All of Mid-Co’s technicians are experienced & knowledgable. They are fast, friendly, and they are on time. They are there to serve you, the customer.

### LARGE SCREEN VIDEO PROJECTORS

<table>
<thead>
<tr>
<th>Model</th>
<th>Screen Width</th>
<th>First Day</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>EIKI LC300 LCD</td>
<td>Adjustable</td>
<td>225.00</td>
<td>Special pick up 125.00</td>
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<tr>
<td>SONY VPH 1041Q</td>
<td>4'-14'</td>
<td>350.00</td>
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<tr>
<td>SONY VPH 1042Q</td>
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<td>DOUBLE STACKED SONY 1042Q</td>
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<td>1075.00</td>
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<tr>
<td>ELECTROHOME MARQUEE 8000</td>
<td>5'-20' Adjustable</td>
<td>800.00</td>
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<tr>
<td>DOUBLE STACKED ELECTROHOME MARQUEE 8000</td>
<td>5'-20' Adjustable</td>
<td>1200.00</td>
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<tr>
<td>GE TALARIA PJ5055HB LIGHT VALVE</td>
<td>4'-20' Adjustable</td>
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<tr>
<td>GE TALARIA 12K MP LIGHT VALVE</td>
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<td>2600.00</td>
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### PROJECTOR ACCESSORIES

<table>
<thead>
<tr>
<th>Accessory</th>
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<tr>
<td>67&quot; Retro Cabinets</td>
<td>300.00</td>
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<tr>
<td>Covid Computer Interfaces</td>
<td>50.00</td>
</tr>
<tr>
<td>Chief Two Tier Stacker for Sony VPH 1042</td>
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<tr>
<td>Chief Two Tier Stacker for Sony VPH 1271 or Electrohome</td>
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</tr>
<tr>
<td>Chief Three Tier Stacker for Sony VPH 1042</td>
<td>100.00</td>
</tr>
<tr>
<td>GE MLS (Multiple lens system for GE Talaria projectors)</td>
<td>380.00</td>
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<tr>
<td>Video Adapter for ASK LCD panel</td>
<td>40.00</td>
</tr>
</tbody>
</table>

### INFORMATION ON PROJECTOR RENTAL

Our projector rental rates include set up and delivery within the Twin Cities metro area during normal business hours with two exceptions: The special Eiki price is for pick up at Mid-Co only. GE Talaria projectors require a Mid-Co operator. Talaria operators are billed on a per hour basis. Please call for quotes.

(612) 544 - 3375
## COMPUTER SCANNING STANDARDS

<table>
<thead>
<tr>
<th>Display</th>
<th>Horiz. scan rates kHz</th>
<th>Vert. scan rates Hz</th>
</tr>
</thead>
<tbody>
<tr>
<td>VGA</td>
<td>31.50</td>
<td>60</td>
</tr>
<tr>
<td>SVGA</td>
<td>35.156</td>
<td>56</td>
</tr>
<tr>
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<tr>
<td>SVGA #3</td>
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<td>76</td>
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<tr>
<td>SVGA #4</td>
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<td>70</td>
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<tr>
<td>Mac, Mac+, Mac SE</td>
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<td>Mac II</td>
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<tr>
<td>SuperMac</td>
<td>48.19</td>
<td>59.3</td>
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## SIGNAL DISTRIBUTION PRODUCTS & ACCESSORIES

**VIDEO SWITCHER**
- Vertical interval: 35.00
- Passive: 10.00
- Video Switcher Amplifier: 10.00
- RGB Switcher: 50.00
- Marquee RGB Switcher: 150.00
- RGB Distribution Amplifier: 40.00
- Ground Loop Isolator: 10.00
- VGA Distribution Amplifier: 40.00
- Editor with TBC: 425.00

**DISTRIBUTION AMPLIFIER**
- Input: 40 mHz
- Output: 150 mHz
- Input: 100 mHz or 180 mHz

**COMMUNICATIONS**

**SITE SURVEYS**
- Price per day: 250.00

**PROGRAM RECORDING**
- Call for quote

---

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LARGE SCREEN DATA PROJECTORS

ASK IMPACT 16.7 LCD PANEL
16.7 million colors, 100 in 1 contrast ratio
Optional video adapter available

ELECTROHOME ECP 3101 ACON
5'-14' Adjustable
Brightness - 650 lumens
RGB band width 60 mHz
Automatic convergence
Scans 15 - 55 kHz, horizontal 45 - 120 Hz, vertical

ELECTROHOME ECP 4101 ACON
5'-14' Adjustable
Brightness - 650 lumens
RGB band width 70 mHz
Automatic convergence
Scans 15 - 85 kHz, horizontal 45 - 120 Hz, vertical

SONY VPH 1271Q
5'-20' Adjustable
Brightness - 650 lumens
RGB band width 70 mHz
15 - 82 kHz, horizontal 38 - 150 Hz, vertical

DOUBLE STACKED VPH 1271Q
5'-20' Adjustable
Brightness - 1800 lumens
Includes 2 1271's and stacker

ELECTROHOME MARQUEE 8000
5'-20' Adjustable
8" CRTs
RGB band width 100 mHz
Brightness - 1100 lumens
30 - 130 kHz, horizontal 38 - 150 Hz, vertical

DOUBLE STACKED ELECTROHOME MARQUEE 8000
5'-20' Adjustable
2200 lumens

PROJECTION SCREENS

<table>
<thead>
<tr>
<th>Screen Size</th>
<th>Front</th>
<th>Rear</th>
<th>Drape Kit</th>
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<tbody>
<tr>
<td>3 1/2' X 5'</td>
<td>40.00</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Various</td>
<td>10.00</td>
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<tr>
<td>5' x 7'</td>
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<td>6' x 6'</td>
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<td>40.00</td>
</tr>
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<td>7 1/2' x 10'</td>
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<td>40.00</td>
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<tr>
<td>9' x 12'</td>
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<td>40.00</td>
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<td>10 1/2' x 14'</td>
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<tr>
<td>15' x 20'</td>
<td>250.00</td>
<td>250.00</td>
<td>90.00</td>
</tr>
</tbody>
</table>

Additional draping available on a per foot basis.

PRICES SUBJECT TO CHANGE WITHOUT NOTICE.
How to use the Kodak Ektographic Slide Projector Model AF-2
# Table of Contents

**Features of the Kodak Ektographic Slide Projector, Model AF-2** .................................................. 3

**The Controls and Their Functions** ............................................ 4

**Setting Up—The Room and the Projector** .................................. 5

- Screen and Seats ................................................................. 5
- Using the Zoom Lens ............................................................ 5
- Loading the Slide Tray .......................................................... 5
- Installing the Slide Tray ......................................................... 6
- Preparing the Projector ......................................................... 6

**Operating the Projector** ....................................................... 7

- Forward and Reverse Buttons ................................................ 7
- Remote Control ..................................................................... 7
- Random Projection ............................................................... 7
- Normal Slide-Tray Removal ..................................................... 7
- Emergency Slide-Tray Removal ............................................... 7
- Alternative Projection Methods .............................................. 8
- For Long-Run Applications ..................................................... 8

**After the Showing—a Shutdown Procedure** .............................. 8

**Servicing the Projector** ....................................................... 9

- Projection Lamp Replacement ................................................ 9
- Thermal Fuses ........................................................................ 9
- Cleaning ................................................................................ 9

**Auxiliary Equipment** .............................................................. 10

**Warranty** ................................................................................ 12

**Notice:** Equipment subject to minor appearance changes.
FEATURES—The Kodak Ektographic Slide Projector, Model AF-2 (Automatic Focus), has been designed for professional slide presentations. One of the valuable features of this projector is the automatic focusing device which keeps each slide in focus throughout its projection. You will find the projector to be an exceptionally durable, dependable audiovisual device—versatile, easy to operate, efficient in its functions. The features that distinguish your projector are these:

- Automatic focusing is accomplished by a built-in electronic control.
- A choice of three Kodak trays is available for use with the Model AF-2 Projector. Each tray has convenient slide identification numbers.
- The Kodak Carousel* Universal Slide Tray, furnished with the projector, has an 80-slide capacity and accepts glass and cardboard slides up to 1/4 inch thick. (The projector will also accommodate the Kodak Carousel 80 Slide Tray and the Kodak Carousel 140 Slide Tray.)
- Any transparency format in a 2 x 2-inch mount can be projected, including 126-size (26.5 x 26.5mm), 135-size (22.9 x 34.2mm), 828-size (26.2 x 38mm), 127-size (38 x 38mm), and 110-size (12 x 15.8mm) transparencies in 2 x 2-inch mounts or Kodak 2 x 2 Adapters for 110 Slides.
- A timer in the projector provides automatic changing of slides for 5-, 8-, or 15-second periods. Split-second intervals between slides eliminate long dark-screen periods.
- Slides can be projected in forward or reverse sequence as individually selected.
- A remote control with a 12-foot cord gives forward, reverse, and focusing control away from the projector. Extension cords (see page 10) can be added if needed.
- Focus shift of the projected image is minimized because all slides are conditioned by warm air before projection.
- Precise horizontal and vertical positioning of each slide is provided. As a result, screen images from two of these projectors can be exactly superimposed. Accurate image registration depends upon carefully mounted transparencies.
- The illuminated control panel includes a 4-position Selector Switch for OFF, FAN, and LOW and HIGH light output.
- Noise is minimized by low blower speed.
- Elevation and leveling controls are provided.
- The 300-watt ELH lamp produces less heat than a 500-watt CBA lamp, but offers equivalent light output.
- A lamp ejector lever simplifies lamp replacement.
- The heat-absorbing glass and condenser lens are held in place independently of any other mechanism. This means that a new lamp can be installed without danger of accidentally displacing these optics.
- The projector is wired to accommodate the Kodak Carousel Dissolve Control and other plug-in accessories (see page 10).

*All Carousel equipment mentioned in this manual can be used with the Kodak Ektographic Slide Projector, Model AF-2.

SPECIFICATIONS

HEIGHT: 4 inches (102mm); with tray—6 5/6 inches (154mm).

AVAILABLE PROJECTION LENSES*

FLAT-FIELD LENSES: Kodak Ektanar, 2 1/2-inch (65mm) f/3.5, 3-inch (75mm) f/3.5, 4-inch (100mm) f/2.8, 5-inch (125mm) f/2.8, Zoom 4 to 6-inch (100 to 150mm) f/3.5, and Kodak Ektanon, 7-inch (180mm) f/3.5.

CURVED-FIELD LENSES:† Kodak Projection Ektanar C, 102mm f/2.8, 127mm f/2.8, and Zoom 102 to 152mm f/3.5.

*Lenses of other focal lengths are available from commercial suppliers.
†Designed specifically to compensate for film curl in cardboard and plastic slide mounts (without cover glass); the result is improved edge-to-edge image sharpness.
the controls
and their functions

**FIGURE 1**

- **Remote Control Receptacle**
  - The 5-pin receptacle is for the connector on the remote-control cable. The connector must be oriented correctly (colored dot on the connector facing up, see Figure 3) before you insert it into the receptacle.

- **Dissolve Control Receptacle**
  - Each Kodak Dissolve Control projector cord has a 7-prong connector which fits the remote control receptacle.

- **Selector Switch**
  - When this switch is at FAN, the cooling fan and mechanism will operate but the projection lamp will not be lighted. This position is provided primarily to operate a dissolve control, or to cool the projector rapidly for lamp replacement. At HIGH, the ELH projection lamp provides full illumination (rated lamp life—35 hours). At LOW, 70% of full illumination is provided (average lamp life—105 hours).

- **Automatic Timer**
  - The triangle on the serrated bar for the timer can be moved to any of four settings: "M" for manual control; "5," "8," or "15" for an automatic interval of 5, 8, or 15 seconds.

**FIGURE 2**

- **Forward and Reverse Buttons**
  - These buttons are at-the-projector controls for forward or reverse movement of the slide tray, one slide space at a time.

- **Select Button**
  - When the select button is depressed and held down, the slide tray can be rotated to select any slide for projection. Another use of this control is for the showing of single slides without a slide tray, or retrieving a slide from the gate.

- **Elevating Wheel**
  - When this device is turned, it raises or lowers the front of the projector for vertical adjustment of the screen image. The range of elevation is from 0 to 6 1/2 degrees.

**FIGURE 3**

- **Leveling Foot (Figure 1)**
  - Turning the leveling-foot wheel raises or lowers the left side of the image on the screen.

- **Remote Control Forward Button (Figure 3)**
  - Depressing the button rotates the slide tray one slide space at a time in the forward (counterclockwise) direction.

- **Remote Control Reverse Button**
  - Firmly depressing the button rotates the slide tray one slide space in the reverse (clockwise) direction.

- **Remote Control Focus Lever**
  - Forward and backward movement of this lever focuses the screen image. The remote focusing control will override the automatic focusing device until the lever is released, then automatic focus is reinstated.
Because slides may be horizontal, vertical, or square, a square screen is most desirable. It should be large enough for easy viewing by everyone present and (for most installations) should be at the same level as, or higher than, the projector.

For best results with most slides, the rear row of seats should not be farther from the screen than eight times the projected image height. Seats should be placed as close as possible to both sides of the beam thrown by the projector. The screen image will appear most realistic to the persons seated near the projector beam.

**USING THE ZOOM LENS**

The Kodak Ektanar Zoom Lens, 4 to 6-inch f/3.5, lets you vary the size of the projected image without moving either the projector or the screen. By this means, you can fill the screen at any normal projector-to-screen distance within the range of the lens.

To use the zoom lens—

a. Focus the image on the screen by turning the focus knob.

b. Rotate the lens barrel until the image fills the screen.

c. Readjust the focus.

**LOADING THE SLIDE TRAY**

**CAUTION:** Do not use damaged slides (bent or torn mounts; exposed sharp glass corners or edges; loose or sticky tape). Such slides should be repaired or remounted before they are loaded into a tray. Also, the focus motor will be adversely affected if a matte-surface write-on slide or a slide mount without film is used.

Before you start to load the Carousel Universal or Carousel 80 Tray, check to be sure that the metal slide retainer plate (Figure 4) is locked in the correct position by the latch. The formed end of the latch should be engaged in the two small latch notches. In case this is not so, turn the plate until it is locked.

Before you start to load the 140 tray, check to be sure that the index hole (Figure 5) is opposite the index notch, as shown. If it is not, press the latch in the direction indicated by the arrow. Holding the latch in this position, turn the...

**PROJECTION DISTANCE TABLE FOR Kodak Ektographic Slide Projectors**

(Projection distances are approximate and are measured from projector gate to screen.)

<table>
<thead>
<tr>
<th>LENS FOCAL LENGTH (IN INCHES)</th>
<th>PROJECTION DISTANCES (IN FEET)</th>
<th>SCREEN-IMAGE DIMENSIONS (IN INCHES)</th>
<th>135–35mm</th>
<th>126</th>
<th>SUPER-SLIDE</th>
<th>SINGLE-FRAME FILMSTRIP</th>
</tr>
</thead>
<tbody>
<tr>
<td>4 to 6 (Zoom)</td>
<td></td>
<td></td>
<td>10 x 13½</td>
<td>6½ x 8½</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**FIGURE 4**

**FIGURE 5**
bottom plate until the index hole points to the index notch. Then release the latch.

The molded numbers on the trays are SLIDE IDENTIFICATION NUMBERS (Figure 6). (Only even numbers are marked on the 140 tray.) The slide being shown will be opposite the gate index on the projector.

Remove the slide LOCK RING (Figure 6) by turning it counterclockwise (UNLOCK) and lifting it off the tray. Insert a slide in each slot in the tray, orienting the slide so that the image projected on the screen is right-side up and reads correctly from left to right.

After all slides are in the tray, replace the lock ring, turning it toward LOCK until you feel the detent action once or twice. This will lock the ring to the tray.

INSTALLING THE SLIDE TRAY
The CAROUSEL Universal and CAROUSEL 80 Trays
Hold the tray over the projector, center it over the center post on the top of the projector, and turn it to place the slide-identification number "0"—or "zero position"—at the GATE INDEX, as shown in Figure 7. Next, lower the tray and seat it firmly within the SLIDE TRAY GUIDE RING. If the tray and projector components do not mesh properly, recheck the metal slide retainer plate as described under "Loading the Slide Tray."

The CAROUSEL 140 Tray
Put the loaded slide tray on the projector so that the hole in the center of the tray fits over the center post on the top of the projector; then revolve the tray slowly in a clockwise direction until the identification bar—or "zero position"—(between numbers 2 and 140) on the tray is adjacent to the gate index. The tray will drop into operating position on the top of the projector. If the slide tray does not easily drop into place, check the alignment of the index hole and index notch as described under "Loading the Slide Tray."

NOTE: The 140 tray drops down farther during the first change cycle or when the select button is pressed.

Using an Extra Slide or Cardboard
If you wish to use an extra slide, for a total of 81 (or 141 with the 140 tray), or a title slide that will be projected as soon as the projection lamp goes on, insert this slide in the projector gate (see Figure 10) before you set the tray in place. Or, if you want the screen to be dark after you have shown slide No. 80 (or No. 140 in the 140 tray), insert a 2 x 2-inch piece of thin cardboard in the gate before you position the tray on the projector. This additional slide or piece of cardboard will enter the blocked-off space in the tray at No. 0 when the first regular slide is projected; it will return to the gate when the slide tray is positioned at zero.

Another use for the 2 x 2-inch cardboard is to separate or terminate small groups of slides in a tray. Insert a cardboard in the tray whenever you want a dark-screen interval.

PREPARING THE PROJECTOR
1. Open the door of the CORD COMPARTMENT (Figure 8) on the bottom of the projector. Remove the remote control cord and withdraw the POWER CORD.

IMPORTANT: Always make sure you have pulled out the cord to its full length before you turn on the projector. The compartment must not be used for storage during projection. This is necessary to provide proper air circulation through the projector case.
The power cord, permanently attached to the projector, has a 3-prong polarized plug for connection to a 110 to 125-volt, 60 Hz outlet of the grounding type.

Connect the remote control cord to the projector with the all ORIENTATION DOT (Figure 3) on the cord plug facing up.

NOTE: The white dot on the plug of the remote control assembly for your projector denotes a 5-conductor cord. This assembly, or an exact duplicate, must be used with the Model AF-2 Projector for all applications, including installations where one or more KODAK Remote Extension Cords are employed.

3. If a loaded slide tray is not on the projector, install one at this time. Use the procedure described above.

4. Set the automatic timer at M. Move the selector switch to either LOW or HIGH.

5. If you have placed an additional slide in the projector gate, as described on page 6, this slide will now be projected on the screen. If you have placed a square of cardboard in the gate, the screen will be dark. Otherwise, the screen will be bright. If there is no image, momentarily depress the forward button on the projector or the remote control to project the first slide.

6. Focus the image on the screen, using the focus knob or the remote-control focus lever. Only the first image requires focusing; the remaining images will be automatically focused. (See page 5 for focusing instructions for the zoom lens.)

7. Level the screen image (leveling foot).

9. Move the selector to OFF until you are ready to start projecting.

At this point the projector should have been prepared for operation as described in the previous section. Now move the selector switch to LOW or HIGH, depending on which level of illumination is best suited to your projection situation.

(If your slide show has been designed for automatic projection, set the timer at 5, 8, or 15. The slide-changing mechanism will then be actuated automatically and each slide will be shown for the number of seconds you have selected.)

FORWARD AND REVERSE BUTTONS
To project the slide with the next higher identification number, momentarily depress the forward button; the slide tray will rotate one slide space in the forward (counterclockwise) direction. Depress the reverse button to rotate the tray one slide space in the reverse (clockwise) direction. (Either button can be used to override automatic-timer operation, if desired.)

IMPORTANT: When you use the reverse button, press it firmly. If this button is not firmly depressed, the slide tray may rotate in a forward direction.

REMOTE CONTROL
The forward and reverse buttons on the remote control function the same as those on the projector.

The focusing lever on the remote control performs the same function as the focus knob on the projector.

RANDOM PROJECTION
To project a slide out of sequence:
1. With one hand, firmly depress the select button and hold it down.
2. Rotate the slide tray with the other hand until the number of the slide you want to project is opposite the gate index on the projector.
3. Release the select button. The selected slide will be immediately projected.

NORMAL SLIDE-TRAY REMOVAL
If the zero position is at the gate index, simply lift off the tray. Otherwise:
1. With the projector turned on, depress the select button firmly and hold it down.
2. Rotate the slide tray—in either direction—until the zero position is opposite the gate index.
3. Release the select button and lift off the tray.

EMERGENCY SLIDE-TRAY REMOVAL
In the event that the slide-changing mechanism becomes inoperative as the result of a defective slide becoming lodged in the projector gate, the tray usually will need to be removed in order to eliminate the trouble. If the tray does not advance, depress either the forward or reverse button. If this does not free the stuck slide, follow the tray-removal procedure given on the next page.
servicing the projector

Before you attempt any maintenance or cleaning operation on the projector, make sure the unit is cool. Disconnect the power cord from its outlet. Also, it is a good idea to remove the slide tray and the remote control cord.

**PROJECTION LAMP REPLACEMENT**

Turn the projector upside down. Open the LAMP DOOR (Figure 8) by turning the coin-slotted screw counterclockwise.

Release the LAMP EJECTOR LEVER (Figure 11) from the notch in which it is secured, and lift the lever to eject the lamp from its socket. Withdraw the lamp, noting how the two pins on its base fit into the socket.

To install a lamp, place it on the socket with the two pins on its base fitting into the two slots in the socket. Return the ejector lever to its original position and make sure it is latched; the lever will locate the lamp correctly for operation. Close and fasten the lamp door.

The standard replacement lamp for this projector is a 300-watt, 120-volt ANSI Code ELH lamp; however, lamps with differing specifications may be desirable for some applications. See table below.

**PROJECTION LAMPS FOR Kodak Ektagraphic SLIDE PROJECTORS**

<table>
<thead>
<tr>
<th>ANSI Code</th>
<th>Relative Brightness</th>
<th>Average Life (Hours)</th>
</tr>
</thead>
<tbody>
<tr>
<td>LOW</td>
<td>70</td>
<td>105</td>
</tr>
<tr>
<td>HIGH</td>
<td>100</td>
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</tr>
<tr>
<td>LOW</td>
<td>50</td>
<td>525</td>
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<tr>
<td>HIGH</td>
<td>75</td>
<td>175</td>
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<tr>
<td>LOW</td>
<td>85</td>
<td>45</td>
</tr>
<tr>
<td>HIGH</td>
<td>130</td>
<td>15</td>
</tr>
</tbody>
</table>

*Continual use of high-brightness lamps may shorten useful slide life.

**THERMAL FUSES**

Your projector is equipped with thermal fuses to prevent overheating. Should the fuses open, the projector will not operate. Replacement of the fuses demands partial disassembly of the projector, a job requiring factory or repair station attention. (See listing of Kodak service facilities on page 12.) Also, you should determine and correct, if possible, any situation outside the projector that may have contributed to fuse failure—inadequate ventilation, dusty environment, etc.—before using the projector.

**CLEANING**

The optical system of your projector must be kept clean for best results. Fingerprints or smudges on the lenses will reduce the brightness and clarity of the screen image. A small amount of dust will have a negligible effect on the projected images.

**Projection Lens**

Remove the lens from the projector. With a soft, clean, lintless cloth or Kodak Lens Cleaning Paper, wipe the front and back surfaces of the lens. Replace the lens, making sure that the teeth on the lens are engaged by the gear on the focus-knob shaft.

**Condenser Optics**

**WARNING:** Heat-absorbing glass is subjected to special processes that tend to put stresses and strains into it. Consequently, the glass may shatter for no apparent reason and without warning. Therefore, handle heat-absorbing glass with care and follow these recommendations:

1. For personal safety, use a piece of cloth or a glove while handling the glass.
2. Place the glass on an insulating material such as wood, rubber, or cardboard.
3. Keep the glass covered while it is removed so that if shattering occurs, it will be confined.

Turn the projector upside down. Open the lamp door as described above. Release the LENS RETAINER from the notch in which it is secured and raise it to an upright position. Carefully lift out the HEAT-ABSORBING GLASS and the CONDENSER LENS, noting their positions in the chamber. Do not attempt to remove the MIRROR; it has been precisely aligned during manufacture to provide optimum screen illumination. Avoid touching the mirror surface with the fingers. Clean the mirror and both sides of the heat-absorbing glass and condenser lens with a clean, soft, lintless cloth or with Kodak Lens Cleaning Paper.

Replace the elements as follows, holding each one by its edges to prevent finger marks: condenser lens in the guides nearer the front of the projector with the flatter side of the condenser toward the front; heat-absorbing glass in the guides nearer the mirror. Return the lens retainer to its original position and make sure it is latched.

**NOTE:** Failure to position the condenser lens correctly will cause the focus motor to run continuously. Close and fasten the lamp door.
Proceed as follows:

1. Turn the coin-slotted TRAY REMOVAL SCREW (Figure 9) in either direction as far as it will go.
2. While holding the screw in this position, lift the tray off the projector.
3. Remove the obstruction from the projector gate by depressing the select button, or correct any other cause of the malfunction.
4. With the locking ring in place, turn the tray upside down. Rotate the bottom plate, or slide retainer, until the latch engages the notches in the plate (or until the index hole is adjacent to the index notch on the 140 tray). See page 5. Place the tray on the projector. Repair the damaged slide (if this was the cause) and return it to the tray.

ALTERNATIVE PROJECTION METHODS

1. Slides in tray without tray ring: By leaving the tray ring off, slides can be inserted or removed easily. This simplifies editing.
2. With the KODAK CAROUSEL Stack Loader: Lets you project and edit up to 40 2 x 2-inch slides in cardboard or thin plastic mounts (.040 to .060-inch thick) without using a slide tray.
3. Without a slide tray: A single slide can be shown simply by inserting it, correctly oriented, into the projector gate as shown in Figure 10. To remove the slide, depress the select button.

FOR LONG-RUN APPLICATIONS

If the projector is to be run for an unusually long period of time, these precautions should be observed:

- Provide for unrestricted flow of air to and from the openings in the projector housing. If the projector is to be used in a window display or in a cabinet, provide a duct for warm air expelled from the rear grill vent. In some cases, additional forced air ventilation may be needed.
- Keep air circulating through the projector. Air at normal room temperature is satisfactory.

In normal use, the parts of the projector that are subject to wear have about equal life expectancy; therefore, no other special precautions are necessary. However, in some specialized applications, a projector may be cycled forward rapidly for hundreds of hours. Under these circumstances, you should consider making the modifications recommended in Kodak Pamphlet No. S-70-2-1, Extending Clutch Life for Heavily Used KODAK Slide Projectors. You can obtain a copy by writing to the address below.

Additional information on long-run applications is contained in Kodak Pamphlets No. S-53, Heavy-Duty Operation of KODAK EKTAGRAPHIC and CAROUSEL Slide Projectors, and No. S-56, The Care and Maintenance of KODAK CAROUSEL Slide Trays. A single copy of each is available on request from Eastman Kodak Company, Dept. 412L, Rochester, N.Y., 14650. Also ask for a free copy of Index to Kodak Information (L-5), which lists many other Kodak publications.

after the showing —a shutdown procedure

We recommend that you use a standard shutdown procedure after your slide presentation has been completed. This will help provide proper care of the projector and will make certain it is ready for the next user.

1. Rotate the slide tray to the zero position, using the select button (page 7, RANDOM PROJECTION).
2. Move the power switch to OFF. Rapidly cooling the projector after each use is not recommended. But, if the unit must be handled immediately after a slide presentation or the lamp must be changed quickly, the fan can be run to accelerate cooling of the projector. (The right-rear corner of your projector may be uncomfortably warm for several minutes after you switch off the power. The maximum temperature reached, however, will be well below the danger point for the lamp, projector, tray, or slides.)
3. Remove the slide tray from the projector.
4. Retract the elevating and leveling feet.
5. Retract the lens (focus knob).
6. Disconnect the remote-control and power-cord plugs. Store the cords in the cord compartment.

If there is no need to move the equipment before your next slide presentation, you can omit steps 4 through 6.
Each of the items described below is a useful accessory for the KODAK EKTAGRAPHIC Slide Projector, Model AF-2.

### KODAK CAROUSEL Universal Slide Tray

KODAK CAROUSEL 80 Slide Tray

KODAK CAROUSEL 140 Slide Tray

Additional slide trays, supplied in attractive bookshelf-type storage boxes. Each box contains an identification card and tray sticker. Use the CAROUSEL Universal Slide Tray for all slides, including glass-mounted slides up to 1/8 inch thick; use the CAROUSEL 80 Slide Tray for slides mounted in cardboard or thin glass (up to 1/10 inch thick). For 140-slide capacity of slides in cardboard or thin plastic mounts up to 1/16 inch thick, use the CAROUSEL 140 Slide Tray.

### KODAK CAROUSEL Projector Case, Model B

Accommodates projector, one slide tray, extra lenses, cords, and spare lamp. Made of gray, heavy-duty simulated leather. Provides complete protection plus convenience and attractive appearance during transportation and storage. (Will hold the KODAK EKTAGRAPHIC Slide Projector, Model AF-2, with 7-inch or zoom lens in place if the projector is inserted on its side.)

### KODAK Carrying Case for KODAK CAROUSEL Slide Trays

Has two compartments so that three slide trays can be carried or one or two trays plus extension cords, lenses, and other equipment.

### KODAK AV Compartment Case

A convenient, rugged case of vulcanized fiber. Will accommodate the KODAK EKTAGRAPHIC Slide Projector, Model AF-2, with 7-inch or zoom lens in place. Also will hold one slide tray, extra lenses, cords, and spare projection lamp.

### KODAK Projection Lenses

Several KODAK Projection Lenses are available for your projector. See table on page 3.

### KODAK Remote Extension Cord, 25-Foot

Extends the range of the 12-foot remote control cord so that you can operate the projector from a location near the screen. Several extension cords can be added to accommodate any reasonable projection distance.

### KODAK CAROUSEL Dissolve Control, Model 2

Controls two Model AF-2 projectors for slide shows in which one image "dissolves" into the next while screen illumination remains virtually constant. The unit contains a timer for continuous automatic operation, or it can be controlled by the remote control cord of one of the projectors. Can also be controlled by the KODAK CAROUSEL Sound Synchronizer, Model 2. Ideal for sales presentations or more sophisticated slide showings.

### KODAK CAROUSEL Sound Synchronizer, Model 2

This unit permits a stereo record/playback tape recorder, that is equipped with an external speaker jack, to be used as a programmer with your projector. In operation, one of the tape tracks is used for slide-change signals while all other sound is recorded on the other channel. Can also control two projectors through a KODAK CAROUSEL Dissolve Control.
KODAK EKTAGRAPHIC
Filmstrip Adapter
The KODAK EKTAGRAPHIC Filmstrip Adapter* will enhance the versatility of your EKTAGRAPHIC Slide Projector, Model AF-2, by equipping it for the projection of 35mm single-frame filmstrips.

*For more even screen illumination when using the filmstrip adapter with this projector, it is recommended that the CONDENSER LENS (Figure 11) be replaced with Kodak Part No. 625889. (Utilization of this substitute condenser lens with slides will result in a slight decrease in the projector's light output.) See your supplier of Kodak audiovisual products or write to Eastman Kodak Company, Dept. 641, Rochester, N.Y. 14650.

KODAK EKTALITE
Projection Screen, Model 3 (40x40)
Provides a uniformly brilliant image that almost totally rejects stray light falling on the screen from anywhere outside the normal viewing position. The result—excellent contrast and color saturation, even in brightly lighted areas.

KODAK Slide Clip
(for KODAK CAROUSEL Stack Loader)
The Kodak Slide Clip provides a new concept that makes handling and showing "blocks" of 2 x 2-inch slides easy and convenient. It helps to prevent loose slides from being accidentally dropped—and the 12-clip box gives them compact, low-cost storage.

SERIAL NUMBER
Each KODAK EKTAGRAPHIC Slide Projector, Model AF-2, has a serial number stamped on the bottom of the projector near the cord compartment. Make a note of this number for your records in case your projector is lost or stolen.
warranty

KODAK EKTAGRAPHIC Slide Projector, Model AF-2

Carefully follow all the instructions in this manual to get the best results and to prevent damage to your projector.

Your projector will be repaired at no charge within one year after purchase, except for worn-out projection lamps and damage caused by misuse or circumstances beyond Kodak's control. This warranty applies only to the projector, and Kodak cannot be responsible for other losses or damages of any kind resulting from projector failure.

Except as mentioned above, no other warranty, express or implied, applies to this slide projector.

For service during or after the warranty period, you may take your projector to a Kodak Consumer Center (located in many U.S. cities). Please consult your local telephone directory under Photographic Equipment and Supplies for the locations of these centers. You may also return the projector directly or through a dealer in Kodak audiovisual products to one of the following Kodak Equipment Service Centers. To help us get the projector back to you promptly, please enclose a note giving the details of the projector malfunction and date of purchase.

Eastman Kodak Company
Central Equipment Service Center
800 Lee Road
Rochester, N.Y. 14650

Eastman Kodak Company
Regional Equipment Service Center
5315 Peachtree Industrial Blvd.
Chamblee, Ga. 30341

Eastman Kodak Company
Regional Equipment Service Center
2800 Forest La.
Dallas, Tex. 75234

Eastman Kodak Company
Regional Equipment Service Center
12100 Rivera Rd.
Whittier, Calif. 90606

Eastman Kodak Company
Regional Equipment Service Center
1334 York Ave.
New York, N.Y. 10021

Eastman Kodak Company
Regional Equipment Service Center
1901 West 22nd St.
Oak Brook, Ill. 60521

Eastman Kodak Company
Regional Equipment Service Center
9100 Alcosta Blvd.
San Ramon, Calif. 94583

Eastman Kodak Company
Regional Equipment Service Center
1122 Mapunapuna St.
Honolulu, Hawaii 96819

Service is also available through dealers selling Kodak audiovisual products. Refer to the yellow pages of your telephone directory under Audiovisual Equipment and Supplies.

Kodak, Ektographic, Carousel, Ektanar, Ektanon, and Ektalite are trademarks.

MOTION PICTURE AND AUDIOVISUAL MARKETS DIVISION
Rochester, N.Y. 14650
Basic Operating Instructions
KODAK EKTAGRAPHIC Slide Projector,
Model AF-2

1. PLUG IT IN
   Open door on bottom of projector and withdraw full length of power cord

2. CONNECT REMOTE CONTROL
   (orientation dot facing up)

3. INSTALL TRAY*
   Emergency Tray Removal Screw

4. TURN IT ON
   Move switch to LOW or HIGH (Be sure timer is set at M)
   Elevating Wheel (under handle)
   Focus Knob
   Forward Button
   Reverse Button
   Gate Index
   Lamp Door (on bottom)
   Automatic Timer

5. PRESS to project first slide (or use forward button)

6. FOCUS the image on the screen (or use focus knob)

*Position tray with zero (0) at gate index.

(See other side)
ELEVATING WHEEL. To raise or lower the image on the screen, turn the elevating wheel on the front of the projector.
LEVELING-FOOT WHEEL. To raise or lower the left side of the image on the screen, turn the leveling-foot wheel.
REMOTE CONTROL (Timer set at M). To project the slide with the next higher identification number, momentarily depress the forward button; to rotate the tray one slide space in the reverse (clockwise) direction, depress and release the reverse button. (Press the reverse button firmly; if this button is pressed too lightly, the tray may rotate in a forward direction.) To focus the image on the screen, use the focus lever.

These functions can also be accomplished by operating the forward button, the reverse button, and the focus knob on the projector body.

RANDOM PROJECTION (Timer set at M). To project a slide out of sequence:
1. Firmly depress the select button and hold it down.
2. Rotate the slide tray until the slide you want to project is opposite the gate index on the projector.
3. Release the select button. The selected slide will be immediately projected.

AUTOMATIC TIMER. For automatic advance of slides at intervals of 5, 8, or 15 seconds, set the timer at "5", "8", or "15" respectively.
SLIDE-TRAY REMOVAL. If the zero position on the tray is opposite the gate index, simply lift off the tray. Otherwise:
1. With the projector turned on, depress the select button firmly and hold it down.
2. Rotate the slide tray—in either direction—until the zero position is opposite the gate index.
3. Release the select button and then lift off the tray.

EMERGENCY SLIDE-TRAY REMOVAL. If for any reason it becomes necessary to remove the tray without returning it to the zero position, use this procedure:
1. Turn the coin-slotted tray removal screw in either direction as far as it will go.
2. Hold the screw in this position and lift off the tray.
3. Turn the tray upside down and rotate the bottom plate until it locks.

PROJECTION LAMP REPLACEMENT. If the lamp burns out during a showing:
1. Allow the fan to run to cool the lamp and lamp compartment.
2. Remove the slide tray.
3. Move the switch to OFF.
4. Disconnect the power cord.
5. Turn the projector upside down.
6. Open the lamp door by turning the coin-slotted screw counterclockwise.
7. Release the lamp ejector lever from the notch in which it is secured. Lift the lever to eject the lamp. Withdraw the lamp.
8. Place a new lamp (ANSI Code ELH) in the socket with the two pins on its base fitting the two slots in the socket. (Code ENH lamp can be used for extended lamp life with less output; ENG lamp for more brightness, but shorter life.)
9. Return the ejector lever to its original position and make sure it is latched. The lever will locate the lamp correctly for operation.
10. Close and fasten the lamp door.

For more detailed information, refer to the instruction manual.

Kodak and Ektographic are trademarks.

Motion Picture and Audiovisual Markets Division
EASTMAN KODAK COMPANY • ROCHESTER, N.Y. 14650
Bruce,
Here are the specifications on the LD-360M Dimmer packs. The sale price for the LD-360M is $595.00 plus tax. Delivery is about one week. Please, call me if you have any questions.
Thanks

Juan
Take a look in our tree-mount dimmer packs! You will find features which are not found in any other tree-mount dimmers. Engineering excellence and concern for quality are visible throughout.

We use dual SCR's for unsurpassed reliability. Full magnetic circuit breakers protect electronic components in the event of overloads or short circuits. There are no fuses to replace. All components are on a G-10 FR circuit board, with minimum wiring for rugged durability and ease of service. You will also find professional quality line noise filtering that eliminates buzz and interference with sensitive audio equipment.

GENERAL SPECIFICATIONS

LOAD POWER CAPACITY. Any channel may handle up to 2400 watts, but the total power of all the loads on a pack should not exceed the pack's power input.

OUTPUT CIRCUITS. The LD-360 series dimmers have six parallel blade U-ground duplex receptacles, while the LD-340 features four parallel blade U-ground duplex receptacles.

POWER DEVICES. Two 25 Amp SCR's per channel, optically isolated from control input circuitry.

CIRCUIT PROTECTION. A single illuminated magnetic circuit breaker (dual for HP models) on the power input provides fast protection from shorts and overloads.

No fuses are used in power circuits.

MOUNTING. Dimmer may be mounted by a pipe clamp or bolt with the yoke provided, or may be bolted directly to a truss.

FILTERING. The rise time of the load current measured from 10% to 90% of peak current at 90 degrees conduction angle with full rated load is 250 μS. (Note: all specifications +/- 10% unless otherwise noted.)

LD-360M CONTROL SPECIFICATIONS

MIDI CONTROL SIGNAL. The LD-360M and LD-360M-HP utilize the MIDI communication protocol to receive control information from the LM-850 control console. The MIDI protocol provides the benefits of a "true" digital signal and is not to be confused with analog multiplexed signals. As a control signal, MIDI is a very quick and versatile protocol which can efficiently carry control information for as many as 104 dimmer channels and can be transmitted reliably over hundreds of feet.

MIDI CONTROL CONNECTOR. One 5 pin female DIN connector In and one female 5 pin DIN connector Thru for daisy chaining dimmer packs.

MIDI CHANNEL. Selectable 1-16 or OMNI. Dimmer pack starting address selectable, channel 0-99.

STAND ALONE MIDI OPERATION. The LD-360M and LD-360M-HP dimmer packs respond to MIDI note-on/note-off and continuous controller information making it possible to control the dimmers with a MIDI keyboard, drum machine or sequencer as well as an LM-850 control console.

MIDI CONTROL SPECIFICATIONS

ANALOG CONTROL SPECIFICATIONS

ANALOG CONTROL INPUT. 0-10VDC, 200k ohm input impedance, with input common floating. Compatible with any controller having 0-10 VDC control outputs.

ANALOG CONTROL INPUT CONNECTOR. One each male and female 8 pin Jones type with a female mating cable connector supplied with dimmer pack.

POWER REQUIREMENTS

POWER INPUT (HP specifications in parenthesis). 105-125 VAC 50-60HZ 15 Amperes (2 x 105-125VAC). 1800 (3600) watts maximum total load. Standard male parallel blade U-ground mounted at the end of 12 gauge-3 conductor power cord(s). This standard plug(s) is rated for 15 amps maximum.

INCREASED POWER (HP Models). The LD-340, LD-360A, and the LD-360M can handle 2400 (4800) watts total pack power if the parallel blade U-ground power plug(s) is replaced with a plug rated to handle 20 amp safely, and the pack is connected to a suitable outlet(s). We recommend a 20 amp stage pin plug or a NEMA type 5-20P or L5-20P plug.

FULL ONE YEAR WARRANTY

For a period of one year from the date of sale, CAE, Inc. will replace any defective parts and will repair any defective module returned to the factory prepaid, without charge for parts or labor. Please consult your dealer for full warranty details.

CAE
PRO LIGHTING EQUIPMENT
10087 Industrial Dr
Hamburg, MI 48139
(810) 331-9373
FAX (810) 231-1631
Before 12-1-93 Dial 9119
To: Woody Vasulka
At: Fred Mikoska
From: CAE INC.

At CAE, Incorporated 810-231-9373, FAX 810-231-1631
Manufacturers of: Leprecon® Pro-Lighting Equipment, Littlite® Gooseneck Lamps & Accessories and ISYS™ Lighting

Message:

Re: Fax info LD-360M ($795)

They also make:

ANG 50 R
MIDI to 48 output cues
0-10 VDC

1800 W 3600 W 7500 W

$795 $1495 $1995

Device can be various
Take a look in our tree-mount dimmer packs! You will find features which are not found in any other tree-mount dimmers. Engineering excellence and concern for quality are visible throughout. We use dual SCR’s for unsurpassed reliability. Full magnetic circuit breakers protect electronic components in the event of overloads or short circuits. There are no fuses to replace. All components are on a G-10 FR circuit board, with minimum wiring for rugged durability and ease of service. You will also find professional quality line noise filtering that eliminates buzz and interference with sensitive audio equipment.

**GENERAL SPECIFICATIONS**

**LOAD POWER CAPACITY.** Any channel may handle up to 2400 watts, but the total power of all the loads on a pack should not exceed the pack’s power input.

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**POWER DEVICES.** Two 25 Amp SCR’s per channel, optically isolated from control input circuitry.

**CIRCUIT PROTECTION.** A single illuminated magnetic circuit breaker (dual for HP models) on the power input provides fast protection from shorts and overloads. No fuses are used in power circuits.

**MOUNTING.** Dimmer may be mounted by a pipe clamp or bolt with the yoke provided, or may be bolted directly to a truss.

**FILTERING.** The rise time of the load current measured from 10% to 90% of peak current at 90 degrees conduction angle with full rated load is 250 μS. (Note: all specifications +/- 10% unless otherwise noted.)

**LD-360M CONTROL SPECIFICATIONS**

**MIDI CONTROL SIGNAL.** The LD-360M and LD-360M-HP utilize the MIDI communication protocol to receive control information from the LM-850 control console. The MIDI protocol provides the benefits of a “true” digital signal and is not to be confused with analog multiplexed signals. As a control protocol, MIDI is a very quick and versatile protocol which can efficiently carry control information for as many as 104 dimmer channels and can be transmitted reliably over hundreds of feet.

**MIDI CONTROL CONNECTOR.** One 5 pin female DIN connector In and one female 5 pin DIN connector Thru for daisy chaining dimmer packs.

**MIDI CHANNEL.** Selectable 1-16 or OMNI. Dimmer pack starting address selectable, channel 0-99.

**STAND ALONE MIDI OPERATION.** The LD-360M and LD-360M-HP dimmer packs respond to MIDI note-on/note-off and continuous controller information making it possible to control the dimmers with a MIDI key-board, drum machine or sequencer as well as an LM-850 control console.

**ANALOG CONTROL SPECIFICATIONS**

**ANALOG CONTROL INPUT.** 0-10VDC, 200k ohm input impedance, with input common floating. Compatible with any controller having 0-10 VDC control outputs.

**ANALOG CONTROL CONNECTOR.** One each male and female 8 pin Jones type with a female mating cable connector supplied with dimmer pack.

**POWER REQUIREMENTS**

**POWER INPUT (HP specifications in parenthesis).** 105-125 VAC 50-60Hz 15 Amperes (2 x 105-125VAC), 1800 (3600) watts maximum total load. Standard male parallel blade U-ground mounted at the end of 12 gauge-3 conductor power cord(s). This standard plug(s) is rated for 15 amps maximum.

**INCREASED POWER (HP Models).** The LD-340, LD-360A, and the LD-360M can handle 2400 (4800) watts total pack power if the parallel blade U-ground power plug(s) is replaced with a plug rated to handle 20 amps safely, and the pack is connected to a suitable outlet(s). We recommend a 20 amp stage pin plug or a NEMA type 5-20P or L5-20P plug.

**FULL ONE YEAR WARRANTY**

For a period of one year from the date of sale, CAE, Inc. will replace any defective parts and will repair any defective module returned to the factory prepaid, without charge for parts or labor. Please consult your dealer for full warranty details.
MIDI Implementation

Normal Control
The dimmer output channels can be controlled by any one of the MIDI continuous controllers 00 through 120. The LM-850 console will control the dimmers using exclusively MIDI continuous controllers 00 through 107, allowing each channel to be set at any of 128 discrete levels from light off (0) to full on (127).

Stand Alone Operation
The MIDI dimmer will also respond to MIDI note ON, MIDI note OFF, and velocity messages. While those commands are not usually generated by the console, they allow for controlling the dimmer directly from standard MIDI controllers such as keyboards, sequencers, MIDI percussion, or drum machines. When used in this fashion, a dimmer is turned on by MIDI note ON message. The note number determines which dimmer is addressed according to the starting address switch (If the address switch is set at 1, the 1st dimmer in the pack will respond to note 1, the 2nd dimmer will respond to note 12 etc.). The “velocity” value of the note ON sets the brightness of the light. A dimmer remains on until turned off by a note OFF message.

Even for a very short note ON note OFF sequence, a dimmer will turn on for at least 200 ms. This will allow drum machines or MIDI percussion systems to produce perceivable flashes of light. Even in this stand alone application, the MIDI dimmer will still respond to MIDI continuous controller commands having the same number as the dimmer identity number.

MIDI Channel
MIDI channel 1-16 and OMNI on-off can be set by dip switch...see previous description. Since too much data can slow down MIDI system response time, it is advisable to run a separate MIDI circuit for the lighting system, which will carry only lighting data. The synthesizers, etc. would be on other MIDI circuits, so their response time would be unaffected by demands for lighting data transmission. Most systems should therefore be run in channel 1, OMNI ON.

Playing Sequenced Cues Without the LM-850
For specific applications, it is possible to use the LM-850 to program a show where the console would not be used at all for playback, if MIDI dimmers are being used. The dimmers can be plugged into the MIDI Out from the sequencer just as the LM-850 normally would, and they will respond to the data as if the console were in place. This method can be used for setups where minimal equipment is desired, but it does have some limitations. First of all, it leaves no margin for changing the show in any way, without connecting in the LM-850 once again. Secondly, it leaves no way to manually being up any lights if this becomes necessary (other than by controlling them, say, with a keyboard driving the dimmers). It also requires lots of MIDI data which may slow down complex shows.

The gist of this technique is that the show is recorded from the LM-850, and the sequencer is fed from the MIDI Dimmer Out rather than from the System Out. Anything that the console does-scene changes, chases, etc., will be recorded by the sequencer. The console can send out this data in either CONTinuous controller or NOTE mode. Again, the former is the most efficient. Be sure that on playback, the dimmers are set to the same MIDI channel that the sequencer data was recorded on. The sequencer then mimics the LM-850's output, driving the dimmers directly— and the 850 is not needed unless real time intervention is required.

Dimmer Control Assignment
The LD-360M and LD-360M-HP MIDI dimmer packs have 6 dimmer circuits built-in. Each dimmer pack has a MIDI input and MIDI thru connector. Each pack also has an identity number assignment switch. This switch is used to assign a Starting Address to each dimmer pack from 00 to 99. If a 6 channel dimmer pack is assigned the starting address 10, the 1st dimmer in the pack will respond as dimmer channel 10, the 2nd dimmer as number 11, the 3rd as number 12 etc. It's address range will be...
<p>| 10.0 | label 16.0 m.m. | 94 | 95 |
| 8.0  | label 16.0 m.m. | 94 | 95 |
| 7.5  | label 16.0 m.m. | 94 | 95 |
| 7.0  | label 16.0 m.m. | 94 | 95 |
| 6.5  | label 16.0 m.m. | 94 | 95 |
| 6.0  | label 16.0 m.m. | 94 | 95 |
| 5.5  | label 16.0 m.m. | 94 | 95 |
| 5.0  | label 16.0 m.m. | 94 | 95 |
| 4.5  | label 16.0 m.m. | 94 | 95 |
| 4.0  | label 16.0 m.m. | 94 | 95 |
| 3.5  | label 16.0 m.m. | 94 | 95 |
| 3.0  | label 16.0 m.m. | 94 | 95 |
| 2.5  | label 16.0 m.m. | 94 | 95 |
| 2.0  | label 16.0 m.m. | 94 | 95 |
| 1.5  | label 16.0 m.m. | 94 | 95 |
| 1.0  | label 16.0 m.m. | 94 | 95 |</p>
<table>
<thead>
<tr>
<th>Controller No. (Decimal) (Hex)</th>
<th>APPENDIX 1 (CONTINUED)</th>
</tr>
</thead>
<tbody>
<tr>
<td>50 32</td>
<td>Channel 51 fader</td>
</tr>
<tr>
<td>51 33</td>
<td>Channel 52 fader</td>
</tr>
<tr>
<td>52 34</td>
<td>Channel 53 fader</td>
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<td>53 35</td>
<td>Channel 54 fader</td>
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<tr>
<td>54 36</td>
<td>CROSSFADE slider</td>
</tr>
<tr>
<td>55 37</td>
<td>MASTER fader</td>
</tr>
<tr>
<td>56 38</td>
<td>SUBMASTER A fader</td>
</tr>
<tr>
<td>57 39</td>
<td>SUBMASTER B fader</td>
</tr>
<tr>
<td>58 3A</td>
<td>Chase LEVEL fader</td>
</tr>
<tr>
<td>59 3B</td>
<td>Chase RATE fader</td>
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<tr>
<td>60 3C</td>
<td>Channel 1 BUMP button</td>
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<tr>
<td>61 3D</td>
<td>Channel 2 BUMP button</td>
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<td>62 3E</td>
<td>Channel 3 BUMP button</td>
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<td>63 3F</td>
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<td>Channel 10 BUMP button</td>
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<td>Channel 11 BUMP button</td>
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<tr>
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<td>75 4B</td>
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<td>81 51</td>
<td>Channel 22 BUMP button</td>
</tr>
<tr>
<td>82 52</td>
<td>Channel 23 BUMP button</td>
</tr>
<tr>
<td>83 53</td>
<td>Channel 24 BUMP button</td>
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<tr>
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<td>Channel 25 BUMP button</td>
</tr>
<tr>
<td>85 55</td>
<td>Channel 26 BUMP button</td>
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<tr>
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<td>Channel 30 BUMP button</td>
</tr>
<tr>
<td>90 5A</td>
<td>Channel 31 BUMP button</td>
</tr>
<tr>
<td>91 5B</td>
<td>Channel 32 BUMP button</td>
</tr>
<tr>
<td>92 5C</td>
<td>Channel 33 BUMP button</td>
</tr>
<tr>
<td>93 5D</td>
<td>Channel 34 BUMP button</td>
</tr>
<tr>
<td>94 5E</td>
<td>Channel 35 BUMP button</td>
</tr>
<tr>
<td>95 5F</td>
<td>Channel 36 BUMP button</td>
</tr>
<tr>
<td>96 60</td>
<td>Channel 37 BUMP button</td>
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<td>97 61</td>
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<td>Channel 39 BUMP button</td>
</tr>
<tr>
<td>99 63</td>
<td>Channel 40 BUMP button</td>
</tr>
</tbody>
</table>
FROM: CAE INC.

TO:  5054730614  AUG 9, 1994  1:36PM  P.02

APPENDIX 1, CONTINUED

<table>
<thead>
<tr>
<th>Controller No. (Decimal)</th>
<th>LM-850 Function</th>
<th>Possible Values (Decimal)</th>
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<tbody>
<tr>
<td>100 64</td>
<td>Channel 41 BUMP button</td>
<td>0=Off, 127=On</td>
</tr>
<tr>
<td>101 65</td>
<td>Channel 42 BUMP button</td>
<td>0=Off, 127=On</td>
</tr>
<tr>
<td>102 66</td>
<td>Channel 43 BUMP button</td>
<td>0=Off, 127=On</td>
</tr>
<tr>
<td>103 67</td>
<td>Channel 44 BUMP button</td>
<td>0=Off, 127=On</td>
</tr>
<tr>
<td>104 68</td>
<td>Channel 45 BUMP button</td>
<td>0=Off, 127=On</td>
</tr>
<tr>
<td>105 69</td>
<td>Channel 46 BUMP button</td>
<td>0=Off, 127=On</td>
</tr>
<tr>
<td>106 6A</td>
<td>Channel 47 BUMP button</td>
<td>0=Off, 127=On</td>
</tr>
<tr>
<td>107 6B</td>
<td>Channel 48 BUMP button</td>
<td>0=Off, 127=On</td>
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<tr>
<td>108 6C</td>
<td>Channel 49 BUMP button</td>
<td>0=Off, 127=On</td>
</tr>
<tr>
<td>109 6D</td>
<td>Channel 50 BUMP button</td>
<td>0=Off, 127=On</td>
</tr>
<tr>
<td>110 6E</td>
<td>Channel 51 BUMP button</td>
<td>0=Off, 127=On</td>
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<tr>
<td>111 6F</td>
<td>Channel 52 BUMP button</td>
<td>0=Off, 127=On</td>
</tr>
<tr>
<td>112 70</td>
<td>Channel 53 BUMP button</td>
<td>0=Off, 127=On</td>
</tr>
<tr>
<td>113 71</td>
<td>Channel 54 BUMP button</td>
<td>0=Off, 127=On</td>
</tr>
<tr>
<td>114 72</td>
<td>CLOCK button</td>
<td>34=pressed</td>
</tr>
<tr>
<td>115 73</td>
<td>Master BUMP button</td>
<td>17=pressed, 16=released</td>
</tr>
<tr>
<td>116 74</td>
<td>Submaster A BUMP</td>
<td>34=pressed, 32=released</td>
</tr>
<tr>
<td>117 75</td>
<td>Chase BUMP button</td>
<td>0=Off, 127=On</td>
</tr>
<tr>
<td>118 76</td>
<td>BLACKout button</td>
<td>127=pressed, 0=released (2)</td>
</tr>
<tr>
<td>119 77</td>
<td>CLEAR button</td>
<td>127=pressed</td>
</tr>
<tr>
<td>120 78</td>
<td>GO button</td>
<td>127=pressed (3)</td>
</tr>
<tr>
<td>121 79</td>
<td>Scene/Song mode buttons</td>
<td>0=Song mode (4), 127=Scene mode</td>
</tr>
</tbody>
</table>

NOTES:

(1) When in Scene mode, the CROSSFADE slider sends a program change number following the initial controller message.

(2) Release message is only sent for MOMentary mode. If button is held down while in LATCH mode, a second "pressed" message is sent after 1/4 second to override timed fades.

(3) Controller message sent in Song mode only. In Scene mode, GO button sends program changes which designate scene number.

(4) Song mode command is followed by a program change byte.

The following panel controls have no associated MIDI function:

- BANK switches
- LATCH/MOM
- SOLO/ADD
- UP/DOWN and NEXT/LAST
- STORE
- TEMPO
- MANUAL
- SENSE
- Keypad
- HELP

LM-850 Page 48
**SPECIAL INSTRUCTIONS:**

- Enter by Date Entered
- Time Printed: 11:57
- Date Required: 10/23/92
- Freight Terms: SP/FA
- F.O.B.: X
- Account Number: 391500

**PART NUMBER/DESCRIPTION**

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<th>Quantity</th>
<th>Unit Price</th>
<th>Extended Amount</th>
</tr>
</thead>
<tbody>
<tr>
<td>500</td>
<td>140.00</td>
<td>70.00</td>
</tr>
</tbody>
</table>

**DELIVERY 10-23-92 ON ACCOUNT**

# 10981657-4. THANKS Rjh

18/2 SVT 250 SPOOLS

**ORDER WAS CONFIRMED TO**

**At 11:57 AM on October 23, 1992**

---

**Packing Information:**

- 18 wires
- Shipped on 10-23-92
- Customer copy / Packing list

---

**Printed On 10/23/92**
**SPECIAL INSTRUCTIONS:**

**PLEASE SHIP FED EX SATURDAY**

<table>
<thead>
<tr>
<th>PART NUMBER</th>
<th>STOCK IN</th>
<th>STOCK OUT</th>
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<tbody>
<tr>
<td>Printed On 10/23/92</td>
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</tbody>
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**DELIVERY 10-23-92 ON ACCOUNT**

# 10981657-4. THANKS RJH

**ORDER WAS CONFIRMED TO**

**At 11:57 AM on October 23, 1992**

---

**RECEIVED IN GOOD CONDITION**

**PLEASE PRINT NAME LEGIBLY AND INITIAL**

---

**CUSTOMER COPY / PACKING LIST**

---
RELIANCE 6718 JEFFERSON
800 999 - 8405

10

20 - 11/2 x 1/2 x 12" #75
3 - 55

Dale

Barnhill Bct

Princeton Between
Menlo & Caudill Rd

Regal - Steve 4/15
Transwhite Stmenne
41" x 96" #258414
48" x 96" #5686

Hamilton 1-700-757-6603
## WORK ORDER

**SOLD TO:** 10396  
ALBUQUERQUE C.O.D. RETAIL  
TAXABLE  
ALBUQUERQUE, NM  

**SHIP TO:**  
WOODY  
100 AGUA FRÍA  
NEAR SAN YSIDRO  
AND A CHURCH  
471-7181  

<table>
<thead>
<tr>
<th>QUANT. ORDERED</th>
<th>QUANT. SHIPPED</th>
<th>PROD REF</th>
<th>PRODUCT DESCRIPTION</th>
<th>UNIT CODE</th>
<th>UNIT PRICE</th>
<th>EXTENDED AMOUNT</th>
</tr>
</thead>
<tbody>
<tr>
<td>3.00</td>
<td>3.00</td>
<td>25841</td>
<td>STYRENE TRANSLUCENT .070 X 41 X 96</td>
<td>SHT</td>
<td>5.0000</td>
<td>15.00</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>** SUBTOTAL **</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>NEW MEXICO SALES TAX</td>
<td>5.81%</td>
<td>0.87</td>
<td></td>
</tr>
<tr>
<td></td>
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<td></td>
<td>** TOTAL INVOICE **</td>
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<td>15.87</td>
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**Ps. = 3143**
# WORK ORDER

**SOLD TO:** 10896
ALBUQUERQUE C.O.D. RETAIL
TAXABLE
ALBUQUERQUE, NM

**SHIP TO:**
WOODY
100 AGUA FRITA
NEAR SAN YSIDRO
AND A CHURCH
471-7181

<table>
<thead>
<tr>
<th>QUANT ORDERED</th>
<th>QUANT SHIPPED</th>
<th>PROD REF</th>
<th>PRODUCT DESCRIPTION</th>
<th>UNIT CODE</th>
<th>UNIT PRICE</th>
<th>EXTENDED AMOUNT</th>
</tr>
</thead>
<tbody>
<tr>
<td>3.00</td>
<td>3.00</td>
<td>25841</td>
<td>STYRENE TRANSLIKE .020 X 41 X 96</td>
<td>SHT</td>
<td>5.0000</td>
<td>15.00</td>
</tr>
</tbody>
</table>

**SUBTOTAL**

NEW MEXICO SALES TAX 5.81 % 0.67

**TOTAL INVOICE**

PL. = 3193

---

**UNIT CODE LEGEND**
- SFT - SHEET
- SF - SQUARE FOOT
- FT - FOOT
- LB - POUND
- EA - EACH

**SPECIAL INSTRUCTIONS**

**RECEIVED BY**

**FILLED BY**

**CHECKED BY DRIVER**

---

**DENVER:**
5251 S. Rio Grande
Littleton, CO 80120

**COLORADO SPRINGS:**
702 Nicholas Blvd
Colorado Springs, CO 80907

**EL PASO:**
10871 Pelicano Dr.
El Paso, TX 79935

**ALBUQUERQUE:**
3455 Princeton NE
Albuquerque, NM 87107

**LOS ANGELES:**
14709 Spring Ave.
Santa Fe Springs, CA 90670

**PHOENIX:**
3210 Rooster Rd. Ste. 5
Phoenix AZ 85040

**SAN DIEGO:**
8651 Production Ave.
San Diego, CA 92121

**AUTHORIZED RETURN**
SUBJECT TO 20%
<table>
<thead>
<tr>
<th>Item</th>
<th>Description</th>
<th>Unit Price</th>
<th>Amount</th>
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<td>Beam Splitter 167 X 1763</td>
<td>$1.80</td>
<td>31.80</td>
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<td>2</td>
<td>Beam Splitter 40/60 Beam Split 5 X 7</td>
<td>$1.80</td>
<td>31.80</td>
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</table>

Total Charge: 63.60
THE VASULKAS

61260

40/60 BEAM SPLIT AR 5 X 7

03) 01-08-H21

40/60 BEAM SPLIT AR 5 X 7
01838047 010432

161260

BEAM SPLITTER 127X178X3

03) 01-09-I43

BEAM SPLITTER 127X178X3
01838047 010432

43362

ROUTE 6 BOX 100 SANTA FE NEW MEXICO 87501 PHONE 505-471-7181 FAX 505-473-0614
Beam Splitters - Filters

MIRROR TYPE BEAM SPLITTERS

Mirror type beam splitters are an optical window with a semi-transparent mirrored coating to break a beam into two or more separate beams. A beam splitter will reflect a portion of the incident energy (see reflectivity %), absorb a relatively small portion, and transmit the remaining energy (see transmission %). Mirror type beam splitters have very neutral color characteristics. Interference coatings are extra durable. Glass is parallel to 20 seconds. Surface flat to approximately 10 wavelengths. See index for photographic special effects application.

<table>
<thead>
<tr>
<th>STOCK #</th>
<th>SIZE (mm)</th>
<th>REFLECTION</th>
<th>TRANSMISSION</th>
<th>COMMENTS</th>
<th>PRICE</th>
</tr>
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<tbody>
<tr>
<td>G31,416</td>
<td>12 x 10 x 1</td>
<td>10</td>
<td>90</td>
<td></td>
<td>$10.90</td>
</tr>
<tr>
<td>G31,414</td>
<td>18 x 30 x 2</td>
<td>50</td>
<td>50</td>
<td></td>
<td>10.90</td>
</tr>
<tr>
<td>G32,269</td>
<td>20 x 27 x 1</td>
<td>50</td>
<td>50</td>
<td></td>
<td>10.90</td>
</tr>
<tr>
<td>G31,413</td>
<td>20 x 57 x 1</td>
<td>50</td>
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<td></td>
<td>10.90</td>
</tr>
<tr>
<td>G31,412</td>
<td>26 x 28 x 1</td>
<td>50</td>
<td>70</td>
<td></td>
<td>11.95</td>
</tr>
<tr>
<td>G32,365</td>
<td>25 x 38 x 1</td>
<td>50</td>
<td>70</td>
<td></td>
<td>11.95</td>
</tr>
<tr>
<td>G31,411</td>
<td>25 x 76 x 2</td>
<td>40</td>
<td>80</td>
<td></td>
<td>12.95</td>
</tr>
<tr>
<td>G43,366</td>
<td>50 x 90 x 1</td>
<td>50</td>
<td>60</td>
<td></td>
<td>12.95</td>
</tr>
<tr>
<td>G43,365</td>
<td>50 x 90 x 1</td>
<td>50</td>
<td>60</td>
<td></td>
<td>12.95</td>
</tr>
<tr>
<td>G43,590</td>
<td>50 x 90 x 1</td>
<td>50</td>
<td>60</td>
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<td>12.95</td>
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<tr>
<td>G51,097</td>
<td>127 x 178 x 3</td>
<td>30</td>
<td>70</td>
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<tr>
<td>G43,302</td>
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<td>30</td>
<td>70</td>
<td>AR CTD</td>
<td>12.95</td>
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<tr>
<td>G31,094</td>
<td>127 x 178 x 3</td>
<td>30</td>
<td>70</td>
<td>AR CTD</td>
<td>12.95</td>
</tr>
<tr>
<td>G72,500</td>
<td>264 x 386 x 3</td>
<td>30</td>
<td>70</td>
<td>AR CTD</td>
<td>12.95</td>
</tr>
<tr>
<td>G43,365</td>
<td>264 x 386 x 3</td>
<td>30</td>
<td>70</td>
<td>AR CTD</td>
<td>12.95</td>
</tr>
<tr>
<td>G72,502</td>
<td>264 x 386 x 3</td>
<td>30</td>
<td>70</td>
<td>AR CTD</td>
<td>12.95</td>
</tr>
</tbody>
</table>

COLOR SEPARATING DICHLORIC FILTER

Used primarily in sets, these filters provide excellent color separation for display systems, light balancing, color correction, and a host of other color lighting needs. Filter coatings are applied on a glass to subject them to moderate amounts of heat without damage. Sets up like that shown in the application drawing will provide rich primary colors that can then be recombined using any color desired.

A) 45 Degree Blue Reflector

B) 45 Degree Red Reflector

C) Blue Corrector

D) Red Corrector

E) Green Corrector

LARGE 5 1/4" DIAMETER INFRARED FILTER

Designed as the front light source filter for a military infrared viewer, this large infrared filter is coated on the face surface and allows only long wavelength infrared light to pass. In total darkness, the amount of visible light passing through the filter from a high intensity portable search lamp is indiscernible at 20 feet.

Filter G60,033 $32.50

DICHROIC HIGH COLOR SATURATION FILTERS

These elements reflect from the front coated surface at least 90% of the incident light at the specified wavelength which includes a tolerance of ±15 microns.

SPECIFICATIONS:

- Dimensions: 2" x 2" x 1 1/4"
- Material: Float Glass (n=1.523)
- Surface Quality: 80 - 50 Scratch-Oz
- Temperature Range: Minus 60°F to 500°F
- Reflection: 90% ±15 microns (0° incidence)

<table>
<thead>
<tr>
<th>CENTRAL COLOR</th>
<th>STOCK NUMBER</th>
<th>1 - 9</th>
<th>10 - 49</th>
<th>50+</th>
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<tbody>
<tr>
<td>Red</td>
<td>G30,684</td>
<td>$20.75</td>
<td>$19.00</td>
<td>$17.00</td>
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<tr>
<td>Blue</td>
<td>G30,635</td>
<td>$20.75</td>
<td>$19.00</td>
<td>$17.00</td>
</tr>
<tr>
<td>Yellow</td>
<td>G30,537</td>
<td>$20.75</td>
<td>$19.00</td>
<td>$17.00</td>
</tr>
<tr>
<td>Cyan</td>
<td>G39,912</td>
<td>$20.75</td>
<td>$19.00</td>
<td>$17.00</td>
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<td>Magenta</td>
<td>G39,913</td>
<td>$20.75</td>
<td>$19.00</td>
<td>$17.00</td>
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</tbody>
</table>

We Manufacture Custom Optics. See Pages 19 & 22 For OEM And Special
**MIRROR TYPE BEAM SPLITTERS**

MIRROR TYPE BEAM splitters are an optical window with a single transparent mirrored coating to break a beam into two or more separate beams. A beam splitter will reflect a portion of the incident energy (see reflectivity %), absorb a relatively small portion, and transmit the remaining energy (see transmission %). Mirror type beam splitters have very neutral color characteristics, interference coatings are extra durable. Glass is parallel to 20 seconds. Surface flat to approximately 10 wavelengths. See index for photographic special effects application.

### Commercial Grade (Standard Design - Unlimited Supply)

<table>
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<th>STOCK #</th>
<th>SIZE (MM)</th>
<th>REFLECTIVITY</th>
<th>TRANSMISSION</th>
<th>COMMENTS</th>
<th>PRICE</th>
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<tbody>
<tr>
<td>G31,416</td>
<td>12 x 10 x 1</td>
<td>10</td>
<td>90</td>
<td></td>
<td>$10.00</td>
</tr>
<tr>
<td>G31,414</td>
<td>10 x 30 x 2</td>
<td>80</td>
<td>10</td>
<td></td>
<td>$10.00</td>
</tr>
<tr>
<td>G32,263</td>
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<td>$10.00</td>
</tr>
<tr>
<td>G32,413</td>
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<td>40</td>
<td></td>
<td>$10.00</td>
</tr>
<tr>
<td>G32,412</td>
<td>25 x 28 x 1</td>
<td>30</td>
<td>70</td>
<td></td>
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<td>60</td>
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</tr>
<tr>
<td>G31,411</td>
<td>25 x 76 x 2</td>
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<td>70</td>
<td></td>
<td>$14.00</td>
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<td>60</td>
<td></td>
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<td>60</td>
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<td>70</td>
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<td>G32,505</td>
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<td>70</td>
<td>AR CTD</td>
<td>$20.00</td>
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### Experimental Grade (Various Grades - Limited Quantities)

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<th>REFLECTIVITY</th>
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<th>PRICE</th>
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<tbody>
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<td>10</td>
<td>90</td>
<td>$10.00</td>
</tr>
<tr>
<td>G32,725</td>
<td>22 X 30 X 2</td>
<td>30</td>
<td>70</td>
<td>$10.00</td>
</tr>
<tr>
<td>G31,437</td>
<td>25 x 38 x 3</td>
<td>25</td>
<td>75</td>
<td>$12.25</td>
</tr>
<tr>
<td>G31,438</td>
<td>25 x 38 x 3</td>
<td>25</td>
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<td>G31,439</td>
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</tr>
<tr>
<td>G31,440</td>
<td>51 x 76 x 3</td>
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<td>75</td>
<td>$15.00</td>
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<td>20</td>
<td>80</td>
<td>$13.00</td>
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<tr>
<td>G31,418</td>
<td>77 DIA. X 2</td>
<td>20</td>
<td>80</td>
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**COLOR SEPARATING DICHRIOIC FILTER**

Used primarily in sets, these filters provide excellent color separation for display systems, light balancing, color correction and a host of other color lighting needs. Filter coatings are applied on a 50mm x 55mm low expansion Borosilicate Substrate (coming 7059-F) thereby, making it possible to subject them to moderate amounts of heat without damage. Each $12.00

- A) 45 Degree Blue Reflector
- B) 45 Degree Red Reflector
- C) Blue Corrector
- D) Red Corrector
- E) Green Corrector

**LARGE 5½" DIAMETER INFRARED FILTER**

* Experimental Grade Optics

Designed as the front light source filter for a military infrared viewer, this large 5½" diameter x ⅛" thick filter is coated on the face surface and allows only long wavelength infrared light to pass. In total darkness, the amount of visible light passing through the filter from a high intensity portable search lantern is indiscernible at 20 feet.

Filter G60,033 $32.50

**DICHRIOIC HIGH COLOR SATURATION FILTERS**

These elements reflect from the front coated surface at least 90% of the incident light at the specified wavelength which includes a tolerance of ± 15 microns.

**SPECIFICATIONS:**

- **Dimensions:** 2" x 2" x ⅛"h
- **Material:** Float Glass (n = 1.523)
- **Surface Quality:** 80 - 90 Scratch-Dig
- **Temperature Range:** Minus 60°F to 500°F
- **Reflection:** 80% ±15 microns (90° incidence)

<table>
<thead>
<tr>
<th>CENTRAL COLOR</th>
<th>STOCK NUMBER</th>
<th>PRICE (EACH)</th>
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<tr>
<td></td>
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<tr>
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<td>Magenta</td>
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* We Manufacture Custom Optics. See Pages 19 & 22 For OEM And Special Order Information.