THE ACOUSTICAL CONSULTANT

Project Series

by R.J. Weisenberger

Here is an experiment with results so obvious that test equipment should not even be required to verify the results.

I am sure anyone who has ever voiced a 16' Wurlitzer tibia is familiar with the results one gets when turning the butterfly valve in the foot of the pipe.

As the valve is gradually opened the pipe will begin to sound a weak fundamental, and as the valve is opened further all tone production will stop and only a quiet rush of air will be heard.

As the valve is advanced still further the tone will build in intensity, pitch and harmonic development until a stable condition is reached — this is when the pipe is considered to be properly voiced. (Those who would disagree at this point should forget the rest of the experiment.)

If the valve is opened still further the third harmonic will increase in prominence until the pipe sounds more like a quintadena than a tibia.

Some still insist vehemently that low pressure pipework inherently possesses a greater degree of harmonic development than high pressure pipework of similar scaling can attain. Those who believe this should perform the following experiment:

Take a familiar pipe and then build two additional pipes identical to it in all respects with these exceptions;

Pipe "A" to have its cut up reduced by $\sqrt{2}$ (approx. 30%) from that of the reference pipe. This will be the low pressure pipe.

Pipe "B" to have its cut up increased by $\sqrt{2}$ (approx. 40%) from that of the reference pipe. This will be the high pressure pipe.

The low pressure pipe should be found to voice properly at ½ the pressure of the reference pipe, while the high pressure pipe will require twice the pressure of the reference pipe before it can be properly voiced. For this experiment to be valid the blower must be capable of delivering whatever this pressure might be, after regulation.

All three pipes will be found to perform in a similar manner to the reference pipe at their respective pressures with these exceptions:

The low pressure pipe will be somewhat softer (approx. 6db) than the reference pipe with its pitch flattened.

The high pressure pipe will be somewhat louder (approx. 6db) than the reference pipe with its pitch sharpened.

The tonal quality of all three pipes will be found to be similar, if not identical if they were all properly voiced. If they weren't, this experiment will prove nothing.

If there still should be some who are not convinced after this experiment, they could have these three pipes subjected to extensive waveform analysis by an acoustical engineer. For the tests to be truly conclusive, do not build just one scale and tonal family of pipes, but build a good representative cross section of scales and tonal families each containing the three test pipes. (When building open pipes using ears, the relative size of the ears must remain proportional to the size of the mouth — as ears definitely have an influence in performance — the same is true of the harmonic bridge in pipes that utilize it.)

Even after having been presented with authenticated facts, there may be some die-hards who will persist in clinging to the myth that low pressure pipework is inherently superior to that of higher pressure, regardless of scaling.

When these biased opinions are dispelled with facts, the theatre pipe organ concept may be seriously considered by builders who would have otherwise totally ignored it. If I can make this point felt, I'll feel I'm beginning to accomplish what I started out to do. □

Closing Chord

James F. Boyce found his life's work at the age of twelve: he wanted to be an organist. He died at home on December 31, 1980 only hours after playing at the weekly organ demonstration at the Kennedy Center for the Performing Arts in Washington, D.C.

James F. Boyce.

Best known for his 4/34 Wurlitzer nightly appearances at the Alexandria (Virginia) Arena, Jimmy was also organist of St. Christophers Episcopal Church in Springfield, Virginia, staff organist at the now razed Virginia Theatre, and, above all, a teacher. His infectious, uptempo, bouncy style of playing complimented classic ability developed at Peabody Conservatory.

He was a charter member of the Potomac Valley Chapter and gave generously of his time and talents over the years to further the chapter's many projects. Jimmy loved the theatre organ and was always willing to play chapter concerts, organ demonstrations for school children and silent movies, or to assist in organ removals, installation and maintenance. Three theatre pipe organ records and his compositions, "Tango In Time," "The Alexandria March," "Charlie's Walk"