

“The Last Sterba Standing”

Voice Of America, Dixon CA Field Trip

Calaveras Amateur Radio Society (CARS)

July 21, 2026



Please see more great photos of Dixon VOA on this site

Our sincere thanks to the owners for safeguarding an artifact that stands as a testament to America’s greatness, resolve, and engineering mastery. To stand beneath that monumental RF structure was a humbling experience.

The CARS July 21, 2026 visit to the Voice of America Dixon relay site was INCREDIBLE! This report is primarily for those who appreciate the history and engineering behind the antennas that once turned steel into words and carried America’s voice across the Pacific. The goal isn’t nostalgia — its preservation. What follows is a straightforward record of the site as it stands today, supported by photos and field notes taken on location. An updated Field Guide is posted alongside this article.

The Dixon relay site stands as a reminder of what careful engineering and quiet persistence can accomplish. The antennas may be silent now, but the workmanship remains. This summary is offered for those who value the significance of the history behind it — nothing more, nothing less.

The tour began around 10:00 am. We were greeted by the owner and assistant outside the 20,000 square-foot, operations building. After some introductions and talking with the owner and tour guide, we got into our cars and caravanned out to the center tower roughly a third of a mile away. Everyone was excited, with cameras ready, eager to study and learn more about this symbol of American engineering excellence.

The Dixon Sterba Curtain was the first constructed and first to be decommissioned and the only one still standing as built. The arrays were erected over a period of two years **1950—1952**. As of this writing, they are 72 and standing proudly. Other than the missing feed lines back to the switch matrix,

and a broken wire or two, nothing looked out of place. The curtain and reflector screens are still sound. While researching this artifact, it was obvious that nothing — absolutely nothing — was left to chance. From choice of location to detail of construction, everything was taken into account and the reasons why the array is still in excellent mechanical condition — 72 years later.

The Array consists of three towers: two outer towers – 325 ft. high and a center tower – 305 ft. high. Each curtain is approximately 700 ft. across and 305 ft. high. Each curtain has four bays of two columns. Each column consists of four, 3-wire fan dipoles for a total of 32 in all. Both the array and reflector screens are suspended by a pair of catenary cables — guyed — stayed — weighted to maintain geometric stability. The outer towers are taller to reduce mid-span sag for a leveler suspension plane. Their box-construction resists torquing and establishes primary dipole-to-reflector spacings.

The Reflector screen is spaced about 30-feet behind the active array. By design, each pair of columns have slightly different vertical and array-to-reflector spacings to fine tune the wavelette beams. Every conductor and feedline in the array is phase matched and fine tuned with matching stubs. Reverse compression springs anchored to a concrete deadman and steel cages with concrete weights suspended underneath by a heavy cable laid over a pulley provide constant tension and keep the curtain geometry stable and reflector screens parallel during normal daily movement and high winds.

Feedlines were phase-matched and column spacings fine-tuned to produce focused, “sawtooth” wavelettes. At about 2 km distance, all 8-columns of sawtooth wavelettes combined with ground reflections and produced a unified — incredibly powerful — RF wave.

Two pairs of heavy, 600-ohm open wire transmission lines suspended on insulators from short utility pole crossarms, went from the switch matrix to each column. The entire curtain was phase-delayed to sequentially “fire” each column and produce each sawtooth wavelet. At roughly 1.5-2 km, wavelettes and ground waves combined to form a narrow, powerful RF wavefront.

Phasing, open wire feedlines and trimmer stubs are carefully interspersed among the myriad of element, reflector, tensioning, and stabilizing cabling without interfering with each other. It’s something that has to be seen to be truly appreciated. It’s overpowering enough just to see, let alone begin to understand it. But, the inventor – Earnest J. Steba and Bell Laboratory Engineers did exactly that.

Modernization in 1965 included three Collins 821A-1 — 250kW AM transmitters that powered a curtain with a gain figure of 20-22 dB, producing a staggering 10 MW of Effective Radiated Power into the ionosphere and out over the Pacific. For vacuum tube lovers, each Eimac 4CV 250,000A power tetrode weighed 180 pounds and operated with a plate voltage of 20kV – Class AB push-pull. The filaments required 12v at 660A. What supplied that current was not a transformer – it was a welder wearing a necktie! Each transmitter, modulator, power supply and cooler assembly weighed 40 tons.

The transmitter was high-level modulated — meaning that the modulator had to be capable of at least 125kW of plate input power to achieve 100% modulation of the carrier. Power to drive the modulator required 1,600 watts.

The “Red Phone” still patiently hangs silent on the wall inside the VOA Dixon guard room, preserved as a Cold War relic of readiness.

The Switch Matrix was the heart of the system. It is located between the transmitters and the antenna farm and could connect any transmitter to any antenna or, in an emergency, connect the standby transmitter in seconds. For testing, a 250kW dummy load housed beside the matrix could be selected.

Following the tour we caravanned into downtown Dixon for lunch at Dawson’s Bar and Grill to enjoy the company, rehash the day, and refuel after a morning in the serengeti of Voice Of America, Dixon, CA.

A savory finish of a memorable day.

Construction 1950-52: Two Sterba Curtain arrays suspended between three towers.

Other antennas consisted of a smaller curtain, and several rhombics installed by

Primary Azimuths: Northern array: **Asia/China.** Southern array: **Philippines/S.Pacific**

EACH CURTAIN

- **End Towers:** 325 ft high.
- **Center Tower:** 305 ft. high.
- **Dipole and Reflector Curtains:** $\approx$ 700 ft. x 305 ft.
- **Weight:** $\approx$ 20,000 lbs. ea.
- **Antennas:** **32** multi-band — 3-wire, low Q fan dipoles trimmed to $\approx$ 15 MHz.
- **Dipole Curtain – 4-bays:** 2-columns of four stacked fan dipoles per bay.
- **Phasing (*excitation*) order:** each pair — outer tower to inner tower, top to bottom.
- **Tower back-sets:** 20° — corrected inherent 20° array azimuth skew towards center tower.
- **Suspension:** Two parallel catenaries – dipole array – reflector screen.
- **Gain:** 20-22 dB.
- **Power Rating:** 500KW.
- **Effective Radiated Power (ERP):** 250 kW in $\approx$ 10 MW out.
- **VSWR:** maintained at 1:1.

Transmitters: Three **Collins 821A — 250 kW**, plate modulated — two online – one hot standby.

Outdoor Switching Matrix: Remotely operated, vacuum relays — could assign any transmitter to any antenna in seconds.

Dummy Load: 250 kW, 50 ohms.

Feedlines: 32 Open wire – 600-ohm – phase matched. Two pairs per column.

~The CARS Group~

Steve, W6RXK – President

Mike, KB6USJ - Tour organizer

Barry, KO6FOB – Public Information Officer

Mark, N6IV – Photographer & Net Manager

Dave, AD6AE – Tech Research / Writer

Bob, KA9MDP – Public records research

Walt, W6WGY — Repeater Trustee

Mike, K6AAN

~Lodi Amateur Radio Club~

“Skip,” N6NFB (Lodi ARC)

Rick, N6DT (Lodi ARC)

XYL's:

Linda XYL — KB6USJ

Stephanie – Photographer & XYL — AD6AE



The “Red Phone”

*(Photo courtesy of
Stephanie Arrich)*



Voice of America, Dixon, CA — From Radio Station Road
 Antennas on left belong to the adjacent Naval Radio Transmitting Station
(Photo courtesy of Stephanie Arrich)



Above Photo Enhanced — Four Bays of Two Dipole Columns per Curtain
 Left Tower to Center Tower: 700 ft. — Left Tower 325 ft. — Center Tower 305 ft.
 Taken from Radio Station Road, Dixon, CA
(Photo Courtesy of Stephanie Arrich)



Switch Matrix and Dummy Load Shed
(Photo Courtesy of David Arrich, AD6AE)



North Array
Notice the amazing condition of the curtains.
(Photo Courtesy of Mark Godbout, N6IV)



North Array

Looking east toward the 20,000 sf. operations building.

The boxes on stands are column tensioning weights. Larger weights that stabilize the curtains against wind are attached to heavier guys. Compression spring tensioners for the reflector curtain can be seen to the right at ground level. Fork-like supports stabilize paired open-wire feedline stays. As rigged, the entire array floats and is locked in relation to the dipole columns.

(Photo Courtesy of Mark Godbout, N6IV)

Written by: David Arrich, AD6AE
July 28, 2026
Research assist: Copilot AI
Gemini AI
Grok AI