

JOE WALKER, recently dubbed the "inventor" cameraman in the motion picture industry, has come up with another lens innovation, this time for television cameras. Shown here, mounted before one of Don Lee's tele-cameras, the lens affords dissolves or quick cuts between two image sizes.

TRANSITION LENS FOR TELEVISION CAMERAS

The Duomar lens, developed by Joseph Walker, A.S.C., enables television cameras to make quick cuts from long shots to closeups.

By FREDERICK FOSTER

BEFORE we tell you about the new Walker "Duomar" lens for television cameras, perhaps we ought to tell something about its inventor, Joseph Walker, A.S.C.

His various patent applications in the fields of optics and electronics take up sizeable file space in Uncle Sam's Patent Office in Washington, D.C. Walker has many patents on motion picture processes and equipment, but ruefully admits that only one ever brought him any real money. That was the patent covering a double exposure process using an imbibition print to form a travelling matt.

He also designed what was probably the first "zoom" lens for motion picture cameras in the early 1920's, although the term "zoom," as applied to lenses of this

type today, did not come into general use until sometime later. The European type zoom lens did not appear until many years afterward.

The Duomar is of different construction than the zoom type lens. It is essentially a lens with two fields of view, with the transition from one size image to the other being accomplished by simply moving a lever.

With customary modesty, Walker refuses to take all the credit for the idea for such a lens. The idea, he says, stemmed from a query posed by John H. Buffum, now a well known Boston radio commentator, in whose employ he worked as a newsreel cameraman many years ago.

"Joe," said Buffum, "I want you to develop something that will permit making

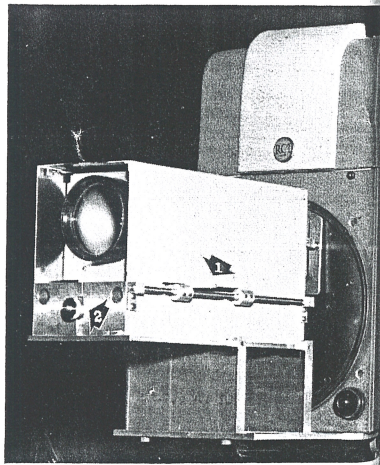
a quick switch from a long shot to a closeup, and vice versa — perhaps two cameras and lenses in a single unit, or better yet, two lenses of different focal length mounted on the same camera with some means of instantly changing from one lens to the other without stopping the camera."

Walker was using a Williamson camera at the time and he soon had a method figured out that would achieve the result suggested by Buffum. The camera featured an extra long aperture plate and film gate. Walker cut an extra aperture in the plate and fitted a telephoto lens immediately above the regular camera lens, so that it would register an image on the film two frames above that of the regular lens. A sliding shutter was installed in the camera so that the aperture behind one lens could be closed simultaneously as the other was opened.

Thus to make a quick switch from a long shot to a closeup, a button was pressed as the cameraman continued cranking, and the sliding shutter cut off the image from the short focal lens and opened the aperture behind the telephoto lens, permitting it to register an image on the film. The resulting blank frame between the switchover (or the single double-exposed frame, resulting when the switch was from closeup to long shot), was deleted at time of editing the film.

Walker had the first opportunity to put this idea to practical use when filming newsreel shots of President Wilson's inauguration. The event was a natural for demonstrating the effectiveness of this new cinematic innovation. Walker had his regular lens focused on the President

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TRANSITION is effected by moving lever (indicated by arrow 1) on side of lens. Manual operation is soon to be replaced by electric remote control. Centering knob (arrow 2) affords adjustment of lens so it will automatically center on subject or scene when switched from long shot to closeup.

THE NEW "SPECTRA" MEASURES COLOR TEMPERATURE

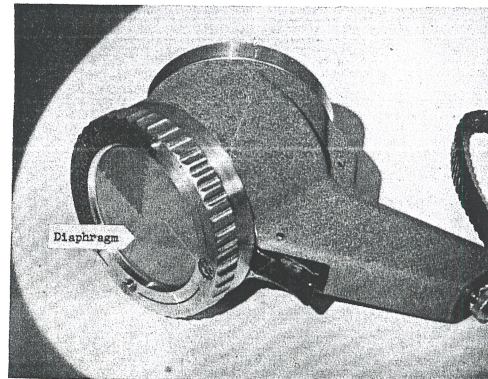
A radically new direct-reading color temperature meter, developed by Karl Freund, A.S.C., takes the guess work out of light analysis.

By FRED GATELY

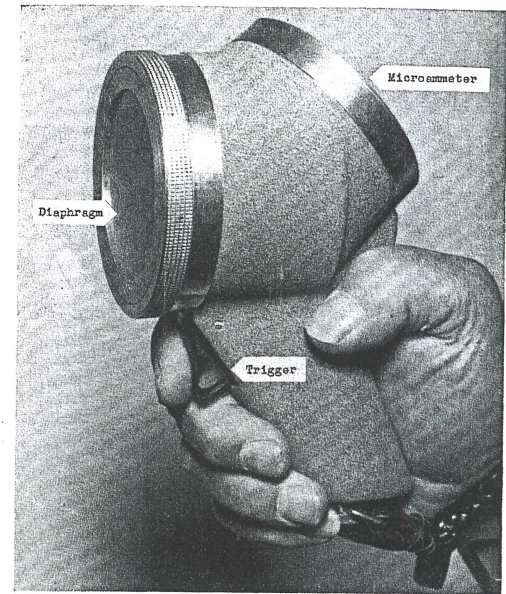
A NEW STAR has been born in the photographic firmament — one whose destiny is to remove the final vestiges of guess work and mental gymnastics from the art of color photography. It is the Spectra, a direct-reading color temperature meter, designed and built by Karl Freund, A.S.C., and his Photo Research Corporation.

The term "color temperature" will do doubt imbue many with the feeling that we are dealing with an esoteric subject in the realm of physics. In the lexicon of the scientist, color temperature of a given source is the temperature to which a radiant black body must be raised to radiate the same spectral distribution of light. For the physicist who must deal with specifics this is a necessary definition; from the practical standpoint of the photographer who must deal with the color temperature problem as a routine phase of his work, it resolves itself down to "how yellow or how blue is my light?"

The synthesis of light is readily apparent in its wide variations to any observant individual. We have all noticed the distinctly red color of the sun either very early in the morning when it is rising or when it is about to set in the evening, and



A RED FILTER rests between the diaphragm and the photocell. Initial setting of meter indicator is based on red light rays passing through red filter to photocell. When trigger is squeezed, blue filter replaces red and the light thus admitted to photocell becomes the ratio between the blue and the red.

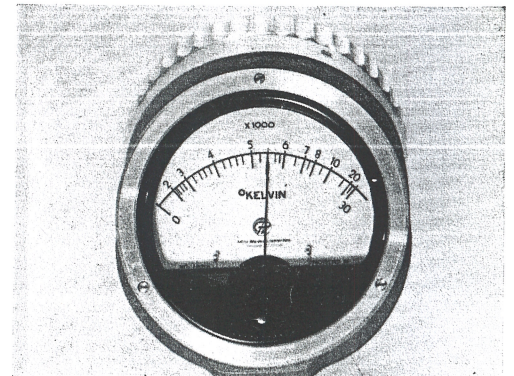


THE SPECTRA is used in the same manner as an incident light meter. It is merely a matter of pointing meter toward light source being examined, adjusting the diaphragm to the reference marker, squeezing the trigger, and taking the reading directly from the microammeter scale.

have seen how objects illuminated by the sun at that time have a distinctly reddish cast. We have observed a candle burning in a room illuminated by standard tungsten lamps, and accept as a natural thing that the candle seems yellow by comparison and, in turn, that the tungsten lamp will seem yellow in comparison with daylight if it be turned on in a room illuminated by windows. The tungsten lamp gives a light having a higher percentage of blue rays than candlelight, and the daylight has a higher percentage of blue rays than the tungsten.

In a thermal source the relative amounts of all wave lengths

(Continued on Page 278)



AFTER METER is pointed toward the light, diaphragm is adjusted until indicator needle rests on reference marker, as shown here. When trigger is squeezed, needle will move to left or right, depending on the color temperature, giving a direct reading. No additional calculations are necessary.

Current Assignments of A. S. C. Members

Members of The American Society of Cinematographers were engaged as Directors of Photography in the Hollywood Studios during the month of June, as follows:

Columbia

HENRY FREULICH, "Song of India," (Cinematographer) with Sabu, Gail Russell and Turhan Director, Albert Rogell.

HARLES LAWTON, "The Lovers," with Cor-Wilde and Patricia Knight. Director, Edgar Sirk.

INCENT FARRAR, "Triple Threat," with Nina Foch and cast of All-American foot-steps. Director, Jean Yarbrough.

EX WIMPY, "Smoky Mountain Melody," with Roy Acuff and Smoky Mountain Boys. Director, Ray Nazarro.

Eagle-Lion

WILLIAM H. GREEN, "The Big Cat," (Technicolor) with Lon McCallister and Peggy Ann Garner. Director, Phil Karlson.

JOHN ALTON and GUY ROE, "Red Stallion the Rockies," (Cinematographer) with Jeanette and Arthur Franz. Director, Ralph E. Hyatt.

Independent

REGG TOLAND, "Enchanted," (Goldwyn) with David Niven, Teresa Wright and Lynn Keyes. Director, Irving Reis.

BOBBE BARNES, "The Numbers Racket," (Enterprise Productions; Enterprise Presentation) with John Garfield and Beatrice Pearson. Director, Abraham Polonsky.

ENIE LAZLO, "Some Rain Must Fall," (Cinematographer) with Gregory Peck and Anne Baxter. Director, William A. Wellman.

JOHN ROSE, "Bungalow," (Belsam Production; Rel.) with Tom Conway and Margaret Hamilton. Director, Edward L. Cahn.

ANTON HOCH, "Tulsa," (Technicolor) with Walter Pidgeon and E. L. Green. Director, John H. Auer.

ARL STRUSS, "Tarzan and the Arrow of Death," (Sol Lesser Prod.) with Lex Barker and Brenda Joyce. Director, Lee Sholem.

ENIE LAZLO, "The Lucky Stiff," (Amusement Enterprises—UA) with Dorothy Lamour and Brian Donlevy. Director, Lew Foster.

JEANETTE ARMSTRONG, "The Luckiest Girl in the World," (Enterprise) with Barbara Bel Geddes. Director, John Berry.

ENJAMIN KLINE, "Miss Mink of 1949," (Cinematographer) with Jimmy Lydon and Lois Lane. Director, Glenn Tryon.

WILLIAM MELLOR, "Blondes Up," (Lester Kohn—UA) with Groucho, Chico and Harpo Marx and Ilona Massey. Director, David Butler.

AL POLITO, "If This Be My Harvest," (Cinematographer) with Valli and Robert Montgomery. Director, Irving Rapper.

ENRY SHARP, "Strike It Rich," (Jack-ther-AA) with Rod Cameron and Bonita Hunt. Director, Lesley Selander.

M-G-M

CHARLES ROSHER, "Words and Music," (Cinematographer) with Judy Garland and Mickey Rooney. Director, Norman Taurog.

BERT SURTEES, "Act of Violence," with Heflin and Janet Leigh. Director, Fred C. Brantley.

JOSEPH RUTTENBERG, "The Bribe," with Robert Taylor and Ava Gardner. Director, Robert Z. Leonard.

CHARLES SCHOENBAUM, "Little Women," (Technicolor) with June Allyson, Margaret O'Brien, Elizabeth Taylor, Janet Leigh and Peter Lawford. Director, Mervyn LeRoy.

Monogram

HARRY NEUMANN, "Sheriff From Medicine Bow," with Johnny Mack Brown, Raymond Hatton, Evelyn Finley. Director, Lambert Hillier.

WILLIAM SICKNER, "Bowery Comeback," with the Dead End Kids. Director, Reginald Le Borg.

Paramount

DANIEL FAPP, "The Heiress," with Olivia de Havilland and Sir Ralph Richardson. Director, William Wyler.

RAY RENNAHAN, "Streets of Laredo," (Technicolor) with William Holden, MacDonald Carey, William Bendix and cast. Director, Leslie Fenton.

R-K-O

ROBERT DE GRASSE, "Baltimore Escapade," with Robert Young, Shirley Temple and John Agar. Director, Richard Wallace.

HARRY WILD, "Interference," with Victor Mature and Lucille Ball. Director, Jacques Tourneur.

20th Century-Fox

JOE MACDONALD, "Yellow Sky," (Technicolor) with Gregory Peck and Anne Baxter. Director, William A. Wellman.

ARTHUR MILLER, "Three Wives," with Jeanne Crain, Linda Darnell, Ann Sothern and Jeffrey Lynn. Director, Jos. L. Menkiewicz.

HARRY JACKSON, "Chicken Every Sunday," with Dan Dailey, Alan Young and Celeste Holm. Director, George Seaton.

CHARLES CLARKE, "Sand," (Technicolor) with Mark Stevens and Coleen Gray. Director, Lou King.

JOSEPH LA SHELLE, "The Fan," with Jeanne Crain and George Sanders. Director, Otto Preminger.

Universal-International

RUSSELL METTY, "You Gotta Stay Happy," (Technicolor) with Joan Fontaine and James Stewart. Director, H. C. Potter.

ARTHUR EDSON, "The O'Flynn," (Fairbanks Co. Prod.) with Douglas Fairbanks, Jr. and Helena Carter. Director, Arthur Pierson.

WILLIAM DANIELS, "Family Honey-moon," with Claudette Colbert and Fred MacMurray. Director, Claude Binyon.

FRANK PLANER, "Criss Cross," with Burt Lancaster and Yvonne de Carlo. Director, Robert Siodmak.

IRVING GLASSBERG, "Black Velvet," (Technicolor) with Anne Blyth and George Brent. Director, George Sherman.

Warner Brothers

PEV MARLEY, "Silver Lining," (Technicolor) with June Haver and Ray Bolger. Director, David Butler.

TED MCCORD, "June Bride," with Bette Davis and Robert Montgomery. Director, Mitchell Leisen.

WILFRED CLINE, "Fighter Squadron," (Technicolor) with Edmond O'Brien, Robert Stack and cast. Director, Raoul Walsh.

KARL FREUND, "South of St. Louis," (Technicolor) (United States Prod.) with Joel McCrea and Alexis Smith. Director, Ray Enright.

PEV MARLEY, "Night Beat," with Robert Douglas and Helen Westcott. Director, Elmer Decker.

ROBERT BURKS, "The Fountainhead," with Gary Cooper and Patricia Neale. Director, King Vidor.

3000 FRAMES PER SECOND

(Continued from Page 269)

A 1/5-h.p., 32-volt universal motor is used to drive the film-moving mechanism, optical plate, and take-up spool. Overloading this motor up to 115 volts increases the speed beyond the normal range. This permits rapid acceleration and maximum speeds without damage to the motor since it is overloaded only for few seconds at a time.

Speed in frames per second is controlled by setting a stop on a built-in rheostat, mechanically coupled to the motor. To limit acceleration strain, this same rheostat, connected in series with the motor, applies a decreasing resistance as the motor comes up to speed and the pointer moves to the stop. At maximum settings, approximately 25 feet of film are required before the camera attains 80% of desired top speed. A motor shut-off switch dial cuts the current when the end of the film is reached and deceleration follows immediately.

In general, the speed at which the camera is to be operated is determined by the speed of the action pictured. Excessive taking speeds increase the problem of adequate lighting for the short exposures involved. A handy formula for computing camera speed is

$$\text{Frames per second} = \frac{40 \times \text{Subject Speed}}{\text{Width of Subject Field}}$$

when subject speed is measured in inches per second and subject field is measured in inches. This formula, however, is based on the assumption that the subject moves in a plane parallel to the plane of the film. Where subject motion is directed toward or away from the camera lens, lower speed may be adequate.

The actual speed of any given action photographed may be timed in absolute units. An argon lamp, connected to normal 115-volt 60-cycle, produces light impressions on the film edge denoting each 1/120 second.

A synchronization switch dial is provided to enable the operator automatically to make or break an external electrical circuit after a portion of the film has

been run. This is useful particularly when a given action is to be photographed only after the camera has attained a predetermined speed.

Standard loading for the Kodak High Speed Camera is a 100-foot roll of specially spooled 16mm. Cine-Kodak Super-XX Panchromatic Film. Where more exposure can be given, Cine-Kodak Super-X Panchromatic Film yields a finer image. In addition to these Eastman reversal films, Super-XX Panchromatic Negative Film may be used as can Kodachrome Film when ample light is available. Fifty-foot rolls of these materials are available on special order where 100-foot rolls are not needed.

Because of its light weight and compactness, the Kodak High Speed Camera has proved especially valuable in industry, both in design of high-speed equipment and in trouble shooting. Not only can the camera easily be transported anywhere in a shop, but—unlike flash discharge photography which must be carried out in subdued light—it may be used in normal room light or daylight and its picture cycle embraces a long enough period of time—1/2 to 5 seconds—to depict the full cycle of the majority of high-speed industrial operations. Thus if a given part is malfunctioning the camera footage is assured that somewhere in his footage the failure will be recorded for study.

The importance of such visual studies cannot be overestimated. Industrial engineers and designers are constantly called upon to increase the speed at which machines and equipment may be operated. As a result, they need accurate knowledge of the time, space, and force relationships

TRANSITION LENS FOR TELEVISION

(Continued from Page 266)

as his automobile rolled up Pennsylvania Avenue toward him. Suddenly there was a renewed ovation from the crowds of spectators lining either side of the Avenue, and the President doffed his hat.

Walker instantly switched to his telephoto lens, capturing a well timed close-up of the President as he removed his hat and bowed, smiling, to the cheering throng. Years later a print of the reel containing this memorable footage was presented as a gift to the President's widow by the newsreel company.

Subsequently, Walker continued his explorations with transition lenses, developing the automatic, multi-element zooming lens for both 35mm. and 16mm. cameras.

With the rapid development of television photography, the tele-camera and its peculiar problems attracted the attention of Joe Walker who makes it a point to keep abreast of every development in

which occur between parts that move too fast for visual observation.

Consequently, the Kodak High Speed Camera has been used to study such varied industrial problems as mechanical power transmission, metal cutting and forming operations, the flow of coolants in metalworking, effects of vibration, electrical arcing, aircraft behavior, fuel injection, the mixing of fluids, and metal flow in welding. This list is by no means exhaustive.

The solution of a typical industrial problem through use of this camera involved a machine embodying a ratchet feed that was continually out of service for replacement of the ratchet and pawl. Six times each second the pawl had to index a six-tooth 2 1/4-inch ratchet wheel with .01 second allowed for engagement. Neither ratchet nor pawl was standing up under this service.

Motion pictures taken with the Kodak High Speed Camera showed the pawl bounding off the ratchet tooth so that maximum force was exerted when the contact was small. Naturally this caused the corner to wear rapidly. A change in the pawl shape to reverse the rebound force eliminated the trouble.

While pictures of this type are primarily intended for engineering use, they often may prove useful in sales promotional films to illustrate a particular point about a machine or process. Incorporating such footage in promotional films provides visual proof of engineering claims and leaves the prospective purchaser convinced that parts operate as intended. Proof of this nature offers a sales argument of real force. ★ ★ ★



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transitional shots during shooting. Instead, two or more cameras are used on the set or event—each operating with lenses of different focal lengths—and cuts between cameras are effected electrically by the operator at the camera control panels.

Earlier it was found that transitions made by swinging the television camera lens turret created a side motion of the entire picture image on the screen that was very disturbing to the eye. So those television studios fortunate to have the equipment, remedied this by using two or more cameras and cutting from one to the other, as prescribed in the script.

The answer to this problem, Walker foresaw, was a lens that would afford a quick change from long shot to closeup without creating any disturbing visual effect on the video screen. And as television's requirements, more often than not, were for a simple switch from long shot to closeup, or closeup to long shot—rather than a zoom effect—Walker's inventiveness enabled him to readily adapt his original two-image lens to television's needs. Subsequently the lens was appropriately tradenamed the Duomar.

The Duomar has two different fields of view. The movement of a lever by the operator changes the field from long shot to closeup, or vice versa, with a pleasing melding of the two scenes marking the transition, instead of the abrupt side motion "wipeoff" that occurs when the television camera's turret is employed for effecting transitions.

By moving the lever (indicated in photo by arrow No. 1) quickly, the result is an almost instantaneous "cut" from one field of view to the other. If the lever is moved moderately slow, a dissolving effect is obtained between the two.

Unlike the continuous zoom lens, of which Walker has made several for use in motion picture photography, the Duomar can be made in any lens speed and with a very high degree of optical correction. Speeds of $f/2$ have been found quite practical; however, in large television studios the speed of $f/4$ is sufficient for practically all purposes. Moreover, size and weight of the lens must always be considered. The faster the lens, the larger it must be.

The Duomar lens pictured here is 12 inches in length and the image range is between that of 8 and 16 inches focal length. The lens requires a lightweight bracket to support it before the camera. The bracket shown in the illustration is made of aluminum and is held in place by an extension which fits between the camera and the tripod head.

The Duomar is not an auxiliary lens. It replaces the regular television camera lenses. The range of the transition is pre-set by adjusting two collars mounted on a shaft paralleling the lever opening.

Early tests of the Duomar lens on the "Queen For A Day" and "Heart's Desire" video shows revealed that, in addition to operating the lens lever, the operator also had to adjust his camera simultaneously in order to keep the lens centered vertically on the scene or subject. Walker soon corrected this and now centering becomes automatic, the range of the centering action being pre-set by adjusting a small knob immediately below the front of the lens, indicated by arrow "2" in lower photo on page 266.

The Duomar lens is fully patented. Harry Lubke, director of Television for Don Lee, and his video cameraman Hermas Smith were the first to employ it. Walker is making the lens available to any television company for experimental or regular program use. ★ ★ ★

GRAND OPERA IN 16MM.

(Continued from Page 274)

have the additional interpretive faculty of English dialogue and the freshness and realism of screen presentation to simplify opera for every type of audience.

On the screen, the arias are sung in the native tongue of the original opera. The dialogue which precedes an aria is spoken in English and thus fully explains and sets the scene; the aria continues the mood.

Although this film marks grand opera's first "adaption" to its new medium, Maestro Peluso says that it was not necessary to alter the original music or arias in any way, except for some of the lengthier musical compositions, which were shortened to allow for more explanatory dialogue. But the essentials of the plot and music were not changed in the streamlining given the screen production.

The musical score and arias were recorded by Metropolitan Opera star Emily Hardy, Frank Travaglione, Giovanni Zavatti and conductor Peluso. Those essaying principal roles on the screen sang and spoke their lines in accompaniment to playback of the original recording, but this was not recorded. The pre-recorded musical score and arias were dubbed in.

Although this was a 16mm. film production, it was handled in the most professional 35mm. manner. Both the technicians and cast were recruited from among regular studio workers. The casual observer accustomed to watching typical Hollywood studio production methods would hardly have noticed any difference in the procedure, except when the camera blimp was raised to reveal within it a Mitchell 16mm. Professional camera instead of the familiar Mitchell 35. Since this camera is almost identical in design and operation to the 35mm., it presented no difficulties to our 35mm. camera operator. ★ ★ ★

MUSIC FOR MOVIES

(Continued from Page 270)

against such music because it happens to have been written as accompaniment for screen drama.

Composing and recording background scores is a highly specialized and rather intricate business. Heading the musical department of each studio is a musical director who supervises the creative efforts of anywhere from eight to twenty composers, arrangers and directors. It is his task to assign various pictures to individual composers and to work with them in developing themes and orchestrating completed scores. Occasionally the musical director personally composes the score for an important picture, and quite frequently several specialists work together on a single score. One may write the score, another will arrange it for the orchestra, and still another will conduct the orchestra in actual recording of the music.

Although scoring procedures vary somewhat with particular studios, the basic techniques are similar. Usually the composer writes his themes while the picture is still on the sound stages or in the cutting room. When the picture is completed, every scene, action and bit of dialogue is accurately timed by a mechanical device, and the composer begins the operation of fitting his music reel-by-reel to the actual content of the film. Elaborate cue sheets enable him to precisely synchronize musical ideas to the celluloid.

The recording is done a reel at a time on the recording stage. The conductor rehearses a large symphonic orchestra repeatedly, while watching the picture projected on a screen at the back of the stage. After several rehearsals a cutting of that portion is made, and as soon as one reel is okayed, the conductor goes on to the next. The utmost precision is needed to get the music to closely match the picture.

Max Steiner, regarded by many as the industry's foremost musical director, has evolved his own highly successful formula for film scoring. He maintains that "the ear must hear what the eye sees," and with this in mind he asks himself, when viewing a completed picture for the first time, "What does it sound like?" He then analyzes the main characters and situations of the story and composes a representative theme for each.

These themes are then turned over to a timing expert who writes out intricate cue sheets to match music with action. Mr. Steiner frequently composes what is known in the trade as "Mickey Mouse Music." More clearly defined, this is the kind of music that closely follows the action of the characters. If a player runs upstairs, the music does likewise—if he falls down, the music takes a tumble, also.

When this specialized timing is done, the composer then completes the transi-

tions and interludes for each reel, after which the score is turned over to the orchestrator to be arranged for recording. Mr. Steiner works closely with the arranger to make sure the desired instrumentation is created. He also sits in on the re-recording session (during which music is "mixed" with dialogue and sound effects) in order to more closely control the volume and modulation of the music in relation to the other sound elements.

Max Steiner has thrice won Academy awards for his scoring of "The Informer," "Now Voyager," and "Since You Went Away." His other outstanding scores include: "Gone With the Wind," "Sergeant York," "Casablanca," "Mission to Moscow" and "Saratoga Trunk." His brilliant score for the motion picture, "She," has been given many concert performances by leading symphony orchestras. Mr. Steiner's musical themes are so melodic that several have been published as popular songs, notably the themes from "Now Voyager" and "Saratoga Trunk." He is one of the foremost proponents of background scores as music worthy of the concert hall.

Commenting on the aforementioned controversial issue, Mr. Steiner says: "A major victory was won when producers came to realize that the score should not always be completely subordinate to the story. Formerly, it was unheard of that a scene should be lengthened so that a musical idea might be more effectively developed. Now, if I need ten more feet of action to complete what I have in mind I can usually get it. That is a definitely encouraging sign." ★ ★ ★

INFRARED FILM

(Continued from Page 265)

"chalking" of the features. In "Fort Apache," no makeup of any kind was used except in the infrared shots.

The shades of brown makeup will vary with the filter used, which should be a 23A, 25A, and, rarely, a 29F. Choice of filter will depend entirely on the background, sky and clouds. In several instances I used a 23A filter and then shot the scene to follow using a 29F filter, and succeeded in maintaining a balanced density in both long shot and closeup.

In using only the red filters it is well to remember that all reds in the scene are consequently highlighted in color and with a corresponding degree according to the filter used. All props normally containing red, such as flags, insignia, etc., should be replaced with duplicates in which the red colors have been replaced by light or medium brown, and the filters for the shot carefully selected.

In balancing connecting shots, the sky should also come in for careful evaluation in the selection of filter to be used for

long and close shots. A ground haze can cause serious trouble if shot in a back-light or back cross light. Where haze prevails, a few test shots developed on the spot, will indicate the best filter to use, and at the same time convince you of the value of infrared film for getting dramatic pictorial effects that would not be possible under the same conditions with any other emulsion.

For the 16mm. movie maker, amateur or professional, infrared film offers many possibilities, both pictorial and timesaving. Where the filmer has not the lighting facilities to photograph actual night shots, infrared and filters will enable him to photograph such shots in daylight. The 16mm. professional will find many uses for the film to enhance production values—something he can easily prove by making a few test shots.

There is no definite emulsion speed indicated for infrared film for use in daylight. Only last month, I contacted Eastman's representative, who was visiting in Hollywood, and could get no definite information regarding this.

In checking my exposures, made during the past few years with this film, I established the following exposure table:

Exposure Meter	Reading	Filter Used	Exposure
General Electric	150 Foot Candles	25A	f/6
General Electric	150 Foot Candles	25A	f/8
General Electric	150 Foot Candles	29F	f/3.5
Norwood Director	250 Foot Candles	25A	f/6
Norwood Director	250 Foot Candles	23A	f/8
Norwood Director	250 Foot Candles	29F	f/3.00

—all of which indicates an emulsion speed of 8 for the film. This may vary greatly, however, depending upon the color of backgrounds and the density desired; so actual tests under given conditions, coupled with past experience should be your safest guide.

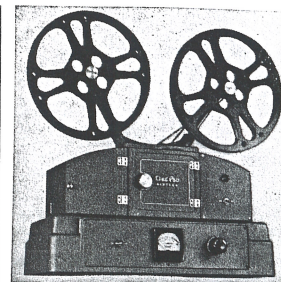
For the successful use of infrared film in photographing "Fort Apache," considerable credit is due director John Ford; for without his understanding, cooperation and assistance, the dramatic pictorial shots that mark the picture would not have been possible. Indeed, Ford was as eager as I to use the film and to leave nothing undone to insure the greatest possible results from it.

BULLETIN BOARD

(Continued from Page 260)

reveal details of the new film treatment, two film strips were screened for the group, one shot under normal conditions and the other deliberately under-exposed by one full stop and then subjected to the new process. Both strips screened with identical results.

S.M.P.E. reports that Czechoslovakia's film industry has established a new standard projection speed of 25 frames per second for 35mm. sound film.



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