Speaker Systems for Background Music and Paging

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Distributed loudspeaker systems for paging and background music are among the most important "bread and butter jobs in sound contracting. In most cities, new restaurants, hotels, health clubs and clinics are continually sprouting up. Each one has needs that can be met by a distributed system, and each represents a potential client for the enterprising contractor.

The overwhelming majority of paging and background systems are relatively small, however. With the margin on many installations running in the $400 to $600 range, there's not much room for error or misunderstanding, since the cost of a single callback can eat up most of the profits. To succeed with distributed sound systems, the professional contractor needs to be able to count on his jobs going in smoothly and efficiently.

In this article, we'll explore some of the "nuts and bolts" issues that affect profitability in the distributed sound system market, and offer suggestions for improving your chances of success in the business.

The Site Survey

Every system specification begins with a survey of the site. The sales engineer, whose job is to ask the right questions and gather all the information necessary to complete an accurate bid, normally performs the survey.

At this stage, it is most important to form an accurate picture of the customer's needs. Will the system be used for paging, background music, or both? Do pages originate from a single location, or from multiple locations? Must the system be tied into the customer's telephone network? Should the system be divided into multiple zones with separate volume controls? If so, should pages be routed to all zones, or should zones be separately addressable? Should zone controls be located at the rack, or is local control required? The answers to questions like these will determine major aspects of the system design.

Talking to individual users of the proposed system will help to flesh out important design details. Is the maitre d'hotel's station located directly under a speaker? If so, then an independent local volume control should be provided for that speaker, so that it can be adjusted to allow conversation

with patrons. Will the person issuing pages be sitting under or near a speaker? If so, then consider equalization, or a separate muting circuit, to avoid feedback. Is light-switch height a comfortable location for zone volume controls, or does the user have another preference? Getting this kind of information at the beginning will help to avoid confusion and delays at the installation stage.

Just as important as the human factors are the construction details of the site. How are the walls and ceilings constructed? What kinds of mounting surfaces will be encountered? Is the drop ceiling a lay-in type, or tongue-and-groove? Where must cabling be routed, and how accessible are those spaces? Do partition walls or bearing members extend above the drop ceiling, where they may obstruct cable runs? Is conduit or plenum cable required? All of these factors directly affect the price quote and the actual task of installation.

Defining The System

Upon completion of a thorough site survey, the system may be specified and quoted. The sales engineer also usually generates the design and quote, often at the same time as the site survey. Success at this stage depends experience and product knowledge.

To avoid ambiguity and confusion at the installation stage, the specification needs to be as explicit as possible. Of course, it should enumerate all of the equipment proposed to do the job, and should include both a block diagram and an accurate floor plan with annotations regarding construction. In addition, it should provide details such as local volume control locations and height, the desired location for amp racks, and even names of the employees who are expected to use the system. To forestall disputes and clarify responsibility if changes are required during or after installation, the customer should be asked to sign a written agreement governing the specification.

Many contracting companies simply communicate the sales engineer's design directly to their installation department, who are charged with putting the system in and making it work. There are potential problems with this approach. For example, the salesman's natural tendency is to over-design and oversell when he can. If the client is amenable, the result can be an excessively complicated (and problematic) system. Moreover, it is easy to make mistakes in the flush of a sale, and these may be compounded when the system goes in.

To address such pitfalls, it makes good sense to have each proposal reviewed by a second engineering employee whose approval should be required before the specification goes to installation. At this stage, design details can be fine-tuned and potential problems can be addressed to assure that the design is feasible, efficient and free of unnecessary redundancy.

Selecting and Positioning Loudspeakers

In the traditional approach to overhead-distributed systems, loudspeakers are located in a grid arrangement whose dimensions are dictated by the room height and the directivity of the speaker elements. Two basic placement patterns prevail: square spacing, and hexagonal (or crisscross) spacing.

In addition to the spacing pattern, the designer must choose between three density types, designated respectively as edge-to-edge, minimum overlap and center-to-center. The greater the overlap, the more uniform the coverage—and the higher the cost. Budgetary constraints tend to favor sacrificing density, so the optimum center-to-center configuration is, in practice, the least common of the three.

Ceiling Speaker Size

System designers usually specify 8-inch cone loudspeakers for distributed overhead systems, at least in part because they represent the traditional choice. In many cases, however, you can achieve equal or better results—at a significant savings—by using 4-inch elements. Characterized by somewhat smoother frequency response and less susceptibility to feedback than 8-inch elements, 4-inch units are also generally less expensive and offer a real advantage in directivity.

Of course, a 4-inch unit will typically be somewhat less sensitive than a comparable 8-inch. For equivalent motor assemblies, the difference is on the order of 3 dB. The 4-inch will also have slightly reduced low-frequency capabilities.

Read more about EV® ceiling speakers.

Ceiling speakers data sheets:
205 Series 4”
405 Series 4”
EP405 Series 4”
EP407 Series 6.5”
PRO-8A Series 8”
209 Series 8”
309 Series 8”
409 Series 8”
EP 309 Series 8”

Expect The Unexpected

The distributed sound system market is highly competitive and margins are small. It makes good sense to do everything you can to avoid problems at the installation stage and to be ready to handle callbacks or last minute changes smoothly. One way to do this is to anticipate problems before they occur and build contingency plans into your operation.

For example, you should always have some inexpensive “fixes” at the ready. Say that the customer decides to change his floor plan at the last minute,

requiring you to add another zone to the system. Electro-Voice offers the MA/MR series of rack-mount or shelf-mount mixer/amplifiers, receivers and power amplifiers that enable you to offer a painless quote for the requested change, and come out a hero. You can even avoid the additional cost of installing a volume control in the new zone by putting the amplifier on a shelf in the zone.

Read more about MA/MR Series amplifiers:
MA-1005B
MA-355B
MA-605B
MR-355C receiver

Similarly, it may make sense to pull a couple of extra cable pairs (both speaker lines and mike lines) when making your home runs. That way, if there's a base that wasn't covered in the specification, you can make it up onsite. The practice also facilitates expanding the system at a later date.

Be sure that the floor plans you use are up-to-date, and keep communications open with the client. Particularly if you are limited to using existing wiring, you need to know if the client's plans for space usage will remain the same. Otherwise, you may end up with a real headache—like having the emergency room announcements directed to the pediatric ward

Finally, it is vitally important to be sure that you know who in the client's company is authorized to make decisions when questions arise on the job site. If the building manager tells your installers to put the amp racks in the basement you don't want the owners calling you and insisting that they should have been in the second floor office

Standardizing for Profitability

One of the best strategies that we can recommend for success in contracting is to standardize your operations wherever possible. Settle on a few basic system designs that can be modified to cover a wide variety of circumstances and then educate your sales staff about them. Develop standard pricing calculations, in cost per hour, for all of the basic labor items: putting in a can, pulling a cable pair, installing a plenum run, and so on. Rather than trying out a new, whiz-bang esoteric product on each installation, stock a carefully selected complement of proven performers and use them consistently. Often you can achieve significant savings by reducing the number of suppliers whose products you use. When you use several suppliers, you encounter differing lead times, minimum order quantity requirements, freight policies and payment terms that complicate your ability to respond quickly and consistently to demands from your customers. These are "hidden" overhead costs that compromise your ability to generate a profit.