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BRIDGING THE GAP BETWEEN DESIGN AND TECHNOLOGY

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ON THE EDGE

Contemporary Electronics Design

by Gregory A. DeTogne

He has an interest in electronics and the latest technologies. She enjoys easy-living elegance. Together, they shared a dream brought to life recently on the rugged cliffs of Lake Tahoe's North Shore that blends technology with a fresh interpretation of a traditional vernacular architecture.

The setting for this couple's dream lies just above 6,000 feet on a rocky promontory punctuated with tall spires of ponderosa pine and red cedar. Spreading over approximately five acres, the property makes a dramatic, 200-ft. plunge from its upper elevations down to the lake at a steep, sloping angle well-suited for mountain goats and developing serious vertigo.

It is here amidst the solitude afforded by land, water, and breathtaking mountain views that Reno architect Jeff Lundahl set about to accomplish the couple's residential design objectives. The stunning result grew from an active, creative alliance forged among design professionals, contractor, and electronic systems specialist who integrated the latest home systems technology into a unified whole.

To instill a sense of unity with the towering majesty of the surrounding mountains, Lundahl designed a low, rambling structure giving it generous scale. The home divides into main quarters and a guest wing that comprise 9,100 sq. ft. and 2,900 sq. ft., respectively.

Visitors to the property arrive at an entry pavilion where two modes of transportation provide access to the home. The first, more conventional mode is a meandering walkway through a landscape of rock outcroppings and native plants. For times when this isn't practical or desirable, a tram-like, glass-enclosed funicular takes a more direct — albeit just as scenic — route to the front door along its own set of tracks.

Just outside the main entry, a bridge crosses a pool of water fed by a controlled source from above. In a clever deceit, a second body of water behind glass on the inside of the house creates an illusion whereby the water outside appears to flow directly into the entry area. An interior spillway allows this second pool, indoors, to cascade charmingly through the structure down to the home's lower level.

Five bedrooms are found within the home, four of which are in the guest quarters. Within the main living space, there are eleven principal rooms — including a polygonal family room, billiards room, solarium, library, home theatre, master bedroom, and a gymnasium — all threaded along a pair of asymmetrical galleries leading from opposite sides of the foyer.

"After analyzing the site and reviewing its features and opportunities," Jeff Lundahl confides, "we decided to push the house as far out onto the promontory as we could. As a result, the structure wound up following the natural curves of the hillside terrain in a somewhat serpentine fashion, with each room having a different view of the lake. The gallery spaces serve as a spine which holds and organizes the rooms, and permits free circulation between the different areas."

The home's exterior respects traditional Lake Tahoe forms. Its high, steeply-pitched rooflines, tall gables, dormer windows, chimneys, and slate shingles are classic examples of time-honored building techniques designed to thwart the region's various climatic assaults.

The interior is defined by project designer Carol John as a measure of "rustic elegance." It pays homage to the great camps of the Adirondacks by virtue of its granite floors, balustrades made from twisting limbs of natural willow, and a pair of red cedar tree trunks which boldly frame the entry to the family room. At the same time, the interior design utilizes scale and color in bringing warmth to the huge volumes of living space.

"I don't like to use pastels," John admits. "Pinks and mauves would never work here. I used colors that brought the strength of the mountains and lake indoors. Granites, earth tones, and shades of blue and green minimize the distinction between indoors and out. It all becomes one, and conveys warmth — just the kind of place you want to put your feet up in and stay forever."

ELECTRONIC SYSTEMS

A big challenge for both Jeff Lundahl and Carol John was to maintain this texture, mood, and character in the face of the client's expectation for sophisticated home technology. "The husband is a technoid, no doubt about it," John notes. "So, naturally, one of the major hurdles we had to jump was how to deal with the myriad electronic systems the house was to include without losing the

ELECTRONIC EQUIPMENT MANUFACTURERS

AMEREC
ARAGON
AUTOPATCH
BEST
BLONDER-TONGUE
BOHLENDER-GRAEBENER
BRYSTON
BTX
CELLO
CHEMTRONICS
CLEARVIEW
COMPUTAR
CRESTRON
DAVIS INSTRUMENT
DELL DIMENSION
DENON
ENERZONE
ESL
EUROPLEX
HOLOSOUND
HUGHES
IBM
LITETOUCH
LOCKNETICS
LUCENT
MIDDLE ATLANTIC
MITSUBISHI
N.E.A.R.
NILES
PANAMAX
PHILIPS
PIONEER
POWER ONE
RANE
SENTROL
SHURE
SONANCE
SONY
SOUND ADVANCE
STEWART
SUNFIRE
TEXAS WEATHER INSTRUMENT
THETA DIGITAL
VIDEOTEK
VISONIC
WHITE INSTRUMENT
WILDFIRE
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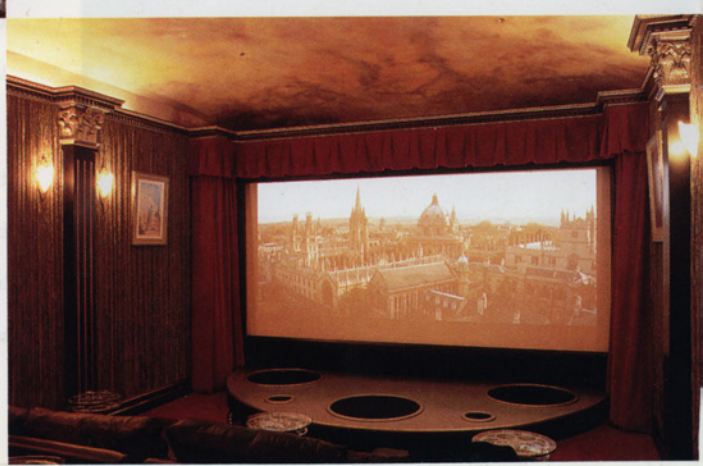

integrity of the architecture."

Helping to solve this dilemma was Intelligent Systems Unlimited (ISU), a systems integration firm in Incline Village, Nevada. ISU wished to spare the client the daunting task of having to learn how to operate all the electronic systems required to run a house of this size and scope, not to mention the nuances.

"The design called for sophisticated house-wide lighting and HVAC networks, a music system, security and surveillance systems, and an extremely high-end home theatre, all of which were to include fully-automated control," ISU owner Wayne Crawford explained. "Aside from these functions, we also had countless other specialized automated issues to contend with like spa control, control of the tram, water features, and satellite TV and music feeds.

"That said," he continued, "now consider that a house like this is going to have multiple HVAC zones, not just one, numerous audio zones, over 100 security points to monitor and control, and an army of phone extensions, and you can see how things can get complex."

ISU's game plan began by the dividing the various electronic systems required into individual groups, each of which would report to its own control center. For lighting, operations centered around a LiteTouch "Elite" system. An Enerzone "Statnet" 16-zone controller managed HVAC functions. Fire alarm, security, and CCTV systems received their own dedicated guidance, as did the telephone system in the form of a "Merlin Legend" system from Lucent.

Once configured as stand-alone entities, each of these systems could be operated independently — an important factor as a redundant measure of safety in the final scheme of things. Next, systems-wide control was introduced in the form of controllers from Crestron Electronics.

"Crestron has provided our clients with their primary household interface," Crawford said, using both wireless and hardwired touchscreens installed throughout the house. "With over 35 miles of cable and fiber in this home connecting the various systems, there are well over 100 inputs and outputs within the base-level Crestron network alone."

In the home theatre and family room — as well as in the master bedroom suite — large-screen LCD touchscreens are used to manage a vast array of functions throughout the property. Says Crawford, "You can, for example, sit in the master bedroom and turn on the home theatre equipment so the lamp on the projector and the amplifiers will be warmed-up and ready to go before you walk to the other end of the house to view a movie.

"You can also run the funicular to the entry pavilion to pick up a guest, lock all the doors, monitor the weather outside, or change the satellite music channel on the whole-house audio system.

"Since all of the systems are integrated and can talk back and forth, we can rely upon motion sensors to determine if no one's been in a specified area for a predetermined

amount of time, and then have those sensors initiate the necessary commands to turn down the HVAC to 65 degrees and dim the lights.

"The same technology in the master bedroom suite also allows us to detect when one of the occupants gets out of bed in the middle of the night and heads to the kitchen for a snack. Lights along his or her path will automatically come on at about seven percent, illuminating the way to the refrigerator without a blinding glare. When the individual returns, the system has the intelligence to automatically shut off the lights once they're safely back in bed."

ARCHI-TECHNOLOGY

To maintain the aesthetics of the home, the designers made every effort to conceal all the elements incorporated within the extensive network of electronic systems. Crawford came up with the idea of how to keep the house music system completely out-of-sight. His solution was flat-panel loudspeakers from Sound Advance Systems.

The "invisible" devices were ceiling-mounted and then covered with either plaster or a drywall masking compound, depending upon the location. "Unlike traditional cone-type loudspeakers, they engulf the listener with sound from every angle," Crawford says of the invisible transducers. "There are no 'hot spots' — audio is everywhere. No one can localize the sources, and the music is just beautiful."

No effort was spared in the acoustical treatment of the home theater, where double walls feature built-in diffusers, refractors, and bass traps kept from view behind an acoustically transparent covering. Designed with a curvature that complements the acoustics of the rest of the room, the domed ceiling floats on the house's superstructure so it can move an inch, up or down, in accord with sound in the room.

A centerpiece of the home theater is a custom, 16-ft. wide (diag.), electric masking screen from Stewart Filmscreen. Serving the audio system are four Cello Stradivari "Legend" surround loudspeakers, together with two "Grand Master" loudspeakers, front left and right, and a center-channel "Pro Armati."

After two years of construction, architect Jeff Lundahl is sanguine about home electronic systems. "Technology builds buildings, and architects have to evolve with that technology. To properly deal with the technical side, we have to anticipate what it will take to integrate all of today's systems, and that is a job requiring more time and attention than ever before."

"We are really not doing anything that hasn't been done in the last 100 years," adds Crawford. "It's just that we use technology, not manpower. Without the technology inherent in this Lake Tahoe project, the clients would be forced to hire a sizable staff to control and monitor their world.

"Our systems integration simply provides a way for only two people to orchestrate the events of their daily lives in an environment that would otherwise be overwhelming." ●

Architect	Jeff Lundahl, AIA Lundahl & Associates Reno, Nevada
Systems Integrator	Wayne Crawford Intelligent Systems Unlimited, Inc. Incline Village, Nevada
Designer	Carol John C. St. John Designs Reno, Nevada
General Contractor	Norm L. Dianda Q&D Construction Inc. Sparks, Nevada