

EXTERNAL POWER SUPPLIES

History. Few subjects arouse as much excitement as a nice hearty discussion of Rane's use of external power supplies. We have done this long enough that it is a good time to review why.

The idea began with the realization that it was unbelievably wasteful and totally unnecessary for *every product* to have separate AC line transformers...and diodes...and capacitors...and regulators. The alternative was what the instrumentation guys did: use *one* power supply for an entire rack of equipment. Our vision was that *no one* would build power supplies into signal processing units; alternatively, the pro-audio industry would have specific manufacturers that *only* built power supplies: big ones, little ones, fat ones, skinny ones, rack-mount, desk-top, stand-alone ones, etc. (but *no wall-warts*—wall-warts bite.)

In our vision, one power supply would give you a system power switch, it would sequence your equipment on and back off; and it would provide all the safety, isolation, balanced AC power, audio-friendly grounding, ground-fault protection, monitoring lights and meters you need. But our vision was not to be.

We tried. From April, 1988 until October, 1989, Rane worked through the AES trying to establish a remote power supply standard, but to no avail (see RaneNote 121 for complete details.)

Name. So we modified the vision, called it **RAP** for **Remote AC Power** and made a successful go of it alone. Since that time we have discovered many more reasons for using external power supplies:

Reasons To Use External Power Supplies

- **Better Audio Performance.** Removes the hum source, i.e. the AC line transformer and all primary circuits resulting in quieter noise performance, without the usual (and annoying) 50/60 Hz and 150/180 Hz hum components.
- **Increased Safety.** Remove the AC primary circuits from the unit and you remove the shock hazard. Remove the shock hazard and you remove the requirement for safety agency compliance. All RAP units qualify worldwide as Safety Extra Low Voltage (SELV) units, i.e., no shock hazard.
- **Agency Compliance Exemption.** By using remote power supplies and sizing them correctly all products powered by them become as exempt as possible from safety agency compliance – only the power supply itself must comply with each safety agency.
- **Quicker Product Development Time.** Eliminates the (considerable) time required to develop a separate power supply for each new product. Getting a transformer correctly sized and located is much more of an art form than a science. Each solution is unique and requires much trial and error – a very time consuming task. Making a product work is much easier than making it work without hum in the noise floor. A tedious thankless job. Rane could not have developed as many products as it has without external power supplies.
- **Faster Product Manufacturing.** Eliminates the time spent on issuing, prepping, installing and testing transformers, line cords, grommets, brackets, hardware, fuses, holders, insulation, hum barriers and shields for each product built. Rane could not build all the units it does each month without external supplies.

Reasons Not To Use External Power Supplies

- **Customers Hate Them.** Explain the life-long benefits instead of apologizing for the one-time inconvenience.
- **Salespersons Hate Them.** See the above.

RAP: A Small Inconvenience; A Large Benefit