gridded into 6-degree sections and photographed in two wavelengths, red and blue, using Palomar’s 48-inch Oschin Schmidt telescope. Rudolf Minkowski, a German refugee astronomer who fled Nazi persecution in the late 1930s, oversaw the POSS, taking and inspecting every one of the 1,620 exposed pairs of glass plates required to obtain 935 acceptable pairs in the final Survey.

The POSS plates are among the most technically and conceptually sophisticated photographs ever made. Prolonged exposure meant they were able to capture objects one million times fainter than the limits of human vision. The resolution of the Survey was ultimately determined by the plates’ photographic emulsion, a hypersensitive spectroscopic formulation developed in consultation with Kodak. According to Dr. Minkowski, “No known reproduction method can reproduce on paper the full density range obtained on a photographic plate.” To minimize loss from generations of photo reproduction, glass contact positives were produced for each plate, which were used to print complete sets of contact negatives. These black-on-white negatives also turned out to be more easily legible for humans. The NGS Palomar Sky Atlas was available in glass or paper editions for around $40,000, and it became an indispensable reference for astronomical observers worldwide, as well as a primary research tool in its own right, for over thirty years.

But the advent of digitized surveys; the discovery of non-optical spectra such as gamma rays and X-rays; and the expansion of space-based observation platforms have rendered analogue photographic prints like the NGS-POSS scientifically obsolete.
At the same moment Palomar’s astronomers were looking at the sky with confident anticipation, ready to discover its mysteries, rocket scientists and their political patrons were freaking out. It was difficult to overstate the anxiety that swept the American political, military, and media establishment following the surprise announcement of Sputnik on Friday, October 4, 1957. A dinner guest at Lyndon Johnson’s Texas ranch that night recalled the troubled senator locking up the sky, saying, “In the Open West, you learn to live closely with the sky. It is a part of your life. But now somehow, in some new way, the sky seems almost alien.”

As soon as Sputnik’s tiny beeping was heard, officials, politicians, and media professionals scrambled to produce a plan of action. The State Department was asked for its ideas. Secretary of State John Foster Dulles asked for one by the end of the day. Dulles, in charge of projecting American strength through the Cold War, had planned to announce the launch of a satellite the following day. The plan was touloshe the American Star, a 100-foot diameter, spherical shape. Engineers at Bell Labs in Holmdel, New Jersey beamed a pre-recorded message to the satellite, which bounced it back to the Jet Propulsion Lab in California, and to the world. This is President Eisenhower speaking. This one more significant step in the United States’ program of space research and exploration being carried forward for peaceful purposes. The satellite balloon, which has reflected these words, may be used freely by any nation for similar experiments in its own interest. Long after its launch, Echo remained in the public eye thanks to the publications of weekly orbit schedules and tips for taking time-lapse pictures at satellite viewing parties. The first photo of Echo IA in orbit was taken within hours of its launch by a Northwestern University student named Jonathan Blair. Many more followed as professional and amateur photographers allele submitted images to their local newspapers, which circulated them through wire services and magazines. In these photos of the night-time sky, one star, the “American Star,” moves against the rest, leaving its glowing track across the sky.

Though Pierce’s practical communications relay experiments at Bell Labs provided the rationale for Project Echo’s existence, they amounted to just a few proof-of-concept demonstrations: some long-distance phone calls, a transmitted photo, a few songs. The greater impact came just as Von Braun had imagined: from the clock-like spectacle of this “American Star,” which helped to ease Americans’ Space Age insecurity; to propagate the U.S. “Open Sky” policy against a feared Soviet militarization of space; and to normalize the concept of living with satellites always overhead.

Since the 1960s, expansion of manned space flight and human activity in space drew public attention away from the rapid proliferation of satellites—except, ironically, among astronomers. Efforts to update NGS-POSS were complicated by the increased “contamination” of their astronomical observations by satellites. An analysis by the Royal Observatory, Edinburgh, found that sky surveys (including a POSS II) made after 1980 had more than twice the satellite contamination of those made before 1960. And so it is that the first, obsolete Palomar Observatory Sky Survey is also the final photographic portrait of earth’s sky before mankind inserted itself into it.

-Greg Allen 2013

Project Echo

NGS-Beecon satellite on display in the US Pavilion at Expo67, Montreal.

L.B.J. would soon call Sputnik “a second Pearl Harbor,” and he convened months of congressional hearings into the apparent hapless state of U.S. space policy. It was at one such House hearing in April 1958 on the creation of a National Aeronautics and Space Administration that William J. O’Sullivan, an engineer at the government’s Langley Research Center in Hampton, Virginia, inflating a 12-foot Beacon satellite in the U.S. Capitol, and promised that, given the chance, a NASA team could quickly build and launch a satelloon concept himself, when his real genius with the sky seems almost alien.”

One of at least two separate proposals that had been circulating within the field for several years, satellite pioneer and Bell Labs executive Dr. John R. Pierce had published satelloon feasibility analyses in science journals in 1955-56. And three years before that, Manhattan Project physicist Dr. Aristid Grosse and reformed Nazi rocket scientist Werner Von Braun had evangelized widely for the immediate launch of a 100-foot, white, plastic, balloon satellite which would, through its awe-inspiring presence alone, basically win the Cold War for America.

The sole purpose of the vehicle would be to be seen. To be seen by 400 million Chinese, 200 million Russians, 400 million Indians etc. “The American Star, rising in the West and setting in the East.” Father would show it to them, and the priests would ask, too. It would be punctual and predictable like a clock. Don’t you think that this would do more for the Western cause in the Asiatic mind than the Korean War, the existence of the A-bomb, or the “Voice of America”? [italics original]

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Project Echo inflation test, April 1960, Weeksville, NC.