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Redesigning the Contrabassoon: An Interview with Arlen Fast

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Introduction

*It has been more than one hundred years since the contrabassoon has been redesigned. In the late nineteenth century, **Wilhelm Heckel** introduced the instrument that became the standard in contrabassoon design for well over a century. But then along came an intrepid bassoonist named **Arlen Fast**, who won the contrabassoon position in the New York Philharmonic in 1996, only to realize that the then-current state of the contrabassoon was woefully inadequate for the voice he thought it could and should be. Thus began a process of research and experimentation that led to the Fast System contrabassoon. From his work with Fox in Indiana (who manufactures the Fast System contrabassoon) to his acoustical research in New South Wales, Australia, Arlen Fast created a contrabassoon that extends the range by a reliable and well-in-tune sixth—up to a full octave depending on the player, reed and bocal—and provides real clarity and stability on some of the more traditionally treacherous contrabassoon notes.*

*What strikes me as so very impressive about the Fast System is that a player (in collaboration with a manufacturer) designed it. Throughout history, it has virtually always been the other way around—a manufacturer creates a new model. The makers frequently work with players to accomplish this, but it is simply extraordinary for a professional musician to redesign an instrument and then go in search of a manufacturer to produce it. But perhaps this is something in the genes of bassoon players. The late **Arthur Weisberg** did the same thing with the Weisberg System—he created his system without a manufacturer involved. Both Arthur Weisberg and Arlen Fast showed that the players alone could be the catalysts for major design changes in their instruments. But this is rare in musical instrument history, and that makes it all the more special when it happens.*

*But before beginning, I wanted to thank everyone who so graciously answered my numerous questions and provided so much helpful information, as well as many insightful comments and suggestions. My thanks to **Anne Ediger, Gregg Henegar, Leonard Hindell, Nancy Huang, James Keyes, Burl Lane, Steve Malarskey, Susan Nigro, Robert Jordan, Paul Laubin, Dianna Sinovic, Albert Somit, and Diane Weisberg.***

Getting Started

Arlen Fast (AF): I was born in Newton, Kansas. I grew up on a farm near Moundridge, Kansas, where my mother grew up; her grandfather bought the farm from the

railroad. It was a family farm and is still in the family. When I was eleven years old, my mother took me to hear a high school music festival. The students played their solos for a judge and received a score. My mother told me to go around and listen to all the instruments and then decide what I wanted to play. I came out saying I wanted to play the bassoon. My mother's comment was what was I going to do with it, since I couldn't march in the band with it? So, on the advice of a highly respected band director, I started instead on the clarinet. That was in the fifth grade. I still had the bassoon in the back of my mind, but remember, I was a farm kid, and my view of the world wasn't very wide. But my mother had some orchestral recordings that I listened to. One was *Scheherazade*.

Nora Post (NP): *Eventually you did find your way to the bassoon. How did that happen?*

AF: Well, one day I was out in the barn milking the cows with Dad and he asked me if I had ever thought about playing something challenging—like the violin. No, I hadn't thought about it, but it sounded interesting. So my parents bought me a violin and I took lessons for two years. This was from about seventh to ninth grade. I liked it, but there was one problem. You usually stand when you practice the violin. I was growing really fast, and I had growing pains; my ankles would itch if I stood in one place for very long. I would get terribly distracted because either I was thinking about the itch I wasn't scratching or I was scratching the itch and I couldn't play!

NP: *How tall are you?*

AF: I'm six feet two.

NP: *So you were growing fast!*

AF: The violin lessons were where I learned I had a good ear. The bassoon came in ninth grade, when I went to the local high school in town. I got a plastic Linton bassoon with a plastic reed and a fingering chart. I took the bassoon home, and it was quite something to figure out. I played all four years of high school. In my senior year, I got a wooden Schreiber when the student ahead of me graduated. During that last year of high school, we had a new band director named Richard Gardner, who was the second trombone player in the Wichita Symphony. He knew enough about recording equipment to help me make tapes—whatever I needed. He also knew about the youth symphony in Wichita. I played two years with the youth symphony. I remember him telling me I could do whatever I wanted with the bassoon, but I didn't really understand what that meant at the time. But now I do, of course.

University Years

NP: *What struck me about when you transferred to the University of Kansas was that you auditioned for the bassoon teacher two or three times and he would not take you, saying you weren't good enough. And you've been in the New York Philharmonic for the past twenty years! Your experience is the ultimate example*

that in order to be successful, sometimes you just have to stick with it through thick and thin. A respected professional bassoonist was saying you weren't good enough, that you needed to go home and practice, and that you would be wasting his time.

AF: Right. My first two years of college were at Bethel College in North Newton, Kansas. They had an oboe teacher who couldn't help me as much as I needed with the bassoon, and especially with reeds. So I quit the bassoon for nearly two years. After I decided to transfer to the University of Kansas as a philosophy major, someone who knew I played the bassoon told me that I could probably get a full scholarship playing the bassoon. I thought that might be useful, so my parents bought me a used Schreiber bassoon. **Austin Ledwith** at the University of Kansas finally did take me on my third try, but I only had a couple of lessons with him because, unbeknownst to me, he was dying of stomach cancer. Then the school had no bassoon teacher. They made an arrangement that anyone studying bassoon could go to Topeka and study with **Rodney Boyd**. He was an excellent teacher—he had studied with **Sherman Walt**, the former principal bassoonist with the Boston Symphony. Sherman Walt had a systematic way of studying scales with the Oubradous scale and interval studies.¹ He said, "Here's what you do." And with reeds, he said, "Here's what you do." That was perfect for me because I hadn't had much time with Austin Ledwith.

NP: *Do you think Sherman Walt had an approach like this?*

AF: Yes. I think the line came from Sherman Walt that a day without Oubradous was like a day without sunshine. I set to work on Oubradous and at the reed desk. This was essentially my junior year. I spent my senior year plus two more at Wichita State. Here's how it all happened: the University of Kansas brought in a couple of people as possible bassoon teachers. I didn't know any of the people who applied for the job. But through the youth symphony in high school I had had contact with **Michael Dicker** at Wichita State. At some point I talked to him about transferring to Wichita State. I also knew that the second bassoon position was going to be open in the Wichita Symphony at the end of the year, and that was also in the back of my mind. Michael Dicker said that they could not recruit me from one state school to another with a scholarship, so I would have to apply and come on my own. But once I was there, he thought they could find scholarship money. I decided to change schools, moved back to the farm and took lessons that summer with Michael Dicker. I painted houses all day, practiced during the evenings and drove to Wichita one day a week for a lesson. I enrolled in music school in the fall, the Wichita Symphony held its audition for second bassoon, and I won that. So there I was, and I really hadn't learned to count 5/8 after a 3/4 yet.

It was a steep learning curve. I only took twelve hours of classes a semester, which was the minimum required for me to keep my scholarship. I figured that way I would have enough time to practice and catch up. It took me three more years to finish the degree. I sat next to my teacher for those years in the Wichita Symphony and I saw how he and all the other woodwind teachers did their job in an orchestra. So, as a student, I was seeing all the woodwind teachers perform regularly. I knew

they all practiced, since I could hear them whenever I went by their studios. I had the good fortune to have a professional playing situation reinforcing what I was learning in lessons.

NP: *That would be almost unheard of nowadays.*

AF: Yes, and it was such an opportunity! People who go to Eastman, Juilliard, and the other big music schools may not realize how good it can be—even in a small school—where there is a professional playing opportunity, and you are playing next to your teacher. I also got some weeks of playing principal bassoon when Mike Dicker was out of town.

Norman Herzberg

NP: *Did you get the job in San Diego right after you graduated?*

AF: Not exactly. I graduated in 1978, and applied to a couple of summer festivals—Tanglewood and the Music Academy of the West. Tanglewood didn't accept me, but **Norman Herzberg** at the Music Academy of the West did. Mike Dicker told me he had had some lessons with Herzberg, and he said I would learn everything I would ever need to know from him. He thought I was actually very fortunate that Tanglewood didn't accept me, since studying with Herzberg was the best thing I could ever do. So I graduated, and I drove out to Santa Barbara. On the way, I decided to go full in on whatever Mr. Herzberg had to teach me. I had a lot of playing experience, between the symphony, the university orchestra, an octet, plus recitals, but what I really needed was practice time. I think the Music Academy of the West was less structured back then than it is now, and I didn't load myself up with performances. Most people were in the opposite situation that I was in; they had had lots of time



Norman Herzberg with bassoon students at the Music Academy of the West in 1978
(Arlen Fast is the third from the right)

to practice, and were there precisely for the playing opportunities. I'll never forget my first lesson with Herzberg. I played an étude—the Orefici *Melodic Studies* #6. Somehow I thought I should play an étude for him. But if you are going to pick out one étude from the entire literature that points out bad attacks, this is probably it. I had no idea! Everything in it was articulated. At the end, Herzberg told me that I had cracked every A, B \flat , B and C that I had played. Well? I told him I sometimes used the half-hole on A and sometimes I flicked on B \flat , B and C. Then he asked, "Is that good enough?" Then he asked me what was I going to do about it. I said, "You tell me, please." He introduced me to using register keys for clarity of attack. (*Interviewer's note: the register keys may be better known to many wind players as octave keys.*) Having a student ask that question was *exactly* his strength. I knew he was a very systematic teacher, and that is why I wanted to study with him. First was the question of how to use the flick keys. Do you press and release or do you hold them down? Herzberg held the register keys down for the duration of the note. So it was really serendipitous that the étude I played for him hit the nail on the head.

NP: *Was he typical in this approach?*

AF: Well, he was a descendant of the West Coast Los Angeles school of bassoon playing that originated with **Fritz Moritz**, who came from Berlin at the age of twenty to play in the Los Angeles Philharmonic. He was principal bassoon of the Los Angeles Philharmonic for an unprecedented forty-seven seasons. He influenced *all* the well-known Los Angeles bassoon players—**Donald Christlieb**, **Jack Marsh**, and Herzberg for starters. Moritz taught anyone who came to play for him to hold the register keys down for the duration of the note. That's what Herzberg learned and that's what he taught: the A key for A, the C key for B \flat , B and C. So I went back to the basics and started building that into my technique. It was a little bit intimidating at first; how was I going to do this? Before that, I wasn't really rigorous about anything. Somehow I just wasn't paying attention to the non-clarity of these notes. You can just get used to something as being part of the sound. No one had sat on me about that, but Herzberg did, and that changed everything. Because once you start clearing that up—it's like a whole bucket full of problems—if you can clean up the first four big ones—A, B \flat , B and C—then other things become apparent!

NP: *It must be like my attic. Once I had evicted the birds, I started worrying about what else might be up there!*

AF: That's exactly right! One problem can mask another, and you don't always know where the problem is when you have so many things going on at once. So, all of this started to focus my ear on clarity of playing. At the end of that summer I went to the IDRS conference in Los Angeles. **Ben Kamins** (who was associate principal of the Minnesota Orchestra at that time), and **Bob Williams** (principal of the Detroit Symphony) were playing, and they were both former Herzberg students. Their playing was stellar. It was eye opening. Herzberg taught at the University of Southern California. I thought OK, this is where bassoon playing is at—here's the result of what Herzberg teaches. Both Kamins and Williams had won their jobs before they had even



Arlen Fast and Norman Herzberg in Encino, California, 2006

finished school. Herzberg himself attended the Eastman School of Music where he was a student of **Vincent Pezzi** (1887-1966). Herzberg didn't use flick keys through his years in the Saint Louis Symphony. Then he went to play for Moritz in Los Angeles. Herzberg had always struggled with these notes—the cracking and the uncertainties. He told the story that after he played for Moritz, Moritz told him he was cracking every A, B \flat , B and C that he played. Herzberg said, “No, I don't!” and Moritz said, “Yes, you do!” Moritz told him to go home and listen to himself play. Hertzberg went home, he listened to himself play, and he said, “I'll be goddamned if I didn't crack every one of those

notes!” But *he* didn't even hear it until someone else made him aware of it. It was Moritz who had the solution of what keys to use when and where. What I learned from Hertzberg is that you use the flick keys whenever you articulate one of these notes or when you slur to it from an interval greater than a minor third. A second or a minor third will usually go (in a slur), but if the slur is bigger than a minor third, you'd better use a flick key.

NP: *How long did it take you to make this adjustment in your playing?*

AF: For the first three weeks, I felt like I was back in second grade. After that, I was able to start to work it into my technique at greater speeds. But I stayed out of ensembles as much as I could so I could practice six to eight hours a day. I went into every lesson with a list: how do you deal with this downward slur, how do you do this and that? And Herzberg had the answer for every single question. He had thought about all this stuff. So I went back to Wichita with all this information. I showed it all to **Dennis Michel**, who had been the bassoon teacher at Wichita State during my final year of school. And he adopted it all because it's so foolproof. Then right after that summer there was an audition for the San Diego Symphony. I had only been working on études all summer, so I wasn't ready to take an audition and I passed it by. However, San Diego didn't hire anyone. Then they held the audition again in December. I took that audition and won it. This was in December of 1978. I moved out there in February of 1979. The Wichita Symphony didn't ever give us contracts, so I wrote a letter of resignation saying I would be leaving in six weeks to take another job. The conductor, Michael Palmer, called me in and asked me how I could leave in the middle of the season. I responded that he didn't give contracts to the section players, I was giving six weeks notice, and that two weeks was standard

in the industry. He asked how I could jeopardize the orchestra's integrity. I responded that I wanted to get off food stamps. Palmer turned to the orchestra manager, who was sitting there, and asked him how much I was making. His answer was \$2,000 a year. So I told them that San Diego was offering \$8,000 a year. Fortunately, it all worked out.

NP: *Did you continue working with Herzberg after you moved to San Diego?*

AF: Once I got settled in San Diego I called Herzberg and asked if I could come play for him. He said sure, so I would go play for him about once a month. He would give me the entire afternoon. When I was at the Music Academy of the West in 1978, Herzberg had shown me the prototype of his profiler. Since this was a prototype, it wasn't available to purchase at that time. So, after my lessons I would stand out in his garage and profile cane. These machines weren't available until about 1983, so Herzberg finally suggested I buy a Pfeifer single-barrel profiler. He said I would be able to make that work. So I did that, and I took it to Ed Laker in Ramona, California. Ed Laker was the machinist who built the oboe and bassoon gouging machines for Bob Gilbert (RDG Woodwinds).² Laker incorporated the best ideas of the Michel Kunibert gouger into the RDG machine. He did all of this during his retirement, and he had quite a number of patents.

Anyway, I needed a way to identify the center of my reed on it, and Ed Laker designed me an ingenious little fixture that would allow me to identify the center of the spine of the reed so that I could position the center of the profile onto the center of the shape. That's exactly what Herzberg was working towards with his profiler and shaper. I have Herzberg's early gouging machine right here, made by Merle Johnston, who was a clarinetist. So this machine has some real history to it. One day Herzberg and I were talking about the problem that when the head is not level to the base in the final cut you don't have an accurate gouge. I commented that it would be nice if you could raise and lower the supports for the shaft. He went to his closet and got out this machine, saying you could do that on this one. The shaft supports are basically on small jackscrews. No one ever built them like this, but Merle Johnston did.

San Diego Symphony Years

NP: *A lot of interesting things happened for you in San Diego. That was where you started playing the contrabassoon, wasn't it?*

AF: Yes. But I didn't play contrabassoon in San Diego until I won the position for second bassoon and contra in the San Diego Opera. The symphony job was second bassoon only. Later there was an opening for principal bassoon, and **Judith LeClair** won that position. We played together for two years in the San Diego Symphony before she came to New York.

The San Diego Symphony and the opera were two different contracts. Judy had a reed from her contra playing days at Eastman (which I borrowed) and I borrowed the symphony's contrabassoon from **John Ottaiano**, the symphony's contrabassoon player. I auditioned for the San Diego Opera, and won the second bassoon/contra

job. I could play just enough contra to survive, and had to figure what the demands were from there.

NP: *I remember that you wrote about your early days playing the contra, saying that the contrabassoon was two times as long as the bassoon but with twice as many problems! How did you get interested in seriously pursuing the contrabassoon?*

AF: I always did just enough to survive on the contra until the fourteen-month lockout in the San Diego Symphony from the fall of 1986 through the fall of 1987. I was on the orchestra negotiating committee, and it was grueling. By the time we finally went back to work, I felt that my mental construct of how orchestras fit into the community had exploded. By that I mean how the people who give the money look at an orchestra, and how we survive on that. The board and the big donors were brutal. I felt like we weren't far away from medieval times when the musicians served at the whim of the court. Being on the committee, we met every day, and I saw *everything*, including all of the politics and power in town. And I didn't like it. When we did go back to work, I felt like playing in the orchestra was just a job, by comparison to the artistic aspirations I had had before that. This really soured me, it lingered, and it was associated with the bassoon. So I thought well, big orchestras go through their own problems, but they are financed better with stronger funding, and they tend to come out of these situations better than we had. I thought that getting into a bigger orchestra would probably be a good thing, and the contrabassoon might be a way to do that. I had two thoughts about this: first, there are fewer people who take contra auditions than bassoon auditions and, second, I had a big learning curve ahead of me on the contra and I didn't have any negatives associated with it. By negatives I am talking about the psychological issues that were tied to the bassoon because of everything I had experienced during the lockout. The problem was having such a sour thing associated with such a beautiful thing; that took the beauty and the joy out of the music making. During the lockout, each member of the committee took one month off at one point or another. My wife Anne had taken a job with a software development company from Japan during the lockout. They took her up to Irvine, California, for a month of meetings and development sessions at the University of California at Irvine. She said, "Come with me," so I did. When we got out of the car in Irvine I took one look at the Santa Ana Mountains to the east, saw a road going to the very top of Santiago Peak and said "I have to ride that!" The next day I bought a mountain bike and went riding every day for a month. That was my big-time therapy. That got me started on mountain biking the National Forest Service roads in the western US!

Contrabassoon Auditions

AF: But back to the contrabassoon: the San Francisco Symphony announced their contra position, and I went to Herzberg and asked him if I could borrow one of his instruments. He loaned me his low A Mollenhauer contra. By the way, he had once told me that in his opinion, the contrabassoon was barely a musical instrument! I took that as a challenge. I made it to the finals of the audition, and I thought OK, I

could win one of these jobs. But I also realized that for the next audition I needed to have my own instrument. I bought a Fox in 1988 (#225), and since San Francisco had not hired anyone, I auditioned again and got into the finals again. Once again they didn't hire anyone. But the important thing was that the joy of playing music came back to me through the contrabassoon. I went through the learning process again, practicing scales and systematically building a technical base. I took auditions in Philadelphia and Toronto. I didn't win either one, but with each one I was able to tackle one more big issue you have to go through on the contra. When I started taking auditions, the cane I bought was Glotin gouged, shaped and profiled (since I didn't have any tools). After **Steve Braunstein** won the San Francisco audition, I took some lessons with him during one weekend. He suggested I order some cane and tools (shaper, mandrel, etc.) from Rieger. Over several days he showed me how he made his reeds. Getting better cane plus all the tools I needed was a big step for the next audition. For each audition I felt like I had tackled one more thing.

NP: *Let me back up for just a second. Are you saying you hadn't worked with a major contra player on any of this, and were just figuring it all out on your own?*

AF: Pretty much, yes. When I borrowed Herzberg's instrument to take the first San Francisco audition, I went to see **Patty Kindel**, the contra player in the Los Angeles Philharmonic. I flailed around on the instrument, and she told me not to worry, *everyone* flails around at the beginning! Later, right after I got my Fox contrabassoon, the St. Louis Symphony played a concert in San Diego. I asked their contrabassoonist, **Brad Buckley**, to give me a lesson.

Getting into the finals in the first contra audition I took outside of San Diego—which was San Francisco—was a fairly big motivation to keep going, even if I didn't win it. I do know that if you make the finals in one audition, if you persevere, you can probably get a job. And I got rather picky about where I would like to relocate. We had been in San Diego for seventeen years, Anne had tenure at San Diego City College, and I had a lot of nice playing opportunities in the area. I also got interested in photography while we were in San Diego; photography was one of the big things that enabled me to think about changing the contrabassoon.

NP: *How so?*

AF: Because in photography you have to work with multiple systems that have to relate to each other. You can dial each system in so that the relationship gives you the outcome you want. Of course your choices in one system may limit your choices in the second. I took a course on black and white photography in San Diego, and that gave me the understanding that I could look at the instrument as one system and the reed as another system. And then how could I deal with them independently? That was a really important aspect of thinking that I could improve the performance characteristics of the instrument. In the end, you have to have both the instrument and the reed working together, but you can also look at each one independently. I saw that people who did their own darkroom work in photography got really, really technical about the details. People make their choices depending on what kind of

outcome they want. For me, I wanted a contrabassoon that gave me optimum performance and clarity of attack on all the upper register notes. I could do that on the bassoon because that is what I learned from Herzberg, but I couldn't do it on the contra.

Joining the New York Philharmonic

AF: I started thinking seriously about redesigning the contrabassoon in October of 1996, after I started my job with the New York Philharmonic.

NP: *But before we get into the details of the Fast System, can you tell me something about the audition process for the New York Philharmonic, and how you won the job?*

AF: Sure. I prepared in a vacuum because I wasn't taking my contra to work, except to play the occasional contra part in the San Diego Opera. But there I was, preparing the orchestral repertoire for a major orchestra. I kept thinking about how this could be the voice that I wanted in the orchestra. I recorded myself; I played for people and then tried to imagine what this voice should be doing in the orchestra. I made a lot of reeds, and I experimented a lot. I think I made twenty-eight reeds for the audition. I ended up playing on reeds that by most contrabassoonists' standards are quite short, and that's what I still play on. I like the tone better. Of course I had some intonation problems on my Fox, but most of that disappeared once we got a proper set of register keys on the instrument later (the Fast System).

The position in the New York Philharmonic was for bassoon and contra, so I auditioned on both instruments. Both were equally important, and I worked on my bassoon playing intensively before the audition. But I knew how to prepare an audition for the bassoon; the contrabassoon was what required a lot of exploration.

The way it all worked was like this: in the first round there were thirty-two or thirty-three players. They narrowed it down to five for the second round. Then two days later they took that down to two—**Mark Romatz** and me. Then Mark and I had to come back in November for the finals. As a result of that, I was asked to come play in the orchestra for several weeks. By that point, I was the remaining candidate. Mark Romatz, incidentally, went on to win the contrabassoon position in the Metropolitan Opera Orchestra.

NP: *You must have known Judith LeClair well from her San Diego days.*

AF: Yes. Kurt Masur was there for the finals, and he asked the committee: who *was* this person from across the country, and did anyone know him? Judy said she knew me from San Diego, and that must have satisfied Masur. I played two weeks on contra and one week on bassoon as part of the final audition process. During that time I also played another audition round on contra. That last round was during the afternoon, just before an evening concert. There was just enough time to grab a bite to eat in the lobby before playing the concert. They offered me the job right after that round, before the concert. I started in May of 1996. Meanwhile, back in San Diego, the San Diego Symphony stopped paying us in January of that year. Management



Photo by Chris Lee

New York Philharmonic Bassoon Section. From left: Principal Judith LeClair, Associate Principal Kim Laskowski, Roger Nye and Arlen Fast

had run out of money. We kept playing for some weeks anyway, but in March we simply stopped playing. We had played so many weeks without any pay. I moved to New York a month after that, and the San Diego Symphony filed for bankruptcy the following month. So I was starting the job in New York with the elation of a dream come true, while at the same time I was seeing all my colleagues at home entering the black abyss of what turned out to be two years of bankruptcy. I couldn't really process all of this at once, so I allowed myself to experience one emotion at a time and tried to focus on the positive—the anticipation of my new job. I've been in the New York Philharmonic for twenty years now.

Historic Period Bassoons

NP: *Going on to something you've mentioned to me before, you once referred to some bassoons and contras as "period" instruments. Having made copies of early oboes myself, I was intrigued. Can you tell me what you meant? To me, a period instrument is a 2-keyed oboe or a recorder, but you were clearly referring to twentieth century bassoons!*

AF: What I was referring to was really the old style contrabassoon. By that I mean the old register key system, which evolved from the 1870s to about 1910 and is still being made today. These contrabassoons are essentially unchanged since 1910. So I am saying that yes, people are buying period instruments that are brand new.



Photo by Chris Lee

NP: *People make copies of 1-keyed flutes, but the difference is that the contras you are referring to are modern instruments. But what you are really saying is that they are not modern instruments.*

AF: Right. The old design has now been superseded. I looked really carefully at woodwind history and development, and at what prompted changes. I looked at what changes stuck and which changes didn't stick. The Triébert bassoon, the Ward bassoons, and Boehm bassoons—none of those stuck. There was a very beautiful French bassoon (Savary) in the early 1800s, but that firm did not continue—the family sold the business and it was closed down. I looked at how the flute made the transition from the old style flute to the Boehm flute, and how long that took. I looked at the instruments that were accepted by players and the ones that were not.

NP: *What conclusion did you draw from all this research?*

AF: It taught me that I should be very careful about changing the tone quality of the instrument. If the tone is not what people already know, they won't accept it. The Boehm flute, for example, was not accepted early on by the professionals. It was the amateurs who first fell in love with it because they found it so easy to play. They went to the teachers, asked them for lessons, and that's how it went. But the old German flute hung on for a long time in the professional orchestras. Even into the 1880s, there were cases in German orchestras where principal flute players were persuaded by conductors (Wagner was one of them) to switch back to the old German system. That was forty years after the development of the Boehm flute. Boehm wrote his treatise on flute playing thirty years after he had introduced his flute in order to try to describe what he had done and to try to influence people not to start changing things back to what they had been on the old flute. So, instrument change comes very slowly. I came away with the idea that I should not try to change the basic concept of the contra. We can fix the response, intonation, the stability issues, we can fix the tone color from note to note, but I learned that I would be better off not trying to change wholesale the entire instrument.

NP: *Well, how about the contraforte?*

AF: **Guntram Wolf** came up with the contraforte, and in one sense he did change everything. But when you look further, his instrument brings back some of the essential concepts of the contrabassophon, namely the larger bore and larger tone holes. The instrument certainly has a following.

NP: *Have you played one?*

AF: Yes, both when it was first introduced in 2001, and again on a new instrument in the last few years. I was really disappointed that they didn't build a register key system that provides clean attacks. Since we already solved that problem at Fox on the Fast System contrabassoon, it's the first thing that stood out to me. I would never consider switching to that instrument, despite the fact that it looks pretty impressive. Then there's the issue of the tone. The contraforte has a bigger bore, and the tone holes are larger. That changed the tone, and it doesn't particularly attract me.

The Bassoon Study that led to the Fast System

AF: But back to my redesign of the contra: I looked at the register system that I had on my contra, and I thought we could do better than that. But I really wasn't sure at that time, and I had to learn what was possible. So I did a study of the holes that could be considered register holes on the bassoon. My study documented what happens when you use one after another, one at a time. I studied the half-hole and high note register holes. These are above the tone holes going up the instrument—until you run out of holes at the whisper key. I documented pitch and stability. For the study, I drilled three more holes into one of my old bocals above the nipple, and I tested those along with everything else. Each note took an entire sheet of paper to document all the data—all the performance behavior you got by playing such and such a note using each hole in succession. For some notes almost all the holes were too high, and for the upper notes of the fundamental octave almost all the holes were too low. So it's only the middle ones where you can study both too high and too low. By the time I got done with all twelve notes of the first octave (on the bassoon, that is low F to open F), I had a pretty good idea of what I would encounter when we tried to locate a new system of holes on the contrabassoon.



Photo by Anne Ediger

Fast playing a Morton contrabassophon in Melbourne, Australia. The contrabassophon, a forerunner of the Heckel contrabassoon design, was the instrument used in the London premiere of the *Strauss Suite in B-flat, Op. 4, for 13 Winds*



Photo by Arlen Fast

Manufacturer's plate for the Morton/London contrabassophon

The Weisberg System

NP: *Had Arthur Weisberg already created his Weisberg System (his double automatic octave key system for the bassoon) when you were doing your work?*

AF: I think Weisberg was working to develop his system at around the same time, but strangely enough, I never talked to him. We each lived in our own little world and pursued our projects independently. This was in the years 1998 to 2001.³ But Weisberg had thought of his system many years before that, certainly by the 1970s. He was always just too busy with the Contemporary Chamber Ensemble and everything else to actually carry the idea forward.

NP: *If you don't mind, I have a couple of very basic questions on the Weisberg System. Does the automatic venting of this system change the pitch or the timbre of the notes or does everything remain unchanged?*

AF: It doesn't appreciably change pitch or timbre. It provides security and clarity of attacks.

NP: *Does it extend the range of the instrument?*

AF: I don't know. You would have to ask Dennis Michel about that. He's been playing the Weisberg System in the Chicago Symphony for the last thirteen years, and he would know. I considered getting one, but I realized that since my contra system is always in development, I thought if I was dealing with changes in *both* instruments, I could get lost. Better to keep the bassoon that I have and that I know how to play.

NP: *Got it. If you use the flick keys as register keys and just hold them down à la Herzberg, what is the difference in terms of the result between that and the Weisberg System?*

AF: There is effectively no difference between the Herzberg version of holding the key down for the duration of the note and the Weisberg System, where you don't have to do anything, but the proper holes are opened through your regular fingerings to give you that note.⁴

NP: *So what is the advantage of the Weisberg System? Is it a lot easier technically?*

AF: I think so. But I haven't spent enough time with a Weisberg bassoon to really know. The advantage is you can play without flicking and the bassoon plays cleanly.

NP: *What got me thinking about all of this is that on most oboes we have three octave keys these days, instead of the old-fashioned system of two octave keys. For the oboe, it doesn't extend the range, but it cleans up the attack completely, it gives you dynamics in the upper register, yet there are players who don't even use it. But if someone is playing any contemporary music, it makes your life possible. And on the oboe d'amour and the English horn, it's simply impossible to get up there without it, so I guess I would have to say that on those instruments it does*

indeed extend the range. But you have to know how to adjust the key to your advantage. I'll just guess that you have similar issues with the contrabassoon.

The Design of the Fast System Contrabassoon

AF: Absolutely. The two big criteria to satisfy in locating the system of holes on the Fast System were: first, on the highest note of the three that you expect to play using a given register hole, does it give a straight-in clean attack at *pianissimo* that is reliable or does it start with a chuff or a hesitation? Second, on the lowest of the three notes for which you expect to use the register hole, does it give a clean attack with the loudest *fortissimo* "T" attack you can give? Is it really clean? If it satisfies both of those, it will do everything else. That's what it came down to, but I had to do the bassoon study first to quantify all these performance characteristics of the register holes on the bassoon.

NP: *I'd like to back up for just a moment to something I should have asked earlier. What were the events leading up to your imagining, designing and creating the Fast System? Were you terribly dissatisfied with the instrument you were playing on, was there a moment or event that was the catalyst? What happened?*

AF: When I got into the New York Philharmonic, I experienced the high level of playing that went on here constantly. I wanted my voice to be *that* good, but I was fighting those bad attacks. They weren't clean. For example, I could obliterate someone else's good attacks with my bad attacks when I entered the note as loudly as I felt was necessary for the musical situation. So I had to adopt some method of disguising my bad attacks. I would start the note very quietly but quickly grow. I called them sneak attacks. But I hated doing that, though, because part of the character of good artful playing is contained in the attack. The brain is incredibly adept at hearing the details in the transient. (The transient is the moment in time between silence and steady state tone, so it is the development of the sound from silence to a steady state.) And those transients are really useful in musical expression. When you have bad transients, all you have is noise, and it sounds just awful. I wanted musical sound in the transient.

NP: *So what did you do in the short-term, since you didn't have the new system?*

AF: I used sneak attacks! But I hated doing it. I explored everything that I could with reeds. I bought different shapers, and I found that some shapes gave more clarity of attack than others.

NP: *Can I assume other contrabassoonists struggle with the same problems?*

AF: They all do. I hear these very same problems in recordings made by other contrabassoon players.

NP: *So all these issues are what I would call the “live-with-its?”*

AF: Yes. And there are some contra players who say they don't have a problem with it, but that's just the denial that exists when you haven't been sensitized to it. And of course Herzberg sensitized me to it.

NP: *Yes, and I could have finished that sentence for you!*

AF: Right. And I thought, well, I had such a great job in the New York Philharmonic, and I was going to be miserable in my career playing an instrument that had such bad behavior. I tried the Heckel contra that the Philharmonic owns, and it had the same problems as the Fox I owned. Mollenhauers have similar problems. They are not exactly the same problems that Heckel and Fox have, but they have some problems that the others don't have. You trade one set of problems for another.

NP: *So there you were, hearing something that no one had designed.*

AF: Exactly.

NP: *Going back to the Fast System, what is it about your system that allows the range to be extended, and how much does it extend the range?*

AF: The extended range comes from the fact that all the register holes are much larger than they used to be, and there are more of them. In the area from the U-Tube up to the bocal, we now have five different holes to choose from in order to produce an upper register note. My research about register holes on the bassoon showed me that the higher you go, the more the instrument likes to have larger and larger register holes to produce the high notes. But they have to be accurately placed. As you go higher, you almost need a second set of register holes, but of course you can't do that. You have to use the holes you have, and maybe open combinations of holes. There are some cases (fingerings) where two holes are open at once, acting on the same nodal point, acting as one larger hole. The first and immediate high note benefit was that I now had a functional and simple D5 where I never had been able to find a fingering for that note before.

On the standard contrabassoon, there are two register holes on the pipe, and one of these is in the form of two separate holes near each other (which function as one). They are about eighteen inches apart. With the Fast System, there are more holes (five of them), and there are actually two automatic systems on the instrument. It happened to work out that the physical layout for the top one is right in the vicinity of the left hand, and the physical layout for the bottom one is near the right hand. That was serendipitous. The D vent is the middle octave key, which is the bridge between these two systems. Not only does it give you a good D, but it also provides comfortable half and whole step trills, so you don't have blank spots. The entire system was really designed to be dedicated for the second octave, but then we had to adjust it to work for the third, and then **Lewis Lipnick** showed it could provide fourth octave notes too, when he premiered Kalevi Aho's *Concerto for Contrabassoon* (2006). Aho wrote it for Lew and the Fast System contra. This is the first major contrabassoon



Upper Vent system of the Fox Fast System contrabassoon



Lower Vent system

Photos by Arlen Fast



Right hand finger keys showing D vent spatula coming in from the left side. It lies under the middle knuckle of the right hand index finger. The finger keys are from left to right: Eb alt, 1, C# alt, 2, 3, F-F# -Ab

Photo by Arlen Fast

concerto recorded by a major label like EMI. It's a big piece. Lew broke new ground playing this concerto.

NP: *Who patented your contrabassoon system?*

AF: Fox, and I am listed as co-inventor. I am a player and I needed an instrument that worked for me.

NP: *Have any other bassoon makers created a system anything like this?*

AF: No, although Mollenhauer added one register key in the general area of my D vent. This was like what Steve Malarskey built for me years ago, and I suppose Mollenhauer assumed this pre-existed the patent.

NP: *So Püchner and Heckel haven't redesigned their instruments?*

AF: No, not that I know of. I always hear that Heckel is going to do something, but I haven't yet seen that they have.

NP: *Just as an aside, have you ever thought about doing a system like this on the traditional bassoon?*

AF: No.

NP: *I mean what if you could build something like this on the bassoon and extend its range by a sixth or more?*

AF: Well, I've thought about it, but it's just too daunting!

NP: *And not a lot of people play the Weisberg System, and that's as close as the bassoon gets to the Fast System right now. Yet the Weisberg System is so intelligent, it makes so much sense, and you would think it would be adopted by a lot of players. But on to something else: how far does the Fast System extend the range of the contrabassoon compared to the traditional contra?*

AF: That's open to debate.

NP: *OK. But I'm not asking how high someone else can play on the Fast System; I'd like to know how high you can go!*

AF: I can get up to written A5, an octave and a 6th above middle C. It starts to get a little sketchy above that—B \flat , B and C. But on the traditional contra, most players give up after C \sharp 5, an octave plus a half step above middle C. A notable exception to this is Gregg Henegar's recording of the Donald Erb *Concerto for Contrabassoon and Orchestra* as well as Erb's *Five Red Hot Duets for Two Contrabassoons*, where Henegar plays up to A5 and B \flat 5, respectively, on his Mollenhauer. These recordings, made in 1989 and 1992, are a tribute to Gregg's artistry.

NP: *So you have added a minimum of a minor sixth to the range of the instrument.*

AF: Easily. The fingerings for the Fast System go up to high high C (written C6). I've made a book of fingerings, and when someone takes delivery of a Fast System contrabassoon from Fox, I send them a copy.

Acoustical Research in Australia

NP: *There is something I meant to ask you about earlier, and that is the acoustics work you did in New South Wales, Australia. How did this come about and how long were you there?*

AF: I was there for two months. I was on a six month sabbatical from the New York Philharmonic in 2007.

NP: *This is not exactly what most of us do! Can you tell me a bit about how you set this up, why you went to New South Wales, and what your goals were?*

AF: OK. We had already created the Fast System in 2001, but I wanted to see a visual representation of how attacks work. I wanted to understand acoustically what we had done and why it had worked. I wanted to study what was in the bad attacks that I didn't like, and what was in the good attacks that I did like—the ones that are successful in the orchestra. Because once I took the Fast System contrabassoon into the orchestra, it completely opened up the possibilities of what I could do expressively, and how I could support the rest of the woodwind section and the orchestra in general. It just changed everything. I wanted to understand more about what I had done. I had a book on acoustics by David Butler with a picture of the beginning of a clarinet tone, from silence to steady state. It showed all the partials coming in at different times to full steady state. I contacted him but he wasn't able to resurrect the program he had used to do this. He suggested I find someone working in an acoustics lab. I ended up getting in contact with Joe Wolfe, a professor in the Physics Department at the University of New South Wales in Sydney, Australia. He agreed to work with me, and he also had a study that he wanted to do. He asked me if I would be willing to help them out on their study, which was an impedance study. I said sure. So Joe Wolfe and his colleague John Smith were willing to help me. John Smith wrote a program in *Mathematica* that was able to do this analysis. We carried out two big studies in two months. Impedance is the study of the instrument itself, divorced from the reed. For my study, I recorded all the notes of the contra with all the different fingerings, with different articulations and dynamics. Once that was all done, we could analyze all the different parameters of sound with the *Mathematica* program. You choose a parameter, click "analyze" and it produces a picture. Each line is a distinct moment of time in the attack. It shows the location and strength of each partial at each moment.

They kept revising the program, and by the time I left Australia, they had given me version six. It shows very clearly what the noise is in a dirty attack. This was Herzberg's whole thing. The computer program showed that the noise comes from the source note—these are harmonics of the source note trying to creep in at the

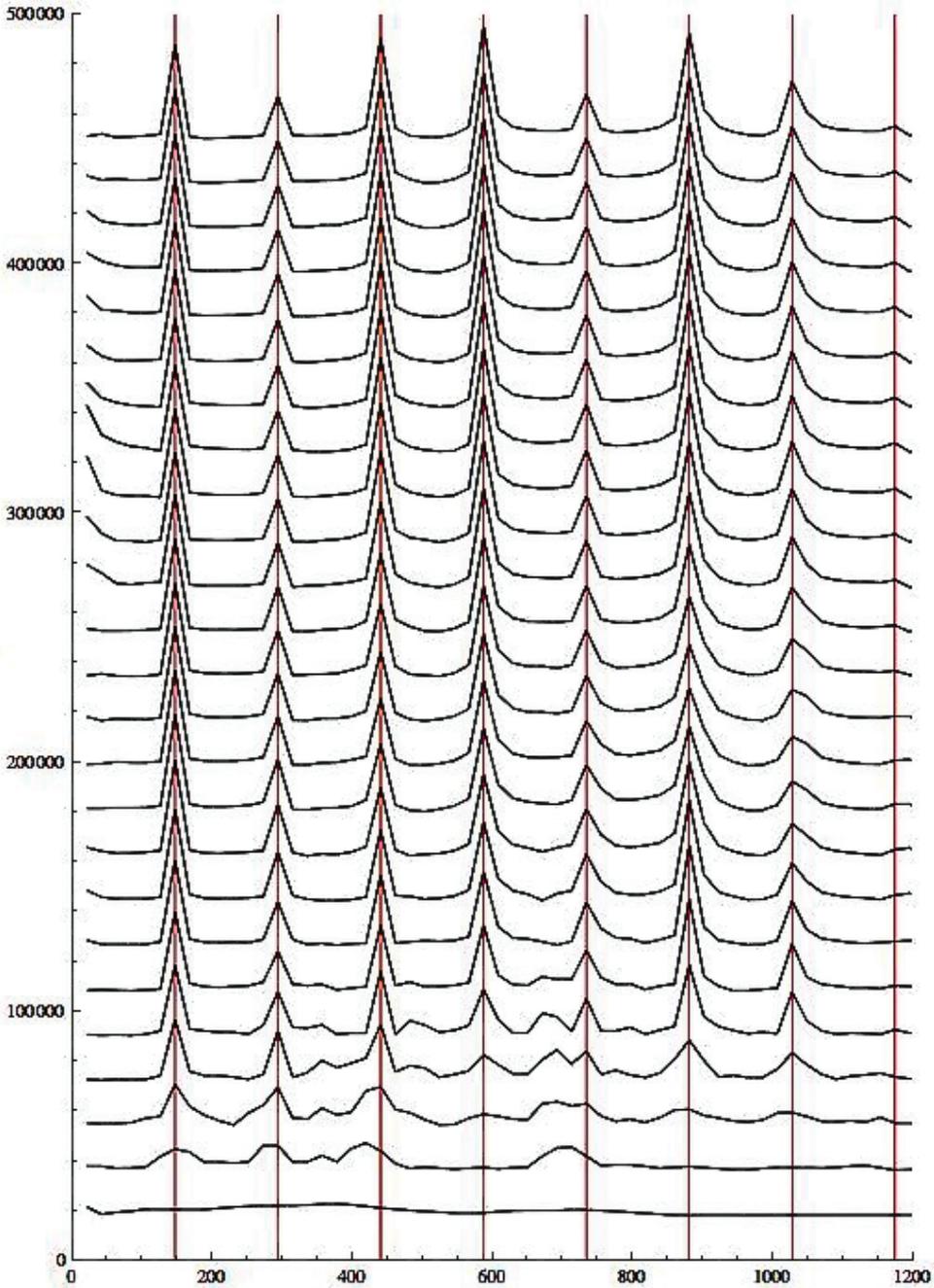
moment of attack. They come in at different times at different strengths, and they disappear at different times in different strengths. This is what produces all the noise in the attack. Joe Wolfe and John Smith told me they enjoyed working on the project because it was a real, live musical problem. We could demonstrate the before and the after. We could analyze how changing the size of a register hole changes the behavior of an attack. Their machinist made me tiny little inserts that went into one of the register holes so that we could do comparisons. Putting the pictures side by side, we were able to see what a larger hole does in terms of providing clarity of attack. It was a lot of work. It certainly improved my computer skills! I had to lay in all that recorded material, organize and manage it, and then learn how to use the program.

Here are two transient-behavior charts to show what all of this looks like (*see charts on the following two pages*). My Fast System contra (#515) was used, and we were looking at the onset transient of the written note D4 (just above middle C). The same reed, instrument and fingering were used for both charts and they were done on the same day. The only difference between the charts is that an insert reduced the vent hole size on the second chart, reducing it from .110" to .055". For both of these charts, the appropriate vent (#3 or the D vent) was used.

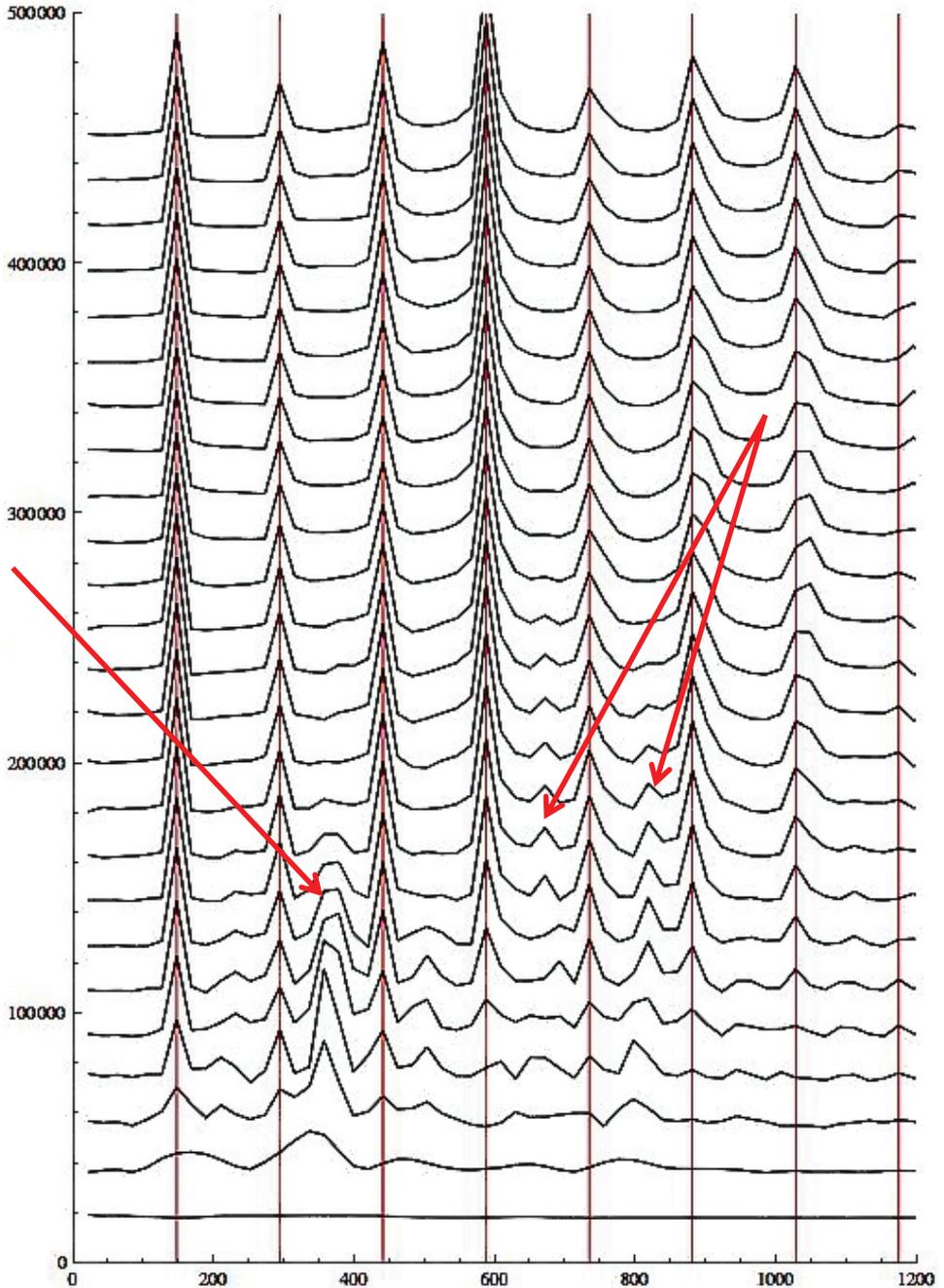
Bear with me here. The black lines in the charts that start at the bottom and end at the top represent each successive increment of time. The bottom line, which is flat, represents silence. At the top, the tone is fully developed and the sound wave is no longer changing. In these two charts the time represented is half a second, shown by the scale at the left that starts out at 0 and tops out at 500000. Each vertical red line represents the harmonics of the note, the left one being the fundamental, the next one being the second harmonic, and so on. The line on the right is the eighth harmonic of the note. The scale at the bottom represents frequency in Hertz from 0 at the left to 1200 on the right. The eighth harmonic is at 1174.64 Hertz, just below 1200.

In the first chart, the .110 chart, we can see the transient of a note that we identify as speaking cleanly. The first three lines (representing six round trips of the sound wave) show a little bit of non-harmonic activity. But that activity is very weak and resolves out fairly quickly. Harmonics one, two, three, and five have fairly strong activity right away and they feed straight into the steady-state tone, with harmonic five being a little misplaced at first but then quickly getting pulled over to its proper pitch.

In the second chart, the .055 chart (studying what happens when the vent hole is too small, even though it is properly located), you can see a lot of squiggles of the horizontal lines (representing the components of the tone) that have peaks in between the red lines. This is non-harmonic activity in the development of the sound—in other words, noise. You can see there is a huge spike of activity between the second and third harmonics almost immediately when the attack is begun. This dominates the sound at the beginning of the attack. There is more non-harmonic activity between harmonics four and five, and also between five and six, a little bit later in time. And there is a very short burst of activity early on between harmonics three and four. These all conspire to produce the dirt in the dirty attack.



A visual display of the difference between a clean (above) and dirty (right) contrabassoon attack of the note D4



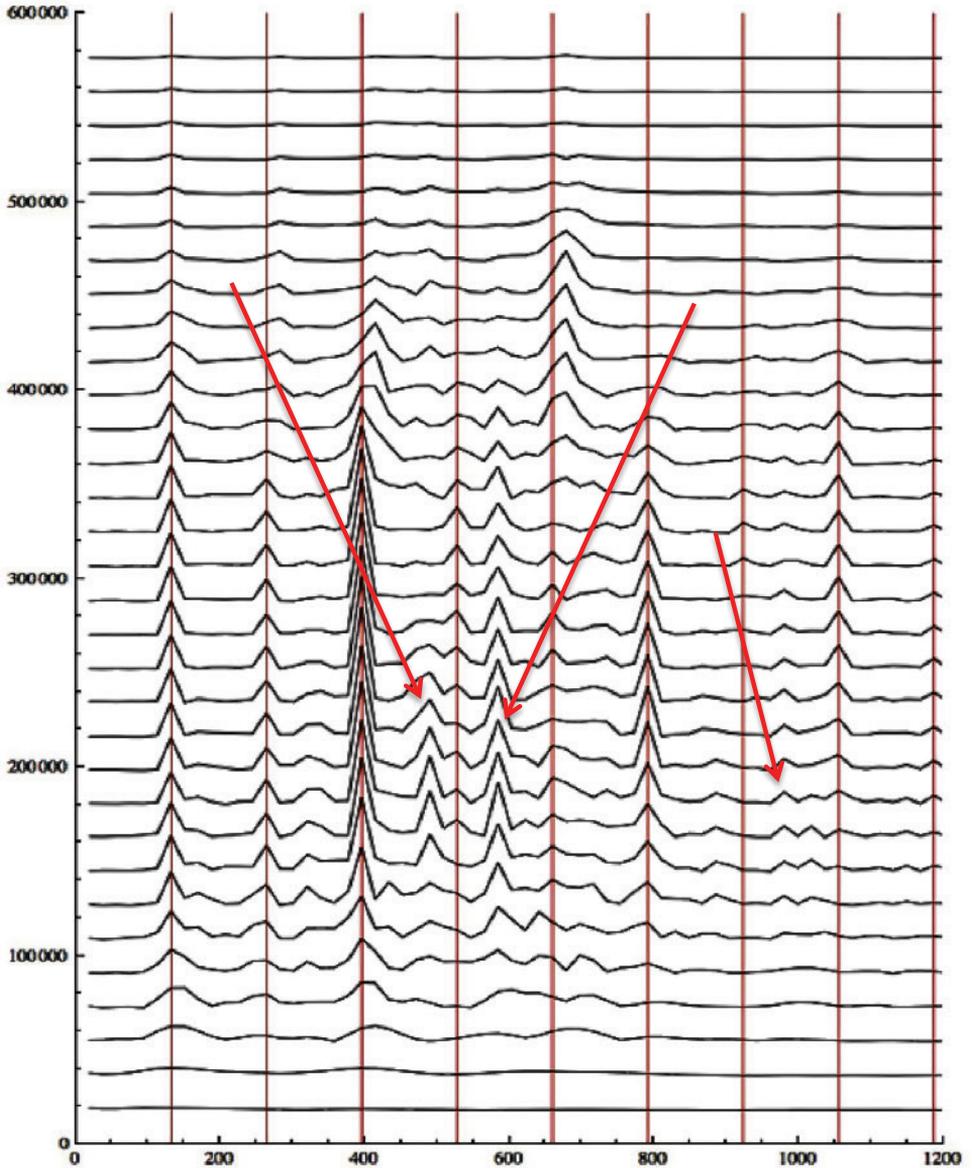
Time-spectra-amplitude display of difference between the onset transient of a Fast System contrabassoon with the D Vent hole at full size, .110" (left) and reduced to .055" (above). Arlen Fast played the note D4 on the same instrument with the same fingering and same reed for both samples. The vertical red lines represent the harmonics of this note. The spectra peaks in between the red lines represent non-harmonic partials in the note. The red arrows in the chart on the right identify the non-harmonic partials that are perceived as noise.

I have one more chart for you, which illustrates what can happen with a staccato note on the traditional contrabassoon. This chart is so useful because almost all the contrabassoon repertoire is post-1900, where short, staccato notes are essential. I mean, think about all the running staccato contra notes in John Adams' *Chamber Symphony*. The chart shows that the non-harmonic partials can easily continue through the entire duration of the note! Some contra players have said to me, "Well, I like the rough character of the old contrabassoon." This picture shows graphically how that line of thinking comes up short. You just don't have an identifiable note if all you get to hear is noise.

Influences on the Fast System

AF: There is one other thing I would like to throw in, and this goes back to my school days. There were really two things that made it possible for me to do a wholesale renovation of the register key system on the contrabassoon. As I mentioned earlier, one was photography—understanding that there are multiple systems relating to each other, and you have to understand the outcome. The other was a Philosophy of Science course that I took at Wichita State University while I was pursuing my music degree. We used a book called *The Structure of Scientific Revolutions* by Thomas Kuhn. We learned what it takes to replace one paradigm with another. A new paradigm has to solve all the problems of the old one, plus answer all the questions that have been posed up to that point. How does that happen? Think about Aristotle, Galileo, Newton, and Einstein. Each one had a new paradigm that replaced the old paradigm. And that is exactly what I wanted to do. When I first talked to **Chip Owen** at Fox, I said that I thought my register holes were too small and I needed bigger ones. He explained that it really doesn't work that way. He was thinking that if you make the holes bigger, the intonation is going to be really bad on some of the notes. So he was right in a way—for his paradigm—but once you change the paradigm, he's wrong.

So I had to change the paradigm. It was the study on the bassoon that showed me how large the register holes had to be in order to provide clean attacks. Then, how many notes could we get on that hole? And the answer is three. If you try to extend it to four notes, you will get either some bad intonation or bad attacks, or both. So I was solving for fourteen notes—the entire second octave—plus two more in the third octave, where you finally run out of room to put octave vents on the contrabassoon's metal pipe. So, fourteen notes divided by three means you need to have five holes. I knew that if we put on two automatic systems plus one more individual vent, we could cover this entire second octave using the new paradigm. That Philosophy of Science class was really valuable. I am a walking example of why people should not specialize too soon, and should get a good general education—including poking their nose into some things that are a bit different! But I could never have guessed that photography coupled with that one college course would give me the wherewithal to ask, well, how do you do this? I couldn't find the answer to this in any of the acoustics books. The acousticians start with the recorder, and they spend most of their time on tone holes. They get to the flute and the oboe. That's all fine. When they get



A visual display of the noise in a traditional contrabassoon staccato note

Time-spectra-amplitude display of a staccato eighth note at mm quarter = 75. Arlen Fast played the note C4 on a standard-system Fox contrabassoon. The vertical red lines represent the harmonics of this note. The spectra peaks in between the vertical red lines represent non-harmonic partials in the note that are perceived as noise. The note ends before they have resolved out. The red arrows in the chart identify the non-harmonic partials that are perceived as noise.

to the bassoon, the comment is usually that the bassoon is pretty complicated and they don't go any further than that! No one talks about the register holes and how they work. They just don't get into it—they rarely discuss the practical applications of things. I read so many books on acoustics, and would usually get maybe one little tidbit out of each book. So I had to read a whole lot of books to get a bunch of tidbits that could go together. So, all the reading combined with my bassoon study got me to the point where I could ask: how do you lay this out in order to have a fingering system that's pretty much the same as what you knew? At the end, you look at it and say, well, that was obvious. But it certainly wasn't obvious at the beginning! We ended up with something that was really close to what players already knew—with what already worked, but just didn't work well enough.

NP: *From everything you have said, it seems really clear to me that the driving force behind your research on both the bassoon and the contra was Norman Herzberg. Everything you have done has a connection to his influence. Is that correct?*

AF: You just nailed it!

Mixing it up with the Bassoon and the Contrabassoon

NP: *Many professional musicians prefer to stick with just one instrument. But you clearly enjoy going back and forth between the bassoon and the contrabassoon. What is it about the mix that appeals to you so much?*

AF: I think it's the variety. I can go to work with one set of challenges and one voice. Then I can go to work with another voice, and really enjoy what both voices do in the orchestra. I think this started for me in San Diego, where I was taking the bassoon into work all the time for the symphony, but I was also sometimes playing contrabassoon in the opera. Often this happened while the schedules were overlapping. So I might be playing the bassoon in a morning rehearsal, and playing the contra for an evening opera performance. I just *liked* that!

The contra serves a variety of functions in the orchestra. My ear has to go to a number of different places—the timpani, low brass, tuba, and string basses, even the bass drum. Sometimes I am with the cellos. But my ear has to go all around the orchestra with the contra, and I really love tuning in to all those other players. Playing second bassoon in San Diego, for example, I was almost always tuned into the woodwind section. The second bassoon voice is so critical to the woodwind section.

NP: *What is the mix between bassoon and contra playing in the orchestra for you nowadays?*

AF: I don't really know, I can only guess. I would think it's maybe 60% contrabassoon and 40% bassoon. My official position is contrabassoon/bassoon. Some orchestras would label that as the solo contra player. So I do all of the contra work, and if there are two contras in a piece, I play the solo contra part. On pieces like Berlioz' *Symphonie Fantastique* that have four bassoon parts, of course I play 4th bassoon. Sometimes if

there are three bassoons, I play third. That depends on the rotation of the principal players. There are some pieces where the second bassoon doubles on contra, so I try to play all of those. There are only a few that have changes between the instruments that are so quick that I split the part. Bartok will do that to me sometimes. One piece that is coming up this season is his *Dance Suite*. It has one particular change that's simply impossible. I love playing that second part, but it has a switch I can't make, so I'll just play the contra part. Even with my arrangement of instrument stands, supports, and the strap I use for holding the contra, I can't switch instruments *that* fast! I *can* do everything on the correct instrument in Mahler's *First Symphony*, but I cannot make it work in the *Dance Suite*. There are some bassoonists who just play something on the other instrument, and then switch to the correct instrument when it is convenient. But I really try to be faithful to the score, and I like that challenge.

The Significance of the Bassoon Study

NP: *Why was your study of bassoon register holes so helpful in order to understand how to determine placement and size for register holes on the Fast System? Could you have done the Fast System without having done the bassoon study first?*

AF: I could *not* have done the Fast System without having done the bassoon study. I believe that no one changed the contrabassoon because they didn't have a method to figure out how to do it. The bassoon study showed me all the symptoms of what happens when a hole is too large, too small, too high or too low. You have to know the symptoms; you have to understand what is wrong and what all of that means before you can start drilling holes. The register key system of the bassoon allowed me to figure that out. On the wing joint the A speaker key is very large—it's unreasonably large—but now I understand why it's that big. On my bassoon, the C and the D speaker keys were exactly the same size as each other. So I could use them as a test for what happens if you move a hole without changing its size. Those two holes of the same size were right next to each other! That was really helpful. Then the whisper key is a tiny hole. It was fortuitous that one was very large, two were mid-sized, and one was very small. So, there you go, the bassoon was like a ready-made vehicle to study. Why someone didn't do this in the previous generation I don't know. Of course, it was a terribly tedious study. I was quantifying all the different possibilities—I made a lot of sounds you wouldn't normally associate with the bassoon. But it showed me why register holes only succeed in very limited circumstances. You have to know how to satisfy that set of circumstances before you can devise a new set of holes that will be successful. That study on the bassoon launched everything.

Fast System Changes to the Contrabassoon: Beyond the Register Keys

NP: *Can you explain the changes that were made to the contrabassoon in addition to the register keys? Can you show me what the divorced low E is, where it is located, and can you tell me how its design came about? I understand Fox has added this to all their contrabassoons now.*

AF: Well, there were a variety of other problems on the contrabassoon that I wanted fixed in addition to the new register system. When I got into serious discussions with Chip Owen at Fox about whether we were going to go forward with this, I told him that I had a laundry list of other things I wanted addressed, not just the register keys. If we went forward, I felt we needed to make a serious effort on all these other things. So I asked him to sit down (he did), and I put the piece of paper in front of him with the list. One was the stability on G3 and G#3. These are the half-hole notes on the contra. (**Editor's Note:** For more information regarding the contrabassoon's half-hole mechanism, please refer to Mr. Fast's article "On the Function of Holes and Keys on the Contrabassoon and Bassoon," also found in this edition of *The Double Reed*.) The stability of the half-hole notes was only one of many items on the list. Chip went down the list and said yes, they would work on all of these things. When he said they would pursue all of those items, I said OK, let's go ahead with this project. My thinking was that I did not want to fix one glaring problem only to have four or five others that were going to glare even more brightly once those other problems were fixed.



Photo by Arlen Fast

Divorced low E mechanism on the Fast System

NP: *Do you feel most of this has been done?*

AF: Yes. The divorced low E you asked about is a mechanism that operates the low E key. For bassoon players this is the pancake key. On the bassoon, the key is right on top of the pad. On the contrabassoon, the pad is some distance away from where your thumb presses the E key, and the mechanism has to span across to another joint. The register key for the *left* thumb was tied into this mechanism so that when you pressed the lower vent key, the low E key would close (it would normally stand open). The problem on the contrabassoon is that when you press the register key to play the half-hole notes G and G \sharp , the low E would close and cause instability in dynamic changes—in crescendos and decrescendos. None of the speaker keys on the wing joint of the bassoon (with the exception of the whisper key) are tied to the mechanism of the pancake key, so this isn't a problem on the bassoon. But this E key on the contrabassoon is useful to close when you press the lower vent for the evenness of tone in the next notes in the scale—A, B \flat , B and C. What I needed was a clutch mechanism that would open that low E key on the contra for the notes G and G \sharp . The new clutch mechanism I designed opened that key back up for those notes, and that fixed the instability problem. Chip Owen built this system, but he didn't like it because it had a problem known as simultaneous closure, meaning that two keys have to close at once off one mechanism. The adjustments may have to be redone if the weather changes or the wood shrinks or swells. I had no trouble with it over the three years or so that I used it, but Chip redesigned that clutch into a completely different mechanism that he called the divorced low E. The "divorced" part of the name means that the E key mechanism is no longer tied into the lower vent at all. Now it is only tied to the third finger of the right hand and the thumb low E key. Chip had to spring the key so that it stands closed most of the time, which introduced a basic change to the contrabassoon's lattice of open and closed standing holes. Fortunately this did not hurt the acoustics of the instrument in the rest of the scale. It's an ingenious mechanism, and I believe it is unique in the woodwind world. It was Chip Owen's response to my clutch mechanism. But he got there because I insisted on a clutch of some kind. It was Boehm who made me aware that you could do this with a clutch. You make keys operate under certain rules. You have to define the rules; you can build a clutch and make the key operate the way you want it to.

Dealing with the Variables of the Reed and the Instrument

NP: *How did you deal with all the variables of redesigning the contra? It's enough to have the reed as a variable, but to have reeds plus the instrument both in flux at the same time would simply be too much! How did you handle this?*

AF: First of all, I looked at the instrument as one system and the reed as another system. As any accomplished player knows, you cannot improve your reeds beyond your level of playing, and you cannot improve your level of playing without bringing your reed-making skills up to your new level of playing. It's like having two ladders—and you have one foot on the rungs of one, and the other foot on the rungs of the other. You can move one leg at a time, and by alternating moves you can climb the

ladder. If you improve your technical ability, then you need your reeds to improve, too. Once the reeds improve, then the technique can improve again. So you climb step by step. I looked at the instrument and the reed in the same relationship. I had explored reeds as much as I could and then I needed the instrument to improve. I had the playing experience to trust that my reeds were at a high enough level that I could use those reeds to start to develop a better instrument—I could climb the ladder by developing a better instrument.

NP: *So it sounds like you tried to keep the reed as stable as possible, so you could address all the issues with the redesign of the instrument.*

AF: Yes, but when Chip built the prototype of the Fast System, I *then* realized I had too many variables going on with my reeds, and I needed to improve my reed-making yet again. The way to improve that was to modify my machines by providing centering marks, so that I could identify the center of the gouge, and then locate the center of the gouge on the center of the profile and on the center of the shape. Before this, I had no way to identify the center of the gouge other than eyeballing it, because there were no indexing marks on my gouging machine. So I bought \$2,000 of precision equipment to be able to analyze, correct and improve my machines. I knew about all of this because this is exactly what Herzberg used to develop his profiler. I got a huge improvement in consistency of reeds once I did the alignments on all my machines. Of course, all of this was the result of suddenly having an instrument that was truly a hundred years better!

Reeds for the Fast System

AF: There's one more thing about reeds that I should explain. I needed to know that the Fast System would work well with a variety of reed styles. So I ordered shapers from all the manufacturers I knew of who made contrabassoon shapers. I got shapers from Prestini, from Rieger, and Nielsen had one modeled after what Burl Lane (the retired contrabassoonist of the Chicago Symphony Orchestra) used. I started making reeds on all of them. Some of them I really liked, and they all had different characteristics. I also realized that there were three different shape types:

1. Concave Shapes

I call one of them concave shapes, where the blade flares out in a curve towards the tip. Those reeds, for me, have a lot of flexibility and beautiful tone colors available in the middle range dynamics. The Prestini shaper I bought was of this type. Various people who play Mollenhauer contrabassoons, including Gregg Henegar of the Boston Symphony, have success with this kind of shape.⁵ For me, though, I could not get these reeds to produce a good body of tone at loud dynamics, so I don't use it. I've got a big brass section behind me, and they aren't shy! I need power.

2. Wine Bottle Shape

The second type of shape is a wine bottle shape. That is much more like an oboe or English horn shaper, where the blade flares out from the collar towards the tip, but then curves back in so the sides near the tip become more nearly parallel. These reeds have more stability, and they generally have more power in the lower register. And the wider ones—the K2 of Rieger—are quite good in the ultra high register. I like the Rieger K2 a lot, although in order to get the tone quality I wanted on this shape, I had to leave quite a bit of wood in the mid area, which is very wide. That puts a lot of strength in the reed, and it takes a lot more muscle to control it. When you are playing long passages or pedal tones, having to bite down on a reed that is very strong against your lips, well, I come up against limits in terms of what I am comfortable controlling. So I designed a narrower version of it, and I really like it a lot. I spent a couple of years pondering the exact curve plots, but finally settled on something that I liked. I sent it to Fox, and they built it. It's my standard shaper now, and it's called F2, as in Fast #2. The F2 is a narrower version of the K2 wine bottle shape that I like so much. It's my "go to" shaper. But I always keep the Burl Lane and the original K2 (the wider wine bottle shape) in my reed box.



Photo by Arlen Fast

Four Contrabassoon Reeds Representing Three Shape Types
 Left to Right: Concave, Narrow Wine Bottle, Wide Wine Bottle, Straight-Sided
 Description of the reeds left to right:
 Concave shape: Pfeiffer shape, reed courtesy of Gregg Henegar
 Narrow Wine Bottle shape: Fox F2 shape
 Wide Wine Bottle shape: Fox CB2 shape, based on Rieger's K-2 foldover shaper
 Straight-Sided shape: Fox CBL shape, based on Nielsen's Burl Lane shaper

3. Straight-Sided Shape

The third type of reed shape is a straight-sided shape. If you hold a ruler next to the edge of the blade, there is no flare along the edge, convex or concave. These reeds are all-around pretty good. The Rieger K1 (which I believe is the first contra shape they ever made) is one of these. It's the first contra shape I ever bought, and I won my job using that shape. The Fox CBL⁶ is in this group, and the Burl Lane shape also falls into this category. It's a very flexible shape, and I use it instead of the concave reeds when I want a nice palette of tone colors. I also tailor the Burl Lane reeds for passages that have rapid articulation or need extreme delicacy in low dynamic ranges or pedal tones.

To summarize all of this, I would say that these three categories are the three distinct shaper types of contrabassoon shapes. I settled on three shapers, but they belong to only two of those categories: one in the category of the straight-sided shape (Burl Lane) and two of the wine bottle shape (K2 and F2).

NP: *On behalf of everyone who wouldn't know—and that starts with me—what is it about the Burl Lane shape that gives such wonderful articulation and delicacy?*

AF: I don't know! But it *does*, and it's a wonderful shape! I wouldn't give it up.

NP: *You said it was Burl Lane's. Where did he get it?*

AF: I don't know.⁷ Nielsen's sold a copy of it for a long time. One feature of the Burl Lane shape is that its narrowest point is all the way down at the third wire, near the butt end of the reed. No other shaper is like that. You can get a freedom of vibration out of these reeds for the size of the reed that is unmatched with any other shape. So I can make pedal tone reeds out of it, I can make reeds that articulate very readily and I can do double and triple tongued passages much easier on that reed than on the K2 or my F2.

The only problem with the Burl Lane shape is that the way I make my reeds, I don't have the extreme power in the low register that I sometimes need. It just doesn't quite have it. And it doesn't have the evenness of resistance in the low register, note to note, that the wine bottle shape has.

So the three different reeds give me an extremely wide palette of what I can do in the orchestra. I have a middle of the road reed (the F2 or narrow wine bottle shape), I have a low note power reed (the K2 or Fox's CB2—the wide wine bottle shape), and I have a low note delicate/pedal tone reed (Burl Lane straight-sided), so I can go any direction I need to for the repertoire we have. The contra has to have the flexibility to feed into so many other voices in the orchestra—the fourth horn, tuba, double bass, etc., and then there is the woodwind section!

I tend to do the bulk of my reed making in spurts, like during a week off. I can feed a bunch of reeds through the system that way. I can finish a reed, fine-tune it, and take it to work and fine-tune it some more, take it home and fine-tune it yet again. But I've got a number of reeds I would call "in waiting!" (*Interviewer's note: the reeds "in waiting" were quite an impressive and large assortment.*) On that top

shelf are contrabassoon reeds, and in the cabinet here are bassoon reeds in various stages of waiting. I'll do experiments with reeds, or bring something along quickly because I realize I have to have a reed to do a specific job, but otherwise I like to let them sit for a couple of years before I take them from the forming stages to wires.

With a good piece of cane, a contra reed can last me a couple of months. Some of these reeds have been in use for several months before they start to give me the qualities of false pitch. It's like strings going false—cane eventually gets tired. Reeds begin to lose their luster, and pitch becomes less well defined. I think it's because the enzymes in saliva break down the cellulose in the cane. It depends on how well you rinse them out after you play them, and how you care for them. But eventually you use them up and run out of options of how to keep them going. I also think it depends on weather changes, as well as how good a piece of cane you have. Or you might just be ready for something new!

NP: *You must have a system to identify what all these reeds are. What is it?*

AF: Everything is coded like a library coding system on the reed (he picks up a reed and explains the coding). This reed, for example, is from Reeds Australia cane. I got the cane in 2012. I cut three millimeters off the butt end, and the outside diameter of the cane I started with was 30.5 millimeters. This is a little bit large, since 29 is my normal size. So I already have an idea of what to expect out of this reed. It is the F2 shape and it has a hardness of sixteen. This is a good hard piece of cane, but it's a large diameter tube. I'll know what to expect when I start scraping it, but I already know this came from a good batch of cane. I know that I have a lot of ways to get to a good reed with this one.

I try not to spend more time than I have to making reeds, and I don't actually make all that many reeds. If a reed gets to the point where I cut the tip, I already know that my chances of being able to use it are 75 or 80 percent. I like that, because it means my reed making time is productive. I don't make reeds to throw away!

NP: *What are you using for a bassoon shaper?*

AF: I use the Herzberg shape. I have used it from when I started on the West coast in 1979. But after I did all that work on the contrabassoon, I decided I was ready to experiment a bit with bassoon shapes. This was in about 2003. I tried a wine bottle shape, the Rieger #9. It's a very subtle wine bottle shape, and it does those things on the bassoon like the wine bottle shape does on the contra. But the Herzberg shape is *so* good—it's a straight-sided shape—and our entire section in the New York Philharmonic uses it. We all got there gradually, one way or the other. The shape is so good that it's a solo bassoon shape, it's a second bassoon shape; it does everything. I have used it for so long that it's like a photographer who knows exactly what he can get out of a certain film.

Summing Up The Fast System

NP: *Here is what I have learned from you in terms of the advantages of the Fast System compared to the traditional contrabassoon: the Fast System provides a much improved response in the upper register, the notes are much more even throughout the instrument, intonation is improved, there are no more unstable notes, the fingering system is simple and more logical, the fingerings do not depend on a certain reed style, and you have added nearly an octave to the range of the instrument. Did I get all of that right?*

AF: Yes. And the learning curve is now linear, meaning that what you learn today will work tomorrow, and it will work next year. You can change reed styles and your fingerings stay the same. That was not the case before—if you changed your reeds a little bit, three or four fingerings wouldn't work.

NP: *This sounds just crazy! Is this all reed dependent, shape dependent, what is it? I know it's true, but I find it hard to comprehend.*

AF: It's instrument design dependent. I am going to show you a chart. Here's a chart where I laid out the bassoon reed, bocal and the layout of the register holes. Here's the approximate location of the first tone hole. In the same scale on the paper, here's the contrabassoon reed, here's the end of the bocal and here is the top register hole. This is the old system. There is just *nothing* until you get down here to two holes, which are four and a half inches apart. Look at how many holes we have on the bassoon in this region which provide the possibility of getting clean attacks. Then look at this wide open space between register holes on the old contrabassoon. This is exactly where you need holes to divide the sound wave. Because you are missing register keys that you need, you are forced to use register keys that are mislocated. This can create problems with bad attacks, unstable notes, or the tone color just doesn't fit. Response, intonation and tone—those are the three big things. If you are missing a register hole that you need, you end up using one that introduces bad variables into any of these three characteristics—response, intonation and tone. You start needing to add other fingers, mostly right hand fingers or low note fingers (your thumb) in order to overcome the problem of the mislocated register holes.

NP: *Let me see if I understand. Are you saying that reeds are a whole lot more finicky because of the limitations of the instrument design?*

AF: Yes, because you end up tailoring the reed to attempt to overcome the bad, or insufficient, instrument design. Once you have proper register holes on the instrument you are free with the reeds. You don't have to sacrifice good tone or good intonation or response trying to overcome problems like instability or bad attacks. A player could solve the problem of bad attacks by making the tip thinner and the back of the reed heavier. But then you have horrible tone at loud dynamics.



Photo by Chris Lee

New York Philharmonic bassoon section in front of the Nativity Façade of Gaudí's Sagrada Família Church in Barcelona, Spain

NP: *So would this argue that it's much easier to make a reed for the Fast System?*

AF: Absolutely. It's much easier to get to a good reed because you know when you are there! The fingerings don't change, since you aren't dependent on this or that reed style.

NP: *Since fingerings can be so reed dependent on the old contra design, doesn't that, well, doesn't that make you just a little nuts?*

AF: It *was* going to make me nuts, and that's why I had to change it. I had my dream job with the Philharmonic, and I realized I was going to be miserable in a career where I had to deal with an instrument that just needed to be better.

NP: *I find it unbelievable not to know from one day to the next what fingerings you will be using. This would completely unglue me, but you have to remember I am an oboe player, and our fingerings don't change much at all. It's kind of a one-size fits all approach.*

AF: I can give you an example about the old contrabassoon design: let's say I have a reed that has been tolerating a certain fingering for two weeks, but now I scrape a little bit more out of the channels in the back for the demands of this week's repertoire. Suddenly, I need to add something to the fingering in order to control this or that. Or I *no longer* have to hold these two fingers down, since I have improved the reed a little bit. But, by the way, I can't play loud in the low register anymore because if

ARTICLES



Photo by Chris Lee

I do, the tone is going to go to hell. Playing the old contra was just a constant fight of bad options.

NP: *You live with this as a contrabassoonist, but it seems to me that you had so many variables on the old contrabassoon, and what all of us really want to do is to get rid of the variables so we can just think about the music. The basic stuff should be on autopilot, but on the contra, it wasn't.*

AF: Right. With the old contrabassoon, I felt like I was spending about 75% of my mental energy on stage trying to simply manage the instrument. I could devote only about 25% of my concentration to playing a musical phrase the way I wanted to. I wanted to reverse that, of course. I wanted to spend most of my mental energy thinking about where am I taking this phrase, how am I going to take over the line that someone has just given me, or what kind of color do I want to provide in a note that is the root of a beautiful chord?

I would say I have gotten to the 75/25 ratio I wanted, but I am still working to improve that. We are about to move one tone hole by one inch, for example. I just did some tests last night, and everything points to this move being successful. It's the constant improvement that is so fascinating to me. I try to manage the variables, and improve the ones I can.

The Next Projects

NP: *What is next? You mentioned you were designing the first tip profiler for the contra. Is that your next project?*

AF: A pattern for a tip profiler for contrabassoon reeds is the current project. No one has made one because there are so few contra players, so there wasn't enough of a market to make it worthwhile.

NP: *When do you think this might be finished?*

AF: I have no idea. A year ago I sat down and mapped out all the things I want to get done before I retire. I looked at the list and thought *I really have to get busy!* This is not to predict when I am going to retire, but the list was so long—just like the To Do list for the contrabassoon that I asked Chip Owen to sit down for.

NP: *After the tip profiler, what else is on the list?*

AF: I would like to see Fox make a low A contrabassoon, that is, adding an extra note to the instrument. They do not have a low A contra right now. Mollenhauer has made them, and Heckel has made low A contras since the early 1900s. Mahler wrote low As for the instrument. Now that the contraforte is being played—and it goes down to low A—composers are specifying that parts should be played on a contraforte or a contrabassoon with a low A. So I am hoping I can convince Fox to build a low A instrument with the Fast System on it.

NP: *I have one question about the contraforte. You were talking about it going down to low A. Do you think the contraforte is going to give the contrabassoon a real run for its money in the future?*

AF: I can't predict that. Only time will tell. The parallel is with bass oboe and Heckelphone. Both are still built, and sometimes people will cross over and play a bass oboe part on the Heckelphone, or the other way around. They are two different instruments, and I don't think one will make the other disappear. Whether one survives and the other does not is not something I can control. With the Fast System, what I can do is make the contrabassoon as good as possible, so that the odds are improved for the contra.

NP: *Something just occurred to me. So much of your energy and activity has gone into the development and design of the instrument itself. Have you commissioned pieces for the Fast System instrument?*

AF: No. I would really like to, but I would have to stop so many things I do in order to have the time to do solo playing beyond the orchestra position that I have. And the orchestra job is demanding enough.

I have two instruments to keep up, and I know the level of bassoon playing that I expect out of myself. That requires a lot of practice beyond the contra, and beyond what we are playing next week and next month. I owe it to the orchestra to show how good the Fast System can be, but I also owe it to the instrument. The Fast System didn't come with an instruction book, and its fingering possibilities are still opening up to me, so I'm always exploring. Working on all the things I am already doing takes about as much energy as I have. I figure that part of what I can contribute to the contrabassoon world is what I can do to push the instrument and the reed making tools forward. I think that is as valuable to the music world as if I were commissioning new concertos. If I can provide an instrument where someone can improve their playing in half the time it took me, well, that's exactly what should happen from one generation to the next. We all stand on the shoulders of the previous generations.

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Endnotes

- 1 **Fernand Oubradous'** *Enseignement complet du Basson, Books 1 and 2.*
- 2 RDG gougers were indeed based on Michel Kunibert's machines. Bob Gilbert and **Frank Desby** worked on developing/refining the oboe machines together. (Email to the interviewer from Nancy Huang, owner of RDG Woodwinds on September 26, 2016)
- 3 Weisberg's wife, Diane, explained some of the origins of the Weisberg System: "Arthur had the idea for this system, as well as other key ideas, as early as the 1950s. Things started taking shape (literally) when he linked up with Jimmy Keyes. Robert Jordan was brought in near the end of Arthur's life, when

Arthur wanted someone to promote the work he had started. He thought a bassoonist was a good choice, and Robert had expressed interest.” (Email to the interviewer from Diane Weisberg on November 7, 2016)

Robert Jordan (President of Weisberg Systems, LLC) recalled the history of the Weisberg System:

“Arthur, James Keyes, and I designed the system, with considerable help from others in the bassoon world. In my opinion, it could not have been accomplished without the incredible work and input of James Keyes. James Keyes made the prototypes that were displayed at each of my University of Dayton Bassoon Days in 2000, 2001, 2002, 2003, and 2004. I began work on the system with James Keyes in the 1990s due in large part to our mutual connection with **L. Hugh Cooper** and **John P. Patterson**. Independently, prior to, and apart from my collaboration with Arthur Weisberg, I had an interest in developing a double octave system for bassoon. In 1969 John Patterson and Arthur Benade made a double octave system for a bassoon. In 1988, Hugh Cooper told me during a lesson that the bassoon needed two more holes to accommodate a double octave key system. James Keyes knew of my interest in bassoon development. I studied with him in high school and we have remained close friends and colleagues ever since, now spanning nearly four decades.

I’d like to say for the record that the idea of a double octave key system for the bassoon has been around for some time. It is a very basic acoustic principle. It’s difficult to say whose idea it really was, since the evidence clearly shows that Arthur Benade and John Patterson made such a system in 1969. Hugh Cooper certainly knew that it was a good idea when he suggested it to me in 1988. Mr. Cooper also knew that manufacturers would not embrace it. When Arthur Weisberg asked me to take over for him, I thought it best to name it the Weisberg System to honor him. It could very well have been named after Patterson, Cooper, Keyes, or Benade. However, without the insistence of Arthur Weisberg, and my persistence since his death in 2009, it could have very well died with him. It may still die, but I have not given up.

There were several design changes as time went on. The most significant change was moving from two independent vents to a rocker system, similar to the saxophone, for the opening and closing of the vents. This particular change occurred around 2006. Our goal was to present the Weisberg System to a bassoon manufacturer and leave the rest to history. Fox’s response was lukewarm. **Stephan Leitzinger**, however, is very agreeable to adding the system to his bassoons. I expect that he will be the first manufacturer to offer it as an option. There are roughly fifty bassoons throughout the world now equipped with the Weisberg System.” (Emails to the interviewer from Robert Jordan on November 7 & 8, 2016)

Further information about the Weisberg System is available at:
www.weisbergsystems.com

- 4 James Keyes makes the Weisberg system. Mr. Keyes has observed consistently that the Weisberg System improves the bassoon acoustically, so that the second

octave notes are richer, fuller, and better in tune than on a conventional bassoon. There is no hesitation (he also uses the term “bracking”) in the attack of the flicking notes. The response is instantaneous with no adjustment of embouchure. The scale is more even, and the response is very noticeably better. (Phone call to the interviewer on November 7, 2016)

- 5 Contrabassoonist Gregg Henegar of the Boston Symphony offered some additional information about the concave classification of shaper tips:

“Yes, my shape fits into Arlen Fast’s concave category, although I have never used a Prestini shaper. Early in my career I started with a foldover contra shaper from Fred Pfeifer. It was proportionately similar to my Pfeifer/Goslee bassoon shape, which was similar to the Herzberg shape (with less flare in the tube).

Not satisfied, I first modified/enlarged the Pfeifer shaper, and then began experimenting with making a straight shaper of my own design (first with a machinist in Texas, ultimately with a machinist in the Physics Department at Northeastern University in Boston). About twenty-five prototypes later, I settled on a shape that has a slightly flared blade with a moderate tube, and another slight flare at the back (enough to accommodate a Herzberg style bevel). I have not reproduced the shaper (demand is pretty low), but **Benson Bell** made a copy from cane shaped on my shaper. The Bell shaper is slightly smaller than what I use.” (Email to the interviewer on October 15, 2016)

- 6 Fast added that: “Fox makes straight shaper versions of Rieger’s foldover shapers, plus the Burl Lane shape. I use the Fox shapers CBL and CB2 because they are so much easier to use than the foldover shapers.” Here is Fast’s explanation of some of the Fox straight shapers:

Fox F2 (Fast 2) is only made by Fox

Fox CB2 is based on the Rieger K2 foldover

Fox CBL is based on Rigotti’s copy of Burl Lane’s original foldover

Fox CBI is based on the Rieger K1 foldover (not included in the photo of reed types)

- 7 The origins of the Burl Lane contrabassoon shaper tip were somewhat mysterious, and led to an intriguing investigation. Lane (retired contrabassoonist of the Chicago Symphony Orchestra) bought his shaper tip at Linx & Long, the iconic double reed specialty store that once existed on West 48th Street in New York. As Burl Lane explains it:

“Linx & Long was my home away from home during my years in New York City studying at Juilliard, 1961-65. Jack Linx owned the shop. Jack had this contra tip in a glass display case, I begged to buy it over and over again, and one day he agreed to sell it. I recall him telling me that it was one of a kind, and it was from **Wally Bhosys**. In any case, he sold it to me and I used that tip to make contra reeds for my forty-three years in the Chicago Symphony Orchestra.” (Email to the interviewer on October 3, 2016)

Bhosys was the second oboist with the Metropolitan Opera who owned a well-known New York double reed business selling instruments, reed tools, cane, gouging machines, etc. Retired New York Philharmonic and Metropolitan Opera Orchestra bassoonist Leonard Hindell suggests that the shaper most likely came

from Bhosys, although Kal Opperman and Fred Pfeifer might also have been possibilities. (Email to the interviewer on October 2, 2016)

Hindell also offered his description of Bhosys:

“Other than his knives, that everyone knew about and many used, he didn’t promote the business side of his talents. He was a big guy, and moved slowly. I think *slow moving* was his overall MO. I often went out to dinner with him and a few other woodwind players on Saturdays between matinee and evening performances. It was not uncommon for him to order two soups and two entrees. I don’t say these things with anything but affection and respect for him, but slow moving was his style, and it carried over to his tool and machine projects.” (Email to the interviewer on October 5, 2016)

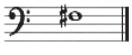
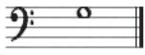
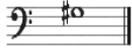
Paul Laubin remembers Linx & Long well partly because his father, **Alfred Laubin**, worked there for some time. He agreed with Leonard Hindell that either Kal Opperman or Fred Pfeifer might have been the source of the shaper tip, but more likely Wally Bhosys. However, Laubin emphasized emphatically that Bhosys never made any of his tools, shapers, knives, gouging machines, etc., and would have gotten them from Europe or possibly from other sources. Laubin also said that Opperman never made anything—Opperman’s father-in-law was a machinist, and he made everything. Laubin also added that he and his father used to *hand make* oboe and English horn shaper tips. He said it was a lot of work, and that they charged \$25.00 for one back in the old days. (Telephone conversation with the interviewer on October 3, 2016)

Nielsen’s made a copy of the Burl Lane shaper tip. According to Barbara Nielsen Shaver of Nielsen’s: “The shaper tip was actually made by Franco Rigotti. I sent him a couple of pieces of shaped cane from Burl’s tip and he was able to make the tip although it was not plated. The problem was I had to buy ten at a time because of the work involved and I only sold about one a year.” (Email to the interviewer on October 9, 2016)

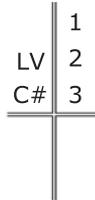
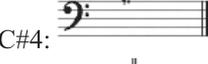
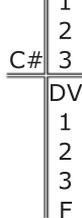
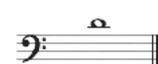
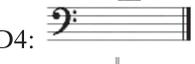
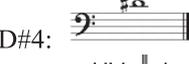
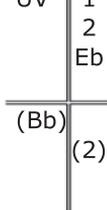
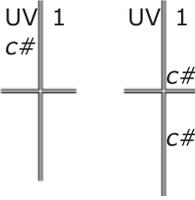
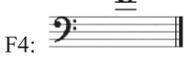
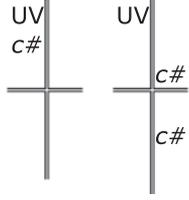
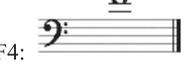
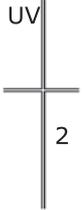
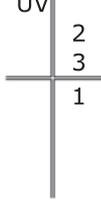
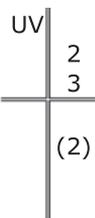
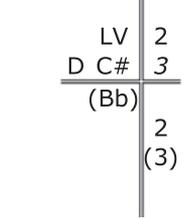
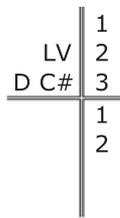
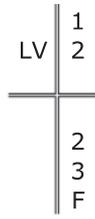
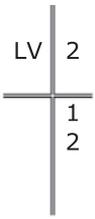
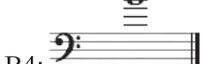
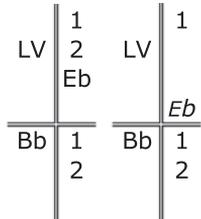
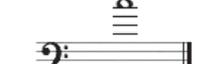
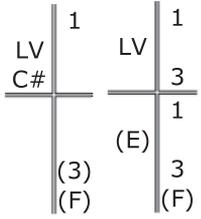
Fox also makes a copy of this shape, called the CBL. Burl Lane gave his shaper tip to contrabassoonist Susan Nigro when he retired, so she is now the owner of this unique shaper.

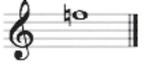
Fox Fast System Contrabassoon Quick Reference Fingering Guide

By Arlen Fast

Quick Reference Fingering Guide Fast System Contrabassoon		Reference Guide to fingerings Locations of Primary and alternate Keys																																											
<p>--Finger keys are shown as 1,2,3 / 1,2,3 --Other keys are named by letters</p> <p>--UV = Upper Vent Key --LV = Lower Vent Key --DV = The D-Vent, and is shown in the "fingers" column, above LH1</p> <p>--Auxiliary Keys are shown with italics</p> <p>--Optional keys in a fingering are shown in parentheses</p> <p>--Most fingerings in this Quick Guide do not show alternate fingering use or possibilities unless that key is essential in the fingering. For more complete fingering information, see the individual pages for each note.</p>		<table border="1"> <tr> <td></td> <td>1</td> </tr> <tr> <td>Bb UV</td> <td>F#tr</td> </tr> <tr> <td>B C#</td> <td>2</td> </tr> <tr> <td>C LV</td> <td>Eb</td> </tr> <tr> <td>D C#</td> <td>3</td> </tr> <tr> <td><i>Eb</i></td> <td><i>Eb</i> <i>Eb</i></td> </tr> <tr> <td></td> <td>C# C#</td> </tr> <tr> <td><i>Eb</i></td> <td>DV <i>Eb</i></td> </tr> <tr> <td>Bb</td> <td>1</td> </tr> <tr> <td>E</td> <td>C#</td> </tr> <tr> <td>F#</td> <td>2</td> </tr> <tr> <td><i>Ab</i></td> <td>3</td> </tr> <tr> <td></td> <td>F F#</td> </tr> <tr> <td></td> <td><i>Ab</i></td> </tr> </table>			1	Bb UV	F#tr	B C#	2	C LV	Eb	D C#	3	<i>Eb</i>	<i>Eb</i> <i>Eb</i>		C# C#	<i>Eb</i>	DV <i>Eb</i>	Bb	1	E	C#	F#	2	<i>Ab</i>	3		F F#		<i>Ab</i>														
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ARTICLES

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<p>D#4:</p>  	<p>E4:</p>  	<p>F4:</p>  	<p>F4:</p>  
<p>F#4:</p>  	<p>G4:</p>  	<p>G#4:</p>  	<p>A4:</p>  
<p>A4:</p>  	<p>A#4:</p>  	<p>B4:</p>  	<p>C5:</p>  

<p>C#5:</p>  <p>1 LV 3 Bb (DV) 3 F</p>	<p>D5:</p>  <p>2 Bb DV 3 F</p>	<p>D5:</p>  <p>1 F#tr (C#) Bb DV (3) (F)</p>	<p>D#5:</p>  <p>F#tr 2 C# Bb DV</p>
<p>D#5:</p>  <p>2 Bb DV 1 2</p>	<p>E5:</p>  <p>UV 1 LV 2 3 1 3</p>	<p>F5:</p>  <p>UV 1 LV 1 2 3 F</p>	<p>F#5:</p>  <p>1 LV 3 E 2 3 F</p>
<p>G5:</p>  <p>LV 3 2</p>	<p>G#5:</p>  <p>LV 2 LV F#tr 1 Bb 3</p>	<p>A5:</p>  <p>UV LV 2 Eb Bb 3 F</p>	<p>A5:</p>  <p>LV F#tr Eb Bb (Eb)</p>
<p>A#5:</p>  <p>UV LV Bb DV (3)</p>	<p>B5:</p>  <p>(D) LV (1) 2 DV 1 2</p>	<p>C6:</p>  <p>UV 1 LV 2 LV 2 Eb DV 2 2 F</p>	<p>C#6:</p>  <p>UV 1 LV F#tr 2 Eb 2</p>

Fast System Contrabassoon Overview of Register Key Usage

Illustrating the application of the register keys to the upper register notes

UV = Upper Vent (Left Thumb presses the upper vent in the fingerings for these notes)

DV = D-Vent (Right Forefinger presses the D-Vent key for these notes)

LV = Lower Vent (Left Thumb presses the lower vent key in the fingerings for these notes)

The diagram consists of two musical staves. The top staff is in bass clef and shows a sequence of notes: C4, C#4, D4, D#4, E4, F4, F#4, G4, G#4, A4, A#4, B4, and C5. Brackets and boxes indicate key usage: a box labeled 'Half-hole used on these notes.' points to C4, C#4, and D4; a box labeled 'DV (D-Vent)' points to D4, D#4, E4, and F4; a box labeled 'LV (Lower Vent)' points to C4, C#4, D4, and D#4; and a box labeled 'UV (Upper Vent)' points to E4, F4, F#4, G4, G#4, A4, and A#4. The bottom staff is in treble clef and shows a sequence of notes: C4, C#4, D4, D#4, E4, F4, F#4, G4, G#4, A4, A#4, B4, and C5. Brackets and boxes indicate key usage: a box labeled 'LV' points to C4, C#4, and D4; a box labeled 'DV' points to D4, D#4, E4, and F4; a box labeled 'UV' points to E4, F4, F#4, G4, G#4, A4, and A#4; and a box labeled 'LV' points to C4, C#4, D4, and D#4.

Note that the notes C4, C#4 and D4 all have the option of which register key to choose. This provides good fingering sequences and it also allows good trill fingerings on any of these notes.