

LEAVE IT ON! NO, TURN IT OFF!

Balancing the Federal budget? That's kid's stuff! Abortion rights? Inconsequential! If you really want to stir up trouble, just ask this question: "Should I leave the studio equipment on all the time or should I turn it off?"

The calmest, most rational people go ballistic. Studio owners resort to fisticuffs. Even the grouchy tech, hunched over his work bench who hasn't uttered a word since the last presidential assassination becomes a screaming lunatic.

Generation after generation of techs, studio owners, fire marshalls, engineers, manufacturers, Tibetan monks, bums on the street, all have grappled with this question. Few have resolved it.

Since I haven't had a good fight lately and since I would like to receive some hate mail, I thought that it might be time to re-investigate this question. Some of the pertinent questions that are raised will follow, but first, let me say that I have been unable to come up with any valid scientific research in this area. However, I've spoken to a number of manufacturers, techs, and engineers about this subject and I add quite a good number of years as an engineer myself to distill out the following opinion. Here are some of the arguments.

"Leave it on! Turning equipment on and off all of the time burns it out. Especially vacuum tube equipment. It's like when you turn the light on, that's when the bulb burns out."

This is a rather commonly heard argument, so let's look a little more closely into it. Properly designed professional equipment has the tolerances to be cycled many tens of thousands of times with no ill effects. Yes, light bulbs do burn out often as they are being turned on, mostly due to thermal expansion of the filament. However, we are talking about a twenty five cent item which may already have been through thousands of cycles.

The most common vacuum tube that we all deal with every day is the picture tube in your TV. This is turned on and off literally thousands of times. When was the last time you had to replace a picture tube? Probably never.

Power handling vacuum tube equipment, when properly designed, has the

DC plate power to the tubes come up slowly, as the tube temperature comes up from the filament's heating. Tube power amps will often have a thermal relay or time delay relay which waits for the tube filaments to heat up before applying plate voltage.

With solid state devices, the same is true. With properly designed power supplies which are voltage regulated, turning equipment on and off should not damage anything. It is interesting in theory that a solid state device should last forever. Unfortunately, this is not true in practice. I have changed a lot more transistors in my career than I have replaced vacuum tubes.

"The equipment sounds better when it is left on!" To a certain extent, this is true if you are comparing sound of equipment which has spent the night in a cold room and which has just been turned on. In practice, most professional equipment is turned on at least an hour before a session and in most cases, equipment should come up to normal operating temperature in an hour or two. I have never heard a difference in sound.

"Should I leave my computer on all the time? What about electro-mechanical devices - tape recorders and computer hard drives?" Certainly, a capstan motor should never be left running when not in use. The life of a motor is calculated by the amount of bearing wear. The more times that the shaft turns, the shorter the life of the motor. And as Dale Manquen of Siemens-Neve-Martek-Flying Faders says, never let a hard drive stay on if it will not be used within the next 5 hours. There is a very nifty motor inside that is spinning its little heart out.

In my experience, and I have been running SEAR SOUND for 30 years, heat is what kills equipment. I have changed far more capacitors than any other component and heat is the biggest enemy of capacitors. Electrolytic capacitors are most prone to heat failure. The longer that you leave them on, the shorter the life. They begin to lose capacitance and will eventually dry out and fail. Turning equipment off when not in use will definitely extend capacitor life.

Another important consideration is fire hazard. Yes, there are fuses in the power line circuit in most professional equipment to prevent a fire. But if the equipment is over-fused (you couldn't quite find the right value, it was an emergency, you replace a burned out fuse with whatever was handy, etc.), you are risking a fire. Should this occur when there is no human in the studio to take prompt action, it could be catastrophic. To keep

equipment cooking when there are no people around makes me nervous.

Even when properly fused, if an electrolytic capacitor in a power supply begins to short, attentive human beings can turn off the equipment before serious damage is done to the power transformer. The smell of the smoldering transformer is a clear giveaway. If the equipment is left on all night and there are no humans present, indeed the fuse will eventually blow, but long after the transformer is dead. There is also a bit of an advantage if someone is present when a piece of equipment fails. The scenerio of 'what happened?' is usually the first question that the tech will ask. It's sometimes helpful if there is an answer. We all know the basic engineering theorem, "if anything can possibly go wrong, it will!" And the corollary that is close to the heart of all techs, "one kick is maintenance, two kicks are abuse".

What about the economics of leaving the equipment on all of the time? I have attended many studio bankruptcy auctions and in many of them, the equipment is STILL on. With the cost of electricity as high as it is in most areas, by leaving all of your equipment full on when you are not recording is adding quite seriously to your overhead. It isn't helping the environment much either. The arithmetic is simple - if you are not recording for more than 12 hours a day, by turning your equipment off, you might be cutting your electric bill almost in half. You can give the air conditioning a rest at the same time. There is another disadvantage to leaving a console on when it is not in use. Rats and mice like a nice warm place to nest and many a rat's nest (real, not the wiring), has been found in left-on consoles. The mice will reward you by chewing through a few cables - they seem to love the taste of insulation.

I think that a lot of the mythology of leaving equipment on all of the time comes from the early days of radio broadcasting when the station was on the air for up to 24 hours a day, hence, the equipment was in use. In most recording studios, we are not booked for 24 hours a day, but the myth persists. It may be time, with the ever increasing rises in electrical rates, to reevaluate your 'leave it on' theory. What you save on your electric bill by turning things off may be enough to cover all of those light bulbs that burn out when you turn them on.

I have found that the equipment which will fail when you turn it on, fails because there was a weak component which was ready to go anyway. I'd rather know about this before the session begins rather than have it fail in

the middle of a session. AND IT WILL FAIL. It's often easier to fix if you can tell the tech where you saw the lightning blue flash before the smoke came out.

It would seem to be perfectly rational, on the basis of this discussion, to begin to turn your stuff off when you close down for the night. I know that old habits are hard to break, but as I said, I've heard these discussions throughout my career, and I'd say that the weight of logic and advice is definitely on the side of the 'turn it off-ers.' It works for me.

No doubt, the fur on the back of the neck for the 'leave it on-ers' will be raised to the point of sending me letter bombs. This argument has deeper than religious commitments. Is this the result of blind faith, or are there some valid arguments to the contrary? I've yet to hear them, and I'm quite willing to listen - but no profanity, please.

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