Values, Benefits and ROI of Power Control

Benefits of Power Control

- Primary (Tangible)
  - Energy Management Savings
- Secondary (Tangible)
  - Reduced Project Costs
  - Transparency
- Tertiary (Intangible)
  - Asset Protection
  - System Automation

Standby (Vampire) Power

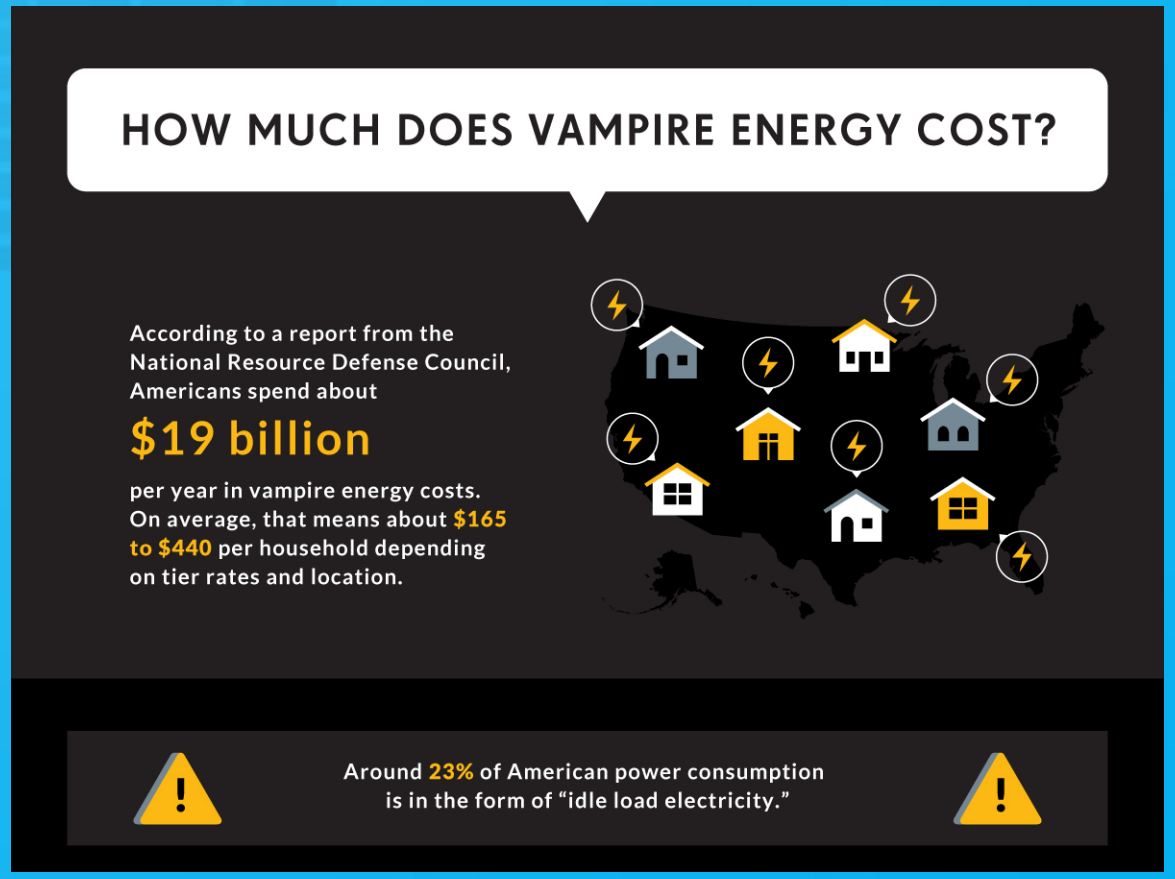
- “Instant On” Devices draw power when device is “off”
  - LEDs, Amps, DSP’s, Control Consoles
- Electronics charged, waiting commands
- Energy Star Certified Products
  - Pull less than 0.5W/hr
- Majority of AVL manufacturer’s don’t post or publish Standby Power Draws…

Energy Management

- (Standby energy consumption)
  (Standby Hours/Week)
  (52 week)
  (Avg. Commercial kWh cost)

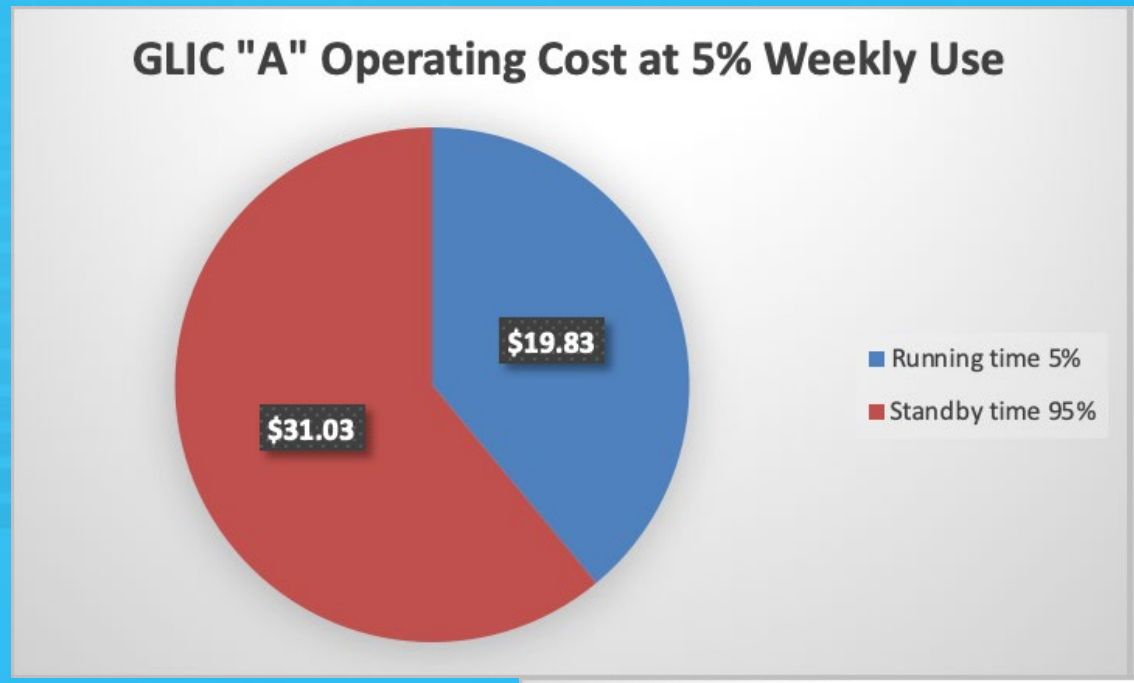
  (1000)

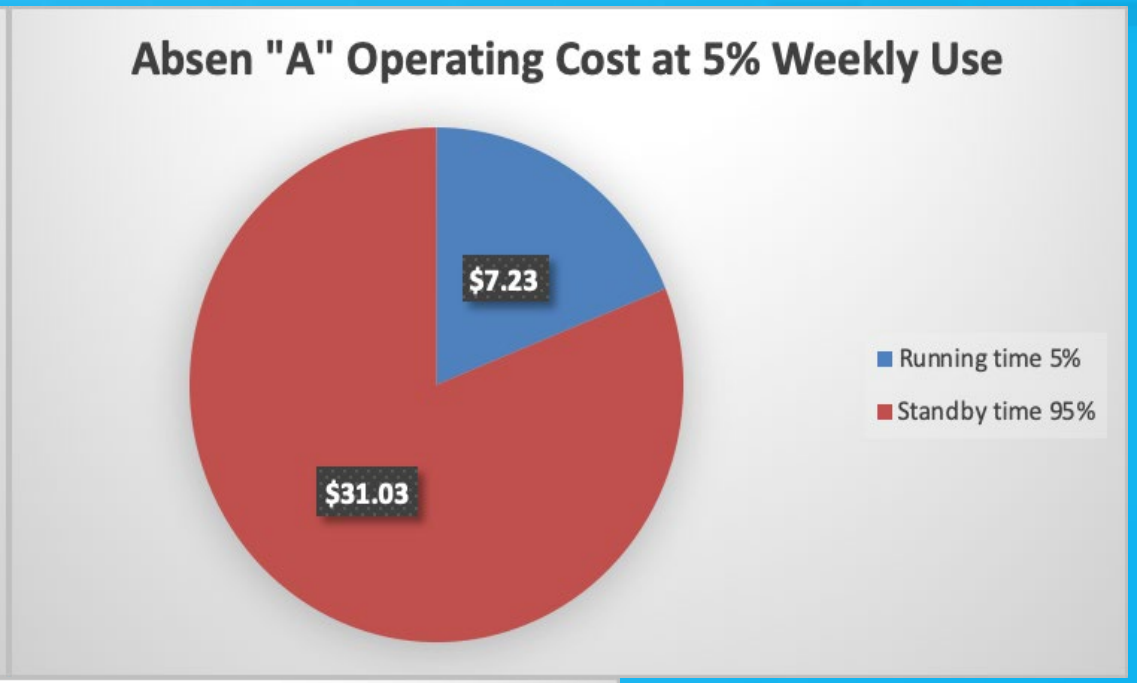
= Energy Cost Savings Per Year

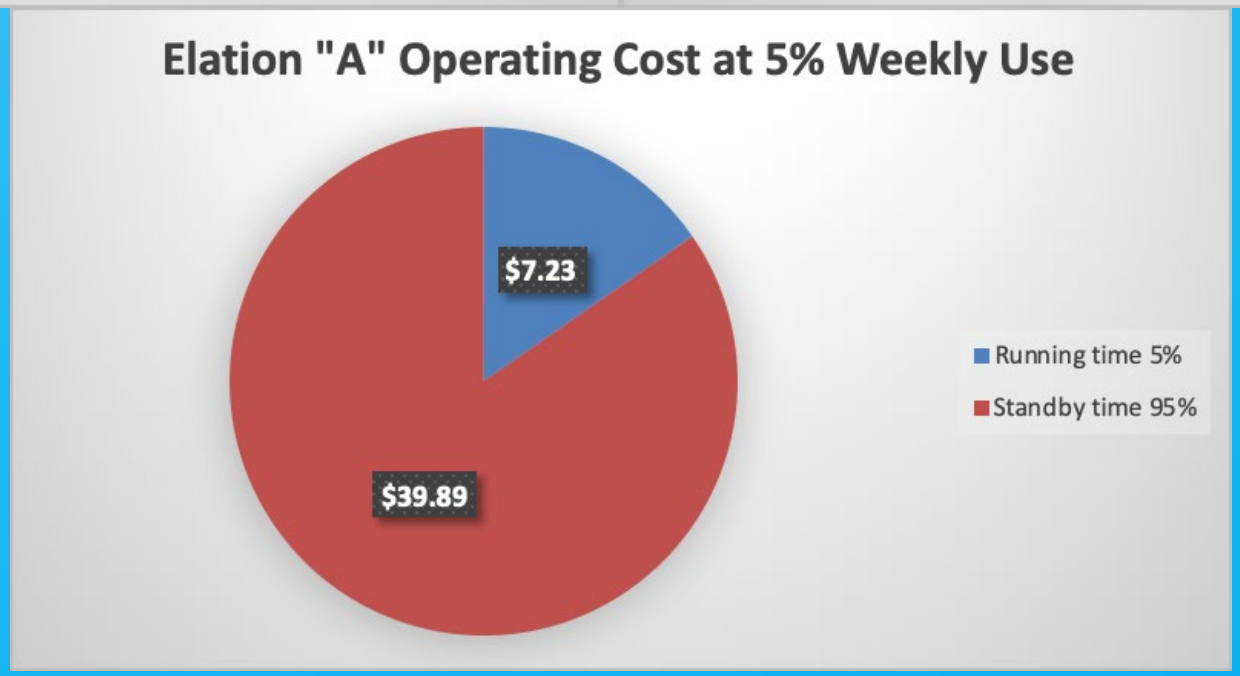


Energy Management Example

- HOW Gear used 5% of the week on average
- Medium Size HOW Approx. Example
  - 200 Devices (audio, video and lighting)
  - Kansas City = 10.751 Cents/kWh
  - 20 w/hr. average standby draw per fixture
- Energy Cost Savings Per Year = (Standby energy consumption) X (Standby Hours/Week) X (52 week) X (kWh cost) / (1000)
- (20 X 200) X (159 hrs.) X (52) X ($0.10751) / 1000
- $3,555.57 = Approximate Energy Cost Savings Per Year


GLIC "A" Operating Cost at 5% Weekly Use
$19.83
$31.03
Running time 5%
Standby time 95%


Absen "A" Operating Cost at 5% Weekly Use
$7.23
$31.03
Running time 5%
Standby time 95%


Elation "A" Operating Cost at 5% Weekly Use
$7.23
$39.89
Running time 5%
Standby time 95%

Every Watt Counts

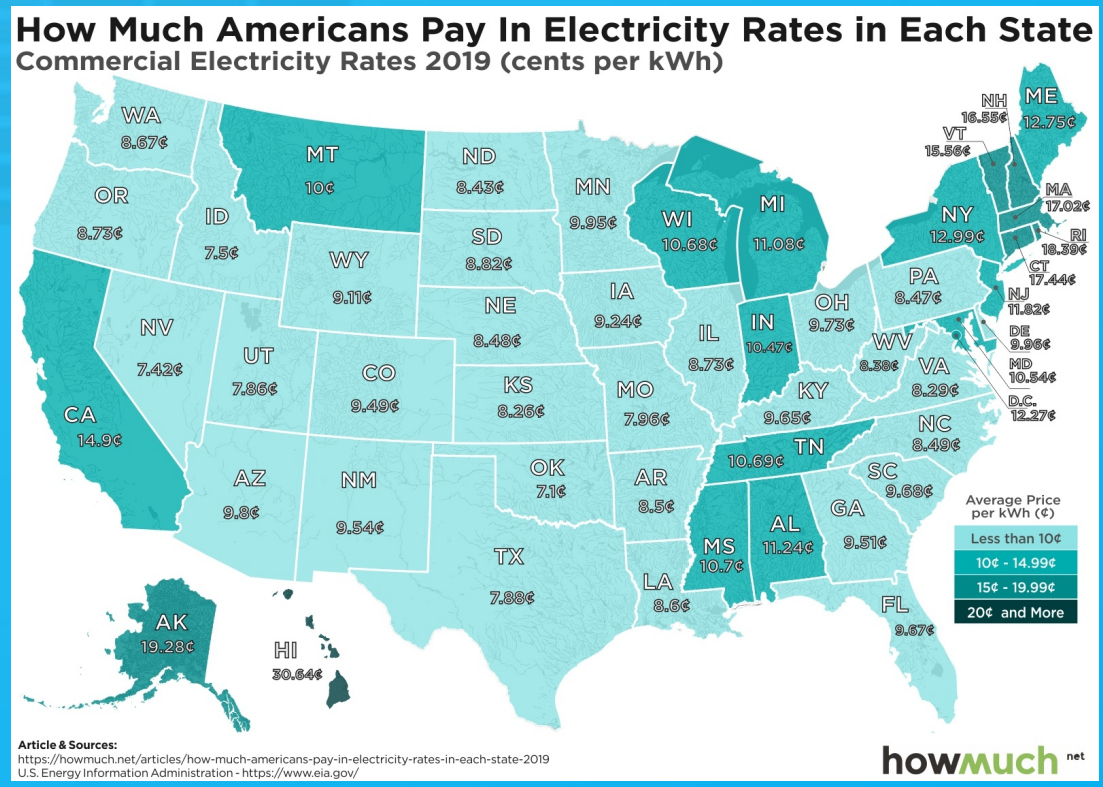
- Facility with 80,000W of AVL equipment
  - 20A = 1,920W or approximately 2,000W of usable power
  - 80,000/2,000 = 40 circuits (1 circuit breaker panel)
- Average # of end-loads per circuit
  - 6-8 LED Lighting Fixtures
  - 4 LED Video Wall Panels
  - 1-2 audio amplifiers
- HOW Example may include…
  - 12 circuits for Audio
  - 8 Circuits for (2) smaller video walls
  - 20 circuits for LED Lighting Fixtures, control and Processors

Every Watt Counts

- Secondary effect of Vampire Power is strain put on HVAC due to heat
  - 1 WATT X 3.414 = 1 BTU (British Thermal Unit)
  - 12,000 BTU – 1 Ton of Air Conditioning (HVAC)
  - 2,000 square feet of building requires approx. 5 tons of HVAC
- Example – Facility with 80,000W of AVL equipment with an average fixture efficiency is 10% draw in Standby mode
  - 80,000 x 10% = 8,000 Watts
  - 8,000W = 27,297 BTU or 2.25 Tons of Air Conditioning

Average Cost of Electricity per Kilowatt Hour

- Hawaii – 30.6 c/kWh
- San Francisco – 21.4 c/kWh
- San Diego – 16.4 c/kWh
- Boston – 13.8 c/kWh
- Kansas City – 10.7 c/kWh
- Atlanta – 9.3 c/kWh
- Las Vegas – 8.3 c/kWh
- Chicago – 4.03 c/kWh



Secondary: Reduced Project Costs

- Compact Solutions Save Wall Space
- Decreased Project Costs
  - Motorized Circuit breakers don’t require secondary relay panel
    - Expenses Saved: relay panel, conduit, wiring and EC labor time.
  - Reduced Electrical Contractor Costs
    - Stick-built configuration can take up to 16 EC labor hours per panel
      - Low-End Potential Cost - $1,200 ($150/hour @ 8 hours)
      - High-End Potential Cost - $2,400 ($150/hour @ 16 hours)
- LynTec RPC Series fully assembled and tested in-house
  - Panel is pre-wired and tested
  - Decreased Warranty Exchanges and Project Delays

Secondary: Systems Transparency

- Remote configuration and setups
  - Doesn’t require on-site personnel
- Monitor electrical loads remotely via network
- Remote Control for hard resets
  - Processor lockups, electrical component malfunctions
- Remote Troubleshooting
  - Rolling a truck may be unnecessary
- Maintenance Agreements

Tertiary: LED and Video Wall Protection

- Electronics, drivers and processors still powered in Standby
  - Fixture life span extended by power cycling end-loads off at the breaker
  - Dimming a lighting fixture to zero does not turn it off.
- Heat is a natural enemy of electronics
  - Degrades electronic components over time
- LED’s and Laser Projectors will last 50,000+ hours, if electronics allow them too
- Processor lock ups require hard reset
  - Video Walls, Digital Signage, TV’s, DSPs, Smart Lighting Fixtures
- Removing end-loads from electrical grid protects from Surges and Spikes

Chauvet Professional Maverick Storm 1 Wash User-Manual

3. Setup

AC Power

Each Maverick Storm 1 Wash has an auto-ranging power supply that works with an input voltage range of 100 to 240 VAC, 50/60 Hz. To determine the power requirements for each Maverick Storm 1 Wash, refer to the label affixed to the product. You can also refer to the Technical Specifications chart in this manual.
The listed current rating indicates the maximum current draw during normal operation. For more information, download Sizing Circuit Breakers from the Chauvet website: www.chauvetprofessional.com.
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- **Always connect the product to a protected circuit (circuit breaker or fuse). Make sure the product has an appropriate electrical ground to avoid the risk of electrocution or fire.**
- **To eliminate unnecessary wear and improve its lifespan, during periods of non-use completely disconnect the product from power via breaker or by unplugging it.**

Never connect the product to a rheostat (variable resistor) or dimmer circuit, even if the rheostat or dimmer channel serves only as a 0 to 100% switch.

AC Plug

The Maverick Storm 1 Wash comes with a power input cord terminated with a Seetronic Powerkon A connector on one end and an Edison plug on the other end (U.S. market). If the power input cord that came with your product has no plug, or if you need the change the plug, use the table below to wire the new plug.

Connection	Wire (U.S.)	Wire (Europe)	Screw Color
AC Live	Black	Brown	Yellow or Brass
AC Neutral	White	Blue	Silver
AC Ground	Green/Yellow	Green/Yellow	Green

Power Linking

The product supports power linking. You can power link up to 3 products at 120 V; up to 6 at 208 V; or up to 7 at 230 V.
This product comes with a power input cord. Power linking cables are available from Chauvet for purchase.

Fuse Replacement

1. Disconnect this product from the power outlet.
2. Using a flat-head screwdriver, unscrew the fuse holder cap from the housing.
3. Remove the blown fuse and replace with another fuse of the same type and rating (F 20 A, 250 V).
4. Screw the fuse holder cap back in place and reconnect power.

Remote Device Management (RDM)

Remote Device Management, or RDM, is a standard for allowing DMX-enabled devices to communicate bi-directionally along existing DMX cabling. Check the DMX controller's User Manual or with the manufacturer as not all DMX controllers have this capability. The Maverick Storm 1 Wash supports RDM protocol that allows feedback to make changes to menu map options.

Altman Lighting PHX LED Ellipsoidal User-Manual

INSTALLATION AND SET UP

POWER CONNECTION - DMX CONTROL MODE: The PHX LED Ellipsoidal Luminaire should be connected to either a constant circuit or relay device when in DMX mode. Note: Altman Lighitng recommends that all Non-Dim circuits powering solid state luminaires are routinely powered down to both conserve energy and maximize luminare performance.

IMPORTANT AC POWER CONNECTION NOTES:

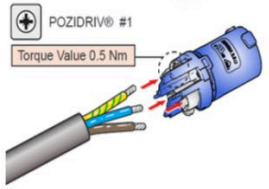
WARNING! The maximum allowable input current is 20 Amps (and the maximum power supply limit of 250 Watts for PHX2 and 150 Watts for PHX1). Do not overload circuits! Luminaires must be supplied by a branch circuit protected by a maximum 20 Amp circuit protector. Doit être alimenté par un circuit de dérivation protégé par un maximum de 20 ampères circuit protecteur. Ne surchargez pas les circuits !

a. Must be supplied by a branch either dimming or constant circuit protected by a maximum 20 Amp circuit protector.
Doit être alimenté par un circuit de dérivation protégé par un maximum de 20 ampères circuit protecteur.
b. When using the daisy-chain connection method, ONLY connect your PHX LED Elipsoidal to AC Output Connection of other PHX LED Elipsoidals. **DO NOT CONNECT OTHER TYPES OF LUMINAIRES OR DEVICES!**
c. Use only approved cable types.
d. Do not overload circuits!
f. The MAXIMUM allowable number of PHX LED Elipsoidals which can be 'daisychained' on one power feed- should not exceed ratings. **DO NOT EXCEED!**

CONNECTING POWER

Connecting Power
Units can be powered in one of two ways:
- Direct connection to a AC power source using a supplied AC input cable.
- Daisy chain connection using an interconnect AC cable.

Field wiring of PHX LED Elipsoidals Luminaire is straight forward. A total of 3 wires/conductors need to be brought to the unit. The following wiring scheme is required: Please consult:
http://www.neutrik.com/en/video/powercon/powercon-20-a/nac3fca
For additional powerCON blue and grey wiring and assembly information.



Wire Color	Purpose
Brown (230V) Black (120V)	Main/(L)ine (120 to 230 VAC)
Blue (230V) White (120V)	(N)eutral
Green/Yellow (230V) Green (120V)	Ground / Earth

WARNING! To prevent injury or death, you must have access to a main circuit breaker or other power disconnect device before installing any wiring. Be sure that power is disconnected by removing fuses or turning the main circuit breaker off before installation. Installing the device with power on may expose you to dangerous voltages and damage the device. A qualified electrician must perform this installation.

Note: The PHX LED Ellipsoidal Luminaire is intended for installation in accordance with the National Electric Code and local regulations. To assure full compliance with local codes and regulations, check with your local electrical inspector before installation. The PHX LED Ellipsoidal is not intended for residential use or installation.

ALTMAN

Electro-Voice User-Manual for Amplifiers

Q44

Q66

Q99

Q1212

IMPORTANT SAFETY INSTRUCTIONS

CAUTION
RISK OF ELECTRIC SHOCK
DO NOT OPEN

WARNING: TO REDUCE THE RISK OF FIRE OR ELECTRIC SHOCK, DO NOT EXPOSE THIS APPLIANCE TO RAIN OR MOISTURE.
AVIS: RISQUÉ DE CHOC ELECTRIQUE. NE PAS OUVRIR.

WARNING: CONNECT ONLY TO MAINS SOCKET WITH PROTECTIVE EARTHING CONNECTION.

The lightning flash with arrowhead symbol, within an equilateral triangle is intended to alert the user to the presence of uninsulated „dangerous voltage" within the product's enclosure that may be of sufficent magnitude to constitute a risk of electric shock to persons.

The exclamation point within an equilateral triangle is intended to alert the user to the presence of important operating and maintance (servicing) instructions in the literature accompanying the appliance.

1. Read these instructions.
2. Keep these instructions.
3. Heed all warnings.
4. Follow all instructions.
5. Do not use this apparatus near water.
6. Clean only with a dry cloth.
7. Do not cover any ventilation openings. Install in accordance with the manufacture's instructions.
8. Do not install near heat sources such as radiators, heat registers, stoves, or other apparatus (including amplifiers) that produce heat.
9. Do not defeat the safety purpose of the polarized or the grounding-type plug. A polarized plug has two blades with one wider than the other. A grounding type plug has two blades and a third grounding prong. The wide blade or the third prong are provided for your safety. I the provided plug does not fit into your outlet, consult an electrician for replacement of the obsolete outlet.
10. Protect the power cord from being walked on or pinched particularly at plugs, convenience receptacles, and the point where they exit from the apparatus.
11. Only use attachments/accessories specified by the manufacturer.
12. Use only with the cart, tripod, bracket, or table specified by the manufacturer, or sold with the apparatus. When a cart is used, use caution when moving the cart/apparatus combination to avoid injury from tip-over.

13. Unplug this apparatus during lightning storms or when unused for a long period of time.
14. Refer all servicing to qualified service personnel. Servicing is required when the apparatus has been damaged in any way, such as power-supply cord or plug is damaged, liquid has been spilled or orbjects have fallen into the apparatus, the apparatus has been exposed to rain or moisture, does not operate normally, or has been dropped.
15. Do not expose this equipment to dripping or splashing and ensure that no objects filled with liquids, such as vases, are placed on the equipment.
16. To completely disconnect this equipment from the AC Mains, disconnect the power supply cord plug from the AC receptacle.
17. The mains plug of the power supply cord shall remain readily operable.

IMPORTANT SERVICE INSTRUCTIONS

CAUTION: These servicing instructions are for use by qualified personnel only. To reduce the risk of electric shock, do not perform any servicing other than that contained in the Operating Instructions unless you are qualified to do so. Refer all servicing to qualified service personnel.

1. Security regulations as stated in the EN 60065 (VDE 0860 / IEC 65) and the CSA E65 - 94 have to be obeyed when servicing the appliance.
2. Use of a mains separator transformer is mandatory during maintenance while the appliance is opened, needs to be operated and is connected to the mains.
3. Switch off the power before retrofitting any extensions, changing the mains voltage or the output voltage.
4. The minimum distance between parts carrying mains voltage and any accessible metal piece (metal endosure), respectively between the mains poles has to be 3 mm and needs to be minded at all times. The minimum distance between parts carrying mains voltage and any switches or breakers that are not connected to the mains (secondary parts) has to be 6 mm and needs to be minded at all times.
5. Replacing special components that are marked in the circuit diagram using the security symbol (Note) is only permissible when using original parts.
6. Altering the circuitry without prior consent or advice is not legitimate.
7. Any work security regulations that are applicable at the locations where the appliance is being serviced have to be strictly obeyed. This applies also to any regulations about the work place itself.
8. All instructions concerning the handling of MOS-circuits have to be observed.

NOTE: **SAFETY COMPONENT (MUST BE REPLACED BY ORIGINAL PART)**

WEEE RECYCLING/DISPOSAL INSTRUCTIONS

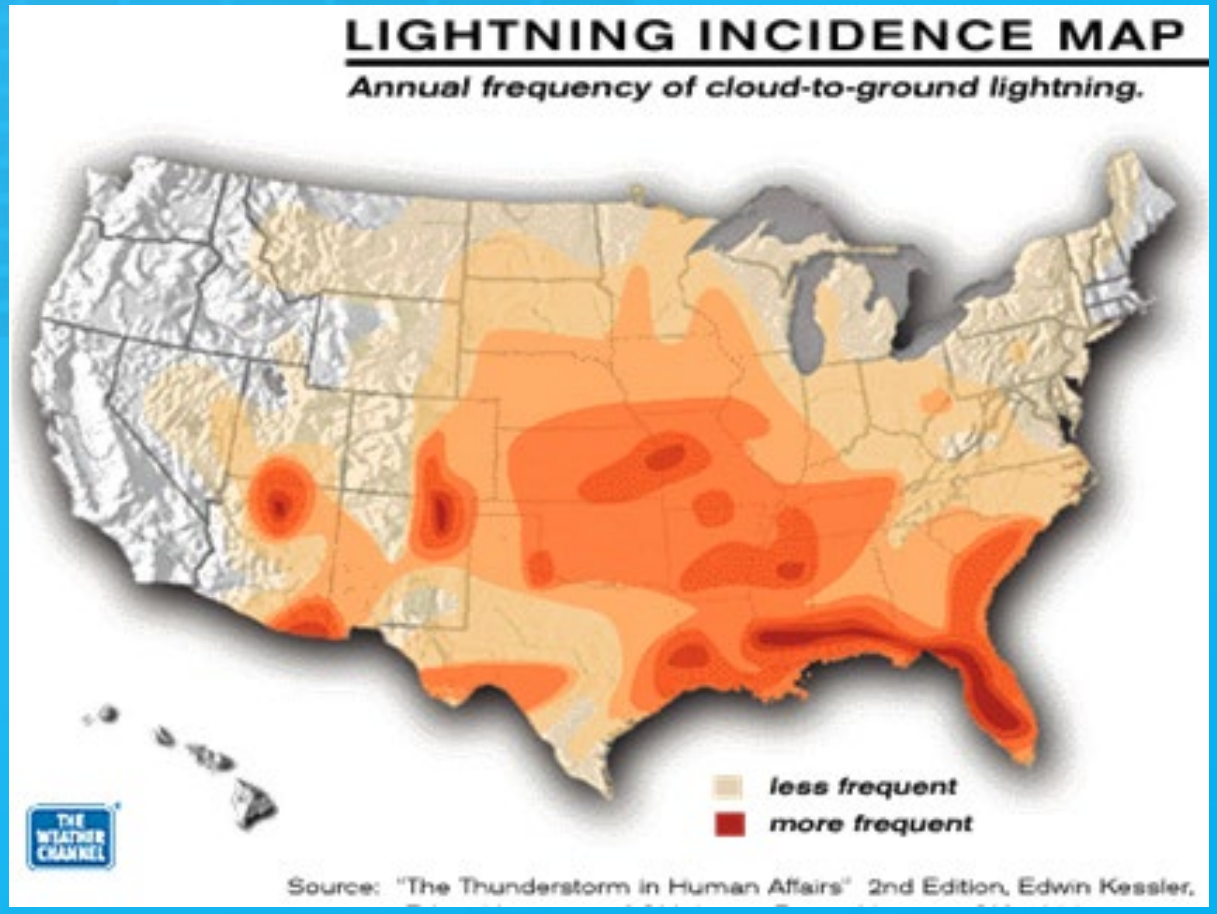
FOR RECYCLING INFORMATION CONTACT YOUR DISTRIBUTOR OR VISIT OUR WEBSITE

WWW.EVIAUDIO.COM

The Wheelie Bin symbol found on the product or in the manual indicates that this product must not be disposed of with other waste. It is in our category the manufacturer's responsibility to properly dispose of their waste electrical and electronic equipment (WEEE) at the end of its life. Due to the differences in each EU country's management of WEEE, please contact your local distributor. We are committed to facilitate our own electronic-waste-management-system, for the free of charge return of all EVI Audio GmbH products: Telex, Dynacord, ElectroVoice, Midas Consoles, KlarkTeknik and RTS. Arrangements are made with the dealer where you purchased the equipment from, for the returning of all unusable equipment ***at no cost***, to the factory in Straubing, for environmental protective disposal.

Electrical Surges

- Surge – transient wave of current, voltage or power in a circuit
  - Duration of less than a half-cycle of the normal wave form
- 60-80% of surges are created within a facility
- Average Surge events per building per month in the USA – 150
- NEMA Surge Protection Institute



Tertiary: Automation

- Startups and Shutdowns fully automated
- Decrease in human error
  - Protects from improper start-ups or shut downs that may damage end-loads
  - Speakers and Amplifiers susceptible to damaging “pops”
  - Astronomical Clock for Sweep-Offs and Startup automation
- Decreased time demands
  - Frees up EC’s, Technical Directors, Facility Managers, Volunteers, etc.