



# AW4416

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Version 2.0 Manual Supplement

This manual supplement explains the functions and specifications that have been added or changed in version 2.0 of the AW4416's system software. "Operation" explains how to use the new functionality, and "Reference" provides detailed explanations of all items in the pages that were added. Since revisions have also occurred in the MIDI data format in the appendices, this material is also provided.

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# Operation

## Extensions to the Quick Rec function

The Quick Rec screen now has two pages: Quick Rec 1 and Quick Rec 2. Operations corresponding to what was the previous Quick Rec page are performed in the Quick Rec 1 page, and the newly added Quick Rec 2 page allows the various input signals/input channels to be freely patched to the tracks of the recorder.

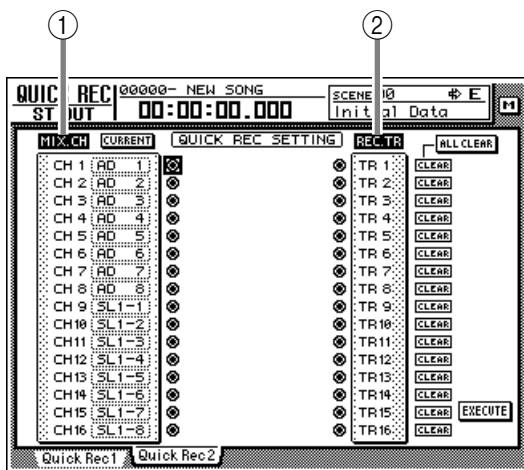
By using the appropriate page (Quick Rec 1 or Quick Rec 2), you can make patching settings more efficiently.

### Quickly assign input sources to tracks

By using the Quick Rec 2 page, you can quickly assign any input source/input channel to a recorder track. Here's how.

**1** In the WORK NAVIGATE section, press the [Quick Rec] key → [F2] (Quick Rec 2) key.

The Quick Rec 2 page will appear. This page displays the following information.



**① MIX.CH (Input channel)**

This area shows the type of input signal that is assigned to each input channel 1–16. The symbols (jacks) displayed at the right of this area indicate the direct output of each input channel.

**② REC.TR (Recorder track)**

This area shows tracks 1–16 (Tr1–Tr16). The symbols (jacks) displayed at the left of this area indicate the input to each track.

**2** To change the input source that is assigned to an input channel, move the cursor to the number box of the corresponding channel, and turn the [DATA/JOG] dial.



The following types of input source can be assigned to an input channel.

- **AD 1–AD 8** ..... Input signals from INPUT 1–8 jacks
- **SL1-1–SL1-8** ..... Inputs 1–8 from an I/O card (slot 1)
- **SL2-1–SL2-8** ..... Inputs 1–8 from an I/O card (slot 2)
- **DIN L/DIN R** ..... L or R channels from the DIGITAL STEREO IN jack
- **SMP 1–SMP 8** ..... Sampling pads 1–8
- **MET** ..... Internal metronome

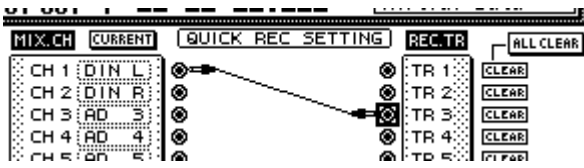
**3** In the MIX.CH area, move the cursor to the patch-source jack, and press the [ENTER] key.

The corresponding input channel will be highlighted, and selected as the patch-source.



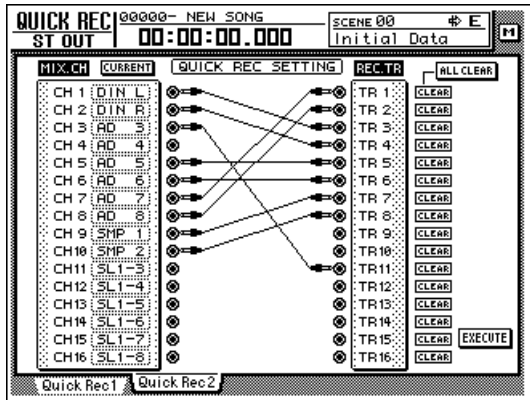
*If you move the cursor to a highlighted input channel and press the [ENTER] key once again, the selection will be cancelled.*

- 4** In the REC.TR area, move the cursor to the jack for the desired patch-destination track, and press the [ENTER] key.
- The patch-source and patch-destination in the screen will be connected by a patch cable.

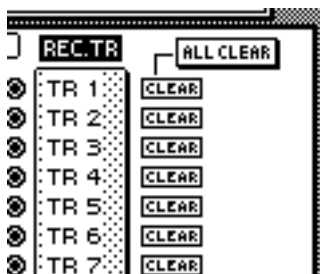


- You may perform steps 3 and 4 in reverse order.
- It is also possible to connect the direct output of the same channel to multiple tracks. However, it is not possible to connect multiple direct outputs to a single track.

- 5** Make connections for other input channels in the same way.



- To cancel a specific patch cable, move the cursor to the CLEAR button located at the right of the corresponding recorder input, and press the [ENTER] key.
- To cancel all patch cables, move the cursor to the ALL CLEAR button located at the upper right of the display, and press the [ENTER] key.



- 6** When you are finished making patch cable connections, move the cursor to the EXECUTE button located in the lower right of the display, and press the [ENTER] key.
- The following popup window will appear.



- 7** To execute the Quick Rec function, move the cursor to the OK button and press the [ENTER] key.

To cancel the operation, move the cursor to the CANCEL button and press the [ENTER] key. When you execute Quick Rec, the internal settings of the AW4416 will change as follows.

- The input patch and recorder input settings will be set according to the settings of the Quick Rec 2 page.
- Assignments to the stereo bus will be forcibly cancelled for any input channel to which a patch cable is connected.
- Channel library number 01 will be recalled for the monitor channel of any track to which a patch cable is connected, restoring it to the default condition.



*If desired, each input channel to which a patch cable is connected can be initialized when you execute Quick Rec. To do this, move the cursor to the FLAT/CURRENT button located in the upper left of the display, and press the [ENTER] key to make the button read "FLAT."*

[Reference pages]

Details on the Quick Rec 2 page → P.23

# Shortcut key definitions

The new version of the system program lets you assign desired functions to various combinations of the [SHIFT] key located at the right of the display (the [CTRL] key), in order to create your own shortcut keys.

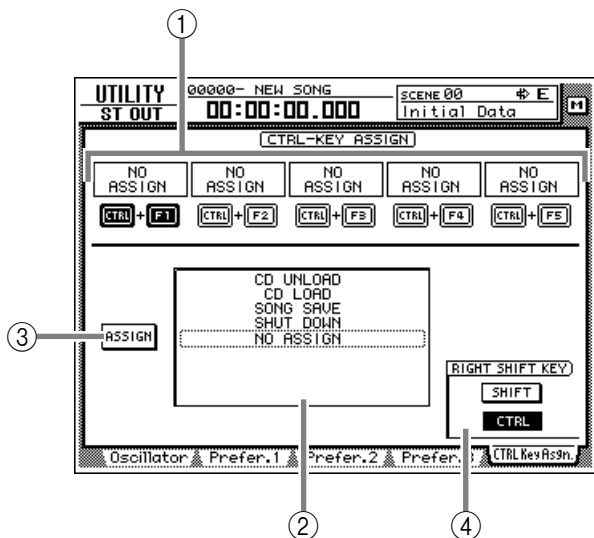
**1** In the UNIT section, press the [UTILITY] key → [F5] (CTRL Key Assign) key.

The CTRL Key Asgn. page added in version 2.0 will appear.

**2** In the RIGHT SHIFT KEY area, move the cursor to the CTRL button, and press the [ENTER] key.

The buttons in the RIGHT SHIFT KEY area are used to switch the function of the [SHIFT] key located at the right of the display. When you turn on the CTRL button, the [SHIFT] key located at the right of the display will function as a [CTRL] key to access shortcuts. (Even in this case, the function of the [SHIFT] key located at the left of the display will not be affected.)

If you turn the CTRL button on, you will be able to assign specific functions (e.g., access a page or turn a certain function on/off) to combinations of the [CTRL] + [F1] – [CTRL] + [F5] keys.



- ① CTRL+F1 –CTRL+F5
- ② Function list
- ③ Assign button
- ④ RIGHT SHIFT KEY area



To return the [SHIFT] key located at the right of the display to its normal function, move the cursor to the SHIFT button and press the [ENTER] key.

**3** Select the shortcut key combination (CTRL+F1–CTRL+F5) to which you want to assign a function, move the cursor to that combination, and press the [ENTER] key.

The corresponding symbol will be highlighted, allowing you to assign a function.



When the AW4416 is in its initial state, all shortcut keys are set to No Assign.

**4** Move the cursor to the function list, and use the [DATA/JOG] dial to select the function that you want to assign.

For a list of the functions that can be selected, refer to page 25.



If you select SCENE RECALL as the assigned function, a field allowing you to specify the scene number will appear at the right of the function list. Move the cursor to this area, and use the [DATA/JOG] dial to specify the scene number.

**5** Move the cursor to the ASSIGN button, and press the [ENTER] key.

A popup window will appear, asking you to confirm the assignment.

**6** To confirm the assignment, move the cursor to the OK button and press the [ENTER] key.

**7** To execute the assigned function, hold down the [CTRL] key (the [SHIFT] key at the right of the display), and press the corresponding function key.

## [Reference pages]

For details on the CTRL Key Asgn. page → P.25

## Added/modified MIDI functions

MIDI-related functionality has been significantly enhanced in version 2.0. The following functions and specifications have been added or modified.

- The various items in the previous MIDI Setup page and MIDI Sync page have been reorganized into the MIDI Setup 1 page and MIDI Setup 2 page.
- You can now use control changes or parameter changes to operate the parameters of the AW4416 from an external MIDI device.
- Internal AW4416 settings can now be output via MIDI.
- A “MIDI Remote” function has been added, allowing you to use faders 1–16 and [ON] keys 1–16 to control external MIDI devices.
- As an MTC output destination, you can now select MIDI/TO HOST/OPTION (option slot 2) in addition to the previous choice of the MTC OUT connector.
- MTC is now transmitted from the MTC OUT connector at all times.
- As the port used to transmit/receive MIDI messages, you can now select OPTION (option slot 2) in addition to the previous choices of MIDI/TO HOST. This setting will be valid when a I/O card able to transmit/receive MIDI messages (such as the mLAN card “MY8-mLAN” expected to go on sale soon) is installed in option slot 2.

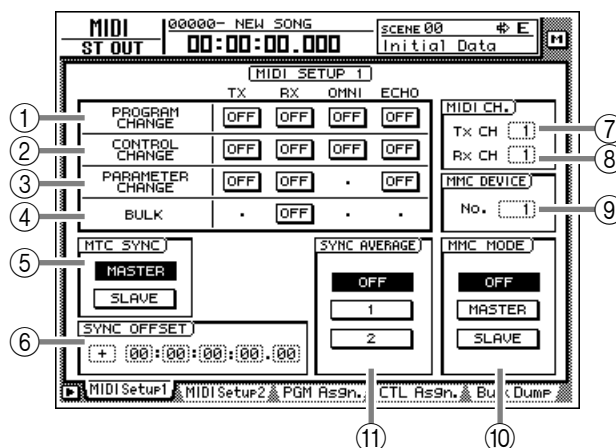
The additions and changes for each item are explained below.

### Changes in the MIDI Setup page/ MIDI Sync page

The various items in the previous MIDI Setup page and MIDI Sync page have been reorganized into the MIDI Setup 1 page and MIDI Setup 2 page. The content of the new pages is as follows.

#### ■ MIDI Setup 1 page

Here you can select the MIDI transmit/receive channels, turn transmission and reception of various MIDI messages on/off, and make settings related to MIDI synchronization.



#### ① PROGRAM CHANGE

Here you can make settings for program change message transmission/reception. Each button has the following function.

##### ● TX

If this button is on, the program change number assigned to a scene will be transmitted when that scene is recalled.

##### ● RX

If this button is on, a scene will be recalled when the program change number assigned to that scene is received.

##### ● OMNI

If this button is on, program changes of all MIDI channels will be received regardless of the Rx CH (Receive MIDI channel) setting (⑧).

##### ● ECHO

If this button is on, received program changes will be “thru-ed” (retransmitted) without change from the MIDI OUT connector/TO HOST connector.

#### ② CONTROL CHANGE

Here you can make settings for control change message transmission/reception. Each button has the following function.

##### ● TX

If this button is on, operating a parameter of the AW4416 will cause the control change assigned to that parameter in the CTL Asgn. page to be transmitted.

##### ● RX

If this button is on, receiving a control change will cause the AW4416 parameter assigned to that control change in the CTL Asgn. page to change.

##### ● OMNI

If this button is on, control changes of all MIDI channels will be received regardless of the Rx CH (Receive MIDI channel) setting (⑧).

● **ECHO**

If this button is on, received control changes will be “thru-ed” (retransmitted) without change from the MIDI OUT connector/TO HOST connector/option slot.

③ **PARAMETER CHANGE**

Here you can make transmission/reception settings for system exclusive messages that control the AW4416’s parameters (parameter change messages). Each button has the following function.

● **TX**

If this button is on, operating a parameter of the AW4416 will cause the corresponding parameter change to be transmitted.

● **RX**

If this button is on, receiving a parameter change will cause the corresponding AW4416 parameter to change.

● **ECHO**

If this button is on, received parameter changes will be “thru-ed” (retransmitted) without change from the MIDI OUT connector/TO HOST connector/option slot.

④ **BULK**

Here you can make settings for bulk data reception. If the BULK RX button is on, the AW4416 will be able to receive bulk dump data and messages requesting a bulk dump (bulk dump requests).

⑤ **MTC SYNC**

When using MTC (MIDI Time Code) to synchronize the AW4416 song with an external MIDI device, this setting selects whether the AW4416 will function as the MTC master (MASTER button on) or MTC slave (SLAVE button on).



*In the previous version, the MTC MASTER indicator in the level meter/counter was lit or dark depending on whether MTC output from the MTC OUT connector was turned on or off. However in version 2.0, MTC is output from the MTC OUT connector at all times. For this reason, the lit/dark status of the MTC MASTER indicator now indicates the on/off state of MTC output from the MIDI OUT connector/TO HOST connector/option slot 2.*

⑥ **SYNC OFFSET**

When using the AW4416 as an MTC slave, this lets you shift the absolute time of the AW4416 relative to the received MTC. The range is “-24:00:00:00.00” – “+24:00:00:00.00”

⑦ **Tx CH (Transmit channel)**

This specifies the channel (1–16) of the MIDI messages that will be transmitted from the AW4416.

⑧ **Rx CH (Receive channel)**

This specifies the channel (1–16) of the MIDI messages that receive received by the AW4416.

⑨ **MMC DEVICE**

This sets the device ID (1–127) used to distinguish between devices when MMC (MIDI Machine Control) messages are used to perform remote control between the AW4416 and external MIDI devices.

⑩ **MMC MODE**

Use the following three buttons to make settings for MMC reception and transmission.

● **OFF button**

If this button is on, the AW4416 will not transmit or receive MMC.

● **MASTER button**

If this button is on, the corresponding MMC command will be transmitted from MIDI OUT/TO HOST connector/option slot when you operate the transport of the AW4416.

● **SLAVE button**

If this button is on, the AW4416 will obey MMC commands received from MIDI IN/TO HOST connector/option slot.



*In order to use MMC, the device ID of the AW4416 and the external MIDI device must match. The device ID of the AW4416 is specified by the MMC DEVICE setting (⑨).*

⑪ **SYNC AVERAGE**

This sets the permissible range of variation in MTC timing when using the AW4416 as an MTC slave. Select one of the following three settings.

● **OFF button**

If this button is on, the permissible range will be the least, and the AW4416 will synchronize to incoming MTC with the highest precision. However if MTC with significant variation is received, synchronization may be lost or become unstable. This setting is suitable when two AW4416 units are being operated in synchronization.

● **1 button/2 button**

Turning on the 1 button will increase the permissible range, and turning on the 2 button will set the permissible range to the maximum setting. These settings are suitable when an external device with significant variation in MTC (such as a tape recorder or computer-based sequencer) is used as the MTC master.



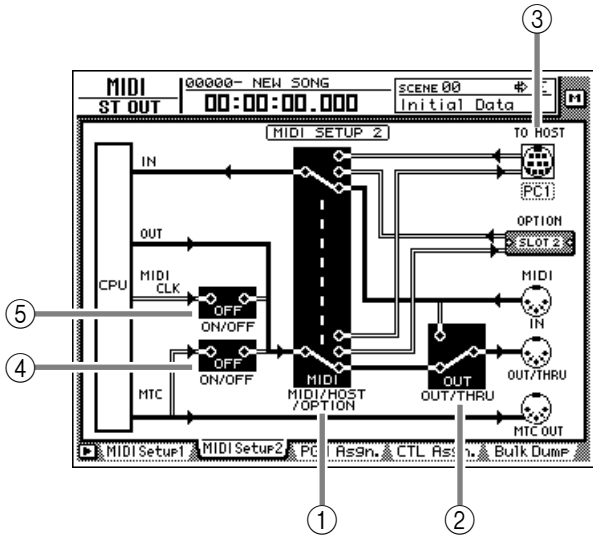
*The SYNC AVERAGE setting is valid only when the word clock source is set to “INT” (internal clock). If the AW4416 is synchronized to an external clock, operation will automatically be the same as when this setting is OFF.*

## ■ MIDI Setup 2 page

In this page you can select the port that will be used for MIDI transmission and reception: MIDI OUT/THRU connectors, TO HOST connector, or option slot. Here you can also select the synchronization messages that will be transmitted to external devices.



*In this page, signal routes along which MIDI messages flow are shown by a solid line (|), and signal routes along which MIDI messages do not flow are shown by a hollow line (||).*



### ① MIDI/HOST/OPTION switch

This selects the port that will be used to transmit/receive MIDI messages. Move the cursor to this area and press the [ENTER] key to cycle through the following three settings.

- **MIDI** ..... The MIDI IN connector and MIDI OUT/THRU connector will be used.
- **HOST** ..... The TO HOST connector will be used. The transmission speed is set by the TO HOST setting.
- **OPTION** ..... The OPTION I/O slot will be used.



*The OPTION setting is valid only if an I/O card that can transmit/receive MIDI messages (such as the mLAN card "MY8-mLAN"; planned for availability in the near future) is installed in option slot 2. MIDI message transmission/reception cannot be performed via option slot 1.*

### ② OUT/THRU switch

This switches the function of the OUT/THRU connector. Move the cursor to this area and press the [ENTER] key to cycle through the following two settings.

- **THRU** ..... The MIDI messages received at the MIDI IN connector will be retransmitted from the OUT/THRU connector.
- **OUT** ..... Messages generated within the AW4416 will be transmitted from the OUT/THRU connector.

### ③ TO HOST

Set the transmission speed of the TO HOST connector according to the type of computer you are using. Move the cursor to the TO HOST connector graphic, and turn the [DATA/JOG] dial to select the transmission speed from the following.

Setting	Platform	Speed
PC1	NEC PC-9800/9821 series*1	31.25 kbps
PC2	IBM PC compatible, NEC PC-9800/9821 series*1	38.4 kbps
MAC	Apple Macintosh series*2	31.25 kbps

- \*1 Select PC1 or PC2 according to the driver you are using.
- \*2 Only for models that provide a modem/printer port. On the software you are using, set the clock to "1 MHz."

### ④ MTC ON/OFF switch

This is an on/off switch for the MTC messages that are sent to the MIDI OUT connector/TO HOST connector/option slot.

### ⑤ MIDI CLK ON/OFF (MIDI Clock on/off) switch

This is an on/off switch for the MIDI Clock messages that are sent to the MIDI OUT connector/TO HOST connector/option slot.



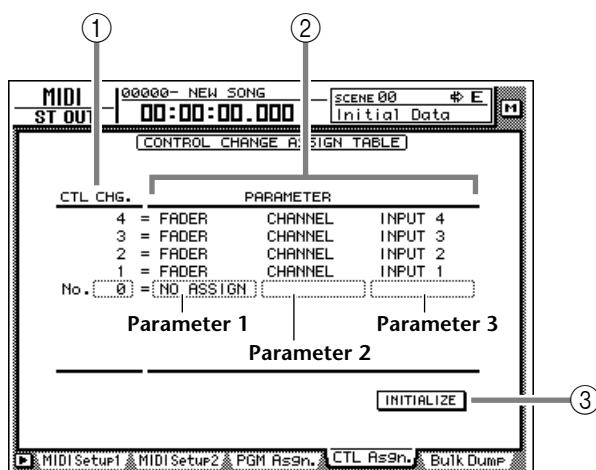
## Using control changes to operate AW4416 parameters

In version 2.0, AW4416 parameters can be assigned to control changes, so that AW4416 operations can be recorded/played back on a MIDI sequencer or other external MIDI device.

### ■ Assigning a parameter to a control change

**1** Press the [MIDI] key → [F4] (CTL Asgn.) key.

The MIDI screen CTL Asgn. page added in version 2.0 will appear. In this page you can assign AW4416 internal parameters to control change numbers. Each part of the screen has the following function.



#### ① CTL CHG. (Control change number)

Move the cursor to this area and use the [DATA/JOG] dial to select a control change number from the range of 0–95 and 102–119.

#### ② PARAMETER

This area shows the parameter that is assigned to each control change. In the left column (parameter 1), select the type of parameter that you want to control. In the center and right columns (parameters 2/3), specify the values required for that parameter. Control change numbers to which no parameter has been assigned will be displayed as “NO ASSIGN.”

#### ③ INITIALIZE

This button resets the control change assignments to the default state.



*For details on the parameters assigned to each control change number when the AW4416 is in the default state, refer to page 30.*

**2** Move the cursor to the CTL CHG. numerical box, and use the [DATA/JOG] dial to select the control change number that you want to assign.

CTL CHG.	PARAMETER		
105 = FADER	AUX7 SEND	INPUT 4	
104 = FADER	AUX7 SEND	INPUT 3	
103 = FADER	AUX7 SEND	INPUT 2	
102 = FADER	AUX7 SEND	INPUT 1	
No. 95 =	NO ASSIGN		
94 =	NO ASSIGN		
93 =	NO ASSIGN		
02 =	PAN	BALANCE	ST OUT

**3** Move the cursor to the various fields in the PARAMETER area, and use the [DATA/JOG] dial to set the parameter and its values.

For the available parameters and values, refer to page 28.

CTL CHG.	PARAMETER		
105 = FADER	AUX7 SEND	INPUT 4	
104 = FADER	AUX7 SEND	INPUT 3	
103 = FADER	AUX7 SEND	INPUT 2	
102 = FADER	AUX7 SEND	INPUT 1	
No. 95 =	FADER	MASTER	AUX 1
94 =	NO ASSIGN		
93 =	NO ASSIGN		
92 =	PAN	BALANCE	ST OUT
91 =	PAN	CHANNEL	RETURN2 R



*Of the parameters that can be assigned, channel fader, AUX send, [ON] key, EQ, and pan operations can be recorded in automix. By using automix to record these operations, and using your MIDI sequencer to record operations of the remaining parameters, you can minimize the amount of MIDI messages that are transmitted and received between the AW4416 and your MIDI sequencer.*



*Control change numbers 0 and 32 are defined as “Bank Select” (messages used to switch the voice banks of a synthesizer, etc.). On some MIDI sequencers, bank select messages are handled differently than other control changes, and therefore may not be suitable for use in parameter operations.*

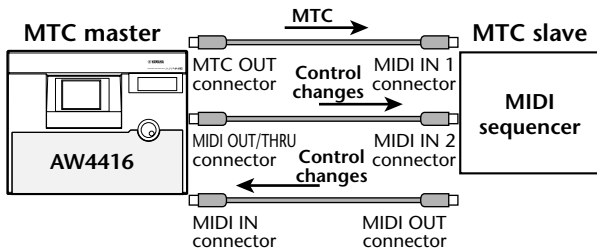
#### [Reference pages]

Details of the CTL Asgn. page → P.27

## ■ Recording/playing back parameter operations on a MIDI sequencer

Here's how you can use control changes to record/play back AW4416 parameter operations on a MIDI sequencer.

**1** Connect the AW4416 and your MIDI sequencer as shown in the following diagram, and make settings so that both devices will operate in synchronization.



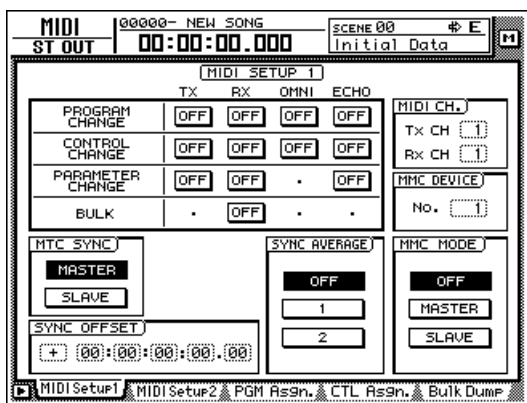
**Tip!** Make sure that "MIDI" is selected as the transmission/reception port for MIDI messages, and that "OUT" is selected as the function of the MIDI THRU/OUT connector.



When recording/playing back control changes on your MIDI sequencer, make sure that the MIDI Thru function (sometimes called "Patch Thru" or "MIDI Echo") of your MIDI sequencer is turned off. If this function is on, the control changes transmitted from the AW4416 will be immediately sent back to the AW4416, causing malfunctions.

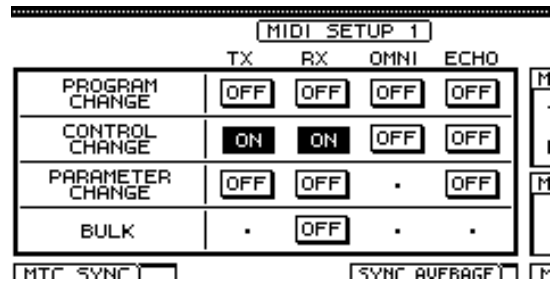
**2** Press the [MIDI] key → [F1] (MIDI Setup 1) key.

The MIDI Setup 1 page will appear.



**3** Use the cursor keys and the [ENTER] key to turn on the CONTROL CHANGE area TX (transmit) button and RX (receive) button.

With these settings, operating a parameter on the AW4416 itself will cause the control change assigned in the CTL Asgn. page to be transmitted. When a control change is received from an external device, the corresponding parameter will change.



**4** Move the cursor to the numerical boxes in the MIDI CH. area, and use the [DATA/JOG] dial to specify the transmit MIDI channel and receive MIDI channel.



- Normally you will set the transmit MIDI channel and receive MIDI channel to the same setting.
- If the CONTROL CHANGE area OMNI button is turned ON, control changes of all MIDI channels will be received, regardless of the receive MIDI channel setting.

**5** Put your MIDI sequencer in record mode, and play back the AW4416 song.



When recording parameter operations on your sequencer, you should turn automix off (DISABLE). If automix is on (ENABLE), the control changes corresponding to parameters recorded in the automix will also be transmitted simultaneously.

**6** Operate the parameters to which control changes are assigned.

As the parameter is changed, the corresponding control change will be transmitted, and recorded on the MIDI sequencer.

**7** When you are finished recording, press the [STOP] key.

**8** Put your MIDI sequencer in playback-ready mode.

**9** Locate to a point earlier than where you begin recording parameter operations, and play back the song.

When control changes from the MIDI sequencer are received by the AW4416 while it is running, the corresponding parameter will change.

## Using parameter changes to perform AW4416 operations

In version 2.0, a type of system exclusive message called “parameter changes” can be used (instead of control changes) to operate internal parameters of the AW4416. Here’s how to record/play back parameter changes on your MIDI sequencer.

- 1 Make settings on the AW4416 and on your MIDI sequencer so that they will operate in synchronization using MTC.

For details on connections, refer to page 10.



**Make sure that “MIDI” is selected as the transmission/reception port for MIDI messages, and that “OUT” is selected as the function of the MIDI THRU/OUT connector.**



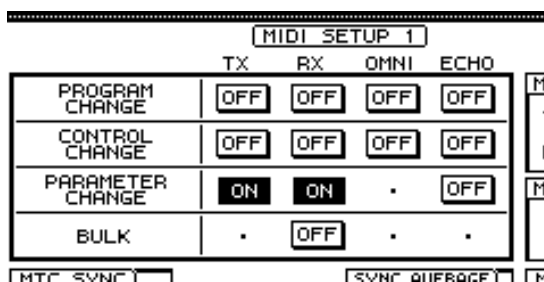
**When recording/playing back parameter changes on your MIDI sequencer, make sure that the MIDI Thru function of your MIDI sequencer is turned off. If this function is on, the parameter changes transmitted from the AW4416 will be immediately sent back to the AW4416, causing malfunctions.**

- 2 Press the [MIDI] key → [F1] (MIDI Setup 1) key.

The MIDI Setup 1 page will appear.

- 3 Use the cursor keys and the [ENTER] key to turn on the PARAMETER CHANGE area TX (transmit) button and RX (receive) button.

With these settings, operating a parameter on the AW4416 itself will cause the corresponding parameter change to be transmitted. When a parameter change is received from an external device, the corresponding parameter will change.



- The parameter change messages corresponding to each parameter are fixed, and cannot be changed.
- For details on the parameters that can be controlled by parameter changes, refer to page 47.

- 4 Put your MIDI sequencer in record mode, and play back the AW4416 song.

- 5 Operate the desired parameters on the AW4416.

As the parameter is changed, the corresponding parameter change will be transmitted, and recorded on the MIDI sequencer.

- 6 When you are finished recording, press the [STOP] key.

- 7 Put your MIDI sequencer in playback-ready mode.

- 8 On the AW4416, locate to a point earlier than where you begin recording parameter operations, and play back the song.

The MIDI sequencer will begin playback in synchronization with the AW4416. When parameter changes from the MIDI sequencer are received by the AW4416, the corresponding parameter will change.

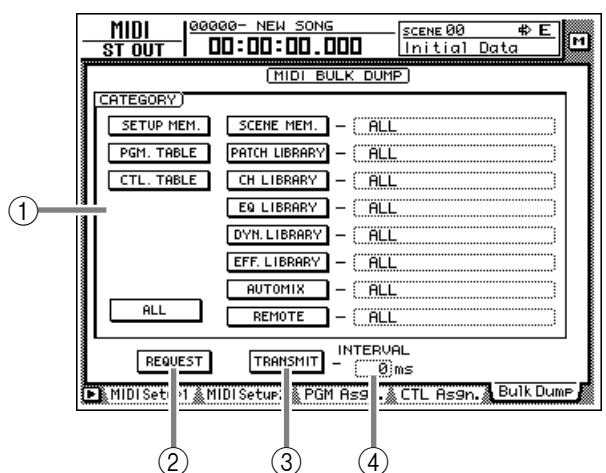
## Transmitting internal AW4416 settings via MIDI (Bulk Dump)

In version 2.0, settings of the MIDI screen and the contents of the various libraries can be converted into MIDI data (bulk data) and transmitted to an external device such as a MIDI sequencer.

- 1 Connect the AW4416’s MIDI OUT/THRU connector to the MIDI IN connector of the external MIDI device, and the AW4416’s MIDI IN connector to the MIDI OUT connector of the external MIDI device.

- 2 Press the [MIDI] key → [F5] (Bulk Dump) key.

The MIDI screen Bulk Dump page will appear. The various areas of the screen have the following functions.



### ① CATEGORY

Move the cursor to the category of information that you want to transmit as bulk data, and press the [ENTER] key to select that category.

If you select a category from the right column of buttons (SCENE MEM.–REMOTE), move the cursor to the column at the far right, and turn the [DATA/JOG] dial to select the content within that category that will be transmitted.

Category		Values	
SETUP MEM.	AW4416 settings other than the following items	—	
PGM. TABLE	Settings of the MIDI screen PGM ASGN. page	—	
CTL. TABLE	Settings of the MIDI screen CTL ASGN. page	—	
SCENE MEM.	The specified scene memory	01–96	Scene number 1–96
		EDIT BUFFER	Current scene (current mixer settings)
		ALL	All scene memories + current scene
PATCH LIBRARY	The specified patch library	01–20	Library number 1–20
		ALL	All patch libraries
CH LIBRARY	The specified channel library	02–64	Library number 2–64
		ALL	All channel libraries
EQ LIBRARY	The specified EQ library	41–128	Library number 41–128
		ALL	All EQ libraries
DYN. LIBRARY	The specified dynamics library	41–128	Library number 41–128
		ALL	All dynamics libraries
EFF. LIBRARY	The specified effect library	42–128	Library number 42–128
		ALL	All effect libraries
AUTO MIX	The specified automix	1–16	Memory number 1–16
		BUFFER	Current automix
		ALL	All automixes + current automix
MIDI REMOTE	Settings of the REMOTE screen	REMOTE A–REMOTE B	Settings of the REMOTE A (REMOTE A 1-8/9-16 pages) or B (REMOTE B 1-8/9-16 pages)
		ALL	Settings of all pages of the REMOTE screen

② **REQUEST button**

When you move the cursor to this button and press the [ENTER] key, a “bulk dump request” message requesting the bulk dump data selected in ① will be transmitted from the MIDI OUT connector/TO HOST connector/option slot.

This button is used when two AW4416 units are connected by their respective MIDI IN/OUT connectors, and you want to copy scene memory or library data from one unit to the other.

③ **TRANSMIT button**

When you move the cursor to this button and press the [ENTER] key, the bulk dump will begin.

④ **INTERVAL**

This adjusts the interval that will be left between data blocks when bulk data is transmitted. You can set the interval in 1 millisecond units over a range of 0–300 milliseconds (default= 0).

3 Move the cursor to the button for the bulk data that you want to transmit, and press the [ENTER] key.

The corresponding button will be turned on, and will be selected for bulk dump.

4 If you selected a SCENE MEM.–REMOTE button, move the cursor to the numerical box at the right of the button, and use the [DATA/JOG] dial to select the internal settings that you want to transmit.



*If you move the cursor to the ALL button located at the lower left of CATEGORY and press the [ENTER] key, all settings that can be bulk-dumped will be selected.*

5 Put your MIDI sequencer in record-ready mode.



*When recording bulk data on your MIDI sequencer, make sure that the MIDI Thru function (sometimes called “Patch Thru” or “MIDI Echo”) of your MIDI sequencer is turned off. If this function is on, the bulk data transmitted from the AW4416 will be immediately sent back to the AW4416, causing malfunctions.*

6 Move the cursor to the TRANSMIT button, and press the [ENTER] key.

The bulk dump will begin. While the bulk dump is occurring, a popup window will appear, indicating the current state of progress.



You can abort the bulk dump by pressing the [ENTER] key while the popup window is displayed.



- If an error occurs during the bulk dump, try increasing the INTERVAL setting to leave a longer pause between the data blocks that are transmitted.
- The time required for executing the bulk dump will depend on the category that is selected and on the content of the data. Particularly in the case of auto-mix, a significantly long time may be required depending on the amount of data that is recorded.

7 To receive previously-stored bulk data, press the [MIDI] key → [F1] (MIDI Setup 1) key.

The MIDI screen MIDI Setup 1 page will appear.

8 Move the cursor to the BULK area RX (Receive) button, and press the [ENTER] key.

The RX button will be turned on, and the AW4416 will be ready to receive bulk data.

MIDI SETUP 1				
	TX	RX	OMNI	ECHO
PROGRAM CHANGE	OFF	OFF	OFF	OFF
CONTROL CHANGE	OFF	OFF	OFF	OFF
PARAMETER CHANGE	OFF	OFF	.	OFF
BULK	.	ON	.	.

9 Make sure that the transport of the AW4416 is stopped, and transmit bulk data from your MIDI sequencer.

When all bulk data has been received, the corresponding settings and/or libraries will be updated.

#### [Reference pages]

Details on the Bulk Dump page → P.31

## Newly added MIDI Remote function

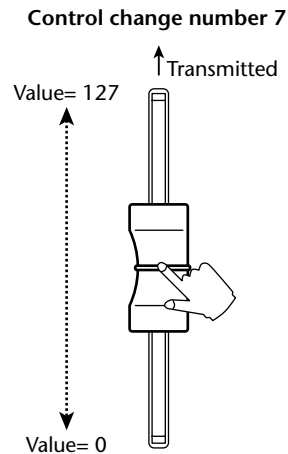
The new MIDI Remote function lets you use faders 1–16 and [ON] keys 1–16 to control a connected external MIDI device.

### ■ About the MIDI Remote function

“MIDI Remote” is a function that lets you assign specific MIDI messages to faders 1–16 and [ON] keys 1–16, so that these messages will be transmitted when you operate the corresponding fader or [ON] key. The following types of messages can be assigned.

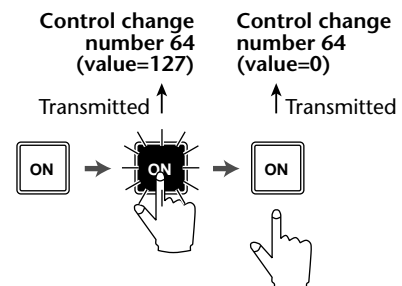
#### ● Messages that can be assigned to faders

MIDI messages whose value changes in a range of 0–127 can be assigned to faders. For example if you assign control change #7 (Volume) to a fader and specify a range of 0–127 as the control change value, operating the fader will control the volume of a MIDI tone generator.

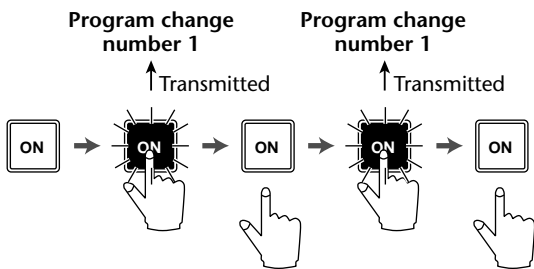


#### ● Messages that can be assigned to [ON] keys

MIDI messages whose value switches to 0 or 127 can be assigned to [ON] keys. For if you assign control change #64 (Hold) to an [ON] key and make settings so that the value switches to either 0 or 127, turning the [ON] key on (lit) will transmit control change #64 with a value of 127 (Hold On), and turning it off (dark) will transmit control change #64 with a value of 0 (Hold Off).



You can also make settings so that a MIDI message with a fixed value is transmitted only when the [ON] key is turned on (lit). For example if you assign a program change #1 message, the corresponding program change message will be transmitted each time you turn the [ON] key on.



### ■ Using the MIDI Remote function with the default settings

With the default settings, MIDI messages are already assigned to some of the faders and [ON] keys. Here's how to use the MIDI Remote function with the default settings.

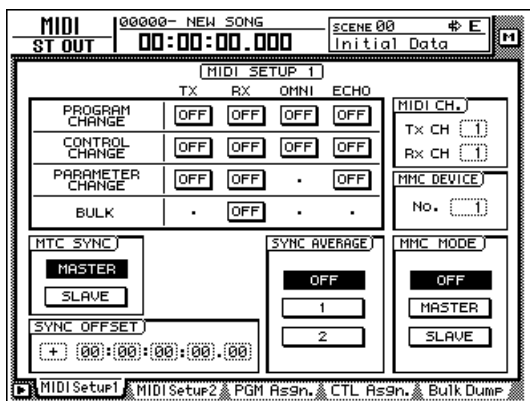


**Tip!** For the MIDI messages that are assigned by default to the faders/[ON] keys by the MIDI Remote function, refer to page 35.

**1** Connect the AW4416's MIDI OUT/THRU connector to the MIDI IN connector of the external device.

At this time, make sure that the MIDI Setup 2 page OUT/THRU switch is set to "OUT."

**2** Press the [MIDI] key. The MIDI screen will appear.

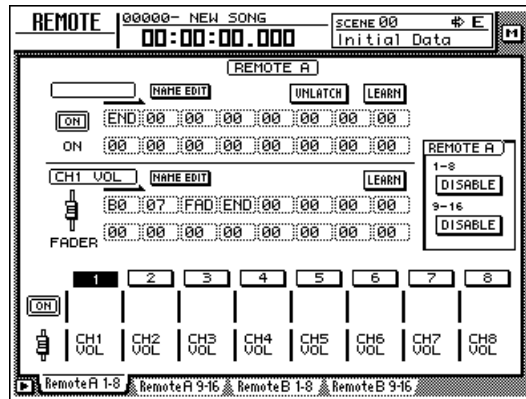


**3** Hold down the [SHIFT] key and press the [F1] key to switch tabs.

In the various pages of the MIDI screen, the lower part of the display will show the tabs as long as you hold down the [SHIFT] key, as shown below.



In this state, you can press the [F1] key to access the REMOTE screen.



The mixing layer that had been selected until now will be cancelled, and a special mixing layer called Remote A/Remote B will be in effect. Remote A and Remote B are mixing layers that let you use faders 1–16 and [ON] keys 1–16 to transmit MIDI messages. Settings and operations are performed in the following four pages.

● **Remote A 1-8**

Assign MIDI messages to Remote A faders 1–8/[ON] keys 1–8

● **Remote A 9-16**

Assign MIDI messages to Remote A faders 9–16/[ON] keys 9–16

● **Remote B 1-8**

Assign MIDI messages to Remote B faders 1–8/[ON] keys 1–8

● **Remote B 9-16**

Assign MIDI messages to Remote B faders 9–16/[ON] keys 9–16

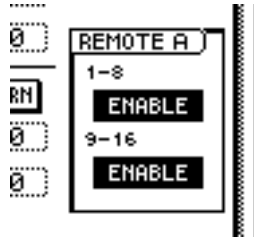
**4** Press one of the [F1]–[F4] keys to select the mixing layer that you want to operate.

If you press the [F1]/[F2] keys, you will be able to operate Remote A. If you press the [F3]/[F4] keys, you will be able to operate Remote B. (In the example screen shown above, the Remote A 1-8 page is selected.)

**5** In the Remote A area in the right side of the display, move the cursor to the DISABLE buttons for 1-8/9-16, and press the [ENTER] key.

The button indication will change to "ENABLE," and the corresponding faders/[ON] keys can be used for the MIDI Remote function.

If you set both the 1-8 and the 9-16 buttons to "ENABLE," remote operations can be performed using all faders 1–16/[ON] keys 1–16 of the same mixing layer.



- 6** Operate faders 1–16/[ON] keys 1–16.  
The MIDI messages assigned to the corresponding fader/[ON] key will be transmitted from the MIDI OUT/THRU connector.



- Even when the REMOTE screen is displayed, the function of the faders and [ON] keys of the stereo output channel will not change.
- The Remote A/Remote B fader positions and [ON] key on/off status can be saved in a scene.
- Fader and [ON] key operations can also be recorded in automix. By using automix to record operations separately in each page, you can perform up to 32 channels of fader/[ON] key operations.

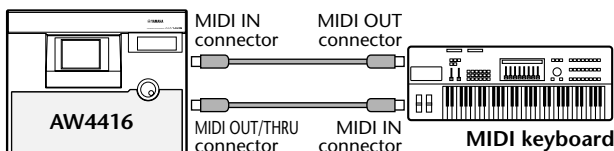
## Assigning a MIDI message to a fader

The MIDI Remote function lets you assign a MIDI message of up to 16 bytes to each fader/each [ON] key.

A message can be assigned in one of two ways. You can input the desired message manually, one byte at a time. Or you can capture a MIDI message received from the MIDI IN connector/TO HOST connector/option slot, and assign it either without change or after editing it.

Here we will explain how to transmit a modulation wheel message (control change #1) from a synthesizer to the AW4416, and assign it to a desired fader.

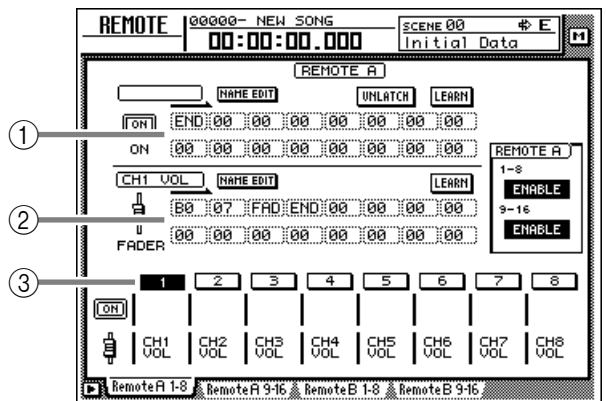
- 1** Connect the MIDI OUT/THRU connector of the AW4416 to the MIDI IN connector of your synthesizer, and the MIDI IN connector of the AW4416 to the MIDI OUT connector of your synthesizer.



- In the MIDI Setup 1 page, make sure that the ECHO button in the CONTROL CHANGE area is turned off. If the ECHO button is turned on, control changes received from the external device will be re-transmitted back to the external device, causing malfunctions.
- In the MIDI Setup 2 page, make sure that the MIDI OUT/THRU switch is set to OUT.
- The TX, RX, and OMNI buttons in the CONTROL CHANGE area of the MIDI Setup 1 page will not affect MIDI Remote operations.

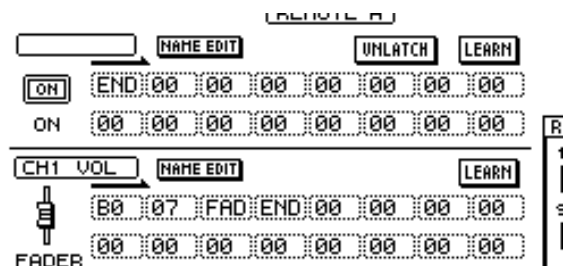
- 2** Press the [MIDI] key.
- 3** Hold down the [SHIFT] key and press the [F1] key to access the REMOTE screen.
- 4** Press one of the [F1]–[F4] keys to display the fader/[ON] key to which you want to assign a MIDI message.

The Remote A 1-8 page is selected in this example.



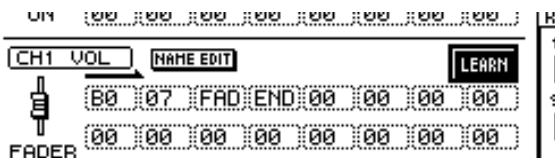
- ① MIDI message assigned to the [ON] key
- ② MIDI message assigned to the fader
- ③ Currently selected channel number

- 5** Press the [SEL] key for the channel to which you want to assign a MIDI message.  
Areas ① and ② will show the MIDI messages that are assigned to the fader and [ON] key of that channel.



**6** Move the cursor to the LEARN button located above the message display area (fader), and press the [ENTER] key.

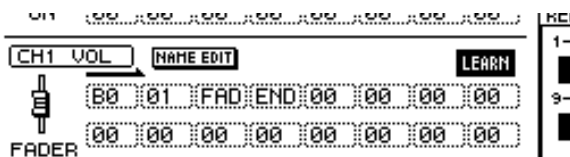
The fader LEARN button will be turned on. While this button is on, channel messages (note-on/off, control change, program change, etc.) or system exclusive messages received from an external device will be captured automatically, and input in the MIDI message display area of the fader.



- If more than one MIDI message is received while the LEARN button is on, the last-received MIDI message will be used.
- By holding down the [SHIFT] key and pressing the [F4] key, you can directly switch the fader LEARN button on/off.

**7** Operate the modulation wheel of your synthesizer.

The captured message (control change #1) will be input into the fader message area. If a control change is received, the byte corresponding to the variable value of 0–127 (the third byte) will be input as “FAD.” This indicates that the fader can be used to vary the value in a range of 0–127.



- When a MIDI message has been captured, a value of “END” will automatically be input at the byte that follows the last-received MIDI message.
- If you use the LEARN button to capture a channel message, the MIDI channel of the captured message will be used without change as the transmission MIDI channel.



- If “FAD” is not specified within the MIDI message, operating the fader will not transmit the MIDI message.
- If a MIDI message that is longer than 16 bytes is received, only the first 16 bytes will be input. In this case, the “END” value will not be input, meaning that no MIDI message will be transmitted when you operate the fader.

**8** Make sure that a MIDI message has been input, and then move the cursor to the fader LEARN button and press the [ENTER] key to turn the LEARN button off.

You can turn this off directly by holding down the [SHIFT] key and pressing the [F4] key.

**9** Make sure that the Remote function of the currently-displayed page is enabled (ENABLE), and operate the fader to which the MIDI message was assigned.

As you raise and lower the fader, control changes will be transmitted with values varying in the range of 0–127.

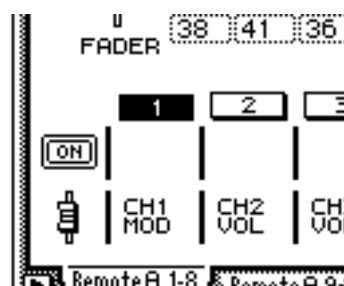
**10** If you want to assign a name to the fader to which the MIDI message was assigned, move the cursor to the NAME EDIT button for the fader, and press the [ENTER] key.

The NAME EDIT popup window will appear.



**11** Use the character palette to input a name, and move the cursor to the OK button and press the [ENTER] key.

The name you input will be displayed below the channel button located in the lower part of the display.



- The edited content of the REMOTE screen is saved as part of the song.
- If you want to return the settings of the displayed page to the factory condition, hold down the [SHIFT] key and press the [F5] key.



## ■ Assigning a MIDI message to an [ON] key

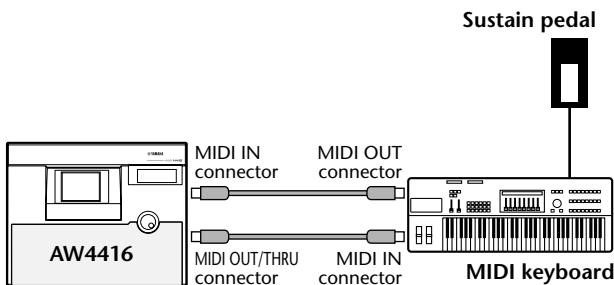
You can assign a desired MIDI message to an [ON] key so that the message will be transmitted when you press the key.

As an example, we will explain how you can use a sustain pedal connected to your synthesizer to assign a Hold-on message (control change #64 with a value of 127) and Hold-off message (control change #64 with a value of 0) to [ON] key 1 of the Remote A 1-8 page.

- 1 Connect a sustain pedal to your synthesizer, the MIDI OUT/THRU connector of the AW4416 to the MIDI IN connector of your synthesizer, and the MIDI IN connector of the AW4416 to the MIDI OUT connector of your synthesizer.



- In the MIDI Setup 1 page, make sure that the ECHO button in the CONTROL CHANGE area is turned off. If the ECHO button is turned on, control changes received from the external device will be re-transmitted back to the external device, causing malfunctions.
- In the MIDI Setup 2 page, make sure that the MIDI OUT/THRU switch is set to OUT.
- The TX, RX, and OMNI buttons in the CONTROL CHANGE area of the MIDI Setup 1 page will not affect MIDI Remote operations.

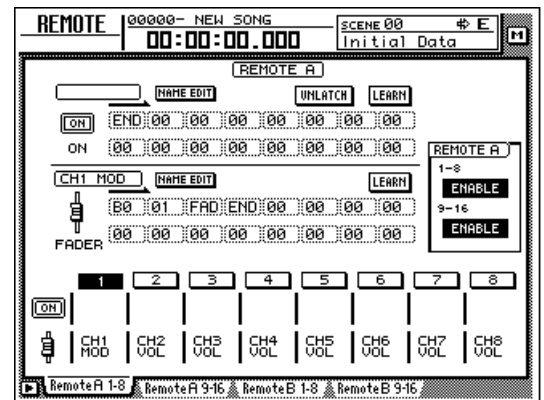


- 2 Press the [MIDI] key.

- 3 Hold down the [SHIFT] key and press the [F1] key to access the REMOTE screen.

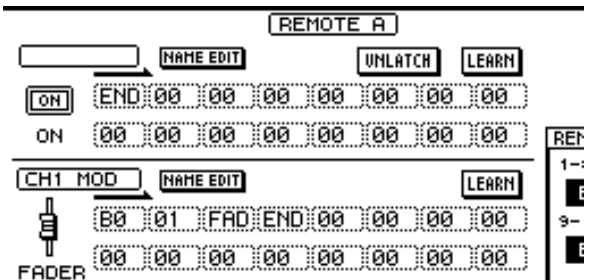
- 4 Press one of the [F1]–[F4] keys to display the fader/[ON] key to which you want to assign a MIDI message.

The Remote A 1-8 page is selected in this example.

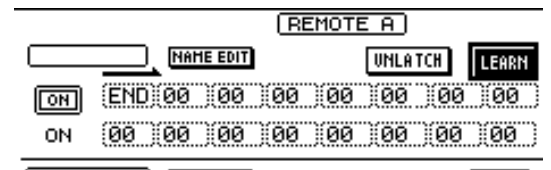


- 5 Press the [SEL] key for the channel to which you want to assign a MIDI message.

The display area will show the MIDI messages that are currently assigned to the fader and [ON] key of that channel.



- 6 Move the cursor to the LEARN button located above the message display area ([ON] key), and press the [ENTER] key.

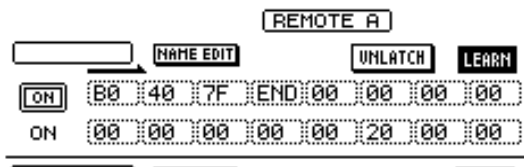


- If more than one MIDI message is received while the LEARN button is on, the last-received MIDI message will be used.
- By holding down the [SHIFT] key and pressing the [F3] key, you can directly switch the [ON] key LEARN button on/off.

## 7 Operate the sustain pedal connected to your synthesizer.

A control change #64 (Hold-on) message with a value of 127 (hexadecimal 7F) will be input in the [ON] key message area.

In this message, the first value in the boxes extending toward the right (i.e., the first byte) is the MIDI channel, the second is the control number, and the third byte is the actual value of the message.



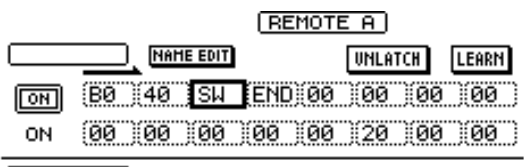
## 8 Turn off the LEARN button, and take your foot off of the sustain pedal.



*If you take your foot off the sustain pedal before turning off the LEARN button, a control change #64 with a value of 0 (hexadecimal 00) will be input in the MIDI message display area. However even in this case, the following steps will not be affected.*

## 9 Move the cursor to the location of the third byte, and use the [DATA/JOG] dial to change the value to "SW."

The byte whose value was set to "SW" will be transmitted as 127 (hexadecimal 7F) when the [ON] key is turned on (lit), and as 0 (hexadecimal 00) when the [ON] key is turned off (dark).



- It is also possible to input an entire MIDI message manually in this way. In this case, be sure to specify "END" at the end of the MIDI message.
- If you want a specific MIDI message to be transmitted each time you press [ON] (for example if you have assigned a program change), it is not necessary to input the "SW" value.



*If you input a MIDI message manually, it is possible to input an inappropriate or invalid message. If such a MIDI message is transmitted to a connected external device, the device may malfunction. Please use caution.*

## 10 Make sure that the Remote function of the currently-displayed page is enabled (ENABLE), and operate the [ON] key to which the MIDI message was assigned.

When you press the [ON] key, the key LED will light and a Hold-on message will be transmitted. When you release the [ON] key, the key LED will go dark and a Hold-off message will be transmitted.



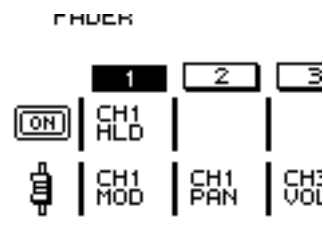
*It is also possible to change the operation of the [ON] key so that the on/off status is switched each time you press the key. For details refer to the explanation of the LATCH/UNLATCH button on page 34.*

## 11 If you want to assign a name to the [ON] to which the MIDI message was assigned, move the cursor to the NAME EDIT button for the [ON] key, and press the [ENTER] key.

The NAME EDIT popup window will appear.

## 12 Use the character palette to input a name, and move the cursor to the OK button and press the [ENTER] key.

The name you input will be displayed below the channel button located in the lower part of the display.



*The edited content of the REMOTE screen is saved as part of the song.*

### [Reference pages]

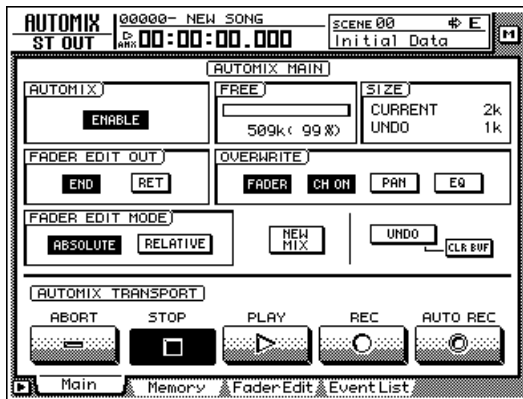
Details on the Remote A 1-8/Remote A 9-16/Remote B 1-8/Remote B 9-16 pages → P.33

## Additional functionality for Automix

Due to the addition of the MIDI Remote function, MIDI Remote operations can now be recorded/edited in the automix.

### ■ Recording/playing back MIDI Remote operations in automix

- 1 In the AUTOMIX screen Main page, make sure that the OVERWRITE area FADER button (if you want to record fader operations) or the CH ON button (if you want to record [ON] key operations) is turned on.



- 2 Put the automix in record-ready mode.
- 3 Access the REMOTE screen, and press one of the [F1]–[F4] keys to select the mixing layer (Remote A or Remote B) that you want to operate.

Remote A operations will be recorded if you press the [F1]/[F2] keys, and Remote B operations will be recorded if you press the [F3]/[F4] keys.

- 4 Make sure that the two buttons (1-8, 9-16) of the REMOTE A area or REMOTE B area are set to ENABLE.



*If the 1-8 or 9-16 button reads DISABLE, the corresponding faders and [ON] keys will have no effect.*

- 5 Begin playing back the song.
- 6 Use the [SEL] keys to select the fader or [ON] key that you want to record, and operate the fader/[ON] key.

While the REMOTE screen is displayed, operating the faders or [ON] keys will cause the operations to be recorded in automix as MIDI Remote events.

- 7 Stop the song.

When you defeat automix recording mode and play back the song from the beginning, the MIDI Remote operations you recorded will be reproduced.

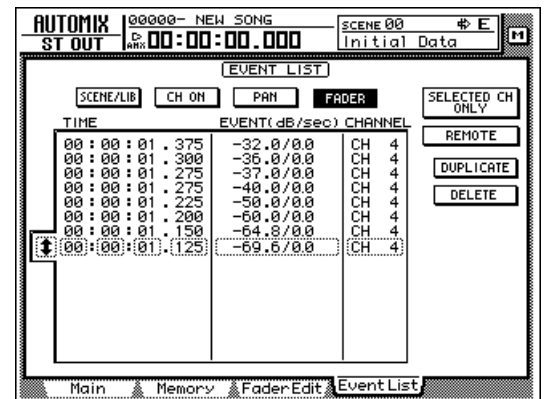


*If necessary, you can switch REMOTE pages and use another mixing layer (REMOTE A or REMOTE B) to record additional MIDI Remote operations onto the automix. By using this method, you can record up to 32 channels of fader/[ON] key operations.*

### ■ Off-line editing of the recorded automix

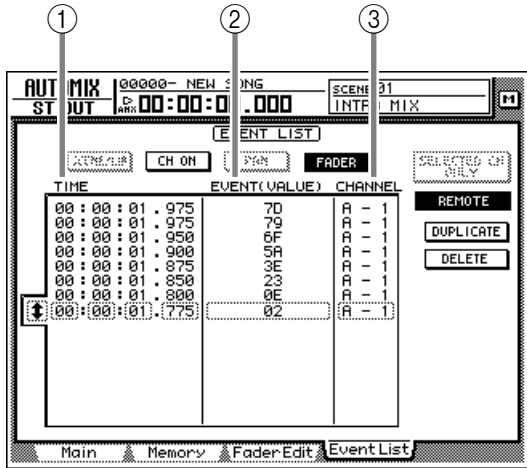
- 1 Access the AUTOMIX screen Event List page.
- 2 In the OVERWRITE area, move the cursor to the FADER button (if you want to edit fader operations) or the CH ON button (if you want to edit [ON] key operations), and press the [ENTER] key.

Only the fader operations or [ON] key operations will be displayed in the event list. (However at this stage, MIDI Remote events will not be displayed.)



**3** Move the cursor to the REMOTE button located at the right of the event list, and press the [ENTER] key.

The event list will display only the MIDI Remote events (fader operations or [ON] key operations). In this screen, each column of the event list displays the following information.



**① TIME**

This indicates the time at which the event is recorded, in units of hours/minutes/seconds/milliseconds. (The minimum unit is 25 milliseconds.)

**② EVENT (VALUE)**

If the OVERWRITE area FADER button is on, fader values will be displayed in hexadecimal form. If OVERWRITE area CH ON button is on, the on/off status of the [ON] keys will be displayed.

**③ CHANNEL**

This shows the mixing layer (Remote A/Remote B) for that event, and the channel (1–16) of the fader/[ON] key.

**4** Move the cursor to the TIME, EVENT (VALUE), and CHANNEL columns of the event that you want to edit, and turn the [DATA/JOG] dial to edit the value.

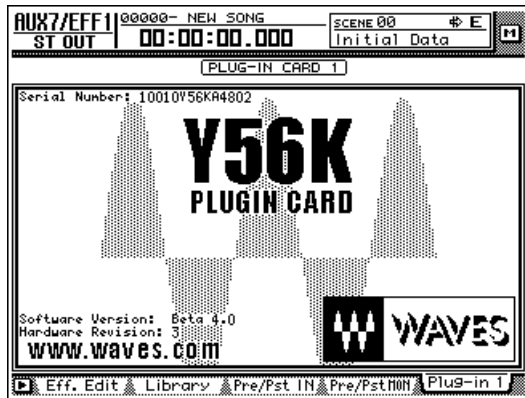
**[Reference pages]**

For details on off-line automix editing → “Operation Guide” P.225

For details on the AUTOMIX page Event List page → “Reference Guide” P.122

# Mini YGDAI plug-in system compatible I/O card operations

Plug-In 1 and Plug-In 2 pages have been added to display parameters for I/O cards compatible with the Mini YGDAI plug-in system. To access the Plug-In 1 page, press the [AUX7] → [F5] key. To access the Plug-In 2 page, press the [AUX8] → [F5] key.



The content and operation of the Plug-In 1/Plug-In 2 pages will depend on the type of I/O card that is installed. The screen shown here is of a prototype Y56K DSP plug-in card manufactured by WAVES Corporation. For details refer to the manual for your I/O card.

For details on the types of I/O cards compatible with the Mini YGDAI plug-in system, please contact a Yamaha information center, distributor, or the following Internet URL.

<http://www.aw4416.com/>



**In the Plug-In 1/Plug-In 2 pages you can use BACKUP and RESTORE as additional functions. For details refer to the sections below.**

## Backing up an I/O card

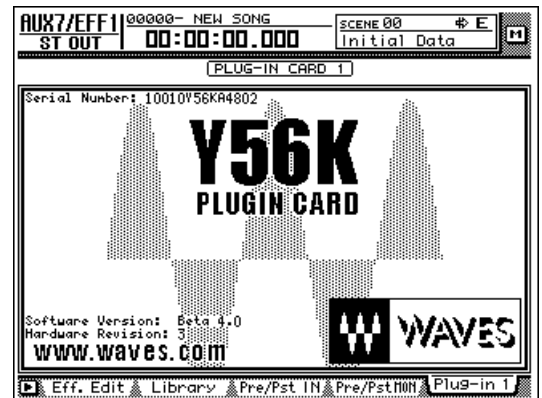
If one or two I/O cards compatible with the Mini YGDAI plug-in system are installed, you can use two memory banks (MEM.BANK 1 / MEM.BANK 2) to store I/O card settings.

Scene changes on the AW4416 are linked to changes of the I/O card settings, and when you store the scene (or save the song), settings of the I/O card installed in option slot 1 will be automatically backed-up to MEM.BANK 1, and settings of the I/O card installed in option slot 2 will be automatically backed-up to MEM.BANK 2.

However if necessary, you can also perform the backup operation manually. This method allows the settings of the I/O card in option slot 1 to be backed up to MEM.BANK 2 (or vice versa). The procedure is as follows.

- 1 Press the [AUX7] key → [F5] key (or [AUX8] key → [F5] key) to access the Plug-In 1 page (or Plug-In 2 page).

Access the Plug-In 1 page if you want to back up the I/O card installed in option slot 1, or access the Plug-In 2 page if you want to back up the I/O card installed in option slot 2.



- 2 Hold down the [SHIFT] key and press the [F1] (Backup) key.

A popup window will appear, allowing you to back up the I/O card settings.



- 3 Move the cursor to either the MEM.BANK 1 or MEM.BANK 2 button, and press the [ENTER] key.

Select either MEM.BANK 1 or MEM.BANK 2 to choose the backup-destination memory bank (1 or 2). If the memory bank already contains data, the bank name will be displayed. If it does not contain data, the display will indicate "NO DATA!"



**The bank name is assigned automatically according to the type of I/O card installed. It is not possible for you to edit this name.**

- 4 To execute the backup, move the cursor to the OK button and press the [ENTER] key.

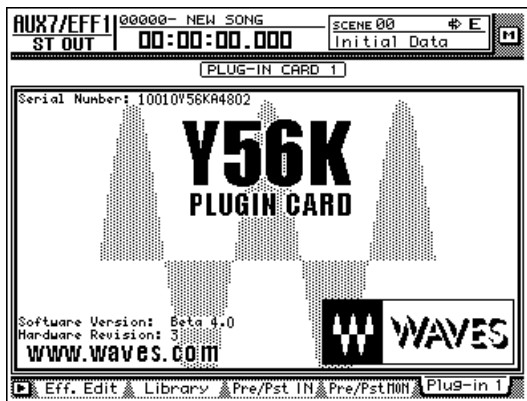
The settings of the I/O card will be saved in the current song.

## Restoring to an I/O card

When an AW4416 scene is recalled (or when a song is loaded), the MEM.BANK 1 settings are automatically restored to the I/O card in option slot 1, and the MEM.BANK 2 settings to the I/O card in option slot 2. However if necessary, you can also perform the restore operation manually. This method allows the MEM.BANK 1 settings to be restored to the I/O card of option slot 2 (or vice versa). The procedure is as follows.

- 1 Press the [AUX7] → [F5] key or the [AUX8] key → [F5] key to access the Plug-In 1 page or Plug-In 2 page.

Access the Plug-In 1 page if you want to restore to the I/O card installed in option slot 1, or access the Plug-In 2 page if you want to restore to the I/O card installed in option slot 2.



- 2 Hold down the [SHIFT] key and press the [F2] (Restore) key.

A popup window will appear, allowing you to restore the I/O card settings.



- 3 Move the cursor to either the MEM.BANK 1 or MEM.BANK 2 button, and press the [ENTER] key.

Select either MEM.BANK 1 or MEM.BANK 2 to choose the restore-source memory bank (1 or 2). If the memory bank already contains data, the bank name will be displayed. If it does not contain data, the display will indicate "NO DATA!"



*At this time you must select a memory bank that contains data for an I/O card of the same type as the restore-destination. If the I/O card is of a different type, the Restore operation cannot be performed.*

- 4 To execute the Restore operation, move the cursor to the OK button and press the [ENTER] key.

The saved settings will be loaded into the I/O card.

# Reference

This section explains all functions of the pages that were added in AW4416 version 2.0.

## QUICK REC screen

### Quick Rec 2 page

#### Visually patching input sources to tracks

##### Function

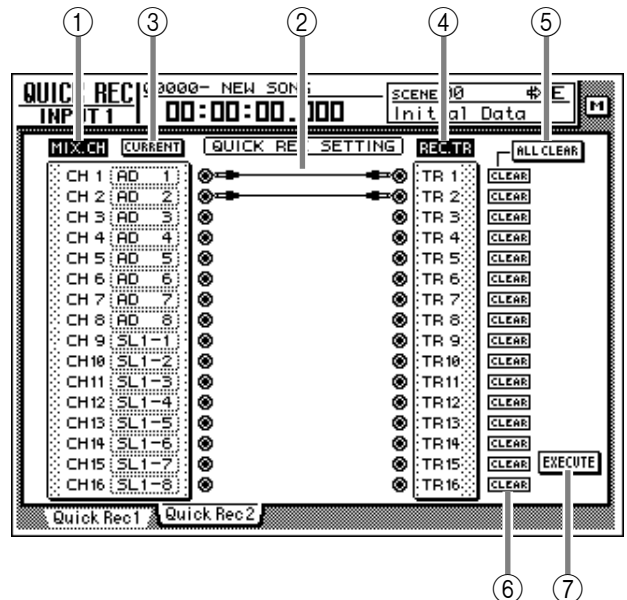
Individually patch 16 input sources to audio tracks 1–16, and make settings for simultaneous recording in one operation.

##### Key operation

- [QUICK REC] key → [F2] (Quick Rec 2) key
- Repeatedly press the [QUICK REC] key until the screen shown at the right appears.


##### Mouse operation

M button → QREC button → Quick Rec 2 tab



##### Screen functions

#### ④ MIX.CH (Mixer channels)

This column shows the type of input sources assigned to input channels 1–16. The  (jack) symbol displayed at the right of this area indicates the direct output of each input channel.

When you move the cursor to the jack symbol and press the [ENTER] key, the input channel for that row will be selected for operations, and will be highlighted. To cancel your selection, press the [ENTER] key once again.

To change the input source assignment, move the cursor to the numerical box for each input channel and turn the [DATA/JOG] dial. The following input sources can be assigned.

- AD 1–AD 8..... Input signals from the INPUT 1–8 jacks
- SL1-1–SL1-8 ... Inputs 1–8 of an I/O card (slot 1)
- SL2-1–SL2-8 ... Inputs 1–8 of an I/O card (slot 2)

- DIN L/DIN R..... L/R channels of the DIGITAL STEREO IN jack
- SMP 1–SMP 8..... Sampling pads 1–8
- MET..... Internal metronome

#### ⑤ Patch cables

This area shows virtual patch cables that connect the direct outputs of input channels 1–16 (MIX.CH column) to recorder inputs 1–16 (REC.TR column). To connect a patch cable, move the cursor to a MIX.CH jack and press the [ENTER] key. Then move the cursor to a REC.TR jack and press the [ENTER] key. (You can make the same connection by performing these steps in the opposite order.)

Use the CLEAR button (⑥) to defeat an individual patch cable, or the ALL CLEAR button (⑤) to defeat all patch cables.



- You may connect the direct output of a channel to more than one track. However you cannot connect more than one direct output to the same track.
- A maximum of 16 patch cables can be connected. If you have connected all 16, you will not be able to further modify the routing unless you disconnect one of the cables.

### ⑥ CURRENT/FLAT button

This button selects whether the corresponding input channels will be reset to the default settings when Quick Rec is executed. Move the cursor to the button and press the [ENTER] key to switch between the following two settings.


#### ● FLAT

When you execute Quick Rec, channel library 01 will be recalled to input channels to which an on-screen patch cable is connected, restoring the parameters to their default settings.

#### ● CURRENT

Input channel settings will not change when you execute Quick Rec; only the patching will change.

### ⑦ REC.TR (Recorder tracks)

This column shows the connection status of tracks 1–16 (Tr 1–16). The  (jack) symbol displayed at the left of this area indicates the input for each track.

When you move the cursor to a jack symbol and press the [ENTER] key, that track will be highlighted, indicating that it is selected for operations. You can cancel the selection by pressing the [ENTER] key once again.

### ⑧ ALL CLEAR button

This button clears all patch cable connections.

### ⑨ CLEAR buttons

These buttons clear the patch cable connected to the corresponding track.

### ⑩ EXECUTE button

When you move the cursor to this button and press the [ENTER] key, the patching settings specified in the Quick Rec 2 page will take effect.

At this time, the input channels/tracks to which patch cables are connected will change as follows.

- The input patch and recorder input settings will change according to the settings of the Quick Rec 2 page.
- Assignments to the stereo bus will be forcibly cancelled for all input channels to which a patch cable is connected.
- Channel library number 01 will be recalled for each monitor channel of a track to which a patch cable is connected, resetting it to the default state.
- All corresponding tracks will be set to record-ready mode.

- If the CURRENT/FLAT button is set to FLAT, settings will be initialized for all input channels to which a patch cable is connected.



- Input channels/tracks (monitor channels) to which no patch cable is connected in the Quick Rec 2 page will not be affected in any way.
- When you access the Quick Rec 2 page, the settings you made most recently will be displayed. However if you manually modified the input patching or recorder input patching in another screen, it is possible that the patch cable display will not match the actual signal flow.



# UTILITY screen

## CTRL Key Asgn. page

### Assign functions to the [CTRL] key + function keys

#### Function

Select the function that will be executed when you hold down the [CTRL] key (right [SHIFT] key) and press an [F1]–[F5] key.

#### Key operation

- [UTILITY] key → [F5] (CTRL KeyAsgn.) key
- Repeatedly press the [UTILITY] key until the screen shown at right appears

#### Mouse operation

M button → UTIL button → CTRL KeyAsgn. tab

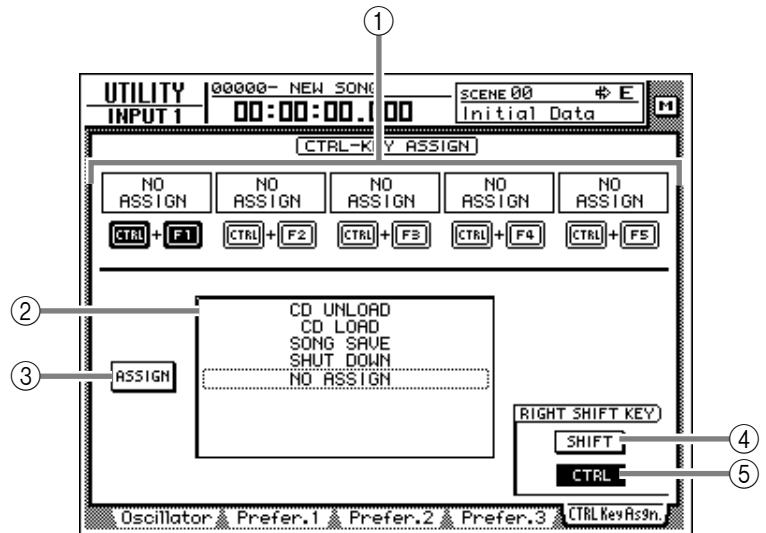
#### Screen functions

##### ① CTRL+F1–CTRL+F5

This area displays the currently-assigned function for each combination of CTRL key + [F1] key – CTRL key + [F5] key. When you move the cursor to the desired combination and press the [ENTER] key, the graphic displaying the corresponding [CTRL] key and [F1]–[F5] key combination will be highlighted, selecting it as the destination for function assignment.

##### ② Function list

In this area you can specify the function to be assigned to the key combination selected in ①. The row enclosed by the dotted frame indicates the currently selected function. The following functions can be assigned.



Display	Function
NO ASSIGN	No function assigned
SHUT DOWN	Display the SONG screen/Shut Down screen (shortcut to shutdown) (*)
SONG SAVE	Display the SONG screen/Song List page, and move the cursor to the SAVE button (shortcut to save the current song) (*)
CD LOAD	Close the tray of the CD-RW drive, and load the CD (*)
CD UNLOAD	Open the tray of the CD-RW drive (*)
AUTOMIX [Enable/Disable]	Turn automix on (Enable) or off (Disable) (*)
MTC SYNC [Master/Slave]	Switch the AW4416 between MTC master (Master) and MTC slave (Slave) (*)
REMOTE LAYER	Switch the mixing layer to Remote
TC DISPLAY	Switch the time counter display method between "SEC" → "TC" → "MES"
SCENE RECALL No##	Recall the desired scene number xx (use the [DATA/JOG] dial to select xx)
DELAY [ON/OFF]	Switch the delay on/off for the currently selected channel
EQ [ON/OFF]	Switch the EQ on/off for the currently selected channel
DYN [ON/OFF]	Switch the dynamics processor on/off for the selected channel
PEAK HOLD [ON/OFF]	Switch peak hold on/off
OSCILLATOR [ON/OFF]	Switch the test tone oscillator on/off

\* Functions marked by an asterisk may not be executable depending on the operating state of the AW4416 (for example when the transport is running). In this case, an error message will appear at the bottom of the display.

**③ ASSIGN button**

This button executes the function assignment. When you move the cursor to this button and press the [ENTER] key, a popup window will appear, asking you for confirmation. Move the cursor to the OK button and press the [ENTER] key to execute the assignment.

**④ SHIFT button****⑤ CTRL button**

Use these two buttons to select the function of the [SHIFT] key at the right of the display. When the SHIFT button is on, the key will function as a [SHIFT] key, as usual. In this case the other items in the CTRL KeyAsgn. page will be unavailable (displayed in gray).

When the CTRL button is on, the [SHIFT] key at the right of the display will function as a [CTRL] key, and the other items in the CTRL KeyAsgn. page will be valid.



- 
- *While you hold down the [CTRL] key, the functions currently assigned to the [F1]–[F5] keys will appear at the bottom of the display.*
  - *If the CD-RW drive is not selected in a screen such as CD PLAY or MASTERING, the “CD LOAD” or “CD UNLOAD” function assigned to the [CTRL] key + function key will not be executed.*

# MIDI screen

## CTL Asgn. page

### Assigning parameters to control changes

#### Function

Assign AW4416 internal parameters to control change numbers (0–95, 102–119).

#### Key operation

- [MIDI] key → [F4] (CTL Asgn.) key (\*1)
- Repeatedly press the [MIDI] key until the screen shown at right appears.
  - \*1. From version 2.0, the tabs displayed at the bottom of the MIDI screen are divided into two groups. If the tabs shown at right are not displayed when you press the [MIDI] key, press the [SHIFT] key + [F1] (CHANGE TAB) key to switch tabs.

#### Mouse operations

M button → MIDI button → CTL Asgn. tab

#### Screen functions

- ① **CTL CHG No. (Control change number)**  
These are the control change numbers to which parameters can be assigned. Move the cursor to this column, and use the [DATA/JOG] dial to select the control change number (0–95, 102–119) to which you want to assign a parameter.



*Control change numbers 96–118 are used for specific purposes such as NRPN and RPN, and cannot be assigned to parameters.*

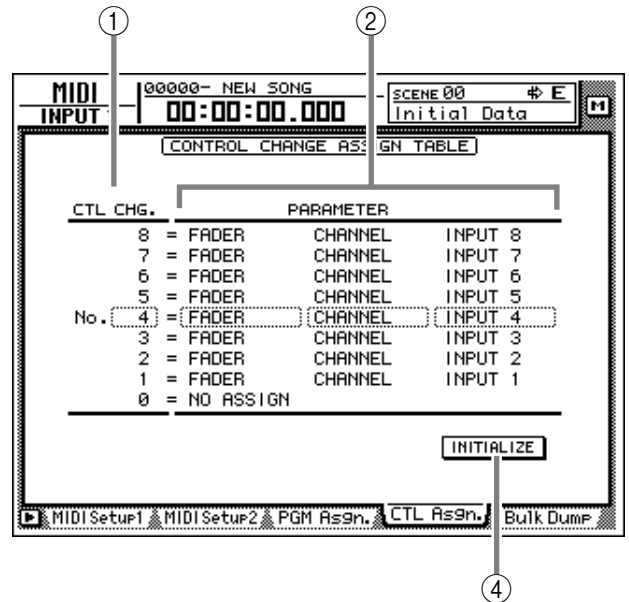
- ② **PARAMETER**  
This area shows the parameter that is assigned to each control change number. In the left column, select the desired parameter group, and in the center and right columns, select the desired values for that group.

For the parameters that can be assigned, refer to the table on page 28.

- ③ **INITIALIZE button**  
This button resets the control change number assignments to the default state. For the default settings, refer to the table on page 30.



*In order for control changes to actually be transmitted and received, the CONTROL CHANGE area TX/RX buttons must be turned on in the MIDI screen MIDI Setup 1 page.*

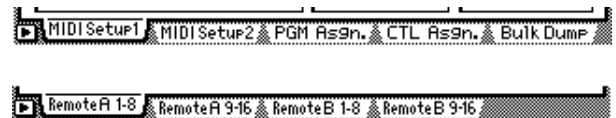


#### Additional functions in the CTRL Asgn. page

In the CTRL Asgn. page, holding down the [SHIFT] key will assign the following function to the [F1] key.



- **[F1] (CHANGE TAB) key**  
Switch between the following two sets of tabs.



- List of parameters that can be assigned

Parameter 1	Parameter 2	Parameter 3	Content
	NO ASSIGN		No parameter assigned

Parameter 1	Parameter 2	Parameter 3	Content
FADER	CHANNEL		Operate the fader of the specified channel.
		INPUT 1–24	Input channel 1–24
		MONI 1–16	Monitor channel 1–16
		RETURN 1/2	Return channel 1/2
	MASTER		Operate the stereo output channel fader or the AUX bus 1–8/bus 1–8 master level.
		ST OUT	Stereo output channel
		AUX 1–8	AUX bus 1–8
		BUS 1–8	Bus 1–8
	AUX 1 SEND   AUX 8 SEND		Operate the send level sent from the specified channel to AUX bus 1–8. Parameter 2 specifies the send destination bus, and parameter 3 specifies the channel.
		INPUT 1–24	Input channel 1–24
MONI 1–16		Monitor channel 1–16	
RETURN 1/2		Return channel 1/2	

Parameter 1	Parameter 2	Parameter 3	Content
ON			Control the on/off status of the channel [ON] key. Use parameters 2 and 3 to specify the desired channel.
	CHANNEL	INPUT 1–24	Input channel 1–24
		MONI 1–16	Monitor channel 1–16
		RETURN 1/2	Return channel 1/2
	MASTER	ST OUT	Stereo output channel

Parameter 1	Parameter 2	Parameter 3	Content
PHASE			Switch the phase (normal/reverse) of the specified channel.
	NOM/REV	INPUT 1–24	Input channel 1–24
		MONI 1–16	Monitor channel 1–16
		RETURN 1/2	Return channel 1/2

Parameter 1	Parameter 2	Parameter 3	Content
PRE/POST	AUX 1 SEND   AUX 8 SEND		Switch the pre-fader/post-fader settings of the signal that is sent from each channel to AUX buses 1–8. Use parameter 2 to specify the bus, and parameter 3 to select the desired channel.
		INPUT 1–24	Input channel 1–24
		MONI 1–16	Monitor channel 1–16
		RETURN 1/2	Return channel 1/2

Parameter 1	Parameter 2	Parameter 3	Content
DELAY			Control the delay of each channel. Use parameter 2 to select the parameter to be controlled, and parameter 3 to select the desired channel.
	ON/OFF		Delay on/off
	TIME HIGH		Delay time ... (1)
	TIME LOW		Delay time ... (2)
		INPUT 1–24	Input channel 1–24
		MONI 1–16	Monitor channel 1–16
		RETURN 1/2	Return channel 1/2



- Parameters that are divided into (1) and (2) use two control changes in conjunction. For example in order to operate the dynamics processor HOLD parameter, you must assign “REL/HOLD H” and “REL/HOLD L” to separate control changes.
- When using control changes to operate parameters, it is not possible to switch the HIGH band EQ and LOW band EQ parameters between shelving and low-pass/high-pass filter.

Parameter 1	Parameter 2	Parameter 3	Content
EQ			Control the channel EQ and attenuation. Use parameter 2 to select the type of parameter that you want to control, and use parameter 3 to specify the desired channel.
	ON/OFF		EQ on/off
	Q LOW		Q of the LOW band EQ
	F LOW		F (frequency) of the LOW band EQ
	G LOW		G (gain) of the LOW band EQ
	Q L-MID		Q of the L-MID band EQ
	F L-MID		F (frequency) of the L-MID band EQ
	G L-MID		G (gain) of the L-MID band EQ
	Q H-MID		Q of the H-MID band EQ
	F H-MID		F (frequency) of the H-MID band EQ
	G H-MID		G (gain) of the H-MID band EQ
	Q HIGH		Q of the HIGH band EQ
	F HIGH		F (frequency) of the HIGH band EQ
	G HIGH		G (gain) of the HIGH band EQ
	ATT.		Attenuation
		INPUT 1–24	Input channel 1–24
		MONI 1–16	Monitor channel 1–16
		RETURN 1/2	Return channel 1/2
		ST OUT	Stereo output channel

Parameter 1	Parameter 2	Parameter 3	Content	
DYNAMICS			Control the dynamics processor of a channel. Parameter 2 selects the dynamics processor parameter that will be controlled, and parameter 3 selects the channel.	
	ON/OFF		Dynamics processor on/off	
	THRESHOLD		THRESHOLD	
	ATTACK		ATTACK	
	GAIN/RANGE		GAIN or RANGE	
	RELEASE/HLD H		RELEASE ... (1) or HOLD H	
	RELEASE/HLD L		RELEASE ... (1) or HOLD L	
	RAT/DEC H		RATIO, or DECAY ... (1)	
	K/DEC L/WIDTH		RATIO, DELAY ... (2), or WIDTH	
			INPUT 1–24	Input channel 1–24
			MONI 1–16	Monitor channel 1–16
		RETURN 1/2	Return channel 1/2	
		ST OUT	Stereo output channel	

Parameter 1	Parameter 2	Parameter 3	Content
EFFECT			Control the parameters of internal effect 1/2. Use parameter 2 to select effect 1 or 2, and use parameter 3 to select the desired effect parameter.
	EFFECT1 H	PARAM 1–15	Parameter number 1–15 for internal effect 1 ... (1)
	EFFECT1 L	PARAM 1–15	Parameter number 1–15 for internal effect 1 ... (2)
	EFFECT1	MIX BAL	MIX BAL parameter of internal effect 1
	EFFECT2 H	PARAM 1–15	Parameter number 1–15 for internal effect 2 ... (1)
	EFFECT2 L	PARAM 1–15	Parameter number 1–15 for internal effect 2 ... (2)
	EFFECT2	MIX BAL	MIX BAL parameter of internal effect 2

Parameter 1	Parameter 2	Parameter 3	Content
PAN			Control the channel pan (or balance). Use parameters 2 and 3 to specify the desired channel.
	CHANNEL	INPUT 1–24	Input channel 1–24
		MONI 1–16	Monitor channel 1–16
		RETURN1 L/R	Return channel 1
		RETURN2 L/R	Return channel 2
BALANCE	ST OUT	Balance of the stereo output channel	

- **Default parameters for each control change number**

<b>CTL CHG.</b>	<b>PARAMETER</b>		
119	NO ASSIGN		
118	NO ASSIGN		
117	FADER	AUX7 SEND	INPUT 16
∫			
102	FADER	AUX7 SEND	INPUT 1
95	NO ASSIGN		
∫			
93	NO ASSIGN		
92	PAN	BALANCE	ST OUT
91	PAN	CHANNEL	RETURN 2R
90	PAN	CHANNEL	RETURN 2L
89	PAN	CHANNEL	RETURN 1R
88	PAN	CHANNEL	RETURN 1L
87	PAN	CHANNEL	INPUT 24
∫			
64	PAN	CHANNEL	INPUT 1
63	ON	MASTER	ST OUT
62	ON	CHANNEL	RETURN 2
61	ON	CHANNEL	RETURN 1
60	ON	CHANNEL	INPUT 20
∫			
41	ON	CHANNEL	INPUT 1
40	FADER	MASTER	BUS 8
∫			
33	FADER	MASTER	BUS 1
32	NO ASSIGN		
31	FADER	MASTER	AUX 8
∫			
24	FADER	MASTER	AUX 1
23	FADER	MASTER	ST OUT
22	FADER	CHANNEL	RETURN 2
21	FADER	CHANNEL	RETURN 1
20	FADER	CHANNEL	INPUT 20
∫			
1	FADER	CHANNEL	INPUT 1
0	NO ASSIGN		

# Bulk Dump page

## Transmitting AW4416 internal settings via bulk dump

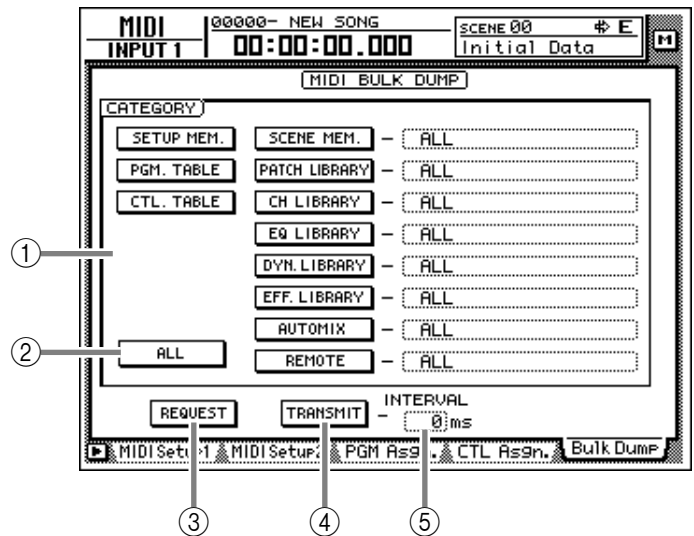
### Function

Transmit the contents of various AW4416 memories (scene memory, libraries, automix, etc.) and MIDI-related settings as bulk data from the MIDI OUT/THRU connector (or TO HOST connector/option slot).

### Key operation

- [MIDI] key → [F5] (Bulk Dump) key (\*1)
- Repeatedly press the [MIDI] key until the screen shown at the right appears.

\*1. From version 2.0, the tabs displayed at the bottom of the MIDI screen are divided into two groups. If the tabs shown at right are not displayed when you press the [MIDI] key, press the [SHIFT] key + [F1] (CHANGE TAB) key to switch tabs.



### Mouse operations

M button → MIDI button → Bulk Dump tab

### Screen functions

#### ① CATEGORY

Select the type of information that will be transmitted as bulk data.

If you select a SCENE MEM.–REMOTE category, move the cursor to the area located at the right of the corresponding button, and turn the [DATA/ JOG] dial to select the content within that category that will be transmitted. Each button corresponds to the following information.

Category		Values	
SETUP MEM.	AW4416 settings other than the following items	—	
PGM. TABLE	Settings of the MIDI screen PGM ASGN. page	—	
CTL. TABLE	Settings of the MIDI screen CTL ASGN. page	—	
SCENE MEM.	The specified scene memory	01–96	Scene number 1–96
		EDIT BUFFER	Current scene (current mixer settings)
		ALL	All scene memories + current scene
PATCH LIBRARY	The specified patch library	01–20	Library number 1–20
		ALL	All patch libraries
CH LIBRARY	The specified channel library	02–64	Library number 2–64
		ALL	All channel libraries
EQ LIBRARY	The specified EQ library	41–128	Library number 41–128
		ALL	All EQ libraries
DYN. LIBRARY	The specified dynamics library	41–128	Library number 41–128
		ALL	All dynamics libraries
EFF. LIBRARY	The specified effect library	42–128	Library number 42–128
		ALL	All effect libraries
AUTO MIX	The specified automix	1–16	Memory number 1–16
		BUFFER	Current automix
		ALL	All automixes + current automix
MIDI REMOTE	Settings of the REMOTE screen	REMOTE A–REMOTE B	Settings of the REMOTE A (REMOTE A 1-8/9-16 pages) or B (REMOTE B 1-8/9-16 pages)
		ALL	Settings of all pages of the REMOTE screen

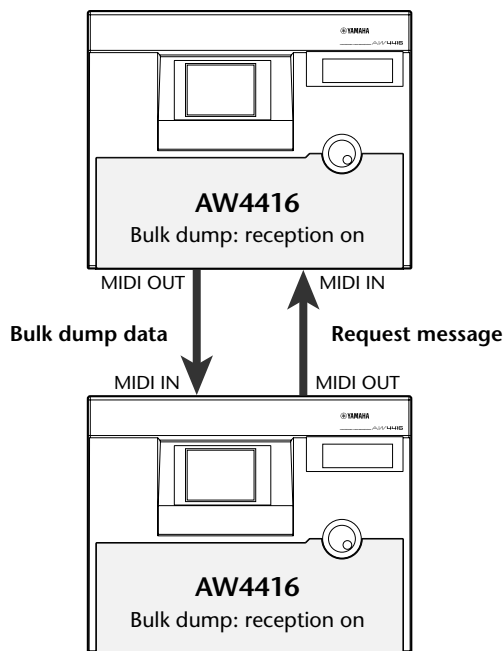
## ② ALL button

When you move the cursor to this button and press the [ENTER] key, all buttons of area ① will be turned on. In addition, the "ALL" setting will be selected as the value for SCENE MEM.–REMOTE.

## ③ REQUEST button

When you move the cursor to this button and press the [ENTER] key, a "bulk dump request" message requesting the bulk dump data selected in ① will be transmitted from the MIDI OUT/THRU connector (or TO HOST connector/option slot).

This function is used when two AW4416 units are connected by their respective MIDI IN/OUT connectors, and you want to copy scene memory or library data from one AW4416 unit to the other.



## ④ TRANSMIT button

When you move the cursor to this button and press the [ENTER] key, the bulk data selected in ① will be transmitted from the MIDI OUT/THRU connector (or TO HOST connector/option slot). Use this when you want to store bulk data on an external device such as a MIDI sequencer or data filer.



**Before transmitting bulk data or a bulk dump request message from an external device to the AW4416, you must turn on bulk dump reception in the MIDI screen MIDI Setup 1 page.**

## ⑤ INTERVAL

This adjusts the interval that will be left between data blocks when bulk data is transmitted from the AW4416. The default setting is 0 milliseconds, and you can adjust the interval in 1 millisecond units over a range of 0–300 milliseconds.



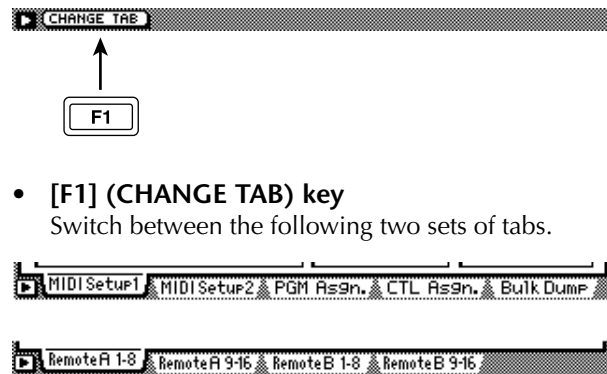
**Depending on the external device to which the data is being transmitted, an error may occur. If an error occurs, try increasing the value of the INTERVAL ⑤ setting to leave a longer pause between the data blocks that are transmitted. When transmitting data between AW4416 units, you can leave this setting at zero.**



**The time required for executing the bulk dump will depend on the category that is selected and on the content of the data. Particularly in the case of auto-mix, a significantly long time may be required depending on the amount of data that is recorded.**

## ■ Additional functions in the Bulk Dump page

In the Bulk Dump page, holding down the [SHIFT] key will assign the following function to the [F1] key.



- [F1] (CHANGE TAB) key

Switch between the following two sets of tabs.



# Remote A 1-8/Remote A 9-16/ Remote B 1-8/Remote B 9-16 pages

## Remotely controlling external MIDI devices

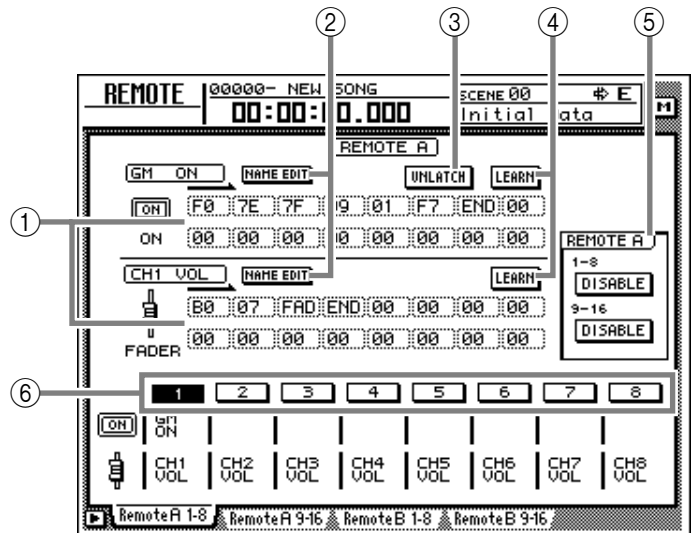
### Function

Use faders 1–16/[ON] keys 1–16 to transmit the desired MIDI messages and remotely control external MIDI devices.

### Key operation

- [MIDI] key → [F1] (Remote A 1-8) key – [F4] (Remote B 9-16) key (\*1)
- Repeatedly press the [MIDI] key until the screen shown at the right appears.

\*1. From version 2.0, the tabs displayed at the bottom of the MIDI screen are divided into two groups. If the tabs shown at right are not displayed when you press the [MIDI] key, press the [SHIFT] key + [F1] (CHANGE TAB) key to switch tabs.



### Mouse operations

M button → MIDI button → Remote A 1-8/Remote A 9-16/Remote B 1-8/Remote B 9-16 tabs

### Screen functions

#### ① MIDI messages

The MIDI messages assigned to the fader and [ON] key of the channel selected by the [SEL] key are displayed here in hexadecimal form.

Move the cursor to each numerical box, and turn the [DATA/JOG] dial to edit the value of each byte (two-digit hexadecimal value). The following values can be selected.

- **00–FF (hexadecimal)**  
..... This is the MIDI message that will actually be transmitted.
- **END** ..... This indicates the end of the MIDI message. When you operate the fader or [ON] key, the MIDI message from the beginning to immediately before END will be transmitted.
- **SW (only for [ON] key)**  
..... This indicates the on/off state of the [ON] key. The byte whose value is set to "SW" will be transmitted as a value of 7F (hexadecimal) when the [ON] key status changes to On, and as a value of 00 (hexadecimal) when the key changes to Off.

#### • FAD (only for fader)

..... This indicates the current position of the fader. The byte whose value is set to "FAD" will be transmitted as a value of 00–7F (hexadecimal) when you operate the fader.



**A MIDI message of up to 16 bytes (including "END") can be registered for a fader/[ON] key.**



- **When assigning a MIDI message, you must be sure to add "END" at the end. If "END" is not specified, the MIDI message will not be transmitted.**
- **If a MIDI message is assigned to a fader but "FAD" is not specified within the MIDI message, operating the fader will not transmit the MIDI message.**
- **When assigning a MIDI message to an [ON] key, you can specify "SW" as one of the bytes as necessary. In this case, the corresponding MIDI messages will be transmitted when the [ON] key is turned on and when it is turned off.**
- **If you do not specify "SW," the assigned MIDI message will be transmitted only when the [ON] key is turned on.**
- **If you input a MIDI message manually, it is possible to input an inappropriate or invalid message. When assigning MIDI messages, we recommend that you use the LEARN button (④) whenever possible. (For details on using the LEARN button to assign a MIDI message, refer to page 15.)**

## ② NAME EDIT button

This button lets you edit the name (maximum of eight characters) assigned to the fader/[ON] key. When you move the cursor to this button and press the [ENTER] key, a popup window will appear, allowing you to input the desired name.

## ③ LATCH/UNLATCH button

This button selects the operation when the [ON] key is pressed. When you move the cursor to this button and press the [ENTER] key, the button will change between the following two settings.

### ● LATCH

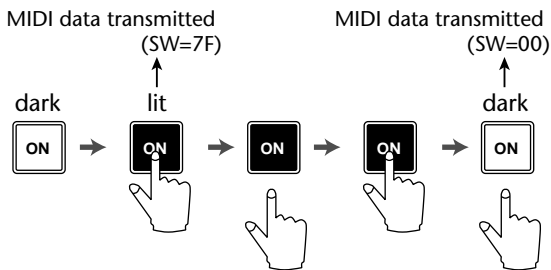
Alternately switch on or off each time you press the [ON] key.

### ● UNLATCH

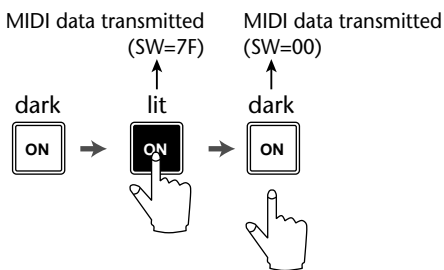
Turn on when you press the [ON] key, and turn off when you release the key.

- If "SW" is specified

### LATCH

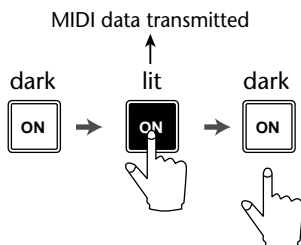


### UNLATCH



- If "SW" is not specified

### UNLATCH



## ④ LEARN buttons

When one of these buttons are on, channel messages or system exclusive messages received at the MIDI IN connector (or TO HOST connector/option slot) will be input to the MIDI message area (①). By using this function, a MIDI message received by the AW4416 can be assigned "as is" (or after being edited) to a fader or [ON] key.



- Normally you will turn on only one of the LEARN buttons.
- When a channel message or system exclusive message is received while the LEARN button is on, "END" will automatically be specified after the last byte.
- If the fader LEARN button is on, and a control change with a continuously changing value is received, "FAD" will automatically be specified for the variable byte.



If a system exclusive message longer than sixteen bytes is received when the LEARN button is on, only the first sixteen bytes will be input. In this case, the "END" will not be input, meaning that no MIDI message will be transmitted even when you operate the fader/[ON] key.

## ⑤ ENABLE/DISABLE buttons

These buttons select whether the Remote function will be enabled (ENABLE) or disabled (DISABLE) for the currently-displayed layer (Remote A or Remote B). The enable/disable setting can be made separately for each page.

When you operate an [ON] key or fader of an enabled page, the MIDI message specified in ① will be transmitted.



- The [ON] key on/off status and fader position are remembered for each layer.
- Operations of the faders and [ON] keys used for the MIDI Remote function can also be recorded in auto-mix. By using this method, you can simultaneously use both layers Remote A and Remote B.

## ⑥ 1-8/9-16 buttons

These indicate the channel (1-8 or 9-16) of the [ON] keys and faders. The currently selected channel will be highlighted, and the MIDI messages assigned to the [ON] key and fader of that channel will be shown in the upper part of the display. Below each button is shown the name of the [ON] key (upper row) and fader (lower row) for the corresponding channel.

The channel can be selected in the following ways.

- Press a [SEL] key
- Move the cursor to the button and press the [ENTER] key

- Default for MIDI remote page

#### Remote A 1–8

Channel	[ON] key		Fader	
	Name	Message	Name	Message
1		No assignment	CH1 VOL	Control change #7 (MIDI ch=1)
2		No assignment	CH2 VOL	Control change #7 (MIDI ch=2)
3		No assignment	CH3 VOL	Control change #7 (MIDI ch=3)
4		No assignment	CH4 VOL	Control change #7 (MIDI ch=4)
5		No assignment	CH5 VOL	Control change #7 (MIDI ch=5)
6		No assignment	CH6 VOL	Control change #7 (MIDI ch=6)
7		No assignment	CH7 VOL	Control change #7 (MIDI ch=7)
8		No assignment	CH8 VOL	Control change #7 (MIDI ch=8)

#### Remote A 9–16

Channel	[ON] key		Fader	
	Name	Message	Name	Message
9		No assignment	CH9 VOL	Control change #7 (MIDI ch=9)
10		No assignment	CH10 VOL	Control change #7 (MIDI ch=10)
11		No assignment	CH11 VOL	Control change #7 (MIDI ch=11)
12		No assignment	CH12 VOL	Control change #7 (MIDI ch=12)
13		No assignment	CH13 VOL	Control change #7 (MIDI ch=13)
14		No assignment	CH14 VOL	Control change #7 (MIDI ch=14)
15		No assignment	CH15 VOL	Control change #7 (MIDI ch=15)
16		No assignment	CH16 VOL	Control change #7 (MIDI ch=16)

#### Remote B 1–8

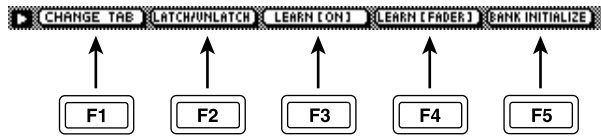
Channel	[ON] key		Fader	
	Name	Message	Name	Message
1	CH1 SUS	Control change #40 (MIDI ch=1)	CH1 VOL	Control change #7 (MIDI ch=1)
2	CH1 SOS	Control change #42 (MIDI ch=1)	CH1 PAN	Control change #10 (MIDI ch=1)
3	CH1 SOFT	Control change #43 (MIDI ch=1)	CH1 EXP	Control change #11 (MIDI ch=1)
4		No assignment	CH1 MOD	Control change #1 (MIDI ch=1)
5	CH1 PORT	Control change #41 (MIDI ch=1)	CH1 PORT	Control change #5 (MIDI ch=1)
6		No assignment	CH1 REV	Control change #91 (MIDI ch=1)
7		No assignment	CH1 CHO	Control change #93 (MIDI ch=1)
8		No assignment	CH1 VAR	Control change #94 (MIDI ch=1)

#### Remote B 9–16

Channel	[ON] key		Fader	
	Name	Message	Name	Message
9	PGM CHG1	Program change #1 (MIDI ch=1)	CTL CHG1	Control change #1 (MIDI ch=1)
10	PGM CHG2	Program change #2 (MIDI ch=1)	CTL CHG2	Control change #2 (MIDI ch=1)
11	PGM CHG3	Program change #3 (MIDI ch=1)	CTL CHG3	Control change #3 (MIDI ch=1)
12	PGM CHG4	Program change #4 (MIDI ch=1)	CTL CHG4	Control change #4 (MIDI ch=1)
13	PGM CHG5	Program change #5 (MIDI ch=1)	CTL CHG5	Control change #5 (MIDI ch=1)
14	PGM CHG6	Program change #6 (MIDI ch=1)	CTL CHG6	Control change #6 (MIDI ch=1)
15	PGM CHG7	Program change #7 (MIDI ch=1)	CTL CHG7	Control change #7 (MIDI ch=1)
16	PGM CHG8	Program change #8 (MIDI ch=1)	CTL CHG8	Control change #8 (MIDI ch=1)

## ■ Additional functions in the Remote A 1-8 – Remote B 9-16 pages

In the Remote A 1-8 – Remote B 9-16 pages, holding down the [SHIFT] key will assign the following functions to the [F1]–[F5] keys.



- **[F1] (CHANGE TAB) key**

Switch between the following two sets of tabs.



- **[F2] (LATCH/UNLATCH) key**

Switch between Latch and Unlatch as the operation when the [ON] key is pressed. This is the same function as the LATCH/UNLATCH button (③).

- **[F3] (LEARN [ON]) key**

A MIDI message received by the AW4416 will be assigned to the [ON] key of the currently-displayed channel. This is the same function as the LEARN button ([ON] key).

- **[F4] (LEARN [FADER]) key**

A MIDI message received by the AW4416 will be assigned to the fader of the currently-displayed channel. This is the same function as the LEARN button (fader).

- **[F5] (BANK INITIALIZE) key**

All settings of the currently displayed page will be reset to the default values. (For the default settings, refer to page 35.)

# MIDI data format

## 1. Functions

### 1.1 MIDI setup

There are two types of serial connector: the MIDI connectors and the TO HOST connector. Each has the same functionality, and you can select either of these to use, depending on the type of device that will be connected. Both types use the MIDI format for communication.

When using the TO HOST connector, you must select one of the three transmission methods listed below. Regardless of the type of connector you select, the MTC OUT connector will output MTC.

Since the MTC transmitted from the MTC OUT connector is generated by hardware, its precision is very high. The MIDI OUT/THRU connector can be used as either THRU or OUT. If THRU is selected, the messages arriving at the MIDI IN connector will be re-transmitted without change from the MIDI OUT/THRU connector.

Name	Speed	Applicable to
PC1	31.25k	for NEC PC9800 series
PC2	38.4k	for DOS/V, NEC PC9800 series
Mac	31.25kf	or Macintosh (CLOCK=1MHz)

### 1.2 Scene change

The settings of the [Program Change Assign Table] specify the scene that is recalled when a Program Change message is received.

The settings of the [Program Change Assign Table] specify the program number that is transmitted when a scene is recalled. If more than one program number has been assigned to that scene memory number, the lowest-numbered program number will be transmitted. (If a memory number is recalled for which there is setting in the [MIDI Program Change Assign Table], the Parameter Change (Function Call) listed later in this section will be transmitted.)

### 1.3 MMC control

These messages allow basic recorder operations such as STOP/PLAY/REC/LOCATE.

If you select the MIDI SETUP menu item MMC MASTER, MMC commands will be transmitted according to the operation of the transport. If you select MMC SLAVE, the internal recorder will operate according to the received MMC commands.

### 1.4 Effect control

Depending on the type of effect, note-on/off messages can be used for control.

These settings are made for the parameters of each effect.

### 1.5 MIDI Clock transmission

If the MIDI SETUP menu item [MIDI CLK] is ON, MIDI Clock messages will be transmitted during playback and recording.

In MIDI Clock transmission mode, Song Position Pointer and Start/Stop/Continue commands will also be issued, and during playback or recording, MIDI Clock will be transmitted according to the MIDI Tempo Map.

### 1.6 MTC master

If the MIDI SETUP menu item [MTC] is ON, MTC will be transmitted during playback and recording. MTC will always be transmitted from the MTC OUT connector regardless of the [MTC] setting.

### 1.7 MTC slave synchronization

If the MIDI SETUP menu item [MTC SYNC] is set to SLAVE, the internal recorder will operate in synchronization to MTC messages received from the MIDI IN or TO HOST connector.

### 1.8 Realtime control of parameters

The internal parameters can be input or output in real-time using control changes or parameter changes.

### 1.9 Transmission of scene memories or library data

The bulk dump function can be used to send data to another device, or copy settings from another device to the AW4416.

### 1.10 MIDI Remote

MIDI data created by the user can be transmitted from the AW4416 by operating its faders or ON keys.

## 2. AW4416 settings and operation

### 2.1 MIDI Setup

#### 2.1.1 MIDI Channel

##### 2.1.1.1 Transmit channel

This sets the MIDI channel that will normally be used. However, transmission in response to a request will occur on the Receive Channel, in order to specify the desired that transmitted the request.

##### 2.1.1.2 Receive channel

This sets the MIDI channel that will be used for reception. MIDI messages are normally received only if the MIDI channel matches, but if OMNI is ON, they will be received regardless of the channel.

#### 2.1.2 ON/OFF

##### 2.1.2.1 Program change

Enable/disable reception and transmission. If OMNI is turned ON, reception will occur regardless of the MIDI channel. If ECHO is ON, messages will be echoed regardless of the channel.

##### 2.1.2.2 Control change

Enable/disable reception and transmission. If OMNI is turned ON, reception will occur regardless of the MIDI channel. If ECHO is ON, messages will be echoed regardless of the channel.

##### 2.1.2.3 Parameter change

Enable/disable reception and transmission. If OMNI is turned ON, reception will occur regardless of the MIDI channel. If ECHO is ON, messages will be echoed regardless of the channel.

##### 2.1.2.4 Bulk

Enable/disable reception.

#### 2.1.3 MMC Device ID

Specify the ID number used to transmit and receive MMC commands.

#### 2.1.4 MIDI/HOST

Select whether the MIDI IN/OUT connectors of the TO HOST connector will be used for serial transmission. (MTC output data will always be transmitted from the MTC OUT connector.)

### 2.1.5 OUT/THRU

Select whether the MIDI OUT/THRU connector will function as OUT or as THRU.

If THRU is selected, messages received at the MIDI IN connector will be re-transmitted without change from the MIDI OUT/THRU connector.

Regardless of the MIDI/HOST setting, the connector will function as a THRU connector if the THRU setting is selected. If you want to use the connector as MIDI OUT, the MIDI/HOST setting must be OUT.

### 2.1.6 TO HOST

If the TO HOST connector is selected, choose one of three settings depending on the type of computer that is connected.

### 2.1.7 MIDI Clock ON/OFF

Specify whether MIDI Clock will be used.

If this is ON, MIDI Clock will be transmitted from the connector selected by MIDI/HOST.

### 2.1.8 MTC ON/OFF

Select whether MTC will be used.

If this is ON, MTC will be transmitted from the connector selected by MIDI/HOST.

Regardless of this setting, MTC will always be transmitted from the MTC OUT connector.

## 2.2 Program change assign table

This table allows you to freely specify the correspondence between Program Change No. and Scene No. This table is used for conversion for both transmission and reception.

## 2.3 Control change assign table

This table allows you to freely specify the correspondence between Control Change No. and Parameter name.

This table is used for conversion for both transmission and reception.

## 3. MIDI format list

### 3.1 CHANNEL MESSAGE

command	rx/tx	function
8n NOTE OFF	rx	Control the internal effect
9n NOTE ON	rx	Control the internal effect
Bn CONTROL CHANGE	rx/tx	Edit parameters (use the Control Change Assign Table)
Cn PROGRAM CHANGE	rx/tx	Switch scene memories (use the Control Change Assign Table)

### 3.2 SYSTEM COMMON MESSAGE

command	rx/tx	function
F1 MIDI TIME CODE	rx/tx	MTC transmission (when MTC Master), MTC reception (when MTC slave)
F2 SONG POSITION POINTER	tx	SPP reception (when MIDI Clock is used)

### 3.3 SYSTEM REAL TIME MESSAGE

command	rx/tx	function
F8 TIMING CLOCK	tx	MIDI Clock transmission (when MIDI Clock is used)
FA START	tx	Start command transmission (when MIDI Clock is used)
FB CONTINUE	tx	Continue command transmission (when MIDI Clock is used)
FC STOP	tx	Stop command transmit (when MIDI Clock is used)

FE ACTIVE SENSING	rx	Check MIDI cable connections
FF RESET	rx	Clear running status

## 3.4 SYSTEM EXCLUSIVE MESSAGE

### 3.4.1 Real Time System Exclusive

#### 3.4.1.1 MMC

command	rx/tx	function
01 STOP	rx/tx	Transport stop
02 PLAY	rx	Transport play
03 DEFERRED PLAY	rx/tx	Transport play
04 FAST FOWARD	rx/tx	Transport fast-forward
05 REWIND	rx/tx	Transport rewind
06 RECORD STROBE	rx	Transport punch-in record
07 RECORD EXIT	rx	Transport punch-out
0F RESET	rx/tx	MMC reset
40 WRITE	rx	Write data field
44 LOCATE	rx/tx	Transport locate

### 3.4.2 Bulk Dump & Request

data name	rx/tx	function
'M'	rx/tx	Scene Memory & Request
'S'	rx/tx	Setup Memory & Request
'R'	rx/tx	Remote Memory & Request
'Q'	rx/tx	Equalizer Library & Request
'Y'	rx/tx	Dynamics Library & Request
'E'	rx/tx	Effect Library & Request
'T'	rx/tx	Patch Library & Request
'H'	rx/tx	Channel Library & Request
'A'	rx/tx	Automix Memory & Request
'P'	rx/tx	Program Change Assign Table & Request
'C'	rx/tx	Control Change Assign Table & Request

### 3.4.3 Parameter Change

Parameter type	rx/tx	function
0x00	rx/tx	edit buffer (byte operation format)
0x01	rx	system memory (byte operation format)
0x02	rx/tx	function call (mem/lib recall, mem/lib store)
0x10	rx/tx	edit buffer (7bit operation format)
0x40	rx/tx	edit buffer (bit operation format)
0x41	rx	system memory (bit operation format)
0x43	rx	controller (key remote) (bit operation format)

## 4. MIDI format details

### 4.1 NOTE OFF (8n)

#### < Reception >

Received when [Rx CH] matches.

Used to control effects. Refer below for details.

STATUS	1000nnnn	8n	Note Off Message
DATA	0nnnnnnn	nn	Note No.
	0vvvvvvv	vv	Velocity ( ignored)

### 4.2 NOTE ON (9n)

#### < Reception >

Received when [Rx CH] matches.

Used to control effects. Refer below for details.

Velocity of 0x00 is equivalent to Note-Off.

STATUS	1001nnnn	9n	Note On Message
DATA	0nnnnnnn	nn	Note No.
	0vvvvvvv	vv	Velocity (1-127:On, 0:off)

\* Effect control by Note

1: Dynamic Flange/Dynamic Phase/Dynamic Filter  
When the SOURCE parameter is set to MIDI, the note velocity (both note-on and note-off) is used to control the Modulation frequency width.

### 4.3 CONTROL CHANGE (Bn)

#### < Reception >

This message is received when [Control Change RX] is ON and the [Rx CH] matches. However if [OMNI] is ON, this is received regardless of the channel.

This message is echoed if [Control Change ECHO] is ON.

Parameters will be controlled according to the [Control Change Assign Table] settings.

If a message is received while the [Control Change Assign Table] is displayed, the cursor will move to that control number.

#### < Transmission >

If [Control Change TX] is ON, this message is transmitted on the [Tx CH] channel when a parameter specified in the [Control Change Assign Table] is operated.

This message is echoed if [Control Change ECHO] is ON.

```
STATUS 1011nnnn Bn Control Change
DATA 0ccccccc cc Control No. (0-95, 102-119)
0vvvvvvv vv Control Value (0-127)
```

The control value is converted into a parameter value according to the following equation.

C = 128 (byte parameter)

16384 (word parameter)

S = total number of variable steps for the parameter

C/S = X remainder Y

$\text{INT}((Y+1)/2) = Z$

If (MIDI data - Z) < 0, then → param = 0

If ((MIDI data - Z)/X) > MAX, then → param = MAX

Otherwise → param =  $\text{INT}((\text{MIDI DATA} - Z)/X)$

### 4.4 PROGRAM CHANGE (Cn)

#### < Reception >

This message is received if [Program Change RX] is ON and [Rx CH] matches. However if [OMNI] is ON, this message is received regardless of the channel.

This message is echoed if [Control Change ECHO] is ON.

A scene memory will be recalled according to the [Program Change Assign Table] settings.

#### < Transmission >

If [Program Change TX] is ON, performing a Recall operation on the AW4416 will cause this message to be transmitted on the [Tx CH] according to the [Program Change Assign Table] settings. If the recalled memory number has been assigned to more than one program number, the lowest-numbered program number will be transmitted.

(If a memory number not specified in the [Program Change Assign Table] is recalled, the Parameter Change (Function Call) described below will be transmitted.)

This message is echoed if [Control Change ECHO] is ON.

```
STATUS 1100nnnn Cn Program Change
DATA 0nnnnnnn nn Program No. (0-127)
```

### 4.5 MIDI TIME CODE QUARTER FRAME(F1)

#### < Transmission >

When the recorder is in Play or Record status, Quarter Frame messages are transmitted from the MIDI OUT connector (if [MTC] is ON) and from the MTC OUT connector.

#### < Reception >

This message is received if [MTC SYNC] is set to SLAVE. Quarter Frame messages received in realtime are internally assembled into time code that controls the recorder.

```
STATUS 11110001 F1 Quarter Frame Message
DATA 0nnndddd dd nnn = message type (0-7)
ddd = data
```

### 4.6 SONG POSITION POINTER(F2)

#### < Transmission >

If [MIDI CLK] is ON, this message is transmitted when the recorder Stops or Locates, to indicate the song position at which the next Start/Continue will begin.

```
STATUS 11110010 F2 Song Position Pointer
DATA 0ddddddd dd0 data( H) high 7 bits of 14 bits data
0ddddddd dd1 data( L) low 7 bits of 14 bits data
```

### 4.7 TIMING CLOCK(F8)

#### < Transmission >

If [MIDI CLK] is ON, this message is transmitted according to the MIDI Tempo Map from when the recorder begins playing or recording, until it stops.

```
STATUS 11111000 F8 Timing Clock
```

### 4.8 START(FA)

#### < Transmission >

If [MIDI CLK] is ON, this message is transmitted when the recorder begins playing or recording at the first measure.

```
STATUS 11111010 FA Start
```

### 4.9 CONTINUE(FB)

#### < Transmission >

If [MIDI CLK] is ON, this message is transmitted when the recorder begins playing or recording at a location other than the first measure.

```
STATUS 11111011 FB Continue
```

### 4.10 STOP(FC)

#### < Transmission >

If [MIDI CLK] is ON, this message is transmitted when the recorder stops.

```
STATUS 11111100 FC Stop
```

### 4.11 ACTIVE SENSING (FE)

#### < Reception >

Once this message is received, subsequent failure to receive any message for a period of 300 ms will cause Running Status to be cleared, and MIDI communications to be initialized.

```
STATUS 11111110 FE Active Sensing
```

### 4.12 RESET

#### < Reception >

When a Reset message is received, MIDI communications will be initialized by clearing Running Status etc.

```
STATUS 11111111 FF Reset
```

### 4.13 EXCLUSIVE MESSAGE (F0-F7)

#### 4.13.1 MMC

##### 4.13.1.1 MMC STOP

#### < Transmission >

When the STOP key is pressed, this message is transmitted with a device number of 7F.

**< Reception >**

If the AW4416 is operating as an MMC Slave, the transport will stop when this message is received with a matching device number or a device number of 7F.

STATUS	11110000 F0	System Exclusive Message
ID No.	01111111 7F	Real Time System Exclusive
Device ID	0ddddddd dd	Destination (00-7E, 7F:all call)
Command	00000110 06	Machine Control Command(mcc) sub-id
	00000001 01	Stop(MCS)
EOX	11110111 F7	End Of Exclusive

**4.13.1.2 MMC PLAY****< Reception >**

If the AW4416 is operating as an MMC Slave, the transport will begin playback when this message is received with a matching device number or a device number of 7F.

STATUS	11110000 F0	System Exclusive Message
ID No.	01111111 7F	Real Time System Exclusive
Device ID	0ddddddd dd	Destination (00-7E, 7F:all call)
Command	00000110 06	Machine Control Command(mcc) sub-id
	00000010 02	Play(MCS)
EOX	11110111 F7	End Of Exclusive

**4.13.1.3 MMC DEFERRED PLAY****< Transmission >**

This message is transmitted with a device number of 7F when the PLAY key is pressed.

**< Reception >**

If the AW4416 is operating as an MMC Slave, the transport will begin playback when this message is received with a matching device number or a device number of 7F.

STATUS	11110000 F0	System Exclusive Message
ID No.	01111111 7F	Real Time System Exclusive
Device ID	0ddddddd dd	Destination (00-7E, 7F:all call)
Command	00000110 06	Machine Control Command(mcc) sub-id
	00000011 03	Deferred play(MCS)
EOX	11110111 F7	End Of Exclusive

**4.13.1.4 MMC FAST FORWARD****< Transmission >**

This message is transmitted with a device number of 7F when the FF key is pressed or when the Shuttle is rotated toward the right to enter Cue mode.

**< Reception >**

If the AW4416 is operating as an MMC Slave, the transport will begin fast-forward when this message is received with a matching device number or a device number of 7F.

STATUS	11110000 F0	System Exclusive Message
ID No.	01111111 7F	Real Time System Exclusive
Device ID	0ddddddd dd	Destination (00-7E, 7F:all call)
Command	00000110 06	Machine Control Command(mcc) sub-id
	00000110 04	Fast Forward(MCS)
EOX	11110111 F7	End Of Exclusive

**4.13.1.5 MMC REWIND****< Transmission >**

This message is transmitted with a device number of 7F when the REWIND key is pressed or when the Shuttle is rotated toward the left to enter Review mode.

**< Reception >**

If the AW4416 is operating as an MMC Slave, the transport will begin rewind when this message is received with a matching device number or a device number of 7F.

STATUS	11110000 F0	System Exclusive Message
ID No.	01111111 7F	Real Time System Exclusive
Device ID	0ddddddd dd	Destination (00-7E, 7F:all call)
Command	00000110 06	Machine Control Command(mcc) sub-id
	00000101 05	Rewind(MCS)
EOX	11110111 F7	End Of Exclusive

**4.13.1.6 MMC RECORD STROBE****< Reception >**

This message is received if the AW4416 is operating as an MMC Slave and the device number matches or is 7F. If the transport is stopped, then recording will begin. If the transport is playing, then punch-in will occur.

STATUS	11110000 F0	System Exclusive Message
ID No.	01111111 7F	Real Time System Exclusive
Device ID	0ddddddd dd	Destination (00-7E, 7F:all call)
Command	00000110 06	Machine Control Command(mcc) sub-id
	00000110 06	Record strobe
EOX	11110111 F7	End Of Exclusive

**4.13.1.7 MMC RECORD EXIT****< Reception >**

This message is received if the AW4416 is operating as an MMC Slave and the device number matches or is 7F. If the transport is recording, then punch-out will occur.

STATUS	11110000 F0	System Exclusive Message
ID No.	01111111 7F	Real Time System Exclusive
Device ID	0ddddddd dd	Destination (00-7E, 7F:all call)
Command	00000110 06	Machine Control Command(mcc) sub-id
	00000111 07	Record Exit
EOX	11110111 F7	End Of Exclusive

**4.13.1.8 MMC RESET****< Transmission >**

This message is transmitted with a device number of 7F when song loading is finished.

**< Reception >**

This message is received if the AW4416 is operating as an MMC Slave and the device number matches or is 7F. MMC-related internal settings will be reset to the power-on state.

STATUS	11110000 F0	System Exclusive Message
ID No.	01111111 7F	Real Time System Exclusive
Device ID	0ddddddd dd	Destination (00-7E, 7F:all call)
Command	00000110 06	Machine Control Command(mcc) sub-id
	00001101 0D	Reset
EOX	11110111 F7	End Of Exclusive

**4.13.1.9 MMC WRITE****< Reception >**

This message is received if the AW4416 is operating as an MMC Slave and the device number matches or is 7F. Data will be written into the specified information field.

STATUS	11110000 F0	System Exclusive Message
ID No.	01111111 7F	Real Time System Exclusive
Device ID	0ddddddd dd	Destination (00-7E, 7F:all call)
Command	00000110 06	Machine Control Command(mcc) sub-id
	01000000 40	Write
	0ccccccc cc	Byte Count
	0nnnnnnn nn	Writeable Information Field name
	0ddddddd dd	Format defined by the Information Filed name
	:	:
	0nnnnnnn nn	More nn dd... pairs as required..
EOX	11110111 F7	End Of Exclusive



#### 4.13.1.9.1 MMC INFORMATION FIELD - TRACK RECORD READY

##### < Reception >

This message is received if the AW4416 is operating as an MMC Slave and the device number matches. REC SELECT will be switched on/off for the recorder tracks as specified by the Standard Track Bitmap data.

```

01001111 4F Track Record Ready (Information Field name)
0nnnnnnn nn Data Length (0:all track off, 3:record track on)
0aaaaaaa aa 1-2tr rec track On(Standard Track Bitmap)
0bbbbbbb bb 3-9tr rec track On
0ccccccc cc 10-16tr rec track On

```

#### 4.13.1.10 MMC LOCATE(TARGET)

##### < Transmission >

This message is transmitted with a device number of 7F when a locate-related key such as MARK SEARCH/IN/OUT is pressed, a FF/REW/shuttle operation is performed, when the transport returns to the auto-punch pre-roll point, or when repeating.

##### < Reception >

This message is received if the AW4416 is operating as an MMC Slave and the device number matches. The transport will locate to the time code position specified within the command data.

```

STATUS      11110000 F0 System Exclusive Message
ID No.      01111111 7F Real Time System Exclusive
Device ID   0ddddd dd Destination (00-7E, 7F:all call)
Command     00000110 06 Machine Control Command(mcc) sub-id
            01000100 44 Locate
            00000110 06 byte count
            00000001 01 "target" sub command
            0hhhhhhh hh hour (Standard Time Code)
            0mmmmmmm mm minute
            0sssssss ss second
            0ffffff ff frame
            0sssssss ss sub-frame
EOX         11110111 F7 End Of Exclusive

```

#### 4.13.2 Bulk Dump & Request

This message inputs/outputs the contents of various internal memories.

The unique header is used to distinguish whether the data belongs to the AW4416.

The check sum is calculated by adding the bytes starting after BYTE COUNT (LOW) and ending before CHECK SUM, then inverting the bits and adding 1 (binary complement), and setting bit 7 to 0.

CHECK SUM = (-sum) & 0x7F

##### < Reception >

This message is received if [Bulk RX] is on, and the [Rx CH] matches the MIDI channel included in the Sub Status.

When a bulk dump is received, it is immediately written into the specified memory.

When a bulk dump request is received, a bulk dump will be transmitted immediately.

##### < Transmission >

Bulk Dump messages are transmitted on the [Tx CH] in response to key operations in the [MIDI BULK] screen.

Bulk Dump messages are transmitted on the [Rx CH] in response to Bulk Dump Request messages.

#### 4.13.2.1 Scene Memory Bulk Dump Format

```

STATUS      11110000 F0 System Exclusive Message
ID No.      01000011 43 Manufacturer's ID No. (YAMAHA)

```

```

SUB STATUS  0000nnnn 0n n=0-15(MIDI Channel No.1-16)
FORMAT No.  01111110 7E Universal Bulk Dump
BYTE COUNT (HIGH) 00011111 1F 4095bytes
BYTE COUNT (LOW)  01111111 7F
01001100 4C 'L'
01001101 4D 'M'
00100000 20 ' '
00100000 20 ' '
00111000 38 '8'
01000011 42 'B'
00110011 39 '9'
00110110 38 '8'
DATA NAME   01001101 4D 'M'
0mmmmmmmm mm m=0-96,127(Scene Memory No.0-96, edit buffer)
Receive is effective No.1-96,127
DATA        0ddddd ds1 Scene Memory(4095-10 bytes)
            :
            0ddddd de1
CHECK SUM   0eeeeeee ee1 ee1=(INVERT('L'+ 'M'+...+ds1+...+de1)+1) AND 7Fh
BYTE COUNT (HIGH) 00000111 07 998bytes
BYTE COUNT (LOW)  01100110 66
DATA        0ddddd ds2 Scene Memory(998 bytes)
            :
            0ddddd de2
CHECK SUM   0eeeeeee ee2 ee2=(INVERT(ds2+...+de2)+1) AND 7Fh
EOX         11110111 F7 End Of Exclusive

```

The first 33 bytes are ID + Protect + Title, and are 7 bit. The subsequent 2525 bytes are all divided into 4 bit units.

#### 4.13.2.2 Scene Memory Bulk Dump Request Format

```

STATUS      11110000 F0 System Exclusive Message
ID No.      01000011 43 Manufacturer's ID (YAMAHA)
SUB STATUS  0010nnnn 2n n=0-15(MIDI Channel No.1-16)
FORMAT No.  01111110 7E Universal Bulk Dump
01001100 4C 'L'
01001101 4D 'M'
00100000 20 ' '
00100000 20 ' '
00111000 38 '8'
01000011 42 'B'
00110011 39 '9'
00110110 38 '8'
DATA NAME   01001101 4D 'M'
0mmmmmmmm mm m=0-97,127(Scene Memory No.0-97, edit buffer)
EOX         11110111 F7 End Of Exclusive

```

#### 4.13.2.3 Setup Memory Bulk Dump Format

```

STATUS      11110000 F0 System Exclusive Message
ID No.      01000011 43 Manufacturer's ID No. (YAMAHA)
SUB STATUS  0000nnnn 0n n=0-15(MIDI Channel No.1-16)
FORMAT No.  01111110 7E Universal Bulk Dump
BYTE COUNT (HIGH) 00000100 04 522(512+10)bytes
BYTE COUNT (LOW)  00001010 0A
01001100 4C 'L'
01001101 4D 'M'
00100000 20 ' '
00100000 20 ' '
00111000 38 '8'
01000011 42 'B'
00110011 39 '9'
00110110 38 '8'
DATA NAME   01010011 53 'S'
00100000 20 ' '
DATA        0ddddd dsSetup Memory(256*2bytes)
            :
            0ddddd de

```

```
CHECK SUM 0eeeeeee ee ee=(INVERT('L'+ 'M'+...+ds+
...+de)+1) AND 7Fh
EOX 11110111 F7 End Of Exclusive
```

All data is divided into 4 bit units.

#### 4.13.2.4 Setup Memory Bulk Dump Request Format

```
STATUS 11110000 F0 System Exclusive Message
ID No. 01000011 43 Manufacturer's ID (YAMAHA)
SUB STATUS 0010nnnn 2n n=0-15(MIDI Channel No.1-16)

FORMAT No. 01111110 7E Universal Bulk Dump
01001100 4C 'L'
01001101 4D 'M'
00100000 20 ' '
00100000 20 ' '
00111000 38 '8'
01000011 42 'B'
00110011 39 '9'
00110110 38 '8'

DATA NAME 01010011 53 'S'
00100000 20 ' '
EOX 11110111 F7 End Of Exclusive
```

#### 4.13.2.5 Remote Memory Bulk Dump Format

```
STATUS 11110000 F0 System Exclusive Message
ID No. 01000011 43 Manufacturer's ID No.
(YAMAHA)
SUB STATUS 0000nnnn 0n n=0-15(MIDI Channel No.1-16)

FORMAT No. 01111110 7E Universal Bulk Dump
BYTE COUNT
(HIGH) 00010100 14 2578(2568+10)bytes

BYTE COUNT
(LOW) 00010010 12
01001100 4C 'L'
01001101 4D 'M'
00100000 20 ' '
00100000 20 ' '
00111000 38 '8'
01000011 42 'B'
00110011 39 '9'
00110110 38 '8'

DATA NAME 01010010 52 'R'
0bbbbbbb bb b = 0-1(bank no.A-B)
DATA 0ddddd ds Remote(Internal Parameter) Memory(1284*2bytes)
: :
0ddddd de
CHECK SUM 0eeeeeee ee ee=(INVERT('L'+ 'M'+...+ds+
...+de)+1) AND 7Fh
EOX 11110111 F7 End Of Exclusive
```

All data is divided into 4 bit units.

#### 4.13.2.6 Remote Memory Bulk Dump Request Format

```
STATUS 11110000 F0 System Exclusive Message
ID No. 01000011 43 Manufacturer's ID (YAMAHA)
SUB STATUS 0010nnnn 2n n=0-15(MIDI Channel No.1-16)

FORMAT No. 01111110 7E Universal Bulk Dump
01001100 4C 'L'
01001101 4D 'M'
00100000 20 ' '
00100000 20 ' '
00111000 38 '8'
01000011 42 'B'
00110011 39 '9'
00110110 38 '8'

DATA NAME 01010010 52 'R'
0bbbbbbb bb b = 0-1(bank no.A-B)
EOX 11110111 F7 End Of Exclusive
```

#### 4.13.2.7 Equalizer Library Bulk Dump Format

```
STATUS 11110000 F0 System Exclusive Message
ID No. 01000011 43 Manufacturer's ID No.
(YAMAHA)
SUB STATUS 0000nnnn 0n n=0-15(MIDI Channel No.1-16)

FORMAT No. 01111110 7E Universal Bulk Dump
BYTE COUNT
(HIGH) 00000000 00 58(48+10)bytes
```

```
BYTE COUNT
(LOW) 00111010 3A
01001100 4C 'L'
01001101 4D 'M'
00100000 20 ' '
00100000 20 ' '
00111000 38 '8'
01000011 42 'B'
00110011 39 '9'
00110110 38 '8'
DATA NAME 01010001 51 'Q'
0mmmmmmmm mm m=0-127 (Equalizer Library
No.1-128)
Receive is effective
No.41-128
DATA 0ddddd ds Equalizer Library Mem-
ory(16+(16*2)bytes)
0ddddd de
CHECK SUM 0eeeeeee ee ee=(INVERT('L'+ 'M'+...+ds+
...+de)+1) AND 7Fh
EOX 11110111 F7 End Of Exclusive
```

The first 16 bytes are the title, and are 7 bit. The subsequent 17 bytes are all divided into 4 bit units.

#### 4.13.2.8 Equalizer Library Bulk Dump Request Format

```
STATUS 11110000 F0 System Exclusive Message
ID No. 01000011 43 Manufacturer's ID (YAMAHA)
SUB STATUS 0010nnnn 2n n=0-15(MIDI Channel No.1-16)

FORMAT No. 01111110 7E Universal Bulk Dump
01001100 4C 'L'
01001101 4D 'M'
00100000 20 ' '
00100000 20 ' '
00111000 38 '8'
01000011 42 'B'
00110011 39 '9'
00110110 38 '8'
DATA NAME 01010001 51 'Q'
0mmmmmmmm mm m=0-127 (Equalizer Library
No.1-128)
EOX 11110111 F7 End Of Exclusive
```

#### 4.13.2.9 Dynamics Library Bulk Dump Format

```
STATUS 11110000 F0 System Exclusive Message
ID No. 01000011 43 Manufacturer's ID No.
(YAMAHA)
SUB STATUS 0000nnnn 0n n=0-15(MIDI Channel No.1-16)

FORMAT No. 01111110 7E Universal Bulk Dump
BYTE COUNT
(HIGH) 00000000 00 40(30+10)bytes
BYTE COUNT
(LOW) 00101000 28
01001100 4C 'L'
01001101 4D 'M'
00100000 20 ' '
00100000 20 ' '
00111000 38 '8'
01000011 42 'B'
00110011 39 '9'
00110110 38 '8'
DATA NAM 01011001 59 'Y'
0mmmmmmmm mm m=0-127 (Dynamics Library
No.1-128)
Receive is effective
No.41-128
DATA 0ddddd ds Dynamics Library Mem-
ory(16+(7*2)bytes)
: :
0ddddd de
CHECK SUM 0eeeeeee ee ee=(INVERT('L'+ 'M'+...+ds+
...+de)+1) AND 7Fh
EOX 11110111 F7 End Of Exclusive
```

The first 16 bytes are the title, and are 7 bit. The subsequent 7 bytes are all divided into 4 bit units.

#### 4.13.2.10 Dynamics Library Bulk Dump Request Format

```

STATUS      11110000 F0 System Exclusive Message
ID No.      01000011 43 Manufacturer's ID (YAMAHA)
SUB STATUS  0010nnnn 2n n=0-15(MIDI Channel No.1-16)

FORMAT No. 01111110 7E Universal Bulk Dump
01001100 4C 'L'
01001101 4D 'M'
00100000 20 ' '
00100000 20 ' '
00111000 38 '8'
01000011 42 'B'
00110011 39 '9'
00110110 38 '8'

DATA NAME   01011001 59 'Y'
Ommmmmmmm mm m=0-127 (Dynamics Library No.1-128)

EOX         11110111 F7 End Of Exclusive

```

#### 4.13.2.11 Effect Library Bulk Dump Format

```

STATUS      11110000 F0 System Exclusive Message
ID No.      01000011 43 Manufacturer's ID No. (YAMAHA)
SUB STATUS  0000nnnn 0n n=0-15(MIDI Channel No.1-16)

FORMAT No. 01111110 7E Universal Bulk Dump
BYTE COUNT (HIGH) 00000000 00 112(102+10)bytes
BYTE COUNT (LOW) 01110000 70
01001100 4C 'L'
01001101 4D 'M'
00100000 20 ' '
00100000 20 ' '
00111000 38 '8'
01000011 42 'B'
00110011 39 '9'
00110110 38 '8'

DATA NAME   01000101 45 'E'
Ommmmmmmm mm m=0-127 (Effect Library No.1-128)
Receive is effective 42-128

DATA        0ddddd ds Effect Library Memory(16+(43*2)bytes)
:
:
0ddddd de
CHECK SUM  0eeeeeee ee ee=(INVERT('L'+ 'M'+...+ds+...+de)+1) AND 7Fh

EOX         11110111 F7 End Of Exclusive

```

The first 12 bytes are the title, and are 7 bit. The subsequent 41 bytes are all divided into 4 bit units.

#### 4.13.2.12 Effect Library Bulk Dump Request Format

```

STATUS      11110000 F0 System Exclusive Message
ID No.      01000011 43 Manufacturer's ID (YAMAHA)
SUB STATUS  0010nnnn 2n n=0-15(MIDI Channel No.1-16)

FORMAT No. 01111110 7E Universal Bulk Dump
01001100 4C 'L'
01001101 4D 'M'
00100000 20 ' '
00100000 20 ' '
00111000 38 '8'
01000011 42 'B'
00110011 39 '9'
00110110 38 '8'

DATA NAME   01000101 45 'E'
Ommmmmmmm mm m=0-127 (Effect Library No.1-128)

EOX         11110111 F7 End Of Exclusive

```

#### 4.13.2.13 Patch Library Bulk Dump Format

```

STATUS      11110000 F0 System Exclusive Message
ID No.      01000011 43 Manufacturer's ID No. (YAMAHA)
SUB STATUS  0000nnnn 0n n=0-15(MIDI Channel No.1-16)

FORMAT No. 01111110 7E Universal Bulk Dump
BYTE COUNT (HIGH) 00000001 01 158(148+10)bytes

```

```

BYTE COUNT (LOW) 00011110 1E
01001100 4C 'L'
01001101 4D 'M'
00100000 20 ' '
00100000 20 ' '
00111000 38 '8'
01000011 42 'B'
00110011 39 '9'
00110110 38 '8'

DATA NAME   01010100 54 'T'
Ommmmmmmm mm m=0-20 (Patch Library No.0-20)
Receive is effective No.1-20

DATA        0ddddd ds Effect Library Memory(16+(66*2)bytes)
:
:
0ddddd de
CHECK SUM  0eeeeeee ee ee=(INVERT('L'+ 'M'+...+ds+...+de)+1) AND 7Fh

EOX         11110111 F7 End Of Exclusive

```

The first 12 bytes are the title, and are 7 bit. The subsequent 41 bytes are all divided into 4 bit units.

#### 4.13.2.14 Patch Library Bulk Dump Request Format

```

STATUS      11110000 F0 System Exclusive Message
ID No.      01000011 43 Manufacturer's ID (YAMAHA)
SUB STATUS  0010nnnn 2n n=0-15(MIDI Channel No.1-16)

FORMAT No. 01111110 7E Universal Bulk Dump
01001100 4C 'L'
01001101 4D 'M'
00100000 20 ' '
00100000 20 ' '
00111000 38 '8'
01000011 42 'B'
00110011 39 '9'
00110110 38 '8'

DATA NAME   01010100 54 'T'
Ommmmmmmm mm m=0-20 (Patch Library No.0-20)

EOX         11110111 F7 End Of Exclusive

```

#### 4.13.2.15 Channel Library Bulk Dump Format

```

STATUS      11110000 F0 System Exclusive Message
ID No.      01000011 43 Manufacturer's ID No. (YAMAHA)
SUB STATUS  0000nnnn 0n n=0-15(MIDI Channel No.1-16)

FORMAT No. 01111110 7E Universal Bulk Dump
BYTE COUNT (HIGH) 00000000 00 112(102+10)bytes
BYTE COUNT (LOW) 01110000 70
01001100 4C 'L'
01001101 4D 'M'
00100000 20 ' '
00100000 20 ' '
00111000 38 '8'
01000011 42 'B'
00110011 39 '9'
00110110 38 '8'

DATA NAME   01001000 48 'H'
Ommmmmmmm mm m=0-64 (Channel Library No.0-64)
Receive is effective No.2-64

DATA        0ddddd ds Effect Library Memory(16+(43*2)bytes)
:
:
0ddddd de
CHECK SUM  0eeeeeee ee ee=(INVERT('L'+ 'M'+...+ds+...+de)+1) AND 7Fh

EOX         11110111 F7 End Of Exclusive

```

The first 12 bytes are the title, and are 7 bit. The subsequent 41 bytes are all divided into 4 bit units.

**4.13.2.16 Channel Library Bulk Dump Request****Format**

```

STATUS      11110000 F0 System Exclusive Message
ID No.      01000011 43 Manufacturer's ID (YAMAHA)
SUB STATUS  0010nnnn 2n n=0-15(MIDI Channel No.1-16)

FORMAT No.  01111110 7E Universal Bulk Dump
01001100 4C 'L'
01001101 4D 'M'
00100000 20 ' '
00100000 20 ' '
00111000 38 '8'
01000011 42 'B'
00110011 39 '9'
00110110 38 '8'

DATA NAME   01001000 48 'H'
0mmmmmmmm mm m=0-64 (Channel Library
No.0-64)

EOX         11110111 F7 End Of Exclusive

```

**4.13.2.17 Automix Bulk Dump Format**

```

STATUS      11110000 F0 System Exclusive Message
ID No.      01000011 43 Manufacturer's ID No.
(YAMAHA)
SUB STATUS  0000nnnn 0n n=0-15(MIDI Channel No.1-16)

FORMAT No.  01111110 7E Universal Bulk Dump
BYTE COUNT  (HIGH) 00010000 10 2078(1024*2+20+10)bytes
BYTE COUNT  (LOW)  00011110 1E
01001100 4C 'L'
01001101 4D 'M'
00100000 20 ' '
00100000 20 ' '
00111000 38 '8'
01000011 42 'B'
00110011 39 '9'
00110110 38 '8'

DATA NAME   01000001 41 'A'
0mmmmmmmm mm m=0-16 (Channel Library
No.1-16, current buffer)

DATA        0xxxxxxx xx block count (high)
0xxxxxxx xx block count (low) [0 -
(size-1)]
0xxxxxxx xx total block count (high)
0xxxxxxx xx total block count (low)
[size-1]

0ttttttt tt title
: :
0ttttttt tt title16
0ddddddd ds Automix Memory(1024*2
bytes)
: :
0ddddddd de

CHECK SUM   0eeeeeee ee ee=(INVERT('L'+ 'M'+...+ds+
...+de)+1) AND 7Fh

EOX         11110111 F7 End Of Exclusive

```

**4.13.2.18 Automix Bulk Dump Request Format**

```

STATUS      11110000 F0 System Exclusive Message
ID No.      01000011 43 Manufacturer's ID (YAMAHA)
SUB STATUS  0010nnnn 2n n=0-15(MIDI Channel No.1-16)

FORMAT No.  01111110 7E Universal Bulk Dump
01001100 4C 'L'
01001101 4D 'M'
00100000 20 ' '
00100000 20 ' '
00111000 38 '8'
01000011 42 'B'
00110011 39 '9'
00110110 38 '8'

DATA NAME   01000001 41 'A'
0mmmmmmmm mm m=0-16 (Channel Library
No.1-16, current buffer)

EOX         11110111 F7 End Of Exclusive

```

**4.13.2.19 Program Change Assign Table Bulk Dump Format**

```

STATUS      11110000 F0 System Exclusive Message
ID No.      01000011 43 Manufacturer's ID No.
(YAMAHA)

```

```

SUB STATUS  0000nnnn 0n n=0-15(MIDI Channel No.1-16)
FORMAT No.  01111110 7E Universal Bulk Dump
BYTE COUNT  (HIGH) 00000001 01 138(128+10)bytes
BYTE COUNT  (LOW)  00001010 0A
01001100 4C 'L'
01001101 4D 'M'
00100000 20 ' '
00100000 20 ' '
00111000 38 '8'
01000011 42 'B'
00110011 39 '9'
00110110 38 '8'

DATA NAME   01010000 50 'P'
00100000 20 ' '

DATA        0ddddddd ds Program Change
Table(128bytes)
: :
0ddddddd de

CHECK SUM   0eeeeeee ee ee=(INVERT('L'+ 'M'+...+ds+
...+de)+1) AND 7Fh

EOX         11110111 F7 End Of Exclusive

```

All data is 7 bit.

**4.13.2.20 Program Change Assign Table Bulk Dump Request Format**

```

STATUS      11110000 F0 System Exclusive Message
ID No.      01000011 43 Manufacturer's ID (YAMAHA)
SUB STATUS  0010nnnn 2n n=0-15(MIDI Channel No.1-16)

FORMAT No.  01111110 7E Universal Bulk Dump
01001100 4C 'L'
01001101 4D 'M'
00100000 20 ' '
00100000 20 ' '
00111000 38 '8'
01000011 42 'B'
00110011 39 '9'
00110110 38 '8'

DATA NAME   01010000 50 'P'
00100000 20 ' '

EOX         11110111 F7 End Of Exclusive

```

**4.13.2.21 Control Change Assign Table Bulk Dump Format**

```

STATUS      11110000 F0 System Exclusive Message
ID No.      01000011 43 Manufacturer's ID No.
(YAMAHA)
SUB STATUS  0000nnnn 0n n=0-15(MIDI Channel No.1-16)

FORMAT No.  01111110 7E Universal Bulk Dump
BYTE COUNT  (HIGH) 00000010 02 352(342+10)bytes
BYTE COUNT  (LOW)  01100000 60
01001100 4C 'L'
01001101 4D 'M'
00100000 20 ' '
00100000 20 ' '
00111000 38 '8'
01000011 42 'B'
00110011 39 '9'
00110110 38 '8'

DATA NAME   01000011 43 'C'
00100000 20 ' '

DATA        0ddddddd ds Control Change
Table(114*3bytes)
: :
0ddddddd de

CHECK SUM   0eeeeeee ee ee=(INVERT('L'+ 'M'+...+ds+
...+de)+1) AND 7Fh

EOX         11110111 F7 End Of Exclusive

```

All data is 7 bit.

**4.13.2.22 Control Change Assign Table Bulk Dump Request Format**

```

STATUS      11110000 F0 System Exclusive Message
ID No.      01000011 43 Manufacturer's ID (YAMAHA)
SUB STATUS  0010nnnn 2n n=0-15(MIDI Channel No.1-16)

```

```

FORMAT No. 01111110 7E Universal Bulk Dump
           01001100 4C 'L'
           01001101 4D 'M'
           00100000 20 ' '
           00100000 20 ' '
           00111000 38 '8'
           01000011 42 'B'
           00110011 39 '9'
           00110110 38 '8'
DATA NAME 01000011 43 'C'
           00100000 20 ' '
EOX       11110111 F7 End Of Exclusive

```

### 4.13.3 Parameter Change

#### 4.13.3.1 Basic format

```

STATUS      11110000 F0 System Exclusive Message
ID No.      01000011 43 Manufacturer's ID (YAMAHA)
SUB STATUS  0ppppnnn pn p=mode (1:parameter change
                        or response for request
                        3:parameter request)
                        n=0-15(Rx Channel No.1-16)
GROUP ID    00111110 3E MODEL ID(Digital Mixer)
MODEL ID    00001000 08 Device Code(AW4416)
PARAM TYPE  0ttttttt tt Parameter type
DATA        0ddddd dd0 data 0
            :
            0ddddd ddn data n
EOX         11110111 F7 End Of Exclusive

```

```

Parameter
type rx/tx function
-----+-----+-----
0x00 rx/tx edit buffer (byte operation format)
0x01 rx/tx setup memory (byte operation format)
0x02 rx/tx function call (mem/lib recall,mem/lib
store)
0x10 rx/tx edit buffer (7bit operation format)
0x40 rx/tx edit buffer (bit operation format)
0x41 rx/tx setup memory (bit operation format)
0x43 rx/tx controller (key remote) (bit opera-
tion format)

```

#### 4.13.3.2 Parameter Change (byte operation for type 0x00:edit buffer)

##### 4.13.3.2

##### < Reception >

This message is received if [Parameter Change RX] is ON and the [Rx CH] matches the MIDI channel included in the Sub Status.

This message will be echoed if [Parameter Change ECHO] is ON.

When this message is received, the specified parameter will be controlled.

##### < Transmission >

If [Parameter Change TX] is ON, this message will be transmitted on the [Tx CH] MIDI channel when a parameter not specified in the [Control Change Assign Table] is edited.

This message will be echoed if [Parameter Change ECHO] is ON.

```

STATUS      11110000 F0 System Exclusive Message
ID No.      01000011 43 Manufacturer's ID No.
                        (YAMAHA)
SUB STATUS  0001nnnn 1n parameter change or
                        response n=0-15(MIDI
                        Channel No.1-16)
GROUP ID    00111110 3e MODEL ID(digital mixer)
MODEL ID    00001000 08 Device code (AW4416)
PARAM TYPE  00000000 00 byte operation for edit
                        buffer (type)
DATA        0aaaaaaa dd1 address( H) high 7 bits of
                        14 bits address
           0aaaaaaa dd2 address( L) low 7 bits of
                        14 bits address
           0000dddd dd3 data( H) high 4 bits of 8
                        bits data
           0000dddd dd4 data( L) low 4 bits of 8
                        bits data
           : : continuous address datas

```

```
EOX       11110111 F7 End Of Exclusive
```

The range of valid addresses is 0x0000 - 0x0595.

#### 4.13.3.3 Parameter Change (7bit operation for type 0x10:edit buffer)

##### < Reception >

This message is received if [Parameter Change RX] is ON and the [Rx CH] matches the MIDI channel included in the Sub Status.

This message will be echoed if [Parameter Change ECHO] is ON.

When this message is received, the specified parameter will be controlled.

##### < Transmission >

If [Parameter Change TX] is ON, this message will be transmitted on the [Tx CH] MIDI channel when a parameter not specified in the [Control Change Assign Table] is edited.

This message will be echoed if [Parameter Change ECHO] is ON.

```

STATUS      11110000 F0 System Exclusive Message
ID No.      01000011 43 Manufacturer's ID No.
                        (YAMAHA)
SUB STATUS  0001nnnn 1n parameter change n=0-
                        15(MIDI Channel No.1-16)
GROUP ID    00111110 3e MODEL ID(digital mixer)
MODEL ID    00001000 08 Device code (AW4416)
PARAM TYPE  00010000 10 7bit operation for edit
                        buffer (type)
DATA        0aaaaaaa dd0 address( H) high 7 bits of
                        14 bits address
           0aaaaaaa dd1 address( L) low 7 bits of
                        14 bits address
           0ddddd dd2 data 7bit
           :
EOX         11110111 F7 End Of Exclusive

```

The range of valid addresses is 0x0000 - 0x0595.

#### 4.13.3.4 Parameter Change (bit operation for type 0x40:edit buffer)

##### < Reception >

This message is received if [Parameter Change RX] is ON and the [Rx CH] matches the MIDI channel included in the Sub Status.

This message will be echoed if [Parameter Change ECHO] is ON.

When this message is received, the specified parameter will be controlled.

##### < Transmission >

If [Parameter Change TX] is ON, this message will be transmitted on the [Tx CH] MIDI channel when a parameter not specified in the [Control Change Assign Table] is edited.

This message will be echoed if [Parameter Change ECHO] is ON.

```

STATUS      11110000 F0 System Exclusive Message
ID No.      01000011 43 Manufacturer's ID No.
                        (YAMAHA)
SUB STATUS  0001nnnn 1n parameter change n=0-
                        15(MIDI Channel No.1-16)
GROUP ID    00111110 3e MODEL ID(digital mixer)
MODEL ID    00001000 08 Device code (AW4416)
PARAM TYPE  01000000 40 bit operation for edit
                        buffer (type)
DATA        0aaaaaaa dd0 address( H) high 7 bits of
                        14 bits address
           0aaaaaaa dd1 address( L) low 7 bits of
                        14 bits address
           0ddddd dd2 data(bit0-2:change bit
                        no.0-7, bit3:0=reset
                        1=set)
           :
EOX         11110111 F7 End Of Exclusive

```

The range of valid addresses is 0x0000 - 0x0595.

#### 4.13.3.5 Parameter Change (byte operation for type 0x01:setup memory)

##### < Reception >

This message is received if [Parameter Change RX] is ON and the [Rx CH] matches the MIDI channel included in the Sub Status.

This message will be echoed if [Parameter Change ECHO] is ON.

When this message is received, the specified parameter will be controlled.

##### < Transmission >

This message will be echoed if [Parameter Change ECHO] is ON.

```

STATUS      11110000 F0  System Exclusive Message
ID No.      01000011 43  Manufacturer's ID No.
              (YAMAHA)
SUB STATUS  0001nnnn 1n  parameter change or
              response n=0-15(MIDI
              Channel No.1-16)
GROUP ID    00111110 3e  MODEL ID(digital mixer)
MODEL ID    00001000 08  Device code (AW4416)
PARAM TYPE  00000001 01  byte operation for system
              memory (type)
DATA        0aaaaaaaa dd0 address( H) high 7 bits of
              14 bits address
              0aaaaaaaa dd1 address( L) low 7 bits of
              14 bits address
              0000dddd dd2 data( H) high 4 bits of 8
              bits data
              0000dddd dd3 data( L) low 4 bits of 8
              bits data
              : : continuous address datas
EOX         11110111 F7  End Of Exclusive

```

The range of valid addresses is 0x0000 - 0x00ff.

#### 4.13.3.6 Parameter Change (bit operation for type 0x41:setup memory)

##### < Reception >

This message is received if [Parameter Change RX] is ON and the [Rx CH] matches the MIDI channel included in the Sub Status.

This message will be echoed if [Parameter Change ECHO] is ON.

When this message is received, the specified parameter will be controlled.

##### < Transmission >

This message will be echoed if [Parameter Change ECHO] is ON.

```

STATUS      11110000 F0  System Exclusive Message
ID No.      01000011 43  Manufacturer's ID No.
              (YAMAHA)
SUB STATUS  0001nnnn 1n  parameter change or
              response n=0-15(MIDI
              Channel No.1-16)
GROUP ID    00111110 3e  MODEL ID(digital mixer)
MODEL ID    00001000 08  Device code (AW4416)
PARAM TYPE  01000001 41  bit operation for system
              memory (type)
DATA        0aaaaaaaa dd0 address( H) high 7 bits of
              14 bits address
              0aaaaaaaa dd1 address( L) low 7 bits of
              14 bits address
              0ddddddd dd2 data(bit0-2:change bit
              no.0-7, bit3:0=reset
              1=set)
              : :
EOX         11110111 F7  End Of Exclusive

```

The range of valid addresses is 0x0000 - 0x00ff.

#### 4.13.3.7 Parameter Value Request (type 0x00:edit buffer, 0x01:setup memory)

##### < Reception >

This message is received if [Parameter Change RX] is ON and the [Rx CH] matches the MIDI channel included in the Sub Status.

This message will be echoed if [Parameter Change ECHO] is ON and this AW4416 unit did not receive the message.

When this message is received, the value of the specified parameter will be transmitted as a Parameter Change Message.

##### < Transmission >

This message will be echoed if [Parameter Change ECHO] is ON and this AW4416 unit did not receive the message.

```

STATUS      11110000 F0  System Exclusive Message
ID No.      01000011 43  Manufacturer's ID No.
              (YAMAHA)
SUB STATUS  0011nnnn 3n  parameter request n=0-
              15(MIDI Channel No.1-16)
GROUP ID    00111110 3e  MODEL ID(digital mixer)
MODEL ID    00001000 08  Device code (AW4416)
PARAM TYPE  00tttttt tt  00:edit buffer, 01:system
              memory (type)
DATA        0aaaaaaaa dd0 address( H) high 7 bits of
              14 bits address
              0aaaaaaaa dd1 address( L) low 7 bits of
              14 bits address
              0ddddddd dd  count
EOX         11110111 F7  End Of Exclusive

```

The range of valid addresses is edit buffer 0x0000 - 0x0595 and setup memory 0x0000 - 0x00ff.

#### 4.13.3.8 Parameter Change (type 0x02:function call)

##### < Reception >

This message is received if [Parameter Change RX] is ON and the [Rx CH] matches the MIDI channel included in the Sub Status.

This message will be echoed if [Parameter Change ECHO] is ON.

When this message is received, the corresponding memory or library will be recalled or stored.

##### < Transmission >

This message will be echoed if [Parameter Change ECHO] is ON.

```

STATUS      11110000 F0  System Exclusive Message
ID No.      01000011 43  Manufacturer's ID No.
              (YAMAHA)
SUB STATUS  0001nnnn 1n  parameter change n=0-
              15(MIDI Channel No.1-16)
GROUP ID    00111110 3e  MODEL ID(digital mixer)
MODEL ID    00001000 08  Device code (AW4416)
PARAM TYPE  00000010 02  function call
DATA        0ddddddd dd0 function
              0ddddddd dd1 number
              0ddddddd dd2 channel
EOX         11110111 F7  End Of Exclusive

```

function	number	channel	Tx/Rx
0x00 scene recall	0-96(memory 0-96)	0x00	Tx* /Rx
0x01 eq lib recall	0-127(library 1-128)	0-26,32-47	Tx/Rx
0x02 dyn lib recall	0-127(library 1-128)	0-23,26,32-47	Tx/Rx
0x03 eff lib recall	0-127(library 1-128)	24,25	Tx/Rx
0x04 ch lib recall	0-64(library 0-64)	0-26,32-47	Tx/Rx
0x05 patch lib recall	0-20(library 0-20)	0	Tx/Rx
0x10 scene store	1-96(memory 1-96)	0x00	Rx only
0x11 eq lib store	40-127(library 41-128)	0-26,32-47	Rx only
0x12 dyn lib store	40-127(library 41-128)	0-23,26,32-47	Rx only
0x13 eff lib store	41-127(library 42-128)	24,25	Rx only
0x14 ch lib store	2-64(library 2-64)	0-26,32-47	Rx only
0x15 patch lib store	1-20(library 1-20)	0	Rx only

Channel 0-7(INPUT 1-8), 8-23(MONITOR 1-16), 24,25(RTN 1-2/EFF 1-2), 26(st mas)

\* [0x00: scene recall] is transmitted only when you recall a program that has not been assigned in the [Program change table]. Normally a program change will be transmitted.

#### 4.13.3.9 Parameter Change (type 0x43:controller(key remote))

##### < Reception >

This message is received if [Parameter Change RX] is ON and the [Rx CH] matches the MIDI channel included in the Sub Status.

This message will be echoed if [Parameter Change ECHO] is ON.

When this message is received, the same processing will be performed as when the specified key (see table below) is pressed (released)

##### < Transmission >

This message will be echoed if [Parameter Change ECHO] is ON.

```

STATUS      11110000 F0  System Exclusive Message
ID No.      01000011 43  Manufacturer's ID No.
                    (YAMAHA)
SUB STATUS  0001nnnn 1n  parameter change n=0-
                    15(MIDI Channel No.1-16)
GROUOP ID   00111110 3e  MODEL ID(digital mixer)
MODEL ID    00001000 08  Device code (AW4416)
PARAM TYPE  01000011 43  controller
DATA        00000000 00  control no.(0:key remote)
                    00000000 dd  No. 0-17(key 1-18)
                    00000000 dd  data(bit0-2:change bit
                    no.0-7, bit3:0=reset
                    1=set)
                    :
                    :
EOX         11110111 F7  End Of Exclusive

```

KEY	key no.	rx/tx	bit0	bit1	bit2	bit3	bit4	bit5	bit6	bit7
key1	0	rx	SONG	VIEW	AUX5	SHIFT-L	BANK	SEL1	SEL9	ON1
key2	1	rx	ON9	ABS	CUE	SAFE	JOGON	NUM	REPEAT	REW
key3	2	rx	QUICK	PAN	AUX6	F1	PAD1	SEL2	SEL10	ON2
key4	3	rx	ON10	PEAK	REC1	REC9	UNDO	MARK<	A	
key5	4	rx	MASTER	EQ	AUX7	F2	PAD2	SEL3	SEL11	ON3
key6	5	rx	ON11	TRACK	REC2	REC10	REDO	MARK>	B	FF
key7	6	rx	CD	DYN	AUX8	F3	PAD3	SEL4	SEL12	ON4
key8	7	rx	ON12	EDIT	REC3	REC11	UP	SEL5	SEL13	
key9	8	rx	SETUP	AUX1	HOME	F4	PAD4	SEL6	SEL14	ON5
key10	9	rx	ON13	A-MIX	REC4	REC12	DOWN	PUNCH	TOP	STOP
key11	10	rx	FILE	AUX2	1-16	F5	PAD5	SEL7	SEL15	ON6
key12	11	rx	ON14	SCENE	REC5	REC13	LEFT	IN	RTZ	
key13	12	rx	UTILITY	AUX3	17-24	SHIFT-R	PAD6	SEL8	SEL16	ON7
key14	13	rx	ON15	STORE	REC6	REC14	RIGHT	OUT	END	PLAY
key15	14	rx	MIDI	AUX4	MONI		PAD7	SEL9	SEL17	ON8
key16	15	rx	ON16	SCENE-	REC7	REC15	ENTER	SET	CANCEL	
key17	16	rx	HIGH	HI-MID	LOW-MID	LOW	PAD8	ASSIGN	SEL-ST	FOOT SW
key18	17	rx	ON-ST	SCENE+	REC8	REC16	SOLO	RECALL	ST	REC

You must transmit Reset (bit 3=0) after transmitting Set (bit 3=1).

