

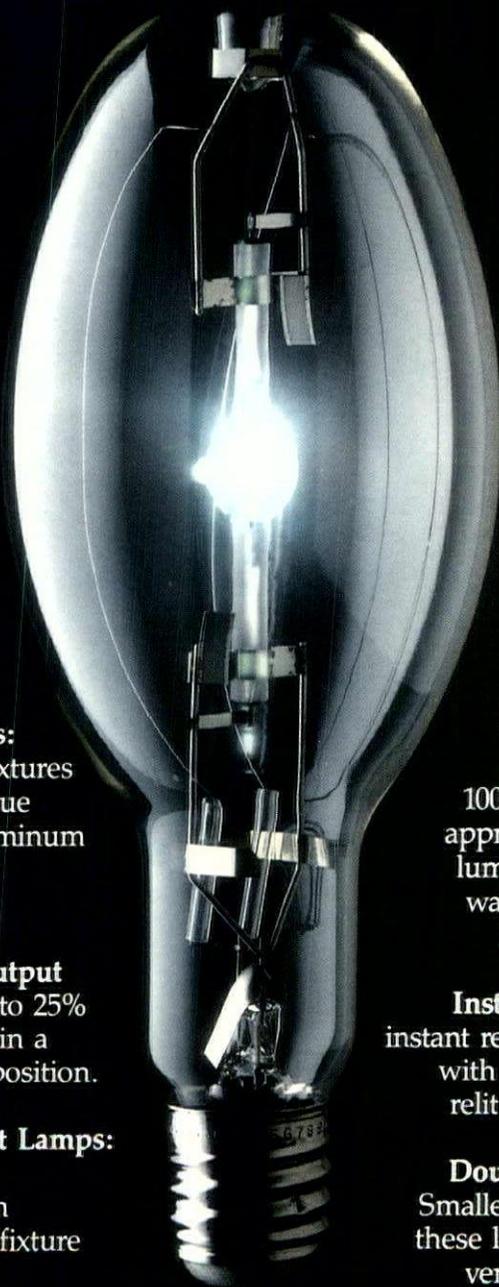
# LIGHTING



April 1987  
Five Dollars

# Brilliant Innovations

With an eye toward innovation and new technological advances, Venture Lighting International has developed the broadest line of Metal Halide lamps in the industry. Advances in the Metal Halide product line include:



**Glare Guard Lamps:** reduce glare from fixtures by utilizing an opaque highly reflective aluminum coating on the top of the bulb.

**Horizontal High Output Lamps:** provide up to 25% greater light output in a horizontal burning position.

**Special Outer Jacket Lamps:** smaller outer jacket assemblies for use in compact low-profile fixture designs.

**Compact Arc Lamps:** short arc gap allows higher level of beam lumens from standard fixtures.

**Low Wattage Lamps:** our 70 and 100 watt lamps deliver approximately the same lumens as 250 and 300 watt tungsten halogen lamps, respectively.

**Instant Restart Lamps:** instant relighting capabilities with 90% light output if relit within 15 seconds.

**Double Ended Lamps:** Smaller envelope size lets these lamps be utilized in very compact fixtures.

To see how brilliant these innovations can be, contact us at:



**VENTURE LIGHTING  
INTERNATIONAL**

A subsidiary of Advanced Lighting International  
625 Golden Oak Parkway, Cleveland, Ohio 44146  
(216) 232-5970 1-800-338-6161

# SPECIFYING A DIMMING SYSTEM ?



## DON'T LOSE CONTROL

## CONSIDER **PRESCOLITE'S** NEW **MICRO-PAC™** UNBELIEVABLE CONTROL AT BELIEVABLE PRICES

Finally, there is a lighting control system perfectly suited for that small to medium size job, be it a conference room, boutique, restaurant or residence. A system that offers unlimited expansion capabilities in a compact unobtrusive form. **MICRO-PAC** manages your lighting needs without mismanaging your money.

**MICRO-PAC's** 1/4 inch thin control panels are available in six designer finishes or field paint them to match any decor.

Achieve elegant lighting effects at prices comparable to wall box dimmers. Manual models have a high and low trim for each channel and all **MICRO-PAC** four scene preset models let you set your own fade rate from zero to sixty seconds.

**MICRO-PAC** dimmers are UL listed at 1200 Watts per load, but total load capacity is unlimited. Assign any load or number of loads, to any channel — with multifunction control — the ultimate in versatility.

Why Wait? **MICRO-PAC** is stocked for "off the shelf" availability. Let us provide you with more information on this amazing new system or with applications assistance. Call **1-800-DIMMERS** or contact your local Prescolite Controls Representative.

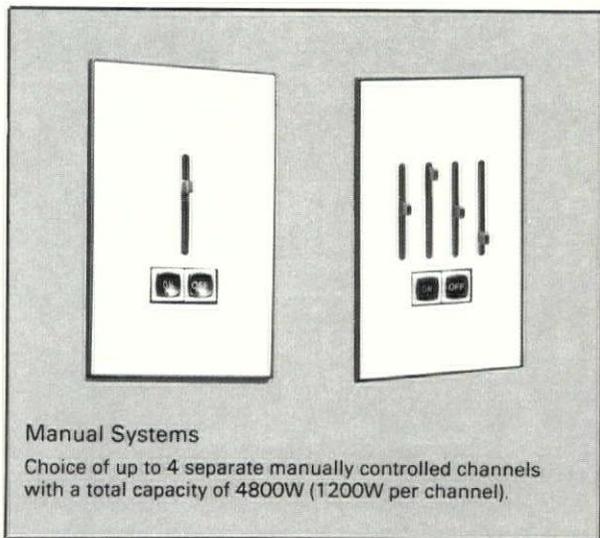
# **MICRO-PAC™**

## **PRESCOLITE CONTROLS**

**usi**  
LIGHTING

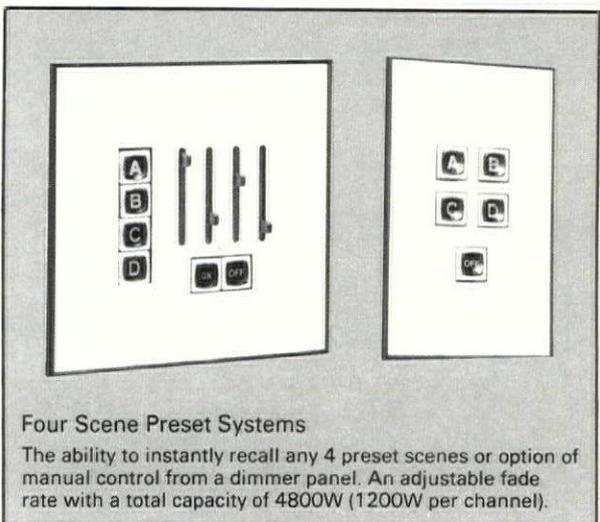
1206 Tappan Circle • Carrollton, Texas 75006  
Phone (214) 242-6581 or 1-800-DIMMERS

USI All Rights Reserved Copyright© 1987 Prescolite Controls



Manual Systems

Choice of up to 4 separate manually controlled channels with a total capacity of 4800W (1200W per channel).



Four Scene Preset Systems

The ability to instantly recall any 4 preset scenes or option of manual control from a dimmer panel. An adjustable fade rate with a total capacity of 4800W (1200W per channel).

# Redwood Classics

Maximum Span:  
72 inches



## SYLVAN DESIGNS, Inc.

8921 Quartz Ave., Northridge, CA 91324  
(818) 998-6868

Circle 3

# Sentry SBP



## The Traditional Luminaire of Battery Park City

Sentry SBP luminaires stand along the Hudson River Esplanade of Battery Park City, evoking past eras to contemporary New Yorkers. At night the SBPs become energy-efficient H.I.D. light sources that extend the Esplanade's usefulness well into the evening. Indestructible polycarbonate globes make them virtually vandal-proof. Available with New York Type B or other suitable post. Write or call for information.



# Sentry

Sentry Electric Corporation  
185 Buffalo Avenue  
Freeport, New York 11520  
516-379-4660

Circle 4

ARCHITECTURAL  
LIGHTING

Published monthly by Cassandra Publishing Corporation  
An affiliate of Aster Publishing Corporation

**Editorial Offices:** 859 Willamette Street  
P.O. Box 10460  
Eugene, OR 97440-1046  
(503) 343-1200

**Sales Offices:** 195 Main Street  
Metuchen, NJ 08840-2737  
(201) 549-3000

**Circulation Offices:** P.O. Box 10955  
Eugene, OR 97440-9895  
(503) 343-1200

**Publisher** Edward D. Aster  
**Associate Publisher** Michael Aster

**Editor** Charles Linn, AIA  
**Associate Editor** M. Jane Ganter  
**Contributing Editor** Stephen P. Schuber  
**Assistant Editor** Gareth Fenley  
**Senior Production Editor** Karen Carlson  
**Assistant Production Editor** Noël Bissontz  
**Editorial Assistants** Linda Crabtree  
Terri L. Kistler  
Kenneth L. Shaw

**Production Director** L. Ghio Imburgio  
**Graphic Designer** Lee Eide  
**Production Manager** Stephen Roberts  
**Advertising Coordinator** Helen Hornick

**Marketing Manager** Isobel Morgenstern  
**Director of Advertising** Robert Joudanin

**Circulation Director** Linda Pierce

**SUBSCRIPTIONS:** U.S.: 1 year (12 issues), \$49; 2 years (24 issues), \$90; 3 years (36 issues), \$129. Foreign surface rates: 1 year (12 issues), \$89; 2 years (24 issues), \$170; 3 years (36 issues), \$249. Foreign airmail: add \$60 per year to foreign surface rates. Single copy price: U.S., \$5; foreign countries, \$10.

**REPRINTS:** Reprints of all articles in this magazine are available (250 minimum). Write or call: Aster Services Department, 859 Willamette Street, P.O. Box 10460, Eugene, OR 97440-1046, USA, (503) 686-1211.

**CHANGE OF ADDRESS:** Allow 4 to 6 weeks for change; provide old mailing label and new address, including ZIP or postal code. **POSTMASTER:** Send address changes to *Architectural Lighting*, P.O. Box 10955, Eugene, OR 97440-9895.

© 1987 Cassandra Publishing Corporation. All rights reserved. Reproduction in part or whole without written permission is strictly prohibited. *Architectural Lighting* and the logo appearing on the cover of this magazine are registered trademarks of Cassandra Publishing Corporation.

BPA membership applied for September 1986.

Application for second class postage rates pending at Eugene, Oregon, and at additional mailing offices.

# FROM THE HOUSE THAT RUTH BUILT TO THE HOUSE THAT JACK BUILT

Incandescent, HID and Fluorescent. Cooper Lighting is the single source that offers a virtually limitless choice of lighting products. The choice for Yankee Stadium, the choice for millions of homes, and the choice for your next project.

Halo, Metalux, Crouse-Hinds, Lumark, McGraw-Edison, Sure-Lites and the SPI lines are now all part of Cooper Lighting. We are an unparalleled resource for manufacturing, engineering, marketing, design and research. Seven regional showrooms provide an opportunity to experience first-hand the effects of lighting.

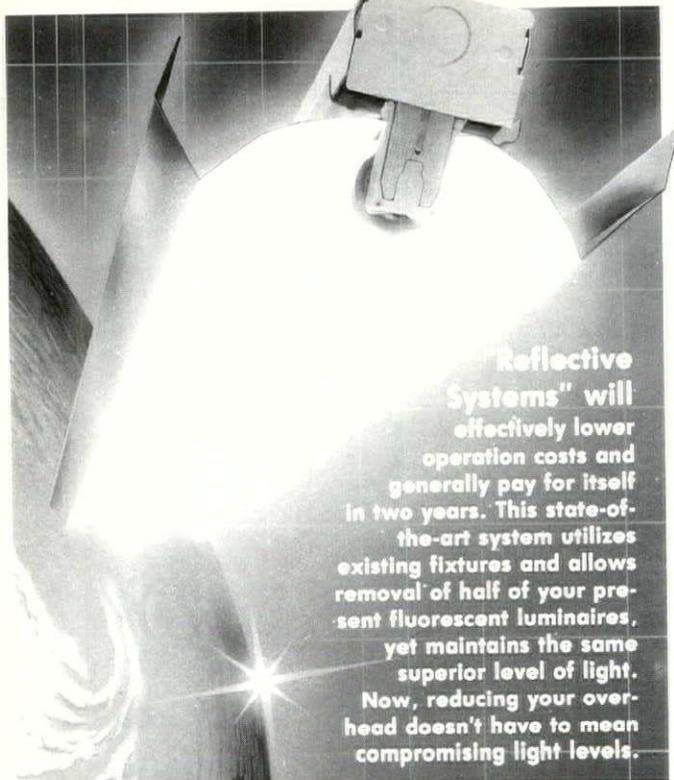
Brilliance from a single light source. Cooper Lighting, 400 Busse Road, Elk Grove Village, IL 60007.

**COOPER LIGHTING**  

---

**THE SINGLE LIGHT SOURCE**





**"Reflective Systems" will effectively lower operation costs and generally pay for itself in two years. This state-of-the-art system utilizes existing fixtures and allows removal of half of your present fluorescent luminaires, yet maintains the same superior level of light. Now, reducing your overhead doesn't have to mean compromising light levels.**



**JK REFLECTIVE SYSTEMS**

a division of *Al Kramp Specialties*



(209) 464-7539 or (209) 948-2621

P.O. BOX 8867 • STOCKTON, CALIFORNIA 95208 • License No. 336039

Circle 6

## LUMINARIES ILLUMINATI ARCHITECTS DESIGNERS

### Architects and Designers:

Share your solution to a lighting problem — large or small. Get Project Submission Guidelines by calling (503) 343-1200 or writing for more information about spotlighting your work in *Architectural Lighting*.

Charles Linn, AIA, Editor  
859 Willamette Street  
P.O. Box 10460  
Eugene, OR 97440  
(503) 343-1200



ARCHITECTURAL  
LIGHTING

## Editorial Advisory Board

### Charles C. Benton

Assistant Professor of Architecture  
University of California at Berkeley  
Faculty Research Associate  
Lawrence Berkeley Laboratory  
Berkeley, California

### David L. DiLaura, FIES

Director of Engineering  
Lighting Technologies, Inc.  
Associate Professor of Civil, Environmental,  
and Architectural Engineering  
University of Colorado  
Boulder, Colorado

### M. David Egan, PE, FASA

Associate Professor of Architecture  
Clemson University  
Clemson, South Carolina

### Raymond Grenald, FAIA

Senior Partner  
Grenald Associates, Ltd.  
Los Angeles, California

### David Lord, MIES

Professor of Architecture  
California Polytechnic University  
San Luis Obispo, California

### Thomas R. Schneider, PhD

President  
Lighting Research Institute  
Palo Alto, California

### Fran Kellogg Smith, ASID, CSI

Founder  
Luminae Lighting Consultants Inc.  
San Francisco, California

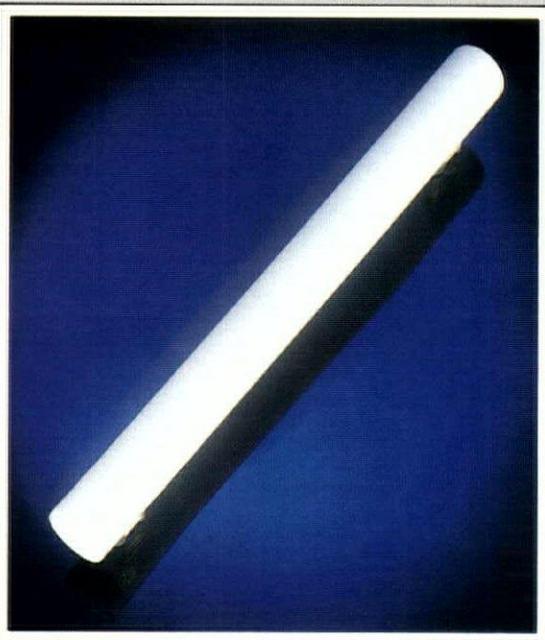
### William I. Whiddon

President  
W.I. Whiddon & Associates Inc.  
McLean, Virginia

*Architectural Lighting's* Editorial Advisory Board represents various facets of the lighting professions, and members were chosen for their expertise. EAB members may suggest article subjects, review manuscripts or projects, and answer questions as they arise.

**PROJECTS AND MANUSCRIPTS:** All submissions are handled with reasonable care, but the publishers assume no responsibility for the safety of artwork, photographs, or manuscripts. Every precaution is taken to ensure accuracy, but the publishers cannot accept responsibility for the accuracy of information supplied or for any opinion expressed herein.

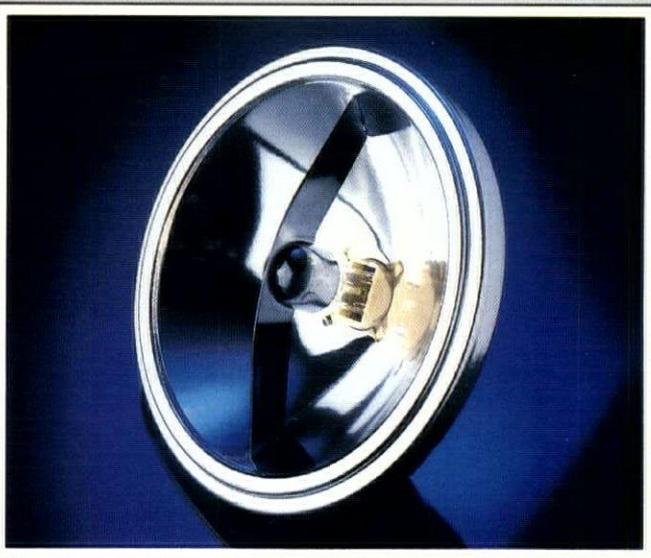
# An Artful Blend of Technology Brought To Light



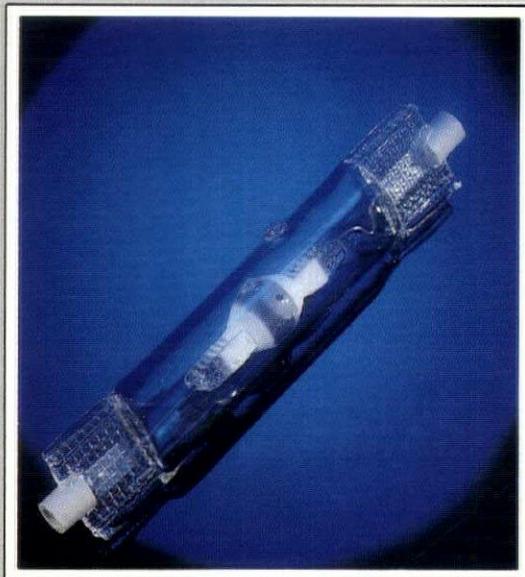
Still delighting architects and designers, Linestra® linear incandescents offer warm, ingenious light in all kinds of decorative and practical applications.



Way ahead of their time—our revolutionary Dulux® D. OSRAM Dulux compact fluorescents last up to 13 times longer than incandescents, but use as little as 25% of the energy. True incandescent-quality color... warm, pleasing light.



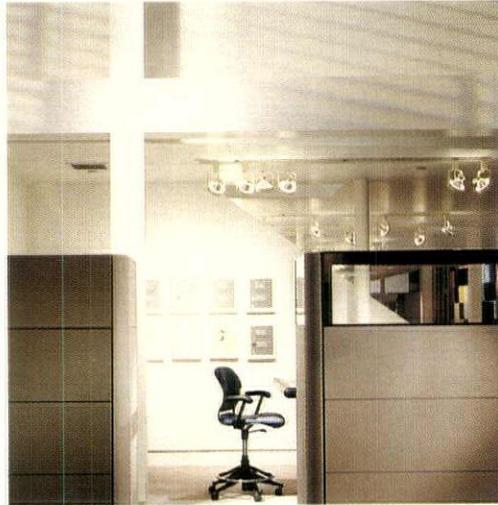
OSRAM advanced designs for low voltage tungsten halogen lamps focus with true color. Long life rating, a choice of color temperatures and types to meet almost every application.



In the market now—HQI® metal halide lamps—exclusively OSRAM! True color rendering in a metal halide, now available in colors to satisfy every need.

OSRAM Corporation, P.O. Box 7062, Jeanne Drive, Newburgh, NY 12550  
Tel. (914) 564-6300 (800) 431-9980. Telex: 926467  
12114 Sherman Way, North Hollywood, CA 91605  
Tel. (818) 982-4723 (800) 458-5584 In So. CA (800) 247-8675

**OSRAM**  
Technology Brought To Light



---

### Cover Story

- 18 A flexible lighting system for a dynamic display environment
- 

### Articles

- 28 Lighting World 5 preview  
34 Unexpected bonus with instant restrike metal halide lighting
- 

### Statements

- 12 Light artist creates building signature with colored light  
14 Lakewood lighting brings downtown to life  
16 Lighting, luncheons, clientele all tops at the Pinnacle
- 

### Columns

- 38 The Design Department  
40 The Parts Department  
42 The Daylighting Department
- 

### Departments

- 10 From the Editor  
11 Letters to the Editor  
45 Book Reviews  
46 Product Showcase  
54 Product Literature  
68 Calendar  
70 Manufacturer Credits  
70 Advertiser Index





# LUMENIZERS™

## New Improved Sunlight... From ALKCO

**P** Peak performing, obedient light day or night, indoors or out. The latest lamp and optics technology, including three optical systems:

LUMENSPOT™ with soft-edged round beams.

LUMENWASH™ walls evenly, top to bottom.

LUMENFLOOD™ larger areas and displays.

Lumenizers rotate 380°, adjust to 90° from vertical, are remarkably compact.

Lumenizers' HQI 70 watt source outperforms incandescents of 5 times the wattage...and lasts 7 times longer!

So if it shows better in natural light, it will show best with Lumenizers.

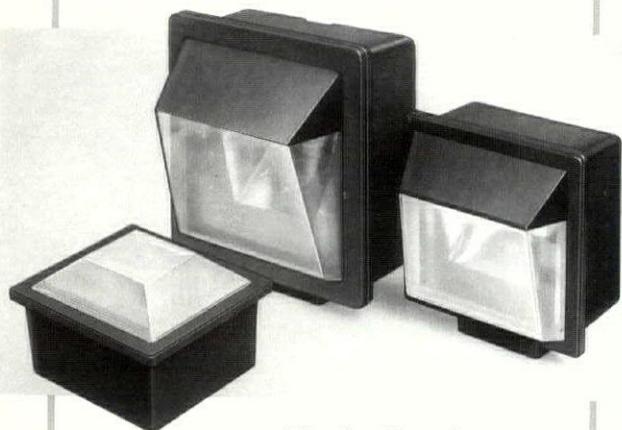
For your copy of Alkco's new condensed Space Enhancers catalog, write to the address below.



**ALKCO**  
where quality  
comes to light

Circle 8

## At ANY Level... "HYPAK"



A family of low glare, high performance luminaires for a full range of lighting applications. IES Type II, III, IV and V. Symmetrical and asymmetrical distributions available.

### HYDREL

12881 BRADLEY AVE. • SYLMAR, CA 91342  
818/362-9465 • FAX: 818/362-6548

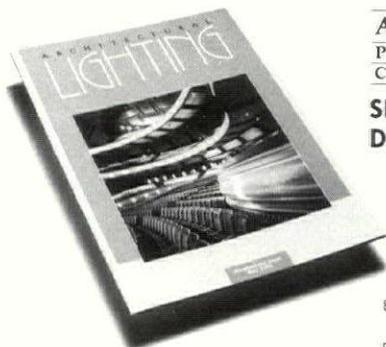
Circle 9

## REPRINT SERVICE

Reprints of all articles published in *Architectural Lighting* are available exclusively through Aster Services Department.

Reprints can be used effectively to broaden your exposure, enhance your marketing and educational programs, or promote your product or services.

For further information on volume orders, please contact:



**A S T E R**  
PUBLISHING  
CORPORATION  
**SERVICES  
DEPARTMENT**

859 Willamette St.  
P.O. Box 10460  
Eugene, OR 97440  
(503) 686-1211

## From the Editor

We've devoted a few pages of this issue to Lighting World, and next month we'll be devoting even more. Why? Because Lighting World is a good deal for everybody. As the largest lighting trade show in the Western Hemisphere, it gives manufacturers and vendors a forum for displaying their products and distributing loads of what many practitioners regard as the backbone of their practice — new product literature.

The practitioner's benefits include the opportunity to consult with manufacturers about design and applications firsthand. And, as far as viewing products is concerned, the exhibition is vast. Virtually every lighting product you would ever want to know anything about will be on display at Lighting World — lamps, interior and exterior luminaires, task lights, controls — including many products that have never been shown anywhere before. Manufacturers and vendors go to incredible lengths to make their booths first-rate product showplaces, and representatives are extraordinarily helpful.

What's more, practitioners have the opportunity to attend a variety of seminars and workshops on lighting-related topics — given by some of the finest consultants in the business. This year's topics run the gamut, including lighting and color, gallery and museum lighting, photometrics, lighting for retail, fiber optics, light as a landscape tool, lighting controls, and office lighting.

It's a terrific opportunity to meet some of the most influential people in the field of architectural lighting today, to hear what they have to say, and to view their work. Even those who don't meet any of the speakers can be sure that by attending the workshops they'll still meet a lot of designers who care about quality lighting.

So, whether you're an expert on lighting or know nothing about it at all, Lighting World is a terrific place to learn — at the programs and on the show floor. We're placing a good bit of emphasis on the show in this issue, although it will take place in May, because there is still time for our readers to make arrangements to attend. Please see the special section in this issue and make your Lighting World plans today.

Charles Linn, AIA

## Letters to the Editor

### Wasted space?

No offense to *Architectural Lighting* magazine, which is excellent, but I think the stockholders of Victoria Park Place ["Down the tubes," February 1987] should sue for return of funds wasted for the high loss of rentable income for interior space and for the huge sums of money spent to pass a little light from outside the building to the inside.

Apparently the amount of light passed to the inside is relatively low because auxiliary 400-watt Hg lamps are needed in early morning, late afternoon, all night, and on all cloudy days.

In adjunct, I saw no way for mom, or any other maintenance person, to get in there with a bucket and scrubbing brush to adequately clean all those windows, mirrors, and reflectors.

Additionally, are the 400-watt inserts and tubes approved by UL, CSA, or any other lab?

*Morton H. Lerner, PE  
Elkins Park, Pennsylvania*

### An opportunity to respond

The editors offered the light pipe system's inventors and developers an opportunity to respond to Lerner's criticism. Instead, they asked their client to do so.

### A problem-free system

As owners of Victoria Park Place, it seems appropriate to comment on Mr. Lerner's concern for our well-being.

Our solar lighting system has been operating problem-free for over a year. The system was designed to provide more than adequate lighting when the sun is shining, and it has surpassed our expectations in this regard. Everyone associated with the project is extremely pleased with the results.

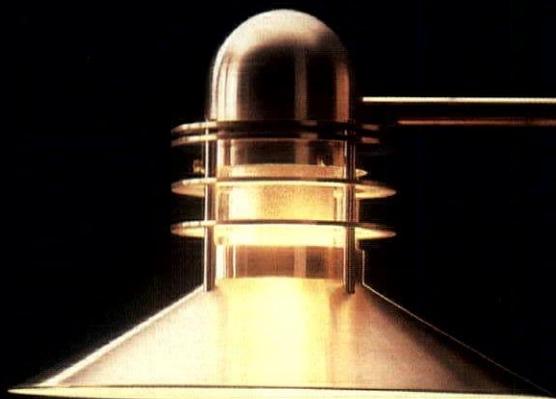
The system is virtually maintenance-free and, in particular, cleaning of the optical surfaces is rarely needed and easily performed. Further, all components of the system meet all relevant building code requirements.

We are a privately owned development company and, as such, one of our primary motives is profit-making; but we also recognize the long-term benefit of research and development into building systems that will reduce energy consumption. We intend to use solar lighting systems in future buildings as well.

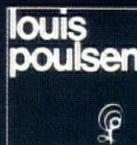
*John R. Hawley  
Vice President, Development  
Victoria Park Place Investments Limited  
Toronto, Ontario*

# NYHAVN.

An award-winning classic  
designed by  
Alfred Homann and Ole V. Kjar.



Copper or White, aesthetically combining  
the old and new worlds.

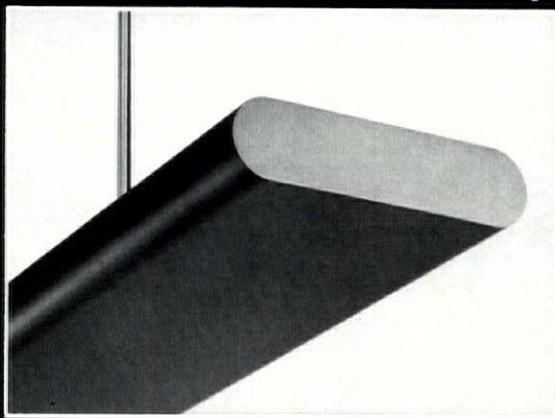


**POULSEN LIGHTING...**  
a history of excellence and innovation.

**Poulsen Lighting Inc.**  
5407 N.W. 163rd Street • Miami, Florida 33014-6130  
Telephone (305) 625-1009 • Faximile (305) 625-1213

Circle 11

## FLAT LITE® ... naturally



**Series 62** a totally harmonic ambient lighting entity! Uniquely distinguished by its elegant flat shape and its very comfortable, energy efficient, glare free, indirect light.

**FEATURES:** T8 lamps are enclosed in a super flat 1 3/4" extruded aluminum profile. Ends are welded and ground smooth. Stems are baked white enamel. Used singularly or in continuous rows, finished to blend or accentuate. Selecting Flat Light/Indirect complements your wisdom as well as your taste.

**neonay**  
NATURALLY

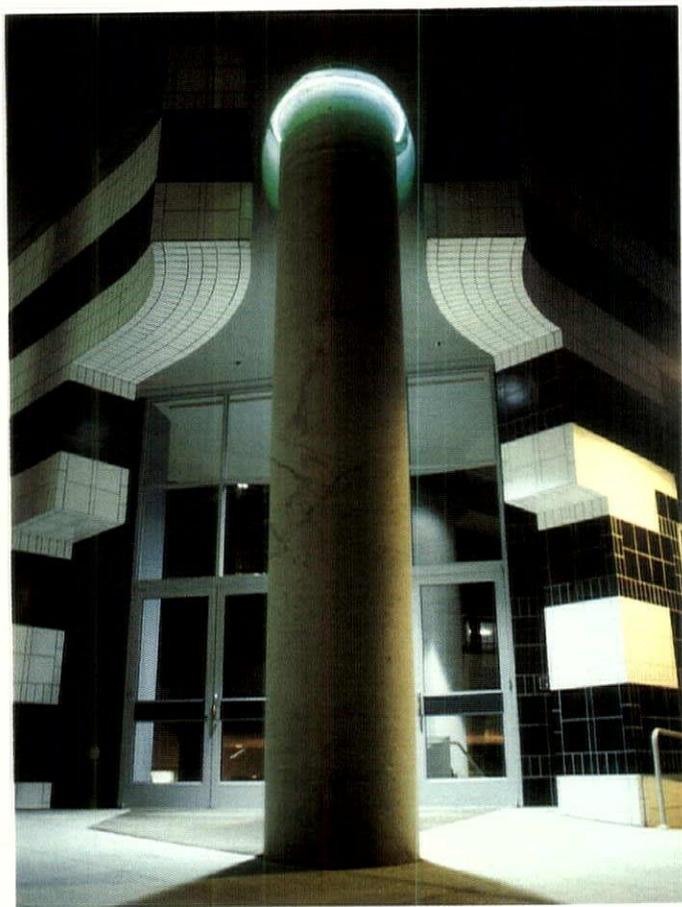
537 Johnson Avenue • Brooklyn, NY 11237  
718/456-7400

Circle 12

Architectural Lighting, April 1987

11

## Light artist creates building signature with colored light



When the old Hamm's Brewery at Bryant and 15th Streets in downtown San Francisco closed some years ago, the building was a natural for several members of the community's bohemian art community. One denizen of an upper story hung colored cloths in the windows, shining a light through them at night. Because the building is surrounded by elevated freeways and is 12 stories high, the old Hamm's building quickly became known around town as "that building with the colored lights at night."

Lighting designer David Malman explains that the building's history thus set a precedent for signature lighting. The fundamental question, Malman says, was "How can we, at relatively low cost, increase the visual impact of the building when it is seen from a distance?" Colored light was an obvious answer — and one in keeping with the building's bohemian tradition.

Malman chose green fluorescent lamps to light the building's fire stairs. The lamps are available in 2-foot and 4-foot lengths. Neon was chosen to highlight a round column at the building's entrance and a large

round concrete pillar in the lobby where once there stood a ventilation stack for the brewery. Two shades of green neon were available; Malman matched the color as closely as possible to the green fluorescents.

Green light was chosen for a variety of reasons, Malman says, the most important of which is the predominantly cool color scheme of the interior — light grays and greens — and the bluish gray of the building's exterior. Green was so integral to the design that when the Food Service Trade Center acquired the building, the new tenants retained the color scheme.

For extra panache, Malman says, green fluorescent cove lighting was used to accentuate the elevator doors in the main lobby. These lights not only continue the overall design scheme but also are integrated with the elevator control circuitry. They switch from green to white when the elevator doors open, matching the white light inside the elevator cars. Visitors are pleased with this novel way to announce that their elevator has arrived.

Tasteful colored lighting also adds the proper tone for the building's occupants: the Food Service Trade Center is an upbeat service organization that offers seminars, wine tastings, demonstrations, and so on. In transforming the old Hamm's building from bohemia to haute cuisine, the lighting certainly fits the bill of fare. ■

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

**Project:** Food Service Trade Center (formerly Hamm's Brewery)

**Location:** San Francisco

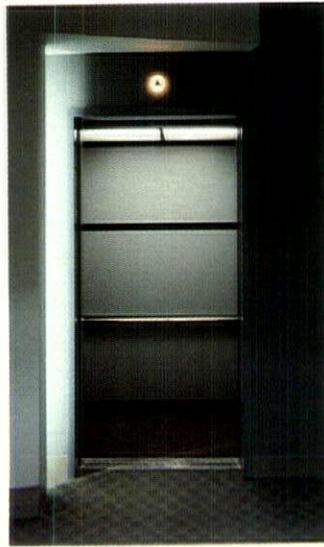
**Renovation Architects:**

Oldknow/Young Associates

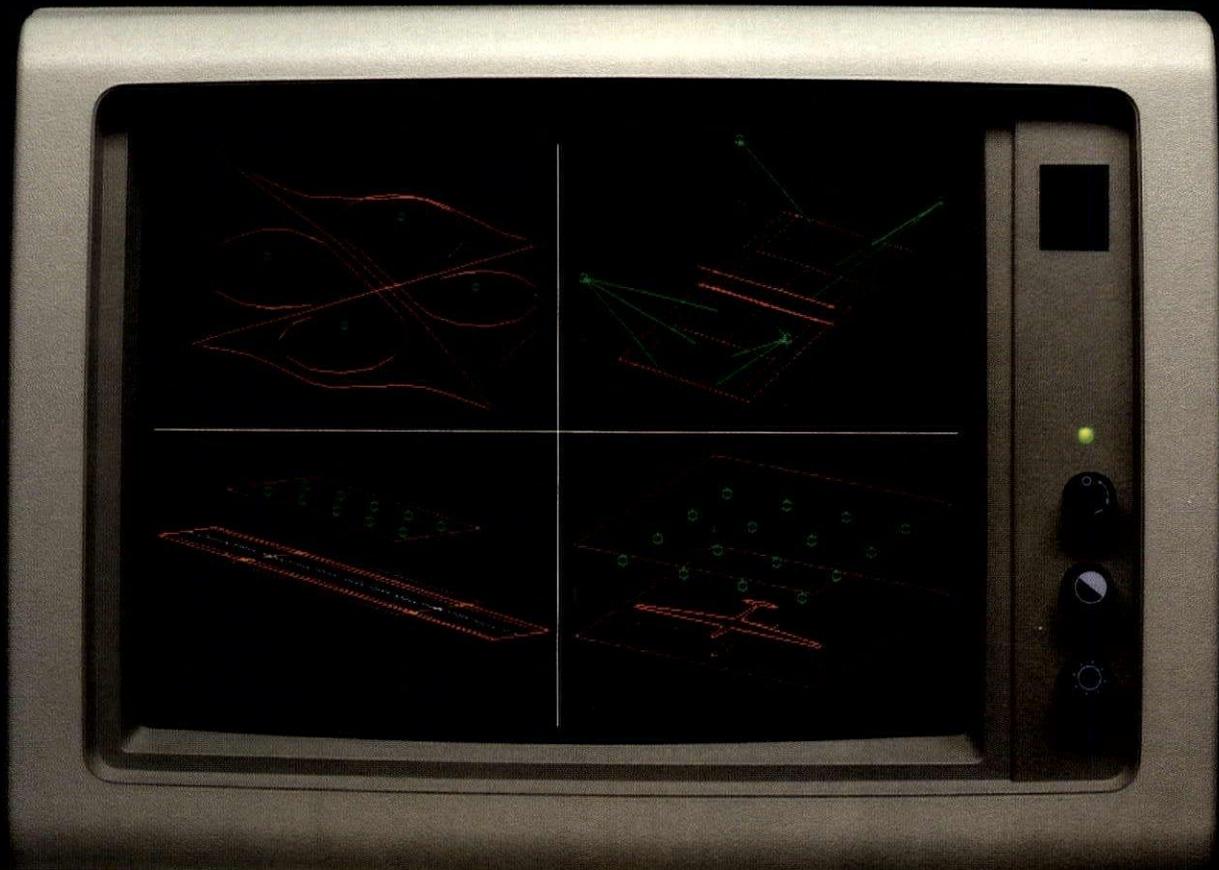
**Design Architects:** Hanns Kainz Associates

**Lighting Designer:** David Malman, Architectural Lighting Design

**Photos:** David Malman



**ONLY ONE LIGHTING MANUFACTURER CAN AFFORD TO  
MARKET A PROGRAM THAT LETS YOU  
LOOK AT ANYONE'S LIGHTING.**



**F**inally there's *one* computer-aided lighting design program that lets you work on every major application: roadway, interchange, indoor, flood, even sports. Without limiting you to only one manufacturer's products.

We call it CALA™, and there's no other lighting design program like it.

CALA lets you input *graphically*, instead of by columns of tedious numerical entries.

It enables you to review your

designs in perspective. *While you're working on them.*

And it includes IES standard formatted photometrics on over 600 Holophane luminaires. You can even use other manufacturers' IES formatted photometrics.

No other lighting program available today can do all CALA does. All you need is a 640k IBM pc or compatible.

The rest is up to you.

CALA will change the way you design lighting. Ask your Holophane sales representative

for your free demo disk showing just how easy it can make your next lighting design. Application Engineering, Holophane Division, Manville, 214 Oakwood Avenue, Newark, Ohio, 43055. (614) 345-9631.

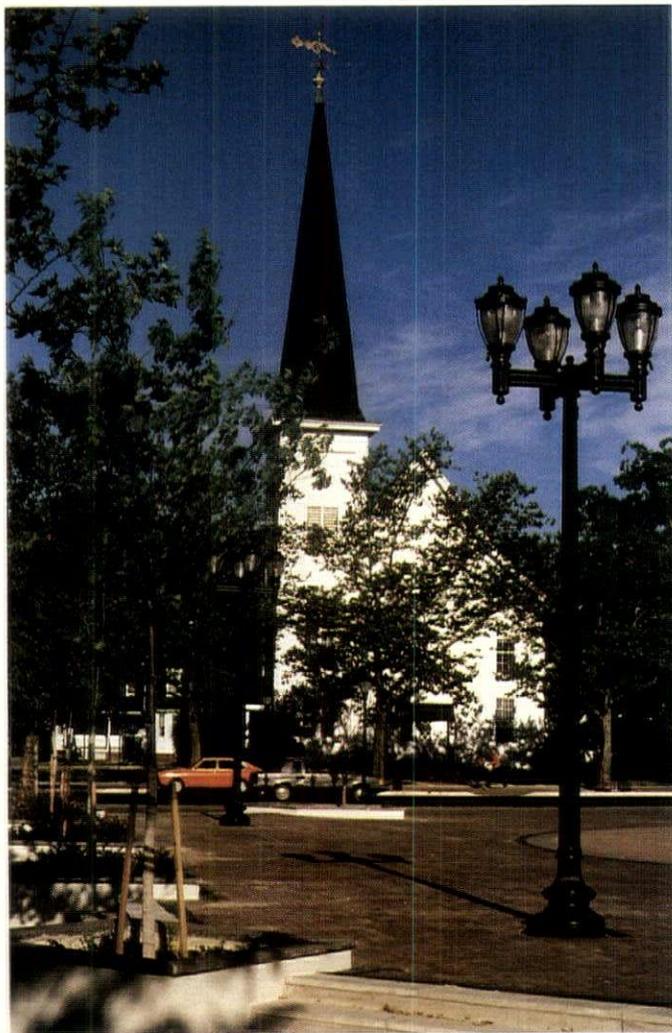


**HOLOPHANE**  
LEADER IN LIGHT CONTROL

**Manville**

This multiple-screen grouping is for demonstration purposes only.  
CALA will provide graphics and calculate data on every major type of lighting application, though not all at once.

## Lakewood lighting brings downtown to life



Time was, notables such as Rudyard Kipling, President Grover Cleveland, and even Mark Twain visited Lakewood, a thriving health resort in the pine forest and lake region of eastern New Jersey. By 1982, however, the central business district was shrouded by a canopy of overhead cables, and lighting was supplied by highway-type cobra-head luminaires stuck atop an array of aluminum and pinewood posts. The Lakewood Redevelopment Agency decided it was time for a change.

Foremost among the agency's goals was removing the unsightly — and in severe weather, unsafe — web of overhead cables. Trenchers, pipelayers, and repavers were promptly put to work. Once the wire utilities were safely underground, the overhead cables, poles, standards, and fixtures were removed. Already the town looked better.

The search for appropriate street lighting that would convey the tone and ambience of turn-of-the-century Lakewood led to a luminaire modeled on early 20th-century street lights. The new version, however, uses cast aluminum with a polycarbonate globe that helps to reduce the ravages of vandalism. Each globe contains a 150-watt high pressure sodium lamp, a light source chosen for its distinctly golden cast of light befitting the effect Lakewood residents sought.

At the request of the redevelopment agency, the manufacturer modified the luminaire by adding an asymmetric prismatic reflector that directs two-thirds of the light onto the roadway and one-third onto the side-

walk. This tailored beam spread prevents spillover glare. In addition, the architects and manufacturer representatives tried various luminaire and post combinations, varying the numbers of luminaires on posts of different heights to achieve lighting levels of more than three footcandles.

Along sidewalks, lighting consists of single luminaires mounted on 10-foot-high posts. Street corners, crosswalks, and selected midblock locations required higher light levels (more than five footcandles) and thus were equipped with twin luminaires fitted to T mounts atop 15-foot posts. Several 18-foot posts fitted with four luminaires each were placed in the town park to create brighter areas in these open public spaces.

Lakewood residents agree that the new lighting of their central business district imparts something of the ambience of the great days of turn-of-the-century Lakewood. And there is no question that the new lighting has inspired a greater feeling of safety after dark, thereby stimulating traffic and trade. What is more, residents now can enjoy their new downtown performing arts center and feel safe as they leave evening performances. ■

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

**Project:** Central Business District

**Location:** Lakewood, New Jersey

**Architect and Planner:** Mark Pavliv, AIA, Beyer Blinder Belle

**Photos:** Courtesy of Beyer Blinder Belle



# GUTH

lighting excellence by tradition

## More Bright Ideas...

from the company who already offers you the most extensive line of unique application lighting fixtures. New Q-Lux is a computer-enhanced wall washing system that uniformly illuminates walls from floor-to-ceiling without

scallops or striations. The tapered styling blends with any design scheme and adjusts 60° for pin-point wall alignment. Surface, pendant and recessed models are available. Send for brochure. Guth Lighting, P.O. Box 7079, St. Louis, MO 63177, 314-533-3200.



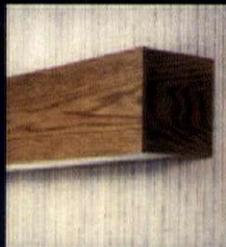
Create interest with indirect units in pastels or neutral tones.



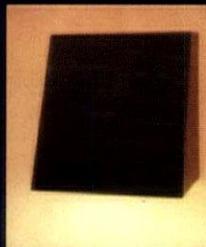
Reversible bracket for direct or cove indirect lighting.



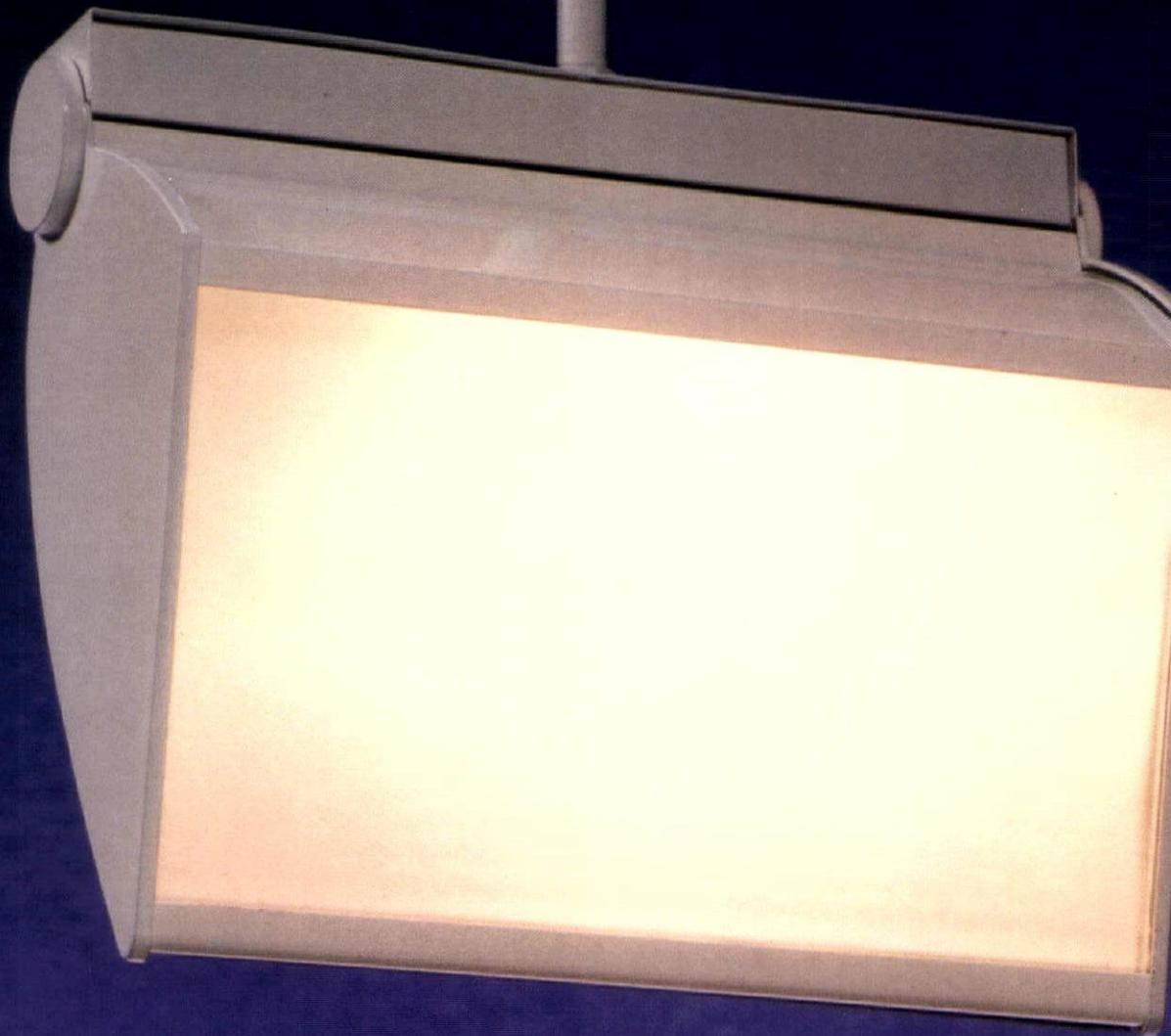
Color pendants feature center mobile to eliminate brightness.



Solid oak bracket adds warmth and elegance.



Outdoor bracket produces 100% downlight to accentuate detail.



A Subsidiary of Jac Jacobsen Industries

Circle 10 for literature. Circle 14 to have a representative call.

## Lighting, luncheons, clientele all tops at the Pinnacle



The Pinnacle Club's name suits its station. The posh private luncheon club is on the 69th floor of Dallas's 72-floor Inter-First Plaza tower, and it caters to the city's elite.

Architectural designer Harold Joiner and lighting designer Bruce Yarnell wanted to create a warm, welcoming atmosphere. "We wanted the reception area to be especially inviting and to have a very soft feel to it," says Joiner, "as well as light that would be soft to look at, so that people would relax."

Both Yarnell and Joiner concur that this was the purpose for creating what they describe as a giant "lampshade" in the reception area — a large oval-shaped ceiling recess filled with gathered linen and illuminated with warm, white light.

This oval is illuminated by two rows of neon tubes with staggered joints. The tubes emit warm — 3100 degrees Kelvin — light and are recessed about 8 inches into a cove. Light from the tubes is reflected onto sheets of translucent white fabric that are held in place by inner and outer metal tension rings. The fabric is fastened to the rings with Velcro strips for easy removal and reinstallation when the fabric needs dry cleaning.

"The fabric pieces are actually pie-shaped. To help the upholsterer, we used our CAD

system to calculate their dimensions," Joiner says. To establish the right amount of gather for the fabric, the upholsterer made a mock-up of the installation for the designers' approval.

Yarnell adds that this soft look is carried through in some of the other lighting details as well. Lighting coves are equipped with 30 watt R 20 floodlamps, placed on 6-inch centers. "We don't get an even wash from top to bottom using fluorescent," he says. "This gives the light a warm color that washes down over the wood and enhances the grain."

Paintings with soft hues were also chosen. These are illuminated with lensed wall washers, which illuminate without the scalloping associated with unlensed wall washers.

Yarnell and Joiner have successfully used a combination of concealed sources to achieve their goal of creating a relaxed atmosphere in the club. "This is definitely a place for a clientele that deserves this kind of treatment," says Yarnell. ■

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

**Project:** The Pinnacle Club  
**Location:** Dallas, Texas  
**Architect:** Harold Joiner, AIA, 3D/International  
**Lighting Designer:** Bruce Yarnell, IALD, Yarnell and Associates  
**Photos:** Hickey-Robertson, Yarnell and Associates



**ALCOA**  
Sheet & Plate Division

# COILZAK



## **Alcoa's Coilzak™ Products Help You Turn A Brilliant Idea Into Brilliant Reality.**

For decades, lighting designers, engineers and architects have insisted on Coilzak reflective aluminum sheet products to solve the most diverse illumination problems in commercial, office and industrial applications. Because Coilzak offers a wide range of optical properties and outstanding uniform appearance, Coilzak creates a total reflectance of up to 86 percent. Whether you need a diffuse or specular finish, Coilzak delivers the lighting control you need, where you need it.

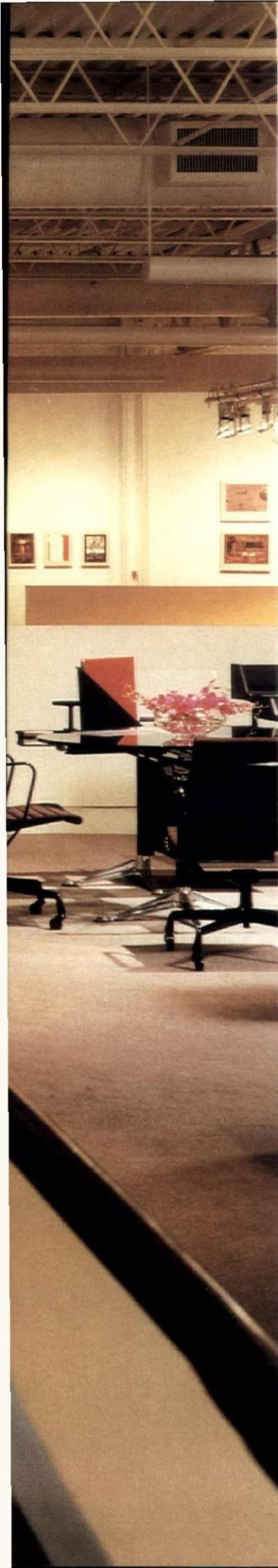
Coilzak aluminum products are highly versatile and easily fabricated. Insist on using Coilzak anywhere a highly-reflective, handsome, long-lasting, low-maintenance surface is required. Wall and ceiling decorations, parabolic reflectors, furniture trim, heat reflectors, and retrofitting fluorescent light fixtures are just a few applications.

End uses are limited only by the imagination and your brilliant ideas.

Contact your Alcoa Sales Office today and insist on Coilzak.

Circle 15





## A flexible lighting system for a dynamic display environment

ARTICLE BY  
CHARLES LINN, AIA

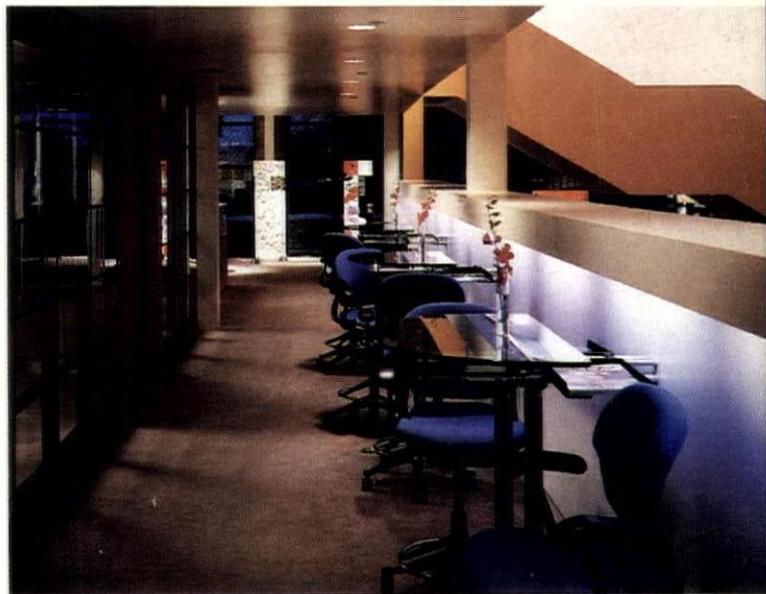
PHOTOGRAPHS BY  
NICK MERRICK, HEDRICH-BLESSING

At first glance, the photographs of the Herman Miller Pavilion in Grandville, Michigan, might suggest an ordinary contract furniture manufacturer's showroom. But the pictures are misleading. Much of what is shown on display in the dynamic environment on these pages has already been changed, which is what sets the Pavilion apart from the many showrooms that change only once or twice a year.

An 80-foot by 240-foot room was partitioned off for the facility at one end of a Herman Miller warehouse building. Inside this space is an essentially separate building with galleries and audiovisual, dining, meeting, and media resource rooms.

The display rooms are constructed around an uncommonly large number of flexible spaces for product display, which are stimulating, yet well ordered. These spaces are formed within volumes and surfaces that support graphics and product displays that can be manipulated on short notice to suit the needs of widely varying audiences. But beyond the contents of these exhibits and displays, the only part of the building envelope that varies is the lighting.

"It's really a hybrid sort of building," explains Architect Daniel Brown; his firm worked with Herman Miller's design



staff on the programming and design of the facility, which opened in 1986. "It became clear during programming that the building was, typologically, a melding of a museum, a theater, a workshop and design studio, and a library. Some of the activities of each of those types of spaces occur here."

Pavilion manager Julie Shireling concurs. "The showroom is used to entertain and educate designers and their clients — many of whom get their first introduction to Herman Miller by coming here — as well as for training staff and Herman Miller representatives."

**Project:** Herman Miller Pavilion

**Location:** Grandville, Michigan

**Client:** Herman Miller, Inc.

**Architect:** Daniel Brown and Associates

**Lighting Designer:** Steven Mesh of Steven Mesh/Diana Juul Architectural Lighting Design

**Exhibit Designers:** Donovan and Green

**Architect of Record:** Newhof and Winer, Inc.

**Mechanical-Electrical**

**Engineer:** Geoff Laham of Fishbeck, Thompson, Carr, and Huber

**Client Team:** George Cary, Keith Winn, Barb Herman



Exhibits include creative product displays and graphic displays depicting corporate history and philosophy. A resource library makes available marketing and product materials, and other rooms are used for audiovisual presentations and meetings.

"The exhibits and product displays here are constantly changing," continues Shireling, "so the building makes a very different statement than most manufacturers' showrooms. In addition to some of the product displays that don't change very often, we also do a lot of custom mock-ups for designers and their clients who are considering Herman Miller for an installation. We have a crew that can come in overnight and create a mock-up of the exact elements they are considering. Or, for smaller installations, sometimes our own staff might be doing a mock-up in one area of the Pavilion while another group is viewing a mock-up in a different area. The space is in constant use and in constant change. Some of the areas may change on a daily or even an hourly basis."

#### Lighting Structure as Volume Control

One of the key design challenges for Brown was to give a sense of order to the vast volume of space devoted solely to



the display of Herman Miller products. One of these areas is 66 feet by 80 feet with a 25-foot-high ceiling. With more than half of the floor space inside the Pavilion devoted to this use, it was necessary to "develop something that could command the volume of this space, to give it scale, and essentially to activate it," says Brown.

"Let's say that at some time in the future this space might be entirely filled with product that is only 2 to 4 feet high — in which case there would be a vast space overhead. Also, there are times when only a

few people are in the space, maybe two or three or a group of six or eight. It can be very lonely there. We had to devise a means to adjust and control the vastness of this space, regardless of what was taking place on the floor."

Brown adds, "At the same time, we had to deal with both the ambient and display lighting and provide a system that would deal with a great number of future conditions that we really couldn't be certain of. These are the issues that started generating the lighting grid."

Brown worked with lighting designer Steven Mesh and

exhibit designers Donovan and Greene to develop the pipe rail grid system. The system essentially allows this space to become a three-dimensional matrix based on 5-foot-square modules. The grid modules are designed so that any of them can be raised or lowered. "Theoretically," says Brown, "the space that is 25 feet high can become 10 feet high by lowering the grids. That can happen in one corner of the space, or that can happen in a line or diagonally, or throughout the entire space."

The grids are constructed of pipe joined by prefabricated

connectors. Each 10-foot-square grid is subdivided into four 5-foot squares, and each whole grid is located 5 feet away from the next. The pipe assemblies are suspended at each corner by metal rods that are anchored to the ceiling structure.

Lighting for each grid is clamped to the pipe and plugged into a prefabricated two-circuit metal outlet strip bolted to the top of the pipe rails. The outlet strip is pre-wired, so that alternating outlets are wired to alternate circuits. This allows the electrical load on each grid to be



divided, at the same time providing the means for switching on only part of the display lighting at one time.

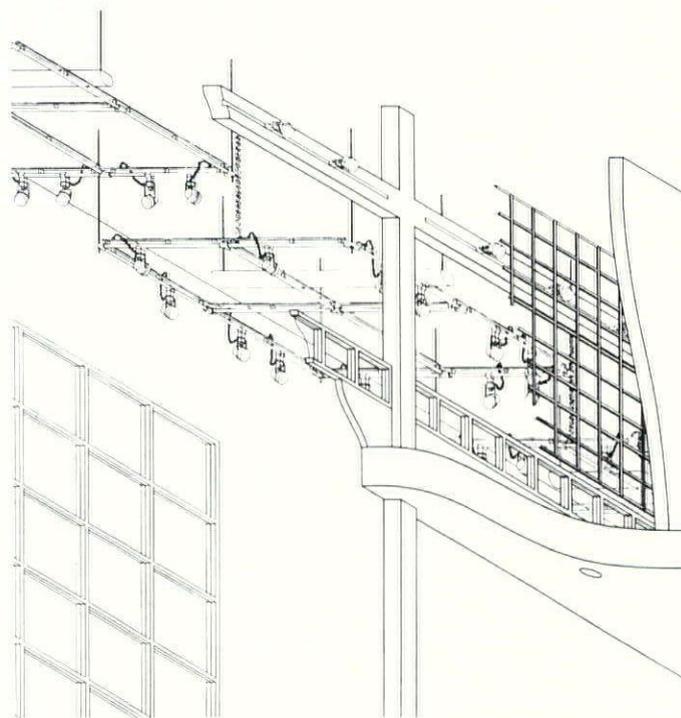
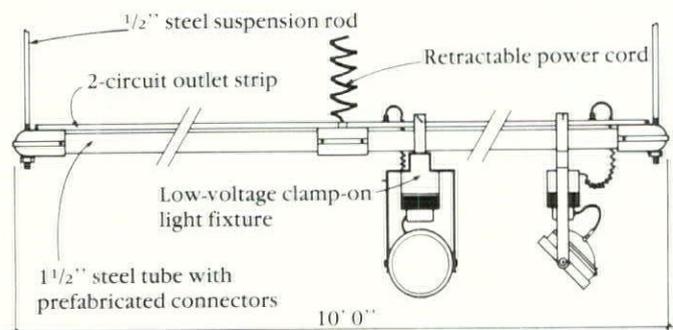
Power is supplied to the grids from the ceiling through a coiled cord — a heavy-duty version of the type of cord found on a telephone handset. The coiled cords give the system added flexibility; entire lighting grid units can be raised or lowered by changing the lengths of the corner suspension rods.

Steven Mesh recommended light fixtures for the grids that are particularly durable and can accommodate a variety of louvers, color filters, and screens. The specified clamp-on fixtures are available in track versions to match the track lighting used elsewhere in the facility. The low-voltage fixtures have integral step-down transformers.

*Lighting grid is also used to anchor venetian blind scrims. Graphics can be personalized for individual visitors by simply changing a 35-millimeter slide.*

Mesh recommended the quantities of fixtures to be purchased by Herman Miller and the lamps to be used in them: 12-volt PAR 36, 56, and 64 lamps that varied in beam spread and wattage, depending on their application.

**Theatrical Capability**  
In some situations, track lighting attached to the pipe rail system might have been consid-

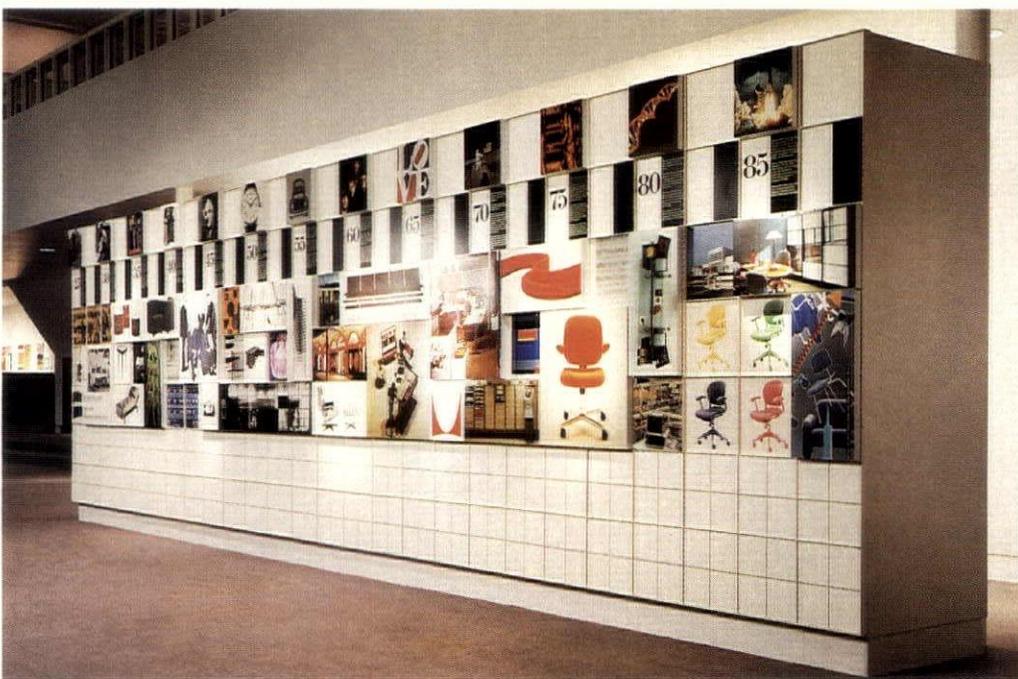


*Detail of typical lighting grid.*

*Axonometric of lighting grid and lighted frames.*



*The 3:1 average brightness-contrast ratio between display and ambient lighting gives extra "punch" to product displays.*

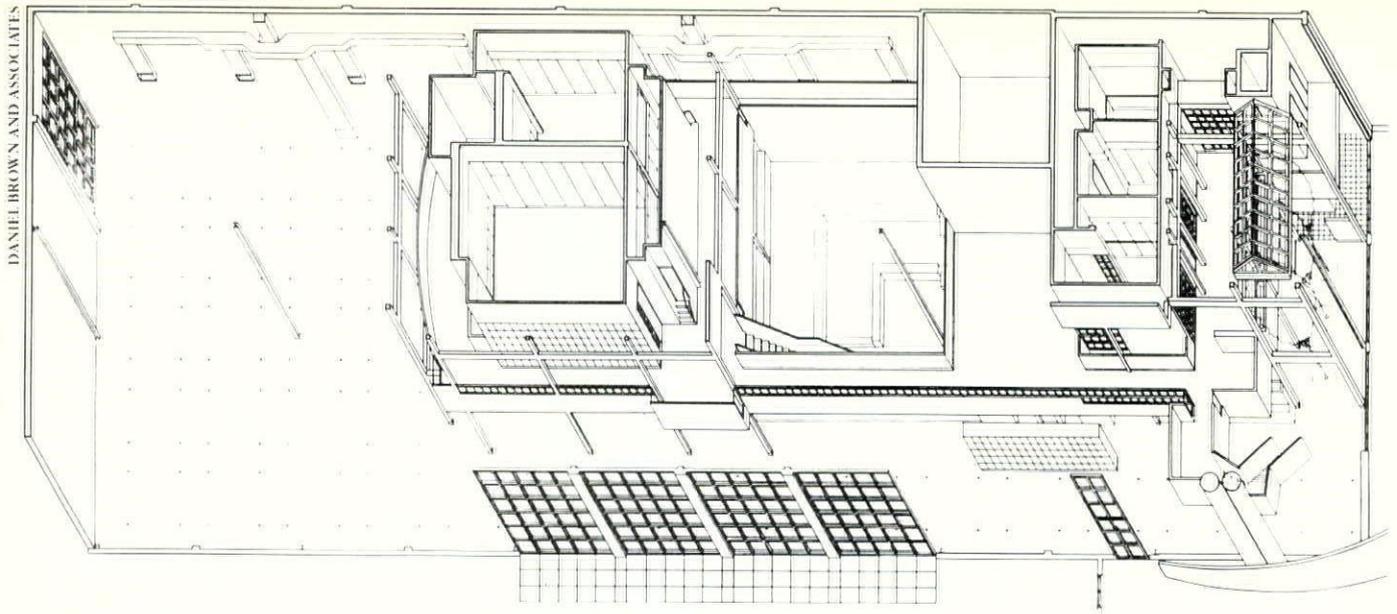


*A graphics display wall developed by Donovan and Green uses interchangeable modular panels.*

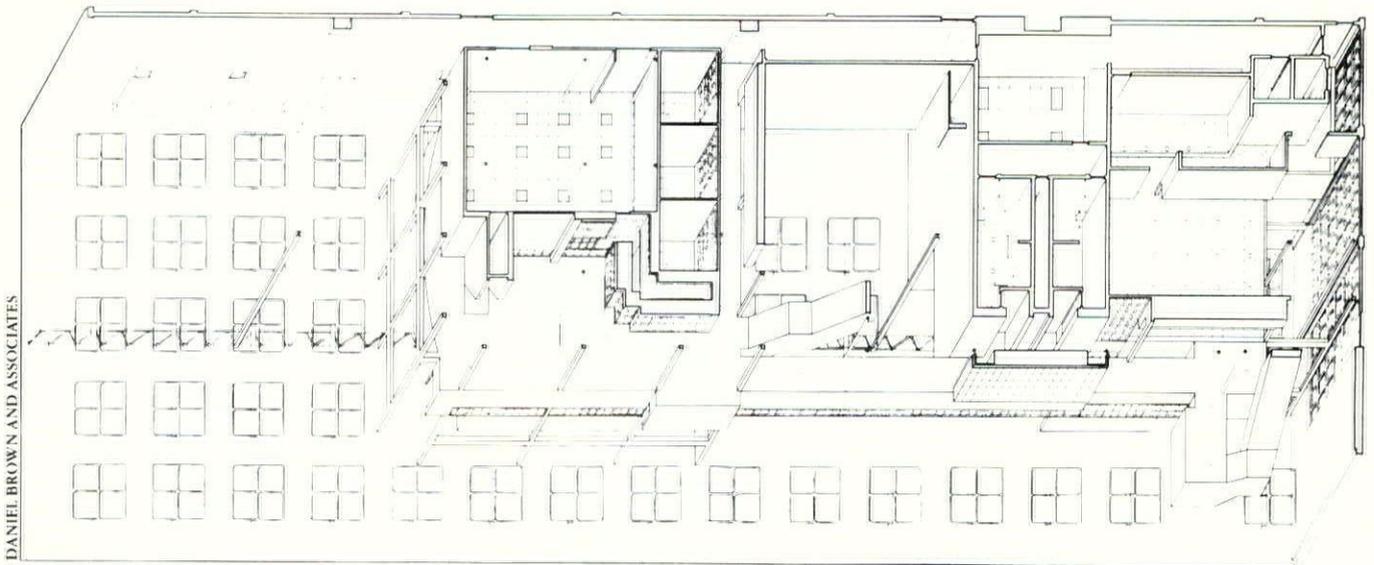
ered. It was not recommended in this case because the grids also support and power theatrical-grade spotlights and projectors that project the logos and light patterns onto the venetian blind "scrim" seen in the accompanying photographs. These fixtures are not compatible with lighting track. Additionally, it was believed that lighting track might not be durable enough to withstand the frequent adjusting required for fixtures in the open display areas.

For special exhibitions, when temporary theatrical-grade lighting with dimming capacity is required, pairs of duplex outlets were installed in the metal ceiling. These are wired to what electrical engineer Geoff Laham refers to as a *patch panel*. "Basically, a patch panel is like any circuit breaker panel, except that there is no wiring between the disconnect and the circuit breakers. The ceiling outlets are dead unless a temporary theatrical dimming board is installed," Laham says.

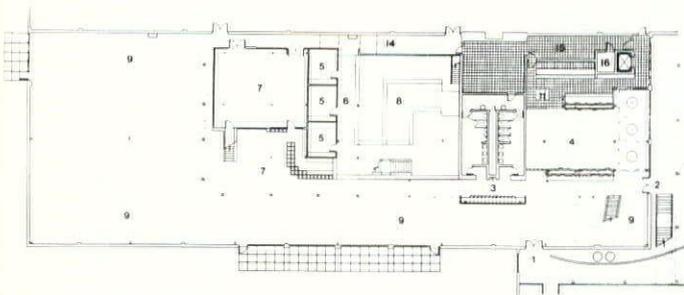
"So, we have power coming in from outside to a disconnect switch. The dimming board is plugged into the disconnect, and the output from the board is patched to terminals in the patch panel. Power goes from the terminals through circuit breakers and up to each outlet. It's basically the kind of set-up



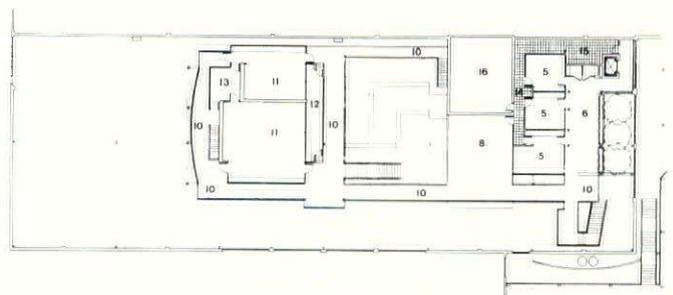
*Axonometric of Herman Miller Pavilion showing first and second levels.*



*Axonometric of Herman Miller Pavilion showing ceiling and lighting system.*



*Ground level plan.*



*Mezzanine level plan.*

- |                    |                          |                             |                      |
|--------------------|--------------------------|-----------------------------|----------------------|
| 1. Visitor entry   | 5. Meeting room          | 9. Activity floor           | 13. Storage          |
| 2. In-house entry  | 6. Break area            | 10. Activity floor overlook | 14. Service corridor |
| 3. Visitor lockers | 7. Media-resource center | 11. Auditorium              | 15. Kitchen          |
| 4. Cafe            | 8. Presentations         | 12. Projection room         | 16. Mechanical       |



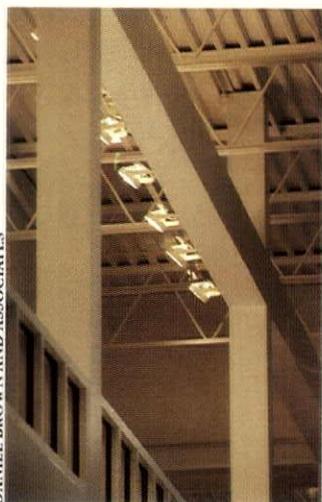
found in theaters that have a lot of road shows coming through," Laham says. Though the system has not been used frequently, the capability is there, and the existing lighting grids permit hanging and using theatrical lights without interfering with the existing lighting system.

#### Ambient Lighting

The lighting grids are used only for accent lighting on displays and product; ambient lighting for the open display areas is provided indirectly by pendant-mounted fluorescent uplights that reflect light off the ceiling.

Mesh recommended that the average footcandles at the task level — in this application, regarded as 2 feet 6 inches above the display floor — be maintained at about 40 footcandles, so that the brightness ratio between the incandescent display lighting and the maximum ambient light level averages about 3 to 1.

"This is a good ratio for allowing easy recognition of the exhibit displays, but still establishes a sense of drama in the space," says Mesh. "At the same time, the ambient lights can be used alone as work lights so the staff can change displays without having the accent lighting turned on. When they're finished setting up, the accent lights can be



DANIEL BROWN AND ASSOCIATES

*Light frames have track lighting mounted behind drywall spandrels to illuminate displays.*

turned on and focused."

#### Lighting Frames

Brown also created drywall frames as integral parts of the architecture of the structure. The effect is like illuminated display windows without the glass or sidewalls. "Along with lending scale to some of the display and exhibit spaces," says Brown, "the frames give us a place to mount track lighting — on the inside face of the intermediate and upper spandrel beams. This gives us light for the exhibit and display



COURTESY HERMAN MILLER, INC.

spaces, and a source to light the mass of the building relative to the open exhibit space."

The result is that the wall planes glow, and the exhibit and display items read well, without glare. "There is nothing to block the ambient light coming from the rest of the space," says Brown, "but you're really not aware of the source of the brighter accent light."

Throughout the rest of the building, track and recessed incandescent lighting and fluorescent troffers have been used, depending on the use of the spaces. Recessed incandescent was used in circulation, dining, meeting, and audiovisual rooms; the dining and audiovisual rooms were

equipped with dimmers. Track lighting was used in the gallery rooms and in second-floor display areas that lacked the ceiling height required for the lighting grids used elsewhere; 2 by 2 fluorescent was used in the media resource rooms.

#### Integration

Brown remarks that how well a lighting system is integrated into a building's architecture is a good measure of its success. Yet that integration must be coupled with sufficient flexibility to allow the system to work for the building users over its lifetime.

"It's not only got to work on the initial installation, but it also must continue to support this company's product for years. I find this an extremely satisfying part of the project. I don't think the facility is going to be dated in 5 or 10 years — I think it's going to continue to work many years beyond that." ■

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

# HOW TO MAKE A BRILLIANT REDUCTION.





At a mere 16.5 inches long, the new General Electric Biax™ 2850 lumen fluorescent lamp gives you more spacial design freedom than ever before.

Compared with standard four-foot F40's, it lets you fill a space with light, not with luminaires.

The compact configuration of the GE Biax 39-watt lamp produces a full 2850 lumens of good color-quality fluorescent light, in a lamp one-third the overall length of conventional linear fluorescents. And it offers a long-rated average lamp life of 12,000 hours.

The 2850 lumen lamp represents only the first in a complete family of GE Biax fluorescents, which will range from an 8.4-inch version to 22.3 inches. So you'll have even more lighting and spacial design flexibility as this line of lamps continues to grow.

Call your Lighting Specialist at the local GE Lamp Sales Office or your fixture manufacturer, and discuss your lighting applications, concepts and designs with them. They can help you make a brilliant reduction on your own.

#### **GE BIAX FIXTURE MANUFACTURERS**

Here are some of the manufacturers of fine lighting fixtures who currently offer luminaires for GE Biax Lamps: Amerlux, West Caldwell, NJ • ATC Lighting, Glendora, CA • Failsafe Lighting, Chicago, IL • Globe Illumination, Gardena, CA • Kennal Manufacturing, Chicago, IL • Lightolier, Jersey City, NJ • Litecontrol, Hansen MA • Lumax, Altoona, PA • Luxo, Port Chester, NY • Northern Light, Milwaukee, WI • Paflight Inc., San Dimas, CA • Rec Specialties, Camarillo, CA • Spero Electric, Cleveland, OH • Varco Products, Cleveland, OH • Western Lighting, North Hollywood, CA • Winona Studio of Light, Winona, MN

We bring good things to life.



## Lighting World 5 preview

Without a doubt, Lighting World International, known familiarly this year as Lighting World 5, is the largest exhibition and conference devoted to architectural lighting held in the United States. Arguably it also is the best. This year's conference will be held at the Jacob K. Javits Convention Center in New York City on May 11, 12, and 13, and the organizers expect about 15,000 people to attend. Participants will have many opportunities to visit approximately 450 exhibitors' booths.

Among those attending will be architects, engineers, lighting designers, interior designers, facility planners and managers, contractors, and builders. Lighting World program coordinator Jeffrey A. Milham notes that the program has been organized to appeal to all these professional groups. Sessions on luminaire design and color perception will be of significant interest to designers, and sessions on industrial lighting and lighting controls will attract people responsible for managing and planning facilities and central plants. Other sessions cover such topics as health controversies surrounding lighting, the introduction of fiber optics into architectural lighting, behavioral responses to lighting, and a preview of exhibitors' latest products. Most presentations, Milham says, will interest both groups.

A special new event at this year's convention is a preview of products that will allow specifiers, buyers, and designers to see the newest in product lines. To maintain confidentiality about the new products that will be introduced during Lighting World 5, conference organizers assembled a select review panel to determine which lighting and control products to feature in the preview session. Only designers

and specifiers were invited to serve on the panel, which excluded everyone associated with manufacturing or sales.

According to Lighting World 5 organizers, the exhibits are likely to include something of interest for everyone attending. Featured will be commercial and industrial luminaires, programmable lighting controls, light sources, occupancy-sensing technology and switching and dimming controls, floodlighting, security lighting, fiber optic developments, and outdoor walkway and roadway equipment. Still other exhibits will focus on retrofit and conversion fixtures, special effects, track lighting, task lighting, landscape lighting, and decorative luminaires.

### The Sponsors

This year's Lighting World conference and exposition is sponsored by the International Association of Lighting Designers (IALD), the Illuminating Engineering Society of North America (IES), and the New York Section of the Illuminating Engineering Society, which will present its 22nd annual Lumen Awards at the conference. The New York Designers Lighting Forum will organize one of the workshops and will hold its Honor Award Reception. For the second year, the American Society of Interior Designers (ASID) will present a workshop.

In all, the 21 events to take place during Lighting World 5 include 14 seminars, 3 workshops, and 4 gatherings to present awards and promote social interaction. The number of programs to be presented is a significant increase over the 15 sessions presented in the last meeting, and the number of exhibitors has increased.

Conference producers and managers, the National Expositions Co., Inc., cite research showing that total lighting sales

for the market represented at the convention (commercial, institutional, industrial, residential, outdoor, and miscellaneous) were \$2.4 billion in 1976. Sales for the same market in 1986 are estimated at \$6.5 billion. National Expositions also reports that inquiries about Lighting World from government agencies and companies outside the United States have nearly doubled since the 1986 show.

Everyone involved in organizing, producing, and presenting Lighting World 5 has tried to ensure that all those attending will find something of interest and use. Further information about Lighting World 5 is available from: National Expositions Co., Inc., 49 West 38th Street, Suite 12A, New York, NY 10018, (212) 391-9111.

Following is a chronological description of the Lighting World 5 program.

### Monday Events

**The opening breakfast, with keynote speaker Hans Hollein** (Monday, May 11, 8:30-10:30 a.m., Level 1, Special Events Hall). The opening breakfast on the first day of each Lighting World has become a popular tradition and will be continued this year.

The keynote speaker is Hans Hollein, the noted Viennese architect, artist, teacher, and recipient of the 1985 Pritzker Architecture Prize.

In 1985, Hollein won two international competitions, one for a museum of modern art in Frankfurt and another for a cultural forum in Berlin. In addition, he designed the exhibition of Viennese culture titled "Dream and Reality," which has toured internationally. Hollein became head of the

School and Institute of Design at the Academy of Applied Arts in Vienna in 1976, and since 1979 he has led one of the two master classes at the Academy.

**Session 1: Color in the mind's eye** (Speaker: Alexander Styne, University of Miami. Monday, May 11, 11:00-12:00 noon, Level 1, Special Events Hall).

Understanding the basic concepts of color and perception can help the designer be more confident in color applications and, at the same time, more closely approach the intended result. Professor Styne will explain the basic principles underlying color and perception, illustrating how insight into the process, potential, and limitations of perception can be used to advantage in lighting design.

Styne is an industrial design consultant and adjunct professor of Electrical Engineering at the University of Miami. He has specialized in lighting and color for more than 25 years.

**Session 2: Gallery and museum lighting — Combining preservation and artistic expression** (Speaker: Frank A. Florentine, National Air and Space Museum, Smithsonian Institution. Monday, May 11, 12:30-1:30 p.m., Level 1, Special Events Hall). Aesthetics and technology, the primary issues in lighting, may nowhere be more important than in a gallery or museum. Gallery and museum lighting must be designed to conserve the life of the artifacts and, at the same time, to express the artistic intent of the exhibit.

Florentine will discuss the issues involved in presenting a visually interesting exhibit and will give equal time to preservation issues, such as footcandle levels, ultraviolet emissions, exposure levels, measurements, filters, fading, and energy management. He will briefly

discuss electrical systems, power distribution, and maintenance of equipment.

Frank Florentine is responsible for lighting design for the exhibits at the National Air and Space Museum at the Smithsonian Institution. He has extensive training in theatrical lighting, particularly for ballet.

**Session 3: Preview of products — The latest in lighting today** (Monday, May 11, 2:00–3:30 a.m., Level 1, Special Events Hall). The newest and the brightest in the world of lighting products and control systems will be unveiled by manufacturers at this special Lighting World session. In one 90-minute program, specifiers and buyers will have the opportunity to survey the state of the art of lighting technology as manufacturers present and demonstrate their latest products and systems.

The products will be drawn from those exhibited at the show: commercial and industrial fixtures, programmable lighting control systems, light sources, occupancy-sensing technology, switching and dimming systems, outdoor walkway and roadway equipment, floodlighting, security lighting, fiber optic developments, retrofit and conversion fixtures, theatrical and special effects, track lighting, task lighting, landscape lighting, and decorative fixtures.

**Session 4: Industrial lighting** (Speaker: Roger L. Knott, HWH Architects Engineers Planners, Inc. Monday, May 11, 4:00–5:00 p.m., Level 1, Room 1C04). Industrial lighting systems present special design and installation challenges. This discussion of industrial lighting will be of particular interest to engineers, contractors, facility planners, and lighting designers.

It will cover the use of various lamps and lamp-ballast

combinations in industrial facilities, with particular emphasis on products introduced recently. The session will include many application slides illustrating principles of industrial lighting.

Roger L. Knott is vice president and manager of electrical engineering for HWH Architects Engineers Planners, Inc. of Cleveland, Ohio. Most of the firm's work over the past few years has been industrial, and many Fortune 500 companies are among its clients.

**New York by night — A New York harbor cruise** (7:00–11:30 p.m.). Boarding begins at 7:00 p.m., and the boat leaves promptly at 7:30 from Pier 62 at West 23rd Street and the Hudson River. Transportation will be provided from the Javits Center to Pier 62 and back to midtown. Limited pay parking is available on a first come, first served basis.

Lighting World will take to the river for a four-hour cruise timed to view the setting sun behind the Statue of Liberty. As twilight fades and the lights of Manhattan rise, the craft will pass the statue, and Eric Staller's latest light sculpture creation, the Bubbleboat, will appear on the water.

Staller, the recipient of an IIDA award, is a light artist with a degree in architecture. He created the Bubbleboat for Liberty Weekend. The 12-foot-diameter craft has 594 computer-controlled red, white, and blue bulbs, which display an infinite variety of visual patterns.

The waterproof cruise — the yacht is heated, air-conditioned, and totally enclosed except for promenade decks — will include a full gourmet buffet, open bar, and live disc jockey. This special Lighting World evening event will bring together people from all facets of the lighting commu-

nity. Space is limited; reservations are required.

## Tuesday Events

**Photometrics workshop for lighting designers and engineers** (Speaker: Ian Lewin, Lighting Sciences, Inc. Tuesday, May 12, 8:30–11:30 a.m., Level 1, Room 1C04). Photometric factors can dramatically affect the lighting design and engineering process. This half-day workshop is intended for lighting designers and engineers who are familiar with the basic principles of photometrics.

Comprehensive presentations will include quantitative uncertainties in photometry, tolerances and variations in lamp operation, tolerances and variations in luminaire operation, environmental factors influencing photometric performance, meters and field measurements, and comparing predictive calculations and field measurements.

Demonstrations will be given and written material provided. IES continuing education units will be offered to those who complete the workshop.

Ian Lewin is president of Lighting Sciences, Inc., of Scottsdale, Arizona, an independent laboratory that offers professional services in optics, vision, testing, and illumination design. He received a doctoral degree in illumination engineering from the University of Newcastle, England.

**Session 5: Photometrics for architects and interior designers** (Speaker: Helen Diemer, Flack + Kurtz Consulting Engineers. Tuesday, May 12, 9:00–10:00 a.m., Level 1, Special Events Hall). Photometry, the measurement of light intensity and distribution, is used by lighting designers to compare the performance of various light fixtures. A knowl-

edge of basic photometrics can help architects and interior designers appreciate the functions of various types of luminaires and understand why they are appropriate for some applications and not for others.

This program is intended for those with little or no background in photometrics and will provide a conceptual understanding of the considerations involved in assigning numbers to lighting. Simple graphics and calculations, as well as actual mock-ups of typical fixture types, will be used to show how photometrics fit into the lighting design process.

Helen Diemer is director of lighting services at Flack + Kurtz Consulting Engineers. An architectural engineering graduate of Pennsylvania State University, she is experienced in the design of lighting and electrical systems.

**Session 6: Light and expectation — The retail experience** (Speaker: Peter Barna, Light & Space Associates Ltd. Tuesday, May 12, 10:30–11:30 a.m., Level 1, Special Events Hall). Lighting design for retail sales is a study in customer expectation. Customers whose expectations about product quality and price are fulfilled during the shopping experience usually are satisfied customers, and lighting plays a significant role in forming customer expectations. Generic or glamorous, K-Mart or Bloomingdale's, retail lighting's first priority is expectation fulfillment.

Peter Barna is president of Light & Space Associates Ltd., a New York City lighting design and interiors firm with a diversified practice that includes many retail installations and showrooms. He received an electrical engineering degree from Virginia Technical University and a master's degree in industrial design from Pratt

Institute.

**New York Designers Lighting Forum: Lighting — by design or by default?** (Panel: James L. Nuckolls, LuxCo Limited; Gerry Zukowski, Lighting by Design; Moderator: Connie Jensen, Lighting Professionals, Inc. Tuesday, May 12, 1:30–4:30 p.m., Level 1, Room 1C04). Do you have a client who wants a bright but all black showroom? Or one who has a living area with 18-foot-high ceilings and needs a sense of intimacy? Do you want artwork without glare? Spaces that come alive?

How do you approach these challenges? How do you determine the solutions? The New York Designers Lighting Forum is offering a dynamic two-part workshop that will address these questions and many more.

Part One covers developing a lighting design — a step-by-step approach. Part Two deals with lighting applications and techniques — the all-important how-to's and why-not's.

With the help of your questions, the speakers will discuss, illustrate, and demonstrate perceptive solutions and approaches to lighting commercial and residential spaces.

James L. Nuckolls is president of LuxCo Limited, a past president of IALD, a faculty member at the Parsons School of Design, and recipient of the New York Designers Lighting Forum Honor Award. He is author of *Interior Lighting for Environmental Designers* and has been a lighting designer for 20 years.

Gerry Zukowski, lighting consultant and partner in Lighting by Design, is a recipient of the IES Distinguished Service Award. He has been published frequently, and is a much sought after international speaker.

Connie Jensen is a lighting consultant and president of Lighting Professionals, Inc. As

an educator and lecturer, she developed "The Art and Science of Lighting," a course sponsored by the New Jersey Section of the Illuminating Engineering Society.

**Session 7: Behavioral responses to lighting** (Speaker: David Loe, Bartlett School of Architecture and Planning, University College, London. Tuesday, May 12, 1:00–2:00 p.m., Level 1, Special Events Hall). To create a pleasant, effective, and efficient environment, visual performance and comfort are only two of the important lighting considerations. Research shows that the pattern and brightness of the lighting in a space affect mood, productivity, traffic patterns, and many other kinds of behavior.

David Loe will use the results of his own research to illustrate how behavior is affected and changed by light and lighting patterns, thereby demonstrating the importance of incorporating subjective considerations into the lighting design process.

David Loe is a lecturer in lighting and color at the Bartlett School of Architecture and Planning, University College, London. He and his students have conducted research projects on behavioral response to various kinds of lighting.

**Session 8: Is lighting harmful? A health controversy** (Speaker: Alan L. Lewis, State University of New York, College of Optometry. Tuesday, May 12, 2:30–3:30 p.m., Level 1, Special Events Hall). Today's light sources and lighting systems are more efficacious, more powerful, and offer a greater spectral range than ever before. However, these sources also have created concern about the photobiological and psychological effects of visible and near-visible radiation. Reported effects range from the possibility of melanoma associated

with fluorescent lamp exposure to retinal damage from quartz halogen sources.

Light sources have also been reported to affect muscle strength, personality, cataract formation, vitamin D synthesis, and the formation of bilirubin. Many of these effects are based on hard data, but others are at best questionable.

Lewis will review the non-controversial uses of light as a therapeutic agent and will assess the scientific validity of the controversial claims. He will address the role of infrared, short-wavelength visible, and ultraviolet radiation in health and vision and the indications for limiting exposure.

Alan L. Lewis is professor of physiological optics at the State University of New York, College of Optometry in New York City. His research interests are human visual performance, color vision, and illumination, with special emphasis on vision of the aged and partially sighted.

**Session 9: What a specifier should know about luminaire design** (Speaker: Noel Florence, Luminaire Design Consultant. Tuesday, May 12, 4:00–5:00 p.m., Level 1, Special Events Hall). Unless specifiers have seen a given luminaire in an actual installation, they must rely on catalog specifications and drawings to determine how the luminaire will look and perform in the space they are designing. The performance of a luminaire — and the differences between similar luminaires — can be appreciated better if a specifier understands the issues involved in their design.

Noel Florence will describe where luminaire designs come from, how ideas are developed, how light is controlled, how to select materials and processes for maximum value, the importance of details, and how fix-

tures are tested. The presentation will include slides and demonstrations.

Noel Florence, who retired in 1986 as Lightolier's vice president of research and technical development, is currently an independent design consultant. He studied engineering at Birmingham University in England and fine arts at Cooper Union.

**Lumen Awards: Dinner of the New York Section, Illuminating Engineering Society** (Speaker: Bartholomew Voorsanger, Voorsanger & Mills Architects. Tuesday, May 12, 6:30–7:30 p.m., cash bar, Crystal Palace. 7:30–9:30 p.m., dinner and awards presentation, Special Events Hall Lobby). The New York Section of the Illuminating Engineering Society will present its 22nd annual Lumen Awards at Lighting World. The Lumen Awards Program was conceived and developed to encourage and publicly recognize excellence, professionalism, ingenuity, and originality in lighting design.

A special feature of the dinner will be the presentation of the first annual Lifetime Achievement Award to a distinguished member of the lighting community. All Lighting World attendees are welcome at the cash bar in the Crystal Palace after the exhibits.

### Wednesday Events

**ASID Workshop: Marketing — Creating new business opportunities for design professionals** (Speaker: Stuart Rose. Wednesday, May 13, 8:30–11:30 a.m., continued 1:00–3:00 p.m., Level 1, Room 1C04). This five-hour seminar, directed to designers from all disciplines, will address how to uncover new business leads, how to educate potential clients in a way that heightens their

interest in and desire to use a designer's services, how to build a solid commitment from prospective clients, and how to design and conduct a winning presentation. ASID will offer continuing education units to registrants.

Stuart Rose conducts a regular series of marketing training workshops for ASID and other professional organizations. His techniques emphasize bottom-line results, and his doctoral work in management and applied behavioral sciences enables him to present a balanced format that stresses individual responsive experience.

**Session 10: Fiber optics and architectural lighting** (Speaker: Bill Novey, Art & Technology, Inc. Wednesday, May 13, 9:00-10:00 a.m., Level 1, Special Events Hall). In fiber optics, light is transmitted through a thin flexible strand in a way that is similar to the way water is conducted through a hose. Used for years in the entertainment industry to create special effects, fiber optics are only now finding applications in architectural lighting.

Novey will explain the theory of fiber optics and applications to architectural lighting for such uses as signage, remote situations, maps, museum exhibits, store displays, and decorative needs. He will touch on the diversity of effects obtainable with fiber optics and the cost-effectiveness of the technique.

Bill Novey is a principal in Art & Technology, Inc., a firm that applies high technology to contemporary exhibits and entertainment. Before starting his firm, he was co-manager of the special effects department at WED Enterprises, where he directed the design, production, and installation of more than 300 special effects for

Disney projects.

**Session 11: Developing a concept for exterior lighting** (Speaker: Peter Golden, Seelye Stevenson Value & Knecht. Wednesday, May 13, 10:30-11:30 a.m., Level 1, Special Events Hall). In any community, a building with a lighted exterior is a major presence, rarely a neutral one. It either contributes positively or it detracts, and much of the praise or blame is traceable to the lighting concept.

Exterior lighting must respect the building's architecture and the surrounding area, and it must engender a sense of place. Peter Golden will concentrate on the conceptual development of exterior lighting for facades, towers, and plazas. He will deal with color, composition, source, directionality, and intensity in terms of conceptual impact rather than application.

Peter Golden is manager of the lighting group at Seelye Stevenson Value & Knecht, engineers and planners. He received a master of science degree in architectural engineering from Pennsylvania State University.

**Session 12: Light as a landscape design tool** (Speaker: Timothy Coppola, The Architects Collaborative. Wednesday, May 13, 1:00-2:00 p.m., Level 1, Special Events Hall). Landscape lighting clarifies the organization of a site after dark and facilitates circulation. Using as its tools the built environment, the walks and drives, and the horticulture, landscape lighting differentiates vehicular and pedestrian areas and reveals the hierarchy and pattern of circulation paths.

Timothy Coppola will show how standard interior lighting considerations compare and apply to landscape lighting and will discuss how to achieve distinctive and special effects using stock fixtures. He will

suggest different attitudes that can be created, illustrating with day and night photos of installations and with diagrams.

Timothy Coppola is a landscape architect with The Architects Collaborative in their San Francisco office. A past president of the Boston Society of Landscape Architects, he has been on the visiting faculty at the University of Michigan and at Harvard and is currently on the landscape faculty at the University of California at Berkeley.

**Session 13: Lighting control in the intelligent building** (Speaker: Alan B. Abramson, Electronic Systems Associates. Wednesday, May 13, 2:30-3:30 p.m., Level 1, Special Events Hall). As a major operating cost in a facility, lighting is a prime candidate for application of control techniques. Automated lighting controls range from simple occupancy detection to more sophisticated centralized, computerized approaches.

This presentation will cover occupancy detection, timed switching, centralized zoned switching, carrier current techniques, automatic dimming, and telecommunication system interface, a technique for activating a lighting control system via local telephone instructions, all in terms of first cost, potential cost savings, occupant convenience, and technological requirements.

Alan B. Abramson is president of Electronic Systems Associates, a firm that designs building and plant automation, fire protection, security, communications, and telecommunication systems.

**Session 14: Office lighting — Matching needs with systems** (Speaker: Lee Waldron, Grenald Associates Ltd. Wednesday, May 13, 4:00-5:00 p.m., Level 1, Special Events Hall). Designing a successful

office lighting system often means finding a way to accommodate several competing needs. Owners need to control the bottom line. Employees need a work space in which they can be comfortable and productive. There is no simple solution to matching need and system.

Lee Waldron will review the three primary approaches used in office lighting today — indirect pendant fixtures, furniture integrated systems, and recessed systems — and will discuss many considerations involved in correlating needs with systems.

Lee Waldron is managing partner and principal in charge of the Philadelphia office of Grenald Associates Ltd., a lighting design firm. Many major office complexes are included among the firm's projects. He is a graduate of Carnegie-Mellon University.

**New York Designers Lighting Forum: Cocktail party and honor award reception for Jeffrey A. Milham** (Wednesday, May 13, 4:30-7:30 p.m., Level 1, The Cafe South). The New York Designers Lighting Forum (DLF) will present its honor award this year to Jeffrey A. Milham for his outstanding contributions to the initiation and continuing success of Lighting World.

All members of the lighting industry are invited for cocktails (cash bar) and hot hors d'oeuvres.

Jeffrey A. Milham is president and head of design for Design Decisions Inc. He is a past president of IALD, former member of the board of managers of the New York Section of IES, a member of the New York DLF, and former lecturer at the Parsons School of Design. ■

# Artemide

Light years ahead™

## New York

National Headquarters  
International Design Center  
528 Center One  
30-30 Thomson Avenue  
L.I.C., NY 11101  
Telephone: 718/786-8200

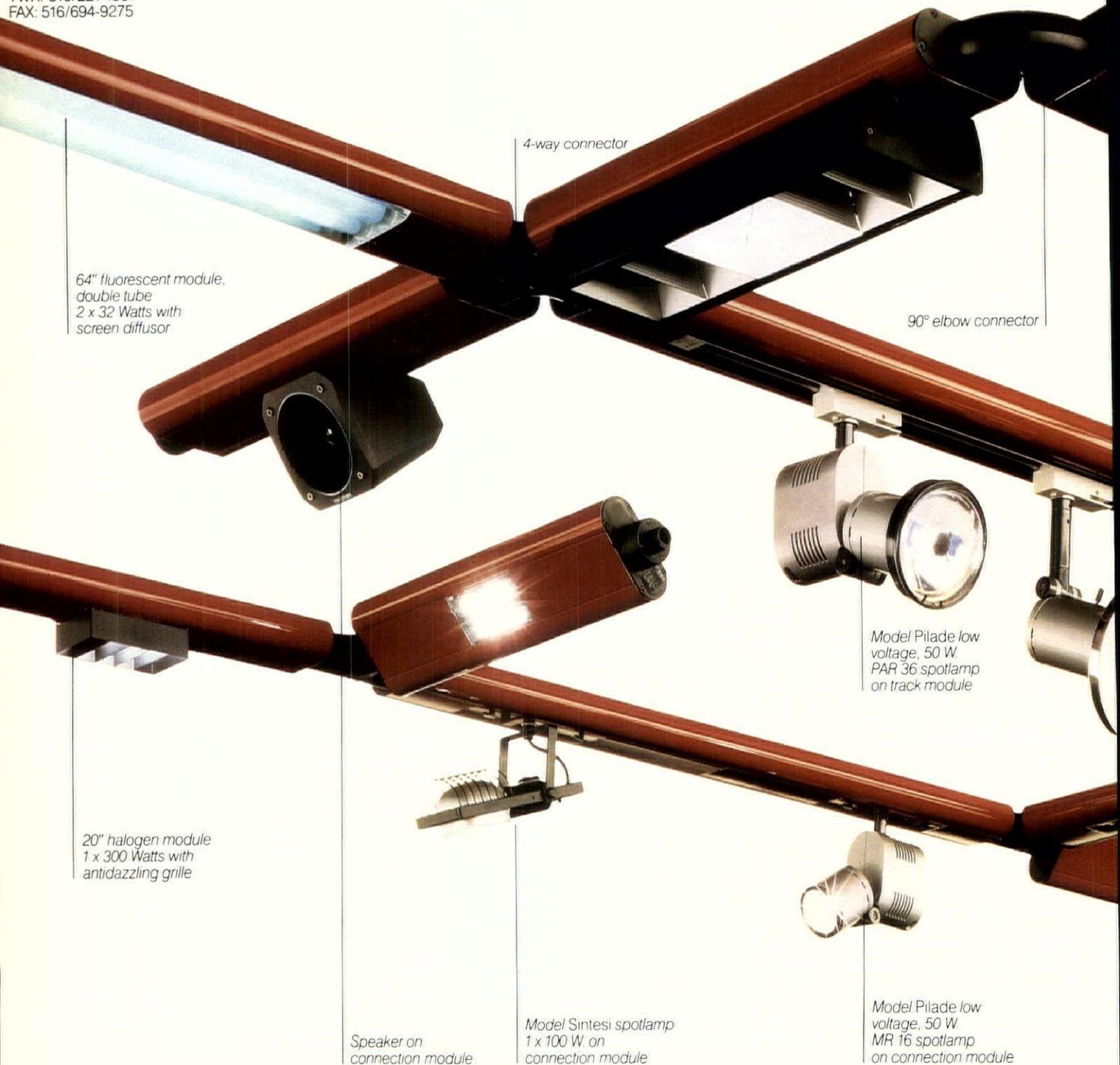
National Sales & Customer Service Center  
1980 New Highway  
Farmingdale, NY 11735  
Telephone: 516/694-9292  
TWX: 510/221-1851  
FAX: 516/694-9275

## Regional Offices:

**Chicago**  
Telephone: 312/644-0510  
**Dallas**  
Telephone: 214/747-6060  
**Houston**  
Telephone: 713/623-2284  
**Los Angeles**  
Telephone: 213/659-1708  
FAX: 213/659-0765  
**Miami**  
Telephone: 305/925-3311

## The Aton Modular Lighting System Design: Ernesto Gismondi

Do functions, use, and personnel change frequently in your space? Has the lighting been poorly planned or forgotten entirely? Is your space temporary; are you planning a move or expansion?



64" fluorescent module,  
double tube  
2 x 32 Watts with  
screen diffuser

4-way connector

90° elbow connector

20" halogen module  
1 x 300 Watts with  
antidazzling grille

Model Pilade low  
voltage, 50 W.  
PAR 36 spotlamp  
on track module

Speaker on  
connection module

Model Sintesi spotlamp  
1 x 100 W. on  
connection module

Model Pilade low  
voltage, 50 W.  
MR 16 spotlamp  
on connection module

# Flexibility Above All

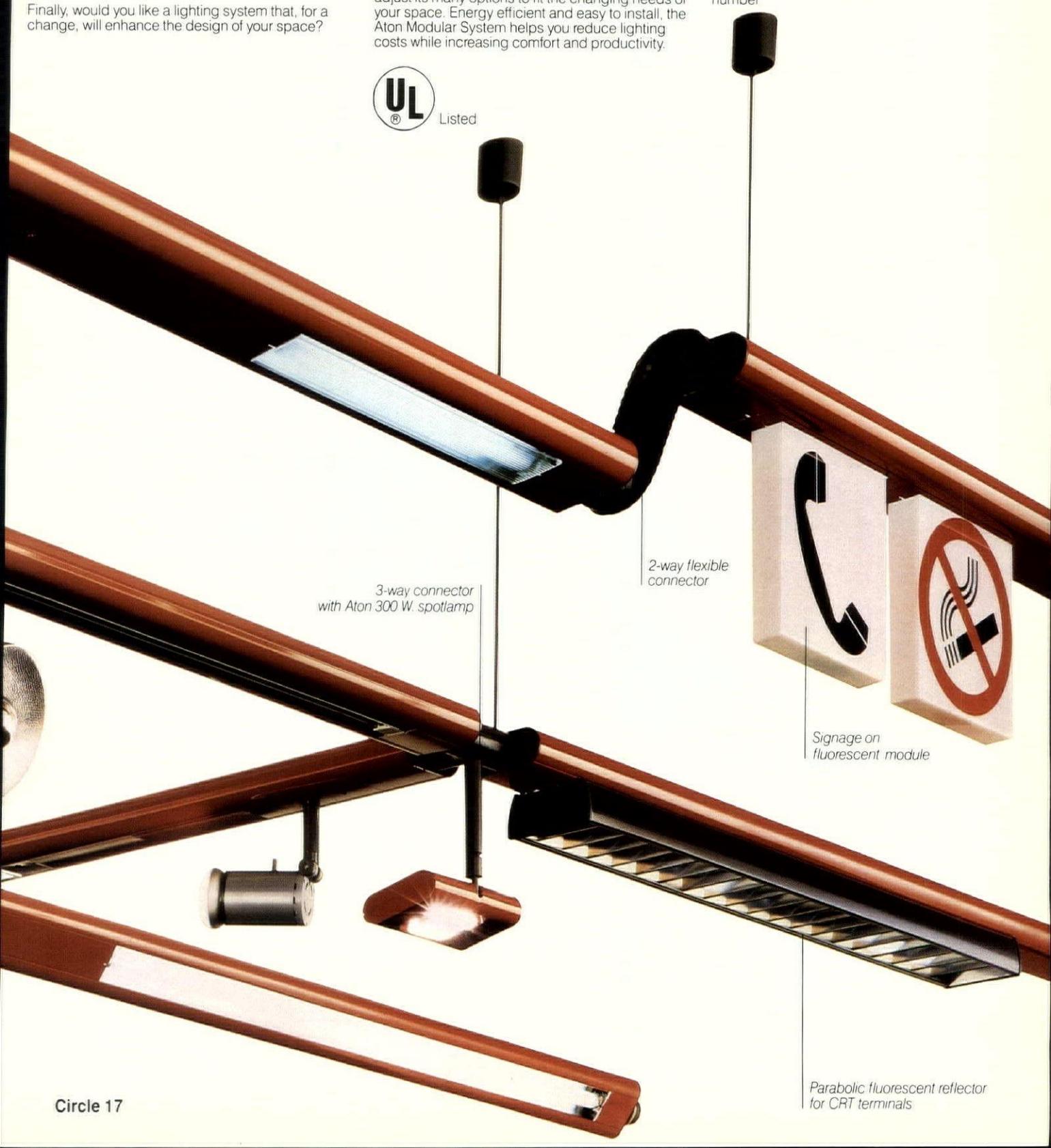
Does your space need more than just regular fluorescent lighting? Do you need lighting for CRT terminals, indirect lighting, spotlighting, track lighting, halogen lighting, incandescent lighting, signage, electrical outlets, or loudspeakers?

Finally, would you like a lighting system that, for a change, will enhance the design of your space?

If your answer to any of these questions is yes, Artemide strongly suggests that you take a close look at its Aton Modular Lighting System.

The flexibility of the Aton Modular System lets you adjust its many options to fit the changing needs of your space. Energy efficient and easy to install, the Aton Modular System helps you reduce lighting costs while increasing comfort and productivity.

Artemide can provide for you, free of charge, a computerized layout showing how the Aton Modular System can meet the lighting requirements of your particular space. Would you like a color brochure? Write to Artemide on your letterhead, or circle number



3-way connector  
with Aton 300 W. spotlamp

2-way flexible  
connector

Signage on  
fluorescent module

Parabolic fluorescent reflector  
for CRT terminals

## Unexpected bonus with instant restrike metal halide lighting

Before the new lighting system was installed in Philadelphia's Spectrum Arena, the building stayed so hot that the ice began to melt almost as soon as the lights were turned on for a hockey game. During concerts and basketball or hockey games, arena air conditioning had to run nonstop — even in winter when it was cold outside.

The new system was sought to improve lighting for the players, the spectators, and television cameras. But it also reduced energy consumption significantly, not only for lighting, but also for air conditioning

**Jane Ganter**

*Jane Ganter is associate editor of Architectural Lighting.*

**Project:** Spectrum Arena

**Location:** Philadelphia

**Designer:** Tom Lemons

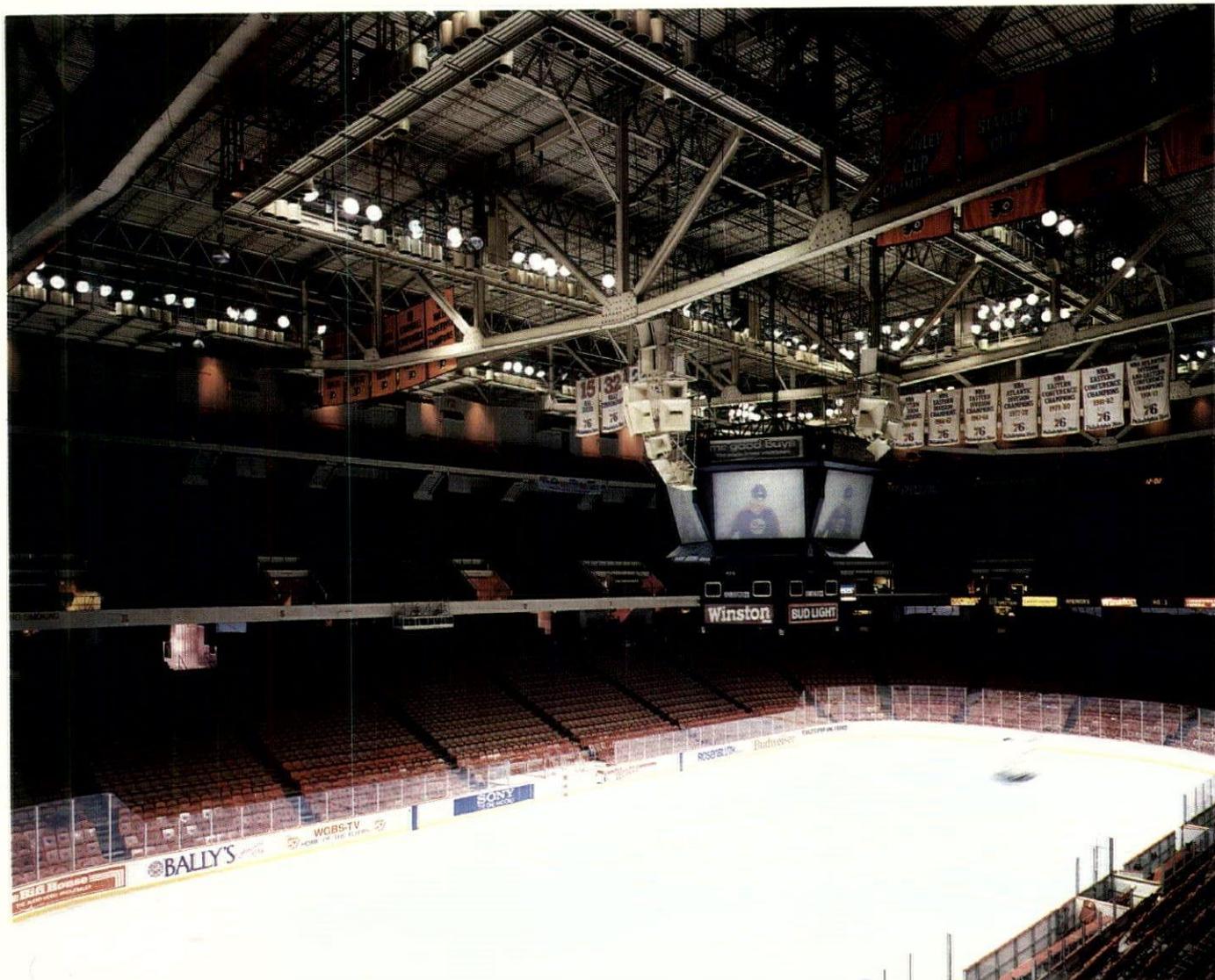
**Photos:** Gene Mopsik

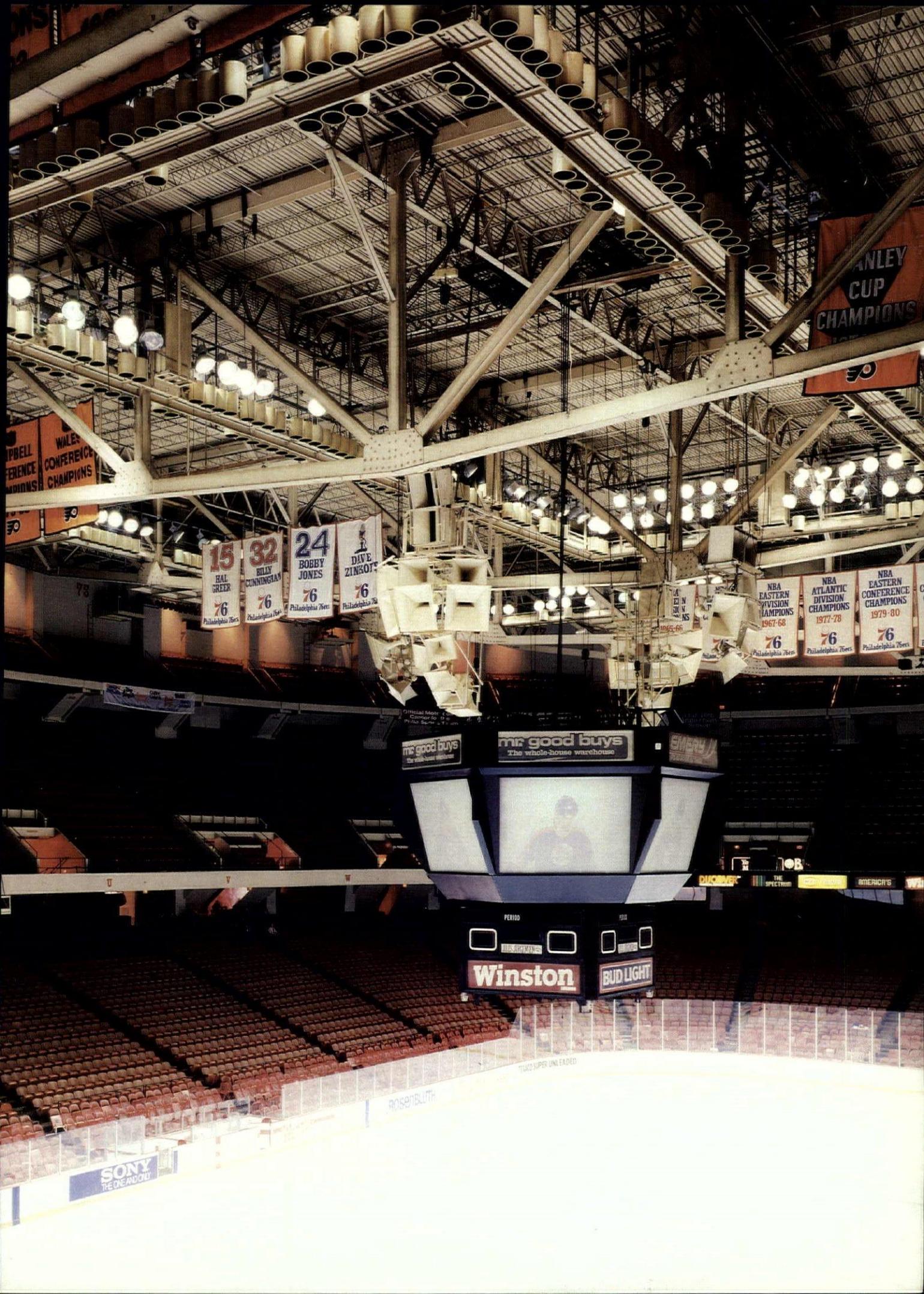
and ice making.

The arena was designed and constructed 20 years ago. Originally it was lit with 1000-watt tungsten halogen lamps — 600 of them. Later, 90 more of those incandescent lamps were installed for improved side and backlighting for television cameras. The 690 kilowatts provided 150–200 footcandles of illumination in the areas used for basketball and hockey games (about 100 footcandles to the expanded floor area used for track meets and tennis matches) and also provided lighting in the stands.

Incandescent light sources, however, introduce about 12 units of heat for every unit of light. So it is little wonder that the original lights had to be turned off between the periods of hockey games so the ice-making machinery could re-freeze the deteriorating playing surface.

Relit with 400-watt metal halide lamps, again the arena gets 150–200 footcandles of illumination, but the 320 specially modified luminaires with their lamps and ballasts use just 142 kilowatts. The resulting reduction in energy consump-





STANLEY CUP CHAMPIONS

76

WALTON CONFERENCE CHAMPIONS

15 HAL GREER Philadelphia 76ers  
32 BILLY CUNNINGHAM Philadelphia 76ers  
24 BOBBY JONES Philadelphia 76ers  
DIVE ZINSKY Philadelphia 76ers

NBA EASTERN DIVISION CHAMPIONS 1967-68  
NBA ATLANTIC DIVISION CHAMPIONS 1977-78  
NBA EASTERN CONFERENCE CHAMPIONS 1979-80

mr. good buys  
The whole-house warehouse

mr. good buys  
The whole-house warehouse



PERIOD  
Winston

BUD LIGHT

DICKSON

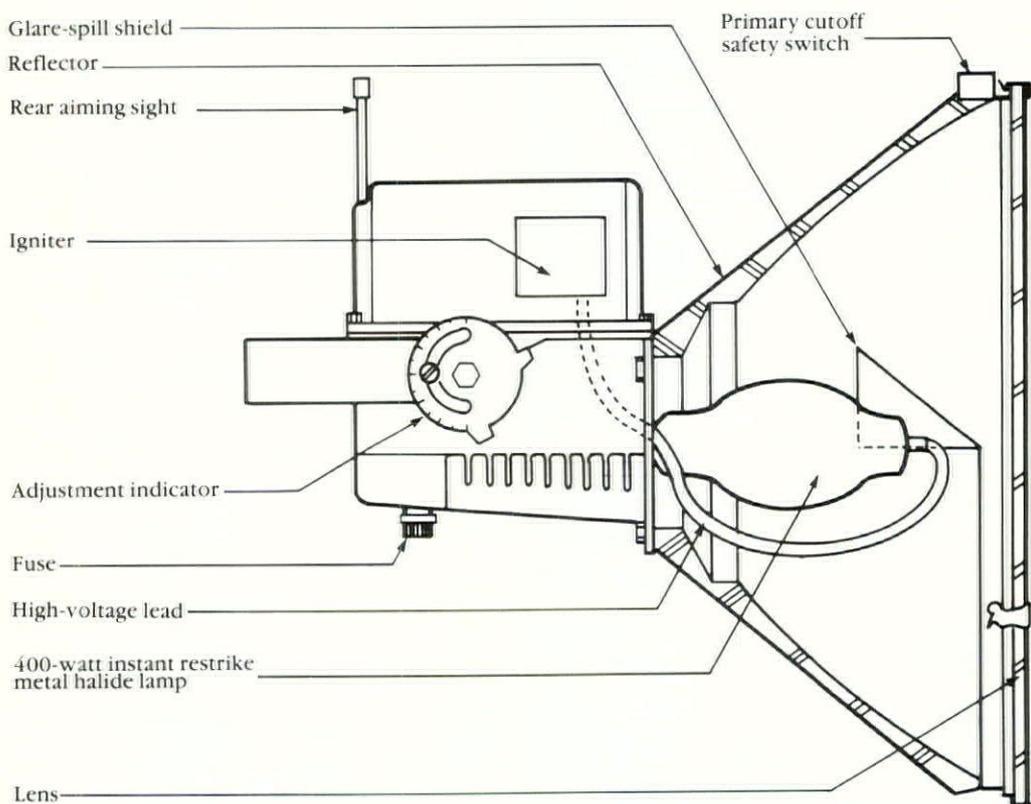
THE SPECTRUM

AMERICA'S

SONY  
THE DEAD END

ROSENBLUTH

TRUO SUPER UNLEADED



tion for lighting is substantial — 548 kilowatts less than the original lighting system.

The considerably cooler operation of the new system also saves energy on air conditioning and ice-making. An additional advantage is freedom to use the new metal halide lighting while ice is being made.

The original incandescent system is still in place, and sometimes is used to warm up the arena when rock bands are rehearsing for a concert. But the arena requires payment of the peak-demand charge by users who have the incandescent system turned on for any reason.

#### Maintenance and Relamping

The original 1000-watt incandescent lamps in the downlighting had a 1000-hour lamp life rating, and the system was in use about 1000 hours per year. The incandescent lamps in-

stalled for TV had a lamp life of only 200 to 400 hours; the need for frequent relamping boosted maintenance costs.

The metal halide system, in contrast, needs relamping only once every three to five years. At that time, each whole luminaire is cleaned.

#### Why Only Now?

The Spectrum is the first major arena in the world to use an instant restrike metal halide system of this kind. Because metal halide lamps have been around for some years, it seems impossible that lighting designers could have overlooked their clear advantages for applications of this type. They did not.

Even recently published reference books list characteristics of metal halide lamps that would have precluded installing the Spectrum's system — limits on the position in which the

lamps will burn and lack of instant restrike capability. Instant restrike is an important new capability for metal halide lamps. Like mercury and sodium lamps, metal halide has needed a cooling off period of as much as 15 or 20 minutes after a momentary outage before it could be relit. Then, it took another couple of minutes for the lamps to reach full output.

Designer Tom Lemons heard that an instant restrike lamp with a universal burning position capability was being developed. It was not yet, however, commercially available.

Working with prototype lamps, Lemons and the fixture manufacturer developed a special luminaire that incorporates an igniter developed specifically to instantly restart the new lamp and an optical system that provides beam and glare control. An early version

created an 18.5-degree beam spread, which made a clearly delineated 22-foot circle of light on the ice. What they wanted, however, was a 22-degree beam and a 30-foot circle of more diffuse light. Close cooperation between designers and technicians obtained the desired result by moving the socket about a half-inch closer to the lens.

#### Television Lighting

The new lamp provides yet another advantage over an earlier instant restrike metal halide lamp — improved color rendering for the television camera. The earlier lamp had a color temperature of only about 3200 degrees Kelvin and would burn only in a horizontal position, throwing an elliptical beam.

The metal halide system has clear advantages for television. During the design phase for the new system, Lemons mocked up both the warm metal halide and the new, cooler, 4300 degrees Kelvin version. The television people much preferred the cooler new lamp.

Video cameras perceive things as being redder than they really are; the new lamp compensated for that video characteristic by emphasizing the blue end of the color spectrum. Color rendition, however, was only part of the problem.

Good television lighting requires key lighting (the main light), backlighting, and side lighting. The shadows created by the original system were distracting for the athletes and disastrous for the television cameras. Additional incandescents installed for television improved the lighting but created even more heat. The new lighting system not only is better for the television crews but also eliminates most of the distracting shadows for the players.

To aim the new system, the

floor was gridded into 20-foot squares. The center of each square served as a guide for aiming sets of six metal halide sources; each source throws a 30-foot circle of light. The lights are bright enough that aiming can be accomplished without turning off all the other lights in the arena.

Each set of six luminaires is aimed in four directions: two lamps for key lighting, two for backlighting, and two — from different directions — for side lighting. An accompanying photo shows that some of the reflectors have "eyebrows" installed on them. These are on the lamps that are aimed more across the floor than downward and protect against light spills from the lamps that would wash out the image on the large television monitors over the center of the floor. It is also possible, with the system's instant restrike capability, to turn off the lights during the showing of a 20- or 30-second television commercial to the 18,000 or 19,000 people in the arena.

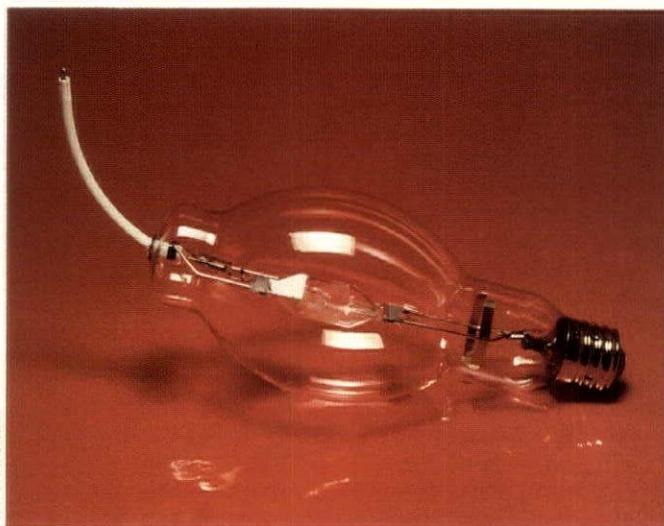
Other glare protection has been built into each floodlight and ballast unit. The photos show three "spokes" through the lens of each source; these hold in place a small, half-pyramid-shaped, arc-hiding glare shield. This shield is another sample of close collaboration between the lighting designer and the lamp and luminaire manufacturers during the development of this system.

Arena lighting has special requirements that depend on the sports or special events to take place in them. The speed and direction of play must be taken into account and balanced with the needs of spectators and television crews.

For the lighting design for the Spectrum arena, special needs included minimizing shadows around the goal areas, providing vertical surface lighting for television, and



*"Eyebrows" shield the video scoreboard from spill light.*



PHOTOSPHERE

*The color temperature of the new 400-watt metal halide lamp compensates for the fact that television cameras "see" more red than eyes do.*

providing modeling of people and objects for optimum visibility. Glare from the spectators' vantage points had to be controlled, yet some light directed onto spectators to include them in the television coverage. The new video scoreboard added another requirement: controlling spill light to avoid washing out the image on the screen and dimming lights during timeouts so that commercials are visible. The design that Tom Lemons worked out in collaboration with the lamp and luminaire manufacturers met all those requirements. ■

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

# The Design Department

The creation of form requires comprehension of the physical construction of a structure. The design of form requires a concept of the human function in the structure. The illumination of form requires an understanding of the nature of light and its interaction with the structure.

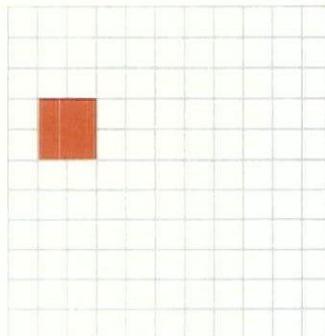
Perception of form is more complex than many people imagine. The way light is used can alter the perception of forms so they seem to take on different characteristics. These subtle changes induce psychological reactions in those who come into contact with the forms.

## **Three-dimensional form is seen as a relationship between highlights and shadows.**

In addition to altering the visual perception of space, the lighting condition also affects visual perception of surfaces and objects in a room. Three-dimensional form is *seen* as a relationship between highlights and shadows. A change in this relationship, caused by a change in the direction and distribution of light, alters the visual impression of depth and form. Viewers' perceptions of surface textures and sculptural form, then, depend upon the direction and distribution of light in a space.

### Lighting for Texture

*Grazing light*, from fixtures located close to the surface being lighted, enhances highlights and shadows. This type of light improves observers' perception of depth by emphasizing the natural textures and sculptural relief of the surface. The same lighting technique, used for inspection, aids in detecting surface blemishes and errors in workmanship.



Gary Gordon, IES, IALD

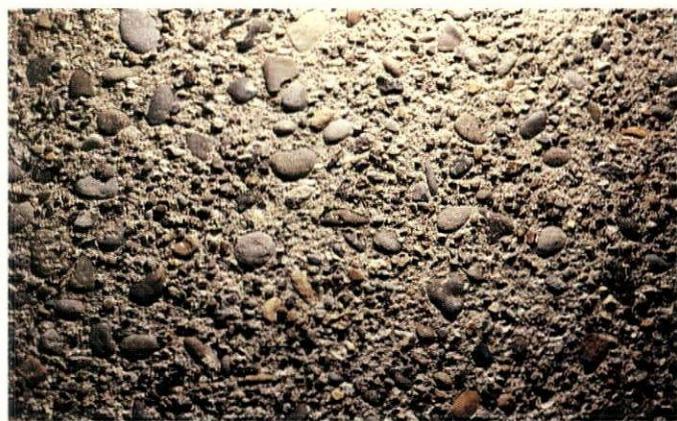
*The author is principal of Gary Gordon Architectural Lighting Design, New York, a firm that designs lighting systems for commercial and institutional settings. He also teaches advanced courses in architectural lighting design practice and techniques at the Parsons School of Design Lighting Institute.*

Light sources should also be placed close to the wall and recessed into the ceiling to prevent reflections from glossy surfaces. A continuous line of directional sources is particularly well suited to lighting highly polished surfaces, such as marble, or heavily textured ones, such as stucco, masonry, or concrete. The same system, however, would be disastrous for flat walls of smooth plaster or gypsum board, where the shadows created by grazing light exaggerate surface imperfections, such as trowel marks, tape, and nail-head depressions.

Conversely, *diffuse light* distribution diminishes the likelihood that surface flaws will be noticed and reinforces the impression of surface smoothness. A lighting system of this type is more suitable for a gypsum board wall or acoustical tile ceiling. Diffuse distribution of frontal light is especially effective in reducing or eliminating shadows and small brightness variations.



PHOTOGRAPH



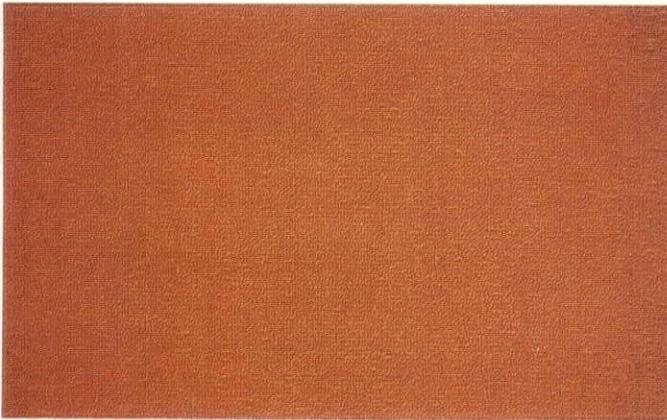
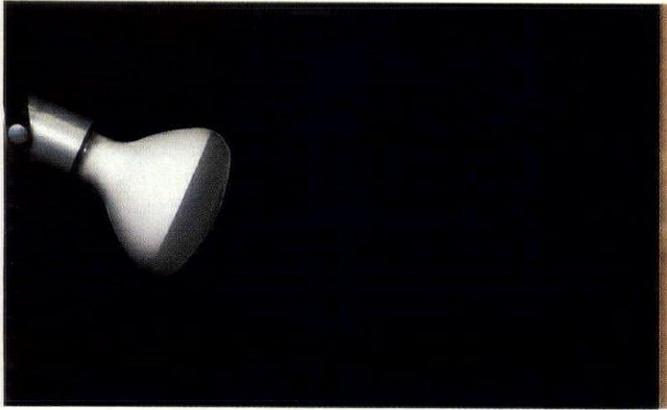
*Grazing light enhances textures by increasing the contrast between highlights and shadows.*

### Lighting for Objects

Directional lighting and brightness contrast can establish a sense of drama and emotional excitement. Yet, the same sharp shadows that contribute to the dramatic effect also reduce the

visibility of detail. Thus, such lighting may affect viewer ability to accurately study and appreciate all aspects of the object.

A diffuse lighting distribution, on the other hand, illumi-



*Diffuse lighting illuminates the entire object, but at some sacrifice of dramatic impact.*

nates the entire object, reducing shadows and facilitating study of workmanship and detail. Desirable for many environments, this type of lighting condition is achieved with some sacrifice of dramatic

impact and visual excitement.

#### Highlights and Shadows

Sharp highlights and deep shadows are effective in creating a dramatic setting for a work of art, and they reinforce

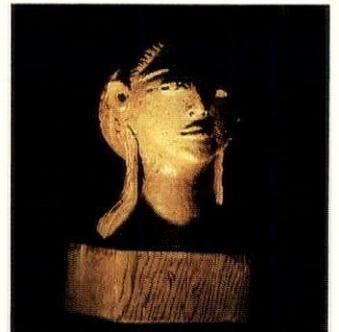
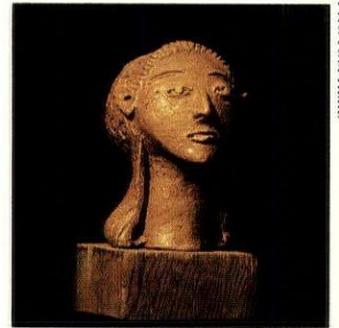
impressions of texture and form. But high contrast lighting distributions may be distracting in a working environment.

Some shadows on a work surface may be mildly irritating, such as those cast by the hand or pencil while writing under a concentrated light source. Shadows may be extremely disconcerting and even hazardous where more precise visual examination is necessary — as on an assembly line. During a period of sustained activity, the extreme concentration and constant readaptation required of workers in shadowy conditions can result in visual fatigue, errors, and accidents.

None of this means that highlight and shadow are never desirable in a work environment. Just as the highlights and shadows of a sunny day are emotionally stimulating influences, carefully placed brightness accents and shadow in an interior provide visual relief and interest. On most work surfaces, however, diffuse light distribution is desirable. In the immediate area of a task, the effects of highlights and shadows should be minimized.

Elements of Visual Perception Experience and memory are also elements of visual perception. Over the years, people have attached psychological associations to variations in the direction and distribution of light. For instance, they expect sunlight to emanate from a concentrated source overhead, at an angle not greater than 45 degrees from nadir. People have also acquired a deep-rooted memory of skylight as a diffuse, multidirectional source.

If a lighting system alters or reverses the expected direction of light, it also changes the normal relationship between highlights and shadows. The resulting visual impressions may seem unnatural and induce a sense of uncertainty, mystery, or fear. Although most environ-



*A lighting scheme that reverses expected source direction creates unnatural visual impressions.*

ments probably favor natural impressions, some elements, such as Gothic gargoyles, call for a sense of mystery. Under all circumstances, variations in light affect the subconscious interpretation of what people are seeing.

The visual perception of surface textures and sculptural form depends to a considerable extent upon the direction and distribution of light. Perceiving a form involves more than seeing the physical form itself. Judgment is based not only on an object's form but on the viewer's perception of that form as *modified by light*. ■

# The Parts Department

Significant growth has taken place in 4-foot rapid start lamp technology during the past few years. Higher lamp efficiency and improved color have been key developments. Improved color rendering is now possible without sacrificing 30 percent to 35 percent of a lamp's lumen output.

Choices offered by the new generation of energy saver lamps and varied ballast options also present new difficulties. Lighting applications engineers and designers must sort through myriad lamp choices, trade names, and order numbers to select compatible lamp and ballast systems while giving full consideration to color rendering.

Checking through files of older lamp catalogs (GE and Sylvania for 1976 and Westinghouse for 1978) turned up 11 listings for warm white (F40WW) and warm white deluxe (F40WWX) from all three catalogs. Today the three manufacturers list 34 warm white possibilities.

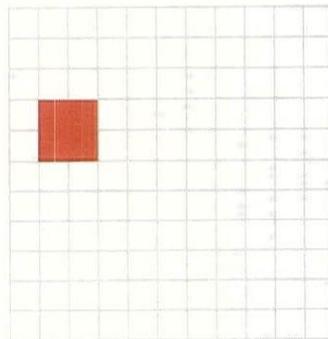
The emergence of lamps with high luminous efficiency and vastly improved color rendering, based on new phosphor technologies, is very exciting. New lamp wall coatings and the combination of conventional and rare-earth phosphors make the difference.

## The New Generation

There is every indication that the new generation of lower wattage lamps — 34- and 32-watt — may be substituted for the standard F40 40-watt lamp without significant loss of lumen output or lamp life. Experience will be the measure.

The first generation of energy-saver lamps suffered from, at best, marginal light levels and longevity. It appears that the new lamp configurations may combine the best of all worlds — energy efficiency, light output, and color.

Triphosphor technology uses



## Sidney M. Pankin

*Sid Pankin, the principal of Pankin & Associates, Inc., is a lighting applications engineer who specializes in lighting design, energy conservation, and the design and fabrication of lighting retrofit components.*

three rare-earth phosphors that closely approximate the primary color wavelengths. The three are blended into combinations with improved light output and color quality in three color temperatures: 3000K, 3500K, and 4100K.

*Chromaticity* is the relative color temperature that indicates the visual appearance of a lamp. Lower temperatures indicate warmer colors. A 3000K lamp is warm, or pinkish; the 4100K lamp is cool, or bluish. A 3500K lamp provides a very acceptable midpoint between warm and cool and provides a much needed color option.

*Color rendering* is the term that describes how well a light source renders the color of objects in a space. The color rendering index (CRI) is a numerical value determined by comparing a specific light source to a standard reference source. The higher the CRI, the better the color rendering and color balance.

It is necessary, however, to understand the limitations of

CRI designations. Although an incandescent lamp's CRI may be close to 100, that does not mean it offers perfect color rendering. Incandescent is very weak in blue. Outdoor north sky daylight also has a CRI of about 100, but it is very weak in red. Comparisons of sources, then, can only be reasonably accurate when both chromaticity and CRI are taken into account.

It is important to experiment with various lamp color options to get a sense of the appearance of the lamps and various objects in a specific environment. Compare the high CRI lamps with standard lamps that have CRIs in the high 40s and low 50s. Also consider the reflective surface of the luminaire, which will dilute the full color of the lamp. A white painted fixture housing, for example, will add white as the light of the lamp reflects from its surface.

Retrofit reflectors have an important effect on color — aluminum is blue-gray and silver is perfectly flat. A silver surface creates virtually no lamp color dilution. The color appearance of a lamp and the color of an object may vary with the light shields used in a fixture; lamp color cannot be taken for granted. The new lamps are valuable design and

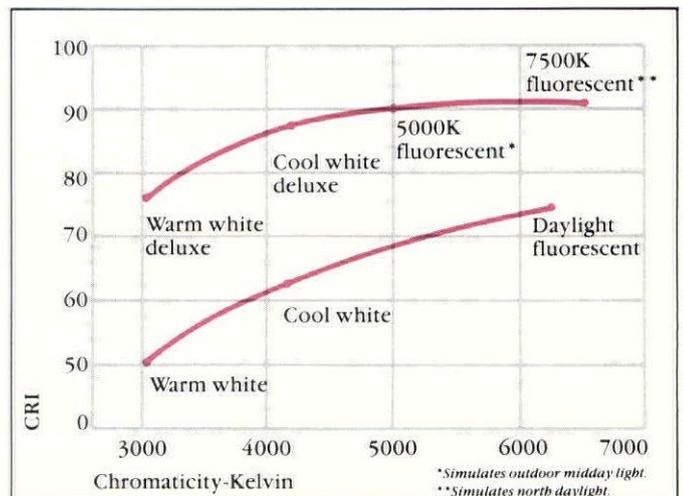
environmental tools for effective lighting.

## The Price of Choice

Obviously, the selection of 4-foot rapid start lamps has become more complex. In addition to a broadened range of color selections there are several new lamping concepts. The typical selection basis rests on either an energy saver (34-watt) or standard (40-watt) lamp. Today there are 40-, 34-, and 32-watt systems; 32-watt lamps are available in T12 (1 1/2-inch tubes) and T8 (1-inch tubes) with a number of different ballast systems. The T8 32-watt systems and ballast developments will be the subject of a future Parts Department column.

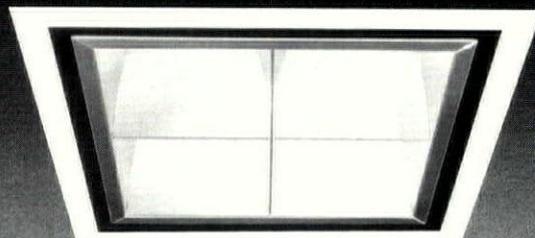
## The higher the color rendering index (CRI), the better a lamp's color rendering and color balance.

Standard 40-watt lamps are still available, as are first generation, energy saver 34-watt lamps. But now, the second generation 34-watt delivers



# PARABOLIC DOWNLIGHT

1' x 1' 2-Lamp 4-Cell



## mini-par

Provides high efficiencies and ultra-low brightness insuring an aesthetically pleasing lighting environment. For general down-lighting in low and medium height ceilings. Excellent for open area lighting. Use for stores, banks, offices, corridors, lobbies, hotels, restaurants, display areas, transportation terminals and many other similar areas.



Globe Illumination Company  
1515 W. 178th Street • Gardena, CA 90248 • 213/321-9000

See Us At Booth No. 877 — Lighting World V

Circle 18

more lumen output — and possibly longer life — and 32-watt T12s are very close in both lumen output and long life. The 32-watter offers highly efficient color rendering choices, and new 40-watt lamps produce more light than the standard F40. It has become a necessity to be familiar with all of the possibilities available.

The selection and use of fluorescent light sources requires establishing application criteria. That means determining the client's needs for light output, chromaticity, color rendering, longevity, and energy use. The ballast system should be considered with lamp selection to assure compatibility; choosing fixtures and shielding devices are also natural parts of the source selection process.

### ***Retrofit reflectors have an important effect on color.***

It is critical to review a mock-up of the final package. That way it is possible to examine the combination of lamps with the luminaire and the environment.

Remember that lamp company sales representatives and product specialists are pleased to provide information, literature, and general assistance. There is a lot of enthusiasm on their part about the exciting new developments, which represent important tools for lighting applications engineers and lighting designers. ■

## SHARE YOUR ILLUMINATING EXPERIENCES

*Architectural Lighting* is looking for practical, problem-solving articles that will help lighting professionals meet commercial, industrial, and institutional lighting challenges. Call or write for Guidelines for Authors or Project Submission Guidelines.

Charles Linn, AIA, Editor  
859 Willamette Street  
P.O. Box 10460  
Eugene, OR 97440  
(503) 343-1200

ARCHITECTURAL  
LIGHTING

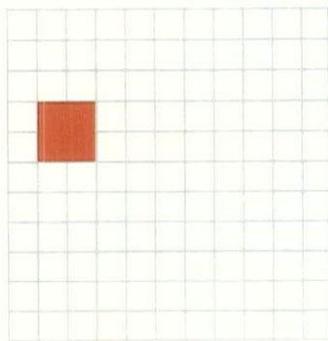
# The Daylighting Department

All light is energy, which is eventually absorbed and turned into heat. In the winter this heat is beneficial; during the cheap energy years, electric lighting heated whole buildings. Unfortunately, in the summer this light energy can overheat a building. Light levels should therefore be kept as low as possible in the summer.

Keeping excess light out of buildings in the summer makes good sense because a strong law of diminishing returns operates on visibility relative to illumination. Above a certain required minimum, increased illumination offers small benefits compared to its cost. For example, a 100-fold increase in illumination from 10 footcandles to 1000 footcandles increases visual performance about the same amount as does increasing the size of lettering on a blackboard by 25 percent. Meanwhile, that same increase in illumination increases the heat gain by a factor of 100. So, it is clear that admitting excessive amounts of light — and its attendant heat — is not a good strategy for improving visibility during the summer months.

## ***A strong law of diminishing returns operates on visibility relative to illumination.***

If the direct sunlight that enters a building is well distributed and creates no excessively high illumination levels, then the heat load from direct sunlight will be less than from electric lights. Incandescent lamps introduce 12 units of heat with every unit of light; fluorescent lamps introduce 3 units of heat with each unit of light. Sunlight, however, introduces only about 2 units of heat



**Norbert M. Lechner**

*Norbert Lechner is an associate professor in Auburn University's School of Architecture, Auburn, Alabama. The daylighting column is adapted from his architectural systems book, which will be published by John Wiley & Sons.*

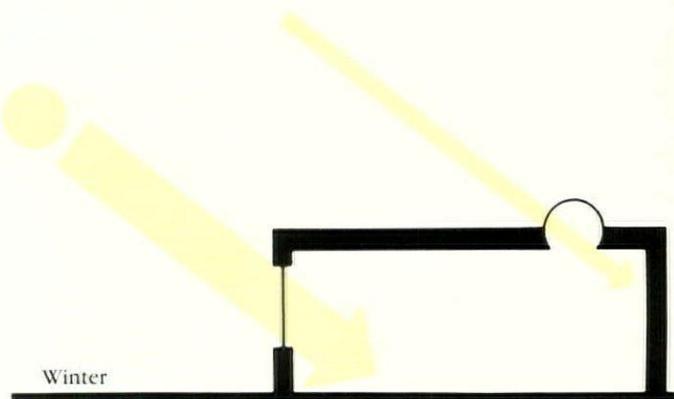
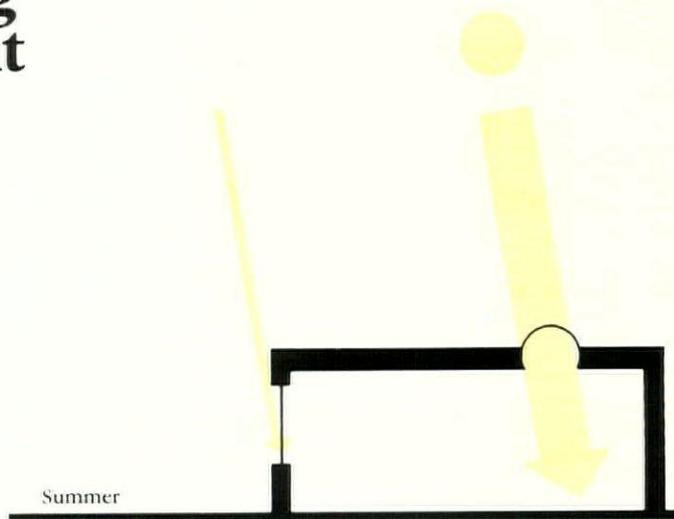
with every unit of light, and light from a blue or cloudy sky introduces even less.

There is no limit on the amount of sunlight that may be introduced in the winter as long as glare and excessive brightness ratios are controlled. After all, the daylighting indoors can never be brighter than the daylighting outdoors, for which the eyes evolved.

Seasonal problems with daylighting are most acute with skylights because horizontal openings receive much more radiation in the summer than the winter. South-facing vertical glazing, on the other hand, captures more sunlight in the winter than in the summer.

### **Rules of Thumb**

**Summer.** During the summer, introduce only as much sunlight as can be used effectively. The sunlight must be well distributed and must raise the illumination levels no higher than needed.



*Vertical south glazing is more in phase with sunshine demand than is horizontal skylight glazing. Although the amount of daylight collected should be just adequate during the summer, there are few limits on the amount for winter.*

**Winter.** During the winter, introduce as much sunlight as possible. There is no upper limit as long as it does not create glare or excessive brightness ratios.

## ***Unlimited sunlight can be admitted in the winter as long as glare and extreme brightness ratios are controlled.***

The amount of heat is a function not only of the amount of daylight but also of the quality of the daylight. About 50 per-

cent of direct sunshine is in the infrared part of the electromagnetic spectrum. The infrared radiation enters a building through glazing as does visible light, but it contributes nothing to daylighting. Light from the blue sky or reflected off clouds has a smaller proportion of infrared radiation and therefore higher efficacy (lumens per watt).

Heat absorbing glass was developed to deal with infrared radiation. Although it absorbs slightly more infrared than it does visible light, its green tint makes it a poor selection for daylighting. Besides, much of the absorbed radiation is reradiated indoors by the uncomfortably hot glazing.

What is really needed is a heat mirror that reflects infra-red while admitting the visible portion of daylight. Some glazing materials now commercially available begin to do this. They are most appropriate for internally dominated buildings in warm climates that need light but little or no heat.

### Six Goals of Daylighting

The general goal for daylighting is the same as that for electric lighting: to achieve enough quality light while minimizing direct glare, veiling reflections, and excessive brightness ratios.

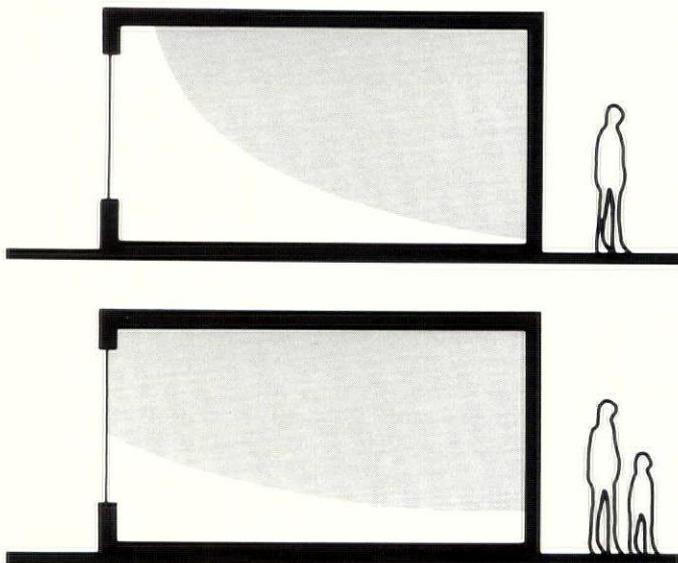
Limitations caused by window location and the variability of daylight lead to some specific goals that refer only to daylighting. The first illumination gradient diagram shows too little light at the back of the room and too much light inside the window. Therefore, the first goal is to get more light deeper into the building in order to raise the illumination level at the back of the room and to reduce the illumination gradient across the room.

The second goal is to reduce or prevent the severe direct glare often caused by unprotected windows and skylights. This glare is aggravated if the walls adjacent to the windows are not illuminated and therefore appear quite dark.

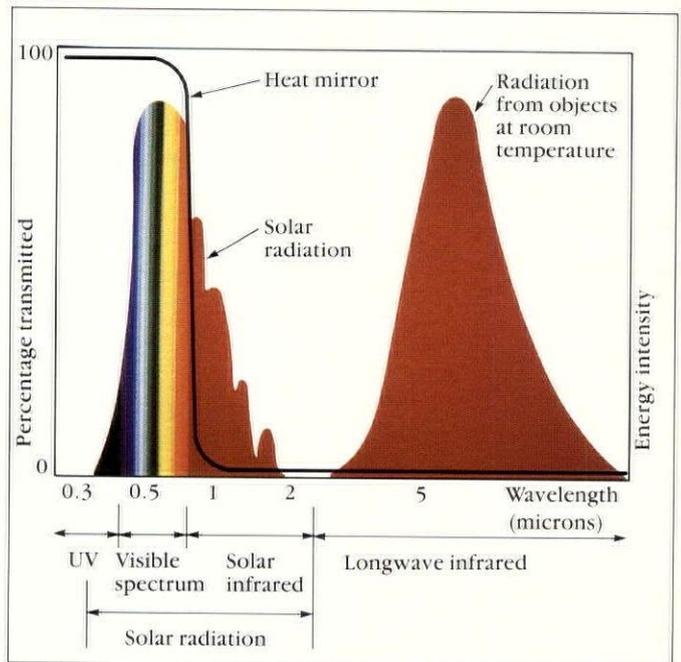
When a beam of sunlight creates a puddle of light over part of a work area, extreme and unacceptable brightness ratios exist. Therefore, the third goal is to prevent excessive brightness ratios — especially those caused by direct sunlight.

Low angle light from windows usually creates no veiling reflections, but light from overhead openings generally does. The fourth goal is therefore to prevent or minimize veiling reflections — especially from skylights and clerestory windows.

Generally, lighting should not be too directional because that creates dark shadows. So, the fifth goal is to diffuse the light by means of multiple reflections off the ceiling and walls.



Window light can create an excessive illumination gradient across a room — too dark near the back wall in comparison to the area near the window. One goal of daylighting design is to create a more acceptable illumination gradient.



The "heat mirror" uses a selective coating that allows only the visible part of the solar spectrum to pass through the glass. Shortwave and longwave infrared rays cannot pass through.

Where no critical seeing tasks take place, the drama and excitement of direct sunlight can be a major design element. The sixth goal is therefore limited to those spaces where there are few, if any, critical seeing tasks: to use the full aesthetic potential of daylighting and sunlight. In fact, the dynamic nature of daylight should be seen as an asset rather than a liability in all spaces. The ever-changing nature of daylight needs only to be limited, not eliminated.

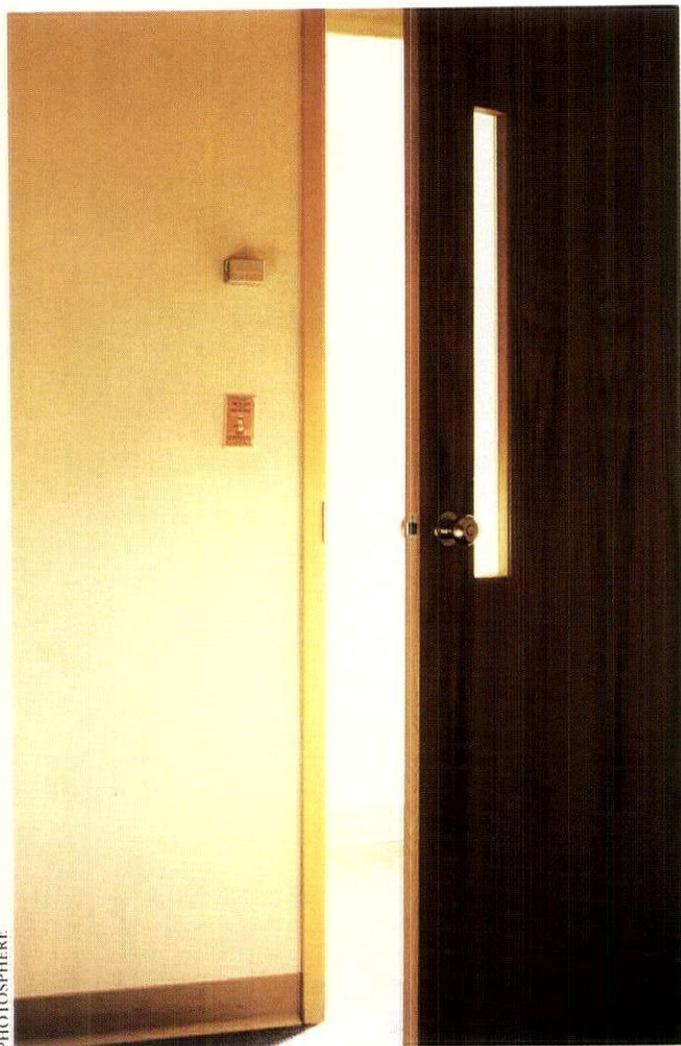
### Daylighting Strategies

To satisfy the goals of good lighting outlined above, various strategies may be used. Some of these strategies must be addressed at the earliest phases of the schematic design process. The orientation and form of a building, for example, are critical to a successful daylighting scheme. Not only the exter-

nal form but also the shape of internal spaces must be considered. Internal partitions, unless made of glass, stop the penetration of daylight. Only after these basic issues have been determined can fenestration design proceed.

### Light-colored finishes increase the distribution and penetration of daylight.

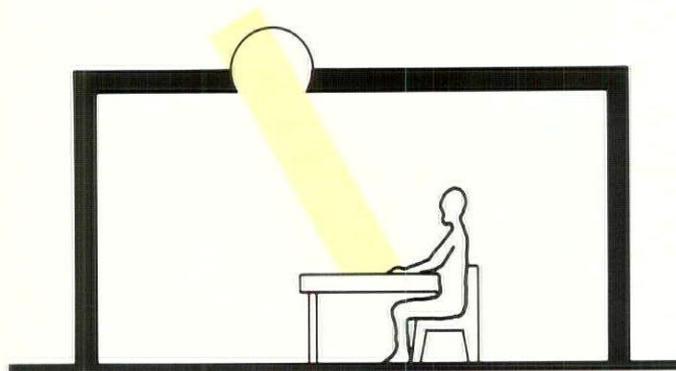
Selecting finishes is normally one of the last steps in the design process, but for effective daylighting it must be considered early. Basically, light-colored finishes are required to increase the distribution and penetration of daylight. The ceiling should have the highest



*Excessive contrast between the opening and the adjacent wall creates glare.*



*Excessive brightness ratios can result from beams of direct sunlight.*



*Veiling reflections are a problem common to all overhead lighting. They partially or totally obscure detail by reducing contrast, and they are most severe when the light source is above and in front of the work surface.*

reflectance factor possible. The floor and small pieces of furniture are the least critical reflectors, and therefore may have fairly low reflectance factors — that is, dark finishes. The descending order of importance for reflecting surfaces is ceiling, back wall, side walls, floor, and small pieces of furniture.

Upcoming Daylighting Department columns will present the most important daylighting strategies currently available. ■

## Book Reviews

*Light: Effective Uses of Daylight and Electric Lighting in Residential and Commercial Spaces*, by Jane Grosslight. New York: Prentice Hall, 1984. 199 pages, \$14.95.

Jane Grosslight has written a book for shop owners, homeowners, and apartment renters who want to improve the quality of lighting in their homes or workplaces. It is one of the least expensive introductions to the field of lighting design available and would make a welcome gift from a lighting designer who wants to educate a client. Even better, a potential client could make the purchase personally — before setting about to hire a lighting designer.

### ***The book raises all the issues important to lighting applications in nontechnical terms.***

This is mostly a how-to book that describes practical ways to solve a range of existing lighting problems or to try out lighting schemes before deciding on an installation. The primary focus is residential lighting, but information is also presented on display lighting for shop owners or managers.

The profuse, clear illustrations and easy-to-read text make the book inviting to all who want to better understand the fundamentals of lighting design and application. It covers a great deal of material in a relatively few pages: from selecting the best desk light for home reading to lighting merchandise and displays in a retail shop.

The real usefulness of the book is the way in which, in nontechnical terms, it raises all the issues important to lighting applications. The proper approach begins with an analysis of the task being performed, whether it's reading, dressing and bathing, preparing a meal, or dining at home or in a restaurant.

The two major issues in all lighting design are *quantity* and *quality*. The author makes recommendations about the amount of light, the color of the light, and the location of the light source based on the seeing needs of the user. She is careful to distinguish between lighting solutions for the owner and those for the renter, describing separate solutions for each.

Lighting efficiency and costs are included in the descriptions, and each example includes calculations of electrical costs.

This helps designers and clients understand the economic benefits and the possible disadvantages of any lighting scheme before a commitment is made to construction. Daylighting is not forgotten, but there are better references for designers who want in-depth information about natural lighting techniques.

A caveat is probably necessary to those who want to try out ideas in the book: the design and construction of some of the projects require more commitment than the average do-it-yourselfer has. This is where the see-for-yourself suggestions come in handy. Mocking up a lighting design with simple materials before building it saves time, expense, and disappointment in the long run.

The author describes effective ways to use temporary incandescent lighting to simulate the way a space will look when a design is completed. Checking a work area for reflected glare is simplified by another of her suggestions: placing a pocket-size mirror on a desk top, exactly where a person would read or write. If a light fixture is visible in the mirror, reflected glare is a potential problem.

Someone once said we must change our minds, if only to prove we have them. The

author realizes the importance of being able to change decisions about lighting designs. One chapter is devoted to modifying spaces by frequent, convenient changes in the lighting.

The examples given for accommodating the lighting to different uses of the space may suggest many opportunities for homeowners or lighting designers. For instance, by clever design, both fluorescent and incandescent lighting can be installed in a dining room to increase its flexibility of use. The room can then be lighted successively for intimate dining, a buffet dinner, or a bridge club gathering. The quality of the space is made to change and adapt to each function at the flick of a switch.

To summarize, *Light* is a good reference for a beginner in conceptual lighting design and a preliminary guide for the production of a completed project. The book is a thought-provoking reminder of the importance of light in creating spatial effects, from the smallest residential application to large commercial spaces.

—David Lord

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

## SHARE YOUR ILLUMINATING EXPERIENCES

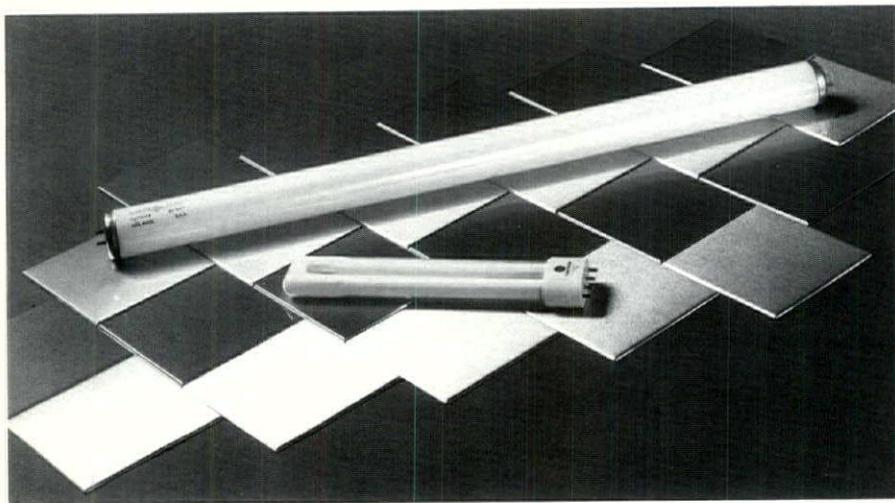
*Architectural Lighting* is looking for practical, problem-solving articles that will help lighting professionals meet commercial, industrial, and institutional lighting challenges.

Call or write for Guidelines for Authors or Project Submission Guidelines.

Charles Linn, AIA, Editor  
859 Willamette Street  
P.O. Box 10460  
Eugene, OR 97440  
(503) 343-1200



## Product Showcase



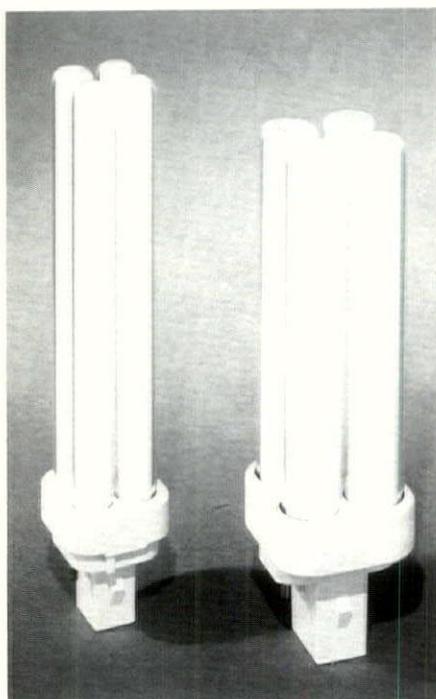
### ■ 18-watt compact fluorescent

The new 18-watt Biax compact fluorescent lamp (shown here in the foreground) produces as much light as a conventional 20-watt fluorescent (shown behind it). General Electric Lighting Business Group added the lamp to the Biax line, which also includes 7-, 9-, 13-, and 39-watt lamps. These lamps offer lumen output comparable to linear fluorescent tubes three times their size.

The new 9-inch-long 18-watt lamp is

rated for 1250 initial lumens, slightly more than a 75-watt incandescent. The manufacturer estimates lamp life at 10,000 hours under conditions of 3 hours operating time per start. The lamp requires an external starter and is available in 3000K and 3500K versions. General Electric Lighting Business Group, Cleveland, OH.

Circle 55



### ■ Double twin-tube lamps

North American Philips Lighting has introduced the PLC\* Quad line of double twin-tube compact fluorescent lamps, the first compact fluorescents to be made available in both 10-millimeter and 15-millimeter diameters. The line includes a range of lamps designed to replace 40-, 60-, 75-, and 100-watt incandescents.

The PLC\* Quad lamps, which are as much as four times more energy efficient than comparable incandescents, last up to 10 times longer. They incorporate a starter in the base and are installed and removed with a simple push and pull.

For greater point source control, the narrower 10-millimeter lamp is available in wattages yielding 600, 900, 1250, and 1800 lumens. The 900- and 1200-lumen 15-millimeter lamps provide a more diffuse light source. North American Philips Lighting Corporation, Somerset, NJ.

Circle 56



### ■ Hand-painted table lamps

The Harlee Museum Collection of hand-painted porcelain table lamps features reproductions of art by Matisse, Mondrian, Monet, and others. The body shapes of the lamps vary with the artwork. The UL-listed lamps are furnished with fabric and vinyl shades. Plymouth Harlee, Inc., Melville, NY.

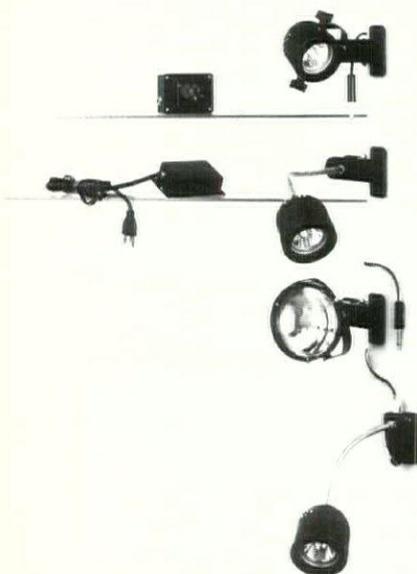
Circle 57



### ■ Pagoda light

Electro-Elf's pagoda-style landscape light accommodates a compact fluorescent lamp. The fixture's body is injection molded of high-impact polycarbonate-polypropylene plastic. Metal parts are cadmium plated, and the fixture is gasketed and sealed to protect electrical parts from environmental damage. Designers can order custom colors or can select standard bronze, green, tan, or black. Electro-Elf, Temple City, CA.

Circle 58

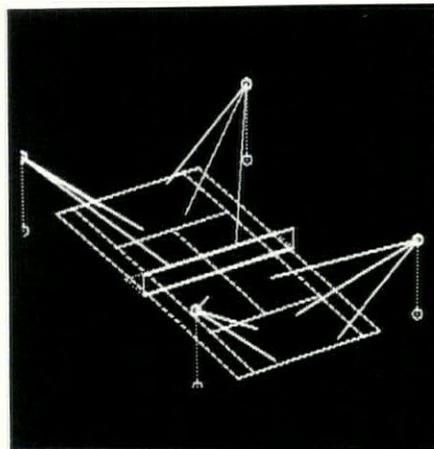


#### ■ Plug-in system

Roxter has introduced two lightweight, solid state transformers that provide low-voltage power to the firm's MR 16 and PAR 36 fixtures. The direct plug-in model and the line cord model, shown here on the left, each supply 12 volts with a capacity of 75 watts.

The fixtures shown on the right are, from top to bottom, a clip-on MR 16 model; a clip-on MR 16 model with a flexible arm; a clip-on, sealed-beam PAR 36 model; and a magnetic-base MR 16 model. Clips open to 1 1/2 inches and grip onto flat or rounded surfaces. Any combination of two fixtures can be plugged into each transformer's two input jacks. Roxter Manufacturing Corp., Long Island City, NY.

Circle 59

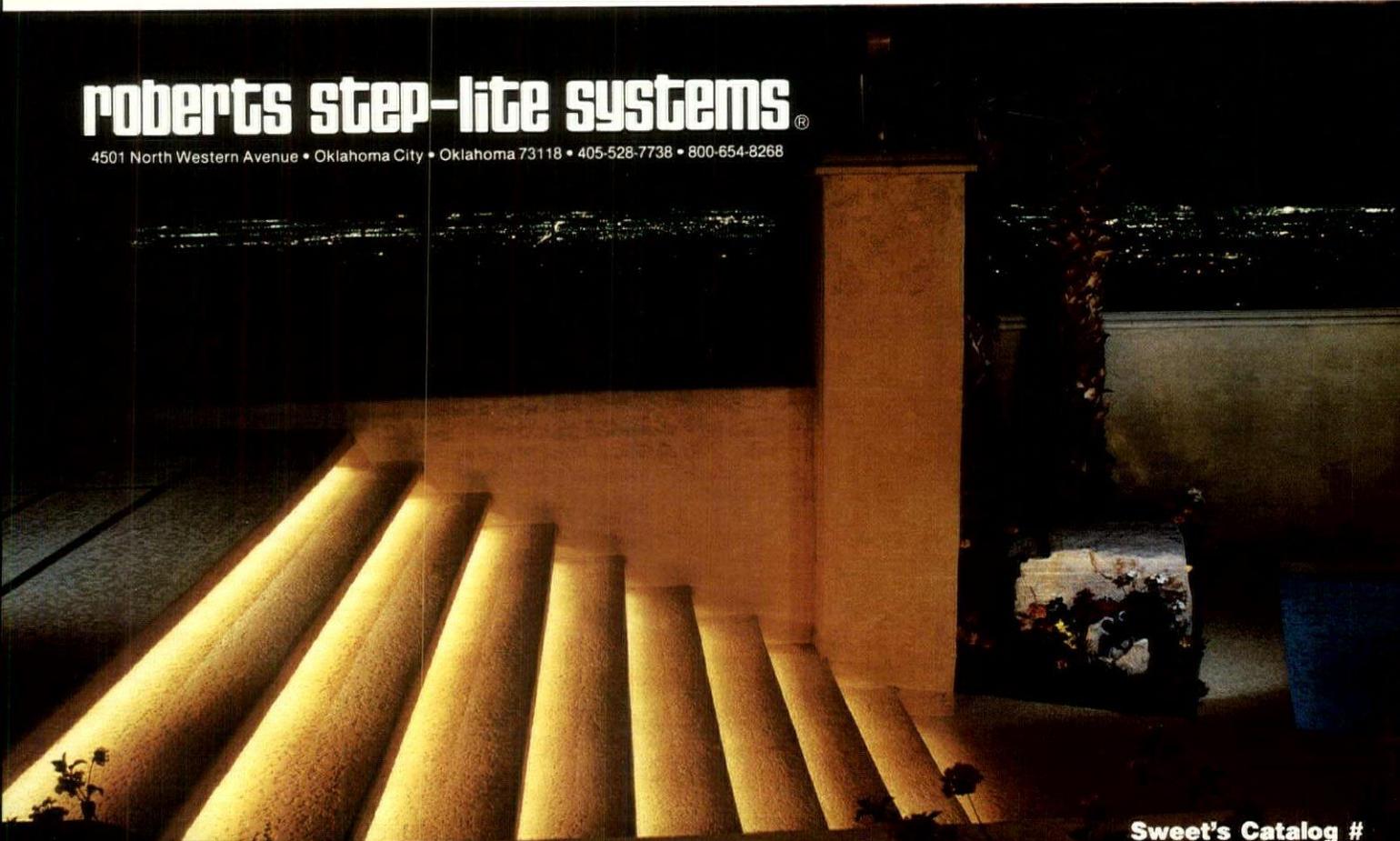


#### ■ Design, analysis software

Holophane has introduced CALA, a lighting design and analysis system for the IBM PC or compatible personal computer. The

## roberts step-lite systems®

4501 North Western Avenue • Oklahoma City • Oklahoma 73118 • 405-528-7738 • 800-654-8268

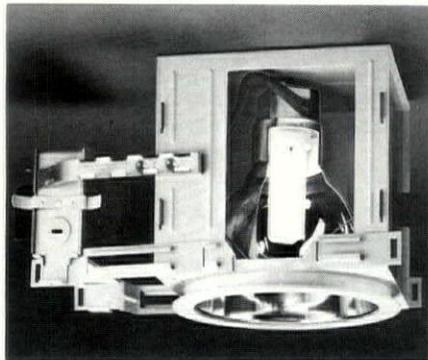


Circle 20

Sweet's Catalog #  
16500/ROB  
Buyline 4899

software allows users to design and analyze lighting layouts including indoor, outdoor, roadway, sports, area, and office lighting. Layouts can be shown graphically (as illustrated) or digitally. Users can add, remove, aim, and adjust luminaires through the computer keyboard. CALA includes more than 800 photometric files from Holophane and can use any manufacturer's disks that are IES formatted. Holophane, Newark, OH.

Circle 60

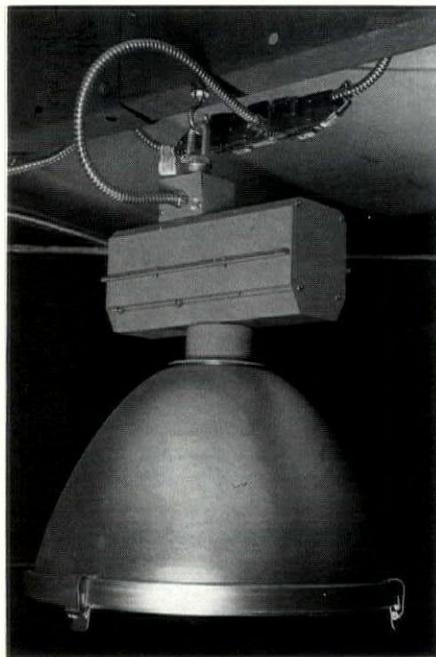


■ **Double twin-tube fluorescent downlight**

Prescolite has expanded its Lite Box product line to include the CBX series of downlights. The new fixtures use the 13-watt double twin-tube compact fluorescent lamp as a light source. A single lamp of this type produces nearly as much light as a 60-watt incandescent lamp, yet saves up to 75 percent in energy costs. The lamp's 10,000-hour life also reduces maintenance costs.

The CBX housings fit in shallow 2-inch by 8-inch construction. They are UL approved for installation in all ceiling types except concrete pour. The encapsulated ballasts are UL approved for damp locations. The manufacturer offers a variety of open and enclosed trims for the downlights. Prescolite, San Leandro, CA.

Circle 62



■ **High-bay wiring**

AFC's (Flex)<sup>4</sup> wiring system simplifies installation of high-bay industrial lighting. The system's modular cable components terminate in connectors that plug together. For high-bay lighting, each fixture is wired with a Power T cable. A fixture manufacturer can install the cables in the factory, or an electrical contractor can install them at the job site. Other cables then plug into the two sides of each Power T connector, linking the fixtures in series. The system allows the removal of any fixture without adding or changing components. AFC, New Bedford, MA.

Circle 61

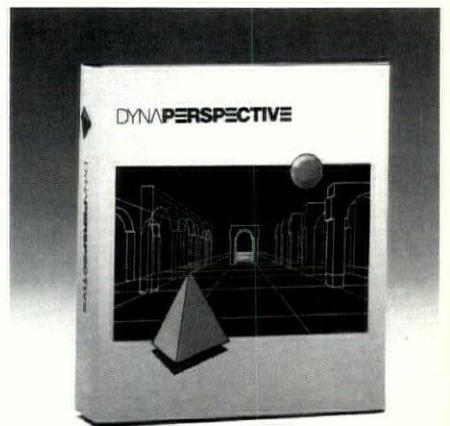


■ **Video terminal task light**

Ledu's Information Processing Lamp is designed specifically for use at video display terminals. Its asymmetric distribution improves contrast, eliminates glare,

and protects the screen from veiling reflections, according to the manufacturer. The fixture uses compact fluorescent lamps and is UL approved. Ledu Corporation, Trumbull, CT.

Circle 63



■ **Modeling software**

Dynaware has introduced Dynaperspective, a new three-dimensional solid modeling graphics software package. The program combines line, shape, form, color, and shade to create complex renderings for conceptual design, visual analysis, and presentation.

Designers can use the program's user-definable light source to see the effect of light and shading on one object, a group of objects, or a design as a whole. The touch of a button can change the source position, and users can test alternative light source and shading effects in seconds.

The program's solid surface modeling capability permits users to view three-dimensional renderings from any perspective seconds after the initial compilation is complete. Other software packages require recompilation to remove hidden lines for each change of perspective, according to the developer. Dynaperspective allows users to present a rendering with fully colored solid surfaces, with transparent surfaces, or as a simple line drawing.

The software package can be used with IBM PC XT's, AT's, and compatibles. The publishers will give users one free major upgrade during the first 12 months after purchase. Dynaware, Bellevue, WA.

Circle 64



### ■ Textured globes

Hadco has added small globes to its Victorian globe series. The small globes measure 8 $\frac{1}{4}$  inches in diameter and 17 inches high. Two are shown here (left and center) alongside a medium-sized globe (right) that is 14 inches in diameter and 28 $\frac{1}{4}$  inches high.

The textured, vandal-resistant globes can protect either incandescent or high intensity discharge light sources. The new globes are available with cast aluminum fixtures with a variety of mounting configurations, including bracket, pier, single post top, and multiple post top. Hadco, Littlestown, PA.

Circle 65



### ■ Retrofit lens

Southern California Edison, a major electrical utility, recently approved K-S-H's 3ER retrofit lens as an energy-saving device. The utility granted the approval after analysis and review of several installed projects under its Energy Conservation Program.

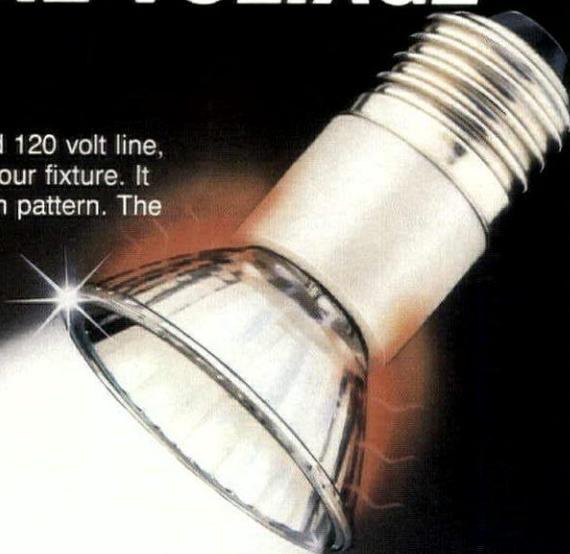
The 3ER prismatic acrylic lens reduces the amount of light output directly beneath a fluorescent fixture and redistributes the light to the sides. The design allows a user to remove two of the lamps from a four-lamp fluorescent fixture, reducing electrical consumption by 50 percent while maintaining as much as 70 percent of the original light level. It can also reduce the dark contrast areas between fixtures, according to the manufacturer. K-S-H, Inc., K-Lite Division, St. Louis, MO.

Circle 66

## INTRODUCING THE SECOND GENERATION LINE VOLTAGE MR16 LAMP

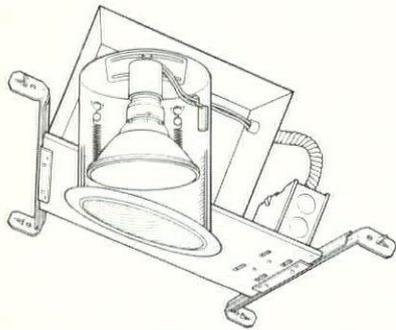
This new state-of-the-art lamp works off any standard 120 volt line, without needing an adapter. Just screw it directly into your fixture. It offers an improved reflector design and a sharper beam pattern. The new reflector design transmits a pure, white beam of visible light forward and heat backward.

So, why buy an intermediate base JDR and an adapter, when you can have this new line voltage MR16 that needs no adapter. Call or write Aamsco Lighting, P.O. Box 15119, Jersey City, NJ 07305 / Phone (201) 434-0722 for more information.



Clip on lens recommended.

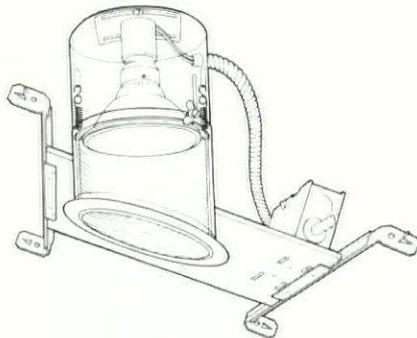
Circle 21



### ■ Sloped-ceiling downlights

Juno's new Sloped Ceiling Down-Lites are specifically designed for vaulted, cathedral, and sloped ceilings. The luminaires' shovel-cut design and adjustable sockets ensure lamp positioning perpendicular to the floor at ceiling slopes between 2:12 and 6:12. Telescopic housings fit standard 2-inch by 10-inch construction or collapse to fit 2-inch by 8-inch construction.

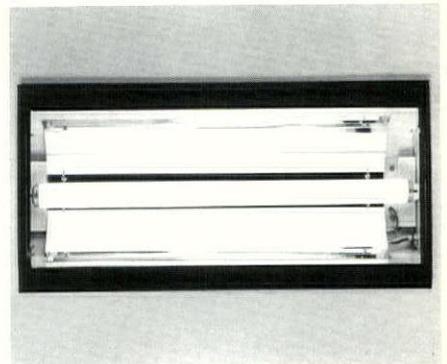
Model ICT 926, illustrated at the left side of the drawing, can be used in direct contact with thermal insulation. Model TC 926, shown at the right, is designed for use



in noninsulated ceiling areas. It has a thermal cutout that disconnects the fixture if insulation is in contact with the housing.

Designers can select five trims for the downlights. A black phenolic baffle — the most popular downlighting trim, according to the manufacturer — slants to match ceiling slope. Other trims include a diffuser, an eyeball, and two low-voltage, round-back cylinders. Juno Lighting, Inc., Des Plaines, IL.

Circle 67



### ■ Optical reflectors

Specular silver optical reflectors from Maximum Technology are suitable for retrofit applications and for new construction. Fluorescent luminaires equipped with the reflectors can produce nearly as much light with half the original lamps and ballasts. The firm supplies reflectors for most types of fluorescent luminaires and can manufacture to custom specifications.

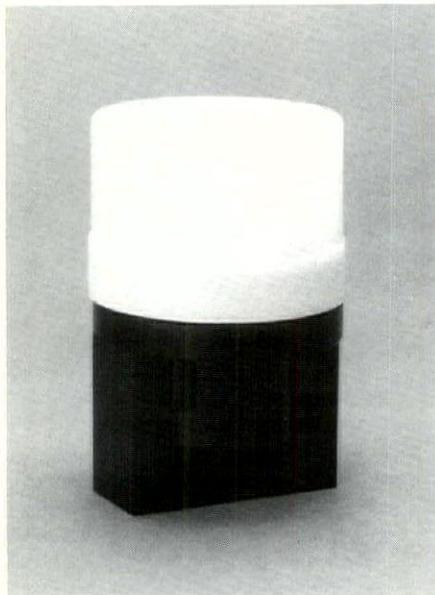
A layer of silver film 0.025 inches thick covers the surface of each aluminum reflector. The film reflects 96 percent of incident light, according to the manufacturer, providing reflectivity superior to that of the aluminum or white metal surfaces found inside most fixtures. As a result, light bounces out of the luminaire and into the work area. Maximum Technology, Brisbane, CA.

Circle 69



### ■ Emergency lighting unit

Teledyne Big Beam offers an emergency lighting unit, the model EFB-40 Light Pak, that converts standard fluorescent fixtures into emergency lights when power fails. The self-contained unit has a maintenance-free nickel-cadmium battery designed to withstand the high temperatures — 40 to 50 degrees Celsius — generated in fluorescent ballast channels.



### ■ Photocell control station

Strand's photocell control station automatically adjusts electrical light levels in response to changes in available ambient light levels. The station thus reduces the amount of electrical light needed to maintain a set level of illumination in rooms where daylight is available. It can compensate for lamp lumen depreciation due to aging and reduce operating costs by extending lamp life, the manufacturer reports.

The firm supplies the station as a complete kit, including a photocell head (shown here) and a control panel with mounting hardware. A push button on the panel activates the photocell; a slider control adjusts the cell's sensitivity. The control station can be combined with other components from the firm's Environ 2 line of dimmers and controls. Strand Lighting, Rancho Dominguez, CA.

Circle 68

The Light Pak is UL-listed for new or retrofit installation and can be completely concealed either inside or above troffers. Each unit has its own test switch and LED indicator light. It provides up to 1½ hours of emergency illumination for a single fluorescent lamp, including single 20-watt, 30-watt, or 40-watt rapid start, instant start, high output, slimline, or U-shaped lamps up to 4 feet long.

Each Light Pak contains a constant-current solid state charger that recharges the unit within 24 hours after power is restored, the manufacturer reports. The firm offers a two-year limited warranty on the unit. Teledyne Big Beam, Crystal Lake, IL.

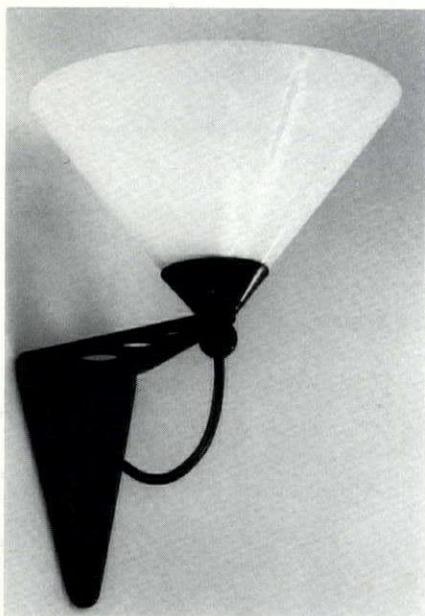
**Circle 70**



■ **Bollard**

The XL Smart bollard from TrimbleHouse stands just 42 inches high. The luminaire is designed to provide efficient light patterns on walkways, driveways, steps, and ground areas. It is available in bronze, black, and clear brushed finishes. Trimble-House Corporation, Norcross, GA.

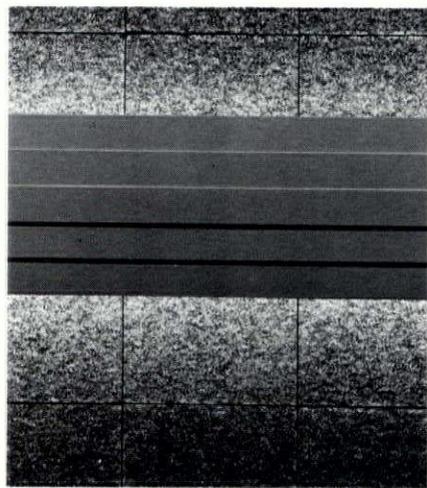
**Circle 72**



■ **Wall sconce**

A new wall sconce from Harry Gitlin accommodates either a 60-watt frosted A 19 lamp or a 100-watt halogen screw-base lamp. A bracket supports a 10-inch-diameter flashed opal glass shade. The manufacturer can coat the bracket with a designer's choice of paint or metal finish. Harry Gitlin, Inc., New York, NY.

**Circle 71**

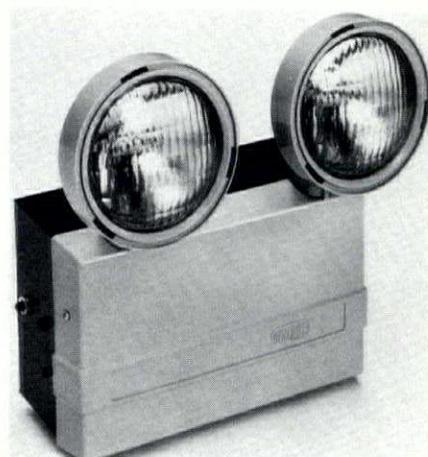


■ **Fluorescent wall valance**

A wall valance from Architectural Lighting Systems provides indirect illumination by up- and downlighting wall surfaces. The

two-lamp fluorescent fixture is part of the new group of articulated linear lighting products designed for the firm by Robert Sonneman. The valance system is available in four standard lengths and accepts four styles of decorative color plates. Architectural Lighting Systems Inc., Taunton, MA.

**Circle 73**

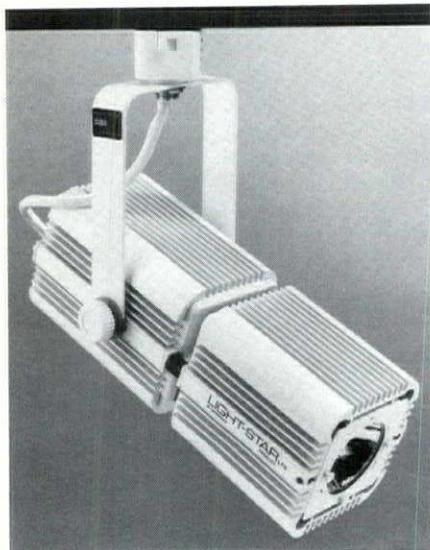


■ **Compact emergency lighting**

Dual-Lite's compact, self-contained ML-12 emergency lighting system holds two lamps and can power as many as 12 remote fixtures. The firm offers several styles of adjustable lighting heads for top, side, or remote mounting. Rated for 100 watts for 90 minutes, the system features low-voltage disconnect for automatic battery protection, a universal transformer for 120- or 277-volt operation, and a test switch.

The ML-12 has an all-metal chassis with injection-molded thermoplastic cover and lamp housings. A coating of elastoplastic silicone protects the system's printed circuit cards and electrical components from moisture, corrosion, mold, and fungus. Dual-Lite, Inc., Newtown, CT.

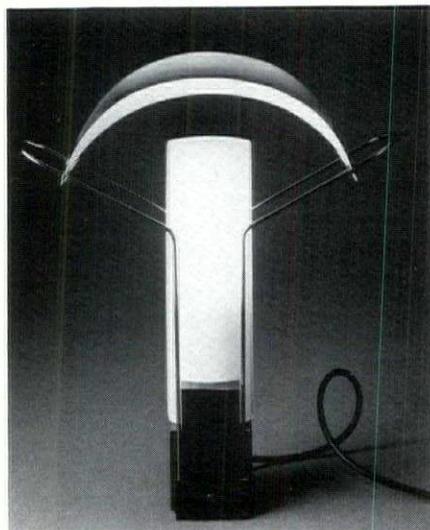
**Circle 74**



#### ■ MR 16 lamp holder

The Litestar luminaire from Lightscape is an MR 16 lamp holder with an optional integral transformer. The luminaire's body is constructed of lacquered extruded aluminum. Accessories enable the lamp holder to project 35-millimeter slides. Lightscape Inc., New York, NY.

Circle 75



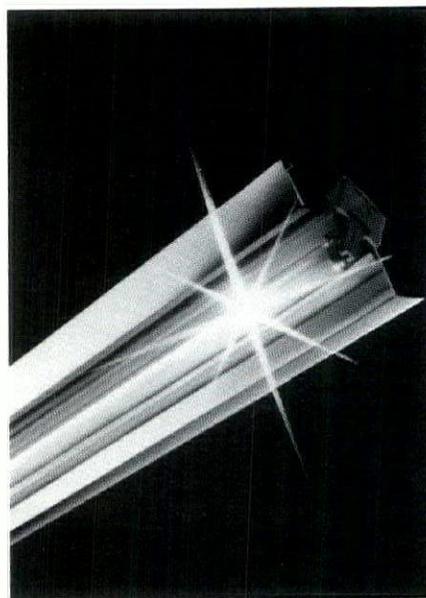
#### ■ Table lamp

Atelier International Lighting offers Palio, a table lamp designed by architects Perry A. King and Santiago Miranda. The lamp produces light through a two-piece, ellipti-

cal, opal glass diffuser body. Thin chrome-plated brass rods suspend a crescent-shaped aluminum reflector over the diffuser. The reflector is available in polished aluminum and polished copper-plated finishes with a textured matte white inner surface.

A black die-cast aluminum base incorporates a full-range rotary dimmer. The manufacturer suggests use of the lamp in executive offices. Atelier International Lighting, New York, NY.

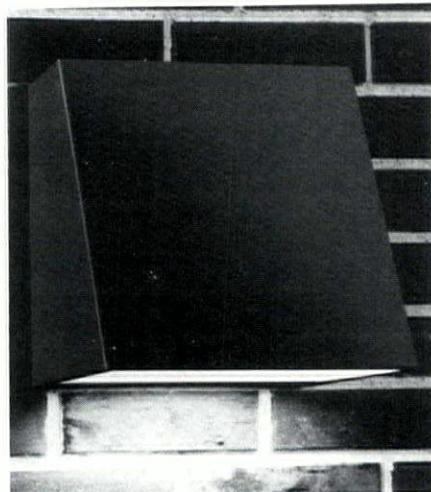
Circle 76



#### ■ Retrofit reflectors

J/K Reflective Systems optical reflectors allow users to reduce lighting wattage by 50 percent without substantially lowering light levels. Users remove half of the lamps in existing fluorescent luminaires, rewire parallel lamps to permit operation by a single ballast, and install the reflectors. The anodized finish of the reflectors is designed to withstand routine cleaning without darkening, yellowing, cracking, or peeling. J/K Reflective Systems, division of Al Kramp Specialties, Stockton, CA.

Circle 77



#### ■ Exterior downlight

Guth recommends its new Sundowner wall-mounted fixture for exterior perimeter lighting applications. The tapered housing of the downlight offers a sharp light cutoff of 85. Specular aluminum reflectors and an etched-glass refractor distribute light to the left and right of the downlight, allowing wide spacing between fixtures, according to the manufacturer. The Sundowner can accommodate metal halide, high pressure sodium, or compact fluorescent lamps. Guth Lighting, St. Louis, MO.

Circle 78

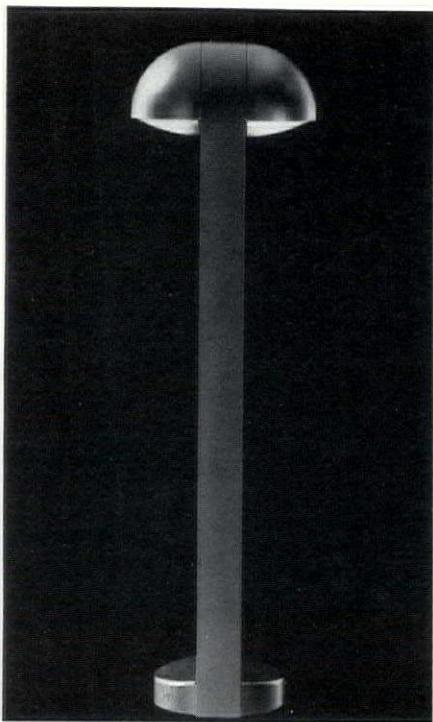


#### ■ Hardwood luminaires

Jack Mitchell, director of design at Boyd Lighting, has designed four new lumi-

nares. The Glasgow series includes a pendant, two ceiling fixtures, and a table lamp. Each has a pyramid-shaped hardwood frame that the firm offers with white limed and black lacquer finishes. Translucent panels of white flash glass or silver mica diffuse the light of two or three A 19 lamps. Boyd Lighting Company, San Francisco, CA.

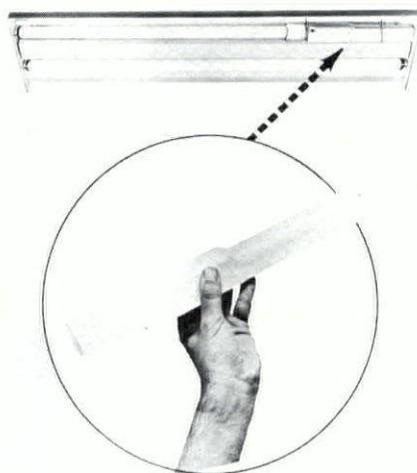
**Circle 79**



**■ Bollard**

The model 9681 bollard from Bega houses two 100-watt A 19 lamps. The similar model 9689S houses two 50-watt E 17 high pressure sodium lamps. Both are constructed of die-cast aluminum and stainless steel with impact-resistant polycarbonate lenses. The bollards provide asymmetrical light distribution for effective illumination of pathways and open spaces. An anchorage system allows the bollards to be rotated 360 degrees for adjustment during installation. Matching single-lamp bollards and wall-mounted units are also available. Bega/FS, Santa Barbara, CA.

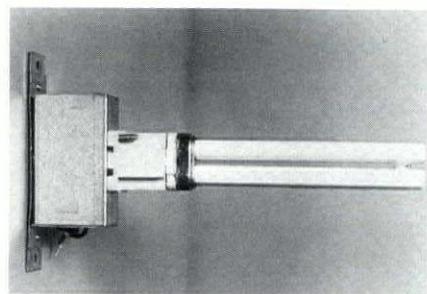
**Circle 80**



**■ Emergency lighting unit**

Radiant Illumination has introduced an emergency lighting unit for fluorescent fixtures, the model SNC 2000, that can be installed without special wiring. Users replace one 4-foot lamp with a 3-foot lamp and the lighting unit, which together fit into the fixture sockets. The UL-listed unit provides an emergency lighting level of 450-650 lumens, according to the manufacturer. Radiant Illumination Inc., North Hollywood, CA.

**Circle 81**



**■ Retrofit exit unit**

Energy Conservation Products has developed exit sign retrofit units that accept 5-, 7-, or 9-watt compact fluorescent lamps. The units are reported to reduce lighting costs by as much as 86 percent. The electrogalvanized steel housing of the Model 170 has a ventilated ballast compartment

for cool operation. An adhesive foam tape back helps in positioning the unit for mounting. The unit can be direct-wired or wired with optional medium, intermediate, or DC bayonet-base pigtails, which allow for attachment to the existing socket. Energy Conservation Products, New York, NY.

**Circle 82**

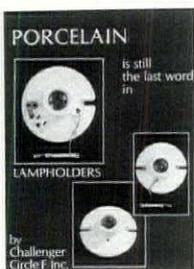


**■ Crystal chandeliers**

Melville crystal chandeliers are imported from Europe and distributed exclusively in the United States by Crystal and Light Enterprises. The chandeliers include trimmings of Strass crystal, 24-karat gold plated fixtures with a kiln-enameled finish, and a detachable design to simplify installation and maintenance. Crystal and Light Enterprises, Wood Dale, IL. ■

**Circle 83**

## Product Literature



### ■ Porcelain lamp holders

A brochure from Challenger Circle F presents a selection from the firm's full line of porcelain lamp holders. Challenger Circle F Inc., Trenton, NJ.

Circle 100



### ■ Lanterns

The 40-page Lantern Collection catalog from Troy Lighting displays decorative lanterns designed for wall, post, ceiling, and pendant mounting. Most are of solid brass or cast aluminum. Troy Lighting Inc., City of Industry, CA.

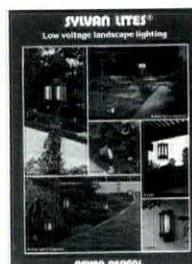
Circle 102



### ■ Occupancy sensor

Literature from Tishman Research outlines the Infracon occupancy sensor, including both the recessed ceiling model and the wide-view, bracket-mounted model. The sensors automatically turn off lights in unoccupied areas. Tishman Research Co., New York, NY.

Circle 101



### ■ Landscape lights

Sylvan Lites are low-voltage fixtures constructed of solid, kiln-dried redwood. A brochure details the line's walkway lights, wall lights, post lights, hanging lights, and floodlights. Sylvan Designs, Inc., Northridge, CA.

Circle 103

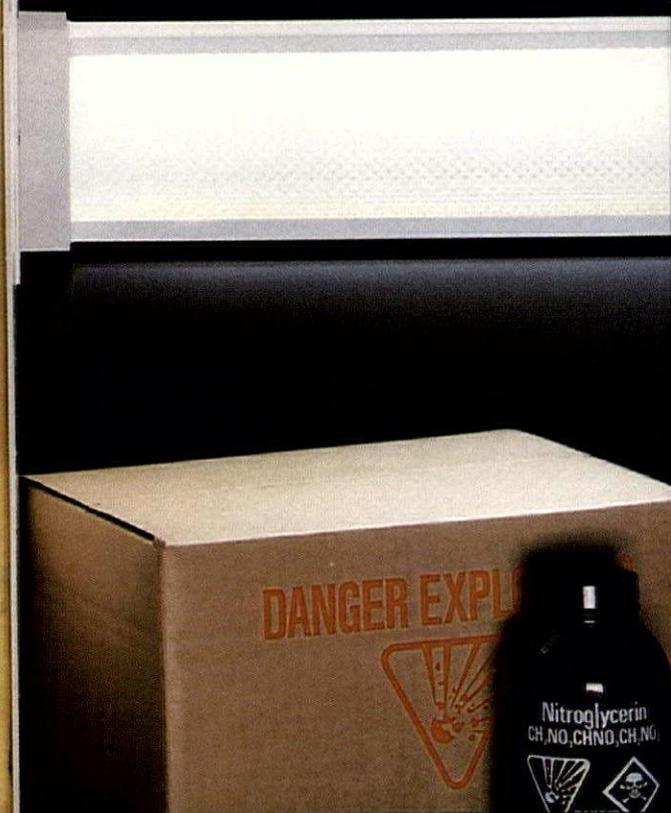
## Light Pipe™

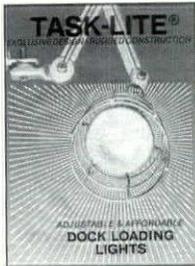
The decorative possibilities with Light Pipe are well known: Building highlighting, Light sculpture...the list of designer applications keeps on growing. But now consider TIR's Light Pipe for its many functional and varied industrial uses. Because Light Pipe and its luminaire are two separate components, the problem solving advantages are many. In a difficult access area, such as a high atrium, the lamp section can be positioned for easy replacement. In a hazardous environment with explosion potential, the lamp can be housed in a safe, adjacent room. In rooms containing sensitive electronic equipment, radio frequency and electromagnetic interference are the enemies. But not so with Light Pipe. Its non-ferrous illumination makes it the bright choice. With ordinary lighting, heat build-up can sometimes be a problem (in museum display cases, or cold storage.) Look to Light Pipe for the solution. If you have a lighting challenge, let's get our imaginations together and talk about it. We do custom fabrication and engineering. Call us. 1-800-663-2036. We'll show you how Light Pipe can solve problems. Beautifully.



Agent Inquiries welcomed.  
See us at Lighting World

## Solves





■ **Dock loading light**

Task-Lites are specifically engineered to provide light inside trucks or trailers or wherever needed in a shipping and receiving area. A brochure shows how each unit's pivot joints permit versatile positioning. Task-Lite Co., Cheltenham, PA.

Circle 104



■ **Incandescent lamps**

A data sheet from Venture Lighting outlines the firm's selection of incandescent lamps for specialty lighting. Choices include PAR lamps, standard and elliptical reflector lamps, and A lamps. Venture Lighting International, Cleveland, OH.

Circle 106



■ **Commercial lighting**

The Benjamin division of Thomas Industries has introduced a new catalog for specialty and decorative commercial lighting. The 22-page Spec Deco catalog details more than 140 product selections. Benjamin, division of Thomas Industries Inc., Sparta, TN.

Circle 105

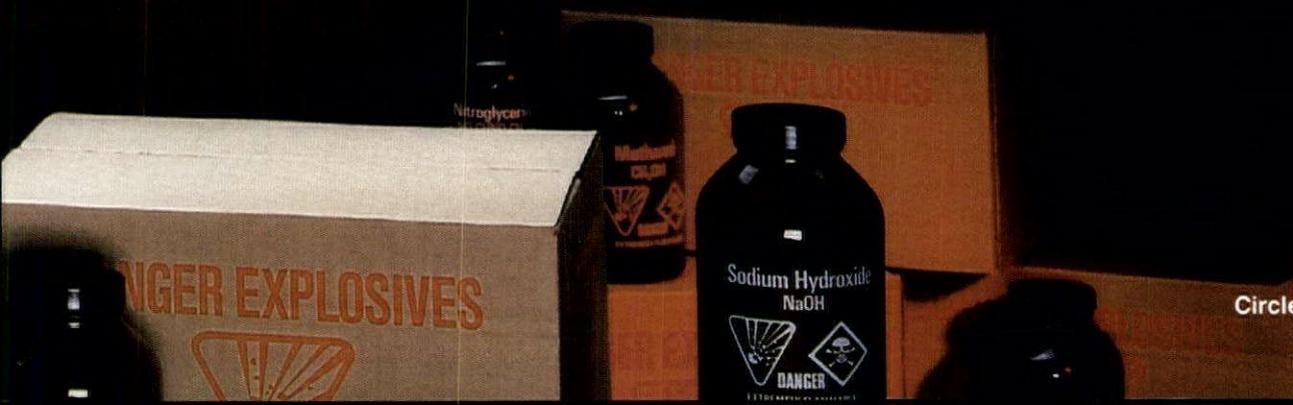


■ **Laminated glass**

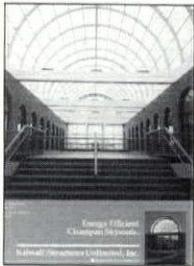
Laminated Glass Corporation manufactures flat and bent laminated glass for a variety of architectural applications, including skylights and atria. A 10-page booklet describes the glass, which offers solar and ultraviolet control. Laminated Glass Corp., Telford, PA.

Circle 107

# Problems Beautifully.



Circle 22



### ■ Clear-span skylights

Kalwall/Structures Unlimited designs, engineers, manufactures, delivers, and installs clear-span skylights and roof systems. A brochure outlines the firm's capabilities and illustrates applications. Kalwall/Structures Unlimited, Inc., Manchester, NH.

Circle 108



### ■ HID ballast guide

Advance Transformer has issued a revised and updated replacement guide for high intensity discharge lamp ballasts. The 16-page guide provides cross-references for the products of other ballast manufacturers. Advance Transformer Co., Chicago, IL.

Circle 109



### ■ Sloped glazing system

The VuLine sloped glazing system incorporates aluminum components that eliminate the need for bent glass or bent framing. The reverse side of a data sheet from the manufacturer shows 11 scale detail drawings. Vistawall Architectural Products, Terrell, TX.

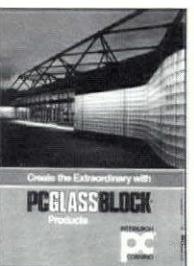
Circle 110



### ■ Lighting products

Hubbell's 232-page buyers' guide for 1987 provides information on the firm's entire line of outdoor, indoor, and roadway lighting products. It includes a seven-page index and a 26-page technical information section. Hubbell Lighting, Christiansburg, VA.

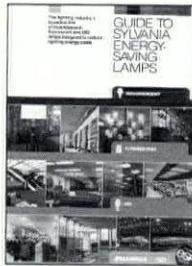
Circle 111



### ■ Glass block products

A 16-page booklet details Pittsburgh Corning's glass block products. Solar Reflective glass block can reduce heat gain by as much as 80 percent in comparison with 1/8-inch plate glass, according to the firm. Pittsburgh Corning Corporation, Pittsburgh, PA.

Circle 112



### ■ Energy-saving lamps

GTE/Sylvania offers a guide that summarizes the energy-saving features of selected lamps. Charts compare the energy-savers with standard lamps, showing the expected savings in electricity costs. GTE/Sylvania, Industrial/Commercial Lighting, Danvers, MA.

Circle 113



### ■ Track lighting accessories

Halo has published a data sheet that introduces new accessories for the Power-Trac track lighting system. The front details seven dichroic color filters; the back features the L1955 beam concentrator. Halo Lighting, Elk Grove Village, IL.

Circle 114



### ■ Remote control unit

PowerLine's dual-point remote control unit (RCU) combines two separate control relays in a single package. A specifications brochure details the device, a component of the firm's control system for lighting and HVAC applications. PowerLine Communications Inc., Williston, VT.

Circle 115



### ■ Direct, indirect lighting

A brochure presents the SLX Series lighting system, which provides indirect, direct, or combination lighting. Pendant stem or cable mountings suspend the housing 12 inches below the ceiling. Illumination Concepts & Engineering, North Kingstown, RI.

Circle 116



### ■ Outdoor lighting

Sentry Electric offers a brochure that outlines its outdoor luminaires. Suggested applications include parks, streets, campuses, plazas, walkways, and malls. Sentry Electric Corporation, Freeport, NY.

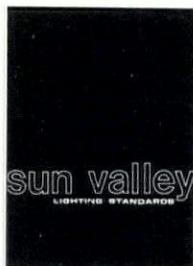
Circle 117



■ **Low-voltage accents**

Sentinel displays its low-voltage accent lighting in a brochure. Four basic extrusion shapes house 12-volt lamps, which are rated at 15,000 hours. The systems can be mitered or curved to custom specifications. Sentinel Lighting, Los Angeles, CA.

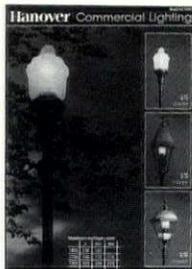
Circle 118



■ **Decorative outdoor lighting**

Sun Valley Lighting Standards offers a 256-page catalog of decorative lighting fixtures and poles. The collection includes matching cast-aluminum arms, wall sconces, and bollards. Sun Valley Lighting Standards, Inc., Sun Valley, CA.

Circle 120



■ **Lamppost lighting**

Hanover's commercial lighting brochure shows several of the firm's post-mounted outdoor luminaires. The firm offers 11 post styles in heights up to 12 feet. Hanover Lantern, Hanover, PA.

Circle 119



■ **Sun screens**

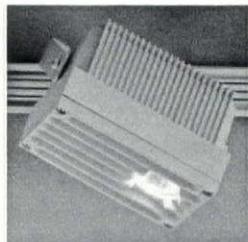
An 8-page booklet from Construction Specialties demonstrates uses of the firm's sun control and sight screening products. The cover shows an application of the C/S Octalinear Grille. Construction Specialties, Inc., Cranford, NJ.

Circle 121

# LIGHT STYLE

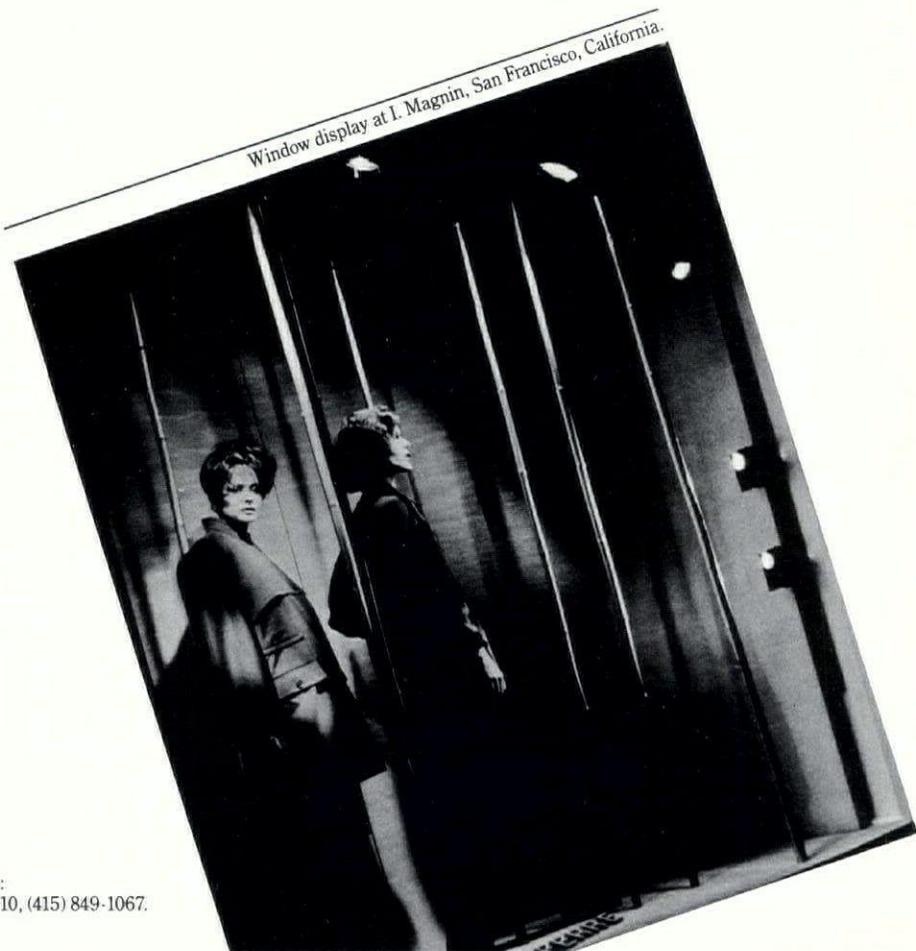
What do stores like I. Magnin, Channel and Safeway Stores have in common? They and many others display their merchandise in the best light possible by using Inlite Track Fixtures.

Inlite fashions the smallest all-metal two circuit track on the market with a wide variety of low voltage and line voltage track fixtures. When it comes to light, Inlite sets the style.



For our new catalog, write or phone:  
Inlite Corporation, 939 Grayson St., Berkeley, CA 94710, (415) 849-1067.

Circle 23

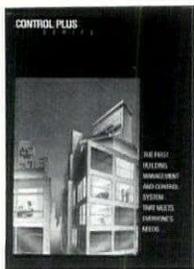




### ■ High-performance lighting

Lighting Research and Development offers a brochure that explains the background of its approach to high-performance lighting, which seeks to achieve optimum light placement and energy efficiency. Lighting Research and Development, Inc., San Rafael, CA.

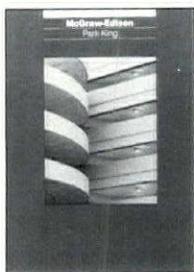
Circle 122



### ■ Control systems

Touch-Plate offers literature that details its Control Plus series of building management and control systems. A foldout brochure lists features of the series, and data sheets provide specific information about three systems. Touch-Plate, Emeryville, CA.

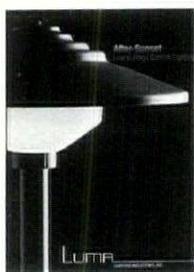
Circle 123



### ■ Parking deck lighting

A brochure from McGraw-Edison introduces the Park-King, a fixture designed to produce glare-free light for effective parking deck illumination. McGraw-Edison, Racine, WI.

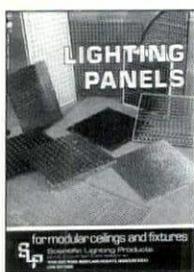
Circle 124



### ■ Garden lighting

Luma Lighting Industries features its After-Sunset series of low-voltage garden luminaires in a full-color brochure that features path, area, directional, and novelty lighting. Luma Lighting Industries, Inc., Santa Ana, CA.

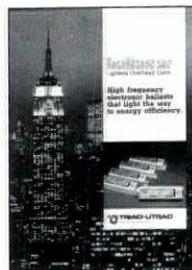
Circle 125



### ■ Lighting panels

Scientific Lighting Products provides illustrations, diagrams, ordering and dimensional data, specifications, and photometric data for its lighting panels in a 16-page catalog. Scientific Lighting Products, Maryland Heights, MO.

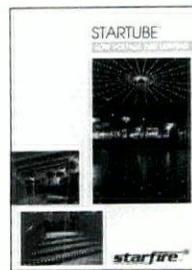
Circle 126



### ■ Electronic ballasts

The Ballastar line of electronic ballasts is described in a brochure released by Triad-Utrad. The brochure also provides information on how to obtain a free energy savings analysis. Triad-Utrad, Huntington, IN.

Circle 127



### ■ Tube lights, fiber optics

Low-voltage tube lights, fiber optics, and the Galaxy system are detailed in Starfire Lighting's new color brochures. The materials are part of a complete product binder. Starfire Lighting, Inc., Jersey City, NJ.

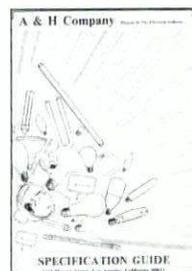
Circle 128



### ■ Low-voltage lighting

The spotlights and accessories featured in Juno's low-voltage lighting catalog provide precise beam control, accurate color rendition, and energy savings, according to the manufacturer. Juno Lighting, Inc., Des Plaines, IL.

Circle 129



### ■ Lamps

A&H Company's specification guide details the options available for each of its 15 types of lamps. The guide also describes a quartz fixture that the firm offers with a lamp. A&H Company, Los Angeles, CA.

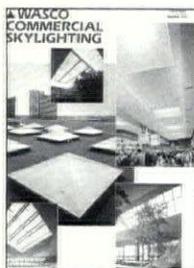
Circle 130



### ■ Chandeliers

A pictorial brochure from Coronet Chandelier Originals illustrates many of the firm's chandeliers and other luminaires. Coronet Chandelier Originals, Brentwood, NY.

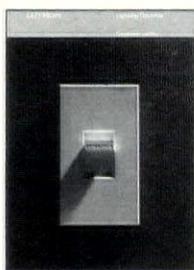
Circle 131



### ■ Skylighting

Wasco's commercial skylighting catalog provides diagrams, specifications, application photographs, daylighting design information, and a list of regional representatives. Wasco Products, Inc., Commercial Division, Sanford, ME.

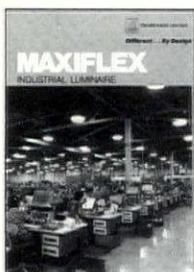
Circle 132



### ■ Wall-box products

Lutron Electronics now offers a condensed catalog of its wall-box products. Wall-box dimmers, lamp dimmers, fan and motor controls, and dimming systems are covered. Lutron Electronics Co., Inc., Coopersburg, PA.

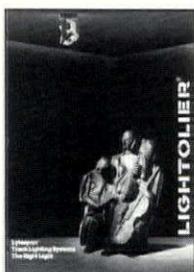
Circle 133



### ■ Industrial luminaire

The diffusing lens and wide opening of the Maxiflex luminaire allow mounting heights lower than those of the typical high-bay industrial luminaire. A brochure demonstrates the resulting low brightness and wide distribution. Crouse-Hinds Lighting, Vicksburg, MS.

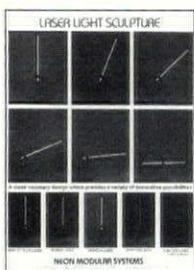
Circle 134



### ■ Track lighting

Lightolier's 82-page Lytespan catalog illustrates a range of track lights and track systems. Lighting performance data enable users to determine appropriate track placement, lamp, beam location, footcandles, and beam size. Lightolier, Secaucus, NJ.

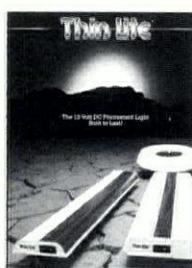
Circle 135



### ■ Portable neon fixture

The Laser Light Sculpture from Neon Modular Systems is a portable fixture with a 48-inch neon lamp. A data sheet details the fixture and shows its five lamp colors. Neon Modular Systems Inc., New York, NY.

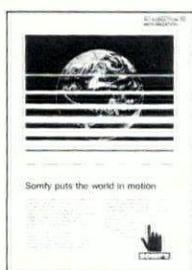
Circle 136



### ■ DC fluorescents

A folder of materials from Thin-Lite presents the firm's 12-volt DC fluorescent luminaires. Applications include mobile showrooms and facilities that use alternative energy sources. Thin-Lite Corporation, Camarillo, CA.

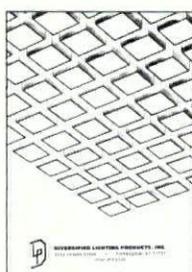
Circle 137



### ■ Motorized products

Somfy's 20-page technical brochure is a condensed version of its product catalog. The brochure provides diagrams and technical data about the firm's motors and controls for awnings, shutters, and screens. Somfy Systems, Edison, NJ.

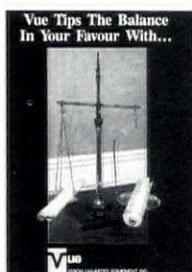
Circle 138



### ■ Louvers, baffles

Eleven louver and baffle styles are illustrated in a brochure from Diversified Lighting Products. Charts show cell size, thickness, weight, and shielding. Diversified Lighting Products, Inc., Farmingdale, NY.

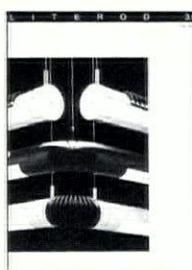
Circle 139



### ■ Reflector

The MorVue anodized aluminum reflector allows users to increase light output from existing fluorescent fixtures or to maintain light output with fewer lamps. A foldout brochure demonstrates the product. Vision Unlimited Equipment, Brampton, Ontario, Canada.

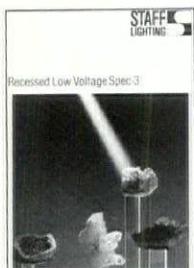
Circle 140



### ■ Modular system

A brochure shows how designers can construct lighting systems with modular components of Literod 3.5 One Way. The extruded aluminum housing can accommodate track and fluorescent lighting. Coast Light Systems Inc., Los Angeles, CA.

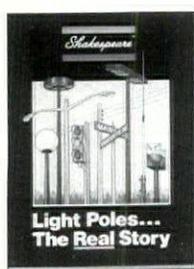
Circle 141



### Low-voltage lighting

A 16-page brochure outlines the Spec-3 low-voltage lighting system. The system's recessed housing allows full adjustability for MR 16 and PAR 36 lamps. Staff Lighting Corp., Highland, NY.

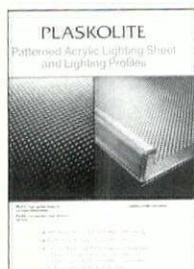
Circle 142



### Light poles

Shakespeare's updated brochure narrates the history of light-pole technology and the advantages of the firm's lightweight fiber glass poles. Shakespeare, Newberry, SC.

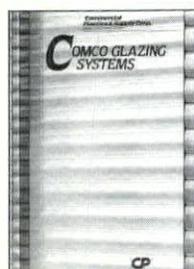
Circle 143



### Patterned acrylic

Patterned acrylic panels from Plaskolite are available as standard sheets recommended for modular commercial and institutional lighting. The firm also has custom profile extrusion and vacuum forming capabilities. Plaskolite, Inc., Columbus, OH.

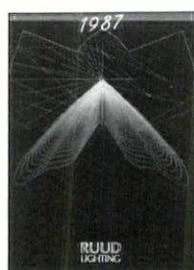
Circle 144



### Glazing systems

Comco glazing systems are designed to accept polycarbonate and acrylic double-skin sheet products. A brochure illustrates the product line and lists distributors. Commercial Plastics & Supply Corp., Richmond Hill, NY.

Circle 145



### Indoor, outdoor luminaires

Ruud's 42-page 1987 catalog features many new products, including deep cutoff security lights, low-bay industrial lights, and fixtures with polished gold anodized shrouds. The catalog presents complete technical and pricing information. Ruud Lighting, Sturtevant, WI.

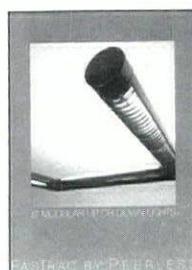
Circle 146



### Modular inverter system

A brochure from York-Lite introduces the MAC-1000, a modular sine-wave inverter system that provides emergency AC power for fluorescent and incandescent lighting. Each inverter module slides out for servicing or replacement. York-Lite Electronics, Inc., Austin, TX.

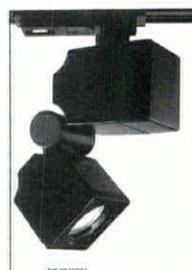
Circle 147



### Uplights, downlights

FasTrac linear fluorescent fixtures offer 13 different optical choices, including uplighting, downlighting, and wall washing modes. The firm delivers the fixtures within 30 days on most orders, according to a brochure. Peerless Electric Company, Berkeley, CA.

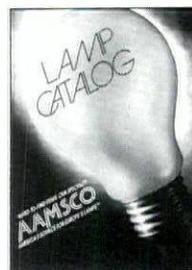
Circle 148



### Miniature fixtures

A foldout brochure illustrates the MR Series of miniature fixtures from LSI. The units, which contain integral transformers, accommodate 20- to 75-watt MR 16 dichroic lamps with beam spreads from very narrow spot to wide flood. Lighting Services Inc., New York, NY.

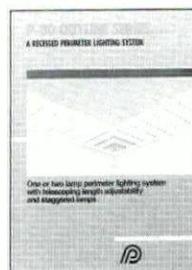
Circle 149



### Specialty lamps

Aamsco's 20-page catalog presents a representative sampling of the firm's specialty lamp inventory. Customers can order additional imported, discontinued, custom, and private-label lamps. Aamsco, Jersey City, NJ.

Circle 150



### Perimeter lighting system

A brochure diagrams the components for the P-80 Outline Series recessed perimeter wall-washing system. Fluorescent lamps are staggered within the housing to prevent scalloping on the wall. Prudential Lighting, Los Angeles, CA.

Circle 151



### ■ Lighting duct systems

A 26-page selection and application guide offers information on I-T-E universal lighting duct systems. The systems support and power overhead lighting fixtures. I-T-E Electrical Products, division of Siemens Energy & Automation, Inc., Roswell, GA.

Circle 152



### ■ Outdoor lighting

Rab's outdoor lighting catalog covers floodlights, garden lights, security lights, and accessories. The firm's LightAlert system turns on automatically when a car or person enters its sensor's detection zone. Rab Electrical Manufacturing Co., Inc., Bronx, NY.

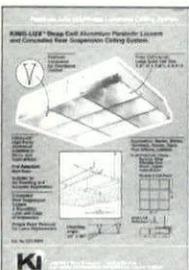
Circle 153



### ■ Emergency lighting

Literature from Kor-Lite provides technical information on the firm's emergency lighting products. Suggested bid specifications and product ordering information are included. Kor-Lite, Santa Clara, CA.

Circle 154



### ■ Retrofit louvers

King-Lux parabolic louvers are recommended for retrofitting in banks, stores, terminals, and other open commercial and institutional spaces. A brochure details three models of the louvers. Kingston Industries Corp., White Lake, NY.

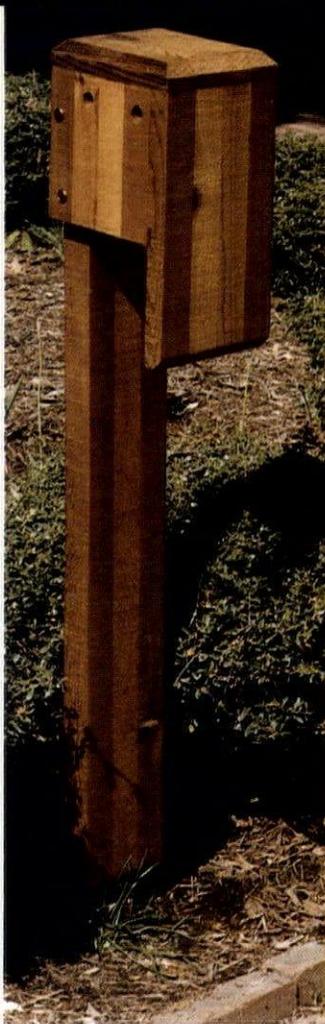
Circle 155



### ■ Ballasts

Jefferson Electric has published a 42-page catalog of fluorescent and high intensity discharge ballasts. The catalog provides application data, a sound control chart, wiring diagrams, and cross-referenced indexes. Jefferson Electric, Downers Grove, IL.

Circle 156



# Unique Bollard

## Landscaping with Lighting!

The "Junior Jefferson" enhances any low level lighting site. Custom selected *Western Red Cedar* is kiln dried and fabricated with care. Direct burial or wall mounted. Wide selection of globes for incandescent to 60 watt.

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

### Ryther-Purdy Lumber Company, Inc.

604 Elm Street  
P.O. Box 622  
Old Saybrook, CT 06475  
Phone (203) 388-4405

Lighting Standards • Fixtures  
Guide Railings • Benches  
Custom Millwork • Signs  
Trash Receptacles

Circle 24

IF YOU'RE IN THE  
**DARK...**

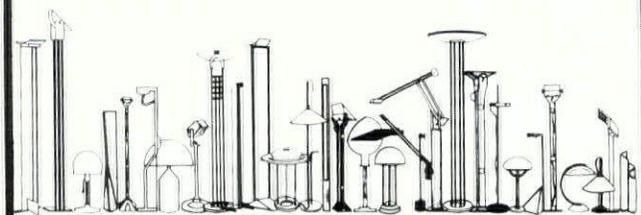
**CITY LIGHTS**

**212-319-6508**

**201-944-4098**

Distributors of Quality Lighting Products

Circle 25





### ■ Dimmers

Hunt Electronics offers a 16-page brochure that reviews the firm's line of electronic dimming controls. The brochure includes tips on radio interference, lamp noise, lamp life, ganging, ballast types, and other considerations. Hunt Electronics, Addison, TX.

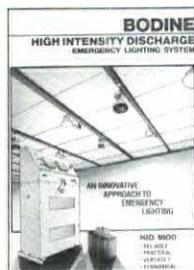
Circle 157



### ■ Modular fluorescents

Forecast is a modular fluorescent lighting system that can be wall-mounted or suspended. A brochure introduces the system, which can support recessed track lighting. Forum, Inc., Pittsburgh, PA.

Circle 158



### ■ HID emergency lighting

Bodine's HID 1600 emergency lighting system uses high intensity discharge lamps for both normal and emergency lighting. The system provides emergency DC power to remote inverter ballasts. The Bodine Company, Collierville, TN.

Circle 159



### ■ Cast brackets

Marco's catalog of cast brackets displays fixtures for use with incandescent, compact fluorescent, and high pressure sodium lamps. A photocell option is available for the high pressure sodium units. Marco Lighting, Los Angeles, CA.

Circle 160



### ■ Outdoor lighting

Hydrel summarizes its offerings in a color brochure. The firm manufactures architectural outdoor and landscape lighting, underwater lighting, and fountains. Hydrel, Sylmar, CA.

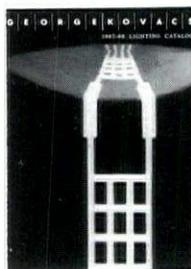
Circle 161



### ■ Exit signs

Flexit exit signs require minimum specification because they can be adapted on site to meet requirements. Each unit is individually packaged with lamps plus two blank fillers and two arrow fillers for each face cover. C.W. Cole & Co., Inc., South El Monte, CA.

Circle 162



### ■ Indoor luminaires

George Kovacs has just issued its 72-page 1987-1988 lighting catalog. It illustrates the firm's floor and table lamps, sconces, pendants, and other luminaires and accessories. George Kovacs Lighting, Inc., New York, NY.

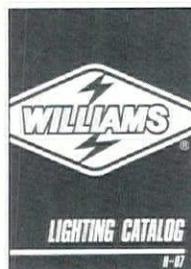
Circle 163



### ■ Low-level floodlights

Kim's 32-page low-level floodlight catalog provides information on six fixture models. Specifications, photometrics, detail drawings, spacing charts, ordering information, and suggested concrete pedestal designs are included. Kim Lighting, City of Industry, CA.

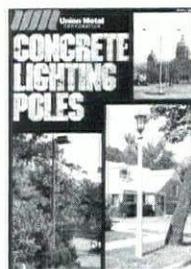
Circle 164



### ■ Fluorescent fixtures

H.E. Williams, a manufacturer of fluorescent lighting fixtures, has published a condensed catalog. The booklet shows each fixture style and lists product features, allowing users to review the firm's entire product line. H.E. Williams, Carthage, MO.

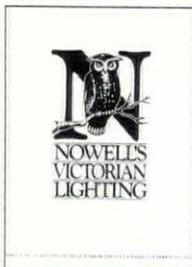
Circle 165



### ■ Concrete poles

Union Metal's concrete lighting poles are prestressed and centrifugally cast. The process results in a concrete with greater strength and lower porosity than that of simple reinforced designs, according to a brochure. Union Metal Corporation, Canton, OH.

Circle 166



### ■ Victorian lighting

A 52-page catalog presents the San Francisco line of Victorian luminaires from Nowell's. The firm manufactures standard and custom reproductions of antique electric and gas lights. Nowell's, Inc., Sausalito, CA.

Circle 167



### ■ Floodlights

Sportsmaster floodlights can illuminate athletic stadiums, sports fields, building fronts, ship loading docks, and truck terminals. Literature from the manufacturer outlines ballast, lamp, and mounting options. Appleton Electric Company, Chicago, IL.

Circle 172



### ■ Metal halide fixtures

Miro-T fixtures use Osram's HQI metal halide lamps as a light source. A brochure from the fixture manufacturer recommends retail applications of the six fixtures. Miroreflector Company, Inc., Inwood, NY.

Circle 168



### ■ Photometer, transducer

A brochure from Bruel & Kjaer examines the features of the Type 1105 precision photometer and the Type 8600 illuminance transducer. The instruments measure light in work areas, walkways, and other spaces. Bruel & Kjaer Instruments, Inc., Marlborough, MA.

Circle 173



### ■ Shade systems

An 8-page brochure from Mecho Shade Systems describes the firm's manual, motorized, and computerized shade systems, including shades controlled by photosensors and solar tracking systems. Mecho Shade Systems, Long Island City, NY.

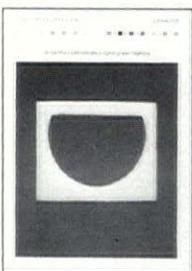
Circle 169



### ■ Lighting products

Regent Lighting provides a 58-page guide to its outdoor lighting and fluorescent replacement products. The firm's outdoor fixtures include directional floodlights, wall lights, area lights, and roadway lights. Regent Lighting Corporation, Burlington, NC.

Circle 174



### ■ Architectural lighting

Litecontrol presents its corporate capabilities in a foldout brochure. The literature introduces the firm's design and manufacturing expertise in standard and custom lighting. Litecontrol Corporation, Hanson, MA.

Circle 170



### ■ Parabolic lighting

A brochure from Paralux outlines the firm's parabolic lighting systems. The presentation includes ceiling compatibility diagrams, sections, and photometric charts. Paralux Lighting, Americus, GA.

Circle 175



### ■ Surveillance units

Gemini surveillance units from Vicor are compatible with Halo's Power-Trac track lighting system. A brochure shows how the units enclose a miniature video camera within a housing that matches the luminaires. Vicor Industries, Inc., Melville, NY.

Circle 171



### ■ Floodlights

A brochure outlines the Nighthawk series, a new line of floodlights. Lamp options include high pressure sodium, metal halide, and mercury vapor. Lumark, Dallas, TX. ■

Circle 176

# Calendar

April 9-11, 1987

**IES regional conference**, east central region, Roanoke, VA. Contact: Michael E. Siska, Hubbell Lighting, Inn Electric Way, Christiansburg, VA 24073, (703) 382-6111.

April 13-15, 1987

**Lighting conference for contract interior designers**, General Electric Lighting Institute, Cleveland. Repeats October 13-15. Contact: Janet Allen, Registrar, GE Lighting Institute, Nela Park, Cleveland, OH 44112, (216) 266-2614.

April 14, 1987

**Custom lighting: From lemons to lumens**, Designers Lighting Forum seminar, Contract Center, San Francisco. Architect David Malman will discuss custom design. Contact: Paula Goodell, (415) 550-0333.

April 15, 1987

**Lighting controls: The frosting on the cake**, Designers Lighting Forum seminar, New York City. James Nuckolls will present the seminar. Contact: Louis Baldinger & Sons, Inc., 19-02 Steinway Street, Astoria, NY 11105, (718) 204-5700.

April 15, 1987

**What's new with ballasts**, discussion and exhibit, Boston. Contact: John C. Gates, IES New England Section, (617) 655-1180.

April 21-23, 1987

**Lighting conference for energy managers and consultants**, General Electric Lighting Institute, Cleveland. Contact: Janet Allen, Registrar, GE Lighting Institute, Nela Park, Cleveland, OH 44112, (216) 266-2614.

April 22-24, 1987

**IES regional conference**, north central region, Milwaukee, WI. Contact: Peg Wallock, Enterprise Lighting, 7112 W. Fond du Lac Avenue, Milwaukee, WI 53218, (414) 462-5257.

April 28-May 1, 1987

**Photometry seminar**, Lighting Sciences Inc., Scottsdale, Arizona. Participants will learn how to understand and use photometric

test reports. Contact: Lighting Sciences Inc., 7830 East Evans Road, Scottsdale, AZ 85260, (602) 991-9260.

April 30-May 2, 1987

**Light Works**, IES regional conference, southwestern region, Dallas. Speakers will include Motoko Ishii, Craig Roeder, Rita St. Clare, Don Baldinger, Allan Bean, and others. Contact: Ruth Maddox, 1506 Commerce, Dallas, TX 75201, (214) 698-7791.

May 3-6, 1987

**Vintage '87**, IES regional conference, Pacific northwest and south Pacific coast regions, Napa Valley, CA. Contact: Elwyn H. Gee, The Elwyn Gee Group, 17 Bolinas Drive, San Raphael, CA 94903, (415) 456-0789 or (415) 285-2954.

May 4-8, 1987

**Fundamentals I**, short course, General Electric Lighting Institute, Cleveland. The course covers basic aspects of indoor commercial and industrial lighting. Repeats June 15-19, September 14-18, October 26-30, and November 30-December 4. Early registration is recommended. Contact: Janet Allen, Registrar, GE Lighting Institute, Nela Park, Cleveland, OH 44112, (216) 266-2614.

May 11-13, 1987

**Lighting World International**, Jacob Javits Convention Center, New York City. The event is jointly sponsored by IALD and IES. Contact: Marion Greene, IALD, 18 East 16th Street, Suite 208, New York, NY 10003, (212) 206-1281.

May 12, 1987

**Lighting atria, lobbies, and executive suites**, Designers Lighting Forum seminar, Contract Center, San Francisco. James R. Benya of Luminae Lighting Consultants will present the seminar. Contact: Paula Goodell, (415) 550-0333.

May 17-19, 1987

**IES regional conference**, midwest region, Kansas City, MO. Contact: Mrs. Beverly Gadberry, Kansas City P&L, P.O. Box 679, Kansas City, MO 64141, (816) 556-2182.

June 1-3, 1987

**Fundamentals of residential lighting**, conference, General Electric Lighting Institute, Cleveland. The conference is for newcomers to residential lighting design and application, including interior designers. Contact: Janet Allen, Registrar, GE Lighting Institute, Nela Park, Cleveland, OH 44112, (216) 266-2614.

June 4-6, 1987

**IES regional conference**, Canadian, maritime, and northeastern regions, St. Andrews-by-the-Sea, New Brunswick, Canada. Contact: Phillip R. Courchaine, P.O. Box 754, Bristol, CT 06010, (203) 634-5843; or Ralph A. Smith, TEK Consultants, P.O. Box 1, Fredericton, NB, Canada E3B 4Y2, (506) 454-1764.

June 17, 1987

**Battery Park City: A walking tour**, Designers Lighting Forum event, New York City. Lighting designer Robert Prouse of Jules Fisher/Paul Marantz, Inc., will lead the tour. Contact: Louis Baldinger & Sons, Inc., 19-02 Steinway Street, Astoria, NY 11105, (718) 204-5700.

June 19-22, 1987

**AIA national convention and design exposition**, Orlando, Florida. Contact: John Gaillard, American Institute of Architects, 1735 New York Avenue NW, Washington, DC 20006, (202) 626-7397.

June 29-July 1, 1987

**Lighting workshop for college and university professors**, General Electric Lighting Institute, Cleveland. Professors and instructors who teach lighting applications, architecture, engineering, or interior design are invited to enroll free of charge. Contact: Janet Allen, Registrar, GE Lighting Institute, Nela Park, Cleveland, OH 44112, (216) 266-2614.

July 12-16, 1987

**Solar '87**, conference and exhibition, Portland, Oregon. Contact: Susie Burley, American Solar Energy Society, 2030 17th Street, Boulder, CO 80302, (303) 443-3130.

July 22-25, 1987

**ASID national conference and international exposition of designer sources**, Toronto, Canada. Contact: American Society of Interior Designers, 1430 Broadway, New York, NY 10018, (212) 944-9220.

August 2-6, 1987

**IES annual conference**, Marriott Camelback Inn, Scottsdale, AZ. Contact: Ian Lewin, Lighting Sciences Inc., 7830 East Evans Road, Scottsdale, AZ 85260, (602) 991-9260.

September 20-22, 1987

**Pan Pacific Lighting Exposition and Conference**, The Concourse at Showplace Square, San Francisco. Contact: Robert Zinkhon, Director, Pan Pacific Lighting Exposition, 2 Henry Adams Street, San Francisco, CA 94103, (415) 621-7345. ■

## When, What, Where

To publicize an upcoming seminar, course, conference, or event, drop us a line at least 8 weeks before the date it will take place.

Please include a contact person's name, address, and telephone number. Send the information to:

Calendar Editor  
*Architectural Lighting*  
P.O. Box 10460  
Eugene, OR 97440



## Manufacturer Credits

*Light artist creates building signature with colored light* (Food Service Trade Center, San Francisco). Green and white fluorescent lamps: **General Electric Lighting Business Group**. Fluorescent luminaires: **General Electric**. Neon fabricator: **Neon Neon**.

*Lakewood lighting brings downtown to life* (central business district, Lakewood, New Jersey). Luminaires: **Sentry Electric**.

*Lighting, luncheon, clientele all tops at the Pinnacle* (The Pinnacle Club, Dallas, Texas). Lensed wall washers: **Lightolier**. Neon tube: **Heath and Company**. Raceway for R20 lamps: **Wiremold**.

*A flexible lighting system for a dynamic display environment* (Herman Miller Pavilion, Grandville, Michigan). Low-voltage clamp-on and track lighting: **Lighting Services Inc**. Pipe rail system: **Speed-rail**. Prewired outlet strips: **Wiremold**. Pendant-mounted indirect fluorescents: **Litecontrol**. Incandescent downlights: **Lithonia**. Fluorescent troffers: **Lithonia**. Incandescent wall washers: **Prescolite**. Dimming equipment: **Lutron**.

*Unexpected bonus with instant restrike metal halide lighting* (Spectrum Arena, Philadelphia). Lamps: **Venture Lighting**. Floodlight fixtures: **Appleton Electric Company**.

## Advertiser Index

Aamsco Lighting, Inc.	49	Hydrel Corporation	10
Alcoa	17	Inlite Corporation	57
Alkco Manufacturing Company	9	JK Reflective Systems	6
Amerlux	71	Neo-Ray Lighting	11
Artemide, Inc.	32-33	Osram Corporation	7
Aster Services Department	10	Poulsen Lighting	11
City Lights	63	Prescolite Controls	3
Cooper Lighting	5	Roberts Step-Lite Systems	47
General Electric, Lighting Business Group	26-27	Ryther-Purdy Lumber Co.	63
Globe Illumination Co.	41	Sentry Electric Corporation	4
Guth Lighting	15	Sylvan Designs, Inc.	4
Holophane/Division of Manville Corp.	13	TIR Systems, Inc.	54-55
		TrimbleHouse Corporation	72
		Venture Lighting International	2