

Shooting Film Style with a Single Video Camera on 1-in Tape

By MICHEL OUDIN

The French state-owned Société Française de Production et de Créations Audiovisuelles (SFP) has been experimenting in recent years with electronic cinematography, shooting with a single video camera on 1-in tape. Some salient points of their latest experiences are described. They include, at the beginning, adjustments in labor union relations. Equipment planning for video recording is outlined. The shooting procedure was equivalent to a normal production on film, except for the use of an electronic camera. The advantages of this method are enumerated, and some of the director's, the lighting director's, and the camera crew's experiences and opinions are cited. The post-production phase — transfer to working dubs, scene selection, rough cut, final cut, sound effects placing and mix-down, final on-line transfer of the 1-in tape in conformity with the workprint — is illustrated, and working days for each step are given. A brief description of the planning of editing equipment and its use concludes the paper.

The French state-owned Société Française de Production et de Créations Audiovisuelles (SFP) has been experimenting in recent years with new production techniques for TV feature productions. The use of the latest technological developments — self-contained, portable video cameras, 1-in portable VTRs — allows us to work in video production with the methods of the filmmaker. This can be truly called electronic cinematography. In October 1977, at the 119th SMPTE Technical Conference in Los Angeles, the author gave an account of the SFP's first experiment: a long format program (six hours) on the life of Offenbach. (See *SMPTE Journal*, Nov. 1977, pp. 812-814.)

At that time, it appeared that the single video camera shooting technique provided many advantages in comparison with traditional film shooting, such as immediate replay-checking of the takes, sizable savings of production time during shooting; an opportunity for the continuity person to log the "good" takes with the accuracy provided by the SMPTE time code, no laboratory delays waiting for the dailies, and reduced editing time. Thus, a production is completed in a shorter time and at a lower cost.

Nevertheless, the experience we described at the 119th Conference was incomplete because the 1-in VTR had only been used as a parallel experiment. The principal taping and editing was done on a remote 2-in VTR, situated away from the sound stage. Thus, a lot of valuable time was spent, during shooting, in communicating by intercom.

The Production Phase

The new experiment described here goes much further and points toward the future. Even though it still is not perfect, it

shows clearly what yet remains to be done, not only on the technical and operational side, but also with respect to production economics. The experiment, a 90-min TV special, called "The Night Watch" and having as its theme Rembrandt's famous painting, gave us the opportunity to surpass another limitation, because the videotaping was done by a motion picture crew on a sound stage, using a film script and a 1-in VTR. The video recorder and supplementary camera equipment were housed in the same small mobile cabinet on the stage.

Labor Relations

Before detailing the production methods and the technical equipment used, I would like to discuss briefly the labor union problems we encountered. Originally, the production had been planned to be shot on film. After much discussion, the director (Gabriel Axel) and the lighting director agreed to shoot with the new electronic technique. However, the film cameramen refused to work with an electronic camera; they did not want to be accused of taking away the jobs of their video colleagues. But, at the same time, the film crew did not want to work with, or to include, a video cameraman.

Also, the video cameramen strongly protested and so did their unions. They objected to the new approach of shooting with a single video camera instead of using the traditional multicamera method. They believed their jobs to be threatened. They did not understand that it was in their own interest to prove by experiment that this new shooting technique made no distinction at all between film and video. The film cameramen finally agreed to work with video cameras after receiving assurance that both types of jobs were considered equivalent. Finally, we went into production with a traditional motion picture crew, complemented by two video technicians, one for the camera and another for the VTR.

Recording Equipment Planning

The basic planning about equipment use was as follows.

1. A self-contained lightweight video

equipment package would be used, for easy transporting and positioning on film sound stages or even on outdoor locations by means of a very light vehicle.

2. The standard equipment would be composed of one camera and one VTR, but capable of including additional elements to obtain two other configurations: two cameras feeding two VTRs, or two cameras feeding one VTR. The equipment would function either in SECAM or PAL.

3. SMPTE time code would be used during shooting and displayed during playback, so that the continuity person could easily prepare the out-take log.

The technical equipment finally adopted was contained in two small mobile cabinets with wheels. The first cabinet contained the camera control unit and a portable 1-in VTR plus a black-and-white monitor. The second cabinet contained the auxiliary electronic equipment (time code generator, video character generator, oscilloscope, etc.) and a color monitor. This equipment was completely self-contained, capable of operating at any location. It could also be powered by means of portable or car batteries (Fig. 1).

Shooting Procedure

The shooting procedure for this 90-min drama was the same as for a motion picture film, but it lasted only 18 days instead of the estimated 20 days. After only the second production day, both the director and the crew made full use of all the advantages of having direct video control of the sequences being shot.



Fig. 1. Mobile cabinets containing equipment for electronic cinematography.

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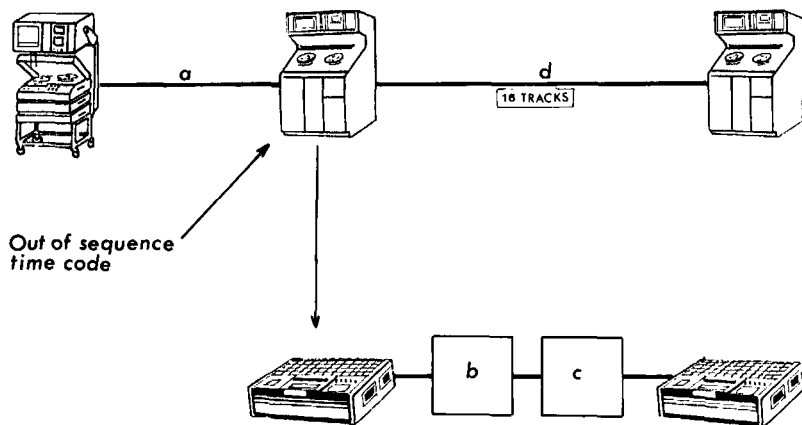


Fig. 2. First post-production steps: (a) transfer of dailies from 1-in to 2-in quad tape; (b) off-line scene selection; (c) off-line preediting and preview of rough cut; (d) off-line final editing.

The advantages are numerous. It is easier for the cameraman to correct and improve the image composition chosen. The assistant cameraman can focus consistently with greater precision. The lighting director can better judge and improve the lighting effects. The continuity person saves time during the blocking out of a scene. The costume designer is able to survey the color of a costume accessory, to correct it if necessary, and to supervise its placement. The stage hand will correctly understand the right travelling speed and movement, as demanded by the director. The make-up artist and the hairdresser are able to complete their last minute work "on camera." The director has an opportunity for immediate replay and thus will get a good idea of the results of his directing. He has no need to wait for the return of the next day's rushes. He will know exactly the quality of each individual take, and there is

no need for recording so-called "protection" takes. The leading actors, finally, are able to discern immediately the rhythm of their delivery and slight nuances in their interpretation, and therefore they may perfect their work. They will be stimulated to give more of themselves while recording fewer takes of a scene.

In our practical production experience, it turned out that in addition to saving time during shooting, the director was able to shoot about 20% more camera angles than originally planned. Therefore, not only was the production quality improved, but in the future we hope to reduce the shooting time. The director and the lighting director both have been extremely enthusiastic about this electronic method of production, with the director claiming that not only had he better working conditions by shooting on videotape, but he also had more security than when shooting on film.

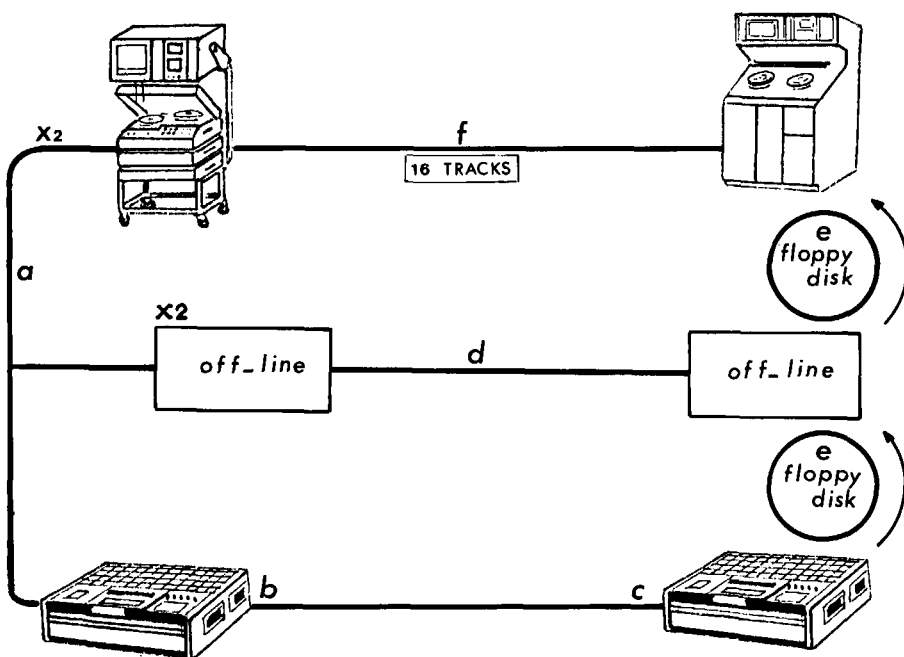


Fig. 3. Final post-production steps: (a), (b), (c), and (d) represent corresponding steps in Fig. 2; (e) ancillary memory on floppy disk or perforated tape; (f) on-line editing by transfer of the original 1-in takes controlled by the edit list to the final tape.

In the lighting director's opinion, the pictorial quality was as good as he could have achieved using any customary color negative film. The excellent color quality of the camera, even at low light levels, enabled him to accomplish low-key and high-contrast effects, thereby obtaining a very sophisticated type of video photography. In his desire to avoid a too harsh and contrasty looking picture, and to soften the video image more than usual, especially in the backgrounds, he used divers types of smoke and fog effect filters. The video engineer and the lighting director worked constantly and closely together in obtaining properly color-corrected pictures.

The lighting director was very satisfied with the two types of zoom lenses available, although he noted that for this type of production, lenses with fixed focal lengths might have been preferable because they permit better measurement of the depth of field, better control of perspective and of conformity between artists and sets, greater safety in the shooting of "moving" continuity shots, and a gain in the maximum relative aperture, thereby reducing the illumination level needed.

The camera operator, who came from the motion picture field, would have felt more comfortable, he said, in shooting with the customary optical viewfinder rather than on — as he put it — "a three-inch screen."

Table I gives an overview of production and post-production data and main characteristics relating to the production of the "The Night Watch."

The Post-Production Phase

The original 1-in tapes had a total duration of 26 h. The takes approved as "good"

Table I. Data on an experience in electronic cinematography.

Production phase	
Duration of the finished show	90 min
Shooting (original recording) time	18 days
Number of scenes (camera angles) shot	400
Individual scene length	1 s to 2 min
Number of takes per scene	1 to 6; average 3
Useful screen time per day	4 to 6 min; average 5 min
Total playing time recorded	26½ hours
Playing time after discarding out-takes	12 hours
Post-production phase	
Preediting (includes scene selection and rough cut)	8 days
Final editing (includes video mixing; 6 days of sound rerecording with 16-track audio recorder)	12 days
Sound post-production (includes incorporation of sound effects and mix down)	9 days

were logged by the continuity person together with their corresponding SMPTE time code data.

Editing Procedure

The first post-production step was then to dub (i.e. to transfer) the selected takes from the original 1-in tapes both onto 2-in quad tape (Fig. 2a) and onto $\frac{3}{4}$ -in U-matic cassettes. This dubbing was carried out in the chronological order of the script; its time code data will no longer be in sequence (scrambled), but will still be usable, of course. Simultaneously, the time code data of the original 1-in tape were also recorded and were incorporated into the $\frac{3}{4}$ -in U-matic picture cassette.

The second step was the preediting: scene selection and first rough cut (Figs. 2b and c). That was carried out using the Convergence Corp. ECS 1 control track editing system. This job took 8 working days.

As the third step, the final editing was carried out with the help of a conventional editing system, using two quad machines per editing room (Fig. 2d). This work phase took 12 days, including the video mixing. For the last 6 days, a synchronized 16-track audio recorder was added for the rerecording of the original sounds, in order to prepare for further sound mixing.

In the fourth step, sound effects and mix-down were accomplished, exactly as one would with film. This took 9 days.

Some special points merit careful consideration. With this system, the director no longer has an opportunity to modify the final editing once the sound mixing begins. The sound editing is based on the use of direct sound; this means that one has to be very careful during shooting. The original sound must be recorded in the same manner as is done in film production when no post synchronization is to be used. The editing time described may appear to be somewhat long, but it must be noted that

conventional equipment was used that had not been specifically adapted for the job.

Editing Equipment Planning

Our design recommendations for post production in electronic cinematography were as follows (see Fig. 3):

1. To use a control track editing system for the selection of the takes and preparing the first rough cut; but this must be completed with an ancillary memory (Fig. 3e) for storing the first rough cut editing list. This may be a floppy disk or a perforated tape.

2. To use an off-line editing system (Figs. 2d and 3d), employing the cheapest VTR cassette one can find or, better yet, a videodisk, loaded with the rough cut edit list. Thus, for the final editing, all the edit points are properly logged, and they may be changed at any time as desired. (In this way, one obtains the equivalent of the final film workprint.)

3. To then carry out the on-line editing by means of two 1-in playback VTRs, a 16-track audio recorder, and a dedicated video switcher, all of them controlled by the final edit list (Fig. 3f). In this way, a better quality will result because the final editing will be done from the original 1-in tapes; at the same time, the costs will decrease because the more expensive VTRs will only be used for the on-line step. (This step is the equivalent of the negative matching or conforming to the workprint, usually carried out by the laboratory, in motion picture production.) The matching operation can be automated.

The single video camera shooting technique leads to a type of post-production work very different from that of a traditional multicamera video production: (1) the number of daily takes is much more considerable; (2) there is even much more time available for the artistically creative work; (3) to ensure an excellent final

quality, the final editing must be done directly from the original and not by multi-generation; (4) the sound editing and sound mixing have as much importance as image editing.

As compared with film, a videotape post-production scheme as described above must provide facilities for making the research and artistic creation work easier and automating as completely as possible the final matching of the originals in conformity with the workprint. In this way, numerous work days will be saved and the finished product will be completed much quicker after the end of the shooting.

Our original plans were to implement a post-production system along these lines during 1980, and to solve some minor technical problems. Since the shooting of "The Night Watch" several other similar experiments have been carried out in the studio and outdoors. In particular, in the summer of 1979, a video crew went to Spain by plane with all the equipment, to shoot on several locations "The Barber of Seville" by Beaumarchais. It was a complete success.

Conclusion

Although we have not yet completed an ideal post-production system, we have learned much about the time required for each step in the post-production chain. Close monitoring of all the elements involved has enabled us to make a first comparison between the actual production costs on film and the cost of electronic cinematography. The initial results we have found to be very encouraging. We are convinced that electronic cinematography will experience a considerable expansion in television production in the near future.

(Note: The presentation of this paper was accompanied by the showing of two examples illustrating the results obtained with this type of electronic cinematography.)