APM120/APM160
POWERED MIXER
IMPORTANT SAFETY INSTRUCTION

CAUTION
RISK OF ELECTRIC SHOCK
DO NOT OPEN

TO REDUCE THE RISK OF ELECTRIC SHOCK
PLEASE DO NOT REMOVE THE COVER OR
THE BACK PANEL OF THIS EQUIPMENT.
THERE ARE NO PARTS NEEDED BY USER
INSIDE THE EQUIPMENT. FOR SERVICE,
PLEASE CONTACT QUALIFIED SERVICE
CENTERS.

WARNING
To reduce the risk of electric shock and fire, do not expose this equipment to moisture or rain.

Dispose of this product should not be placed in municipal waste and should be separate collection.

11. Move this Equipment only with a cart, stand, tripod, or bracket, specified by the manufacturer, or sold with the Equipment. When a cart is used, use caution when moving the cart / equipment combination to avoid possible injury from tip over.

12. Permanent hearing loss may be caused by exposure to extremely high noise levels. The US. Government’s Occupational Safety and Health Administration (OSHA) has specified the permissible exposure to noise level. These are shown in the following chart:

<table>
<thead>
<tr>
<th>HOURS X DAY</th>
<th>SPL</th>
<th>EXAMPLE</th>
</tr>
</thead>
<tbody>
<tr>
<td>8</td>
<td>90</td>
<td>Small gig</td>
</tr>
<tr>
<td>6</td>
<td>92</td>
<td>train</td>
</tr>
<tr>
<td>4</td>
<td>95</td>
<td>Subway train</td>
</tr>
<tr>
<td>3</td>
<td>97</td>
<td>High level desktop monitors</td>
</tr>
<tr>
<td>2</td>
<td>100</td>
<td>Classic music concert</td>
</tr>
<tr>
<td>1.5</td>
<td>102</td>
<td></td>
</tr>
<tr>
<td>1</td>
<td>105</td>
<td></td>
</tr>
<tr>
<td>0.5</td>
<td>110</td>
<td></td>
</tr>
<tr>
<td>0,25 or less</td>
<td>115</td>
<td>Rock concert</td>
</tr>
</tbody>
</table>

According to OSHA, an exposure to high SPL in excess of these limits may result in the loss of heat. To avoid the potential damage of heat, it is recommended that Personnel exposed to equipment capable of generating high SPL wear hearing protection while such equipment is under operation.

The apparatus shall be connected to a mains socket outlet with a protective earthing connection.

The mains plug or an appliance coupler is used as the disconnect device, the disconnect device shall remain readily operable.

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.

CAUTION
Describes precautions that should be observed to prevent damage to the product.
1. Read this Manual carefully before operation.
2. Keep this Manual in a safe place.
3. Be aware of all warnings reported with this symbol.
4. Keep this Equipment away from water and moisture.
5. Clean it only with dry cloth. Do not use solvent or other chemicals.
6. Do not damp or cover any cooling opening. Install the equipment only in accordance with the Manufacturer's instructions.
7. Power Cords 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.
8. Unplug this equipment when unused for long periods of time or during a storm.
9. Refer all service to qualified service personnel only. Do not perform any servicing other than those instructions contained within the User's Manual.
10. 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.
Thank you for your purchasing of the L TO APM120 12-channel (16-channel for APM 160) power mixer with 24-bit digital multi-effect built-in. It is just one of the many LTO products that a talented, multinational Team of Audio Engineers and Musicians have developed with their great passion for music. Your APM is a remarkable compact powered mixer that doesn't find many equals in the market today. With 8 microphone (12 microphone for APM160) and 2 stereo Line-level inputs for serious live performances, your APM Series also includes a 24-bit digital multi-effect with 16 Factory Presets and 16 variations for every preset, for a total of 256 different digital effects. There is a three bands EQ on mono input channels, four bands EQ on stereo input channels. Use it for small Gigs, for Church applications and for Conference.

Enjoy your APM Series and make sure to read this Manual carefully before operation!

**2. FEATURES**

- 8 MONO (APM120)/12 MONO (APM160) inputs with gold plated XLR and balanced TRS jack.
- 2 Stereo input channels with balanced TRS jacks.
- GAIN and +48 V Phantom power for mono/MIC inputs.
- Peak LED in each channel.
- 3-band EQ with sweepable MID on mono inputs.
- 4-band EQ on stereo inputs.
- 24-bit internal DSP with 256 effects, 16 presets by 16 variations with DSP mute switch and peak LED.
- 9-band graphic EQ.
- BNC socket for connecting gooseneck lamps.
- Low cut filters 75 Hz, 18 dB/Oct. on mono inputs.
- Low pass filter on mono outputs (80~120 Hz).
- High accurate 12-segment Bar graph Meters.

**Maximum Output Power(EIAJ):**

- APM120: 500 W+500 W/4 Ohms (1000 W bridge/8 Ohms)
- APM160: 750 W+750 W/4 Ohms (1500 W bridge/8 Ohms)
3. QUICK START

This is the fastest way to get something out from your APM Series, if you have a keyboard and a microphone.

a. Plug the microphone into Channel 1 MIC IN.
b. Turn down AUX and LEVEL controls on the input channel.
c. Put the EQ controls on center position.
d. Connect 2 passive cabinets to the rear speaker cabinets.
e. Turn on your APM Series.
f. Sing or speak into the microphone with normal volume and adjust the channel LEVEL control of half.
g. If you like, you can adjust the EQ at this stage.
h. The LED on the Master LED meter should flash only occasionally, otherwise you will hear distortion. If this LED is not active and you still hear distortion, please turn down a little the input LEVEL control or reduce the output level of your source instrument.
i. Connect your stereo keyboard into channel 9/10 and repeat the sequence.(for APM120) Connect your stereo keyboard into channel 13/14 and repeat the sequence.(for APM160)

Here you are. It is your first gig with your APM Series.
Mono and Stereo Input Channels

1. The MONO MIC/LINE Channels
Your APM120 is equipped with 8 (12 for APM160) low-noise microphone preamplifiers with optional phantom power, 45 dB of Gain and over 115 dB of S/N ratio. You can connect almost any type of microphone. Dynamic microphones do not need phantom power. Use phantom power only with condenser microphones but make sure that the phantom power button is disengaged before connecting the microphone. Phantom power will not damage your dynamic microphones, so make sure to read the microphone instructions manual before engaging phantom power. Use switch (4) to activate/deactivate phantom power. These channels are also equipped with 1/4" TRS balanced/unbalanced LINE-IN plugs to connect line-level instruments such as keyboards, drum machines and effect devices.

2. MONO Channel INSERT
This is where you connect external sound processors such as compressor-limiter, equalizers, etc. The insert point is available on the first 8 MIC (12 for APM120) channels only. For the other channels you can always insert the processor in between the sound source (such as keyboard or drum machine) and the APM input. The Insert sockets can be used as direct-outs to feed the input of a 4-track tape recorder.

3. STEREO INPUTS
These are Channel 9/10 and 11/12 (Channel 13/14 and 15/16 for APM160). They are organised in stereo pair and provided with 1/4" TRS phone sockets. If you connect only the left jack, the input will operate in mono mode, that is the mono signal will appear on both input channels. You can use these inputs with a stereo keyboard, drum machine, etc.

4. +48 Volt Phantom Power
It is available only to the XLR MIC sockets. Never plug in a microphone when phantom power is already on. Before turning phantom power on, make sure that all faders are all the way down. In this way you will protect your stage monitors and main loudspeakers.
4. CONTROL ELEMENTS

5 MONO IN GAIN
This control is provided with 2 different indications: One is for the MIC and the other for LINE levels. When you use a microphone, you shall read the MIC ring (0~45dB); when you use a line level instrument, you shall read the LINE ring (+15~30dB). For optimum operation you shall set this control in a way that the PEAK LED(18) blinks only occasionally in order to avoid distortion on the input channel.

6 LEVEL SET LED
This LED will help you to detect the input level immediately. In this case the research of the fault will become much faster!

7 LOW-CUT Button
By pressing this button you will activate a 75 Hz low frequency filter with a slope of 18 dB per octave. You can use this facility to reduce the hum noise infected by the mains power supply, or the stage rumble while using a microphone.

8 STEREO IN GAIN
When you use a line level instrument, you shall read the ring (+20~20dB). For optimum operation you shall set this control in a way that the PEAK LED(18) blinks only occasionally in order to avoid distortion on the input channel.

EQUALISER
There are 3 bands EQ with sweepable MID on all mono input channel1-8 (channel1-12 for APM160): HI, MID and LOW band. There are 4 bands fixed frequency EQ on the stereo channel 9-12 (channel13-16 for APM160): HI, HI-MID, MID-LOW and LOW band. All bands provide up to 15 dB of boost or cut.
4. CONTROL ELEMENTS

9 HI
If you turn this control up, you will boost all the frequencies above 12 kHz (shelving filter). You will add transparency to vocals and guitar and also make cymbals crisper. Turn the control down to cut all frequencies above 12 kHz. In such way you can reduce Sibilances of human voice or reduce the hiss of a Tape player.

10 MID
This is a peaking filter and it will boost/cut frequencies from 100 Hz to 8 kHz depending on the position of the MID freq control. This control will affect especially upper male and lower female vocal ranges and also the harmonics of most musical instruments.

11 HI-MID
This control gives you up to 15 dB boost/cut at 3 kHz. It is useful for controlling voice. It can accurately polish your performance via adjusting this knob.

12 MID-LOW
This control gives you up to 15dB boost or cut at 500Hz.

13 LOW
If you turn this control up, you will boost all frequencies below 80Hz. You will give more punch to bass drum and bass guitar and make the vocalist more "macho". Turn it down, you will cut all the frequencies below 80Hz. In this way you can avoid low-frequency vibrations and resonance thus preserving the life of your woofers.

14 AUX SENDS Level Control
These four controls are used to adjust the level of the respective signal sent to AUX bus. AUX1 and AUX2 can be switched to PRE/POST-FADER via the PRE/POST button, so, generally, they can be used for monitor application and effects & sound processors Input. AUX3 and AUX4 are configured as POST-Faders. In this typical compact unit, excluding sending out the signal directly to the external effect or processor equipment, AUX SEND4 can also be assigned to the internal onboard effect module.
4. CONTROL ELEMENTS

15 PAN/BAL Control
Abbreviation of PANORAMA control for mono channels, or the stereo channels, always says, BALANCE control. Keep this control in center position, then the signal will be positioned in the middle of stage.

16 MUTE Switch
Each channel is equipped with the MUTE switch. Pressing this switch is equal to turning the fader down, which can mute the corresponding channel output except for the PRE AUX sends, channel INSERT send.

17 PFL (pre-fader listen) Switch
Each channel has a PFL switch which will send a signal from a post-EQ pre-fader location to the PHONES jack. Use this when you wish to use the headphones to monitor only a specific channel. Moreover, you can monitor a channel no matter the channel is lowered or the MUTE switch is on when this PFL switch is engaged. This will not affect the signals that are sent to the ST bus and AUX buses.

18 PEAK LED
Inside your APM Series the audio signal is monitored in several different stages and then sent to the PEAK LED. When the LED is red illuminated, it warns you that you are reaching signal saturation and possible distortion, then you should reduce the input level for avoiding distortion.

19 FADER
This fader will adjust the overall level of this channel and set the amount of signal sent to the main output.

Master Section

20 2-TRACK IN/OUT
- TAPE IN
Use the Tape input if you wish to listen to your mix from a Tape Recorder or DAT.

- TAPE OUT
These RCA jacks will route the main mix into a tape recorder.
21 AUX/DFX SENDS Connectors
These 1/4" phone jacks are used to send out the signal from the AUX bus to external devices such as effect units and/or stage monitors.

22 P. AMP INPUT Jacks
These 1/4" phone jacks are used to input line level stereo signals to the built-in power amplifier.

23 ST OUT Jacks
These jacks are used to output the signal of the STEREO bus. The final output level from these jacks is adjusted by the ST OUT fader.

24 ST SUB OUT Jacks
These jacks are used to output the signal of the STEREO bus. Use the ST SUB OUT control to adjust the final output level at the ST SUB OUT jacks. Generally, it is available to connecting effects unit.

25 ST SUB IN 1-3 Jacks
These 1/4" jacks are used to connect stereo output of a sub mixer or external effect processor. The signal input can be routed to the AUX1-3 bus and STEREO bus.

26 MONO OUTPUT Jack
Use this balanced MONO jack to connect the input of an external amplifier or active monitor speaker.

27 FOOTSWITCH Jack
This 1/4" jack can be used to connect an external foot switch to turn on/off the onboard effect module.
28 PHONES Jack
This jack will be used to send the signal to a headphone or to a pair of powered studio monitors.

29 LAMP
This lovable LAMP is very convenient for your operation, it is located in the top right corner of the front panel, and provides the 12V socket that can drive standard BNC-type lamp.

30 LED METER Display
The LED METER Display indicates the output signal level. By pressing the switch, you can choose the output signal source. When the switch is off, the stereo LED meter will indicate the signal level sent to ST OUT outputs. When the switch is on, the LED meter indicates the signal level sent to PHONES output.

31 ST SUB OUT Control
This knob adjusts the final level of the signal sent from the ST bus to the ST SUB OUT jacks.

32 AUX1-3 Controls
These knobs are used to adjust the amount of the signal sent from the ST SUB IN1-3 jacks to the AUX1, 2 and 3 buses.

33 ST (stereo ) Controls
The ST knob is used to adjust the amount of stereo signal sent from the ST SUB IN1-3 jacks to the STEREO bus.

34 PFL (pre-fader listen) Switch
When this switch is engaged, the signal at the point before the ST control knob is sent to the PHONES jack.
35 POWER LED
The LED indicates when the power is switched on.

36 PHONES Control
This control is used to adjust the level of PHONES output, which can be varied from $-\infty$ to $+10$.

37 LPF (MONO OUT)
- LPF ON/OFF Switch
This switch applies a low-pass filter to the signal that is output from the STEREO bus.
- LPF Control
You can adjust the frequency to the desired position by using a screwdriver to turn the control. The output region will below the frequency (80-120 Hz) if you specify by the control. Use it when you are using a sub-woofer.

38 ST (stereo) Control
This knob is used to adjust the level of the signal sent from the 2TR IN jacks to the STEREO bus. The adjustable range goes from $-\infty$ to $+10$dB.

39 PFL Switch
When this switch is engaged, the signal input from the 2TR IN jacks is routed at the point before the ST control to the PHONES jack.
40 AFL Switch
When this switch is on, the output signal that passes through the corresponding fader is sent to the jack.

41 PFL Switch
When this switch is engaged, the signal at the point before the ST OUT control fader is sent to the PHONE jack.

42 DFX RTN Fader
This fader is used to adjust the level of the return signal which is sent from the built-in DSP to the STEREO bus.

43 AUX1-3 Fader
The AUX1-3 faders adjust the final level of the signal sent from the AUX1-3 bus to the AUX SEND1-3 jacks.

44 MONO OUT Fader
The MONO OUT fader adjusts the final level of the signal output from the STEREO bus to the MONO OUT jack.

45 ST OUT Fader
The ST OUT fader adjusts the final level of the signal sent from the STEREO bus to the ST OUT jacks.

46 EQ Switch
Engage this button to add the stereo graphic EQ into the main mix output circuit. It can be used to modify the frequency "contour" of a sound. If you release the button free, the stereo graphic EQ will be bypassed.
47 STEREO GRAPHIC EQ
Each one of these faders will boost or attenuate (+/-15dB) the selected frequency at a preset bandwidth. When all the faders are in the centre position, the output of the equalizer is flat response.

48 POWER AMP. MODE Switch
This switch provides three modes: MAIN L/MAIN R; AUX1/MONO; BRIDGE. Select any one of these modes to specify the signals to be routed to the corresponding jacks according to the speaker connection at speaker jacks on the rear panel. The details refer to later content.

49 POWER AMP Switch
This switch is used to control the amplifier input signal.

DSP SECTION
There is a powerful 24-bit/256 presets digital multi-effects included in your APM Series. Effects include reverb, chorus, flanger, delay and combinations of the above.

50 PRESETS Control
Adjust this knob to select the right effect you wish to perform. There are total 16 options for you: several kinds of reverb, mono and stereo delay, effects with modulation, and versatile two-effect combination.

52 VARIATIONS Control
Since you have selected the preferable effect, the next step, please go with the fine consideration, there are also total 16 variations for each preset, and each variation may be managed by several different factors.

53 DFX MUTE Switch & PEAK LED
This switch is used to activate/deactivate the effect facility. This LED lights up when the input signal is too strong. In case of the digital effect module being muted, this LED also lights up.
4. CONTROL ELEMENTS

REAR PANEL

53 POWER ON/OFF Switch
This switch is used to turn the main power ON and OFF.

54 AC Inlet with FUSE Holder
Use it to connect your APM Series to the main AC with the supplied AC cord. Please check the voltage available in your country and how the voltage for your APM Series is configured before attempting to connect your APM Series to the main AC.

55 VOLTAGE Selector
There are two kinds of voltages for your operation. From this switch you can select the voltage at 100~120VAC or 220~240VAC.

56 VENTS
These vents are used for ventilation and heat dissipation.

57 SPEAKERS Jacks
These jacks are used to connect speakers. They are configured with 4-way speakon connectors and 1/4" phone jacks. You can determine the signal that is output to these jacks according to the setting of the AMPLIFIER MODE select switch.

Note: In order to avoid damage to the built-in amplifier, please pay attention to the allowed impedance of the speaker. Very low load impedances may damage the amplifier.
Ok, you have got to this point and you are now in the position to successfully operate your APM Series. However, we advise you to read the following section carefully to be the real master of your own mix. Not paying enough attention to the input signal level, the routing of the signal and the assignment of the signal will result in unwanted distortion, a corrupted signal or no sound at all. So you should follow this procedure for every single channel:

1. Turn down all Input and output gain controls.
2. Connect phantom powered microphones before switching on the +48 Volt phantom power switch.
3. Set the output level of your APM Series or the connected power amplifier at no more than 75%.
4. Position EQ controls on middle position.
5. Position panoramic (PAN) control on center position.
6. Increase the input gain properly for maintaining the good headroom and ideal dynamic range.
7. Depending on the actual application, turn slowly the input and output level controls for obtaining the maximum gain before distortion.
8. Now repeat the same sequence for all input channels. The main LED meter could move up into the red section. In this case you can adjust the overall output level through the main mix control.

Audio Connections
You can connect unbalanced equipment to balanced inputs and outputs. Simply follow these schematics.
5. INSTALLATION AND CONNECTION

**MAIN SPEAKERS CONNECTION**

Please use only the power connectors to make connections with other signal source equipment for the passive speaker cabinets. The power connector has four terminals: 1+, 1-, 2+, 2-.

**Speakon connector**
And now some tips how to use the AMPLIFIER MODE switch

**MAIN L + MAIN R Mode**
This is the most common application. The built-in amplifier drives two main speaker cabinets Left and Right. The AMPLIFIER MODE is on MAIN L+MAIN R position.

**AUX1 + MONO Mode**
With the AMPLIFIER MODE in AUX1+MONO position, channel1 drives a Main speaker cabinet while channel2 drives a stage monitor.
Bridge Mode

With the AMPLIFIER MODE switch in BRIDGE position the two power amplifiers in your APM Series drive together a single speaker cabinet with the sum of the power of the 2 amps. Usually this solution is used to drive a single subwoofer and the main out output on the front panel are used to feed a pair of powered speakers as mid-high units.
## 6. PRESET LIST

<table>
<thead>
<tr>
<th>NO.</th>
<th>Preset</th>
<th>Description</th>
<th>Controllable Parameter</th>
<th>Parameter Variable range</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>VOCAL1</td>
<td>Simulate a room with small delay time.</td>
<td>Decay time</td>
<td>0.8–1.1s Pre delay 0–79ms</td>
</tr>
<tr>
<td>2</td>
<td>VOCAL2</td>
<td>Simulate a small space with slight decay time</td>
<td>Decay time</td>
<td>0.8–2.5s Pre delay 0–79ms</td>
</tr>
<tr>
<td>3</td>
<td>LARGE HALL</td>
<td>Simulate a large acoustic space of the sound.</td>
<td>Decay time</td>
<td>3.6–5.4s Pre delay 23–55ms</td>
</tr>
<tr>
<td>4</td>
<td>SMALL HALL</td>
<td>Simulate a stage space of the sound.</td>
<td>Decay time</td>
<td>1.0–2.9s Pre delay 20–45ms</td>
</tr>
<tr>
<td>5</td>
<td>LARGE ROOM</td>
<td>Simulate a studio room with many early reflections</td>
<td>Decay time</td>
<td>2.9–4.5s Pre delay 23–55ms</td>
</tr>
<tr>
<td>6</td>
<td>SMALL ROOM</td>
<td>Simulate a bright studio room.</td>
<td>Decay time</td>
<td>0.7–2.1s Pre delay 20–45ms</td>
</tr>
<tr>
<td>7</td>
<td>PLATE</td>
<td>Simulate the transducers sound like classic bright vocal plate.</td>
<td>Decay time</td>
<td>0.6–6.1s Pre delay 10ms</td>
</tr>
<tr>
<td>8</td>
<td>TAPE REVERB</td>
<td>Simulate a record head and multiple playback heads at intervals along the tape.</td>
<td>Decay time</td>
<td>1.3–5.4s Pre delay 0–84ms</td>
</tr>
<tr>
<td>9</td>
<td>SPRING REVERB</td>
<td>Simulate the analog transducers’ springs lightly stretched sound.</td>
<td>Decay time</td>
<td>1.3–5.4s Pre delay 0–35ms</td>
</tr>
<tr>
<td>10</td>
<td>MONO DELAY</td>
<td>Reproduce the sound input on the output after a lapse of time.</td>
<td>Period</td>
<td>60–650ms</td>
</tr>
<tr>
<td>11</td>
<td>STEREO DELAY</td>
<td>Recreate the input sound on the stereo output with different time.</td>
<td>Period</td>
<td>210–400ms Feedback 37–73%</td>
</tr>
<tr>
<td>12</td>
<td>FLANGER</td>
<td>Simulate to play with another person carrying out same the notes on the same instrument</td>
<td>Rate</td>
<td>0.16–2.79Hz</td>
</tr>
<tr>
<td>13</td>
<td>CHORUS</td>
<td>Recreate the illusion of more than one instrument from a single instrument sound</td>
<td>Rate</td>
<td>0.5–5Hz</td>
</tr>
<tr>
<td>14</td>
<td>REV.+DELAY</td>
<td>Delay with room effect</td>
<td>Decay period</td>
<td>211–375ms Rev.decay time 1.0–2.9s</td>
</tr>
<tr>
<td>15</td>
<td>REV.+FLANGER</td>
<td>Stereo flanger and large room reverb</td>
<td>Flanger Rate</td>
<td>0.16–2.52Hz Rev.decay time</td>
</tr>
<tr>
<td>16</td>
<td>REV.+CHORUS</td>
<td>Stereo chorus and large room reverb</td>
<td>Chorus rate</td>
<td>0.5–4.74Hz Rev.decay time 1.5–2.9s</td>
</tr>
</tbody>
</table>
### 8. Technical Specification

#### Mono Input Channels
- **Microphone Input**: Electronically balanced, discrete input configuration
- **Frequency Response**: 10 Hz to 55 kHz, +/- 3 dB
- **Distortion (THD & N)**: 0.005% at +4 dBu, 1 kHz
- **Gain**: 0 dB to 45 dB (MIC)
- **SNR (Signal to Noise Ratio)**: 115 dB
- **Line Input**: Electronically balanced
- **Frequency Response**: 10 Hz to 55 kHz, +/- 3 dB
- **Distortion (THD & N)**: 0.005% at +4 dBu, 1 kHz
- **Gain**: 15 dBu to 30 dBu

#### Stereo Input Channels
- **Line Input**: Unbalanced
- **Frequency Response**: 10 Hz to 55 kHz, +/- 3 dB
- **Distortion (THD & N)**: 0.005% at +4 dBu, 1 kHz

#### Impedances
- **Microphone Input**: 1.4 kOhm
- **Channel Insert Return**: 2.5 kOhm
- **All Other Inputs**: 10 kOhm or greater
- **Tape Out**: 1 kOhm
- **All Other Outputs**: 120 Ohm

#### Mono Equalization
- **Hi Shelving**: +/- 15 dB @ 12 kHz
- **Mid Peak/Dip**: +/- 15 dB, Frequency range 100–8kHz
- **Low Shelving**: +/- 15 dB @ 80 Hz

#### Stereo Equalization
- **Hi Shelving**: +/- 15 dB @ 12 kHz
- **Mid Peak/Dip**: +/- 15 dB @ 3 kHz
- **Mid Low Peak/Dip**: +/- 15 dB @ 500 Hz
- **Low Shelving**: +/- 15 dB @ 80 Hz

#### DSP Section
- **A/D and D/A Converters**: 24 bit
- **DSP Resolution**: 24 bit
- **Type of Effects**: Hall, Room, Vocal & Plate Reverbs
  - Mono & Stereo Delay (max Delay Time 650ms)
  - Chorus, Flanger & Reverb Modulations
  - Reverb + Delay, Reverb + Chorus,
  - Reverb + Flanger combinations
- **Presets**: 256
- **Controls**: 16 position PRESET Selector
  - 16 position VARIATION selector
  - CLIP LED
  - MUTE SWITCH with LED indicator

#### Main Mix Section
- **Noise (Bus Noise)**: Fader 0 dB, all input channels assigned and set to
- **Unity Gain**: 100 dB (ref.: +4 dBu)
- **Max Output**: +22 dBu balanced
- **AUX Sends Max Out**: +22 dBu
- **ST SUB Out**: +22 dBu

#### Power Supply
- **Main Voltage**: 100 VAC – 60 Hz, 230 VAC – 50 Hz
- **120 VAC – 60 Hz, 240 VAC – 50 Hz

#### Power Consumption
<table>
<thead>
<tr>
<th>Model</th>
<th>Stereo Mode</th>
<th>Bridge Mode</th>
</tr>
</thead>
<tbody>
<tr>
<td>APM120</td>
<td>2 x 500 W @ 4 Ohm(EIAJ) 2 x 340 W @ 4 Ohm(RMS)</td>
<td>1000 W @ 8 Ohm(EIAJ)</td>
</tr>
<tr>
<td>APM160</td>
<td>2 x 750 W @ 4 Ohm(EIAJ) 2 x 520 W @ 4 Ohm(RMS)</td>
<td>1500 W @ 8 Ohm(EIAJ)</td>
</tr>
<tr>
<td>Fuse</td>
<td>APM120</td>
<td>100 ~ 120 V : 10 A</td>
</tr>
<tr>
<td></td>
<td></td>
<td>210 ~ 240 V : 6.3 A</td>
</tr>
<tr>
<td></td>
<td>APM160</td>
<td>100 ~ 120 V : 12 A</td>
</tr>
<tr>
<td></td>
<td></td>
<td>210 ~ 240 V : 6.3 A</td>
</tr>
<tr>
<td>Physical</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Dimension (WxDxH)</td>
<td>APM120</td>
<td>565x450x145 mm</td>
</tr>
<tr>
<td></td>
<td>APM160</td>
<td>565x555x145 mm</td>
</tr>
<tr>
<td>Weight</td>
<td>APM120</td>
<td>(Net) : 10.68 kg (23.5 lb)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>(Gross) : 15.2 kg (33.5 lb)</td>
</tr>
<tr>
<td></td>
<td>APM160</td>
<td>(Net) : 12.5 kg (27.6 lb)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>(Gross) : 17.4 kg (38.4 lb)</td>
</tr>
</tbody>
</table>
9. WARRANTY

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 provide 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 your warranty service.

2. RETURN NOTICE
   2.1 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.
   2.2 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.
   2.3 A brief description of the defect will be appreciated.
   2.4 Please prepay all the costs involved in the return shipping, handling and insurance.

3. TERMS AND CONDITIONS
   3.1 ▲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.
   3.2 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.
   3.3 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.
   3.4 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.
   3.5 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.
   3.6 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.