LETTER FROM FRANKFURT AM MAIN

Three worlds of color TV unite

Transmission methods vary; a single system would have been wiser, but switching turns out to be no problem

The day of full, worldwide television interchange has quietly arrived. Satellites have conquered the distance barrier, and now scientists have solved the puzzle of swapping color TV pictures between countries with different transmission systems.

The Olympic Games are providing the needed spur to perfecting the color swap techniques. Color pictures of the Winter Games at Grenoble were taken with a French system, and transcoded into a very different system for viewers in other European countries. This fall's games at Mexico City will probably arrive in Europe via a third kind of signal used in the U.S., to be transcoded into both other types.

The transcoding of color pictures does not represent any sensational breakthrough. There were challenges aplenty in transcoding, but the really thorny ones (European-American differences in screen lines and scannings per second) had been licked before color came on the scene.

Why is the world divided into three color TV camps? It is partly a matter of technological advances and partly a matter of national prestige, particularly French national prestige.

America's West European friends were inclined to go along with the American NTSC (National Television System Committee) system. But NTSC was a decade old before Europe got to thinking seriously about color TV, and the state of the art had naturally advanced quite a bit in that time. The Europeans added certain features to NTSC, mainly to improve the color fidelity, and the result was PAL (Phase Alternation Line).

Thus PAL is little more than an improved version of NTSC. The basic principle is the same with each: Hue and saturation are transmitted simultaneously, with phase modulation determining hue and amplitude modulation determining saturation. The difference in the signals is similar to the difference in AM and FM radio.

Western Europe, with the exception of France, is moving rapidly toward standardization on PAL. Britain, Holland and Germany have already started service in it, with Austria and Switzerland due to follow suit during 1968. All other non-Communist countries have made definite decisions for PAL, except Greece (which has no TV at all as yet), Spain and Portugal.

France, with its now familiar sense of national grandeur and anti-Americanism, has developed its own system, called SECAM, radically different from PAL-NTSC. Hue and saturation are transmitted alternately with the same FM signal; a line of hue, a line of saturation, another line of hue, and so on. The set must remember the last line and hold it on the screen while the new line is appearing. That way the eye can see both components simultaneously, as it must.

The Soviet Bloc countries, also unwilling to have a "Made in USA" TV system, are going along with SECAM. France and Russia already are transmitting in it, and most Communist countries have also opted for it.

It still seems that Europe would have been wise to adopt a single system while things were in the formative stage. But the ease with which the Winter Olympics were transcoded proves that the division is no great tragedy.

A color TV camera produces electrical impulses representing three primary colors, and these are much the same whether the picture is to be coded into SECAM, PAL or NTSC. They differ only after they are coded for transmission. In the case of a simple telecast, without transcoding, these signals are coded at the studio and decoded by the individual sets. With transcoding there are two extra steps in between. When the Winter Olympics were telecast to Germany, the signals were first sent through a central office in Frankfurt, which decoded them from SECAM and then recoded them into PAL.

Transcoding would be done in much the same way whatever two systems were involved. However, there can be other problems. In the case of the SECAM-to-PAL transcoding, for example, things were complicated by the fact that SECAM was transmitting hue and saturation alternately. But a set built for the PAL system must get them simultaneously, so it was necessary for the Frankfurt central office to "remember" each line and transmit it twice.

Ted Shoemaker