Three installations: a thesis chronicle

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THREE INSTALLATIONS:
A THESIS CHRONICLE

by

Jonathan F. Kline

Submitted in Partial Fulfillment of the Requirements for the Degree
MASTER OF FINE ARTS

MFA PHOTOGRAPHY PROGRAM
SCHOOL OF PHOTOGRAPHIC ARTS AND SCIENCES
ROCHESTER INSTITUTE OF TECHNOLOGY
ROCHESTER, NEW YORK
August, 1984

Nathan Lyons, Chairman
Professor, Director
Visual Studies Workshop

Bea Nettles
Associate Professor
School of Photographic Arts & Sciences
Rochester Institute of Technology

Ellen Brooks
Associate Professor
Tisch School of the Arts
New York University
Permission Page

I prefer to be contacted each time a request for reproduction of my thesis is made. I can be reached at the following address:

Jon Kline
2194 Lewis Road
South Wales, New York 14139

September 1984

Jon Kline
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Introduction

This is a special book. It serves to document the course of my work and, more specifically, the development of my thesis exhibition. As a document it is filled with copies of relevant journal entries, drawings, and photographs woven in with the text.

Fulfilling the written requirement for the degree in this way has allowed me to step back and objectively look at where I've come from and what's been done. Sifting through the many boxes, journals, and portfolios in order to put this together has been very valuable. The thesis is seen as a series of projects done at a certain point in time, derived from the succession of ideas going back eight or nine years.

This book was done primarily for my own benefit as a clarifying, self-defining act.
I. Early Work, 1975-1978
I first moved to California in the summer of 1974. I had just completed the two-year foundation program in the art school at RIT which included some basic photography classes. At the time, I was then eager to get on with the making of art in a more vibrant setting.

Initially, I spent two years at the San Francisco Art Institute completing the requirements for a BFA degree by taking lots of drawing, filmmaking, and printmaking. The main emphasis of my study, however, revolved around photography. This seemed to surprise me because I never actually felt myself to be a photographer nor to be steeped in the history and hardware of photography. None the less, the camera was becoming an intriguing tool with which I kept finding more and more interesting applications.

Unlike painting or sculpture, photography is capable of dealing more directly with issues of time and place. I was fascinated by photography’s ability to record and reproduce specific segments of reality and thereby came to regard the medium as a framing and measuring device. People such as Jan Dibbets, Douglas Heubler, and Mel Bochner were producing work which I found to be interesting at the time.¹

Using a standard 35mm camera, I was engaged by the way movement and action in space became flattened, fragmented within a rectangle, recorded linearly, and read left to right.

¹Important books at the time were Lucy Lippard, Six Years (New York: Praeger, 1973) and Ursula Meyer, Conceptual Art (New York: E.P. Dutton & Co., 1972).
Concept of flattening:
1. Cylinders
2. Curves and shapes
3. Curved

Incorporating a shape or line in space with a camera, drawing using the cinemader frame as a "building block," and taking lots of pictures, putting them all together to discuss shape, line.

The camera automatically constructs the original action because the film is horizontal and can read left to right, flat regardless of the camera's position in space.

Example:
Original action: camera captures:

Journal entry, Autumn 1975.
THREE CONSTRUCTIONS

Process: Inscribing a shape in space with a camera using the viewfinder's frame as a building block.

Horizontal Rectangle

Vertical Rectangle

Integrated Square

FLATTENED CURVE

Inscribing a curved line in space with a camera; the photographs to be mounted horizontally.

key

Drawing, Summer 1975.
Flattened Cubes, Installation; San Francisco Art Institute, 1976.

To me, the viewfinder was perceived as a building block and I developed a series of photographic exercises which discussed the contrasts between specific actions and the way they became reconstructed via photography.

Overleaf: Detail, Flattened Cubes, Installation; 80 Langton Street, 1977.
The incentive for a great deal of this work came from spending a lot of time in certain areas of Northern California. The feel of the land helped shape the type of questions posed.

I was drawn to the ridge of hills running along the western border of the San Joaquin Valley, about 40 miles east of San Francisco. Soft, undulating hills of vast treeless ranchland and lunar stillness seemed so magnetic and alien in the clear Northern California light. Cloudless blue sky vaulted over the gentle crests and valleys of the foothills below. Hiking into this barren yet vol- taic environment invoked similar feelings to working with clean white sheets of drawing paper; sky, earth, and horizon line. It couldn't be reduced any further.
General view of hills near Dublin, California; 1975.

Minimal landscape helped emphasize the concept and the structural nature of each piece.
The site, the photographic interpretation of the site, and the reconstruction of that interpretation via large scale photographic installations fascinated me.

Walked lines, squares, arcs, and circles were some of the fundamental geometries performed in the most minimal of locales as structure predominated image and action.

5 180° Arcs, drawing with pastels and photographs, 1975.
With time however, the engineering of a piece both in terms of its logic as well as its design became even more important than actually going out and performing it. The work evolved into a series of diagrammetric studies of specific actions that were to be photographed.
Landscape Rotation, (Seascape Version), Installation; San Francisco Art Institute, 1977. See also Photography and Language, pp. 66-67.

The horizon line became increasingly more important as an element within the photographs because it acted as a divider between earth and sky, the only edge within the image. I investigated the horizon's relationship to the viewfinder's frame.

Overleaf: Landscape Rotation (Seascape Version), detail.
As time went on, I investigated the contrast between the rectangular or square format of the camera and the enclosed shape of the area photographed.

I began by focusing obliquely onto flat surfaces, tracing the projection of the viewfinder's frame onto the surface, thereby comparing the square photograph to a trapezoidal area.
I continued this approach by focusing onto two surfaces coming together, such as a corner, and pairing the photograph with the actual taped outline of the imaged area. I studied the way convex and concave surfaces intersected within the viewfinder's two dimensional frame.

**PLANE PHOTOGRAPHS**

An investigation of the camera's viewfinder, in this case a square, projected obliquely onto alternate surfaces composed of one, two, or three planes. Dealing with the inherent discrepancy between the viewfinder's perimeter and the resulting shape of that perimeter as it is projected onto the varying surfaces. The transformation of a square into a 4, 5, 6, or 7-sided figure via photography.

One Plane Projection:

Two Plane Projection:

Three Plane Projection:

The camera's square viewfinder projected obliquely onto a flat, single-planed surface.

The camera's square viewfinder projected obliquely onto two perpendicular surfaces, convex and concave.

The camera's square viewfinder projected obliquely onto three surfaces intersecting at 90° convex and concave.


A corner with three surfaces coming together proved even more complex as the frame capturing these intersecting planes became abstracted from the scene.

The work continued to be as minimal as the landscape work that had come before. Walls and corners, in both convex and concave orientation to the camera, were simply generic, unconnected with issues of light and color.

In May 1978, I left San Francisco for the Middle East. I spent the following two years there working for the Israeli Department of Antiquities as an archaeological photographer. During this period, I kept only journals of my thoughts.
II. Rochester, 1981-1983
Pete's Grass, two overlapping trapezoids. Color photographs, 16x20in. each.

Structural themes dominated the majority of work I did the first year or so after coming to Rochester. I picked up where I had left off a few years earlier in California.
I continued to explore basic principles of monocular optics and perspective; frame vs. framed. When asked to occupy one minute of time on the Laserdisc Project, I chose to work out an idea taken from an older notebook from 1977.
In this piece exactly how geometric shapes are perceived is based on position and different perceived points of obliquity and a rectangle function of the change of rotation of the line the edges position varies.

Rectangle 2
Triangle 3
Square 4

(See Ron Gregory, "Test Target Display" (MFA Thesis, Rochester Institute of Technology, 1984).)
Slope, (deriving the slope equation of four horizons. B&W photograph, 40x52in.

Taking a class with Nathan Lyons at the Visual Studies Workshop brought about some new ideas. Working simultaneously on pre-planned/choreographed imagery as well as associative/stream of consciousness approach, I produced the following murals.
Run; 4 24x32 in. B&W prints, RIT.
Run, detail.
Horizon Run; 3 24x32 in. B&W prints.
Floor/Wall presentation.
White Corner, 8x10 B&W contacts on mural paper with pen.

Feeling revitalized by what was coming out, I continued working at VSU, showing work every two weeks to a group of graduates from the Workshop and RIT, led by Nathan. My first need was to work out a piece that would somehow summarize, and maybe finalize, my concerns with structuralist questioning.
It was a complex piece that compared the camera's image to the shape of the imaged area. White walls and corners were exposed on 8x10 film and then contacted onto a single sheet of mural paper. I drew the shape of the imaged area over each photograph. One of the most insightful responses to this particular mural was the question from Nathan: "Are your intentions to explicate principle alone, or to provide an interesting example of the principle in action?"

Many suggestions were offered by Keith Smith to help move on to the next step:

- continue working on paper with angles and diagrams, and also work three dimensionally by building small mock-ups of the drawings.

- explore ways of coming off the paper.

- project light in a similar manner onto walls and corners.
Despite all the winds of change around me, I spent the following month working on a series of five B&W prints that were hauntingly reminiscent of work I had done long before in California. They were influenced by origami and based on a series of drawings done in 1977.

Drawing on graph paper; pen & ink. Segment of long scroll shown here.
I now began treating the familiar horizon line as a fold line and I was interested in studying the multifarious ways the rectangle became modified as the earth's portion of the frame was folded over the sky.

Folded Horizons, 5 16x20 in. B&W photographs.

This was another difficult project which involved masking, multiple exposures, and gold toning. The end result was, for me, too similar to work already done and yet these photographs were able to speak through all their stark, barren greyness of quiet geometry, transposed shape, and most interestingly, transperancy.
I decided to write up a thesis proposal that would allow me to bring to fruition my obsession with structure, and, at the same time, challenge me to explore some of the recent suggestions offered at VSW.

**Statement of Purpose**

I am interested in doing a series of pieces which deal with the connections that exist between the way the camera interprets a space and observing the photographic reconstruction of that space in another environment.

Some of the options I outlined for investigation:

**Procedure**

Some of the concerns that I will be investigating involve:
- extending basic theories and principles of monocular optics which have already been extensively dealt with in past work into pieces which illustrate those same theories/principles in action.
- examining the folded edge vs. the photographed edge.
- continuing to explore ways of activating the whole space in the gallery; having the work become a function of the viewer's movement through that space via projected imagery.
- investigating possibilities of dealing with scale issues outside the gallery environment, i.e., projected imagery outdoors.
The proposal was submitted and approved with the board consisting of Nathan Lyons, Bea Nettles, and Ellen Brooks. Ellen had been a faculty member at the San Francisco Art Institute and was currently living and working in New York. I looked forward to visiting her and the city for input on the thesis.

It was at this time that I was offered a chance to return to the Middle East with old friends from the University of Arizona, Tucson, and work as the staff photographer on an excavation in the Jordan Valley. I decided to leave Rochester and use this time in the Middle East to rekindle some of the passion I deeply felt for its environment and history. My work needed that sort of intensive energy more than any further class time.

On March 31, I flew to Amman, Jordan, for a two-month stay.
III. Jordanian Entries
Au'di, Hussein, and Muschrif.
Tel-el-Hayyat Project, Spring 1983.
Petra, 4/29/83: The light is bare-bulbed overhead with turquoise sheets and a private room on the top floor of the Petra Resthouse. I've got the floor to myself and a mountain out the back deck which, after a four minute climb, affords a wonderful view of these entrancing, alien landscapes. The rock structures are simply amazing. Tumbled, rough yet worn bits of doughy sandstone, soft and granular, easily dug into. Curving volumes with their sloping edges. Erosion and water and wind. And on and on into the far distances which are disturbingly perspectiveless in the brilliant dazzle of mid-day, caught in a shimmering blue haze, softly immobile and flat. As the sun sets, the gentle heat haze renders the distant horizons in muted purples of fuchsia and mauve. Twilight, and I walk excitedly to the top. The air is filled with something familiar; not the Negev try as I might, but to the California coastline, something soft and saline, scented yet illusive. I pick the last of the winter's rain flowers, bits of still-blossoming flora, a cache of color midst sand, stone and boulder. Burying my nose deep into a freshly cut stalk, biting its stem, I wait for something powerfully familiar to present itself. It's as if it's there, only waiting for the sun to dry it out and let its inner juices crystalize, crisp and dry in the desert sun. Too early.

Deir Allah, 5/12/83: Very magical afternoon today. No nap and a request to drive into town for supplies and other urgent errands from friends. Black clouds to the south and quite a wind. By the time I got the Chevy truck into town, the sky overhead was grey-orange and threatening. Lightning coming down the valley. Distant thunder coming closer. Shopkeepers pulled their wares indoors and the air became heavy and still. Arabs; mother with small boy in knickers and knee socks, school girls in turquoise jumpers with black trouses beneath; Bedouin kids in rags; youths in tight jeans and Marlboros; the religious in dusty gelabas; all in a great variety of head gear. Dirt and life, action and entropy. Remember Cairo. And then the town grew dark and the lights came on; neon triangles and kerosine lamps flooded some interiors, while in the mudbrick homes of the poor a single bare bulb cast a dulling dimness throughout. And then it rained and rained, washing the dust away - violently cleansing.
5/15/83: And the ride home was the best. Coming down off the high plateau on the west side of the Bekaa Valley, slowly following ancient roads west and down to the Jordan River. Down and down, descending slowly through terraced hills pocketed with cream yellow rocks in the red brown soil, grape vines, olive groves, and scrub oak. Cornflowers, meadow grasses, and poppies. Small Moslem & Christian villages tucked into the niches of the hillsides, offering grand vistas down into the Valley and across to Israel. Crusader fortresses high atop strategic mountain passes, Bellevoir and Ajlun Castle, Saracens and the Holy Wars, Sulieman and Richard. Taken and re-taken; lines of warfare past and present.

Deir Allah, 5/21/83: Twilight. Listening to the evening call to prayer from the roof of our house. Overlooking life going on in the yards and gardens below me. The muezzin chanting his call, slow, deep and dreamlike. Chickens nesting nearby, a kite flying from atop the tel. Fading orange yellow sky aglow, soft grey purple hills to the north and west. Chickens aimlessly running about in the dusk light. A motorcycle gains speed in the distance. Silverware tinkling in the dining room below. Scents of cinnamon soup, the latrine, soft dust, and Syrian hibiscus.
I knew when I returned to the States that I wanted to work on a series of three to four projects that would be specifically designed for the Photo Gallery's space at RIT. I wanted to work with the way light illuminated each piece as if to install some of the magical presence of the Jordan Valley's light in the work. I read enthusiastically Lawrence Weschler's biography of Robert Irwin, *Seeing is Forgetting the Name of the Thing One Sees*.

In early July I went to New York and just talked with Ellen Brooks about light, revitalized energy, and new insight. She suggested investigating the recent work of Jim Turrell, Elyn Zimmerman and Maria Nordman. She showed me Jaap Reitman's bookstore on Spring Street where I immediately got lost in his collection of art books, museum catalogues, and other relevant publications. A wonderful spot which I would continue to visit on future trips.

Researching in the art library of Rush Rhees over at the University of Rochester as well as the Memorial Art Gallery's library to find out what's been asked, what's been worked out. Over the ensuing months, Rush Rhees and the Memorial Art Gallery (MAG) libraries would provide privacy and the complete collections of publications necessary for the development of this thesis. Full days were to be richly spent hunting down obscure articles, searching out important interviews, and enjoying all the surprises found along the way.
Knowing I had the full gallery's space to exhibit the thesis which was slated for March 9-16, 1984, I continued putting together thoughts and ideas, prioritizing what I felt needed to be communicated.

Projecting
Reflecting
Function of wind
Function of people's movement
Huge Scale
Rich Color
Plastic/fabric/gauze

Photography as a rich recording device

Thoughts of universal principles of heat/light/motion

Organic rich textures and the implication of speed

Large murals

Geometric sequencing

Horizon lines

Enveloping
Engaging
Meditative
Inducing/encouraging imagination
Invoking wonder.
Clipping, Democrat & Chronicle, August 1983.

On frequent drives down the back roads that dry summer, Joan & I came across these cornfields being watered. Pulling over and turning off the car's engine, we observed these huge, spurting jets of water arch up into the summer sky, carried aloft by the wind, circling around slowly, over and over again. The encompassing fields were alive with the invisible rhythmic release of jettisoned water.
Throughout the development of the thesis, my workroom's four windows played a significant role. Through the day they delivered a variety of different types of light which seemed to energize my drawings and enliven my thoughts.
Autumn

By early October I had laid out on paper a floor plan of the gallery and started to draw up plans for three installations. I knew I wanted to somehow use the two 30 foot long windows that ran along the north and east walls of the gallery. Each of the pieces developed simultaneously; while one was on the drawing table, the other two were close by.

With each piece it was my intention to encourage reflection and imagination on the part of the viewer. With the interaction of light and space I hoped to convey a sense of immediacy and presence.

wonder invocation sensation
reflection absorption diffusion
event context structure
minimal sensual animate
clear honest alive

Edge Dissemination/Atmospheric Analogy

My first thoughts with this piece centered around the notion of sequentially magnifying an edge to such a degree that it eventually becomes fused with the space surrounding it; an example of the breakdown of matter into constantly moving fields of atomic energy where no clear boundaries exist. The mergence of positive and negative space. I visualized the edge scattering and dispersing with increased magnification, and it took on the appearance of a horizon line seen through a variety of distances and atmospheric conditions. I referred to Webster's:

analogy:...partial resemblance explaining something by comparing it to something else...
similarity in some respects between things otherwise unlike.
dissipate
disseminate
disperse
dispel
scatter
I conceived of a series of huge murals sequentially revealing this phenomena as recorded on the Scanning Electron Microscope with a razor's edge used to simulate the horizon line.

Yet why not just go out and shoot a series of horizon lines which actually appear the way I preconceived them, from hard edge clarity to misty, cloud-hidden blur? Because the act of simulating this with magnification on a microscope provided evidence of matter's immateriality in much the same way I felt light and atmosphere affected the appearance of the horizon line. One was real yet invisible to the eye, while the other was equally as real, yet poetically visible and present. Their visual and conceptual similarities fascinated me.

I wanted the murals to be illuminated by diffuse light coming through the north window in the gallery. I wanted the way they were to be installed and lighted to have a direct relationship to the imagery. For the duration of this book, I'll refer to this as the Magnification piece.
The second piece I was developing at this time dealt with the continuing interest I had in horizon lines and folded edges. I visualized intersecting, suspended color images that would somehow reveal the order and geometry of successively bisected rectangles. Working on a variety of ways of presenting this with diffused gallery light, I considered both free-form, arbitrary planes of color as well as a much more systemized method of arrangement. I'll refer to this as the Folded Horizons piece.

Sketch, pastels and graphite; 18x24 in.
A line of parallel transparent planes through which 5 photographs intersect along the horizon line.

Along hill

Folded Horizons, notebook sketch.
Initially, the third piece was conceived as a space to be illuminated by continually changing slides of dawn/dusk light that had been shot while in Jordan. I began drawing up different projection systems for the gallery space. My main concern was whether the piece would be something walked through like a corridor, or something arrived at and remained in for a while. In time, more drawings would be generated for this project, referred to as the Skylight piece, than the first two projects.

In all the pieces, I began looking at Japanese architecture and its usage of diffused light indoors. I then became interested in the way contemporary Western architects are using natural light in their designed interiors.

Sketch, crayon and graphite, 18x24 in.
Mid-October

I arranged meetings with Bea Nettles, Tim Callahan, Dick Floberg, and NTID theater people to discuss the actual materials necessary for the successful presentation of these projects.

Bea suggested getting in touch with Contact Supplies here in Rochester and see about their Xerox 20-30 Copier\(^2\) which handles originals up to 23 inches wide by any length. It is also capable of photocopying the original onto vellum, mylar, and bond paper. She also suggested investigating Kodak's Translite Film \#5561, a B\&W emulsion coated on a transparent and very drawable base. Sold in large sheets and long rolls, this could be an ideal material for the large Folded Horizons piece. It would mean imaging it in B\&W and hand-coloring it afterwards.

Tim suggested that Kodak's Duratrans Display Film \#4022, a rear-projection color material on a translucent base, could be used for the Folded Horizons piece. Examples of this product in action can be seen in airports around the country as well as in Grand Central Station, where the huge mural of eight seated babies greets commuters 24 hours a day. Tim also suggested that Rosco Laboratories made a variety of diffusion materials that could be perfect, yet costly, for covering both of the gallery windows.

Dick Floberg and Bob Pratt, an NTID theater designer, both suggested investigating the local company Brighton Lites to see what specific Rosco products they carried. I was also informed that Syracuse Scenery, a huge theater supply company in Syracuse, sold muslin in nine foot wide bolts, and also carried the BD Company's line of less expensive diffusion material.

\(^2\)For further information about this product and all the other underlined products and companies on this page, please refer to the Materials Index at the end of this book.
Late October

New York:

Whitney - "Minimalism to Neo-Expressionism"
"Sculptor as Draughtsman"

Avery Fischer Hall - open rehearsal: Zubin Mehta and the NY Philharmonic working with Carlo Menotti on a recent composition of his to be performed that evening.

Carnegie Hall - Seiji Ozawa and the Boston Symphony Orchestra with mezzo soprano Fredericka Von Strade performing 'Six Songs' by Berlioz.

Brooklyn Academy of Music - opening night; Lucinda Childs Dance Group performance with music by Laurie Anderson and stage designs by Robert Rauschenberg.

I met with Ellen Brooks and showed her the drawings done to date:

Folded Horizons - make sure the materials add to the lushness and reflectivity of the earth/sky phenomenon.

Magnification - make sure the window is really being incorporated into the piece.

Skylight - a room or corridor? Is there any way to integrate architecturally the presence of multi-layered translucent surfaces in the piece without distracting the viewer and lessening the sense of light envelopment?

3 These sets were incredibly interesting; twelve movie projectors projected down onto the stage where three translucent tent-like structures contained the dancers. Film/music/dance.
Refreshed, I came back to Rochester and worked out more drawings of the SkyLight piece, trying to incorporate a sense of tent/dome/shell surrounding the viewer.

Bluffy surface forming a plan curve about a straight line

Ellipse surface forming a curve about its diameter

Full shell surface

A variety of shapes...
I also thought about working more directly with the window which illuminated the Magnification piece. I thought of louvred systems that would refer to what was occurring in the imagery; the horizon was being altered, why not alter in a similar way the light that came into the space where the images were hung?
I began researching attitudes of contemporary painters toward light and its presence in their work.

Edward Hopper: time of day as subject.
Willem DeKooning: sheer luminosity of white.
Mark Rothko: atmospheric light of land and sea.
Larry Poons: glowing, recurrent light.
Jules Olitski: diffused, volumetric spaces.

10/23/83: I went to see the Motherwell show at the Albright. Such huge canvases hung in near claustrophobic fashion. Most attracted to his Open Series which speak about light, space, and enclosure with minimal color and abstracted forms. There is no reference to the symbolic use of color as in his older series dealing with his perceptions of the Spanish War in the Thirties.

Also saw a sculptural piece by Charles Wilmarth while at the Albright. It was a sheet of folded black steel and thick frosted glass in front of it. Heavy material translated via glass and light into something entirely different.

10/31/83: I've visited the fabric show twice at the Memorial Art Gallery. So many great pieces which deal with the suspension and draping of materials in innovative ways. Only one piece was illuminated with diffuse light from behind.

Caught the lecture by Paterson Sims, one of the Whitney curators who put the show "Minimalism to Neo-Expressionism" together. Discussion of the Post-Modernist obsession with death/self/holocaust that comes close to predominating much of contemporary painting. However, a sense of pluralism in the arts exists as never before. It's an environment which can support the recent strong contributions of Minimalists such as Brice Marden and Ellsworth Kelly, as well as the army of younger Neo-Expressionists led by Julian Schnabel.

Early November

I took a lot of my current drawings over to Jim Thomas, my sculpture instructor from my freshman year at RIT. His input was really good at this stage. Cautioning me about the discrepancy between drawings and actual construction, he advised me to be aware as soon as possible of the limits of the materials I intended to use, both in terms of the way they handled
color and the way they were illuminated. He questioned the direction of the Skylight piece: "Why waste time recreating the effect of a planetarium? It would be impossible to pull off skillfully given the time frame of the thesis exhibition. Why not design something for that space which acts as a way of introducing the viewer to the gallery and the other two pieces?"

11/6/83: Tibetan chants heard in the high-ceiled gallery of the MAG, entrancing spatial sounds. Steve Reich at Kilbourn Hall, talking rapid-fire about his musical development; quick-witted, open, demonstrating with clapping hands and double beat the metamorphosis of a single beat into a rythmic symphony.

Spent a few weekends searching the shores of Lake Ontario for site to shoot the Folded Horizons series. Considering a variety of beaches that provide different perspectives of the water and horizon. Working with sea and sky rather than land and sky seemed to make much more sense to me; water reflects light and is a direct function of the sky. Earth, for the most part, introduces too many of its own variables which are much less dependent on the sky than water is.

I finally chose the heights of Chimney Bluffs to shoot from. One hundred or so feet above the beach I could look out and survey vast areas on the ground glass.
While at the Rush Rhees Library, I discovered a book out on the California artist Richard Diebenkorn that contained this passage:

"He has learned that large flat spaces, if the color is not opaque, can also suggest an infinite space, like that of the sea and sky."

Driving out to Chimney Bluffs at different times of the day, I watched the changes in the light of the sky and on the lake as it altered dramatically day to day in erratic November weather.

Cloudy/clear/snowy/quiet/white-capped.
Dawn/morning/midday/late afternoon/dusk.
Always changing, always absorbing.

I took all the drawings done up until this point down to VSW and showed them to Nathan. By mid-January he wanted to see a model of the gallery space with all the pieces built to scale. We discussed the need to have each project work in relation to the others, and to consider the directional flow of the viewers through the gallery's space. It was suggested that one piece be used as an entry/introduction to the rest of the show thus forcing people to see it twice, once to get in and once again to exit. Re-seeing it, they might be awakened to feelings activated by having viewed the other two pieces.

Maurice Tuchman's book, *Art and Technology*, was lent to me. I had been searching around for a copy because it included the early collaboration attempts of Robert Irwin and Jim Turrell with some of the R&D people at Garrett Aerospace Industries during the late '60s in California.

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December

This was the month spent predominantly getting the murals made for the Magnification piece.

The actual images of an ordinary razor's edge were first imaged onto 4x5 Tri-X film on the Scanning Electron Microscope over in the College of Science. Dr. Frederick was more than willing to help out and provided the machine for my use. We shot the same portion of the razor's edge at the following magnifications:

250 500 1000 2500 5000 10,000 25,000 50,000

I first investigated the Large Print Room on the second floor of the Photo Building and found that it was too small an area to make ten foot long images. I then arranged with the Cage People to have one of the 8x10 enlargers brought up to the third floor MFA Center where there was ample room for projecting an image that large. Over Christmas Break, I worked daily cutting the paper, exposing it (often more than 1 hour in length), and then processing it by hand downstairs in the large sinks of the Large Print Room.

During this month I also made an important contact with Pat Byrne down at VSW. She looked over my drawings and plans and was full of suggestions about who to see regarding the mounting logistical challenges.

1. Vic Costanzo and the Audio/Visual Crew at the Strasenburgh Planetarium had much to offer about lenses and projectors available for what I wanted to do with the Skylight piece.

2. Alan Winer, a woodworker, offered much help with devising a method of suspending the diffusion material in front of the gallery windows. He also gave me the following advice: "This is the first time you're building these things; expect to have problems".
Magnification murals, mock-up.
Rethinking Window Piece:

Possibility: Light + Color + Shadow

Expansive vision with magical

Window sketch: measured details.
Window sketches; method of suspending diffusion material.
Skylight piece: variations on entering the gallery's space through a corridor of light, top views.
Early January

I've chosen the materials that each project will need. The Folded Horizons piece will be done on a permanent, richly saturated, clear emulsion. After much research and hunting around, I found that Cibachrome CTDF-7 Transparency Film was the only product that met these requirements. Duratrans by Kodak is not permanent, and it has a milky base that would be awkward when folded. Vericolor Print Film is too grainy and impermanent. Translite is merely black and white and would require hand-coloring.

I then went to Chimney Bluffs a total of six separate times, loaded down with the Plaubell 4x5, an 8x10 tripod that allowed the camera to be swung to the appropriate degree required for each separate shot, tons of film, and the omnipresent green tool box. Each time the entire sequence was shot on Ektachrome film.

Having finished the Magnification murals, they now will require photocopying onto architectural drafting paper. Then they will be able to be seen from both sides due to the paper's translucency, and will have much more of a direct relationship to the diffused light entering that portion of the gallery. The six 10 ft. murals will be copied onto vellum via the Xerox 20-80 Copier.

The Skylight piece, comprised of 120 slides taken of dawn/dusk light in the Jordan Valley, will require two slide projectors and a diffusion screen to project them from behind. Despite all the searching around, I've found too much complication and expense associated with this type of fairly sophisticated light exhibit, and I've opted to make it as simple as possible.
I took all the drawings and the model I constructed of the gallery down to Nathan for a chat. I was advised to use the whole of the gallery's space, with each piece interactive with the others, and to be conscious of the directional flow of the people as they came into the space and looked around.
Drawings of audience flow through gallery space.
January/February

January was the month I sat down and drafted letters to the companies which manufacture the specific products I needed for the exhibition. Gaining courage from Lida Moser's *Grant Writing in Photography*, I directed my requests to people in power positions such as presidents and public relations people. At this stage Joan's MBA and business savvy helped out immensely. She edited the letters, made small but incredibly significant changes in intonation, and made it appear as if it were in their best interest to support the projects. The letters were typed, and I included slides of the model I had made of the gallery's space as well as slides of the more pertinent drawings. We waited quietly for the following companies to respond:

- **Ilford Inc.** 1 roll CTDF-7 Transperancy Film, 36"x50'.
- **Rosco Labs** 2 rolls Tough Rolux Diffusion screen, 25'x4' each.
- **BD Company** 4 rolls Translum Diffusion screen, 18'x4' each.
- **Xerox Inc.** 20-80 Copier usage for 6 10' photo murals.

After a week of silence, I got on the phone and maneuvered doggedly through secretarial and inter-office channels to reach my contacts directly. I was amazed at the range of accessibility these various companies exhibited. While some were forthcoming and positive, others were condescendingly pessimistic.

By mid-February however, all the necessary supplies had been sent and the energy level shifted into an exuberant high gear and Joan became linked with almost every phase of activity.
Three Weeks Left:

My father printed up the announcement on vellum in grey ink with his hand-operated printing press. I used a Cibachrome image of one of the skylight shots done in Jordan.

Magnification:

The people at Xerox went out of their way to provide their special copier for my use. It took a few afternoons working down in the basement of their Rochester headquarters, but we eventually got the bugs out and ended up making more than enough copies of each original 10' mural.

Folded Horizons:

I did filtration tests on the Cibachrome material and sent them via express mail to a lab in Massachusetts that could accommodate the large size (32" x 48") images I was making. To produce the finals, I worked in one of the MFA color darkrooms which I had thoroughly cleaned out and vacuumed beforehand. Black paper was applied to the walls to reduce flare, the material was cut to size, and I was then ready to expose all six sheets. Afterwards, I rolled them all up in a tube and drove them to Massachusetts the next day for processing.

Skylight:

All the slide projectors and stands were acquired from the RIT Library's Inter-Media Service (IMS) for the length of the show.

While school was closed down over Spring Break, Joan and I:

- repainted the gallery white.
- dismantled the central portion of the partition separating the gallery from the storage area. Both 30' windows could now be seen from the center of the gallery.
removed the drapes. The rolls of fresh diffusion material were first unfurled on the perfectly clean, papered floor, (the diffusion material attracted dust like a magnet), and taped together, edge to edge with no overlapping. After grommets were put in all along the length of the top edge, we very gingerly hung the now huge sheet from the drapery hooks and pulled it snugly into place.

hung the Magnification murals from the ceiling near the north window as planned. The lowest mural was suspended at the floor level, and with each successive mural they rose higher and higher until the sixth one was running 15 inches below the ceiling. Each mural was reinforced along its top length with a painted piece of 1x2" lumber. White seamless paper was taped down, completely covering the entire floor area of this section of the gallery.

Dory helped hang the first five Folded Horizons transperancies in front of the east window. We unrolled them, punched holes in specific corners and with tons of fishing line, went about suspending them from the ceiling. Not until we reached #6 did we run into difficulty. Its placement and alignment with the others was tedious for Dory and I as well as for Pat and Beth who had come over to help. After at least 1½ hours of moving it every which way, we finally found its best position. It was made particularly difficult because it was evening, forcing us to work by artificial light; there was to be no artificial light in the entire gallery for the exhibit. The gallery would be open from 10AM to 5PM only.

the Skylight piece was helped to completion with the support, muscle, and suggestions of Pat, Beth, and Dory. Initially, I had planned on rear-view projection of slides onto a 4x8 ft. screen recessed near the gallery entrance. It appeared too passive in this position, so we brought the screen out more and angled its direction, making it visible from the entrance and outer hallway. It hung as a brilliantly illuminated rectangle of light at the end of the passageway leading into the gallery. Benches were placed along the wall enabling people to sit and watch.
three installations

Announcement, (pull out).
diffused scattered imaged light

Jon Kline

Photography Gallery
School of Photographic Arts and Sciences
Rochester Institute of Technology
March 12-16 1984 10:00 am - 5 pm daily.
Opening Reception Sunday March 11th, 2:00 pm.
The Opening

A sunny bright, wintry day with 40mph ground winds creating zero visibility. This being a Sunday afternoon affair insured that there would be no maintenance plowing of any kind on campus. I couldn't help but laugh as I found myself at 1:45 knee-deep in our driveway's snowdrifts, vainly trying to get the Volvo out. God only knew the fate of the florist, or of Joan and Bruce, as they made all the last minute preparations earlier that day.

Despite the worst that March tried to deliver that day, I found the gallery pleasantly and unexpectedly alive with friends, family, and students, from as far away as Ithaca and Buffalo. I wandered about in still-damp socks, castigating myself for not having brought Medals of Honor to award all those who did attend.

The cala lilies arched radiantly above the forsythia from their vase in the corner as people milled about, surprised, bemused, and bewildered. The gallery looked completely different, glowing brightly in the diffused wintry light that shone through the two large windows. Some cautiously investigated the translucent Magnification piece hanging quietly before the north window, alone in its clean, altar-like environment. Others sat in the darkened entrance and watched as 120 dawn/dusk slides were projected onto the large screen, and silently dissolved one into the next.

The show was up for a week, and for those who ventured past the Skylight piece and came into the gallery proper, they were generally surprised at what they found waiting for them. It was definitely an unorthodox show for the RIT community to witness.
This is a record of the thesis sharing for Jon Kline, student.

Date held: Thursday, March 15th.

The thesis show was; Approved X Disapproved

Chairman

Comments:
Magnification
(untitled for exhibit)
Folded Horizons
Skylight
I'd like to give special thanks to all the following people who helped out in many different ways:

Pat Byrne
Tim Callahan
Jean Paul Debattice
Dick Floberg
Tom Frederick
Beth Gafarian
Joan Green
Russell Kraus
Galt Piper and the Cage People
Planetarium People; Vic, Carl, et al.
Steve and Bonnie, Tucson
Dory Ellen Thanhauser
Jim Thomas
Addison Thompson
Alan Winer
Tom Zigon

B.D. Company
R.H. Elliott Enterprises
Ilford
Rosco Laboratories
Xerox

My parents,
Bruce and Kris,
and especially, Joan Barten.
Conclusion

Now, a few months after the exhibit, I've had time to think about what was learned from the past year's ambitious activity.

If nothing more, my main wish is to leave school and focus more closely on issues that interest me. I hope to refine, sophisticate, and intensify my work in order to minimize the gap that always exists between an idea and its realization.

While putting together these three projects, things were learned at a logarithmic pace. The successive steps my work has taken since the thesis have come much more clearly, and with greater resolve.

The thesis provided an opportunity to begin to deal with ideas and materials in a way and on a scale that feels both honest and alive to me. To be able to feel that way about the way I work is the most I can ask of myself or of anyone else.
Bibliography

The time spent researching information on relevant topics, events, and people for this thesis was very worthwhile for me. I'm including a fairly extensive listing of sources mainly for my own records. My notebooks have bits and pieces of important entries scattered throughout, and this is a good opportunity to straighten them up.


Materials Index

The nature of these projects involved research into a wide variety of materials, processes, and supplies. I've grouped them alphabetically according to their general purpose. If an entry is followed by an asterisk, this means there is further information concerning this item on the following pages.

Ciba Processing Lab

E.B. Luce Corporation
74 Chilmark Street
Worcester, MA 01604
Capacity: 50" wide x any length.

Copiers

Contact Supply Company
1327 Culver Road
Rochester, NY
Xerox 20-80 Copier
Capacity: 23" wide x any length.

H.H. Sullivan Company
1346 Culver Road
Rochester, NY
Océ Copier
Capacity: 23" wide x any length.

Diffusion Material

BD Company
Post Office Box 3057
Erie, PA 16512
Translum
Brighton Lites
Post Office Box 24799
Rochester, NY 14624

Rosco Products*
Diffusion Material, Continued

Rosco Laboratories
36 Bush Avenue
Port Chester, NY 10573
Tough Rolux*

Syracuse Scenery and Stage Lighting
1423 North Salina Street
Syracuse, NY 13208

Films/Emulsions

Eastman Kodak Company
Customer Technical Service
Professional and Finishing Markets
343 State Street
Rochester, NY 14650

Translite Film 5561*
Duratrans Display Film 4022*
Vericolor Print Film*

Ilford Inc.
West 70 Century Road
Paramus, NJ 07652

Cibachrome Transparency Film CTDF-7*

Lenses/Projectors

D.O. Industries
317 East Chestnut Street
East Rochester, NY 14445

Navitar Lenses & Projectors*

Langie Audio Visual
410 West Commercial Street
East Rochester, NY 14445

Clear Lite Multi-Image Products*
Rear View Screen Manufacturers

Draper Screen Co.
Spiceland, Indiana 47385

Phoenix Communications
4220 York Road
Baltimore, MD 21212

Tapes/Adhesives

R.H. Elliott Enterprises, Inc.
1902 Rochester Industrial Drive
Rochester, Michigan 48063

Scientific Supplies

Edmund Scientific
101 East Gloucester Pike
Barrington, NJ 08007

Ward's Natural Science Establishment, Inc.
Post Office Box 1712
Rochester, NY 14603
(Route 15 near Lehigh Station Rd.)
Using Light Diffusion Media

The use of polymer-based diffusion materials has risen dramatically in the past few years, offering new beam shapes and modified beam characteristics for traditional performing arts lighting fixtures. Diffusion has become a legitimate design tool, giving light new form and shape, in addition to the traditional use for repair of problems after the design is conceived.

To convert a leko beam into a beam characteristic of a Fresnel (modifying the hard edge of an ellipsoidal reflector instrument to that of a soft-edge spherical reflector fixture with a Fresnel lens) means getting more mileage from the same instruments. It means specifically that with directional frosts, you can put the light where you want it, or get more coverage with the same lamp.

The diffusion materials can be combined with color media or used independently to get the exact effect you need.

Of course you can combine diffusions for special uses.

Three applications are:

a. smoothing out unevenness in ellipsoidal beam fields; or

b. reducing intensity of Fresnel-type fixtures without changing color temperature or tying up a dimmer; or

c. softening one shutter on an ellipsoidal while keeping the others sharp.

So the uses of diffusion materials are only limited by your own imagination.

Historically, diffusion materials have been used more widely in cinema production, and many of these frosts were first used by more inventive cameramen. This applications information is written with theatre practice in mind, but much of it is applicable to film and television practice. One major difference between film and theatre lighting is that the film cameraman is more likely to locate his diffusion and reflection materials away from the fixture itself, independently supported outside the color frame - a practice that affords even more variety to the effects possible, but which is frequently not usual for live theatre lighting where there is limited space, or where fixtures are in view of an audience.
## Diffusion Material

**No. 108**

- **Type:** Combination No. 104 & 104
- **Remarks:** The densest, heaviest of the whole frost series. Diffuses the most. Gives soft, shadowless light, and a totally even field—which none of the other frosts do. Has low transmission without any punch to the beam. Makes a leko into a striplight or a frosted “A” lamp or a soft light or a scoop.

<table>
<thead>
<tr>
<th>TYPE</th>
<th>BEAM EDGE</th>
<th>HOT CENTER</th>
<th>IRIS AND SHUTTER</th>
<th>TRANS MISSION</th>
<th>FLARE</th>
<th>SPREAD</th>
<th>REMARKS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tough Rolux No. 111</td>
<td>None</td>
<td>None</td>
<td>No Edge</td>
<td>Low</td>
<td>Maximum</td>
<td>Maximum</td>
<td>The densest, heaviest of the whole frost series. Diffuses the most. Gives soft, shadowless light, and a totally even field—which none of the other frosts do. Has low transmission without any punch to the beam. Makes a leko into a striplight or a frosted “A” lamp or a soft light or a scoop.</td>
</tr>
<tr>
<td>Matte Silk No. 113</td>
<td>None</td>
<td>None</td>
<td>No Edge</td>
<td>Low</td>
<td>Maximum</td>
<td>Maximum</td>
<td>Combines the diffusion qualities of No. 100 (for slight softening) and No. 104 (for directional spread) to give diffuse, directional light. Good for striplights and specials.</td>
</tr>
<tr>
<td>Hamburg Frost No. 114</td>
<td>Almost Unaffected</td>
<td>Very Good</td>
<td>Clean Edge</td>
<td>Very High</td>
<td>Minimum</td>
<td>Minimum</td>
<td>This is the lightest of the frost series, for use where only the subtlest diffusion effect is needed.</td>
</tr>
<tr>
<td>Diffusion Nos. 120-123</td>
<td>None</td>
<td>None</td>
<td>No Edge</td>
<td>Fair</td>
<td>Slight</td>
<td>Good</td>
<td>Combines a color with Matte Diffusion. Gives a good hot spot, is very soft, and the color holds up well. Intended for cyc lighting.</td>
</tr>
<tr>
<td>Tough Silk No. 104 Combined with Tough Silk No. 104 (Two Filters)</td>
<td>None</td>
<td>None</td>
<td>No Edge</td>
<td>Fair</td>
<td>Considerable</td>
<td>Good</td>
<td>Two filters with striae at right angles to one another for special star effect or directional spread in two paths.</td>
</tr>
<tr>
<td>Type</td>
<td>Beam Edge</td>
<td>Hot Center</td>
<td>Iris and Shutter</td>
<td>Transmission</td>
<td>Flare</td>
<td>Spread</td>
<td>Remarks</td>
</tr>
<tr>
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</tr>
<tr>
<td>Frost No. 100</td>
<td>Considerable (but soft)</td>
<td>Very Good</td>
<td>Clean Edge</td>
<td>High</td>
<td>Minimum</td>
<td>Minimum</td>
<td>This is a matte frost. Creates a halo or second concentric ring outside the beam. Shuttering is still good, but soft. Good for chandelier specials, dance down-light, or moon halo effect.</td>
</tr>
<tr>
<td>Light Frost No. 101</td>
<td>Very Little</td>
<td>Very Good</td>
<td>Just Reduces Flare</td>
<td>High</td>
<td>Minimum</td>
<td>Minimum</td>
<td>A light matte frost, a little more dense than No. 100 giving the light a little more spread. Gives a slightly different beam form than No. 100. No. 101 is slightly directional. Can be used in a follow spot with oil for a very soft beam, or with other frosts.</td>
</tr>
<tr>
<td>Light Tough Frost No. 102</td>
<td>None</td>
<td>Good</td>
<td>No Edge</td>
<td>Good</td>
<td>Considerable</td>
<td>Good</td>
<td>A frost with good spread of the beam in 180°, but with a hot center. Spreads more than No. 100 or No. 101. Yellows the hot center, warming the light slightly. Makes a leko into a flood or scoop.</td>
</tr>
<tr>
<td>Tough Frost No. 103</td>
<td>None</td>
<td>Good</td>
<td>Just Reduces Flare</td>
<td>Good</td>
<td>Considerable</td>
<td>Good</td>
<td>Is more dense, diffuses light more, gives more flare, and warms light a little more than No. 102. Has twin qualities of wide diffusion and a warm center.</td>
</tr>
<tr>
<td>Tough Silk Spun No. 104</td>
<td>Very Little</td>
<td>Very Good</td>
<td>Shutter Parallel to Spread</td>
<td>Good</td>
<td>Flare In One Direction</td>
<td>Good in One Direction</td>
<td>A new tool for light diffusion: it frosts in one direction only. Spreads the light in one direction perpendicular to the lines in the frost. Still possible to shutter and iris parallel with spread of beam. Makes instruments open to new uses. Helps a leko beam spread up an aisle or staircase. Puts light where you want it.</td>
</tr>
<tr>
<td>Tough Spun No. 105</td>
<td>Considerable</td>
<td>Good</td>
<td>Clean Edge</td>
<td>Fair</td>
<td>Considerable</td>
<td>Minimum</td>
<td>Lowers transmission without losing the beam edge. Gives a lot of flare through 180° greatly softening the light. Good for dance down light or balancing intensities of different instruments. Gives “air” to the light plot special and could be used in theatre-in-the-round to give the “feel” of a color.</td>
</tr>
<tr>
<td>Light Tough Spun No. 106</td>
<td>Considerable</td>
<td>Good</td>
<td>Clean Edge</td>
<td>Fair</td>
<td>Considerable</td>
<td>Minimum</td>
<td>Is a less-dense version of No. 105, reducing transmission less and giving a little less flare than No. 105. Could be used in wings and border lights to give color to those wings and borders, while the beam covers acting areas. Could be used to give feeling of moonlight, or for other special projections.</td>
</tr>
<tr>
<td>Cool Frost No. 107</td>
<td>None</td>
<td>Good</td>
<td>No Edge</td>
<td>Good</td>
<td>Considerable</td>
<td>Good</td>
<td>Combines No. 103 and light blue for boosting the color temperature to slightly counteract orange of dimmed incandescent light.</td>
</tr>
<tr>
<td>Daylight Frost No. 108</td>
<td>None</td>
<td>Good</td>
<td>No Edge</td>
<td>Fair</td>
<td>Considerable</td>
<td>Good</td>
<td>Combines the qualities of No. 103 and a strong blue to strongly counteract orange of dimmed incandescent light.</td>
</tr>
<tr>
<td>Cool Silk No. 109</td>
<td>Very Little</td>
<td>Very Good</td>
<td>Shutter Parallel to Spread</td>
<td>Good</td>
<td>Flare In One Direction</td>
<td>Good in One Direction</td>
<td>Combines the qualities of No. 104 and a light blue to slightly counteract orange of dimmed incandescent light.</td>
</tr>
<tr>
<td>Product #</td>
<td>Product Name</td>
<td>Description</td>
<td>Size</td>
<td>Price</td>
<td></td>
<td></td>
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<td>-----------</td>
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<td>-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------</td>
<td>--------</td>
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<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3401</td>
<td>Rosco Sun 85</td>
<td>Standard window correction in extra wide rolls for seamless installation. Optically clear.</td>
<td>58&quot; wide, 100 sq. ft.</td>
<td>$104.00</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3407</td>
<td>Rosco Sun CTO</td>
<td>Use where heavy correction is desired for warm look. Reduces 5500 K to 3100 K. Optically clear. (Rosco Plus 85).</td>
<td>58&quot; wide, 100 sq. ft.</td>
<td>$104.00</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3408</td>
<td>Rosco Sun ½ CTO</td>
<td>Use where slight correction is desired. Reduces 5500 K to 3800 K. Optically clear. (Rosco Lite 85).</td>
<td>58&quot; wide, 100 sq. ft.</td>
<td>$104.00</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3409</td>
<td>Rosco Sun ¾ CTO</td>
<td>Reduces 5500K to 4500K. Windows have a blue appearance. Optically clear. (Rosco Half 85).</td>
<td>58&quot; wide, 100 ft.</td>
<td>$104.00</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3761</td>
<td>Roaco 85</td>
<td>Optically clear rigid panels of ¾&quot; acrylic resin.</td>
<td>51&quot; x 100&quot;</td>
<td>$140.00</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**To Reduce the Intensity of Daylight**

<table>
<thead>
<tr>
<th>Product #</th>
<th>Product Name</th>
<th>Description</th>
<th>Size</th>
<th>Price</th>
</tr>
</thead>
<tbody>
<tr>
<td>3402</td>
<td>Rosco Sun N3</td>
<td>Reduces light intensity 1 stop. Optically clear. Extra wide.</td>
<td>58&quot; wide, 100 sq. ft.</td>
<td>$104.00</td>
</tr>
<tr>
<td>3403</td>
<td>Rosco Sun N6</td>
<td>Reduces light intensity 2 stops. Optically clear. Extra wide.</td>
<td>58&quot; wide, 100 sq. ft.</td>
<td>$104.00</td>
</tr>
<tr>
<td>3404</td>
<td>Rosco Sun N9</td>
<td>Reduces light intensity 3 stops. Optically clear. Extra wide.</td>
<td>58&quot; wide, 100 sq. ft.</td>
<td>$104.00</td>
</tr>
<tr>
<td>3762</td>
<td>Roacoex N3</td>
<td>Reduces light intensity 1 stop. Optically clear rigid panels.</td>
<td>51&quot; x 100&quot;</td>
<td>$140.00</td>
</tr>
<tr>
<td>3763</td>
<td>Roacoex N6</td>
<td>Reduces light intensity 2 stops. Optically clear rigid panels.</td>
<td>51&quot; x 100&quot;</td>
<td>$140.00</td>
</tr>
<tr>
<td>3405</td>
<td>Rosco Sun 85N3</td>
<td>Reduces light 1 stop and converts. Optically clear. Extra wide.</td>
<td>58&quot; wide, 100 sq. ft.</td>
<td>$109.00</td>
</tr>
<tr>
<td>3406</td>
<td>Rosco Sun 85N6</td>
<td>Reduces light 2 stops and converts. Optically clear. Extra wide.</td>
<td>58&quot; wide, 100 sq. ft.</td>
<td>$109.00</td>
</tr>
<tr>
<td>3809</td>
<td>Roacoexrim</td>
<td>Perforated material. Reduces light 2 stops.</td>
<td>54&quot; wide, 100 sq. ft.</td>
<td>$104.00</td>
</tr>
</tbody>
</table>

**To convert 3200°K to Daylight (boost Kelvin temperature of lights)**

<table>
<thead>
<tr>
<th>Product #</th>
<th>Product Name</th>
<th>Description</th>
<th>Size</th>
<th>Price</th>
</tr>
</thead>
<tbody>
<tr>
<td>3202</td>
<td>Tough Blue 50</td>
<td>Boosts 3200 K to &quot;daylight.&quot; Tough, high heat resistant base. Standard daylight correction.</td>
<td>54&quot; wide, 100 sq. ft.</td>
<td>$104.00</td>
</tr>
<tr>
<td>3204</td>
<td>Tough Booster Blue</td>
<td>Increases K 900 degrees. Tough, high heat resistant base.</td>
<td>54&quot; wide, 100 sq. ft.</td>
<td>$104.00</td>
</tr>
<tr>
<td>3206</td>
<td>Tough 1/4 Booster Blue</td>
<td>Increases K 600 degrees. Tough, high heat resistant base.</td>
<td>54&quot; wide, 100 sq. ft.</td>
<td>$104.00</td>
</tr>
<tr>
<td>3208</td>
<td>Tough 1/2 Booster Blue</td>
<td>Increases K 300 degrees. Tough, high heat resistant base.</td>
<td>54&quot; wide, 100 sq. ft.</td>
<td>$104.00</td>
</tr>
<tr>
<td>3216</td>
<td>Tough 3/4 Booster Blue</td>
<td>Increases K 150 degrees. Tough, high heat resistant base.</td>
<td>54&quot; wide, 100 sq. ft.</td>
<td>$104.00</td>
</tr>
<tr>
<td>3210</td>
<td>Tough TD25</td>
<td>Converts 3200 K to over 8000 K. Tough base. Heavier correction than Tough Blue. Use where &quot;cool&quot; daylight is desired.</td>
<td>54&quot; wide, 100 sq. ft.</td>
<td>$104.00</td>
</tr>
</tbody>
</table>

**To Soften and Diffuse Light**

<table>
<thead>
<tr>
<th>Product #</th>
<th>Product Name</th>
<th>Description</th>
<th>Size</th>
<th>Price</th>
</tr>
</thead>
<tbody>
<tr>
<td>3002</td>
<td>Soft Frost</td>
<td>Soft white diffusion. May be stretched on frames. Place at a distance from high temperature lights.</td>
<td>54&quot; wide, 100 sq. ft.</td>
<td>$55.00</td>
</tr>
<tr>
<td>3023</td>
<td>Wide Soft Frost</td>
<td>Same as Soft Frost, extra-wide for large area diffusion.</td>
<td>72&quot; wide, 150 sq. ft.</td>
<td>$75.00</td>
</tr>
<tr>
<td>3004</td>
<td>Half Density Soft Frost</td>
<td>Similar to Soft Frost, but less dense. May be stretched on frames.</td>
<td>54&quot; wide, 100 sq. ft.</td>
<td>$55.00</td>
</tr>
<tr>
<td>23711B</td>
<td>Light Grid Cloth</td>
<td>High transmission. Reinforced diffusion material. Ideal for tenting and large area diffusion.</td>
<td>43&quot; wide, 100 yd. roll</td>
<td>$750.00</td>
</tr>
<tr>
<td>23721B</td>
<td>Grid Cloth</td>
<td></td>
<td>40&quot; wide, 100 yd. roll</td>
<td>$750.00</td>
</tr>
<tr>
<td>23731Y</td>
<td>Light Grid Cloth</td>
<td></td>
<td>43&quot; wide, 100 sq. ft.</td>
<td>$85.00</td>
</tr>
<tr>
<td>23741Y</td>
<td>Grid Cloth</td>
<td></td>
<td>40&quot; wide, 100 sq. ft.</td>
<td>$85.00</td>
</tr>
<tr>
<td>Y-3000</td>
<td>Tough Rolux</td>
<td>Density, white diffusion. Tough, may be used directly on lights.</td>
<td>49&quot; wide, 100 sq. ft.</td>
<td>$75.00</td>
</tr>
<tr>
<td>Y-3001</td>
<td>Light Rolux</td>
<td>Similar to Tough Rolux, but less dense.</td>
<td>49&quot; wide, 100 sq. ft.</td>
<td>$75.00</td>
</tr>
<tr>
<td>3006</td>
<td>Tough Spun</td>
<td>Effect of spun glass without particle irritation. Tough base.</td>
<td>55&quot; wide, 100 sq. ft.</td>
<td>$75.00</td>
</tr>
<tr>
<td>3007</td>
<td>Light Tough Spun</td>
<td>Similar to Tough Spun but less dense.</td>
<td>50&quot; wide, 100 sq. ft.</td>
<td>$75.00</td>
</tr>
<tr>
<td>3008</td>
<td>Tough Frost</td>
<td>Soft, even light. For use on hot lights.</td>
<td>48&quot; wide, 100 sq. ft.</td>
<td>$75.00</td>
</tr>
<tr>
<td>3009</td>
<td>Light Tough Frost</td>
<td>Less dense than Tough Frost.</td>
<td>48&quot; wide, 100 sq. ft.</td>
<td>$75.00</td>
</tr>
<tr>
<td>3011</td>
<td>Tough Silk</td>
<td>Effect of silk with high resistance. Spreads the light.</td>
<td>48&quot; wide, 100 sq. ft.</td>
<td>$75.00</td>
</tr>
<tr>
<td>3012</td>
<td>Tough Booster Silk</td>
<td>Combines Tough Silk and Quarter Booster Blue. 300 K increase.</td>
<td>54&quot; wide, 100 sq. ft.</td>
<td>$85.00</td>
</tr>
<tr>
<td>3025</td>
<td>Tough 1/4 Booster Frost</td>
<td>Combines Tough Frost and 1/4 Booster Blue. Increases K 150 degrees.</td>
<td>54&quot; wide, 100 sq. ft.</td>
<td>$85.00</td>
</tr>
<tr>
<td>3013</td>
<td>Tough Booster Frost</td>
<td>Combines Tough Frost and Half Booster Blue. 600 K increase.</td>
<td>54&quot; wide, 100 sq. ft.</td>
<td>$85.00</td>
</tr>
<tr>
<td>3017</td>
<td>Tough Blue 50 Frost</td>
<td>Combines Tough Frost and Blue 50 Correction.</td>
<td>54&quot; wide, 100 sq. ft.</td>
<td>$85.00</td>
</tr>
<tr>
<td>3026</td>
<td>Tough White Diffusion</td>
<td>Matte white diffusion for use on lights or bounce effects.</td>
<td>48&quot; wide, 100 sq. ft.</td>
<td>$75.00</td>
</tr>
<tr>
<td>3020</td>
<td>Diffusion Test Kit</td>
<td>Sheets 20&quot; x 24&quot;.</td>
<td>4.25</td>
<td></td>
</tr>
</tbody>
</table>

Diffusion Material
Rosco Laboratories
KODAK TRANSLITE FILM 5561

DESCRIPTION

1. Blue sensitive
2. Medium speed
3. Translucent base
4. Flat lying
5. Emulsion on both sides

USES

Advertising and display transparencies

SAFELIGHT

KODAK Safelight Filter OC (light amber) in a suitable
safelight lamp with a 15-watt bulb not less than 4 feet from the film.

EXPOSURE

Either side can be exposed. A sheet of black paper should
be placed between the film and the easel.

PROCESSING

Develop

Develop with continuous agitation at 68 F for 2 minutes in
KODAK SELECTOL Developer (1:1) or KODAK Developer D-52 (1:1). Turn
over at frequent intervals to provide even development on both sides.
The exposed side should appear darker than a paper print when properly
exposed and developed.

Rinse

Rinse, with agitation in KODAK Indicator Stop Bath or KODAK
Stop Bath SB-1' at 65 to 70 F for at least 15 seconds. Running
water can be used if stop bath is not available.

Fix

Fix 2 to 4 minutes at 65 to 70 F in KODAK Fixer or KODAK
Fixing Bath F-5 or F-6. Agitate frequently during fixing.

Wash

Wash 20 to 30 minutes in running water at 65 to 70 F. It is
essential that transparencies be washed thoroughly to minimize fading.
To minimize drying marks use KODAK PHOTO-FLO Solution.

Rapid Washing

Use KODAK Hypo Clearing Agent as recommended on the package.
PROCESSING - continued

Dry

Dry in a dust-free area.

COLORING

Black-and-white or toned images can be colored as easily as paper prints and do not require any special treatment before coloring.

TONERS

KODAK Polysulfide Toner T-8
KODAK Sulfide Sepia Toner T-7a
KODAK Hypo Alum Sepia Toner T-1a
KODAK Sepia Toner
KODAK Brown Toner
KODAK DURATRANS Display Film 4022 is an attractively priced, translucent-base color film offering good contrast, high-quality color reproduction, and rich blacks for making transparencies from negatives or internegatives. It is ideally suited for large transparency displays where durability and good splicing characteristics are important.

Characteristics of DURATRANS Display Film include the following:

- Processed in KODAK EKTAPRINT 2 Chemicals (using a 6-minute development time)
- Image characteristics are specifically designed for viewing by transmitted light
- White-pigmented coating on the support provides built-in diffusion for viewing
- Translucent 7-mil ESTAR Thick Base
- Can be spliced similarly to print film
- Retouching characteristics similar to those of KODAK EKTACOLOR Papers
- Dye stability comparable with those of KODAK EKTACOLOR Papers
- Rolls available in widths up to 50 inches

For use in:
- Illuminated displays
- Exhibits
- Transit advertising
- Anywhere there is a need for an economical, translucent, color film with a durable base

Availability

<table>
<thead>
<tr>
<th>Size</th>
<th>CAT No.</th>
</tr>
</thead>
<tbody>
<tr>
<td>10 in. x 100 ft, Sp 915</td>
<td>165 5489</td>
</tr>
<tr>
<td>20 in. x 100 ft, Sp 913</td>
<td>164 1208</td>
</tr>
<tr>
<td>30 in. x 100 ft, Sp 913</td>
<td>165 5356</td>
</tr>
<tr>
<td>40 in. x 100 ft, Sp 351</td>
<td>162 2810</td>
</tr>
<tr>
<td>50 in. x 100 ft, Sp 351</td>
<td>162 2919</td>
</tr>
<tr>
<td>8 x 10 in., 10-sheet package</td>
<td>162 2497</td>
</tr>
<tr>
<td>8 x 10 in., 50-sheet package</td>
<td>162 2547</td>
</tr>
<tr>
<td>11 x 14 in., 10-sheet package</td>
<td>162 2570</td>
</tr>
<tr>
<td>11 x 14 in., 50-sheet package</td>
<td>162 2596</td>
</tr>
<tr>
<td>16 x 20 in., 10-sheet package</td>
<td>162 2604</td>
</tr>
<tr>
<td>16 x 20 in., 50-sheet package</td>
<td>162 2612</td>
</tr>
<tr>
<td>20 x 24 in., 10-sheet package</td>
<td>162 2737</td>
</tr>
<tr>
<td>30 x 40 in., 10-sheet package</td>
<td>162 2760</td>
</tr>
</tbody>
</table>

Orders may be placed through your normal source of supply for KODAK Professional Products.

Storage

High temperature or high humidity may produce undesirable changes in DURATRANS Display Film. Keep unexposed film at 13°C (55°F) or lower in the original sealed package.

To avoid moisture condensation on unexposed film that has been refrigerated, allow the material to warm to room temperature before opening the sealed bag. For best results, remove unexposed film from cold storage the day before printing.

Safelight

Use a KODAK Safelight Filter No. 13 (amber), with a 7½-watt bulb in a suitable safelight lamp, kept at least 1.2 metres (4 ft) from the film.

Always keep exposure to the safelight as short as possible. After exposure this film can be handled under the safelight for no longer than ½ minutes. Before exposure, a slightly longer exposure to the safelight can be tolerated.

For information about testing safelights, see KODAK Publication No. K-4, How Safe Is Your Safelight?

Latent-Image Keeping

For best results, process exposed film on the same day it is exposed. To minimize differences in latent-image shifts that may result when the exposed film is held at room temperature (21°C/70°F) for a period of time, keep the interval between exposure and processing as consistent as possible. For example, if several transparencies are to be made from the same negative, hold the exposed test film and, later, the other exposed films at room temperature for the same length of time.

It is recommended that exposed films not be held overnight before processing. However, if it is necessary to hold the exposed film between 8 and 24 hours before processing, store it at 10°C or lower. Or if holdover time to processing will exceed 24 hours, store the exposed film at -18°C (0°F). Maximum holdover time for exposed but unprocessed film at -18°C is 3 days. Always allow film to warm to room temperature before processing. The cold storage procedures are intended to handle unusual situations and to minimize latent image shifts when the film cannot be processed shortly after exposure.

Exposure

Exposure characteristics are essentially the same as those for KODAK EKTACOLOR 74 RC and 78 Papers.

Color balance is controlled by dichroic filters built into the exposing equipment or a set of printing filters. KODAK Color Printing Filters (Acetate) are used between the light source and the negative. KODAK Color Compensating Filters (Gelatin) are used between the lens and the film, in the path of image-forming light. The number of CC filters used at one time should be kept small to minimize any optical effect. The filters used in this position should also be clean and free of scratches. If cyan filtration is necessary, use filters identified by the suffix "-2," as in "CC10C-2" or "CP10C-2."
Starting Filter Pack: 50M + 70Y

Make the initial test transparency using the starting filter pack. Since light quality, optical components, filters, and dial settings will vary considerably among enlargers, this filter pack is only a starting point. Adjust the exposure to produce satisfactory density. If the color balance of the resulting transparency is not satisfactory, modify the filter pack. Once a good transparency has been made from a typical negative, the same group of filters or filter pack can be used for trial exposures with other negatives.

If the base of the printing easel is not solid, flat black, place a piece of black paper on the base under the film during exposure. This film has no antihalation backing, and the paper will minimize reflections from light-colored easels.

Judge transparencies under illumination similar to that used for final display. The KODAK Color Print Viewing Filter Kit. KODAK Publication No. R-25, contains 18 color print viewing filters that can be used to evaluate test transparencies. The instructions with the kit explain how to determine filter pack adjustments. Use the "Prints from Color Negatives" information. You will find six color print viewing filters and a wall chart to help you make filter pack adjustments in the KODAK Color Darkroom DATAGUIDE, KODAK Publication No. R-19.

Machine Processing

DURATRANS Display Film can be processed in the same roller-transport processor used for KODAK EKTACOLOR Papers. The equipment must be capable of handling the ESTAR Thick Base.

Roller-transport processors have higher oxidation and evaporation rates than deep-tank processors primarily due to the partially submerged rotating rollers that continually expose small amounts of solution to the air. KODAK EKTAPRINT 2 Developer Replenisher RT and KODAK EKTAPRINT 2 Bleach-Fix and Replenisher RT are specifically formulated to minimize the effects of oxidation and evaporation in roller-transport processors. See KODAK Publication No. Z-122J, Using KODAK EKTAPRINT 2 Developer Replenisher RT and KODAK EKTAPRINT 2 Bleach-Fix and Replenisher RT in Roller-Transport Processors for more information about KODAK EKTAPRINT 2 RT Chemicals.

For laboratories preferring to use KODAK EKTAPRINT 2 Chemicals see KODAK Publication No. Z-122H, Processing KODAK EKTACOLOR Paper in Roller-Transport Processing Machines Using KODAK EKTAPRINT 2 Chemicals.

Any amount of DURATRANS Display Film or KODAK EKTACOLOR Paper may be processed in any proportion provided the processing times (processor transport speed) and replenishment rates are adjusted for each. All other process specifications for both products are the same.

When using KODAK EKTAPRINT 2 or EKTAPRINT 2 Chemicals RT, the transport speed must be adjusted to provide these times:

<table>
<thead>
<tr>
<th>Processing Step</th>
<th>Time (minutes)</th>
<th>Temperature (°F)</th>
<th>Temperature (°C)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Developer</td>
<td>6</td>
<td>91 ± 0.5</td>
<td>32.6 ± 0.3</td>
</tr>
<tr>
<td>Bleach-Fix</td>
<td>2½</td>
<td>86 to 93</td>
<td>30 to 34</td>
</tr>
<tr>
<td>Wash</td>
<td>6</td>
<td>86 to 93</td>
<td>30 to 34</td>
</tr>
<tr>
<td>Dry</td>
<td></td>
<td>Not over 210</td>
<td>99</td>
</tr>
</tbody>
</table>

NOTE: Minimum developer time is 5½ minutes. Maximum developer time is 6½ minutes. The bleach-fix time is the suggested minimum.

An increase in dryer temperature may be necessary in some cases. Underdried film may be tacky, causing stacks or rolls of transparencies to stick together. Overdrying may cause excessive film curl. The first transparencies through any processor should be carefully watched and necessary adjustments should be made before any customer work is run.

Replenishment

These replenishment rates are suggested starting points and may require adjustment depending on the variables in your processing system:

<table>
<thead>
<tr>
<th>Processing Step</th>
<th>Replenishment Rate (mL/ft²) (mL/m²)</th>
</tr>
</thead>
<tbody>
<tr>
<td>KODAK EKTAPRINT 2 RT Chemicals*</td>
<td></td>
</tr>
<tr>
<td>EKTAPRINT 2 Developer Replenisher RT</td>
<td>90 968</td>
</tr>
<tr>
<td>EKTAPRINT 2 bleach-Fix and Replenisher RT</td>
<td>90 968</td>
</tr>
<tr>
<td>EKTAPRINT 2 RT Chemicals</td>
<td></td>
</tr>
<tr>
<td>EKTAPRINT 2 Developer Replenisher †</td>
<td>90 968</td>
</tr>
<tr>
<td>EKTAPRINT bleach-Fix and Replenisher †</td>
<td>90 968</td>
</tr>
<tr>
<td>EKTAPRINT bleach-Fix and Replenisher NR †</td>
<td>30 323 (L/m²)</td>
</tr>
<tr>
<td>Wash§</td>
<td></td>
</tr>
<tr>
<td>One wash tank</td>
<td>1700 10.8</td>
</tr>
<tr>
<td>Two countercurrent flow wash tanks</td>
<td>1400 to 1700 8.6 to 10.8</td>
</tr>
</tbody>
</table>

*The developer and bleach-fix rates should be the same.
†KODAK Topping Solution UX 1114 (see KODAK Publication No. Z-122H) should be added to the developer replenisher and the replenisher should be diluted 10% with water. The developer and bleach fix replenishment rates should be the same.
‡Topping solution must be added to the bleach-fix and replenisher for use in roller-transport processors. The topping solution may be added to the replenisher or processor tank. See KODAK Publication No. Z-122H for more detailed information.
§These wash rates reflect the same flow rate used for EKTACOLOR Paper. Thus, no change in wash rate is required when changing between DURATRANS Display Film and EKTACOLOR Paper.
DRUM PROCESSING

DURATRANS Display Film can be processed in drum processors, such as the KODAK Rapid Color Processor, Model 11 or Model 16-K, using KODAK EKTAPRINT 200 Developer and KODAK EKTAPRINT 2 Bleach-Fix. The model 11 processor requires 4 fluidounces (118 mL) of each solution, and the model 16-K processor requires 8 fluidounces (237 mL) of each solution for each run.

Only sheet film (or paper) is recommended for these processors. Process one sheet at a time and handle the film carefully. If roll film must be used, cut it into sheets and store it for a period of time, before using it, to remove roll curl. Kinks, cracks, or breaks in the emulsion will affect development.

The proper green-coated processing blanket is recommended for processing DURATRANS Display Film. The blanket is used with the green side against the base of the film to prevent it from slipping on the drum. The green blanket for the model 11 processor is Part No. 500273; for the model 16-K processor it is Part No. 512093.

Maintain the drum temperature carefully during processing. Special care must be taken in adjusting the processor before use to obtain optimum processing uniformity. The cleaning, leveling, and operating instructions in the processor manual should be followed carefully. The processing tray must be kept in the correct position.

Here are the processing times and temperatures for EKTAPRINT 200 Developer and EKTAPRINT 2 Bleach-Fix:

<table>
<thead>
<tr>
<th>Processing Step</th>
<th>Time* (minutes)</th>
<th>Temperature (°F)</th>
<th>Temperature (°C)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Prewet</td>
<td>½</td>
<td>70 to 102</td>
<td>21 to 39</td>
</tr>
<tr>
<td>Developer</td>
<td>2½</td>
<td>100±½</td>
<td>38±0.3</td>
</tr>
<tr>
<td>First Wash†</td>
<td>½</td>
<td>100±2</td>
<td>38±1.2</td>
</tr>
<tr>
<td>Bleach-Fix</td>
<td>2</td>
<td>100±2</td>
<td>38±1.2</td>
</tr>
</tbody>
</table>

Remaining steps can be done in normal room illumination.

<table>
<thead>
<tr>
<th>Step</th>
<th>Time (seconds)</th>
<th>Temperature (°F)</th>
<th>Temperature (°C)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dry†</td>
<td>250</td>
<td>225</td>
<td>107</td>
</tr>
</tbody>
</table>

*Include drain time of 10 seconds for prewet step. 5 seconds for all other processing steps.
†Minimum wash water flow rate is ½ U.S. gallon (1.9 litres) per minute for the model 11 processor and 1 U.S. gallon (3.8 litres) for the model 16-K processor. Maximum flow rate for both processors is 1½ U.S. gallons (5.7 litres) per minute. Allow water to flow over the entire area of the net blanket and back of the film. Do not hold the processor solution tray in the dump position, but empty it quickly several times during the wash cycle.
‡To minimize drying time, squeegee the transparency after the second wash. The film may be dried on racks or air impingement dryers.

SILVER RECOVERY

Silver recovery recommendations for KODAK EKTACOLOR Papers, whether using a KODAK Silver Recovery Cartridge or electrolytic recovery, will apply for a process containing DURATRANS Display Film only or any proportion of DURATRANS Display Film and EKTACOLOR Paper.
KODAK VERICOLOR PRINT FILM 4111 (ESTAR THICK BASE)

CHARACTERISTICS
- This is a color print film for making transparencies from color negatives or color internegatives.
- It yields positive transparencies for use in displays or for photomechanical reproduction.
- A retouching surface is located on both sides.
- The film has a dimensionally stable 0.007-inch (0.8 mm) ESTAR Thick Base.

ORDERING

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>4 x 5 in.</td>
<td>122 1367</td>
<td>351</td>
</tr>
<tr>
<td>8 x 10 in.</td>
<td>122 1373</td>
<td>351</td>
</tr>
<tr>
<td>8 x 10 in.</td>
<td>122 1399</td>
<td>351</td>
</tr>
<tr>
<td>10 x 10 in.</td>
<td>122 1415</td>
<td>351</td>
</tr>
<tr>
<td>11 x 14 in.</td>
<td>122 1431</td>
<td>351</td>
</tr>
<tr>
<td>16 x 20 in.</td>
<td>122 1456</td>
<td>351</td>
</tr>
<tr>
<td>20 x 24 in.</td>
<td>122 1472</td>
<td>351</td>
</tr>
<tr>
<td>30 x 40 in.</td>
<td>122 1498</td>
<td>351</td>
</tr>
</tbody>
</table>

STORAGE
13°F (55°F) or lower.

SAFELIGHT
No safelight is recommended. Handle only in total darkness.

PRINTING FROM COLOR NEGATIVES

EXPOSURE
This film is designed for exposure times of 10 to 120 seconds to 3200 K light. A typical negative or internegative requires 10 to 20 seconds’ exposure when the illumination at the printing surface is 2 footcandles as measured without a negative or filter in the light beam.

These starting point recommendations are based on average emulsions. Instructions packaged with the film give more specific recommendations.

LARGE TRANSPARENCIES
This film can be used for making large transparencies or "coloramas" using a special technique. This involves printing segments of a negative onto wide lengths of KODAK VERICOLOR Print Film 4111 (ESTAR Thick Base) and joining processed strips to form a composite of the original picture.

Special apparatus and procedures are required for cutting and exposing film strips and joining the strips after processing. KODAK Splicing Tape (CAT No. 172 7775) and KODAK Display Film Cement (CAT No. 195 6416) are recommended for joining the processed strips of film. KODAK Background Sheeting (CAT No. 152 3216), for diffusion of light in displaying color transparencies, can be joined together in the same way. KODAK Publication E-58, Preparing Large Color Transparencies for Display (available in mid-1982) will provide more information on this subject.

PROCESSING
KODAK FLEXICOLOR Chemicals (Processes C-41 and C-411V) can be used. A replenished process requires an adjusted developer replenishment rate. For details, see the chart on page 8.

Products manufactured prior to January 1982 required that the starter be added to the developer based on the quantity of print film to be processed. This is no longer required with the new print film.
KODAK VERICOLOR PRINT FILM 4111 (ESTAR THICK BASE)

Diffuse RMS Granularity

Resolving Power (lines per mm)
T.O.C. 1.6:1
T.O.C. 1000:1

Characteristic Curves:

D-Log E, KODAK VERICOLOR Print Film 4111 (ESTAR Thick Base)

Exposure: 10 seconds, Tungsten
Process: Process C-41
Densitometry: Status A

Spectral Dye Density, KODAK VERICOLOR Print Film 4111 (ESTAR Thick Base)

Normalized dyes to form a visually neutral density of 1.0
for viewing illuminant of D 5000
Process: C-41

Modulation Transfer Function KODAK VERICOLOR Print Film 4111 (ESTAR Thick Base)

Exposure: 10 seconds, Tungsten
Process: Process C-41
Densitometry: Visual

Spectral Sensitivity, KODAK VERICOLOR Print Film 4111 (ESTAR Thick Base)

Effective Exposure: 1.4 seconds
Process: Process C-41
Densitometry: E.N.D.
Density: 1.00 above D-min

Read at a net diffuse density of 1.0 using a 48-micrometre aperture, 12X magnification

Determined according to a method similar to the one described in ANSI Standard No. PH2.33-1969, Methods for Determining the Resolving Power of Photographic Materials.
ILFORD Cibachrome II-Transparent is specially made for back-lit display applications. The emulsion layers are coated on a tough, crystal clear, dimensionally-stable polyester plastic base. For front surface protection, a polyester or polypropylene laminate can be added, or the Cibachrome II transparency can be laminated directly to clear Plexiglas®. (When laminating to Plexiglas, care should be taken to specify the tempered material. This will avoid “gassing” of the Plexiglas which results in the formation of small bubbles of vapor trapped between the plastic and the photographic material.)

In the back-lit display field, Cibachrome has built an unmatched reputation for effectiveness. Illuminated color transparencies have always had a powerful influence on consumer buying habits. But that influence quickly becomes negative if the display fades prematurely and takes on an unappealing bluish or greenish cast. With ILFORD Cibachrome II that problem is totally eliminated. Unlike most color materials which can fade in months, the colors of Cibachrome II will stay true and beautiful for years. In fact, one major back-lit Cibachrome display sign in O’Hare Airport was installed in 1972. After more than 9 years of nearly constant illumination, the sign is still bright, rich and beautiful...and still strongly effective in achieving its sales mission.

With Cibachrome II, installations once considered “too permanent” for back-lit displays are now fully practical. Applications like permanent museum displays...touring exhibitions...lobby, store and restaurant interiors...and large advertising signs in terminals, sports arenas and other high traffic areas.

Some specific examples include the permanent exhibit in the new Boston Aquarium, back-lit Cibachrome ceilings and walls at a medical center in California, and major displays at the Smithsonian, at the Library of Congress and in New York’s Penn Station.

But as important as fade-resistance is, it’s not the only reason to specify Cibachrome II-Transparent. Even for relatively short-term back-lit displays, Cibachrome II provides important advantages over conventional color materials. Rich color saturation, superior tone reproduction and super crisp sharpness...these are also important reasons to specify Cibachrome II-Transparent. Combined, they make Cibachrome II-Transparent the most exciting and effective back-lit transparency material you can specify.
NAVITAR

XENON 550
Slide Projector

Special Features:

- Built-in power supply
- Compact size
- Film gate always remains cool
- Instant strike bulb
- Only 9 amps required to run projector
- Very quiet

- External 3-way bulb adjustment
- Easy bulb replacement
- Dissolve module capable of doing animation sequences
- Adjustable screw type legs

Unit pictured is the NAVITAR Xenon 550 DM which consists of a NAVITAR Xenon 550 projector with the optional Dissolve Module attached.
**NAVITAR Xenon 550 Projector-Lamp-Power Supply**

<table>
<thead>
<tr>
<th>Light Output</th>
<th>4000 Lumens</th>
</tr>
</thead>
<tbody>
<tr>
<td>Color Temperature</td>
<td>5500 deg. K</td>
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</tbody>
</table>

**Lamp**
- **Type**: Quartz-Xenon, high pressure arc
- **Power**: 550 Watts
- **Life**: 1000 Hours
- **Reflector**: Simple lamp replacement

**Power Supply**
- **Voltage**: Integral
- **Amps.**: 9 (Special order 220/240 volts avail.)
- **Frequency**: 50/60 hertz
- **Protection**: Fuse, external - Thermal circuit breaker, internal

**Cooling**
- Forced Air; Multiple blower for Lamp, power supply, film gate and housing, within power supply. Low noise design

**Projector**
- **Body**: Kodak Ektographic E-2
- **Controls**: Forward/Reverse, local or remote
- **Leveling**: Individually adjustable screw-type feet
- **Slide Trays**: Carousel or Ektographic round type 80 (140 for noncritical applications)*

**Physical**
- **Dimensions**: 11.0" width, 13.4" height, 19.7" depth
- **Weight**: 45 pounds
- **Color**: Pearl grey

*note: Kodak recommends against use of 140 slide trays for critical applications*

When you specify the NAVITAR Xenon 550 DM, the Xenon projector comes already equipped with a Dissolve Module.

---

**For multi-media presentations, the following accessories are required**

**1-Dissolve Module**
- This is a shutter mechanism which is placed in the light path. The shutter opens and closes according to the instructions programmed into the dissolve controller and relayed by the dissolve interface.

**1-Dissolve Interface**
- This transmits the information from the dissolve controller to the shutter of the dissolve module. This unit has no dissolve capability of its own, but can be thought of as a relay system. One unit controls up to three projectors.

**1-Dissolve Controller**
- These units are programmed to control a series of projectors for multimedia shows. All of the dissolve rates are initiated by this equipment.

**NAVITAR Xenon Dissolve Module**
- **Function**: Shutter mechanism bolted to projector which performs the dissolve functions.
- **Operating Mode**: Mounts to lamp house of Projector unit. Mounting requires screw driver only. No adjustments necessary. Connects, by cable, to MDC-100 Dissolve Interface.
- **Dissolve Rate**: Capable of doing Animation Sequences.
- **Physical Dimensions**: 6.0" x 3.0" x 4½"
- **Weight**: 3 Pounds
- **Color**: Pearl Grey

**NAVITAR Xenon Dissolve Interface MDC-100**
- **Function**: Converts signals from standard dissolve-controller to operate Dissolve Module.
- **Capacity**: Three projectors
- **Power Supply**
  - **Voltage**: 120 Volts
  - **Amps.**: > 1 Amp
  - **Frequency**: 50 or 60 Hertz, internally selectable
- **Physical Dimensions**: 9.3" x 15.0" x 14.9"
- **Weight**: 16 pounds
- **Color**: Black

*(note: one MDC-100 required for up to three Projector-Lamp-Power Supplies)*
SUPERSTAR COMPUTER
Clear Light brings multi-image into the computer age, not just the computer to multi-image. The Superstar is the total communications and production tool. Start with sophisticated word processing for proposals, scripts and story boards. Use StarGraphics imaging software to create slide, charts and graphs. Plug in a special keyboard to write and record your own music soundtrack. Then, with Clear Light's AMPL/M multi-image software, program control of up to 10 screen areas and 30 projectors with features like Multi-Tasking and run-time variables plus much more. The Superstar is fully compatible with all off-the-shelf software for the Apple II or Apple II + computer, including CP/M

Clear Light's Superstar... the complete business and creative tool for the multi-image industry.

StarGraphics
Design StarGraphics slides easily and economically in your own office using Clear Light's Superstar computer. Created expressly for the non-technician operator, StarGraphics allows anyone to create professional high-resolution (2000 lines) text, chart and graph slides quickly and easily. You control all the elements of design — such as colors, type font, size, position and special effects such as drop shadow and underlining — but the computer does the layout work for you automatically. And when the design is complete, the Superstar will send it by phone to a StarGraphics production center. What you get back are quality, high-resolution slides in less than 48 hours.

Universal Interface
The UI's primary function is to interface Star Dissolves to the Superstar computer for multi-image production. The UI controls up to 5 Star Dissolves directly from the Superstar or from a sync track on audio tape, generated by either the Superstar or Star Programmers. Features include encoding and decoding of cues at 50 per second with Cue Servo™, five built-in auxiliaries, expandable to 33 general purpose I/O ports for future expansion plus four remote inputs. One is used for every 5 Star Dissolves.

The STAR Systems
State-of-the-art in dedicated multi-image programming. The Star 3 system controls 15 projectors and up to 33 auxiliary functions. Programming features include 11 precisely timed dissolve rates including left-out, three modes of projector access; to choose from for smooth program flow, multi-level loops for complex animation and automatic sync link for precise timing plus 100 cues per-second program execution and cue resolution. Modular system comprises Star 3 Programmer, Star Memory and Star 3 Dissolves. Also available Star 2 system with similar features limited to six projectors. All Star systems can use the Universal Interface for added capability.

NEW! PortaStar
Clear Light's completely portable dissolve system for two and three projectors. The PortaStar is small enough (25" x 17 1/2" x 7") to fit under an airline seat, but rugged enough to ship as baggage. It sets up in minutes and plays back programs generated on any Clear Light programmer including the Superstar. The PortaStar nests inside a foam-lined ATA approved case, with its own built-in A/V Cassette deck and 5 watt amplifier plus two detachable "micro component" speakers. The PortaStar can be used as a dissolve for both programming and playback with any Clear Light system. Also, you can connect any Clear Light dissolve for playback of larger shows. Connect a Remote and control your projectors for live presentations. PortaStar... Clear Light's completely portable system for two and three projector shows on the road.
Micro Star

Places at your finger tips the sophistication of the "big" systems in an affordable five pound package for two and three projector control. Clear Light's revolutionary design incorporates an intelligent display, which plainly indicates which programming step is required next. The Micro Stars, are available in three versions. Micro Star II, Micro Star Programmer, and Micro Star Memory Programmer. All three draw their features from the Star 3 system - up to 11 dissolve rates, an auxiliary, control of two or three projectors and on the Memory Programmer a 512 cue memory featuring animation loops. Syncrolink timing and full editing. The Micro Stars accept Clear Light's Micro Remote for live speaker support and are fully compatible with the rest of Clear Light's family of multi-image products.

Micro Diamond Dissolve

The basis of Clear Light's family of multi-image products, the Micro Diamond Dissolve is unparalleled in simplicity, and reliability. It is a real-time programmer and dissolve for two projector control. Available are 5 dissolve rates (Cut, 1.24, and 8 seconds). You can change the rate of dissolve even as it happens, hold a dissolve in progress, then release it. Freeze the last projector and superimpose the other projector over it. Animate between slides without cycling trays and ripple back and forth. When your show is over, command the trays to home the shortest way electronically. All with push-button ease. And the Micro Diamond Dissolve is compatible with all of Clear Light's multi-image systems, including the amazing new Superstar. Advanced enough to challenge professionals, the Micro Diamond Dissolve is simple enough for the beginner to master.

Micro Diamond Memory Programmer

Another Clear Light design breakthrough with its exclusive Simple Memory Assisted Real Time (SMART) programming. Program 2, 4, or 6 projectors with the assistance of a 127 cue memory combined with features such as Autostep, Timing, and animation loops. For programming, the Micro Diamond Memory Programmer utilizes all 9 functions of the Micro Diamond Dissolve plus 3 auxiliaries. The Micro Diamond Memory Programmer also accepts the Micro Remote for live operation of two projectors and the Micro Printer for permanent copies of memory programs.

Clear Light Accessories

Clear Light has a wide range of products for specialized audio visual applications, too. From live speaker support with the Micro Remote to controlling a film projector with the E.E interface. Clear Light can meet almost any need. The Star External Auxiliary expands Star 3 control to 33 and Superstar control to 297 auxiliary devices. Clear light accessories give you full capability and more.
The CINEFOLD consists of a flexible vinyl viewing surface attached to a folding aluminum frame. Surprisingly light in weight, yet sturdy and durable, it sets up easily in minutes—with absolutely no tools. Folds just as quickly into an attractive luggage-like carrying case small enough to carry on a plane or in a car trunk.

Here are the particulars—

FRAME AND LEGS—1" square hard alloy anodized structural aluminum.

HARDWARE—Zinc plated steel. Rust resistant.

CASE—Durable, vinyl covered plywood. Built to take years of abuse.

VIEWING SURFACE—Your choice of:

PEARLESCENT MATT WHITE for front projection. High gain white vinyl.

CINEFLEX rear projection material. Flexible vinyl film, neutral gray, impregnated with millions of light diffusing optical lenses. Provides crisp, brilliant images. Can be used in a normally lighted room.

Furnished with tough 8" leatherette binding with snap buttons which attach to studs on screen frame. Both materials are washable with mild soap and water, fungus resistant and fire retardant. Order one of each for maximum flexibility.

ANOTHER FINE PRODUCT FROM

DRAPER SCREEN CO.
SPICEI AND INDIANA 47385

FOR SALE BY-

DIMENSIONS AND DATA

<table>
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<th>OVERALL SCREEN SIZE</th>
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<td>75</td>
<td>11 x 11 x 55</td>
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</table>
"illuminating."

Don't leave your viewers in the dark. They can't take notes in the dark. They can't read or identify speakers in the dark. They can't conduct a productive meeting or seminar in the dark.

And in the past the dark is where they've been, trapped by the limitations of their projection system. But, now there's a light at the end of the tunnel... the Optixx Mark XX.

Utilizing a unique black stripe matrix set into the screen surface, the Optixx Mark XX screen is itself nearly 50 percent matte black. This lets the screen absorb a great deal of the ambient light in the viewing area and thus permits operation in extremely bright conditions. Washouts, blurs, and hot spots, common problems produced by standard rear projection screens, are avoided by the Optixx Mark XX.

"wide angle."

The Optixx Mark XX is the first of a new generation of rear projection screens.

In addition to being uniquely bright, the screens feature a lenticular design that allows the user to enjoy a light flow of directed intensity and evenness over an audience field in excess of 90°. Every seat in the house can be a good one, with viewers across the described viewing area assured of an equally bright, equally sharp, accurate and undistorted image.

Every screen is custom fabricated to size and employs an assemblage of biconvex lenses secured to a diffused, rigid substrate; this provides uniform viewing over carefully prescribed areas. Total viewing angles of the Optixx Mark XX have been measured in excess of 90° horizontally and 20° vertically, a considerable advance over existing screen technology. Yet even at angles...
in excess of 45° off the horizontal center axis, Mark XX audiences can expect an image measurably, visibly, markedly brighter than alternative screens.

The rigid acrylic construction of the screens prevents the kind of accidental rips and pulls that afflict most flexible screens and allows certain options previously unavailable with other projection screens. These options include the ability to install an acrylic overlay which will allow erasable dry markers to be used in conjunction with the projected materials. This write-on feature can be an especially effective tool during training sessions, medical lectures, sporting events, seminars, advertising presentations, teleconferencing, instant replay and other visual applications. Furthermore, because of the unique design of the screens, they can be manufactured in very large sizes which can easily accommodate projection formats even in bright environments such as stadiums and large auditoriums.

"picture perfect."


The Optixx Mark XX is the state of the art communications tool that has no microprocessors, no silicon chips, not a single moving part. Relying on innovations in optics and acryllics, the screen has won high praise world wide. The technical data printed elsewhere in this brochure can attest to the uncompromising quality of the engineering and execution behind the Optixx Mark XX. But only a demonstration can prove that when the Optixx Mark XX was introduced, a new screen star for the eighties was born. The Optixx Mark XX. The reviews are in. Now, see it for yourself.

Optixx Mark XX
The Optixx Mark XX Specifications and Technical Information

Maximum Screen Size...... 8'6" High x 25 feet or more wide
Horizontal Dispersion.................. 45° Off Axis (90° Total)
Vertical Dispersion.................... 10° Off Axis (20° Total)
Horizontal Resolution............... 4 Lines per Millimeter
Vertical Resolution................... 1 Line per Millimeter
Weight................................. 1.87 Pounds per Square Foot

The screen is constructed of acrylic and polycarbonate plastics.

Frame Details
Each screen requires factory installed aluminum framing. Very large screens may require special framing.

For further information contact:
Phoenix Communications
4220 York Road
Baltimore, MD 21212
Phone: (301) 243-3883
Telex: 908041