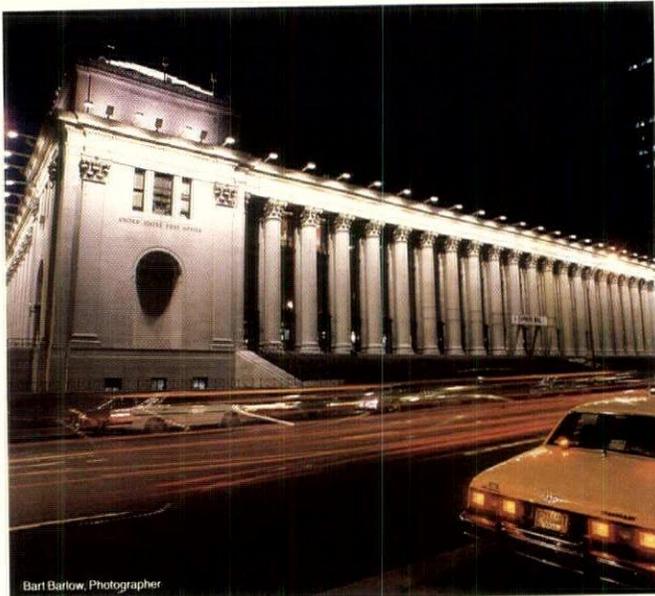


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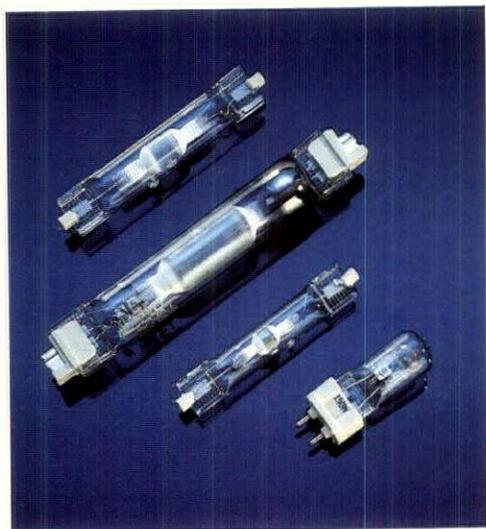
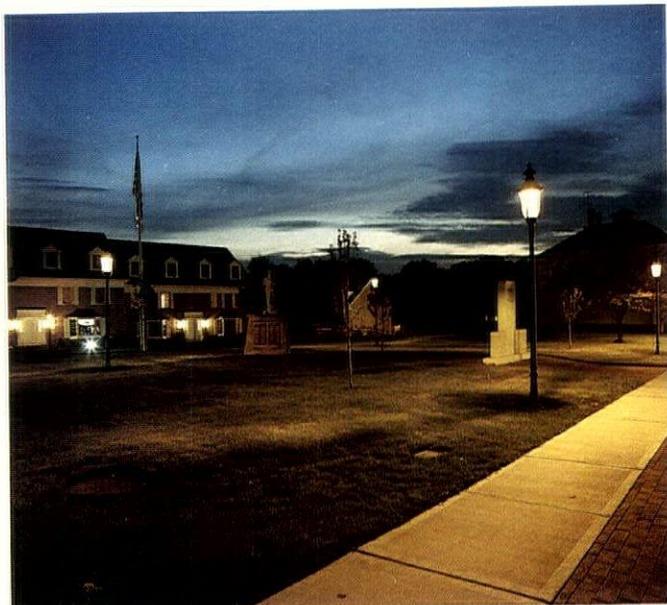
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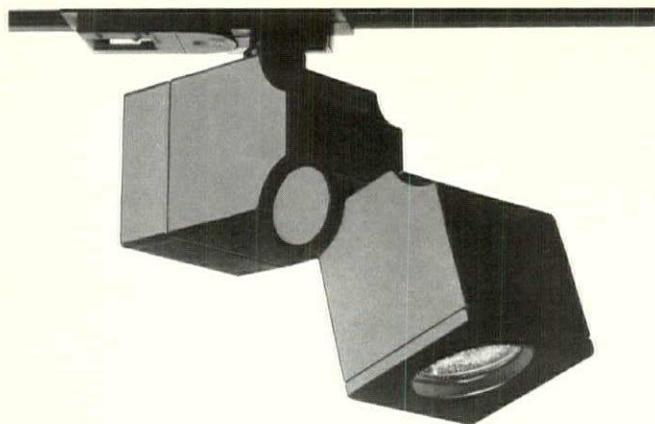
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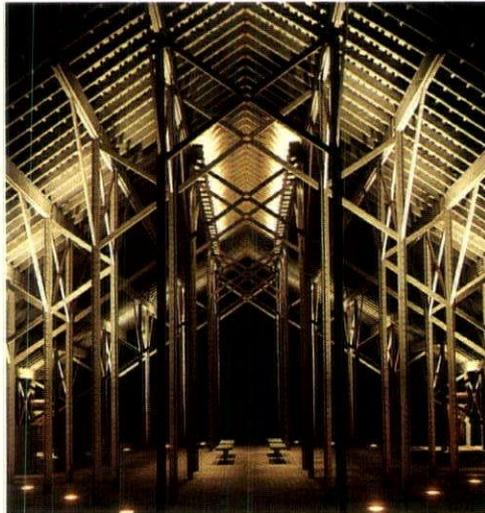
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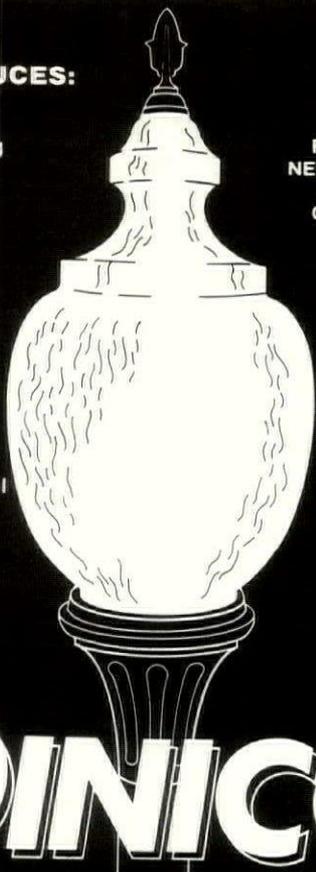
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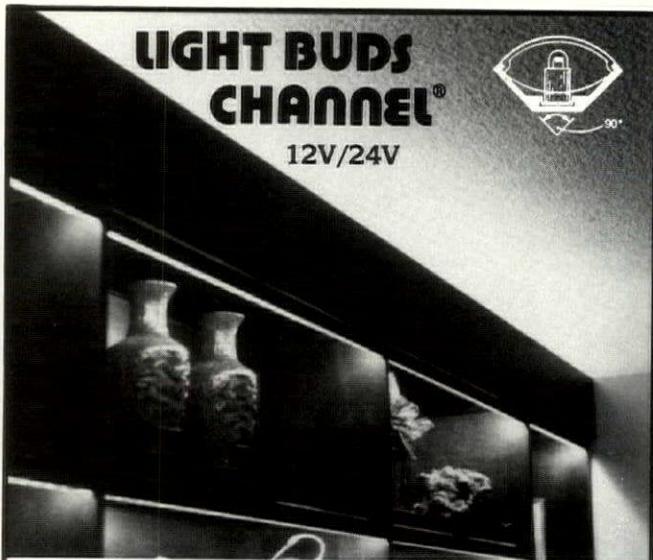
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From the Editor

Sometimes, I find myself telling people to do things without realizing how difficult it is to actually do them. About nine months ago, I wrote in this column that, as designers, we should all set a good example for the public by, among other things, specifying and installing compact fluorescent lamps.

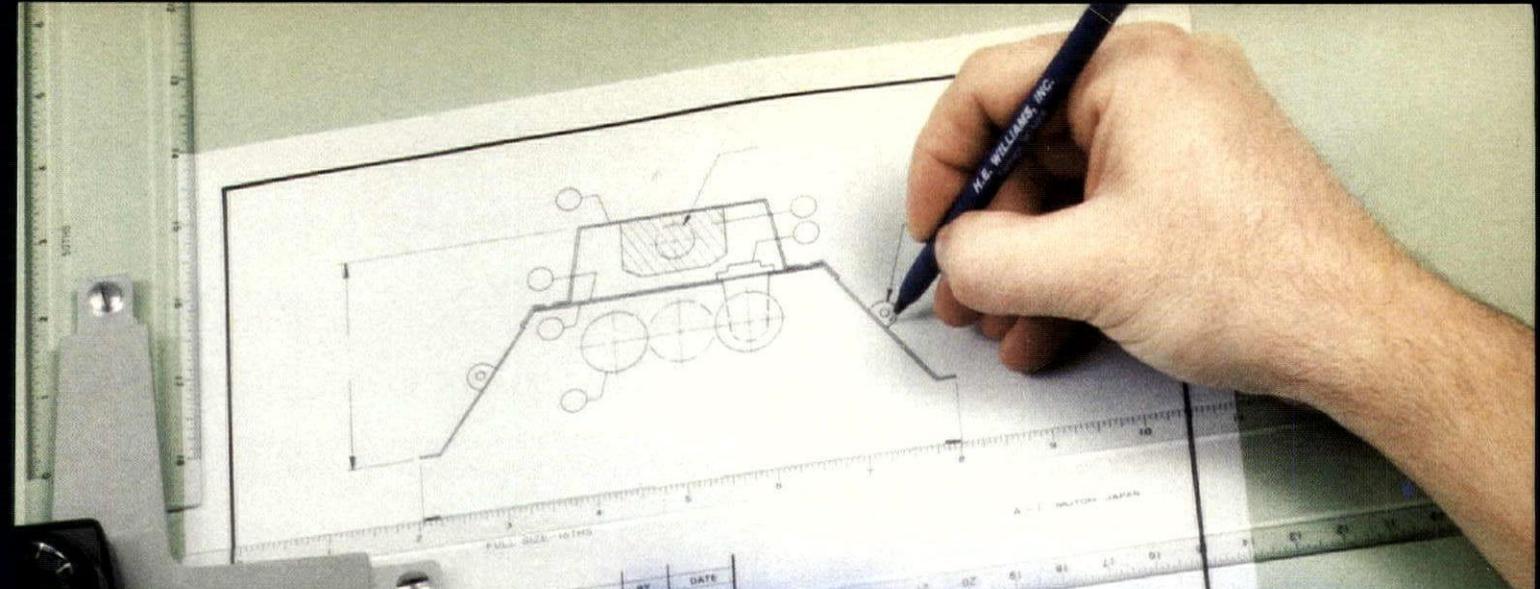
Since then, I've tried repeatedly to actually take my own suggestion seriously, but found I was unable to purchase them at any of my local stores. When I described the devices to one local hardware man, he looked at me as if I'd asked for some sort of ray gun out of a Buck Rogers movie. "There's no such thing," he said, dispatching me with a handful of horseshoe nails from a nearby keg.

Why retailers won't put a product as great as compact fluorescent lamps on their shelves so people can buy them is a mystery to me. Probably the main reason compact fluorescents aren't in stores is that they cost too much, and people won't buy them. But I really can't blame any uneducated consumer for questioning whether a "light bulb" that costs \$14.95 is a bargain.

Looking at it from the other side, what's really in the deal for retailers and manufacturers? They can sell a dozen 750-hour A-lamps instead of one 9000-hour compact fluorescent. If they reduce the price of compact fluorescents — and the public buys them — it would probably hurt their sales numbers. But in the meantime, we burn billions of extra kilowatt hours to get the same amount of light from incandescent lamps as we could get from compact fluorescents, if only we'd spend the money to get them.

I guess the compact fluorescent lamp is one of those inventions that is just too good for its own benefit. With the economies of production, the price of the thing is sure to tumble once the public really starts buying them. That is, *if* anyone will ever make them cheap enough that they really sell. If we're lucky, somebody will build a 4000-hour compact fluorescent that retails for \$5.95. Then we can afford to buy our lamps, and keep our energy savings too.

Charles Linn, AIA



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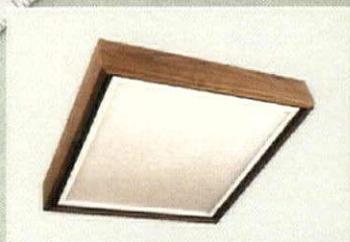
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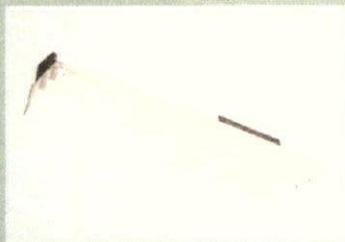
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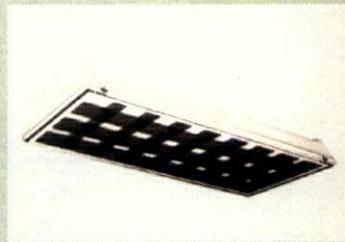
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Letters

Mock-ups versus computer modeling

Super article on the Ben Franklin Bridge [January 1988]! Everyone involved in the design is to be praised for their imaginative use of technology in this fascinating project. As a lighting educator, I appreciate works such as this for their value in making one aspect of my job infinitely easier: motivating students. I have only to point to such projects and say, "See, this is the kind of excitement that results when the art of lighting meets the science of lighting. Only people with a thorough understanding of both can create such splendor."

As excited as I am about the design, I have one criticism of the design process. If we are going to spend large sums on such extravagance, shouldn't we at least proceed in the most efficient manner available? I am referring, of course, to the use of a full-scale mock-up. Mathematical modeling of lighting systems has reached a level of sophistication that enables us to analyze even the most complex and unusual situation with relative ease. After crunching the numbers, visual representations can be made on the screen that would rival seeing the mock-up. In fact, such graphics sur-

pass the physical model in their ability to portray the entire bridge instead of a single suspender cable. The computer thus would give much more information than the "initial approximation of lighting and control requirements" afforded by the mock-up.

Projects on the forefront of technology application, such as this, deserve high-tech design methods.

*M. Clay Belcher, PhD, PE
Assistant Professor
Architectural Engineering
The University of Kansas
Lawrence, Kansas*

Essential guidance and support

While the Izenours, through the world class firm of Venturi, Rauch and Scott Brown, are undoubtedly the creative spirit behind the lighting of our world class bridge, they would not have had the opportunity if the Penjerdel Council had not spearheaded the effort through the Benjamin Franklin Bridge Lighting Committee. The guidance and support of the Delaware River Bridge Commission on this project has been just as essential. Financial support for the project has come from sources that include foundations, government, business, private citizens, and school children.

As the 1986 President of the American Institute of Architects, I was fortunate to convince the committee to have a paid competition involving combined entries of architects, engineers, and lighting consultants. The breadth and creativity of the 14 schemes reflected the cooperative spirit of the multidiscipline teams, which represented both sides of the Delaware River.

A commission has been formed to recommend to the Delaware River Port Authority potential ideas for the use of the flexible lighting design in the coming years. Thank you for capturing so well the spirit of this effort.

*Wesley M. Heilman III, AIA
Vice President
Geddes Brecher Qualls Cunningham
Philadelphia, Pennsylvania*

The sum not equal to the parts

As usual, your photography is superb and the Ben Franklin Bridge in Philadelphia looks smashing on the cover. Although everyone involved in the lighting was top-notch, the final effect was less than successful. I noted that most of the pictures shown were at dusk. When it is completely dark, the bridge all but disappears.

Having seen bridge lighting from The Embankment in London to Sydney, Australia, the final result in my own home town was a disappointment. Perhaps trying to be too avant

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garde sometimes does not work. Philadelphians just are not ready for it.

Anyway, we thank you for mentioning Philadelphia. For years I have been trying to get them to floodlight all the wonderful historical buildings in town like they do in Europe. Would that the movers and shakers here would read your excellent publication.

*Gersil Newmark Kay
Chief Executive Officer
Morris Newmark & Bro., Inc.
Philadelphia, Pennsylvania*

Surprised at omission

Thank you for the inclusion of the daylighting column in your publication. I am writing in reference to the "Physical models as daylighting tools" column in the January 1988 issue which I just received. Since Cris Benton, of your Editorial Advisory Board, has been so generous with his slides of student work, it does not surprise me to see them used as illustrations for the article. I use duplicates of these very slides to teach my architecture students about the use of models in daylight design. However, I was extremely surprised to see *no credit* to Cris Benton as either the teacher of the class in which the model was built or as the source of the slide images. I would hope that both authors and editors involved with your publication exercise more caution in the crediting of work such as this.

Thank you for a provocative magazine. I really do enjoy its arrival each month and have found the regular columns invaluable in my teaching.

*M. Susan Ubbelohde
Assistant Professor
Co-Director, Regional Daylighting Center
University of Minnesota
Minneapolis, Minnesota*

Apologies

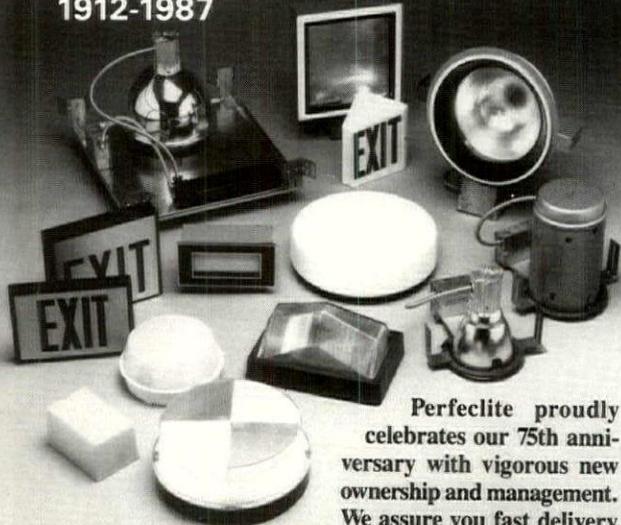
Cris Benton's only request when he sent slides was that we let him know which slides we had chosen so that he could identify the student model builders. Despite his modesty, we should have credited him as the photographer and teacher.

Despite our best efforts and careful proofreading procedures, an occasional error slips into the magazine. Our apologies to Sylvan Designs, Inc., whose registered trademarks Light Buds and Bud Lights were inadvertently used as generic terms in our January 1988 issue.

The editors

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Lighting develops themes of contrast, theater, simplicity



Project: Paper Moon
Location: Washington, D.C.
Client: Rakam, Inc.
Architect: Ian J. Birchall, AIA, RIBA
Electrical Engineer: George Worsley & Associates
Photos: Kenneth M. Wyner

Washington's Paper Moon presents a contrast to the city's many brass-and-wood bars. Against a backdrop of brick and concrete, the former warehouse makes use of color, space, and texture to establish a sense of theater, visual openness, and simplicity.

The 3200-square-foot space was organized into two distinct zones — one for dining, the other for the bar area. The designer, Ian Birchall, wanted to integrate the two principal areas, yet maintain a sense of distinction between them. In addition, the design needed to be flexible enough to give the proprietors the option of converting part of the dining area into a dance floor.

A low, marble-topped wall defines and separates the two main spaces. As customers enter, they are guided by this wall to the center of the room. At the center, the wall forms a circle, open on two sides to allow an easy flow of movement between the bar and dining area. The dining area within the circle doubles as a dance floor.

To enhance this definition of space, two lines of neon in the shape of a keyhole suspended from the ceiling echo the line of the wall; the light helps to lead customers alongside the bar toward the central circle that forms the transition to the dining area. Trim that runs along the wall and parallels the neon helps to integrate the neon lines with the rest of the room. An additional strip of neon set into the bar front adds color, scale, and focus to the bar area.

To meet Birchall's requirement that the overhead tubes be suspended 2 feet below the

open ceiling grid, the fabricator used custom-made hangers of polished clear acrylic. Their transparency makes them nearly invisible against the flat black ceiling and allows patrons to see uninterrupted lines of color from anywhere in the room. The beams of blue argon gas glowing through the clear tubes contribute to the fixture's lighter-than-air quality.

Low-voltage, very narrow spot PAR 36 lamps, installed in tracks on the ceiling grid, continue the theme of color, theater, and contrast. Filters of ruby red, medium blue, and medium amber provide washes of color against walls of deep blue, sea green, light gray, and warm blue gray. White spotlights focused on the center of the marble-topped tables enhance the theatrical effect.

Lighting and effects can be easily changed by changing the location and number of fixtures and colored filters. The tracks were designed in eight zones; both the spotlights and the neon can be dimmed to create the desired effect.

Fluorescent wall washers located behind mirrors along each side wall complete the theme of contrast. The high-lighted bare bricks and mortar of the walls juxtapose the clear, clean glow of neon, the spotlights, and the reflective marble, helping to make the Paper Moon stand out as one of Washington's most unusual restaurants.

—Stephen Mallory

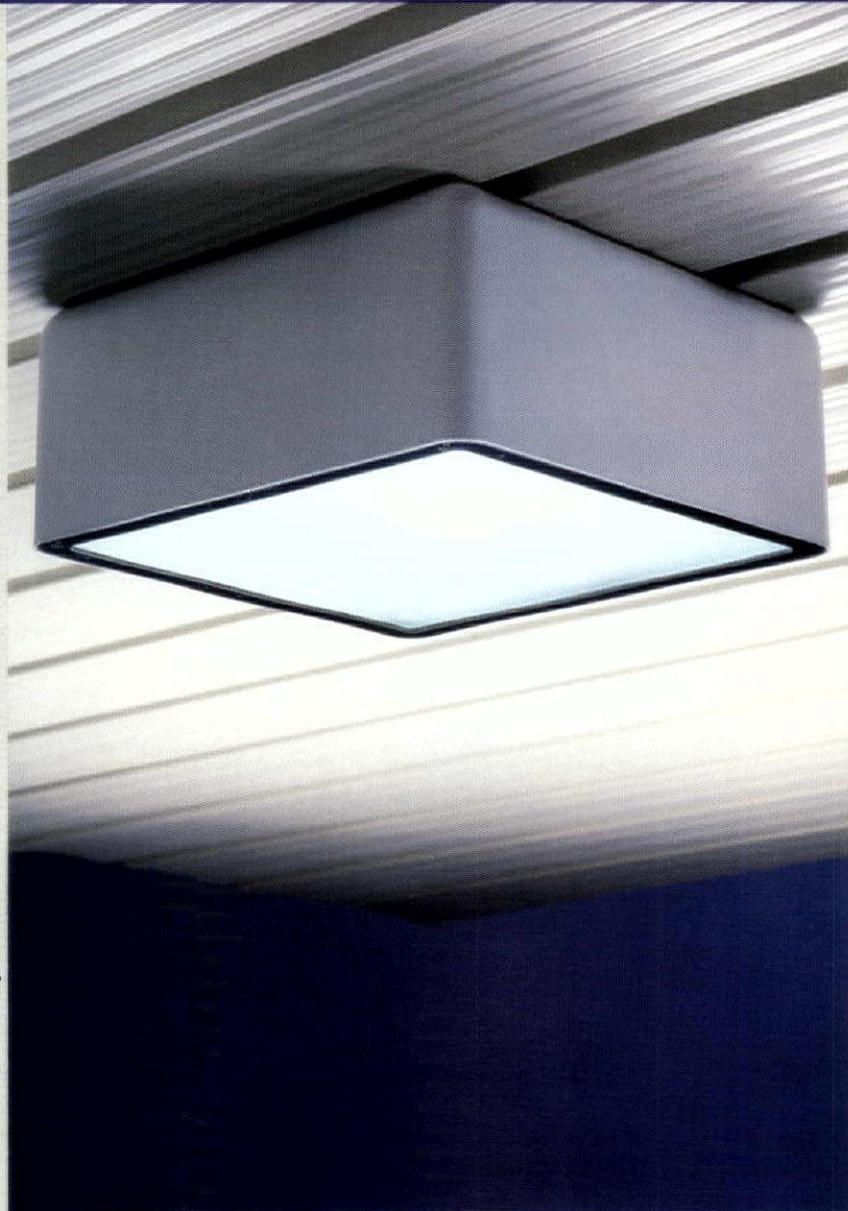
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123 N. Wacker's lighted pyramid a Chicago nightscape standout



GEORGE LAMBROS

123 North Wacker Drive, a new office building in Chicago, uses an illuminated pipe pyramid flanked by illuminated setback walls to join the city's nighttime vista.

"The tradition of lighting tall buildings is returning," says architect Ralph Johnson. "The buildings of the fifties and sixties were basically big glass boxes. You couldn't light those. Now we're recognizing the potential of lighting the building's profile against the skyline. It makes the skyline more exciting, and it gives an identity to the user of the building, which is part of the marketing program of this building.

"The pyramid itself is a marriage of function and aesthetics. It's about three stories high and had to be open to accommodate the building's cooling towers. Detailing the pyramid was a result of thinking about how we could illuminate it from within in a soft sort of way," says Johnson. The undersides of the horizontal rows of steel pipe that make up the walls of the structure are lit by a dozen 250-watt metal halide floods and a dozen 150-watt high pressure sodium lamps. The fixtures are pedestal-mounted around the inside perimeter of the pyramid and aimed upward toward the peak of the structure. The lighting designers and architects agreed that a blend of light from high pressure sodium and metal halide lamps would best bring out the warm gray color of the structure. Setback walls were also flooded by the same mixture of light from high pressure sodium and metal

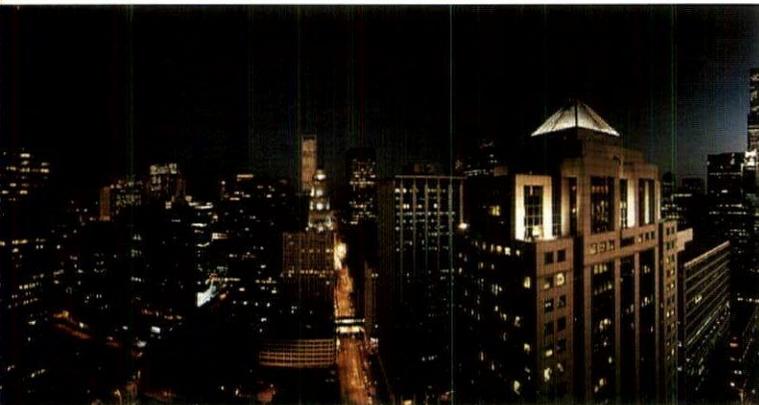
halide lamps.

The pin lights — squares of ornamental light located below the pyramid on its base — required a bit of refining. Illuminated from within the pyramid base by PAR 38 lamps, the 2-foot square openings in the wall were originally covered by clear acrylic panels. The result was too bright. "I was looking out over the skyline from my apartment one night," says Johnson, "and I saw this really bright object. I realized it was 123! That's when we came up with the idea of using the diffusing panels. Before you would read a sort of a bright spotty thing. Now you read a square."

That's all in keeping with Johnson's philosophy that the building's nighttime lighting level should complement nearby illuminated landmarks, such as the Merchandise Mart, and not distract attention from them. The ultimate result is a building that makes an unmistakable addition to Chicago's skyline, and a highly recognizable image for its corporate tenants.

—Charles Linn, AIA

For product information, see the Manufacturer Credits section on page 70.



TOM YANUL, BIG SHOT PHOTO CO.

Project: 123 N. Wacker Drive

Location: Chicago, Illinois

Client: Rubloff Inc.

Architect: Perkins & Will, Ralph Johnson, AIA, design principal; August Battaglia, project designer

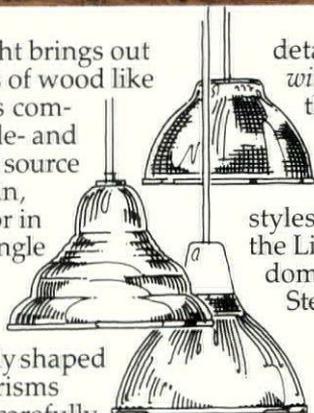
Lighting Designer: William Richardson and Richard Eisenberg; Jaros, Baum and Bolles, Consulting Engineers

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Bank's custom luminaires, unique lighting attract mall pedestrians



Project: Central Bank of Denver renovation
Location: Denver, Colorado
Architect: W.C. Muchow and Partners Inc. Architects; Marcus Tucker, partner-in-charge; Timothy Hoehn, project architect
Lighting Designer: Carl Hillmann, CHA Design Inc.
Electrical Engineer: Garland D. Cox and Associates
Interior Design: Lisa Gallun, W.C. Muchow and Partners Inc.
Custom Fixture Design: W.C. Muchow and Partners Inc. with CHA Design Inc.
Photos: Chas McGrath



With unique torcheres on the main banking floor, the Central Bank of Denver has updated its image to attract a new customer — the pedestrian. A new lighting design, part of a recent remodel, has helped the bank take advantage of a location adjacent to the city's 16th Street mall — a popular pedestrian-oriented thoroughfare that still carried heavy auto traffic when the building was completed in 1973.

According to design team member Paul Hutton, the bank's lobby was envisioned as an extension of the mall. "Key to this concept," he says, "are the custom-designed torcheres, which establish a distinctive identity for the bank relating to the imagery of the mall's light standards and trees." Twenty-one low-bay and three high-bay versions of the torcheres now dominate the banking floor.

The low-bay torcheres lead away from the mall and define the teller area. Their support frames are similar to those of the mall's distinctive sphere-topped standards. Atop each 8-foot, 2-inch torchere in the teller area is a 5-foot-square shade of fin-shaped white tempered glass panels decorated with a sandblasted sunburst pattern. The shade's form blossoms out and up in an abstract treelike shape.

Ambient light for the teller area is provided by the torcheres. Each conceals a 175-watt coated metal halide uplight surrounded by a glass reflector with a perforated specular spun aluminum extension. Beneath each uplight is a stainless steel box with nine small glitter lights on

each side panel. The box houses a 50-watt, 12-volt MR16 downlight for a small built-in stainless steel planter in the luminaire's frame.

Three high-bay torcheres, each nearly 20 feet tall, provide direct and indirect lighting for the customer service area. Each standard supports four separate luminaires like those in the teller area. The primary sources of ambient uplight are 175-watt coated metal halide lamps with glass reflectors.

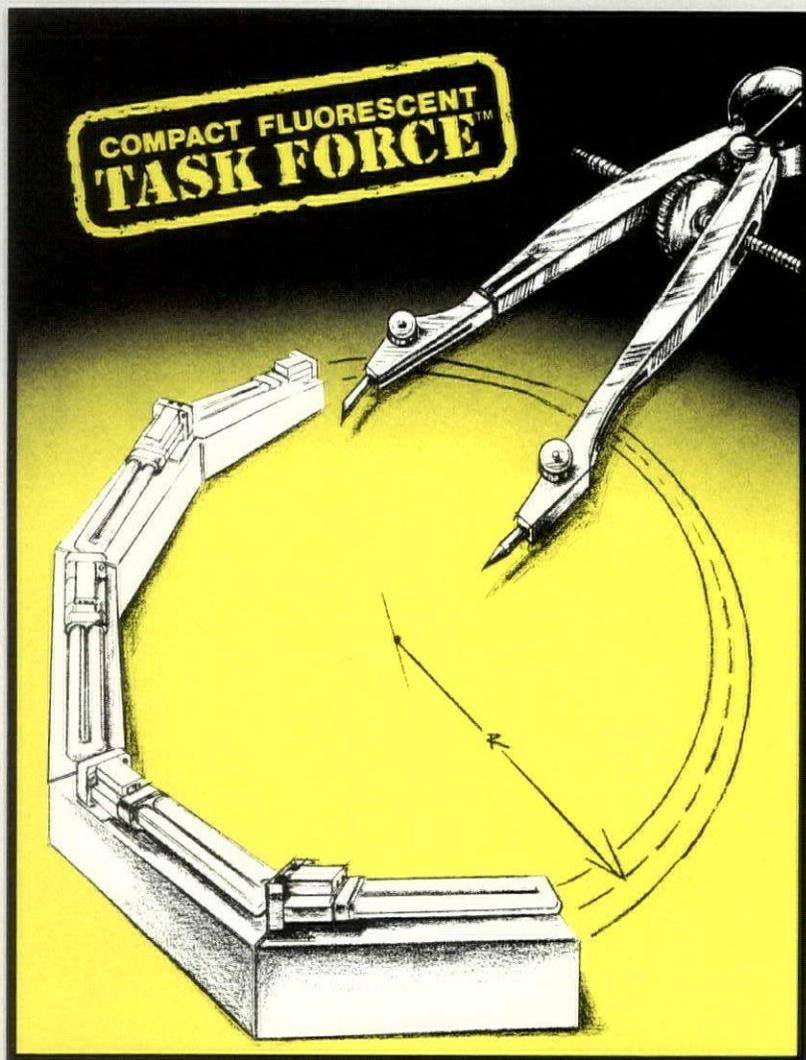
Additional illumination for the potted trees and for the area in general comes from several sources: a 250-watt quartz PAR 38 floodlight under each luminaire, 30 existing downlights that were relocated and relamped with 150-watt PAR 38 spots, and daylight from a two-story-tall window wall. The southeast-facing window wall has wooden louver blinds, each with a manual control rod and set positions for four seasonal adjustments: winter, spring and fall, summer, and maximum open.

Not only did the installation come in under budget, but it also substantially decreased the lighting load. "By replacing the previous 10-watt-per-square-foot luminous ceiling with the new indirect luminaires, accent downlighting, and cove lighting at the teller area, the total lighting load is 2½ watts per square foot, drastically reducing energy costs and providing a fast payback," says Hutton.

—Susan R. Degen

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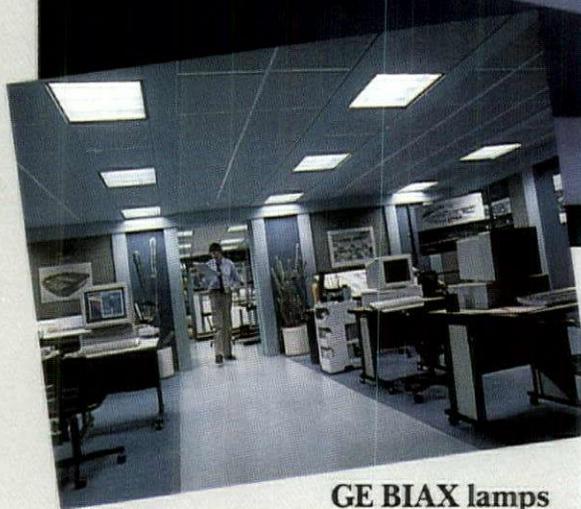
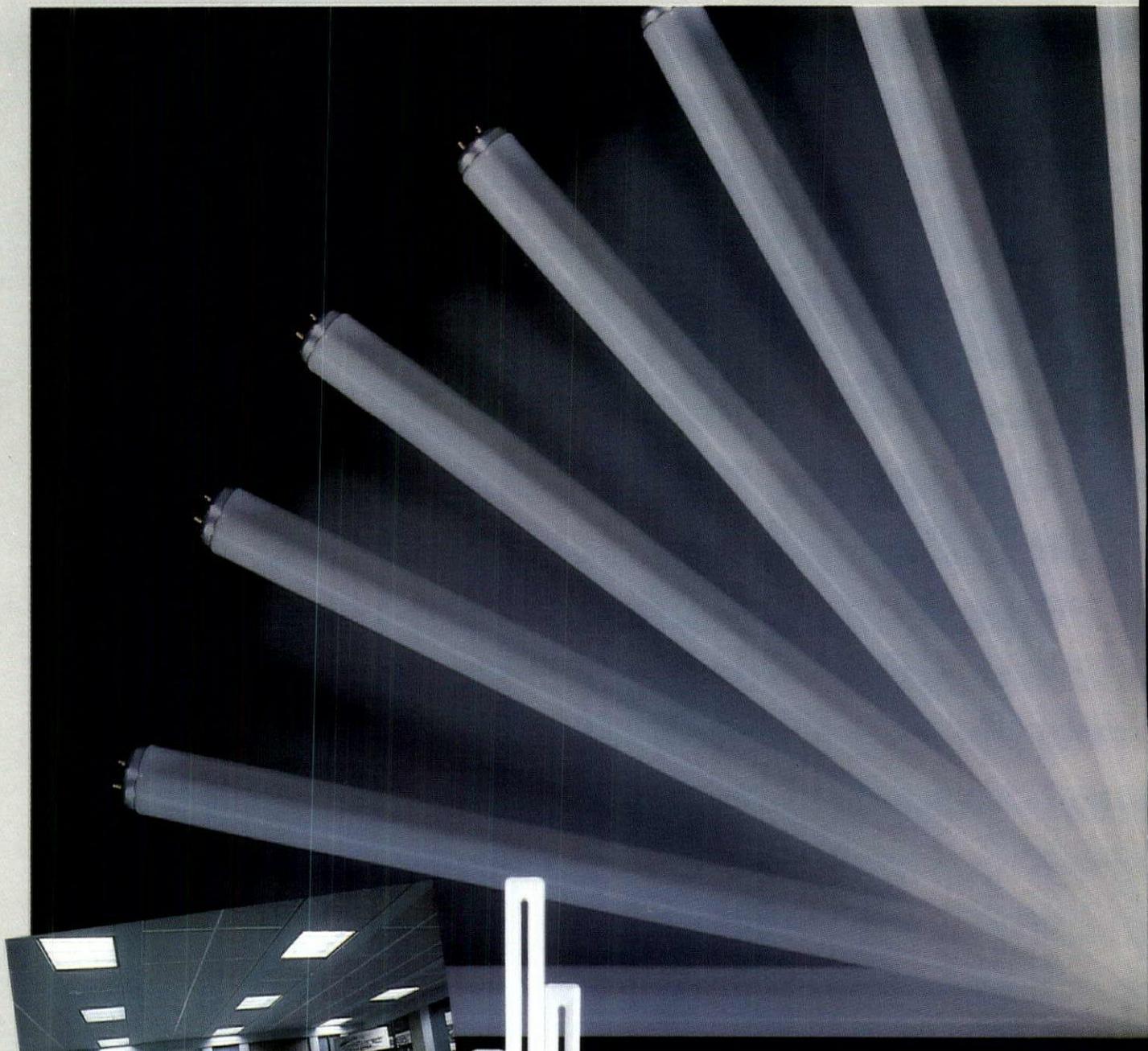
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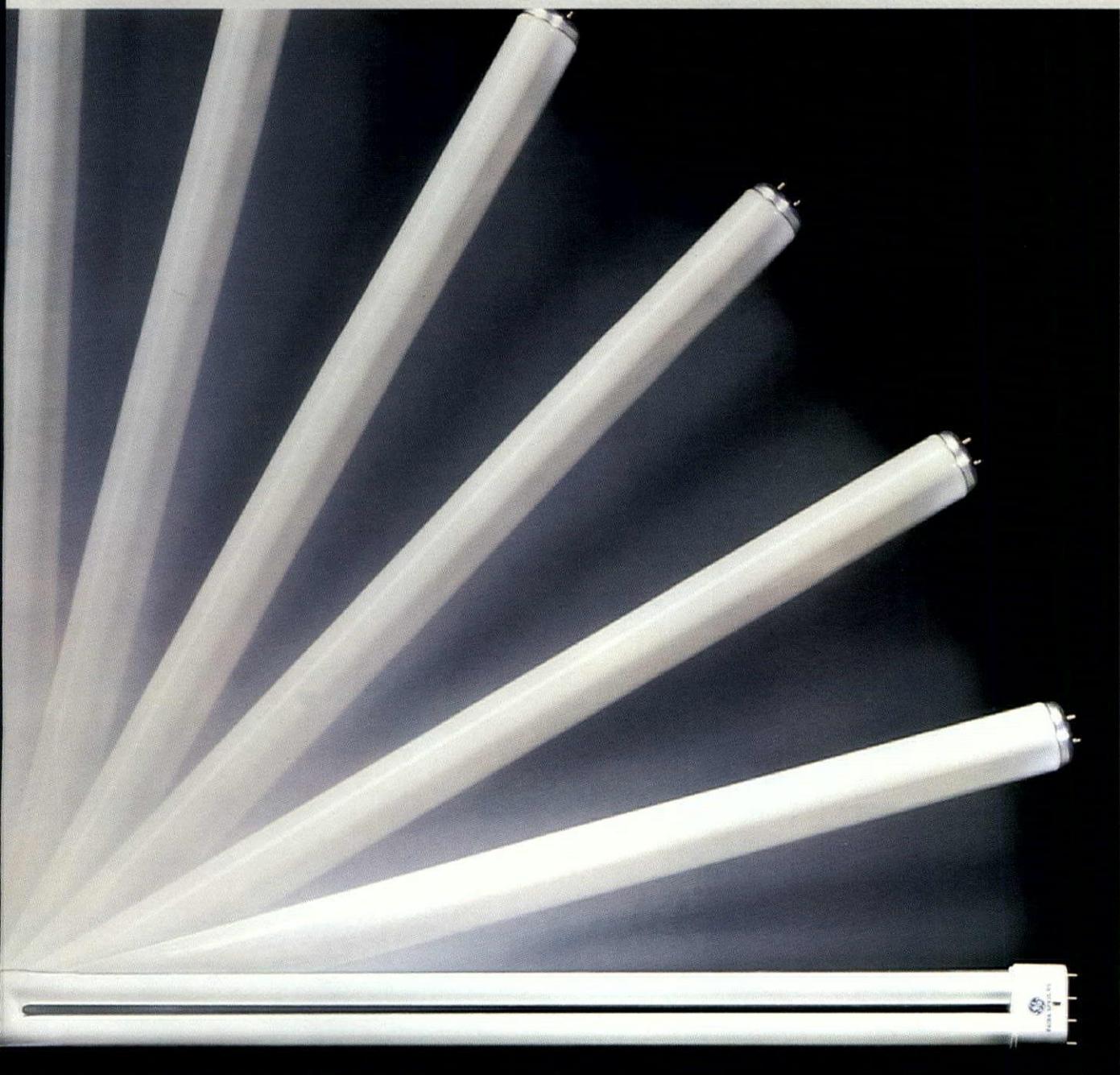


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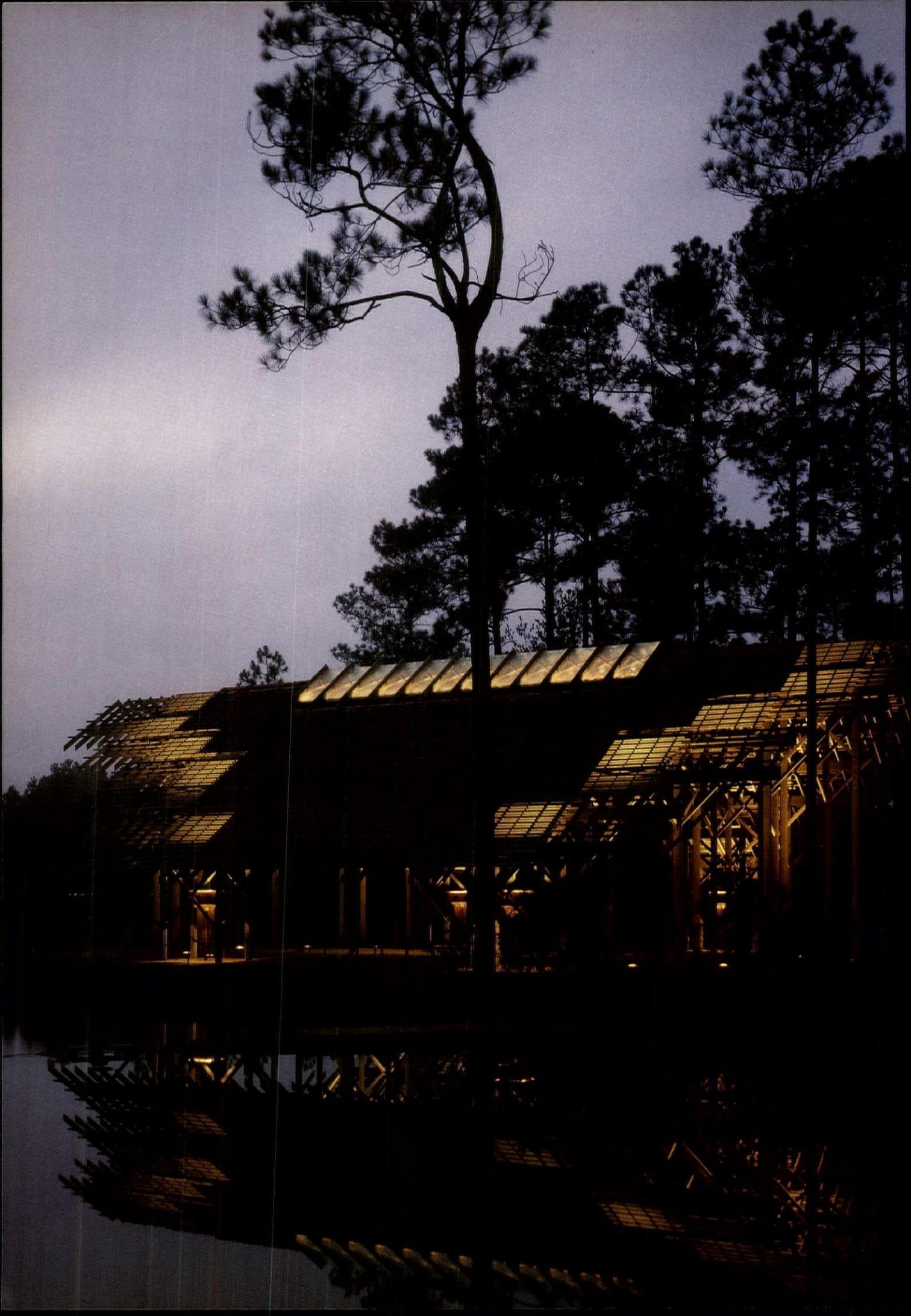
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Light and shadow only decoration park shelter needs

ARTICLE BY
GARETH FENLEY

PHOTOGRAPHS BY
TIMOTHY HURSLEY,
THE ARKANSAS OFFICE

The Mississippi pine savannah, unlike thicker forests, is a place where you can see the sky from the ground. At Pinecote, the Crosby Arboretum Interpretive Center, you can see the sky while standing on the brick floor — looking through the roof. Ever-changing patterns of light and shadow play on closely spaced pine columns, beams, bracing, and decking.

The architect's composition of structural elements requires no further ornamentation. "The time of day and the seasonal changes modify the shadows that frame the light," says E. Fay Jones, who designed the open pavilion — the first of four buildings called for in the arboretum's master plan. The structure shows how the light of the natural world can enhance a building and how electrical lighting can reveal an entirely different appearance.

"The pavilion is a very simple, open building that marks a place in the landscape," says Jones. "It functions as a starting point for nature walks, a place for talks and discussion about the natural world, and a setting for social gatherings, exhibits, and performances. Most of these gatherings focus on the arboretum's work with environmental and ecological issues."

Visitors to the Crosby Arboretum learn about the vege-



tation native to this section of the country. The 64 flat, wooded acres are set aside for the study of pine trees and other native plants.

Jones chose the name Pinecote for the pavilion. A cote, he explains, is a simple shelter that protects birds or other creatures from the weather. This particular shelter is built of yellow pine, harvested just

Project: Pinecote, the Crosby Arboretum Interpretive Center

Location: Picayune, Mississippi

Architect: Fay Jones & Maurice Jennings Architects

Landscape Architecture

Consultants: Andropogon Associates and Edward Blake, Jr.



a few miles from the arboretum.

Visitors approach on a meandering path through the slash pine that allows changing perspectives on Pinecote. "There are clumps and groups of pines that are fairly close together," says Jones, "but it's not densely forested, so you can see the building from some distance. You catch glimpses, then it disappears, and then you catch glimpses again.

"I really wanted something that had strong visual interest from afar, and yet the pavilion is an arrival and gathering place, a place where people spend good time before they move back out into the landscape. So I certainly wanted it to be an interior space conducive to the kinds of activities that go on there." Lighting was an essential element in the process Jones used to achieve

these objectives, arriving at complementary solutions as different as night and day.

Light as Design Determinant

"I consider light the most potent force that the architect has to work with — the most potent design determinant in architecture," Jones says. "Light delineates the space and form in a building, and so it's an element to consider very early in any kind of design or composition.

"I always try to think first of whatever I'm doing in terms of natural light and its changing conditions, the various kinds or qualities of light depending on time of day and season. If a structure has been designed for natural lighting, the challenge then becomes how to make the electrical lighting enhance that form so that it

appears equally exciting and equally well delineated at night."

Jones observes that designers who rely on natural lighting are using a kind of single source — the sun during the day or, perhaps, the moon at night. For electrical lighting, however, designers place multiple sources, choosing from an endless variety of standard and custom fixtures.

"The design problem of night lighting is not necessarily to repeat the daylighting, but to recognize the potential of the structure," says Jones. "Generally, it's an opportunity to get some other kinds of complementary effects that enhance the form and space."

Daylighting First

Jones followed this philosophy closely as he designed Pine-

cote. The pavilion is designed for daylighting, supplemented by electrical lighting that can extend its hours of use into the night.

"We tried to do nothing to the structure that was merely decoration," he says. "Any decorative embellishment comes from the light and shadow playing on structural elements, as the sun and the moon move across the sky and natural light comes in at various angles from above. This keeps the spaces in and around the pavilion alive and vital."

The unusual roof is the primary shadow-maker. "The edges are not crisp at all," says Jones. "Like the pine straw and pine limbs, they progressively thin out from something that's close and dense to something open and fragile." The



roof creates a gradual transition from dark, sheltered interior to brighter exterior around the edges of the pavilion.

Daylighting was a strong factor in determining orientation to the site. Pinecote is aligned on a north-south axis; its high, peaked south end juts into a small lake. Low winter sunlight penetrates deeply into the building from the south, and Jones also notes that light reflecting off the water gives some movement to the shadows by reflecting up underneath the roof.

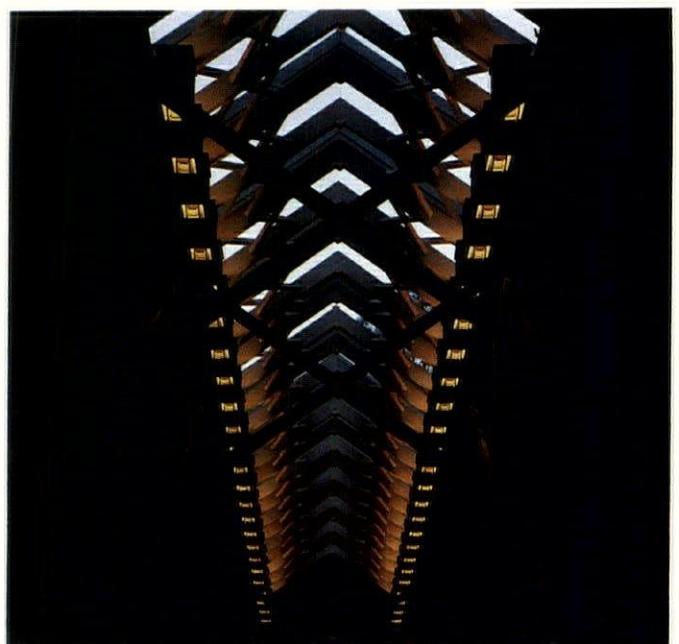
A ridge skylight brings more daylight into the center of the shelter. "The roof comes so low around two sides that the central gathering point could often become too dark without the skylight," says Jones. As it is, "the pavilion gets quite

a bit of daylight inside, except on very dark wintry days when adding electric light creates a sense of warmth and a little more aliveness to the place."

Simple Electrical Lighting

Because Pinecote's structure is completely exposed, Jones kept the electrical hardware simple. "I certainly wanted to try to create some dramatic effects," he says. "But I had limits on where I could run electrical wiring and conduit without detracting from the simplicity of the basic construction."

First, he lined the skylight with 24 custom downlights in two rows. Jones describes them as "simple little wooden boxes with little wooden grilles." The louvered downlights are the only electrical fixtures



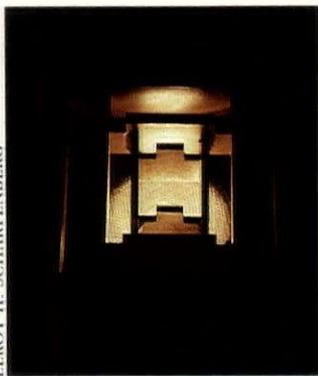
Skylight is lined with louvered wooden downlights.



mounted on the structure.

"They have simple porcelain lamp holders that hold ordinary 60-watt light bulbs. The tops are left open so light gets out of the top at night. The tops of the lanterns are out under the skylight, so you see a reflection on the glass. The uplighting and downlighting kind of glorify the skylight from a night lighting standpoint."

Twelve recessed uplights, cast into the concrete base, each hold a weatherproof fixture with a 150-watt PAR 38 flood lamp. Light shines up through a metal grating, closely related in pattern to the wooden grilles in the downlights. To clean out debris, "all you have to do is lift the grate, just like you would open a shoe box," says Jones. A 2-inch line



LEROY H. SCHARFENBERG

Detail of floor-mounted uplight with custom metal grille.

drains rainwater from the uplights into the lake.

The floor-based fixtures uplight the columns and the bays they define, spreading light around the perimeter of Pinecote. "Where that light

shines up through the open rafters and out through the top part of the building at night, it really delineates the openness of the roof," says Jones.

"It's kind of a reversal of what happens in the daytime," he continues. "When you're underneath and the strong light's above, you really notice the silhouette and the shadow play; whereas when you're outside at night and see the uplighting, you're much more aware of the openness of the structure."

Sculptural Fixtures

To supplement the small louvered fixtures, four large steel sculptural lighting fixtures stand in the pavilion's corners. They beam light both up and down and are intended to "become

a place where one could put certain objects — sculptural objects or bowls of plantings — that would be underlighted. They serve as a kind of furnishing for the space," says Jones.

Jones decided that by using steel instead of wood, he could create delicate-looking fixtures that stand up to abuse. "The fixtures are down where people can put their hands on them and lean against them. I could get thinner sections, make the legs and support arrangement look a little more delicate, and make it better proportioned," he explains, "and make a fixture that will hold up over a longer period of time."

Each fixture holds four 100-watt A lamps in an ordinary lamp holder set in the center of a square steel surround

topped with flat glass. The flat steel is cut in a stepped-edge pattern that emphasizes vertical edges. Like all other exposed metal in Pinecote, the fixtures are painted a muted color to harmonize with the surrounding earth and plants.

Jones also designed small landscape lights that continue the stepped-edge pattern. They will soon be mounted on the ground along the pathway; some with open tops will underlight special trees.

Geometric Order

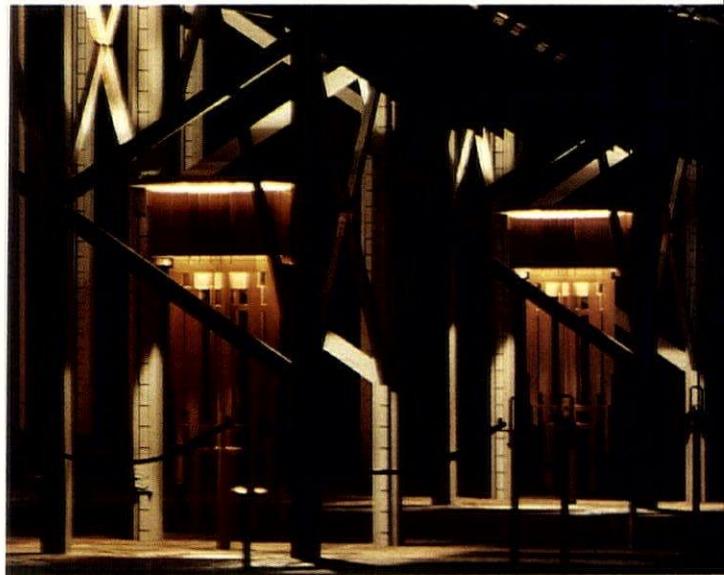
The patterns of the lighting fixtures also harmonize with Pinecote itself. "The whole building is ordered by a certain geometric theme," says Jones, "a stepped-edge pattern that defines the outline of the base and then the roof's outer edges, and the equally spaced framing of rafters across a number of long, parallel, longitudinal beams.

"The solid, shingled part of the roof is the central part, so that there's a kind of a vignetting or playing out at the edges where the framing is not covered and is open between alternating thin and thick pieces of the roof decking — letting the light penetrate and create a gradual transition. So there is a spreading out of the structural members and a progressive thinning out of the decking toward the

edges of the big roof."

The use of incandescent lamps throughout fit with the ideal of simplicity in structure and maintenance. "It played a strong part in the whole organic relationship idea — trying to have everything all of a piece, looking like it stemmed from a single source," Jones says.

Jones is pleased that a variety of people have visited and enjoyed Pinecote, from Scout troops to the director of the U.S. National Arboretum. "Some people who've been there when there aren't many people around — who have had it to themselves, a quiet time — have indicated they feel it has a spirit to it, or that





it's a spiritual place.

"Yet, much of the time when I've been there, it's been with a number of people — during a music performance, a barbecue, or a picnic," he says. During social events, people have commented "that it's just a nice place to be, how well it accommodates that kind of activity, and how well it fits in with the site." For some activities, people want a sense of enclosure, and Jones points out that people can feel somewhat protected by being in the pavilion. The interpretive center decorated with only light and shadow can serve as a functional shelter or it can reward contemplation.

Like the plants of the surrounding landscape, the vitality of Pinecote springs from changes that occur with the hours of the day and the seasons of the year. Electric light dramatizes the difference between night and day, transforming the building itself into a glowing light source.

Changes in the light of nature are sometimes more subtle. Bright reflections from the lake dance on the rafters with a riffling breeze. The long, pale shadows of a gray winter afternoon eventually give way to the sharp-edged shadows of high noon in July, when the sun shining through the skylight casts images of wooden louvers on the brick below. ■

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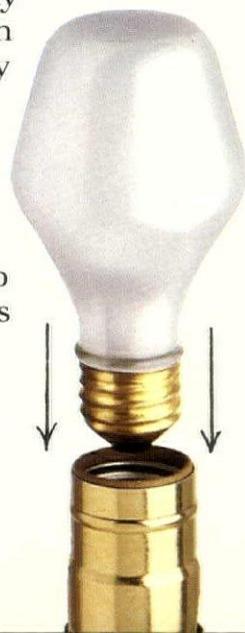
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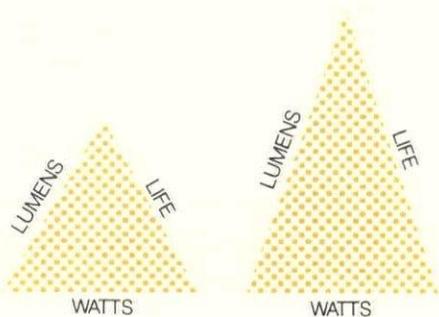
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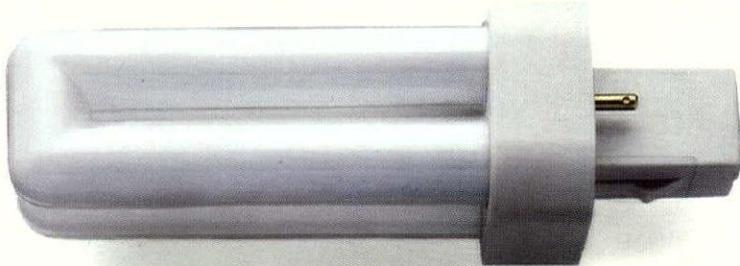
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Special effects with standard indirect fixtures

Lighting can be a cost-effective way to make an architectural statement. Sophisticated lighting designs are always more expensive than grids of two-by-four lay-in fluorescents, but lighting can create hierarchies and distinctions of space at less cost than the traditional route: downlights and upgrade finishes, such as marble and expensive wall coverings.

Alan Gaynor

Alan Gaynor, AIA, is principal and director of design at Alan Gaynor & Company, New York City.

When initiating a concept for the design of a space, it's important to keep in mind both the aesthetic and the pragmatic purposes of light. Light attracts attention, so it can be used for visual stops or exclamation points to emphasize entrances, signage, or other design features. Think of the garish lighting of nightclubs and tourist spots.

More theoretically, Le Corbusier described architecture as form and surface rendered by light. Light shapes and defines each space and can be used to alter forms and colors, to emphasize or de-emphasize, to create moods and personality. Lighting, especially indirect lighting, is a key design element in all my interiors projects, from initial concep-



DERRICK & LOVE

Foreign exchange trading room at Wells Fargo Bank International.



Skylight-inspired design at Tribune Cable Communications.

tion to final result.

Indirect lighting can serve a combination of practical and aesthetic purposes. In this computer-intensive era, every desk — from the secretary's to the top executive's — has a VDT on it, and the effect of screen glare on productivity and comfort is a major consideration.

Indirect lighting can eliminate much of the glare. It is softer, more diffused, and lacks the visual hot spots direct light can cause. The overall effect is more soothing. By using energy-efficient fluorescent and metal halide lamps in these luminaires, instead of incandescents, designers can reduce power consumption and cooling requirements.

The designs discussed in this article use a mixture of standard and special lighting fixtures, often situated in specially designed locations. The superb technical skills of managing associate Michele Boddewyn have been a key factor in realizing many of these designs. For the most part, we have relied heavily upon industry standards, technical manuals, and manufacturers' representatives for information to locate products and materials. We only rarely find it necessary to construct a mock-up.

Lighting to Calm Stress

A tight schedule left us no time to experiment when designing

the new headquarters of Wells Fargo Bank International in New York City. Because the bank's trading activity involves markets around the world, the foreign exchange trading room is in use 24 hours a day. The stress level of the people using the room and its many VDTs is high.

Our design uses soft, diffused light together with the warm tone coloring of the room to counteract the rising pressures of the trading day. We suspended high intensity discharge (HID) fixtures within a stepped dry-wall vault that echoes the outline of custom trading desks. The light bounces off the ceiling and the vault concentrates it onto the desks below.

We chose fixtures that we had successfully used in other situations requiring glare-free lighting for computer screens. But there is also an aesthetic advantage to using HID lighting. Fewer fixtures can provide the right amount of light, yet achieve the pattern and dramatic effect we want.

The luminaires are standard catalog fixtures with metal halide lamps. To determine the spacing and the number of fixtures needed to achieve the desired lighting level, we consulted the manufacturer's representative and technical literature.

Simulated Skylighting

The concentrated light provided by these same HID fixtures is useful in another situation, not computer related. The client, Tribune Cable Communications, planned to occupy the top floor of a suburban office building in Mahwah, New Jersey. The building owner turned down Tribune Cable's request to install skylights in the upgraded areas, so we were asked to solve the problem — to somehow approximate or simulate skylights as one part of the overall design scheme.

The major impression that a skylight makes is that of intense white light streaming through a cutout in the ceiling. With metal halide lamps, the whitest of the HID family, we created a skylight effect in the reception area that would satisfy the client's aspirations and budget, within the landlord's restrictions.

We set standard, circular HID fixtures within square coffers in a custom sheetrock ceiling. The fixtures align flush with the soffit. The circle-square pattern augments the geometries of the overall design. Functionally, the coffers concentrate the light of the fixtures, and the resulting intensity gives the impression of bright daylight in a series of luminous pools that illu-





Formal conference room (left) and reception area (above) of Advantest America's sales headquarters.

minate the reception area and delineate the progression down the main hallway.

Extending Geometries

Another pattern of simple geometries — lines, triangles, squares, and rectangles — plays an important part in the design of Advantest America's northeastern sales headquarters in Fort Lee, New Jersey. Personal computers are ubiquitous at this multimillion-dollar computer manufacturer, so indirect lighting seemed the logical choice.

Aesthetic and functional considerations rank equally in this project. To provide indirect lighting and also to augment the overall architectural design, we designed custom housings that are triangular on the ends and rectangular on the sides. Fluorescent light reflects up and bounces off the standard two-by-four lay-in ceiling to provide an even spread of light throughout the work space. Though solid, the

fixture seems to float just below the shimmering ceiling, creating a futuristic atmosphere and reinforcing the company's high-tech image.

The linearity of fluorescent lamps best suits the concept of the housing, and there is not enough available ceiling height to allow for the spread of HID. Initially cautious about the idea, the client finally gave the go-ahead after seeing a demonstration of a mock-up of the proposed fixture.

A millwork contractor fabricated the housings from wood-veneer plywood. Paint on the inside increases reflectivity, and paint on the outside matches a major theme color of the office space. Installation involved simply suspending the assembled fixtures with aircraft cable; mounting heights and distances were determined by industry standards.

The same fixtures appear in several special areas of the offices. In the reception area,

where the basic geometric elements of the overall office design are introduced and defined, a single fixture suspended from a rectangular recess in the sheetrock ceiling focuses the reflected light on and in front of the reception desk. The flanking screen walls, made up of triangles and rectangles, extend the geometric theme, along with the squares of the furniture and wall accents.

The theme is repeated subtly in the largest conference room, where the colors are quieter and more formal. Five shorter fixtures hang close together in a line over the conference table, again from a rectangular recess. Squares and rectangles are restated by the doors and walls.

Shadow Play

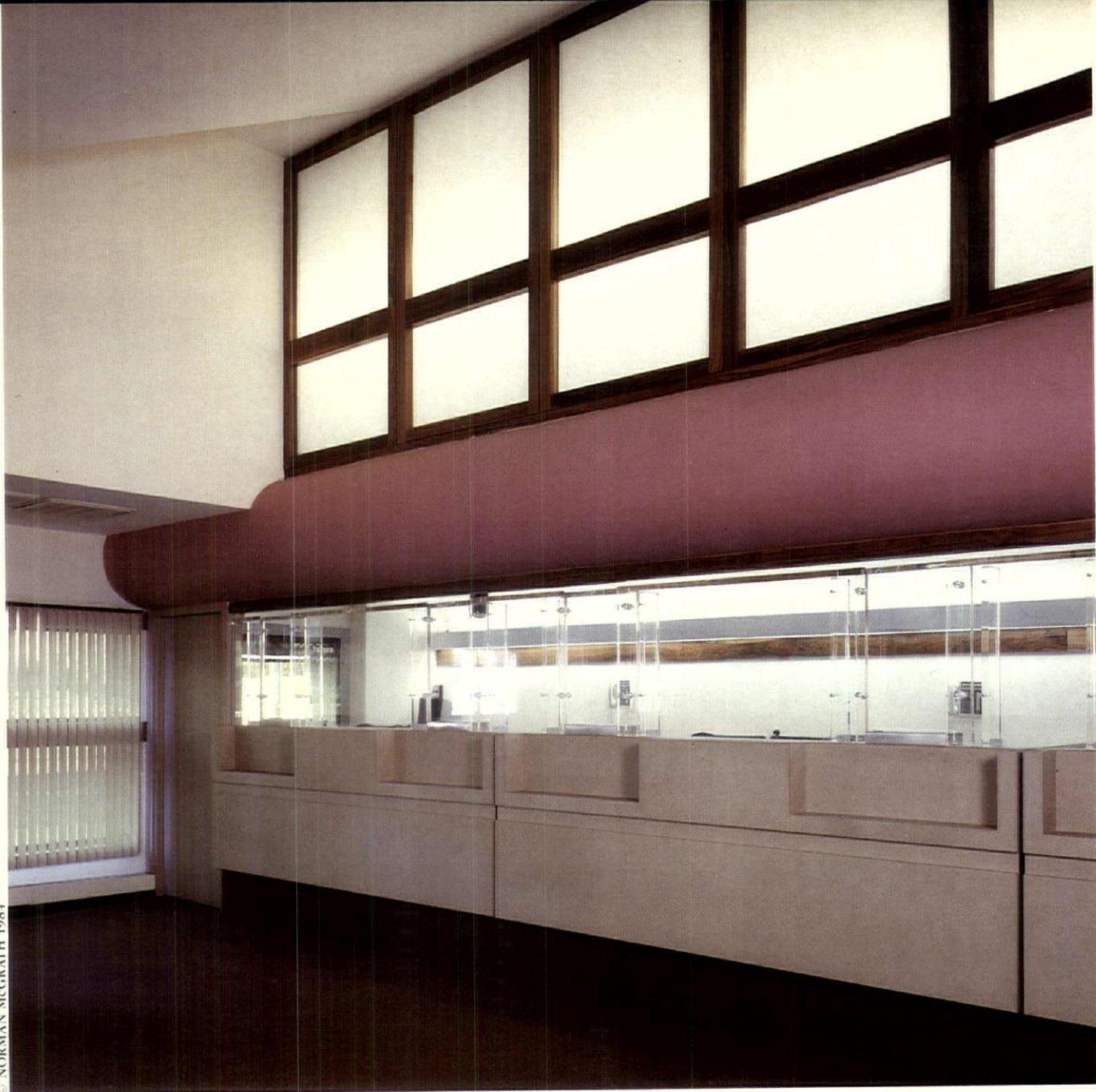
We used standard lighting fixtures with specially designed ceilings to devise a motif that is repeated in the upgraded areas of the Roseland, New Jersey, law firm of Lum, Hoens, Abeles, Conant & Danzis. Two

square reception alcoves and a small conference room each have a drywall ceiling with four rectangular coffers that form a cross.

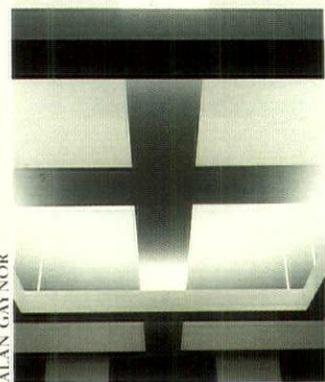
To provide indirect lighting, we selected a fluorescent fixture whose straight and corner sections, like Tinker-Toy parts, lend themselves to a multitude of configurations. The manufacturer assembled several simple squares that we suspended from the ceiling. To determine the mounting height and the amount of light the fixture would provide, we again gathered information from the manufacturer's representative and from technical literature. The design concentrates light on the areas below and creates a play of shadow and light, square upon rectangle upon cross.

Guiding Light

At a Newark, New Jersey, branch of Carteret Savings & Loan, the client requested a contemporary, individual image. We took advantage of a very high



Teller line of Carteret Savings & Loan.



Ceiling of law office conference room.

ceiling to design a different kind of specialized lighting. The two-story space allowed room to create an unusual

feature — an illuminated wall above the teller's windows. This attention-grabbing effect emphasizes the main functional area of the bank and directs customers toward the tellers.

Theatrical diffusing material, outlined by a decorative wood frame, is the "lampshade" for the 500-watt quartz fixtures behind. Technical literature and the manufacturer's information were again adequate to determine the number of fixtures and their placement. The electrical contractor influenced the design by demonstrating that some less expensive lamps worked just as well as the ones originally specified.

The diffusing material "lampshade" is a flexible idea that

we have successfully adapted in several projects. At Wells Fargo Bank, for instance, we set fluorescent lamps inside a 73-foot-long box fronted with the same translucent fabric. This box, placed horizontally against the ceiling and the side wall, is one of the major perspective lines leading into the bank's executive suite.

In all our projects, lighting design is an integral part of the overall concept. The concept is client-driven in terms of budget, needs, and taste, but clients rarely request specific lighting fixtures.

In originating a concept for a lighting scheme, consider how the fixtures fit into the overall design, as well as how light will shape the space. Designs

sometimes have to be modified when the available fixtures don't quite fit the original concept, but in general, simple designs are fairly easy to fulfill with "ready-mades." Reliance on catalog fixtures increases the ease of installation and maintenance of the lighting, which in turn increases client acceptance.

At the end of a project, I've had the opportunity to explore some creative ideas and to give my client something original and easy to live with that hasn't cost an arm and a leg. That's a satisfying conclusion for both of us. ■

For product information, see the Manufacturer Credits section on page 70.

Consider these new angles in architectural lighting—clean, crisp, boldly-styled luminaires; ultra contemporary in design and function; shapes that harmonize with a wide range of modern building environments. They're typical of the complete Hubbell line of quality engineered cutoff luminaires, created to satisfy the most stringent architectural and engineering requirements.

Hubbell's architectural luminaires feature stylish forms which enhance the visual environment during daylight hours and provide safety and security

at night. The fixture's beauty is magnified by Hubbell's durable Lektrocote® finish, an electrostatically-applied powder coating, providing a decorative appearance for years to come.

Luminaires are available in various wattages ranging from 50 to 1000 watts and featuring mercury, metal halide, and high pressure sodium H.I.D. sources. All units are prewired, making installation fast and easy.

Typical applications include shopping centers, parking areas, malls, commercial and industrial complexes, roadways, walkways and campus areas.

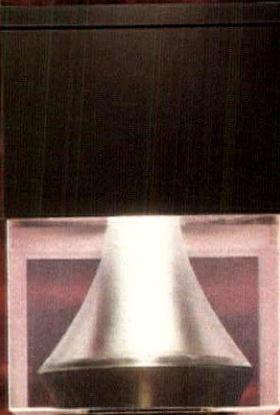
For complete details on Hubbell's full line of architectural luminaires, write to Hubbell Lighting Division, Hubbell, Inc., 2000 Electric Way, Christiansburg, VA 24073. Phone (703) 382-6111.



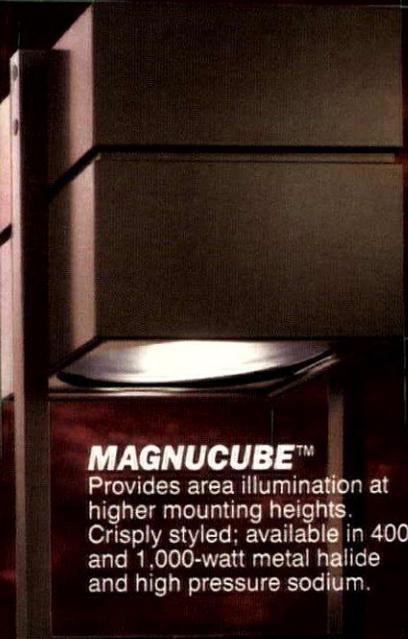
Advanced Geometry.



MAGNUFORM® II SERIES Rectangular luminaires which provide sharp cutoff control for uniform area lighting or roadway installations



MAGNU V® POST TOP Shielded source lighting luminaires for area safety and security. Dual reflector system, housed in clear acrylic enclosure, provides sharp cutoff and uniform illumination.



MAGNUCUBE™ Provides area illumination at higher mounting heights. Crisply styled; available in 400 and 1,000-watt metal halide and high pressure sodium.



MAGNU V® BOLLARD Lower-level illumination from a shielded source system in attractive square or round housings. Available in metal halide and high pressure sodium.



MAGNUPAR® Clean, yoke-mounted unit available with symmetrical or asymmetrical distribution for highly uniform illumination.

1988 Lighting World International offers speakers, exhibits

Speakers will share their expertise in lighting design and application, technical advances, and postoccupancy issues in 14 educational sessions at 1988's Lighting World International. Presentations will be tailored to the interests of architects, engineers, lighting designers, interior designers, and facility planners and managers. The role of light and lighting in architecture is the subject of the keynote address by prominent architect Arthur Erickson.

The 1988 exposition and conference will take place on April 13, 14, and 15 at the Los Angeles Convention Center. Sponsors expect it to be the largest architectural lighting show ever presented in the United States.

Those who attend the conference will have three full days to attend educational sessions and roam the exhibition floor. About 500 companies will display and demonstrate architectural lighting products; the newest and most innovative will be introduced at a special preview session. An evening tour of Universal Studios adds a social dimension to the show. A schedule of topics and speakers follows.

Wednesday, April 13
Opening breakfast and keynote address. (8:30–10:30 a.m. Speaker: Arthur Erickson, Arthur Erickson Associates.) Internationally known architect Arthur Erickson will take a thoughtful look at the role of light and lighting in architecture at the opening breakfast.

"It is only through light that we perceive architecture. Other senses may enhance that perception, but without light the experience does not exist at all," Erickson says. "The art of lighting goes far beyond the need to illuminate the path or augment our vision. It can reveal a new and arresting presence not previously evident. The

The program for Lighting World International was organized by a committee of representatives of the sponsoring organizations: the Illuminating Engineering Society of North America, the International Association of Lighting Designers, and the Southern California Section of IES.

potential of lighting lies in the exploration of this alternate architectural landscape."

Erickson is known for a diversity of projects shaped by his innovative and creative solutions. Among his current projects are the 11-acre California Plaza in downtown Los Angeles, the San Diego Convention Center, and the Canadian Chancery in Washington, D.C. Among his many honors and awards are gold medals from architectural societies in Canada, France, and the United States.

Preview of products: The latest in lighting technology. (1:00–2:30 p.m. Presenters: James R. Benya, senior principal, Luminae Inc.; Ian Lewin, president, Lighting Sciences, Inc.) This session offers designers an inside look at products that represent significant advancements in lighting technology.

A panel of IES and IALD experts is selecting from the lamps, fixtures, and controls to be exhibited at Lighting World. Each product will be highlighted in a brief slide presentation during the session.

Creating subjective responses with lighting: A debate. (Session 101, 3:00–4:00 p.m. Speakers: Mark S. Rea, National Research Council Canada; Gary R. Steffy, president, Gary Steffy Lighting Design, Inc.) Most designers

accept the idea that spaces should seem pleasant and spacious, engendering a feeling of relaxation among occupants. Lighting experts disagree about which lighting techniques create which impressions.

A lighting designer and a researcher will present contrasting viewpoints on the psychological aspects of lighting in design practice. Gary Steffy will show how to use data from both research and experience in design practice. Mark Rea will discuss the potential weaknesses of many prevailing design assumptions — and the doubts that prompt continuing research.

The session will begin with a survey of the audience's subjective responses to several design solutions. Preliminary results will be announced at the end of the program, and a follow-up summary will be published later.

Airfield lighting: A navigational aid for pilots. (Session 102, 3:00–4:00 p.m. Speaker: Fred Gronberg, chairman of the board, Flash Technology Corporation of America.) Thousands of airfields in the United States have outdated lighting systems or no lighting at all. Specialized illumination at airfields — where planes approach, land, and taxi — is directed toward the eyes of the pilot, who uses the lighting as a navigational aid.

Fred Gronberg will present a simplified method for calculating light source intensity for airfields and touch on systems now in development, such as electroluminescent, solar, and tritium-powered sources. This session will be of particular interest to electrical and civil design engineers and airport engineers.

An evening at Universal Studios. (7:00–11:00 p.m.) Reservations are required for a special after-hours tour of the world's largest motion picture studio complex. Transporta-

tion will be provided to and from the studios, where visitors can see film and television sets including those of *Back to the Future*, "Knight- rider," and "Murder, She Wrote."

Visitors will encounter Jaws, the parting of the Red Sea, Battlestar Galactica, and the all-new King Kong. The tour ends with an international food reception and a performance of "Conan the Barbarian — A Sword and Sorcery Spectacular."

Thursday, April 14
Light: The bridge for all cultures. (Session 201, 8:30–9:30 a.m. Speaker: Motoko Ishii, president, Motoko Ishii International.) Modern communication and transportation have helped create an international society in which people throughout the world can experience a variety of cultural traditions. Motoko Ishii, the founder of a group of companies based in Tokyo, will discuss the cultural significance of light — which is common to all cultures, yet can be combined with local materials to radiate a specific national identity.

"Light gives life not only in a biological sense but in a spiritual way," she says. "By focusing our discussion on our common bond, light, we have a unifying understanding with which all nations can reach out together into the 21st century."

Street and cityscape lighting using principles of visual communication. (Session 301, 10:00–11:00 a.m. Speaker: William M.C. Lam, president, William Lam Associates, Inc.) A city's positive image is created as a by-product of providing maximum safety, security, convenience, and enjoyment for all users. At night, the quality — rather than the quantity — of lighting largely determines both aesthetic and functional success.

William Lam will discuss street, highway, and cityscape

lighting as functional problems to be solved, emphasizing principles of visual communication based on an understanding of visual perception.

Exterior lighting in a historical context. (Session 401, 11:30 a.m.–12:30 p.m. Speaker: Charles G. Stone II, partner, Jules Fisher & Paul Marantz, Inc.) When a city's design precedents have been established over decades or even centuries, designers must bring a historical perspective to the renovation and restoration of buildings if they are to be sympathetic to the fabric of the city.

Charles Stone will explore how architecture informs and guides the lighting designer in deciding how to light a building's exterior. He will touch on the romantic potential of architecture at night.

The complications, cautions, and common sense of industrial lighting. (Session 402, 11:30 a.m.–12:30 p.m. Speaker: Gordon D. Rowe, senior lecturer [retired], General Electric Lighting Institute.) Factory task visibility problems can be more complex and frustrating to solve than those of the office. This session will address the dos and don'ts of delivering light appropriate to the demands of industrial tasks.

Gordon Rowe will explain how to examine task characteristics, how to evaluate task response to several lighting techniques, and how to choose the system appropriate to optimum visibility. He will offer suggestions for assessing the importance of visual comfort and environment to worker well-being, visual efficacy, lighting utilization and economy, and cost analysis.

Learning to "see the light" during the design phase. (Session 501, 1:00–2:00 p.m. Speakers: Lesley Wheel, president, and Babu Shankar, vice president, Wheel Gersztzoff

Friedman Associates, Inc.) Visualizing a lighting installation while it is still in the design phase requires two ways of seeing — a kind of dual vision. Designers must be able to anticipate the physical appearance of the lighting fixtures in a space. They also must be able to see the light that the fixtures will produce and the effect of the light on one's perception of the space.

Lesley Wheel and Babu Shankar will propose a method of learning to visualize with dual vision. They will discuss how to see the effect of each component of a lighting system separately, and then how to put them together to see the whole.

Energy constraints and design integrity: Are they compatible? (Session 601, 2:30–3:30 p.m. Speakers: Hayden N. McKay, partner, Howard Brandston Lighting Design Inc.; Sandra M. Stashik, design studio manager, Grenald Associates Ltd.) Energy codes continue to evolve as researchers seek realistic standards for energy-efficient buildings. Codes challenge designers to maintain creative integrity under stringent energy constraints.

The session will begin with a review of existing codes and standards, including California's Title 24, ASHRAE/IES/ANSI Standard 90, and the current status of the newly revised Standard 90. The speakers will discuss DOE-funded work on whole-building energy targets and how this work may affect future designs. They will also look beyond energy-saving features to review the total environmental effect of selected energy-saving equipment and applications.

Lighting maintenance: Designing to minimize an owner's postoccupancy costs. (Session 602, 2:30–3:30 p.m. Speaker: Leon Mendelsohn, president, Imperial

Lighting Maintenance Company.) The cost of maintaining a lighting system often gets less attention than aesthetics, function, and initial cost — at least in the design stage. The result can be an enormous bill for cleaning, relamping, and other types of routine service.

Leon Mendelsohn will review typical lighting maintenance issues that should be addressed in the design stage in order to provide an affordable system and to protect the design from piecemeal tinkering after the tenant moves in.

Friday, April 15

Lighting education: What you should know and where you can find it. (Session 701, 8:30–10:30 a.m. Speakers: Craig A. Bernecker, director of illumination studies, Pennsylvania State University; Rita M. Harrold, manager of sales training and development, Lightolier/Genlyte.) In lighting, where techniques and technology are developing so rapidly, the need to remain current is particularly acute.

The speakers will discuss university degree programs, industry and professional society courses, and independent study materials. Those who attend will receive the results of an educational survey currently in progress.

A new look at light and color. (Session 801, 11:00 a.m.–12:00 noon. Speakers: Mayer Spivak, president, Spivak Associates; Chris Ripman, president, Ripman Lighting Consultants.) A new look at the effects of light and color reveals subtle criteria for evaluating lighting schemes and decisions. If lighting is understood to be a supporter of social process and nonverbal communication, lighting design should create environments that become meaningful to the users and, as a result, serve them and make them feel good.

To illustrate theory, the

speakers will demonstrate various light sources, including lasers. Topics to be covered include sheen, iridescence, skin tones, illusions, meaning, shadow definition, orientation, seeing in stereo, and appreciating the experience of pure color.

Lighting the Ben Franklin Bridge. (Session 901, 1:00–2:00 p.m. Speaker: George C. Izenour, professor emeritus of theater design and technology, Yale University School of Drama.) The steel cable suspension bridge is both a monumental utilitarian structure and an exemplary aesthetic object. Those two factors encouraged the design team to bring theater techniques to the lighting of the Benjamin Franklin Bridge, which links Philadelphia with Camden, New Jersey.

George Izenour will discuss how he and other design team members arrived at the final scheme. He will describe the animated lighting system, the decision to light the steel cables while keeping the towers dark, and maintenance and driver safety aspects of the project.

Lights, camera, action! (Session 902, 2:30–3:30 p.m. Speaker: Kenneth M. Palus, vice president and lighting director, Imero Fiorentino Associates.) This seminar will address the design and implementation of lighting and camera controls for television studio lighting. It will incorporate actual working equipment with design scenarios used in many current television, motion picture, and stage productions. ■

The program is subject to change; be sure to pick up a copy of the final version when you arrive at Lighting World. For further information, contact National Expositions Co., Inc., 15 West 39 Street, New York, NY 10018, (212) 391-9111.

Software Reviews

In this month's column, lighting analysis, HVAC, and CAD software are discussed, as are two books about software; first, the lighting software. Point and Isopoint are two lighting programs from Lighting Analysts that are worth getting to know. The names refer to the type of lighting problems each program tackles.

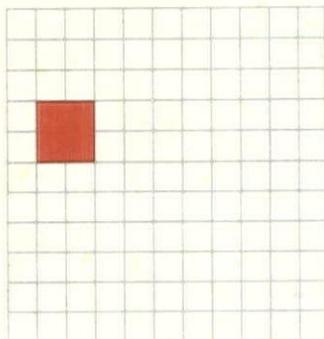
Point Lighting Calculation

Point is a general purpose, point-by-point lighting calculation program from Lighting Analysts that almost any electric lighting designer will find useful. It is simple enough to run for those who might use it only once a month, yet sophisticated enough to satisfy frequent power users, from consulting engineers to manufacturers.

Point and Isopoint are two lighting programs worth getting to know.

Although some lighting manufacturers offer complimentary software that works only with their photometric data, Point is a reasonably priced package that will work with any Illuminating Engineering Society (IES) standard photometric data. It is organized around a worksheet display, so entering data into Point is very straightforward. On-line help is available at the touch of a key. From the main menu, a user can branch to any of the following options: create or change a worksheet, create or change a photometric file, create a title block, replot a gray scale plot, or send a file to the screen or printer.

The program seems faster than most and is capable of printing point-by-point graphics to any scale up to 50 inches wide by 30 inches long with a user-definable gray scale il-



Lighting analysis, HVAC, and CAD programs

David Lord, PhD

David Lord is a professor of architecture at California Polytechnic State University, San Luis Obispo.

luminance grid. It accommodates horizontal, vertical, or tilted planes of analysis with any light meter orientation. The major strength of the program is the capability it gives designers to specify most of the variables in lighting analysis. Users are not limited to a narrow range of possibilities. Included with Point is a utility, Phodir, that allows the manipulation of standard IES photometric files.

Users who desire gray scale printouts must have a printer that can print IBM graphic characters. Most, but not all, dot-matrix printers have this capability.

Lighting Analysts has scheduled two add-on modules for release in the near future. These will allow users to show shadowing and obstructions as well as luminaire locations and aiming angles.

Isopoint Outdoor Design
Isopoint, a program that creates isofootcandle design templates for outdoor area lighting, was written as a marketing tool

with manufacturers in mind. The program can be customized and licensed to any lighting manufacturer, who can then distribute it to specifiers of their particular luminaires.

Lighting designers and specifiers can also purchase Isopoint in a generic version, however, and use it to compare alternate luminaires using IES format data from different manufacturers. Until Isopoint, such templates were produced by pen plotters or by hand.

Isopoint allows designers to produce large numbers of templates overnight, using a generic PC and a dot-matrix printer. Once you are familiar with the way it works and confident in your computer and printer, you can start the program at night and come back for the printout the next morning.

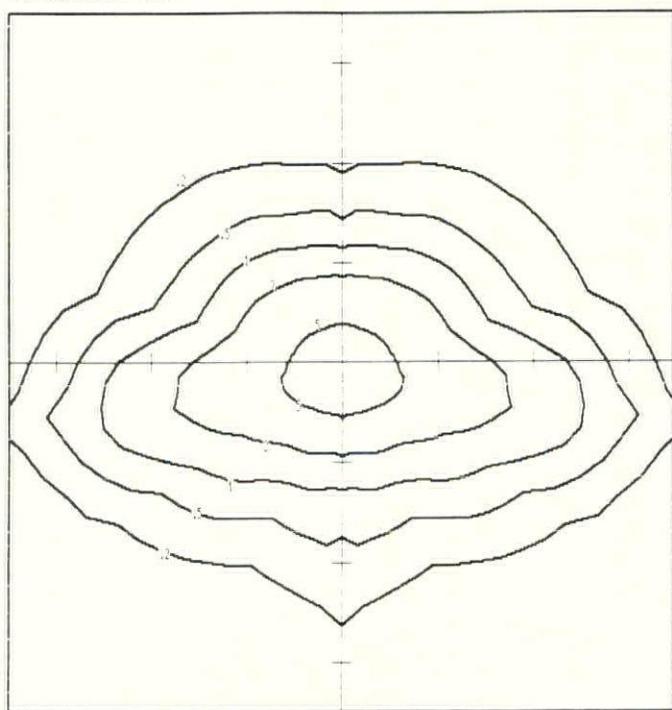
Both Point and Isopoint come

with complete documentation contained, logically, in magnetic form on the diskette. The slight disadvantage is that it must be printed out before beginning the program. I appreciated the robust, no-nonsense nature of the program with all its trappings. The excellence of the program stems from the fact that it was initially written by lighting engineers, not software developers, for their own practice.

Other Programs

Load 123. Another program that may interest lighting engineers is Load 123, an HVAC analysis program that calls on the power of Lotus 1-2-3 to calculate and present numerical information. One of a series of programs from Jessup and Associates, it computes loads for an entire building or its zones or each of its

ISOFOOTCANDLE PLOT



GENERIC LIGHTING
TYPE II SHOEBOX
400 WATT CLP HPS
TEST REPORT 99999

HORIZONTAL FOOTCANDLES
SCALE: 1 INCH = 30.00 FT
LLF = 0.810
PRESENT LUMENS = 50000
MH = 30.00 FT

A typical printout from Point.

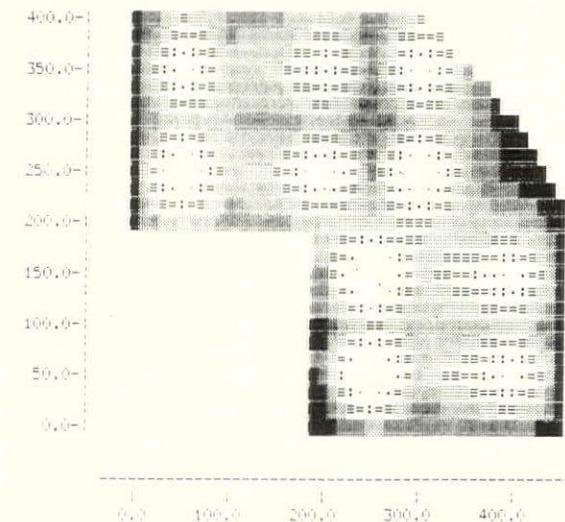


Enhanced graphics display of an AutoSketch drawing.

GREY SCALE ILLUMINANCE GRID

RANGE OF VALUES IN FOOTCANDLES
SENSITIVITY = 0.000

0.12	0.51	1.01	1.51	2.01	2.51	3.01	3.51	4.01	4.51
TO									
0.50	1.00	1.50	2.00	2.50	3.00	3.50	4.00	4.50	7.49



A typical printout from Isopoint.

spaces. The load profiles can then be shown as Lotus 1-2-3 graphs. This series of programs is relatively inexpensive and a good purchase for a design office that is already using Lotus 1-2-3 for other tasks.

For some designers, AutoSketch may be the perfect medium-duty drawing program.

AutoSketch. AutoCAD and AutoShade will be reviewed in an upcoming Software Reviews column, but this month we will mention AutoSketch, the entry-level software from Autodesk. We have had the chance to use AutoSketch and found it remarkable. Not only is it more powerful than the early

Featured programs

Point, \$245

Isopoint, \$195

Requires an IBM PC/XT/AT or compatible with an 8087 or 80287 math coprocessor and a dot-matrix printer with graphic capabilities. A hard disk is recommended.

David M. Speer
Lighting Analysts, Inc.
10572 E. Park Mountain Road
Littleton, CO 80127
(303) 972-8852

Load 123, \$120

Requires Lotus 1-2-3 (version 2.0). A demonstration diskette is available for \$5.

Ernie Jessup
E. Jessup and Associates
4977 Canoga Avenue
Woodland Hills, CA 91364
(818) 884-3997

AutoSketch (8087 version), \$99.50

Requires an IBM PC/XT/AT or 100% compatible system, 640 kilobyte RAM, and 8087 math coprocessor.

Autodesk, Inc.
2320 Marinship Way
Sausalito, CA 94965
(415) 331-0356 or (800) 445-5415

versions of AutoCAD of just four years ago. AutoSketch — with its pull-down menus and dialogue boxes — is also far easier to learn. Best of all, it costs less than \$100.

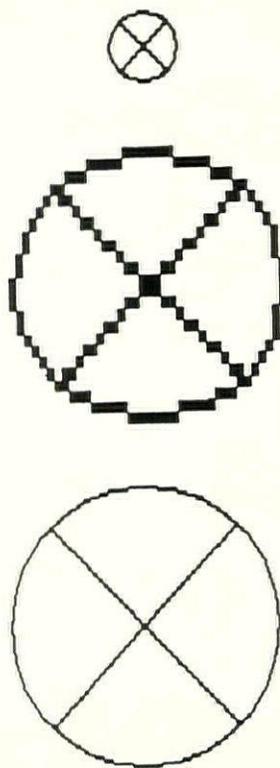
Full-featured and fleet as it is, AutoSketch also gives you the option of converting drawings to the DXF format and transporting them to AutoCAD or other CAD programs. DXF stands for "drawing interchange file," a way of saving drawing data that can be read by most CAD programs.

For many, this will be the perfect, medium-duty drawing program. This is because of an important difference between AutoSketch and many other drawing programs for today's desktop computers: most other programs are *pixel-oriented*. That is, when you draw an object, the appropriate dots are lit on the computer's screen and become part of the drawing. The program doesn't remember that the dots represent a circle and two lines. If you magnify or zoom in on the object to make it four times bigger, the program can only duplicate the dots at a larger scale.

AutoSketch, on the other hand, is *object-oriented*, meaning that it stores the data for the example object as a *circle* with a particular center and radius, and as *lines* with particular end points. If you zoom in on the object, AutoSketch uses the mathematical definitions to redraw an image with greater detail. Thus it is possible to zoom into a single architectural drawing and see minute detail, such as a telephone on a desk, or to zoom out and see the surrounding site, without losing resolution.

Software Tools

We recently received a copy of *A Software Guide for Architects and Designers*, by Janice Hillman and Susan Bickford (Van Nostrand Reinhold, 1987). It lists vendors and products that help designers sort through the mountain of possibilities. Although reference material about computers and software becomes stale quickly, this is a valuable resource for the firm considering a major purchase. Experienced users will also enjoy the cross-indexed organization of computer graphic hardware and



Circle, two lines

Pixel-oriented

Object-oriented

Zooming in on pixel-oriented and object-oriented graphics.

software packages that range in price from a \$39.95 IBM PC graphics utility to a complete mainframe CAD system costing over \$150,000.

If your needs lean toward the more technical, obscure, or experimental software that exists mainly in university settings, then you will want to refer to the *ASHRAE Bibliography of Available Computer Programs*, compiled for the American Society of Heating, Refrigerating and Air-Conditioning Engineers by Larry O. Degelman, a professor at Texas A&M. It lists not only HVAC programs, but also software for electric lighting, daylighting, and energy calculations. ASHRAE also maintains on its data base an on-line search service, by request, for software abstracts.

The Software Reviews column has received for future review an important perspective drawing package — Dyna-

perspective (version 1.1) from DynaWare Corp, Foster City, California — and Grafplus, a graphics printing utility from Jewell Technologies, Seattle, Washington. ■

The Software Reviews columnist welcomes reader comments. Write to David Lord, Architecture Department, Cal Poly, San Luis Obispo, CA 93407.

Books

***A Software Guide for Architects and Designers*, \$21.95**

Ordering Department
Van Nostrand Reinhold
7625 Empire Drive
Florence, KY 41042
(606) 525-6600

***A Bibliography of Available Computer Programs in the Area of Heating, Ventilating, Air-Conditioning, and Refrigeration*, \$49 (\$33 to members)**

Also lists software for electric lighting, daylighting, and energy calculations.

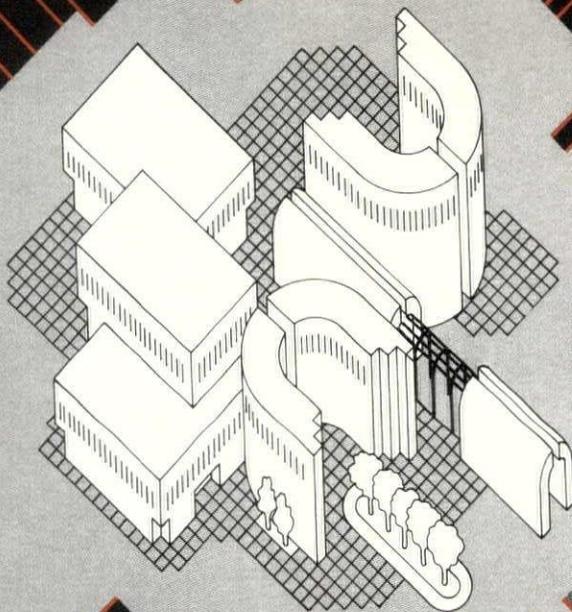
Software Bibliography Services
American Society of Heating, Refrigerating and Air-Conditioning Engineers, Inc.
1791 Tullie Circle, N.E.
Atlanta, GA 30329
(404) 636-8400

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Whether you're designing an historic restoration or a modern high-rise, EMCO has the lighting to enhance the environment.



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Lighting Graphics

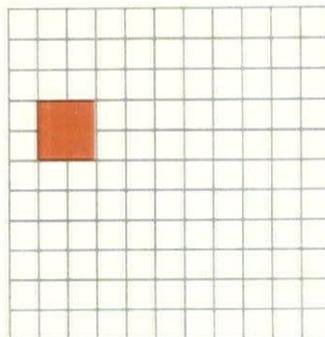
Daylight seems to take on special characteristics when introduced into interior space through skylights. This is most apparent when it is reflected off other architectural surfaces as it enters the space, modifying it to give a soft, indirect quality to the light. Attempting to duplicate this effect with electric light sources presents an interesting challenge to an interior designer.

Lighted ceiling and wall coves can simulate some of these lighting characteristics if close attention is paid to the appropriate scale and detailing. For example, accurate simulation of the architectural scale associated with skylight construction is important. The divider beams shown in the accompanying sketch are sized in accordance with the structural requirements of a typical skylight and avoid the appearance and materials that might suggest commercial lighting equipment — such as aluminum T-bars and prismatic lenses.

Custom-designed cove lighting furnishes a soft, indirect quality that simulates daylight.

This type of ceiling cove requires space above the ceiling for proper installation and depends on high-reflectance ceiling and wall finishes. As a general rule, these surfaces should have a flat or satin finish to minimize specular reflections.

Fluorescent lamps are recommended as a light source and can be circuited to control individual rows of lamps for variable levels of illumination or, perhaps, special color effects (January's Lighting Graphics column discussed white light from color sources).



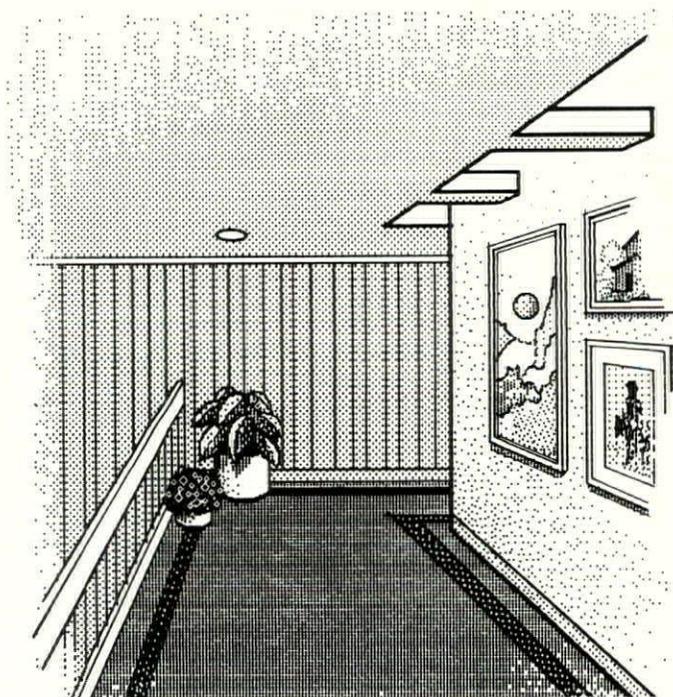
Simulated skylight cove

Sam Mills, AIA, IES

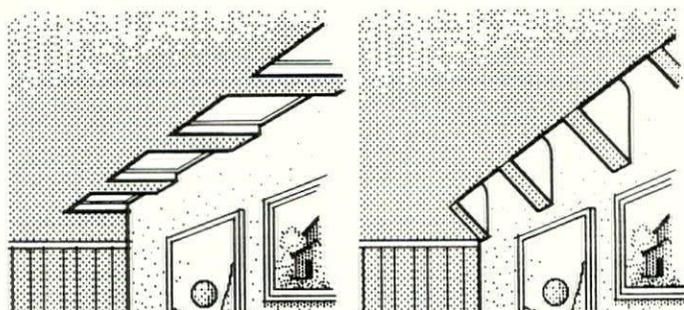
Sam Mills is an architect and lighting consultant in Oklahoma City. His column offers graphic design ideas and technical data selected to help coordinate lighting and architecture.

Lamps with good color rendering characteristics are also desirable. A color rendering index (CRI) of 75 or above is recommended; 5000K or 7500K lamps with CRIs of 90 and 92, respectively, furnish light of excellent quality in the cooler color range usually associated with daylight. Warmer color lamps, on the other hand — such as 3000K, 3500K, and 4000K types with CRIs around 75 — also furnish excellent results. They are also more compatible with typical incandescent and fluorescent lamp colors.

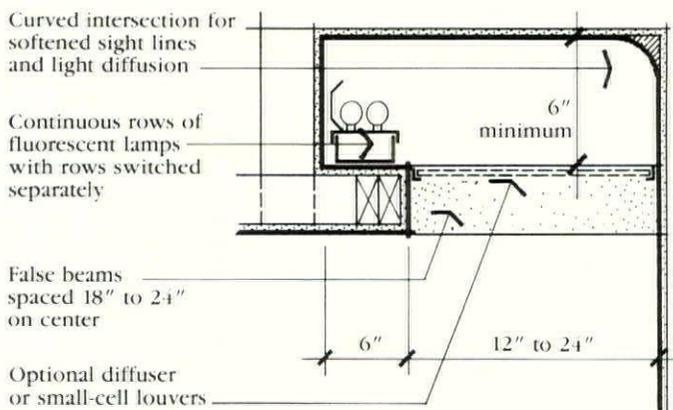
With a little imagination, many other design variations are possible. The simulated skylight cove is an effective architectural lighting element that brightens interior spaces with a refreshing change of pace. ■



Simulated skylight cove



Alternate cove designs



Cross-section through cove

ONCE AGAIN, DRAMATIC OUTDOOR LIGHTING IS IN THE SPOTLIGHT.

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The Lighting Design Professional

Low wattage, compact size, and unparalleled flexibility make low-voltage lighting the ideal choice in many design situations. These factors, combined with its potential for inherently safe circuits, make it necessary for a lighting designer to understand its many shapes and forms.

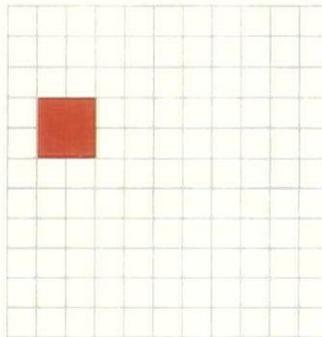
Most importantly, a lighting designer must master the art of low-voltage dramatic lighting in order to achieve the "low-voltage look." This is truly artistic lighting design — as opposed to "fixture picking," or lighting fixture design. It requires that a designer understand completely the capabilities and limitations of equipment, design with all the potential interactions of lighting and architecture in mind, and personally direct the lighting adjustments to achieve an interpretive, sensitive, and often spontaneous result. In low-voltage lighting design, the practical and technological concerns of architectural lighting meet the art and psychology of theater lighting.

In low-voltage lighting design, the practical concerns of architecture meet the art of theater.

Low-Voltage Equipment

The first two columns in this series introduced the many forms of low-voltage lamps and lighting equipment. The low-voltage look is achieved primarily with recessed and track equipment.

Recessed lighting. Recessed lighting is considered architecturally *neutral*, meaning it imposes no shape or form on the space. It is preferred where the potential for conflict exists between the architectural style and lighting equipment, such as with traditional in-



The low-voltage look

James R. Benya, PE, IALD

James R. Benya is senior principal and CEO of Luminae, Inc., San Francisco. He is on the faculty of California College of Arts and Crafts, is active in IES and Designers Lighting Forum of Northern California, and teaches lighting design classes for the ASID, IBD, and AHLI.

terior furnishings and finishes. Recessed lighting is also preferable in the very clean interiors popular today, as well as in any interior where ambient uplighting is used.

Recessed lighting, however, is usually more costly than track, and offers less flexibility for relocation. It is very important to be certain of fixture locations and aiming angles with recessed equipment, because most fixtures can be raised to a maximum of 40 degrees from vertical and are very unforgiving to even small mislocations.

Recessed lighting has a few major advantages. Some fixtures can be locked into place, allowing relamping without disturbing the designer's adjustments. Most manufacturers offer a full line of fairly inexpensive interchangeable trims for fixtures, making it possible to easily change a recessed

housing from a downlight to a wallwasher to an accent light. Some fixtures can even be switched between MR16 and PAR 36 trims with the same size hole in the ceiling. Finally, integral transformer fixtures can have 120-, 277-, or 120/277-volt primaries, solving design voltage problems in commercial-scale applications.

Designers should make trial adjustments to sample recessed fixtures prior to specifying a major installation. Several poorly designed fixtures on the market are difficult and time-consuming to adjust; others tear up the adjuster's fingers with rough metal edges.

Track lighting. Track is the ultimate lighting design tool, bringing the flexibility of the theater to practical, affordable interior lighting fixtures. Most lighting track is installed on the surface of a ceiling or wall, making it easy to add spurs if needed in the future. Track is usually the least expensive way to provide "designed" lighting, because of low labor costs. Beginning with a single outlet box, a homeowner can easily install lighting track.

The major advantage of track, other than its almost unlimited location flexibility, is the variety of lighting equipment that can be attached to it. On the same track, one can mix standard-voltage equipment, low-voltage fixtures, framing projectors, and even fluorescent equipment. The primary limiting factor is the wattage and rating of the dimming or control equipment.

Unfortunately, track is architecturally *positive*, meaning that it imposes fixture shapes and designs on the architecture. The major reason for the intense popularity of MR11 and MR16 lamps is the very small size of track fixtures that use them. Older track fixture designs that use standard-voltage lamps and PAR 36

lamps seem big and clunky by comparison.

To minimize the architectural impact of track, try using recessed track, which appears to be flush with the ceiling; products are available for dry-wall and acoustical tile ceilings. Or, use painted-out track and fixtures. Have the fixtures and track factory-painted to ensure a good paint job with properly prepared surfaces and baked enamel finishes. Avoid field painting, which results in peeling fixtures and scraped track. Some designers are trying out the new, fully recessed track-and-trough systems, which appear to be a cross between track and recessed lighting. It will be interesting to see how these work out.

Tracks are not interchangeable, and one manufacturer's track fixture will not operate on another's track unless the electrical connector is converted. Availability of track and fixtures is an important consideration in selecting track systems. Also, prudent lighting designers select track types according to their expected use.

Low-voltage tracks — which have remote transformers that feed the track with 12 or 24 volts — should be limited to residential use, because most commercial applications demand too much wattage per feed point. Single-circuit 120-volt tracks and tracks with lightweight, fragile connectors are fine for homes, small commercial properties, and similar installations where the track is not changed often or expected to hold large equipment like 240-watt PAR 56 integral transformer fixtures. At the opposite extreme, art galleries and similar installations with a variety of often-changed big lamp equipment demand heavy-duty, multiple-circuit 120-volt track.

As with recessed equipment, try track fixtures and track

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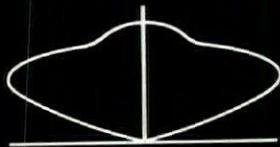
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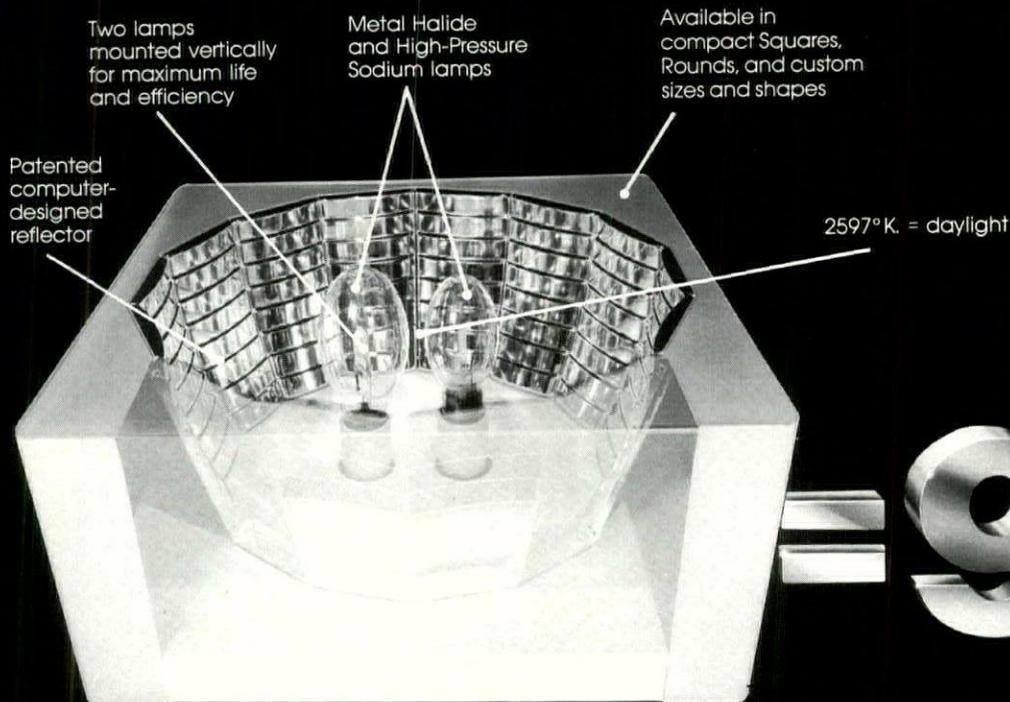
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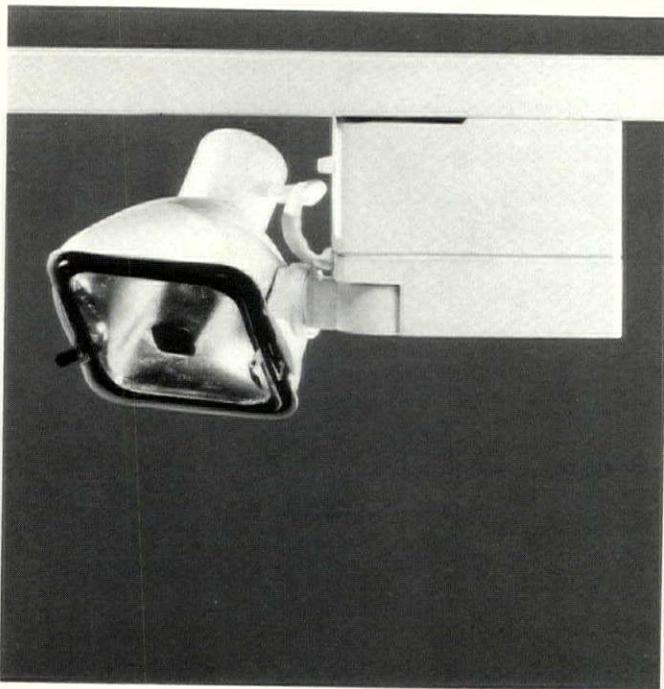


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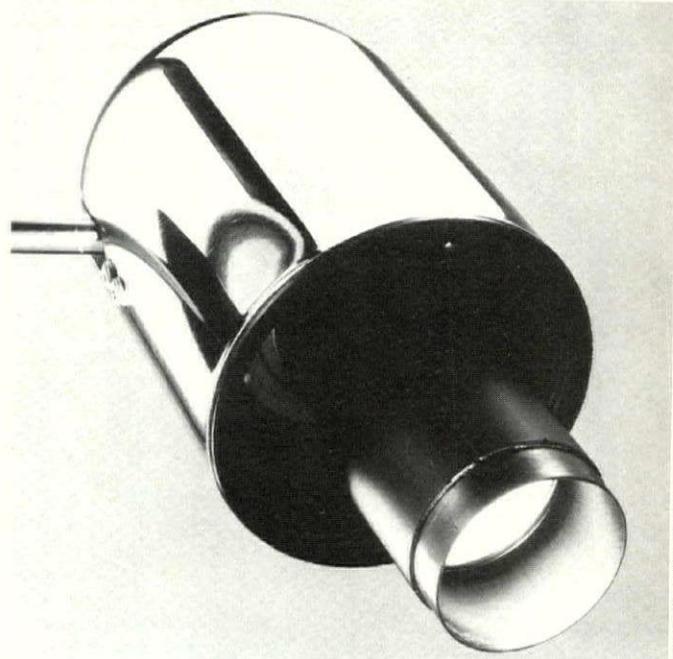
Circle 23

= 94%

efficiency



The clips on this low-voltage track light can hold a spread lens, beam-elongating lens, hexagonal cell louver, or color filter.



A snoot concentrates light into a sharply defined beam.

prior to specifying. The most annoying problem with track fixtures is usually the difficulty with which they are installed and removed from the track. In good track systems, fixtures install easily and quickly with one hand.

Other considerations include installation flexibility and parts availability. Track should allow field cutting to meet actual construction dimensions, and track fixtures and accessories should be obtainable for the user's needs. Be wary of solid-state transformer systems; some have serious problems with audible noise and dimming.

Design Techniques for Art and Artifacts

Soft-edged accents. The proper fixture location allows light to fill the art completely, spilling over the top, sides, and bottom. Steep angles (20 to 30 degrees from vertical) should be used to prevent mirror re-

flections from art covered with glass. Shallow angles (30 to 40 degrees from vertical) are preferred for uncovered art. Very shallow angles, up to 45 degrees, work well for statuary and sculpture. Very steep angles, between 10 and 20 degrees, are best for tapestries and other flat art with a lot of relief or texture.

With MR lamps, use a prismatic or frosted spread lens to widen the beam and eliminate striations. Prismatic lenses make a sharper quality beam, and frosted lenses create a "soft focus" that designers often prefer.

Choose the MR lamp wattage and beam spread according to the size of the piece: low-wattage narrow spots with spread lens are for smaller pieces, while higher-wattage wide floods with spread lens are best for very large pieces. Sometimes, an MR16 flood lamp can be used with a linear spread lens to create a rec-

tangular or oval beam. Cosmetic lenses with gentle softening are excellent for leaving the central punch in the beam while smoothing out striations and filling around the central accent.

PAR 36 wide flood and very wide flood lamps are excellent for short throws, usually without a lens. They provide oval beams with soft edges. For very long throws, such as galleries and cathedral ceilings, expect to use PAR 36 narrow spot lamps in many applications.

Hard-edged framing accents. MR11 and MR16 lamps make excellent framing projectors for applications where the ambient light level is low. Track and recessed framing projectors provide sharp-edged framing accents, round accents, and pattern projections.

Observing design considerations, such as aiming angles for soft-edged accents, select from a variety of different

projector types. Use cutout framing patterns for permanent art displays, and shutters for changing displays. In general, "barn doors" are not designed for or useful as framing devices.

Techniques for Surfaces and Space

Pin spotting. This technique uses a very narrow spot MR16 or PAR 36 to create a small-diameter spot on an object or horizontal surface. For highlighting very small objects, the aiming angle is usually about 45 degrees.

Architectural pin spotting, on the other hand, uses vertical downlights shining onto a horizontal surface, such as a counter, bar, or floor. In bars and clubs, pin spots pick up smoke in the air, creating light curtain and "rain light" effects. The maximum effect is created with super pin spots, 6-volt PAR 36 and PAR 46 lamps.

Dappling. When a pattern,

Adding Color

Colored lighting is risky. Used forcefully, colored lighting appears contrived and does not wear well. Used tastefully, however, colored lighting can add drama, emphasis, and beauty to a design that relies primarily on white light.

Subtle use of color

Color can be used to tint or blush white light. Slightly amber filters warm halogen MR lamps to a lower, incandescent color temperature, while slightly bluish filters raise color temperature to a cooler, more daylight-like rendition. Neodymium and lavender filters remove yellow, providing a more flattering, rich red-blue light.

Dramatic use of color

Approach more dramatic use of color very carefully. One generally successful application is lighting statuary, sculpture, and plants. The key light should be white, but a complementary or accent color can be added off-axis to create color highlights or a color silhouette.

Another good design, applicable in very modern interiors, uses colored light as art on a wall or ceiling. Here, the slash of the 4415 lamp and the "bow-tie" of the 4416 provide interesting patterns without the expense or difficulty of lenses.

Color media

In general, color gel media can be used on lower wattage lamps, and will last reasonably long. However, for permanent installations, consider glass media and dichroic filters. As theater designers know well, the blues and cooler colors fade faster and burn more easily than the reds. Colored lamps may also work, although the available products are fairly limited. □

such as perforated metal, is placed in front of an MR16 lamp, a soft-edged dapple occurs on the affected surfaces. This can lend interest and texture to otherwise homogeneous surfaces, like carpet. Note that dappling patterns are very soft and indiscernible, and should not be used where a focused pattern is desired.

Pattern projection. A focused, definable pattern, such as a logo or drawing, requires a framing projector and cut pattern (gobo). MR11 projectors can be used in homes and low ambient level rooms, such as restaurants. MR16 projectors have a greater range, including many commercial applications where a pattern is

desired. But consider 120-volt framing projectors and theatrical ellipsoids in higher ambient light level situations.

Slashing. Linear beams create elongated slashes of light. Several excellent applications include linear art, such as statuary and long scrolls; long horizontal surfaces, such as buffets, credenzas, bars, and counters; "lap light," a preferred way to accent sofas; and stripe designs in light-as-art displays.

Slashes can be created using very narrow spot MR and PAR lamps with a linear spread lens (linear prisms). The length of the slash depends on the quality of the lens and the tightness of the spot lamp. An alterna-

tive is to use a PAR 36 sealed-beam specialty lamp, such as the 4415, which has a built-in linear refractor.

Filling. Filling is a down-lighting and angle lighting technique that makes use of PAR and MR lamps, usually with flood beam spreads and often with spread lenses. Filling in between spots is critical in avoiding the "museum look."

Accessories: The Finest Points

In making the final adjustments to a low-voltage installation, a designer should provide the necessary lenses and other accessories to make the design come out perfectly. Besides creating the beam shape and color (see sidebar), designers should also use other accessories to clean up the installation by controlling glare and concealing the sources as much as possible. Of the available accessories, the following are among the most handy.

Louvers. When used with a spot lamp, louvers cut out side field, keeping stray light off adjacent walls and objects and hiding the source. When used with a flood lamp, louvers introduce a dappled field around the main beam. Louvers are useful for all fixtures and lamps, including line-voltage equipment.

Designers should provide lenses and other accessories to make the design come out perfectly.

Honeycomb hexagonal louvers seem to work the best; they are available in a variety of thicknesses and cell opening sizes. It is important that louvers be matte black or a very dark matte color.

Snoots. Snoots are tubes that, again, cut out field and help to conceal the source. Unlike louvers, snoots cut off both spot and flood lamps. Snoots tend to create a distinct field shape, though, and are best used on spots in accent and pin spotting situations.

Snoots are readily available MR16 accessories, and larger snoots can easily be fabricated. Again, make certain that the snoot interior is matte black.

UV-blocking filters. Special filters for MR lamps can block ultraviolet output in the 300 to 400 nanometer range. These filters may be especially useful for lighting art and artifacts that are highly sensitive to ultraviolet damage.

Multiple accessory holders. It is frustrating to discover that many fixtures can accept only one accessory, such as a lens or louver. Some fixtures have optional multiple accessory holders that make the focusing session much more enjoyable.

Paint. Sometimes, a simple spray painting can save an installation. For instance, in some MR16 recessed Alzak trims, highly pitched lamps reflect back off the cone into the room. Painting the cone a dark matte color complementary to the room's finishes can eliminate the problem in a very aesthetic way. ■

Product Showcase

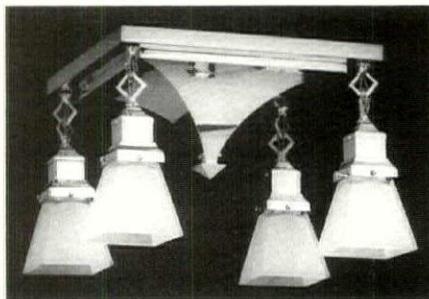


■ Portable task light

Holophane's Task-Mate portable task light for a 13-watt compact fluorescent lamp produces light performance superior to that of a standard fluorescent lamp, according to the manufacturer. Its injection-molded, metallized reflector provides maximum specularity without the rainbow effect of some metal reflectors. The fixture's rotatable optical system permits light level adjustment and control of reflected glare within task areas, which makes the fixture particularly useful for lighting VDT areas.

The fixture is made of injection-molded color-impregnated plastic and comes in a wide choice of colors. Its 3/8-inch flat base and a selection of accessory mounting brackets allow users to position it under a shelf, on a wall, or on a desk. A magnetic mounting system ensures quick installation, but will not affect computer disks stored on or near the unit, according to the manufacturer. Holophane, Newark, OH.

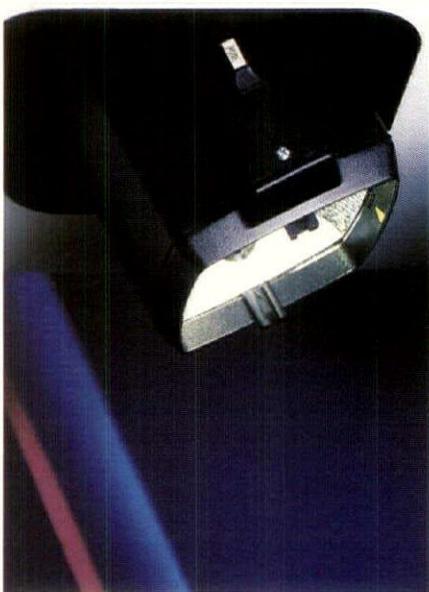
Circle 60



■ Ceiling pendant

The Dearborn ceiling pendant from Brass Light Gallery's Goldenrod Collection is a solid brass reproduction of a classic Prairie-style original. It features a 14-inch-square base from which four glass shades are suspended on rectangular chains. The glass shades come in a pink satin color and clear crystal sandblasted on the inside. Variations include several finishes and a longer chain for the suspended shades. The fixture accommodates four 150-watt incandescent lamps. Brass Light Gallery, Milwaukee, WI.

Circle 61



■ Semirecessed display light

Amerlux offers a semirecessed, adjustable display light for a compact metal halide lamp. The die-cast, extruded aluminum fixture has a 15-degree beam spread reflector of anodized specular aluminum. The fixture fits in a ceiling cavity but can

be pulled below the ceiling level for adjusting the beam position. The fixture accommodates Osram HQI lamps in 70, 150, and 250 watts and is available in matte black and matte white finishes. Amerlux, Fairfield, NJ.

Circle 62

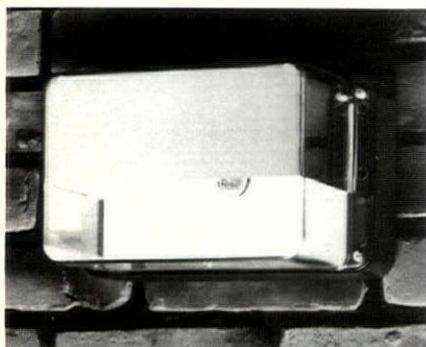


■ Outdoor luminaire

The late Howard A. Daum designed the #8930 outdoor luminaire from Sternberg Lanterns, which features a finialed, period-style roof atop an eight-sided, lensed cage. The 36-inch-high luminaire is 15 inches wide on each side (18 inches on diagonal). It has a clear, seeded acrylic lens and a glass refractor.

Models are available to accommodate high pressure sodium, metal halide, and mercury lamps for street or area lighting applications. Three smaller models with various types of mountings are also available. Standard finishes include the verde green shown; custom colors can be special ordered. Sternberg Lanterns Inc., Chicago, IL.

Circle 63

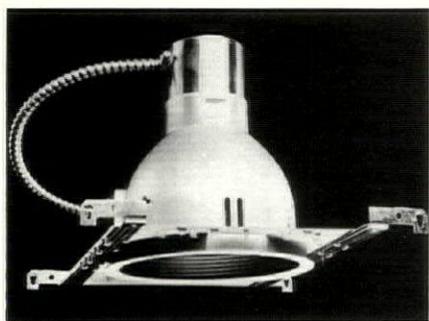


■ Metal halide security light

Ruud Lighting's security light for a 100-watt medium base metal halide lamp is 10 inches wide, 6 inches high, and just over 7 inches deep. It has a die-cast aluminum housing finished with a bronze acrylic powder-coat paint, is completely gasketed for wet and damp locations, and has a vandal-resistant polycarbonate lens and fasteners. A thermal air isolation chamber between the ballast and electronic components lowers operating temperatures to extend component life. The fixture's polished aluminum shroud is designed for easy removal.

Accessories include a variety of reflectors, shrouds, finishes, lenses, ballasts, poles, and a factory-installed photocell. The security light is recommended for applications where accurate color rendering is important. Ruud Lighting, Inc., Racine, WI.

Circle 64



■ Frame-in downlights

Flex-All frame-in recessed downlights from Halo Lighting offer predictable photometric performance in a wide choice of lamp types, wattages, and lighting effects. A frame-in kit allows reflector and trim installation after con-

struction is complete, thereby minimizing the potential for damage.

The model H500 has a 5-inch aperture and accommodates 75-watt A19 or R30 lamps. The model H600 has a 6-inch aperture and accommodates 100-watt A19 or R30 lamps and 150-watt A21, R40, or PAR 38 lamps. Accessories include a selection of diffusers, lenses, reflector cones, baffles, eyeballs, wall-wash attachments, and trims. Halo Lighting, Elk Grove Village, IL.

Circle 65

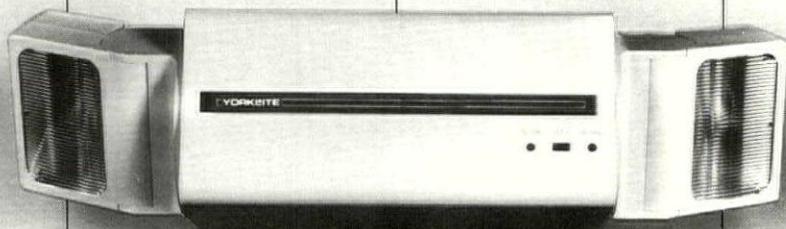
It doesn't have to be ugly to be functional.

Yorklite's Designer Series Emergency Lighting has the good looks and features worth looking at.

Yorklite is trying to eliminate functional as well as cosmetic problems faced by today's emergency lighting designers and engineers. The sleek lines of the injec-

The battery and charger are easily inspected with Yorklite's easy-access forward opening enclosure.

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tion molded Designer Series Emergency Fixture hide the most complete technical features available in emergency lighting today.

This compact unit includes an automatic charger with precision float voltage regulator and industrial-class transformer. Long-life calcium-lead batteries are recharged in less than 12 hours after discharge and then maintained at full charge.

voltage works on either 120v or 277v power. Universal mounting plate attaches to 3½", 4" or single gang box for easy installation.

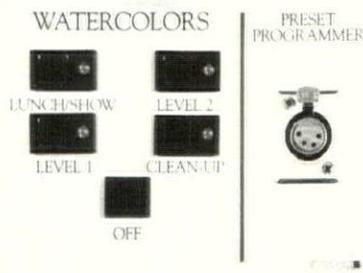
Simplify your emergency lighting problem by specifying Yorklite's Designer Series. The Emergency Light that looks great and works better. For more information concerning exit signs and power systems, call us at (512) 385-1773.

YORKLITE

Yorklite Electronics, Inc.

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Circle 24



■ Control system

The LightNet lighting control system from Sterner combines advanced elec-

tronics, standard hardware, and customized software. Intelligent control panels have a programmable microcomputer card that reads slider and push-button positions and sends messages through the network. Similar cards in dimmer cabinets control dimmers and relays according to messages received.

The system features programmable and manual controls, occupancy sensing, preset scenes recall, light balancing, and time scheduling. Control panels come in painted and anodized finishes; custom graphics and lettering are available. The system is recommended for public buildings, commercial establishments, and office facilities. Sterner Lighting Systems Incorporated, Winsted, MN.

Circle 66



Fluorescent lamps

Advantage X 40-watt fluorescent lamps from North American Philips produce 3700 initial lumens, 17 percent more than the average for standard F40 cool white fluorescent lamps. Their rated average life is 24,000 hours, which is 4000 hours longer than that of standard F40 lamps, and their color rendering index of 80 compares favorably with other high color rendering lamps.

The lamp has a T10 tube, which is smaller than the standard F40 lamp's. The reduced size takes less storage space

and makes the lamp easy to install in tight fixtures. The lamps can operate on all standard 40-watt rapid start or pre-heat circuits. They are available in color temperatures of 3000K (warm white), 3500K (standard white), and 4100K (cool white). North American Philips Lighting Corporation, Somerset, NJ.

Circle 67



Custom wall fixture

TrimbleHouse offers custom fixture manufacturing in addition to its regular lines of lighting fixtures. Pictured is a wall fixture that was custom designed for the Campanile Building in Atlanta. The fixture has a frosted, etched glass diffuser enclosed in a polished brass frame. The diffuser is on a matched marble mounting block that matches the lobby and exterior walls of the building for which it was designed. The luminaire accommodates two compact fluorescent lamps. TrimbleHouse, Norcross, GA.

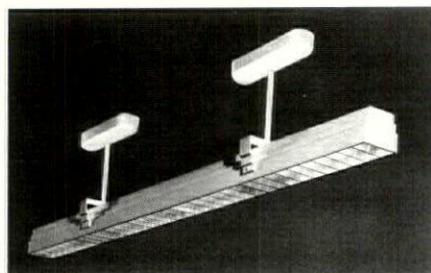
Circle 68



Western red cedar bollard

Ryther-Purdy offers the Pondcliff illuminated bollard, which is made of kiln-dried, laminated western red cedar, a wood with natural preservative oils, and has a clear, natural finish that weathers to silver-gray. The bollard has a standard mounting height of 42 inches above grade and is designed for direct burial post mounting. It accommodates a 9-watt compact fluorescent or an incandescent lamp up to 60 watts. Options include other heights and finishes and a pedestal mounting arrangement. The bollard is recommended for paths and walkways, patios, or any low-level lighting application. Ryther-Purdy Lumber Company, Inc., Old Saybrook, CT.

Circle 69



Fluorescent lighting

Neo-Ray Lighting offers the Series 12 fluorescent luminaires, which evenly distribute direct and indirect illumination with minimal glare or shadows. The luminaires are mounted on 24-inch

stems; a 120-volt remote ballast is located in the stem canopy housing. Reflector louvers are available in specular aluminum or champagne gold finishes, and the luminaire itself has a white satin finish. Models in lengths from 3 to 10 feet accommodate T8 fluorescent lamps. Three-foot and 4-foot models for U-shaped lamps are also available. Neo-Ray Lighting, Brooklyn, NY.

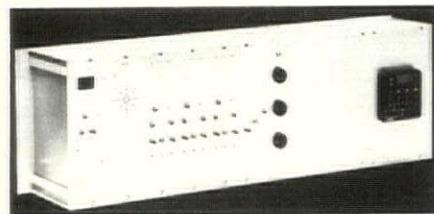
Circle 70



■ HID ambient lighting

Forum's patented HID indirect lighting system surrounds the light source with faceted reflectors to provide indirect ambient lighting. A new system component, a circular Fresnel lens set in the bottom of the fixture's shroud, allows users to combine ambient lighting and accent or task lighting in one fixture. The lensed downlight component is available for virtually all wattages of metal halide or high pressure sodium lamps. An optional opal overlay is also available. Forum, Inc., Pittsburgh, PA.

Circle 71



■ Automatic shade control

The Otto-Matic from AM Source International automatically raises and lowers,

opens and closes individual window treatments. A computerized command module activates tilting of blind slats according to sun elevation and season of the year; an anemometer automatically lowers blinds when wind speeds become dangerous. The unit also has a fire alarm tie-in that raises blinds in case of fire.

The unit can control blinds from a central location, and the entire system can be locked with a key. The sun control command operates on an elevation-to-elevation basis: for example, when the sun is in the south, blinds for other elevations retract. Local switches can override the centrally controlled system. A time module raises and lowers blinds at a preset time for added security. AM Source International, Wauconda, IL.

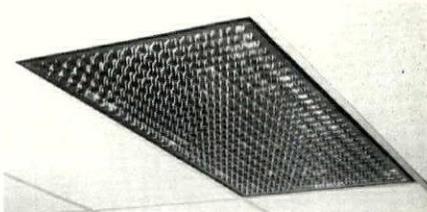
Circle 72



■ Brass, aluminum chandelier

Art Directions offers the Art Deco style Apollo chandelier, which is part of the Original Cast collection. The chandelier is handcrafted of brass and aluminum and has a wide luminous white acrylic dome 27 inches in diameter with a 36-inch drop. The luminaire accommodates three 100-watt incandescent lamps. Art Directions, St. Louis, MO.

Circle 73



■ Recessed troffer

The recessed FL troffer from Lithonia Lighting has a low-brightness, metallized cube louver. A continuous black reveal surrounds the louver to conceal mounting hardware and create a floating appearance. The 1-inch-deep metallized louver has a 1/2-inch-square cube pattern and is finished in specular silver or specular gold. The troffer offers a full range of air functions and compatibility with ceiling systems. It comes in a choice of three sizes: 1 by 4 feet, 2 by 4 feet, and 2 feet square. Lithonia Lighting, Conyers, GA.

Circle 74



■ Pastel exterior finishes

Dinico Products offers four natural pastel exterior finishes among its 12 standard finishes for items in its master catalog. The pastels — rose, gulf stream blue, clear pool green, and trade winds gray — are all colors found in the natural environment. They are coated with clear acrylic lacquer for additional protection. Pictured is the model PUD 8020 two-armed fixture from the Forum series 8000, mounted on a model 3P pole. Both fixture and pole are finished in rose. Standard panels are available in clear and amber acrylic; a white globe is optional. Dinico Products Inc., Hackensack, NJ.

Circle 75

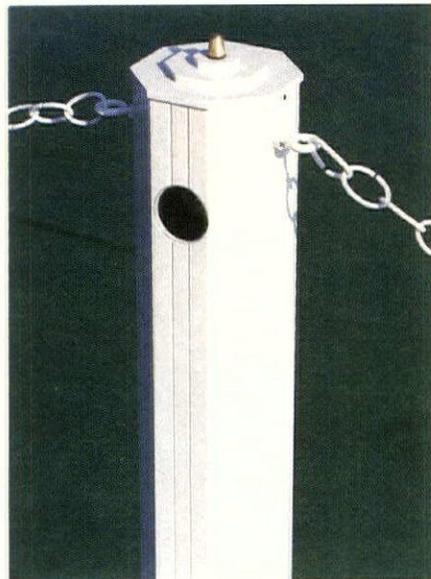


■ Decorative pendant

Poulsen Lighting's PH6 1/2-6 pendant luminaire was designed by Poul Henningsen. It features an architecturally scaled system of four graduated reflector shades and concealing cones supported by a series of curved struts. The pendant measures approximately 25 1/2 inches in diameter and is slightly over 15 1/2 inches high.

The pendant luminaire provides uniform, glare-free, symmetrical lighting distribution, according to the manufacturer. A stainless steel aircraft cable supports the pendant, which comes with a ceiling canopy and 12 feet of cord covered in white plastic. The UL-listed luminaire accommodates a mogul-based incandescent lamp up to 500 watts; a PS35 clear lamp is recommended. Inner and outer shades are finished in baked matte white enamel. Poulsen Lighting Inc., Miami, FL.

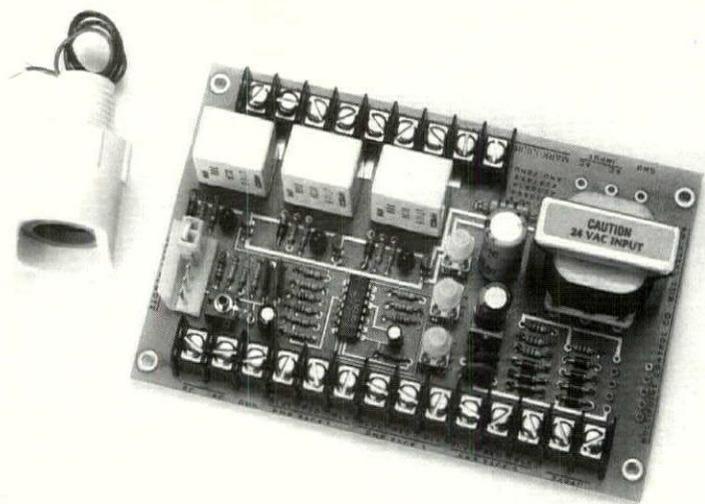
Circle 76



■ Low-voltage outdoor lighting

Nightscaping offers a low-voltage decorative and safety lighting fixture that was originally designed to illuminate 60 Christmas trees lining the 1987 Walkway of Peace at the White House. The fixture looks like a fence post, but an opening on the side away from passersby conceals an MR16 lamp in a recessed spring-loaded socket. The octagonal fixture has an overall height of 55 inches and is made of 1/4-inch extruded aluminum finished with a white polymer powder coat. The fixture's outside diameter is slightly over 4 inches, and its slotted halves snap apart for easy maintenance. Nightscaping, division of Loran, Inc., Redlands, CA.

Circle 78

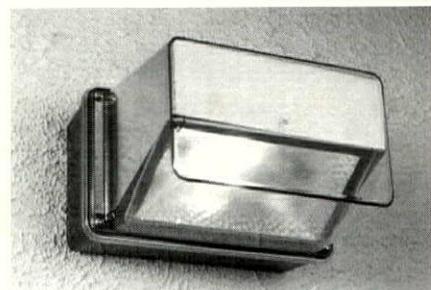


■ Photocell control systems

Mark I, II, and III photocell lighting control modules from Multipoint Control Systems switch lighting on and off according to daylight levels. Two low-voltage wires connect the two system components: a control board and a photoconductive sensing head, usually roof mounted, that can be up to 1000 feet away from the board. The sensing cell communicates ambient light levels to

the control board, which has an on-off adjustment range of 0 to 500 foot-candles. Model numbers indicate the number of separate circuits a system can control — one, two, or three. The units are recommended for use anywhere that lighting is affected by changing daylight levels. Multipoint Control Systems, Inc., Mill Creek, WA.

Circle 77



■ Wall pack, security light

Gim Metal Products offers the model 3505 specification-grade wall pack and security light. The unit features a rugged,

What do you gain when fluorescent ballasts wear this mark?

die-cast housing and a vandal-resistant injection-molded polycarbonate lens. It has outstanding photometrics and thermal performance, according to the manufacturer, and is UL listed for wet locations.

The fixture accommodates a variety of lamps: high pressure sodium, mercury vapor, multitube compact fluorescent, and metal halide, including the Osram HQI. The model for the HQI lamp features an adjustable reflector; models are available for horizontal, vertical, and overhead mounting. The fixture is supplied to lighting manufacturers unassembled, with all necessary hardware and gaskets. Ballasts, lamps, and sockets must be purchased separately. Gim Metal Products, Inc., Carle Place, NY.

Circle 79



■ Wall sconce

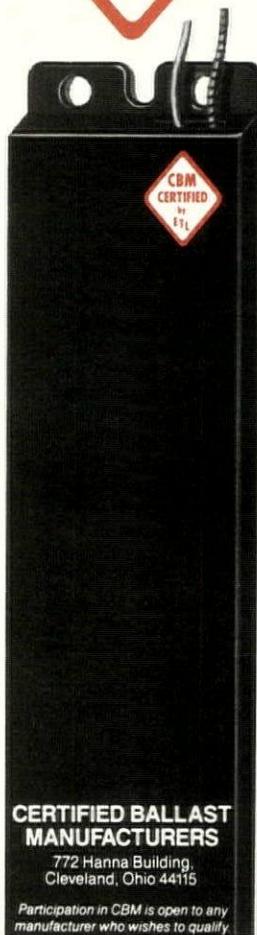
Rambusch Lighting's U-500 cast aluminum scallop shell wall sconce has been used for 50 years in restorations and new installations of building interiors in Gothic and classic styles. It provides illumination without creating strong hot spots immediately above the fixture. The wall sconce is 10 inches tall and 12½ inches deep and accommodates a 500-watt R40 flood lamp. It is available in natural aluminum and custom colors. Rambusch Lighting, New York, NY.

Circle 80

- Ballasts that provide specified lamp performance, including full light output and rated lamp life... from the "certified-for-use" types listed on the ballast label... performance that meets or exceeds the requirements of ANSI C82.1 and C78.

- Ballasts that meet the safety standards of ANSI/UL 935.

- Ballasts that provide efficient use of energy... are high power factor.



Circle 25

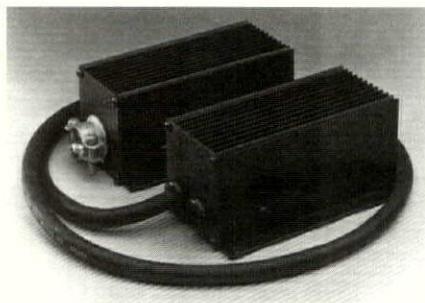
In short, you gain assurance of quality and performance. That's what the CBM Certification program is all about... to provide assurance for you. Assurance that's supported by the CBM check-up.

Periodically, independent ETL Testing Laboratories visits each participating manufacturer, selects random samples of CBM Certified ballasts from production line or stock, and tests them to make sure they continue to measure up.

Good reasons for you to guard your dollars in fluorescent lighting, by insisting on ballasts marked CBM Certified... when new fixtures are installed or for replacement in compatible fixtures.



FREE BOOKLET
Contains facts about ballasts and fluorescent lighting it will pay you to know



■ Dimmable electronic transformers

E-Former dimmable electronic trans-

formers from Luminance can be used with both permanent and portable low-voltage lighting systems. The surface-mount transformers have extruded aluminum housings. A 12-volt, 150-watt contractor version (left) accepts standard electrical fittings and is designed for permanent mounting on a junction box. A theatrical version (right) has a flexible power cord for portable installations. Models are available in a variety of voltages and capacities. Luminance, Inc., a division of FM Productions, Brisbane, CA.

Circle 81



■ Simulated wood finish

Hubbell Lighting offers a maintenance-free simulated walnut finish for its 50-watt high pressure sodium and 26-watt fluorescent wall-mount Entralux and Perimalux luminaires. Unlike real wood, this permanently bonded finish does not discolor, mildew, rot, dry out, or crack, according to the manufacturer. Both luminaires are suitable for indoor and outdoor safety and security lighting applications. Hubbell Incorporated, Lighting Division, Christiansburg, VA.

Circle 82



■ Outdoor lighting controller

Paragon Electric's two-channel SunTracker EC7ST operates automatically without a photocell to turn outdoor lights on at dusk and off at dawn. It also adjusts to seasonal changes in daylight hours. An additional channel adds flexibility, so lights turned on automatically at dusk can be turned off at any designated time between dusk and dawn. Lights can also be turned on again before sunrise.

The controller is simple to program and features 24-hour programming, adjustment for daylight savings time, leap year correction, and override capabilities. The unit is suitable for controlling parking lot and security lights, lighted outdoor signs, and other types of outdoor lighting. Paragon Electric Company, Inc., Two Rivers, WI.

Circle 83



■ Commercial, industrial lighting

Perfelite's UL-listed products for commercial and industrial lighting applications include those shown here. Exit signs are available for incandescent or fluorescent lamps in a choice of housing materials, styles, and mounting configurations. Incandescent downlights provide high-efficiency accent lighting with low surface brightness. They are designed for easy installation in dry construction ceilings.

A wide selection of square units with recessed lenses feature a choice of five trims, eight lenses, and a variety of light patterns for applications in auditoriums, hallways, and entryways. Vandal-resistant fixtures for indoor and outdoor public areas accommodate fluorescent, incandescent, and mercury vapor sources. Perfelite Company, Cleveland, OH.

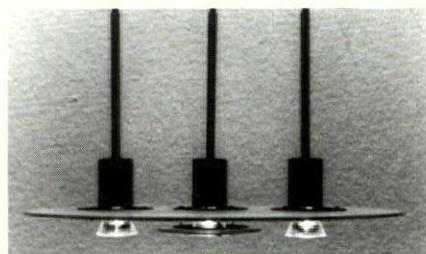
Circle 84



■ Halogen floor lamp

Roxter's Mity Lite halogen floor lamp is a compact 2-inch by 2½-inch by 4-inch fixture. The yoke-mounted fixture has an adjustable light beam, a built-in transformer, and a convenient line cord switch for turning the lamp on and off. It can be adjusted up to 3 feet in height and has a weighted base that prevents tipping. The unit is available in a white or black semigloss finish and accommodates a 12-watt MR11 lamp. Roxter Mfg. Corp., Long Island City, NY.

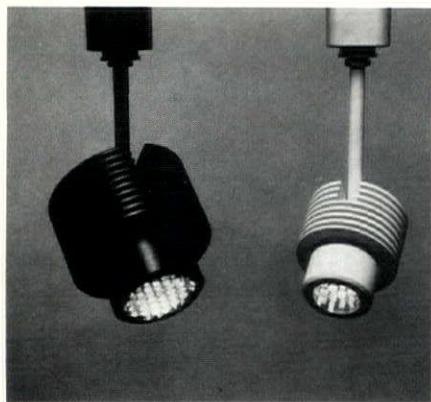
Circle 85



■ Suspended luminaire

Michel Morelli designed the Network series of ceiling fixtures, which are part of Sverige's 1988 winter collection. Models are available with frosted glass in several sizes and configurations for one, two, or three low-voltage, 50-watt MR16 halogen lamps. The luminaires come in black and silver finishes. Sverige Inc., Ste-Therese, Quebec, Canada.

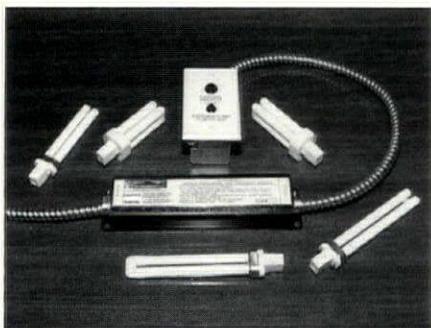
Circle 86



■ Low-voltage track fixtures

Tech Lighting offers the ICE 11 and 16 low-voltage halogen fixtures from Lighting Technology, which help provide maximum life for 75-watt halogen lamps by reducing heat buildup in the fixture. An integral cooling element protects the electrical connector and seal strips in the light source by removing heat from the rear of the light source and conducting it outside the housing. An internal heat sink between the lamp and connector absorbs much of the heat and infrared radiation before they reach the connector and cause the lamp to burn out prematurely. The unit's finned metal body increases the surface area for effective cooling. The unit is available in models for MR11 and MR16 halogen lamps and white or black finishes. Tech Lighting, Inc., Chicago, IL.

Circle 87



■ Emergency ballast

I-13-EM series emergency ballasts from Iota Engineering are specifically designed for the 13-watt compact fluorescent lamp. The same fixture and lamp can be used for both normal and emergency

operation because of the UL-listed emergency ballasts, eliminating the need for auxiliary emergency lighting equipment. Two models are available. The downlight model has a test switch, charge light, and unit battery connector installed in a standard switch box, which is mounted in the ceiling tile adjacent to the fixture and wired to the unit. The model for hard-wired installations can be mounted in an approved fixture ballast compartment; the test switch and charge light are installed on the fixture. The I-13 series is also compatible with 7- and 9-watt compact fluorescent lamps. Iota Engineering Company, Tucson, AZ.

Circle 88



■ Recessed reflectors

Ecolite Industries offers 2-foot by 4-foot recessed reflectors that help reduce energy consumption and glare, according to the manufacturer. Their durable Cycloc plastic shell has a specially bonded silver foil for maximum reflectivity and long life. Reflector panels help save energy by allowing users to eliminate two lamps from a four-lamp fluorescent fixture without sacrificing lighting quality or output, according to the manufacturer. They can easily replace prismatic lenses, in most cases without the need for any additional hardware. The reflectors carry a 7-year warranty against defects in material and workmanship. Ecolite Industries, Inc., Nutley, NJ.

Circle 89

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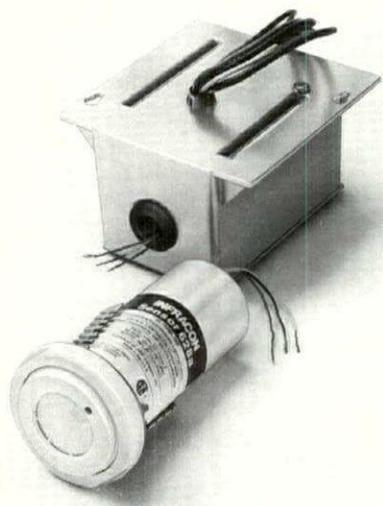


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Circle 26



■ Lighting control, sensor

JWP Infracon has introduced its model 628a passive infrared occupancy sensor and its model 629a lighting control. The sensor-controller system automatically turns lights on and off by responding to changes in infrared heat caused by people who enter or leave the sensor's area. The devices can be installed easily and inconspicuously in suspended ceilings.

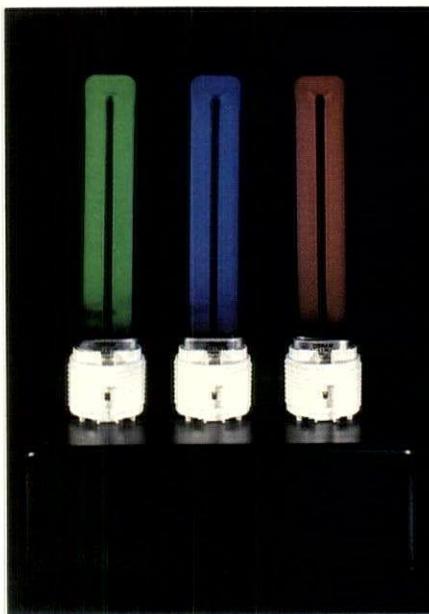
Each sensor covers 300 square feet; as many as four sensors can be used with one control unit to control up to 1200 square feet of space. The units are shielded from radio frequency interference to eliminate false triggering. They are contained in aluminum housings and can accept conduit fittings to meet municipal building code requirements. JWP Infracon, Inc., Fairfield, NJ.

Circle 90

grams for interior, area, and floodlighting that runs on IBM/PC, XT, AT, or compatible machines. The software provides fast, accurate answers to typical field lighting design questions independent of manufacturers' data bases, according to the publisher.

Calculations for interior lighting include fixture quantities, layouts, and lighting costs. Calculations for area lighting and floodlighting include fixture quantities and suggested uniformity guidelines. The easy-to-use software operates from menus. Users' names appear on printouts, and the software can be further customized to meet individual needs. RLH Lighting Consultants, Raleigh, NC.

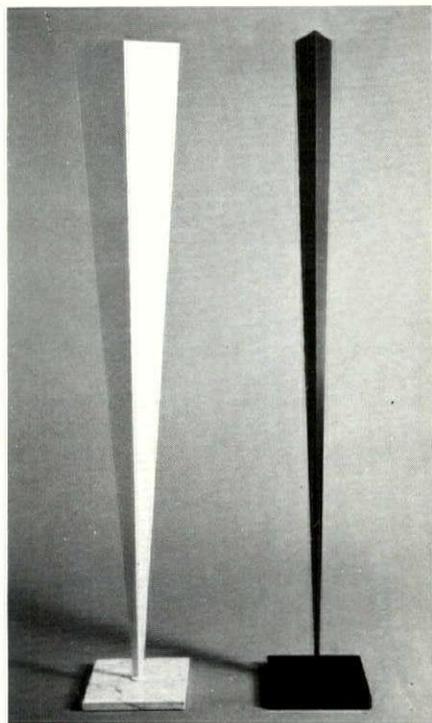
Circle 91



■ Colored compact fluorescents

Osram's Dulux S compact biaxial fluorescent lamps are available in three colors — red, blue, and green — as well as in color temperatures compatible with warm incandescent and cool white fluorescent sources. The lamps come in wattages of 5, 7, 9, and 13. They are recommended for indoor and outdoor applications where low-wattage incandescent lamps are used, such as for architectural, entertainment, or landscaping effects; display, task, or corridor lighting; floodlighting; and downlighting. Osram Corporation, Newburgh, NY.

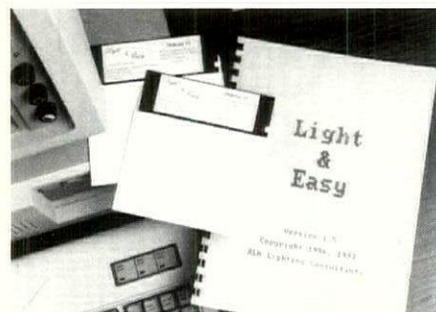
Circle 92



■ Marble-based floor lamp

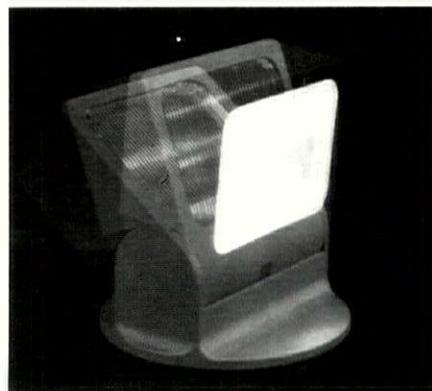
Koch + Lowy's Ciaravino floor lamp stands 72 inches high on a marble base 1 foot square and 1 inch thick. The lamp accommodates a 500-watt halogen lamp and has a full-range sliding floor dimmer. It is available in two finishes: white with a white marble base and black with a black marble base. Koch + Lowy, Long Island City, NY.

Circle 93



■ Lighting design software

RLH Lighting Consultants offers Light & Easy, version 1.5, a series of three pro-



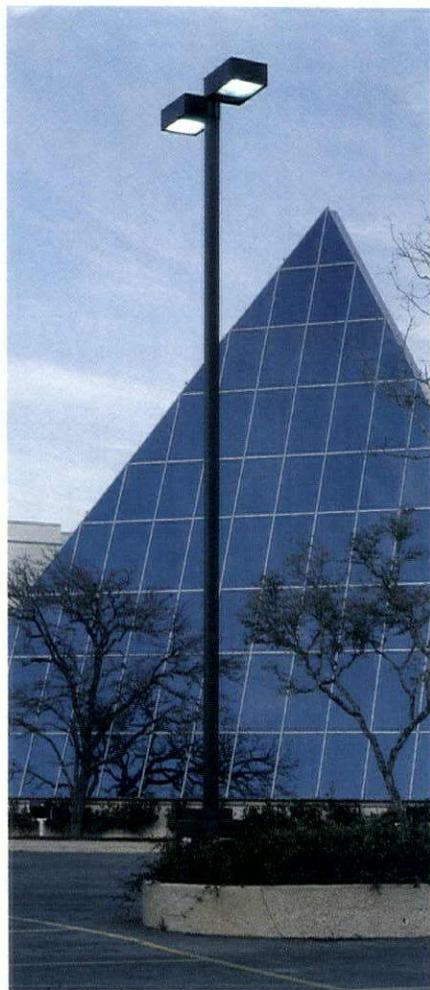
■ Emergency light

York-Lite Electronics features a fully adjustable, self-contained remote lamp head

from the Designer Series of emergency lighting fixtures. An injection-molded plastic case houses the battery and charges. Each lamp head measures approximately 4 inches wide, 5 inches high, and 2 inches deep. It can be wall- or ceiling-mounted with no exposed hardware.

The remote lamp head unit comes in single- and twin-head models. It accommodates a standard 6-volt, 12-watt halogen lamp; optional lamp wattages for 6 and 12 volts are available. Standard case colors are black, beige, and brown. The units carry a 3-year limited warranty. York-Lite Electronics, Inc., Austin, TX.

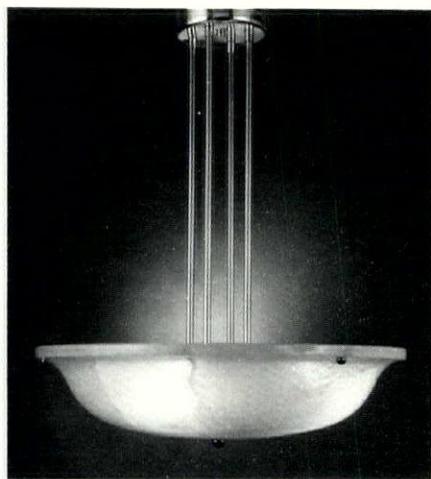
Circle 94



Outdoor area lighting

Emco's Infinity II luminaire is a rectilinear unit with a one-piece extruded silicone gasket. The gasket, in combination with a labyrinth extruded aluminum door frame and a corner web design, seals the luminaire completely from the elements. Standard finishes are dark bronze and black; custom finishes and an anodized finish are also available. The luminaire accommodates high pressure sodium, metal halide, and mercury vapor lamps up to 1000 watts. Emco Environmental Lighting, Milan, IL.

Circle 96



Alabaster pendant

A stem-mounted pendant lamp from Royalty's Alabaster series features solid brass fittings and a 19½-inch-diameter translucent bowl of hand-carved alabaster in white or creamy agate. The pendant lamp has standard-length stems of 18 inches and accommodates three 60-watt incandescent lamps. Options include custom stem lengths and compact fluorescent ballasts. Royaltyte, Highland Park, NJ.

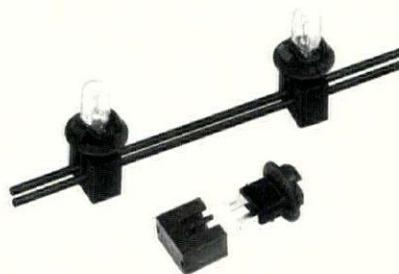
Circle 97



Compact HID floodlight

GE's compact PF-400 Powerflood has a variety of features and options that make it suitable for many high intensity discharge floodlighting applications. It can be easily installed with trunnion, wall, or pipe mounting, and quickly accessed at the front through a hinged and removable door. The floodlight's tempered glass lens is heat- and shock-resistant. A quick-aiming sight is molded into the die-cast aluminum housing. The lightweight fixture accommodates HID lamps from 200 to 400 watts, mounted vertically or horizontally for greater flexibility in light distribution patterns. It is UL listed for wet locations. GE Lighting Systems Department, Hendersonville, NC.

Circle 95



Lamp holder

Leecraft's model 23-540 wedge-base lamp holder accepts 18-gauge wire directly. A positive locking cap snaps firmly into place for reliable electrical connections without soldering or stripping wires. The unit also permits quick and easy harness assembly without special tools.

The unit accommodates T3¼ and T5 wedge-base lamps. It is suitable for accent lighting, display fixtures, and similar applications. Leecraft Manufacturing Co., Inc., Long Island City, NY. ■

Circle 98

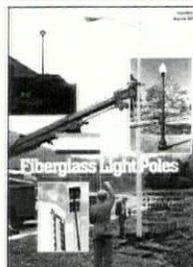
Product Literature



■ Electronic controllers

A brochure details industrial-grade electronic controls for managing lighting and HVAC systems. The brochure contains photos, features, and other information for controllers, motion sensors, and accessories. Tork, Mt. Vernon, NY.

Circle 120



■ Fiber glass poles

Shakespeare's line of fiber glass light poles includes tapered round poles, straight and tapered square poles, and the Presidential series of decorative poles. A color brochure details features, sizes, specifications, and colors. Shakespeare, Newberry, SC.

Circle 125



■ Period reproductions

The Vintage Collection of 30 chandeliers re-created in Europe from original molds and patterns includes the Empire Chandelier from the early 19th century. A data sheet details materials and finishes. Metropolitan Lighting Fixture Co., Inc., New York, NY.

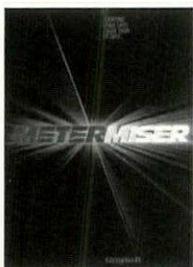
Circle 121



■ Prismatic panels

A 16-page illustrated color brochure from Siemens describes the Daylight System of fixed-angle and movable prismatic panels or baffles and shows schematic drawings of several facade and roof arrangements. Siemens Lighting Systems, Iselin, NJ.

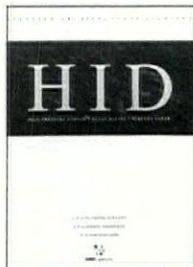
Circle 126



■ Energy-saving fixtures

Meter Miser fixtures from Graybar are featured in a 22-page catalog that describes a variety of fluorescent, incandescent, and HID fixtures for commercial, industrial, and residential applications. Graybar Electric Company, St. Louis, MO.

Circle 122



■ Recessed HID fixtures

A brochure features Juno Lighting's line of recessed HID fixtures, which includes ellipsoidal downlights, ellipsoidal wall washers, and lensed downlights. Juno Lighting, Inc., Des Plaines, IL.

Circle 127



■ Pole-top luminaire

A data sheet includes specifications, cutaway illustrations, and photometric data for Hadco's contemporary-styled Spectra II pole-top luminaires for HID sources. Hadco, Littlestown, PA.

Circle 123



■ Translucent panels

I-wall insulating translucent panels for windows, skylights, and curtain walls contain fiber glass-reinforced polyester sheets bonded to an aluminum grid. A brochure lists specifications and design features. Exterior Technologies, Inc., Pittsburgh, PA.

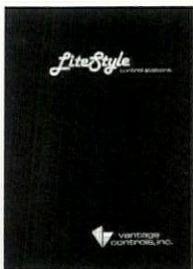
Circle 128



■ Railing systems

A Livers Bronze Company brochure profiles its line of railing systems, including three lighted rails for standard T12 fluorescent lamps. The company also fabricates custom lighting fixtures. Livers Bronze Co. Inc., Kansas City, MO.

Circle 124

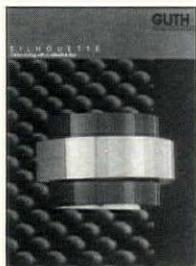


■ Control stations

LiteStyle control stations feature user-definable preset functions and several dimming and switching capabilities. A brochure details features, options, and color choices for faceplates, trims, and buttons. Vantage Controls, Inc., Salt Lake City, UT.

Circle 129

VANDAL/SPHERE LIGHTING



■ Wall sconces

Silhouette wall sconces have simple, classic body lines and designer finishes in polished brass, black pearl, and a combination of both. A color brochure illustrates styles and lists specifications. Guth Lighting, St. Louis, MO.

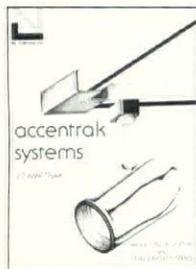
Circle 130



■ Three-way dimmer

A brochure describes the Nova 3-Way System, which provides full-range dimming at one location and on-off switching at up to 10 additional locations. Detailed information on features, wiring, and specifications is included. Lutron Electronics Co., Inc., Coopersburg, PA.

Circle 131



■ Track lighting system

NL Corporation offers the Accentrak 20 for single- and dual-circuit, low-profile 20-ampere tracks and track fixtures. A brochure contains illustrations and other information on tracks, fixtures, components, and accessories. NL Corporation, Cleveland, OH.

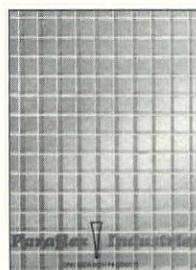
Circle 132



■ Ceramic luminaires

American Crafts Lighting offers a collection of handmade ceramic luminaires, including bath strips, wall sconces, pendants, and ceiling fans with lights. Four bisque and five glossy finishes are available. American Crafts Lighting, Coolidge, AZ.

Circle 133



■ Louvers

A brochure from Paraflex Industries illustrates 10 styles of specular louvers and other accessories for fluorescent ceiling systems with photos, descriptions, specifications, sizes, and finishes for each style. Paraflex Industries, Beacon, NY.

Circle 134

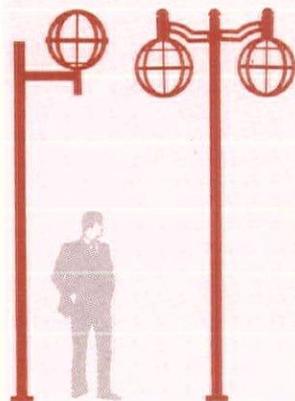


SPHERE WITH CAST GUARD

Designed to withstand the punishment in high vandalism and play areas. A durable cast aluminum guard with an 18" Lexan sphere defies breakage. A perfect luminaire for replacement of existing fixtures with an adaptor to fit existing poles.



Existing Poles

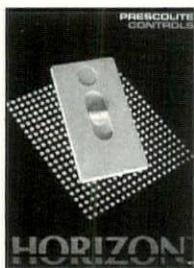


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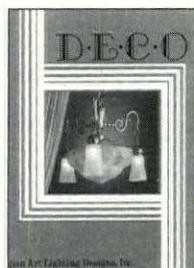




■ Slide dimmer

The Horizon specification-grade linear control slide dimmer is available in single- and multiple-location models. An 8-page brochure details features, models, colors, and sample system layouts. Prescolite Controls, Carrollton, TX.

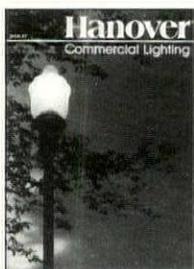
Circle 135



■ Indoor luminaires

A color brochure describes the Deco collection of brass and glass chandeliers, ceiling fixtures, and wall brackets. It illustrates each fixture and details dimensions, finishes, and lamping requirements. Georgian Art Lighting Designs, Lawrenceville, GA.

Circle 140



■ HID outdoor lighting

A color catalog from Hanover Lantern profiles a line of commercial cast aluminum HID luminaires, including custom luminaires, posts, accessories, and period and contemporary styles for wall or post-top mounting. Hanover Lantern, Hanover, PA.

Circle 136



■ Lighted ceiling fans

The Rodeo Drive Collection 1988 includes four ceiling fan models, two with light kits as standard features and two with optional light kits. It also offers a halogen light kit with built-in transformers. Beverly Hills Fan Company, North Hollywood, CA.

Circle 141



■ Low-voltage fixtures

A brochure illustrates components of four low-voltage systems for halogen lamps. It includes surface, recessed, and framing fixtures; miniature recessed, semirecessed, and wall wash fixtures; low-heat picture lights; and flexible light strips. CSL Lighting, Inc., Los Angeles, CA.

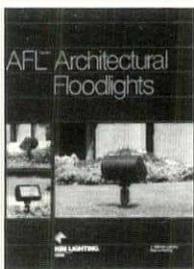
Circle 137



■ Tube lighting

A brochure describes and illustrates four versions of tube lighting: a semirigid square or round tube, a hanging model for chandeliers or light curtains, and two flexible PVC units that mount on channels or clips. Vista Manufacturing, Inc., Elkhart, IN.

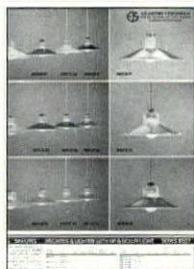
Circle 142



■ Floodlights

AFL series floodlights function as uplights or downlights for walls, parking areas, signs, atriums, ceilings, or landscapes. A brochure illustrates a variety of beam patterns, mounting options, and suggested applications. Kim Lighting, City of Industry, CA.

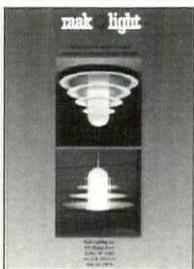
Circle 138



■ Pendant lamps

A data sheet from EJS Lighting contains color photos of 15 finishes for two pendant lamp models. Each model features a glass diffuser above the shade for added ambient uplighting. EJS Lighting Corporation, Compton, CA.

Circle 143



■ Indoor, outdoor luminaires

A brochure presents Raak Light's line of indoor and outdoor luminaires, including floor and table lamps, pendants, tube lights, wall brackets and sconces, ceiling lights, bollards, and pole-top luminaires. Raak Light, Buffalo, NY.

Circle 139



■ Automatic switches

Light-O-Matic wall and ceiling switches automatically turn lights off whenever a room is unoccupied. A brochure describes features of a wall switch for one-person offices and ceiling switches for larger spaces. Novitas, Santa Monica, CA. ■

Circle 144

Calendar

March 30, 1988

Lighting Workshop '88, Lightolier lighting laboratory, New York City. Continues April 6 and April 13, 1988. Sponsored by The Designers Lighting Forum of New York. Three small-group sessions on new light sources and lighting design for architects and interior designers. Fee. CEU credits pending. Contact: Chilton Brown, (212) 751-0575.

April 12, 1988

Residential/small commercial control systems, DLF event. Mark Schulkamp of Schulkamp Electric is the speaker. Contact: Paula Goodell, Northern California Designers Lighting Forum, P.O. Box 1429, San Francisco, CA 94101, (415) 550-0333 or (415) 843-3468.

April 13-15, 1988

Lighting World International, Los Angeles Convention Center. Sponsored by IESNA, IALD, and the Southern California Section of the IES. Program details elsewhere in this magazine. Contact: National Expositions Co., Inc., 15 West 39th Street, New York, NY 10018. (212) 391-9111.

April 15, 1988

Submittal deadline for 1988 IES Progress Report. Rules and submittal forms available from IES headquarters. Contact: LaRee DiStasio, Progress Committee, Illuminating Engineering Society, 345 East 47th Street, New York, NY 10017.

April 21, 1988

Efficient luminaires with specular reflectors, IES Golden Gate Section event, San Rafael Joe's, San Rafael. John Brass is the speaker. Study club on goniophotometers. Contact: Mike Mazzi, Program Chairman, California Architectural Lighting, 310 Townsend, Suite 200, San Francisco, CA 94107, (415) 777-5111.

April 22-23, 1988

IES seminars, Hyatt Regency, Chicago. Two two-day seminars: display lighting with James Benya and office lighting with Gary Steffy. CEUs available. Repeats May 20-21 in Atlanta. Contact: Diane Darrow, Meetings Manager, Illuminating Engineering Society, 345 East 47th Street, New York, NY 10017, (212) 705-7269.

April 25, 1988

Calendar deadline for June *Architectural Lighting*. Contact: Susan Degen, Assistant Editor, *Architectural Lighting*, P.O. Box 10460, Eugene, OR 97440, (503) 343-1200.

April 29-May 1, 1988

1st annual national symposium for health care interior design, La Costa Hotel & Spa, Carlsbad, CA. A symposium for health facility administrators, interior designers, architects, and manufacturers. Contact: National Symposium for Health Care Interior Design, Inc., 4550-H Alhambra Way, Martinez, CA 94553, (415) 370-0345.

May 1, 1988

Entry deadline for the Howard Brandston Student Lighting Design Education Grant. Applicants must be full-time students with substantial coursework in illumination studies from accredited programs and must solve a lighting design problem supplied by IES. Contact: Illuminating Engineering Society, 345 East 47th Street, New York, NY 10017, (212) 705-7923.

May 2-5, 1988

DesCon '88 — A/E/C Systems '88, McCormick Place-North, Chicago. The conference and trade show focus on computer graphics, other computer and management systems, construction systems, and related topics. Contact: Sharon Price, A/E/C Systems '88, P.O. Box 11318, Newington, CT 06111, (800) 451-1196.

May 15-18, 1988

AIA annual convention, Jacob K. Javits Convention Center, New York City. Contact: The American Institute of Architects, 1735 New York Avenue, N.W., Washington, DC 20006, (202) 626-7396.

May 25-27, 1988

International Lighting Exposition, conference and trade show, Metro Convention Centre, Toronto, Canada. Sponsored by the IESNA, Toronto Section. Contact: Deborah Dugan, Show Manager, Kerrwil Trade Show Division, 501 Oakdale Road, Downsview, Ontario M3N 1W7, (416) 746-7360. ■



Manufacturer Credits

Page 16. *Lighting develops themes of contrast, theater, and simplicity* (Paper Moon restaurant, Washington, D.C.).

Neon Projects: Neon.

Lightolier: Low-voltage PAR track lighting.

Page 18. *123 N. Wacker's lighted pyramid a Chicago nightscape standout.*

General Electric: Metal halide and high pressure sodium lamps and fixtures.

Page 20. *Bank's custom luminaires, unique lighting attract mall pedestrians* (Central Bank of Denver).

ELA Company: Custom fixtures.

Great Panes: Glass light shield fabrication.

Holophane: High-bay and low-bay fixture metal halide uplights.

GE Lighting: Low-bay fixture glitter lights.

Trautmann: Custom wood slat blinds.

Neo-Ray: Teller-line rear wall lighting.

Lithonia Lighting: Teller-line front cove.

Page 24. *Light and shadow only decoration park shelter needs* (Pinecote, the Crosby Arboretum Interpretive Center, Picayune, Mississippi).

Burge Contracting: Custom wooden fixtures and freestanding sculptural fixtures.

Hubbell: PAR 38 lamp holders for floor uplights.

Great Southern Metals: Custom metal grilles for floor uplights.

Lutron: Switching.

Page 34. *Special effects with standard indirect fixtures.*

Lam Inc.: Pendant indirect HID fixtures.

Mercury Lighting Products: Fluorescent fixtures, built into custom housings by contractor.

Litecontrol: Indirect fluorescent fixtures.

Kliegl: Quartz fixtures.

Rosco: Translucent screen diffuser.

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