The Color War Goes to the Moon

BY STANLEY LEBAR

In the Winter 1997 Issue of this Magazine, David E. and Marshall Jon Fisher chronicled the take-no-prisoners battle over whose technology would define color television, CBS's mechanical system or RCA's electronic one. Peter Goldmark of CBS finally conceded defeat to David Sarnoff and a triumphant RCA in 1953, but the story doesn't end there. I was one of a small group of dedicated Westinghouse engineers who inadvertently opened the old wounds more than a decade later. We had to pick a system for NASA's Apollo Television Camera Program. We ended up going with the vanquished CBS approach—and winning an Emmy for the outstanding technical achievement in television for 1969.

In 1964 Westinghouse won a competition to be the developer of a small black-and-white TV camera for astronauts to use in Apollo spacecraft and on the moon. In 1969 that camera recorded one of history's most exciting moments as the astronaut Neil Armstrong stepped onto the moon. For me, as the Apollo TV program manager, the thrill was a double one, for I had spent the preceding five years having a recurring nightmare in which the whole world stared at its television sets and no image ever appeared. I can hardly express the clarion I felt seeing that first beautiful fuzzy transmission from the moon.

NASA had ensured in 1960 that the image would be fuzzy by allocating only 700-kilohertz bandwidth for the signal and imposing other technical limitations. We realized early on that low-resolution black-and-white TV would do for that first lunar exploration but would not satisfy the needs of the program and scientists on future missions. NASA was going to need color TV in space too. In 1968, a year before Apollo 11, we set out to define a color camera system that would be small, portable, simple to use, and able to withstand the moon's extreme environment.

As a soldier in the conflict recalls, it wasn't all over yet when RCA's color TV system defeated CBS's to become the industry standard.
Outdated as it was, CBS’s color-wheel system offered small size, low power, and rugged single-tube construction, all of which we needed.

N OTHER WORDS, WE WERE USING CUTTING-EDGE technology to revive a broadcast system pronounced obsolete a decade and a half before. That obsolete system allowed us to build a color camera that was small, light, low-powered, and capable of working in dim, lunar light. Now we truly did have the best of both worlds. By early 1969 we had built a camera, and our research engineers were working with NASA to implement the conversion system. We got Tom Stafford, commander of Apollo 10, to try out the system eight weeks before that mission orbited the moon. He liked it enough to say that if we could have the camera space-tested in time, he’d get it on board. We did and he did.

Apollo 10’s color imagery got a thumbs-up from NASA, the public, and the television industry, so we knew that color TV from space had arrived. The camera traveled to the moon with Apollo 11, and though it was not used on the moon walk, it did transmit from inside the command module and give a color tour of the lunar excursion module. From Apollo 12 on, the camera ventured out onto the moon itself.

RCA, which had made its name synonymous with color TV technology, could hardly sit by while Westinghouse broadcast the first TV from the moon and used a CBS type of color or camera. RCA had provided an unsolicited proposal to NASA for an NTSC color camera for the moon, but as we had expected, the device would have had to be too large, heavy, and unwieldy for lunar-mission use. With solid-state camera sensors just beginning to be developed, time was against RCA to get one of its color cameras on an Apollo flight.

A camera designed and built by RCA did finally make it to the moon with Apollo 15, in 1971. But it wasn’t an NTSC camera; it was what the company called an RCA Sequential Color Wheel System. David Sarnoff’s son and successor, Robert, had cashed in all his chips to get the RCA logo on the moon. The camera performed extremely well, and it did RCA proud, but public interest in Apollo missions had waned by then, and whatever public relations battle Sarnoff was fighting he had already lost in the earlier Apollo flights. The Apollo experience was undoubtedly a frustrating one for Sarnoff, especially since Westinghouse went on to provide the cameras for Skylab and the joint U.S.-Soviet Apollo-Soyuz venture.

As for Peter Goldmark and CBS, they had finally beaten out their nemesis, RCA, and that should have felt good. But it didn’t. Goldmark himself was but a footnote, not a major player, in what became the most successful use of sequential-color-wheel technology in the history of television. He and his company were given credit for the basic concept in all the press releases, but he cannot have enjoyed standing on the sidelines through it all.

So in a way Peter Goldmark and David Sarnoff both lost the final battle in their color war. But by then they both had also left an indelible imprint on an industry that has become part of the lives of everyone the world over.

Stanley Lebar retired from an engineering career with Westinghouse in 1988.