

7. APPENDIX

7.1 Parameter overview

Nr.	Effect	True Stereo	Edit A	Edit B	Edit C	Edit D	Edit E	Edit F	Mix
Reverb									
1	Cathedral		Pre Delay	Decay	Hi Dec. Damp.	Bass Mul.	Shv. Damp.	Rev. Mod.	Mix
2	Gold Plate		Pre Delay	Decay	Hi Dec. Damp.	Size	Shv. Damp.	Diffusion	Mix
3	Small Hall		Pre Delay	Decay	Hi Dec. Damp.	Size	Shv. Damp.	Low Cut	Mix
4	Room		Pre Delay	Decay	Hi Dec. Damp.	Size	Shv. Damp.	Diffusion	Mix
5	Concert		Pre Delay	Decay	Hi Dec. Damp.	Bass Mul.	Shv. Damp.	Reverb Mod.	Mix
6	Studio		Pre Delay	Decay	Hi Dec. Damp.	Low Cut	Shv. Damp.	Shv. Freq.	Mix
7	Stage		Pre Delay	Decay	Hi Dec. Damp.	Size	Shv. Freq.	ER/Rev.	Mix
8	Spring Reverb		Pre Delay	Decay	Hi Dec. Damp.	Metal Res.	High Cut	Diffusion	Mix
9	Ambience		Pre Delay	Decay	Diffusion	Size	Shv. Damp.	Shv. Freq.	Mix
10	Early Reflections	x	Pre Delay	Size	Wall Damp.	Reflections	Stereo Width	-	Mix
11	Gated Reverb		Pre Delay	Decay	Hi Dec. Damp.	Shv. Damp.	Gate Threshold	Gate Hold	Mix
12	Reverse Reverb		Pre Delay	Decay	Hi Dec. Damp.	Shv. Damp.	Threshold	Hold Time	Mix
Delay									
13	Stereo Delay	x	Del. L. Co.	Del. L. Fine	Del. R. Co.	Del. R. Fine	Feedback L.	Feedback R.	Mix
14	Tape Echo	x	Delay Left	Delay Right	Feedback	Bandlimit	Feedback HP	Feedback LP	Mix
15	Ping Pong	x	Delay Left	Delay Right	Feedback L.	Feedback R.	Feedb. Del. L.	Feedb. Del. R.	Mix
Modulation									
16	Stereo Chorus	x	Speed	Depth	Delay	Stereo Phase	LFO Wave	Bandlimit	Mix
17	Analog Chorus		Speed	Depth	Delay	Spread	-	-	Mix
18	Vintage Chorus		Speed	Depth	Delay	Bandlimit	-	-	Mix
19	Ultra Chorus		Speed	Depth	Delay	Widness	Stereo Spread	Bandlimit	Mix
20	Stereo Flanger	x	Speed	Depth	Feedback	Delay	Stereo Phase	Feedback LP	Mix
21	Vintage Flanger		Speed	Depth	Feedback	Delay	-	-	Mix
22	Jet Stream Flanger	x	Speed	Depth	Feedback	Delay	-	-	Mix
23	Stereo Phaser	x	Speed	Depth	Feedback	Stereo Phase	Mode	LFO Wave	Mix
24	Vintage Phaser	x	Speed	Depth	Feedback	Intensity	Stereo Phase	-	Mix
25	Dual Phaser	x	Speed	Depth	Feedback	Base	-	-	Mix
26	Rotary		Speed	Drum Depth	Horn Depth	Drive	Balance	Split Frequency	Mix
27	Pitch Shifter	x	Semitones 1	Cents 1	Semitones 2	Cents 2	Semitones 3	Cents 3	Mix
28	Vibrato	x	Speed	Depth	Wave	Auto Modul.	-	-	Mix
29	Tremolo	x	Speed	Depth	Wave	Auto Modul.	-	-	Mix
30	Auto Panning	x	Speed	Depth	Wave	Auto Modul.	-	-	Mix
Dynamics									
31	Compressor	x	Ratio	Threshold	M-Gain	Soft Knee	Attack	Release	On/Off
32	Expander	x	Ratio	Threshold	M-Gain	Soft Knee	Attack	Release	On/Off
33	Gated Reverb	x	Hold	Threshold	Attack	Release	Range	-	On/Off
34	Ana. Kompr./Lim.	x	Ratio	Threshold	M-Gain	Limiter Thresh.	Attack	Release	On/Off
35	Ultramizer	x	Density	Range	Speed	Split Frequency	Stereo FX	Enhancer Freq.	Lo/Hi/Wide
36	Denoiser	x	LP Freq.	LP Depth	LP Speed	Gate Threshold	Gate Hold	Gate Response	On/Off
37	De-Esser	x	Ratio	Threshold	M-Gain	Frequency	Attack	Release	Lo/Hi/Wide
38	Wave Designer	x	Attack L	Release L	Attack R	Release R	Gain L	Gain R	On/Off

Tab. 7.1: Overview of the individual parameters of effects types (continued on next page)

Nr.	Effect	True Stereo	Edit A	Edit B	Edit C	Edit D	Edit E	Edit F	Mix
Psycho Acoustics									
39	Exciter	x	Frequency	Filter Q	Harmonics	Timbre	Harmon. Kick	-	Mix
40	Enhancer	x	Frequency	Filter Q	Process	Bass Gain	Bass Freq.	Bass Q	Mix
41	Ultrabass	x	Subbass Freq.	Subbass Level	Split Freq.	Harmon. Lev.	Harm. Density	Bass Level	On/Off
42	Stereo Imager	x	Spread	MS Balance	Spread Mode	Gain	Stereo Balance	Mono Balance	On/Off
43	Ultra Wide	x	Center	Spread	Xover Freq.	Gain	-	-	On/Off
44	Binauralizer	x	Center	Space	Spk/Head	Gain	Spk. Distance	Speaker Compens.	On/Off
Filter/EQ									
45	Auto Filter	x	Base Freq.	Depth	Type	Resonance	Attack	Release	Mix
46	LFO Filter	x	Base Freq.	Depth	Type	Resonance	Speed	Wave	Mix
47	Param. EQ	x	Gain 1	Freq. 1	Q 1	Gain 2	Freq. 2	Q 2	Gain
48	Graph. EQ	x	200 Hz	400 Hz	800 Hz	1.6 kHz	3.2 kHz	6.4 kHz	Gain
Distortion/Amp Simulation									
49	Vocal Distortion	x	Distortion	Delay Level	Delay	Flanger Level	Type	Flanger Speed	Mix
50	Tube Distortion	x	Drive	Pre HP	Pre LP	Bandlimit	Tube Selection	Mid EQ	Mix
51	Guitar Amp		In Gain	Drive	Presence	Gain	Cabinet Type	Mid EQ	Mix
52	Tri Fuzz		In Gain	Low Fuzz	Mid Fuzz	Hi Fuzz	Drive	Hi Damp	Mix
53	Speaker Simulation	x	Type	Peak Gain	Peak Freq.	Peak Q	-	-	Mix
54	Ring Modulator	x	Speed	Depth	Carrier Freq.	Bandlimit	Mode	Slewing	Mix
55	LoFi	x	Bit Resolution	Bandlimit	Buzz Level	Noise Level	Noise HP	Noise LP	Mix
Special FX									
56	Vinylizer	x	Speed	Clicks Level	Scratch Level	Noise Level	Bandlimit	Noise Freq.	Mix
57	Sampler	x	Record / Stop	Play / Stop	Speed	Mode	Start Point	Stop Point	Mix
58	Vocoder		Sensitivity	Noise	Attack	Release	-	-	Mix
59	Voice Canceler	x	Bass Freq.	MS Balance	Treble Pan.	Gain	-	-	On/Off
60	Resonator	x	Speed	Depth	Carrier Freq.	Feedback	Mode	Slewing	Mix
Combination									
61	Chorus & Reverb		Speed	Depth	Delay	Reverb Mix	Decay	HiDamp	Mix
62	Flanger & Reverb		Speed	Depth	Feedback	Reverb Mix	Decay	HiDamp	Mix
63	Leslie & Reverb		Speed	Depth	Doppler	Reverb Mix	Decay	HiDamp	Mix
64	Pitch & Reverb		Semitones	Cents	Bandlimit	Reverb Mix	Decay	HiDamp	Mix
65	Delay & Reverb		Delay	Feedback	Type	Reverb Mix	Decay	HiDamp	Mix
66	Tremolo & Reverb		Speed	Depth	Auto Mod.	Reverb Mix	Decay	HiDamp	Mix
67	Phaser & Reverb		Speed	Depth	Feedback	Reverb Mix	Decay	HiDamp	Mix
68	Chorus & Delay		Speed	Depth	Delay	Delay Mix	Delay Time	Feedback	Mix
69	Flanger & Delay		Speed	Depth	Feedback	Delay Mix	Delay Time	Feedback	Mix
70	Pitch & Delay		Semitones	Cents	Bandlimit	Delay Mix	Delay Time	Feedback	Mix
71	Tremolo & Delay		Speed	Depth	Auto Mod.	Delay Mix	Delay Time	Feedback	Mix

Tab. 7.2: Overview of the individual parameters of effects types (continuation)

7.2 MIDI implementation

MIDI Implementation Chart				
Function		Transmitted	Recognized	Remarks
Basic Channel	Default	OFF, 1 - 16	OFF, 1 - 16	memorized
	Changed	OFF, 1 - 16	OFF, 1 - 16	
Mode	Default	1,2,3,4	1,2,3,4	
	Messages	X	X	
	Altered	X	X	
Note Number		X	X	
	True Voice	X	X	
Velocity	Note ON	X	X	
	Note OFF	X	X	
After Touch	Key's	X	X	
	Ch's	X	X	
Pitch Bender		X	X	
Control		0,102 - 116	0,102 - 116	
Progr. Change		O (0-99)	O (0-99)	
	True #	1-100	1-100	
System Exclusive		O	O	
System Common	Song Pos	X	X	
	Song Sel	X	X	
	Tune	X	X	
System Real Time	Clock	X	X	
	Commands	X	X	
Aux Messages	Local ON/OFF	X	X	
	All notes OFF	X	X	
	Active Sense	X	X	
	Reset	X	X	
Notes				
O = YES, X = NO				
Mode 1: OMNI ON, POLY				
Mode 2: OMNI ON, MONO				
Mode 3: OMNI OFF, POLY				
Mode 4: OMNI OFF, MONO				

Tab. 7.3: MIDI implementation chart

Parameter Name	Display Range	MIDI Control Number	Control Value Range
Bank Select	I.001 .. 100/U.001 .. 100	0	0 = ROM / 1 = RAM
Algorithm	Algorithm Name	102	0 .. 70
Edit A	Depends on effect	103	Depends on effect
Edit B	Depends on effect	104	Depends on effect
Edit C	Depends on effect	105	Depends on effect
Edit D	Depends on effect	106	Depends on effect
Edit E	Depends on effect	107	Depends on effect
Edit F	Depends on effect	108	Depends on effect
EQ Low	-16 .. +16 dB	109	0 .. 32
EQ High	-16 .. +16 dB	110	0 .. 32
Mix	Depends on effect	111	Depends on effect
Store	U.001 .. U.100	112	0 .. 99
In/Out	BYP/0 .. 100%	113	0 = BYP / 1 = MIX
Combination Mode	SER 1, SER 2, PARA	114	0 = S1 / 1 = S2 / 2 = PA
Input Mode	MONO, STER	115	0 = MONO / 1 = STER
External/Internal Mix	EXTN/INTN	116	0 = EXTN / 1 = INTN

Tab. 7.4: Controller functions with MIDI

7.3 Default settings

Nr.	Effect	Edit A	Edit B	Edit C	Edit D	Edit E	Edit F	Mix
Reverb								
1	Cathedral	30 ms	5.11 s	10%	0	15%	7	50%
2	Gold Plate	10 ms	2.365 s	10%	33	32%	20	50%
3	Small Hall	2 ms	0.113 s	10%	23	15%	53 Hz	50%
4	Room	1.5 s	1.5 s	10%	25	0%	20	50%
5	Concert	10 ms	1.9 s	10%	-1.0	15%	7	50%
6	Studio	2 ms	0.252 s	10%	77 Hz	0 dB	437 Hz	50%
7	Stage	40 ms	2 s	40%	50	10.7 kHz	50%	50%
8	Spring Reverb	0 ms	1.465 s	25%	60%	5	6	50%
9	Ambience	2 ms	0.254 s	15	28	9 dB	9 kHz	50%
10	Early Reflections	20 ms	38	50%	15	100%	-	50%
11	Gated Reverb	10 ms	3.19 s	10%	40%	-21 dB	0.209 s	50%
12	Reverse Reverb	10 ms	3.19 s	10%	40%	-21 dB	0.376 s	50%
Delay								
13	Stereo Delay	350 ms	0 ms	450 ms	0 ms	35%	25%	50%
14	Tape Echo	190 ms	205 ms	50%	2402 Hz	176 Hz	5.32 kHz	50%
15	Ping Pong	320 ms	380 ms	45%	40%	190 ms	255 ms	50%
Modulation								
16	Stereo Chorus	0.247 Hz	50%	20.2 ms	180 d	Tri	0	50%
17	Analog Chorus	33	20	6	20	-	-	50%
18	Vintage Chorus	13	20	20	4	-	-	50%
19	Ultra Chorus	21	21	40	12	20	0	50%
20	Stereo Flanger	0.247 Hz	90%	80%	3.02 ms	45 d	4.54 kHz	50%
21	Vintage Flanger	13	16	20	11	-	-	50%
22	Jet Stream Flanger	16	6	20	11	-	-	50%
23	Stereo Phaser	1.526 Hz	100%	60%	180 d	2	Sin	100%
24	Vintage Phaser	28	100%	38	20	4	-	100%
25	Dual Phaser	28	100%	38	23	-	-	100%
26	Rotary	50	10%	20%	15%	50/50	316 Hz	100%
27	Pitch Shifter	+2	0 c	Ster.	0 c	Off	0 c	100%
28	Vibrato	1.27 Hz	85%	Sin.	25%	-	-	100%
29	Tremolo	2.2 Hz	50%	Opto	15%	-	-	100%
30	Auto Panning	3.21 Hz	80%	Sin.	0%	-	-	100%
Dynamics								
31	Compressor	4	-30 dB	+3 dB	3	37 ms	106 ms	100%
32	Expander	3.25	-9 dB	+3 dB	2	49 ms	167 ms	100%
33	Gated Reverb	54 ms	-12 dB	37 ms	37 ms	Mute	-	100%
34	Ana. Kompr./Lim.	3.00	-24 dB	+9.5 dB	0.0 dB	20 ms	Auto	100%
35	Ultramizer	36	9 dB	38	190 Hz	0%	12.5 kHz	Wide
36	Denoiser	916 Hz	75%	604 ms	-48 dB	33 ms	37 ms	100%
37	De-Esser	3.00	-36 dB	+6 dB	2.78 kHz	33 ms	Auto	Wide
38	Wave Designer	-25	+25	Ster.	0	Auto	0 dB	100%

Tab. 7.5: Parameter default settings of effects algorithms (continued on next page)

Nr.	Effect	Edit A	Edit B	Edit C	Edit D	Edit E	Edit F	Mix
Psycho Acoustics								
39	Exciter	7.08 kHz	1	25%	50%	Off	-	50%
40	Enhancer	11.0 kHz	2	10%	50%	251 Hz	11	40%
41	Ultrabass	110 Hz	25%	97 Hz	25%	3	50%	100%
42	Stereo Imager	50%	75%	Space	+1 dB	50%	50%	100%
43	Ultra Wide	40%	75%	1.01 kHz	-6 dB	-	-	100%
44	Binauralizer	40%	75%	Speaker	+6 dB	5	70%	100%
Filter/EQ								
45	Auto Filter	212 Hz	50%	LP.24	38	136 ms	442 ms	100%
46	LFO Filter	353 Hz	100%	BP.12	1..50	0.38 Hz	Tri	90%
47	Param. EQ	0 dB	1.43 kHz	2.24	0 dB	1.43 kHz	2.24	0 dB
48	Graph. EQ	0 dB	0 dB	0 dB	0 dB	0 dB	0 dB	0 dB
Distortion/Amp Simulation								
49	Vocal Distortion	51	25%	0.106 Hz	50%	3	0.321 Hz	100%
50	Tube Distortion	26	106 Hz	1.97 kHz	3.83 kHz	2	+8 dB	100%
51	Guitar Amp	60	65	100	51	8	0 dB	100%
52	Tri Fuzz	80	51	51	51	80	36	100%
53	Speaker Simulation	5	0 dB	1.43 kHz	2.24	-	-	100%
54	Ring Modulator	0.39 Hz	25%	179 Hz	2 kHz	LFO	-	100%
55	LoFi	7	2828 Hz	20%	40%	632 Hz	6.19 kHz	100%
Special FX								
56	Vinylizer	45.0 upm	75%	70%	60%	25	25	100%
57	Sampler	Stop	Stop	100%	Frwd	0.0 s	5.08 s	50%
58	Vocoder	25%	0%	24 ms	24 ms	-	-	100%
59	Voice Canceler	116 Hz	55%	50%	+1 dB	-	-	100%
60	Resonator	0.4 Hz	40%	298 Hz	-80%	LFO	-	100%
Combination								
61	Chorus & Reverb	0.285 Hz	100%	19.8 ms	60%	1.6 s	40%	65%
62	Flanger & Reverb	0.509 Hz	80%	+80%	40%	1.6 s	40%	62%
63	Leslie & Reverb	5.6 Hz	90%	50%	30%	1.0 s	40%	80%
64	Pitch & Reverb	+2	+0	0%	50%	1.6 s	40%	100%
65	Delay & Reverb	220 ms	50%	Ster.	55%	1.6 s	40%	50%
66	Tremolo & Reverb	3.97 Hz	100%	10%	40%	1.6 s	40%	80%
67	Phaser & Reverb	0.318 Hz	100%	-100%	40%	1.6 s	40%	50%
68	Chorus & Delay	0.318 Hz	100%	17.8 ms	30%	350 ms	40%	65%
69	Flanger & Delay	0.318 Hz	80%	+80%	30%	350 ms	40%	70%
70	Pitch & Delay	+4	+0	0%	30%	350 ms	40%	65%
71	Tremolo & Delay	0.73 Hz	95%	25%	15%	190 ms	40%	75%

Tab. 7.6: Parameter default settings of effects algorithms (continuation)

7.4 Parameter range of effects algorithms

Nr.	Effect	Edit A	Edit B	Edit C	Edit D	Edit E	Edit F	Mix
Reverb								
1	Cathedral	0 .. 200 ms	2.0 .. 8.0 s	0 .. 100%	-10 .. +10	0 .. 100%	1 .. 20	0 .. 100%
2	Gold Plate	0 .. 200 ms	1.2 .. 4.6 s	0 .. 100%	1 .. 50	0 .. 100%	1 .. 20	0 .. 100%
3	Small Hall	0 .. 50 ms	50 .. 380 ms	0 .. 100%	1 .. 50	0 .. 100%	20 .. 400 Hz	0 .. 100%
4	Room	0 .. 100 ms	1.0 .. 2.2 s	0 .. 100%	1 .. 50	0 .. 100%	1 .. 20	0 .. 100%
5	Concert	0 .. 200 ms	1.0 .. 5.0 s	0 .. 100%	-10 .. +10	0 .. 100%	1 .. 20	0 .. 100%
6	Studio	0 .. 50 ms	0.1 .. 1.0 s	0 .. 100%	20 .. 400 Hz	0 .. 30 dB	0.1 .. 10 kHz	0 .. 100%
7	Stage	0 .. 100 ms	0.6 .. 3.0 s	0 .. 100%	1 .. 50	15.0 .. 0.5 kHz	0 .. 100%	0 .. 100%
8	Spring Reverb	0 .. 50 ms	0.8 .. 2.0 s	0 .. 100%	0 .. 100%	0 .. 50	1 .. 20	0 .. 100%
9	Ambience	0 .. 50 ms	100 .. 640 ms	1 .. 20	1 .. 50	0 .. 30 dB	15.0 .. 0.5 kHz	0 .. 100%
10	Early Reflections	0 .. 200 ms	1 .. 50	0 .. 100%	1 .. 15	0 .. 100%	-	0 .. 100%
11	Gated Reverb	0 .. 200 ms	1 .. 10 s	0 .. 100%	0 .. 100%	0 .. -60 dB	0.02 .. 1 s	0 .. 100%
12	Reverse Reverb	0 .. 200 ms	1 .. 10 s	0 .. 100%	0 .. 100%	0 .. -60 dB	0.02 .. 1 s	0 .. 100%
Delay								
13	Stereo Delay	0 .. 5400 ms	0 .. 99 ms	0 .. 5400 ms	0 .. 99 ms	0 .. 100%	0 .. 100%	0 .. 100%
14	Tape Echo	0 .. 635 ms	0 .. 635 ms	0 .. 100%	0.1 .. 20 kHz	0.02 .. 10 kHz	0.1 .. 10 kHz	0 .. 100%
15	Ping Pong	0 .. 635 ms	0 .. 635 ms	0 .. 100%	0 .. 100%	0 .. 635 ms	0 .. 635 ms	0 .. 100%
Modulation								
16	Stereo Chorus	0.05 .. 5 Hz	0 .. 100%	5 .. 50 ms	0.45, 90, 180 d	Tri/Sine	0 .. 20	0 .. 100%
17	Analog Chorus	1 .. 50	1 .. 20	1 .. 20	1 .. 20	-	-	0 .. 100%
18	Vintage Chorus	1 .. 50	1 .. 20	1 .. 20	0 .. 20	-	-	0 .. 100%
19	Ultra Chorus	1 .. 50	1 .. 50	1 .. 50	1 .. 20	0 .. 20	0 .. 20	0 .. 100%
20	Stereo Flanger	0.05 .. 5 Hz	0 .. 100%	0 .. 100%	1 .. 10 ms	0.45, 90, 180 d	0.5 .. 20 kHz	0 .. 100%
21	Vintage Flanger	1 .. 50	1 .. 20	1 .. 20	1 .. 20	-	-	0 .. 100%
22	Jet Stream Flanger	1 .. 50	1 .. 20	1 .. 20	1 .. 20	-	-	0 .. 100%
23	Stereo Phaser	0.1 .. 10 Hz	0 .. 100%	0 .. 100%	0 .. 180 d	1, 2, 3	Tri, Sin, Squ	0 .. 100%
24	Vintage Phaser	1 .. 50	0 .. 100%	0 .. 50	1 .. 20	0 .. 20	-	0 .. 100%
25	Dual Phaser	1 .. 50	0 .. 100%	0 .. 50	1 .. 50	-	-	0 .. 100%
26	Rotary	1 .. 50	0 .. 100%	0 .. 100%	0 .. 100%	50/0 .. 0/50	0.1 .. 1 kHz	0 .. 100%
27	Pitch Shifter	-12 .. +12	-50 .. +50 c	St. -12 .. +12	-50 .. +50 c	Off. -12 .. +12	-50 .. +50 c	0 .. 100%
28	Vibrato	0.5 .. 20 Hz	0 .. 100%	Sin, Tri, Opto	0 .. 100%	-	-	0 .. 100%
29	Tremolo	0.5 .. 20 Hz	0 .. 100%	Sin, Tri, Opto, Squ, Sw, Up, Sw, Dw	0 .. 100%	-	-	0 .. 100%
30	Auto Panning	0.5 .. 20 Hz	0 .. 100%	Sin, Tri, Opto, Squ, Sw, Up, Sw, Dw	0 .. 100%	-	-	0 .. 100%
Dynamics								
31	Compressor	1.25 .. 100	-60 .. 0 dB	0 .. +24 dB	0 .. 6	50 .. 200 ms	0.05 .. 1 s	BYP, 100%
32	Expander	1.25 .. 100	-60 .. 0 dB	0 .. +24 dB	0 .. 6	50 .. 200 ms	0.05 - 1s	BYP, 100%
33	Gated Reverb	1 .. 1000 ms	-60 .. 0 dB	5 .. 200 ms	5 .. 500 ms	M, -60 .. 0 dB	-	BYP, 100%
34	Ana. Komp./Lim.	1.5 .. 100	-48 .. 0 dB	0 .. +24 dB	-24 .. 0 dB	1 .. 150 ms	50 .. 977 ms, A	BYP, 100%
35	Ultramizer	1 .. 100	0 .. 24 dB	1 .. 100	0.05 .. 10 kHz	0 .. 100%	2.5 .. 15 kHz	LO, HI, WD
36	Denoiser	0.04 .. 20 kHz	0 .. 100%	1 .. 1000 ms	-60 .. 0 dB	1 .. 1000 ms	5 .. 200 ms	BYP, 100%
37	De-Esser	1.5 .. 100	-48 .. 0 dB	0 .. +24 dB	0.5 .. 15 kHz	1 .. 150 ms	50 .. 977 ms, A	LO, HI, WD
38	Wave Designer	-50 .. +50	-50 .. +50	St. -50 .. +50	-50 .. +50	Auto, -24 .. +24 dB	Auto, -24 .. +24 dB	BYP, 100%

Tab. 7.7: Parameter range of effects algorithms (continued on next page)

Nr.	Effect	Edit A	Edit B	Edit C	Edit D	Edit E	Edit F	Mix
Psycho Acoustics								
39	Exciter	1 .. 10 kHz	1 .. 20	0 .. 100%	0 .. 100%	On, Off	-	0 .. 100%
40	Enhancer	2 .. 12 kHz	1 .. 20	0 .. 100%	0 .. 100%	50 .. 500 Hz	1 .. 20	0 .. 100%
41	Ultrabass	80 .. 150 Hz	0 .. 100%	30 .. 250 Hz	0 .. 100%	1 .. 7	0 .. 100%	BYP, 100%
42	Stereo Imager	0 .. 100%	0 .. 100%	Spread, Space	-6 .. +6 dB	0 .. 100%	0 .. 100%	BYP, 100%
43	Ultra Wide	0 .. 100%	0 .. 100%	0.1 .. 10 kHz	-12 .. +12 dB	-	-	BYP, 100%
44	Binauralizer	0 .. 100%	0 .. 100%	Phones, Speak	-12 .. +12 dB	0 .. 18	25 .. 100%	BYP, 100%
Filter/EQ								
45	Auto Filter	0.1 .. 15 kHz	0 .. 100%	LP12/24, HP12/24, BP12/24	1 .. 50	5 .. 2000 ms	5 .. 2000 ms	0 .. 100%
46	LFO Filter	Base Freq	0 .. 100%	LP12/24, HP12/24, BP12/24	1 .. 50	0.1 .. 20 Hz	Sin, Tri, Sw, Up, Sw, Dw, Squ	0 .. 100%
47	Param. EQ	-16 .. +16 dB	0.2 .. 10 kHz	0.5 .. 10	-16 .. +16 dB	0.2 .. 10 kHz	0.5 .. 10	-16 .. +16 dB
48	Graph. EQ	-16 .. +16 dB	-16 .. +16 dB	-16 .. +16 dB	-16 .. +16 dB	-16 .. +16 dB	-16 .. +16 dB	-16 .. +16 dB
Distortion/Amp Simulation								
49	Vocal Distortion	1 .. 100	0 .. 100%	0.05 .. 1 s	0 .. 100%	1, 2, 3	0.05 .. 2 Hz	0 .. 100%
50	Tube Distortion	1 .. 100	0.05 .. 1 kHz	1 .. 15 kHz	15 .. 1 kHz	1, 2, 3	-16 .. +16 dB	0 .. 100%
51	Guitar Amp	1 .. 100	1 .. 100	1 .. 100	1 .. 100	1 .. 8	-16 .. +16 dB	0 .. 100%
52	Tri Fuzz	1 .. 100	1 .. 100	1 .. 100	1 .. 100	1 .. 100	1 .. 100	0 .. 100%
53	Speaker Simulation	1 .. 8	-16 .. +16 dB	0.2 .. 10 kHz	0.5 .. 10	-	-	0 .. 100%
54	Ring Modulator	0.1 .. 10 Hz, 5 .. 500 ms, 1 .. 100 Hz	0 .. 100%	0.1 .. 10 kHz	0.2 .. 20 kHz	LFO, ENV, RAND, SIN	0 .. 100%	0 .. 100%
55	LoFi	24 .. 6	20 .. 0.4 kHz	0 .. 100%	0 .. 100%	0.02 .. 20 kHz	0.4 .. 20 kHz	0 .. 100%
Special FX								
56	Vinylizer	20 .. 80 upm	0 .. 100%	0 .. 100%	0 .. 100%	0 .. 50	0 .. 50	0 .. 100%
57	Sampler	Rec/Stop	Play/Stop	25 .. 400%	Back, Frwd, 1 .. 10 x	0 .. 5.04 s	0.04 .. 5.08 s	0 .. 100%
58	Vocoder	0 .. 100%	0 .. 100%	5 .. 200 ms	5 .. 200 ms	-	-	0 .. 100%
59	Voice Canceled	0.02 .. 1 kHz	0 .. 100%	0 .. 100%	-6 .. +6 dB	-	-	BYP, 100%
60	Resonator	0.1 .. 10 Hz, 5 .. 500 ms, 1 .. 100 Hz	0 .. 100%	0.2 .. 10 kHz	-100 .. +100%	LFO, ENV, RAND	0 .. 100%	0 .. 100%
Combination								
61	Chorus & Reverb	0.05 .. 5 Hz	0 .. 100%	5 .. 50 ms	0 .. 100%	0.5 .. 5 s	0 .. 100%	0 .. 100%
62	Flanger & Reverb	0.05 .. 5 Hz	0 .. 100%	-80 .. +80%	0 .. 100%	0.5 .. 5 s	0 .. 100%	0 .. 100%
63	Leslie & Reverb	1 .. 10 Hz	0 .. 100%	0 .. 100%	0 .. 100%	0.5 .. 5 s	0 .. 100%	0 .. 100%
64	Pitch & Reverb	-12 .. +12	-50 .. +50	0 .. 100%	0 .. 100%	0.5 .. 5 s	0 .. 100%	0 .. 100%
65	Delay & Reverb	30 .. 665 ms	0 .. 100%	Mo, St, PP, Tp	0 .. 100%	0.5 .. 5 s	0 .. 100%	0 .. 100%
66	Tremolo & Reverb	1 .. 10 Hz	0 .. 100%	0 .. 100%	0 .. 100%	0.5 .. 5 s	0 .. 100%	0 .. 100%
67	Phaser & Reverb	0.05 .. 5 Hz	0 .. 100%	-100 .. +100%	0 .. 100%	0.5 .. 5 s	0 .. 100%	0 .. 100%
68	Chorus & Delay	0.05 .. 5 Hz	0 .. 100%	5 .. 50 ms	0 .. 100%	30 .. 665 ms	0 .. 100%	0 .. 100%
69	Flanger & Delay	0.05 .. 5 Hz	0 .. 100%	-80 .. +80%	0 .. 100%	30 .. 665 ms	0 .. 100%	0 .. 100%
70	Pitch & Delay	-12 .. +12	-50 .. +50	0 .. 100%	0 .. 100%	30 .. 665 ms	0 .. 100%	0 .. 100%
71	Tremolo & Delay	0.05 .. 20 Hz	0 .. 100%	0 .. 100%	0 .. 100%	30 .. 665 ms	0 .. 100%	0 .. 100%

Tab. 7.8: Parameter range of effects algorithms (continuation)

8. SPECIFICATIONS

ANALOG INPUTS

Connectors	XLR and 1/4" TRS
Type	RF filtered, servo-balanced input stage
Impedance	80 k Ω balanced
Nominal Operating Level	-10 dBV or +4 dBu (selectable)
Max. Input Level	+15 dBu at +4 dBu nominal level, +1 dBV at -10 dBV nominal level

ANALOG OUTPUTS

Connectors	XLR and 1/4" TRS
Type	Electronically servo-balanced output stage
Impedance	80 Ω balanced
Max. Output Level	+15 dBu at +4 dBu nominal level, +1 dBV at -10 dBV nominal level

SYSTEM SPECIFICATIONS

Bandwidth	20 Hz to 20 kHz, +/- 3 dB
SNR	91 dB, unweighted, 20 Hz to 20 kHz
THD	0.018 % typ. @ +4 dBu, 1 kHz, 0 dBu input, gain 1
Crosstalk	< -76 dB

MIDI INTERFACE

Type	5-pin DIN-socket IN / OUT / THRU
------	----------------------------------

DIGITAL PROCESSING

Converters	24-bit Sigma-Delta, 64/128-times oversampling
Sampling Rate	46.875 kHz

DISPLAY

Type	4-digit 14 segment alpha-numeric LED-Display
------	--

POWER SUPPLY

Voltage	USA/Canada 120 V~, 60 Hz Europe/U.K./Australia 230 V~, 50 Hz Japan 100 V~, 50 - 60 Hz General export model 120/230 V~, 50 - 60 Hz
Fuse	100 - 120 V~: T 200 mA H 250 V 200 - 240 V~: T 100 mA L 250 V
Power Consumption	15 Watts max.
Mains Connection	Standard IEC receptacle

PHYSICAL

Dimensions (H x W x D)	1 3/4" x 19" x 8" (44 mm x 482,6 mm x 204,4 mm)
Net Weight	approx. 4 1/2 lbs (2 kg)
Shipping Weight	approx. 6 2/3 lbs (3 kg)