DETERMINING THE ASA/ISO RATING OR EXPOSURE INDEX OF A VIDEO CAMERA

When you are setting up a video camera at the beginning of a shoot, it is possible to establish an effective ISO/ASA rating or exposure index for the camera by means of a simple procedure that takes only a few minutes. First set up a chip chart and light it evenly just as you would for color-balancing the camera. Then focus the camera on the chart and open the iris until the crossover chip is a 55 units on the waveform monitor or the peak white chip is a 100. Normally you will have already done this in order to set levels.

Check the f-stop on the lens, and then take a reading with a Spectra Professional IV or IV-A incident meter at the chip chart. The photosphere on the meter should be pointed at the camera. Set the frames per second on the meter to read 25 FPS. Set the film speed (ISO/ASA) on the meter to 100 and take the reading, change the film speed (ISO/ASA) on the meter until the f-stop reading on the meter coincides with the f-stop at which the lens is set. You have determined the effective exposure index of the camera. You need only to remember the meter setting ISO and FPS, keep that setting on the meter and use it as you would with film.

This method of setting up the meter to coincide with the camera has the added advantage of compensating for any light loss due to the camera optics. It is the equivalent of establishing T-stops for the lens, since what you are doing is matching the meter to the amount of light that is actually reaching the pickup tubes. The f-stop on the lens then becomes an accurate indication both of exposure and of depth of field.

The exposure index determined in this manner may not be a scientific measure of the camera's sensitivity, but it is a reliable, practical basis for setting the f-stop during production. It enables you to expose every scene so that midtones will be consistently reproduced or to adjust the exposure so that the production of the midtones will be altered in a controllable manner.

It may be helpful to review how using an exposure index of this sort differs from setting exposure simply by means of the waveform monitor. A waveform monitor is like a reflected light reading. It can tell how to expose a scene so that as much as possible of it can be encompassed by the latitude of the camera, but it cannot easily ensure that a given object will be reproduced with consistency.

Normally a waveform monitor is used by a video engineer to set an f-stop that will place the brightest object in the scene at peak white in the signal. If the engineer knows that the brightest object is something like a window where detail is not important, he or she may adjust the exposure and let the brightest area exceed the normal peak white level in order to bring out more detail in the shadow areas; but nothing on the waveform monitor indicates how much to adjust the exposure. Similarly, there is no guarantee that the brightest object in a given scene should necessarily be a peak white. Depending on the content of the scene, the brightest object may be a skin tone or some other object that really looks better at a such lower level.

The waveform monitor also cannot easily ensure that an object will be reproduced consistently from one shot to the next. Consider as an example a scene involving two different angles in a room that has dark paneling on the walls and is filled with dark furniture. One angle includes a white marble bust of Napoleon next to the bookcase. The other angle does not include the bust but includes a table and part of a wall visible to the first. Suppose that the brightest area in the second angle is a portion of the polished tabletop that is reflecting light from an off-screen window. The same tabletop is visible in the first angle, but is would obviously not be a bright as the white marble bust.

If the f-stop for each angle were set so that the brightest area was at peak white, then the paneled wall would appear much darker in the first angle than in the second. This might be all right for each shot out of context, but if the two are cut together in one scene the result would be distracting and confusing. The solution is obviously to set the exposure so that the tabletop or the wall is more or

less at the same exposure level in both angles. Accomplishing this without an incident light meter would require analyzing the display on the waveform monitor in order to determine which portion of the signal represented the wall or the tabletop and matching that level for both shots. While this may be possible, it is not very practical, especially since using an incident light meter will give identical results.

With an incident light meter it is only necessary to take a reading with the photosphere pointed at the camera for each angle and set the f-stop according to the meter. In many situations it may be useful to refer to the waveform monitor after setting the f-stop. If the scene has an extended brightness range, it may be useful to check the waveform monitor to see how well the range of the scene is being captured. Adjusting the exposure level may be one only of altering the tone reproduction for that scene in order to deal with the extended brightness range. The use of gamma compression circuits on the camera (if it is so equipped) may be another.