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INSTRUCTION MANUAL

THE SUPER PANATAR

A PRODUCT OF

PANAVISION, INCORPORATED

HOLLYWOOD, CALIFORNIA

U. S. A.

VARIABLE ANAMORPHIC LENS

"Gottschalk Lens."

TABLE OF CONTENTS

INTRODUCTION

This manual has been prepared for the purpose of acquainting the purchaser of the SUPER PANATAR 35mm projection lens with the unique features which the lens incorporates. In this regard, certain basic principles of the SUPER PANATAR will be discussed so as to provide a clear understanding of the lens for those who work with it. In this way, the fullest advantage can be taken of the SUPER PANATAR . . . an anamorphotic lens whose performance is unequaled.

It must be clearly understood that the alignment of the projector's optical system with that of the SUPER PANATAR is important. For this reason, provision has been made in the design of the lens for every type of adjustment which will be necessary for proper alignment. Therefore, while care must be employed in mounting the SUPER PANATAR, it will be seen immediately that nothing has been overlooked in making this procedure as simple as possible.

WHAT IS PANAVISION?

THE SUPER PANATAR

"Panavision" is a word that has become a part of the motion picture vocabulary.

"Panavision" means: "a superbly engineered optical system for the photographing, printing, and projection of anamorphosed film."

The Panavision effect in projection is created by an auxiliary lens attachment, named the SUPER PANATAR, which is completely compatible with all existing motion picture equipment (conventional or anamorphotic) and it means this to you as a user:

1. Highest definition—sharpest resolution.
2. Ultimate in color rendition—pure white light.
3. Elimination of distortion due to curved screens.
4. Greatest light transmission.
5. Proper "squeeze" with all focal length lenses.
6. Quickly adjustable for any squeeze ratio from 2.66 to 1.0 down.
7. Adaptable to any standard projector.
8. Accommodates all standard projector lenses.
9. All glass surfaces easily cleaned.
10. Can be mounted or dismounted in five seconds.
11. Reasonably priced.

OTHER PRODUCTS OF PANAVISION, INC.

The SUPER PANATAR 35mm projection lens is but one of several items being offered to the motion picture industry by Panavision, Inc. In addition, an anamorphotic "taking" lens with adjustable squeeze ratio is available, as well as "squeeze" and "unsqueeze" optical printing lenses. Of course, all lenses for 35mm use have 16mm counterparts. Further developments will be announced shortly.

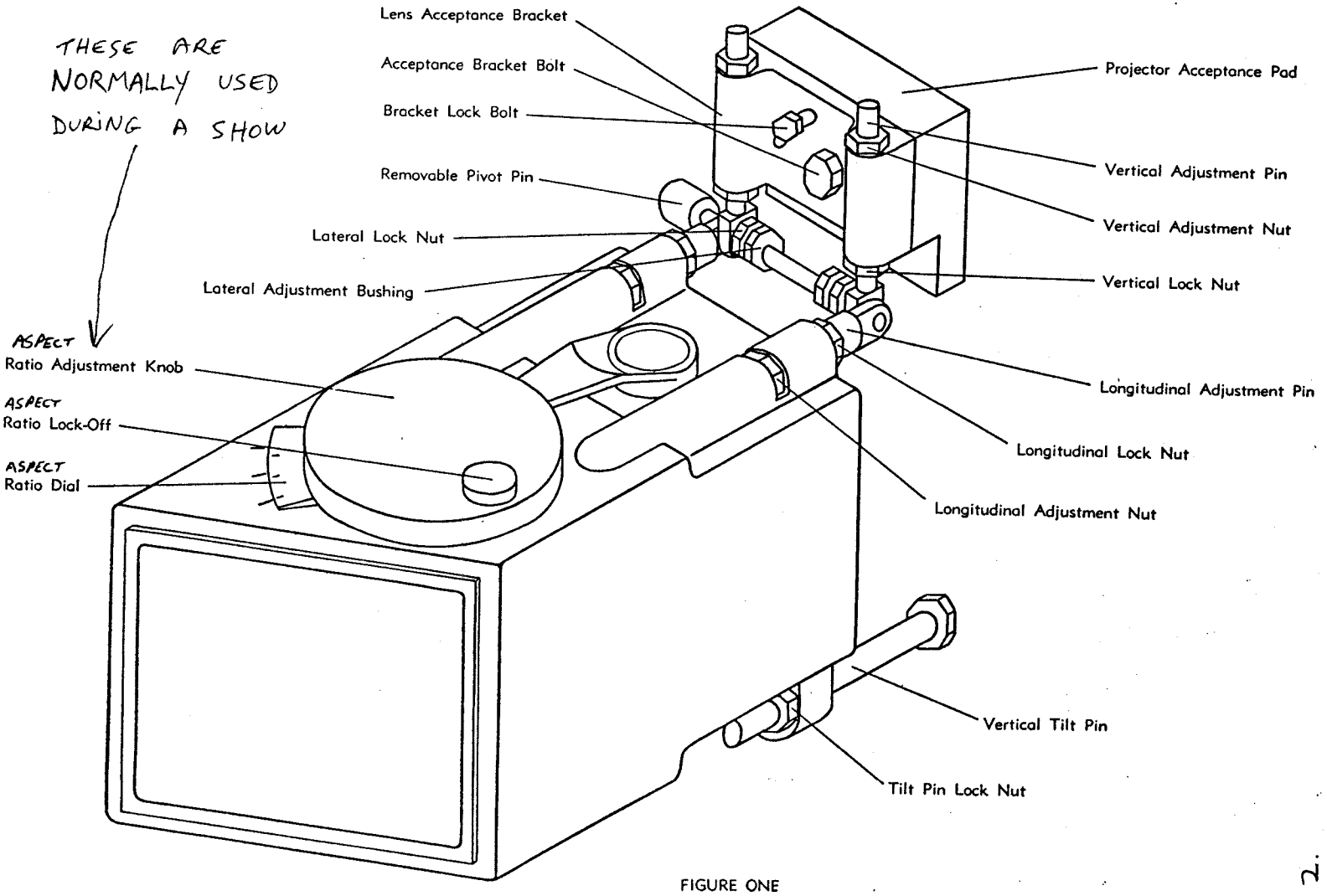
THESE ARE NORMALLY USED DURING A SHOW
Lens Acceptance Bracket
Acceptance Bracket Bolt
Bracket Lock Bolt
Removable Pivot Pin
Lateral Lock Nut
Lateral Adjustment Bushing
ASPECT Ratio Adjustment Knob
ASPECT Ratio Lock-Off
ASPECT Ratio Dial
Projector Acceptance Pad
Vertical Adjustment Pin
Vertical Adjustment Nut
Vertical Lock Nut
Longitudinal Adjustment Pin
Longitudinal Lock Nut
Longitudinal Adjustment Nut
Vertical Tilt Pin
Tilt Pin Lock Nut

FIGURE ONE

THE SUPER PANATAR IN CONJUNCTION WITH EXISTING EQUIPMENT

THE PROJECTOR ITSELF

For reasons which will be disclosed further on in this manual, the SUPER PANATAR is mounted on the face of the projector head and independent of the projector's lens. As will be seen, Panavision, Inc., provides an aceptance bracket for the SUPER PANATAR which will adapt it to standard models of the following projectors: Simplex, Motiograph, Century, RCA, Brenkert, and others.

In most cases, the mounting of the SUPER PANATAR will require nothing more than drilling two holes in the face of the projector head. In certain installations, modifications will be necessary such as removing the front shutter and shifting the position of the focusing knob. Only in the case of extremely old equipment may it prove necessary to make extensive alterations or to replace the equipment entirely. Consult with your regional dealer in this regard.

THE OBJECTIVE LENS

Concerning the objective lens of the projector, two important factors must be kept in mind. First, that in most installations a much larger screen area will have to be illuminated by the projector. Therefore, in order to maintain proper screen brilliance and definition, it is highly advisable to use only fast, precision-ground, coated objective lenses. In the final analysis, the performance of the SUPER PANATAR can be no better than that of the objective lens with which it is used.

The second point is in regard to the focal length of the objective lens. By referring to the chart on page eight, it will be seen that most installations will require a longer focal length lens than those used for conventional 1.33 to 1.0 projection.

A brief mention is made at this point regarding an extremely useful feature of the SUPER PANATAR. It may be found that an objective lens of the exact focal length necessary to fill the screen is not obtainable. However, tests have shown that by adjusting the prisms of the SUPER PANATAR (see section 5E), the projected image can be "squeezed" or "unsqueezed" by as much as 5% without noticeable distortion. This makes it possible for the projectionist to obtain just the right amount of bleed-off on the screen edges, assuming that his objective lens brings him within proper range.

SPROCKETS

It is the purpose of this heading only to remind the purchaser of the SUPER PANATAR that certain modifications in sprocket and idler wheels are required for the projection of anamorphosed film. Information on this subject can be obtained either from your film distributor or theater supply house.

APERTURE

Here again specifications for proper aperture size should be obtained from the distributor or theater supply. Of course, the conventional means of eliminating keystoning may be employed.

SOUND HEAD

Several manufacturers produce sound heads necessary for the presentation of anamorphosed film. Information on this topic may be obtained from the sources mentioned above.

OTHER PROJECTION EQUIPMENT

PROJECTION PORT

It may be found that the projection port is too narrow to pass the widened beam of light from the projector. This, of course, depends on the dimensions of the port and the position of the projector in relation to it. The simplest solution of this problem may be found in moving the projector closer to the port. Otherwise, it will be necessary to enlarge the port.

Although formulae can be provided by Panavision, Inc., for the purpose of computing the minimum width and height requirements, the surest method of increasing port size adequately is to project through the SUPER PANATAR before any alterations are made. Simply note the pattern of light thrown upon the projection booth wall and enlarge the port accordingly, taking into consideration the wall thickness.

By the same token that it is imperative to use only the finest objective lens in connection with the SUPER PANATAR, it is quite important that only the best grade of glass be used in the projection port. The glass should be water-white, optically flawless, coated, and should be treated with the same care as a lens. If these precautions are not taken, the port glass can introduce loss of definition, loss of light transmission, and a detrimental change of color in the projected image. As a service to its customers, and in the interest of assuring maximum results with the SUPER PANATAR, Panavision, Inc., will supply port glass which meets the above specifications. Prices for various dimensions of glass will be furnished upon request.

SCREEN

Since all anamorphotic systems require the use of considerably larger screens, it is very important to choose a screen of high reflectance. Panavision, Inc., has found that the new lenticulated screens, such as the Magnaglo Astrolite, provide an exceedingly brilliant picture and distribute the light evenly to every seat in the theater.

A CONSIDERATION OF "HORIZONTAL LINE DISTORTION" IN THE PROJECTED IMAGE

DISTORTION AFFECTED BY PROJECTOR POSITION IN RELATION TO A CURVED SCREEN.

When a projector is placed in a theater so that its beam of light falls on a curved screen at an oblique angle, an extremely disconcerting distortion results. Specifically, horizontal lines in the image sag noticeably from one edge of the screen to the other. This distortion of horizontal lines cannot be seen from the projection booth, but it is quite apparent from the main floor, and becomes more pronounced as the angle between the screen and the projector increases.

The SUPER PANATAR is capable of correcting horizontal line distortion, as will be discussed in the following section.

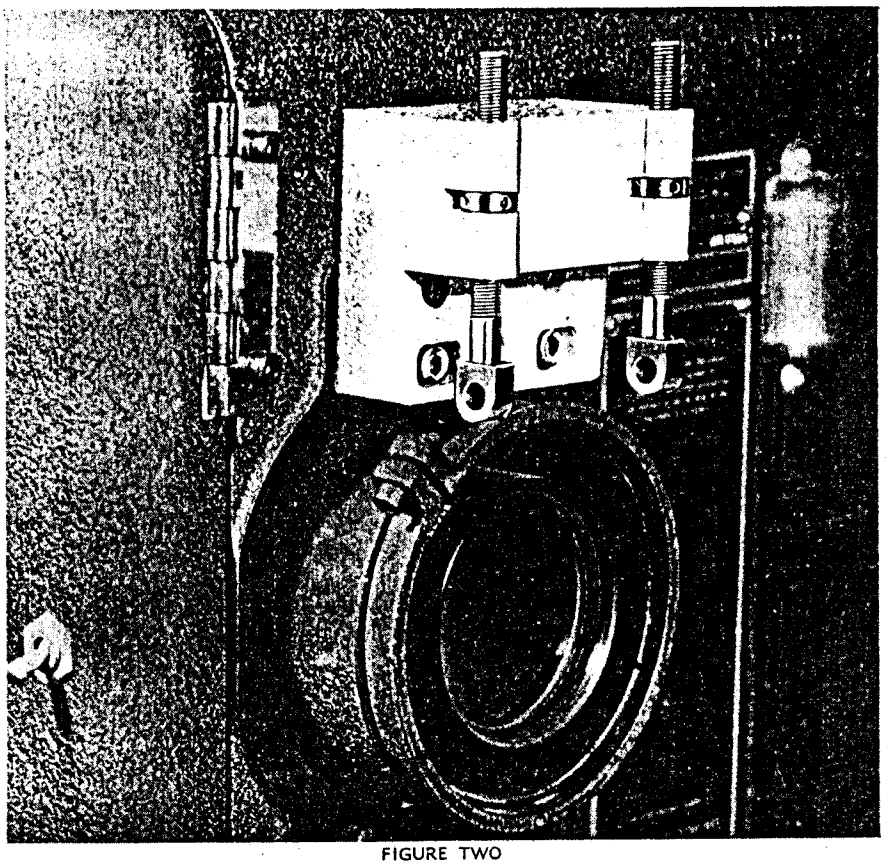

FIGURE TWO

By adjusting the vertical tilt pins so that the SUPER PANATAR is in a level position (regardless of the angle of the projector), horizontal lines on the screen will appear straight **when the picture is viewed from the main floor.** These same horizontal lines will now appear bent when viewed from the projection booth. In theaters with a balcony it may be best to set the SUPER PANATAR so that a compromise of correction is achieved for the main floor and the balcony.

MOUNTING THE SUPER PANATAR ON THE PROJECTOR
SECURING THE ACCEPTANCE BRACKET

Each SUPER PANATAR is supplied with an acceptance bracket, and securing this bracket to the projector head is the first step in mounting the lens.

The bracket for mounting the lens to the projector comes in two sections. One of these, called the projector acceptance pad, attaches directly to the face of the projector in the following manner. Center pad above lens and drill face of projector (except Simplex X-L), using holes in pad as guides. Use suitable machine screws or bolts to firmly secure pad to projector (see figure two).

The lens acceptance bracket is next placed on the projector pad. The positioning of the lens bracket on the projector pad controls the lateral tilt of the lens. It is here that clockwise or counter-clockwise rotation of the lens is adjusted so that vertical lines in the picture are parallel to the edge of the screen. As soon as this alignment is correctly achieved, secure the lens bracket to the pad by means of the bracket lock bolt. The acceptance bracket remains on the projector head permanently and the SUPER PANATAR can be mounted or dismounted at will by means of the removable pivot-pin.

After the acceptance bracket has been secured, the SUPER PANATAR may be mounted on the bracket by inserting the pivot pin through the ends of the vertical and longitudinal adjustment pins. With the lens still supported by hand, it can be seen how far to unscrew the vertical tilt pins or order to support the SUPER PANATAR properly.

PROCEDURE IN MAKING PRELIMINARY ADJUSTMENTS

As stated previously, it is important to align the optical axis of the SUPER PANATAR with that of the projector, or vignetting and loss of light may result.

Throw the projector's beam of light into the SUPER PANATAR and adjust its position vertically and laterally until the cone of light is centered on the rear prism. (This adjustment is the most critical in the alignment procedure.) Finally, rotate the longitudinal adjustment nuts until the back of the SUPER PANATAR is as close to the projector as possible without actually touching.

FINAL ADJUSTMENT OF LENS AND LOCKING-OFF

Now that the SUPER PANATAR is in approximate position, the final adjustments can best be made by projecting a target frame or picture on the screen.

Assuming that the projector was centered on the screen before the SUPER PANATAR was mounted, rotate the longitudinal adjustment nuts until the projected image is centered on the screen.
If the projectionist is satisfied that the lens is well aligned in respect to both the projector and the screen, all lock nuts may be secured.

RAPID CONVERSION OF THE SUPER PANATAR FROM 2.66 TO 1.0 SQUEEZE RATIO TO OTHER RATIOS

Aside from the exceptional optical quality of the SUPER PANATAR, the most important feature of this lens is its ability to change aspect ratio in a matter of seconds. In other words, the lens can be rapidly adjusted for the projection of prints in whatever aspect ratio the print is supplied. It will be found that in most cases, prints are supplied for 2.66 to 1.0 projection. However, it may well be necessary for the projectionist to shift from 2.66 prints to 2.0 prints on the same program. Furthermore, it may be found desirable to shift from conventional 1.33 prints into the projection of 2.66 prints without removing the SUPER PANATAR. It is also possible to achieve novel effects in the projection of cartoons and titles, regardless of the aspect ratio of the film, by gradually adjusting the aspect ratio control knob. Any film which contains only geometric

or free-form objects, such as most titles and cartoons, can be grossly distorted by the SUPER PANATAR without objectionable effects. However, it must be kept in mind that films which contain objects whose proportions are easily identified MUST BE PROJECTED ONLY AT THE ASPECT RATIO FOR WHICH THEY WERE INTENDED! You cannot project a conventional 1.33 to 1.0 print of a typical dramatic motion picture through the SUPER PANATAR (or any other anamorphotic lens) when it is adjusted for 2.66 to 1.0 projection . . . the distortion will be intolerable.

It must be well understood that the aspect ratio of any anamorphotic lens varies according to the focal length of the lens on the projector. In other words, an anamorphotic lens will project a slightly wider picture when used with a 2¾" projection lens, than when it is used with a 6" projection lens. For this reason, the SUPER PANATAR is not supplied with a complete aspect ratio scale, and it is necessary for the projectionist to indicate proper index marks on the aspect ratio dial.

Four indices are provided next to the edge of the aspect ratio dial. These marks make it possible for the projectionist to lay out a "vernier-type" aspect ratio scale. The following procedure should be used: adjust the lens (by projecting through it) for 2.66 to 1.0 and make a mark on the aspect ratio dial opposite the fourth index mark. The lens may now be adjusted for three other aspect ratios (probably 2.0, 1.75, 1.33) and the other three index marks utilized. It will be found that this system spreads the scale out considerably and makes it easier to read than if only one index were used.

FOCUSING THE PROJECTOR IN CONJUNCTION WITH THE SUPER PANATAR

The SUPER PANATAR is a fixed focus supplementary lens and does not require focusing. The projector lens should be focused in the normal manner. In theaters with a projection throw of 70 feet or less, a "short throw" attachment must be used with the SUPER PANATAR. These attachments are available from your dealer at a nominal cost.

MAINTENANCE OF THE SUPER PANATAR

If it ever appears necessary to clean the surface of the prisms, the lens may be dismantled as follows: Remove the screws which secure the lens housing to the chassis, and very carefully remove the chassis from the housing. The prisms are secured to the chassis and they must not be moved. The prisms may now be readily cleaned. Reassemble in reverse sequence.

For service other than that described above, consult your regional dealer.

Focal Length Inches	PROJECTION DISTANCE – FEET																
	40'	50'	60'	70'	80'	90'	100'	110'	120'	130'	140'	150'	160'	170'	180'	190'	200'
2.00	36.5 14.3	45.6 17.9	54.7 21.5	63.8 25.0	72.9 28.6	82.0 32.2	91.2 35.8										
2.25	32.4 12.7	40.5 15.9	48.6 19.1	56.7 22.2	64.8 25.4	72.9 28.6	81.0 31.8										
2.50	29.3 11.4	36.5 14.3	43.7 17.2	51.0 20.0	58.3 22.9	65.6 25.7	72.9 28.6	80.2 31.5									
2.75	26.5 10.4	33.1 13.0	39.8 15.6	46.4 18.2	53.0 20.8	59.6 23.4	66.3 26.0	72.9 28.6	79.6 31.2								
3.00	24.3 9.5	30.4 11.9	36.5 14.3	42.5 16.7	48.6 19.1	54.7 21.5	60.1 23.8	66.9 26.2	72.9 28.6	79.0 31.0							
3.25	22.4 8.8	28.1 11.0	33.7 13.2	39.3 15.4	44.9 17.6	50.5 19.8	56.1 22.0	61.7 24.2	67.3 26.4	72.9 28.6	78.5 30.8						
3.50	20.8 8.2	26.0 10.2	31.3 12.3	36.5 14.3	41.7 16.4	46.9 18.4	52.1 20.4	57.3 22.5	62.5 24.5	67.7 26.6	72.9 28.6	78.1 30.6					
3.75	19.4 7.6	24.3 9.5	29.2 11.4	34.0 13.4	38.9 15.3	43.7 17.2	48.6 19.1	53.5 21.0	58.4 22.9	63.2 24.8	68.1 26.7	72.9 28.6	77.8 30.5				
4.00		22.8 8.9	27.3 10.7	31.9 12.5	36.5 14.3	41.0 16.1	45.6 17.9	50.1 19.7	54.7 21.5	59.3 23.2	63.8 25.0	68.4 26.8	72.9 28.6	77.5 30.4			
4.25		21.4 8.4	25.7 10.1	30.0 11.8	34.3 13.5	38.6 15.2	42.9 16.8	47.2 18.5	51.5 20.2	55.8 21.9	60.0 23.6	64.4 25.2	68.6 26.9	72.9 28.6	77.2 30.3		
4.50		20.3 7.9	24.3 9.5	28.4 11.1	32.4 12.7	36.5 14.3	40.5 15.9	44.5 17.5	48.6 19.1	52.6 20.7	56.7 22.2	60.7 23.8	64.8 25.4	68.8 27.0	72.9 28.6	77.0 30.2	
4.75		19.2 7.5	23.0 9.0	26.9 10.5	30.7 12.0	34.5 13.6	38.4 15.1	42.2 16.6	46.1 18.1	49.9 19.6	53.7 21.1	57.6 22.6	61.4 24.1	65.3 25.6	69.1 27.1	72.9 28.6	76.8 30.1
5.00			21.9 8.6	25.5 10.0	29.2 11.4	32.8 12.9	36.5 14.3	40.1 15.7	43.8 17.2	47.4 18.6	51.0 20.0	54.7 21.5	58.3 22.9	62.0 24.3	65.6 25.7	69.2 27.2	72.9 28.6
5.25			20.8 8.2	24.3 9.5	27.8 10.9	31.2 12.3	34.7 13.6	38.2 15.0	41.7 16.3	45.2 17.7	48.6 19.1	52.1 20.4	55.6 21.8	59.0 23.2	62.5 24.5	66.0 25.9	69.4 27.2
5.50			19.9 7.8	23.2 9.1	26.5 10.4	29.8 11.7	33.1 13.0	36.5 14.3	39.8 15.6	43.1 16.9	46.4 18.2	49.7 19.5	53.0 20.8	56.3 22.1	59.6 23.4	63.0 24.7	66.3 26.0
5.75				22.2 8.7	25.4 10.0	28.5 11.2	31.7 12.4	34.9 13.7	38.0 14.9	41.2 16.2	44.4 17.4	47.6 18.7	50.7 19.9	53.9 21.1	57.1 22.4	60.2 23.6	63.4 24.9
6.00				21.3 8.3	24.3 9.5	27.3 10.7	30.4 11.9	33.4 13.1	36.5 14.3	39.5 15.5	42.6 16.7	45.6 17.9	48.6 19.1	51.7 20.3	54.7 21.5	57.7 22.6	60.8 23.8
6.25				20.4 8.0	23.4 9.2	26.1 10.3	29.2 11.4	32.1 12.6	35.0 13.7	37.9 14.9	40.9 16.0	43.8 17.2	46.7 18.3	49.6 19.5	52.5 20.6	55.4 21.7	58.4 22.9
6.50					22.4 8.8	25.2 9.9	28.1 11.0	30.9 12.1	33.7 13.2	36.5 14.3	39.3 15.4	42.1 16.5	44.9 17.6	47.7 18.7	50.5 19.8	53.3 20.9	56.1 22.0
6.75					21.6 8.5	24.3 9.5	27.0 10.6	29.7 11.7	32.4 12.7	35.1 13.8	37.8 14.8	40.5 15.9	43.2 17.0	45.9 18.0	48.6 19.1	51.3 20.1	54.0 21.2
7.00					20.8 8.2	23.4 9.2	26.0 10.2	28.7 11.2	31.3 12.3	33.9 13.3	36.5 14.3	39.1 15.3	41.7 16.4	44.3 17.4	46.9 18.4	49.5 19.4	52.1 20.4
7.50							24.3 9.5	26.8 10.5	29.2 11.4	31.6 12.4	34.0 13.4	36.5 14.3	38.9 15.3	41.3 16.2	43.7 17.2	46.2 18.1	48.6 19.1
8.00							22.8 8.9	25.1 9.8	27.3 10.7	29.6 11.6	31.9 12.5	34.2 13.4	36.5 14.3	38.7 15.2	41.0 16.1	43.3 17.0	45.6 17.9
8.50								23.6 9.3	25.7 10.1	27.9 10.9	30.0 11.8	32.2 12.6	34.3 13.5	36.5 14.3	38.6 15.2	40.7 16.0	42.9 16.8
9.00									24.3 9.5	26.3 10.3	28.4 11.1	30.4 11.9	32.4 12.7	34.4 13.5	36.5 14.3	38.5 15.1	40.5 15.9
	40'	50'	60'	70'	80'	90'	100'	110'	120'	130'	140'	150'	160'	170'	180'	190'	200'

FIGURE THREE

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PANAVISION, INC.
18618 OXNARD ST.
TARZANA, CALIF. 91356

PANAVISION, INCORPORATED

Post Office Box 24611

Los Angeles 24, California, U.S.A.

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