHz–**48.00 kHz**–50.00 kHz (fs=48.0 kHz)
		16.00 kHz–**44.10 kHz**–50.00 kHz (fs=44.1 kHz)
		16.00 kHz–**32.00 kHz**–50.00 kHz (fs=32.0 kHz)
Solo / Mute Switch Type	SOLO / MUTE Sw TYPE	**All Bus Send**, MIX BUS Send
Scrub Length	SCRUB LENGHT	25–**70**–100 ms
Preview To Length	PREVIEW TO LENGHT	**1.0**–10.0 sec
Preview From Length	PREVIEW FROM LENGHT	**1.0**–10.0 s

■ MIDI Parameter [UTILITY] → [(Page1) F5 (MIDI)]

Parameter name	Display	Value, Initial value
MIDI through Switch	MIDI OUT / THRU	**Out**, Thru
Device ID	DEVICE ID	1–**17**–32
MMC Mode	MMC MODE	Off, **MASTER**, SLAVE
MMC source	MMC SOURCE	**MIDI,** R-BUS1, R-BUS2

■ Sync Parameter [UTILITY] → [(Page1) F6 (SYNC)]

Parameter name	Display	Value, Initial value
Sync Mode	SYNC MODE	**INT**, EXT
Sync with Gap	SYNC with Gap	**Off**, On
External Sync Source	EXT SYNC SOURCE	**MIDI IN**, R-BUS1, R-BUS2, SMPTE IN
Sync Offset Time	SYNC OFFSET TIME	**00:00:00:00.00**–23:59:59:29.99(*)
Frame Rate	FRAME RATE	**30**, 29N, 29D, 25, 24
Error Level	ERROR LEVEL	0–**5**–10
MIDI OUT Sync Generator	MIDI OUT SYNC Gen.	**Off**, MTC, MIDIclk, SyncTr
R-BUS1 OUT Sync Generator	R-BUS1 SYNC Gen.	**Off**, MTC
R-BUS2 OUT Sync Generator	R-BUS2 SYNC Gen.	**Off**, MTC

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

■ Tempo Map [UTILITY] → [(Page2) F1 (TEMPO)]

Parameter name	Display	Value, Initial value
Tempo Map Number	MAP #	**1**–50
Beat	BEAT	1 / 1–16 / 1, 1 / 2–16 / 2, 1 / 4–**4/4**–16 / 4, 1 / 8–16 / 8, 1 / 16–16 / 16
Tempo	♩ =	25.0–**120.0**–250.0
Measure	MEASURE	**1**–999

■ Metronome Parameter [UTILITY] → [(Page2) F2 (Metro)]

Parameter name	Display	Value, Initial value
Metronome Out	METRONOME OUT	**Off**, INT, MIDI
Internal Level	INT LEVEL	-∞–**0.0**–6.0 dB (*1)
Metronome Mode	METRONOME MODE	**Rec Only**, Rec & Play (*2)
Tone Type	TONE TYPE	**CLICK1**, CLICK2, CLICK2(NOTE), DRUM (*3)
Metronome MIDI Channel	METRONOME MIDI Ch	1–**10**–16 (*4)
Accent Note	ACCENT NOTE	C_0–**C#2**–G_9 (*4)
Accent Velocity	ACCENT VELOCITY	1–**100**–127 (*4)
Normal Note	NORMAL NOTE	C_0–**C#2**–G_9 (*4)
Normal Velocity	NORMAL VELOCITY	1–**60–**127 (*4)

*1 Valid when Metronome Out is “INT.”
*2 Valid when Metronome Out is except “Off.”
*3 When the tone type is "CLICK (NOTE)," notes in accordance with the accent note and normal note are output.
*4 Valid when Metronome Out is “MIDI.”

■ Metronome Drum Pattern Edit [UTILITY] → [(Page2) F2 (Metro)] → [F1 (PtnEdt)]

Parameter name	Display	Value, Initial value
Percussion	PERCUSSION	Hand Clap, Cowbel, Maracas
Percussion Switch	-	Off, On
Percussion Verocity	VELO	1–**100**–127
High Hat Switch	H.H.	○(Off), ●(**Close**), ○(Open)
High Hat Verocity	VELO	1–**100**–127
Snare Drum Switch	S.D.	Off, On (Initial value: odd-numbered beats are On. even-numbered beats are Off.)
Snare Drum Verocity	VELO	1–**100**–127
Bass Drum Switch	B.D.	Off, On (Initial value: odd-numbered beats are Off. even-numbered beats are On.)
Bass Drum Verocity	VELO	1–**100**–127

■ Auto Punch/Loop [UTILITY] → [(Page2) F3 (A.P/LP)]

Parameter name	Display	Value, Initial value
Auto Punch In Point	IN	**Unregistration**, 00:00:00:00.00–23:59:59:29.99 (*)
Auto Punch Out Point	OUT	**Unregistration**, 00:00:00:00.00–23:59:59:29.99 (*)
Loop Start Point	START	**Unregistration**, 00:00:00:00.00–23:59:59:29.99 (*)
Loop End Point	END	**Unregistration**, 00:00:00:00.00–23:59:59:29.99 (*)

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

■ V.Fader [UTILITY] → [(Page2) F6 (V.FDR)]

Parameter name	Display	Value, Initial value
Knob/Fader Assign	KNOB/FDR ASSIGN USER	ATT, PHASE, GROUP, Ch LINK, Fader LINK, LEVEL, **PAN**, SOLO, MUTE, AUX1–8 Send Sw, AUX1–8 Send Lev, AUX1/2–7/8 SendPAN, InsFX1–8 Sw, InsFX1–8 SndLev, InsFX1–8 RrnLev, Surnd PAN, Surnd DEPTH, Surnd LR:C, Surnd SubWLev, Dyn Sw, Dyn Type, Cmp KeyIn, Cmp Thresh, Cmp RATIO, Cmp ATTACK, Cmp RELEASE, Cmp LEVEL, Cmp AUTOGAIN, Exp KeyIn, Exp Thresh, Exp RATIO, Exp ATTACK, Exp RELEASE, EQ Sw, EQ Low Gain, EQ Low Freq, EQ LoMid Gain, EQ LoMid Freq, EQ LoMid Q, EQ HiMid Gain, EQ HiMid Freq, EQ HiMid Q, EQ High Gain, EQ High Freq, EQ Fltr TYPE,EQ Fltr Freq, EQ Fltr Q
Knob1–16	FADER1–16	cc# 0–**cc# 7**–cc# 119
Knob1–16	KNOB1–16	cc# 0–**cc# 10**–cc# 119

■ Scene [UTILITY] → [(Page3) F1 (SCENE)]

Parameter name	Display	Value, Initial value
Scene Active Channel	INPUT MIXER (1–24)	**Valid**, Ignore
	TRACK MIXER (1–24)	**Valid**, Ignore
	FX RETURN (1–8)	**Valid**, Ignore
	AUX MASTER (1–8)	**Valid**, Ignore
	DIR (1–8)	**Valid**, Ignore
	EFFECT (1–8)	**Valid**, Ignore
	MST (MST)	**Valid**, Ignore

■ Automix [UTILITY] → [(Page3) F2 (A.MIX)]

Parameter name	Display	Value, Initial value
Writing Parameter	WRITING PARAMETER	LEVEL, PAN / Bal, EQ, MUTE, Aux Send, InsFX Lev, SURROUND(initial value is all On)
After Punch Out	AFTER PUNCH OUT	Return, **Keep**
Return Time	RETURN TIME	**0**, 100, 200, 300, 400, 500, 600, 700, 800, 900, 1000 ms
Master Block	MST	MST(Initial value is all MANUAL)
Input Mixer	INPUT MIXER(1–24)	**MANUAL**, WRITE, READ
Track Mixer	TRACK MIXER(1–24)	**MANUAL**, WRITE, READ
Effect Return Mixer	FX RETURN(1–8)	**MANUAL**, WRITE, READ
AUX Master	AUX MASTER(1–8)	**MANUAL**, WRITE, READ
Direct Path	DIR(1–8)	**MANUAL**, WRITE, READ
Effect Switch	FX(1–8)	**MANUAL**, WRITE, READ

■ Surround [UTILITY] → [(Page3) F3 (Surrnd)]

Parameter name	Display	Value, Initial value
Surround Mix Switch	SURROUND MIX Sw	**Off**, On
Surround Mix Mode	SURROUND MIX MODE	**2+2**, 3+1, 3+2+1

■ Oscillator/Analyzer [UTILITY] → [(Page3) F4 (OscAna)]

Oscillator

Parameter name	Display	Value, Initial value
Switch	Sw	**Off,** On
Source	SOURCE	**PINK Noise**, WhiteNoise, Sin Wave, METRONOME (*1)
Attenuator	ATT	-42.0–**-12**–+0 dB (*2)
Fader	Fader	-∞–**0.0**–6.0 dB
Mix Send Pan	PAN	L63–**C**–R63
Mix Send Switch	MIX	**Off**, On
AUX Send Switch	AUX (1–8)	Off, **On**
AUX Send Level	-	**-**∞–6.0 dB
Direct Path	DIR (1–8)	**Off**, On

*1 Metronome is not output to monitor when “METRONOME” is selected.
*2 Valid when Source is except “METRONOME.”

Analyzer

Parameter name	Display	Value, Initial value
Source	SOURCE	**IN1**–IN24, TR1–TR24, FX1–8 RTN L, FX1–8 RTN R, Gen / OSC, MST L, MST R, MON L, MON R, AUX1–8, DIR1–8
Average Times	AVERAGE TIMES	**1**–128
Average Type	AVERAGE TYPE	Off, **NRM**, EXP
Use Effect Board	Use EFFECT Board	**Off**, A, B, C, D

■ Parameter Initialize [UTILITY] → [(Page3) F6 (PrmIni)]

Parameter name	Display	Value, Initial value
Initialize Section	INITIALIZE SECTION	**MIXER & UTILITY**, MIXER, UTILITY

■ Project New [PROJECT] → [(Page1) F2 (NEW)]

Parameter name	Display	Value, Initial value
Project Name	NAME	InitProj 000 (*)
Copy Utility Parameter	Copy Utility Prm	**Off**, On
Copy Mixer / Scene Parameter	Copy Mixer / Scene Prm	**Off**, On
Sample Rate	Sample Rate	96k, 88.2k, 64k, 48k, **44.1k**, 32k
Recording Mode	Recording Mode	M24, **MTP**, CDR, M16, MT1, MT2, LIV, LV2

* A new number which is not designated to the projects which are already stored is allocated to 000.

■ Project Protect [PROJECT] → [(Page1) F4 (PROTEC)]

Parameter name	Display	Value, Initial value
Project Protect	-	**Off**, On

■ Format Drive [PROJECT] → [(Page4) F2 (FmtDrv)]

Parameter name	Display	Value, Initial value
Partition Size	Partition Size	500 MB, 1 GB (1000 MB), 2 GB (2000 MB), **10GB**
Physical Format	Physical Format	**Off(Quick)**, On
Surface Scan	SurfaceScan	**Off**, On

■ Clear Partition [PROJECT] → [(Page4) F3 (ClrPrt)]

Parameter name	Display	Value, Initial value
Surface Scan	SurfaceScan	**Off**, On

Preset Patch List

On the VS-2480 / 2480CD, you can access the range of effects listed below.

Loop: 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.

* The Patches using algorithm shown below cannot be selected on the EFFECT 2, 4, 6 and 8.
  Reverb / Gate Reverb / Vocoder2 (19) / Voice Transformer / Mastering Tool Kit
* The Patches cannot be selected on the EFFECT 2, 4, 6 and 8, when the Algorithm shown below is used on the EFFECT 1, 3, 5 and 7.
  Vocoder2 (19) / Voice Transformer / Mastering Tool Kit
* The Patches using algorithm shown below cannot be selected on the projects with 64kHz or higher sampling rate.
  Reverb / Gate Reverb / Vocoder2 (19) / Voice Transformer / Mic Modeling / Speaker Modeling / Mastering Tool Kit

■ Same as Algorithm (36 presets)

No.	Patch Name	Algorithm	Type	Input	Comment	
P000	Reverb	Reverb	Loop	Mono	(p. 34)	[3 Band EQ] → [Reverb]
P001	Reverb2	Reverb2	Loop	Mono	(p. 36)	[Reverb] → [Gate] → [3 Band EQ]
P002	Gate Reverb	Gate Reverb	Loop	Mono	(p. 38)	[Gate Reverb] → [3 Band EQ]
P003	Delay	Delay	Loop	Mono	(p. 40)	[Delay] → [3BAND EQ]
P004	StPS-Delay	Stereo Pitch Shifter Delay	Insert	Stereo	(p. 42)	[Pitch Shifter] → [Delay] → [3 Band EQ]
P005	Delay RSS	Delay RSS	Insert	Mono	(p. 44)	[3 Tap Delay] → [RSS]
P006	TapeEcho201	Tape Echo 201	Loop	Mono	(p. 45)	[Tape Echo 201]
P007	MultiTapDly	Multi Tap Delay	Insert	Mono	(p. 46)	[Multi Tap Delay] → [3 Band EQ]
P008	StDly-Chorus	Stereo Delay Chorus	Insert	Stereo	(p. 48)	[Delay] → [Chorus] → [3 Band EQ]
P009	Chorus RSS	Chorus RSS	Insert	Mono	(p. 50)	[Chorus] → [RSS]
P010	Space Chorus	Space Chorus	Insert	Stereo	(p. 51)	[Space Chorus]
P011	St Phaser	Stereo Phaser	Insert	Stereo	(p. 52)	[Phaser] → [3 Band EQ]
P012	AnalogPhaser	Analog Phaser	Insert	Stereo	(p. 54)	[Analog Phaser]
P013	St Flanger	Stereo Flanger	Insert	Stereo	(p. 55)	[Flanger] → [3 Band EQ]
P014	AnalogFlnger	Analog Flanger	Insert	Stereo	(p. 56)	[Analog Flanger]
P015	Rotary	Rotary	Insert	Mono	(p. 57)	[Noise Suppressor] → [Over Drive] → [Rotary Speaker]
P016	2ch RSS	2ch RSS	Insert	2ch	(p. 58)	[RSS 3D Panner]
P017	MicModeling	Mic Modeling	Insert	2ch	(p. 60)	[Mic Converter] → [Bass Cut] → [Distance] → [Limiter]
P018	GuitarMulti1	Guitar Multi 1	Insert	Mono	(p. 62)	[Compressor] → [Heavy Metal] → [Noise Suppressor] → [Auto Wah] → [GAmp Mdl] → [Flanger] → [Delay]
P019	GuitarMulti2	Guitar Multi 2	Insert	Mono	(p. 62)	[Compressor] → [Distortion] → [Noise Suppressor] → [Auto Wah] → [GAmp Mdl] → [Flanger] → [Delay]
P020	GuitarMulti3	Guitar Multi 3	Insert	Mono	(p. 62)	[Compressor] → [OverDrive] → [Noise Suppressor] → [Auto Wah] → [GAmp Mdl] → [Flanger] → [Delay]
P021	GuitarAmpMdl	Guitar Amp Modeling	Insert	Mono	(p. 64)	[Noise Suppressor] → [G-Amp] → [Speaker Modeling]
P022	Vocal Multi	Vocal Multi	Insert	Mono	(p. 66)	[Noise Suppressor] → [Limiter / De-esser] → [Enhancer] → [3 Band EQ] → [Pitch Shifter] → [Delay] → [Chorus]
P023	Voice Trans	Voice Transformer	Insert	Mono	(p. 68)	[Voice Transformer] → [Reverb]
P024	Vocal Cancel	Vocal Canceler	Insert	Stereo	(p. 69)	[Vocal Canceler] → [3 Band EQ]
P025	Vocoder	Vocoder	Insert	Mono	(p. 71)	[10 Band Vocoder] → [Chorus]
P026	Vocoder2 (19)	Vocoder2 (19)	Insert	Mono	(p. 72)	[19 Band Vocoder] → [Chorus]
P027	Lo-Fi Proces	Lo-Fi Processor	Insert	Stereo	(p. 74)	[Lo-Fi Processor] → [Realtime Modify Filter] → [Noise Supressor]
P028	3BndIsolator	3band Isolator	Insert	Stereo	(p. 75)	[3 Band Isolator]
P029	DualComp / Lim	Dual Compressor / Limiter	Insert	2ch	(p. 76)	[Compressor / Limiter] → [Noise Suppressor]
P030	ParametricEQ	Parametric Equalizer	Insert	2ch	(p. 78)	[4 Band EQ]
P031	Graphic EQ	Graphic Equalizer	Insert	2ch	(p. 79)	[10 Band EQ]
P032	Hum Canceler	Hum Canceler	Insert	Stereo	(p. 80)	[Hum Canceler] → [Noise Suppressor]
P033	Stereo Multi	Stereo Multi	Insert	Stereo	(p. 81)	[Noise Suppressor] → [Compressor / Limiter] → [Enhancer] → [3 Band EQ]
P034	Speaker Mdl	Speaker Modeling	Insert	Stereo	(p. 83)	[SP Modeling] → [Bass Cut Freq] → [Lo Freq Trim] → [Hi Freq Trim] → [Limiter]
P035	MastringTool	Mastering Tool Kit	insert	Stereo	(p. 85)	[4 Band EQ] → [Bass Cut] → [Enhancer] → [3 Band Expander] → [3 Band Compressor] → [Mixer] → [Limiter] → [Soft Clip]

Preset Patch List

■ Reverb (18 presets)

No.	Patch Name	Algorithm	Type	Input	Comment
P036	RV:LargeHall	Reverb	Loop	Mono	Large concert hall reverberation.
P037	RV:SmallHall	Reverb	Loop	Mono	Small hall reverberation.
P038	RV:Strings	Reverb	Loop	Mono	Reverberation optimized for delicate highs of strings.
P039	RV:PianoHall	Reverb	Loop	Mono	Rich and warm reverberation optimized for pianos.
P040	RV:Orch Room	Reverb	Loop	Mono	Reverberation of large-capacity rooms such as big banquet halls.
P041	RV:VocalRoom	Reverb	Loop	Mono	Room reverb suitable for vocals and chorus.
P042	RV:MediumRm	Reverb	Loop	Mono	Warm and naturally spacious room reverb.
P043	RV:LargeRoom	Reverb	Loop	Mono	Modeled acoustics of wide rooms with lots of reverberation.
P044	RV:CoolPlate	Reverb	Loop	Mono	Distinctive bright plate reverb.
P045	RV:Short Plt	Reverb	Loop	Mono	Shorter plate reverb.
P046	RV:Vocal Plt	Reverb	Loop	Mono	Crystal-clear reverb optimized for vocals.
P047	RV:Soft Amb.	Reverb	Loop	Mono	Modeled reverberation of a room with minimal wall reflections.
P048	RV:Room Amb.	Reverb	Loop	Mono	Natural reverberation of rooms with good acoustics, suitable for drums and guitars.
P049	RV:Cathedral	Reverb	Loop	Mono	Acoustics of a very large, high-ceilinged church.
P050	RV:Long Cave	Reverb	Loop	Mono	Modeled reverberation of deep caves.
P051	RV:GarageDr.	Reverb	Loop	Mono	Natural reverb that enhances unique drum sounds.
P052	RV:Rock Kick	Reverb	Loop	Mono	Reverb with many low-frequency components, suitable for rock kicks.
P053	RV:RockSnare	Reverb	Loop	Mono	Rich and thick sounding reverb suitable for rock snares.

■ Reverb2 (20 presets)

* "Reverb" and "Reverb2" use different algorithms with different sound characters.

No.	Patch Name	Algorithm	Type	Input	Comment
P054	R2:LargeHall	Reverb2	Loop	Mono	Large concert hall reverberation.
P055	R2:SmallHall	Reverb2	Loop	Mono	Small hall reverberation.
P056	R2:Strings	Reverb2	Loop	Mono	Reverberation optimized for delicate highs of strings.
P057	R2:PianoHall	Reverb2	Loop	Mono	Rich and warm reverberation optimized for pianos.
P058	R2:Orch Room	Reverb2	Loop	Mono	Reverberation of large-capacity rooms such as big banquet halls.
P059	R2:VocalRoom	Reverb2	Loop	Mono	Room reverb suitable for vocals and chorus.
P060	R2:MediumRm	Reverb2	Loop	Mono	Warm and naturally spacious room reverb.
P061	R2:LargeRoom	Reverb2	Loop	Mono	Modeled acoustics of wide rooms with lots of reverberation.
P062	R2:CoolPlate	Reverb2	Loop	Mono	Distinctive bright plate reverb.
P063	R2:Short Plt	Reverb2	Loop	Mono	Shorter plate reverb.
P064	R2:Vocal Plt	Reverb2	Loop	Mono	Crystal-clear reverb optimized for vocals.
P065	R2:Soft Amb.	Reverb2	Loop	Mono	Modeled reverberation of a room with minimal wall reflections.
P066	R2:Room Amb.	Reverb2	Loop	Mono	Natural reverberation of rooms with good acoustics, suitable for drums and guitars.
P067	R2:Cathedral	Reverb2	Loop	Mono	Acoustics of a very large, high-ceilinged church.
P068	R2:Long Cave	Reverb2	Loop	Mono	Modeled reverberation of deep caves.
P069	R2:GarageDr.	Reverb2	Loop	Mono	Natural reverb that enhances unique drum sounds.
P070	R2:Rock Kick	Reverb2	Loop	Mono	Reverb with many low-frequency components, suitable for rock kicks.
P071	R2:RockSnare	Reverb2	Loop	Mono	Rich and thick sounding reverb suitable for rock snares.
P072	R2:BriteGte2	Reverb2	Loop	Mono	A high-density and bright sounding gated reverb. Adjust Threshold.
P073	R2:Fat Gate2	Reverb2	Loop	Mono	A high-density and warm sounding gated reverb. Adjust Threshold.

■ Gate Reverb (4 presets)

No.	Patch Name	Algorithm	Type	Input	Comment
P074	RV:BriteGate	Gate Reverb	Loop	Mono	Slightly brighter gate reverb.
P075	RV:Fat Gate	Gate Reverb	Loop	Mono	Dynamic reverb sound with powerful mids and lows.
P076	RV:ReverseGt	Gate Reverb	Loop	Mono	A reverse gate commonly used as a special effect.
P077	RV:PanningGt	Gate Reverb	Loop	Mono	A special effect with gate reverb shifting from left to right.

■ Delay (9 presets)

No.	Patch Name	Algorithm	Type	Input	Comment
P078	DL:Short Dly	Delay	Loop	Mono	An ambience effect that adds depth to the sound by doubling.
P079	DL:MediumDly	Delay	Loop	Mono	Natural echo optimized for vocals.
P080	DL:LongDelay	Delay	Loop	Mono	Long delay suited for brass and analog synth solos.
P081	DL:AnalogDly	Delay	Loop	Mono	Analog sound with gradually diminishing feedbacking highs.
P082	DL:Tape Echo	Stereo Delay Chorus	Loop	Stereo	Modeled tape echo with distinctive wow flutter.
P083	DL:Karaoke	Stereo Delay Chorus	Loop	Stereo	Intense reverberation that effectively enhances karaoke vocals.
P084	DL:Multi-Tap	Stereo Delay Chorus	Loop	Stereo	Spacious reflections using positioning delay at any point along the stereo soundfield.
P085	DL:MltTapAmb	Multi Tap Delay	Loop	Mono	An ambience effect using 10 short delay units.
P086	DL:Ping Pong	Multi Tap Delay	Loop	Mono	A special effect using tap delay.

■ Tape Echo 201 (4 presets)

No.	Patch Name	Algorithm	Type	Input	Comment
P087	TE:ShortEcho	Tape Echo 201	Loop	Mono	Models short type tape echo.
P088	TE:LongEcho	Tape Echo 201	Loop	Mono	Models long type tape echo.
P089	TE:OldTape	Tape Echo 201	Loop	Mono	Models tape echo using an old tape.
P090	TE:PanEcho	Tape Echo 201	Loop	Mono	Models tape echo in stereo.

■ Chorus (6 presets)

No.	Patch Name	Algorithm	Type	Input	Comment
P091	CH:Lt Chorus	Stereo Delay Chorus	Insert	Stereo	Natural stereo chorus with shallow depth for spacious, crystal-clear sound.
P092	CH:Deep Cho	Stereo Delay Chorus	Insert	Stereo	Intense stereo chorus that adds depth and spaciousness to the sound.
P093	CH:DetuneCho	Stereo Pitch Shifter Delay	Insert	Stereo	Chorus with left and right channels separately pitch shift-detuned up and down.
P094	SPCHO:MODE 1	Space Chorus	Insert	Stereo	Models MODE1 of the classic SDD-320 ambience processor.
P095	SPCHO:MODE 2	Space Chorus	Insert	Stereo	Models MODE2 of the classic SDD-320 ambience processor.
P096	SPCHO:MODE 3	Space Chorus	Insert	Stereo	Models MODE3 of the classic SDD-320 ambience processor.

■ Phaser (3 presets)

No.	Patch Name	Algorithm	Type	Input	Comment
P097	PH:Lt Phaser	Stereo Phaser	Insert	Stereo	Lighter 4-stage stereo phaser suitable for synth strings.
P098	PH:DeepPhase	Stereo Phaser	Insert	Stereo	Deep phaser effective for electronic piano and clavinet sounds.
P099	AP:FB-Phaser	Analog Phaser	Insert	Stereo	Models analog phaser with oscillation on purpose.

■ Flanger (3 presets)

No.	Patch Name	Algorithm	Type	Input	Comment
P100	FL:LtFlanger	Stereo Flanger	Insert	Stereo	Stereo flanger with slight modulation.
P101	FL:Deep Fl	Stereo Flanger	Insert	Stereo	Deeper stereo flanger for metallic jet swooshing sound.
P102	AF:SBF-325	Analog Flanger	Insert	Stereo	Models Roland SBF-325 analog flanger.

■ Pitch Shifter (7 presets)

No.	Patch Name	Algorithm	Type	Input	Comment
P103	PS:-4thVoice	Vocal Multi	Insert	Mono	Adds sound down a fourth to the direct sound.
P104	PS:ShimmerUD	Stereo Pitch Shifter Delay	Insert	Stereo	A special effect with left channel pitch rising and right channel pitch dropping over time.
P105	VT:M to Fm	Voice Transformer	Insert	Mono	Converts a male voice into a female voice.
P106	VT:Fm to M	Voice Transformer	Insert	Mono	Converts a female voice into a male voice.
P107	VT:Male Duo	Voice Transformer	Insert	Mono	Turns a single male voice into a duet (by adding a female voice).
P108	VT:FemaleDuo	Voice Transformer	Insert	Mono	Turns a single female voice into a duet (by adding a male voice).
P109	VT:Robot	Voice Transformer	Insert	Mono	Special effect like a robot speaking.

* PSD = Pitch Shifter Delay

■ Mic Modeling (29 presets)

No.	Patch Name	Algorithm	Type	Input	Comment
P110	MM:57→58	Mic Modeling	Insert	2ch	Converts a general-purpose D. mic to a vocal D. mic. Rich mid / low range.
P111	MM:57→421	Mic Modeling	Insert	2ch	Converts a general-purpose D. mic to a large D. mic. For drums and guitar amp.
P112	MM:57→451	Mic Modeling	Insert	2ch	Converts a general-purpose D. mic to a small C. mic. For acoustic guitar and cymbals.
P113	MM:57→87	Mic Modeling	Insert	2ch	Converts a general-purpose D. mic to a large C. mic. For vocals and acoustic inst.
P114	MM:57→47	Mic Modeling	Insert	2ch	Converts a general-purpose D. mic to a vintage C. mic. For vocals and acoustic inst.
P115	MM:57→Line	Mic Modeling	Insert	2ch	Cancels the characteristics of D.mic, giving the sound a flat frequency response.
P116	MM:DR20→421	Mic Modeling	Insert	2ch	Converts a Roland DR-20 to an instrumental D. mic. For drums and guitar amp.
P117	MM:DR20→451	Mic Modeling	Insert	2ch	Converts a Roland DR-20 to a small C. mic. For acoustic guitar and cymbals.
P118	MM:DR20→87	Mic Modeling	Insert	2ch	Converts a Roland DR-20 to a large C. mic. For vocals and acoustic inst.
P119	MM:10→58	Mic Modeling	Insert	2ch	Converts a headset mic to a vocal D. mic.
P120	MM:10→87	Mic Modeling	Insert	2ch	Converts a headset mic to a large C. mic.
P121	MM:Mini→57	Mic Modeling	Insert	2ch	Converts a miniature C. mic to a general-purpose D. mic.
P122	MM:Mini→87	Mic Modeling	Insert	2ch	Converts a miniature C. mic to a large C. mic.
P123	MM:C3KB→57	Mic Modeling	Insert	2ch	Converts a AKG C3000B to a general-purpose D. mic
P124	MM:C3KB→58	Mic Modeling	Insert	2ch	Converts a AKG C3000B to a vocal D. mic.
P125	MM:C3KB→421	Mic Modeling	Insert	2ch	Converts a AKG C3000B to an instrumental D. mic.
P126	MM:C3KB→451	Mic Modeling	Insert	2ch	Converts a AKG C3000B to a small C. mic.
P127	MM:C3KB→87	Mic Modeling	Insert	2ch	Converts a AKG C3000B to a large C. mic.
P128	MM:C3KB→47	Mic Modeling	Insert	2ch	Converts a AKG C3000B to a vintage C. mic.

P129	MM:C3KB→Line	Mic Modeling	Insert	2ch	Cancels the characteristics of AKG C3000B, giving the sound a flat frequency response.
P130	MM:Kick&Snr1	Mic Modeling	Insert	2ch	For the bass drum (L channel) and snare drum (R channel) of a drum set (1).
P131	MM:Kick&Snr2	Mic Modeling	Insert	2ch	For the bass drum (L channel) and snare drum (R channel) of a drum set (2).
P132	MM:H.Hat&Tom	Mic Modeling	Insert	2ch	For the hi-hat (L channel) and tom (R channel) of a drum set.
P133	MM:Dr.OvrTop	Mic Modeling	Insert	2ch	A patch for placing mics above the drums mainly to mic the cymbals.
P134	MM:Dr.OvrAll	Mic Modeling	Insert	2ch	A patch for placing mics above the front of the drums to mic the entire set.
P135	MM:Ac.Guitar	Mic Modeling	Insert	2ch	For acoustic guitar. InsertL: brighter, InsertR: warmer.
P136	MM:StudioVcl	Mic Modeling	Insert	2ch	For vocals. InsertL: natural, InsertR: Rock.
P137	MM:StereoMic	Mic Modeling	Insert	2ch	Gives time-lag to a sound miked in stereo, emphasizing spaciousness.
P138	MM:Ambience	Mic Modeling	Insert	2ch	Models ambience mics. Add reverb and mix with original source.

* D. mic = dynamic microphone, C. mic = condenser microphone

■ Vocal (10 presets)

No.	Patch Name	Algorithm	Type	Input	Comment
P139	VO:Vocal Fx	Vocal Multi	Insert	Mono	Basic setup for recording / mixdown of vocals.
P140	VO:JazzVocal	Vocal Multi	Insert	Mono	A natural sounding jazz club-like ambience for warm reverb well-suited for vocals.
P141	VO:RockVocal	Vocal Multi	Insert	Mono	Sound featuring limiter / enhancer processing as well as a unison effect.
P142	VO:Narration	Vocal Multi	Insert	Mono	An effect with heavy compression, used for narration.
P143	VO:BigChorus	Vocal Multi	Insert	Mono	A spacious-sounding stereo effect similar to increasing the number of vocalists.
P144	VO:Club DJ	Vocal Multi	Insert	Mono	A club DJ-tailored effect that uses a pitch shifter to make voices lower.
P145	VO:AM-Radio	Vocal Multi	Insert	Mono	Sound featuring hard compression and narrower frequency range.
P146	VO:PlusTwo	Stereo Pitch Shifter Delay	Insert	Stereo	A special effect that adds two more voices using a pitch shifter.
P147	VO:Robot Fx	Stereo Pitch Shifter Delay	Insert	Stereo	SF movie-like effect using a pitch shifter.
P148	VO:Bull Horn	Guitar Multi 3	Insert	Mono	Modeled effect of sound produced from a Bull Horn or old radio.

* PSD = Pitch Shifter Delay

■ Guitar (11 presets)

No.	Patch Name	Algorithm	Type	Input	Comment
P149	GT:Rock Lead	Guitar Multi 2	Insert	Mono	Straight distortion sound with delay.
P150	GT:LA Lead	Guitar Multi 2	Insert	Mono	Lead guitar sound with tasty compression and chorus applied.
P151	GT:MetalLead	Guitar Multi 1	Insert	Mono	Metal sound with dynamic, ultrahigh gain distortion.
P152	GT:Metal Jet	Guitar Multi 1	Insert	Mono	Distortion together with a metallic effect achieved by flanging.
P153	GT:CleanRthm	Guitar Multi 1	Insert	Mono	Clean sound with compression and chorus applied.
P154	GT:DIedClean	Vocal Multi	Insert	Mono	Superclean sound like line recording directly into the console.
P155	GT:Delay Rif	Guitar Multi 2	Insert	Mono	Delay sounds at dotted eighth note intervals when a 120 BPM riff is played.
P156	GT:Acoustic	Vocal Multi	Insert	Mono	Optimized for electroacoustic guitars.
P157	GT:BluesDrv.	Guitar Multi 3	Insert	Mono	Crunchy overdrive sound suited to blues and R&R.
P158	GT:Liverpool	Guitar Multi 3	Insert	Mono	Crunchy sound often heard on ‘60s British rock.
P159	GT:Country	Guitar Multi 3	Insert	Mono	Clean sound featuring distinctive compression and delay.

■ Guitar Amp Modeling (9 presets)

No.	Patch Name	Algorithm	Type	Input	Comment
P160	GA:JazzChorus	Guitar Amp Modeling	Insert	Mono	Roland JC-120 amp. Sounds more authentic when used with chorus for mixdown.
P161	GA:CleanTwin	Guitar Amp Modeling	Insert	Mono	U.S. tube combo amp circa “black panel.”
P162	GA:Vin.Tweed	Guitar Amp Modeling	Insert	Mono	’50s U.S. tube amp overdrive.
P163	GA:BluesDrv.	Guitar Amp Modeling	Insert	Mono	Old British amp crunchy overdrive.
P164	GA:MatchLead	Guitar Amp Modeling	Insert	Mono	Hot-rodded British combo amp.
P165	GA:StudioCmb	Guitar Amp Modeling	Insert	Mono	Favorite late ‘70s amp of studio musicians.
P166	GA:JMP-Stack	Guitar Amp Modeling	Insert	Mono	Late ‘60s British stacks.
P167	GA:SLDN Lead	Guitar Amp Modeling	Insert	Mono	An ‘80s amp known for versatile distortion.
P168	GA:5150 Lead	Guitar Amp Modeling	Insert	Mono	Big tube amp standard for American heavy metal.

* Mdl. = Modeling

■ Bass (6 presets)

No.	Patch Name	Algorithm	Type	Input	Comment
P169	BS:DI’edBass	Vocal Multi	Insert	Mono	Slight limiting and equalization optimized, ideal for line recording applications.
P170	BS:MikedBass	Guitar Amp Modeling	Insert	Mono	A miked speaker box with four 12”s.
P171	BS:CompBass	Stereo Multi	Insert	Stereo	Hard-compressed sound optimized for slaps.
P172	BS:Fat Bass	Mastering Tool Kit	Insert	Stereo	Enhanced low end. Edit LoMid EQ to suit the source instruments.
P173	BS:Auto Wah	Guitar Multi 2	Insert	Mono	Synth bass like sound added with auto wah essential for ‘70s funk.
P174	BS:FX Bass	Stereo Delay Chorus	Insert	Stereo	Solo-optimized sound with depth and spaciousness added through delay and chorus.

* Mdl. = Modeling

■ Special Effects (11 presets)

No.	Patch Name	Algorithm	Type	Input	Comment
P175	LFP:BreakBts	Lo-Fi Processor	Insert	Stereo	Reproduces the tonal change produced by lowering the bit / rate of a sampled sound.
P176	LFP:1bitDist	Lo-Fi Processor	Insert	Stereo	Extreme distortion sound produced by lowering the number of bits.
P177	LFP:TeknoFlt	Lo-Fi Processor	Insert	Stereo	Emphasizes the out-of-band noise that occurs with low sampling rates.
P178	LFP:Reso Flt	Lo-Fi Processor	Insert	Stereo	Filter with resonance as found on synthesizers. Adjust CutOff.
P179	LFP:FatBotom	Lo-Fi Processor	Loop	Stereo	Add heavy low-range for the groove. Mix with original source.
P180	VOP22:M19Band	Vocoder2 (19)	Insert	Mono	Clear and crisp vocoder.
P181	VOP22:S19Band	Vocoder2 (19)	Insert	Mono	Special stereo vocoder with long decay.
P182	HC:Quiet60Hz	Hum Canceler	Insert	Stereo	Cancels 60 Hz hum noise.
P183	HC:Quiet50Hz	Hum Canceler	Insert	Stereo	Cancels 50 Hz hum noise.
P184	VC:Vocal Cnl	Vocal Canceler	Insert	Stereo	Cancels a vocal located in the center.
P185	VC:CenterCnl	Vocal Canceler	Insert	Stereo	Cancel all sound located in the center.

■ Parametric Equalizer (26 presets)

No.	Patch Name	Algorithm	Type	Input	Comment
P186	PEQ:BassDrum	Parametric Equalizer	Insert	Stereo	For bass drum. Adjust LowQ and HiG.
P187	PEQ:RockBD	Parametric Equalizer	Insert	Stereo	For bass drum. A sound suitable for rock with mid-lows emphasized.
P188	PEQ:RockSD	Parametric Equalizer	Insert	Stereo	For snare drum. Drops the mid-lows and emphasizes the attack and snares.
P189	PEQ:RimShot	Parametric Equalizer	Insert	Stereo	For rim shot. Emphasizes the feeling of attack unique to a rim shot.
P190	PEQ:Toms	Parametric Equalizer	Insert	Stereo	For toms. Adjust LowF and LowMidF.
P191	PEQ:Hi Hat	Parametric Equalizer	Insert	Stereo	For the crisper hi-hat. Adjust bell sound with HiMidG.
P192	PEQ:Cymbals	Parametric Equalizer	Insert	Stereo	For cymbals. Emphasizes the difference in tone between cymbals and their clarity.
P193	PEQ:Overhead	Parametric Equalizer	Insert	Stereo	For drum kit. Use when miking the sound of the entire kit.
P194	PEQ:Bass 1	Parametric Equalizer	Insert	Stereo	For electric bass. Wide-range and tight bass sound.
P195	PEQ:Bass 2	Parametric Equalizer	Insert	Stereo	For electric bass. Fatter and with more punch than P194. For rock.
P196	PEQ:SlapBass	Parametric Equalizer	Insert	Stereo	For electric bass. Settings that emphasize the accent of pulled notes with slap technique.
P197	PEQ:Sax	Parametric Equalizer	Insert	Stereo	For alto / soprano sax. Lower HiG for mellow sound.
P198	PEQ:Bari.Sax	Parametric Equalizer	Insert	Stereo	For baritone sax. Adjust LoMidF.
P199	PEQ:ElecGtr	Parametric Equalizer	Insert	Stereo	Settings that keep the lead guitar from being buried in the mix.
P200	PEQ:NylonGtr	Parametric Equalizer	Insert	Stereo	Emphasize the tone of nylon strings. Adjust fret sound with HiG.
P201	PEQ:BluesGtr	Parametric Equalizer	Insert	Stereo	Adds a delicate nuance suitable when playing blues on an acoustic guitar.
P202	PEQ:SlideGtr	Parametric Equalizer	Insert	Stereo	Adds a rich feel to acoustic slide guitar. Adjust HiF.
P203	PEQ:LineGtr	Parametric Equalizer	Insert	Stereo	For piezo pickups. Adjust brightness with HiG.
P204	PEQ:Male	Parametric Equalizer	Insert	Stereo	Improves the tone quality of a male vocal. Adjust HiG.
P205	PEQ:RockMale	Parametric Equalizer	Insert	Stereo	Equalizer that adds energy to a male vocal. Best for rock. Try with Comp.
P206	PEQ:Female	Parametric Equalizer	Insert	Stereo	Improves the tone quality of a female vocal. Adjust LoMidG.
P207	PEQ:RockFeml	Parametric Equalizer	Insert	Stereo	Equalizer that adds energy to a female vocal. Best for rock. Try with Comp.
P208	PEQ:Narrator	Parametric Equalizer	Insert	Stereo	Standard equalizer for male narration. Brings out the character of the voice.
P209	PEQ:Organ	Parametric Equalizer	Insert	Stereo	Settings to bring out the character of a church organ.
P210	PEQ:St.Piano	Parametric Equalizer	Insert	Stereo	For miking piano in stereo. Left: low range, right: high range.
P211	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
P212	GEQ:TotalEQ1	Graphic Equalizer	Insert	Stereo	Boosts the low and high ranges.
P213	GEQ:TotalEQ2	Graphic Equalizer	Insert	Stereo	Attenuates the lows and highs to narrow the range, tightening up the sound.
P214	GEQ:Space EQ	Graphic Equalizer	Insert	Stereo	Special settings that turn a monaural source into stereo.

■ Stereo Multi (5 presets)

No.	Patch Name	Algorithm	Type	Input	Comment
P215	CL:Comp	Stereo Multi	Insert	Stereo	Stereo type compression optimized for broadcast mixing.
P216	CL:Limiter	Stereo Multi	Insert	Stereo	A convenient effect for analog mastering because it can limit peak signals.
P217	EQ:Loudness	Stereo Multi	Insert	Stereo	Applies EQ curve with slightly boosted lows and highs.
P218	EQ:Fat Dance	Stereo Multi	Insert	Stereo	Hard compression plus equalizing for dance music.
P219	EQ:ThinJingl	Stereo Multi	Insert	Stereo	Limiter and EQ processing for FM radio and TV broadcasting.

■ Speaker Modeling (11 presets)

No.	Patch Name	Algorithm	Type	Input	Comment
P220	SPM:SuperFlt	Speaker Modeling	Insert	Stereo	Modeling is used to compensate the DS-90, to produce an even flatter sound with a wider range.
P221	SPM:P.GenBlk	Speaker Modeling	Insert	Stereo	A widely used model of powered monitors (two-way type, with a woofer diameter of 170 mm (6-1/2 inches)).
P222	SPM:P.E-Bs	Speaker Modeling	Insert	Stereo	Powered monitors characterized by a bright tone.
P223	SPM:P.Mack	Speaker Modeling	Insert	Stereo	Powered monitors characterized by an extended low-frequency response.
P224	SPM:SmalCube	Speaker Modeling	Insert	Stereo	Small full-range speakers widely used in recording studios.
P225	SPM:WhiteCon	Speaker Modeling	Insert	Stereo	Sealed enclosure two-way speakers known for their white woofers and widely used in recording studios.
P226	SPM:W.C+tiss	Speaker Modeling	Insert	Stereo	A more mild sound, with tissue paper affixed over the tweeters of the above “White Cone” speakers.
P227	SPM:S.Radio	Speaker Modeling	Insert	Stereo	Small pocket-type radio.
P228	SPM:SmallTV	Speaker Modeling	Insert	Stereo	Speakers built into a 14 inch size television.
P229	SPM:BoomBox	Speaker Modeling	Insert	Stereo	Radio cassette recorder.
P230	SPM:BB.LowBs	Speaker Modeling	Insert	Stereo	Radio cassette recorder with the Low Boost switched on.

■ Mastering Tool Kit (19 presets)

No.	Patch Name	Algorithm	Type	Input	Comment
P231	MTK:Mixdown	Mastering Tool Kit	Insert	Stereo	Mix down for CD
P232	MTK:PreMastr	Mastering Tool Kit	Insert	Stereo	Pre-master for video editing
P233	MTK:LiveMix	Mastering Tool Kit	Insert	Stereo	Final mix of live recording
P234	MTK:PopMix	Mastering Tool Kit	Insert	Stereo	for Pop music
P235	MTK:DanceMix	Mastering Tool Kit	Insert	Stereo	for Dance music
P236	MTK:JinglMix	Mastering Tool Kit	Insert	Stereo	Jingle for FM radio
P237	MTK:HardComp	Mastering Tool Kit	Insert	Stereo	Heavy compression
P238	MTK:SoftComp	Mastering Tool Kit	Insert	Stereo	Light compression
P239	MTK:ClnComp	Mastering Tool Kit	Insert	Stereo	Eliminating the background noise and clean up the sound
P240	MTK:DnceComp	Mastering Tool Kit	Insert	Stereo	Compression for dance music
P241	MTK:OrchComp	Mastering Tool Kit	Insert	Stereo	Compression for orchestra
P242	MTK:VocalCmp	Mastering Tool Kit	Insert	Stereo	Compression for vocal
P243	MTK:Acoustic	Mastering Tool Kit	Insert	Stereo	Acoustic guitar
P244	MTK:RockBand	Mastering Tool Kit	Insert	Stereo	for Rock band
P245	MTK:Orchestr	Mastering Tool Kit	Insert	Stereo	for Orchestra
P246	MTK:LoBoost	Mastering Tool Kit	Insert	Stereo	Enhancing the low frequency range
P247	MTK:Brighten	Mastering Tool Kit	Insert	Stereo	Enhancing the high frequency range
P248	MTK:DJsVoice	Mastering Tool Kit	Insert	Stereo	DJ Microphone
P249	MTK:PhoneVox	Mastering Tool Kit	Insert	Stereo	Telephone voice modeling

Algorithm List

This section describes the effects associated with the respective algorithms and internal terminations. Read this section when you need to check the algorithms in the built-in library (pre-set library) or before creating a new library.

● **To add reverbs (Reverb-related)**
- Reverb ..... (p. 34)
- Reverb2 ..... (p. 36)
- Gate Reverb ..... (p. 38)

● **To add delayed sounds (Delay-related)**
- Delay ..... (p. 40)
- Stereo Pitch Shifter Delay ..... (p. 42)
- Tape Echo 201 ..... (p. 45)
- Multi Tap Delay ..... (p. 46)

● **To expand sounds (Chorus-related)**
- Stereo Delay Chorus ..... (p. 48)
- Space Chorus ..... (p. 51)

● **To swing sounds (Modulation-related)**
- Stereo Phaser ..... (p. 52)
- Analog Phaser ..... (p. 54)
- Stereo Flanger ..... (p. 55)
- Analog Flanger ..... (p. 56)

● **To alter the volume increment (Compressor-related)**
- Dual Compressor / Limiter ..... (p. 76)

● **To increase/decrease levels by frequency band (Filter-related)**
- 3band Isolator ..... (p. 75)
- Parametric Equalizer ..... (p. 78)
- Graphic Equalizer ..... (p. 79)

● **To make sound quality rough (Lo-Fi-related)**
- Lo-Fi Processor ..... (p. 74)

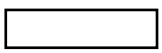
● **To add effects suited for the guitar/bass**
- Guitar Multi 1 ..... (p. 62)
- Guitar Multi 2 ..... (p. 62)
- Guitar Multi 3 ..... (p. 62)
- Guitar Amp Modeling ..... (p. 64)

● **To add effects suited for vocals**
- Vocal Multi ..... (p. 66)
- Voice Transformer ..... (p. 68)
- Vocal Canceler ..... (p. 69)

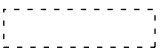
● **To add movement to sounds**
- Rotary ..... (p. 57)

● **To give three-dimensional location**
- Delay RSS ..... (p. 44)
- Chorus RSS ..... (p. 50)
- 2ch RSS ..... (p. 58)

● **Others**
- Mic Modeling ..... (p. 60)
- Vocoder ..... (p. 71)
- Vocoder2 (19) ..... (p. 72)
- Hum Canceler ..... (p. 80)
- Stereo Multi ..... (p. 81)
- Speaker Modeling ..... (p. 83)
- Mastering Tool Kit ..... (p. 85)



Effect block



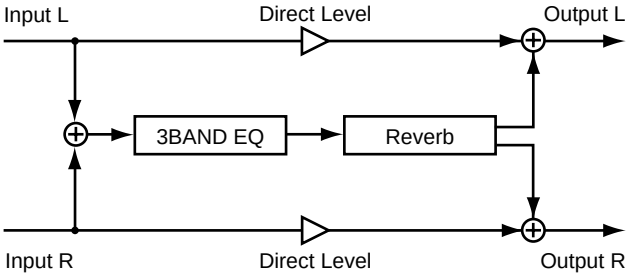
Parameters within the same effect
(left/right channels linked)

Audio signal

Control signal

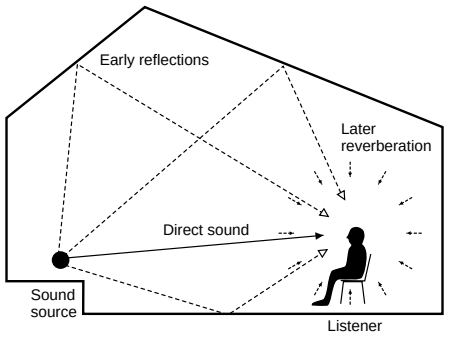
Reverb

This feature adds reverberation to the sound to model the size of space such as a hall and a room.



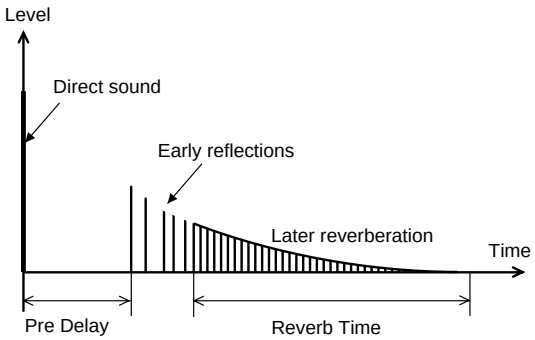
Sound types

Sounds around us can be analyzed and categorized into three types: direct sounds, early reflections and reverberation. A direct sound is the sound that reaches the listener directly from the source. An early reflection is the sound that has rebounded from the wall once, twice or several times. A reverberation is the sound we hear after sound reflections are repeated many times.



Relationship between sound and time

Reflected sound reach 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.



Reverb sound quality

The sound quality of a reverb is affected by materials of the walls and other members from which the sound is rebounded. This is because the degree of attenuation in the High and low frequency bands varies. HF-Damp Gain and LF-Damp Gain are provided so that you can adjust such attenuation degrees. The smaller the value becomes, the steeper the degree of attenuation of the reverberation becomes severer in the High and low frequency bands. In addition, in order to obtain softer reverberation, make the frequency lower by using HF-Damp Frequency (High Freqreq-Damp Freq). In order to obtain harder reverberation, make the frequency Higher by using LF-Damp Frequency (LoFreq-Damp Freq).

Parameter (full name)	Setting	Function
EQ (Equalizer)		
Sw (Switch)	On, Off	Turns the equalizer on or off.
Low Gain	-12– +12 dB	Sets the boost/cut amount in the low frequency band.
Low Freq (Low Frequency)	20 - 2000 Hz	Sets the center frequency in the low frequency band.
Low Q	0.3–10.0	Sets the width of the area around the low frequency that will be affected by the gain settings. *1
Low Type	Shlv, Peak	Sets the type of the low frequency band equalizer (Shelving type or peaking type).
Mid Gain (Middle Gain)	-12– +12 dB	Sets the boost/cut amount in the middle frequency band.
Mid Freq (Middle Frequency)	200–8000 Hz	Sets the center frequency in the middle frequency band.
Mid Q (Middle Q)	0.3–10.0	Sets the width of the area around the middle frequency that will be affected by the gain settings.
High Gain	-12– +12 dB	Sets the boost/cut amount in the High frequency band.
High Freq (High Frequency)	1.4–20.0 kHz	Sets the center frequency in the High frequency band.
High Q	0.3–10.0	Sets the width of the area around the High frequency that will be affected by the gain settings. *1
Hi Type (High Type)	Shlv, Peak	Sets the type of the High frequency band equalizer (Shlving type or peaking type).
Level (Output Level)	0–100	Sets the volume after passing through the equalizer.
Reverb:	**Adds reverberation.**	
Room Size (Room Size)	5–40 m	Sets the size of the room.
Time (Reverb Time)	0.1–32.0 sec.	Sets the time length of the reverb sound.
PreDLY (Pre-Delay)	0–200 ms	Sets the time until the reverb sound appears.
Difusi (Diffusion)	0–100	Sets the extent of diffusion of the early reflection sound.
Densty (Density)	0–100	Sets the density of the reverb sound.
ERLvl (Early Reflection Level)	0 to100	Sets the volume of the early reflection.
LF Damp Gain (LF-Damp Gain)	-36–0 dB	Sets the degree of attenuation of the reverb in the low frequency band.
LF Damp Freq (LF-Damp Frequency)	50–4000 Hz	Sets the frequency on which the reverb starts attenuating in the low frequency band.
HF Damp Gain (HF-Damp Gain)	-36–0 dB	Sets the degree of attenuation of the reverb in the High frequency band.
HF Damp Freq (HF-Damp Frequency)	1.0–20.0 kHz	Sets the frequency on which the reverb starts attenuating in the High frequency band.
HiCF (High Cut Frequency)	0.2–20.0 kHz	Sets the frequency for which the High frequency band elements of the reverb are cut.
FX Lvl (Effect Level)	-100–100	Sets the volume of the reverb sound.
DirLvl (Direct Level)	-100–100	Sets the volume of the direct sound.

NOTE

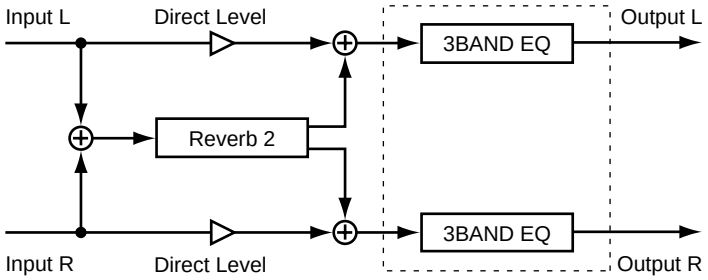
*1: If Low Type (Lo Type) or High Type (Hi Type) is set to “Shlv (Shlving Type),” the setting for Lo Q or High Q is invalid.

* “Reverb” cannot be used on EFFECT2, 4, 6, and 8 (even-numbered effects).

* “Reverb” cannot be used on the projects with 64kHz or higher sampling rate.

Reverb2

This gate reverb works in either of two modes of gate operation (Gate / Ducking). In the Gate mode, the gate opens when a certain volume (Threshold Level) is exceeded while in the Ducking mode, the gate opens when the volume becomes as low as or lower than Threshold Level. You can use two reverbs (FX1 and FX2) with different settings, or use it in combination with a previous reverb.



Reverb types

There are five reverb types: You can choose the type with Reverb Type.

Room1:	Ordinary room reverb
Room2:	Room reverb with a softer tone compared with Room1
Hall1:	Ordinary hall reverb
Hall2:	Hall reverb with a softer tone compared with Hall1
Plate:	Plate reverb

Selecting Gate type

Reverb sounds have different effects depending on the gate operation types. Use Gate Mode to select the type.

Gate:	The gate opens when the volume of the direct sound exceeds the value set with Threshold Level (Thres). The gate closes when the volume drops below the Threshold Level value.
Duckn:	Operates in the opposite manner as in the “Gate” mode. The gate closes when the volume of the direct sound exceeds the value set with Threshold Value. The gate opens when the volume becomes as low as or lower than the Threshold Level value.

Parameter (full name)	Setting	Function

Rev (Reverb 2): Gate reverb with two modes of gate operation

Sw (Switch)	On, Off	Turns the reverb on or off.
Type (Reverb Type)	See the column on the previous page.	Sets the reverb type.
Gate (Gate)	On, Off	Opens or closes the gate.
Mode (Gate Mode)	Gate, Ducking	Sets the gate operation type.
Time (Reverb Time)	0.1–10.0 sec.	Sets the length (time) of the reverb sound.
PreDLY (Pre-Delay)	0–200 ms	Sets the time until the reverb sound is output.
Densty (Density)	0–100	Sets the density of the reverb sound.
HPF (High Pass Filter)	Thru, 20 - 2000 Hz	Sets the frequency at which HPF starts taking effect. Set this to “Thru” if HPF is to be disabled.
LPF (Low Pass Filter)	1.0–20.0 kHz, Thru	Sets the frequency at which LPF starts taking effect. Set this to “Thru” if LPF is to be disabled.
Thresh (Threshold)	0–100	Sets the reference volume for controlling gate operations.
Attack (Attack)	1–100	Sets the time from when the direct sound level exceeds the threshold level until when the gate is completely open.
Releas (Release)	1–100	Sets the time from when the hold time has elapsed until the sound is completely muted.
HoldT (Hold Time)	1–100	Sets the time from when the input falls below the threshold level until when the release begins.
FX Lvl (Effect Level).	0–100	Sets the volume of the reverb sound.
DirLvl (Direct Level)	0–100	Sets the volume of the direct sound.

EQ (Equalizer)

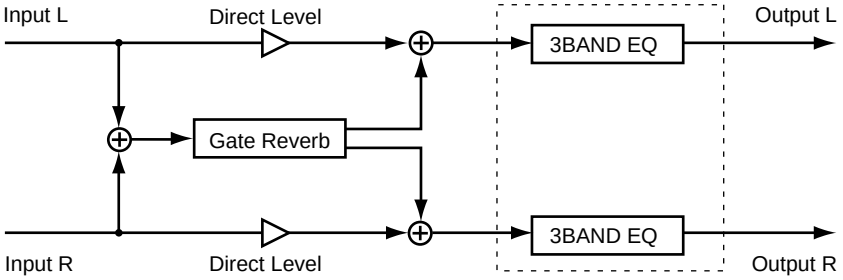
Sw (Switch)	On, Off	Turns the equalizer on or off.
Low Gain (Low Gain)	-12– +12 dB	Sets the boost/cut amount in the low frequency band.
Low Freq (Low Frequency)	20 - 2000 Hz	Sets the center frequency in the low frequency band.
Low Q	0.3–10.0	Sets the width of the area around the low frequency that will be affected by the gain settings.1 *1
Low Type	Shlv, Peak	Sets the type of the low frequency band equalizer (Shlving type or peaking type).
Mid Gain (Middle Gain)	-12– +12 dB	Sets the boost/cut amount in the middle frequency band.
Mid Freq (Middle Frequency)	200–8000 Hz	Sets the center frequency in the middle frequency band.
Mid Q (Middle Q)	0.3–10.0	Sets the width of the area around the middle frequency that will be affected by the gain settings.
High Gain	-12– +12 dB	Sets the boost/cut amount in the High frequency band.
High Freq (High Frequency)	1.4–20.0 kHz	Sets the center frequency in the High frequency band.
High Q	0.3–10.0	Sets the width of the area around the High frequency that will be affected by the gain settings.1 *1
Hi Type (High Type)	Shlv, Peak	Sets the type of the High frequency band equalizer (Shlving type or peaking type).
Level (Output Level)	0–100	Sets the volume after passing through the equalizer.

NOTE

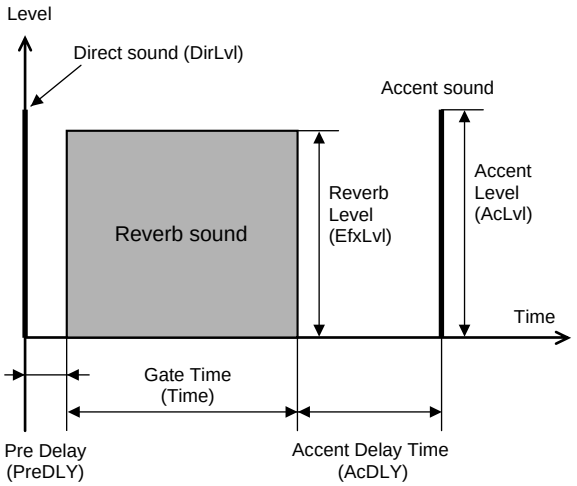
*1: If Low Type (Lo Type) or High Type (Hi Type) is set to “Shlv (Shlving Type),” the setting for Lo Q or High Q is invalid.

Gate Reverb

This is a reverb in which the reverberation is muted during its decay. Its reverse mode can be used in conjunction with Accent sounds to obtain sounds like from reverse playback of a tape.



Gate Reverb



Reverb applications

You can select how reverb sounds can be applied by setting up Gate Mode (Mode).

Normal:	Ordinary Gate Reverb
L->R:	The Gate Reverb sound moves from the left to right side.
R->L:	The Gate Reverb sound moves from the right to left side.
Reverse1:	Reverse Gate (effect as if reverb are replayed backward.)
Reverse2:	Reverse Gate that causes the reverb sound to decay midway.

Parameter (full name)	Setting	Function
GRev (Gate Reverb):	**Mutes the revert sound midway.**	
Sw (Switch)	On, Off	Turns the gate reverb on or off.
Mode (Gate Mode)	See the column on the previous page.	Defines how the reverb sound is applied.
Time (Gate Time)	10–400 s	Sets the time from when the reverb sound begins until it is muted.
PreDLY (Pre-Delay)	0–300 ms	Sets the time until the reverb sound appears.
Thick (Thickness)	0–100	Sets the thickness of the reverb sound.
Densty (Density)	0–100	Sets the density of the reverb sound.
AcDLY (Accent Delay Time)	0–200 ms	Sets the time from when the reverb sound is muted until the accent sound appears.
AcLvl (Accent Level)	0–100	Sets the volume of the accent sound.
AcPan (Accent Pan)	L63–R63	Sets the pan of the accent sound.
FX Lvl (Effect Level).	-100–100	Sets the volume of the gate reverb sound.
DirLvl (Direct Level)	-100–100	Sets the volume of the direct sound.
EQ (Equalizer)		
Sw (Switch)	On, Off	Turns the equalizer on or off.
Low Gain (Low Gain)	-12– +12 dB	Sets the boost/cut amount in the low frequency band.
Low Freq (Low Frequency)	20 - 2000 Hz	Sets the center frequency in the low frequency band.
Low Q	0.3–10.0	Sets the width of the area around the low frequency that will be affected by the gain settings.1 *1
Low Type	Shlv, Peak	Sets the type of the low frequency band equalizer (Shlving type or peaking type).
Mid Gain (Middle Gain)	-12– +12 dB	Sets the boost/cut amount in the middle frequency band.
Mid Freq (Middle Frequency)	200–8000 Hz	Sets the center frequency in the middle frequency band.
Mid Q (Middle Q)	0.3–10.0	Sets the width of the area around the middle frequency that will be affected by the gain settings.
High Gain	-12– +12 dB	Sets the boost/cut amount in the High frequency band.
High Freq (High Frequency)	1.4–20.0 kHz	Sets the center frequency in the High frequency band.
High Q	0.3–10.0	Sets the width of the area around the High frequency that will be affected by the gain settings.1 *1
Hi Type (High Type)	Shlv, Peak	Sets the type of the High frequency band equalizer (Shlving type or peaking type).
Level (Output Level)	0–100	Sets the volume after passing through the equalizer.

NOTE

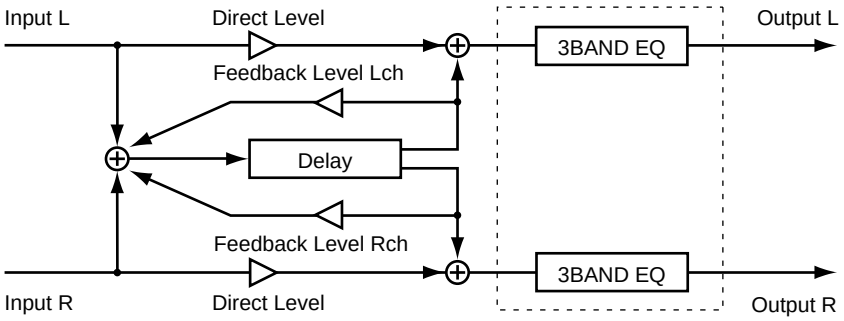
*1: If Low Type (Lo Type) or High Type (Hi Type) is set to “Shlv (Shlving Type),” the setting for Lo Q or High Q is invalid.

* “Gate Reverb” cannot be used on EFFECT2, 4, 6, and 8 (even-numbered effects).

* “Gate Reverb” cannot be used on the projects with 64kHz or higher sampling rate.

Delay

Delay is a feature to add a delayed sound to the direct sound in order to add thickness to the sound or to yield a special effect.



Delay sounds and the spread of sound

As a delay is output in the stereo mode, it sounds from the right and the left sides. These delay sounds can be adjusted by setting Delay shift (shift). Set it to the value on the L side to cause the left-side delay sound lag behind and to the value on the R side to cause the right-side delay sound lag behind. Set shift to "0" to make the delay sounds on the both sides simultaneously. Setting the right and left delay times to different values yields more spreading effect.

* *The sum of the Delay Time value and the Delay shift value should not exceed the setting range of Delay Time. For example, if the setting range of Delay Time is 0 to 1200 ms and Delay Time is set to 1000 ms, the setting range of Delay Shift should be L200 to R200 ms.*

Delay repetition

Delay feedback means to return the delay sound to the Delay input. The amount of feedback is set with FBLevel (Feedback Level). The greater this value becomes, the more times the delay sound is repeated. Setting this level to a negative value inverts the phase. Excessively large values may cause oscillation.

Parameter (full name)	Setting	Function
Delay: Adds a delayed sound to the direct sound, adding depth to the sound or creating special effects.		
Sw (Switch)	On, Off	Turns the delay on or off.
Time (Delay Time)	0–1200 ms	Sets the time from direct sound until when the delay sound is heard. *1
Shift (Delay Shift)	L1200–0–R1200 ms	Sets the delay time difference between the right and left delay sounds.
Lch FeedbackLvl (Lch Feedback Level)	-100–100	Sets the amount of the left-side delay should be returned to the delay input.
Rch FeedbackLvl (Rch Feedback Level)	-100–100	Sets the amount of the right-side delay should be returned to the delay input.
LF Damp Gain (LF-Damp Gain)	-36–0 dB	Sets the degree of attenuation in the low frequency band for the delay sound fed back.
LF Damp Freq (LF-Damp Frequency)	50–4000 Hz	Sets the frequency at which attenuation in the low frequency band starts to the delay sound fed back.
HF Damp Gain (HF-Damp Gain)	-36–0 dB	Sets the degree of attenuation in the High frequency band for the delay sound fed back.
HF Damp Freq (HF-Damp Frequency)	1.0–20.0 kHz	Sets the frequency at which attenuation in the High frequency band starts to the delay sound fed back.
Lch FXLvl (Lch Effect Level)	-100–100	Sets the volume for the left-side delay sound.
Rch FXLvl (Rch Effect Level)	-100–100	Sets the volume for the right-side delay sound.
DirLvl (Direct Level)	-100–100	Sets the volume of the direct sound.

EQ (Equalizer)

Sw (Switch)	On, Off	Turns the equalizer on or off.
Low Gain (Low Gain)	-12– +12 dB	Sets the boost/cut amount in the low frequency band.
Low Freq (Low Frequency)	20 - 2000 Hz	Sets the center frequency in the low frequency band.
Low Q	0.3–10.0	Sets the width of the area around the low frequency that will be affected by the gain settings.1 *2
Low Type	Shlv, Peak	Sets the type of the low frequency band equalizer (Shlving type or peaking type).
Mid Gain (Middle Gain)	-12– +12 dB	Sets the boost/cut amount in the middle frequency band.
Mid Freq (Middle Frequency)	200–8000 Hz	Sets the center frequency in the middle frequency band.
Mid Q (Middle Q)	0.3–10.0	Sets the width of the area around the middle frequency that will be affected by the gain settings.
High Gain	-12– +12 dB	Sets the boost/cut amount in the High frequency band.
High Freq (High Frequency)	1.4–20.0 kHz	Sets the center frequency in the High frequency band.
High Q	0.3–10.0	Sets the width of the area around the High frequency that will be affected by the gain settings.1 *2
Hi Type (High Type)	Shlv, Peak	Sets the type of the High frequency band equalizer (Shlving type or peaking type).
Level (Output Level)	0–100	Sets the volume after passing through the equalizer.

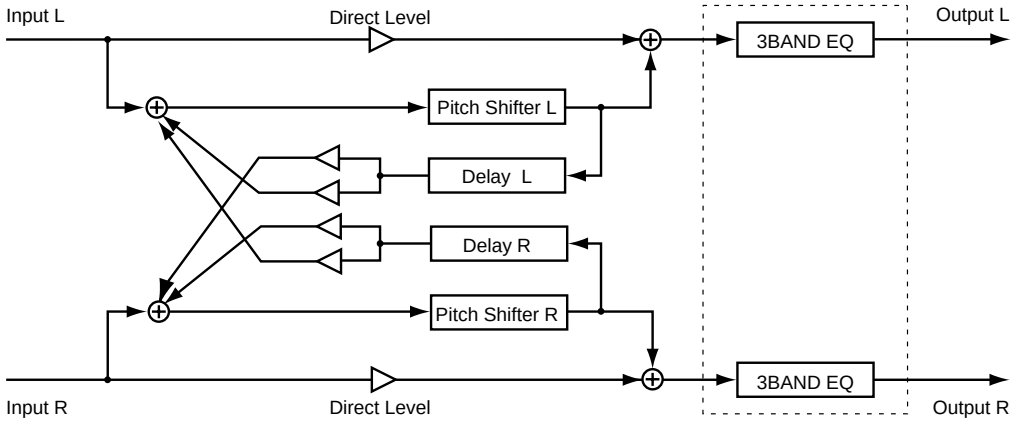
NOTE

*1: The sum of the Delay Time (Time) value and the Delay Shift (Shift) value should not exceed the setting range of Delay Time. For example, if Delay Time is set to 1000 ms, the setting range of Delay Shift is L200 to R200 ms.

*2: If Low Type (Lo Type) or Hi Type (High Type) is set to “Shlv (Shlving Type),” the setting for Lo Q or High Q is invalid.

Stereo Pitch Shifter Delay

Changes the pitch of the direct sound. Corrects vocals out of tune or adds thickness to the sound by mixing the direct sound and a sound at a shifted pitch.



Setting up pitch

Chromatic Pitch (Chromatic) is used for major pitch variation while Fine Pitch (Fine) is used for fine adjustment. Setting up slightly different pitches for the right and left gives thickness to the sound.

Parameter (full name)	Setting	Function
PShift (Pitch Shifter Delay) : Shifts the pitch.		
Sw (Switch)	On, Off	Turns the pitch shifter on or off.
Lch Chroma Pitch (Lch Chromatic Pitch)	-12–12	Sets the left-side pitch variation (by semitone).
Rch Chroma Pitch (Rch Chromatic Pitch)	-12–12	Sets the right-side pitch variation (by semitone).
Lch Fine Pitch	-100–100	Sets the left-side pitch variation (by cent).
Rch Fine Pitch	-100–100	Sets the right-side pitch variation (by cent).
Lch PreDly (Lch Pre-Delay)	0–50 ms	Sets the time from when the direct sound is output until when the left-side sound at a shifted pitch is output.
Rch PreDly (Rch Pre-Delay)	0–50 ms	Sets the time from when the direct sound is output until when the right-side sound at a shifted pitch is output.
Lch FBDly (Lch Feedback Delay Time)	0–500 ms	Sets the feedback repetition cycle for the left-side delay sound.
Rch FBDly (Rch Feedback Delay Time)	0–500 ms	Sets the feedback repetition cycle for the right-side delay sound.
Lch FeedbackLvl (Lch Feedback Level)	-100–100	Sets the amount of the left-side sound at a shifted pitch should be returned to the left pitch shifter input.
Rch FeedbackLvl (Rch Feedback Level)	-100–100	Sets the amount of the right-side sound at a shifted pitch should be returned to the right-side pitch shifter input.
Lch CrossFeedbackLvl (Lch Cross-Feedback Level)	-100–100	Sets the amount of the left-side sound at a shifter pitch should be returned to the right-side pitch shifter input.
Rch CrossFeedbackLvl (Rch Cross-Feedback Level)	-100–100	Sets the amount of the right-side sound at a shifted pith should be returned to the left-side pitch shifter input.
FX Lvl (Effect Level)	-100–100	Sets the volume of the sound at a shifter pitch.
DirLvl (Direct Level)	-100–100	Sets the volume of the direct sound.

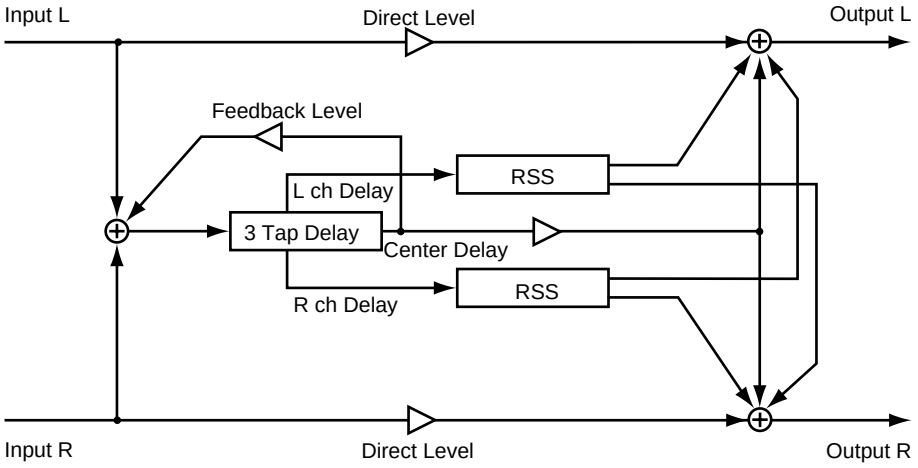
EQ (Equalizer)

Sw (Switch)	On, Off	Turns the equalizer on or off.
Low Gain (Low Gain)	-12– +12 dB	Sets the boost/cut amount in the low frequency band.
Low Freq (Low Frequency)	20 - 2000 Hz	Sets the center frequency in the low frequency band.
Low Q	0.3–10.0	Sets the width of the area around the low frequency that will be affected by the gain settings.1 *1
Low Type	Shlv, Peak	Sets the type of the low frequency band equalizer (Shlving type or peaking type).
Mid Gain (Middle Gain)	-12– +12 dB	Sets the boost/cut amount in the middle frequency band.
Mid Freq (Middle Frequency)	200–8000 Hz	Sets the center frequency in the middle frequency band.
Mid Q (Middle Q)	0.3–10.0	Sets the width of the area around the middle frequency that will be affected by the gain settings.
High Gain	-12– +12 dB	Sets the boost/cut amount in the High frequency band.
High Freq (High Frequency)	1.4–20.0 kHz	Sets the center frequency in the High frequency band.
High Q	0.3–10.0	Sets the width of the area around the High frequency that will be affected by the gain settings.1 *1
Hi Type (High Type)	Shlv, Peak	Sets the type of the High frequency band equalizer (Shlving type or peaking type).
Level (Output Level)	0–100	Sets the volume after passing through the equalizer.

*1: If Low Type (Lo Type) or High Type (Hi Type) is set to “Shlv (Shlving Type),” the setting for Lo Q or High Q is invalid.

Delay RSS

The right-side, left-side and center Delay sounds can be set separately. As RSS (p. 58) is connected to both the right and left outputs, the sound image of the sound from the left-side channel is localized at 90˚ to the left and that of the sound from the right-side channel at 90˚ to the right. The center Delay output can receive the Feedback effect.



NOTE

- The location is fixed; no azimuth or elevation can be specified.
- Refer to the column “Labeling on RSS product package”(p. 59).

Parameter (full name)	Setting	Function
DlyRSS (Delay RSS):	**Gives three-dimensional location to Delay sounds.**	
Time (Delay Time)	0–1200 ms	Sets the time from direct sound until when the left and right delay sound is heard.
shift (Delay shift)	L1200–0–R1200 ms	Sets the balance of the right and left delay times.
C.Time (Center Delay Time)	0–1200 ms	Sets the time from direct sound until when the center delay sound is heard.
RSS Lvl (RSS Level)	0–100	Sets the volume of the RSS sound.
C-Lvl (Center Level)	0–100	Sets the volume for the center delay sound.
LF Damp Gain (LF-Damp Gain)	-36–0 dB	Sets the degree of attenuation in the low frequency band for the center delay sound returned to the input.
LF Damp Freq (LF-Damp Frequency)	50–4000 Hz	Sets the frequency at which attenuation in the low frequency band starts for the center delay sound returned to the input.
HF Damp Gain (HF-Damp Gain)	-36–0 dB	Sets the degree of attenuation in the High frequency band for the center delay sound returned to the input.
HF Damp Freq (HF-Damp Frequency)	1.0–20.0 kHz	Sets the frequency at which attenuation in the High frequency band starts for the center delay sound returned to the input.
FBLvl (Feedback Level)	-100–100	Sets the amount of the center delay sound should be returned to the delay input.
FX Lvl (Effect Level)	-100–100	Sets the volume of the delay RSS sound.
DirLvl (Direct Level)	-100–100	Sets the volume of the direct sound.
Phones (Phones)	Off, On	Set to On when you use headphones Set to Off when you use speakers *1

NOTE

*1 Refer to the column “Precautions for using RSS”(p. 59).

Tape Echo 201

Models the tape echo section of the Roland RE-201 Space Echo. Capable of reproducing very subtle behavior at the measuring instrument level as well as adding subtle changes in pitch due to deterioration of the tape or inconsistency in tape rotation

About replay head

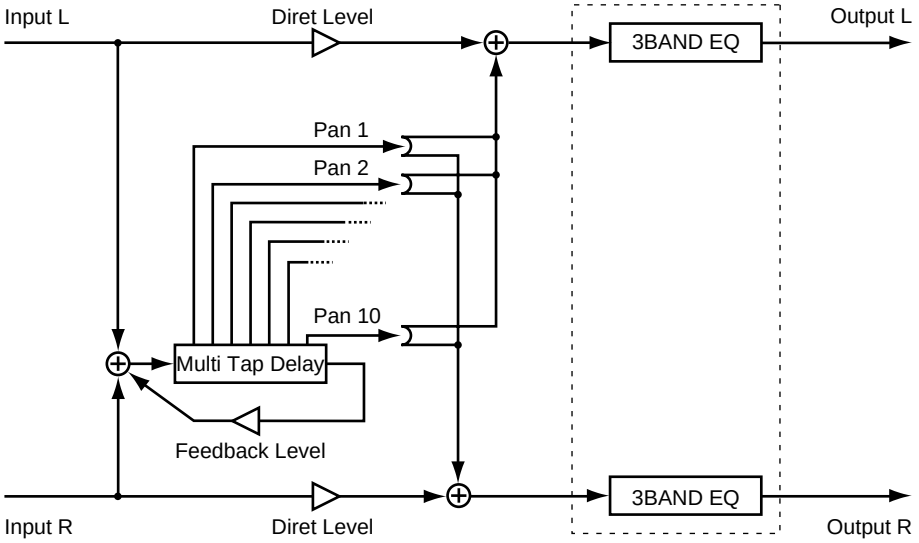
RE-201 is equipped with three heads for creating sounds with different delay times (short, middle and long delay sounds). A desired combination of heads for use can be selected with Mode Selector (Mode).
In addition, separate panning features for the three replay heads not included in RE-201 are added.

Echo (Tape Echo 201): Models the tape echo section of the Roland RE-201 Space Echo.

Parameter (full name)	Setting	Function
Sw (Switch)	On, Off	Turns the tape echo on or off.
Mode (Mode Selector)	1–7	Selects a combination of the three replay heads.
Repeat Rate (Repeat Rate)	0–100	Sets the tape speed.
Intnsty (Intensity)	0–100	Sets the number of repeated the delay sound.
Tone Bass (Tone Bass)	-100– +100	Sets the low frequency band tone of the tape echo sound.
Tone Treble (Tone Treble)	-100– +100	Sets the High frequency band tone of Tape Echo sound.
Pan HeadS (Pan Head S)	L63–R63	Sets the pan settings for the short delay playback head.
Pan HeadM (Pan Head M)	L63–R63	Sets the pan settings for the middle delay playback head.
Pan HeadL (Pan Head L)	L63–R63	Sets the pan settings for the long delay playback head.
Tape Dist (Tape Distortion)	0–100	Adds tape-specific distortion.
WahFluter Rate (Wah-Flutter Rate)	0–100	Sets the fluttering rate of pitch due to deterioration of the tape or inconsistency in the rotation.
WahFlutter Depth (Wah-Flutter Depth)	0–100	Sets the fluttering depth of pitch due to deterioration of the tape or inconsistency in the rotation.
FX Lvl (Effect Level).	0–100	Sets the volume of the tape echo sound.
DirLvl(Direct Level)	0–100	Sets the volume of the direct sound.

Multi Tap Delay

This is a Delay feature that can set 10 delay sounds separately.



Parameter (full name)	Setting	Function
MTD (Multi-Tap Delay):	**Issues 10 delay sounds separately.**	
Time Ch1 – Ch10 (Delay Time 1 – 10)	0–1200 ms	Sets the time from the direct sound until when the delay sound for channels 1–10 is heard.
Level Ch1 – Ch10 (Delay Level 1 – 10)	0–100	Sets the volumes of delay sounds for channels 1–10.
Pan Ch1 – Ch10 (Pan 1 – 10)	L63–R63	Sets the pan of the delay sounds for channels 1–10.
FBTim (Feedback Delay Time)	0–1200 ms	Sets the repetition frequency for feedback.
FBLvl (Feedback Level)	-100–100	Sets the amount of the delay sound should be returned to the delay input.
FX Lvl (Effect Level).	-100–100	Sets the volume of the delay sound.
DirLvl (Direct Level)	-100–100	Sets the volume of the direct sound.

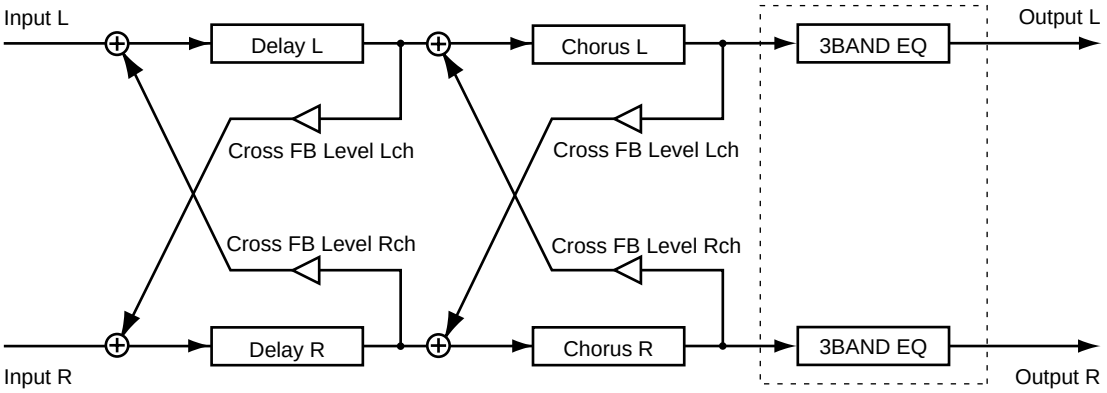
EQ (Equalizer)

Sw (Switch)	On, Off	Turns the equalizer on or off.
Low Gain (Low Gain)	-12– +12 dB	Sets the boost/cut amount in the low frequency band.
Low Freq (Low Frequency)	20 - 2000 Hz	Sets the center frequency in the low frequency band.
Low Q	0.3–10.0	Sets the width of the area around the low frequency that will be affected by the gain settings.1 *1
Low Type	Shlv, Peak	Sets the type of the low frequency band equalizer (Shlving type or peaking type).
Mid Gain (Middle Gain)	-12– +12 dB	Sets the boost/cut amount in the middle frequency band.
Mid Freq (Middle Frequency)	200–8000 Hz	Sets the center frequency in the middle frequency band.
Mid Q (Middle Q)	0.3–10.0	Sets the width of the area around the middle frequency that will be affected by the gain settings.
High Gain	-12– +12 dB	Sets the boost/cut amount in the High frequency band.
High Freq (High Frequency)	1.4–20.0 kHz	Sets the center frequency in the High frequency band.
High Q	0.3–10.0	Sets the width of the area around the High frequency that will be affected by the gain settings.1 *1
Hi Type (High Type)	Shlv, Peak	Sets the type of the High frequency band equalizer (Shlving type or peaking type).
Level (Output Level)	0–100	Sets the volume after passing through the equalizer.

*1: If Low Type (Lo Type) or High Type (Hi Type) is set to “Shlv (Shlving Type),” the setting for Lo Q or High Q is invalid.

Stereo Delay Chorus

Delay and Chorus can be combined to create spaciousness.



How feedback works for Delay and Chorus

Feedback is the feature to return the effect sound to its input. The amount of feedback is set with FBLevel (Feedback Level). Cross-Feedback is the feature to return the effect sound from the right input to the left input and the effect send from the left input to the right. The amount of cross-feedback is set with Cross-Feedback Level (CrossFB Level).

The greater this value becomes, the more times the delay sound is repeated. Setting this level to a negative value inverts the phase.

For feedback of chorus, the greater the value becomes, the more spaciousness and thickness is added to the sound. Setting this level to a negative value inverts the phase.

* *Excessively great values may cause oscillation, leading to abnormal noise.*

Parameter (full name)	Setting	Function
Delay: Adds a delayed sound to the direct sound, adding depth to the sound or creating special effects.		
Sw (Switch)	On, Off	Turns the delay on or off.
Time (Delay Time)	0–500 ms	Sets the time from direct sound until when the delay sound is heard. *1
Shift (Delay Shift)	L500–0–R500 ms	Sets the delay time difference between the right and left delay sounds.
Lch FeedbackLvl (Lch Feedback Level)	-100–100	Sets the amount of the left-side delay should be returned to the left delay input.
Rch FeedbackLvl (Rch Feedback Level)	-100–100	Sets the amount of the right-side delay should be returned to the right delay input.
Lch CrossFeedbackLvl (Lch Cross-Feedback Level)	-100–100	Sets the amount of the left-side delay should be returned to the right delay input.
Rch CrossFeedbackLvl(Rch Cross-Feedback Level)	-100–100	Sets the amount of the right-side delay should be returned to the left delay input.
FX Lvl (Effect Level)	-100–100	Sets the volume of the delay sound.
DirLvl (Direct Level)	-100–100	Sets the volume of the direct sound.

Chorus: **Adds spaciousness and depth to the sound.**

Sw (Switch)	On, Off	Turns the chorus on or off.
Rate (Rate)	0.1–10.0 kHz	Sets the rate of modulation.
Depth (Depth)	0–100	Sets the depth of modulation.
PreDLY (Pre-Delay)	0–50 ms	Sets the time delay from when the direct sound begins until the processed sound is heard.
Lch FeedbackLvl (Lch Feedback Level)	-100–100	Sets the amount of the left-side chorus sound should be returned to the left chorus input.
Rch FeedbackLvl (Rch Feedback Level)	-100–100	Sets the amount of the right-side chorus sound should be returned to the right chorus input.
Lch CrossFeedbackLvl (Lch Cross-Feedback Level)	-100–100	Sets the amount of the left-side chorus sound should be returned to the right chorus input.
Rch CrossFeedbackLvl(Rch Cross-Feedback Level)	-100–100	Sets the amount of the right-side chorus sound should be returned to the left chorus input.
FX Lvl (Effect Level)	-100–100	Sets the volume of the chorus sound.
DirLvl (Direct Level)	-100–100	Sets the volume of the direct sound.

EQ (Equalizer)

Sw (Switch)	On, Off	Turns the equalizer on or off.
Low Gain (Low Gain)	-12– +12 dB	Sets the boost/cut amount in the low frequency band.
Low Freq (Low Frequency)	20 - 2000 Hz	Sets the center frequency in the low frequency band.
Low Q	0.3–10.0	Sets the width of the area around the low frequency that will be affected by the gain settings.1 *2
Low Type	Shlv, Peak	Sets the type of the low frequency band equalizer (Shlving type or peaking type).
Mid Gain (Middle Gain)	-12– +12 dB	Sets the boost/cut amount in the middle frequency band.
Mid Freq (Middle Frequency)	200–8000 Hz	Sets the center frequency in the middle frequency band.
Mid Q (Middle Q)	0.3–10.0	Sets the width of the area around the middle frequency that will be affected by the gain settings.
High Gain	-12– +12 dB	Sets the boost/cut amount in the High frequency band.
High Freq (High Frequency)	1.4–20.0 kHz	Sets the center frequency in the High frequency band.
High Q	0.3–10.0	Sets the width of the area around the High frequency that will be affected by the gain settings.1 *2
Hi Type (High Type)	Shlv, Peak	Sets the type of the High frequency band equalizer (Shlving type or peaking type).
Level (Output Level)	0–100	Sets the volume after passing through the equalizer.

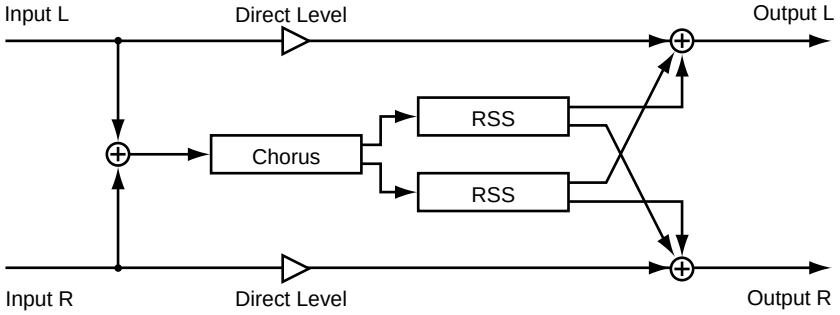
NOTE

*1: The sum of the Delay Time (Time) value and the Delay Shift (Shift) value should not exceed the setting range of Delay Time. For example, if the delay time is set to 300 ms, the setting range of Delay Shift is L200 to R200 ms.

*2: If Lo Type (Low Type) or Hi Type (High Type) is set to “Shlv (Shlving Type),” the setting for Lo Q or High Q is invalid.

Chorus RSS

RSS (p. 58) is connected to the Chorus output. The sound image is defined with the sound from the left-side channel located at left 90˚ and the sound from the right-side channel at right 90˚.



NOTE

- Location is fixed; no azimuth or elevation can be specified.
- Refer to the column “Labeling on RSS product package”(p. 59).

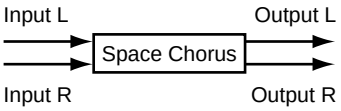
Parameter (full name)	Setting	Function	
ChoRSS (Chorus RSS) : Locates chorus sounds three-dimensionally.			
Rate (Chorus Rate)	0.1–10.0 Hz	Sets the rate of modulation.	
Depth (Chorus Depth)	0–100	Sets the depth of modulation.	
FX Lvl (Effect Level)	-100–100	Sets the volume of the chorus RSS sound.	
DirLvl (Direct Level)	-100–100	Sets the volume of the direct sound.	
Phones (Phones)	Off, On	Set to On when you use headphones Set to Off when you use speakers	*1

NOTE

*1 Refer to the column “Precautions for using RSS”(p. 59).

Space Chorus

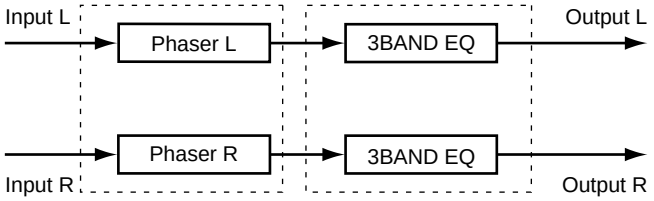
This is a chorus effect simulating Roland SDD-320. The effect to be changed can be reproduced by turning the four buttons 1 to 4 on or off.



Parameter (full name)	Setting	Function
Spcho (Space Chorus):	**Adds a chorus effect simulating SDD-320.**	
Sw (Switch)	On, Off	Turns the space chorus on or off.
InMode (Input Mode)	Mono, Stereo	Specifies whether the input signal is stereo or mono.
Mode (Space Mode)	1, 2, 3, 4, 1+4, 2+4, 3+4	Sets the chorus variation style.
MixBal (Mix Balance)	0–100	Sets the volume balance between the chorus sound and the direct sound.

Stereo Phaser

A phaser adds a phase-shifted sound to the direct sound, producing a twisting modulation that creates spaciousness and depth.



Phaser and Flanger

The effects obtained with Phaser and Flanger are very similar. Both add twisting modulation effects to the sound, creating spaciousness and depth. In other words, they create something like strongly accentuated chorus. Phaser provides a unique surge sounding like bubbles coming up. Flanger works mostly in the same mechanism as for Chorus. Besides that, it can create SE-type sounds like ascending / descending sounds of a jet.

Parameter (full name)	Setting	Function
Phs (Phaser):		**Adds a sound with a shifted phase to the direct sound to add spaciousness to the sound.**
Sw (Switch)	Off, On	Turns the phaser on or off.
Mode (Mode)	4, 8, 12, 16	Sets the number of stages in the phaser (p. 54).
Pol (Polarity)	Sync, Inv	Sets the right and left phases of modulation. *3
Rate (Rate)	0.1–10.0 Hz	Sets the rate at which the phaser will modulate.
Depth (Depth)	0–100	Sets the depth of modulation.
Manual (Manual)	0–100	Sets the reference frequency for adding the surging effect to the sound.
Reso (Resonance)	0–100	Enhances frequency components at around the center frequency set with Manual. *1
CrossFBLvl (Cross-Feedback Level)	0–100	Sets the amount of the phaser sound to be returned to the channel opposite to the one used for input. *2
FX Lvl (Effect Level).	-100–100	Sets the volume of the phaser sound.
DirLvl (Direct Level)	-100–100	Sets the volume of the direct sound.

EQ (Equalizer)

Sw (Switch)	On, Off	Turns the equalizer on or off.
Low Gain (Low Gain)	-12– +12 dB	Sets the boost/cut amount in the low frequency band.
Low Freq (Low Frequency)	20 - 2000 Hz	Sets the center frequency in the low frequency band.
Low Q	0.3–10.0	Sets the width of the area around the low frequency that will be affected by the gain settings.1 *4
Low Type	Shlv, Peak	Sets the type of the low frequency band equalizer (Shlving type or peaking type).
Mid Gain (Middle Gain)	-12– +12 dB	Sets the boost/cut amount in the middle frequency band.
Mid Freq (Middle Frequency)	200–8000 Hz	Sets the center frequency in the middle frequency band.
Mid Q (Middle Q)	0.3–10.0	Sets the width of the area around the middle frequency that will be affected by the gain settings.
High Gain	-12– +12 dB	Sets the boost/cut amount in the High frequency band.
High Freq (High Frequency)	1.4–20.0 kHz	Sets the center frequency in the High frequency band.
High Q	0.3–10.0	Sets the width of the area around the High frequency that will be affected by the gain settings.1 *4
Hi Type (High Type)	Shlv, Peak	Sets the type of the High frequency band equalizer (Shlving type or peaking type).
Level (Output Level)	0–100	Sets the volume after passing through the equalizer.

NOTE

*1: An excessively great values for Resonance (Reso) may cause oscillation.

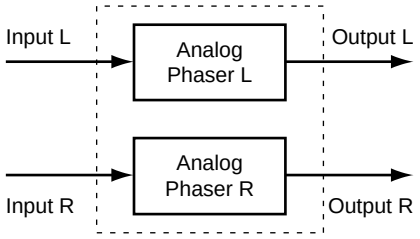
*2: An excessively large value for Cross-Feedback level may cause oscillation.

*3: When a mono source has been input, set “Inv” to provide spaciousness to the sound. Set “Sync” for inputting a stereo source.

*4: If Low Type (Lo Type) or High Type (Hi Type) is set to “Shlv (Shlving Type),” the setting for Lo Q or High Q is invalid.

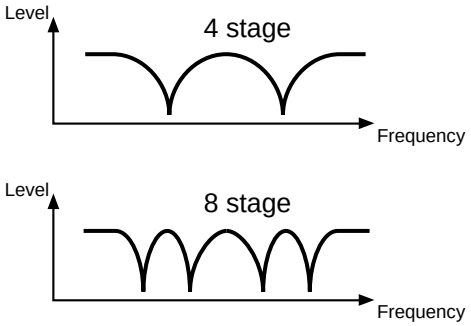
Analog Phaser

Two units of analog phasers are placed in parallel to accommodate stereo sounds. Surges unique to Phaser is created by adding sounds with the phase shifted periodically.



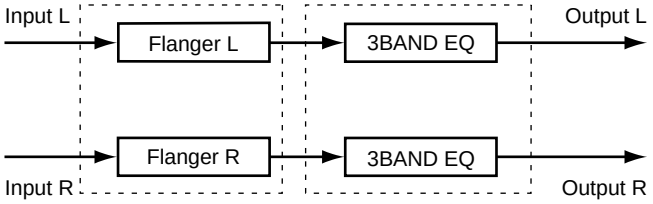
Number of stages of Phaser

As the number of sages of Phaser increases, the number of frequency points suppressed increases as well, generating sharper effect.



Parameter (full name)	Setting	Function
APH (Analog Phaser):	**Two units of analog phaser are placed in parallel to accommodate stereo sounds.**	
Sw (Switch)	On, Off	Turns the analog phaser on or off.
Mode (Mode)	8STAGE, 4STAGE	Sets the number of stages of phaser.
Freq (Frequency)	0–100	Sets the center frequency to which the phase effect is applied.
Reso (Resonance)	0–100	Enhances frequency components at around the center frequency set with Frequency.
LFO1/2 Rate (LFO1/2 Rate)	0–100	Sets the phase effect cycle length.
LFO1/2 Dep (LFO1/2 Depth)	0–100	Sets the depth of the phase effect cycle.
LFO1/2 ChB(LFO1/2 Channel B Inverse)	Nor Inv	“Inv” indicates that the surge phase should be inverted and “Nor” indicates that it should not be inverted.

Stereo Flanger



Flg (Flanger): Adds effect similar to ascending/descending sound of a jet.

Sw (Switch)	On, Off	Turns the flanger on or off.
Pol (Polarity)	Sync, Inv	Sets the right and left phases of modulation. *3
Rate (Rate)	0.1–10.0 Hz	Sets the rate at which the flanger is modulated.
Depth (Depth)	0–100	Sets the depth of modulation.
Manual (Manual)	0–100	Sets the center frequency subject to application of the Flanger effect.
Reso (Resonance)	0–100	Enhances frequency components at around the center frequency set with Manual. *1
CrossFBLvl (Cross-Feedback Level)	0–100	Sets the amount of the flanger sound to be returned to the channel opposite to the one used for input. *2
FX Lvl (Effect Level).	-100–100	Sets the volume of the flanger sound.
DirLvl (Direct Level)	-100–100	Sets the volume of the direct sound.

EQ (Equalizer)

Sw (Switch)	On, Off	Turns the equalizer on or off.
Low Gain (Low Gain)	-12– +12 dB	Sets the boost/cut amount in the low frequency band.
Low Freq (Low Frequency)	20 - 2000 Hz	Sets the center frequency in the low frequency band.
Low Q	0.3–10.0	Sets the width of the area around the low frequency that will be affected by the gain settings.1 *4
Low Type	Shlv, Peak	Sets the type of the low frequency band equalizer (Shlving type or peaking type).
Mid Gain (Middle Gain)	-12– +12 dB	Sets the boost/cut amount in the middle frequency band.
Mid Freq (Middle Frequency)	200–8000 Hz	Sets the center frequency in the middle frequency band.
Mid Q (Middle Q)	0.3–10.0	Sets the width of the area around the middle frequency that will be affected by the gain settings.
High Gain	-12– +12 dB	Sets the boost/cut amount in the High frequency band.
High Freq (High Frequency)	1.4–20.0 kHz	Sets the center frequency in the High frequency band.
High Q	0.3–10.0	Sets the width of the area around the High frequency that will be affected by the gain settings.1 *4
Hi Type (High Type)	Shlv, Peak	Sets the type of the High frequency band equalizer (Shlving type or peaking type).
Level (Output Level)	0–100	Sets the volume after passing through the equalizer.

NOTE

*1: An excessively great values for Resonance (Reso) may cause oscillation.

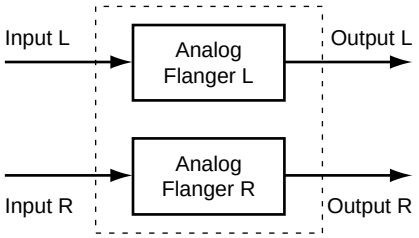
*2: An excessively large value for Cross-Feedback level may cause oscillation.

*3: When a mono source has been input, set “Inv” to provide spaciousness to the sound. Set “Sync” for inputting a stereo source.

*4: If Low Type (Lo Type) or High Type (Hi Type) is set to “Shlv (Shlving Type),” the setting for Lo Q or High Q is invalid.

Analog Flanger

Models Roland SBF-325 Analog Flanger. Provides three types of flanger effects as well as chorus-like effect.



Types of Flanger Effect

Analog Flanger provides a variety of flanger effects or chorus effects. Selecting the desired flanger effect type in Mode.

FL1:	General monaural flanger
FL2:	Stereo flanger that allows stereo location of the direct sound to take effect.
FL3:	Cross mix flanger that provides more powerful effect
CHO:	Chorus effect

AFL (Analog Flanger): Models SBF-325 Analog Flanger.

Parameter (full name)	Setting	Function
Sw (Switch)	On, Off	Turns the analog flanger on or off.
Modulation Freq (Modulation Frequency)	0–100	Sets the center frequency subject to application of the flanger effect.
Modulation Rate (Modulation Rate)	0–100	Sets the flanger's modulation rate.
Modulation Depth (Modulation Depth)	0–100	Sets the depth of the flanger modulation.
Mode (Mode)	FL1, FL2, FL3, CHO	Sets the type of flanger effects.
Feedback (Feedback Level)	0–100	Sets the amount of the delayed sound should be returned to the flanger input. *1, *2
ChB (Channel B Inverse)	Nor, Inv	"Inv" indicates that the Flanger effect on Channel B should be inverted. "Nor" indicates that it should not be inverted.
Phase ChA (Mix A Inverse)	Nor, Inv	"Inv" indicates that the phase should be inverted for mixing Channel A Flanger sound into the direct sound. "Nor" indicates that the phase should not be inverted.
Phase ChB (Mix B Inverse)	Nor, Inv	"Inv" indicates that the phase should be inverted for mixing Channel B Flanger sound into the direct sound. "Nor" indicates that the phase should not be inverted.

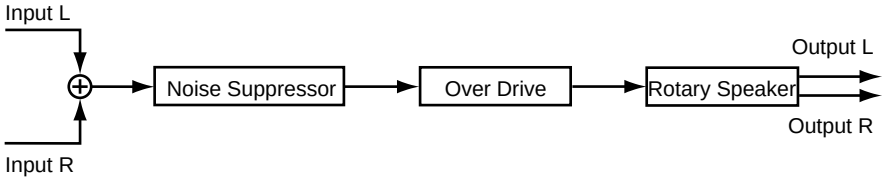
NOTE

*1: This feature is disabled when Mode is set to "CHO."

*2: Excessively large values may cause oscillation.

Rotary

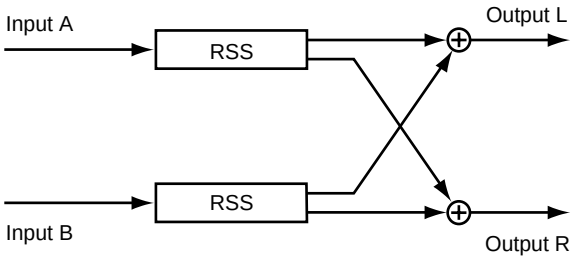
Models a rotary speaker. Behaviors of High and low frequency band Roters can be set up separately, allowing realistic modeling of unique surging sensation. This effect is suited for organ sounds.



Parameter (full name)	Setting	Function
NS (Noise Suppressor):	**Mutes noise in the silent mode.**	
Sw (Switch)	On, Off	Turns the noise suppressor on or off.
Thresh (Threshold)	0–100	Sets the level to start muting noise.
Release (Release)	0–100	Sets the time over which the volume will drop to 0 after the noise starts being muted.
Ovd (Overdrive):	**Adds distortion to the sound.**	
Sw (Switch)	On, Off	Turns overdrive on or off.
Gain (Gain)	0–100	Sets the degree of sound distortion.
Level (Level)	0–100	Sets the volume of the overdrive sound.
Rot (Rotary Speaker):	**Models a rotary speaker.**	
LRate (Low Rate)	0.1–10.0 Hz	Sets the rotary frequency of the low frequency band roter.
HRate (High Rate)	0.1–10.0 Hz	Sets the rotary frequency of the High frequency band roter.

2ch RSS

Gives each of the sounds input into the respective channels three-dimensional locations.

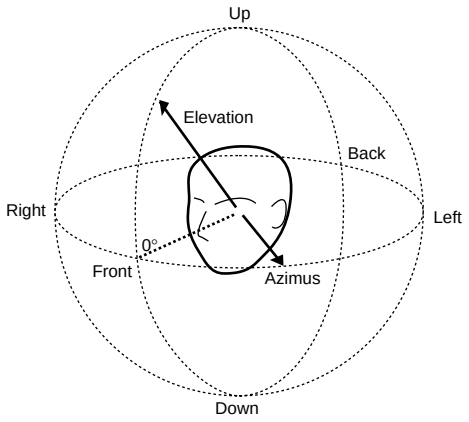


NOTE

- Input A is input into the L-channel side of the effect. Therefore, it is required to insert and connect "Lch" of the effect to the channel handling Input A. Similarly, Input B is input into the R-channel side of the effect. Insert and connect "Rch" of the effect to the channel handling Input B.
- Do not output the direct sound.

What is RSS?

It stands for Roland Sound Space. This is one of the Roland's proprietary effect technologies that enables three-dimensional location of the sound source on the ordinary stereo system. Not only control on effect for the front and the sides of the audience, this technology provides controls on directions (azimuth) such as up, down and rear as well as control on distance to localize the sound source.

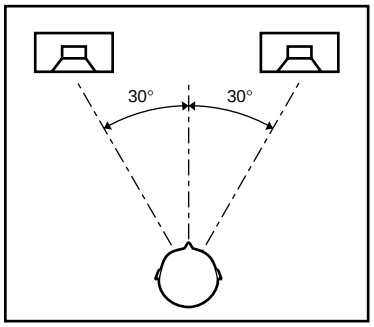


Parameter (full name)	Setting	Function
RSS:	**Gives sounds three-dimensional locations.**	
Azimuth	-180–180°	Sets output directions, front, back, right and left, for the Input A channel.
Elevation	-90–90°	Sets output directions, up and down, for the Input A channel.
Type	A	Same effects can be achieved as the old VS series (VS-880/880EX/890/1680/1880/1824/1824CD/VSR-880).
	B	More distinctive effects can be achieved than Type A.
Phones	Off, On	Set to On when you use headphones Set to Off when you use speakers.

Precautions for using RSS

When you use RSS with Phones Off, please notice the following points.

- Acoustically “dead” rooms are most suitable.
- A single-way speaker is suited. However, a multi-way type will do if it incorporates the coaxial or virtual coaxial system.
- Place the speakers as far as possible from the walls on the sides.
- Do not separate the right and left speakers too much.
- Recommended sweet spots for listening are as follows:



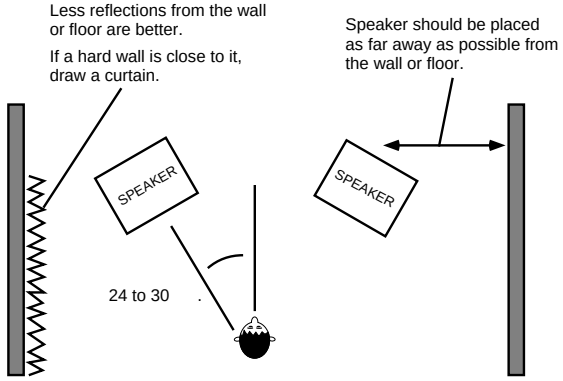
Labeling on RSS product package

In order to allow RSS to demonstrate its maximum performance, it is important to specify listening environment. For sale, we recommend that you should attach the following labeling on the packages of your products produced by using RSS patches.

■ When using with Phones Off

Roland Sound Space For Stereo Speakers

This sound is made to be played specifically through speakers.
The proper effect cannot be obtained if listened to through headphones.



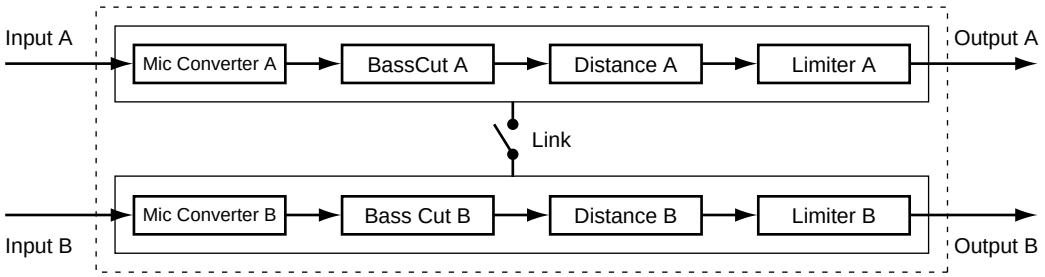
■ When using with Phones On

Roland Sound Space For Headphones

This sound has been made specifically for playing through headphones.
You cannot obtain the proper effect if listening through speakers.

Mic Modeling (Microphone Modeling)

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.



Selecting the microphone used for recording.

Input of Mic Converter selects the type of microphone to be used recording.

DR-20:	Roland DR-20 (dynamic microphone manufactured by Roland)
Sml.Dy:	Small Dynamic Microphone (dynamic microphone used for instruments and vocal)
Hed.Dy:	Head-worn Dynamic Microphone (headset-type dynamic microphone)
Min.Cn:	Miniature Condenser Microphone (very small condenser microphone)
Flat:	Line input
C3000B:	AKG C3000B (Condenser microphone manufactured by AKG)

Microphone types that can be modeled

The characteristics of the low-end general-purpose microphone are converted into the characteristics of the High-end microphone for studio application. You can add sound quality changes to already recorded sounds just as if a different type of microphone were used or if they were recorded at a different distance. In addition, it is possible to add microphone characteristics to line-recorded instrumental sounds. These characteristics can be set up by selecting the relevant value for Out of Mic Converter.

Sml.Dy:	Dynamic microphone for general musical instruments and vocal sounds. Ideal for a guitar amplifier and snare drums.
Voc.Dy:	Dynamic microphone for standard vocal sounds. Characterized in middle frequency band sounds with tension. Suited for vocal.
Lrg.Dy:	Dynamic microphone with a extended low frequency band. For bass and tom drums.
Sml.Cn:	Small condenser microphone for musical instruments. Characterized in bright High frequency band sounds. For metal percussion and acoustic guitars.
Lrg.Cn:	Condenser microphone with flat characteristics. For vocal, narration and live musical instruments.
Vnt.Cn:	Vintage condenser microphone. For vocal and live musical instruments.
Flat:	Microphone with flat frequency response. For removing peculiarity of the microphone used for recording sounds.

* *When a condenser-type mic is selected in OUT, low-range noise transmitted through the mic stand may be accentuated due to the mic's low range characteristics. In such instances, either cut out any unnecessary low end with bass cut filter, or equip the mic stand with an isolation mount (a mic holder with rubber or other shock absorbing material).*

Proximity effect of microphone

In nature, a microphone tends to extend the low frequency band characteristics when placed close to the sound source. This is called proximity effect. This effect can be modeled in Proximity Effect (Prox-Efect). Set the parameter to a positive (+) value for a shorter distance to the sound source and a negative (-) value for a longer distance to the sound source. Time of Distance models the time difference due to distance from the sound source.

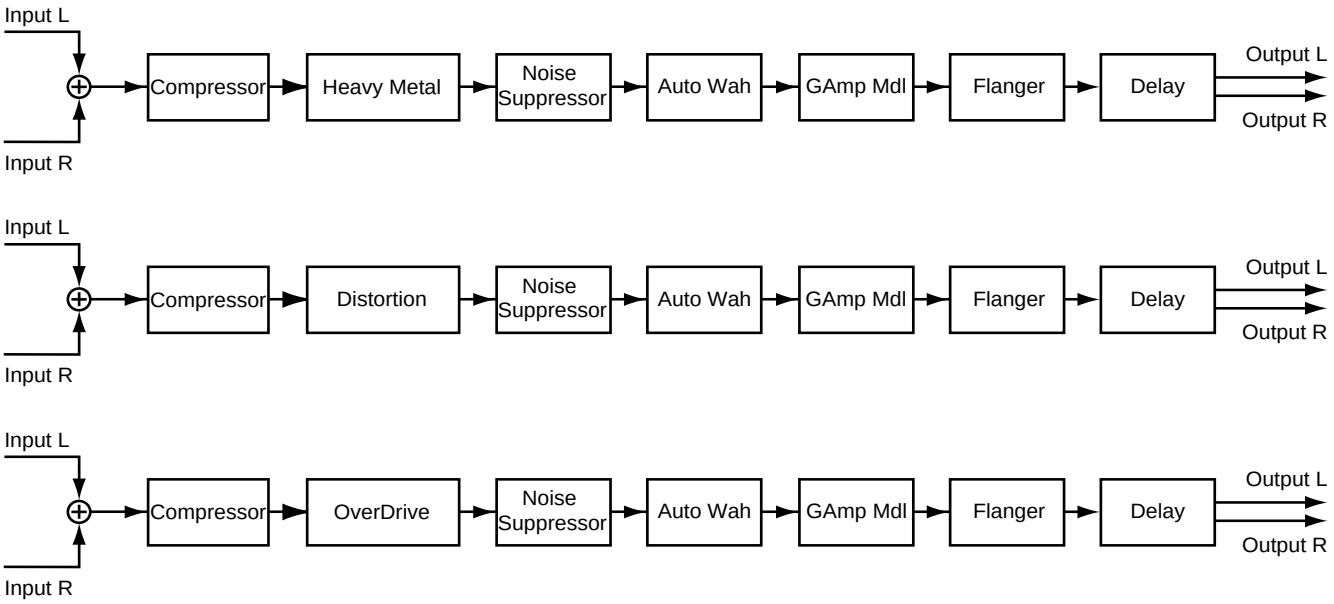
Controlling Channels A and B separately

Setting Link On enables simultaneous control on the 4-Band Parametric Equalizer via Channel B according to the settings on the Channel A side. To control Channels A and B separately, turn Link Off.

Parameter (full name)	Setting	Function
Lnk (Link):	**Channel B follows the settings for Channel A.**	
Link (Link Switch)	On, Off	Specifies if Channel B follows or does not follow the settings for Channel A.
CnvA, CnvB (Mic Converter):	**Converts the characteristics of the low-end general-purpose microphone into the characteristics of the High-end microphone for studio application.**	
Sw (Switch)	On, Off	Turns the microphone converter on or off.
Input (Input)	See the column on the previous page.	Sets the microphone type used for recording.
Output (Output)	See the column on the previous page.	Sets the microphone types to be Modeled.
Phase (Phase)	Nor, Inv	Sets the microphone phase.
BCutA, BCutB (Bass Cut Filter):	**Cuts off undesired low frequency band sounds such as pop noise.**	
Sw (Switch)	On, Off	Turns the bass cut filter on or off.
Freq (Frequency)	Thru, 20 - 2000 Hz	Sets the frequency for cutting off undesired low frequency band sounds such as pop noise.
DstnA, DstnB (Distance):	**Models the frequency characteristics and time difference due to distance difference.**	
Sw (Switch)	On, Off	Turns the distance on or off.
Prox.Fx (Proximity Effect)	-12– +12	Corrects the low frequency band characteristics due to the distance from the sound source.
Time (Time)	0–3000 cm	Models the time difference due to the distance from the sound source.
LmtA, LmtB (Limiter):	**Prevents distortion by suppressing signals at High levels.**	
Sw (Switch)	On, Off	Turns the limiter on or off.
Thrsh (Threshold)	-60–0 dB	Sets the volume level to start suppressing excessive input.
Attack (Attack Time)	0–100	Sets the time from when the input level exceeds the threshold level to when the effect begins to apply.
Release (Release Time)	0–100	Sets the time from when the input level drops below the threshold level to when the effect ceases to apply.
Detect HPF Freq (Detect HPF Frequency)	Thru, 20 - 2000 Hz	Normally, sets “Thru”. Sets the cutoff frequency of the level detection section.
Level (Output Level)	-60– +24 dB	Sets the volume of the compressor sound.

Guitar Multi 1–3

These provide multi-effects for guitar sounds suited for rock. Guitar Multi 1 through 3 differ in the degree of sound distortion. Guitar Multi 1 provides the Highest degree of distortion and Guitar-Multi 3 the lowest.



Usage of Guitar Multi 1 through 3

The basic configuration is almost identical for all of Guitar-Multi 1 through 3. The only difference is the type of the second effect (heavy metal, distortion, and overdrive). Select Guitar Multi 1 to add severe distortion to the sound, and select Guitar Multi 3 for soft distortion as that achieved with the vacuum tube amplifier.

Adding Wah effect by changing input volume

Typically, Auto-Wah provides an automatic wah effect at the cycle set with Rate (Rate).
Alternatively, you can give wah effect according to changes of input volume. For example, you can apply the wah effect so that it reflects changes in picking on the guitar. First, adjust sensitivity for changes in input volume by using Sense (Sens). Set it to a larger value for finer subtlety. After that, you simply decide the direction into which the filter should be moved by entering a setting for Polarity (Pol).

Selecting Guitar Amplifier

You can select which type of Guitar Amplifier to use with Mode (Mode) under Guitar Amplifier Simulator.

Small:	Small-sized amplifier
Built In:	Built-in type amplifier
2 Stack:	Large-sized two-deck stacked amplifiers
3 Stack:	Large-sized three-deck stacked amplifiers

Compressors used in Guitar Multi 1 through 3

Compressors used in Guitar Multi 1 through 3 are designed to accommodate playing of the guitar, providing a slightly different effect from ordinary compressors. Compressors for the guitar unifies volumes by suppressing signals at High levels and enhancing signals at low levels.
Unlike these, ordinary compressors simply suppress signals at High levels.

Parameter (full name)	Setting	Function
Comp (Compressor):Compresses the entire output signals when the input volume exceeds a specified value.		
Sw (Switch)	On, Off	Turns the compressor on or off.
Sustain (Sustain)	0–100	Sets the time over which low level signals are boosted to a constant volume.
Attack (Attack)	0–100	Sets the strength of attack when a sound is input.
Tone (Tone)	-50–50	Sets the tone color.
Level (Level)	0–100	Sets the volume of the compressor sound.
Metal (Heavy Metal) / Dstr (Distortion) / Ovd (Overdrive): Gives distortion to the sound.		
Sw (Switch)	On, Off	Turns the metal, distortion or overdrive on or off.
Gain (Gain)	0–100	Sets the degree of the distortion.
Low Gainain (Low Gain)	-100–100	Sets the boost/cut amount in the low frequency band. (only for Metal)
MidGain (Middle Gain)	-100–100	Sets the boost/cut amount in the middle frequency band.(only for Metal)
High Gainain (High Gain)	-100–100	Sets the boost/cut amount in the High frequency band. (only for Metal)
Tone (Tone)	0–100	Sets the tone color. (for Distortion/Overdrive only)
Level (Level)	0–100	Sets the volume of the metal, distortion or overdrive sound.
NS (Noise Suppressor): Mutes noise in the silent mode.		
Sw (Switch)	On, Off	Turns the noise suppressor on or off.
Thresh (Threshold)	0–100	Sets the level to start muting noise.
Release (Release)	0–100	Sets the time over which the volume will drop to 0 after the noise starts being muted.
Wah (Auto Wah): Adds the wah effect.		
Sw (Switch)	On, Off	Turns the auto wah on or off.
Mode (Mode)	LPF, BPF	Set to “BPF” for the wah effect in a narrow range of frequencies and to “LPF” for wah effect in a broad range of frequencies.
Pol (Polarity)	Up, Down	Activated only for adding the wah effect according to input volume changes. Set to “Up” for moving the filter to a Higher frequency and “Down” for moving it to a lower frequency.
Sens (Sense)	0–100	Normally “0.” Sets sensitivity for input volume changes for adding the wah effect according to input volume changes.
Freq (Frequency)	0–100	Sets the frequency at which the wah effect starts working.
Peak (Peak)	0–100	Sets the degree of the wah effect applied at around the frequency.
Rate (Rate)	0.1–10.0 Hz	Sets the rate at which the wah effect will be cyclically modulated.
Depth (Depth)	0–100	Sets the depth at which the wah effect will be cyclically modulated.
Level (Level)	0–100	Sets the volume of the wah sound.
Mdl (Guitar Amplifier Simulator): Models Guitar Amplifier.		
Sw (Switch)	On, Off	Turns the guitar amplifier simulator on or off.
Mode (Mode)	See the column on the previous page.	Type of the guitar amplifier.
Flg (Flanger): Adds effects similar to ascending/descending sound of a jet.		
Sw (Switch)	On, Off	Turns the flanger on or off.
Rate (Rate)	0.1–10.0 Hz	Sets the rate of modulation for the flanger.
Depth (Depth)	0–100	Sets the depth of modulation for the flanger.
Manual (Manual)	0–100	Sets the center frequency subject to application of the flanger effect.
Reso (Resonance)	0–100	Enhances frequency components at around the center frequency set with Manual.

→ Continued...

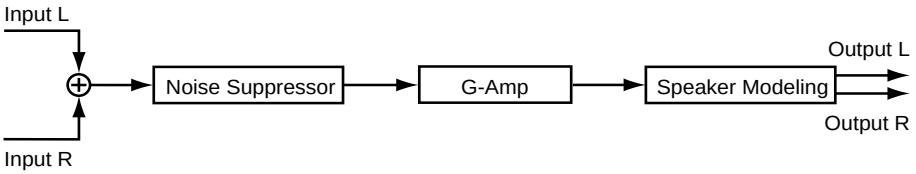
Dly (Delay):Adds a delayed sound to the direct sound, adding depth to the sound or creating special effects.

Sw (Switch)	On, Off	Turns the delay on or off.
Time (Delay Time)	0–1000 ms	Sets the time from direct sound until when the delay sound is heard. *1
shift (shift)	L1000–0–R1000 ms	Sets the delay time difference between the right and left delay sounds.
FBTim (Feedback Delay Time)	0–1000 ms	Sets the feedback repetition cycle.
FBLvl (Feedback Level)	-100–100	Sets the amount of the delay sound should be returned to the delay input.
FX Lvl (Effect Level)	-100–100	Sets the volume of the delay sound.
DirLvl (Direct Level)	-100–100	Sets the volume of the direct sound.

NOTE *1: The sum of the Delay Time value and the Delay shift value should not exceed the setting range of Delay Time. For example, if Delay Time is set to 800 ms, the setting range of Delay shift is L200 to R200 ms.

Guitar Amp Modeling (Guitar Amplifier Modeling)

Models a guitar amplifier.



Parameter (full name) Setting Function

NS (Noise Suppressor): Mutes noise in the silent mode.

Sw (Switch)	On, Off	Turns the noise suppressor on or off.
Thresh (Threshold)	0–100	Sets the level to start muting noise.
Release (Release)	0–100	Sets the time over which the volume will drop to 0 after the noise starts being muted.

AMP (Pre-Amplifier): Models the pre-amplifier section of a guitar amplifier.

Sw (Switch)	On, Off	Turns the compressor on or off.	
Amp Type (Pre-amplifier type)	See the column on the next page.	Sets the type of the guitar amplifier.	
Gain (Gain)	Low, Middle, High	Sets the degree of sound distortion on the pre-amplifier.	
Bright (Bright)	On, Off	You can set this on to generate clear-cut bright sounds.	*1
Volume (Volume)	0–100	Sets the volume and degree of distortion of the amplifier.	
Bass (Bass)	0–100	Sets the tone of the low range.	
Middle (Middle)	0–100	Sets the tone of the middle range.	*2
Treble (Treble)	0–100	Sets the tone of the High range.	
Presence (Presence)	0–100 (-100–0)	Sets the tone of the ultra-High range.	*3
Master (Master)	0–100	Sets the volume of the entire pre-amplifier	

Sp (Speaker Simulator): Models a speaker.

Sw (Switch)	On, Off	Turns the speaker simulator on or off.
Sp Type (Speaker Type)	See the column on the previous page.	Sets the speaker type.
Mic Setting (Microphone Setting)	1, 2, 3	Sets the location of the microphone that is recording the sound of the speaker.This can be adjusted in three steps, with the microphone becoming more distant in the order of 1, 2, and 3.
MicLvl (Microphone Level)	0–100	Sets the microphone volume.

DirLvl (Direct Level)	0–100	Sets the volume of the direct sound.

NOTE
*1: Can be set only when JC-120, Clean Twin or BG Lead is selected for Pre-amplifier Type.
*2: Cannot be set when Match Drive is selected for the Pre-amplifier Type.
*3: The setting range is -100 to 0 when Match Drive is selected for the Pre-amplifier Type.

Pre-amplifier

Models the pre-amplifier section of a guitar amplifier. 14 types of pre-amplifiers that can be modeled are listed below: The type can be set with pre-amplifier Type.

JC-120:	The sound of a Roland.
Clean Twin:	The sound of standard built-in type vacuum tube amplifier.
Match Drive:	The sound of a recent vacuum tube amplifier widely used in blues, rock and fusion.
BG Lead:	The sound of a vacuum tube amplifier representative of the late 70's through 80's.
MS1959<I>:	The sound of the large vacuum tube amplifier stack that was indispensable to the British hard rock of the 70's, with input I connected.
MS1959<II>:	The same amplifier as MS1959 <I>, but with input II connected.
MS1959<I+II>:	The same amplifier as MS1959 <I>, but with input I and II connected in parallel.
SLDN Lead:	The sound of a vacuum tube amplifier usable in a wide variety of styles.
Metal 5150:	The sound of a large vacuum tube amplifier 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-2Turbo:	The sound of the BOSS OD-2 compact effector with the Turbo switch on.
Distortion:	Distortion sound
Fuzz:	Fuzz sound

* *With JC-120, Clean Twin or BG Lead is selected, turning Bright (Bright) on generates clear-cut bright sound.*

Speaker simulator

Models a speaker. The 12 types of speakers as listed below can be modeled: The type is set with Speaker Type. The type can be set with Speaker Type.

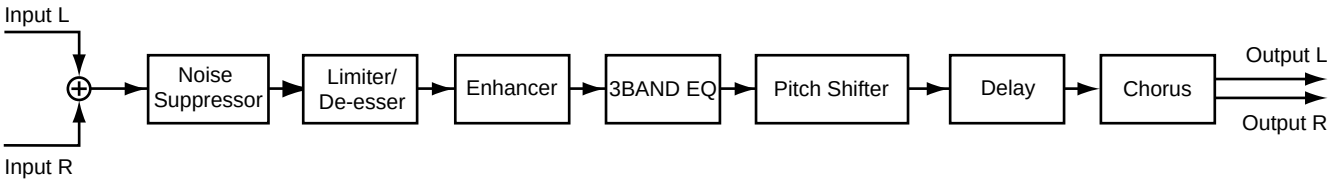
Type	Cabinet (size (in inch), number of units)	Speaker	Microphone
Small	Small open-back enclosure	10	Dynamic microphone
Middle	Open back enclosure	12 x 1	Dynamic microphone
JC-120	Open back enclosure	12 x 2	Dynamic microphone
Built In 1	Open back enclosure	12 x 2	Dynamic microphone
Built In 2	Open back enclosure	12 x 2	Condenser microphone
Built In 3	Open back enclosure	12 x 2	Condenser microphone
Built In 4	Open back enclosure	12 x 2	Condenser microphone
BG Stack 1	Sealed enclosure	12 x 2	Condenser microphone
BG Stack 2	Large sealed enclosure	12 x 2	Condenser microphone
MS Stack 1	Large sealed enclosure	12 x 4	Condenser microphone
MS Stack 2	Large sealed enclosure	12 x 4	Condenser microphone
Metal Stack	Large double stack	12 x 4	Condenser microphone

Recommended combinations of Pre-amplifier and Speaker

Pre-amplifier Type	Speaker Type
BG Lead	BG Stack 1, BG Stack 2, Middle
MS1959II	BG Stack 1, BG Stack 2, Metal Stack
MS1959I+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 In1 - 4
Distortion	Built In1 - 4
Fuzz	Built In 1 - 4

Vocal Multi

This feature provides a multi-effect suited for vocals.



Cutting distortion in vocals

Limiter can be used to suppress signals at a High level to prevent sound distortion. To do this, follow the steps below:

Mode (Mode):	Limiter
Limiter Threshold (Thresh):	Sets the volume at which sound distortion starts being suppressed.
Limiter Release (Release):	Determines the time that elapses before the input level becomes off after it drops below the Limiter Threshold.
Limiter Level (Level):	Decides the volume after passing through Limiter.

Cutting the sibilant sounds of a voice.

De-esser can be used to cut off sibilant sounds contained in vocal sounds to achieve softer sound quality. To do this, follow the steps below:

Mode (Mode):	De-esser
De-esser Sense (Sens):	Sets the degree of the De-esser effect.
De-esser Frequency (Freq):	Sets the frequency at which De-esser effect starts working.

Parameter (full name)	Setting	Function
NS (Noise Suppressor): Mutes noise in the silent mode.		
Sw (Switch)	On, Off	Turns the noise suppressor on or off.
Thresh (Threshold)	0–100	Sets the level to start muting noise.
Release (Release)	0–100	Sets the time over which the volume will drop to 0 after the noise starts being muted.
Lmt (Limiter / De-esser): Suppresses signals at High levels to control distortion / Suppresses the annoying s-consonant.		
Sw (Switch)	On, Off	Turns the limiter/de-esser on or off.
Mode (Mode)	Limiter, De-esser	Selects limiter or de-esser.
Thresh (Limiter Threshold)	0–100	Sets the volume at which sound distortion starts being suppressed.
Release (Limiter Release)	0–100	Sets the time until when the limiter will turn off after the input level falls the limiter Threshold (Thresh).
Level (Limiter Level)	0–100	Sets the volume of the limiter sound.
ENH (Enhancer): Accentuates the sound and push the sound forward.		
Sw (Switch)	On, Off	Turns the enhancer on or off.
Sens (Sense)	0–100	Sets the degree of the enhancer effect desired.
Freq (Frequency)	1.0–10.0 kHz	Sets the frequency at which the enhancer effect starts working.
MixLvl (Mix Level)	0–100	Sets the amount of the enhancer sound should be mixed into the direct sound.
Level (Level)	0–100	Sets the volume of the enhancer sound.

EQ (Equalizer)

Sw (Switch)	On, Off	Turns the equalizer on or off.
Low Gain (Low Gain)	-12– +12 dB	Sets the boost/cut amount in the low frequency band.
Low Freq (Low Frequency)	20 - 2000 Hz	Sets the center frequency in the low frequency band.
Low Q	0.3–10.0	Sets the width of the area around the low frequency that will be affected by the gain settings.1 *1
Low Type	Shlv, Peak	Sets the type of the low frequency band equalizer (Shlving type or peaking type).
Mid Gain (Middle Gain)	-12– +12 dB	Sets the boost/cut amount in the middle frequency band.
Mid Freq (Middle Frequency)	200–8000 Hz	Sets the center frequency in the middle frequency band.
Mid Q (Middle Q)	0.3–10.0	Sets the width of the area around the middle frequency that will be affected by the gain settings.
High Gain	-12– +12 dB	Sets the boost/cut amount in the High frequency band.
High Freq (High Frequency)	1.4–20.0 kHz	Sets the center frequency in the High frequency band.
High Q	0.3–10.0	Sets the width of the area around the High frequency that will be affected by the gain settings.1 *1
Hi Type (High Type)	Shlv, Peak	Sets the type of the High frequency band equalizer (Shlving type or peaking type).
Level (Output Level)	0–100	Sets the volume after passing through the equalizer.

Pshift (Pitch shifter): shifts the pitch.

Sw (Switch)	On, Off	Turns the pitch shifter on or off.
Chromatic Pitch	-12–12	Pitch variation (by semitone)
Fine Pitch	-100–100	Pitch variation (by cent)
FX Lvl (Effect Level)	-100–100	Sets the volume of the pitch shift sound.
DirLvl (Direct Level)	-100–100	Sets the volume of the direct sound.

Dly(Delay):Adds a delayed sound to the direct sound, adding depth to the sound or creating special effects.

Sw (Switch)	On, Off	Turns the delay on or off.
Time (Delay Time)	0–1000 ms	Sets the time from direct sound until when the delay sound is heard.
FBLvl (Feedback Level)	-100–100	Sets the amount of the delay sound should be returned to the delay input.
FX Lvl (Effect Level)	-100–100	Sets the volume of the delay sound.
DirLvl (Direct Level)	-100–100	Sets the volume of the direct sound.

Cho (Chorus): Adds spaciousness and thickness to the sound.

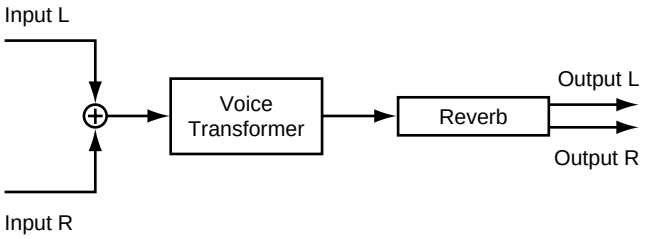
Sw (Switch)	On, Off	Turns the chorus on or off.
Rate (Rate)	0.1–10.0 Hz	Sets the rate of modulation.
Depth (Depth)	0–100	Sets the depth of modulation.
PreDLY (Pre-Delay)	0–50 ms	Sets the time delay from when the direct sound begins until the processed sound is heard.
FX Lvl (Effect Level)	-100–100	Sets the volume of the chorus sound.
DirLvl (Direct Level)	-100–100	Sets the volume of the direct sound.

NOTE

*1: If Low Type (Lo Type) or High Type (Hi Type) is set to “Shlv (Shlving Type),” the setting for Lo Q or High Q is invalid.

Voice Transformer

You can convert male voice into female voice, female voice into male voice, and human voice into mechanical voice to create sounds of various qualities by controlling the base pitch and the formant separately.

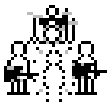


NOTE

- When inputting voice, use voice of one person only. Inputting voices of more than one person disables normal operation.
- 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.
- A undirectional microphone is recommended for use. It is also recommended that the person should speak standing as close to the microphone as possible.
- "Voice Transformer" cannot be used on EFFECT2, 4, 6, and 8 (even-numbered effects).
- When "Voice Transformer" is used on EFFECT1, 3, 5, and 7 (odd-numbered effects), EFFECT2, 4, 6, and 8 (even-numbered effects) cannot be used.
- "Voice Transformer" cannot be used on the projects with 64kHz or higher sampling rate.

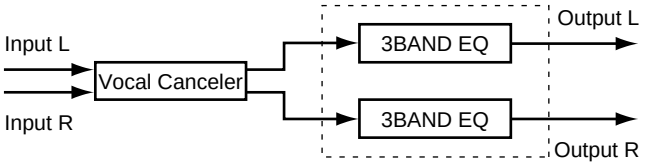
Parameter (full name)	Setting	Function
VT (Voice Transformer): Creates various voice characters.		
Sw (Switch)	On, Off	Turns Vocal the transformer on or off.
Robot (Robot)	On, Off	When this is on, the audio will be output at a fixed pitch regardless of the pitch that is input.
Chromatic Pitch	-12– +36	Sets the pitch variation of the voice to be output (by semitone).
Fine Pitch	-100–100	Sets the pitch variation of the voice to be output (by cent).
Chromatic Formant	-12– +12	Sets the formant variation of the voice to be output (by semitone).
Fine Formant	-100– +100	Sets the formant variation of the voice to be output (by cent).
MixBal (Mix Balance)	0–100	Sets the volume balance between the output voice and the input voice.
REV (Reverb): Adds reverberation.		
Sw (Switch)	On, Off	Turns the reverb on or off.
Time (Reverb Time)	0.1–32.0 sec	Sets the length (time) of the reverb sound.
PreDLY (Pre-Delay)	0–200 ms	Sets the time until the reverberation appears.
Densty (Density)	0–100	Sets the density of the reverb sound.
FX Lvl (Effect Level).	0–100	Sets the volume of the reverb sound.

Formants (p.13)



Vocal Canceler

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



NOTE

Depending on the music 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 canceler may not produce the desired result.

Canceling the vocals alone

Vocal Canceler cancels the sound located in the center. That means it cancels sounds such as the bass and sounds of the lead instrument along with vocal sounds. To cancel vocals only to create music for karaoke, for example, set Range Lo to around 100 Hz and Range Hi to around 1 kHz.

Parameter (full name)	Setting	Function
VC (Vocal Canceler):	**Cancels sounds located in the center such as vocals and the bass.**	
Sw (Switch)	On, Off	Turns the vocal canceler on or off.
Balance (Balance)	0–100	If the sound that you wish to cancel is not located in the center, find the point at which it is most effectively cancelled.
RangeLo (Range Low)	Unlimit, 20 - 2000 Hz	Sets the lower limit of the frequency band to be canceled. *1
RangeHi (Range High)	1.0 - 20.0 kHz, Unlimit	Sets the upper limit of the frequency band to be canceled. *2
EQ (Equalizer)		
Sw (Switch)	On, Off	Turns the equalizer on or off.
Low Gain (Low Gain)	-12– +12 dB	Sets the boost/cut amount in the low frequency band.
Low Freq (Low Frequency)	20 - 2000 Hz	Sets the center frequency in the low frequency band.
Low Q	0.3–10.0	Sets the width of the area around the low frequency that will be affected by the gain settings.1 *3
Low Type	Shlv, Peak	Sets the type of the low frequency band equalizer (Shlving type or peaking type).
Mid Gain (Middle Gain)	-12– +12 dB	Sets the boost/cut amount in the middle frequency band.
Mid Freq (Middle Frequency)	200–8000 Hz	Sets the center frequency in the middle frequency band.
Mid Q (Middle Q)	0.3–10.0	Sets the width of the area around the middle frequency that will be affected by the gain settings.
High Gain	-12– +12 dB	Sets the boost/cut amount in the High frequency band.
High Freq (High Frequency)	1.4–20.0 kHz	Sets the center frequency in the High frequency band.
High Q	0.3–10.0	Sets the width of the area around the High frequency that will be affected by the gain settings.1 *3
Hi Type (High Type)	Shlv, Peak	Sets the type of the High frequency band equalizer (Shlving type or peaking type).
Level (Output Level)	0–100	Sets the volume after passing through the equalizer.

→ Continued...

NOTE

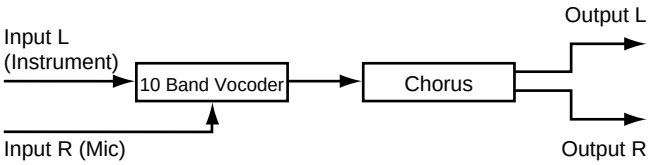
*1: Setting to “Unlimit” means that the frequency that can be played back on this unit is the lower limit.

*2: Setting to “Unlimit” means that the frequency that can be played back on this unit is the upper limit.

*3: If Low Type (Lo Type) or High Type (Hi Type) is set to “Shlv (Shlving Type),” the setting for Lo Q or High Q is invalid.

Vocoder

The vocoder creates “talking instrument” effects. To use Vocoder, input an instrumental sound into the left channel and a vocal sound into the right channel. The instrumental sound is split into ten frequency bands to be processed according to its frequency components.



NOTE

Instrumental sounds are input into the L-channel side of the effect. Therefore, it is required to insert and connect “Lch” of the effect to the channel handling instrumental sounds. Similarly, vocal sounds are input into the R-channel side of the effect. Insert and connect “Rch” of the effect to the channel handling vocal sounds.

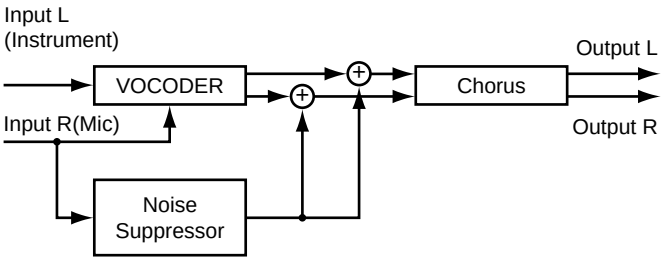
Tips for using Vocoder

It is a good idea to choose instrumental sounds containing a lot of overtones. Recommended sounds include those with saw-tooth waveforms such as strings and distorted guitar sounds.

Parameter (full name)	Setting	Function
Voc (Vocoder): The pitch is specified with the instrumental sound while the tone is output in vocals.		
Char 1–10 (Voice Characters)	0–100	Sets the volume by frequency band. These are used to change the vocoder tone.
CHO (Chorus): Adds spaciousness and depth to the sound.		
Sw (Switch)	On, Off	Turns the chorus on or off.
Rate (Rate)	0.1–10.0 Hz	Sets the rate of modulation.
Depth (Depth)	0–100	Sets the depth of modulation.
PreDLY (Pre-Delay)	0–50 ms	Sets the time delay from when the direct sound begins until the processed sound is heard.
FBLvl (Feedback Level)	-100–100	Sets the amount of the chorus sound should be returned to the chorus input.
FX Lvl (Effect Level)	-100–100	Sets the volume of the chorus sound.
DirLvl (Direct Level)	-100–100	Sets the volume of the direct sound.

Vocoder2 (19)

This is a 19-band vocoder. Provides clear sounds that used to be impossible with the previous vocoders.



NOTE

- Instrumental sounds are input into the L channel side of Effect. Therefore, it is required to insert-connect “Lch” of Effect to the channel handling instrumental sounds. Similarly, vocal sounds are input into the R channel side of Effect. Insert-connect “Rch” of Effect to the channel handling vocal sounds.
- “Vocoder2 (19)” cannot be used on EFFECT2, 4, 6, and 8 (even-numbered effects).
- When “Vocoder2 (19)” is used on EFFECT1, 3, 5, and 7 (odd-numbered effects), EFFECT2, 4, 6, and 8 (even-numbered effects) cannot be used.
- “Vocoder2 (19)” cannot be used on the projects with 64kHz or higher sampling rate.

Difference between Vocoder and Vocoder 2

Compared to Vocoder, Vocoder 2 has a significant number of frequency bands as points. It also makes it possible to make fine adjustment including adjustment of the input sensitivity of the microphone and location of sounds as well as setting the input level for instrumental sounds and removing noise. All this yields clear human voices.

“Envelope” for defining sound characteristics

Each sound has its own envelope. An envelope gives characteristics to the sound and functions as a significant factor for the human ear to distinguish different sound types. On Vocoder 2, you can use Envelope to give the following characteristics.

Sharp:	Enhances human voice.
Soft:	Enhances instrumental sound.
Long:	Vintage sound with long reverberation.

Sound location

Pan Mode (PanMode) can be used to specify how Vocoder sounds should be located.

Mono:	Locating in the middle.
Stereo:	Stereo (Odd-number frequencies are located to the left and even-number frequencies to the right.)
L→R:	Lower frequencies are located to the left and upper frequencies to the right.
R→L:	Lower frequencies are located to the right and upper frequencies to the left.

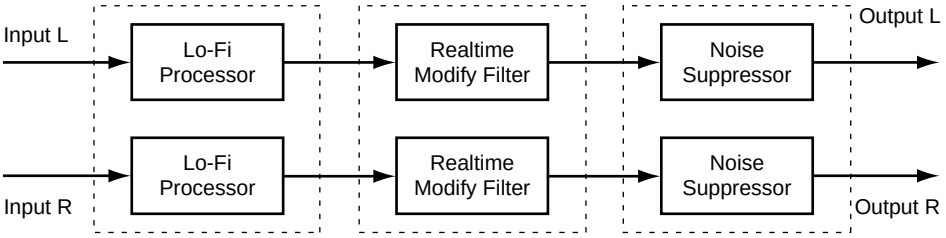
Sounding instrumental sounds with the formant fixed

While inputting voice through the microphone, instrumental sounds can be sounded at the same vocal formant. For example, when saying “a-i-u-e-o” into the microphone, set “Hold” On at the moment the speaker is on the “i” sound to issue an instrumental sound with the formant of the “i” sound.

Parameter (full name)	Setting	Function
Voc (Vocoder 2):	**The pitch is specified as in the instrumental sound while the tone is output in the human voice.**	
Envelope (Envelope)	Sharp, Soft, Long	Defines characteristics of the sound.
PanMode (Pan Mode)	Mono, Stereo, L→R, R→L	Defines how the sound is located.
Hold (Hold)	On, MIDI	Specifies that an instrumental sound is or is not issued with the formant fixed.
MicSens (Microphone Sensitivity)	0–100	Sets the input sensitivity of the microphone.
SynInLvl (Synthesizer In Level)	0–100	Sets the input level of the instrumental sound.
Character Ch1 – 19 (Voice Character Channels 1 - 19)	0–100	Sets the tone of the vocoder.
Mic (Microphone Mix)	0–100	Sets the amount of the sound after passing through the microphone HPF should be mixed into the Vocoder output.
MicHPF (Microphone HPF)	Thru, 1.0–20.0 kHz	Sets the frequency at which HPF on the vocal sounds through the microphone starts taking effect. Sets this to “Thru” if HPF is not desired.
MicPan (Microphone Pan)	L63–R63	Sets the panning of vocal sounds through the microphone.
NSThresh (Noise Suppressor Threshold)	0–100	Sets the volume to start muting noise on the instrumental sound input.
Cho (Chorus):	**Adds spaciousness and depth to the sound.**	
Sw (Switch)	On, Off	Turns the chorus on or off.
Rate (Rate)	0.1–10.0 Hz	Sets the rate of modulation.
Depth (Depth)	0–100	Sets the depth of modulation.
PreDly (Pre-Delay)	0–50 ms	Sets the time delay from when the direct sound begins until the chorus sound is heard.
MixBal (Mix Balance)	0–100	Sets the volume balance between the chorus sound and the direct sound.

Lo-Fi Processor

This allows you to create a “lo-fi” sound by lowering the sample rate and / or decreasing the number of bits.



Creating lo-fi sounds

Follow the steps below to create lo-fi sounds essential to dance music including hip-hop and DJ music.

Lo-fi Processor

- Turn Pre Filter and Post Filter off. This provides powerful lo-fi sounds containing digital distortion.
- Set Rate and Bit to relatively low values. Note, however, an excessively low value for Bit may cause big noise even in the silent mode. In that case, increase Threshold (Thresh) of Noise Suppressor.

Realtime Modify Filter

- Increase resonance to add a twist to the sound. Note that excessive resonance may cause oscillation.

Lo-Fi (Lo-Fi Processor): Creates lo-fi sounds.

Sw (Switch)	On, Off	Turns the lo-fi processor on or off.
Pre Filter (Pre Filter Switch)	On, Off	Turns the filter to reduce digital distortion on or off.
Rate (Rate)	Off, 1/2 - 1/32	Sets the sample rate. Set Rate to “Off” if no change is desired.
Bit (Bit)	Off, 15 bits - 1 bit	Sets the number of bits in data. Set Bit to “Off” if no change is desired.
Post Filter (Post Filter Switch)	On, Off	Turns the filter to reduce digital distortion due to modification to lo-fi sounds on or off.
FX Lvl (Effect Level).	0–100	Sets the volume of the lo-fi sound.
DirLvl (Direct Level)	0–100	Sets the volume of the direct sound.

RMF (Realtime Modify Filter): Creates sounds with a twist.

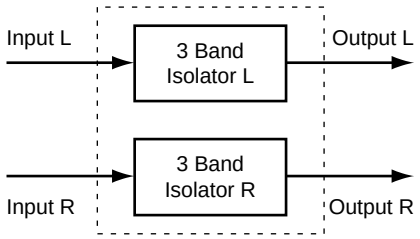
Sw (Switch)	On, Off	Turns the realtime modify filter on or off.
Type (Type)	LPF, BPF, HPF	Sets the filter type.
CutOff (Cutoff Frequency)	0–100	Sets the cutoff frequency.
Reso (Resonance)	0–100	Enhances the frequency components around cutoff frequency.
Gain (Gain)	0–24 dB	Sets the volume of the realtime modify filter.

NS (Noise Suppressor): Mutes noise in the silent mode.

Thresh (Threshold)	0–100	Sets the level to start muting noise.
Release (Release)	0–100	Sets the time over which the volume will drop to 0 after the noise starts being muted.

3band Isolator

Sharply cuts off components by frequency band to eliminate undesired sounds. Useful to eliminate undesired sounds and take out only specific sounds from a CD. Isolator can make sounds completely perish, unlike ordinary equalizers that leave some sounds even with the gains of the respective frequency bands set to the minimum.



Muting the bass

Set up as follows to eliminate low frequency band sounds such as bass sounds.

Anti-phase Low Mix Switch (AntiPhase LoMixSw): On
Anti-phase Low Level (AntiPhase LoLev): Relatively High

Muting vocals

Set up as follows to eliminate middle frequency band sounds such as vocal sounds.

Anti-phase Middle Mix Switch (AntiPhase MidMixSw): On
Anti-phase Middle Level (AntiPhase MidLev): Relatively High

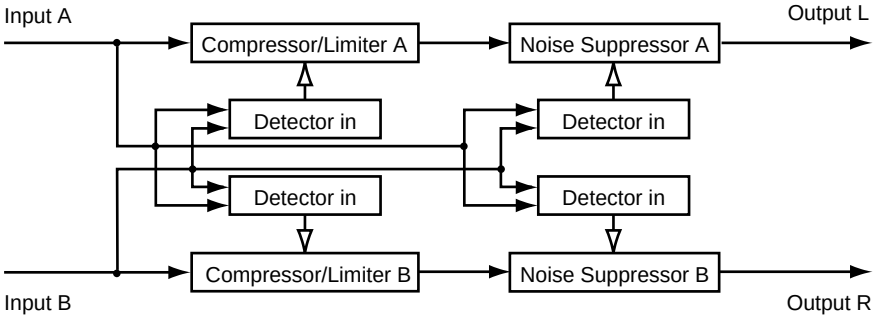
Muting noise

Identify the frequency band of the noise and set the relevant Level (LowLvl, MidLvl or HiLvl) to -60 dB.

Parameter (full name)	Setting	Function
Iso (3-band Isolator):	**Divides the input sound into three frequency bands to abstract or eliminate the sound.**	
Sw (Switch)	On, Off	Turns the 3-band isolator on or off.
AntiPhase LoLev (Anti-phase Low Level)	0–100	Sets the amount of the low frequency band sound should be muted.
AntiPhase MidLev (Anti-phase Middle Level)	0–100	Sets how much of the middle frequency band sound should be muted.
LoMixSw (Anti-phase Low Mix Switch)	On, Off	Mutes or leaves the low frequency band sound.
MidMixSw (Anti-phase Middle Mix Switch)	On, Off	Mutes or leaves the middle frequency band sound.
LowLvl (Low Level)	-60– +4 dB	Increases or decreases frequency bands in the low frequency band.
MidLvl (Middle Level)	-60– +4 dB	Increases or decreases frequency bands in the middle frequency band.
HiLvl (High Level)	-60– +4 dB	Increases or decreases frequency bands in the High frequency band.

Dual Compressor/Limiter

Compressors suppress signals at High levels. Limiter is used to control excessive input. Each of the above is used to prevent sound distortion or to control dynamics.



NOTE

Input A is input into the L-channel side of the effect. Therefore, it is required to insert and connect "Lch" of the effect to the channel handling Input A. Similarly, Input B is input into the R-channel side of the effect. Insert and connect "Rch" of the effect to the channel handling Input B.

Difference between Compressor and Limiter

Behaviors of Compressor and Limiter are very similar. Both of them compress the entire output signals if input signals exceed a certain level (threshold level), according to the input level.
Compressor automatically drops the amplitude to suppress all levels in the exceeding section. Limiter suppresses only the maximum level of input signals.

Using as Limiter

Threshold Level (Thresh):	Relatively High
Ratio (Ratio):	100:1
Attack Time (Attack):	Relatively short
Release Time (Release):	Relatively short

Using as Compressor

Threshold Level (Thresh):	A level that does not cause distortion of output sounds.
Ratio (Ratio):	1.5:1, 2:1, 4:1
Attack Time (Attack):	Adjusted according to the input sound type.
Release Time (Release):	Adjusted according to the input sound type.

Parameter (full name)	Setting	Function

CmpA, CmpB

(Compressor): **Compresses the entire output signals when the input volume has exceeded a preset value.**

(Limiter): **Suppresses the volume of the section where the input volume has exceeded the preset value.**

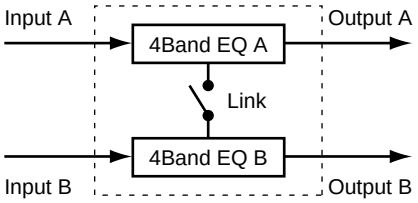
Sw (Switch)	On, Off	Turns the compressor/limiter on or off.
Thrsh (Threshold Level)	-60 - 0 dB	Sets the level at which the compressor/limiter starts taking effect.
Ratio (Ratio)	1.5:1, 2:1, 4:1, 100:1	Sets the compression ratio applied when threshold level (Thresh) is exceeded.
Attack (Attack Time)	0–100	Sets the time from when the input level exceeds the threshold level to when the effect begins to apply.
Release (Release Time)	0–100	Sets the time from when the input level drops below the threshold level to when the effect ceases to apply.
Level (Output Level)	-60–12 dB	Sets the volume of the compressor/limiter sound.
Detect (Detect In)	A, B, Link	Selects Input A or B for controlling compressor/limiter. Set this to “Link” for controlling by the input at a greater level.

NS (Noise Suppressor): **Mutes noise in the silent mode.**

Sw (Switch)	On, Off	Turns the noise suppressor on or off.
Thresh (Threshold)	0–100	Sets the level to start muting noise.
Release (Release)	0–100	Sets the time over which the volume will drop to 0 after the noise starts being muted.
Detect (Detect In)	A, B, Link	Selects the input (Input A/Input B) for controlling Noise Suppressor. Set this to “Link” for controlling by the input at a greater level.

Parametric Equalizer (4-Band Parametric Equalizer)

This is an equalizer that can freely change the cutoff frequency or the band width (Q). With this equalizer, you can create sounds with subtlety.



Cutting noise.

4-Band Parametric Equalizer can freely change the cutoff frequency or the band width (Q) at four points, that is, in the High, High middle, low middle and low frequency bands.
Capitalizing on this feature, you can precisely capture the point where any noise or howling is occurring. To find such point, the first step is to increase the gain for easier identification of sound variation and move the cutoff frequency little by little. Then, perform filtering by sharpening "Q."

Controlling Channels A and B separately

Setting Link On enables simultaneous control on the 4-Band Parametric Equalizer via Channel B according to the settings on the Channel A side. To control Channels A and B separately, turn Link off.

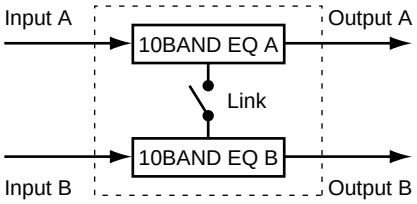
Parameter (full name)	Setting	Function
Lnk (Link):	**Makes Channel B follow the settings for Channel A.**	
Link (Link Switch)	On, Off	Specifies if Channel B follows or does not follow the settings for Channel A.
PEQA, PEQB (4 Band Parametric Equalizer): Parametric equalizer with four bands.		
Sw (Switch)	On, Off	Turns the parametric equalizer on or off.
Low Gain (Low Gain)	-12– +12 dB	Sets the boost/cut amount in the low frequency band.
Low Freq (Low Frequency)	20 - 2000 Hz	Sets the center frequency in the low frequency band.
Low Q (Low Q)	0.3–10	Sets the width of the area around the low frequency that will be affected by the gain settings. *1
Low Type	Shlv, Peak	Sets the type of the low frequency band equalizer (Shlving type or peaking type).
LowMid Gain (Low Middle Gain)	-12– +12 dB	Sets the boost/cut amount in the low middle frequency band.
LoMid Freq (Low Middle Frequency)	200–8000 Hz	Sets the center frequency in the low middle frequency band.
LoMid Q (Low Middle Q)	0.3–10	Sets the width of the area around the Low middle frequency that ill be affected by the gain settings.
HiMid Gain (High Middle Gain)	-12– +12 dB	Sets the boost/cut amount in the High middle frequency band.
HiMid Freq (High Middle Frequency)	200–8000 Hz	Sets the center frequency in the High middle frequency band.
HiMid Q (High Middle Q)	0.3–10	Sets the width of the area around the High middle frequency that will be affected by the gain settings.
Hi Type (High Type)	Shlv, Peak	Sets the type of the High frequency band equalizer (Shlving type or peaking type).
High Gain (High Gain)	-12– +12 dB	Sets the boost/cut amount in the High frequency band.
High Freq (High Frequency)	1.4–20.0 kHz	Sets the center frequency in the High frequency band.
High Q (High Q)	0.3–10	Sets the width of the area around the High frequency that will be affected by the gain settings. *1
InputG (Input Gain)	-60– +12 dB	Sets the overall volume before passing through the equalizer.
Level (Output Level)	-60– +12 dB	Sets the overall volume after passing through the equalizer.

NOTE

*1: If Low Type (Low Type) or High Type (High Type) is set to “Shlv (Shlving Type),” the setting for Lo Q or High Q is invalid.

Graphic Equalizer (10-Band Graphic Equalizer)

This Equalizer sets the boost / cut amount by each segment of the frequency divided into ten bands. In performing PA at a live, this feature is useful to prevent howling by cutting the site-specific resonance frequency.



Preventing howling

While performing PA at a live, follow the steps below to prevent howling. First, identify the site-specific resonance frequency to cut its gain.

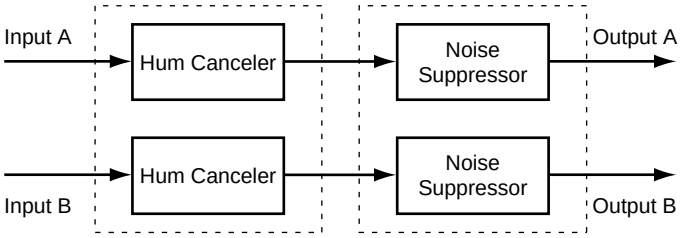
Controlling Channels A and B separately

Setting Link On enables simultaneous control on the 10-Band Parametric Equalizer via Channel B according to the settings on the Channel A side.
To control Channels A and B separately, turn Link Off.

Parameter (full name)	Setting	Function
Lnk (Link):	**Makes Channel B follow the settings for Channel A.**	
Link (Link Switch)	On, Off	Specifies if Channel B follows or does not follow the settings for Channel A.
GEQA, GEQB (10-Band Graphic Equalizer): Models a 10-band graphic equalizer.		
Sw (Switch)	On, Off	Turns the parametric equalizer on or off.
31.2 – 16 k (Gain)	-12– +12 dB	Sets the boost/cut amount at the respective frequencies.
InputG (Input Gain)	-60– +12 dB	Sets the overall volume before passing through the equalizer.
Level (Output Level)	-60– +12 dB	Sets the overall volume after passing through the equalizer.

Hum Canceler

Eliminates annoying hum (or “surge” sounding “boon”).



Removing hum

Hum is a noise with a certain low frequency. Hum is generated mostly due to ingression of part of alternating current into signals as alternating current is converted into direct current in the power circuit. Sets Frequency (Freq) to that according with the frequency of the power source (50 Hz / 60 Hz), and hum with that frequency and frequencies of its multiples can be removed.
Range Lo and Rage Hi can be used to specify the frequency band of hum to be removed.

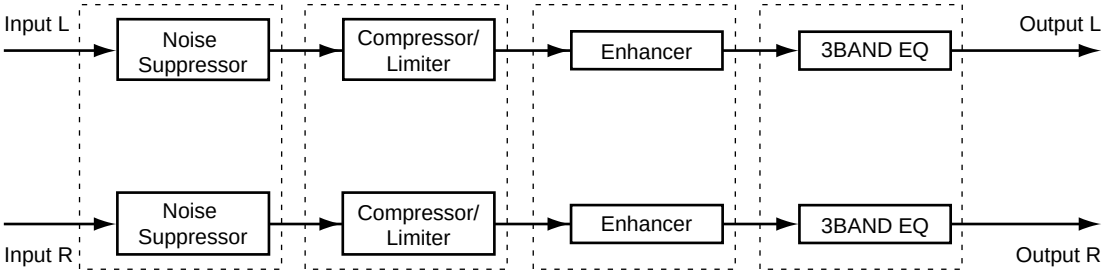
Parameter (full name)	Setting	Function
HC (Hum Canceler):	**Removes hum.**	
Sw (Switch)	On, Off	Turns the hum canceler on or off.
Freq (Frequency)	20.0–800.0 Hz	Sets the frequency of hum to be removed.
Width (Width)	10–40%	Sets the width of the filter which will remove the hum.
Depth (Depth)	0–100	Sets the depth of the filter which will remove the hum.
Thresh (Threshold)	0–100	Sets the level at which the hum is to be removed.
RangeLo (Range Low)	Unlimit, 20 - 2000 Hz	Sets the lower limit of the frequency of hum to be removed. *1
RangeHi (Range High)	1.0 - 20.0 kHz, Unlimit	Sets the upper limit of the frequency of hum to be removed. *2
NS (Noise Suppressor):	**Mutes noise in the silent mode.**	
Sw (Switch)	On, Off	Turns the noise suppressor on or off.
Thresh (Threshold)	0–100	Sets the level to start muting noise.
Release (Release)	0–100	Sets the time over which the volume will drop to 0 after the noise starts being muted.

NOTE

*1: Setting to “Unlimit” means that the frequency that can be played back on this unit is the lower limit.

*2: Setting to “Unlimit” means that the frequency that can be played back on this unit is the upper limit.

Stereo Multi



Parameter (full name)	Setting	Function
NS (Noise Suppressor):	**Mutes noise in the silent mode.**	
Sw (Switch)	On, Off	Turns the noise suppressor on or off.
Thresh (Threshold)	0–100	Sets the level to start muting noise.
Release (Release)	0–100	Sets the time over which the volume will drop to 0 after the noise starts being muted.
Cmp (Compressor/Limiter):	**Compresses the entire output signals when the input volume exceeds a specified value.**	
Sw (Switch)	On, Off	Turns the compressor on or off.
Thrsh (Threshold Level)	-60–0 dB	Sets the level at which the compressor starts taking effect.
Ratio (Ratio)	1.5:1, 2:1, 4:1, 100:1	Sets the compression ratio applied when the threshold level is exceeded.
Attack (Attack Time)	0–100	Sets the time from when the input level exceeds the threshold level to when the effect begins to apply.
Release (Release Time)	0–100	Sets the time from when the input level drops below the threshold level to when the effect ceases to apply.
Level (Output Level)	-60–12 dB	Sets the volume of the compressor sound.
Enh (Enhancer):	**Accentuates the sound and push the sound forward.**	
Sw (Switch)	On, Off	Turns the enhancer on or off.
Sens (Sense)	0–100	Sets the degree of the enhancer effect desired.
Freq (Frequency)	1.0–10.0 kHz	Sets the frequency at which the enhancer effect starts working.
MixLvl (Mix Level)	0–100	Sets the amount of the enhancer sound should be mixed into the direct sound.
Level (Level)	0–100	Sets the volume of the enhancer sound.

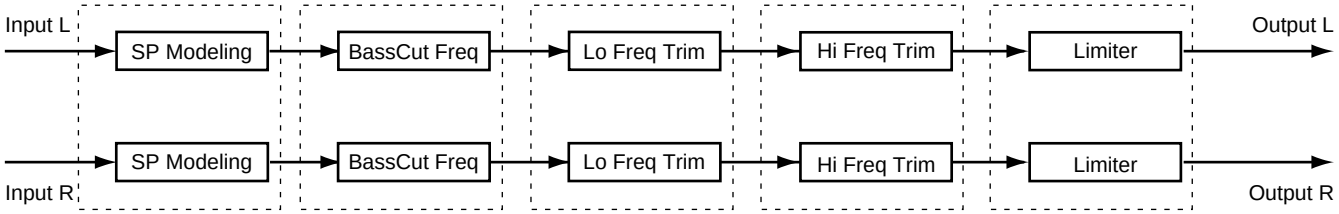
EQ (Equalizer)

Sw (Switch)	On, Off	Turns the equalizer on or off.
Low Gain (Low Gain)	-12– +12 dB	Sets the boost/cut amount in the low frequency band.
Low Freq (Low Frequency)	20 - 2000 Hz	Sets the center frequency in the low frequency band.
Low Q	0.3–10.0	Sets the width of the area around the low frequency that will be affected by the gain settings.1 *1
Low Type	Shlv, Peak	Sets the type of the low frequency band equalizer (Shlving type or peaking type).
Mid Gain (Middle Gain)	-12– +12 dB	Sets the boost/cut amount in the middle frequency band.
Mid Freq (Middle Frequency)	200–8000 Hz	Sets the center frequency in the middle frequency band.
Mid Q (Middle Q)	0.3–10.0	Sets the width of the area around the middle frequency that will be affected by the gain settings.
High Gain	-12– +12 dB	Sets the boost/cut amount in the High frequency band.
High Freq (High Frequency)	1.4–20.0 kHz	Sets the center frequency in the High frequency band.
High Q	0.3–10.0	Sets the width of the area around the High frequency that will be affected by the gain settings.1 *1
Hi Type (High Type)	Shlv, Peak	Sets the type of the High frequency band equalizer (Shlving type or peaking type).
Level (Output Level)	0–100	Sets the volume after passing through the equalizer.

*1: If Low Type (Lo Type) or High Type (Hi Type) is set to “Shlv (Shlving Type),” the setting for Lo Q or High Q is invalid.

Speaker Modeling

Models a variety of speaker characteristics ranging from those of High-end professional monitor speakers used as the standard at studios around the world to those of speakers of small-sized TV sets and portable radios.



NOTE

- Speaker Modeling is adjusted so that its optimal effect is achieved when a Roland Powered Monitor DS-90 is used in digital connection. Its effect may not be fully achieved with other types of speakers.
- "Mic Modeling" cannot be used on the projects with 64kHz or higher sampling rate.

Speaker types applicable for modeling

The characteristics of the following types of speakers can be modeled. Set the desired type for Model.

THRU:	No modeling is to be performed.
Super FLAT:	DS-90 is corrected by modeling to produce wider-range and untwisted sounds.
Powered GenBlk:	Typical model of powered monitor (two-way type, the woofer diameter = 170 mm (6-1/2 inches))
Powered E-Bas:	Powered monitor characterized in delightful sound quality
Powered Mack:	Powered monitor characterized in well-extended low frequency band sounds
Small Cube:	Small-sized full-range speaker widely used in recording studios
White Cone:	Enclosed-type two-way speaker widely used in recording studios, characterized in white woofers.
White C +tissue:	Mild sounds from "White Cone" Tweeter covered with tissue paper
Small Radio:	Pocket-type small-sized radio
Small TV:	Speaker attached to the 14-inch TV set
Boom Box:	Radio cassette recorder
BoomBox LoBoost:	Radio cassette recorder with the low frequency band enhanced

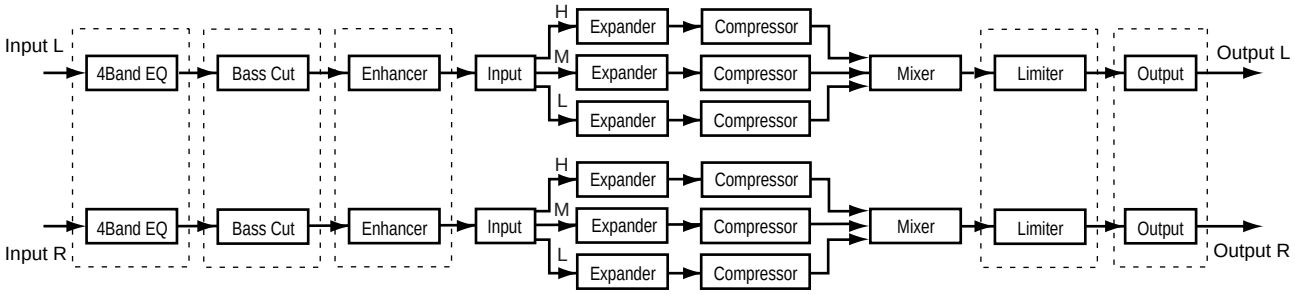
* *Use "THRU" for clear comparison between sounds with and without modeling.*

→ Continued...

Parameter (full name)	Setting	Function
SpMod (Speaker Modeling): Selects the speaker subject to characteristics modeling.		
Sw (Switch)	Off, On	Turns the Speaker Modeling on or off.
Model (Model)	See the column on the previous page.	Specifies the speaker actually generating sounds.
Output Speakers (Output Speakers)	DS-90/DS-90A, DS-50A	
Phase (Phase)	NRM, INV	Sets the phase of the speaker. “NRM” for the same phase, and “INV” for the inverted phase.
BCut (Bass Cut Filter): Cuts off undesired low sounds such as pop noise.		
Sw (Switch)	On, Off	Turns the bass cut filter on or off.
Freq (Frequency)	Thru, 20 - 2000 Hz	Sets the frequency for cutting off undesired low frequency band sounds such as pop noise.
LFT (Low Frequency Trimmer): Adjusts the low frequency band sounds.		
Sw (Switch)	On, Off	Turns the low frequency trimmer on or off.
Gain (Gain)	-12– +12dB	Sets the boost/cut amount.
Freq (Frequency)	20–2000 Hz	Sets the center frequency of the trimmer.
HFT (High Frequency Trimmer): Adjusts the High frequency band sounds.		
Sw (Switch)	On, Off	Turns the High frequency trimmer on or off.
Gain (Gain)	-12– +12dB	Sets the boost/cut amount.
Freq (Frequency)	1.0–20.0 kHz	Sets the center frequency.
Lmt (Limiter): Prevents distortion by suppressing signals at High levels.		
Sw (Switch)	On, Off	Turns the limiter on or off.
Thresh (Threshold)	-60–0 dB	Sets the volume at which the limiter starts working.
Release (Release)	0–100	Sets the time from when the input level drops below the threshold level to when the effect ceases to apply.
Level (Level)	-60– +24 dB	Sets the volume after passing through the limiter.

Mastering Tool Kit

This Kit is a compressor that splits sounds into different frequency band to unify their volumes. With this feature, you can perform mastering at the optimized level when mixing down into an MD or a CD or when producing your original audio CD using the CD-R disk.

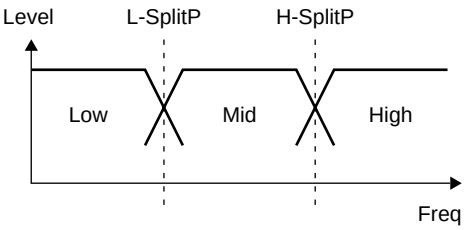


Effect of "Detect Time" under Input

With ordinary compressors, a moment of delay occurs to suppress a level over instance after it has been detected. With this algorithm, this problem is bypassed by using the input sound only for level detection and adding a specified length of delay to the sound for processing and output. "Detect Time" under Input is the setting of the delay time for this purpose. Note that supplying Detect Time causes time difference between input and output of audio signals, requiring due considerations if used for operations other than mastering (ex. channel insertion).

Splitting into frequency bands

To split into High, middle and low frequency bands, Low Split Point (LoSplit Point) and High Split Point (HiSplit Point) under Input are used to specify frequencies.



Parameter (full name)	Setting	Function
EQ (Equalizer)		
Sw (Switch)	On, Off	Turns the equalizer on or off.
InputG (Input Gain)	-24– +12 dB	Sets the overall volume before passing through the equalizer.
Low Gain (Low Gain)	-12– +12 dB	Sets the boost/cut amount in the low frequency band.
Low Freq (Low Frequency)	20–2000 Hz	Sets the center frequency in the low frequency band.
Low Q (Low Q)	0.3–16.0	Sets the width of the area around the low frequency that will be affected by the gain settings. *1
Low Type	Shlv, Peak	Sets the type of the low frequency band equalizer (Shlving type or peaking type).
LoMid Gain (Low Middle Gain)	-12– +12 dB	Sets the boost/cut amount in the low middle frequency band.
LoMid Freq (Low Middle Frequency)	20–8000 Hz	Sets the center frequency in the low middle frequency band.
LoMid Q (Low Middle Q)	0.3–16.0	Sets the width of the area around the low middle frequency that will be affected by the gain settings.
HiMid Gain (High Middle Gain)	-12– +12 dB	Sets the boost/cut amount in the High frequency band.
HiMid Freq (High Middle Frequency)	20–8000 Hz	Sets the center frequency in the High middle frequency band.

→ Continued...

HiMid Q (High Middle Q)	0.3–16.0	Sets the width of the area around the High middle frequency that will be affected by the gain settings.
High Gain (High Gain)	-12– +12 dB	Sets the boost/cut amount in the High frequency band.
High Freq (High Frequency)	1.40–20.0 kHz	Sets the center frequency in the High frequency band.
High Q (High Q)	0.3–16.0	Sets the width of the area around the High frequency that will be affected by the gain settings. *1
Hi Type (High Type)	Shlv, Peak	Sets the type of the High frequency band equalizer (Shlving type or peaking type).
Level (Level)	-24– +12 dB	Sets the overall volume after passing through the equalizer.

BCut (Bass Cut Filter): Cuts off undesired low frequency band sounds such as pop noise.

Sw (Switch)	On, Off	Turns the bass cut filter on or off.
Freq (Frequency)	Thru, 20 - 2000 Hz	Sets the frequency for cutting off undesired low frequency band sounds such as pop noise.

Enh (Enhancer): Accentuates the sound and push the sound forward.

Sw (Switch)	On, Off	Turns the enhancer on or off.
Sens (Sensitivity)	0–100	Sets the degree of the enhancer effect desired.
Freq (Frequency)	1.00–10.0 kHz	Sets the frequency at which the enhancer effect starts working.
MixLvl (Mix Level)	-24– +12dB	Set the amount of the enhancer sound to be added to the direct sound.

In (Input): Splits the direct sound into three frequency bands, that is, low, middle and High frequency bands.

InGain (Input Gain)	-24– +12dB	Sets the overall volume before entering expander/compressor.
D-Time (Detect Time)	0–10 ms	Sets the length of delay to add to the direct sound input.
Split Point Low (Low Split Point)	20–800 Hz	Sets the frequency at which the direct sound is split into three bands (on the low frequency band side).
Split Point High (High Split Point)	1.60–16.0 kHz	Sets the frequency at which the direct sound is split into three bands (on the High frequency band side).

Exp (Expander): Expands the dynamic range at a certain ratio.

Sw (Switch)	On, Off	Turns the expander on or off.
Low Thre (Low Threshold)	-80–0 dB	Sets the volume at which the expander for the low frequency band starts working.
Low Ratio (Low Raito)	1:1.0–1:16, 1:INF	Sets the ratio at which the output in the low frequency band is increased when the input level has dropped below the low threshold level.
Low Atck (Low Attack)	0–100 ms	Sets the time until when the low frequency band expander starts working after the input level dropps below the low threshold level.
Low Rel (Low Release)	50 ms–5.000 s	Sets the time until when the High frequency band expander stops working after the input level exceeds the low threshold level.
Mid Thre (High Threshold)	-80–0 dB	Sets the volume at which the expander for the middle frequency band starts working.
Mid Ratio (High Ratio)	1:1.0–1:16, 1:INF	Sets the ratio at which the output in the middle frequency band is increased when the input level has dropped below the middle threshold level.
Mid Atck (High Attack)	0–100 ms	Sets the time until when the middle frequency band expander starts working after the input level dropps below the middle threshold level.
Mid Rel (High Release)	50 ms–5.000 s	Sets the time until when the middle frequency band expander stops working after the input level exceeds the middle threshold level.
High Thre (High Threshold)	-80–0 dB	Sets the volume at which the expander for the High frequency band starts working.
High Ratio (High Ratio)	1:1.0–1:16, 1:INF	Sets the ratio at which the output in the High frequency band is increased when the input level has dropped below the High threshold level.
High Atck (High Attack)	0–100 ms	Sets the time until when the High frequency band expander starts working after the input level dropps below the High threshold level.
High Rel (High Release)	50 ms–5.000 s	Sets the time until when the High frequency band expander stops working after the input level exceeds the High threshold level.

Cmp (Compressor):Compresses the entire output signals when the input volume exceeds a specified value.

SW (Switch)	On, Off	Turns the compressor on or off.
Low Thre (Low Threshold)	-24–0 dB	Sets the volume at which the compressor for the low frequency band starts working.
Low Ratio (Low Raito)	1:1.0–1:16, 1:INF	Sets the ratio at which the output in the low frequency band is suppressed when the input level has exceeded the low threshold level.
Low Atck (Low Attack)	0–100 ms	Sets the time until when the low frequency band compressor starts working after the input level has exceeded the low threshold level.
Low Rel (Low Release)	50 ms–5.000 s	Sets the time until when the low frequency band compressor stops working after the input level has dropped below the low threshold level.
Mid Thre (Middle Threshold)	-24–0 dB	Sets the volume at which the compressor in the middle frequency band starts working.
Mid Ratio (Middle Ratio)	1:1.0–1:16, 1:INF	Sets the ratio at which the output in the middle frequency band is suppressed when the input level has exceeded the middle threshold level.
Mid Atck (Middle Attack)	0–100 ms	Sets the time until when the middle frequency band compressor starts working after the input level has exceeded the middle threshold level.
Mid Rel (Middle Release)	50 ms–5.000 s	Sets the time until when the middle frequency band compressor stops working after the input level has dropped below the middle threshold level.
High Thre (High Threshold)	-24–0 dB	Sets the volume at which the compressor for the High frequency band starts working.
High Raito (High Ratio)	1:1.0–1:16, 1:INF	Sets the ratio at which the output in the High frequency band is suppressed when the input level has exceeded the High threshold level.
High Atck (High Attack)	0–100 ms	Sets the time until when the High frequency band compressor starts working after the input level has exceeded the High threshold level.
High Rel (High Release)	50 ms–5.000 s	Sets the time until when the High frequency band compressor stops working after the input level has dropped below the High threshold level.

Mix (Mixer): Adjusts the volume by frequency band.

Low Level (Low Level)	-80– +6 dB	Sets the volume in the low frequency band after passing through the expander and compressor.
Mid Level (Middle Level)	-80– +6 dB	Sets the middle frequency band volume after passing through the expander and compressor.
High Level (High Level)	-80– +6 dB	Sets the volume in the High frequency band after passing through the expander and compressor.

Lmt (Limiter): Prevents distortion by suppressing signals at High levels.

Sw (Switch)	On, Off	Turns the limiter on or off.
Thresh (Threshold)	-24–0 dB	Sets the volume at which the limiter starts working.
Attack (Attack)	0–100 ms	Sets the time until when the limiter starts working after the input level has exceeded threshold level.
Release (Release)	50 ms–5.000 s	Sets the time until when the limiter stops working after the input level drops below the threshold level.

Out (Output): Provides settings concerning overall output.

SoftClip (Soft Clip)	On, Off	Suppresses conspicuous distortion that may occur when the effect of compressor/limiter has been applied excessively.
Level (Level)	-80– +6 dB	Sets the overall volume after passing through the limiter.

NOTE

*1: If Low Type (Lo Type) or High Type (Hi Type) is set to "Shlv (Shlving Type)," the setting for Lo Q or High Q is invalid.

- With Compressor, the level is automatically adjusted to the optimal with the settings for Threshold (Thres) and Raito (Ratio). Setting Attack (Atck) to a relatively long time may cause distortion. For this reason, a margin of -6 dB is provided. Adjust the Mixer (Mix) level as required.
- "Mastering Tool Kit" cannot be used on EFFECT2, 4, 6, and 8 (even-numbered effects).
- When "Mastering Tool Kit" is used on EFFECT1, 3, 5, and 7 (odd-numbered effects), EFFECT2, 4, 6, and 8 (even-numbered effects) cannot be used.
- "Mastering Tool Kit" cannot be used on the projects with 64kHz or higher sampling rate.

MIDI Implementation

MIDI Implementation
Model VS-2480/2480CD Version 1.01 Jun. 29 2001

1. TRANSMITTED DATA AND RECOGNIZED RECEIVE DATA

■Channel Voice message

●Note On/Off

When "METORONOME OUT" in the UTILITY condition METRONOME screen is "OUT," MIDI note number/velocity of MIDI channel number which is assigned to the Metronome is transmitted.
Received when the effect patch Voice Transformer effect (algorithm 27) is selected (FX1, 3, 5 or 7) and MIDI CONTROL Sw is "On."

Status	Second	Third
9nH	mmH	llH
n = MIDI Channel No.:		0H - FH (ch.1-ch.16) (*1)
		0H - 7H (ch.1-ch.8) (*2)
mm = Note No.:		0CH - 7FH (12 - 127) (*1)
		24H - 54H (38 - 64) (*2)
ll = Velocity:		01H - 7FH (1 - 127) / 00H = NOTE OFF

(*1) Only when transmitting Metronome.
(*2) Only when receiving with MIDI CONTROL Sw of Voice Transformer is "On."
n = 0,2,4,6 (FX1,3,5,7): Voice Transformer: Chromatic Pitch
mm = 24H - 54H (C2 - C6)
ll = ignored
n = 1,3,5,7 (FX1,3,5,7): Voice Transformer: Chromatic Formant
mm = 24H - 3CH (C2 - C4)
ll = Ignored

●Polyphonic Key Pressure

Transmits the level meter value of VS-2480/2480CD according to the value of "DISPLAY SECTION." (MIDI ch. is fixed to 16.)
Ignored when received.

Status	Second	Third
AFH	mmH	llH
mm = Note No.:		00H - 5BH (0 - 91)
ll = Level Meter Value:		00H - 7FH (0 - 127)

Level Meter and Note Number table

Level Meter Target	Analog Input	Digital Input	Input Mixer	Track Mixer	FX Return	AUX/ DIR	Analog Output	Digital Output
Note Number	Level Meter Channel	Level Meter Channel	Level Meter Channel	Level Meter Channel	Level Meter Channel	Level Meter Channel	Level Meter Channel	Level Meter Channel
0	Input 1	R-BUS1 1	InMix 1	TrMix 1	FxRtn 1L	AUX 1	Output 1	R-BUS1 1
1	Input 2	R-BUS1 2	InMix 2	TrMix 2	FxRtn 1R	AUX 2	Output 2	R-BUS1 2
2	Input 3	R-BUS1 3	InMix 3	TrMix 3	FxRtn 2L	AUX 3	Output 3	R-BUS1 3
3	Input 4	R-BUS1 4	InMix 4	TrMix 4	FxRtn 2R	AUX 4	Output 4	R-BUS1 4
4	Input 5	R-BUS1 5	InMix 5	TrMix 5	FxRtn 3L	AUX 5	Output 5	R-BUS1 5
5	Input 6	R-BUS1 6	InMix 6	TrMix 6	FxRtn 3R	AUX 6	Output 6	R-BUS1 6
6	Input 7	R-BUS1 7	InMix 7	TrMix 7	FxRtn 4L	AUX 7	Output 7	R-BUS1 7
7	Input 8	R-BUS1 8	InMix 8	TrMix 8	FxRtn 4R	AUX 8	Output 8	R-BUS1 8
8	Input 9	R-BUS2 1	InMix 9	TrMix 9	FxRtn 5L	DIR 1	-	R-BUS2 1
9	Input 10	R-BUS2 2	InMix 10	TrMix 10	FxRtn 5R	DIR 2	-	R-BUS2 2
10	Input 11	R-BUS2 3	InMix 11	TrMix 11	FxRtn 6L	DIR 3	-	R-BUS2 3
11	Input 12	R-BUS2 4	InMix 12	TrMix 12	FxRtn 6R	DIR 4	-	R-BUS2 4
12	Input 13	R-BUS2 5	InMix 13	TrMix 13	FxRtn 7L	DIR 5	-	R-BUS2 5
13	Input 14	R-BUS2 6	InMix 14	TrMix 14	FxRtn 7R	DIR 6	-	R-BUS2 6
14	Input 15	R-BUS2 7	InMix 15	TrMix 15	FxRtn 8L	DIR 7	-	R-BUS2 7
15	Input 16	R-BUS2 8	InMix 16	TrMix 16	FxRtn 8R	DIR 8	-	R-BUS2 8
16	-	Coaxial L	InMix 17	TrMix 17	-	-	-	Coaxial L
17	-	Coaxial R	InMix 18	TrMix 18	-	-	-	Coaxial R
18	-	Optical L	InMix 19	TrMix 19	-	-	-	Optical L
19	-	Optical R	InMix 20	TrMix 20	-	-	-	Optical R
20	-	-	InMix 21	TrMix 21	-	-	-	-
21	-	-	InMix 22	TrMix 22	-	-	-	-
22	-	-	InMix 23	TrMix 23	-	-	-	-
23	-	-	InMix 24	TrMix 24	-	-	-	-
24	-	-	-	-	-	-	-	-
25	-	-	-	-	-	-	-	-
26	-	-	-	-	-	-	-	-
27	-	-	-	-	-	-	-	-
28	-	-	-	-	-	-	-	-
29	-	-	-	-	-	-	-	-
30	-	-	-	-	-	-	-	-
31	-	-	-	-	-	-	-	-
32	MONITOR L	MONITOR L	MONITOR L	MONITOR L	MONITOR L	MONITOR L	MONITOR L	MONITOR L
33	MONITOR R	MONITOR R	MONITOR R	MONITOR R	MONITOR R	MONITOR R	MONITOR R	MONITOR R
34	MASTER L	MASTER L	MASTER L	MASTER L	MASTER L	MASTER L	MASTER L	MASTER L
35	MASTER R	MASTER R	MASTER R	MASTER R	MASTER R	MASTER R	MASTER R	MASTER R

36		
37		
38		
39		
40	Channel Status 1ch	0:Off, 1:Play, 2:Bounce/Source, 3:Rec
41	Channel Status 2ch	0:Off, 1:Play, 2:Bounce/Source, 3:Rec
42	Channel Status 3ch	0:Off, 1:Play, 2:Bounce/Source, 3:Rec
43	Channel Status 4ch	0:Off, 1:Play, 2:Bounce/Source, 3:Rec
44	Channel Status 5ch	0:Off, 1:Play, 2:Bounce/Source, 3:Rec
45	Channel Status 6ch	0:Off, 1:Play, 2:Bounce/Source, 3:Rec
46	Channel Status 7ch	0:Off, 1:Play, 2:Bounce/Source, 3:Rec
47	Channel Status 8ch	0:Off, 1:Play, 2:Bounce/Source, 3:Rec
48	Channel Status 9ch	0:Off, 1:Play, 2:Bounce/Source, 3:Rec
49	Channel Status 10ch	0:Off, 1:Play, 2:Bounce/Source, 3:Rec
50	Channel Status 11ch	0:Off, 1:Play, 2:Bounce/Source, 3:Rec
51	Channel Status 12ch	0:Off, 1:Play, 2:Bounce/Source, 3:Rec
52	Channel Status 13ch	0:Off, 1:Play, 2:Bounce/Source, 3:Rec
53	Channel Status 14ch	0:Off, 1:Play, 2:Bounce/Source, 3:Rec
54	Channel Status 15ch	0:Off, 1:Play, 2:Bounce/Source, 3:Rec
55	Channel Status 16ch	0:Off, 1:Play, 2:Bounce/Source, 3:Rec
56	Channel Status 17ch	0:Off, 1:Play, 2:Bounce/Source, 3:Rec
57	Channel Status 18ch	0:Off, 1:Play, 2:Bounce/Source, 3:Rec
58	Channel Status 19ch	0:Off, 1:Play, 2:Bounce/Source, 3:Rec
59	Channel Status 20ch	0:Off, 1:Play, 2:Bounce/Source, 3:Rec

60	Channel Status 21ch	0:Off, 1:Play, 2:Bounce / Source, 3:Rec
61	Channel Status 22ch	0:Off, 1:Play, 2:Bounce / Source, 3:Rec
62	Channel Status 23ch	0:Off, 1:Play, 2:Bounce / Source, 3:Rec
63	Channel Status 24ch	0:Off, 1:Play, 2:Bounce / Source, 3:Rec
64		
65		
66		
67		
68		
69		
70		
71		
72	SCALE	0:X1, 1:X1 / 2
73	LOCATION	1:PRE FADER, 2:POST FADER
74		
75		
76		
77		
78	8SEG.MODE	0:Measure / Beat, 1:Time Code, 2:Clock+Scene
79	OVER RANGE	0:0db
80	MASTER MUTE	0:OFF, 1:ON
81	PEAK HOLD TIME	0:OFF
82		
83		
84		
85		
86		
87		
88	CLOCK HOUR(*1) / MEAS. MSB (*2)	
89	CLOCK MIN.(*1) / MEAS. LSB (*2)	
90	CLOCK SEC.(*1) / BEAT (*2)	
91	SCENE (*1) / TICK (*2)	
92		

(*1) When 8SEG.MODE is 2.

(*2) When 8SEG.MODE is 0.

Level Meter Value and Level

Value	Level
0	0dB
1	-1dB
2	-2dB
:	
127	-Infinite

●Control Change

The controller numbers that have been set by means of the FADER / KNOB parameters in the Utility menus FADER / USER screen are transmitted when the faders and knobs are operated while the faders are inV.Fader mode.

Status	Second	Third
BnH	mmH	llH

n = MIDI Channel No.: 0H - FH (ch.1-ch.16)

mm = Controller No.: 00H - 77H (0 - 119)

ll = Controller Value: 00H - 7FH (0 - 127)

Parameters on the Mixer section can be received and transmitted by the control change messages when MIXER CONTROL TYPE in the UTILITY-MIDI screen 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.

INPUT 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
FADER LEVEL	7	->	->	->	->	->	->	->	->	->	->	->	->	->	->	->
PAN	10	->	->	->	->	->	->	->	->	->	->	->	->	->	->	->
AUX1 SEND LEVEL	12	->	->	->	->	->	->	->	->	->	->	->	->	->	->	->
AUX2 SEND LEVEL	13	->	->	->	->	->	->	->	->	->	->	->	->	->	->	->
AUX3 SEND LEVEL	14	->	->	->	->	->	->	->	->	->	->	->	->	->	->	->
AUX4 SEND LEVEL	15	->	->	->	->	->	->	->	->	->	->	->	->	->	->	->
AUX5 SEND LEVEL	16	->	->	->	->	->	->	->	->	->	->	->	->	->	->	->
AUX6 SEND LEVEL	17	->	->	->	->	->	->	->	->	->	->	->	->	->	->	->
AUX7 SEND LEVEL	18	->	->	->	->	->	->	->	->	->	->	->	->	->	->	->
AUX8 SEND LEVEL	19	->	->	->	->	->	->	->	->	->	->	->	->	->	->	->
AUX1/2 SEND PAN	20	->	->	->	->	->	->	->	->	->	->	->	->	->	->	->
AUX3/4 SEND PAN	21	->	->	->	->	->	->	->	->	->	->	->	->	->	->	->
AUX5/6 SEND PAN	22	->	->	->	->	->	->	->	->	->	->	->	->	->	->	->
AUX7/8 SEND PAN	23	->	->	->	->	->	->	->	->	->	->	->	->	->	->	->
OFFSET FADER LEVEL	24	--	->	--	->	--	->	--	->	--	->	--	->	--	->	--
OFFSET PAN	25	--	->	--	->	--	->	--	->	--	->	--	->	--	->	--
INPUT MIX CH.	17	18	19	20	21	22	23	24								
MIDI ch. ->	1	2	3	4	5	6	7	8								
FADER LEVEL	71	->	->	->	->	->	->	->								
PAN	74	->	->	->	->	->	->	->								
AUX1 SEND LEVEL	76	->	->	->	->	->	->	->								
AUX2 SEND LEVEL	77	->	->	->	->	->	->	->								
AUX3 SEND LEVEL	78	->	->	->	->	->	->	->								
AUX4 SEND LEVEL	79	->	->	->	->	->	->	->								
AUX5 SEND LEVEL	80	->	->	->	->	->	->	->								
AUX6 SEND LEVEL	81	->	->	->	->	->	->	->								
AUX7 SEND LEVEL	82	->	->	->	->	->	->	->								
AUX8 SEND LEVEL	83	->	->	->	->	->	->	->								
AUX1/2 SEND PAN	84	->	->	->	->	->	->	->								
AUX3/4 SEND PAN	85	->	->	->	->	->	->	->								
AUX5/6 SEND PAN	86	->	->	->	->	->	->	->								
AUX7/8 SEND PAN	87	->	->	->	->	->	->	->								
OFFSET FADER LEVEL	88	--	->	--	->	--	->	--								
OFFSET PAN	89	--	->	--	->	--	->	--								

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(*2)	35	->	->	->	->	->	->	->	->	->	->	->	->	->	->	->
FADER LEVEL	39	->	->	->	->	->	->	->	->	->	->	->	->	->	->	->
PAN	42	->	->	->	->	->	->	->	->	->	->	->	->	->	->	->
AUX1 SEND LEVEL	44	->	->	->	->	->	->	->	->	->	->	->	->	->	->	->
AUX2 SEND LEVEL	45	->	->	->	->	->	->	->	->	->	->	->	->	->	->	->
AUX3 SEND LEVEL	46	->	->	->	->	->	->	->	->	->	->	->	->	->	->	->
AUX4 SEND LEVEL	47	->	->	->	->	->	->	->	->	->	->	->	->	->	->	->
AUX5 SEND LEVEL	48	->	->	->	->	->	->	->	->	->	->	->	->	->	->	->
AUX6 SEND LEVEL	49	->	->	->	->	->	->	->	->	->	->	->	->	->	->	->
AUX7 SEND LEVEL	50	->	->	->	->	->	->	->	->	->	->	->	->	->	->	->
AUX8 SEND LEVEL	51	->	->	->	->	->	->	->	->	->	->	->	->	->	->	->
AUX1/2 SEND PAN	52	->	->	->	->	->	->	->	->	->	->	->	->	->	->	->
AUX3/4 SEND PAN	53	->	->	->	->	->	->	->	->	->	->	->	->	->	->	->
AUX5/6 SEND PAN	54	->	->	->	->	->	->	->	->	->	->	->	->	->	->	->
AUX7/8 SEND PAN	55	->	->	->	->	->	->	->	->	->	->	->	->	->	->	->
OFFSET FADER LEVEL	56	--	->	--	->	--	->	--	->	--	->	--	->	--	->	--
OFFSET PAN	57	--	->	--	->	--	->	--	->	--	->	--	->	--	->	--
TRACK MIX CH.	17	18	19	20	21	22	23	24								
MIDI ch. ->	9	10	11	12	23	14	15	16								
TRACK STATUS(*2)	67	->	->	->	->	->	->	->								
FADER LEVEL	71	->	->	->	->	->	->	->								
PAN	74	->	->	->	->	->	->	->								
AUX1 SEND LEVEL	76	->	->	->	->	->	->	->								
AUX2 SEND LEVEL	77	->	->	->	->	->	->	->								
AUX3 SEND LEVEL	78	->	->	->	->	->	->	->								
AUX4 SEND LEVEL	79	->	->	->	->	->	->	->								
AUX5 SEND LEVEL	80	->	->	->	->	->	->	->								
AUX6 SEND LEVEL	81	->	->	->	->	->	->	->								
AUX7 SEND LEVEL	82	->	->	->	->	->	->	->								
AUX8 SEND LEVEL	83	->	->	->	->	->	->	->								
AUX1/2 SEND PAN	84	->	->	->	->	->	->	->								
AUX3/4 SEND PAN	85	->	->	->	->	->	->	->								
AUX5/6 SEND PAN	86	->	->	->	->	->	->	->								
AUX7/8 SEND PAN	87	->	->	->	->	->	->	->								
OFFSET FADER LEVEL	88	--	->	--	->	--	->	--								
OFFSET PAN	89	--	->	--	->	--	->	--								

RETURN MIX CH.	1	2	3	4	5	6	7	8
MIDI ch. ->	1	2	3	4	5	6	7	8
FADER LEVEL	102	->	->	->	->	->	->	->
BALANCE	103	->	->	->	->	->	->	->
AUX1 SEND LEVEL	104	->	->	->	->	->	->	->
AUX2 SEND LEVEL	105	->	->	->	->	->	->	->
AUX3 SEND LEVEL	106	->	->	->	->	->	->	->
AUX4 SEND LEVEL	107	->	->	->	->	->	->	->
AUX5 SEND LEVEL	108	->	->	->	->	->	->	->
AUX6 SEND LEVEL	109	->	->	->	->	->	->	->
AUX7 SEND LEVEL	110	->	->	->	->	->	->	->
AUX8 SEND LEVEL	111	->	->	->	->	->	->	->
AUX1/2 SEND Bal	112	->	->	->	->	->	->	->
AUX3/4 SEND Bal	113	->	->	->	->	->	->	->
AUX5/6 SEND Bal	114	->	->	->	->	->	->	->
AUX7/8 SEND Bal	115	->	->	->	->	->	->	->

MASTER BLOCK								
MIDI ch.=14								
DIR1 LEVEL	104							
DIR2 LEVEL	105							
DIR3 LEVEL	106							
DIR4 LEVEL	107							
DIR5 LEVEL	108							
DIR6 LEVEL	109							
DIR7 LEVEL	110							
DIR8 LEVEL	111							
DIR1/2 Bal	112							
DIR3/4 Bal	113							
DIR5/6 Bal	114							
DIR7/8 Bal	115							
MIDI ch.=15								
AUX1 LEVEL	104							
AUX2 LEVEL	105							
AUX3 LEVEL	106							
AUX4 LEVEL	107							
AUX5 LEVEL	108							
AUX6 LEVEL	109							
AUX7 LEVEL	110							
AUX8 LEVEL	111							
AUX1/2 Bal	112							
AUX3/4 Bal	113							
AUX5/6 Bal	114							
AUX7/8 Bal	115							
MIDI ch.=16								
MASTER LEVEL	102							
MASTER BAL	103							
MONITOR BAL	104							

(*1) Mixer Level Table

Data	Lev(dB)	Data	Lev(dB)	Data	Lev(dB)	Data	Lev(dB)	Data	Lev(dB)
0	-Inf	30	-22.0	60	-10.3	90	- 2.3	120	4.6
1	-80.0	31	-21.6	61	-10.0	91	- 2.0	121	4.8
2	-68.0	32	-21.2	62	- 9.8	92	- 1.8	122	5.0
3	-60.0	33	-20.8	63	- 9.5	93	- 1.5	123	5.2
4	-54.0	34	-20.4	64	- 9.3	94	- 1.3	124	5.4
5	-50.0	35	-20.0	65	- 9.0	95	- 1.0	125	5.6
6	-50.0	36	-19.6	66	- 8.8	96	- 0.8	126	5.8
7	-48.0	37	-19.2	67	- 8.6	97	- 0.6	127	6.0
8	-46.0	38	-18.8	68	- 8.4	98	- 0.4		
9	-44.0	39	-18.4	69	- 8.2	99	- 0.2		
10	-42.0	40	-18.0	70	- 8.0	100	0.0		
11	-40.0	41	-17.6	71	- 7.8	101	0.2		
12	-38.0	42	-17.2	72	- 7.5	102	0.4		
13	-36.0	43	-16.8	73	- 7.3	103	0.6		
14	-34.5	44	-16.4	74	- 7.0	104	0.8		
15	-33.0	45	-16.0	75	- 6.8	105	1.0		
16	-32.0	46	-15.6	76	- 6.6	106	1.3		
17	-31.0	47	-15.2	77	- 6.3	107	1.5		
18	-30.0	48	-14.8	78	- 6.1	108	1.8		
19	-29.0	49	-14.4	79	- 5.8	109	2.0		
20	-28.0	50	-14.0	80	- 5.6	110	2.3		
21	-27.2	51	-13.6	81	- 5.3	111	2.5		
22	-26.4	52	-13.2	82	- 5.1	112	2.8		
23	-25.6	53	-12.8	83	- 4.8	113	3.0		
24	-24.8	54	-12.4	84	- 4.6	114	3.3		
25	-24.0	55	-12.0	85	- 4.3	115	3.5		
26	-23.6	56	-11.6	86	- 4.1	116	3.8		
27	-23.2	57	-11.3	87	- 3.8	117	4.0		
28	-22.8	58	-11.0	88	- 3.6	118	4.2		
29	-22.4	59	-10.6	89	- 2.6	119	4.4		

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

(Track status cannot be switched when tracks are assigned to Phrase Pads.)

(1) While VS-2480 / 2480CD stops

Value:	0-41	42-83	84-127
Status:	MUTE -> MUTE	MUTE -> REC	MUTE -> PLAY
	PLAY -> MUTE	PLAY -> REC	PLAY -> PLAY
	REC -> MUTE	REC -> REC	REC -> PLAY

(2) While playback / recording

Value:	0-41	42-83	84-127
Status:	MUTE -> X	MUTE -> X	MUTE -> PLAY
	PLAY -> MUTE	PLAY -> X	PLAY -> PLAY
	REC -> X	REC -> REC	REC -> X

(*) X = Ignored

❍Bank Select (MSB/LSB)

Switches the effect bank.

Status	Second	Third
BnH	00H	mmH
BnH	20H	llH

n = MIDI Channel No.: 0H - 7H (ch.1 = FX1 ch.2 = FX2 ch.3 = FX3 ch.4 = FX4 ch.5 = FX5 ch.6 = FX6 ch.7 = FX7 ch.8 = FX8)

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 - 27H (0 - 39)	Preset #200 - #239
00H	03H	00H - 63H (0 - 99)	User #000 - #099
00H	04H	00H - 63H (0 - 99)	User #100 - #199

❍Hold1

VS-2480/2480CD can receive when EFFECT C.C. Rx Sw" in the UTILITY condition MIDI screen is "OUT," effect patch Vocoder2 effect (algorithm 28) is selected, and Vocoder2's Hold parameter is "MIDI."

Status	Second	Third
BnH	40H	llH

n = MIDI Channel No.: 0,2,4,6H (ch.1 = FX1 ch.3 = FX3 ch.5 = FX5 ch.7 = FX7)

ll = Control Value: 00H - 7FH (0 - 127)

❍NRPN(MSB/LSB)

Parameters on the Mixer/Effect section can be changed when UTILITY-MIDI screens EFFECT C.C. Rx Sw is "On."

Status	Second	Third
BnH	62H	llH
BnH	63H	mmH

n = MIDI Channel No.:
0H - 7H (ch.1 = FX1 ch.2 = FX2 ch.3 = FX3 ch.4 = FX4 ch.5 = FX5 ch.6 = FX6 ch.7 = FX7 ch.8 = FX8)
8H - 9H (ch.9 = Input Mixer, ch.10=Track Mixer)

mm = upper byte of the parameter number to be assigned with NRPN.:
00H n = 0H - 7H
00H - 17H (1 - 24) n = 8H - 9H

ll = lower byte of the parameter number to be assigned with NRPN.:
00H - 3EH (0 - 62)

❍Data Entry (MSB/LSB)

When UTILITY-MIDI screens EFFECT C.C. Rx Sw is "On," controls effect parameter assigned with NRPN.

Status	Second	Third
BnH	06H	mmH
BnH	26H	llH

n = MIDI Channel No.:
0H - 7H (ch.1 = FX1 ch.2 = FX2 ch.3 = FX3 ch.4 = FX4 ch.5 = FX5 ch.6 = FX6 ch.7 = FX7 ch.8 = FX8)
8H - 9H (ch.9 = Input Mixer, ch.10 = Track Mixer)

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

When UTILITY-MIDI screens EFFECT C.C. Rx Sw is "On," increments the effect parameter assigned with NRPN.

Status	Second	Third
BnH	60H	00H

n = MIDI Channel No.:
0H - 7H (ch.1 = FX1 ch.2 = FX2 ch.3 = FX3 ch.4 = FX4 ch.5 = FX5 ch.6 = FX6 ch.7 = FX7 ch.8 = FX8)
8H - 9H (ch.9 = Input Mixer, ch.10 = Track Mixer)

Increment the effect parameter selected with NRPN.

❍Data Decrement

When UTILITY-MIDI screens EFFECT C.C. Rx Sw is "On," decrements the effect parameter assigned with NRPN.'

Status	Second	Third
BnH	61H	00H

n = MIDI Channel No.:
0H - 7H (ch.1 = FX1 ch.2 = FX2 ch.3 = FX3 ch.4 = FX4 ch.5 = FX5 ch.6 = FX6 ch.7 = FX7 ch.8 = FX8)
8H - 9H (ch.9 = Input Mixer, ch.10 = Track Mixer)

Decrement the effect parameter selected with NRPN.

NRPN Parameters Number Map

Ch	NRPN MSB LSB	
0	00H 00H	EFFECT 1 Parameter
	01H 00H	(Reserved)
	:	:
	7FH 7FH	
1	00H 00H	EFFECT 2 Parameter
	01H 00H	(Reserved)
	:	:
	7FH 7FH	
2	00H 00H	EFFECT 3 Parameter
	01H 00H	(Reserved)
	:	:
	7FH 7FH	
3	00H 00H	EFFECT 4 Parameter
	01H 00H	(Reserved)
	:	:
	7FH 7FH	
4	00H 00H	EFFECT 5 Parameter
	01H 00H	(Reserved)
	:	:
	7FH 7FH	
5	00H 00H	EFFECT 6 Parameter
	01H 00H	(Reserved)
	:	:
	7FH 7FH	
6	00H 00H	EFFECT 7 Parameter
	01H 00H	(Reserved)
	:	:
	7FH 7FH	
7	00H 00H	EFFECT 8 Parameter
	01H 00H	(Reserved)
	:	:
	7FH 7FH	
8	00H 00H	Input Mixer Channel 1 EQ Parameter
	01H 00H	Input Mixer Channel 2 EQ Parameter
	:	:
	17H 00H	Input Mixer Channel 24 EQ Parameter
	18H 00H	(Reserved)
	:	:
	7FH 7FH	
9	00H 00H	Track Mixer Channel 1 EQ Parameter
	01H 00H	Track Mixer Channel 2 EQ Parameter
	:	:
	17H 00H	Track Mixer Channel 24 EQ Parameter
	18H 00H	(Reserved)
	:	:
	7FH 7FH	

NRPN and Mixer Parameters

NRPN	Data Entry	
ccH 00H	mmH llH	EQ SWITCH 0,1 = Off,On
ccH 01H	mmH llH	EQ LOW GAIN −150,,,150 = −15.0,,,15.0dB
ccH 02H	mmH llH	EQ LOW FREQUENCY 20,,,88 = 20Hz,,,1.00kHz(*1)
ccH 03H	mmH llH	EQ LOWMID GAIN −150,,,150 = −15.0,,,15.0dB
ccH 04H	mmH llH	EQ LOWMID FREQUENCY 20,,,140 = 20Hz,,,20.0kHz(*1)
ccH 05H	mmH llH	EQ LOWMID Q 30,,,96 = 0.36,,,16.0(*2)
ccH 06H	mmH llH	EQ HIGHMID GAIN −150,,,150 = −15.0,,,15.0dB
ccH 07H	mmH llH	EQ HIGHMID FREQUENCY 20,,,140 = 20Hz,,,20.0kHz(*1)
ccH 08H	mmH llH	EQ HIGHMID Q 30,,,96 = 0.36,,,16.0(*2)
ccH 09H	mmH llH	EQ HIGH GAIN −150,,,150 = −15.0,,,15.0dB
ccH 0AH	mmH llH	EQ HIGH FREQUENCY 88,,,140 = 1.00kHz ,,,20.0kHz(*1)
ccH 0BH	mmH llH	EQ FILTER TYPE 0,,,4 = Off,LPF,HPF,BPF,BEF
ccH 0CH	mmH llH	EQ FILTER FREQUENCY 20,,,140 = 20Hz,,,20.0kHz(*1)
ccH 0DH	mmH llH	EQ FILTER Q 30,,,96 = 0.36,,,16.0(*2)

* The Mixer Channel number is specified in NRPN's MSB (avove ccH).

(*1) Mixer Frequency Table

Data	Freq(Hz)	Data	Freq(Hz)	Data	Freq(Hz)	Data	Freq(Hz)	Data	Freq(Hz)
20	20	45	84	70	355	95	1.50k	120	6.30k
21	21	46	90	71	376	96	1.60k	121	6.70k
22	22	47	94	72	400	97	1.70k	122	7.10k
23	24	48	100	73	422	98	1.80k	123	7.50k
24	25	49	106	74	450	99	1.90k	124	8.00k
25	27	50	112	75	473	100	2.00k	125	8.40k
26	28	51	120	76	500	101	2.10k	126	9.00k
27	30	52	125	77	530	102	2.24k	127	9.44k
28	32	53	133	78	560	103	2.37k	128	10.0k
29	33	54	140	79	600	104	2.50k	129	10.6k
30	36	55	150	80	630	105	2.66k	130	11.2k
31	38	56	160	81	670	106	2.80k	131	12.0k
32	40	57	170	82	710	107	3.00k	132	12.5k
33	42	58	180	83	750	108	3.15k	133	13.3k
34	45	59	190	84	800	109	3.35k	134	14.0k
35	47	60	200	85	840	110	3.55k	135	15.0k
36	50	61	210	86	900	111	3.76k	136	16.0k
37	53	62	224	87	944	112	4.00k	137	17.0k
38	56	63	237	88	1.00k	113	4.22k	138	18.0k
39	60	64	250	89	1.06k	114	4.50k	139	19.0k
40	63	65	266	90	1.12k	115	4.73k	140	20.0k
41	67	66	280	91	1.20k	116	5.00k		
42	71	67	300	92	1.25k	117	5.30k		
43	75	68	315	93	1.33k	118	5.60k		
44	80	69	335	94	1.40k	119	6.00k		

(*2) Mixer Q Table

Data	Q	Data	Q	Data	Q	Data	Q
30	0.36	50	1.12	70	3.55	90	11.2
31	0.38	51	1.26	71	3.76	91	12.0
32	0.40	52	1.25	72	4.00	92	12.5
33	0.42	53	1.33	73	4.22	93	13.3
34	0.45	54	1.40	74	4.50	94	14.0
35	0.47	55	1.50	75	4.73	95	15.0
36	0.50	56	1.60	76	5.00	96	16.0
37	0.53	57	1.70	77	5.30		
38	0.56	58	1.80	78	5.60		
39	0.60	59	1.90	79	6.00		
40	0.63	60	2.00	80	6.30		
41	0.67	61	2.10	81	6.70		
42	0.71	62	2.24	82	7.10		
43	0.75	63	2.37	83	7.50		
44	0.80	64	2.50	84	8.00		
45	0.84	65	2.66	85	8.40		
46	0.90	66	2.80	86	9.00		
47	0.94	67	3.00	87	9.44		
48	1.00	68	3.15	88	10.0		
49	1.06	69	3.35	89	10.6		

NRPN and Effect Parameters

❍Algorithm 0 Reverb (FX1,FX3,FX5,FX7)

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

❍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 7FH	00H 00H : 00H 00H	(Reserved)	

❍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
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	mmH llH	2CH RSS: Phones SW	0,1 = Off,On
00H 05H	mmH llH	2CH RSS: RSS Type	0,1 = Type A,Type B
00H 06H : 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	mmH llH	Delay RSS: Phones SW	0,1 = Off,On
00H 0DH : 00H 7FH	00H 00H : 00H 00H	(Reserved)	

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

❍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	mmH llH	Chorus RSS: Phones SW	0,1 = Off,On
00H 05H : 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 Modeling 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 Modeling: 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 Multi 1

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 Modeling

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, 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
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	(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	(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
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	(Reserved)	

❍Algorithm 17 Gate Reverb (FX1 or FX3)

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	(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
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
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 Off	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 Gain	–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 Gain	–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 (FX1,FX3,FX5,FX7)

NRPN	Data Entry	
00H 00H	mmH llH	Voice Transformer SW 0,1 = Off,On
00H 01H	mmH llH	Reverb SW 0,1 = Off,On
00H 02H	mmH llH	(Reserved)
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 (FX1,FX3,FX5,FX7)

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 Modeling

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,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)	

❍Algorithm 34 Speaker Modeling

NRPN	Data Entry		
00H 00H	mmH llH	Speaker Modeling SW	0,1 = Off,On
00H 01H	mmH llH	Bass Cut SW	0,1 = Off,On
00H 02H	mmH llH	Low Frequency Trimmer SW	0,1 = Off,On
00H 03H	mmH llH	High Frequency Trimmer SW	0,1 = Off,On
00H 04H	mmH llH	Limiter SW	0,1 = Off,On
00H 05H	mmH llH	Output Speakers	0,1 = DS−90/DS−90A,DS−50A
00H 06H	mmH llH	Speaker Modeling Model 0,,,11 = THRU,Super Flat,Powered GenBlk, Powered E−Bas,Powered Mack,Small Cube,White Cone, White C +tissue,Small Radio,Small TV,Boom Box, BoomBox LoBoost	
00H 07H	mmH llH	Speaker Modeling Phase	0,1 = NRM,INV
00H 08H	mmH llH	Bass Cut Frequency	1,,,200 = Thru,20,,,2000Hz
00H 09H	mmH llH	Low Frequency Trimmer Gain	−12,,,12dB
00H 0AH	mmH llH	Low Frequency Trimmer Frequency	2,,,200 = 20,,,2000Hz
00H 0BH	mmH llH	High Frequency Trimmer Gain	−12,,,12dB
00H 0CH	mmH llH	High Frequency Trimmer Frequency	10,,,200 = 1.0,,,20.0kHz
00H 0DH	mmH llH	Limiter Threshold	−60,,,0dB
00H 0EH	mmH llH	Limiter Release	0,,,100
00H 0FH	mmH llH	Limiter Level	−60,,,24dB
00H 10H : 00H 7FH	00H 00H : 00H 00H	(Reserved)	

❍Algorithm 35 Mastering Tool Kit

NRPN	Data Entry		
00H 00H	mmH llH	EQ SW	0,1 = Off,On
00H 01H	mmH llH	Bass Cut SW	0,1 = Off,On
00H 02H	mmH llH	Enhancer SW	0,1 = Off,On
00H 03H	mmH llH	Expander SW	0,1 = Off,On
00H 04H	mmH llH	Compressor SW	0,1 = Off,On
00H 05H	mmH llH	Limiter SW	0,1 = Off,On
00H 06H	mmH llH	EQ: Input Gain	−24,,,12dB
00H 07H	mmH llH	EQ: Low EQ Type	0,1 = Shelving, Peaking
00H 08H	mmH llH	EQ: Low EQ Gain	−12,,,12dB
00H 09H	mmH llH	EQ: Low EQ Frequency	2,,,42 = 20,,,2000Hz(*1 Frequency Table)
00H 0AH	mmH llH	EQ: Low EQ Q	0,,,31 = 0.3,,,16.0(*2 Q Table)
00H 0BH	mmH llH	EQ: Low Mid EQ Gain	−12,,,12dB
00H 0CH	mmH llH	EQ: Low Mid EQ Frequency	2,,,54 = 20,,,8000Hz(*1 Frequency Table)
00H 0DH	mmH llH	EQ: Low Mid EQ Q	0,,,31 = 0.3,,,16.0(*2 Q Table)
00H 0EH	mmH llH	EQ: High Mid EQ Gain	−12,,,12dB
00H 0FH	mmH llH	EQ: High Mid EQ Frequency	2,,,54 = 20,,,8000Hz(*1 Frequency Table)
00H 10H	mmH llH	EQ: High Mid EQ Q	0,,,31 = 0.3,,,16.0(*2 Q Table)
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	39,,,62 = 1.4,,,20.0kHz(*1 Frequency Table)
00H 14H	mmH llH	EQ: High EQ Q	0,,,31 = 0.3,,,16.0(*2 Q Table)
00H 15H	mmH llH	EQ: Level	−24,,,12dB
00H 16H	mmH llH	Bass Cut Frequency	1,,,42 = Off,20,,,2000Hz(*1 Frequency Table)
00H 17H	mmH llH	Enhancer Sens	0,,,100
00H 18H	mmH llH	Enhancer Frequency	36,,,56 = 1.0,,,10.0kHz(*1 Frequency Table)
00H 19H	mmH llH	Enhancer Mix Level	−24,,,12dB
00H 1AH	mmH llH	Input Gain	−24,,,12dB
00H 1BH	mmH llH	Input Detect Time	0,,,10ms
00H 1CH	mmH llH	Input Low Split Point	2,,,34 = 20,,,800Hz(*1 Frequency Table)
00H 1DH	mmH llH	Input High Split Point	40,,,60 = 1.6,,,16.0kHz(*1 Frequency Table)
00H 1EH	mmH llH	Expander Low Threshold	0,,,80 = −80,,,0dB
00H 1FH	mmH llH	Expander Mid Threshold	0,,,80 = −80,,,0dB
00H 20H	mmH llH	Expander High Threshold	0,,,80 = −80,,,0dB
00H 21H	mmH llH	Expander Low Ratio	0,,,13 = 1:1.0,,,1:INF(*3 Ratio Table)
00H 22H	mmH llH	Expander Mid Ratio	0,,,13 = 1:1.0,,,1:INF(*3 Ratio Table)
00H 23H	mmH llH	Expander High Ratio	0,,,13 = 1:1.0,,,1:INF(*3 Ratio Table)
00H 24H	mmH llH	Expander Low Attack	0,,,100ms
00H 25H	mmH llH	Expander Mid Attack	0,,,100ms
00H 26H	mmH llH	Expander High Attack	0,,,100ms
00H 27H	mmH llH	Expander Low Release	0,,,100 = 50,,,5000ms
00H 28H	mmH llH	Expander Mid Release	0,,,100 = 50,,,5000ms
00H 29H	mmH llH	Expander High Release	0,,,100 = 50,,,5000ms
00H 2AH	mmH llH	Compressor Low Threshold	−24,,,0dB
00H 2BH	mmH llH	Compressor Mid Threshold	−24,,,0dB
00H 2CH	mmH llH	Compressor High Threshold	−24,,,0dB
00H 2DH	mmH llH	Compressor Low Ratio	0,,,13 = 1:1.0,,,1:INF(*3 Ratio Table)
00H 2EH	mmH llH	Compressor Mid Ratio	0,,,13 = 1:1.0,,,1:INF(*3 Ratio Table)
00H 2FH	mmH llH	Compressor High Ratio	0,,,13 = 1:1.0,,,1:INF(*3 Ratio Table)
00H 30H	mmH llH	Compressor Low Attack	0,,,100ms
00H 31H	mmH llH	Compressor Mid Attack	0,,,100ms
00H 32H	mmH llH	Compressor High Attack	0,,,100ms
00H 33H	mmH llH	Compressor Low Release	0,,,100 = 50,,,5000ms
00H 34H	mmH llH	Compressor Mid Release	0,,,100 = 50,,,5000ms
00H 35H	mmH llH	Compressor High Release	0,,,100 = 50,,,5000ms
00H 36H	mmH llH	Mixer Low Level	0,,,86 = −80,,,6dB
00H 37H	mmH llH	Mixer Mid Level	

			0,,,86 = –80,,,6dB
00H 38H	mmH llH	Mixer High Level	0,,,86 = –80,,,6dB
00H 39H	mmH llH	Limiter Threshold	–24,,,0dB
00H 3AH	mmH llH	Limiter Attack	0,,,100ms
00H 3BH	mmH llH	Limiter Release	0,,,100 = 50,,,5000ms
00H 3CH	mmH llH	Output Level	0,,,86 = –80,,,6dB
00H 3DH	mmH llH	Output Soft Clip	0,1 = Off,On
00H 3EH	00H 00H	(Reserved)	
:	:		
00H 7FH	00H 00H		

* 1 Effect Frequency Table

Data	Freq(Hz)	Data	Freq(Hz)	Data	Freq(Hz)	Date	Freq(Hz)
0	THRU	16	100	32	630	48	4.00k
1	THRU	17	112	33	710	49	4.50k
2	20.0	18	125	34	800	50	5.00k
3	22.4	19	140	35	900	51	5.60k
4	25.0	20	160	36	1.00k	52	6.30k
5	28.0	21	180	37	1.12k	53	7.10k
6	31.5	22	200	38	1.25k	54	8.00k
7	35.5	23	224	39	1.40k	55	9.00k
8	40.0	24	250	40	1.60k	56	10.0k
9	45.0	25	280	41	1.80k	57	11.2k
10	50.0	26	315	42	2.00k	58	12.5k
11	56.0	27	355	43	2.24k	59	14.0k
12	63.0	28	400	44	2.50k	60	16.0k
13	71.0	29	450	45	2.80k	61	18.0k
14	80.0	30	500	46	3.15k	62	20.0k
15	90.0	31	560	47	3.55k	63	22.4k

*2 Effect Q Table

Data	Q	Data	Q
0	0.3	16	2.8
1	0.4	17	3.1
2	0.5	18	3.5
3	0.6	19	4.0
4	0.7	20	4.5
5	0.8	21	5.0
6	0.9	22	5.6
7	1.0	23	6.3
8	1.1	24	7.1
9	1.2	25	8.0
10	1.4	26	9.0
11	1.6	27	10.0
12	1.8	28	11.2
13	2.0	29	12.5
14	2.2	30	14.0
15	2.5	31	16.0

*3 Ratio Table

Data	RATIO	
0	1:1.0	(OFF)
1	1:1.1	
2	1:1.2	
3	1:1.4	
4	1:1.6	
5	1:1.8	
6	1:2.0	
7	1:2.5	
8	1:3.1	
9	1:4.0	
10	1:5.6	
11	1:8.0	
12	1:16	
13	1:INF	

●Program Change

Parameters on the Mixer/Effect section can be changed when UTILITY-MIDI screens EFFECTP.C.Rx Sw is "On."

When UTILITY-MIDI screens EFFECT P.C. Rx Sw is "On," 00H-07H is received if it operates as the Effect Program Change.

When UTILITY-MIDI screens SCENE P.C. Rx Sw is "On," MIDI Channel No. FH is received if it operates as the Scene Change.

VS-2480/2480CD never transmits this message.

Status	Second
CnH	ppH

n = MIDI Channel No.:
0H - 7H (ch.1 = FX1 ch.2 = FX2 ch.3 = FX3 ch.4 = FX4
ch.5 = FX5 ch.6 = FX6 ch.7 = FX7 ch.8 = FX8)
FH (ch.16 = Scene Memory (*1))

pp = Program No.: 00H - 63H (0 - 99) n = 0H - 7H

pp = Program No.: 00H - 63H (0 - 99) n = FH

(*1) If received while VS-2480/2480CD is playing, playback stops, and then restarts after the scene switched. Never receives while recording.

●Pitch Bend Change

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 - 7H (ch.1-ch.8)
n = 0,2,4,6 (ch.1 = FX1, ch.3 = FX3, ch.5 = FX5, ch.7 = FX7)
: Voice Transformer : Fine Pitch
n = 1,3,5,7 (ch.2 = FX1, ch.4 = FX3, ch.6 = FX5, ch.8 = FX7)
: Voice Transformer : Fine 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-2480/2480CD is running (Playing or Recording) if the UTILITY-SYNC screens SYNC MODE is "INT" and SYNC Gen. is "MTC." The transmitted time counts are summed to "SYNC OFF SET TIME" as the project top is "00:00:00:00."

The VS-2480/2480CD synchronizes with the time counts which are summed to "SYNC OFFSET TIME" as the project top is "00:00:00:00" if the SYNC screens SYNC MODE 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 = 4bit 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	Second Count (0-59)
Minutes Count	xxyyyyyy	
	xx	Reserved (00)
	yyyyyy	Minutes Count (0-59)
Hour Count	xyyzzzzz	
	x	Reserved (0)
	yy	Time Code Type
		0 = 24 Frame/Sec
		1 = 25 Frame/Sec
		2 = 30 Frame/Sec (Drop Frame)
		3 = 30 Frame/Sec (Non Drop Frame)
	zzzzz	Hours Count

●Song Position Pointer

The current position is transmitted with the Song Position Pointer Message before the VS-2480/2480CD starts top run or after the locate operation when UTILITY-SYNC screens SYNC MODE is "INT" and SYNC 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 UTILITY-SYNC screens SYNC MODE is "INT" and SYNC Gen. is "MIDIclk" or "SyncTr."

●Timing Clock

Status
F8H

●Start

Status
FAH

●Continue

Status
FBH

●Stop

Status
FCH

■System Exclusive Message

Status	Data Byte	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 Real-time Message	
	7FH Universal Real-time Message	
ddH	Data:	00H - 7FH (0 - 127)
:	:	
eeH	Data	
F7H	EOX	(End of System Exclusive message)

The VS-2480/2480CD can transfer and receive the internal parameters information using system exclusive messages, and also can be controlled by the external devices using system exclusive message.
The VS-2480/2480CD can transmit and receive Universal System Exclusive messages, Data Request (RQ1) and Data set (DT1) as the System Exclusive Message.

❍About Model ID

The Model ID of the VS-2480/2480CD is 00H,40H as for Data Request (RQ1) and Data set (DT1). The VS-2480/2480CD also can receive 00H,40H (VS-2480/2480CD) and 00,36H (VE-7000).

❍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-2480/2480CD units.
The VS-2480/2480CD 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 UTILITY-MIDI screens DEVICE ID minus one.

●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 Real-time 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-2480/2480CD.
The VS-2480/2480CD does not transmit the message.
If the VS-240 received the message and the device ID of the message is same as its device.
ID or 7FH, the VS-2480/2480CD transmits the following Identify Reply message.

❍Identity Reply

Status	Data Byte	Status
F0H	7EH,Dev,06H,02H,41H,mmH,mmH, 00H,00H,00H,00H,ssH,ssH	F7H

Byte	Description
F0H	Status of System Exclusive Message
7EH	Universal System Exclusive Non Real-time Header
Dev	Device ID
06H	General Information (sub-ID #1)
02H	Identify Request (sub-ID #2)
41H	Manufacturer ID (Roland)
mmH mmH	Device Family Code (VS-2480/2480CD)
00H 00H	Device Family No.
00H	
00H	
ssH ssH	Software Revision Level
F7H	EOX (End of Exclusive Message)

The value of the device family code is according to the value of SYSTEM parameters “MIDI Model ID.”
When VS-2480/2480CD, the value of the device family code is 40H 01H.

❍MIDI Time Code

Status	Data Byte	Status
F0H	7FH,Dev,01H,01H,hr,mn,sc,fr	F7H

Byte	Description
F0H	Status of System Exclusive Message
7FH	Universal System Exclusive Real-time Header
Dev	Device ID
01H	MIDI Time Code
01H	MIDI Time Code Full Message
hr	Type/Hour (0yyzzzzz) yy: Time Code Type 0=24 Frame/Sec 1=25 Frame/Sec 2=30 Frame/Sec (Drop) 3=30 Frame/Sec (Non-Drop)
mn	Minutes (0–59)
sc	Second (0–59)
fr	Frame (0–29)
F7H	EOX (End of Exclusive Message)

❍MIDI Machine Control Commands

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

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

(*) see “3. MIDI Machine Control.”

●Data Transfer (RQ1,DT1)

❍Data Request (RQ1)

Status	Data Byte	Status
F0H	41H,Dev,mmH,mmH,11H, aaH,bbH,ccH,ddH, ssH,ssH,ssH,ssH,Sum	F7H

Byte	Description
F0H	Status of System Exclusive Message
41H	Manufacturer ID (Roland)
Dev	Device ID
00H 40H	Model ID (VS-2480/2480CD)
11H	Command ID (RQ1)
aaH	Address MSB
bbH	Address
ccH	Address
ddH	Address LSB
ssH	Data MSB
ssH	Data
ssH	Data
ssH	Data LSB
Sum	Check Sum
F7H	EOX (End of Exclusive Message)

❍Data Set (DT1)

<Model ID = 00H 40H (VS-2480/2480CD)>

Status	Data Byte	Status
F0H	41H,Dev,mmH,mmH,12H, aaH,bbH,ccH,ddH, ..., eeH,Sum	F7H

Byte	Description
F0H	Status of System Exclusive Message
41H	Manufacturer ID (Roland)
Dev	Device ID
00H 40H	Model ID (VS-2480/2480CD)
12H	Command ID (DT1)
aaH	Address MSB
bbH	Address
ccH	Address
ddH	Address LSB
eeH	Data
Sum	Check Sum
F7H	EOX (End of Exclusive Message)

<Model ID = 00H 36H (VE-7000)>

Status	Data Byte	Status
F0H	41H,Dev,mmH,mmH,12H, aaH,bbH,ccH,ddH, ..., eeH,Sum	F7H

Byte	Description
F0H	Status of System Exclusive Message
41H	Manufacturer ID (Roland)
Dev	Device ID
00H 36H	Model ID (VE-7000)
12H	Command ID (DT1)
aaH	Address MSB
bbH	Address
ccH	Address LSB
ddH	Data
Sum	Check Sum
F7H	EOX (End of Exclusive Message)

❍The message is transmitted 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 form the specified parameter base address.
If the interval of received messages is shorter than 25 msec, the VS-2480/2480CD can not work the receive message procedure correctly.

2. Data Transfer Address Map

Address are expressed in 7bit hexadecimal values.

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

■Address Block

<Model ID = 00H 40H (VS-2480 / 2480CD)>

Start address	Contents and remarks
00 00 00 00	(Reserved)
02 00 00 00	Utility Parameter
03 00 00 00	Project Parameter
04 00 00 00	Mixer Parameter
05 00 00 00	Effect Parameter
06 00 00 00	Sync Track Data

●Utility Parameter

Start address	Data	Contents and remarks
02 00 00 00	00 – 01	PHANTOM SWITCH ANALOG INPUT1 Off,On
02 00 00 01	00 – 01	PHANTOM SWITCH ANALOG INPUT2 Off,On
02 00 00 02	00 – 01	PHANTOM SWITCH ANALOG INPUT3 Off,On
02 00 00 03	00 – 01	PHANTOM SWITCH ANALOG INPUT4 Off,On
02 00 00 04	00 – 01	PHANTOM SWITCH ANALOG INPUT5 Off,On
02 00 00 05	00 – 01	PHANTOM SWITCH ANALOG INPUT6 Off,On
02 00 00 06	00 – 01	PHANTOM SWITCH ANALOG INPUT7 Off,On
02 00 00 07	00 – 01	PHANTOM SWITCH ANALOG INPUT8 Off,On
02 00 00 08	00 – 08	MB–24 DISPLAY SECTION OFF, ANALOG INPUT 1–16,R–BUS/COAX/OPT IN, INPUT MIXER 1–24,TRACK MIXER 1–24, FX1–8 RETURN,AUX1–8/DIR1–8, ANALOG OUTPUT,R–BUS/COAX/OPT OUT
02 00 00 09	00 – 01	MB–24 METER POSITION Pre,Pst
02 00 00 0A	00 – 02	MB–24 TIME DISPLAY MEASURE/BEAT,TIME CODE,CLOCK/SCENE
02 00 00 0B	00 – 01	MB–24 METER SCALE x1,x1/2
02 00 00 0C	00 – 01	VGA OUT Off,On
02 00 00 0D	00 – 03	VGA REFRESH RATE 60,66,70,75Hz
02 00 00 0E	01 – 0B	VGA H.POSITION +5,,,0,,,–5
02 00 00 0F	01 – 5F 01 – 20 01 – 4B 01 – 17	VGA V.POSITION –47,,,0,,,+47 (VGA REFRESH RATE = 60 Hz) –15,,,0,,,+16 (VGA REFRESH RATE = 65 Hz) –37,,,0,,,+37 (VGA REFRESH RATE = 70 Hz) –11,,,0,,,+11 (VGA REFRESH RATE = 75 Hz)
02 00 00 10	00 – 01	PS/2 MOUSE Off,On
02 00 00 11	00 – 04	PS/2 MOUSE POINTER SPEED 0,,,4
02 00 00 12	00 – 01	PS/2 KEYBOARD Off,On
02 00 00 13	00 – 01	PS/2 KEYBOARD TYPE 101/104,106/109
02 01 00 00	00 – 02	INPUT PEAK LEVEL 0,–3,–6dB
02 01 00 01	00 – 05	FOOT SWITCH ASSIGN Play/Stop,Record, TapMarker,Next,Previous,GP1
02 01 00 02	00 – 01	CD DIGITAL REC Off,On
02 01 00 03	00 – 02	SHIFT LOCK Off,On,Once
02 01 00 04	03 – 14	SWITCHING TIME 0.3,,,2.0sec
02 01 00 05	00 – 01	KNOB/FADER ASSIGN SWITCH Knob,Fader
02 01 00 06	00 – 01	PREVIOUS/NEXT SWITCH Phrase,Marker
02 01 00 07	00 – 01	LOCATOR/SCENE TYPE Safe,Quick
02 01 00 08	00 – 01	NUMERICS TYPE Up,Down
02 01 00 09	00 – 01	UNDO MESSAGE Off,On
02 01 00 0A	00 – 01	EDIT MESSAGE Off,On
02 01 00 0B	00 – 01	PAN KNOB AUTO DISPLAY Off,CH VIEW
02 01 00 0C	00 – 01	PRM KNOB AUTO DISPLAY Off,CH VIEW
02 01 00 0D	00 – 01	AUX KNOB AUTO DISPLAY Off,CH VIEW
02 01 00 0E	00 – 01	DATE/REMAIN SWITCH Date,Remain
02 01 00 0F	00 – 03	REMAIN DISPLAY TYPE Time,CapaMB,Capa %,Event
02 01 00 10	00 – 01	RETURN TO LOCATE SWITCH Off,On
02 01 00 11	00 – 01	EDIT POINT SWITCH TYPE Same LOCATOR,OVERWRITE
02 02 00 00	00 – 06	MASTER CLOCK INT,R–BUS1,R–BUS2,COAXIAL IN, OPTICAL IN,WORD CLOCK,EXT TIME CODE
02 02 00 01	00 – 7F	DITHER 127,24,,,8 = Off,24,,,8bit
02 02 00 02	00 – 01	DIGITAL COPY PROTECT Off,On
02 02 00 03		(Reserved)
02 02 00 04 02 02 00 05# 02 02 00 06# 02 02 00 07# 02 02 00 08# 02 02 00 09# 02 02 00 0A# 02 02 00 0B#	0000aaaa 0000bbbb 0000cccc 0000dddd 0000eeee 0000ffff 0000gggg 0000hhhh	DISPLAY OFFSET TIME (*1,2,3) aaaabbbbccccddddeeeeffffgggghhhh = 0,,,4294967295block (1block=16sample)
02 02 00 0C	00 – 01	TIME DISPLAY FORMAT ABS,REL
02 02 00 0D	00 – 01	PEAK HOLD SWITCH Off,On
02 02 00 0E	00 – 02	R–BUS2 COAXIAL Sel R–BUS2–1/2 5/6, COAX R–BUS2–1/2,COAX R–BUS2–5/6
02 02 00 0F	00 – 02	R–BUS2 OPTICAL Sel R–BUS2–3/4 7/8, OPTI R–BUS2–3/4,OPTI R–BUS2–7/8
02 03 00 00	00 – 01	RECORD MONITOR Auto,Source
02 03 00 01	00 – 01	MARKER STOP Off,On
02 03 00 02	00 – 01	FADE CURVE Linear/Exp
02 03 00 03	00 – 05	FADE LENGTH 2,10,20,30,40,50ms
02 03 00 04	00 – 01	VARI PITCH SWITCH Off,On
02 03 00 05		(Reserved)
02 03 00 06 02 03 00 07# 02 03 00 08# 02 03 00 09#	0aaaaaaa 0bbbbbbb 0ccccccc 0ddddddd	VARI PITCH 499,,,1561 = 50.00,,,16.00kHz (SAMPLE RATE = 32,44.1,48kHz) 254,,,1561 = 98.00,,,16.00kHz (SAMPLE RATE = 64,88.2,96kHz)
02 03 00 0A	00 – 01	SOLO/MUTE TYPE All BUS Send,MIX BUS Send
02 03 00 0B	00 – 4B	SCRUB LENGTH 25,,,100ms
02 03 00 0C	0A – 64	PREVIEW TO LENGTH 1.0,,,10,0sec
02 03 00 0D	0A – 64	PREVIEW FROM LENGTH 1.0,,,10,0sec
02 04 00 00	00 – 01	MIDI OUT/THRU SWITCH Out,Thru
02 04 00 01	00 – 1F	MIDI SYSTEM EXCLUSIVE DEVICE ID 1,,,32
02 04 00 02	00 – 02	MMC MODE Off,Master,Slave
02 04 00 03	00 – 02	MMC SOURCE MIDI,R–BUS1,R–BUS2
02 04 00 04	00 – 01	MIDI SYSTEM EXCLUSIVE RX SWITCH Off,On
02 04 00 05	00 – 01	MIDI SYSTEM EXCLUSIVE TX SWITCH Off,On
02 04 00 06	00 – 02	MIDI CONTROL TYPE Off,CC,SysEx
02 04 00 07	00 – 01	SCENE CHANGE BY PROGRAM CHANGE SWITCH Off,On
02 04 00 08	00 – 01	FX CHANGE BY PROGRAM CHANGE SWITCH Off,On
02 04 00 09	00 – 01	FX CONTROL BY CONTROL CHANGE SWITCH Off,On
02 05 00 00	00 – 01	SYNC Mode INT,EXT
02 05 00 01	00 – 01	SYNC with Gap Off,On
02 05 00 02	00 – 03	EXT SYNC SOURCE MIDI IN,R–BUS1,R–BUS2,SMPTE IN
02 05 00 03		(Reserved)
02 05 00 04 02 05 00 05# 02 05 00 06# 02 05 00 07# 02 05 00 08# 02 05 00 09# 02 05 00 0A# 02 05 00 0B#	0000aaaa 0000bbbb 0000cccc 0000dddd 0000eeee 0000ffff 0000gggg 0000hhhh	SYNC OFFSET TIME (*1,2,3) aaaabbbbccccddddeeeeffffgggghhhh = 0,,,4294967295block (1block=16sample)
02 05 00 0C	00 – 04	FRAME RATE 24,25,29D,29N,30
02 05 00 0D	00 – 0A	SYNC ERROR LEVEL 0,,,10
02 05 00 0E	00 – 03	MIDI OUT SYNC GENERATE Off,MTC,MIDIclk,SyncTr
02 05 00 0F	00 – 01	R–BUS1 SYNC GENERATE Off,MTC
02 05 00 10	00 – 01	R–BUS2 SYNC GENERATE Off,MTC
02 05 00 11	00 – 01	SYNC TRACK ENABLE Off,On
02 06 00 00 02 06 00 01# 02 06 00 02# 02 06 00 03# 02 06 00 04# 02 06 00 05# 02 06 00 06# 02 06 00 07#	0000aaaa 0000bbbb 0000cccc 0000dddd 0000eeee 0000ffff 0000gggg 0000hhhh	TEMPO MAP–1 TEMPO MAP TIME (*1,2) aaaabbbbccccddddeeeeffffgggghhhh = 0,,,4294967295block (1block=16sample)
02 06 00 08 02 06 00 09# 02 06 00 0A# 02 06 00 0B# 02 06 00 0C# 02 06 00 0D# 02 06 00 0E# 02 06 00 0F#	0aaaaaaa 0bbbbbbb 0ccccccc 0ddddddd 0eeeeeee 0fffffff 0ggggggg 0hhhhhhh	TEMPO MAP–1 SYNC TRACK TIME (*1,2) aaaabbbbccccddddeeeeffffgggghhhh = 0,,,4294967295block (1block=16sample)
02 06 00 10 02 06 00 11#	0aaaaaaa 0bbbbbbb	TEMPO MAP–1 TEMPO 250 – 2500 = 25.0 – 250.0
02 06 00 12 02 06 00 13#	0aaaaaaa 0bbbbbbb	TEMPO MAP–1 MEASURE 1,,,999
02 06 00 14 02 06 00 15#	00 00 – 4F	TEMPO MAP–1 Beat 0 – 79 = 1/1,2/1,3/1,,,15/16,16/16
02 06 00 16 02 06 00 1F#	00 00	TEMPO MAP–1 (Reserved)
02 06 00 20 :	: :	TEMPO MAP–2 (See TEMPO MAP–1, 16bytes each)
02 06 06 3F#		TEMPO MAP–50
02 06 06 40	01 – 32	Total TEMPO MAP NUMBER 1,,,50
02 07 00 00	00 – 02	METRONOME OUT Off,INT,MIDI
02 07 00 01		(Reserved)
02 07 00 02 02 07 00 03#	0aaaaaaa 0bbbbbbb	METRONOME INT LEVEL less than –905,–905,,,60 = –Inf,–90.5,,,+6.0dB
02 07 00 04	00 – 01	METRONOME MODE Rec Only,Rec&Play
02 07 00 05	00 – 03	METRONOME TONE TYPE CLICK1,CLICK2, CLICK2(Note),DRUM
02 07 00 06	00 – 0F	METRONOME MIDI CHANNEL 1,,,16
02 07 00 07	0C – 7F	METRONOME MIDI ACCENT NOTE C_0,,,G_9
02 07 00 08	01 – 7F	METRONOME MIDI ACCENT VELOCITY 1,,,127
02 07 00 09	0C – 7F	METRONOME MIDI NORMAL NOTE C_0,,,G_9
02 07 00 0A	01 – 7F	METRONOME MIDI NORMAL VELOCITY 1,,,127
02 07 00 0B	00 – 02	METRONOME PERCUSSION Hand Clap,Cowbel,Maracas
02 07 10 00 02 07 10 01 02 07 10 02 02 07 10 03 02 07 10 04 02 07 10 05 02 07 10 06 02 07 10 07	00 – 02 01 – 7F 00 – 01 01 – 7F 00 – 01 01 – 7F 00 – 01 01 – 7F	DRUM BEAT PATTERN 1 H.H. Switch Off,On,Open Velocity 1,,,127 S.D. Switch Off,On Velocity 1,,,127 B.D. Switch Off,On Velocity 1,,,127 PERCUSSION Switch Off,On Velocity 1,,,127
02 07 10 08 :	: :	DRUM BEAT PATTERN 2 (See DRUM BEAT PATTERN 1, 8bytes each)
02 07 12 78		DRUM BEAT PATTERN 16
02 08 00 00 02 08 00 01# 02 08 00 02# 02 08 00 03# 02 08 00 04# 02 08 00 05# 02 08 00 06# 02 08 00 07#	0000aaaa 0000bbbb 0000cccc 0000dddd 0000eeee 0000ffff 0000gggg 0000hhhh	AUTO PUNCH IN (*1,2,3) aaaabbbbccccddddeeeeffffgggghhhh = 0,,,4294967295block (1block=16sample)
02 08 00 08 02 08 00 09# 02 08 00 0A# 02 08 00 0B# 02 08 00 0C# 02 08 00 0D# 02 08 00 0E# 02 08 00 0F#	0000aaaa 0000bbbb 0000cccc 0000dddd 0000eeee 0000ffff 0000gggg 0000hhhh	AUTO PUNCH OUT (*1,2,3) aaaabbbbccccddddeeeeffffgggghhhh = 0,,,4294967295block (1block=16sample)
02 08 00 10 02 08 00 11# 02 08 00 12# 02 08 00 13# 02 08 00 14# 02 08 00 15# 02 08 00 16# 02 08 00 17#	0000aaaa 0000bbbb 0000cccc 0000dddd 0000eeee 0000ffff 0000gggg 0000hhhh	LOOP FROM (*1,2,3) aaaabbbbccccddddeeeeffffgggghhhh = 0,,,4294967295block (1block=16sample)

02 08 00 18 02 08 00 19# 02 08 00 1A# 02 08 00 1B# 02 08 00 1C# 02 08 00 1D# 02 08 00 1E# 02 08 00 1F#	0000aaaa 0000bbbb 0000cccc 0000dddd 0000eeee 0000ffff 0000gggg 0000hhhh	LOOP TO (*1,2,3) aaaabbbbccccddddeeeeffffgggghhhh = 0,,,4294967295block (1block=16sample)	
02 08 00 20	00 – 01	AUTO PUNCH SWITCH	Off,On
02 08 00 21	00 – 01	LOOP SWITCH	Off,On
02 09 00 00 02 09 00 01# 02 09 00 02# 02 09 00 03# 02 09 00 04# 02 09 00 05# 02 09 00 06# 02 09 00 07#	0000aaaa 0000bbbb 0000cccc 0000dddd 0000eeee 0000ffff 0000gggg 0000hhhh	MARKER TIME or MARKER NUMBER (*1,2,4) aaaabbbbccccddddeeeeffffgggghhhh = 0,,,4294967295block (1block=16sample) or 0,,,999 Marker Number, >=1000 All	
02 09 00 08 : : :	20 – 7F	MARKER NAME –1	(ASCII)
02 09 00 13	20 – 7F	MARKER NAME –12	
02 09 01 00	00 – 04	MARKER COMMAND (*4) 00=MARKER READ 01=MARKER WRITE 02=MARKER CLEAR 03=MARKER NAME READ 04=MARKER NAME WRITE	
02 0A 00 00 02 0A 00 01# 02 0A 00 02# 02 0A 00 03# 02 0A 00 04# 02 0A 00 05# 02 0A 00 06# 02 0A 00 07#	0000aaaa 0000bbbb 0000cccc 0000dddd 0000eeee 0000ffff 0000gggg 0000hhhh	LOCATOR– 00 TIME (*1,2) aaaabbbbccccddddeeeeffffgggghhhh = 0,,,4294967295block (1block=16sample)	
02 0A 00 08 : : :	20 – 7F	LOCATOR– 00 NAME –1	(ASCII)
02 0A 00 13	20 – 7F	LOCATOR– 00 NAME –12	
02 0A 00 14 : : :	00 –	LOCATOR– 01 (similar to 02 0A 00 00 – 02 0A 00 13)	
02 0A 00 27 : : :	00 –		
02 0A 0F 3C : : :	00 –	LOCATOR– 99 (similar to 02 0A 00 00 – 02 0A 00 13)	
02 0A 0F 4F	00 –		
02 0B 00 00 02 0B 00 01# 02 0B 00 02# 02 0B 00 03#	0aaaaaaa 0bbbbbbb 0ccccccc 0ddddddd	KNOB/FADER ASSIGN to ATT, PHASE, GROUP, Ch LINK, Fader LINK, LEVEL, PAN, SOLO, MUTE, AUX1 Send Sw, AUX2 Send Sw, AUX3 Send Sw, AUX4 Send Sw, AUX5 Send Sw, AUX6 Send Sw, AUX7 Send Sw, AUX8 Send Sw, AUX1 Send Lev, AUX2 Send Lev, AUX3 Send Lev, AUX4 Send Lev, AUX5 Send Lev, AUX6 Send Lev, AUX7 Send Lev, AUX8 Send Lev, AUX1/2SendPAN, AUX3/4SendPAN, AUX5/6SendPAN, AUX7/8SendPAN, InsFX1 Sw, InsFX2 Sw, InsFX3 Sw, InsFX4 Sw, InsFX5 Sw, InsFX6 Sw, InsFX7 Sw, InsFX8 Sw, InsFX1 SndLev, InsFX2 SndLev, InsFX3 SndLev, InsFX4 SndLev, InsFX5 SndLev, InsFX6 SndLev, InsFX7 SndLev, InsFX8 SndLev, InsFX1 RtnLev, InsFX2 RtnLev, InsFX3 RtnLev, InsFX4 RtnLev, InsFX5 RtnLev, InsFX6 RtnLev, InsFX7 RtnLev, InsFX8 RtnLev, Surnd PAN, Surnd DEPTH, Surnd LR:C, Surnd SubWLev, Dyn Sw, Dyn Type, Cmp KeyIn, Cmp Thresh, Cmp RATIO, Cmp ATTACK, Cmp RELEASE, Cmp LEVEL, Cmp AUTOGAIN, Exp KeyIn, Exp Thresh, Exp RATIO, Exp ATTACK, Exp RELEASE, EQ Sw, EQ Low Gain, EQ Low Freq, EQ LoMid Gain, EQ LoMid Freq, EQ LoMid Q, EQ HiMid Gain, EQ HiMid Freq, EQ HiMid Q, EQ High Gain, EQ High Freq, EQ Fltr TYPE, EQ Fltr Freq, EQ Fltr Q	
02 0B 00 04 : : :	00 – 77	V.Fader Fader 1	0,,,119
02 0B 00 13	00 – 77	V.Fader Fader 16	0,,,119
02 0B 00 14 : : :	00 – 77	V.Fader Knob 1	0,,,119
02 0B 00 23	00 – 77	V.Fader Knob 16	0,,,119
02 0C 00 00 : : :	00 – 01	SCENE INPUT MIXER 1	Valid,Ignore
02 0C 00 17	00 – 01	SCENE INPUT MIXER 24	Valid,Ignore
02 0C 00 18 : : :	00 – 01	SCENE TRACK MIXER 1	Valid,Ignore
02 0C 00 2F	00 – 01	SCENE TRACK MIXER 24	Valid,Ignore
02 0C 00 30 : : :	00 – 01	SCENE FX RETURN 1	Valid,Ignore
02 0C 00 37	00 – 01	SCENE FX RETURN 8	Valid,Ignore
02 0C 00 38 : : :	00 – 01	SCENE AUX MASTER 1	Valid,Ignore
02 0C 00 3F	00 – 01	SCENE AUX MASTER 8	Valid,Ignore
02 0C 00 40 : : :	00 – 01	SCENE DIR MIXER 1	Valid,Ignore
02 0C 00 47	00 – 01	SCENE DIR MIXER 8	Valid,Ignore
02 0C 00 48 : : :	00 – 01	SCENE EFFECT 1	Valid,Ignore
02 0C 00 4F	00 – 01	SCENE EFFECT 8	Valid,Ignore
02 0C 00 50	00 – 01	SCENE MASTER	Valid,Ignore
02 0D 00 00 : : :	00 – 02	AUTOMIX STATUS INPUT MIXER 1	Manual,Write,Read
02 0D 00 17	00 – 02	AUTOMIX STATUS INPUT MIXER 24	Manual,Write,Read
02 0D 00 18 : : :	00 – 02	AUTOMIX STATUS TRACK MIXER 1	Manual,Write,Read
02 0D 00 2F	00 – 02	AUTOMIX STATUS TRACK MIXER 24	Manual,Write,Read
02 0D 00 30 : : :	00 – 02	AUTOMIX STATUS FX RETURN 1	Manual,Write,Read
02 0D 00 37	00 – 02	AUTOMIX STATUS FX RETURN 8	Manual,Write,Read
02 0D 00 38 : : :	00 – 02	AUTOMIX STATUS AUX MASTER 1	Manual,Write,Read
02 0D 00 3F	00 – 02	AUTOMIX STATUS AUX MASTER 8	Manual,Write,Read
02 0D 00 40 : : :	00 – 02	AUTOMIX STATUS DIR 1	Manual,Write,Read
02 0D 00 47	00 – 02	AUTOMIX STATUS DIR 8	Manual,Write,Read
02 0D 00 48 : : :	00 – 02	AUTOMIX STATUS EFFECT 1	Manual,Write,Read
02 0D 00 4F	00 – 02	AUTOMIX STATUS EFFECT 8	Manual,Write,Read
02 0D 00 50	00 – 02	AUTOMIX STATUS MASTER	Manual,Write,Read
02 0D 00 51	00 – 01	AUTOMIX WRITING PARAMETER LEVEL	Off,On
02 0D 00 52	00 – 01	AUTOMIX WRITING PARAMETER PAN/Bal	Off,On
02 0D 00 53	00 – 01	AUTOMIX WRITING PARAMETER EQ	Off,On
02 0D 00 54	00 – 01	AUTOMIX WRITING PARAMETER MUTE	Off,On
02 0D 00 55	00 – 01	AUTOMIX WRITING PARAMETER AUX Send	Off,On
02 0D 00 56	00 – 01	AUTOMIX WRITING PARAMETER InsFXLev	Off,On
02 0D 00 57	00 – 01	AUTOMIX WRITING PARAMETER SURROUND	Off,On
02 0D 00 58	00 – 01	AUTOMIX AFTER PUNCH OUT	Return,Keep
02 0D 00 59	00 – 0A	AUTOMIX RETURN TIME	0,,,10 = 0,,,1000ms
02 0E 00 00	00 – 01	SURROUND MIX SWITCH	Off,On
02 0E 00 01	00 – 02	SURROUND MIX MODE	2+2,3+1,3+2+1
02 0F 00 00	00 – 01	GENERATOR SWITCH	Off,On
02 0F 00 01	00 – 01	GENERATOR SOURCE Pink Noise,White Noise,Sin Wave,METRONOME	
02 0F 00 02 02 0F 00 03#	0aaaaaaa 0bbbbbbb	GENERATOR ATT –420,,,60 = –42.0,,,+6.0dB(*5)	
02 0F 00 04 02 0F 00 05#	0aaaaaaa 0bbbbbbb	GENERATOR FREQUENCY 20,,,140 = 20Hz,,,20.0kHz(*6,7)	
02 0F 00 06 02 0F 00 07#	0aaaaaaa 0bbbbbbb	GENERATOR FADER LEVEL less than –905,–905,,,60 = –Inf,–90.5,,,+6.0dB	
02 0F 00 08	01 – 7F	GENERATOR PAN	L63,,,R63
02 0F 00 09	00 – 01	GENERATOR MIX SEND SWITCH	Off,On
02 0F 00 0A	00	(Reserved)	
02 0F 00 0B	00	(Reserved)	
02 0F 00 0C	00 – 01	GENERATOR AUX1 SEND SWITCH	Off,On
02 0F 00 0D	00 – 01	GENERATOR AUX2 SEND SWITCH	Off,On
02 0F 00 0E	00 – 01	GENERATOR AUX3 SEND SWITCH	Off,On
02 0F 00 0F	00 – 01	GENERATOR AUX4 SEND SWITCH	Off,On
02 0F 00 10	00 – 01	GENERATOR AUX5 SEND SWITCH	Off,On
02 0F 00 11	00 – 01	GENERATOR AUX6 SEND SWITCH	Off,On
02 0F 00 12	00 – 01	GENERATOR AUX7 SEND SWITCH	Off,On
02 0F 00 13	00 – 01	GENERATOR AUX8 SEND SWITCH	Off,On
02 0F 00 14 02 0F 00 15#	0aaaaaaa 0bbbbbbb	GENERATOR AUX1 SEND LEVEL less than –905,–905,,,60 = –Inf,–90.5,,,+6.0dB	
02 0F 00 16 02 0F 00 17#	0aaaaaaa 0bbbbbbb	GENERATOR AUX2 SEND LEVEL less than –905,–905,,,60 = –Inf,–90.5,,,+6.0dB	
02 0F 00 18 02 0F 00 19#	0aaaaaaa 0bbbbbbb	GENERATOR AUX3 SEND LEVEL less than –905,–905,,,60 = –Inf,–90.5,,,+6.0dB	
02 0F 00 1A 02 0F 00 1B#	0aaaaaaa 0bbbbbbb	GENERATOR AUX4 SEND LEVEL less than –905,–905,,,60 = –Inf,–90.5,,,+6.0dB	
02 0F 00 1C 02 0F 00 1D#	0aaaaaaa 0bbbbbbb	GENERATOR AUX5 SEND LEVEL less than –905,–905,,,60 = –Inf,–90.5,,,+6.0dB	
02 0F 00 1E 02 0F 00 1F#	0aaaaaaa 0bbbbbbb	GENERATOR AUX6 SEND LEVEL less than –905,–905,,,60 = –Inf,–90.5,,,+6.0dB	
02 0F 00 20 02 0F 00 21#	0aaaaaaa 0bbbbbbb	GENERATOR AUX7 SEND LEVEL less than –905,–905,,,60 = –Inf,–90.5,,,+6.0dB	
02 0F 00 22 02 0F 00 23#	0aaaaaaa 0bbbbbbb	GENERATOR AUX8 SEND LEVEL less than –905,–905,,,60 = –Inf,–90.5,,,+6.0dB	
02 0F 00 24	01 – 7F	GENERATOR AUX1X2 SEND PAN	L63,,,R63
02 0F 00 25	01 – 7F	GENERATOR AUX3X4 SEND PAN	L63,,,R63
02 0F 00 26	01 – 7F	GENERATOR AUX5X6 SEND PAN	L63,,,R63
02 0F 00 27	01 – 7F	GENERATOR AUX7X8 SEND PAN	L63,,,R63
02 0F 00 28 : : :	01 – 7F	(Reserved)	
02 0F 00 2D	00	(Reserved)	
02 0F 00 2E	00 – 01	GENERATOR DIR1 SELECT SWITCH	Off,On
02 0F 00 2F	00 – 01	GENERATOR DIR2 SELECT SWITCH	Off,On
02 0F 00 30	00 – 01	GENERATOR DIR3 SELECT SWITCH	Off,On
02 0F 00 31	00 – 01	GENERATOR DIR4 SELECT SWITCH	Off,On
02 0F 00 32	00 – 01	GENERATOR DIR5 SELECT SWITCH	Off,On
02 0F 00 33	00 – 01	GENERATOR DIR6 SELECT SWITCH	Off,On
02 0F 00 34	00 – 01	GENERATOR DIR7 SELECT SWITCH	Off,On
02 0F 00 35	00 – 01	GENERATOR DIR8 SELECT SWITCH	Off,On

MIDI Implementation

Start address	Data	Contents and remarks
02 0F 00 36	00 – 7F	ANALYZER SOURCE 127,0,,,84 = Off,IN1,,,IN24,TR1,,,TR24, FX1 RTN L,,,FX8 RTN R,Gen/Osc,MST L,MST R, MON L,MON R,AUX1,,,AUX8,DIR1,,,DIR8
02 0F 00 37	00 – 01	ANALYZER POSITION Pre,Pst
02 0F 00 38	00 – 7F	ANALYZER AVERAGE TIMES 1,,,128
02 0F 00 39	00 – 02	ANALYZER AVERAGE TYPE Off,NRM,EXP
02 10 00 00	00 – 04	DATE FORMAT mm/dd/yyyy,dd/mm/yyyy,yyyy/mm/dd, MMM.dd,YY,ddMMM'YY|
02 11 00 00	00 – 01	Phrase Pad Master Switch Off,On
02 12 00 00	00 – 01	R–BUS1 REMOTE CONTROL Off,On
02 12 00 01	00 – 01	R–BUS1 DIF–AT INPUT SELECT ADAT,TDIF
02 12 00 02 : :	01 – 02	R–BUS1 DIF–AT INPUT CH 1 STATUS PLY,REC
02 12 00 09	01 – 02	R–BUS1 DIF–AT INPUT CH 8 STATUS PLY,REC
02 12 00 0A	00 – 02	R–BUS1 ADA–7000 CLOCK SOURCE INTERNAL,R–BUS,WORD CLOCK
02 12 00 0B	00 – 03	R–BUS1 ADA–7000 SAMPLING FREQ 32,44.1,48,96k
02 12 00 0C	00 – 01	R–BUS1 ADA–7000 FRONT PANEL CONTROL Off,On
02 12 00 0D : :	00 – 01	R–BUS1 ADA–7000 INPUT CH 1 PHANTOM +48V Off,On
02 12 00 14	00 – 01	R–BUS1 ADA–7000 INPUT CH 8 PHANTOM +48V Off,On
02 12 00 15 : :	00 – 44	R–BUS1 ADA–7000 INPUT CH 1 INPUT SENS +4dBu,,,–64dBu
02 12 00 1C	00 – 44	R–BUS1 ADA–7000 INPUT CH 8 INPUT SENS +4dBu,,,–64dBu
02 12 00 1D	00 – 02	R–BUS1 AE–7000 CLOCK SOURCE R–BUS,WORD CLOCK,INPUT–A
02 12 00 1E	00 – 01	R–BUS1 AE–7000 DIGITAL OUT TYPE TYPE2,TYPE1
02 12 00 1F	00 – 01	R–BUS1 AE–7000 COPY PROTECT On,Off
02 12 00 20 : :	00 – 03	R–BUS1 VSR–880 CH 1 STATUS SRC,PLY,REC,MUT
02 12 00 27	00 – 03	R–BUS1 VSR–880 CH 8 STATUS SRC,PLY,REC,MUT
02 12 01 00 : : :	00 –	R–BUS2 (similar to 02 12 00 00 – 02 12 00 27)
02 12 01 27	00 –	
02 30 00 00	00 – 01	MASTERING ROOM Off,On
02 30 00 01	00 – 01	MASTERING STATUS Play,Rec
02 30 00 02	00 – 01	MASTERING CDR Rec MODE Off,On
02 30 00 03	00 – 01	MASTERING Auto Marker Off,On
02 30 00 04	00 – 0F	MASTERING V.Track 1,,,16
02 30 00 05	00 – 04	MASTERING After Rec to ZERO, to Last Phrs:0s, to Last Phrs:2s, to Last Phrs:4s, Stay HERE

(*) Addresses with a "#" are ignored, even when sent as the Start Address. Transmit the Data Set (DT1) or Data Request (RQ1) message with the specified size to the address without "#" mark.

(*1) Time parameters are set to the relocated time (REL) that the time of project top is "00h00m00s00f00."

(*2) The VS-2480/2480CD treats the 16 sample as 1 block for managing internal time. Pay attention to the expression of the internal time changes respond to the sampling frequency of each project. And time parameter cannot be set to over 24 hours.

Ex.1) Set the time 00h01m00s00f00(FRAME RATE = 30Non-Drop)

Sampling Frequency is 96kHz:

5760000 sample = 360000 block = 00 00 00 05 07 0E 04 00 (4bit nibble)

Sampling Frequency is 88.2kHz:

5292000 sample = 330750 block = 00 00 00 05 00 0B 0F 0E (4bit nibble)

Sampling Frequency is 64kHz:

3840000 sample = 240000 block = 00 00 00 03 0A 09 08 00 (4bit nibble)

Sampling Frequency is 48kHz:

2880000 sample = 180000 block = 00 00 00 02 0B 0F 02 00 (4bit nibble)

Sampling Frequency is 44.1kHz:

2646000 sample = 165375 block = 00 00 00 02 08 05 0F 0F (4bit nibble)

Sampling Frequency is 32kHz:

1920000 sample = 120000 block = 00 00 00 01 0D 04 0C 00 (4bit nibble)

Ex.2) 23h59m59s29f00(FRAME RATE = 30 Non-Drop)

Sampling Frequency is 96kHz:

8294396800 sample = 518399800 block = 01 0E 0E 06 02 07 03 08 (4bit nibble)

Sampling Frequency is 88.2kHz:

7620477060 sample = 476279816 block = 01 0C 06 03 07 04 00 08 (4bit nibble)

Sampling Frequency is 64kHz:

5529597867 sample = 345599867 block = 01 04 09 09 06 07 07 0B (4bit nibble)

Sampling Frequency is 48kHz:

4147198400 sample = 259199900 block = 00 0F 07 03 01 03 09 0C (4bit nibble)

Sampling Frequency is 44.1kHz:

3810238530 sample = 238139908 block = 00 0E 03 01 0B 0A 00 04 (4bit nibble)

Sampling Frequency is 32kHz:

2764798933 sample = 172799933 block = 00 0A 04 0C 0B 07 0B 0D (4bit nibble)

(*3) The Loop Start point must be before the Loop Stop point. the Auto PUunch In point must be before the Auto Punch Out point. If the interval of each point is shorter than 1 sec, the VS-2480/2480CD does not work correctly.

(*4) 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.

Ex.1) Delete all mark points (Device ID = 10)

```
(HOST) => F0 41 10 00 40 12 02 09 00 00 0F 0F 0F 0F 0F 0F 0F 7D F7 => (VS-2480/2480CD)
(HOST) => F0 41 10 00 40 12 02 09 01 00 02 72 F7                   => (VS-2480/2480CD)
(HOST) <= F0 41 10 00 40 12 02 09 00 00 00 00 00 00 00 00 00 75 F7 <= (VS-2480/2480CD)
```

The MARKER CLEAR command is issued with specifying time "FFFFFFFF."

The return value "0" is a sum of mark points.

Ex.2) Write the mark point (Device ID = 10)

```
(HOST) => F0 41 10 00 40 12 02 09 00 00 0a 0a 0a 0a 0a 0a 0a 0a ss F7 => (VS-2480/2480CD)
            aaaaaaaa = time of Marker, ss = check sum
(HOST) => F0 41 10 00 40 12 02 09 01 00 01 73 F7                   => (VS-2480/2480CD)
(HOST) <= F0 41 10 00 40 12 02 09 00 00 0n 0n 0n 0n 0n 0n 0n 0n ss F7 <= (VS-2480/2480CD)
            nnnnnnnn = total Marker number, ss = check sum
```

If the total of mark point is over 1000, the VS-2480/2480CD 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-2480/2480CD ignores the writing and returns the total numbers of the mark points.

Ex.3) Read the mark point #3 (Device ID = 10)

```
(HOST) => F0 41 10 00 40 12 02 09 00 00 00 00 00 00 00 00 03 72 F7 => (VS-2480/2480CD)
(HOST) => F0 41 10 00 40 12 02 09 01 00 00 74 F7                   => (VS-2480/2480CD)
(HOST) <= F0 41 10 00 40 12 02 09 00 00 0n 0n 0n 0n 0n 0n 0n 0n ss F7 <= (VS-2480/2480CD)
            nnnnnnnn = total Marker number, ss = check sum
(HOST) <= F0 41 10 00 40 12 02 09 00 00 0a 0a 0a 0a 0a 0a 0a 0a ss F7 <= (VS-2480/2480CD)
            aaaaaaaa = time of Marker #3, ss = check sum
```

If the mark point is less than 3, the VS-2480/2480CD does not return the block of "aaaaaaaa."

Ex.4) Read all mark points (Device ID = 10)

```
(HOST) => F0 41 10 00 40 12 02 09 00 00 0F 0F 0F 0F 0F 0F 0F 7D F7 => (VS-2480/2480CD)
            FFFFFFFF(>= 1000) means All Marker
(HOST) => F0 41 10 00 40 12 02 09 01 00 00 74 F7                   => (VS-2480/2480CD)
(HOST) <= F0 41 10 00 40 12 02 09 00 00 0n 0n 0n 0n 0n 0n 0n 0n ss F7 <= (VS-2480/2480CD)
            nnnnnnnn = total Marker number, ss = check sum
(HOST) <= F0 41 10 00 40 12 02 09 00 00 0a 0a 0a 0a 0a 0a 0a 0a ss F7 <= (VS-2480/2480CD)
            aaaaaaaa = time of Marker #1, ss = check sum
(HOST) <= F0 41 10 00 40 12 02 09 00 00 0b 0b 0b 0b 0b 0b 0b 0b ss F7 <= (VS-2480/2480CD)
            bbbbbbbb = time of Marker #2, ss = check sum
                  :
(HOST) <= F0 41 10 00 40 12 02 09 00 00 0x 0x 0x 0x 0x 0x 0x 0x ss F7 <= (VS-2480/2480CD)
            xxxxxxxx = time of the last Marker#, ss = check sum
```

If the mark point does not exist, the VS-2480/2480CD does not return blocks under "aaaaaaaa."

Ex.5) Delete the mark point (Device ID = 10)

```
(HOST) => F0 41 10 00 40 12 02 09 00 00 0a 0a 0a 0a 0a 0a 0a 0a ss F7 => (VS-2480/2480CD)
            aaaaaaaa = time of Marker, ss = check sum
(HOST) => F0 41 10 00 40 12 02 09 01 00 02 72 F7                   => (VS-2480/2480CD)
(HOST) <= F0 41 10 00 40 12 02 09 00 00 0n 0n 0n 0n 0n 0n 0n 0n ss F7 <= (VS-2480/2480CD)
            nnnnnnnn = total marker number, ss = check sum
```

The VS-2480/2480CD deletes the mark point which includes specified time, and returns the total numbers of the mark point.

Ex.6) Read the name of mark point #3 (Device ID = 10)

```
(HOST) => F0 41 10 00 40 12 02 09 00 00 00 00 00 00 00 00 03 72 F7 => (VS-2480/2480CD)
(HOST) => F0 41 10 00 40 12 02 09 01 00 03 71 F7                   => (VS-2480/2480CD)
(HOST) <= F0 41 10 00 40 12 02 09 00 00 0n 0n 0n 0n 0n 0n 0n 0n ss F7 <= (VS-2480/2480CD)
            nnnnnnnn = total Marker number, ss = check sum
  (HOST) <= F0 41 10 00 40 12 02 09 00 08 aa bb cc dd ee ff gg hh ii jj kk ll ss F7 <= (VS-2480/
2480CD)
            abcdefghijkl = name of Marker #3, ss = check sum
```

If the mark point is less than 3, the VS-2480/2480CD does not return the block of "abcdefghijkl."

ó·7) Write the name to the mark point #3(Device ID = 10)

```
  (HOST) => F0 41 10 00 40 12 02 09 00 00 00 00 00 00 00 00 03 72 F7 => (VS-2480/2480CD)
  (HOST) => F0 41 10 00 40 12 02 09 00 08 aa bb cc dd ee ff gg hh ii jj kk ll ss F7 => (VS-2480/
2480CD)
            abcdefghijkl = name of Marker #3, ss = check sum
(HOST) => F0 41 10 00 40 12 02 09 01 00 04 70 F7                   => (VS-2480/2480CD)
(HOST) <= F0 41 10 00 40 12 02 09 00 00 0n 0n 0n 0n 0n 0n 0n 0n ss F7 <= (VS-2480/2480CD)
            nnnnnnnn = total Marker number, ss = check sum
```

If the mark point is less than 3, the VS-2480/2480CD ignores the writing and returns the total numbers of the mark points.

(*5)GENERATOR SOURCE is "METRONOME" when invalid.

(*6)GENERATOR SOURCE is "Sin Wave" when valid.

(*7)see Mixer Frequency Table of NRPN and Mixer Parameter.

●Project Parameter

Start address	Data	Contents and remarks
03 00 00 00 : : :	20 – 7F	CURRENT PROJECT NAME –1 (ASCII)
03 00 00 0B	20 – 7F	CURRENT PROJECT NAME –12
03 00 00 0C	00 – 05	CURRENT PROJECT SAMPLE RATE 96k(3),88.2k(4),64k(5),48k(0),44.1k(1),32k(2)
03 00 00 0D	00 – 08	CURRENT PROJECT RECORDING MODE M24(8),MTP(5), CDR(4),M16(3),MT1(0),MT2(1),LIV(2),LV2(6),
03 00 00 0E 03 00 00 0F 03 00 00 10 03 00 00 11 03 00 00 12 03 00 00 13 03 00 00 14 03 00 00 15#	00 – 3B 00 – 3B 00 – 17 01 – 07 01 – 1F 01 – 0C 0aaaaaaa 0bbbbbbb	CURRENT PROJECT CREATED (second) (minute) (hour) (a day of week) (day) (month) (year)
03 00 00 16 03 00 00 17 03 00 00 18 03 00 00 19 03 00 00 1A 03 00 00 1B 03 00 00 1C 03 00 00 1D#	00 – 3B 00 – 3B 00 – 17 01 – 07 01 – 1F 01 – 0C 0aaaaaaa 0bbbbbbb	CURRENT PROJECT SAVED (second) (minute) (hour) (a day of week) (day) (month) (year)
03 00 00 1E	00	(Reserved)
03 00 00 1F	00	(Reserved)
03 00 00 20	00 – 01	CURRENT PROJECT PROTECT Off, On
03 00 00 21	00	(Reserved)
03 00 00 22 03 00 00 23#	0000000a 0bbbbbbb	PROJECT LIST LENGTH abbbbbbb = 1,,,200
03 00 00 24 : : :	00	(Reserved)
03 00 00 7F	00	(Reserved)
03 00 01 00 : : :	20 – 7F	CURRENT PROJECT COMMENT – 1 (ASCII)
03 00 01 63	20 – 7F	CURRENT PROJECT COMMENT –100 (ASCII)
03 00 01 64 : : :	00	(Reserved)
03 00 01 7F	00	(Reserved)
03 00 02 00 : : :	00 –	PROJECT– 1 (similar to 03 00 00 00 – 03 00 00 1F)
03 00 02 1F	00 –	

:	:	:
03 00 33 60	00 –	PROJECT–200 (similar to 03 00 00 00 – 03 00 00 1F)
:	:	:
03 00 33 7F	00 –	

(*) Addresses with a "#" are ignored, even when sent as the Start Address. Transmit the Data Set (DT1) message with the specified size to the address without "#" mark.

(*) Only the Data Set (DT1) message to the project name and project comment is acceptable.

●Mixer Parameter

Start address	Data	Contents and remarks
04 00 00 00 04 00 00 01#	0aaaaaaa 0bbbbbbb	INPUT CHANNEL 1 ATT –420,,,60 = –42.0,,,+6.0dB
04 00 00 02	00 – 01	INPUT CHANNEL 1 PHASE NRM,INV
04 00 00 03	00 – 7F	INPUT CHANNEL 1 GROUP 127,0,,,15 = Off,1,,,16
04 00 00 04	00 – 01	INPUT CHANNEL 1 LINK Off,On
04 00 00 05	00 – 01	INPUT CHANNEL 1 FADER LINK Off,On
04 00 00 06 04 00 00 07#	0aaaaaaa 0bbbbbbb	INPUT CHANNEL 1 FADER LEVEL less than –905,–905,,,60 = –Inf,–90.5,,,+6.0dB
04 00 00 08 04 00 00 09#	0aaaaaaa 0bbbbbbb	INPUT CHANNEL 1 OFFSET FADER LEVEL less than –905,–905,,,60 = –Inf,–90.5,,,+6.0dB
04 00 00 0A	00	(Reserved)
04 00 00 0B	00	(Reserved)
04 00 00 0C	00	(Reserved)
04 00 00 0D	01 – 7F	INPUT CHANNEL 1 PAN L63,,,R63
04 00 00 0E	01 – 7F	INPUT CHANNEL 1 OFFSET PAN L63,,,R63
04 00 00 0F	00 – 01	INPUT CHANNEL 1 SOLO Off,On
04 00 00 10	00 – 01	INPUT CHANNEL 1 MUTE Off,On
04 00 00 11	00 – 7F	INPUT CHANNEL 1 ASSIGN TRACK SELECT 127,0,,,23 = Off,Tr1,,,Tr24
04 00 00 12	00 – 01	INPUT CHANNEL 1 AUX1 SEND SWITCH Off,On
04 00 00 13	00 – 01	INPUT CHANNEL 1 AUX2 SEND SWITCH Off,On
04 00 00 14	00 – 01	INPUT CHANNEL 1 AUX3 SEND SWITCH Off,On
04 00 00 15	00 – 01	INPUT CHANNEL 1 AUX4 SEND SWITCH Off,On
04 00 00 16	00 – 01	INPUT CHANNEL 1 AUX5 SEND SWITCH Off,On
04 00 00 17	00 – 01	INPUT CHANNEL 1 AUX6 SEND SWITCH Off,On
04 00 00 18	00 – 01	INPUT CHANNEL 1 AUX7 SEND SWITCH Off,On
04 00 00 19	00 – 01	INPUT CHANNEL 1 AUX8 SEND SWITCH Off,On
04 00 00 1A 04 00 00 1B#	0aaaaaaa 0bbbbbbb	INPUT CHANNEL 1 AUX1 SEND LEVEL less than –905,–905,,,60 = –Inf,–90.5,,,+6.0dB
04 00 00 1C 04 00 00 1D#	0aaaaaaa 0bbbbbbb	INPUT CHANNEL 1 AUX2 SEND LEVEL less than –905,–905,,,60 = –Inf,–90.5,,,+6.0dB
04 00 00 1E 04 00 00 1F#	0aaaaaaa 0bbbbbbb	INPUT CHANNEL 1 AUX3 SEND LEVEL less than –905,–905,,,60 = –Inf,–90.5,,,+6.0dB
04 00 00 20 04 00 00 21#	0aaaaaaa 0bbbbbbb	INPUT CHANNEL 1 AUX4 SEND LEVEL less than –905,–905,,,60 = –Inf,–90.5,,,+6.0dB
04 00 00 22 04 00 00 23#	0aaaaaaa 0bbbbbbb	INPUT CHANNEL 1 AUX5 SEND LEVEL less than –905,–905,,,60 = –Inf,–90.5,,,+6.0dB
04 00 00 24 04 00 00 25#	0aaaaaaa 0bbbbbbb	INPUT CHANNEL 1 AUX6 SEND LEVEL less than –905,–905,,,60 = –Inf,–90.5,,,+6.0dB
04 00 00 26 04 00 00 27#	0aaaaaaa 0bbbbbbb	INPUT CHANNEL 1 AUX7 SEND LEVEL less than –905,–905,,,60 = –Inf,–90.5,,,+6.0dB
04 00 00 28 04 00 00 29#	0aaaaaaa 0bbbbbbb	INPUT CHANNEL 1 AUX8 SEND LEVEL less than –905,–905,,,60 = –Inf,–90.5,,,+6.0dB
04 00 00 2A	01 – 7F	INPUT CHANNEL 1 AUX1/2 SEND PAN L63,,,R63
04 00 00 2B	01 – 7F	INPUT CHANNEL 1 AUX3/4 SEND PAN L63,,,R63
04 00 00 2C	01 – 7F	INPUT CHANNEL 1 AUX5/6 SEND PAN L63,,,R63
04 00 00 2D	01 – 7F	INPUT CHANNEL 1 AUX7/8 SEND PAN L63,,,R63
04 00 00 2E	00 – 04	INPUT CHANNEL 1 FX1 INSERT SWITCH Off,Ins,InsL,InsR,InsS
04 00 00 2F	00 – 04	INPUT CHANNEL 1 FX2 INSERT SWITCH Off,Ins,InsL,InsR,InsS
04 00 00 30	00 – 04	INPUT CHANNEL 1 FX3 INSERT SWITCH Off,Ins,InsL,InsR,InsS
04 00 00 31	00 – 04	INPUT CHANNEL 1 FX4 INSERT SWITCH Off,Ins,InsL,InsR,InsS
04 00 00 32	00 – 04	INPUT CHANNEL 1 FX5 INSERT SWITCH Off,Ins,InsL,InsR,InsS
04 00 00 33	00 – 04	INPUT CHANNEL 1 FX6 INSERT SWITCH Off,Ins,InsL,InsR,InsS
04 00 00 34	00 – 04	INPUT CHANNEL 1 FX7 INSERT SWITCH Off,Ins,InsL,InsR,InsS
04 00 00 35	00 – 04	INPUT CHANNEL 1 FX8 INSERT SWITCH Off,Ins,InsL,InsR,InsS
04 00 00 36 04 00 00 37#	0aaaaaaa 0bbbbbbb	INPUT CHANNEL 1 FX1 INSERT SEND LEVEL less than –905,–905,,,60 = –Inf,–90.5,,,+6.0dB
04 00 00 38 04 00 00 39#	0aaaaaaa 0bbbbbbb	INPUT CHANNEL 1 FX2 INSERT SEND LEVEL less than –905,–905,,,60 = –Inf,–90.5,,,+6.0dB
04 00 00 3A 04 00 00 3B#	0aaaaaaa 0bbbbbbb	INPUT CHANNEL 1 FX3 INSERT SEND LEVEL less than –905,–905,,,60 = –Inf,–90.5,,,+6.0dB
04 00 00 3C 04 00 00 3D#	0aaaaaaa 0bbbbbbb	INPUT CHANNEL 1 FX4 INSERT SEND LEVEL less than –905,–905,,,60 = –Inf,–90.5,,,+6.0dB
04 00 00 3E 04 00 00 3F#	0aaaaaaa 0bbbbbbb	INPUT CHANNEL 1 FX5 INSERT SEND LEVEL less than –905,–905,,,60 = –Inf,–90.5,,,+6.0dB
04 00 00 40 04 00 00 41#	0aaaaaaa 0bbbbbbb	INPUT CHANNEL 1 FX6 INSERT SEND LEVEL less than –905,–905,,,60 = –Inf,–90.5,,,+6.0dB
04 00 00 42 04 00 00 43#	0aaaaaaa 0bbbbbbb	INPUT CHANNEL 1 FX7 INSERT SEND LEVEL less than –905,–905,,,60 = –Inf,–90.5,,,+6.0dB
04 00 00 44 04 00 00 45#	0aaaaaaa 0bbbbbbb	INPUT CHANNEL 1 FX8 INSERT SEND LEVEL less than –905,–905,,,60 = –Inf,–90.5,,,+6.0dB
04 00 00 46 04 00 00 47#	0aaaaaaa 0bbbbbbb	INPUT CHANNEL 1 FX1 INSERT RETURN LEVEL less than –905,–905,,,60 = –Inf,–90.5,,,+6.0dB
04 00 00 48 04 00 00 49#	0aaaaaaa 0bbbbbbb	INPUT CHANNEL 1 FX2 INSERT RETURN LEVEL less than –905,–905,,,60 = –Inf,–90.5,,,+6.0dB
04 00 00 4A 04 00 00 4B#	0aaaaaaa 0bbbbbbb	INPUT CHANNEL 1 FX3 INSERT RETURN LEVEL less than –905,–905,,,60 = –Inf,–90.5,,,+6.0dB
04 00 00 4C 04 00 00 4D#	0aaaaaaa 0bbbbbbb	INPUT CHANNEL 1 FX4 INSERT RETURN LEVEL less than –905,–905,,,60 = –Inf,–90.5,,,+6.0dB
04 00 00 4E 04 00 00 4F#	0aaaaaaa 0bbbbbbb	INPUT CHANNEL 1 FX5 INSERT RETURN LEVEL less than –905,–905,,,60 = –Inf,–90.5,,,+6.0dB
04 00 00 50 04 00 00 51#	0aaaaaaa 0bbbbbbb	INPUT CHANNEL 1 FX6 INSERT RETURN LEVEL less than –905,–905,,,60 = –Inf,–90.5,,,+6.0dB
04 00 00 52 04 00 00 53#	0aaaaaaa 0bbbbbbb	INPUT CHANNEL 1 FX7 INSERT RETURN LEVEL less than –905,–905,,,60 = –Inf,–90.5,,,+6.0dB
04 00 00 54 04 00 00 55#	0aaaaaaa 0bbbbbbb	INPUT CHANNEL 1 FX8 INSERT RETURN LEVEL less than –905,–905,,,60 = –Inf,–90.5,,,+6.0dB
04 00 00 56	01 – 7F	INPUT CHANNEL 1 SURROUND PAN L63,,,R63
04 00 00 57	01 – 7F	INPUT CHANNEL 1 SURROUND DEPTH R63,,,F63
04 00 00 58	01 – 64	INPUT CHANNEL 1 SURROUND LRC 0,,,100%
04 00 00 59	00	(Reserved)
04 00 00 5A 04 00 00 5B#	0aaaaaaa 0bbbbbbb	INPUT CHANNEL 1 SURROUND SUBWOOFER LEVEL less than –905,–905,,,60 = –Inf,–90.5,,,+6.0dB
04 00 00 5C	00 – 01	INPUT CHANNEL 1 DYNAMICS SWITCH Off,On
04 00 00 5D	00 – 02	INPUT CHANNEL 1 DYNAMICSTYPE CMP,EXP,EXP+CMP
04 00 00 5E	00 – 17	INPUT CHANNEL 1 DYNAMICS CMP KEYIN CH1,,,CH24
04 00 00 5F	00	(Reserved)
04 00 00 60 04 00 00 61#	0aaaaaaa 0bbbbbbb	INPUT CHANNEL 1 DYNAMICS CMP THRESHOLD –240,,,0 = –24.0,,,0.0dB
04 00 00 62	00 – 0D	INPUT CHANNEL 1 DYNAMICS CMP RATIO 1.00:1,,,Inf:1(*1)
04 00 00 63	00	(Reserved)
04 00 00 64	00 – 7C	INPUT CHANNEL 1 DYNAMICS CMP ATTACK 0.0,,,800.0ms(*2)
04 00 00 65	00 – 7C	INPUT CHANNEL 1 DYNAMICS CMP RELEASE 0,,,8000ms(*2)
04 00 00 66 04 00 00 67#	0aaaaaaa 0bbbbbbb	INPUT CHANNEL 1 DYNAMICS CMP LEVEL –240,,,240 = –24.0,,,+24.0dB –240,,,60 = –24.0,,,+6.0dB when AUTO GAIN is On
04 00 00 68	00 – 01	INPUT CHANNEL 1 DYNAMICS CMP AUTO GAIN Off,On
04 00 00 69	00 – 17	INPUT CHANNEL 1 DYNAMICS EXP KEYIN CH1,,,CH24
04 00 00 6A 04 00 00 6B#	0aaaaaaa 0bbbbbbb	INPUT CHANNEL 1 DYNAMICS EXP THRESHOLD –800,,,0 = –80.0,,,0.0dB
04 00 00 6C	00 – 0D	INPUT CHANNEL 1 DYNAMICS EXP RATIO 1.00:1,,,Inf:1(*1)
04 00 00 6D	00	(Reserved)
04 00 00 6E	00 – 7C	INPUT CHANNEL 1 DYNAMICS EXP ATTACK 0.0,,,800.0ms(*2)
04 00 00 6F	00 – 7C	INPUT CHANNEL 1 DYNAMICS EXP RELEASE 0,,,8000ms(*2)
04 00 00 70	00 – 01	INPUT CHANNEL 1 EQ SWITCH Off,On
04 00 00 71	00	(Reserved)
04 00 00 72 04 00 00 73#	0aaaaaaa 0bbbbbbb	INPUT CHANNEL 1 EQ LOW GAIN –150,,,150 = –15.0,,,+15.0dB
04 00 00 74 04 00 00 75#	0aaaaaaa 0bbbbbbb	INPUT CHANNEL 1 EQ LOW FREQUENCY 20,,,88 = 20Hz,,,1.00kHz(*3)
04 00 00 76 04 00 00 77#	0aaaaaaa 0bbbbbbb	INPUT CHANNEL 1 EQ LOWMID GAIN –150,,,150 = –15.0,,,+15.0dB
04 00 00 78 04 00 00 79#	0aaaaaaa 0bbbbbbb	INPUT CHANNEL 1 EQ LOWMID FREQUENCY 20,,,140 = 20Hz,,,20.0kHz(*3)
04 00 00 7A 04 00 00 7B#	0aaaaaaa 0bbbbbbb	INPUT CHANNEL 1 EQ LOWMID Q 30,,,96 = 0.36,,,16.0(*4)
04 00 00 7C 04 00 00 7D#	0aaaaaaa 0bbbbbbb	INPUT CHANNEL 1 EQ HIGHMID GAIN –150,,,150 = –15.0,,,+15.0dB
04 00 00 7E 04 00 00 7F#	0aaaaaaa 0bbbbbbb	INPUT CHANNEL 1 EQ HIGHMID FREQUENCY 20,,,140 = 20Hz,,,20.0kHz(*3)
04 00 01 00 04 00 01 01#	0aaaaaaa 0bbbbbbb	INPUT CHANNEL 1 EQ HIGHMID Q 30,,,96 = 0.36,,,16.0(*4)
04 00 01 02 04 00 01 03#	0aaaaaaa 0bbbbbbb	INPUT CHANNEL 1 EQ HIGH GAIN –150,,,150 = –15.0,,,+15.0dB
04 00 01 04 04 00 01 05#	0aaaaaaa 0bbbbbbb	INPUT CHANNEL 1 EQ HIGH FREQUENCY 88,,,140 = 1.00kHz,,,20.0kHz(*3)
04 00 01 06	00 – 04	INPUT CHANNEL 1 EQ FILTER TYPE Off,LPF,HPF,BPF,BEF
04 00 01 07	00	(Reserved)
04 00 01 08 04 00 01 09#	0aaaaaaa 0bbbbbbb	INPUT CHANNEL 1 EQ FILTER FREQUENCY 20,,,140 = 20Hz,,,20.0kHz(*3)
04 00 01 0A 04 00 01 0B#	0aaaaaaa 0bbbbbbb	INPUT CHANNEL 1 EQ FILTER Q 30,,,96 = 0.36,,,16.0(*4)
04 00 01 0C	00 – 7F	INPUT CHANNEL 1 INPUT SELECT 127,0,,,7,8,,,15 = Off,A.IN1x2,,,A.IN15x16,R–BUS1_1x2,,,R–BUS2_7x8
04 00 01 0D	00	(Reserved)
04 00 01 0E	00	(Reserved)
04 00 01 0F	00	(Reserved)
04 00 01 10	00 – 01	INPUT CHANNEL 1 MIX SEND SWITCH Off,On
04 00 01 11	00 – 01	INPUT CHANNEL 1 DIR1 SELECT SWITCH Off,On
04 00 01 12	00 – 01	INPUT CHANNEL 1 DIR2 SELECT SWITCH Off,On
04 00 01 13	00 – 01	INPUT CHANNEL 1 DIR3 SELECT SWITCH Off,On
04 00 01 14	00 – 01	INPUT CHANNEL 1 DIR4 SELECT SWITCH Off,On
04 00 01 15	00 – 01	INPUT CHANNEL 1 DIR5 SELECT SWITCH Off,On
04 00 01 16	00 – 01	INPUT CHANNEL 1 DIR6 SELECT SWITCH Off,On
04 00 01 17	00 – 01	INPUT CHANNEL 1 DIR7 SELECT SWITCH Off,On
04 00 01 18	00 – 01	INPUT CHANNEL 1 DIR8 SELECT SWITCH Off,On
04 00 01 19	00	(Reserved)
:	:	:
04 00 7F 7F	00	(Reserved)
04 01 00 00	00 –	INPUT CHANNEL 2 (similar to 04 00 00 00 – 04 00 7F 7F)
:	:	:
04 01 7F 7F	00 –	
:	:	:
04 17 00 00	00 –	INPUT CHANNEL 24 (similar to 04 00 00 00 – 04 00 7F 7F)
:	:	:
04 17 7F 7F	00 –	
04 18 00 00	00	(Reserved)
:	:	:
04 1F 7F 7F	00	(Reserved)
04 20 00 00 04 20 00 01#	0aaaaaaa 0bbbbbbb	TRACK CHANNEL 1 ATT –420,,,60 = –42.0,,,+6.0dB
04 20 00 02	00 – 01	TRACK CHANNEL 1 PHASE NRM,INV
04 20 00 03	00 – 7F	TRACK CHANNEL 1 GROUP 127,0,,,15 = Off,1,,,16
04 20 00 04	00 – 01	TRACK CHANNEL 1 LINK Off,On
04 20 00 05	00 – 01	TRACK CHANNEL 1 FADER LINK Off,On
04 20 00 06 04 20 00 07#	0aaaaaaa 0bbbbbbb	TRACK CHANNEL 1 FADER LEVEL less than –905,–905,,,60 = –Inf,–90.5,,,+6.0dB
04 20 00 08 04 20 00 09#	0aaaaaaa 0bbbbbbb	TRACK CHANNEL 1 OFFSET FADER LEVEL less than –905,–905,,,60 = –Inf,–90.5,,,+6.0dB
04 20 00 0A	00	(Reserved)

MIDI Implementation

04 20 00 0B	00	(Reserved)
04 20 00 0C	00	(Reserved)
04 20 00 0D	01 – 7F	TRACK CHANNEL 1 PAN L63,,,R63
04 20 00 0E	01 – 7F	TRACK CHANNEL 1 OFFSET PAN L63,,,R63
04 20 00 0F	00 – 01	TRACK CHANNEL 1 SOLO Off,On
04 20 00 10	00 – 01	TRACK CHANNEL 1 MUTE Off,On
04 20 00 11	00 – 7F	TRACK CHANNEL 1 ASSIGN TRACK SELECT 127,0,,,23 = Off,Tr1,,,Tr24
04 20 00 12	00 – 01	TRACK CHANNEL 1 AUX1 SEND SWITCH Off,On
04 20 00 13	00 – 01	TRACK CHANNEL 1 AUX2 SEND SWITCH Off,On
04 20 00 14	00 – 01	TRACK CHANNEL 1 AUX3 SEND SWITCH Off,On
04 20 00 15	00 – 01	TRACK CHANNEL 1 AUX4 SEND SWITCH Off,On
04 20 00 16	00 – 01	TRACK CHANNEL 1 AUX5 SEND SWITCH Off,On
04 20 00 17	00 – 01	TRACK CHANNEL 1 AUX6 SEND SWITCH Off,On
04 20 00 18	00 – 01	TRACK CHANNEL 1 AUX7 SEND SWITCH Off,On
04 20 00 19	00 – 01	TRACK CHANNEL 1 AUX8 SEND SWITCH Off,On
04 20 00 1A 04 20 00 1B#	0aaaaaaa 0bbbbbbb	TRACK CHANNEL 1 AUX1 SEND LEVEL less than –905,–905,,,60 = –Inf,–90.5,,,+6.0dB
04 20 00 1C 04 20 00 1D#	0aaaaaaa 0bbbbbbb	TRACK CHANNEL 1 AUX2 SEND LEVEL less than –905,–905,,,60 = –Inf,–90.5,,,+6.0dB
04 20 00 1E 04 20 00 1F#	0aaaaaaa 0bbbbbbb	TRACK CHANNEL 1 AUX3 SEND LEVEL less than –905,–905,,,60 = –Inf,–90.5,,,+6.0dB
04 20 00 20 04 20 00 21#	0aaaaaaa 0bbbbbbb	TRACK CHANNEL 1 AUX4 SEND LEVEL less than –905,–905,,,60 = –Inf,–90.5,,,+6.0dB
04 20 00 22 04 20 00 23#	0aaaaaaa 0bbbbbbb	TRACK CHANNEL 1 AUX5 SEND LEVEL less than –905,–905,,,60 = –Inf,–90.5,,,+6.0dB
04 20 00 24 04 20 00 25#	0aaaaaaa 0bbbbbbb	TRACK CHANNEL 1 AUX6 SEND LEVEL less than –905,–905,,,60 = –Inf,–90.5,,,+6.0dB
04 20 00 26 04 20 00 27#	0aaaaaaa 0bbbbbbb	TRACK CHANNEL 1 AUX7 SEND LEVEL less than –905,–905,,,60 = –Inf,–90.5,,,+6.0dB
04 20 00 28 04 20 00 29#	0aaaaaaa 0bbbbbbb	TRACK CHANNEL 1 AUX8 SEND LEVEL less than –905,–905,,,60 = –Inf,–90.5,,,+6.0dB
04 20 00 2A	01 – 7F	TRACK CHANNEL 1 AUX1/2 SEND PAN L63,,,R63
04 20 00 2B	01 – 7F	TRACK CHANNEL 1 AUX3/4 SEND PAN L63,,,R63
04 20 00 2C	01 – 7F	TRACK CHANNEL 1 AUX5/6 SEND PAN L63,,,R63
04 20 00 2D	01 – 7F	TRACK CHANNEL 1 AUX7/8 SEND PAN L63,,,R63
04 20 00 2E	00 – 04	TRACK CHANNEL 1 FX1 INSERT SWITCH Off,Ins,InsL,InsR,InsS
04 20 00 2F	00 – 04	TRACK CHANNEL 1 FX2 INSERT SWITCH Off,Ins,InsL,InsR,InsS
04 20 00 30	00 – 04	TRACK CHANNEL 1 FX3 INSERT SWITCH Off,Ins,InsL,InsR,InsS
04 20 00 31	00 – 04	TRACK CHANNEL 1 FX4 INSERT SWITCH Off,Ins,InsL,InsR,InsS
04 20 00 32	00 – 04	TRACK CHANNEL 1 FX5 INSERT SWITCH Off,Ins,InsL,InsR,InsS
04 20 00 33	00 – 04	TRACK CHANNEL 1 FX6 INSERT SWITCH Off,Ins,InsL,InsR,InsS
04 20 00 34	00 – 04	TRACK CHANNEL 1 FX7 INSERT SWITCH Off,Ins,InsL,InsR,InsS
04 20 00 35	00 – 04	TRACK CHANNEL 1 FX8 INSERT SWITCH Off,Ins,InsL,InsR,InsS
04 20 00 36 04 20 00 37#	0aaaaaaa 0bbbbbbb	TRACK CHANNEL 1 FX1 INSERT SEND LEVEL less than –905,–905,,,60 = –Inf,–90.5,,,+6.0dB
04 20 00 38 04 20 00 39#	0aaaaaaa 0bbbbbbb	TRACK CHANNEL 1 FX2 INSERT SEND LEVEL less than –905,–905,,,60 = –Inf,–90.5,,,+6.0dB
04 20 00 3A 04 20 00 3B#	0aaaaaaa 0bbbbbbb	TRACK CHANNEL 1 FX3 INSERT SEND LEVEL less than –905,–905,,,60 = –Inf,–90.5,,,+6.0dB
04 20 00 3C 04 20 00 3D#	0aaaaaaa 0bbbbbbb	TRACK CHANNEL 1 FX4 INSERT SEND LEVEL less than –905,–905,,,60 = –Inf,–90.5,,,+6.0dB
04 20 00 3E 04 20 00 3F#	0aaaaaaa 0bbbbbbb	TRACK CHANNEL 1 FX5 INSERT SEND LEVEL less than –905,–905,,,60 = –Inf,–90.5,,,+6.0dB
04 20 00 40 04 20 00 41#	0aaaaaaa 0bbbbbbb	TRACK CHANNEL 1 FX6 INSERT SEND LEVEL less than –905,–905,,,60 = –Inf,–90.5,,,+6.0dB
04 20 00 42 04 20 00 43#	0aaaaaaa 0bbbbbbb	TRACK CHANNEL 1 FX7 INSERT SEND LEVEL less than –905,–905,,,60 = –Inf,–90.5,,,+6.0dB
04 20 00 44 04 20 00 45#	0aaaaaaa 0bbbbbbb	TRACK CHANNEL 1 FX8 INSERT SEND LEVEL less than –905,–905,,,60 = –Inf,–90.5,,,+6.0dB
04 20 00 46 04 20 00 47#	0aaaaaaa 0bbbbbbb	TRACK CHANNEL 1 FX1 INSERT RETURN LEVEL less than –905,–905,,,60 = –Inf,–90.5,,,+6.0dB
04 20 00 48 04 20 00 49#	0aaaaaaa 0bbbbbbb	TRACK CHANNEL 1 FX2 INSERT RETURN LEVEL less than –905,–905,,,60 = –Inf,–90.5,,,+6.0dB
04 20 00 4A 04 20 00 4B#	0aaaaaaa 0bbbbbbb	TRACK CHANNEL 1 FX3 INSERT RETURN LEVEL less than –905,–905,,,60 = –Inf,–90.5,,,+6.0dB
04 20 00 4C 04 20 00 4D#	0aaaaaaa 0bbbbbbb	TRACK CHANNEL 1 FX4 INSERT RETURN LEVEL less than –905,–905,,,60 = –Inf,–90.5,,,+6.0dB
04 20 00 4E 04 20 00 4F#	0aaaaaaa 0bbbbbbb	TRACK CHANNEL 1 FX5 INSERT RETURN LEVEL less than –905,–905,,,60 = –Inf,–90.5,,,+6.0dB
04 20 00 50 04 20 00 51#	0aaaaaaa 0bbbbbbb	TRACK CHANNEL 1 FX6 INSERT RETURN LEVEL less than –905,–905,,,60 = –Inf,–90.5,,,+6.0dB
04 20 00 52 04 20 00 53#	0aaaaaaa 0bbbbbbb	TRACK CHANNEL 1 FX7 INSERT RETURN LEVEL less than –905,–905,,,60 = –Inf,–90.5,,,+6.0dB
04 20 00 54 04 20 00 55#	0aaaaaaa 0bbbbbbb	TRACK CHANNEL 1 FX8 INSERT RETURN LEVEL less than –905,–905,,,60 = –Inf,–90.5,,,+6.0dB
04 20 00 56	01 – 7F	TRACK CHANNEL 1 SURROUND PAN L63,,,R63
04 20 00 57	01 – 7F	TRACK CHANNEL 1 SURROUND DEPTH R63,,,F63
04 20 00 58	01 – 64	TRACK CHANNEL 1 SURROUND LRC 0,,,100%
04 20 00 59	00	(Reserved)
04 20 00 5A 04 20 00 5B#	0aaaaaaa 0bbbbbbb	TRACK CHANNEL 1 SURROUND SUBWOOFER LEVEL less than –905,–905,,,60 = –Inf,–90.5,,,+6.0dB
04 20 00 5C	00 – 01	TRACK CHANNEL 1 DYNAMICS SWITCH Off,On
04 20 00 5D	00 – 02	TRACK CHANNEL 1 DYNAMICS TYPE CMP,EXP,EXP+CMP
04 20 00 5E	00 – 17	TRACK CHANNEL 1 DYNAMICS CMP KEYIN CH1,,,CH24
04 20 00 5F	00	(Reserved)
04 20 00 60 04 20 00 61#	0aaaaaaa 0bbbbbbb	TRACK CHANNEL 1 DYNAMICS CMP THRESHOLD –240,,,0 = –24.0,,,0.0dB
04 20 00 62	00 – 0D	TRACK CHANNEL 1 DYNAMICS CMP RATIO 1.00:1,,,Inf:1(*1)
04 20 00 63	00	(Reserved)
04 20 00 64	00 – 7C	TRACK CHANNEL 1 DYNAMICS CMP ATTACK 0.0,,,800.0ms(*2)
04 20 00 65	00 – 7C	TRACK CHANNEL 1 DYNAMICS CMP RELEASE 0,,,8000ms(*2)
04 20 00 66 04 20 00 67#	0aaaaaaa 0bbbbbbb	TRACK CHANNEL 1 DYNAMICS CMP LEVEL –240,,,240 = –24.0,,,+24.0dB –240,,,60 = –24.0,,,+6.0dB when AUTO GAIN is On
04 20 00 68	00 – 01	TRACK CHANNEL 1 DYNAMICS CMP AUTO GAIN Off,On
04 20 00 69	00 – 17	TRACK CHANNEL 1 DYNAMICS EXP KEYIN CH1,,,CH24
04 20 00 6A 04 20 00 6B#	0aaaaaaa 0bbbbbbb	TRACK CHANNEL 1 DYNAMICS EXP THRESHOLD –800,,,0 = –80.0,,,0.0dB
04 20 00 6C	00 – 0D	TRACK CHANNEL 1 DYNAMICS EXP RATIO 1.00:1,,,Inf:1(*1)
04 20 00 6D	00	(Reserved)
04 20 00 6E	00 – 7C	TRACK CHANNEL 1 DYNAMICS EXP ATTACK 0.0,,,800.0ms(*2)
04 20 00 6F	00 – 7C	TRACK CHANNEL 1 DYNAMICS EXP RELEASE 0,,,8000ms(*2)
04 20 00 70	00 – 01	TRACK CHANNEL 1 EQ SWITCH Off,On
04 20 00 71	00	(Reserved)
04 20 00 72 04 20 00 73#	0aaaaaaa 0bbbbbbb	TRACK CHANNEL 1 EQ LOW GAIN –150,,,150 = –15.0,,,+15.0dB
04 20 00 74 04 20 00 75#	0aaaaaaa 0bbbbbbb	TRACK CHANNEL 1 EQ LOW FREQUENCY 20,,,88 = 20Hz,,,1.00kHz(*3)
04 20 00 76 04 20 00 77#	0aaaaaaa 0bbbbbbb	TRACK CHANNEL 1 EQ LOWMID GAIN –150,,,150 = –15.0,,,+15.0dB
04 20 00 78 04 20 00 79#	0aaaaaaa 0bbbbbbb	TRACK CHANNEL 1 EQ LOWMID FREQUENCY 20,,,140 = 20Hz,,,20.0kHz(*3)
04 20 00 7A 04 20 00 7B#	0aaaaaaa 0bbbbbbb	TRACK CHANNEL 1 EQ LOWMID Q 30,,,96 = 0.36,,,16.0(*4)
04 20 00 7C 04 20 00 7D#	0aaaaaaa 0bbbbbbb	TRACK CHANNEL 1 EQ HIGHMID GAIN –150,,,150 = –15.0,,,+15.0dB
04 20 00 7E 04 20 00 7F#	0aaaaaaa 0bbbbbbb	TRACK CHANNEL 1 EQ HIGHMID FREQUENCY 20,,,140 = 20Hz,,,20.0kHz(*3)
04 20 01 00 04 20 01 01#	0aaaaaaa 0bbbbbbb	TRACK CHANNEL 1 EQ HIGHMID Q 30,,,96 = 0.36,,,16.0(*4)
04 20 01 02 04 20 01 03#	0aaaaaaa 0bbbbbbb	TRACK CHANNEL 1 EQ HIGH GAIN –150,,,150 = –15.0,,,+15.0dB
04 20 01 04 04 20 01 05#	0aaaaaaa 0bbbbbbb	TRACK CHANNEL 1 EQ HIGH FREQUENCY 88,,,140 = 1.00kHz,,,20.0kHz(*3)
04 20 01 06	00 – 04	TRACK CHANNEL 1 EQ FILTER TYPE Off,LPF,HPF,BPF,BEF
04 20 01 07	00	(Reserved)
04 20 01 08 04 20 01 09#	0aaaaaaa 0bbbbbbb	TRACK CHANNEL 1 EQ FILTER FREQUENCY 20,,,140 = 20Hz,,,20.0kHz(*3)
04 20 01 0A 04 20 01 0B#	0aaaaaaa 0bbbbbbb	TRACK CHANNEL 1 EQ FILTER Q 30,,,96 = 0.36,,,16.0(*4)
04 20 01 0C	00	(Reserved)
04 20 01 0D	01 – 03	TRACK STATUS PLAY,REC,MUTE
04 20 01 0E	00 – 0F	V.TRACK SELECT 1,,,16
04 20 01 0F	00	(Reserved)
04 20 01 10	00 – 01	TRACK CHANNEL 1 MIX SEND SWITCH Off,On
04 20 01 11	00 – 01	TRACK CHANNEL 1 DIR1 SELECT SWITCH Off,On
04 20 01 12	00 – 01	TRACK CHANNEL 1 DIR2 SELECT SWITCH Off,On
04 20 01 13	00 – 01	TRACK CHANNEL 1 DIR3 SELECT SWITCH Off,On
04 20 01 14	00 – 01	TRACK CHANNEL 1 DIR4 SELECT SWITCH Off,On
04 20 01 15	00 – 01	TRACK CHANNEL 1 DIR5 SELECT SWITCH Off,On
04 20 01 16	00 – 01	TRACK CHANNEL 1 DIR6 SELECT SWITCH Off,On
04 20 01 17	00 – 01	TRACK CHANNEL 1 DIR7 SELECT SWITCH Off,On
04 20 01 18	00 – 01	TRACK CHANNEL 1 DIR8 SELECT SWITCH Off,On
04 20 01 19	00 – 01	TRACK CHANNEL 1 PHRASE PAD SWITCH Off,On
04 20 01 1A	00 – 02	TRACK CHANNEL 1 PHRASE PAD PLAY MODE Gate,Trg,OneS
04 20 01 1B : : :	00	(Reserved)
04 20 7F 7F	00	(Reserved)
04 21 00 00 : : :	00 –	TRACK CHANNEL 2 (similar to 04 20 00 00 – 04 20 7F 7F)
04 21 7F 7F : : :	00 –	
04 37 00 00 : : :	00 –	TRACK CHANNEL 24 (similar to 04 20 00 00 – 04 20 7F 7F)
04 37 7F 7F : : :	00 –	
04 38 00 00 : : :	00	(Reserved)
04 3F 7F 7F	00	(Reserved)
04 40 00 00	00 – 7F	RETURN CHANNEL 1 INPUT SELECT 127,0,,,15 = Off,AUX1,,,DIR8
04 40 00 01 : : :	00	(Reserved)
04 40 00 03	00	(Reserved)
04 40 00 04	00 – 7F	RETURN CHANNEL 1 GROUP 127,0,,,15 = Off,1,,,16
04 40 00 05	00 – 01	RETURN CHANNEL 1 MONO SWITCH Off,On
04 40 00 06	00	(Reserved)
04 40 00 07	00	(Reserved)
04 40 00 08 04 40 00 09#	0aaaaaaa 0bbbbbbb	RETURN CHANNEL 1 FADER LEVEL less than –905,–905,,,60 = –Inf,–90.5,,,+6.0dB
04 40 00 0A : : :	00	(Reserved)
04 40 00 0C	00	(Reserved)
04 40 00 0D	01 – 7F	RETURN CHANNEL 1 BALANCE L63,,,R63
04 40 00 0E	00	(Reserved)
04 40 00 0F	00 – 01	RETURN CHANNEL 1 SOLO Off,On
04 40 00 10	00 – 01	RETURN CHANNEL 1 MUTE Off,On
04 40 00 11	00 – 7F	RETURN CHANNEL 1 ASSIGN TRACK SELECT 127,0,,,23 = Off,Tr1,,,Tr24
04 40 00 12	00 – 01	RETURN CHANNEL 1 AUX1 SEND SWITCH Off,On
04 40 00 13	00 – 01	RETURN CHANNEL 1 AUX2 SEND SWITCH Off,On
04 40 00 14	00 – 01	RETURN CHANNEL 1 AUX3 SEND SWITCH Off,On
04 40 00 15	00 – 01	RETURN CHANNEL 1 AUX4 SEND SWITCH Off,On
04 40 00 16	00 – 01	RETURN CHANNEL 1 AUX5 SEND SWITCH Off,On
04 40 00 17	00 – 01	RETURN CHANNEL 1 AUX6 SEND SWITCH Off,On
04 40 00 18	00 – 01	RETURN CHANNEL 1 AUX7 SEND SWITCH Off,On
04 40 00 19	00 – 01	RETURN CHANNEL 1 AUX8 SEND SWITCH Off,On
04 40 00 1A 04 40 00 1B#	0aaaaaaa 0bbbbbbb	RETURN CHANNEL 1 AUX1 SEND LEVEL less than –905,–905,,,60 = –Inf,–90.5,,,+6.0dB

04 40 00 1C 04 40 00 1D#	0aaaaaaa 0bbbbbbb	RETURN CHANNEL 1 AUX2 SEND LEVEL less than –905,–905,,,60 = –Inf,–90.5,,,+6.0dB
04 40 00 1E 04 40 00 1F#	0aaaaaaa 0bbbbbbb	RETURN CHANNEL 1 AUX3 SEND LEVEL less than –905,–905,,,60 = –Inf,–90.5,,,+6.0dB
04 40 00 20 04 40 00 21#	0aaaaaaa 0bbbbbbb	RETURN CHANNEL 1 AUX4 SEND LEVEL less than –905,–905,,,60 = –Inf,–90.5,,,+6.0dB
04 40 00 22 04 40 00 23#	0aaaaaaa 0bbbbbbb	RETURN CHANNEL 1 AUX5 SEND LEVEL less than –905,–905,,,60 = –Inf,–90.5,,,+6.0dB
04 40 00 24 04 40 00 25#	0aaaaaaa 0bbbbbbb	RETURN CHANNEL 1 AUX6 SEND LEVEL less than –905,–905,,,60 = –Inf,–90.5,,,+6.0dB
04 40 00 26 04 40 00 27#	0aaaaaaa 0bbbbbbb	RETURN CHANNEL 1 AUX7 SEND LEVEL less than –905,–905,,,60 = –Inf,–90.5,,,+6.0dB
04 40 00 28 04 40 00 29#	0aaaaaaa 0bbbbbbb	RETURN CHANNEL 1 AUX8 SEND LEVEL less than –905,–905,,,60 = –Inf,–90.5,,,+6.0dB
04 40 00 2A	01 – 7F	RETURN CHANNEL 1 AUX1/2 SEND PAN L63,,,R63
04 40 00 2B	01 – 7F	RETURN CHANNEL 1 AUX3/4 SEND PAN L63,,,R63
04 40 00 2C	01 – 7F	RETURN CHANNEL 1 AUX5/6 SEND PAN L63,,,R63
04 40 00 2D	01 – 7F	RETURN CHANNEL 1 AUX7/8 SEND PAN L63,,,R63
04 40 00 2E : : :	00	(Reserved)
04 40 00 55	00	(Reserved)
04 40 00 56	01 – 7F	RETURN CHANNEL 1 SURROUND PAN L63,,,R63
04 40 00 57	01 – 7F	RETURN CHANNEL 1 SURROUND DEPTH R63,,,F63
04 40 00 58	01 – 64	RETURN CHANNEL 1 SURROUND LRC 0,,,100%
04 40 00 59	00	(Reserved)
04 40 00 5A 04 40 00 5B#	0aaaaaaa 0bbbbbbb	RETURN CHANNEL 1 SURROUND SUBWOOFER LEVEL less than –905,–905,,,60 = –Inf,–90.5,,,+6.0dB
04 40 00 5C : : :	00	(Reserved)
04 40 01 0F	00	(Reserved)
04 40 01 10	00 – 01	RETURN CHANNEL 1 MIX SEND SWITCH Off,On
04 40 01 11	00 – 01	RETURN CHANNEL 1 DIR1 SELECT SWITCH Off,On
04 40 01 12	00 – 01	RETURN CHANNEL 1 DIR2 SELECT SWITCH Off,On
04 40 01 13	00 – 01	RETURN CHANNEL 1 DIR3 SELECT SWITCH Off,On
04 40 01 14	00 – 01	RETURN CHANNEL 1 DIR4 SELECT SWITCH Off,On
04 40 01 15	00 – 01	RETURN CHANNEL 1 DIR5 SELECT SWITCH Off,On
04 40 01 16	00 – 01	RETURN CHANNEL 1 DIR6 SELECT SWITCH Off,On
04 40 01 17	00 – 01	RETURN CHANNEL 1 DIR7 SELECT SWITCH Off,On
04 40 01 18	00 – 01	RETURN CHANNEL 1 DIR8 SELECT SWITCH Off,On
04 40 01 19 : : :	00	(Reserved)
04 40 7F 7F	00	(Reserved)
04 41 00 00 : : :	00 –	RETURN CHANNEL 2 (similar to 04 40 00 00 – 04 40 7F 7F)
04 41 7F 7F : : :	00 –	
04 47 00 00 : : :	00 –	RETURN CHANNEL 8 (similar to 04 40 00 00 – 04 40 7F 7F)
04 47 7F 7F	00 –	
04 48 00 00 : : :	00	(Reserved)
04 4F 7F 7F	00	(Reserved)
04 50 00 00 04 50 00 01#	0aaaaaaa 0bbbbbbb	MASTER LEVEL less than –905,–905,,,60 = –Inf,–90.5,,,+6.0dB
04 50 00 02	01 – 7F	MASTER BALANCE L63,,,R63
04 50 00 03	00	(Reserved)
04 50 00 04 04 50 00 05#	0aaaaaaa 0bbbbbbb	MONITOR LEVEL (*5) less than –905,–905,,,60 = –Inf,–90.5,,,+6.0dB
04 50 00 06	01 – 7F	MONITOR BALANCE L63,,,R63
04 50 00 07	00	(Reserved)
04 50 00 08	00 – 01	AUX1 MASTER POSITION Pre,Pst
04 50 00 09	00 – 01	AUX2 MASTER POSITION Pre,Pst
04 50 00 0A	00 – 01	AUX3 MASTER POSITION Pre,Pst
04 50 00 0B	00 – 01	AUX4 MASTER POSITION Pre,Pst
04 50 00 0C	00 – 01	AUX5 MASTER POSITION Pre,Pst
04 50 00 0D	00 – 01	AUX6 MASTER POSITION Pre,Pst
04 50 00 0E	00 – 01	AUX7 MASTER POSITION Pre,Pst
04 50 00 0F	00 – 01	AUX8 MASTER POSITION Pre,Pst
04 50 00 10 04 50 00 11#	0aaaaaaa 0bbbbbbb	AUX1 MASTER LEVEL less than –905,–905,,,60 = –Inf,–90.5,,,+6.0dB
04 50 00 12 04 50 00 13#	0aaaaaaa 0bbbbbbb	AUX2 MASTER LEVEL less than –905,–905,,,60 = –Inf,–90.5,,,+6.0dB
04 50 00 14 04 50 00 15#	0aaaaaaa 0bbbbbbb	AUX3 MASTER LEVEL less than –905,–905,,,60 = –Inf,–90.5,,,+6.0dB
04 50 00 16 04 50 00 17#	0aaaaaaa 0bbbbbbb	AUX4 MASTER LEVEL less than –905,–905,,,60 = –Inf,–90.5,,,+6.0dB
04 50 00 18 04 50 00 19#	0aaaaaaa 0bbbbbbb	AUX5 MASTER LEVEL less than –905,–905,,,60 = –Inf,–90.5,,,+6.0dB
04 50 00 1A 04 50 00 1B#	0aaaaaaa 0bbbbbbb	AUX6 MASTER LEVEL less than –905,–905,,,60 = –Inf,–90.5,,,+6.0dB
04 50 00 1C 04 50 00 1D#	0aaaaaaa 0bbbbbbb	AUX7 MASTER LEVEL less than –905,–905,,,60 = –Inf,–90.5,,,+6.0dB
04 50 00 1E 04 50 00 1F#	0aaaaaaa 0bbbbbbb	AUX8 MASTER LEVEL less than –905,–905,,,60 = –Inf,–90.5,,,+6.0dB
04 50 00 20	00 – 01	AUX1/2 BUS LINK Off,On
04 50 00 21	00 – 01	AUX3/4 BUS LINK Off,On
04 50 00 22	00 – 01	AUX5/6 BUS LINK Off,On
04 50 00 23	00 – 01	AUX7/8 BUS LINK Off,On
04 50 00 24	01 – 7F	AUX1/2 MASTER BALANCE L63,,,R63
04 50 00 25	01 – 7F	AUX3/4 MASTER BALANCE L63,,,R63
04 50 00 26	01 – 7F	AUX5/6 MASTER BALANCE L63,,,R63
04 50 00 27	01 – 7F	AUX7/8 MASTER BALANCE L63,,,R63
04 50 00 28	00 – 7F	AUX1 ASSIGN TRACK SELECT 127,0,,,23 = Off,Tr1,,,Tr24
04 50 00 29	00 – 7F	AUX2 ASSIGN TRACK SELECT 127,0,,,23 = Off,Tr1,,,Tr24
04 50 00 2A	00 – 7F	AUX3 ASSIGN TRACK SELECT 127,0,,,23 = Off,Tr1,,,Tr24
04 50 00 2B	00 – 7F	AUX4 ASSIGN TRACK SELECT 127,0,,,23 = Off,Tr1,,,Tr24
04 50 00 2C	00 – 7F	AUX5 ASSIGN TRACK SELECT 127,0,,,23 = Off,Tr1,,,Tr24
04 50 00 2D	00 – 7F	AUX6 ASSIGN TRACK SELECT 127,0,,,23 = Off,Tr1,,,Tr24
04 50 00 2E	00 – 7F	AUX7 ASSIGN TRACK SELECT 127,0,,,23 = Off,Tr1,,,Tr24
04 50 00 2F	00 – 7F	AUX8 ASSIGN TRACK SELECT 127,0,,,23 = Off,Tr1,,,Tr24
04 50 00 30	00 – 01	DIR1 MASTER POSITION Pre,Pst
04 50 00 31	00 – 01	DIR2 MASTER POSITION Pre,Pst
04 50 00 32	00 – 01	DIR3 MASTER POSITION Pre,Pst
04 50 00 33	00 – 01	DIR4 MASTER POSITION Pre,Pst
04 50 00 34	00 – 01	DIR5 MASTER POSITION Pre,Pst
04 50 00 35	00 – 01	DIR6 MASTER POSITION Pre,Pst
04 50 00 36	00 – 01	DIR7 MASTER POSITION Pre,Pst
04 50 00 37	00 – 01	DIR8 MASTER POSITION Pre,Pst
04 50 00 38 04 50 00 39#	0aaaaaaa 0bbbbbbb	DIR1 MASTER LEVEL less than –905,–905,,,60 = –Inf,–90.5,,,+6.0dB
04 50 00 3A 04 50 00 3B#	0aaaaaaa 0bbbbbbb	DIR2 MASTER LEVEL less than –905,–905,,,60 = –Inf,–90.5,,,+6.0dB
04 50 00 3C 04 50 00 3D#	0aaaaaaa 0bbbbbbb	DIR3 MASTER LEVEL less than –905,–905,,,60 = –Inf,–90.5,,,+6.0dB
04 50 00 3E 04 50 00 3F#	0aaaaaaa 0bbbbbbb	DIR4 MASTER LEVEL less than –905,–905,,,60 = –Inf,–90.5,,,+6.0dB
04 50 00 40 04 50 00 41#	0aaaaaaa 0bbbbbbb	DIR5 MASTER LEVEL less than –905,–905,,,60 = –Inf,–90.5,,,+6.0dB
04 50 00 42 04 50 00 43#	0aaaaaaa 0bbbbbbb	DIR6 MASTER LEVEL less than –905,–905,,,60 = –Inf,–90.5,,,+6.0dB
04 50 00 44 04 50 00 45#	0aaaaaaa 0bbbbbbb	DIR7 MASTER LEVEL less than –905,–905,,,60 = –Inf,–90.5,,,+6.0dB
04 50 00 46 04 50 00 47#	0aaaaaaa 0bbbbbbb	DIR8 MASTER LEVEL less than –905,–905,,,60 = –Inf,–90.5,,,+6.0dB
04 50 00 48	01 – 7F	DIR1/2 MASTER BALANCE L63,,,R63
04 50 00 49	01 – 7F	DIR3/4 MASTER BALANCE L63,,,R63
04 50 00 4A	01 – 7F	DIR5/6 MASTER BALANCE L63,,,R63
04 50 00 4B	01 – 7F	DIR7/8 MASTER BALANCE L63,,,R63
04 50 00 4C	00 – 7F	DIR1 ASSIGN TRACK SELECT 127,0,,,23 = Off,Tr1,,,Tr24
04 50 00 4D	00 – 7F	DIR2 ASSIGN TRACK SELECT 127,0,,,23 = Off,Tr1,,,Tr24
04 50 00 4E	00 – 7F	DIR3 ASSIGN TRACK SELECT 127,0,,,23 = Off,Tr1,,,Tr24
04 50 00 4F	00 – 7F	DIR4 ASSIGN TRACK SELECT 127,0,,,23 = Off,Tr1,,,Tr24
04 50 00 50	00 – 7F	DIR5 ASSIGN TRACK SELECT 127,0,,,23 = Off,Tr1,,,Tr24
04 50 00 51	00 – 7F	DIR6 ASSIGN TRACK SELECT 127,0,,,23 = Off,Tr1,,,Tr24
04 50 00 52	00 – 7F	DIR7 ASSIGN TRACK SELECT 127,0,,,23 = Off,Tr1,,,Tr24
04 50 00 53	00 – 7F	DIR8 ASSIGN TRACK SELECT 127,0,,,23 = Off,Tr1,,,Tr24
04 50 00 54 : : :	00	(Reserved)
04 50 00 57	00	(Reserved)
04 50 00 58	00 – 01	MASTER FX1 INSERT SWITCH Off,Ins
04 50 00 59	00 – 01	MASTER FX2 INSERT SWITCH Off,Ins
04 50 00 5A	00 – 01	MASTER FX3 INSERT SWITCH Off,Ins
04 50 00 5B	00 – 01	MASTER FX4 INSERT SWITCH Off,Ins
04 50 00 5C	00 – 01	MASTER FX5 INSERT SWITCH Off,Ins
04 50 00 5D	00 – 01	MASTER FX6 INSERT SWITCH Off,Ins
04 50 00 5E	00 – 01	MASTER FX7 INSERT SWITCH Off,Ins
04 50 00 5F	00 – 01	MASTER FX8 INSERT SWITCH Off,Ins
04 50 00 60 04 50 00 61#	0aaaaaaa 0bbbbbbb	MASTER FX1 INSERT SEND LEVEL less than –905,–905,,,60 = –Inf,–90.5,,,+6.0dB
04 50 00 62 04 50 00 63#	0aaaaaaa 0bbbbbbb	MASTER FX2 INSERT SEND LEVEL less than –905,–905,,,60 = –Inf,–90.5,,,+6.0dB
04 50 00 64 04 50 00 65#	0aaaaaaa 0bbbbbbb	MASTER FX3 INSERT SEND LEVEL less than –905,–905,,,60 = –Inf,–90.5,,,+6.0dB
04 50 00 66 04 50 00 67#	0aaaaaaa 0bbbbbbb	MASTER FX4 INSERT SEND LEVEL less than –905,–905,,,60 = –Inf,–90.5,,,+6.0dB
04 50 00 68 04 50 00 69#	0aaaaaaa 0bbbbbbb	MASTER FX5 INSERT SEND LEVEL less than –905,–905,,,60 = –Inf,–90.5,,,+6.0dB
04 50 00 6A 04 50 00 6B#	0aaaaaaa 0bbbbbbb	MASTER FX6 INSERT SEND LEVEL less than –905,–905,,,60 = –Inf,–90.5,,,+6.0dB
04 50 00 6C 04 50 00 6D#	0aaaaaaa 0bbbbbbb	MASTER FX7 INSERT SEND LEVEL less than –905,–905,,,60 = –Inf,–90.5,,,+6.0dB
04 50 00 6E 04 50 00 6F#	0aaaaaaa 0bbbbbbb	MASTER FX8 INSERT SEND LEVEL less than –905,–905,,,60 = –Inf,–90.5,,,+6.0dB
04 50 00 70 04 50 00 71#	0aaaaaaa 0bbbbbbb	MASTER FX1 INSERT RETURN LEVEL less than –905,–905,,,60 = –Inf,–90.5,,,+6.0dB
04 50 00 72 04 50 00 73#	0aaaaaaa 0bbbbbbb	MASTER FX2 INSERT RETURN LEVEL less than –905,–905,,,60 = –Inf,–90.5,,,+6.0dB
04 50 00 74 04 50 00 75#	0aaaaaaa 0bbbbbbb	MASTER FX3 INSERT RETURN LEVEL less than –905,–905,,,60 = –Inf,–90.5,,,+6.0dB
04 50 00 76 04 50 00 77#	0aaaaaaa 0bbbbbbb	MASTER FX4 INSERT RETURN LEVEL less than –905,–905,,,60 = –Inf,–90.5,,,+6.0dB
04 50 00 78 04 50 00 79#	0aaaaaaa 0bbbbbbb	MASTER FX5 INSERT RETURN LEVEL less than –905,–905,,,60 = –Inf,–90.5,,,+6.0dB
04 50 00 7A 04 50 00 7B#	0aaaaaaa 0bbbbbbb	MASTER FX6 INSERT RETURN LEVEL less than –905,–905,,,60 = –Inf,–90.5,,,+6.0dB
04 50 00 7C 04 50 00 7D#	0aaaaaaa 0bbbbbbb	MASTER FX7 INSERT RETURN LEVEL less than –905,–905,,,60 = –Inf,–90.5,,,+6.0dB
04 50 00 7E 04 50 00 7F#	0aaaaaaa 0bbbbbbb	MASTER FX8 INSERT RETURN LEVEL less than –905,–905,,,60 = –Inf,–90.5,,,+6.0dB
04 50 01 00	00 – 11	MONITOR SOURCE MASTER,REC BUS,AUX1,,,AUX8,DIR1,,,DIR8
04 50 01 01	00	(Reserved)
04 50 01 02	00 – 09	PHONES1 SOURCE MASTER,MONITOR,AUX1/2,,,AUX7/8,DIR1/2,,,DIR7/8
04 50 01 03	00 – 09	PHONES2 SOURCE MASTER,MONITOR,AUX1/2,,,AUX7/8,DIR1/2,,,DIR7/8

04 50 01 04	00 – 09	(*6) A.MULTI 1/2 SOURCE MASTER,MONITOR,AUX1/2,AUX3/4,L/R,Ls/Rs, DIR1/2,,,DIR7/8(*7) MASTER,MONITOR,AUX1/2,AUX3/4,L/R,C/RC, DIR1/2,,,DIR7/8(*8) MASTER,MONITOR,AUX1/2,L/R,C/Sub.W,Ls/Rs, DIR1/2,,,DIR7/8(*9)
04 50 01 05	00 – 09	AUX A SOURCE (*10) MASTER,MONITOR,AUX1/2,,,AUX7/8,DIR1/2,,,DIR7/8 A.MULTI 3/4 SOURCE MASTER,MONITOR,AUX1/2,AUX3/4,L/R,Ls/Rs, DIR1/2,,,DIR7/8(*7) MASTER,MONITOR,AUX1/2,AUX3/4,L/R,C/RC, DIR1/2,,,DIR7/8(*8) MASTER,MONITOR,AUX1/2,L/R,C/Sub.W,Ls/Rs, DIR1/2,,,DIR7/8(*9)
04 50 01 06	00 – 09	AUX B SOURCE (*10) MASTER,MONITOR,AUX1/2,,,AUX7/8,DIR1/2,,,DIR7/8 A.MULTI 5/6 SOURCE MASTER,MONITOR,AUX1/2,AUX3/4,L/R,Ls/Rs, DIR1/2,,,DIR7/8(*7) MASTER,MONITOR,AUX1/2,AUX3/4,L/R,C/RC, DIR1/2,,,DIR7/8(*8) MASTER,MONITOR,AUX1/2,L/R,C/Sub.W,Ls/Rs, DIR1/2,,,DIR7/8(*9)
04 50 01 07	00 – 09	(*6) A.MULTI 7/8 SOURCE MASTER,MONITOR,AUX1/2,AUX3/4,L/R,Ls/Rs, DIR1/2,,,DIR7/8(*7) MASTER,MONITOR,AUX1/2,AUX3/4,L/R,C/RC, DIR1/2,,,DIR7/8(*8) MASTER,MONITOR,AUX1/2,L/R,C/Sub.W,Ls/Rs, DIR1/2,,,DIR7/8(*9)
04 50 01 08	00 – 09	R–BUS1 1/2 SOURCE MASTER,MONITOR,AUX1/2,,,AUX7/8,DIR1/2,,,DIR7/8
04 50 01 09	00 – 09	R–BUS1 3/4 SOURCE MASTER,MONITOR,AUX1/2,,,AUX7/8,DIR1/2,,,DIR7/8
04 50 01 0A	00 – 09	R–BUS1 5/6 SOURCE MASTER,MONITOR,AUX1/2,,,AUX7/8,DIR1/2,,,DIR7/8
04 50 01 0B	00 – 09	R–BUS1 7/8 SOURCE MASTER,MONITOR,AUX1/2,,,AUX7/8,DIR1/2,,,DIR7/8
04 50 01 0C	00 – 09	R–BUS2 1/2 SOURCE MASTER,MONITOR,AUX1/2,,,AUX7/8,DIR1/2,,,DIR7/8
04 50 01 0D	00 – 09	R–BUS2 3/4 SOURCE MASTER,MONITOR,AUX1/2,,,AUX7/8,DIR1/2,,,DIR7/8
04 50 01 0E	00 – 09	R–BUS2 5/6 SOURCE MASTER,MONITOR,AUX1/2,,,AUX7/8,DIR1/2,,,DIR7/8
04 50 01 0F	00 – 09	R–BUS2 7/8 SOURCE MASTER,MONITOR,AUX1/2,,,AUX7/8,DIR1/2,,,DIR7/8
04 50 01 10	00 – 09	COAXIAL L/R SOURCE MASTER,MONITOR,AUX1/2,,,AUX7/8,DIR1/2,,,DIR7/8
04 50 01 11	00 – 09	OPTICAL L/R SOURCE MASTER,MONITOR,AUX1/2,,,AUX7/8,DIR1/2,,,DIR7/8
04 50 01 12	00 – 01	TRACK DIRECT OUT Off,On
04 50 01 13	00 – 01	TRACK DIRECT SOURCE PreFader,PostFader
04 50 01 14	00 – 0C	TRACK DIRECT OUT PHONES1 SOURCE (*12) TR1/2,,,TR23/24,MONITOR
04 50 01 15	00 – 0C	TRACK DIRECT OUT PHONES2 SOURCE (*12) TR1/2,,,TR23/24,MONITOR
04 50 01 16	00 – 0C	TRACK DIRECT OUT A.MULTI 1/2 SOURCE (*12) TR1/2,,,TR23/24,MONITOR
04 50 01 17	00 – 0C	TRACK DIRECT OUT A.MULTI 3/4 SOURCE (*12) TR1/2,,,TR23/24,MONITOR
04 50 01 18	00 – 0C	TRACK DIRECT OUT A.MULTI 5/6 SOURCE (*12) TR1/2,,,TR23/24,MONITOR
04 50 01 19	00 – 0C	TRACK DIRECT OUT A.MULTI 7/8 SOURCE (*12) TR1/2,,,TR23/24,MONITOR
04 50 01 1A	00 – 0C	TRACK DIRECT OUT R–BUS1 1/2 SOURCE (*12) TR1/2,,,TR23/24,MONITOR
04 50 01 1B	00 – 0C	TRACK DIRECT OUT R–BUS1 3/4 SOURCE (*12) TR1/2,,,TR23/24,MONITOR
04 50 01 1C	00 – 0C	TRACK DIRECT OUT R–BUS1 5/6 SOURCE (*12) TR1/2,,,TR23/24,MONITOR
04 50 01 1D	00 – 0C	TRACK DIRECT OUT R–BUS1 7/8 SOURCE (*12) TR1/2,,,TR23/24,MONITOR
04 50 01 1E	00 – 0C	TRACK DIRECT OUT R–BUS1 1/2 SOURCE (*12) TR1/2,,,TR23/24,MONITOR
04 50 01 1F	00 – 0C	TRACK DIRECT OUT R–BUS1 3/4 SOURCE (*12) TR1/2,,,TR23/24,MONITOR
04 50 01 20	00 – 0C	TRACK DIRECT OUT R–BUS1 5/6 SOURCE (*12) TR1/2,,,TR23/24,MONITOR
04 50 01 21	00 – 0C	TRACK DIRECT OUT R–BUS1 7/8 SOURCE (*12) TR1/2,,,TR23/24,MONITOR
04 50 01 22	00 – 0C	TRACK DIRECT OUT COAXIAL L/R SOURCE (*12) TR1/2,,,TR23/24,MONITOR
04 50 01 23	00 – 0C	TRACK DIRECT OUT OPTICAL L/R SOURCE (*12) TR1/2,,,TR23/24,MONITOR
04 50 01 24 04 50 01 25#	0aaaaaaa 0bbbbbbb	REC BUS MIX ATT –42.0,,,+0.0dB(–420,,,0)

(*) Addresses with a "#" are ignored, even when sent as the Start Address. Transmit the Data Set (DT1) or Data Request (RQ1) message with the specified size to the address without "#" mark.

(*1) Dynamics Ratio Table

Data	RATIO
0	1.00:1
1	1.12:1
2	1.25:1
3	1.40:1
4	1.60:1
5	1.80:1
6	2.00:1
7	2.50:1
8	3.20:1
9	4.00:1
10	5.60:1
11	8.00:1
12	16.0:1
13	Inf:1

(*2) Dynamics Attack / Release time Table

Data	Atk(ms)	Rel(ms)	Data	Atk(ms)	Rel(ms)	Data	Atk(ms)	Rel(ms)	Data	Atk(ms)	Rel(ms)
0	0.0	0	32	4.0	40	64	25.0	250	96	160.0	1600
1	0.1	1	33	4.2	42	65	26.6	266	97	170.0	1700
2	0.2	2	34	4.5	45	66	28.0	280	98	180.0	1800
3	0.3	3	35	4.7	47	67	30.0	300	99	190.0	1900
4	0.4	4	36	5.0	50	68	31.5	315	100	200.0	2000
5	0.5	5	37	5.3	53	69	33.5	335	101	210.0	2100
6	0.6	6	38	5.6	56	70	35.5	355	102	224.0	2240
7	0.7	7	39	6.0	60	71	37.6	376	103	237.0	2370
8	0.8	8	40	6.3	63	72	40.0	400	104	250.0	2500
9	0.9	9	41	6.7	67	73	42.2	422	105	266.0	2660
10	1.0	10	42	7.1	71	74	45.0	450	106	280.0	2800
11	1.1	11	43	7.5	75	75	47.3	473	107	300.0	3000
12	1.2	12	44	8.0	80	76	50.0	500	108	315.0	3150
13	1.3	13	45	8.4	84	77	53.0	530	109	335.0	3350
14	1.4	14	46	9.0	90	78	56.0	560	110	355.0	3550
15	1.5	15	47	9.4	94	79	60.0	600	111	376.0	3760
16	1.6	16	48	10.0	100	80	63.0	630	112	400.0	4000
17	1.7	17	49	10.6	106	81	67.0	670	113	422.0	4220
18	1.8	18	50	11.2	112	82	71.0	710	114	450.0	4500
19	1.9	19	51	12.0	120	83	75.0	750	115	473.0	4730
20	2.0	20	52	12.5	125	84	80.0	800	116	500.0	5000
21	2.1	21	53	13.3	133	85	84.0	840	117	530.0	5300
22	2.2	22	54	14.0	140	86	90.0	900	118	560.0	5600
23	2.4	24	55	15.0	150	87	94.4	944	119	600.0	6000
24	2.5	25	56	16.0	160	88	100.0	1000	120	630.0	6300
25	2.7	27	57	17.0	170	89	106.0	1060	121	670.0	6700
26	2.8	28	58	18.0	180	90	112.0	1120	122	710.0	7100
27	3.0	30	59	19.0	190	91	120.0	1200	123	750.0	7500
28	3.2	32	60	20.0	200	92	125.0	1250	124	800.0	8000
29	3.3	33	61	21.0	210	93	133.0	1330			
30	3.6	36	62	22.4	224	94	140.0	1400			
31	3.8	38	63	23.7	237	95	150.0	1500			

(*3)See Mixer Frequency Table of NRPN and Mixer Parameter.

(*4)See Mixer Q Table of NRPN and Mixer Parameter.

(*5)This is read-only. Settings can only be made from the panel.

(*6)This is disabled when SURROUND MIX SWITCH is set to "Off."

(*7)This is enabled when SURROUND MIX SWITCH is set to "On" and SURROUND MIX MODE is set to "2+2."

(*8)This is enabled when SURROUND MIX SWITCH is set to "On" and SURROUND MIX MODE is set to "3+1."

(*9)This is enabled when SURROUND MIX SWITCH is set to "On" and SURROUND MIX MODE is set to "3+2+1."

(*10)This is enabled when SURROUND MIX SWITCH is set to "Off."

(*12)This is enabled when TRACK DIRECT OUT is set to "On."

●Effect Parameter

❍Basic Address

Start address	Contents and remarks
05 00 00 00 05 00 00 01#	0aaaaaaa 0bbbbbbb
	EFFECTOR – 1 Algorithm aaaaaaabbbbbbb = (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 Modeling 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 Transformer *1,*2) (28:Vocoder 2 *1,*2) 29:Mic Modeling 30:3Band Isolator 31:Tape Echo 201 32:Analog Flanger 33:Analog Phaser 34:Speaker Modeling (35:Mastering Tool Kit *1,*2)
05 00 00 02 : : 05 00 00 0D	20 – 7F : : 20 – 7F	EFFECTOR – 1 Name –1 (ASCII) : : EFFECTOR – 1 Name –12
05 00 00 0E : : 05 00 7F 7F	00 – 7F : : 00 – 7F	EFFECTOR – 1 Parameter Area (See Below)
05 01 00 00 : : 05 01 7F 7F	00 – : : 00 –	EFFECTOR – 2 (similar to 05 00 00 00 – 05 00 7F 7F)
05 02 00 00 : : 05 02 7F 7F	00 – : : 00 –	EFFECTOR – 3 (similar to 05 00 00 00 – 05 00 7F 7F)
05 03 00 00 : : 05 03 7F 7F	00 – : : 00 –	EFFECTOR – 4 (similar to 05 00 00 00 – 05 00 7F 7F)
05 04 00 00 : : 05 04 7F 7F	00 – : : 00 –	EFFECTOR – 5 (similar to 05 00 00 00 – 05 00 7F 7F)
05 05 00 00 : : 05 05 7F 7F	00 – : : 00 –	EFFECTOR – 6 (similar to 05 00 00 00 – 05 00 7F 7F)
05 06 00 00 : : 05 06 7F 7F	00 – : : 00 –	EFFECTOR – 7 (similar to 05 00 00 00 – 05 00 7F 7F)
05 07 00 00 : : 05 07 7F 7F	00 – : : 00 –	EFFECTOR – 8 (similar to 05 00 00 00 – 05 00 7F 7F)

(*1) Cannot select "0:Reverb," "17:Gate Reverb," "27:Voice Transformer,"28:Vocoder2," or "35:Mastering Tool Kit" on Effect 2,4,6, and 8.

(*2) If "27:Voice Transformer," "28:Vocoder2," or "35:Mastering Tool Kit" is selected at Effect 1,3,5, or 7, Effect 2,4,6, or 8 is invalid.

* 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 (FX1,FX3,FX5,FX7)

05 00 00 0E 05 00 00 0F#	0aaaaaaa 0bbbbbbb	EQ SW	0,1 = Off,On
05 00 00 10 05 00 00 11#	0aaaaaaa 0bbbbbbb	EQ: Low EQ Type	0,1 = Shelving, Peaking
05 00 00 12 05 00 00 13#	0aaaaaaa 0bbbbbbb	EQ: Low EQ Gain	−12,,,12dB
05 00 00 14 05 00 00 15#	0aaaaaaa 0bbbbbbb	EQ: Low EQ Frequency	2,,,200 = 20,,,2000Hz
05 00 00 16 05 00 00 17#	0aaaaaaa 0bbbbbbb	EQ: Low EQ Q	3,,,100 = 0.3,,,10.0
05 00 00 18 05 00 00 19#	0aaaaaaa 0bbbbbbb	EQ: Mid EQ Gain	−12,,,12dB
05 00 00 1A 05 00 00 1B#	0aaaaaaa 0bbbbbbb	EQ: Mid EQ Frequency	20,,,800 = 200,,,8000Hz
05 00 00 1C 05 00 00 1D#	0aaaaaaa 0bbbbbbb	EQ: Mid EQ Q	3,,,100 = 0.3,,,10.0
05 00 00 1E 05 00 00 1F#	0aaaaaaa 0bbbbbbb	EQ: High EQ Type	0,1 = Shelving, Peaking
05 00 00 20 05 00 00 21#	0aaaaaaa 0bbbbbbb	EQ: High EQ Gain	−12,,,12dB
05 00 00 22 05 00 00 23#	0aaaaaaa 0bbbbbbb	EQ: High EQ Frequency	14,,,200 = 1.4,,,20.0kHz
05 00 00 24 05 00 00 25#	0aaaaaaa 0bbbbbbb	EQ: High EQ Q	3,,,100 = 0.3,,,10.0
05 00 00 26 05 00 00 27#	0aaaaaaa 0bbbbbbb	EQ: Out Level	0,,,100
05 00 00 28 05 00 00 29#	0aaaaaaa 0bbbbbbb	Reverb: Room Size	5,,,40m
05 00 00 2A 05 00 00 2B#	0aaaaaaa 0bbbbbbb	Reverb: Reverb Time	1,,,320 = 0.1,,,32.0s
05 00 00 2C 05 00 00 2D#	0aaaaaaa 0bbbbbbb	Reverb: Pre Delay	0,,,200 = 0,,,200ms
05 00 00 2E 05 00 00 2F#	0aaaaaaa 0bbbbbbb	Reverb: Diffusion	0,,,100
05 00 00 30 05 00 00 31#	0aaaaaaa 0bbbbbbb	Reverb: Density	0,,,100
05 00 00 32 05 00 00 33#	0aaaaaaa 0bbbbbbb	Reverb: Early Reflection Level	0,,,100
05 00 00 34 05 00 00 35#	0aaaaaaa 0bbbbbbb	Reverb: LF Damp Frequency	5,,,400 = 50,,,4000Hz
05 00 00 36 05 00 00 37#	0aaaaaaa 0bbbbbbb	Reverb: LF Damp Gain	−36,,,0dB
05 00 00 38 05 00 00 39#	0aaaaaaa 0bbbbbbb	Reverb: HF Damp Frequency	10,,,200 = 1.0,,,20.0kHz
05 00 00 3A 05 00 00 3B#	0aaaaaaa 0bbbbbbb	Reverb: HF Damp Gain	−36,,,0dB
05 00 00 3C 05 00 00 3D#	0aaaaaaa 0bbbbbbb	Reverb: HI Cut Frequency	2,,,200 = 0.2,,,20.0kHz
05 00 00 3E 05 00 00 3F#	0aaaaaaa 0bbbbbbb	Reverb: Effect Level	−100,,,100
05 00 00 40 05 00 00 41#	0aaaaaaa 0bbbbbbb	Reverb: Direct Level	−100,,,100
05 00 00 42 :	00 :	(Reserved)	
05 00 7F 7F	00		

❍Algorithm 1 Delay

05 00 00 0E 05 00 00 0F#	0aaaaaaa 0bbbbbbb	Delay SW	0,1 = Off,On
05 00 00 10 05 00 00 11#	0aaaaaaa 0bbbbbbb	EQ SW	0,1 = Off,On
05 00 00 12 05 00 00 13#	0aaaaaaa 0bbbbbbb	Delay: Delay Time	0,,,1200ms
05 00 00 14 05 00 00 15#	0aaaaaaa 0bbbbbbb	Delay: Shift	−1200,,,1200 = L1200,,,R1200ms
05 00 00 16 05 00 00 17#	0aaaaaaa 0bbbbbbb	Delay: Lch Feedback Level	−100,,,100
05 00 00 18 05 00 00 19#	0aaaaaaa 0bbbbbbb	Delay: Rch Feedback Level	−100,,,100
05 00 00 1A 05 00 00 1B#	0aaaaaaa 0bbbbbbb	Delay: Lch Level	−100,,,100
05 00 00 1C 05 00 00 1D#	0aaaaaaa 0bbbbbbb	Delay: Rch Level	−100,,,100
05 00 00 1E 05 00 00 1F#	0aaaaaaa 0bbbbbbb	Delay: LF Damp Frequency	5,,,400 = 50,,,4000Hz
05 00 00 20 05 00 00 21#	0aaaaaaa 0bbbbbbb	Delay: LF Damp Gain	−36,,,0dB
05 00 00 22 05 00 00 23#	0aaaaaaa 0bbbbbbb	Delay: HF Damp Frequency	10,,,200 = 1.0,,,20.0kHz
05 00 00 24 05 00 00 25#	0aaaaaaa 0bbbbbbb	Delay: HF Damp Gain	−36,,,0dB
05 00 00 26 05 00 00 27#	0aaaaaaa 0bbbbbbb	Delay: Direct Level	−100,,,100
05 00 00 28 05 00 00 29#	0aaaaaaa 0bbbbbbb	EQ: Low EQ Type	0,1 = Shelving, Peaking
05 00 00 2A 05 00 00 2B#	0aaaaaaa 0bbbbbbb	EQ: Low EQ Gain	−12,,,12dB
05 00 00 2C 05 00 00 2D#	0aaaaaaa 0bbbbbbb	EQ: Low EQ Frequency	2,,,200 = 20,,,2000Hz
05 00 00 2E 05 00 00 2F#	0aaaaaaa 0bbbbbbb	EQ: Low EQ Q	3,,,100 = 0.3,,,10.0
05 00 00 30 05 00 00 31#	0aaaaaaa 0bbbbbbb	EQ: Mid EQ Gain	−12,,,12dB
05 00 00 32 05 00 00 33#	0aaaaaaa 0bbbbbbb	EQ: Mid EQ Frequency	20,,,800 = 200,,,8000Hz
05 00 00 34 05 00 00 35#	0aaaaaaa 0bbbbbbb	EQ: Mid EQ Q	3,,,100 = 0.3,,,10.0
05 00 00 36 05 00 00 37#	0aaaaaaa 0bbbbbbb	EQ: High EQ Type	0,1 = Shelving, Peaking
05 00 00 38 05 00 00 39#	0aaaaaaa 0bbbbbbb	EQ: High EQ Gain	−12,,,12dB
05 00 00 3A 05 00 00 3B#	0aaaaaaa 0bbbbbbb	EQ: High EQ Frequency	14,,,200 = 1.4,,,20.0kHz
05 00 00 3C 05 00 00 3D#	0aaaaaaa 0bbbbbbb	EQ: High EQ Q	3,,,100 = 0.3,,,10.0
05 00 00 3E 05 00 00 3F#	0aaaaaaa 0bbbbbbb	EQ: Out Level	0,,,100
05 00 00 40 :	00 :	(Reserved)	
05 00 7F 7F	00		

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

❍Algorithm 2 Stereo Delay Chorus

05 00 00 0E 05 00 00 0F#	0aaaaaaa 0bbbbbbb	Delay SW	0,1 = Off,On
05 00 00 10 05 00 00 11#	0aaaaaaa 0bbbbbbb	Chorus SW	0,1 = Off,On
05 00 00 12 05 00 00 13#	0aaaaaaa 0bbbbbbb	EQ SW	0,1 = Off,On
05 00 00 14 05 00 00 15#	0aaaaaaa 0bbbbbbb	Delay: Delay Time	0,,,500ms
05 00 00 16 05 00 00 17#	0aaaaaaa 0bbbbbbb	Delay: Shift	−500,,,500 = L500,,,R500ms
05 00 00 18 05 00 00 19#	0aaaaaaa 0bbbbbbb	Delay: Lch Feedback Level	−100,,,100
05 00 00 1A 05 00 00 1B#	0aaaaaaa 0bbbbbbb	Delay: Rch Feedback Level	−100,,,100
05 00 00 1C 05 00 00 1D#	0aaaaaaa 0bbbbbbb	Delay: Lch Cross Feedback Level	−100,,,100
05 00 00 1E 05 00 00 1F#	0aaaaaaa 0bbbbbbb	Delay: Rch Cross Feedback Level	−100,,,100
05 00 00 20 05 00 00 21#	0aaaaaaa 0bbbbbbb	Delay: Effect Level	−100,,,100
05 00 00 22 05 00 00 23#	0aaaaaaa 0bbbbbbb	Delay: Direct Level	−100,,,100
05 00 00 24 05 00 00 25#	0aaaaaaa 0bbbbbbb	Chorus: Rate	1,,,100 = 0.1,,,10.0Hz
05 00 00 26 05 00 00 27#	0aaaaaaa 0bbbbbbb	Chorus: Depth	0,,,100
05 00 00 28 05 00 00 29#	0aaaaaaa 0bbbbbbb	Chorus: Pre Delay	0,,,50ms
05 00 00 2A 05 00 00 2B#	0aaaaaaa 0bbbbbbb	Chorus: Effect Level	−100,,,100
05 00 00 2C 05 00 00 2D#	0aaaaaaa 0bbbbbbb	Chorus: Direct Level	−100,,,100
05 00 00 2E 05 00 00 2F#	0aaaaaaa 0bbbbbbb	Chorus: Lch Feedback Level	−100,,,100
05 00 00 30 05 00 00 31#	0aaaaaaa 0bbbbbbb	Chorus: Rch Feedback Level	−100,,,100
05 00 00 32 05 00 00 33#	0aaaaaaa 0bbbbbbb	Chorus: Lch Cross Feedback Level	−100,,,100
05 00 00 34 05 00 00 35#	0aaaaaaa 0bbbbbbb	Chorus: Rch Cross Feedback Level	−100,,,100
05 00 00 36 05 00 00 37#	0aaaaaaa 0bbbbbbb	EQ: Low EQ Type	0,1 = Shelving, Peaking
05 00 00 38 05 00 00 39#	0aaaaaaa 0bbbbbbb	EQ: Low EQ Gain	−12,,,12dB
05 00 00 3A 05 00 00 3B#	0aaaaaaa 0bbbbbbb	EQ: Low EQ Frequency	2,,,200 = 20,,,2000Hz
05 00 00 3C 05 00 00 3D#	0aaaaaaa 0bbbbbbb	EQ: Low EQ Q	3,,,100 = 0.3,,,10.0
05 00 00 3E 05 00 00 3F#	0aaaaaaa 0bbbbbbb	EQ: Mid EQ Gain	−12,,,12dB
05 00 00 40 05 00 00 41#	0aaaaaaa 0bbbbbbb	EQ: Mid EQ Frequency	20,,,800 = 200,,,8000Hz
05 00 00 42 05 00 00 43#	0aaaaaaa 0bbbbbbb	EQ: Mid EQ Q	3,,,100 = 0.3,,,10.0
05 00 00 44 05 00 00 45#	0aaaaaaa 0bbbbbbb	EQ: High EQ Type	0,1 = Shelving, Peaking
05 00 00 46 05 00 00 47#	0aaaaaaa 0bbbbbbb	EQ: High EQ Gain	−12,,,12dB
05 00 00 48 05 00 00 49#	0aaaaaaa 0bbbbbbb	EQ: High EQ Frequency	14,,,200 = 1.4,,,20.0kHz
05 00 00 4A 05 00 00 4B#	0aaaaaaa 0bbbbbbb	EQ: High EQ Q	3,,,100 = 0.3,,,10.0
05 00 00 4C 05 00 00 4D#	0aaaaaaa 0bbbbbbb	EQ: Out Level	0,,,100
05 00 00 4E :	00 :	(Reserved)	
05 00 7F 7F	00		

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

❍Algorithm 3 Stereo Pitch Shifter Delay

05 00 00 0E 05 00 00 0F#	0aaaaaaa 0bbbbbbb	P.ShifterDelay SW	0,1 = Off,On
05 00 00 10 05 00 00 11#	0aaaaaaa 0bbbbbbb	EQ SW	0,1 = Off,On
05 00 00 12 05 00 00 13#	0aaaaaaa 0bbbbbbb	P.ShifterDelay: Lch Chromatic Pitch	−12,,,12
05 00 00 14 05 00 00 15#	0aaaaaaa 0bbbbbbb	P.ShifterDelay: Lch Fine Pitch	−100,,,100
05 00 00 16 05 00 00 17#	0aaaaaaa 0bbbbbbb	P.ShifterDelay: Lch Pre Delay	0,,,50ms
05 00 00 18 05 00 00 19#	0aaaaaaa 0bbbbbbb	P.ShifterDelay: Lch Feedback Delay Time	0,,,500ms
05 00 00 1A 05 00 00 1B#	0aaaaaaa 0bbbbbbb	P.ShifterDelay: Lch Feedback Level	−100,,,100
05 00 00 1C 05 00 00 1D#	0aaaaaaa 0bbbbbbb	P.ShifterDelay: Lch Cross Feedback Level	−100,,,100
05 00 00 1E 05 00 00 1F#	0aaaaaaa 0bbbbbbb	P.ShifterDelay: Rch Chromatic Pitch	−12,,,12
05 00 00 20 05 00 00 21#	0aaaaaaa 0bbbbbbb	P.ShifterDelay: Rch Fine Pitch	−100,,,100
05 00 00 22 05 00 00 23#	0aaaaaaa 0bbbbbbb	P.ShifterDelay: Rch Pre Delay	0,,,50ms
05 00 00 24 05 00 00 25#	0aaaaaaa 0bbbbbbb	P.ShifterDelay: Rch Feedback Delay Time	0,,,500ms
05 00 00 26 05 00 00 27#	0aaaaaaa 0bbbbbbb	P.ShifterDelay: Rch Feedback Level	−100,,,100
05 00 00 28 05 00 00 29#	0aaaaaaa 0bbbbbbb	P.ShifterDelay: Rch Cross Feedback Level	−100,,,100
05 00 00 2A 05 00 00 2B#	0aaaaaaa 0bbbbbbb	P.ShifterDelay: Effect Level	−100,,,100
05 00 00 2C 05 00 00 2D#	0aaaaaaa 0bbbbbbb	P.ShifterDelay: Direct Level	−100,,,100
05 00 00 2E 05 00 00 2F#	0aaaaaaa 0bbbbbbb	EQ: Low EQ Type	0,1 = Shelving, Peaking
05 00 00 30 05 00 00 31#	0aaaaaaa 0bbbbbbb	EQ: Low EQ Gain	−12,,,12dB
05 00 00 32 05 00 00 33#	0aaaaaaa 0bbbbbbb	EQ: Low EQ Frequency	2,,,200 = 20,,,2000Hz
05 00 00 34 05 00 00 35#	0aaaaaaa 0bbbbbbb	EQ: Low EQ Q	3,,,100 = 0.3,,,10.0
05 00 00 36 05 00 00 37#	0aaaaaaa 0bbbbbbb	EQ: Mid EQ Gain	−12,,,12dB

05 00 00 38 05 00 00 39#	0aaaaaaa 0bbbbbbb	EQ: Mid EQ Frequency 20,,,800 = 200,,,8000Hz
05 00 00 3A 05 00 00 3B#	0aaaaaaa 0bbbbbbb	EQ: Mid EQ Q 3,,,100 = 0.3,,,10.0
05 00 00 3C 05 00 00 3D#	0aaaaaaa 0bbbbbbb	EQ: High EQ Type 0,1 = Shelving, Peaking
05 00 00 3E 05 00 00 3F#	0aaaaaaa 0bbbbbbb	EQ: High EQ Gain –12,,,12dB
05 00 00 40 05 00 00 41#	0aaaaaaa 0bbbbbbb	EQ: High EQ Frequency 14,,,200 = 1.4,,,20.0kHz
05 00 00 42 05 00 00 43#	0aaaaaaa 0bbbbbbb	EQ: High EQ Q 3,,,100 = 0.3,,,10.0
05 00 00 44 05 00 00 45#	0aaaaaaa 0bbbbbbb	EQ: Out Level 0,,,100
05 00 00 46 :	00 :	(Reserved)
05 00 7F 7F	00	

❍Algorithm 4 Vocoder

05 00 00 0E 05 00 00 0F#	0aaaaaaa 0bbbbbbb	Chorus SW 0,1 = Off,On
05 00 00 10 05 00 00 11#	0aaaaaaa 0bbbbbbb	Vocoder: Voice Character 1 0,,,100
05 00 00 12 05 00 00 13#	0aaaaaaa 0bbbbbbb	Vocoder: Voice Character 2 0,,,100
05 00 00 14 05 00 00 15#	0aaaaaaa 0bbbbbbb	Vocoder: Voice Character 3 0,,,100
05 00 00 16 05 00 00 17#	0aaaaaaa 0bbbbbbb	Vocoder: Voice Character 4 0,,,100
05 00 00 18 05 00 00 19#	0aaaaaaa 0bbbbbbb	Vocoder: Voice Character 5 0,,,100
05 00 00 1A 05 00 00 1B#	0aaaaaaa 0bbbbbbb	Vocoder: Voice Character 6 0,,,100
05 00 00 1C 05 00 00 1D#	0aaaaaaa 0bbbbbbb	Vocoder: Voice Character 7 0,,,100
05 00 00 1E 05 00 00 1F#	0aaaaaaa 0bbbbbbb	Vocoder: Voice Character 8 0,,,100
05 00 00 20 05 00 00 21#	0aaaaaaa 0bbbbbbb	Vocoder: Voice Character 9 0,,,100
05 00 00 22 05 00 00 23#	0aaaaaaa 0bbbbbbb	Vocoder: Voice Character 10 0,,,100
05 00 00 24 05 00 00 25#	0aaaaaaa 0bbbbbbb	Chorus: Rate 1,,,100 = 0.1,,,10.0Hz
05 00 00 26 05 00 00 27#	0aaaaaaa 0bbbbbbb	Chorus: Depth 0,,,100
05 00 00 28 05 00 00 29#	0aaaaaaa 0bbbbbbb	Chorus: Pre Delay 0,,,50ms
05 00 00 2A 05 00 00 2B#	0aaaaaaa 0bbbbbbb	Chorus: Feedback Level –100,,,100
05 00 00 2C 05 00 00 2D#	0aaaaaaa 0bbbbbbb	Chorus: Effect Level –100,,,100
05 00 00 2E 05 00 00 2F#	0aaaaaaa 0bbbbbbb	Chorus: Direct Level –100,,,100
05 00 00 30 :	00 :	(Reserved)
05 00 7F 7F	00	

❍Algorithm 5 2CH RSS

05 00 00 0E 05 00 00 0F#	0aaaaaaa 0bbbbbbb	2CH RSS: Ach Azimuth –30,,,30 = –180,,,180
05 00 00 10 05 00 00 11#	0aaaaaaa 0bbbbbbb	2CH RSS: Ach Elevation –15,,,15 = –90,,,90
05 00 00 12 05 00 00 13#	0aaaaaaa 0bbbbbbb	2CH RSS: Bch Azimuth –30,,,30 = –180,,,180
05 00 00 14 05 00 00 15#	0aaaaaaa 0bbbbbbb	2CH RSS: Bch Elevation –15,,,15 = –90,,,90
05 00 00 16 05 00 00 17#	0aaaaaaa 0bbbbbbb	2CH RSS: Phones SW 0,1 = Off,On
05 00 00 18 05 00 00 19#	0aaaaaaa 0bbbbbbb	2CH RSS: RSS Type 0,1 = Type A,Type B
05 00 00 1A :	00 :	(Reserved)
05 00 7F 7F	00	

❍Algorithm 6 Delay RSS

05 00 00 0E 05 00 00 0F#	0aaaaaaa 0bbbbbbb	Delay RSS: Delay Time 0,,,1200ms
05 00 00 10 05 00 00 11#	0aaaaaaa 0bbbbbbb	Delay RSS: Shift –1200,,,1200 = L1200,,,R1200ms
05 00 00 12 05 00 00 13#	0aaaaaaa 0bbbbbbb	Delay RSS: Center Delay Time 0,,,1200ms
05 00 00 14 05 00 00 15#	0aaaaaaa 0bbbbbbb	Delay RSS: RSS Level 0,,,100
05 00 00 16 05 00 00 17#	0aaaaaaa 0bbbbbbb	Delay RSS: Center Level 0,,,100
05 00 00 18 05 00 00 19#	0aaaaaaa 0bbbbbbb	Delay RSS: Feedback Level –100,,,100
05 00 00 1A 05 00 00 1B#	0aaaaaaa 0bbbbbbb	Delay RSS: LF Damp Frequency 5,,,400 = 50,,,4000Hz
05 00 00 1C 05 00 00 1D#	0aaaaaaa 0bbbbbbb	Delay RSS: LF Damp Gain –36,,,0dB
05 00 00 1E 05 00 00 1F#	0aaaaaaa 0bbbbbbb	Delay RSS: HF Damp Frequency 10,,,200 = 1.0,,,20.0kHz
05 00 00 20 05 00 00 21#	0aaaaaaa 0bbbbbbb	Delay RSS: HF Damp Gain –36,,,0dB
05 00 00 22 05 00 00 23#	0aaaaaaa 0bbbbbbb	Delay RSS: Effect Level –100,,,100
05 00 00 24 05 00 00 25#	0aaaaaaa 0bbbbbbb	Delay RSS: Direct Level –100,,,100
05 00 00 26 05 00 00 27#	0aaaaaaa 0bbbbbbb	Delay RSS: Phones SW 0,1 = Off,On
05 00 00 26 :	00 :	(Reserved)
05 00 7F 7F	00	

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

❍Algorithm 7 Chorus RSS

05 00 00 0E 05 00 00 0F#	0aaaaaaa 0bbbbbbb	Chorus RSS: Chorus Rate 1,,,100 = 0.1,,,10.0Hz
05 00 00 10 05 00 00 11#	0aaaaaaa 0bbbbbbb	Chorus RSS: Chorus Depth 0,,,100
05 00 00 12 05 00 00 13#	0aaaaaaa 0bbbbbbb	Chorus RSS: Effect Level –100,,,100
05 00 00 14 05 00 00 15#	0aaaaaaa 0bbbbbbb	Chorus RSS: Direct Level –100,,,100
05 00 00 16 05 00 00 17#	0aaaaaaa 0bbbbbbb	Chorus RSS: Phones SW 0,1 = Off,On
05 00 00 18 :	00 :	(Reserved)
05 00 7F 7F	00	

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

05 00 00 0E 05 00 00 0F#	0aaaaaaa 0bbbbbbb	Compressor SW 0,1 = Off,On
05 00 00 10 05 00 00 11#	0aaaaaaa 0bbbbbbb	Metal/Distortion/Over Drive SW 0,1 = Off,On
05 00 00 12 05 00 00 13#	0aaaaaaa 0bbbbbbb	Noise Suppressor SW 0,1 = Off,On
05 00 00 14 05 00 00 15#	0aaaaaaa 0bbbbbbb	Auto Wah SW 0,1 = Off,On
05 00 00 16 05 00 00 17#	0aaaaaaa 0bbbbbbb	Guitar Amp Modeling SW 0,1 = Off,On
05 00 00 18 05 00 00 19#	0aaaaaaa 0bbbbbbb	Flanger SW 0,1 = Off,On
05 00 00 1A 05 00 00 1B#	0aaaaaaa 0bbbbbbb	Delay SW 0,1 = Off,On
05 00 00 1C 05 00 00 1D#	0aaaaaaa 0bbbbbbb	Compressor: Attack 0,,,100
05 00 00 1E 05 00 00 1F#	0aaaaaaa 0bbbbbbb	Compressor: Level 0,,,100
05 00 00 20 05 00 00 21#	0aaaaaaa 0bbbbbbb	Compressor: Sustain 0,,,100
05 00 00 22 05 00 00 23#	0aaaaaaa 0bbbbbbb	Compressor: Tone –50,,,–50
05 00 00 24 05 00 00 25#	0aaaaaaa 0bbbbbbb	Noise Suppressor: Threshold 0,,,100
05 00 00 26 05 00 00 27#	0aaaaaaa 0bbbbbbb	Noise Suppressor: Release 0,,,100
05 00 00 28 05 00 00 29#	0aaaaaaa 0bbbbbbb	Auto Wah: Mode 0,1 = LPF,BPF
05 00 00 2A 05 00 00 2B#	0aaaaaaa 0bbbbbbb	Auto Wah: Polarity 0,1 = Down,Up
05 00 00 2C 05 00 00 2D#	0aaaaaaa 0bbbbbbb	Auto Wah: Frequency 0,,,100
05 00 00 2E 05 00 00 2F#	0aaaaaaa 0bbbbbbb	Auto Wah: Level 0,,,100
05 00 00 30 05 00 00 31#	0aaaaaaa 0bbbbbbb	Auto Wah: Peak 0,,,100
05 00 00 32 05 00 00 33#	0aaaaaaa 0bbbbbbb	Auto Wah: Sens 0,,,100
05 00 00 34 05 00 00 35#	0aaaaaaa 0bbbbbbb	Auto Wah: Rate 1,,,100 = 0.1,,,10.0Hz
05 00 00 36 05 00 00 37#	0aaaaaaa 0bbbbbbb	Auto Wah: Depth 0,,,100
05 00 00 38 05 00 00 39#	0aaaaaaa 0bbbbbbb	Guitar Amp Modeling: Mode 0,,,3 = Small,BultIn,2Stack,3Stack
05 00 00 3A 05 00 00 3B#	0aaaaaaa 0bbbbbbb	Flanger: Rate 1,,,100 = 0.1,,,10.0Hz
05 00 00 3C 05 00 00 3D#	0aaaaaaa 0bbbbbbb	Flanger: Depth 0,,,100
05 00 00 3E 05 00 00 3F#	0aaaaaaa 0bbbbbbb	Flanger: Manual 0,,,100
05 00 00 40 05 00 00 41#	0aaaaaaa 0bbbbbbb	Flanger: Resonance 0,,,100
05 00 00 42 05 00 00 43#	0aaaaaaa 0bbbbbbb	Delay: Delay Time 0,,,1000ms
05 00 00 44 05 00 00 45#	0aaaaaaa 0bbbbbbb	Delay: Shift –1000,,,1000 = L1000,,,R1000ms
05 00 00 46 05 00 00 47#	0aaaaaaa 0bbbbbbb	Delay: Feedback Time 0,,,1000ms
05 00 00 48 05 00 00 49#	0aaaaaaa 0bbbbbbb	Delay: Feedback Level –100,,,100
05 00 00 4A 05 00 00 4B#	0aaaaaaa 0bbbbbbb	Delay: Effect Level –100,,,100
05 00 00 4C 05 00 00 4D#	0aaaaaaa 0bbbbbbb	Delay: Direct Level –100,,,100

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

❍Individual Algorithm 8 Guitar Multi 1

05 00 00 4E 05 00 00 4F#	0aaaaaaa 0bbbbbbb	Metal: Gain 0,,,100
05 00 00 50 05 00 00 51#	0aaaaaaa 0bbbbbbb	Metal: Level 0,,,100
05 00 00 52 05 00 00 53#	0aaaaaaa 0bbbbbbb	Metal: Hi Gain –100,,,100
05 00 00 54 05 00 00 55#	0aaaaaaa 0bbbbbbb	Metal: Mid Gain –100,,,100
05 00 00 56 05 00 00 57#	0aaaaaaa 0bbbbbbb	Metal: Low Gain –100,,,100
05 00 00 58 :	00 :	(Reserved)
05 00 7F 7F	00	

❍Individual Algorithm 9 Guitar Multi 2

05 00 00 4E 05 00 00 4F#	0aaaaaaa 0bbbbbbb	Distortion: Gain 0,,,100
05 00 00 50 05 00 00 51#	0aaaaaaa 0bbbbbbb	Distortion: Level 0,,,100
05 00 00 52 05 00 00 53#	0aaaaaaa 0bbbbbbb	Distortion: Tone 0,,,100
05 00 00 54 :	00 :	(Reserved)
05 00 7F 7F	00	

❍Individual Algorithm 10 Guitar Multi 3

05 00 00 4E 05 00 00 4F#	0aaaaaaa 0bbbbbbb	Over Drive: Gain 0,,,100
05 00 00 50 05 00 00 51#	0aaaaaaa 0bbbbbbb	Over Drive: Level 0,,,100
05 00 00 52 05 00 00 53#	0aaaaaaa 0bbbbbbb	Over Drive: Tone 0,,,100

05 00 00 54	00	(Reserved)
:	:	
05 00 7F 7F	00	

❍Algorithm 11 Vocal Multi

05 00 00 0E 05 00 00 0F#	0aaaaaaa 0bbbbbbb	Noise Suppressor SW 0,1 = Off,On
05 00 00 10 05 00 00 11#	0aaaaaaa 0bbbbbbb	Limiter/De–esser SW 0,1 = Off,On
05 00 00 12 05 00 00 13#	0aaaaaaa 0bbbbbbb	Enhancer SW 0,1 = Off,On
05 00 00 14 05 00 00 15#	0aaaaaaa 0bbbbbbb	EQ SW 0,1 = Off,On
05 00 00 16 05 00 00 17#	0aaaaaaa 0bbbbbbb	P.Shifter SW 0,1 = Off,On
05 00 00 18 05 00 00 19#	0aaaaaaa 0bbbbbbb	Delay SW 0,1 = Off,On
05 00 00 1A 05 00 00 1B#	0aaaaaaa 0bbbbbbb	Chorus SW 0,1 = Off,On
05 00 00 1C 05 00 00 1D#	0aaaaaaa 0bbbbbbb	Limiter/De–esser Mode 0,1 = Limiter,De–esser
05 00 00 1E 05 00 00 1F#	0aaaaaaa 0bbbbbbb	Noise Suppressor: Threshold 0,,,100
05 00 00 20 05 00 00 21#	0aaaaaaa 0bbbbbbb	Noise Suppressor: Release 0,,,100
05 00 00 22 05 00 00 23#	0aaaaaaa 0bbbbbbb	Limiter: Threshold 0,,,100
05 00 00 24 05 00 00 25#	0aaaaaaa 0bbbbbbb	Limiter: Release 0,,,100
05 00 00 26 05 00 00 27#	0aaaaaaa 0bbbbbbb	Limiter: Level 0,,,100
05 00 00 28 05 00 00 29#	0aaaaaaa 0bbbbbbb	De–esser: Sens 0,,,100
05 00 00 2A 05 00 00 2B#	0aaaaaaa 0bbbbbbb	De–esser: Frequency 10,,,100 = 1.0,,,10.0kHz
05 00 00 2C 05 00 00 2D#	0aaaaaaa 0bbbbbbb	Enhancer: Sens 0,,,100
05 00 00 2E 05 00 00 2F#	0aaaaaaa 0bbbbbbb	Enhancer: Frequency 10,,,100 = 1.0,,,10.0kHz
05 00 00 30 05 00 00 31#	0aaaaaaa 0bbbbbbb	Enhancer: MIX Level 0,,,100
05 00 00 32 05 00 00 33#	0aaaaaaa 0bbbbbbb	Enhancer: Level 0,,,100
05 00 00 34 05 00 00 35#	0aaaaaaa 0bbbbbbb	EQ: Low EQ Type 0,1 = Shelving, Peaking
05 00 00 36 05 00 00 37#	0aaaaaaa 0bbbbbbb	EQ: Low EQ Gain –12,,,12dB
05 00 00 38 05 00 00 39#	0aaaaaaa 0bbbbbbb	EQ: Low EQ Frequency 2,,,200 = 20,,,2000Hz
05 00 00 3A 05 00 00 3B#	0aaaaaaa 0bbbbbbb	EQ: Low EQ Q 3,,,100 = 0.3,,,10.0
05 00 00 3C 05 00 00 3D#	0aaaaaaa 0bbbbbbb	EQ: Mid EQ Gain –12,,,12dB
05 00 00 3E 05 00 00 3F#	0aaaaaaa 0bbbbbbb	EQ: Mid EQ Frequency 20,,,800 = 200,,,8000Hz
05 00 00 40 05 00 00 41#	0aaaaaaa 0bbbbbbb	EQ: Mid EQ Q 3,,,100 = 0.3,,,10.0
05 00 00 42 05 00 00 43#	0aaaaaaa 0bbbbbbb	EQ: High EQ Type 0,1 = Shelving, Peaking
05 00 00 44 05 00 00 45#	0aaaaaaa 0bbbbbbb	EQ: High EQ Gain –12,,,12dB
05 00 00 46 05 00 00 47#	0aaaaaaa 0bbbbbbb	EQ: High EQ Frequency 14,,,200 = 1.4,,,20.0kHz
05 00 00 48 05 00 00 49#	0aaaaaaa 0bbbbbbb	EQ: High EQ Q 3,,,100 = 0.3,,,10.0
05 00 00 4A 05 00 00 4B#	0aaaaaaa 0bbbbbbb	EQ: Out Level 0,,,100
05 00 00 4C 05 00 00 4D#	0aaaaaaa 0bbbbbbb	P.Shifter: Chromatic Pitch –12,,,12
05 00 00 4E 05 00 00 4F#	0aaaaaaa 0bbbbbbb	P.Shifter: Fine Pitch –100,,,100
05 00 00 50 05 00 00 51#	0aaaaaaa 0bbbbbbb	P.Shifter: Effect Level –100,,,100
05 00 00 52 05 00 00 53#	0aaaaaaa 0bbbbbbb	P.Shifter: Direct Level –100,,,100
05 00 00 54 05 00 00 55#	0aaaaaaa 0bbbbbbb	Delay: Delay Time 0,,,1000
05 00 00 56 05 00 00 57#	0aaaaaaa 0bbbbbbb	Delay: Feedback Level –100,,,100
05 00 00 58 05 00 00 59#	0aaaaaaa 0bbbbbbb	Delay: Effect Level –100,,,100
05 00 00 5A 05 00 00 5B#	0aaaaaaa 0bbbbbbb	Delay: Direct Level –100,,,100
05 00 00 5C 05 00 00 5D#	0aaaaaaa 0bbbbbbb	Chorus: Rate 1,,,100 = 0.1,,,10.0Hz
05 00 00 5E 05 00 00 5F#	0aaaaaaa 0bbbbbbb	Chorus: Depth 0,,,100
05 00 00 60 05 00 00 61#	0aaaaaaa 0bbbbbbb	Chorus: Pre Delay 0,,,50ms
05 00 00 62 05 00 00 63#	0aaaaaaa 0bbbbbbb	Chorus: Effect Level –100,,,100
05 00 00 64 05 00 00 65#	0aaaaaaa 0bbbbbbb	Chorus: Direct Level –100,,,100
05 00 00 66	00	(Reserved)
:	:	
05 00 7F 7F	00	

❍Algorithm 12 Rotary

05 00 00 0E 05 00 00 0F#	0aaaaaaa 0bbbbbbb	Noise Suppressor SW 0,1 = Off,On
05 00 00 10 05 00 00 11#	0aaaaaaa 0bbbbbbb	Over Drive SW 0,1 = Off,On
05 00 00 12 05 00 00 13#	0aaaaaaa 0bbbbbbb	Noise Suppressor: Threshold 0,,,100
05 00 00 14 05 00 00 15#	0aaaaaaa 0bbbbbbb	Noise Suppressor: Release 0,,,100
05 00 00 16 05 00 00 17#	0aaaaaaa 0bbbbbbb	Over Drive: Gain 0,,,100
05 00 00 18 05 00 00 19#	0aaaaaaa 0bbbbbbb	Over Drive: Level 0,,,100
05 00 00 1A 05 00 00 1B#	0aaaaaaa 0bbbbbbb	Rotary: Low Rate 1,,,100 = 0.1,,,10.0Hz
05 00 00 1C 05 00 00 1D#	0aaaaaaa 0bbbbbbb	Rotary: Hi Rate 1,,,100 = 0.1,,,10.0Hz
05 00 00 1E	00	(Reserved)
:	:	
05 00 7F 7F	00	

❍Algorithm 13 Guitar AMP Modeling

05 00 00 0E 05 00 00 0F#	0aaaaaaa 0bbbbbbb	Noise Suppressor SW 0,1 = Off,On
05 00 00 10 05 00 00 11#	0aaaaaaa 0bbbbbbb	Pre Amp SW 0,1 = Off,On
05 00 00 12 05 00 00 13#	0aaaaaaa 0bbbbbbb	Speaker SW 0,1 = Off,On
05 00 00 14 05 00 00 15#	0aaaaaaa 0bbbbbbb	Noise Suppressor: Threshold 0,,,100
05 00 00 16 05 00 00 17#	0aaaaaaa 0bbbbbbb	Noise Suppressor: Release 0,,,100
05 00 00 18 05 00 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
05 00 00 1A 05 00 00 1B#	0aaaaaaa 0bbbbbbb	Pre Amp: Volume 0,,,100
05 00 00 1C 05 00 00 1D#	0aaaaaaa 0bbbbbbb	Pre Amp: Bass 0,,,100
05 00 00 1E 05 00 00 1F#	0aaaaaaa 0bbbbbbb	Pre Amp: Middle 0,,,100
05 00 00 20 05 00 00 21#	0aaaaaaa 0bbbbbbb	Pre Amp: Treble 0,,,100
05 00 00 22 05 00 00 23#	0aaaaaaa 0bbbbbbb	Pre Amp: Presence 0,,,100
05 00 00 24 05 00 00 25#	0aaaaaaa 0bbbbbbb	Pre Amp: Master 0,,,100
05 00 00 26 05 00 00 27#	0aaaaaaa 0bbbbbbb	Pre Amp: Bright 0,1 = Off,On
05 00 00 28 05 00 00 29#	0aaaaaaa 0bbbbbbb	Pre Amp: Gain 0,1,2 = Low,Middle,High
05 00 00 2A 05 00 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
05 00 00 2C 05 00 00 2D#	0aaaaaaa 0bbbbbbb	Speaker: MIC Setting 0,1,2 = 1,2,3
05 00 00 2E 05 00 00 2F#	0aaaaaaa 0bbbbbbb	Speaker: MIC Level 0,,,100
05 00 00 30 05 00 00 31#	0aaaaaaa 0bbbbbbb	Speaker: Direct Level 0,,,100
05 00 00 32	00	(Reserved)
:	:	
05 00 7F 7F	00	

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

❍Algorithm 14 Stereo Phaser

05 00 00 0E 05 00 00 0F#	0aaaaaaa 0bbbbbbb	Phaser SW 0,1 = Off,On
05 00 00 10 05 00 00 11#	0aaaaaaa 0bbbbbbb	EQ SW 0,1 = Off,On
05 00 00 12 05 00 00 13#	0aaaaaaa 0bbbbbbb	Phaser: Mode 0,,,3 = 4,8,12,16stage
05 00 00 14 05 00 00 15#	0aaaaaaa 0bbbbbbb	Phaser: Rate 1,,,100 = 0.1,,,10.0Hz
05 00 00 16 05 00 00 17#	0aaaaaaa 0bbbbbbb	Phaser: Depth 0,,,100
05 00 00 18 05 00 00 19#	0aaaaaaa 0bbbbbbb	Phaser: Polarity 0,1 = Inverse,Synchro
05 00 00 1A 05 00 00 1B#	0aaaaaaa 0bbbbbbb	Phaser: Manual 0,,,100
05 00 00 1C 05 00 00 1D#	0aaaaaaa 0bbbbbbb	Phaser: Resonance 0,,,100
05 00 00 1E 05 00 00 1F#	0aaaaaaa 0bbbbbbb	Phaser: Cross Feedback 0,,,100
05 00 00 20 05 00 00 21#	0aaaaaaa 0bbbbbbb	Phaser: Effect Level –100,,,100
05 00 00 22 05 00 00 23#	0aaaaaaa 0bbbbbbb	Phaser: Direct Level –100,,,100
05 00 00 24 05 00 00 25#	0aaaaaaa 0bbbbbbb	EQ: Low EQ Type 0,1 = Shelving, Peaking
05 00 00 26 05 00 00 27#	0aaaaaaa 0bbbbbbb	EQ: Low EQ Gain –12,,,12dB
05 00 00 28 05 00 00 29#	0aaaaaaa 0bbbbbbb	EQ: Low EQ Frequency 2,,,200 = 20,,,2000Hz
05 00 00 2A 05 00 00 2B#	0aaaaaaa 0bbbbbbb	EQ: Low EQ Q 3,,,100 = 0.3,,,10.0
05 00 00 2C 05 00 00 2D#	0aaaaaaa 0bbbbbbb	EQ: Mid EQ Gain –12,,,12dB
05 00 00 2E 05 00 00 2F#	0aaaaaaa 0bbbbbbb	EQ: Mid EQ Frequency 20,,,800 = 200,,,8000Hz
05 00 00 30 05 00 00 31#	0aaaaaaa 0bbbbbbb	EQ: Mid EQ Q 3,,,100 = 0.3,,,10.0
05 00 00 32 05 00 00 33#	0aaaaaaa 0bbbbbbb	EQ: High EQ Type 0,1 = Shelving, Peaking
05 00 00 34 05 00 00 35#	0aaaaaaa 0bbbbbbb	EQ: High EQ Gain –12,,,12dB
05 00 00 36 05 00 00 37#	0aaaaaaa 0bbbbbbb	EQ: High EQ Frequency 14,,,200 = 1.4,,,20.0kHz
05 00 00 38 05 00 00 39#	0aaaaaaa 0bbbbbbb	EQ: High EQ Q 3,,,100 = 0.3,,,10.0
05 00 00 3A 05 00 00 3B#	0aaaaaaa 0bbbbbbb	EQ: Out Level 0,,,100
05 00 00 3C	00	(Reserved)
:	:	
05 00 7F 7F	00	

❍Algorithm 15 Stereo Flanger

05 00 00 0E 05 00 00 0F#	0aaaaaaa 0bbbbbbb	Flanger SW 0,1 = Off,On
05 00 00 10 05 00 00 11#	0aaaaaaa 0bbbbbbb	EQ SW 0,1 = Off,On
05 00 00 12 05 00 00 13#	0aaaaaaa 0bbbbbbb	Flanger: Rate 1,,,100 = 0.1,,,10.0Hz

05 00 00 14 05 00 00 15#	0aaaaaaa 0bbbbbbb	Flanger: Depth 0,,,100
05 00 00 16 05 00 00 17#	0aaaaaaa 0bbbbbbb	Flanger: Polarity 0,1 = Inverse,Synchro
05 00 00 18 05 00 00 19#	0aaaaaaa 0bbbbbbb	Flanger: Manual 0,,,100
05 00 00 1A 05 00 00 1B#	0aaaaaaa 0bbbbbbb	Flanger: Resonace 0,,,100
05 00 00 1C 05 00 00 1D#	0aaaaaaa 0bbbbbbb	Flanger: Cross Feedback Level 0,,,100
05 00 00 1E 05 00 00 1F#	0aaaaaaa 0bbbbbbb	Flanger: Effect Level –100,,,100
05 00 00 20 05 00 00 21#	0aaaaaaa 0bbbbbbb	Flanger: Direct Level –100,,,100
05 00 00 22 05 00 00 23#	0aaaaaaa 0bbbbbbb	EQ: Low EQ Type 0,1 = Shelving, Peaking
05 00 00 24 05 00 00 25#	0aaaaaaa 0bbbbbbb	EQ: Low EQ Gain –12,,,12dB
05 00 00 26 05 00 00 27#	0aaaaaaa 0bbbbbbb	EQ: Low EQ Frequency 2,,,200 = 20,,,2000Hz
05 00 00 28 05 00 00 29#	0aaaaaaa 0bbbbbbb	EQ: Low EQ Q 3,,,100 = 0.3,,,10.0
05 00 00 2A 05 00 00 2B#	0aaaaaaa 0bbbbbbb	EQ: Mid EQ Gain –12,,,12dB
05 00 00 2C 05 00 00 2D#	0aaaaaaa 0bbbbbbb	EQ: Mid EQ Frequency 20,,,800 = 200,,,8000Hz
05 00 00 2E 05 00 00 2F#	0aaaaaaa 0bbbbbbb	EQ: Mid EQ Q 3,,,100 = 0.3,,,10.0
05 00 00 30 05 00 00 31#	0aaaaaaa 0bbbbbbb	EQ: High EQ Type 0,1 = Shelving, Peaking
05 00 00 32 05 00 00 33#	0aaaaaaa 0bbbbbbb	EQ: High EQ Gain –12,,,12dB
05 00 00 34 05 00 00 35#	0aaaaaaa 0bbbbbbb	EQ: High EQ Frequency 14,,,200 = 1.4,,,20.0kHz
05 00 00 36 05 00 00 37#	0aaaaaaa 0bbbbbbb	EQ: High EQ Q 3,,,100 = 0.3,,,10.0
05 00 00 38 05 00 00 39#	0aaaaaaa 0bbbbbbb	EQ: Out Level 0,,,100
05 00 00 3A :	00 :	(Reserved)
05 00 7F 7F	00	

❍Algorithm 16 Dual Compressor/Limiter

05 00 00 0E 05 00 00 0F#	0aaaaaaa 0bbbbbbb	Comp/Limit A SW 0,1 = Off,On
05 00 00 10 05 00 00 11#	0aaaaaaa 0bbbbbbb	Noise Suppressor A SW 0,1 = Off,On
05 00 00 12 05 00 00 13#	0aaaaaaa 0bbbbbbb	Comp/Limit B SW 0,1 = Off,On
05 00 00 14 05 00 00 15#	0aaaaaaa 0bbbbbbb	Noise Suppressor B SW 0,1 = Off,On
05 00 00 16 05 00 00 17#	0aaaaaaa 0bbbbbbb	Comp/Limit A: Detect 0,1,2 = A,B,Link
05 00 00 18 05 00 00 19#	0aaaaaaa 0bbbbbbb	Comp/Limit A: Level –60,,,12dB
05 00 00 1A 05 00 00 1B#	0aaaaaaa 0bbbbbbb	Comp/Limit A: Thresh –60,,,0dB
05 00 00 1C 05 00 00 1D#	0aaaaaaa 0bbbbbbb	Comp/Limit A: Attack 0,,,100
05 00 00 1E 05 00 00 1F#	0aaaaaaa 0bbbbbbb	Comp/Limit A: Release 0,,,100
05 00 00 20 05 00 00 21#	0aaaaaaa 0bbbbbbb	Comp/Limit A: Ratio 0,,,3 = 1.5:1,2:1,4:1,100:1
05 00 00 22 05 00 00 23#	0aaaaaaa 0bbbbbbb	Noise Suppressor A: Detect 0,1,2 = A,B,Link
05 00 00 24 05 00 00 25#	0aaaaaaa 0bbbbbbb	Noise Suppressor A: Threshold 0,,,100
05 00 00 26 05 00 00 27#	0aaaaaaa 0bbbbbbb	Noise Suppressor A: Release 0,,,100
05 00 00 28 05 00 00 29#	0aaaaaaa 0bbbbbbb	Comp/Limit B: Detect 0,1,2 = A,B,Link
05 00 00 2A 05 00 00 2B#	0aaaaaaa 0bbbbbbb	Comp/Limit B: Level –60,,,12dB
05 00 00 2C 05 00 00 2D#	0aaaaaaa 0bbbbbbb	Comp/Limit B: Thresh –60,,,0dB
05 00 00 2E 05 00 00 2F#	0aaaaaaa 0bbbbbbb	Comp/Limit B: Attack 0,,,100
05 00 00 30 05 00 00 31#	0aaaaaaa 0bbbbbbb	Comp/Limit B: Release 0,,,100
05 00 00 32 05 00 00 33#	0aaaaaaa 0bbbbbbb	Comp/Limit B: Ratio 0,,,3 = 1.5:1,2:1,4:1,100:1
05 00 00 34 05 00 00 35#	0aaaaaaa 0bbbbbbb	Noise Suppressor B: Detect 0,1,2 = A,B,Link
05 00 00 36 05 00 00 37#	0aaaaaaa 0bbbbbbb	Noise Suppressor B: Threshold 0,,,100
05 00 00 38 05 00 00 39#	0aaaaaaa 0bbbbbbb	Noise Suppressor B: Release 0,,,100
05 00 00 3A :	00 :	(Reserved)
05 00 7F 7F	00	

❍Algorithm 17 Gate Reverb (FX1,FX3,FX5,FX7)

05 00 00 0E 05 00 00 0F#	0aaaaaaa 0bbbbbbb	G.Reverb SW 0,1 = Off,On
05 00 00 10 05 00 00 11#	0aaaaaaa 0bbbbbbb	EQ SW 0,1 = Off,On
05 00 00 12 05 00 00 13#	0aaaaaaa 0bbbbbbb	G.Reverb: Gate Time 10,,,400ms
05 00 00 14 05 00 00 15#	0aaaaaaa 0bbbbbbb	G.Reverb: Pre Delay 0,,,300ms
05 00 00 16 05 00 00 17#	0aaaaaaa 0bbbbbbb	G.Reverb: Effect Level –100,,,100
05 00 00 18 05 00 00 19#	0aaaaaaa 0bbbbbbb	G.Reverb: Mode 0,,,4 = Normal,L–>R,R–>L,Reverse1,Reverse2
05 00 00 1A 05 00 00 1B#	0aaaaaaa 0bbbbbbb	G.Reverb: Thickness 0,,,100
05 00 00 1C 05 00 00 1D#	0aaaaaaa 0bbbbbbb	G.Reverb: Density 0,,,100
05 00 00 1E 05 00 00 1F#	0aaaaaaa 0bbbbbbb	G.Reverb: Accent Delay 0,,,200ms
05 00 00 20 05 00 00 21#	0aaaaaaa 0bbbbbbb	G.Reverb: Accent Level 0,,,100
05 00 00 22 05 00 00 23#	0aaaaaaa 0bbbbbbb	G.Reverb: Accent Pan 1,,,127 = L63,,,R63
05 00 00 24 05 00 00 25#	0aaaaaaa 0bbbbbbb	G.Reverb: Direct Level –100,,,100
05 00 00 26 05 00 00 27#	0aaaaaaa 0bbbbbbb	EQ: Low EQ Type 0,1 = Shelving, Peaking
05 00 00 28 05 00 00 29#	0aaaaaaa 0bbbbbbb	EQ: Low EQ Gain –12,,,12dB
05 00 00 2A 05 00 00 2B#	0aaaaaaa 0bbbbbbb	EQ: Low EQ Frequency 2,,,200 = 20,,,2000Hz
05 00 00 2C 05 00 00 2D#	0aaaaaaa 0bbbbbbb	EQ: Low EQ Q 3,,,100 = 0.3,,,10.0
05 00 00 2E 05 00 00 2F#	0aaaaaaa 0bbbbbbb	EQ: Mid EQ Gain –12,,,12dB
05 00 00 30 05 00 00 31#	0aaaaaaa 0bbbbbbb	EQ: Mid EQ Frequency 20,,,800 = 200,,,8000Hz
05 00 00 32 05 00 00 33#	0aaaaaaa 0bbbbbbb	EQ: Mid EQ Q 3,,,100 = 0.3,,,10.0
05 00 00 34 05 00 00 35#	0aaaaaaa 0bbbbbbb	EQ: High EQ Type 0,1 = Shelving, Peaking
05 00 00 36 05 00 00 37#	0aaaaaaa 0bbbbbbb	EQ: High EQ Gain –12,,,12dB
05 00 00 38 05 00 00 39#	0aaaaaaa 0bbbbbbb	EQ: High EQ Frequency 14,,,200 = 1.4,,,20.0kHz
05 00 00 3A 05 00 00 3B#	0aaaaaaa 0bbbbbbb	EQ: High EQ Q 3,,,100 = 0.3,,,10.0
05 00 00 3C 05 00 00 3D#	0aaaaaaa 0bbbbbbb	EQ: Out Level 0,,,100
05 00 00 3E :	00 :	(Reserved)
05 00 7F 7F	00	

❍Algorithm 18 Multi Tap Delay

05 00 00 0E 05 00 00 0F#	0aaaaaaa 0bbbbbbb	EQ SW 0,1 = Off,On
05 00 00 10 05 00 00 11#	0aaaaaaa 0bbbbbbb	M.Tap Delay: Time 1 0,,,1200ms
05 00 00 12 05 00 00 13#	0aaaaaaa 0bbbbbbb	M.Tap Delay: Level 1 0,,,100
05 00 00 14 05 00 00 15#	0aaaaaaa 0bbbbbbb	M.Tap Delay: Pan 1 1,,,127 = L63,,,R63
05 00 00 16 05 00 00 17#	0aaaaaaa 0bbbbbbb	M.Tap Delay: Time 2 0,,,1200ms
05 00 00 18 05 00 00 19#	0aaaaaaa 0bbbbbbb	M.Tap Delay: Level 2 0,,,100
05 00 00 1A 05 00 00 1B#	0aaaaaaa 0bbbbbbb	M.Tap Delay: Pan 2 1,,,127 = L63,,,R63
05 00 00 1C 05 00 00 1D#	0aaaaaaa 0bbbbbbb	M.Tap Delay: Time 3 0,,,1200ms
05 00 00 1E 05 00 00 1F#	0aaaaaaa 0bbbbbbb	M.Tap Delay: Level 3 0,,,100
05 00 00 20 05 00 00 21#	0aaaaaaa 0bbbbbbb	M.Tap Delay: Pan 3 1,,,127 = L63,,,R63
05 00 00 22 05 00 00 23#	0aaaaaaa 0bbbbbbb	M.Tap Delay: Time 4 0,,,1200ms
05 00 00 24 05 00 00 25#	0aaaaaaa 0bbbbbbb	M.Tap Delay: Level 4 0,,,100
05 00 00 26 05 00 00 27#	0aaaaaaa 0bbbbbbb	M.Tap Delay: Pan 4 1,,,127 = L63,,,R63
05 00 00 28 05 00 00 29#	0aaaaaaa 0bbbbbbb	M.Tap Delay: Time 5 0,,,1200ms
05 00 00 2A 05 00 00 2B#	0aaaaaaa 0bbbbbbb	M.Tap Delay: Level 5 0,,,100
05 00 00 2C 05 00 00 2D#	0aaaaaaa 0bbbbbbb	M.Tap Delay: Pan 5 1,,,127 = L63,,,R63
05 00 00 2E 05 00 00 2F#	0aaaaaaa 0bbbbbbb	M.Tap Delay: Time 6 0,,,1200ms
05 00 00 30 05 00 00 31#	0aaaaaaa 0bbbbbbb	M.Tap Delay: Level 6 0,,,100
05 00 00 32 05 00 00 33#	0aaaaaaa 0bbbbbbb	M.Tap Delay: Pan 6 1,,,127 = L63,,,R63
05 00 00 34 05 00 00 35#	0aaaaaaa 0bbbbbbb	M.Tap Delay: Time 7 0,,,1200ms
05 00 00 36 05 00 00 37#	0aaaaaaa 0bbbbbbb	M.Tap Delay: Level 7 0,,,100
05 00 00 38 05 00 00 39#	0aaaaaaa 0bbbbbbb	M.Tap Delay: Pan 7 1,,,127 = L63,,,R63
05 00 00 3A 05 00 00 3B#	0aaaaaaa 0bbbbbbb	M.Tap Delay: Time 8 0,,,1200ms
05 00 00 3C 05 00 00 3D#	0aaaaaaa 0bbbbbbb	M.Tap Delay: Level 8 0,,,100
05 00 00 3E 05 00 00 3F#	0aaaaaaa 0bbbbbbb	M.Tap Delay: Pan 8 1,,,127 = L63,,,R63
05 00 00 40 05 00 00 41#	0aaaaaaa 0bbbbbbb	M.Tap Delay: Time 9 0,,,1200ms
05 00 00 42 05 00 00 43#	0aaaaaaa 0bbbbbbb	M.Tap Delay: Level 9 0,,,100
05 00 00 44 05 00 00 45#	0aaaaaaa 0bbbbbbb	M.Tap Delay: Pan 9 1,,,127 = L63,,,R63
05 00 00 46 05 00 00 47#	0aaaaaaa 0bbbbbbb	M.Tap Delay: Time 10 0,,,1200ms
05 00 00 48 05 00 00 49#	0aaaaaaa 0bbbbbbb	M.Tap Delay: Level 10 0,,,100
05 00 00 4A 05 00 00 4B#	0aaaaaaa 0bbbbbbb	M.Tap Delay: Pan 10 1,,,127 = L63,,,R63
05 00 00 4C 05 00 00 4D#	0aaaaaaa 0bbbbbbb	M.Tap Delay: Feedback Delay Time 0,,,1200ms
05 00 00 4E 05 00 00 4F#	0aaaaaaa 0bbbbbbb	M.Tap Delay: Feedback Level –100,,,100
05 00 00 50 05 00 00 51#	0aaaaaaa 0bbbbbbb	M.Tap Delay: Effect Level –100,,,100
05 00 00 52 05 00 00 53#	0aaaaaaa 0bbbbbbb	M.Tap Delay: Direct Level –100,,,100
05 00 00 54 05 00 00 55#	0aaaaaaa 0bbbbbbb	EQ: Low EQ Type 0,1 = Shelving, Peaking
05 00 00 56 05 00 00 57#	0aaaaaaa 0bbbbbbb	EQ: Low EQ Gain –12,,,12dB
05 00 00 58 05 00 00 59#	0aaaaaaa 0bbbbbbb	EQ: Low EQ Frequency 2,,,200 = 20,,,2000Hz
05 00 00 5A 05 00 00 5B#	0aaaaaaa 0bbbbbbb	EQ: Low EQ Q 3,,,100 = 0.3,,,10.0
05 00 00 5C 05 00 00 5D#	0aaaaaaa 0bbbbbbb	EQ: Mid EQ Gain –12,,,12dB
05 00 00 5E 05 00 00 5F#	0aaaaaaa 0bbbbbbb	EQ: Mid EQ Frequency 20,,,800 = 200,,,8000Hz

05 00 00 60 05 00 00 61#	0aaaaaaa 0bbbbbbb	EQ: Mid EQ Q 3,,,100 = 0.3,,,10.0
05 00 00 62 05 00 00 63#	0aaaaaaa 0bbbbbbb	EQ: High EQ Type 0,1 = Shelving, Peaking
05 00 00 64 05 00 00 65#	0aaaaaaa 0bbbbbbb	EQ: High EQ Gain −12,,,12dB
05 00 00 66 05 00 00 67#	0aaaaaaa 0bbbbbbb	EQ: High EQ Frequency 14,,,200 = 1.4,,,20.0kHz
05 00 00 68 05 00 00 69#	0aaaaaaa 0bbbbbbb	EQ: High EQ Q 3,,,100 = 0.3,,,10.0
05 00 00 6A 05 00 00 6B#	0aaaaaaa 0bbbbbbb	EQ: Out Level 0,,,100
05 00 00 6C :	00 :	(Reserved)
05 00 7F 7F	00	

❍Algorithm 19 Stereo Multi

05 00 00 0E 05 00 00 0F#	0aaaaaaa 0bbbbbbb	Noise Suppressor SW 0,1 = Off,On
05 00 00 10 05 00 00 11#	0aaaaaaa 0bbbbbbb	Comp/Limit SW 0,1 = Off,On
05 00 00 12 05 00 00 13#	0aaaaaaa 0bbbbbbb	Enhancer SW 0,1 = Off,On
05 00 00 14 05 00 00 15#	0aaaaaaa 0bbbbbbb	EQ SW 0,1 = Off,On
05 00 00 16 05 00 00 17#	0aaaaaaa 0bbbbbbb	Noise Suppressor: Threshold 0,,,100
05 00 00 18 05 00 00 19#	0aaaaaaa 0bbbbbbb	Noise Suppressor: Release 0,,,100
05 00 00 1A 05 00 00 1B#	0aaaaaaa 0bbbbbbb	Comp/Limit: Level −60,,,12dB
05 00 00 1C 05 00 00 1D#	0aaaaaaa 0bbbbbbb	Comp/Limit: Thresh −60,,,0dB
05 00 00 1E 05 00 00 1F#	0aaaaaaa 0bbbbbbb	Comp/Limit: Attack 0,,,100
05 00 00 20 05 00 00 21#	0aaaaaaa 0bbbbbbb	Comp/Limit: Release 0,,,100
05 00 00 22 05 00 00 23#	0aaaaaaa 0bbbbbbb	Comp/Limit: Ratio 0,,,3 = 1.5:1,2:1,4:1,100:1
05 00 00 24 05 00 00 25#	0aaaaaaa 0bbbbbbb	Enhancer: Sens 0,,,100
05 00 00 26 05 00 00 27#	0aaaaaaa 0bbbbbbb	Enhancer: Frequency 10,,,100 = 1.0,,,10.0kHz
05 00 00 28 05 00 00 29#	0aaaaaaa 0bbbbbbb	Enhancer: MIX Level 0,,,100
05 00 00 2A 05 00 00 2B#	0aaaaaaa 0bbbbbbb	Enhancer: Level 0,,,100
05 00 00 2C 05 00 00 2D#	0aaaaaaa 0bbbbbbb	EQ: Low EQ Type 0,1 = Shelving, Peaking
05 00 00 2E 05 00 00 2F#	0aaaaaaa 0bbbbbbb	EQ: Low EQ Gain −12,,,12dB
05 00 00 30 05 00 00 31#	0aaaaaaa 0bbbbbbb	EQ: Low EQ Frequency 2,,,200 = 20,,,2000Hz
05 00 00 32 05 00 00 33#	0aaaaaaa 0bbbbbbb	EQ: Low EQ Q 3,,,100 = 0.3,,,10.0
05 00 00 34 05 00 00 35#	0aaaaaaa 0bbbbbbb	EQ: Mid EQ Gain −12,,,12dB
05 00 00 36 05 00 00 37#	0aaaaaaa 0bbbbbbb	EQ: Mid EQ Frequency 20,,,800 = 200,,,8000Hz
05 00 00 38 05 00 00 39#	0aaaaaaa 0bbbbbbb	EQ: Mid EQ Q 3,,,100 = 0.3,,,10.0
05 00 00 3A 05 00 00 3B#	0aaaaaaa 0bbbbbbb	EQ: High EQ Type 0,1 = Shelving, Peaking
05 00 00 3C 05 00 00 3D#	0aaaaaaa 0bbbbbbb	EQ: High EQ Gain −12,,,12dB
05 00 00 3E 05 00 00 3F#	0aaaaaaa 0bbbbbbb	EQ: High EQ Frequency 14,,,200 = 1.4,,,20.0kHz
05 00 00 40 05 00 00 41#	0aaaaaaa 0bbbbbbb	EQ: High EQ Q 3,,,100 = 0.3,,,10.0
05 00 00 42 05 00 00 43#	0aaaaaaa 0bbbbbbb	EQ: Out Level 0,,,100
05 00 00 44 :	00 :	(Reserved)
05 00 7F 7F	00	

❍Algorithm 20 Reverb 2

05 00 00 0E 05 00 00 0F#	0aaaaaaa 0bbbbbbb	Reverb SW 0,1 = Off,On
05 00 00 10 05 00 00 11#	0aaaaaaa 0bbbbbbb	EQ SW 0,1 = Off,On
05 00 00 12 05 00 00 13#	0aaaaaaa 0bbbbbbb	Reverb 2: Reverb Type 0,,,4 = Room1,Room2,Hall1,Hall2,Plate
05 00 00 14 05 00 00 15#	0aaaaaaa 0bbbbbbb	Reverb 2: Reverb Time 1,,,100 = 0.1,,,10.0sec
05 00 00 16 05 00 00 17#	0aaaaaaa 0bbbbbbb	Reverb 2: Pre Delay 0,,,200msec
05 00 00 18 05 00 00 19#	0aaaaaaa 0bbbbbbb	Reverb 2: Density 0,,,100
05 00 00 1A 05 00 00 1B#	0aaaaaaa 0bbbbbbb	Reverb 2: High Pass Filter 1,,,200 = Thru,20,,,2000Hz
05 00 00 1C 05 00 00 1D#	0aaaaaaa 0bbbbbbb	Reverb 2: Low Pass Filter 10,,,201 = 1.0,,,20,0kHz,Thru
05 00 00 1E 05 00 00 1F#	0aaaaaaa 0bbbbbbb	Reverb 2: Effect Level 0,,,100
05 00 00 20 05 00 00 21#	0aaaaaaa 0bbbbbbb	Reverb 2: Direct Level 0,,,100
05 00 00 22 05 00 00 23#	0aaaaaaa 0bbbbbbb	Reverb 2: Gate SW 0,1 = Off,On
05 00 00 24 05 00 00 25#	0aaaaaaa 0bbbbbbb	Reverb 2: Gate Mode 0,1 = Gate,Ducking
05 00 00 26 05 00 00 27#	0aaaaaaa 0bbbbbbb	Reverb 2: Gate Threshold 0,,,100
05 00 00 28 05 00 00 29#	0aaaaaaa 0bbbbbbb	Reverb 2: Gate Attack Time 1,,,100
05 00 00 2A 05 00 00 2B#	0aaaaaaa 0bbbbbbb	Reverb 2: Gate Release Time 1,,,100
05 00 00 2C 05 00 00 2D#	0aaaaaaa 0bbbbbbb	Reverb 2: Gate Hold Time 1,,,100
05 00 00 2E 05 00 00 2F#	0aaaaaaa 0bbbbbbb	EQ: Low EQ Type 0,1 = Shelving, Peaking
05 00 00 30 05 00 00 31#	0aaaaaaa 0bbbbbbb	EQ: Low EQ Gain −12,,,12dB
05 00 00 32 05 00 00 33#	0aaaaaaa 0bbbbbbb	EQ: Low EQ Frequency 2,,,200 = 20,,,2000Hz
05 00 00 34 05 00 00 35#	0aaaaaaa 0bbbbbbb	EQ: Low EQ Q 3,,,100 = 0.3,,,10.0
05 00 00 36 05 00 00 37#	0aaaaaaa 0bbbbbbb	EQ: Mid EQ Gain −12,,,12dB
05 00 00 38 05 00 00 39#	0aaaaaaa 0bbbbbbb	EQ: Mid EQ Frequency 20,,,800 = 200,,,8000Hz
05 00 00 3A 05 00 00 3B#	0aaaaaaa 0bbbbbbb	EQ: Mid EQ Q 3,,,100 = 0.3,,,10.0
05 00 00 3C 05 00 00 3D#	0aaaaaaa 0bbbbbbb	EQ: High EQ Type 0,1 = Shelving, Peaking
05 00 00 3E 05 00 00 3F#	0aaaaaaa 0bbbbbbb	EQ: High EQ Gain −12,,,12dB
05 00 00 40 05 00 00 41#	0aaaaaaa 0bbbbbbb	EQ: High EQ Frequency 14,,,200 = 1.4,,,20.0kHz
05 00 00 42 05 00 00 43#	0aaaaaaa 0bbbbbbb	EQ: High EQ Q 3,,,100 = 0.3,,,10.0
05 00 00 44 05 00 00 45#	0aaaaaaa 0bbbbbbb	EQ: Out Level 0,,,100
05 00 00 46 :	00 :	(Reserved)
05 00 7F 7F	00	

❍Algorithm 21 Space Chorus

05 00 00 0E 05 00 00 0F#	0aaaaaaa 0bbbbbbb	Chorus SW 0,1 = Off,On
05 00 00 10 05 00 00 11#	0aaaaaaa 0bbbbbbb	Chorus: Input Mode 0,1 = Mono,Stereo
05 00 00 12 05 00 00 13#	0aaaaaaa 0bbbbbbb	Chorus: Mode 0,,,6 = 1,2,3,4,1+4,2+4,3+4
05 00 00 14 05 00 00 15#	0aaaaaaa 0bbbbbbb	Chorus: Mix Balance 0,,,100
05 00 00 16 :	00 :	(Reserved)
05 00 7F 7F	00	

❍Algorithm 22 Lo-Fi Processor

05 00 00 0E 05 00 00 0F#	0aaaaaaa 0bbbbbbb	Lo−Fi Processor SW 0,1 = Off,On
05 00 00 10 05 00 00 11#	0aaaaaaa 0bbbbbbb	Realtime Modify Filter SW 0,1 = Off,On
05 00 00 12 05 00 00 13#	0aaaaaaa 0bbbbbbb	Lo−Fi Processor: Pre Filter SW 0,1 = Off,On
05 00 00 14 05 00 00 15#	0aaaaaaa 0bbbbbbb	Lo−Fi Processor: Rate 0,,,31 = 0ff,1/2,,,1/32
05 00 00 16 05 00 00 17#	0aaaaaaa 0bbbbbbb	Lo−Fi Processor: Number of Bit 0,,,15 = Off,15,,,1bit
05 00 00 18 05 00 00 19#	0aaaaaaa 0bbbbbbb	Lo−Fi Processor: Post Filter SW 0,1 = Off,On
05 00 00 1A 05 00 00 1B#	0aaaaaaa 0bbbbbbb	Lo−Fi Processor: Effect Level 0,,,100
05 00 00 1C 05 00 00 1D#	0aaaaaaa 0bbbbbbb	Lo−Fi Processor: Direct Level 0,,,100
05 00 00 1E 05 00 00 1F#	0aaaaaaa 0bbbbbbb	Realtime Modify Filter: Filter Type 0,,,2 = LPF,BPF,HPF
05 00 00 20 05 00 00 21#	0aaaaaaa 0bbbbbbb	Realtime Modify Filter: Cut Off 0,,,100
05 00 00 22 05 00 00 23#	0aaaaaaa 0bbbbbbb	Realtime Modify Filter: Resonance 0,,,100
05 00 00 24 05 00 00 25#	0aaaaaaa 0bbbbbbb	Realtime Modify Filter: Gain 0,,,24dB
05 00 00 26 05 00 00 27#	0aaaaaaa 0bbbbbbb	Noise Suppressor: Threshold 0,,,100
05 00 00 28 05 00 00 29#	0aaaaaaa 0bbbbbbb	Noise Suppressor: Release 0,,,100
05 00 00 2A :	00 :	(Reserved)
05 00 7F 7F	00	

❍Algorithm 23 4 Band Parametric EQ

05 00 00 0E 05 00 00 0F#	0aaaaaaa 0bbbbbbb	Parametric EQ Link SW 0,1 = Off,On
05 00 00 10 05 00 00 11#	0aaaaaaa 0bbbbbbb	Parametric EQ Ach SW 0,1 = Off,On
05 00 00 12 05 00 00 13#	0aaaaaaa 0bbbbbbb	Parametric EQ Bch SW 0,1 = Off,On
05 00 00 14 05 00 00 15#	0aaaaaaa 0bbbbbbb	EQ Ach: Input Gain −60,,,12dB
05 00 00 16 05 00 00 17#	0aaaaaaa 0bbbbbbb	EQ Ach: Low EQ Type 0,1 = Shelving, Peaking
05 00 00 18 05 00 00 19#	0aaaaaaa 0bbbbbbb	EQ Ach: Low EQ Gain −12,,,12dB
05 00 00 1A 05 00 00 1B#	0aaaaaaa 0bbbbbbb	EQ Ach: Low EQ Frequency 2,,,200 = 20,,,2000Hz
05 00 00 1C 05 00 00 1D#	0aaaaaaa 0bbbbbbb	EQ Ach: Low EQ Q 3,,,100 = 0.3,,,10.0
05 00 00 1E 05 00 00 1F#	0aaaaaaa 0bbbbbbb	EQ Ach: Low Mid EQ Gain −12,,,12dB
05 00 00 20 05 00 00 21#	0aaaaaaa 0bbbbbbb	EQ Ach: Low Mid EQ Frequency 20,,,800 = 200,,,8000Hz
05 00 00 22 05 00 00 23#	0aaaaaaa 0bbbbbbb	EQ Ach: Low Mid EQ Q 3,,,100 = 0.3,,,10.0
05 00 00 24 05 00 00 25#	0aaaaaaa 0bbbbbbb	EQ Ach: High Mid EQ Gain −12,,,12dB
05 00 00 26 05 00 00 27#	0aaaaaaa 0bbbbbbb	EQ Ach: High Mid EQ Frequency 20,,,800 = 200,,,8000Hz
05 00 00 28 05 00 00 29#	0aaaaaaa 0bbbbbbb	EQ Ach: High Mid EQ Q 3,,,100 = 0.3,,,10.0
05 00 00 2A 05 00 00 2B#	0aaaaaaa 0bbbbbbb	EQ Ach: High EQ Type 0,1 = Shelving, Peaking
05 00 00 2C 05 00 00 2D#	0aaaaaaa 0bbbbbbb	EQ Ach: High EQ Gain −12,,,12dB
05 00 00 2E 05 00 00 2F#	0aaaaaaa 0bbbbbbb	EQ Ach: High EQ Frequency 14,,,200 = 1.4,,,20.0kHz
05 00 00 30 05 00 00 31#	0aaaaaaa 0bbbbbbb	EQ Ach: High EQ Q 3,,,100 = 0.3,,,10.0
05 00 00 32 05 00 00 33#	0aaaaaaa 0bbbbbbb	EQ Ach: Output Level −60,,,12dB
05 00 00 34 05 00 00 35#	0aaaaaaa 0bbbbbbb	EQ Bch: Input Gain −60,,,12dB
05 00 00 36 05 00 00 37#	0aaaaaaa 0bbbbbbb	EQ Bch: Low EQ Type 0,1 = Shelving, Peaking

05 00 00 38 05 00 00 39#	0aaaaaaa 0bbbbbbb	EQ Bch: Low EQ Gain	−12,,,12dB
05 00 00 3A 05 00 00 3B#	0aaaaaaa 0bbbbbbb	EQ Bch: Low EQ Frequency	2,,,200 = 20,,,2000Hz
05 00 00 3C 05 00 00 3D#	0aaaaaaa 0bbbbbbb	EQ Bch: Low EQ Q	3,,,100 = 0.3,,,10.0
05 00 00 3E 05 00 00 3F#	0aaaaaaa 0bbbbbbb	EQ Bch: Low Mid EQ Gain	−12,,,12dB
05 00 00 40 05 00 00 41#	0aaaaaaa 0bbbbbbb	EQ Bch: Low Mid EQ Frequency	20,,,800 = 200,,,8000Hz
05 00 00 42 05 00 00 43#	0aaaaaaa 0bbbbbbb	EQ Bch: Low Mid EQ Q	3,,,100 = 0.3,,,10.0
05 00 00 44 05 00 00 45#	0aaaaaaa 0bbbbbbb	EQ Bch: High Mid EQ Gain	−12,,,12dB
05 00 00 46 05 00 00 47#	0aaaaaaa 0bbbbbbb	EQ Bch: High Mid EQ Frequency	20,,,800 = 200,,,8000Hz
05 00 00 48 05 00 00 49#	0aaaaaaa 0bbbbbbb	EQ Bch: High Mid EQ Q	3,,,100 = 0.3,,,10.0
05 00 00 4A 05 00 00 4B#	0aaaaaaa 0bbbbbbb	EQ Bch: High EQ Type	0,1 = Shelving, Peaking
05 00 00 4C 05 00 00 4D#	0aaaaaaa 0bbbbbbb	EQ Bch: High EQ Gain	−12,,,12dB
05 00 00 4E 05 00 00 4F#	0aaaaaaa 0bbbbbbb	EQ Bch: High EQ Frequency	14,,,200 = 1.4,,,20.0kHz
05 00 00 50 05 00 00 51#	0aaaaaaa 0bbbbbbb	EQ Bch: High EQ Q	3,,,100 = 0.3,,,10.0
05 00 00 52 05 00 00 53#	0aaaaaaa 0bbbbbbb	EQ Bch: Output Level	−60,,,12dB
05 00 00 54 :	00 :	(Reserved)	
05 00 7F 7F	00		

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

❍Algorithm 24 10 Band Graphic EQ

05 00 00 0E 05 00 00 0F#	0aaaaaaa 0bbbbbbb	Graphic EQ Link SW	0,1 = Off,On
05 00 00 10 05 00 00 11#	0aaaaaaa 0bbbbbbb	Graphic EQ Ach SW	0,1 = Off,On
05 00 00 12 05 00 00 13#	0aaaaaaa 0bbbbbbb	Graphic EQ Bch SW	0,1 = Off,On
05 00 00 14 05 00 00 15#	0aaaaaaa 0bbbbbbb	EQ Ach: Input Gain	−60,,,12dB
05 00 00 16 05 00 00 17#	0aaaaaaa 0bbbbbbb	EQ Ach: 31.25Hz Gain	−12,,,12dB
05 00 00 18 05 00 00 19#	0aaaaaaa 0bbbbbbb	EQ Ach: 62.5Hz Gain	−12,,,12dB
05 00 00 1A 05 00 00 1B#	0aaaaaaa 0bbbbbbb	EQ Ach: 125Hz Gain	−12,,,12dB
05 00 00 1C 05 00 00 1D#	0aaaaaaa 0bbbbbbb	EQ Ach: 250Hz Gain	−12,,,12dB
05 00 00 1E 05 00 00 1F#	0aaaaaaa 0bbbbbbb	EQ Ach: 500Hz Gain	−12,,,12dB
05 00 00 20 05 00 00 21#	0aaaaaaa 0bbbbbbb	EQ Ach: 1.0kHz Gain	−12,,,12dB
05 00 00 22 05 00 00 23#	0aaaaaaa 0bbbbbbb	EQ Ach: 2.0kHz Gain	−12,,,12dB
05 00 00 24 05 00 00 25#	0aaaaaaa 0bbbbbbb	EQ Ach: 4.0kHz Gain	−12,,,12dB
05 00 00 26 05 00 00 27#	0aaaaaaa 0bbbbbbb	EQ Ach: 8.0kHz Gain	−12,,,12dB
05 00 00 28 05 00 00 29#	0aaaaaaa 0bbbbbbb	EQ Ach: 16.0kHz Gain	−12,,,12dB
05 00 00 2A 05 00 00 2B#	0aaaaaaa 0bbbbbbb	EQ Ach: Output Level	−60,,,12dB
05 00 00 2C 05 00 00 2D#	0aaaaaaa 0bbbbbbb	EQ Bch: Input Gain	−60,,,12dB
05 00 00 2E 05 00 00 2F#	0aaaaaaa 0bbbbbbb	EQ Bch: 31.25Hz Gain	−12,,,12dB
05 00 00 30 05 00 00 31#	0aaaaaaa 0bbbbbbb	EQ Bch: 62.5Hz Gain	−12,,,12dB
05 00 00 32 05 00 00 33#	0aaaaaaa 0bbbbbbb	EQ Bch: 125Hz Gain	−12,,,12dB
05 00 00 34 05 00 00 35#	0aaaaaaa 0bbbbbbb	EQ Bch: 250Hz Gain	−12,,,12dB
05 00 00 36 05 00 00 37#	0aaaaaaa 0bbbbbbb	EQ Bch: 500Hz Gain	−12,,,12dB
05 00 00 38 05 00 00 39#	0aaaaaaa 0bbbbbbb	EQ Bch: 1.0kHz Gain	−12,,,12dB
05 00 00 3A 05 00 00 3B#	0aaaaaaa 0bbbbbbb	EQ Bch: 2.0kHz Gain	−12,,,12dB
05 00 00 3C 05 00 00 3D#	0aaaaaaa 0bbbbbbb	EQ Bch: 4.0kHz Gain	−12,,,12dB
05 00 00 3E 05 00 00 3F#	0aaaaaaa 0bbbbbbb	EQ Bch: 8.0kHz Gain	−12,,,12dB
05 00 00 40 05 00 00 41#	0aaaaaaa 0bbbbbbb	EQ Bch: 16.0kHz Gain	−12,,,12dB
05 00 00 42 05 00 00 43#	0aaaaaaa 0bbbbbbb	EQ Bch: Output Level	−60,,,12dB
05 00 00 44 :	00 :	(Reserved)	
05 00 7F 7F	00		

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

❍Algorithm 25 Hum Canceler

05 00 00 0E 05 00 00 0F#	0aaaaaaa 0bbbbbbb	Hum Canceler SW	0,1 = Off,On
05 00 00 10 05 00 00 11#	0aaaaaaa 0bbbbbbb	Noise Suppressor SW	0,1 = Off,On
05 00 00 12 05 00 00 13#	0aaaaaaa 0bbbbbbb	Hum Canceler: Freq	200,,,8000 = 20.0,,,800.0Hz
05 00 00 14 05 00 00 15#	0aaaaaaa 0bbbbbbb	Hum Canceler: Width	10,,,40%
05 00 00 16 05 00 00 17#	0aaaaaaa 0bbbbbbb	Hum Canceler: Depth	0,,,100
05 00 00 18 05 00 00 19#	0aaaaaaa 0bbbbbbb	Hum Canceler: Threshold	0,,,100
05 00 00 1A 05 00 00 1B#	0aaaaaaa 0bbbbbbb	Hum Canceler: Range Low	1,,,200 = Unlimit,20,,,2000Hz
05 00 00 1C 05 00 00 1D#	0aaaaaaa 0bbbbbbb	Hum Canceler: Range High	10,,,201 = 1.0,,,20,0kHz,Unlimit
05 00 00 1E 05 00 00 1F#	0aaaaaaa 0bbbbbbb	Noise Suppressor: Threshold	0,,,100
05 00 00 20 05 00 00 21#	0aaaaaaa 0bbbbbbb	Noise Suppressor: Release	0,,,100
05 00 00 22 :	00 :	(Reserved)	
05 00 7F 7F	00		

❍Algorithm 26 Vocal Canceler

05 00 00 0E 05 00 00 0F#	0aaaaaaa 0bbbbbbb	Vocal Canceler SW	0,1 = Off,On
05 00 00 10 05 00 00 11#	0aaaaaaa 0bbbbbbb	EQ SW	0,1 = Off,On
05 00 00 12 05 00 00 13#	0aaaaaaa 0bbbbbbb	Vocal Canceler: Balance	0,,,100
05 00 00 14 05 00 00 15#	0aaaaaaa 0bbbbbbb	Vocal Canceler: Range Low	1,,,200 = Unlimit,20,,,2000Hz
05 00 00 16 05 00 00 17#	0aaaaaaa 0bbbbbbb	Vocal Canceler: Range High	10,,,201 = 1.0,,,20,0kHz,Unlimit
05 00 00 18 05 00 00 19#	0aaaaaaa 0bbbbbbb	EQ: Low EQ Type	0,1 = Shelving, Peaking
05 00 00 1A 05 00 00 1B#	0aaaaaaa 0bbbbbbb	EQ: Low EQ Gain	−12,,,12dB
05 00 00 1C 05 00 00 1D#	0aaaaaaa 0bbbbbbb	EQ: Low EQ Frequency	2,,,200 = 20,,,2000Hz
05 00 00 1E 05 00 00 1F#	0aaaaaaa 0bbbbbbb	EQ: Low EQ Q	3,,,100 = 0.3,,,10.0
05 00 00 20 05 00 00 21#	0aaaaaaa 0bbbbbbb	EQ: Mid EQ Gain	−12,,,12dB
05 00 00 22 05 00 00 23#	0aaaaaaa 0bbbbbbb	EQ: Mid EQ Frequency	20,,,800 = 200,,,8000Hz
05 00 00 24 05 00 00 25#	0aaaaaaa 0bbbbbbb	EQ: Mid EQ Q	3,,,100 = 0.3,,,10.0
05 00 00 26 05 00 00 27#	0aaaaaaa 0bbbbbbb	EQ: High EQ Type	0,1 = Shelving, Peaking
05 00 00 28 05 00 00 29#	0aaaaaaa 0bbbbbbb	EQ: High EQ Gain	−12,,,12dB
05 00 00 2A 05 00 00 2B#	0aaaaaaa 0bbbbbbb	EQ: High EQ Frequency	14,,,200 = 1.4,,,20.0kHz
05 00 00 2C 05 00 00 2D#	0aaaaaaa 0bbbbbbb	EQ: High EQ Q	3,,,100 = 0.3,,,10.0
05 00 00 2E 05 00 00 2F#	0aaaaaaa 0bbbbbbb	EQ: Out Level	0,,,100
05 00 00 30 :	00 :	(Reserved)	
05 00 7F 7F	00		

❍Algorithm 27 Voice Transformer (FX1,FX3,FX5,FX7)

05 00 00 0E 05 00 00 0F#	0aaaaaaa 0bbbbbbb	Voice Transformer SW	0,1 = Off,On
05 00 00 10 05 00 00 11#	0aaaaaaa 0bbbbbbb	Reverb SW	0,1 = Off,On
05 00 00 12	00	(Reserved)	
05 00 00 13	00	(Reserved)	
05 00 00 14 05 00 00 15#	0aaaaaaa 0bbbbbbb	MIDI Control SW	0,1 = Off,On
05 00 00 16 05 00 00 17#	0aaaaaaa 0bbbbbbb	Voice Transformer: Robot SW	0,1 = Off,On
05 00 00 18 05 00 00 19#	0aaaaaaa 0bbbbbbb	Voice Transformer: Chromatic Pitch	−12,,,36
05 00 00 1A 05 00 00 1B#	0aaaaaaa 0bbbbbbb	Voice Transformer: Fine Pitch	−100,,,100
05 00 00 1C 05 00 00 1D#	0aaaaaaa 0bbbbbbb	Voice Transformer: Chromatic Formant	−12,,,12
05 00 00 1E 05 00 00 1F#	0aaaaaaa 0bbbbbbb	Voice Transformer: Fine Formant	−100,,,100
05 00 00 20 05 00 00 21#	0aaaaaaa 0bbbbbbb	Voice Transformer: Mix Balance	0,,,100
05 00 00 22 05 00 00 23#	0aaaaaaa 0bbbbbbb	Reverb: Reverb Time	1,,,100 = 0.1,,,10.0sec
05 00 00 24 05 00 00 25#	0aaaaaaa 0bbbbbbb	Reverb: Pre Delay	0,,,200msec
05 00 00 26 05 00 00 27#	0aaaaaaa 0bbbbbbb	Reverb: Density	0,,,100
05 00 00 28 05 00 00 29#	0aaaaaaa 0bbbbbbb	Reverb: Effect Level	0,,,100
05 00 00 2A 05 00 00 2B#	0aaaaaaa 0bbbbbbb	MIDI Control: Bend Range	0,,,12 = 0ff,1,,,12
05 00 00 2C 05 00 00 2D#	0aaaaaaa 0bbbbbbb	MIDI Control: Portamento	0...100 = Off,1,,,100
05 00 00 2E :	00 :	(Reserved)	
05 00 7F 7F	00		

❍Algorithm 28 Vocoder 2 (FX1,FX3,FX5,FX7)

05 00 00 0E 05 00 00 0F#	0aaaaaaa 0bbbbbbb	Chorus SW	0,1 = Off,On
05 00 00 10 05 00 00 11#	0aaaaaaa 0bbbbbbb	Vocoder: Envelope Mode	0,,,2 = Sharp,Soft,Long
05 00 00 12 05 00 00 13#	0aaaaaaa 0bbbbbbb	Vocoder: Pan Mode	0,,,3 = Mono,Stereo,L−>R,R−>L
05 00 00 14 05 00 00 15#	0aaaaaaa 0bbbbbbb	Vocoder: Hold	0,1 = Off,MIDI
05 00 00 16 05 00 00 17#	0aaaaaaa 0bbbbbbb	Vocoder: Mic Sens	0,,,100
05 00 00 18 05 00 00 19#	0aaaaaaa 0bbbbbbb	Vocoder: Synth Input Level	0,,,100
05 00 00 1A 05 00 00 1B#	0aaaaaaa 0bbbbbbb	Vocoder: Voice Char Level 1	0,,,100
05 00 00 1C 05 00 00 1D#	0aaaaaaa 0bbbbbbb	Vocoder: Voice Char Level 2	0,,,100
05 00 00 1E 05 00 00 1F#	0aaaaaaa 0bbbbbbb	Vocoder: Voice Char Level 3	0,,,100
05 00 00 20 05 00 00 21#	0aaaaaaa 0bbbbbbb	Vocoder: Voice Char Level 4	0,,,100
05 00 00 22 05 00 00 23#	0aaaaaaa 0bbbbbbb	Vocoder: Voice Char Level 5	0,,,100
05 00 00 24 05 00 00 25#	0aaaaaaa 0bbbbbbb	Vocoder: Voice Char Level 6	0,,,100
05 00 00 26 05 00 00 27#	0aaaaaaa 0bbbbbbb	Vocoder: Voice Char Level 7	0,,,100
05 00 00 28 05 00 00 29#	0aaaaaaa 0bbbbbbb	Vocoder: Voice Char Level 8	0,,,100

05 00 00 2A 05 00 00 2B#	0aaaaaaa 0bbbbbbb	Vocoder: Voice Char Level 9	0,,,100
05 00 00 2C 05 00 00 2D#	0aaaaaaa 0bbbbbbb	Vocoder: Voice Char Level 10	0,,,100
05 00 00 2E 05 00 00 2F#	0aaaaaaa 0bbbbbbb	Vocoder: Voice Char Level 11	0,,,100
05 00 00 30 05 00 00 31#	0aaaaaaa 0bbbbbbb	Vocoder: Voice Char Level 12	0,,,100
05 00 00 32 05 00 00 33#	0aaaaaaa 0bbbbbbb	Vocoder: Voice Char Level 13	0,,,100
05 00 00 34 05 00 00 35#	0aaaaaaa 0bbbbbbb	Vocoder: Voice Char Level 14	0,,,100
05 00 00 36 05 00 00 37#	0aaaaaaa 0bbbbbbb	Vocoder: Voice Char Level 15	0,,,100
05 00 00 38 05 00 00 39#	0aaaaaaa 0bbbbbbb	Vocoder: Voice Char Level 16	0,,,100
05 00 00 3A 05 00 00 3B#	0aaaaaaa 0bbbbbbb	Vocoder: Voice Char Level 17	0,,,100
05 00 00 3C 05 00 00 3D#	0aaaaaaa 0bbbbbbb	Vocoder: Voice Char Level 18	0,,,100
05 00 00 3E 05 00 00 3F#	0aaaaaaa 0bbbbbbb	Vocoder: Voice Char Level 19	0,,,100
05 00 00 40 05 00 00 41#	0aaaaaaa 0bbbbbbb	Vocoder: Mic High Pass Filter	9,,,200 = Thru,1.0,,,20.0kHz
05 00 00 42 05 00 00 43#	0aaaaaaa 0bbbbbbb	Vocoder: Mic High Pass Filter Pan	1,,,127 = L63,,,R63
05 00 00 44 05 00 00 45#	0aaaaaaa 0bbbbbbb	Vocoder: Mic Mix	0,,,100
05 00 00 46 05 00 00 47#	0aaaaaaa 0bbbbbbb	Vocoder: Noise Suppressor Threshold	0,,,100
05 00 00 48 05 00 00 49#	0aaaaaaa 0bbbbbbb	Chorus: Rate	1,,,100 = 0.1,,,10.0Hz
05 00 00 4A 05 00 00 4B#	0aaaaaaa 0bbbbbbb	Chorus: Depth	0,,,100
05 00 00 4C 05 00 00 4D#	0aaaaaaa 0bbbbbbb	Chorus: Pre Delay	0,,,50ms
05 00 00 4E 05 00 00 4F#	0aaaaaaa 0bbbbbbb	Chorus: Mix Balance	0,,,100
05 00 00 50 :	00 :	(Reserved)	
05 00 7F 7F	00		

❍Algorithm 29 Mic Modeling

05 00 00 0E 05 00 00 0F#	0aaaaaaa 0bbbbbbb	Link SW	0,1 = Off,On
05 00 00 10 05 00 00 11#	0aaaaaaa 0bbbbbbb	Mic Converter Ach SW	0,1 = Off,On
05 00 00 12 05 00 00 13#	0aaaaaaa 0bbbbbbb	Bass Cut Ach SW	0,1 = Off,On
05 00 00 14 05 00 00 15#	0aaaaaaa 0bbbbbbb	Distance Ach SW	0,1 = Off,On
05 00 00 16 05 00 00 17#	0aaaaaaa 0bbbbbbb	Limiter Ach SW	0,1 = Off,On
05 00 00 18 05 00 00 19#	0aaaaaaa 0bbbbbbb	Mic Converter Bch SW	0,1 = Off,On
05 00 00 1A 05 00 00 1B#	0aaaaaaa 0bbbbbbb	Bass Cut Bch SW	0,1 = Off,On
05 00 00 1C 05 00 00 1D#	0aaaaaaa 0bbbbbbb	Distance Bch SW	0,1 = Off,On
05 00 00 1E 05 00 00 1F#	0aaaaaaa 0bbbbbbb	Limiter Bch SW	0,1 = Off,On
05 00 00 20 05 00 00 21#	0aaaaaaa 0bbbbbbb	Mic Converter Ach: Input	0,,,5 = DR-20,SmlDy,HedDy,MinCn,Flat,C300B
05 00 00 22 05 00 00 23#	0aaaaaaa 0bbbbbbb	Mic Converter Ach: Output	0,,,6 = SmlDy,VocDy,LrgDy,SmlCn,LrgCn,VntCn,Flat
05 00 00 24 05 00 00 25#	0aaaaaaa 0bbbbbbb	Mic Converter Ach: Phase	0,1 = Normal,Inverse
05 00 00 26 05 00 00 27#	0aaaaaaa 0bbbbbbb	Bass Cut Ach: Bass Cut Frequency	1,,,200 = Thru,20,,,2000Hz
05 00 00 28 05 00 00 29#	0aaaaaaa 0bbbbbbb	Distance Ach: Proximity Effect	−12,,,+12
05 00 00 2A 05 00 00 2B#	0aaaaaaa 0bbbbbbb	Distance Ach: Timelag	0,,,1000 = 0,,,3000cm
05 00 00 2C 05 00 00 2D#	0aaaaaaa 0bbbbbbb	Limiter Ach: Detect HPF Frequency	1,,,200 = Thru,20,,,2000Hz
05 00 00 2E 05 00 00 2F#	0aaaaaaa 0bbbbbbb	Limiter Ach: Level	−60,,,24dB
05 00 00 30 05 00 00 31#	0aaaaaaa 0bbbbbbb	Limiter Ach: Threshold	−60,,,0dB
05 00 00 32 05 00 00 33#	0aaaaaaa 0bbbbbbb	Limiter Ach: Attack	0,,,100
05 00 00 34 05 00 00 35#	0aaaaaaa 0bbbbbbb	Limiter Ach: Release	0,,,100
05 00 00 36 05 00 00 37#	0aaaaaaa 0bbbbbbb	Mic Converter Bch: Input	0,,,5 = DR-20,SmlDy,HedDy,MinCn,Flat,C300B
05 00 00 38 05 00 00 39#	0aaaaaaa 0bbbbbbb	Mic Converter Bch: Output	0,,,6 = SmlDy,VocDy,LrgDy,SmlCn,LrgCn,VntCn,Flat
05 00 00 3A 05 00 00 3B#	0aaaaaaa 0bbbbbbb	Mic Converter Bch: Phase	0,1 = Normal,Inverse
05 00 00 3C 05 00 00 3D#	0aaaaaaa 0bbbbbbb	Bass Cut Bch: Bass Cut Frequency	1,,,200 = Thru,20,,,2000Hz
05 00 00 3E 05 00 00 3F#	0aaaaaaa 0bbbbbbb	Distance Bch: Proximity Effect	−12,,,+12
05 00 00 40 05 00 00 41#	0aaaaaaa 0bbbbbbb	Distance Bch: Timelag	0,,,1000 = 0,,,3000cm
05 00 00 42 05 00 00 43#	0aaaaaaa 0bbbbbbb	Limiter Bch: Detect HPF Frequency	1,,,200 = Thru,20,,,2000Hz
05 00 00 44 05 00 00 45#	0aaaaaaa 0bbbbbbb	Limiter Bch: Level	−60,,,24dB
05 00 00 46 05 00 00 47#	0aaaaaaa 0bbbbbbb	Limiter Bch: Threshold	−60,,,0dB
05 00 00 48 05 00 00 49#	0aaaaaaa 0bbbbbbb	Limiter Bch: Attack	0,,,100
05 00 00 4A 05 00 00 4B#	0aaaaaaa 0bbbbbbb	Limiter Bch: Release	0,,,100
05 00 00 4C :	00 :	(Reserved)	
05 00 7F 7F	00		

* 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

05 00 00 0E 05 00 00 0F#	0aaaaaaa 0bbbbbbb	Isolator SW	0,1 = Off,On
05 00 00 10 05 00 00 11#	0aaaaaaa 0bbbbbbb	Isolator High Volume	−60,,,+4dB
05 00 00 12 05 00 00 13#	0aaaaaaa 0bbbbbbb	Isolator Middle Volume	−60,,,+4dB
05 00 00 14 05 00 00 15#	0aaaaaaa 0bbbbbbb	Isolator Low Volume	−60,,,+4dB
05 00 00 16 05 00 00 17#	0aaaaaaa 0bbbbbbb	Isolator Anti Phase Middle Switch	0,1 = Off,On
05 00 00 18 05 00 00 19#	0aaaaaaa 0bbbbbbb	Isolator Anti Phase Middle Level	0,,,100
05 00 00 1A 05 00 00 1B#	0aaaaaaa 0bbbbbbb	Isolator Anti Phase Low Switch	0,1 = Off,On
05 00 00 1C 05 00 00 1D#	0aaaaaaa 0bbbbbbb	Isolator Anti Phase Low Level	0,,,100
05 00 00 1E :	00 :	(Reserved)	
05 00 7F 7F	00		

❍Algorithm 31 Tape Echo 201

05 00 00 0E 05 00 00 0F#	0aaaaaaa 0bbbbbbb	Tape Echo SW	0,1 = Off,On
05 00 00 10 05 00 00 11#	0aaaaaaa 0bbbbbbb	Tape Echo Mode Select	0,,,6 = 1,,,7
05 00 00 12 05 00 00 13#	0aaaaaaa 0bbbbbbb	Tape Echo Repeat Rate	0,,,100
05 00 00 14 05 00 00 15#	0aaaaaaa 0bbbbbbb	Tape Echo Intensity	0,,,100
05 00 00 16 05 00 00 17#	0aaaaaaa 0bbbbbbb	Tape Echo Effect Level	0,,,100
05 00 00 18 05 00 00 19#	0aaaaaaa 0bbbbbbb	Tape Echo Direct Level	0,,,100
05 00 00 1A 05 00 00 1B#	0aaaaaaa 0bbbbbbb	Tape Echo Tone Bass	−100,,,100
05 00 00 1C 05 00 00 1D#	0aaaaaaa 0bbbbbbb	Tape Echo Tone Treble	−100,,,100
05 00 00 1E 05 00 00 1F#	0aaaaaaa 0bbbbbbb	Tape Echo Tape Head S Pan	1,,,127 = L63,,,R63
05 00 00 20 05 00 00 21#	0aaaaaaa 0bbbbbbb	Tape Echo Tape Head M Pan	1,,,127 = L63,,,R63
05 00 00 22 05 00 00 23#	0aaaaaaa 0bbbbbbb	Tape Echo Tape Head L Pan	1,,,127 = L63,,,R63
05 00 00 24 05 00 00 25#	0aaaaaaa 0bbbbbbb	Tape Echo Tape Distortion	0,,,100
05 00 00 26 05 00 00 27#	0aaaaaaa 0bbbbbbb	Tape Echo Wah Flutter Rate	0,,,100
05 00 00 28 05 00 00 29#	0aaaaaaa 0bbbbbbb	Tape Echo Wah Flutter Depth	0,,,100
05 00 00 2A :	00 :	(Reserved)	
05 00 7F 7F	00		

❍Algorithm 32 Analog Flanger

05 00 00 0E 05 00 00 0F#	0aaaaaaa 0bbbbbbb	Analog Flanger SW	0,1 = Off,On
05 00 00 10 05 00 00 11#	0aaaaaaa 0bbbbbbb	Analog Flanger Mode	0,,,3 = FL1,FL2,FL3,CHO
05 00 00 12 05 00 00 13#	0aaaaaaa 0bbbbbbb	Analog Flanger Feedback	0,,,100
05 00 00 14 05 00 00 15#	0aaaaaaa 0bbbbbbb	Analog Flanger Modulation Rate	0,,,100
05 00 00 16 05 00 00 17#	0aaaaaaa 0bbbbbbb	Analog Flanger Modulation Depth	0,,,100
05 00 00 18 05 00 00 19#	0aaaaaaa 0bbbbbbb	Analog Flanger Modulation Frequency	0,,,100
05 00 00 1A 05 00 00 1B#	0aaaaaaa 0bbbbbbb	Analog Flanger Channel B Modulation	0,1 = Nor,Inv
05 00 00 1C 05 00 00 1D#	0aaaaaaa 0bbbbbbb	Analog Flanger Channel A Phase	0,1 = Nor,Inv
05 00 00 1E 05 00 00 1F#	0aaaaaaa 0bbbbbbb	Analog Flanger Channel B Phase	0,1 = Nor,Inv
05 00 00 20 :	00 :	(Reserved)	
05 00 7F 7F	00		

❍Algorithm 33 Analog Phaser

05 00 00 0E 05 00 00 0F#	0aaaaaaa 0bbbbbbb	Analog Phaser SW	0,1 = Off,On
05 00 00 10 05 00 00 11#	0aaaaaaa 0bbbbbbb	Analog Phaser Mode	0,1 = 4STAGE,8STAGE
05 00 00 12 05 00 00 13#	0aaaaaaa 0bbbbbbb	Analog Phaser Frequency	0,,,100
05 00 00 14 05 00 00 15#	0aaaaaaa 0bbbbbbb	Analog Phaser Resonance	0,,,100
05 00 00 16 05 00 00 17#	0aaaaaaa 0bbbbbbb	Analog Phaser LFO 1 Rate	0,,,100
05 00 00 18 05 00 00 19#	0aaaaaaa 0bbbbbbb	Analog Phaser LFO 1 Depth	0,,,100
05 00 00 1A 05 00 00 1B#	0aaaaaaa 0bbbbbbb	Analog Phaser LFO 1 Channel B Mod	0,1 = Nor,Inv
05 00 00 1C 05 00 00 1D#	0aaaaaaa 0bbbbbbb	Analog Phaser LFO 2 Rate	0,,,100
05 00 00 1E 05 00 00 1F#	0aaaaaaa 0bbbbbbb	Analog Phaser LFO 2 Depth	0,,,100
05 00 00 20 05 00 00 21#	0aaaaaaa 0bbbbbbb	Analog Phaser LFO 2 Channel B Mod	0,1 = Nor,Inv
05 00 00 22 :	00 :	(Reserved)	
05 00 7F 7F	00		

❍Algorithm 34 Speaker Modeling

05 00 00 0E 05 00 00 0F#	0aaaaaaa 0bbbbbbb	Speaker Modeling SW	0,1 = Off,On
05 00 00 10 05 00 00 11#	0aaaaaaa 0bbbbbbb	Bass Cut SW	0,1 = Off,On
05 00 00 12 05 00 00 13#	0aaaaaaa 0bbbbbbb	Low Frequency Trimmer SW	0,1 = Off,On
05 00 00 14 05 00 00 15#	0aaaaaaa 0bbbbbbb	High Frequency Trimmer SW	0,1 = Off,On

05 00 00 16 05 00 00 17#	0aaaaaaa 0bbbbbbb	Limiter SW 0,1 = Off,On
05 00 00 18 05 00 00 19#	0aaaaaaa 0bbbbbbb	Output Speakers 0,1 = DS–90/DS–90A,DS–50A
05 00 00 1A 05 00 00 1B#	0aaaaaaa 0bbbbbbb	Speaker Modeling Model 0,,,11 = THRU,Super Flat,Powered GenBlk, Powered E–Bas,Powered Mack,Small Cube,White Cone, White C +tissue,Small Radio,Small TV,Boom Box, BoomBox LoBoost
05 00 00 1C 05 00 00 1D#	0aaaaaaa 0bbbbbbb	Speaker Modeling Phase 0,1 = NRM,INV
05 00 00 1E 05 00 00 1F#	0aaaaaaa 0bbbbbbb	Bass Cut Frequency 1,,,200 = Thru,20,,,2000Hz
05 00 00 20 05 00 00 21#	0aaaaaaa 0bbbbbbb	Low Frequency Trimmer Gain –12,,,12dB
05 00 00 22 05 00 00 23#	0aaaaaaa 0bbbbbbb	Low Frequency Trimmer Frequency 2,,,200 = 20,,,2000Hz
05 00 00 24 05 00 00 25#	0aaaaaaa 0bbbbbbb	High Frequency Trimmer Gain –12,,,12dB
05 00 00 26 05 00 00 27#	0aaaaaaa 0bbbbbbb	High Frequency Trimmer Frequency 10,,,200 = 1.0,,,20.0kHz
05 00 00 28 05 00 00 29#	0aaaaaaa 0bbbbbbb	Limiter Threshold –60,,,0dB
05 00 00 2A 05 00 00 2B#	0aaaaaaa 0bbbbbbb	Limiter Release 0,,,100
05 00 00 2C 05 00 00 2D#	0aaaaaaa 0bbbbbbb	Limiter Level –60,,,24dB
05 00 00 2E :	00 :	(Reserved)
05 00 7F 7F	00	

○Algorithm 35 Mastering Tool Kit (FX1,FX3,FX5,FX7)

05 00 00 0E 05 00 00 0F#	0aaaaaaa 0bbbbbbb	EQ SW 0,1 = Off,On
05 00 00 10 05 00 00 11#	0aaaaaaa 0bbbbbbb	Bass Cut SW 0,1 = Off,On
05 00 00 12 05 00 00 13#	0aaaaaaa 0bbbbbbb	Enhancer SW 0,1 = Off,On
05 00 00 14 05 00 00 15#	0aaaaaaa 0bbbbbbb	Expander SW 0,1 = Off,On
05 00 00 16 05 00 00 17#	0aaaaaaa 0bbbbbbb	Compressor SW 0,1 = Off,On
05 00 00 18 05 00 00 19#	0aaaaaaa 0bbbbbbb	Limiter SW 0,1 = Off,On
05 00 00 1A 05 00 00 1B#	0aaaaaaa 0bbbbbbb	EQ: Input Gain –24,,,12dB
05 00 00 1C 05 00 00 1D#	0aaaaaaa 0bbbbbbb	EQ: Low EQ Type 0,1 = Shelving, Peaking
05 00 00 1E 05 00 00 1F#	0aaaaaaa 0bbbbbbb	EQ: Low EQ Gain –12,,,12dB
05 00 00 20 05 00 00 21#	0aaaaaaa 0bbbbbbb	EQ: Low EQ Frequency 2,,,42 = 20,,,2000Hz(*1)
05 00 00 22 05 00 00 23#	0aaaaaaa 0bbbbbbb	EQ: Low EQ Q 0,,,31 = 0.3,,,16.0(*2)
05 00 00 24 05 00 00 25#	0aaaaaaa 0bbbbbbb	EQ: Low Mid EQ Gain –12,,,12dB
05 00 00 26 05 00 00 27#	0aaaaaaa 0bbbbbbb	EQ: Low Mid EQ Frequency 2,,,54 = 20,,,8000Hz(*1)
05 00 00 28 05 00 00 29#	0aaaaaaa 0bbbbbbb	EQ: Low Mid EQ Q 0,,,31 = 0.3,,,16.0(*2)
05 00 00 2A 05 00 00 2B#	0aaaaaaa 0bbbbbbb	EQ: High Mid EQ Gain –12,,,12dB
05 00 00 2C 05 00 00 2D#	0aaaaaaa 0bbbbbbb	EQ: High Mid EQ Frequency 2,,,54 = 20,,,8000Hz(*1)
05 00 00 2E 05 00 00 2F#	0aaaaaaa 0bbbbbbb	EQ: High Mid EQ Q 0,,,31 = 0.3,,,16.0(*2)
05 00 00 30 05 00 00 31#	0aaaaaaa 0bbbbbbb	EQ: High EQ Type 0,1 = Shelving, Peaking
05 00 00 32 05 00 00 33#	0aaaaaaa 0bbbbbbb	EQ: High EQ Gain –12,,,12dB
05 00 00 34 05 00 00 35#	0aaaaaaa 0bbbbbbb	EQ: High EQ Frequency 39,,,62 = 1.4,,,20.0kHz(*1)
05 00 00 36 05 00 00 37#	0aaaaaaa 0bbbbbbb	EQ: High EQ Q 0,,,31 = 0.3,,,16.0(*2)
05 00 00 38 05 00 00 39#	0aaaaaaa 0bbbbbbb	EQ: Level –24,,,12dB
05 00 00 3A 05 00 00 3B#	0aaaaaaa 0bbbbbbb	Bass Cut Frequency 1,,,42 = Off,20,,,2000Hz(*1)
05 00 00 3C 05 00 00 3D#	0aaaaaaa 0bbbbbbb	Enhancer Sens 0,,,100
05 00 00 3E 05 00 00 3F#	0aaaaaaa 0bbbbbbb	Enhancer Frequency 36,,,56 = 1.0,,,10.0kHz(*1)
05 00 00 40 05 00 00 41#	0aaaaaaa 0bbbbbbb	Enhancer Mix Level –24,,,12dB
05 00 00 42 05 00 00 43#	0aaaaaaa 0bbbbbbb	Input Gain –24,,,12dB
05 00 00 44 05 00 00 45#	0aaaaaaa 0bbbbbbb	Input Detect Time 0,,,10ms
05 00 00 46 05 00 00 47#	0aaaaaaa 0bbbbbbb	Input Low Split Point 2,,,34 = 20,,,800Hz(*1)
05 00 00 48 05 00 00 49#	0aaaaaaa 0bbbbbbb	Input High Split Point 40,,,60 = 1.6,,,16.0kHz(*1)
05 00 00 4A 05 00 00 4B#	0aaaaaaa 0bbbbbbb	Expander Low Threshold 0,,,80 = –80,,,0dB
05 00 00 4C 05 00 00 4D#	0aaaaaaa 0bbbbbbb	Expander Mid Threshold 0,,,80 = –80,,,0dB
05 00 00 4E 05 00 00 4F#	0aaaaaaa 0bbbbbbb	Expander High Threshold 0,,,80 = –80,,,0dB
05 00 00 50 05 00 00 51#	0aaaaaaa 0bbbbbbb	Expander Low Ratio 0,,,13 = 1:1.0,,,1:INF(*3)
05 00 00 52 05 00 00 53#	0aaaaaaa 0bbbbbbb	Expander Mid Ratio 0,,,13 = 1:1.0,,,1:INF(*3)
05 00 00 54 05 00 00 55#	0aaaaaaa 0bbbbbbb	Expander High Ratio 0,,,13 = 1:1.0,,,1:INF(*3)
05 00 00 56 05 00 00 57#	0aaaaaaa 0bbbbbbb	Expander Low Attack 0,,,100ms
05 00 00 58 05 00 00 59#	0aaaaaaa 0bbbbbbb	Expander Mid Attack 0,,,100ms
05 00 00 5A 05 00 00 5B#	0aaaaaaa 0bbbbbbb	Expander High Attack 0,,,100ms
05 00 00 5C 05 00 00 5D#	0aaaaaaa 0bbbbbbb	Expander Low Release 0,,,100 = 50,,,5000ms
05 00 00 5E 05 00 00 5F#	0aaaaaaa 0bbbbbbb	Expander Mid Release 0,,,100 = 50,,,5000ms
05 00 00 60 05 00 00 61#	0aaaaaaa 0bbbbbbb	Expander High Release 0,,,100 = 50,,,5000ms
05 00 00 62 05 00 00 63#	0aaaaaaa 0bbbbbbb	Compressor Low Threshold –24,,,0dB
05 00 00 64 05 00 00 65#	0aaaaaaa 0bbbbbbb	Compressor Mid Threshold –24,,,0dB
05 00 00 66 05 00 00 67#	0aaaaaaa 0bbbbbbb	Compressor High Threshold –24,,,0dB
05 00 00 68 05 00 00 69#	0aaaaaaa 0bbbbbbb	Compressor Low Ratio 0,,,13 = 1:1.0,,,1:INF(*3)
05 00 00 6A 05 00 00 6B#	0aaaaaaa 0bbbbbbb	Compressor Mid Ratio 0,,,13 = 1:1.0,,,1:INF(*3)
05 00 00 6C 05 00 00 6D#	0aaaaaaa 0bbbbbbb	Compressor High Ratio 0,,,13 = 1:1.0,,,1:INF(*3)
05 00 00 6E 05 00 00 6F#	0aaaaaaa 0bbbbbbb	Compressor Low Attack 0,,,100ms
05 00 00 70 05 00 00 71#	0aaaaaaa 0bbbbbbb	Compressor Mid Attack 0,,,100ms
05 00 00 72 05 00 00 73#	0aaaaaaa 0bbbbbbb	Compressor High Attack 0,,,100ms
05 00 00 74 05 00 00 75#	0aaaaaaa 0bbbbbbb	Compressor Low Release 0,,,100 = 50,,,5000ms
05 00 00 76 05 00 00 77#	0aaaaaaa 0bbbbbbb	Compressor Mid Release 0,,,100 = 50,,,5000ms
05 00 00 78 05 00 00 79#	0aaaaaaa 0bbbbbbb	Compressor High Release 0,,,100 = 50,,,5000ms
05 00 00 7A 05 00 00 7B#	0aaaaaaa 0bbbbbbb	Mixer Low Level 0,,,86 = –80,,,6dB
05 00 00 7C# 05 00 00 7D#	0aaaaaaa 0bbbbbbb	Mixer Mid Level 0,,,86 = –80,,,6dB
05 00 00 7E 05 00 00 7F#	0aaaaaaa 0bbbbbbb	Mixer High Level 0,,,86 = –80,,,6dB
05 00 01 00# 05 00 01 01#	0aaaaaaa 0bbbbbbb	Limiter Threshold –24,,,0dB
05 00 01 02 05 00 01 03#	0aaaaaaa 0bbbbbbb	Limiter Attack 0,,,100ms
05 00 01 04 05 00 01 05#	0aaaaaaa 0bbbbbbb	Limiter Release 0,,,100 = 50,,,5000ms
05 00 01 06 05 00 01 07#	0aaaaaaa 0bbbbbbb	Output Level 0,,,86 = –80,,,6dB
05 00 01 08 05 00 01 09#	0aaaaaaa 0bbbbbbb	Output Soft Clip 0,1 = Off,On
05 00 01 0A :	00 :	(Reserved)
05 00 7F 7F	00	

(*1) See the Frequency Table of NRPN and Effect Parameters "Algorithm 35 Mastering Tool Kit."

(*2) See the Q Table of NRPN and Effect Parameters "Algorithm 35 Mastering Tool Kit."

(*3) See the Ratio Table of NRPN and Effect Parameters "Algorithm 35 Mastering Tool Kit."

●Sync Track Data

Start address	Data	Contents and remarks
06 00 00 00 06 00 00 01# 06 00 00 02# 06 00 00 03#	0000aaaa 0000bbbb 0000cccc 0000dddd	Sync Track Data 1 aaaabbbbccccdddd
06 00 00 04 06 00 00 05# 06 00 00 06# 06 00 00 07#	0000aaaa 0000bbbb 0000cccc 0000dddd	Sync Track Data 2 aaaabbbbccccdddd
06 00 00 08 :	0000aaaa :	Sync Track Data 3 :
06 07 7F 7B#	0000dddd	Sync Track Data 32767
06 07 7F 7C 06 07 7F 7D# 06 07 7F 7E# 06 07 7F 7F#	0000aaaa 0000bbbb 0000cccc 0000dddd	Sync Track Data 32768 aaaabbbbccccdddd

<Model ID = 00H 36H (VE-7000)>

Address are expressed in 7bit hexadecimal values.

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

Start address	Data	Contents and remarks
00 00 00	01	CH_COM_PHASE
00 00 01	01	VIEW SCREEN (ATT)
00 00 02	01	DYNAMICS SWITCH
00 00 03	01	DYNAMICS SCREEN
00 00 04	01	AUX1 SEND SWITCH
00 00 05	01	AUX2 SEND SWITCH
00 00 06	01	AUX3 SEND SWITCH
00 00 07	01	AUX4 SEND SWITCH
00 00 08	01	AUX5 SEND SWITCH
00 00 09	01	AUX6 SEND SWITCH
00 00 0A	01	AUX7 SEND SWITCH
00 00 0B	01	AUX8 SEND SWITCH
00 00 10	01	VIEW SCREEN (AUX SEND)
00 00 11	01	FILTER TYPE SWITCH
00 00 12	01	EQ SWITCH
00 00 13	01	EQ SCREEN
00 00 14	01	SURROUND SCREEN
00 00 15	01	VIEW SCREEN
00 00 16	01 – 02	SHIFT
00 00 17	01	MIX SWITCH
00 00 18	01	VIEW SCREEN (PAN)
00 01 00	00–7F(*1)	ATT
00 01 01	00–7F(*1)	THRESHOLD
00 01 02	00–7F(*1)	RATIO
00 01 03	00–7F(*1)	ATTACK

00 01 04	00–7F(*1)	RELEASE
00 01 05	00–7F(*1)	AUX1 SEND LEVEL
00 01 06	00–7F(*1)	AUX2 SEND LEVEL
00 01 07	00–7F(*1)	AUX3 SEND LEVEL
00 01 08	00–7F(*1)	AUX4 SEND LEVEL
00 01 09	00–7F(*1)	AUX5 SEND LEVEL
00 01 0A	00–7F(*1)	AUX6 SEND LEVEL
00 01 0B	00–7F(*1)	AUX7 SEND LEVEL
00 01 0C	00–7F(*1)	AUX8 SEND LEVEL
00 01 11	00–7F(*1)	EQ HIGH GAIN
00 01 12	00–7F(*1)	EQ HIGH FREQ
00 01 13	00–7F(*1)	EQ HIGH–MID GAIN
00 01 14	00–7F(*1)	EQ HIGH–MID FREQ
00 01 15	00–7F(*1)	EQ HIGH–MID Q
00 01 16	00–7F(*1)	EQ LO–MID GAIN
00 01 17	00–7F(*1)	EQ LO–MID FREQ
00 01 18	00–7F(*1)	EQ LO–MID Q
00 01 19	00–7F(*1)	EQ LOW GAIN
00 01 1A	00–7F(*1)	EQ LOW FREQ
00 01 1B	00–7F(*1)	EQ HIGH FREQ
00 01 1C	00–7F(*1)	PAN
00 02 00	00 – 7F	SURROUND VERTICAL
00 02 01	00 – 7F	SURROUND HORIZONTAL

(*1) 7-bit binary complement

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 Realtime Header
Dev	Device ID (or 7FH)
06H	MMC Command Message
01H	STOP (MCS)
F7H	EOX (End of Exclusive Message)

If the device ID on the message was as same as that of the receiving device or 7FH, the VS-2480/2480CD stops immediately.
If the transport switch [STOP] was pressed, the VS-2480/2480CD 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 Realtime Header
Dev	Device ID (or 7FH)
06H	MMC Command Message
02H	PLAY(MCS)
F7H	EOX (End of Exclusive Message)

If the device ID on the message was as same as that of the receiving device or 7FH, the VS-2480/2480CD goes into the playback condition.
The VS-2480/2480CD does not transmit this message.

●DEFERRED PLAY(MCS)

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

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

If the device ID on the message was as same as that of the receiving device or 7FH, the VS-2480/2480CD goes into the playback condition after the locate operation.
If the transport switch [PLAY] was pressed, the VS-2480/2480CD transmits as the device ID 7FH.

●FAST FORWARD(MCS)

Status	Data Byte	Status
F0H	7FH,Dev,06H,04H	F7H

Byte	Description
F0H	Status of System Exclusive Message
7FH	Universal System Exclusive Realtime Header
Dev	Device ID (or 7FH)
06H	MMC Command Message
04H	FAST FORWARD(MCS)
F7H	EOX (End of Exclusive Message)

If the device ID on the message was as same as that of the receiving device or 7FH, the VS-2480/2480CD goes into the fast forward condition.
The VS-2480/2480CD does not transmit this message.

●REWIND(MCS)

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

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

If the device ID on the message was as same as that of the receiving device or 7FH, the VS-2480/2480CD goes into the rewind condition.
The VS-2480/2480CD does not transmit this message.

●RECORD STROBE

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

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

If the device ID on the message was as same as that of the receiving device or 7FH, the VS-2480/2480CD goes into the following condition.
1. The VS-2480/2480CD is in the playback condition. Start Recording the tracks that status are the record standby mode.
2. The VS-2480/2480CD 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, he VS-2480/2480CD transmits as the device ID 7FH.

●RECORD EXIT

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

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

If the device ID on the message was as same as that of the receiving device or 7FH, the VS-2480/2480CD exit from the record condition.
If the transport switch [REC] was pressed while recording, the VS-2480/2480CD transmits as the device ID 7FH.

●MMC RESET

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

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

If the device ID on the message was as same as that of the receiving device or 7FH, the VS-2480/2480CD resets all communication channels related with MMC.
When powered on the VS-2480/2480CD transmits as the device ID 7FH.

●WRITE

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

Byte	Description
F0H	Status of System Exclusive Message

7FH	Universal System Exclusive
	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 Exclusive Message)

If the device ID on the message was as same as that of the receiving device or 7FH, the VS-2480/2480CD write the data to the specified information field.
The VS-2480/2480CD does not transmit this message.

●MASKED WRITE

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

Byte	Description
F0H	Status of System Exclusive Message
7FH	Universal System Exclusive
	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 Exclusive Message)

If the device ID on the message was as same as that of the receiving device or 7FH, the VS-2480/2480CD writes the data to the specified bit map byte.
The VS-2480/2480CD does not transmit this message.

●LOCATE(MCP)

❍Format 1 - LOCATE[I/F]

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

Byte	Description
F0H	Status of System Exclusive Message
7FH	Universal System Exclusive
	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 Exclusive Message)

If the device ID on the message was as same as that of the receiving device or 7FH, the VS-2480/2480CD locates the selected time location stored to the specified information filed.
The VS-2480/2480CD does not transmit this message.

❍Format 2 - LOCATE[TARGET]

Status	Data Byte	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
	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 Exclusive Message)

If the device ID on the message was as same as that of the receiving device or 7FH, the VS-2480/2480CD locates the specified time location received from the command.
If the efficient locate number or marker number is selected, the VS-2480/2480CD transmits as the device ID 7FH.

●MOVE

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

Byte	Description
F0H	Status of System Exclusive Message
7FH	Universal System Exclusive
	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
F7H	EOX (End of Exclusive Message)

If the device ID on the message was as same as that of the receiving device or 7FH, the VS-2480/2480CD transfers the data on the selected source information filed to the destination Information Field, if the name of both information fields in efficient.
The VS-2480/2480CD does not transmit this message.

●The efficient Information Field

The followings are the efficient Information Field on the VS-2480/2480CD.
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. Bulk Dump

VS-2480/2480CD can transfer and receive the scenes, the EZ ROUTING User Templates and the User Effect Patches by bulk dump.
In order to make bulk dump transmit, a transmitting function is performed on UTILITY-MIDI BULK DUMP screen.
In order to make bulk dump receive, after changing into a reception standby state on UTILITY-MIDI BULK DUMP screen, the bulk dump which the VS-2480/2480CD outputted beforehand is sent to the VS-2480/2480CD.

■Address Block

Start address	Contents and remarks
10 00 00 00	SCENE #00
: :	
10 00 7F 7F	
10 01 00 00	SCENE #01
: :	
10 01 7F 7F	
: :	
10 63 00 00	SCENE #99
: :	
10 63 7F 7F	
11 00 00 00	EZ ROUTING USER TEMPLATE #00
: :	
11 00 7F 7F	
11 01 00 00	EZ ROUTING USER TEMPLATE #01
: :	
11 01 7F 7F	
: :	
11 13 00 00	EZ ROUTING USER TEMPLATE #19
: :	
11 13 7F 7F	
12 00 00 00	EFFECT USER PATCH #000
: :	
12 00 01 7F	
12 00 02 00	EFFECT USER PATCH #001
: :	
12 00 03 7F	
: :	
12 03 0E 00	EFFECT USER PATCH #199
: :	
12 03 0F 7F	

5. 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 expression two 7-bit bytes would indicate a value of aa x 128 + bb.
(*) In the case of values which have a +/- sign, 40H=-64, 00H=0, 3FH=+63, so that the decimal expression would be 64 less than the value given in the above chart. In the case of two types, 40 00H = -8192, 00 00H = 0, 3F 7FH = +8191.
(*) Data marked “nibbled” is expressed in hexadecimal in 4-bit units. A value expressed as a 20byte nibble 0a 0bH has the value of a x 16 + b.
<Ex.1> What 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 above table. So ((10 x 16 + 3) x 16 + 9) x 16 + 3 = 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 above 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

●Command 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

●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

Command	Action	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-2480/2480CD

MIDI Implementation Chart

Date: Jun. 29, 2001
Version : 1.01

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:		o *1	o *6	
	True Voice	12-127	36-84, 36-60	
Velocity:	Note On	1-127 *1	x	
	Note Off	x 9n, v=0	x	
After Touch:	Key's	o *5	x	
	Channel's	x	x	
Pitch Bender:		x	o *6	
Control Change:	0-119	o *11		
	0, 32	x	o	
	6, 38	x	o	
	7, 39, 71	o	o	
	10, 42, 74	o	o	
	12, 44, 76	o	o	
	13, 45, 77	o	o	
	14, 46, 78	o	o	
	15, 47, 79	o	o	
	16, 48, 80	o	o	
	17, 49, 81	o	o	
	18, 50, 82	o	o	
	19, 51, 83	o	o	
	20, 52, 84	o	o	
	21, 53, 85	o	o	
	22, 54, 86	o	o	
	23, 55, 87	o	o	
	24, 56, 88	o	o	
	25, 57, 89	o	o	
	35, 67	o	o	
	64	x	o	
	96, 97	x	o	
	98, 99	x	o	
	102-115	o	o	
Program Change:		x	o *1	
	True Number	**********	0-99 *7	Effect 0-99
		**********	0-99 *8	Scene 0-99
System Exclusive		o *9	o *10	
Common:	Quarter Frame	o *2	o *2	
	Song Position	o *3	x	
	Project Select	x	x	
	Tune	x	x	
Realtime:	Clock	o*3	o*4	
	Command	o	o	
Aux:	All sound Off	x	x	
	Reset All Controllers	x	x	
	Local on/off	x	x	
	All Notes Off	x	x	
	Active Sensing	x	x	
	System Reset	x	x	
Notes		*1 MIDI Metronome Only *2 MIDI OUT SYNC Gen.=MTC Only *3 MIDI OUT SYNC Gen.=MIDIclk or SyncTr Only *4 When recording Sync Track Only *5 Transmits Level Meter Value according to the value of UTILITY-SYSTEM screen's DISPLAY SECTION. MIDI CH=16 (fixed). *6 When the effect patch Voice Transformer effect (algorithm 27) is selected and MIDI CONTROL Sw is "On" only. *7 When EFFECT P.C. Rx Sw=On and MIDI CH=1-8. *8 When SCENE P.C. Rx Sw=On and MIDI CH=16. *9 SysEx. Tx Sw=On Only *10 SysEx. Rx Sw=On Only *11 When the Fader is V.FADER Mode.		

Mode1 : OMNI ON, POLY
Mode 2 : OMNI ON, MONO
o: Yes
Mode3 : OMNI OFF, POLY
Mode 4 : OMNI OFF, MONO
x: No

Roland® VS-2480

Track Sheet (1)

Project _____ Artist _____ Client _____

Project Name _____ Date _____

☐ Internal ☐ Removable Backing up to _____

V-Tracks	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								

LOCATOR	SCENE

Roland® VS-2480

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								

NOTES

Track Sheet

Roland® VS-2480

Track Sheet (3)

		Tracks							
		17	18	19	20	21	22	23	24
V-Tracks	1								
	2								
	3								
	4								
	5								
	6								
	7								
	8								
	9								
	10								
	11								
	12								
	13								
	14								
	15								
	16								

NOTES

SPECIFICATIONS

VS-2480/2480CD

24Tr, 24bit, 96kHz Sampling Digital Studio Workstation

Tracks

Tracks: 24
V-Tracks: 384 (16 V-Tracks per each Track)

Sample Rate

96.0 / 88.2 / 64.0 / 48.0 / 44.1 / 32.0 kHz

* *Adjustable range with vari-pitch function*
22.00kHz-98.00kHz (at 96kHz)
22.00kHz-50.00kHz (at 48kHz)

Recording Mode

Mastering 24-bit (M24)
Multitrack Pro (MTP)
CD Writing (CDR)
Mastering 16-bit (M16)
Multitrack 1 (MT1)
Multitrack 2 (MT2)
Live 1 (LIV)
Live 2 (LV2)

Maximum Simultaneous Recording / Playback Tracks

● Sample Rate 48 / 44.1 / 32kHz
16 tr. Rec / 16 tr. Play (M24, M16, CDR)
16 tr. Rec / 24 tr. Play (MTP, MT1 / 2, LIV, LV2)
● Sample Rate 96 / 88.2 / 64kHz
8 tr. Rec / 8 tr. Play (M24, M16, CDR)
8 tr. Rec / 12 tr. Play (MTP, MT1 / 2, LIV, LV2)

* *Depending on the organization of the song data or the disk drive performance etc., the number of tracks which can be simultaneously recorded or played back may be limited.*

Maximum Useful Capacity

VS-2480

1024G bytes: 10Gbytes(Capacity) x 13(Partition) x 8(Disk Drive)

VS-2480CD

910G bytes: 10Gbytes(Capacity) x 13(Partition) x 7(Disk Drive)

Recording Time (at 10GB Partition, conversion in 1 track, unit: minutes)

Recording Mode	Sample Rate 96kHz	88.2kHz	64kHz	48kHz	44.1kHz	32kHz
M24	662	721	993	1,324	1,442	1,987
MTP	1,989	2,165	2,983	3,977	4,329	5,966
M16	994	1,082	1,491	1,989	2,165	2,983
CDR	994	1,082	1,491	1,989	2,165	2,983
MT1	1,989	2,165	2,983	3,977	4,329	5,966
MT2	2,651	2,885	3,976	5,302	5,771	7,953
LIV	3,181	3,462	4,772	6,362	6,925	9,543
LV2	3,977	4,329	5,966	7,955	8,658	11,932

* *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.*

* *In "CDR" recording mode, two tracks are always used in a pair (channel link is on), so recording time is half the above-listed.*

Frequency Response

96.0kHz: 20Hz – 40kHz (+0dB / -2dB)
88.2kHz: 20Hz – 40kHz (+0dB / -2dB)
48.0kHz: 20Hz – 22kHz (+0dB / -2dB)
44.1kHz: 20Hz – 20kHz (+0dB / -2dB)
32.0kHz: 20Hz – 14kHz (+0dB / -2dB)

Projects

200 projects in each partition

Marker

1000 per project

Locator

100 (10 x 10 banks) per project

Scene

100 (10 x10 banks) per project

Undo/Redo

999 Undo / 1 Redo

Nominal Input Level (variable)

Input 1-8: -64 - +14dBu (maximum +26dBu: balanced, maximum +20dBu: unbalanced)
Input 9-16: -64 - +14dBu (maximum +26dBu : balanced, maximum +20dBu : unbalanced)
Guitar (Hi-Z): -64 - +14dBu (maximum +20dBu)

Input Impedance

Input 1-8 : 40k ohm (balanced)
Input 9-16: 40k ohm (balanced)
Guitar (Hi-Z): 1M ohm

SPECIFICATIONS

Nominal Output Level

Master Out: +4dBu (balanced)
AUX A (L, R): +4dBu (balanced)
AUX B (L, R): +4dBu (balanced)
Monitor Out: +4dBu (balanced)

Output Impedance

Master Out: 600 ohm
AUX A (L, R): 600 ohm
AUX B (L, R): 600 ohm
Monitor Out: 600 ohm
Phones: 22 ohm

Recommended Load Impedance

Master Out: 10k ohm or greater
AUX A (L, R): 10k ohm or greater
AUX B (L, R): 10k ohm or greater
Monitor Out: 10k ohm or greater
Phones: 8 - 600 ohm

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

Master Out: -88dBu or less
AUX A: -88dBu or less
AUX B: -88dBu or less
Monitor Out: -88dBu or less

EQ

4-band (2 shelving + 2 peaking)

* *Useful simultaneously at up to 48ch in both Input Mixer and Track Mixer.*

Dynamics Processor

Compressor, Expander

* *Useful simultaneously at up to 48ch in both Input Mixer and Track Mixer.*

Compressor+Expander

* *Useful simultaneously at up to 24ch in Input Mixer or Track Mixer.*

* *If this type is used at Mixer section, Dynamics cannot be used in the other Mixer.*

Effects

Maximum 8 stereo (One pre-installed + 3 more optional VS8F-2)

Display

320 x 240 dots Graphic LCD (with backlit)

Hard Disk Drive

VS-2480CD

3.5 inches 80 GB

CD-RW Drive

VS-2480CD

Reading Speed: 24x (max.)
Recording Speed: Record (CD-R) 4x correspond
Re-Write (CD-RW) 4x correspond

Interface

SCSI: 25-pin D-sub
Digital I/O: Coaxial, Optical (conforms to S/P DIF)
VGA Out: 15-pin miniD-sub
PS/2: MimiDIN 6pin
MIDI: DIN 5pin

Connectors

SCSI Connector (DB-25 type)
MIDI Connectors (DIN 5pin type)
Input Jack 1--8 (XLR type, balanced, phantom power)
Input Jack 1--16 (1/4inch phone type, TRS balanced)
Guitar (Hi-Z) Jack (1/4inch phone type)
Digital In Connectors (Coaxial type, Optical type)
Digital Out Connectors (Coaxial type, Optical type)
Foot Switch Jack (1/4inch phone type)
Word Clock In jack (BNC type)
SMPTE In Jack (RCA phone type)
PS/2 Mouse Connector (miniDIN 6pin type)
PS/2 Keyboard Connector (miniDIN 6pin type)
VGA Out Connector (MiniDB-15 type)
R-BUS Connectors (DB-25 type)
Master Out Jack L/R (1/4inch phone type, TRS balanced)
Monitor Out Jack L/R (1/4inch phone type, TRS balanced)
AUX A Send Jack L/R (1/4inch phone type, TRS balanced)
AUX B Send Jack L/R (1/4inch phone type, TRS balanced)
Headphones Jack (Stereo 1/4inch phone type)

Power Supply

AC117 V, AC230 V or AC240 V

Power Consumption

80 W (including internal hard disk for VS-2480)

Dimensions

620 (W) x 520 (D) x 138 (H) mm
24-3/8 (W) x 20-1/2 (D) x 5-7/16 (H) inches

Weight

VS-2480

12.2 kg (Excluding internal hard disk)
26 lbs 15 oz

VS-2480CD

13.4 kg
29 lbs 9 oz

Accessories

Owner's Manual English
User Guide
Appendices
R-BUS Equipment Connection and Setting Guide 2
Newly Added Functions
Block diagram
Demo CD
PS/2 MOUSE
Short Cut Seal
AC Cord

Options

Internal Hard Disk Drive Unit: HDP35 Series for VS-2480
24-bit Effect Expansion Board: VS8F-2
CD-RW Drive: Roland CD Recorder
Channel Edit Controller: VE-7000
Level Meter Bridge: MB-24
Level Meter Bridge Adaptor: VS24-MBA
Bi-amp Monitor: DS-90A, DS-50A
Dynamic Microphone: DR-20
8CH A/D-D/A Converter: ADA-7000
AES/EBU Interface: AE-7000
R-BUS Cable: RBC-1 (1 m)
Footswitch: FS-5U (BOSS)
Pedal Switch: DP-2

(0dBu=0.775Vrms)

* *In the interest of product development, the specifications for this product are subject to change without prior notice.*

Index

Numerics

10-Band Graphic Equalizer 79
2ch RSS 58
3band Isolator 75
4-Band Parametric Equalizer 78

A

Aborted Command! 9
Active Terminator 12
active terminator 4
algorithm 7
Already Selected 9
Analog Flanger 56
Analog Phaser 54
Analyzer 12, 25
Arbitration Failed! 9
Attenuator 6
audio cable 5
Auto Punch/Loop Parameter 24
Automix 25

B

Bass 30
Blank Disc 9
Busy Status! 9

C

Can't Communicate! 9
Can't record CD! 9
Can't Recover Project! 9
Can't Set Marker! 9
Cannot write in “Track at Once” format on CD-RW Disc! 9
CD-R 12
CD-R disc 7
CD-R/RW drive 7
CD-RW 12
CD-RW drive 6
CH EDIT 19–20
CH EDIT/SELECT/PHRASE SEQ STATUS/AUTOMIX STATUS buttons 16
Change to Internal Clock? 9
Channel fader 5
Check Condition! 9
Chorus 29
Chorus RSS 50
Clear Partition 26
COAXIAL In Lock 9
COAXIAL In Unlock 9
Compact Disc Recordable 12
Compact Disc ReWritable 12
Composite Object Sound Modeling 12
Compressor 12
Control Change messages 3
COSM 12
Current Project 12

D

daisy chain 4
DAT 12
DB-25 type 4
Delay 28, 40
Delay RSS 44
Device ID 3
Digital Signal Processing 12
Disk Memory Full! 9
Done! 9
Drive Busy! 9
Drive Not Ready! 10
Drive Status Error! 9
Drive Time-out! 9
Drive Unformatted! 11
DSP 12
Dual Compressor/Limiter 76
Dynamics 12

E

Effect Return 20
Event Memory Full! 9
events 5
Exclusive messages 3
Expander 12

F

F1 (PtnEdt) 24
F1 (SCENE) 25
F1 (SYSTEM) 22
F1 (TEMPO) 23
F2 (A.MIX) 25
F2 (GLOBAL) 22
F2 (Metro) 24
F2 (NEW) 26
F3 (A.P/LP) 24
F3 (ClrPrt) 26
F3 (MkPart) 26
F3 (Proj) 22
F3 (Surrnd) 25
F4 (OscAna) 25
F4 (PlyRec) 23
F4 (PROTEC) 26
F5 (MIDI) 23
F6 (PrmIni) 26
F6 (SYNC) 23
F6 (V.FDR) 24
Finalize 12
Finalized CD! 10
Flanger 29
Formants 13
Format Drive 26
Found Illegal Track Pair! 10
Frame 13
FX RTN 20

G

Gate Reverb 28, 38

Gated Reverb 7
General Purpose Interface 13
Global Parameter 22
GPI 13
Graphic Equalizer 31, 79
Guitar 30
GUITAR (Hi-Z) 13
Guitar Amp Modeling 30, 64
Guitar Multi 1 62
Guitar Multi 2 62
Guitar Multi 3 62

H

Hardware Error! 10
Hum Canceler 80

I

IDE 13
Illegal Request! 9
Illegal Track! 10
IN 18
IN 1-16 18
IN 17-24 AUX MST 18
Input Mixer 18
Integrated Device and Electronics 13

L

Lack of CD-R Memory! 10
Lack of IDE Memory! 10
Limiter 13
LOCATOR / MARKER / SCENE buttons 16
Lo-Fi Processor 74

M

MARKER Memory Full! 10
Master Block 21
MASTER CLOCK 6
MASTER EDIT 21
Master fader 5
Mastering Tool Kit 7, 32, 85
Medium Error! 10
Message Error! 9
Metronome Drum Pattern Edit 24
Metronome Parameter 24
Mic Modeling 29
Microphone Modeling 60
MIDI
  channels 3
  connectors 3
  IN 3
  messages 3
  OUT 3
  sequencer 7
  THRU 3
MIDI Implementation Chart 3
MIDI Machine Control 13
MIDI messages 3
  Control Change messages 3
  Exclusive messages 3
  Note messages 3
MIDI Parameter 23
MIDI Time Code 13
MMC 13
MONITOR knob 5
MTC 13
Multi Tap Delay 46
Musical Instrument Digital Interface 3
Mute 5

N

No CD-R Drive! 10
No Data to Write 10
No Disc! 10
No Disk Drive! 10
No Drive Found. 9
No IDE Drive! 10
Not 44.1kHz Project! 10
Not Enough Free Events! 10
Note messages 3
note number 3
NTSC Format 13

O

Obey Copyrights? 10
Operation Canceled! 11
Operation Failed! 10
OPTICAL In Lock 9
OPTICAL In Unlock 9
Oscillator 13, 25

P

PAL Formats 14
Parameter Initialize 26
Parametric Equalizer 31, 78
Phantom Power 14
Phase Mismatch! 9
Phaser 29
PHONES knob 5
Phrase
  Delete 6
Pink noise 14
Pitch Shifter 29
Play / Recording Parameter 23
Please Insert CD-R Disc! 10
Please Wait... 10
Preset Patch List
  Bass 30
  Chorus 29
  Delay 28
  Flanger 29
  Gate Reverb 28
  Graphic Equalizer 31
  Guitar 30
  Guitar Amp Modeling 30
  Mastering Tool Kit 32
  Mic Modeling 29

Parametric Equalizer 31
Phaser 29
Pitch Shifter 29
Reverb 28
Reverb2 28
Same as Algorithm 27
Special Effects 31
Stereo Multi 31
Tape Echo 201 29
Vocal 30
Project
Optimize 6
Project New 26
Project Parameter 22
Project Protect 26
Project Protected! 11
PS/2 Keyboard 14
PS/2 Mouse 14

R

R-BUS 14
R-BUS1 Lock 9
R-BUS1 Unlock 9
R-BUS2 Lock 9
R-BUS2 Unlock 9
Region
Cut 6
Erase 6
Removable Disk Drives 14
Reverb 7, 28, 34
Reverb2 ..... 28, 36
Rotary 57
RSS 14

S

S/P DIF 14
Same as Algorithm 27
Scene 25
SCMS 14
SCSI 4, 14
cable 4
ID number 4
SCSI chain 4
SCSI ID Error! 10
SCSI Not Available! 10
SECAM Formats 14
Shutdown 14
Sine wave 14
Small Computer System Interface 4
SMPTE time code 15
Solo 5
Space Chorus 51
Speaker Modeling 83
Special Effects 31
St Phaser 55
STATUS indicator 5
StDly-Chorus 48
Stereo Flanger 55
Stereo Multi 31, 81
Stereo Phaser 52
Stereo Pitch Shifter Delay 42
Surround 25
Sync Parameter 23
System Parameter 22

T

Tape Echo 201 ..... 29, 45
Tempo Map 23
terminator 4
externally attached 4
internal 4
Terminator Power 4, 15
time compression 6
time expansion 6
TOC 15
TOC Read Error! 11
Too Many Markers! 11
TR 19
TR 1-16 19
TR 17-24 FX RTN 19–20
Track Minutes 15
Track Mixer 19
Track Sheet 120
Transport Control buttons 16

U

Undefined Sense! 9
Unknown Drive Error! 9
Unusable Sector! 10

V

V.Fader 24
VARI PITCH 6
velocity 3
VGA 15
video device 8
Vocal 30
Vocal Canceler 69
Vocal Multi 66
Vocoder 71
Vocoder2 (19) 7, 72
Voice Transformer 7, 68
VS8F-2 7

W

WORD CLOCK In Lock 9
WORD CLOCK In Unlock 9
Write Another CD? 11
Write Protected! 11

Z

Zip Drive 6, 15

...MEMO...

...MEMO...

Information

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

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