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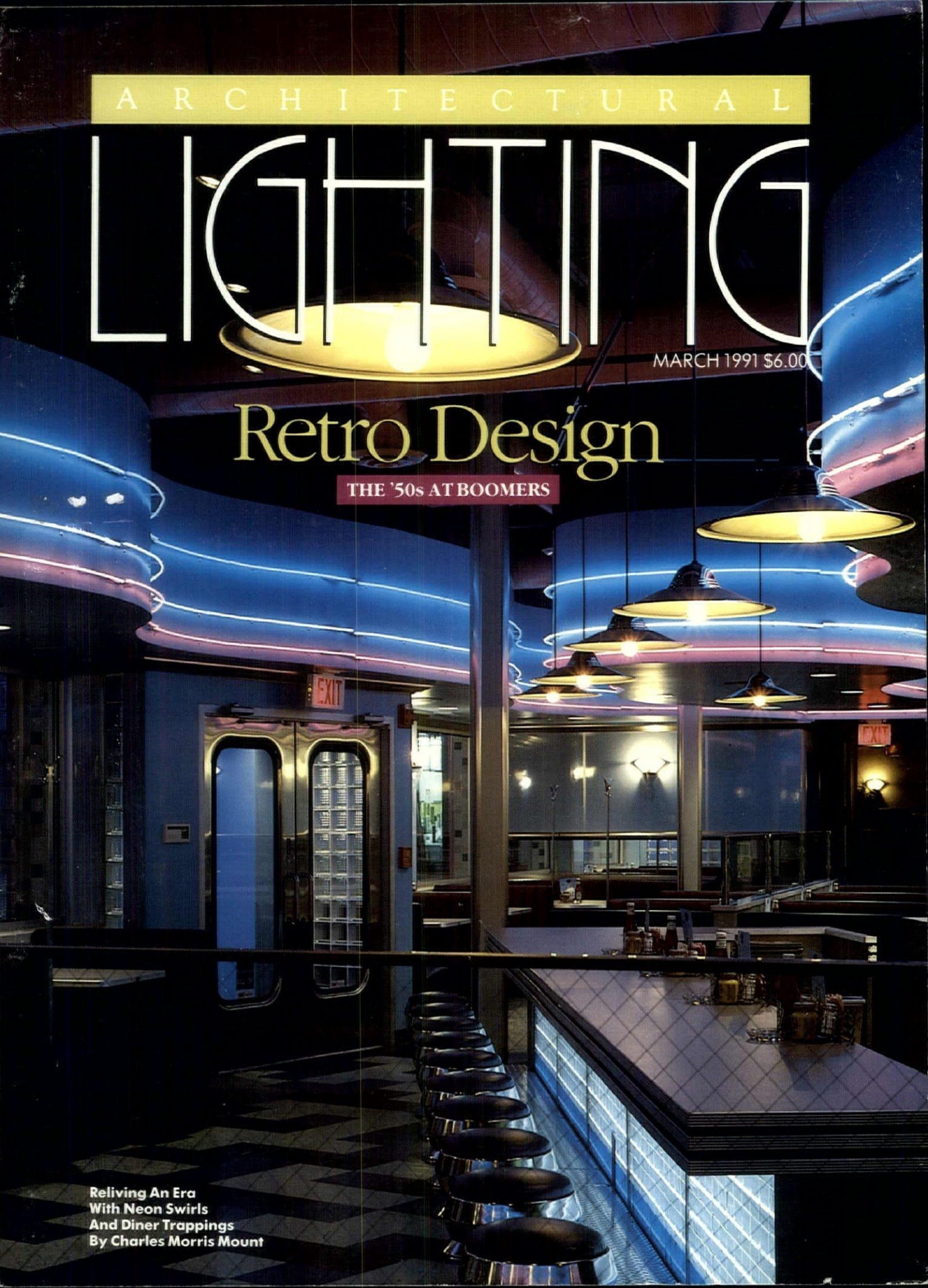

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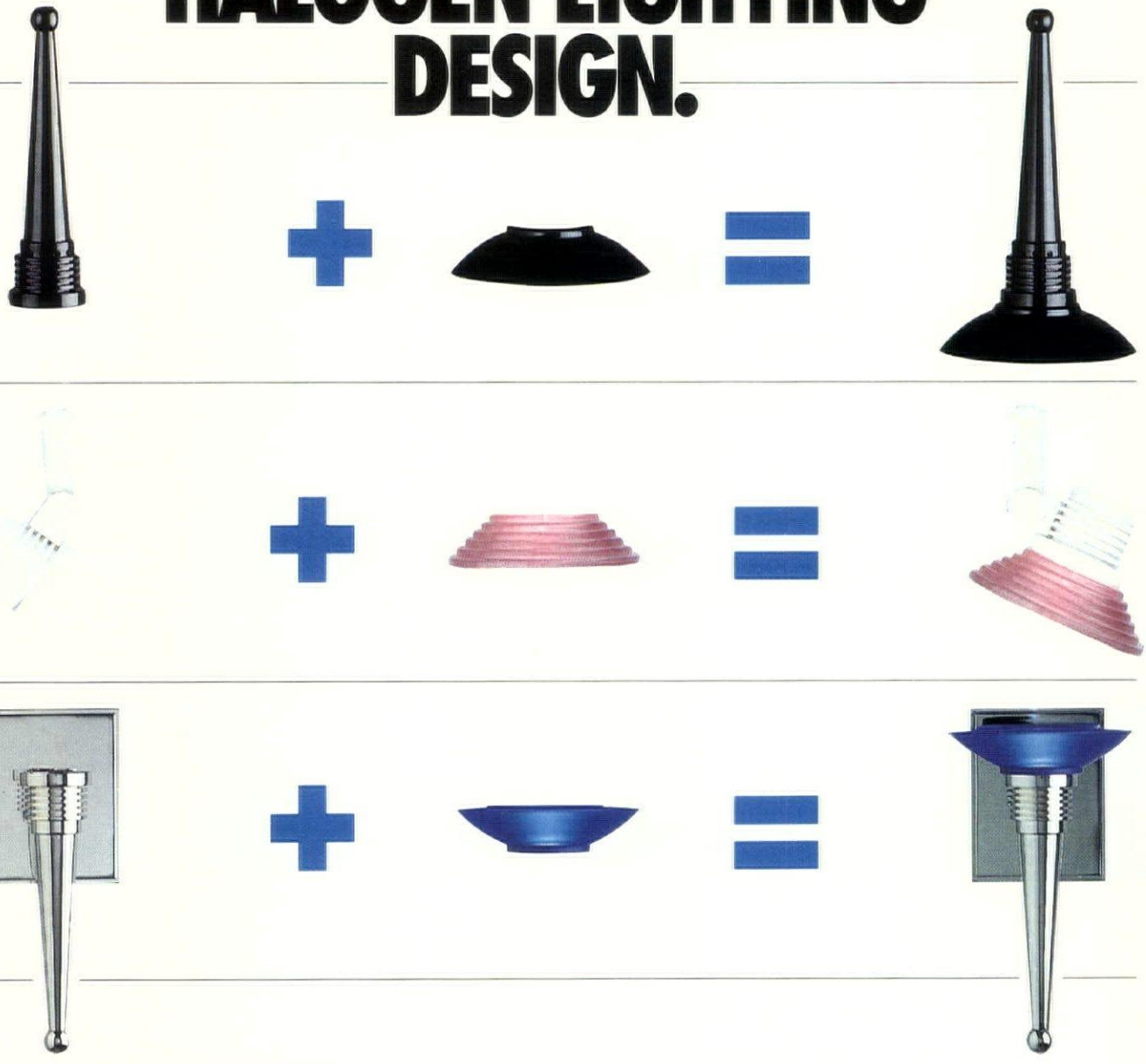

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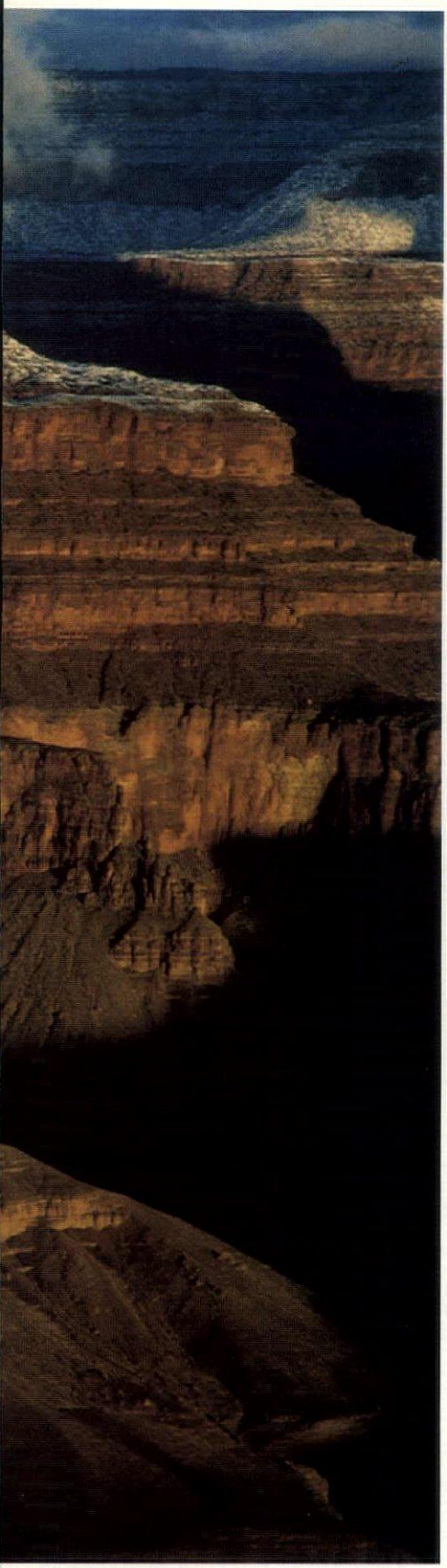

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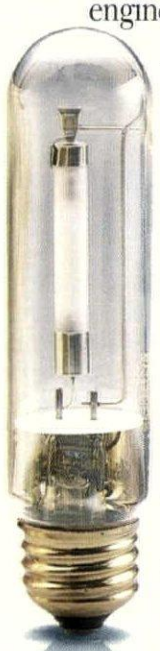

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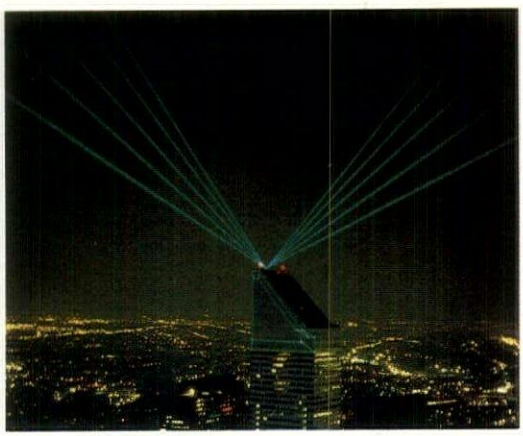
18 FEASTING BY NEON



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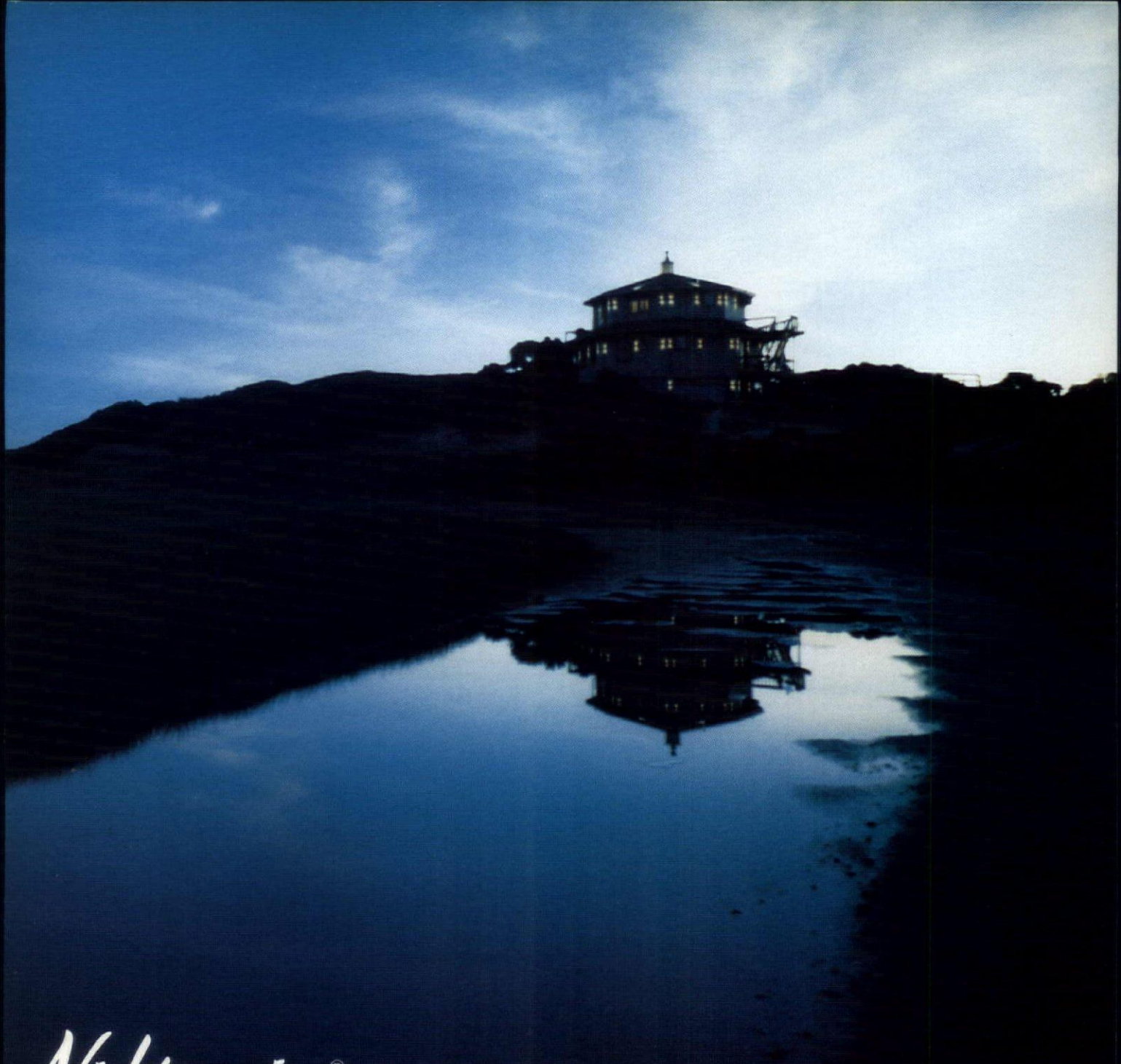

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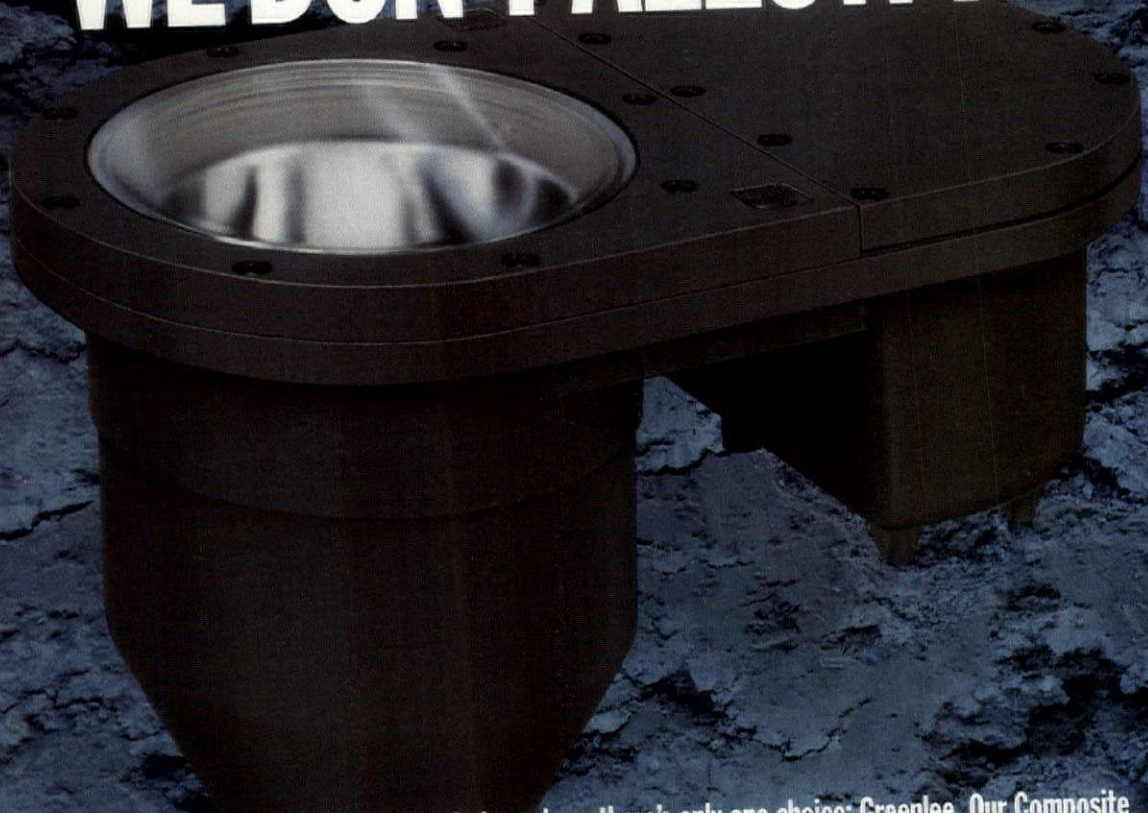

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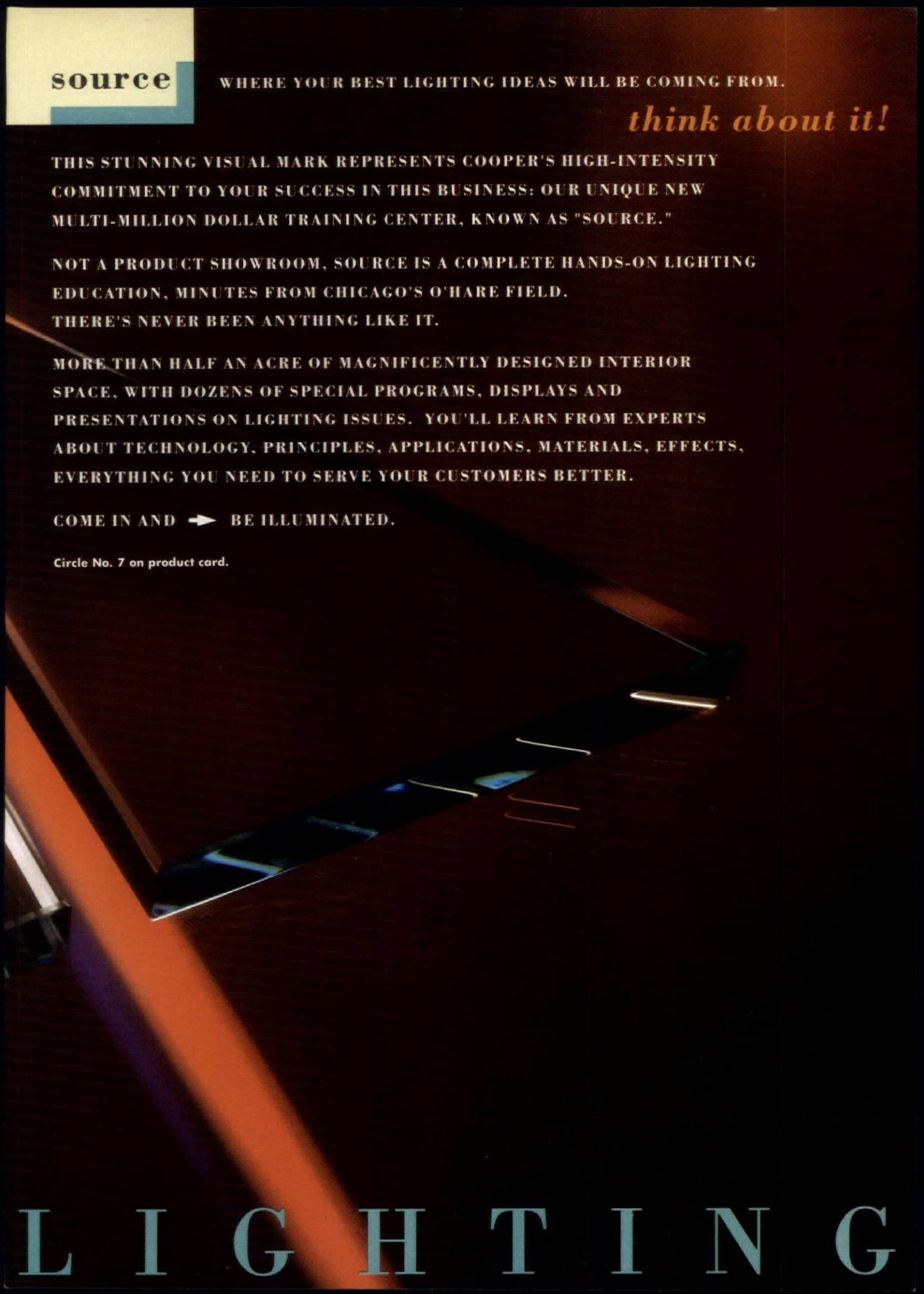
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Please welcome a new Editorial Advisory Board to *Architectural Lighting*. These professionals bring with them a range of diverse experiences, with backgrounds in architecture, interior design, structural engineering and construction, theatrical lighting design, and research and education. Together, we plan to serve you better by offering the most useful ideas and information on lighting—and how they relate to architecture and interior design.

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Prior to founding the lighting design firm of Mesh & Juul, Diana Juul worked at Jules Fisher & Paul Marantz, Inc., and Incorporated Consultants Limited. Ms. Juul is a corporate member of the International Association of Lighting Designers (IALD), and a member of IES. She has been the chairperson of the IALD Lighting Awards Program, and recently served as a judge for the 1990-91 program. She is currently on IALD's Business Standards Committee.

Ms. Juul is an instructor of lighting design at the New York School of Interior Design. She has taught at Parsons School of Design, and the Fashion Institute of Technology. Ms. Juul holds a B.A. from Adelphi University, and an A.A.S. from Parsons School of Design. Her background is in lighting, interior design, fine arts, and graphic arts.

RANDALL WHITEHEAD
PRESIDENT
LIGHT SOURCE
SAN FRANCISCO

Randall Whitehead has been in the lighting design field for over 12 years. His company, Light Source, handles residential and commercial projects throughout the United States. Current commercial projects include Le Meridien Hotel, the Mandarin Oriental, Hotel Union Square, Ivy's Restaurant, Fox Creek Restaurant, Granlibakken Ski Resort, St. Stephen's Church, The Claremont Resort Hotel, and Domaine Chandon Winery.

Mr. Whitehead has taught lighting classes at San Francisco Academy of Art College, and Canada College, and teaches lighting design seminars nationwide for the American Lighting Association and other organizations. He has received numerous design awards from the Illuminating Engineering Society of North America (IESNA). His work has been published in *Architectural Lighting, House Beautiful, Metropolitan Home,* and many other publications.

GARY R. STEFFY, IES, IALD
PRESIDENT
GARY STEFFY LIGHTING DESIGN INC.
ANN ARBOR, MI

Over the past eight years, Gary Steffy's firm has provided lighting design for more than 5 million square feet of office, hospitality, retail, and transportation space. Particular emphasis has been placed on lighting for people in electronic offices, and open plan spaces for clients such as The Prudential, Steelcase, and General Electric Company.

Mr. Steffy is immediate past-president of the IALD, and he has chaired the Illuminating Engineering Society of North America's (IESNA) VDT Lighting Subcommittee. He has authored many articles, and recently completed the book, *Architectural Lighting Design,* published by Van Nostrand Reinhold in 1990.

ALFRED R. BORDEN, IV, IALD
PRINCIPAL DESIGNER
THE LIGHTING PRACTICE
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The Lighting Practice, for which Alfred Borden is principal designer, provides lighting design services for a variety of corporate, commercial, institutional, and residential projects. Mr. Borden was trained as a theatrical lighting designer, and has a B.A. degree from Temple University, and an M.F.A. from the Tisch School of the Arts at New York University. He has practiced architectural lighting design for 12 years.

Mr. Borden is a corporate member of the IALD, chairman of

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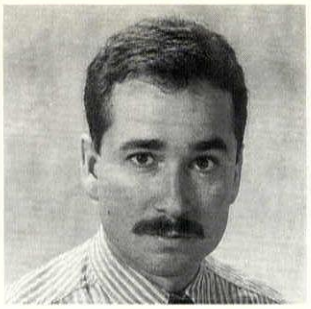

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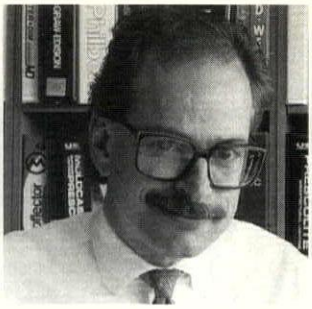

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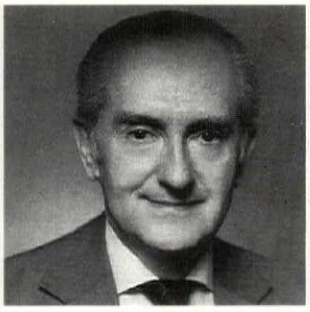

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the IALD Business Standards Committee, and a member of the Board of Directors of IALD. He is past-president of the Philadelphia Section of IESNA, and currently sits on their Board of Managers. He is a member of the IESNA Health Care Lighting Committee. Mr. Borden is also an instructor of lighting design in the School of Architecture at Drexel University.

MICHAEL JOHN SMITH, AIA, IES, IALD
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HOUSTON

When Michael John Smith established his firm in 1982, it was the first independent lighting consulting firm in Houston unaffiliated with any manufacturer. Mr. Smith holds a degree in architecture from the University of Texas at Austin. He is a member of the American Institute of Architects (AIA), past president of the San Jacinto Section of the IESNA, and has served a three-year term on the national board of the IALD.

Mr. Smith has completed projects throughout the United States, and in Mexico, Turkey, and Saudi Arabia. Major projects include the Texas State Supreme Court and Attorney General Complex, Compaq Computer Corporation's Conference Center, and a Saudi Arabian palace.

JULES G. HORTON, FIALD, FIES
PRESIDENT
HORTON • LEES LIGHTING DESIGN INC.
NEW YORK

Jules Horton founded his own practice as a lighting designer in 1962, and also acted from 1963 through 1967 as a lighting consultant with Syska & Hennessy consulting engineers. Since the beginning of 1968, he has been president of Horton • Lees Lighting Design Inc.

Mr. Horton graduated from the Warsaw Polytechnic Institute, received an M.A. degree in engineering from Columbia University, and has worked in building construction as a structural and construction engineer. Through his construction experience, he became interested in the lighting aspects of building design.

Mr. Horton is a registered professional engineer, a fellow and past president of the IALD, and a fellow of the IESNA. He has taught and lectured at institutions such as the Fashion Institute of Technology, Cornell and Yale universities, Parsons School of Design, and Pratt Institute. Mr. Horton has received awards and citations from the IALD, IESNA, IBD/Interior Design, and the American Society of Landscape Architects.

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Craig Bernecker directs a program in the Department of Architectural Engineering that is one of the few academic programs in the country that teaches professional practice and theory of illumination engineering, as well as maintains a strong and developing research program. His experience in illumination engineering is comprehensive, having worked as a specifier, a project coordinator for a manufacturer, a researcher, an educator, and a consultant to the lighting profession. As such, he has designed the lighting for over 100 buildings, has published a number of articles both on technical and educational aspects of lighting, and has been a leader in both technical and educational activies of the IESNA and the International Commission on Illumination (CIE).

Mr. Bernecker received a B.A. in psychology from Muhlenberg College, and an M.S. in architectural engineering and a Ph.D. in experimental psychology from The Pennsylvania State University. He is a member not only of the IESNA and CIE, but of the IALD as well. ■

RENSSELAER STARTS PRODUCT TESTING PROGRAM

"I believe that in the next two years the public will wake up to the fact that something is going to have to be done about the energy we're wasting on inefficient lighting," says Mark Rea, director of the Lighting Research Center (LRC) at Rensselaer Polytechnic Institute.

In response to the need for verifiably efficient lighting technologies, Rea recently announced that the LRC has started a major new product testing program funded by Rensselaer, the United States Environmental Protection Agency (EPA), the Lighting Research Institute, and electric utilities.

The testing comes about now because utility companies are now offering to rebate all or part of the incremental first costs for the design, purchase, and installation of energy efficient lighting systems. Manufacturers have responded with stepped-up development and production of energy efficient ballasts, fixtures, lamps, controls, glazing, and other lighting technologies. But there are currently no standardized methods for verifying product energy performance. As a consequence, utility companies have no satisfactory basis for deciding which products should qualify for their rebate programs.

"There is a great need for a third party to verify that any proposed system will produce the light, last as long, and save as much as the manufacturer says it will," says Robert Kwartin, director of the EPA's energy-efficient lighting program.

The newly-funded product testing program will have great impact nationwide, says Russell Leslie, associate director of the LRC.

"It will finally give us a methodology to ask the right questions about lighting, ranging from energy efficiency and maintenance costs through occupant reaction and whole-building energy use. Decision makers can then decide whether or not to include a product in the very lucrative incentive programs the utilities have," Leslie says.

In other efforts directed toward improved lighting efficiency, the LRC is involved in research and development of enhanced brightness glass, dynamic glazing, intelligent control systems, and computer simulations of the effect of lighting on whole-building energy consumption.

"We're also developing a brand new facility to model daylighting," says Leslie. "There isn't another facility like it that I know of in the world. It will allow you to assess architectural models for task visibility and lighting quality as well as the illumination daylight contributes."

Important and urgent as the effort to improve lighting efficiency may be, Rea insists that risking human safety and productivity in order to control energy consumption would be more wasteful and inefficient.

"The cost of providing good illumination at a worker's desk or job site for an entire year is less than a company spends to pay that worker for one hour," says Rea.

For this reason, the LRC also stresses the importance of

CONTINUED ON PAGE 14

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CONTINUED FROM PAGE 12

companion research in human factors. One such research project is designed to explore the effect of lighting on the way people think, feel and behave.

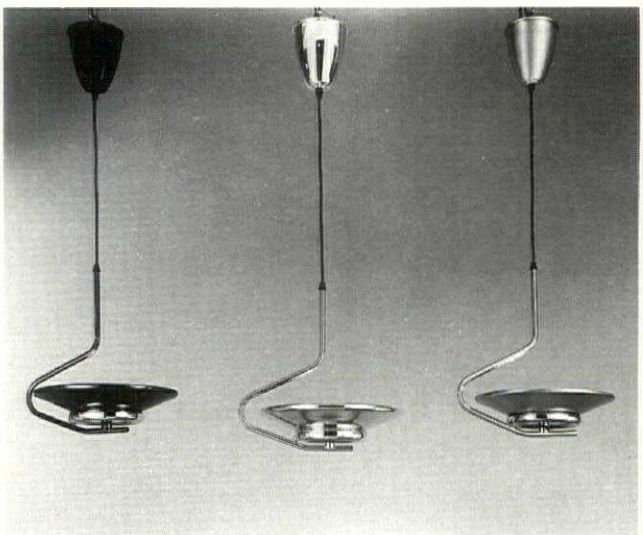
"Although our preliminary studies need to be replicated, indications are that you can change the outcome of a meeting with lighting," says Rea. "You can make people less confrontational and more willing to negotiate."

Peter Boyce, head of R&D in human factors at the LRC, is also conducting extensive research on the particular lighting needs of older people—an area he says is of growing concern as America's population and workforce become increasingly older.

The LRC is also exploring the role of lighting in shift work vigilance; seeking effective ways to reduce discomfort glare; and developing strategies for increasing VDT workstation visibility.

"Lighting is intended to serve people," says Rea. "And, for some, conservation suggests sacrifice, doing without—like dieting. That needn't happen. At the LRC we have already developed a control system that makes lighting better for people and more energy efficient at the same time."

The Lighting Research Center at Rensselaer Polytechnic Institute in Troy, NY, founded in 1988, is the largest university-based research center for lighting in the United States. ■



CORRECTION

The photo of Murray Feiss fixtures featured on page 41 of the January 1991 issue was upside down. *Architectural Lighting* regrets the error.

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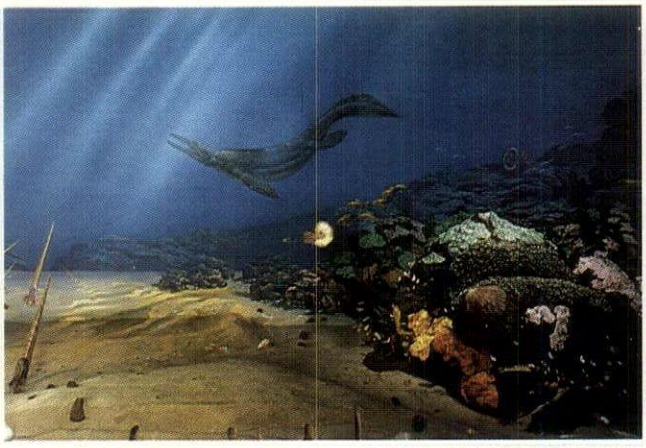

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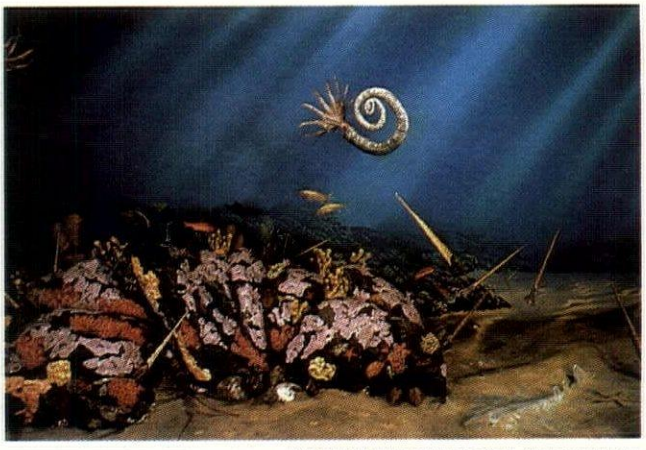

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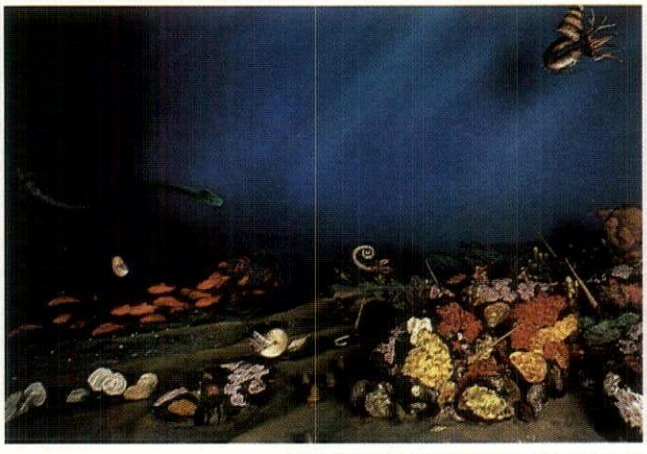

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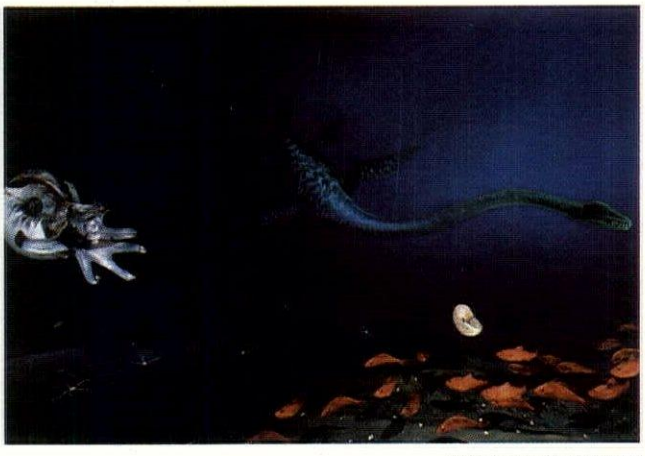


LIFE IN DEEP WATER

BY LONNER F. HOLDEN

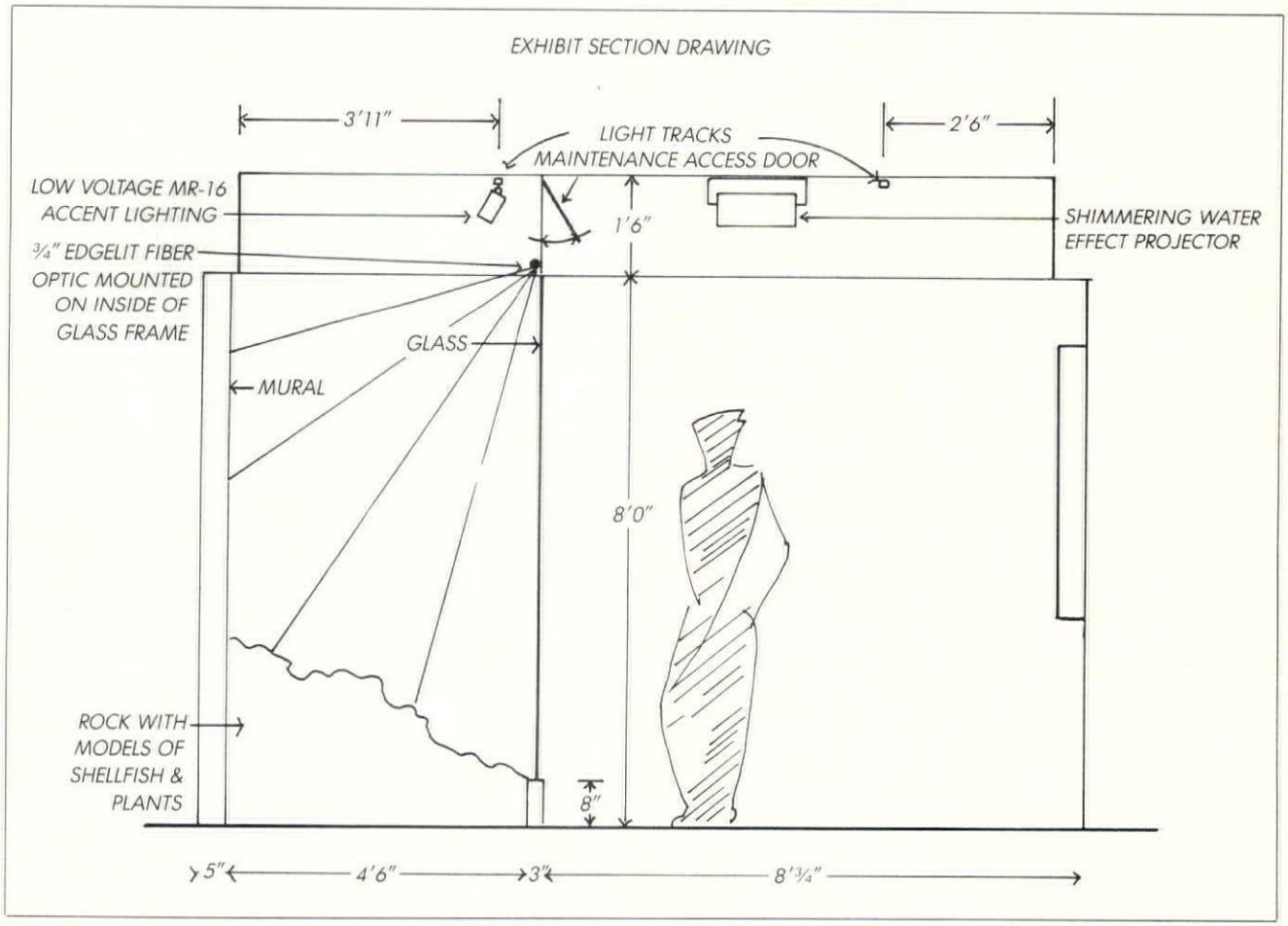
The author is a museum lighting specialist at the California Academy of Sciences, San Francisco.

CHALLENGE "The Evidence For Evolution" Mesozoic diorama is part of the Life Through Time Hall at the California Academy of Sciences in Golden Gate Park, San Francisco. The 43-foot long, 5-foot deep, and 8-foot high diorama depicts an ocean scene from approximately 70 million years ago. A team of designers, scientists, modelmakers, and preparators designed, built, and installed the scientifically accurate exhibit in a one-year period. The diorama describes three ocean habitats. One end displays the shallow coastal zone; the center exhibits medium depth flora and fauna; and the other end portrays life in deep water. The lighting for the exhibit had to illuminate the models; complement the design intention of diminishing penetrations of sunlight towards the deep end; and allow the background mural to blend with the foreground, all in a long, narrow space.

DESIGN/TECHNICAL CONSIDERATIONS Accent lighting with good color rendering was needed to highlight the models, while maintaining an underwater look. Also, a diffused light source was needed to: fill the space with an even glow along its length, visually integrating the three depth zones; sufficiently illuminate the background mural; and provide fill light for the foreground models. In the past, fluorescent, tungsten and low-voltage incandescent, and sunlight had been used in the academy's dioramas, but different concerns in this display made them unsuitable: the shallow 5-foot, front-to-back depth; a desire to avoid heat damage to the models from light sources; the need for total control over brightness; and the ability to oscillate the light to create an underwater effect. Fluorescent, for example, was eliminated because it was bulky and too bright, even when fitted with theatrical filters.

METHOD Track fixtures mounted in the ceiling space above the diorama provide the accent lighting. The MR 16 lamps are

Undulating light from fiber optics and accents from track fixtures bring the sea, as it was 70 million years ago, to life today in "The Evidence For Evolution" diorama.



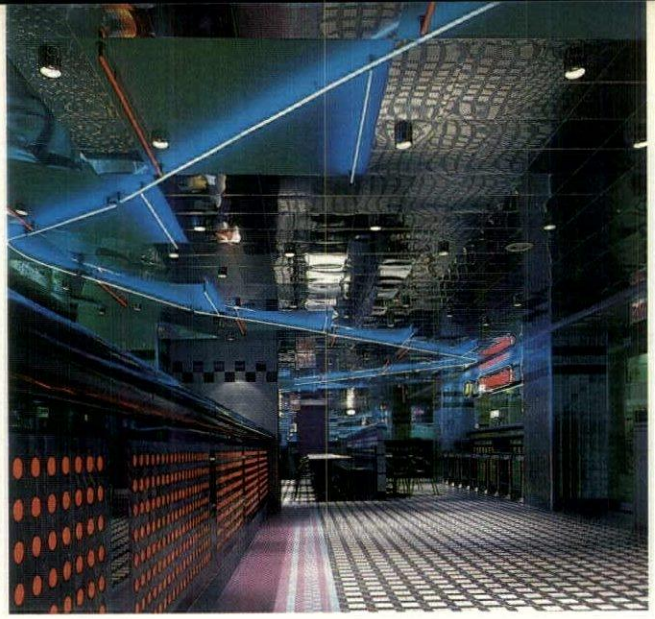
used for good color rendering, as well as excellent beam control. A combination of snoots, louvers, barndoors, linear spread lenses, and neutral density material focuses the light away from the background, and controls the intensity to create a progression from the bright, shallow end, to the shadowy, deep end.

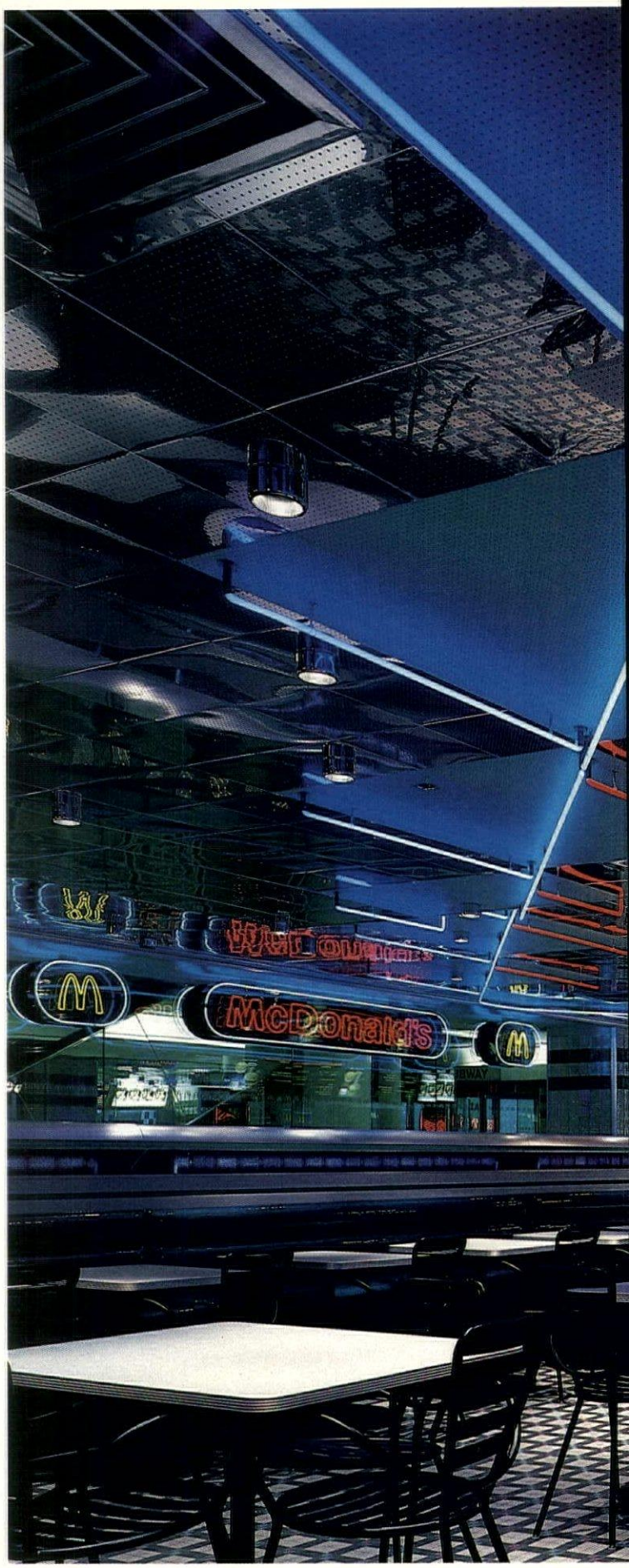
For the diffused lighting, fiber optics was researched, tested, and finally chosen. A single length of edge-lit fiber optic material, three-quarters of an inch in diameter, stretches 40 feet with one central splice. One illuminator is installed at the shallow end of the exhibit, in an accessible maintenance zone with the track lighting. A rotating color wheel installed in the illuminator simulates the oscillations of light to dark experienced under the surface of a rising and falling sea. At the shallow end, where the accent lighting is brightest, the optical fiber provides just enough low-level fill light. As the progression is made to the deeper end, the lighting makes the background seem to move in and out of focus, lighter, then darker and bluer. At the deep end display, with almost no accent light at all, the optical fiber dominates as a light source. Diffused and undulating, it carries the illusion of light in deep water to its fullest expression. As a final touch, a second animated light source was installed at the shallow end where the effect of light shimmering underwater brings the diorama to life.

CONCLUSION "The Evidence For Evolution" was installed in June 1990 and remains at the California Academy of Sciences as a permanent exhibit.

DETAILS

PROJECT: *LIFE THROUGH TIME: THE EVIDENCE FOR EVOLUTION EXHIBIT*
LOCATION: *CALIFORNIA ACADEMY OF SCIENCES, SAN FRANCISCO*
EXHIBIT DESIGNER: *LINDA GRANDKE-KULIK*
EXHIBIT DETAILER: *ALAN HAYWARD*
LIGHTING DESIGNERS: *LONNER F. HOLDEN, IES; and ROBERT O. VALADEZ*
PHOTOGRAPHER: *SUSAN MIDDLETON*
LIGHTING MANUFACTURERS: *HALO: single circuit track and low-voltage track fixtures; LUMENYTE INTERNATIONAL CORPORATION: three-quarters of an inch diameter fiber optics and illuminator; GENERAL ELECTRIC: MR 16, 12-volt lamps*





Two eateries by restaurant designer Charles Morris Mount capture the flavor of fast food and the Fifties

BY CATHERINE SCHETTING SALFINO
MANAGING EDITOR

McDONALD'S AT A&S PLAZA

Food, folks, and fun. That's what McDonald's says it's all about. And at the fast food restaurant in New York's A&S Plaza, the design emphasis is definitely on fun.

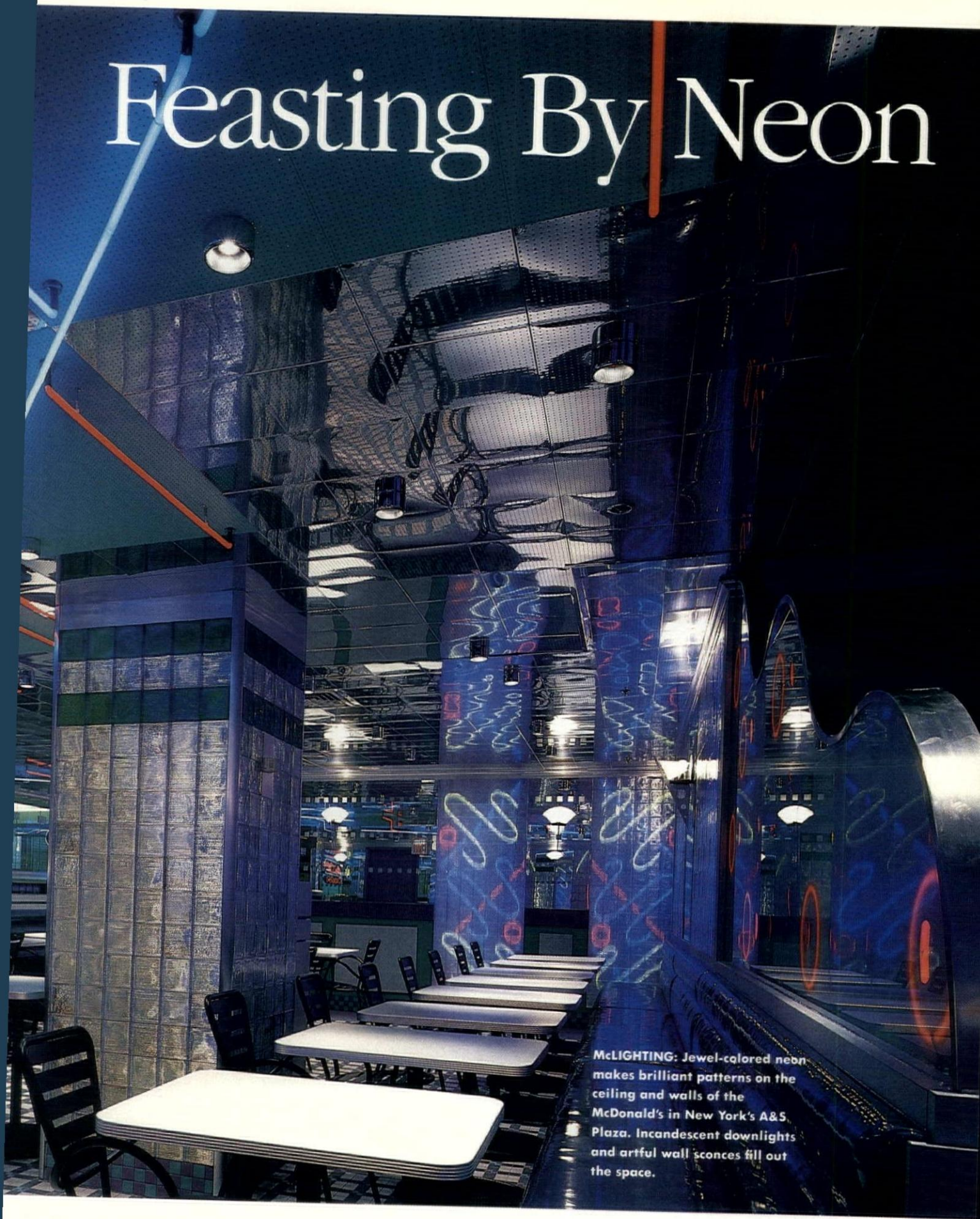
Extensive use of neon pumps life into the 2,500-square-foot space, which is centered in the part of town where Broadway meets Herald Square, where parades, people, and an abundance of happenings happen. With all that excitement surrounding it, McDonald's owner, Irwin Kruger, designer Charles Morris Mount, principal of New York-based Silver & Ziskind/Mount, and his assistant Jennifer Wellmann, didn't want their space to get lost in the crowd. Needless to say, the chain's standard red, yellow, and orange motif was dropped.

"There's no reason for all of the McDonald's to look alike," Mount says. "The cost of fast food—with a burger, shake, and fries—is fast approaching $5-plus. When you go to a diner or equivalent, you get waiter service and more of an ambience. Irwin and I discovered how design really adds that extra something for fast food that people recognize as differing from the standard."

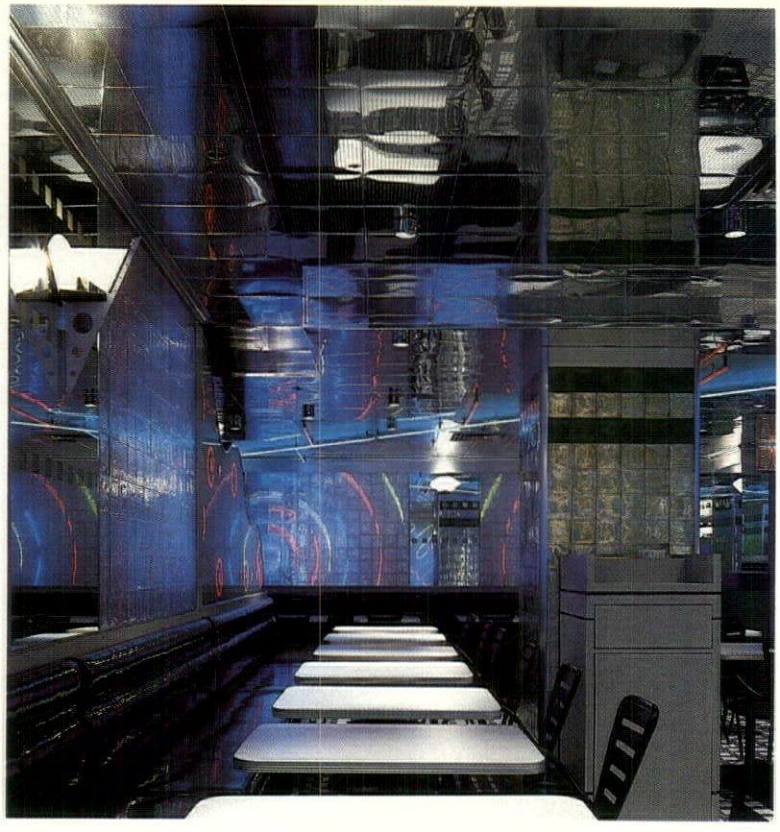
The jewel tones of ruby red, sapphire blue, and turquoise welcome those who want as much excitement from their dining surroundings as they do from

PHOTOS BY NORMAN MCGRATH

Feasting By Neon



McLIGHTING: Jewel-colored neon makes brilliant patterns on the ceiling and walls of the McDonald's in New York's A&S Plaza. Incandescent downlights and artful wall sconces fill out the space.



shopping in the city that beckons shopping.

The A&S restaurant, which opened September 1990, is the third McDonald's Mount has designed for franchisee Kruger, following one in New York's Rockefeller Center and another on 57th Street. The McDonald's projects are approached as if they are their own restaurants, Mount says, not a link in the international chain.

"The philosophy of creating a special place goes into all the designs we do," Mount says.

Which is why neon plays such an important role in the A&S spot. Because the space is half the size of the McDonald's stores on 57th and Rock Center, every foot had to count.

"I wanted to make an art statement here with neon," Mount says. "You see lots of pattern, lots of painting with neon I call it, and they're all in beautiful tones."

The neon wall art is behind hand-cast glass tiles, which were especially made for this project. A cavity exists between the wall and the glass tile. The neon was fabricated on half-inch clear plexiglass panels and hung in the space before the glass tile was installed. The glass tile is mounted on plexiglass, too. This way, Mount says, if maintenance needs to be done with the neon, the glass can easily be removed.

TALKING A BLUE STREAK

SIDE LIGHTS

"I call it my underwater club," says Charles Morris Mount of the McDonald's on 57th Street in New York. "The entrance is ground level but the restaurant is entirely upstairs. It's like an aquarium because you can look out the floor-to-ceiling windows and everyone from the street is looking in."

Plus, the glowing, blue neon lighting has a very soft, underwater feeling to it, Mount says. The neo-blue tubing runs everywhere—sandwiched between the glass block walls and along the ceiling soffit, the curves of which exactly match the black slate pattern of the floor border.

The only connection to the standard McDonald's decor is a glass block column that contains red, orange, and blue neon "M's." The column runs through the two floors of the restaurant and is capped with an ionic capital.

"You can only see it from one direction, so they don't really become part of that blue feeling that runs throughout the restaurant."

Recessed downlighting of 75-watt lamps on dimmers fills out the space.

"It's a very different McDonald's than that of A&S—it's very restrained in comparison," Mount says. "It's still very beautiful and it makes its own statement."

"We went through a lot of different patterns before we found the circular pattern, or what I call loop backs," Mount says. "We had some mock-ups done in neon. And Let There Be Neon executed the designs exactly as we drew them. We were trying to create a kind of staccato—a rhythm, a motion."

The neon reflects on the ceiling, which is made of polished aluminum and custom-painted turquoise panels. The neon is also mounted in a zigzag pattern across the ceiling to pull the eye directly into the restaurant.

The counter is made of rotary-brushed stainless steel perforated panels. Red laminate is behind the panels, and red neon is sandwiched in between. The resulting glow could be considered a modern hearth. The neon inside is comprised of 20-inch diameter circles. The inside perimeter of each panel is framed with red neon, creating a very even glow.

Accent lighting is provided with incandescent wall sconces, which offer a sense of warmth and intimacy in the dining area.

The only other lighting comes from 50-watt MR 16s housed in semi-recessed, low-voltage can fixtures. The crowded space above the ceiling allowed for only 2 inches of the luminaires to be installed inside the ceiling.

The "M" is created with a neon that was last made about 1954 for Westinghouse, and Mount says he got the last of the supply. The antique tubing is also being used in the next McDonald's he and Kruger are again teaming up for on Seventh Ave. and 33rd Street.

"I've done over 150 restaurants in my design career," Mount says. "And if a restaurant doesn't have well-designed lighting, the diners are going to miss out on an important aspect of eating out. We must recognize that."

WALL POWER: Neon wall art is mounted behind hand-cast glass tiles, which were made especially for the McDonald's project (opposite and below). Polished aluminum and custom-painted turquoise ceiling panels reflect the radiance.

DETAILS
PROJECT: *MCDONALD'S*
LOCATION: *A&S PLAZA, NEW YORK*
CLIENT: *ISK—IRWIN KRUGER*
LIGHTING DESIGNER: *SILVER & ZISKIND/MOUNT: CHARLES MORRIS MOUNT*
ARCHITECT: *BLOCH, HESSE & SHALAT*
INTERIOR DESIGNER: *CHARLES MORRIS MOUNT & JENNIFER WELLMANN*
ELECTRICAL CONTRACTOR: *STEGLA CONSTRUCTION*
MILLWORK: *ED BENZENBERG*
PHOTOGRAPHER: *NORMAN McGRATH*
LIGHTING MANUFACTURERS: *LET THERE BE NEON CITY: neon, custom fabrication of signage; NORBERT BELFER: miniature light strip; ALCKO: exti sign; ARTEMIDE: "Filicudara" wall sconce; REGGIANI: semi-recessed downlight, remote transformer*

BOOMERS

Changing the image of a restaurant that has become a 20-year-old fixture in a mall can be risky. Especially when the restaurant is patronized by the seniors crowd and families with small children—people who expect things to be a certain way, no surprises, thank you.

But the renovation proposed for the former Lum's restaurant in Milford, CT, wasn't merely the owner's whim—it was a necessity. The owner was giving up the franchise and changing the name and image of the establishment. Plus, the mall that houses the dining spot is undergoing major renovations. The western saloon style of the dining areas would look very dated and out of place in the new surroundings.

Mount decided to futurize the joint by going back in time and turning the place into a diner/dance bar with a '50s decor—and Boomers was born. But how does one go from dark wood paneling, captain's chairs, and Tiffany-style lamps to stainless steel, booths and stools, and neon boomerangs?

"The owner had seen a '50s style diner I had done in Washington," Mount says. "We decided a '50s motif here would be different but it would still attract the greatest number of people by keeping the existing clientele and bringing in a new, younger set."

The boomerang idea came from a popular toy that Mount associates with the *Happy Days* era.

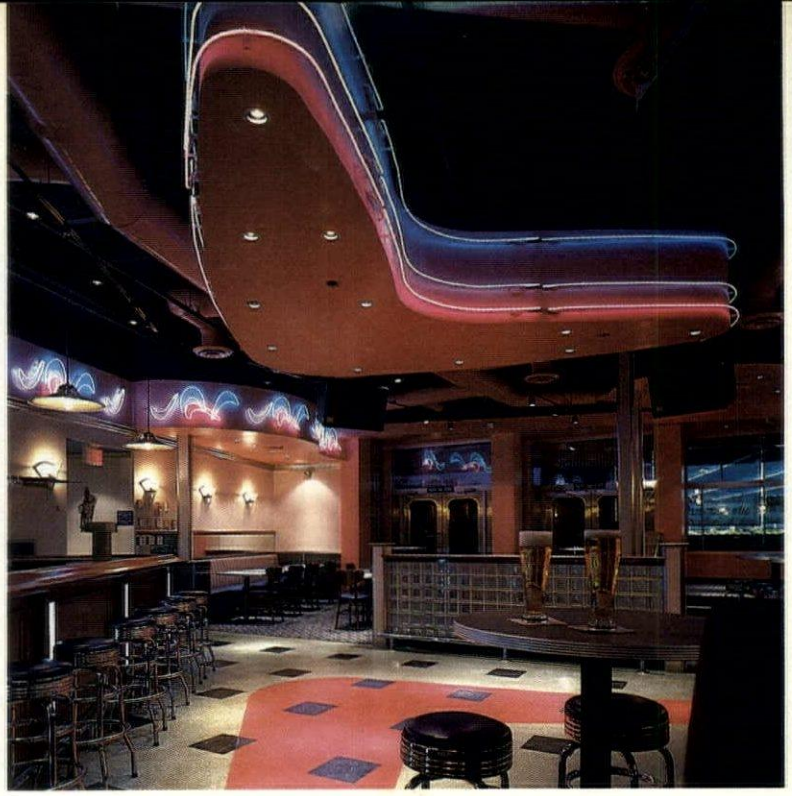
The 6,000-square-foot space, which was completed in November 1988, is long enough that the bar and restaurant are two distinct areas. The bar is connected to the dining room by a corridor or it can be entered from outside. The bar's general lighting is accomplished with 150-watt PAR 38 flood downlights. The fixtures line the perimeter of the room and are recessed in the giant boomerang over the dance floor. The boomerang is outlined with white, pink, and aqua tubes of neon.

The boomerang's drywall construction is suspended from the existing steelwork of the roof structure. The lamp wiring is concealed by the black paint that covers everything above 12 feet. The boomerang suspension and the ducts are painted bubble gum pink. Exposed suspended track lighting also houses the 150-watt PAR 38s.

More neon "dances" along the soffit in the form of baby boomerangs.

"I remembered from childhood that neon always moved back then, so I thought it would be appropriate that this would look like it was wiggling and moving around," Mount says.

Italian wall sconces with shades made of fiberglass and 75-watt incandescent lamps wash the walls and provide an abundance of light for those seated.



"It's sort of a boomerang form made from a structural steel piece," Mount says. "It looks as if it was customed designed for the space."

Pendant lamps that are sprinkled throughout the main part of the restaurant and over the bar's counter have the same screw base bulb.

The pendant luminaires, recessed lamps, sconces, and neon tubing are the lighting features in the dining room. Glass block and neon mark the entryway to the dining room, which has a sitdown counter not unlike a diner, booth seating, and loose tables and chairs. The room has the same open ceiling treatment with the neon on the soffits being the decorative element.

The face of the counter in the dining room is lit from behind with white and blue neon. The 14-foot long strips are broken into two runs. The neon shines behind the handcast, serrated glass tile, one strip of it being sapphire blue.

"We tried to create a design that is reflective of the '50s period but not a complete replica, not a reproduction," Mount says. "We wanted to use materials that are familiar to everybody, like the vinyl, carpet, and laminate. And we wanted to add the new stuff like the dancing neon and glass block—although a lot of people are familiar with that. But we really were aiming to create a balance of new and old, without being too gimmicky or overdesigning." ■

LOST IN THE '50s: Three shades of neon wrap around the soffit and perimeter of the dining area in Boomers (opposite). Downlighting, pendants, and sconces complete the room's lighting. A giant boomerang outlined with neon is suspended above the dance floor in Boomers' bar area (above), while smaller boomerangs "dance" along the soffit.

DETAILS

PROJECT: *BOOMERS RESTAURANT*
LOCATION: *CONNECTICUT POST MALL, MILFORD, CT*
CLIENT: *NEIL REGGIONE*
LIGHTING DESIGNER: *SILVER & ZISKIND/MOUNT: CHARLES MORRIS MOUNT*
INTERIOR DESIGNER: *CHARLES MORRIS MOUNT, MATT TAGER*
PHOTOGRAPHER: *NORMAN McGRATH*
LIGHTING MANUFACTURERS: *LIGHTOLIER: track light tron 36, incandescent downlight; SYLVANIA: PAR 38 capsylite; ARTEMIDE: "Filicudara" wall sconce; TREND: pendant light; SHINER SIGNS, INC.: all neon*

TEMPORARY INSTALLATION

A CITICORP FOURTH OF JULY

The triangular crown of Citicorp Center spins and pops to celebrate the Fourth of July. The laser projections played with the notions of architecture and perspective to bring the building to life. Animated imagery was projected onto the east and west facades from laser systems mounted on adjacent buildings.

PHOTO BY TETSU OKUHARA

Lasers and Architecture

Science Faction reveals the workings behind the wonder

BY WANDA JANKOWSKI
EDITOR-IN-CHIEF

During the past decade, buildings have begun to play starring roles in skyline performances in cities around the world. Until recently, laser performances on buildings have been limited to runs of a few days, weeks, or months for special occasions such as the World's Fairs.

Now, however, permanent installations are demonstrating the effectiveness of architectural laser applications in revitalizing downtown urban areas and public parks.

Since 1978, Science Faction, led by laser artist and founder, Richard Sandhaus, has been inspiring a new sense of wonder for well-known landmarks by choreographing lasers and architecture in a nightly sky dance, and projecting laser imagery upon building facades.

"I think of laser light as a medium rather than a light source—as a medium of expression that combines elements of visual art and performing art," says Sandhaus.

"Whether reflecting from airborne particles or a building facade, the value and effectiveness of laser light lies in the broad range of temporal and spacial transformations that can be created," he says. "It's the transformation or choreography of these large-scale laser light sculptures and paintings that constitute a whole new performance medium, a medium that just happens to work at the scale of monumental architecture, enliven a building, and visibly extend its presence."

WHAT IS LASER?

The word "laser" is an acronym for light amplification by stimulated emission of radiation. Invented in 1960, a laser is a device that concentrates light waves in an intense, low-divergence beam. Even though the light source is an inefficient converter of electrical energy to light energy, a single laser system becomes incredibly efficient when applied to a very large-scale lighting requirement.

What is collectively referred to as a laser is really a complete lighting system composed of three main parts: the laser tube, a gas-filled tube that emits the light; the projector that manipulates or scans the beam; and the computer hardware and software that stores and controls the performance.

The laser tube filled with either argon or krypton gas emits the visible light to be manipulated into spec-

TEMPORARY INSTALLATION

A WORLD TRADE CENTER CHRISTMAS

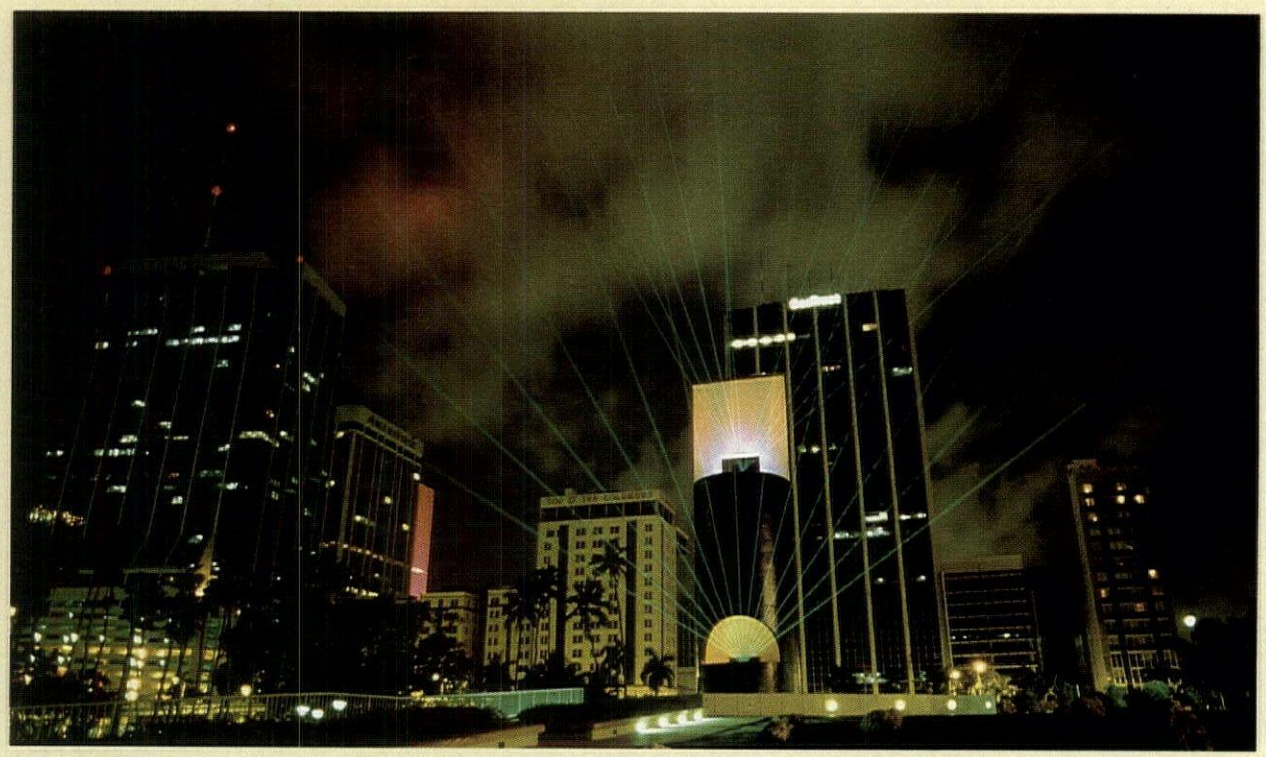
Science Faction's month-long installation at the World Trade Center (WTC) lit up the Twin Towers and the New York skies. "Light Up The World," a multi-color laser music program, played continuously from 5-11 p.m. for audiences at the WTC plaza from Thanksgiving through Christmas in 1990.

Conical beam arrays from laser systems, perched over the roof's edge on window-washing rig platforms, were projected down to plaza level, creating a 1,300-foot-high laser Christmas tree. The beams creating the stylized tree terminated in a sunken fountain in the center plaza of the WTC that was also the site of a holiday-themed show projected onto the lower facade of the Number One tower.

High-power argon and krypton laser imagery—depicting Santa and the reindeer, dancing Christmas trees, and laser snowstorms—was projected from a mobile laser unit. This self-contained laser studio was parked on the plaza 500 feet away from the tower's facade; the animated imagery was projected onto non-windowed mechanical floors.

Between performances of the 15-minute spectacular, the rooftop lasers directed their blue aerial projections over parts of the city. The photo shown was taken from Long Island City, nearly 10 miles from the Towers.

The project was commissioned by the Port Authority of New York and New Jersey as its 1990 holiday gift to metropolitan New York.



PERMANENT INSTALLATION

MIAMI TOWER OF LIGHT

The Tower of Light is one element in a project the city of Miami commissioned from the late Japanese-American sculptor, Isamu Noguchi, to bring new life to Bayfront Park. Although it overlooks Biscayne Bay and is only blocks from the business district, the park was not considered a safe or desirable destination.

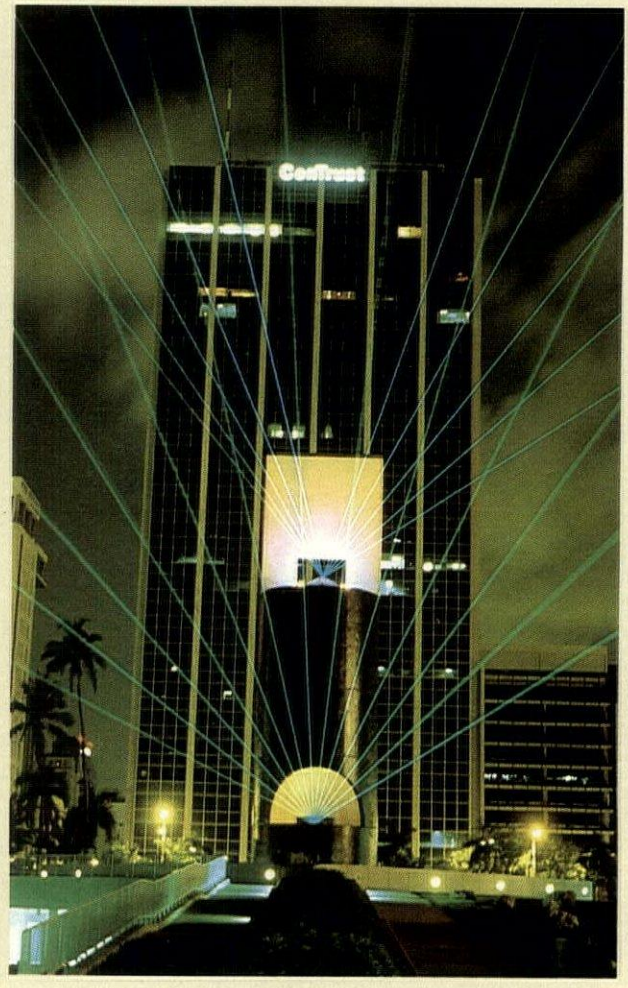
So Noguchi conceived the Tower of Light, a starkly modern, 88-foot tall interpretation of a lighthouse on the bay. Richard Sandhaus was asked to collaborate on the project, to ensure that the redeveloped park would have a visible presence far beyond its 43 downtown acres.

Two lasers are installed in the sculpture. From the laser mounted nearly 70 feet above the ground, beams are projected in a 360-degree pattern from the tower, visible from several miles away.

The large-scale, long-range performances of the tower's upper laser contrast with the nearly private performances offered by a second laser mounted low on the Tower's eastern exposure, tucked out of view in the center of a half-moon cutout.

The lower laser is installed only 12 feet from the ground, so a series of intimate laser ceilings could be raised and lowered above the quiet rock garden facing Biscayne Bay.

The Miami Herald review of the project, which opened to the public in April 1989, stated, ". . .the Tower of Light is one element among many in Noguchi's redesign of Bayfront Park, but more than anything else it has the potential to transform us."



The Laseriter system allows graphic animation programming. It's the laser version of a musical instrument...

tacular light sculptures and paintings. Argon lasers emit light in the blue-green range. For aerial projections to be visible, all the light energy from large-frame 20-watt lasers must be used. For projected images, however, the argon beam can be divided into its component wavelengths of blue and green to create beam colors that can be manipulated separately.

Krypton lasers emit red light, which provide important color contrast and spectrum expansion for facade projections. However, even the most powerful krypton tube, 6 watts, does not emit enough laser light to be significantly visible when reflected only from particles in air space. Therefore, aerial projections are always the brilliant turquoise color of the argon laser.

Science Faction purchases the tubes directly from two California-based manufacturers: Coherent, Inc., and Spectra-Physics. It is the other two components of a laser system—the computer control unit and the projector—that turn the light source into a medium of expression.

The Science Faction Laseriter is a computer control system that allows real-time graphic animation programming. It's the laser version of a musical instrument, a computer keyboard that provides Sandhaus with the capability of instant laser performance in the studio and on site. Science Faction's proprietary systems are designed and manufactured at their New York headquarters.

All of the laser installations and performances described in this article comply with a range of federal, state and local regulations designed to protect the public health and safety. Specifically, Science Faction's hardware, software and installation procedures are designed to eliminate any possibility of direct human exposure to the projected laser beams. The concentrated energy in the low-divergence beam—within a determinable distance from the beam origin—could cause retinal damage if projected directly into the eye. Consequently, various regulations call for minimum "separation distances" (3-meter vertical, 2.5-meter lateral) between beam projections and humans.

Although the beam is an extremely low-divergence one, it is not non-divergent. Its energy concentration does diminish with distance, and its effective power density is substantially reduced by the very high velocity scanning movement of the manipulated beam. Consequently, Science Faction has been able to create permanent, nightly aerial displays in compliance with all regulatory codes and in cooperation with the Federal Aviation Administration (FAA). The

TEMPORARY INSTALLATION

QUEBEC PARLIAMENT BUILDING HIGHLIGHTS HISTORY

To honor the 450th anniversary of Quebec in 1984, a laser performance was used in conjunction with the facade of the Quebec Parliament Building to celebrate history through architecture. The nightly "lasers, son et lumiere" performance ran for 12 weeks.

The specific and selected details of both the magnificent structure of the Parliament Building, and the saga of the French-Canadian experience were revealed to the audience using lasers in two ways. Within a stage or framework created by conventional lighting, lasers would perform an animated routine. Or the lasers' precision beams would outline a specific area later "filled in" by theatrical light sources.

Shown is a laser portrait of Jacques Cartier on the Parliament building's facade. The project received a 1985 Lumen Award from the New York Section of the Illuminating Engineering Society.

Miami, and Phoenix installations described in this article have been deemed by the FAA to be non-hazardous in navigable airspace. All three are located within a few miles of major airports.

Laser light, like all light, is visible only when reflected from something. Aerial laser projections are visible by virtue of the reflection of light from airborne particles ranging from dust to water micro-droplets (humidity) to particulate pollutants. Consequently, the "thicker" the air, the greater the apparent brightness of the laser beam projection. Even more impactful upon apparent brightness, however, are the factors of competing light in the viewing area; and the angular direction of the beam projection with respect to the viewer. Referring to the page 25 photo of the World Trade Center installation, it is clear that the northeast-bound projections are significantly visible at a distance of about 10 miles. However, if these same projections were panned to the south or west, they would become invisible from the photographer's location. SFC's "360" projector is used to continuously and sequentially pan aerial projections across the full 360-degree horizon to provide visibility for viewers located randomly about the projection source.

All of Sandhaus' laser performances are site specific.

"We have never created 'off-the-shelf' laser performances to be imposed on a public space," Sandhaus says. "We collaborate with the client—whether a lighting designer, architect, or public agency—to understand a space and create a meaningful site-specific work."

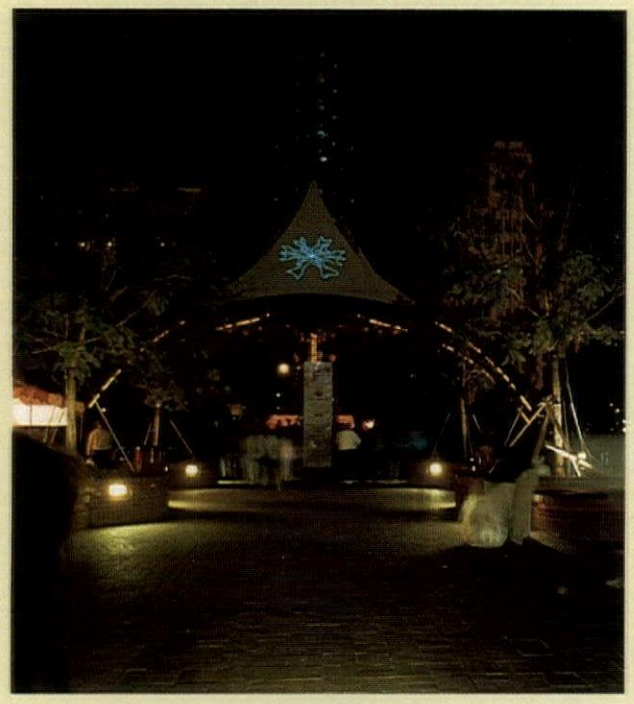
Each building facade presents a new canvas for the moving light paintings. To date, Science Faction has installed three permanent outdoor installations. Two are featured in this article. (The third, not shown, is located at the Sands Hotel & Casino in Atlantic City, NJ.) Also shown are a variety of temporary installations.

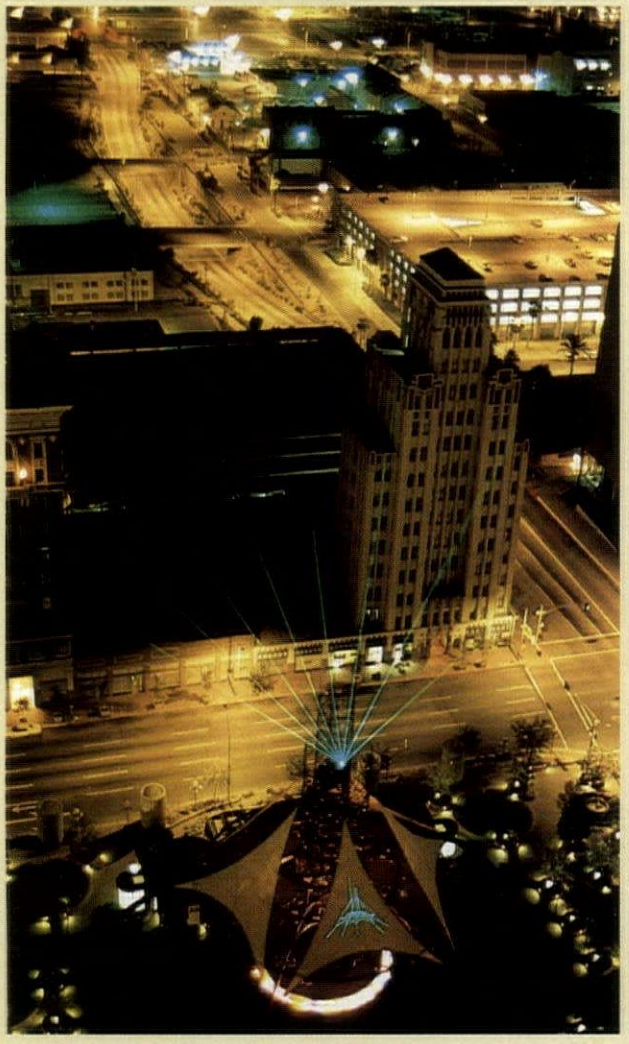
TEMPORARY INSTALLATION

INTERNATIONAL FESTIVAL OF THE ARTS

A nightly light sculpture exhibition filled the New York sky for the month-long New York International Festival of the Arts.

Laser systems placed atop the Pan Am Building, Trump Tower, and One Liberty Plaza (not shown. The individual laser systems were synchronized via telephone lines in orchestrated performances that were seen throughout the city and parts of New Jersey.





PERMANENT INSTALLATION

PHOENIX VALLEY LASER LIGHT

Located in Patriot's Square, Phoenix's new downtown park, Valley Laser Light is a viewer-controlled laser installation that complements the dome/spire sculpture designed by Ted Alexander, AIA. The public art project is the world's first large-scale interactive laser display; it reflects Phoenix's eagerness to position itself as a city of the future.

"Lasers look appropriately futuristic for Phoenix and are obviously cutting edge technology," says Alexander, who also designed the architect for Patriot's Square, and has been working on the project with Science Faction's Richard Sandhaus since 1987. "Yet it was important that we find a way to put the technology in the hands of the people, to give them some control. The centrally located spire sculpture for Patriot's Square was already designed and built when I started working with Richard. I am very pleased with how he incorporated the 'hands-on' laser application into the existing structure."

This marks the first-ever public art installation where the viewer "creates" a new animated laser light painting every minute, with about 100 graphic images, from 48 possible image-movement combinations.

Science Faction's LaserMaster is the viewer-activated console located about 150 feet north of the dome/spire sculpture in the center of Patriot's Square. It serves as the control center for one of two laser projectors mounted in the spire portion of the sculpture.

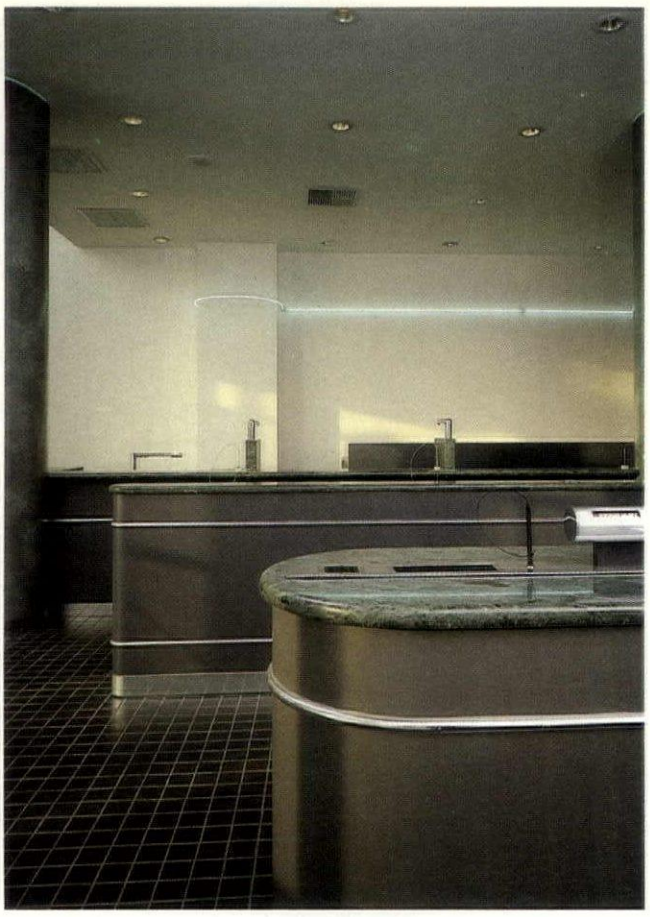
The upper laser, near the spire's top, is 75 feet above the ground, and projects a pre-programmed continuous aerial beam display that revolves 360 degrees across the city skies, visible for several miles. The lower laser—controlled by LaserMaster—is mounted 40 feet up, just above the dome. To create the nightly animated graphic images, the laser rear-projects imagery onto the spire's north-facing triangular fabric screen.

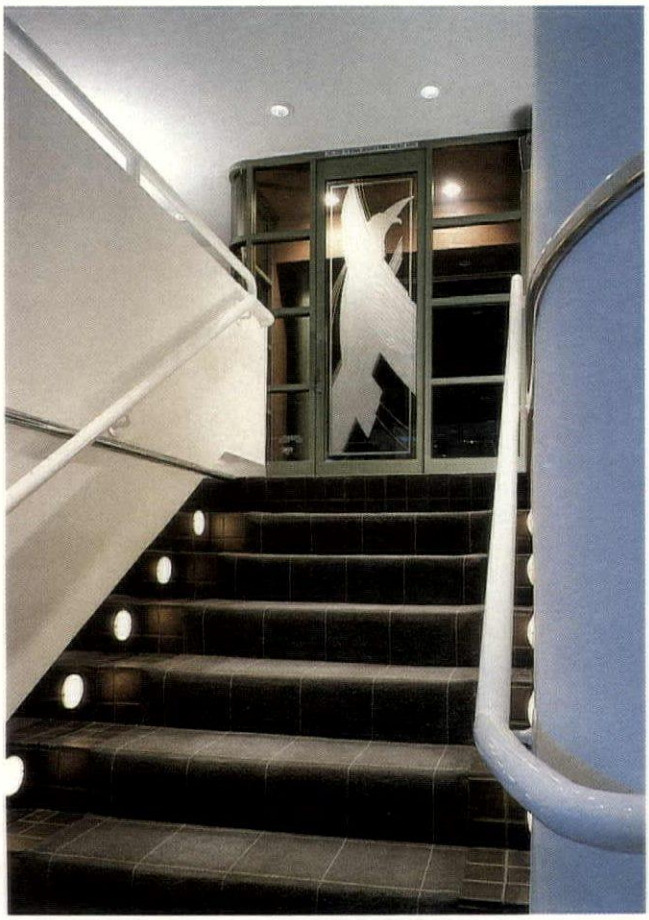
To use Valley Laser Light, the visitor touch-selects a single square from one of 10 unmarked squares displayed along the edges of the LaserMaster screen. Each square corresponds to a different mystery image, which is immediately projected onto the large triangular "laser" screen. The projected image is nearly 30 feet tall.

Once an image is projected, of a helicopter, for example, the visitor can animate it, flying the aircraft image about the screen, or even transforming it into an animated abstraction. The controls available to the visitor are represented by six rectangular strips located in the center of the LaserMaster screen.

Nearly record-setting attendance at the official opening, and a steady, nightly stream of visitors to Valley Laser Light has marked the success of the installation to motivate a reluctant population downtown after dark.

HOLLYWOOD BANKING: Green neon circles the tops of the non-structural columns (this page) and runs the length of the wall behind the teller stations (opposite page, top) in the Bank of Los Angeles. The stairwell (opposite, bottom) is marked with 25-watt tread washers.





Banking L.A. Style

A West Hollywood bank is brightened with untraditional lighting

BY MARY ELIZABETH NAEGELE
CONTRIBUTING EDITOR

It wouldn't be Tinseltown without *some* glitter. That's why the Bank of Los Angeles in West Hollywood, in a move to present a semi-conservative but not staid image, went with neon accents and contemporary task lighting in its recent interior design. Sharon Landa, ISID, created a space that features lighting for both day and night activities, and ambient lighting that makes up for the bank's high ceilings. The neon in the bank is meant to "make a declarative statement," says Landa, ISID, of Landa-Stevens Partnership, Architecture, West Hollywood. She worked with Carol Poet, ISID, Poet Design Associates, West Hollywood, on the lighting and interior design. The pair chose green neon for the interior to complement the painted jade columns. Behind the teller line is a neon tube that runs the length of the wall.

"It's like a piece of art," Landa explains. "We were hoping there would not be a lot of art back there. We wanted something that would not argue with the basic architecture of the building."

Green neon also circles the tops of the nonstructural columns, which run down the center of the main business area.

"The green neon doesn't pull sharply away from the columns. It is an exciting bit at the top," Landa says. The designers carried the neon theme throughout the project, from the bank's entryway to its conference room.

"Flesh-colored neon frames the entire ziggurat of the entrance," Landa says. "I tried about 10 different colors of neon in different light at different times of the day before finally deciding that this one looked best against the bank's rosy plaster exterior."

Bright neon would have been a distraction in the major intersection near the bank, she points out. Task lights housing 40-watt lamps reach out like elongated periscopes.

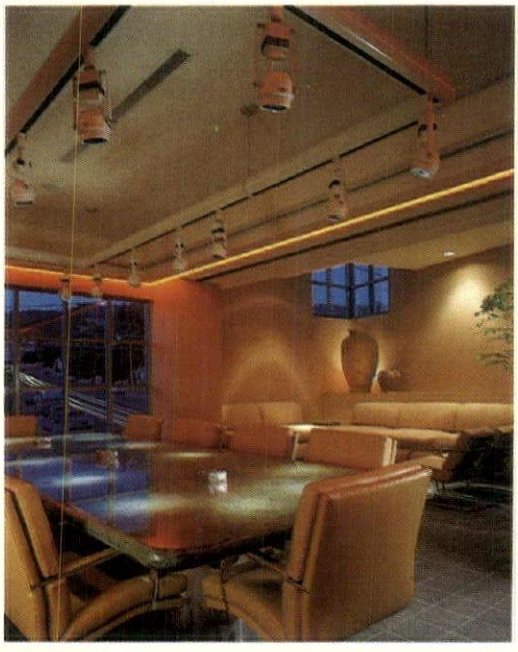
PHOTOS BY DAVID GLOMB

OFFICE ART: A Tizio table lamp serves as the art element in the chairman of the board's office (above). The conference room glows with a peach-colored neon that improves skin tone.

"We wanted these fixtures to work harder, not just light the areas," Landa says. "They provide an interesting change of line and form on the teller line."

On the other hand, 75-watt recessed downlights were not meant to do anything but their task. "We were very concerned that the lighting wouldn't jump out since trim is painted the ceiling color."

Since this bank holds various social and cultural activities in the evenings, some of the lighting was specified for nighttime. Landa says the 25-watt tread washers that punctuate the stairs, while used in the daylight, were really chosen with night use in mind. The recessed downlighting is on reostats, and when that light is low, the neon is particularly effective.



Further use of lighting as art is seen in the chairman of the board's office. It features a Tizio table lamp, one of which is displayed at the Museum of Modern Art in New York.

Sconces with green glass echo Landa's green neon accents and were used throughout the bank to temper the vastness of the 15-foot ceilings, she says.

And in the conference room, peach-colored neon creates a warm glow that "makes the board members look great," she says. "We dropped U-shaped track lighting so that there is a lamp over each board member's writing area. We did a graph to determine where the lights would sit exactly so the green marble table is beautifully lit—not the tops of heads." ■

DETAILS

PROJECT: *BANK OF LOS ANGELES*
LOCATION: *WEST HOLLYWOOD, CA*
LIGHTING/INTERIOR DESIGNERS: *SHARON LANDA, ISID, LANDA-STEVENS PARTNERSHIP, ARCHITECTURE, WEST HOLLYWOOD; CAROL POET, ISID, POET DESIGN ASSOCIATES, WEST HOLLYWOOD*
LIGHTING MANUFACTURERS: *GEORGE KOVACS: task lighting; CAPRI: recessed downlighting; KOCH & LOWY: distributor of TIZIO lamp; LUMINOUS NEON.*
PHOTOGRAPHER: *DAVID GLOMB PHOTOGRAPHY*

TROUBLESHOOTING FLUORESCENT LIGHTING

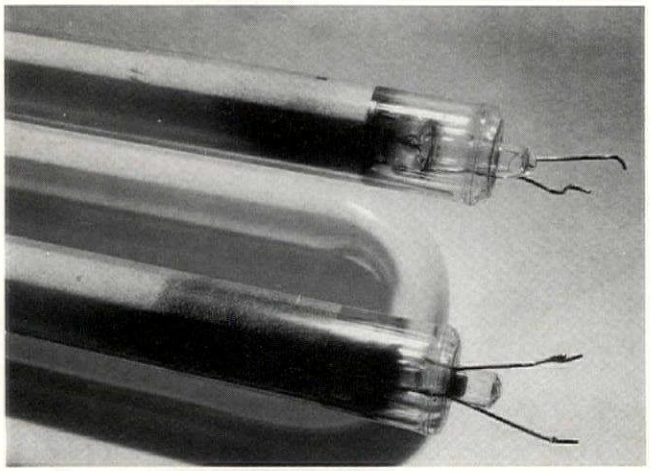


FIGURE 1: End of life occurs when insufficient material remains on the cathode. Cathode emissive material collects on the inner surface of the lamp, blackening the ends.

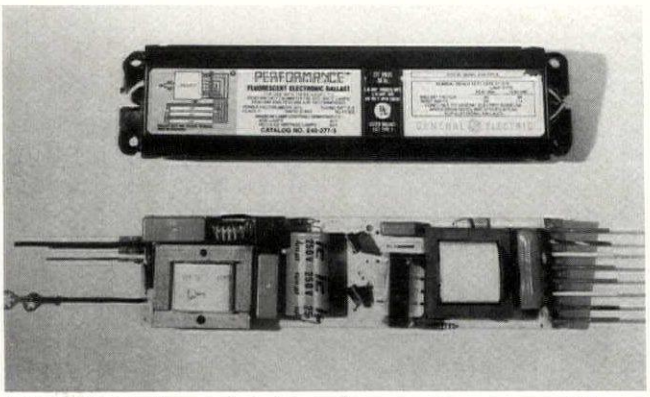


FIGURE 2: An electronic ballast photograph, courtesy of the General Electric Lamp Business Group.

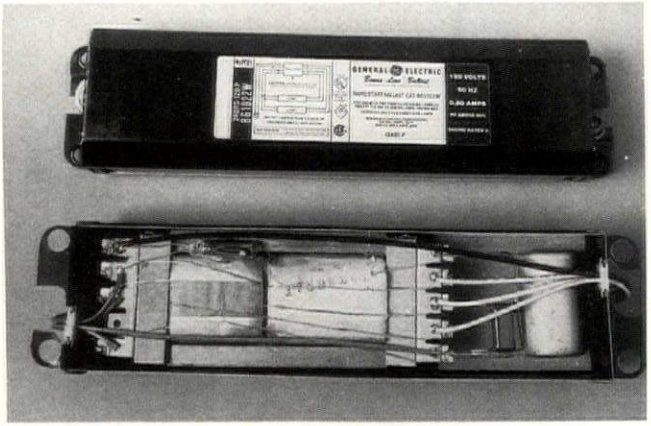


FIGURE 3: A core and coil electronic ballast photograph, courtesy of the General Electric Lamp Business Group.

BY VICTOR MEELDIJK

The author is reliability/maintainability engineering manager, Diagnostic/Retrieval Systems, Inc., Oakland, N.J.

Fluorescent lighting failures can be caused by a variety of problems including defective ballasts, starters, or end of lamp life. The most common problem is lamp end of life, which is categorized by the blackening of the inner surface of the lamp, especially at the ends (Figure 1). This is caused by the barium, strontium, and calcium emissive material given off by the tungsten electrodes. The lamp blinking that signals the end of life occurs because there is insufficient material remaining on the lamp electrodes to strike an arc. Before attempting any repairs, or component replacements you need to know about the different fluorescent fixture designs.

IDENTIFYING LAMP DESIGNS

PREHEAT LAMPS—Introduced in 1938, these bulbs require several seconds of current flow to the cathode to preheat them between the time the lamp is turned on and when it lights. Switching from preheat to full voltage is usually done automatically but in some desk lamps, and under counter fixtures, it is done by manually depressing a start button for a few seconds and releasing it to start the lamp. Preheat lamps are identified by the two external contacts at the ends of the lamp that connect to the lamp cathodes.

INSTANT START (SLIMLINE)—Introduced in 1944 this design eliminates the slow starting of preheat lamps. These lamps operate with a ballast that provides a high voltage which strikes an arc instantly (.050 seconds) without starters. The lampholders are usually push-pull types that disconnect the ballast unless the lamp is properly seated in position. The lamps have only one external contact since no preheating is required, although sometimes they have two pins at each end with the extra pins connected together inside the lamp base.

RAPID START—These lamps, introduced in 1952, start smoothly and quickly—using cathode heating provided by heating windings in the ballast—and do not use starters. An external starting aid is either a grounded metal strip within a half inch to 1 inch of the bulb that extends the full length of the bulb, or the metal of the fixture itself.

Circline lamps are rapid start types but also work with preheat ballasts and starters. Fluorescent lamps, and all arc discharge lamps, require a ballast.

IDENTIFYING BALLAST DESIGNS

Each type of fluorescent lamp requires a ballast that has been especially designed for its electrical characteristics, the type of current for which it operates, and the voltage and frequency of the input power. The lamp ballast, whether it be

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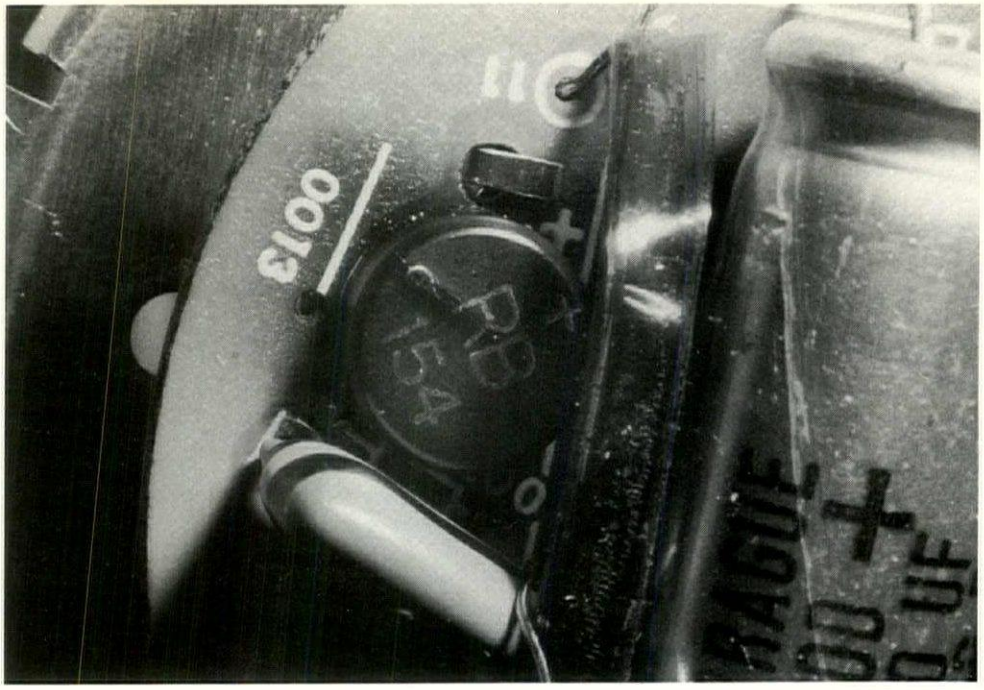

FIGURE 4: This input diode bridge opened, causing the failure in an electronic ballast.

CONTINUED FROM PAGE 33

choke coil, reactor, capacitor, resistive or electronic, supplies the starting kick voltage for the lamp and acts as a choke to limit lamp current. Current limiting is necessary due to the negative resistance effect of the fluorescent lamp. As the current increases, resistance drops and without a current limiting ballast the arc will draw enough current to destroy itself in a fraction of a second. It is therefore very important that the proper starter is used when replacements are made not only for safety but to optimize lamp life and keep noise low in office areas.

CORE AND COIL BALLAST—The core and coil ballast consists of an inductor made up of a copper wire coil and a laminated steel core. It may also contain a transformer to develop sufficient lamp starting voltage and to heat the electrodes continuously for rapid start circuits.

To comply with National Electrical Code and Underwriters Laboratory requirements for class P ballasts, they are also equipped with a self-resetting thermal protector, which opens when the ballast case temperature reaches 100 degrees C ± 5 degrees C. When the ballast cools, the protector resets (closes), restoring operating power. The ballast will continue to recycle until the cause of the overheating is corrected. If the problem is internal to the ballast, it must be replaced.

All magnetic ballasts produce a sound, called a hum. Ballasts are sound rated from A to F with the A ballast having the least hum for use in quiet areas. The most audible F ballasts are used for street lighting or noisy factory areas.

ELECTRONIC BALLASTS—Electronic ballasts, initially introduced around 1980, save 25 to 36 percent in energy costs over conventional core and coil ballasts. Dimming functions can save an additional 8 to 10 percent. Electronic ballasts are lighter than magnetic ballasts (55 percent less weight at 1.5 pounds), run cooler (thus saving in air conditioning costs),

FLUORESCENT FIXTURE TROUBLESHOOTING GUIDE

SYMPTOM: Humming/buzzing noise
CAUSES: Loose fixture; ballast mounting loose; defective ballast

SYMPTOM: Ballast hot (case temperature over 90 degrees C)
CAUSES: Line voltage too high; defective lamps (instant start or preheat designs)

SYMPTOM: Lamp discolored, dark bands near ends
CAUSES: Defective starter; defective ballast; end of lamp life; mercury accumulation (gray streaks on lower part of tube, rotate lamp tube to correct)

SYMPTOM: Radio interference
CAUSES: Move radio 4 to 10 feet away, and, if no effect, install line filter in lamp fixture; For special applications, such as labs, RFI screens in front of the lamps with the line filters can be used

SYMPTOM: Lamp blinks
CAUSES: Lamp failure (end of life if lamp blackened); defective starter (especially if a new lamp has been installed); defective lamp; low input voltage; low ambient temperature

SYMPTOM: Only lamp ends light
CAUSE: Defective starter

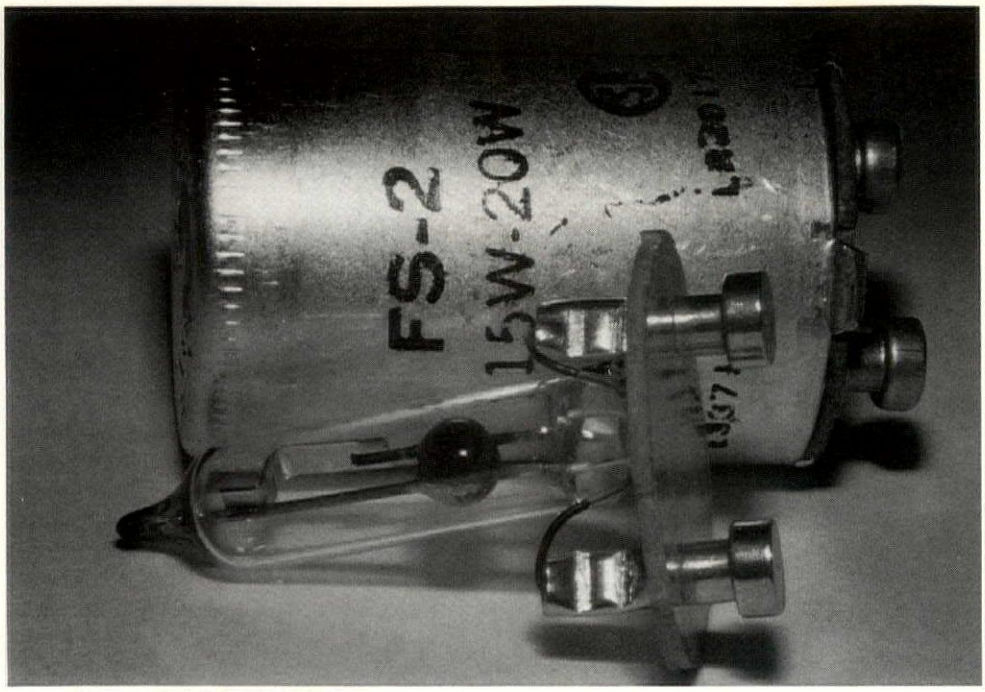

FIGURE 5:
A glow switch starter.

and are quieter than the A rated ballasts. Electronic ballast designs include:

Field Adjustable Dimming Module Option—a set screw is provided on each ballast for up to a 65 percent light reduction.

Remote Manual Dimmer—this replaces the standard wall switch and operates up to 100 ballasts.

Automatic Dimmer—a photocell tracks the light level in the room and maintains a constant light intensity.

ELECTRONIC BALLAST OPERATIONS

The electronic ballast operates at frequencies between 25 and 35 KHZ (some operate as high as 50 KHZ) versus the standard electromagnetic ballast, which runs at the 60 HZ line frequency. At these higher frequencies less energy is required to heat the fluorescent gas inside the lamp because the gas has less time to cool down between cycles and the phosphor has less time to fade since it is charged more often. Flicker rate, with this higher frequency of charging, drops from 34 to 2 percent. It is also reported that lamp life may increase by a factor of 25 percent with electronic ballasts. (However, lamp life may also reduce if the ballast does not meet lamp operating frequency, wave shape, and voltage requirements. Some manufacturers now offer lamps with higher gas pressure, different cathode mount structure, and special phosphor coating for operation with electronic ballasts).

Electronic ballasts are available for Rapid Start, Modified Rapid Start, and Instant Start Designs. Compare Figure 2, an electronic ballast, with Figure 3, a coil and core ballast.

Early electronic ballast designs had as many as 100 components in their design and were prone to early failure. Figure 4 shows a diode bridge that failed due to a line transient. Current designs, which have far fewer compo-

CONTINUED ON PAGE 36

SYMPTOM: Lamp will not go on
CAUSES: Lamp failure; poor lamp socket contact; ambient temperature too low (below 50 degrees F); ballast failure—core and coil type: open winding; electronic: failed part (see Figure 5)

SYMPTOM: Short lamp life
CAUSES: Input voltage too high or too low; poor contact in lamp socket; switched on/off too often (special duty lamp needed); defective starter; defective ballast

SYMPTOM: Lamps shiver or flicker (erratic swirling or twisting pattern, or uneven brightness)
CAUSES: New lamps (should be burned-in for 100 hours); lamp failure (cathode failure in instant start circuit); low ambient temperature (check if near air conditioner duct); defective starter; defective lamps; incorrect line voltage; defective ballast

SYMPTOM: Slow starting
CAUSES: With some compact fluorescents full brightness takes a few seconds after turn-on; low line voltage; poor lamp socket contact (in rapid-start circuits, one side may be the problem); defective starter; in rapid start design, check spacing of the lamp from the reflector, also check fixture ground; defective lamp (in rapid start circuit, one cathode may be open); low ambient temperature (in rapid-start circuits, high humidity may effect lamp coating, clean the lamp). Note: Lamps turned on/off without much operation may become hard to start; operate several hours to correct.

FLUORESCENTS CONTINUED FROM PAGE 35

nents, are typically rated for a 30,000-hour life, which compares against a 20,000-hour life for magnetic ballast designs.

STARTERS

In preheat lamp circuits, when the power is applied to a starter or automatic switch, current is allowed to flow through the lamp cathodes. The types of starters are:

GLOW SWITCH—upon starting, a glow discharge heats a bimetallic strip that closes switch contacts to start preheating and extinguishing the glow. During the preheating, the bimetallic strip cools, which opens the switch contacts, starting the lamp. During lamp operation the voltage is too low to produce a heating glow and the switch contacts remain open (see Figure 5).

MANUAL RESET CUT OUT (WATCH DOG) STARTER—Like the glow switch but incorporates a lock-out switch that automatically removes the glow switch from the circuit if the lamp fails to start after 15 to 20 seconds. This stops annoying lamp blinking and prevents ballast overheating. A reset button projects through the top of the starter case.

AUTOMATIC RESET STARTERS—In areas where it is not practical to manually reset starters (i.e., in factories where line voltage may be low for a period of time) an automatic reset starter is used. These starters have an extra heater which keeps the starter contacts open as long as voltage is supplied to the lamp. The lamps start when the starter cools or when the lamps are switched off and on.

THERMAL SWITCH STARTERS—These starters contain a thermal switch and heater. The thermal switch is closed when voltage is first applied to the lamp circuit. As preheating

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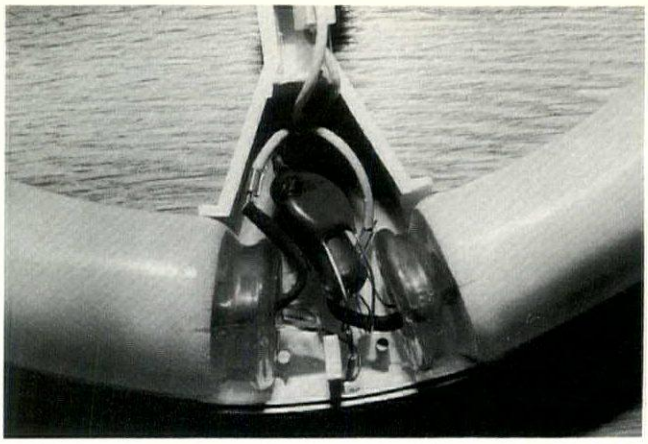
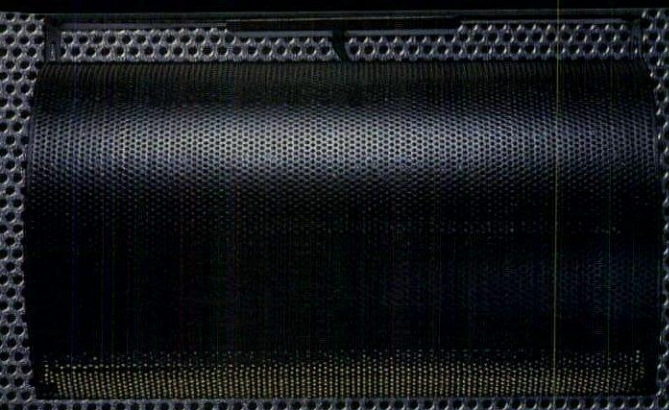


FIGURE 6: A failed capacitor in a GE Circlite Miser lamp starter circuit.



Echo

To provide a controlled wash of illumination across a plane. To transform shadow into highlighted detail. To put the true versatility of indirect asymmetric lighting into a word: **Echo**.

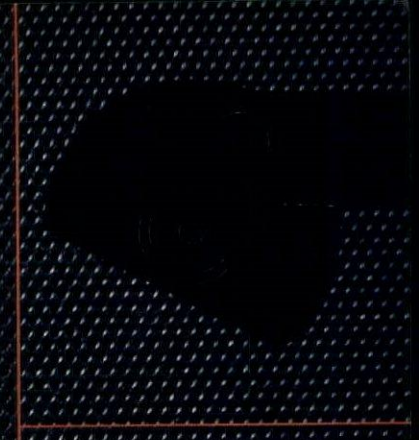
Echo is three sizes with multiple lamp types and wattages.

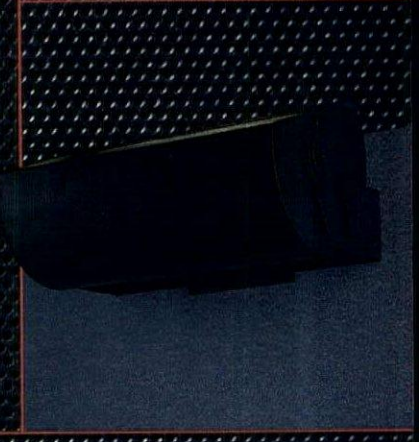
Echo is wall, ceiling or pier mounted with integral or remote ballasting.

Echo is superior optical performance and safe, cool operation.

Echo is perforated or solid housings with decorative shrouds.

Echo is only from SPI Lighting.





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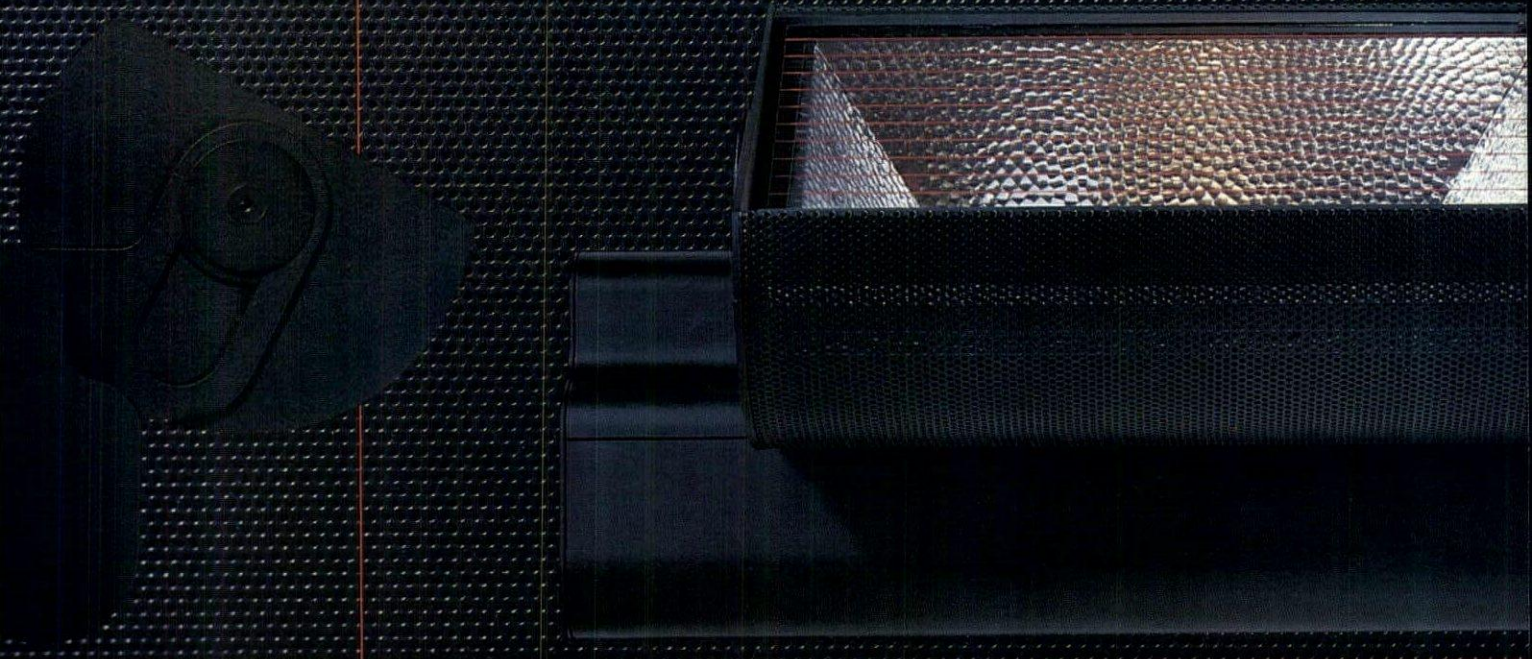

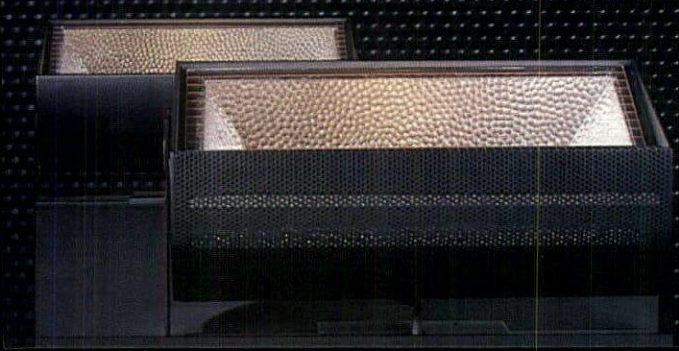

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Circle No. 13 on product card.

FLUORESCENTS CONTINUED FROM PAGE 36

occurs, the heating coil actuates a bimetallic strip to open the starter switch contacts. During the lamp operation a small amount of energy is used to keep the starter switch contacts open.

COMPACT FLUORESCENT LAMPS

These lamps are used to directly replace incandescent lamps. Compact fluorescent lamp designs include the use of an electronic ballast, in the North American Philips units, and core and coil designs in the Mitsubishi, Sylvania, and General Electric units. In the General Electric twin tube design, a core and coil ballast is in the removable base and the starter is incorporated into the bulb assembly. This is also true of the General Electric Miser Circlite Fluorescent adaptors.

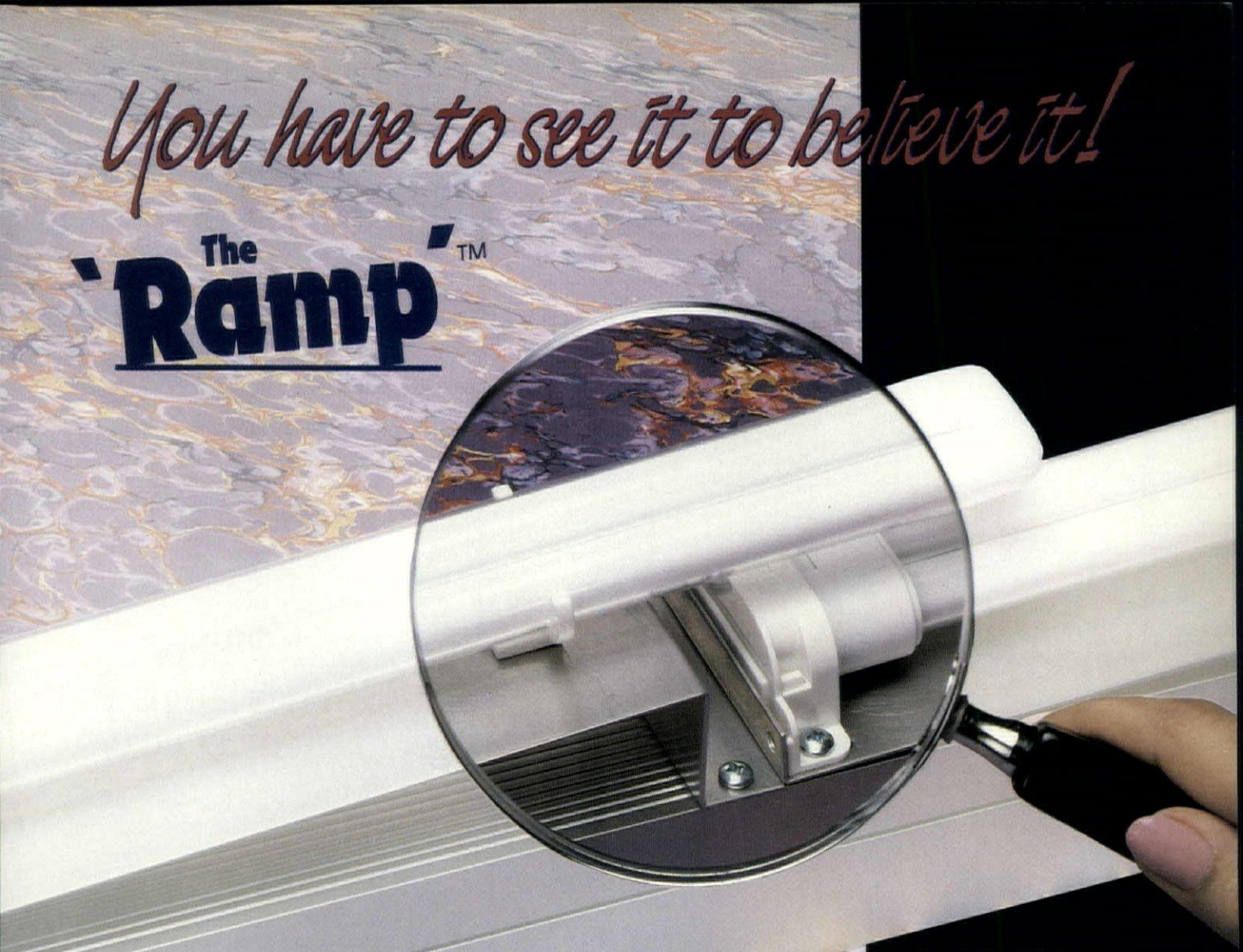
In standard fluorescent lamp fixtures the faulty component is replaced. With compact fluorescents, however, either the whole assembly is replaced or, with two-piece designs, the ballast base of the lamp is replaced.

NOTES:

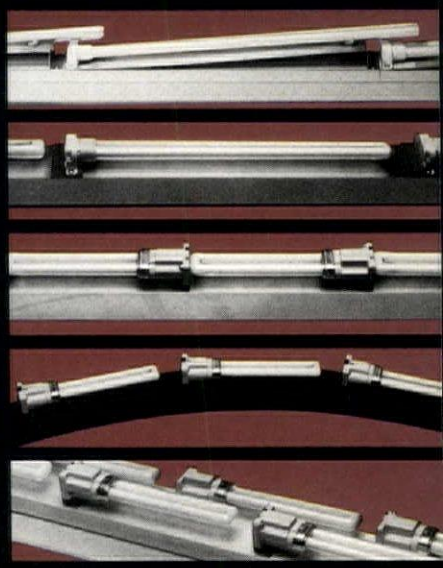
1. If one lamp on a rapid-start, two-lamp circuit fails, both may become dim or go out. The good lamp will not be damaged as heating current still flows through the cathodes.
2. Preheat circuits can use preheat and rapid start bulbs. Do not use instant start bulbs. Instant start circuits can only use instant start lamps. Preheat and rapid start lamps may light but will have a very short life. Rapid start can use rapid start lamps only; instant start lamps will not light and could cause ballast burn out. Preheat lamps may work but their operation may be unreliable and their use is not recommended.
3. A 1 percent variation in voltage changes lumen output by about 1 percent. Line voltage drops that cause a 40-watt T 12 lamp to go out are: 25 percent for preheat circuits, 20 percent for rapid start circuits, and 50 percent for instant start.
4. Lamp life is reduced when it is switched on and off frequently; a continuously burning lamp may last 2.5 percent longer than one is operated for three hours at a time.
5. Optimum ambient temperature around the bulb is 77 degrees F, and a rule of thumb is that for every 2 degrees F above this, the loss of light output is 1 percent. This however, does not apply to some compact fluorescents, which may increase their light output at higher temperatures.
6. The base mark (a bump in the lamp end collar) should be aligned with the center of the lamp socket for proper seating of the bulb.
7. End banding may occur gradually during normal lamp life but excessive blackening may be a sign of insufficient cathode heating in rapid start circuits, which results in shortened lamp life. ■

You have to see it to believe it!

The 'Ramp'™



Norbert Belfer Lighting produces a wide variety of compact fluorescent light strips in various configurations and lamp wattages. Please consult factory for further details!



If you are looking for the ultimate in shadowless, high lumen, cost efficient perimeter lighting... Look no more! "The Ramp" is your answer.

Overlapping one CF-40 biaxial lamp over the socket of the next lamp allows the designer to provide 1920 lumens per linear foot.

Sockets are mounted on an extruded aluminum raceway which is supplied in custom lengths or factory mitred for curving. Even re-lamping has been made easy with "Lift-up" sockets.

"The Ramp" utilizes integral rapid start, high power factor regular or electronic ballasts. 120 volt or 277 volt.

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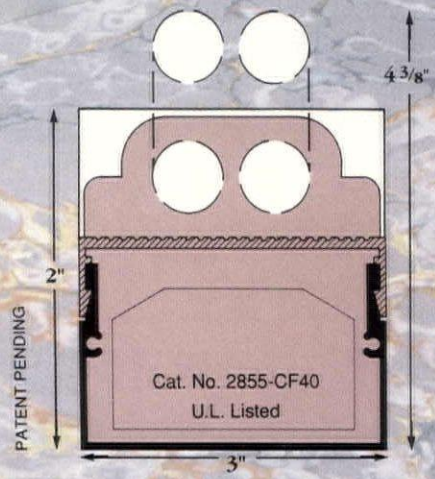

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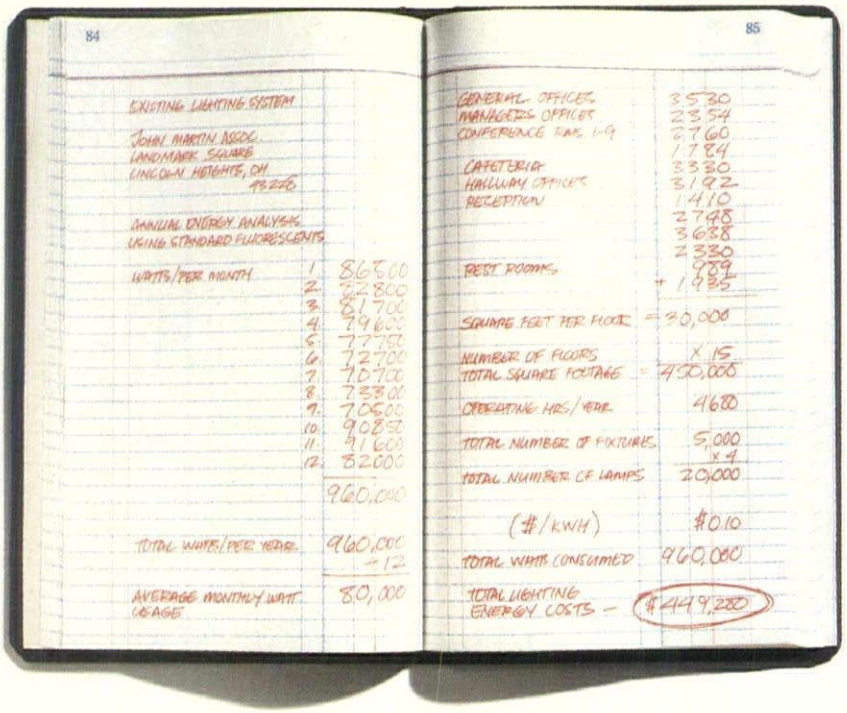
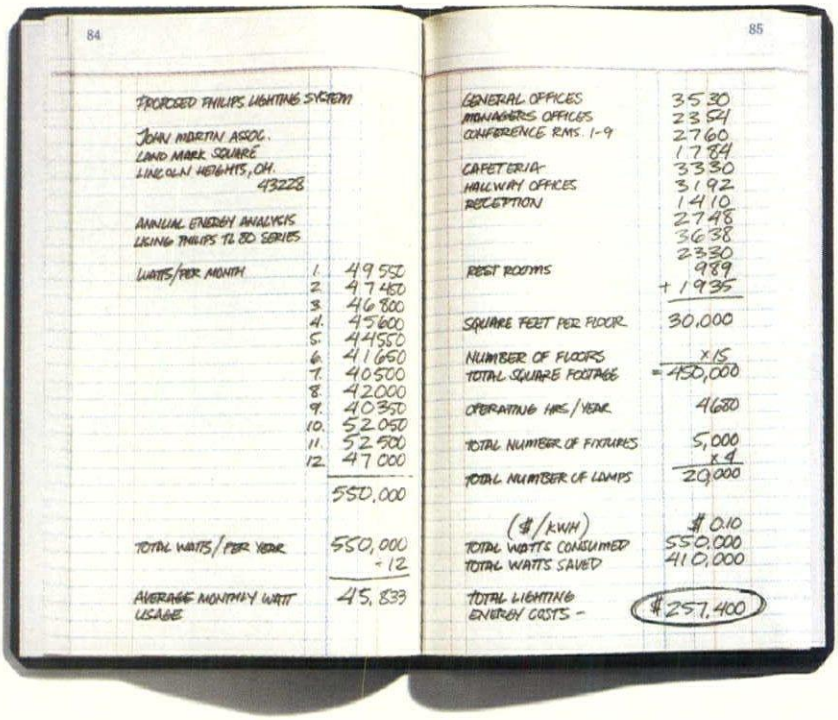


Using Philips TL 80 Series.



With Philips TL 80 Series lamps, you get much nicer colors.

Pastels will look softer. Earth tones will look richer. Office spaces will look more comfortable. And electric bills will look much less alarming.

By replacing standard T-12 fluorescent lamps with Philips TL 80 Series lamps, combined with an electronic ballast, your clients will get the best fluorescent lighting system in the world. No other T-8 fluorescent lamp has a higher color rendering index or a higher light output level. Thanks to rare earth phosphors, the quality of light is quite similar to incandescent. And that can have a dramatic effect on the workplace.

Not to mention your electricity consumption. When you specify TL 80 Series lamps with electronic ballasts, you'll cut energy costs by 43%, versus standard fluorescents. Considering that lighting can account for up to 50% of your total bill, these lamps could really make your client a hero around the office.

If you'd like more information on how TL 80 Series lamps can save energy costs in your building, give the Philips Lighting Team a call at **1-800-631-1259.** We might not be able to change red to black, but we sure can save your clients some green.

TL 80

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ARCHITECTURAL
LIGHTING

DESIGN FOCUS REPORT

Corporate Spaces

ENJOYING THE WORKPLACE

The work environment has a significant effect on productivity and well-being. Developers and employers are using high-quality surroundings to attract tenants and top-notch employees. Featured here are a lobby renovated to keep up with the competition, and an office complex that creates a medieval world in miniature (shown above is a lobby mural lighted with MR 16s). Because today's workplaces must be energy efficient, guidelines on conducting a pre-retrofitting audit are included also.—*WJ*

22 CORTLANDT LOBBY

HIGH PROFILE

WIDE-OPEN SPACE: Updating this office building lobby (before-renovation view far right) meant redesigning its floor and ceiling (right). The new look, with luminous geometric patterns and easily maintained lamps, was created by the combined talents of architect and lighting designer.

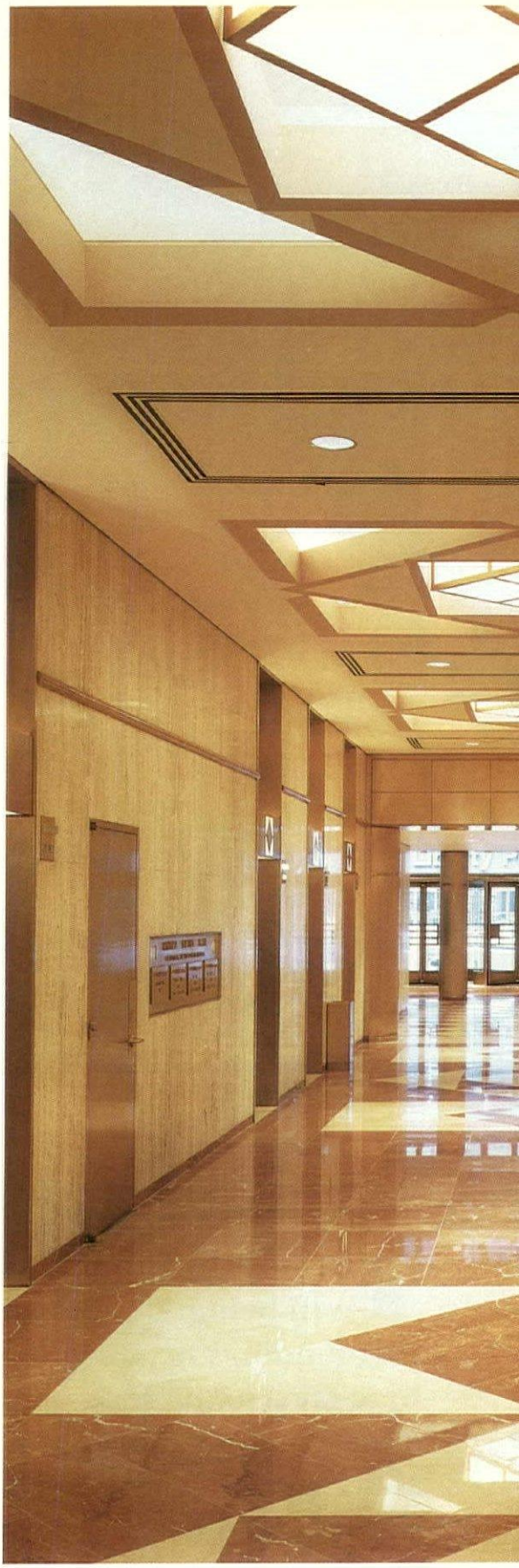
The lobby of any public building is the main thoroughfare and gathering place for those who work in and visit the building. Employees and clients not only pass through, but often meet in the lobby, so naturally, it's also one of the most important spaces considered by prospective tenants.

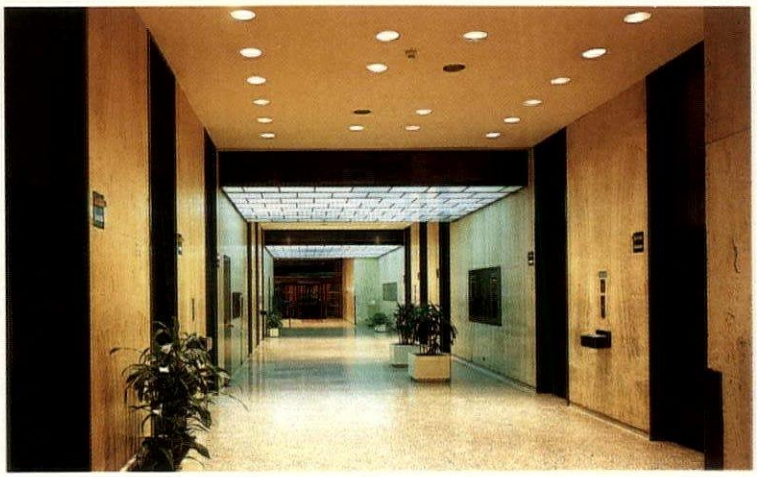
The lobby of the Manhattan office building at 22 Cortlandt Street required an updated design in order to compete with newer buildings for companies and firms looking to rent. Architect Jay B. Walter, AIA, salvaged what he could from the 1960s design—the walls and muntz metal elevator doors—and then radically changed the floor and ceiling to create an attractive, upscale, and sumptuous lobby.

The ceiling is quite complicated, becoming a home for different lighting elements that not only illuminate the space, but really define it by uniting the lighting scheme with the architectural design.

"The lighting is integral to the architecture, because the architect intended to synthesize the two from the outset," says lighting designer Diana Juul of Mesh & Juul Inc. "He gave us a real opportunity to do more than merely provide illumination. He created structural forms to achieve the desired effects—so, the project is really a marriage of lighting and architecture."

The center squares in the ceiling are large luminous cubes that project up into the ceiling coffer. Inside these plastic diffusing cubes are 60-watt A 19 lamps. Directly below the coffer, the cubes are surrounded by a rotated square that floats flush with the ceiling plane. As a result, hollow traingular-shaped areas are open to the uplit coffer above, says Juul. Mounted on the "floor" of the custom ceiling coffer, and uplighting the





cavity are 60-watt A 19 silver bowl lamps. Recessed in the ceiling area between coffers are 150-watt PAR 38 floods.

The light cubes and uplit coffers of the ceiling provide ambient light, while the PAR 38 downlights in between the coffers make the floor sparkle and highlight the marble.

"As lighting designers we worked very closely with the architect to make his concept work—it was a real collaborative effort," Juul says. "Because the design was so unusual, we had to build a full-size mock-up of one of the coffers to calculate shadow lines and specify the correct light sources."

Although the scheme is quite complicated, very common lamps are used.

"It is usually assumed that when things look elaborate, that means they're difficult to maintain and afford," Juul says. "That wasn't the case here. Our design development work paid off because the owners got a great looking lobby with inexpensive equipment that is easy to maintain."

The architect's strong ceiling design led to design solutions for other lighting elements in the lobby. Mesh & Juul aided the architect in creating custom light fixtures for the elevators. Located in the transom panel above the elevator door are 40-watt A 19 lamps. Milk-white acrylic panels inside the elevator cab are illuminated by 40-watt lamps.

"We also provided specifications for wallwashers and downlights near the lobby's front and rear entries," Juul says.

There was no furniture added to the renovated lobby—except the concierge desk—so the walls, floor, and ceiling become its decorative elements. The architecture and lighting, being truly one design, makes this space innovative and unique.

—Christina Lamb

DETAILS

PROJECT: *LOBBY AT 22 CORTLANDT STREET*
LOCATION: *NEW YORK*
BUILDING OWNERS: *HELMSLEY-NOYES CO.; METROPOLITAN LIFE*
LIGHTING DESIGNER: *STEVEN MESH & DIANA JUUL, MESH & JUUL INC.*
ARCHITECT: *JAY B. WALTER, AIA*
GENERAL CONTRACTOR: *HERBERT CONSTRUCTION CO.*
PHOTOGRAPHER: *STEPHEN FISCHER*
LIGHTING MANUFACTURERS: *EDISON PRICE: PAR 38 lamps; C.J. LIGHTING CO.: 40-watt A 19 lamps in medium screw-base sockets; WIREMOLD SOCKETS & RACEWAY: Lumiline lamp; LANCER METAL: custom ornamental metal work*

DESIGN FOCUS REPORT

CAMBRIDGE COURT

CONTEMPORARY CAMELOT

OUTSIDE & IN: The exterior of One Cambridge Court at night (below) glows golden with washers from HPS fixtures, and sparkle from roofline incandescent bud lights. The lobby at dusk (right) is illuminated by custom-made chandeliers. In this photo, the exterior skylight fixtures have not been turned on.

The scenery along I-495 on the way from downtown Washington, D.C., to Merrifield, VA, is just like any suburban highway landscape—plain, boxlike structures housing fast-food restaurants and office buildings. It is not until you turn down Gatehouse Road that a phenomenon jolts you out of place and time.

Cambridge Court, six stories of peaked and turreted green glass and limestone, looks like a 20th century castle. The structure is actually a luxury office complex that includes two 111,000-square-foot office buildings joined by a 95-foot skylit atrium. Its unusual character results from the combination of styling derived from the Gothic structures of the 14th and 15th centuries, and clean, modern lines and materials.

"The impression a building makes—its visual drama and the atmosphere it creates—is derived from numerous architectural details: materials, finishes, forms, and shapes," says Lowell Baier, president of Baier Properties, Inc., and one of the developers of the complex. "Distinctive buildings either establish or follow principles of architecture that have developed through the centuries and have become timeless in their character."

The architectural details have been enhanced, in turn, by interior and exterior illumination designed by Abe Feder, Lighting By Feder, New York. At night, the building exterior is bathed in a golden glow. The perimeter of the roof is lined with a double row of low-voltage incandescent bud lights. Gables and the central peak of the atrium skylight are highlighted with stadium fixtures—26 fitted with 1,000-watt high-pressure sodium (HPS) lamps, and 52 with 400-watt HPS lamps.

At ground level, HPS lamps are used in grade-level fixtures to gently wash the facade, and in decorative poles in the front plaza. The front plaza fountain, and four flagpoles are also lighted with unobtrusive HPS fixtures.

Detailed ecclesiastical–style elements are abundant in the atrium, described by Baier as the heart and soul of the building. Classic stones—limestone, green and white marble, black granite—are assembled into colorful mosaics drawn from patterns in one of the Medici palaces of Venice. A contemporary rendering of a rose window, commonly found in 14th century cathedrals, adorns the upper glass walls at the front and back of the atrium.

In the center of the lobby stands a 29-foot high concierge/security kiosk, inspired by the French Abbey of Fontervault (c. 1195). It's custom made of intricately carved, red-stained oak, and limestone and wrought iron patterned in tracery fashion. The roof is made of chevron-patterned polished lead topped by a gilded crown. It is lit from within by a complementary decorative lantern.

The atrium lobby contains two custom-designed chandeliers. Each chandelier contains 48 incandescent lamps that cast direct light down towards the lobby floor, and project light up to illuminate the skylight. Each chandelier is fabricated from black wrought iron with 15th century, ecclesiastical–style polished bronze reliefs, and suspended 46 feet above the lobby floor.

The southern-situated main entry

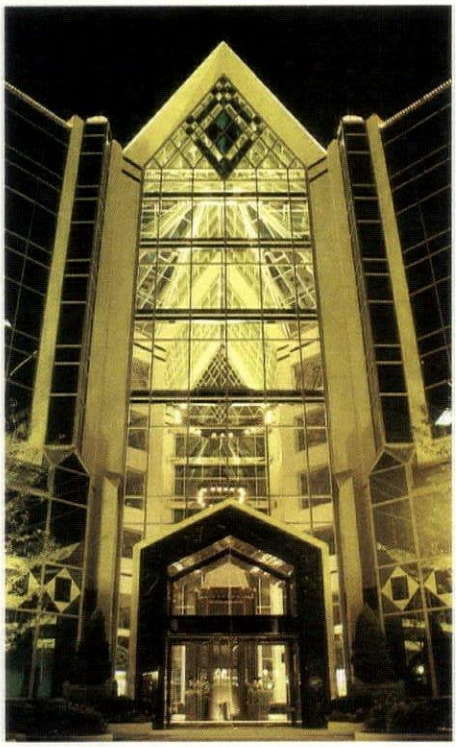
DETAILS

PROJECT: *ONE CAMBRIDGE COURT, FALLS CHURCH, VA*
DEVELOPER: *BAIER PROPERTIES, INC., AND ST. PAUL PROPERTIES, INC.*
ARCHITECT: *THE WEIHE PARTNERSHIP*
SPACE PLANNER: *GREENWELL GOETZ ARCHITECTS, P.C.*
INTERIOR DESIGNER: *TOM LEE LTD., SARAH TOMERLIN LEE*
LANDSCAPE ARCHITECT: *ZION & BREEN ASSOCIATES*
LIGHTING DESIGNER: *LIGHTING BY FEDER*
GENERAL CONTRACTOR: *CHAS. H. THOMPKINS CO.*
ENGINEERS: *GHT LIMITED, MEYER ASSOCIATES, P.A.*
MURAL ARTIST: *SHIRLEY TATTERSFIELD*
KIOSK & ELEVATOR DESIGNER: *TODD LEE/CLARK/ROZAS ASSOCIATES*
PHOTOGRAPHER: *JIM TINGSTRUM*
LIGHTING MANUFACTURERS: *LIGHTWORKS: roof and perimeter skylight fixtures; STERNER LIGHTING SYSTEMS: roof atrium, and garage fixtures; KIM LIGHTING: floodlights; KLIEGL BROS.: wall washers and pinspots; SOLUX CORP.: domes and pergola fixtures; BERGEN ART METAL: chandeliers; UNION METAL CORP.: poles; CUSTOM LIGHTING INTERNATIONAL: sconces. GENERAL ELECTRIC, GTE SYLVANIA, DURO-TEST: lamps*

APPROXIMATE COSTS

Overall development value: $50 million
Lighting: $300,000
Garden and landscaping: $650,000
Concierge/security kiosk: $175,000

WHAT REAL MEDIEVAL CASTLES didn't have, that Cambridge Court does have, is atrium illumination (below)—interior chandeliers, and exterior fixtures at the base of the skylight. The kiosk and murals (bottom) contribute to the medieval flavor.



THIS PHOTO ONLY BY JACK SILVER

portion of the lobby—55 feet × 55 feet—contains an octagonal chandelier 18 feet in diameter. The northern portion of the lobby—30 feet × 36 feet—that extends beyond is illuminated with a rectangular, 14 foot × 11 foot chandelier.

"If I'd installed lights any other way, it would have cost 20 times as much," Feder says. "And where would you put them—on the walls? They wouldn't belong."

The medieval motif is continued in four 5-foot × 10-foot murals placed near the entrance that are copied from the Book of Hours of the Duke of Berry (c. 1309). They depict the four seasons at the duke's chateaux and towns. A linnenfold bench with tapestry-covered cushions has been placed under each mural.

Each of the murals is lit by a row of low-voltage MR 16 lamps concealed behind coves mounted above the murals. The ability of the light source to punch up the already brilliant, saturated colors in the paintings makes the murals look like stained glass windows, Feder says.

The lighting in east and west elevator lobbies comes from incandescent dome ceiling fixtures, and wall-mounted decorative sconces. The 6-foot × 16-foot murals at either end of the elevator banks are exact copies of medieval paintings by Simone Martini from the Palazzo Pubblico in Siena, Italy (c. 1328), and are illuminated with recessed quartz wall-washers.

Recessed incandescent troffers in the second floor elevator banks cast light toward the lobby entrance.

The medieval, European character continues into a garden and parking garage behind the office building. A pergola that connects the office complex with the garage has luminous panels fitted with fluorescent lamps in the upper portions of the columns. Incandescent fixtures placed on the atrium roof cast light onto the facade of the 806-car parking facility that looks like a tower clock with a carillon.

Between the office building and parking facility is a one-acre garden, for use by tenants at lunchtime and for special events. The garden is reminiscent of the turn-of-the-century English gardens of landscape designer Gertrude Jekyll and architect Edwin Lutyens.

At Cambridge Court, the work place becomes a world filled with art, serenity, and a sense of the noble refinements of the past. —*Wanda Jankowski*

DESIGN FOCUS REPORT

How To Conduct A Lighting Audit

BY GARY MARKOWITZ, IES

The author is energy administrator/facilities engineer for Raytheon Company, Missile Systems Laboratories, Bedford, MA.

As designers, we often face situations where an existing lighting system must be made more efficient. The challenge is in trying to maintain, if not enhance, the quality of the lighting in these existing spaces, while complying with stringent energy codes.

It is difficult to establish a strategy for meeting this challenge without extensively examining the existing lighting system beforehand. In fact it is a big mistake to assume that simply adding more efficient lamps and ballasts to a room full of existing fixtures is the best way to save energy.

To help establish a strategy for planning retrofits, it helps to develop a simple lighting audit procedure. Audits help establish the condition of an existing lighting system and the architectural finishes of the space and assess the interaction between the lighting and the occupants of the space. Most important, an audit gives benchmarks for determining how effective the improvements to the lighting system will be during and after the completion of the design process.

Site Visit

A site visit to examine the specific characteristics of the existing lighting system is the keystone of the audit. Below are suggested steps to follow:

1. Note the age, condition, and quantity of the existing light fixtures. If an accurate reflected ceiling plan with dimensions does not exist, this is the time to make one.

2. Record the manufacturers and model numbers of the fixtures to help establish photometrics.

3. Record the wattage of the lamps, the ballast types, and model numbers.

4. Note the condition of the fixtures. Are the lenses yellowed or cracked? If so, they are probably at the end of their useful lives. Observe the painted surfaces. Are there burn marks or greasy smudges? Is there yellowing? Deterioration of the fixtures causes excessive loss of efficiency.

5. Ascertain the environmental conditions of the space for dirt depreciation. More dirt will accumulate in fixtures placed in a sandblasting shop, say, than in an office. This will aid in specifying an appropriate replacement fixture that will minimize future maintenance costs.

6. Note the activities of the end-users in the space. Pay particular attention to occupants' ages, and what sort of work is being done in the space.

7. Observe and record how the lighting is switched, and establish whether there are any automated lighting controls or another type of lighting control system.

8. Check all work surfaces with a light meter to establish existing lighting levels. Note the coloration and reflectances of the walls, floors, and ceiling in the space, and establish all other calculation criteria for the space. This will facilitate the use of lumen method and point-by-point calculations for the replacement lighting system.

Reverse Engineering

Once all of this basic information has been recorded and digested, one can begin to make some useful conclusions about the existing lighting system.

- Look at the original intent of the space and the related costs of operating the lighting system that was installed there. Does the existing system still provide an appropriate level of light for the space as it is used? Are energy and maintenance costs in line with this use?
- Run some rough lumen method or point-by-point calculations to establish the illumination levels the original lighting system was designed to produce, and compare them to the light meter readings taken. This will give a good idea of how much the existing lighting system has deteriorated.
- Establish the existing lighting power density. How efficient is the existing lighting system in terms of watts per square foot? How efficient is it in terms of the amount of light actually available at the work surface?

This information gives us a basis for deciding how to improve the lighting system's efficiency and also helps justify improvements to the system in terms of aesthetics, ergonomics, and the cost of maintaining and operating the new lighting system.

A Hypothetical Example

Imagine an insurance form processing center located in a high-rise office building. Originally an open office, it now has been subdivided by 7-foot high partitions into 8-foot by 10-foot cubicles. The walls bear 10-year old paint, the ceilings are stained, and the vinyl floor tile has not been maintained.

The lighting system in this space is a virtual sea of

An audit provides benchmarks for determining how effective lighting system improvements will be during and after the retrofit design process

Remember that the quality of the luminous environment is more important than providing a high quantity of light—in many cases buildings are overlit, and less light will result in better vision.

fixtures, all in terrible condition. The lenses are yellowed and caked with dust. The ballasts are old, core-and-coil types.

The light meter reads an average of 65 footcandles at the work surface. By looking up the photometric data of the fixture, and making some assumptions about the reflectances of the walls, floor, and ceiling in their current state, it can be calculated that the system was originally designed to produce 110 footcandles at the work surface. The unit power density is 3.5 watts per square foot.

Although the users of the space feel that the lighting level is adequate, the facility owners are paying for more light—almost double the amount—than they're actually getting. Apparently, there is room for some improvements here.

Energy Savings Goals

Now that it is known how inefficient the existing lighting system is, energy savings and ergonomics goals can be established by looking at two numbers: unit power densities and recommended illumination levels.

On any project, the first step is to examine local energy codes to establish a maximum allowable unit power density. Generally, it is a good idea to try to use an even lower unit power density than this—the incremental cost can easily be justified by the extra energy savings, and utility company rebates can often help further offset any additional cost.

Next, consult the reference lighting handbook of your choice to determine what lighting levels are suitable for your project. Remember that the quality of the luminous environment is more important than providing a high quantity of light—in many cases buildings are overlit, and less light will result in better vision.

When comparing energy saving strategies, always compare the costs for both a system retrofit and a complete system replacement.

Two Hypothetical Solutions

Solution one. In this scenario, the lighting system in our hypothetical office is redesigned from scratch. The lighting level is decreased from the 110 footcandles it was originally designed to produce to 65 footcandles, by using fewer, more efficient fixtures with high efficiency components. This also reduces the connected unit power density to about 1.2 watts per square foot. Additional energy savings are realized through the addition of a relatively sophisticated control system.

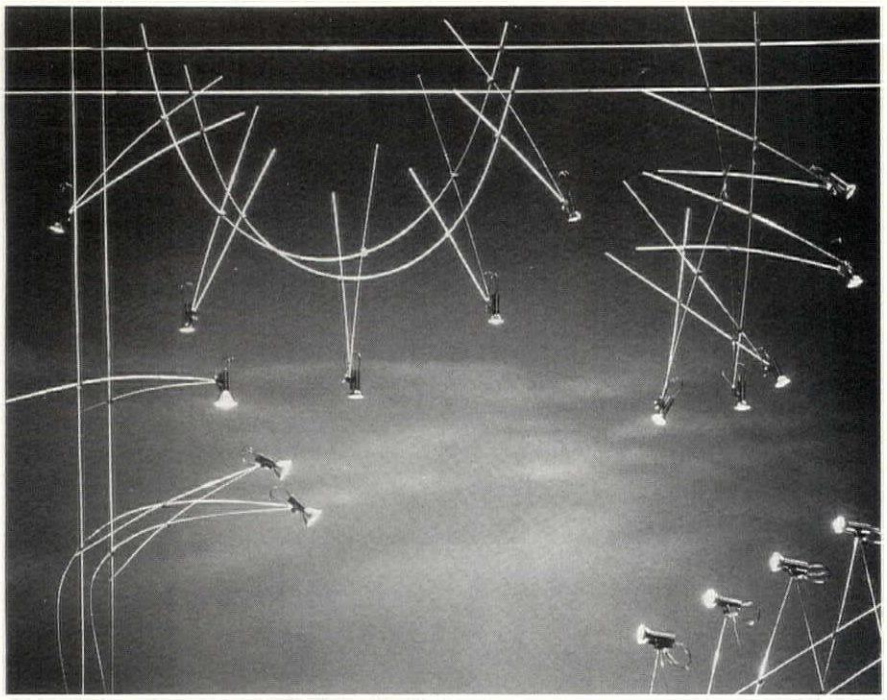
The lighting fixtures might consist of parabolic troffers with energy saving color-corrected fluorescent lamps (3,000K to 3,500K) and electronic ballasts. The control system might have pre-programmed occupancy scheduling, with telephone actuated after-hours override. The wiring to the fixtures could be split to allow one or two lamps to be dropped out after hours to correspond with building maintenance or security activities.

To make the most of the improved lighting system, the entire room would be refinished with new materials having better reflectance values.

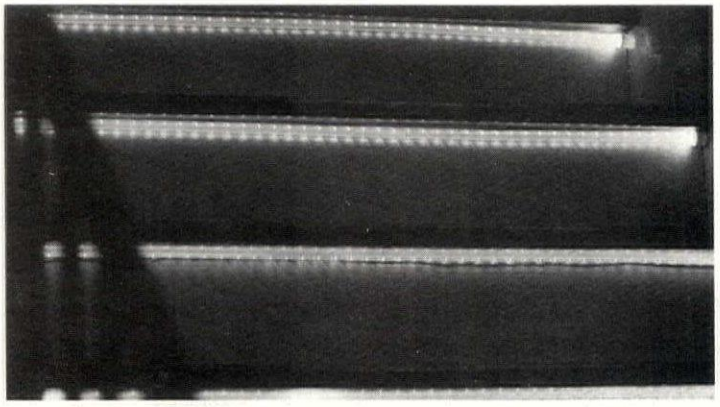
*Solution two.*In this scenario, the lighting system is remodeled. This eliminates the cost of wiring new circuits and hanging new fixtures. The lighting level is lowered from 110 to 65 footcandles by eliminating lamps, and adding reflectors, new aluminum parabolic louvered door assemblies, electronic ballasts, and energy-efficient lamps. The connected unit power density remains slightly higher, at 1.5 watts per square foot, because fewer fixtures could be eliminated than in the first solution. Time clock activated occupancy sensors help save additional energy, although they are not as effective as the control strategy in the first scenario.

Take No Chances

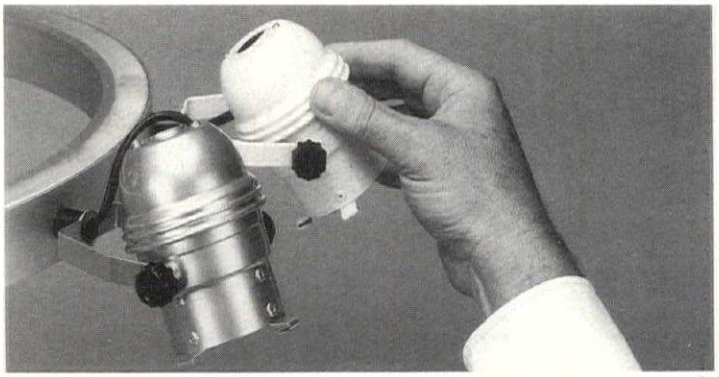
Changes to a facility's lighting system that will allow it to be operated within today's energy guidelines without losing quality can't happen by chance. Even a thorough, well-intended retrofit using all the right tools to reduce energy use can still be wasteful if lighting levels remain too high. Conversely, a retrofit that neglects the needs of the users in a space can drastically cut visual comfort and productivity—and that gives energy conservation a bad name. An audit procedure helps establish a basis for improving energy efficiency, without leaving users in the dark. ■



ZELCO VIA LATTEA



LUMENYTE STARBURST



NORBERT BELFER PRO SERIES

SUSPENDED SPOTS & FLOODS

Via Lattea is a system that uses 20-watt and 50-watt spot and floodlights suspended by a network of connectors and rods. Low-voltage halogen "Stella" heads will suit home, shop, gallery, or display applications. Zelco Industries, Inc., Mt. Vernon, NY. ***Circle 50***

FIBER OPTIC

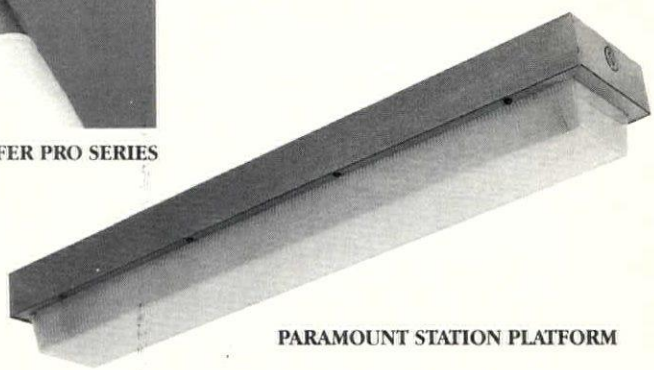
Starburst has points of light evenly spaced along a length of side-lighted Clear Coat Rigid optic which offers increased brightness. Spacing can vary based on the specific application such as step, aisle, cove, or glass block lighting. The oval optic is jacketed in a rectangular rigid coating, which helps protect against UV and vandalism. Lumenyte International Corp., Costa Mesa, CA. ***Circle 51***

THEATRICAL FIXTURES

The Pro series is a family of lighting fixtures that enables the lighting designer to accentuate display areas with theatrical flair. They are finished in classic textures and are available in six sizes. The fixtures can be used for raceway, track, or surface mono-point mounting. Norbert Belfer Lighting, Ocean, NJ. ***Circle 52***

STATION PLATFORM LITE

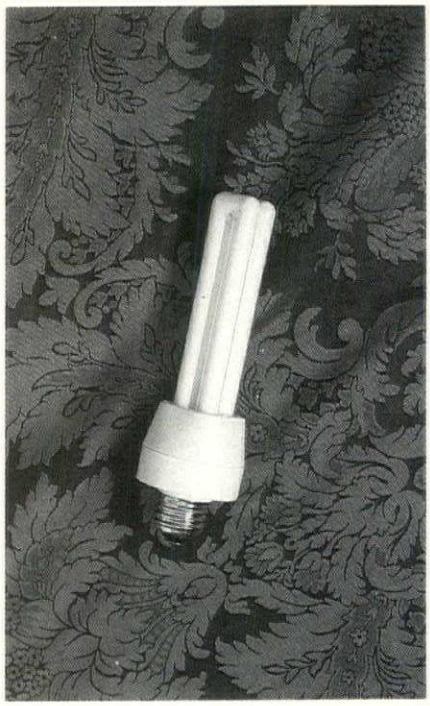
The Station Platform Lite is a rugged, surface-mount fluorescent fixture suitable for wet locations and public abuse areas. The body is constructed of 22 gauge electrozinc coated steel and finished in polyester enamel. The lens is light controlled polycarbonate. Standard two-lamp, 4-foot and 8-foot models are available. Paramount Industries Inc., Croswell, MI. ***Circle 53***



PARAMOUNT STATION PLATFORM

◀ **Circle No. 17 on product card.**

LIGHTALARMS KB-1



GTE LAMP/BALLAST COMBO

COMPACT EMERGENCY LIGHT

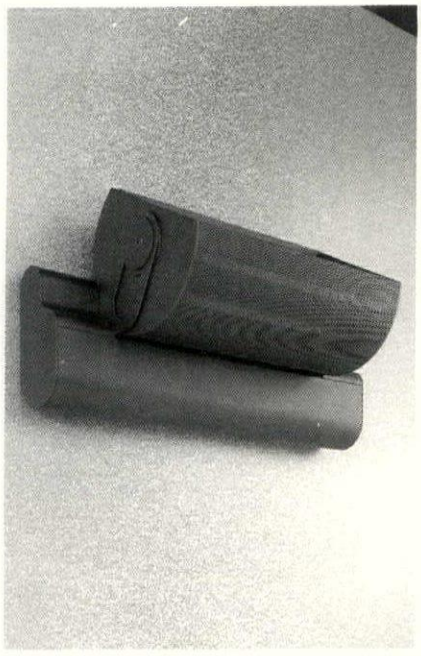
Model KB-1 is a contemporary-styled emergency light that's a compact, easy-to-install unit. It includes features such as a universal mounting plate with mounting tabs and AC quick connect plug, an injection molded, corrosion resistant, thermo plastic housing, and maintenance free battery. Lightalarms Electronics Corp., Baldwin, NY. ***Circle 54***

COMPACT FLUORESCENT LAMP

A fluorescent lamp/electronic ballast combination is rated at 18 watts and produces 1,100 lumens. The unit is designed to replace a 75-watt incandescent lamp, and has a 10,000-hour rated life. GTE Sylvania, Danvers, MA. ***Circle 55***

WALL-MOUNTED LIGHT

The EDI/ECI Echo series is an asymmetric wall-mounted light source with an integral ballast located in a separate housing attached to the fixture. Echo projects a controlled pattern of light to uniformly wash the wall or ceiling, and indirectly illuminates the space below. The unit can be used in a variety of applications including pier or pendant mounting in a cluster of two, three, or four fixtures, or concealed in a cove. SPI Lighting Inc., Mequon, WI. ***Circle 56***



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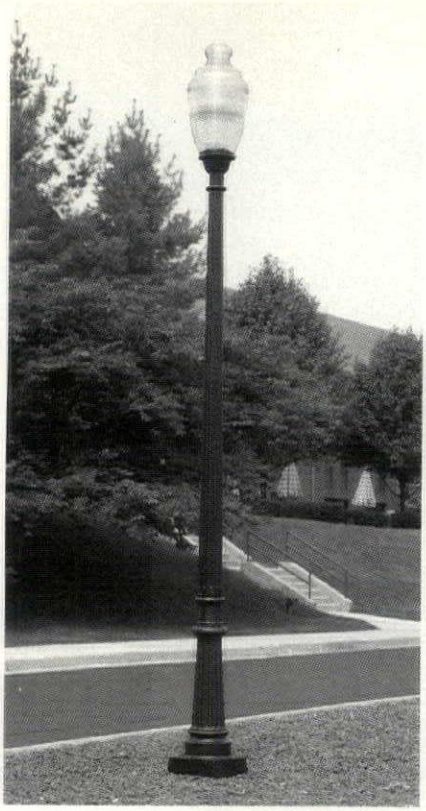
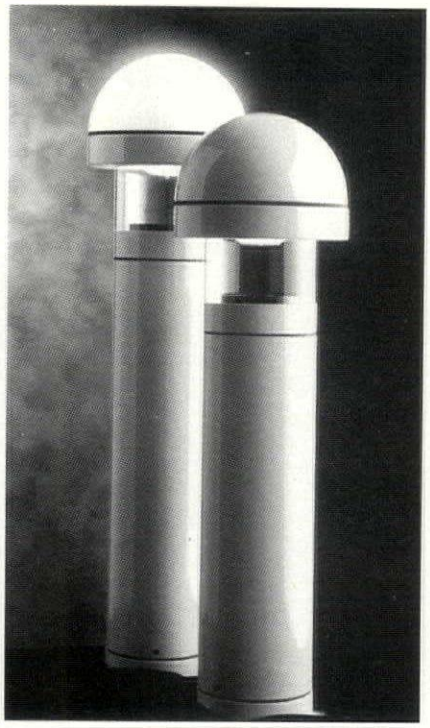
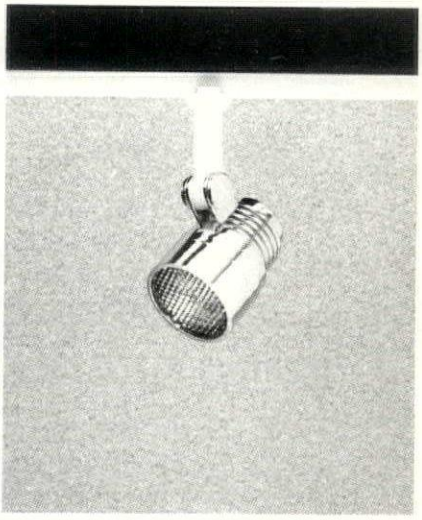


HADCO VICTORIAN V



MCGRAW-EDISON BOLLARDS



CSL TINY TRACK

REFRACTOR GLOBE

A companion to the Victorian III, the Victorian V offers symmetric lighting. A prismatic refractor globe and internal reflector redirects light downward, providing increased efficiency. A removable ballast door and slide-out ballast tray allow easy maintenance. The fixture measures 37 inches high × 15 inches wide, and is finished in a thermoset polyester powdercoat. Hadco, Littlestown, PA. ***Circle 57***

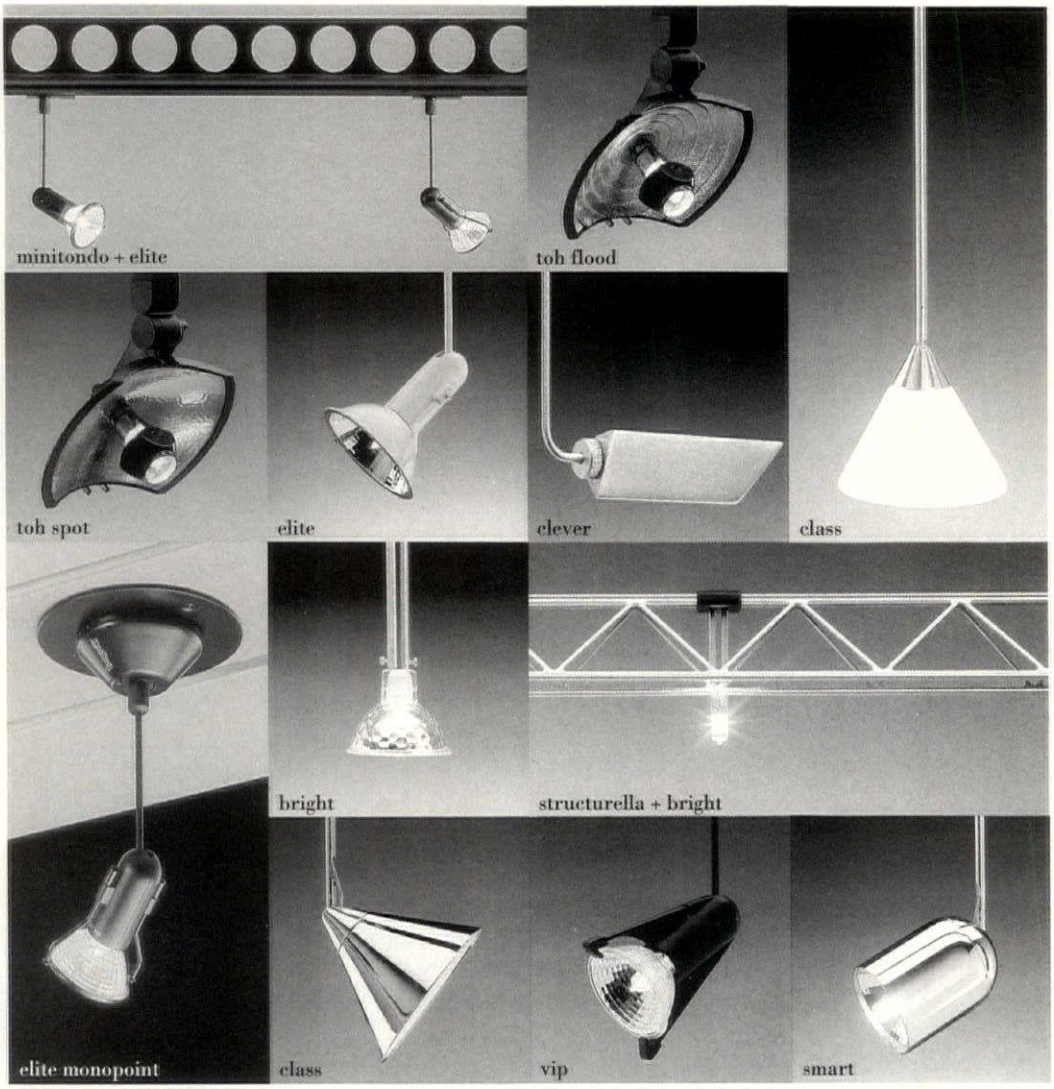
CREDENZA BOLLARDS

The bollards feature four different designs, 10 color choices, two beam patterns, and six heights. They are available in 28-, 32-, 36-, 40-, 44-, and 48-inch heights, and the 6.5-inch and 10-inch diameter dome tops come in either spun aluminum and luminous translucent acrylic or polycarbonate. There are 10 standard finishes ranging from silver and bronze to high gloss and textured black. The series is available in HPS, metal halide, mercury, incandescent, and PL fluorescent lamp types up to 15 watts. McGraw-Edison, Elk Grove Village, IL. ***Circle 58***

COMPACT TRACK

Tiny Track is a miniaturized, low-voltage track system. It is .75 inches wide and less than .50 inches deep. With the inclusion of its companion fixtures, the system provides flexibility without large equipment. CSL Lighting Mfg., Inc., Valencia, CA. ***Circle 59***

ITALIAN DESIGN & AMERICAN INVENTORY



An attractive collection of miniature halogen bipin and MR16 spotlights completes Targetti's innovative low voltage track lighting systems. Minitondo and Structurella are ideal solutions for display lighting in stores, art galleries, exhibitions, restaurants ...even contemporary homes. Both systems are UL-listed and available in the United States for immediate delivery.

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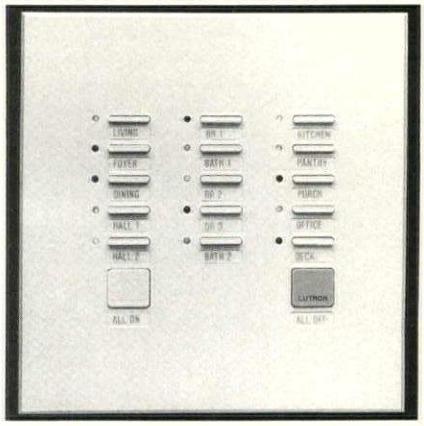
Circle No. 21 on product card.

CONTROL SYSTEM

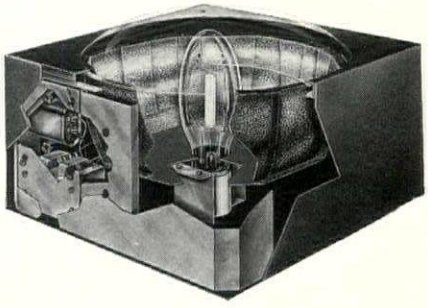
The NeT*work system makes it possible to monitor and control lighting in as many as 15 lighting areas from one or more locations. This system links with other Lutron dimming controls to create a central system. Lutron Electronics Co., Inc., Coopersburg, PA. ***Circle 60***

VERTICAL LAMP FIXTURE

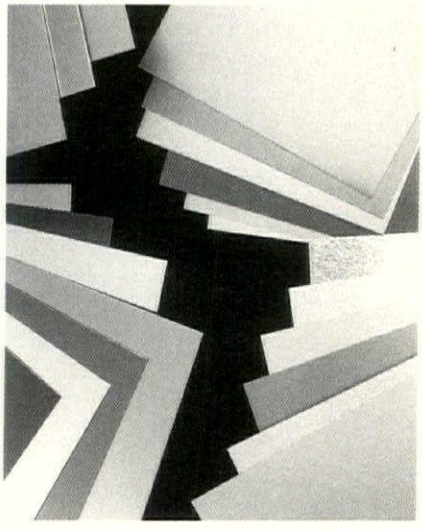
The Series 100 luminaire is a vertical lamp fixture that produces a perfect square lighting pattern with all lamp types and wattages used. This is achieved with facets that redirect the light at 45-degree angles. Lowering Systems Inc., Chicago. ***Circle 61***



LUTRON NET*WORK



LOWERING SYSTEMS SERIES 100



LORIN LIGHTPACK

LIGHTPACK

Pre-packaged and inventoried for shipment, the anodized aluminum lightpack comes in 11 different finishes and is available in 50 sheet packs. Anodized aluminum is finished with a reflective surface from diffused to highly specular allowing it to be used for any architectural application. Lorin Industries, Muskegon, MI. ***Circle 62***

NORAL ORCHESTRATES AN EXCITING NEW LOOK.

Tuba, Trumpet Models Lead The Way.

20-YEAR LIMITED WARRANTY AGAINST CORROSION

Noral, The Light of Scandinavia, is not just for residential use anymore. American-made Noral lanterns can now be specified for commercial outdoor lighting applications as well.

Landscaping . . . Public Spaces . . . Streets . . . Commercial Buildings . . . the distinct design and unprecedented quality of Noral (20-year limited warranty against corrosion) can now be utilized to bring out the best in your next project.

All Noral outdoor lanterns and poles are constructed of noncorrosive, polyester-coated cast aluminum with single-piece lenses. Most commercial lanterns accommodate a variety of wattages, voltages and light sources, including mercury vapor, high-pressure sodium, and metal halide.

Combine the rugged beauty of Scandinavian design with quality and long-lasting weatherability for your next commercial—or residential—outdoor lighting project.

For more information contact Noral Lighting, Inc., P.O. Box 360532, Cleveland, Ohio 44136. Telephone: (216) 273-7155; Telefax: (216) 273-5007.

NORAL

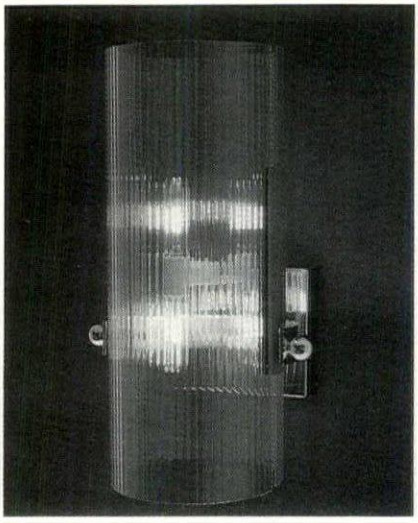
LIGHTING, INC.

The Light of Scandinavia.

Circle No. 23 on product card.

CUSTOM WALL SCONCE

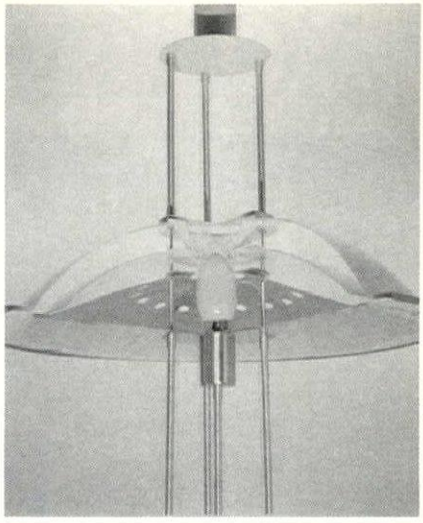
The custom wall sconce for the Peace Center for the Performing Arts in Greenville, SC, is 24 inches tall, 10 inches wide, and has a 13-inch projection. It is made of slumped fluted glass with polished and patinized brass. The fixture, designed by Ron Geyer of Craig, Gaulden & Davis, uses six T 10 lamps. Appleton Lamplighter, Appleton, WI. ***Circle 63***



APPLETON CUSTOM SCONCE

H.I.D. LAMP REFLECTOR

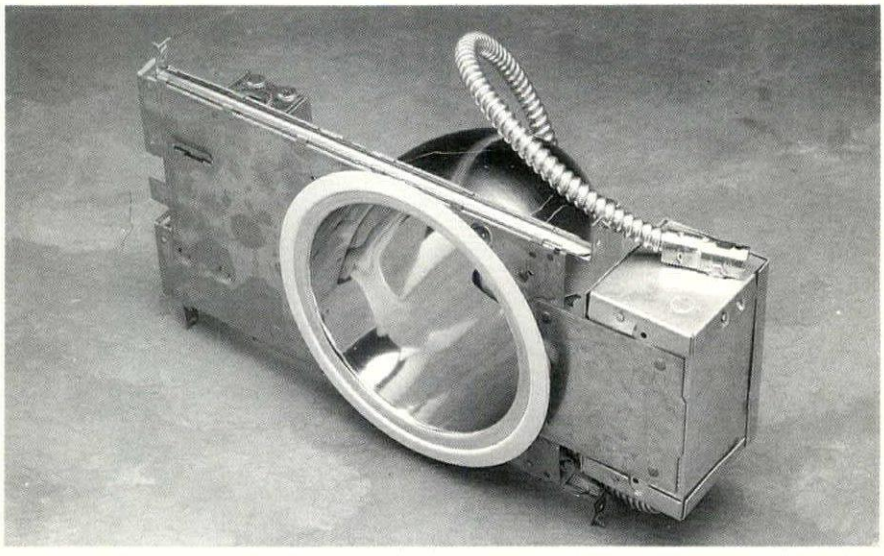
This new reflector design improves the application of H.I.D. lamp sources in decorative fixtures. A computer-aided reflector design has created the shallowest profile while maintaining efficiency. A unique center-cut hole and acrylic diffuser lights translucent materials with a soft, even glow. Lamping options include 100 and 175 watts for pendants less than 30 inches in diameter, and 175, 250, and 400 watts for larger diameters. Winona Lighting, Winona, MN. ***Circle 64***



WINONA H.I.D. LAMP REFLECTOR

RECESSED DOWNLIGHT

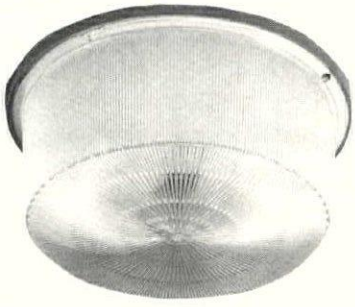
The MX713 series recessed downlight utilizes two 13-watt energy-saving quad type fluorescent lamps in an aperture size of only 6.75 inches. It is listed for use in direct contact with insulation and damp locations. The lamps may be independently switched for bi-level operation to further reduce energy consumption. Reflector trims are available in clear and gold specular alzak, black step baffle, fresnel lens, and a scoop wall-washer. Hubbell/Marco, Christiansburg, VA. ***Circle 65***



HUBBELL/MARCO MX713 DOWNLIGHT

VANDALPROOF FIXTURE

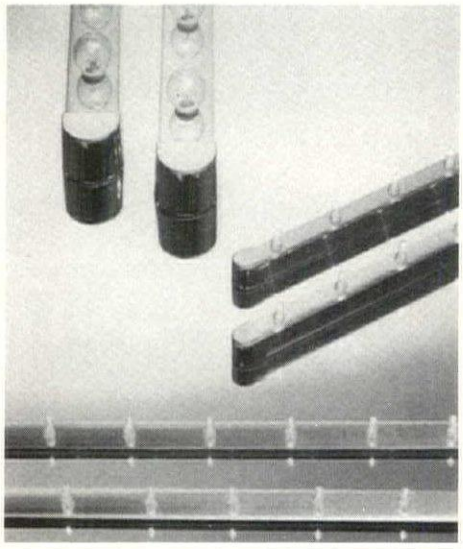
The Light Guard series of vandalproof fixtures is available in a range of sizes, shapes, and light sources. American Fluorescent Corporation, Waukegan, IL. ***Circle 66***



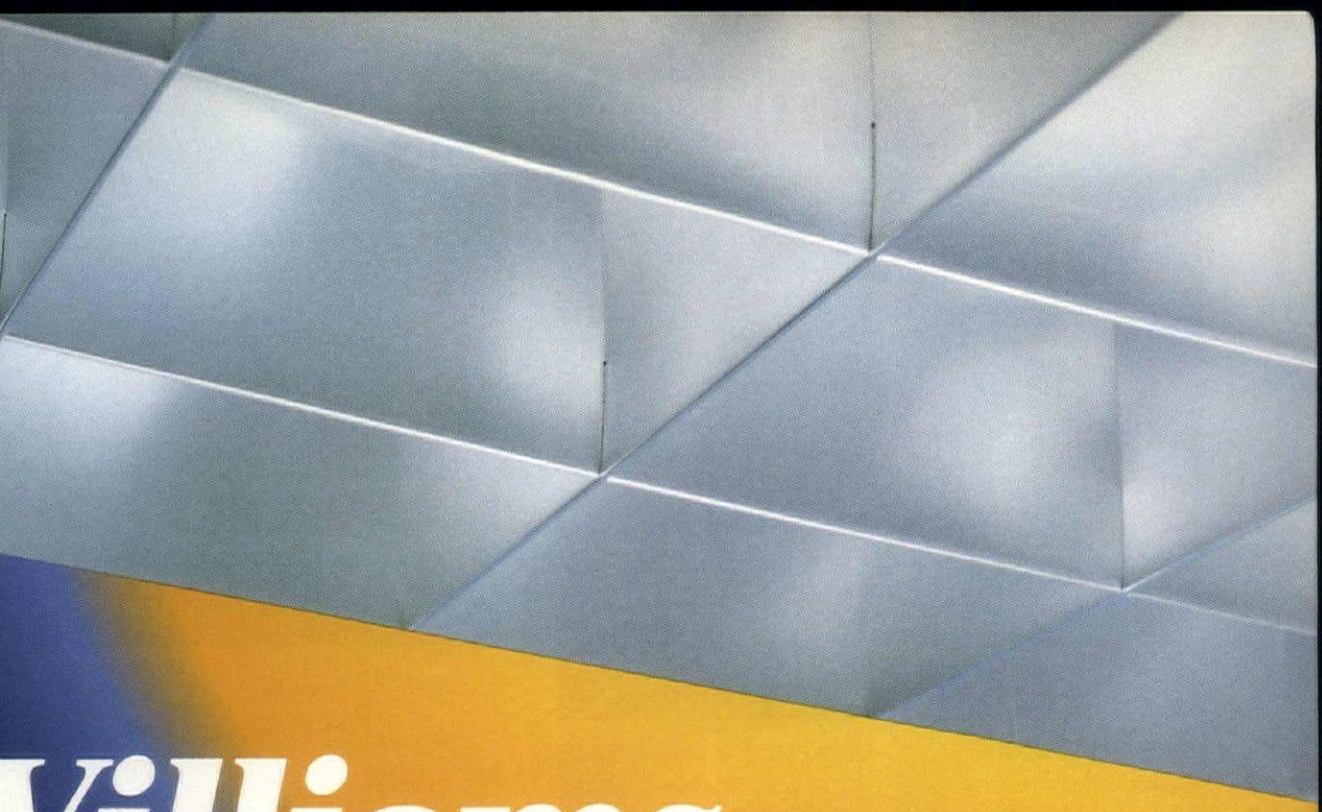
AMERICAN FLUORESCENT LIGHT GUARD

LOW PROFILE MODULE

Metalicon is a low-profile, modular, indoor lighting product formed by pressure fitting metallic veneer over preformed PVC extrusions. The result is a durable, lightweight, linear product with silver or gold lustre finish. Metalicon utilizes parallel circuitry, and may be field cut to frame, accent, or provide decorative general illumination. Wolic, Inc., Dallas. ***Circle 67***



WOLIC METALICON



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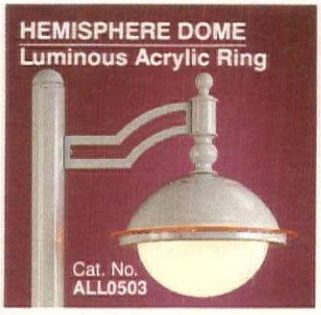

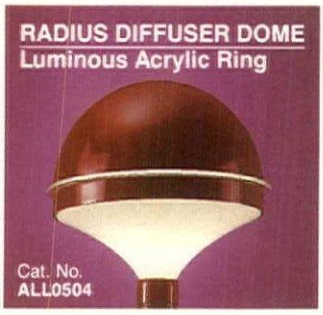

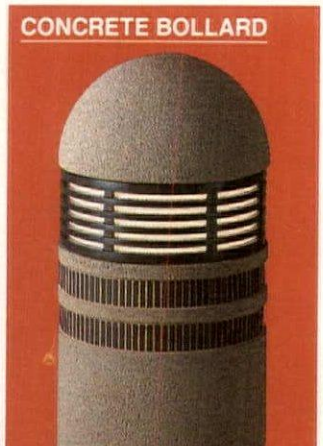

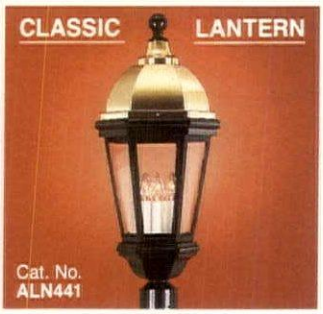

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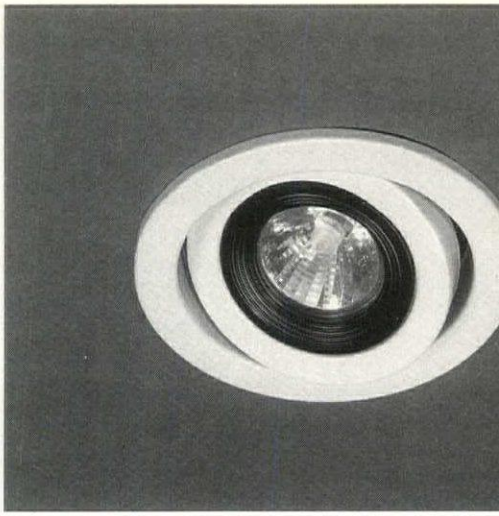
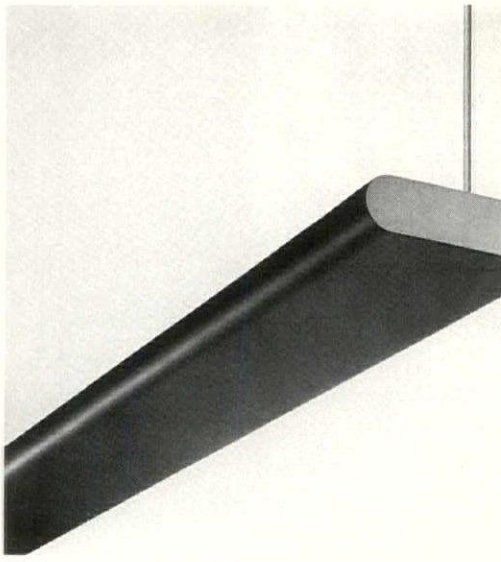
Circle No. 25 on product card.



CON-TECH RECESS



NEO-RAY SERIES

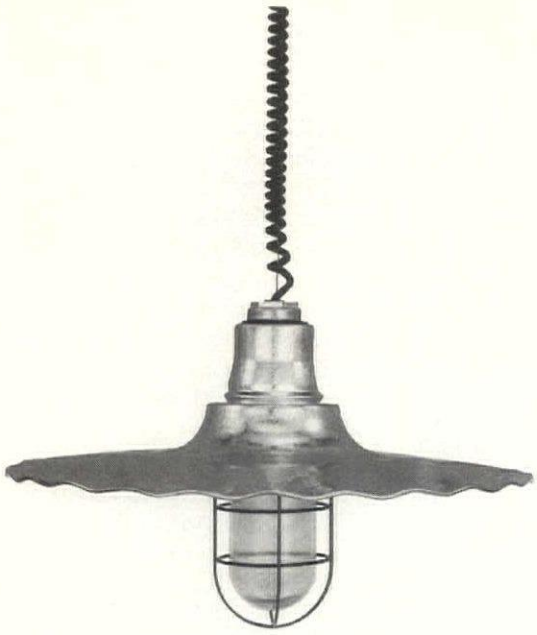
RECESSED HALOGEN

A product line of five types of low-voltage rece lighting for replacement and new construction ap easily aimed and installed, cool operating, and co source, small in size with small apertures. They ar 20-, 35-, and 50-watt ratings with a variety of trir types include multiplier, wall-wash, eyeball, baf justable downlight designs. Con-Tech Lighting, ***Circle 68***

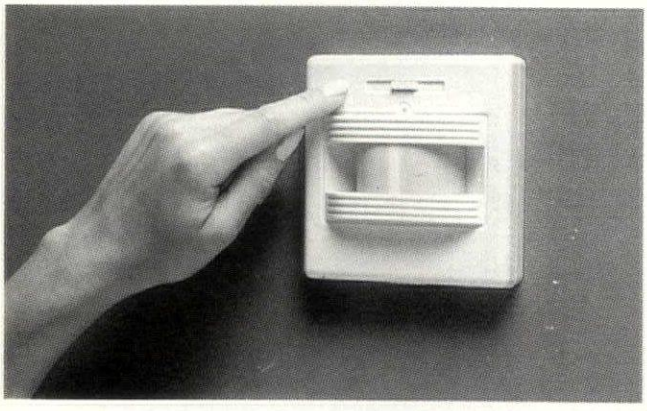
LAMP VERSATILITY

Series 67 Flatlite has computerized optical syste lamp versatility and maximum efficiency. It offe rect, glare-free lighting with very wide distributi uniform ceiling and work plane illumination. Opti systems include one or two T8, T 12, and biax la fabricated specular aluminum reflectors. Neo- Brooklyn, NY. ***Circle 69***

NEW AT LIGHTFAIR



ABOLITE GAL-TECH



NOVITAS TWO-LEVEL SWITCH

GALVANIZED FINISH

Gal-Tech is a new finish available for the RLM series. It's a hot-dipped galvanized treatment that provides a high-tech industrial alternative to the standard RLM powedercoat finishes. To further enhance this look are glass globe assemblies and painted wire guards that can be topped off with coiled cord or conduit. Abolite Lighting, West Lafayette, OH. ***Circle 70***

AUTOMATIC WALL SWITCH

The two-level automatic wall switch turns on room lights when an occupant enters, keeps them on as long as the room is occupied, and turns the lights off after the occupant leaves. It is designed to mount into a single or double switch box. The switch is compatible with all fluorescent lighting ballasts, including high-efficiency electronic ballasts, and works equally well with incandescent fixtures. The unit will handle both 120-volt and 277-volt lighting. The contemporary design is available in white, gray, and beige. Novitas Inc., Santa Monica, CA.
Circle 71

BROWNLEE ANDREWS-214

ENERGY-SAVING LUMINAIRE

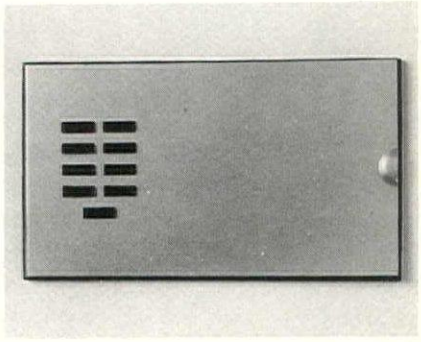
Andrew-214 is a luminaire that uses either one or two compact fluorescent lamps. It has a glass diffuser on the front of a brass plated steel housing and measures 13 5/16 × 8 1/2 inches deep. Brownlee Lighting, Orlando, FL. ***Circle 72***

WALL-MOUNTED DIMMING SYSTEM

Scenario is a stand alone, wall-mounted dimmer unit capable of controlling up to four dimming or switching loads with a total capacity of 2,400 watts. Each Scenario has four independent load control switches, four-scene switches, and a master off switch. In addition, up to three remote, nine-switch stations may be connected to each Scenario. The unit is capable of connecting up to eight Scenarios to form an integrated system. LiteTouch Inc., Salt Lake City. ***Circle 73***

LENSED/LOUVERED TROFFER

The UltraSpec lensed/louvered troffer provides flexibility and efficiency for commercial, retail, and institutional lighting applications. The unit is available in 1-foot × 4-foot, 2-foot × 2-foot, and 2-foot × 4-foot sizes, with a range of lenses, louvers, air functions, door frame styles, lamps, and ballasts. The screw-assembled door frame features hinge/latch design for the suspensions of the lens/louver when opened, and precise self-alignment when closed. Lumax Industries, Inc., Altoona, PA. ***Circle 74***



LITETOUCH SCENARIO

LUMAX ULTRASPEC

EMERGENCY LIGHTING FIXTURE

Prestor is finished in black, measures 18⅛ inches long, and offers distortion-free illumination. A 5.4-watt wedge base incandescent lamp and specular reflector located at each end of the housing appear to float in the clear tamper-proof domes. The specular reflectors can be adjusted 180 degrees vertically and 180 degrees horizontally. Halo/Sure-Lites, Elk Grove, Village, Il. ***Circle 75***

HALO/SURE-LITES PRESTOR

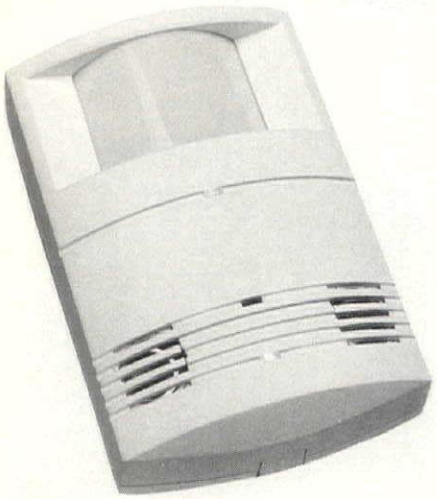
PASSIVE INFRARED/ ULTRASONIC SENSOR

The DT-100 sensor incorporates two sensor technologies—passive infrared and ultrasonic—into one sensor. The DT-100 also has a built-in light-level sensor for natural/artificial light balancing, and an isolated relay contact that can be used to interface with HVAC, EMS, or other control systems. The Watt Stopper, Santa Clara, CA. ***Circle 76***

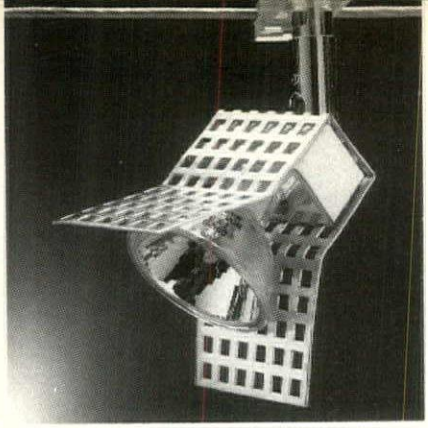
LEADLESS BALLAST

The Val-Miser XL series of leadless ballasts had all internal connections converging at an external plug. A wiring harness is inserted to complete the connection. This new technology can support fixture automation, cut storage requirements, and simplify ballast replacement. Valmont Electric, Danville, IL. ***Circle 77***

VALMONT VAL-MISER XL



WATT STOPPER DT-100 SENSOR



TRANSLITE LOW-VOLTAGE SYSTEM

BARE CONDUCTOR SYSTEM

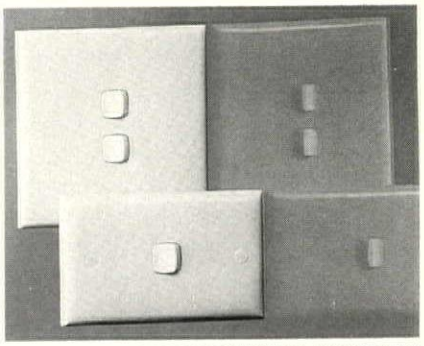
This low-voltage lighting system uses bare conductors. Two versions of the power supply is offered: the portable model plugs into a grounded outlet, and the permanent model is suitable for wiring in. The wide range of fixtures includes decorative pendants to glass fixtures. Translite Systems, Redwood City, CA. ***Circle 78***

DECORATOR SWITCH

Futura decorator lighting switches are manufactured of strong, lightweight polycarbonate. The Futura series features a new miniaturized switch mechanism that is the smallest UL listed 15 amp light switch mechanism in the U.S. and allows more switches per plate, while maintaining an attractive, sleek design. It can accommodate either single pole or three-way wiring. The series is offered in several configurations in red, white, ivory, mist gray, and black. Carlon, Cleveland, OH. ***Circle 79***

THEATRICAL TRACK

The Theatrical Design track line for PAR 38, PAR 30, PAR 16/20, and MR 16 lamps is an alternative to the stage light style of track fixture used in the retail environment. Available in three sizes, this fixture features an integrated accessory clip for color filters and louver and is compatible with Juno and Indy track. Indy Lighting Inc., Indianapolis, IN. ***Circle 80***



CARLON FUTURE SWITCHES

INDY THEATRICAL DESIGN TRACK

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MARKETPLACE

The Marketplace is a monthly feature of Architectural Lighting, offering readers easy access to lighting products and services for commercial, industrial, and institutional applications. Listings in this reference section are sold on an annual basis. First Line (Bold Face) $990/yr. Additional lines $690/yr. Mini Display $3600/yr., $1990/6 months.

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