

musicals includes two classes of loudspeaker, one big enough to do justice to the sound of the show, the other small enough to be mounted near those people too far away from the big speakers to hear them well. The big speakers, rigged near the proscenium, embody the sound man's brightest hopes and darkest anxieties for the show, as well as a lot of the producer's money; the little ones are in location, specification design and performance a compromise, their one essential virtue that of being little. Loudspeaker performance is nowadays described in a jargon, more distilled than that of the wine-taster, which is useless even when honest, but in an attempt to convey the practical value of quantities like bandwidth and distortion we can say that, of two loudspeakers, the better conveys more information, more accurately. In the auditorium those hearing the better loudspeaker perceive more surely, with less ambiguity, more quickly; when we consider that they are listening not to an undifferentiated and random version of what happens to be going on near a casually available microphone but to a calculated selective, rehearsed combination of the work of many performers, among whom the sound operator has an essential place it is clear that the considerations which put the sound control position out of reach of the principal loudspeakers must be extraneous to the question of the sound. No doubt the arguments for tucking the operator away are good ones, but they are not conclusive.

The deficiencies of the small loudspeaker are not inherently as serious perhaps as I've implied; there are some very good, very expensive, very small loudspeakers which so far as I know are not yet used in musicals. Meanwhile a partial response to the shortcomings which I've been discussing is the nowadays frequently used output matrix in the control desk. The input signals in the desk (from microphones, for example), after fading and equalisation are routed to subgroups or buses, typically eight in number. Associated with each bus are (again typically) eight level controls to determine the level of bus signal which is distributed to each of the eight main outputs. "Pirates" is by no means the first musical to employ the device but the way in which it is used at Drury Lane is fairly representative. Bus signals, for example groups of radio microphones, percussion microphones, keyboards and so on, are sent in independently variable mixtures to each separate group of loudspeakers in the auditorium. The scheme offers obvious flexibility in compensating for imperfect (and unequally imperfect) distribution in multiple-tier auditoriums.

Increased flexibility means increased set-up time, I fear. An unusually large crew of reasonably experienced and thoughtful people proved unable to adjust, assess and readjust the levels in the matrix while the operators were coping with the insistent demands of live rehearsal. In any case, calling for an adjustment during one passage of rehearsal and assessing it during another seems strikingly unmethodical. The alternative setting-up method is to play pink

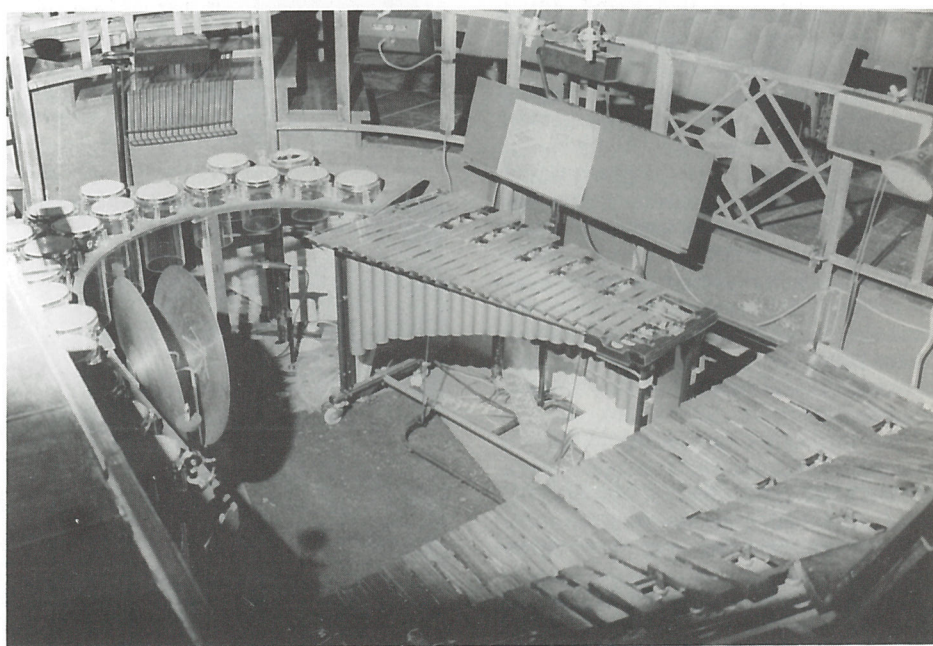
noise through the equipment and, by manipulating level controls and equalisers, secure even level and frequency response throughout the auditorium, measuring the audible pink noise with a calibrated microphone and a spectrum analyser.

My experience of this adjustment procedure is consistently baffling and disappointing. Whatever the shortcomings of a loudspeaker equipment, pink noise and analyzer adjustment can make it sound worse. I don't understand altogether why

this should be so, but it is worth pointing out that the acoustic level necessary for this measurement is necessarily high so that the irreducible noise (wind, traffic, ventilation) in the building is masked. This level is certain to be much higher than that of the theatre musical. Since our loudspeakers sound different at different levels (in most cases), adjustments carried out at measurement level will almost certainly be in error at programme level. It is also likely that the absorption characteristic of the



*Good performance from the radios is ensured by a lengthy and painstaking setup routine for each performance and rehearsal. The channels are checked visually and for performance – cables, connectors and capsules, and batteries are checked for short-circuit current before they are allowed into a transmitter. In this photograph, four of the under-balcony loudspeakers can be seen, one partly obscured by the operator's head. No justice is here done to the scenery, but the operator's remoteness from the sound of the performance is suggested not too misleadingly.*



*Xylophone, marimba, vibraphone, boobams and cymbals on the prompt side of the orchestra pit. The corresponding position on the OP side contains the other percussion array, principally of drums, while the rock drum kit is just out of shot, this side of the xylophone.*