

Some, who saw at the Institute of Radio Engineers exhibit in New York the tiny TV camera scarcely larger than the "pistol grip" it was held by, have foreseen such lightweight, portable cameras linked to magnetic recording equipment thousands of miles, possibly continents, away, by cable or microwave circuit. The tape-recorded image would provide a motion-picture record for instant viewing or later use. At the same time, any single tape section could be "played back" to provide a "still" picture that could be printed electronically on paper directly from a special type of TV picture tube. Progress will also be made in achieving color prints on paper by such electronic means. Eventually, such systems should become extremely compact since these electronic systems do not have to repeat continuously picture information which is not changing. Thus, more picture "information" can be transmitted and stored in a given area of material.

Obviously, this future we have just been scanning poses problems which can be met only by education. In this field our Society has been active too. For example, this week Ralph Heacock will be holding the first convention meeting of the recently constituted Projectionists Information Committee, which he and his capable sub-chairmen, Merle Chamberlain and Gio Gagliardi, have been organizing.

As a result in great measure of the efforts of your Past-President, John Frayne, and his Education Committee, the Society is sponsoring courses at several Universities and Colleges in Los Angeles and in New York. Ed Stifle, your Section Vice-President, has also been pioneering. Chiefly through his good efforts, our student section program has been revitalized and there are now student sections at the City College of New York, New York University, Rochester Institute of Technology and the University of Southern California.

Recognizing the key position held by education, not only in the future of the Society and the industries which we serve, but of the nation, your Board of Governors, seeking to promote further this education effort, has authorized an Annual Student's Award to be made first at the next Spring Convention. This Student Award of the SMPTE, a \$100 Government Savings Bond, will be awarded annually to the student submitting the best paper at a student section meeting during the preceding school year.

Your Board of Governors is hopeful that this Student Award will be one more factor increasing the interest of students in our industries — to the benefit of student, industry and of our nation.

## Letter to the Editor

### 16mm Projector Possibilities

I have read with great interest the article by John A. Maurer, "Developmental Possibilities in 16mm Projectors," which appeared in the February 1957 issue of the *Journal*. It's true, as stated in Mr. Maurer's article, that the 16mm film medium has reached a high degree of quality to compete with professional 35mm equipment; however, the present 16mm projector is still in a slow developmental process. Several projectors are now selling at high prices without a reasonable approach to the JAN-Spec ideal projector design.

Some projectors now on the market are of first quality with respect to sound reproduction, but fail in mechanical design. The reason is simple: most of the present high-priced 16mm projectors retain the old claw intermittent movement. This is, of course, a polemic point of view for many designers. In Mr. Maurer's article, regarding the mechanical film-drive design, he discussed some interesting points which form the basis of an ideal mechanical design in 16mm projection machines.

Any designer interested in creating a good and efficient 16mm projector must agree that the intermittent sprocket mechanism is the only mechanical means to secure rock-steady projection. The film-drive system must be one with at least 12-tooth feed and holdback sprockets. The main shaft in the intermittent movement must be 1,440 rpm for obvious reasons, and should use worms and worm gears for the rest of the film-drive mechanism, as employed in the Philips EL5000 16mm projector.

Now, for the intermittent movement, there are several good ways of achieving a good acceleration and deceleration pull-down cycle. The use of the old Geneva star, with more than four slots, presents some geometrical difficulties which can be solved by means of elliptical gears or coupled accelerator movements to bring the pull-down cycle under 90° of intermittent shaft rotation. The latter solution seems to be the most rational and is at present employed in some American and European projectors such as the Kodak Model 25 and the Duiker and Leitz 16mm projectors.

However, other designers prefer to use the four-slot Geneva star geared down by means of two gears in 1:2 ratio and coupled to one 8-frame intermittent sprocket. This type of movement is perhaps more complex than one employing a fast-running shaft with a star pinwheel actuated by a single drunken cam. However, the Eugene Bauer Selection II 16mm projector employs the standard four-slot Geneva geared down to one 8-frame intermittent sprocket and is an excellent mechanism. To return to the crossed-shaft intermittent movements, these are at present employed by some manufacturers such as the Holmes Decimittent movement projector, the General Precision Laboratory Model PB100, the Miracle and the Philips EL5000.

If 16mm projectors are designed to compete with the 35mm professional equipment, they must fall into the high-priced field for obvious reasons. The sound-reproduction system with its associated

precision film drive—as the optical or magnetic type—presents no difficulty in achieving results comparable to the professional 35mm equipment. Portability is a matter of price and ingenuity in the design. Projectors like the Duiker, Philips, Bauer, Leitz and Hortson are portable and at the same time employ an intermittent sprocket mechanism and professional sound systems, and are, in general, of robust construction.

The film drives in some European machines are simplified as much as possible with respect to the gear train and associated mechanical elements. This condition is found in the Philips machine. The EL5000 projector employs only a worm and three gears for the complete film drive. The use of two mechanically linked synchronous motors, one for the intermittent and another for the film-drive system, is a must in modern operational design. The Kodak Model 25 machine is also a good example of this. The isolation of the intermittent mechanism from the continuous film drive is the best way to assure perfect sound reproduction. The problem of the overall 16mm projector design falls into two categories: the medium priced machine with the claw pull-down movement and relatively good sound reproduction; and the professional-type machine rated as a commercial projector and costing as much as any 35mm theatrical motion-picture equipment.

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