GUITAR RESEARCH ENGINEERS

Turning Ideas Into Instruments

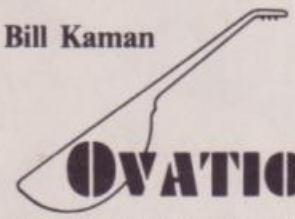
By Jim Schwartz

EVERYONE KNOWS WHAT an electric guitar is, although there might be some disagreement among guitarists about which of the scores of new and used instruments currently available provides the best sound for any given playing situation, or which guitar seems to be the most adaptable to the ever-widening range of stylistic directions many musicians are currently exploring.

Besides musical considerations, guitarists often take a number of other factors into account before purchasing an instrument, including the unit's pickup and control configuration, its scale length, physical makeup (including shape, weight, color, types of wood and/or synthetics used, etc.), warranty, and, of course, its cost. After weighing both musical and aesthetic criteria and after putting the guitar to the ultimate test, by playing it, the buyer is then ready to make the important financial and artistic commitment.

But have you ever wondered why there are so many electric guitars to choose from,

Bill Kaman



ALTHOUGH 27-YEAR-OLD Bill Kaman is the son of Ovation's president, he earned his stripes as a guitar research designer on his own merit. Bill has been working on and off at the Ovation factory in Connecticut for the last 13 years, and from that experience has gained valuable insights into many facets of instrument construction. "I'd be in the detail shop one summer, after school was out," he says, "while the next I'd work in the top shop." But his big move into the company occurred in 1974 when he, still a senior in college, volunteered his services to the production of what became the Applause and Matrix acoustic guitars.

"The aerospace division of Kaman was tackling the project of building a good guitar that would be sold at a lower price than our other Ovations," he recalls. "While they have far more knowledge than I concerning materials, construction and tooling methods, and the like, if you don't know what a guitar is supposed to look and feel like, you don't get too far. So for two weeks in January of '74 I made the 200-mile trip to the factory to help out. It was the middle of winter; so, of course, the heater in my car broke. But it was lots of fun, and when I graduated from college I decided to come on here full-time."

Realism is a fundamental principle in Bill's philosophy of guitar manufacturing. "You have to know what other guitars are available," he says. "Most all companies make a good product, and once you reach a certain level, they're all good. So it just becomes a subjective question of what you personally want." If this is true, how do you make your guitar a winner? "First," Bill says, "you do it by talking to professionals who make their living by playing instruments and get input from them as to what they like and don't like in a guitar, and what they feel is lacking in present-day instruments. Also, it helps if you play yourself and have a circle of friends who play, because from just talking with them you get another valuable perspective concerning what a guitar should look and sound like."

After the research engineer collects various opinions, the process of designing and building guitars begins. "In the case of our electrics," Bill says, "we wanted them to be unique. So we built the Deacon and the Breadwinner with some interesting features like active electronics. And after they were out for a while, we decided to expand the line a bit more and offer instruments with a more conventional shape and without active electronics. And the result was the Preacher and the Viper.

"A lot of people liked the active electronics, but they didn't like the shape of either the Deacon or the Breadwinner; so then came the Preacher Deluxe. What I'm getting at is we start with a guitar that we know is good and we work from there. If there's enough demand for a modification or a completely revamped unit, we'll build it."

Even when there is a great demand for a certain type of guitar, building it often presents its own special set of problems for the designer. "I have to be concerned about making a design that will meet the instrument's targeted price," Bill says. "And there are some things, you know, that take time

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Jeff Hasselberger

Ibanez

JEFF HASSELBERGER'S conception of what guitar design engineering is all about reflects very well the opinion of most of his peers: "Guitar research and development might sound like a romantic job, but in fact it's a lot of legwork, comparative data, prototypes, blind alleys, failures, and, once in a great while, a pretty satisfying success or two." The 32-year-old head of R&D and marketing director for Ibanez has, in the six short years he's worked for the Japanese instrument manufacturer, helped to firmly establish Ibanez guitars as the choice of many professional and amateur U.S. guitarists.

Jeff's past personal and professional activities before concentrating all of his time and energies designing and promoting Ibanez's guitar line include training as a mechanical engineer (although he received his college degree in English), journalist, and advertising writer; gigging in many rock and roll bands; racing automobiles; running his own advertising agency; and working in a retail music store as a salesperson and as a guitar repair person. His affiliation with Ibanez came about quite by chance. "I was sort of in the right place at the right time," he says. "I'd built guitars for myself and did repair work for other people. When Ibanez first wanted to enter the U.S. market, they needed someone who could help them out both with designing guitars as well as with promoting and advertising them. With my background, everything just fell into place."



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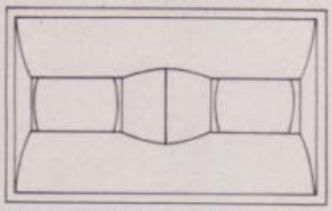

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BOB MONDAY

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It's tough to keep it rolling smoothly."

Bob has three major requirements for anyone who's interested in pursuing a career as a guitar research engineer: repair, sales, and playing experience. "It's very nice if you can be an engineer, a luthier, and a crack sales and marketing expert. All those things are great, but it's very hard to do it all. So I'd look for someone who has a basic understanding of all three, although the most important thing is to know the guitar and how it works. If somebody tells you they don't like the instrument for some reason—if you sit down and play, it has this problem, or if you stand up and play, it has that problem—you have to be able to relate to what they're saying.

"But the product manager is not the whole ball game. He or she works closely with many other people who are experts in their particular field. Although I don't know all the answers, and there's not one person here at Gretsch who claims to, together we're going to make sure we know as much as humanly possible before proceeding."

BILL KAMAN

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to change, and the wait can be frustrating. For instance, you have to first decide that the modification is necessary, and then you think about what's the best way to do it. Sometimes you need to re-tool, or get a new casting, and from the time you want to do it until it actually gets done might be a year or so.

"Designs are also greatly affected by cost factors. The original design may be quite good, but when you actually get down to building it, the instrument or a component part may be very difficult to tool as originally designed. But if we did it a little bit differently, maybe changed the shape somewhat, then it would be a lot easier to tool. And the end result of all this is that we would reduce our costs—and be able to offer the guitar at a lower retail price—without affecting the quality of the product or radically changing the initial concept and design features that made us build the guitar in the first place."

Many of Bill's ideas eventually find their way onto an Ovation guitar, and he is modest about his role as a research designer. "I've designed some instruments based on many of my own conceptions about what a guitar should be," he says, "but if one person thinks he or she is going to design the whole thing—and that's going to be it—then you can bet that that person is going to miss the mark. Guitar designing to me is not an ego thing. You want to have a good instrument that's going to be popular enough to sell.

"I'll design a guitar, then present it to a number of players and other people involved with instrument production. Sometimes they suggest changes, and if they make sense, we'll do it. Even if I don't personally like the modifications; if I think they're valid, well, it's done. And while I can say honestly that I've never had a design turned down cold, I just don't go creating for the sake of creating either. If there's a need, you build something to fit that need. And the way I originally envision a guitar, and the way it finally comes out, well, sometimes it's quite different, and sometimes not."

Bill lists his requirements for someone who wants to become a guitar research and development engineer as knowledge and experience in guitar playing and repair as well as management experience. "When you're running an R&D department," he says, "you need to be able to understand budgets, cost estimates, and people. Also, some knowledge of machinery and tooling would be helpful. You might come up with an idea, but if there's no way to make it, it's not going to go. And if you can take some mechanical engineering courses, so you understand layouts, graphics, etc., those would be valuable. But the most important thing to me is an understanding of what a guitar is all about and a love for the instrument. You probably won't go far in the business if your heart isn't in it."

Next Month:

A Built-In Bass Preamp

CHIP TODD

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interesting problems. "When I was working on the monorail," he recalls, "I had to do a lot of tolerancing, draft angles, and new materials evaluation scientifically, not just by trial-and-error. On the first guitar I worked on here we drew up plans like a designer, not an engineer, would; and when our vendors came back before they did the tooling, we had to get together with them and figure out the draft angles we could live with and the tolerances here and there and yonder. So I learned right off to take a much more scientific rather than purely aesthetic approach to designing."

Chip considers his experiences and training in mechanical engineering to have been the most helpful in preparing him for his current job. "But it really helps if you also know how to play the guitar," he adds. "You have to be able to understand where a musician is coming from when he or she tells you what's good or bad about your product. And probably the most important thing is to always be inquisitive. If someone says something, I want to know why."