

# Reels, Magazines, Spindles for 3-D

For theater owners who are planning to equip for 3-D, the present magazine-reel-spindle situation is chaotic, to say the least. It may therefore, serve a useful purpose to discuss a number of factors related to the current problem, as viewed by the engineers, and to report on efforts now being made to smooth the path toward conversion.

## Reel Size

The vast majority of theaters have only two or at best three projectors, and since 3-D today requires simultaneous use of two machines, the "continuous performance" goes out. The length of an "average" motion picture program, including feature and some combination of abbreviated second feature, newsreel or short subjects, will run about two hours, as a conservative estimate, and at the standard projection rate of 90 ft/min, will use  $90 \times 60 \times 2$  or 10,800 ft of film. As it is physically impractical to put two miles of film on a single reel, theaters must use more than one reel per program. Most will need one or more intermissions to permit rethreading the two projectors; the minimum is obviously preferred.

Reel size is not critical if more than one intermission is planned (although a standard will be necessary). Considering the single intermission, therefore, it would appear that a reel should have a minimum capacity of 5400 ft. Assuming a hub diameter of 5 in. (presently contemplated), it has been estimated by the Motion Picture Research Council and others that this footage does require a 24-in. diameter reel. Exact determination will depend on such variables as take-up tension, thickness of film, condition and cleanliness of film, etc. It should be noted that a reel can hold roughly 10% more black-and-white than color film because of the difference in film thickness.

However, the only large reels now being produced in quantity, against orders from a large number of exhibitors, are 23 in. and not 24 in. The reasons for this are twofold: partly economic and partly based on the technical considerations of the early 3-D productions.

First: *Bwana Devil* totals 7600 ft and *House of Wax* reportedly will have a release footage of 8200 ft or approximately 10-15% less than the average 2-D and expected 3-D features. Capacity of the 23-in. reel is probably in the order of 4500-4800 ft. This capacity is therefore adequate for running one of these features plus a newsreel or short spliced to the end of reel two of the feature.

Second: At this critical moment of demand only 24-in. magazines and 23-in. reels are available. These were initially designed for some of the larger houses who wanted to decrease the number of change-overs and for the export market where the demand stemmed from single-projector theaters. To capitalize on the widespread initial interest in 3-D, the limited available stock was purchased and immediate orders placed for future delivery.

On the one hand, flexibility in film production and exhibition appear to call for a 24-in. reel and 25-in. magazine; on the other hand, immediate usefulness and availability of 23-in. reels and 24-in. magazines dominate the scene for the moment.

## Magazines

Some exhibitors have voiced concern as to the possibility of installing the 24-in. or 25-in. magazines on their equipment. This has been with particular reference to theaters still using Universal bases. There is definite information that either modification can be made with but few exceptions. The exceptions occur where the Universal base is used in very cramped quarters. In those cases smaller magazines will have to be used and the number of intermissions increased.

## Spindle Size

Diameter of the spindle in present use with 2000-ft reels is  $\frac{3}{8}$  in. With the load increased some 250% by the larger reels of film, it is generally felt that the spindle diameter must be increased to withstand the increased stress. No definite recommendations have been made as yet although  $\frac{1}{2}$  in. has been mentioned as a likely value.

### Take-up Tension

With regard to the 24-in. reel, the MPRC has stated that "Because of their size and weight, such reels must have free wheeling flanges to minimize strain on the film when the machine is started." By making the flanges free-wheeling, the reel inertia is appreciably decreased. And, of course, it is the flywheel effect of the flange mass which produces the film damage; that is, the reel tends to stay at rest after the projector is started and to continue at a fixed speed once it is in motion. Therefore, with fast start projectors, slack is created at the start and when the reel catches up it tends to maintain its speed and consequently gives an awful wallop

to the film perforations engaged in the hold-back sprocket.

Essentially what is required is a method of applying an adequate and constant take-up tension from the beginning of the start-cycle through to the end of the reel. Several methods, other than the free-wheeling reel, have been mentioned as potential solutions: use of a separate-drive, constant-torque motor, the double-cone type of mechanism and others.

### Committee Meeting

The Film Projection Practice Committee has scheduled a meeting to consider those aspects of these questions which lend themselves to and require standardization. This will be reported in the next *Journal*.—*Henry Kogel*, Staff Engineer.

## 73d Convention, Los Angeles Statler, April 27 – May 1

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Stereoscopic motion pictures and the engineering of drive-in theaters are phases receiving special attention at the Spring Convention. The technical and entertainment program is outlined on cards mailed on March 2 to all members in the western hemisphere. This card and the Advance Program, to be mailed March 27 to all members, will be sent to anyone on request.

President Herbert Barnett has announced plans for the Get-Together Luncheon:

Mitchell Wolfson, noted exhibitor, television broadcaster and former President of Theatre Owners of America, will speak at the opening luncheon, Monday noon. His keynote address will bring to Hollywood and to the engineers, the exhibitors' views on stereoscopic and wide-screen motion pictures, present outlook for theater television, and current prospects, technical and economic, for the drive-in theaters of the United States.

The Advance Program will give the full schedule, with abstracts, of the papers that Chairman Ralph Lovell now has firmly committed.

Stereo is scheduled for Monday afternoon and evening and Tuesday afternoon. Stereoscopic and wide-screen principles will be presented, along with photography and exhibition demonstrations. A stereo-

phonic sound demonstration has been planned for Friday evening.

Television begins on Tuesday with a papers session and a tour of the new CBS Television City. Tuesday evening's session will have a progress report on NISCC color standardization. (The April *Journal* will have the popular paper on this subject presented at the Washington Convention by A. V. Loughren.) Subscription television will also be on the program. The television sessions have been scheduled to precede the NARTB engineering sessions which begin on April 29.

On Wednesday morning and afternoon it is drive-in theaters—factors affecting picture and sound quality and new equipment.

High-speed photographers take a trip on Wednesday to the U.S. Naval Ordnance Test Station's Morris Dam Test Facility at Azusa, Calif. High-speed papers are scheduled for Thursday evening and Friday morning.

Wednesday evening is set aside for the traditional Cocktail Hour and the Semi-annual Banquet and Dance.

And the morning after the ball—it's open house at the Hollywood film processing laboratories. Thursday afternoon offers film processing subjects and Thursday night, a general session. Friday's sessions are on sound recording and on magnetic