Comments in Moscow on Motion-Picture Industry

By DEANE R. WHITE, *Leader of the Delegation*
(*Other Delegates:* FRANK CAPRA, E. M. STIFLE and W. E. GEPHART, JR.)

NOTE: On October 19 this delegation left the United States to study the Soviet motion-picture industry: Frank Capra, film producer-director of Hollywood; Ethan M. Stifle of Eastman Kodak Co., New York, and Executive Vice-President of SMPTE; William E. Gephart, Jr., of General Film Laboratories, Hollywood, and a Governor of SMPTE; and Dr. Deane R. White of E. I. du Pont de Nemours & Co., Parlin, N. J., and Engineering Vice-President of SMPTE. The visit was part of the U.S.-U.S.S.R. exchanges program and was complementary to a visit of a similar delegation from the Soviet Union to the United States last year under the sponsorship of the SMPTE.

To provide a brief report of the trip the Journal has the benefit of a copy of "Comments Made to the Representatives of the Committee on Motion Pictures of the U.S.S.R. in Moscow on Sunday, November 10." Present were: A. F. Barinov, Deputy Chairman of the Committee; V. G. Roudakov; J. A. Baltunov (representing the film laboratories); M. M. Pugacheva and M. Riabov (for protocol); B. N. Konoplev, the Chief Engineer at Mosfilm Moscow; M. Z. Wysotsky, Deputy Chief Engineer also at Mosfilm; V. G. Komar, Director Scientific Research, Cine Photographic Institute (NIKFI); and the U.S. Delegation.

THE OUTLINE OF THE comments was discussed within the Delegation and represented the composite views of the group. The comments are published here almost verbatim except that verbs have been changed for natural reading in the past tense at this date. A report to U.S. Industry is being prepared by the Delegation and will be published as soon as possible.

We first acknowledged that we had been shown all that we asked during our first meeting and had been shown additional items at the initiative of our host. We leave with an impression of a comprehensive view of the Russian industry.

Particularly, we acknowledged the personal care and attention of our friends whom we had come to know as Mike, Roman and Yuri. Dr. Wysotsky spent long hours in planning and travel and was a key man in making the visit successful.

Mr. Yuri Tikhonov proved himself an able arranger and met well the crises created by our active and changing schedule. Mr. Fessenko, in the difficult situation of having to interpret the unpredictable and often heretical thoughts and words of these peculiar Americans, proved himself an able man for this post and we believe he learned a few more American expressions as we learned a few halting Russian words. We thanked the Central Committee for making available these three men, and in particular Dr. Wysotsky who has such full knowledge of the industry.

When we first came to the U.S.S.R. it was obvious that we wanted a broad view of the Russian motion-picture industry, and were not ready to limit ourselves to any one area or phase of the business. This broad view was arranged for us in spite of evident misgivings as to its value to us. As we completed our visit, we assured our hosts that we were well satisfied with the course taken and that we felt well repaid for the sometimes strenuous pace of travel. As the first U.S. group, we believed we had laid a good foundation upon which more detailed studies can be based when, as and if other groups visit the U.S.S.R.

We saw operations in four studios and visited two sites for new studio construction. We visited theaters, design and construction centers, and printing laboratories. We visited the State school for cinematography.

One highlight of our visit was the Central Research Institute, NIKFI. Another highlight was our visit to the Palace of Congresses. Every segment of the industry which we saw was in a stage of change, reconstruction and growth.

We saw much equipment that is basically similar to that in use in the U.S.A. We were particularly interested in the choices made where Russian engineering studies led to the incorporation of their own design features for conventional units adapted to Russian needs. Probably the most obvious example was the choice of 70mm film width for the negative used in the wide-format system as compared to U.S. usage of 65mm negative width. Associated with this choice is the requirement of development of new camera designs not duplicated, so far as we know, at any other spot in the world.

We noted with approval the fact that the choices made still permit interchangeability of the final product: 70mm prints.

We promised that in our report to the U.S. industry we would give an outline of the motion-picture industry as we had seen it in the U.S.S.R., planning to draw attention to those points which we have seen where U.S.S.R. practice has departed from the customary U.S. practice with which we are acquainted. We believe that different segments of our industry may wish to study these things closely. Mentioning a few such areas will illustrate the point:

The two methods we saw for following action as photographed in wide-screen or wide-format systems during the production of a 4 × 3 format print for television usage may well prove interesting to many Americans working in the motion-picture and television field.

The latest lens designs for wide-angle lenses for both 35mm and 70mm cameras interested us. We believe that the *f*/2.8 lens of 16mm focal length for 35mm film and the 12.5mm focal length lens for 70mm film are both beyond the range of lenses in common use in the U.S.A.

Design of the "Rossiya" theater, which has been outlined in the "Technika" journal, is worthy of study by those interested in theater design. We plan to see that this publication is translated and made more available to our people, who as a whole are not fluent in Russian.

An optical printer, which we saw at the Lenfilm studio, was very interesting. We understand this is nearing the production stage and we plan to ask the Soviet Ministry of Foreign Trade about its specifications, availability, price, etc.

At NIKFI one of the laboratory instruments, a reciprocity law sensitometer to give controlled exposures from 10^{-7} seconds to 10 seconds, appeared to be an interesting laboratory tool. Probably this was not expected to become an ordinary item of commerce since the world market would presumably be saturated by only a few instruments. Again, we plan to ask the Ministry of Foreign Trade about its availability.

The equipment now under experimental development for automatic control of motion-picture projection at the Leningrad Theater in Moscow may prove of interest to theater operators in the U.S.

In subsequent discussion the Deputy Chairman of the Committee requested comment concerning unfavorable situations which had been observed. Two points were made in response to this request. First, comment was made about the prevalence of dirt in many of the prints seen. Some of this appeared black and could have accumulated in handling and projection of finished prints but many showed white specks indicating opaque dirt on the negatives printed through onto the positive.

The second comment was on safety. Nitrate film is still in use in the U.S.S.R. in some 35mm negative and positive film. No sample seen of nitrate film carried any marking or symbol so identifying it. Practices observed did not meet our standards for protection of life and property from the peril of fire. Aside from such local hazards, there is great danger to others should such unmarked film become an article of commerce in international trade.

As a group, we hope that there will be more interchanges of visits of this type between the two countries. We recognize that there are, of unfortunate necessity, political factors as well as technical factors which will bear on a continuation of this program. It is our hope that the political climate will continue to improve, as it has been improving, and I will close with a statement of my own optimism that such will be the case.—*Deane R. White*, for the Delegation.

A New Method of Transverse-Stroke Recording of Electrical Signals on Magnetic Tape

A Translation

By V. M. SASIN

VARIOUS METHODS have been used for recording signals on magnetic tape for the case of frequencies which are considerably higher than sound frequencies (for instance, video-frequency signals). The most important of these are the longitudinal method, with a stationary magnetic head; the longitudinal-stroke method with a large number of heads and a complex electronic commutation system; and the transverse-stroke method with rotating magnetic heads.[1–4]

The main deficiencies of these methods are the complexity of the apparatus and the large velocity of the tape relative to the head, which leads to rapid wear.

With the new method[5] recording and reproduction are produced by stationary magnetic heads; the rate of transport of the tape is low, making the apparatus simple. Such a magnetic head for recording signals is shown in Fig. 1. The core of the head is constructed of plates 1 with high magnetic permeability, between which are placed nonmagnetic layers 2. The working gap 3 is located between the plates on one side of the structure. To the other side of the plates is "fastened" a π-shaped rotating framework 4, attached to a wheel 5, which rotates on a spindle 6. The π-shaped framework surrounds a stationary coil 7, which is attached by means of an extended side-piece 8 to the base of the head 9. The magnetic tape 10 is pressed into intimate contact with the working gap. The thickness of the framework must be a little less than the sum of the thicknesses of one nonmagnetic layer and one ferromagnetic plate of the core of the head. All the items of the head (apart from the plates of the core and the frameworks) are made of nonferromagnetic materials.*

Recordings on tape are produced as follows: The electrical signals are passed into the coil and recorded by simultaneous motion of the magnetic tape and the wheel with the framework. The magnetic flux then appears in the core of the head only in those ferromagnetic plates which overlap the rotating framework. The magnetic tape is thus magnetized, not over the whole of the gap, but only opposite to platelets which at the particular instant overlap the framework. The strokes are therefore step-like in nature.

The recorded information is reproduced by a simple head with a closed core, the construction of which does not differ in principle from that of the magnetic head used in magnetophones, but has a longer working gap, since here the tape is of appreciable width. The widths of the working gaps of the reproducing and recording heads are the same, since during the motion of the tape near the working gap, the reproducing head induces an e.m.f. in its coil only in zones corresponding to the magnetized parts of the recording which completely span the working gap (see Fig. 2). Those magnetized zones which pass into the gap, but do not extend completely across it, do not induce an e.m.f. in the coil (Fig. 3). Thus, the reproduced signals repeat the recorded signals.

Let us suppose that it is necessary to record the signal shown in Fig. 4. The duration of the period is assumed to be minimal. In the direct method of recording if the width of the working gap of the head Δ is n times smaller than the minimum wave length λ, the minimum velocity of the tape is

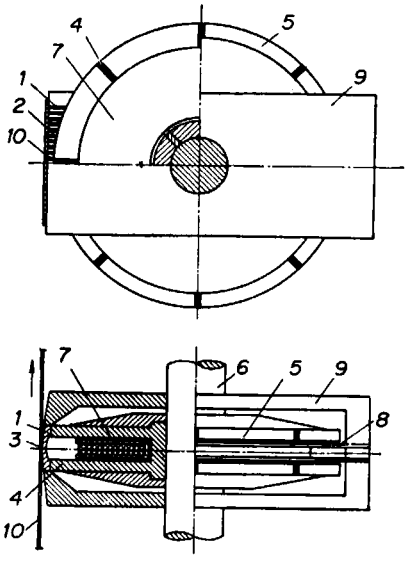

Figure 1

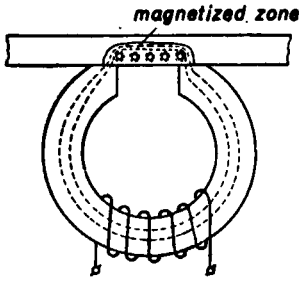

Figure 2

Translated from the Russian; this paper appeared in *Tekhnika Kino i Televideniya*, No. 3, pp. 61–63, Mar. 1963.

* The magnetic recording method described here in very sketchy form is a complete translation of the original paper. The translation has been checked and reviewed and is presented as an example of a possible solution to the head-wear problem. No information was included on the experimental results with this system, or on the top frequencies which can be recorded and reproduced.