

Designing Your Studios

By Gordon Carter

We are finally to the point of designing our studio space. We have assembled our moving team, assessed our needs, and picked the space we will move into. The studio design phase of the project brings together all of the disciplines of the audio engineer. Designing a good studio space requires some knowledge of acoustics, electronics, ergonomics, architecture, structural engineering, air handling systems, and more. Fortunately you don't have to know all of this yourself if you have assembled a good team.

The first thing you have to look at is the space required for each room. To determine the size of each room you will need to know what equipment will be used in the room and how it will be used. This will, to some extent, determine the layout of the equipment in the room. As you look at various ideas, be sure to get feedback from the people who will be using the room. Remember

that not everyone has an easy time relating to room layout drawings, so other techniques may be required to communicate the design. Depending on the resources available to you, you could use perspective drawings, models, full-size mock-ups, computer modelling, and more. As you lay out the equipment, be sure to allow adequate room for the people who will be using it, to get around and don't forget to allow adequate room for service access. I have seen many radio stations designed with all of the equipment pushed up against a wall so it requires a strong furniture mover just to plug something in.

While you plan the dimensions of the various rooms, be sure to allow for the necessary wall thickness and ceiling drop to conceal such things as conduits, air ducts, sound proofing, and

structural members. Your studio designer and architect can help you with this.

As your layout takes shape, the necessary size of the room will become apparent. Be careful with the room dimensions if you want the room to sound even the least bit good. If the dimensions of the various sides are close to multiples of one another, standing waves could result that will make the room boomy or have other problems that will be difficult or impossible to tame. Various acousticians have come up with "ideal" room ratios to avoid standing waves in rooms, but reality may dictate a compromise. It is best to have your studio designer check the dimensions for possible

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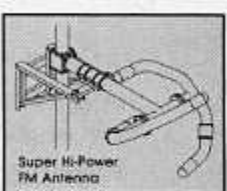
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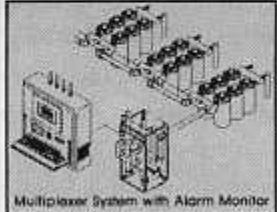
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Studio Site

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interactions, with a computer program. You may want to move a wall a few inches to improve the sound, and it is easier to do now than later.

There are a myriad of concerns to be addressed with the mechanical design of your studios, relating to isolation and noise control. Your studio designer can discuss these with you in more detail and help work out the combination of techniques that is best for your situation and budget. Some things you may want to consider are floating floors, separate walls for adjoining studios, lead-lined walls, acoustic doors and windows, sound locks, and more. Each of these items has its own set of advantages and disadvantages, so you will want to weigh each one carefully.

If you are even the least bit concerned about noise in your studios, you will want to pay some special

attention to the air handling system. For minimum noise transmission you will want any air handling devices (air conditioners and fans) located as far from your most critical room as possible. They should be mounted on properly designed isolation pads to reduce vibration transmission. An improperly designed isolation pad may actually increase vibration transmission and may fail prematurely.

The routing and design of the ductwork is very important to reduce rumble and air noise. The ductwork should be large enough to allow for adequate air flow to each room (determined by heat loading calculations) with as little velocity as possible. Any turns in the ductwork should be large sweeping turns, not sharp corners. When the duct enters the room it should do so in such a manner that the air is dropping into the room instead of blowing through it. Avoid corners near the air baffles and make sure the baffles are the low turbu-

lence type. Any dampers that are necessary in the ductwork should be as far from the baffle as possible to avoid turbulence. If you have more than one room being served by the same air system, put as much ductwork as possible between rooms. This will help reduce sound leakage between rooms.

As you design your studios, be sure to allow for the necessary electrical systems. Your architect and local building codes will probably require some exit signs and emergency lighting. You will also need lighting for your operations. If your people like to work in low light (like Venus Flytrap on WKRP) that is fine. Just remember to have enough light available when it comes time to sweep the floors or work on the equipment. You really don't want to fight with a work light every time you need to clean some tape heads, do you?

Many designers like to use fluorescent lights for their low cost and

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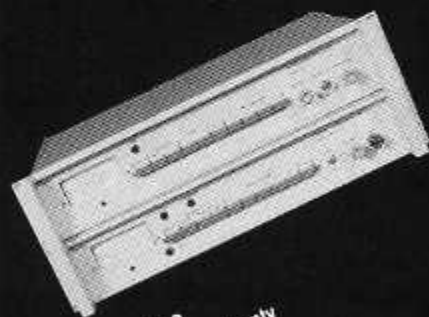
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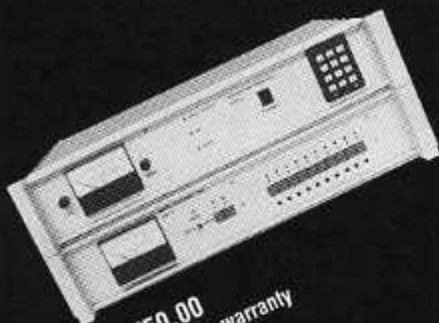
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high efficiency. If you choose to have fluorescent lights in your studios, have the ballasts for the lights located outside the studio itself. Ballasts hum, especially as they get older, and this can be a real annoyance to your people and your listeners. Another popular item is dimmers on incandescent lights. If you use dimmers, be sure to get the "zero-crossing" type which greatly reduce the electrical noise generated by the dimmer. I have seen complete control rooms rendered useless by one improper dimmer at the other end of the building.

While on the subject of power, be sure to put all of your technical equipment on the same phase of the AC power. If possible, have a special transformer installed that steps down to a true single phase. If this is not available, make sure the phases are balanced to prevent line-induced problems. Also, take whatever precautions are necessary to insure that your power is clean. Dirty power can create noise and operating problems with some equipment and may even shorten its life. ■

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