

## Horseshoe Nails Won't Work Anymore

By Tom Pincu

**A** long time ago, an electrician running resistance dimmers kept a box of horseshoe nails in his tool box. If one of the contact assemblies on the resistance dimmers died or shorted out, he could pound a horseshoe nail in between the contacts and jump the bad contact. His total investment for the box of horseshoe nails was probably less than a buck and the audience rarely noticed the change in lighting when the commutator arm of the dimmer ran over the bad contact. When auto-transformer dimmers came along, they were not as forgiving of abuse as the resistance dimmers. But Ward Leonard and Superior Electric kept a pretty good supply of brushes on hand, and a smart electrician with emery cloth and spare brushes for the dimmers could keep the show going. There wasn't a heck of a lot you could do to the old iron dimmers that would cause them to fail.

With the introduction of the Thyatron dimmer, the maintenance requirements began to change. Thyatrons were reliable devices and they usually gave you warning when they were going to die. However, the users of Thyatron dimmers generally had to call the manufacturer's service department for help when the dimmer began to perform poorly. The television networks had graduate engineers on hand who could deal with the mysteries of Thyatron tubes and early electronic circuits, so they didn't have too much of a problem. Schools and universities were the people who had to go to the manufacturers for help.

When the silicon controlled rectifier dimmer came along, maintenance became a greater problem. The manufacturers' service departments became busier because the product had become more complex. It required more care and feeding. By the middle 1960s, SCR's were built with such high short circuit capacity that about the only thing that died in the dimmer was an occasional component on the trigger board, and any smart owner of a silicon controlled rectifier dimming system kept trigger boards on hand so he wouldn't be inconvenienced. Anyone with reasonable electronic background could find a bad resistor or capacitor on the board and replace it. Even the lighting control consoles, which were multi-scene preset manual electronic systems, were pretty easy to maintain. There wasn't an awful lot that could go wrong.

With the introduction of microprocessor-based lighting control systems, a new Pandora's box has been opened. The systems are all computer based. When they break down, a call to the manufacturer of the system is a pretty common occurrence. The user does not have the know-how to maintain the system when it breaks down. If the system is out of warranty, the situation is worse. The cost for a field service representative of a manufacturer to visit the installation can be considerable. By the time you add the per day man-hour cost plus air travel and expenses, some systems owners can be looking at \$1000 per trip and up for technical support.

These systems are not inexpensive. Generally, a substantial investment has been made on the part of the user to acquire the system. What the user has not acquired, however, is someone who can provide on-site service on short notice. For the production company that takes rock shows around the world and uses these systems, the risk is even greater. A major rock group or entertainer might be doing a show half way around the world when, due to the realities of "Murphy's Law," the system breaks down. Take for instance a tour that might be worth millions of dollars and a performance that cannot go on because the system has failed. For the production tour operator to use a microprocessor based lighting control system and not have a good hardware man on his staff at the performance site is to court certain disaster. Back-up parts such as printed circuit boards, chips, etc., can be taken along and used for system support. But when you're in Lower Slobbovia (God knows why), and you get into trouble and you don't have the appropriate technical support services, you deserve everything you get.

Murphy's Law basically says that, "If something is going to go wrong, it will and at the most inconvenient time." For those of you who have microprocessor based lighting control systems, the sales statement that the systems are super reliable and won't break down is so much manure. They will break down and most probably on opening night. If it is a system with a memory back-up, you better watch out, because the memory back-up may use some of the bussing and circuitry the prime memory uses and if the failure is really bad, the back-up memory may not work. If the

system has a manual back-up, it better be of sufficient redundancy to permit you to run your show. We have received reports of shows being canceled because the lighting could not be run on memory back-up or manual back-up of the system, so complex were the lighting cues. The more realistic approach in this day of super technology (let's face it, even your corner garage can't repair the microprocessor in your car) is to have a good hardware specialist on site or learn how to repair the system yourself.

We are into "future shock" in theatre technology. The equipment is changing monthly. New systems are being introduced with increasing rapidity. Each one is different. In many cases, the hardware is unique to the system. How are you going to cope? How are you going to deal with field service problems? You have to make the investment of "getting smart." You have to have some way of getting quick service. The IBM's of the world provide cradle to grave service for their systems. The service contracts are expensive, but customers rarely experience long downtime periods. Periodic maintenance is a part of the service contract, so that there is some opportunity to detect early potential faults in the system. If you want to operate in a high technology environment, you have to be prepared to pay the price for the use of that technology. That means either paying top dollar for field service support from the equipment manufacturer or providing your own service for the system. Servicing may mean an extensive diagnostic procedure that has to be done by a qualified individual on site. In either event there is going to be an investment involved. An investment in terms of material and talent that should be made at the time you buy the system, not after, when the warranty has expired. Horseshoe nails won't work anymore.

### Editor's Notes

Tom Pincu, the author of this *Contrasts*' piece is vice president/sales of Colortran. He's also one of the great realists of the industry. *Contrasts* is a semi-regular column that brings divergent opinions to the *Lighting Dimensions* forum. *Contrasts* is just that, one person's thoughts. We welcome reader response.