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A Novel Modular Construction Technique For db Recording Studios, Florida

An Easy-to-build and Removable
Acoustics Treatment for Today's
Cost-Conscious Studio Operators

by Tom Paine

When a well known studio designer and pro-equipment dealer decides to build his own studio, you can bet that it won't be just a "run of the mill" room. Case in point is South Florida's newest "World Class" studio, db Recording. Located in North Miami, db Recording Studio represents a good example of a knowledgeable but pragmatic approach to studio design for the Eighties, and incorporates many ideas soon to be seen elsewhere.

Seth Snyder, president of Florida's Recording Studio Equipment Company, has aided many of today's top artists in the design and construction of both "personal-use" and "commercial" studios, among them The Bee Gees' Middle Ear Studio, K.C. and the Sunshine Company, European notable James Last, and the late Bob Marley. When Snyder decided to build db Recording, he wanted it to be a showcase for the latest in studio hardware from MCI, and also a demonstration facility for a new concept in studio construction techniques, called "Modular Perfection." Equally important, Snyder wanted a comfortable, workable room that would pay for itself as a viable production facility, and his choice of equipment and studio design enables db to offer an unbeatable combination of features and value — a combination he intends to pass along to any clients.

Sharing the feelings expressed by many other Floridians that the State is destined to become a new center for productions of all types — music, teleproduction, and films — Seth Snyder has

built db Recording to cater to the needs of all those requiring high-quality audio recording facilities. Although he does not talk too much about the potential for video production in this studio, the extra large studio space, high ceilings, and a control room that can best be described as huge, make it obvious that db can handle very diverse requirements — to say nothing of the fact that there is enough power brought into the main studio to light a small town.

The Modular Design Approach

The db Recording Studio is one of several new rooms to take advantage of this unique concept in studio construction, and the idea is gaining popularity every year. It all started several years ago when Snyder was discussing with some friends the problems facing the "start up" studio, particularly regarding design and construction. At that time a studio owner had about three ways to go, all of them with some disadvantages. If you were on a tight budget, you could do the design yourself and then subcontract it; you could even try to



Novel Modular Construction Technique

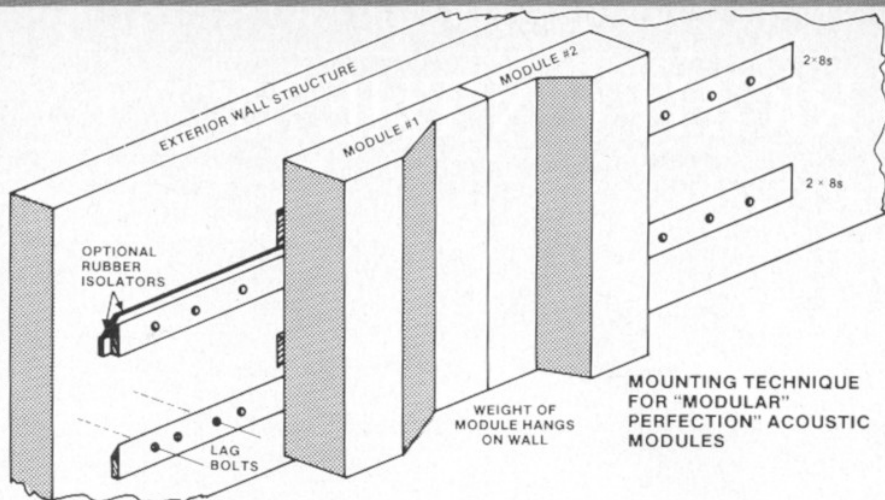
build it yourself if you dared. If you had a little more financing, you could turn to one of the well known studio design consultants and have him plan it out — but you were still faced with finding contractors who knew how to do the job right, the first time. Of course if funding was no problem, you could go to a “turnkey” outfit, who would then employ a consultant, subcontract the work, and give you a good or even great room. Then all you had to worry about was doing enough business to keep the banks off your back.

All of these approaches, save the last, are fraught with many dangers, not the least of which is the problem of finding local contractors who have the least bit of feeling for studio construction techniques. And all three approaches have two fundamental disadvantages: it takes a long time to build a studio this way; and when you are done you have an enormous amount of money sunk into a building somewhere — so much, in fact, that it has long been a wise move to “buy the building,” thus protecting yourself against the whims of landlords.

Even if you have the money this is not always possible, particularly if you wish to put your studio in a high density, high priced area — like almost any US city. And what if you want to move? Although multitrack recorders and automated mixing consoles are hardly what you would call “portable,” they can go with you (along with the piano and the Hammond B-3). Not easy, but do-able. But the walls, the windows and doors, several tons of soundproofing and numerous other interior decor items usually stay where they are, to be just another pain to the new owner or tenant.

In 1978 a company called Modular Perfection was formed to provide an alternative to the more traditional methods of studio design and construction. The concept was simple: design and construct individual modules that could be assembled in a variety of ways to create spaces that are acoustically correct and aesthetically pleasing. Build these modules in a factory environment and make them as complete as possible, including trapping, conduit for electrical lines, and separate PVC conduit for mike and signal lines. In short, create a system which would enable a studio to be built in record time within almost any space; a studio where you could take the walls with you should a move be necessary.

Since already Seth Snyder had built several of these modular studios for clients located all over the world, it was logical for him to use the system at db Recording. Early this year three tractor-trailer rigs pulled up their loads to a nondescript warehouse location in North



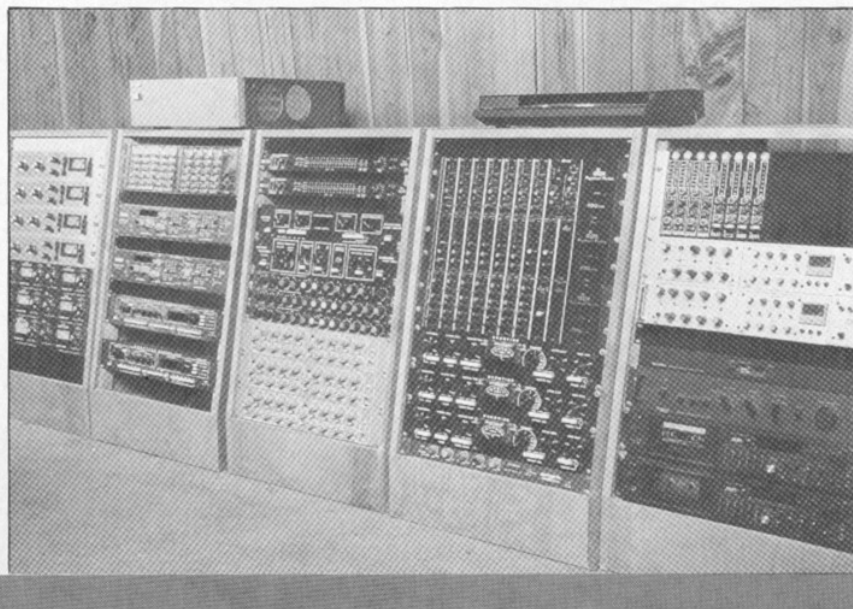
Miami, and within three weeks the basic studio “shell” was up, ready for delivery of console and multitracks. To construct the studio, 83 modules in all were used: 34 to form the main studio; 28 for the control room; and 21 for the large isolation room.

Individual modules can be installed in a number of ways; db chose to use them free standing and locked together with panels nailed to the back. Other installation methods involve “hanging” the modules from the walls of an existing structure, using strips of 2 x 8s with angled bevel cuts on the long sides (one 2 x 8 on the wall and one nailed to the module). The modules are then lifted into place and hung on the walls. If additional isolation is required, rubber strips can be placed within the mating bevel joints, and the wall strips can be mounted on rubber as well. The free-standing approach used at db offers good isolation from outside noise, and could be taken one step further with little effort. This would be to construct a “floating” slab floor, and then free-

stand the modules around its perimeter. Although this approach has yet to be taken with Modular Perfection, it probably would offer the “ultimate” in acoustic isolation.

The modules weigh in at over 400 pounds each, and careful attention to detail in the construction phase is necessary to avoid compromising the acoustic and aesthetic integrity of this design approach. Special tools are also required to make possible fast installation. For all these reasons the makers of the Modular Perfection system include installation with every sale, and discourage “Do It Yourselfers.” A smaller-scale Modular Perfection system has been developed to meet the needs of broadcasters, and these systems can be installed by the user. When a system is designed, every module is numbered and they come off the truck in plastic overwraps, ready for installation in order, thus eliminating the old “put Tab ‘A’ in Slot ‘B’” type confusion.

After the shell is up electrical contractors can come in and pull their wires



CONSOLE SELECTION FOR db RECORDING STUDIO

MCI's new JH-652 Console — Capable of Being Operated in Both Split and In-Line Formats

by Gregg Lamping, Technical Representative
MCI, A Division of the Sony Corporation of America

The console selected for the new db Recording Studio had to fulfill some very special requirements. Not only did it have to meet or exceed specifications considered "pro" — such as signal-to-noise ratio, crosstalk, etc. — but it also had to offer great versatility in its mixing, routing, and cue functions, while still remaining sensible in controls and ergonomics. In addition, the console was to be used with a variety of production formats (everything from dual multitracks, to digital, to direct to half-inch two-track) and operated by a wide cross section of engineers and producers — each with their own preferred method of operation. Since db was to cater to the needs of many guest engineers and producers, the board had to be quickly understandable and easy to use as well.

It was exactly these goals that the MCI console designers had in mind during the conceptualization and realization of the new JH-652, making it an ideal choice for db Recording's new facility.

Inputs, Outputs, and Sends

The JH-652 uses the standard JH-600 Series input/output module which, coupled with considerable design innovations in the main frame and master/control modules, provides the console with unequalled performance and flexibility. With master control sections in the center of the desk, and 26 I/O modules on each side, the board may be configured to operate as a standard "American" style in-line console, or as a "Split" console with inputs and channel outputs on one side and monitoring on the other. Full effects sends, EQ, grouping, etc., are retained no matter what configuration is selected, and changing from one operational mode to another requires only the push of a button. The channel bussing output select buttons on the left side of the console feed the active combining networks on the right side. In this way, working with dual multitrack machines and performing complex submaster-to-master 24-track bounces required no patching. In addition the ".2." or stereo (combined two-track/monitor) mix bus output can be fed from the left, right, or both sides of the console. Control room monitoring also offers these selections, independent of the mix bus.

The six sends on each side of the console can be operated together for all 52 channels, or split in the same way as the mix bus. Four cue submaster modules allow for feed to cue from any of the six sends, or the ".2." mix from either or both sides, as well as an auxiliary input and studio monitor feed. Studio select routes whatever signal source is selected on the studio monitor module to the cue feeds, making playback to cue from any control room source as simple as pushing a button.

Console Automation and Grouping Functions

The console's automation (standard equipment on the JH-652) is configured in a way to complement the ".2." mix routing functions. Either side can be operated independently, or all 52 channels automated together. A mix made on one side can be moved to the other side while retaining its channel and effects integrity.

Master faders for the eight subgroups can be selected to be any of the 52 channel faders, enabling the mixing engineer to locate the group masters anywhere on the console. For example, an entire left side submix can be controlled from the left, the right, or anywhere the mixer finds most convenient — thereby putting the masters where they should be, in the area of the console where the operator is working. Should the operator's position change after group masters are selected, they can be deselected and moved to another location on the console without affecting the automation levels.

In addition to the 52 channel faders, six "wild faders" are provided in the center section of the board. These can be used as submasters, and are available at the patch bay for automated level and mute control of any audio in the studio facility. Overall VCA master control is accomplished by one VCA Grand Master fader that controls two more masters — one for the left side of the console and one for the right, controlling all VCAs and groups.

Metering Systems

The JH-652 metering system features MCI's newest generation Plasma Display 100-segment bar graphs on channel and mix outputs, and includes conventional VU metering on the mix bus as well. The Plasma Display system can be operated in the Peak Reading mode (DIN-standard ballistics), or used to read the DC levels controlling the automated faders. Metering of sends and ".2." mix is independently selectable for the left or right side or the entire console. A phase meter is also included as standard equipment.

through pre-installed conduit in the walls. Most wiring is then brought to the top of the module structure and tied together through more conduit. Signal lines can be treated in the same manner, and run through PVC conduit to the control and equipment rooms.

Main Studio and Isolation Rooms

The first thing that strikes a visitor to db Recording's main room is a feeling of spaciousness. A high ceiling with track lighting and extensive trapping is coupled with what seems like acres of floor space, yielding a room which could comfortably hold a big band, or even an orchestra. The modules that make up the walls of the studio are shaped to form low-frequency traps, and slotted wooden surfaces cover a proprietary damping material that fills the interior, thus providing uniform absorption. Vertical strips of wood cover the face of each module, and a variety of woods — fir, cypress, and cedar — give each module a different acoustical characteristic. The floor is half thick parquet tiles and half earth-toned carpeting, also providing two distinctly different acoustics. There is nothing to reveal that the walls are made of "building blocks," since once they have been installed with nailguns and glue all joint lines disappear.

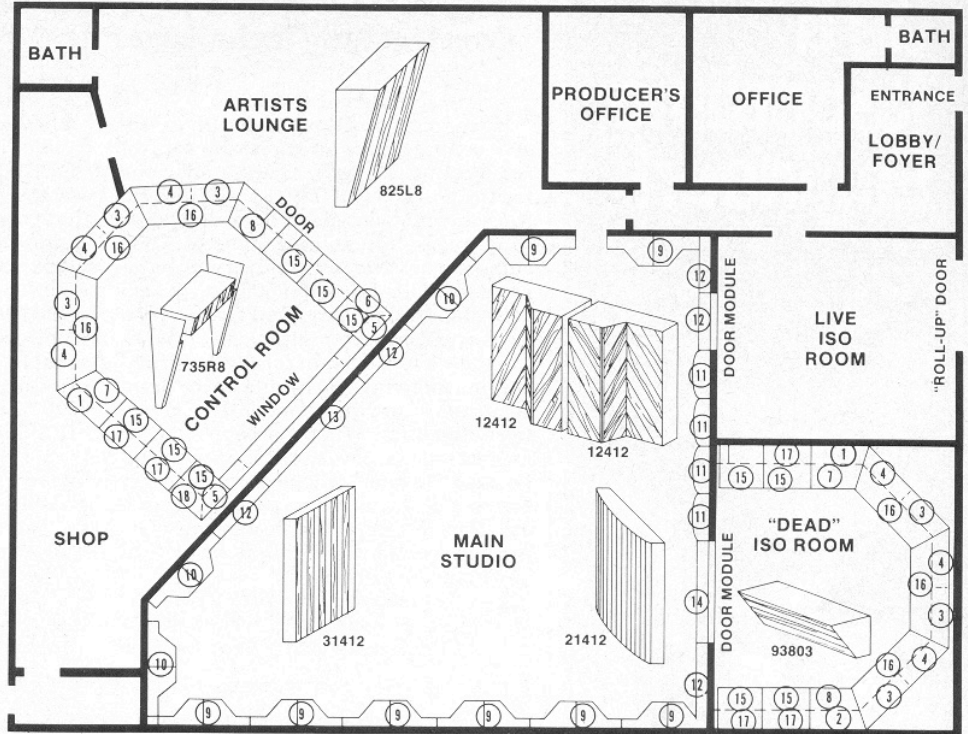
A walk through the main studio's warm comfortable atmosphere leads to the double glass doors of the first isolation room. A semi-hexagon measuring about 20 by 25 feet, the room is normally host to a Yamaha grand piano, and has a very dead acoustic. There is some wood in sight, and all microphone and cue lines available in the main studio are brought out at a connector panel here as well. More noticeable are the large acoustical "wedges" pointing down from the ceiling and in from the walls, providing a very high degree of broadband absorption. Average decay time of the room is on the order of 0.2 seconds, but this small a figure is hard to measure accurately. Another isolation room is to be found off the main studio. Ultra-live in characteristic, it is the only "standard" construction room in the complex. Measuring 20 by 12 feet, the live room has a cubic volume of 2,000 cubic feet, and non-parallel walls and ceiling. Its average decay time is 1.06 seconds; 1.75 seconds at 500 Hz.

Another interesting feature of the studio is its air-conditioning system, which does not use any ducts or fans. Instead, specially made refrigerant pipes line the ceiling, and air circulation is by convection only, thereby maintaining a comfortable temperature at all times without noise, and saving approximately 60% on the power bill compared to conventional systems. Various units are available to provide cooling capacities between 12,000 BTU (1-ton) and 37,500 BTU (3-ton).

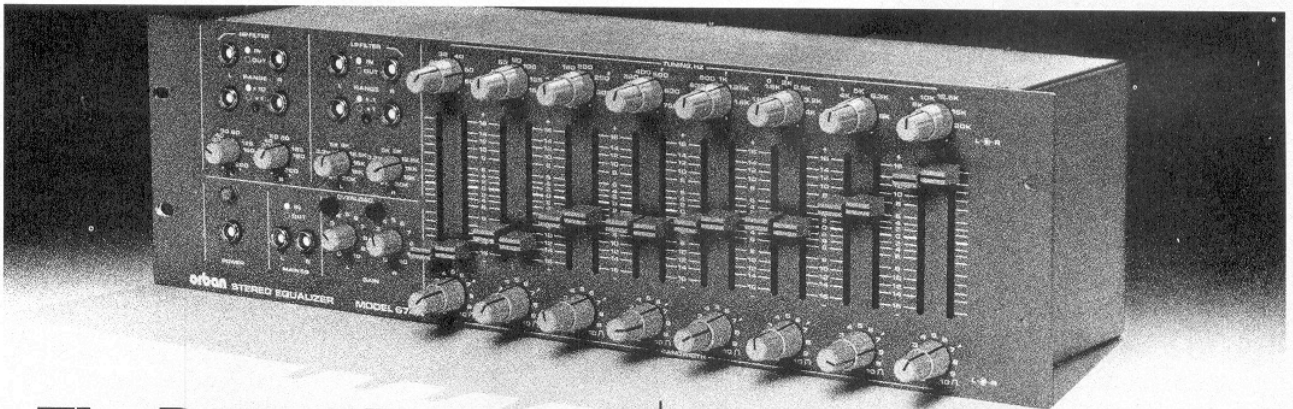
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**KEY TO LAYOUT
OF ACOUSTIC MODULES**

- 735R8 1
- 735L8 2
- 825R8 3
- 825L8 4
- 3924R8 5
- 3924L8 6
- 4923R8 7
- 4923L8 8
- 11412 9
- 12412 10
- 21412 11
- 31412 12
- 31124 13
- 31809 14
- 92403 15
- 93803 16
- 283408 17
- 39234L8 18



Floor Plan of db Studios, showing positions and orientations of acoustic treatment modules laid out within the existing building shell.



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Novel Modular Construction Technique

Control Room

Hexagonal in shape, and with extensive ceiling and wall traps, the control room echos the main studio's spacious feeling. A Live-end/Dead-end™ design, the control room floor area measures 475 square feet; total volume is 5,000 cubic feet. Primary production hardware is MCI's latest JH-600 Series console, the JH-652. Designed for use with dual synchronized multitracks, this 52-input desk is of a "split format" configuration, allowing each side to be used separately and independently, including automation. When a session requires only 24 tracks, one side of the board can be used for basic tracks, and the other side set up for mixing material from a completely different project — thus saving time when the studio is busy with back-to-back projects.

Two transformerless MCI JH-24 24-tracks are provided, two ½-inch stereo JH-110B machines being used for mix-

down. A ¼-inch JH-110A is also provided, and if digital mixdown is desired it can be accomplished with two Sony PCM converters coupled with U-Matic format video cassette recorders.

Hard-wired into the console are two Studio Technologies Ecoplates, and a SDRE 2000 Digital Reverberator. Two separate cue systems are provided for the studio headphone mix, both of them in stereo. Forty-eight channels of Dolby noise reduction are available for use with the multitracks.

Three different pairs of control room monitors can be switched in from the console. The standard monitor choices are JBL 4435 systems driven by JBL 6233 "Ice Cubes" (bi-amplified), UREI 813A Time Aligned™ monitors driven by a UREI 6500 power amplifier, and Technics HoneyComb Disc speakers, driven by another "Ice Cube." Of course the ubiquitous Auratone 5C Sound Cubes are also provided.

The db Recording Studio has an open mind towards monitoring, even with all these choices available. Specially constructed roll-around speaker platforms

CONTROL ROOM EQUIPMENT COMPLEMENT FOR db RECORDING STUDIO

Multitrack and Production Hardware

- JH-652 Split Format Console; 52 inputs fully automated
- JH-45 Auto Lock SMPTE/EBU Generator/Reader/Synchronizer
- Two JH-24-24 Multitrack Recorders
- Auto Locator III
- Two JH-110B ½-inch Stereo Recorder/Reproducers
- JH-110A ¼-inch Stereo Recorder/Reproducer
- Two Sony PCM Audio Converters
- Sony U-Matic Recorder
- Two TTM Dolby Frames with 24 Dolby Cards Each
- Sony DRE 2000 Digital Reverberator
- Two Studio Techniques Ecoplates

Processing Gear

- Three dbx 900 Signal Processing Frames containing the following modules:
9 904 Noise Gate/Expanders
8 903 Compressors
4 902 De-Essers
8 905 Parametric Equalizers
1 906 Flanger/Phaser
- Four UREI 1176-LN Compressor/Limiters
- Six UREI LA-3A Leveling Amps
- Two Eventide H-949 Harmonizers
- Eventide H-910 Harmonizer
- Three Eventide 2850 Omnipressors
- Eventide Clockworks FL-201 Flanger
- Two Lexicon Model 93 Prime Times
- Two Valley People Frames containing:
4 Kepex II
4 Kepex

- 4 Gain Brains
- 4 Gain Brain II
- Two Delta Lab DL-1 Digital Delay Lines
- Delta Lab DL-2 Acousticcomputer
- Two Orange County Vocal Stressors
- Three Audio Arts 2100 Parametric Equalizers
- Three Orban 622B Parametric Equalizers

Monitor Systems

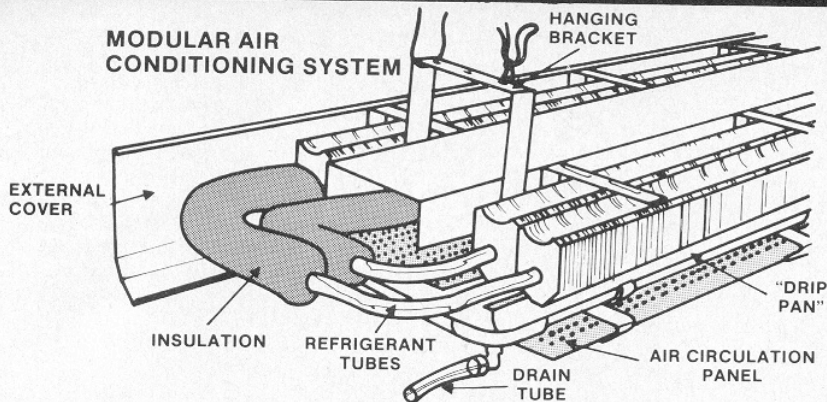
- Control Room: two JBL 4435 Monitors bi-amplified with JBL 6233 "Ice Cubes"; two UREI 813A Time Aligned Monitors driven by UREI 6500 power amp; four Technics Model SB10 HoneyComb Disc Speakers driven by JBL 6233; two JBL 4311 monitors; two Auratone 5C Sound Cubes.
- Studio: two JBL 4331 WX Monitors driven by JBL 6233 "Ice Cubes."

Microphones

- Eight AKC C-414s, five C-452s, two D-12Es, two D-170Es, two D-190Es, two D-200s, D-224, and D-1000E
- Two Electro-Voice RE55s, five DS-35s, three CO-15s, and three CS-15s.
- Five Neumann U-87s, and six U-47s
- Three Shure SM56s, two SM59s, SM53, six SM57s, and four SM7s
- Sony C-38B and three ECM 56Fs

Instruments

- Yamaha "Conservatory Model" 7½-foot Grand Piano
- Fender Rhodes Piano
- Wurlitzer Electric Piano
- 7-Piece TAMA Drum Kit



are available, so that any guest engineer who wants to "bring his own" can easily move them into the control room and place them exactly where he requires. Additional monitor lines are already in place, enabling a guest's monitors to be hooked up quickly and with a minimum of effort.

A series of waist-high wooden racks attractively house almost every effects and signal processing unit imaginable, with many pairs and even four of some of them. These roll-around racks can be moved right up to the console, and all units are terminated at the JH-652's patchbay for easy access. (Rather than describe in detail what devices are available, a full list of outboard process-

ing equipment is to be found in an accompanying sidebar to this article.)

Clearly, db Recording has accomplished the objectives that Seth Snyder aimed for when he began construction, and already several major recording projects have been completed. The studio's complement of instruments includes a Yamaha Conservatory Grand piano, Fender Rhodes, and Wurlitzer electric pianos, and a TAMA Drum set; more acquisitions are planned. When interviewed for this article, Snyder summed up the construction of db Recording as follows:

"I'm very pleased with the way the facility turned out," he offers, "and as we complete more and more projects we are continuing to discover 'sweet spots' in our main studio and isolation rooms. We built this studio to show what could be done today, quickly and without 'Howard Hughes' type financing. We have invested in proven analog technology, and offer the advantages of digital mixdown to any clients who may desire it. After all, the *tune's* the thing, and the most important aspect of a successful room is that it be priced at a level which makes it accessible to new artists and their recording projects. The rates a studio must charge — unless it is in the business to lose money — are directly related to the capital that it took to build the place. When we put db together we coupled the cost saving advantages of the Modular Perfection System with MCI's proven analog multitrack technology — and are thus able to offer a tremendous creative tool [the studio] at prices which make sense to almost everyone. It is interesting to note that our complete multitrack system — console, two multitracks and synchronizing hardware to go with them — all together cost less than just one of those new digital multitracks; and we at db are confident that we can deliver a top notch sound quickly and easily to even the most demanding clients." ■■■

DECAY TIME AND ISOLATION MEASUREMENTS

All measurements were taken during July 1982 using an Inovonics Model 500 Acoustic Analyzer and AKG C-452 EB microphone fitted with an omnidirectional capsule.

Decay Time

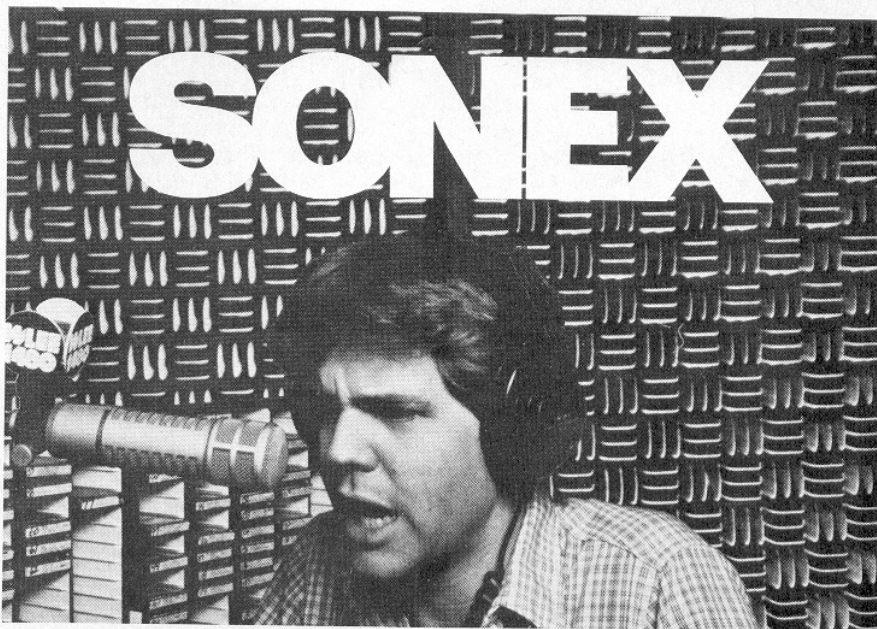
Decay time was measured at a variety of frequencies on octave centers, and a mathematical average is quoted unless otherwise specified. In all cases at least six frequencies were used.

- Main Studio: Average decay time 0.4 seconds (RT60)
- "Dead" Room: Average decay time 0.2 seconds (RT60)
- "Live" Room: Average decay time 1.06 seconds; 1.75 at 500 Hz (RT60)

Isolation

Using the studio monitors located immediately below the main studio/control room window, the main room was driven with pink noise to 115 dB SPL measured at 1 meter on-axis to the speaker. The analyzer was used to measure broadband noise in the adjacent rooms, and the figures below represent the difference between the SPL in the main studio and these measurements. All sound locks were closed during measurements.

- Studio to Control Room: 55 dB
- Studio to Isolation Rooms (either): 50 dB
- Studio to Outside of Building: 55 dB



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