“One of the great challenges in teaching audio production is to enable more than three or four students to see the action and hear the results. People gathered around a console can’t hear what the mixer hears; most of them probably can’t see exactly what he or she is doing, and as a group they change the acoustics within the control room,” says Russ Berger, president, Russ Berger Design Group Inc. Clearly, a solution more conducive to teaching is required. To solve the problem, Berger developed a design featuring a lab located adjacent to each control room, where students can see multiple aspects of the control room operation and simultaneously listen to an accurate audio monitoring system.

Each of the two labs is designed to be an acoustically accurate listening room using monitors identical to those located in the associated control rooms. The instructor can teach from the front of the lab while a lab assistant handles operations in the control room. Full communication capabilities via microphones and overhead speakers exist between the instructor, lab assistant, and students, providing a completely interactive teaching environment. The labs have three rows of tiered seating, allowing 24 students a clear sight path to the video screens and instructor. Each seat offers a listening environment rivaling that in the mix position.

In addition to controlling lab playback volume, the instructor has complete pan and tilt control over two HD video cameras, one located above the mixing console and one in the front wall of the control room. A third camera may be set up in the studio or machine room.

Three rear projection video screens are located in the front wall of each lab. The center screen can display console automation data. The left screen usually displays the actual console surface as seen from the overhead camera, and the right screen can display either outboard gear, software screens, activity in the studio, or video program material. This arrangement allows students to accurately hear and see the control room and studio activity while seated in a classroom.
VIDEO SCREENING ROOM
VIDEO and AUDIO SYSTEMS: JBL 5.1 monitor system, QSC power amplifiers, Sony VPH 1041Q video projector, Pioneer DVD/LD player, Pioneer preamp Dolby Digital decoder, Tascam 112 cassette, Mitsubishi VHS

MASTER CLASSROOM
A/V SYSTEM: EAW speakers, Fostex D-5 DAT, Mitsubishi receiver, NEC data projector, Elmo video presenter, Mac and PC computers w/Internet connections

TESTING/MAINTENANCE
TEST EQUIPMENT: Audio Precision System One, Audio Precision Portable 1, Techron TEF 20, Bruel and Kjaer 2230 Integrating SPL meter w/Bruel and Kjaer 1625 1/3 octave filter set, Bruel and Kjaer 4007 test microphone, Neutrik Audiograph 3300 acoustic analysis

LAB STATIONS: Tenma 72-3060 20MHz oscilloscope, Tenma 72-4045A power supply, Tenma 21-17A solder station, Tenma 72-6170 multimeter

CHECKOUT EQUIPMENT
PREAMPS: Neve, Hardy M1, Studer Valve, Avalon Tube Vt737 w/EQ and compressor, Curtis Tube

OUTBOARD: GML 8200 EQ, Aphex Dominator, Aphex Compellor, Aphex Aural Exciter

REMOTE RECORDING: Tascam DAP 1 DAT w/Sony EMC 99 shotgun and C76 stereo microphones, Sony DC 10 DAT w/Sony DC M55 stereo microphone

“The recording studios are world class…”

RANDY WACHTLER
PRESIDENT,
615 MUSIC PRODUCTIONS
Department of Recording Industry

Teaching & Production Facilities & Equipment

College of Mass Communication
Middle Tennessee State University, Murfreesboro
The state-of-the-art teaching and production facilities that house the MTSU Department of Recording Industry are the result of input from industry professionals, award-winning consultants, faculty members, alumni, and students. The department, based in the $15-million Bragg Mass Communication complex, supports the innovative Bachelor of Science in Recording Industry degree with its Production and Technology, Music Business, and Commercial Songwriting concentrations. In addition, outstanding programs in Digital Communication, Electronic Media, Advertising, Public Relations, Graphic Communication, Media Management, and Journalism are housed in the building. The 90,000-square-foot building includes two audio recording studios, a post-production laboratory, mastering laboratory, MIDI laboratory, listening laboratory, digital editing/dubbing room, 5.1 surround film mixing laboratory, television studio with associated video and audio control rooms, video post-production rooms, video edit suites, digital imaging and animation lab, electronic newsroom, mobile teleproduction laboratory, central machine room, maintenance and testing areas, computer writing laboratories, online computer laboratory, and well-equipped lecture and seminar rooms. The acoustic spaces in the Bragg building were designed by renowned studio designer Russ Berger, head of the Russ Berger Design Group, and the systems design was overseen by Richard Zwiebel of Peak Audio. The MTSU Department of Recording Industry offers the innovative Bachelor of Science in Recording Industry degree and a new Master of Fine Arts in Recording Arts and Technologies. It is part of MTSU’s College of Mass Communication, which also offers outstanding programs in digital communication, electronic media, advertising, public relations, graphic communication, media management, and journalism. The equipment and facilities described herein were designed for the education of students. Facilities are in use 24 hours a day most of the year. Access is almost exclusively for students enrolled in Recording Industry classes. A hands-on approach to teaching and learning is fundamental. Learning the business, art, and technology of the recording industry is exciting at MTSU, thanks in part to world-class facilities.
VISITING TEAM REPORT

RECORDING SERVICES (SPARS)
—SOCIETY OF PROFESSIONAL AUDIO

are enthusiastic.

students and faculty is excellent...The rate...The program
impressive and first

“The facility is
impressive and first rate...The program
is excellent...The students and faculty are enthusiastic.”

—SOCIETY OF PROFESSIONAL AUDIO
RECORDING SERVICES (SPARS)
VISITING TEAM REPORT

STUDIO COMPLEX A

This complex was designed to accommodate the needs of audio for video and film as well as traditional music production and includes a studio, control room, mastering/observation lab, and machine room. Recording floor A is a large (38’ x 50’) room equipped with a lighting grid. Masonry low-frequency diffusing series are coupled with a balance of absorbent and reflective surface finishes. Interconnect panels around the perimeter allow connection of mic, line, headphones, speakers, and MIDI tie lines to the control room.

Control Room A features a Studer digital mixing system with all film sound panning formats, Coastal Acoustics, Boxer, and 5.1 channel monitor systems, near-field monitors, Dolby surround encoder and decoders, a MIDI station, a ProTools digital audio workstation with multiple audio interfaces, and numerous outboard signal processing units. A Studer digital 24-track, a Studer analog 24- track, and Tascam DTRS recorders are located in the adjoining machine room. Master recorders include two-track analog with Dolby SR and a Masterlink. While the main loudspeakers are supported on pedestals, their enclosures are suspended from an independent system of beams and columns, and both the pedestals and enclosures are isolated from the room’s floating floor, walls, and ceiling. A masonry low-frequency diffusing series was constructed along the entire rear wall of the control room as a framework for the high frequency acoustical diffusers by RPG Diffuser Systems.

Mastering/Observation Lab A does dual service as an observation classroom for Studio A (see the Observation Lab Concept) and the location for an eight-channel SADiE hard disk editing, mastering, and CD preparation system. This lab also sports a Boxer/Coastal Acoustics monitor system. Studio Complex A is equipped to teach Dolby Surround encoding procedures. Control Room A and Mastering/Observation Lab A are equipped with complete Dolby Surround and Dolby Digital playback systems and 5.1 channel speaker systems. The Mastering Lab is further equipped with a Dolby Digital encoder and decoder.

DIGITAL STUDIO A

DIGITAL MIXING SYSTEM: Studer D-950 Digital Console, 24 I/O strips, 96x96 D-1/0, 72x72 A-1/0

MONITOR SYSTEMS: Coastal Acoustics Boxer 5.1 monitor system, Yamaha NS-10 speakers, Briston, Hafler, and Yamaha power amplifiers


SURROUND SYSTEMS: Dolby SEU4 and SUD4 Surround Sound encode/decode, Technics SHAC500D Dolby Digital and DTS decoder

DIGITAL RECORDERS/PLAYERS: Studer D-827 and A-827, Tascam DTRS, Sony PMC 7010 DATs, Alesis Masterlink

ANALOG RECORDERS: Studer A-827 24-track, Otari MX 55 w/Dolby 363 SR N/R

SYNC SYSTEM: Lynx Time Code modules

VIDEO SYSTEM: JVC XV-SA70 DVD, Sony SLV-679HF VHS, Samsung 36” monitor

MIDI SYSTEM: Mark of the Unicorn MTPAV, Yamaha MOTIF E88, AKAI S1000, and Kurzweil K2500RS samplers, Alesis D4. Software: MOTU Digital Performer, MOTU

OUTBOARD PROCESSING: Yamaha Pro R3, SPX 90, REV 7, and YDD 2600, Lexicon PCM 70, Sony R 201, Publislon Infernal Machine 90, Eventide DFP 4500, Klark Teknik DN 410, Ensoing DP4+, DBX 160, Aphex Dominator and Compellor, Alesis 3630, TubeTech CLZ3A and MP1A; Millennia HV-3D and STT-1, T.C.Electronics M6000, Drawmer DS201, GML 8200

MICROPHONES: Neumann TLM 170, M147, KM 140, and TLM 103, Schoeps CMC 5/6, AKG C414, C460, and D12. Yamaha MZ 204, Sennheiser MD421, E602, E604, and MKH 40, Shure SM20DX, SM 81, SM98, SM 98, and SM 57, Audiotecnica ATM4033, Realistic PZM, Countryman and Whirlwind DI Boxes

MUSICAL INSTRUMENTS: Kawai grand piano, Hammond B-3 w/Leslie,Wurlitzer electric piano, Pearl drums, Fender Bassman

MASTERING LABORATORY A

DIGITAL AUDIO WORKSTATION: SADiE w/ Apogee Digital I/O, CEDAR Noise Reduction, Dual 20’ monitors

MONITOR SYSTEM: Coastal Acoustics Boxer 5.1 system, Mackie HR-824

SURROUND SYSTEMS: Dolby SUD4 Surround Sound decoder; Martin Sound MultiMax


ANALOG RECORDER/PLAYERS: Studer A721 cassette, Sony PSLSX510 turntable

OUTBOARD PROCESSING: Manly stereo limiter compressor; Millennia NSEQ-2

VIDEO PROJECTION SYSTEM: Sony DXC 101 video cameras, Sony VPH 1270Q and VPH 10410 video projectors, Grass Valley Performer video switcher, Sony SLV-N77 VHS

STUDIO COMPLEX A

MUSICAL INSTRUMENTS:

Pianos:

Kawai grand piano,

Hammond B-3 w/Leslie,

Wurlitzer electric piano,

Pearl drums,

Fender Bassman

MUSICAL INSTRUMENTS:

Pianos:

Kawai grand piano,

Hammond B-3 w/Leslie,

Wurlitzer electric piano,

Pearl drums,

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Pianos:

Kawai grand piano,

Hammond B-3 w/Leslie,

Wurlitzer electric piano,

Pearl drums,

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Pianos:

Kawai grand piano,

Hammond B-3 w/Leslie,

Wurlitzer electric piano,

Pearl drums,

Fender Bassman

MUSICAL INSTRUMENTS:

Pianos:

Kawai grand piano,

Hammond B-3 w/Leslie,

Wurlitzer electric piano,

Pearl drums,

Fender Bassman

MUSICAL INSTRUMENTS:

Pianos:

Kawai grand piano,

Hammond B-3 w/Leslie,

Wurlitzer electric piano,

Pearl drums,

Fender Bassman

MUSICAL INSTRUMENTS:

Pianos:

Kawai grand piano,

Hammond B-3 w/Leslie,

Wurlitzer electric piano,

Pearl drums,

Fender Bassman

MUSICAL INSTRUMENTS:

Pianos:

Kawai grand piano,

Hammond B-3 w/Leslie,
STUDIO COMPLEX B

Studio B is primarily designed for music production. It consists of a large main recording space, a large drum room, an isolation booth, a piano alcove, the control room, an observation lab, and a machine room. The same type of interconnect panels and low frequency diffusers found in Studio A are in Studio B. Control Room B is physically and acoustically identical to Control Room A. It features an SSL Duality mixing console with moving fader automation and a variety of outboard signal processing units and has Boxer IV main monitors. Recorders include a Pro Tools HD2 system with 192io converters, Studer D827 24-track, Studer analog 24-track, and a Tascam DTRS. Master recorders include two-track analog with Dolby SR, Otari DAT, and an Alesis Masterlink.
MIXING STUDIO C
Mixing Studio C was designed by TEC award-winning designer Bob Todrank with assistance from Chris Haseleu, then director of the Center for Recording Arts and Sciences. The complex includes a control room, machine room, and isolation booth. Serving as a mix and overdub room, Studio C is equipped with a Solid State Logic AWS 900+ console with Total Recall automation. Boxer main monitors are complemented with Adam S3A nearfields. The machine room holds a Pro Tools HD2 system and a Studer 24-track analog machine. A full complement of plugins rounds out this hybrid console/mixing suite.

STUDIOS D&E
Designed to bridge the gap between the modern, all-digital project studio and the large-scale commercial facilities of yesteryear, Studios D and E are built around Sony DMRX-100 digital consoles and the Pro Tools HD2 recording systems. With identical designs, equipment, and layout, these studios are outfitted with a primary tracking space and a complement of outboard and built-in processing. With Genelec main and near field monitors, external preamps, EQs, and dynamics processors by Millennia, RNC, TC Electronics, Lexicon, and others, these are the perfect studios for introductory recording classes to get acquainted with the commercial studio of tomorrow.

THE MIDI LAB
The MIDI lab affords students the opportunity to become conversant in virtually any concept integrating computers and sound. Courses that make use of this lab include those involving software-based MIDI sequencing, electronic sound design, analog and digital synthesis, digital sampling, and MIDI studio applications.

The stadium seating lab contains nine Macintosh-based stations loaded with MOTU Digital Performer. In addition, each station includes a keyboard controller, state-of-the-art MIDI modules, and digital control surface. Also in the lab is a MIDI controlled lighting system, a wide variety of digital and analog synthesizers, and numerous sample and effects CDs.

The instructor can audibly monitor student progress on headphones or on studio monitors. In addition, the instructor’s computer monitor can be projected onto a screen at the front of the lab allowing the students to see and follow along from their seats.

STUDIOS D&E

MIX SYSTEM: Sony DMRX-100 digital console with moving fader and Total Recall Automation
DIGITAL AUDIO WORKSTATION: Pro Tools HD2 with 192 Digital i/o
DIGITAL RECORDERS/PLAYERS: Tascam DA-45 HR DAT, Tascam CDRW-700
MONITOR SYSTEM: Genelec 1030a, Genelec 1038a
MIDI SYSTEM: Yamaha MOTIF ES8
OUTBOARD PROCESSING: Lexicon PCM91, TC M2000, Eventide Eclipse, Drawmer DS201, Yamaha ProR3, Millennia Media HV3D preamp, RNC compressors
MICROPHONES: Neumann KM184, TLM103, AKG C414, C451, Sennheiser MD421, 602s, Shure SM81, Shure SM57, Stewart, Whirlwind, and Countryman DI boxes

MIDI LABORATORY
MAIN STATION: Macintosh G5, Yamaha 01X, Pro Tools Dig002, ZIP drive, Mark of the Unicorn MIDI Time Piece 1 & 2, Yamaha ES5, Kurzweil MIDI Board, KAT drum Kat, Kat Kit and Hat Kat, Casio M6 510 guitar, ARP 2600, Yamaha TX216 FM synthesis, YS200, AKAI S-1000, and Kurzweil K2500RS samplers, Proteus I, Alesis D4, Lexicon I and 5, Leprecon LM-850 MIDI light board. Software: Mark of the Unicorn Digital Performer, Reason, Mach5


MONITOR SYSTEM: Urei 809 monitors, Crown 200 power amplifier
VIDEO SYSTEM: NEC video projector

POSTPRODUCTION
CONSOLES: Digidesign 24 fader Dcommand
RECORDING SYSTEMS: Pro Tools HD2
MIDI SYSTEM: Vintage Keyboards Kurzweil K2500RS, Roland JV-1080, MOTU MIDI Time Piece AV MIDI/Time Code interface
ANALOGUE KEYBOARDS: Moog Memory-Moog, Roland SH-2
SURROUND/MONITORING SYSTEMS: Dolby SEU4 ProLogic Encoder, Carver amplification, PMC Near-field monitors, Sony STRS25 ProLogic decoder
VIDEO PLAYBACK/MONITORING: Sony DV deck, Mitsubishi VHS recorder, JVC VHS recorder, Sony 27” monitor, Panasonic 20” monitor, Sony VPH 1041 Q video projectors
POSTPRODUCTION LABORATORY

 Designed to teach advanced techniques in hard disc recording, editing and mixing, especially as it relates to sound for picture, this lab features a Mac Pro computer equipped with flat screen monitors and includes a full ProTools HD2 system with 5.1 surround capability. For recording, an isolation booth is available, and a wide selection of microphones, preamplifiers, and outboard processing can be used. The main monitor system is a Meyer 5.1 system complimented by Yamaha near-field monitors. Software provides for Dolby Surround Sound encoding while hardware provides professional decoding. DASH and DTRS digital tape systems support the hard disc platforms. The Postproduction Lab also includes a collection of vintage analog synthesizers as well as digital synthesizers.

DIGITAL EDIT ROOM

 The Edit room is equipped with a ProTools Digi002 system for editing. This room also provides for dubbing from or to most any 2-track format. The room also contains a Disc Makers automated duplication system for CD-R and DVD.

THE COMPUTER RESOURCES ROOM

 In support of all concentrations, the Computer Research Room has 16 computer stations. Two stations are dedicated to Recording Industry students and are outfitted with $20,000 worth of specialized music business software. Most stations have access to the Internet, Walker Library and Center for Popular Music catalogs, and the Lexis/Nexus databases.

THE CINEMA MIX

 A 63-seat theater uses video projection to display DVD, Laser Disc, VHS tape, and cable TV sources. The sound is provided with a 5.1 channel, 10-speaker JBL system. A preamp includes Dolby Pro Logic, DTS, and Dolby Digital decoding. This room is the site for instruction in sound design and multi-channel audio.

CLASSROOMS

 The Bragg Mass Comm facilities include five classrooms with superb media support systems. Two are lecture halls, each with a seating capacity of 72. The remaining three are seminar rooms which seat 40 students in a semicircle. All are designated as Master Classrooms and contain custom-designed audio/visual/computer systems.

AUDIO MAINTENANCE LABORATORY

 The Audio Maintenance Laboratory provides both technical maintenance services and instructional support. Advanced test equipment complements student test and repair stations.

PHOTOGRAPHY: Tom Jimison, Associate Professor, Electronic Media Communication Department; Nathan Adam, Associate Chair, Department of Recording Industry; MTSU Photographic Services
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