

STUDIO MAINTENANCE

Technological changes have kept maintenance departments busy with learning and acclimating to changing work methods.

by Greg Hanks

"Any sufficiently advanced technology is indistinguishable from magic."
-Arthur C. Clarke

Over the past two years I have been railing in this publication and others about many of the different technical aspects involved in the operation of a professional audio facility. With 20-20 hindsight, I see that we have never addressed the fundamental issues.

This business of ours has been changing radically over the years. In earlier times, the recording studio was a hand-crafted facility where the equipment was either built by, or custom constructed for the studio owner. In those halcyon days it was assumed that either the studio owner or someone on the staff was capable of electronic design and repair. The expertise of these individuals would often determine the viability of the studio operation. There were no "off-the-shelf" consoles; outboard equipment consisted of limiters, compressors, equalizers and echo devices. Multi-track tape recorders were as much "production prototypes" as they were mature products. Because of the small number of studios in existence, everybody knew everyone else, and technical information on the "what to do if" and "how do

I?" situations was traded as inside gossip. The "maintenance man" was responsible for the construction, installation, and servicing of all of the equipment used in a studio. When a microphone cable was needed, it was built in the "shop." Before a session, all the machines would require alignment. It was necessary to stock sufficient spare parts to repair anything that might break, for a ready replacement device was not to be found. Audio dealerships were rare and the inventory meager. Equipment rental was something that a studio would do with spare inventory.

Well, things are a little different now, eh? The demand for recording services has grown tremendously, and the number of studios has exponentially increased. The demand for readily available, mass produced equipment has flourished. In the beginning \$100,000 was a large budget for constructing and equipping a control room/studio. These days, a million plus creates the same status facility. The growth and health of the recording business has made magazines like this possible, and some fundamental changes in the mentality of the equipment suppliers and studio owners were necessary to accommodate that growth.

The modern studio owner is much more of a businessman than in the past, because the burgeoning expansion of facilities has made competition fierce. Technological change has

kept the maintenance department busy with learning and acclimating to changing work methods. Synchronization, automation, sequencers, synthesizers, control tracks, machine controllers, edit decision lists and the like have kept the technically inclined more in an instructional and advisory position than the previous repair technician role. The integration of LSI, automatic insertion equipment, and "Bed O'Nails" testing stations has made the equipment we use much more reliable than their ancestors and they are also more difficult to repair at a component level. The world at large has experienced the same maturation of technology as the recording industry. Capable repair of "high-tech" electronics is becoming increasingly more difficult to obtain, and concurrently the costs are increasing. We are approaching an age of disposable assemblies, where repair consists of replacing modules of relatively modest expense. Herein lies the crux of this article.

Furor is brewing! Disagreement is fermenting in the minds of my readers. I can see it already: "What do you mean, it has become more reliable? It doesn't do what it's supposed to, or what I need." The equipment of today does perform more reliably than in the past, it's relatively less expensive (for moderately featured models) and in general, it sounds better. These points are partially responsible for the proliferation of the home studio. Current studio competition is based upon hourly rate, equipment selection, outboard equipment on hand and the features that the control room can offer. Equipment is expected to operate within specification and to perform the operations for which it was purchased. In a previous era the specifications of most manufacturers were not good enough, so a studio would perform extensive testing and modification of each piece of gear to optimize its sonic purity and electronic interface with the facility. The necessity of modifying the offerings of today are mandated by the situation where the function(s) required are not met by the initial product design. These modifications are not repairs.

Today's modern recording facility is a veritable cornucopia of control surfaces comprising a hierarchal command structure, with a variety of syntax and protocol. With the infusion of MIDI controlled synthesizers running via sequencer, controlled by SMPTE time code that is accompanying picture, we have a much greater chance of operator error. In the past, the trouble-shooting of a session problem was dominated by looking for the pressed

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solo button, the hidden mute or the wrong operating mode. The same process is involved in the trouble-shooting of today, with the addition of verification of the correct command sequences, switch settings, and the Integrity of the data tracks. When a problem was isolated in the past it was patched around until the session broke to afford an opportunity for repair of the offending item(s). These repairs were usually effected by the studio staff using parts from the shop.

This is still the case in some situations today, but those instances are the exception. The economics of studio operation have mandated cutting back on large staffs, and the dearth of qualified personnel at a reasonable salary level has made it difficult to justify the outlay required to keep a maintenance staff. With the mammoth product of the business being the utilization of high technology, things go wrong. Headphones break and mic cables open up and there is an ever present need for another adapter. There are those situations where primary equipment malfunctions, and technical capability is required. Every studio minimally requires the presence of at least one person who is familiar with the operation of all of the equipment required on a session. It is also essential that there be personnel available that can handle a soldering iron and a screwdriver. It is not necessary that this be the same person who can figure out how the edit controller Interfaces to the VCR. The combination of these two functions is the job description of the modern day studio maintenance man.

All of this must seem quite pedestrian to many of you, but it forms the basis of the manpower decisions required in staffing the operation. With the knowledge of how the equipment in use is supposed to function it is possible to ascertain whether or not a piece of equipment is malfunctioning, and if it is broken, how we repair it.

There are some preliminary steps that should be taken before we go for help. Is the unit correctly plugged in? Are the controls set correctly? Is the fuse blown? Does it pass audio? What is the specific patch setup so we can duplicate the problem? If we have another unit of the same type, does it do the same thing in the same setup? Common sense (which seems to be in great demand these days) is the first tool in solving a problem. Most of you will perform these steps as an instinctive reaction in a session situation.

Once it has been determined that "The damned thing broke!" there are five primary paths of pursuit possible:

- 1) Fix it yourself
- 2) Have a staff person perform the repair
- 3) Contact the dealer that the unit was purchased from to correct the difficulty
- 4) Have the manufacturer execute the repair
- 5) Contact a service agency that will perform the task

The choice will be determined by your circumstances, such as whether or not the unit is still under warranty

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or if you bought it via mail order. But the equipment still has to be repaired. A large portion of the equipment in the facility is not easily shipped and service on it must be done on site. In order for service to be efficiently performed "on location" there are a number of things that the facility should provide. These include:

1) All documentation pertinent to the equipment. The owner's manual and/or the service manual will often suffice.

2) A complete selection of "user serviceable" spare parts that apply to the gear. Fuses are an example of this. The main source(s) or service that you employ will determine what is your most effective spare parts inventory level. If you rely primarily on in-house labor, such as you or your staff, then it is cost effective to keep a greater depth of module level spares. We will ex-

plore this aspect in greater depth a little later. (For a more detailed analysis of parts that should be kept on hand, see the February '86 Mix "Budgeting for the Cost of Maintenance" article.)

3) Rudimentary test equipment. Who performs the repair, and how well equipped they are will determine what is required in this department. Most manufacturers and dealership service facilities prefer to travel light, and this means more responsive service if they know that they don't have to carry a scope and VTVM.

4) Essential hand tools. In order to perform even the most basic examination on your equipment you will require a complement of screw drivers, wrenches and pliers. In order to repair the headphones and mic cables discussed earlier you will need a soldering iron and solder. (For an in-depth discussion of tools and test equipment please refer to the October '85 Mix "A Guide to Cost-Effective Tools and Techniques" article.)

The technical requirements of a studio do not just involve repairs but also include equipment installation, facility modification and custom construction. Functionally, repair can be divided into different classes, such as:

A. Minor repairs. Headphones, mic cables, lamp replacement, routine machine alignment, driver replacement, simple equipment relocation and the like fall into this category. This encompasses the bulk of the technical work in a studio. It is best handled by someone on staff, and major academic accomplishment is not a prerequisite.

B. Major repairs. Breakdown of equipment that requires the replacement of internal components, tape machine mechanical alignment and resetting of system gain structure all fall into this category. A knowledge of electronics, mechanics, physics, familiarity with the equipment and a logical mind are required for this type of task to be accomplished competently. For work of this type to be successfully performed in-house, a substantial investment must be made in tools, test equipment, module assemblies and component level spares.

C. Major design inadequacies. When a piece of equipment does not perform a function satisfactorily it is time to call in either the dealer, the manufacturer or a specialist on that piece of equipment. All of the abilities described above are needed, as well as an intimate knowledge of the particulars of the machine in question. The ability to understand and change the fundamental design of the gear in question is also desirable.

The performance of the technical tasks required by your studio should

be a team effort. It is beyond the capabilities of all but the richest of firms to be able to employ all of the specialists needed to optimally care for the facility. In times of dire need, the manufacturers are most eager to assist you with information and parts. You should avail yourself of this help, for a telephone call to the technical support department can often help lead you to the defective sub-assembly. The ability of the manufacturer to provide you with replacement assemblies "overnight" can reduce the need for expensive spare parts. Most dealerships are required by the manufacturer to provide warranty service on what they sell. Why should you pay your people to fix something that you just bought?

Studios have other needs too, such as major repairs, facility expansion, equipment modification and the like. How do we cope with them? This depends upon a number of factors, like how many rooms you have, what type of manpower is available in your local area and how much that manpower costs. The budget decision to create a technical staff should include cost considerations other than just salary. The type and quantity of tools and test equipment that you must maintain for your staff to effectively accomplish their job(s) can be much more expensive than if you rely on outside sources of labor. With a technical staff, component level repair should be expected if you are going to get your money's worth. This means that you will have to purchase resistors, capacitors, transistors, analog and logic ICs, and many other miscellaneous parts and bits of hardware. An outside service vendor should provide both tools and parts in addition to the technical ability that is the foundation of its rate. This is an important consideration when weighing the financial impact of technical staff.

If you are having repetitive failures, or you seem to be having trouble with many different things concurrently, it may be wise to consult with an outside service organization. Experts may be hired by the hour, by the day or by the job to help you correct a problem or offer suggestions and solutions to your situation. Even a well staffed recording studio can and should profit from the talent that is available in this manner. But it is my contention that if the studio staff is not overworked, then you have too many people on staff! ■

Greg Hanks, formerly chief engineer at Wally Heider Recording (L.A. and SF) and technical director of Audio-techniques, now heads New York Technical Support, the service company for the New York area.

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