

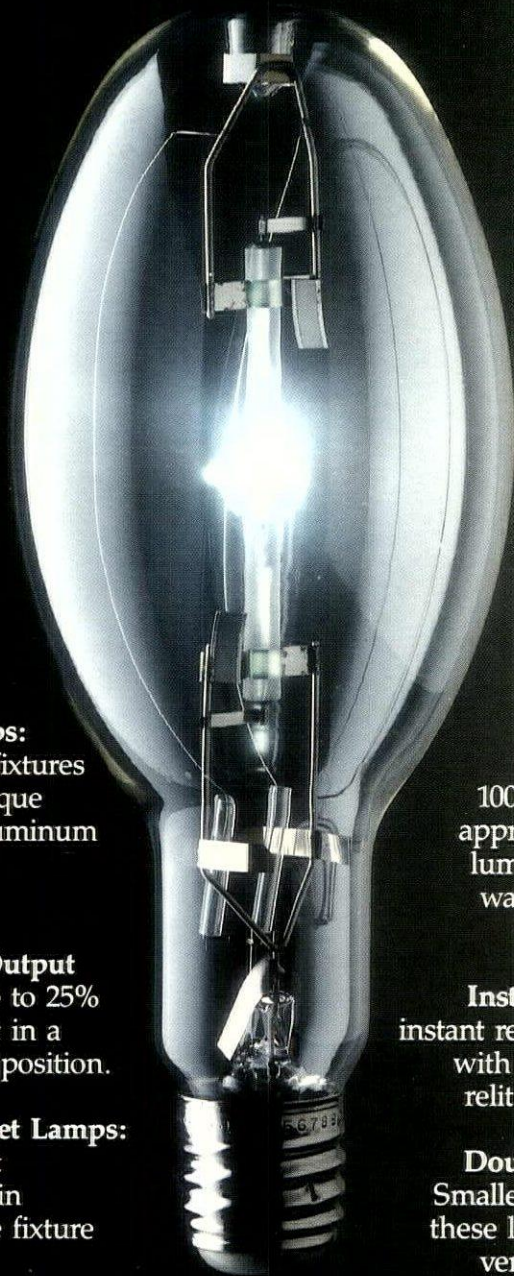
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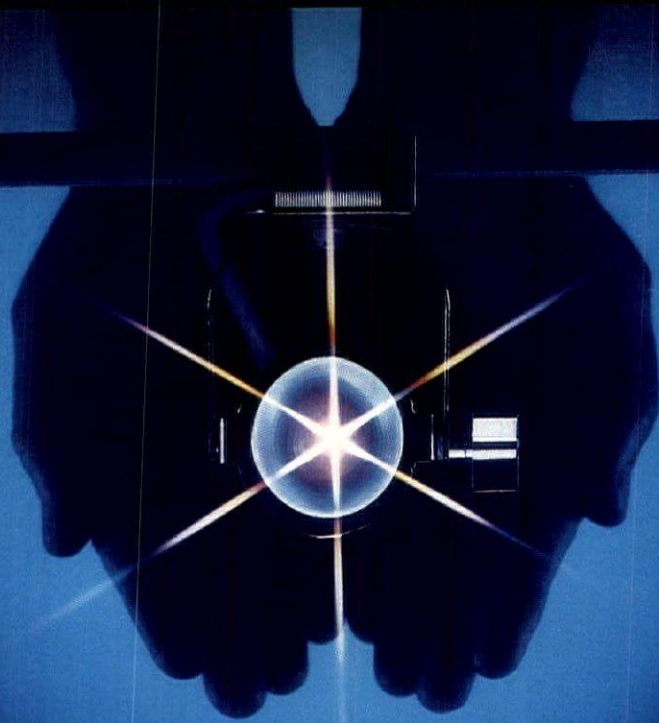
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Circle 2

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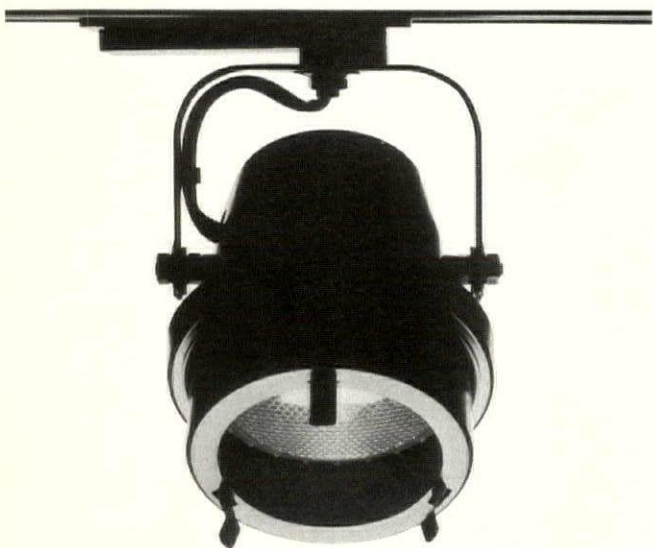


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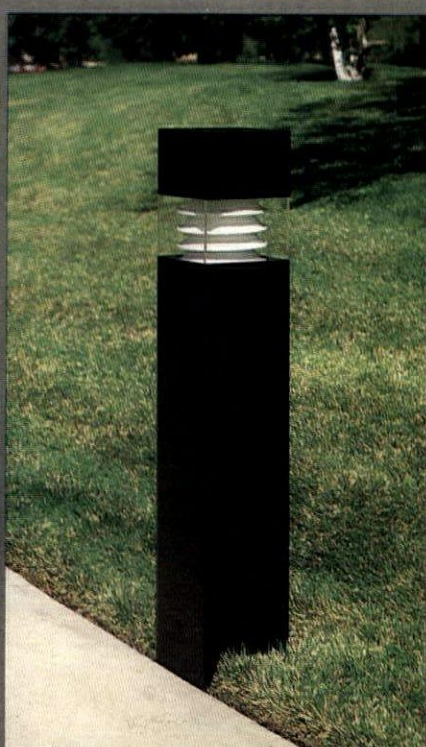
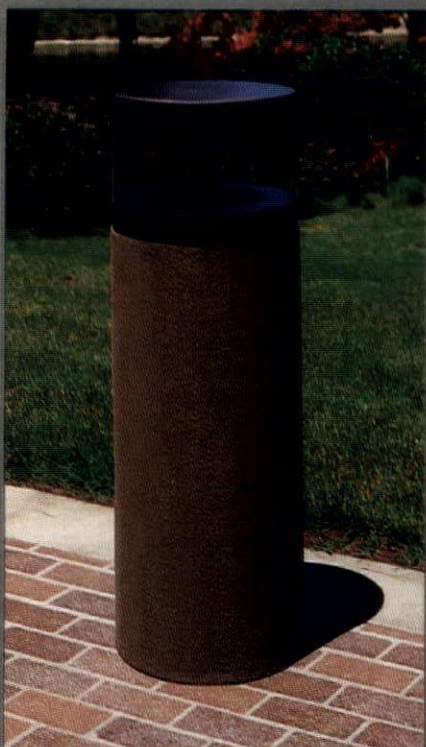
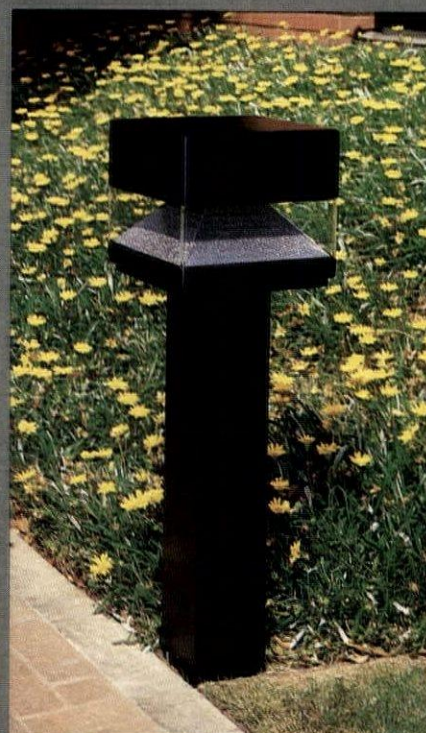
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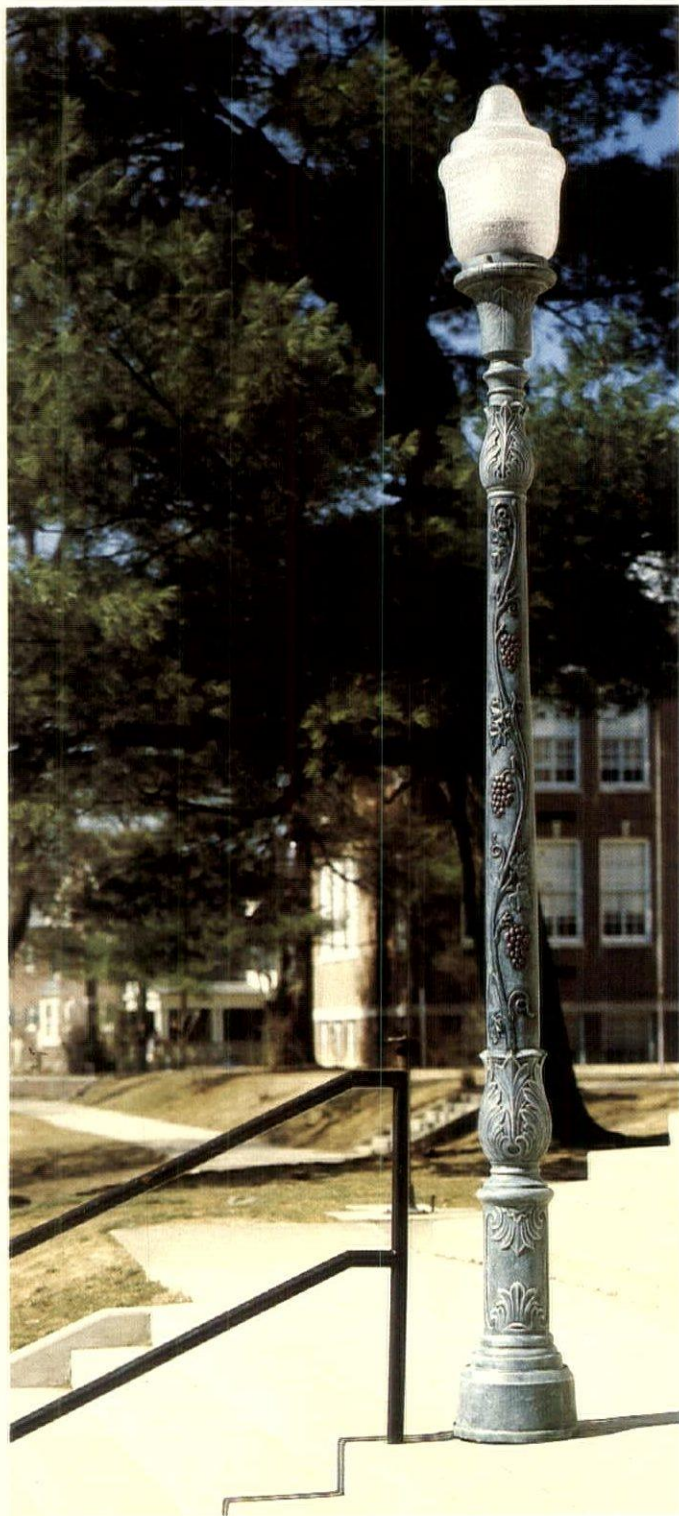
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PARAMOUNT'S heavy-duty CRAFT LITE, two-lamp standard, is pictured illuminating the pit area in a maintenance building for the Bay Area Rapid Transit, San Francisco, CA. This fixture is featured in optional Stainless Steel with 1/8" white lens of high-impact cast acrylic.



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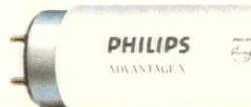
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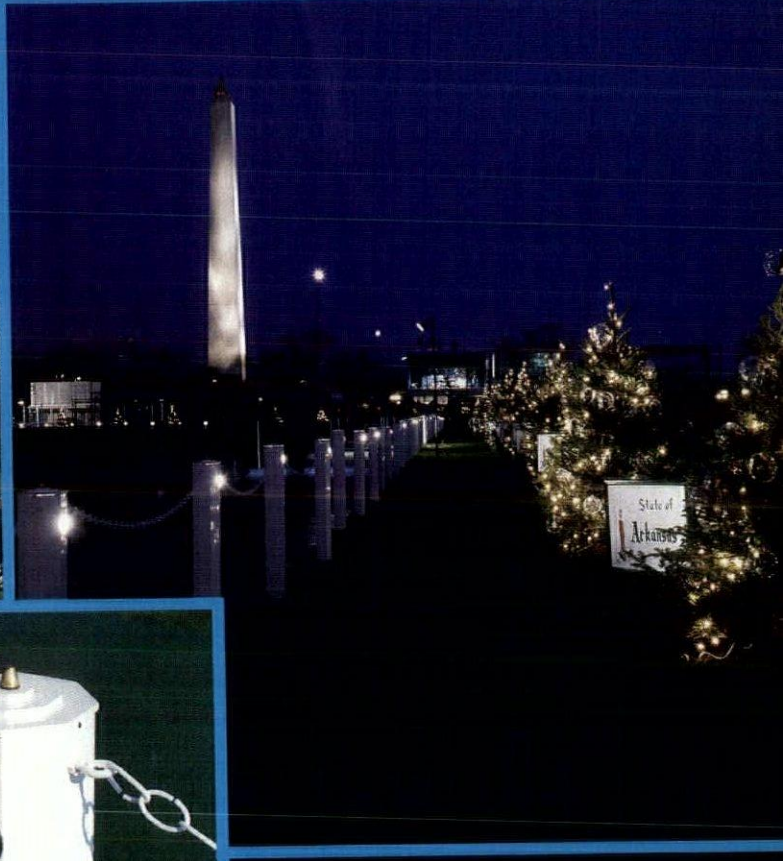
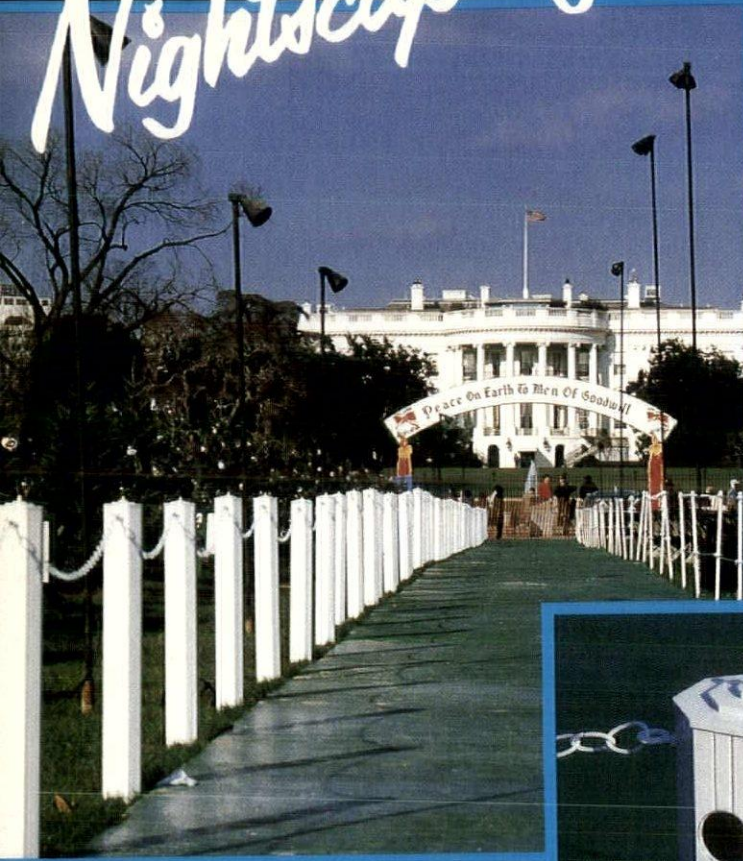
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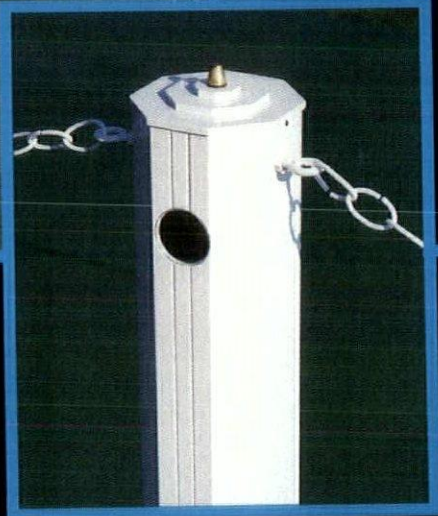
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Circle 9



■ From the Editor

This is our annual Lighting World International issue. If you haven't read or heard about it, Lighting World International is the largest lighting trade show anywhere. This year's show, located at the Los Angeles Convention Center, will boast about 400 exhibitors and 14,000 attendees.

Lighting World is more than the industry's largest trade show, though. Its program offers a terrific continuing education opportunity. I can't think of any other place where, in only three days, one could hear so many lighting design experts talk about so many different lighting subjects. It's also a great place to meet many of the designers and authors whose work is featured in *Architectural Lighting*.

But the program is only part of the fun. The extent of the exhibition is incredible. Large and small companies set up their booths side by side, to display and demonstrate the latest and greatest in lighting products and equipment. Going through the whole show, aisle by aisle, can take hours — but it's also a real education. If, for example, you've never quite grasped what we're talking about when we write about the difference between metal halide and mercury vapor lamps, there'll be plenty of chances to see the difference for yourself. It's also a great place to find ideas and inspiration — not to mention the fact that it would take months for a person to gather as much new product literature as can be had in a tour of the show. Many manufacturers introduce their new products at Lighting World International, so those who attend can expect to be surprised.

This issue is special for *Architectural Lighting* because we've devoted lots of space to new products and new literature for those of you who won't be able to attend and as a preview for those of you who will. In addition, our index to advertisers in the back of this issue includes each advertiser's booth number — so when you get to the show, you'll know where to go. Enjoy!

Charles Linn, AIA

The Designer's SINGLE LIGHT SOURCE



Old World Lighting

A new dimension in decorative theme lighting. The range of possible choices includes ornamental chandeliers, table lighting, wall sconces, floor lighting, and custom pieces. All this allows you to create exquisite lighting interiors such as this dramatic chandelier in the Fess Parker Red Lion Inn in Santa Barbara.

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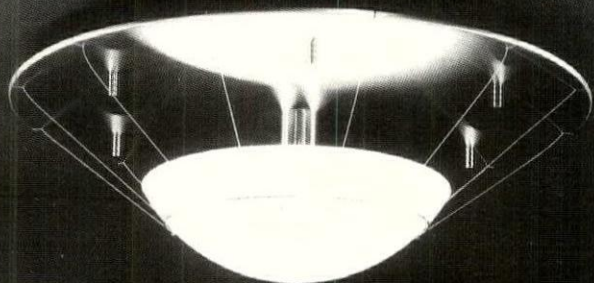
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Circle 11

■ Lighting Clinic

Lighting offices for VDTs

Architectural Lighting gets a lot of questions about lighting offices where video display terminals (VDTs) are used. That doesn't surprise Stephan Konz, Kansas State University industrial engineer and ergonomist. Industry seers predict that within the next two years about 25 percent of office workers will be using a computer for some part of their work day. Konz says that "people usually install new computer systems and video display units in existing offices without considering the kinds of changes the new machines will demand from people." He and Robert Yearout (who is now at the University of North Carolina-Ashville) have been evaluating common office lighting environments and designing modifications to help people work more comfortably and easily at VDTs. So, the editors asked them to highlight their work here.

An extremely demanding task

Working at a screen is extremely demanding on users' eyes. People are used to looking at printed material, which presents a crisp, sharp image with high contrast between the print and the paper. The screen display, by comparison, is fuzzy and jiggly, and it has lower contrast. Our eyes strain continuously to crisp up the image and make it legible. A number of studies have shown that it takes about 30 percent longer to read the same text from a screen than to read it in print.

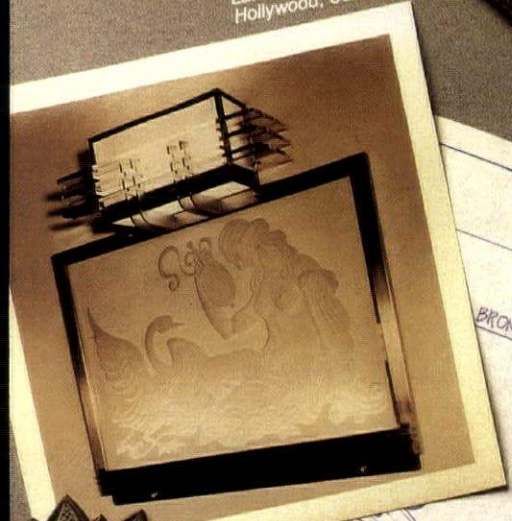
Architects and engineers have spent many years designing offices in which people can read paper easily. Those environments have too much light for working at a computer screen. Some common contributors to that excess light, in addition to too many light fixtures, are inadequately shielded fluorescent lights, uncovered windows, and walls that have been painted white or a light color to reflect large amounts of light.

To determine the amount of "light noise" on a VDT screen, hold a mirror in front of it at operator eye level. The mirror will reflect bright objects or lights. Then, eliminate or alter the sources of reflected brightness, including lights, windows, white telephones, and paper on bulletin boards. Cover nearby windows with opaque drapes or blinds. If windows cannot be covered, they should be to a worker's right or left, not ahead or behind. The quick mirror test might also reveal that the user should change clothes. Light-colored clothing reflects onto the screen, so it may be better to wear a dark-colored shirt or blouse at the computer.

Because computer operators and secretaries who work at VDTs are most often transferring information from a printed document into a computer, they focus their eyes on the document more often than on the screen. To reduce eye strain, Yearout recommends using an adjustable task light that shines on the document. He tested several combinations of direct and indirect lighting with volunteers who ranged in age from 18 to 61. They reported being most comfortable when ambient work area lighting was reduced

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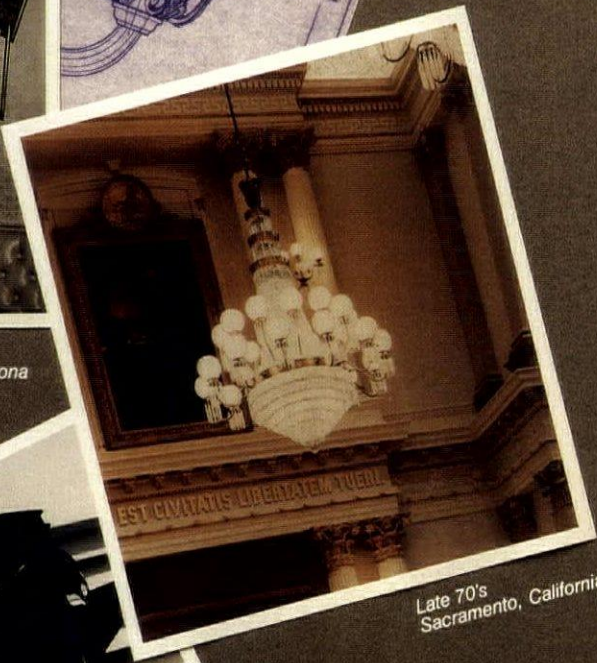
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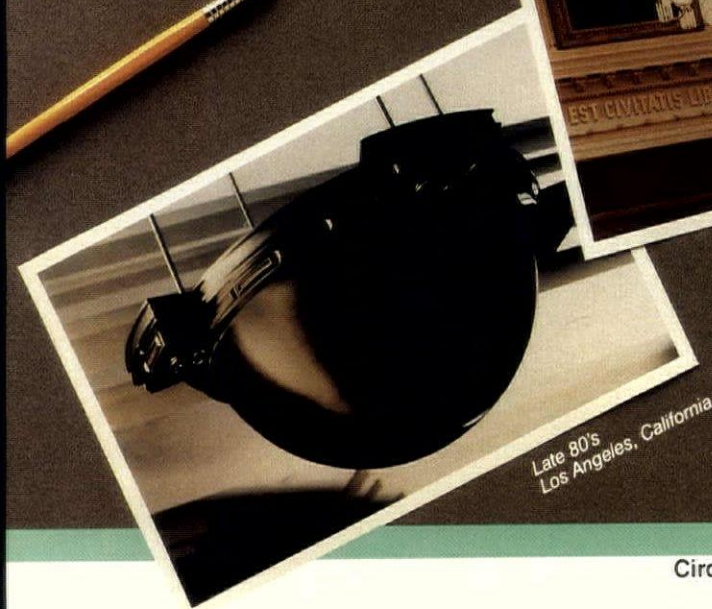
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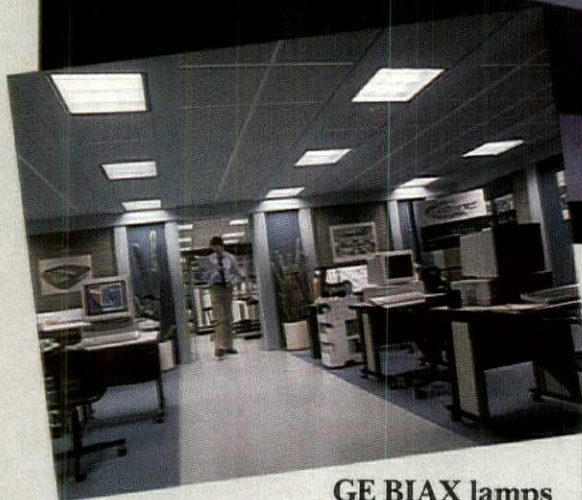
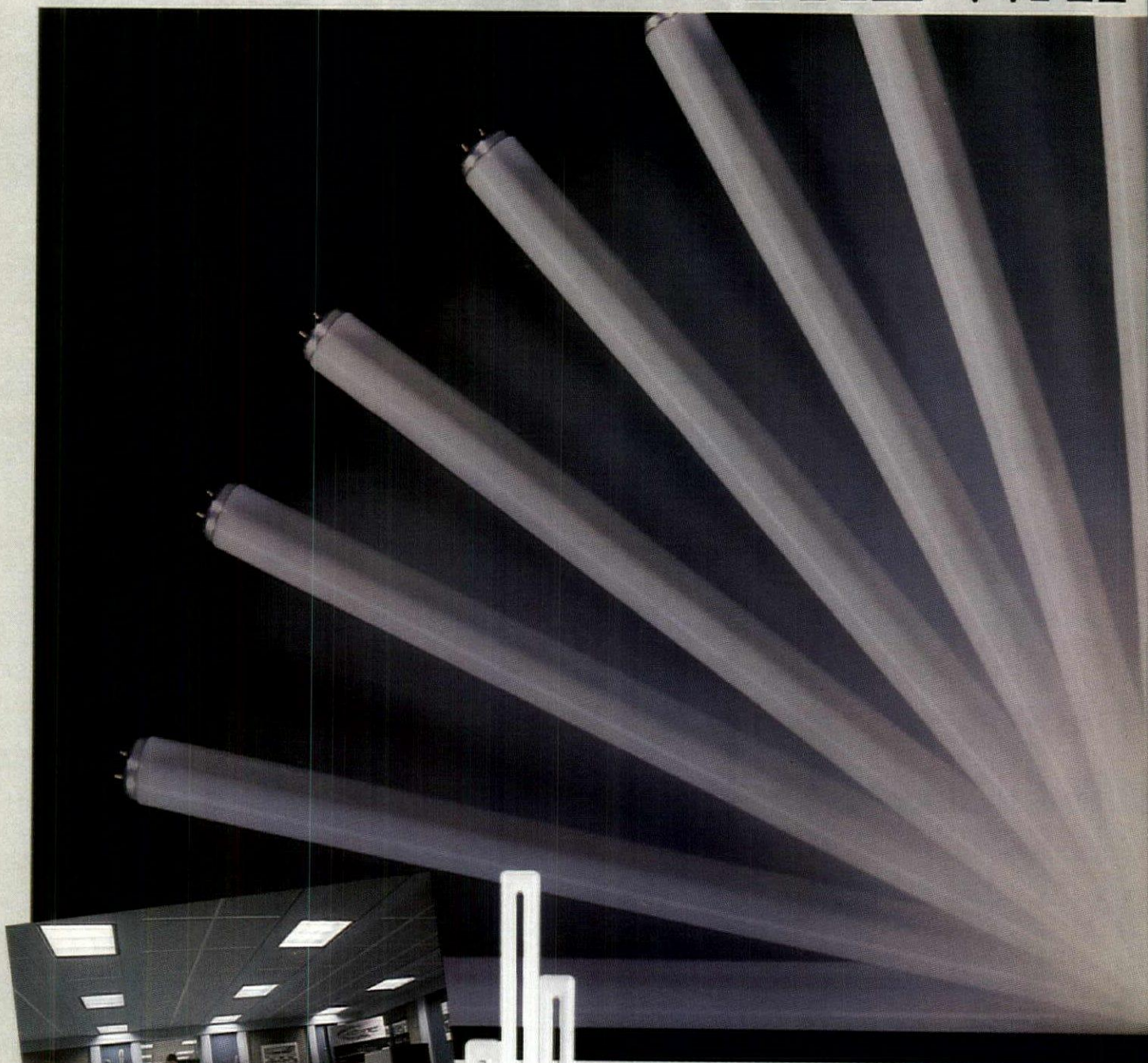
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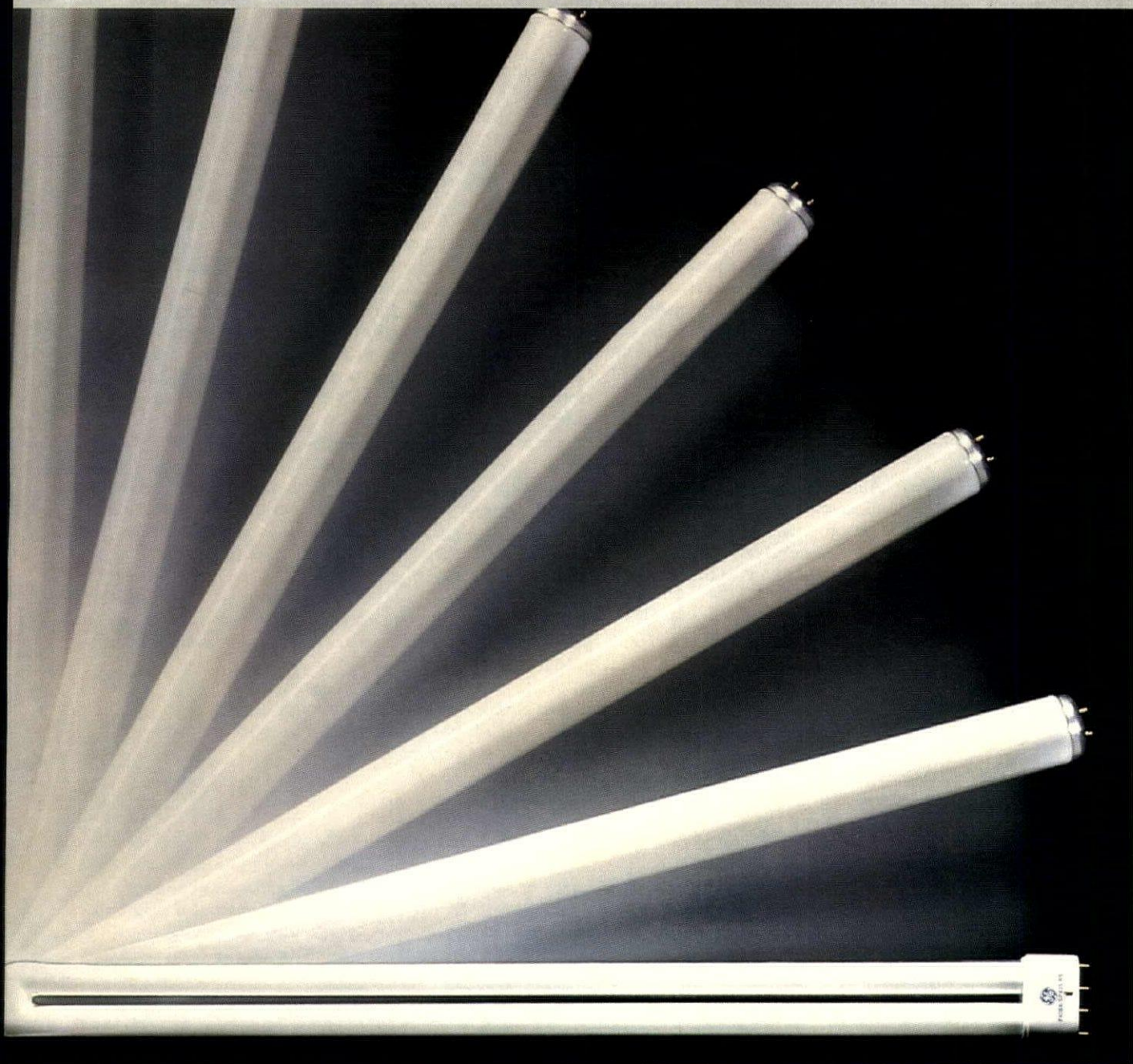


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Circle 13

and a task light shone on the document from which they worked. Reducing environmental light to about 40 foot-candles helps to reduce glare on the screen. One way to achieve ambient light reduction is by removing, for example, two of the lamps from a four-lamp luminaire.

Adjustability should be the guiding design principle for computerized offices. It's important to be able to adjust the chair height and backrest, to place the computer keyboard so that fingertips are about 2 inches higher than elbows, and to set the work object looked at most often directly in front of the worker. For "document intensive" work, that means placing the document on an adjustable copy holder directly in front of the operator about 18 to 25 inches from the eyes. For "screen intensive" work, the operator should be looking slightly down at the screen at a 20-degree angle. It's sometimes useful to add an adjustable glare shield or hood over the VDT to block room light.

Finally, it's a good idea for everyone who works at a computer screen to have an eye examination and to describe the office lighting conditions to the optometrist. People who wear bifocals and who work at a VDT intensively should consider having glasses ground especially for working at the screen.

*Stephan Konz, PhD
Professor Department of Industrial Engineering
Kansas State University
Manhattan, Kansas*

Emergency and security lighting for galleries, museums

Your magazine occasionally discusses display lighting for galleries and museums, but my museum lighting project is different. I must make emergency lighting provisions for safe evacuation in the event of a power failure or other emergency, and I have to design night lighting for building security. Do I need two lighting systems? Or is there some way to meet those needs with one system?

*N.G.E.
Seattle, Washington*

The essential requirements

The purpose of the two necessary lighting systems mentioned above is identical: to permit ready passage through the space and to illuminate obstacles, stairs, and doorways. Both systems can be provided by the same fixtures. Here is a list of the essential requirements.

- A highly reliable, quick-starting light source.
- A long-life light source.
- Connection of ordinary power systems for regular night-time use and automatic transfer to an emergency power source when normal power fails.
- A means of testing both the lights and the power source.

- An emergency power source of at least 1.5 hours duration.
- Reasonably uniform coverage of the patrol or egress route.
- Little or no light on the displays to avoid adding to unnecessary light degradation.

The National Museum of American History has emergency lighting circuits fed by the local utility. Its back-up emergency generator is tested every week and is provided with automatic start-up devices and automatic transfer switches. The lights we provide for all new and remodeled spaces incorporate two 7-watt twin-tube fluorescent lamps. They are designed for surface mounting in halls without a finished ceiling and for recessed mounting in any type of finished ceiling. The lights are mounted over the public passageways in exhibit areas and in a regular wide-spaced grid pattern where exhibits change frequently.

A relay provided for each hall turns on the safety-emergency lights whenever the normal hall lighting is shut off. In addition, another switch is provided for actuating the relay and turning on emergency lights at any time for inspection and maintenance.

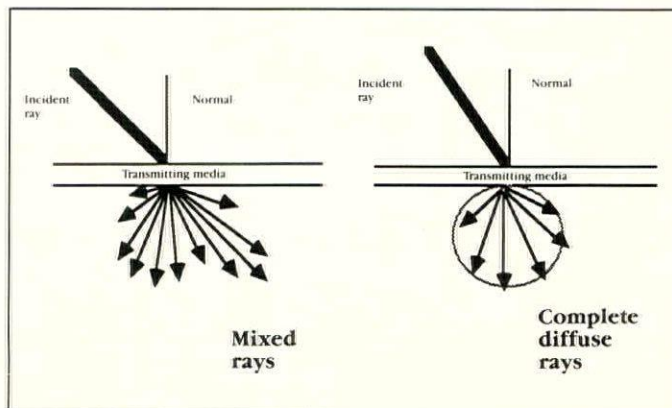
The approach has provided very reliable safe egress and patrol lighting. Energy and maintenance costs have been excellent.

*Edwin K. Robinson, Lighting Engineer
National Museum of American History
Smithsonian Institution
Washington, D.C.*

Mislabeled drawings

In the February 1988 Daylighting Techniques column, two diagrams were mislabeled. The *correctly labeled* diagrams are shown here. Our apologies to our new daylighting columnist for the confusion.

The editors



Architecture That Lights.

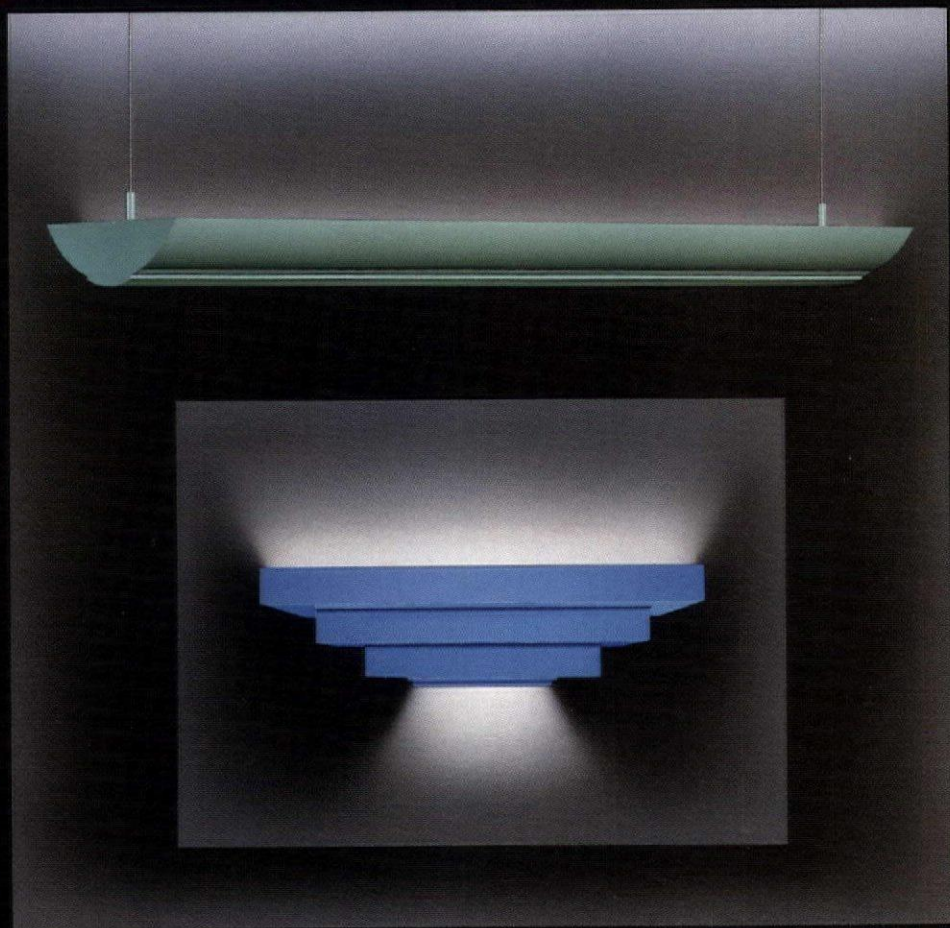
Architectural Lighting Systems brings architectural detail to linear lighting. Our new smaller cove system lights more from less. Our new sconces light up and down.

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Design: Robert Sonneman



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Circle 15

Designers light restaurant with golden touch



Relying on ambition and a \$450,000 small business loan, a young business owner brought together a design team to create space for Ho Chow, a new Chinese restaurant. "The client wanted to transform a small space within a rather ordinary shopping center into a sparkling jewel," recalls lighting designer Michael Souter.

Souter and interior designer Robert Rockwood coordinated their designs to create a fresh, contemporary, and inviting environment with a sense of openness. Rockwood selected surface finishes with specular qualities to maximize reflected light. Partitions stop short of the ceiling, allowing light to pass over and through edge-lit glass blocks.

"We worked with several different color temperatures," says Souter. "The idea was to balance a subtle mix. The ceiling appears very warm because of the strip lighting, about 2700 Kelvin. The halogen PAR 38 downlights that indicate the traffic paths are whiter, about 3000 Kelvin. The other lighting is somewhere in between."

For focal accent lighting, adjustable MR16 fixtures aim bright beams at art objects,

bounce light off gold-leafed finials, and illuminate booth tabletops. "MR16s create a festive sparkle on crystal, china, and white tablecloths," says Souter. "But we could only do pinspotting on tables that aren't movable."

In the two largest seating areas, where tables are often rearranged for banquets, ellipsoidal luminaires provide a wide, even, soft-edged distribution of light. "For more saturated colors, flattering to the food and to skin tones, we used A lamps coated with rare-earth phosphors that are higher in the red end of the spectrum," Souter says.

The lighting is circuited in 13 separate zones, each independently dimmable so the restaurant staff can change lighting moods to suit different occasions. Because the budget was stretched to its limits, Souter marked settings on linear slide control stations instead of using a preset controller.

The space has hosted a successful new business. After just two years, Ho Chow is so popular that the owner recently decided to double the size of the restaurant.

—Gareth Fenley



Project: Ho Chow Restaurant
Location: Fremont, California
Client: Carol Sum, Henry Tao, and Frank Tao
Architect and Interior Designer: Robert Rockwood, Vicky Tsai, and Tim Bullinger, Rockwood Design Associates
Lighting Designer: Michael K. Souter, Luminae Souter
Electrical Engineer: Felix Yee
Photos: Stephen Fridge

For product information, see the Manufacturer Credits section on page 102.

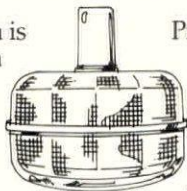
HOLOPHANE PRISMATIC LIGHTING HELPS PICK UP PROBLEMS BEFORE THEY BECOME A PROBLEM.



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.

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PrismGlo,[™] a prismatic fixture that uses hundreds of tiny prisms to fine tune light direction and distribution. It improves contrast, defines form and texture, and reduces glare. Lighting distribution is balanced between upward (reflecting off the ceiling) and downward (directly on the work surfaces). So both the task and its environment are lit, eliminating the undesirable "cavern" effect.

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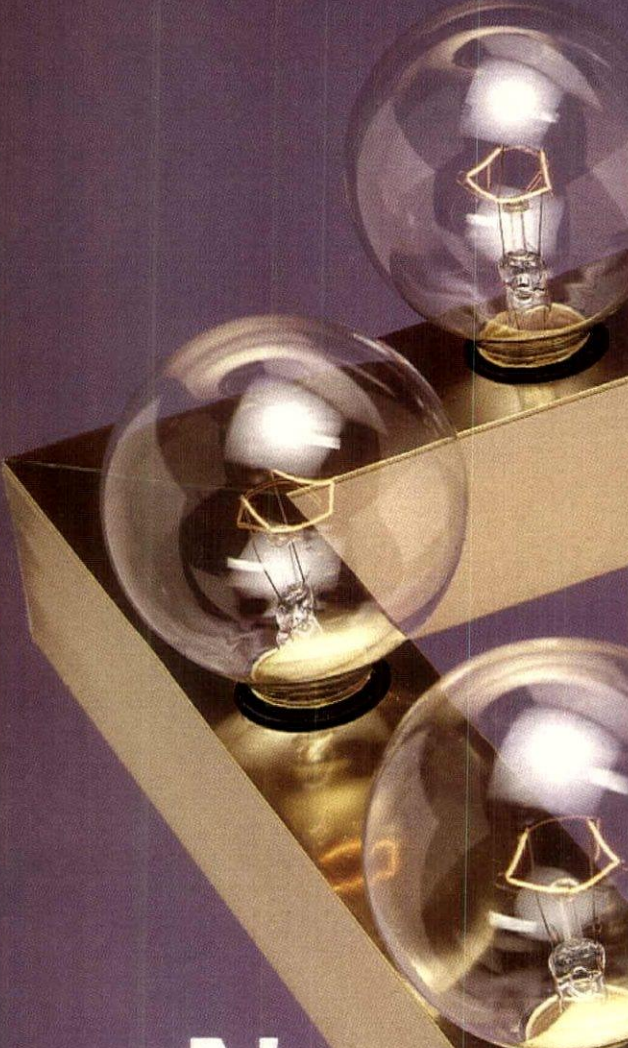
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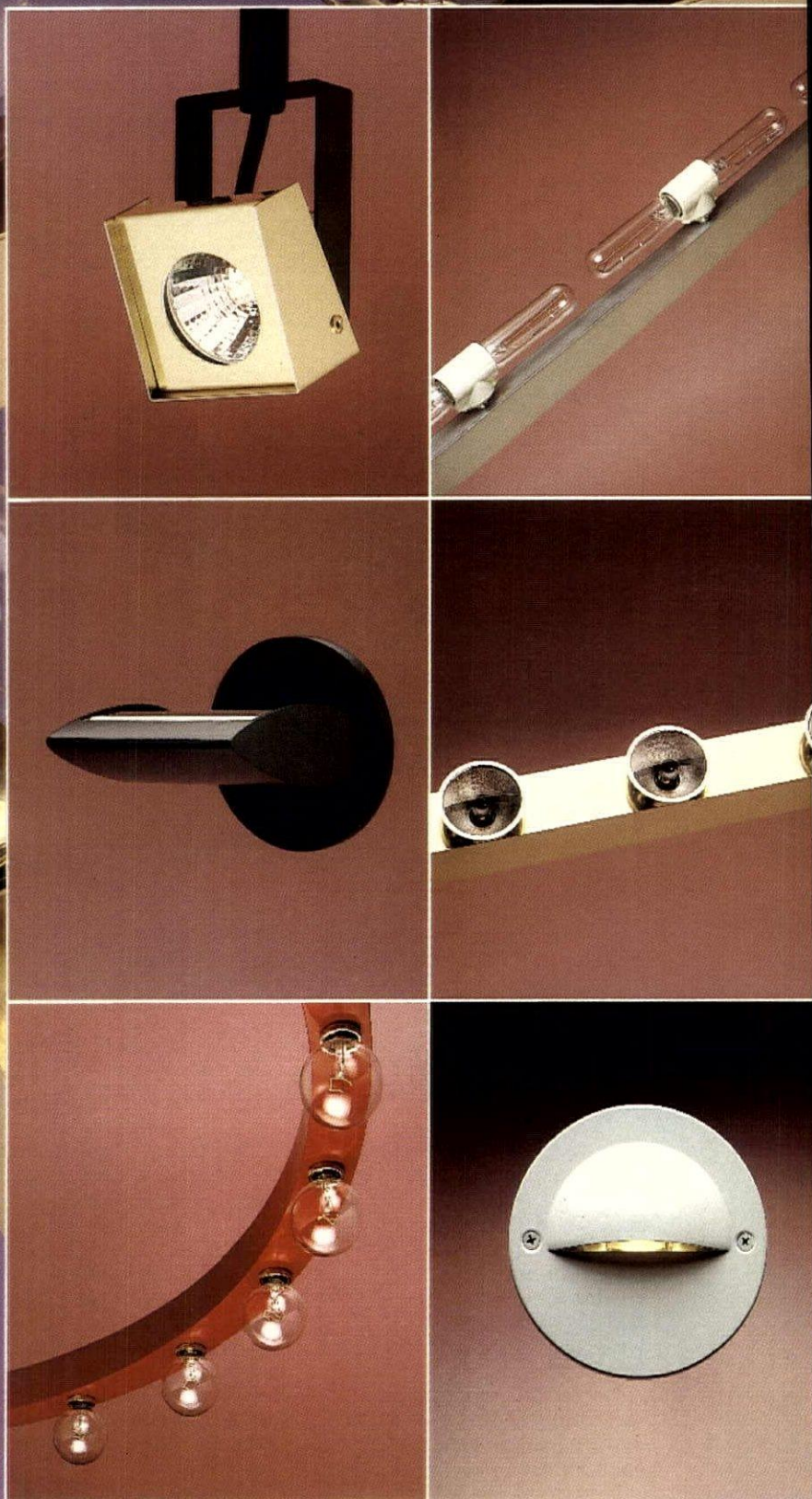
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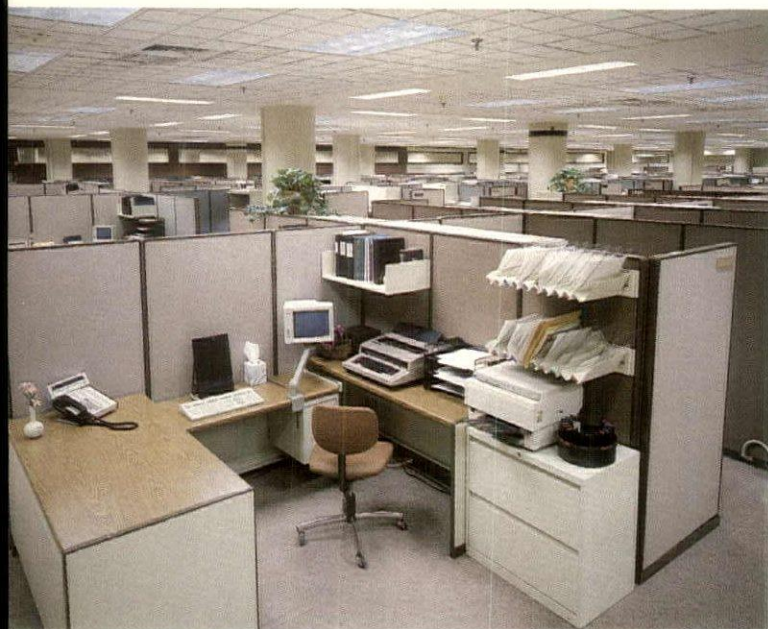
Since 1968



Lighting Systems Manufacturer



Computer turns off lights, saves electricity dollars for bank



Project: Society National Bank Service Center
Location: Cleveland, Ohio
Client: Society Corp.
Utility Cost Control Consultant: Richard G. Lubinski, COMSE Energy Managers
Photos: Greg Sereta

Saving \$42,000 in a year by turning off lights is enough to make any banker take notice. That is the electricity savings reaped by Society Corp. after installing a computer-controlled two-way building management system in its corporate services center. "This is a relatively new building, and it was not overlit," says Richard Lubinski of COMSE Energy Managers. However, many lights were being left on all night.

David Edmonds, vice president and facilities manager for Society Corp., wanted to control the lights automatically — no simple task in a center where work schedules differ from department to department and from day to day. The goal was to reduce energy costs without interfering with bank operations. That meant, for one thing, that employees needed to be able to override the system if they worked late.

"We wanted to determine how many hours per day the lights could be shut off," Lubinski says. "After making arrangements with security, we showed up unannounced several times over several weeks and did a complete survey of the primary area — about 200,000 square feet — department by department. We noted how many people were working, and what activity was going on at different hours, housekeeping as well as business activity." The area contains 2415 fluorescent fixtures with 298,105 watts of lighting on 277 volts; there are 80 branch circuits.

After completing the study, COMSE recommended a powerline carrier system that is "some-

what different from traditional energy management systems," Lubinski says. Powerline carrier systems use a building's existing electrical lines to carry on-and-off messages from a central transmitter to remote receiver relays. With such a system, little rewiring is required for an energy management installation. "Ordinarily you get a box with some sort of panel in it that runs on firmware," which, he explains, provides just one way to do what it does. With the software-based system selected, however, "We can say, 'This is what we want, this is how we want it, and this is when we want it to happen — based on these terms and conditions.' And it runs on a standard personal computer."

Society's building management system uses two schedules per day for about 80 loads. Each receiver handles two address codes, a feature that Lubinski says significantly reduced installation costs compared to other powerline carrier systems. Labels at each of more than 750 workstations list the building automation phone number, the password for that station, and a lighting zone number. To override the system and extend a workstation's lighting schedule by two hours, an employee simply makes a touch-tone phone call and provides the information via voice modem. Additional overrides may be entered if necessary. ■

For product information, see the Manufacturer Credits section on page 102.

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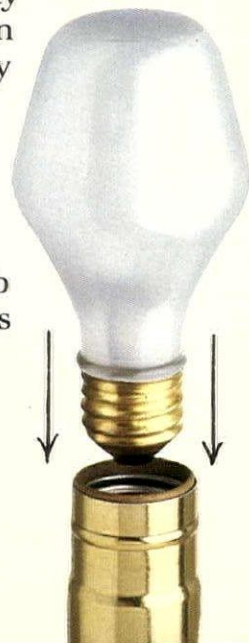
"What's more important to me is how the company I work for is committed to taking technology to the limit, into the 21st century.

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Our Capsylite lasts 40% longer than long life incandescents.

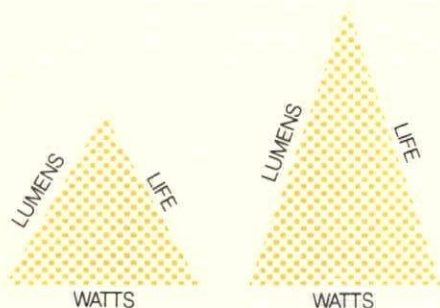
"I'm proud to say we were the first U.S. company to market tungsten halogen technology in an everyday light bulb. That gave us an advantage in creating long-lived bulbs.

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Jack Shaffer
Engineering Manager

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We found a way to increase lumens and life without increasing wattage.

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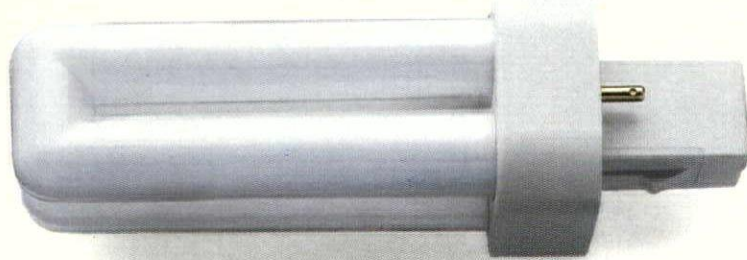
"Here in Montoursville, we make all the Sylvania Double Twin Tube lamps for the world market. Not

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Team spirit enlivens sports bar at arena



Designers of the Arena Club Lounge had to capture the enthusiasm of a true sports fan — team spirit. The club occupies a high-profile, two-story addition to the McNichols Sports Arena, home of the Denver Nuggets basketball team. Glass walls to the east reveal a dramatic view of the downtown skyline, and passing motorists are attracted to the spectacular color and lights within. The lounge and restaurant are sometimes open to the general public, but on sporting event nights, admission is limited to season-ticket holders who have paid extra for special memberships.

Inside the bar, the excitement and activity of the arena surrounds patrons. Orange and blue, the Nuggets' team colors, were a natural choice for playful neon lighting and graphics with a basketball theme. Sophisticated touches, such as Italian wall sconces near the entrance, are designed to appeal to an upscale clientele.

Twelve video monitors and two extra-large TV screens bring arena activity into the bar. From the bottom of the video cabinets, recessed downlights project light on the counters below. The interior designers chose pink A lamps for an intriguing and intimate source of light. Neon-lined basketball

hoops set in the counters are a popular novelty.

In coordination with a neon fabricator, electrical engineer Jeff Nielsen devised ways to conceal transformers for 14 independently dimmed neon units. For private evening parties, the atmosphere can be subdued by dimming the neon and other light sources. Lighting can intensify for a dynamic, spirited mood on event nights while patrons watch the monitors; Nielsen and the architects carefully located fixtures so that no glare reaches the screens.

The bar was just one part of a program by architects Sink Combs Dethlefs to create four new restaurants at the arena. The entire project was on a fast track: 10 months from initial design to the opening event.

"This kind of project can be a nightmare if you don't have everybody working together, but it was definitely a team effort," says Heidi Hamilton of Exhibits, Inc., interior designers for the club. The architects, interior designers, electrical engineer, contractor, and client held meetings every Thursday during construction. "We worked crazy, wild hours, and it was all worth it," Hamilton says.

"The place is hot. The patrons love it; it's jammed on event nights. It was a dream project for us," she concludes. "We had a ball."

—G.E.

Project: Arena Club Lounge

Location: McNichols Sports Arena, Denver

Client: The Denver Nuggets

Architect: Sink Combs Dethlefs

Electrical Engineer: Jeff Nielsen, The RMH Group, Inc.

Interior Designer: Exhibits, Inc.

Photos: R. Greg Hursley

For product information, see the Manufacturer Credits section on page 102.

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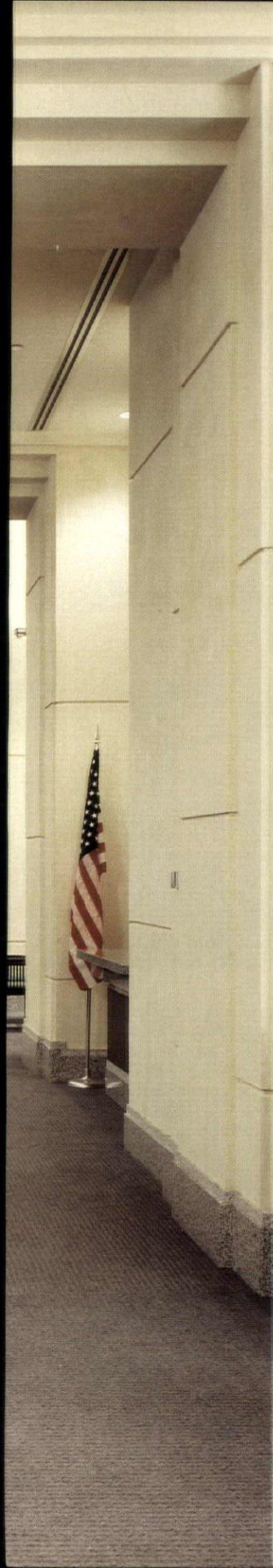
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Custom fixtures, planning strategies meet Title 24 challenge

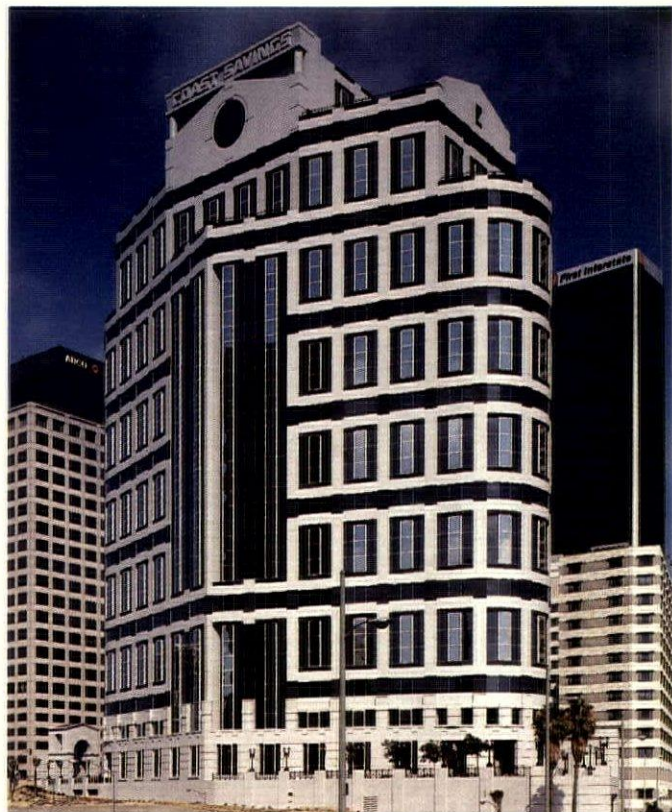
ARTICLE BY
CHARLES LINN, AIA

INTERIOR PHOTOGRAPHS BY
TOSHI YOSHIMI

"Working with Title 24 is sort of like working with tax law," says lighting designer Paul Helms of Lightsource. "It requires that you know all the rules and that you have a planning strategy. You have to conceive the lighting design as it's appropriate to the program — the functions of the spaces, and the design direction given by the client. Then you have to decide how to use the amount of energy available in proportion to those various lighting functions. In our office, we call Title 24 'the hidden design partner.' It actually has more impact on our work than the dollar budget — I mean, the dollar budget is never absolute, but Title 24 is."

Coast Savings and Loan's banking hall and headquarters at 1000 Wilshire Boulevard are fine examples of projects that had to meet Title 24 — part of the California Administrative Code and one of the strictest energy conservation standards in the country. Meeting Title 24 requirements while still coming up with workable, innovative lighting has become a great challenge for designers practicing in that state.

Buildings built under Title 24 must be designed to minimize energy consumption for lighting and HVAC. The prescriptive building packages described in the code estab-



JOCK POTTLE

Project: Coast Savings and Loan

Location: 1000 Wilshire Boulevard, Los Angeles

Interior Design: Cole Martinez Curtis and Associates; project executive, Joel Curtis; project director, Maggie Mandel

Lighting Designer: Lightsource, Inc.; design principal, Paul Helms; project designer, Jim Shimmin

General Contractor: Swinerton & Walbert Co.

Project: 1000 Wilshire Boulevard

Architect: Kohn Pedersen Fox Associates and Langdon Wilson Mumper Architects

lish values for nearly every possible variable involved in the total energy consumption — percent of glazed area, shading coefficient of glazing, insulation value of opaque walls, and HVAC power index to name a few — that the building must meet.

Also established by the code is the lighting power density, or the number of watts per square foot that can be used for lighting. The lighting power density average for high-rise office buildings in the Los Angeles area cannot exceed 1.5 watts per square foot of conditioned floor area. If certain control strategies are employed, however, some wattage credits can be obtained.

At first glance it might seem difficult, if not impossible, to achieve lighting power densities this low while providing enough light. It is true that reaching such low power densities requires the use of highly efficient light sources like fluorescent and high intensity discharge, but designers need not entirely eliminate incandescent from their lighting design palettes.

The key to being able to use incandescent is keeping the power density below an *average* of 1.5 watts per square foot. The designer can “bank” watts by using lower lighting levels in some areas, such as storage

rooms and hallways, and concentrating the higher light levels where they are needed functionally or will have the greatest visual effect.

The Banking Hall

“The banking hall is kind of a transparent, generously daylight space,” says Helms. “The ceiling plane itself is subdivided into many planes, which are then bordered by various trim materials. These, in turn, give the ceiling plane some definition, shadow, and interest. Our first thought was to simply supplement the daylight coming into the space, but the owners asked us to provide an average of at least 55 foot-candles of light at all times, so that was one criterion.

“Another was the interior design. At one time we had

considered hanging some kind of luminous tubes, but we decided to keep the nice high volume of the space relatively uncluttered. The lighting needed to be laid out so that it related to the ceiling plan and would also respond to the actual position of the working counters and the deal plates on the teller line. From there it could continue throughout the entire space.

“We still wanted something that would compliment the incoming daylight, and knew that an indirect source would be nice,” says Helms. “All of this led us to start exploring a custom, indirect metal halide fixture. We looked at several different commercially available reflector systems and chose one that would give us the right combination of watt-

age and light distribution. We slipped in under the prescribed power density, and, in fact, had enough left over to add a small component of incandescent downlighting. The PAR and MR16 lamps add a little bit of color and texture, and keep the lighting from being totally indirect.

“The next question is, ‘What do you house the hardware in?’” says Helms. “The design team studied a number of shapes, looking for something that was reasonably simple geometrically. Cole Martinez Curtis had already made a decision to carry some of the very strong elements Kohn Pedersen Fox had used for the design of 1000 Wilshire into the banking hall. We settled on the bowl shape, detailed it, and then it went through





some alterations before it was finally approved."

The final design of the bowl-shaped chandeliers was executed in two sizes, the larger using a 400-watt lamp, and the smaller a 175-watt lamp, both metal halide. The fixtures switch on when daylight drops to a certain level.

The Executive Floors

Coast Savings' headquarters is on the 21st and 22nd floors. "We used a combination of light sources in these areas, fluorescent and incandescent, and again, we had to plan ahead so that we complied with Title 24. We banked watts in certain areas so we could use them where they really counted," says Helms. In addition, the designers specified occupancy sensors,

dimming controls for both incandescent and fluorescent, and energy saving incandescent and fluorescent lamps in order to meet the lighting power density requirements.

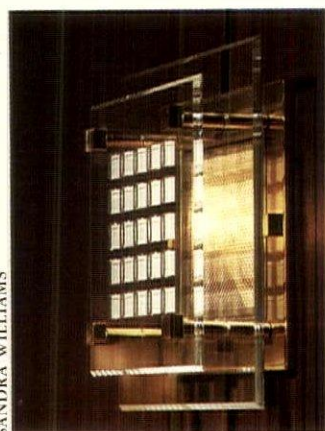
"In the private suites, for example, the lighting is predominantly recessed fluorescent with parabolic louvers. We went through the usual exercise of selecting fixtures for their efficiency as well as brightness control. In the public areas and wherever else it was appropriate, we used incandescent downlighting. When incandescent is used selectively throughout a space — like at the ends of corridors or near the entry of a special room — visually the space can give an appearance of having more incandescent lighting than it really does. On these

floors we deliberately placed it in pathways and grazed the surface of the Brazilian mahogany paneling. The whole place comes to life."

A good example of a space where incandescent lighting is appropriate is the executive dining room. "Image, in the financial field, is very important," notes Helms, "and people in financial institutions are constantly entertaining clients, brokers, and other people. The client wanted a room that would bespeak elegance and a 'chandelier' sort of image." Because of the low ceiling height and the need to constantly reconfigure tables, Lightsource was unable to design something that hung down into the space.

"In order to pick up some of the architectural detailing

that occurred elsewhere on the executive floors, we designed a custom recessed incandescent fixture. It's a boxlike shape, recessed into the ceiling. The inside of it is made of a stainless steel screen that obscures the clear incandescent lamp inside. The stainless steel box produces some very interesting interreflections that are also partially obscured by the screen. Suspended below are three panes of English crystal. The bottommost layer picks up a square dot pattern, which is found elsewhere in the interior millwork and detailing vocabulary on the upper floors. The square patterns are beveled on one side and etched into the other, to give a very interesting dimension and sparkle to the glass. We also used that fixture for



SANDRA WILLIAMS

wall-mounted sconces in some of the circulation spaces, and to create markers at the reception area and in some of the special rooms."

A Custom Philosophy
Helms stresses that his firm's nontraditional approach to having custom fixtures built makes a great contribution to the success of the final product. "We don't engage in tradi-

tional vendor relationships. We go right to the source," he says. "The bowl shapes for the fixtures in the banking hall were spun out of number 8 stainless steel — a difficult operation and an expensive material. Through a source, we located a firm that makes aircraft components and had these parts fabricated there. The bright metal inlaid into the stainless steel is standard bronze section. The reflector package came from another manufacturer, and finally, the whole thing was assembled by someone else.

"We're really active in finding sources, and knowing what's available, because if you give somebody a drawing and you sit back and wait for shop drawings to occur, you're going to get in trouble. The first thing the vendors always ask is to substitute cheaper materials. We've found that we can nearly always get the materials we specify — like solid bronze,



SANDRA WILLIAMS

rather than plate — within our budgets, and we insist upon it. That's one of the reasons our projects look different."

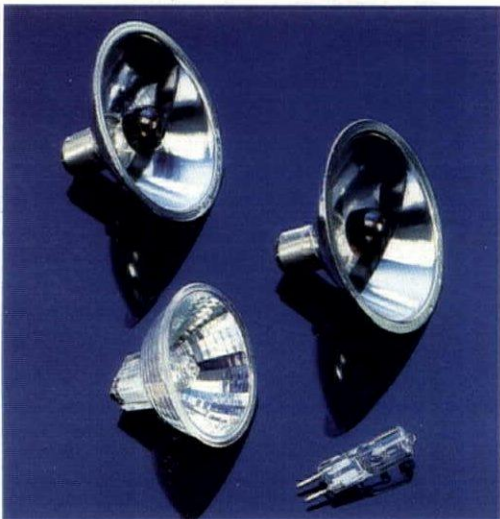
Helms concludes by saying, "I don't want to sound too theoretical about design, because we don't feel that way. We like to think of lighting from the visual angle. Other people like to talk about light in the context of all this number crunching, but we perceive of

the lighting very much as an extension of the architectural and interior design process. It's not something that comes along and tries to do everything on its own." ■

For product information, see the Manufacturer Credits section on page 102.



Mark Darley, Photographer



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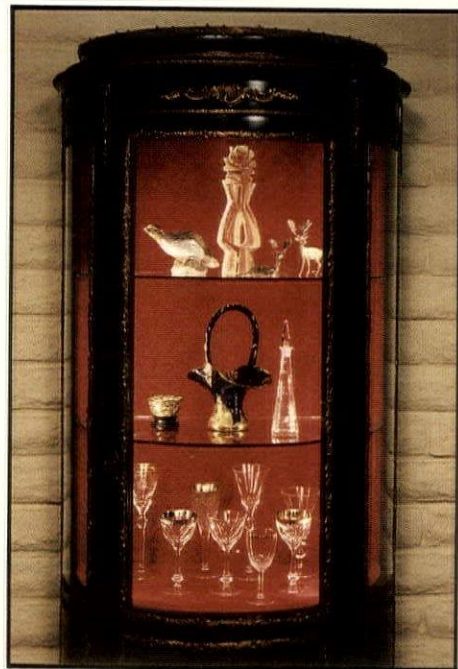
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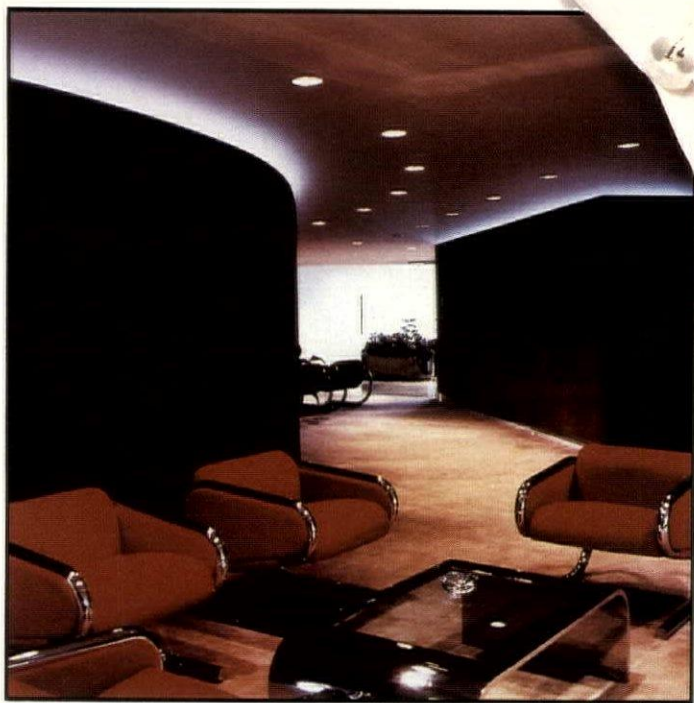
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Surf, sand, and elegant lighting at a world-class resort

The Sheraton Mirage Gold Coast Resort at Surfers Paradise is the only beachfront resort on the Gold Coast, the subtropical capital of Australia's tourist industry. Sun and surf are the primary tourist attractions at the hotel on the northern tip of Surfers Paradise. The eastern side of the site fronts the Pacific Ocean, and the western or entry side faces the Southport Broadwater. The eastward vista from the resort is a seascape bounded on both sides by palm trees. In this direction, guests can watch the sunrise over the ocean, one of the most spectacular sights in this part of the world.

Mirage Resorts, a member of the Qintex Group, opened the international hotel in late 1987. Qintex chairman Christopher Skase held very strong views about the end product of his group and briefed consultants on his expectations: this was to be the finest resort in the world.

The designers sought to fulfill the client's vision by creating an atmosphere of sophistication and relaxation through a blend of architecture, landscape, and seascape. The lighting was designed to enhance an ambience of luxury, privilege, comfort, and superb service for those who can afford one of the most ex-

Tony Douthwaite is an electrical engineer with Norman Disney & Young consulting engineers, Surfers Paradise, Queensland, Australia. Norman Disney & Young has offices throughout Australia, New Zealand, and Kuala Lumpur with a staff of nearly 400. On the Sheraton Mirage Gold Coast project, the company provided services engineers for air conditioning, electrical, elevators, fire services, communications, and building automation.

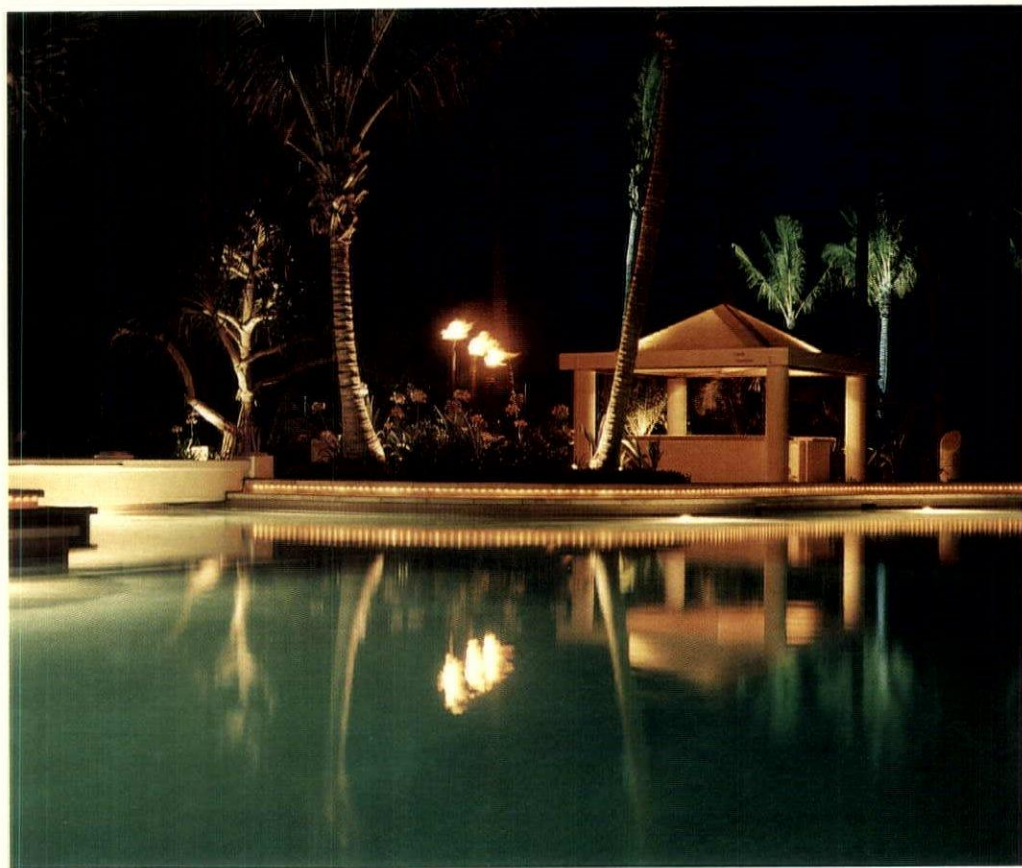
pensive hotels in the area. At the same time, the designers took care to avoid letting electrical lighting infringe upon the view hotel guests expect to enjoy.

The design intent throughout the central hotel facilities was to illuminate each space effectively using the ceiling as the light source, to create a feeling of spaciousness and eliminate the need for pendant fixtures that would interrupt the seascape vista. For uninterrupted viewing of the same vista in the evening, the facility required an accurate, efficient dimming system — not only for incandescent fixtures, but also for many fluorescent systems. To complete the picture, exterior lighting illuminates landscape features at night.

Lighting Concepts

The formal ceiling system that is the source of the light is immediately evident as one enters the main reception area from the porte cochere. It continues, with variations, throughout the hotel. Moods and ambience within each area change with the type of lamps used, and their configuration within the coffered grids.

Lighting scene control centers individually control all areas in the central facilities building. Generally, each area has an incandescent zone, a low-voltage zone, and a fluorescent zone, all programmed to four preset levels. The 2700K triphosphor lamps have a color rendering index of 82; we chose them for their color rendering properties, an important design criterion for



Flaming torches and low-voltage lighting surround the swimming pool.

Project: Sheraton Mirage Gold Coast

Location: Gold Coast, Australia

Client: Mirage Resorts Trusts

Project Manager: Qintex Group Management

Architect: Media Five; Desmond K. Brooks, managing director

Electrical Engineer: Norman Disney & Young; Don Miller, manager, Gold Coast office; Tony Douthwaite, project electrical and lighting engineer

Photos: Rik Hamilton



Main lobby ceiling shows the grid system of recessed fluorescent and incandescent lighting.

the interior designer. At a design development meeting, we found it worthwhile to light the sample boards with these lamps to give the interior designers an idea of the final appearance of the finishes.

The Entrance Level

The porte cochere, the western facade's central feature, draws attention to the resort's main entrance area on Level Two. The effect is particularly dramatic when the area is brightly illuminated at night. The soffit of the porte cochere is divided into coffered, and each coffer has a series of exposed incandescent ball lamps evenly spaced on its vertical face.

From the porte cochere, the ceiling system for the entire central facilities building begins to unfold. In the main lobby, a solid grid arrangement conceals a continuous fluorescent system in a series of six large coffered. Two concentric squares of lamps illuminate each panel. All lamps are dimmable to 1 percent output with a high-frequency control system.

At two corner points in each panel, recessed low-voltage profile spots define shapes and create shadows

from interior plants at floor level. For flexibility, dimming and zoning for the spots is separate from that for the fluorescent system. In the center of each panel, a system of recessed, low-voltage downlights, also dimmed and zoned separately, provides interest at floor level.

To the right of this welcoming area is the Breakers Cocktail Bar, a space treated to provide a feeling of festivity and sophistication. The ceiling continues the grid arrangement established in the lobby, but with more subtle lower light levels to suit the mood of a cocktail bar. Low-voltage tube lights are recessed into the underside of the grid, and a single square of fluorescents lights the panel above the grid. Over the bar, low-voltage tungsten halogen downlights are mounted over glass racks to provide sparkle, and a series of apertures cast into the floor slab accept fixtures that uplight the bar's marble face.

Also on the entry level, to the left of the main lobby, the Horizons Restaurant offers dining of an international caliber. The coffered fluores-



In the Breakers Cocktail Bar, low-voltage tube lighting highlights the ceiling grid.

cent arrangement continues with a series of ceiling panels similar to those in the Breakers Bar. Recessed low-voltage eyeball-type downlights — 16 in each panel — light the tables below. The adjustable fixtures allow for rearranging tables and seating and give flexibility for aiming on or around tables, as each arrangement dictates.

Low-voltage recessed profile spots are placed at the corners of each panel to illuminate art pieces in the restaurant. These fixtures can tilt and rotate, accommodating changing placement of art objects.

Level One

To reach the Grand Terrace (a foyer outside the ballroom) and the coffee shop, guests descend to Level One down the grand staircase from Level Two, the entrance level. In both the Grand Terrace and the coffee shop, the grid system is more complex; a lattice is suspended from the structure above, with a cross-sectional area smaller than the grids on Level Two. Fluorescent lamps within the lattice grid uplight the ceiling above, thus indirectly lighting the space below. The grid here was de-

signed by the architects to accept a single-lamp fluorescent strip in both directions.

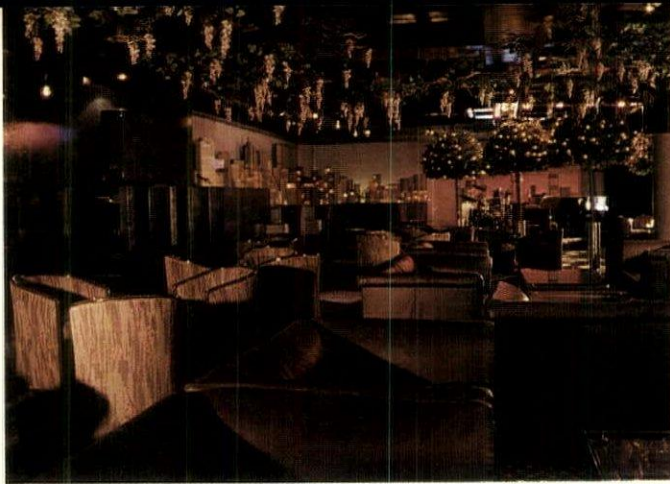
The interior designer used colored fabric pyramids to break up the grid system in these spaces. At the apex of each pyramid, a 100-watt incandescent ball lamp creates a glowing effect within the shape.

In all of the central areas, in conjunction with the architects and interior designers, we provided concealed lighting for fixed items, such as bars and reception counters. Most of the backlighting is done with low-voltage tungsten halogen downlights.

The Ballroom

The Sheraton Mirage ballroom may be the most flexible facility of its kind in Australia. It consists of nine enormous bays, each of which has a major coffer with a central chandelier. Pockets in the beams between the coffers can receive various types of lighting, including theatrical and display lighting. At either end of each pocket is a position for a low-brightness recessed downlight.

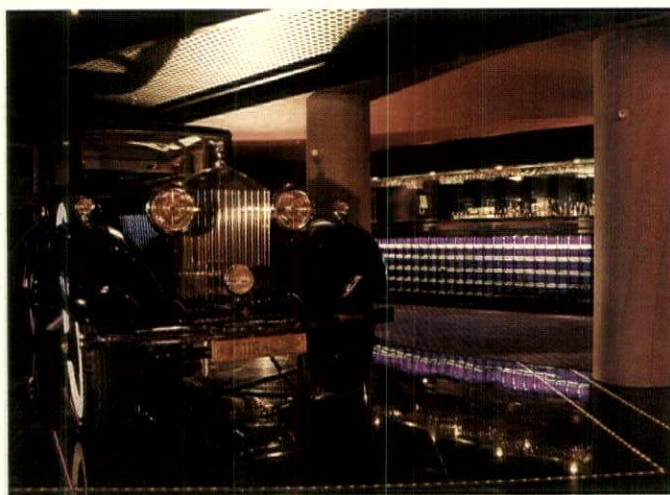
On the side walls in the



Low-voltage downlighting helps to create an intimate mood at Rolls Supper Club.



Two of the ballroom's nine enormous bays, partitioned off to form a room with its own independently controlled lighting.



A vintage Rolls Royce is namesake of the hotel's exclusive nightclub.

paneling, low-voltage tube lights backlight arrangements of vertical luminous material, similar to Japanese wall screening. Between these are luminous opalescent glass sconces. Above, small, backlit opal fixtures form a frieze, creating an effect similar to large dentils found in ancient Greek buildings.

The entire ballroom can be divided into five separate "rooms." In each, the user can take command of the lighting, sound, and all other available functions as if he or she were using the whole ballroom. The complete lighting system can function in each space, no matter how it is broken up. A centralized ballroom light dimming system accomplishes this by providing complete, independent lighting control to each partitioned area.

Seven ballroom control panels (BCPs) are on the ballroom walls; each is programmed for four preset illumination levels and three zones: chan-

deliers, recessed downlights, and wall sconces. From the main panel in a sound and light control booth, technical staff members can assign control to any BCP in the space; the BCP, in turn, can operate the lighting for the entire ballroom or any of the rooms partitioned off in it.

The ballroom also has a separate, comprehensive stage lighting system that has 36 fixed bars built into a recessed ceiling grid. Eight separate outlets are available at each bar; all outlets are patched onto professional stage lighting dimmers. Technicians can control these dimmers with a portable 36-channel lighting desk from any one of the three control booths, seven BCPs, or nine floor patch panels.

Further, two major performance areas are equipped with remote-controlled electric hoists that have nearly 4½ tons of load capacity, to which

stage light and sound grids may be attached. Up to 36 stage lighting channels can be separately controlled in the performance areas.

Rolls Supper Club

The Rolls Supper Club differs in character from every other space in the resort. The nightclub is completely enclosed with no outward view. Patrons reach it through a single exterior entrance or a specific staircase from the main entry level.

The client emphasized that this club was not to be a flashy discotheque; rather it was to have the atmosphere of a 1920s speakeasy. Jazz trios perform here, allowing patrons to enjoy conversation while downing expensive drinks.

Upon entering the club, one sees a vintage Rolls Royce parked in a back-street scene. Two walls of the club are treated with scale models of a Manhattan skyline, backlit by dimmed neon that can create the effect of different times of day, from sunset to sunrise. The models have windows cut into them, and each individual building has a series of lamps to create a nighttime effect of randomly lit windows in a typical high-rise building.

Ambient lighting for the space is provided by recessed low-voltage downlights and about 36 low-voltage profile spots. The downlights are controlled and dimmed by a control station with four preset levels; the profile spots are not dimmed. Consequently, when the downlights are at low levels, the beams from profile spots are accentuated, showing various geometric shapes at floor level.

A suspended grid over the dance floor supports a series of pink and blue linear incandescent lamps and low-voltage PAR 36 fan lights. An electronic matrix control system synchronizes four groups of fan lights mounted in the grid, activating the motion of sharp beams of light that traverse the dance floor. In keeping with the design concept, no further disco lighting systems are included.

Exterior Lighting

The landscape lighting had to be intense enough to illuminate the canopies of palms and other foliage planted around the complex, although the overall effect sought was subtle exterior lighting. Cast aluminum fixtures uplift the palm trees with low-voltage 50-watt dichroic lamps.

All the walkways are illuminated subtly, but sufficiently, and provide a path for guests from the hotel suites to the central facilities building. Low-voltage tube lights on the underside of low rails define bridges and over-water walkways.

Low-voltage tube lighting also outlines the swimming pool. The fabric roof of a pool attendant's hut is uplift by simple PAR 38 fixtures in each corner. Dramatic gas-fired flaming torches are scattered throughout the landscaping.

For product information, see the Manufacturer Credits section on page 102.

Project: Headquarters, Real Estate and Construction Division, IBM, Stamford CT
Interior Architect: HOK, Dallas
Lighting Design: Ralph Savarese, IBM, Stamford
Lighting: 10' x 3 3/8" Rounded Softshine Indirect Small Office Light by Peerless



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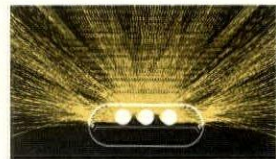
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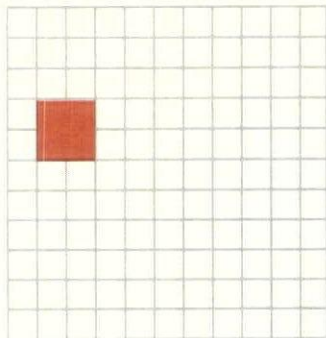
If you'd like to see the Small Office Fixture installed in an actual office, write on your letterhead to Peerless Lighting, Box 2556, Berkeley CA 94702-0552. (415) 845-2760.

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Lighting Graphics

Intermediate hues and tints of colored light can be obtained by two different and separate methods of mixing colors. Both methods can create all colors in the visible light spectrum, but the techniques for producing the colors are exactly opposite.

In the *additive* method of color mixing, the three primary colors of light — red, green, and blue — are combined equally to produce white light or mixed in unequal quantities to produce all the intermediate hues and tints of color. The accompanying additive color mixing diagram can be used to determine the approximate mixtures needed to create specific colors. Violet, for example, is a mixture of 100 percent blue and 50 percent red. A redder violet can be obtained by mixing 100 percent blue with 75 percent red.



Color mixing of light

Sam Mills, AIA, IES

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

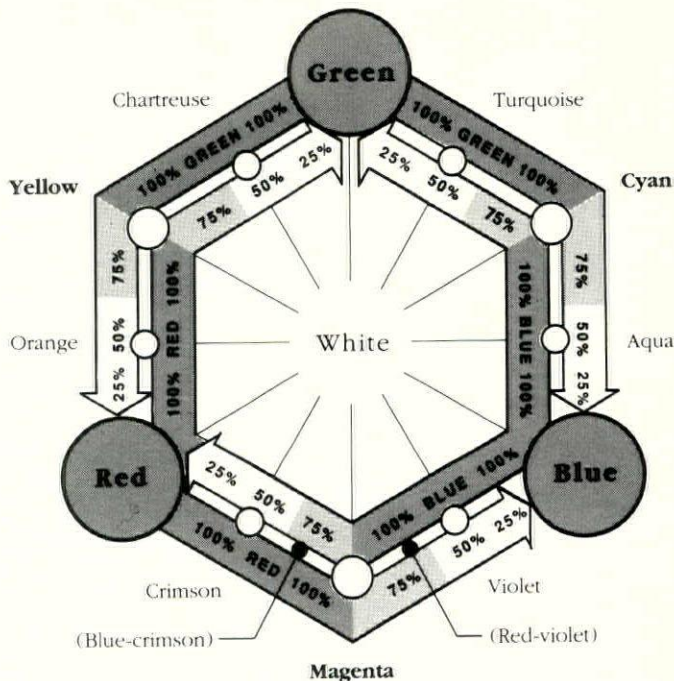
Mixing primary colors in unequal parts produces intermediate colors and tints.

In additive color mixing, the primary colors — red, green, and blue — are typically supplied by colored incandescent and fluorescent lamps. These sources differ widely in the efficiency of their light output due to the filtering techniques used to create the color. This is important to people who are mixing specific quantities of colored light. For example, it would take 25 red fluorescent lamps to equal the output of one green fluorescent lamp (the relative output of color lamps was charted in the January 1988 Lighting Graphics column). It is possible to get more saturated

primary colors by using highly selective filters.

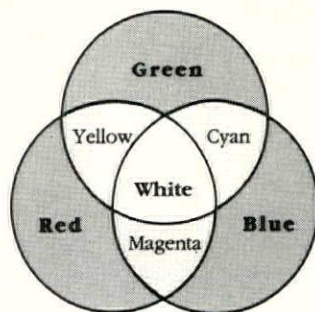
Mixing adjacent hues — those around the perimeter of the color mixing diagram — produces all the intermediate colors. For example, mixing 100 percent red and 50 percent green produces orange. Mixing complementary colors — those directly across from each other on the diagram — produces white light.

The second method of color mixing, *subtractive* color mixing, is accomplished by passing white light through absorption filters to remove different wavelengths or colors. The secondary colors of additive color mixing — yellow, cyan, and magenta — now become the *primary* colors for subtractive color mixing. Removing portions of these colors (filtering) produces all the other colors.

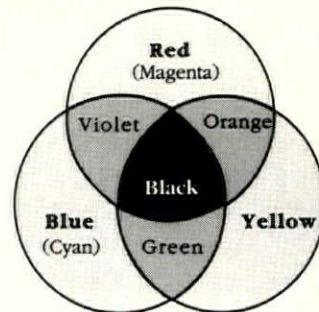


Additive color mixing diagram

The result of mixing different colors of light can be approximately determined with the color mixing diagram shown above. For example, a mixture of 100 percent red light and 75 percent blue light produces blue-crimson (or red-magenta) light; 100 percent blue and 75 percent red furnishes red-violet (or blue-magenta).



Additive primaries



Subtractive primaries

Ultimately, filtering can remove all colors and result in the total absence of light. The resulting darkness is similar to the black produced by mixing color dyes and pigments — with the primary colors iden-

tified as red, yellow, and blue. The accompanying diagrams graphically present the difference between additive and subtractive color mixing. ■

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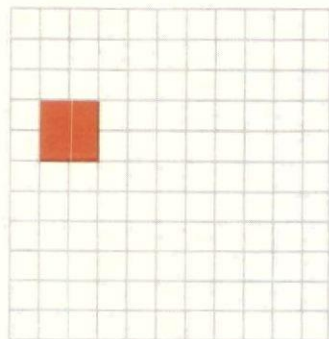
The Lighting Design Professional

Different electric light sources produce different colors of "white" light. Architects, designers, and engineers are responsible for specifying these subtle tints as part of their lighting design work. Most are aware of the perceivable difference between "cool" and "warm" lamps, but considering the major revolution in light source color since 1975, many specifiers' knowledge of color and color rendering is obsolete.

The color revolution began with Westinghouse (now Philips) Ultralume fluorescent lamps, introduced in 1976. These were the first high-efficiency, high color rendering fluorescent lamps. Unfortunately, the high cost of their rare-earth phosphors made their cost prohibitive for all but the most demanding situations. Specifiers continued writing "F40CW" and "F40WW" in deference to their clients' pocketbooks.

The double-coated lamp, known as the SP, SPEC, or Designer series, was developed next, and it solved the cost problem. A thick coat of conventional halophosphor, such as used for warm white or cool white, produces most of the light, but a thin coat of the expensive rare-earth phosphors improves lamp color rendition tremendously for a tolerable increase in cost. These lamps can be used in almost every application and eliminate the often-encountered concern over fluorescent color.

The color revolution continued with several other major developments: compact fluorescent lamps, most offered in rare-earth phosphors only; compact, high color rendering metal halide lamps; and higher color temperature, improved color rendering high pressure sodium lamps. The accompanying table lists color temperature or correlated color temperature



Matching electric light sources

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 the ASID, IBD, and AHLI.

(CCT), color rendering index (CRI), and one distributor's typical unit price for a wide selection of architectural interior light sources. The unit price gives designers an idea of how little or how great the cost of specific different colors of lamps may be.

Matching White to White

Contemporary designers must combine a variety of lamps to design energy-efficient lighting systems — especially in states, such as California, that have restrictive energy codes. Unfortunately, the wide choice of different sources makes it difficult to ensure a well-matched design that flows easily from source to source.

One approach is to use all exactly matching light sources in one space. This is fairly difficult to do; very few exact

matches are available — mostly between incandescent or quartz lamps and a few of the better 3000K fluorescent lamps.

More commonly, a practical design presents a smoothly, evenly flowing rendition of color. This seems to occur when the appropriate base (ambient), set at the selected color temperature, flows into highlights (tasks) that are slightly whiter, clearer, and brighter. Obviously, this means it is desirable to have a higher color temperature and higher CRI source for task lights than for ambient light. The effect is best if the difference between the sources is subtle; wide differences result in an unreal appearance.

Because humans have traditionally used daylight plus another source, such as candlelight or electric light, we are culturally accustomed to seeing two dissimilar sources of white light concurrently. One of these sources, however, is usually natural daylight, so many designers desire to match all electric sources as closely as possible. Three guidelines will help.

First, match the color temperature of all electric sources. Either the sources should have approximately the same color temperature (within 300K), or there should be a natural progression from a lower ambient to a higher task color temperature, not exceeding about 1000K in range.

Second, match the sources in apparent whiteness. If color rendering properties are reason-

ably similar, the light coloration will look similar when the beams are viewed simultaneously on a white wall. Be especially wary of lamps that purportedly match in temperature and CRI; one, for example, may still appear greenish compared with the other.

Third, conceal small differences between adjacent sources. Use high-quality, well-shielded fixtures, and carefully prevent different sources from shining on the same surface.

Setting a Mood

Choice of color temperature establishes a thermal mood in a space. Research at Kansas State University in the late 1970s documented that the coloration of white light, combined with interior finishes, could change perceptions of thermal comfort. Warm lamps and earth tones effected a perceived difference of 2 degrees Fahrenheit when compared with cool lamps and cool pastels.

A classic, long-standing lighting design philosophy calls for higher color temperatures with higher illumination levels. This mimics the natural progression of daylight color temperature, which falls dramatically as the sun sets. Thus, picking a color temperature, in some aspects, reflects the time of day and activity level that the designer wants the interior environment to feel like.

The most commonly found commercial and institutional

Photographers, take heed!

The color revolution is based heavily on the primary color theory of light (see Lighting Graphics column, October 1987-January 1988). Photographic films and human eyes react very differently. Even though the recommended source combinations may look good to an observer, they require filtration to appear matched on film. Multiple exposures, each with the proper filter for the light source, are still recommended for architectural photography. □



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Architectural interior electric light sources

Source	Color Temperature or CCT	CRI	Unit Price*
Incandescent and tungsten halogen			
Incandescent	2800K	100	\$ 0.87 (90W A)
Light blue incandescent	4000K	100	—
Daylight incandescent	5000K	100	4.05 (100W A)
Tungsten halogen (T.H.)	3100K	100	4.38 (90W A)
T.H. w/light blue filter	4000K	100	—
T.H. w/blue filter	5000K	100	—
Fluorescent			
SPX/D8/U 30	3000K	80-85	\$ 16.63
SPX/D8/U 35	3500K	80-85	17.12
SP/D/SPEC 41	4100K	70-75	4.50
SP/D/SPEC 50	5000K	70-75	6.26
IF (incandescent fluorescent)**	2700K	92	8.16
WWX (warm white deluxe)**	2800K	77	4.50
WW (warm white)	2900K	50	3.32
FL/N (natural)**	3450K	77	6.26
FL/W (white)	3450K	55	4.11
CWX (cool white deluxe)**	4100K	87	4.50
CW (cool white)	4100K	56	2.52
LW (lite white)	4100K	49	4.11
C50 (Chroma 50, etc.)**	5000K	91	6.26
VL (Luxor Vitalight)**	5500K	91	—
FL/D (daylight)	6500K	56	3.75
High intensity discharge (HID)			
HPS/DX (high pressure sodium deluxe)	2200K	65	\$ 52.84 (70W)
MH (conventional clear metal halide)	4200K	65	44.20 (175W)
MH/C (conventional coated metal halide)	3900K	70	47.33 (175W)
MH/MXR/100 (American clear 3K M.H.)	3100K	65	59.83 (175W)
MH/3K/SP30 (American coated 3K M.H.)	3000K	70	49.09 (175W)
MH/WDL (European warm clear M.H.)	3000K	85	76.00 (150W)
MH/1000 (American 1000W M.H.)	3400K	65	135.03
MH/NDL (European neutral clear M.H.)	4100K	85	76.00 (150W)
MH/D (European daylight clear M.H.)	5500K	92	82.00 (250W)
MV/N (Philips mercury vapor Styletone)	3100K	65	63.21 (250W)

*Unit prices to end user, for comparison purposes only. All fluorescent lamp prices are for standard F40T12 lamps. Source: Horizon Lighting, San Francisco.

**Reduced lumen output fluorescent lamps, as compared to standard cool white.

environments are cool (4100K), a direct result of the use of cool white fluorescent and cool-colored HID light sources. Their popularity was in turn caused by the high lighting levels of the 1960s. Today,

cool environments are still recommended for active work areas with high lighting levels (over 100 footcandles), such as labs, electronics assembly areas, and medical settings.

In contrast, the most com-

monly requested environments are warm. These are created by incandescent-colored sources of about 3000K and are preferred for lower light level spaces, such as residences, hotels, restaurants, and similar

comfortable interior spaces.

Intermediate environments (3500K) combine some of the best qualities of both warm and cool. They are warmish and friendly, yet have a certain clarity and crispness not found in warm environments. Intermediate environments have become much more desirable since the energy crisis of the 1970s. Recommended lighting levels have dropped, making warmer coloration more appropriate. Intermediate environments work well in offices, schools, stores, hospitals, and many other fluorescent lighting situations.

Very warm environments (2500K) are effective for nighttime spaces with extremely low light levels, where the reddish-orange setting sunlight is mimicked. Good applications range from parking garages to bars and restaurants.

Bluish-white light at 5000K and over creates cold environments — excellent for precision spaces with high light levels, such as art studios, paint laboratories, and similar applications. For most interior spaces, however, the light is considered too cold. This is the primary problem with the indiscriminate use of so-called "full-spectrum" fluorescent lamps.

Determining Light Color Quality

To take full advantage of the color revolution, select light sources according to the type of application and the amount the client is willing to spend. The accompanying table shows well-matched source combinations for various color temperature environments at three levels of quality.

Excellent quality is preferred for residences, boutiques, five-star hotels, and similar facilities where the quality of the environment is paramount. These designs use very high color rendering sources throughout. Task and

Well-matched electric lamps for specific settings

Color Temperature	Application	Quality		
		Excellent	Very Good	Good
Very Warm (2500K)	Ambient and general	Gaslight Candlelight Incandescent	HPS/DX	HPS/DX
	Task	Incandescent	SPX/D8/U30 SPX27/27K IF Incandescent	SP/D/SPEC30 SPX27/27K WWX Incandescent
Warm (3000K)	Ambient and general	SPX/D8/U30 SPX27/27K IF MH/WDL	SP/D/SPEC30 WWX MH/3K/SP30 SPX27/27K	WW SPX27/27K MH/MXR/100
	Task	Incandescent Tungsten halogen (T.H.)	SPX/D8/U30 SPX27/27K MH/WDL IF Incandescent T.H.	SP/D/SPEC30 SPX27/27K WWX Incandescent T.H.
Intermediate (3500K)	Ambient and general	SPX/D8/U35 SPX35/35K FL/N	SP/D/SPEC35 SPXB5/35K MH/1000W	FL/W SPX35/35K
	Task	T.H., optional very light blue filter Light blue incandescent Lt. blue incandescent	SPX/D8/U35 SPX35/35K FL/N T.H., light blue filter T.H., lt. blue filter	SP/D/SPEC35 FL/N SPX35/35K Light blue incandescent
Cool (4100K)	Ambient and general	SPX/D8/U41 SPX41/41K CWX MH/NDL	SP/D/SPEC41 SPX41/41K MH/C	CW LW MH
	Task	T.H., blue filter Daylight incandescent	SPX/D8/U41 SPX41/41K MH/NDL CWX T.H., blue filter Daylight incandescent	SP/D/SPEC41 SPX41/41K T.H., blue filter Daylight incandescent
Cold (5000K)	Ambient and general	U50 C50 VL	MH/D	FL/D
	Task	T.H., blue filter	T.H., blue filter	T.H., blue filter

display lighting is almost always some form of incandescent, and ambient lighting is primarily rare-earth triphosphor or deluxe conventional fluorescent. Compact fluorescent lamps can be used for many situations.

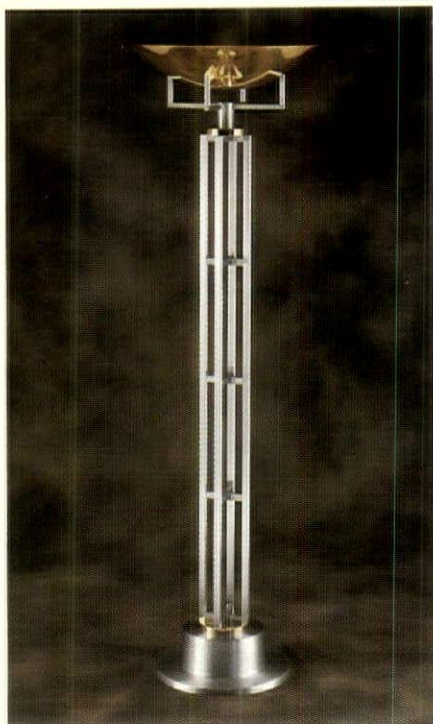
Very good quality combinations are the general purpose sources for use today. These sources work well in offices, stores, schools, hospitals, and many, many other situations. Use them wherever a healthy rendition of skin tone is desirable. Because of the cost-effectiveness of most sources in this category, these combinations generally give the best cost-benefit to the owner.

Choose lamp combinations to fit the type of space and the client's budget.

Although good quality source combinations fail to take full advantage of the color revolution, they do offer an acceptable alternative for the budget-conscious or stubborn client. Good applications include budget and hardware stores, service facilities, and similar locations where color rendition is fairly insignificant.

Poorer quality source combinations are not recommended for interiors because they create dingy or eerie spaces. Probably the worst sources to use, especially as general light, are mercury vapor (except Philips Styletone) and high pressure sodium (except deluxe). These lamps were designed for exterior and industrial use, and that is where they belong! ■

Product Showcase



■ Torchere

The Orion torchere is the first in a new product line from Visa Lighting; it is 72 inches high and has a 22-inch-diameter bowl. Finish options include a brushed aluminum structure and bowl; a painted structure with a brushed aluminum, polished solid brass, or chrome bowl; and both structure and bowl painted in one of a variety of custom finishes. The torchere accommodates an incandescent, fluorescent, quartz halogen, or metal halide lamp. Visa Lighting Corporation, Milwaukee, WI.

Circle 100



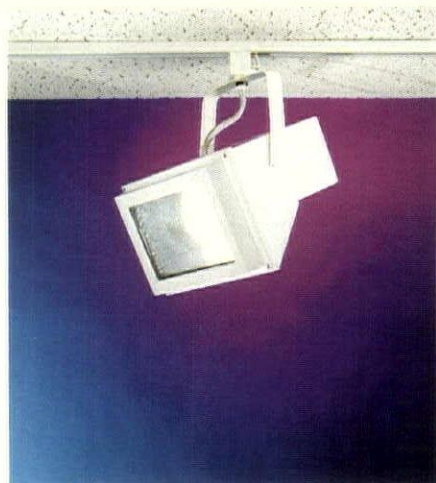
■ Exit, general purpose lighting

Kenall Manufacturing's Exilume serves as both a UL-listed exit sign and a general lighting fixture. The fixture's two standard 40-watt T12 lamps provide enough general illumination to eliminate the need for an extra fixture at the point of

egress. An optional self-contained battery pack provides a lighting level that meets building code requirements for a minimum of 90 minutes of emergency illumination in the event of a power failure.

The fixture's high-strength design includes a wraparound, injection-molded polycarbonate diffuser with clips for surface conduit applications. An optional mounting adapter enables the fixture to be used in wet locations. The luminaire is suitable for applications in schools, parking structures, gymnasiums, public assembly areas, and tunnels. Kenall Manufacturing Company, Chicago, IL.

Circle 101

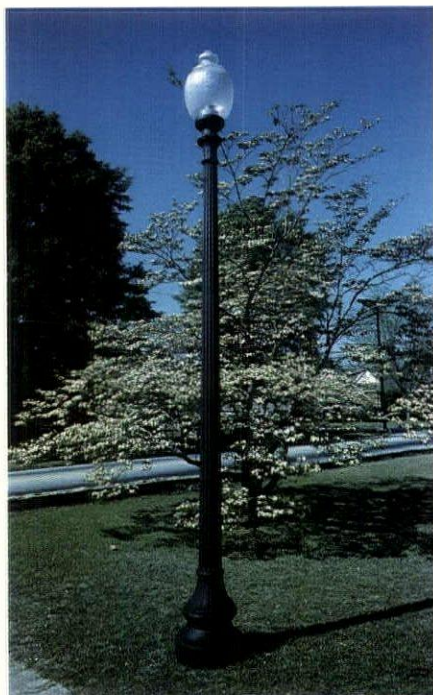


■ Metal halide track head

Gim Metal Products offers a track head for the 70-watt Osram HQI lamp. The UL-listed fixture provides excellent color rendition and cuts the cost of lighting and related air conditioning by over 50 percent, according to the manufacturer.

The fixture mounts to most track adapters on existing or new track systems. Optional barn doors are available for light control and cutoff. The unassembled fixture is sold for OEM use with all necessary hardware; ballasts and lamps must be purchased separately. Gim Metal Products, Carle Place, NY.

Circle 103

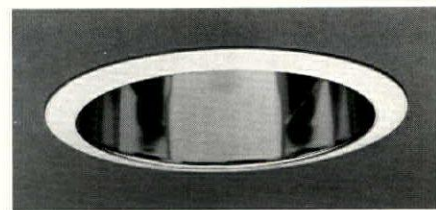


■ Decorative light poles

Shakespeare's Presidential Series decorative light poles are made of fiber glass, which requires little maintenance and resists rust and corrosion. Color is impregnated in the pole wall, and a polyurethane topcoat increases durability.

The poles are available with a traditional anchor base or a direct burial post that reduces installation costs by eliminating the need for anchor bolts and a concrete foundation. They are available in heights of 9½, 12, and 14½ feet. Shakespeare, Newberry, SC.

Circle 102



■ Recessed HID fixture

Trakliting offers the R7 economy series of recessed ceiling fixtures for HID sources. They can accommodate mercury lamps of 75 and 100 watts, high pressure sodium lamps from 50 to 100 watts, and metal halide lamps of 70 and 100 watts. A full variety of trims, baffles, Alzak reflectors, and lenses are available as accessories. Trakliting, Inc., City of Industry, CA.

Circle 104



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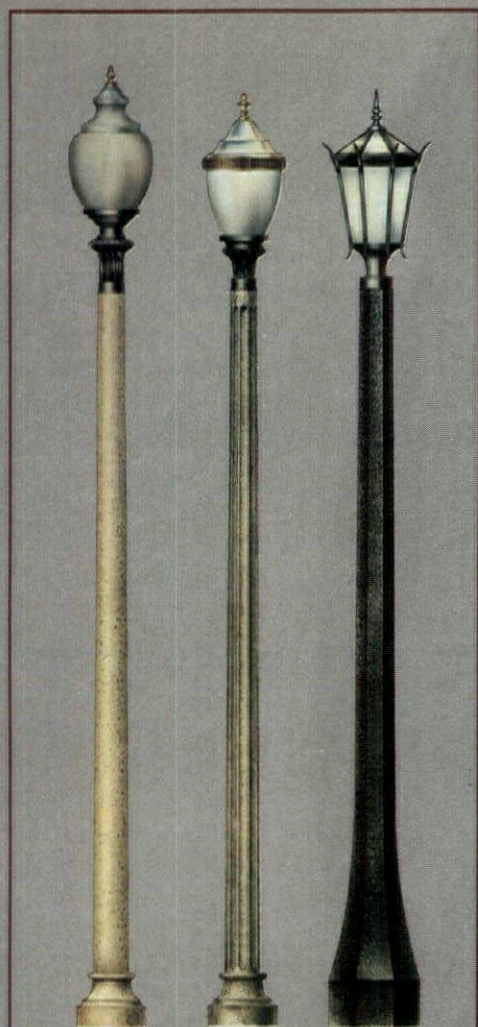
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Circle 27



1901

1902

1903

Victorian

1900 COLLECTION

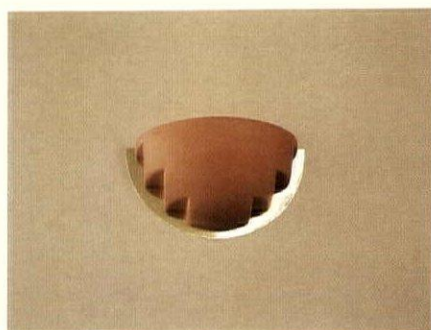
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■ **Decorative wall sconce**

ELA offers a collection of ceramic wall sconces in five different styles, including the Southwestern model shown, which comes in nine colors. Sconces are available in two sizes with one or two medium-base incandescent porcelain sockets. All styles and sizes can be converted to accommodate compact twin-tube fluorescent lamps. The wall sconces are available with or without a metal back trim; custom finishes can be ordered. Environmental Lighting for Architecture, Inc., City of Industry, CA.

Circle 106



■ **Sanitary fixtures**

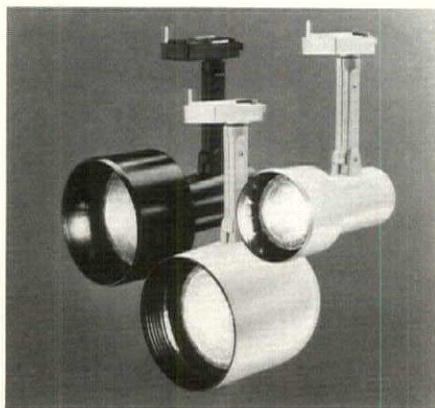
Paramount Industries features lighting fixtures in three categories approved by the National Sanitation Foundation: food zones, splash zones, and nonfood zones. The NSF helps develop standards and criteria for areas of food preparation and processing, pharmaceutical manufacturing, laboratories, and clean rooms. Several NSF-approved lines of fluorescent lighting are available for safe application in such areas. Paramount Industries, Inc., Crosswell, MI.

Circle 107

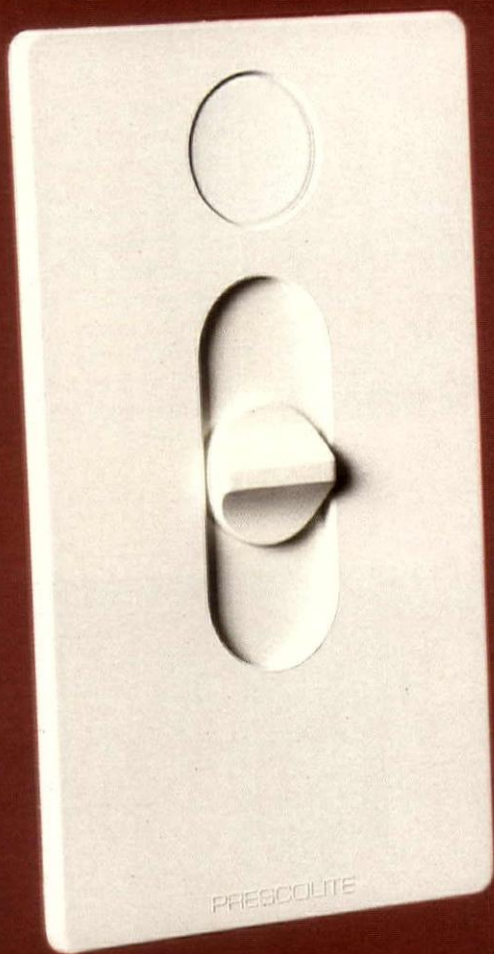
■ **Beam spots**

Inlite offers low-profile beam spots for 120-volt PAR 20 and PAR 30 tungsten reflector lamps. These fixtures complement the company's 3000 Series two-circuit track light system and matching canopy-mount versions that can be installed on ceiling or wall outlet boxes. The adjustable beam spots are available in the three styles shown. The model on the left comes in white, black, white with chrome, and black with chrome; the other two come in black and white. Inlite Corporation, Berkeley, CA.

Circle 105



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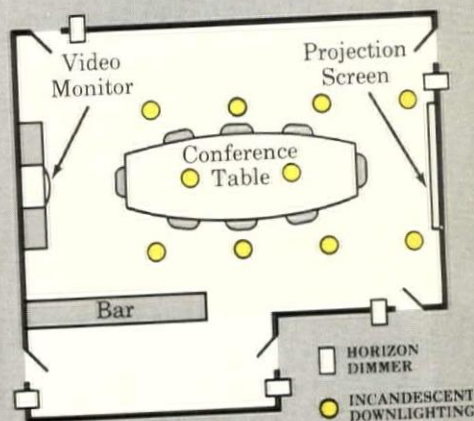
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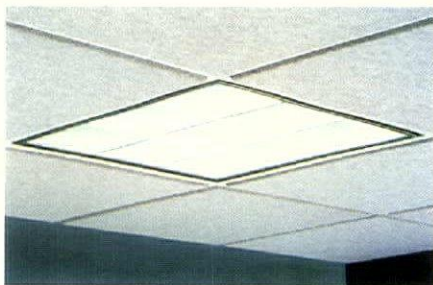


■ **Custom brass fixture**

This brass accent lighting fixture is an example of TrimbleHouse's custom luminaire manufacturing. It was custom designed and manufactured for the atrium balcony of the Ravinia Office Complex. The fixture encircles the balcony and illuminates foliage in planters. It is mounted on brass stems that are secured to the building's I-

beams. A cutoff reflector system directs light from the fluorescent sources down towards the planters. The flexible design accommodates multiple fixture configurations. TrimbleHouse Corporation, Norcross, GA.

Circle 108



■ **Parabolic troffer**

The 9030 series Tri-Par troffer from Globe Illumination supports three GTE/Sylvania Octron Curvalume or GE Biax fluorescent lamps. The luminaire's housing is of die-embossed, code-gauge steel. The 2-foot-square luminaire has contoured parabolic lamp compartments and a nine-cell louver of preanodized semispecular aluminum. Self-aligning, spring-loaded trigger latches and heavy-gauge steel hook hinges allow users to open the louver from either side for easy maintenance. The troffer's design is compatible with most standard ceiling systems; it is recommended for CRT and merchandising areas and can be ordered with or without lamps. Globe Illumination Company, Gardena, CA.

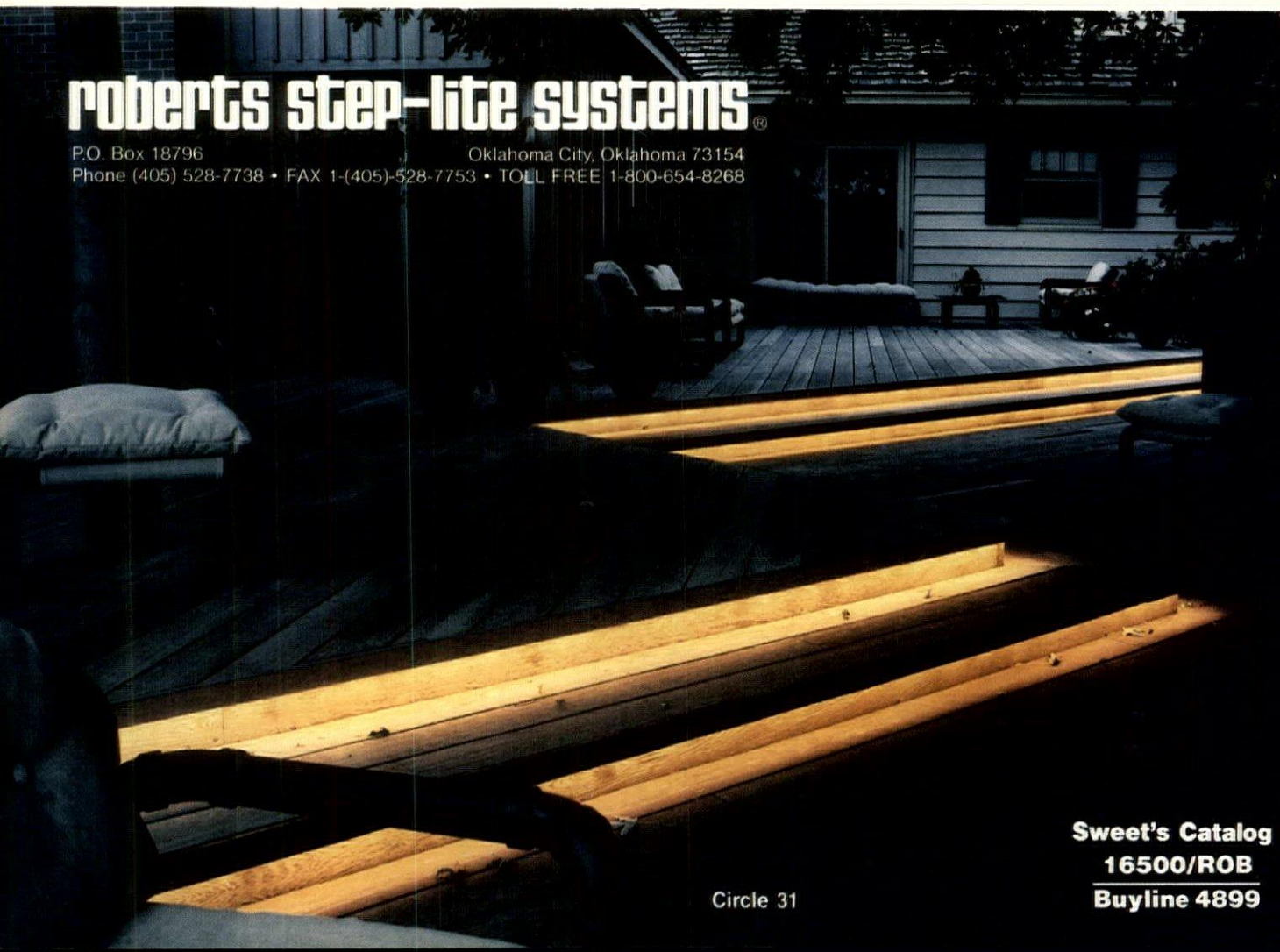
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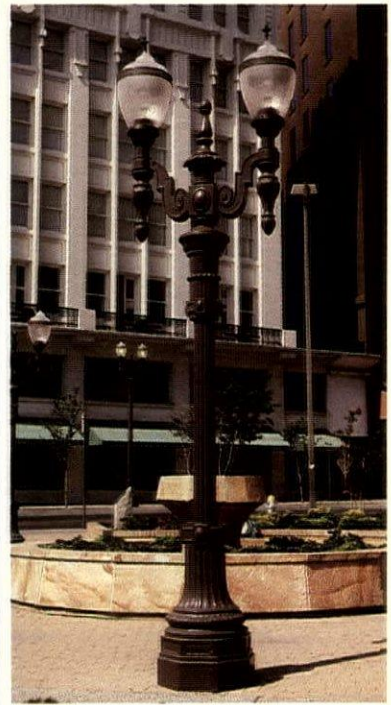
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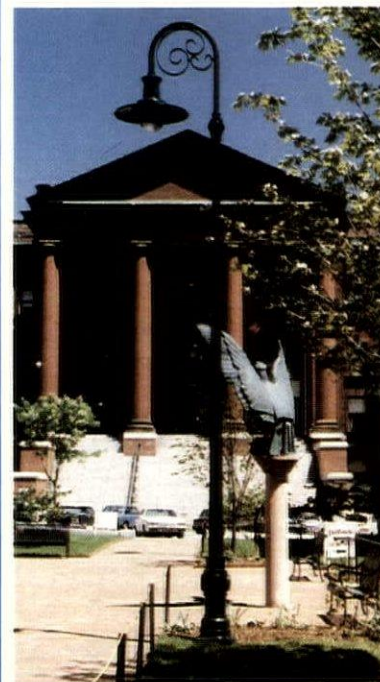
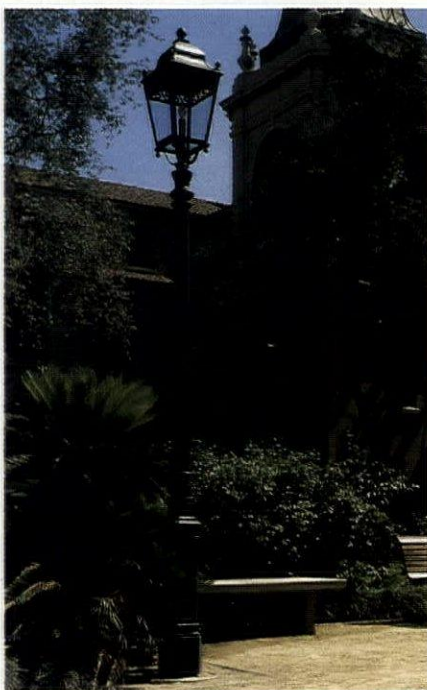
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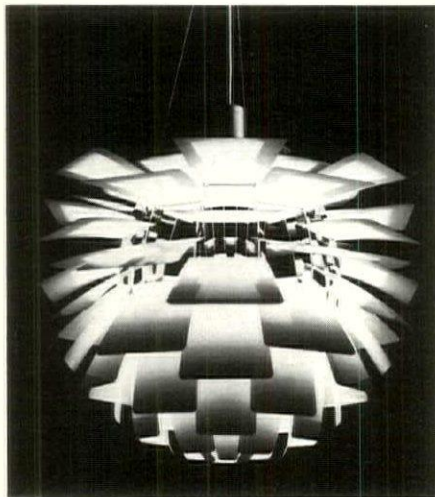


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base. Modified
Manchester
luminaire.

PASADENA POST, City Hall, Pasadena, CA.
9' 6¼" high excluding luminaire. 9" octagonal base.



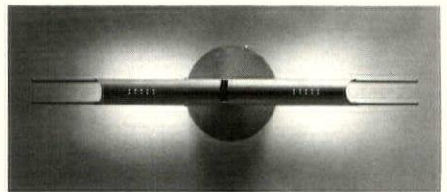
■ **Pendant luminaire**

Poulsen Lighting's PH Artichoke, designed by Poul Henningsen, features overlapping

reflecting panels of lacquered heavy-gauge pure copper or aluminum finished in baked white gloss enamel. Vertical chromated brass struts and a connecting base support the panels; a chrome-plated interior collar conceals the electrical assembly.

The pendant comes in three sizes: 18½ inches high by 23½ inches in diameter, 25 inches high by just over 28 inches in diameter, and 27 inches high by 33 inches in diameter. Its mounting assembly consists of three stainless steel aircraft cables, a white cone-shaped ceiling canopy, and a mounting bar. The luminaire accepts an incandescent lamp up to 500 watts; a PS35 clear lamp is recommended. Poulsen Lighting, Miami, FL.

Circle 110

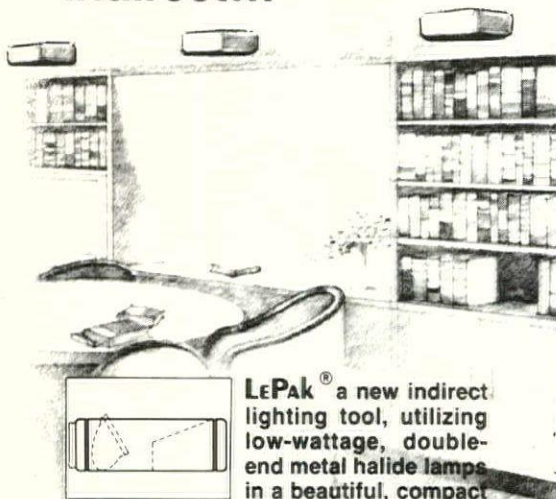


■ **Wall lamp**

Koch + Lowy's Copernicus P/W-73 wall lamp was designed by Piotr Sierakowski. It is 32 inches long, 2 inches wide, and 5 inches deep and can be mounted vertically or horizontally. One version is for direct wall mounting; one has a cord and plug and a high-low switch on the backplate. The lamp is available in black and matte aluminum finishes. It accommodates two 60-watt T lamps or two 13-watt compact fluorescent lamps. Koch + Lowy, New York, NY.

Circle 111

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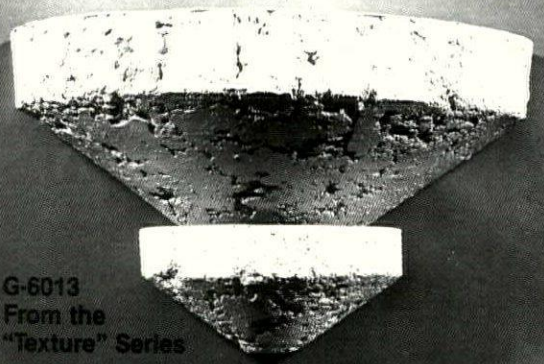
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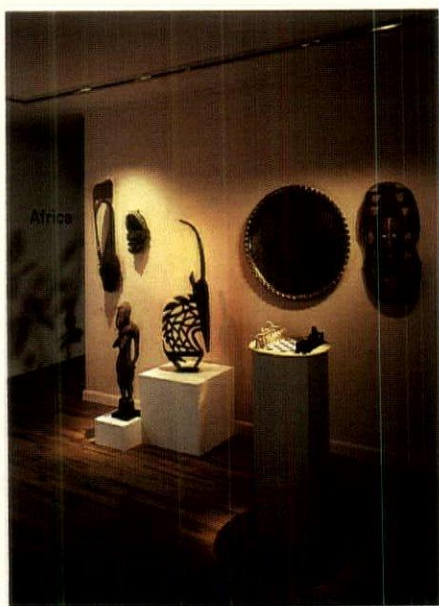
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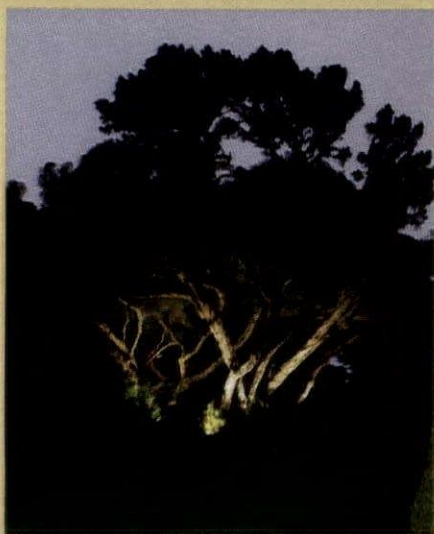
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Circle 113

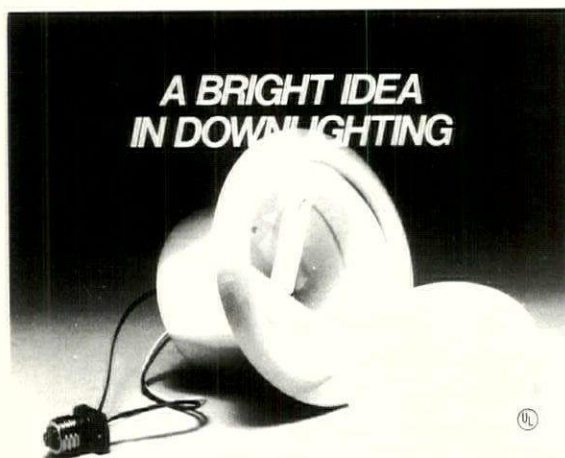


■ Sports lighting

Day-Brite features the Sports Floodlight.

one of five high-performance floodlights in the NiteBrite series. Six NEMA beam patterns for 400-, 1000-, and 1500-watt metal halide sources provide precise, strategic placement for improved visibility on the field and in the stands. Constructed of die-cast aluminum, the floodlight has a heavy-duty two-piece housing with silicone gasketing. Its heavy-gauge spun-aluminum reflector has a silicone rubber gasket, a heavy-gauge steel door, a stainless steel hinge, and an adjustable trunnion with a vertical aiming quadrant. Its heat-sink ballast mount provides cool operation. An isolated wiring compartment and auto-memory unit allow quick and easy maintenance. The fixture can accommodate comparable high pressure sodium and mercury vapor sources. Day-Brite, Tupelo, MS.

Circle 114



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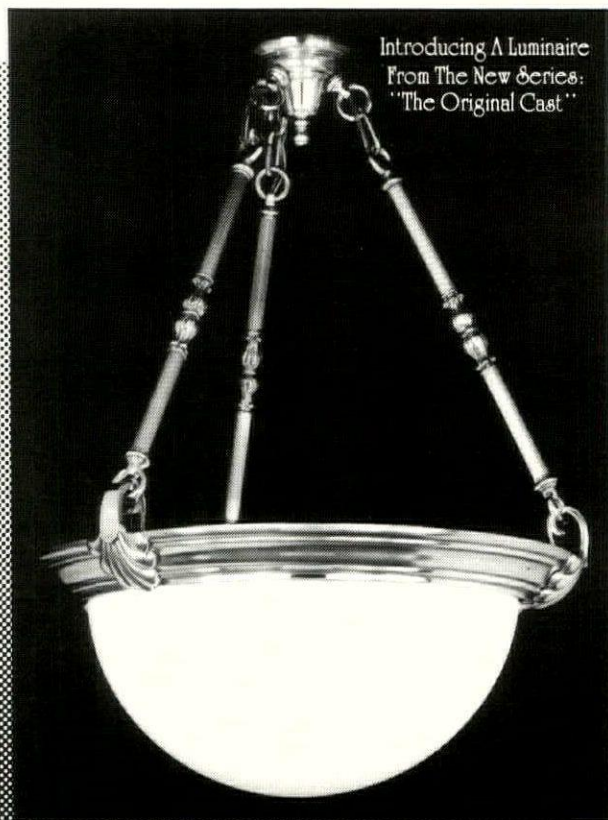
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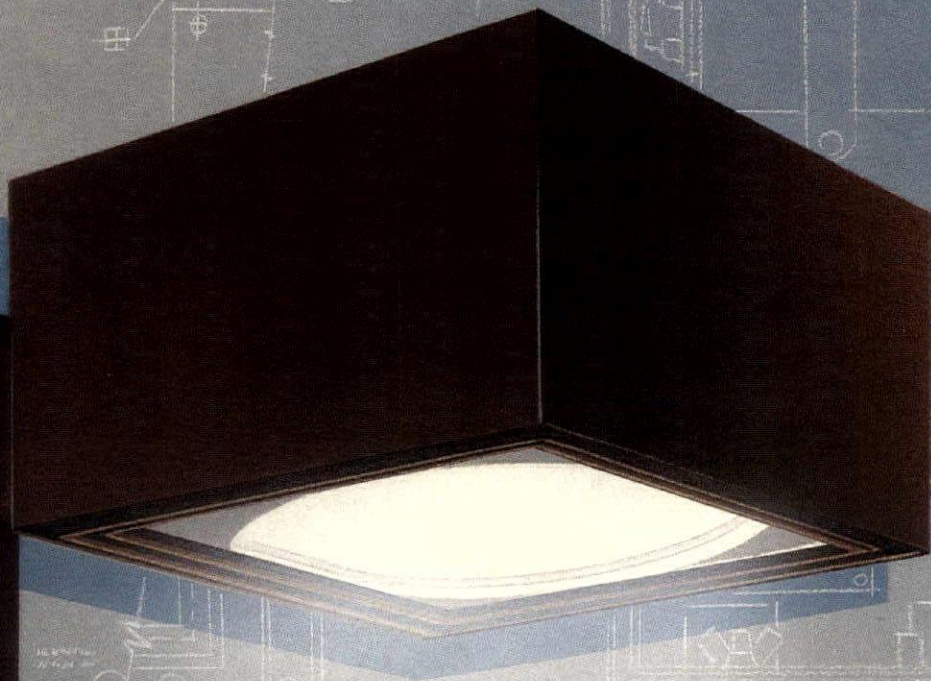
■ Retrofit reflectors

The Megalux silver reflector from Badger USA helps increase lumen output per watt when installed inside a fluorescent luminaire. Three different types are available — specular silver film, aluminum film, and anodized aluminum — which range in reflectivity from 85 to 95 percent. Each reflector is custom cut and manufactured for retrofitting existing installations. All are UL recognized and tested according to ASTM standards. Badger USA, Inc., Baraboo, WI.

Circle 115



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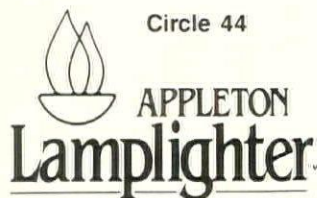


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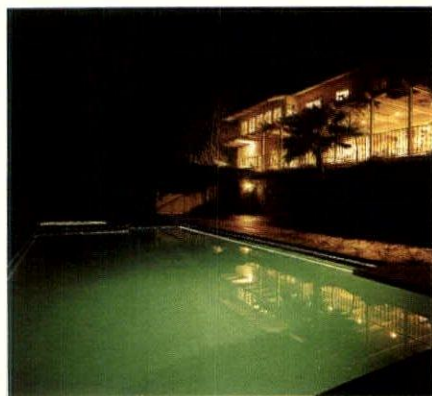


■ Low-voltage series

Luma Lighting has introduced the Newport and the Balboa cast aluminum directional fixtures for outdoor and rough service. The fixtures have a heavy cast aluminum outer body for strength and an inner aluminum lamp housing that functions as a heat shield. The air space between the inner and outer parts keeps the outer body cool, according to the manufacturer.

The fixtures have a tempered lens retained in a cast ring and a cast-aluminum swivel with a lock knob. They can be mounted to any outlet box or to a self-contained transformer box; they can also be stake-mounted with the company's two-circuit low-voltage distribution system. Luma Lighting Industries, Inc., Santa Ana, CA.

Circle 118



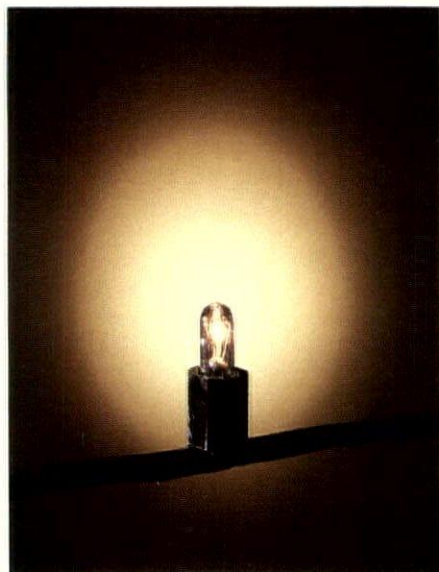
■ Fiber-optic system

Fiberstar's fiber-optic lighting system is designed to illuminate the perimeter of virtually any shape. A simple lamp and color wheel inside its light box housing

transmit light to fiber optics encased in flexible tubing. The light box is UL listed and approved for outdoor environments. No electricity passes through the tubing, and no heat is generated.

Two systems come complete with a light box that has four ports for two closed-loop runs of fiber and track: the S75-4 system, with 75 feet of fiber optics and track, and the P200-4 system, with 200 feet of fiber optics and track. Fiberstars, Fremont, CA.

Circle 119

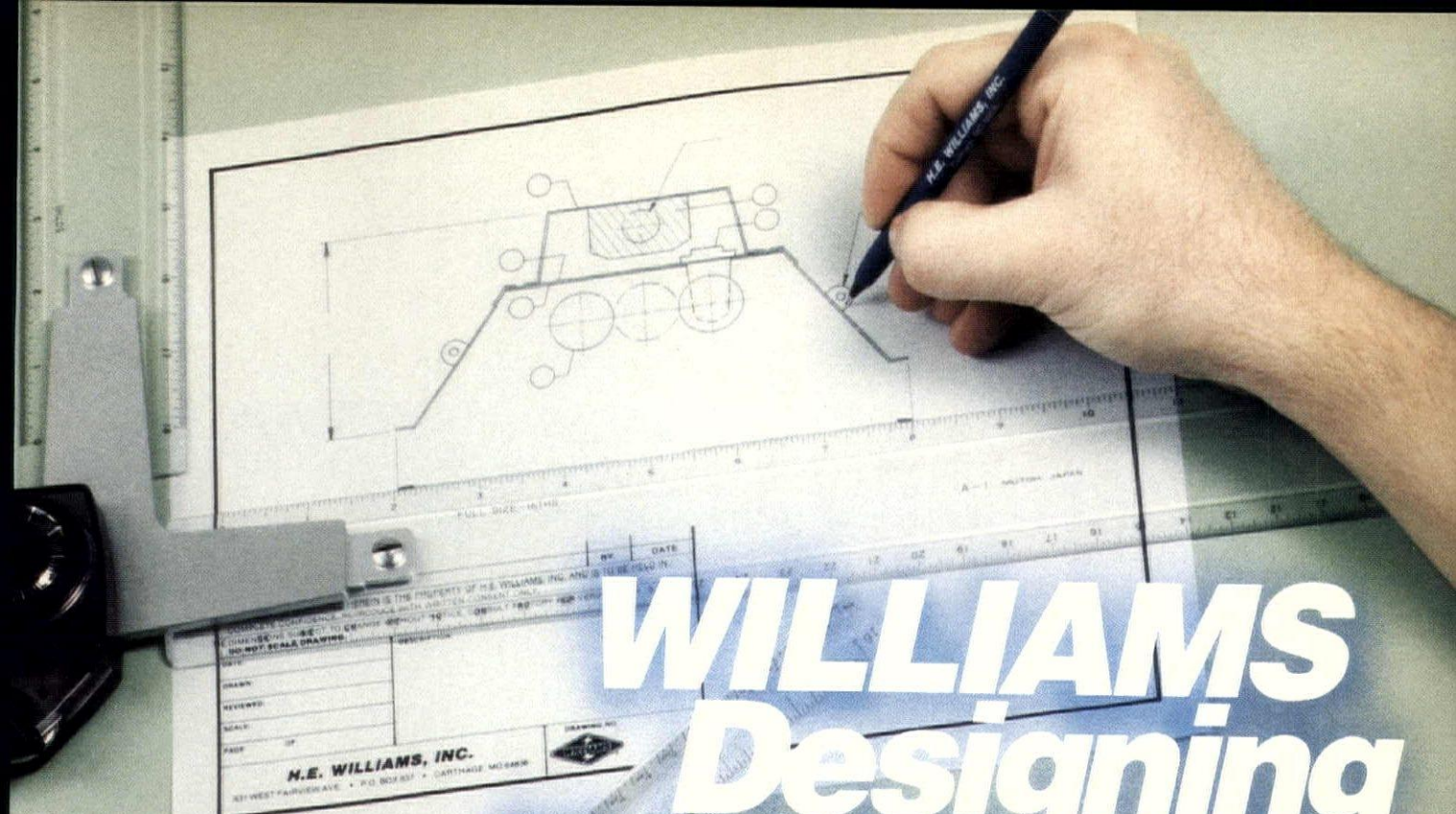


■ Exterior string lights

Nightscaping's Micro-Border Lites are miniature accent string lights designed for low-voltage exterior applications. Wedge-base 0.6-watt lamps are spaced 6 inches on center in standard lengths of 50 feet; other spacing may be custom ordered.

Accessories include an extruded aluminum Micro-Channel, with or without a light shield, that lets users attach the light strings to brick, stucco, or similar materials with standard masonry screws. The channel is available in 5-foot lengths. Its powder spray finish with a 10-year warranty may be ordered in several colors. Nightscaping, Division of Loran Inc., Redlands, CA.

Circle 120

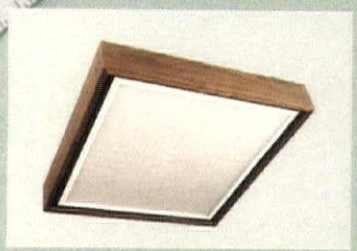


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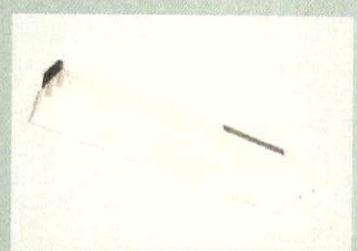
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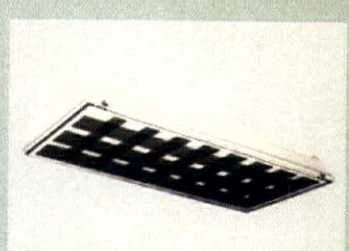
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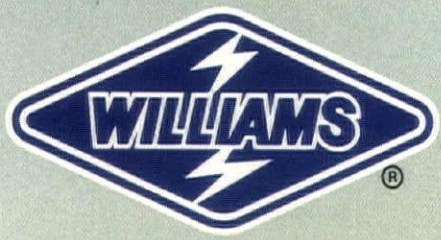
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LS Luminaire. Factory-assembled, recessed luminaire. Labor-saving unit mounts easily in standard inverted tee ceiling systems and is serviceable from below. Available in slimline and high-output models; can be ordered with lamps installed. Ideal for high-traffic merchandising areas.



THE BLADE® NEMA type "G" troffer with THE BLADE® louver and floating door. Attractive aluminum vertical cross blade louver comes in colors that can change a room's atmosphere: aluminum paint, white, off-white, black, bronze. Flat door hinges from either side and has fully enclosed, spring-loaded cam action latches.



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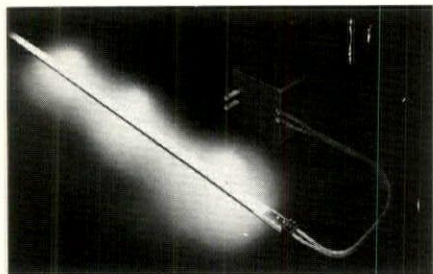
Circle 45



■ Decorative lantern

ELA's Vienna lantern is constructed of cast aluminum and has a hood that removes easily for relamping; it comes in three sizes. The smallest features a glass bowl and is equipped with a 60-watt three-candle cluster. The two larger sizes have acrylic bowls and 60-watt five-candle clusters; they can be converted to accept some HID sources. The lanterns can be mounted on posts or walls. Four standard finishes are available: black, verde, rust, and painted antique brass. Options include a frosted glass bowl and custom finishes. Environmental Lighting for Architecture, Inc., City of Industry, CA.

Circle 121



■ Strip lighting system

CSL Lighting's Invizilite is a flexible, concealable strip lighting system. It replaces rigid fluorescent, cold cathode, and neon fixtures, and other line-voltage lamp sources. It can curve 180 degrees, turn a 90-degree angle, and reach into tight spaces, according to the manufacturer.

The strip system handles up to 240 watts and comes in standard lengths of 4, 8, 12, 16, and 20 feet. Strips can be installed easily with double-backed adhesive tape or clips. Lamps are normally spaced 8 inches on center, but 4-inch spacing can be ordered. Seven-watt halogen lamps are standard (they are individually replaceable); 3-watt lamps are available for special installations. CSL Lighting, Inc., Los Angeles, CA.

Circle 122

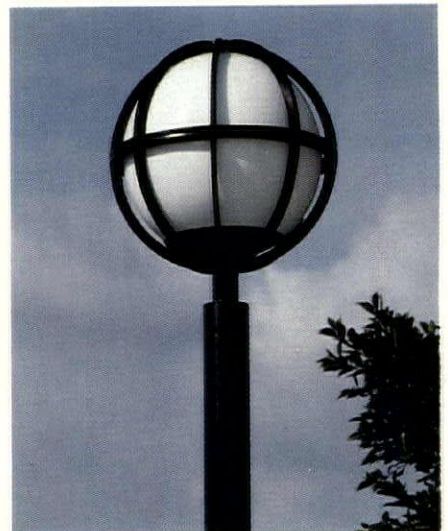


■ Emergency light

Holophane's M-4 6-volt automatic emergency light features a prismatic lens that wraps around and under the luminaire to wash adjacent walls. This creates a visual environment during a power outage more comforting than that produced by a conventional head lamp, according to the manufacturer. High-impact thermoplastic construction and a molded polycarbonate lens make the unit highly resistant to vandalism and harsh environmental conditions.

The solid-state unit contains an integrated circuit charger, a sealed rechargeable battery, and an LED indicator light; it supplies light for 90 minutes during an emergency, as required by UL 924, NEC, NFPA 101 Life Safety Code, and OSHA. Holophane, Newark, OH.

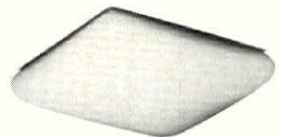
Circle 123



■ Vandal-resistant sphere

Architectural Area Lighting offers a vandal-resistant luminaire of heavy cast aluminum with a durable cast aluminum guard on its white or clear Lexan globe. The luminaire accommodates a 175-watt HID source and comes with an adapter so it can be retrofitted on existing poles. It is designed for use in areas of high abuse, such as playgrounds. Architectural Area Lighting, La Mirada, CA.

Circle 124



■ Fluorescent ceiling unit

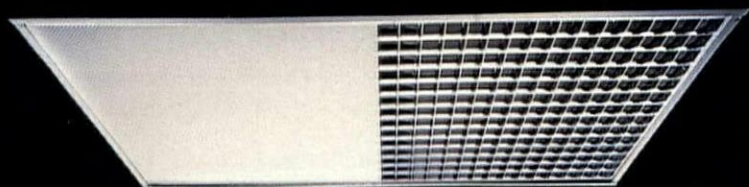
The Tapered Floating Cloud series of fluorescent ceiling fixtures from American Fluorescent features a distinctive non-yellowing white acrylic diffuser with tapered edges for safety. The unit is completely wired and assembled. It comes in three sizes: 1 by 4 feet for two or four 40-watt lamps, 2 feet square for four 20-watt straight or two 40-watt lamps, and 2 by 4 feet with four 40-watt lamps. American Fluorescent Corporation, Waukegan, IL.

Circle 125

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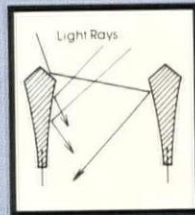
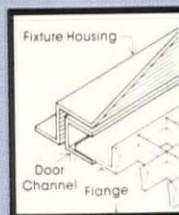


The compatibility of fluorescent lighting, small cube parabolic louvers and CRT screens is generally acknowledged. American Louver Company now introduces new features that put the PARACUBE I H.E.F. (High Efficiency Flange) $\frac{1}{2}$ " x $\frac{1}{2}$ " x $\frac{1}{2}$ " louver* ahead of the rest—"light years" ahead.

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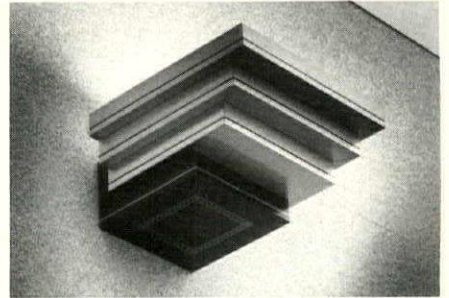
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■ Cutoff luminaire

The Performance Plus series of luminaires from Hadco provide uniform, glare-free Type II cutoff illumination for most outdoor lighting applications. They are constructed of precision die-cast aluminum and are finished with a burnished bronze powder coat. They come in two sizes: one for pole heights from 12 to 35 feet and one for heights from 3 to 15 feet. The larger model accommodates high pressure sodium and metal halide lamps up to 400 watts, the smaller a 150-watt high pressure sodium or a 100-watt mercury lamp. The luminaires are backed by a three-year limited warranty. Hadco, Littlestown, PA.

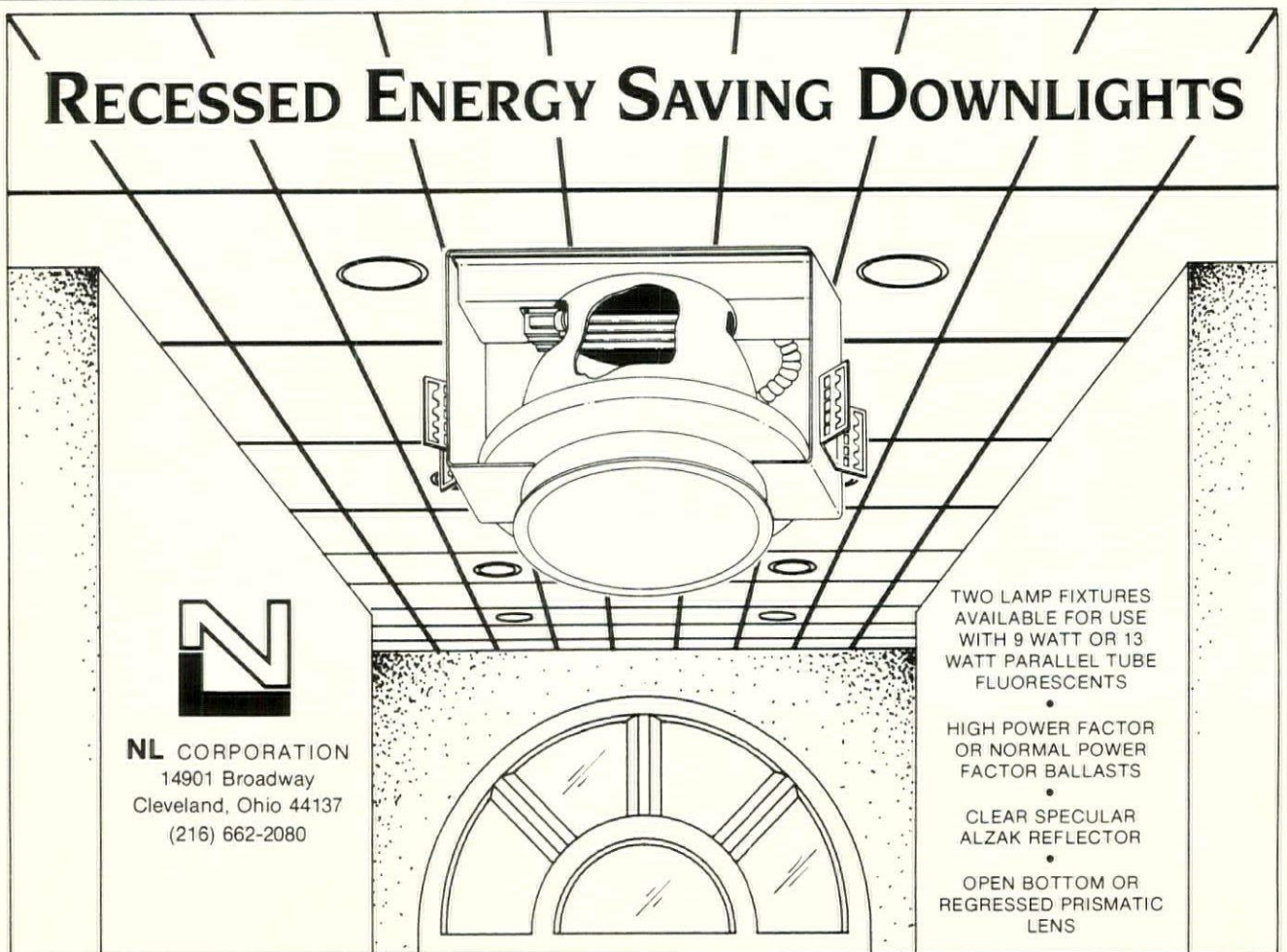
Circle 126



■ Custom luminaire

Appleton Lamplighter, a manufacturer of custom luminaires, produced this decorative upright housing for the lobby of the Manufacturers Hanover Plaza in Chicago. It is finished in brushed brass with kelly green accents and a silk-screened design. The design is the outcome of a collaborative process involving company manage-

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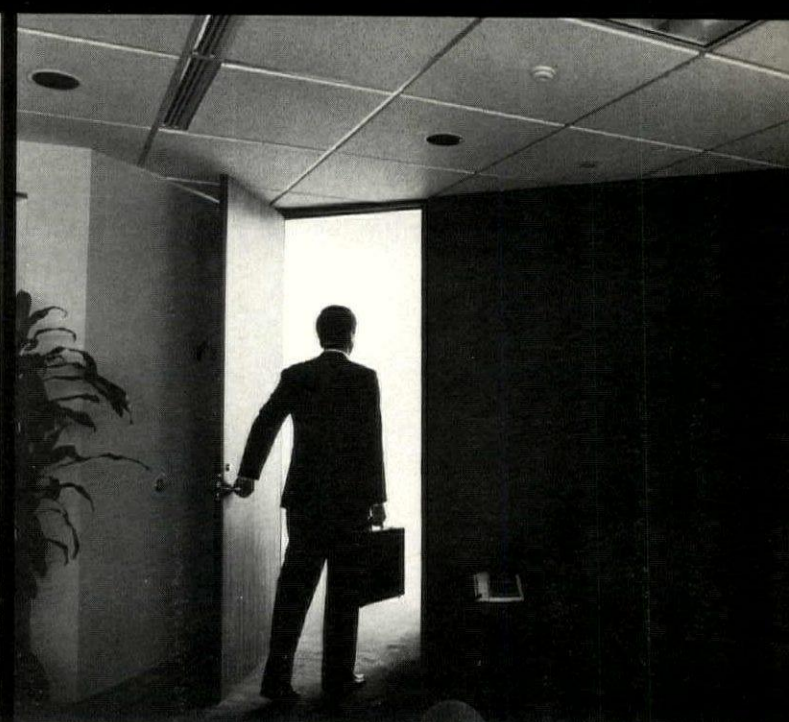
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*A list of these companies will gladly be supplied upon request.

Circle 48

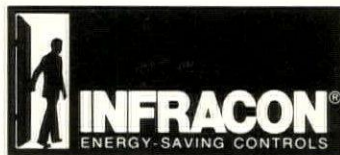
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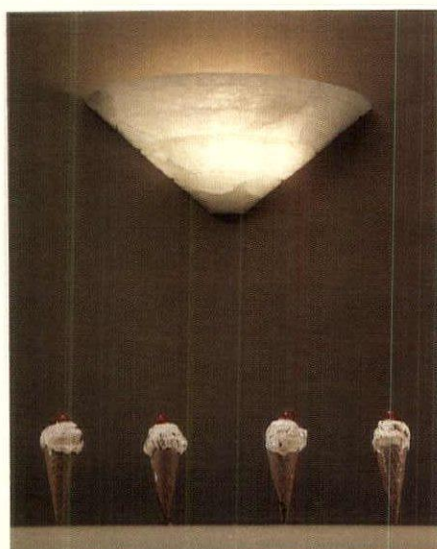
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ment and designers, architects, planners, and construction contacts. Twenty fixtures were fabricated and delivered in less than three weeks. Appleton Lamp-lighter, Appleton, WI.

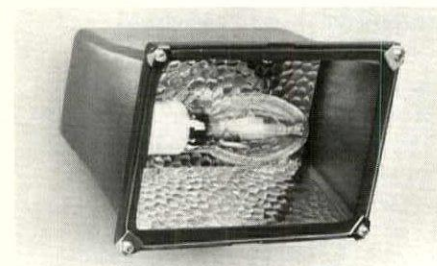
Circle 127



Alabaster wall sconce

Boyd Lighting's Cirrus wall sconce is individually quarried and turned. The solid natural white alabaster sconce, designed by Gary Cross, is 6 1/4 inches high, 17 inches in diameter, and projects 8 3/8 inches from the wall. It accommodates a 100-watt A19 incandescent or a 13-watt compact fluorescent lamp.

Circle 128



HPS microflood

Lumark's Yes Microflood low-wattage surface-mounted fixture uses a formed aluminum stippled reflector with a high pressure sodium source. Features include a die-cast aluminum housing and a bronze polyester powder coat finish. An integral

photoelectric control and a polycarbonate shield are also available. The fixture accepts medium-base high pressure sodium sources from 35 to 150 watts. It is recommended for entryways, on-site signage, and remote, high-use areas such as bank machine locations. Lumark Lighting, Vicksburg, MS.

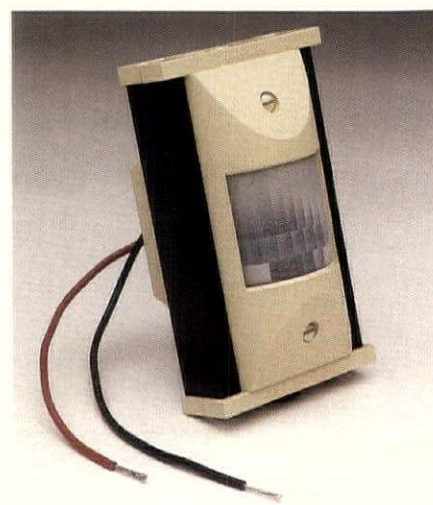
Circle 129



Table lamps

VeArt International's Bugia table lamp series features a white opaline Murano glass shade and a base of clear or Venetian blue crystal. The lamp is available in two sizes: 17 1/2 inches high with a 17-inch-diameter shade and 10 inches high with an 8-inch-diameter shade. It accommodates a 100-watt incandescent lamp.

Circle 130



Occupancy sensor

Sensor Switch offers the Wall Switch II, a passive infrared occupancy sensor that

replaces a traditional toggle switch to control fluorescent or incandescent office lighting. It automatically switches lights on and off 30 seconds to 20 minutes after sensing changes in infrared energy in the space; users can preset the adjustable time delay.

The wall switch has an indicator light that meets California Title 24 code requirements. It has a coverage area of 800 square feet and a load capacity of up to 1200 watts, depending on voltage. Models are available for 120- and 277-volt AC systems. Installation typically takes less than 10 minutes, according to the manufacturer. Sensor Switch, Inc., Branford, CT.

Circle 131



Commercial luminaire

The Benjamin Division of Thomas Industries originally designed its commercial quartz luminaire for the Nashville Convention Center. The luminaire has a matte black exterior finish that eliminates glare in areas where ambient light control is critical, according to the manufacturer. It can be used by itself or as a supplement to other lighting systems and can be controlled with standard dimming systems.

Three reflector sizes are available for use with GE's 500-, 750-, and 1000-watt 3000K, 2000-hour clear quartz halogen stage and studio lamps. The manufacturer recommends the luminaire for auditoriums, gymnasiums, stages, studios, and other applications where color and dimming are important to the lighting design. Benjamin Division of Thomas Industries Inc., Sparta, TN.

Circle 132



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Circle 49



■ Desk lamp

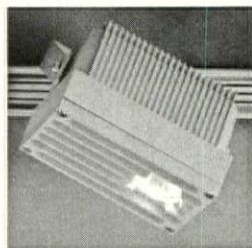
Thunder & Light's Graal desk lamp was designed by Italian industrial designer Gabriella Montaguti and manufactured by the company's Contraluce division. The desk lamp has a strong cast-aluminum body finished in black or white enamel. A 360-degree adjustable vertical rotation allows flexibility in lighting effects. Matching floor, wall, ceiling, and studio models are available. Thunder & Light, New York, NY.

Circle 133

LIGHT STYLE

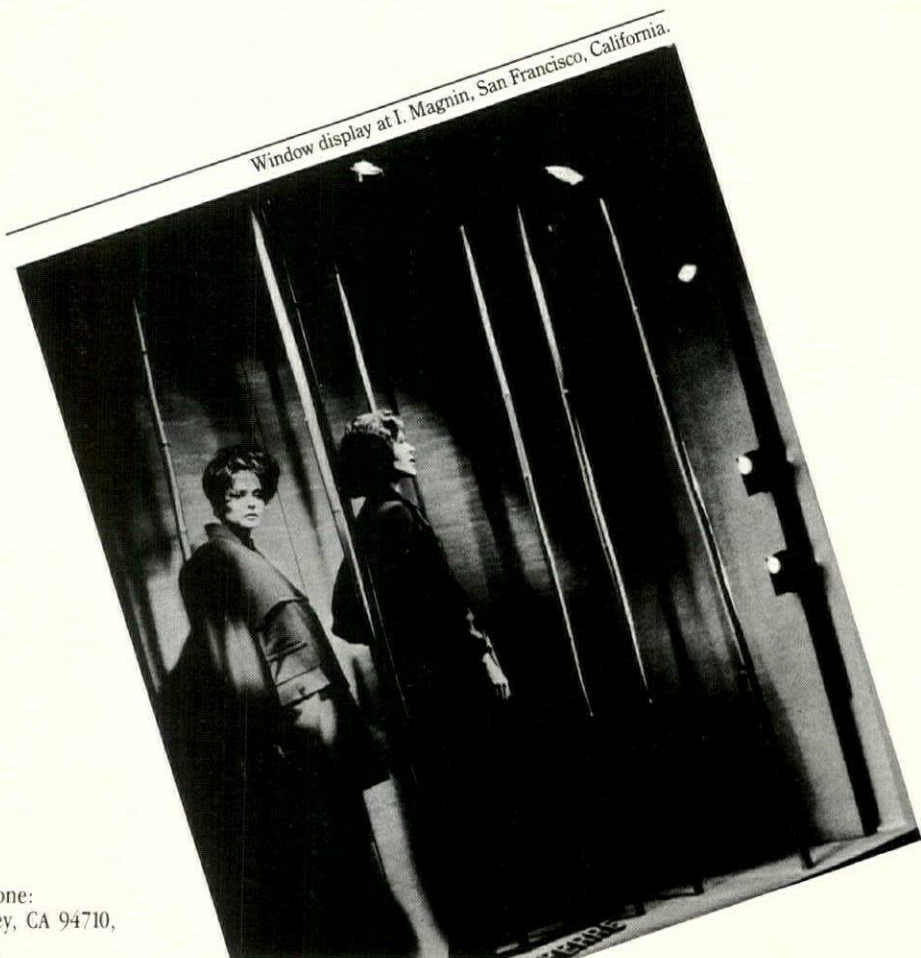
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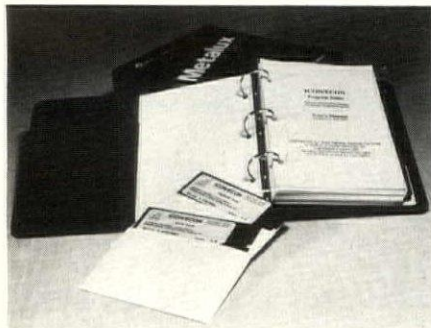
Circle 50



■ Decorative poles

Centrecon offers a series of decorative, durable concrete flag poles with a nighttime uplighting option. The centrifugally cast, prestressed, hollow-core poles come in heights from 20 to 120 feet and in a wide selection of colors and aggregates. A permanent clear acrylic plastic coating accentuates the color and protects against most graffiti. The poles are designed for easy installation and have an internal halyard system as a standard feature. Centrecon, Everett, WA.

Circle 134



■ Lighting software

Metalux Lighting's Icon/Econ software analyzes luminaire performance and provides users with a precise graphic lighting layout. The two-part software operates on

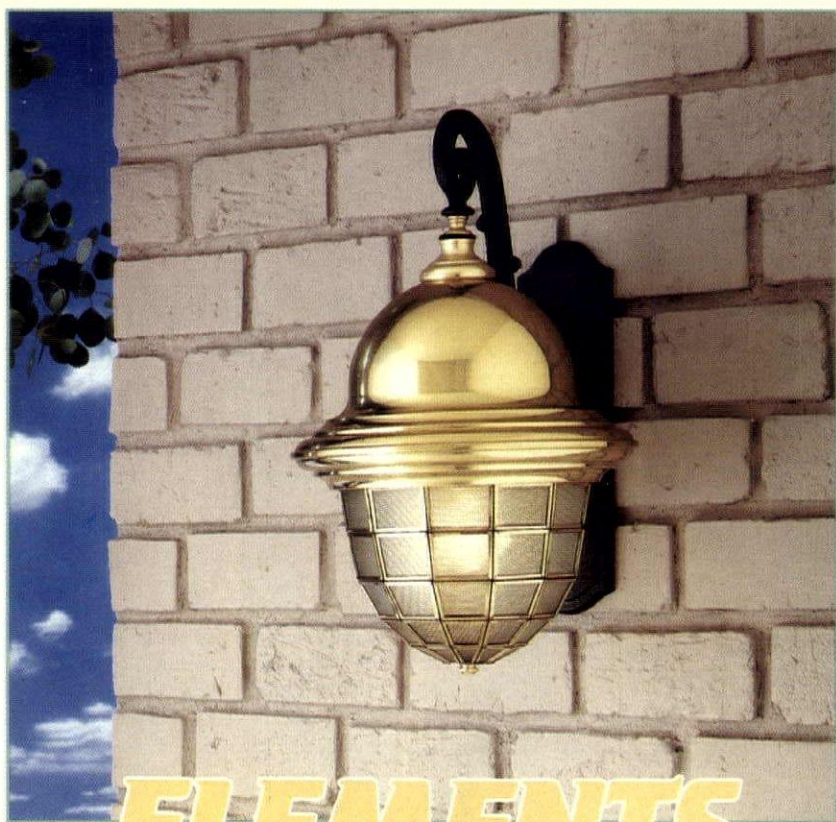
IBM PCs and most printers for personal computers; it can be personalized to its licensed user. A user's manual accompanies a 5 1/4- or 3 1/2-inch floppy program disk.

The Icon illumination analysis program portion has a data base of more than 500 luminaires for comparing elements of as many as five lighting solutions. It calculates numbers of fixtures or footcandles and creates a recommended graphic layout compatible with any size ceiling module or other symmetric spacing limitations, according to the manufacturer.

The Econ economic analysis comparison portion provides a description of costs,

including the initial cost of fixtures and components. Users can compare as many as five different lighting systems simultaneously and determine the payback period for each. The software includes products from Metalux and sister companies. Other luminaires may be added to the data bases by the licensed user. Metalux Lighting, Americus, GA.

Circle 135



ELEMENTS OF DESIGN

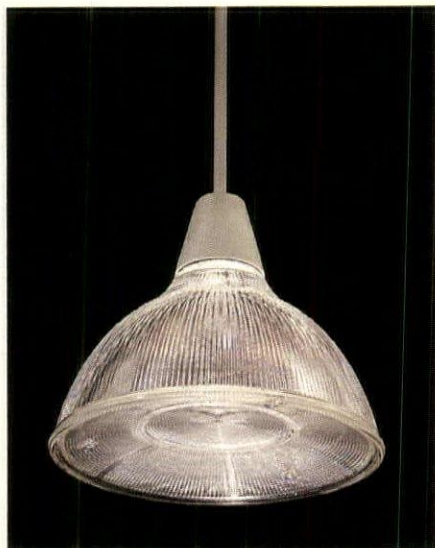


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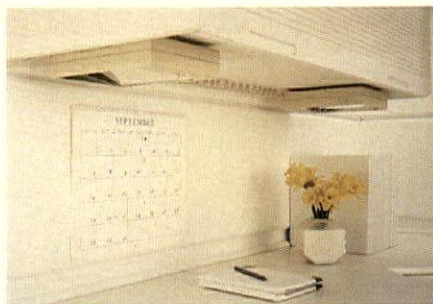


■ Prismatic glass luminaire

The Paradome pendant luminaire from Holophane is a totally enclosed prismatic glass fixture that uses a low-wattage metal halide lamp. The unit is recommended for retail areas, shopping malls, and high-tech interiors.

The luminaire's ballast tray mounts on T-bars above the ceiling. Its prismatic glass enclosure is secured by torsion springs that release for easy maintenance. The luminaire accommodates 100- and 175-watt lamps. Stem lengths up to 48 inches and a choice of other finishes can be ordered. Holophane, Newark, OH.

Circle 136

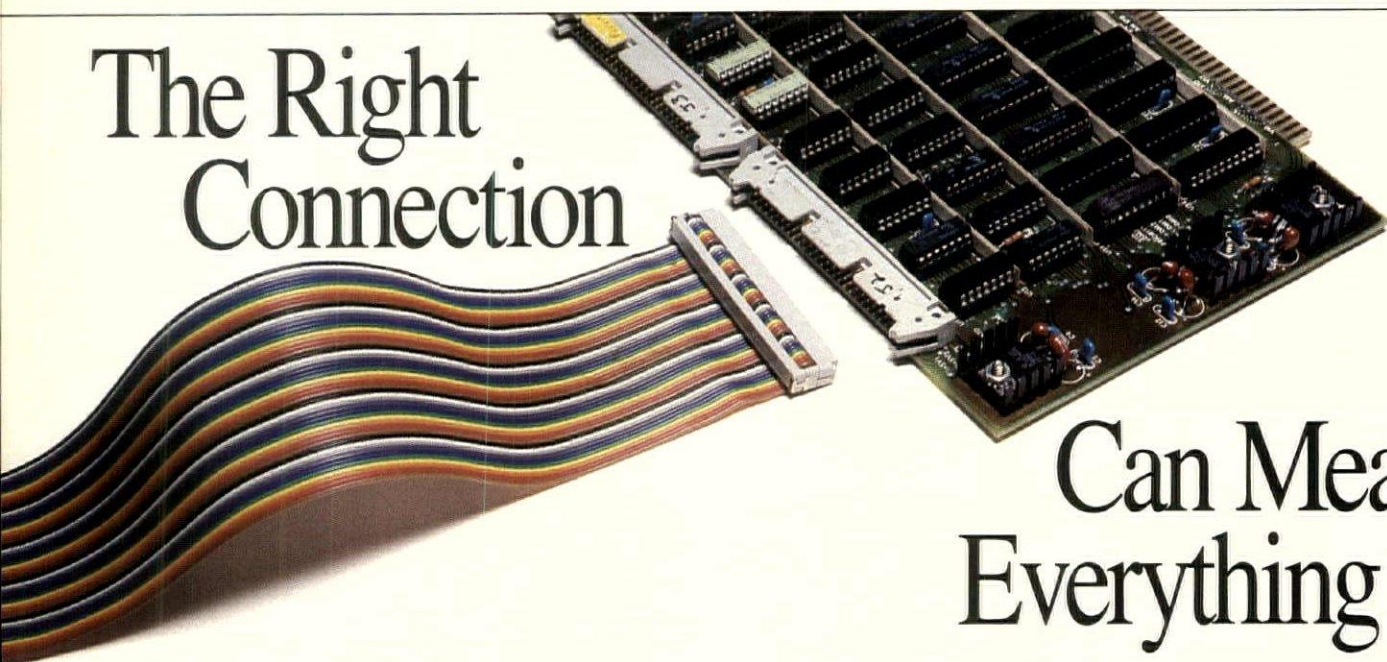


■ Task light

SPI Lighting's STD-33 twin task light is designed to eliminate glare and veiling reflections. Its polished, asymmetrical reflectors direct the light at right angles to a person seated at a workstation. It uses two 13-watt twin-tube compact fluorescent lamps.

The housing is made of injection-molded, high-strength Noryl plastic. A

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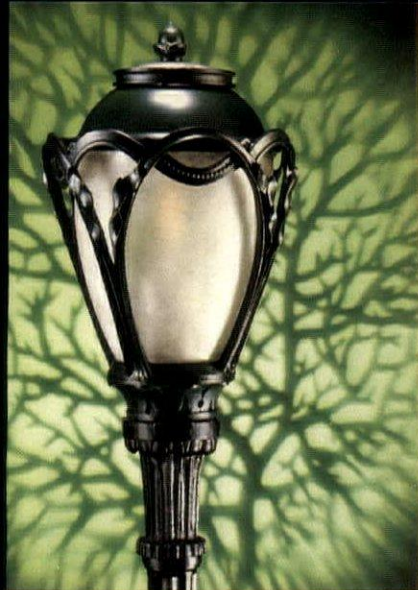
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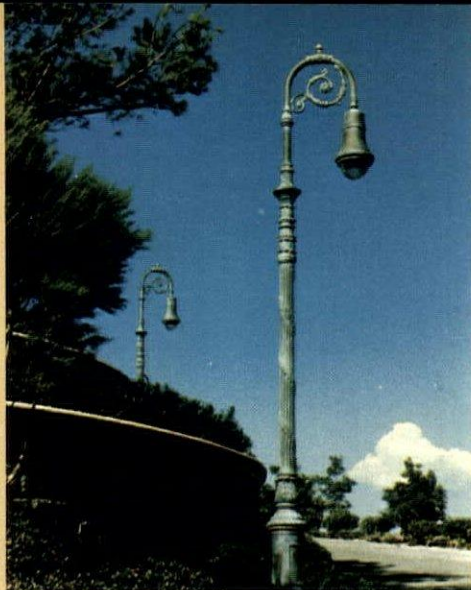
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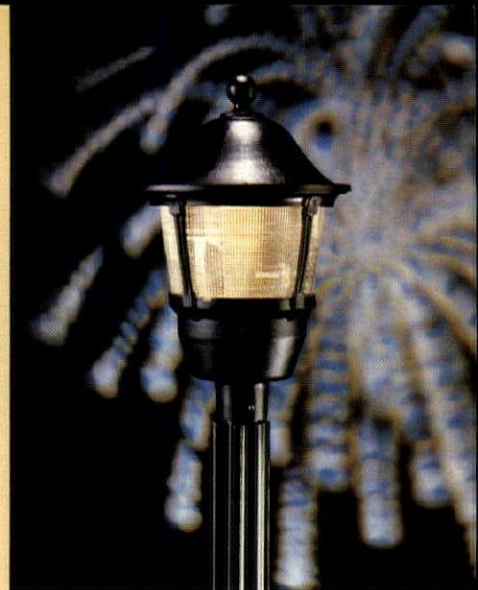
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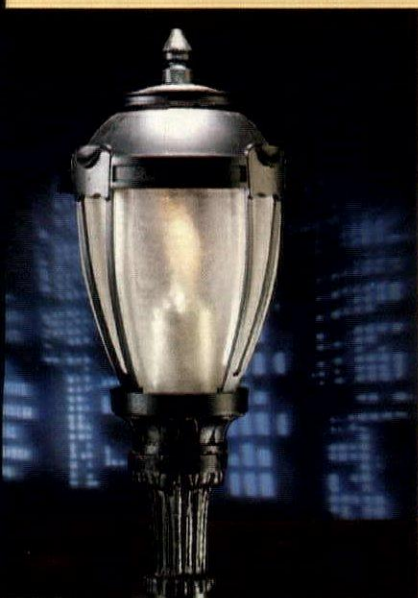
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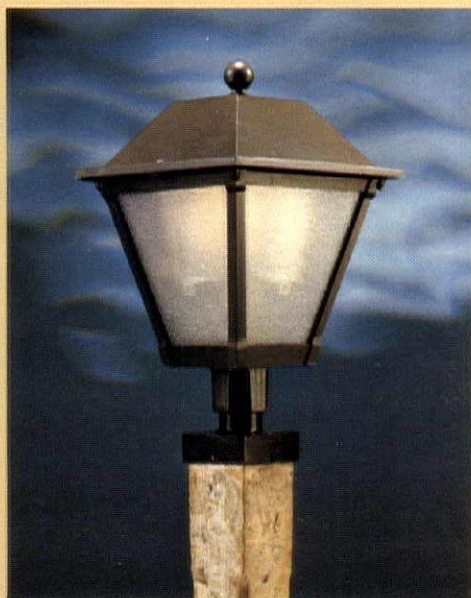
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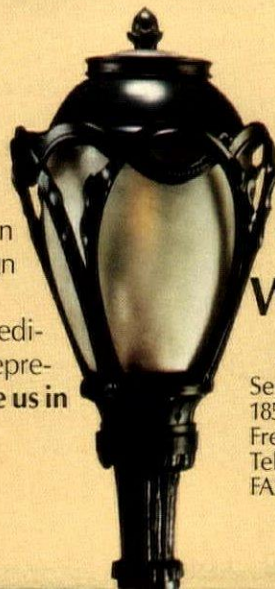
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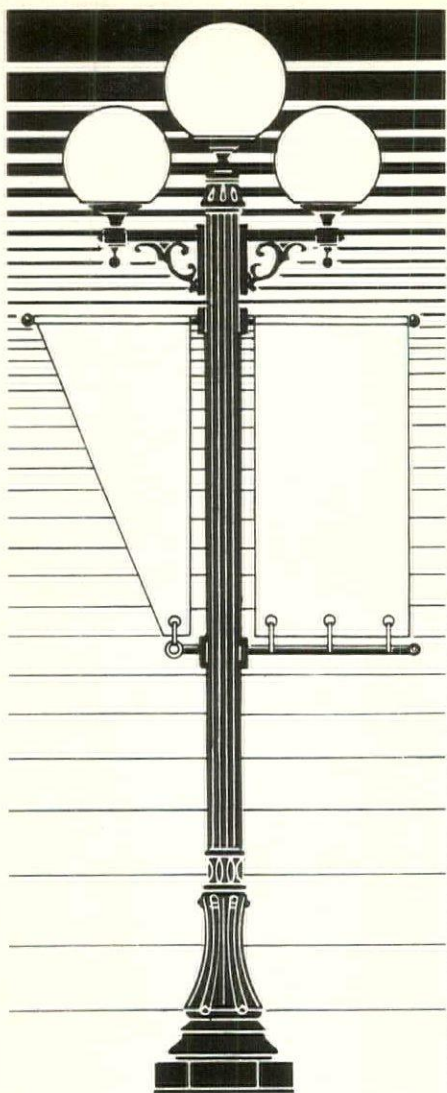
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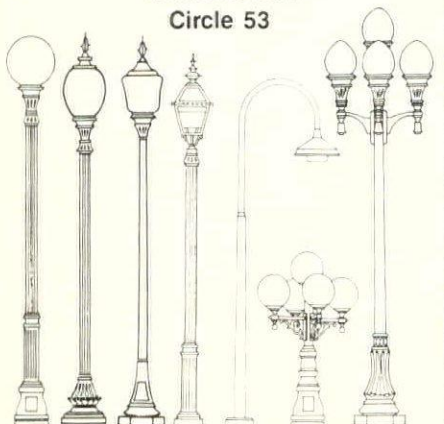
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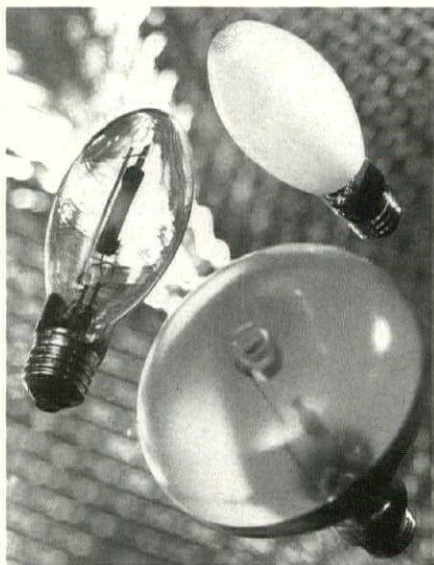
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Circle 53



coiled cord joins the two units so they can be spaced up to 72 inches apart; a variety of mounting brackets are available for metal, wood, and other surfaces. The units can be plugged into any 120-volt outlet. SPI Lighting Inc., Racine, WI.

Circle 137

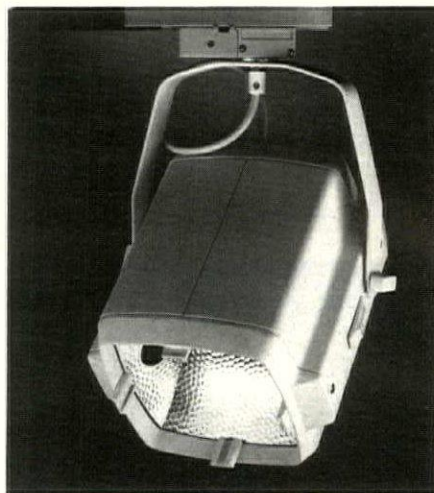


■ Low-wattage HPS lamps

GE Lighting has improved the performance of its 35- and 70-watt Lucalox high pressure sodium lamps. The 35-watt lamp now includes an external amalgam reservoir, which controls voltage rise in the arc tube at a predictable low level throughout its life, according to the manufacturer. The life rating of the LU35/MED and LU35/D/MED models has increased from 16,000 hours to 24,000 hours; lumen maintenance remains at 90 percent.

The arc tube of the 70-watt lamp has been redesigned to achieve a 10 percent increase in initial lumen output; it has the highest lumens-per-watt rating of any 70-watt high pressure sodium lamp available domestically, according to the manufacturer. Lumen increases apply to LU70, LU70/D, LU70/MED, and LU70/D/MED models; changes do not apply to the R38 lamp, also shown. GE Lighting, Cleveland, OH.

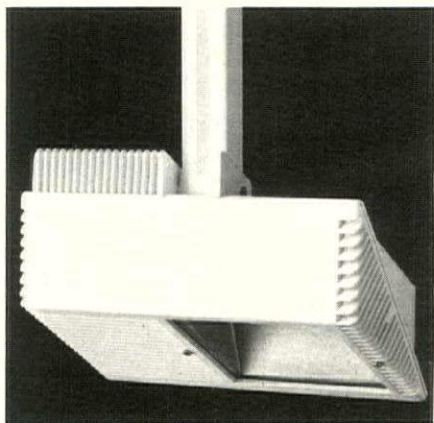
Circle 138



■ HID display light

The Amerlux Series 700 display light is designed to accommodate the 70-watt Osram HQI metal halide lamp. It is available with spot or flood reflectors and separate lenses for three different beam spreads and comes in matte black and matte white finishes. Amerlux, Fairfield, NJ.

Circle 139



■ Asymmetric beam luminaire

Miroflector's Silhouette luminaires are designed to accommodate the 70-watt Osram HQI metal halide lamp; they can pivot 180 degrees. A fin-cooled, die-cast aluminum body incorporates a ballast and an asymmetric aluminum reflector. A floor lamp model and models for mounting on ceilings, tracks, and walls are available. Miroflector Company, Inc., Inwood, NY.

Circle 140



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Circle 54



■ Parabolic fluorescent

Visual Comfort Lighting offers the Para-S System for combined ambient indirect illumination and precise direct parabolic lighting. The luminaire's parabolic louver of semispecular or specular anodized aluminum has a 60-degree vertical cutoff.

The luminaire's reflector design, interchangeable outer fascia panels, and modified strip light housing allow flexibility in fixture configurations. Units are available in lengths of 3, 4, 6, and 8 feet to accommodate two or four F30 or F40 fluorescent lamps. Visual Comfort Lighting, Old Bethpage, NY.

Circle 141

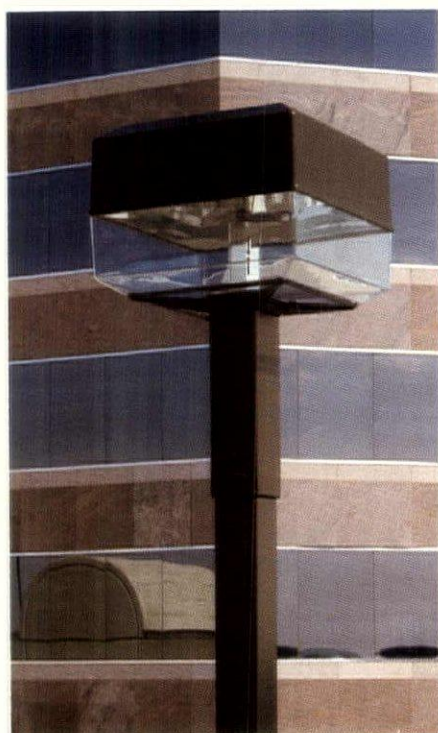


■ Pendant lamp

Multiworld offers a 24-inch-diameter, 8-inch-high pendant lamp designed by Gianni Moncalieri that is fully adjustable up, down, and sideways. The model 1625/60

lamp has a metal body with an enamel finish in black, white, gray, or yellow. It accommodates one 300-watt halogen lamp. Multiworld Inc., Falls Church, VA.

Circle 142

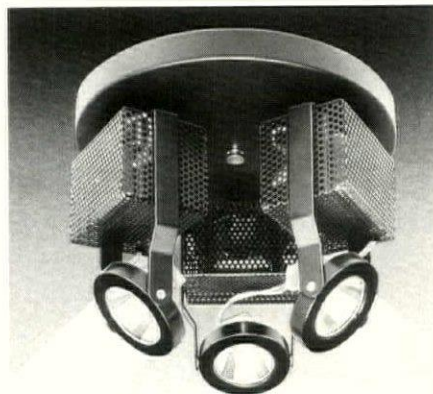


■ Outdoor area luminaire

Wide-Lite's Supra-Lyte luminaire has a lightweight, nonmetallic optical housing and high-performance optics that provide maximum intensities near a cutoff of 70 degrees. It produces the same light level from a 250-watt high pressure sodium lamp as does a typical 400-watt high pressure sodium post-top luminaire, according to the manufacturer. The luminaire produces a Type V square distribution pattern and meets IES roadway cutoff criteria.

Options include mounting brackets, a house-side shield, and a bilevel ballast. The UL-listed luminaire comes in a standard bronze finish and in white, black, or aluminum. It is covered by a three-year limited warranty. Wide-Lite, San Marcos, TX.

Circle 143



■ Halogen ceiling fixture

Roxter offers the model 9163 three-lamp, multidirectional ceiling fixture complete with lamps. Low-voltage 50-watt transformers are housed above each of the three MR16 lamps. The fixture is 7 inches high overall; the canopy diameter is 10 inches. It comes in white and black finishes and a choice of spot, flood, and wide flood beam patterns. Matching models with one or two lamps are available. Roxter, Long Island City, NY.

Circle 144



■ Lighted ceiling fan

The Glass Disc ceiling fan from Beverly Hills Fan evokes the style of the Art Deco period with its concentric rings of polished glass. Fan bodies with matching wooden blades come in platinum, peach, and rose; a chrome fan comes with white blades, and a polished brass fan comes with medium oak blades. Options include a spotlight kit and a halogen lighting kit (shown) with built-in transformers for 20-watt MR16 lamps. Beverly Hills Fan Co., North Hollywood, CA.

Circle 145

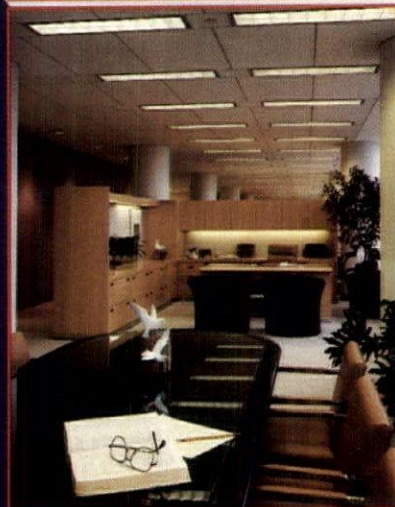


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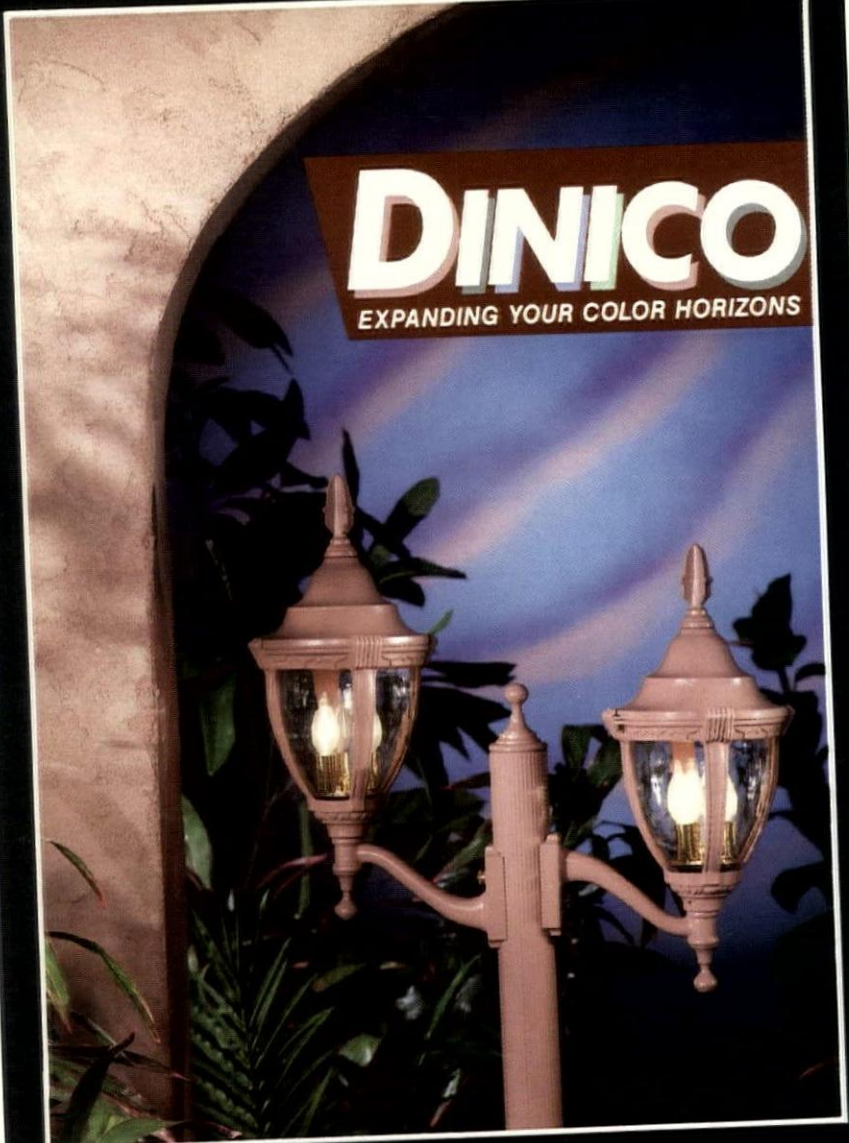
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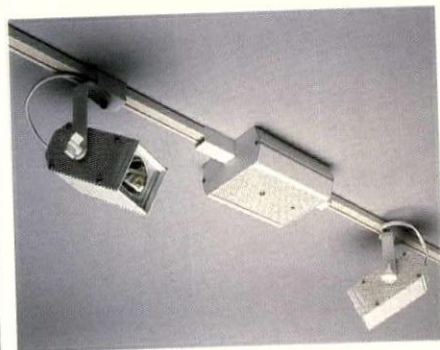
See us at Lighting World, Booth 621



■ Retrofit reflectors

The Megalux silver reflector from Badger USA helps increase lumen output per watt when installed inside a fluorescent luminaire. Three different types are available — specular silver film, aluminum film, and anodized aluminum — which range in reflectivity from 82 to 95 percent. Each reflector is custom designed and manufactured for retrofitting existing installations. All are UL referenced and tested according to ASTM standards. Badger USA, Inc., Baraboo, WI.

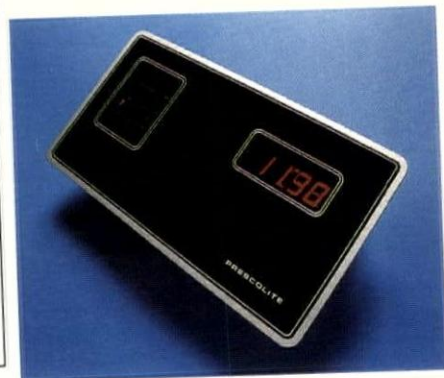
Circle 115



■ Surface-mount transformer

Luma Lighting now offers a slim, surface-mounted transformer for its Starline track. The toroidally wound transformers are silent, according to the manufacturer, and are designed to power the company's two-circuit low-voltage track system. Fuses protect each circuit from overload. This shallow power package, shown with the Modena V track fixture, is available in 150- and 300-watt versions finished in black or white. Luma Lighting Industries, Inc., Santa Ana, CA.

Circle 116



■ Automated light control

The Lite Clock from Prescolite Controls features a user-friendly automated lighting control for architectural and energy management applications. The solid-state timing device automatically activates up to 11 different lighting scenes and accepts up to 672 commands with 10-minute resolution on a 7-day week. All commands are stored in a nonvolatile memory that can withstand a 10-year power failure. Prescolite Controls, Carrollton, TX.

Circle 117



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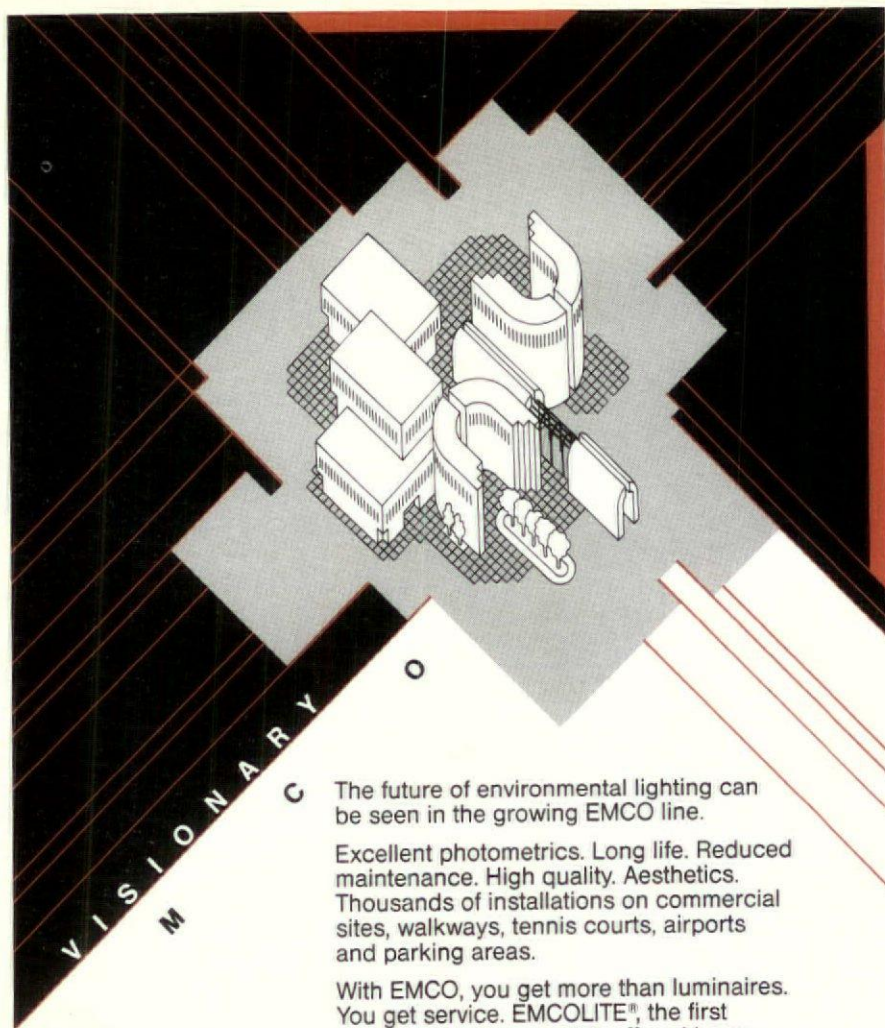


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Circle 58

measurements of luminance and chromaticity. Noncontact measurements are far more accurate than the needle-type systems in some meters, according to the manufacturer. The meter's state-of-the-art optical system provides a 5-degree field of view, measuring field angles of 2, 1, 0.2, and 0.1 degrees; its measuring range is 0.01 to 12,000,000 cd/m².

The system provides a luminance accuracy of ± 4 percent of reading and ± 1 digit and chromaticity accuracy within

± 0.03 . Measurements made by the system's silicon photocell are instantly registered in footlamberts or the metric equivalent. The unit meets CIE standards for spectral sensitivity characteristics. An AC adapter is standard; optional accessories are available. Topcon Instrument Corp. of America, Paramus, NJ.

Circle 148



■ Commercial area lighting

Hanover Lantern's Seattle series outdoor luminaires use only UL-listed components, which are factory-installed and tested to ensure proper operation. Features include corrosion-resistant cast aluminum construction, a removable roof for easy maintenance and relamping, shatter-resistant opal acrylic panels, and stainless steel fasteners.

The luminaires come in two sizes: the series 2900, 34 inches high and 15 inches wide, comes in six models for HID sources from 35 to 250 watts; the series 2800, 23 inches high and 10 inches wide, comes in six models for HID sources from 35 to 100 watts. The luminaires are suitable for wet locations and have a weather-resistant matte black enamel finish; other finishes can be ordered. Hanover Lantern, Hanover, PA.

Circle 149

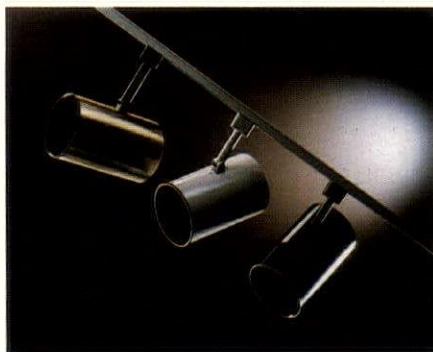


■ Coated lamps

Shat-R-Shield's coated lamps eliminate the potential hazards of shattered glass with a coating that contains all broken glass, phosphors, and mercury in the event of breakage. The coatings eliminate the need for sleeves and end caps and facilitate installation and maintenance of light sources.

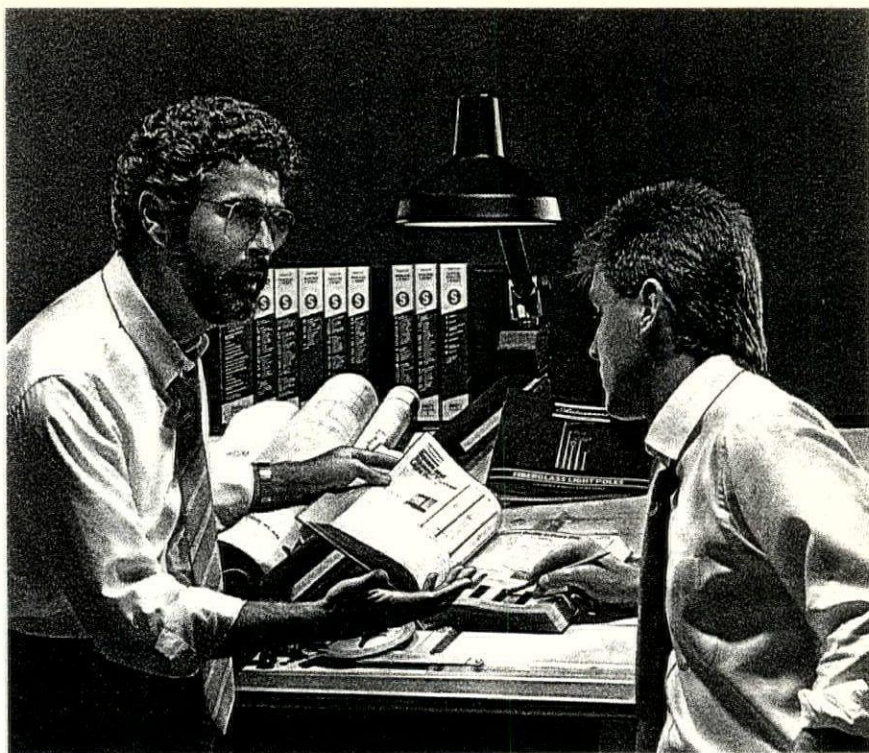
The coatings do not yellow, crack, or craze, nor do they shorten lamp life by contributing to heat build-up, according to the manufacturer. Incandescent, fluorescent, and high output fluorescent lamps are available in a full range of sizes; they meet FDA and OSHA requirements and are USDA approved. Shat-R-Shield Inc., Shrewsbury, NJ.

Circle 150



■ Track lighting system

The Lighting Zone track lighting system from Conservation Technology is a commercial-grade, low-profile system with easy-to-install track and connectors. Fixtures for the system feature a special deep black phenolic baffled aperture for controlling glare and a highly reflective specular white interior finish. The stem-mounted fixtures come in four designs



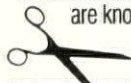
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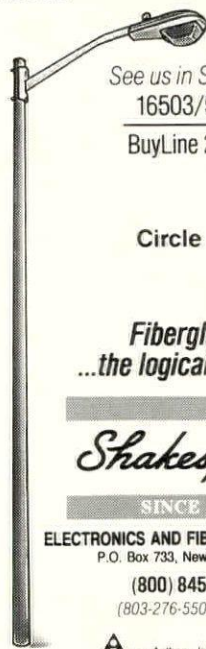
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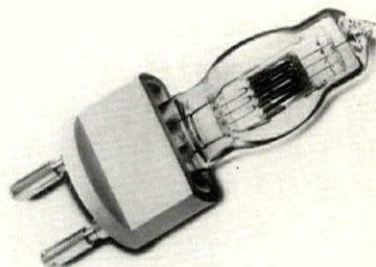
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A an Anthony Industries company

and three sizes; some come with a flexible yoke mounting.

The track and its components come in white and black finishes. The light fixtures are available in white, black, polished brass, and antique brass finishes, and accommodate a PAR 38 or R40 lamp up to 150 watts. Conservation Technology, Ltd., Northbrook, IL.

Circle 151

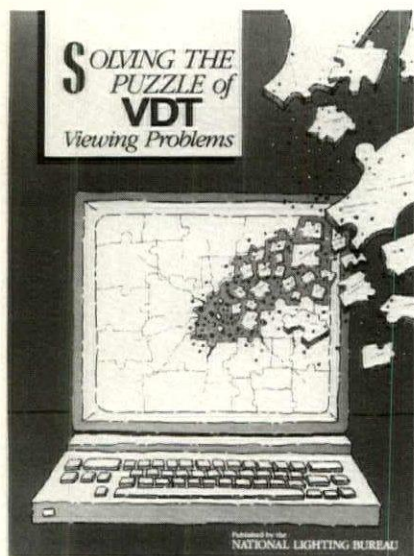


■ Stage, studio lamp

SureSpot quartz halogen lamps from North American Philips have built-in prox-

imity reflectors that eliminate the need for lamp-to-reflector focusing and reduce problems with dust accumulation and mirror corrosion. Models for 750, 1000, and 2000 watts are available; the 2000-watt model has an average life of 250 hours. All can withstand lamp temperatures up to 900 degrees Centigrade and can burn in any position. The lamps are designed for applications in television, color film, and photographic studios. The manufacturer also recommends the lamps for spotlights, follow spots, and floodlighting. North American Philips Lighting Corporation, Somerset, NJ.

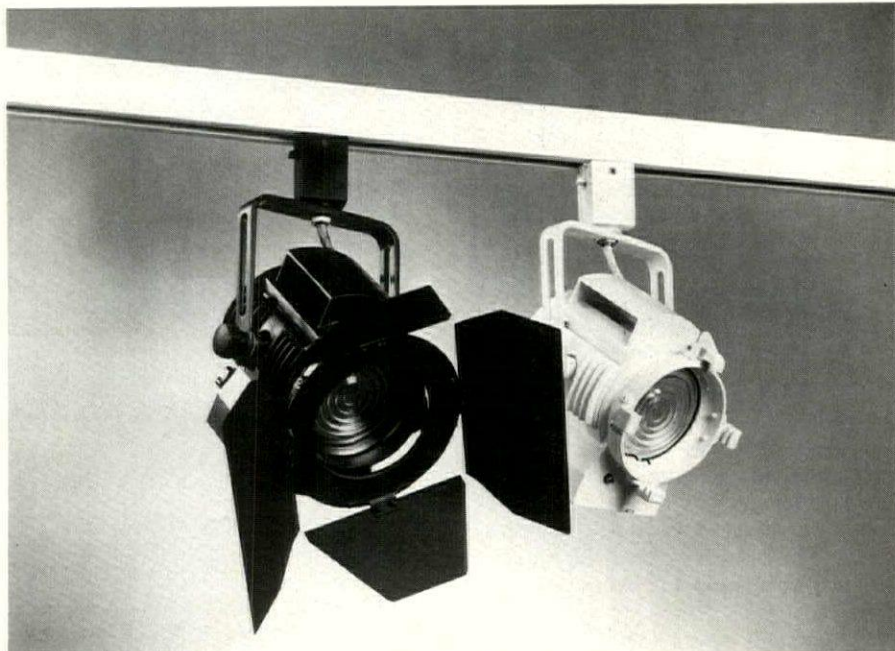
Circle 152



■ VDT lighting handbook

The National Lighting Bureau offers a 20-page illustrated handbook that discusses video display terminal viewing tasks and ways to improve lighting for VDT users in office, commercial, and institutional settings. The National Lighting Bureau, Washington, DC.

Circle 153

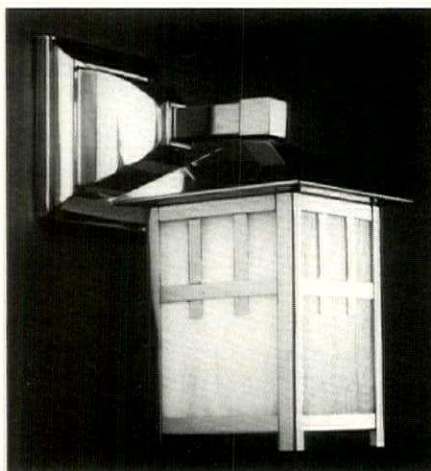


■ Fresnel track fixture

The Designer Fresnel 101 track fixture from LTM features a combination spherical reflector, point light source, and prismatic Fresnel lens that produces light with a totally controllable spot-to-flood focusing range. Accessories include barn doors and snoots for highlighting and a

theatrical, high-tech look. The unit is UL listed for track mounting; it takes a 150-watt incandescent lamp and is available in black and white satin finishes. LTM Corporation of America, Hollywood, CA.

Circle 154



■ Brass wall sconce

The Craftsman lantern wall sconce from Brass Light Gallery features a welded frame in solid brass that comes in six finishes: polished brass, satin antique, verdigris copper, nickel, white enamel, and black enamel. A choice of glass colors is also available. The sconce is recommended for both interior and exterior applications, and accommodates a 150-watt incandescent lamp. The lantern can also be used on numerous other fixtures from the company's Goldenrod Collection. Brass Light Gallery, Milwaukee, WI.

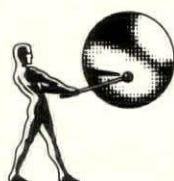
Circle 155

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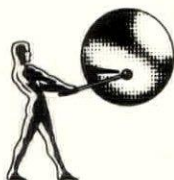
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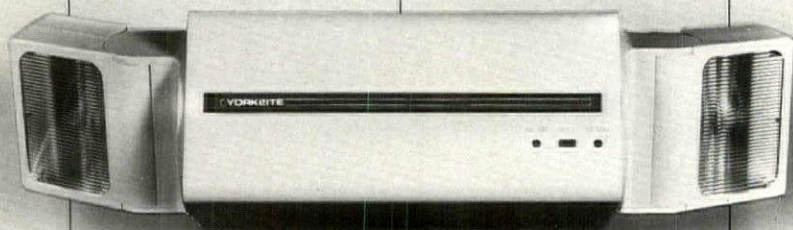
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Circle 62



■ Low-voltage light channel

The 12-volt Light Bud Channel from Sylvan Designs is a ribbon of sub-miniature bare-bulb lamps backed by a stippled nonmetallic reflector. They are mounted in an aluminum channel with a snap-in acrylic diffuser. The lamps are wired in parallel so that when a lamp fails, only it goes out. The channel unit can easily be disassembled and reassembled for relamping and can be mounted on any of its three sides with double-sided foam adhesive tape or screws.

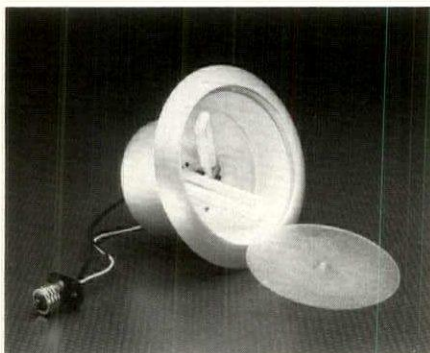
The channels come in lengths up to 20 feet with gold or silver reflectors. Options include custom lengths and lamp spacings, anodized colored channels, and multiple-light construction. Sylvan Designs, Inc., Northridge, CA.

Circle 157



■ Recessed canopy light

The RC Series recessed canopy light from Ruud Lighting has a seamless die-cast aluminum housing finished with white acrylic powder coat paint. The compact, watertight unit has steel L brackets that can be adjusted to the thickness of the



■ Compact fluorescent fixture

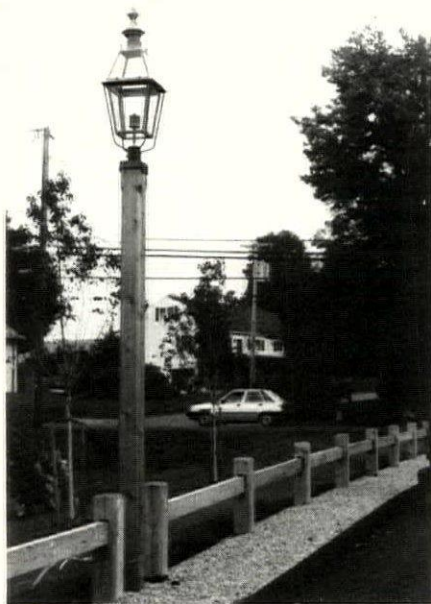
Scientific Component Systems offers the X18 Series of compact fluorescent fixtures. The UL-listed fixtures have diffusers in clear, natural, and pink polycarbonate and accommodate two 5- or 7-watt compact fluorescent lamps. A ceiling trim ring doubles as a cooling fin to draw heat away from transformers and lamps. Models are available for both new construction and retrofit installation. The X18 retrofit model shown is a flush-mounted, screw-in fixture for a 6-inch-diameter recessed ceiling fixture. Scientific Component Systems, Anaheim, CA.

Circle 156

ceiling material. Its UL-listed thermal protector allows mounting on most surfaces.

Standard features include a clear or crystal prismatic high-impact tempered glass lens, a narrow distribution optical system, and a high power factor ballast. Optical systems for wide distribution or forward-projection cutoff are also available. UL lists the unit for wet locations. It accommodates 100- or 175-watt metal halide lamps or 70-, 100-, or 150-watt high pressure sodium lamps. Ruud Lighting, Racine, WI.

Circle 158



■ Wooden lamp pole

Ryther-Purdy offers the Type W lamp pole of solid or laminated western red cedar. Chamfered corners on its square shaft combine a tapered appearance with structural strength. Shaft widths range from 4 to 12 inches square and heights to 40 feet. Poles are fashioned to individual requirements and customized to accept top- or side-mounted fixtures or arm mounts from other manufacturers. They may be combined with fences and other matching accessories for a unified architectural appearance. Ryther-Purdy Lumber Company, Old Saybrook, CT.

Circle 159

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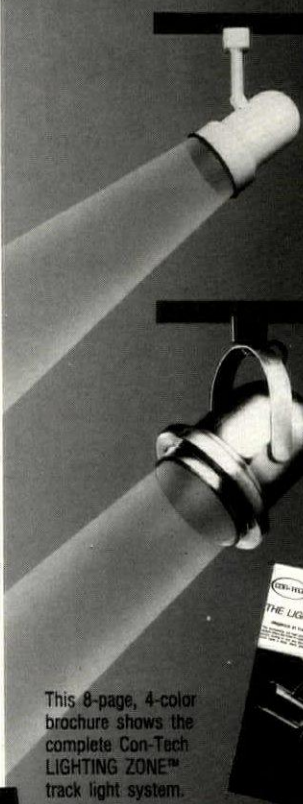
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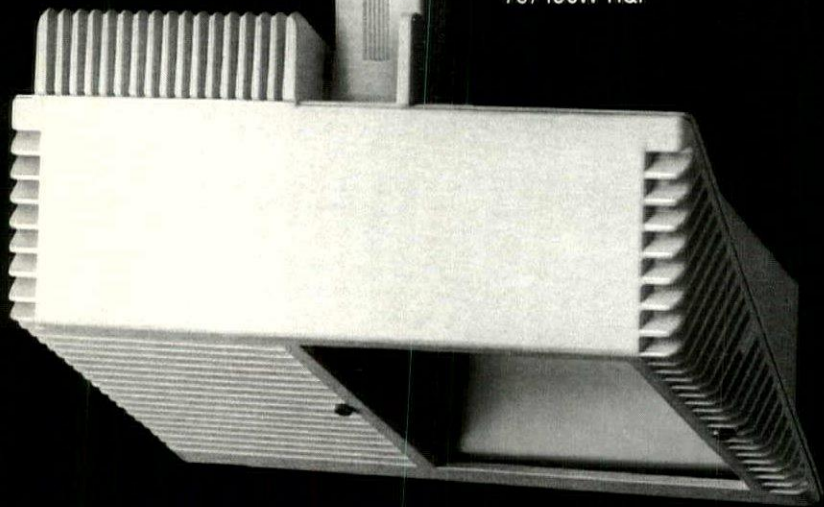
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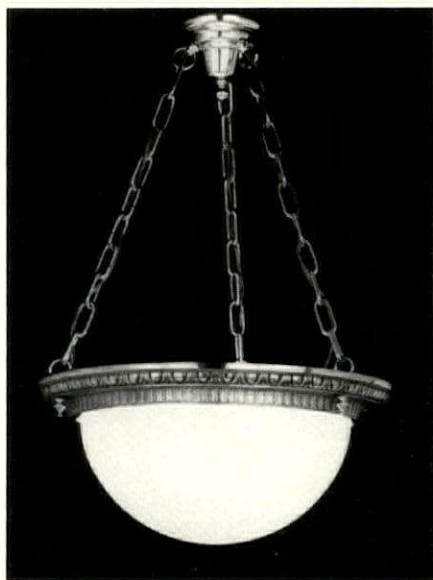
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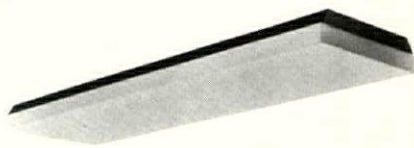
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■ Brass pendant

Art Directions offers the cast brass Camelot pendant fixture with a luminous acrylic dome. The fixture measures 20 inches in diameter and has an overall drop of 28 1/4 inches. It accommodates three 100-watt incandescent lamps. Art Directions, St. Louis, MO.

Circle 160

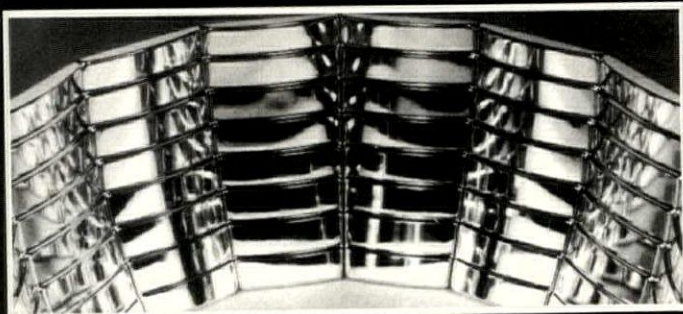
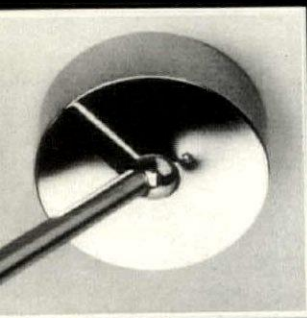


■ Fluorescent wraparound

KLP's Dominaire II is a high-efficiency fluorescent wraparound set in a durable 1 1/8-inch black step-back housing for a floating appearance. Its 70.9 percent efficiency ranks it highest among all wrap-around fixtures, according to the manufacturer. The prismatic-lensed fixture produces uniform light output from all sides via luminous catadioptric end caps that refract light to useful areas. The wraparound comes in sizes of 9 by 48 inches, 9 by 96 inches, and 14 by 48 inches. It can be surface- or pendant-mounted; a low-density mounting option is available for fibrous-wood ceiling tile applications. Keene Lighting Products, Wilmington, MA. ■

Circle 161

TEMPO I PLUS



Whole New Direct/Indirect Lighting System.

The genius of the Forum Tempo I PLUS lighting system is 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 pre-determined zones. With the addition of a Fresnel lens (and optional opal overlay) located on the bottom of the fixture body, Forum Tempo I PLUS now also provides the advantages of a controlled downlighting component in conjunction with the superior performance of an indirect system.

With the addition of a controlled downlighting component, the Forum Tempo I PLUS provides:

- Increase footcandles on task areas
- Accent lighting to meet specific design criteria
- 'Ease of mind' reference to the source of illumination.



Full Range of Lamps/Wattage

175W, Metal Halide
250W, Metal Halide
400W, Metal Halide
1000W, Metal Halide

150W, H.P.S.
250W, H.P.S.
400W, H.P.S.
1000W, H.P.S.



FORUM

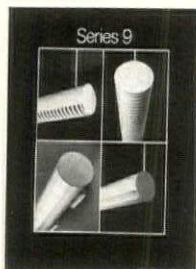
Inc.

214 Lexington
Avenue
Pittsburgh, PA
15208
(412) 244-8780

Circle 80

Patent NO. 4,293,900

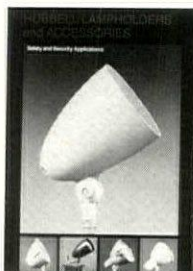
Product Literature



■ Linear fluorescent system

A brochure profiles Neo-Ray's Series 9 wall- or pendant-mounted linear fluorescent system for direct, indirect, and combination direct-indirect lighting configurations. Diffusers and baffles are also available. Neo-Ray Lighting, Brooklyn, NY.

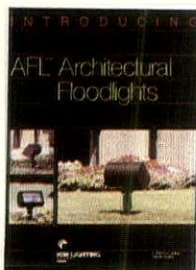
Circle 170



■ Lamp holders

A brochure from Hubbell Lighting describes a full line of lamp holders and accessories for indoor and outdoor use. Included are sockets, gaskets, and fixture. Hubbell Incorporated, Lighting Division, Christiansburg, VA.

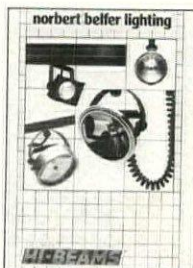
Circle 175



■ Floodlighting

Kim Lighting's AFL series architectural floodlights for indoor or outdoor use come in three beam patterns, three colors, and nine mounting configurations. A color brochure illustrates accessories and options. Kim Lighting, City of Industry, CA.

Circle 171



■ Low-voltage lighting

A brochure from Norbert Belfer describes and illustrates low-voltage track and mounting canopy-mounted fixtures, ceiling fixtures, light strips, miniature strips, shell lights, and step lights. Norbert Belfer Lighting, Ocean, NJ.

Circle 176



■ Specialty lamps

A catalog from Osram features short arc, long arc, special discharge, and special incandescent lamps. The 40-page catalog contains descriptions, technical data, dimensions, and illustrations of a variety of lamps. Osram Corporation, Newburg, NY.

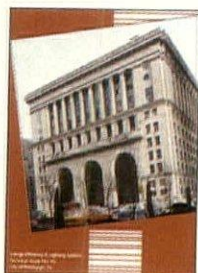
Circle 172



■ Outdoor, task lighting

A color brochure summarizes Sterner's lighting products and services. It includes drawings and photos of bollards, post-top and roadway fixtures, task-ambient systems, controllers, and floodlights. Sterner Lighting Systems Incorporated, Winsted, MN.

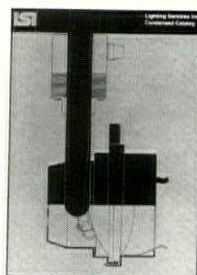
Circle 177



■ Reflective sheets

A brochure describes a two-phase project in which the city of Pittsburgh used Alcoa's highly reflective aluminum Everbrite sheets to retrofit fluorescent fixtures in city-owned buildings. Alcoa, Sheet & Plate Division, Bettendorf, IA.

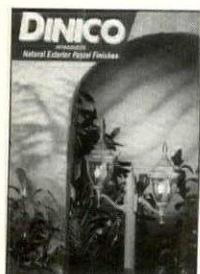
Circle 173



■ Track system

LSI's 14-page brochure contains photos and specifications for track fixtures, dimmers, and accessories from the low-voltage, Spotlight, MR, and Tungsten Halogen lines and for Linear and Cylinder products. Lighting Services Inc., Stony Point, NY.

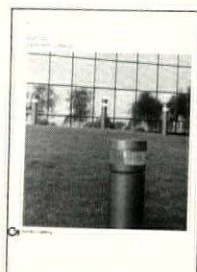
Circle 178



■ Pastel finishes

Dinico Products offers four natural exterior pastel finishes for all items in its master catalog. A color brochure illustrates sample outdoor luminaires and poles in the pastel finishes. Dinico Products, Inc., Hackensack, NJ.

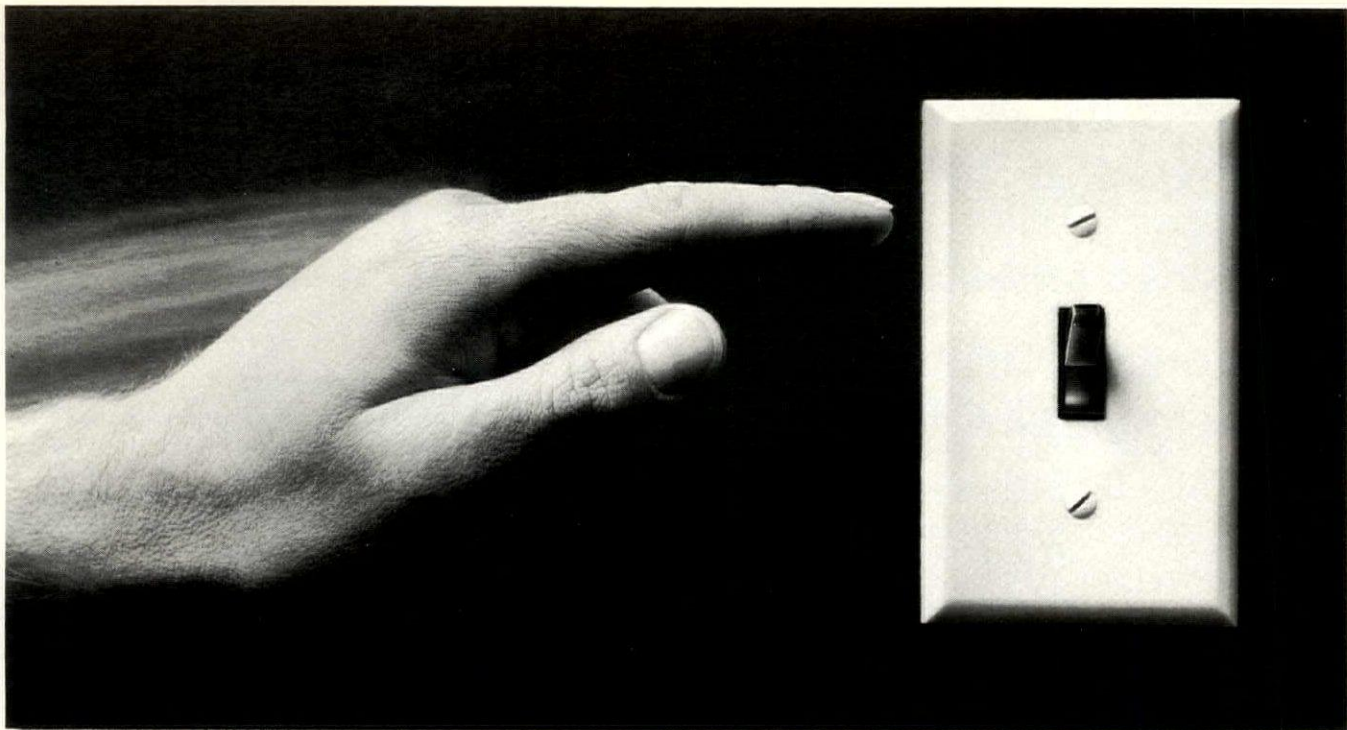
Circle 174



■ Bollards

Gardco bollards resist damage from vandals, weather, and insects. A 12-page color catalog details features, specifications, and photometric data for standard round and square models and the 16-inch-diameter Bollard Ten. Gardco Lighting, San Leandro, CA.

Circle 179



IF YOU CAN WORK ONE OF THESE, YOU CAN OPERATE INCOM.

THE WESTINGHOUSE
INCOM LIGHTING AND ENERGY
MANAGEMENT SYSTEM.

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Now there's a lighting and energy management system so advanced, yet so simple, virtually anyone can operate it with very little training. And that makes INCOM one of today's easiest and most cost-effective systems to install, operate and maintain.

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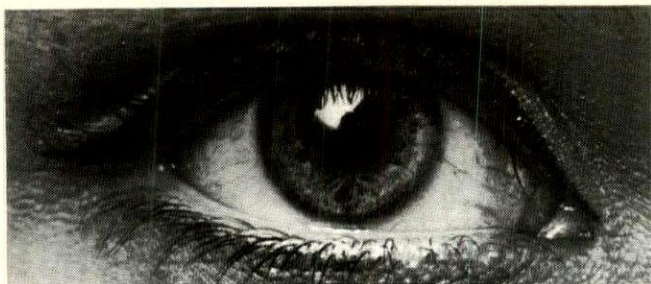


INCOM also has Class A FCC Approval. So it won't interfere with other systems in your building, and other systems won't interfere with it.

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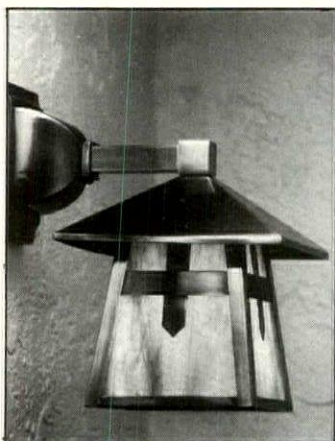
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Circle 66

See the Light

The Stamford Exterior Light

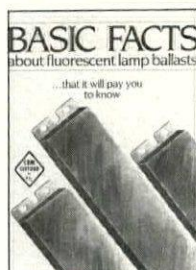


Order your Stamford in handsome verdigris copper finish, durable for exterior as well as interior use. Variety of glass. Choose finish—Verdigris copper, white enamel, black enamel. 9" high, 9¼" deep, 7" wide.

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■ Ballast guide

A 16-page booklet from Certified Ballast Manufacturers explains the function and importance of ballasts for fluorescent lamps, defines terms, and discusses energy-saving options. Certified Ballast Manufacturers, Cleveland, OH.

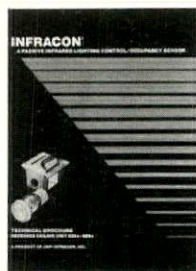
Circle 180



■ Cast iron posts

A color brochure from Spring City Electrical Manufacturing profiles 20 different styles of heavy-duty, cast iron ornamental lighting posts. Spring City Electrical Manufacturing Company, Spring City, PA.

Circle 181



■ Sensor, controller

A brochure from JWP Infracon profiles the 628a/629a recessed ceiling system, which combines a passive infrared occupancy sensor and a lighting control unit. It also describes a compatible wide-view sensor. JWP Infracon, Inc., Fairfield, NJ.

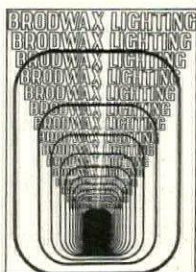
Circle 182



■ Chandeliers

Gross Chandelier's Series 80000 colonial-style chandeliers and wall sconces for commercial applications come in a variety of finishes and shade treatments. The company also offers custom design services. Gross Chandelier Company, St. Louis, MO.

Circle 183



■ Fluorescent luminaires

A color catalog illustrates Brodwax Lighting's line of fluorescent luminaires, many with oak or walnut frames, in sizes to accommodate straight, circular, or U-shaped fluorescent lamps. Brodwax Lighting Corp., Island Park, NY.

Circle 184



■ Wooden luminaires

A 12-page color brochure illustrates Idaho Wood's cedar and oak luminaires, including outdoor posts, bollards, landscape lights, wall lights, light bars, and fluorescent ceiling fixtures. Idaho Wood Industries, Inc., Sandpoint, ID.

Circle 185



■ Louver guide

American Louver offers an illustrated guide to retrofitting fluorescent ceiling lighting systems with parabolic louvers and shows configurations for four common ceiling-fixture combinations. American Louver Company, Skokie, IL.

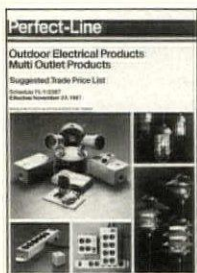
Circle 186



■ Corner fixture

The Concorde is part of the Corner Lite collection of corner-mounted fixtures that can provide indirect lighting, task lighting, or general illumination. A data sheet describes features and illustrates available finishes. Spectrum Lighting Corp., Ledgewood, NJ.

Circle 187



■ Outdoor components

A 30-page master catalog profiles American Electric's Perfect-Line outdoor products, including lamp holders, vaporproof fixtures, photoelectric controls, and low-voltage fixtures. American Electric, Construction Materials Group, Pittsburgh, PA.

Circle 188



■ Dimming control

The Grafik Eye preset dimming control fits a standard four-gang switchbox and operates up to four zones and four preset scenes. A color brochure describes features, specifications, installation, and system components. Lutron Electronics Co., Inc., Coopersburg, PA.

Circle 189

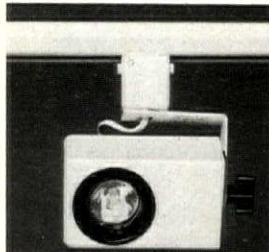
MITY LITE®



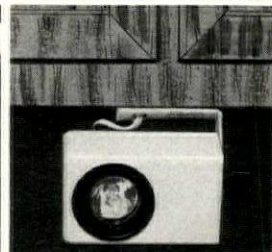
HALOGEN LAMP Series



MITY LITE Model No. 7060 Floor Lamp Model No. 8621



Track Model No. 3114



Under Cabinet Model No. 9020

Sensation of the year! Roxter's new MITY LITE Series shines like no other light you've ever seen. These compact halogen lights pack a punch of pure white light from their tiny, unbelievably efficient, low voltage bulbs.

Just think—with only 12 watts (Model No. 7060) of power you can light up (and I do mean LIGHT UP) your favorite sculpture, painting, or any small item you want to focus your attention on. Light beam is adjustable, and convenient line cord switch turns lamp on/off. Offered in semi-gloss white or semi-gloss black.

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Write or call today for new color catalog.

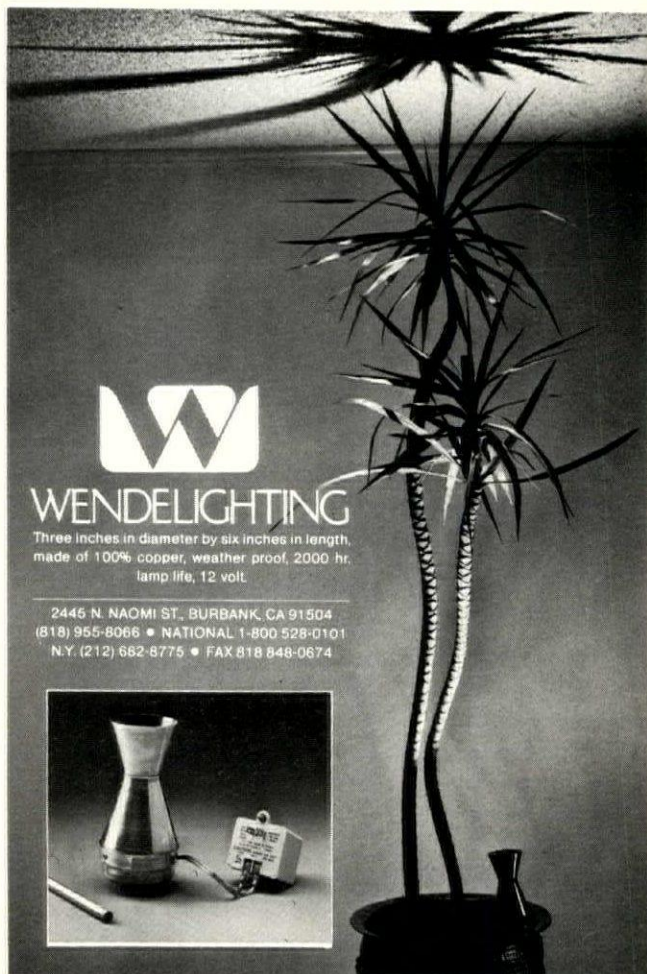


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Circle 69

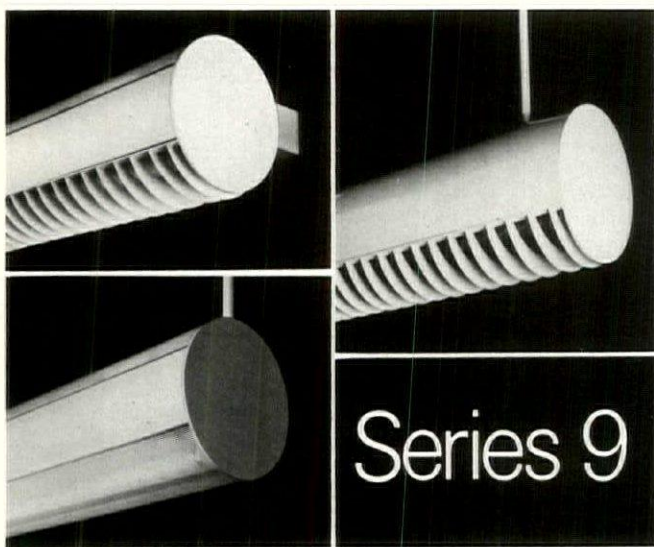


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Circle 70



Series 9

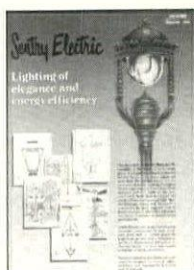
A series of 6 new fixtures . . . High level of glare free, wide spread illumination is projected up, down, or up and down. Wall and pendant mounted applications are provided to any length, to any configuration, and in a standard or custom finish. The extruded aluminum 9" round spatial tubes offer the unity and the quality required for today's energy conscious free style open plan space design.

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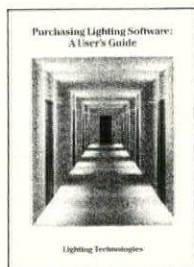
Circle 71



■ Outdoor luminaires

Sentry Electric presents a selection of 10 outdoor luminaires in an illustrated color brochure. Custom-designed and manufactured luminaires for New York's Union Square, Central Park, and Battery Park City are shown. Sentry Electric Corporation, Freeport, NY.

Circle 190



■ Software buying guide

A free guide for design professionals interested in buying computer programs for lighting applications introduces important but less obvious concepts such as program validation and accuracy. Lighting Technologies, Boulder, CO.

Circle 191



■ Compact fluorescent lighting

A 48-page catalog details 24 recessed, surface-mount, night-light, and exit fixtures for compact fluorescent sources; it details features and descriptions and has cutaway sketches of each fixture. The Kirlin Co., Detroit, MI.

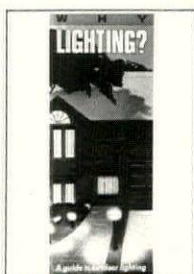
Circle 192



■ Automatic controller

The Time Machine allows time-of-day or sunlight-time control of most electrical loads and has special lighting control capabilities. A brochure details components and features. Electro Controls, Salt Lake City, UT.

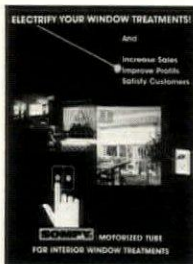
Circle 193



■ Lighting guide

Toro's 15-page booklet on low-voltage outdoor lighting describes the benefits of outdoor systems and includes an illustrated do-it-yourself section on system installation. The Toro Company, Mound, MN.

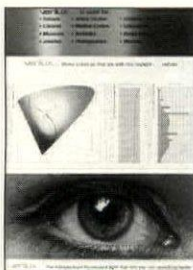
Circle 194



■ Shading system

Somfy Systems offers the Motorized Tube, which automatically raises and lowers interior window treatments. A brochure outlines features, operation, and other technical information. Somfy Systems, Edison, NJ.

Circle 195



■ Full-spectrum fluorescent

The Verilux full-spectrum fluorescent lamp has a color rendering index of 93 and a color temperature of 6200K. A brochure describes features and advantages. Color Perfect, White Plains, NY.

Circle 196



■ Neon, tubular system

The TLS-5 from Staff Lighting combines a tubular lighting system and neon lamps. Tube modules are available for direct and indirect fluorescent, track lighting, or neon only. Staff Lighting, Highland, NY.

Circle 197



■ Indoor, outdoor lighting

A 72-page color catalog profiles Hinkley Lighting's decorative indoor and outdoor luminaires, including brass, copper, and cast aluminum lanterns, landscape fixtures, chandeliers, and ceiling and wall fixtures. Hinkley Lighting, Inc., Cleveland, OH.

Circle 198



■ Special effect lighting

Ness Imports features the Neonstick neon tube, the XenonLine colored strobe lighting system, and the Linocolor mains voltage tubular lighting product. A brochure lists applications, specifications, sizes, and colors. Ness Imports Inc., Hackensack, NJ. ■

Circle 199

Bright Idea

The LIGHTHOUSE

New fixture for low level lighting. Handsome bollard design. Laminated of custom selected, kiln dried *Western Red Cedar*. Easy access to lamp and ballast compartment. Incandescent, mercury vapor or high pressure sodium.

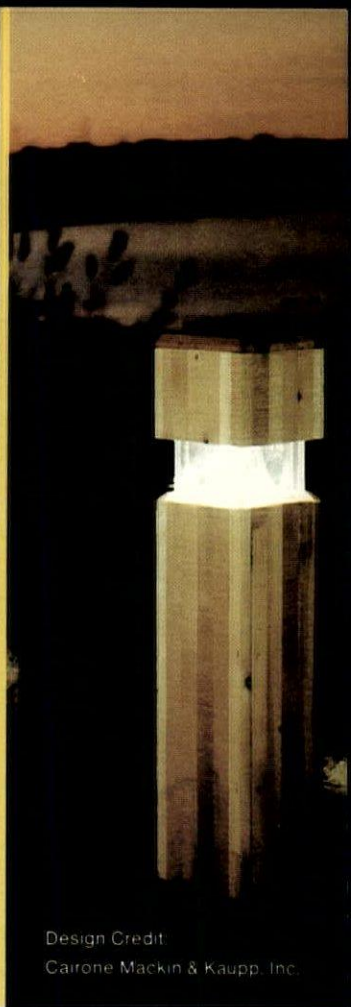
Write on letterhead for catalog of wood lighting standards and accessories.

Ryther-Purdy Lumber Company, Inc.

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P.O. Box 622
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Phone (203) 388-4405

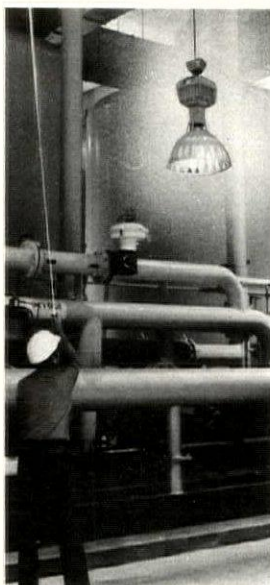


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Circle 72



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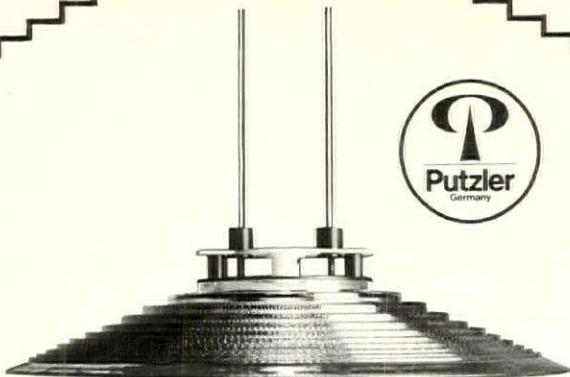
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Circle 73



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Calendar

April 20, 1988

DLF annual workshop. Speaker: Connie Jensen of Lighting Professionals, Inc. Contact: Sy Bollinger, President, The Designers Lighting Forum of New York, 58 Stratford Ave., Greenlawn, NY 11740, (212) 255-8555.

May 1, 1988

Entry deadline for 1988 International Illumination Design Awards for installations completed between April 1, 1986, and March 31, 1988. Rules and applications available from local IESNA Sections. Contact: Illuminating Engineering Society of North America, 345 East 47th Street, New York, NY 10017, (212) 705-7923.

May 10, 1988

Decorative fixtures that are aesthetically pleasing while being functional, DLF event. Speaker: Susan Huey of Luminae Souter. Contact: Paula Goodell, President, Designers Lighting Forum, Northern California Chapter, P.O. Box 1429, San Francisco, CA 94101, (415) 550-0333 or (415) 843-3468.

May 15-18, 1988

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

May 19, 1988

Awards program, IES Golden Gate section event, San Remo's, San Francisco. Contact: Mike Mazzi, Program Chairman, California Architectural Lighting, 310 Townsend, Suite 200, San Francisco, CA 94107, (415) 777-5111.

May 20-21, 1988

IES seminars, Westin Peachtree Plaza, Atlanta. Two two-day seminars: display lighting with James Benya, office lighting with Gary Steffy. CEUs available. Contact: Diane Darrow, Meetings Manager, Illuminating Engineering Society, 345 East 47th Street, New York, NY 10017, (212) 705-7269.

May 23-24, 1988

Lighting for corporate and institutional facilities, seminar, Real Estate Institute, New York University, New York City. Instructor: Peter Golden of STV/Seelye Stevenson Value & Knecht. Contact: Anne Ballantine, New York University, Real Estate Institute, 11 West 42nd Street, New York, NY 10036, (212) 790-1345.

May 23-25, 1988

Energy — An integrated approach, energy design conference, Chattanooga-Hamilton County Convention and Trade Center, Chattanooga, Tennessee. Sponsor: Tennessee Valley Authority with AIA and others. Contact: Susan Ross, TVA, 35 65D Signal Place, Chattanooga, TN 37402-2801, (615) 751-7405.

May 25, 1988

Landscape lighting, DLF event. Contact: Sy Bollinger, President, The Designers Lighting Forum of New York, 58 Stratford Ave., Greenlawn, NY 11740, (212) 255-8555.

May 25-27, 1988

International Lighting Exposition, Metro Convention Centre, Toronto, Canada. Sponsor: IESNA, Toronto Section. Contact: Deborah Dugan, Show Manager, Kerrwil Trade Show Division, 501 Oakdale Road, Downsview, Ontario M3N 1W7, (416) 746-7360.

May 27, 1988

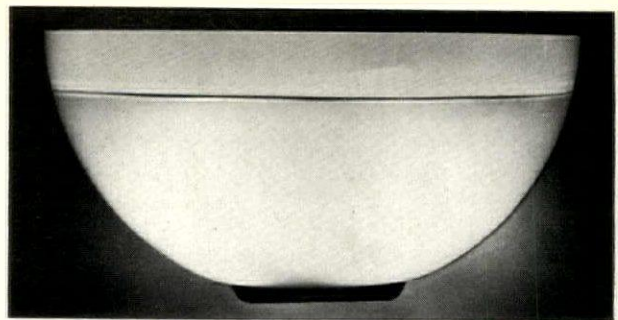
Entry deadline, 12th annual lighting design competition sponsored by Cooper Lighting Group and held under ASID auspices. Contact: The Hanlen Organization, 401 N. Michigan Avenue, Chicago, IL 60611, (312) 222-1060.

June 14, 1988

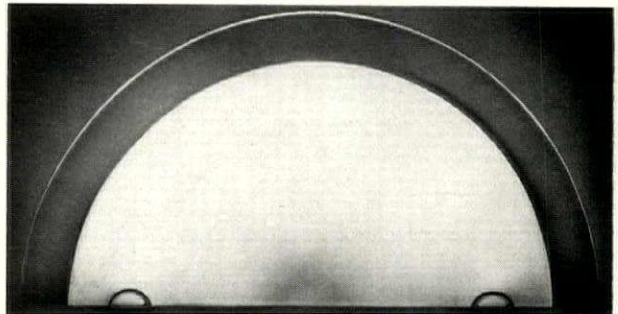
Gallery of Bay Area designers, DLF event. Contact: Paula Goodell, President, Designers Lighting Forum, Northern California Chapter, P.O. Box 1429, San Francisco, CA 94101, (415) 550-0333 or (415) 843-3468.

June 20-24, 1988

Solar '88, Massachusetts Institute of Technology, Cambridge, MA. American Solar Energy Society and 13th national passive solar energy conferences. Contact: Larry Sherwood, Northeast Solar Energy Association, P.O. Box 541, Brattleboro, VT 05301, (802) 254-2386. ■



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Circle 76

Manufacturer Credits

Page 20. *Designers light restaurant with golden touch* (Ho Chow, Fremont, California).

Alesco: Low-voltage recessed R14 minidownlights over bar.

Applied Lighting Systems: Flexible tube lighting for glass block.

GE: Narrow spot halogen PAR 38 lamps.

Halo: Recessed MR16 accent lights with linear spread lenses and honey-comb louvers, recessed downlights.

Luxor: Phosphor-coated A lamps.

Sylvan Designs: Flexible tube lighting for coffers.

Verosol: Pleated shades.

Page 24. *Computer turns off lights, saves electricity dollars for bank* (Society Corp. Corporate Services Center, Cleveland).

Elemco: Powerline carrier software.

Honeywell Building Controls Division: Building management system.

Page 28. *Team spirit enlivens sports bar at arena* (Arena Club Lounge, Denver).

Atelier: Incandescent wall sconces.

Dual-Lite: Exit signs.

General Electric: Lamps.

Lightolier: Recessed A lamp downlights; recessed 50-watt MR16 downlights (flood and narrow spot); dimming control.

Mostly Neon: Neon.

Page 30. *Custom fixtures, planning strategies meet Title 24 challenge* (Coast Savings and Loan, Los Angeles).

ELA Company: Custom indirect metal halide fixtures, custom incandescent ceiling fixtures and wall sconces.

Globe Illumination: Recessed fluorescent fixtures.

GTE/Sylvania: Lamps.

Guth: Indirect metal halide reflector and hardware.

Lightolier: Recessed incandescent downlights, lighting control system.

Lutron: Fluorescent dimmers.

Page 38. *Surf, sand, and elegant lighting at a world-class resort* (Sheraton Mirage Gold Coast Resort, Surfers Paradise, Australia).

Concord: Standard and low-voltage downlights.

Jaguar (Italy): Landscape lighting.

Lutron: Control systems.

Nightscaping: Landscape lighting.

Philips: Fluorescent lamps.

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

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