



**WARNING**  
TO PREVENT ELECTRICAL SHOCK OR FIRE HAZARD, DO NOT EXPOSE THIS APPLIANCE TO RAIN OR MOISTURE. BEFORE USING THIS APPLIANCE, READ BACK COVER FOR FURTHER WARNINGS.

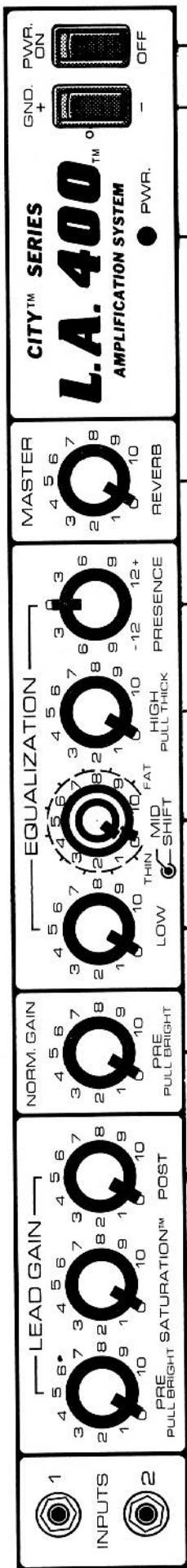


# **L.A. 400™**

## OPERATING GUIDE

### **GENERAL DESCRIPTION**

The LA-400™ produces 210 watts RMS system into a 4 ohm load and features many new ideas which our R & D program has designed to enhance the warmth and smooth operating characteristics normally found only with tube amplifiers. The LA-400™ also features our Gain Block™ which consists of three controls; pre gain, Saturation™ and post gain. This Gain Block™ allows the player total control of the overall texture of harmonic content and overload characteristics by varying the amount of drive of the pre gain and the Saturation™ control and finally, adjusting the post gain to the desired output level. The combination of the input dynamics, Saturation™ effect, and the extremely effective equalization circuit enables the LA-400™ to quite literally simulate almost any guitar sound available from any amp, old or new. This unit also features a second normal channel that is footswitch selectable and incorporates our unique automatic switching circuitry now being copied by so many of our competitors. In addition to the above, we have included our Black Widow®/Super Structure™ loudspeaker (#1203-4) whose characteristics have been carefully matched to complement the frequency response, power output, and damping factor of the LA-400's™ power amplifier. Since the LA-400™ is an extremely powerful single unit amplifier, we have included our patented DDT® compression circuit. As applied to this particular amp, the DDT® feature will allow the power amp to operate at optimum levels without distortion. When distortion is utilized within the Gain Block™, however, the DDT® circuit allows the preamp to generate the warm tube-like harmonics **without** the harshness created by the power amp.



**POWER SWITCH (ON/OFF):** The AC power switch is the conventional rocker type which indicates off at the bottom and on at the top.

**GROUND LIFT SWITCH:** This switch is the three-position type with the center position completely removing the internal grounding capacitor from the circuit. This position is normally recommended for situations where the AC power receptacle is known to contain a properly grounded third wire. If properly grounded AC mains supply is not available, suitable ground lift adaptor should be used. The (+ and -) positions are used to ground the amplifier properly when only two-wire services are available. One of these positions will yield the lowest amount of residual hum or "popping" when the instrument is touched.

**PILOT LED:** The pilot LED indicates when the unit is receiving electrical supply from the mains and is operational.

**MASTER REVERB CONTROL:** The master reverb control determines the desired amount of reverberation from the internal reverb system. Clockwise rotation increases the reverb effect and counterclockwise decreases the effect.

**PRESENCE CONTROL:** The presence is an active high frequency EQ with cut and boost capability. This control may be used similarly to a bright boost for the upper range of frequencies when additional bite is desired.

**HIGH/PULL THICK:** The high EQ control is similar in operation to a typical passive treble control and varies response of the high end at frequencies below the effect of the presence control. The pull switch on the high control activates the "thick" mid range boosted tonality which is very popular with rock players. Notice that the bass and mid controls have little effect when pull thick is activated.

**MID SHIFT CONTROL:** The vital mid frequencies are controlled by this unique concentric (stacked) system of potentiometers. **Please be aware that mid frequencies contribute, to a large degree, to the overall tone color of the guitar in all forms of music.** Although this is a new type of system for controlling the mids, it should present no problem in operation. The inner (top) control determines the **amount** of mid frequencies. Rotating this control clockwise increases the mids for a greater degree of "fat" tonalities while counterclockwise rotation will cause the overall tone color to become "thin." The outer (bottom) control allows the player to "passively" shift the band at which the mid frequencies will operate. After experimenting with these controls, the player will be able to determine "where" and "how much" of the mid-range tonalities best suit his/her playing style and technique.

**LOW FREQUENCY CONTROL:** The low frequency control adjusts the tonality for the amount of smoothness and offers extended bandwidth on the low end of the tonal range. Care should be taken to not overboost with this control to avoid muddiness and premature overdriving of the power amp. Extreme overboosting of bass frequencies tends to distract from the projection capability of the amplifier and confuses material which should be heard for lead guitar lines.

**NORMAL GAIN CONTROL/PULL BRIGHT:** The normal gain control determines the overall level of the normal channel. This channel is accessible only with the remote footswitch and utilizes the EQ circuit above. The normal channel gain is **unaffected** by the post (master) gain and works independently for a clean sound when no distortion is desired. When the normal channel is selected, the **pull thick feature** is defeated and EQ controls function normally. Notice also that **Saturation™** is not functional with the normal channel. The **normal** channel gain also includes a **pull bright** feature for additional bite or edge on the high frequencies when the control knob is pulled.

**GAIN BLOCK™ SECTION:** The LA-400™ has been designed utilizing our new Gain Block™ signal processing front end. The provision of the three interacting controls listed below allows total control of the amp's gain structure (dynamics), harmonic content, overload texture, and output level. Each of the three control functions must be understood and adequate experimentation time must be spent in order to fully utilize the potential of this unique and innovative Gain Block™ circuitry.

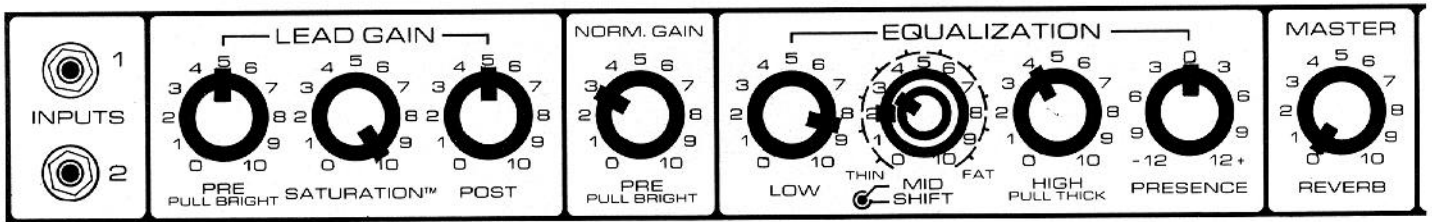
**POST GAIN CONTROL:** The post gain control regulates the overall gain (sensitivity) and system noise of the LEAD GAIN BLOCK™ and is conventional in operation. The post control may be used exactly like any other master gain control. Settings of 5 or less will reduce lead gain block levels and simultaneously reduce noise levels generally required for smaller club performances and studio applications. Settings of 6 and above will allow maximum power output reserve from the LA-400's™ 210 watt RMS power amplifier section while the automatic DDT® feature will prevent power amplifier clipping thereby reducing the possibility of loudspeaker damage and the associated harsh distortion sounds usually associated with power amplifier breakup. NOTE: The normal channel gain control is not affected by the post gain control when the normal channel is footswitch selected.

**SATURATION™ CONTROL:** The Saturation™ control is a function of the preamp circuitry and very closely simulates warm, tube type, harmonic overload. This control creates preamp overload and works in conjunction with the pre and post gain controls in the LEAD GAIN BLOCK™. When using Saturation™, the pre gain control should be adjusted properly to adequately drive the Saturation™ circuitry. A very low setting of the pre gain control doesn't usually produce the necessary drive for Saturation™ but the overall effect is determined by the input signal of the instrument patched in. The gain/compression effect of Saturation™ is increased with clockwise rotation and decreased with counterclockwise setting of the control. A full counterclockwise (0) setting will result in no Saturation™.

**PRE GAIN CONTROL:** The pre gain control for the **lead Gain Block™** determines the input level and functions similar to any typical channel gain control. This control should be operated with sufficient gain to drive the **Saturation™** control for the smooth, compressed, tube-type overload. Please be aware that this control exhibits an audio taper and develops approximately 1/4 gain at the 12 o'clock position with the balance being obtained as the control is rotated clockwise. After adjusting the post gain to its approximate mid point position, the pre gain control should be set once again to your personal taste for your particular style of music. This control features a pull switch for extra brightness when the knob is pulled outward slightly. Saturation™ generally sounds better without the bright feature activated.

**INPUTS:** The new LA-400™ has two input jacks, each having different sensitivities and a unique arrangement allowing the gain of both jacks to be equalized when instruments are plugged into both inputs. The high gain jack (1) is the input normally used for most instruments and has considerably more sensitivity than the low gain jack (2). The low gain jack is 6 dB less sensitive than the high gain input and should be used when the signal from your instrument is very hot and premature overloading of the input is detected. Many times the (2) or low gain input should be used when extremely hot signals are available from other preamps such as effects devices, etc.

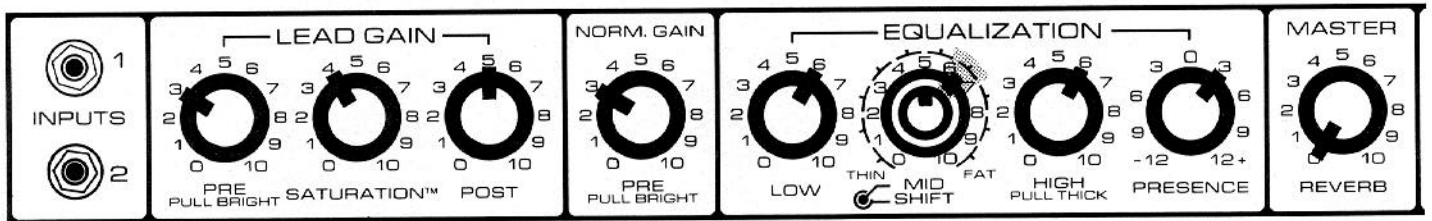
The tone settings given are general and will vary according to type of guitar, type and gauges of strings, type of pickup, and type of pick.



ACTIVATE

ADJUST TO TASTE

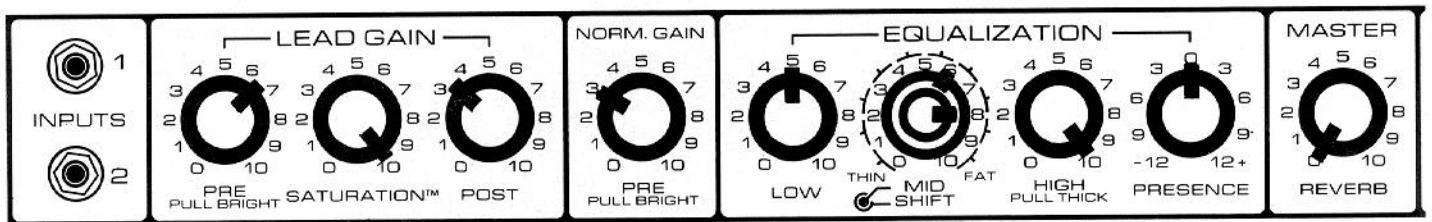
### JAZZ ROCK



SHIFT SETTING:  
VARIABLE

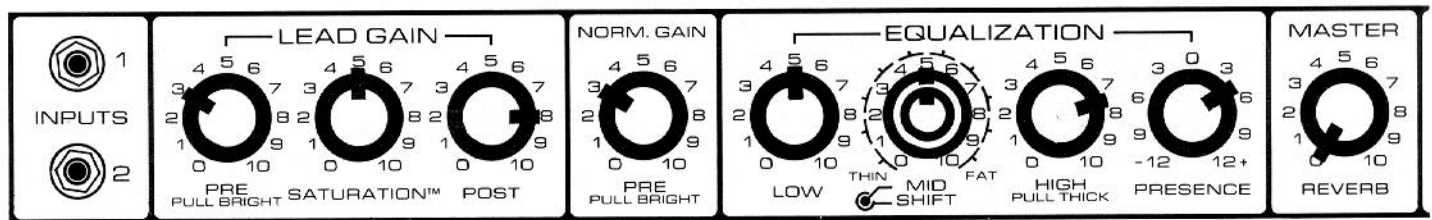
ADJUST TO TASTE

### SOFT SATURATION™/COUNTRY ROCK



ADJUST TO TASTE

### MAXIMUM SATURATION™/RHYTHM & BLUES



ACTIVATE

ADJUST TO TASTE

### BLUES/COUNTRY

#### SET UP AND OPERATIONS INSTRUCTIONS

The procedure for arriving at optimum control settings with any particular guitar and equalization characteristics are as follows:

1. Plug into the high or low gain input jack.
2. Set the **post gain** control around mid point.
3. Set the pre gain control somewhere in the middle of its range.
4. Adjust the Saturation™ control for the desired amount of gain/compressed clipping.
5. Readjust the pre gain control to assure adequate drive.
6. Readjust the post gain control just below the point at which the power amp/ speaker reaches the clipping point and adds its own harmonics to the predistorted signal. This setting is readily noticeable since the additional harmonics are audible when the power amp reaches its maximum output level and will not necessarily be pleasing to the ear.

#### SPECIAL NOTE:

THE **NORMAL** CHANNEL CAN ONLY BE SELECTED WITH THE FOOTSWITCH. ALSO, THE **NORMAL** CHANNEL GAIN CONTROL IS **NOT** AFFECTED BY THE **POST GAIN** AND IS THE **SINGLE** DETERMINING ELEMENT FOR THE LEVEL OF THE NORMAL CHANNEL. WHEN THE FOOTSWITCH IS USED TO SELECT BETWEEN THE **SATURATED LEAD CHANNEL AND THE CLEAN NORMAL CHANNEL**, THE **PULL THICK** FEATURE DROPS OUT (IS DEFEATED IF IT HAS BEEN SELECTED). AS MENTIONED, THE **POST CONTROL DOES NOT** AFFECT THE NORMAL CHANNEL. THIS SWITCHING ARRANGEMENT ALLOWS THE PLAYER TO PRESET THE BALANCE BETWEEN THE PRE GAIN, SATURATION™, AND POST GAIN OF THE LEAD GAIN BLOCK™ FOR ANY DESIRED OVERLOAD AND LEVEL, AND SWITCH BACK TO THE NORMAL CHANNEL FOR A TOTALLY CLEAN SOUND WITHOUT INTERFERENCE OF THOSE TWO CONDITIONS.

## REAR PANEL

### REMOTE SWITCH JACK:

The remote switch jack is of the two circuit (stereo) type featuring ring-tip-sleeve construction. One circuit of this jack controls Automix™ channel switching function enabling selection of either the lead or normal channel, while the other controls the reverberation signal. Remote switching is accomplished through the use of the supplied Automix™ footswitch, which is conventional in function and should present no operational difficulty. Please note when plugging in the Automix™ footswitch to be sure and insert the plug all the way ("second click") into the jack. Failure to insert the plug all the way will not allow full function of the footswitch.

### PREAMP OUTPUT/POWER AMP INPUT:

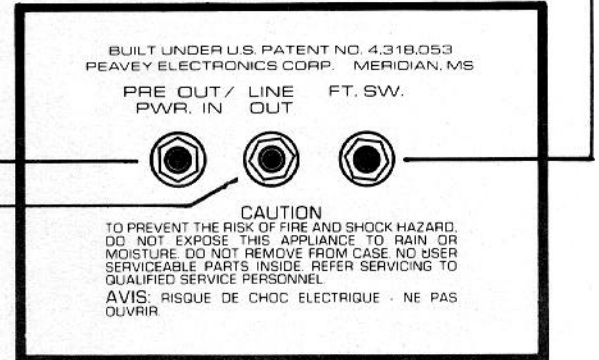
To allow in-line patching of battery or AC powered effects and signal processors, we have incorporated a simple out/in jack on the back panel. The out/in jack (post EQ) is a 1/4" ring/tip/sleeve configuration where the tip portion of the jack serves as the preamp output while the ring acts as the power amp input or return. The sleeve is ground. A typical patch for this out/in jack would be to utilize a "Y" cord and connect the output portion of the "Y" to the input of the device. The return portion of the "Y" is then connected to the output of the device which will return the processed signal to the LA-400™.

### LINE OUT:

Same as preamp output except the signal has been frequency compensated to eliminate the undesirable effect of overboosting highs or lows when patching to recording or sound reinforcement consoles.

### LINE CORD:

For your safety we have incorporated a 3-wire line (mains) cable on the bottom of the chassis with proper grounding facilities. It is not advisable to remove the ground pin under any circumstances. If it is necessary to use the amplifier without proper grounding facilities, suitable grounding adapters should be used. Much less noise and greatly reduced shock hazard exists when the unit is operated with the proper grounded receptacles.



### LA-400™ SPECS:

#### POWER AMPLIFIER SECTION:

##### RATED POWER & LOAD:

210 W RMS into 4 ohms with DDT\* compression

##### POWER @ CLIPPING: (Typically)

(5% THD, 1 KHz, 120 VAC line)

130 W RMS into 8 ohms

220 W RMS into 4 ohms

2 ohms not recommended

##### FREQUENCY RESPONSE:

-0. -1 dB, 20 Hz to 20 KHz @ 200 W RMS into 4 ohms

##### TOTAL HARMONIC DISTORTION:

Less than 0.2% 100 mW to 200 W RMS, 20 Hz to 10 KHz.

4 ohms, typically below 0.1%

##### DDT\* DYNAMIC RANGE:

Greater than 20 dB

##### DDT\* MAXIMUM THD:

Below 0.5% THD for 6 dB overload

Below 1% THD for 20 dB overload

##### HUM & NOISE:

Greater than 95 dB below rated power

##### POWER CONSUMPTION: (Domestic)

600 watts, 50/60 Hz, 120 VAC

### PREAMP SECTION:

THE FOLLOWING SPECS ARE MEASURED @ 1 KHz

WITH THE CONTROLS PRESET AS FOLLOWS:

Lead Gain Pull Bright Off (In)

Saturation™ @ 0

Post Gain @ 10

Normal Pre Gain @ 0

Normal Gain Pull Bright Off (In)

Low & High EQ @ 10

Mid EQ @ 0

Shift @ 5

Pull Thick Off (In)

Presence @ 0 dB

Reverb @ 0

Nominal Levels are with Pre Gain @ 5

Minimum Levels are with Pre Gain @ 10

#### PREAMP JACK A INPUT:

Impedance: High Z, 220K ohms

Nominal Input Level: -28 dBV, 40 mV RMS

Minimum Input Level: -46 dBV, 5 mV RMS

Maximum Input Level: +4 dBV, ±5 V RMS

#### PREAMP JACK B INPUT:

Impedance: High Z, 44K ohms

Nominal Input Level: -22 dBV, 80 mV RMS

Minimum Input Level: -40 dBV, 10 mV RMS

Maximum Input Level: +10 dBV, 3 V RMS

### LINE OUTPUT: (Frequency Compensated)

Load Impedance: 600 ohms or greater

Nominal Output: -10 dBV, 300 mV RMS

Maximum Output: +10 dBV, 3 V RMS into 50K ohms

+8 dBm, 2 V RMS into 600 ohms

#### PREAMP OUTPUT: (Full Range)

Load Impedance: 1K ohms or greater

Nominal Output: 0 dBV, 1 V RMS

#### POWER AMP INPUT:

Impedance: High Z, 22K ohms

Designed Input Level: 0 dBV, 1 V RMS

(Switching jack providing preamp output to power amp input connection when not used)

#### SYSTEM HUM & NOISE @ NOMINAL INPUT LEVEL:

(20 Hz to 20 KHz unweighted)

72 dB below rated power

#### EQUALIZATION:

Special low, mid and high passive type EQ with Mid Shift

(thin/fat) circuitry & Pull Thick

Presence: +12 dB @ 5 KHz, shelving (active)

Pull Bright: +6 dB @ 2 KHz

#### AUTOMIX™ FEATURES:

Reverb function defeated with footswitch

Normal channel only operational with footswitch

Pull Thick and Post Gain defeated in normal channel

### DANGER

EXPOSURE TO EXTREMELY HIGH NOISE LEVELS MAY CAUSE A PERMANENT HEARING LOSS. INDIVIDUALS VARY CONSIDERABLY IN SUSCEPTIBILITY TO NOISE INDUCED HEARING LOSS, BUT NEARLY EVERYONE WILL LOSE SOME HEARING IF EXPOSED TO SUFFICIENTLY INTENSE NOISE FOR A SUFFICIENT TIME.

THE U.S. GOVERNMENT'S OCCUPATIONAL SAFETY AND HEALTH ADMINISTRATION (OSHA) HAS SPECIFIED THE FOLLOWING PERMISSIBLE NOISE LEVEL EXPOSURES:

#### DURATION PER DAY IN HOURS

8  
6  
4  
3  
2  
1½  
1  
½  
¼  
or less

#### SOUND LEVEL dBA, SLOW RESPONSE

90  
92  
95  
97  
100  
102  
105  
110  
115

ACCORDING TO OSHA, ANY EXPOSURE IN EXCESS OF THE ABOVE PERMISSIBLE LIMITS COULD RESULT IN SOME HEARING LOSS.

EAR PLUGS OR PROTECTORS IN THE EAR CANALS OR OVER THE EARS MUST BE WORN WHEN OPERATING THIS AMPLIFICATION SYSTEM IN ORDER TO PREVENT A PERMANENT HEARING LOSS IF EXPOSURE IS IN EXCESS OF THE LIMITS AS SET FORTH ABOVE. TO INSURE AGAINST POTENTIALLY DANGEROUS EXPOSURE TO HIGH SOUND PRESSURE LEVELS, IT IS RECOMMENDED THAT ALL PERSONS EXPOSED TO EQUIPMENT CAPABLE OF PRODUCING HIGH SOUND PRESSURE LEVELS SUCH AS THIS AMPLIFICATION SYSTEM BE PROTECTED BY HEARING PROTECTORS WHILE THIS UNIT IS IN OPERATION.

### CAUTION

THIS AMPLIFIER HAS BEEN DESIGNED AND CONSTRUCTED TO PROVIDE ADEQUATE POWER RESERVE FOR PLAYING MODERN MUSIC WHICH MAY REQUIRE OCCASIONAL PEAK POWER TO HANDLE OCCASIONAL PEAK POWER. ADEQUATE POWER "HEADROOM" HAS BEEN DESIGNED INTO THIS SYSTEM. EXTENDED OPERATION AT ABSOLUTE MAXIMUM POWER LEVEL IS NOT RECOMMENDED SINCE THIS COULD DAMAGE THE ASSOCIATED LOUDSPEAKER SYSTEM. PLEASE BE AWARE THAT MAXIMUM POWER CAN BE OBTAINED WITH VERY LOW SETTINGS OF THE GAIN CONTROLS IF THE INPUT SIGNAL IS VERY STRONG.

1. Read all safety and operating instructions before using this product.
2. All safety and operating instructions should be retained for future reference.
3. Obey all cautions in the operating instructions and on the back of the unit.
4. All operating instructions should be followed.
5. This product should not be used near water, i.e. a bathtub, sink, swimming pool, wet basement, etc.
6. This product should be located so that its position does not interfere with its proper ventilation. It should not be placed flat against a wall or placed in a built-in enclosure that will impede the flow of cooling air.
7. This product should not be placed near a source of heat such as a stove, heater, radiator or another heat producing amplifier.

8. Connect only to a power supply of the type marked on the unit adjacent to the power supply cord.
9. Never break off the ground pin on the power supply cord. For more information on grounding write for our free booklet "Shock Hazard and Grounding".
10. Power supply cords should always be handled carefully. Never walk or place equipment on power supply cords. Periodically check cords for cuts or signs of stress, especially at the plug and the point where the cord exits the unit.
11. The power supply cord should be unplugged when the unit is to be unused for long periods of time.
12. Metal parts can be cleaned with a damp rag. The vinyl covering used on some units can be cleaned with a damp rag or an ammonia based household cleaner if necessary.

13. Care should be taken so that objects do not fall and liquids are not spilled into the unit through the ventilation holes or any other openings.
14. This unit should be checked by a qualified service technician if:
  - A. The power supply cord or plug has been damaged.
  - B. Anything has fallen or been spilled into the unit.
  - C. The unit does not operate correctly.
  - D. The unit has been dropped or the enclosure damaged.
15. The user should not attempt to service this equipment. All service work should be done by a qualified service technician.



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Due to our efforts for constant improvement, features and specifications are subject to change without notice.