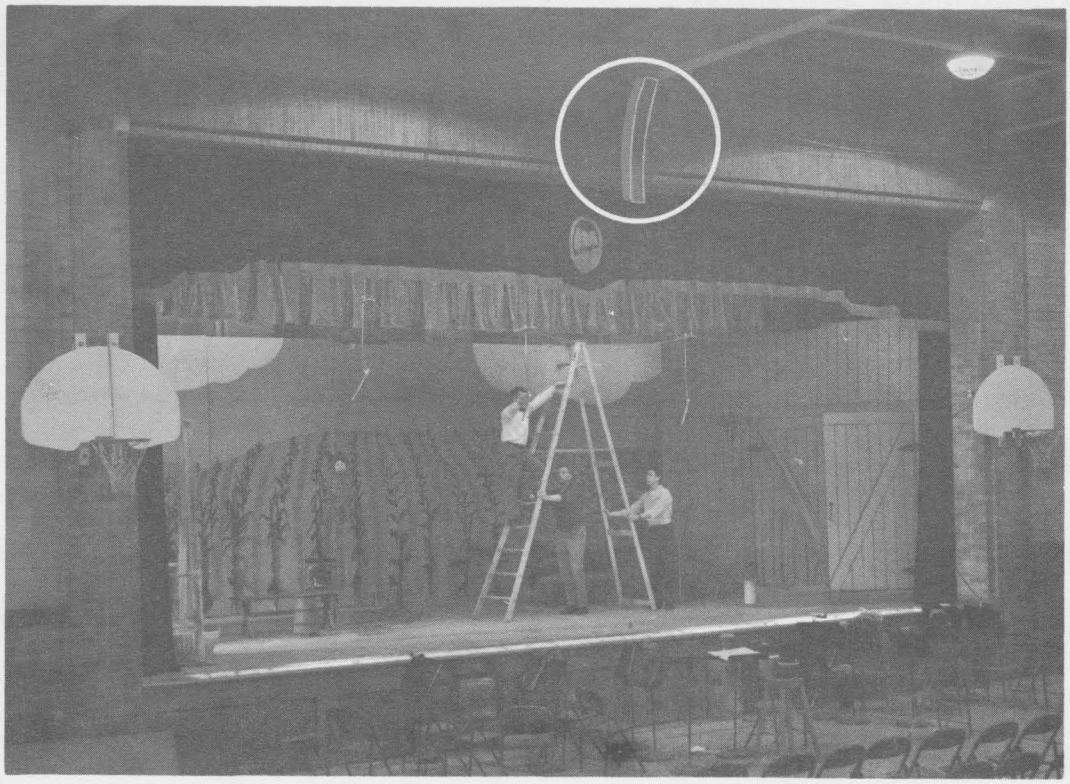
P. A. FACT SHEET NO. 2

SUBJECT:

SMALL GYMNASIUM

THREE OAKS, MICHIGAN

Electro-Voice®



PROBLEM

This situation involved a small, acoustically hard gymnasium-auditorium typical of those found in thousands of small schools. Two 12-inch cone speakers in wall baffles were mounted on either side of the stage above the baskets. These were used during events involving use of the stage and for announcements during basketball games. Two public address cardioid microphones were placed on the stage for plays; one microphone was used with a portable podium for lectures.

During general assemblies and stage plays only that small portion of the student body or other audience directly in front of the loudspeakers obtained sufficient sound level to hear what was being said, even this occurred only when the performers were close to the microphones. Attempts to raise the sound level invariably resulted in severe feedback. A good quality 25-watt amplifier was being used, and accentuation of high frequencies through use of the tone controls assisted to a small extent. The improvement, however, was not great enough to provide satisfactory audience coverage. Even in that absence of feedback, the narrow horizontal coverage afforded by the 12-inch cone speakers would have been insufficient.

SOLUTION

Because extremely wide horizontal dispersion was required to solve the coverage problem, one Electro-Voice model LR4 Line Radiator was selected. The depth of the audience was relatively short, and the 25-watt capacity of this Line Radiator assured adequate level for complete audience coverage with a large reserve margin.

To preserve a maximum of realism, the speaker was centered over the stage and suspended from a convenient "I" beam. The mounting bracket provided with the loudspeaker was bent into a "U" shape and fastened to the top of the cabinet in a location where, if hanging free, the radiator front axis would point approximately 25° below horizontal. This tilt was selected so the projected front axis would intersect the audience in the lower part of the permanent bleachers. A smaller angle would project a higher sound level onto the rear wall with the inevitable increase in reverberation and feedback.

To complete the system, three model 644 Sound Spot® microphones were placed on desk stands in the footlights and located at equal intervals across the stage. While sufficient pickup could be obtained to the full depth of the stage, there was little margin of level before the system broke into feedback. This, it was felt, was due to "bounce" or reflection off the stage floor. To correct this situation the three microphones were suspended overhead from a light batten, as shown in the photograph. Rotational movement of these highly-directional microphones was prevented by utilizing floor stand risers mounted in wood blocks which were suspended from two points. (See Figure 3) Utilization of the light batten allowed the microphones to be raised or lowered as desired.

This placement of the microphones provided adequate coverage of the stage to its entire depth and even to the lateral extremities. Sufficient sound level was obtained from the single model LR4 to cover the entire audience with only half the power available from the amplifier and with a large margin before the occurence of feedback. A single model 664 cardioid microphone was used for pickup of speech from a single performer or lecturer and announcements at games or exhibitions.

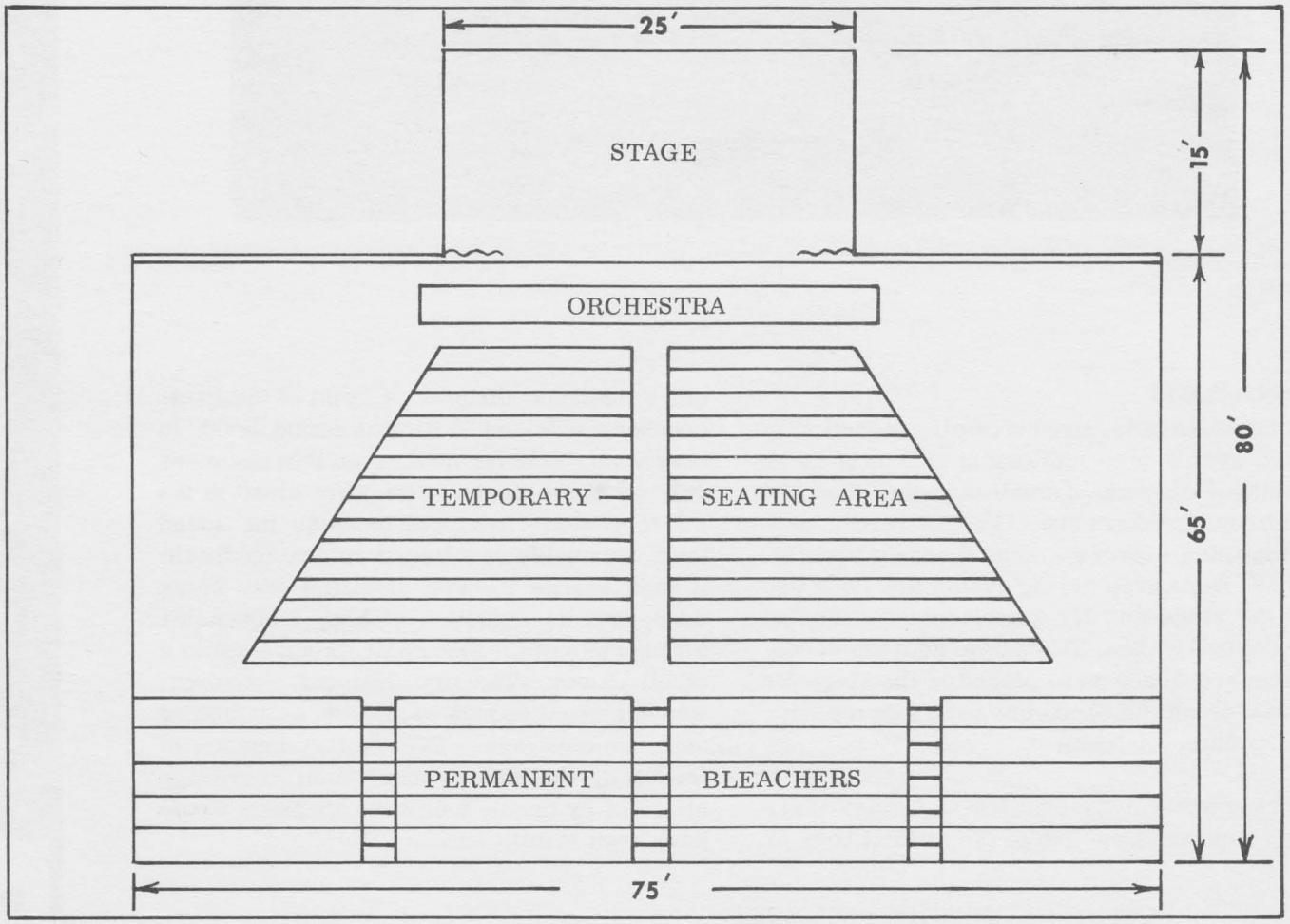


FIGURE 1 - PLAN VIEW GYMNASIUM - AUDITORIUM

COMMENTS

In order to overcome the disadvantages of a very "hard" room and to suppress the effects of the resulting echo and reverberation, pick-up and reproduction units were selected to give every possible advantage. The speaker system was located in the ideal position for best audience coverage and a minimum of reflected poser. This position also allowed the microphones to be placed in the null area under the Line Radiator. Use of highly directional microphones made possible further elimination of low-level feedback and extended pickup distance throughout the stage area. During operettas and other musicals the stage microphones provided excellent separation between the vocalist and the orchestra. Cost, which could have been a limiting factor, was not a problem since the entire solution involved only the addition of four microphones and one Line Radiator. The entire installation was completed and tested in one afternoon.

LOCATION: Three Oaks High School
Three Oaks, Michigan

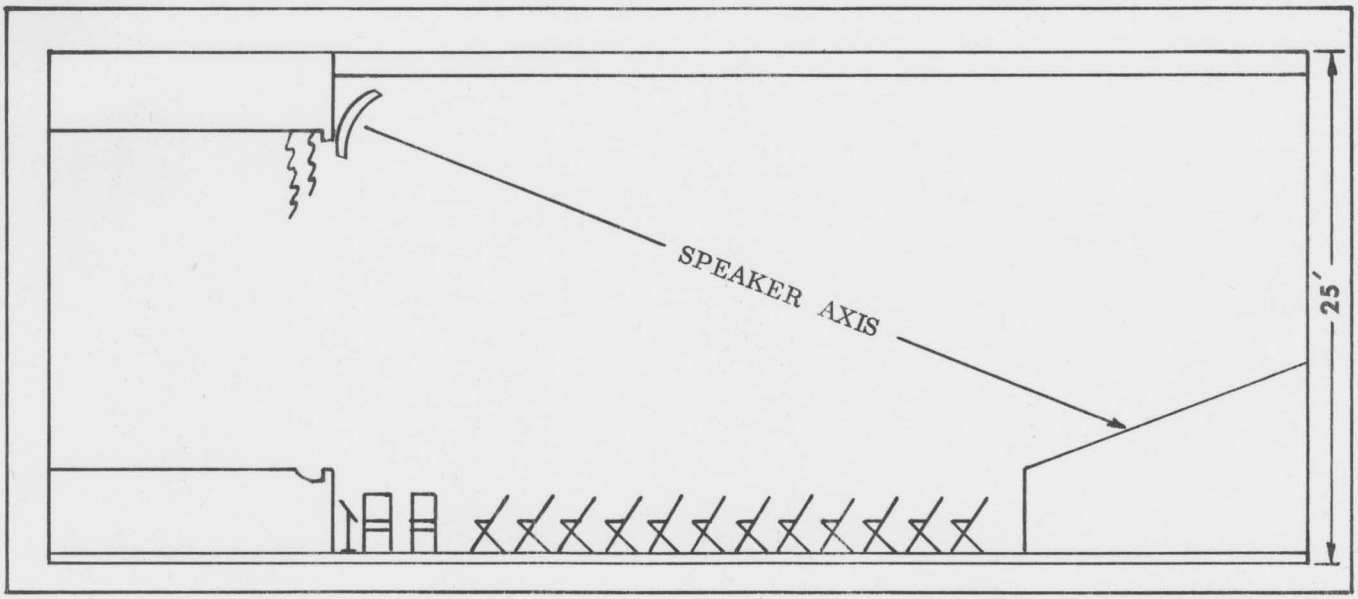


FIG. 2 - ELEVATION SHOWING LINE RADIATOR PLACEMENT

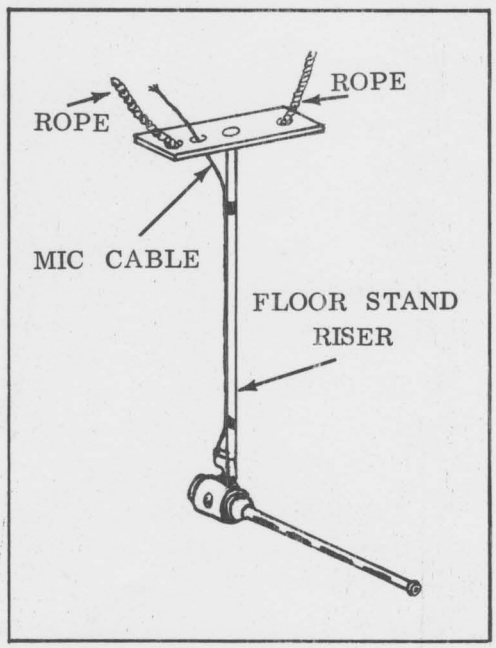


FIG. 3 - SIMPLE MOUNTING ARRANGEMENT FOR OVERHEAD SUSPENSION OF HIGHLY DIRECTIONAL MICROPHONE