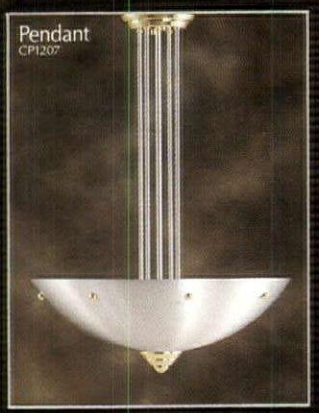
# ARCHITECTURAL LIGHTING

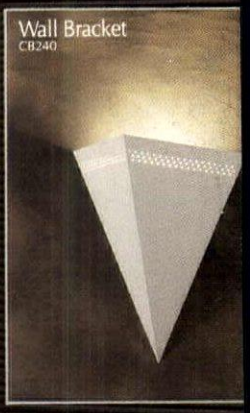

May 1988
Five Dollars

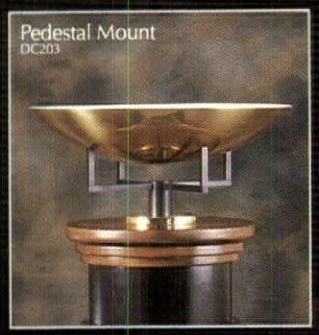
# V I S A

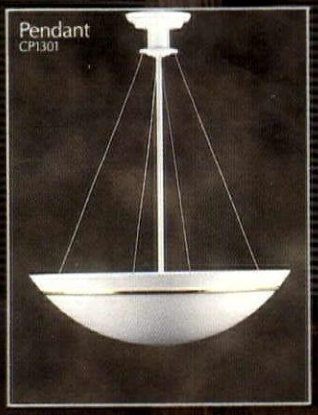
## The Art of Decorative Lighting

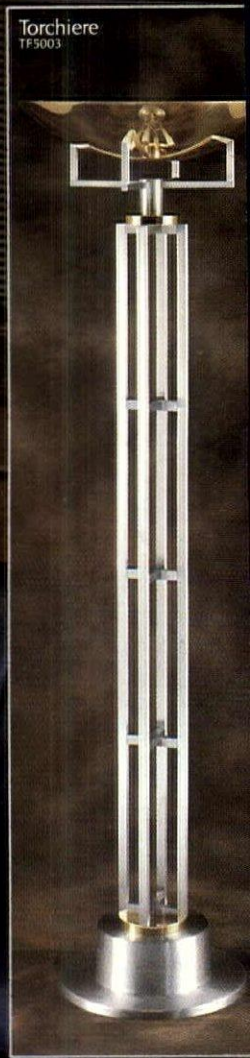




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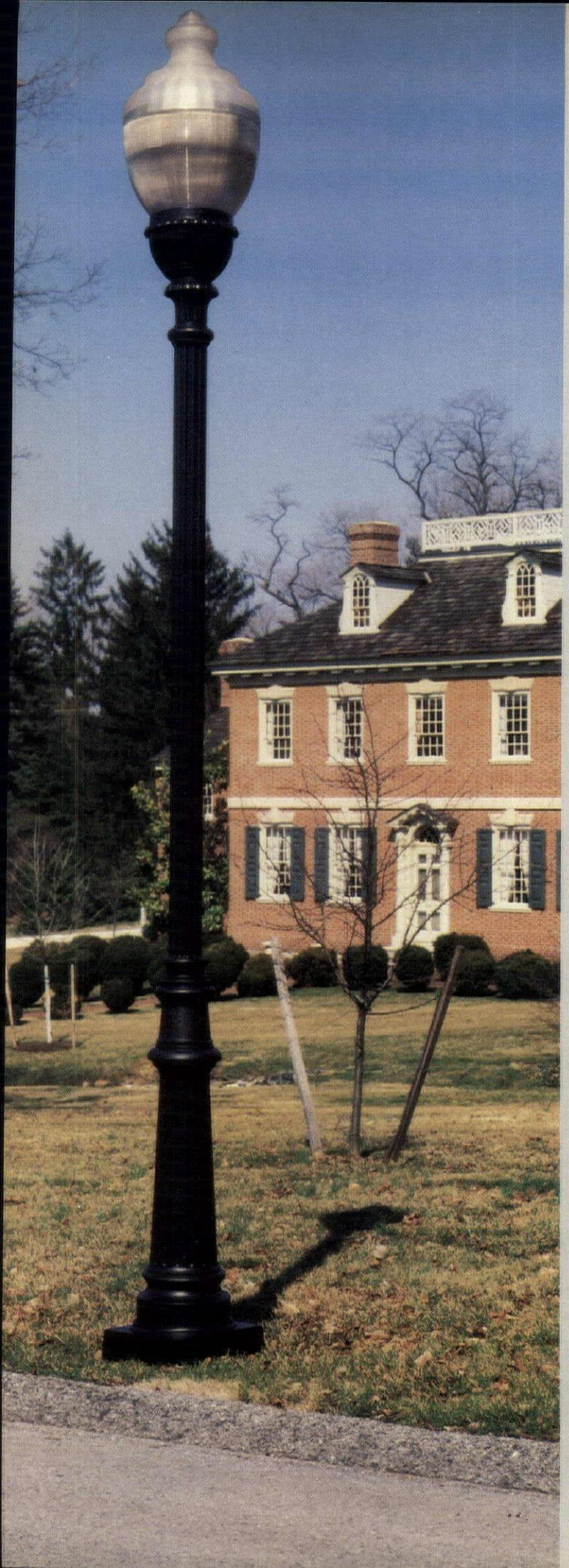

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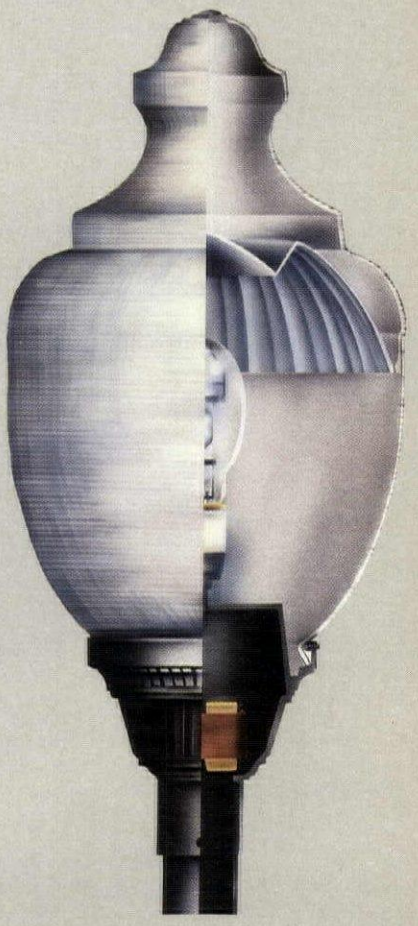

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ARCHITECTURAL LIGHTING

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ARCHITECTURAL LIGHTING

**May 1988**
**Volume 2, Number 5**

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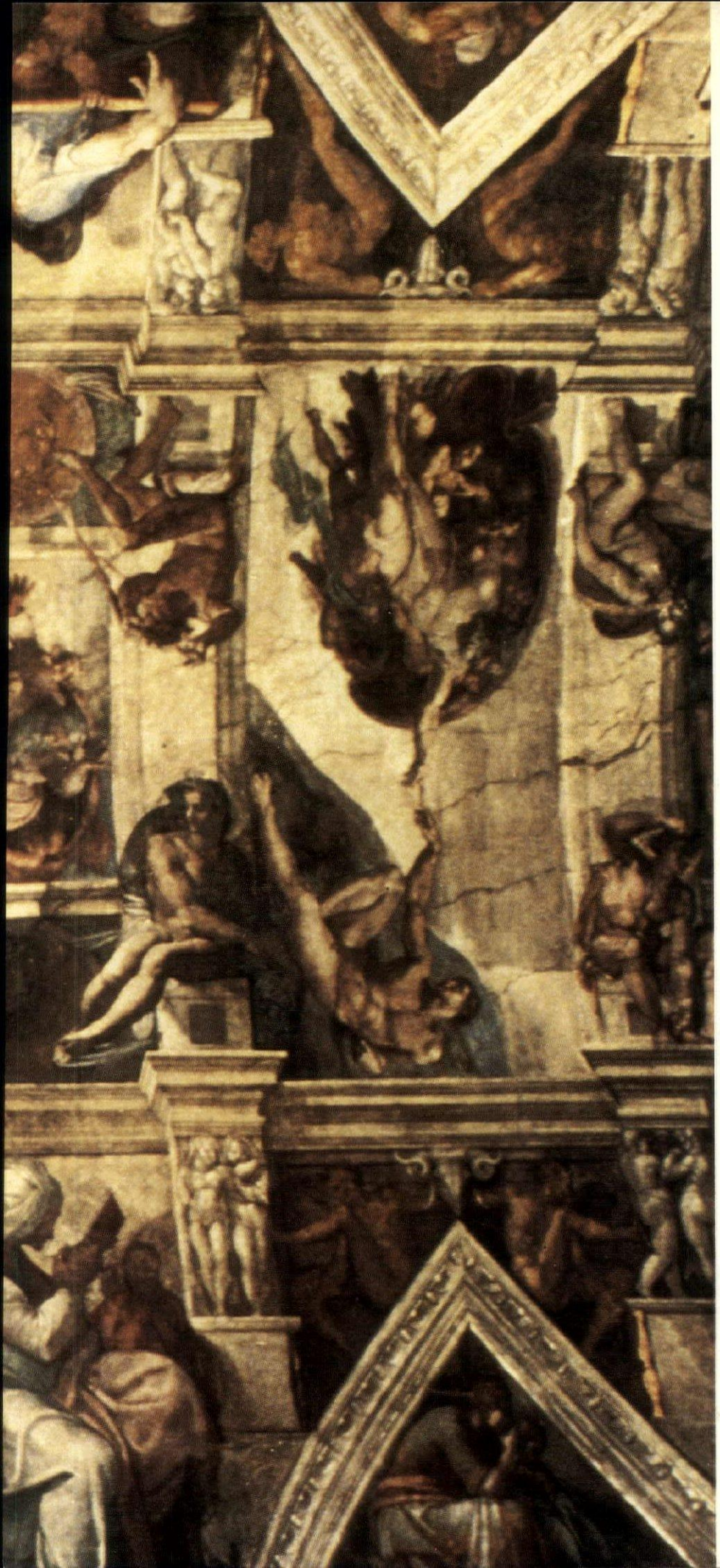

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By creating the Advantage X fluorescent lamp, the people at Philips Lighting have raised the concept of design to new heights.

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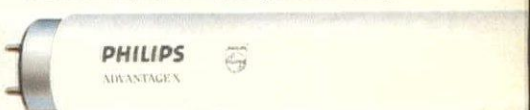
For more information about the new Advantage X, call Philips at 1-800-631-1259, ext. 932, and see how we've taken fluorescent lighting out of the dark ages.

*The new Philips Advantage X fluorescent lamp.*




**IT'S TIME TO CHANGE YOUR BULB.™**

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Circle 8

# From the Editor

This month, Jim Benya's column, the Lighting Design Professional, tackles a controversial subject: certification of lighting designers. It's very different for us to devote two and a half pages to so political a subject. But the discussion is important. The issue may come to haunt a most influential group of our readers: those whose primary business is architectural lighting design.

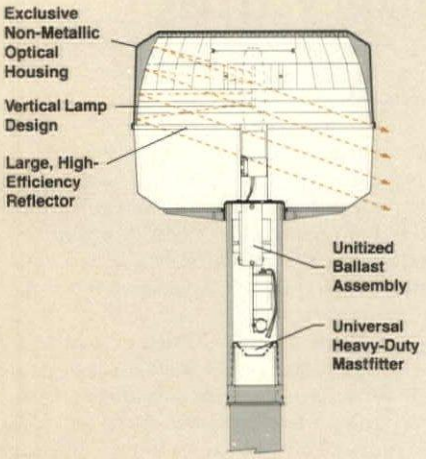
New professions emerge when a technology, such as lighting, increases in sophistication to a point that it can only be used properly by people with specialized skills. Some lighting designers believe lighting has reached that point. Here is their dilemma: Do the members of this new profession band together and pursue legal protection of their trade through legislation? Or does the new profession just hope nobody from a related field (in this case, architects and engineers) notices this new market niche and decides to legislate its practitioners out of business by strengthening the boundaries of their already licensed turf?

Benya suggests that the best way for lighting designers to get legislated out of existence is to pursue licensing. That would draw so much attention it couldn't help but create a strong backlash from other professions. But, he says, the best way for lighting designers to establish their worth — and their turf — is to develop a meaningful education and examination program that leads to a lighting design certificate.

As I noted in this column last September, there appears to be a tremendous amount of confusion about certification and licensing among lighting design professionals. The confusion must be cleared up before any progress can take place — even toward deciding to certify. I hope Benya's column helps clarify some of the basic issues for everybody.

Charles Linn, AIA

# LOOK AT ENERGY EFFICIENCY IN A NEW LIGHT.




## NEW SUPRA-LYTE FROM WIDE-LITE.

Maximize the performance and efficiency of your area lighting designs with the new Supra-Lyte from Wide-Lite. It's superior to typical post-top luminaires because it offers initial and life-cycle cost savings, easy installation and exceptional durability.

## MAXIMUM EFFICIENCY.

Supra-Lyte has an extra large reflector and vertical lamp configuration to provide maximum peak intensities for HID light sources. Its optics are so effective that a 250 watt HPS lamp produces the same peak intensities as a 400 watt HPS lamp in typical post-top luminaires. And for higher light levels, an optional energy efficient dual lamp Supra-Lyte is available.

Additional energy savings can be achieved when Supra-Lyte is ordered with the optional Bi-level switching system. During off-peak hours, luminaires can be switched to provide low level illumination and reduce operating costs up to 75%. Typically, the energy savings can pay for the system within the 3 year Wide-Lite warranty period.

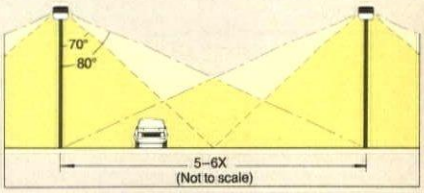
## SUPERIOR PERFORMANCE.

Engineered to provide the optimum square Type V light pattern, Supra-Lyte maximizes light at a peak beam angle of 70°. This provides better control of light intensity and distribution with cut-off that minimizes spill light on adjacent property. Areas are illuminated smoothly and uniformly without glare, shadows or hot spots near the poles.

Supra-Lyte offers an excellent spacing-to-mounting height ratio of 5–6 mounting heights. Fewer poles are needed so visual clutter and overall expenses are reduced.

## FUNCTIONAL STYLING.

Supra-Lyte features an exclusive lightweight non-metallic housing that is both attractive and exceptionally durable. Plus it has no structural arms or supports to cast shadows or detract from its stylish appearance.




**Supra-Lyte provides maximum light output at 68°–70° to illuminate areas between poles spaced up to six mounting heights.**

It also features an integral ballast/mastfitter assembly located far away from lamp heat for longer component life, with a full-length access door for easy maintenance. This universal mastfitter assembly can be mounted to round tapered poles and 5" and 6" square poles with 4" O.D. tenons, making Supra-Lyte the perfect choice for new *and* retrofit projects.

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Circle 9

# Lighting Clinic

## Lighting frigid locations

We have been receiving *Architectural Lighting* for several months and find your magazine really helpful in learning about the lighting industry and new products. We look forward to each issue. The Letters section has been especially interesting since it reflects what is happening in the actual applications of the lighting industry. I have a question for you.

We live in an extremely cold climate (16,000 degree heating days) where lighting is needed much of the year. As a result, lights in entryways and on porches operate much of the winter. Under less extreme conditions, the compact fluorescent lights would be perfect, but the extreme cold prevents the lamps from operating well much of the time. Right now, it is 18 degrees out with a 35-mile-per-hour wind. Last night there was little wind, but the still air temperature was minus 18 degrees Fahrenheit, with a chill factor of minus 39.

We have done some testing, and even with a vapor jar enclosure, the temperature gets too cold for adequate operation of compact lamps. With electricity at 23 cents per kilowatt hour, there is an incentive to find some alternative, but I'm not sure where to look. HPS lamps have been suggested, but they are so expensive that most people don't want them. Any suggestions you could offer would be greatly appreciated.

*Bob Taylor*
*Northern Lights*
*Kotzebue, Alaska*

## Cold weather fixtures

Here are some recommendations for cold weather conditions. I hope they help.

Use a 40- or 50-watt mercury vapor lamp with an initial lumen rating of 1140. These lamps are rated down to 22 degrees below zero (Fahrenheit) when appropriate ballasts are used. Self-ballasted mercury lamps have a temperature rating of only 5 degrees Fahrenheit, so they may not be appropriate.

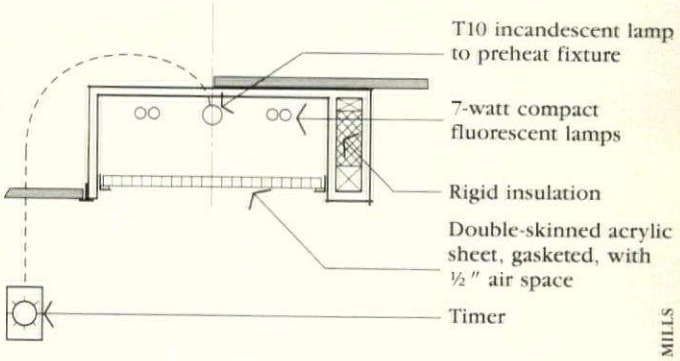
Use 7-watt compact fluorescent lamps in a fixture and run them continuously. In other words, start the lamps when the ambient temperature is above freezing; the heat of the lamps will assure that minimum temperatures are maintained.

Use a fluorescent-incandescent hybrid fixture such as that shown here. A 40-watt incandescent lamp on a 15-minute wall-box timer will preheat the fixture. Once the fixture is heated, compact fluorescent lamps on a separate circuit can then be energized. In critical areas, the fixture should be sealed and insulated to retain heat.

With all fluorescents, light output, color temperature, and efficacy can vary with variations in ambient temperature.

The critical factor is starting fluorescent lamps in cold environments; these recommendations should help to overcome the starting problems.

*Chip Israel*
*Grenald Associates Ltd.*
*Los Angeles, California*



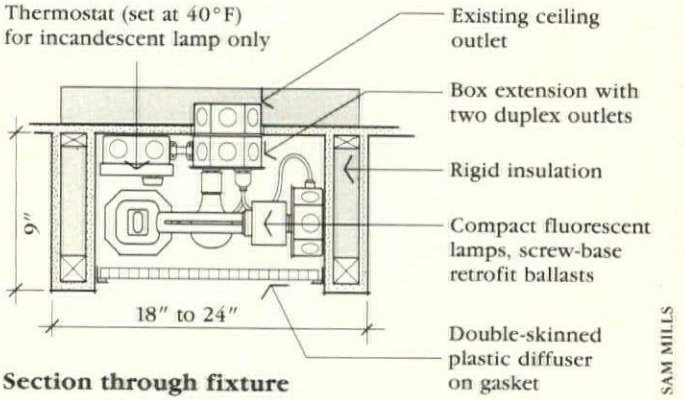

**Recessed** **Surface-mounted**

SAM MILLS

## Another cold weather fixture

Here's another idea for a cold weather fixture. This solution uses an inexpensive (about $10 or $15) electric heating thermostat in place of the timer. This eliminates the need for separate wiring for the timer; one circuit turns on all the lamps. The 40-watt incandescent will go off when the temperature in the fixture reaches 40 degrees Fahrenheit and its two or three low-wattage compact fluorescent lamps are warm enough to start. This version of the fixture has rigid insulation in a wood-framed gypsum board housing.

*Sam Mills, AIA, IES*
*Architect and Lighting Consultant*
*Edmond, Oklahoma*




**Section through fixture**

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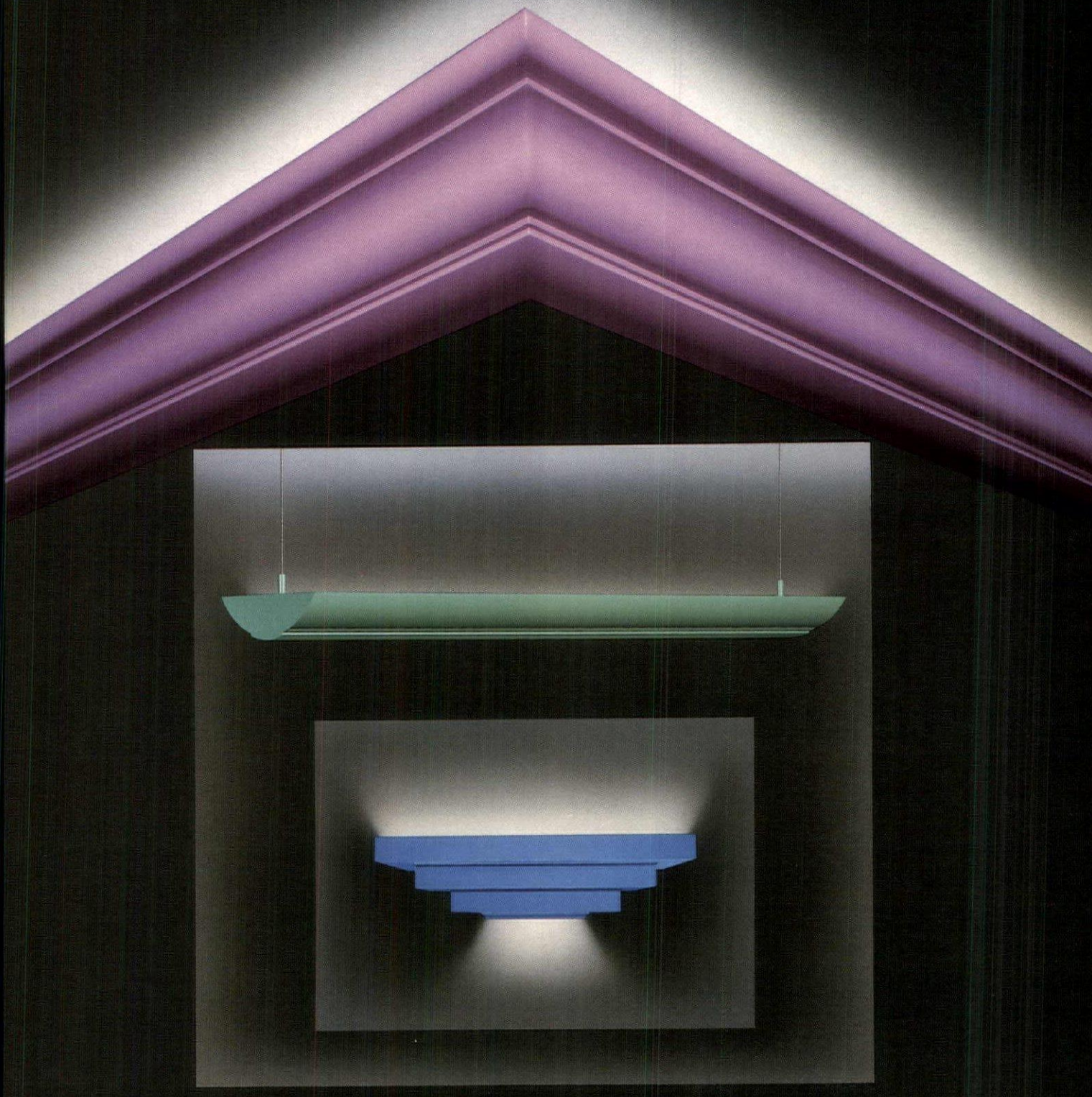

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Telephone 617-823-8277

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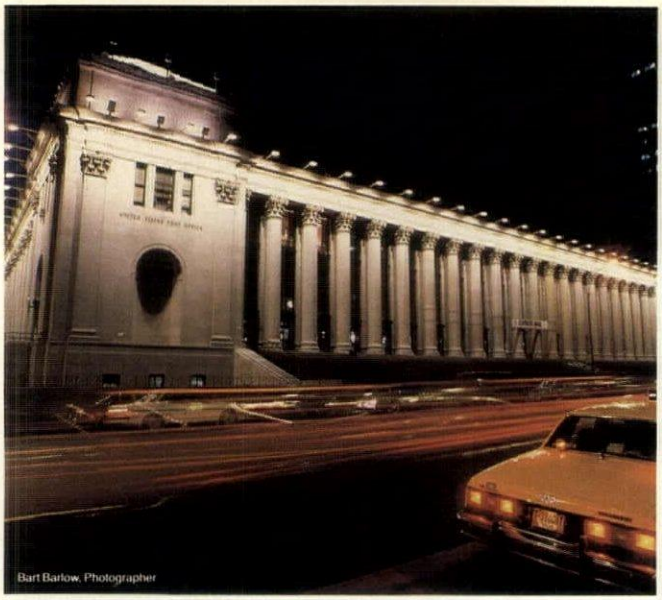



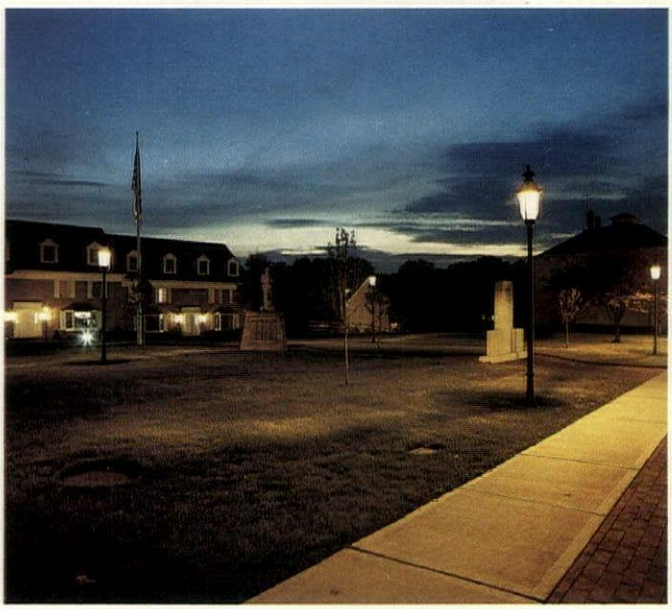

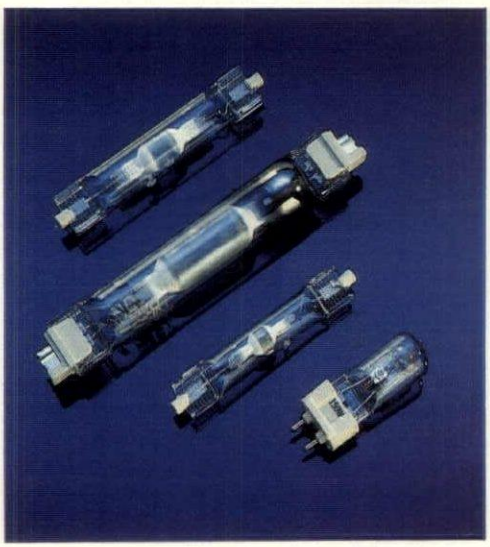

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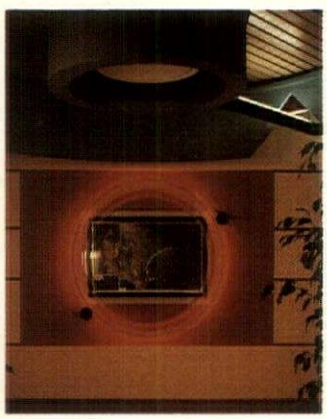
Circle 15

# Lighting design illustrates company's services



**Project:** Telecommunication renovation
**Owner:** Arco Pipe Line Company
**Location:** Independence, Kansas
**Project Designer:** Antonio P. Fernandez
**Consulting Architect:** J.E. Heckman, AIA
**Electrical Engineer:** Randall Downing, PE
**Lighted Map Display:** Stephen T. Grimes
**Photos:** R.J. Osborn

Like spokes in the handwheel of a giant valve, eight 4-foot-long segments of suspended tubular fluorescent uplights fan out around a 4-foot-diameter luminaire recessed in a circular soffit. The wheel is surrounded by a second, curved soffit more than 15 feet in diameter; it repeats the pattern of concentric circles beneath it: a round bookcase in the middle of a ring of desks outfitted with computer terminals, video monitors, and phones. Daylight and recessed incandescent downlights in the corners of the room illuminate additional work areas.

This is the Arco Pipe Line Company's radio control room — the hub of the company's telecommunication operations. On a 24-hour basis, electronic technicians here monitor the communication pipeline systems, which serve transport systems that run from the Texas coast to Ohio.

Remodeling the telecommunication facilities coincided with the recent computerization of the company's microwave and telecommunication operations. In-house architect Antonio P. Fernandez and consulting architect J.E. Heckman collaborated on the project. Their lighting design repeats the motif of geometric forms used throughout the project to create a functional, aesthetic environment that reflects the uniqueness of the telecommunication operations.

A lighted display in the foyer illustrates the company's telecommunication operations. Beneath a 5-foot glass panel, a map of the United States glows in a magenta neon ring, its glare softened by frosted bands in the glass. An animated arc of different colored light emitting diodes (LEDs) outlines the microwave towers, leased facilities, and satellite earth stations. A 3-foot luminaire, recessed in a circular soffit and surrounded by a larger curved soffit, illuminates the foyer. Additional light comes from recessed incandescent downlights in the corners.

Fernandez used 4-inch tubular fluorescent fixtures to symbolize the pipeline. "The fluorescent tube system is a visual link between the foyer and the operations area," he says. "We wanted something dramatic, so we used a power source to connect the two nodal points."

The lighted guide begins with a single 4-foot uplight segment joining the foyer's ceiling unit and a 22-foot-long run of tubular fluorescent uplights in the corridor that leads to the radio control room. At the other end, a 6-foot-long unit connects the corridor piece to the "hub" of the control center's ceiling luminaire and forms one spoke of the wheel pattern. Flexible connectors at 45-degree turns between the segments give the uplights a continuous look.

Fernandez is pleased that workers like the new lighting design. "We've had lots of good response from people," he says. "They are all excited about their new and functional environment."

**—Susan R. Degen**

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

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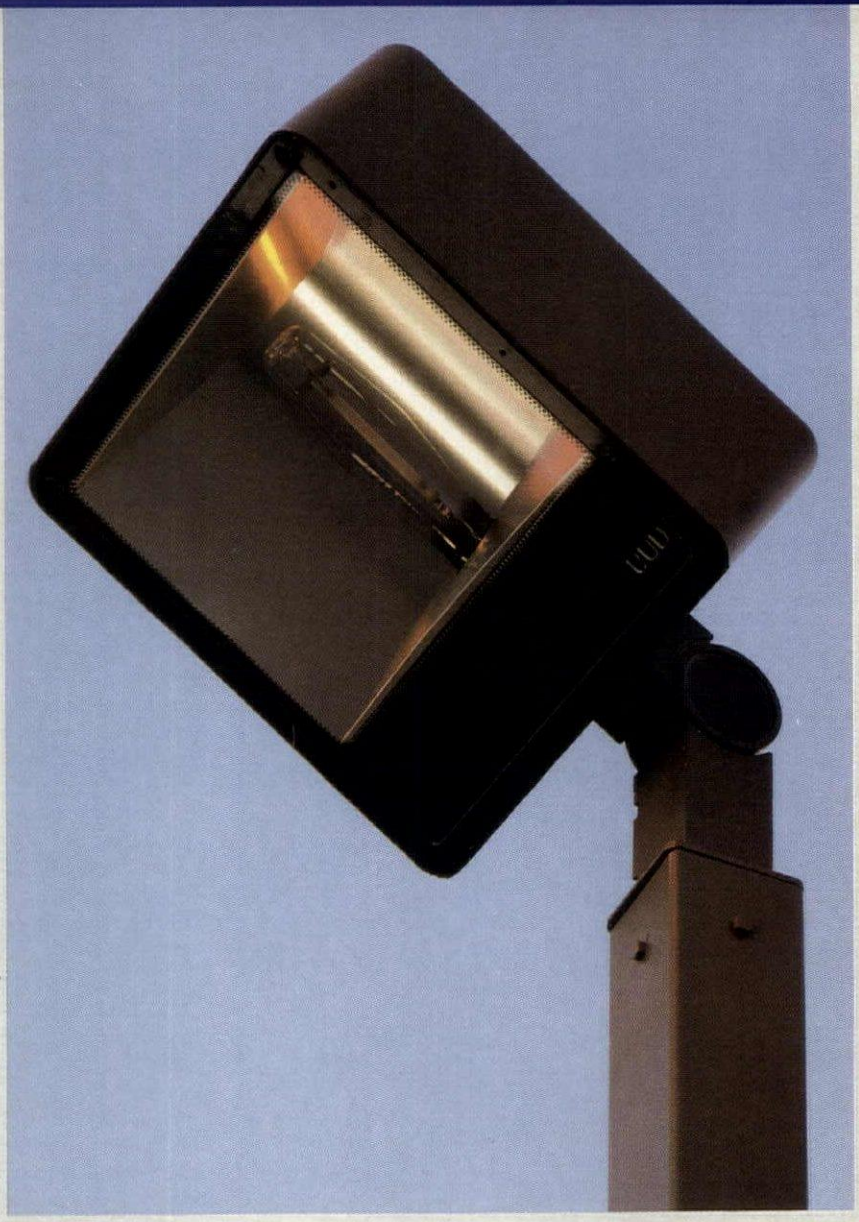
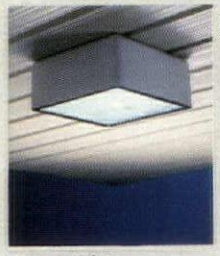
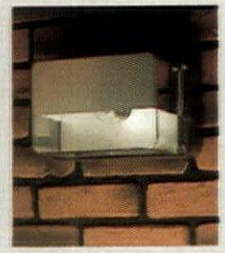


**Floodlights**



Canopy Lights

Industrial Lights



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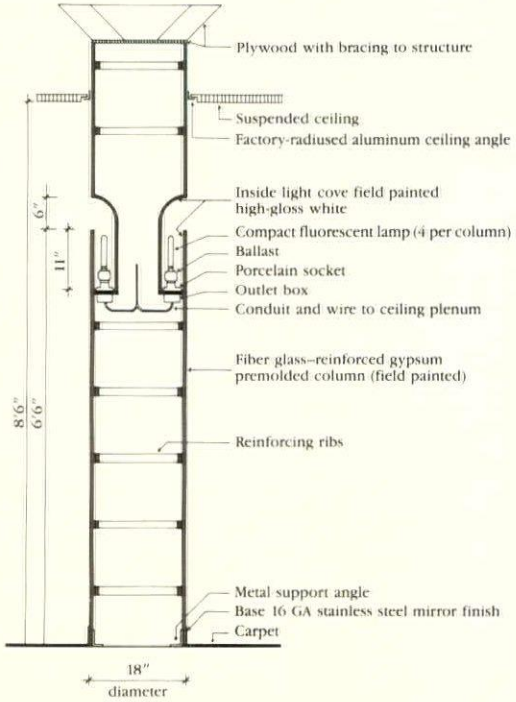
# Custom columns add visual interest, ambient light to open-plan office




Seafoam green lighted columns add visual interest and a soft glow of ambient light to the offices of Copley Real Estate Advisors. Made of molded fiber glass–reinforced plaster, the custom-built columns border secretarial stations outside offices along the perimeter of the space. They are part of a lighting design that combines indirect light and daylight to create a warm and lively environment while illuminating the company's interior open-office plan.

"The initial objective of this project was to provide an interim office for Copley Real Estate Advisors," says project manager Jeffrey Wade. "However, as a result of the successful design of the facility, the client decided to make this space its permanent home." The 8½-foot-high, 18-inch-diameter columns cost approximately $700 each to make, which shows that "highly decorative custom lighting does not always have to be expensive."

The columns were formed from two separate pieces that were wired individually and then joined together on site. After being raised into position, they were anchored to the floor and the structure above the suspended ceiling. Four 9-watt compact twin-tube fluorescent lamps with ballasts are evenly spaced around the circumference of each column within a cove, thus concealing the lamps from view.

Above the lamps is a curved reflective surface finished in high-gloss white paint. It appears to have a translucent glow, as if the light source were actually behind a curved white lens in the column. "We experimented with specular reflectors," says Wade, "but they created hot spots of light on the cove and did not produce noticeable increases of light in the space."

Daylight and indirect lighting fixtures bring illumination into the office interior. Rooms along the building perimeter have interior walls with 2-foot-high clerestory windows. Task lights supplement the square fluorescent troffers over workstations, and the systems furniture supports pairs of fluorescent uplights. Fluorescent cove lights around the building's core wash walls and brighten corridors and recessed file cabinets. A low-voltage relay system allows one-switch control of the uplights, cove lights, and column fixtures.

Copley Real Estate Advisors projects an image of confidence, innovation, and stability without being overly formal or stodgy. "The new space," says Wade, "accurately reflects the client's image and provides a unique and exciting work environment."

**—S.R.D.**

**Project:** Copley Real Estate Advisors Headquarters
**Location:** Boston, Massachusetts
**Architect:** ADD Inc, Wilson F. Pollock, FAIA, and Wayne S. Koch, AIA, principals-in-charge; Jeffrey T. Wade, project manager
**Mechanical and Electrical Engineering:** Shooshanian Engineering Associates, Inc.
**Photo:** Warren Jagger

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

# HOLOPHANE PRISMATIC LIGHTING HELPS PICK UP PROBLEMS BEFORE THEY BECOME A PROBLEM.

Industrial illumination is more demanding than almost any other application. Contrasts are lower, action takes place over a far greater vertical range, and glare is inescapable when task location or angle can't be adjusted.

Worst of all, the resulting shortcomings can be far more costly here than in any other environment.

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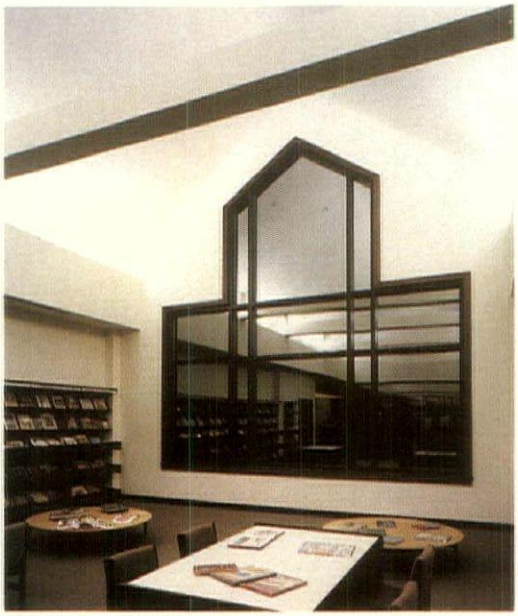
Circle 17

# Indirect lighting solves problems for library designer



**Project:** St. Tammany Parish Library
**Location:** Covington, Louisiana
**Owner:** St. Tammany Parish Police Jury
**Architect:** Michael Mattax, N-Y Architects, Ltd.
**Electrical Engineer and Lighting Designer:** Nestor Houghton, N-Y Associates, Inc.
**Interior Designer:** Library Interiors, Inc.
**Photos:** Ken Glaser

Light is obviously essential in a library, a building designed for reading, but poorly designed lighting can antagonize users. Glare irritates readers, inflexible fixture layouts restrict staff members who want to move furniture, and ultraviolet emissions distress archivists who need to protect fragile documents.

The indirect lighting system at St. Tammany Parish Library represents one attempt to resolve these perennial problems. "The idea started with one room in the library — the genealogy and Louisiana history room for old books," explains electrical engineer Nestor Houghton, who designed the lighting. "It worked so well there that we used it in other areas where we had the problem of vaulted ceilings. Anything else would have created a warehouse look."

Houghton concealed indirect metal halide fixtures along the furring of supporting beams in the book stack area, maintaining an open and uncluttered space. The scheme eliminates glare and allows rearrangement of shelving and seating. It also moderately reduces the ultraviolet light that tends to cause fading and deterioration of library materials. Because common white paint pigments are relatively poor reflectors of UV light, the light reflected off the ceiling has a reduced UV component.

To electronically mock up his design, Houghton found a lighting manufacturer with computer modeling capability. "I contacted many manufacturers and asked them if they could do this," he says. "Only one had a program that took into consideration the book stacks and the vaulted ceiling condition."

Some of the asymmetric, forward-throw luminaires are equipped with quartz lamps that cycle on for supplementary lighting during the metal halide warm-up and restrike periods. On the site, however, the quartz lamps have proven inadequate for the application. "There's not enough light for any indirect contribution," says Houghton.

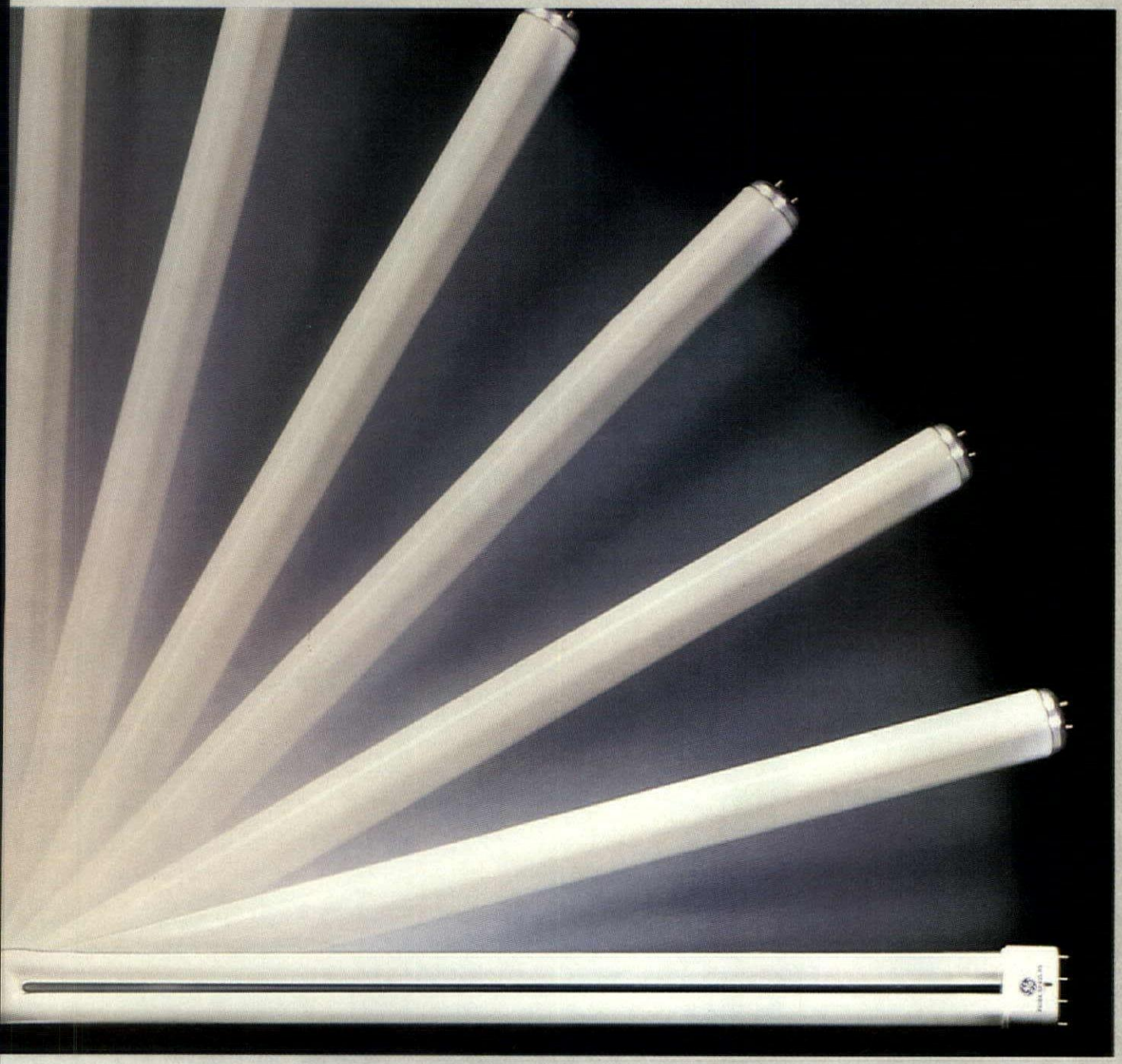
Compact fluorescent downlights along the supporting beams are a more successful element of the design. They illuminate pathways while the metal halides warm up, and then contribute extra ambient light in shadowed spots where air conditioning ducts block the indirect light. Some have battery packs for emergency lighting. Houghton also notes that the downlights provide a psychologically important light source for library patrons who expect to see fixtures.

As a finishing touch, fluorescent lamps concealed along furring next to windows provide decorative, energy-efficient security lighting after hours. The effect as seen from the street is a soft glow that reminds passersby of the inviting, functional atmosphere in their new local library.

**—Gareth Fenley**

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

# YOU DESIGN LIGHTING.



cents can, the lighting you design will make the environment and the people who work in it more attractive.

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Circle 19


Food for the gourmet in all of us

# Lighting a supermarket from produce to check-out

**ARTICLE BY**
RON HARWOOD

**PHOTOGRAPHS BY**
SUTTON PHOTOGRAPHIC

Competition among supermarkets has heated up, and major chains are working on new prototypes. They're retrofitting over 50 percent of the retail area in older stores and even going for complete redos. Market managers are trying to get the most bang for the buck and a leg up on the competition.

To do that, some of them have made lighting — along with a top-shelf graphics presentation — one of their first priorities. These retailers are holding architectural changes to a minimum, postponing the purchase of items like expensive new coolers, and addressing lighting first. And with good reason.

Let's take a walk through a typical, though imaginary, market. This hypothetical supermarket is about 60,000 square feet and was last updated in 1970. Our visit begins about 6:30 in the evening in mid-March; we've watched the sunset on our way.

Bang! 120 footcandles flying off the ceiling. The ceiling is brighter than the merchandise. High-output fluorescent strips — bare lamps — are pounding at our retinas, causing us to squint. This phenomenon is diametrically opposed to the principles of good merchandise lighting, yet chains still build stores this way.

They don't do that because of the cost; mostly they light that way because no one has shown them a better way. It isn't necessarily "better" to turn off lamps; retrofitting many of the strips — or, in the case of a new installation, using fewer lamps — can make a huge improvement.

Several types of baffled, louvered, and otherwise enclosed fluorescent fixtures can be recessed or pendant- or surface-mounted. A simple way to improve the brightness ratio problem of existing fluorescent strips is to select retrofit baffles with tested and proven optical efficiency, which can be fitted to virtually any strip cross-section. These usually improve the downlighting attributes of existing fixtures while reducing glare from the bare lamp. Typically, a high-output lamp is preferable; warm white or a hybrid form of color-corrected lamp can add warmth to an environment.

We use warm white simply because it is the least expensive of the bunch, and the easiest to maintain in inventory. The newest versions of 3000K lamps — triphosphor lamps — provide better color rendering, but they're not necessarily required throughout the store.

Designers who tried mercury vapor or metal halide lamp sources five or more years ago may wince at the sound of the three little letters HID. Like any new lamp source, metal halide had initial problems. But, field testing over a period of years brought obvious improvements — such as extended lamp life and better color rendering. Fixture manufacturers eventually designed proper and efficient reflectors for HID lamps.

Today, when used in the right lighting fixture, metal halide stands out as a very effective merchandise light source. We find that the point source illumination of a metal halide lamp allows for visible variations in depth perception. This provides a somewhat more upscale, dramatic look to the merchandise by giving each item more definition.

Most retailers believe the high-bay HID gives the store a warehouse look that tells customers the store is a mass merchandise, thrift conscious operation. The store therefore gets a new 20th century complexion without getting a pricey appearance.

The lighting design, of course, is critical to the success of any new or retrofit plan. It is especially important when using metal halide. When it's well designed, you can't beat it. Two approaches have been used successfully in stores that use high-bay HID fixtures: centering the fixtures down the aisle and locating them over the gondolas, specifying batwing distribution.

Centering the fixtures down the aisle can be tricky because


*Shadows make each individual piece of fruit and each vegetable distinguishable from the next. Fluorescent strips produce basically shadow-free light, but these point source lamps provide a pinpoint of sparkle.*

heating, cooling, and sprinkler lines may prevent aligning the luminaires properly. If this occurs several times in a store, the appearance can be distracting. When it is possible, a "down the aisle" approach works fine with a low-brightness luminaire, such as the die-cast, semispecular, deep-shade fixture shown in an accompanying photograph. One important point to keep in mind is this: many HID fixtures are available with shallow reflectors at reduced cost. However, these smaller, lower-cost reflectors may result in substantial glare.

Our preferred layout is to locate fixtures over the gondolas and to specify a batwing distribution pattern that allows for more output at 35 degrees than straight down. Moving light out of a fixture at this angle puts higher levels of illumination on the lower sections of shelving, thus minimizing the difference between illumination levels at the top and bottom shelves of the gondola. This is particularly important during rush hours, when shelves are not always full of merchandise and severe shadowing could result from lighting directly overhead.

The higher the lighting angle, the less shadowing will occur. This approach also allows for variations in the location of the luminaires because direct centering is not obvious. We also believe that customers are less distracted by lighting that does not follow the center of the aisle; they can look directly down the aisleway without encountering the light source in their field of vision.

We use color-corrected, high-lumen-output lamps in enclosed, recessed, and pendant-mounted fixtures. The pendant-mounted fixtures offer an opportunity to add a dimension of design to the store while adding no more to the bottom line than the cost of a custom paint color — about $12 per fixture. We'll discuss other lamp sources as we continue our walk through the store.

## Produce

The first, and probably most profitable, section in the supermarket is the produce department. Under fluorescent strips, some fruits, especially apples and oranges, have a plastic appearance. This is because there is no point source lamp above them. Light is emitted along the linear surface of the fluorescent tube, and therefore produces basically shadow-free illumination over the produce cases. Unfortunately, in this instance, shadows are preferable.

Shadows make each piece of fruit distinguishable from the next and give the display a sense of depth and drama. Also, a point source lamp provides a pinpoint of sparkle.

We recommend enclosed metal halide fixtures, properly selected, over the center of the displays and some form of incandescent lighting around the sides and angled edges of the coolers. How much light to use is directly dependent on the ambient light levels of the adjacent areas.

We have successfully turned off — or, in the case of a new store, omitted — the strips above the produce section and added new forms of light that make the produce look like a bargain at any price! Admittedly, some trial and error is involved in balancing the light levels against a ceiling that still has 70 percent of its strip lights illuminated. Remember, if the produce is to look better than the canned goods, it needs more light. If you start out with glare levels like sunlight on the ceiling, it is a tricky affair.

Choosing the best form of incandescent to supplement the metal halide is more difficult than most other supermarket lighting problems. Here we are dealing with a need for great color rendering; at the same time, we are introducing a factor that is unfamiliar to most markets: 2000 to 3000 hours of lamp life instead of the 10,000 to 20,000 hours they get from fluorescent or metal halide.

Thus, to put our best foot forward, we stir lamp replacement cost into the lighting broth to spotlight all dimensions of the answer. Currently, we use three lamp types; our choices depend on the client's


*Missing in typical supermarket delis is incandescent lighting to highlight the countertops — where the gourmet impulse items are displayed. Signage lighting was designed to avoid overpowering countertop lighting.*

needs.

*A19 lamp.* The most common lamp on the market is a 100-watt A19. Extended-life versions cost about $1.50 to $2 and, typically, you can expect about 2000 hours of life. A new version of this lamp is coming onto the market in reduced wattage but with the same lamp lumen output. It uses a quartz capsule and has a more stable life expectancy — 2500 to 3000 hours — at a slightly higher price; it will probably stabilize in the $3 range.

We have been testing this hybrid lamp, generically called a *midline,* with mixed results. In a recessed downlight, it works better in many cases (watt for lumen) than almost any other lamp form. In some track heads designed specifically for A lamps, it also works well; but in certain rare cases, the track head has such a severe focusing parabola that the heavy diffuse coating on the midline lamp hampers this process, resulting in a "soft focus."

*PAR 38 lamp.* We use the PAR 38 90-watt quartz capsule lamp almost without reservation — as long as the client is prepared to spend $7 or more for replacements; most popular is the spot variety. This lamp has a life expectancy similar to that of its cousin, the midline. The biggest advantage of this lamp is that it can be used in a myriad of track heads and downlights in any focusing beam offered by manufacturers. This means that existing track heads may be used if they're currently rated for this lamp.

*MR16.* The MR16 low-voltage lamp has both the highest lamp replacement cost and the highest first investment fixture cost. Because each lamp holder or track head requires a transformer, the fixture and lamp combination can cost from 20 percent to 100 percent more than alternative lamp and fixture combinations.

With all this information at our disposal, we try to use A lamps where possible, PAR 38 lamps where practical, and MR16s only when necessary. All these sources have excellent color.

A word of caution: While setting up our first produce displays, we encountered a slight warming of certain fruits where the incandescent light was so concentrated that you could see the small area each lamp was striking. Correct spacing between fixtures and distance from product is a vital consideration.

## Meat

Today an increasing number of supermarket owners and designers take care to avoid misrepresenting store goods through design techniques. As a result, innovative merchandising techniques are giving a fresh look to grocery meat departments. Old practices that forced color on meat products to manipulate its presentation are now being rejected. Consequently, new lighting applications that keep the consumer in mind are becoming popular.

Traditionally, fluorescent lamps have been used in and above meat display cases. Currently, designers are supplementing the fluorescent lamps with an additional light source for interest and an upgraded presentation.

We recommend the even power distribution of 3000K or triphosphor lamps to provide a light source that aids in product enhancement without deceiving the consumer. Dramatic architectural and graphic treatments continue to play an important role in maintaining consumer interest in meat departments.

## Cheese

The next stop on our walk-through is a cheese department. You may have bent over a cheese cooler and been blinded by the glare from prewrapped slices and bricks. Here, we see a display with large graphics and fluorescent lights above. We do two things to correct or prevent this problem.

Sometimes we take out the strips above and use pendant-mount incandescent lamps that are both decorative and functional; they add warm color to the product. Then we supplement lighting in the


*The trick to overcoming the mirror effect of wine bottles is to get light to strike the labels at a 45-degree angle. Track lighting allows the labels to appear warmly illuminated and colorful.*

area with a metal halide point source.

At other times, we drop louvered fluorescent fixtures closer to the product, so that once again the product is brighter than the surrounding displays. The louvers break up the lamp image of the fluorescent enough to make the look acceptable.

Interesting light-related phenomena encountered by some merchants were mold stimulation and product bleaching. Open high-bay HID lamps in the first prototype failed to filter out ultraviolet light, which stimulated rapid growth of mold on wrapped cheeses. It also bleached the color from wrapped pizzas and lunch meats. Standard fluorescent lamps had a similar, although less dramatic, effect. We reduced, but did not eliminate, the problem by using enclosed, lensed units.

Ultimately, we relocated the high-bays away from these areas. That also allowed for a more dramatic presentation by taking advantage of greater light-to-dark ratios of adjacent areas. Color rendering was improved by using quartz capsule lamps and/or color-corrected fluorescent lamps, depending upon the needs of each store.

## Wine

Our next stop is the wine department. Wine is a relatively expensive item for a supermarket, yet these displays always seem bland. In this instance, great graphics can bring customers to an area only to disappoint them.

One of the first rules a lighting consultant learns is that glass is almost impossible to light. In the wine department, all the customer usually sees is glare from the light source reflecting off the rosé and dark red wines. The dark color of the contents gives the containers a mirror effect.

The problem is compounded when the light source is overhead, at a 90-degree angle from the face of the container or its label. The trick here is to get light to strike the labels at a 45-degree angle, thereby allowing the labels to appear warmly illuminated and colorful. This technique deals with the nature of reflectance. Basically, a 30- to 45-degree angle allows light to bounce off the merchandise and illuminate it without adding glare to the glass.

One solution we have used is mounting track heads in the trusses and highlighting the labels with 250-watt quartz spot lamps. We would like to see some display-mounted lighting in the future of wine departments, to create an environment reminiscent of Old World aesthetics.

## The Deli and Fish

The delicatessen and fish are now in front of us. In a typical store, these departments get more attention than the others. They have canopies or bulkheads and good graphics.

Typically missing in supermarket delis, however, is incandescent lighting to illuminate the tops of the counters — the area where impulse items such as gourmet foods are displayed. Two things happen on the top of glass delicatessen cases: customers are handed or shown items for purchase and goods are displayed. Good manners in lighting design tell us to use louvered fluorescent fixtures above the employees, so that the signage on the back wall and the consumer items stacked on the countertop are not overpowered by the glare of strips or recessed prismatic troffers. This technique also gives the overall appearance of the department a richer look.

## Houseplants

In a store of this size, we are likely to run into a houseplant display of some magnitude. So little is done to make it attractive, customers usually have no idea the section exists until they stumble onto it. Usually it falls into the path of shoppers on their way out. What's more, plants look awful under fluorescent light. Typically, houseplants lose their individuality and seem out of place in a supermarket.

Some of our clients are now integrating lighting design with good retail marketing principles to breathe life and profit into this department. One way is by focusing light


*So that supermarket customers would carry away the corporate image the market is trying to project, the check-out features for this store were carefully selected with the corporate image in mind.*

upon this display, using light sources with good color rendering. Another technique is using track lighting with trellis displays that remind customers of a neighborhood flower shop.

Recently, we've had success with a European form of metal halide lighting in low-wattage format. The 70-watt HQI lamp fits into some special track-mounted fixtures, allowing us to aim very intense — but cool — light at the plants. The light source stimulates growth and is bright enough to overcome the glare from the overhead strips. If you were bold enough to turn off the strips, the results would be quite dramatic. This would be especially effective for a display in a corner of a store.

## Check-out

On our way to the check-out in this typical supermarket, we notice that the check-out numbers are hanging from the ceiling without illumination. Decorative incandescent fixtures hang from chains at the end of the grocery conveyor. Without an optic system, they're purely decorative. What's more, in many cases, those fixtures are 15 or 20 years old. We get rid of them.

Retailers have educated shoppers to recognize lighting as current, outdated, or unique and futuristic. Supermarket clients want shoppers to leave their stores with the corporate image they're trying to project. We recommend that check-out features also reflect the corporate image.

We selected the fixture shown in the photo for several reasons. It is an extremely efficient light source; with its open cell parabolic louver, its distribution suited our needs perfectly. Suspending the fixtures just 11 feet above the floor gave the area a more human scale and comfortable feeling. We also raised the light level on the impulse products at the registers without spilling light into the aisleway where people line up. And, we believe that reducing the light level between the check-outs and the first "nose displays" makes for a better looking presentation to customers entering the store. The fixtures are painted the corporate "poppy orange" color to reinforce the new image of the chain.

## Parking Lot Lighting

Bang! It's dark again. Walking out of the store with eyes adjusted to high-level interior light makes the parking lot lighting look totally inadequate. We recommend that the client throw out those old cobra head fixtures in the parking lot and replace them with new high-output, energy-efficient heads. Look for a minimum maintained footcandle level of 1½. Our research has led us to some unique and inexpensive retrofit fixtures that illuminate parking lots better with less energy and without the expense of changing poles. We have achieved as much as 50 percent energy reduction with 100 percent light improvement on several recent jobs, so it's worth your while to research these possibilities.

While you're at it, suggest high quality, optically precise floodlights on the elevation of the market building. Floodlights light signage economically.

When you work with supermarket owners, you've entered an arena where merchandising concepts are changing, where deciding what to do with a store's square footage is no longer certain, where prepared foods are creeping in and experiments are taking place with sit-down food service.

Working in a supermarket these days sometimes feels as if you've stumbled into a regional mall — with its infinite lighting design challenges and opportunities. ■

*Ron Harwood is president and senior designer with Illuminating Concepts, a lighting applications and product development firm in Farmington, Michigan.*

# Dramatic lighting revives movie theater excitement

**Robert E. Oringdulph**

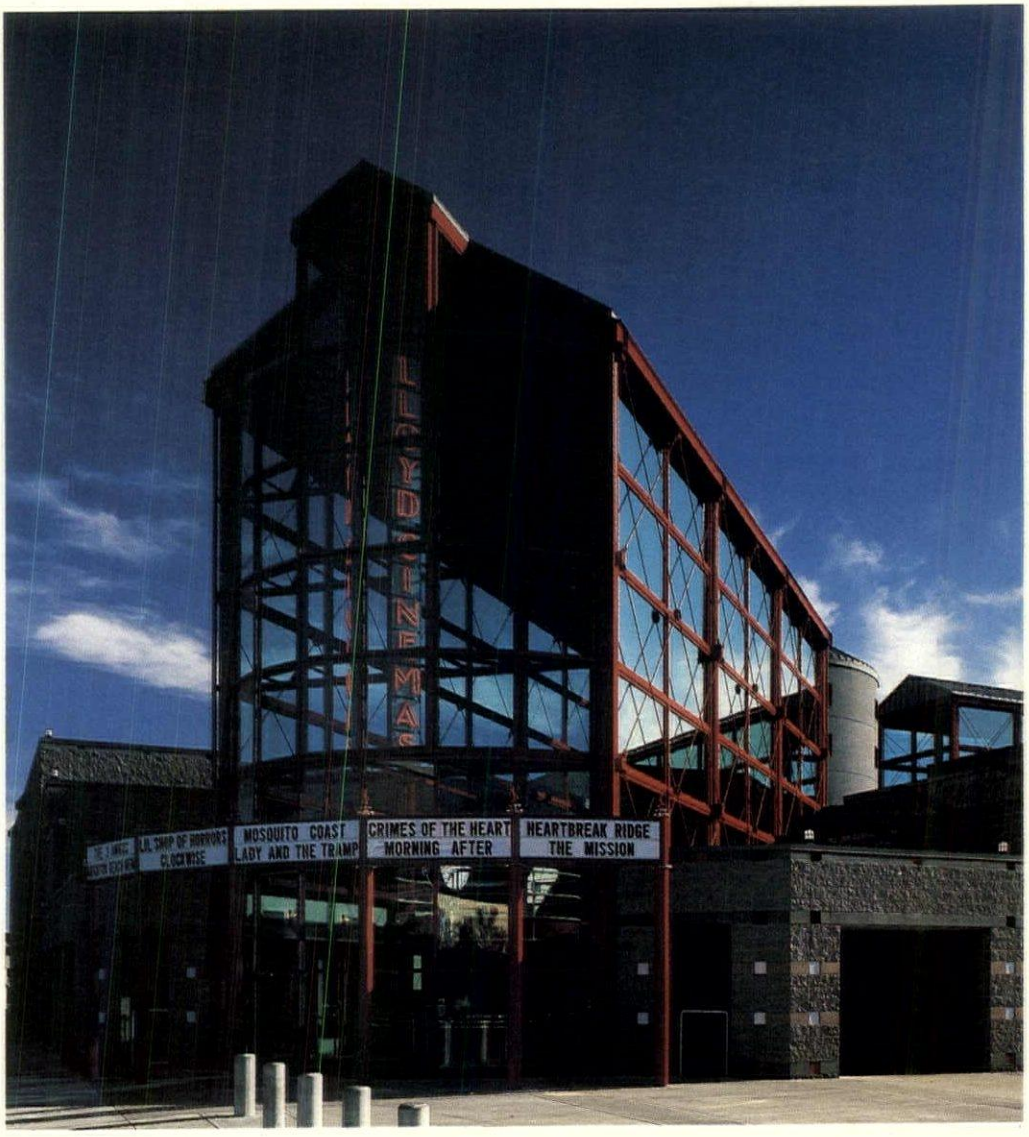
*Robert E. Oringdulph, FAIA, is a principal of Broome, Oringdulph, O'Toole, Rudolf, Boles & Associates (BOOR/A) in Portland, Oregon.*

Patrons enter the Lloyd Cinemas in Portland, Oregon, through a soaring, neon-lit lobby, where the ticket box is draped with neon signage and decoration. They then move through an arching rotunda — a portal to a "street of theaters" that offers life, light, and laughter. Along the street, each cinema's independence is established by its own facade, neon sign, and reader board. The 40-foot ceiling height and 10-foot-high windows in the interior arcade create a sense of the outdoors.

On the marquees, single and multiple strands of neon trace architectural forms; other neon bends to form words and stars. Housings provide support and give form to the neon patterns, their aluminum skins reflecting the glowing colored light. Each neon structure uses a different combination of colors. Animation manipulates the combinations into patterns of flashing sequences, creating a feeling of a constantly changing scene. The owner spent about $190,000 on 3800 linear feet — nearly three-quarters of a mile — of neon.

Until Lloyd Cinemas opened in 1987, Portland reflected the national decline in movie theater architecture. In the 1920s and 1930s, competition for moviegoers was fierce. Theater owners designed stimulating, attractive environments to entice patrons to watch the latest blockbusters on their screens. Every imaginable interior effect greeted millions of patrons, from medieval towns under purple skies of twinkling stars to Egyptian temples lined with pharaohs and hieroglyphics. Electrical lighting in every conceivable form was the mainstay because theater lobbies were almost always windowless.

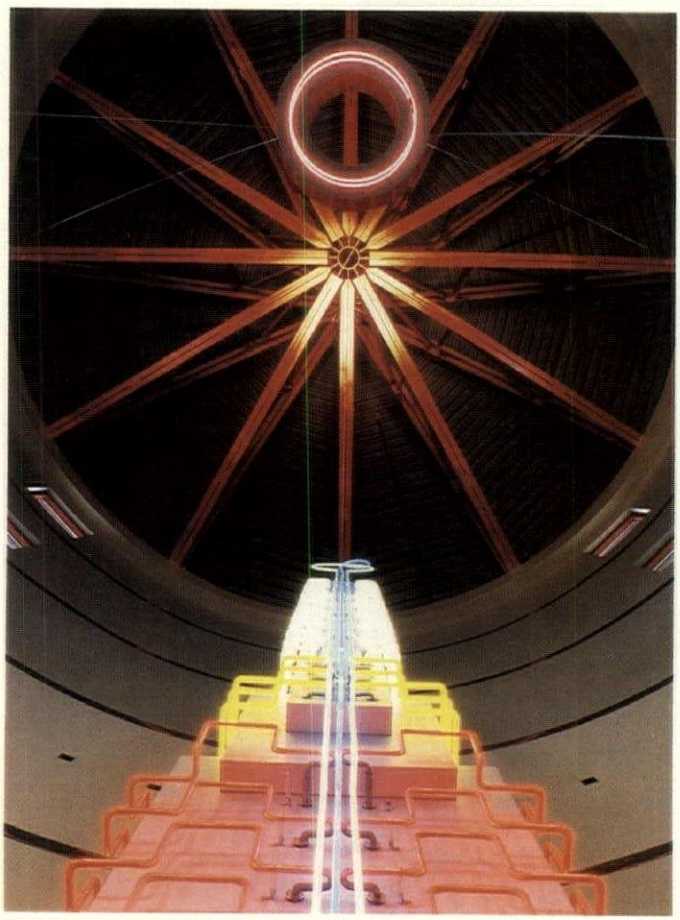
Attendance patterns began to change in the 1950s, and plummeted downhill during the 1960s and 1970s. Television captured part of the movie market, and the grand old houses were torn down; then VCRs arrived on the scene, further compounding



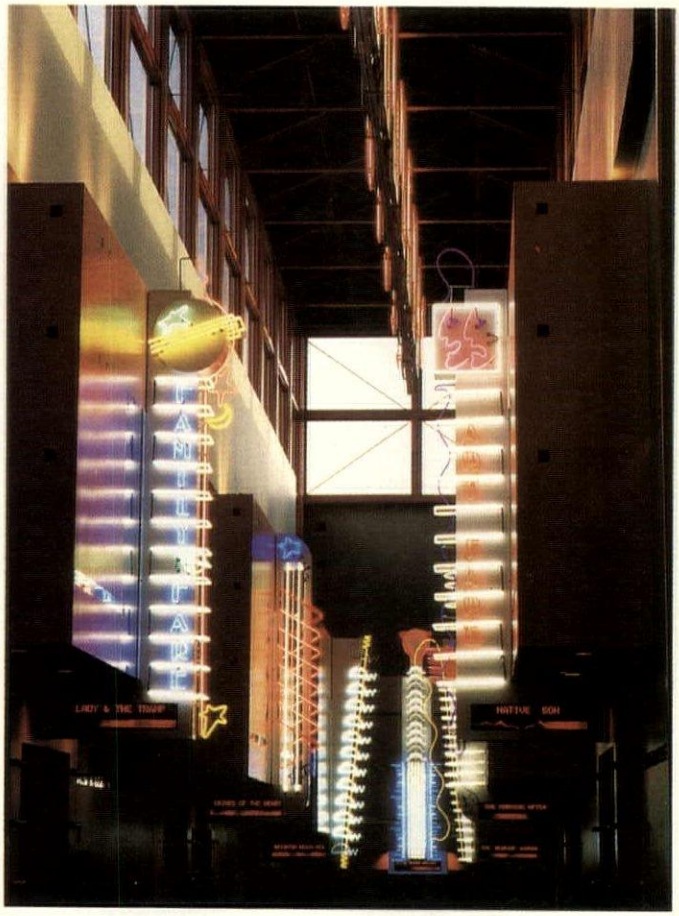

*Roofs of the entry lobby, rotunda, and street of theaters soar above the lower roofs of 10 cinema houses.*

**Project:** Lloyd Cinemas
**Location:** Portland, Oregon
**Client:** Luxury Theaters
**Architect:** Robert E. Oringdulph, FAIA, and Richard K. Spies, AIA, of BOOR/A
**Landscape Architect:** McArthur Gardner Partnership
**Electrical Engineer and Lighting Designer:** Interface Engineering, Inc.
**Interior Designer:** Chris Johnson, BOOR/A
**Neon Graphic Artists:** Robert Bailey, Inc.
**Photos:** Strode Eckert Photographic

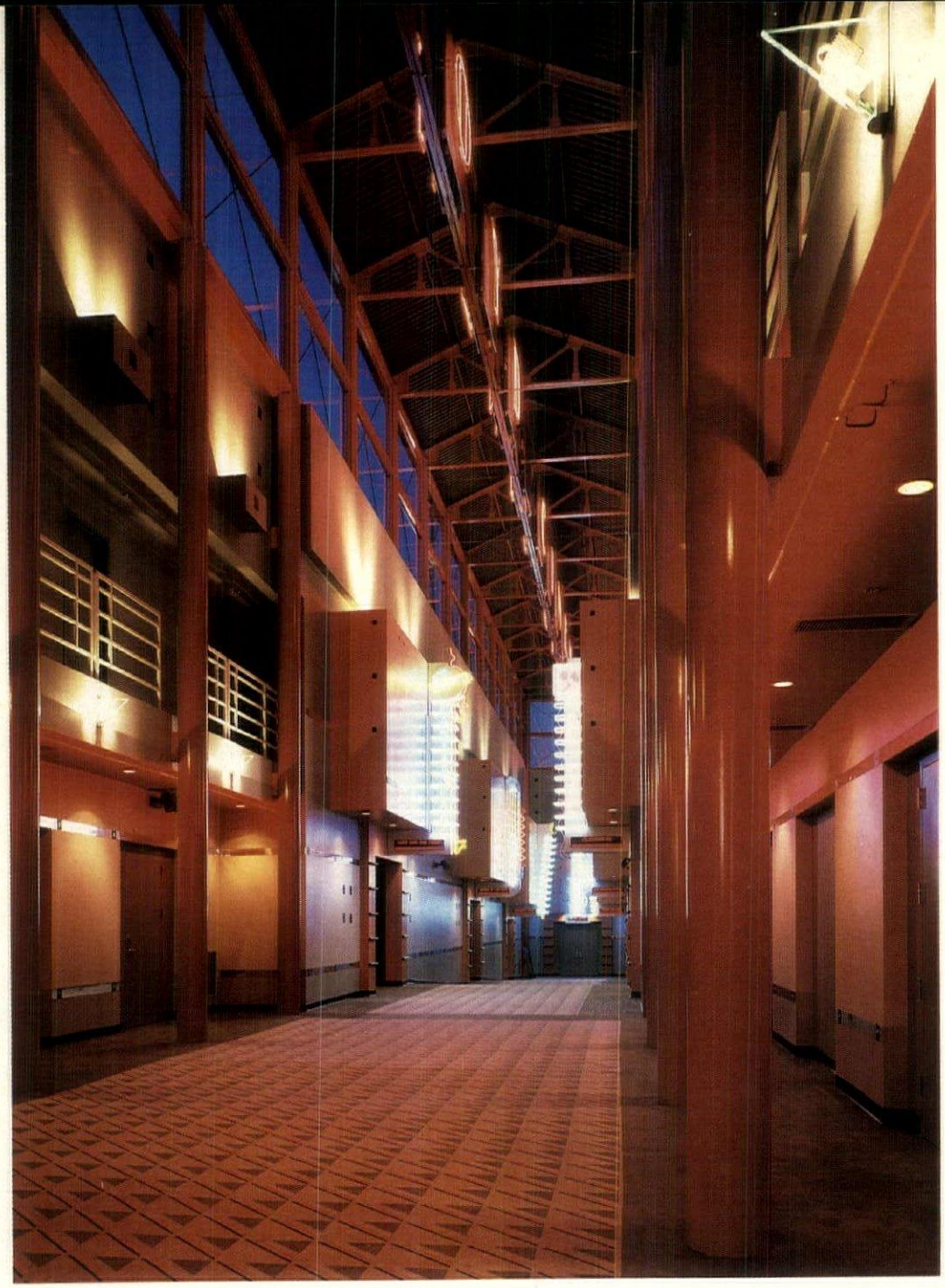
*Patrons pass through the rotunda on their way to the movies.*



*Neon spire attracts upward looks to rotunda ceiling, lit by a single uplight.*



*Elaborate, fanciful neon marquees give each cinema house a unique personality.*



*Sconces, marquees, uplights, and downlights illuminate street of theaters.*

the problems faced by the motion picture industry. The industry has responded to the challenge: the 1980s have brought a rebirth of great movies and a renewal of public interest.

## A Grand New Complex

Lloyd Cinemas is a star of this new generation. Tom Moyer, a Pacific Northwest cinema mogul, challenged BOOR/A Architects to recreate the grand old theaters with a new image. The result is a cinema complex with 10 houses ranging in size from 250 to 800 seats, for a total capacity of 3000.

The entry lobby and street of theaters form the facility's spine. A red steel column framework — reinforced with diagonal rod bracing and almost totally glazed — soars above the lower cinema roofs. The glazing is of low-emissivity thermal glass that gains its solar reflective quality from a thin, transparent Mylar film stretched between the two glass panes. The film eliminates mirroring without reducing solar heat rending abilities and allows a shading coefficient of 0.30, a daylight transmittance of 31 percent, and a thermal rating of 3.2. Interior neon signage is visible to the outside through the high monitors of transparent glass, which also provide a sense of openness even when several thousand people pack the lobbies.

BOOR/A Architects developed the lighting philosophy, establishing a sense of activity and fun. Robert Bailey, Inc., Portland graphic artists, then translated the philosophy into dynamic neon shapes. Neon outlines special areas such as the concessions and ticket booth, forms all interior signage, and adds illumination to that of the special entry lobby uplights. These ring-shaped suspended fixtures each have six 150-watt PAR floods aimed at the ceiling.

Neon signs and accents are predominantly red, rose, and deep blue, effective colors even when the spine is flooded with daylight. But although the cinemas are interesting during the day, they truly come alive with excitement at night, when animated neon in a potpourri of shapes and colors dances on reflective surfaces.

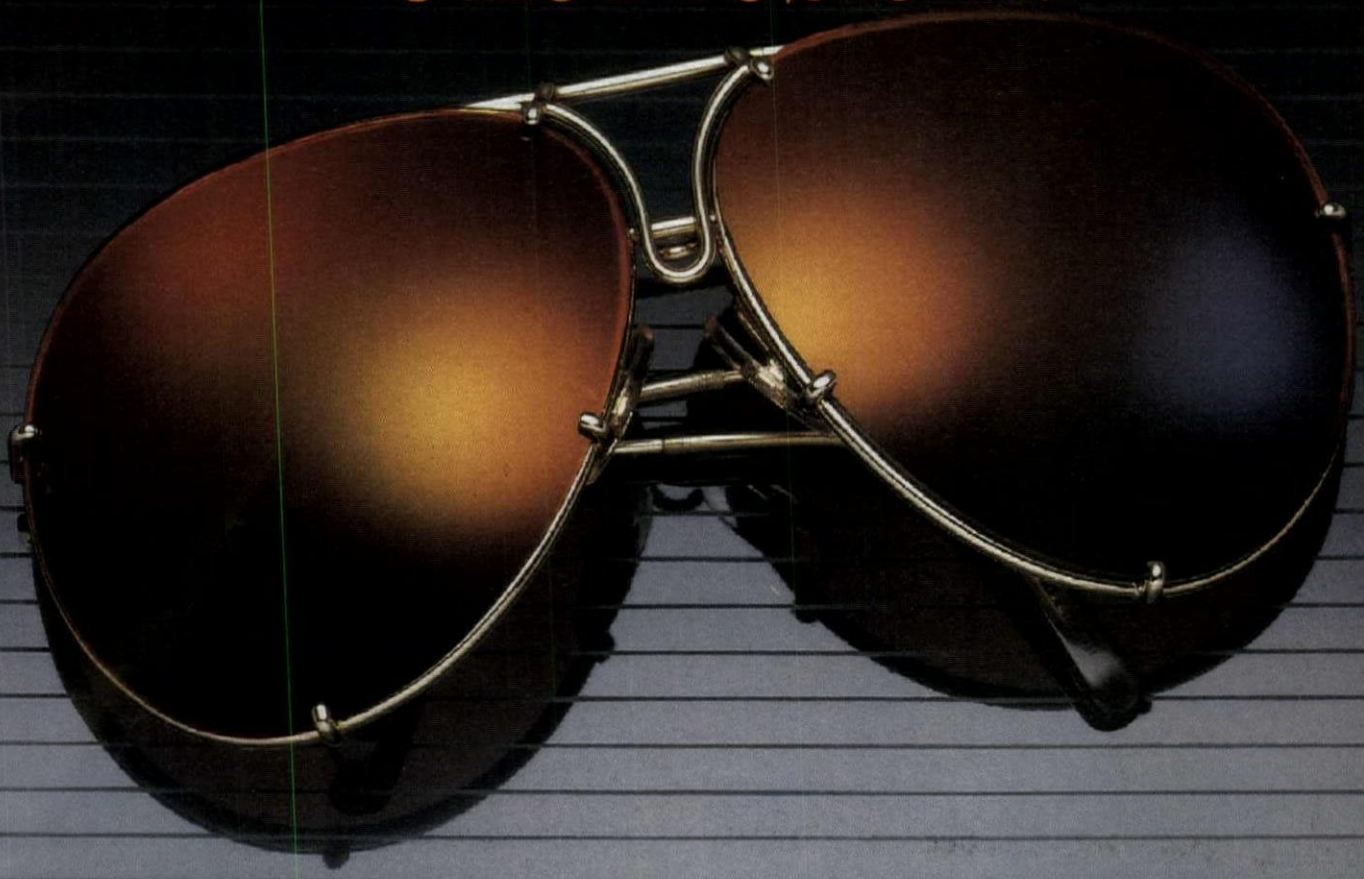
Sconces add sparkle to the lobby areas. The 150-watt halogen luminaires have crystal glass diffusers with chrome-finished perforated metal shields. Along the "street," marquees provide direct lighting, and pairs of 200-watt PAR floods illuminate the walls and ceilings to supply indirect light. The PAR lamps are mounted in wall-washing uplights and concealed within projections that emphasize the individual cinemas.

Theater room lighting has three components: entry, aisle, and maintenance. Entry lighting uses stacked wall sconces (a series of three mounted one above another), and aisle lighting is accomplished with floor-mounted low-voltage strip lights. The strips, which line the aisles and exits, remain on during the showing of a movie.

Glass. Color. Playful neon forms. Against a background of simple block enclosures, these elements blend to give viewers a joyful experience they want to repeat again and again — patrons enjoyed movies and popcorn at the Lloyd Cinemas more than 2 million times in the cinema's first 12 months of operation. In Portland, going to the movies is once again in vogue. ■

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

# Since The Beginning Of Time, Direct Lighting Has Always Had One Problem:



On day one, there was the Sun. It was the dawn of direct lighting. It was the birth of glare, shadows and eyestrain.

As civilization built the great indoors, it created new ways to reproduce the original problem: direct lighting. Finally, after millenniums of migraines and squinting, man arrived at a brilliant interior solution.

At first, the move to indirect lighting was called a natural evolution. Today, it's known as on-going innovation, from SPI Lighting.

HID (high-intensity-discharge) indirect lighting from SPI provides a level of visibility, visual comfort, luminance and economy unmatched by any other type of lighting. And it can be designed to fit the world you're building around you; from large expansive environments to small, private offices.

If you're looking to move away from the dark ages of ordinary interior lighting systems, rest your eyes with HID indirect lighting from SPI. Call or write for a free catalog of SPI Lighting systems and products.

SPI Lighting Inc. 7601 Durand Avenue, P.O. Box 1205, Racine, WI 53405 (414) 554-5600.

**SPI** **Indirect Lighting Systems**

Patented reflector design and HID lamps, the secret behind SPI superiority.

Circle 20

# Powerful magnetic field a challenge to lighting MRI exam room

**Scott Muma**

*Scott Muma is a senior electrical designer with GE MedFacs, Waukesha, Wisconsin; he has lit many MRI examination rooms.*

*The powerful magnetic field produced by this new diagnostic device sets up a resonant frequency in AC incandescent lamps that interferes with imaging. Using DC instead prevents the wild oscillation of the lamp filaments.*

At the same time magnetic resonance imaging (MRI) offered physicians a new diagnostic tool, it presented lighting designers with a new challenge. The heart of the high-powered device that lets physicians "see" muscles, fat, and internal organs is a superconducting magnet (1.5 Tesla). MRI uses a magnetic field and a low-level, pulsed radio frequency (RF) signal to obtain images.

The magnetic field produced by the machine is so strong that it can magnetize a watch or erase all the data off the magnetic strip on the back of a credit card accidentally carried into the scan room. Ordinary lighting system components would either interfere with the imaging or be rapidly destroyed by the magnetic field.

The nature of the system dictates that no ballasted lighting be used in an MRI room. The RF noise of even the best fluorescent system interferes with MRI systems; so lighting for such an examination room must be incandescent.

Even incandescent lamps can interfere with images. In engineering prototype MRI rooms, AC lamp filaments developed a particular resonant frequency that interfered with imaging at a certain frequency. The only way to obtain images in the prototype rooms was to turn off the lights during imaging. That was not an acceptable solution for a claustrophobic high-tech environment, where patients are slid into a magnet bore that is almost 8 feet long.

Lamp life is another problem in the planning of lighting for an MRI environment. In the prototype room, even "rough service" incandescent lamps lasted only two or three weeks. Lamp life was shortened because the AC current constantly changed state on the filament, and the filament oscillated wildly in the high DC magnetic field.

The engineers reasoned that DC current on the filament could prevent the oscillation. They checked with the lamp design engineers, who reported that any incandescent lamp should have essentially the same characteristics on 120-volt DC as on 120-volt AC. Using DC current with minimal ripple, the engineers decided, should eliminate the resonant frequency interference problem.

## Product Development

The following design parameters were established for product development: 110- to 115-volt DC output, purposely under voltage to improve lamp life without undue sacrifice of lumen output; AC ripple on the output voltage to be no more than 10 percent; 3000-watt capacity for lighting a typical 24-foot by 30-foot by 11-foot high screen room. Dimming capability was requested to allow physicians to soften the lighting to help put their patients at ease.

The lighting level was established at an average of 30 footcandles of soft, comfortable, uniform lighting. Energy consumption for lighting and temperature control was to be kept at a level consistent with good design practices. The designers knew that, using only incandescent lamps, uniformity and glare could be problems — particularly annoying problems for patients flat on their backs when wheeled into the exam room.

Fortunately, however, the ceiling height required for an MRI examination room — 10 feet to 11 feet — makes it a natural for indirect lighting. The issue, then, was to get enough punch to push light across the ceiling and out into the room space.

The fixture selected is specifically designed for indirect quartz lighting and is designed to throw the light out across the ceiling with only a minimal hot spot near each fixture. The new T3 quartz lamp used is rated at 350 watts, yet it has 90 percent of the lumen output of a 500-watt quartz lamp. Therefore, it cuts energy use and heat gain by 30 percent. The high output source also minimizes the number of fixtures required, thereby keeping installation costs down.

Motorized dimming lowers the input voltage and enables physicians to position their patients, then dim the lights to a soft, relaxing level. Dimming not only increases patient comfort, it also increases lamp life.

This system has been installed in more than 30 MRI scan rooms, where the measured light levels range from 32 footcandles to 42 footcandles when using only six fixtures. The uniformity of the lighting is excellent, and the softness is pleasant. Best of all, using the DC source increases lamp life an estimated 20 to 25 times over that expected in this environment with an AC source. ■

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

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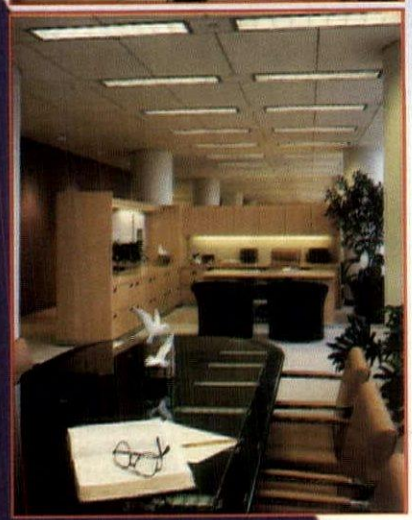

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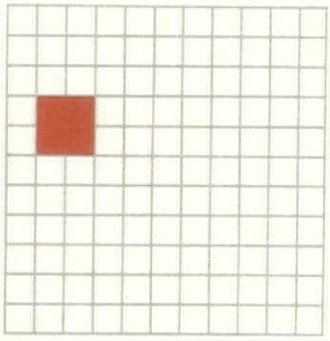
# Software Reviews



## A solid modeling program

**David Lord, PhD**

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

This month we review DynaPerspective, a solid modeling program that represents a powerful new breed of microcomputer programs that should appeal to all designers who visualize spatial relationships. DynaPerspective is a comprehensive perspective drawing program that allows rapid, high-resolution, full-color shaded solid modeling on the IBM PC family of computers. Users can manipulate colors and light sources to change the shading of the solid models.

For the past six months, at Cal Poly, San Luis Obispo, we have used DynaPerspective on an IBM PC/XT and on an IBM PS/2 model 50 with hard disk and Microsoft mouse. Design students have found that its intuitive command structure makes it relatively easy to learn DynaPerspective. We have also discovered that the sophisticated capabilities and depth of the program make it a valuable tool for design professionals as well as students.

Dynaware bills the program as "the most powerful, user-friendly, three-dimensional, solid modeling design and presentation software for personal computers." It takes only a few hours working with the program to verify that claim. Its price — less than $1000 — is a fraction of what such a program would have cost two years ago.

DynaPerspective is the Dynaware Corporation's first entry into the American market. In its own country, the Japanese software company markets popular packages for graphics, spreadsheet analysis, word processing, and music scoring.

DynaPerspective was originally written for the visually sophisticated Japanese design professional. It relies heavily on visual, icon-based prompting, pull-down menus, and dialogue boxes. Where necessary, one-word menu descriptions or abbreviations are used. These visual features make the program feel intuitive to most designers.

Installing the program on a hard disk and specifying computer peripheral devices proceeds quickly. Once installed, DynaPerspective's opening screen displays four drawing views: top, front, side, and perspective. Any one of the four views may be selected, using a border icon, to fill the screen. The perspective view is the one used primarily to view an object during construction and for the final presentation. Objects are viewed as wire-frame drawings until the solid modeling calculation is performed.

The main menu bar at the top of the screen has eight pull-downs: draw, attribute, select, edit, grid, area, screen, and utility. By selecting any one of these, the user has access to virtually all of DynaPerspective's 110 commands. The user guide is also organized around the eight basic menu areas, with thorough explanation of all the commands in a well-illustrated 316-page text.

Execution relies on natural, almost intuitive mouse-selected commands. Practically the only keyboard entries needed in a DynaPerspective session are occasional numerical parameter settings.

Drawing may take place in any of the four views by moving the cursor into that view and selecting it as the active view. Drawing coordinates are selected either by moving the cursor to the desired point, or by keying in the $x$, $y$, and $z$ coordinates in the parameter bar, located at the bottom of the screen. Each parameter window is activated either by mouse selection or by pressing a function key: F1 activates the $x$ axis, F2 activates the $y$ axis, and F3 activates the $z$ axis. If the coordinate entry must be calculated, a pull-down calculator is available as part of the Utility menu. Musical tones are generated as each numeric value is entered on the keyboard, resulting in a little tune for each sequence of numbers.

To draw an object requires selecting one of the 14 drawing primitives available in the Draw menu. These primitives range from Line, Cylinder, Wall, or Roof to Stairs. Most of the drawing primitives require that certain parameters be entered as part of the drawing sequence. To draw stairs, for instance, it is necessary to key in the number of steps and the height of each step. Then, in the top view (plan view), the area to be covered by the stairs is outlined with mouse and cursor. The resulting stairs are quickly generated in plan, front, and side elevations, and in perspective view.

DynaPerspective is deceptive at first; it reminds the user of some far shallower drawing programs that use pull-down menus. After a moderate amount of use, the depth and sophistication of the program become apparent. DynaPerspective can quickly deliver results because it uses random access memory (RAM) instead of the disk to perform its operations. The only drawback is that the size of files is limited by the capacity of RAM. To avoid problems, memory usage for larger drawings may be monitored on the Draw menu.

A good way to demonstrate DynaPerspective's capabilities is to load an example architectural perspective drawing file provided with the program. After the file is loaded, the building is drawn on the screen in all four views. As the building takes shape, each successive surface obscures the surfaces

**Featured program**

**DynaPerspective, version 1.1, $975**

Requires an IBM PC/XT/AT or compatible, minimum 640K memory; hard disk suggested. Comes on five 5¼-inch floppy disks (three program disks, two sample drawing disks).

Graphic Cards: IBM EGA 640×350, 16 colors Number Nine 2048×4.

Tablets and Mice: Summagraphics, Calcomp, Microsoft Mouse, Mouse Systems Mouse, Logitech Mouse.

Plotters: Hewlett-Packard, Houston Instruments, Calcomp, Roland, IO Line.

Printers: Epson, NEC, C. Itoh, Sharp.

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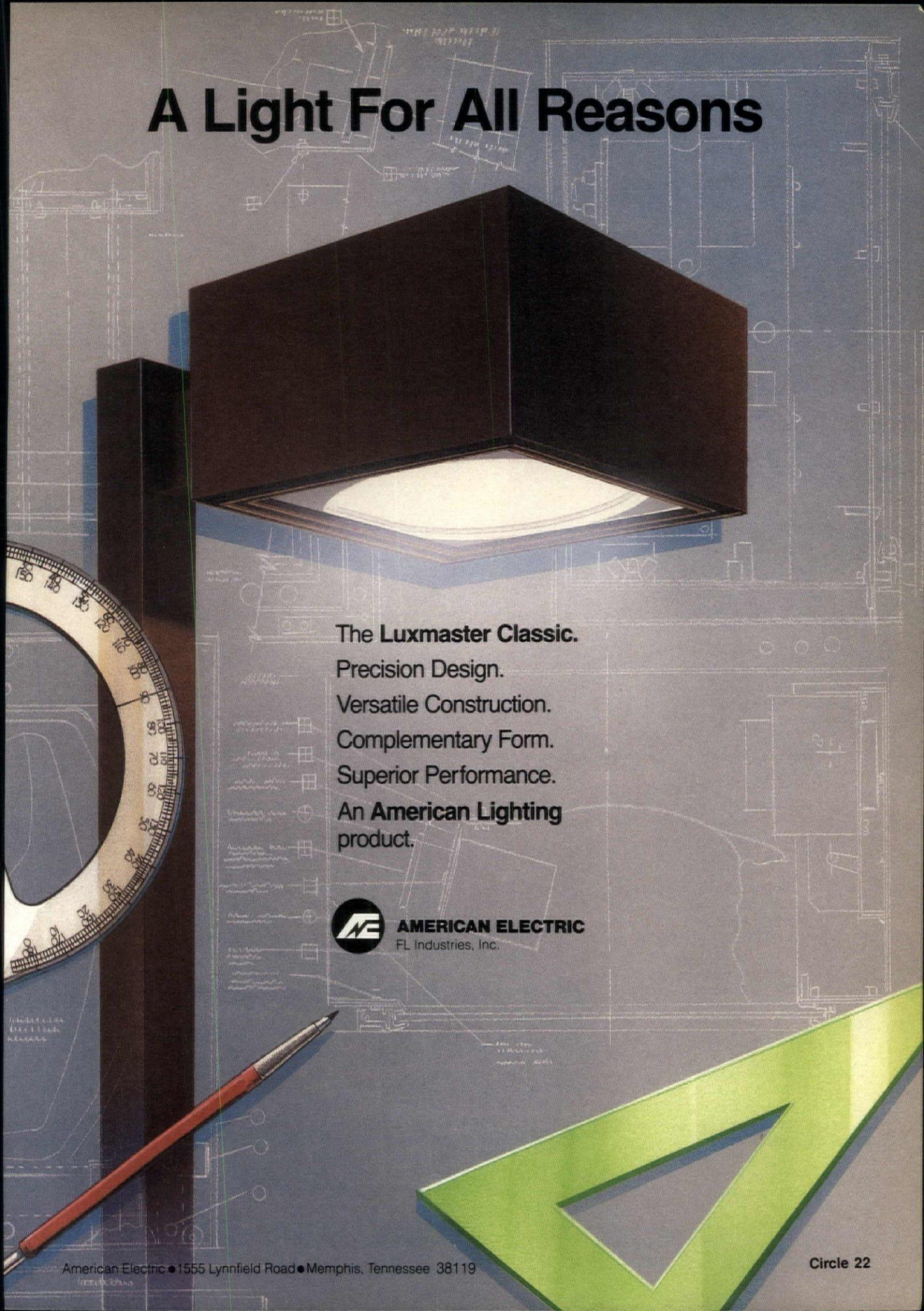
# A Light For All Reasons



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*A color printout of a DynaPerspective drawing from a Sharp JX 720 color printer.*

that lie behind it, behaving as a proper solid object. Each surface is shaded according to the position of the light source. Shading may be adjusted by selecting the Light command from the Screen menu. However, shadows, such as those cast by a solid object in bright sunlight, are not simulated.

The key to DynaPerspective's power and speed is the fact that the solid modeling system uses hidden surface algorithms instead of hidden line algorithms. At any point in the creation of a model, you can select the Screen menu and *compile* the hidden surfaces of your drawing. This generates a drawing data file of the model as a solid, which allows for efficient solid model redraw. This can be a somewhat lengthy process with complex drawings on slower computers.

Once the drawing surfaces are compiled, rapid multiple images of the model can be viewed from any angle, at almost any focal distance. Each surface in a model can be specified as wire-frame or solid, opaque or semitransparent, bordered or nonbordered. Compiling a small building required about six minutes on an IBM PC and two minutes on a PS/2 model 50.

For an on-screen simulated walk-through or fly-around sequence, a script can be created using the Utility menu. A series of views are chained together and redisplayed, without borders or menus, like a slide show presentation. Up to 100 views of a model can be chained together for any one show. Scripts can be saved for future presentations.

Colors of any element in the drawing can be quickly modified to the designer's satisfaction; the Ink utility menu makes it possible to continuously vary the hue, saturation, and value of the drawing on a sliding scale. This utility works smoothly and quickly and makes possible a huge number of color comparisons in very short order. Once the model is compiled, it is only possible to change large areas of color on the display.

Printing may be done in black on white or in color. Printouts up to four times the standard sheet size on a dot matrix printer allow users to paste together four sheets to create a larger image with better resolution. The resolution of the printout is linked to the resolution of the screen display. A range of standard plotters is supported, permitting larger size plots to be made, from A to E size.

## Compatible with Other CAD Programs

The Utility menu also permits DXF file transfers from DynaPerspective to other CAD programs. We have imported DynaPerspective DXF files of simple drawings into AutoCAD Release 9 with little trouble. Correct scaling of the drawing requires a little fiddling, and, occasionally, some lines are missing in the AutoCAD drawing. Some drawing elements, such as hatching, colors, and line characteristics are changed in predictable ways, which are outlined in the DynaPerspective user guide. AutoCAD deals with much more data than DynaPerspective, so there is no limitation in drawing complexity when exporting to AutoCAD from DynaPerspective.

Version 1.1 of DynaPerspective has a separate DXF file conversion utility, DXFTOPRS, which allows reversal of the above sequence. In converting DXF drawings from AutoCAD to DynaPerspective, neither fonts nor shapes are recognized. We imported a simple AutoCAD drawing to DynaPerspective and encountered no significant difficulties.

Currently, DynaPerspective supports neither text nor dimensioning. Therefore, conversion of the drawing file would be necessary if you need these features.

AutoCAD Release 9 with AutoShade gives results similar to those achieved by DynaPerspective, but learning to use the full-featured programs takes much longer, and the cost of the software is about three times as much. DynaPerspective is a single, integrated program, whereas AutoShade is a postprocessor, which requires an image drawn in AutoCAD.

A small architectural firm might want to have the capabilities of both AutoCAD and DynaPerspective. Although AutoCAD is better suited as a production aid, DynaPerspective is an ideal visualization and presentation package. Its strength is in the conceptual phase of design: it helps to breathe life into designs by rapidly displaying them in three dimensions.

A version for the Macintosh II is planned for release in the near future. Because DynaPerspective's menu system is already similar to the traditional Macintosh interface, it should feel at home in the Macintosh world. Regardless of the computer on which it is used, DynaPerspective is defining new standards in current CAD software.■

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

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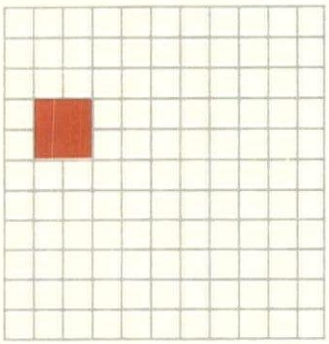
# The Lighting Design Professional



## Should lighting designers be licensed?

**James R. Benya, PE, IALD**

*James R. Benya is senior principal and CEO of Luminae Souter, 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 ASID, IBD, and AHLI. The opinions expressed in this column are his own and do not necessarily reflect those of* Architectural Lighting*'s publisher or editors.*

Rapidly growing acceptance of professional lighting designers throughout the world has, for the first time, raised the question of licensing. Many lighting experts believe their work and knowledge is worthy of special recognition. They look at their years of training, experience, and expertise and wonder why they aren't licensed as other professionals are.

The design of electric lighting and daylighting for buildings in the United States, admittedly, is undertaken by persons with a wide range of job descriptions. Many are already licensed professionals; among them are architects, engineers, contractors, electricians, and landscape architects.

Lighting design for buildings is also undertaken by quite a few nonlicensed professionals and artisans. In addition to lighting designers and lighting consultants, these include fine artists, media consultants, theater lighting designers, and dozens more, not to mention building owners and tenants. Interior architects, interior designers, and interior decorators also design lighting. A few states license these professionals; licensing laws are pending in others.

A great deal of building lighting is designed by sales representatives for lighting manufacturers, distributors, wholesalers, and retailers. More lighting is designed by salespeople for utilities, stores, showrooms, and suppliers of every description. Finally, there's the "in-house lighting consultant/designer/expert" found at many manufacturers and distributors of lighting and related products.

### Is Lighting a Commodity?

The apparently minimal qualifications needed to design lighting, illustrated by this virtually unlimited list of practitioners, suggest that lighting should be considered a commodity. If it were, there would be virtually no need for concern about the title or certification of a "lighting designer." Lighting *design* would remain an art, something to be done by anyone with a knack for it.

But commodities are scrutinized when changes in society, often propagated by technological advances, make common things complex. Automobile mechanics are an interesting example. Because of the increased technical complexity of automobiles, certification and licensing are now required for mechanics to protect consumers and the environment from incompetent work. The assumption is that the consumer can no longer judge the competence of the service rendered. At least in California, the complications arising from auto emissions controls have necessitated state intervention through licensing.

Lighting is going through this type of rapid technological advance. The field has completely changed in the past 10 years. In commercial lighting, superior color, better glare control, and a 100 percent increase in the efficiency of sources and luminaires have become available since 1975. Meanwhile, low-voltage halogen lighting and a renaissance in fixture design have multiplied the opportunities in residential lighting. A lighting education five years or more old, unless bolstered by continuing education, is obsolete.

### Certification versus Licensing

It is important to distinguish four major concepts involved in the identification and regulation of a profession.

The *certification* process does not involve government. An independent peer organization — through examination, apprenticeship, education, or other means — certifies that an individual meets established and impartial criteria.

In *licensing,* state government regulates certain services and practices by requiring practitioners to possess a license granted by the state. Licensure is based on requirements similar to those for certification. In the construction industry, many licensees are allowed to practice in related fields; architects may, for example, practice electrical engineering.

A state may grant *title protection* to licensed practitioners as a means of informing consumers that an individual practitioner is indeed licensed in a specific field. Under such protection, civil engineers may not call themselves electrical engineers, for example, but may practice electrical engineering in the course of their work if they consider themselves competent.

Under *practice protection,* however, a state may restrict actual practice to certain specifically licensed individuals. In some states with earthquake concerns, for example, only structural engineers are permitted to practice structural engineering; in others, it

### Certifiable design skills

If lighting design is to be more than a commodity, it must be associated with benefits that require competence beyond a consumer's ability to ascertain. Some things that exceed the skill of average individuals:

☐ Ability to predict and provide appropriate and necessary quantities and qualities of light, with full consideration of the eye's level of adaptation, the user's age, and the type and importance of the visual task.
☐ Ability to provide the appropriate lighting spectrum.
☐ Ability to use state-of-the-art equipment wisely and effectively.
☐ Ability to minimize energy consumption.
☐ Knowledge and application of the principles of photobiology, photodegradation, and a range of similar technical issues.

Unfortunately, aesthetic design skills will be difficult if not impossible to test objectively as part of the certification process. No one may be more qualified than a consumer to say a design looks good.☐

is legal for architects, engineers, and contractors to provide structural engineering.

## An Act to Follow

Interior designers have set an important licensing precedent — particularly the designers represented by the American Society of Interior Designers (ASID) and the Institute of Business Designers (IBD). Over the past decade, ASID and IBD have certified Professional Members through an independent examination conducted by the National Council for Interior Design Qualification (NCIDQ). Recent versions of the examination have been very tough, intensely testing knowledge of codes, building materials and systems, and related technical topics.

Now, with their track record of independent, impartial, and thorough examination, ASID and IBD are seeking licensing and title protection. Some states have already passed this legislation, but it is still an uphill battle. Opponents contend that consumers can easily detect bad interior design, and they ask how it would benefit the public to license a class of practitioners that isn't causing any trouble. Interior designers, however, argue that their service is both an art and a science — unique, specialized, and sophisticated.

The road to licensing interior designers has been blocked by an array of practitioners in related areas who, through title protection, would lose the freedom to expand their own businesses. Architects are notable in this group: AIA has been one of the greatest opponents of ASID and IBD licensing programs.

The experience of the interior design profession is frightfully close to that which lighting designers might expect. The disparate backgrounds, lack of common professional affiliation, perception of the service as a commodity, and large volume of design provided as a sales incentive are common to both groups. Both lighting design and interior design have the same fundamental shortcoming: a historical lack of accredited, generally accepted curricula of higher education.

## Lighting Design Education

The relative infancy of lighting design has made its education difficult. All professors and lecturers teaching lighting are really pioneers, bringing with them the strengths and limits of their own academic and professional backgrounds. Several noteworthy programs exist, but only one — Parsons — grants a degree in lighting design. The rest include it in some more encompassing degree, such as architecture, engineering, or theater.

This means that we cannot define what exactly constitutes lighting design knowledge or skill. The extreme diversity of opinion and curriculum suggests that agreement upon a common core will be hard to achieve. The teaching of technical knowledge, involving lumens, footcandles, and so on, is common to all programs. Programs disagree, however, on how to apply this knowledge to the creative process of design.

For years, the Illuminating Engineering Society (IES) of North America has struggled with this issue, both to stimulate academic consensus and to define education at the professional, continuing education level. IES has done an excellent job of being a center for technical knowledge collection and dissemination. But IES has consistently been unable to involve designers, artisans, and related professionals who design lighting on an aesthetic or intuitive level. A constant tension of "designer versus engineer" has prevailed. Today, IES better understands this problem and appears to be working toward developing and supporting a common, useful lighting design curriculum.

One major stumbling block is the fact that IES is a small society, constantly in need of new members and new sources of income in order to provide its services. Most of its work is done by volunteers. It is critical that the work of the IES be supported through membership and participation; the society's relative independence and openness are the keys to establishing an educational base for lighting.

By charter, IES cannot pursue professional issues, such as licensing. If it did, it would no longer be a technical society accredited to write ANSI standards. To fill the gap, the International Association of Lighting Designers, a relatively new organization, serves the lighting design community. IALD appears to be to lighting designers what ASID has been to interior designers.

IALD uniquely understands the professional practice issues of lighting design. It currently certifies lighting designers by portfolio review. Its heavy emphasis on aesthetics and function contrast with the technical emphasis of IES. To become a Corporate Member of IALD, one must pass the scrutiny of a membership committee.

The polarity of IES and IALD has terrific side benefits. Lighting World, for example, is the result of their collaboration. They form other joint committees and provide common support for certain of each other's causes.

## Certify First

Certification is the natural first step in the process of gaining professional recognition for lighting design as more than a commodity. If knowledgeable clients can at least demand professional membership in a certifying group similar to ASID, then a standard exists against which to measure progress and to judge qualification criteria.

The work being done by IES and IALD committees in this area is very timely. Of course, agreeing upon testing topics, skills, and the like will be a problem. The secret of success, as NCIDQ has demonstrated, is to establish an independent third-party testing and certification authority whose test results will be accepted by both organizations. The testing standards defined by the third party will establish the required knowledge and skills, in turn helping to define academic curricula and, ultimately, accreditation of schools and colleges.

IALD has established professional ethics that prevent members from holding any vested interest in the products they specify. The public deserves to know that an IALD member is honestly independent, earning fees by the hour. IES could easily accommodate its members who work for manufacturers, distributors, agencies, and so forth by establishing a premier membership grade for independent certified professionals.

The American Home Lighting Institute (AHLI) provides a thorough and competent program of training and certification for lighting salespersons. Unfortunately, it has chosen to award its participants the title Certified Lighting Consultant based on attendance of technical and sales seminars. Hopefully, AHLI will change this title, and perhaps participate in the lighting designer certification process.

## Pitfalls of Licensing

The need to avoid licensing — at least for now — is as obvious as the need for a good certification program. Too many engineers, architects, in-

terior designers, and other licensable professionals could rightfully argue that lighting design is part of their current practice, and that their personal skill and knowledge level is competent.

The battle over title and practice protection can be brutally emotional. Architects and the AIA have fought progress toward licensing interior designers all along the way. Some states have accepted the interior designers' contention that they are professionals and deserve title protection through licensing; others, like Iowa, have gone the other direction, and now make the practice of interior design dangerously close to practicing architecture without a license.

Opposing positions parallel to those in the interior design debate could emerge if lighting designers campaign for licensing. From an architect's perspective, one must note that, traditionally, lighting has been designed by salespeople and "designers" as paraconsultants to architects. The architect accepted full responsibility for the aesthetic and functional outcome, compliance with codes, structural integrity, and other factors beyond just the lighting effects. Considering these issues, the public could rightfully expect lighting to be designed by such a professional. After all, to be licensed to practice lighting design fully with respect to structure, codes, and so forth is to *be* an architect or engineer.

But, to parallel the interior designers' position, lighting designers could reasonably maintain that they provide a uniquely specialized service that often does not require overall building expertise beyond that of the skilled trade workers performing the installation. *Professional* designers — willing to be tested by an independent party — ought to be accepted as knowing both their trade and their limits. In other words, the professional lighting designer ought to know when to call in an engineer, architect, or other skilled major professional.

Frankly, though, practice protection is the real issue. Everyone wants to protect a piece of the pie, financially and emotionally. If a strong push is made to license lighting designers, there will probably be an equally strong push back from those whose livelihoods and egos are threatened.

Of greatest concern is the jurisdiction and manner in which lighting could be licensed too hastily. It scares me to think that lighting would be considered "engineering." Many of the most talented lighting designers could not qualify for the Professional Engineer's examinations. For lighting to be more than a commodity, however, the qualification criteria must be partially technical. Look at the acceptance interior design has gained with its ever-more-technical NCIDQ examination. We must learn how to test for knowledge in the art and science of lighting.

In the meantime, architects and interior designers are the primary individuals to involve a lighting designer or consultant. It will be necessary for these design professionals to accept and employ lighting designers instead of using other means to design lighting. If architects and interior designers demand and respect certification, the future of the profession is in good hands.

For their part, lighting designers and consultants must be willing to submit to the certification process rather than avoiding it and putting it down. It is the only way to make the system really professional.■

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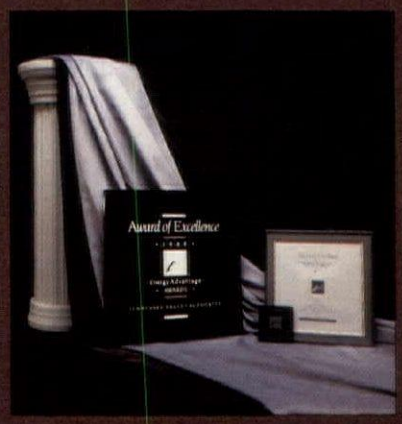


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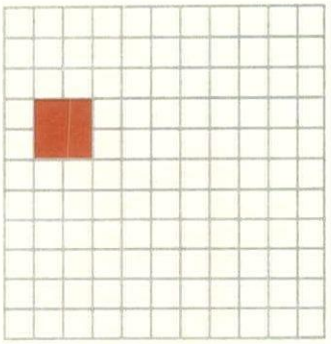
# Lighting Graphics



## Custom-designed fluorescent ceiling fixture

**Sam Mills, AIA, IES**

*Sam Mills is an architect and lighting consultant with his own firm in Oklahoma City.*

The use of luminous ceilings in kitchens has been popular in recent years for both custom-designed and speculative homes in spite of the high energy use and brightness characteristics associated with this type of installation. A less expensive and more efficient alternative to the luminous ceiling is a large-area custom-designed ceiling fixture that furnishes excellent illumination with reduced glare and heat.

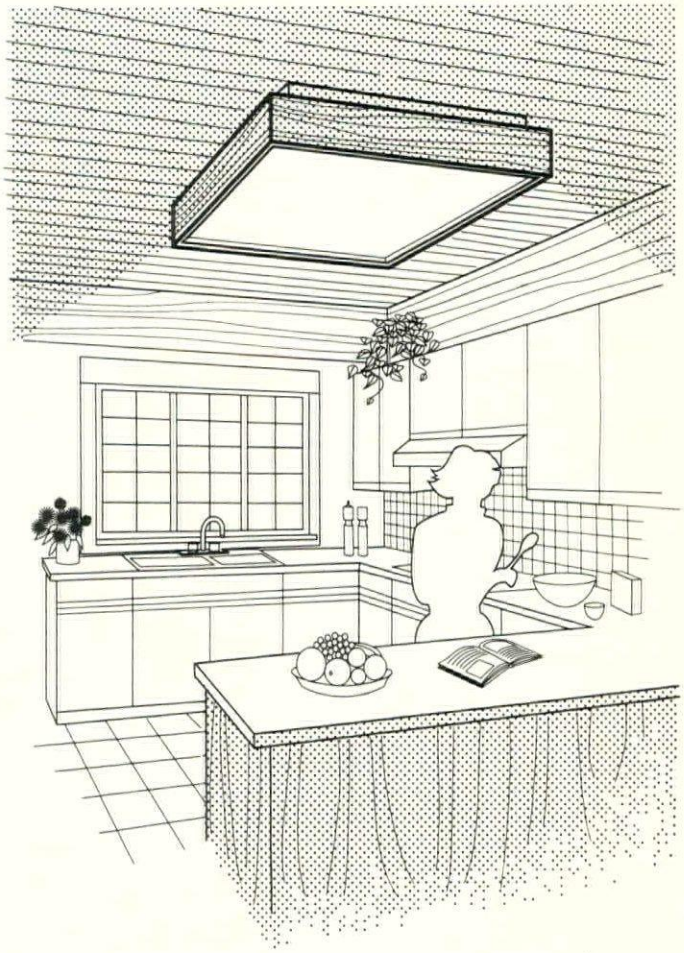
The fixture shown in the illustration is coordinated with the interior design of the room through the use of similar materials and finishes. It uses 3-foot or 4-foot rapid-start fluorescent lamps. Such lamps work well with fixtures ranging in size from a 2-foot by 3-foot rectangle to a 4-foot square.

The exact size is often determined by the dimensions of the diffusing materials used. Diffusing materials are available in nominal sizes of 2 feet by 4 feet and 2 feet square. Actual dimensions are about 1½ inches smaller than the nominal measurements. So, when using 4-foot lamps, it is necessary to use two pieces of diffuser material because the wood supporting frame is longer than the 46½-inch diffuser length.

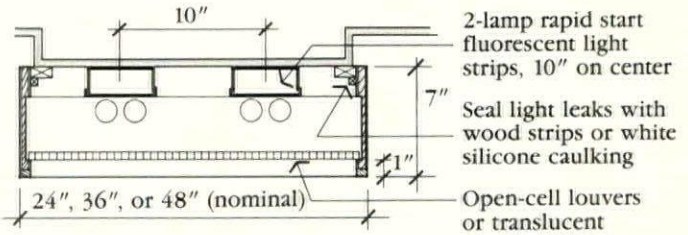
T-bars can be used for support at the joints. With some of the open-cell louver materials, it's possible to make special overlapping invisible joints. The small-cell white plastic louver offers this type of joint and provides good diffusion and lamp shielding along with minimum dirt and bug collection.

Warm-color fluorescent lamps are generally preferable for residential use because the color of their light is very similar to that of incandescent lamps. You'll find, however, that warm-color lamps usually are not available at local discount and hardware outlets. You may have to try a specialized lamp or lighting store where the lamps are known by various generic and trade names. Some examples are deluxe warm white, incandescent fluorescent, soft white, and 3000K; 3000K refers to the color temperature that applies to most warm fluorescent lamps and is close to the incandescent lamp color of 2800K.

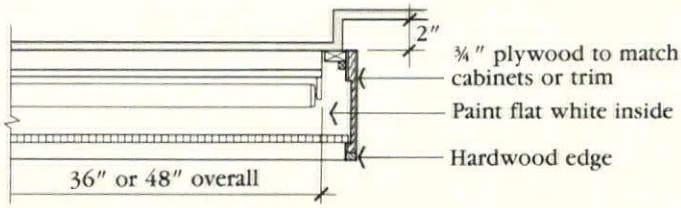
Ceiling fixtures — and to some degree, luminous ceilings — for the most part furnish illumination from a location behind the person standing at a work surface. So it is generally desirable to add task lighting, such as under-cabinet lighting, over the work surfaces. Future columns will discuss under-cabinet task lighting and wood-trimmed downlights and special perimeter lighting designed to complement the large-area ceiling fixture. ■



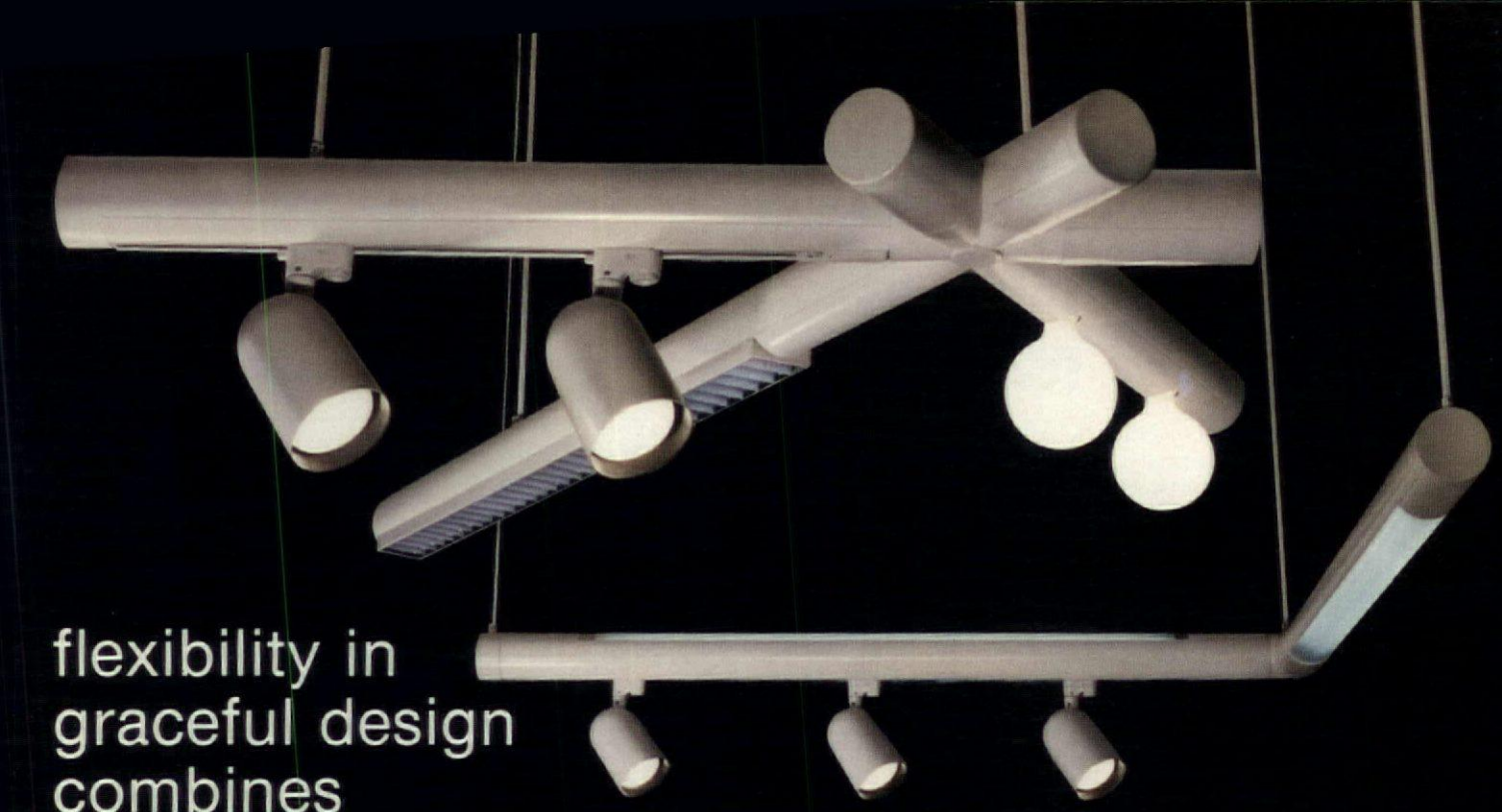
*Large-area ceiling fixtures can be custom designed to be coordinated with kitchen cabinets and interior trim while furnishing comfortable and efficient general lighting.*




**Section perpendicular to lamps**




**Section parallel to lamps**



# flexibility in graceful design combines incandescent-fluorescent low voltage-track lighting


*Card Party Store—Boston, MA*
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*Lighting Consultants: Illuminating Concepts.*

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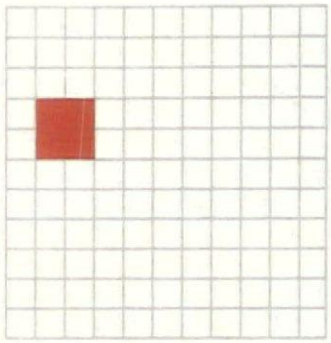
Circle 26

# Daylighting Techniques

The first Daylighting Techniques column (February 1988) presented an overview of the ways light is transmitted and reflected and provided general information about the characteristics of transparent and translucent materials. The importance of identifying the components of the daylighting systems now available and of learning how to match a system's function with a user's actual requirements is illustrated in the applications described in this and upcoming columns.



## Translucent and transparent daylighting systems

**Mojtaba Navvab**

*Mojtaba Navvab is an assistant professor of architecture in the College of Architecture and Urban Planning at the University of Michigan, Ann Arbor.*

**Natural light transmission and shading coefficients for panels of selected nominal U values**

| Face sheet colors | | % light transmission | | | Shading coefficient | | |
|---|---|---|---|---|---|---|---|
| | | U factor | | | U factor | | |
| Exterior | Interior | 0.40 | 0.24 | 0.15 | 0.40 | 0.24 | 0.15 |
| Clear | Clear | 64 | 32 | 10 | 0.93 | 0.36 | 0.11 |
| Clear | White | 42 | 22 | 9 | 0.64 | 0.27 | 0.08 |
| White | Clear | 41 | 21 | 8 | 0.62 | 0.24 | 0.06 |
| White | White | 30 | 18 | 6 | 0.40 | 0.18 | 0.06 |
| Bronze | Clear | 22 | 10 | 4 | 0.56 | 0.32 | 0.09 |
| Bronze | White | 12 | 9 | 2 | 0.45 | 0.22 | 0.07 |

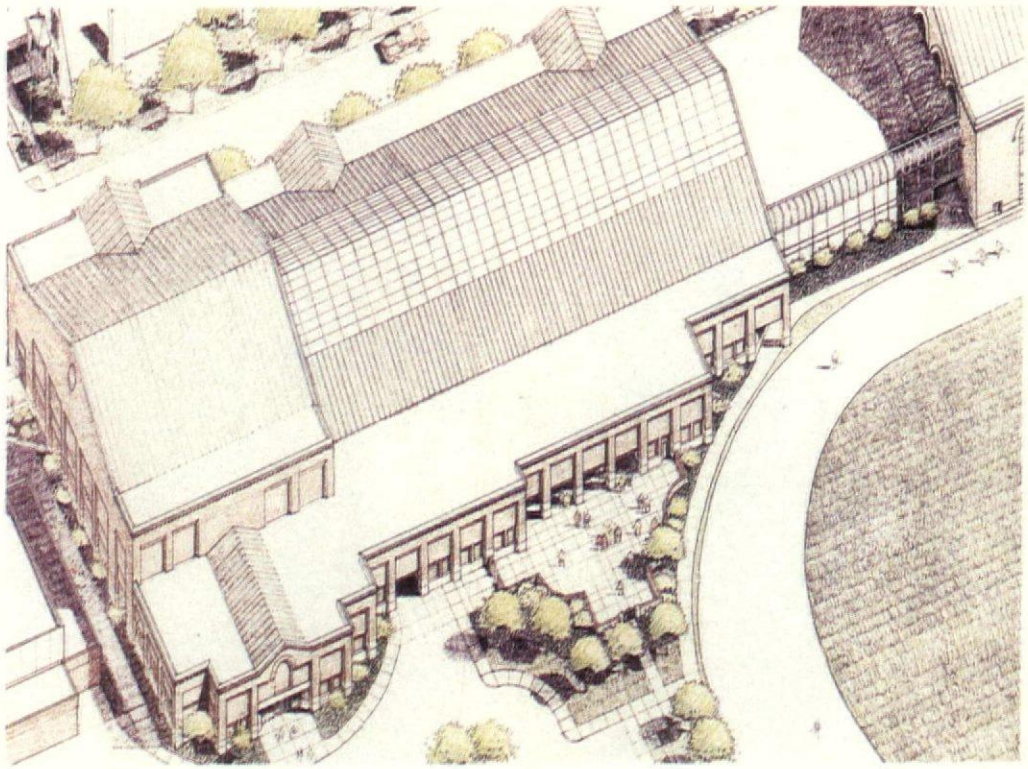
### A Translucent Daylighting System

Translucent fiber glass panels are designed for use in windows and skylights as part of a daylighting system for a wide variety of industrial and commercial applications. These panels provide the benefits of daylight while preventing the harsh, uncomfortable glare of direct sunlight. These benefits are achieved without the use of blinds or shades. The glass fibers within the panels scatter light throughout the space, creating very few shadows and a soft, comfortable light with which to work.

*Translucent panels provide the benefits of daylight while preventing the harsh glare of direct sunlight.*

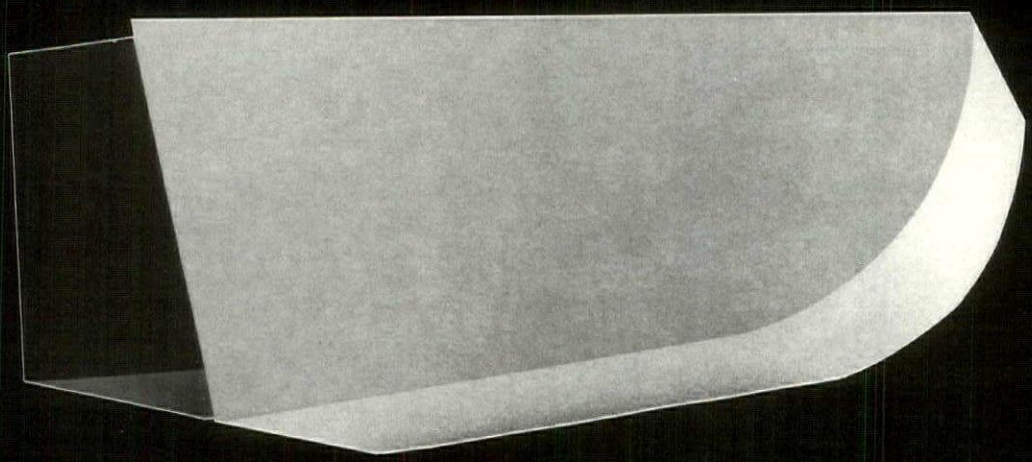
The panes have an aluminum grid core made of interlocking extrusions; bonded onto the grid are skins of fiber glass–reinforced polyester (FRP) sheet or another facing. The glass fibers in the panel skin scatter the light and eliminate hot spots from direct sunlight. The air space between panels provides good insulation; the air space could be filled with other insulating materials, but adding insulation decreases transmittance.

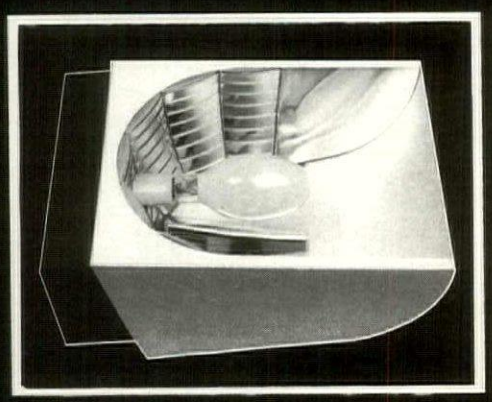
This translucent daylighting system was used as a skylight system for the University of Michigan swimming and diving facility designed by Hobbs and Black Associates. Climate in the area was an important issue in the selection of the daylighting system for this indoor swimming facility. Competitions are held during various seasons, so one of the design criteria was making this large swimming facility comfortable during all seasons. The system

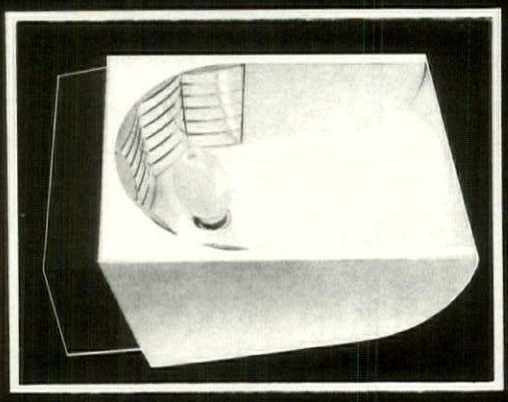


*Overhead view of the University of Michigan swimming and diving facility shows placement of translucent skylight panels.*

# TEMPO/KPT







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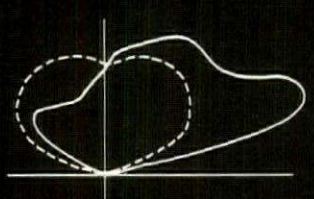
## A Whole New Indirect Asymmetric Lighting System.

The genius of the Forum Tempo I KPT lighting system is in its second generation reflector. . . the first, computer designed reflector created specifically to maximize the output of an H.I.D. source by distributing the light into predetermined zones. With the addition of a sloped convex reflector located on the bottom of the fixture body Forum Tempo I KPT provides a wide spread lateral lighting distribution in conjunction with an asymmetric forward throw "batwing" that is synonymous with the name TEMPO.

When wall-mounting of an H.I.D. source is required the Forum Tempo I KPT will provide for:

- wider spacings of fixtures
- uniform illumination on surrounding surfaces
- high level of uniform, ambient light on the work surface



—— Forward
– – – Lateral

## Full Range Of Lamps/Wattages

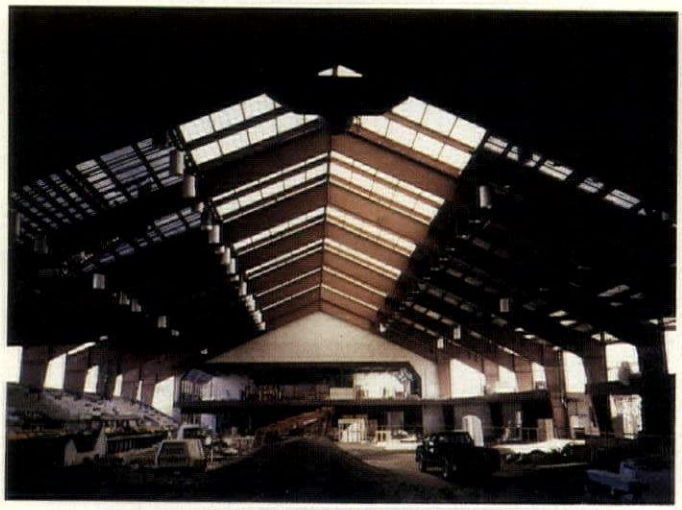
175W. METAL HALIDE
250W. METAL HALIDE
400W. METAL HALIDE

150W. H.P.S.
250W. H.P.S.
400W. H.P.S.

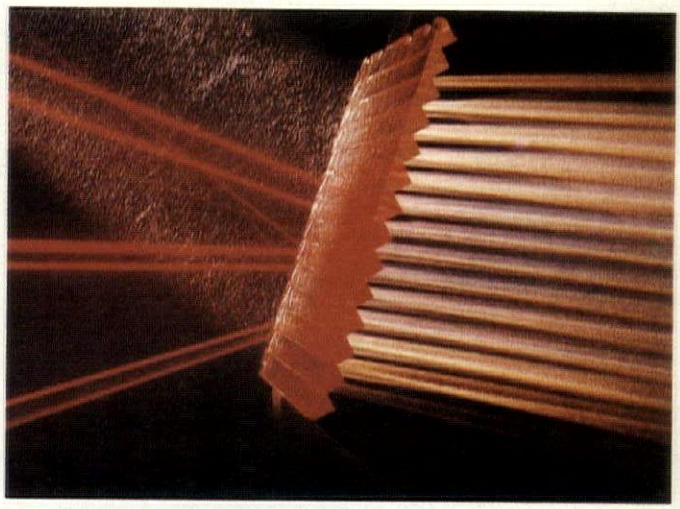
XXV
1963-1988

Circle 27

Patent NO. 4,293,900



*Translucent skylight panels prevent the harsh glare of direct sunlight without the use of blinds or shades. The glass fibers in the panels scatter light throughout the space and eliminate hot spots caused by direct sunlight.*



*This fixed-angle prismatic panel has a specular surface on one side to ensure that all sunlight beam angles are within the panel's cutoff range. Movable prismatic panels or prismatic baffles are also available.*

selected provides enough light during the daytime for regular student use — classes and recreational swimming. During the winter, when an outdoor pool would be extremely uncomfortable, the skylights provide daylight and swimmers have a more comfortable environment.

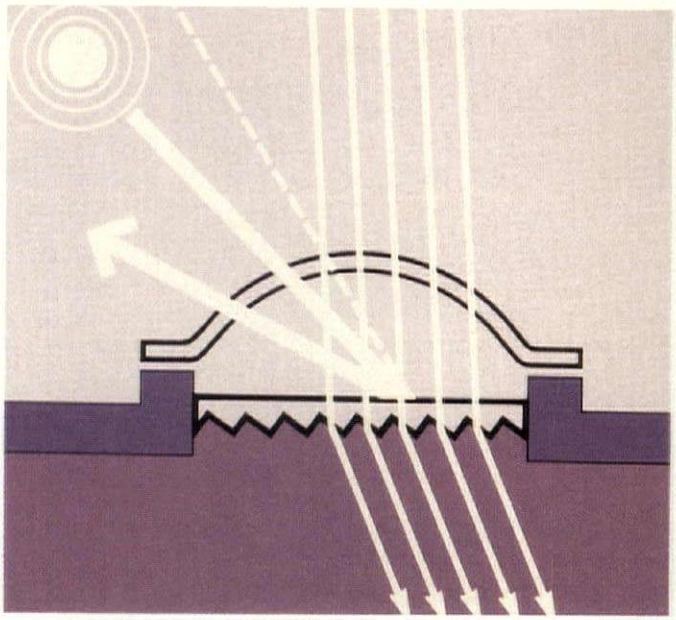
The facility houses a 50-meter competitive swimming pool and a diving pool. The daylighting system of the building that encloses the pool is a large clear-span space that peaks at 43 feet over the swimming area and at 67 feet over the diving area. The clear white panel, which has a 0.24 U factor and 0.27 shading coefficient, has a light transmission rating of 22 percent. It provides ambient light during the daylight hours. An accompanying table displays other choices of panels with their light transmission and shading coefficients.

The lighting requirements for the facility include an average illuminance level of 100 footcandles at the pool during swimming practice and 150 footcandles during competition, for television coverage. The diving pool requires a 175-footcandle illuminance level. To provide those levels, metal halide lamps, ranging from 500 to 1200 watts, are used. The energy savings realized by using daylighting in the space were calculated at 14 percent to 38 percent.

Although some daylighting systems create problems for television cameras, no problems should be encountered in this facility because of the system's uniform light distribution. Another potential problem of indoor swimming facilities — excessive condensation — was also avoided in this application, with a specially designed air circulation system.

## Transparent Panels

Transparent prismatic panels are designed with various prism angles and types of specular surfaces for a variety of sun screening and light guiding applications. Prismatic panels are used in protected spaces — for example, between the panes of an insulating glass window or skylight system. This construction was selected partly because of dust and

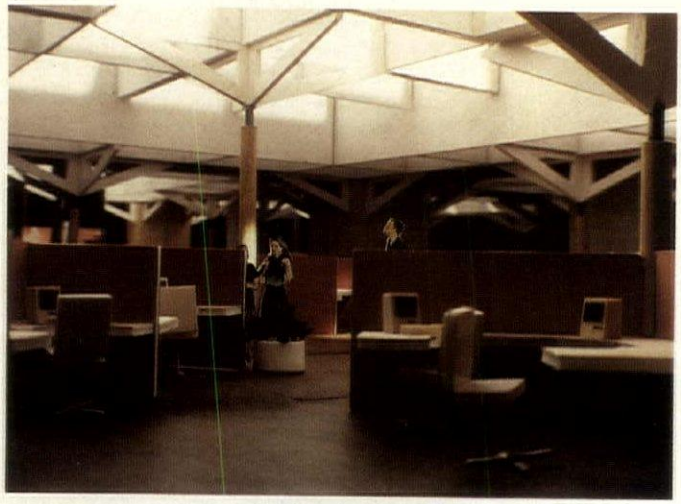


*A diagram of a prismatic panel similar to that specified for the University of Michigan computer center.*

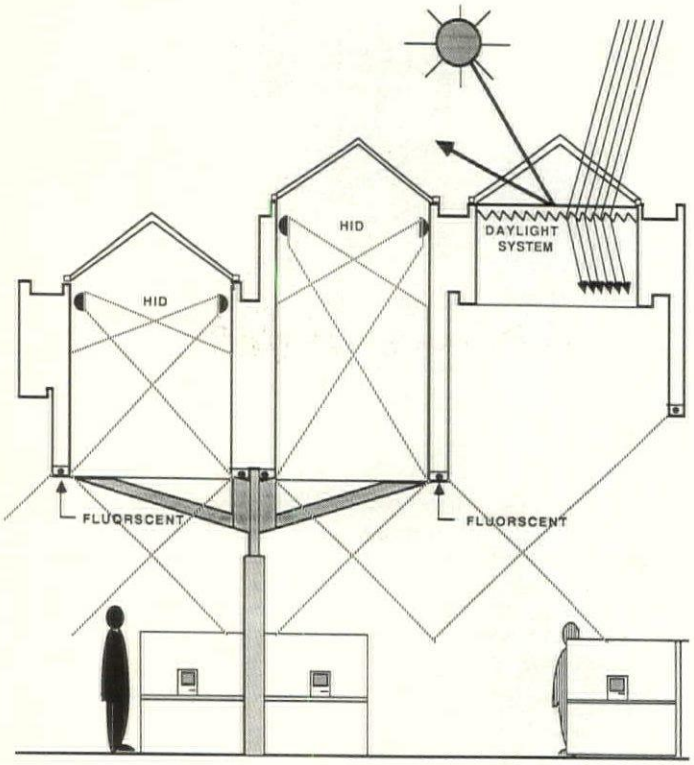
partly for structural strength.

A prismatic panel daylighting system transmits and reflects the light coming from certain angles to another direction. Its cutoff range prevents the transmission of direct sunlight into the interior, thus blocking direct sunlight from the space while transmitting indirect light. There are times when direct sunlight causes undesirable glare.

The optical refraction of the prism changes the direction and intensity of daylight. The



*To avoid reflections on monitor screens, computer stations are usually located in the middle of a building, or a basement. In this project, the daylighting system provides ambient light to computer center during the daytime.*




ANGELL HALL COMPUTING CENTER

*Section shows lighting system in computer facility. A combination of metal halide lamps recessed in the light well and fluorescent lamps along the bottom edge of the light well lights the space after dark.*

fixed-angle prismatic panel has a specular surface on one side to ensure that all possible sunlight beam angles are within the panel's cutoff range. The movable prismatic structures are motorized.

The cutoff angle is ±4.5 degrees in relation to the current angle of the sun's position. These systems are examples of spread or mixed transmitting daylighting systems. Whether to use this type of system depends on such factors as the task to be performed in the space and special lighting requirements — such as those for art museums or buildings with computer stations.

To avoid glare problems from windows reflected on monitor screens, computer stations are usually located in the middle or core of a building or on a lower level. These transparent prismatic panels offered one option for sun screening in the skylight system at the new University of Michigan computer center designed by Sim and Varner Associates. Other options were paracube lenses, movable horizontal baffles, and very low transmitting glass for the glazing system. This computer center houses over 250 stations. The space is 120 feet by 120 feet and is 34 feet high, covered by a grid of 7½-foot-square skylights on top of light wells that are 4 feet to 8 feet deep. The deep light wells with the prismatic panels prevent direct sun penetration into the space; the direct sun is reflected onto the walls of the light well.

This daylighting system provides ambient light inside the space during the daytime. The combined use of metal halide lamps recessed within the light well's walls and fluorescent lamps along the bottom edge of the light well provides night light requirements.

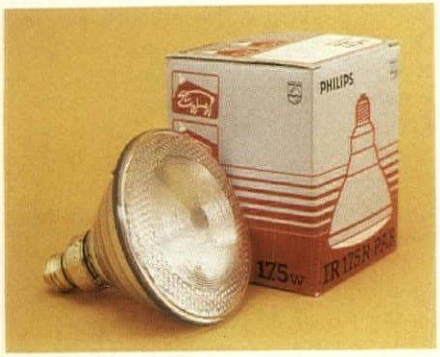
The design and execution of any daylight system may differ with different building types, sites, and orientations. The application of a daylight system has to be integrated within other building systems, such as lighting and HVAC, in order to benefit from the energy savings and visual comfort they provide.

## *A prismatic panel daylighting system transmits and reflects the light coming from certain angles to another direction.*

Many architects and daylighting and electric lighting designers seem to prefer integrating daylighting and electric lighting in their designs. It appears that this trend will continue in the future. The integration of daylighting and electrical lighting systems provides a more energy efficient, comfortable, and spectrally balanced luminous environment. ■

*The daylighting columnist would like to hear from readers about unique daylighting applications. Write to Mojtaba Navvab, MIES, College of Architecture, University of Michigan, Ann Arbor, MI 48109.*

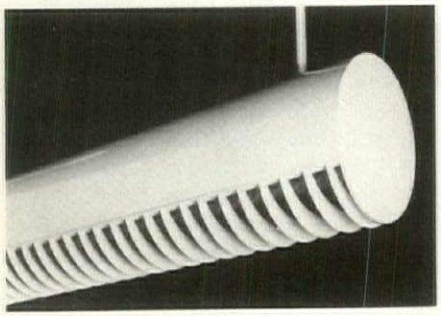
# Product Showcase




### ■ PAR heat lamp

North American Philips has introduced a 175-watt PAR 38 infrared heat lamp designed to replace a 250-watt R40 heat lamp. It offers a 30 percent reduction in energy consumption and a Pyrex bulb that resists thermal shock and makes the lamp safer to operate than standard soft-glass lamps, according to the manufacturer. The lamp warms to full temperature almost immediately, and a built-in reflector controls heat direction. North American Philips Lighting Corporation, Somerset, NJ.

**Circle 60**



### ■ Tube lighting system

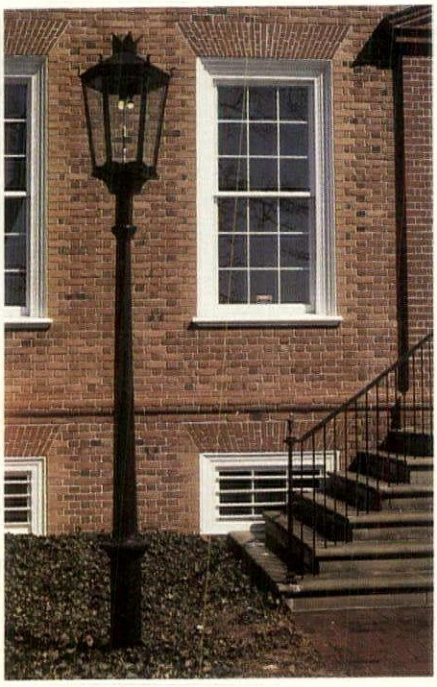
Neo-Ray features the Series 9 line of six 9-inch-diameter extruded aluminum tube lights for uplighting, downlighting, or a combination of both. Wall- and pendant-mounted versions are available in sections 3, 4, 6, and 8 feet long; they accommodate two or three T12 fluorescent lamps. They can be ordered in the standard white baked enamel finish or in custom colors. Accessories include a clear acrylic ribbed lens, a round lateral baffle, and connectors in cross, T, and 90-degree shapes. Neo-Ray Lighting, Brooklyn, NY.

**Circle 61**

### ■ Low-voltage transformer

Nightscaping's 12-volt power supply transformer reduces regular 120-volt house current to safe, economical, energy-efficient 12-volt current. The transformer comes in two models: the weather-resistant Raintite model with a 10-year warranty and the Non-Raintite model for surface mounting in dry locations with a one-year warranty. Nightscaping, division of Loran, Inc., Redlands, CA.

**Circle 62**



### ■ Gaslight

U.S. Gaslight offers lanterns and poles for Victorian-style gas-lighting in more than 25 traditional styles. The commercial installation shown is AGA-approved model 9000. Its features include a heavy sand-cast aluminum frame assembly, tempered glass panes, and a triple inverted burner with cast aluminum burner head; its machined aluminum burner base has an air shutter for the proper air-gas mixture. U.S. Gaslight, Norcross, GA.

**Circle 63**

### ■ Switch, sensor

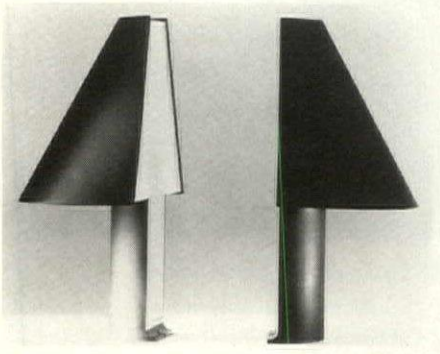
The Wall Switch II from Sensor Switch replaces the traditional toggle switch for lighting control. It automatically switches lights on and off in response to the presence or absence of a human being in the sensor's range. The second-generation occupancy sensor switch covers 800 square feet, 300 feet more than the earlier model. It has a load capacity as high as 1200 watts, depending on voltage, and an adjustable time delay that ranges from 30 seconds to 20 minutes. Its indicator light meets California's Title 24 requirements. Sensor Switch, Inc., Branford, CT.

**Circle 64**

## ■ MR16 track fixture

The Siena from Luma Lighting is the smallest 75-watt MR16 track fixture available, according to the manufacturer. Its ventilated construction keeps operating temperatures low by causing convection currents to flow over the lamp and release heat. The fixture's extruded aluminum body functions as a heat sink; its two-circuit track system allows for remote transformer placement. Luma Lighting Industries, Inc., Santa Ana, CA.

**Circle 65**



## ■ Table lamp

Koch + Lowy distributes the Edipo table lamp, designed by Marco Barbaglia and Marco Columbo for PAF, an Italian company. The 22-inch-high, 22-inch-wide lamp has a white opal diffuser and accommodates one 100-watt E27 incandescent lamp. Both the base and the shade are available in black and white. Koch + Lowy, Long Island City, NY.

**Circle 66**

### ■ Directional light

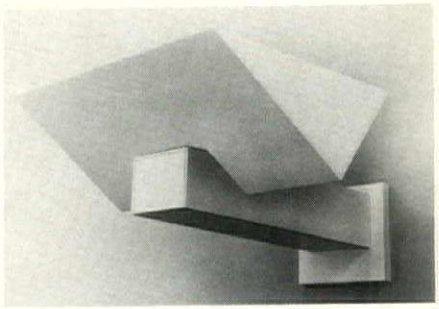
The 5200 Primo Hi Beam fixture from Norbert Belfer Lighting offers economical, stylized directional lighting. The 4½-inch-diameter, 4½-inch-high fixture comes with Osram's PAR 36 metal reflector halogen lamp. Single-, twin-, or multiple-fixture units are available; they can be mounted on a raceway or a canopy and come in standard and custom colors. A remote 12-volt transformer is required. Norbert Belfer Lighting, Ocean, NJ.

**Circle 67**

### ■ Halogen spot lamps

The new lens design of GE's 45- and 90-watt Performance Plus halogen PAR spotlights combines lenticular and stippled treatments to achieve a tight beam with little spill light. It provides the same useful light as conventional incandescent PAR lamps while saving 40 percent on energy costs. GE Lighting, Cleveland, OH.

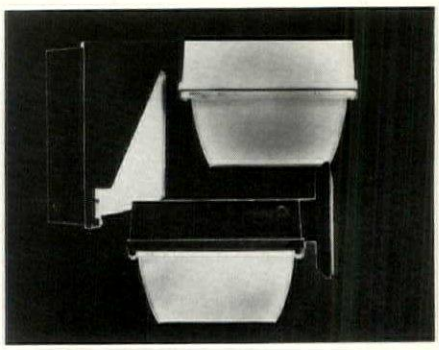
**Circle 68**



### ■ Wall sconce

Elliptipar's Ensconce self-contained, compact lighting modules are designed to be concealed in architectural features, in enclosures created by designers, or in decorative enclosures such as the one pictured here. The modules have an asymmetric reflector mounted to a ballast compartment by adjustable brackets. The reflector is designed to project indirect light evenly across surfaces from one edge. A variety of units accommodate halogen and metal halide sources. Elliptipar, Inc., West Haven, CT.

**Circle 69**



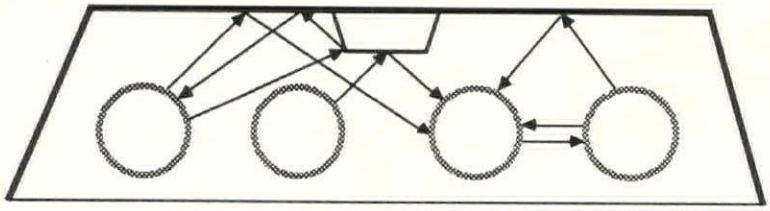
### ■ Industrial luminaire

Esco International features a luminaire specifically designed for heavy-duty commercial and industrial uses. The cast aluminum Surface Square meets the requirements for a wide range of industrial lighting applications. It is available in models for mercury vapor, metal halide, high pressure sodium, and fluorescent lamps. Esco International, Chicago, IL.

**Circle 70**

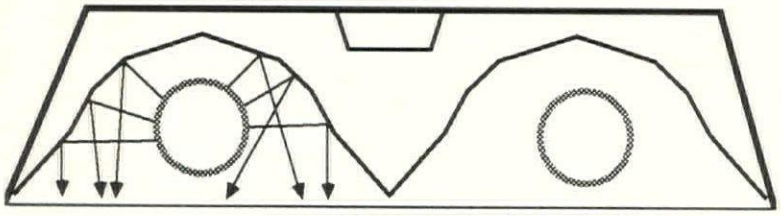
## The Problem

Conventional lighting systems are inefficient and costly—40 to 60 percent of the light from fluorescent lamps can be trapped inside your fixture.



## The Solution

An Optical Reflector System from Maximum Technology —to effectively reflect trapped light and redirect it to the work surface, eliminating costly excess lamps and ballasts.



## The Benefits

- 40 to 50 percent lower lighting energy costs
- Fewer lamps and ballasts to replace
- Optimum light levels
- Illumination uniformity
- Glare control
- Cooling system load reduction

## The Company

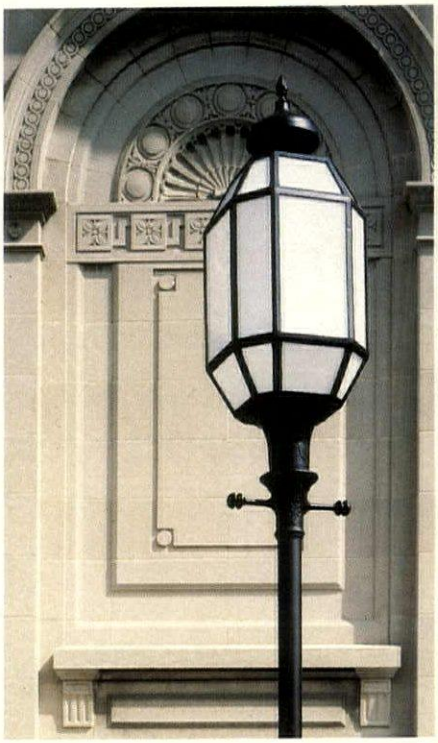
The oldest, largest, most experienced reflector manufacturer in the industry.

**MAXIMUM TECHNOLOGY**

**The Quality Reflector Company**

60 Industrial Way Brisbane, CA 94005 (415) 468-2560

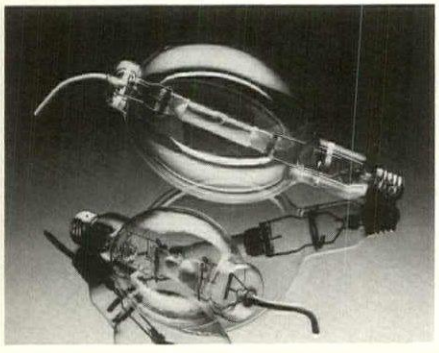
Circle 30



## ■ Commercial area lighting

The Bridgeport from Hanover Lantern is a large octagonal post-top luminaire made of cast aluminum with stainless steel external fasteners. Vandal-resistant prismatic panels of clear UV-stabilized polycarbonate can be removed easily for cleaning. Reflectors, refractors, and a photoelectric controller are available. The luminaire accommodates several HID sources; a model for incandescent sources is available. Hanover Lantern, Hanover, PA.

**Circle 72**



## ■ Instant restart lamps

Instant restart metal halide lamps from Venture Lighting International offer an advantage over standard metal halide lamps, which need 10 to 15 minutes to restart after power interruptions. With the use of a suitable fixture and power supply, the instant restart lamps can be instantly relighted, according to the manufacturer. Their light level after reignition depends upon the length of time they were turned off. Venture Lighting International, Cleveland, OH.

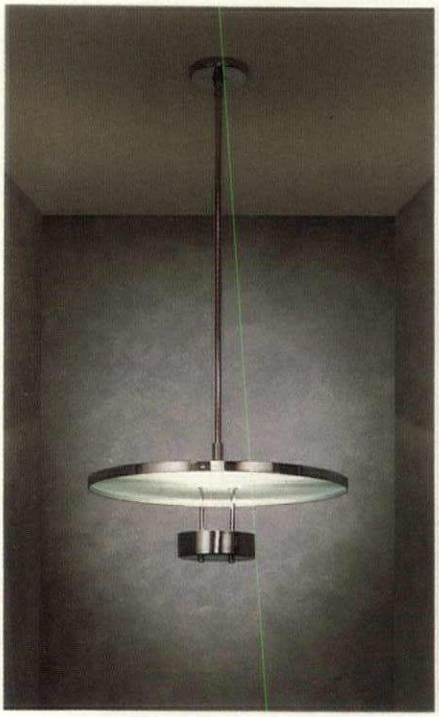
**Circle 71**

## ■ Walkway light

The S-144BG low-voltage walkway light from Sylvan Designs illuminates paths,

stairs, and other potential pedestrian hazards. It is constructed of clear kiln-dried redwood heartwood, which resists insects and decay, even in damp environments. Its clear, vertical grain provides strength and dimensional stability. A clear prismatic diffuser directs soft, glare-free light downward. The 4⅞-inch-square walkway light stands 18 inches above ground level and is installed by direct burial. Relamping involves removing the top and replacing the 12-volt, 18-watt bayonet-type lamp. Sylvan Designs, Inc., Northridge, CA.

**Circle 73**



## ■ Glass pendant

Jack G. Mitchell designed the Glass Spectro pendant luminaire from Boyd Lighting, which has a 24-inch-diameter light-diffusing reflector disk of ¼-inch-thick, sand-etched tempered glass and an overall height of 36 inches. The luminaire accommodates one minican-base halogen lamp of up to 250 watts and comes in polished brass and chrome finishes. Boyd Lighting, San Francisco, CA.

**Circle 74**

### ■ Halogen display light

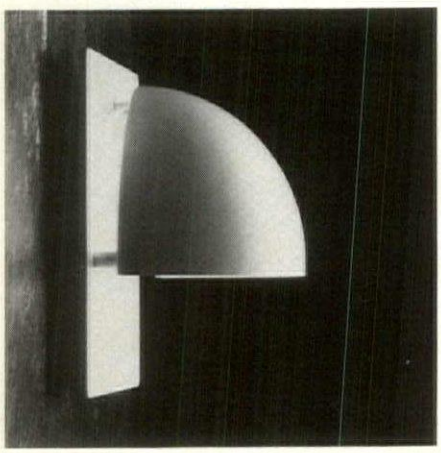
Amerlux offers the PM 300, a thin-profile display light designed to accommodate halogen lamps. The display light comes in two sizes. Amerlux, Fairfield, NJ.

**Circle 76**

### ■ Cast iron post

Spring City's cast iron lighting posts are manufactured to buyers' specifications to accommodate the customer's choice of luminaire. Light sources can be incandescent, mercury, metal halide, or high pressure sodium. Shown is the Princeton model with a Princeton ladder rest and a Nantucket model luminaire. An access door is located in the base of the post. The post comes in heights of 9, 10, and 11 feet and has a 10-inch base. Compatible luminaires are available. Spring City Electrical Mfg. Co., Spring City, PA.

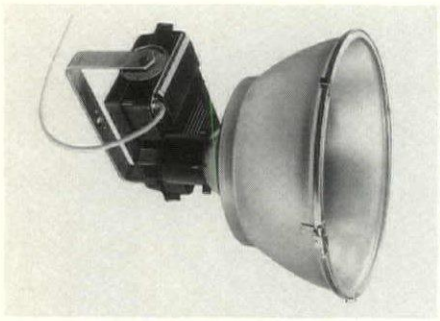
**Circle 77**



### ■ Wall luminaire

Poulsen Lighting offers the Homann wall-mounted luminaire, designed by Alfred Homann. The quarter sphere–shaped luminaire is formed from a die-cast silica aluminum alloy. It accommodates a candelabra-base incandescent lamp up to 40 watts and comes in two finishes. A name plate kit and a vandal-resistant clear polycarbonate shield are available. Poulsen Lighting Inc., Miami, FL.

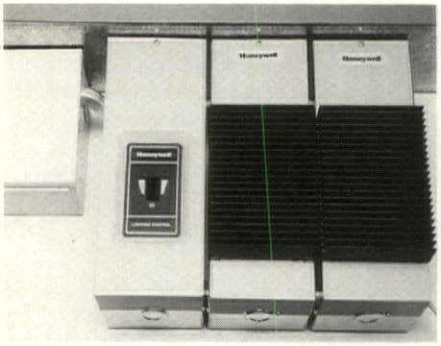
**Circle 75**



## ■ Sports floodlight

The Olympic floodlight, series 283, from American Electric is a high-intensity luminaire engineered for small- to medium-sized sports facilities. It features precision reflector contours for high illumination performance. The luminaire has an adjustable heavy-duty yoke and aiming scales with sights to aid in installation. It comes in models for several high pressure sodium and metal halide lamps, and in voltages from 120 to 480; a multivolt model is also available. American Electric, Memphis, TN.

**Circle 78**

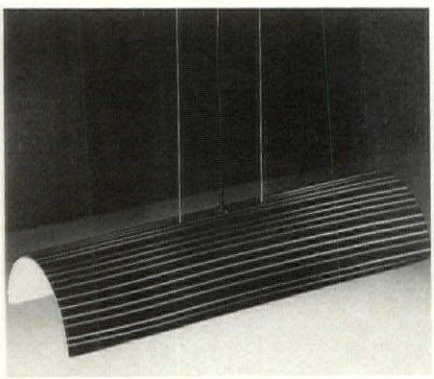


## ■ Fluorescent system control

Honeywell's lighting control system dims fluorescent lamps and saves up to 30 percent of annual lighting energy costs, according to the manufacturer. The system adjusts light levels in response to light sensors, manual controls, and/or building automation or energy management systems. It can be installed in an existing building without rewiring. An ambient light sensor is installed in the area to be controlled, and a remote control can be installed in areas where local control of light levels is desired. Honeywell, Minneapolis, MN.

**Circle 79**





## ■ Murano glass chandelier

Giusto Toso designed the Stola chandelier from DEC USA. It features a shade of black hand-blown Murano glass embedded with multicolored threads. All hardware has a matte black finish. The chandelier is 21 inches long and 1 inch high; it accommodates two 13-watt SL18 Edison-base fluorescent lamps. DEC USA, Ltd., Mount Vernon, NY.

**Circle 80**

■ **Industrial floodlight**

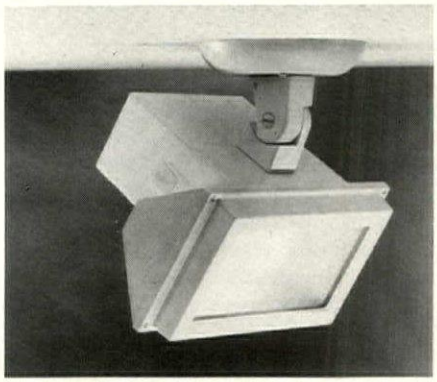
Holophane's Predator heavy-duty industrial floodlight provides a broad horizontal and narrow vertical beam with minimum glare. Its reflector design eliminates bright streaks to allow uniform surface brightness. Electrical components are mounted on the door, which has a quick disconnect feature that allows removal for testing, repairs, and replacement. With the yoke, the fixture can be rotated 360 degrees for bottom, back, or top mounting. Without the yoke, it can be mounted directly to a wall or column. It accommodates a variety of HID lamps. Holophane, Newark, OH.

**Circle 82**

■ **Brass chandelier**

Art Directions offers the Broadway, a 30½-inch-diameter cast brass chandelier that is part of the Original Cast series. The luminaire has a standard overall height of 42 inches; drops come in several lengths. It accommodates 15 25-watt S11 lamps. Art Directions, St. Louis, MO.

**Circle 81**



■ **Accent light**

Gim Metal Products offers the Model 3521 accent and merchandising light for 70-watt single- and double-ended metal

halide lamps. The surface-mounted fixture rotates 359 degrees and its vertical adjustment arc is 110 degrees. It equals the light output of two 150-watt incandescent fixtures, provides excellent color rendition, and can reduce lighting and related air conditioning costs by more than 50 percent, according to the manufacturer. The company sells the unassembled unit for OEM use and supplies all necessary hardware; ballasts and lamps must be purchased separately. Gim Metal Products, Carle Place, NY.

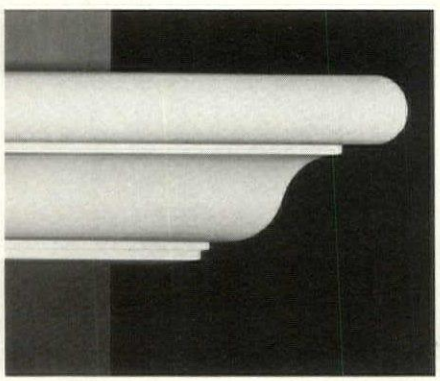
**Circle 83**

## ■ Pole, lowering system

Joslyn's Servisafe poles allow one person to maintain tennis court and athletic field lighting fixtures. A lowering system integrated into the poles automatically disconnects the fixture, lowers it to ground level for cleaning and relamping, raises it back to its original position and focus, and automatically reconnects it. The poles can accommodate from one to eight fixtures at heights up to 100 feet. Joslyn Corporation, Cleveland, OH.

**Circle 84**

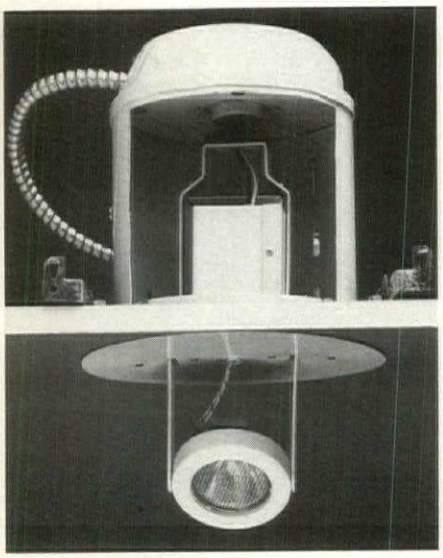




## ■ Cove lighting

Architectural Lighting Systems offers a cove lighting system designed by Robert Sonneman that serves as a wall-mounted indirect light source. The articulated linear fluorescent system is available in four decorative styles, including the Chippendale pictured here, to house single or double runs of F30 or F40 fluorescent lamps. It can be customized for specific jobs. Architectural Lighting Systems, Inc., Taunton, MA.

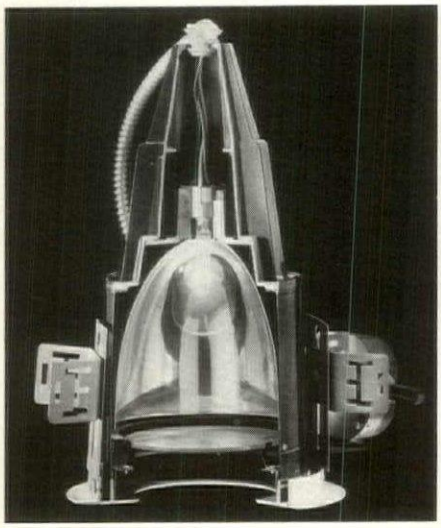
**Circle 85**



## ■ Halogen retrofit unit

The model 9550 50-watt halogen retrofit unit is part of Roxter's series of fixtures that let users convert from 110-volt to low-voltage systems without rewiring, according to the manufacturer. They are designed for installation in new or existing recessed ceiling units and come with a built-in transformer, a 360-degree ratchet socket, an adjustable flange cover, and a universal swivel for unlimited lighting positions. Roxter Mfg. Corp., Long Island City, NY.

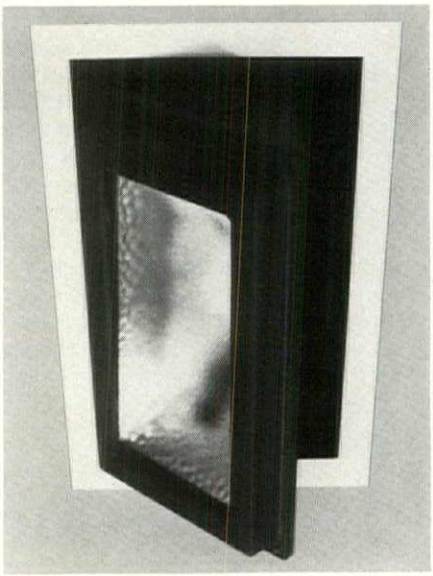
**Circle 86**



## ■ Halogen downlight

The Rambusch Downlite Series includes more than 20 different models, each with a uniform 5-inch-diameter aperture. The units are engineered for optimum footcandle performance with smooth light distribution. Shown is a tungsten halogen downlight, a high-efficiency incandescent color source. It accommodates halogen lamps, in narrow or wide beam spreads, and is available in models for a variety of low to high ceiling configurations. Models are also available for HID sources and for ceilings without recess space. The Rambusch Company, New York, NY.

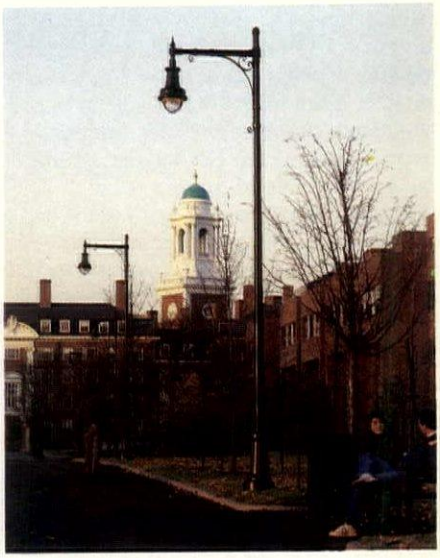
**Circle 87**



## ■ Metal halide fixture

The rectangular VersaFlood pull-down fixture from Miroflector's Miro-T line is designed for 70- and 150-watt Osram HQI metal halide lamps. It has a microgrooved, baffled, recessed housing to control glare and an optical system that provides even, striation-free illumination. As a downlight, the compact, adjustable fixture can be tilted vertically 90 degrees when fully extended and 15 degrees when fully recessed. As a wall washer, it provides a 120-degree horizontal and a 101-degree vertical beam spread. Miroflector Company, Inc., Inwood, NY.

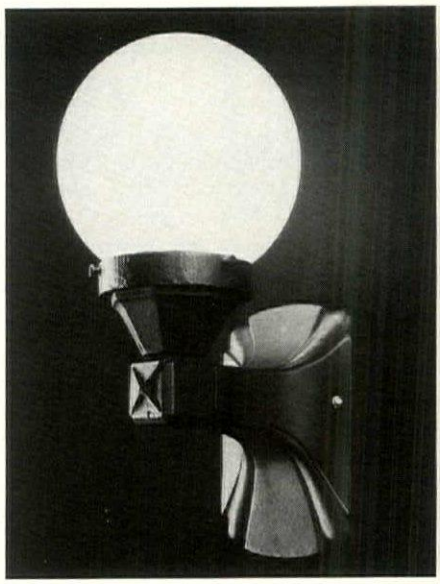
**Circle 88**



## ■ Traditional street light

Welsbach Lighting offers the Charles, a street-lighting fixture with turn-of-the-century detailing and a prismatic globe in symmetric and asymmetric light patterns. Welsbach Lighting Inc., RWL Corporation, New Haven, CT.

**Circle 89**

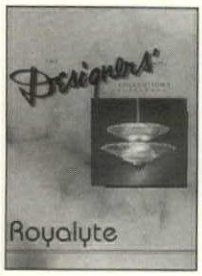


## ■ Porch sconce

Rejuvenation Lamp & Fixture's Craftsman-style Alsea outdoor sconce is made of cast iron with a black enamel finish and has a glass globe. Rejuvenation Lamp & Fixture Co., Portland, OR. ■

**Circle 90**

# Product Literature




### ■ Decorative luminaires

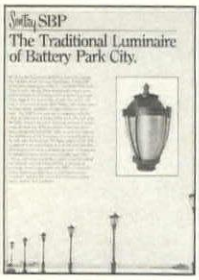
A color brochure from Royalyte illustrates the Aurora series of ribbed crystal luminaires and the Alabaster series of pendants and sconces of hand-carved natural alabaster. Royalyte, Highland Park, NJ.

**Circle 120**


### ■ Parabolic louvers

A pull-tab card illustrates how Paracube specular parabolic louvers eliminate glare on CRT screens. Louvers of injection-molded polystyrene or acrylic are available for new and retrofit applications. American Louver Company, Skokie, IL.

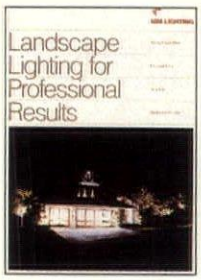
**Circle 121**




### ■ Traditional outdoor luminaire

Sentry Electric developed the SBP traditional-style luminaire for the Esplanade of Battery Park City in lower Manhattan. A data sheet describes the luminaire's features, specifications, lamps, and colors. Sentry Electric Corporation, Freeport, NY.

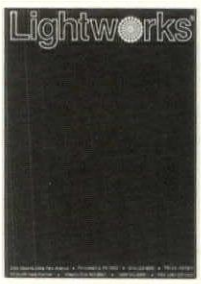
**Circle 122**




### ■ Landscape lighting guide

Kim Lighting offers a brochure on using accent lights for professional results in landscape lighting. The brochure provides complete fixture specifications and illustrates proper installation methods. Kim Lighting, City of Industry, CA.

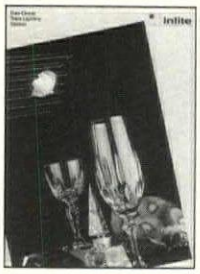
**Circle 123**




### ■ Lighting effects

A color brochure from Lightworks profiles the LP Litepanel series and six tube light systems, including aisle lights, light curtains and dividers, illuminated hand rails, and chandeliers. Lightworks, Philadelphia, PA.

**Circle 124**




### ■ Track lighting

A 12-page color brochure profiles Inlite's two-circuit track system for display and accent lighting. System components and a wide selection of low-voltage and line-voltage fixtures are shown. Inlite Corporation, Berkeley, CA.

**Circle 125**


### ■ Recessed fluorescent troffer

The LS recessed fluorescent fixture is designed for inverted T ceiling systems. A brochure describes the unit's simple, labor-saving installation. H.E. Williams, Inc., Carthage, MO.

**Circle 126**


### ■ Outdoor, industrial lighting

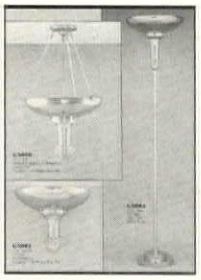
Ruud Lighting profiles its fixtures for outdoor area lighting and industrial applications in a 50-page color catalog that includes photometric data, specifications, and photos of applications. Ruud Lighting, Inc., Racine, WI.

**Circle 127**


### ■ Protected lighting

A 6-page brochure features Craft Lite enclosed and gasketed fluorescent fixtures for areas requiring protected lighting. Photos and descriptions of models for one to four lamps are included. Paramount Industries Incorporated, Croswell, MI.

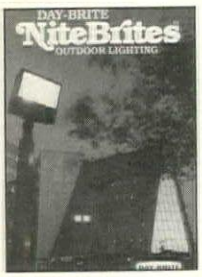
**Circle 128**



### ■ Deco-style fixtures

A color brochure from Gross Chandelier profiles its Deco collection of polished brass and chrome fixtures, including three wall sconces, two pendant lamps, and a floor lamp, many with clear polished acrylic accents. Gross Chandelier Company, St. Louis, MO.

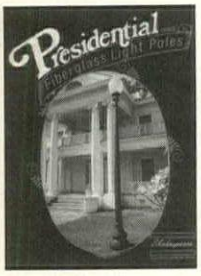
**Circle 129**




### ■ Outdoor area lighting

A 26-page illustrated color catalog from Day-Brite profiles NiteBrites high-performance outdoor luminaires for floodlighting, sports lighting, security lighting, and area lighting. Day-Brite Lighting Division, Emerson Electric Co., Tupelo, MS.

**Circle 130**




### ■ Fiber glass poles

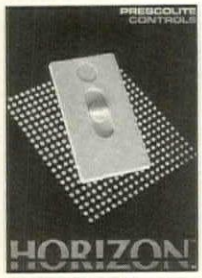
A brochure profiles Shakespeare's Presidential series fiber glass lamp posts. It lists specifications and illustrates several compatible styles of luminaires. Shakespeare, Newberry, SC.

**Circle 131**


### ■ Linear fluorescent system

A brochure shows many possible configurations for the Peerless 6-inch rectangular fluorescent system, available in depths of 4¾, 6, and 8 inches. Ideas for uplighting, downlighting, and combinations of both are included. Peerless Lighting Corporation, Berkeley, CA.

**Circle 132**




### ■ Slide dimmer, controller

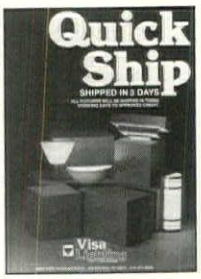
The Horizon specification-grade linear control slide dimmer comes in models for single-location dimming, multiple-location dimming, remote on-off switching, and a minisystem of dimmers and on-off remote switches. Prescolite Controls, Carrollton, TX.

**Circle 133**


### ■ Landscape lighting

Imperial Bronzelite features the LW series low-wattage landscape lighting in a descriptive, illustrated brochure that includes performance data, specifications, cutaway sketches, and photos of applications. Imperial Bronzelite, San Marcos, TX.

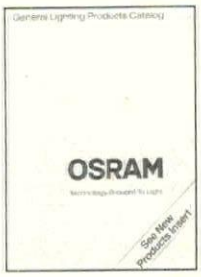
**Circle 134**




### ■ Quick shipping program

The 16 wall sconces in Visa Lighting's Quick Ship program can be shipped within three working days of an order being received. Included are sconces of glass, brass, chrome, aluminum, acrylic, and plastic. Visa Lighting Corporation, Milwaukee, WI.

**Circle 135**




### ■ Lighting products

A general lighting products catalog from Osram contains descriptions, drawings, and ordering information for linear incandescent lamps and holders, low- and line-voltage halogen lamps, fluorescent lamps, and HID lamps. Osram Corporation, Newburgh, NY.

**Circle 136**


### ■ Contract fixtures

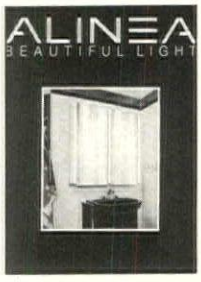
A color brochure from VeArt portrays a variety of chandeliers and other contract lighting fixtures, many with glass rods or tubes. It includes lamp requirements, dimensions, and cutaway sketches. VeArt International Inc., Pte. Claire, Quebec, Canada.

**Circle 137**


### ■ Area lighting

Lumark Lighting offers the White Lightnin' II, a compact stem- or trunnion-mount area lighting fixture designed for a 175-watt metal halide lamp. A brochure describes the fixture and illustrates features. Lumark Lighting, Vicksburg, MS.

**Circle 138**

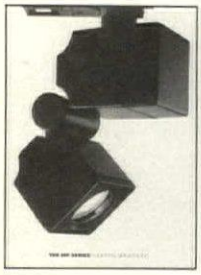



### ■ Linear incandescents

Aamsco offers the Art Deco–inspired Alinea linear incandescent lamp and fixture in three lengths. A brochure describes the system, details its specifications, and illustrates components and colors. Aamsco Manufacturing Inc., Jersey City, NJ.

**Circle 139**

# Calendar



### ■ Track, task lighting

A brochure from Lighting Services describes features and components of track-mounted and freestanding task lighting fixtures in the MR series. Colors, accessories, and lamp types are included. Lighting Services Inc., Stony Point, NY.

**Circle 140**

### ■ Decorative HID luminaire

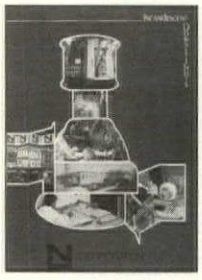
Hadco's Victorian-style New Oxford outdoor HID luminaire is made of corrosion-resistant aluminum with stainless steel fasteners. A data sheet contains specifications, photometric data, and a cutaway drawing. Hadco, Littlestown, PA.

**Circle 141**


### ■ Wall-mount fluorescents

Alkco's Wallscapes line of fluorescent wall-mounted downlights, sconces, and indirect and combination indirect-downlight fixtures are described and illustrated in a color brochure showing colors and suggested applications. Alkco, Franklin Park, IL.

**Circle 142**



### ■ Incandescent downlights

A brochure from NL Corporation features a line of incandescent downlights, including six adjustable fixtures, six low-brightness cones and baffles, three A-lamp downlights, and three wall washers. NL Corporation, Cleveland, OH.

**Circle 143**


### ■ Street lighting

Centrecon's Victorian 1900 collection includes round, fluted, and octagonal prestressed concrete poles and three luminaires based on styles popular between 1900 and 1930. Natural and terrazzo textures are shown in seven finishes. Centrecon Inc., Everett, WA. ■

**Circle 144**

| | |
|---|---|
| **June 14, 1988** | **The Business of Design,** IBD annual conference, Merchandise Mart, Chicago, IL. Contact: Institute of Business Designers, 1155 Merchandise Mart, Chicago, IL 60654, (312) 467-1950. |
| **June 15, 1988** | **Application deadline** for second international work space design competition. Cosponsors: Workspace and the Institute of Business Designers, Northern California Chapter. Contact: LIMN Company, 821 Sansome, San Francisco, CA 94133, (415) 397-7471. |
| **June 24, 1988** | **Calendar deadline** for August *Architectural Lighting.* Contact: Susan Degen, Assistant Editor, *Architectural Lighting,* P.O. Box 10460, Eugene, OR 97440, (503) 343-1200. |
| **June 24–26, 1988** | **32nd annual CSI Convention and Exhibit,** Washington Convention Center, Washington, DC. Contact: Sandy Humphries, Construction Specifications Institute, 601 Madison Street, Alexandria, VA 22314, (703) 684-0300. |
| **August 3–6, 1988** | **ASID conference,** Sheraton Washington Hotel, Washington, DC. National conference and international exposition. Contact: American Society of Interior Designers, 1430 Broadway, New York, NY 10018, (212) 944-9220. |
| **August 7–11, 1988** | **IES annual conference,** City Center, Minneapolis, MN. Contact: The Illuminating Engineering Society of North America, 345 East 47th Street, New York, NY 10018, (212) 705-7269. |
| **August 24–27, 1988** | **World Design '88/New York,** IDSA international conference, Marquis Hotel, New York City. Contact: Industrial Designers Society of America, Great Falls, VA 22066, (703) 759-0100. |
| **August 30–31, 1988** | **Workspace '88,** Moscone Center, San Francisco. Contact: (415) 776-2111. |
| **September 14–19, 1988** | **Euroluce 13,** Milan, Italy. Held in conjunction with the Milan Furniture Fair. ■ |

# In This Issue

## Manufacturers

**Page 18.** *Lighting design illustrates company's services* (Arco renovation, Independence, Kansas).
**Peerless:** Rotatable suspended tube fluorescent fixtures with lens and flexible connectors.
**Columbia:** Circular recessed fluorescent fixtures.
**Ameri-Sign System Inc.:** Neon.
**Marco:** Recessed incandescent downlights.

**Page 20.** *Custom columns add visual interest, ambient light to open-plan office* (Copley Real Estate Advisors headquarters, Boston, Massachusetts).
**Architectural Shapes, Inc.:** Fiber glass–reinforced gypsum light columns.
**Enercon Data Corporation:** Low-voltage lighting control relay system.
**J.G. System Furniture:** Fluorescent uplights for systems furniture.
**Roberts:** Fluorescent fixtures for cove lighting.

**Page 22.** *Indirect lighting solves problems for lighting designer* (St. Tammany Parish Library, Covington, Louisiana).
**Sterner:** Indirect fixtures and computer modeling service.
**GTE/Sylvania:** Metal halide lamps.
**Lightolier:** Compact fluorescent downlights.
**Saunders-Roe Developments:** Self-luminous exit lights.
**Spectrum:** Tinted glass.

**Page 32.** *Dramatic lighting revives movie theater excitement* (Lloyd Cinemas, Portland, Oregon).
**Artemide:** Crystal sconces.
**Kawneer:** Glazing system.
**Keller House:** Custom ring-shaped suspended uplights.

**Page 36.** *Powerful magnetic field a challenge to lighting MRI exam room.*
**GE:** Lamps and controls.

*Manufacturer credits reflect the products specified for the projects; it is possible that other products were installed during construction or maintenance.*

## Photographers

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**Warren Jagger,** Warren Jagger Photography Inc., 150 Chestnut Street, Providence, RI 02905, (401) 351-7366

**Scott Sutton,** Sutton Photographic, P.O. Box 145, Birmingham, MI 48012, (313) 545-3410

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