Film-Tech

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MANUAL

PRINCIPLES OF QUALITY

3D

MOTION PICTURE PROJECTION

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FOR BEST 3-D QUALITY

FOLLOW THESE SIMPLE RULES:

1. Read the 3-D lens instruction book.
2. Clean up around your projector to remove all dirt and dust which can ruin a 3-D print. Thread your machine very carefully. Be sure the splices are correct.
3. Use a new Xenon lamp bulb for the 3-D run if possible.
4. Clean the lamphouse mirror using approved cleaner.
5. Boost your rectifier to maximum safe amperage.
6. Mask your screen as shown in the illustration.
7. Be sure your screen masking cuts slightly into all four sides of the picture.
8. Without wearing 3-D glasses, align images carefully to reduce vertical parallax. Both images should be the same height.
9. Adjust your lamphouse reflector mirror so each 3-D image is equal brightness without shading, while wearing the 3-D glasses.
10. Use projection port masking sparingly!
11. Use binoculars to focus on the image "grain".
12. Now put on your 3-D glasses and enjoy the show!

MAIN REQUIREMENTS FOR HIGH QUALITY POLARIZED PROJECTION OF 3-D FILMS

NO. 1 YOU MUST HAVE A GOOD SILVER (ALUMINIZED) SCREEN. (Re-painted screens are NOT recommended.) Non-silver screens will not work AT ALL for 3-D.

NO. 2 YOU MUST HAVE VERY HIGH SCREEN ILLUMINATION. The world standard is 15 to 16 foot lamberts reflecting off of your white screen, using your 1.85 "flat" lens. Open dowser momentarily to measure light without film in gate.

If you have already installed a silver screen, the reading while projecting through your 1.85 "flat" lens should read at least 35 foot lamberts (7.8 LVS). The polarizers in the 3-D optics and the 3-D glasses will reduce this to about 16 foot lamberts reaching the patrons eyes.

If you do not have a screen brightness meter, it is possible to use a high grade photo spot meter such as a Soligor, Pentax, Minolta, etc. You must convert "LVS" reading to foot lamberts as follows: (Readings off your silver screen.)

WITHOUT POLARIZERS, USING A FLAT 1.85 LENS THE LVS READING SHOULD BE 8.4 OR MORE.

FOOT LAMBERTS	APPROX. LVS READING
7	6.5
8	6.8
12	7.0
14	7.5
16	7.8
24	8.0
28	8.2
30	8.3
50	8.5
65	9.0

REMEMBER .... THE LVS READING SHOULD BE 8.4 OR MORE OFF YOUR SILVER SCREEN, 7.8 OFF YOUR WHITE SCREEN.

You can read the spot meter from the booth if your projector does not have a steep pitch (not over 5°). Otherwise you should read it from the main floor, middle seats. Note that the illumination should be EVEN at middle corners and edges of screen. Balance light by careful adjustment of lamphouse. This may require an expert lamphouse technician to achieve optimum illumination.

Boost the lamphouse rectifier to MAXIMUM safe power.

Use a NEW Xenon bulb if possible. New bulbs can be as much as 25% brighter then old bulbs. It may be possible to temporarily borrow a better bulb.

Clean the reflector, bulb and filter, using non-abrasive approved cleaning procedure. (See lamphouse maintenance manual.)

Use a LARGER bulb if your lamphouse, ventilation and rectifier permits.

NO. 3 YOU MUST HAVE GOOD SCREEN MASKING ON ALL FOUR SIDES OF THE SCREEN. THE MASKING SHOULD BE DULL BLACK.

It should cut into the picture at least 2" so that there is NO gray edge when the picture is viewed with either eye while wearing 3-D glasses. It is preferable to have masking that is at LEAST two feet wide all around the screen, especially at bottom and top of screen.

NO. 4 YOU SHOULD USE A 3-D APERTURE PLATE.

The inside edges of the aperture plate should not show on the screen. The size of the opening of the plate should conform to the 3-D film you are showing. The most common 3-D aperture plate opening size is .725" tall and .800" wide (20mm x 18.6mm).

NO. 5 YOU MUST USE A SHARP 3-D PROJECTION LENS SYSTEM. 3-D DOES NOT WORK WELL UNLESS THE PICTURE IS SHARP.

3-D projection systems that do not use high grade optics, including high optical grade polarizers and are not kept clean cannot project optimum 3-D. If the picture has been photographed sharply, is projected with a sharp 3-D projection system and is FOCUSED sharply (both images), the 3-D should be excellent (assuming all other requirements are met).

NO. 6 YOU MUST MAINTAIN POLARIZATION THROUGH THE ENTIRE SYSTEM.

This means good 3-D glasses meeting recommended extinction standards. (It is far better to boost illumination in the lamp-house rather than try to gain it back by using high leakage polarizers.)

Your projection port glass or periscope mirrors should NOT de-polarize the projection light.

Your screen should be a proven brand 3-D silver screen.

You should post placards at the auditorium entrances cautioning patrons not to touch the lenses of the 3-D glasses. It is suggested to have tissue and a spray bottle of glass cleaner on a table near the entrances so patrons can clean their own glasses.

NO. 7. AVOID SEATING PATRONS IN UPPER BALCONIES.

It is practically impossible to show good 3-D in theaters that have steep projection pitches anyway. The same is true of very short throw theaters unless the screen is small.

The ratio of screen width to throw for Above/Below wide screen 3-D films should be no more than 2.5x. In other words, if your screen is 30 ft. wide, your throw should not be less than 75 ft. Another simple rule is, the total focal length of the 3-D projection system is ideally between 2" to 2-3/4" for the average theatre configuration. Clear 3-D can be shown with shorter or longer focal lengths, but this becomes less enjoyable to some of the patrons sitting near the front or towards the rear.

INTRODUCTION

Three dimensional (3-D) motion pictures have been part of the film business since the invention of movies in the late 1800's. The principles of stereoscopic photography were already well-known and it was only natural that most of the early motion picture pioneers, such as Edison, Friese-Greene, Lumiere, etc. experimented with 3-D films.

The 1920's and 1930's saw several examples of 3-D shorts, all projected in the "anaglyphic" (red and blue) single strip projection process. In 1939, with the invention of inexpensive plastic polarizer material by Dr. Edwin Land, it became possible to project 3-D without subjecting the audience to opposite colors being fed to each eye.

Filming of polarized 3-D films is done in the same way as the anaglyphic process. However, the polarized process allows full natural color exactly like regular color movies. Early 3-D polarized films had to be projected with two projectors interlocked in exact synchronization. Each projector lens had a polarizer sheet positioned in front of it, opposite to the polarization axis of the other machine. The audience wore 3-D glasses having corresponding opposing polarizers over each eye, thus blocking off the unwanted left or right eye image on the screen. If the 3-D photography was properly done, using scientific principles already established, and the projection alignment coincided, excellent 3-D resulted.

The Festival of Britain was photographed in color 3-D, using this system. In 1953, twin strip 3-D became very popular all over the world. Those theater circuits that had expert technicians were able to show consistently high-grade 3-D. The public was very pleased and wanted more. However, as less expert personnel became involved, projection quality suffered. It was impossible to train enough projectionists in good 3-D technique to keep up with the demand. There was also a loss of quality control from too rapid (and often inexpert) 3-D film production.

CINEMASCOPE

Concurrently, with the sudden popularity of 3-D in early 1953, the wide screen (non-three dimensional) process Cinemascope was introduced by 20th Century-Fox as the answer to the complications of 3-D projection. It was not 3-D.

THE TRUE 3-D POTENTIAL & RESPONSIBILITY

Three dimensional motion pictures have the potential of being the most fascinating, the most realistic and the most entertaining of all the visual media. These marvelous films stimulate total visual perception. However, any errors in the highly specialized art of 3-D cinematography and any deviation from the well-known requirements of good 3-D projection can result in a visually mediocre show. Instead of being a wonderful entertainment experience, inexpert 3-D projection can cause viewing to be annoying and visually uncomfortable.

THE NEW 3-D METHOD

Modern 3-D films are now supplied in the single strip form. Both of the 3-D stereo images are on each film frame so that only one projector is needed to project the film. There is no possibility of loss of synchronization, color mismatch, or loss of shutter phase. When properly done, this is a superb process with none of the problems associated with the old "two projector" method.

TOP QUALITY 3-D PROJECTION IS NOT DIFFICULT – HOWEVER, ALL THE RULES MUST BE ADHERED TO.

Unfortunately, there has been a tremendous lack of information and much confusion about 3-D. Some sources have been overselling "simplicity" instead of informing the exhibitors (and producers) about the necessary technology required for good 3-D presentations. Truly optimum 3-D has rarely been shown by today's exhibitors and, unfortunately, has rarely been seen by most theater patrons!

Many who eagerly paid to see 3-D films have instead been disappointed by dim, dark and dull images — nowhere near the potential excellence of 3-D.

As experienced people in the 3-D business, we can assure our exhibitor friends that optimum 3-D is attainable in the great majority of cinemas. It is a breathtakingly beautiful visual experience and a substantial enhancement of even the very best movie. THIS BOOKLET IS INTENDED TO HELP YOU GET GOOD 3-D PROJECTION.

Ask any of your young patrons who saw "Raiders of The Lost Ark" if they wouldn't pay double to see it again in 3-D!

GOOD 3-D . . . NOT POOR 3-D!

TYPES OF 3-D MOVIES

There are three basic types of 3-D movies being shown today. About 80% are the single strip, "above/below" wide screen type . . . "Parasite," "Friday the 13th, Part III," "Rottweiler," "Frankenstein," etc. Another 15% are the non-wide screen (1.33 ratio) single strip re-prints of older twin strip films such as "Dial 'M' for Murder," "House of Wax" and "The Stewardesses." The remaining 5% are twin strip versions of "Dial 'M'," "Charge At Feather River," etc. We will discuss the "anaglyphic" method in another chapter. See page 36 for a complete list of current single strip 3-D films along with their configuration specifications.

SINGLE STRIP 3-D

All of the "single strip" films are characterized by the fact that both the left and right stereoscopic images are locked together on each motion picture frame. Unlike the older twin strip 3-D movies, they cannot go out of synchronization. The color matching, phasing and exposure consistancy are much better than the older films. Both the "above/below" and side-by-side 3-D single strip

films have this very desirable characteristic.

Remember, there is an enormous difference in audience reaction to bright, well-projected 3-D films when compared to poorly-projected, dim 3-D films.

Those exhibitors who have taken the time to learn about properly projecting these films have often been able to gain considerable success with 3-D in their communities.

THE PROJECTOR

Almost any modern 35mm projection machine is capable of showing good 3-D provided it is in excellent operating condition. It is very important that the intermittent movement and drive sprocket be in perfect condition so that the 3-D picture will be very steady on the screen. THE JIGGLE SHOULD NOT EXCEED SMPTE STANDARDS!

The gate tension should also be checked and the film path carefully cleaned so there is no accumulation of dirt. All rollers should be checked for free turning and all lube positions properly but not excessively oiled.

Good 3-D requires that the film be clean, scratch free and properly spliced. Focusing the 3-D projection lens is much more critical than for a "flat" picture. If the focusing mechanism on your machine is loose and needs servicing or repair, be sure that this is done prior to the 3-D picture opening.

The lens mount clamp must be operating properly so that the 3-D projection lens is securely held and perpendicular to the film plane. If it is loose, it may cause one of the two images to be out of focus.

If there is a deficiency in screen illumination, it may be desirable to increase the shutter angle to the "drive-in" type. This passes somewhat more light, but must be carefully adjusted to

avoid travel ghost. The Simplex XL machine has this option.

In a few instances when extremely high illumination is available, it may be possible to install a three-bladed shutter. This results in some light loss, but will reduce flicker and increase apparent image sharpness.

Be sure to check the entire projector mechanism so that no parts are insecurely fastened and that there are no sharp burred metal edges on any of the parts that the film may come in contact with. The changeover dowser should retract fully when the film is playing.

Be sure that the projector is not vibrating. Lightly touch the lens while the machine is operating. If you feel it vibrating, it may be caused by a loose bolt attaching the sound drive or a bad bearing. Contact your service technician. Vibration of the lens will adversely affect image sharpness on the screen. An unsteady 3-D image is tiresome to watch and has a very bad effect on the dimensional effect.

NEEDLESS TO SAY, THE PROJECTION PORT GLASS MUST BE CLEAN ON BOTH SIDES. MANY PROJECTIONISTS REMOVE THE GLASS FROM THE PORT WHEN SHOWING 3-D FOR ADDED BRIGHTNESS AND BETTER CLARITY.

REMEMBER: It is possible to show very good 3-D in your theater often without any extra expense! DON'T GET DISCOURAGED IF THERE IS A PROBLEM.

In all cases, being knowledgeable is essential. The reward will be enthusiastic response by appreciative audiences and profitable repeat business.

THE LAMPHOUSE

Good 3-D projection, like good "flat" projection, requires good illumination. While it is quite common to have deficient illumination when showing "flat" films with few if any patron complaints,

3-D does not work well unless an adequate amount of illumination is achieved. HAVE YOUR SERVICE COMPANY CHECK BRIGHTNESS WITH A METER! If your lamphouse will illuminate a white screen to meet the SMPTE standard of 16 foot lamberts, you can play good 3-D on a silver screen. If you are not sure that your present lamphouse has enough illumination, have your service person measure the "foot lambert" reading. From a silver screen the meter reading should read at least 40 "foot lamberts" using your 1.85 "flat" lens. The polarizers in the 3-D projection system will reduce that reading by more than 50% and the 3-D glasses will reduce it by an additional 20%. Good screen brightness is one of the most important elements for good 3-D projection. There are many different types of projection lamphousings. We will briefly review their characteristics for 3-D.

XENON HORIZONTAL BULB WITH "DEEP METAL" REFLECTOR

This is the latest type and generally gives the highest effective screen illumination per wattage of lamp. This type includes the Christie "H" series, all of the ORC, the later models made by Strong as well as the majority of other manufacturers. The reflectors in these are rated at about f/1.8. This means the cone of illumination can be fully employed with lenses having an f/1.8 aperture. The light cone emanating from these lamphousings is intended to illuminate the film in the projector gate in as efficient manner as possible if it is properly adjusted. IT PAYS TO HAVE AN EXPERT ADJUST YOUR LAMPHOUSE.

Practical experience indicates that the brightness of various Xenon lamphousings varies considerably. I can be shown that late model horizontal 2000 watt Xenon lamphousings can adequately illuminate up to a 15 ft. by 35 ft. 3-D picture.

For various reasons, however, the majority of 2000 watt horizontal lamphousings do not properly illuminate 3-D films on this large a screen. Remedies are discussed later in this booklet. Important factors are the lamphouse design, the newness of the Xenon bulb, the proper adjustment of the reflector and the proper matching of the 3-D projection optics. Other essential requirements are

that the maximum amperage be used, that the silver screen be a factory made (not a re-painted screen) and that the theater configuration be "normal" not "short".

XENON HORIZONTAL BULB WITH SHALLOW GLASS REFLECTOR

This type of lamphousing has considerably less efficiency than the "deep" reflector type. Under the very best of conditions the glass reflector is rarely better than f/2.2. The dichroic coating (for reducing the I.R. heat rays reflected onto the film) is less efficient than the type used on many of the "deep" metal reflectors. The 2000 watt version at best will handle a 13 ft. by 30 ft. 3-D picture.

VERTICAL XENON BULB WITH SHALLOW GLASS REFLECTOR

These are usually 'conversions" of arc lamphousings, and have similar characteristics to the above two types. The 1600 watt versions will usually project a 10 ft. by 24 ft. 3-D picture adequately on a "factory" silver screen.

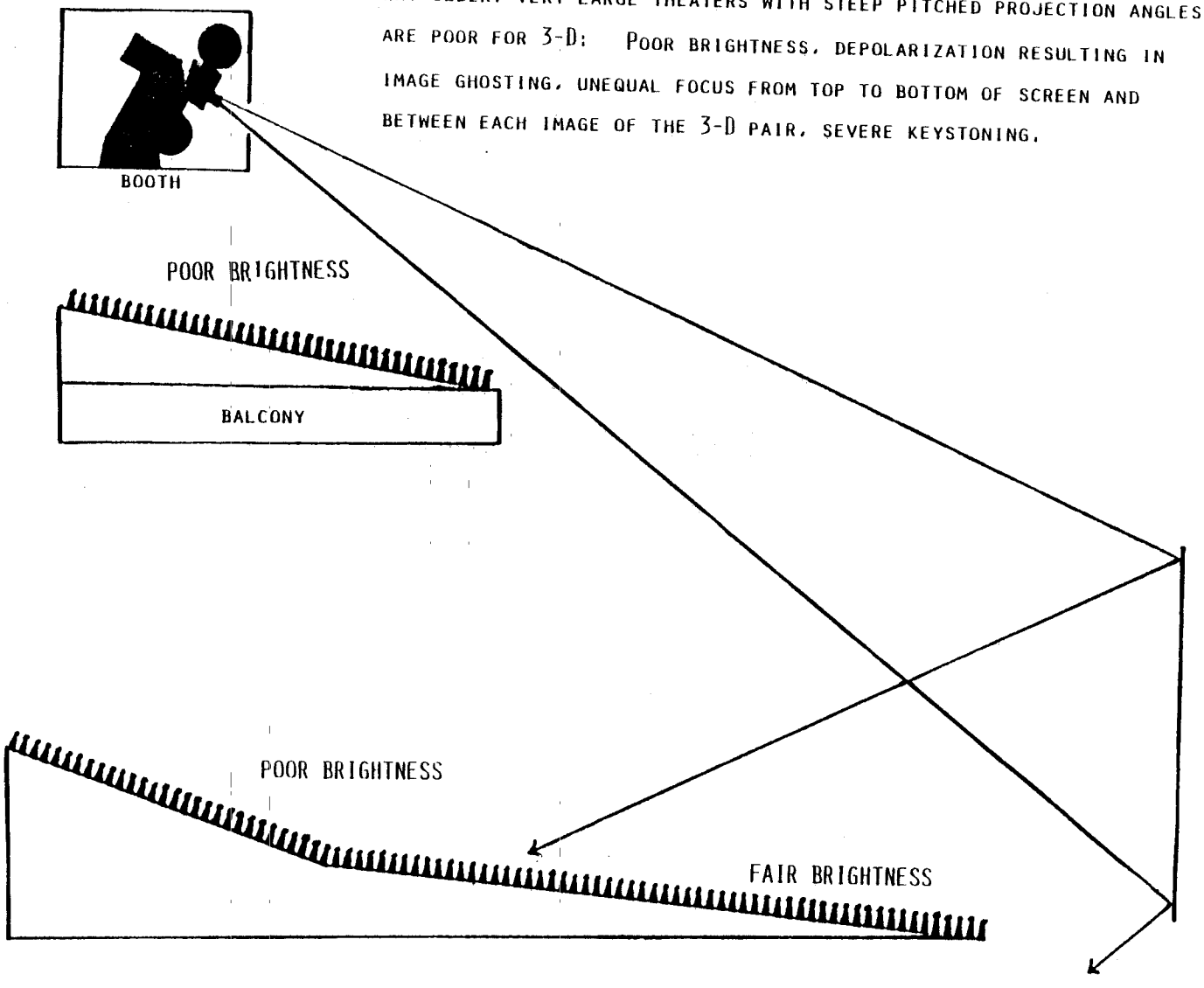
NOTICE: IN NO CASE SHOULD THE REFLECTIVE COATING ON ANY LAMPHOUSE MIRROR BE CLEANED WITH AN ABRASIVE CLEANER AS THIS MAY DESTROY THE DICHROIC REFLECTING COATING AND CAUSE EXCESSIVE HEAT TO STRIKE THE POLARIZERS.

Regularly inspect the coating on reflectors to be sure that it has not burned off. "Cold" lamphouse optics will keep the gate cool, thus the film will lay flatter and project more sharply.

ARC LAMPHOUSING

Although carbon arc lamps are being replaced in most situations by Xenon, there are considerable advantages to this type. The quality of light from a good carbon arc with a dichroic reflector is rarely equalled by Xenon lamps. While the Xenon bulb is still new, lamp color quality will be very acceptable. When the bulb burns on however, color quality will change as the lamp fades in brilliance. Carbon arc, on the other hand, is exactly the opposite. As the carbon rods burn down, the electrical

WHY OLDER, VERY LARGE THEATERS WITH STEEP PITCHED PROJECTION ANGLES ARE POOR FOR 3-D: POOR BRIGHTNESS, DEPOLARIZATION RESULTING IN IMAGE GHOSTING, UNEQUAL FOCUS FROM TOP TO BOTTOM OF SCREEN AND BETWEEN EACH IMAGE OF THE 3-D PAIR, SEVERE KEYSTONING.



contacts are brought closer together and the light increases in intensity, retaining the same outstanding color characteristic. Like Xenon lamps, carbon arcs are designed for different uses. Here are some of them along with their general performance if well maintained.

40 to 60 Amp Arcs

These lamps constitute the bulk of arcs in the world and include such brands as Brenkert Enarc, Peerless Magnarc and Ashcraft Models A through D. When properly adjusted, a Peerless Magnarc operating at 60 amps will easily fill a 15 ft. by 35 ft. silver screen with very even light for excellent 3-D.

80 to 160 Amp Arcs

These arcs were built for the very biggest indoor screens and drive-ins. Many in this class will provide light unequaled by an Xenon light source. Lamps such as Strong Futura, Ashcraft Cinex and Super-Corelight are capable of lighting large screen surfaces of 50 feet or more for truly optimum 3-D.

SUPER ARCS

The only lamps greater than 160 amp lamps, Super Arcs use blown flames or condensing optical systems to make literally the brightest light on earth. Dichroic reflectors are mandatory on high amperage light sources to keep from overheating the film and to reduce gate temperatures.

ADJUSTING THE LAMPHOUSE REFLECTOR OR THE BULB FOR EVEN 3-D SCREEN ILLUMINATION

For good 3-D, it is essential that both images be as symmetrical as possible with regards to evenness of illumination. After you have set up the 3-D projection lenses, you should see a full image with either eye when wearing the 3-D glasses. Each image should be of equal brightness and there should be no shading. If this needs correcting, be sure that any masking attached to your projection ports is removed. We recommend that a projection lamp expert adjust the reflector and lamp position.

However, if one is not available, an approved employee can carefully adjust the reflector tilt or lamp position until both images have even illumination and shading is minimized.

Do not adjust the lamphouse unless you have the approval of your supervisor.

Only qualified technical personnel should open up the lamphouse. Be sure that all optical surfaces are carefully cleaned.

THE AUDITORIUM

With very few exceptions, the great majority of theater auditoriums are excellent for good 3-D presentations. (About 90% of all theaters.)

THE 10% EXCEPTION

These exceptions are not very common and are listed below. We do not feel that it is advisable that 3-D be shown in these situations because the conditions for optimum 3-D viewing cannot be met.

NOT FAVORABLE FOR GOOD 3-D:

1) Theaters having screen height to throw ratios less than 1 to 5. This means that a 15 ft. tall screen should have a projection throw of 75 ft. or more. This ratio can be shortened somewhat if the front row of seats is not less than two screen heights from the screen. The best ratio for 3-D is about 1 to 7. (The best ratio for 70mm 3-D is about 1 to 4.) The most enjoyable 3-D viewing position is about halfway from the screen to the projector. Many viewers find the most comfortable viewing from the rear of the auditorium. The 3-D effect is most notable there.

   For theaters that have "Shadow Box" screens without any masking, we strongly recommend that either screen masking be installed or do not attempt to play 3-D at all in such situations. The cost of good screen masking will be easily covered by customer satisfaction and fewer refunds.

NOT FAVORABLE FOR GOOD 3-D:

2) Theaters that have a steep projection pitch angle such as older very large auditoriums. The angle of reflectance of the projection beam on the screen results in very dark 3-D in the balcony seats. The distorted 3-D image will be uncomfortable to watch.

NOT FAVORABLE FOR GOOD 3-D:

3) Very wide "Cinerama" style theaters where the viewing angle of the first three rows of seats are substantially wider than the screen. This can be controlled somewhat by blocking off the seating along the walls of the first few rows.

NOT FAVORABLE FOR GOOD 3-D:

4) Theaters having deep curved screens. Although 3-D has been successfully shown on mildly curved screens (not over 10% curve), such theaters should avoid playing 3-D.

NOT FAVORABLE FOR GOOD 3-D:

5) Theaters using mirror "Periscopes" to direct the projection beam over the heads of patrons in some low ceiling theaters. The problem here is possible loss of polarization from the silver-backed mirrors. If, however, the mirrors are front surfaced aluminized (but not over-coated), they may not interfere with the polarization of the 3-D image beam. Only by testing can this be ascertained. Some plastic projection ports may interfere with polarization. The same is true of poor quality plate glass that is not annealed. The internal stress in the glass may cause depolarization. Remove the glass to test.

NOT FAVORABLE FOR GOOD 3-D:

6) Radically altered large auditoriums where "twinning" has resulted in severe horizontal

projection angles. This, combined with steep vertical pitch angle, causes severe "keystoning", poor illumination and generally unsatisfactory 3-D.

THE 3-D SCREEN

One of the most important elements for optimum 3-D presentation is the projection screen. Polarized full-color 3-D is the state of the art. Modern science knows of no better way to present 3-D to an audience. To Maintain polarization of the light, the surface of the screen must have a high metallic content. Fortunately, the silver aluminized screen meets this requirement perfectly. Modern silver screens are manufactured with quality control for an evenness of reflectance that cannot be equaled by attempting to paint the screen at the theater. Although it is possible to paint an existing screen with aluminum paint, it is virtually impossible to obtain an even coating that will not show some "grey" areas. Nor will it have the reflectance of a factory made silver screen. Factory silver screens have a "gain" of about "2.5". Repainted silver screens rarely have a "gain" of more than "1.5". That's a 25% light loss over a new silver screen.

We believe that 3-D movies are here to stay and that the wise exhibitor plans accordingly. A good "factory made" silver screen is indeed a wise investment. The better the 3-D presentation, the better his business will be and the fewer refunds. When more exhibitors show high quality 3-D, more producers will make high quality 3-D films.

For this reason, we recommend that exhibitors who plan to show 3-D films should invest in new silver screens. Over 2,000 U.S.A. exhibitors already have silver screens. They are also very satisfactorily projecting their regular "flat" product on these screens. Contrary to common belief, a good silver screen can project a "flat" picture as well and, in many cases, better than a white screen! Many major theater circuits have researched this recently, and conclude that taking down a silver screen after 3-D presentation is totally unnecessary and a waste of money! There are a few exceptions such as very wide theaters, but they are very rare.

HOWEVER . . .

To those exhibitors who insist on painting their screens for 3-D, we offer this advice:

1) Use only a proven 3-D screen paint.

2) Use only a proven 3-D screen painter. Ask to see a screen he has recently painted and talk to the owner.

3) Be sure that the paint is compatible with your screen material.

4) Do not paint over a screen previously painted with a roller or brush, as the silver will make the uneven surface even more noticeable.

5) Be sure that the auditorium is well illuminated while painting. Use ample light stands so the painter can see the screen clearly while he paints.

6) Be sure the paint is applied as an even "semi gloss". The paint should not be granular, "wet glossy" or "sandy" finish.

7) Be prepared to buy a new 3-D screen later anyway. Plan ahead. Order your new silver screen NOW!

Some exhibitors who have taken the interest in superior 3-D presentations have even tilted their screens forward about five degrees to optimize the reflectance of the highly directional light toward the audience. Consult your engineer. This could add about 30% to the effective screen brightness and give a much better 3-D effect!

EVERY MULTIPLE THEATER SHOULD HAVE AT LEAST ONE AUDITORIUM WITH A SILVER SCREEN. CHOOSE THE ONE THAT HAS THE RECOMMENDED SCREEN/THROW RATIO AND THE BEST LAMPHOUSE. (See page 28.)

Any screen should be brushed with a screen brush at least twice a year. Too much dust can cause some depolarization of the image. In some instances it may not be feasible to increase the lamp-house illumination in order to achieve sufficient screen brightness. In this case, we suggest masking

the screen to a smaller size. This may be necessary if the recommended screen size to lamphouse power is radically insufficient. It has been proven many times that a smaller but brighter 3-D image is far more acceptable than a large dim picture. THIS IS RARELY NECESSARY IF YOUR LAMP-HOUSE IS THE RIGHT SIZE FOR YOUR SCREEN.

To those exhibitors who are considering taking down their 3-D screens and re-hanging them for each 3-D screening, we advise second thoughts. The handling required will almost certainly cause some rub marks on the surface which cannot be removed and will show grey areas when projected upon. Again, we suggest that you locate a theater near you that has a "factory" silver screen installed and compare the brightness, color fidelity and sharpness of even non-3-D pictures with any other screen.

Remember, a silver screen can play ANY picture, a white screen cannot play quality 3-D.

CONTACT STEREOVISION™ IF YOU NEED A NEW SILVER SCREEN OR NEED ANY ADVICE ON 3-D SCREENS.

THE SCREEN MASKING

Projection screen masking has been an important part of all motion picture presentation, yet this has not been fully understood. The subconscious referencing of the viewer's eyes to the screen masking is one of the factors that gives movies their sense of reality. The sharp black border around the picture results in a "window of reality". There are many theories on this, including the opposite or "Shadow Box" theory in which no screen masking is used at all. Instead, a white cove surrounds the screen. This, of course, is totally unsuitable for good 3-D.

Proper screen masking is an absolute necessity for good 3-D. Without the sharp black border, the two images that compose the 3-D effect tend to cancel each other at the edges of the screen. The audience's eyes rapidly scan the 3-D image and are constantly referencing all the visual cues,

including the screen masking. In order to perceive the full three dimension effect, it is necessary to cut off the blurred edges on all four sides of the screen. This can only be done by good screen masking, adjusted to cut slightly into the image area. It is far better to cut off a little too much of the image than not enough. Masking should be a velvety flat black so it reflects none of the picture. The screen masking need not be elaborate or expensive. Vertical masking for narrow 1.33:1 old-style 3-D films can even be made from inexpensive fireproof crepe paper. Black Duvetyne is more commonly used and it can hang by its own weight. A common method is to staple a thin wooden slat along the edge of the masking cloth and drape it over the top of the screen. If the theater has dark colored drapes that can be drawn to frame the picture left and right, these may serve for good 3-D masking.

For the wide screen masking required for "above/below" 3-D films, we recommend that the existing masking be adjusted so that it cuts slightly into the picture on all four sides. This is very important. If it is not possible to mask all four sides, the bottom edge of the screen can be masked by stretching a wire along the bottom edge of the screen, tightened by a turnbuckle, then draping black Duvetyne cloth or fireproof black crepe paper over it.

Repeat! There is no substitute for good screen masking. It is not possible to have a screen masking effect by depending upon the projector aperture plate or by attempting to mask the projection port window. These will only make a fuzzy grey shadow, NOT the sharp black mask that is essential for enhancing the 3-D effect and aiding in comfortable viewing.

The texture of the masking should be as close to a flat black velvet velour as possible. The masking width should extend away from the edges of the screen at least five percent on each side, preferably ten percent. The recommended screen masking width for a 15 ft. x 35 ft. screen is at least 2 ft. on each side, 1 ft. to 2 ft. at the top edge, and at least 2 ft. at the bottom edge. Avoid any light drapery or light colored painted surface on the stage as this will detract from the effectiveness of the masking.

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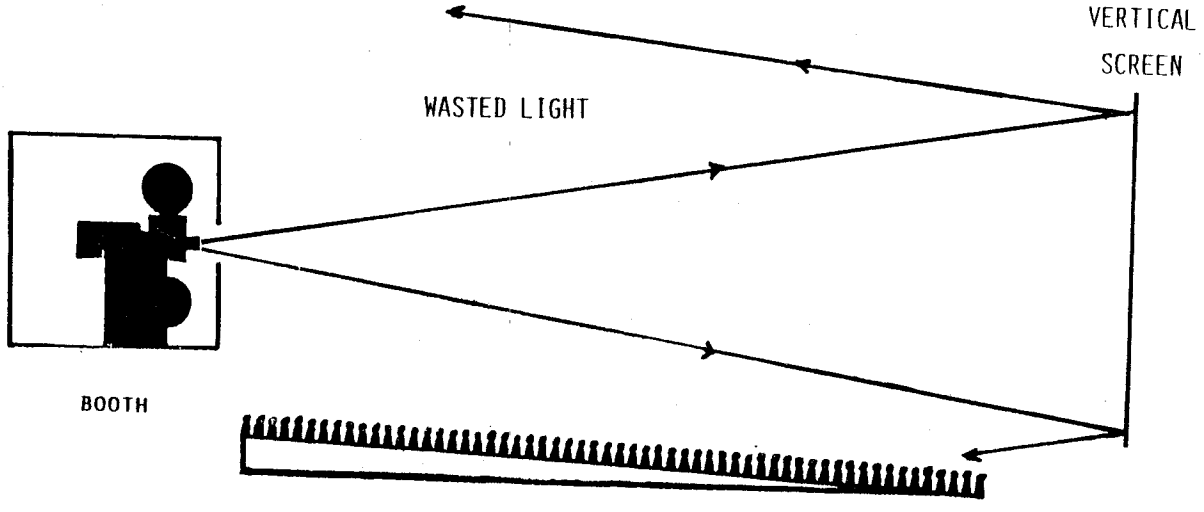
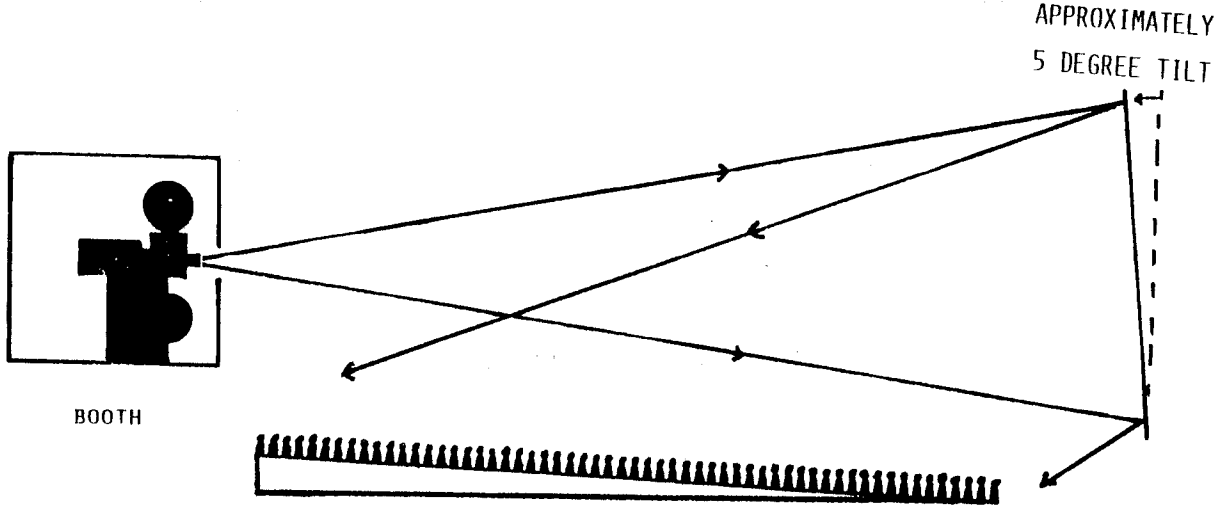
SLIGHT TILTING OF THE PROJECTION SCREEN INCREASES BRIGHTNESS!





GETTING THE MOST PICTURE BRIGHTNESS

In order to achieve the most light and the brightest picture, we offer the following suggestions:

1. Use the smallest screen size acceptable.

2. Keep the house lights to absolute legal minimum. The darker the theater, the less the patrons will be distracted and the brighter the picture will be.

3. Boost the rectifier or generator current to the maximum that the projector lamp or carbons can safely accept. Use the thickest carbons possible and boost current.

4. Remove the projector port glass whenever possible (6% gain in light).

5. Trim carbons often. Burn only high grade carbons for 3-D. "Economy" or cheap carbons can splatter and damage the "cold" mirrors and cause expensive replacement.

6. If possible, tilt the screen slightly toward the audience. The 3-D screen is like a mirror and reflects light very directionally.

7. Avoid seating patrons in high balconies or in seats off to the extreme side in front. The best 3-D effect is on the main floor middle or toward the rear of auditorium.

THE IMPORTANCE OF SCREEN MASKING

For good 3-D it is essential that the projection screen have black masking on all four sides, bordering the screen at a 2.35:1 wide-screen ratio. If the bottom masking on your screen is not adjustable, it may be necessary to install an auxiliary masking strip. One way to do this is to use a wire and turn-buckle with approval masking material draped over the wire. (See page 20.)

MASKING OFF EXCESS IMAGES

If extra images appear above or below the screen, they must be masked off by means of cardboard strips attached at the projection ports, as far from the lens as possible, preferably outside the booth wall. (See illustration on page 6.)

SLIGHT TILTING OF THE PROJECTION SCREEN INCREASES BRIGHTNESS!

ILLUMINATION REQUIRED FOR TOP QUALITY 3-D

XENON LAMPHOUSE – SUCH AS CHRISTIE, XENOLITE, ORC AND OTHER HORIZONTAL LAMP XENON HOUSINGS (APPROXIMATELY 10 WATTS REQUIRED FOR EACH SQUARE FOOT OF SCREEN AREA).

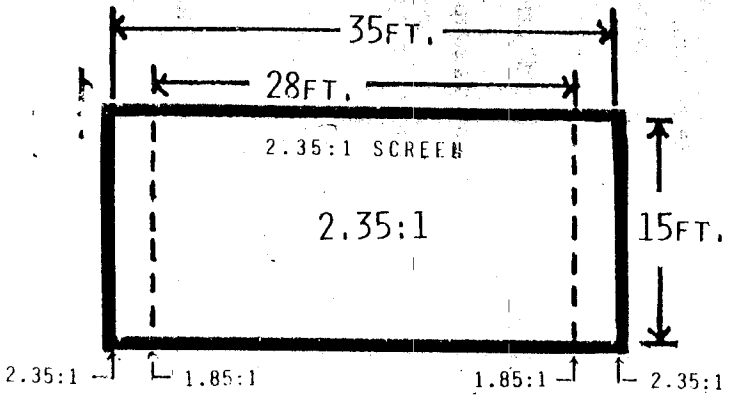
MAX. SCREEN WIDTH	WATTS REQUIRED
15 ft.	1000
22 ft.	1600
26 ft.	2000
28 ft.	2500
32 ft.	3000
38 ft.	4000

FOR OLDER STYLE VERTICAL XENON LAMPHOUSINGS, INCREASE WATTS REQUIRED **BY 30%.**

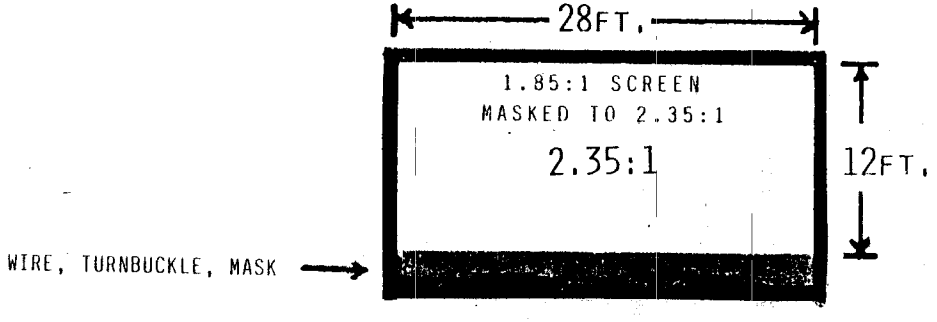
CARBON ARC LAMPHOUSE – SUCH AS MAGNARC, BRENKERT STRONG (APPROXIMATELY 2.2 AMPS PER SQUARE FOOT ON SCREEN AREA).

MAX. SCREEN WIDTH	AMPS REQUIRED
23 ft.	50
27 ft.	70
32 ft.	90
37 ft.	125
40 ft.	160
45 ft.	200

GAINS EFFECTED THROUGH MASKING SCREEN TO SMALLER AREA:



525SQ.FT.



336SQ.FT.

APPROXIMATELY 25% INCREASE IN BRIGHTNESS

APPROXIMATELY 25% INCREASE IN SHARPNESS

APPROXIMATELY 25% INCREASE IN VIEWING COMFORT

APPROXIMATELY 25% INCREASE IN 3-D QUALITY

APPROXIMATELY 100% INCREASE IN AUDIENCE SATISFACTION!

TYPES OF 3-D PROJECTION SYSTEMS

There are several types of 3-D projection systems. A brief description of these is listed below.

THE STEREOVISION™ 3-D SPLIT LENS (BARREL) LENS SYSTEM

This is the simplest and most widely used 3-D projection lens. It is very compact, very lightweight (less than 28 ounces) and very reliable. Since it closely resembles a conventional "flat" lens, most projectionists learn to use it in a few minutes. It is completely pre-set at the factory for each specific 3-D picture. No adjustments whatsoever are required by the projectionist other than conventional focusing. This system can be used for projecting any of the following 3-D single strip wide screen movies such as "Parasite," "Friday the 13th, Part II," "Warhol's Frankenstein," "Rottweiler," "Comin' At Ya," "Fantastic Invasion," "Treasure of The Four Crowns," "Shogun Women," "Dynasty," "Jaws 3-D," "Rock and Roll Hotel," "Hot Heir," "Space Hunter," "Metalstorm," "The Man Who Wasn't There," etc.

Although these lenses are designed to be used with all the modern "cold" Xenon or "cold" arc lamps, certain precaustions are required if used with "hot" lamphousings. By installing a simple dichroic heat filter in the lamphouse and by verifying with a simple test, you are ready to project 3-D within a few minutes.

SIDE-BY-SIDE SPLIT LENSES

There is also a version of the StereoVision™ lens that is intended to be used with anamorphic (Cinemascope) attachments for unsqueezing 3-D films printed side-by-side, such as "House of Wax," "Dial 'M'", etc.

StereoVision™ lenses are also available for single strip 70mm 3-D films such as the 70mm versions of "House of Wax," "The Stewardesses" and "Parade of Attractions." These 70mm films have magnetic sound tracks and require specially modified magnetic "clusters," supplied by StereoVision™ at no extra charge. Without the specially modified cluster, the theater's sound pick-up may scratch the picture area.

THE STEREOVISION™ "STEREOFLEX HI-LITE" 3-D PROJECTION SYSTEM (Patent Pending)

This is StereoVision's™ latest 3-D projection system and combines all the best features required for optimum 3-D. It is precision made, using the finest materials and workmanship. No plastic parts are used and it is designed for years of trouble-free service. Only "above/below" 3-D film can be projected with this system. All that is necessary is to adjust one control knob to match the alignment film matching the picture being played.

The brightness and sharpness of this system is equal to or better than any other system. Unlike some cheaply made mirror systems (some are even made of plastic parts that can melt from the projector heat), the Stereoflex is sturdily made, yet weighs less than 3 lbs. Whenever possible, it is supplied, complete, with a high-grade matching prime lens to fill the theater's 2.35 wide screen. If the screen cannot be matched from the prime lenses the StereoVision™ assembly then fits to the front of the theater's existing 1.85 lens. The magnifier converts the focal length of the theater's 1.85 lens to allow the 3-D image to fill the theater's full 2.35 screen.

A built-in masking device is available to reduce spill light above and below the screen. Focal length as short as 1.6" (40mm) may be used with the Stereoflex. The theater's projection port should be at least 8" tall and at least 6" wide in order to use the Stereoflex properly.

3-D PROJECTION SYSTEM, TYPE "M"

This projection system was introduced in 1972 by a company located in the New York City area. It consists of a tilting double optical wedge attachment, combined with a Magnacom. It was designed to be used with films having a "dark bar" printed between each of the two stereo images. It weighs over 9 lbs. and often requires a considerable amount of technical expertise to adjust (sometimes requiring assembly of delicate optical trimmer wedges onto the system by the theater's personnel). Sometimes the optical wedges must be radically tilted so stereo images will overlay on the screen. This may cause a dark shading along the lower edge of the screen. However, we consider this device to be potentially capable of projection good 3-D in many circumstances, even though it may require skilled personnel to adjust it. In 1983 a model II version from the same manufacturer was introduced.

3-D PROJECTION SYSTEM "P"

(MIRROR TYPE)

This system is made in the Los Angeles area for a major film distributor that released a 3-D film in late summer 1982. The unit is made of sheet metal and uses twin mirror pairs (originally described as "state-of-the-art" although this method was invented over 50 years ago.) It uses plastic polarizers. Adjustment of the mirrors requires that several knobs be skillfully adjusted by the operator. It has good brightness, fair sharpness. Can easily go out of adjustment and cause eye discomfort.

(SPLIT LENS TYPE)

These units were made for the same film distributor after it was discovered that their mirror units would not fit many types of projectors. The distributor of this device has limited optical servicing capability.

3-D PROJECTION SYSTEM TYPE "PX"

This system is a twin offset lens attachment and was introduced in 1983. It has fair to good brightness. It can only be used in theaters that require an enlarged picture. Because of its offset optical design, it has fair sharpness. Somewhat fragile construction. Requires some skill to attach to the theater's existing lens. The distributor of this device has little or no servicing organization.

3-D PROJECTION SYSTEM TYPE "3DV"

This 3-D mirror attachment was also introduced in early 1983 by a company that specialized in 3-D television glasses and cardboard polarized glasses. The unit uses plastic polarizers. It has been claimed as being usable for all "above-and-below" as well as old "side-by-side" 3-D films. It was not disclosed that it will not work with short focal length lenses nor will it attach to the anamorphi lens required for "side-by-side" 3-D films. The unit will not work with turret machines. This company has little or no servicing organization and very little experience in 3-D projection.

CONCLUSION

Why deal with a "Johnny Come Lately" company that has little or no experience when you can deal with an established company with over 15 years of day-to-day 3-D experience, an excellent reputation and a skilled, reliable staff dedicated to help you get top quality?

You may get a slightly lower price and a lot of sales promises, but why take a chance? In the long run it may cost you a lot more.

STEREOVISION has been in the 3-D equipment business nearly 15 years. Its five year guarantee means something!

PRICES

StereoVision's™ prices are competitive. Higher quality construction and high-grade optics always cost a little more, but if you are going to play five or more 3-D films over the next year, the actual extra cost may be as little as $1.00 per show.

Why not use the best? Universal Pictures, Panavision and many others checked the rest and chose STEREOFLEX. Give your patrons a better show too. Your projectionist will appreciate how easy it installs!

STEREOVISION™

35 years of optical excellence and a solid reputation for reliability and courteous service.

TO 3-D FILM DISTRIBUTORS AND THEATER ENGINEERS

For the best possible 3-D images and maximum enjoyment by theater patrons, it is very important that you select the most appropriate theaters for playing your 3-D films. The vast majority of theaters have "standard" configuration and can play excellent 3-D.

However, some theater configurations cannot show optimum 3-D and whenever possible should be avoided. This includes very large theaters with balconies.

Specifically, it is important to adhere to certain screen height/projection throw ratios to enable the audience to view the screen image at a proper distance and to avoid excessive stereoscopic projection distortion. Attempting to play 3-D in these theaters may cause viewing discomfort, bad "word-of-mouth," walk-outs and refunds.

The ratio of screen height to throw should be at least 1:6, with an extreme minimum of 1:5. A table below provides typical dimensional ratios:

SCREEN HEIGHT	PROJECTOR DISTANCE OR THROW
8'	45' or farther
9'	50' or farther
10'	55' or farther
11'	60' or farther
12'	65' or farther
13'	75' or farther
14'	80' or farther
15'	85' or farther
16'	90' or farther
17'	95' or farther
18'	100' or farther

SCREEN HEIGHT OVER 18' NOT RECOMMENDED FOR GOOD 3-D. For best 3-D effect and eye comfort, patrons should avoid sitting closer than two (2) screen heights from screen. Sitting too close also "flattens" the 3-D image excessively and can cause eye discomfort.

Whenever possible verify which of your auditoriums have the highest ratios and install silver screens in those only.

FOR FURTHER INFORMATION, PLEASE CONTACT US.

STEREOVISION™ 3D

PROJECTION SYSTEM

GENERAL INFORMATION

The patented STEREOVISION™ 3-D projection lens system is the simplest, most compact and lightest weight unit ever developed for cinema theater use.

It is very easy to use. All of the optics and polarizer elements are enclosed within a barrel the same size as a "normal" lens. In fact, it resembles your convention "flat" lens. The operator hardly has to make any change in his usual installation procedure.

Over 4,000 3-D play dates have been made with the STEREOVISION™ lenses. While installation is very simple, it is essential that the projector lamphouse must be the "cool" dichroic type to avoid overheating of the polarizer module. Please specify the title of the 3-D movie you are playing when ordering.

STEREOVISION 3-D LENS KIT SPECIFICATIONS

Each STEREOVISION™ 3-D projection lens kit consists of the following items:

(Specify title of 3-D picture when ordering)

Two (2) STEREOVISION™ type 2319 lenses
(This focal length, in conjunction with the magnifier lens, will cover about 70% of the theater screen sizes. Other sizes are available at similar prices.)

Two (2) STEREOVISION™ magnifier lenses

Two (2) STEREOVISION™ dichroic heat filters

Two (2) spare polarizer modules

Four (4) 3-D polarized viewers

One (1) Instruction Manual

One (1) carrying case

WEIGHT of each STEREOVISION™ 3-D lens, approx. 20 oz., 550 GR

WEIGHT of each STEREOVISION™ 3-D lens kit, with case, approx. 16 lbs., 7.2 KG

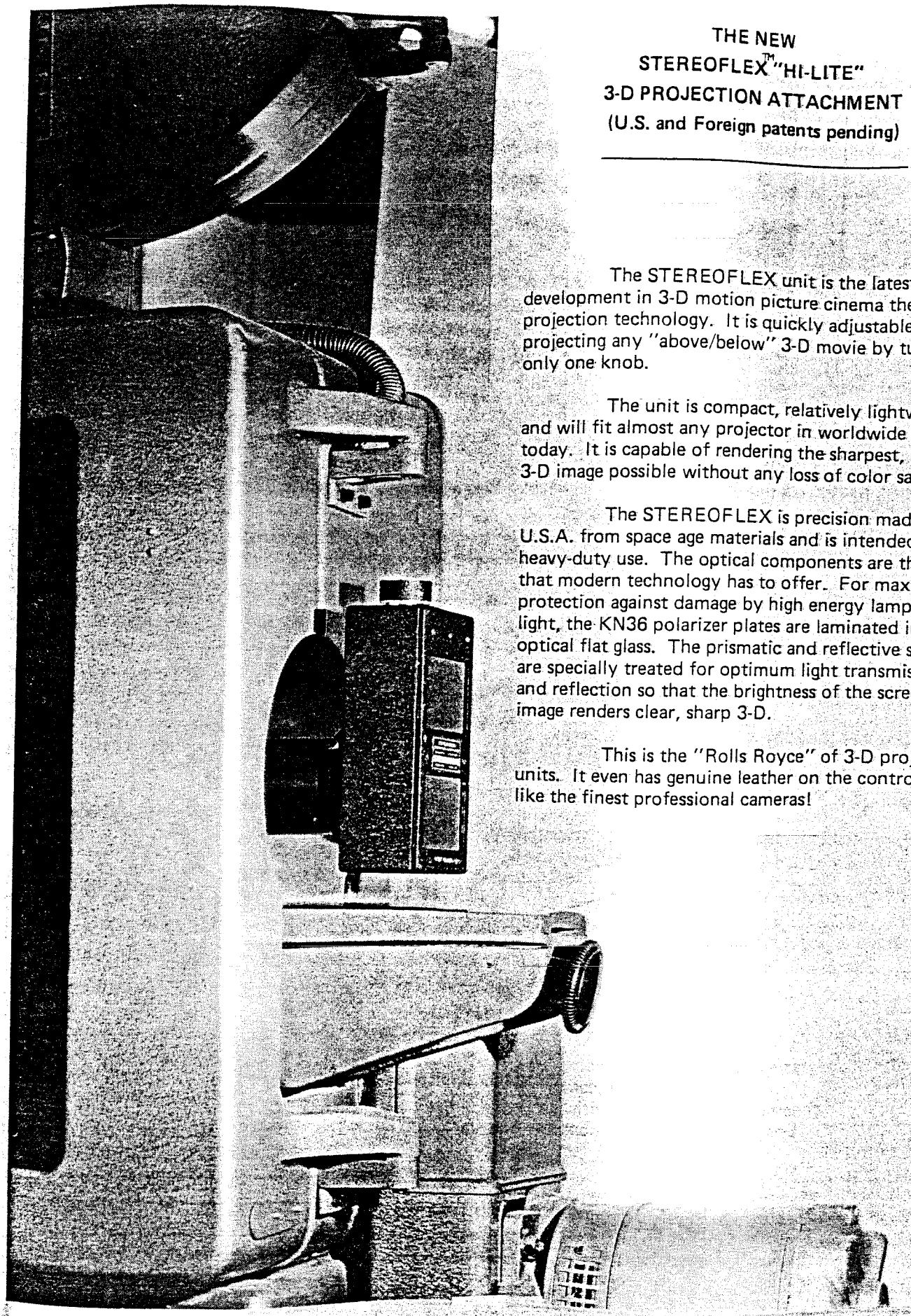
MADE in U.S.A.

The STEREOVISION™ 3-D projection lens is patented and is available on a short term rental basis or long term lease (one year, three years, or longer). PURCHASE AVAILABLE.

(Please see separate rate sheet.)

SERVICING: Servicing STEREOVISION™ 3-D projection lenses is available in several European countries, Hong Kong, Canada and France. We will cooperate in training servicing personnel in user's own country or territory.

If necessary to return equipment to our factory for repair or servicing, turn-around can usually be accomplished within ten days.



THE NEW STEREOFLEX™ "HI-LITE" 3-D PROJECTION ATTACHMENT

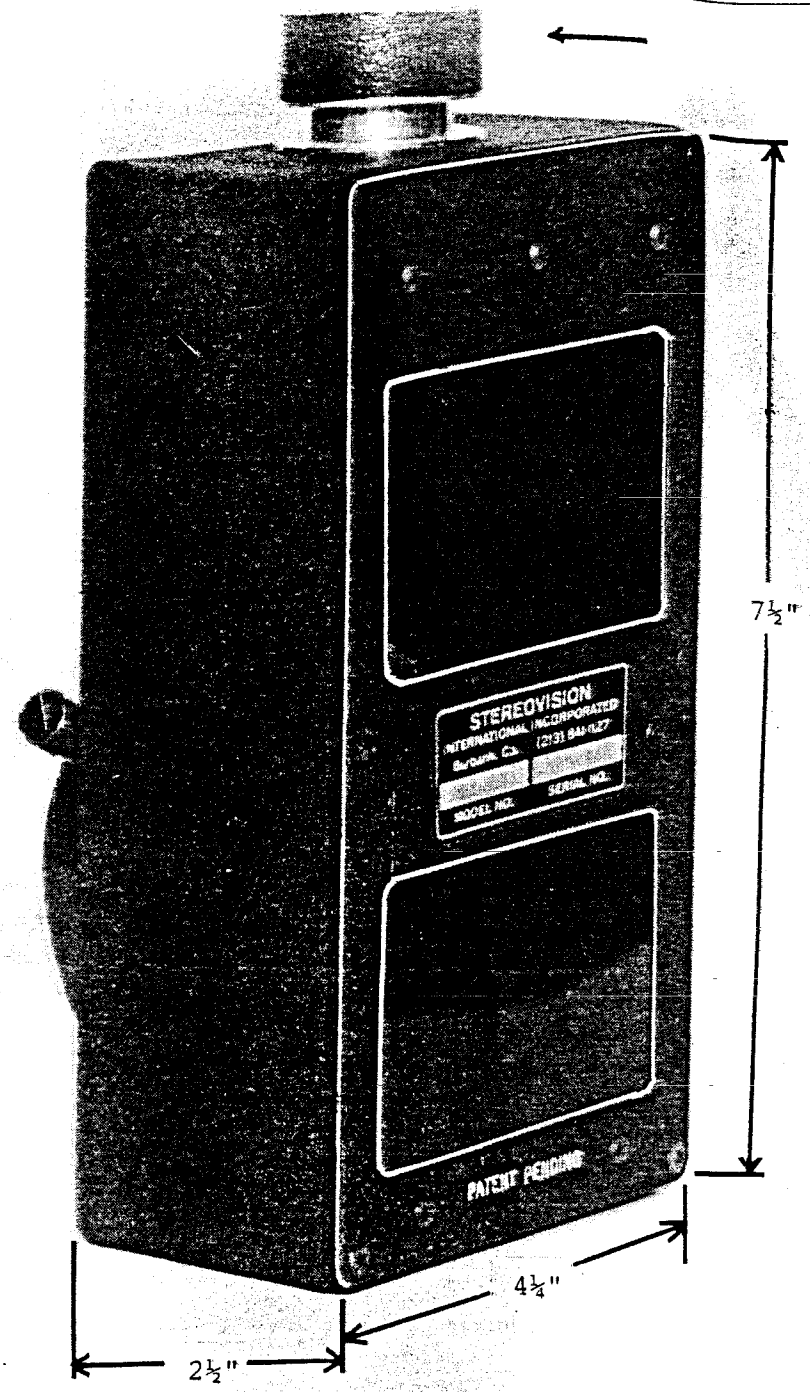
(U.S. and Foreign patents pending)

The STEREOFLEX unit is the latest development in 3-D motion picture cinema theater projection technology. It is quickly adjustable for projecting any "above/below" 3-D movie by turning only one knob.

The unit is compact, relatively lightweight and will fit almost any projector in worldwide use today. It is capable of rendering the sharpest, brightest 3-D image possible without any loss of color saturation.

The STEREOFLEX is precision made in the U.S.A. from space age materials and is intended for heavy-duty use. The optical components are the finest that modern technology has to offer. For maximum protection against damage by high energy lamphouse light, the KN36 polarizer plates are laminated in optical flat glass. The prismatic and reflective surfaces are specially treated for optimum light transmission and reflection so that the brightness of the screen image renders clear, sharp 3-D.

This is the "Rolls Royce" of 3-D projection units. It even has genuine leather on the control knob like the finest professional cameras!



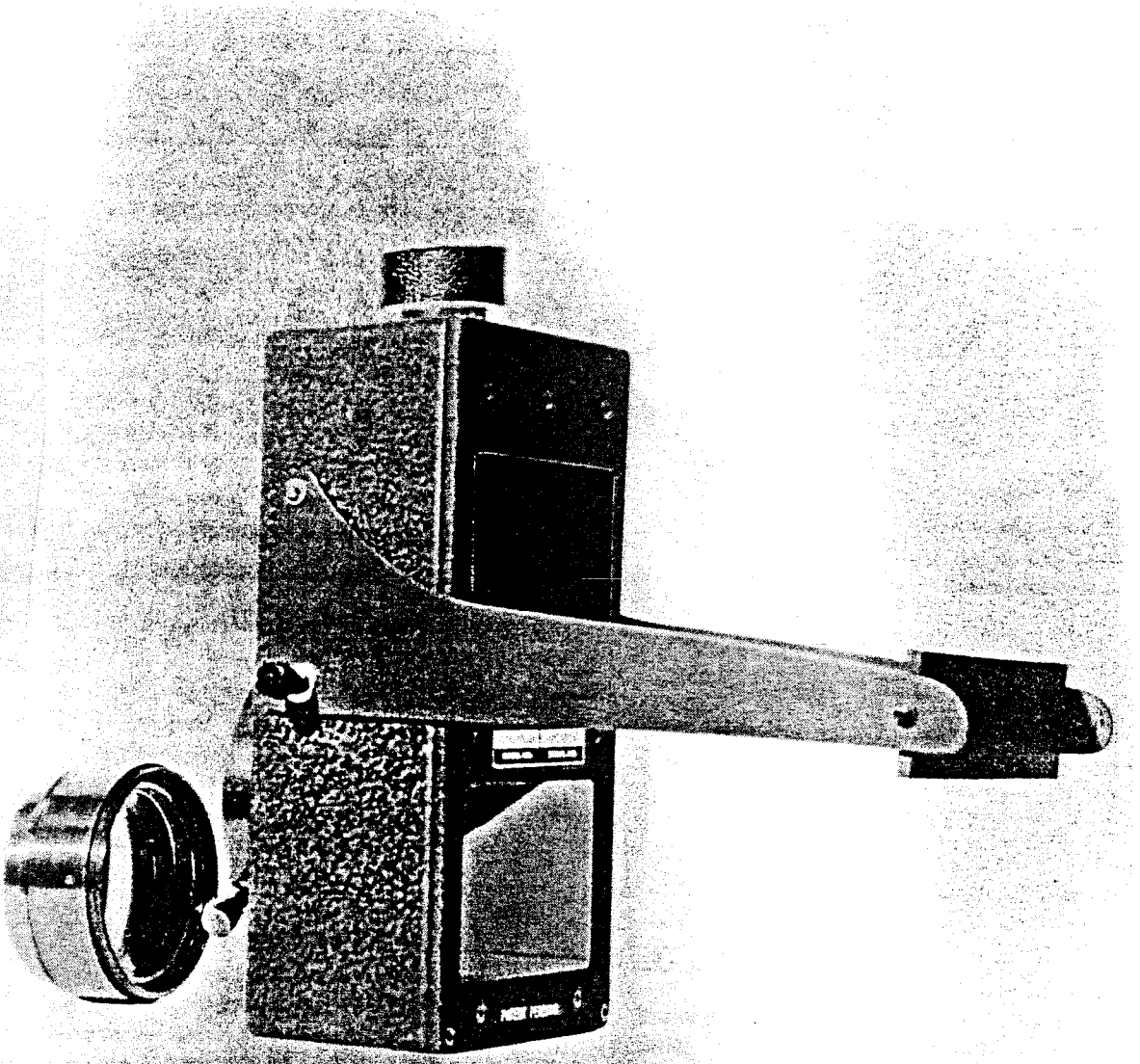
BASIC STEREOFLEX™ KIT

The STEREOFLEX™ basic kit is the least expensive option for showing "above/below" 3-D films because it uses the customer's existing primary lens. It includes:

Two (2) STEREOFLEX™ "HI-LITE" units with one 3-D 35MM alignment film (30 meters) of customer's choice; instruction manual in English, and metal carrying case.

The above kit is intended to be used with the customer's own primary lens of very short focal length for a specific screen size/throw ratio. The correct focal length of the primary lens required can be calculated by the usual formula (half the focal length of your scope lens).

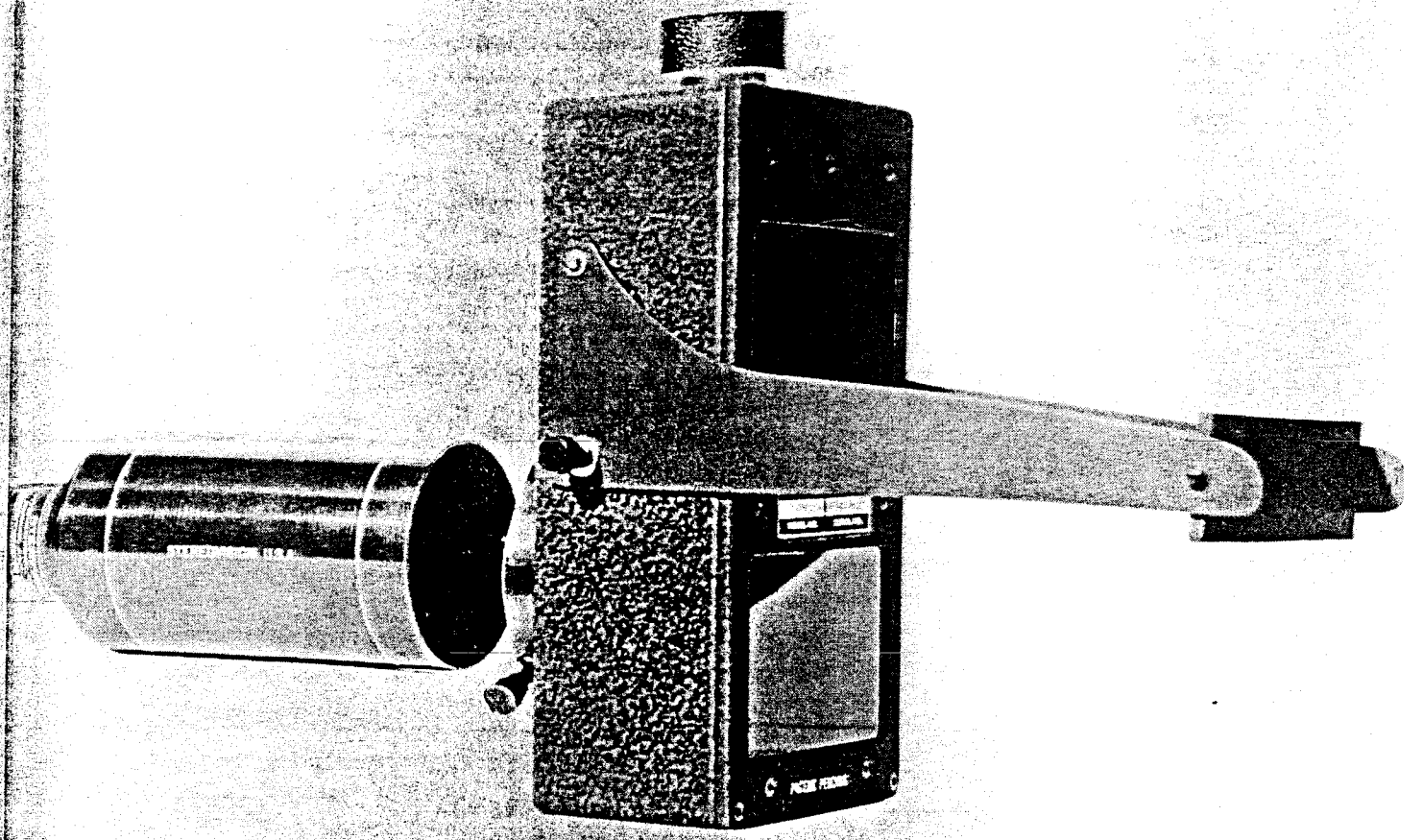
The STEREOFLEX™ clamps to the front of the customer's primary lens (Series II diamater, 70.5MM lens barrel diameter).



(Shown with masking device — available as an accessory.)

THE STEREOFLEX™ UNIVERSAL 3-D ATTACHMENT KIT

The STEREOFLEX UNIVERSAL 3-D ATTACHMENT KIT is supplied with two basic STEREOFLEX units plus two special optical magnifiers. This kit is intended to be easily fitted onto the theater's existing "flat" lens (1.85 or 1.66). Since the 3-D image height is about 30% smaller than the 1.85 image, the STEREOFLEX UNIVERSAL KIT includes two 30% optical magnifiers that enlarge the 3-D image to be the same height as the 1.85 image on the screen. (If desired, 20% optical magnifiers can be supplied instead of the 30%.) All the other accessories, same as the basic kit. THIS IS THE MOST COMMONLY USED KIT.



THE STEREOFLEX™ CUSTOM 3-D ATTACHMENT KIT

This kit is the same as the basic kit, but also includes all the optics needed to project 3-D in a specific cinema or a specific screen to throw size ratio. The customer only has to specify which focal length is required and we will supply the entire STEREOFLEX™ system ready to project 3-D. No other optics are needed.

All STEREOFLEX™ units require a projection port size of at least 20 CM (8") high by at least 15 CM (6") wide.

NOTICE: If your theater's projection ports are less than this size, we recommend that you consider using the STEREOVISION™ 3-D projection lens (See page 29), which has all the components within the standard Series II (70.5) diameter barrel. It requires only a small projection port (less than 10 CM [4"] square).

STEREOFLEX™ 3-D kits are available on a short term rental (under one month) or long term leases (up to thirty years). PURCHASE AVAILABLE.

These units are supplied in the most common international projector barrel diameter (Series II) 70.5MM (2-25/32") – (101MM 4" collars available). Special sizes for old European (62MM) are also available.

(Shown above with masking device for minimizing secondary images falling upon screen masking.)

INTEGRATED CONTROL SYSTEM

The STEREOFLEX™ has only one precision adjustment knob and can be set up within a few minutes. All that is needed is an appropriate 3-D alignment film to match the picture being played. These alignment films are available from STEREOVISION™ at low cost and make the projectionist's job very easy.

The STEREOFLEX™ can be supplied as an attachment, only to be used with the exhibitor's short focal length lens (with or without the magnifier optical system to be used with the theater's regular flat lens), or including the primary lens. The primary lens is used in lieu of the theater's existing flat lens, if desired.

BEST FOCAL LENGTH COMPATABILITY

(Please specify when ordering BASIC KIT or UNIVERSAL KIT)

TOTAL EQUIVALENT OF YOUR PRIME LENS IN mm	TOTAL EQUIVALENT FOCAL LENGTH OF YOUR PRIME LENS IN INCHES	PLEASE SPECIFY STEREOFLEX™
40mm to 47mm	1.6" to 1.8"	(TYPE AA)
48mm to 58mm	1.8" to 2.2"	(TYPE A)
59mm to 63mm	2.25" to 2.5"	(TYPE B)
64mm to 150mm	2.5" to 6"	(TYPE C)
80mm to 180mm	3.25" to 7"	(TYPE CC)

NOTICE: The STEREOFLEX™ units are usable with almost any focal length primary lens by simply tilting the projector slightly.

SPECIFICATIONS

NEW STEREOFLEX™ "HI-LITE" 3-D ATTACHMENT

SIZE: 18 CM (7-1/2") high, 11.2 CM (4-1/2") wide, 6.3 CM (2-1/2") thick

WEIGHT: 2.8 lbs., 1.3KG

HOUSING: Die cast aluminum alloy (All precision parts, no plastic components.)

POLARIZERS: HN36 laminated – U.V. protected

OPTICS: Low reflection coated per mil. spec F675. Finest optical glass. Usable for all 3-D films having above/below image configurations such as "PARASITE," "COMIN' AT YA," "FRIDAY THE 13th, PART III," "ROTTWEILER," "WARHOL'S FRANKENSTEIN," "HOT HEIR," "JAWS 3-D," "SPACE HUNTER," "METALSTORM," "THE MAN WHO WASN'T THERE."

VERTICAL SCREEN DISTANCE CONVERGENCE RANGE: 12 meters to 100 meters.

Make in U.S.A. EACH KIT INCLUDES THREE ALIGNMENT FILMS OF YOUR CHOICE.

3-D FILM INFORMATION SHEET
(For choosing the correct lens setting)

The STEREOFLEX "HI-LITE"™ and STEREOSTAR™ adjustable 3-D projection units will project all of the following films. (Contact us for matching alignment test films.) Compact STEREOVISION™ split barrel non-adjustable 3-D lenses can also be supplied for any of these films. Please specify.

35mm 3-D RELEASE PRINTS

ABOVE/BELOW TYPES

ALIGNMENT FILM OPTICAL CENTER SPACING	TITLE
A/B TYPE .359	* "THE 3-D MOVIE"
A/B TYPE .366	"JAWS 3-D" * "AMITYVILLE 3-D"
A/B TYPE .370 - .375	"COMIN' AT YA"
A/B TYPE .374 (SAME AS STEREOVISION WIDE SCREEN)	* "SWORDKILL" * "HOT HEIR" "METALSTORM" "PARASITE" "ROTTWEILER" "REVENGE OF THE 13" (SHOGUN MAIDENS) "THE WINNERS" (SHORT) "MAGNIFICENT GUARDSMEN" * "EMANUELLE-4" "3-D ON PARADE" (SHORT) "DYNASTY" "WILD RIDE" (SHORT) "HIT THE ROAD RUNNING" * "RAH RAH YOU'RE DEAD" "PENSIONATTE" * "99 WOMEN" * "TALES OF THE THIRD DIMENSION" * "RETURN OF THE LIVING DEAD" * "THE LEGEND OF VENUS" * "DARK ZONE"
A/B TYPE .380	"WARHOL'S FRANKENSTEIN" "FANTASTIC INVASION" (THE BUBBLE) "ATTACK OF THE GIANT GORILLA" (A*P*E) "ARTIGATO" * "ROCK AND ROLL HOTEL"
A/B TYPE .383	"LOVE IN 3-D" "TICKLED PINK" (WHAT THE BUTLER SAW) "NORTH AND SOUTH CHIVALRY"
A/B TYPE .387	"SPACEHUNTER" * "THE MAN WHO WASN'T THERE" (UNDER PRESSURE) "PRISON GIRLS" "FRIDAY THE 13th – PART III" "TREASURE OF THE FOUR CROWNS"
A/B TYPE .404	"TIGER MAN"

* IN PRODUCTION JUNE 1983

CONTACT STEREOVISION INTERNATIONAL, INC. FOR ALIGNMENT LOOPS FOR ANY OF THE ABOVE FILMS. $10.00 EACH WITH CONTAINER. 100 ft. LENGTHS $50.00 (ON PLASTIC CORE).

NOW YOU CAN RENT LEASE OR BUY STEREOFLEX 3-D PROJECTION UNITS

FOR DETAILS PLEASE CONTACT:

STEREOVISION™ 3D

3421 W. Burbank Boulevard • Burbank, California 91505
(213) 841-1127