User's
Manual

marani ®

DEF–220P
Effects Processor Unit

482mm 19" | DIGITAL | USB

DEF-220P

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1. INTRODUCTION

Thank you for purchasing the DEF-220P. With the DEF-220P you have purchased an easy-to-use effects unit, which you will surely come to appreciate for its sound enhancement capabilities.

With the DEF-220P you get 16 classic effects in 24-bit quality, including reverb, delay, chorus,flanger,phaser,rotary speaker,pitch shifter and other combined-effects.

1.1 Before you get started

1.1.1 Initial operation

Be sure that there is enough space around the unit for cooling.To avoid overheating, do not place the DEF-220P on top of power amps or near radiators, etc.

To power the DEF-220P, use only the power supply unit that is delivered with your equipment.

Please ensure that the unit is installed and operated only by people qualified to do so.During installation and operation the user must have sufficient electrical contact to earth. Electrostatic discharge may affect the operation of the unit.

Malfunction may occur due to static discharge at the inputs/outputs of the DEF-220P. In this case, switch off the unit temporarily.

After turned ON the Unit, before start using the front panel control, make sure the"TME ON"and"ON"leds stop blinking, informing that the Unit's set up process is ended.

DEF-220P

Professional 24-Bit Stereo FX Processor

* Professional Stereo effects processor for studio and stage.

* 16 classic Effects in 24-bit/48 kHz resolution including reverb, delay,chorus,flanger, phaser, rotary speaker, pitch shifter and combined-effects.

* Effects selection and full parameters editing by powerful LCD interface and Pc Remote Control Sw via USB or MIDI port.

* Dedicated Independent Direct/Effect Mix and Input/Output Level controls for Effects level adjustment.

* Additional footswitch connectors for Effects on/off and Tap Delay control.

* Selectable mono or Stereo Input.

* Selectable Line or Microphone Input Levels.

* Balanced XLR or Unbalance Jack Input/Outputs.

2. CONTROLS AND CONNECTIONS
2.1 Front panel

Fig. 2.1: Front panel controls of the DEF-220P

(1)INPUT LEVEL POTENTIOMETER: use the INPUT LEVEL POTENTIOMETER to adjust the Unit's input signal level. Please be sure to set a level that is sufficiently high but does not overload the unit.

(2)MIX DIRECT POTENTIOMETER: use the MIX DIRECT POTENTIOMETER to set the percentage of DIRECT (Original) signal on the Unit's Output.

(3)MIX EFFECT POTENTIOMETER: use the MIX EFFECT POTENTIOMETER to set the Percentage of EFFECTED (Processed) signal on the Unit's Output. Turning the MIX DIRECT POTENTIOMETER fully on the left and the MIX EFFECT POTENTIOMETER fully on the right will bring the Unit to have on the Output ONLY the EFFECTED signal.

This condition can be useful when the Unit is used in Send/Return configuration with a Mixer.

(4)OUTPUT LEVEL POTENTIOMETER: use the OUTPUT LEVEL control to adjust the Unit's output level.

(5)PAR VALUE ENCODER: use the PAR VALUE ENCODER to adjust the edited parameter on the current editing page during the Editing of the Effects.

The PAR VALUE ENCODER can be also used to select the MIDI Channel when used the unit connected to a remote MIDI controller, or USB, when the unit is connected to a PC for being controlled by the Pc sw.

To Select the MIDI or the USB interface need to enter the MIDI/USB selection page,pressing the FX LOAD/PAR/TAP Button for at least 3 seconds.

To exit the MIDI/USB editing page, need to press again the FX LOAD/PAR/TAP Button for at least 3 seconds.

The MIDI/USB selection page cannot ne accessed when the FX LOAD/PAR/TAP BUTTON is used with TAP function in Tap Mode with the TAP DELAY effect [see TAP DELAY], need to exit that mode for using the button for entering the MIDI/USB selection page.

(6)FX SELECT ENCODER: once finished the Start Up phase after turned on the Unit, use the FX SELECT ENCODER to select one of the 16 effect available (see below the effects list).

Once Selected the Effect, if different from the current one, the name of the new effect will appear flashing until will be not confirmed the selection pressing the FX LOAD/PAR/TAP button.

 (7) FX LOAD/PAR/TAP BUTTON: this is a multi-function button.

    a. When the DEF-220P is in operative conditions and a new Effects has been chosen and selected using the FX SELECT ENCODER, pressing the FX LOAD/PAR/TAP button, the new selected effect will take place becoming the current running one.

    b. if pressed for at least 3 seconds, the FX LOAD/PAR/TAP button is allowing to enter the page forthe MIDI/USB communication selection.

Once within the MIDI/USB selection page, pressing again the FX LOAD/PAR/TAP button, the MIDI/USB selection page will be left and the unit will go back to its operative status.

c. the FX LOAD/PAR/TAP button once pressed in normal conditions, allows to enter and "scroll"the several Parameters' pages during the Effect editing.

d. with particular effects. The FX LOAD/PAR.TAP button is used as "extra"control for a particular parameter of the effect.

Particularly:

TAP DELAY effect: Hitting the button at least 4 times with fixed time intervals eventually corresponding to a "desired tempo", will force the "DELAY (TAP)"effect to set the Delay Time accordingly with the "tapped"tempo.

The TAP LED on top of the TAP button starts flashing with time intervals corresponding to the tapped tempo.

See later about how to select the TAP DELAY tempo to be controlled by the FX LOAD/PAR/TAP button .

ROTARY effect: the FX LOAD/PAR/TAP button can here be used for switching between"Slow"and"fast"speed of Rotating Speaker emulation.

(8)BYPASS/ENTER BUTTON: Hit the button to "Bypass"the effects muting them on the outputs.

The BYPASS LED on top of the Bypass button will light ON when "Bypass" the effects and on the extreme right of the upper row of the LCD will be displayed'OFF".(will be displayed "ON"when the effect is not bypassed).

BYPASS/ENTER button is also used with extra function for the "Start"and"Stop"of the Rotating Speaker emulation when selected the ROTARY effect.

(9)CLIP LED: the CLIP LED is indicating the occurrence of an analog overload at the Unit's Input/output or/and of a digital overflow at the DSP side (Processing overflow).

When the CLIP LED will start flashing, please reduce the Input or output Level through the Input or Level Potentiometer.

(10)2X24 LCD SCREEN: wide screen used for Unit management and effects editing.

(11) PWR LED: the PWR LED when lighted is indicating that the unit is ON.

Switch ON Push Button is located on the front panel of the DEF-220P

[Please note: when the DEF-220P is turned on, is taking some time for executing a "start-up"procedure, necessary for setting the all parameters used by the several effects and for the initialization of memories and controls.

For this reason, during the start-up procedure, the Unit cannot respond to the front panel controls, therefore these will be available for the use ONLY after the end of the start-up procedure.

During the start up phase the LCD is showing the Unit's model name and then the Sw version of the firmware.

After it, the currently running effect will be displayed.

When the name of the current effect will appear on the LCD, the starting up phase is finished and the unit's controlarefullyoperative.]

[Merely switching the unit off does not mean that it is fully disconnected from the mains. To disconnect the unit from the mains, pull out the mains connector. Please make sure before installation that the mains connector has not been damaged. If you do not use the unit for an extended period of time, please disconnect it at the mains]

2.2 Rear panel

Fig. 2.2: Rear panel connectors of the DEF-220P

(1) INPUTS: the DEF-220P is equipped with 2 types of Inputs connectors:

XLR female connectors are allowing to connect to the Unit BALANCED input signals. Unbalanced Input signal can access the Unit through Mono 1/4"Jack connectors.

A"STEREO/MONO"switch is available so to transform the Stereo Inputs Unit in Mono Input Unit, where the Mono Input is the LEFT IN; the Mono Mode, when selected, is routing the LEFT IN signal to both In put channels going to the DPS processor.

A"MIC LINE"switch is available, allowing to change the Input section sensitivity in order to make the Unit accessible with Line or Microphone Level Signals.

When selected "LINE", the Unit can be connected to common Line sound sources, instead, when selected "MIC", the Unit can be directly accessed by Microphones

(2) OUTPUTS: the DEF-220P is equipped with 2 types of Output connectors:

XLR male connectors are providing BALANCED output signals.

Unbalanced output signal are instead available on Mono 1/4"Jack connectors.

(3) FOOT SWITCH: the DEF-220P has to 1/4"Jack Inputs for the Foot Control of the TAP function, operative when selected the Delay/Tap effect, or the Speed Selection when selected the Rotary effect, and .the Effects BYPASS or ROTARY Stop/Go when selected the ROTARY Effect. The Foot Switch to be used has to be a NORMALLY OPEN one.

(4) MIDI INPUT/OUTPUT connectors: these connector are allowing to connect the DEF-220P to an external MIDI controller or Pc Sequencer.

(5) USB connector: this connector is allowing to connect the DEF-220P to an external PC via USB port, for controlling the Unit's effects editing and general functions through the available Remote Control Pc Sw coming with the unit itself.

(6) MAIN POWER : the Unit is a 230V/50Hz power supply one, powered with a standard IEC C-13 cable.

The DEF220P is also protected by power overloads by a 250ma T-Type fuse.

3.THE EFFECTS

The DEF-220P comes with 16 classic Effects.
All of them perform a pure Stereo or pseudo-Stereo output.
[Table 6.1 contains a list of the effects parameters which can be edited as well as a description of the FX LOAD/PAR/TAP and BYPASS/ENTER buttons'functions related to theeffects parameters extra control].

3.1 CLASSIC REVERBS

The Classic REVERB effect reproduce the characteristics of natural spaces and a classic artificial reverb as the plate.

* HALL simulates the reverberation that you can hear in big Hall. This effect is characterized by a long reverb and a considerable amount of Pre-Delay. Good for solo instruments and vocals.
* ROOM simulates the reverberation in a mid-size Room. The effect can be used for natural instruments such as piano.
* PLATE simulates the sound of a reverb plate as used in the past in studio as reverb unit. This effect is a sort of modulated reverb and is particularly suited for drums and vocals.

3.2 PARTICULAR REVERBS

The Particular REVERB comprises not natural reverb algorithms.
* VOCAL REV simulates the reverberation that you can hear in big Hall, but with the addition of small echoes suitable for better characterizing the voice.
* GATED REV simulates the reverb type cut off by a gate.
This effect was typically used with snare or kick drums.

3.3 DELAYS

The DELAY effect is provided in 2 different shapes, dedicate one expressly to the Vocal use and the other one to the classic Delay use.
* VOCAL ECHO produces different echoes on the 2 output channels, with not equal delay times, so to simulate "casual"echoes spreading the and sustaining the voice differently on the 2 output channels.
The effects is similar to a reverb, where the voice body is maintained dense and well defined.
* DELAY produces several echoes of the input signal, reducing their amplitude and add the result to the original signal.
The FX LOAD/PAR/TAP button can be used to set the delay Delay Time and the Led on topof the FX LOAD/PAR/TAP button will blink with the same interval of time used for tapping the FX LOAD/PAR/TAP button, matching the set tapped Delay time.

3.4 MODULATIONS

The MODULATION effects set offers the most classic modulation used for "moving"sound shifting up and down harmonics components.
 * CHORUS gives a signal more body and width, moving it in frequency, creating a nice "moving sound"making the sound itself richer.

*FLANGER it is a sort of "extension"of the Chorus, adding to this one a"retro"touch,making the "sound movement"more perceivable than with the chorus, and adding a more metallic/bright color.

* PHASER is an effect adding a "phase shifted"copy of the input signal , to the input signal itself. PHASER is a traditional guitar, electric piano and keyboard effect.

* TREMOLO is an effect modulating the input signal amplitude, changing so its "volume"increasing and decreasing it cyclically. TREMOLO is particularly suitable for electric pianos orelectric organs.

* ROTARY simulates the rotating movements of a Leslie loudspeaker system. The fast rotation produces a characteristic shifting of frequencies. Traditionally, this is an effect for electronic organ.

With the ROTARY effect, the BYPASS/ENTER button is used for the Stop and GO function of the Rotary, emulating the start and stop of the loudspeakers.

The FX LOAD/PAR/TAP is used for toggling the Rotary Speakers' speed.

3.5 COMBINED EFFECTS

The combined effects are 3 effects combining Reverb, Modulation and Delay in different shapes.

The combined effects are set in parallel configuration.

* CHR/FLG+REVERB is a combination of the CHORUS/FLANGER and ROOM effects.
* DELAY+REVERB is a combination of the DELAY and HAL L effects.
* CHR/FLG+DELAY is a combination of the CHORUS/FLANGER and Delay effects.

3.6 PITCHSHIFTER

* PITCH SHIFT adds another signal to the original signal, below or above the original pitch.

4. EFFECTS' EDITABLE PARAMETERS

The all 16 effects of the DEF-220P are fully editable in their parameters.
Once selected the desired effect through the FX/SELECT encoder and confirmed it, making it the current one, pressing the FX LOAD/PAR/TAP, it is possible to enter the several parameter pages scrolling between them again pressing the FX LOAD/PAR/TAP button.
At any pressure of the FX LOAD/PAR/TAP button, the current parameter page will leave the place to the next one, and this cyclically.

When scrolled the all pages, the first one will take place again.
Each effect's parameter has its own page and when inside the page, the parameter's value can be adjusted using the PAR VALUE ENCODER.
After almost 8 Seconds from the last parameter's valued adjustment, the LCD will automatically leave the editing pages going back to display the effect's name and the currently loaded preset.
To enter a new editing session, need to press again the FX LOAD/PAR/TAP button.

[Table 6.1 contains a list of the effects parameters which can be edited as well as a description of the FX LOAD/PAR/TAP and BYPASS/ENTER buttons' functions related to the effects parameters extra control].

4.1 REVERBS EDITABLE PARAMETERS

HALL, ROOM, PLATE and VOCAL effect: here we have 22 editable parameter and the Load/Store functions for creating and recalling up to 8 presets.
The Hall, Room, Plate and Vocal's editable parameters are the following.

Decay: it is the reverb duration until the tail is damped.
PreDly Rev: t ime delay before the reverb starts acting.
Density: amount of early reflection on the reverb "body".
H-Damp Freq: filter introducing an attenuation on the high frequencies above the selected one; this filter is inserted in the reverb main loop ans is attenuating as more as the reverb tail is lasting.
L-Damp Freq: filter introducing an attenuation on the low frequencies below the selected one; this filter is inserted in the reverb main loop ans is attenuating as more as the reverb tail is lasting.
Low-Pass F: filter attenuating the high frequencies above the selected one, on the reverb output.
PEQ1 Gain: +-15dB Gain/Attenuation of the first of 3 available bell filters on the reveb input signal.
PEQ1 Freq: Center Frequency of the first of 3 available bell filters on the reveb input signal.
PEQ1 Q: Q adjustment, allowing to size the width of the first of 3 available bell filters on the reveb input signal.
E.Ref Vol: adjustable level of the early reflections section output on the reverb main output signal.
PreDly E.Ref: time delay before the early reflections starts acting.
F.Ref Vol: adjustable level of the fast reflections section output on the reverb main output signal; the fast reflections represent the reflectionscoming from obstacles, as walls, in a far positions respect the ones creating the early reflections, and the characteristic of the fast reflectionsis to be less defined than the early reflections.

PreDly F.Ref: time delay before the fast reflections starts acting.
Reverb Vol: adjustable level of the reverb's internal delay loop on the reverb main output signal.
High-Pass F: filter attenuating the Low frequencies below the selected one, on the reverb output.
PEQ2 Gain: +-15dB Gain/Attenuation of the second of 3 available bell filters on the reveb input signal.
PEQ2 Freq: Center Frequency of the second of 3 available bell filters on the reveb input signal.
PEQ2 Q: Q adjustment, allowing to size the width of the second of 3 available bell filters on the reveb input signal.
PEQ3 Gain: +-15dB Gain/Attenuation of the third of 3 available bell filters on the reveb input signal.
PEQ3 Freq: Center Frequency of the third of 3 available bell filters on the reveb input signal.
PEQ3 Q: Q adjustment, allowing to size the width of the third of 3 available bell filters on the reveb input signal.
Pseudo St: percentage of delay between Left and Right reverb output channels, used for giving to the Mono reverb a stereo feeling.ons, and the characteristic of the fast reflectionsis to be less defined than the early reflections.

GATED REV effect: here we have 25 editable parameter and the Load/Store functions for creating and recalling up to 8 presets.
Time: it is the lasting time of the gated reverb before to be muted.
PreDly Rev: t ime delay before the gated reverb starts acting.
Density: amount of early reflection on the gated reverb "body".
H-Damp Freq: filter introducing an attenuation on the high frequencies above the selected one; this filter is inserted in the gated reverb main loop ans is attenuating as more as the gated reverb tail is lasting.
L-Damp Freq: filter introducing an attenuation on the low frequencies below the selected one; t h i s filter is inserted in the gated reverb main loop ans is attenuating as more as the gated reverb tail is lasting.
Low-Pass F: filter attenuating the high frequencies above the selected one, on the gated reverb output.
PEQ1 Gain: +-15dB Gain/Attenuation of the first of 3 available bell filters on the reveb input signal.
PEQ1 Freq: Center Frequency of the first of 3 available bell fi l t ers on the reveb input signal.
PEQ1 Q: Q adjustment, allowing to size the width of the first of 3 available bell filters on the reveb input signal.
E.Ref Vol: adjustable level of the early reflections section output on the gated reverb main output signal.
PreDly E.Ref: time delay before the early reflections starts acting.
F.Ref Vol: adjustable level of the fast reflections section output on the gated reverb main output signal; the fast reflections represent the reflections coming from obstacles, as walls, in a far positions respect the ones creating the early reflections, and the characteristic of the fast reflections is to be less defined than the early reflections.
PreDly F.Ref: time delay before the fast reflections starts acting.
Reverb Vol: adjustable level of the gated reverb's internal delay loop on the gated reverb main output signal.
High-Pass F: filter attenuating the Low frequencies below the selected one, on the gated reverb output.

PEQ2 Gain: +-15dB Gain/Attenuation of the second of 3 available bell filters on the reveb input signal

PEQ2 Freq: Center Frequency of the second of 3 available bell filters on the reveb input signal

PEQ2 Q: Q adjustment, allowing to size the width of the second of 3 available bell filters on the reveb input signal

PEQ3 Gain: +-15dB Gain/Attenuation of the third of 3 available bell filters on the reveb input signal

PEQ3 Freq: Center Frequency of the third of 3 available bell filters on the reveb input signal

PEQ3 Q: Q adjustment, allowing to size the width of the third of 3 available bell filters on the reveb input signal

Pseudo St: percentage of delay between Left and Right gated reverb output channels, used for giving to the Mono gated reverb a stereo feeling.

Threshold: gate reveb threshold, it is the threshold above the one the input signal level is activating the gated reverb which duration, once activated is depending from the "time" parameter.

Release: it is the time necessary to the gated reverb to pass from the active status to the muted once passed the selected "time"; the fading out of the signal, with signal amplitude decrease, will take the time set by the "release" parameter

Attack: it is the time necessary to the gated reverb to pass from the not active status to the active one once the input signal level got above the "threshold" value; the fading in of the signal, with signal amplitude increase, will take the time set by the "attack" parameter

4.2 DELAYS

VOCAL ECHO effect: here we have 15 editable parameter and the Load/Store functions for creating and recalling up to 8 presets.

Displacement: relative delay between the several delays of the original signal.

Delay: distance in time between 2 repetition of the original group of delayed signal s.

Feedback: number of repetitions of the delayed signal.

High-Pass F: filter attenuating the Low frequencies below the selected one, on the vocal delay output.

Low-Pass F: filter attenuating the high frequencies above the selected one, on the vocal delay output.

PEQ1 Gain: +-15dB Gain/Attenuation of the first of 3 available bell filters on the vocal delay input signal.

PEQ1 Freq: Center Frequency of the first of 3 available bell fi l t ers on the vocal delay input signal

PEQ1 Q: Q adjustment, allowing to size the width of the first of 3 available bell filters on the vocal delay input signal.

PEQ2 Gain: +-15dB Gain/Attenuation of the second of 3 available bell filters on the vocal delay input signal.

PEQ2 Freq: Center Frequency of the second of 3 available bell filters on the vocal delay input signal.

PEQ2 Q: Q adjustment, allowing to size the width of the second of 3 available bell filters on the vocal delay input signal.

PEQ3 Gain: +-15dB Gain/Attenuation of the third of 3 available bell filters on the vocal delay input signal.

PEQ3 Freq: Center Frequency of the third of 3 available bell filters on the vocal delay input signal.

PEQ3 Q: Q adjustment, allowing to size the width of the third of 3 available bell filters on the vocal delay input signal.

Out Level: level of the Vocal Echo output.

TAP DELAY ef fect : here we have 15 editable parameter and the Load/Store functions for creating and recalling up to 8 presets.

Delay: distance in time between 2 repetition of the original delayed signals.

When within the Delay parameter page, maintaining pressed for at least 3 seconds the FX LOAD/PAR/TAP button, the "Tap Mode"will be entered.

The display will change the parameter definition in "Delay [TM]", where TM is for "Tap Mode".

In this Mode. It is possible to set the delay time using the FX LOAD/PAR/TAP button: Hitting the button at least 4 times with fixed time intervals eventually corresponding to a "desired tempo", will force the "DELAY (TAP)"effect to set the Delay Time accordingly with the "tapped"tempo.

The Led on top of the FX LOAD/PAR/TAP BUTTON starts flashing with time intervals corresponding to the tapped tempo.

To exit the TAP MODE so to enter the delay time using the PAR VALUE ENCODER, it is enough to maintain pressed again the FX LOAD/PAR/TAP button for at least 3 seconds.

When in Tap Mode, it is not possible to pass to a new effects rotating the FX SELECT, need first to exit the Tap Mode.

Feedback: number of repetitions of the delayed signal.

High-Pass F: filter attenuating the Low frequencies below the selected one, on the delay output.

Low-Pass F: filter attenuating the high frequencies above the selected one, on the delay output.

PEQ1 Gain: +-15dB Gain/Attenuation of the first of 3 available bell filters on the delay input signal.

PEQ1 Freq: Center Frequency of the first of 3 available bell fi l t ers on the delay input signal.

PEQ1 Q: Q adjustment, allowing to size the width of the first of 3 available bell filters on the delay input signal.

PEQ2 Gain: +-15dB Gain/Attenuation of the second of 3 available bell filters on the delay input signal.

PEQ2 Freq: Center Frequency of the second of 3 available bell filters on the delay input signal.

PEQ2 Q: Q adjustment, allowing to size the width of the second of 3 available bell filters on the delay input signal.

PEQ3 Gain: +-15dB Gain/Attenuation of the third of 3 available bell filters on the delay input signal.

PEQ3 Freq: Center Frequency of the third of 3 available bell filters on the delay input signal.

PEQ3 Q: Q adjustment, allowing to size the width of the third of 3 available bell filters on the delay input signal.

Out Level: level of the delay output.

Mode: define if the output of the TAP DELAY will be a Mono or a Stereo one; if Mono, the input Left/Right signals are summed together, delayed and sent to the Left/Right outputs, in Stereo mode, the Left/Right input signals wi l l be delayed independently, providing so a real Stereo out, even the selected parameters will act in the same way on both channels.

4.3 MODULATIONS

CHORUS effect: here we have 9 editable parameter and the Load/Store functions for creating and recalling up to 8 presets.

Depth: depth of the modulation, affecting the pitch variation amount as more as the value is high.

H-Damp Freq: f i l t e r attenuating the high frequencies above the selectedone, on the chorus output.

L-Damp Freq: filter attenuating the Low frequencies below the selected one, on the chorus output.

Link Rate: this function, when ON, allows to assign to both channels the same parameters' values, resulting on a MONO chorus, with both channels modulating with same rate adjustable with the Rate L&R parameter.

When Link Rate is OFF, then the left and right channels have independent Rates, selectable through the Rate L and Rate R parameters.

Rate L&R: active and appearing on the LCD screen ONLY if Link Rate is ON, define the speed of the MONO chorus's frequency modulation.

Rate L: active and appearing on the LCD screen ONLY if Link Rate is OFF,define the speed of the Left channel chorus's frequency modulation.

Rate R: active and appearing on the LCD screen ONLY if Link Rate is OFF, define the speed of the Right channel chorus's frequency modulation.

Chorus Vol: level of the chorus output

Phase: is the "distance"between the original sound and the chorus delay buffer, affecting, when direct and chorus signals are added, the relative phase between them.

As more as the percentage is small, as more the original signal and the chorus have close phases.

FLANGER EFFECT : here we have 11 editable parameter and the Load/Store functions for creating and recalling up to 8 presets.

Link Rate: this function, when ON, allows to assign to both channels the same parameters' values, resulting on a MONO flanger , with both channels modulating with same rate adjustable with the Rate L&R and Rate R&L parameter .

When Link Rate is OFF, then the left and right channels have independent Rates, selectable through the Rate L and Rate R parameters.

Rate L&R: active and appearing on the LCD screen ONLY if Link Rate is ON, define the speed of the MONO flanger's frequency modulation.

Rate R&L: active and appearing on the LCD screen ONLY if Link Rate is ON, define the speed of the MONO flanger's frequency modulation.

Rate L: active and appearing on the LCD screen ONLY if Link Rate is OFF, define the speed of the Left channel flanger's frequency modulation.

Rate R: active and appearing on the LCD screen ONLY if Link Rate is OFF, define the speed of the Right channel flanger's frequency modulation.

Depth: depth of the modulation, affecting the pitch variation amount as more as the value is high.

H-Damp Freq: f i l t e r attenuating the high frequencies above the selected one, on the flanger output.

L-Damp Freq: filter attenuating the Low frequencies below the selected one, on the flanger output.

Feedback: amount of modulated signal (flanger output) added to the Input signal at the flanger input.

Flanger Vol: level of the flanger output.

Phase: is the "distance" between the original sound and the flanger delay buffer, affecting, when direct and flanger signals are added, the relative phase between them.

As more as the percentage is small, as more the original signal and the flanger have close phases.

PHASER effect: here we have 18 editable parameter and the Load/Store functions for creating and recalling up to 8 presets.

Rate: define the speed of the phaser's phase modulation

PEQ1 Gain: +-15dB Gain/Attenuation of the first of 2 available bell filters on the phaser input signal.

PEQ1 Freq: Center Frequency of the first of 2 available bell fi l t ers on the phaser input signal.

PEQ1 Q: Q adjustment, allowing to size the width of the first of 2 available bell filters on the phaser input signal.

PEQ2 Gain: +-15dB Gain/Attenuation of the second of 2 available bell filters on the phaser input signal.

PEQ2 Freq: Center Frequency of the second of 2 available bell filters on the phaser input signal.

PEQ2 Q: Q adjustment, allowing to size the width of the second of 2 available bell filters on the phaser input signal.

High-Pass F: filter attenuating the Low frequencies below the selected one, on the vocal phaser output.

Low-Pass F: filter attenuating the high frequencies above the selected one, on the vocal phaser output.

PEQ Gain: +-15dB Gain/Attenuation of the bell filters on the phaser output signal.

PEQ Freq: Center Frequency of the bell filters on the phaser output signal.

PEQ Q: Q adjustment, allowing to size the width of the bell filters on the phaser output signal.

Feedback: amount of modulated signal (phaser output) added to the Input signal at the phaser input.

Depth: depth of the modulation , affecting the pitch variation amount as more as the value is high.

Phaser Vol: level of the phaser output.

Phaser In: assign the polarity to the phaser input: "DIR" if maintained the original input phase, "INV" if 180Deg. Inverted.

Feedback Phase: assign the polarity to the modulated signal (phaser output) added to the input signal at the phaser input: "DIR" the original phaser output phase, "INV" if 180Deg. Inverted.

Offset Depth: displacement in time between the phaser's modulation sources.

TREMOLO effect: here we have 6 editable parameter and the Load/Store functions for creating and recalling up to 8 presets.

Rate: define the speed of the tremolo's amplitude modulation.

H-Damp Freq: f i l t e r attenuating the high frequencies above the selected one, on the tremolo output.

L-Damp Freq: filter attenuating the Low frequencies below the selected one, on the tremolo output.

Depth: amount of amplitude modulation operated by the tremolo.

Tremolo Vol: level of the tremolo output.

Offset: minimum amplitude allowed for the tremolo's modulation process.

ROTARY effect: here we have 23 editable parameter and the Load/Store functions for creating and recalling up to 8 presets.

Switch: select the speed of the Speakers' Rotation, which can be SLOW or FAST.

When within the Switch parameter page, maintaining pressed for at least 3 seconds the FX LOAD/PAR/TAP button, the "Rotary Mode"will be entered.

The display will change the parameter definition in "Switch [RM]", whereRM is for "Rotary Mode".

In this Mode. It is possible to set the Speakers' Rotation speed using the FX LOAD/PAR/TAP BUTTON: Hitting the button the Speakers' Rotation speed will toggle from SLOW to FAST and viceversa.

When the led on top of the FX LOAD/PAR/TAP BUTTON is ON, then the Speakers' Rotation is in FAST mode, if the led is OFF, then the Speakers' Rotation speed is in SLOW mode.

To exit the ROTARY MODE so to enter the Speakers' Rotation speed using the PAR VALUE ENCODER, it is enough to maintain pressed again the FX LOAD/PAR/TAP button for at least 3 seconds.

When in Rotary Mode, it is not possible to pass to a new effects rotating the FX SELECT, need first to exit the Rotary Mode.

When selected and running the Rotary Speaker effect the BYPASS/ENTER BUTTON is EVER used for the function of STOP and GO of the Speakers Rotation.

Emulation: when the BYPASS/ENTER Led is ON, then the Rotation of the Speakers is in STOP, when the led is OFF, the rotation of the speakers is in GO.

When selected/running the Rotary effect, the BYPASS/ENTER cannot be used for the effect bypass.

Cyl LPF: low pass filter used for setting the upper frequency of the signal sent as output of the section emulating the Cylinder of the Rotary Speaker Cabinet.

Cyl PEQ G: +-15dB Gain/Attenuation of the bell filters available for the frequency characterization of the Cylinder sound.

Cyl PEQ F: Center Frequency of the bell filters available for the frequency characterization of the Cylinder sound.

Cyl PEQ Q: Q adjustment, allowing to size the width of the bell filters available for the frequency characterization of the Cylinder sound.

Horn HPF: high pass filter used for setting the lower frequency of the signal sent as output of the section emulating the Horn of the Rotary Speaker Cabinet.

Horn LPF: low pass filter used for setting the upper frequency of the signal sent as output of the section emulating the Horn of the Rotary Speaker Cabinet.

Horn PEQ G: +-15dB Gain/Attenuation of the bell filters available for the frequency characterization of the Horn sound.

Horn PEQ F: Center Frequency of the bell filters available for thefrequency characterization of the Horn sound.

Horn PEQ Q: Q adjustment, allowing to size the width of the bellfilters available for the frequency characterization of the Horn sound.

Cyl LowSpeed: Cylinder rotation speed when the Rotary Speaker is running switched at LOW SPEED (switch parameter on Slow).

Cyl HighSpeed: Cylinder rotation speed when the Rotary Speaker is running switched at FAST SPEED (swi t ch parameter on Fast).

Cyl Depth: depth of the frequency/amplitude modulation of the Cylinder section, affecting the pitch variation amount and the sound level variation as more as the value is high.

Cyl Feedback: amount of modulated signal (Cyl section output) added to the Input signal at the Cyl section input.

Cyl Level: level of the cyl inder section output.

Horn LowSpeed: Horn rotation speed when the Rotary Speaker is running switched at LOW SPEED (switch parameter on Slow).

Horn HighSpeed: Horn rotation speed when the Rotary Speaker is running switched at FAST SPEED (switch parameter on Fast).

Horn Depth: depth of the frequency/amplitude modulation of the Horn section, affecting the pitch variation amount and the sound level variation as more as the value is high.

Horn Feedback: amount of modulated signal (Horn section output) added to the Input signal at the Horn section input.

Horn Level: level of the horn section output.

PEQ G: +-15dB Gain/Attenuation of the bell filters available on the output of the combined Cylinder/Horn sounds for the main output frequency characterization.

PEQ F: Center Frequency of the bell filters available on the output of the combined Cylinder/Horn sounds for the main output frequency characterization.

PEQ Q: Q adjustment, allowing to size the width of the bell filters available on the output of the combined Cylinder/Horn sounds for the main output frequency characterization.

4.4 COMBINED EFFECTS

CHR/FLG+REVERB effec t : here we have 21 editable parameter and the Load/Store functions for creating and recalling up to 8 presets.

Chr/Flg Depth: depth of the modulation, affecting the pitch variation amount as more as the value is high.

Chr/Flg Rate: define the speed of the Chr/Flg's frequency modulation.

Feedback: amount of modulated signal (Chr/Flg output) added to the Input signal at the Chr/Flg section input.

Chr/Flg HPF: filter attenuating the Low frequencies below the selected one, on the Chr/Flg section output.

Chr/Flg LPF: filter attenuating the high frequencies above the selected one, on the Chr/Flg section output.

Chr/Flg Vol: level of the Chr/Flg section output.

H-Damp Freq: filter introducing an attenuation on the high frequencies above the selected one; this filter is inserted in the reverb main loop ans is attenuating as more as the reverb tail is lasting.

L-Damp Freq: filter introducing an attenuation on the low frequencies below the selected one; this filter is inserted in the reverb main loop ans is attenuating as more as the reverb tail is lasting.

PreDly Rev: t ime delay before the reverb starts acting.

Density: amount of early reflection on the reverb "body".

Decay: it is the reverb duration until the tail is damped.

Reverb Vol: level of the delay section output.

PEQ1 G: +-15dB Gain/Attenuation of the first of 3 available bell filters on the chr/flg+reverb input signal.

PEQ1 F: Center Frequency of the first of 3 available bell filters on the chr/flg+reverb input signal.

PEQ1 Q: Q adjustment, allowing to size the width of the first of 3 availablebell filters on the chr/flg+reverb input signal.

PEQ2 G: +-15dB Gain/Attenuation of the second of 3 available bell filters on the chr/flg+reverb input signal.

PEQ2 F: Center Frequency of the second of 3 available bell filters on the chr/flg+reverb input signal.

PEQ2 Q: Q adjustment, allowing to size the width of the second of 3 available bell filters on the chr/flg+reverb input signal.

PEQ3 G: +-15dB Gain/Attenuation of the third of 3 available bell filters on the chr/flg+reverb input signal.

PEQ3 F: Center Frequency of the third of 3 available bell filters on the chr/flg+reverb input signal.

PEQ3 Q: Q adjustment, allowing to size the width of the third of 3 available bell filters on the chr/flg+reverb input signal.

DELAY+REVERB e f f e c t : here we have 20 editable parameter and the Load/Store functions for creating and recalling up to 8 presets.

Delay Time: distance in time between 2 repetition of the original delayed signals.

Delay Decay: number of repetitions of the delayed signal.

Delay HPF: f ilter attenuating the Low frequencies below the selected one, on the delay section output.

Delay LPF: filter attenuating the high frequencies above the selected one,on the delay section output.

Delay Vol: l evel of the delay section output.

H-Damp Freq: filter introducing an attenuation on the high frequencies above the selected one; this filter is inserted in the reverb main loop ans is attenuating as more as the reverb tail is lasting.

 L-Damp Freq: filter introducing an attenuation on the low frequencies below the selected one; this filter is inserted in the reverb main loop ans is attenuating as more as the reverb tail is lasting.

PreDly Rev: t ime delay before the reverb starts acting.

Density: amount of early reflection on the reverb "body".

Decay: it is the reverb duration until the tail is damped.

Reverb Vol: level of the reverb section output.

PEQ1 G: +-15dB Gain/Attenuation of the first of 3 available bell filters on the delay+reverb input signal.

PEQ1 F: Center Frequency of the first of 3 available bell filters on the delay+reverb input signal

PEQ1 Q: Q adjustment, allowing to size the width of the first of 3 available bell filters on the delay+reverb input signal.

PEQ2 G: +-15dB Gain/Attenuation of the second of 3 available bell filters on the delay+reverb input signal

PEQ2 F: Center Frequency of the second of 3 available bell filters on the delay+reverb input signal.

PEQ2 Q: Q adjustment, allowing to size the width of the second of 3 available bell filters on the delay+reverb input signal.

PEQ3 G: +-15dB Gain/Attenuation of the third of 3 available bell filters on the delay+reverb input signal.

PEQ3 F: Center Frequency of the third of 3 available bell filters on the delay+reverb input signal.

PEQ3 Q: Q adjustment, allowing to size the width of the third of 3 available bell filters on the delay+reverb input signal.

CHR/FLG+DELAY e f f e c t : here we have 20 editable parameter and the Load/Store functions for creating and recalling up to 8 presets.

Chr/Flg Depth: depth of the modulation, affecting the pitch variation amount as more as the value is high.

Chr/Flg Rate: define the speed of the Chr/Flg's frequency modulation.

Feedback : amount of modulated signal (Chr/Flg output) added to the Input signal at the Chr/Flg section input.

Chr/Flg HPF : filter attenuating the Low frequencies below the selected one , on the vocal Chr/Flg section output.

Chr/Flg LPF : filter attenuating the high frequencies above the selected one , on the vocal Chr/Flg section output.

Chr/Flg Vol: level of the chr/flg section output.

Delay Time: distance in time between 2 repetition of the original delayed signals.

Delay Decay: number of repetitions of the delayed signal.

Delay LPF: filter attenuating the high frequencies above the selected one,on the delay output.

Delay HPF: f ilter attenuating the Low frequencies below the selected one,on the delay output.

Delay Vol: l evel of the delay output.

PEQ1 G: +-15dB Gain/Attenuation of the first of 3 available bell filters on the chr/flg+delay input signal.

PEQ1 F : Center Frequency of the first of 3 available bell filters on the chr/flg+ delay input signal.

PEQ1 Q: Q adjustment, allowing to size the width of the first of 3 available bell filters on the chr/flg+ delay input signal.

PEQ2 G: +-15dB Gain/Attenuation of the second of 3 available bell filters on the chr/flg+ delay input signal.

PEQ2 F: Center Frequency of the second of 3 available bell filters on the chr/flg+ delay input signal.

PEQ2 Q: Q adjustment, allowing to size the width of the second of 3 available bell filters on the chr/flg+ delay input signal.

PEQ3 G: +-15dB Gain/Attenuation of the third of 3 available bell filters on the chr/flg+ delay input signal.

PEQ3 F: Center Frequency of the third of 3 available bell filters on the chr/flg+ delay input signal.

PEQ3 Q: Q adjustment, allowing to size the width of the third of 3 available bell filters on the chr/flg+ delay input signal.

4.5 PITCH SHIFTER

PITCH SHIFTER effect: here we have 5 editable parameter and the Load/Store functions for creating and recalling up to 8 presets.

Semitones : amount of frequency shift (detuning) of the original sound up to +- 1 Octave, by steps of 1/3 of semitones

Chorus: amount of harmonics added to the pitch shifter output and coming from the addition of the pitch shifter output to the pitch shifter input in a feedback configuration.

PEQ G: +-15dB Gain/Attenuation of bell filters on the pitch shifter input signal.

PEQ F: Center Frequency of the bell filters on the pitch shifter input signal.

PEQ Q : Q adjustment , allowing to size the width of the bell filters on the pitch shifter input signal.

4.6 STORE/RECALL PRESETS

The all effects can store/recall up to 8 presets.

Within the editing parameters list , there are 2 option same for each effect, allowing to store/recall the presets.

Load_P: page allowing to recall 1 of 8 presets of parameters configurations.

Once scrolled up to this page, in order to start the preset recall need to press the BYPASS/ENTER BUTTON.

As soon as the BYPASS/ENTER BUTTON is pressed, will be possible to scroll up/down the available 8 presets through the PAR VALUE ENCODER.

The available presets will be shown with an "asterisk" of the name, indicating that the preset displayed it is not the currently running one.

Chosen the preset, it can be loaded pressing again the BYPASS/ENTER BUTTON.

The preset will be then loaded and will become the current one.

The location number of the loaded preset will be displayed on the upper row of the LCD at the right side of the effect's type name, the name of the currently loaded preset will be displayed on the lower row of the LCD, again with its location number on the left.

Save_P: page allowing to store up to 8 presets of parameters configurations.

Once scrolled up to this page, in order to start the preset store process need to press the BYPASS/ENTER BUTTON.

As soon as the BYPASS/ENTER BUTTON is pressed, will be possible to scroll up/down the available 8 locations where to store the parameters configuration as preset, through the PAR VALUE ENCODER.

The available locations empty or containing previous presets, not currently in use, will be shown with an "asterisk"on the left side of the name.

Chosen the location for storing the preset, need to press again the BYPASS/ENTER BUTTON for entering the page of the Preset Name's.

Editing: with the FX SELECT encoder can be selected the name's character position, and with the PAR VALUE ENCODER, the character itself; up to 8 characters are available for naming the preset.

Defined the name , pressing again the BYPASS/ENTER BUTTON, the new preset will be saved in the chosen location, unless the location instead of empty was occupied by a previous preset.

In this case, before to store the new one, the DEF-220P will ask.

confirmation: if pressed again the BYPASS/ENTER BUTTON, confirming the will to store the new preset on the place of the old one, the new preset will be stored.

If not sure, it is possible to exit the storing process pressing the FX LOAD/PAR/TAP BUTTON.

As soon as a new preset will be saved, this will become the current one, its name will be displayed on the lower row of the LCD and its location number aside the Effect type name.

5. APPENDIX 1
5.1 List of effects and editable parameters

Sel	Effect	Editable Parameters	Parameters' Range	Extra Controls
1 2 3 4	HALL ROOM PLATE VOCAL	Decay PreDly Rev Density H-Damp Freq: L-Damp Freq Low-Pass F PEQ1 Gain PEQ1 Freq PEQ1 Q E.Ref Vol PreDly E.Ref F.Ref Vol PreDly F.Ref Reverb Vol High-Pass F: PEQ2 Gain PEQ2 Freq PEQ2 Q PEQ3 Gain PEQ3 Freq EQ3 Q Pseudo St	0% -100% 0ms -80MS,1ms Steps 0% -100% 20Hz-20KHz,1/3Oct Steps 20Hz-20KHz,1/3Oct Steps 20Hz-20KHz,1/3Oct Steps -15dB - +15dB, 0.5dB Steps 20Hz-20KHz,1/3Oct Steps 0.05 -3.00,0.05 Steps 0% -100% 0ms-40ms,1ms Steps 0% -100% 0ms-40ms,1ms Steps 0% -100% 20Hz-20KHz,1/3Oct Steps -15dB - +15dB, 0.5dB Steps 20Hz-20KHz,1/3Oct Steps 0.05 -3.00,0.05 Steps -15dB - +15dB, 0.5dB Steps 20Hz-20KHz,1/3Oct Steps 0.05-3.00,0.05 Steps 0% -100%	----
5	GATED REV	Time PreDly Rev Density H-Damp Freq L-Damp Freq Low-Pass F PEQ1 Gain PEQ1 Freq PEQ1 Q E.Ref Vol PreDly E.Ref F.Ref Vol PreDly F.Ref Reverb Vol High-Pass F PEQ2 Gain PEQ2 Freq PEQ2 Q PEQ3 Gain PEQ3 Freq PEQ3 Q Pseudo St Threshold Release Attack	0ms - 3150ms, 31.5 ms Steps 0ms -80MS,1ms Steps 0% -100% 20Hz-20KHz,1/3Oct Steps 20Hz-20KHz,1/3Oct Steps 20Hz-20KHz,1/3Oct Steps -15dB - +15dB, 0.5dB Steps 20Hz-20KHz,1/3Oct Steps 0.05-3.00,0.05 Steps 0% -100% 0ms-40ms,1ms Steps 0% -100% 0ms-40ms,1ms Steps 0% -100% 20Hz -20KHz,1/3Oct Steps -15dB - +15dB, 0.5dB Steps 20Hz -20KHz,1/3Oct Steps 0.05-3.00,0.05 Steps -15dB - +15dB, 0.5dB Steps 20Hz-20KHz,1/3Oct Steps 0.05-3.00,0.05 Steps 0% -100% 0% -100% 0% -100% 0% -100%	----
6	VOCAL ECHO	Displacement Delay Feedback High-Pass F Low-Pass F PEQ1 Gain PEQ1 Freq PEQ1 Q PEQ2 Gain PEQ2 Freq PEQ2 Q PEQ3 Gain PEQ3 Freq PEQ3 Q Out Level	0% -100% 0ms - 700ms, 5 ms Steps 0% -100% 20Hz-20KHz,1/3Oct Steps 20Hz-20KHz,1/3Oct Steps -15dB - +15dB, 0.5dB Steps 20Hz-20KHz,1/3Oct Steps 0.05-3.00,0.05 Steps -15dB - +15dB, 0.5dB Steps 20Hz-20KHz,1/3Oct Steps 0.05-3.00,0.05 Steps -15dB - +15dB, 0.5dB Steps 20Hz -20KHz,1/3Oct Steps 0.05-3.00,0.05 Steps 0% -100%	----

7	DELAY	Delay	0ms - 1270ms, 5 ms Steps, Mono mode 0ms - 800ms, 5 ms Steps, Stereo mode	See Note1
		Feedback	0% -100%	
		High-Pass F	20Hz-20KHz,1/3Oct Steps	
		Low-Pass F	20Hz-20KHz,1/3Oct Steps	
		PEQ1 Gain	-15dB - +15dB, 0.5dB Steps	
		PEQ1 Freq	20Hz-20KHz,1/3Oct Steps	
		PEQ1 Q	0.05-3.00,0.05 Steps	
		PEQ2 Gain	-15dB - +15dB, 0.5dB Steps	
		PEQ2 Freq	20Hz-20KHz,1/3Oct Steps	
		PEQ2 Q	0.05-3.00,0.05 Steps	
		PEQ3 Gain	-15dB - +15dB, 0.5dB Steps	
		PEQ3 Freq	20Hz-20KHz,1/3Oct Steps	
		PEQ3 Q	0.05-3.00,0.05 Steps	
		Out Level	0% -100%	
		Mode	Mono - Stere0	
8	CHORUS	Depth	0% -100%	––––
		H-Damp Freq	20Hz-20KHz,1/3Oct Steps	
		L-Damp Freq	20Hz-20KHz,1/3Oct Steps	
		Link Rate	On - Off	
		Rate L&R	0% -100%	
		Rate L	0% -100%	
		Rate R	0% -100%	
		Chorus Vol	0% -100%	
		Phase	0% -100%	
9	FLANGER	Link Rate	On - Off	––––
		Rate L&R	0% -100%	
		Rate R&L	0% -100%	
		Rate L	0% -100%	
		Rate R	0% -100%	
		Depth	0% -100%	
		H-Damp Freq	20Hz-20KHz,1/3Oct Steps	
		L-Damp Freq	20Hz-20KHz,1/3Oct Steps	
		Feedback	0% -100%	
		Flanger Vol	0% -100%	
		Phase	0% -100%	
10	PHASER	Rate	0% -100%	––––
		PEQ1 Gain	-15dB - +15dB, 0.5dB Steps	
		PEQ1 Freq	20Hz-20KHz,1/3Oct Steps	
		PEQ1 Q	0.05-3.00,0.05 Steps	
		PEQ2 Gain	-15dB - +15dB, 0.5dB Steps	
		PEQ2 Freq	20Hz-20KHz,1/3Oct Steps	
		PEQ2 Q	0.05-3.00,0.05 Steps	
		High-Pass F	20Hz-20KHz,1/3Oct Steps	
		Low-Pass F	20Hz-20KHz,1/3Oct Steps	
		PEQ Gain	-15dB - +15dB, 0.5dB Steps	
		PEQ Freq	20Hz-20KHz,1/3Oct Steps	
		PEQ Q	0.05-3.00,0.05 Steps	
		Feedback	0% -100%	
		Depth	0% -100%	
		Phaser Vol	0% -100%	
		Phaser In	Dir - Inv	
		Feedback Phase	Dir - Inv	
		Offset Depth	0% -100%	
11	TREMOLO	Rate	0% -100%	––––
		H-Damp Freq	20Hz-20KHz,1/3Oct Steps	
		L-Damp Freq	20Hz-20KHz,1/3Oct Steps	
		Depth	0% -100%	
		Tremolo Vol	0% -100%	
		Offset	0% -100%	

12	ROTARY	Switch	Slow -Fast	See Note2
		Cyl LPF	20Hz-20KHz,1/3Oct Steps	
		Cyl PEQ G	-15dB - +15dB, 0.5dB Steps	
		Cyl PEQ F	20Hz-20KHz,1/3Oct Steps	
		Cyl PEQ Q	0.05-3.00,0.05 Steps	
		Horn HPF	20Hz-20KHz,1/3Oct Steps	
		Horn LPF	20Hz-20KHz,1/3Oct Steps	
		Horn PEQ G	-15dB - +15dB, 0.5dB Steps	
		Horn PEQ F	20Hz-20KHz,1/3Oct Steps	
		Horn PEQ Q	0.05-3.00,0.05 Steps	
		Cyl LowSpeed	0% -100%	
		Cyl HighSpeed	0% -100%	
		Cyl Depth	0% -100%	
		Cyl Feedback	0% -100%	
		Cyl Level	0% -100%	
		Horn LowSpeed	0% -100%	
		Horn HighSpeed	0% -100%	
		Horn Depth	0% -100%	
		Horn Feedback	0% -100%	
		Horn Level	0% -100%	
		PEQ G	-15dB - +15dB, 0.5dB Steps	
		PEQ F	20Hz-20KHz,1/3Oct Steps	
		PEQ Q	0.05-3.00,0.05 Steps	
13	CHR/FLG+REVERB	Chr/Flg Depth	0% -100%	––––
		Chr/Flg Rate	0% -100%	
		Feedback	0% -100%	
		Chr/Flg HPF	20Hz-20KHz,1/3Oct Steps	
		Chr/Flg LPF	20Hz-20KHz,1/3Oct Steps	
		Chr/Flg Vol	0% -100%	
		H-Damp Freq	20Hz-20KHz,1/3Oct Steps	
		L-Damp Freq	20Hz-20KHz,1/3Oct Steps	
		PreDly Rev	0ms -80MS,1ms Steps	
		Density	0% -100%	
		Decay	0% -100%	
		Reverb Vol	0% -100%	
		PEQ1 G	-15dB - +15dB, 0.5dB Steps	
		PEQ1 F	20Hz-20KHz,1/3Oct Steps	
		PEQ1 Q	0.05-3.00,0.05 Steps	
		PEQ2 G	-15dB - +15dB, 0.5dB Steps	
		PEQ2 F	20Hz-20KHz,1/3Oct Steps	
		PEQ2 Q	0.05-3.00,0.05 Steps	
		PEQ3 G	-15dB - +15dB, 0.5dB Steps	
		PEQ3 F	20Hz-20KHz,1/3Oct Steps	
		PEQ3 Q	0.05-3.00,0.05 Steps	
14	DELAY+REVERB	Delay Time	0ms-800ms,5ms Steps	––––
		Delay Decay	0% -100%	
		Delay HPF	20Hz-20KHz,1/3Oct Steps	
		Delay LPF	20Hz-20KHz,1/3Oct Steps	
		Delay Vol	0% -100%	
		H-Damp Freq	20Hz-20KHz,1/3Oct Steps	
		L-Damp Freq	20Hz-20KHz,1/3Oct Steps	
		PreDly Rev	0.05-3.00,0.05 Steps	
		Density	0% -100%	
		Decay	0% -100%	
		Reverb Vol	0% -100%	
		PEQ1 G	-15dB - +15dB, 0.5dB Steps	
		PEQ1 F	20Hz-20KHz,1/3Oct Steps	
		PEQ1 Q	0.05-3.00,0.05 Steps	
		PEQ2 G	-15dB - +15dB, 0.5dB Steps	
		PEQ2 F	20Hz-20KHz,1/3Oct Steps	
		PEQ2 Q	0.05-3.00,0.05 Steps	
		PEQ3 G	-15dB - +15dB, 0.5dB Steps	
		PEQ3 F	20Hz-20KHz,1/3Oct Steps	
		PEQ3 Q	0.05-3.00,0.05 Steps	

15	CHR/FLG+DELAY	Chr/Flg Depth	0% -100%	See Note2
		Chr/Flg Rate	0% -100%	
		Feedback	0% -100%	
		Chr/Flg HPF	20Hz-20KHz,1/3Oct Steps	
		Chr/Flg LPF	20Hz-20KHz,1/3Oct Steps	
		Chr/Flg Vol	0% -100%	
		Delay Time	0ms-800ms,5ms Steps	
		Delay Decay	0% -100%	
		Delay LPF	20Hz-20KHz,1/3Oct Steps	
		Delay HPF	20Hz-20KHz,1/3Oct Steps	
		Delay Vol	0% -100%	
		PEQ1 G	-15dB - +15dB, 0.5dB Steps	
		PEQ1 F	20Hz-20KHz,1/3Oct Steps	
		PEQ1 Q	0.05-3.00,0.05 Steps	
		PEQ2 G	-15dB - +15dB, 0.5dB Steps	
		PEQ2 F	20Hz-20KHz,1/3Oct Steps	
		PEQ2 Q	0.05-3.00,0.05 Steps	
		PEQ3 G	-15dB - +15dB, 0.5dB Steps	
		PEQ3 F	20Hz-20KHz,1/3Oct Steps	
		PEQ3 Q	0.05-3.00,0.05 Steps	
16	CHR/FLG+DELAY	Semitones	-12 - +12, 1/3 Semitone Steps	
		Chorus	0% -100%	
		PEQ G	-15dB - +15dB, 0.5dB Steps	
		PEQ F	20Hz-20KHz,1/3Oct Steps	
		PEQ Q	0.050.05-3.00,0.05 Steps	

Table 5.1: List of effects and parameters

NOTE 1 : When using the TAP DELAY , the FX LOAD/PAR/TAP can be used for setting the delay time to the Delay [See 'Tap Delay' Parameters description]

NOTE 2 : When using the ROTARY Effect, the FX LOAD/PAR/TAP and BYPASS/ENTER buttons can be used for particular functions making the Rotary Speaker effect as closer as possible to the real one:

FX LOAD/PAR/TAP button: toggle between Fast and Slow rotation speed

BYPASS/ENTER button: toggle between Run and Stop of speaker rotation

[See 'Rotary' Parameters description]

6. APPENDIX 2

6.1 DEF-220P Effects MIDI CHART
Program Change

Effects	Value	Legend
REVERB HALL	00H	Efx 1
REVERB ROOM	01H	Efx 2
REVERB PLATE	02H	Efx 3
REVERB VOCAL	03H	Efx 4
GATE REVERB	04H	Efx 5
VOCAL ECHO	05H	Efx 6
TAP DELAY	06H	Efx 7
CHORUS	07H	Efx 8
FLANGE	08H	Efx 9
PHASER	09H	Efx 10
TREMOLO	0AH	Efx 11
ROTARY	0BH	Efx 12
CHORUS REVERB	0CH	Efx 13
DELAY REVERB	0DH	Efx 14
DELAY CHORUS	0EH	Efx 15
PITCH SHIFTER	0FH	Efx 16

Control Change

Parameter	Controller	Value	Legend
VARIATION	10H	View Tab.1	Change value
SELECT	11H	View Tab.1	Select parameter
FX BYPASS	0x50	0,1	0 = OFF 1 = ON

To change a parameter the User must send 2 command control change:
<B0H, 11H, number parameter>; <B0H, 10H, value parameter>
Example: Reverb-Hall change the DENSITY parameter to 30%
Send <B0H, 11H, 02H> (with this control change the user select the parameter density)
Send <B0H, 10H, 1EH> (with this control change the user change the parameter value)
6. Appendix 2

REVERB HALL, REVERB ROOM, REVERB PLATE, REVERB VOCAL

Par 1:
Decay:. Range: 0-100%. Value N of control 17=0
Value N of control change 16=from 0 up to 100
Par 2:
PreDly Rev:. Range: 0-80 ms (in 1ms Steps.)
Value N of control change 17=1
Value N of control change 16=from 0 up to 80
Par 3:
Density: Range: 0-100%
Value N of control change 17=2
Value N of control change 16=from 0 up to 100
Par 4:
H-Damp Freq:: Range: 20hz-20Khz,1/3 Oct Steps.
Value N of control change 17=3
Value N of control change 16= from 0 up to 30 Table n°1
Par 5:
L-Damp Freq: Range: 20hz-20Khz,1/3 Oct Steps.
Value N of control change 17=4
Value N of control change 16= from 0 up to 30 Table nn°1
Par 6:
Low-Pass F: Range: 20hz-20Khz,1/3 Oct Steps.
Value N of control change 17=5
Value N of control change 16=from 0 up to 30 Table n°1
Par 7:
PEQ Gain: (+/-15 dB in 0.5dB Steps).
Value N of control change 17=6
Value N of control change 16=from 0 up to 60 Table n°2
Par 8:
PEQ Freq: Range: 20hz-20Khz 1/3 Oct Steps.
Value N of control change 17=7
Value N of control change 16=from 0 up to 30 Table n°1
Par 9:
PEQ Q:. Range: 0.050 -3   in 0.05 Steps.
Value N of control change 17=8
Value N of control change 16=from 0 up to 59 Table n°3
Par 10:
E.Ref Vol: Range: 0-100%
Value N of control change 17=9
Value N of control change 16=from 0 up to 100
Par 11:
PreDly E.Ref:: 0-40 ms in 1ms Steps.
Value N of control change 17=10
Value N of control change 16=from 0 up to 40

Par 12:
F.Ref Vol: Range: 0-100%
Value N of control change 17=11
Value N of control change 16=from 0 up to 100
Par 13:
PreDly F.Ref: Range da 0-40 ms in 1 ms Steps.
Value N of control change 17=12
Value N of control change 16=from 0 up to 40
Par 14:
Reverb Vol:. Range da 0-100%
Value N of control change 17=13
Value N of control change 16=from 0 up to 100
Par 15:
High-Pass F: Range: 20hz-20Khz,1/3 Oct Steps.
Value N of control change 17=14
Value N of control change 16=from 0 up to 30 Table n°1
Par 16:
PEQ2 Gain:(+/-15 dB in 0.5dB Steps).
Value N of control change 17=15
Value N of control change 16=from 0 up to 60 Table n°2
Par 17:
PEQ2 Freq: Range: 20hz-20Khz 1/3 Oct Steps.
Value N of control change 17=16
Value N of control change 16=from 0 up to 30 Table n°1
Par 18:
PEQ2 Q:. Range: 0.050 -3, in 0.05 Steps.
Value N of control change 17=17
Value N of control change 16=from 0 up to 59 Table n°3
Par 19:
PEQ3 Gain: (+/-15 dB in 0.5dB Steps).
Value N of control change 17=18
Value N of control change 16=from 0 up to 60 Table n2
Par 20:
PEQ3 Freq: Range: 20hz-20Khz 1/3 Oct Steps.
Value N of control change 17=19
Value N of control change 16=from 0 up to 30 Table n°1
Par 21:
PEQ3 Q:. Range: 0.050 -3, in 0.05 Steps.
Value N of control change 17=20
Value N of control change 16=from 0 up to 59 Table n°3
Par 22:
Pseudo Stereo: Range: 0-100%
Value N of control change 17=21
Value N of control change 16=from 0 up to 100

GATE REVERB

Par 1:
Time: Range: da 0-100 (from 31.5ms to 3150ms step 31.5ms)
Value N of control change 17=0
Value N of control change 16=from 0 up to 100
Par 2:
PreDly Rev:. Range: 0-80 ms (in 1ms Steps.)
Value N of control change 17=1
Value N of control change 16=DA 0 a 80
Par 3:
Density: Range: 0-100%
Value N of control change 17=2
Value N of control change 16=from 0 up to 100
Par 4:
H-Damp Freq:: Range: 20hz-20Khz,1/3 Oct Steps.
Value N of control change 17=3
Value N of control change 16= from 0 up to 30Tabella n^{0}1
Par 5:
L-Damp Freq: Range: 20hz-20Khz,1/3 Oct Steps.
Value N of control change 17=4
Value N of control change 16= from 0 up to 30 Table n^{0}1
Par 6:
Low-Pass F: Range: 20hz-20Khz,1/3 Oct Steps.
Value N of control change 17=5
Value N of control change 16=from 0 up to 30 Table n^{0}1
Par 7:
PEQ Gain: (+/-15 dB in 0.5dB Steps).
Value N of control change 17=6
Value N of control change 16=from 0 up to 60 Table n^{0}2
Par 8:
PEQ Freq: Range: 20hz-20Khz 1/3 Oct Steps.
Value N of control change 17=7
Value N of control change 16=from 0 up to 30 Table n^{0}1
Par 9:
PEQ Q:. Range: 0.050 -3   in 0.05 Steps.
Value N of control change 17=8
Value N of control change 16=from 0 up to 59 Table nn^{0}3
Par 10:
E.Ref Vol: Range: 0-100%
Value N of control change 17=9
Value N of control change 16=from 0 up to 100

Par 11:
PreDly E.Ref:: da 0-40 ms in 1ms Steps.
Value N of control change 17=10
Value N of control change 16=from 0 up to 40
Par 12:
F.Ref Vol: Range: 0-100%
Value N of control change 17=11
Value N of control change 16=from 0 up to 100
Par 13:
PreDly F.Ref: Range 0-40 ms in step di 1 ms.
Value N of control change 17=12
Value N of control change 16=from 0 up to 40
Par 14:
Reverb Vol:. Range da 0-100%
Value N of control change 17=13
Value N of control change 16=from 0 up to 100
Par 15:
High-Pass F: Range: 20hz-20Khz,1/3 Oct Steps.
Value N of control change 17=14
Value N of control change 16=from 0 up to 30 Table n°1
Par 16:
PEQ2 Gain: (+/-15 dB in 0.5dB Steps).
Value N of control change 17=15
Value N of control change 16=from 0 up to 60 Table n°2
Par 17:
PEQ2 Freq: Range: 20hz-20Khz 1/3 Oct Steps.
Value N of control change 17=16
Value N of control change 16=from 0 up to 30 Table n°1
Par 18:
PEQ2 Q:. Range: 0.050 -3, in 0.05 Steps.
Value N of control change 17=17
Value N of control change 16=from 0 up to 59 Table n°3
Par 19:
PEQ3 Gain: (+/-15 dB in 0.5dB Steps).
Value N of control change 17=18
Value N of control change 16=from 0 up to 60 Table n°2
Par 20:
PEQ3 Freq: Range: 20hz-20Khz 1/3 Oct Steps.
Value N of control change 17=19
Value N of control change 16=from 0 up to 30 Table n°1
Par 21:
PEQ3 Q:. Range: 0.050 -3, in 0.05 Steps.
Value N of control change 17=20
Value N of control change 16=from 0 up to 59 Table n°3

Par 22:
Pseudo Stereo: Range: 0-100%
Value N of control change 17=21
Value N of control change 16=from 0 up to 100
Par 23:
Thershold: Range: 0-100%
Value N of control change 17=22
Value N of control change 16=from 0 up to 100
Par 24:
Release: Range: 0-100%
Value N of control change 17=23
Value N of control change 16=from 0 up to 100
Par 25:
Attack: Range: 0-100%
Value N of control change 17=24
Value N of control change 16=from 0 up to 100

VOCAL ECHO

Par 1:
Displacement: Range da 0-100%
Value N of control change 17=0
Value N of control change 16=from 0 up to 100
Par 2:
Delay: Range da 0-720 ms (step 10ms)
Value N of control change 17=1
Value N of control change 16=from 0 up to 72
Par 3:
Feedback: Range da 0-100%
Value N of control change 17=2
Value N of control change 16=from 0 up to 100
Par 4:
High-Pass F: Range: 20hz-20Khz,1/3 Oct Steps.
Value N of control change 17=3
Value N of control change 16=from 0 up to 30 Table n°1
Par 5:
Low-Pass F: Range: 20hz-20Khz,1/3 Oct Steps.
Value N of control change 17=4
Value N of control change 16=from 0 up to 30 Table n°1
Par 6:
PEQ1 Gain: (+/-15 dB in 0.5dB Steps).
Value N of control change 17=5
Value N of control change 16=from 0 up to 60 Table n°2
Par 7:
PEQ2 Freq: Range: 20hz-20Khz 1/3 Oct Steps.
Value N of control change 17=6
Value N of control change 16=from 0 up to 30 Table n°1
Par 8:
PEQ3 Q:. Range: 0.050 -3   in 0.05 Steps.
Value N of control change 17=7
Value N of control change 16=from 0 up to 59 Table n°3
Par 9:
PEQ2 Gain: (+/-15 dB in 0.5dB Steps).
Value N of control change 17=8
Value N of control change 16=from 0 up to 60 Table n°2
Par 10:
PEQ2 Freq: Range: 20hz-20Khz 1/3 Oct Steps.
Value N of control change 17=9
Value N of control change 16=from 0 up to 30 Table n°1

Par 11:
PEQ2 Q:. Range: 0.050 -3   in 0.05 Steps.
Value N of control change 17=10
Value N of control change 16=from 0 up to 59 Table n^{0}3
Par 12:
PEQ3 Gain: (+/-15 dB in 0.5dB Steps).
Value N of control change 17=11
Value N of control change 16=from 0 up to 60 Table n^{0}2
Par 13:
PEQ3 Freq: Range: 20hz-20Khz 1/3 Oct Steps.
Value N of control change 17=12
Value N of control change 16=from 0 up to 30 Table n^{0}1
Par 14:
PEQ3 Q:. Range: 0.050 -3   in 0.05 Steps.
Value N of control change 17=13
Value N of control change 16=from 0 up to 59 Table n^{0}2
Par 15:
Out Level: Range: 0-100%
Value N of control change 17=14
Value N of control change 16=from 0 up to 100

TAP DELAY

Par 1:
if Mono then
Delay: Range: 0-1270ms (step 10ms)
Value N of control change 17=0
Value N of control change 16=from 0 up to 127
if Stereo then
Delay: Range: 0-800ms (step 10ms)
Value N of control change 17=0
Value N of control change 16=from 0 up to 80
Par 2:
Feedback: Range da 0-100%
Value N of control change 17=1
Value N of control change 16=from 0 up to 100
Par 3:
High-Pass F: Range: 20hz-20Khz,1/3 Oct Steps.
Value N of control change 17=2
Value N of control change 16=from 0 up to 30 Table n°1
Par 4:
Low-Pass F: Range: 20hz-20Khz,1/3 Oct Steps.
Value N of control change 17=3
Value N of control change 16=from 0 up to 30 Table n°1
Par 5:
PEQ1 Gain: (+/-15 dB in 0.5dB Steps).
Value N of control change 17=4
Value N of control change 16=from 0 up to 60 Table n°2
Par 6:
PEQ2 Freq: Range: 20hz-20Khz 1/3 Oct Steps.
Value N of control change 17=5
Value N of control change 16=from 0 up to 30 Table n°1
Par 7:
PEQ3 Q:. Range: 0.050 -3   in 0.05 Steps.
Value N of control change 17=6
Value N of control change 16=from 0 up to 59 Table n°3
Par 8:
PEQ2 Gain: (+/-15 dB in 0.5dB Steps).
Value N of control change 17=7
Value N of control change 16=from 0 up to 60 Table n°2
Par 9:
PEQ2 Freq: Range: 20hz-20Khz 1/3 Oct Steps.
Value N of control change 17=8
Value N of control change 16=from 0 up to 30 Table n°1
Par 10:
PEQ2 Q:. Range: 0.050 -3   in 0.05 Steps.
Value N of control change 17=9
Value N of control change 16=from 0 up to 59 Table n°3

Par 11:
PEQ3 Gain: (+/-15 dB in 0.5dB Steps).
Value N of control change 17=10
Value N of control change 16=from 0 up to 60 Table n^{0}2
Par 12:
PEQ3 Freq: Range: 20hz-20Khz 1/3 Oct Steps.
Value N of control change 17=11
Value N of control change 16=from 0 up to 30 Table n^{0}1
Par 13:
PEQ3 Q:. Range: 0.050 -3   in 0.05 Steps.
Value N of control change 17=12
Value N of control change 16=from 0 up to 59 Table n^{0}3
Par 14:
Out Level: Range: 0-100%
Value N of control change 17=13
Value N of control change 16=from 0 up to 100
Par 15:
Mode: Range: 0-1
Value N of control change 17=14
Value N of control change 16=from 0 up to 1 (0=Stereo, 1=Mono)

CHORUS

Par 1:
Depth: Range: 0-100%
Value N of control change 17=0
Value N of control change 16=from 0 up to 100
Par 2:
Hi-Damp F: Range: 20hz-20Khz,1/3 Oct Steps.
Value N of control change 17=1
Value N of control change 16=from 0 up to 30 Table n^{0}1
Par 3:
Lo-Damp F: Range: 20hz-20Khz,1/3 Oct Steps.
Value N of control change 17=2
Value N of control change 16=from 0 up to 30 Table n^{0}1
Par 4:
Link Rate: Range: 0-1
Value N of control change 17=3
Value N of control change 16=0,1 (Off,On)
Par 5:
Rate L: Range: 0-100%
Value N of control change 17=4
Value N of control change 16=from 0 up to 100
Par 6:
Rate R: Range: 0-100%
Value N of control change 17=5
Value N of control change 16=from 0 up to 100
Par 7:
Chorus Vol: Range: 0-100%
Value N of control change 17=6
Value N of control change 16=from 0 up to 100
Par 8:
Phase: Range: 0-100%
Value N of control change 17=7
Value N of control change 16=from 0 up to 100

FLANGER

Par 1:
Link Rate: Range: 0-1
Value N of control change 17=0
Value N of control change 16=0,1 (Off,On)
Par 2:
Rate L: Range: 0-100%
Value N of control change 17=1
Value N of control change 16=from 0 up to 100
Par 3:
Rate R: Range: 0-100%
Value N of control change 17=2
Value N of control change 16=from 0 up to 100
Par 4:
Depth: Range: 0-100%
Value N of control change 17=3
Value N of control change 16=from 0 up to 100
Par 5:
Hi-Damp F: Range: 20hz-20Khz,1/3 Oct Steps.
Value N of control change 17=4
Value N of control change 16=from 0 up to 30 Table n?
Par 6:
Lo-Damp F: Range: 20hz-20Khz,1/3 Oct Steps.
Value N of control change 17=5
Value N of control change 16=from 0 up to 30 Table n?
Par 7:
Feedback: Range: 0-100%
Value N of control change 17=6
Value N of control change 16=from 0 up to 100
Par 8:
Flanger Vol: Range: 0-100%
Value N of control change 17=7
Value N of control change 16=from 0 up to 100
Par 9:
Phase: Range: 0-100%
Value N of control change 17=8
Value N of control change 16=from 0 up to 100

PHASER

Par 1:
Rate: Range: 0-100%
Value N of control change 17=0
Value N of control change 16=from 0 up to 100
Par 2:
PEQ1 Gain: (+/-15 dB in 0.5dB Steps).
Value N of control change 17=1
Value N of control change 16=from 0 up to 60 Table n?
Par 3:
PEQ1 Freq: Range: 20hz-20Khz 1/3 Oct Steps.
Value N of control change 17=2
Value N of control change 16=from 0 up to 30 Table n?
Par 4:
PEQ1 Q:. Range: 0.050 -3   in 0.05 Steps.
Value N of control change 17=3
Value N of control change 16=from 0 up to 59 Table n?
Par 5:
PEQ2 Gain: (+/-15 dB in 0.5dB Steps).
Value N of control change 17=4
Value N of control change 16=from 0 up to 60 Table n?
Par 6:
PEQ2 Freq: Range: 20hz-20Khz 1/3 Oct Steps.
Value N of control change 17=5
Value N of control change 16=from 0 up to 30 Table n?
Par 7:
PEQ2 Q:. Range: 0.050 -3   in 0.05 Steps.
Value N of control change 17=6
Value N of control change 16=from 0 up to 59 Table n?
Par 8:
High-Pass F: Range: 20hz-20Khz,1/3 Oct Steps.
Value N of control change 17=7
Value N of control change 16=from 0 up to 30 Table n?
Par 9:
Low-Pass F: Range: 20hz-20Khz,1/3 Oct Steps.
Value N of control change 17=8
Value N of control change 16=from 0 up to 30 Table n?
Par 10:
PEQ3 Gain: (+/-15 dB in 0.5dB Steps).
Value N of control change 17=9
Value N of control change 16=from 0 up to 60 Table n?

Par 11:
PEQ3 Freq: Range: 20hz-20Khz 1/3 Oct Steps.
Value N of control change 17=10
Value N of control change 16=from 0 up to 30 Table n?
Par 12:
PEQ3 Q:. Range: 0.050 -3, in 0.05 Steps.
Value N of control change 17=11
Value N of control change 16=from 0 up to 59 Table n?
Par 13:
Feedback: Range: 0-100%
Value N of control change 17=12
Value N of control change 16=from 0 up to 100
Par 14:
Depth: Range: 0-100%
Value N of control change 17=13
Value N of control change 16=from 0 up to 100
Par 15:
Phaser Vol: Range: 0-100%
Value N of control change 17=14
Value N of control change 16=from 0 up to 100
Par 16:
Phase In: Range: 0-1
Value N of control change 17=15
Value N of control change 16=from 0 up to 1 (0=Direct, 1=Inverse)
Par 17:
Feedback Phase: Range: 0-1
Value N of control change 17=16
Value N of control change 16=from 0 up to 1 (0=Direct, 1=Inverse)
Par 18:
Offset Depth: Range: 0-100%
Value N of control change 17=17
Value N of control change 16=from 0 up to 100

TREMOLO

Par 1:
Rate: Range: 0-100%
Value N of control change 17=0
Value N of control change 16=from 0 up to 100
Par 2:
Hi-Damp F: Range: 20hz-20Khz,1/3 Oct Steps.
Value N of control change 17=1
Value N of control change 16=from 0 up to 30 Table n?
Par 3:
Lo-Damp F: Range: 20hz-20Khz,1/3 Oct Steps.
Value N of control change 17=2
Value N of control change 16=from 0 up to 30
Par 4:
Depth: Range: 0-100%
Value N of control change 17=3
Value N of control change 16=from 0 up to 100
Par 5:
Tremolo Vol: Range: 0-100%
Value N of control change 17=4
Value N of control change 16=from 0 up to 100
Par 6:
Offset: Range: 0-100%
Value N of control change 17=5
Value N of control change 16=from 0 up to 100

ROTARY SPEAKER

Par 1:
Switch: Range: 0-1
Value N of control change 17=0
Value N of control change 16=from 0 up to 1 (0=slow 1=Fast)
Par 2:
Cyl Low-Pass F: Range: 20hz-20Khz,1/3 Oct Steps.
Value N of control change 17=1
Value N of control change 16=from 0 up to 30 Table n?
Par 3:
Cyl PEQ Gain: (+/-15 dB in 0.5dB Steps).
Value N of control change 17=2
Value N of control change 16=from 0 up to 60 Table n?
Par 4:
Cyl PEQ Freq: Range: 20hz-20Khz 1/3 Oct Steps.
Value N of control change 17=3
Value N of control change 16=from 0 up to 30 Table n?
Par 5:
Cyl PEQ Q:. Range: 0.050 -3   in 0.05 Steps.
Value N of control change 17=4
Value N of control change 16=from 0 up to 59 Table n?
Par 6:
Horn High-Pass F: Range: 20hz-20Khz,1/3 Oct Steps.
Value N of control change 17=5
Value N of control change 16=from 0 up to 30 Table n?
Par 7:
Horn Low-Pass F: Range: 20hz-20Khz,1/3 Oct Steps.
Value N of control change 17=6
Value N of control change 16=from 0 up to 30 Table n?
Par 8:
Horn PEQGain: (+/-15 dB in 0.5dB Steps).
Value N of control change 17=7
Value N of control change 16=from 0 up to 60 Table n?
Par 9:
Horn PEQ Freq: Range: 20hz-20Khz 1/3 Oct Steps.
Value N of control change 17=8
Value N of control change 16=from 0 up to 30 Table n?
Par 10:
Horn PEQ Q:. Range: 0.050 -3   in 0.05 Steps.
Value N of control change 17=9
Value N of control change 16=from 0 up to 59 Table n?
Par 11:
Cyl Low Speed: Range: 0-100%
Value N of control change 17=10
Value N of control change 16=from 0 up to 100

Par 12:
Cyl High Speed: Range: 0-100%
Value N of control change 17=11
Value N of control change 16=from 0 up to 100
Par 13:
Cyl Depth: Range: 0-100%
Value N of control change 17=12
Value N of control change 16=from 0 up to 100
Par 14:
Cyl Feedback: Range: 0-100%
Value N of control change 17=13
Value N of control change 16=from 0 up to 100
Par 15:
Cyl Level: Range: 0-100%
Value N of control change 17=14
Value N of control change 16=from 0 up to 100
Par 16:
Horn Low Speed: Range: 0-100%
Value N of control change 17=15
Value N of control change 16=from 0 up to 100
Par 17:
Horn High Speed: Range: 0-100%
Value N of control change 17=16
Value N of control change 16=from 0 up to 100
Par 18:
Horn Depth: Range: 0-100%
Value N of control change 17=17
Value N of control change 16=from 0 up to 100
Par 19:
Horn Feedback: Range: 0-100%
Value N of control change 17=18
Value N of control change 16=from 0 up to 100
Par 20:
Horn Level: Range: 0-100%
Value N of control change 17=19
Value N of control change 16=from 0 up to 100
Par 21:
PEQ Gain: (+/-15 dB in 0.5dB Steps).
Value N of control change 17=20
Value N of control change 16=from 0 up to 60 Table n?
Par 22:
PEQ Freq: Range: 20hz-20Khz 1/3 Oct Steps.
Value N of control change 17=21
Value N of control change 16=from 0 up to 30 Table n?
Par 23:
PEQ Q:. Range: 0.050 -3, in 0.05 Steps.
Value N of control change 17=22
Value N of control change 16=from 0 up to 59 Table n?

CHORUS/FLANGER REVERB

Par 1:
Chr/Fla Depth: Range: 0-100%
Value N of control change 17=0
Value N of control change 16=from 0 up to 100
Par 2:
Chr/Fla Rate: Range: 0-100%
Value N of control change 17=1
Value N of control change 16=from 0 up to 100
Par 3:
Chr/Fla Feedback: Range: 0-100%
Value N of control change 17=2
Value N of control change 16=from 0 up to 100
Par 4:
Chr/Fla High-Pass F: Range: 20hz-20Khz,1/3 Oct Steps.
Value N of control change 17=3
Value N of control change 16=from 0 up to 30 Table n?
Par 5:
Chr/Fla Low-Pass F: Range: 20hz-20Khz,1/3 Oct Steps.
Value N of control change 17=4
Value N of control change 16=from 0 up to 30 Table n?
Par 6:
Chr/Fla Volume: Range: 0-100%
Value N of control change 17=5
Value N of control change 16=from 0 up to 100
Par 7:
Hi-Damp Rev: Range: 20hz-20Khz,1/3 Oct Steps.
Value N of control change 17=6
Value N of control change 16=from 0 up to 30 Table n?
Par 8:
Lo-Damp Rev: Range: 20hz-20Khz,1/3 Oct Steps.
Value N of control change 17=7
Value N of control change 16=from 0 up to 30 Table n?
Par 9:
PreDelay Rev: Range: 0-80ms (step 1ms)
Value N of control change 17=8
Value N of control change 16=from 0 up to 80
Par 10:
Density: Range: 0-100%
Value N of control change 17=9
Value N of control change 16=from 0 up to 100

Par 11:
Decay: Range: 0-100%
Value N of control change 17=10
Value N of control change 16=from 0 up to 100
Par 12:
Rev Volume: Range: 0-100%
Value N of control change 17=11
Value N of control change 16=from 0 up to 100
Par 13:
PEQ1 Gain: (+/-15 dB in 0.5dB Steps).
Value N of control change 17=12
Value N of control change 16=from 0 up to 60 Table n?
Par 14:
PEQ1 Freq: Range: 20hz-20Khz 1/3 Oct Steps.
Value N of control change 17=13
Value N of control change 16=from 0 up to 30 Table n?
Par 15:
PEQ1 Q:. Range: 0.050 -3, in 0.05 Steps.
Value N of control change 17=14
Value N of control change 16=from 0 up to 59 Table n?
Par 16:
PEQ2 Gain: (+/-15 dB in 0.5dB Steps).
Value N of control change 17=15
Value N of control change 16=from 0 up to 60 Table n?
Par 17:
PEQ2 Freq: Range: 20hz-20Khz 1/3 Oct Steps.
Value N of control change 17=16
Value N of control change 16=from 0 up to 30 Table n?
Par 18:
PEQ2 Q:. Range: 0.050 -3, in 0.05 Steps.
Value N of control change 17=17
Value N of control change 16=from 0 up to 59 Table n?
Par 19:
PEQ3 Gain: (+/-15 dB in 0.5dB Steps).
Value N of control change 17=18
Value N of control change 16=from 0 up to 60 Table n?
Par 20:
PEQ3 Freq: Range: 20hz-20Khz 1/3 Oct Steps.
Value N of control change 17=19
Value N of control change 16=from 0 up to 30 Table n?
Par 21:
PEQ3 Q:. Range: 0.050 -3, in 0.05 Steps.
Value N of control change 17=20
Value N of control change 16=from 0 up to 59 Table n?

DELAY REVERB

Par 1:
Delay Time: Range: 0-800ms (step 10ms)
Value N of control change 17=0
Value N of control change 16=from 0 up to 80
Par 2:
Delay Decay: Range: 0-100%
Value N of control change 17=1
Value N of control change 16=from 0 up to 100
Par 3:
Delay Low-Pass F: Range: 20hz-20Khz,1/3 Oct Steps.
Value N of control change 17=2
Value N of control change 16=from 0 up to 30 Table n?
Par 4:
Delay High-Pass F: Range: 20hz-20Khz,1/3 Oct Steps.
Value N of control change 17=3
Value N of control change 16=from 0 up to 30 Table n?
Par 5:
Delay Vol: Range: 0-100%
Value N of control change 17=4
Value N of control change 16=from 0 up to 100
Par 6:
Hi-Damp Rev: Range: 20hz-20Khz,1/3 Oct Steps.
Value N of control change 17=5
Value N of control change 16=from 0 up to 30 Table n?
Par 7:
Lo-Damp Rev: Range: 20hz-20Khz,1/3 Oct Steps.
Value N of control change 17=6
Value N of control change 16=from 0 up to 30 Table n?
Par 8:
PreDelay Rev: Range: 0-80ms (step 1ms)
Value N of control change 17=7
Value N of control change 16=from 0 up to 80
Par 9:
Density: Range: 0-100%
Value N of control change 17=8
Value N of control change 16=from 0 up to 100
Par 10:
Decay: Range: 0-100%
Value N of control change 17=9
Value N of control change 16=from 0 up to 100

Par 11:
Rev Volume: Range: 0-100%
Value N of control change 17=10
Value N of control change 16=from 0 up to 100
Par 12:
PEQ1 Gain: (+/-15 dB in 0.5dB Steps).
Value N of control change 17=11
Value N of control change 16=from 0 up to 60 Table n?
Par 13:
PEQ1 Freq: Range: 20hz-20Khz 1/3 Oct Steps.
Value N of control change 17=12
Value N of control change 16=from 0 up to 30 Table n?
Par 14:
PEQ1 Q:. Range: 0.050 -3, in 0.05 Steps.
Value N of control change 17=13
Value N of control change 16=from 0 up to 59 Table n?
Par 15:
PEQ2 Gain: (+/-15 dB in 0.5dB Steps).
Value N of control change 17=14
Value N of control change 16=from 0 up to 60 Table n?
Par 16:
PEQ2 Freq: Range: 20hz-20Khz 1/3 Oct Steps.
Value N of control change 17=15
Value N of control change 16=from 0 up to 30 Table n?
Par 17:
PEQ2 Q:. Range: 0.050 -3, in 0.05 Steps.
Value N of control change 17=16
Value N of control change 16=from 0 up to 59 Table n?
Par 18:
PEQ3 Gain: (+/-15 dB in 0.5dB Steps).
Value N of control change 17=17
Value N of control change 16=from 0 up to 60 Table n?
Par 19:
PEQ3 Freq: Range: 20hz-20Khz 1/3 Oct Steps.
Value N of control change 17=18
Value N of control change 16=from 0 up to 30 Table n?
Par 20:
PEQ3 Q:. Range: 0.050 -3, in 0.05 Steps.
Value N of control change 17=10
Value N of control change 16=from 0 up to 59 Table n?

CHORUS/FLANGER DELAY

Par 1:
Chr/Fla Depth: Range: 0-100%
Value N of control change 17=0
Value N of control change 16=from 0 up to 100
Par 2:
Chr/Fla Rate: Range: 0-100%
Value N of control change 17=1
Value N of control change 16=from 0 up to 100
Par 3:
Chr/Fla Feedback: Range: 0-100%
Value N of control change 17=2
Value N of control change 16=from 0 up to 100
Par 4:
Chr/Fla High-Pass F: Range: 20hz-20Khz,1/3 Oct Steps.
Value N of control change 17=3
Value N of control change 16=from 0 up to 30 Table n?
Par 5:
Chr/Fla Low-Pass F: Range: 20hz-20Khz,1/3 Oct Steps.
Value N of control change 17=4
Value N of control change 16=from 0 up to 30 Table n?
Par 6:
Chr/Fla Volume: Range: 0-100%
Value N of control change 17=5
Value N of control change 16=from 0 up to 100
Par 7:
Delay Time: Range: 0-800ms (steps 10ms)
Value N of control change 17=6
Value N of control change 16=from 0 up to 80
Par 8:
Delay Decay: Range: 0-100%
Value N of control change 17=7
Value N of control change 16=from 0 up to 100
Par 9:
Delay Low-Pass F: Range: 20hz-20Khz,1/3 Oct Steps.
Value N of control change 17=8
Value N of control change 16=from 0 up to 30 Table n?
Par 10:
Delay High-Pass F: Range: 20hz-20Khz,1/3 Oct Steps.
Value N of control change 17=9
Value N of control change 16=from 0 up to 30 Table n?

Par 11:
Delay Vol: Range: 0-100%
Value N of control change 17=10
Value N of control change 16=from 0 up to 100
Par 12:
PEQ1 Gain: (+/-15 dB in 0.5dB Steps).
Value N of control change 17=11
Value N of control change 16=from 0 up to 60 Table n?
Par 13:
PEQ1 Freq: Range: 20hz-20Khz 1/3 Oct Steps.
Value N of control change 17=12
Value N of control change 16=from 0 up to 30 Table n?
Par 14:
PEQ1 Q:. Range: 0.050 -3, in 0.05 Steps.
Value N of control change 17=13
Value N of control change 16=from 0 up to 59 Table n?
Par 15:
PEQ2 Gain: (+/-15 dB in 0.5dB Steps).
Value N of control change 17=14
Value N of control change 16=from 0 up to 60 Table n?
Par 16:
PEQ2 Freq: Range: 20hz-20Khz 1/3 Oct Steps.
Value N of control change 17=15
Value N of control change 16=from 0 up to 30 Table n?
Par 17:
PEQ2 Q:. Range: 0.050 -3, in 0.05 Steps.
Value N of control change 17=16
Value N of control change 16=from 0 up to 59 Table n?
Par 18:
PEQ3 Gain: (+/-15 dB in 0.5dB Steps).
Value N of control change 17=17
Value N of control change 16=from 0 up to 60 Table n?
Par 19:
PEQ3 Freq: Range: 20hz-20Khz 1/3 Oct Steps.
Value N of control change 17=18
Value N of control change 16=from 0 up to 30 Table n?
Par 20:
PEQ3 Q:. Range: 0.050 -3, in 0.05 Steps.
Value N of control change 17=10
Value N of control change 16=from 0 up to 59 Table n?

PITCH SHIFTER

Par 1:
SemiTones: Range: 0-72
Value N of control change 17=0
Value N of control change 16=from 0 up to 72 Table n°4
Par 2:
Chorus: Range: 0-100%
Value N of control change 17=1
Value N of control change 16=from 0 up to 100
Par 3:
PEQ Gain: (+/-15 dB in 0.5dB Steps).
Value N of control change 17=2
Value N of control change 16=from 0 up to 60 Table n°2
Par 4:
PEQ Freq: Range: 20hz-20Khz 1/3 Oct Steps.
Value N of control change 17=3
Value N of control change 16=from 0 up to 30 Table n°1
Par 5:
PEQ Q:. Range: 0.050 -3   in 0.05 Steps.
Value N of control change 17=4
Value N of control change 16=from 0 up to 59 Table n°3

Table 1 –Frequency [Hz]

	0	1	2	3	4	5	6	7	8	9
0	20	25	31,5	40	50	63	80	100	125	160
10	200	250	315	400	500	630	800	1000	1250	1600
20	2000	2500	3150	4000	5000	6300	8000	10000	12500	16000
30	20000									

Table 2–Gain [dB]

	0	1	2	3	4	5	6	7	8	9
0	-15	-14,5	-14	-13,5	-13	-12,5	-12	-11,5	-11	-10,5
10	-10	-9,5	-9	-8,5	-8	-7,5	-7	-6,5	-6	-5,5
20	-5	-4,5	-4	-3,5	-3	-2,5	-2	-1,5	-1	-0,5
30	0	0,5	1	1,5	2	2,5	3	3,5	4	4,5
40	5	5,5	6	6,5	7	7,5	8	8,5	9	9,5
50	10	10,5	11	11,5	12	12,5	13	13,5	14	14,5
60	15									

Table–3 Bandwidth[0ct]

	0	1	2	3	4	5	6	7	8	9
0	0,05	0,10	0,15	0,20	0,25	0,30	0,35	0,40	0,45	0,50
10	0,55	0,60	0,65	0,70	0,75	0,80	0,85	0,90	0,95	1,00
20	1,05	1,10	1,15	1,20	1,25	1,30	1,35	1,40	1,45	1,50
30	1,55	1,60	1,65	1,70	1,75	1,80	1,85	1,90	1,95	2,00
40	2,05	2,10	2,15	2,20	2,25	2,30	2,35	2,40	2,45	2,50
50	2,55	2,60	2,65	2,70	2,75	2,80	2,85	2,90	2,95	3,00

Table 4 –SemiTones

	0	1	2	3	4	5	6	7	8	9
0	-12	-12+33%	-12+66%	-11	-11+33%	-11+66%	-10	-10+33%	-10+66%	-9
10	-9+33%	-9+66%	-8	-8+33%	-8+66%	-7	-7+33%	-7+66%	-6	-6+33%
20	-6+66%	-5	-5+33%	-5+66%	-4	-4+33%	-4+66%	-3	-3+33%	-3+66%
30	-2	-2+33%	-2+66%	-1	-1+33%	-1+66%	0	0+33%	0+66%	1
40	1+33%	1+66%	2	2+33%	2+66%	3	3+33%	3+66%	4	4+33%
50	4+66%	5	5+33%	5+66%	6	6+33%	6+66%	7	7+33%	7+66%
60	8	8+33%	8+66%	9	9+33%	9+66%	10	10+33%	10+66%	11
70	11+33%	11+66%	12							

7. SPECIFICATIONS

INPUT

Type	1/4"TS connectors, unbalanced
Impedance	approx. 30 kOhm
Max. Input level	+15 dBu

OUTPUT

Type	1/4"TS connectors, impedance balanced
Impedance	approx. 150 Ohm
Max. output level	+21 dBu

EFX/BYPASS

Type	1/4"TS footswitch connector

MIDI PORT

Type	Standard 2xFemale DIN 5 Poles connectors

USB

Type	Standard USB connector Type A

DIGITAL PROCESSING

Converters	24-Bit Delta-Sigma, 128-times oversampling
Sampling rate	48 kHz

SYSTEM SPECIFICATIONS

Frequency response	10 Hz to 22 kHz, -3 dB
Dynamic range	103 dB, 10 Hz to 22 kHz A-Weighted
Distortion	0,01 % typ. @ 0 dBFS
Crosstalk	-75 dB @ 1 kHz
Signal-to-noise ratio	10 Hz to 22 kHz >100 @ 0 dBu, A-weighted

POWER SUPPLY

Mains connection	IEC C-13 Cable
Mains voltage	230 V, 50 Hz
Power consumption	approx. 15 W

DIMENSIONS/WEIGHT

Dimensions (H x W x D)	approx. 44 mm x 440 mm x185 mm
Weight	approx. 2.7 kg

Marani is constantly striving to maintain the highest professional standards. As a result of these efforts, modifications may be made from time to time to existing products without prior notice. Specifications and appearance may differ from those listed or illustrated.

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