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Playback Records in Motion Picture Production

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PLAYBACK RECORDS in MOTION PICTURE PRODUCTION

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In the early days of sound recording for motion pictures, the recordings were made on wax discs. It was customary in those days to "cut" two or more disc records simultaneously on each scene and one of these discs was "played back" to the recording artists immediately after the recording was made. This "playback" served as a quick check on the quality of the recording and the performance of the artist, and was considered necessary in view of the several days' time which elapsed between making a recording and receiving the finished processed record. These playbacks were the forerunner of the playback as we know it today and which has become one of the major production tools of the recording engineer.

With the introduction of musical pictures, playbacks were used extensively as a means of synchronizing the "long shot" camera angles of singers and dancers. The performers were first photographed and recorded simultaneously in "close-up," in order to obtain satisfactory recordings and accurate synchronism between sound and picture in close shots. These recordings, usually referred to as "Standard Recordings," were then played back to the performers, and while they duplicated their performances as closely as possible in synchronism with the reproduced sound, they were photographed in longer shots where any lack of synchronization was harder to detect.

The author is shown here with one of the earliest playback reproducers. This museum piece forms part of the Warner Bros.' collection of early recording and reproducing equipment.

Objections arose to this method of shooting which were both economical and artistic, particularly where orchestras were involved. The cost of maintaining an orchestra on the set during the complete photographing of a number and the cost of time lost by the electrical, camera, and construction groups, due to their having to remain quiet during long rehearsal periods, ran beyond all reasonable bounds. The physical location of the performer relative to the offstage orchestra was rarely ideal for optimum balance and co-ordination between them. Acoustic conditions were seldom optimum for music recording, and often times the conductor would have to follow the artist by peering through a battery of lamps and cameras. It was found that many singers did not look particularly photogenic while singing, and the difficulties of obtaining satisfactory performances for both the camera and the microphone were many fold. The outgrowth of all these difficulties was the present day practice of "pre-recording" virtually all musical sequences. In "pre-recording," the entire musical number is recorded on a specially designed music recording stage at some time prior to the photographing of the number. The artist is subsequently photographed while duplicating his performance in exact synchronism with a playback of the pre-recording.

Playbacks of pre-recorded music may be put to a variety of uses. The most generally accepted use is for the synchronizing of the lips of singers, the steps and taps of dancers, and the action of instrumentalists and orchestral performers. In some cases where it is anticipated that a performer, say a singer or a pianist or violinist, may experience some difficulty in accurately synchronizing to the playback, the pre-recorded record is made to carry only the accompaniment. This is played back on the set with the minimum possible volume and the artist is recorded and photographed simultaneously while performing to this reproduced accompaniment. The correct balance between the synchronous solo recording and the pre-

recorded accompaniment is later established by re-recording them together into a single recording.

In the shooting of long dance routines, it is sometimes considered more economical to establish tempo by playing back a piano recording, instead of attempting to pre-record the number with a full orchestra. The piano sound track is later used as a tempo guide to the conductor when the final orchestra recording is made. In this way, any special orchestral effects which may be called for to accentuate the action on the screen and which may not have been established at the time a pre-recording would have been made, can be incorporated in the orchestral score.

Pre-scored playback records are, of course, used extensively for rehearsal purposes. The use of playback records for rehearsing dancing routines assures a perfect duplication of tempo for each rehearsal and the reproduction of an orchestral recording provides much greater inspiration to the dancers than can ever be obtained from a piano player.

In the making of pre-scored records for playback purposes, it is customary to record a number of ticks or counting, ahead of the first notes of music. The ticks or counting are in the same tempo as the following music and serve as a warning cue to the artist of the exact moment the first note of music will be heard.

Music recorded *after* the picture has been photographed and edited is known as "post-recording" or "post-scoring." Here again playbacks play an important part. Dialogue may be played back to the conductor through a headphone to aid him in cueing his music correctly. Pre-scored music tracks may be played back to the conductor to enable him to make smooth musical transitions and connecting inserts between pre-scored and post-scored material. In cases where standard musical recordings have been made synchronously with the camera, and where for such reasons as poor acoustic conditions, bad pick-up or bad balance, the recordings are unsatisfactory, these recordings may be played back in synchronism with the projected picture on the scoring stage as an aid in the making of new and more ideal recordings. This frequently happens in the recording of piano. Many scenes are staged in which dialogue is interspersed with piano playing. In shooting these scenes, the piano recording is seldom satisfactory, due either to the dialogue recording characteristic of the recording system or due to the piano

Joan Crawford, star of M.G.M.'s "Torch Song" soon to be released, with Adolph Deutsch, musical director and composer, rehearsing to playback.

being offstage. In such cases, the piano recording is played back on the scoring stage in synchronism with the projected picture and both picture and playback serve as checks on the accuracy of synchronism of the new piano recording which is made.

There are several uses of playbacks which are common to both pre and post recording. One of their most important uses is as an immediate check on the balance and performance of the orchestra and recording artist.

The intelligibility of lyrics in a song, the clarity of the orchestration, the tempo, the balance within the orchestra, the balance between orchestra and soloist can be quickly and accurately checked by means of a playback and many valuable minutes of inconclusive discussions and arguments saved.

In the recording of orchestra and chorus combinations, the chorus of voices may not sound big enough or have sufficient clarity. In such cases. the recording of the orchestra and chorus ensemble can be played back to the chorus members through headphones. With this as a guide for pitch and tempo, the chorus can repeat the performance exactly and a new chorus recording obtained.

In recording the chorus separately this way, the pick-up, being independent of any masking effect from the orchestra, can be adjusted to give the effect of maximum sonority and magnitude. The recordings of the separate chorus track and the original orchestra and chorus ensemble can be combined in any desired balance by rerecording them together. Similarly, the apparent magnitude of a purely orchestral recording can be increased by making to playback, supplementary tracks of any section of the orchestra it may be necessary to augment. For instance, many recording orchestras are poorly balanced within themselves. Their instrumentation usually consists of the full symphony complement of brass, wood winds and percussion, but with only a fraction of the symphony string section. As a result, it is frequently impossible, where the orchestration is heavily scored in brass, to obtain a recording giving sufficient prominence to the strings for satisfactory balance. In these cases it is possible to make a supplementary recording of the string section alone, which, when added to the original orchestra recording, produces the required effect.

In the recording of dance routines involving tap dances, it is generally unsatisfactory to attempt to record the orchestra and the taps simultaneously. A microphone located near enough to a dance floor to pick up the taps over the orchestra, causes the balance and quality of the orchestra pick-up to suffer badly. In addition, it is usually im-

possible to pre-determine the balance between orchestra and taps for correct illusion on the screen. In an extreme long shot the taps should be barely audible, while in extreme close-ups, they should be correspondingly prominent. Where these changes in balance cannot be pre-determined, the play-back offers a satisfactory solution to this problem. A recording of the orchestra alone is first made. This is then played back through headphones to the dancer or dancers, and as they dance in tempo to the reproduced music, a separate recording of the footsteps or taps can be made. The correct balance between the taps and music for optimum illusion on the screen is later secured by re-recording.

One of the most valuable uses of the playback is to provide "clicks" of any desired tempo for guidance of conductors in the scoring of pictures and cartoons. All cartoons and many sequences in motion pictures have fixed rhythmic tempi. In cartoons, the animated picture is drawn to an established tempo of a certain number of frames of picture per beat. In scoring the cartoon, tick records of the same tempo are played back to the conductor through a pair of headphones and thus absolute synchronization between the music and animation is assured without any reference to the picture at the time of scoring. In many cases the music is recorded before the picture is drawn and ready for projection.

In the scoring of motion pictures, certain types of sequences call for strict tempo music. Such scenes as those involving marching feet, the steady click of train wheels on the rails, cafe scenes with a dance floor background, all call for music of a steady strict tempo which is easily determined and reproduced by a click playback record.

In the scoring of dramatic sequences in which no rhythmical pattern has been set and in which it is desired to accurately synchronize musical effects with pictorial action, the playback tempo record is again used to good effect, although the method of establishing the necessary tempo is somewhat more complicated.

Each sequence designated for scoring is carefully measured and a cue sheet is prepared which shows at what point in the reel a musical sequence is to start and the distance from this point in feet and frames of each picture cut, each significant piece of action, and the beginning and end of each line of dialogue. From the information contained in this cue sheet the composer decides on the general form of his musical composition and the approximate tempo at which it will be played. To assist the composer in establishing tempo, he is supplied with a complete set of tempo records carrying a range of tempos from 15 to 25 frames per beat at quarter-frame intervals. When the composer has decided upon the required tempo, the exact beat or fraction of a beat at which an important cue occurs is listed on his cue sheet.

Several methods have been devised to eliminate the tedious computations necessary to determine the distance in feet and frames from a start mark of any number of beats for any specified tempo. At the Warner Bros. Studios, this information is contained in charts bound in book form. Other studios have designed slide-rule type calculators for the same purpose. With the information contained on the cue sheets, the composer can proceed with the actual composition, so designing the music that any musical effect he may wish to use to accentuate the action and synchronize with it. will fall on any specified beat. By judicious changing of the number of beats per bar, and by the use of varying rhythmic patterns in accompanying instruments, the composer can skillfully avoid any metronomic character from appearing in the final sound of the music.

In the recording of music scored in this manner, tempo ticks are played back to the conductor and the rhythmic instrumentalists in the orchestra through headphones. With such an arrangement, synchronism of both picture and music is absolutely assured at all times. Long and tedious rehearsals are no longer necessary for purposes of timing and the accuracy with which musical and pictorial effects can be synchronized greatly enhances the value of the music score in pointing up dramatic moments. For the scoring of sequences of obvious fixed tempo such as marching, dancing, cartoons, etc., a stock library of tempo records is maintained. It frequently happens, however, that musical sequences may call for variations in the spacing of the tempo clicks. At the Warner Bros. Studios, a special machine has been developed which can be set to rapidly and automatically punch holes in a strip of film in the sound track area at any spacing from 7 to 25 frames at 1/8-frame intervals. The clicks from the punched sound track are transferred to acetate disc records for faster and easier handling on the scoring stage.

EQUIPMENT

The acetate type of disc record has provided an excellent medium for playback purposes. The high quality, low surface noise, reasonably long playing life and ease of handling of this type of record have resulted in its almost universal use for playbacks. A great advantage of the disc record for playbacks is the ease with which start marks can be made at any point of the recording and the rapidity with which the reproducer needle can be located on the start mark for repeated playings of the record. Many ingenious devices for rapid location of any point on any groove of a record have been described in the technical literature. (Editor's Note: See Page 6 for cueing devices)

Fig. 1—Warner Bros.' Cueing Device

in general use at the various Hollywood studios.) The simplest is a grease pencil mark across several grooves. By drawing the reproducer needle through the desired groove, a clear line appears through the grease pencil mark which serves as an accurate start mark. A small magnifying glass mounted above the reproducer needle point enables the needle to be located in the correct groove with no difficulty. Where several such marks are placed on a record, one or more marks may be erased by playing through them. To overcome this difficulty a simple device is used at the Warner Bros. Studio, which is illustrated in Fig. 1.

The desired groove position is marked in lead pencil on the white surface of the curved arm that is held over the record face. The position of the start in the specific groove is indicated by means of a grease pencil mark at the center of the record. Where several start marks are cued at different places on the record, each groove mark on the white arm is numbered and a corresponding number is given to the center grease pencil location marks. A metal pointer is mounted on the side of the reproducer head which serves as a guide for marking the groove cue lines on the white arm and for subsequent location of the needle point in the desired groove.

While disc records are most generally used for playbacks, there are some occasions where film recordings can be used to greater advantage. In long travelling shots requiring playbacks, as, for example, a group of horsemen singing while jogging along on horseback, it may be found necessary to move the playback equipment along with the camera. In such cases, the difficulties encountered in making the reproducer needle track the record grooves, make the film reproducer more satisfactory. However, for general use, the time consumed in rewinding the film and threading it in a film phonograph or moviola, prohibits its use in favor of the disc.

It has been found most desirable to reproduce playback records with the best possible quality. Poor quality playbacks are very disconcerting to the actor and every effort is made to avoid any such influence from detracting from the actor's performance. As a result, turntables are kept free of flutter, adequate power is available in the amplifiers to avoid overloading, and high quality loud speaker systems are used.

In some special cases where an actor is required to speak dialogue while playing an instrument, say a piano, to

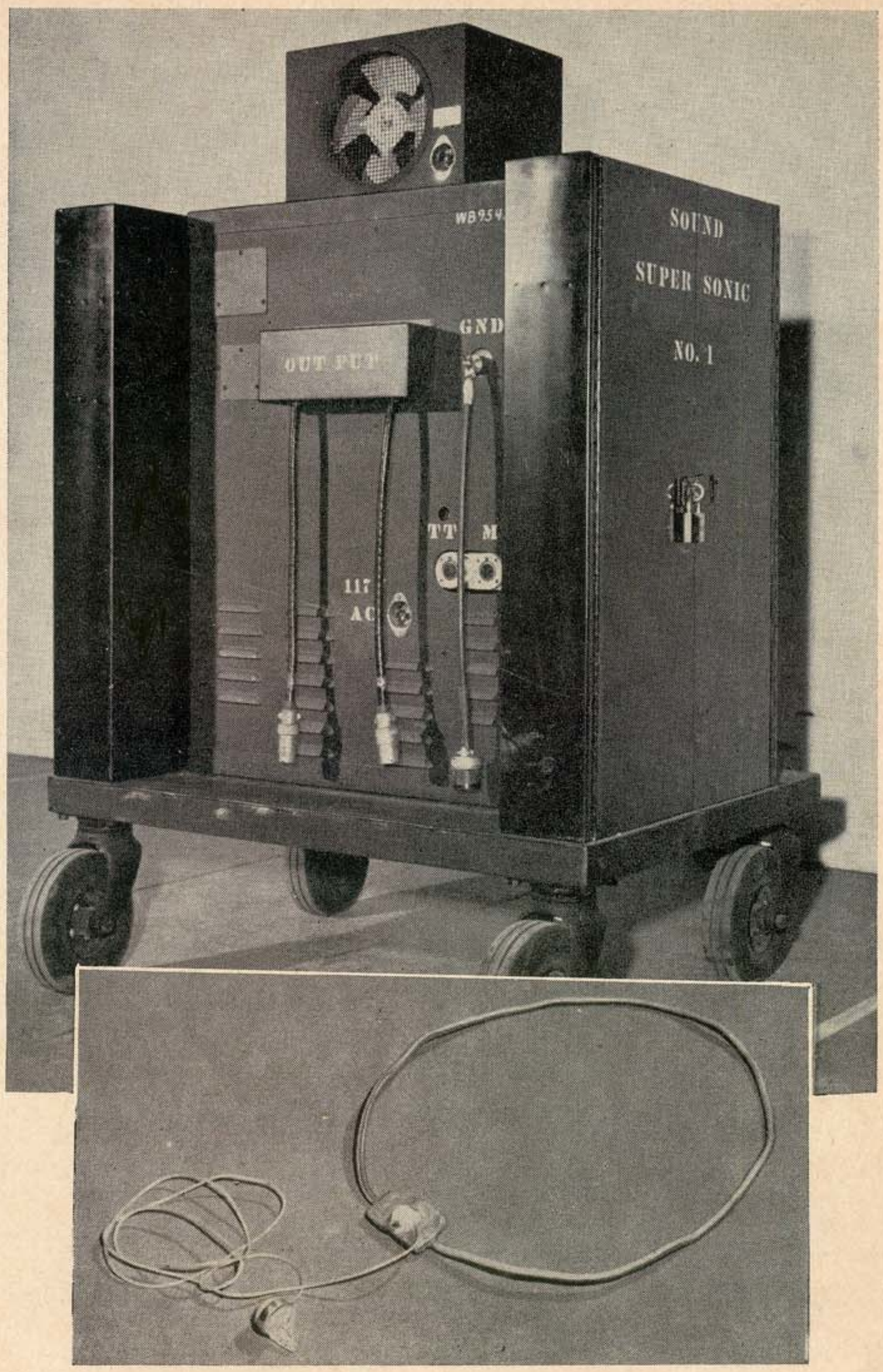

FIG. 2 Warner Bros.' Supersonic Playback Transmitter. Inset shows receiver, loop and earphone.

playback, the loud speaker may be substituted by a small high quality deaf set type (hearing air) headphone, which is worn by the actor. This type of receiver is very small and fits directly into the ear and may be easily hidden from the camera view by suitable head dress or choice of camera angles. By this means the actor can hear the playback and synchronize his action to it, while the microphone picks up and records only his speech. With this arrangement, the speech recording is kept clear of any music and editing of the speech track is accordingly greatly facilitated.

In situations similar to this, where it is inconvenient or impractical to have connecting cables between the playback

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PLAYBACKS

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equipment and the receiver worn by the actor, it is customary to use a so-called Supersonic playback system (Fig. 2). This system is, in essence, a radio transmitter and receiver. The equipment consists of a crystal controlled electromagnetic generator which supplies power to a single turn loop which encircles the set. In the particular equipment designed by Warner Bros., the carrier frequency in the loop is 100 kc, and it is amplitude modulated by any desired external audio source such as a disc or film sound reproducer. The equipment is capable of supplying an adequate modulated carrier signal to a loop up to approximately 400 feet long. The dancer or actor who is to hear the playback wears a loop receiver similar to the one illustrated in Fig. 2 around his neck which is connected to a hearing-aid type of earphone receiver. This loop is about 10 inches in diameter, approximately ¼-inch thick and weighs only a few ounces. The complete unit constitutes a tuned crystal receiver that is tuned to the carrier frequency of the transmitter. Since the transmitter is supplying power to a loop that has low radiation resistance, the effective range of the system is only within the induction field of the transmitting loop, which for all practical purposes is within its enclosed area.

From the foregoing, we can see that the many uses to which the playback is put, in present day recording for motion pictures, make it one of the most useful tools available to the sound recording engineer, without which present day production technique would not be possible.

O.K. FOR SOUND

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pictures, "Hysteriama" and for the sound "Schizophonic."

Glen Glenn. Ryders and Studio Sound seem to be getting their share of work . . . Picture Recorders have their dubbing room just about finished so they should be in business before long . . . Our old friend Bill Low has been doing a little booming for Bob Newman over at Film Recorders . . . Bob has a nice little place and doing a swell job with the Hank McCune show . . .. We had a nice visit from Jose Carles who is one of Mexico's top mixers . . . Last week he got a big kick seeing a lot of our boys again who have been to Mexico City on location . . . he was impressed by Bill Stancil's equipment . . . is shipping some to Mexico . . . So with that I will say "Adios Amigos."

—JAMIE

Clarence Peterson, expert R.K.O. playback operator and Singer Frank Sinatra rehearsing to playback.

SOUND LOG

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• STUDIO SOUND

COWBOY G-MEN (Telemount Pictures) TV

Jack Solomon—Mixer
Tommy Thompson—Boom Operator
Ted G. Mann—Service Recorder

RAGE OF THE JUNGLE (Alpine Prod.)

Ben Winkler—Mixer
Al Overton—Boom Operator
Theodore H. Mann—Service Recorder
Mickey Emerson—Stageman

• UNIVERSAL

GOLDEN BLADE (Dubbing)

Joe Lapis—Mixer
Glenn Rominger—Mixer
Robert Guhl—Mixer
Corson J. Jowett—Mixer
Thom. Piper—Recorder
Ernest Pearson—Machine Operator
Glenn Anderson—Machine Operator

STAND AT APACHE RIVER (Dubbing)

William Hedgcock—Mixer
Ronald Pierce—Mixer
Richard DeWeese—Mixer
Glenn Anderson—Mixer
Sterling Alsdorf—Recorder
Harold Tucker—Machine Operator
Billy Ray Hedgcock—Machine Operator
Russell Carlson—Operative Supervisor

• GLEN GLENN SOUND COMPANY

I LOVE LUCY - OUR MISS BROOKS (Desilu Productions)

Cameron McCulloch—Mixer
George Hanson—Service Recorder
Stanley Cooley—Boom Operator
Dave Wolpa—Stageman
James Duffy, Jr.—Stageman
George Dormont—Stageman

DANNY THOMAS SHOW (Desilu Productions)

Cameron McCulloch—Mixer
Joe Keener—Service Recorder
Bob Quick—Boom Operator
Dick Williams—Boom Operator
James Duffy, Jr.—Stageman
Harry Kornfield—Stageman

CISCO KID (Frederick W. Ziv Co.)

Garry Harris—Mixer
Elden Ruberg—Service Recorder
Jay Ashworth—Boom Operator

HARRY OWENS TV

Jack Lilly—Mixer
George Hansen—Service Recorder
Stanley Cooley—Boom Operator
Don Robinson—Playback Operator

ART LINKLETTER AND THE KIDS (George Fox Company)

Cameron McCulloch—Mixer
Bob Youell—Service Recorder
Murray Jarvis—Boom Operator

DUBBING CREW:

Glen Glenn—Mixer
James Stewart—Mixer
Frank Dyke—Mixer
Harry Eckles—Service Recorder
Gordon Day—Recorder
Don Robinson—Recorder
Joe Kelley—Maintenance
Everett Tobey—Machine Operator