User's Manual

TOPVerb

40 Bit Digital Effects Module

SAFETY RELATED SYMBOLS

CAUTION
RISK OF ELECTRIC SHOCK
DO NOT OPEN

This symbol, wherever used, alerts you to the presence of un-insulated and dangerous voltages within the product enclosure. These are voltages that may be sufficient to constitute the risk of electric shock or death.

This symbol, wherever used, alerts you to important operating and maintenance instructions. Please read.

⏚ Protective Ground Terminal
∼ AC mains (Alternating Current)
⚡ Hazardous Live Terminal

ON: Denotes the product is turned on.
OFF: Denotes the product is turned off.

WARNING

Describes precautions that should be observed to prevent the possibility of death or injury to the user.

CAUTION

Describes precautions that should be observed to prevent damage to the product.

WARNING

• **Power Supply**

Ensure that the mains source voltage (AC outlet) matches the voltage rating of the product. Failure to do so could result in damage to the product and possibly the user. Unplug the product before electrical storms occur and when unused for long periods of time to reduce the risk of electric shock or fire.

• **External Connection**

Always use proper ready-made insulated mains cabling (power cord). Failure to do so could result in shock/death or fire. If in doubt, seek advice, from a registered electrician.

• **Do not Remove any Covers**

Within the product are areas where high voltages may present. To reduce the risk of electric shock do not remove any covers unless the AC mains power cord is removed.
Covers should be removed by qualified service personnel only.
No user serviceable parts inside.

• **Fuse**

To prevent fire and damage to the product, use only the recommended fuse type as indicated in this manual. Do not short-circuit the fuse holder. Before replacing the fuse, make sure that the product is OFF and disconnected from the AC outlet.

• **Protective Ground**

Before turning the product ON, make sure that it is connected to Ground. This is to prevent the risk of electric shock.
Never cut internal or external Ground wires. Likewise, never remove Ground wiring from the Protective Ground Terminal.

• **Operating Conditions**

Always install in accordance with the manufacturer's instructions.
To avoid the risk of electric shock and damage, do not subject this product to any liquid/rain or moisture. Do not use this product when in close proximity to water.

Do not install this product near any direct heat source.
Do not block areas of ventilation. Failure to do so could result in fire.
Keep product away from naked flames.

IMPORTANT SAFETY INSTRUCTIONS

Read these instructions
Follow all instructions
Keep these instructions. Do not discard.
Heed all warnings.
Only use attachments/accessories specified by the manufacturer.

• Power Cord and Plug

Do not tamper with the power cord or plug. These are designed for your safety.
Do not remove Ground connections!
If the plug does not fit your AC outlet seek advice from a qualified electrician.
Protect the power cord and plug from any physical stress to avoid risk of electric shock.
Do not place heavy objects on the power cord. This could cause electric shock or fire.

• Cleaning

When required, either blow off dust from the product or use a dry cloth.
Do not use any solvents such as Benzol or Alcohol.
For safety, keep product clean and free from dust.

• Servicing

Refer all servicing to qualified service personnel only.
Do not perform any servicing other than those instructions contained within the User's Manual.

Preface

Dear Customer:

Thank you for choosing the ▲LTO TOPVerb 40 bit digital effects module which is the result of our ▲LTO AUDIO TEAM's endeavours.

For ▲LTO AUDIO TEAM music and audio are much more than a job, they are a passion and an obsession!

We have, in fact, been designing professional audio products for a number of years in cooperation with many of the world's major brands.

The ▲LTO line represents unparalleled analogue and digital products made by musicians, for musicians. With our design centres in Italy, the Netherlands, and the United Kingdom we provide you with world-class designs, while our software development teams continue to develop and impressive range of audio specific algorithms.

By purchasing our ▲LTO products you become the most important member of our ▲LTO AUDIO TEAM. We would like to share with you our passion for what we design and we invite you to make suggestions, which will aid us in developing future products for you. We guarantee you our commitment to quality, continual research and development, and of course the best performance/price ratio.

Our ▲LTO TOPVerb is the result of many hours of listening and tests involving common people, area experts, musicians and technicians.

The result of this effort is the realization of effects such as reverb, chorus, flanger and delay that are today available in the best guitar amplifiers and studio equipment in the world, effects that we collected in our small, efficient and easy to use ▲LTO TOPVerb.

We would like to thank all the people that worked with us to make a vision real! Our designers and ▲LTO staff made the ▲LTO TOPVerb 40 bit digital effects module, a very reliable and high quality product. And thanks to their passion for music and professional audio it has been possible for us to offer you, our most important team member, our continued support too.

Thank you very much.
▲LTO AUDIO TEAM

Table of Contents

1. Introduction

Purchasing ▲LTO TOPVerb, you purchased a very powerful effect processor, easy to use and contained in a very small box.

▲LTO TOPVerb is divided in 16 effects algorithms and 16 variations for each of these algorithms. The variations modify the most important parameter of the current algorithm. The first 8 algorithms are reverb algorithms and have been designed following theory of different reverberation algorithms, taking care about the density and the body of the reverberated sound. The second 8 algorithms have been designed following the theory of modulation effects as chorus, flanger and rotary speakers. Within this second group of algorithms are included also the delay, tremolo and combined effects as delay/reverb, flanger/reverb and chorus/reverb.

All the algorithms are based on classical algorithms for the effects generation and environment response modeling, modified and optimized thanks to the experience of ▲LTO AUDIO TEAM researchers.

2. Feature List

· Robust and Compact Design
· 40 bits Digital Audio Processor
· Automatic Bypass Foot Switch Detection
· 16 Great Sounding Programs
· Variation Adjust Knob (16 positions)
· Analog Mix (Dry/Wet) Potentiometer
· Variable Input/Output Gain
· Stereo/Mono Jack Inputs on 1/4" phone jacks
· Digital Saturation LED
· Up to 9dBu Line Level
· Easy to Operate Front Panel Controls
· SMT Design for Greater Reliability
· Manufactured Under QS9000, VDA6.1 Quality System

3. Front and Back Panels Description

3.1 Control Panel (Front Panel)

1 HALL1	8 PLATE2	15 CHORUS / REV.	22 ∼	29 ∼	36 ∼	
2 HALL2	9 TREMOLO	16 ROTARY	23 ∼	30 ∼	37 ∼	
3 HALL3	10 CHORUS	17 ∼	24 ∼	31 ∼	38 ∼	
4 SPRING1	11 FLANGER	18 ∼	25 ∼	32 ∼	39 ∼	
5 SPRING2	12 DELAY	19 ∼	26 ∼	33 ∼	40 ∼	
6 TAPE	13 DELAY / REV.	20 ∼	27 ∼	34 ∼	41 ∼	
7 PLATE1	14 FLANGER / REV.	21 ∼	28 ∼	35 ∼	42 ∼	
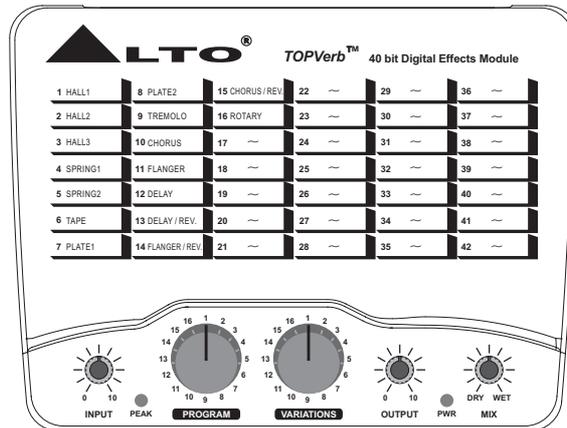
a. Program and Variations Selections

- **Program Select Knob:** The Program Select Knob is used to choose the program you wish to perform.

- **Variations Select Knob:** Each program on this apparatus has one parameter which can be adjusted. Depending on the type of program selected, this knob might alter reverb decay, chorus depth, etc.

b. Analog levels

- **Analog Input Level Potentiometer:** The input level control sets the main input Gain, before the signal reaches the input bus. It controls both the Left (Mono) and Right input levels simultaneously.

- **Analog Output Level Potentiometer:** The output level control sets the level of the output signal going to the amplifier or mixer from TOPVerb.

- **Dry/Wet Mix Potentiometer:** Adjusts the balance between the dry signal coming into the input and the effects generated by TOPVerb.

c. PEAK LED and Power LED

- **PEAK LED:** This LED lights up when the input signal is too strong. In case of the unit being muted, this LED also lights up.

- **Power LED:** when this unit is connected to mains, this LED will turn red, which means the unit is in the state of standby.

3.2 Analog Connections (Back Panel)
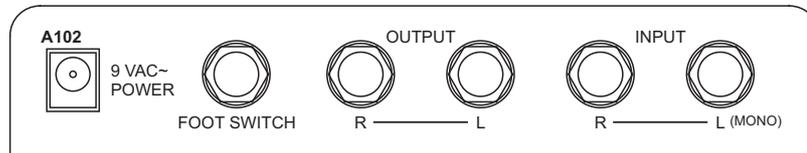
a. Analog Inputs/Outputs

- **Inputs:** These are 1/4" unbalanced phone jacks which connect to sources such as the effects sends of mixing console. They may be used with nominal input level.
For mono application, use the Left / Mono input. The Left / Mono input jack is normal to the Right jack. This means that when nothing is plugged into the Right input jack, the signal present at the Left / Mono input is routed to the Right as well.

- **Outputs:** These are 1/4" unbalanced phone jacks which connect to devices such as the effects returns on a mixing console or power amplifier inputs.

b. Foot switch

- **Foot Switch:** This is a 1/4" phone jack, which allows connecting a footswitch for muting the unit. If you want to activate or inactivate the effects, only to touch the footswtich.

c. Power Connector

- **Power connector:** This is a plug for connecting the 9VAC power supply adaptor provided by the manufacturer.

4. Installation & Connection

4.1 Audio Connections and Power Up

a. Audio Connections

The connections between the TOPVerb and the other audio devices have to be made using high quality cables so to prevent bad performances of the TOPVerb itself. So it should be good to use low-capacitance shielded cables with a flexible internal conductor.

b. Power Up Setting

Before turning on the system's power, please use the following procedure, check if:
· All connections have been made correctly.
· The volume controls of the amplifier or mixer are turned down.

Insert the Power plug into the POWER input on the rear panel of the TOPVerb and plug the power adapter into an AC outlet.

Turn on the power of the amplifier/mixer, and adjust the volume.

4.2. Installation

a. Standard Use

The TOPVerb may be placed almost anywhere: on a table, on top of an amp, next to a mixing console. If it will be on furniture, check the rubber feet provided to the bottom of the unit. Make sure to place the TOPVerb's power supply away from other audio equipment that may induce fields, and away from the signal wiring. It is possible that TOPVerb may pick up noise fields generated by other equipment such as large power amplifiers; in this case, move the TOPVerb until the noise goes away.

b. Application Examples

- LINE INSTRUMENT

When connecting audio cables and/or power cord to mains, make sure that all devices in your system have their volume controls turned down.

The TOPVerb has two 1/4" unbalanced inputs and two 1/4" unbalanced outputs. These input/output configuration may provide three different audio connections options:

· **MONO.** Connect an audio cable to the [LEFT] INPUT of the TOPVerb from a mono source, and another audio cable from the [LEFT] output of the TOPVerb to an amplification system or mixer input.
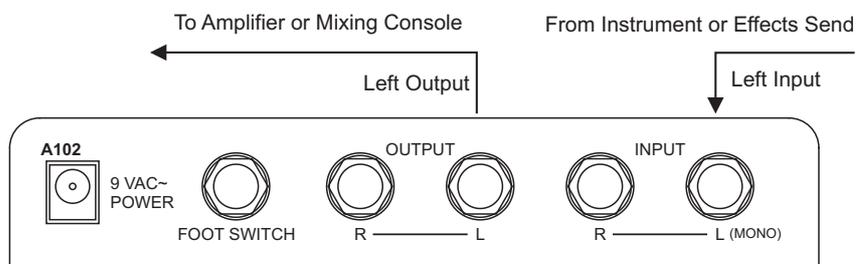
· **MONO IN, STEREO OUT.** While still using a mono input, you could connect two audio cables to the [LEFT] and [RIGHT] outputs of the TOPVerb to a stereo amplification system or two mixer inputs.

To Amplifier or Mixing Console

From Instrument or Effects Send

Right Output | Left Output

Left Input

A102

9 VAC~
POWER

OUTPUT

INPUT

FOOT SWITCH

R ——— L

R ——— L (MONO)
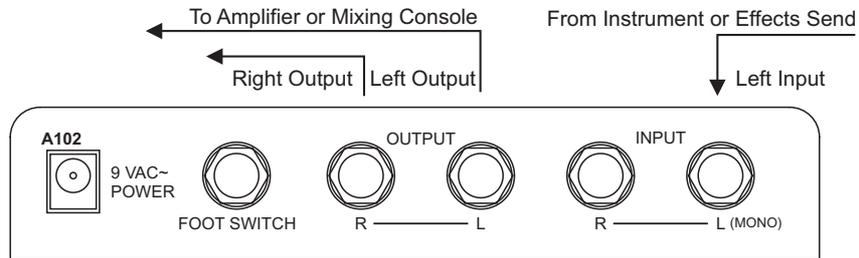
- **STEREO.** Connect two audio cables to the [LEFT] and [RIGHT] INPUTS of the TOPVerb from a stereo source, and two other audio cables from the [LEFT] and [RIGHT] OUTPUTS of the TOPVerb to a stereo amplification system or two mixer inputs.

To Amplifier or Mixing Console

From Instrument or Effects Send

Right Output | Left Output

Right Input | Left Input

A102

9 VAC~
POWER

OUTPUT

INPUT

FOOT SWITCH

R ——— L

R ——— L (MONO)
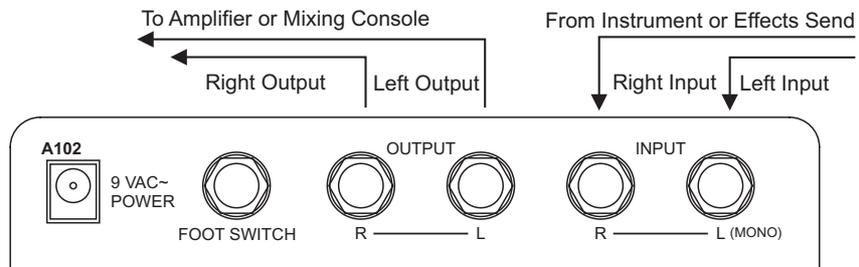
- **MIXER**

Interfacing to a Mixing Console

The TOPVerb can accept mono or stereo sends at all system levels. The input circuitry of the TOPVerb can easily accept professional +8/9dBu levels while having enough input and output gain to interface with the low signal levels of home recording systems.

Aux Send

Aux Return

MIXING CONSOLE

A102

9 VAC~
POWER

OUTPUT

INPUT

FOOT SWITCH

R ——— L

R ——— L (MONO)
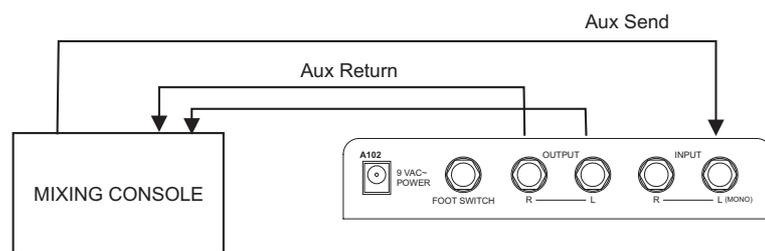
The TOPVerb may be connected to a mixing console in several different ways. It can be used to with multiple channels at once by using the auxiliary send and return controls of the mixer. Another way of interfacing is to connect the TOPVerb directly to the insert send and return of a single channel that is to be effected. More, TOPVerb could be to connected to a mixer or recording console

in-line between the output of the mixing console and the input of a tape deck or power amplifier. This last setup would effect the entire mix output.

5. Preset Functions Descriptions

5.1 Presets

1). Hall 1

This is a large bright hall program with 54ms predelay, and can be used for almost anything.

2). Hall 2

This is a warmer hall program with 54ms predelay, and adds depth and character to acoustic instruments.

3). Hall 3

The third program is a medium bright hall with no predelay, and can be used on rock snares and percussions.

4). Spring1

This program is suitable for organs and will still find them in many guitar amplifiers.

5). Spring2

This program is similar to the previous one, and also be used in organs and guitar amplifiers.

6). Tape

This program allows you to create more complex patterns that can add a rhythmic quality to the instrument.

7). Plate1

The plate algorithm simulates the "sound" of a classic plate reverb. The plate1 is a classic bright vocal plate.

8). Plate2

A warmer variation of the previous program, sounding very well on acoustic guitar and strings.

9). Tremolo

This program provides an amplitude modulation of the input signal and is normally used as "WET" effect without adding direct sound or adding a few percentage of it, so to avoid the direct sound to cover the amplitude modulation.

10). Chorus

This program tries to recreate the illusion of more than one instrument from a single instrument sound. Typical modulated effect suitable for vocals, guitar and keyboards.

11). Flanger

Typical flanging effect, particularly effective on guitar and other string instruments.

12). Delay

This program provides a delay of up to 650ms. The delay time can be adjusted in terms of delay and the decay time depends automatically from the delay time. This is a useful utility program which can add space to vocals or instruments.

13). Delay + Reverb

The multi-effects program adds a room to the different delay presets. Particularly suitable for the use with vocals.

14). Flanger + Reverb

The multi-effects program is a layered stereo flange and large room reverb. It works great on guitars, synths and electric pianos.

15). Chorus + Reverb

The multi-effects program is a layered stereo chorus and large room reverb. Also that one works great on guitars, synths and electric pianos.

16). Rotary

The rotary speaker effect simulates the sound effect achieved by rotating horn speakers and a bass cylinder. It can be used for organs and guitar amplification.

5.2 Effects Summary Table

<u>TOPVerb PRESET LEST</u>

01. Hall 1

No.	Rev Time	Room Size	Rev. Type	Pre-Delay	Hi Damp	Efx	Connect type
1	0.70	8.00	Hall	54	-12	100	D(D)
2	0.70	9.03	Hall	54	-12	98	D(D)
3	0.70	10.06	Hall	54	-12	96	D(D)
4	0.70	11.08	Hall	54	-12	94	D(D)
5	1.20	12.11	Hall	54	-12	92	D(D)
6	1.20	13.14	Hall	54	-12	90	D(D)
7	1.20	14.17	Hall	54	-12	88	D(D)
8	1.20	15.19	Hall	54	-12	86	D(D)
9	2.10	8.00	Hall	54	-12	84	D(D)
10	2.10	9.03	Hall	54	-12	82	D(D)
11	2.10	10.06	Hall	54	-12	80	D(D)
12	2.10	11.08	Hall	54	-12	78	D(D)
13	2.90	12.11	Hall	54	-12	76	D(D)
14	2.90	13.14	Hall	54	-12	74	D(D)
15	2.90	14.17	Hall	54	-12	72	D(D)
16	2.90	15.19	Hall	54	-12	70	D(D)

02. Hall 2							
No.	Rev Time	Room Size	Rev. Type	Pre-Delay	Hi Damp	Efx	Connect type
1	3.6	16.22	Hall	54	-12	100	D(D)
2	3.6	17.25	Hall	54	-12	98	D(D)
3	3.6	18.28	Hall	54	-12	96	D(D)
4	3.6	19.31	Hall	54	-12	94	D(D)
5	4.0	20.33	Hall	54	-12	92	D(D)
6	4.0	21.36	Hall	54	-12	90	D(D)
7	4.0	22.39	Hall	54	-12	88	D(D)
8	4.0	23.42	Hall	54	-12	86	D(D)
9	4.5	16.22	Hall	54	-12	84	D(D)
10	4.5	17.25	Hall	54	-12	82	D(D)
11	4.5	18.28	Hall	54	-12	80	D(D)
12	4.5	19.31	Hall	54	-12	78	D(D)
13	6.1	20.33	Hall	54	-12	76	D(D)
14	6.1	21.36	Hall	54	-12	74	D(D)
15	6.1	22.39	Hall	54	-12	72	D(D)
16	6.1	23.42	Hall	54	-12	70	D(D)

03. Hall 3							
No.	Rev Time	Room Size	Rev. Type	Pre-Delay	Hi Damp	Efx	Connect type
1	0.70	24.44	Hall	0	-12	100	D(D)
2	0.70	25.47	Hall	0	-12	98	D(D)
3	0.70	26.50	Hall	0	-12	96	D(D)
4	0.70	27.53	Hall	0	-12	94	D(D)
5	1.20	28.56	Hall	0	-12	92	D(D)
6	1.20	29.58	Hall	0	-12	90	D(D)
7	1.20	30.61	Hall	0	-12	88	D(D)
8	1.20	31.64	Hall	0	-12	86	D(D)
9	2.10	32.67	Hall	0	-12	84	D(D)
10	2.10	33.69	Hall	0	-12	82	D(D)
11	2.10	34.72	Hall	0	-12	80	D(D)
12	2.10	35.75	Hall	0	-12	78	D(D)
13	2.90	36.78	Hall	0	-12	76	D(D)
14	2.90	37.81	Hall	0	-12	74	D(D)
15	2.90	40.89	Hall	0	-12	72	D(D)
16	2.90	45.00	Hall	0	-12	70	D(D)

04. Spring 1

No.	Rev Time	Room Size	Rev. Type	Pre-Delay	Hi Damp	Efx	Connect type
1	0.70	8.00	Spring	3	-0.16	100	D(D)
2	0.70	9.03	Spring	3	-0.16	98	D(D)
3	0.70	10.06	Spring	3	-0.16	96	D(D)
4	0.70	11.08	Spring	3	-0.16	94	D(D)
5	1.20	12.11	Spring	3	-0.16	92	D(D)
6	1.20	13.14	Spring	3	-0.16	90	D(D)
7	1.20	14.17	Spring	3	-0.16	88	D(D)
8	1.20	15.19	Spring	3	-0.16	86	D(D)
9	2.10	16.22	Spring	3	-0.16	84	D(D)
10	2.10	17.25	Spring	3	-0.16	82	D(D)
11	2.10	18.28	Spring	3	-0.16	80	D(D)
12	2.10	19.31	Spring	3	-0.16	78	D(D)
13	2.90	20.33	Spring	3	-0.16	76	D(D)
14	2.90	21.36	Spring	3	-0.16	74	D(D)
15	2.90	22.39	Spring	3	-0.16	72	D(D)
16	2.90	23.42	Spring	3	-0.16	70	D(D)

05. Spring 2

No.	Rev Time	Room Size	Rev. Type	Pre-Delay	Hi Damp	Efx	Connect type
1	3.6	26.50	Spring	9	-12	100	D(D)
2	3.6	27.53	Spring	9	-12	98	D(D)
3	3.6	28.56	Spring	9	-12	96	D(D)
4	3.6	29.58	Spring	9	-12	94	D(D)
5	4.0	30.61	Spring	9	-12	92	D(D)
6	4.0	31.64	Spring	9	-12	90	D(D)
7	4.0	32.67	Spring	9	-12	88	D(D)
8	4.0	33.69	Spring	9	-12	86	D(D)
9	4.5	34.72	Spring	9	-12	84	D(D)
10	4.5	35.75	Spring	9	-12	82	D(D)
11	4.5	36.78	Spring	9	-12	80	D(D)
12	4.5	37.81	Spring	9	-12	78	D(D)
13	6.1	38.83	Spring	9	-12	76	D(D)
14	6.1	39.86	Spring	9	-12	74	D(D)
15	6.1	40.89	Spring	9	-12	72	D(D)
16	6.1	45.00	Spring	9	-12	70	D(D)

06. Tape

No.	Rev Time	Room Size	Rev. Type	Pre-Delay	Hi Damp	Efx	Connect type
1	0.70	8.00	Tape	19	-12	100	D(D)
2	0.80	8.00	Tape	19	-12	98	D(D)
3	0.90	8.00	Tape	19	-12	96	D(D)
4	1.00	8.00	Tape	19	-12	94	D(D)
5	1.20	8.00	Tape	19	-12	92	D(D)
6	1.50	8.00	Tape	19	-12	90	D(D)
7	1.70	8.00	Tape	19	-12	88	D(D)
8	1.70	8.00	Tape	19	-12	86	D(D)
9	2.10	8.00	Tape	19	-12	84	D(D)
10	2.40	8.00	Tape	19	-12	82	D(D)
11	2.40	8.00	Tape	19	-12	80	D(D)
12	2.90	8.00	Tape	19	-12	78	D(D)
13	3.60	8.00	Tape	19	-12	76	D(D)
14	4.00	8.00	Tape	19	-12	74	D(D)
15	4.50	8.00	Tape	19	-12	72	D(D)
16	6.10	8.00	Tape	19	-12	70	D(D)

07. Plates 1

No.	Rev Time	Room Size	Rev. Type	Pre-Delay	Hi Damp	Efx	Connect type
1	0.70	8.00	Plate	19	-12	100	D(D)
2	0.70	9.03	Plate	19	-12	98	D(D)
3	0.70	10.06	Plate	19	-12	96	D(D)
4	0.70	11.08	Plate	19	-12	94	D(D)
5	1.20	12.11	Plate	19	-12	92	D(D)
6	1.20	13.14	Plate	19	-12	90	D(D)
7	1.20	14.17	Plate	19	-12	88	D(D)
8	1.20	15.19	Plate	19	-12	86	D(D)
9	2.10	16.22	Plate	19	-12	84	D(D)
10	2.10	17.25	Plate	19	-12	82	D(D)
11	2.10	18.28	Plate	19	-12	80	D(D)
12	2.10	19.31	Plate	19	-12	78	D(D)
13	2.90	20.33	Plate	19	-12	76	D(D)
14	2.90	21.36	Plate	19	-12	74	D(D)
15	2.90	22.39	Plate	19	-12	72	D(D)
16	2.90	23.42	Plate	19	-12	70	D(D)

08. Plates 2							
No.	Rev Time	Room Size	Rev. Type	Pre-Delay	Hi Damp	Efx	Connect type
1	1.20	26.50	Plate	19	-0.16	100	D(D)
2	1.20	27.53	Plate	19	-0.16	98	D(D)
3	1.20	28.56	Plate	19	-0.16	96	D(D)
4	1.20	29.58	Plate	19	-0.16	94	D(D)
5	2.10	30.61	Plate	19	-0.16	92	D(D)
6	2.10	31.64	Plate	19	-0.16	90	D(D)
7	2.10	32.67	Plate	19	-0.16	88	D(D)
8	2.10	33.69	Plate	19	-0.16	86	D(D)
9	2.40	34.72	Plate	19	-0.16	84	D(D)
10	2.40	35.75	Plate	19	-0.16	82	D(D)
11	2.40	36.78	Plate	19	-0.16	80	D(D)
12	2.40	37.81	Plate	19	-0.16	78	D(D)
13	2.90	38.83	Plate	19	-0.16	76	D(D)
14	2.90	39.86	Plate	19	-0.16	74	D(D)
15	2.90	40.89	Plate	19	-0.16	72	D(D)
16	2.90	45.00	Plate	19	-0.16	70	D(D)

09. Tremolo					10. Chorus				
No.	Mod Freq.	Amplit Mod	Efx	Connect type	No.	Mod Freq.	Pitch Depth	Efx	Connect type
1	0.3	95	100	C(M)	1	0.10	100	100	C(M)
2	0.6	95	100	C(M)	2	0.21	100	100	C(M)
3	0.9	95	100	C(M)	3	0.32	100	100	C(M)
4	1.2	75	100	C(M)	4	0.60	100	100	C(M)
5	1.5	75	100	C(M)	5	0.76	100	100	C(M)
6	1.8	75	100	C(M)	6	0.96	100	100	C(M)
7	2.1	75	100	C(M)	7	1.37	100	100	C(M)
8	2.4	75	100	C(M)	8	2.16	100	100	C(M)
9	2.7	55	100	C(M)	9	0.11	75	100	C(M)
10	3.0	55	100	C(M)	10	0.94	75	100	C(M)
11	3.3	55	100	C(M)	11	1.61	75	100	C(M)
12	3.6	55	100	C(M)	12	2.13	75	100	C(M)
13	3.9	35	100	C(M)	13	1.78	75	100	C(M)
14	4.2	35	100	C(M)	14	2.50	75	100	C(M)
15	4.5	35	100	C(M)	15	3.33	75	100	C(M)
16	5.0	35	100	C(M)	16	3.50	75	100	C(M)

11. Flange							12. Delay				
No.	Mod Freq.	Amplit Mod	Feedback L/R	Dir Level	Efx	Connect type	No.	Delay R/L	Feedback L/R	Efx	Connect type
1	0.07	100	67	40	100	C(M)	1	30	0	100	C(D)
2	0.07	100	75	40	100	C(M)	2	40	0	100	C(D)
3	0.07	100	82	40	100	C(M)	3	50	0	100	C(D)
4	0.16	100	60	40	100	C(M)	4	60	0	100	C(D)
5	0.16	100	72	40	100	C(M)	5	70	0	100	C(D)
6	0.16	100	82	40	100	C(M)	6	82	0	100	C(D)
7	0.16	100	89	40	100	C(M)	7	104	40	100	C(D)
8	0.16	100	92	40	100	C(M)	8	204	40	100	C(D)
9	0.22	100	82	40	100	C(M)	9	304	40	100	C(D)
10	0.33	100	82	40	100	C(M)	10	354	40	100	C(D)
11	0.57	100	82	40	100	C(M)	11	400	40	100	C(D)
12	0.76	100	82	40	100	C(M)	12	450	40	100	C(D)
13	1.00	100	82	40	100	C(M)	13	500	40	100	C(D)
14	1.33	100	82	40	100	C(M)	14	550	40	100	C(D)
15	1.42	100	82	40	100	C(M)	15	600	40	100	C(D)
16	1.88	100	82	40	100	C(M)	16	650	40	100	C(D)

13. Delay/Rev							
No.	Delay R/L	Feedback L/R	Rev Time	Room Size	Hi Damp	Efx	Connect type
1	30	0	0.70	8	-12	100	C(D)
2	40	0	0.80	8	-12	98	C(D)
3	50	0	0.90	8	-12	96	C(D)
4	60	0	1.00	8	-12	94	C(D)
5	70	0	1.20	8	-12	92	C(D)
6	82	0	1.50	8	-12	90	C(D)
7	104	40	1.70	8	-12	88	C(D)
8	204	40	1.70	8	-12	86	C(D)
9	304	40	2.10	8	-12	84	C(D)
10	354	40	2.40	8	-12	82	C(D)
11	400	40	2.40	8	-12	80	C(D)
12	450	40	2.90	8	-12	78	C(D)
13	500	40	3.60	8	-12	76	C(D)
14	550	40	4.00	8	-12	74	C(D)
15	600	40	4.50	8	-12	72	C(D)
16	650	40	6.10	8	-12	70	C(D)

14. Flange/Rev								
No.	Mod Freq.	Pitch Depth	Feedback L/R	Dir Level	Rev Time	Room Size	Hi Damp	Connect type	Efx
1	0.07	100	67	40	0.70	8	-12	C(M)	100
2	0.07	100	75	40	0.80	8	-12	C(M)	98
3	0.07	100	82	40	0.90	8	-12	C(M)	96
4	0.16	100	60	40	1.00	8	-12	C(M)	94
5	0.16	100	72	40	1.20	8	-12	C(M)	92
6	0.16	100	82	40	1.50	8	-12	C(M)	90
7	0.16	100	89	40	1.70	8	-12	C(M)	88
8	0.16	100	92	40	1.70	8	-12	C(M)	86
9	0.22	100	82	40	2.10	8	-12	C(M)	84
10	0.33	100	82	40	2.40	8	-12	C(M)	82
11	0.57	100	82	40	2.40	8	-12	C(M)	80
12	0.76	100	82	40	2.90	8	-12	C(M)	78
13	1.00	100	82	40	3.60	8	-12	C(M)	76
14	1.33	100	82	40	4.00	8	-12	C(M)	74
15	1.42	100	82	40	4.50	8	-12	C(M)	72
16	1.88	100	82	40	6.10	8	-12	C(M)	70

15. Chorus/Rev							
No.	Delay R/L	Feedback (L/R)	Rev Time	Room Size	Hi Damp	Efx	Connect type
1	0.10	100	0.70	8	-12	100	C(M)
2	0.21	100	0.80	8	-12	98	C(M)
3	0.32	100	0.90	8	-12	96	C(M)
4	0.60	100	1.00	8	-12	94	C(M)
5	0.76	100	1.20	8	-12	92	C(M)
6	0.96	100	1.50	8	-12	90	C(M)
7	1.37	100	1.70	8	-12	88	C(M)
8	2.16	100	1.70	8	-12	86	C(M)
9	0.11	75	2.10	8	-12	84	C(M)
10	0.94	75	2.40	8	-12	82	C(M)
11	1.61	75	2.40	8	-12	80	C(M)
12	2.13	75	2.90	8	-12	78	C(M)
13	1.78	75	3.60	8	-12	76	C(M)
14	2.50	75	4.00	8	-12	74	C(M)
15	3.33	75	4.50	8	-12	72	C(M)
16	3.50	75	6.10	8	-12	70	C(M)

16. Rotary

No.	Mod Freq	Pitch Depth	Feedback	Dir Level		Efx	Connect type
1	1	10	40	40		100	C(M)
2	4	20	40	40		100	C(M)
3	1	30	40	40		100	C(M)
4	4	40	40	40		100	C(M)
5	1	50	40	40		100	C(M)
6	4	60	40	40		100	C(M)
7	1	70	40	40		100	C(M)
8	4	80	40	40		100	C(M)
9	3	10	40	40		100	C(M)
10	5	20	40	40		100	C(M)
11	3	30	40	40		100	C(M)
12	5	40	40	40		100	C(M)
13	3	50	40	40		100	C(M)
14	5	60	40	40		100	C(M)
15	3	70	40	40		100	C(M)
16	5	80	40	40		100	C(M)

P.S.

A: 1 input - 2 mono output

B: 2 input - 2 mono output

C: 1 input - 1 stereo output - paralle.efx

D: 1 input - 1 stereo output - series.efx

E: 2 input - 1 stereo output

(M): Modulator

(D): Delay

6.2 Specifications

Electrical	Frequency Response:	+0.5 / -1.5 dB from 20Hz to 20 kHz
	S/N Ratio (process)	80 dB "A" wtg, 20 Hz-22kHz
	S/N Ratio (bypass)	>90 dB "A" wtg, 20 Hz-22kHz
	THD+Noise:	<0.008% @ 1kHz (0dBV, bypass)
Input	Number of Channels:	2
	Format:	1/4" unbalanced
	Maximum Level (bypass):	+9 dBu
	Impedance:	>500 Kohms
A/D - D/A Conversions	A/D converter:	1 bit Sigma-Delta
	D/A converter:	1 bit Sigma-Delta
Output	Number of Channels:	2
	Format:	1/4" unbalanced
	Maximum Level (bypass):	+9 dBu
	Output Impedance:	<500 ohms
Front Panel	Controls	IN/OUT levels (ANALOG)
		PROGRAM selections (2 knobs)
	Indicators	Power, Signal clip LED
Rear Panel	Input (LEFT/MONO, RIGHT)	1/4" 2-conductor (mono)
	Output (LEFT, RIGHT)	1/4" 2-conductor (mono)
	BYPASS	1/4" 2-conductor (auto-sense pedal type)
		for momentary footswitches
	Power	9 Volt AC Power Transformer
Processing and Memory	Processor Speed:	12 MIPs (million instructions per second)
	Internal DSP resolution:	52 bit MPY accumulator
	Main Preset Programs	16
	Preset Total Combinations	256
	Internal digital audio memory:	3000 milliseconds
Physical	Net Weight:	0.57kg(1.26lb)
	Dimension:	175(W)×130(D)×42(H)mm
		(6.89" × 5.12"× 1.65")

7. WARRANTY

7.1 Warranty registration card

To obtain Warranty Service, the buyer should first fill out and return the enclosed Warranty Registration Card within 10 days of the Purchase Date.
All the information presented in this Warranty Registration Card gives the manufacturer a better understanding of the sales status, so as to purport a more effective and efficient after-sales warranty service.
Please fill out all the information carefully and genuinely, miswriting or absence of this card will void any of your warranty service.

7.2 Return notice

a. In case of return for any warranty service, please make sure that the product is well packed in its original shipping carton, and it can protect your unit from any other extra damage.
b. Please provide a copy of your sales receipt or other proof of purchase with the returned machine, and give detail information about your return address and contact telephone number.
c. A brief description of the defect will be appreciated.
d. Please prepay all the costs involved in the return shipping, handling and insurance.

7.3 Terms and conditions

a. ▲LTO warrants that this product will be free from any defects in materials and/or workmanship for a period of 1 year from the purchase date if you have completed the Warranty Registration Card in time.
b. The warranty service is only available to the original consumer, who purchased this product directly from the retail dealer, and it can not be transferred.
c. During the warranty service, ▲LTO may repair or replace this product at its own option at no charge to you for parts or for labor in accordance with the right side of this limited warranty.
d. This warranty does not apply to the damages to this product that occurred as the following conditions:
  - Instead of operating in accordance with the user's manual thoroughly, any abuse or misuse of this product.
  - Normal tear and wear
  - The product has been altered or modified in any way .
  - Damage which may have been caused either directly or indirectly by another product/force/etc.
  - Abnormal service or repairing by anyone other than the qualified personnel or technician. And in such cases, all the expenses will be charged to the buyer.

e. In no event shall ▲LTO be liable for any incidental or consequential damages. Some states do not allow the exclusion or limitation of incidental or consequential damages, so the above exclusion or limitation may not apply to you.

f. This warranty gives you the specific rights, and these rights are compatible with the state laws, you may also have other statutory rights that may vary from state to state.