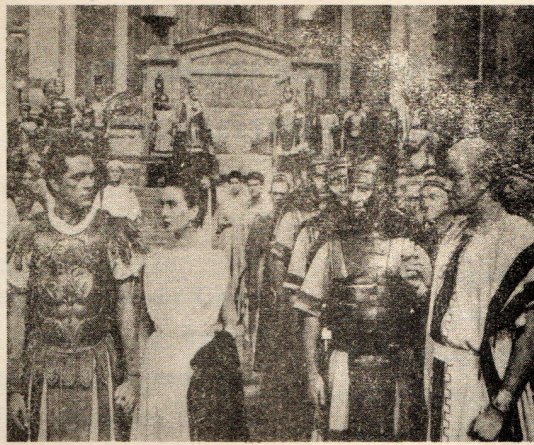
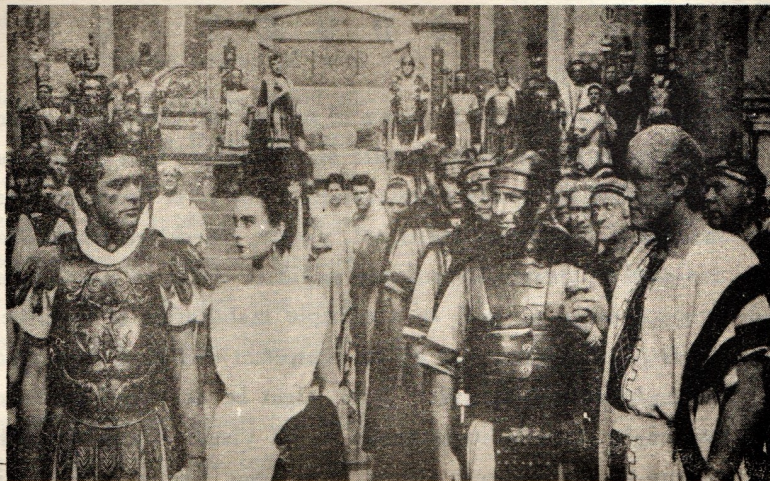


31 SOHO SQUARE, LONDON, W.1.

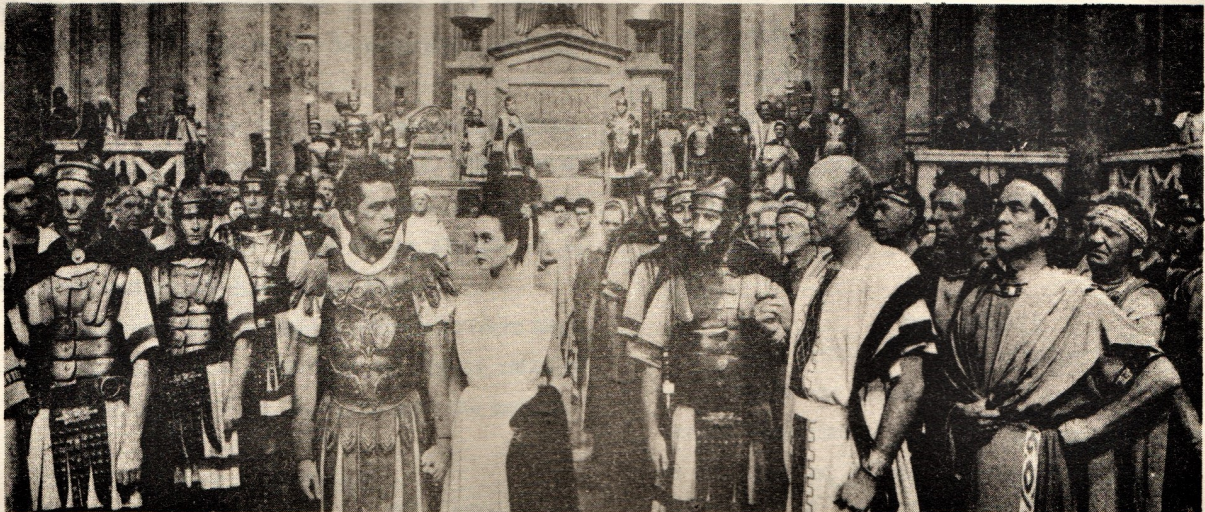
MANUAL
OF
PRELIMINARY INSTRUCTIONS
ON
SURVEYING THEATRES FOR
CINEMASCOPE
1953



PRESENT CONVENTIONAL



WIDE SCREEN PICTURE (Short Focal Length Lens)
Based on Present Conventional Picture



CINEMASCOPE PICTURE

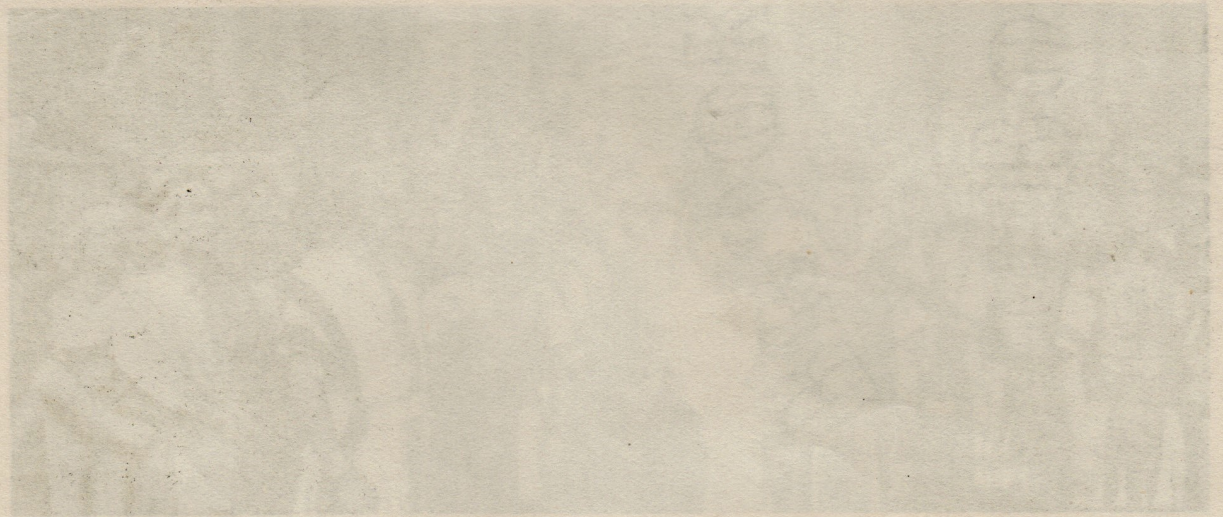
(Anamorphic Lens)

WHAT YOU SEE



I N T R O D U C T I O N

CinemaScope is a system of making and presenting motion pictures including in the theatre an anamorphic lens for expanding the projected picture horizontally, a curved or concave screen of special design, an additional, simple, film-driven sound head designed to pickup the multiple magnetic tracks of the CinemaScope system, as well as a multiple installation of amplifiers, speaker assemblies and allied equipment designed to produce stereophonic sound, which latter might be described as sound seemingly actually to originate at its visual source upon the picture or, as respects effects, from some source entirely outside the limits of the picture.



PRELIMINARY INSTRUCTIONS ON SURVEYING THEATRES FOR CINEMASCOPE

THE LENS

The anamorphic lenses supplied with the CinemaScope Package have been designed as frontal attachments to the regular projection lenses, and represent an approximate $6\frac{1}{2}$ " of extension beyond such projection lenses in installations using projection lenses of a diameter of $2\frac{25}{32}$ ", and an approximate $9\frac{1}{2}$ " in installations using projection lenses of a diameter of 4".

At the present time, projection lenses of focal lengths of 5.00" or less are furnished in barrel diameters of $2\frac{25}{32}$ ", and projection lenses in focal lengths of 5.25" and over are furnished in barrel diameters of 4.00", though in older types these longer focal length lenses appear in the smaller diameter barrels. It is recommended, however, that this latter type be replaced by new, higher quality, high-speed lenses.

Should the surveyed projection heads be fitted with a shutter in front of the projection lens, some modification of that arrangement may be necessary.

Some present projection lenses may not be of sufficiently high quality to permit the undistorted projection of the CinemaScope picture and replacement of such projection lenses is desirable, and may be essential.

Should the survey indicate a change in picture height outside of the range set forth in **THE APERTURE**, then additional projection lenses are required in any event, and these in all cases should be of high quality and should have a flat field.

The aperture and the anamorphic lens have been designed to produce a picture of an aspect ratio of 2.55 to 1; that is, the width is 2.55 times the height.

THE APERTURE

The aperture dimension for the CinemaScope picture is .715" x .912", resulting in an increase in height of the present picture by about one-sixth if the present projection lenses are retained. In practice, this dimension is entirely actual only in the case of head-on projection.

In angular projection, that is at greater angles of projection throw than zero degrees, the aperture plate, being delivered with a lesser opening than its nominal dimension, may be filed to the opening required by the individual situation as a correction for keystoneing.

This, as at present, is an on-the-job operation.

Accompanying these instructions are two charts being (a) a chart of the CinemaScope picture sizes resulting from the use of various focal length lenses at various throws at intervals of 10', and (b) a similar chart of picture sizes for the present conventional aperture of .600" x .825", obtained from the use of various focal length lenses at various throws, also in the intervals of 10'.

An examination of the chart indicates that for the same picture height, different size projection lenses will be required for the CinemaScope picture and for the present conventional picture.

Since heights increase somewhat with the angle of the throw, some account must be taken of this difference.

The actual picture widths given in the CinemaScope tables are figured upon the chord of the screen and not upon the arc.

For definitions of the terms chord, arc, rise and radius as they apply to the CinemaScope picture, see the chart and diagrams covering these terms and fixing these dimensions.

THE PORTS

(Not included in CinemaScope Package)

Since the beam from the anamorphic lens diverges immediately it leaves the lens, and the width of the beam is, generally speaking, more than double the width of the present beam, the present beam should be measured at the port and at any enframing of the port to determine the width required for the CinemaScope beam, and where necessary, ports must be enlarged and enframing of the ports cut away.

This width may be computed roughly as follows:

- (a) Multiply the distance of the face of the projection lens from the outer face of the wall of the projection booth (in inches) by 2.00;
- (b) Divide the above result by the focal length of the projection lens (in inches);
- (c) To this result add 4"

For example:

If the distance is 25"

and

The focal length is 5"

Then (A) : $25 \times 2.00 = 50.00$ inches

(B) : $50.00 \div 5 = 10.00$ inches

(C) : $10.00 + 4 = 14.00$ inches

or the minimum width of the port opening.

In case the light beam passes through the wall of the booth at an angle thereto, this width must be increased to compensate for the angle and the thickness of the wall.

THE SCREEN

The Miracle Mirror Screen delivered with the CinemaScope Package has been designed for maximum light reflection coupled with correct distribution, and will be fabricated and delivered in the over-all sizes required, webbed and grommeted, the latter on 6" centers with an additional grommet at each end of all seams.

There are two types of surface design available, one for projection angles approximately 10 to 12 degrees and greater, known as Type M-5 or tilted pattern, and one for projection angles less than approximately 10 to 12 degrees, and known as Type M-2 or head-on pattern, but a selection of Type can best be judged by first examining the Light Distribution charts and figures included in this manual, consisting of a series of drawings indicating the light reflections from these two types of screens at various angles of projection, and at vertical and tilted positions of the screen.

THE FRAME

(May or may not be included in the CinemaScope Package)

The screen must be mounted in a suitable frame and in a smooth concave curve, the arc of which is the picture throw or as close thereto as possible. In many instances, a cord or tape affixed to the projection booth wall at a point between the two projection

ports, may be used as a radius to describe the arc upon the floor of the stage.

Also included in this Manual is a chart explaining the meaning of the terms chord, arc, rise and radius as they apply to the CinemaScope picture and fixing the unknown dimensions when the length of the projection throw is known to the nearest 10 feet, and the size of the CinemaScope picture has been established.

In addition to the shaping of the aperture, where an angle of projection approximates 14 - 15 degrees and over, some tilt should be given the entire concave screen and frame to overcome keystoneing, but in practically every case this tilt should not exceed an approximate 5 - 6 degrees.

Some means of varying the tilt of the screen is desirable, but attention is called to the fact that, as a concave screen is tilted, its outer extremities rise, and this situation should be recognized in the design and construction of the frame.

By reason of the considerable size of the frame itself, and by reason of the various situations arising in theatres, standard forms of frames are not possible in every case. The exhibitor may wish to furnish his own frame in accordance with the diagrams attached to this survey, or a similar one of his own devising, but should he be unable to furnish and erect such a frame, then he should request frame quotations additionally from the supplier.

Since the picture width is computed upon the chord of the screen, the arc of such chord should be computed in order to obtain the width of screen necessary, and the height should be determined from the exhibitors' calculations as respects the size of the CinemaScope picture he desires, the size of the conventional picture he desires, and the size he might require for other methods of projection. Consult the charts for CinemaScope and conventional picture sizes.

THE MASKING

(Not included in CinemaScope Package)

The screen and frame should be masked top and bottom to the established height of the picture, placing the bottom of the CinemaScope picture as close to the floor of the stage as possible, or as low as the sight lines permit.

Since, as has been mentioned heretofore under THE FRAME, the outer ends of the picture projected

upon a curved or concave screen rise from the floor when the picture is tilted, a bottom masking with a curved top is indicated for such tilted installations. However, since the public has been accustomed to the straight lines of present maskings and the curved masking presents several additional problems, the bottom masking may be installed level in most instances provided it does not mask essential portions of the center of the picture upon which it must encroach.

The side maskings should be adjustable in width, possibly with a stiffened leading edge - to close in to mask the sheet for conventional pictures, and to open up to mask the sheet for the CinemaScope picture.

This may be done by supporting the side masking on tracks with suitable stops on the tracks and at the floor, or by other means, as may be devised by the engineer or the purchaser.

For this purpose, and for the use of close-in curtains, curved tracks are available from the supplier.

CLOSE-IN OR SCREEN CURTAIN

(Not included in CinemaScope Package)

In all cases a curtain, and including a valance, should be employed, if for no other reason than to keep the screen clean.

The curtain may be mounted on a curved or a straight track as may be indicated, and can be used for a side trim or false proscenium where required or desired, or extended with fixed tabs at each end to form a transition between picture and the house decoration.

THE SOUND

The stereophonic sound system, basically an integral part of the CinemaScope system, consists of an element to be attached to the projection head at its intersection with the upper magazine, designed to pick up the magnetic tracks of the picture film, together with the necessary pre-amplifiers, matched amplifier and speaker assemblies with monitor and other associated equipment.

The operation of this element will be controlled by switching arrangements as will the photographic pick-up in the present sound head, permitting them to

operate independently of one another as desired.

Since, in addition to the three primary magnetic sound tracks required for stereophonic sound, CinemaScope picture film will be supplied with a fourth effects and control track, some theatres may wish at their own election to extend the range of participation or effect into the auditorium where an additional pre-amplifier and amplifier will be required, together with a number of house speakers as may be indicated by survey.

The Amplifiers: In every case, the amplifiers provided for stereophonic sound must match, but should the present amplifier be entirely suitable, it may be retained and two identical amplifiers added to complete the basic requirements of CinemaScope.

Should it be unsuitable, its use for auditorium speaker use should be assessed, and three perfectly matched units installed.

Speaker Assemblies: In every case, the speaker assemblies must match, but should the present speaker assembly be entirely suitable, it may be retained and two identical assemblies added to complete the basic requirements of CinemaScope.

Should the speaker assembly be unsuitable, then three matched units must be installed.

The suitability of the amplifiers and the speaker assemblies and the ability to match them must be determined by the equipment-supplying engineers after their survey of the theatre.

The three speaker assemblies will be mounted in the usual manner back of the screen, one upon the center line, the other two on the center line of each outside one-third of the picture, i.e., at $W/3$ each side of the center line and as close to the screen surface as practicable. Proper mounting is extremely important if the maximum effectiveness possible with stereophonic sound is to be attained throughout the theatre.

No braces or other obstructions in the frame construction should be permitted to be installed immediately in front of these assemblies.

For additional definition of $W/3$, consult the screen frame drawings included in this manual.

* * *

35-MM PROJECTION TABLE

CINEMASCOPE APERTURE: 0.912" x 0.715"

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'	

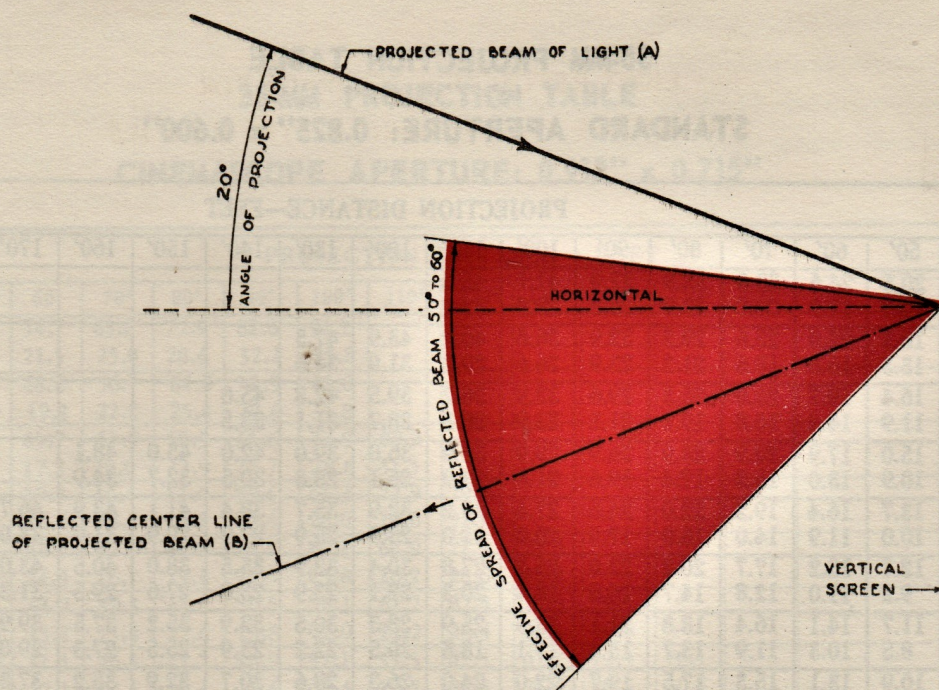
SIZES GIVEN ARE TO THE NEAREST TENTH OF A FOOT

35-MM PROJECTION TABLE

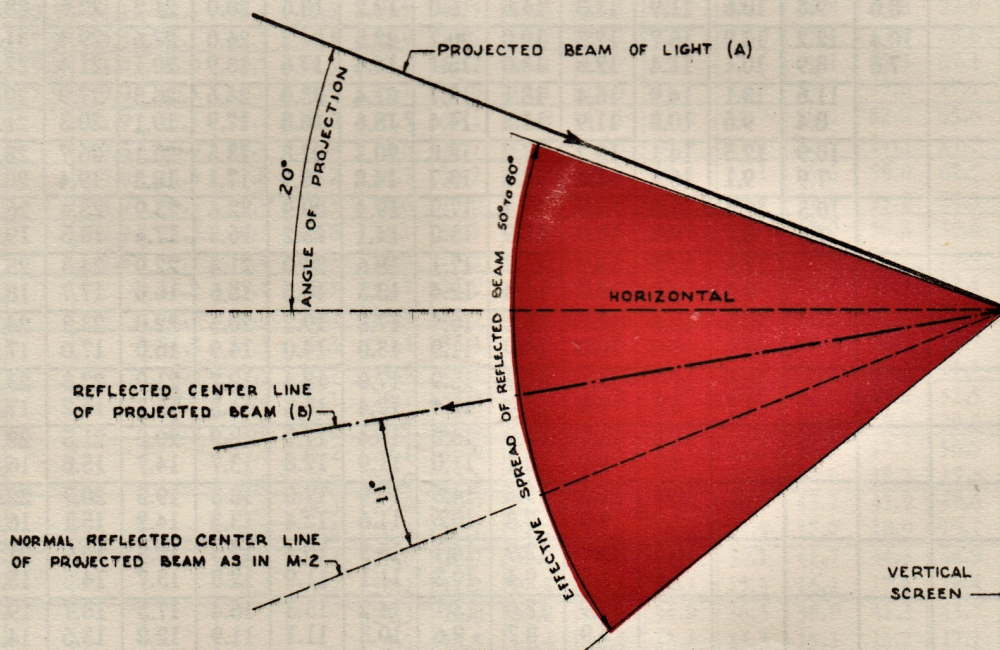
STANDARD APERTURE: 0.825" x 0.600"

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	16.4 11.9	20.5 14.9	24.6 17.9	28.8 20.9	32.9 23.9	37.0 26.9	41.1 29.9	45.3 32.9									
2.25	14.6 10.6	18.3 13.3	22.0 16.0	25.6 18.6	29.2 21.2	32.9 23.9	36.6 26.6	40.2 29.2	43.9 31.9	47.5 34.6							
2.50	13.1 9.6	16.4 11.9	19.7 14.4	23.0 16.8	26.3 19.1	29.6 21.5	32.9 23.9	36.2 26.3	39.5 28.7	42.8 31.1	45.6 33.5						
2.75	12.0 8.7	15.0 10.9	17.9 13.0	20.9 15.2	23.9 17.4	26.9 19.6	29.9 21.8	32.9 23.9	36.0 26.1	39.0 28.3	42.0 30.5	45.0 32.7	48.1 34.9				
3.00	10.9 8.0	13.7 10.0	16.4 11.9	19.2 14.0	22.0 16.0	24.6 17.9	27.4 20.0	30.2 22.0	32.9 23.9	35.7 25.9	38.4 27.9	41.1 29.9	43.9 31.9	46.7 34.0			
3.25	10.1 7.3	12.7 9.2	15.2 11.0	17.7 12.8	20.2 14.7	22.8 16.6	25.3 18.4	27.8 20.3	30.4 22.1	32.9 23.9	35.5 25.8	38.0 27.6	40.5 29.5	43.0 31.3	45.6 33.1		
3.50	9.4 6.8	11.7 8.5	14.1 10.3	16.4 11.9	18.8 13.7	21.1 15.4	23.5 17.1	25.9 18.8	28.3 20.5	30.5 22.2	32.9 23.9	35.2 25.5	37.5 27.3	39.9 29.0	42.3 30.8	44.7 32.5	47.0 34.2
3.75		10.9 7.9	13.1 9.6	15.3 11.1	17.5 12.8	19.7 14.4	22.0 16.0	24.0 17.6	26.3 19.1	28.6 20.7	30.7 22.3	32.9 23.9	35.2 25.6	37.3 27.2	39.5 28.8	41.7 30.3	43.9 31.9
4.00		10.2 7.4	12.3 8.9	14.3 10.4	16.4 11.9	18.5 13.4	20.5 14.9	22.6 16.4	24.6 17.9	26.7 19.4	28.8 20.9	30.8 22.4	32.9 23.9	35.0 25.4	37.0 26.9	39.1 28.4	41.1 29.9
4.25		9.7 7.1	11.7 8.5	13.5 9.8	15.5 11.2	17.4 12.7	19.3 14.0	21.2 15.4	23.2 16.8	25.2 18.3	27.1 19.7	29.1 21.1	30.9 22.5	32.9 23.9	34.9 25.3	36.8 26.8	38.8 28.8
4.50			10.9 8.0	12.8 9.3	14.6 10.6	16.4 11.9	18.3 13.3	20.1 14.6	22.0 16.0	23.7 17.2	25.6 18.6	27.4 20.0	29.2 21.2	31.0 22.6	32.9 23.9	34.8 25.3	36.6 26.6
4.75			10.4 7.6	12.2 8.9	13.9 10.1	15.7 11.4	17.3 12.6	19.0 13.0	20.7 15.1	22.5 16.4	24.2 17.6	26.0 18.9	27.6 20.1	29.4 21.4	31.1 22.6	32.9 23.9	34.7 25.2
5.00				11.6 8.4	13.1 9.6	14.9 10.8	16.4 11.9	18.1 13.2	19.7 14.4	21.4 15.6	23.0 16.8	24.6 17.9	26.3 19.1	27.9 20.3	29.6 21.5	31.3 22.8	32.9 23.9
5.25				10.9 7.9	12.5 9.1	14.1 10.3	15.7 11.4	17.2 12.5	18.8 13.7	20.3 14.8	21.8 15.9	23.5 17.1	25.1 18.3	26.7 19.4	28.3 20.5	29.8 21.7	31.3 22.8
5.50				10.5 7.6	12.0 8.7	13.5 9.8	15.0 10.9	16.4 11.9	17.9 13.0	19.4 14.1	20.9 15.2	22.4 16.3	23.9 17.4	25.4 18.5	26.9 19.6	28.4 20.6	29.9 21.8
5.75					11.3 8.3	12.8 9.3	14.2 10.3	15.7 11.4	17.1 12.4	18.6 13.5	20.0 14.5	21.4 15.6	22.9 16.6	24.3 17.7	25.8 18.7	27.2 19.8	28.6 20.8
6.00					10.9 8.0	12.3 8.9	13.7 10.0	15.1 10.9	16.4 11.9	17.8 13.0	19.2 14.0	20.5 14.9	22.0 16.0	23.3 17.0	24.6 17.9	26.0 18.9	27.4 20.0
6.25					10.5 7.7	11.9 8.6	13.1 9.5	14.3 10.4	15.9 11.4	17.0 12.4	18.4 13.3	19.7 14.3	21.0 15.3	22.3 16.2	23.6 17.2	25.0 18.1	26.3 19.1
6.50						11.4 8.3	12.7 9.2	13.9 10.1	15.2 11.0	16.4 11.9	17.7 12.8	18.9 13.7	20.2 14.7	21.5 15.6	22.8 16.6	24.0 17.5	25.3 18.4
6.75						10.9 7.9	12.2 8.8	13.4 9.8	14.6 10.6	15.9 11.6	17.0 12.4	18.3 13.3	19.5 14.2	20.7 15.1	22.0 16.0	23.2 16.9	24.4 17.8
7.00						10.5 7.6	11.7 8.5	12.9 9.4	14.1 10.3	15.3 11.1	16.4 11.9	17.5 12.8	18.8 13.7	19.9 14.5	21.1 15.4	22.3 16.2	23.5 17.1
7.50							10.9 7.9	12.0 8.7	13.1 9.6	14.2 10.3	15.3 11.1	16.4 11.9	17.5 12.8	18.7 13.5	19.7 14.4	20.8 15.2	22.0 16.0
8.00							10.2 7.4	11.2 8.2	12.3 8.9	13.3 9.7	14.3 10.4	15.4 11.2	16.4 11.9	17.4 12.7	18.5 13.4	19.5 14.2	20.5 14.9
8.50								10.6 7.6	11.7 8.5	12.6 9.1	13.5 9.8	14.5 10.5	15.5 11.2	16.4 11.9	17.4 12.7	18.4 13.4	19.3 14.0
9.00									11.0 8.0	11.8 8.6	12.8 9.3	13.7 10.0	14.6 10.6	15.5 11.3	16.4 11.9	17.3 12.6	18.3 13.3

SIZES GIVEN ARE TO THE NEAREST TENTH OF A FOOT



SCREEN TYPE M-2
HEAD ON PATTERN



SCREEN TYPE M-5
TILTED PATTERN

ACTION OF A BEAM OF LIGHT PROJECTED AT 20 DEGREES UPON MIRACLE MIRROR SCREENS

NOTE: THE APPLICATION OF THIS PRINCIPLE TO VARIOUS TYPES OF THEATERS AND VARIOUS ANGLES OF PROJECTION ARE SHOWN IN THE FOLLOWING FIGURED CHARTS

**LIGHT REFLECTION COVERAGE FOR
CINEMASCOPE PICTURE SCREEN TYPE M-2 & M-5**

Fig. 1 Type M2 tilted 6°
Angle of projection 20°
150' throw. Seating 2200 to 3000

Type M5 tilted 6°
Angle of projection 20°
150' throw - Seating 2200 to 3000

Fig. 2 Type M2 tilted 6°
Angle of projection 15°
150' throw. Seating 1800 to 2500

Type M5 tilted 6°
Angle of projection 15°
150' throw. Seating 1800 to 2500

Fig. 3 Type M2 Vertical
Angle of projection 15°
150' throw. Seating 1800 to 2500

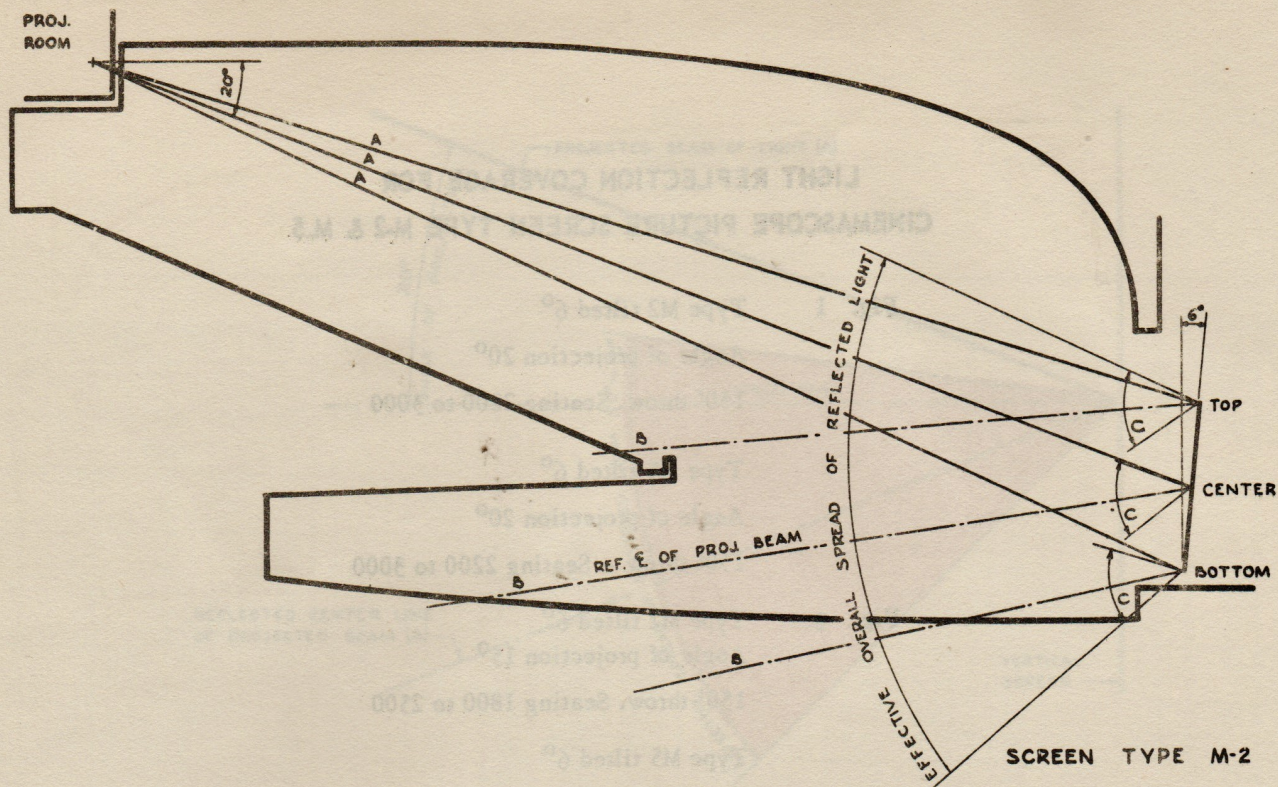
Type M5 Vertical
Angle of projection 15°
150' throw. Seating 1800 to 2500

Fig. 4 Type M2 Vertical
Angle of projection 10°
150' throw. Seating 1500 to 2000

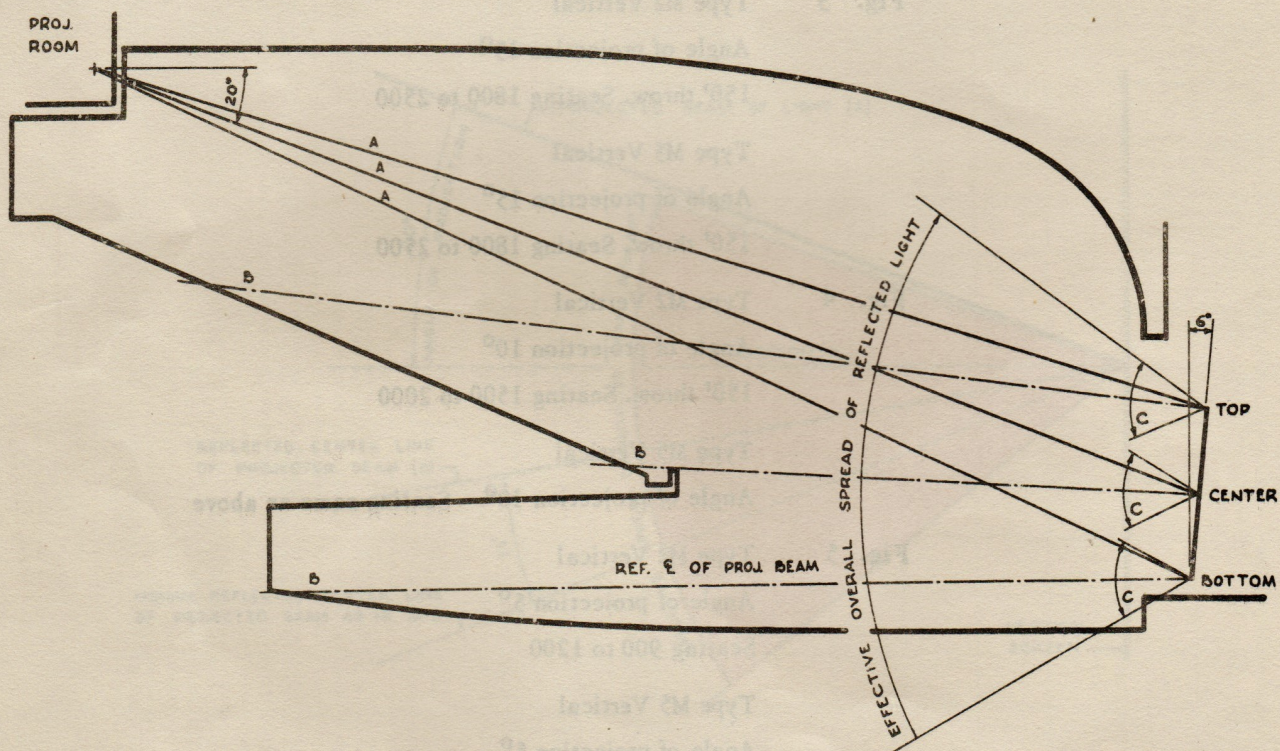
Type M5 Vertical
Angle of projection 10° - Seating same as above

Fig. 5 Type M2 Vertical
Angle of projection 5°
Seating 900 to 1200

Type M5 Vertical
Angle of projection 5°
Seating same as above



SCREEN TYPE M-2



SCREEN TYPE M-5

Figure 1

ANGLE OF PROJECTION 20° 150 FT. THROW SEATING 2200 TO 3000

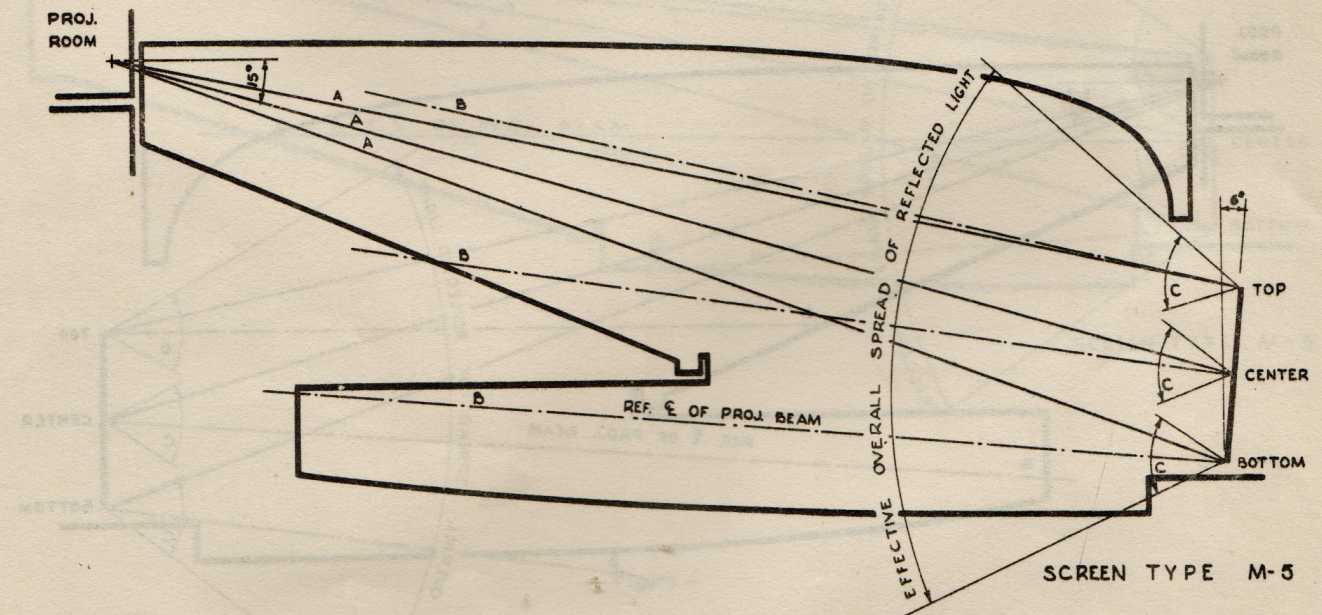
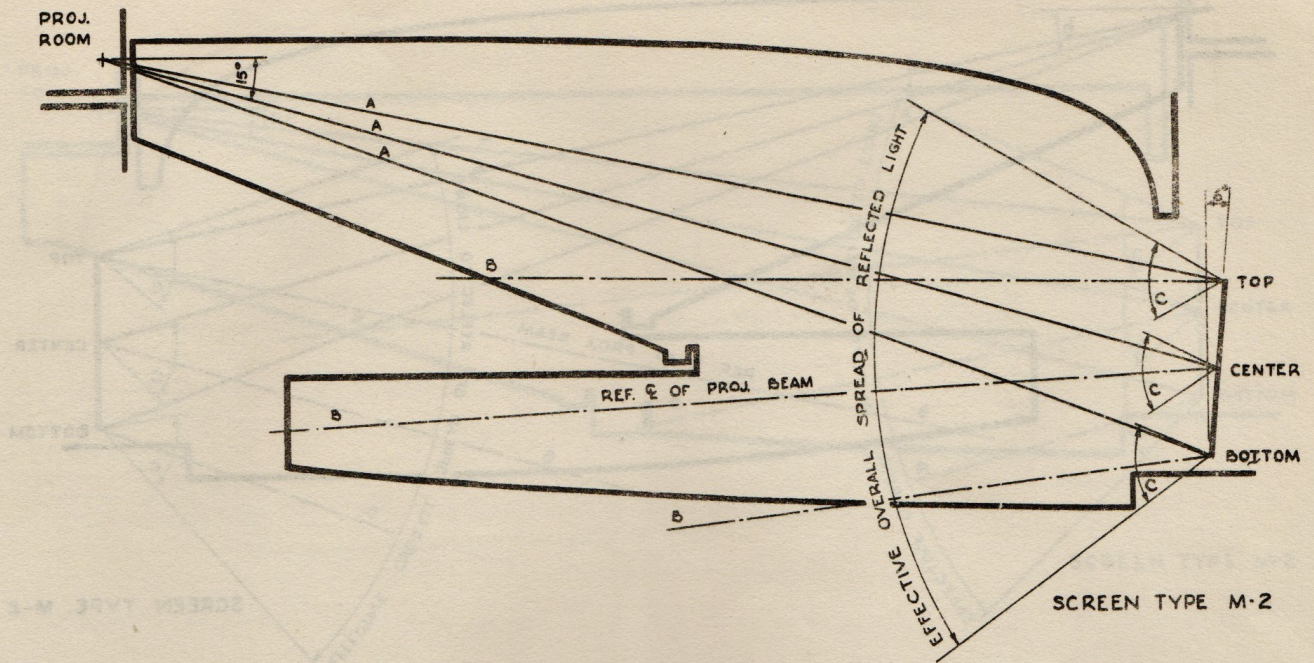


Figure 2

ANGLE OF PROJECTION 15°

150 FT. THROW

SEATING 1800 TO 2500

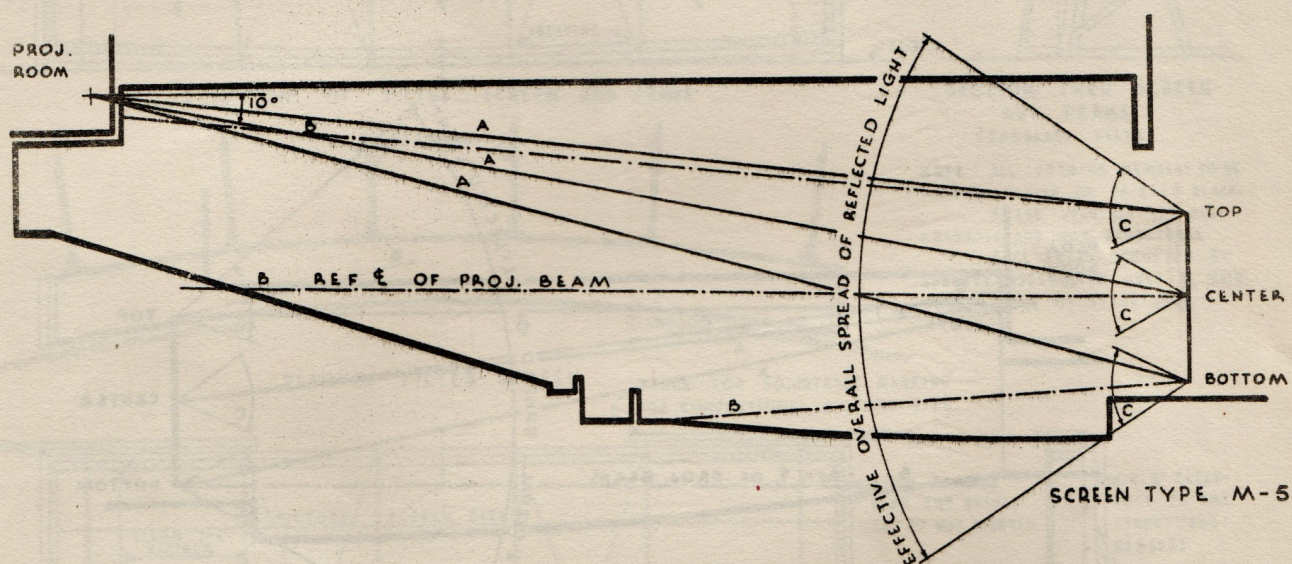
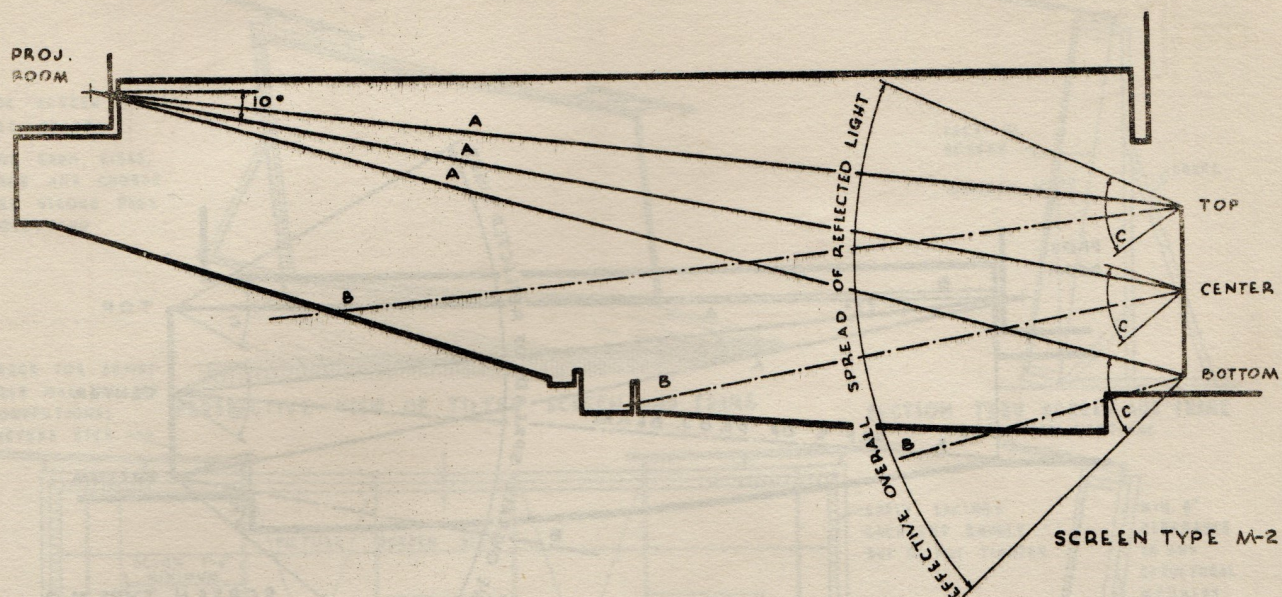


Figure 4

ANGLE OF PROJECTION 10° 150 FT THROW SEATING 1500 TO 2000

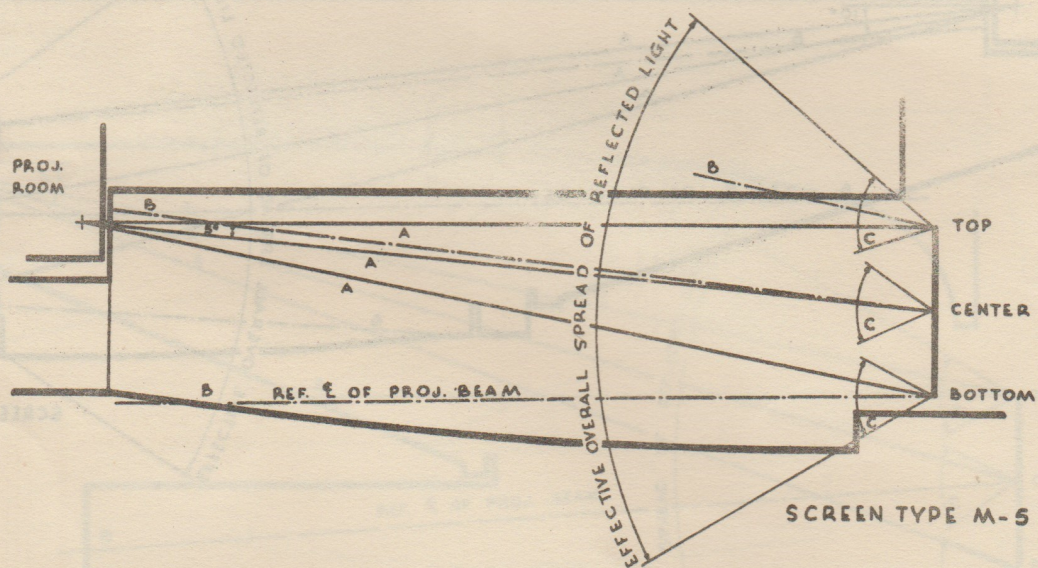
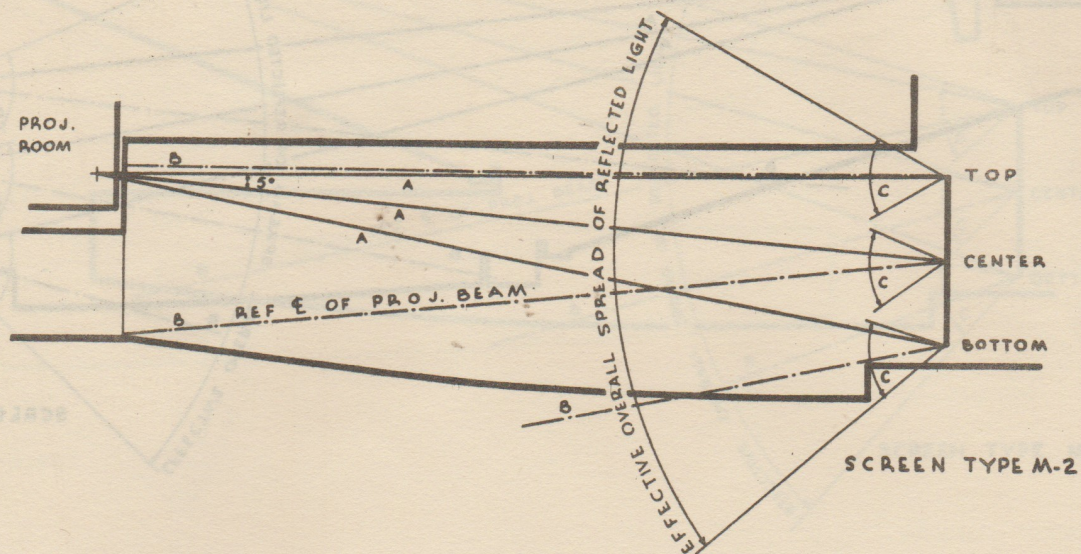


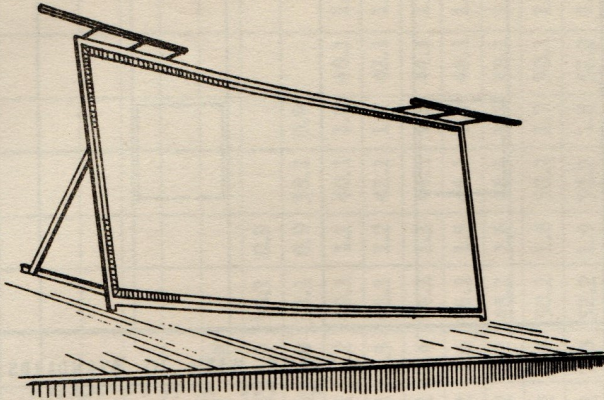
Figure 5

ANGLE OF PROJECTION 5° 110 FT THROW

SEATING 900 TO 1200

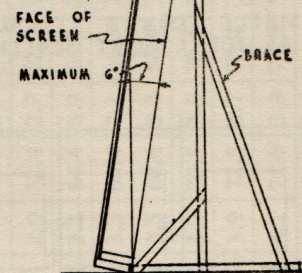
FOR SCREEN SIZES
SEE CHART

FOR RADII, RISES,
ARCS AND CHORDS
SEE SECOND PAGE
FOLLOWING

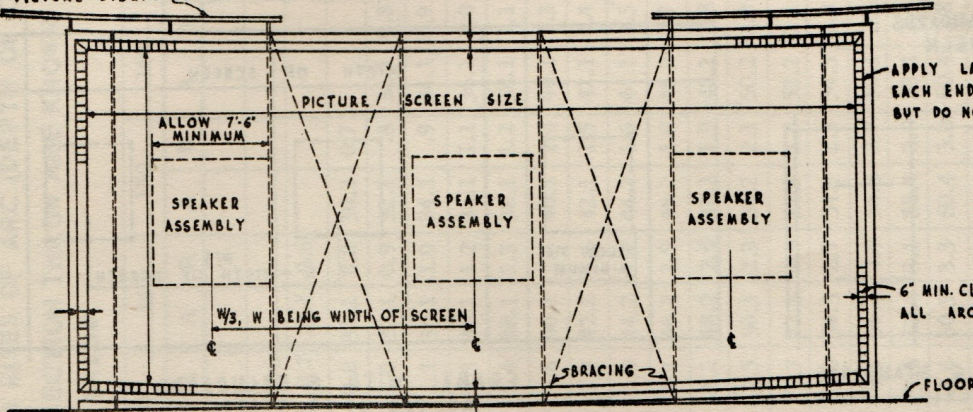


TRACK FOR ADJUST-
ABLE MASKING FOR
CONVENTIONAL
PICTURE SIZE.

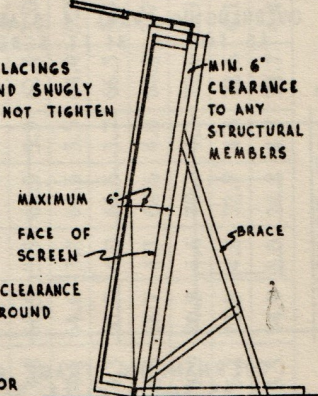
PERSPECTIVE VIEW OF TILTED SCREEN AND FRAME



SECTION THRU SCREEN AND FRAME
STANDARDS VERTICAL

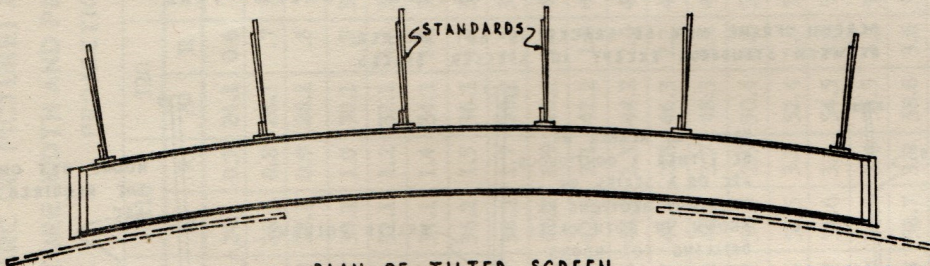


ELEVATION OF TILTED SCREEN AND FRAME



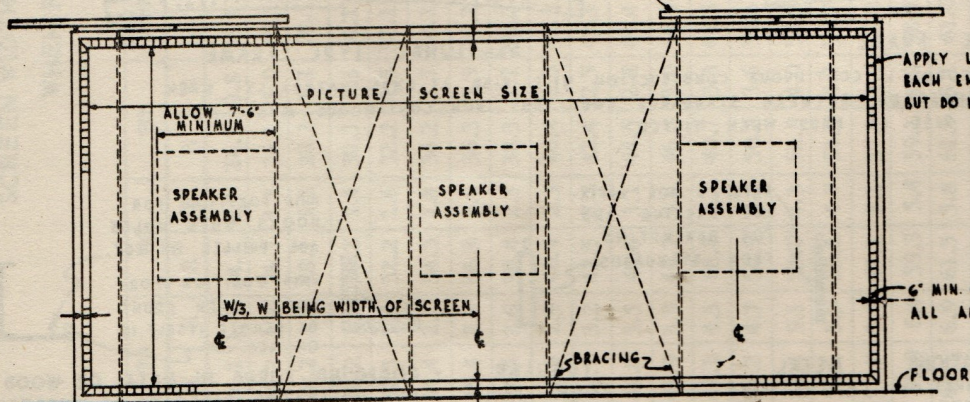
SECTION THRU SCREEN
AND FRAME
STANDARDS TILTED

NOTE: ALL FRAMING MEMBERS TO BE
PAINTED IN FINISH OR PAINTED BLACK.
THESE DRAWINGS ARE DIA-
GRAMMATIC AND NOT STRUCTURAL.
FACE AREAS OCCUPIED BY
SPEAKER ASSEMBLIES MUST BE MAIN-
TAINED FREE OF STRUCTURAL
MEMBERS.

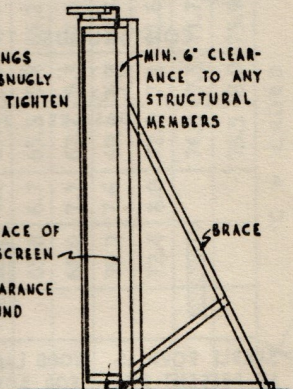


PLAN OF TILTED SCREEN

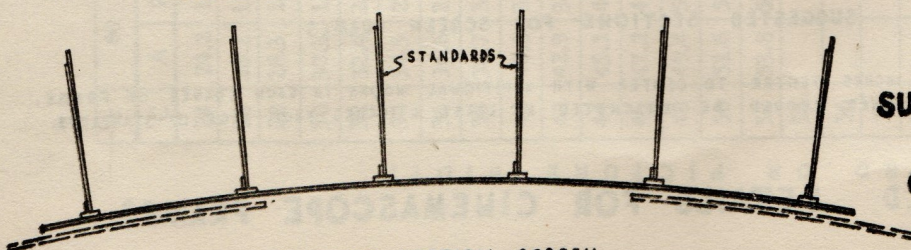
TRACK FOR ADJUSTABLE MASKING
FOR CONVENTIONAL PICTURE SIZE



ELEVATION OF VERTICAL SCREEN AND FRAME

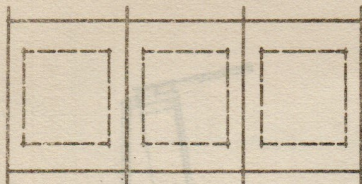


SECTION THRU SCREEN
AND FRAME

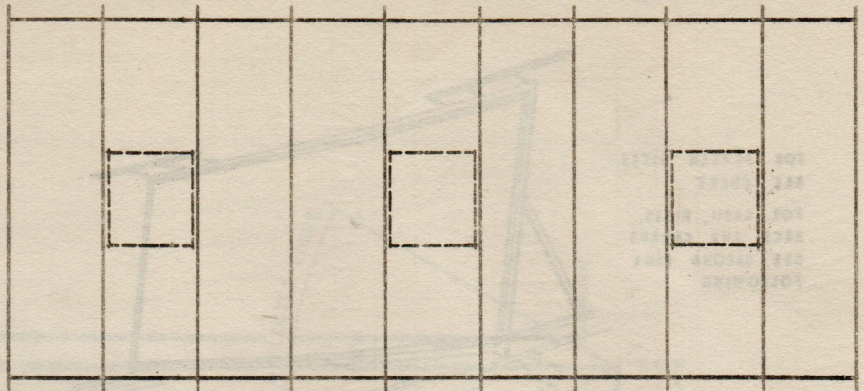


PLAN OF VERTICAL SCREEN

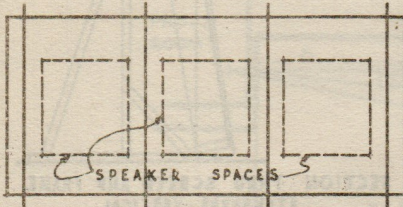
**SUGGESTED FRAME FORMS
FOR
CINEMASCOPE SCREEN**



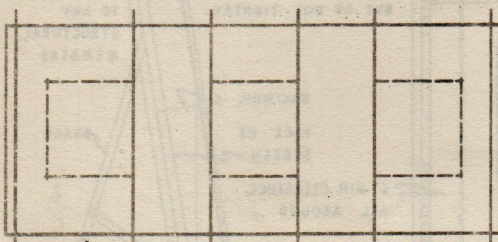
SIMPLE FORM 4 STANDARDS
AS FOR A 30 FT. SCREEN



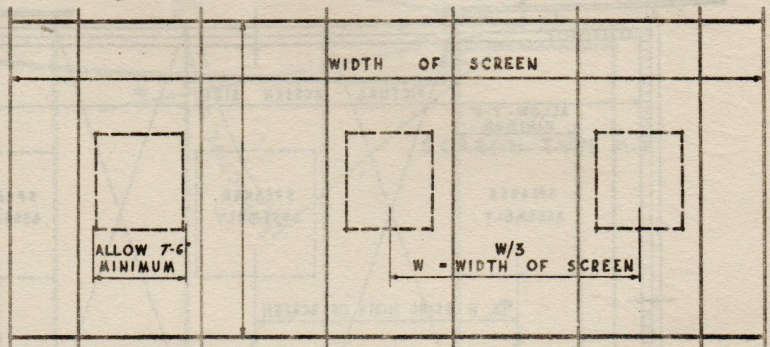
FRAME WITH 10 STANDARDS
AS FOR A 72 FT. SCREEN



OVERHANGING FRAME 4 STANDARDS
AS FOR A 34 FT. SCREEN



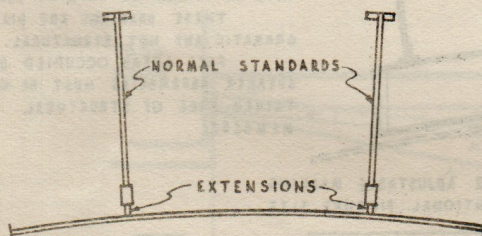
OVERHANGING FRAME 6 STANDARDS
AS FOR A 42 FT. SCREEN



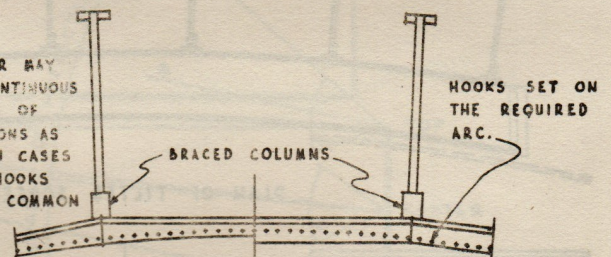
FRAME WITH 8 STANDARDS
AS FOR 64 FT. SCREEN

SUGGESTED POSITIONING OF STANDARDS SUPPORTING SCREEN FRAME

SCREEN FRAME MAY BE BRACED IN ANY MANNER
BETWEEN STANDARDS EXCEPT IN SPEAKER SPACES.

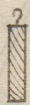


CONTINUOUS TYPE FRAME

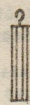


SECTIONAL TYPE FRAME

NOTE: ALL FORMS IF CONTINUOUS CONSTRUCTION WILL RISE AT ENDS NATURALLY WHEN
TILTED. IF INSERTED BETWEEN STANDARDS AND THUS NON-CONTINUOUS MUST BE
DESIGNED FOR RISE AT ENDS WHEN TILTED.



SIMPLE FORM AS
AT PRESENT FOR
SMALLER SIZES



WOOD LAMINATIONS
FOR SOMEWHAT
LARGER SIZES



METAL
LAMINATIONS
FOR LARGE SIZES



TUBULAR
FORMS FOR
ALL SIZES



THIS POSITION FOR
HOOKS WHEN HOLES
ARE DRILLED ON ARC.

THIS POSITION FOR
HOOKS WHEN FRONT
OF MEMBER ITSELF IS
ON ARC.

COMPOUND FORMS IN METAL OR WOOD
FOR UNLIMITED SIZES TO BE INSERTED
BETWEEN STANDARDS AS SHOWN ABOVE.

SUGGESTED SECTIONS FOR SCREEN FRAMES

ALL LACING HOOKS TO BE 6 INCHES CENTER TO CENTER WITH ADDITIONAL HOOKS IN EACH CORNER OF FRAME.
ALL CONTINUOUS TYPE FRAMES SHOULD BE BRACKETED AT LEAST 6 INCHES FROM FACE OF STANDARDS.

SUGGESTED DETAILS FOR CINEMASCOPE FRAMES

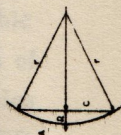
**SCREEN WIDTHS (ARC OF PICTURE) AND RISES OF ARC (DEPTH OF CURVE)
WHEN PICTURE WIDTH AND PROJECTION THROW ARE KNOWN.**

PROJECTION THROW

r	60		70		80		90		100		110		120		130		140		150		160		170		180		190		200	
	C	A	R	A	R	A	R	A	R	A	R	A	R	A	R	A	R	A	R	A	R	A	R	A	R	A	R	A	R	A
24	24.2	1.2	24.1	1.0	24.1	0.9	24.1	0.8	24.1	0.7	24.1	0.7	24.1	0.6																
26	26.2	1.4	26.2	1.2	26.1	1.1	26.1	1.0	26.1	0.9	26.1	0.8	26.1	.7	26.1	0.6														
28	28.3	1.6	28.2	1.3	28.1	1.2	28.1	1.1	28.1	1.0	28.1	0.9	28.1	.8	28.1	0.7	28.1	0.6												
30	30.3	1.9	30.2	1.6	30.2	1.4	30.1	1.3	30.1	1.2	30.1	1.0	30.1	.9	30.1	0.8	30.1	0.8	30.1	0.7										
32	32.4	2.2	32.3	1.9	32.2	1.6	32.2	1.5	32.1	1.3	32.1	1.2	32.1	1.1	32.1	1.0	32.1	0.9	32.1	.8	32.1	0.8								
34	34.5	2.5	34.4	2.1	34.3	1.8	34.2	1.7	34.1	1.5	34.1	1.4	34.1	1.2	34.1	1.1	34.1	1.0	34.1	.9	34.1	0.9	34.1	0.8						
36	36.6	2.8	36.4	2.3	36.3	2.0	36.3	1.9	36.2	1.7	36.2	1.5	36.1	1.4	36.1	1.3	36.1	1.2	36.1	1.1	36.1	1.0	36.1	1.0	36.1	0.9				
38	38.7	3.1	38.5	2.6	38.4	2.3	38.3	2.1	38.2	1.9	38.2	1.7	38.2	1.5	38.1	1.4	38.1	1.3	38.1	1.2	38.1	1.1	38.1	1.0	38.1	0.9	38.1	0.9		
40	40.8	3.4	40.6	2.9	40.4	2.5	40.4	2.3	40.3	2.1	40.2	1.9	40.2	1.7	40.2	1.6	40.1	1.5	40.1	1.4	40.1	1.3	40.1	1.2	40.1	1.1	40.1	1.0	40.1	1.0
42	42.9	3.8	42.7	3.2	42.5	2.8	42.4	2.5	42.3	2.3	42.3	2.1	42.2	1.8	42.2	1.7	42.2	1.6	42.1	1.5	42.1	1.4	42.1	1.3	42.1	1.2	42.1	1.1	42.1	1.1
44	45.1	4.2	44.8	3.5	44.6	3.1	44.5	2.8	44.4	2.5	44.3	2.3	44.2	2.0	44.2	1.9	44.2	1.7	44.2	1.6	44.1	1.5	44.1	1.4	44.1	1.3	44.1	1.2	44.1	1.2
46	47.2	4.6	46.9	3.9	46.7	3.4	46.6	3.0	46.4	2.7	46.4	2.5	46.3	2.2	46.2	2.1	46.2	1.9	46.2	1.8	46.2	1.7	46.2	1.6	46.1	1.5	46.1	1.4	46.1	1.3
48	49.4	5.0	49.1	4.3	48.8	3.7	48.7	3.3	48.5	3.0	48.4	2.7	48.3	2.4	48.3	2.2	48.2	2.0	48.2	1.9	48.2	1.8	48.2	1.7	48.2	1.6	48.1	1.5	48.1	1.4
50	51.6	5.5	51.2	4.7	50.9	4.0	50.8	3.6	50.6	3.2	50.5	2.9	50.4	2.6	50.3	2.5	50.3	2.3	50.2	2.1	50.2	2.0	50.2	1.9	50.2	1.8	50.2	1.7	50.1	1.6
52	53.8	5.9	53.4	5.1	53.0	4.3	52.9	4.0	52.7	3.5	52.5	3.2	52.4	2.9	52.4	2.7	52.3	2.5	52.3	2.3	52.2	2.1	52.2	2.0	52.2	1.9	52.2	1.8	52.2	1.7
54			55.6	5.5	55.1	4.7	54.9	4.2	54.7	3.7	54.6	3.4	54.5	3.1	54.4	2.9	54.3	2.7	54.3	2.5	54.3	2.3	54.3	2.2	54.2	2.0	54.2	1.9	54.2	1.8
56			57.7	5.9	57.2	5.1	57.0	4.5	56.8	4.0	56.6	3.6	56.5	3.3	56.5	3.1	56.4	2.9	56.3	2.7	56.3	2.5	56.3	2.3	56.3	2.2	56.2	2.1	56.2	2.0
58			59.9	6.4	59.3	5.4	59.1	4.8	58.9	4.3	58.7	3.9	58.6	3.6	58.5	3.3	58.4	3.1	58.4	2.9	58.3	2.6	58.3	2.5	58.3	2.3	58.3	2.2	58.2	2.1
60			62.1	6.9	61.5	5.8	61.3	5.1	61.0	4.6	60.8	4.2	60.6	3.8	60.6	3.6	60.5	3.3	60.4	3.0	60.4	2.8	60.3	2.7	60.3	2.5	60.3	2.4	60.2	2.3
62			64.3	7.4	63.7	6.2	63.4	5.5	63.1	4.9	62.9	4.5	62.7	4.1	60.6	3.8	60.5	3.5	62.5	3.3	62.4	3.0	62.4	2.9	62.4	2.7	62.3	2.6	62.3	2.4
64					65.8	6.7	65.5	5.8	65.2	5.2	65.0	4.8	64.8	4.4	64.7	4.1	64.6	3.8	64.5	3.5	64.4	3.2	64.4	3.1	64.4	2.9	64.3	2.8	64.3	2.6
66					68.0	7.1	67.7	6.3	67.4	5.5	67.1	5.1	66.9	4.6	66.8	4.3	66.7	4.0	66.6	3.7	66.5	3.5	66.4	3.3	66.4	3.1	66.3	2.9	66.3	2.7
68					70.2	7.6	69.8	6.7	69.5	5.9	69.2	5.4	68.9	4.9	68.8	4.6	68.7	4.3	68.6	4.0	68.5	3.7	68.5	3.5	68.4	3.3	68.4	3.1	68.3	2.9
70					72.4	8.0	72.0	7.1	71.6	6.3	71.3	5.7	71.0	5.2	70.9	4.9	70.8	4.6	70.7	4.2	70.6	3.9	70.5	3.7	70.5	3.5	70.4	3.4	70.4	3.1
72							74.2	7.5	73.7	6.7	73.4	6.0	73.1	5.5	73.0	5.2	72.9	4.8	72.7	4.5	72.6	4.1	72.6	3.9	72.5	3.7	72.4	3.5	72.4	3.3
74							76.5	8.0	75.9	7.1	75.5	6.4	75.3	5.9	75.3	5.5	74.9	5.0	74.8	4.7	74.7	4.4	74.7	4.1	74.6	3.9	74.5	3.7	74.4	3.4

NOTICE: These figures may be used for screen or frame; the inside dimension of the frame being a minimum 12 inches greater than the screen.

C = CHORD
R = RADIUS
A = ARC LENGTH
R = RISE



CHORD OR PICTURE RADIUS

DIRECTIONS FOR HANGING MIRACLE MIRROR SCREENS

The Miracle Mirror Screen is shipped as a roll and is carefully boxed, with the reflecting face of the screen protected by paper, inserted during the rolling.

In the case of Type M-5, the tilted pattern, the top of the screen is plainly marked, but all screens will usually be fitted with ties in the top webbing, thereby not only indicating the top of the screen but providing a preliminary means of hanging the screen from the hooks of the top member of the frame, these ties being removed as the lacing is completed.

Screen sizes are given in over-all dimensions, including the webbing, in which latter the grommets are spaced evenly on 6 inch centers, with extra grommets at the ends of all seams, which seams are vertical.

The screen will be rolled upon a metal tube to stiffen the package and must not be unrolled except to install it upon the frame.

Accompanying the screen container will be a wooden plate somewhat larger than the diameter of the roll.

In this wooden plate is a rectangular hole thru which a peg, (also included in the package) may be thrust and nailed securely in place.

This peg will be furnished long enough to enter the tube on which the screen is rolled and yet leave a sufficient length below the plate to position the upper webbing of the screen at lacing distance from the upper member of the frame, when the entire roll, plate and peg have been assembled and lifted to a vertical position. The length below the plate may vary somewhat in every installation.

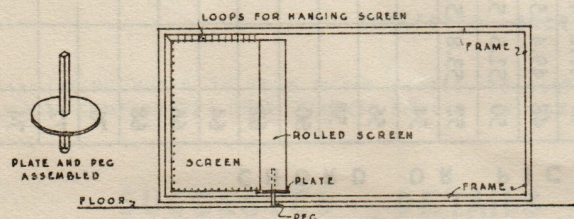
If this peg is rounded at its lower extremity, the entire roll may be rotated freely upon the floor of the stage when upright, and the lower portions of the screen will be protected by the plate from crushing.

Before starting the installation of the screen, it should be determined how close the lower webbing of the screen is to be set to the floor and the lower member of the frame.

A dimension should then be taken from that point to the hooks of the top member of the frame.

This dimension should then be used to fix loops in the ties affixed to the top webbing of the screen; that is by measuring from the lower webbing of the screen roll to a point on the ties where the hanging loop is to be made, using the dimension previously secured.

The operation of installing the screen is started by standing the roll upright adjacent to the frame and as the loops in the ties are hooked to the top member of the frame, the screen is unrolled by rotating it and the previously described plate and peg, and at the same time advancing the roll, plate and peg longitudinally in front of the frame.



Lacing of the top member may then be commenced and if the grommet holes of the screen are all immediately below the hooks of the upper member of the frame, a loop type lacing may be used, but if the relationship of grommets and hooks is irregular, then a diagonal type of lacing should be employed. Usually the relationship will be correct as respects the top of the screen and frame.

Once the screen has been unrolled and laced completely and evenly to the top member of the frame, the bottom webbing should be laced to the bottom member of the frame, starting at the middle of the screen and frame and lacing both ways. Before lacing the bottom member, the relationship of the grommets of the bottom webbing and the hooks of the bottom member of the frame should be studied and if the screen falling evenly itself, the grommets and hooks in a vertical line, then the loop type lacing may be employed, but if the relationship is irregular, a diagonal type lacing should be used.

If upon completion of this operation, the screen lays evenly and without folds in its final position, then the lacing on both screen ends should be completed either by loops or diagonals, in accordance with the relationship of the grommets and hooks at the sides.

If upon completion of the above operation, the screen still lies evenly upon the frame, then the top and bottom lacings may be gradually firmed, using care not to exert too great tension at the individual grommets or in the overall.

When the top and bottom members have been snugly laced, then the end lacings may be completed, but only to the point of snugness, since a tight lacing at the ends will tend to raise the middle sections of the screen, thereby giving its face a reverse curve vertically.

It is usually desirable to snug all lacings progressively to the extent, if necessary, of going over them several times.

If the screen should not lay evenly, after preliminary lacing upon a TILTED FRAME, the trouble will probably be found in the frame itself, which, in all probability, has not been tilted properly, and the ends of which do not rise naturally.

In that case it will probably be necessary to lace the screen unevenly as respects the frame: that is, the central portions of the screen must be lowered and the outer portions raised, creating a smooth curved relationship between the top and bottom members of the frame and the screen itself.

This relationship between screen and frame members must be adjusted until the screen falls evenly.

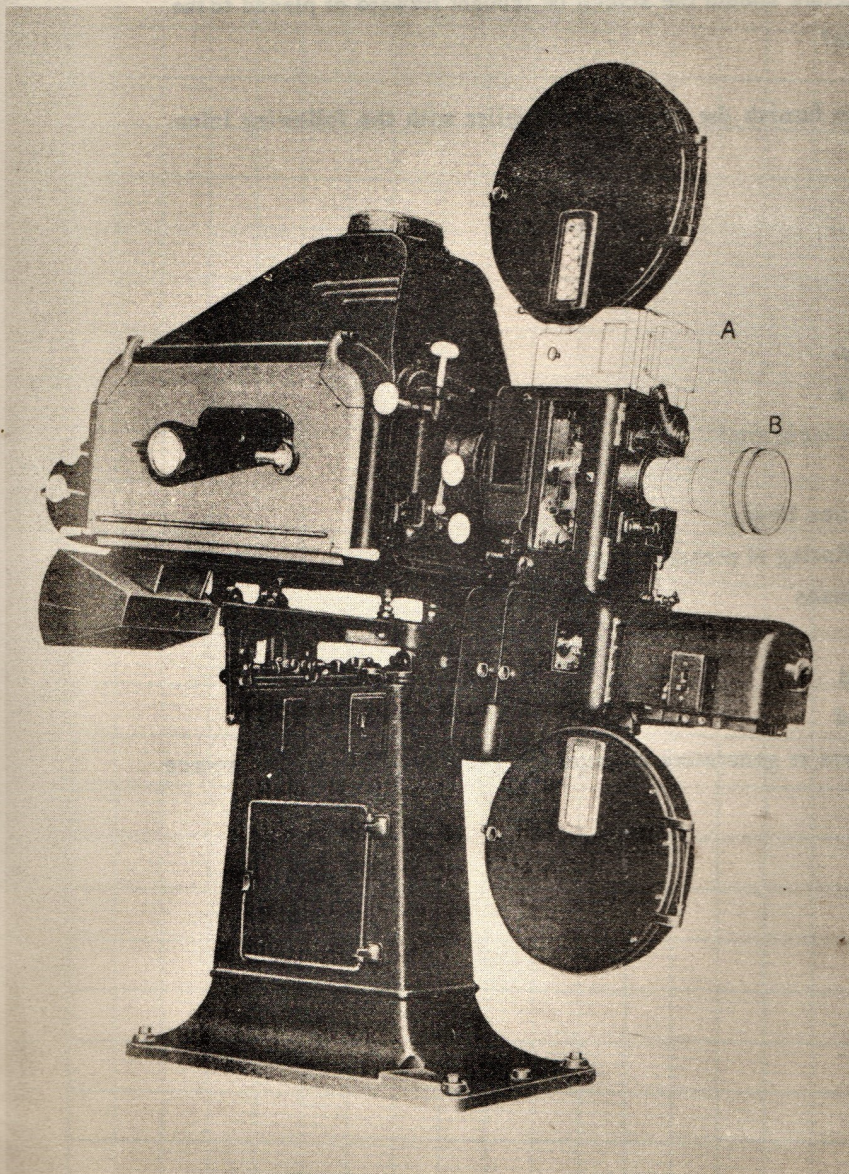
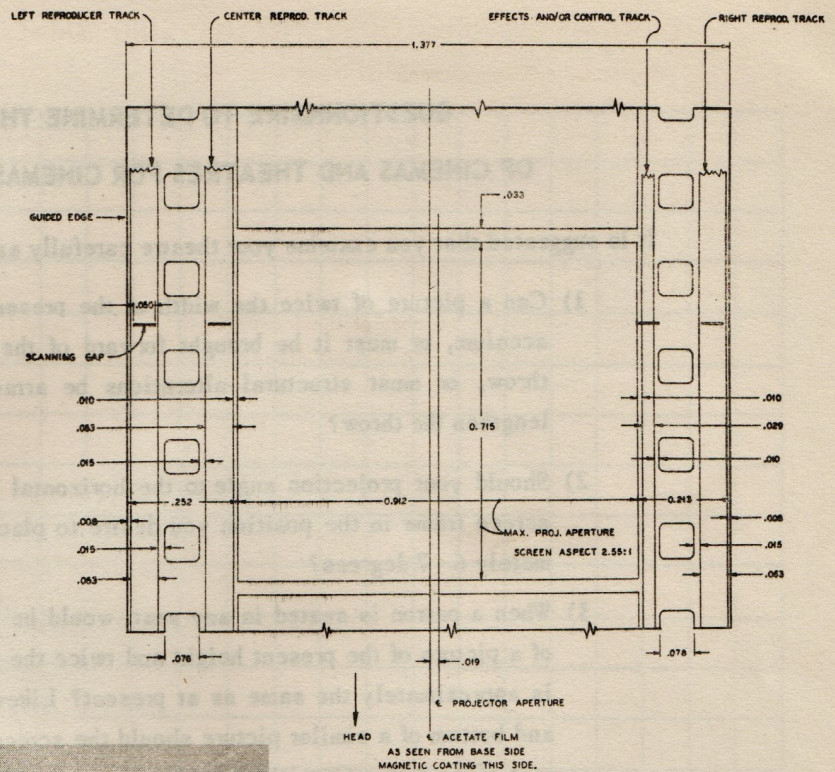
The final step in lacing is to install additional ties thru the grommets at each end of all seams, tightening them sufficiently to remove seam wrinkles.

Both in installation and subsequent care, the reflecting face of the Miracle Mirror screen should be carefully protected since its embossed surface and finish is the key to its effectiveness, and any crushing, creasing, marking or tearing may not be repairable to full efficiency.

FOUR MAGNETIC SOUND TRACKS AND THE PICTURE ON 35MM FILM

At the right is illustrated by a drawing a section of the film which has now simplified and standardized projection of stereophonic sound: The CinemaScope film.

Note that sprocket holes have been narrowed from .110 to .078, requiring a slight reduction in width of the teeth of the intermittent and other sprockets.



A. The new film driven sound mechanism for picking up the four magnetic channels of the CinemaScope film, which is illustrated in the above cut. This is a tight loop, rotary stabilized type and is complete with Pre-Amplifier. (not illustrated).

B. The Anamorphic Lens: Furnished in two sizes, this lens is adjusted to the picture throw by means of the knurled rings and the adjusting scale on the forward section of the barrel.

While the barrel of the anamorphic lens is threaded and fits the threads of some makes and models of projection lens, MOUNTINGS ARE PROVIDED FOR ITS SUPPORT by all manufacturers of projection heads.

The adjustment of these lenses can be checked by the projection of test patterns, designed for that purpose.

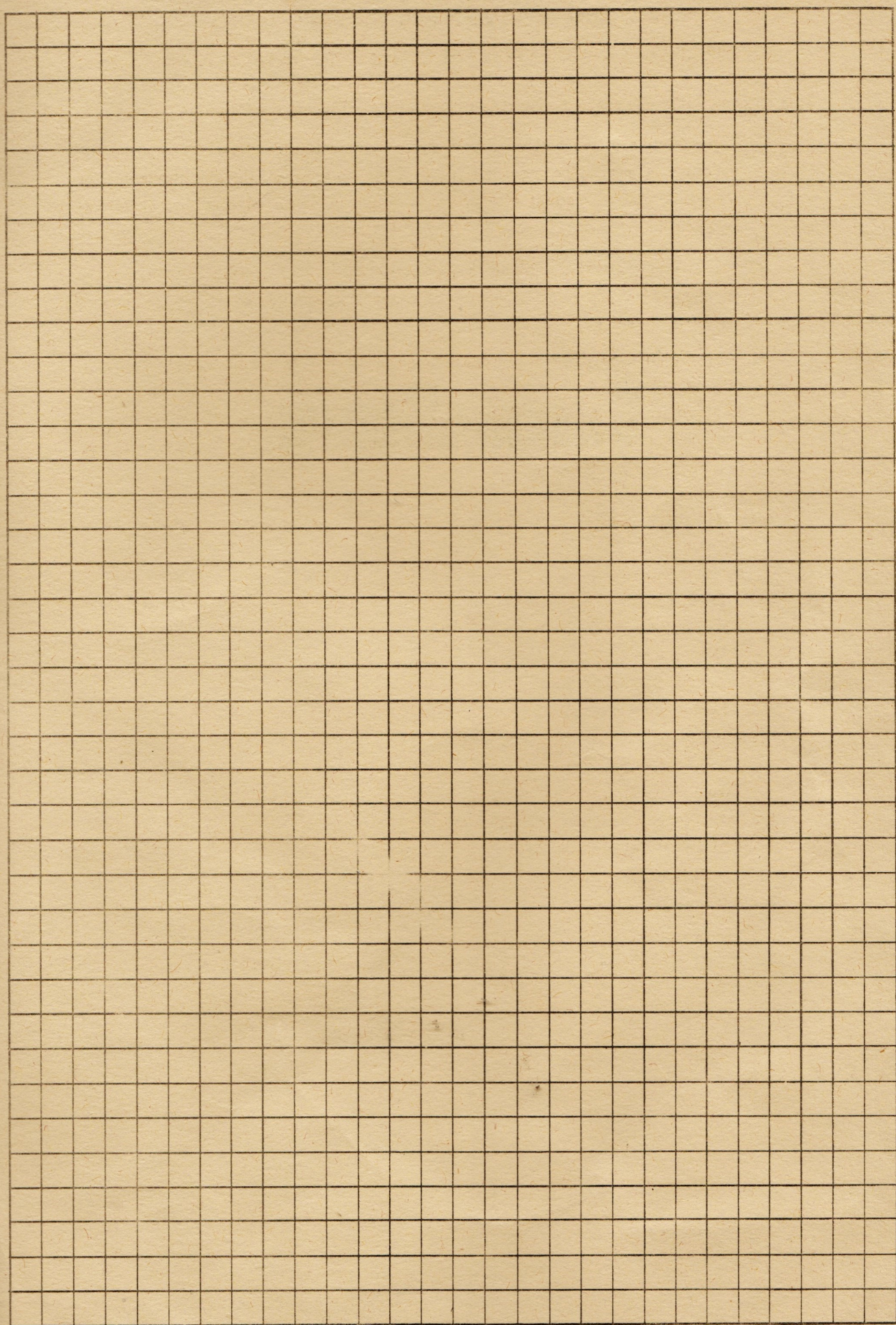
QUESTIONNAIRE TO DETERMINE THE REQUIREMENTS OF CINEMAS AND THEATRES FOR CINEMASCOPE INSTALLATIONS

It is suggested that you examine your theatre carefully as respects the following points:

- 1) Can a picture of twice the width of the present picture be secured within the proscenium, or must it be brought forward of the proscenium, thereby shortening the throw, or must structural alterations be arranged which might either shorten or lengthen the throw?
- 2) Should your projection angle to the horizontal be 14 - 15 degrees or more, can the screen frame in the position you desire to place it be tilted to the rear to approximately 6 - 7 degrees?
- 3) When a patron is seated in any seat, would he be able to see the top and bottom of of a picture of the present height and twice the present width, if the screen position is approximately the same as at present? Likewise, will he be able to see the top and bottom of a similar picture should the screen be brought forward or placed to the rear of its present position?

It is suggested that you be able to furnish the equipment supplier with the following information:

1. Projection Lenses
 - Focal Length
 - Speed
 - Make and Model
2. Length of projection throw—
 - Lens to center of picture
3. Angle of such throw to the horizontal
 - (angle of lamphouse)
4. Make and Model of Projection Heads
5. Make, Model and Wattage Rating of present sound system
6. Make and Model of lamphouses
7. Present lamp amperage
8. Size positive carbons used
 - Size negative carbons used
9. Ampere capacity of rectifiers or generators or amperage available from outside source



CINEMASCOPE