YAMAHA
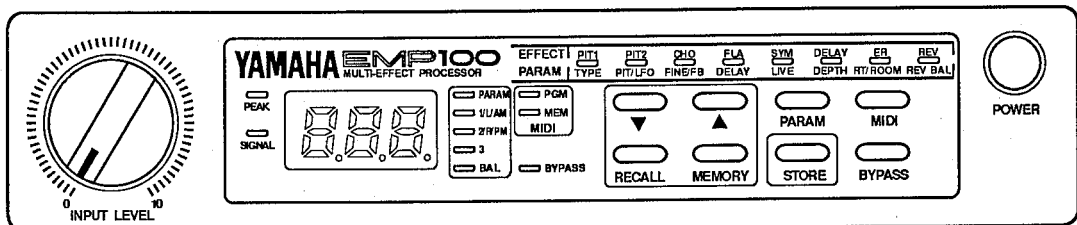
MULTI-EFFECT PROCESSOR
PROCESSEUR D'EFFETS NUMERIQUE

EMP100

OPERATION MANUAL
MANUEL D'INSTRUCTIONS
BEDIENUNGSANLEITUNG

The Yamaha EMP100 Multi-Effect Processor offers the best of advanced Yamaha digital signal processing technology in a compact, cost-effective unit that can be used in a wide range of applications. The EMP100 is a mono-in/stereo-out processor that can be used directly with electric or electronic instruments and instrument amplifiers, or connected into the effect loop of a mixing console for recording or sound reinforcement. The effects include pitch change, chorus, flange, symphonic, delay, early reflections, and reverb. Further depth and variety is provided by a range of "combination" effects — pitch and reverb, chorus and delay, symphonic and reverb, delay and reverb, delay and early reflections. Each effect has up to eight programmable parameters which can be adjusted to custom-tailor the sound to suit individual musical requirements. The EMP100 comes with 100 superb pre-programmed effects, and 50 RAM memory locations that can be programmed with original effect programs by the user.

The overall sound and quality of the effects are better than ever. In particular, the early-reflection and reverb programs feature increased reflection density for a fuller, more natural sound. A 20 Hz — 20 kHz frequency response also contributes to the superior sound of this outstanding little effect unit.

Please read this operation manual thoroughly while trying out the many features and effects provided by the EMP100, and keep the manual in a safe place for later reference.

CONTENTS

PRECAUTIONS !! PLEASE READ THIS BEFORE PROCEEDING !!

1. AVOID EXCESSIVE HEAT, HUMIDITY, DUST AND VIBRATION

Keep the unit away from locations where it is likely to be exposed to high temperatures or humidity — such as near radiators, stoves, etc. Also avoid locations which are subject to excessive dust accumulation or vibration which could cause mechanical damage.

2. AVOID PHYSICAL SHOCKS

Strong physical shocks to the unit can cause damage. Handle it with care.

3. DO NOT OPEN THE CASE OR ATTEMPT REPAIRS OR MODIFICATIONS YOURSELF

This product contains no user-serviceable parts. Refer all maintenance to qualified Yamaha service personnel. Opening the case and/or tampering with the internal circuitry will void the warranty.

4. MAKE SURE POWER IS OFF BEFORE MAKING OR REMOVING CONNECTIONS

Always turn the power OFF prior to connecting or disconnecting cables.

5. HANDLE CABLES CAREFULLY

Always plug and unplug cables by gripping the connector, not the cord.

6. CLEAN WITH A SOFT DRY CLOTH

Never use solvents such as benzine or thinner to clean the unit. Wipe clean with a soft, dry cloth.

7. ALWAYS USE THE CORRECT POWER SUPPLY

The EMP100 should only be powered using the supplied Yamaha AC Adaptor. The use of other adaptors can cause serious damage to the EMP100.

8. ELECTRICAL INTERFERENCE

Since the EMP100 contains digital circuitry, it may cause interference and noise if placed too close to TV sets, radios or similar equipment. If such a problem does occur, move the EMP100 further away from the affected equipment.

9. MIDI CABLES

When connecting to EMP100 to MIDI equipment, be sure to use high-quality cables made especially for MIDI data transmission. Also avoid cables longer than about 15 meters, as longer cables can pick up electrical noise that can causes data errors.

10. MEMORY BACKUP

The EMP100 contains a special long-life battery that retains the contents of its internal RAM memory even when the power is turned OFF. The backup battery should last for approximately 5 years. When the battery voltage drops to a level that is too low to maintain the memory contents, "E4" will appear on the numeric display when the power is turned ON:

If this display appears, have the backup battery replaced by qualified Yamaha service personnel. DO NOT ATTEMPT TO REPLACE THE BACKUP BATTERY YOURSELF!

11. ERROR MESSAGES

When the EMP100 power is initially turned ON, a selfdiagnostic program runs automatically to check a number of important operational parameters. If a problem is found, an error message ("E1"through "E3") will appear on the numeric display. If an error message appears, please take EMP100 to your nearest Yamaha dealer for servicing, and be sure to tell the service personnel which error message was displayed.
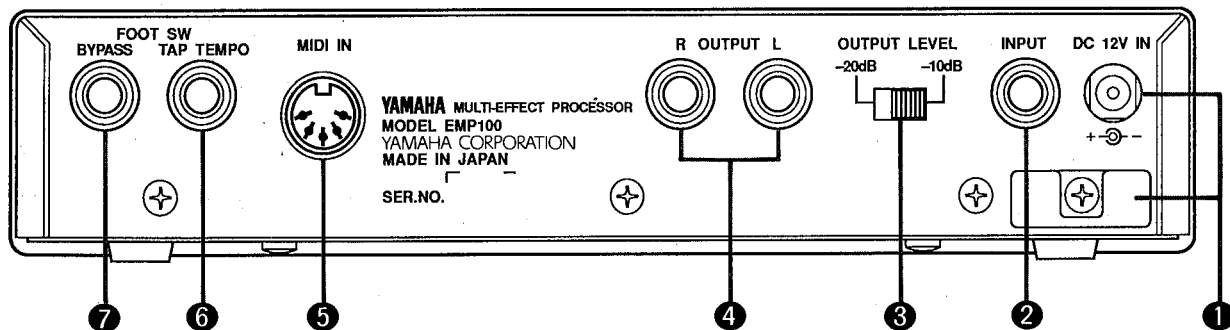
❶ DC 12V IN Jack and Cable Clip

The DC output cable from the supplied AC Adaptor should be connected here. When connecting the power supply, make sure that the EMP100 [POWER] switch is in the OFF position (extended), then plug the AC adaptor output cable into the DC 12V IN jack, and finally the adaptor's AC plug into a convenient AC wall outlet.

The cable clip located immediately below the DC 12V IN jack helps to prevent accidental unplugging of the power supply during use. Wrap the DC cable firmly around the clip a few centimeters from the plug end.

Note: Be sure to unplug the AC adaptor from the AC mains socket when the EMP100 is not in use.

CAUTION!

Do not attempt to use a different AC adaptor to power the EMP100. The use of an incompatible adaptor may cause irreparable damage to the EMP100, and might pose a serious shock hazard!

❷ INPUT Jack

This mono 1/4" phone jack accepts the output from your guitar, keyboard, or line-level signal source.

❸ OUTPUT LEVEL Selector

This switch is used to match the output level of the EMP100 to the input sensitivity of the amplifier, mixing console or other device it is feeding. For compatibility with standard line-level inputs the –10 dB setting should be appropriate, while the –20 dB setting should be used when the EMP100 is connected to a high-sensitivity input — the input of a guitar amplifier, for example.

❹ OUTPUT R and OUTPUT L Jacks

These are the main stereo outputs from the EMP100. We recommend using both outputs and connecting them to the corresponding right and left channels of a stereo sound system, since the full impact of many of the EMP100 effects can only be appreciated in stereo. If, however, only a mono sound system is available, use either the OUTPUT R or OUTPUT L jack.

❺ MIDI IN Connector

The MIDI IN connector accepts MIDI signals from an external MIDI device such as a MIDI foot controller, keyboard, etc. The EMP100 will accept MIDI PROGRAM CHANGE messages to directly select effect programs.

[See page 26 for further details]

❻ TAP TEMPO Jack

An optional Yamaha FC5 Footswitch may be connected here for convenient "tap tempo· delay" control in which the footswitch is used to set the delay time for effects with delay parameters.

[See page 25 for further details]

❼ BYPASS Jack

An optional Yamaha FC4 or FC5 Footswitch connected here performs exactly the same function as the front-panel [BYPASS] key. Press the footswitch once to activate the bypass mode, and again to turn bypass off.

■ Basic System Configurations

Here's how the EMP100 can be connected for use with electric guitar (or bass), an electronic keyboard, or in a multitrack recording system. The actual configuration of your system will naturally depend on your own individual requirements, but these examples may help to give you a few ideas.

● Electric Guitar

Electric Guitar

Effector

INPUT

OUTPUT
L   R

EMP100

Guitar Amplifier   Guitar Amplifier

● Keyboard

Keyboard

OUTPUT

INPUT

OUTPUT
L   R

EMP100

Powered Speaker   Powered Speaker

● Multitrack Recording

Multitrack Recorder

EFFECT SEND

INPUT   **EMP100**

EFFECT RETURN
L
R

L   R
OUTPUT
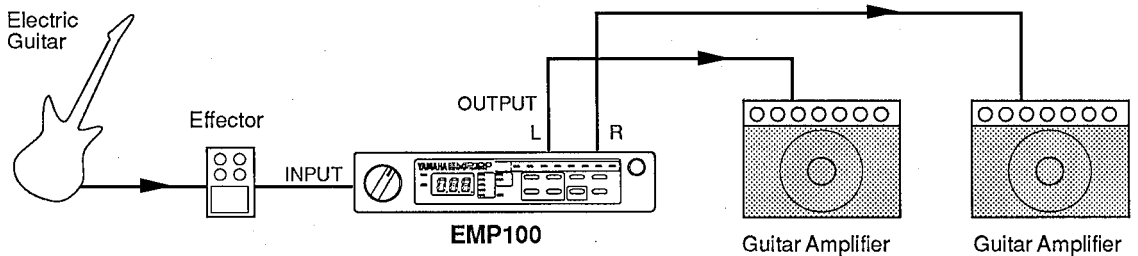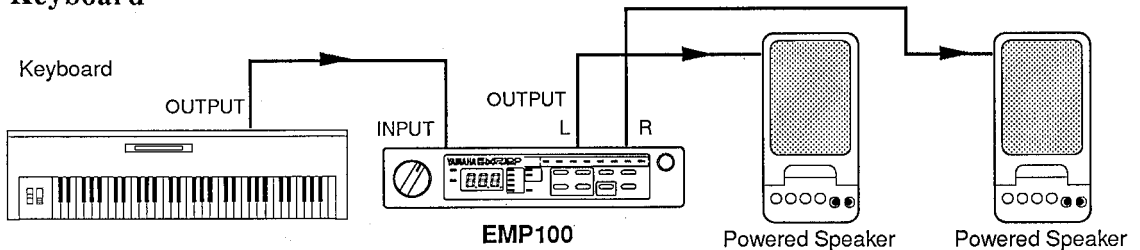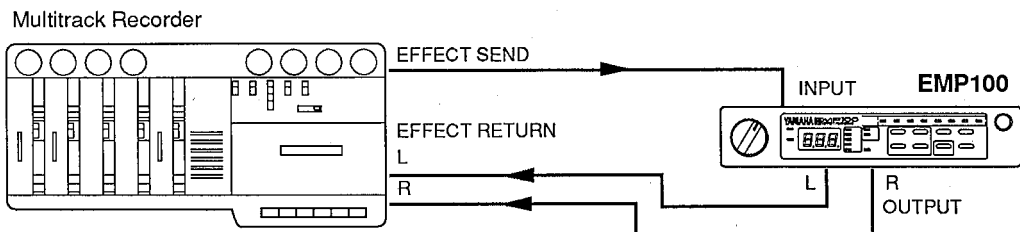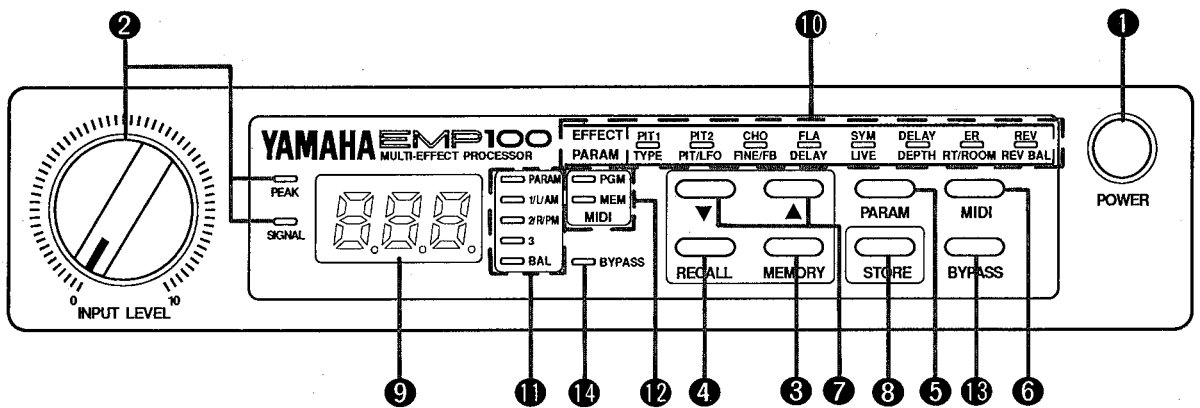
❶ [POWER] Switch

Press once to turn the EMP100 on, and a second time to turn the power off. When the power is turned ON, the effect program that was selected prior to turning the power OFF will be automatically selected.

❷ INPUT LEVEL Control with SIGNAL and PEAK Indicators

For the optimum input level setting, play your source at the highest level it will be played in actual use, and adjust the INPUT LEVEL control so that the SIGNAL Indicator lights most of the time but the PEAK indicator does not light, or lights only occasionally on brief high-level peaks.

❸ [MEMORY] Mode Key

The [MEMORY] key activates the EMP100 memory mode allowing effect programs (1 — 150) to be selected and recalled using the [▲] and [▼] keys and [RECALL] key.

[See page 8 for further details]

❹ [RECALL] Key

After using the [▲] and [▼] keys to select a desired effect program while in the memory mode, the [RECALL] key is pressed to actually recall and activate the selected program.

[See page 8 for further details]

❺ [PARAM] Mode Key

The [PARAM] key selects the parameter mode in which the individual parameters for each effect can be edited as required.

[See page 9 for further details]

❻ [MIDI] Mode Key

Pressing this key activates the MIDI mode, allowing access to the EMP100 Program Change Table Edit function.

[See page 25 for further details]

❼ Increment/Decrement ([▲] and [▼]) keys

The [▲] and [▼] keys function differently in the MEMORY, PARAM and MIDI modes.

● When the MEMORY mode is selected, the [▲] and [▼] keys are used to select the desired effect program.

[See page 8 for further details]

● When the PARAM mode is selected, they are used to change the value of or "edit" the selected effect parameter.

[See page 9 for further details]

● When the MIDI mode is selected, the [▲] and [▼] keys are used to edit the EMP100 MIDI program change table.

[See page 25 for further details]

❽ [STORE] Key

After editing any of the EMP100 effect programs, the new program can be stored in any of the RAM memory locations (101 through 150) for later recall and use. The [STORE] key is used to store edited data to a RAM memory location.

[See page 10 for further details]

❾ Numeric Display

This 3-digit numeric LED display shows the currently selected effect program number when the memory mode is selected, the current value of a selected effect parameter when editing effect parameters in the parameter mode, or the appropriate values when editing the MIDI program change table in the MIDI mode.

[See pages 8, 9 and 26 for further details]

❿ EFFECT/PARAM Indicators

This row of 8 LED indicators shows the type of effect selected in the memory mode, or the type of parameter selected in conjunction with the Parameter Type Indicators (below) in the parameter mode. The white labels above the indicators indicate effect types in the memory mode, and the green labels below the indicators indicate parameter types in the parameter mode.

[See pages 8 and 9 for further details]

⓫ Parameter Type Indicators

When editing parameters in the parameter mode, these indicators work in conjunction with the EFFECT/PARAMETER indicators to tell you which parameter is currently selected.

[See page 9 for further details]

⓬ MIDI PGM and MEM Indicators

The PGM and MEM indicators function in the MIDI mode to indicate whether a MIDI program change number or effect program number is being shown on the numeric display.

[See page 26 for further details]

⓭ [BYPASS] Key

When the [BYPASS] key is pressed and the BYPASS indicator lights, the EMP100 effects are completely bypassed and the input signal is fed directly to the output. Press the [BYPASS] key a second time to turn the bypass function off. The rear-panel BYPASS footswitch jack can also be used for bypass control (see "❼ BYPASS Jack" in the "REAR PANEL & CONNECTIONS" section on page 5).

⓮ BYPASS Indicator

The BYPASS indicator lights when the EMP100 is set to the BYPASS mode using either the front-panel [BYPASS] key or a footswitch connected to the rear-panel BYPASS jack.

7

SELECTING AN EFFECT

■ Memory & Effect Organization

The EMP100 has 150 memory locations. Memory locations 1 through 100 contain a range of preset effect programs that you can simply select and use.* Memory locations 101 through 150 can be used to store your own original effect programs created by editing any of the presets (editing instructions on page 9).

All of the EMP100 effect programs are based on one of the "single" or "combination" effects listed below:

● SINGLE EFFECTS
PIT1: Stereo Pitch
PIT2: Triple Pitch
CHO: Chorus
FLA: Flange
SYM: Symphonic
DELAY: Stereo Delay
ER: Early Reflection
REV: Reverb

● COMBINATION EFFECTS
PIT1 REV: Stereo Pitch + Reverb
PIT2 REV: Stereo Pitch → Reverb
SYM REV: Symphonic + Reverb
DLY REV: Delay + Reverb
DLY ER: Delay → Early Reflection
CHO DLY: Chorus → Delay

The EFFECT/PARAM LEDs along the top of the EMP100 panel will tell you which type of effect is used in the effect program you have selected (refer to the white labels above the LEDs).

If the selected program uses the stereo pitch effect, for example, the PIT1 LED will light:

EFFECT	PIT1	PIT2	CHO	FLA	SYM	DELAY	ER	REV
PARAM	TYPE	PIT/LFO	FINE/FB	DELAY	LIVE	DEPTH	RT/ROOM	REV BAL

If the selected program uses the chorus effect, then the CHO LED will light:

EFFECT	PIT1	PIT2	CHO	FLA	SYM	DELAY	ER	REV
PARAM	TYPE	PIT/LFO	FINE/FB	DELAY	LIVE	DEPTH	RT/ROOM	REV BAL

When a combination effect is used, both of the corresponding LEDs will light. The "Stereo Pitch + Reverb" effect display, for example, looks like this:

EFFECT	PIT1	PIT2	CHO	FLA	SYM	DELAY	ER	REV
PARAM	TYPE	PIT/LFO	FINE/FB	DELAY	LIVE	DEPTH	RT/ROOM	REV BAL

* Refer to the "EMP100 Preset Program List" accompanying this manual for descriptions of each of the 100 presets.

■ Effect Selection Procedure

1. Press the [MEMORY] key to select the memory mode if it is not already selected. The memory mode is NOT selected, for example, if any of the LEDs shown below are lit:

PARAM	PGM
1/L/AM	MEM
2/R/PM	MIDI
3	
BAL	

2. Use the [▲] and [▼] keys to increment or decrement the memory location number shown on the numeric display. Press the [▲] or [▼] key briefly to select the next highest or lowest numbered program, or hold either key down for continuous scrolling in the corresponding direction. Faster scrolling is achieved by pressing the opposite arrow key while holding the arrow key corresponding to the direction of scrolling.
Note that at this stage the memory number display is flashing, indicating that although a new location has been selected, its contents have not yet been recalled.

3. When the desired number has been selected, press the [RECALL] key. The memory number display will stop flashing and the selected effect will be engaged.

Each of the EMP100's single and combination effects has up to eight different parameters that you can edit to "customize" the sound for your own requirements. In this section we'll describe the basic editing and memory store procedures. Refer to the "THE EFFECTS & PROGRAMMABLE PARAMETERS" section beginning on page 11 for complete descriptions of the effects and parameters.

■ Basic Editing Procedure

1. After selecting the program to be edited (see "Selecting an Effect" on page 8), press the [PARAM] key to select the parameter editing mode.

2. Select the parameter to be edited by pressing the [PARAM] key as many times as necessary.

   A program that uses the SYMPHONIC effect, for example, will have three programmable parameters: LFO SPEED, DEPTH, and BALANCE. These will be called in sequence each time the [PARAM] key is pressed, and will be indicated on the EMP100 panel as follows:
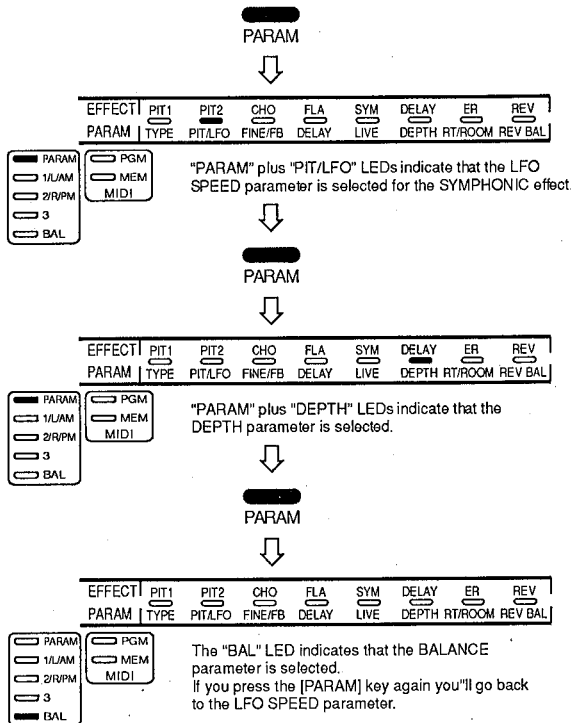
Note that the parameters are always indicated by a combination of indicators in the EFFECT/PARAM group (refer to the green labels below the indicators) and the Parameter Type Indicators to the lower left of the EFFECT/PARAM indicators. The LED indicator combinations indicating each parameter are given along with the parameter descriptions in the "THE EFFECTS & PROGRAMMABLE PARAMETERS" section beginning on page 11.

3. The current value of the selected parameter will now be shown on the numeric LED display. Use the [▲] and [▼] keys to increment or decrement the value as required.

4. Press the [MEMORY] key to return to the memory mode.

NOTE: Unless you store the edited program into a memory location between 101 and 150 using the memory store procedure described below, it will only remain active until a different memory location is recalled. Be sure you STORE edited programs that you want to keep.

PARAM
⇩

EFFECT PIT1 PIT2 CHO FLA SYM DELAY ER REV
PARAM TYPE PIT/LFO FINE/FB DELAY LIVE DEPTH RT/ROOM REV BAL

PARAM / PGM
1/L/AM / MEM
2/R/PM / MIDI
3
BAL

"PARAM" plus "PIT/LFO" LEDs indicate that the LFO SPEED parameter is selected for the SYMPHONIC effect.

⇩

PARAM
⇩

EFFECT PIT1 PIT2 CHO FLA SYM DELAY ER REV
PARAM TYPE PIT/LFO FINE/FB DELAY LIVE DEPTH RT/ROOM REV BAL

PARAM / PGM
1/L/AM / MEM
2/R/PM / MIDI
3
BAL

"PARAM" plus "DEPTH" LEDs indicate that the DEPTH parameter is selected.

⇩

PARAM
⇩

EFFECT PIT1 PIT2 CHO FLA SYM DELAY ER REV
PARAM TYPE PIT/LFO FINE/FB DELAY LIVE DEPTH RT/ROOM REV BAL

PARAM / PGM
1/L/AM / MEM
2/R/PM / MIDI
3
BAL

The "BAL" LED indicates that the BALANCE parameter is selected.
If you press the [PARAM] key again you'll go back to the LFO SPEED parameter.

■ Memory Store Procedure

NOTE: You can only store edited data to a memory location number between 101 and 150.

1. If you have edited a program residing in a memory location between 101 and 150 and simply want to store the edited data back to the same memory location, ignore this step and go directly to step 2, below.
   If you want to store the edited program to a new memory location, press the [MEMORY] key after editing to return to the memory mode, and select the memory location to which you want to store the edited program (101 ... 150).

2. Press the [STORE] key to store the new program. "---" will appear on the numeric display for about one second while the store operation is in progress, then the memory location number will reappear.
   Please note that any previous data in the selected memory location will be erased and replaced by the new program.

THE EFFECTS & PROGRAMMABLE PARAMETERS

The chart below lists the parameters available for each effect and their ranges. Flip to the page numbers indicated for complete descriptions of the effects and their parameters.

■ SINGLE EFFECTS

PIT1: Stereo Pitch ....Page 12

L PITCH	L P.FINE	L DELAY	R PITCH	R P.FINE	R DELAY	FEED BACK	BALANCE
–12...+12	–99...+99	0.1...300ms	–12...+12	–99...+99	0.1...300ms	–99...+99%	0...100%

PIT2: Triple Pitch ....Page 13

1 PITCH	1 P.FINE	2 PITCH	2 P.FINE	3 PITCH	3 P.FINE	DELAY	BALANCE
–12...+12	–99...+99	–12...+12	–99...+99	–12...+12	–99...+99	0.1...200ms	0...100%

CHO: Chorus ....Page 14

LFO SPEED	AM DEPTH	PM DEPTH	BALANCE
0.1...20Hz	0...100%	0...100%	0...100%

FLA: Flange ....Page 14

LFO SPEED	MOD DELAY	FEED BACK	DEPTH	BALANCE
0.1...20Hz	0.1...15ms	–99...+99%	0...100%	0...100%

SYM: Symphonic ....Page 15

LFO SPEED	DEPTH	BALANCE
0.1...20Hz	0...100%	0...100%

DELAY: Stereo Delay ....Page 16

L DELAY	L FEED BACK	R DELAY	R FEED BACK	BALANCE
0.1...740ms	–99...+99	0.1...740ms	–99...+99	0...100%

ER: Early Reflection ....Page 17

TYPE	INITIAL DELAY	LIVENESS	DEPTH	ROOM SIZE	BALANCE
1...5	0.1...350ms	0...10	0...10	0.1...10	0...100%

REV: Reverb ....Page 18

TYPE	INITIAL DELAY	DEPTH	REV TIME	BALANCE
1...4	0.1...50ms	0...10	0.3...40s	0...100%

■ COMBINATION EFFECTS

PIT1 REV: Stereo Pitch + Reverb ....Page 19

L PITCH	L P.FINE	R PITCH	R P.FINE	INITIAL DELAY	REV TIME	REV BALANCE	BALANCE
–12...+12	–99...+99	–12...+12	–99...+99	0.1...200ms	0.3...40s	0...100%	0...100%

PIT2 REV: Stereo Pitch → Reverb ....Page 20

L PITCH	L P.FINE	R PITCH	R P.FINE	P. BAL(DEPTH)	REV TIME	REV BALANCE	BALANCE
–12...+12	–99...+99	–12...+12	–99...+99	0...100%	0.3...40s	0...100%	0...100%

SYM REV: Symphonic + Reverb ....Page 21

LFO SPEED	DEPTH	INITIAL DELAY	REV TIME	REV BALANCE	BALANCE
0.1...20Hz	0...100%	0.1...300ms	0.3...40s	0...100%	0...100%

DLY REV: Delay + Reverb ....Page 22

L DELAY	L FEED BACK	R DELAY	R FEED BACK	DEPTH	REV TIME	REV BALANCE	BALANCE
0.1...300ms	–99...+99	0.1...300ms	–99...+99	0...10	0.3...40s	0...100%	0...100%

DLY ER: Delay → Early Reflection ....Page 23

DELAY	FEED BACK	TYPE	LIVENESS	DEPTH	ROOM SIZE	ER BALANCE	BALANCE
0.1...350ms	–99...+99%	1...5	0...10	0...10	0.1...10	0...100%	0...100%

CHO DLY: Chorus → Delay ....Page 24

LFO SPEED	AM DEPTH	PM DEPTH	L DELAY	L FEED BACK	R DELAY	R FEED BACK	BALANCE
0.1...20Hz	0...100%	0...100%	0.1...340ms	–99...+99	0.1...340ms	–99...+99	0...100%

SINGLE EFFECTS

● PIT1: Stereo Pitch

EFFECT	PIT1	PIT2	CHO	FLA	SYM	DELAY	ER	REV
PARAM	TYPE	PIT/LFO	FINE/FB	DELAY	LIVE	DEPTH	RT/ROOM	REV BAL

The Stereo Pitch effect produces independent pitch-shifted notes for the left and right channels, each with independently programmable delays. Feedback allows a series of pitch-changed notes to be produced.
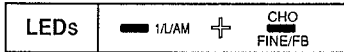
— Programmable Parameters —
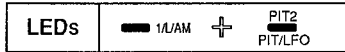
L PIT (Left-channel Pitch Shift: –12 ... +12)

LEDs	▬ 1/L/AM ╬ PIT2 PIT/LFO

This parameter sets the pitch of the left-channel pitch-shifted note between one octave below (–12) and one octave above (+12) the input note. Each increment represents one semitone.

L FINE
(Left-channel Pitch Fine Tuning: –99 ... +99)

LEDs	▬ 1/L/AM ╬ CHO FINE/FB

Permits fine tuning of the left-channel pitch-shifted note in 1-cent steps (1 cent is 1/100th of a semitone).

L DELAY
(Left-channel Delay Time: 0.1 ... 300 ms)

LEDs	▬ 1/L/AM ╬ FLA DELAY

The L DELAY parameter determines the time delay between input of the original note and output of the left-channel pitch-shifted note.

R PIT (Right-channel Pitch Shift: –12 ... +12)
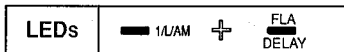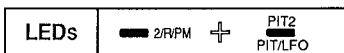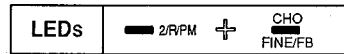
LEDs	▬ 2/R/PM ╬ PIT2 PIT/LFO

This parameter sets the pitch of the right-channel pitch-shifted note between one octave below (–12) and one octave above (+12) the input note. Each increment corresponds to one semitone.

**R FINE (Right-channel Pitch Fine Tuning: –99 ...+99)**

LEDs	▬ 2/R/PM ╬ CHO FINE/FB

Permits fine tuning of the right-channel pitch-shifted note in 1-cent steps (1 cent is 1/100th of a semitone).

R DELAY
(Right-channel Delay Time: 0.1 ... 300 ms)

LEDs	▬ 2/R/PM ╬ FLA DELAY
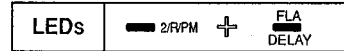
The R DELAY parameter determines the time delay between input of the original note and output of the right-channel pitch-shifted note.

FB (Feedback: –99 ... +99%)

LEDs	▬ PARAM ╬ CHO FINE/FB
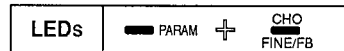
When this parameter is set to 0, only a single pitch-shifted sound is produced after the DELAY time has elapsed. As the value of this parameter is increased, however, more and more delayed repeats are produced, each pitch-shifted up or down from the previous repeat according to the settings of the L PIT and R PIT parameters.

BAL (Balance: 0 ... 100%)

LEDs	▬ BAL

Sets the balance between the direct and effect sound. Higher values produce a greater proportion of effect sound in relation to direct sound.

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● PIT2: Triple Pitch

EFFECT	PIT1	PIT2	CHO	FLA	SYM	DELAY	ER	REV
PARAM	TYPE	PIT/LFO	FINE/FB	DELAY	LIVE	DEPTH	RT/ROOM	REV BAL

The Triple Pitch effect produces three independent pitch-shifted notes in addition to the original note, making it possible to produce automatic four-part harmonies.

— Programmable Parameters —

1 PIT (1st Pitch Shift: –12 ... +12)

LEDs	▬ 1/L/AM ╬ PIT2 / PIT/LFO

This parameter sets the pitch of the first pitch-shifted note between one octave below (–12) and one octave above (+12) the input note. Each increment corresponds to one semitone.

1 FINE (1st Pitch Fine Tuning: –99 ... +99)

LEDs	▬ 1/L/AM ╬ CHO / FINE/FB

Permits fine tuning of the first pitch-shifted note in 1-cent steps (1 cent is 1/100th of a semitone).

2 PIT (2nd Pitch Shift: –12 ... +12)

LEDs	▬ 2/R/PM ╬ PIT2 / PIT/LFO

Sets the pitch of the second pitch-shifted note between one octave below (–12) and one octave above (+12) the input note. Each increment corresponds to one semitone.

2 FINE (2nd Pitch Fine Tuning: –99 ... +99)

LEDs	▬ 2/R/PM ╬ CHO / FINE/FB

Permits fine tuning of the second pitch-shifted note in 1-cent steps (1 cent is 1/100th of a semitone).

3 PIT (3rd Pitch Shift: –12 ... +12)

LEDs	▬ 3 ╬ PIT2 / PIT/LFO

Sets the pitch of the third pitch-shifted note between one octave below (–12) and one octave above (+12) the input note. Each increment corresponds to one semitone.

3 FINE (3rd Pitch Fine Tuning: –99 ... +99)

LEDs	▬ 3 ╬ CHO / FINE/FB

Permits fine tuning of the third pitch-shifted note in 1-cent steps (1 cent is 1/100th of a semitone).

DELAY (Delay Time: 0.1 ... 200 ms)

LEDs	▬ PARAM ╬ FLA / DELAY

Determines the time delay between input of the original note and output of the first pitch-shifted note, and the delay between all subsequent pitch-shifted notes.

BAL (Balance: 0 ... 100%)

LEDs	▬ BAL

Sets the balance between the direct and effect sound. Higher values produce a greater proportion of effect sound in relation to direct sound.
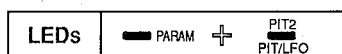
● CHO: Chorus

EFFECT	PIT1	PIT2	CHO	FLA	SYM	DELAY	ER	REV
PARAM	TYPE	PIT/LFO	FINE/FB	DELAY	LIVE	DEPTH	RT/ROOM	REV BAL

The chorus effect combines delay time and amplitude modulation to effectively thicken and add warmth to the sound.
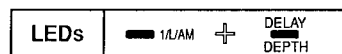
— Programmable Parameters —

LFO (Low Frequency Oscillator Speed: 0.1 ... 20 Hz)

LEDs	▬ PARAM ╬ PIT2 / PIT/LFO

Sets the speed of LFO modulation and therefore the rate at which the chorus effect varies.

AM DEPTH
(Amplitude Modulation Depth: 0 ... 100%)

LEDs	▬ 1/L/AM ╬ DELAY / DEPTH

Sets the depth of amplitude modulation. Higher values produce deeper amplitude modulation.

PM DEPTH
(Pitch Modulation Depth: 0 ... 100%)

LEDs	▬ 2/R/PM ╬ DELAY / DEPTH
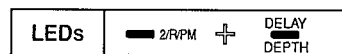
Sets the depth of delay time modulation. Higher values produce deeper pitch modulation.

BAL (Balance: 0 ... 100%)

LEDs	▬ BAL

Sets the balance between the direct and effect sound. Higher values produce a greater proportion of effect sound in relation to direct sound.

## ● FLA: Flange

EFFECT	PIT1	PIT2	CHO	FLA	SYM	DELAY	ER	REV
PARAM	TYPE	PIT/LFO	FINE/FB	DELAY	LIVE	DEPTH	RT/ROOM	REV BAL

Flanging is a fairly pronounced effect based primarily on delay time modulation. By adjusting the various parameters you should be able to create an extremely broad range of sounds, from gentle shimmering to wild sweeps.
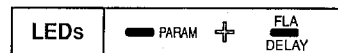
— Programmable Parameters —

LFO (Low Frequency Oscillator Speed: 0.1 ... 20 Hz)

LEDs	▬ PARAM ╬ PIT2 / PIT/LFO
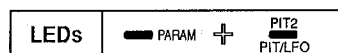
Sets the speed of LFO modulation and therefore the rate at which the flange effect varies.

DELAY
(Modulation Delay Time: 0.2 ... 15 ms)

LEDs	▬ PARAM ╬ FLA / DELAY

Sets the modulation delay time. Delay times shorter than 1 millisecond produce the greatest effect in the high-frequency range, while with delay times from 1 to 3 ms the effect extends to the middle frequencies. Longer delays produce a stronger effect in the low-frequency range.

FB (Feedback: –99 ... +99%)
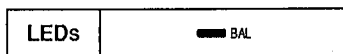
LEDs	▬ PARAM ╬ CHO / FINE/FB

Determines the amount of effect-sound feedback returned to the input of the processor. Higher values produce a more pronounced effect.

DEPTH (Flange Depth: 0 ... 100%)
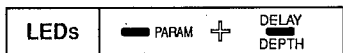
LEDs	━ PARAM ╬ DELAY DEPTH

Sets the depth of modulation. Higher values produce deeper modulation.

BAL (Balance: 0 ... 100%)

LEDs	━ BAL

Sets the balance between the direct and effect sound. Higher values produce a greater proportion of effect sound in relation to direct sound.

● **SYM: Symphonic**

EFFECT	PIT1	PIT2	CHO	FLA	SYM	DELAY	ER	REV
PARAM	TYPE	PIT/LFO	FINE/FB	DELAY	LIVE	DEPTH	RT/ROOM	REV BAL

Symphonic is a broad, sweeping effect that adds a sense of scale to the sound.

— **Programmable Parameters** —

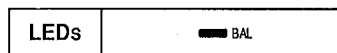**LFO (Low Frequency Oscillator Speed: 0.1 ... 20 Hz)**

LEDs	━ PARAM ╬ PIT2 PIT/LFO

Sets the speed of LFO modulation and therefore the rate at which the symphonic effect varies.

DEPTH (Symphonic Depth: 0 ... 100%)

LEDs	━ PARAM ╬ DELAY DEPTH

Sets the depth of modulation. Higher values produce deeper modulation.

BAL (Balance: 0 ... 100%)

LEDs	━ BAL

Sets the balance between the direct and effect sound. Higher values produce a greater proportion of effect sound in relation to direct sound.
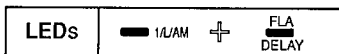
● DELAY: Stereo Delay

EFFECT	PIT1	PIT2	CHO	FLA	SYM	DELAY	ER	REV
PARAM	TYPE	PIT/LFO	FINE/FB	DELAY	LIVE	DEPTH RT/ROOM	REV	BAL

This sophisticated stereo delay program features independent delay and feedback settings for the left and right channels.
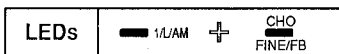
— Programmable Parameters —

L DELAY
(Left Channel Delay Time: 0.1 ... 740 ms)

LEDs	▬ 1/L/AM ╬ ▬ FLA DELAY

Sets the delay time for the left channel.

L FB (Left Channel Feedback: –99 ... +99%)

LEDs	▬ 1/L/AM ╬ CHO ▬ FINE/FB

Determines the amount of effect-sound feedback returned to the input of the left-channel processor. Negative values produce out-of-phase feedback. Higher positive values produce a greater number of repeats.

R DELAY
(Right Channel Delay Time: 0.1 ... 740 ms)

LEDs	▬ 2/R/PM ╬ ▬ FLA DELAY

Sets the delay time for the right channel.

R FB
(Right Channel Feedback: –99 ... +99 %)

LEDs	▬ 2/R/PM ╬ CHO ▬ FINE/FB

Determines the amount of effect-sound feedback returned to the input of the right-channel processor. Negative values produce out-of-phase feedback. Higher positive values produce a greater number of repeats.

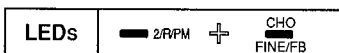### BAL (Balance: 0 ... 100%)

LEDs	▬ BAL

Sets the balance between the direct and effect sound. Higher values produce a greater proportion of effect sound in relation to direct sound.

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● ER: Early Reflection

EFFECT	PIT1	PIT2	CHO	FLA	SYM	DELAY	ER	REV
PARAM	TYPE	PIT/LFO	FINE/FB	DELAY	LIVE	DEPTH	RT/ROOM	REV BAL

These effects are created using different groupings of "early reflections" — the first cluster of reflections that occurs after the direct sound but before the dense reflections that are known as reverberation begin.

— Programmable Parameters —

TYPE (Early Reflection Type: 1 ... 5)

LEDs	■■ PARAM +	PIT1 ▪▪ TYPE

Type 1 (Hall) selects a typical grouping of early reflections that would occur in a performing environment such as a hall. Type 2 (Random) produces an irregular series of reflections that could not occur naturally. Type 3 (Reverse) generates a series of reflections that increase in level — like the effect produced by playing a recorded reverberation sound backwards. Type 4 (Plate) produces a typical grouping of reflections that would occur in a plate reverb unit. Type 5 (Spring) simulates the sound of a spring reverb unit.

DELAY (Initial Delay Time: 0.1 ... 350 ms)

LEDs	■■ PARAM +	FLA ▪▪ DELAY

Sets the delay time before the early reflection sound begins.

LIVE (Liveness: 0 ... 10)

LEDs	■■■ PARAM +	SYM ▪▪ LIVE

Determines how the early reflections decay. Higher values result in slower decay, producing the effect of a more reflective ("live") room.

DEPTH (Early Reflection Depth: 0 ... 10)

LEDs	■■ PARAM +	DELAY ▪▪ DEPTH

If the DEPTH parameter is set to "0," a relatively simple reflection structure results in a clearer, more straightforward early-reflection effect. As the DEPTH value is increased, the complexity of the reflections increases producing a "deeper," more spacious sound.

ROOM (Room Size: 0.1 ... 10)

LEDs	■■ PARAM +	ER ▪▪ RT/ROOM

Sets the separation between reflections. Higher values produce greater separation between reflections, and therefore the effect of a bigger room.

BAL (Balance: 0 ... 100%)

LEDs	■■ BAL

Sets the balance between the direct and effect sound. Higher values produce a greater proportion of effect sound in relation to direct sound.
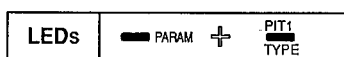
● REV: Reverb

EFFECT	PIT1	PIT2	CHO	FLA	SYM	DELAY	ER	REV
PARAM	TYPE	PIT/LFO	FINE/FB	DELAY	LIVE	DEPTH	RT/ROOM	REV BAL

Reverberation is the warm musical "ambience" you experience when listening to music in a hall or other natural environment.

— Programmable Parameters —

TYPE (Reverb Type: 1 ... 4)

LEDs	▬▬ PARAM + PIT1 / TYPE

The EMP100 offers several different reverb types. Type 1 (Hall) simulates the type of reverberation you would experience in a hall. Type 2 (Room) simulates the sound of a smaller room. Type 3 (Vocal) is a reverb effect ideally suited to vocals. Type 4 (Plate) produces the type of reverberation produced artificially by a plate reverberator.

### DELAY (Initial Delay Time: 0.1 ... 50 ms)

LEDs	▬▬ PARAM + FLA / DELAY
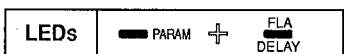
Sets the delay time before the reverb sound begins.

DEPTH (Reverb Depth: 0 ... 10)

LEDs	▬▬ PARAM + DELAY / DEPTH

If the DEPTH parameter is set to "0", a relatively simple reflection structure results in a clearer, more straightforward reverb effect. As the DEPTH value is increased, the complexity of the reflections increases producing a "deeper," more spacious sound.

RT (Reverb Time: 0.3 ... 40 s)

LEDs	▬▬ PARAM + ER / RT/ROOM
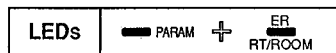
Sets the amount of time it takes for the reverb sound to decay by approximately 60 dB (virtually to silence).

BAL (Balance: 0 ... 100%)

LEDs	▬▬ BAL

Sets the balance between the direct and effect sound. Higher values produce a greater proportion of effect sound in relation to direct sound.
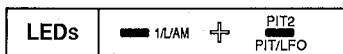
COMBINATION EFFECTS

● PIT1 REV: Stereo Pitch + Reverb

EFFECT	PIT1	PIT2	CHO	FLA	SYM	DELAY	ER	REV
PARAM	TYPE	PIT/LFO	FINE/FB	DELAY	LIVE	DEPTH	RT/ROOM	REV BAL

This effect combines stereo pitch change and reverb in parallel. This means that the pitch-change sound is "dry" (i.e. not affected by the reverb effect), while the reverb is applied only to the direct sound.
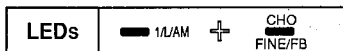
— Programmable Parameters —

L PIT (Left-channel Pitch Shift: –12 ... +12)

LEDs	▬ 1/L/AM ╬ PIT2 / PIT/LFO

Sets the pitch of the left-channel pitch-shifted note between one octave below (–12) and one octave above (+12) the input note. Each increment represents one semitone.
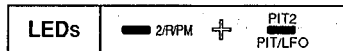
L FINE
(Left-channel Pitch Fine Tuning: –99 ... +99)

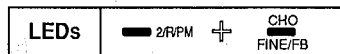| LEDs	▬ 1/L/AM ╬ CHO / FINE/FB

Permits fine tuning of the left-channel pitch-shifted note in 1-cent steps (1 cent is 1/100th of a semitone).

R PIT (Right-channel Pitch Shift: –12 ... +12)

| LEDs	▬ 2/R/PM ╬ PIT2 / PIT/LFO

Sets the pitch of the right-channel pitch-shifted note between one octave below (–12) and one octave above (+12) the input note. Each increment corresponds to one semitone.

R FINE (Right-channel Pitch Fine Tuning: –99 ... +99)

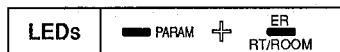| LEDs	▬ 2/R/PM ╬ CHO / FINE/FB

Permits fine tuning of the right-channel pitch-shifted note in 1-cent steps (1 cent is 1/100th of a semitone).

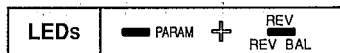**DELAY (Initial Delay Time: 0.1 ... 50 ms)**
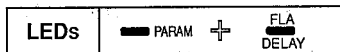
LEDs	▬ PARAM ╬ FLA / DELAY

Sets the delay time before the reverb sound begins.

RT (Reverb Time: 0.3 ... 40 s)

LEDs	▬ PARAM ╬ ER / RT/ROOM

Sets the amount of time it takes for the reverb sound to decay by approximately 60 dB (virtually to silence).

REV BAL (Reverb Balance)

LEDs	▬ PARAM ╬ REV / REV BAL

Adjusts the level of the reverb sound in relation to the pitch-change sound. Higher values produce a higher reverb level.

BAL (Balance: 0 ... 100%)

LEDs	▬ BAL

Sets the balance between the direct and effect sound. Higher values produce a greater proportion of effect sound in relation to direct sound.
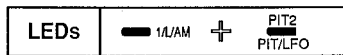
● PIT2 REV: Stereo Pitch → Reverb

EFFECT	PIT1	PIT2	CHO	FLA	SYM	DELAY	ER	REV
PARAM	TYPE	PIT/LFO	FINE/FB	DELAY	LIVE	DEPTH	RT/ROOM	REV BAL

In this combination the pitch change and reverb effects are connected in series. This means that the reverb effect is applied to the the pitch change sound as well as the direct sound.
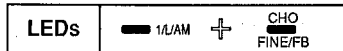
— Programmable Parameters —

L PIT (Left-channel Pitch Shift: −12 ... +12)

LEDs	▬ 1/L/AM ╬ PIT2 PIT/LFO

Sets the pitch of the left-channel pitch-shifted note between one octave below (−12) and one octave above (+12) the input note. Each increment represents one semitone.
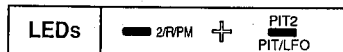
L FINE
(Left-channel Pitch Fine Tuning: −99 ... +99)

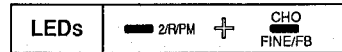| LEDs	▬ 1/L/AM ╬ CHO FINE/FB

Permits fine tuning of the left-channel pitch-shifted note in 1-cent steps (1 cent is 1/100th of a semitone).

R PIT (Right-channel Pitch Shift: −12 ... +12)

| LEDs	▬ 2/R/PM ╬ PIT2 PIT/LFO

Sets the pitch of the right-channel pitch-shifted note between one octave below (−12) and one octave above (+12) the input note. Each increment corresponds to one semitone.

R FINE (Right-channel Pitch Fine Tuning: −99 ... +99)

LEDs	▬ 2/R/PM ╬ CHO FINE/FB

Permits fine tuning of the right-channel pitch-shifted note in 1-cent steps (1 cent is 1/100th of a semitone).

DEPTH (Pitch Balance: 0 ... 100%)

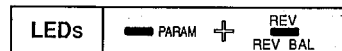| LEDs	▬ PARAM ╬ DELAY DEPTH
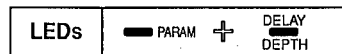
Adjusts the level of the pitch-change sound in relation to the direct sound. Higher values produce a higher pitch-change level.
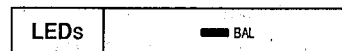
RT (Reverb Time: 0.3 ... 40 s)

LEDs	▬ PARAM ╬ ER RT/ROOM

Sets the amount of time it takes for the reverb sound to decay by approximately 60 dB (virtually to silence).

REV BAL (Reverb Balance)

LEDs	▬ PARAM ╬ REV REV BAL

Adjusts the level of the reverb sound in relation to the pitch-change sound. Higher values produce a higher reverb level.

BAL (Balance: 0 ... 100%)

LEDs	▬ BAL

Sets the balance between the direct and effect sound. Higher values produce a greater proportion of effect sound in relation to direct sound.

● SYM REV: Symphonic + Reverb

EFFECT	PIT1	PIT2	CHO	FLA	SYM	DELAY	ER	REV
PARAM	TYPE	PIT/LFO	FINE/FB	DELAY	LIVE	DEPTH	RT/ROOM	REV BAL

The symphonic and reverb effects are combined in parallel, so the symphonic sound is "dry" (i.e. not affected by the reverb effect) while the reverb is applied only to the direct sound.

— Programmable Parameters —

LFO (Low Frequency Oscillator Speed: 0.1 ... 20 Hz)

LEDs	▬ PARAM ╬ PIT2 / PIT/LFO

Sets the speed of LFO modulation and therefore the rate at which the symphonic effect varies.

DEPTH (Symphonic Depth: 0 ... 100%)

LEDs	▬▬ PARAM ╬ DELAY / DEPTH

Sets the depth of modulation. Higher values produce deeper modulation.

DELAY (Initial Delay Time: 0.1 ... 300 ms)

LEDs	▬ PARAM ╬ FLA / DELAY

Sets the delay time before the reverb sound begins.

RT (Reverb Time: 0.3 ... 40 s)

LEDs	▬▬ PARAM ╬ ER / RT/ROOM

Sets the amount of time it takes for the reverb sound to decay by approximately 60 dB (virtually to silence).

REV BAL (Reverb Balance)

LEDs	▬ PARAM ╬ REV / REV BAL

Adjusts the level of the reverb sound in relation to the symphonic sound. Higher values produce a higher reverb level.

BAL (Balance: 0 ... 100%)

LEDs	▬▬ BAL

Sets the balance between the direct and effect sound. Higher values produce a greater proportion of effect sound in relation to direct sound.
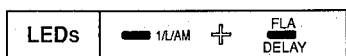
● DLY REV: Delay + Reverb

EFFECT	PIT1	PIT2	CHO	FLA	SYM	DELAY	ER	REV
PARAM	TYPE	PIT/LFO	FINE/FB	DELAY	LIVE	DEPTH	RT/ROOM	REV BAL

In this effect delay and reverb are connected in parallel so they are applied independently to the direct sound.
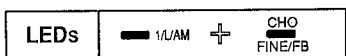
— Programmable Parameters —

L DELAY
(Left Channel Delay Time: 0.1 ... 300 ms)

LEDs	▬ 1/L/AM ➕ FLA DELAY

Sets the delay time for the left channel.

L FB (Left Channel Feedback: –99 ... +99%)

LEDs	▬ 1/L/AM ➕ CHO FINE/FB

Determines the amount of effect-sound feedback returned to the input of the left-channel processor. Negative values produce out-of-phase feedback. Higher positive values produce a greater number of repeats.

R DELAY
(Right Channel Delay Time: 0.1 ... 300 ms)

LEDs	▬ 2/R/PM ➕ FLA DELAY

Sets the delay time for the right channel.

R FB
(Right Channel Feedback: –99 ... +99 %)

LEDs	▬ 2/R/PM ➕ CHO FINE/FB

Determines the amount of effect-sound feedback returned to the input of the right-channel processor. Negative values produce out-of-phase feedback. Higher positive values produce a greater number of repeats.
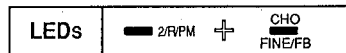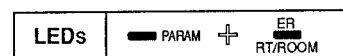
DEPTH (Reverb Depth: 0 ... 10)

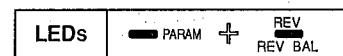| LEDs	▬ PARAM ➕ DELAY DEPTH

If the DEPTH parameter is set to "0," a relatively simple reflection structure results in a clearer, more straightforward reverb effect. As the DEPTH value is increased, the complexity of the reflections increases producing a "deeper," more spacious sound.

RT (Reverb Time: 0.3 ... 40 s)

LEDs	▬ PARAM ➕ ER RT/ROOM

Sets the amount of time it takes for the reverb sound to decay by approximately 60 dB (virtually to silence).

REV BAL (Reverb Balance)

LEDs	▬ PARAM ➕ REV REV BAL

Adjusts the level of the reverb sound in relation to the delay sound. Higher values produce a higher reverb level.

BAL (Balance: 0 ... 100%)

LEDs	▬ BAL

Sets the balance between the direct and effect sound. Higher values produce a greater proportion of effect sound in relation to direct sound.
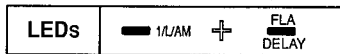
● DLY ER: Delay → Early Reflection

EFFECT	PIT1	PIT2	CHO	FLA	SYM	DELAY	ER	REV
PARAM	TYPE	PIT/LFO	FINE/FB	DELAY	LIVE	DEPTH	RT/ROOM	REV BAL

Delay and early reflections connected in series. The early reflection effect is applied to the delay sound.
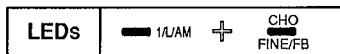
— Programmable Parameters —
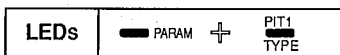
DELAY (Delay Time: 0.1 ... 350 ms)

LEDs	▬ 1/L/AM ✛ FLA / DELAY

Sets the delay time for the left channel.

FB (Feedback: –99 ... +99%)

| LEDs	▬ 1/L/AM ✛ CHO / FINE/FB

Determines the amount of effect-sound feedback returned to the input of the delay processor. Negative values produce out-of-phase feedback. Higher positive values produce a greater number of repeats.

TYPE (Early Reflection Type: 1 ... 5)

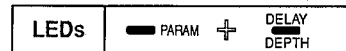| LEDs	▬ PARAM ✛ PIT1 / TYPE

Type 1 (Hall) selects a typical grouping of early reflections that would occur in a performing environment such as a hall. Type 2 (Random) produces an irregular series of reflections that could not occur naturally. Type 3 (Reverse) generates a series of reflections that increase in level — like the effect produced by playing a recorded reverberation sound backwards. Type 4 (Plate) produces a typical grouping of reflections that would occur in a plate reverb unit. Type 5 (Spring) simulates the sound of a spring reverb unit.
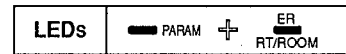
LIVE (Liveness: 0 ... 10)
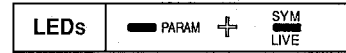
LEDs	▬ PARAM ✛ SYM / LIVE

Determines how the early reflections decay. Higher values result in slower decay, producing the effect of a more reflective ("live") room.

DEPTH (Early Reflection Depth: 0 ... 10)

| LEDs	▬ PARAM ✛ DELAY / DEPTH

If the DEPTH parameter is set to "0," a relatively simple reflection structure results in a clearer, more straightforward early-reflection effect. As the DEPTH value is increased, the complexity of the reflections increases producing a "deeper," more spacious sound.

ROOM (Room Size: 0.1 ... 10)

LEDs	▬ PARAM ✛ ER / RT/ROOM

Sets the separation between reflections. Higher values produce greater separation between reflections, and therefore the effect of a bigger room.

REV BAL (Reverb Balance)

LEDs	▬ PARAM ✛ REV / REV BAL
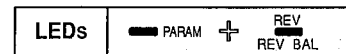
Actually "Early Reflection Balance" in this effect. Adjusts the level of the early reflection sound in relation to the delay sound. Higher values produce a higher reverb level.

BAL (Balance: 0 ... 100%)

LEDs	▬ BAL
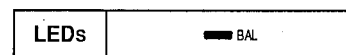
Sets the balance between the direct and effect sound. Higher values produce a greater proportion of effect sound in relation to direct sound.

● CHO DLY: Chorus → Delay

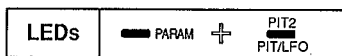| EFFECT	PIT1	PIT2	CHO	FLA	SYM	DELAY	ER	REV
PARAM	TYPE	PIT/LFO	FINE/FB	DELAY	LIVE	DEPTH	RT/ROOM	REV BAL

Chorus and delay connected in series. The delay effect is applied to the chorus sound.
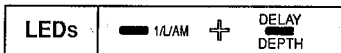
— Programmable Parameters —

LFO (Low Frequency Oscillator Speed: 0.1 ... 20 Hz)

LEDs	▬ PARAM ╋ PIT2 / PIT/LFO

Sets the speed of LFO modulation and therefore the rate at which the chorus effect varies.

AM DEPTH (Amplitude Modulation Depth: 0 ... 100%)

LEDs	▬ 1/L/AM ╋ DELAY / DEPTH

Sets the depth of amplitude modulation. Higher values produce deeper amplitude modulation.

PM DEPTH (Pitch Modulation Depth: 0 ... 100%)

LEDs	▬ 2/R/PM ╋ DELAY / DEPTH
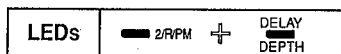
Sets the depth of delay time modulation. Higher values produce deeper pitch modulation.

L DELAY (Left Channel Delay Time: 0.1 ... 340 ms)

LEDs	▬ 1/L/AM ╋ FLA / DELAY

Sets the delay time for the left channel.

L FB (Left Channel Feedback: –99 ... +99%)

LEDs	▬ 1/L/AM ╋ CHO / FINE/FB

Determines the amount of effect-sound feedback returned to the input of the left-channel processor. Negative values produce out-of-phase feedback. Higher positive values produce a greater number of repeats.

R DELAY (Right Channel Delay Time: 0.1 ... 340 ms)

LEDs	▬ 2/R/PM ╋ FLA / DELAY

Sets the delay time for the right channel.

R FB (Right Channel Feedback: –99 ... +99 %)

LEDs	▬ 2/R/PM ╋ CHO / FINE/FB

Determines the amount of effect-sound feedback returned to the input of the right-channel processor. Negative values produce out-of-phase feedback. Higher positive values produce a greater number of repeats.
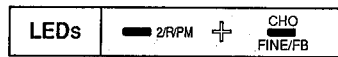
BAL (Balance: 0 ... 100%)

LEDs	▬ BAL

Sets the balance between the direct and effect sound. Higher values produce a greater proportion of effect sound in relation to direct sound.

TAP TEMPO DELAY TIME CONTROL

A Yamaha FC4 or FC5 footswitch is plugged into the rear-panel TAP DELAY jack can be used to set the delay time when the single DELAY effect or any of the combination effects including DELAY are selected. Simply tap the footswitch twice at the appropriate interval. The time between "taps" sets the time between delays. In programs that have left and right-channel delay parameters, the time of the delay parameters for both channels is changed by the same amount.

By tapping in time with the music you are playing, this function makes it simple to accurately match the delay time to tempo.

TAP!   TAP!

Time between taps on footswitch sets delay time.
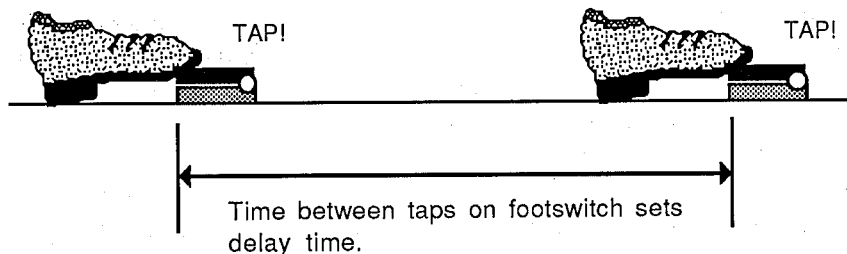
In programs that have left and right-channel delay parameters, the TAP TEMPO footswitch directly sets the time of the leftchannel delay parameter, and the right-channel delay parameter is set differently depending on whether the difference between the left- and right-channel delay times is less or greater than 50 ms:

Less than 50 ms: The left- and right-channel delay times are changed by the same amount.

Greater than 50 ms: The right-channel delay time is changed proportionally by the same amount as the left-channel delay time. E.g. if the left-channel delay is increased by 1.5 times, the right-channel delay time will also be increased by 1.5 times.

Although standard programming procedure allows delay time setting in millisecond increments, using the TAP TEMPO footswitch will often result in a delay time setting that is accurate to within a fraction of a millisecond. Such settings can be stored in memory using the standard memory store procedure. When a delay time setting that includes a fraction is selected in the parameter mode, a decimal point will appear to the right of the displayed delay time (since the display shows a maximum of three digits, however, the actual decimal fraction will not be shown).

MIDI FUNCTIONS

■ MIDI Program Selection

The EMP100 makes it possible to select specific programs via external MIDI control. You can set up the EMP100, for example, so that when you select a voice on a synthesizer the most appropriate effect for that voice is automatically selected. This is accomplished because each time you select a voice on your MIDI synthesizer it transmits the corresponding MIDI PROGRAM CHANGE NUMBER. The EMP100 receives this PROGRAM CHANGE NUMBER and selects the effect program that you have assigned to it using the Program Change Table Edit function which will be described below. A more convenient idea for guitarists or bassists would be to use a MIDI foot controller such as the Yamaha MFC05 to transmit the required MIDI PROGRAM CHANGE NUMBERs.

● Editing the Program Change Table

This function lets you assign EMP100 memory location numbers to MIDI program change numbers 1 through 128 as required. If, for example, you assign EMP100 program number 145 to MIDI program change number 1, then EMP100 program number 145 will be selected whenever you select voice number 1 on your keyboard or other MIDI instrument.

1. Press the [MIDI] key. The "PGM" LED in the MIDI LED group will light.

2. Use the [▲] and [▼] keys to select the desired MIDI program change number.

3. Press the [MIDI] key again and the "MEM" LED will light.

4. Use the [▲] and [▼] keys to assign the desired EMP100 memory location number to the MIDI program change number selected in step 2.

5. Repeat steps 1 through 4 as many times as necessary.

6. Press the [MEMORY] key to return to the memory mode.

NOTE: The EMP100 will not receive MIDI data while the MIDI mode is selected.

■ MIDI Receive Channel Selection

MIDI allows transmission and reception of MIDI data on 16 different channels. Multiple channels have been implemented to allow selective control of certain instruments or devices connected in series. In any MIDI setup, the MIDI channels of the transmitting and receiving equipment must be matched for proper data transfer. An "OMNI" receive mode is also available, which allows reception on all 16 MIDI channels. In the OMNI mode it is not necessary to match the receive channel of the receiving device to the transmit channel of the transmitting device.

Since the EMP100 is a receive-only device, you only have to make sure that it is set to receive on the same channel that your keyboard or other program-change device is transmitting on.

1. Begin with the EMP100 power OFF.

2. Turn the power switch ON while holding the [MIDI] key. The current receive channel will be shown on the numeric display — "C1" ... "C16," or "ALL" if the omni mode is selected, or "OFF" if MIDI reception is turned off.

3. Use the [▲] and [▼] keys to select the desired MIDI receive channel, select the OMNI mode ("ALL"), or turn MIDI reception "OFF." "ALL" is selected by decrementing below "C1," and "OFF" is selected by incrementing above "C16."

4. Press the [MIDI] key to return to the memory mode.

SPECIFICATIONS

● **ANALOG CIRCUITRY**

Frequency Response: 20 Hz — 20 kHz.
Dynamic Range: Better than 85 dB, effect OFF.
Total Harmonic Distortion: Less than 0.1%
@ 1 kHz, maximum level.

● **INPUTS**

Channels: Mono (1).
Type: Unbalanced.
Impedance: Greater than 500 kΩ.
Connector: Rear-panel phone jack.

● **OUTPUTS**

Channels: Stereo (2).
Type: Unbalanced
Nominal Level: –20/–10 dB, switchable.
Impedance: 1 kΩ.
Connectors: Rear-panel phone jacks.

● **DIGITAL CIRCUITRY**

A/D Converter: 16-bit quantization.
D/A Converter: 2-channel 16-bit quantization.
Sampling Frequency: 44.1 kHz.

● **MEMORY & EFFECTS**

Memory:
ROM (PRESET) area: 1 — 100
RAM (USER) area: 101 — 150
Basic Effects:
STEREO PITCH
TRIPLE PITCH
CHORUS
FLANGE
SYMPHONIC
DELAY
EARLY REFLECTION
REVERB
STEREO PITCH + REVERB
STEREO PITCH → REVERB
SYMPHONIC + REVERB
DELAY + REVERB
DELAY → ER
CHORUS → DELAY

● **CONTROLS, DISPLAYS & CONNECTORS**

Controls:
INPUT LEVEL control.
▲ and ▼ (increment/decrement) keys.
RECALL key.
MEMORY key.
PARAM key.
MIDI key.
BYPASS key.
STORE key.
Displays:
SIGNAL and PEAK indicators.
7-segment 3-digit memory number LED.
Parameter indicators x 5.
MIDI PGM and MEM indicators.
EFFECT/PARAM indicators x 7.
BYPASS indicator.
Connectors:
INPUT.
OUTPUT R & L with –20/–10dB switch.
BYPASS.
TAP TEMPO.
MIDI IN.
DC 12V IN.

● **GENERAL**

Power Supply:
U.S. & Canada: PA-1207 AC Adaptor
(120 V AC, 60 Hz).
General Model: PA-1210 AC Adaptor
(220/240 V AC, 50/60 Hz).
Dimensions (W x H x D): 220 x 45 x 232.7 mm.
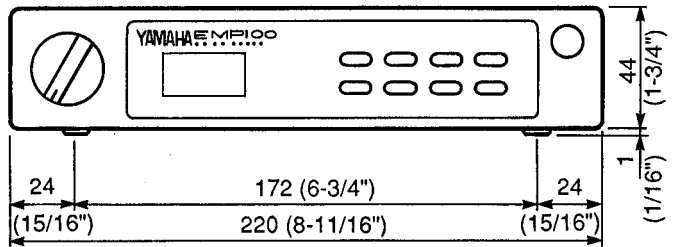(8-11/16" x 1-3/4" x 9-3/16")
Weight: 1.25 kg. (2 lbs 12 oz)

MIDI DATA & DATA CHART
DONNEES MIDI ET TABLES DE DONNEES
MIDI-DATEN UND DATENTABELLEN

EMP100

DIMENSIONS
DIMENSIONS
ABMESSUNGEN

4.3 (3/16")

39.6 (1-9/16")

217.4 (8-9/16")

7 (1/4")

9.6 (3/8")

232.7 (9-3/16")

223.8 (8-13/16")

176 (6-15/16")

38.2 (1-1/2")

1.9 (1/16")

YAMAHA EMP100

44 (1-3/4")

1 (1/16")

24 (15/16")

172 (6-3/4")

220 (8-11/16")

24 (15/16")
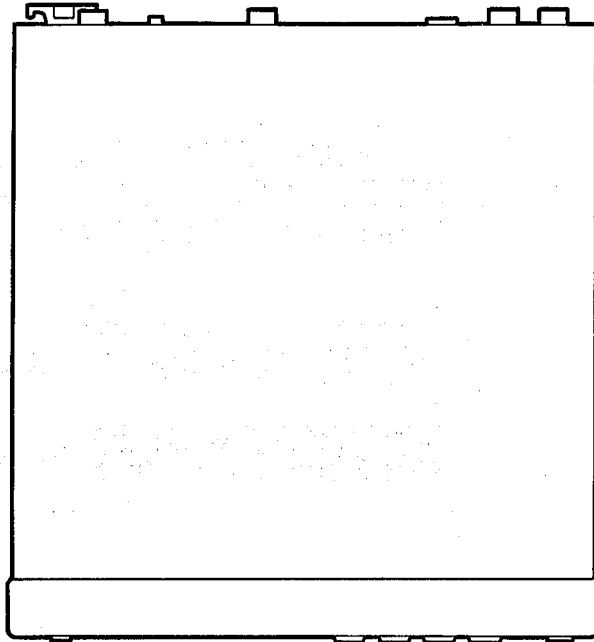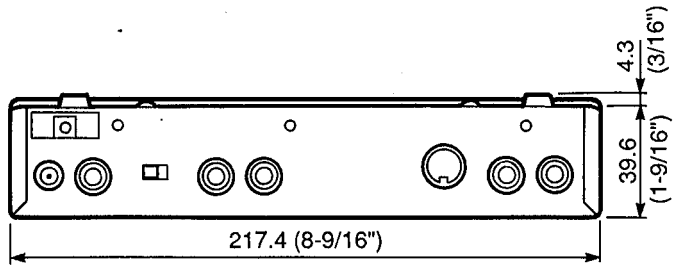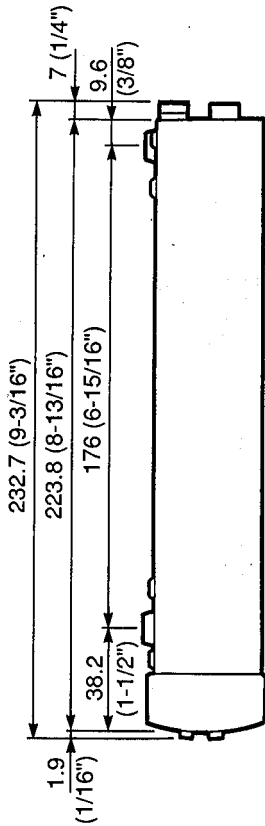
Unit: mm (inch)
Unité: mm (pouce)
Einheit: mm (zoll)

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BLOCK DIAGRAM
SCHEMA DE PRINCIPE
BLOCKDIAGRAMM
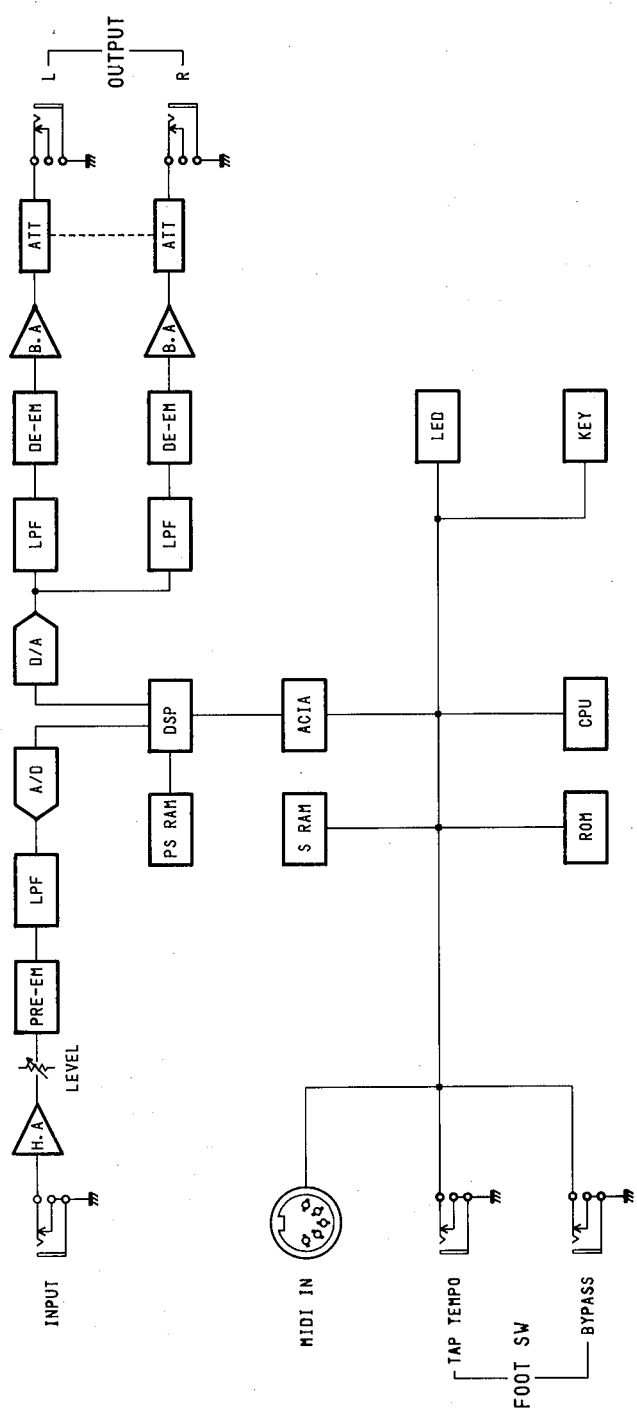
MIDI DATA FORMAT

■ Reception Conditions

1. Program Change

Can be received on the currently selected MIDI receive channel.

The program assigned to the received program change number in the EMP100 program change assignment table will be recalled.

```
status      1100nnnn  (CnH)  n=0(channel 1)-
                                15(channel 16)
program #   0ppppppp         p=0-127
```
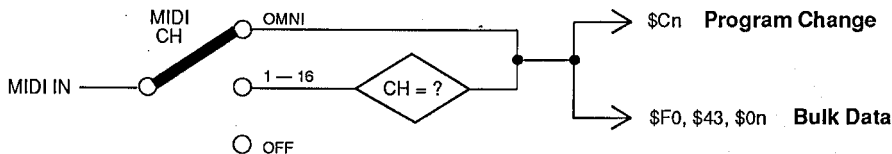
2. System Exclusive Messages

Can be received on the currently selected MIDI receive channel.

1) Memory Bulk Data

```
status      11110000  (F0H)
ID #        01000011  (43H)
sub status  0000nnnn  (0nH)  n=0(channel 1)-
                                15(channel 16)
format #    01111110  (7EH)
byte count  00000000  (00H)
byte count  00111110  (3EH)
            01001100  (4CH)  "L"
            01001101  (4DH)  "M"
            00100000  (20H)  " "
            00100000  (20H)  " "
            00111000  (38H)  "8"
            00110111  (37H)  "7"
            00110010  (32H)  "2"
            00111001  (39H)  "9"
data name   01001101  (4DH)  "M"
memory #    0mmmmmmm         m=1(memory 101)-
                                50(memory 150)
data        0ddddddd
              |              36 bytes
            0ddddddd
check sum   0eeeeeee
EOX         11110111  (F7H)
```

2) Program Change Table Bulk Data

```
status      11110000  (F0H)
ID #        01000011  (43H)
sub status  0000nnnn  (0nH)  n=0(channel 1)-
                                15(channel 16)
format #    01111110  (7EH)
byte count  00000010  (02H)
byte count  00001010  (0AH)
            01001100  (4CH)  "L"
            01001101  (4DH)  "M"
            00100000  (20H)  " "
            00100000  (20H)  " "
            00111000  (38H)  "8"
            00110111  (37H)  "7"
            00110010  (32H)  "2"
            00111001  (39H)  "9"
data name   01010100  (54H)  "T"
            00000001  (01H)
data        0ddddddd
              |              128 bytes
            0ddddddd
check sum   0eeeeeee
EOX         11110111  (F7H)
```

3) System Setup Bulk Data

```
status      11110000  (F0H)
ID #        01000011  (43H)
sub status  0000nnnn  (0nH)  n=0(channel 1)-
                                15(channel 16)
format #    01111100  (7CH)
byte count  00000000  (00H)
byte count  00001101  (0DH)
            01001100  (4CH)  "L"
            01001101  (4DH)  "M"
            00100000  (20H)  " "
            00100000  (20H)  " "
            00111000  (38H)  "8"
            00110111  (37H)  "7"
            00110010  (32H)  "2"
            00111001  (39H)  "9"
data name   01010011  (53H)  "S"
            00100000  (20H)  " "
version #   00000001  (01H)
            00000000  (00H)
data        000nnnnn         n=0(OMNI ON),
                                1(channel 1)-
                                16(channel 16), 17(OFF)
check sum   0eeeeeee
EOX         11110111  (F7H)
```

YAMAHA [MULTI-EFFECT PROCESSOR]   Date :11/07, 1990
       Model   EMP100   MIDI Implementation Chart   Version : 1.0

Function ...	Recognized	Remarks
Basic Default Channel Changed	1 - 16, off 1 - 16, off	memorized

Mode   Default
           Messages
           Altered
	OMNI off/OMNI on
	x
	x
		memorized

Note Number : True voice	x x	
Velocity Note ON Note OFF	x x	
After Key's Touch Ch's	x x	
Pitch Bender	x	
Control Change	x	
Prog Change : True #	o 0 - 127	*1
System Exclusive	o	Bulk Dump
System : Song Pos : Song Sel Common : True	x x x	
System :Clock Real Time :Commands	x x	
Aux :Local ON/OFF :All Notes OFF Mes- :Active Sense sages:Reset	x x x x	

Notes: *1 ; For program 1 - 128, memory #1 - #150 is selected.

Mode 1 : OMNI ON, POLY   Mode 2 : OMNI ON,   MONO   o :Yes
Mode 3 : OMNI OFF, POLY   Mode 4 : OMNI OFF, MONO   x :No

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BLANK CHART
TABLE VIERGE
LEERBOGEN

LED	PARAMETERS							
PIT1	L PITCH	L P.FINE	L DELAY	R PITCH	R P.FINE	R DELAY	FEED BACK	BALANCE
PIT2	1 PITCH	1 P.FINE	2 PITCH	2 P.FINE	3 PITCH	3 P.FINE	DELAY	BALANCE
CHO	LFO SPEED	AM DEPTH	PM DEPTH	———	———	———	———	BALANCE
FLA	LFO SPEED	MOD DELAY	FEED BACK	DEPTH	———	———	———	BALANCE
SYM	LFO SPEED	DEPTH	———	———	———	———	———	BALANCE
DELAY	L DELAY	L FEED BACK	R DELAY	R FEED BACK	———	———	———	BALANCE
ER	TYPE	INITIAL DELAY	LIVENESS	DEPTH	ROOM SIZE	———	———	BALANCE
REV	TYPE	INITIAL DELAY	DEPTH	REV TIME	———	———	———	BALANCE
PIT1 REV	L PITCH	L P.FINE	R PITCH	R P.FINE	INITIAL DLY	REV TIME	REV BALANCE	BALANCE
PIT2 REV	L PITCH	L P.FINE	R PITCH	R P.FINE	P. BAL(DEPTH)	REV TIME	REV BALANCE	BALANCE
SYM REV	LFO SPEED	DEPTH	INITIAL DLY	REV TIME	REV BALANCE	———	———	BALANCE
DLY REV	L DELAY	L FEED BACK	R DELAY	R FEED BACK	DEPTH	REV TIME	REV BALANCE	BALANCE
DLY ER	DELAY	FEED BACK	TYPE	LIVENESS	DEPTH	ROOM SIZE	ER BALANCE	BALANCE
CHO DLY	LFO SPEED	AM DEPTH	PM DEPTH	L DELAY	L FEED BACK	R DELAY	R FEED BACK	BALANCE

No.	MEMO							

YAMAHA