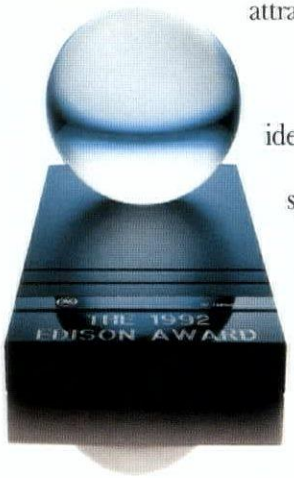
Usually Pays To Look Beneath The Surface.

But when the surface is 835,000 gallons of salt water populated with the world's largest collection of dangerous sea creatures, it pays to look to GE.

That's what Randy Burkett and Mark Hershman of Randy Burkett Lighting Design did in conjunction with Scott McMurtrie of Sea World® of Florida in Orlando when illuminating the theme park's "Terrors of the Deep" attraction.



Using a variety of Multi-Vapor® metal halide floodlights and Quartzline® PAR narrow spot quartz luminaries combined with some ingenious optical illusion, they duplicated underwater lighting conditions.

And while our lamps provide some of the most natural lighting in the world, it took the brilliant thinking of this design team to prove that, in some cases, water and electricity do mix.

The results were stunning enough to fool even the moray eels into thinking they were swimming in the Caribbean Sea. And to garner the coveted 1992 Edison Award for outstanding lighting.

For more information about how we can help your next project, call your GE Lighting Specification Area Manager at 1-800-523-5520.

GE Is Light. And The Light Matters.

GE Lighting

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INTRODUCING

MICROTRAC™

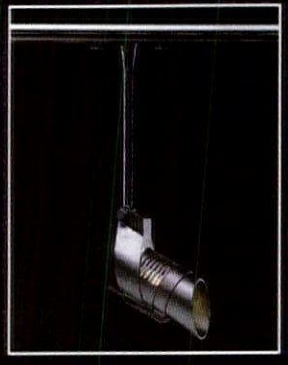
LOW VOLTAGE HALOGEN TRACK LIGHTING SYSTEM

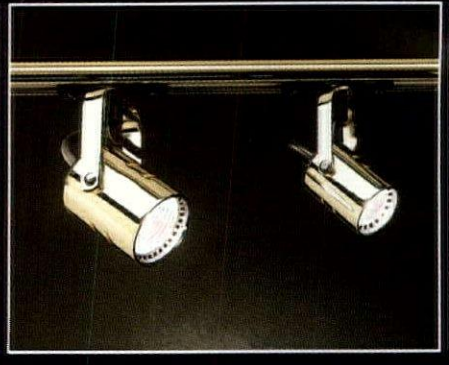
MicroTrac is a fully integrated micro track system:

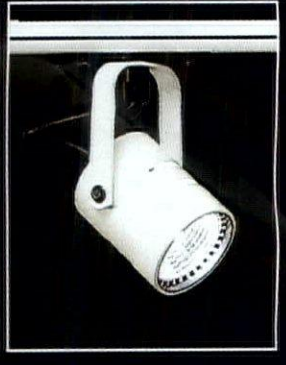
- Available in 2', 4', 6', and 8' sections.
- Only 15/16" wide by 11/16" deep.
- Fixtures just snap in and out.
- Flexible elbow joiner.
- 25 Ampere track
- Track available in 3 accent colors.
- Low voltage halogen.

Fixtures now available with CSL's Sur-Loc™ sockets and GE's Twist and Lock Precise™ Lamps for hassle free re-lamping.

THE 2ND GENERATION OF LOW VOLTAGE TRACK







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See MicroTrac™ and other CSL products at LightFair, May 4 - 6, Booth No. 1118

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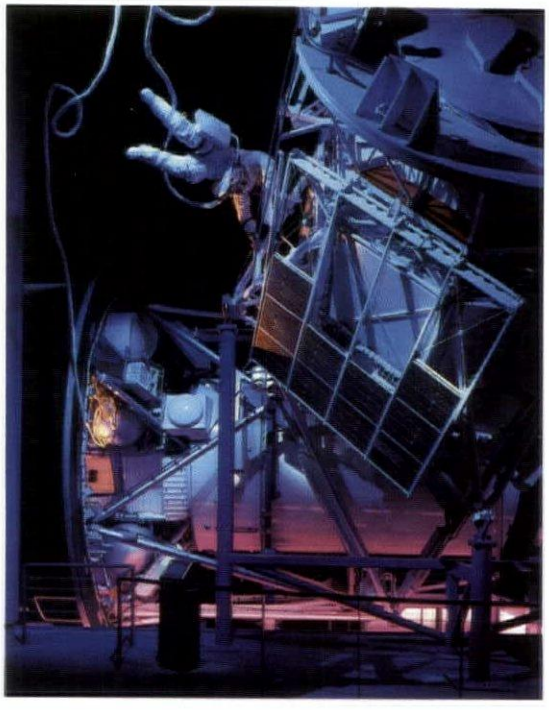
ARCHITECTURAL
LIGHTING

APRIL/MAY 1994 VOLUME 8, NUMBER 2



44 **SPACE CENTER HOUSTON**
COVER PHOTO BY PAUL HESTER

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PROGRESS & TECHNOLOGY SPECIAL SECTION

DESIGN FEATURES

DEPARTMENTS

ARCHITECTURAL LIGHTING (ISSN 0894-0436) is published quarterly by Miller Freeman Inc., a member of United Newspapers Group, 600 Harrison St., San Francisco, CA 94107. Phone (415) 905-2200. Editorial offices, 1515 Broadway, New York, NY 10036. Phone (212) 869-1300. Subscriptions: U.S. and possessions—1 year (4 issues) $24. Canadian—1 year $30. Other foreign—1 year $125. Single copy price: U.S—$6 plus postage; outside U.S.—$8 plus postage. **Prepayment required for all single copy orders.** Address all single copy requests and customer service (subscription) questions to 1-800-255-2824, or write to ARCHITECTURAL LIGHTING, P.O. Box 1061, Skokie, IL 60076-8061. Allow 4-6 weeks for change of address: provide old mailing label and new address changes to ARCHITECTURAL LIGHTING, P.O. Box 7609, Skokie, IL 60076-8061. Second class postage paid at San Francisco, CA, and additional mailing offices.

ARCHITECTURAL
LIGHTING

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National Classified Sales: **Kathleen Singh, Sharon Eakin,** (800) 688-7318 or (214) 239-3060, Miller Freeman Inc., 13760 Noel Rd., Suite 500, Dallas, TX 75240; Fax (214) 419-7900

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Commercial Design Network Publications: Contract Design, Facilities Design & Management, Architectural Lighting, Catalog Request Service, Product Showcase. Miller Freeman, Inc., division of the United Newspapers Group, 1515 Broadway, New York, NY, 10036. Telephone (212) 869-1300.

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Not Even Charles Atlas Could Make Something So Thin So Powerful.

Not to kick sand in the competition's face, but no other T-8 fluorescent outperforms our TL 80™ Series. When combined with electronic ballasts, they can reduce costs up to 43%.

Green Lights Ally EPA DOES NOT ENDORSE ANY PRODUCT OR SERVICE

A fact that carries a lot of weight. Especially considering lighting can account for up to 50% of your electric bill. What's more, when you combine those savings with utility rebates, your system payback period will be reduced even further.

Our TL 80s dramatically improve lighting quality as well. Resulting in more natural colors and a more productive working environment. They're now available in a wider range of sizes. Including an 8', which provides up to 40% energy savings versus standard slimlines. And a U-Bent, an ideal retrofit for 2x2 fixtures.

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PHILIPS

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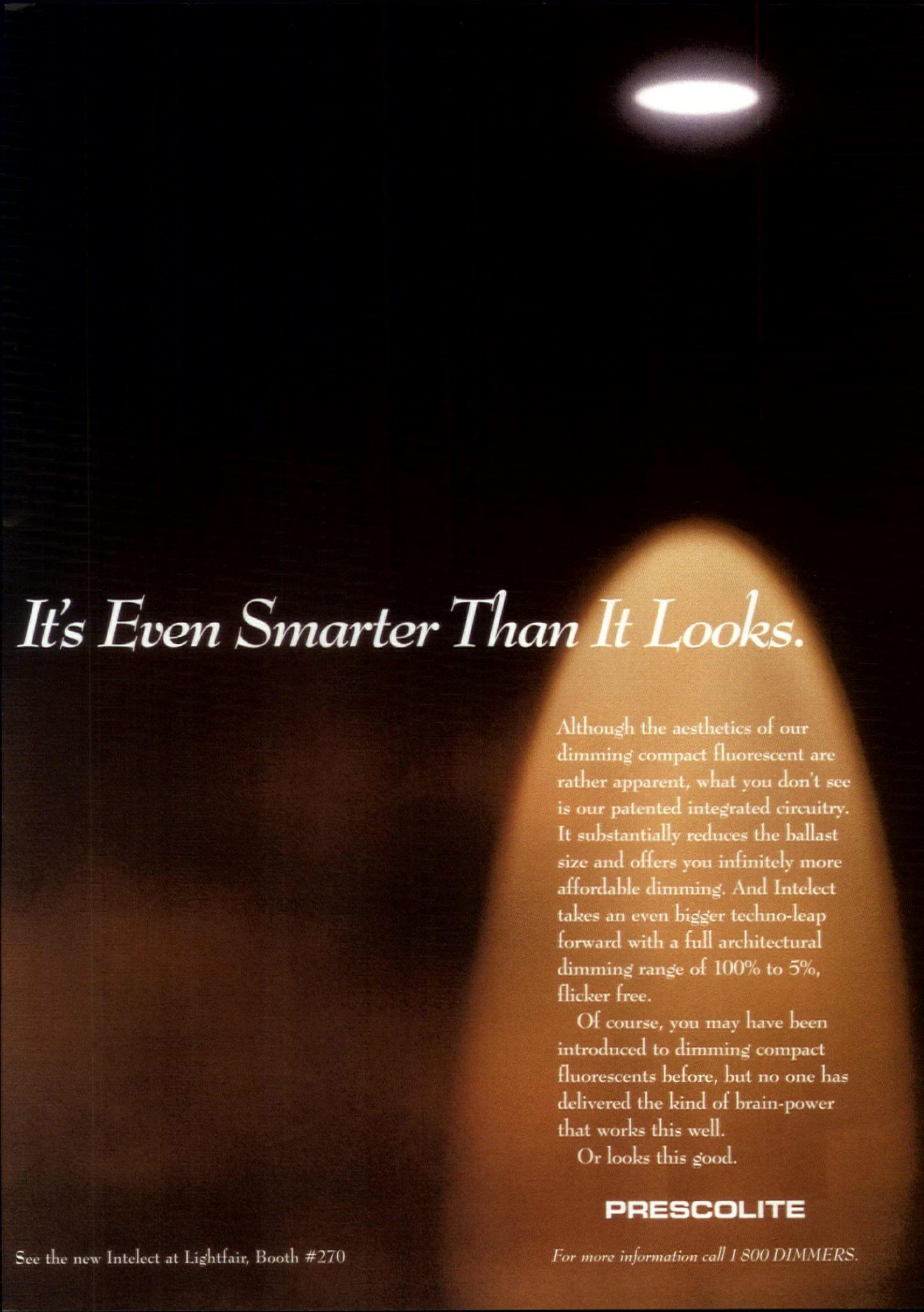
Presenting Intelect.™


It's Even Smarter Than It Looks.
Although the aesthetics of our dimming compact fluorescent are rather apparent, what you don't see is our patented integrated circuitry. It substantially reduces the ballast size and offers you infinitely more affordable dimming. And Intelect takes an even bigger techno-leap forward with a full architectural dimming range of 100% to 5%, flicker free.
Of course, you may have been introduced to dimming compact fluorescents before, but no one has delivered the kind of brain-power that works this well.
Or looks this good.
PRESCOLITE
See the new Intelect at Lightfair, Booth #270
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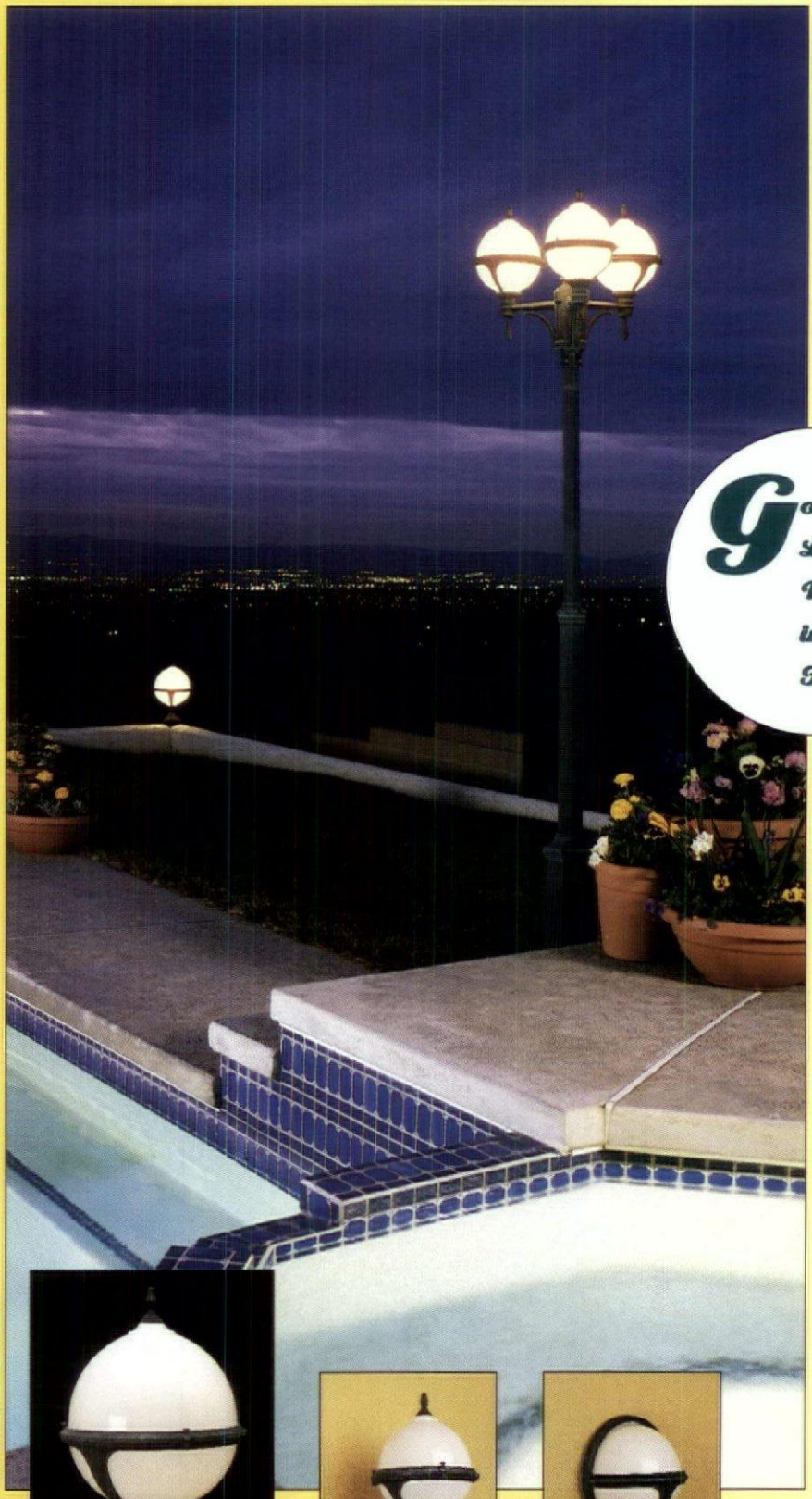

Post: Roulette II, Piermount: Roulette III

Roulette III

Roulette II

Provence

Good Looks Run in Our Family

When it comes to spectacular and consistent styling for both outdoor and indoor lighting applications, our Roulette family of luminaires outshines the competition. Our beauty radiates in a wide variety of lamp designs, sizes, voltages, optics, accessories and colors, too. They include textured black, white, patina green and custom colors.

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If you want elegant luminaire styling for a home, a building, one street or a whole neighborhood, you'll want to meet the Roulette family. We also carry four other great lighting families and individual models.

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NORAL

L I G H T I N G

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LIGHTFAIR INTERNATIONAL

LightFair International, held May 4-6, 1994 at the Jacob K. Javits Convention Center in New York City, is produced and managed by AMC Trade Shows and sponsored by The Illuminating Engineering Society of North America (IESNA), the International Association of Lighting Designers (IALD), and New York Section, IESNA. Attendees include architects, engineers, interior designers, lighting designers, facility managers, landscape architects, developers, contractors and other lighting specifiers.

Following are program highlights. To register, call 1-800-856-0327, or fax 214-245-8700.

WEDNESDAY, MAY 4

9:00 A.M.-10:30 A.M.

NEW PRODUCT SHOWCASE

Sponsored by *Architectural Lighting* and hosted by Craig A. Roeder, IALD, IESNA, Craig A. Roeder Associates, Inc., and Theo Kondos, IALD, IESNA, DLF, ASID, Kondos Associates. This opening session will highlight new lighting products introduced in the past year. Categories include outdoor, commercial/fluorescent, recessed downlights, decorative fixtures, industrial/commercial, lamps/ballasts, controls/components, custom applications, software, and accessories.

10:45 A.M.-12:15 P.M.

ARE YOU TURNED ON, OR ARE YOU TURNED OFF?

Gary Dulanski, IESNA, Warshaw Electric Company. The latest technologies and techniques in lighting control for energy management are explored.

AREN'T YOU TIRED OF DOWNLIGHTS YET?

Glenn M. Johnson, IESNA, Spectrum Professional Services. Various products, specific techniques and applications in difficult and unique architectural situations are reviewed.

2:00 P.M.-3:30 P.M.

WATTSNEW?

Denise Y. Bruya Fong, IALD, Lighting Design Lab. New lamp technologies that include replacement lamps for those that will be eliminated as sections of the Energy Policy Act become effective are presented.

EXTERIOR LIGHTING FOR THE HOME

Bradley A. Bouch, IESNA, Luminae Souter Lighting Design. Covered are the selection and use of decorative fixtures as the jewels of interior residential design.

3:45 P.M.-5:15 P.M.

MAKIN' IT

Daniel Baldinger, Louis Baldinger & Sons, Inc., and Henry Muller, IESNA, DLF, Lightolier Inc. In this design-oriented presentation, the materials and processes of lighting fabrication are discussed to show how to get the look without blowing the budget.

KITCHENS AND BATHS

Michael John Smith, AIA, IALD, IESNA, Michael John Smith Lighting Consultants. Unique requirements for lighting kitchens and baths, including budget restraints, are discussed, with examples of both good and poor lighting.

THURSDAY, MAY 5

9:00 A.M.-10:30 A.M.

YOU CAN'T INSTALL THAT HERE

Gilbert Lang Mathews, IESNA, Lucifer Lighting Company; Gerard M. Plank, Jr., MIES, NFPA, IAEI, Wilger Liaison Co.; and George J. Fechmann, PE, IEC, ASTM, IEEE, Underwriters Laboratories. European safety and quality control standards are discussed, including The Lum Agreement and ISO 9000 Series Standards.

THE UPS AND DOWNS OF OFFICE LIGHTING DESIGN

David Malman, IALD, IESNA, AIA, Architectural lighting Design; Paul

Degelman, IESNA, NEMA, Cooper Lighting; and Franz Euler III, IESNA, Litecontrol. Presented are lighting design solutions for a typical office space, and cutting-edge solutions for unusual office lighting problems.

APPLICATIONS OF SPECIALTY LIGHT SOURCES

Allan Leibow, IALD, Wheel Gersztoff Friedman Shankar Lighting Design Inc.; Paul Gregory, IESNA, USAA, Focus Lighting Inc.; and Kenneth Yarnell, IALD, The Kling-Lindquist Partnership, Inc. Reviewed are sources such as neon, cold cathode, fiberoptics, projectors, lasers and more, and how they can be used in unusual applications.

10:45 A.M.-12:15 P.M.

LIGHTING DESIGN AROUND THE WORLD

Motoko Ishii, Motoko Ishii Lighting Design Inc. and John Marsteller, IESNA, IALD. Lighting projects of these two seasoned professionals are discussed with emphasis on use of natural energy, optical fiber and other high technology.

LIGHTING WITHIN THE MASTER PLAN

Philip Gabriel, IALD, IESNA, CIE, Gabriel/design and Steve Margulies, IESNA, IALD, Cosentini Lighting Design. The panelists demystify the process through case studies that reveal how and why the master plan approach is an integral part of a new urban plan.

THE PHYSIOLOGICAL AND PSYCHOLOGICAL EFFECTS OF LIGHTING

Craig A. Bernecker, PhD, IALD, FIES, CIE, Penn State University, and George C. Brainard, PhD, IESNA, CIE. The presentation updates the valid existing knowledge of light's effects on shiftwork, jet lag, and seasonal affective disorder, as well as mechanisms responsible for these effects. Case studies and information on joint research effortsare also presented.

2:00 P.M.-3:30 P.M.

IT'S DUE TOMORROW AND I'M LATE ALREADY: DESIGN ACROSS THE INTERNATIONAL DATELINE

Charles G. Stone, II, IESNA, Fisher Marantz Renfro Stone, Inc. Case studies illustrate aspects of philosophical attitudes about lighting in various cultures and some of the basic commercial realities that confront one overseas.

HEALTHCARE FACILITIES: A NEW DESIGN DIRECTION

Craig A. Roeder, IALD, IESNA, Craig A. Roeder Associates, Inc. The session addresses the transformation in modern healthcare facilities, including the latest innovations in lighting techniques.

LIGHT POLLUTION

Nancy E. Clanton, IALD, IESNA, Clanton Engineering, Inc. and Dave Crawford, IESNA, CIE, Kitt Peak Observatory. The speakers explore problems and pitfalls communities face in writing an ordinance, including dealing with pollution, trespass, nuisance glare, and safety.

3:45 P.M.-5:15 P.M.

NEW LAMPS FOR OLD: THE INS AND OUTS OF RETROFIT

Earl R. Print, IESNA, Philips Lighting Company; R. Harold Chappell, IESNA, NALMCO, NESA, IllumElex Corporation; Willard L. Warren PE, IESNA, IEEE, Willard L. Warren Associates, Inc.; and Nicholas C. Bleeker, IESNA, Philips Lighting Company. Panelists address, via case studies and experiences, advantages and disadvantages of lighting system retrofits.

WHERE WERE YOU WHEN THE LIGHTS WENT OUT?

Kim Reitterer, PE, IESNA, IEEE, Little & Associates Architects, Inc.; Michael Ouellette, IESNA, IEEE, CIE, CSA, National Research Council, Canada; and Peter R. Boyce, PhD, IESNA, CIBSE, Lighting Research Center, Renssalaer Polytechnic Institute. Vital issues in emergency lighting are addressed, including UL and code trends, illuminance requirements, human movement through buildings, exit sign technology and applications.

ADVANCED COMPUTER TECHNIQUES OF MODELING LIGHTING DESIGN

David L. Munson, IALD, IESNA, Hellmuth, Obata & Kassabaum, Inc. The speaker presents radiosity imaging of lighting as a video animation experience in this problem-solving session.

FRIDAY, MAY 6

9:00 A.M.-10:30 A.M.

REBATES; FREE MONEY AND HOW DO YOU GET IT?

Stuart Cooley, IESNA, ASHRAE, ADSMP, Barakat & Chamberlin, Inc. The speaker traces DSM from its legislative beginnings to its market maturity.

THE SOLOMON R. GUGGENHEIM MUSEUM: PERFECTING THE NEARLY PERFECT

Laura Antonow, IESNA, IALD, Solomon R. Guggenheim Museum. The recent renovation and expansion of Frank Lloyd Wright's museum has added to the challenges of exhibition lighting, which are addressed.

9:00 A.M.-3:30 P.M.

LIGHTING DESIGN FOR INTERIOR SPACES (CEU COURSE, ACCREDITED BY ASID AND IBD, CORE LEVEL 0.6 CEU'S)

James R. Benya, FIES, IALD, NSPE, Luminae Souter Lighting Design. Refresher in lighting design technology and technique for interior designers and architects. All new material will cover both residential and commercial project types.

10:45 A.M.-12:15 P.M.

THE DESIGN IMPACT OF ENERGY CODES

Sandra M. Stashik, IALD, FIES, IFMA, Grenald Associates Ltd., and Karen Goldstick, IALD, IESNA, Flack & Kurtz. The speakers discuss the design process as it relates to producing more energy efficient environments that meet codes and standards.

MANIPULATING VISUAL PERCEPTIONS IN THE MUSEUM ENVIRONMENT

Steven Hefferan, IALD, IESNA, Steven Hefferan Lighting. Discussed are key principles of museum lighting design via side-by-side slide comparison.

2:00 P.M.-3:30 P.M.

ENERGY LEGISLATION UPDATE

JoAnne Lindsley, IALD, IESNA, Synergy Consultants Incorporated; James M. Yorgey, IESNA, IEEE, Lutron Electronics; Peter A. Bleasby, IESNA, NEMA, CIBSE, Osram Corporation; and J. Delaine Jones, PhD, AIA, New York State Energy Office. The panelists offer a review of existing and potential energy legislation and its impact on the lighting industry.

THEATER IN RETAIL

Ron Harwood, IESNA, DLF, Illuminating Concepts. Case studies of major players in the entertainment retail game are offered.

EXHIBIT HALL HOURS

May 4—10: a.m.-6:00 p.m.; May 5—9:00 a.m.-6:00 p.m.; and May 6—9:00 a.m.-3:00 p.m. Free Product Demonstration Pavilion.

ON-SITE REGISTRATION HOURS

May 4 and 5—7:30 a.m.-6:00 p.m.; May 6—7:30 a.m.-3:00 P.M.

SPECIAL EVENTS

RICHARD KELLY: SELECTED WORKS EXHIBITION, presented by New York Section, IESNA, open during show hours at the Javits Center.

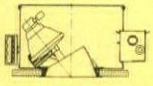
THE NUCKOLLS FUND CRUISE on Wednesday, May 4 from 12:30 p.m.-2:00 p.m., luncheon cruise around New York Harbor, cost: $50.

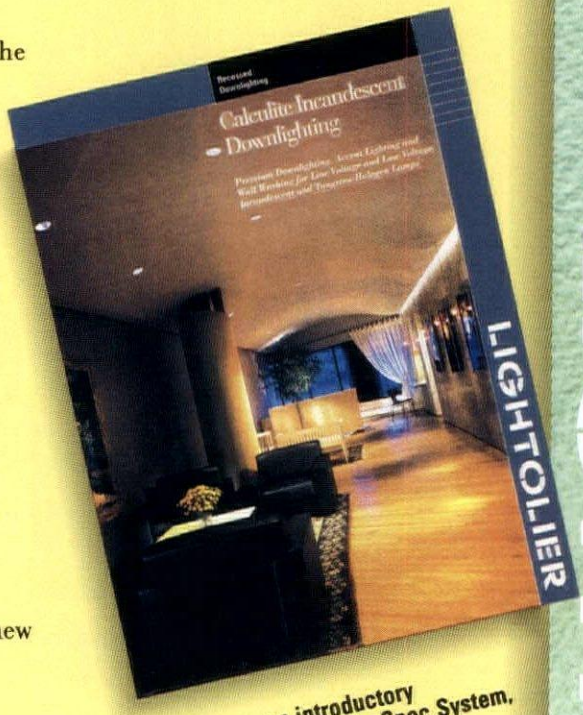
THE CLASSIC GLAMOUR OF NEW YORK, sponsored by Philips Lighting and presented by the Designers Lighting Forum of New York, cocktail reception at the Rainbow Pavilion in Rockefeller Plaza, cost: $50.

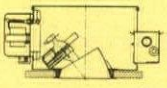
IALD AWARDS PRESENTATION DINNER, beginning at 6:30 p.m. at the Hudson Theater on West 44th Street, cost $90.

PRECISION DOWNLIGHTING

Calculite is the industry's best selling line of premium specification grade downlights.

Coming in June Lightolier introduces **a new Calculite catalog** of specification grade incandescent downlighting solutions. This catalog includes **new finish and trim options new sources**, and an **increased selection** of fixture types.  The catalog also will mark the introduction of Lightolier's revolutionary new downlighting system – **ProSpec™**



Previewed at Lightfair,  ProSpec offers the designer a **completely modular system** of housings, transformers, lampholders, and accessories with important new features.  Like cam action **locking**, up to **45 degrees** adjustability, **shallow housings** and **unitized optics**

To arrange an introductory presentation of the ProSpec System, please fax us today.

Calculite Incandescent Downlighting.	
Light sources	20 different lamp types in wattages from 20 — 500.
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Selection	Over 70 different fixture types with over 3,000 specifiable options.
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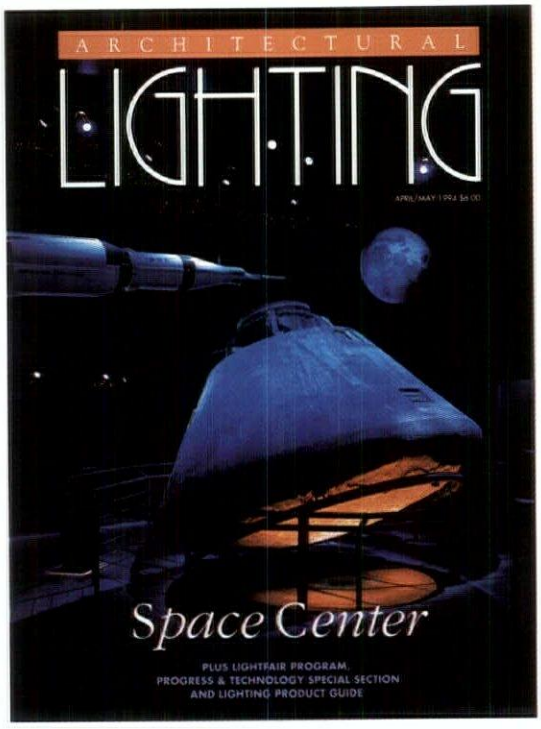
LIGHTOLIER®

PROGRESS & TECHNOLOGY

Turn a couple of pages (after you read this!) and you'll see dead animals, a desert aflame, and a river winding through a verdant valley. What have they to do with lighting? The answer lies in the truth that "Progress" is not synonymous with "Technology." Discovered knowledge and the tools that are invented and refined as a result are of no good use to humankind unless they are used well.

Technology has made tasks easier, faster to accomplish. With a faster pace can come the illusion that time for thought on the consequences resulting from choices made, and individual acceptance of responsibility are no longer required or important. Mark Kruger's "Points of Departure" column in this issue is a photo essay and one of several articles grouped around the theme of "Progress & Technology." The essay, "powaqqatsi," shows us that we all must stop and think about what we do—even in our business dealings—because each of us can make a difference in the world for better or worse.



Abe Feder, the first independent lighting consultant, has seen the lighting field grow—in large part through his own genius, creativity and invention—during its infancy and beyond. We are honored that he shares his wisdom with us in "Reality and the Art of Revealment." It's all right to dream, but dreams must be rooted in reality and responsibility to come true.

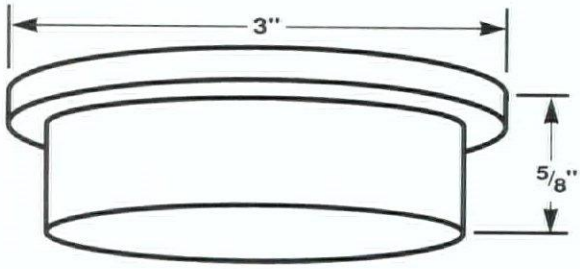
Knowledge does enable each of us to seize and shape the future through informed choices. Glimpses into what today's discoveries will lead to tomorrow are found in Gary Markowitz's "Energy Watch" column entitled "The Evolution of the Smart Fixture," and in the state-of-the-art product and application developments used in "Con Edison Clock's Energy Saving Facelift."

Knowledge, education and communication are the keys to assuring the hand-in-hand development of "Progress & Technology." By communicating thoughts such as those outlined above, as well as offering insights into the applications of lighting techniques, and details on new products in our regularly featured articles, we fulfill our role as a conduit to progress. Some of you will be attending LightFair International in New York, May 4-6. Architectural Lighting is proud to be sponsoring the Product Showcase event, which provides attendees with an overview of the new tools that technology has birthed.

We hope all of you will take time to read, reflect, and be informed and inspired by the thoughts which are offered in this issue. And when next you act or choose, keep in mind that acceptance of responsibility for what you do in your job also brings the benefit of pride in achievement.

WANDA JANKOWSKI
EDITOR-IN-CHIEF

THE BRILLIANCE OF SOME DESIGNS CAN BE CONTAINED IN A SPACE ABOUT YEA-BIG.



At 3 by 5/8 inches, Hafele's halogens have one of the lowest profiles on the market. So it's ironic that you're seeing so much of them in today's better interior designs.

Stowed beneath a row of cabinets, high in a tight corner, along a dark hallway, Hafele's Low Profile halogens open up a space without taking any room. Amidst the most modern, dramatic designs, they provide the limelight without stealing it.

As if that weren't enough to warm you up to them, consider this. Our efficient

Recessed light. *Swivel light.* *Swivel light with switch.* *Swivel light.* *Surface mounted light.*

halogens last twice as long as ordinary incandescents, providing an average of 2,000 hours of warm, white light. And a halogen's unique self-cleaning properties mean it will burn bright throughout its long life.

So if you want to make a big impression with your next design, use a halogen light. Call today for specifications and more information on Hafele's Low Profile Halogens. And let your brilliance shine through in the details.

HÄFELE

3901 Cheyenne Drive, Post Office Box 4000, Archdale, North Carolina 27263 **1-800-HÄFELE-1**

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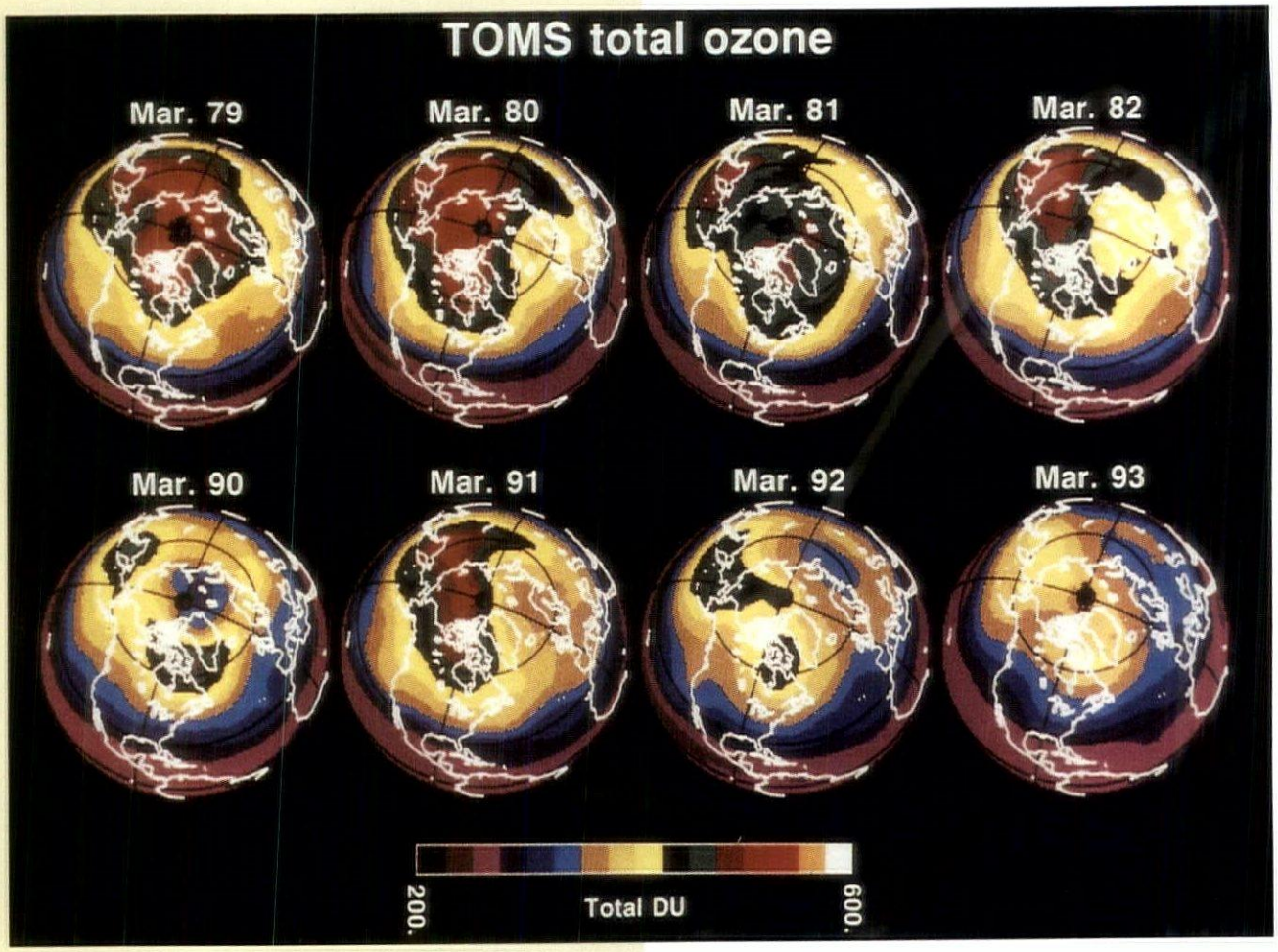
PROGRESS & TECHNOLOGY

po-waq-qa-tsi

BY MARK D. KRUGER, IES — MARK D. KRUGER DESIGNS LIGHT, NEW YORK, NY



NASA, Goddard Space Flight Center

po-waq-qa-tsi —It's from the Hopi language, a noun from the roots "powaq" [sorcerer] and "qatsi [life]. It means "An entity, a way of life, which consumes the life forces of other living things to further its own."

WE ARE POWAQQATSI.

A view from aloft records the deep incisions into the "lungs of the world," its tropical rain forests.

During the height of the burning season in the Amazon River Basin, huge plumes rise above the enflamed forests. The pall of smoke which blankets the landscape covers an area three times the size of Texas, and rises to meet the Andes Mountains some 650 miles away.

Into this gasping biosphere, the industrialized world emits five billion tons of airborne pollution each year. Lighting our country alone produces four hundred million tons of carbon dioxide, three million tons of sulphur dioxide, and almost two million tons of nitrogen oxide. We are consuming fossil fuels at an unsustainable rate...

...While robbing this and and future generations of a precious, life-sustaining veil of ozone.

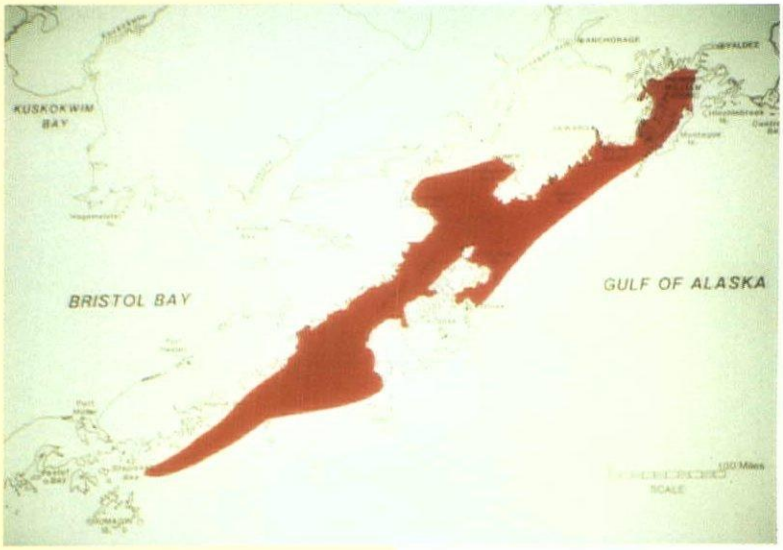
U.S. Geological Survey Data Center

NASA Media Services, J.S.C.

Lee Marshall Studio, New York, NY

National Steel and Shipbuilding Co.

T.B.D.



Jill Parker, U.S. Fish & Wildlife Service

Our most advanced technology can't provide safe transportation for the fuel or adequate disposal of the harmful by-products generated by our gluttonous consumption of energy. The Exxon Valdez tragedy is a case in point.

When the ship ran aground in Prince William Sound, it disgorged 11 million tons of crude oil onto 1,200 miles of pristine coastline. It was the largest ecological disaster in our nation's history.

To view the tortured path of this oil slick is to understand the vulnerability of every coastline on earth to such catastrophe.

The spill befouled four national wildlife preserves and two national parks. It killed a quarter of a million sea birds, 400 seals, 90 percent of all sockeye salmon, and one third of all the orcas in the region, and many hundreds of thousands of food chain fish, mollusks and crustaceans...

...And 300 of America's endangered national symbol, the bald eagle.

"If there is a common cause of global warming, overpopulation, unsustainable economic growth, loss of bio-diversity, depletion of natural resources, and the needless suffering of humans and animals, it is the failure of we the people to take moral responsibility for our world."—Ronald Engle, Professor of Social Ethics, Meadville-Lombard Divinity School

"We are responsible for seven generations, in my tradition...Our leadership must not make decisions that will bring pain, harm or suffering seven generations into the future."—Elder Audrey Shenendoah, Eel Clan of the Onondaga Iroquois Confederation

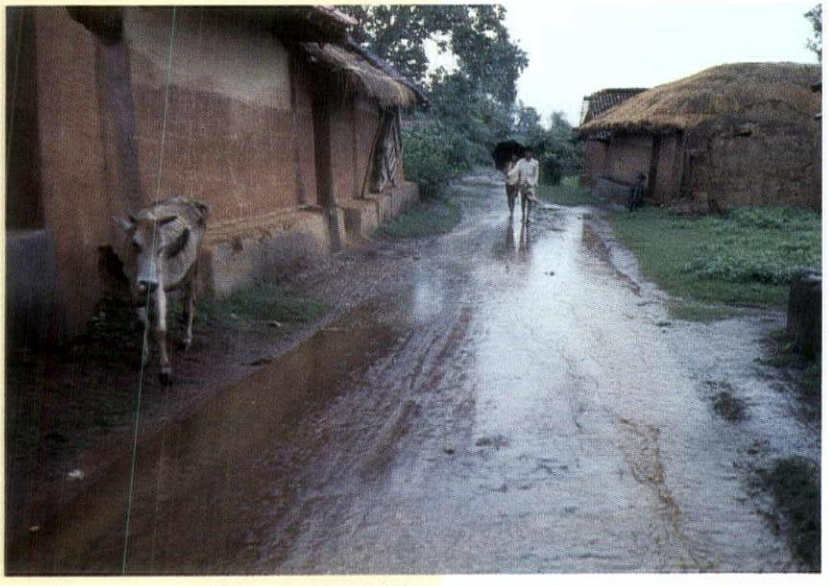
National Audubon Society, New York, NY

Jill Parker, U.S. Fish & Wildlife Service

U.S. Department of Defense

Oil, the black gold. Oil as a reason for war. Oil as a weapon of war...The Iraqi invasion of Kuwait, and our subsequent involvement in the Persian Gulf War, had their roots in a struggle for the control of oil. Smoke from the burning wells drifted to the east and south...

Elliott Kaufman, New York, NY



...And fell as a slurry onto third world peoples who had precious little to win, but everything to lose in this conflict.

"The industrialized countries [must] show that they are using their own energy resources rationally. They cannot ask the developing countries to pay the bill, while they, themselves, are enjoying their lives."—Dr. Mostafa Tolba, PhD., Executive Director, U.N. Environment Programme

Elliott Kaufman, New York, NY

We don't inherit the earth from our ancestors, we borrow it from our children.

Sadly, we borrow from some children more than we do from others. For example, each day the city of Los Angeles consumes more energy than the entire Indian sub-continent. As a nation, we are home to six percent of the world's population, but consume 29 percent of all global energy resources.

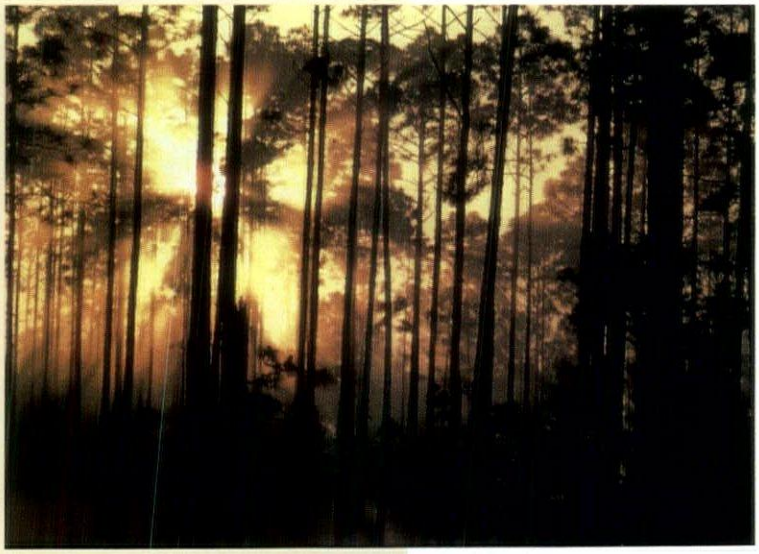
We must acknowledge this pivotal moment in a continuum of time...

"We are smart enough and have time enough to avoid an environmental catastrophe of civilization-threatening dimensions, but the technical problems are sufficiently formidable to require a redirection of science and technology, and the ethical issues are so basic as to force a reconsideration of our self-image as a species."— Edward O. Wilson, "Is Humanity Suicidal?"

Dr. M. Mintz

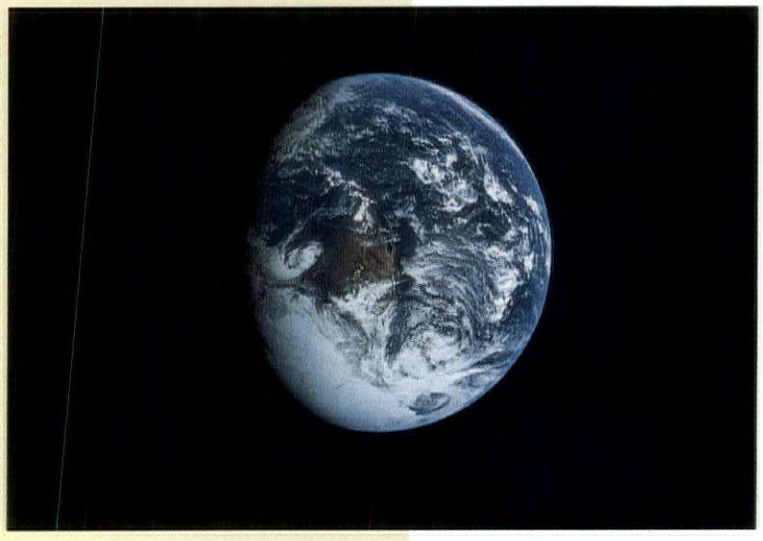
National Audubon Society, New York, NY

National Audubon Society, New York, NY



NASA Space Center, J.S.C.

NASA Space Center, J.S.C.



...And deal seriously with the problems of unbridled energy consumption in direct and enlightened ways,

...In order to salvage a world where we, and all other species, can live and prosper.

"We are created equally with the earth, and then we are given the very special intellect, the power of reason to make decisions. We have options in what we do with our lives, our behavior, and how we treat [other] living things."—Elder Audrey Shenendoah, Eel Clan of the Onondaga Iroquois Confederation

"You see, taking care of our planet is nothing special, nothing sacred, and nothing holy. It is just like taking care of our own house. We have no other planet, no other house, than this."—H.H. Tenzin Gyatso, The 13th Dalai Lama

"Upon the Conduct of Each Depends the Fate of All."—Alexander the Great

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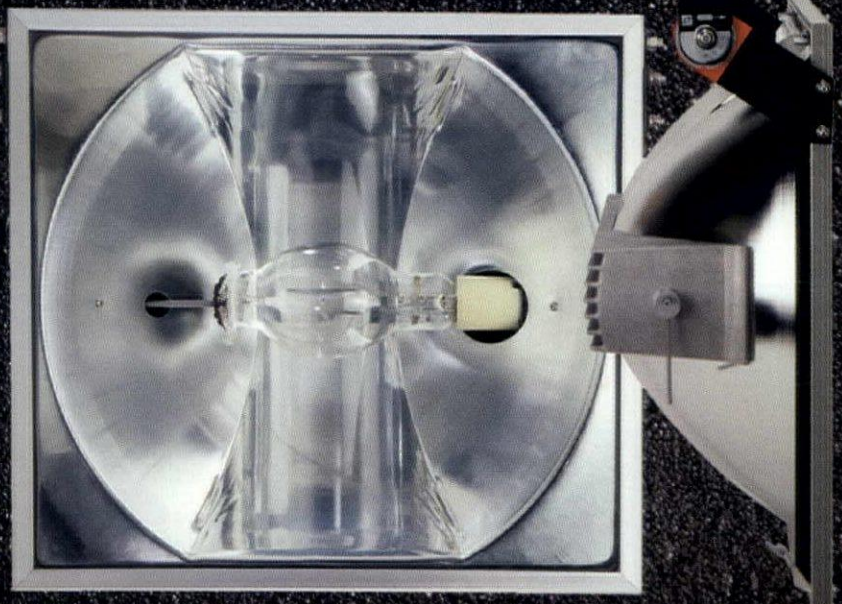
SPECIAL THANKS TO...

Willard Whitson, American Museum of Natural History, New York, NY; Kim Grosso, Johnson Space Flight Center, NASA, Houston, TX; Carrie Holba, Oil Spill Public Information Center, Anchorage, AK; Christine Ondoe, National Audubon Society, New York, NY; Office of the Assistant Secretary of Defense for Public Affairs, The Pentagon, Washington, DC; Bill Moyers, Public Affairs Television, New York, NY; Al Kinnetzer, Goddard Space Flight Center, Greenbelt, MD; Paul Seversen, U.S.G.S. Data Center, Sioux Falls, SD; David Ross, Policy Research Association, Reston, VA.



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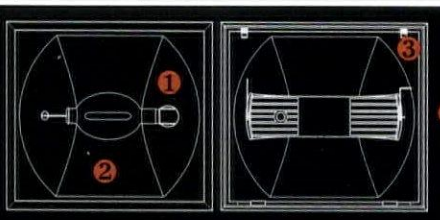

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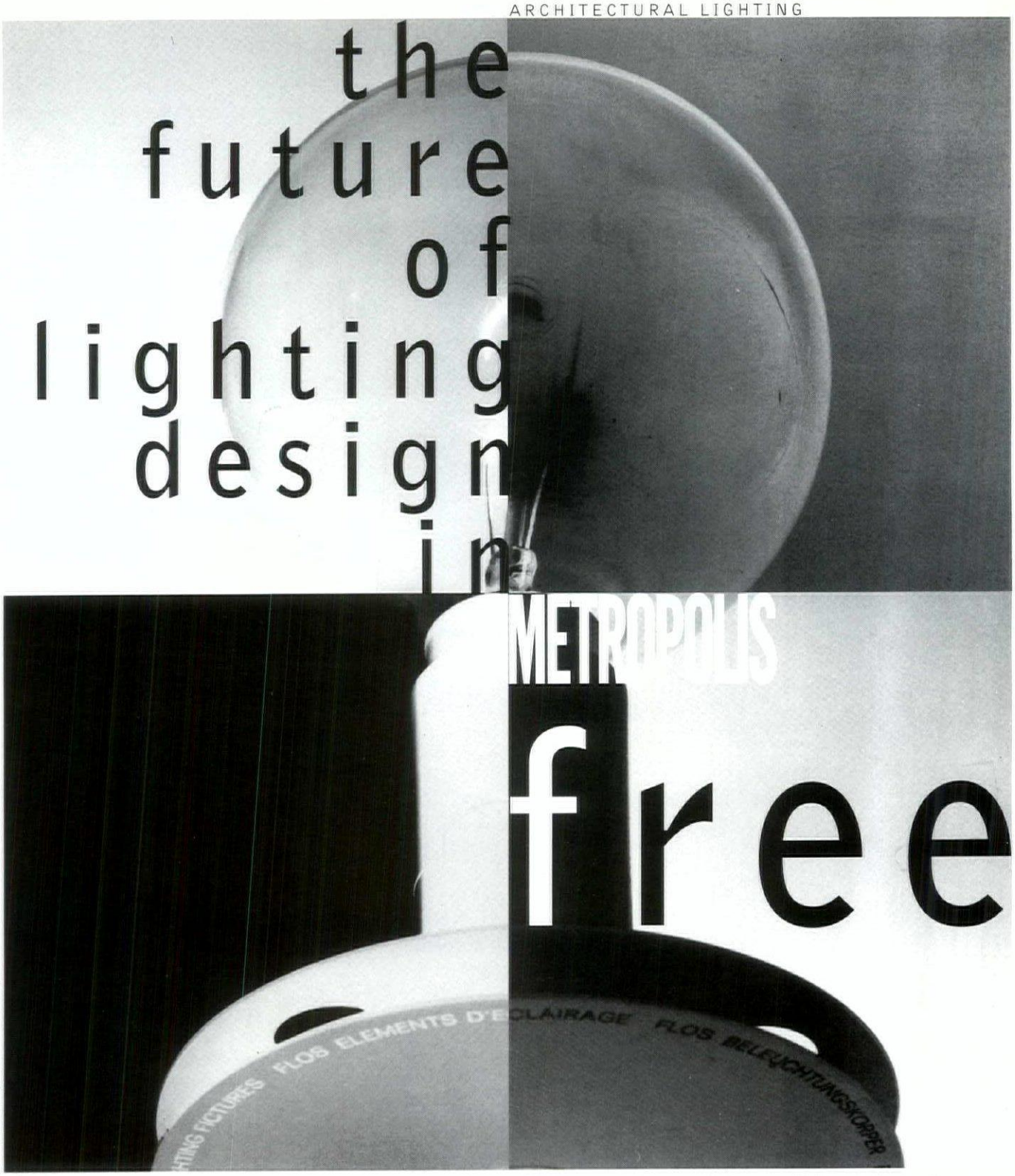

photo courtesy of Flos International

What lessons can you learn from the latest developments in museum lighting—from enhancing color to reducing ultraviolet radiation? What should you know about the new "lighthouse" advances in skylights that distribute light evenly and provide heatless light?

Those are just two of the critical questions you'll find answered in the April Metropolis, the award-winning Magazine of Architecture and Design. In a special issue featuring some of the most far-reaching, practical advances in lighting, you'll get a close look at the new skylights developed in response to the demand for energy-saving products. Other articles will examine the newest attitudes toward museum lighting and how mixing sunlight with electricity is changing what museum goers see...study the innovative lighting fixtures of visionary designer Ingo Maurer... reveal some remarkable experiments in redesigning Noguchi's famous paper lamps of the 1950's.

Handsomely illustrated and packed with ideas, this special issue is a must-read for anyone interested in lighting design. Come April, it will be available at selected bookstores. But you may receive a copy absolutely free.

There is absolutely no further obligation. No one will call you. It's a courtesy extended exclusively to readers of ARCHITECTURAL LIGHTING.

mail the coupon today.

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REALITY & THE ART OF REVEALMENT

BY ABE H. FEDER, FIES, FIALD

At the moment, the economics of the country is at a low point and few new buildings are being constructed. Some parts of the country are overbuilt and existing structures are standing empty. The architectural world is in disarray. For thousands of architectural designers, there is no work.

Many large architectural firms—solid ones that had 300 or 400 employees—still have work, but have shrunk to a staff of 100. Architects and designers are functioning in retrofitting department stores, hotels and offices in existing buildings. However, the adventures of new buildings, new directions in architecture may not be forthcoming in the near future.

The concept of artistry in lighting design appears consistently in magazines, but the reality of it is: you have to have a client.

When I was in Wichita, KS, last year speaking before graduate theatrical lighting designers at the United States Institute of Theatre Technology (USITT) Conference, I was flabbergasted that colleges were turning out so many in the field. The question that came to mind was: Where are they going to work?

The "purity" of the teaching factor at the college level that turns out architects and designers can result in the teaching of wishful dreams, in abstract designs. Some of these teachers have never had to sell anything, they have never had to practice the profession and function in the reality of the workforce. Yet the students need to learn the basics, and to have the training. However, the schools teach the nonobjectivity—the pureness of art. The real question is: How do you get clients and keep them?

When these graduates work for someone else for a time, that's easy, but when they start to feel strong enough to try it on their own, that's more difficult. They face hard realities in judgment. How much is the fee? Will it cover your overhead and still allow you a profit? Because you must address the continuous mechanics of running a business.

Then they begin to think realistically as well as artistically, "This is what I'd like to design—but this is in the realm of the possible."

The irony of it is, who says the clients are profound enough to pick the great creative minds to design their projects? Sometimes they are not. It's always catch as catch can. Talent alone is not a guarantee.

And who is the ogre in the lighting world that stands behind one's back always ready to impose demands on creative designs? It is the light bulb, with its maintenance, its life span, and its color. But if you're breaking ground and inventing new lamps for new applications, the light bulb becomes an omnipresent factor. If your jobs aren't large enough, one day that manufacturer may become an "invisible" bulb company—go out of business—then, you're out of luck, because you've used those particular bulbs and that's a very big reality.

One of the confusions in lighting today involves the question of responsibility. Designers may create something new that's wonderful and that works—yet six months later, does the same designer take the responsibility for that wonderful design continuing to function?

In my early career, the jobs were very few, and the client's expectations extended beyond the installation phase. I could get called up by the client 6 months after a project had been completed, and be taken to task if the design faltered because of the equipment I had specified. Today, a designer today might say, "But it's not my fault."

However, it is your fault, because a bulb is not a piece of steel. It's not a door, it's not a chair—it's expendable and it's limited, and did you allow them a substitute for what you had planned? That's a reality. The creation of the design is not enough. You have to deal with the reality of its life expectancy. It's something the inexperienced don't know.

It also happens that clients will say, "Well, that's a beautiful lighting design, but what can we fall back on—I don't want to spend that much." And you have no choice but to cut—they are the clients and it's their money. So the idea of measuring up to design perfection is nonsense. Sometimes you are cursed by realities and there's nothing you can do about it. So when projects are completed, they may have a certain mundane quality and one wonders, "Why did they do something like that?" The reality is: Who said, "No" and who got tired?

Essentially, my philosophy of light is revealment, and lighting design is the art of that revealment. The tools to light exist. Whatever is to be illuminated is there. I think it is the job of the lighting designer to reveal with light the design intent of the original creator, whether it be an architect, a playwright, a sculptor, or retailer. Some lighting designers have given lighting design a major omnipotence in itself and they are wrong. There is enough in the lighting field and all that's involved to maintain a stewardship over creative design without trying to make it something it's not.

So at this point in time we're back to the light source that makes it possible. And the gods are kind. We're living in an era where light is the one of the few sciences for which we don't know all the answers. Look at what's happened with computers. We're underwater, we're in the air. Man has conquered these factors, but has yet to conquer light. The unknown still remains to be found out decades into the future.

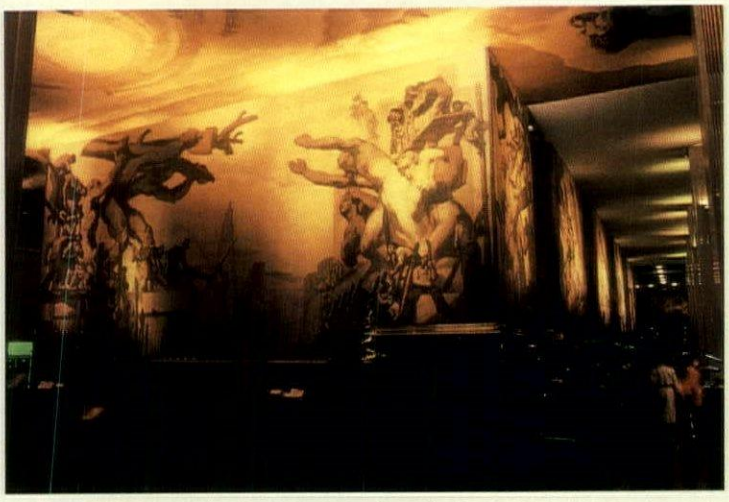
Abe Feder, FIES, FIALD, was the first independent lighting designer in both the theatrical and architectural worlds. His firm, Lighting By Feder, is located in New York City. Mr. Feder's Broadway credits are legion and include My Fair Lady *and* Camelot. *He is responsible for many lamp and fixture developments which are now catalog standards. He was the first president of the International Association of Lighting Designers (IALD).*

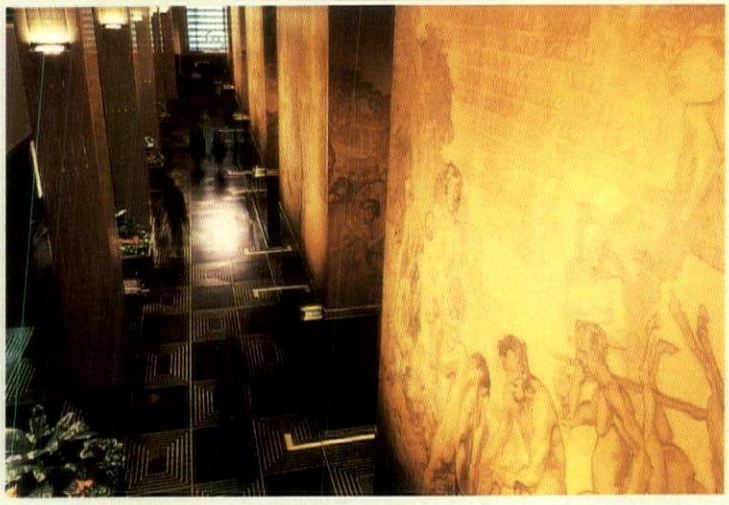
(Article continued on page 26.)

LIGHT REVEALS ART

The visibility and beauty of the lobby murals at Rockefeller Center's GE Building are enhanced with newly installed lighting designed by Abe Feder, Lighting By Feder. The sepia-toned murals, created by artists Jose Maria Sert and Frank Brangwyn in the 1930s, had been developed under the theme "New Frontiers," and represent the labor of man and the achievements of America.

The lighting design consists of light fixtures attached throughout the lobby which are carefully painted to blend with the walls so that the light source goes undetected. Specialty lamps, mounted in fixtures created especially by Abe Feder, provide a projection of 40 feet onto the murals. The lamps provide illumination with a target beam that projects onto the murals without glare. Each wall mount unit contains 20 of the reflective miniature lamps which are cross-targeted to light the murals. These lamps are separately focused so that each lamp pinpoints an area of the artwork to achieve an overall dramatic lighting effect. In addition, strip lighting has been placed above the entrance of 30 Rockefeller Plaza facing upward to illuminate the ceiling murals.





"Lighting is the art of revealment," says Feder. "Revealing the original intent of the artists was of utmost importance to this design. The miniature reflector lamps offer low heat impact along with low wattage and enable the beams of light to be targeted onto the murals, maximizing the brilliance of light and enhancing the artwork."

The lighting system is composed of ConstantColor Precise Lamps from GE Lighting, custom-designed wall mounts manufactured by Bergen Art Metal Works, Inc., and striplighting supplied by Altman Stage Lighting, Inc. Consultants on the project included Edwards & Zuck, Consulting Engineers, and E.J. Electric Installation Company.

The installation is the first lighting design specifically targeted to enhance these murals, which previously had been lit only by the fluorescent lobby lighting. This lighting scheme is a continuation of Rockefeller Center's architectural lighting program with lighting designed by Feder, which began in 1949 and includes projects such as the lighting of the GE Building exterior facade, the interiors of the International Building, the Associated Press building, and 10 Rockefeller Plaza; the exteriors of the McGraw-Hill and Celanese buildings; the Channel Gardens and Promenade; the Center streetlighting and the Fifth Avenue entrance to Channel Gardens (in progress) and such artworks as the Prometheus Fountain and the Atlas Sculpture.

FIRST BY A FIRST

The genius of Abe Feder, who pioneered lighting design in both theatrical and architectural realms of the field, is captured for the first time on videotape. The retrospective of Feder's career, narrated by associate LaVerne Roston, virtually documents the history of lighting design as demonstrated in examples of his work and reflections by Feder on the past, present and future of lighting design. The 66-minute videotape records Abe Feder's presentation at the United States Institute of Theater Technology (USITT) Conference held in March 1993 in Wichita, KS. For information on ordering the tape, which lists for $59.95, contact Lighting By Feder, 212-262-0480.

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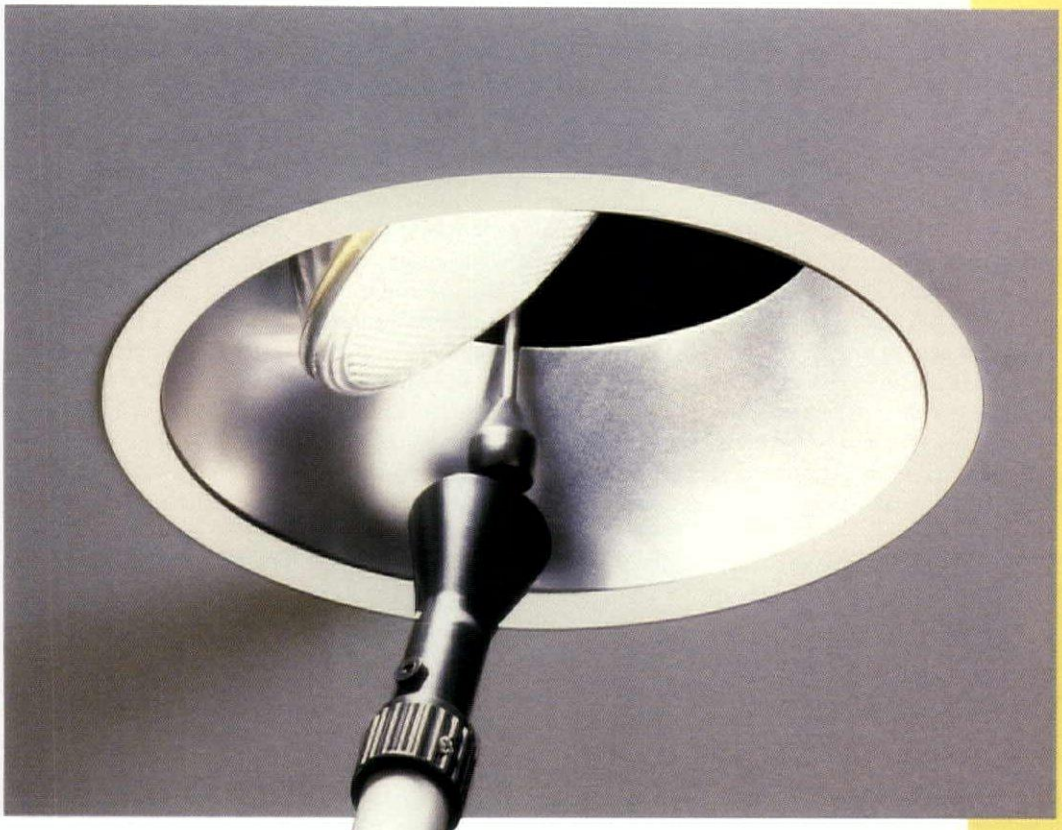

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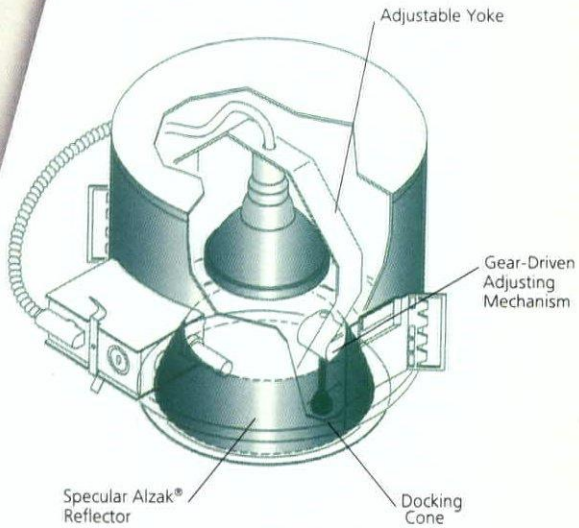

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THE EVOLUTION OF THE SMART FIXTURE

BY GARY K. MARKOWITZ, MIES

I have often wondered about the origins of the art of controlling light:

Was it in the beginning of time when light was created by the Supreme Being, only to be doused by the nightfall?

Perhaps our cave-dwelling ancestors (Og, the caveman, for example) developed the concept by finding shelter from the daylight and building fires to overcome the darkness. This new-fangled way to light the family cave had some serious negative characteristics:

Add more wood to the fire, get more light and heat (not exactly the best method on those hot summer nights)...

Pile the wood higher onto the fire for those tasks requiring high visual acuity (for example, darning Og's best fur suit) and either invent the first sauna, or burn the family out of cave, and home.

Put out the fire, and there is the darkness again.

Well, at that point, controlling lighting sources was only a concept that was in its infancy. The eventual development of electricity, and the electric light bulb brought light into modern man's home without the high risks of fire source lighting. The light switch was a further development invented to control this source of light. Further refinements in this technology brought about a device to control the intensity of incandescent sources. The rheostat is still the most commonly utilized device found in both residential and commercial installations.

Despite man's initial achievements to control the luminous environment, there was a desire to produce sources providing greater efficacy and develop better methods to control these sources. Electronics technology continues to defy stagnancy as demonstrated by the daily announcements of refinements being made to the devices of work and leisure.

Improvements are also common in the field of illumination where technology moves from the laboratory to the electrical distributors' shelves at an almost break-neck pace. This week I was informed of two new ballast manufacturers, and their one-upsmanship over the rest of the pack.

In the January/February issue, I reviewed some of the more interesting aspects of fluorescent electronic ballasting. In just two short months, the technology has been further refined to include improved harmonic control, reduced-cost dimming for architectural or daylight-based controls, and improved regulation of the current crest factor. *(continued on page 30)*

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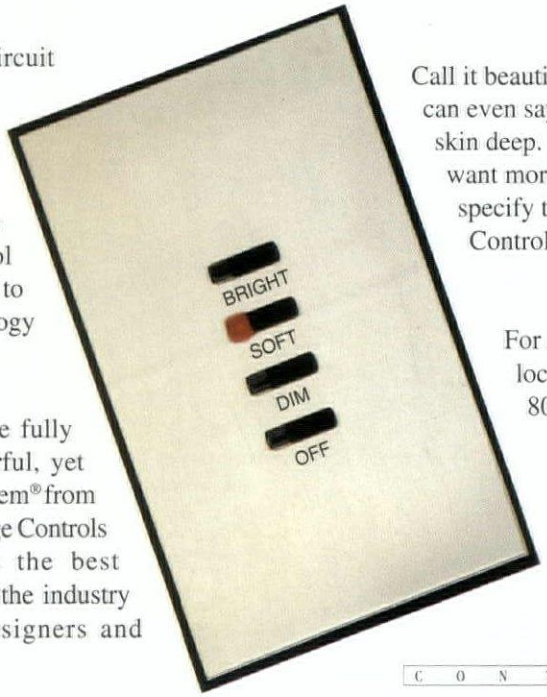

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SMART FIXTURES *(continued from page 28)*

The integration of the semiconductor microprocessor chip into ballasts is certainly not a new idea, as many hybrid and electronic ballasts utilize this device to provide precise control over lamp operation. Some chips are more advanced than others, providing control circuitry that allows for dimming.

The development of the electronic ballast integrating the microprocessor into the design reminds me of an analogy closely akin to the development of the personal computer: the first personal computers incorporated an eight-bit, eight mega-Hertz processor...it was literally an incredible breakthrough at the time of introduction. Yet, in light of where we are now with the recent introductions of the Pentium Chip, the Alpha-Chip, and the PowerPC Chip, the first personal computers seem to be a distant part of the past. But that was only 12 years ago!

When a sophisticated microchip is incorporated into an electronic ballast through imaginative engineering and refinement, a Buck Rogers product results. Industry sources indicate that the development of "smart-fixture" technology has been underway for a couple of years. Two fixtures reflecting the combined technologies approach have already appeared on the market. The concept behind smart fixtures is the incorporation of a high-efficiency/high-efficacy lamp-ballast combination with control-sensing devices embedded within the fixture body. In future, other features likely to be included are: an addressable unique identification for use in lighting management systems, occupancy sensing, automatic daylight compensation sensing/lumen maintenance, and the ability to alternately switch lamps in any combination (through ballast dip-switches).

The market forces behind this type of technological development involve Demand Side Management (DSM), and Integrated Resource Planning (IRP). Both IRP and DSM deserve a full column to the discussion of the new direction in utility rebate incentive programs. In general, utility incentive programs are becoming more complex. Energy measures are required to incorporate plans to verify savings projections. Financial incentives are based upon the actual verified savings.

Developments such as the smart fixture promise to deliver reliable/verifiable savings to the customer and utility while operating seemingly transparently within the customers' business.

Gary Markowitz, MIES, serves on the U.S. Department of Energy's New England Energy Task Force, and is a member of the Editorial Advisory Board of Architectural Lighting.

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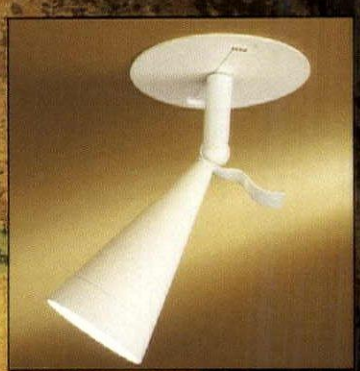
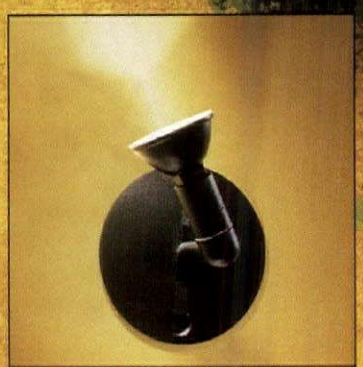
Truss Track and Spots



Lightpoint with Cornetto Spot

Framing Projector



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(Below) The Light Engine's inherent brightness, maximum transmission fibers, and a design that minimizes light waste are the keys to the brightness of the clock face, even when viewed at dusk.

CON EDISON CLOCKS' ENERGY-SAVING FACELIFT

PROGRESS & TECHNOLOGY

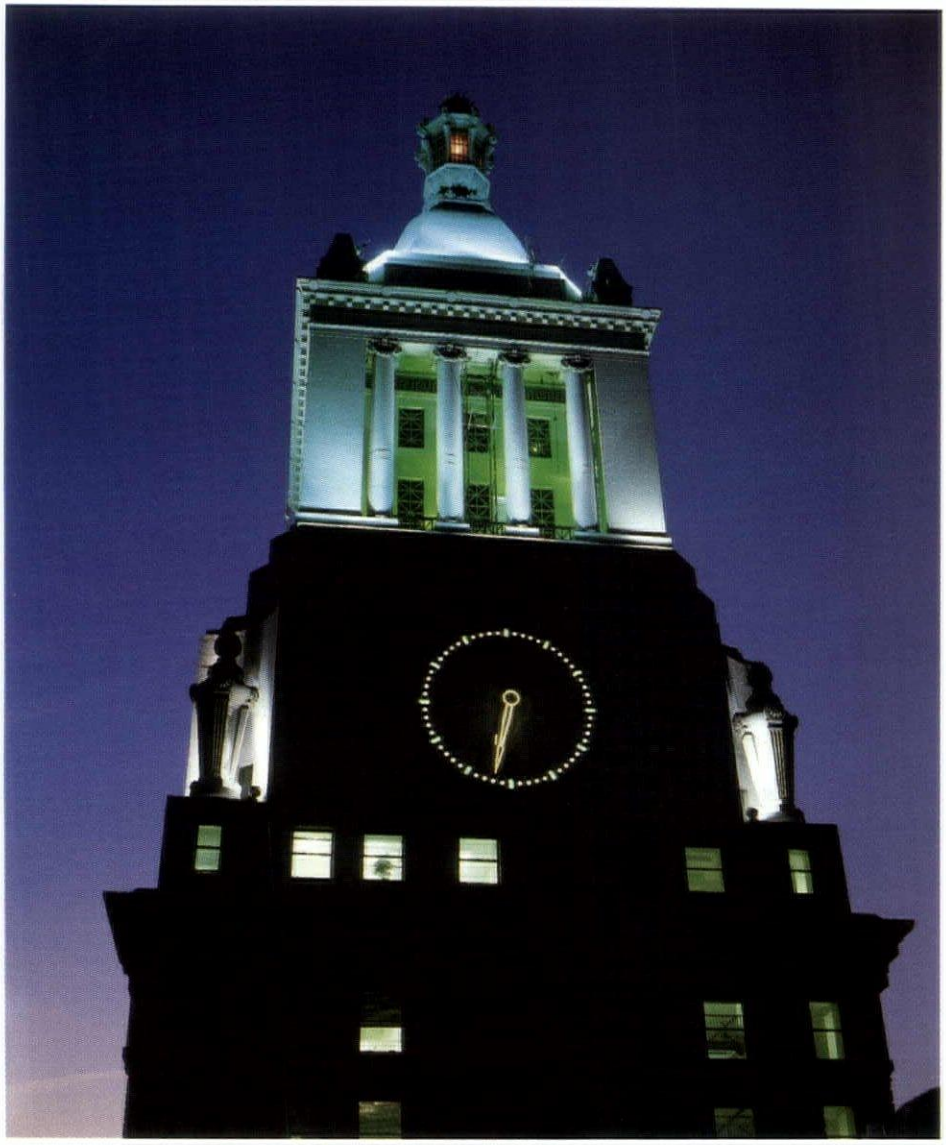
BY WANDA JANKOWSKI
EDITOR-IN-CHIEF

It is fitting that the hands of time in the tower of the Con Edison complex in midtown Manhattan should be relighted using the most timely lighting technology—fiberoptic light guides connected to modified GE Lighting Light Engines.

The four clocks, one on each side of the 1927-built Con Edison tower, had been lit with an incandescent system that involved rear-illuminating the windows on which the clock numbers are mounted. It had come time for the mechanical system of the clocks to be replaced, and so Peter Jacobson, Con Edison energy management specialist, saw the opportunity for the lighting to be upgraded also. At the 1992 LightFair International in New York, Jacobson, along with thousands of other show attendees, viewed the prototype for GE Lighting's Light Engine displayed in a suitcase at their booth. At the time, the engine was intended for eventual application in the automotive industry. Jacobson thought the engine could be used to illuminate the clocks.

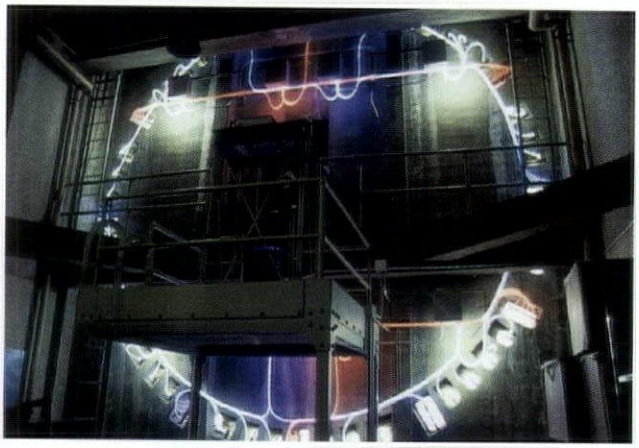
Lighting designer Howard Brandston, H.M. Brandston & Partners, became involved in the project, and functioned as the shepherd between Con Edison and the clockmaker.

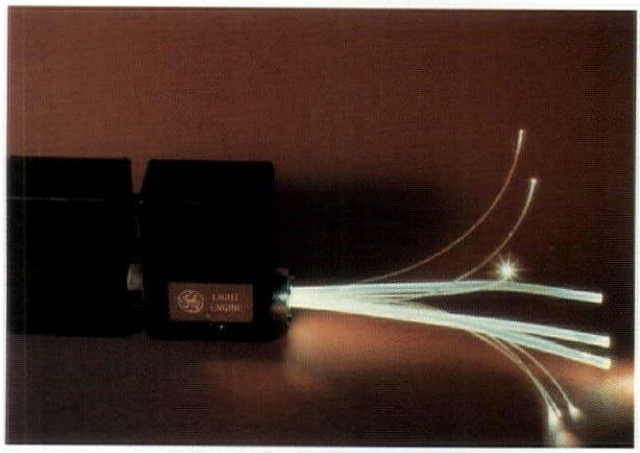
The Light Engine has been modified to light the hands of each clock, and use custom metal halide/xenon sources. Ninety incandescent lamps on the minute hands have been replaced with two fiber bundles. Each 45-strand bundle is lighted with a separate Light Engine. Each hour hand is illuminated with one engine and one bundle of fibers that also replace incandescent lamps. An optic at each fiber strand end spreads the light via refraction and total internal reflection so the hands appear bright from every angle of view.



A new modular 60-watt metal halide version of the engine with separate ballast is used to light the clock faces. Eight engines are required for each of the four faces. Four of them provide illumination via fibers to 48 minute windows, and four furnish colored light to the 12 five-minute windows. The colors may be changed on computer command to red, amber, green, or blue.

What distinguishes this project from other fiberoptics installations is the stunning brightness achieved. This is attributed to several factors: the high inherent brightness of the Light Engine, the use of fibers with maximum transmission capability and careful attention to the design of the system so that a minimum of light is wasted. According to experts at GE Lighting, the improved brightness was achieved with a factor of seven reduction in power consumption.





(Right) The old incandescent system used 860 lamps. The new fiberoptic one uses only 44 low-wattage metal halides.

(Center) Each clock is 25 feet in diameter. Behind them, a colorful display of curved and sinuous illuminated fibers.

(Bottom) GE Lighting's Light Engine shown below has been modified for use in the Con Edison clock relighting project.

Not only is the Light Engine able to introduce the largest amount of light into very small light guides or fibers (viz. less than 10mm diameter) of any of the incandescent or metal halide illuminators on the market, but because of the low wattage of the lamps, it is possible to operate the engine in an enclosure without a cooling fan. The metal halide source gives it a long average life. In addition, instant light and relight also makes it different from other metal halide illuminators.

The Light Engine, invented by GE Lighting's John Davenport, is based on many years of research in metal halide lamps, especially low-wattage versions. The engine was specially developed as a source for fiberoptics. Experts at GE explain that to get the maximum light into a fiberoptic, called by GE "light guides," since the diameter may be as large as 3/4 inches, requires maximum brightness or light per unit area of the source. The arc tube in the Light Engine is characterized by a short arc gap, small size and high operating pressure.

Jacobson estimates the installation will accomplish payback in about three years, because of the energy and maintenance costs saved. The old lighting system used 860 lamps in the clock face and hands. The new system uses 44, with a projected annual maintenance savings of $40,000. The existing lighting system consumed 22.85 kW per year; the new one will use 4.04 kW, resulting in 18.81 kW saved. The existing system used 83,402 kWh; the new one will use 14, 746 kWh, resulting in 68,656 kWh saved. The existing lighting energy cost had been $12,501 per year; the new system will cost $2,211, with an annual savings of $10,290. The Enlightened Energy Program rebate is $9,400.

The project, from concept to installation, took about a year; final go-ahead to completion took about six months. Not only has Con Edison achieved the desired goals of easy maintenance and improved aesthetics, using up-to-date technology, but it has demonstrated proudly that it can do what it urges its customers to do—to thoughtfully save energy.

The Light Engine, commercially available in the modular form as announced at Hannover Fair in mid-April, is still being explored for automotive applications, particularly for low-profile headlamps. Lower hood lines in today's aerodynamic car bodies afford scant room for headlamps. The engines can be remotely located and guide light via fibers to where it is needed. Downlighting, display, safety and decorative lighting applications are also possibilities for future investigation and product development.

Regarding the creative thinking involved in this project, Howard Brandston says, "These kinds of experiments are the keys to the development of lighting—you don't really know what will happen, and you start to discover what you need along the way, and it has a cascading effect that leads to other discoveries and other solutions to problems."

It is in inventive applications like this that progress and technology truly go hand in hand.

DETAILS

PROJECT: CON EDISON CLOCK LIGHTING SYSTEM
LOCATION: NEW YORK, NY
CLIENT: CON EDISON
LIGHTING CONSULTANT: HOWARD BRANDSTON, and ROBERT PROUSE, project manager, H.M. BRANDSTON & PARTNERS
ELECTRICAL CONTRACTOR: SCHLESINGER ELECTRICAL CONTRACTORS, NEW YORK, NY
FIBEROPTIC INSTALLATION: ELDERHORST BELLS INC., PALM, PA
PHOTOGRAPHERS: MICHAEL DANOWSKI and LINDA ZAI (page 32), LINDA ZAI (top, page 33), BILL BRENNAN (center, page 33), CON EDISON; photo page 33, bottom, courtesy of GE Lighting
LIGHTING MANUFACTURERS: GE LIGHTING—Light Engine, JOHN DAVENPORT and RICHARD L. HANSLER; LUMENYTE INTERNATIONAL—large-core plastic optical fiber used in clock faces; FIBER OPTIC TECHNOLOGY—glass fiber bundles used in clock hands

PERFECTLY BALANCED SYSTEM SOLUTIONS.

At OSRAM SYLVANIA, we've raised lighting technology to an art form. Our OCTRON® T-8 lamp and QUICKTRONIC® electronic ballast combinations are the perfect balance between innovation and reliability.

Not only do they reduce energy costs by up to 40% compared to ordinary F40 lamps on standard magnetic ballasts, they also provide high color rendition of 75-90 to improve lighting quality. And all systems are carefully engineered to provide optimum performance while maintaining maximum reliability. Our broad scope of lamp and ballast combinations also guarantees that we can provide system solutions to meet all your lighting needs.

And these systems are covered by the newest, most comprehensive warranty in the industry – QUICK 60+. With up to 60 months coverage for the ballast *plus*...up to 24 months coverage for the lamps, this warranty provides an unmatched assurance that the system selected will provide reliable performance.

In fact, we offer the largest selection of energy-efficient, high performance lighting products in the industry. So, when you have a lighting problem, pick up the phone and let us provide the solutions: 1-800-LIGHTBULB.

OSRAM
SYLVANIA

TECHNOLOGY BROUGHT TO LIGHT

Circle No. 19 on product service card

The Commercial Design Network

LIGHTING PRODUCT GUIDE

This special presentation of state-of-the-art lighting equipment, which appears in the publications of the Commercial Design Network (*Architectural Lighting, Contract Design,* and *Facilities Design & Management*) includes information on a range of products from decorative and outdoor luminaires, to lamps and ballasts. For readers' convenience, the names, addresses and telephone and fax numbers of manufacturers have been listed, in addition to reader service card numbers. This Guide is only one way in which the Network publications are working together to benefit both the manufacturing and specifier segments of the architectural and design communities.

AMERICAN LANTERN COMPANY

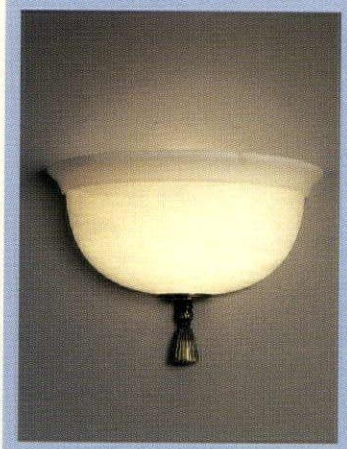
4344 HIGHWAY 67N
NEWPORT, AR 72112
TEL. 501-523-2705/
FAX 501-523-5744

Contact: Sarah Sexton

Product Shown: The new Duraplex molded bath line combines generous proportions and hand-sculpted styling with durability and versatility. Shell series above is shown in Marbelesque finish. Light strip styles have easily removable, decorative panels and are available in matte white, allowing custom finishing. Over 40 designs are offered in the 8-page "Light Sculpture" brochure.

Company Profile: American Lantern offers a line of over 1500 interior and exterior styles for residential and commercial markets.
Circle 101

BALDINGER ARCHITECTURAL LIGHTING



19-02 STEINWAY STREET
ASTORIA, NY 11105
TEL. 718-204-5700/
FAX 718-721-4986

Contact: Linda Senter

Product Shown: Designed by world-renowned architect, Robert A.M. Stern, Tassel comes in 12-inch or 16-inch widths and is available in a variety of finishes and diffusers. (Antique brass and alabaster shown.)

Company Profile: Baldinger produces the lighting collections of world-renowned architects and designers, as well as wonderfully handcrafted custom lighting in all styles.
Circle 102

CSL LIGHTING MFG.

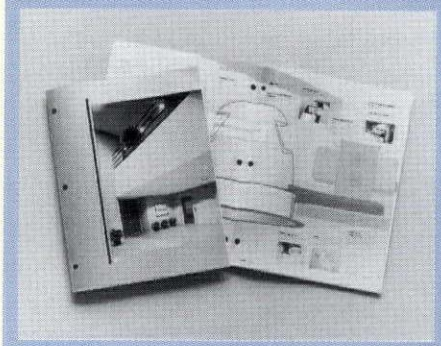
27615 AVENUE HOPKINS
VALENCIA, CA 91355
TEL. 805-257-4155/
FAX 805-257-1554

Contact: Richard Stellar

Product Shown: Mitelite halogen under-cabinet lighting, offered in three sizes, is the slimmest, most unobtrusive undercabinet light on the market. A mere 1 1/4 inches deep, and fully dimmable, Mitelite delivers higher lumens, brighter light than any other. Easy to mount, instant-on (no flickering), and available with a cord, switch and plug. Contractor friendly models are also available that hardwire directly to house current.

Company Profile: Low-voltage, track, decorative, and 2D fluorescent lines are also available.
Circle 103

CAPRI LIGHTING



6430 E. SLAUSON AVENUE
LOS ANGELES, CA 90040
TEL. 213-726-1800/
FAX 213-728-1319

Contact: Larry Collins

Product Shown: Capri Lighting has introduced a broad offering of recessed and surface fixtures for use with energy-efficient compact fluorescent lamps. The new catalog presents three major families of fluorescent downlights: the Commercial offering, Design/Build products, and the Pacesetter series.

Company Profile: Capri manufactures a variety of products, including architectural recessed incandescent, low voltage, HID, fluorescent and track lighting.
Circle 104

LIGHTING PRODUCT GUIDE

DESIGNPLAN LIGHTING, INC.

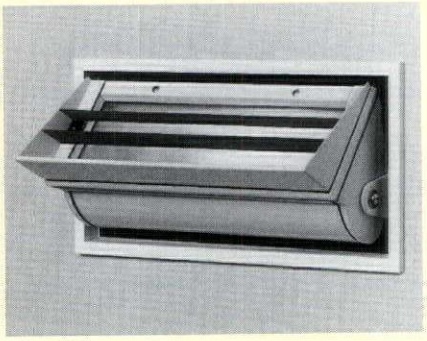
1225 STATE ROUTE 12
FRENCHTOWN, NJ 08825
TEL. 908-996-7710/
FAX 908-996-7042

Contact: Richard Klapper

Product Shown: The Quarter is a cast aluminum, vandal-resistant indoor/outdoor wall sconce. The unit is U.L. listed wet label and takes an 18-watt compact Quad Deluxe D/E fluorescent lamp. It uses a 120-volt electronic ballast capable of starting down to -25F.

Company Profile: DesignPlan produces a range of decorative vandal-resistant luminaires for indoor and outdoor use, as well as custom products.
Circle 105

ELLIPTIPAR, INC.

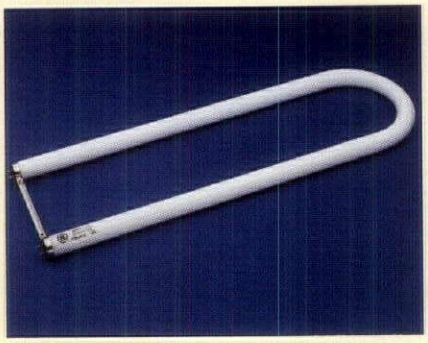


114-152 ORANGE AVENUE
WEST HAVEN, CT 06516
TEL. 203-931-4455/
FAX 203-931-4464

Contact:
Jennifer B. Monahan

Product Shown: Elliptipar's A.D.A. luminaires are small but mighty. Their unique asymmetric reflector, when mounted in the wall at eye height, will spread even brightness across a broad expanse of ceiling. It can use tungsten halogen or efficient and warm, people-flattering HQI lamps. Great for hospital and school corridors and the like.
Company Profile: Elliptipar manufactures indoor and outdoor products including asymmetric direct/indirect, task/ambient, incandescent, fluorescent and HID.
Circle 106

GE LIGHTING



NELA PARK
CLEVELAND, OH 44112

Contact: To contact your GE Lighting Specialist 1-800-523-5520

Product Shown: The T8 Mod-U-Line U-shaped lamp offers design flexibility for the commercial and industrial market. Only 1 inch in diameter, the lamp is ideal for innovative fixtures in modular building designs, while maintaining uniform levels. The lamp is efficient, has a long life and is available in SP color (CRI 75), and SPX color (CRI 84). The lamp may also be included on energy reduction rebate programs offered by electric utilities.
Circle 107

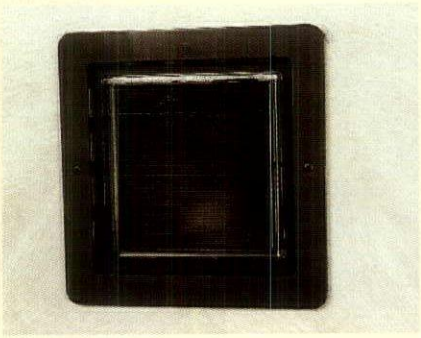
HAFELE AMERICA CO.

3901 CHEYENNE DRIVE
ARCHDALE, NC 27263
TEL. 1-800-334-1873/
FAX 910-431-3831

Product Shown: The undercabinet halogen light bar is available with 20-watt lamps in attractive white or black housings. The 9-inch model features one 20-watt bulb; the 18-inch model, two lamps; and the 27-inch unit, three lamps. Each fixture comes with a cord and plug, and has its own off/on switch. The unit is U.L. and C.S.A. listed and can be used in kitchens, offices, laboratories and other locations. Two mounting screws are provided.

Company Profile: Hafele offers a complete halogen lighting collection for furniture and cabinetry, all U.L. and C.S.A. listed.
Circle 108

HYDREL



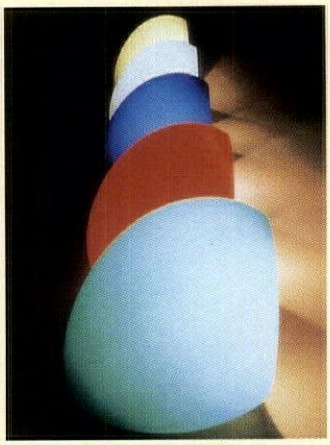
12881 BRADLEY AVENUE
SYLMAR, CA 91342
TEL. 818-362-9465/
FAX 818-362-6548

Contact: Hal Madsen

Product Shown: The 9600 Series Recessed Wall Lights have improved beam patterns and unique internal glare control that allow remarkable 10 to 1 spacing, making far fewer fixtures necessary. Sealed lighting components eliminate water intrusion, the number one outdoor lighting problem. Modular components provide for fast, easy installation and maintenance.

Company Profile: Hydrel manufactures innovative outdoor lighting, incorporating advanced technology for sealing in-grade surface mount, wall mount, and underwater fixtures to meet the rigors of the outdoor environment.
Circle 109

LEUCOS USA INC.



70 CAMPUS PLAZA II
EDISON, NJ 08837
TEL. 908-225-0010/
FAX 908-225-0250

Contact: Christina Mazzawi

Product Shown: The Golf P1 globular wall sconce made of Murano hand-blown glass provides upward and diffused illumination. Companion table, floor and pendant versions are also available. The fixture is offered in five brilliant colors: satin white, cobalt blue, red, amber and Nile green. It is offered in versions that use halogen or incandescent lamps. Golf P1 is in a moderate price range.

Company Profile: In addition to the Golf family, Leucos introduces the Vittoria, Pulce, Grillo, Aladino, Vela and Inchino series available in Spring 1994.
Circle 110

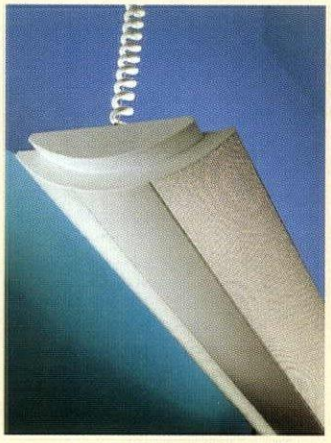
LIGHTING PRODUCT GUIDE

LIGHTOLIER

100 LIGHTING WAY
SECAUCUS, NJ 07096
TEL. 201-864-3000/
FAX 201-864-4512

Product Shown: Pro Spec is a modular, recessed point source system allowing greater design creativity by providing the flexibility of eleven sources and three optics in one housing. Modular plug-in accessories and shallow housings increase the system's versatility and usefulness to the design professional. Matching apertures and finishes allow Pro Spec to be utilized with all other Calculite incandescent, compact fluorescent, and metal halide downlights.
Circle 111

LITECONTROL CORPORATION



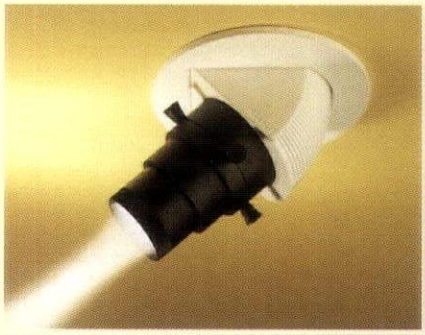
100 HAWKS AVENUE
HANSON, MA 02341
TEL. 617-294-0100/
FAX 617-293-2849

Contact: Amy Simmons

Product Shown: Classica, by Litecontrol, is the ultimate blending of design and technology. Designed for use in upscale, high-design interior spaces, including offices where VDTs are used. This creative solution answers the need for high-lumen, energy efficient, multi-lamp combinations, making Classica a project-oriented system.

Company Profile: Litecontrol Corporation manufactures high performance, energy efficient architectural fluorescent lighting systems for commercial and institutional applications.
Circle 112

LUCIFER LIGHTING COMPANY



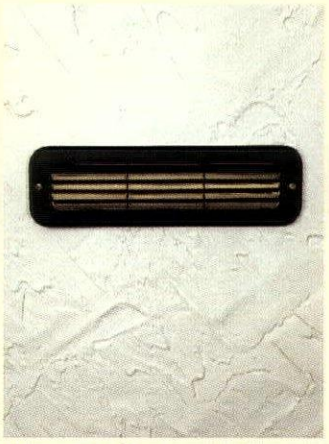
414 LIVE OAK STREET
SAN ANTONIO, TX 78202
TEL. 1-800-879-9797/
FAX 210-227-4967

Contact: Marisa Martin

Product Shown: This new framing projector inserts into Lucifer adjustable downlights for framing artwork and interior settings. Accessory uses an optical lens and trimming shutter to focus light in square patterns. The unit is for use with MR 16 quartz halogen lamps. The framing projector accepts Optivex lens for ultraviolet protection.

Company Profile: Lucifer Lighting Company manufactures miniature low-voltage lighting fixtures, including linear light strips, recessed downlights, track and spotlights, and shelf lights.
Circle 113

LUMIERE DESIGN & MFG. INC.

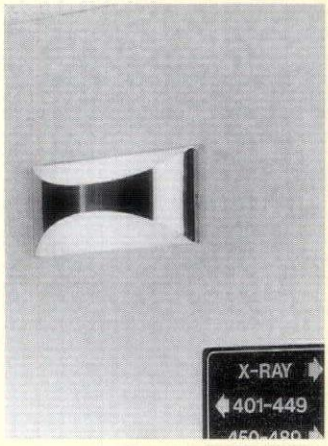


31360 VIA COLINAS #101
WESTLAKE VILLAGE, CA 91362
TEL. 818-991-2211/
FAX 818-991-7005

Product Shown: To solve problems associated with concrete installations, Lumiere Design & Mfg. has created the Zuma #1211 composite recessed step light. Crafted from glass-filled polycarbonate, Zuma #1211 defeats the corrosive elements of concrete and stone. Zuma #1211 stands strong for years, in residential or commercial applications. Also available: CAT. #1212 120-volt, with 20-watt incandescent light source; and #1213 12-volt, two 18-watt incandescent lamps.

Company Profile: Lumiere is a prime manufacturer of landscape and specialty lighting fixtures, with its own state-of-the-art manufacturing equipment on site.
Circle 114

R.A. MANNING COMPANY



P.O. BOX 1063
1810 NORTH AVENUE
SHEBOYGAN, WI 53082
TEL. 414-458-2184/
FAX 414-458-2491

Contact: Tom Manning

Product Shown: R.A. Manning Company has added to their full line of designer lighting, creating a complete line of wall sconce fixtures built to meet the Americans with Disabilities Act (ADA) requirements. The law specifies that light fixtures projecting from walls not extend more than 4 inches into hallways, aisles or passageways, if they are mounted 27 to 80 inches above the finished floor.

Company Profile: For over four decades, Manning has been a leading manufacturer of high-quality custom lighting for churches, schools and public buildings worldwide.
Circle 115

NORAL LIGHTING

12940 SAN FERNANDO ROAD
SYLMAR, CA 91342
TEL. 818-367-9773/
FAX 818-367-7113

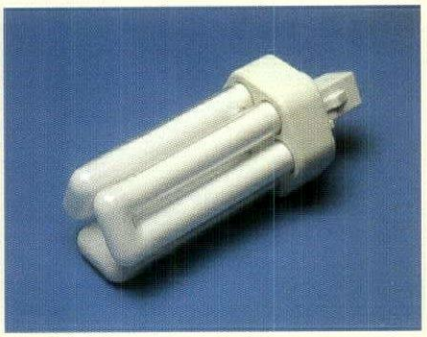
Contact: Clint Wade (909-624-3916)

Product Shown: The Princess Model residential-use luminaire can be wall or post mounted. The housings, brackets and posts are offered in black, white, patina or custom color, polyester-coated aluminum. Sun, weather, and impact resistant lenses in one-piece acrylic or polycarbonate. Choice of lamp, voltage, accessories, optics.

Company Profile: Grouping models of various sizes and applications into "Families of Luminaires" provides high-quality, integrated lighting solutions for residential and commercial uses.
Circle 116

LIGHTING PRODUCT GUIDE

OSRAM SYLVANIA INC.

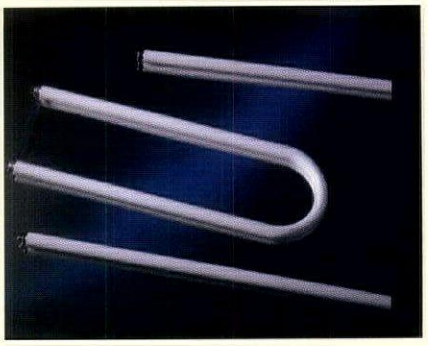


100 ENDICOTT STREET
DANVERS, MA 01923
TEL. 508-777-1900/
FAX 508-750-2152

Product Shown: The Sylvania Dulux T and T/E triple tube compact fluorescent family are up to 78 percent more efficient than incandescent lamps. Rated at 10,000-hour life, the 18- to 32-watt units produce up to 2400 lumens, equivalent to a 150-watt incandescent lamp.

Company Profile: Osram Sylvania's focus is on new product innovation, system solutions and energy efficient, longer-life lighting products.
Circle 117

PHILIPS LIGHTING COMPANY

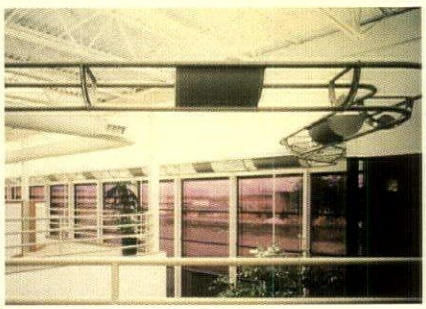


200 FRANKLIN
SQUARE DRIVE
SOMERSET, NJ 08875
TEL. 908-563-3273

Contact: Nick Bleeker

Product Shown: Philips Lighting TL 80TM Series fluorescent lamps represent a major innovation in lighting quality. The thin 1-inch diameter lamps contain the finest blend of rare-earth trichromatic phosphors, achieving a color rendering index of 85. TL 80 lamps installed with electronic ballast result in a savings of up to 43 percent in energy costs compared to standard T 12 on magnetic ballasts. In addition to energy savings, TL 80 Series lamps have a lumen maintenance of 93 percent and provide total system efficacies of up to 104 lumens per watt. Philips Lighting's TL 80 Series offer an array of wattages, lengths and color temperatures that suit every application imaginable.
Circle 118

SPI LIGHTING INC.



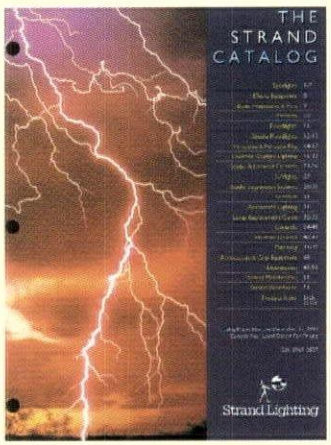
10400 N. ENTERPRISE DR.
P.O. BOX 635
MEQUON, WI 53092
TEL. 414-242-1420/
FAX 414-242-6414

Contact: Cindy Frederick

Product Shown: Lightruss is a series of indirect light modules with HID lamps that are uniformly spaced in a continuous truss system anchored by die-cast aluminum bulkheads. The system can be configured to round corners, accommodate changes in elevation, be pier-mounted or be inverted to provide a direct light source.

Company Profile: Renaissance, Echo and Options product lines are also manufactured by SPI Lighting Inc.
Circle 119

STRAND LIGHTING

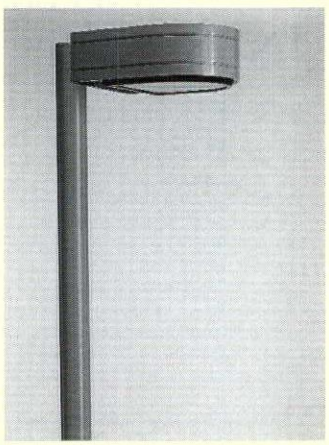


1814 SOUTH SANTA FE AVENUE
RANCHO DOMINGUEZ, CA 90221
TEL. 310-637-7500/
FAX 310-635-5519

Product Shown: Stand Lighting's full line catalog includes information on spotlights, effects equipment, beam projectors & PARs, fresnels, floodlights, studio floodlights, portables & portable kits, location daylight lighting, studio & location fresnels, softlights, studio suspension systems, scrollers, automated lighting, lamp replacement guide, controls, interface devices, dimming, accessories & grip equipment and distribution.

Company Profile: Strand manufactures a full line of dimmers, controls and luminaires for architectural and entertainment uses.
Circle 120

STERNER LIGHTING SYSTEMS, INC.



351 LEWIS AVENUE WEST
WINSTED, MN 55395
TEL. 612-485-2141/
FAX 612-485-2899

Contact: Barbara Kampmeyer

Product Shown: Sterner's Sedona expands it "custom look" Area/Roadway line with a full range of HID lamps and IES light distribution patterns. Two sizes, to 400 watts, the Sedona provides the toolless maintenance and sealed optics standard in Sterner's Roadway products, as well as strong architectural appeal.

Company Profile: Sterner Lighting Systems manufactures area/roadway lighting, Infranor precision floodlighting, architectural lighting controls, custom luminaires, ambient and interior lighting, and Northern Light security lighting.
Circle 121

TIVOLI INDUSTRIES, INC.

1513 EAST SAINT
GERTRUDE PLACE
SANTA ANA, CA 92705
TEL. 714-957-6101/
FAX 714-957-1501

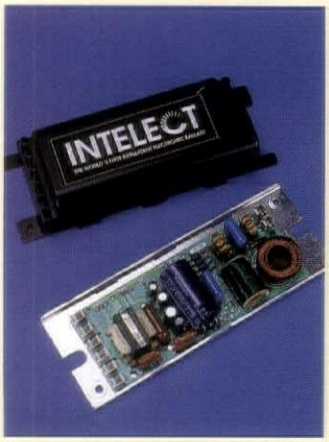
Contact: Mitch Bronson

Product Shown: The unique Tivoli bi-directional step light is available in two versions: direct/direct (shown) and direct/indirect. They combine a durable vinyl extrusion with a variety of replaceable lamp and LED light sources. Tivoli bi-directional step lights are offered with colored and clear lenses for carpeted applications.

Company Profile: Tivoli also manufactures cove lighting (BX & PL), starlight ceiling panels, task/accent lighting, landscape lighting, special effects—chase & fade, aisle lighting, and fiberoptic animated signs.
Circle 122

LIGHTING PRODUCT GUIDE

USI LIGHTING/PRESCOLITE



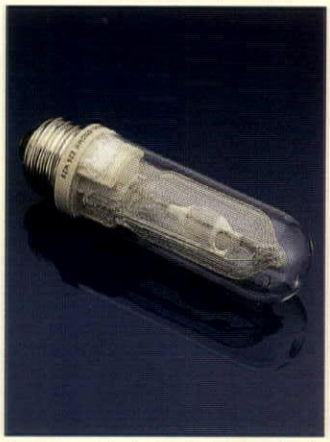
1251 DOOLITTLE DRIVE
SAN LEANDRO, CA 94577
TEL. 510-562-3500

Contact: Keith Bahde

Product Shown: Intelect is a compact fluorescent dimming system that uses new patented integrated circuitry to substantially reduce the ballast size and provide a dimming solution that is finally affordable. The unit provides flicker free, full-range dimming from 100 percent down to 5 percent.

Company Profile: Other product lines include: Prescolite track and downlighting, Prescolite Emergency systems, Prescolite controls, Columbia (specification fluorescent), and Moldcast (outdoor).
Circle 123

USHIO AMERICA, INC.



10550 CAMDEN DRIVE
CYPRESS, CA 90630
TEL. 1-800-838-7446/
FAX 1-800-776-3641

Contact: Craig Asato

Product Shown: The UHI-S70DW/E26/EUP compact 70-watt single-ended metal halide lamp is explosion proof and ultraviolet protected. The lamp burner is contained within an explosion-proof envelope for open fixture use with standard ANSI ballast. Axial burner provides improved light output of up to 30 percent.

Company Profile: Ushio America manufactures quartz halogen, incandescent and discharge lamps. Standard and specialty MR 16 and compact metal halide lamps available with ultraviolet-absorbing quartz glass.
Circle 124

VANTAGE CONTROLS, INC.

345 EAST 800 SOUTH
OREM, UT 84058
TEL. 801-224-6560/
FAX 801-224-0355

Product Shown: Home control systems designed for the luxury residence and the custom architectural project, Vision by Vantage is the designer's choice for today's intelligent living environment. Vantage Controls' Vision technology is a fully programmable, microprocessor-based lighting and home control system. Featuring distributed processing and designer control stations, the system provides unparalleled flexibility, convenience and reliability.
Circle 125

VISA LIGHTING

8600 WEST BRADLEY ROAD
MILWAUKEE, WI 53224
TEL. 414-354-6600/
FAX 414-354-7436

Contact: Geoffrey S. Marlow

Product Shown: Visa's quality design and construction has gone portable with its table lamp series. These lamps stand 28 1/2 inches high and 22 inches wide with an 8-inch shade. Created with several configurations and classic shade options, these table lamps are available with incandescent or integrally ballasted compact fluorescent lamping. Options include brushed solid aluminum and painted finishes.
Circle 126

THE WATT STOPPER INC.

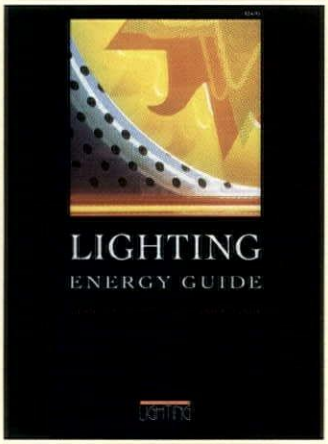
2800 DE LA CRUZ BLVD.
SANTA CLARA, CA 95050
TEL. 1-800-879-8585/
FAX 408-988-5373

Contact: Stan Lynch

Product Shown: PIR ultrasonic and dual technology occupancy sensors automatically turn lights on only in areas that are occupied and off when vacated. They come in a variety of models to fit every room in a building and provide 20-60 percent in energy savings.

Company Profile: The Watt Stopper manufactures light level sensors, energy auditing tools and office power controls.
Circle 127

COMMERCIAL DESIGN NETWORK



MILLER FREEMAN INC.
1515 BROADWAY
NEW YORK, NY 10036
TEL. 212-626-2585

Contact: Michelle Murtha

Product Shown: The 60-page "Lighting Energy Guide: Designing For Quality & Savings," published by Architectural Lighting magazine, includes information on how to sell clients on energy efficiency, guidelines for effective energy management, Energy Policy Act implications, how to conduct a lighting audit, fluorescent dimming and electronic ballasts, HID luminaires, guidelines for smart fixture shopping, occupancy sensors, controls, maintenance, and new construction and retrofit case studies that detail energy efficient and design-wise techniques. The guide can be purchased by sending $24.95 plus $3.00 shipping and handling to the address above.

DESIGNER'S CHALLENGE

How many light bulbs does it take to change a designer? Just one.

Many lighting installation designers and inventors of lighting equipment have historically built around incandescent PARs and generic MR-16 reflector lamps.

For today's designer, the challenge of creating high-end, sophisticated designs need only be restricted by artistic imagination. Ushio's REFLEKTO® series of MR-16 lamps offer an aesthetically pleasing line of matt black, white, silver and clear finishes— and what's more— their special aluminized coating reduces thermal load away from the socket and transformer, while the reflected light produces a beautifully uniform beam pattern.

Take the DESIGNER'S CHALLENGE....

Design or retrofit your lighting fixture for any REFLEKTO® lamp and submit your entry. The creator of the best design will win a trip for two to Munich, Germany to visit our BLV lamp factory...just in time for OKTOBERFEST

Send a postcard requesting contest rules and registration by August 10, 1994 to Ushio America, Inc. - Marketing Communications, 10550 Camden Drive, Cypress, CA 90630

USHIO

Circle No. 21 on product service card

Light & Form

MULTI-PLANED SURFACES ARE CAST INTO PERSPECTIVE WITH VARIED FORMS AND SHAPES OF LIGHT IN THIS SINGLE-FAMILY, 60-YEAR-OLD RESIDENCE

BY THEODORE J. THEODORE, AIA, AND JOHN BRADSHAW, AIA

ENTRY HALL: (Right) Modulated surfaces interplay with light from narrow coves.

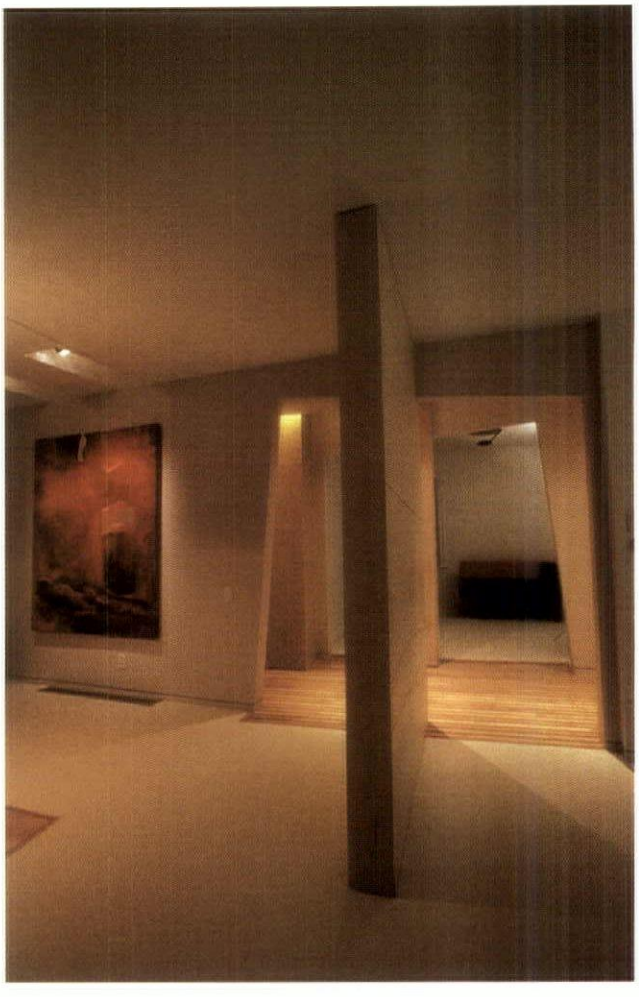
Not unlike most residential suburbia, this single-family bungalow, built in 1933, contained spaces which were merely residues of its shell. As a result, minimal natural illumination in combination with sparse artificial illumination made the inherently dark, compressed spaces even more imposing and less eventful. The challenge to us, as architects, was to utilize natural and artificial illumination as a primary design tool in redesgning each space.

Through our design approach of "addition through subtraction," we removed unnecessary walls and ornamentation in an attempt to unfold each space, to make them less partitioned. The elements of color, form and space/place are given life by the quintessential element of light.

We see beauty in lighting from a complementary point of view. More specifically, the effect/affect lighting can have in a space is critical when one attempts to delineate, define or demarcate zones or "atmospheres of feeling." If studied and successfully applied, lighting plays an integral role in creat-

DINING TO MEDIA ROOMS VIEW: (Below right) The partitions are used sparingly to set up expectations and then confound them.

DINING ROOM: (Top right) A simple pendant illuminates the dining table area. Two ceiling niches conceal fixtures that highlight artwork.



ing the architecture. This, for us, is beauty. It is not about celebrating the fixture itself, its form or material, but more about the fixture's illuminative ability to uncover the essence of the architecture. Consider our approach a shift from "object oriented" to "subject enriched" design.

ENTRY HALL

The spear-shaped entry hall soffit is flanked by narrow coves which conceal low-voltage strips fitted with 5-watt xenon lamps placed 6 inches on center. The intent is to punch up the form of the soffit, while simultaneously washing the entire wall of canary yellow glass mosaic tiles. The xenon lamps, also used in automobiles, provide the qualities of whiteness and brightness, which are unusual for 5-watt lamps.

LIVING PLACE

The owner wanted to retain the three existing ceiling-mounted projector lamps and replace the two Deco-style wall-mounted sconces in the living place. As the client requested, there are no free-standing lamps. The projector lamps have now been re-oriented to frame an Erte sculpture located within the redesigned fireplace face and a Miro painting on an adjacent wall.

DINING PLACE

A circular pendant luminaire is suspended over the rectangular glass Carlo Scarpa table. Niches carved into the 8-foot ceiling house monopoint fixtures, while drramatically illuminating the boldly colored wall-mounted painting.

BATH PLACE

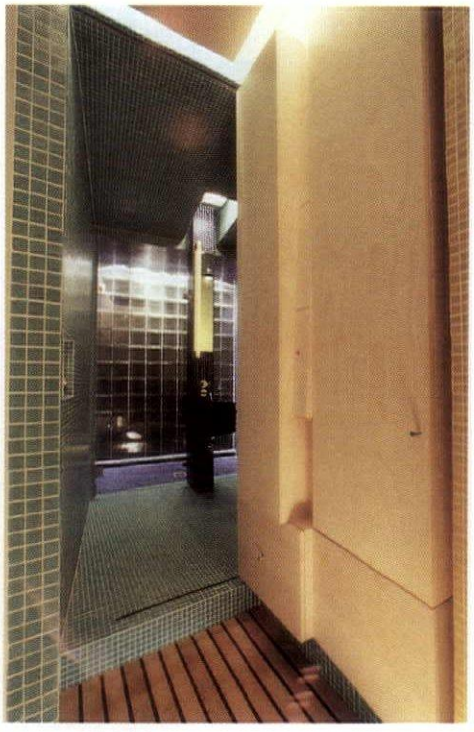
The design approach in the bath place was to capture the prismatic qualities offered by the new double-fritted glassblock window wall and colorful 3/4 inch square mosaic tiles installed throughout. The intent was to re-radiate and blend the conditions of refreshing sunlight from the window wall, which change daily and seasonally, with complementary washes of quartz-halogen illumination. The cobalt blue, seafoam green and canary yellow mosaic tiles are enhanced by the illumination from line-voltage waterproof fixtures lamped with 50-watt, PAR 20, NFL quartz halogens placed in the shower and toilet areas.

A line-voltgae linear incandescent fixture lamped with an opal frosted, 150-watt strip light source i s placed at the bath mirror over the cobalt

LIVING ROOM: **(Below) The ceiling fixtures are pre-existing. Fixed luminaires have been added to highlight artwork above the fireplace and above the sofa.**

BATH: (Right) Electric illumination and daylight blend and play on the multi-colored mosaic tiles and glassblock.

BATH: (Far right) Xenon 5-watt lamps are concealed in a cove cut into the sloped ceiling at the bath's entry.



blue wet-wall column. This lamp offers good color rendition, while providing a relatively glare-free source of illumination.

TIME FRAME

This project, from design through construction, has been completed in a six-month period. **pky**architecture not only provided architectural services, but also the general contracting and millworking services as well.

*The authors are principals of **pky**architecture based in Skokie, IL.*

DETAILS

PROJECT: SINGLE FAMILY RESIDENCE
LOCATION: PARK RIDGE, IL
ARCHITECT, INTERIOR DESIGNER & LIGHTING DESIGN: THEODORE J. THEODORE, AIA and JOHN BRADSHAW, AIA, **pky**architecture
GENERAL CONTRACTOR: **pky**architecture
CARPENTRY: MOGUL CONSTRUCTION CO, INC.
PLUMBING: FETTUS, LOVE AND SIEBEN
ELECTRICIAN: ELMHURST ELECTRIC CO., INC.
TILE DISTRIBUTOR: BRANN CLAY PRODUCTS CO.
TILE SETTER: G.M. SLOAN MOSAIC & TILE CO.
WOOD FLOOR CONTRACTOR: FLOORS BY JUELL, INC.
GLAZER: LAKESIDE GLASS & MIRROR, INC.
LIGHTING MANUFACTURERS: TASK LIGHTING, JUNO LIGHTING, MULBERRY, GE LIGHTING, OSRAM/SYLVANIA

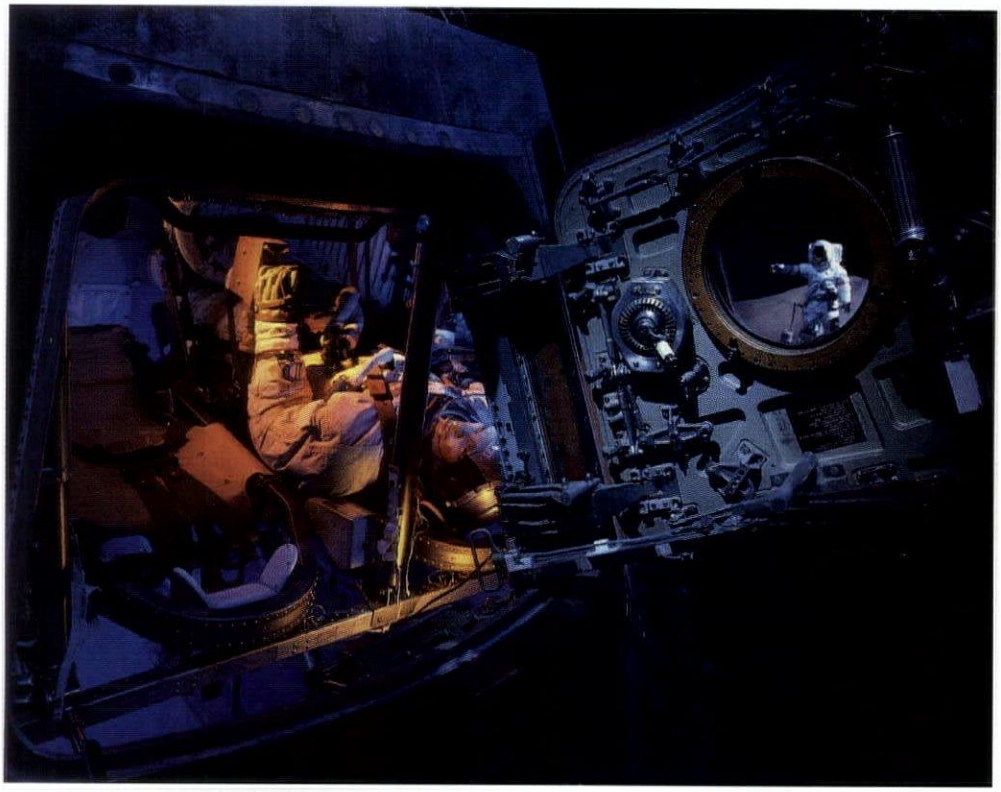
(This page) The interior of an "actually flown" Gemini capsule is revealed. One astronaut is "EVA" beyond the spacecraft. A model of the Saturn rocket points away in the distance.

(Opposite page) Shown is the interior of Apollo 17, the last spacecraft to make it to the moon and back. Through the window in the door one can see a man located within the moonscape diorama.

Space Center Houston

LIGHTING ARTIFACTS OF OUTER SPACE EXPLORATION INVOLVED MAJOR DOWN-TO-EARTH CONSIDERATIONS FOR THE DESIGN TEAM OF THE NASA JOHNSON SPACE CENTER

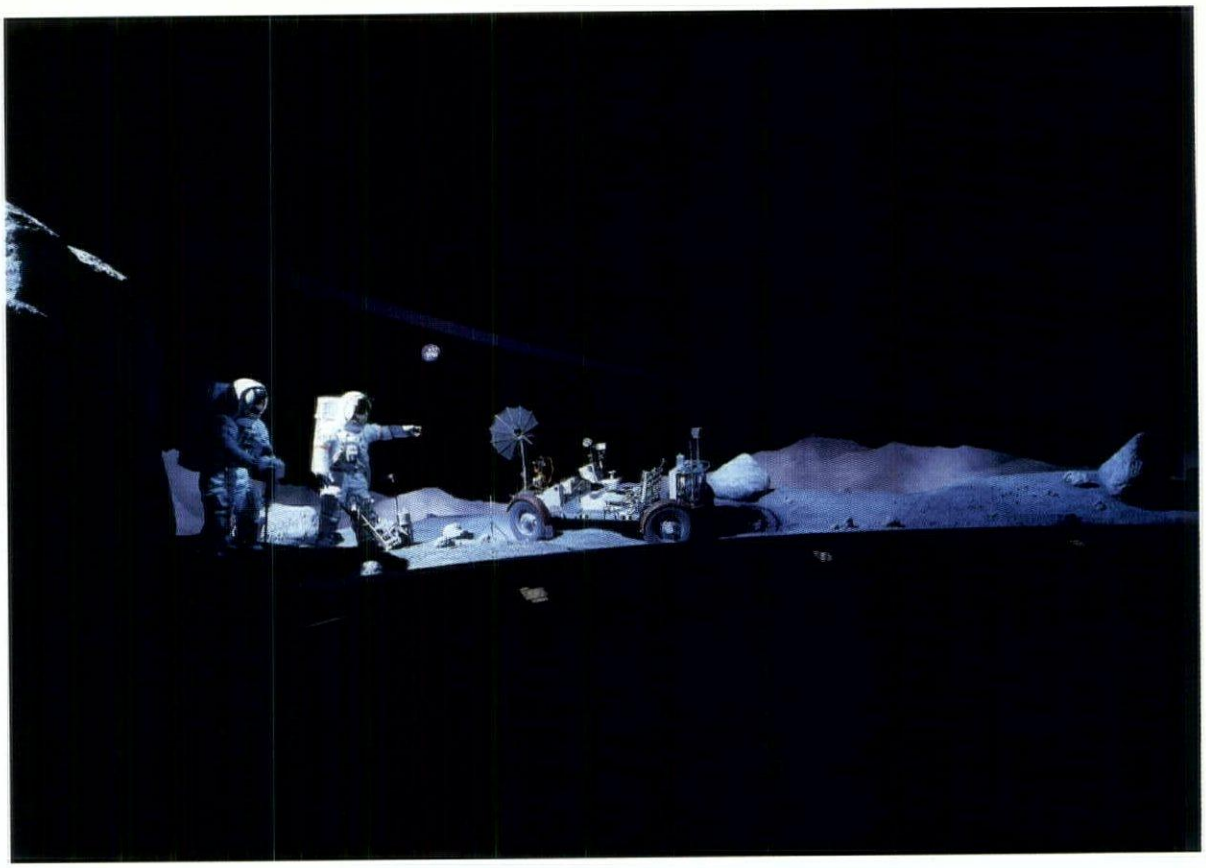
BY LARRY FRENCH



Hands-on experience of the adventures of human space exploration, past and present, is offered in a visually dazzling and emotionally rich environment at the new Visitors' Center for the NASA Johnson Space Center in Clear Lake, TX. The mission statement of the building is: "To present to the public America's Manned Space Program—its past, its present, and a realistic projection of its future—in order to inspire the young to be participants in the space program and to instill in all a sense of pride in America's accomplishments on behalf of its citizens."

Due to timetable and fiscal restraints, the project has been designed and completed on an extremely fast schedule. About five months elapsed from beginning design development to the completion of contract documents. Construction began on the foundation and steel at approximately 30 percent contract documents, with final design work required within this footprint.

The exhibit lighting had been developed and approved relatively late in the design process. From its ground-breaking to completion, the facility was constructed in 14 months, including 75 days of rain delays during the grading and foundation work. Both the architectural lighting and the show/exhibit lighting for the project has been designed by S. Leonard Auerbach & Associates in San Francisco, CA, and coordinated by Larry French, of S. Leonard Auerbach & Associates, in collaboration with Clive Grout of the architectural firm of Waisman Dewar Grout Carter, and Bob Rogers and Chuck Roberts of BRC Imagination Arts.



THE PLAZA

Visitors enter the 183,000 square foot building through the Space Center Plaza, a very large atrium space that holds the original lunar module trainer and a full-scale mockup, both interior and exterior, of the Space Shuttle cockpit section. Off the Plaza are an 870mm (IMAX and IWERKS) film theater, a 570mm film theater, a "live" format theater sharing direct communication between Houston Mission Control and space shuttle crews, and an interactive experience area with space shuttle flight simulators, including a live orientation show, called "Living in Space," explaining life aboard the space station. Restaurants, a retail gift shop and the entry to the tram tour of the Johnson Space Center facility are also located adjacent to this central hub.

Luminaire mounting locations for general and exhibit lighting in the Space Center Plaza were limited to the exposed trusswork located at the ceiling plane. General illumination has been achieved with adjustable 175-watt metal halide fixtures with a rotatable oval beam pattern. Incandescent well lights, equipped with a custom top cover plate and color filter, simulate runway lights recessed in the floor.

All exhibits have been illuminated with theatrical fixtures using tungsten halogen sources. In almost all cases, tungsten halogen sources were preferentially selected for the longer life version of a given lamp. For example, all PAR 64 units specified are the 4,000-hour average rated life lamps. Instead of the 1,000-watt FEL lamp, the 750-watt EHG lamp with a 2,000-hour average rated life is used. Glass color filters have been installed, after initial color trials using theatrical color filter media, to ensure color stability over time.

In general, lighting of space ancillary to the Plaza has been accomplished using low-glare metal halide downlighting. In some cases, metal halide downlights are equipped with black cones to further decrease the apparent brightness. The sit-down restaurant and the gift store are an exception to the general use of long-life metal halide.

Both of these special spaces required a high degree of sparkle and visual interest to draw patrons. Within the gift store, the architectural delta wing motif is echoed by a chrome finish, low-voltage track suspended in expanding delta wing patterns. Delicate MR 16 fixtures, magnetically connected to the metal track, allowed a flexible retail lighting approach to the space.

SPACE CENTER THEATER

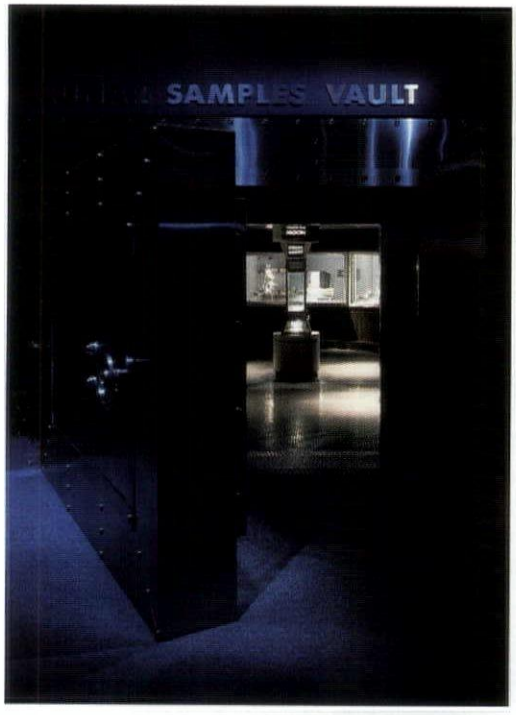
The 870mm film theater is a fully automated double load theater and one of a few in the world incorporating both the IMAX and IWERKS film formats. The 500-watt and 250-watt T4 medium distribution downlights provide general illumination. Theatrical 8-inch fresnels are used for general screen washes, supplemented by 250PAR38FL strips in a pit below the screen. A low-voltage incandescent indicator strip alerts visitors to the pit edge. Glowing incandescent wall sconces mark entries and exits. Compact fluorescent step lights with true 45 degree cutoff louvers illuminate steps and aisles. Due to the extremely steep rake of the seating and the very high ceilings, downlighting has been rigged on a manual lowering system to allow for lamp replacement. All incandescent circuits are

(Above) Exhibit showing a panoramic view of astronauts on the moonscape.

(Opposite page, top) Exiting from the Starship Gallery and moonscape area, one looks into the Lunar Vault.

(Opposite page, below) Entry into the Skylab. The mock-up is so large it had to be installed first and the building built around it.

(On the cover) The glowing red heat shield of the Apollo capsule has a motion effect created with light.



dimmed on a centralized system which receives automated commands from a show controller.

MISSION STATUS

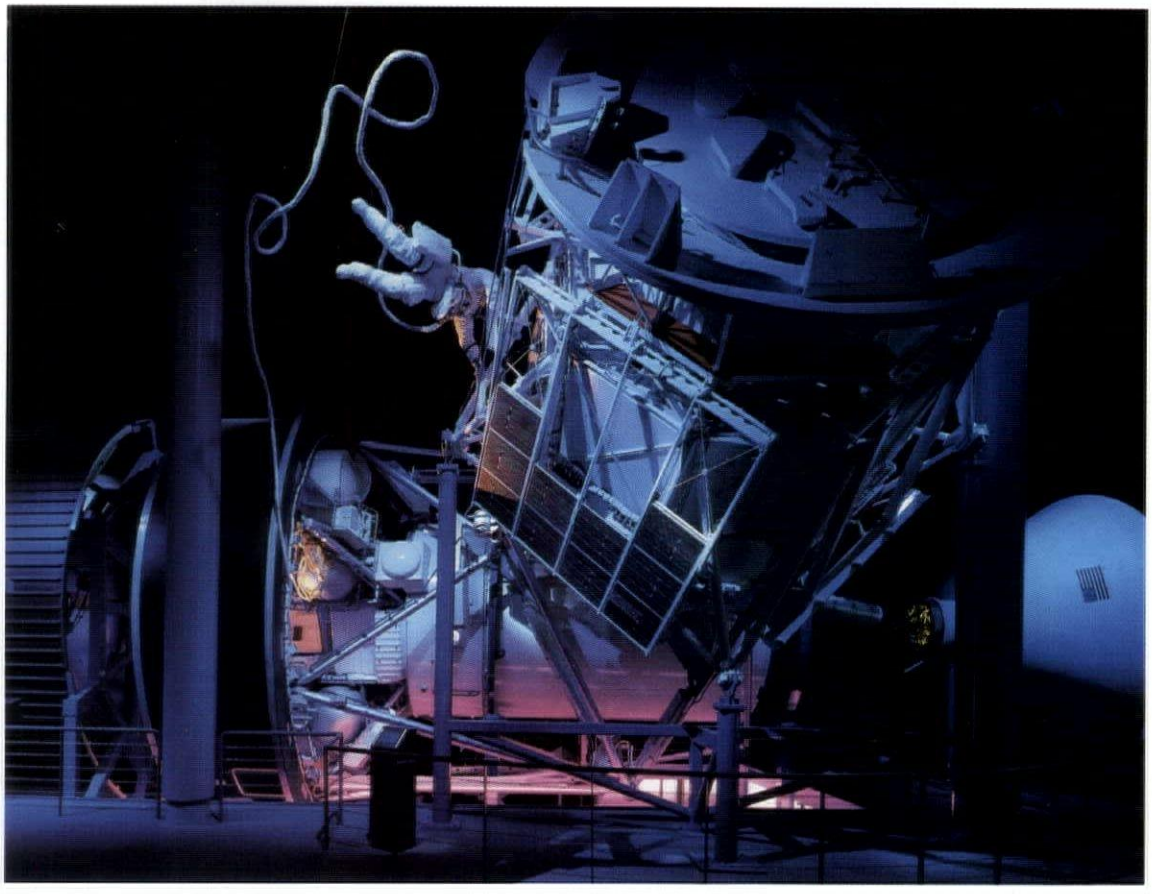
The Mission Status Theater is most often used in a pre-recorded mode with individual segments of film and video that provide information about current space missions. When a live mission is in progress, these pre-recorded segments may be pre-empted by the moderator at any time to live link footage with the astronauts. Both general lighting using 250-watt quartz PAR 38s and console lighting using theatrical ellipsoidal spotlights dim automatically from a centralized system based upon pre-recorded or live commands initiated by the moderator.

STARSHIP GALLERY/DESTINY THEATER

The Starship Gallery experience begins with the viewing of a 570mm film in the Destiny Theater. Upon completion of this retrospective of the manned space program, patrons exit into the Mercury Saturn/Gemini Gallery. A fiberoptic star field containing a night view of the earth's surface with sunrise appearing just over the horizon creates an interesting backdrop for the integration of several space artifacts. The night earth profile is painted with earth-tone fluorescent paints and illuminated with mercury vapor fixtures fitted with ultraviolet lenses. The sunrise is accomplished with an edge-lit piece of one-inch thick acrylic, beveled and painted to produce the sunset image and colors. Compact F40 biax sources in a removable slide-out tray are used for the edge-lighting of the sunrise effect.

The isolation of humans in space is evoked through careful use of angle, source and color. Color induces a "cold outside/warm inside" emotional response to the artifacts. A rim light effect for the "sun" side or key light for the artifact exteriors is created by a high-focus angle and a pale cold blue color. The "dark" side of the exteriors are lit from low angles wherever possible and with very saturate blues. In some cases, the heat shields are subtly warmed with orange reds. All exterior lighting is accomplished with ellipsoidal and fresnel theatrical fixtures fitted with glass color media.

The Apollo 17 spacecraft is mounted on a supporting frame over a shallow pit. A custom-designed motion effect created with compact fluorescent sources is located inside the pit to add the ripple of expanding heat patterns to the heat shield. Static color in oranges, yellows and reds to complement the motion effect is made with standard fluorescent fixtures encased in ultraviolet-resis-



tant and colored tube sleeves. The pit itself is covered with a custom louver to shield the view of the source from the visitors.

As the spacecraft are national historic artifacts, nothing can be permanently mounted to them. General lighting of the artifact interiors is accomplished with custom 26-watt compact fluorescent low-profile boxes with an integral ballast, cord and plug, and attachment rings on the back of the box. A colored acrylic lens in either rich amber or a warm saturate blue surround the lamp. Accent lighting within the artifacts is done with small profile MR 11 fixtures with a mini C-clamp, and cord and plug. Glass color filters in less saturate ambers, blues and lavenders are held by integral filter holders.

Power is brought into the artifact interior through low-profile SO type cable terminating in quad plug boxes. All plug boxes and luminaires are located out of the viewers' sight and secured to the artifacts with plastic wire ties or mini C-clamps.

(Below) Inside the Skylab, the full-size mannequin spins. Subtle colors are used in the capsule interiors.

MOONSCAPE

Photographs of men on the moon have become icons of our time. The visual expectation is that light on the moon will be single-shadow, unscattered, have direct linear shadows without keystoning, and be very cold and harsh. Ideally, this would be best accomplished in an exhibit through the use of a large single source projector located a good distance from the subject.

The Moonscape diorama, however, posed some very significant lighting problems. The ceiling was relatively low, the foreground dimensional, the background flat, and the proscenium opening curved. Minimal spill and bounce could be allowed to impact the back wall surface, painted black to create the illusion of the void of deep space. The earth, a hemisphere of acrylic painted realistically both inside and out, has been inset into the black back wall.

A series of fixtures light the foreground as the curved proscenium and low ceiling height did not allow the use of a single fixture. Each luminaire had to have very precise control to eliminate multiple shadows caused by beam overlapping and spill outside the proscenium or onto the background. A series of custom Linnebach projectors have been designed with both 1,000-watt HQI and 250-watt HQI long-life sources to accomplish this.

The Linnebach projectors are an adaptation of an early theatrical lighting instrument which relies upon a small point source inside a non-reflective fixture. The point source acts as a miniature "sun," as those light rays not absorbed by the fixture walls travel directly from the source out the front of the luminaire. A piece of glass, located at the aperture of the luminaire and painted to the precise shape of the area required to be illuminated, allows an exact template to be projected. At beam overlap points, the line on the glass template is hazed slightly to allow an almost invisible overlay from one unit to the next.

The background is painted in perspective, and a flat, even illumination reveals the fine scene painting. The focus angle had to be calculated precisely to ensure that no spill over the top of the background would hit the back wall. Color matching of the dimmed the-

(Left) Visitors can catch a glimpse of what is to come in the On to the Future exhibit area.

atrical ellipsoidals that light the background with the HQI sources that light the foreground was difficult. After much trial and error with color media, paint retouching of the background under the light source helped resolve the issue.

The earth hemisphere inset into the back wall is illuminated from the inside with a compact fluorescent source to reveal the oceans and continents painted on the inner surface with transparent dyes. The outer surface is illuminated with an iris theatrical ellipsoidal which brings the semi-opaque clouds painted on the outer surface visually to life.

LUNAR VAULT/KEYS TO THE UNIVERSE

The exit from the Starship Gallery is through the Lunar Vault. Inside this mock-up of a high-security room are display samples of rocks and other mineral deposits brought back from the lunar surface. The interior of the display area is illuminated with standard lensed 2-foot by 4-foot fixtures and cool-white lamps to simulate actual labs used for lunar rock research. The display cases are illuminated with low-voltage quartz fixtures mounted out of visitor view. These MR 16 sources hit the edges and corners of both the specular and brushed stainless steel casework and examination equipment with light to add gleam and sparkle to the display. The high-color rendering of the display sources also enables the exhibits to "jump out" in relationship to the fluorescent-lit room.

The transition room that follows the Lunar Vault is called Keys to the Universe and contains a large mural that investigates the commercial potential of the moon for mining, farming and energy production. The mural has been developed in collaboration with local Houston elementary school science classes and NASA scientists. Two freestanding exhibits in this area also provide a working example of lunar farming in a controlled environment and a lunar mining scheme. All exhibits in this area are illuminated with quartz asymmetric wall-washers and MR 16 accent lights.

SKYLAB

The original Skylab trainer, a full-scale mock-up of the actual spacecraft, had been stored in pieces in a NASA warehouse since the end of the program in 1974. Lighting both the interior and exterior of an object that large posed problems of operatic proportions. When planning the building, it became apparent that the Skylab mock-up would have to be installed first and the building built around it.

Due to physical space limitations, the walls and ceiling of the room containing Skylab are relatively close to the object and the trainer is set down into a shallow pit in the floor. Bringing a sense of drama to an object which is basically a long cylinder in a proportionally small room proved particularly vexing.

Eventually, a decision was made to focus all light on the object and to keep light on the surrounding room surfaces to a minimum. The walls and ceiling were painted black to assist in making the room recede from view. The interior of the pit was illuminated with standard fluorescent strips. The lamps were colored with tube sleeves and a prismatic lens added to the edge of the pit to shield the fixtures from view. The general exterior was lit with theatrical sources and very saturate color.

The interior was lit in much the same manner as the other artifacts except on a much larger scale. Color was also a bit less saturate than in other exhibits to ensure that the multitude of interesting objects inside the trainer were perceived without too much color distortion. Much of the original fluorescent lighting was restored but with added color media to increase the sense of drama and reduce the glare produced by the original sources.

ON TO THE FUTURE

Exit from the Skylab area is marked by a series of internally lit portals which recede in scale as you pass through. Upon exit from the portals, a series of floating truss rings, internally illuminated by low-voltage incandescent sources, are revealed. The restraining handrail, made of braided industrial hose strain relief stretched over a curved plexiglass tube, is internally illuminated with low-voltage incandescent sources. An array of MR 16 fixtures, hung in a concave circular pattern, complete the sphere visually implied by the trusses and railing. Within the smaller truss ring are six suspended video monitors which display a program exploring the coming adventures of the United States space program.

(Below) The telescope section is about halfway down the exterior of the Skylab.

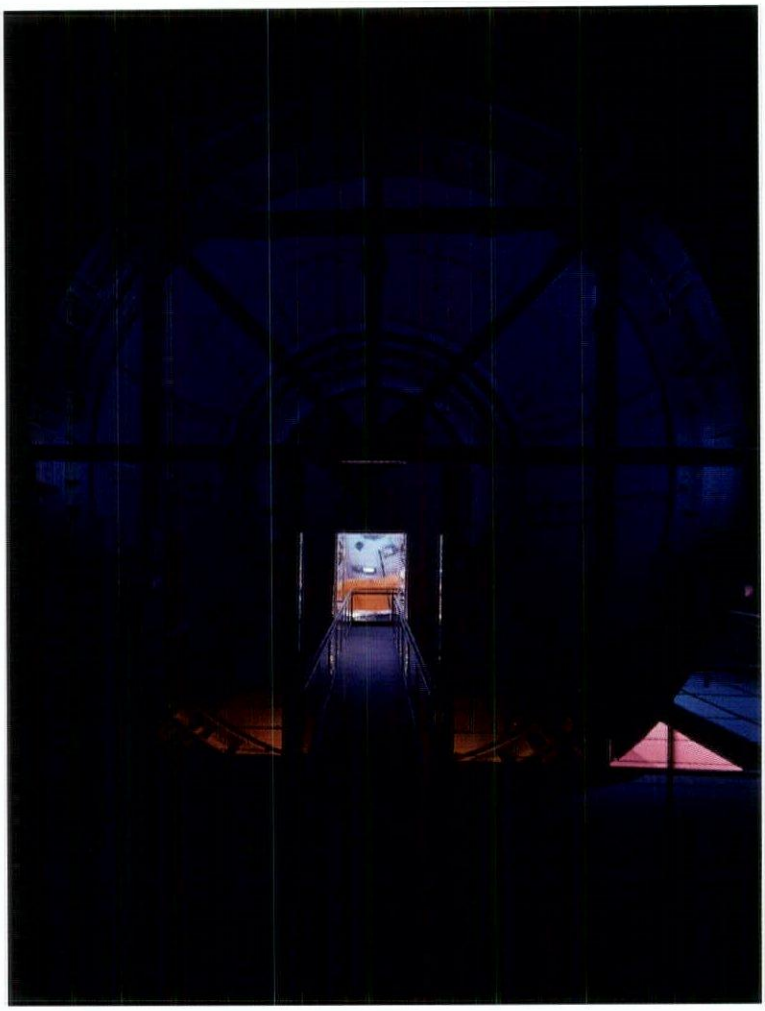
DIMMING SYSTEMS

Each of the spaces indicated above was controlled on one of the two Premiere dimming systems controlling centralized CD80 dimmer racks. Each space was identified as a room, or several rooms, within each system. In the case of the static exhibits, lighting presets were switched on in the morning just before opening and off in the evening after closing with the internal time clock. Another preset, with all channels at full, was activated for 45 minutes each night to ensure that the tungsten halogen cycle of the dimmer quartz sources was activated. A worklight preset, activated by a keyswitch in maintenance closets adjacent to each room, allows clean-up and work crews to turn lights on and off without access to the relatively complex dimming system.

More complicated systems were used in the automated film theaters. Each set of channels required to move independently is identified as a separate room. A series of contact closures activated by a show control device cause various actions to be taken by the Premiere controller. In most cases, this action is a "Go" command which cycles cues in a continuous loop. A "reset" command causes the lighting system to go back to the beginning of the sequence. An "emergency" command accesses a preset to bring all channels in certain rooms to full. Other commands such as "flash" and "microphone on" identify exits with lighting and bring up lights automatically when microphone keys are depressed.

In the "Living in Space" exhibit off the main plaza, a mock-up of the interior of the proposed Freedom space station lights up one section at a time. The lighting for each section is controlled by a master of ceremonies who pushes a button on the floor at appropriate times during the show. The control system prevents the sequence from backing up if a prior button in the sequence is depressed by accident.

Remote jacks, located in each space in the building, allow programming of presets through a portable master programming station. As late-breaking changes had been a major feature during the weeks leading to opening, the system programming flexibility and independence from other control devices proved invaluable. The ability to adjust software rather than hardware to solve functional problems in a rapidly changing setting proved its worth.



EXTERIOR

The octagonal shape of the Plaza interior is echoed on the upper portion of the building exterior. Very narrow beam metal halide fixtures are located at each corner of the octagon and at the high corners of the upper volume of the Space Center Theater exterior. Building corners are accented again at the leading edge of the building entry. Trees planted on either side of the entry area are uplit by metal halide uplights. Originally, it was planned to install very narrow, very high-intensity searchlights at the corners of the octagonal roof to continue the building line upward into the night sky. Future budgets may allow this dramatic feature to be installed.

Through a very theatrical approach to the lighting of the exhibits, the monumental achievements of man in space are emphasized. The fragility and lilliputian scale of man in space is made evident through careful use of color and intensity. The incredible technical accomplishments are revealed through story and appropriate illumination of the artifacts. Perhaps, the rich and dramatic content of the lighting aroused the emotional responses of the visitors to the exhibits. From all reports, the original mission statement of the project has been met.

The author is an Associate at S. Leonard Auerbach & Associates, Inc., San Francisco, CA and is the lighting designer for the Space Center Houston.

DETAILS

PROJECT: SPACE CENTER HOUSTON
LOCATION: HOUSTON, TX
ARCHITECTURAL LIGHTING DESIGNERS: LARRY FRENCH, S. LEONARD AUERBACH, S. LEONARD AUERBACH & ASSOCIATES
SHOW & EXHIBIT LIGHTING DESIGN: LARRY FRENCH, PATTY GLASOW, S. LEONARD AUERBACH & ASSOCIATES
PHOTOGRAPHERS: PAUL HESTER and LISA CAROL HARDAWAY, LISA CAROL HARDAWAY & PAUL HESTER PHOTOGRAPHY
LIGHTING MANUFACTURERS: KURT VERSEN: metal halide, compact fluorescent, and PAR 38 downlights; JOSLYN THOMPSON: theater fixture lowering system; ARTEMIDE: wall sconces; STERNER LIGHTING: plaza adjustable metal halide fixtures and building exterior roof-mounted fixtures; STRAND LIGHTING: plaza exhibit lighting fixtures and exhibit gallery theatrical fixtures, dimmer racks and microprocessor controls; HYDREL: custom plaza runway lights; ARTUP: gift store low-voltage system; SF12V: restaurant low-voltage wire system; BEGA: low-level compact fluorescent step lights; ALTMAN: exhibit gallery theatrical fixtures; LSI: exhibit gallery theatrical fixtures; SHAPER LIGHTING: sunrise effect fixture and custom artifact interior compact fluorescent fixtures; HALO: low-voltage artifact MR 16 and MR 11 fixtures; PHOEBUS LIGHTING: custom HQI Linnebach projectors; JOHN LILLY: custom Apollo heat shield motion effect; LUMIERE: pendant hung MR 16 fixtures; KIM: building exterior well lights; LUTRON: wallbox dimmers

SIDELIGHTS

CAPTURING THE RIGHT REALITY

Paul Hester, who with Lisa Carol Hardaway, photographed the Space Center Houston, reveals that capturing the project on film was more difficult than a typical architectural interior photo shoot for several reasons. First, the dramatic exhibit format presented its own parameters. "Instead of photographing light as it falls on and reflects from objects and furnishings," Hester says, "the focus became photographing light sources themselves in darkness, for example with representations of the star-filled night sky and moonlight.

"The second consideration was that the contrast the eye perceives is not equal to what the camera can handle," Hester explains. Hester and Hardaway planned each shot carefully and incorporated "tricks," like adding light, using double exposures and keeping some lights on longer than others while filming, and adding neutral density filters in some cases to diminish the effects of light sources that would appear too bright on film. "A great deal of fiberoptics are used in the exhibits and this typically renders pale in the camera's eye, so these scenes were exposed and lights added to brighten them up," Hester explains. "In some shadow areas, in which objects were placed in nighttime darkness, lights had to be added because though the eye would have caught details, the camera would not." These techniques were not used to enhance or distort the lighting design, but rather incorporated to render the camera-shot view as close as possible to how the human eye would see it.

The most significant challenge and concern, according to Hester, was the rendering of the colors on film. Hester says, "The pastels and softer colors popular with interior designers today are more difficult to reproduce on film because they react so differently to varied light sources—whether it be incandescent, fluorescent or daylight." What the color actually is is relative to what light source is being used. And many of the colors in the exhibit are subtle, fragile blues and whites depicting ephemeral moonlight and space.

Some of the photos have been retouched by Marisha Schwartz after film development to render the colors used in the exhibits accurately.

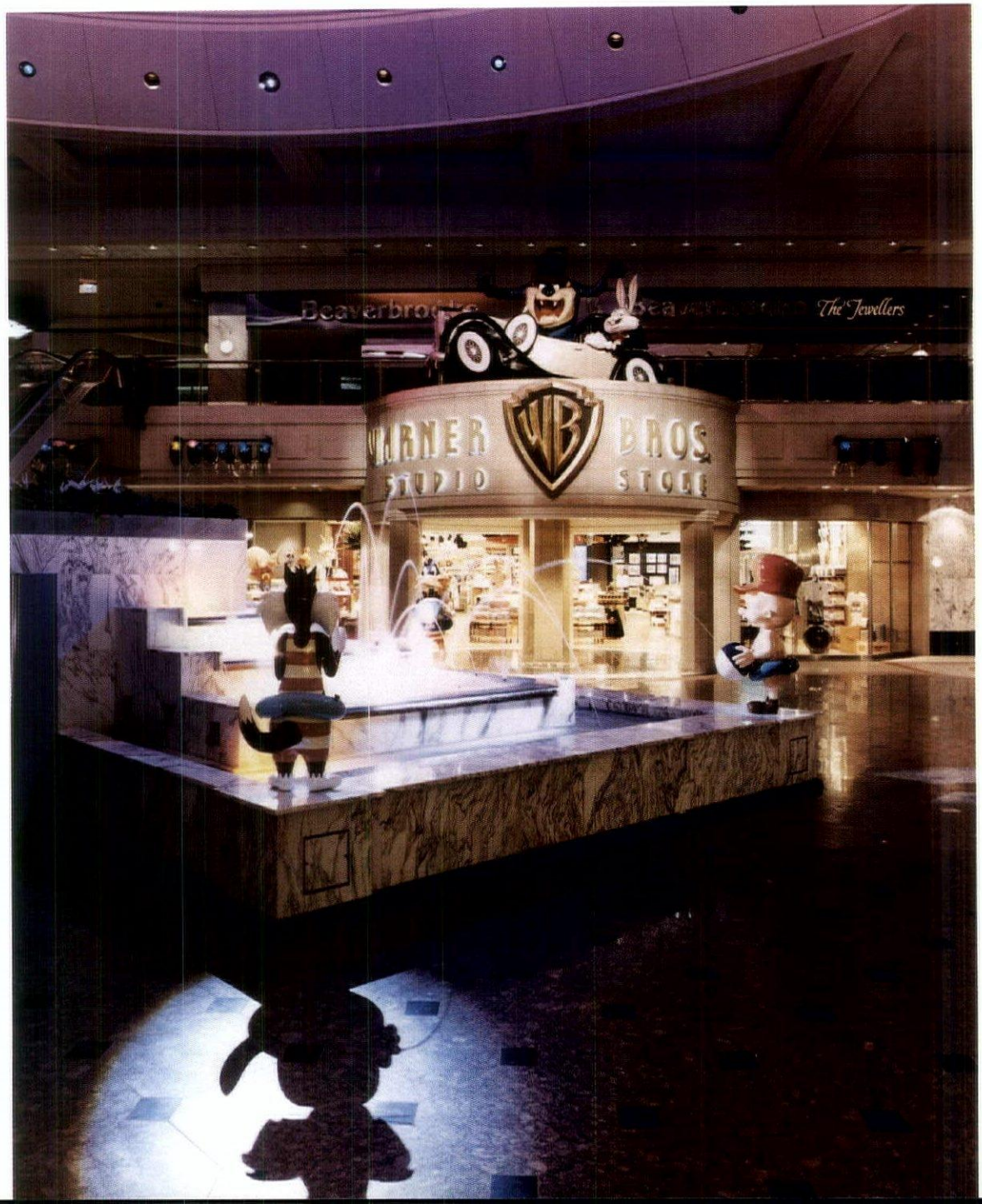
The photo shoot took two nights—about 12 hours total—which is longer than most interior architectural shoots. Even so, a great deal of time and effort was saved due to the sophisticated control system used in the exhibit. Space center staff were able to change lighting intensity from individual controls panels in each room.

"Larry French knew it was going to be a labor intensive project from his own experiences, so he gave us the time we needed—we like challenges," says Hester. Lisa Carol Hardaway & Paul Hester Photographers are exterior and interior architectural photographers, located at P.O. Box 211, Fayetteville, TX 78940, tel. 409-378-4220.

Shopper *Showstopper*

BUGS BUNNY, PORKY PIG AND THE REST OF THE WARNER BROS. LOONEY TUNES GANG HAVE FOUND A NEW FORUM AT ENGLAND'S ARNDALE SHOPPING CENTRE

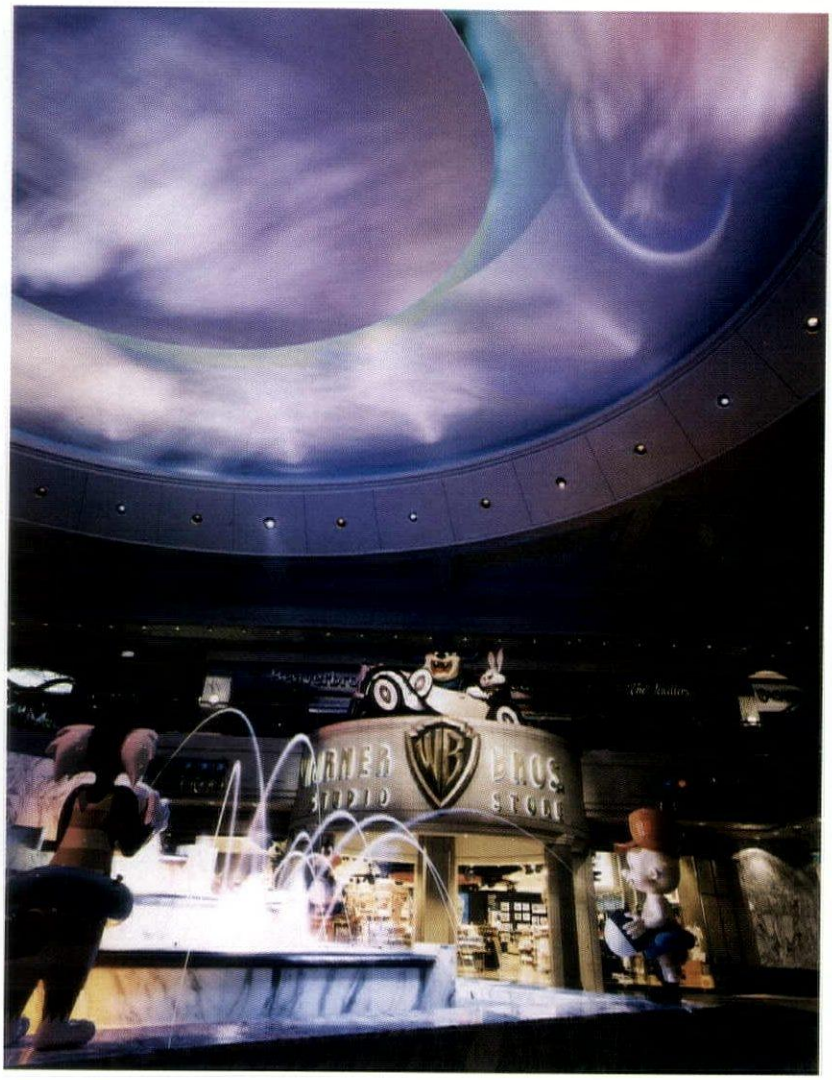
BY RONALD HARWOOD



In the epicenter of England's blue collar economic community, Manchester has suffered the same slings and arrows as Detroit or Cleveland since our mutual economies headed south during the last recession. Now, with a glint of sunlight peeking over the horizon, the P & O company, which owns the Arndale Shopping Centre, has hit on a brilliant idea to be first in line for their shoppers' pound.

Given that the entertainment industry has thrived during the past few years, it seemed obvious that bad times bring on a need for people to escape into a fantasy environment. The less expensive the fantasy, the more people escape. Thus, the centre owners came to Warner Bros. to devise a scheme which would include Warner's first European store and a themed attraction within a newly renovated grand court.

The store, of course, was no problem—simply a matter of sorting out how to build an already successful design in the U.K. Store planner, Ken Nisch from JGA, along with Bruce Fabel, vice president of Property Development for Warner Bros., had already built almost 50 stores in the U.S. and took on this project with relative ease. During the planning process, our lighting design team, which had done all of Warner's store lighting design, was asked to look at the center court for a possible light show.



CREATING THE CEILING STAGE

With the architectural scheme for innovation already in the working drawing stage by Ratcliff Partners of Manchester, we had to react quickly to avoid serious cost overruns or even more costly tearouts.

To keep the entertainment theme as the central focus, Warner Bros. agreed to show Looney Tunes cartoon segments at the beginning of every hour. First thoughts were to use video monitors mounted to the ceiling and rear project with some form of video cube technology. After several weeks of research, video cubes were eliminated in favor of projected 35mm film. There were several reasons for this. First, while video cubes were certainly bright enough, there is the visible element of the high-tech look which does not disappear when the monitors are off.

Second, maintaining clear viewing angles was important as we anticipated pedestrians at ground and upper level balconies to watch from a 30 to 40 degree angle and from about 40 feet away. Third, getting the video monitors harmoniously integrated into architecture, whether they were on or off was a serious problem solved by housing the film projector within the fountain architecture, accomplishing an extremely clean architectured look during all phases of the "show." Audio-visual consultants Dan Golditch and Brett Armstrong began their job of designing the gear, the housings and the electrical requirements. Lighting became the next issue.

Because the 35 mm film consumed a tremendous amount of reel space, it could only be used approximately ten minutes each hour or 80 minutes during the 8-hour period. In order to keep the show "fresh" each day at lunch and dinner time, ten shows were put on the film platter to "stagger" the selections throughout the week.

This left the lighting designers with several tasks. First, to design a lighting show for 50 minutes of each hour that would be entertaining yet not capture the public's attention to the degree that no one shopped! Second, to design a lighting system that supported the Looney Tunes cartoons that played on the hour without washing out the projected images. Third, to develop a unique beginning and end to the Looney Tunes movie. Fourth, to use the fewest exposed lighting sources and conceal them whenever possible to maintain the integrity of the new architectural renovation.

FOUNTAIN OF FILM: (Opposite page) The film projector is concealed in fountain architecture.

WEATHER TALK: (Above) Customized gobos project cloudy skies while 3-D characters begin to discuss stormy weather ahead.

SUNRISE/SUNSET

Teammate Gary Decker designed the sky paintings. These were used with varying degrees of color, hue and intensity to support the classical audio tracks selected by Laura Lent of Warner Bros. Laura also selected and edited all of the film footage.

We developed a sunrise and sunset effect using Intellabeam HX700 units with gobo wheels cus-

WATER WONDERS: (Above) Rapid-fire color/light changes capture water streams in mid-flight.

OVAL STAGE: (Opposite page) Center ceiling oval, dropped down 3 feet, provides a hard edge to highlight the Looney Tunes cartoons. Dichroic filters blend colors in the outer oval with film footage backgrounds in the center oval.

tomized to suit the project needs. The show begins with the three-dimensional Looney Tunes fountain-mounted characters talking to each other about a recent change in the weather. Thunder claps are heard over the surround system and 16 dataflash units concealed behind the outer oval begin to emulate lighting. Intellabeam units with lighting gobos randomly project lighting images around the mall ceiling and onto the floor while a film of an actual storm plays on the inner oval.

Within 30 seconds the Looney Tunes film plays while border lights behind the inner oval play color to expand the "look" of the film to the entire 100-foot expanse of the ceiling. By employing dichroic filters wherever possible, color saturation closely matched the film footage. At the end of the movie an animated fireworks ending plays to the "That's All Folks" logo and Intellabeam fireworks gobos play on the entire ceiling in support. Hundreds of programming hours were needed by our expert computer lighting team member Chris Stuba to create realistic animated lighting sequences.

Next, the storm clouds disappear and the moon, projected by Intellabeams, begins to fade as the sky turns red on the opposite side of the ceiling as the sun slowly rises. Following is almost 50 minutes of slowly changing sun, sky and cloud effects that move across the ceiling.

Timing the show was perhaps the most difficult, yet unnoticed challenge. We needed the film to synchronize everything because it was a fail-safe way of knowing that the film wasn't broken. Thus the film "clicks" a computer which starts the laser disc at the correct audio selection. The laser disc had a separate sempte time code track which was "frame accurate" so that we could cue a lighting move to the frame.

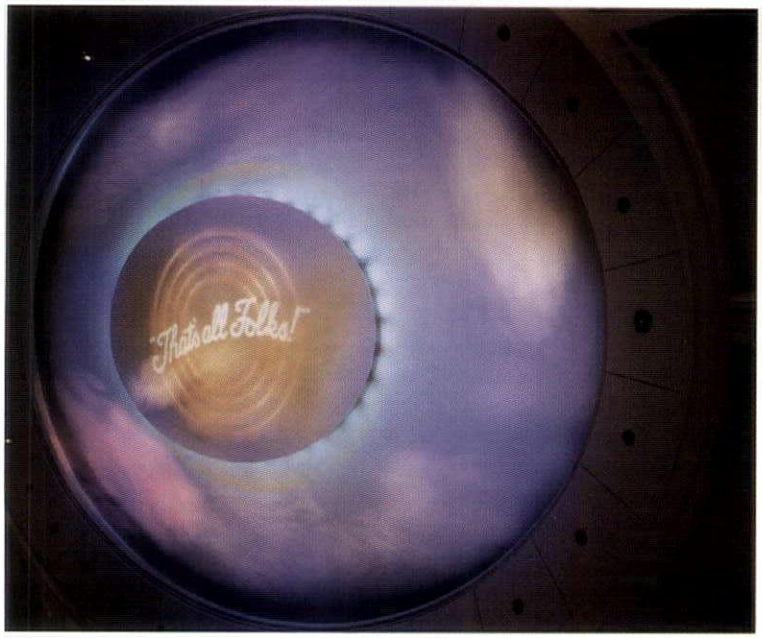
It took a stand-alone computer and custom software to run all of the lighting equipment since the Strand board, the Intellabeam program controller and the dataflash controller all listen and speak different languages. By using a controller computer that had the ability to stack cues and call them at random, we retained the unique opportunity to change the show order without re-programming. Carlos Ferriera, our team's project manager, had the assignment of getting the gear and instruments specified, measured, mounted and wired correctly. Working with Gary Decker, Chris Stuba and myself, he pooled all of our resources and set our dreams down on paper.

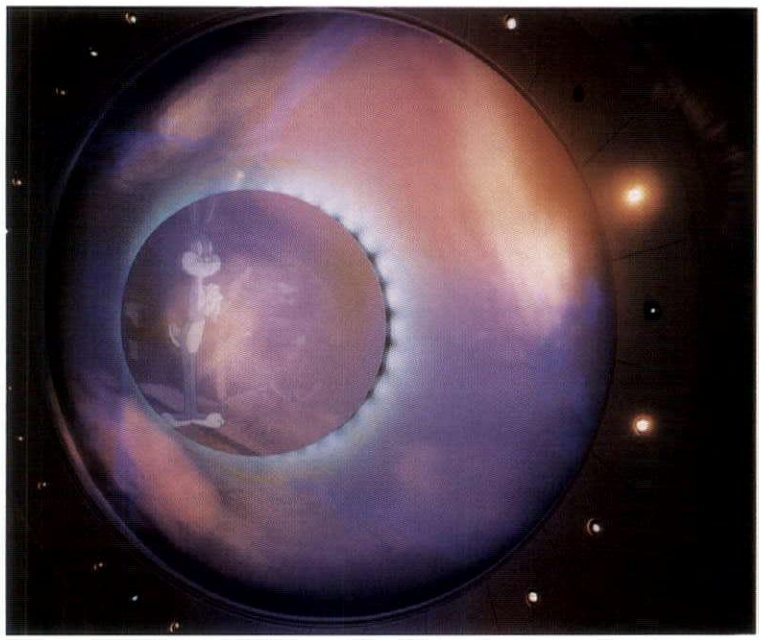
Although the political aspects of coordinating the needs of the mall owner with the requirements of Warner Bros., with respect to the proprietary nature of the LooneyTunes characters and the environment within which they are presented, needed attending to, I spent most of my time dealing with the architectural integration of the lighting.

To keep from washing out the film, I had the center oval dropped 3 feet from the higher ceiling plane to create an inner and an outer oval. This provides hard edge to "cut" the film from the lighting. By using border lights behind the inner oval, blended with 1,000-watt PAR cans, shot from the balcony rail, there was no lapping onto the inner oval while the film played.

All around the outer oval, apertures were integrated into the architectural design so that the Intellabeams and PAR cans could be mounted to rails behind them and accessed by catwalk. Due to the extreme need to conserve on exposed instruments, more motorized lighting units were employed to provide multiple effects from fewer sources. Twelve Intellabeams took the place of several dozen Lekos and dramatically enhanced the animated feeling of the shows.

Custom designed light bars were mounted to the mezzanine level fascia. Spaced from 20 to 30 feet apart and only broad enough to carry the exact requirement of instruments, calculations of light levels at the ceiling plane became critical. Light losses as a result of using dichroic glass filters, and an error margin of 10 percent were included. Measurements of the ambient levels were taken with all lighting excluded, save the storefront fascia. The decision was made to include all house-light and center court downlighting in the dimming scheme so that during critical show times we could drop all unneeded lights to zero. This proved a huge advantage, as we needed every bit of contrast ratio to enhance the impact of the film.





FOUNTAIN GLITTER

The last element of the show was the fountain lighting. Technifex designed and programmed the fountain sprays and synchronized them under the tutelage of Laura Lent. We took advantage of our concealed ceiling lighting and rapid-fire color change ability to catch the streams of water in mid-flight andcreate a marvelous glitter as the streams begin to break at the peak of their arcs. Synchronized to classical evocative melodies, the fountain programming crescendo occurs on the 1/2 hour opposite the film.

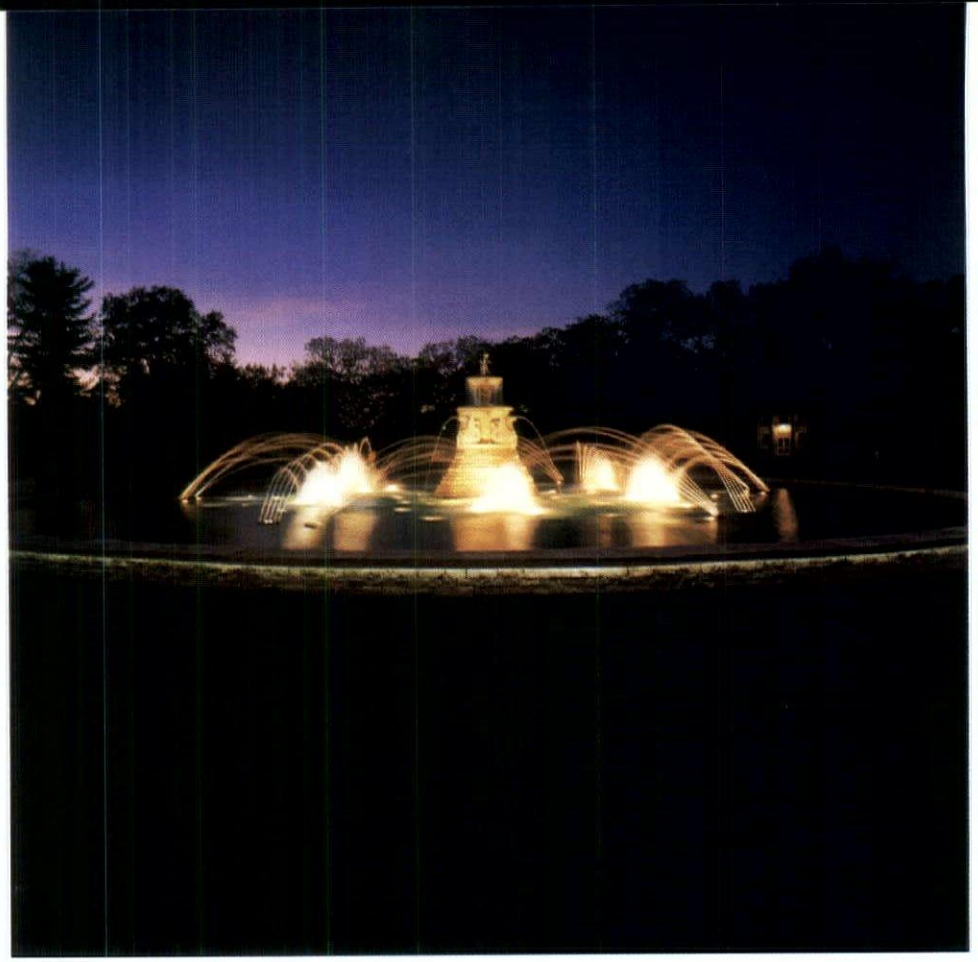
The show has been such a huge success that plans are already underway for phases two and three. As a team, we are most proud of accomplishing a virtually hands-free, automatic multimedia permanent installation. What we actually accomplished may have set the groundwork for a new era in shopping environments. Hundreds of thousands of new shoppers have visited the Arndale Mall since the show opened and no signs have been seen of any slowdown.

With the cost of renovation so high and the payback so slow, the new solution seems to have been found by Phil Cooke and Tony Roberts of P & O Properties. Give them a "jolly good show." Who better to team up with than Peter Starret, president of Warner Bros. Studio Stores and his pal Bugs Bunny.

The author is president of Illuminating Concepts, Farmington Hills, MI, the lighting designer for the Arndale Shopping Centre Looney Tunes Show, and a member of ARCHITECTURAL LIGHTING'S *Editorial Advisory Board.*

DETAILS

PROJECT: ARNDALE MALL CENTER COURT LIGHT SHOW
LOCATION: MANCHESTER, ENGLAND
CLIENTS: P&O PROPERTIES, WARNER BROS. STUDIO STORES
ARCHITECT: JOHN RATCLIFF and CLIFF BOWN, RATCLIFF PARTNERSHIP
LIGHTING CONSULTANTS: RON HARWOOD, GARY DECKER, CHRIS STUBA, BOB WHITE, CARLOS FERREIRA, MARK VORNDRAN and RONNA JACOBS, ILLUMINATING CONCEPTS
GENERAL CONTRACTOR: BOVIS
ELECTRICAL ENGINEERS: FERGENSON & PARTNERS
FILM & AUDIO: BACKGROUND ENGINEERING
STORE PLANNER: KEN NISCH, JGA
FOUNTAIN SPRAY DESIGN/PROGRAMMING: TECHNIFEX
PHOTOGRAPHER: KAREN WRIGHT, MANCHESTER, ENGLAND
LIGHTING MANUFACTURERS: STRAND, TEATRO, HIGH END SYSTEMS INC., LIGHTWAVE RESEARCH, ELECTROSONIC



Sea Horse Fountain

LOW-VOLTAGE INCANDESCENTS AND FIBEROPTICS ENABLE KANSAS CITY'S RECENTLY RENOVATED LARGEST FOUNTAIN TO BE APPRECIATED BY NIGHT

BY WANDA JANKOWSKI EDTIOR-IN-CHIEF

Though Paris, France, may be the City of Lights, Kansas City, MO, outshines Paris when it comes to the number of flowing fountains that beautify its landscape. The Sea Horse, Kansas City's largest fountain, is one of many marble statues and sculptures that punctuate the city streets, bought and brought in from Italy at the turn of the century by far-sighted developer and visionary, J.C. Nichols, who converted farmland into quality shopping districts, and carefully planned each of the suburban neighborhoods to have its own individual character.

The fountain's age and deterioration prompted the city of Kansas City to proceed with a complete renovation and upgrading, including the lighting system and water sprays. Lighting designer Tim Strobel, Strobel Energy Consultants, Leawood, KS, and architects John Fasnacht and Mark Hillman with Fasnacht & Nelson P.C., were challenged with designing a new lighting system within the varied parameters set by the city and the environmental conditions.

Though the design of the newly installed 100-foot diameter fountain matches the original, it is made of different materials. The original was marble; the new one is constructed of sandstone, with a limestone surround.

The fountain, surrounded by grassy ground cover is, in turn, enveloped by a traffic circle on a major artery that leads into the city. In addition to satisfying local electrical codes and safety standards regarding placement of fixtures near water, the city did not allow any lighting equipment to be installed in the grassy areas surrounding the fountain, thus eliminating the possibility of using pole-mounted fixtures. Burial units also had to be avoided because of the potential glare that could serve as a dangerous distraction to drivers in nearby moving vehicles. Selected sources had to be low-brightness, well-concealed, and require low maintenance.

Strobel devised a system incorporating low-voltage incandescent units and fiberoptics. The low-voltage sources, which are a specific type required by the city for use in public spaces, have been placed in the fountain foundation to highlight the beginning, middle and end of water arcs, bubble jets, the central sculpture base and the sea horse statues. Fiberoptic cables illuminated with amber-filtered metal halide sources housed in concealed illuminators highlight sculpture details and the 316-foot outer perimeter of the fountain. The amber filters have been added because the metal halide rendered the sandstone an unattractive shade of green. The amber addition creates a more pleasing, warmer glow.

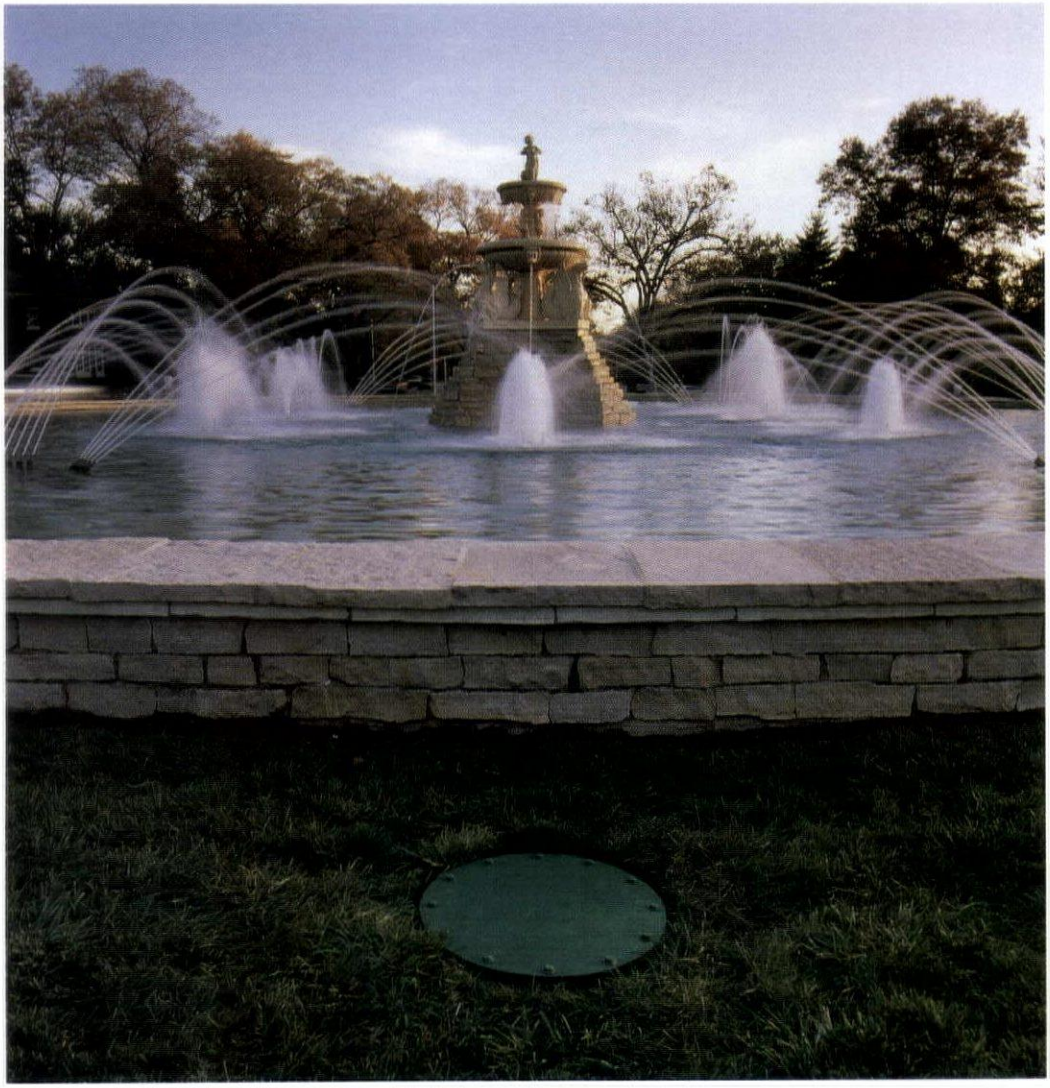
The illuminators are concealed in a pre-existing main vault on the south side, and in three added, custom-designed smaller satellite vaults on the north, east and west sides. The main vault houses five illuminators to light the sculptures, and two for the wall.

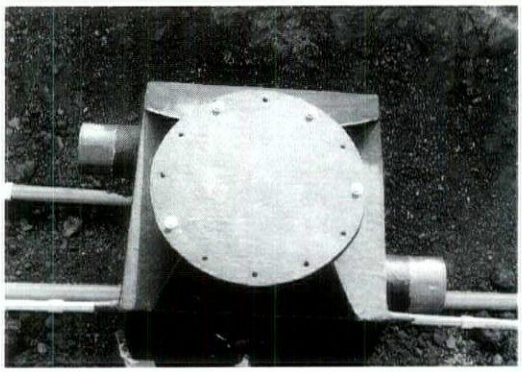
Strobel designed the three smaller, flange-type vaults to be watertight, and to withstand heavy truck weight. They house two 150-watt or one 400-watt illuminator.

Because the illuminators need ventilation to dissipate the heat produced by the light sources, 6-inch diameter conduits have been installed to connect the main vault to the satellites. Cooling air, 250 CFM, is blown from the main vault through the conduits and boosted from vault to vault by mini-fans at each vault. The underground air tubes also help to act as air-cooling tubes.

WATER & LIGHT: (Opposite page) Sea Horse Fountain is lit with fiberoptics and low-voltage incandescents.

WATERTIGHT VAULTS: (Right) Four vaults (one green-painted circular vault cover visible in foreground) house air-cooling equipment and illuminators.

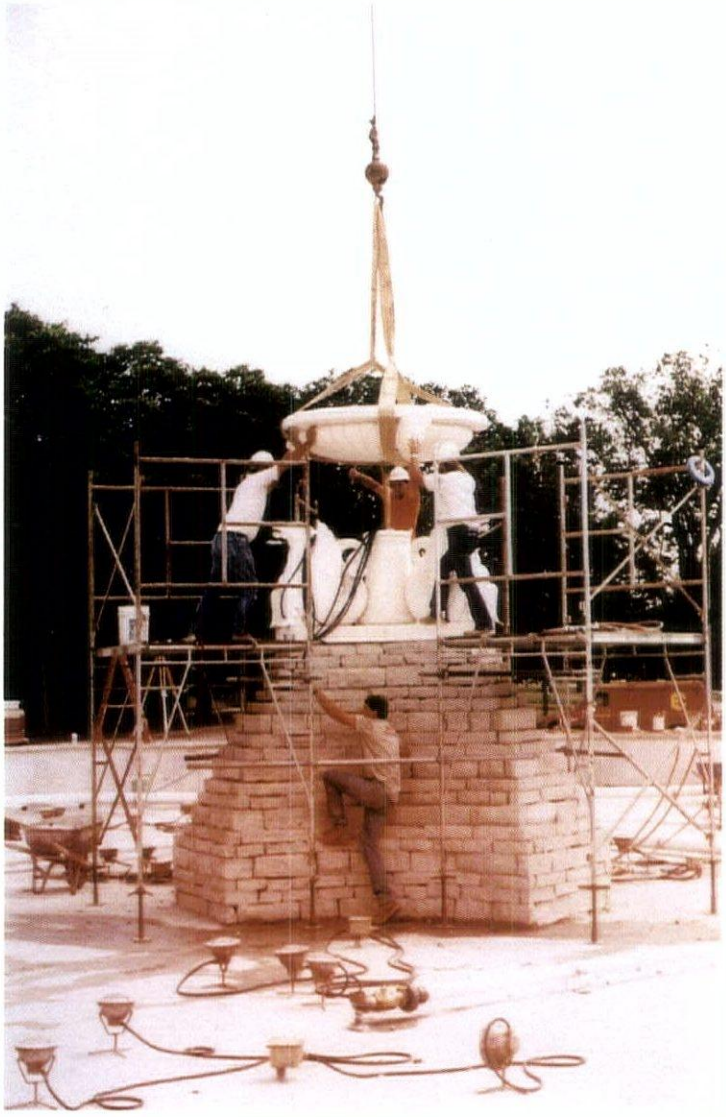




FOUNTAIN FIBERING: (Below) Ten black fiberoptic cables have been threaded through the central fountain sculpture.

FAN POWER: (Above left) Cool air needed for the illuminators passes from one vault to the next through 6-inch conduits.

COPPER CONDUIT: (Above right) Two 50-strand cables (two per illuminator) exit the vault through 2-inch copper conduit.



Corings allow water and fiberoptic cables into the sea horses, the lower bowl (six cables), the upper bowl (three cables) and one cable to the dolphin's mouth held by the cherub at the top.

Two bundles of fiberoptic cables are run around the outside perimeter of the fountain to graze the irregular set stones of the surround, so if one lamp in an illuminator burns out, the second strand, connected to the second illuminator in each small vault, remains intact and produces half light.

The two 50-strand fiber cables (two per illuminator) exit the vaults through 2-inch copper conduit, enter the inside of the pool, are run up the wall, back through the wall above water line and trace the perimeter wall under the perimeter lip to the next vault.

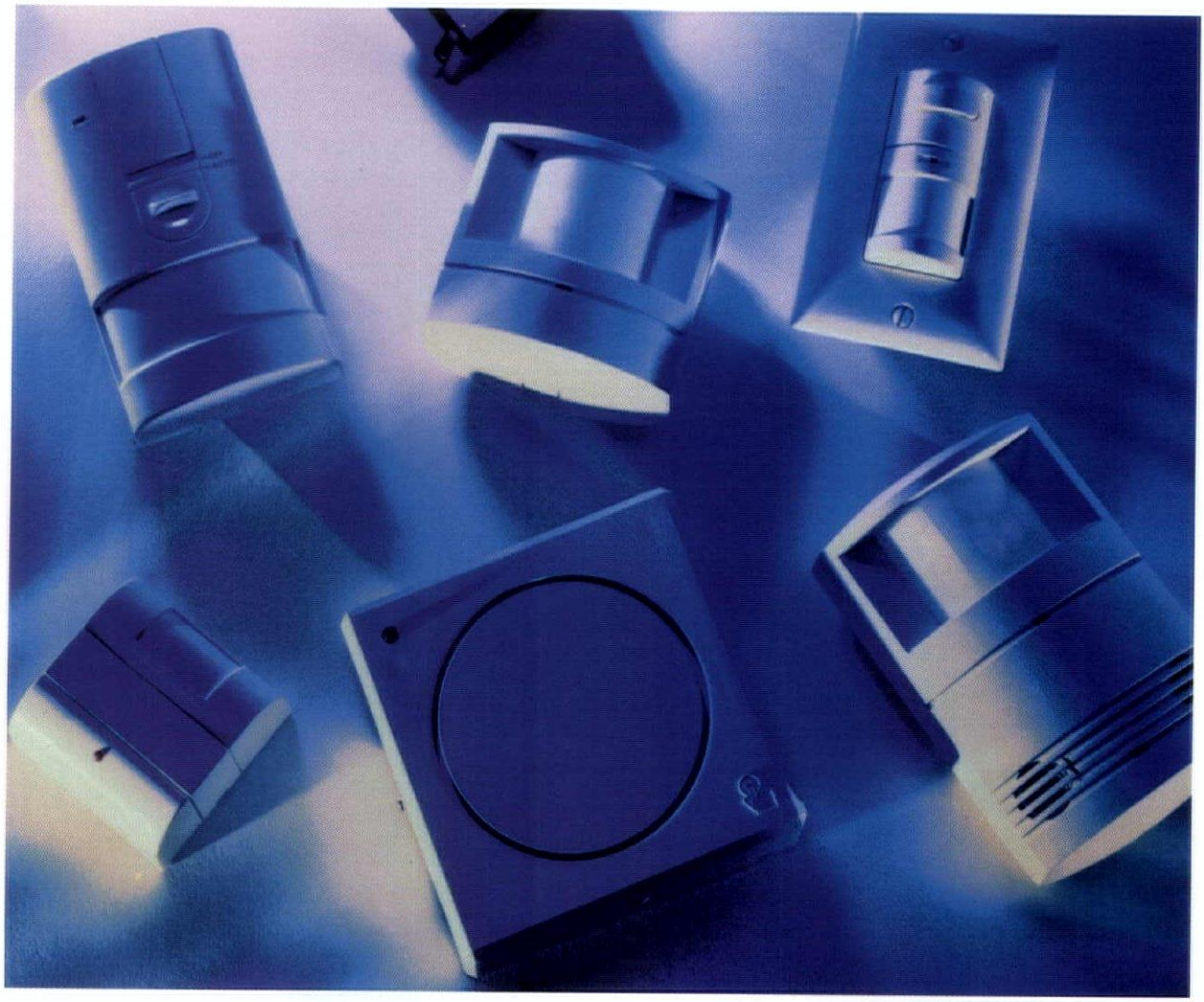
An interesting detail concerns the mounting of the fiberoptic cables underneath the stone ledge around the perimeter. Since the unevenness of the stones create a bright spot in the cable wherever there is a gap between the cable and the stone surface, a 1 1/2-inch wide, sheet metal lip has been mounted beneath the stone ledge and in front of the cable to conceal it, so only the soft grazing effect is visible. Interestingly, the metal strip has been painted to look exactly like the stones.

The Sea Horse Fountain renovation is a cause for civic pride, not only because of its attractiveness and energy efficiency, but because it was completed, in spite of the absence of a city budget for a large part of the lighting system, with donations from local citizens and businesses who cared.

DETAILS

PROJECT: SEA HORSE FOUNTAIN RENOVATION
LOCATION: KANSAS CITY, MO
OWNER: VAN POOL, KANSAS CITY PARKS & RECREATION DEPARTMENT
LIGHTING DESIGNER: TIM STROBEL, STROBEL ENERGY CONSULTANTS, LEAWOOD, KS
ARCHITECTS: JOHN FASNACHT and MARK HILLMAN, FASNACHT & NELSON P.C.
CUSTOM FIBEROPTIC VAULTS: HYDRO-DRAMATICS
PERIMETER PAINTING: TOWNLEY RESTORATION
PHOTOGRAPHER: NICK VEDROS, VEDROS & ASSOCIATES PHOTOGRAPHY
LIGHTING MANUFACTURERS: ILLUMILIGHT, distributor of FIBERSTARS: fiberoptics, HYDREL: low-voltage in-water lighting

PERFECTING LIGHTING CONTROL



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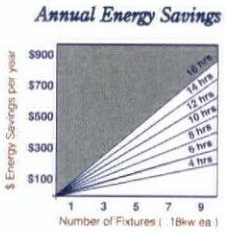

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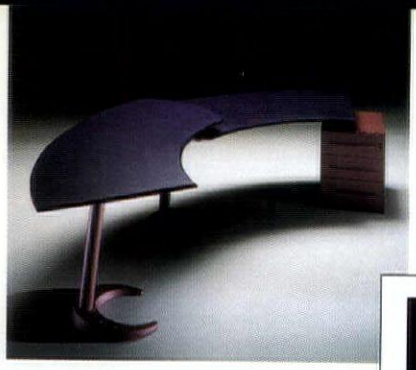
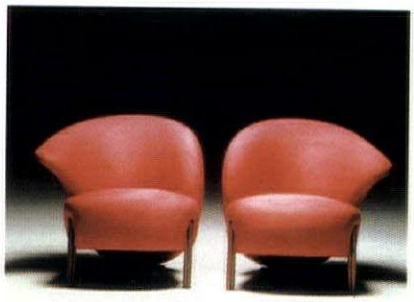
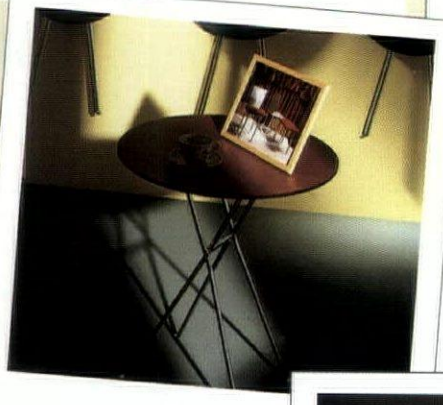




VIEWS



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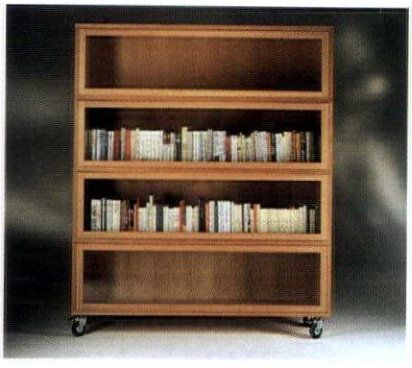
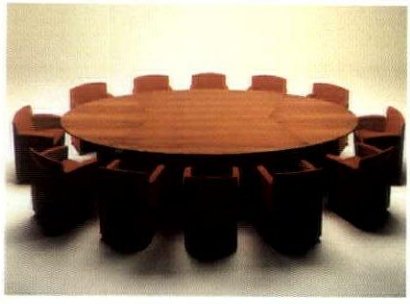


ITALIAN



DESIGN

forma

Italian Trade Commission

HI TECH OR HIGH-TOUCH? COEXISTENCE IS THE SOLUTION

Comments from Architect Giuseppe Raimondi

Airports, congress centers, hotels, restaurants, universities, offices, cinemas, theaters, conference rooms. Meeting points for multitudes of people everyday. Where simple tools such as a "chair" are found side-by-side a complex information network used to interact with unknown faces a world away.

Here lies the basic complexity and difficulty in planning and creating products for public spaces. Oscillating between "high-tech" and "high-touch", between the search for a personalized image and a common language. A language that in attempting to speak to many has often been subject to certifications and approvals which have flattened its expressiveness, rendering it incapable of stimulating emotions and desires in the user.

Today's solutions are found in more fluid and permissive combinations, where contradictory situations can coexist: the "cellular office" with "open space", territorial identity and personal comfort.

The dominant tendency is towards a new simplicity and a greater humanization of the work environment. The hallmark of quality which distinguishes the new Italian products is expressed in an elegant understament of design.

Among the new designs presented at Eimu, the Italian office furntiure fair, last September were an illuminated false ceiling designed by Pierluigi Cerri for **Unifor**, trolleys and storage units with casters by Antonio Citterio for **Kartell**, and folding chairs by Giuseppe Raimondi for **Art & Form**.

There have also been significant developments in the hotel and restaurant fields with particular attention to lighting by companies such as **Artemide**, **Flos**, **Guzzini** and **Luceplan**.

Industrial technology and artisan craftsmanship are brought together in the interior of a luxury sea-going vessel. **B & B Italia Marine**, a joint venture between **B & B Italia** and Costa Crociere specializing in ships' furnishings, has already magnificently fitted two ships which proudly sail the oceans of the world as a gracious demonstration of Italian design.

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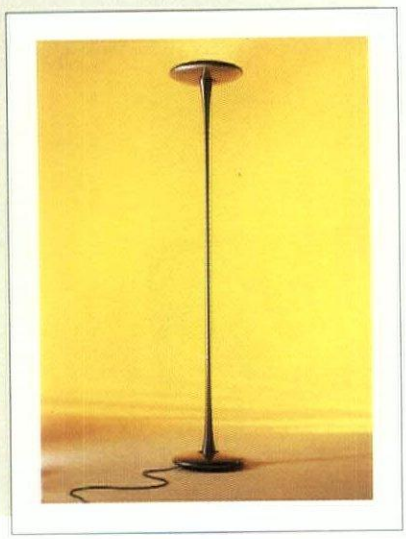
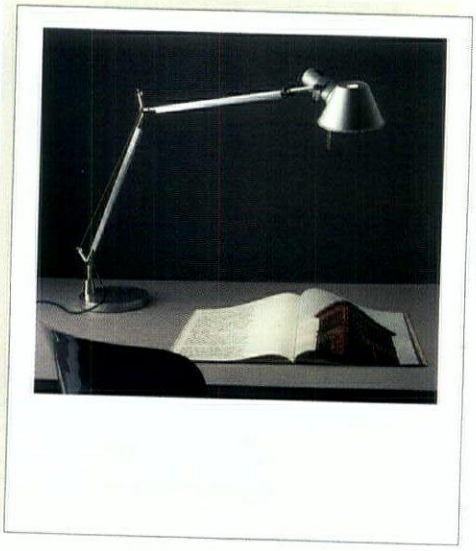


FLOS

Helice
Marc Newson
Circle No. 151

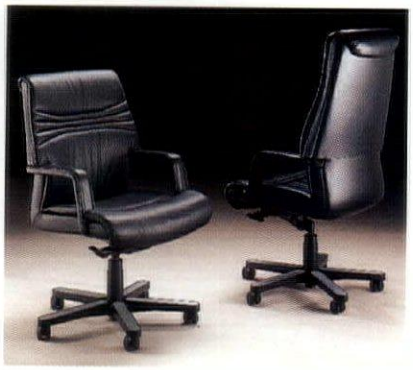


ARTEMIDE

Tolomeo
M. de Lucchi/G. Fassina
Circle No. 152

ARREDI

Taglia
Luigi Boffi
Circle No. 153



BEGHELLI

Eros Bolani
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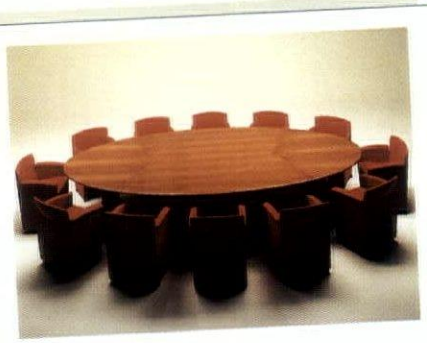

BUSNELLI UNO

Zelda
Hans Von Klier
Circle No. 155

CAPPELLINI

3 Sofa Regular
Jasper Morrison
Circle No. 156

CASSINA

Revers
Andrea Branzi
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CATTELAN

Graphic
Giorgio Cattelan
Circle No. 158

DIMSAU

Data Project
Baldanzi/Novelli
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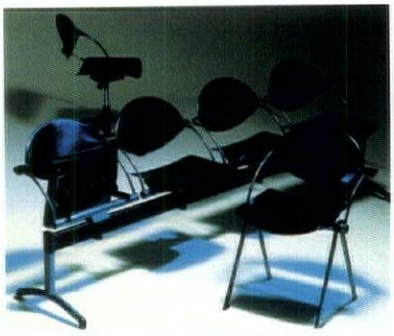
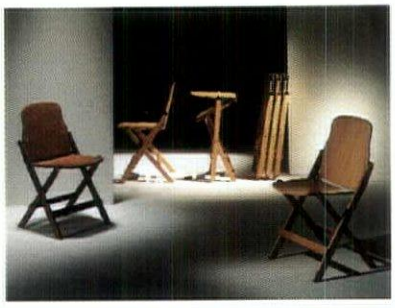
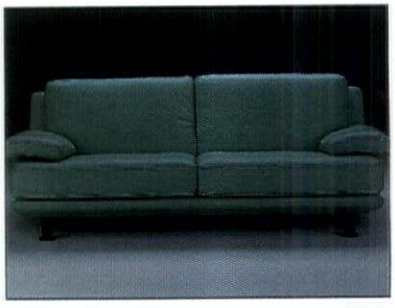




ART & FORM

Sam
Giuseppe Raimondi
Circle No. 160



INDUSTRIE NATUZZI

NAT 1049
L. Scarati/P. Natuzzi
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FONTANA ARTE

Lenticchia
Franco Raggi
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ITALIANA LUCE

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F. A. Porsche
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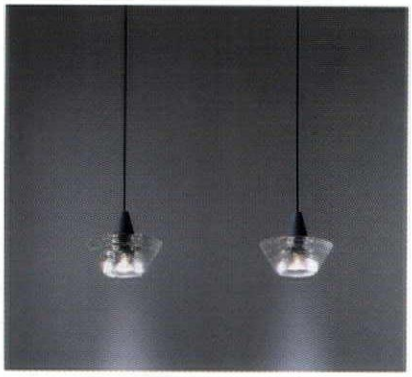
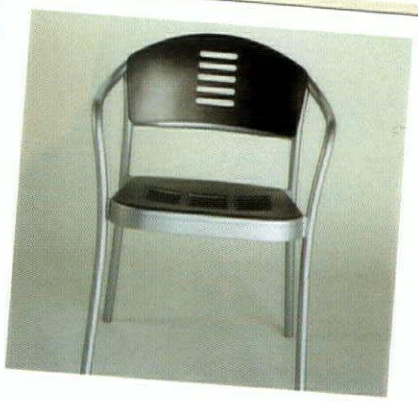


ITRE

Top Suspension
Carlo Nason
Circle No. 164



KARTELL

Mauna-Kea
Vico Magistretti
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MOVE

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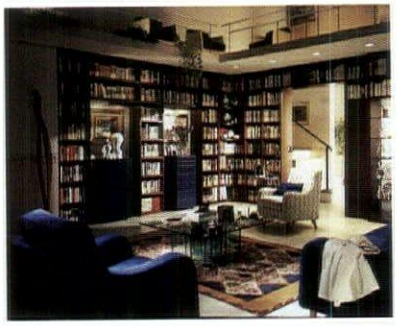

MDF

Bookcase
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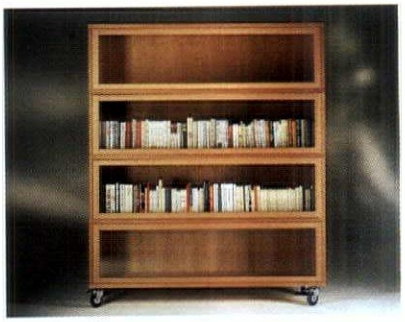
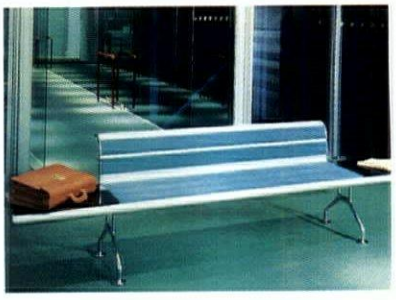


MOROSO

Princess
Moroso Design Center
Circle No. 168

MATTEO GRASSI

Metron Collection
Carlo Bartoli
Circle No. 169



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Liza to Flight
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NEMO

Sharatan/2
L. Agnoletto/M. Rusconi
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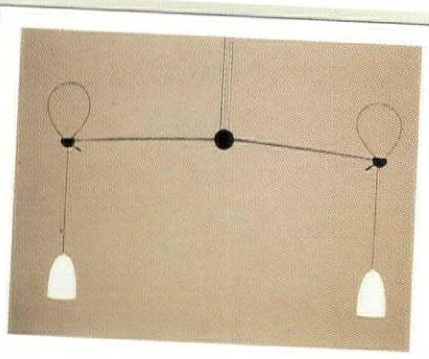

REGGIANI

Super Techne
Fabio Reggiani
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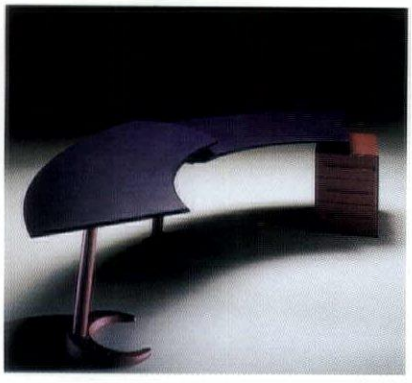
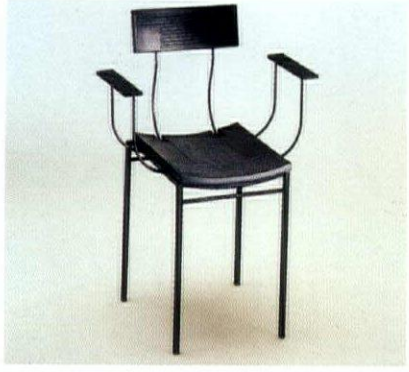


PARIGI

Cifra
Paolo Parigi
Circle No. 173



NOTO - ZEUS

Glassnost Armchair
Maurizio Peregalli
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Pesaro
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Udine
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Rimini
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Hospitality
Genova
November 19 - 23, 1994

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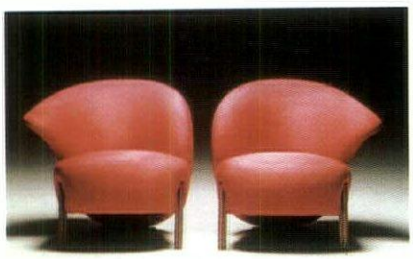

SAPORITI

Calla
Mauro Lipparini
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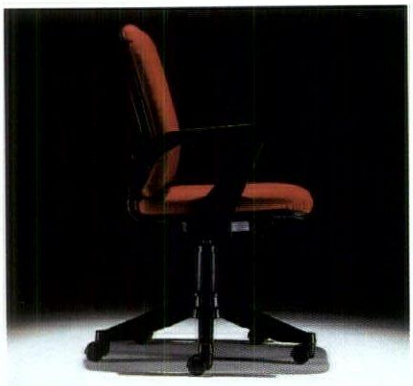
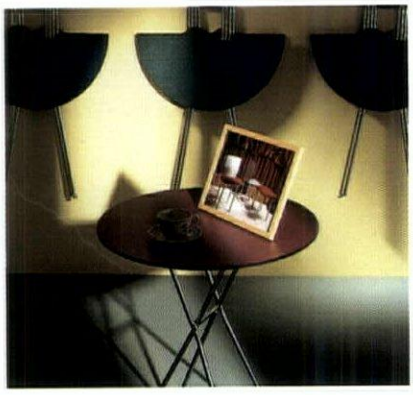


VAGHI

Numea
G. Raimondi/R. Carrer
Circle No. 177



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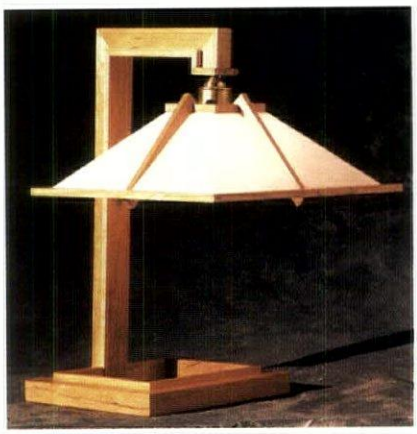
FRANK LLOYD WRIGHT LAMPS REPRODUCED

SUMAC IV: (Top) 1 foot, 2 inches high by 5 inches wide and made of bronze and lustre glass.

ROBIE I: (Center) 11 inches high by 1 foot, 1 inch wide and made of cherry wood and white glass.

TALIESIN I: (Bottom) 20 inches high by 14 inches wide and made of natural cherry wood.



At first glance, it might seem an unusual pairing: East meeting West via Japanese lighting manufacturer, The Yamagiwa Corporation, working with the Decorative Designs Collection, established by the Frank Lloyd Wright Memorial Foundation at Taliesin West, to reproduce 14 of the renowned architect's lighting fixtures. Closer inspection reveals several reasons for the not-so-unusual alliance.

The Wright Foundation had long searched for a licensee capable of working with the wide variety of materials that the architect used, including wood, metal and art glass. Yamagiwa's tradition of working with specialist fabricators and artisans in a variety of mediums to put custom pieces into production could accommodate such diversity and was a precise match for the hand craftsmanship of Wright's prototypes.

The alliance also suggests a cultural or philosophical fit. Wright's aesthetic reflects a respect for the straightforward use of natural materials associated with Japanese design, and several of these fixtures are Japanese in spirit. The architect is revered in Japan and his work has a receptive market there.

The reproductions have been produced with the guidance of Bruce Brooks Pfeiffer, director of archives for the Frank Lloyd Wright Memorial Foundation and Donald Hallmark Site Administrator of the Dana Thomas House.

Wright designed interior furnishings as integrated components of the architectural whole, striving for a sense of unity in the domestic landscape. The pieces embody stylistic references that vary from the fluid, organized renderings of nature to more austere and abstract geometric renderings of form.

Though the pieces have been conceived as the smaller components of the broader designed environment, they are able to stand on their own strengths. A parallel achievement is Yamagiwa's success in adapting one-of-a-kind custom lighting fixtures to the more stringent demands of a production line, while maintaining the detail of the original prototype.

Taliesin I reproduces the wooden table lamp designed by Wright for his own residence in Spring Green, WI. A square shade hangs from a pedestal over a square base. Taliesin II and Taliesin III are architectural constructions of a different sort, in which a graceful sequence of square wooden blocks and plywood shields climbs a central column.

The Robie House, built in Chicago in 1908, suggests a connection between architecture and the natural landscape. Robie I was originally referred to as the "sun lamp," its radiant sphere suspended in a square wooden frame to convey a sense of weightlessness. Similarly, the half sphere of the wall sconce in Robie II is suspended from a bronze armature with a perforated design.

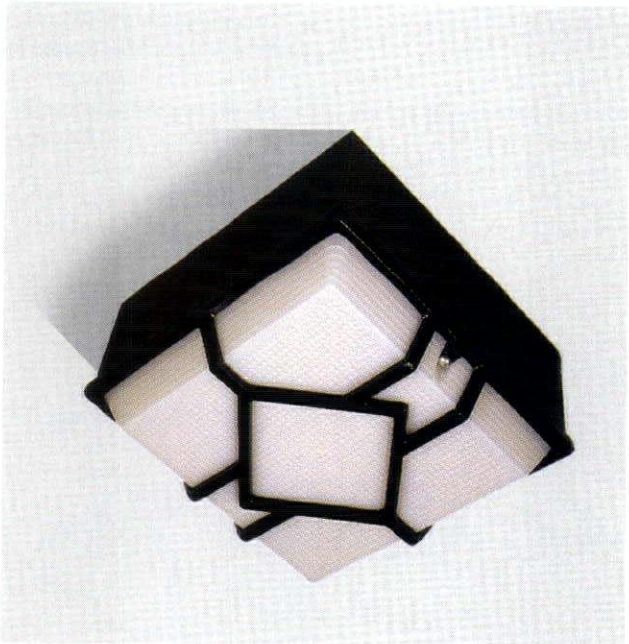
Most lavish among these may be the five lamps in the Sumac collection, drawn from the decorative details of the Dana Thomas House in Springfield, IL. Wright's adherence to the forms of the natural world are clear in the art glass of the residence, where the stained glass windows in the dining room evoked sumac boughs and butterfly wings.

More austere are the floor lamp and hanging lamp designed for the John Storer House in Los Angeles. The slender steel rods of the lamps, with their cubes of frosted glass are a poetic reference to the structure of the residence.

The Midway metal table lamp was designed in 1913 for Midway Gardens, a Chicago restaurant and beer garden. Its low pitched glass shade hangs from a steel shaft that is connected to a steel base, making for an austere sculptural composition.

The introduction of this collection coincides with the retrospective on the work of Frank Lloyd Wright at the Museum of Modern Art in New York City, and the initial outlet for these pieces will be the museum's Design Store. Yamagiwa will also distribute the collection through selected lighting showrooms in major American cities and directly through its Seattle office. The company's own sales offices will offer the collection in Japan and Southeast Asia. Yamagiwa USA Corporation, the company's new subsidiary based in Seattle, will market the designs in the United States. *Circle 77*

WHO SAYS YOU CAN'T PLEASE ALL THE PEOPLE ALL THE TIME...



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ARTISTRY AND THE DOWNLIGHT

PRO SPEC: (Below) The new generation of downlight has been born, allowing designers greater flexibility and control, and ease of installation.

The current standard line of Calculite adjustable accents and lensed wallwasher downlights will be discontinued with the May 1994 introduction of the next generation in downlights from Lightolier: the Pro Spec series.

Significant improvements and modifications in downlight technology have been created to afford greater flexibility and range of artistic options to lighting specifiers.

Lightolier approached the redesign of the fixture types by holding two focus groups and also drawing upon the opinions of over 400 design professionals, including lighting and interior designers, architects, engineers, design and build contractors, distributor sales staffs, owners and managers and visual display technicians. Culled from the on-site interviews conducted across the country in over 30 cities were suggestions that resulted in 30 key action items. Major changes incorporated into the fixture design are:

- Modular unitization—the Pro Spec fixture is modular with snap-in connectors that eliminate labor intensive hard-wiring during installation and relamping.
- Offset centering pivot—previously, when a lamp was adjusted and angled in a fixture, the light beam could be thrown off center, creating blocked beam patterns. The new fixture includes an offset pivoting mechanism that maintains the beam exiting from the fixture at center.
- Accessories are accepted easily—these include hex louver, spread lens, cross hair baffle, diffusion lenses, snoots and color filters, and perforated percent gradings—which slide easily into ridges designed especially for this purpose to hold them secure.
- Cam Locking is easier to manipulate and holds the modules securely in place. It replaces knurl knob locking.
- Capacity for installation in shallower ceilings—some of the new fixtures are 8 inches deep, with the option to make it deeper and accept larger light sources.
- Operation with multiple sources—three Pro Spec models accept three lamps; other models can accept up to 12.
- The degree of adjustability has been increased from 35 degrees to 40 in the 6-inch aperture model, and to 45 degrees in the 7-inch model.
- No refocusing is required after relamping, because the lamp angle is locked in place and the aperture is large enough to relamp without angle adjustment.
- Because the unit is forgiving, it can be installed and accommodate later changes in design schemes without having to replace the fixture.
- Easy mounting of transformers and junction boxes.
- In residential applications, it operates in 2x10 construction.
- Standard aperture design instead of unique aperture design.
- It has 2-inch, instead of 1-inch, ceiling maximum.
- Mounting brackets accept EMT.

Several models of Pro Spec are offered, each with different capabilities. The Basic model meets or exceeds the specifications of all fixed-source competing units. It does not have lamp or aperture type portability, or media capability except for spreadlenses, and operates with a simplified source vocabulary that includes PAR 38, 30 and 36, and MR 16 lamps.

The Premium model exceeds specifications of all fixed or multi-sourced competing units. It has lamp and aperture type portability, media accessories, and operates with an expanded range of sources that includes PAR 30, 38, 38/3, 36, and MR 16, AR 70 and 111, PAR 56 line and low voltage, and R30. It has a frame and finish design.

The Premium Elite model allows component specification, and operates with an increased number of sources, including PAR 30, 38, 38/3, 16, 20, 36, MR 16, AR 70, 111 and ALR 58, R30, PAR 46 and PAR 56 line and low voltage, and GE twist-lock MR 16. The Premium Elite model incorporates greater flexibility for problem solving, allowing earlier closings of ceilings, and later source/type determination, making it well-suited for fast track projects, with reduced cost to inventory and superior distributor service.

Reflector selection in the 6-inch unit allows for 0-40 degrees, 20-40 degrees and 0-20 degrees. The 7-inch model allows for 0-45 degrees, 20-45 degrees, and 0-20 degrees. Both unit sizes have options for lensed wallwashers.

Features which had existed in adjustable downlights and which will remain include capacity for damp location use, and inspection from below, top relamping, C channel and hanging bars, and internal levelling.

Finishes offered include clear, gold and black in polished self-flange, painted white self-flange, and flush versions.

Calculite models which will be obsolete when the Pro Spec line is introduced in May 1994 include models 7771, 7776, 7778, 7047, 7048, and 7042.

Housing selection includes deep versions (includes PAR 38, 46 and 56) and shallow versions (excludes PAR 38, and PAR 56). *Circle 81*

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not introduce a new
fixture every month. When
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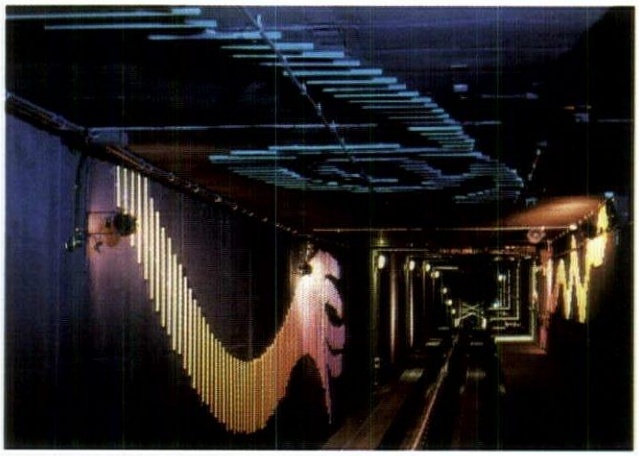
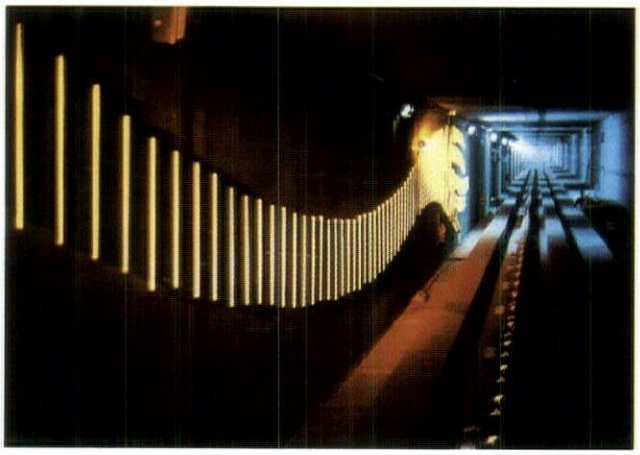
Classica's graceful design will complement both highly-styled and simple interiors. And, various lamping configurations are available to accommodate the diverse lighting requirements often encountered in a project.

Consider Classica for spaces that demand unsurpassed lighting by Litecontrol.





SUBTERRANEAN SCULPTURE

CHALLENGE The goal of Denver's $7.7 million One Percent For Art Program, currently the largest public arts program in the nation, was to integrate artworks into the new Denver International Airport from the inception of its design. Artist and designer, Leni Schwendinger, whose career "has two concurrent paths," she explains, "one more conventional lighting (architectural and theatrical), and the other, more art oriented," responded to the "Call for Artists" issued in 1992. Twenty-six artists were selected in June 1992 from a pool of 100 to create site-specific artwork throughout the airport, in interior and exterior spaces. Two tunnels were slated to contain artworks, and Schwendinger was selected to adorn one of them.

DESIGN/TECHNICAL CONSIDERATIONS "Deep Time/Deep Space: A Subterranean Journey," has drawn elements from Colorado's industrial and social history to transform the shuttle train tunnel into a fantasy passage replete with images evoking deep and shadowy environs—a mine shaft, a cave, deep space. Schwendinger used a combination of mathematical calculations, three-dimensional CAD renderings, and on-site testing to plan the effects and integrate all elements. "'Deep Time/Deep Space' fulfills my lifelong dream to design a 'dark ride'," says Schwendinger. "Unlike a theme park, real-life travellers are invited to envision a landscape below the earth's surface alive with human labor and other-worldly dreams."

METHOD There are four "zones" through which the train and its passengers travel at about 30 miles per hour—a construction area, a mine, an underground night sky and a dreamscape. The zones incorporate a shimmering animation of varied sculptural forms, from miners' pickaxes to hovering satellites. Messages of hope are projected onto the tunnel walls—"I Have A Dream," and "Mine Your Dream," as well as specific references to actual Colorado mines—Silent Friend and Ludlow.

The permanent installation is made with over 5,000 feet of conduit, strips of reflective street sign sheeting, construction materials, steel cut-out shapes, and architectural and theatrical lighting units. In addition to its locale and scale, "Deep Time/Deep Space" is distinguished by its technical sophistication. The sequence of lighting effects are controlled by an industrial computer and sensor system traditionally used to automate factory assembly lines.

The design, fabrication and installation of the artwork involved Schwendinger's collaboration with a team of 33 men and women, including surveyors, architects, ironworkers, installers, electricians, and engineers. *(continued on page 76)*

SCENES FROM DEEP TIME/DEEP SPACE: (Photos left) Tunnel sculpture segments include a construction area, mine, underground night sky and dreamscape

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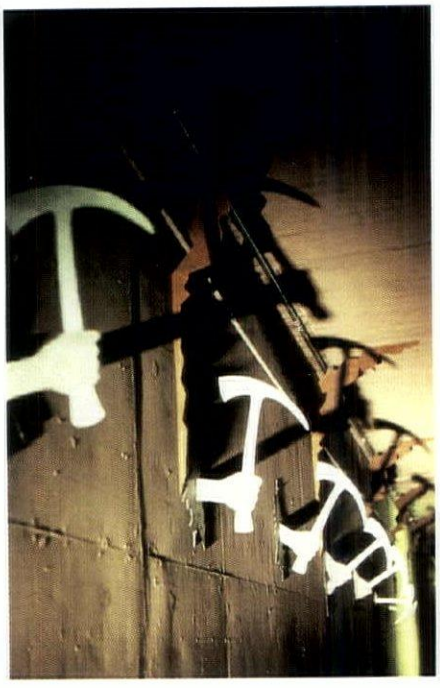
(continued from page 74)

CONCLUSION The collection of works created through the program are unique among the nation's civic buildings. Beginning May 15, 1994 when the airport opens, "Deep Time/Deep Space: A Subterranean Journey" will be experienced by an average of 25,000 airport travellers a day—close to 10 million annually—and provide them with not only a physical journey, but one of mind and spirit as well.



DREAM MINES: (Above) Miners' pickaxes allude to actual Colorado mines, such as Silent Friend and Ludlow. The sculpture includes animated lighting effects controlled by an industrial computer and sensor system traditianally used to automate factory assembly lines.

DETAILS

PROJECT: DEEP TIME/DEEP SPACE, A SUBTERRANEAN JOURNEY
DESIGN: LENI SCHWENDINGER LIGHT PROJECTS, LTD., LENI SCHWENDINGER, artist; DAVID LANDER, design director and project manager; JIN WEN and CHRISTINE SCIULI, drafting; ELIZABETH METCALF, artist representative; MINNA PYYKALA, studio manager
ARCHITECT: GARY DESMOND, HOOVER BERG DESMOND ARCHITECTS
ELECTRICAL ENGINEER: DAVID HOUDESHELL, JVA STRUCTURAL ENGINEERS
CAD ANIMATION: ANDREW MALCOLMSON
CAD SERVICES: JIM JENKINS
ELECTRICAL CONTRACTOR: JWP DYNALECTRIC C O.
FABRICATION: COLORADO INSTRUMENTS
INSTALLATION: B & C STEEL, INC., METRO STEEL, INC.
SURVEY TEAM: ZYLSTRA-BAKER SURVEYING, INC.

INTERPLAN
THE NEW DESIGNER'S SATURDAY

SEPTEMBER 27 - 29, 1994

JACOB JAVITS CONVENTION CENTER

NEW YORK, NEW YORK

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S T R A N D S C A P E S

No. 3

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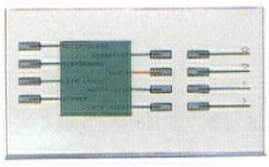

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Pop Light retracts when not in use, eliminating potential damage from weather conditions, and moving vehicles. (Below) Graphic representation of Pop Light in retracted and unretracted positions. (Right) One of several models available.

MOTORIZED RETRACTACLE OUTDOOR FIXTURES

Potential problems involving landscape lighting fixtures include damage from contact with lawnmowers, or moving vehicles in driveways, and from environmental conditions. Pop Light is an electric, motor/gear driven fixture that eliminates these problems, because it retracts into the ground when not in use. When the fixture is energized by the 12-volt transformer, the motor drives the gears, and the fixture rises out of the ground. At the top of the protraction cycle, the lamp lights. When the power is shut off, the fixture recedes back into the ground automatically. The fixtures remain unseen and protected by day, and visible at night.

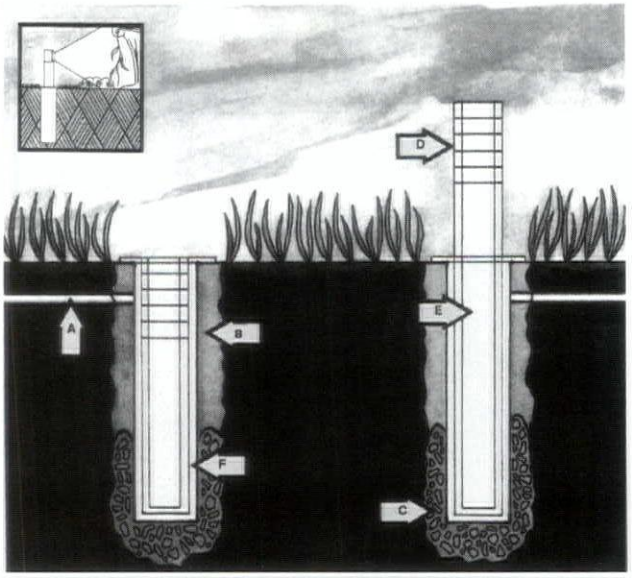
Each fixture has a rechargeable Energizer Pack that automatically charges when the fixture is on, making the fixture compatible with any 12 VAC transformer. Each unit has a clutch assembly that releases when a force of 15 to 18 pounds is placed on top of the fixture, so the fixture will not break if someone tries to push it back into the ground when it is on. This safety feature prevents the gears or the motor from breaking.

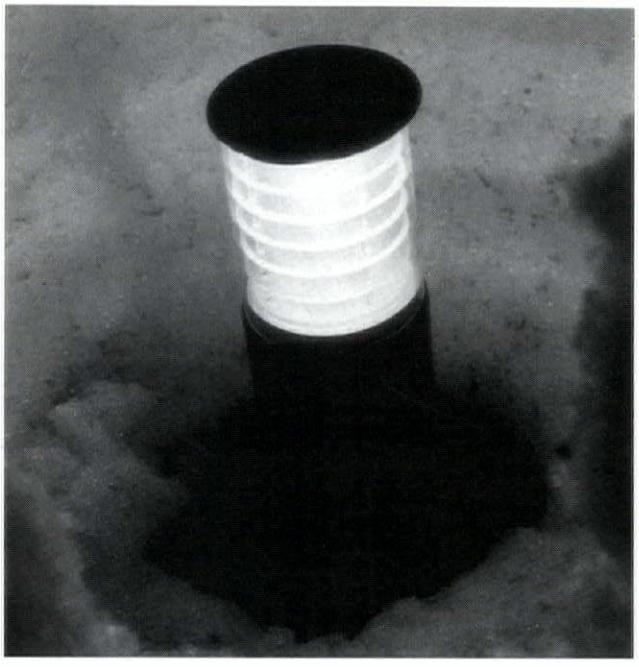
If a branch or ice cover prevents the fixture from reaching full height, the fixture will try to protract for 30 seconds. If unsuccessful, a thermal circuit breaker shuts off the motor to prevent damage, and resets the next time fixtures are energized.

All moving parts are in a waterproof gearbox. The water that does go down into the fixture drains through channels in the bottom that allow the water to wash out any dust or debris.

The wattage draw of the fixture is determined primarily by the type and size of the light source used. Since the lamp lights only at the top of the protraction cycle (when the motor is turned off), and the motor draws much less than the lamp, using the lamp wattage is sufficient.

The black-bodied fixture is 18 inches long (pop-up height from grade level is 10.5 inches). Varied models are available that use MR 16s in different wattages. The product includes a two-year warranty. *Circle 80*

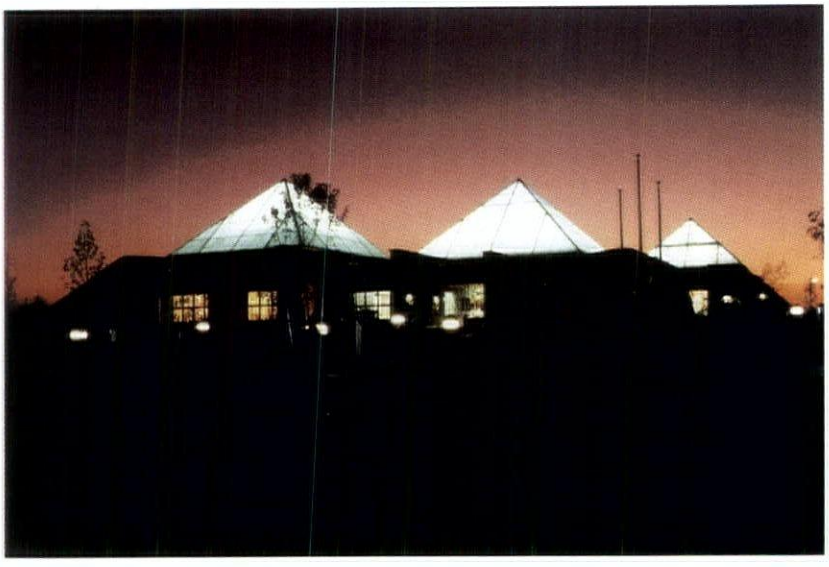




WEST VIRGINIA TOURIST INFORMATION CENTER

(Below top) Each of three portions of the West Virginia Tourist Center had different spacing and mounting requirements.

(Below bottom) Energy efficient metal halide fixtures uplight the translucent pyramidal ceilings.



CHALLENGE The facility is divided into three spaces, each defined from the outside by a pyramidal roof made of a translucent material, designed to glow at night when illuminated from inside.

DESIGN/TECHNICAL CONSIDERATIONS The original lighting scheme had called for two-lamp T12/RS fluorescent strip units to be mounted around the base of each pyramid to uplight each sloped side and create a uniform glow. However, the concern developed that this would not provide enough uniform light (the roof material transmittance is typically 30 percent) up the entire ceiling surface. Consequently, metal halide sources have been selected to achieve higher light levels, as well as fixture mounting positions away from the perimeter to produce better aiming angles.

Though each of the three spaces posed different mounting challenges, in each case either 250-watt or 175-watt metal halide lamps were used to insure color consistency.

METHOD The large exhibit area has been lit with 250-watt metal halide units mounted atop crossbeams at the base of the pyramid ceiling at 14 feet, 0 inches AFF. Four 250-watt fixtures per side uplight each face. Additionally, the peak segment of the pyramid has been constructed of a clearer material (about 70 percent transmittance), and more brightness was needed, so one additional 250-watt fixture has been mounted per side to highlight the peak area.

The small exhibit area had no crossbeams overhead onto which to mount fixtures, and there was a 10-foot wide balcony along the entire perimeter. One option was to mount 250-watt metal halide fixtures atop torchiere-style posts, integrated with the balcony handrail system, to uplight the ceiling. However, the architect preferred hanging pendants from an exposed purlin above, and mounting the fixtures from these. Two 250-watt units per side have been installed in this area.

The toilet/mechanical area posed a special problem, in that the mechanical room and the toilet rooms were completely separate spaces, but their ceilings had to read as a single illuminated space from outside. Here 175-watt metal halide fixtures are mounted two per side on the upper walls of the mechanical room to uplight the upper portion of the pyramid, and two 250-watt fixtures per side are mounted on the toilet area side of the wall, to uplight the lower pyramid portion (above the toilet areas). On the entry side, wall partitions above each of the toilet area doors required odd spacing of fixtures to cover the ceiling area uniformly. Also, the presence of a plumbing chase access door required fixtures to be mounted higher on this wall than on the others. This odd spacing, decreasing setback from the ceiling, prompted the use of three 175-watt metal halide units in this area.

DETAILS

PROJECT: WEST VIRGINIA TOURIST INFORMATION CENTER
LOCATION: PRINCETON, WV
ARCHITECT: E. T. BOGGESS, AIA, ARCHITECT
LIGHTING CONSULTANT: ART TILLMAN, ROBERT S. KIMBALL ASSOC.
LIGHTING MANUFACTURER: ELLIPTIPAR

(Below) Theatrical techniques used by lighting consultant Maggie Guisto add visually interesting contrasts of light and shadow to the lobby of the Hotel Nikko. (Photos on pages 81 and 83 courtesy of Colortran, Inc.)

THEATRICAL LIGHTING IN ARCHITECTURAL APPLICATIONS

In theatrical environments, the function of lighting is to control the focus of attention, emphasize rhythm and structure, establish mood and realistic elements. The goals of architectural lighting are really no different. The only difference lies in the relationship between the space and its audience. In the theater, the space and the audience are conventionally separate. In architecture, the audience is within the space, experiencing effects directly. Developments in technology are allowing fixtures, control systems and lighting techniques previously used predominantly in theater to be integrated into architectural lighting schemes to produce more varied effects.

"Fixtures and control systems can no longer be strictly defined as theatrical or architectural. It's all a matter of function," says John Fuller, vice president of marketing for Colortran, Inc. Many architectural designers have expanded their "toolbox" with the use of theatrical equipment and techniques.

LIGHTING TECHNIQUES

Independent lighting consultant, Maggie Guisto, often uses theatrical techniques to emphasize texture and integration of design in appropriate applications. Most clients don't expect the level of texture and highlight achievable with theatrical techniques. The Botanica Restaurant in the Essex House is designed to have a greenhouse atmosphere. So Giusto placed uplights in plants and lights behind the wrought iron fixtures so that the light could move through and create natural patterns.

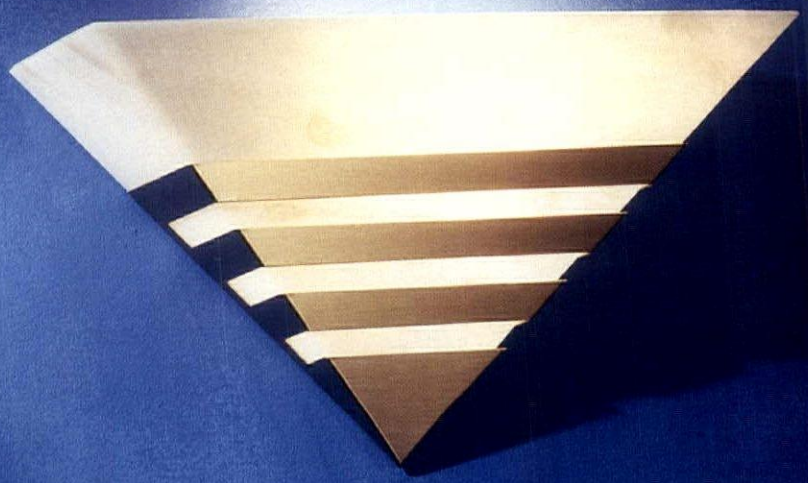
In her lighting design for the first floor of the Hotel Nikko, Maggie Guisto was responsible for creating effect and mood in the hotel's lobby, port cochiere, small atrium, two restaurants, the hospitality suites, and the ballroom. For the ballroom, Guisto designed four programmed "shows" incorporating light and sound cues, which can be turned on with the press of a button. Perhaps the most dramatic element is a three-minute thunderstorm effect that is used to announce the end of the cocktail hour and the beginning of the dinner hour.

Strobe lights and lamps that have been dipped in color are hidden in the room's chandeliers. Ingeniously placed tube lights are programmed to chase for a rain effect. Also available is a 30-second fanfare used to announce speakers and special guests, a "New Age" musical piece with lighting effects, and a one-minute thunderstorm demo for prospective clients.

More subtlely, Guisto used magenta neon and lamp groupings that produce defined pools of light and interesting ceiling patterns in the Nikko's upscale restaurant. In the port cochiere, she used uplights from the floor and "shin-busters," fixtures that shoot across the floor at shin level. Both of these techniques come directly from the theater and were adapted for use with architectural fixtures.

CONTROLS

Guisto has also found that clients don't expect theatrical control systems to be as flexible and accessible as they are. Theatrical effects needn't require highly trained operators. Throughout her design for the Hotel Nikko, Guisto used the



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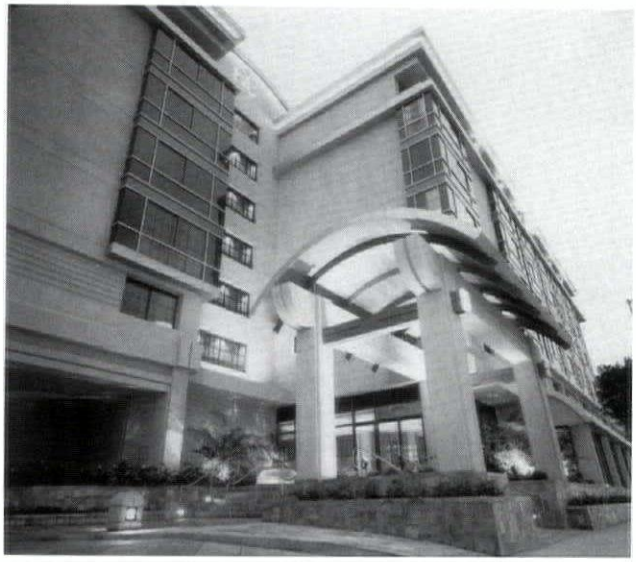
(Below) The Hotel Nikko's port cochiere is highlighted with "shinbusters" and dramatic uplighting.



Viewpoint control system based on the operation of a conventional theatrical console and user-friendly. The LCD master station operates in conjunction with smaller 9-inch by 6-inch wall panel stations with several pushbuttons that are located in key areas throughout the spaces. Programming is achievable both through the master station and the wall panels. Even smaller one-button stations are located near entryways. The controls can operate over 500 lights through 99 different control zones or dimmer groupings. A designer can have access to each fixture and can pre-program looks for meetings, presentations, performances or dinners. The designer can program control over each separate type of light or by zone.

Up to 14 presets can be built for each room or area. A brief description or title for the preset is typed in for readout on the LCD. From any given wall panel, an operator has access to all 14 labelled presets.

Presets can be changed at any time using the LCD station or the laptop. A timeclock function allows for scheduling effects up to a year in advance. The function also gives the designer and operator the ability to efficiently conserve energy by automatically controlling the amount of light.

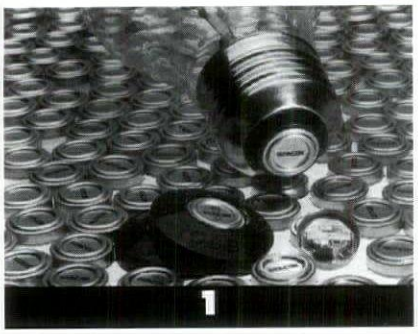
A building's management and AV systems can also interface with a control system to create automatic execution along with regular functions. Theatrical lighting controls can be used to implement emergency lighting. According to Ted Jones, theatrical consultant for the Indianapolis Convention Center, the center was the first project to make an issue of using incandescent for emergency lighting. High-intensity discharge lamps are used for day-to-day illumination in the new exhibit hall, but they could present a difficulty if power fails because they require a cooling down period before they can come on again. Using the control system, Jones has programmed some fixtures fitted with incandescent lamps to turn on automatically in the event of a power failure while the memory of the previous preset is maintained. Once power is restored, the energy used to power the emergency lights is automatically relayed back to the HIDs used in the preset, covering for the warm-up time. There would be darkness for only a few seconds. This innovation required new engineering but it is now generally available.

THEATRICAL EQUIPMENT

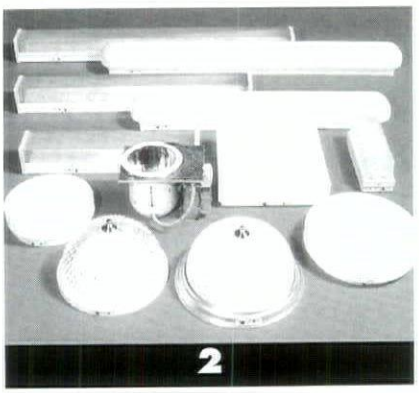
Other theatrical equipment is also available to the architectural lighting designer. Theatrical fixtures tend to produce a more evenly distributed and easily controllable beam that can be soft- or hard-edged, colored and patterned. These fixtures can also maintain the integrity of the beam for a longer throw, as far as 50 to 100 feet if necessary—a feature especially useful in hotel atriums and large building lobbies.

Theatrical equipment needn't be complicated or high-maintenance. A dichoric is a coated glass filter that allows for longer life with more precise color than a conventional gel. A theatrical mini-ellipse is popular in architectural applications because it holds a long-life 500-watt lamp, is compact, and has a variable beamspread that is accomplished by repositioning the lens. It can also be painted to match interiors. Chases, fireplace effects, long fades working in conjunction with short fades, and simultaneous fades are all available to the designer. Moving light fixtures allow for a change of position, but this is difficult to accomplish without allowing the instruments to be visible.

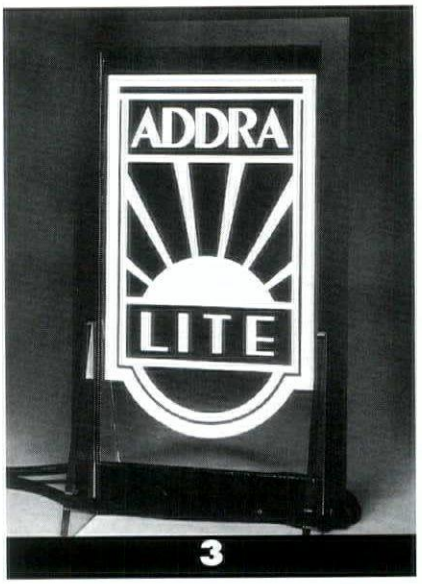
Strength with subtlety, drama with flexibility, sophistication with simplicity—all of this can be accomplished with the application of theatrical techniques, fixtures and controls to architectural design.


1

1. Built-In Bulb Controls
Beacon Light Products, Inc.'s Smart-Bulb technology places a tiny microprocessor computer chip (Bulb Boss) at or in the base of a standard light bulb, transforming it into a low-cost lamp which provides customized, socket-by-socket consumer control of a variety of lighting functions. The functions include: automatic off, allowing consumers to turn any light out after a preset time interval in areas where lights are chronically left on; automatic dimming with the flip of the control switch (a bulb in any socket can become up to a four-way dimmer with no special wiring); and combination control that marries timing and intensity such as a night light or automatic flashing for home security at preset intervals. Beacon Light Products, Inc., Meridian, ID.
Circle 60


2

2. Decorative Emergency Light
Diverse-A-Lite self-contained fixtures combine decorative styling with the response of emergency lighting. When power fails the units remain on, utilizing the same light source for both normal and emergency illumination. The fixtures need no special wiring or assembly and are equipped with an LED and test button. Models come with a replaceable nickel cadmium battery that can last up to 10 years, use a variety of lamps and are offered in a number of styles. Diverse-A-Lite, Boston, MA.
Circle 61



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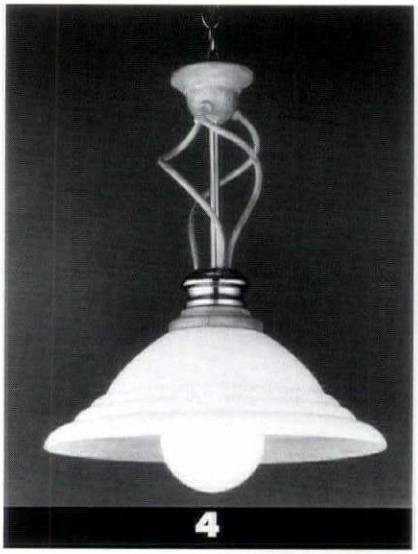
3. Fiberoptic Lit Signage
Glass Illuminations has introduced a fiberoptics system for multi-color etched glass illumination called Addra-Lite. Addra-

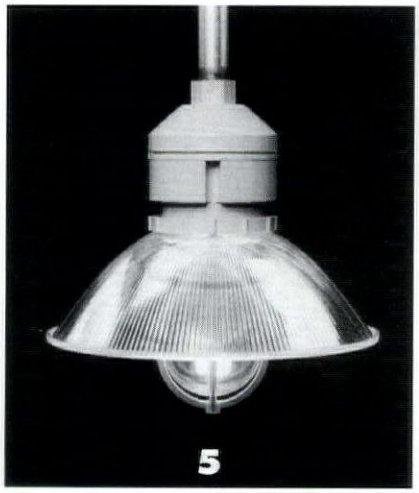


Lite's fiberoptics eliminates the use of electricity, or lamps and the production of heat within the sign or panel, so no cooling or heat removal is needed. Etched glass illuminations may be ordered with a single color or constantly changing colors. The system is fused and thermally protected, so it can be used indoors or out, with a virtually unlimited lifetime. The panels can be used for signs, logos, door/window/room /restaurant divider panels, and illuminated glass table tops. Glass Illuminations, Sun Valley, CA.
Circle 62

4. Patina Glass Fixture

Scavo patina glass fixture is accented with verde and light antique brass and uses one standard base lamp (G-40). The New Metal Crafts fixture #1391 measures 18 inches high by 16 1/2 inches wide (lamp not included, which adds 2 inches to total height). The fixture is also offered in polished or light antique brass finishes. New Metal Crafts, Chicago, IL.
Circle 63

5. Polycarbonate Reflector



Canlet non-metallic vaporproof fixtures now have an added polycarbonate prismatic reflector that directs the light downward, where it is needed for most lighting tasks. The patented prism design increases the lower hemisphere light by 40 percent and increases the 0 to 60 degree lumen value by over 140 percent. The prism also transmits 13 percent uplight to eliminate shadowing on the ceiling. The reflector screws on and off with the guard for easy cleaning. Canlet, Canplas Industries Ltd., Barrie, Ontario, Canada.
Circle 64

6

6. Medium To Large Scale Pendant

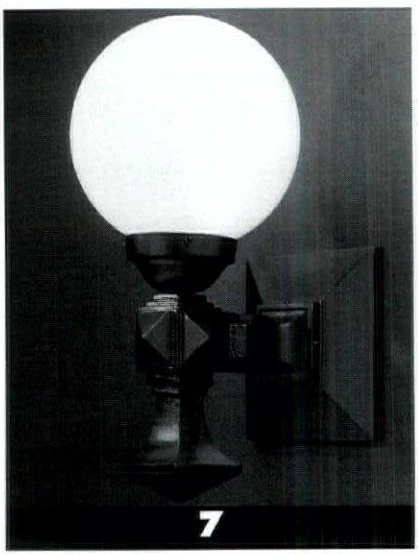
The Orion Pendant from Boyd Lighting responds to the need for a medium to large scale pendant that offers both ambient and direct illumination (adjustable beam-spread/MR 16 capability). The Orion allows for either fluorescent lamping (three compact fluorescents), or incandescent lamping (three A-lamps). The pendant is wired with two circuits so each component can be dimmed separately. The satin white glass bowl is crafted in diameters of 22, 25 or 31 inches. Boyd Lighting Company, San Francisco, CA.

Circle 65

7. Cast Iron Wall Bracket

The Portland large cast iron wall bracket was popular in the early 20th century. Finished with black enamel, the fixture can be fitted with several different shades. Portland is 10 inches wide, 19 inches high, with an 8-inch wall canopy and 13-inch projection. The unit accepts one 150-watt lamp and is UL listed. Rejuvenation Lamp & Fixture Company makes authentic reproduction lighting from the turn of the century through the 1950s for both commercial and residential use. Rejuvenation Lamp & Fixture Company, Portland, OR.

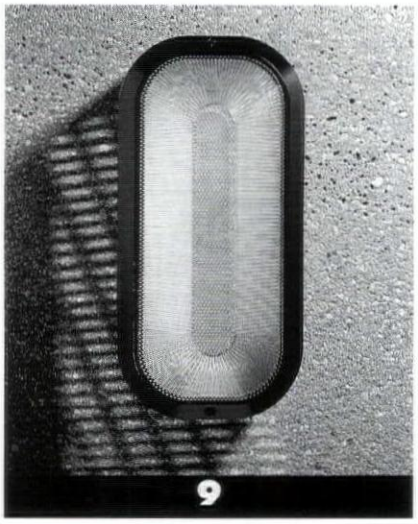
Circle 66



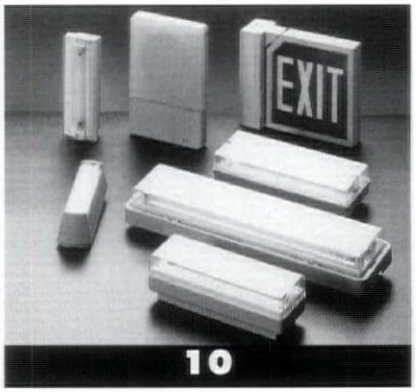
7

defines and distinguishes the Lumark Lighting family of vandal-resistant fixtures. Shown is a typical fixture from the VRE 2000 decorative series. An entire family of high-abuse units, serving virtually any indoor or outdoor area is offered. Lumark Lighting, brand of Cooper Lighting, Vicksburg, MS.
Circle 68

8. ADA Compliant Fixtures
Justice Design Group has added a line of low-profile fixtures that adhere to the guidelines for the Americans with Disabilities Act. With a depth of under four inches, these sconces are especially suited for public access ways or anywhere space is limited. Made of Ceramalight, a non-corrosive, non-conductive ceramic composite, the units are available for indoor and outdoor applications. A number of finish options, custom colors and faux finishes and lamping options are also available. Justice Design Group, Los Angeles, CA.
Circle 67

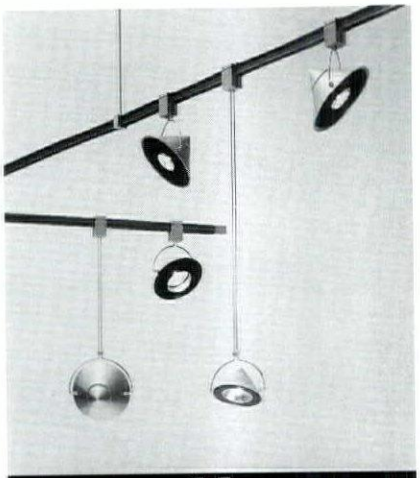


9. Vandal-Resistant Fixtures
A unique lens with architecturally angled facets and radius corners that deflect blows and absorb impact



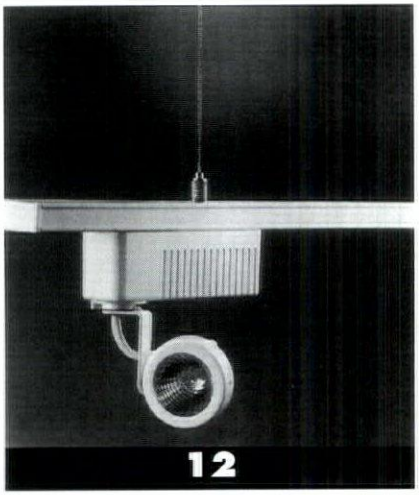
10. Fluorescent Emergency Lighting
Beghelli Inc. offers a series of fluorescent emergency lighting. Aesthetic appeal and state-of-the-art technology are combined with a patented plug-in connection system which provides easy installation and maintenance. Most units are designed to meet ADA requirements. Beghelli Inc., Jacksonville, FL.
Circle 69

NEW PRODUCTS



11. Halogen Track System
Major advantages of the new Mikado Track system over the previously introduced system are: positioning of spotlights anywhere on the conductor profile, easy snap on/ off spotlight adaptor, new rod-extended spotlights, and flexibility of installation with remote or canopy incorporated transformers. Artemide Inc., Farmingdale, NY.
Circle 74

12. Track Suspension
Con-Tech introduces the Aircraft Cable suspension system for track lighting. The effect allows track systems to appear to float in space. Galvanized steel cable is supplied with a patented grip-lock connector that allows for adjustable length and rapid installation. The cable attaches to ceiling via furnished 1/4-20 hanger bolt or T-bar mounting clip. Two kits are recommended for each 2-, 4- or 6-foot track, three for an 8-foot section, and four for each 12-foot section. Each cable supports 300 pounds plus. Conservation Technology, Ltd., Northbrook, IL.
Circle 72



INTERPLAN SHOW SET FOR SEPTEMBER '94 DEBUT

A new show designed to unite the buyers and sellers of furniture and design services for corporate and institutional environments, InterPlan—The Interior Planning and Design Exposition—will be held September 27-29, 1994 at the Jacob K. Javits Convention Center in New York City.

The show is co-sponsored by Designer's Saturday Inc., the New York City based trade organization of contract furnishings manufacturers; Miller Freeman Inc., a leading trade show producer, and the Commercial Design Network publications, *Contract Design*, *Facilities Design & Management*, and *Architectural Lighting*.

Among the many events slated for InterPlan is an entirely new, cutting-edge education program that will stress an interdisciplinary approach to commercial design. The education tracks will address the total buying team who collectively spend between $15-20 billion dollars annually on furnishings and services for the interiors of offices, healthcare institutions, restaurants and hospitality, public spaces and educational institutions.

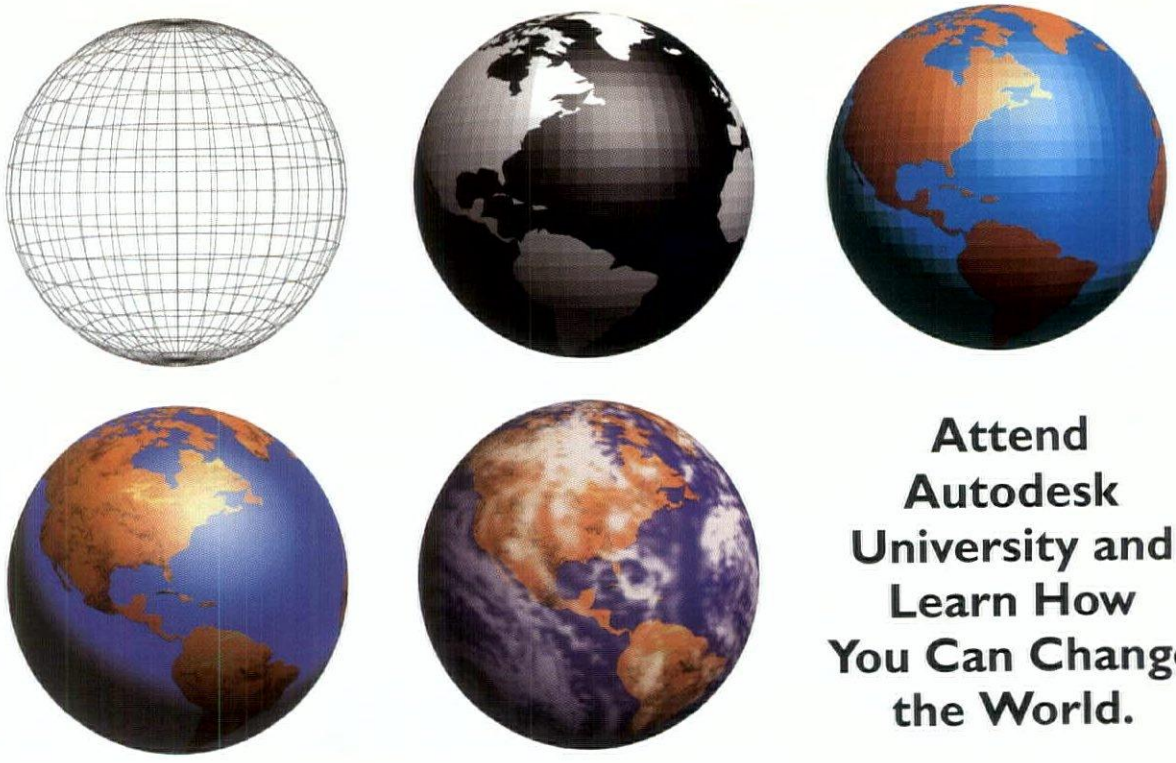
To date, over 200 booths have been sold to some of the nation's leading commercial manufacturers. For information, contact: Jennifer Gam at 212-626-2331.

RAMBUSCH PROCESS OF DESIGN EXHIBIT

The president, Board of Governors and the Design Committee of the National Arts Club announce the opening of an exhibition entitled "Rambusch Current Work: The Process of Design." The exhibition celebrates and marks the 95th year of the Rambusch Decorating Company. The Rambusch Company has concentrated its work in North America, but has for nearly a century also worked around the globe. Established in 1989 by a Danish immigrant painter-decorator, the family firm is now in its fourth generation, headed by president Viggo Bech Rambusch, FIES, ASID, and by his sons, Edwin, vice president for lighting, and Martin, vice president for crafts. The firm's design and stained glass studios are in Greenwich Village. The art metal and lighting workshops are in Clifton, NJ.

The Rambusch design process involved a continuous thread, from the creative inception in the design rooms to the completed solution in the workshops—from the idea to the object. This exhibition illustrates this process through full-size drawings, carved wooden patterns, maquettes, before and after photographs, crystal, mosaic, and stained glass.

The commissions selected for the exhibition include: McCormick Spice Company World Headquarters, The Freer Gallery of Art, Sacred Heart Cathedral, Moss County Courthouse, St. Vincent Ferrer, and American Airlines International



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This year in Atlanta, Autodesk University will offer even better high-quality, high-performance classes and exhibits. Autodesk University is the conference and exhibition to attend if you want to get the most out of your Autodesk products.

CONTINUING EDUCATION Autodesk University provides access to more productivity, more efficiency, and better designs. We have more than 120 technical courses guaranteed to make a difference in your use of Autodesk design tools every day. Not just theories—information specific to your job and level of expertise.

EXPANDING EXHIBITION You face a bewildering array of hardware and software choices in your search for the most customized and productive CAD workstation, peripherals, and software. What better way to make your buying decisions than by seeing ALL the choices in one place? Autodesk University brings together more than 150 companies at the world's most comprehensive, "Autodesk only" exhibition.

EXCHANGE OF IDEAS Attending Autodesk University also means exchanging ideas with other AutoCAD professionals from around the world. Between classes, on the exhibit floor and at the after-hours events you'll gain insight on how others maximize their Autodesk products.

QUESTIONS?
Call our FAX-ON-DEMAND number (800)-858-7057 or Marcia Gulino at (415) 905-2354.
Autodesk University is on-line. If you're on CompuServe, look in the Autodesk University section of the CADENCE forum (type "Go CADENCE") for up-to-date information. Direct inquiries to Marcia at autodesku@mfi.com through the Internet.

AUTODESK
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ALAUP

Autodesk University: Continuing Education for Serious Autodesk Professionals.

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Arrivals Building. The exhibition opens in the Marquise Gallery at the National Arts Club on Monday, April 4, and will run through Sunday, May 1. The public is invited from 12:00-6:00 p.m. daily. For more information, contact Office of the Secretary: 212-475-3424.

A concurrent exhibition focusing on the history of Rambusch will be at the Lehman College Art Gallery in the Bronx, NY, from April 12 through May 28, 1994. For information, contact Susan Hoeltzel at 718-960-8732.

GE AND MOTOROLA TO MARKET FLUORESCENT SYSTEM

GE Lighting and Motorola Lighting, Inc. announce they will team up to market GE linear (tubular) fluorescent lamps and Motorola Lighting electronic ballasts as an energy-efficient light system. Initially, GE Lighting will be marketing a line of co-branded GE-Motorola Lighting electronic ballasts manufactured by Motorola Lighting. The companies also intend to collaborate in developing other light system products for the future.

A new line of electronic ballasts will be packaged into a light system that combines technologies and products of both businesses. The systems will be sold to commercial and industrial customers through GE Lighting's distribution network in North America.

William Woodburn, GE Lighting vice president of worldwide marketing, said the emergence of advancing developments in electronics technologies represents a revolution in the lighting industry. He added, "We anticipate that within 10 years, more than 80 percent of lighting products will be different than they are today.....Because of this revolution, it's vital for a lighting business to team up with an electronics busines,s and for an electronics business to have a similar link with a lighting business."

LIGHTOLIER COMBINES OPERATIONS IN FALL RIVER, MA

Lightolier Inc. announces it will consolidate its U.S. customer service, marketing, product design and engineering functions in a single new state-of-the-art facility at the company's primary manufacturing site in Fall River, MA. Located near the Cape Cod peninsula, Lightolier sales and marketing management, project management and order entry will be housed in the center as well.

Lightolier will continue to maintain other operations at the company's headquarters in Secaucus, NJ, home to its parent organization, Genlyte Corporation.

"As a result of this innovative new center, we anticipate speeding responsiveness, new product development and marketing, and lowering costs to customers," says Lightolier president, Zia Eftekhar.

In addition to construction of the new building, present office facilities at the Fall River plant will be renovated to enhance operating efficiency.

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