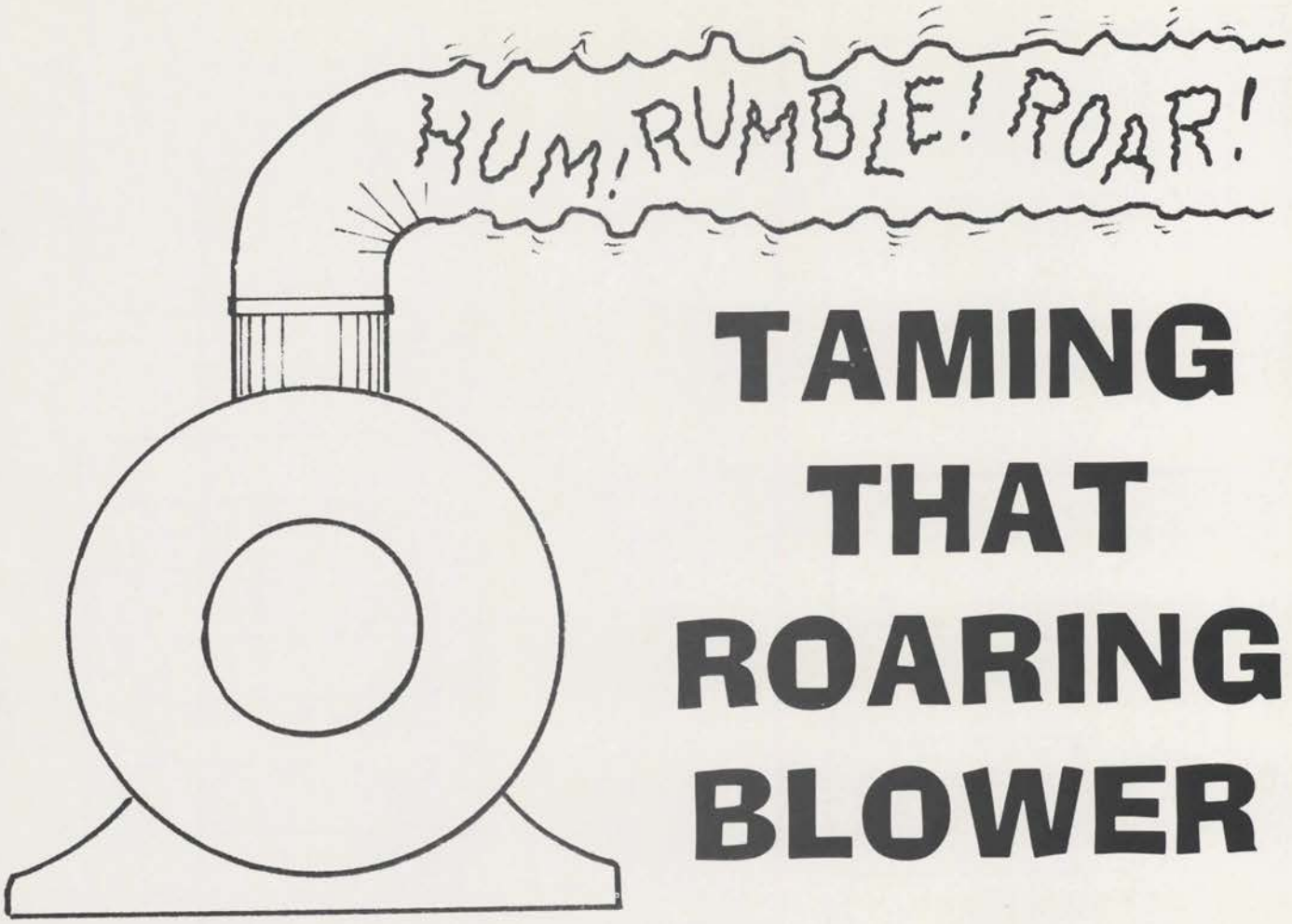

TAMING THAT ROARING BLOWER

by Stu Green

A few years ago we ran an article by Allen Miller on how to bring down the volume of an organ voiced for a theatre to a level suitable for home consumption – "Taming the Monster." This article will continue the idea of adapting the theatre instrument for home use but we'll deal solely with reducing the noise inherent in the compressed air generator which blows the pipes.

A concrete block enclosure is usually sufficient to confine the rumble and roar of the blower unit and the motor which turns it. The enclosure can be made more effective by filling the air spaces in the concrete blocks with dry sand and lining the inside walls with acoustic celotex.

But many enthusiasts who take every precaution to seal blower noise within the enclosure overlook one channel which makes an excellent noise conductor – the air line to the regulators and chests in the chambers. The most commonly used wind line, galvanized metal pipe, is also a fine sound conductor. The blower noise conducted by wind line probably wasn't objectionable in the theatre. However, the same amount of noise can be much more prominent in a home installation, so we'll suggest some ways to reduce it.

The solution is found in padding a portion of the wind conductor channel with sound-absorbent fabric which absorbs the noise. But padding the inside of the metal duct would reduce the diameter of the wind line. It is much more practical to break the wind line and insert a sound-absorbing box; in effect, lengthening the wind line to allow room for treatment.

There is nothing complicated about our muffler box. It can be either a simple rectangular enclosure or a maze. The whole idea is to run the wind through a section of conductor with sound absorbent walls. The box should have a channel somewhat larger than the diameter of the wind line which feeds it. This is partly to allow room for the sound absorbent fabric which will line the box. Another reason is that the more sound absorbing area exposed, the better. So, a 10-inch pipe might well feed into a muffler box with a 12-inch diameter channel. Too small a lined channel can cause loss of pressure.

No dimensions will be given for the muffler box because each installation will be unique, with channels as large as practical. The box should be built of three-quarter inch plywood (shop grade is fine) with all intersecting surfaces glued and secured with screws at 6-inch intervals.

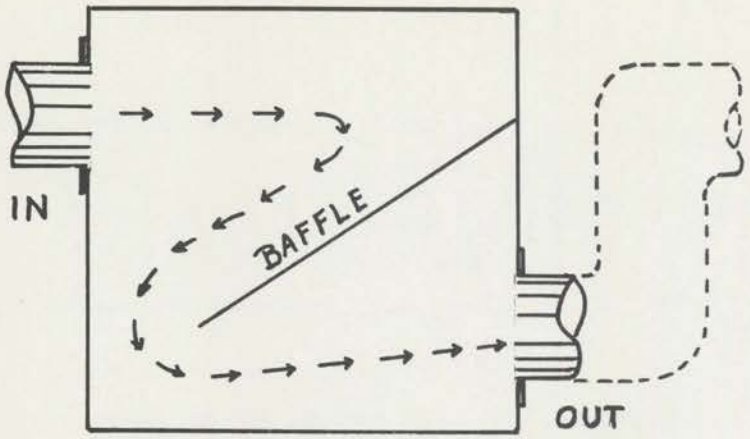

FIGURE 1

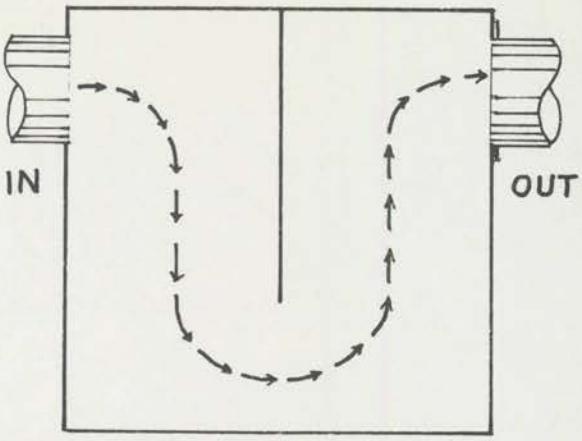

FIGURE 3

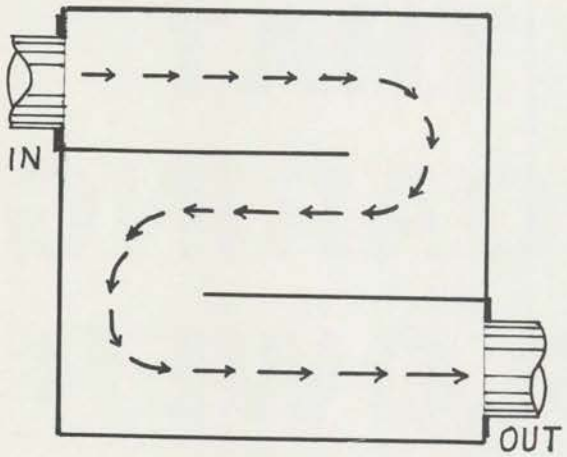

FIGURE 2

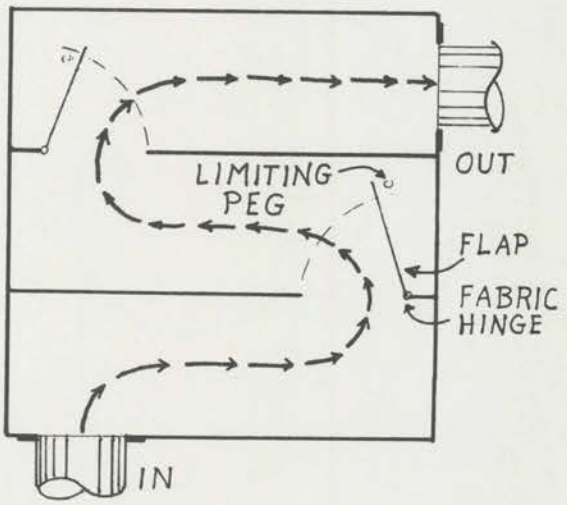

FIGURE 4

The Wiltern Kimball 25 hp blower, showing the 18-inch-pressure static duct in which the muffler box was inserted. Bill Exner (left) supervised the installation. *(Stufoto)*

The Wiltern muffler boxes. Constructed by former Maintenance Chief Bob Alder Sr., they were installed by the maintenance crew under the supervision of Bill Exner and current Crew Chief Leonard Worne. *(Stufoto)*

We show four types of muffler box in the illustrations. All of them must be lined with absorbent fabric, details of which we'll discuss shortly. Figure 1 is simply a lined box which fits into a break in our noisy wind line shown at the start of this article. It may be improved by the addition of the baffle indicated by the dotted line. Figure 2, with a two-baffle maze, is more effective. Note that both Figures 1 and 2 require extra ductwork (including 2 elbows) to continue the wind line at the same height as the input. Figure 3 is nearly as effective as Figure 2 and requires no extra ductwork.

Figure 4 is the most effective sound deadener by merit of two valves which open and close according to air volume requirements. When the instrument is silent, the valves are closed, thus cutting off any sound missed by the channel lining. In order to include the valves, the input must be from the bottom. If there is room above the blower (say 3½ feet), the muffler box shown in Figure 4 is well worth the effort required to suspend it from the blower room ceiling or brace it with angle iron. The air pressure-actuated flaps must not be too heavy. Quarter inch plywood or 1/8" prestwood work well. Be sure to put a limiting nail in the side wall so the flap will return to closed position and not flop to full open and remain there.

Now to the sound absorbent material. There is a wide choice. One possibility is to raid the disposal bin of a carpet merchant. Scraps of carpeting stapled to the channel walls do the trick. Carpeting can also be used for the hinge for the flaps in Figure 4. . A more absorbent material is the thick padding used under carpets. Old blankets cut into strips may be used in double thickness. Fiberglass is good but the effective thickness makes it somewhat impractical unless space saving may be overlooked. Heavy staples hold the material in place easily.

As a practical illustration of effectiveness we can point to the Los Angeles Wiltern theatre 4/37 Kimball organ, until recently a very "noisy" organ from the conducted noise viewpoint. Figure 5 shows the king size 25 hp blower and the huge wind conductor above it. Figure 6 shows the double muffler boxes installed to reduce the noise. As originally constructed there were baffles within the boxes but they wasted too much air pressure. So the baffles were removed and it was learned that just the insulation-lined boxes did the trick. The air path is shown in Figure 7. A and B show where the pipe was cut to permit insertion of the muffler boxes.

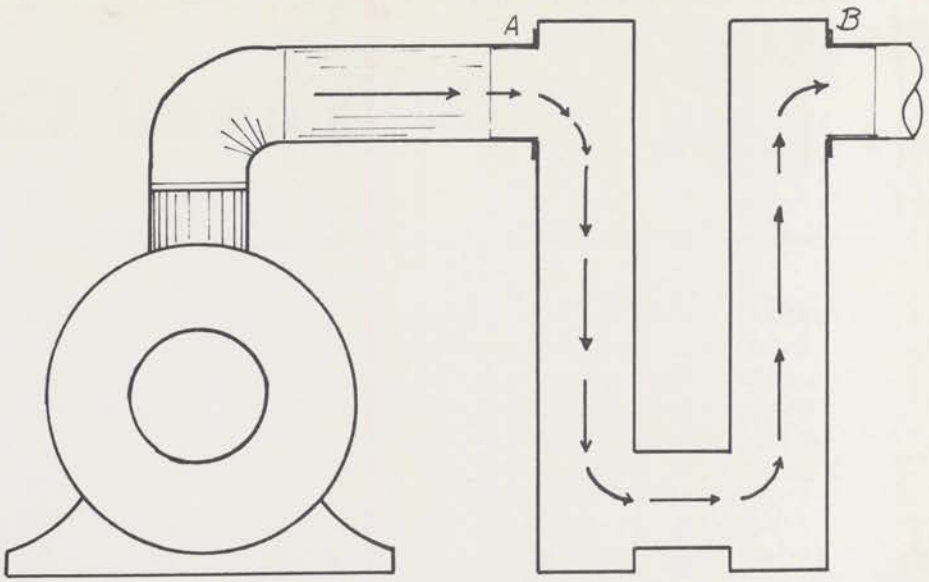

FIGURE 7

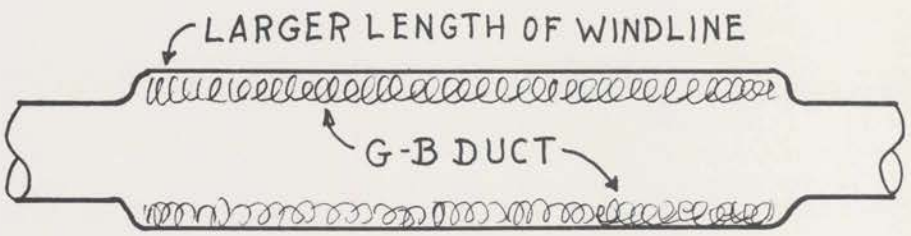

FIGURE 8

There is another trick, and this will be of interest mainly to those planning an organ installation because it involves the use of a length of larger than normal wind conductor. The tip comes from Allen Miller who uses it on his Austin organ installations. Allen recommends lining about six feet of the main conductor near the blower with a commercial air conditioner quieter called "G-B Duct," Gustin-Bacon product. It is one-inch thick fiberglass wrapped in heavy aluminum foil. To use G-B Duct, and not lose air pressure, a larger size blower pipe must be used to compensate for the one inch thickness of the Duct (See Figure 8). Al says it's easy to work with and inexpensive.

G-B would seem also to be an ideal liner for the air return conductor applicable to installations that re-use air. The return pipe can also conduct blower noise from blower room to chamber and requires some deadening, although not as much as the pressure conductor which is connected directly to the blower.

In cases where there is a regulator in the blower room, lining that regulator with felt will do much toward reducing noise, adds Al Miller.

These measures can reduce air conductor noise by as much as 75 percent, and that's a big step in the direction of "noiseless" operation. □