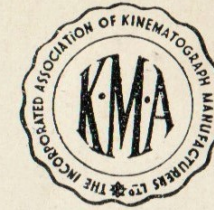


EQUIPMENT

FOR
CINEMAS
STUDIOS
SCHOOLS &
LABORATORIES



This



Book

is being distributed

by

The Equipment Section

of

**The Incorporated Association of
Kinematograph Manufacturers Ltd.**

All enquiries should be addressed to

**THE SECRETARY,
51 LINCOLN'S INN FIELDS, LONDON, W.C. 2
Holborn 2683**



*A Message
from
Ernest E. Blake, Esq.*

*Chairman of the Incorporated Association of
Kinematograph Manufacturers Ltd.*

"Propaganda is a word which is used very loosely these days—many appear to regard it as a synonym for 'stunt.' The majority of people, however, knows that its true meaning is the systematic effort to spread knowledge and to gain support for a definite course of action.

"These are the two main objectives of the Kinematograph Manufacturers' Association; to carry on work of a constructive nature which will assist the industry generally—by giving service of every kind on any occasion which might arise—and to bring to the notice of users the merits of kinematograph equipment produced in this country.

"It is because I know that the K.M.A. can be relied upon to work to attain these objectives in the best spirit that I am pleased to serve as Chairman of the Association.

"It is for the same reason that I recommend with confidence this booklet to all those in Cinemas, Studios, Laboratories, and Schools whose business it is to keep themselves informed of the latest types of equipment being manufactured at the present time."

Ernest E. Blake



THE K.M.A.

Two queries are often put regarding the K.M.A. First, what the K.M.A. is, and second, what the K.M.A. does. This, it seems, is an opportune moment — when a new brochure concerning the Association is being issued—to deal with those queries.

K.M.A. (Kinematograph Manufacturers' Association) is the short title of the Incorporated Association of Kinematograph Manufacturers, Ltd., which represents the manufacturers and distributors of kinematograph equipment.

The K.M.A. when formed in 1911 had amongst its first members Cinematograph Merchants, Cinematograph Film Publishers, Bioscope Outfitters, Cinematograph Film Makers and Kinematograph Manufacturers, all being designated as "the trade," which expression was meant to include all ancillary and allied industries. So, in effect, the K.M.A. was the "Mother" of many of the Trade Associations which exist to-day. As in the case of nearly all families, however, time saw the majority of its "children" depart to set up house for themselves, and the Organisation, in due course, established an Equipment Section which includes amongst its members those who supply all equipment needed by Cinemas, Studios, Laboratories and Local Education Authorities.

The principal aims and objects of the Association are:—

- (a) To carry on any activities which would help to improve the technical and general knowledge of manufacturers by arranging lectures and debates; by exhibitions of equipment, and by using any methods of disseminating knowledge likely to assist the Kinematograph Industry and members of the Association.

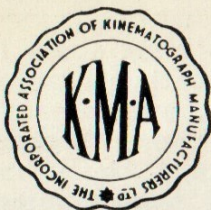
- (b) To co-operate with all kindred Organisations and Associations to bring about improvements in trading and technical matters connected with the Kinematograph Industry, and to take steps to establish contact with analogous Organisations in the Colonies and self-governing Dominions in order to promote the interests of manufacturers at home and overseas by consideration of problems common to all manufacturers of kinematograph equipment.

The method adopted to achieve these objectives has been to form Sections of reputable manufacturers and distributors, so that all problems can be given immediate consideration by experts and a thoroughly efficient service can be rendered to those purchasing equipment.

Co-operation between manufacturers and distributors, whilst retaining the necessary element of competition, has resulted in better post-war products at prices which are very reasonable taking into consideration present day costs.

The advance in the design of sound apparatus, for instance, during the past decade, has been remarkable and in varying degrees this applies to all other kinds of equipment, for instance the modern Screen is superior to that produced in olden days. Notable improvements can be seen in arc lamps and projectors, whilst the thought given to the manufacture of up-to-date seats has made it possible to produce an article far exceeding in comfort anything which exhibitors have seen in the past.

The value of a Trade Association to-day, however, must not be assessed merely in terms of the benefits it confers on its members. All Government Departments and various other Organisations prefer to conduct negotiations with Associations rather than individuals, and many of the subjects so discussed may affect all sides of an Industry. This has been amply proved by the K.M.A. which is dealing throughout the year with problems which often affect those purchasing equipment just as much as they do those supplying it.



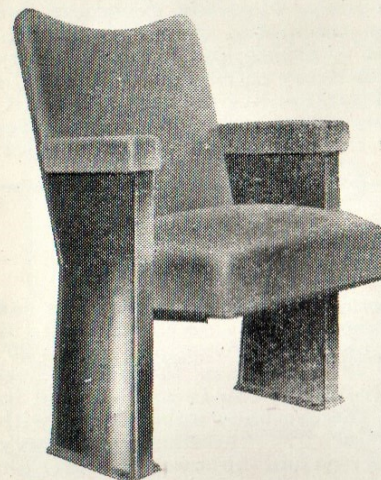
Better Equipment - - -

ANNOUNCEMENTS which follow are by members of the Kinematograph Manufacturers' Association, all of whom are ready to assist the Industry in any way possible.

They will willingly supply full information regarding the equipment they manufacture and/or supply. You are therefore invited to make contact with Members of the Association, either by filling up the Reply Card enclosed, or by writing direct to the firms whose addresses can be found on pages 32/37. Please mention this booklet when so doing.

- - - - Better Business

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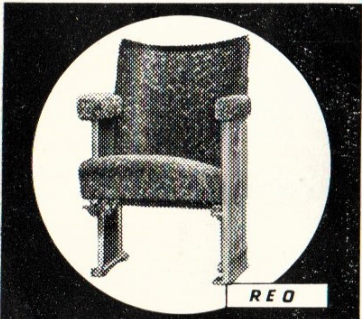
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AGENTS

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LEEDS: Provincial Cinematograph Trading Co., Wellesley Buildings, 17 Wellington St. 1
GLASGOW: George Baker, 151 Renfield Street, C.2

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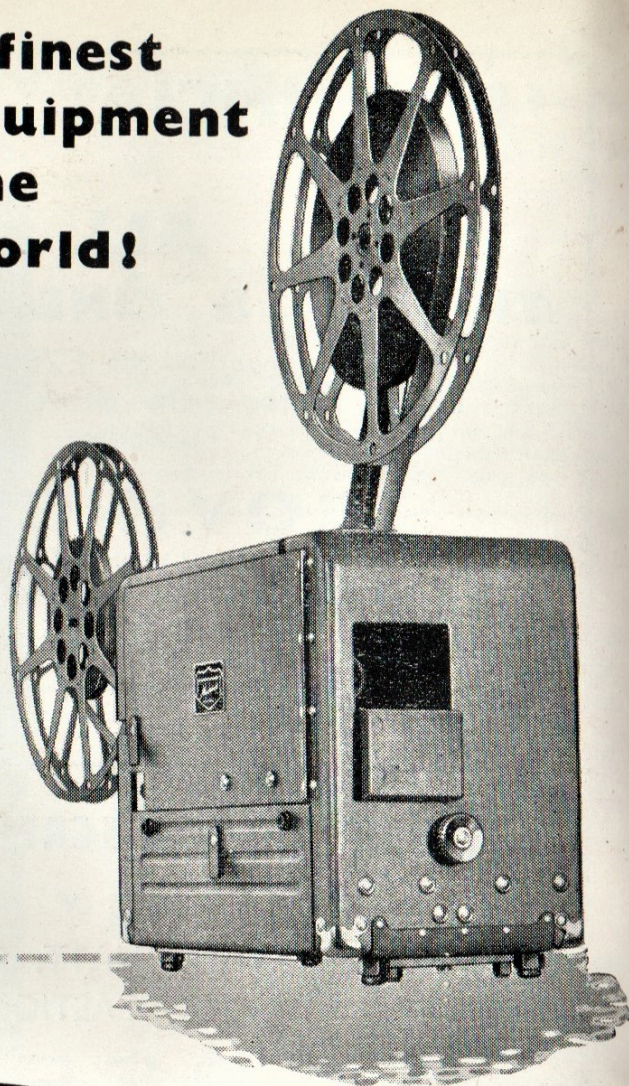
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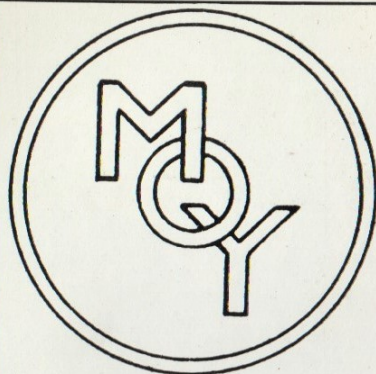
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*Pages 20-31 of this Book
contain Information of
Technical and General
Interest to Projectionists
and all other users of
Kinematograph Equip-
ment.*

PROJECTION TABLE FOR

Showing width of Screen Picture at different distances with lenses of different focal lengths.

Distance Lens to Screen. Feet.	FOCUS OF LENS IN INCHES								
	3 in.	3 $\frac{1}{4}$ in.	3 $\frac{1}{2}$ in.	3 $\frac{3}{4}$ in.	4 in.	4 $\frac{1}{4}$ in.	4 $\frac{1}{2}$ in.	4 $\frac{3}{4}$ in.	
	ft. in.	ft. in.	ft. in.	ft. in.	ft. in.	ft. in.	ft. in.	ft. in.	
20	5 5	5 0	4 7	4 3	4 0	3 9	3 7	3 4	
25	6 9	6 3	5 9	5 5	5 1	4 9	4 6	4 3	
30	8 2	7 6	7 0	6 6	6 1	5 9	5 5	5 1	
35	9 6	8 9	8 2	7 7	7 1	6 8	6 4	6 0	
40	10 11	10 1	9 4	8 8	8 2	7 8	7 3	6 10	
45	12 3	11 4	10 6	9 9	9 2	8 7	8 2	7 8	
50	13 8	12 7	11 8	10 11	10 2	9 7	9 1	8 7	
55	15 0	13 10	12 10	12 0	11 3	10 7	10 0	9 5	
60	16 5	15 1	14 0	13 1	12 3	11 6	10 11	10 4	
65	17 9	16 5	15 3	14 2	13 4	12 6	11 10	11 2	
70	19 2	17 8	16 5	15 3	14 4	13 6	12 9	12 1	
75	20 6	18 11	17 7	16 5	15 4	14 5	13 8	12 11	
80	21 11	20 2	18 9	17 6	16 5	15 5	14 7	13 9	
85	23 3	21 6	19 11	18 7	17 5	16 5	15 6	14 8	
90	24 8	22 9	21 1	19 8	18 5	17 4	16 5	15 6	
95	26 0	24 0	22 3	20 9	19 6	18 4	17 4	16 5	
100	27 5	25 3	23 6	21 11	20 6	19 4	18 3	17 3	
105	28 9	26 7	24 8	23 0	21 7	20 3	19 2	18 2	
110	30 2	27 10	25 10	24 1	22 7	21 3	20 1	19 0	
115	31 6	29 1	27 0	25 2	23 7	22 3	21 0	19 10	
120	32 11	30 4	28 2	26 3	24 8	23 2	21 11	20 9	
125	34 3	31 7	29 4	27 5	25 8	24 2	22 10	21 7	
130	35 8	32 11	30 6	28 6	26 8	25 1	23 9	22 6	
135	37 0	34 2	31 9	29 7	27 9	26 1	24 8	23 4	
140	38 5	35 5	32 11	30 8	28 9	27 1	25 7	24 2	

CINEMATOGRAPH LENSES

"TALKIE" Mask aperture 0.825 in. wide.
The height of the picture is approximately $\frac{3}{4}$ the width.

FOCUS OF LENS IN INCHES								
5 in.	5 $\frac{1}{4}$ in.	5 $\frac{1}{2}$ in.	5 $\frac{3}{4}$ in.	6 in.	6 $\frac{1}{4}$ in.	6 $\frac{1}{2}$ in.	6 $\frac{3}{4}$ in.	7 in.
ft. in.	ft. in.	ft. in.	ft. in.	ft. in.	ft. in.	ft. in.	ft. in.	ft. in.
3 2	3 0	—	—	—	—	—	—	—
4 0	3 10	3 8	3 6	3 4	3 2	3 1	—	—
4 10	4 7	4 5	4 2	4 0	3 10	3 8	3 7	3 5
5 8	5 5	5 2	4 11	4 8	4 6	4 4	4 2	4 0
6 6	6 2	5 11	5 8	5 5	5 2	5 0	4 9	4 7
7 4	7 0	6 8	6 4	6 1	5 10	5 7	5 5	5 2
8 2	7 9	7 5	7 1	6 9	6 6	6 3	6 0	5 9
9 0	8 6	8 2	7 9	7 5	7 2	6 10	6 7	6 4
9 9	9 4	8 11	8 6	8 2	7 10	7 6	7 3	7 0
10 7	10 1	9 8	9 3	8 10	8 6	8 2	7 10	7 7
11 5	10 11	10 5	9 11	9 6	9 2	8 9	8 5	8 2
12 3	11 8	11 2	10 8	10 2	9 9	9 5	9 1	8 9
13 1	12 6	11 11	11 4	10 11	10 5	10 1	9 8	9 4
13 11	13 3	12 8	12 1	11 7	11 1	10 8	10 3	9 11
14 9	14 0	13 5	12 10	12 3	11 9	11 4	10 11	10 6
15 7	14 10	14 2	13 6	12 11	12 5	11 11	11 6	11 1
16 5	15 7	14 11	14 3	13 8	13 1	12 7	12 1	11 8
17 2	16 5	15 8	14 11	14 4	13 9	13 3	12 9	12 3
18 0	17 2	16 5	15 8	15 0	14 5	13 10	13 4	12 10
18 10	18 0	17 2	16 5	15 8	15 1	14 6	13 11	13 5
19 8	18 9	17 11	17 1	16 5	15 9	15 1	14 7	14 0
20 6	19 6	18 8	17 10	17 1	16 5	15 9	15 2	14 7
21 4	20 4	19 5	18 7	17 9	17 1	16 5	15 9	15 3
22 2	21 1	20 2	19 3	18 5	17 9	17 0	16 5	15 10
23 0	21 11	20 11	20 0	19 2	18 4	17 8	17 0	16 5

PROJECTION & SOUND EQUIPMENT

It is sometimes difficult to realise that talking pictures, in a practicable commercial form, have been with us for over 20 years. Indeed, talking pictures in Cinemas, in a more or less acceptable form, have been with us for very much more than 20 years; short "comic song" pictures were regularly shown in at least one English Cinema in 1911, and again in 1912, but these were mere novelties at that time, and the films were very short items in a regular programme of silent films.

Even when "the talkies" really arrived, the equipment, both for picture and sound, was, by present-day standards, *comparatively* crude. A reasonably good picture reached the screen, and intelligible dialogue reached the audience; but it is not until a direct comparison is made that it is possible to appreciate the enormous advances in photography, sound recording and reproduction since those early days.

Many of these improvements have become possible only because parallel development has been going on in arts and sciences allied to the talking motion picture. Thermionic tubes have improved in performance and reliability out of all recognition; loud speakers, from the relatively primitive designs available in 1928, have evolved into precisely and scientifically designed and controlled instruments. New photographic emulsions, lenses, lighting, and technique, have contributed to produce and project much better pictures. Arc lamps now give greater and more uniform light-output; projector mechanisms are quieter and smoother in operation, and much kinder to the film itself; the story is one of gradual evolution, of constant and unremitting attention to detail, and of a progressive accumulation of improvements which have contributed to the grand total of technical achievement.

It would be difficult, if not impossible, to single out any one equipment design or branch of development, and to state fairly that it had played a greater part in such technical achievement than any or all of the others. The Equipment Industry has striven consistently and conscientiously to evolve always a better breed of product, and to solve the almost innumerable problems encountered; these are the principles animating the research and development policy of every Member of the K.M.A.

Your needs for Projection and Sound Equipment are catered for by K.M.A. Members

FILM RUNNING TIME TABLE

Calculated at 90 ft. per minute

ft.		mins.		ft.		mins.		ft.		mins.		ft.		mins.	
90	1	1890	21	3690	41	5490	61	7290	81	9090	101	10800	120		
180	2	1980	22	3780	42	5580	62	7380	82	9180	102				
270	3	2070	23	3870	43	5670	63	7470	83	9270	103				
360	4	2160	24	3960	44	5760	64	7560	84	9360	104				
450	5	2250	25	4050	45	5850	65	7650	85	9450	105				
540	6	2340	26	4140	46	5940	66	7740	86	9540	106				
630	7	2430	27	4230	47	6030	67	7830	87	9630	107				
720	8	2520	28	4320	48	6120	68	7920	88	9720	108				
810	9	2610	29	4410	49	6210	69	8010	89	9810	109				
900	10	2700	30	4500	50	6300	70	8100	90	9900	110				
990	11	2790	31	4590	51	6390	71	8190	91	9990	111				
1080	12	2880	32	4680	52	6480	72	8280	92	10080	112				
1170	13	2970	33	4770	53	6570	73	8370	93	10170	113				
1260	14	3060	34	4860	54	6660	74	8460	94	10260	114				
1350	15	3150	35	4950	55	6750	75	8550	95	10350	115				
1440	16	3240	36	5040	56	6840	76	8640	96	10440	116				
1530	17	3330	37	5130	57	6930	77	8730	97	10530	117				
1620	18	3420	38	5220	58	7020	78	8820	98	10620	118				
1710	19	3510	39	5310	59	7110	79	8910	99	10710	119				
1800	20	3600	40	5400	60	7200	80	9000	100	10800	120				

ACCESSORY EQUIPMENT AND FILM MUTILATION

Motion Picture Film is a substance of the utmost fragility that demands the most delicate handling at all times. Although the majority of projectionists are careful in handling film, the human element still prevails, and, in rewinding and splicing the importance of the human element exceeds the mechanical. Some common rewinding faults are these: the main and auxiliary ends of many rewinders are out of alignment; others have worn spindle bearings causing an elliptical and not a circular movement; others have inadequate braking tension on the idle end; some combine all these defects. And again the human element: rewinding too fast — failure to examine film — emulsion side downwards when it should be upwards — inadequate or even non-existent spooling-on and spooling-off discs.

The joining or splicing of film has a very material bearing on its life and calls for special attention; yet one often hears, "I can make a better join by hand than with any splicing machine." It may be possible to make an adequate join by hand, but not a perfect one, thus much mutilation may be caused by hand splicing — bad overlap, bad alignment, excessive width or stiffness; all or any of these defects will cause breaking and tearing of the film. It is imperative to use a reliable cement and to refrain from applying it in excess. A good join is actually a weld, when one side of the film is partly dissolved into the other section to be joined. To ensure a perfect join it is necessary to remove by scraping not only the emulsion, but also the substratum, so that there is base in contact with base.

This is not possible without a joiner specially designed for the work, in which are embodied all essential requirements: a scraper to remove emulsion and substratum, a guided cutter to effect correct trimming, precision pins to ensure perfect overlap and alignment, and a spring-loaded centre bar that applies adequate tension during the welding operation, and expels the air bubbles from between the two pieces of film by its *initially abrupt impact*.

Much mutilation is caused by obsolete methods and equipment, and great economies could be effected by the correct utilisation of the latest kinematograph accessory equipment.

Your needs for Accessories are catered for by K.M.A. Members

PROJECTOR INSPECTION ROUTINE

By making a routine check every week the projectionist will develop confidence in the correct use of tools—he may even make special tools of his own design for certain purposes; but he should never attempt any work—except in emergency—unless he is certain of the outcome. A little knowledge is dangerous, and if in doubt the representative of the manufacturer is usually glad to advise or help.

Projectionists generally will find the following weekly inspection detail helpful:—

- Check (1) Upper magazine spindle for freedom, tolerance, correct adjustment and lubrication.
- „ (2) Upper fire-trap rollers for flattening, uneven wear, freedom in running, fluff, deposits, etc.
- „ (3) Upper sprocket for toothwear, deposits, etc. —
- „ (4) Upper stripper for fluff and foreign matter — adjustment.
- „ (5) Upper pad-roller for freedom of rotation, presence of flattening, correct spacing from face of sprocket (thickness of a film splice).
- „ (6) Back plates—or film-trap shoes—for troughing.
- „ (7) Pressure-pads or skates for ridging or sprocket marking.
- „ (8) Intermittent sprocket for toothwear, deposits, etc.
- „ (9) Intermittent shoes—or rollers—for flats, adjustments and correct operation.
- „ (10) Safety shutter for efficiency.
- „ (11) Lower sprocket assembly as for 3, 4 and 5.
- „ (12) Sound drum for deposits, ease of rotation, etc., or
- „ (13) Sound gate for correct tension, wear or dirt.
- „ (14) Optical unit for cleanliness.
- „ (15) Lower fire-trap rollers as for 2.
- „ (16) Take-up assembly — cleanliness and condition, adjustment, etc.
- „ (17) Adaptation gear for cleanliness and security of all recessed gears etc.

LENS — FILM — SCREEN

Size Relationships.

This table shows sizes of pictures thrown from 16 mm. film, single-and-double-frame filmstrip, by lenses of different focal lengths at distances from the screen up to 48 ft. The sizes of pictures with longer throws can be calculated from the formula given below :—

FOCAL LENGTH OF LENS

Distance of Screen		1 in.	2 in.	3 in.	4 in.	6 in.	WIDTH OF PICTURE ON SCREEN.
3 ft.	16 mm. Film ...	1' 1"	—	—	—	—	
	Single Fr. Strip ...	—	1' 5"	11"	—	—	
	Double Fr. Strip...	—	2' 2"	1' 4"	1' 1"	—	
6 ft.	16 mm. Film ...	2' 3"	1' 1"	—	—	—	
	Single Fr. Strip ...	—	2' 10"	1' 11"	1' 5"	11"	
	Double Fr. Strip...	—	4' 3"	2' 10"	2' 1"	1' 4"	
12 ft.	16 mm. Film ...	4' 6"	2' 3"	1' 6"	1' 1"	—	
	Single Fr. Strip ...	—	5' 10"	3' 10"	2' 10"	1' 11"	
	Double Fr. Strip...	—	8' 8"	5' 9"	4' 3"	2' 10"	
18 ft.	16 mm. Film ...	6' 10"	3' 5"	2' 3"	1' 8"	—	
	Single Fr. Strip ...	—	8' 9"	5' 10"	4' 4"	2' 10"	
	Double Fr. Strip...	—	—	8' 8"	6' 7"	4' 3"	
24 ft.	16 mm. Film ...	9' 1"	4' 6"	3' 0"	2' 3"	1' 6"	
	Single Fr. Strip ...	—	—	7' 9"	5' 10"	3' 10"	
	Double Fr. Strip...	—	—	—	8' 8"	5' 9"	
36 ft.	16 mm. Film ...	—	6' 10"	4' 6"	3' 5"	2' 3"	
	Single Fr. Strip ...	—	—	11' 9"	8' 9"	5' 10"	
	Double Fr. Strip...	—	—	—	—	8' 8"	
48 ft.	16 mm. Film ...	—	9' 1"	6' 1"	4' 6"	3' 0"	
	Single Fr. Strip ...	—	—	—	—	7' 9"	
	Double Fr. Strip...	—	—	—	—	11' 8"	

WIDTH OF PICTURE ON SCREEN.

The British Standard size of frame width for 16 mm. film is 0.380 inches and for single-frame filmstrip 0.94 inches, double frame filmstrip 1.4 inches.

Through courtesy of Film Users Year Book.

SCREENS

Much time and money have been spent in perfecting the efficiency of arc-lamps, mirrors, and projection-lenses, and in matching their optical characteristics. The finest combination of all three can, however, be defeated if the other end of the optical chain, i.e., the screen, is not kept up to the same high standard in the cinema.

A screen should not be used much longer than two years, generally much less. Efficiency is impaired by dust, dirt, and nicotine tar, which collect upon the screen, absorbing the projected light in a percentage increasing with the accumulation of dirt; 5% in six months, 16% in one year, 24% in eighteen months, 42% in two years, 49% in two year and a half. Thus, at the end of this time, nearly 50% of the Exhibitor's outlay on Current and Carbons is completely wasted, and his audiences see pictures becoming progressively worse in quality as time marches on.

Renovation is a poor remedy. Uniformity of application is difficult if not impossible, and sound is impaired if perforations are filled with renovator. Freshly refinished, efficiency will not be likely to exceed 70%, and even that will be of short duration, because a renovator applied over a dirty screen will cause a severe drop in light within three months; dirt will accumulate more rapidly, and the screen will soon be worse than before renovation. The process of deterioration is relatively slow. Efficiency can, however, be tested simply, by holding against the screen, in ordinary light, a sheet of *ordinary white* tissue paper. If the tissue appears whiter than the screen, the screen efficiency is too low, the screen is absorbing half the light, and should be replaced.

Many factors determine the efficiency of screens; the angle at which light is reflected, the tolerable viewing-angle, the quality and uniformity of the surface. A high reflective-efficiency (85% at least), is essential, and the perforation-frequency and pattern must give the best possible compromise between effective sound-reproduction and minimum light-loss.

The Exhibitor who conscientiously strives for the best possible projection in his Theatre, with the greatest economy in current and carbon costs, can confidently rely upon the products of K.M.A. members to satisfy all of these requirements.

Your needs for Screens are catered for by K.M.A. Members

STUDIO EQUIPMENT

In every department of Film Production, it would be today an encouraging experience for any manufacturer of British Studio Equipment, to walk through Studios, not only in the United Kingdom but in many other parts of the world, and to witness the increasing use of such equipment everywhere.

Compact-source lamps from British Manufacturers are lighting more and more sets everywhere; British Cameras are turning on greater numbers of films every year, and some of them have turned on such International Award Winners as "Hamlet"; British Sound Recorders, Editing Machines, and Projectors, are holding their own against all competition, and all are continually breaking new ground.

In certain departments, notably Process Projection equipment and Magnetic Sound Recording, British Manufacturers are leading the world, and to the high quality of British Studio Equipment generally, the success enjoyed by so many British films in overseas markets can be attributed in due measure.

It is all the more creditable to the British Studio Equipment manufacturers that many of their best products have had to be engineered entirely in the years following the War of 1939-45.

With British lenses in 8 out of every 10 Motion Picture Cameras in Hollywood, British Cameras turning on many prize-winning films, British Lighting, Sound Recording, Projection, Editing, and Laboratory equipment to be encountered in Studios all over the globe, it is no exaggeration to state that the British Manufacturers, prominent amongst them the members of the K.M.A., are today producing Studio Equipment at least the equal of, and in many cases superior to that of any other source in the world.

*Your needs for Studio Equipment are catered for by
K.M.A. Members*

THEATRE FURNISHING

Before 1939, when the cost of carpet was not too prohibitive to be taken in with the ordinary maintenance charges of a cinema, it was the general custom to "close cover" the whole of the floor area of the house. Even in those days this was an extravagance, because the considerable areas of carpet underneath the chairs showed no signs of wear, and were wasted when carpets were replaced. Today, when purchase-tax and the cost of materials have raised prices to approximately six times the pre-war level, carpet-replacement has become a serious worry for the majority of exhibitors.

By way of a solution to this problem, many exhibitors now use strips of linoleum between the seatways, but this practice suffers from the disadvantages that the shuffling of feet is unduly audible, and that there is a general impression of coldness. During a recent discussion with a K.M.A. member, on subject of carpet replacement, it was suggested that the most economical scheme for an exhibitor who takes pride in keeping his theatre as well equipped as possible is:

- (a) The back stalls, promenades, and across front of orchestra should be close-covered with 27-in. wide body carpet.
- (b) Main down gangways to be covered with carpet runners in the nearest standard widths corresponding to them.
- (c) Carpet runners, 18-in. wide should be used between seatways for the dearer seats, and linoleum runners of the same width for the cheaper seats.
- (d) From experience it will be generally agreed that 5-frame Wilton carpets of either W.1 or W.0 quality are best able to withstand the hard wear which they are bound to undergo, and if either of these carpets is laid on an underlay of rubber-and-hair composition, their life will be enhanced by approximately 33½%."

*Your needs for Theatre Furnishings are catered for by
K.M.A. Members*

SEATS IN ALL PARTS

There are two things in every Cinema which are directly important to the patron—the Screen, which naturally claims the major share of his attention; and the Chair in which he sits for some three hours.

Whether the Chair claims any share of his attention at all depends upon the degree of comfort which it affords; ideally, the patron should be so well and comfortably seated that he does not have to pay any attention at all to his chair.

In order to achieve this a great deal of time, money, and thought has gone into the development of Cinema chairs, which are by no means as simple as may appear. There is no necessity here to elaborate problems of seat-widths, floor-rakes, space between rows, and compliance with regulations as to gangways, etc., these are sufficiently familiar to all exhibitors. The trend of developments accentuated by competition, is toward greater comfort and convenience for patrons.

Certain types of chairs are made to adjust themselves to the posture of patrons; others have special forms of upholstery; experiments are continually being conducted with new ideas along these lines, and it has even been suggested that swivelling and reclining chairs similar to those used in certain types of American aircraft and chair-cars on trains should be installed in Cinemas. Another proposal for future development involves means of automatic and self-compensating electro-mechanical posture-adjustment, with self-adjusting pneumatic devices.

The economics of the Cinema impose a natural limitation upon the extent to which such trends of development can be followed; after all, for a given size of building, with its concomitant overhead and running costs, a minimum number of patrons must be accommodated for the Cinema to pay its way; the alternative is to raise the price of admission, which is more likely to repel than to attract patronage. Unfortunately modernistic seating tends to reduce the total number of seats.

These are continually recurring aspects of our Industry, however, problems exist only to be solved and to spur human ingenuity to greater achievement, and doubtless the Cinema of the future will possess commercially efficient and comfortable seating surpassing the already high standards of today. It is certain that KMA members will be found in the front ranks of the seating designers of the future, as always.

Your Seating needs are catered for by K.M.A. Members

SUB-STANDARD EQUIPMENT IN EDUCATION

Teachers brought up in the classical or verbal methods of teaching were slow to recognise that words, spoken or written, were often nothing more than symbols for things and processes, and that unless the words were related pictorially to these things and processes, they might not be properly understood and their lesson would thus be lost. A few adventurous film producers have overcome this problem, and have written a new chapter in the theory of education. Working in collaboration with teachers, they have developed a style of presentation that is much more than a visual aid—it is in fact a compelling pictorial teaching method because attention of students is, willy-nilly, riveted to the screen while a film is showing. The method is one to which all concerned become accustomed, so that it is not until it is omitted or withdrawn that its absence emphasizes its importance.

Thus the 16 mm. film projector has become not only a recognised piece of educational equipment, but a necessary one—educational in its broadest sense, covering schools, colleges, university departments, youth groups, industry, hospitals and other institutions. It is also, as it was in the beginning, a source of entertainment, but it is no longer a luxury. It is as essential and permanent as the blackboard.

The Manufacturers have kept closely in touch with educational needs and developments, and, partly in consequence of these contacts with educationists, have developed cinematograph machines that are portable, quiet in operation, and simple in manipulation—in fact, so simple to operate, that even the most unmechanically-minded of teachers can show films while giving their full attention to the lesson.

*Your needs for Sub-standard Equipment are catered for by
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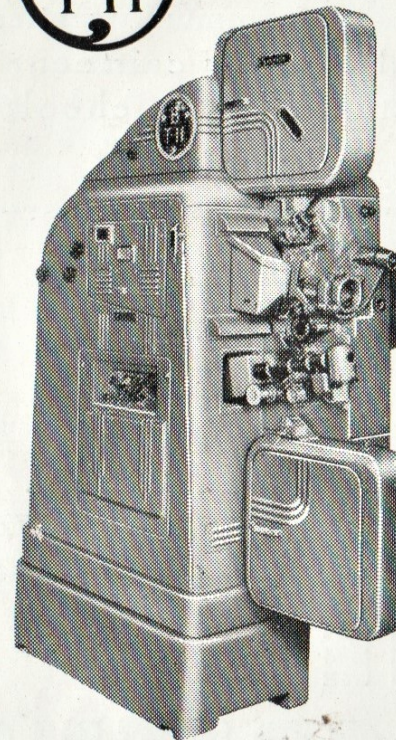
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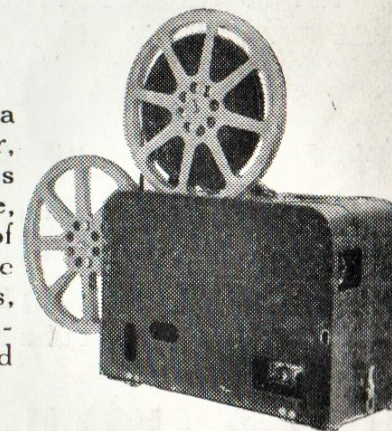
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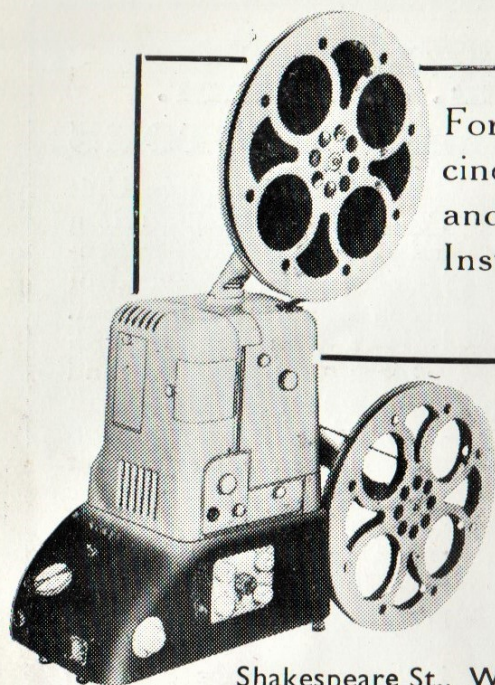
BTH also manufacture a 16 mm. sound-film projector, Type 301. Because of its brilliant and steady picture, fidelity of sound and ease of operation, it has proved the ideal choice for schools, hospitals, hotels, factory instruction, and travelling road shows.



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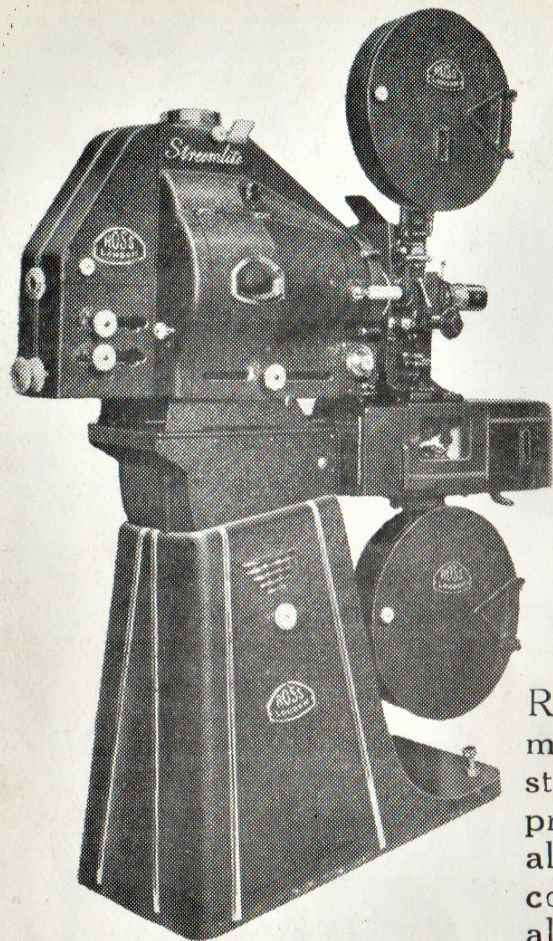
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Matting, Machines
Measurers Film
Metallization
Optical Work
Meter Panels
Microphones
Microphone Booms
Mirror Protectors, Arc
Montage Mechanisms
Motors
Motor Generator Sets
Music Stands
Mutilators

Neon Signs
Non-Sync Tables
Numbering Machine,
Visible Edge
Numbers, Ivory or Metal

Oil Lubricating
Operating Booths, Portable
Optical Equipment
Optical Reduction Step
Printers
Optical Systems of Cine-
matograph Cameras
and Projectors, Special
Optical Lanterns
Orchestra Lifts
Orchestra Stands
Organ Dressings

Organ Lifts
Organs, Pipe and Elec-
tronic

Paints, Floor
Panic Bolts
Parabolic Mirrors
Perforating Machines, Films
35 mm., 16 mm. and
9.5 mm.

Petrol Generators
Photo Electric Cells
Photographic Lenses
Plugs
Price Plates
Printers, Film
Projectors, Effects
Projectors, Film Strip
Projector Equipment
Projectors, Portable (35
mm. and Sub-Stand-
ard)

Projector Stands
Post Synchronising Equip-
ment
Posters, Handwritten, Silk
Screen
Public Address Equipment

Recording Equipment
Reduction Printing
Machines

Reels, Film
Reflectors
Refrigerators
Regulators
Reproducers, Sound Film
Rewinders (and Rewind
Room Equipment)
Rotary Converter Equip-
ment
Rubber Flooring

Scent Sprays and Essences
Screens, Front and Back
Projection, Studio,
Television
Screen Frames and
Maskings

Seat Indicators
Seat Pans
Seats, Attendant, Regula-
tion Wall Fixing
Seat Labels, Numbered
Sheet Metal Work
Shutters, Projection Room
Slide Containers and
Carriers

Slides
Silent Heads 35 mm. and
16 mm., on adjustable
stands

Sockets
Soundheads
Special Effects
Splicers
Spool Bins
Spools
Spotlights, Arc and

Incandescent
Sprockets
Springs, Door Check
Springs, Floor Check
Stage Equipment
Stage Lighting
Standards, Welded Steel
Sound Reproducing Equip-
ment
Still Frames
Studio Equipment
Studio Editing Equipment
Studio Lighting Equipment
Suspension Gear

Switchboards
Switchboxes
Switchgear
Synchronisers, 35 mm. and
16 mm., 4-way and
2-way

Take-up Attachments
Theatre Lighting
Telecommunication
Telescopic Stands
Ticket Boxes (Roll)
Ticket Check Boxes
Ticket Machines
Tickets
Tins, Film
Title Boxes
Torches
Transformers
Transit Cases 35 mm. and
16 mm.
Tripods—and Tripod Heads
Trolleys, Film Transport
Trucks, Remote Control
Trunking, Metal

Underfelts
Uniforms
Unipods

Vacuum Cleaners
Valves
Valve Battery Chargers
Ventilating Systems
Voltmeters

Waste-film-Bins
Waxing Machines

TABLE OF SOUND ABSORPTION CO-EFFICIENTS

Open Window	1.00	Cork	.03
Plaster	.025 - .034	Linoleum	.03
Concrete	.015	Carpets	.15 .29
Brick	.025	Cretonne Cloth	.15
Marble	.01	Heavy Curtains	.5 - 1.0
Glass	.027	1 in. Hairfelt	.45
Wood plain	.061	Audience, per person	4.7
Wood varnished	.03	Wood seats, each	.1

Upholstered seats, each 1.0 - 2.0



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REFLECTIVE PROPERTIES OF MATERIALS

Material	Percentage of reflection
Highly polished silver	92%
Highly polished brass	70-75%
Highly polished copper	60%
Ordinary Mirrors	50%(about)
White paper	82%
Aluminium reflecting cloth	90%
Yellow painted wall	40%
Light green paper	20%
Dark brown paper	13%
Red, blue and green paper	11%
Dull black paper	5%
Black cloth	1%
Black velvet	1/250%

Note on the above table—This gives total proportion of reflected to incident light over all directions.

