Such Sweet Thunder

BY ARNIE PASSMAN

Cross Wernher Von Braun and R. Crumb and you get Charlie Butten, a 30-year-old chain-smoking electronics eccentric who once made an entire stage into a bass speaker. Charlie, as unassuming a rock person as you'll find, is on a trip that is placing Santana, for reasons perhaps beyond their sheer creative powers, in the vanguard of a growing and refining rock music during the Seventies.

Envisioning an acoustic sound for electronics instruments and a P.A. system that uses the spectral power distribution characteristics of music *and* voice, Charlie has custom built a $35-40,000 live performance sound system for Santana. The band can now do things on stage that were previously available to them only in the recording studio. For Santana's complex rhythms—and its current popularity and cutting edge for Chicano music—this means a great deal. And it may mean as much to frustrated fellow performers.

For one thing, through Charlie's system, bass guitarists can now use that bottom string in live performance—and have it heard. The best musical instrument amplification systems begin reproducing flat at 80 cycles. Charlie's "earthy" system begins at 40 cycles. In other words, the breakthrough means an additional octave for bass players and percussionists in concert.

Charlie, a native of Storrington, Conn., moved to Canaan, N.Y., at the age of five. There, his best buddies became Doug Hall and Derek Van Loan, who he later followed to San Francisco. They came under the spell of Von Braun's rocketry feats so that during their high school days the trio built howitzers and such as "The Chatham Cannon Club," out of the local blacksmith shop. And a flare for electronics followed right along.

Following graduation, Charlie went to work for Paul's radio shop in nearby Chatham. Then he put in some time in Troy with the Audio-Visual Division of the New York State Department of Education and Q & Q Electronic Supply. In 1962, through Q & Q, Charlie was hired by the New York State Department of Architecture to work on wiring for the Alternate Seat of Government (Subsurface). This came somewhat after the peak of the bomb shelter frenzy, but it was just that, a four-story establishment roughly three floors below what is now the State University in Albany.

After knocking around in odd jobs during 1963-64, Charlie came to San Francisco in 1965. He got a job, briefly, with the Fargo Company, which made police bugs of the classic briefcase variety. Then, he worked for nearly a year as "a mindless flunky" for Cormac, the communications system and recording studio on 18th Street.

Late in 1966, Prankster Lou Todd, now of the Hog Farm, persuaded Dave Rapkin, who owned a string of topless clubs on Broadway, to take over a club way out on Mission Street and convert it into the best room imaginable for rock music. Charlie was contacted to provide the sound for the Rock Garden, which opened with the Grateful Dead and Big Brother and the Holding Company in January 1967.

Charlie determined to use the stage to enclose the speakers—literally build them below the musicians!

"The stage was eight by 16 by three feet high," said Charlie, smiling puckishly. "And I was building a folded four-throated 16-cycle exponential horn into it. We got the bass speaker done, but then Todd left and Rapkin wouldn't let us go any further. He said the sound was too muddy, which, of course, it was because there was nothing to go with it.

Annie Leibovitz

"Oh look, they left half a 12AX7. When you want feedback, Eric, plug into the red jack."

"The bass stopped at 100 cycles and the highs didn't go below 500. And I think some of the musicians complained that it hurt. So, in about March of '67 [after appearances by Buffalo Springfield, Love, and the Electric Chamber Orchestra with David LaFlamme], the place went back to Latin music and Rapkin put the bass speakers into one of his Broadway joints."

With that prologue to the world of show biz, Charlie's odyssey really began in August, 1967, when Cream came to San Francisco to play at the old Fillmore. Charlie was working at Don Wehr's Music City, an instrument and amplifier hospital for rock bands in North Beach. Holed up in the back repairing Fenders, Charlie was still surprisingly oblivious to the sounds they produced.

One day, Wehr called Charlie at home and said: "There's some English group coming into town by the name of Cream. And they've got amplifiers with them, they're called Marshalls. Have you ever heard of them?"

"No."

"Well, neither have I," said Wehr. "However, from what I understand, they're pretty fragile and subject to breakdown. So, somebody should be down there to convert them over to American power and check 'em out as they come off the plane."

Wehr had been contacted to do this by the Marshall factory. "Apparently he had a Marshall franchise," said Charlie. "But he had put it in the very bottom of his drawer because nobody had ever heard of the Marshalls before. All he had was one tiny, little pamphlet. Not even a schematic. So, I had no idea of what a Marshall was.

"We uncrated 'em at the Fillmore and I took 'em back to my place on Texas Street and fixed 'em. Cream was quite happy because they were able to play out of them that night.

"I ended up just about living with those amps for two weeks. Which was fine, because Cream was paying me a pretty good price each night. As I said, at the time, I wasn't really into rock music and I hadn't ever really thought of even being into the field.

"At first, I couldn't believe how loud the music was. So, I would zoom away into the back room. But I started to discover I actually liked rock, not quite as loud as Cream was playing, but I liked it. They asked me to become their sound man, but I refused because I didn't want to leave San Francisco and my friends."

That fall, however, a band Charlie lived with called the C.I.A. decided to go to New York on the promise of a gig, and Charlie went along. But when they got there with $60 between them, no job. Fortunately, Cream was in town and Eric Clapton hired Charlie for the two weeks they were working the Cafe Au Go Go.

"Howard Solomon and Barry Imhoff were running the Cafe Au Go Go at the time," said Charlie. "And one of them managed to keep us in the Hotel Albert quite awhile. I remember Barry cooking everyone a great Thanksgiving dinner that included the most incredible stuffed mushrooms. After Cream left, they kept me on and I worked with Canned Heat, Procol Harum, and the Paupers."

Charlie was not totally aware of the problems of a rock guitarist at the time. However, the second exposure to Clapton's work made him realize that Eric's problem was that he couldn't get enough feedback from his guitar without leaning up against the speaker cabinets. Said Charlie:

"This was a tall set of speaker cabinets with a Marshall on top. And so someone always had to be behind the stack to stabilize it, because as Eric would push against it, the stack would move back and then waver forward. He could picture this huge stack of speakers falling on Eric."

Finally, Charlie realized that what Clapton needed was more gain from his amplifier. "Gain" refers to how much an input signal can be amplified. (That's not the same as "maximum sound power," which means how loud it can get before it begins to distort.) So an amplifier can be very powerful and not have enough gain or be so small that it drives itself into distortion right away.

"From what I gather," said Charlie, "Jim Marshall at the time he built the amplifiers had no notion they were going to be used this way. He had sort of pictured more like a Chet Atkinsy-type trip. At one point, he said to Eric: 'How do you use it?' And Eric said: 'I just turn everything all the way up.' Marshall was absolutely astounded by this.

"So, I used a little pre-amp to increase the amplifier's sensitivity to the guitar. The maximum level of sound was not any higher, but its sensitivity to the guitar was much higher.

"Marshall, in the construction of the amplifier, had left one-half of a double tube unused. So, I used it for my pre-amp. One day, I just took the amp apart and said: 'Oh look, they left another half of a 12AX7 that isn't doing anything.' So, I constructed my pre-amp on that and wired it to one input jack, which I painted red. When you want feedback, I told Eric, plug into the red jack."

This achieved the desired feedback and classic Clapton sound without Eric having to lean up against the speakers. In fact, Charlie had modified the amp in such a way that Eric, upon returning to England, asked Marshall to make him another one like it. They did, said Charlie, even though they didn't quite understand why Charlie had done what he had done.

Charlie Butten and his Earthy Sound System

That success attracted the attention of Bill Hanley, whose rental firm is the largest supplier of sound equipment for clubs, concerts and festivals in the country. Hanley took Charlie back to his shop in Boston ("without even so much as a toothbrush"), where he offered him the job of chief engineer for Hanley Sound.

"I lived in the shop for two weeks," said Charlie. "And I slept wherever I could because I was kind of the bat in the belfry with my late night hours. As a matter of fact, at one point, Bill's mother fell over me in the hall. Fell on top of me, I guess; I didn't even wake up."

Back in San Francisco, Charlie ended up working for Wehr through most of 1968, fixing amps and doing custom work, notably for Harvey Mandel.

"That was a lot more complicated because Harvey was not only interested in the sustaining effect but the final, resulting tonal qualities," said Charlie. "Part of the problem is trying to convert what is essentially a piece of artistic information into concrete, electronic terms. That's a large part of the gig, many times."

According to Wehr, the sustain unit looked like a super fuzztone. Charlie's work is acknowledged on the first Mandel album. "When the notes started to decay," said Wehr, "Charlie would add volume or something."

So, with Charlie back, the enterprising Wehr decided to start his own amplifier company. "We flew to Chicago," he said, "for the National Association of Music Merchants convention. To investigate amp companies. Then we flew to L.A. to visit them—Standell, Fender, Vox Acoustic, JBL, Altec Lansing.

"When we got back here, I rented a shop down the street and opened the Wehr Amplifier Company, with Charlie doing the design. He built about a dozen of them like the ones Santana has—on the power side, with the large heat sinks. Charlie really blew me out. He designed a lot of speaker cabinets, too, the bass reflex ones we use now. He was the first to do a round-back cabinet. He said it would increase rigidity in the back panel and eliminate a lot of distortion. And about six months later, Ovation came out with a round-back guitar.

"He also made a horn cabinet column, with ten-inch speakers. It was incredible. I'm sure it could have handled large outdoor crowds in sufficient quantity."

At the same time, Charlie came up with a guitar with its own feedback built into it. "Since it is happening in the guitar itself, you can even play it acoustically and still have feedback happening," said Charlie. "You have to feed the energy, the sound from the pickup, back into the strings, but control it just enough to get the strings going. In this particular case, it's magnetic. Its advantages are that it doesn't have to be outrageously loud and it has duplicability. It was one of those interesting curios of things that happen, but don't quite fully happen."

These experiences intensified how Clapton's creative problems had gotten into Charlie's blood. So, he split from Wehr ("He's always got a job here") and started his own amp shop in an eight-foot wide basement in his home.

During that time, Hanley was doing a show at the Paladium in Hollywood and flew Charlie down to help him. Brent Lewis, a showy

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Charlie with the boobams: the problem was, sometimes it would 'bork' or just plain cough, so he came up with horn speakers & three-way crossover

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conga drummer and law student from Beverly Hills, was on the bill and, as it turned out, Lewis' sound problems became the big step in Charlie's amp improvement evolution.

"It was a maddening project," said Charlie. "It turned out to be a lot more heavy duty than I figured it to be. But this is where I really, really learned at lot.

"Brent mikes his congas very close for a full, big sound. His original system used two big MacIntosh amplifiers and lots of JBL D140Fs, and it kept running out of power—running into overload at an outrageously low level for a pair of Mac 275s.

"So I tried other amplifiers, like a Sunn 2000S, which would normally be a loud amplifier. But doing Brent's thing, it was just barely loud enough for a monitor speaker before it began to distort. It was the same thing with other amplifiers. I could only get about one-tenth of the power out of them I'd normally expect.

"As it finally turned out, the big problem—as you initially hit them, that initial shock is very, very loud. So, if you turn up the amplifiers, this initial shock would throw the amps so out of kilter, it would take a split second to recover.

"During that time, it would *bork,* or sometimes just plain cough and cut the sound out completely. I had to do a lot of things to overcome this. It finally turned out that I came up with the system that I'm now using, with the horn speakers and three-way cross-over.

"Also, the congas have two totally unrelated, harmonically different tones. The head develops one tone which changes, of course, with tightening. But the air volume down in the drum remains constant. So, I came up with a bass speaker for the longer, whooshier, bottom sounds and a mid-range to carry the head. By handling them separately I was able to give Brent the auditorium volume he had been unable to get before."

Working out of a Terra Linda studio with financing from John Herbert of Aspen, Colorado, Lewis was able to keep Charlie working on his drums during 1969. That year, the drummer also got into chromatic tympany, or "talking drums" (also known as "boobams")—a set of 24 tuned drums that looks like an organ/vibraharp mating when set up.

These really basic African drums, which Lewis likes to call "symphonic percussion," have been developed in the United States over the past 20 years by jazz musicians David "Buck" Wheat and Bill Loughborough (now Love), the latter currently the manager of The Committee in San Francisco. The pair grew up together in San Antonio, Texas.

Around the time Santana opened the day at Altamont, Barry Imhoff, who had come to San Francisco to work for the Fillmore Corporation, introduced the band to Charlie. They had heard about Brent Lewis' system and felt that with their heavy percussion emphasis, Charlie could do something for them.

To satisfy their need for natural, non-contrived musical reproduction, Charlie spent nine months developing a new set of music tools—speakers, amps and mixers. The acquisition in February, 1970, of an ample 42[illegible] square-foot building in San Francisco's produce and warehouse district helped, and by June, the band was able to use a portable Butten Sound system in a concert at the Spectrum in Philadelphia.

But the major assistance came from a half-dozen Berkeley high school students. Doug Hall, a teacher at the progressive Bay High School, asked for volunteers to help build the cabinets for the system.

During late spring, the Bay High team worked heavily and happily at Charlie's plant. Working up to 30 hours straight, the students made money for themselves and the school as well as learning what it's like to work together on a real project—the educational justification for their task.

The system was originally built with the Fillmore West in mind, but the times Santana appeared there since acquiring their new system, they played through the regular Fillmore sound equipment. With rare exceptions, Bill Graham did not allow the few individual group systems in his rooms. And compared to what most concerts are heard through, his Swanson-designed systems were among the best in the nation.

But, unfortunately, San Franciscans have yet to hear Santana play through Charlie's system (A May concert at Stanford's Frost Amphitheatre gave 7000 people the surprise appearance of Santana and the return of percussionist Jose "Chepito" Areas. Along with them were the scheduled Stoneground, Tower of Power, and Country Weather—all using the Santana system).

Originally intended to be a portable system for 5000 people, the Butten P.A. actually was used only once for that small an audience. "We did a show last September at Stoney Brook on Long Island for maybe 4000 people," said Charlie. "Miles Davis was also on the bill." Working conservatively, Charlie said he did not realize the carrying potential of the system. It has since been used for 18,000 people.

Actually, the first use of the complete Butten Sound system was in June, 1970, at the Alternative Media Project Conference at Goddard College in Vermont. Brent Lewis and his congas were part of the entertainment. Meanwhile, since Santana had gone on a European tour on which they would not be using Charlie's mixers and speakers, the Butten Sound team brought the Santana gear up from Philadelphia to go with Lewis' six 300-watt, 35-pound amplifiers.

Last fall, Santana's system had its baptism, using eight identical amps which Charlie said have proved thoroughly reliable. As far as the other components, the 16 channel mixer has a frequency response of 40-15,000 cps, which, said Charlie, is purposely limited because there is no acoustic result with a wider range.

The mixer has a dynamic range of 70 decibels, but 120 db at input will pass without distorting or overloading, said Charlie. This dynamic range makes possible the reduced limiting that enables the system to electronically extend acoustic space and permit the performer to fill it at a higher average level—and with organic clarity.

The key to the overload "resistant" system ("it breaks up nicely, not noticeably") is a three-way electronic speaker (high, mid-range and low) cross-over, so that the sound is crossed over before amplification. This, said Charlie, solves the problem of inter-modulation.

The four-way, all-horn speakers have an average output gain of 6-10 db, and their 300 watts of electronic power has 1200 watts of electroacoustic effect. This all-horn design lowers distortion, said Charlie. Moreover, he explained, the highly directional horn system maintains the decibel levels in excess of the conventional formula, i.e., volume drop at square root of distance.

The amplifiers, aimed at Marshall characteristics, but totally different because they are solid-state, are really the end product of nearly four years work. What Charlie has done is to produce an amp that rounds off the top of the sound wave rather than clipping it.

"It slows up and stops, but it doesn't abruptly hit a ceiling," said Charlie. "Even a gentle amount of rounding makes the tone infinitely better."

Consequently, this eliminates geometrically multiplied distortion, rather than screaming "BREAK UP!" Charlie's amps also generate second- and third-level harmonics near the fundamental instead of producing hard, brittle higher order harmonics which would obscure the fundamental.

The system also makes a voice clearer without really raising the loudness of the amp and the speaker. A significant advantage, said Charlie, because of the design of the system, is that it sets up in about an hour, as opposed to the three to four hours most rock bands need. Charlie also said it is impossible to make wrong cable connections because of the way the jacks and cables have been designed.

All well and good, but how does it sound?

"It's very difficult to gauge audience response," said Charlie. "I usually talk to the promoters because they're aware of how it compares with other systems. Their comments have ranged from 'nearly as good as I've heard' to 'the best I've heard.' The Crosby, Stills, Nash and Young system [Swanson] has a great reputation."

That system was developed by Bob Sterne, whose outdoor achievements, including Altamont, have made him a revered man in sound. When he is not secluded on his farm in Oregon these days, Sterne, who runs Northwest Sound in Portland, pretty much limits his road activity to work for Neil Young.

Another indication of just how good the Santana system may be is the fact that Charlie began working on one for Miles Davis. At the Stoney Brook concert, the then Miles' equipment man dug what he heard from Santana.

Subsequently, Charlie got together with Miles one night last fall between sets in the Basin Street West dressing room in San Francisco. Said Charlie:

"He wanted it to be very fast, which to me would be transient response. He wanted a very quick, fast response; the feeling of the system was lively. He found it somewhat difficult to remember fully what he heard at Stoney Brook. He remembered that it was good. Somehow or other I bridged that gap.

"At first, he didn't know whether he wanted his own P.A. system or not. And he talked to the other guys. One fella pointed out he was renting them for so much a night, and then Miles went out. Then the other fella went out and came back, and later on Miles came back and said: 'Go ahead and start it.'

"Right now, it's somewhere between Miles and all his managers who disappear. From the best I can learn at this point, Miles said yes, but his managers, and there's a whole thing between managers here and managers on the East Coast . . . I'm not doing anything until his managers get it together."

Currently, Butten Sound is being financed by John Herbert, who has brought Brent Lewis back to Colorado where he is gigging in and around Denver and in Rocky Mountain ski resorts. Charlie is presently making spare parts for Lewis' system, the main recent ones being a crossover and a patch panel for connecting parts. Charlie said Lewis and Herbert are very pleased with the development of the chromatic drums.

As for Santana, Charlie is currently cutting their bass and mid-range speakers in half and fitting them with high-powered drivers and custom-built cabinets. "Eight little speakers are easier to move than four," said Charlie. "And it also gives them a power increase since I'm building three high-powered amplifiers to go along with a new 24-channel mixer."

Another sound system is taking shape, most likely for rental purposes. According to Dick Rosenblatt, who had the color organ operation, Kineticolor, that brought Charlie back to San Francisco three-and-a-half years ago, speakers have been built for a second system. He was going to begin working on building the amps until he became the manager of the Loading Zone.

"The mixer will come later," said Rosenblatt, who was instrumental in acquiring Butten Sound's current plant and did publicity for the company through most of 1970. "Most likely, it will be 20-channel stereophonic. Santana's system is monaural because that's what they wanted. But the use of stereo over mono P.A. systems is a rather controversial subject.

"In a mono system, the sound is heard similarly as well everywhere in a room. In a stereo one, like listening in your living room, the changes in balance are more noticeable—unless you are pretty much centrally located. But, in either case, the sound, as is the trouble in most halls, isn't heard at its optimum right in front of the stage. About 20 or 30 feet back is best.

"Actually, in Charlie's system, although it has its limits, further back in a good-sized room, 80-100 feet, is better, particularly for the mid-range. That equation lessens in larger halls and outdoors. The point is, loudest and closest isn't necessarily best."

A needed and welcome financial boon to Butten and his people took place this summer. What looks like a long-term rental of a small JBL monitor speaker system was made to San Francisco's Lone Mountain College for their highly successful production of the rock opera *Tommy*. Jack Davis of the Lone Mountain drama department heard the system during its late spring residence at Friends and Relations Hall, the old Family Dog on the beach.

Charlie is not alone in his experiments. Attempts to improve and advance sound systems for rock bands are going on and being presented little by little. Pink Floyd's stereophonic setup has received lots of attention lately, and the Grateful Dead have been experimenting for years.

As Dick Rosenblatt pointed out, it's amazing how many people believe that a group's sound is controlled by the musicians on stage playing with their dials. The men behind the scenes are responsible in many ways for what you hear, and state-of-the-art "techies" like Charlie Butten are just coming into their own as true artists. If you want to hear how good a job they're doing, just listen, as they do initially and a lot, to the drums.