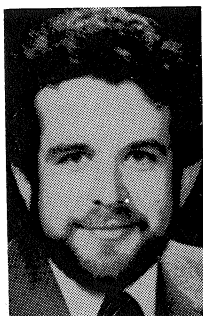


Color Yields More Useful Videotapes

by Tim Garrett and Elliott Goldstein, B.A., LL.B.



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In the December 1992 issue of *Canadian Security* (page 14) Tim Fletcher of the Hamilton-Wentworth Regional Police Service video unit discusses some of the common mistakes that people make when purchasing closed circuit television systems. In his article, "Too Much Bad Equipment Has been Sold", Fletcher reveals that not only are people getting poor quality systems to start with, but that they worsen matters by providing poor lighting conditions, placing obstructions in the path of view, not focusing on areas of interest properly, and not providing maintenance to the camera, recorder, or videotape. Thus, when an image that could be of importance is captured on these systems, it is often of very little use. Even in this age of digital enhancement, as one industry insider puts it, "You can't

enhance resolution that isn't there to start with".

As with any commodity on the market, the watchword "You get what you pay for" applies to CCTV. Fortunately, technological advances in cameras and lenses mean superior black and white performance over earlier equipment. Also, there is another solution to people's CCTV needs, one that has been around for a while but was considered prohibitively expensive – namely color.

In the past, the vast majority of systems sold have been black and white. Under optimum conditions, the system would do what the salesperson promised: deliver a usable image, though often grainy, black and white images would be the best they could hope for. But recent technical advances in cameras, lenses, and tape format have meant that sophisticated color systems are now within reach of almost anyone requiring a CCTV system. Why color? Besides the fact that today's color systems have much more sophisticated technology, it has been stated that a color image will give 40% more information than a black and white one. Let's take a shoplifter caught on film as an example. A video image of the suspect is obtained and presented in court, but the suspect's face is partially obscured. What color hair did the suspect have? What about skin tone? What color clothing was he wearing? Was the dress he was stealing the \$400 red one, or the \$50 blue one? In a subsequent videotaped interview with the police, the suspect blushed deeply when asked certain questions. Would this show up on a black and white image? Perhaps the suspect claims the police roughed him up a bit while he was in custody. A color videotape would reveal any bruising much more clearly than would black and white. Remember, black and white television simply consists of varying degrees of grey, ranging from the very dark to very light. Color television presents the world as we are used to seeing it, in a way that captures

more attention and creates stronger impact.

Technological innovations have greatly increased the ability of CCTV systems to capture useful images. Today's cameras are very effective in low light conditions, more effective than the human eye in some cases. New videotape formats offer over 400 lines of resolution compared with approximately 240 color and 300 black and white respectively in regular format systems. People should be consistent when upgrading their systems. The piece of the equipment which has the lowest resolution will be the limiting factor in a system. If you have a high resolution camera with a good lens, it won't mean much if you are using a low quality VHS recorder. The same goes for monitors, switchers, or the videotape itself. Everything should be of the highest quality that your budget allows. And, of course, it all comes down to price. How do the new color CCTV systems compare to traditional black and white? Color systems have advanced to the stage where they are affordable to practically everyone and once people see the difference between black and white CCTV and color, they will find it hard to go back.

While it will probably be a while before black and white disappears completely, the advantages of color cameras are so obvious that it virtually assures their pre-eminence in the field of CCTV. Anyone who is looking to purchase a CCTV system, or upgrade an existing one, should give serious consideration to the trend towards color.

From a legal standpoint, slight or inconsequential deviations from true color values should affect the weight but not the admissibility of a color videotape. However, if color is one of the crucial issues in the case, a substantial departure of the color reproduction from the original color values should affect the admissibility of the color videotape. Therefore, a videotape should be rejected if its color is so unrealistic as to create an essentially

false and misleading impression of the matter it depicts.

Inaccuracy in the color of a videotape could arise for three reasons:

1) Light used to illuminate the object or scene is not full spectrum; if the light shining on an object is missing certain wavelengths of the spectrum, then the object will not appear its true color.

2) Video camera's white balance function is not properly set. If the camera is not recording all colors equally, then the signal sent to the recorder will not be balanced and some colors will be over- or under-emphasized,

3) Playback monitor's color controls are not properly set. If the tint and saturation controls are not set to give seven well separated colors, then the image presented on the monitor will not render the same color shades or tones as the original scene.

To forestall an objection to visual evidence on the grounds of color distortion, the camera operator could include a Kodak neutral test card, grey scale, and color patches or a MacBeth color-checker chart in the scene being recorded and make it available for viewing in the court. Obviously, this would be a major inconvenience for operators of CCTV systems. A possible solution would be to place a poster, a picture, or even a set of drapes in the frame of view to serve as a color reference if needed.

Preventing color inaccuracies that could potentially cause legal problems is something that should be done at the time of purchase and installation. Modern systems will compensate for color temperature changes automatically and completely within the full range of visible light. Cameras should be aligned and verified at the time of installation, and calibrated periodically as recommended by the manufacturer and installer. A supplier should be willing to invest the time to do a full study of the location, noting existing lighting, lighting changes that occur during the day, and give thought to how light will change during the course of the year. The angle of the sun changes dramatically during different seasons, and a valid installation may fail if the sun shines through a window at varying angles throughout the seasons. Reputable installers will offer a periodic maintenance program to ensure that the system continues to perform as designed.

Many of the problems which used to plague color cameras have been eliminated thanks to the advanced technology being applied to today's CCTV systems. With proper thought given to camera installation and placement, lighting, and maintenance, admissibility should not be a major issue with images produced from these systems.



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