TASCAM
TEAC Professional Division

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2488

Digital Portastudio
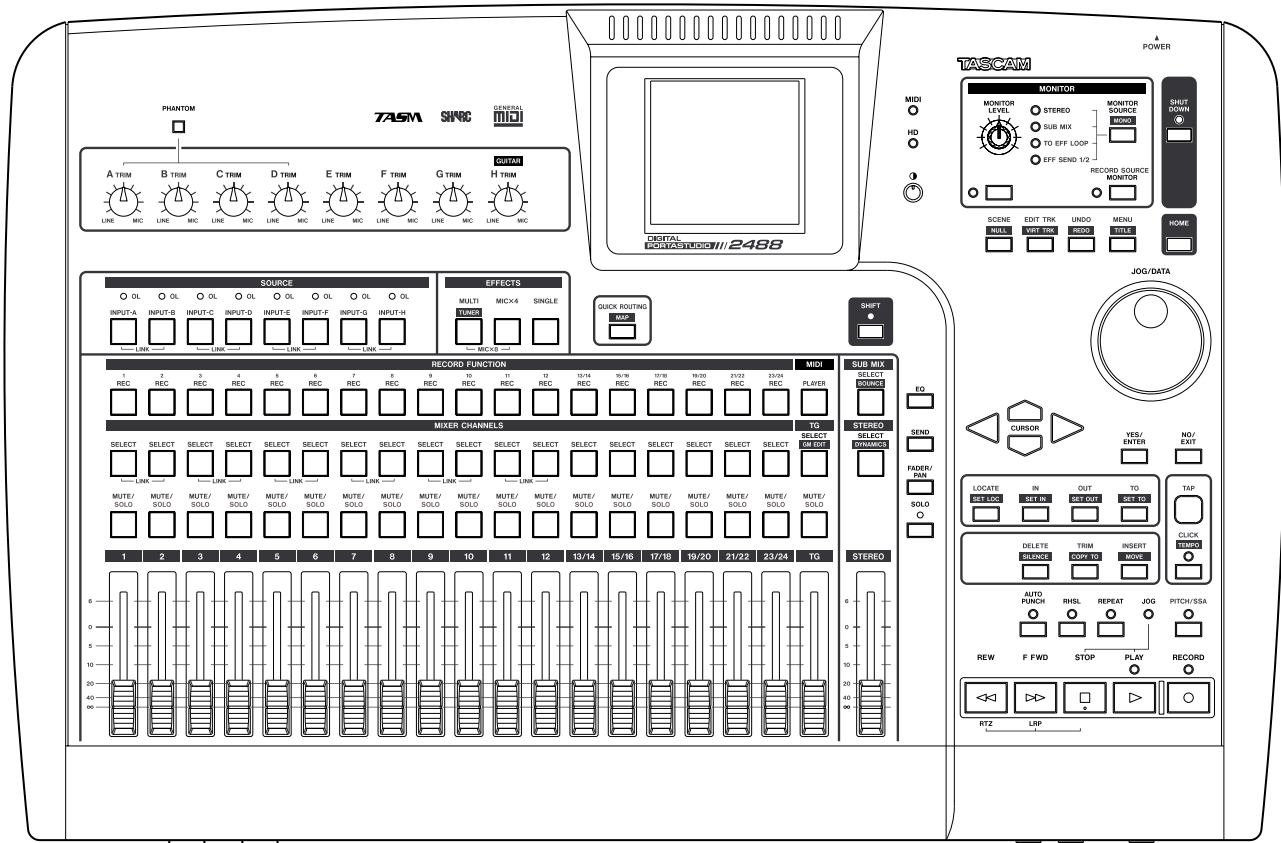
REFERENCE MANUAL

Contents

The following are the MIDI Control Change messages accepted by the 2488 to control different settings. When used with an external sequencer, this provides a certain degree of automation for mixing, etc.

Mixer Control Change parameters

The Bank Select controller is used with channel 15 to choose which group of eight channels or inputs are affected. It is therefore necessary to send a MIDI message of BE 00 xx (where xx selects the group of eight channels or inputs) before sending the Control Change messages on the appropriate MIDI channel.

Bank 0: Mixer channels 1 though 8
Bank 1: Mixer channels 9 through 16
Bank 2: Mixer channels 17 through 24
Bank 3: Inputs A through H

Once the group has been selected, use MIDI channels 1 through 8 to control the mixer channels or inputs (or MIDI channel 13 for the tone generator, or MIDI channel 16 for the stereo master or send master).

MIDI channel		1–8	13	16
		Mixer/Input channel	TG	STEREO/MASTER
Control Change Number	**Parameter**	**Values**		
7	Internal Level	0 - 127 (0= −∞dB, 100 = 0dB, 127 = +6dB)		
10	Pan	1 = L63, 64 = Center, 127 = R63		—
11	Attenuation	0 − 8 = −42, −36, −30, −24, −18, −12, −6, 0, +6(dB)		
16	Low Freq	0 − 31 = 32, 40, 50, 60, 70, 80, 90, 100, 125, 150, 175, 200, 225, 250, 300, 350, 400, 450, 500, 600, 700, 800, 850, 900, 950, 1.0k, 1.1k, 1.2k, 1.3k, 1.4k, 1.5k, 1.6k (Hz)		
17	Low Gain	0 − 24 = −12 to +12 (dB)		
18	Mid Freq	0 − 63 = 32, 40, 50, 60, 70, 80, 90, 100, 125, 150, 175, 200, 225, 250, 300, 350, 400, 450, 500, 600, 700, 800, 850, 900, 950, 1.0k, 1.1k, 1.2k, 1.3k, 1.4k, 1.5k, 1.6k, 1.7k, 1.8k, 1.9k, 2.0k, 2.2k, 2.4k, 2.6k, 2.8k, 3.0k, 3.2k, 3.4k, 3.6k, 3.8k, 4.0k, 4.5k, 5.0k, 5.5k, 6.0k, 6.5k, 7.0k, 7.5k, 8.0k, 9.0k, 10k, 11k, 12k, 13k, 14k, 15k, 16k, 17k, 18k (Hz)		
19	Mid Gain	0 − 24 = −12 to +12 (dB)		
20	Mid Q	0 - 6 = 0.25, 0.5, 1, 2, 4, 8, 16		
21	High Freq	32 − 63 = 1.7k, 1.8k, 1.9k, 2.0k, 2.2k, 2.4k, 2.6k, 2.8k, 3.0k, 3.2k, 3.4k, 3.6k, 3.8k, 4.0k, 4.5k, 5.0k, 5.5k, 6.0k, 6.5k, 7.0k, 7.5k, 8.0k, 9.0k, 10k, 11k, 12k, 13k, 14k, 15k, 16k, 17k, 18k (Hz)		
22	High Gain	0 − 24 = −12 to +12 (dB)		
23	LOOP Effect Level	0 − 127 (0= −∞dB, 100 = 0dB, 127 = +6dB)		(MASTER LEVEL)
24	EFFECT1 Level	0 − 127 (0= −∞dB, 100 = 0dB, 127 = +6dB)		(MASTER LEVEL)
25	EFFECT2 Level	0 − 127 (0= −∞dB, 100 = 0dB, 127 = +6dB)		(MASTER LEVEL)
80	EQ SW	0, 1 = OFF, ON		
81	LOOP Effect Pos	0, 1 ,2 = OFF, PRE, POST		—
82	EFFECT1 Pos	0, 1, 2 = OFF, PRE, POST		
83	EFFECT2 Pos	0, 1, 2 = OFF, PRE, POST		
84	Phase	0, 1 = N, R		

Effect parameter change MIDI messages

Use the following MIDI channels to send messages to the 2488 effects (see the *User's Guide* for further details about the types of effect available on the 2488):

Channels 1 through 8 are used for mic effects. The Bank Select controller is used with channel 14 to choose which group of eight channels or inputs is affected.

Bank 0: Mixer channels 1 though 8
Bank 1: Mixer channels 9 through 16
Bank 2: Mixer channels 17 through 24
Bank 3: Inputs A through H

Channel 9 is used to control the stereo dynamics processor effect.

Channel 10 is used to control the single effect.

Channel 11 is used to control the multi-effect.

The way in which the effects are controlled is by the use of NRPN (non-Registered Parameters).

Controller 98 is used for the LSB of each NRPN, and controller 99 for the MSB.

In effect settings where more than one effect may be selected, the same NRPN may produce a different outcome, depending on the selected effect.

NOTE

All values, etc. listed in these tables are in decimal notation.

Example effect parameter change

This example shows the MIDI bytes (in hexadecimal notation) needed to set the ratio of a compressor effect on mixer channel 9.

Note how Control Changes 6 and 38 (decimal) are used for data entry.

Control Changes 96 and 97 (decimal) are used for increment and decrement as well.

MIDI message (hexadecimal)	Meaning
BD 00 01	Sends a Control Change 0 (Bank Select) message on channel 14 to select bank 1
B0 63 00	Sends NPRN MSB to 2nd channel in group (mixer channel 9) on MIDI channel 1
B0 62 01	Sends 1 as NPRN LSB to 2nd channel in group, which controls the ratio when compressor is selected as mic effect
B0 06 00	Data entry Control Change LSB on MIDI channel 1
B0 26 00	Data entry Control Change MSB on MIDI channel 1

The ratio of the compressor on mixer channel 9 is now set to a value of 0.

Mic effects

Mic effects are controlled by channels 1 through 8 (see above for channel/input assignments enabled through Bank Select).

One of three different types of effect can be selected as a mic effect: compressor, de-esser or exciter.

Effect	NRPN	Parameter	Values
Compressor (CMP)	00 00	Threshold	0 – 100 = −40.0, −39.6, −39.2, −38.8, −38.4, −38.0, −37.6, −37.2, −36.8, −36.4, −36.0, −35.6, −35.2, −34.8, −34.4, −34.0, −33.6, −33.2, −32.8, −32.4, −32.0, −31.6, −31.2, −30.8, −30.4, −30.0, −29.6, −29.2, −28.8, −28.4, −28.0, −27.6, −27.2, −26.8, −26.4, −26.0, −25.6, −25.2, −24.8, −24.4, −24.0, −23.6, −23.2, −22.8, −22.4, −22.0, −21.6, −21.2, −20.8, −20.4, −20.0, −19.6, −19.2, −18.8, −18.4, −18.0, −17.6, −17.2, −16.8, −16.4, −16.0, −15.6, −15.2, −14.8, −14.4, −14.0, −13.6, −13.2, −12.8, −12.4, −12.0, −11.6, −11.2, −10.8, −10.4, −10.0, − 9.6, − 9.2, − 8.8, − 8.4, − 8.0, −7.6, −7.2, − 6.8, − 6.4, − 6.0, − 5.6, − 5.2, − 4.8, − 4.4, − 4.0, − 3.6, − 3.2, − 2.8, − 2.4, − 2.0, − 1.6, − 1.2, − 0.8, − 0.4, 0.0(dB)
	00 01	Ratio	0 – 100 = 0 – 100
	00 02	Attack	0 – 100 = 0 – 100
	00 03	Post Gain	0 – 100 = 0 – 100
De-esser (DSR)	00 04	Frequency	0 – 20 = 1.00, 1.07, 1.15, 1.23, 1.32, 1.41, 1.52, 1.62, 1.74, 1.87, 2.00, 2.14, 2.30, 2.46, 2.64, 2.83, 3.03, 3.25, 3.48, 3.73, 4.00(kHz)
	00 05	Depth	0 – 100 = 0 – 100
Exciter (EXC)	00 06	Frequency	0 – 20 = 1.00, 1.07, 1.15, 1.23, 1.32, 1.41, 1.52, 1.62, 1.74, 1.87, 2.00, 2.14, 2.30, 2.46, 2.64, 2.83, 3.03, 3.25, 3.48, 3.73, 4.00(kHz)
	00 07	Depth	0 – 100 = 0 – 100

Stereo dynamics processor

The dynamics processor inserted at the stereo master bus can be either a compressor or an expander. Use MIDI channel 9 to control this processor.

Effect	NRPN	Parameter	Values
Compressor (CMP)	00 00	Threshold	0 – 32 = 0 – −32dB
	00 01	Ratio	0 – 14 = 1.0:1, 1.1:1, 1.3:1, 1.5:1, 1.7:1, 2.0:1, 2.5:1, 3.0:1, 3.5:1, 4.0:1, 5.0:1, 6.0:1, 8.0:1, 16:1, ∞:1,
	00 02	Attack	1 – 100 = 1 – 100(msec)
	00 03	Release	1 – 100 = 1 – 100(msec)
	00 04	Post Gain	0 – 32 = 0 – 32(dB)
	00 05	Switch	0, 1 = Off, On

Effect	NRPN	Parameter	Values
Expander (EXP)	00 00	Threshold	0 – 32 = 0 – –32dB
	00 01	Ratio	0 – 14 = 1:1.0, 1:1.1, 1:1.3, 1:1.5, 1:1.7, 1:2.0, 1:2.5, 1:3.0, 1:3.5, 1:4.0, 1:5.0, 1:6.0, 1:8.0, 1:16, 1:32,
	00 02	Attack	1 – 100 = 1 – 100(msec)
	00 03	Release	1 – 100 = 1 – 100(msec)
	00 04	(reserved)	
	00 05	Switch	0, 1 = Off, On

Single effect

Use MIDI channel 10 to control this processor. The single processor can use any one of a number of effect types: reverb, delay, chorus, pitch shifter, flanger, phaser and gated reverb.

Effect	NRPN	Parameter	Values
Reverb (REV)	00 00	Room Type	0 – 3 = Hall, Room, Live, Studio
	00 01	Pre Delay	0 – 250 = 0 – 250(msec)
	00 02	Rev Time	1 – 100 = 0.1 – 10.0(sec)
	00 03	Diffusion	0 – 100 = 0 – 100
	00 04	Out Level	0 – 127 = 0 – 127
Delay (DLY)	00 00	Type	0 – 2 = Stereo, Ping-Pong, Multi-Tap
	00 01	Pre Delay	0 – 1000 = 0 – 1000(msec)
	00 02	FB Delay	0 – 1000 = 0 – 1000(msec)
	00 03	Feedback	0 – 100 = 0 – 100
	00 04	Out Level	0 – 127 = 0 – 127
Chorus (CHO)	00 00	Rate	1 – 100 = 0.1 – 10.0(Hz)
	00 01	Depth	0 – 100 = 0 – 100
	00 02	FB Delay	0 – 100 = 0 – 100(msec)
	00 03	Feedback	0 – 100 = 0 – 100
	00 04	Out Level	0 – 127 = 0 – 127
Pitch Shifter (PIT)	00 00	Pitch	0 – 12 – 24 = –12 – 0 – +12
	00 01	Fine	0 – 50 – 100 = –50 – 0 – +50
	00 02	FB Delay	0 – 500 = 0 – 500(msec)
	00 03	Feedback	0 – 100 = 0 – 100
	00 04	Out Level	0 – 127 = 0 – 127
Flanger (FLG)	00 00	Rate	1 – 100 = 0.1 – 10.0(Hz)
	00 01	Depth	0 – 100 = 0 – 100
	00 02	FB Delay	0 – 1000 = 0 – 1000(msec)
	00 03	Feedback	0 – 100 = 0 – 100
	00 04	Out Level	0 – 127 = 0 – 127

Effect	NRPN	Parameter	Values
Phaser (PHA)	00 00	Rate	1 – 100 = 0.1 – 10.0(Hz)
	00 01	Depth	0 – 100 = 0 – 100
	00 02	Resonance	0 – 100 = 0 – 100
	00 03	Step	0 – 3 = 4, 8, 12, 16
	00 04	Out Level	0 – 127 = 0 – 127
Gated reverb(GRV)	00 00	Type	0,1 = Normal, Reverse
	00 01	Threshold	0 – 30 = –46 – –16(dB)
	00 02	Gate Time	1 – 300 = 10 – 3000(msec)
	00 03	Density	0 – 100 = 0 – 100
	00 04	Out Level	0 – 127 = 0 – 127

Multi effect

Use MIDI channel 11 to set the parameters of this effect. Note that this effect chains together a sequence of effects (each step in the chain can hold one effect, the sequence in the chain of which is given in the first column of this table):

Effect chain #	Effect	NRPN	Parameter	Values
1	Noise suppressor (NSP)	00 00	Threshold	0 – 100 = –84.0, –83.4, –82.8, –82.2, –81.6, –81.0, –80.4, –79.8, –79.2, –78.6, –78.0, –77.4, –76.8, –76.2, –75.6, –75.0, –74.4, –73.8, –73.2, –72.6, –72.0, –71.4, –70.8, –70.2, –69.6, –69.0, –68.4, –67.8, –67.2, –66.6, –66.0, –65.4, –64.8, –64.2, –63.6, –63.0, –62.4, –61.8, –61.2, –60.6, –60.0, –59.4, –58.8, –58.2, –57.6, –57.0, –56.4, –55.8, –55.2, –54.6, –54.0, –53.4, –52.8, –52.2, –51.6, –51.0, –50.4, –49.8, –49.2, –48.6, –48.0, –47.4, –46.8, –46.2, –45.6, –45.0, –44.4, –43.8, –43.2, –42.6, –42.0, –41.4, –40.8, –40.2, –39.6, –39.0, –38.4, –37.8, –37.2, –36.6, –36.0, –35.4, –34.8, –34.2, –33.6, –33.0, –32.4, –31.8, –31.2, –30.6, –30.0, –29.4, –28.8, –28.2, –27.6, –27.0, –26.4, –25.8, –25.2, –24.6, –24.0(dB)
		00 01	Supression	0 – 100 = 0 – 100
		00 02	Attack	0 – 100 = 0 – 100
		00 03	Release	0 – 100 = 0 – 100
		00 04	Switch	0, 1 = Off, On

Effect chain #	Effect	NRPN	Parameter	Values
2	Distortion (DST)	00 05	Distortion	0 – 100 = 0 – 100
		00 06	Tone	0 – 100 = 0 – 100
		00 07	Post Gain	0 – 100 = 0 – 100
		00 08	(reserved)	
		00 09	Switch	0, 1 = Off, On
	Compressor (CMP)	00 05	Threshold	0 – 100 = –60.0, –59.6, –59.2, –58.8, –58.4, –58.0, –57.6, –57.2, –56.8, –56.4, –56.0, –55.6, –55.2, –54.8, –54.4, –54.0, –53.6, –53.2, –52.8, –52.4, –52.0, –51.6, –51.2, –50.8, –50.4, –50.0, –49.6, –49.2, –48.8, –48.4, –48.0, –47.6, –47.2, –46.8, –46.4, –46.0, –45.6, –45.2, –44.8, –44.4, –44.0, –43.6, –43.2, –42.8, –42.4, –42.0, –41.6, –41.2, –40.8, –40.4, –40.0, –39.6, –39.2, –38.8, –38.4, –38.0, –37.6, –37.2, –36.8, –36.4, –36.0, –35.6, –35.2, –34.8, –34.4, –34.0, –33.6, –33.2, –32.8, –32.4, –32.0, –31.6, –31.2, –30.8, –30.4, –30.0, –29.6, –29.2, –28.8, –28.4, –28.0, –27.6, –27.2, –26.8, –26.4, –26.0, –25.6, –25.2, –24.8, –24.4, –24.0, –23.6, –23.2, –22.8, –22.4, –22.0, –21.6, –21.2, –20.8, –20.4, –20.0(dB)
		00 06	Ratio	0 – 100 = 0 – 100
		00 07	Comp Level	0 – 100 = 0 – 100
		00 08	Direct Mix	0 – 100 = 0 – 100
		00 09	Switch	0, 1 = Off, On
3	Amp simulator (AMP)	00 10	Pre Gain	0 - 100 = 0 - 100
		00 11	Tone	0 - 20 = 0.12, 0.14, 0.16, 0.18, 0.20, 0.22, 0.25, 0.28, 0.31, 0.35, 0.39, 0.44, 0.49, 0.55, 0.62, 0.70, 0.79, 0.89, 1.00, 1.12, 1.26(kHz)
		00 12	Box Size	0 - 3 = 1x8", 1x12", 2x12", "4x10", 4x12"
		00 13	Post Gain	0 - 100 = 0 - 100
		00 14	Switch	0, 1 = Off, On

Effect chain #	Effect	NRPN	Parameter	Values
4	Flanger (FLG)	00 15	Speed	1 – 100 = 0.1 – 10.0(Hz)
		00 16	Depth	0 – 100 = 0 – 100
		00 17	Resonance	0 – 100 = 0 – 100
		00 18	Mix Level	0 – 100 = 0 – 100
		00 19	Switch	0, 1 = Off, On
	Phaser (PHA)	00 15	Speed	1 – 100 = 0.1 – 10.0(Hz)
		00 16	Depth	0 – 100 = 0 – 100
		00 17	Resonance	0 – 100 = 0 – 100
		00 18	(reserved)	
		00 19	Switch	0, 1 = Off, On
	Chorus (CHO)	00 15	Speed	0 – 99 = 0.1 – 10.0(Hz)
		00 16	Depth	0 – 100 = 0 – 100
		00 17	Tone	0 – 100 = 0 – 100
		00 18	Mix Level	0 – 100 = 0 – 100
		00 19	Switch	0, 1 = Off, On
	Exciter (EXC)	00 15	Frequency	0 – 20 = 1.00, 1.07, 1.15, 1.23, 1.32, 1.41, 1.52, 1.62, 1.74, 1.87, 2.00, 2.14, 2.30, 2.46, 2.64, 2.83, 3.03, 3.25, 3.48, 3.73, 4.00(kHz)
		00 16	Depth	0 – 100 = 0 – 100
		00 17	(reserved)	
		00 18	(reserved)	
		00 19	Switch	0, 1 = Off, On
	Pitch shifter(PIT)	00 15	Pitch	0 – 12 – 24 = –12 – 0 – +12
		00 16	Fine	0 – 50 – 100 = –50 – 0 – +50
		00 17	Mix Level	0 – 100 = 0 – 100
		00 18	(reserved)	
		00 19	Switch	0, 1 = Off, On
	Tremolo(TRM)	00 15	Speed	1 – 100 = 0.1 – 10.0(Hz)
		00 16	Depth	0 – 100 = 0 – 100
		00 17	Shape	0 – 100 = 0 – 100
		00 18	(reserved)	
		00 19	Switch	0, 1 = Off, On
	Vibrato (VIB)	00 15	Speed	1 – 100 = 0.1 – 10.0(Hz)
		00 16	Depth	0 – 100 = 0 – 100
		00 17	(reserved)	0 – 100 = 0 – 100
		00 18	(reserved)	
		00 19	Switch	0, 1 = Off, On

Effect chain #	Effect	NRPN	Parameter	Values
4	Wah (WAH)	00 15	Attack	0 – 100 = 0 – 100
		00 16	Sense	0 – 100 = 0 – 100
		00 17	Pedal	0, 1 = Off, On
		00 18	(reserved)	
		00 19	Switch	0, 1 = Off, On
5	Delay (DLY)	00 20	Delay Time	0 – 1000 = 0 – 1000(ms)
		00 21	Feedback	0 – 100 = 0 – 100
		00 22	Hi Damp	0 – 100 = 0 – 100
		00 23	Mix Level	0 – 100 = 0 – 100
		00 24	Switch	0, 1 = Off, On

MIDI Program Change messages

The 2488 can accept Program Change messages to select an effect and to change scenes.

Before a Program Change message is sent for changing an effect, a Bank Select message must be sent to select whether an effect will be selected from the preset bank or from the user bank of memories. In each case, bank 0 corresponds to the preset memories, and bank 1 to the user bank.

Send the Bank Select messages (CC 0) on MIDI channels 1 through 8 for mic effects (see below), MIDI channel 9 for stereo dynamics, channel 10 for the single effect, and channel 11 for the multi effect.

When selecting a mic effect, a Bank Select message should first be sent on channel 14 to select the group of eight channels or inputs out of which the channel is selected:

Bank 0: Mixer channels 1 though 8
Bank 1: Mixer channels 9 through 16
Bank 2: Mixer channels 17 through 24
Bank 3: Inputs A through H

The Program Change messages that are then valid are as follows (see the tables following for details of the preset values—the "user" messages correspond to the entry number in the library):

Mic effects (preset) Program Change 0 to 2

Mic effects (user) Program Change 0 to 99 (maximum)

Stereo dynamics effect (preset) Program Change 0 to 1

Stereo dynamics effect (user) Program Change 0 to 99 (maximum)

Single effect (preset) Program Change 0 to 34

Single effect (user) Program Change 0 to 99 (maximum)

Multi effect (preset) Program Change 0 to 41

Multi effect (user) Program Change 0 to 99 (maximum)

Scene memory Program Change messages
These are transmitted on channel 16. The Program Change message may be from 0 to 99.

Preset mic effects

Program Change	Name shown on display	Effect component
0	VOCAL-COMP	Compressor (CMP)
1	DE-ESSER	De-esser (DSR)
2	VOCAL-EXC	Exciter (EXC)

Preset stereo dynamics effects

Program Change	Name shown on display	Effect component
0	COMPRESSOR	Compressor (CMP)
1	EXPANDER	Expander (EXP)

Preset Multi effects

The first 16 effects are generic effects, and the rest are presets that you can use "as is" or as jumping-off points for your own sounds.

The chain of all multi effects start with (1) a noise suppressor, followed by either (2) distortion or clean compression, then (3) an amp simulator, (4) another effect, and finally by (5) a delay setting.

The effects in (4) are abbreviated as follows:

FLG: Flanger
PHA: Phaser
CHO: Chorus
EXC: Exciter
PIT: Pitch shifter
TRM: Tremolo
VIB: Vibrato
WAH: Wah (auto or pedal)

Effects 2 and 4 in the chain are listed here as "main components".

Program Change	Name shown on display	Main components
0	DIST-FLANGER	DIST- FLG
1	DIST-PHASER	DIST- PHA
2	DIST-CHORUS	DIST- CHO
3	DIST-EXCITER	DIST- EXC
4	DIST-PITCH	DIST- PIT
5	DIST-TREMOLO	DIST- TRM
6	DIST-VIBRATO	DIST- VIB
7	DIST-WAH	DIST- WAH
8	COMP-FLANGER	CLEAN-FLG
9	COMP-PHASER	CLEAN-PHA

Program Change	Name shown on display	Main components
10	COMP-CHORUS	CLEAN-CHO
11	COMP-EXCITER	CLEAN-EXC
12	COMP-PITCH	CLEAN-PIT
13	COMP-TREMOLO	CLEAN-TRM
14	COMP-VIBRATO	CLEAN-VIB
15	COMP-WAH	CLEAN-WAH
16	Flange Rock	DIST- FLG
17	Old Style	DIST- PHA
18	FAT Phase	DIST- PHA
19	Universe Box	DIST- CHO
20	Texas Tube	DIST- EXC
21	Loaded Gain	DIST- EXC
22	Grind	DIST- EXC
23	Practice Amp	DIST- EXC
24	FlabbyChorus	DIST- PIT
25	RotaryCrunch	DIST- TRM
26	Vibed Crunch	DIST- VIB
27	"VIOLIN"	DIST- WAH
28	BigFlangeCho	CLEAN-FLG
29	NaturalDrive	CLEAN-FLG
30	Robo-Phaser	CLEAN-PHA
31	Jazzy Chorus	CLEAN-CHO
32	NashN' Snappy	CLEAN-EXC
33	Light Grit	CLEAN-EXC

Program Change	Name shown on display	Main components
34	The Jazz Gig	CLEAN-EXC
35	Shimmer	CLEAN-PIT
36	Fast Tremolo	CLEAN-TRM
37	MoodyTremolo	CLEAN-TRM

Program Change	Name shown on display	Main components
38	PoManzChorus	CLEAN-VIB
39	Wiggle Room	CLEAN-VIB
40	Touch Wah	CLEAN-WAH
41	KoZou	CLEAN-WAH

Preset single effects

The types here are:

REV: Reverb
DLY: Delay
CHO: Chorus
PIT: Pitch shift
FLG: Flanger
PHA: Phaser
GRV: Gate and reverb

Program Change	Name shown on display	Type of effect
0	REVERB	REV
1	DELAY	DLY
2	CHORUS	CHO
3	PITCH SHIFT	PIT
4	FLANGER	FLG
5	PHASER	PHA
6	GATE+REVERB	GRV
7	Church Hall	REV
8	Small Room	REV
9	Vocal Room	REV
10	Midium Room	REV
11	Large Room	REV
12	Ambience	REV
13	Long Drum	REV

Program Change	Name shown on display	Type of effect
14	Live Club	REV
15	MltDly 250ms	DLY
16	MltDly 500ms	DLY
17	MltDly 1 sec	DLY
18	PanDly 250ms	DLY
19	St Dly 250ms	DLY
20	St Dly 500ms	DLY
21	St Dly 1 sec	DLY
22	SparklChorus	CHO
23	DeepChorus	CHO
24	Octave Up	PIT
25	Octave Down	PIT
26	TinkyPiano	PIT
27	Monks	PIT
28	Chipmunks	PIT
29	Slow Flanger	FLG
30	Fantastic	FLG
31	Slow Phaser	PHA
32	FarOutPhase	PHA
33	Mirror 'Verb	GRV
34	Gate Reverb	GRV

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Model: 2488   MIDI Implementation Chart   Version   : 1.0

Function		Transmitted	Recognized	Remarks
Basic	Default	1-16	1-16[d]	
Channel	Changed	x	1-16	
Mode	Default	x	Mode 3	
	Messages	x	x	
	Altered	**********		
Note		0 — 127	0 — 127	
Number	True Voice	**********	0 — 127	
Velocity	Note On	O	O	
	Note Off	x	x	
After	Key's	O	O	
Touch	Ch's	O	O	
Pitch Bend		O	O	
Control	0,32	O[a]	O[e]	Bank Select
Change	1	O	O	Modulation
	5	O	O	Portamento time
	6, 38	O	O	Data entry
	7	O	O	Volume
	10	O	O	Panpot
	11	O	O	Expression
	64	O	O	Hold 1
	65	O	O	Portamento
	66	O	O	Sostenuto
	67	O	O	Soft
	80	O	O	Reverb program
	81	O	O	Chorus program
	91	O	O	Reverb send
	93	O	O	Chorus send
Prog		O	O	
Change	True #	**********	0—127[c]	
System Exclusive		O	O	g
Common	MTC Quarter Frame	O[b]	O[f]	
	Song Pos	O[c]	x	
	Song Sel	O[a]	x	
	Tune	O[a]	x	
System	Clock	O[c]	x	
Real Time	Commands	O	x	
Aux	Local ON/OFF	x	x	
Messages	All Notes OFF	O	O	
	Active Sense	x	x	
	Reset	O	O	

a. On SMF playback

b. When generator is set to output MTC

c. When generator is set to output clock

d. In pattern playback mode, Channel 10 is not recognized

e. In tone generator playback mode, effects and mixer cannot be controlled through external MIDI

f. When source is set to external

g. MMC as master or slave RP Ver 1.00 (T, R) : MIDI Full Timecode is T when generator is MTC, and R when SOURCE is external.

MODE 1: OMNI ON, POLY	MODE 2: OMNI ON, MONO	O:Yes
MODE 3: OMNI OFF, POLY	MODE 4: OMNI OFF, MONO	x: No

Bit-map array of MMC commands

Byte	Bit7	Bit6 (40H)	Bit5 (20H)	Bit4 (10H)	Bit3 (08H)	Bit2 (04H)	Bit1 (02H)	Bit0 (01H)
c0	−0	(06) RECORD STROBE	(05) REWIND	(04) FAST FORWARD	(03) DEFERRED PLAY	(02) PLAY	(01) STOP	(00) reserved
c1	−0	(0D) MMC RESET	(0C) ~~COMMAND ERROR RESET~~	(0B) ~~CHASE~~	(0A) ~~EJECT~~	(09) PAUSE	(08) ~~RECORD PAUSE~~	(07) RECORD EXIT
c2	−0	(14)	(13)	(12)	(11)	(10)	(0F)	(0E)
c3	−0	(1B)	(1A)	(19)	(18)	(17)	(16)	(15)
c4	−0	−0	−0	−0	(1F)	(1E)	(1D)	(1C)
c5	−0	(26)	(25)	(24)	(23)	(22)	(21)	(20)
c6	−0	(2D)	(2C)	(2B)	(2A)	(29)	(28)	(27)
c7	−0	(34)	(33)	(32)	(31)	(30)	(2F)	(2E)
c8	−0	(3B)	(3A)	(39)	(38)	(37)	(36)	(35)
c9	−0	−0	−0	−0	(3F)	(3E)	(3D)	(3C)
c10	−0	(46) SEARCH	(45) VARIABLE PLAY	(44) LOCATE	(43) ~~UPDATE~~	(42) READ	(41) MASKED WRITE	(40) WRITE
c11	−0	(4D) ~~ADD~~	(4C) ~~MOVE~~	(4B) ~~MTC COMMAND~~	(4A) ~~GENERATOR COMMAND~~	(49) ~~ASSIGN SYS, MAS~~	(48) ~~STEP~~	(47) SHUTTLE
c12	−0	(54) ~~DEFERRED VARI, PLAY~~	(53) ~~COMMAND SEGMENT~~	(52) ~~GROUP~~	(51) ~~EVENT~~	(50) ~~PROCEDURE~~	(4F) ~~DROP FR ADJUST~~	(4E) ~~SUBTRACT~~
c13	−0	(5B)	(5A)	(59)	(58)	(57)	(56)	(55) ~~REC STROBE VARIABLE~~

Byte	Bit7	Bit6 (40H)	Bit5 (20H)	Bit4 (10H)	Bit3 (08H)	Bit2 (04H)	Bit1 (02H)	Bit0 (01H)
c15	−0	(66)	(65)	(64)	(63)	(62)	(61)	(60)
c16	−0	(6D)	(6C)	(6B)	(6A)	(69)	(68)	(67)
c17	−0	(74)	(73)	(72)	(71)	(70)	(6F)	(6E)
c18	−0	(7B)	(7A)	(79)	(78)	(77)	(76)	(75)
c19	−0	−0	−0	−0	(7F) ~~RESUME~~	(7E)	(7D)	(7C) ~~WAIT~~

Bit-map array of Response/Information field

Byte	Bit7	Bit6 (40H)	Bit5 (20H)	Bit4 (10H)	Bit3 (08H)	Bit2 (04H)	Bit1 (02H)	Bit0 (01H)
r0	−0	(06) ~~GENERATOR TIMECODE~~	(05) ~~LOCK DEVIATION~~	(04) ~~ACTUAL OFFSET~~	(03) ~~REQUESTED OFFSET~~	(02) ~~SELECTED MASTER CODE~~	(01) SELECTED TIMECODE	(00) reserved
r1	−0	(0D) GP5	(0C) GP4	(0B) GP3	(0A) GP2	(09) GP1	(08) GP0/LOCATE POINT	(07) ~~MTC INPUT~~
r2	−0	(14)	(13)	(12)	(11)	(10)	(0F) GP7	(0E) GP6
r3	−0	(1B)	(1A)	(19)	(18)	(17)	(16)	(15)
r4	−0	−0	−0	−0	(1F)	(1E)	(1D)	(1C)
r5	−0	(26) ~~Short GENERATOR TIMECODE~~	(25) ~~Short LOCK DEVIATION~~	(24) ~~Short ACTUAL OFFSET~~	(23) ~~Short REQUESTED OFFSET~~	(22) ~~Short SELECTED MASTER CODE~~	(21) ~~Short SELECTED TIMECODE~~	(20) reserved
r6	−0	(2D) Short GP5	(2C) Short GP4	(2B) Short GP3	(2A) Short GP2	(29) Short GP1	(28) Short GP0 LOCATE POINT	(27) ~~Short MTC INPUT~~
r7	−0	(34)	(33)	(32)	(31)	(30)	(2F) Short GP7	(2E) Short GP6

Byte	Bit7	Bit6 (40H)	Bit5 (20H)	Bit4 (10H)	Bit3 (08H)	Bit2 (04H)	Bit1 (02H)	Bit0 (01H)
r8	−0	(3B)	(3A)	(39)	(38)	(37)	(36)	(35)
r9	−0	−0	−0	−0	(3F)	(3E)	(3D)	(3C)
r10	−0	(46) ~~SELECTED TIMECODE SOURCE~~	(45) ~~TIME STANDARD~~	(44) ~~COMMAND ERROR LEVEL~~	(43) ~~COMMAND ERROR~~	(42) ~~RESPONSE ERROR~~	(41) ~~UPDATE RATE~~	(40) SIGNATURE
r11	−0	(4D) RECORD STATUS	(4C) RECORD MODE	(4B) ~~FAST MODE~~	(4A) ~~STOP MODE~~	(49) ~~VELOCITY TALLY~~	(48) MOTION CONTROL TALLY	(47) ~~SELECTED TIMECODE USER BITS~~
r12	−0	(54) ~~STEP LENGTH~~	(53) ~~TRACK INPUT MONITOR~~	(52) ~~TRACK SYNC MONITOR~~	(51) ~~RECORD MONITOR~~	(50) ~~GLOBAL MONITOR~~	(4F) TRACK RECORD READY	(4E) TRACK RECORD STATUS
r13	−0	(5B) ~~GENERATOR COMMAND TALLY~~	(5A) ~~CHASE MODE~~	(59) ~~RESOLVED PLAY MODE~~	(58) ~~CONTROL DISABLE~~	(57) ~~LIFTER DEFEAT~~	(56) ~~FIXED SPEED~~	(55) ~~PLAY SPEED REFERENCE~~
r14	−0	−0	−0	−0	(5F) ~~MTC SETUP~~	(5E) ~~MTC COMMAND TALLY~~	(5D) ~~GENERATOR USER BITS~~	(5C) ~~GENERATOR SETUP~~
r15	−0	(66)	(65) FAILURE	(64) ~~RESPONSE SEGMENT~~	(63) ~~VITC INSERT ENABLE~~	(62) ~~TRACK MUTE~~	(61) ~~EVENT RESPONSE~~	(60) ~~PROCEDURE RESPONSE~~
r16	−0	(6D)	(6C)	(6B)	(6A)	(69)	(68)	(67)
r17	−0	(74)	(73)	(72)	(71)	(70)	(6F)	(6E)
r18	−0	(7B)	(7A)	(79)	(78)	(77)	(76)	(75)
r19	−0	−0	−0	−0	(7F) ~~RESUME~~	(7E)	(7D)	(7C) ~~WAIT~~

The following provides a brief description of the patterns available (see the section on "Patterns" in the *User's Guide* for details) together with their default tempo and the drum kit used for each pattern (see "Drum kits" on page 20).

Patterns

Style	Description	TEMPO	Drum Kit
RCK01	60s Hard Rock1	95	STD JAZZ
RCK02	60s Hard Rock2	190	ROOM ROCK
RCK03	70s Hard Rock1	108	POWER WET
RCK04	70s Hard Rock2	156	POWER WET
RCK05	70s Hard Rock3	120	ROOM ROCK
RCK06	70s Hard Rock4	70	POWER WET
RCK07	70s Hard Rock5	80	POWER WET
RCK08	Glam Rock	132	STANDARD
RCK09	American Hard Rock1	120	ROOM ROCK
RCK10	American Hard Rock2	140	STD DISCO
RCK11	American Hard Rock3	110	ROOM ROCK
RCK12	Shuffle Hard Rock1	166	ROOM CHORUS
RCK13	Shuffle Hard Rock2	120	ROOM ROCK
RCK14	Grunge1	114	POWER R&B
RCK15	Grunge2	130	ROOM ROCK
RCK16	Loud1	120	ROOM ROCK
RCK17	Loud2	140	POWER WET
RCK18	Speed Metal	185	STANDARD
RCK19	Heavy Metal1	170	ROOM ROCK
RCK20	Heavy Metal2	95	ROOM ROCK
RCK21	Thrash	135	ROOM ROCK
RCK22	Death Metal	148	ROOM ROCK
RCK23	70s Vintage Rock1	120	STD DRY
RCK24	70s Vintage Rock2	165	STANDARD
RCK25	70s Vintage Rock3	160	STANDARD
RCK26	Blues Rock1	55	POWER WET
RCK27	Blues Rock2	125	STANDARD
RCK28	70s Rock & Roll1	130	STANDARD
RCK29	70s Rock & Roll2	105	STANDARD
RCK30	80s Vintage Rock1	145	STD DISCO
RCK31	80s Vintage Rock2	175	ROOM ROCK
RCK32	80s Vintage Rock3	57	POWER WET

Style	Description	TEMPO	Drum Kit
RCK33	80s Vintage Rock4	142	ROOM ROCK
RCK34	80s Vintage Rock5	120	ROOM ROCK
RCK35	Alternative Rock1	150	ROOM ROCK
RCK36	Alternative Rock2	72	POWER WET
RCK37	Piano Trio Rock	138	STANDARD
RCK38	Progressive Rock	85	POWER WET
RCK39	Shuffle Rock1	120	STANDARD
RCK40	Shuffle Rock2	130	STD DRY
RCK41	Liverpool	150	STD LO-FI
RCK42	80s Irish Rock1	100	ROOM ROCK
RCK43	80s Irish Rock2	110	ROOM ROCK
RCK44	Electric Rock1	180	TECHNO
RCK45	Electric Rock2	120	808 CHORUS
RCK46	Latin Rock	123	STD LATIN
RCK47	Surf Rock	155	STANDARD
RCK48	Old Rock'n' Roll	170	POWER R&B
RCK49	Rockabilly	179	ROOM R&B
RCK50	Jungle-Rock	145	ELECTRO
RCK51	Fusion Rock	90	STD LATIN
RCK52	Funk Rock	100	POWER R&B
RCK53	Synth Rock	132	ELECTRO
RCK54	C&W Rock	110	STD DRY
RCK55	British Shuffle Beat	145	STANDARD
BLD01	POP Ballad1	80	STD LATIN
BLD02	POP Ballad2	90	STANDARD
BLD03	6/8 Pop Ballad1	68	STD LATIN
BLD04	6/8 Pop Ballad2	70	BRUSH
BLD05	Organ Ballad	75	STD DEEP REV
BLD06	Hard Rock Ballad1	105	STD DEEP REV
BLD07	Hard Rock Ballad2	100	STD DEEP REV
BLD08	Slow Blues 12/8	68	STD JAZZ
BLD09	16 Beat Ballad1	76	STD DISCO
BLD10	16 Beat Ballad2	70	STD LATIN

Style	Description	TEMPO	Drum Kit		Style	Description	TEMPO	Drum Kit
BLD11	Unplugged Ballad1	75	BRUSH		RNB13	R&B 5	90	808
BLD12	Unplugged Ballad2	120	STD LATIN		RNB14	R&B 6	102	POWER R&B
BLD13	AOR Ballad1	66	808		RNB15	R&B 7	95	STD LATIN
BLD14	AOR Ballad2	65	STD DEEP REV		RNB16	R&B 8	132	STANDARD
BLD15	Rock Ballad1	60	ROOM ROCK		RNB17	R&B 9	110	STD LATIN
BLD16	Rock Ballad2	125	STD DEEP REV		RNB18	R&B 10	105	STANDARD
BLD17	R&B Ballad1	75	808 CHORUS		RNB19	R&B 11	115	STD LATIN
BLD18	R&B Ballad2	68	ELECTRO		RNB20	R&B 12	130	ROOM ROCK
BLD19	New Age Ballad	75	808 CHORUS		CNT01	Country Pop1	120	STANDARD
BLD20	Fusion Ballad	80	STD JAZZ		CNT02	Country Pop2	85	POWER R&B
POP01	Lite Pop1	123	STANDARD		CNT03	C&W	108	STANDARD
POP02	Lite Pop2	90	STD LATIN		CNT04	C&W Folk	120	BRUSH
POP03	AOR1	96	STD DISCO		CNT05	C&W Ballad	140	BRUSH JAZZ
POP04	AOR2	125	ROOM ROCK		CNT06	C&W Waltz	104	BRUSH
POP05	AOR POP	77	STD DEEP REV		CNT07	Bluegrass	160	BRUSH JAZZ
POP06	16beat Pop1	107	808		CNT08	Cajun Rock	166	STD DRY
POP07	16beat Pop2	78	STANDARD		CNT09	Trad	130	STD LATIN
POP08	Brit Pop1	83	ROOM ROCK		CNT10	Dixie	160	BRUSH JAZZ
POP09	Brit Pop2	140	STD LATIN		DAN01	Techno1	135	808
POP10	24Beat Pop	98	STD JAZZ		DAN02	Techno2	125	TECHNO
POP11	Synth Pop	110	808		DAN03	Drum'n'Bass1	165	STD JUNGLE
POP12	Dance Pop1	120	POWER R&B		DAN04	Drum'n'Bass2	165	POWER R&B
POP13	Dance Pop2	132	POWER R&B		DAN05	House1	116	808 CHORUS
POP14	Shuffle Pop	125	STD JAZZ		DAN06	House2	135	ELECTRO
POP15	80s British Pop	100	STD LATIN		DAN07	House3	155	808
RNB01	JB Funk	140	ROOM R&B		DAN08	Disco	112	STD DISCO
RNB02	Funk2	80	POWER R&B		DAN09	HipHop1	96	POWER R&B
RNB03	Motown	97	ROOM R&B		DAN10	HipHop2	95	POWER R&B
RNB04	Soul	90	ROOM R&B		DAN11	HipHop3	98	STD LO-FI
RNB05	90s Blues	105	STD LATIN		DAN12	HipHop4	100	POWER R&B
RNB06	6/8 R&B	140	STD JAZZ		DAN13	HipHop5	85	POWER R&B
RNB07	Blues Shuffle	140	STD LATIN		DAN14	Digital Rock1	110	POWER R&B
RNB08	Dance Classic	30	STD DISCO		DAN15	Bigbeat	120	POWER R&B
RNB09	R&B 1	80	808 CHORUS		JAZ01	Combo Jazz1	100	BRUSH JAZZ
RNB10	R&B 2	86	STD HI PITCH		JAZ02	Combo Jazz2	124	BRUSH JAZZ
RNB11	R&B 3	75	STD DEEP REV		JAZ03	Combo Jazz3	120	STD JAZZ
RNB12	R&B 4	118	POWER R&B		JAZ04	Combo Jazz4	60	BRUSH

Style	Description	TEMPO	Drum Kit
JAZ05	Cool Jazz	120	STD LO-FI
JAZ06	Soul Jazz	160	STD JAZZ
JAZ07	Swing Jazz1	105	STD JAZZ
JAZ08	Swing Jazz2	135	STD JAZZ
JAZ09	Latin Jazz	130	STD JAZZ
JAZ10	Fast Be-bop	130	STD JAZZ
JAZ11	Jazz Waltz (6/8)	168	STD DISCO
JAZ12	Big Band	128	STD LO-FI
JAZ13	JAZZ 4/5	168	STD DISCO
JAZ14	Acid Jazz1	98	STD LATIN
JAZ15	Dixie Jazz	120	STD JAZZ
FSN01	FUSION 1	116	STANDARD
FSN02	FUSION 2	123	STD LATIN
FSN03	FUSION 3	116	ROOM ROCK
FSN04	FUSION 4	125	ROOM CHORUS
FSN05	FUSION 5	150	STD JAZZ
FSN06	FUSION 6	140	STD LATIN
FSN07	FUSION 7	140	STD JAZZ
FSN08	FUSION 8	110	STD LATIN
FSN09	FUSION 9	86	STD LATIN
FSN10	FUSION 10	135	STD LATIN
FSN11	FUSION 11	120	STD LATIN
FSN12	FUSION 12	145	STD LATIN
FSN13	FUSION 13	120	STD LATIN
FSN14	FUSION 14	137	POWER R&B
FSN15	FUSION 15	85	STD LATIN
LTN01	Latin Pop1	120	ELECTRO
LTN02	Latin Pop2	110	STD LATIN
LTN03	Latin Pop3	115	POWER R&B
LTN04	Latin Pop4	100	STD LATIN
LTN05	Latin Pop5	180	STD LATIN
LTN06	Salsa1	100	STD LATIN
LTN07	Salsa2	150	STD LATIN
LTN08	Samba1	107	STD LO-FI
LTN09	Samba2	120	STD LATIN
LTN10	Bossa1	150	STD JAZZ

Style	Description	TEMPO	Drum Kit
LTN11	Bossa2	165	ELECTRO
LTN12	Mambo	95	STD LATIN
LTN13	Cha Cha	120	STD LATIN
LTN14	Rumba	110	STD DEEP REV
LTN15	Caribbean1	114	ROOM CHORUS
LTN16	Caribbean2	120	ELECTRO
LTN17	Merengue	140	ELECTRO
LTN18	Songo	100	STD LATIN
LTN19	Bolero	75	STD DEEP REV
LTN20	Cumbia	130	STD LATIN
OTH01	Reggae1	140	STD LATIN
OTH02	Reggae2	76	ROOM CHORUS
OTH03	Reggae3	88	808 CHORUS
OTH04	Reggae4	70	STD LATIN
OTH05	Reggae5	77	808 CHORUS
OTH06	Ska1	120	STD LATIN
OTH07	Ska2	150	STD LATIN
OTH08	Polka	110	STD JAZZ
OTH09	Afro	110	STD DEEP REV
OTH10	March	120	STANDARD
OTH11	Tango	125	STD LATIN
OTH12	Cajun	100	STANDARD
OTH13	African Pops	90	ELECTRO
OTH14	Foxtrot	120	STD LATIN
OTH15	Hawaiian	105	BRUSH

Drum kits

Displayed kit name	Description
STANDARD	Standard general purpose drum kit
STD HI PITCH	Drum kit with snare tuned to a higher pitch
STD LO-FI	Drum kit filtered to give a low fidelity effect
STD LATIN	Kit tuned to work well with Latin percussion
STD JAZZ	Jazz kit
STD DISCO	A kit with a high-pitched hi-hat
STD DEEP REV	Standard kit with noticeable reverb added
STD JUNGLE	A "low-fi" kit
STD DRY	A "dry" kit without effects
ROOM R&B	An kit with room ambience and an R&B-type snare sound
ROOM CHORUS	A rock kit with a chorus effect added
ROOM ROCK	Power kit 1
POWER R&B	Power kit 2
POWER WET	Power kit with reverb ("wet")
ELECTR	Electro & trance electric kit 1
TECHNO	Electro & trance electric kit 2
808	Analog drum machine 1
808 CHORUS	Analog drum machine 2
BRUSH JAZZ	Brush kit 1
BRUSH	Brush kit 2

The following is a list of error messages that may be displayed by the 2488, together with a note of their possible cause, and the actions you can take when they occur.

In the messages, keys to be pressed are enclosed in brackets ([ENTER] or [NO]) and menu items are written in uppercase/capital letters (DELETE UNUSED).

No.	Message	Meaning	Action
1	Cannot do this when not stopped. Stop the transport. Press [EXIT].	The hard disk is being accessed for playback or recording, so the selected action cannot be performed.	Press **EXIT**, stop the transport and retry the operation.
2	Cannot find digital input. Check your system set-up Press [EXIT].	Digital audio input mode has been selected, but the 2488 cannot detect a valid digital audio input.	Press **EXIT** and check the digital connection. If the connection is good, it is possible that the signal is the wrong type. The 2488 expects a signal in S/PDIF (IEC60958 Consumer use) format at 44.1kHz. It cannot accept compressed audio formats, etc.
3	Can't duplicate to the same track as the source. Press [EXIT]	When editing tracks, you have selected the same track as both source and destination for a duplicate operation.	Press **EXIT** and select a different source or destination track as appropriate.
4	Can't insert at this position. Choose another insert point. Press [EXIT].	When arranging patterns, an attempt has been made to insert more than 99 patterns into a song, or insert a pattern at a point where a pattern cannot be inserted (inside the source selection).	Press **EXIT**, and reduce the number of patterns in the song, or select another point to insert the pattern.
5	Digital input is selected. Cannot do this operation now. Press EXIT.	Because digital audio input is selected, the following functions cannot take place: Tuner, pitch and SSA functions, MTC slave operations, jog and trim functions, audio CD operations).	Press **EXIT** and turn off digital input (the MIXER section of the PREFERENCES menu) before proceeding with the operation that produced this message.
6	Disc is already blank. Can't erase it. Press [EXIT].	An attempt has been made to erase a disc (CD-RW) that is already blank.	Press **EXIT** and replace the disc if necessary.
7	Disc is blank. Can't finalize this disc. Press [EXIT].	An attempt has been made to finalize a blank disc (CD-R or CD-RW).	Press **EXIT** and replace the disc if necessary.
8	File too big to import. Choose another file for import. Press [EXIT].	The selected WAV or Standard MIDI File cannot be imported into the current song as there is not enough disk space on the current partition.	Press **EXIT** and delete a song (SONG -> DELETE) to free up space on the partition (note that this cannot be undone).

No.	Message	Meaning	Action
9	File too big to export. Choose another file for export. Press [EXIT].	The data selected for export to the FAT partition is too big (there is not sufficient space on the FAT partition).	Press **EXIT**, use the USB OPEN function to manage the files (move or delete unwanted ones) on the FAT partition from a computer and retry. Alternatively, if there is no wanted data on the FAT partition, use the 2488 to reformat the FAT partition (all data on the FAT partition is irrecoverably lost). The FAT partition size is fixed at 4GB.
10	Import file not found. Use USB OPEN to import file. Press [EXIT].	The file selected (backup file, WAV file for import, or SMF) is not available.	Press **EXIT**, use the USB OPEN function to transfer the appropriate file to the FAT partition and then try importing again.
11	Invalid Fs rate detected. Check your system set-up Press [EXIT].	Digital audio input mode has been selected, but the 2488 has detected the wrong sampling frequency (Fs) for the incoming digital audio to be used.	Press **EXIT** and check the digital audio source. The output should be 44.1kHz (note that some players output 48kHz). A unit with varispeed (pitch control) may have varispeed turned on, altering the sampling frequency from 44.1kHz.
12	Master track is too short. Use PRE-MASTERING to correct it. Press [EXIT].	The master track is too short, and therefore cannot be checked.	Press **EXIT**, re-set the OUT point to at least four seconds after the zero point, then use the PRE-MASTERING menu item for checking.
13	MTC slave mode selected. Cannot do this operation now. Press [EXIT].	Since the unit is currently slaved to external MIDI timecode, the selected operation cannot take place. Operations not possible in MTC slave mode include: pitch control and SSA, repeat playback, auto-punch operations, jog and trim as well as audio CD playback and digital audio input.	Press **EXIT** and use the menu system (SYNC/MIDI->SYNC) to select INTERNAL sync.
14	No file for import has been found. Change CD [YES], else press [NO]	No WAV file for import has been discovered on the loaded CD.	Press **YES** to change the disc (use an ISO9660 formatted disc which contains audio data with 44.1kHz sampling frequency in WAV format) or **NO** to cancel the operation.
15	No free hard disk space, Use DELETE UNUSED to make space. Press [EXIT].	The hard disk is full, and the current operation has failed because it needs hard disk space.	Press **EXIT** and use one of the SONG menu operations such as DELETE UNUSED or ERASE to free up some space (these operations cannot be undone).
16	No LAST REC point. Use IN-OUT instead. Press [EXIT].	Can't use the last recording point for auto-punch operations, as no recording has been done yet.	Press **EXIT** and set the IN and OUT points as the punch positions. Use the **RHSL** key to refine these points if necessary, by rehearsing takes without recording.

No.	Message	Meaning	Action
17	No locate markers have been set. Use INSERT MARK. Press [EXIT].	Because there are no locate markers currently set, a location command cannot be performed.	Press **EXIT**, and use the **INSERT** or **SET LOC** key from the home screen to add some locate markers at the appropriate positions.
18	No master track found. Use PRE-MASTERING to create one. Press [EXIT].	There is no master track available for making an audio CD.	Press **EXIT**, then use the PRE-MASTERING menu item to create the master track.
19	No MIDI player selected. Use MIDI PLAYER to select. Press [EXIT].	An attempt has been made to play back the MIDI track with the MIDI PLAYER mode set to OFF.	Press **EXIT**, and use the menu system to select either SMF or PATTERN as the MIDI PLAYER mode, as appropriate.
20	No tracks have been armed. Arm at least one track. Press [EXIT].	Before an auto-punch operation, you must have at least one armed track.	Press **EXIT** and press the **REC** key of at least one track on which you will be recording (once a track has been armed in auto-punch, the track arming status cannot be changed).
21	Non-linear audio detected. Check your system set-up Press [EXIT].	Digital audio input mode has been selected, but the 2488 has detected the wrong data format for the incoming digital audio to be used.	Press **EXIT** and check the digital audio source. The 2488 expects a signal in S/PDIF (IEC60958 Consumer use) format at 44.1kHz. It cannot accept compressed audio formats, etc.
22	Not enough free disk space. Use DELETE UNUSED to make space. Press [EXIT].	Copying a song has failed because there is not enough space on the selected or target partition.	Press **EXIT** and use one of the SONG menu operations such as DELETE UNUSED or ERASE to free up some space on the partition where there is not enough space (these operations cannot be undone).
23	Not enough free memory. Use DELETE UNUSED to free memory. Press [EXIT].	Sometimes after repeated operations, the internal memory of the 2488 becomes used, and recording, etc. is not possible.	Press **EXIT**. Use the DELETE UNUSED menu item from the SONG menu. As well as deleting the unused song data, this action will also free up memory, so recording can continue. Remember that this operation cannot be undone.
24	Not enough room on CD for burn. Use another CD [YES] or cancel [NO].	Too much data has been selected to fit onto the CD that is currently loaded.	Press **YES** to change the CD for another one, or **NO** to cancel the current operation. Use a higher-capacity disc when burning a master track or exporting data, or one of the same capacity as the current disc when backing up.

No.	Message	Meaning	Action
25	Not enough room on hard disk for this operation. Press [EXIT].	No enough space on the hard disk to create the image file necessary to create a CD.	Press **EXIT** and create space by deleting songs, etc.,(SONG->ERASE) backing them up if necessary (this operation cannot be undone). You can free up space on a partition other than the current partition (use the DISK->SELECT function) in order to create space for the image.
26	Protected song. Unprotect with SONG PROTECT. Press [EXIT].	Recording, track editing, recording, titling, etc. cannot be carried out when the current song has been protected.	Press **EXIT**, and use the PROTECT menu item from the SONG menu to remove the protection from the song before proceeding.
27	Repeat mode is selected. Cannot do this operation now. Press [EXIT].	Because repeat mode is selected, the following functions cannot take place: locate operation, track editing, undo/redo, auto punch, quick routing, all menu operations, and shutdown.	Press **EXIT** and cancel the repeat mode (**REPEAT** key) before proceeding with the operation that produced this message.
28	SSA mode is selected. Cannot do this operation now. Press EXIT.	Because SSA mode is selected, the following functions cannot take place: MTC slave operations, jog and trim functions, recording (including auto-punch) and digital input.	Press **EXIT** and cancel the SSA mode (**PITCH/SSA** key) before proceeding with the operation that produced this message.
29	Time between IN and OUT is too short. Re-set the points. Press [EXIT].	Repeat playback or auto-punch operations cannot be carried out because the time between the IN and OUT locate markers is too short.	Press **EXIT**, and re-enter or edit the IN and OUT points so that the time between them is longer, before attempting the operation again.
30	Too many locate markers. Use DELETE MARK to delete some markers. Press [EXIT].	More than 999 markers have been set in the song and so a new marker cannot be entered.	Press **EXIT**, and use the **DELETE** key from the home screen to delete some of the unwanted marks.
31	Too many songs to continue with this operation. Press [ENTER].	Copying a song has failed because there are too many songs already on the selected or target partition.	Press **ENTER**. Back up any songs you want to keep, and then use the ERASE menu item from the SONG menu to erase unwanted songs, or songs you have backed up before proceeding with the song copy (deleting songs cannot be undone).
32	Too many songs. Use SONG ERASE to delete songs you don't need. Press [EXIT].	There are too many songs stored on the current partition (the limit is 250 songs on one partition) for a new song to be created, or a song that has been backed up to be restored.	Press **EXIT**. Back up any songs you want to keep, and then use the ERASE menu item from the SONG menu to erase unwanted songs, or songs you have backed up before proceeding with the creation or restoration of a song (deleting songs cannot be undone). Alternatively, use DISK -> SELECT to select another partition.

No.	Message	Meaning	Action
33	Too many takes. Can't continue recording Press [EXIT].	The repeat auto-punch procedure can't continue because more than 99 takes have been recorded.	Press **EXIT**, stop recording, select the desired take from the list. Press **ENTER** and press **AUTO PUNCH** again, selecting a mode other than LAST TAKE LOAD. Takes recorded before this cannot be restored, so the first selection should be made carefully!
34	Track already written to disc so only 1 song can be written. Press [EXIT].	Because at least one track is already present on the disc, it is not possible to burn more than one track at once. To burn several tracks at one time (Disc At Once), you must start with a blank disc.	Press **EXIT** and replace the disc if necessary.
35	Track is too short. Choose and set another OUT point. Press [EXIT].	The distance between the zero point and the OUT point is too short for mastering. A CD track must be at least four seconds long.	Press **EXIT**, and re-set the OUT point to at least four seconds after the zero point.
36	Wrong type of CD. Check the disc. Press [EXIT].	The wrong type of CD for the operation has been loaded in the drive. This could be because : A non-writable CD has been selected for writing An attempt has been made to finalize an already finalized disc An attempt has been made to erase a non-CD-RW disc. A disc which is not a backup disc has been loaded for a restore operation.	Press **EXIT** and replace the disc with the correct type of disc for the operation.

NOTES

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