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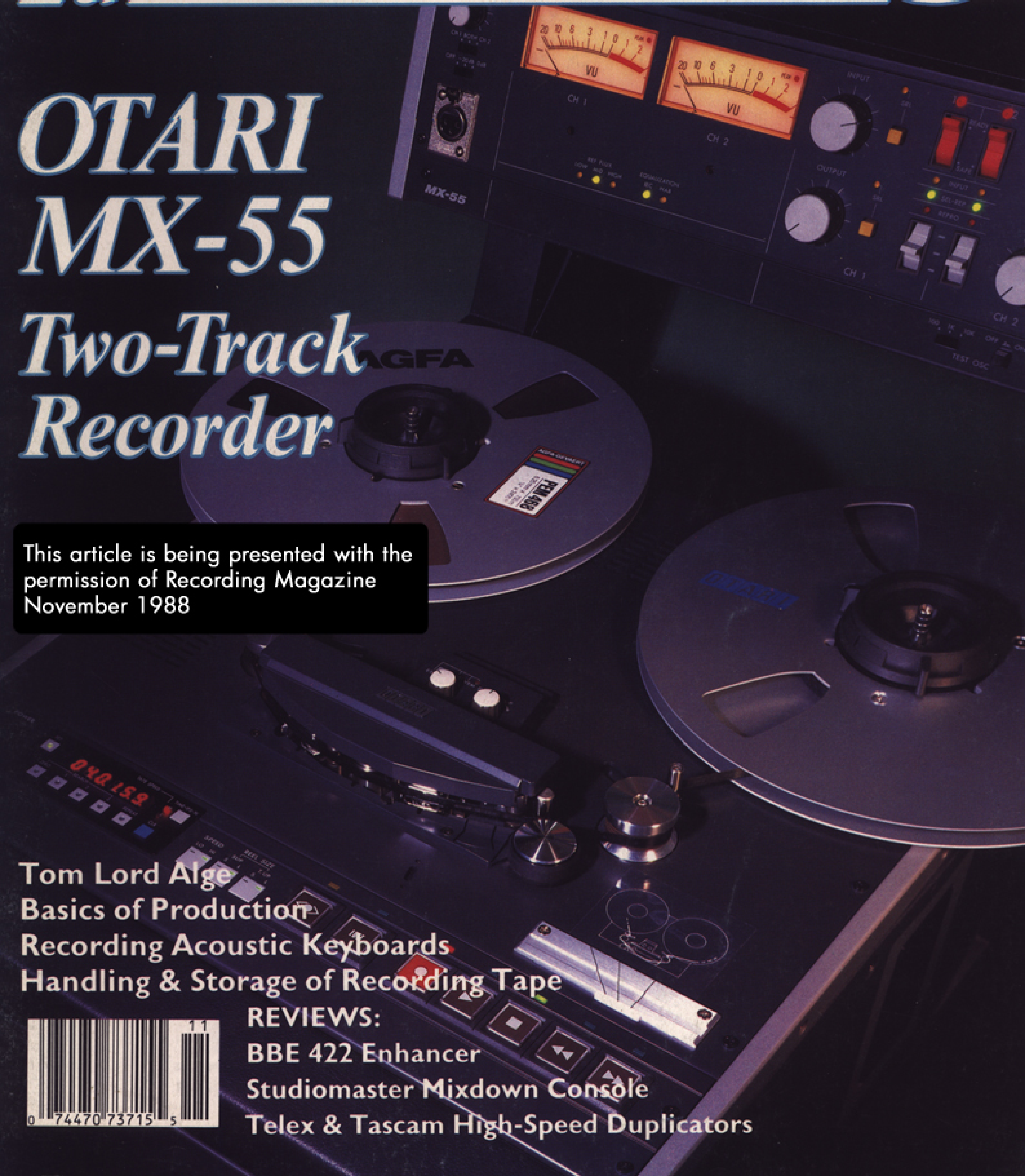

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JOHN TESH STUDIO

Photography Rose Rounseville — Construction photos courtesy of Mark Wenner and Jerry Steckling

Garage studios come in all shapes and sizes; this particular one went through a metamorphosis that any budding home studio designer could learn from. *Report by Amy Ziffer.*

A GOOD DESCRIPTION of John Tesh would be a man of many talents. Best known to the viewing public as one of the two hosts of *Entertainment Tonight*, his musical forays have only recently come to the attention of the listening public at large. His recent Private Music release *Tour de France* is a compilation of music composed and recorded for CBS' coverage of the annual bicycle race of the same name. A dynamic and spotlessly clean recording (courtesy of primarily digital equipment and largely virtual tracks from the Synclavier), *Tour de France* was conceived and performed in Tesh's personal studio built in a leased two-car garage in Hollywood, California - practically down the street from the Paramount lot where he works on his daily television show. One of his main reasons for choosing to locate it in a building separate from his home was his desire to become involved in commercial work aside from his own album releases, and the need to maintain a true working atmosphere.

The system was initially put together by John Schoetz, a fellow musician and friend, but as Tesh says, "the problem was that while John built the facility, he didn't build the room sonically. We were having a problem with the sounds bouncing all over. I was over at Yanni's (another Private Music artist) studio one day and noticed that it sounded great, so I asked who built it." Yanni gave him the names of the two designers, and, as it turned out, a week later Tesh ran into one of them at a party. The two designers are Mark Wenner and Jerry Steckling, late of Minneapolis, Minnesota.

Steckling comes from a background in studios, having worked as an engineer and technician for many years. Wenner's forte is construction. Having worked on several rooms together in the Midwest, and with skills that complemented one another nicely, it was natural for them to team up when they both found themselves in Los Angeles a couple of years ago. Both men are largely self-taught when it comes to studio design. As Steckling put it, "If there's something I don't know, I'll go crack the books. Education never stops. You just figure out what you need."

The garage's main drawback was its dimensions: 22ft by 24ft - roughly a square box with a standard 8-9 foot ceiling. To give the same example Steckling did, the effect was not unlike that of an inner tube or balloon, which will both give a distinct pitched "ping" when thumped because of their constant inner dimensions. Except, Steckling says, "when you talk about something as large as a room, it isn't a little ping - it's a bass resonance."

Most of what was done in the way of redesign was to eliminate the resonances that occurred across a band in the bass region that converged at the listening position. With the photos and text that follow, I'll try to reconstruct the sequence of steps that were taken in the process.

• *Photo 1:* Here Jerry Steckling is shown seated behind the console in the room as it was. Notice the Tube Traps in the corner, which initially were installed to try to remedy the bass resonance problem. Also notice the treatment on the far wall, which was placed so as to soak up more stray frequencies, and the positioning of the Tannoy monitors. The door in the front wall was one of the first things to bite the dust, to make room for speaker soffits.

On top of the board (a Neotek Elite) are a sound pressure level meter and spectrum analyzer, which Steckling used to produce plots of the room response in order to determine just what was happening. In his words, "I used a banded, as opposed to wide-band, pink noise generator. The typical situation is to send out full-spectrum noise into the room, and then band the receptor so that you can see an individual band. This works exactly the opposite, by banding the noise that goes into the room. I can go down to about a twentieth of an octave. When you do that, you can excite the room with the problem frequency, take the spl meter, walk around, and actually see the nodes and peaks. You can then take the blueprints of the studio and actually start drawing lines

Photo 1: Evaluating the room's problems.

on it, until it becomes a three-dimensional picture (of the room). Sometimes you'll even do an elevation, if height is a problem."

• *Photo 2:* Construction work begins. Here, the space that will become the left speaker soffit is outlined. The lowered

Photo 2: Outlining the speaker soffits.

portion of the ceiling to the left, which originally housed some duct work and AC lines, was also altered and sealed up, because it was acting as a resonance chamber. Wenner explains: "That's his isolation room in back, so there are two decoupled walls at the front of this room that we're going to have to blow a hole through, which causes us to lose our integrity, our sound seal. We then have to build that integrity into the soffits and the housings for the speaker cabinets."

Because of the lost door, you now have to go through Tesh's office, which is located to the right, to get to the studio room on the other side of the window.

• *Photos 3 & 4:* These shots show the speaker enclosures under construction. ¾" plywood and dry wall are alternated with soundboard, a product composed of ground cardboard compressed with glue. It provides a resilient, almost spongy surface which will decouple the rigid plywood and dry wall layers and keep vibrations from being transmitted through the enclosure. No nails are used; instead,

Photo 3: Building the outer speaker enclosures.

screws and glue, which is stronger than nails, hold everything together. The only difference between the inner dimensions

Photo 4: Laying neoprene in the speaker enclosure.

of the enclosure and the outer dimensions of the speaker cabinets is the ½" sheet of neoprene that you can see being applied in Photo 4.

Steckling says, "You can stop sound in a couple of different ways. One is to create some isolation, which we're using the soundboard to do. The best way is to use air between one wall and another wall. Another way to stop sound transmission from one room to another is add mass. This is a great way to add considerable mass; lead is another. In a smaller area we could have used lead sheeting."

• *Photos 5 & 6:* These show the speakers positioned roughly in the soffits, from the control room and studio, respectively. Wenner says, "I wanted to split the difference so they didn't hang too much into the room, forcing back the sweet spot listening area that was already established and the placement of the outboard effects rack (the edge of which can be seen in Photo 7)."

Steckling continues: "We did tack up the speakers before the actual surfaces of the speaker soffits were committed, and analyzed the distance from the speakers to

Photo 5: Preliminary positioning of the speakers (front).

Photo 6: Preliminary positioning of the speakers (back).

the spot where perhaps the console would go, and determined exactly where the sweet spot would be. That has to be done individually (according to speaker type). He wanted to go with JBLs. If, for instance, he were using UREIs, there would be a difference in angle. The JBLs happen to have a much smoother and wider treble dispersion. UREIs beam a lot more. We do that pretty much by ear. You just listen and find the sweet spots for the speakers and aim them into the listening situation . . . I mean, you could cause one really great spot in front of the console, but more often than not there are two or three people working at once, so you want a sort of elliptical arc in and around the middle of the console where they can all work comfortably and still hear both sides. So you don't focus right on the listening position."

They spent about four hours just listening, trying to position the speakers. By hanging some blankets around the ►

room they tried to minimize the effect of the room, which was still under construction.

The back of the speaker enclosures ended up mounted in what Wenner describes as "a square box that only extends from the wall about 10 inches, dry-walled twice and stuffed with insulation, so it's not obtrusive."

Photo 7: Deciding on the "sweet spot."

• *Photo 7:* Tesh and a co-worker, Mike Hanna, are shown at the estimated listening position, which is somewhat elevated to take into account Tesh's height. Strings are attached to the speaker faces and pulled out into the room until they converge to help in aiming the monitors.

Photo 8: Final positioning of the speakers.

At the back of the room, covered in plastic sheeting, is an effects rack that was never moved during construction. The sheeting is to protect the equipment housed in the rack from dust more than anything else.

• *Photo 8:* Wenner elaborates: "Now we're squaring up the two planes, up and down and side to side, and directing them to a 20" spread where we think his ears are going to be." The cabinet is then shored up in the position they believe it should finally end up. Strings are again employed, attached to the baffle of the speaker faces and pulled out to the surrounding walls at about ten different places to determine the line at which the front surface of the blocked-off area will meet the side walls.

• *Photo 9:* 2×4s and R19 insulation combine to form the enclosed space underneath and to the side of the soffited monitors, which will act as a Helmholtz resonator and provide a "window" for standing waves in the control room to leave. The open area that goes from floor to ceiling will be the mouth of the resonator on that side of the room. That corner of the room will then "cease to exist acoustically" to the room as a whole. The cubic footage of the enclosed space, along with the area of the mouth opening and the mouth depth, will determine its resonant frequency. The 2×4 and a couple layers of sheet rock (which are still to be placed) is the mouth depth.

• *Photo 10:* They had taken a guess at the size of the mouth openings (the entrances to the resonating cavities), and came within a few square inches of the final

Photo 9: Enclosing the corner resonator areas.

figure. Steckling adds, "The smaller the cavity the higher the resonant frequency, so with a given square footage you have to

Photo 10: Laying insulation to absorb energy at the front of the room.

make the mouth opening smaller to make the resonant frequency go down. In different terms, you turn the bathtub faucet so less water will flow through it, and the bathtub fills up slower. Since this cavity was small, we had to make the mouth opening small to resonate at our problem frequency, which was at about 75-90 cycles."

The yellow material is fiberglass insulation, which is used for the inside acoustic treatment – it doesn't have anything to do with the resonator. Cloth is going to cover the entire corner area, as well as a parabolic reflector in back and a portion of the ceiling (which can be seen in Photos 11 and 12). Steckling says, "Rather than hang the insulation in the cloth panels, which can end up giving a pillowy effect if the insulation sticks out, you staple the insulation to the wall and just leave space for the framework of the cloth panel."

Materials also make a difference in the sound of the room. For instance, polyester and other synthetic fibers do not rate very high in the minds of Wenner and Steckling as absorbent materials, because they reflect sound. Natural fibers, on the other hand, act in exactly the opposite way. Wenner also adds, "The structural problem with polyester is that you can't get a finish head nail through the nap, or lack of nap in it. Otherwise, it works great, because it's stretchy, it's tight, and it gives you a good finished look." They decided to go with polyester as a covering for parts of the room because they felt there was enough soak going on elsewhere so that it wouldn't present a problem.

Photo 11: Rear wall parabolic reflector minimizes short reflections in the room.

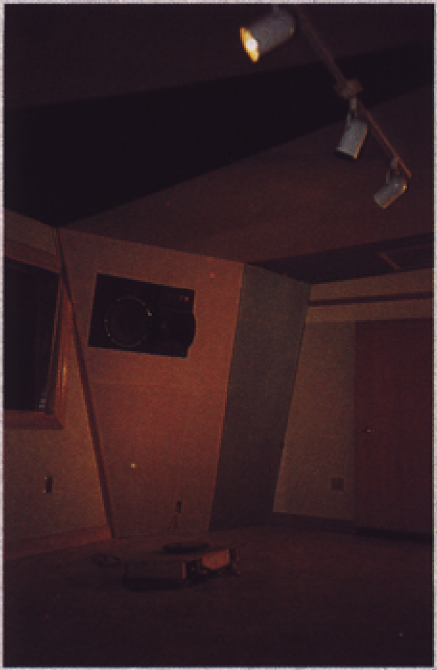

Photo 12: Construction and installation of speakers completed.

All studio photos courtesy of Mark Wenner and Jerry Steckling.

• *Photo 11:* The parabolic reflector mounted on the back wall of the control room, which is made from Masonite and plywood, covered with polyester. Its purpose is to scatter any sound that hits it into different directions, breaking up sound waves.

• *Photo 12:* Wenner says, "Jerry determined that we should probably soften the reflections up to the listening area," which accounts for the triangular shaped patch which can be clearly seen on the ceiling. Steckling continues: "There are a couple of schools of thought about reflections in rooms. If you're going with LEDE (Live End, Dead End) type of thing, then what you want to try to do is eliminate any hard early reflections, because they will cause comb filtering – anything that's inside of your Haas zone. Haas did some experiments with a 'clicker' while he was standing at a wall. When he walked real close to the wall and clicked it, he couldn't hear a reflection until he took X number of steps back, at which point he heard a slap. When you step inside of this zone, your mind, psychoacoustically, even though it's hearing two separate sounds, interprets it as the same one, and it uses the information to decipher direction. So, when you're working with speakers, all of your imagery is affected by these reflections that come inside of your Haas zone, somewhere between 25 and 50msec. Outside of the Haas zone we interpret it as a reverb or an echo. So, if you take a sound from the speaker to the back wall and then again an excursion across the room back to the listening position, you are perhaps outside the Haas zone, and you don't mind those reflections – they don't affect the stereo imagery. But reflections inside the Haas zone do.

"Studio designers can use that in some cases to flatter the stereo imagery of a control room – make it sound a little bit bigger than what's actually there. That's where it gets to be subjective. Some engineers prefer the big speakers in their studios to sound as big as possible, and some engineers say, 'No. I want to do all my own spatial imagery.' I tend to push room designs toward the LEDE approach, so we take any place where early reflections can occur and deaden them, although because we don't follow all the ideas about LEDE we couldn't call our control rooms LEDE in the strictest terms."

One of the areas Steckling felt needed to be deadened was that ceiling area, because the projection of the high frequency horn of the speaker had the potential to reflect off it and beam onto nearby hard surfaces, such as the console top and back, the window, and the side walls (which are quite live despite the original treatment, which can be seen in Photo 2).

It is possible to go too far in the opposite direction, however. Steckling warns, "If you soak up everything it's an equally unnatural situation. You don't want to be listening inside of a pillow. What you try to do is control the reflections in such a way as to bring them back into the listening position where 1) they're outside of the Haas zone and don't affect your spatial imagery; and 2) enough of them are going back into the listening position so the room doesn't sound too terribly dead. The listening situation we're

trying to recreate in a control room is a natural situation that might be at home."

The end result of all this pleases Tesh enormously. As he says, "All I wanted was a comfortable atmosphere where I could hear in any part of the room, because when you work alone a lot, you may be at any position in the room. You don't want to be able to mix from every position, but you at least have to be able to hear. This is basically a synth room – making everything accessible to one person is the most important part of it. That's basically the project I gave them, and they were able to accomplish it. When we took this latest record to Bernie Grundman (a well-know mastering engineer in Los Angeles), he said, 'Hey! You guys have a flat record here.' I don't know how they did it, but they pretty much designed a flat room; at least, that's what all the experts are saying."

Steckling adds: "Our real client is the guy who has gotten himself some equipment, he's at home in the garage, bedroom, whatever – and he's got a problem. He's got to work after 10 o'clock in the evening, and he can't keep his neighbors up. Our clients are the type of people who really need to stay in the music business, and upgrade their situation with their room in a way that they can afford and still be there. And perhaps not hang too much into the walls, because in some cases these places are leased – you can't take it with you. For $10-30 thousand you can go solve those problems for people.

"Where you'll find much of the money in big studios is in the finishing. What fabric are you going to put on the walls? What are you going to use for furniture and carpet and trim? That can be 40-50% of the budget. I mean, the ones you see in the trades are the guys that spent two million dollars, and of course those are picturesque."

For two million, I'd say they'd better be. I'd also say John Tesh probably made a better investment with his garage.