Voice of America Radio Relay Station – Dixon, California Field Guide

D.F. Arrich, AD6AE

A 1952 Aerial View of the Voice of America Dixon, California, Transmitter Site

Looking south towards the towers of the recently completed Sterba curtain, dual [traveling wave*] arrays. The original World War II rhombic antennas are seen to the far right; [shorter curtain arrays lie directly behind the main curtain and to the near right*] *(Courtesy of Bill Newbrough) [*added by AD6AE]*

This field guide will highlight the:

1. History
2. The Inventor
3. Historical Timeline
4. Towers
5. Sterba Curtain Arrays
6. Antenna Switch Matrix
7. Impedance Matching
8. What's not covered
9. Pre-GE Transmitters
10. Summary & Dedication
11. Curtain Structural Data
12. Photos
13. Appendix: Sawtooth Wave, Phasing Illustration, 200KW balun

1. HISTORY

Although not the largest curtain array ever built, it was the first in the US. The **VOA Dixon Relay Station**, built in **1943–44**, was one of the United States' major West Coast shortwave transmission centers, paired with Delano. It broadcast toward **Japan, Australia, the Philippines, and the Pacific**

Rim, using **rhombic antennas**, later **Sterba curtain arrays**, and up to **ten high-power transmitters**. It closed in **1988**, was declared surplus in **1993**, and sold in **1998.** Many antenna structures remained standing for years afterward.

The establishment of the Dixon Naval Radio Transmitter Facility was driven by the urgent communications demands exposed during World War II, particularly the need for robust shortwave infrastructure to support Pacific Theater operations. In 1947, the Navy selected a 1,700 acre site adjacent to the town of Dixon, California, for its ideal radio propagation characteristics, including expansive flat agricultural terrain free of obstacles for low-angle signals, high ground conductivity, and its proximity to nearby communications coast-to-coast facilities located in San Francisco. A number of early photos and information were presented, *Courtesy of Bill Newbrough* and *By John Schneider, W9FGH*. Both authors did an incredible job of photo-documenting the original structures and their history.

2. THE INVENTOR 0F THE UNIQUE STERBA CURTAIN ARRAYS

Ernest J. Sterba (1900–1973) *Radio Engineer • Antenna Designer • Early HF Pioneer*
and inventor of the **Sterba curtain array**, a simple, scalable, high-gain HF broadcast antenna widely used in the 1930s–1950s by commercial broadcasters, military stations, and early Voice of America sites and was the first domestic site to be permanently closed.

Career Highlights:

- Helped technology transition from spark-gap to high-frequency continuous-wave systems.
- Specialized in **phased arrays**, **wire curtains**, and **traveling-wave antennas** (Rhombics).
- Published the original Sterba curtain design in the early 1930s, introducing a practical phasing method that produced a stable, broadside, high-gain pattern with minimal hardware.
- His designs became foundational during WWII and the early Cold War for long-range HF communication.

Legacy:

Sterba's curtain array became a global standard for economical, reliable HF broadcasting. Though later surpassed by more advanced curtain systems, the Sterba remains a classic example of elegant, field-practical RF engineering — and a key part of the lineage behind stations like **VOA Dixon**.

3. HISTORICAL TIMELINE

1943–44 — Construction

- Built rapidly by the **Office of War Information (OWI)** during WWII.
- Operated under contract by **NBC**.
- First broadcast: **December 27, 1944**.

1944–1952 — Early Operations

- Original antennas: **rhombic's** aimed at Japan, Australia, Philippines.
- Original transmitters:
    - **Four RCA 50 kW** units
    - **Two Federal Telegraph modulators**
    - Later: **200 kW Federal transmitter**
- NBC operated under callsigns **KNBA, KNBC, KNBI, KNBX**.

1952 — Major Upgrade

- Installation of **two GE G-100C 100 kW transmitters**.
- Construction of **Sterba curtain arrays** with massive steel towers.

1965 — Modernization

- Building expansion.
- Installation of **three Collins 821A-1 250 kW transmitters**.

1979–1988 — Decline

- Mothballed in **1979**.
- Reopened **1983–1988** for Spanish-language broadcasts to Central America.
- Closed permanently **April 1988** — first VOA domestic site to shut down.

1993–1998 — Disposal

- VOA relinquished the property in **1993**.
- Sold at auction in **1998** for **$160,000**.

Globe Wireless acquired it for maritime HF email connectivity.

4. TOWERS

- **Tower 1 (Southern Array):** 350 ft
- **Tower 2 (Center Tower):** 305 ft
- **Tower 3 (Northern Array):** 350 ft

The towers were built as **box-section structures** rather than tapered masts. This provided the lateral stiffness and torsional resistance needed to support the **large wind-loaded curtain surfaces**, and ensured the **proper horizontal separation** between the catenary support lines for both the dipole and reflector curtains.

The **lower center tower** established the **reference plane** for both catenaries. By placing the end towers higher, each curtain formed **two shorter catenary spans** rather than one long one. This geometry reduced overall sag, kept the radiating and reflecting surfaces in a **more uniform electrical plane**, and allowed the structure to absorb daily thermal movement and high-wind loading without distorting the curtain alignment.

If all three towers had been the same height, the single long catenary would have produced **excessive mid-span sag**, making it impossible to maintain a level radiating aperture. The as-built height differential created a **wider, flatter, and more stable suspension region**, improving both mechanical reliability and electrical performance.

5. STERBA CURTAIN ARRAYS (1952 onward)

- These were the iconic structures that made Dixon visually spectacular.
- Sterba curtains are multi-bay, multi-element wire arrays with reflectors.
- High gain, narrow beamwidth — ideal for long-haul HF broadcasting.
- Dixon's arrays were among the largest ever built in the U.S.
- Gain: 20-22 dBi
- Beamwidth: 20-30°
- Depending on the transmitter feeding it, 5-10MW ERP

Physical Characteristics

- **Center tower:** 305 ft
- **End towers:** 325 ft
- **Antenna span:** 350 ft each side of the center tower
- **Two separate curtain antenna arrays** suspended between each tower set; each curtain contained 4-rows of 4-dipoles for two 4x4 arrays with each array measuring 305 ft H by 350 ft W

Coverage from Dixon

- **Southern array:** The Philippines 280-290 true
- **Northern array:** Northern Asia (Japan/Korea/NE China) 300-320° true

Two Separate 4x4 Phased Curtain Arrays

Each antenna system utilizes a parallel column architecture, where transmission lines for each column are split symmetrically at the Switch Matrix to drive each vertical column independently. Also, a sequenced phase delay between columns is accomplished at the matrix allows for horizontal beam steering (slewing) to target different global regions. A physical "back-set" in end tower positioning offsets the inherent 20° off-center radiation angle.

Column (bay) Phasing

What distinguishes this antenna from billboard-style, same-phase curtains is its dynamic, column-delayed feed system. Rather than driving every element simultaneously, the main transmission lines route through the outdoor matrix yard to establish a precise, sequential phase delay between the four vertical columns.

When steered horizontally, the columns radiate in a delayed sequence. Each vertical feedline acts as a continuous distributed delay line, introducing a 1/4-wavelength delay that produces a 90° phase shift between adjacent columns. Array column 1 is closest to the outside tower. Each column fires sequentially from (1) toward (4) closest to the center as:

- Column 1: 0°
- Column 2: −90°
- Column 3: −180°
- Column 4: −270°

This creates a **horizontally sweeping** wave across the curtain. Each **column** “trails” the previous one by 90°, forming a sawtooth wavefront that reinforces itself in the forward direction. At 10 MHz, the combined contributions of all **four columns** – plus the ground-reflected image of the vertical bay – merge in the far field (≈1.5 – 2.1 km depending on frequency) to produce:

- A 10° takeoff angle
- A 20–30° horizontal beamwidth
- 20–22 **dBi** forward gain
- 20° slew towards center tower – offset by end-tower placement

The dipoles themselves are constructed as multi-wire, cage-like folded elements. This gives them a remarkably low Q and a broad operating range spanning roughly 9 to 15 MHz. This heavy-duty, multi-wire geometry also stabilizes the system's characteristic impedance of 300, making the array highly resistant to detuning from rain, heavy ice, or wind-induced line deformation.

Effective Radiated Power

The performance of this “ugly but brilliant” design is best appreciated in terms of ERP.
With 20–22 dBi of gain:

- A **250 kW** transmitter produces **≈4.5 MW ERP**
- A **500 kW** transmitter produces **≈10 MW ERP**

Antenna Feed System

Each 4×4 curtain array was driven by a balanced, parallel-branched feed network engineered for maximum power efficiency and precise horizontal beam steering. The main transmission lines from the outdoor switch yard branched symmetrically to feed the four vertical columns independently and simultaneously.

Feedline Branching (Corporate) Network

The RF path from the switching matrix to the antenna elements was designed as a perfectly balanced tree structure:

- **The Main Trunk:** Four phase-adjusted, high-power, open-wire feedlines arrived at the base of the support structures for each column from the outdoor matrix switchyard.
- **The Column Risers:** Each of these four distinct, pre-phased lines transitioned straight into its own dedicated vertical open-wire transmission riser climbing up the center of its respective column.

Eliminating Power Waste (Resonant vs. Terminated)

- A common misconception is that high-power shortwave curtain arrays require termination resistors to absorb backward-traveling waves. In a 250 kW broadcast environment, a termination resistor would intentionally waste thousands of watts of raw transmitter power as useless heat.
- The Dixon curtain arrays were fundamentally **resonant broadside arrays** operating with highly efficient standing waves. Instead of a lossy resistive termination, rearward radiation was completely suppressed by a massive **passive wire reflector screen** suspended one-fifth of a wavelength behind the dipole grid. This screen acted as a giant radio mirror, bouncing nearly 100% of the rearward energy into a single, high-intensity beam aimed cleanly at the Pacific Rim.
- To create the sawtooth wavelets and high gain of the curtain, precise phase delays of (0°, −90°, −180°, −270°) were introduced back at the matrix switchyard before the signal ever entered the electrically identical feed lines. This also provided ease of incremental azimuth “fine tuning” adjustments and SWR trimming following frequency changes. The four parallel vertical risers simply mirrored this central timing, allowing the array to cleanly sweep its global target azimuth without needing any adjustable components on the towers themselves. Because the physical length of the branching transmission lines from the matrix out to all four columns was cut to be mathematically identical, all four feed lines perfectly preserved whatever custom steer angle was dialed in at the central matrix.

6. ANTENNA OPEN-WIRE SWITCH MATRIX

For personnel safety, each transmitter’s RF output was first routed through a heavy coaxial line into a shallow, gravel-lined trench that carried the coax from the transmitter hall to the switch matrix. Only at the matrix did the line transition to open-wire.

Purpose of the Switch Matrix

The switch matrix was the **central routing hub** that connected any transmitter to any antenna. Its functions were:

- Select which curtain (North or South) received RF
- Allow rapid reassignment of transmitters during propagation changes
- Permit maintenance on one curtain while the other remained operational
- Provide a safe, visible, air-insulated switching environment for high-power HF

This made the entire Dixon site behave like a **network**, not a fixed installation.

Physical Layout

- The matrix occupied a long gallery adjacent to the transmitter hall. It consisted of:
- Heavy copper open-wire bus pairs
- Ceramic standoffs
- Large double-pole interlocked knife switches
- Wide air gaps for insulation
- Overhead clearance to prevent corona

The visual impression was closer to a **substation** than a radio room.

Signal Path Through the Matrix

- Each transmitter output pair entered the matrix on its own **vertical bus**. Each antenna feedline (North curtain, South curtain) connected to its own **horizontal bus**.
- At each intersection was a **double-pole, double-throw knife switch** that could:
- Connect a transmitter to a curtain
- Disconnect a curtain entirely
- Ground a curtain for maintenance
- Reassign transmitters in *seconds*

Why the Matrix Was Essential

Without the matrix:

- Each curtain would require manual feedline changes at the tower
- Propagation changes would require physical reconfiguring
- Maintenance would require taking the entire site off-air
- Redundancy would be impossible

With the matrix:

- Operators could switch antennas in *seconds*
- Transmitters could be rotated for load balancing and maintenance
- Curtains could be isolated safely
- The site could maintain **continuous service** even during a transmitter failure and why VOA stations worldwide used similar systems.

Why the Open-Wire Feeders Didn't Interfere With Each Other

The open-wire feeders didn't radiate or interfere because they carried equal and opposite currents, so their differential fields canceled. Strung on long, straight, parallel utility-pole lines, the geometry kept the system in near perfect balance, preventing common-mode current — the only mode that would have caused radiation or coupling.

7. IMPEDANCE MATCHING

- **The Main Open-Wire Transmission Lines:** The long, parallel feedlines crossing the fields from the outdoor switch yard to the antennas typically maintained a characteristic impedance of **600 ohms**. This high impedance was ideal for minimizing transmission line losses over long physical distances.
- **Flawless 600-Ω Continuity:** Each of the four independent, column-dedicated open-wire feedlines maintained a continuous, uniform **600-ohm characteristic impedance (Z_0)** across the entire field run from the matrix yard to the tower base.
- **Symmetrical Riser Branching:** At the tower, the 600-ohm line transitioned into a vertical **riser branch**, utilizing a perfectly balanced network to distribute the power equally among the four vertically stacked folded-dipole elements. This geometric symmetry matched the individual dipole impedances back to the main 600-ohm line without requiring any active or lossy transformers out in the field.
- **The Transmitter Interface:** Inside the building, the modern transmitters operated on a standard **50-ohm coaxial output**. To bridge the gap between the indoor 50-ohm unbalanced coax and the outdoor 300/600-ohm balanced open-wire lines, the VOA utilized massive, 300-pound pole-mounted **wide-band matching transformers (baluns)** rated for a staggering 200,000+ watts for each curtain (Appendix – Figure. 5).

8. WHAT THIS GUIDE *DOESN'T* COVER

The complex switch matrix mechanical interlocking system — the part that prevented:

- Two transmitters from being tied to the same curtain
- A transmitter from being tied to two curtains
- A curtain from being energized while grounded for maintenance

9. PRE-GE TRANSMITTER PRESERVATION

RCA 50 kW units, circa 1944–1951. While the massive 250 kW Collins workhorses and the branching transmission fields remained the focal points of the physical Dixon landscape, the early 50 KW RCA shortwave units were successfully acquired for long-term historical preservation by the **Southwest Museum of Engineering and Communications (SMECC)**, ensuring that the physical legacy of the station's early Cold War broadcasting era is permanently protected.

10. SUMMARY

The switch matrix was the **heart of the station**, enabling:

- Flexibility
- Safety
- Redundancy
- Rapid reconfiguration
- Continuous operation

It tied the transmitters, feedlines, and curtains into a single, coherent system. Together, these systems made Dixon capable of continuous, flexible operation under any load or failure condition.

Dedicated to the engineers, builders, and operators of Dixon — *those who turned theory into transmission, and steel into speech. Their work carried voices across oceans and decades, proving that precision and purpose can outlast time itself. This guide stands as a tribute to their mastery, their endurance, and the quiet brilliance that made Dixon speak to the world.*

"One cannot help but be humbled by the pure engineering genius behind this massive structure and the masterful hands that were required to build, operate and maintain it." *– D. Arrich, AD6AE*

Credits & Sources

1. Historical Reference Material: *Grokipedia* (Dixon Naval Radio Transmitter Facility, accessed 2026).
2. Historical Literature: "The Mystery of the Dixon VOA Relay Station" by Merrill Stevenson (KG6AMW).
3. Historical Text & Imagery: John F. Schneider (W9FGH), *The Radio Historian*.
4. Archival Imagery: Photographs courtesy of the Bill Newbrough collection.
5. Institutional Archives: The Radio Heritage Foundation ("History of the VOA Dixon Transmitter") and The Center for Land Use Interpretation (CLUI).
6. Site Photography: Merrill Stevenson (KG6AMW).
7. Visual Graphics: Sine wave diagram courtesy of Wikipedia / Wikimedia Commons.
8. Photo – visualization: Curtain antenna at Hoerby shortwave station - Curtain array - Wikipedia
9. Research & Computational Assistance: Powered by Grok, Copilot, and Google AI.

In closing, I offer this simple analogy that neatly wraps it all together.

The Quartet Analogy

"The four bays of the Sterba curtain behave like a tight four-piece band. Each bay plays its own 'line' — its own phase, timing, and wavelet — just like individual instruments in a quartet.

Up close, you can hear each part separately. But as the wavelets travel outward, they blend, reinforce, and merge into one unified wavefront. In the far field, the listener doesn't hear four instruments — they hear one song. The Sterba Curtain works the same way: four phased bays forming one coherent, powerful beam." – *D. Arrich, AD6AE*

11. STRUCTURAL DATA

Each Curtain:

- **Aperture (A):** 240m x 240m
- **Far field boundary *R*** (for 15MHz) where traveling and ground waves fully combine.
  $R=2(D^2)/\lambda$: W: 240m x H: 240m = 5.8 km (3.6 mi)
- **Site Acreage:** ≈1,700 ac.

Curtain Array Structural Summary (Approximate)

Parameter	Scaled Value	Notes
Curtain dimensions (each)	**≈ 328 ft x 328 ft**	**4×4 Sterba configuration**
Total radiating surface (both curtains)	**≈ 215,278 ft²**	**Two active curtains combined**
Reflector curtain area	**≈215,278 ft²**	**Same geometry, spaced ~15 m behind**
Combined effective surface area (radiator + reflector)	**≈ 430,556 ft²**	**Used for wind-load calculations**
Curtain wire mass (radiator only)	**≈ 8,378 lbs**	**Scaled from copper-clad steel, 3 mm dia**
Reflector wire mass	**≈ 6,613 lbs**	**Slightly lighter gauge**
Total suspended weigh (curtains + hardware)	**≈ 1,543 lbs**	**Excludes tower and guy system**
Design wind load at 80 mph / 36 m/s)	**≈ 9,450 lbf**	**Equivalent to ~4.7 tons lateral force**
Maximum sustained wind tolerance	**≈ 100 mph**	**Beyond this, counterweights travel fully**
Counterweight travel range	**≈ 5 ft**	**Allows for thermal and wind expansion**
Tower heights	**305 ft center/ 325 ft ends**	**Creates a shallow catenary arc**
Total pan length	**≈ 700 ft**	**Between end towers**

These figures are approximate and scaled from VOA engineering notes and typical Sterba Curtain design data.

12. PHOTOS (In Date Order)

The following views illustrate the sheer scale and complexity of the two Sterba curtains; the operations center, transmitters, and antenna switch matrix described above and enshrines it as a masterpiece of early RF and Mechanical Engineering.

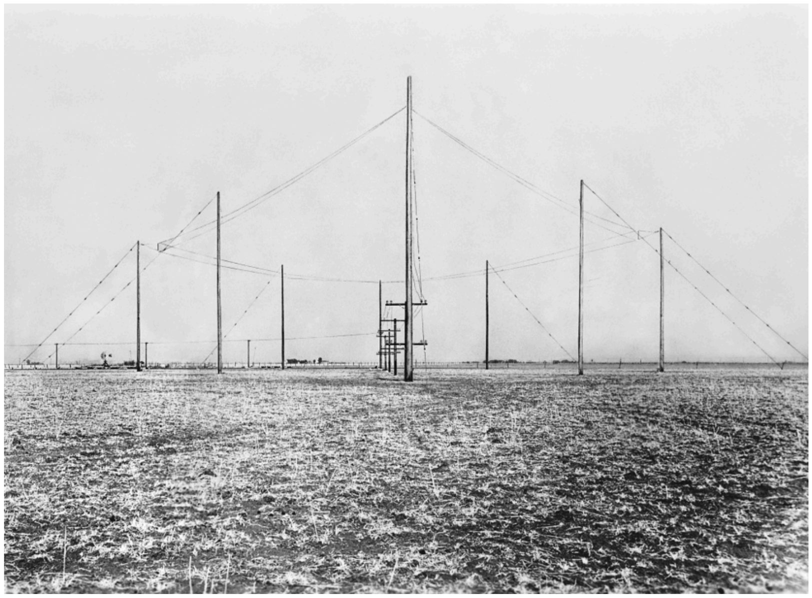


Photo 1.

2-Wire Rhombic Antenna (reversable)

Transpacific Telephone Company, circa. 1931 *(Author's collection)*

Feedlines on poles with terminating resistors at each end of the diamond.

Photo 2.

Transmitter - Transpacific Telephone Company, circa 1931

Transmitter frequency and ancillary equipment control cabinets - left. Output power control cabinets - right. The second cabinet down on the left are frequency controls. *(Author's collection)*

Photo 3.
NBC Rhombic Antenna Arrays, circa 1943
Eventually, ten Rhombic’s were installed and aimed at different areas with several being reversible.
(Courtesy of Bill Newbrough)

Photo 4.
AT&T/KMI Station circa. 1950
Behind the building - Poles carry the open-wire feedlines to the Rhombic Antenna field.

(Maritime Radio Historical Society)

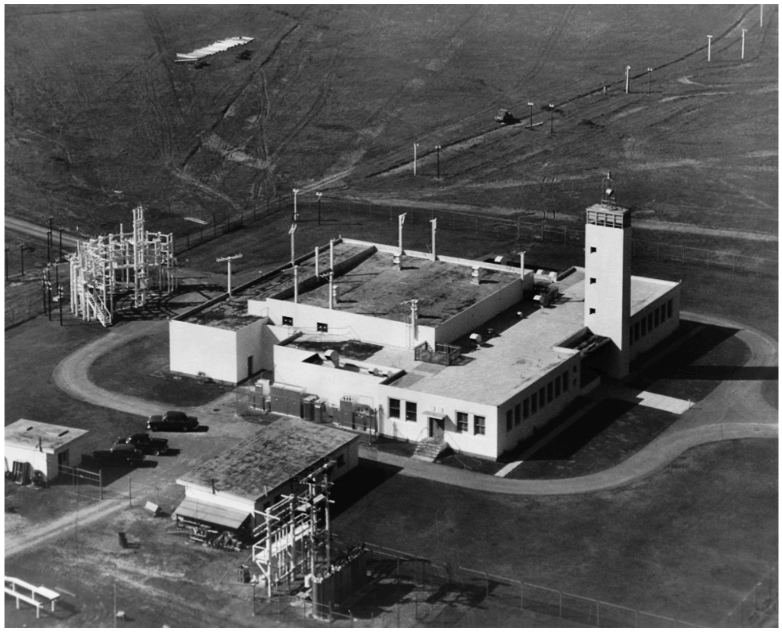


Photo 5.
VOA Transmitter Building, circa 1952
Security tower, AC power transformers, generator building, pneumatic antenna switching matrix, open-wire feedlines on poles trail off to the right for each array. *(Photo Courtesy of Bill Newbrough)*

Photo 7.
Transmitter Building, circa 1952
The operator control room is located behind the lobby in the center of the building and guard tower. Transmitters were housed in the East and West wings. The reinforced concrete structure measured approximately 200 × 100 ft that housed the GE 100 kW transmitters and served as the heart of the Dixon relay station. *(Photo Courtesy of Bill Newbrough)*

Photo 8.

100 kW General Electric G-100-A, AM Transmitter, circa 1952

Left cabinet - low level RF stages Middle cabinet - RF power amplifier controls. The 50 kW Modulator is located right of the transmitter access door. *(Photo Courtesy of Bill Newbrough)*

Photo 9.
Newly Completed Sterba Curtain, circa 1952
Center tower: 305 feet; End towers: 325 feet. 350 feet of curtain stretched between each tower. Northern array (center to right) targets Northern Asia, Southern (left to center) array is aimed at The Philippines. NBC Rhombic's remain in the background.
(Photo Courtesy of Bill Newbrough)

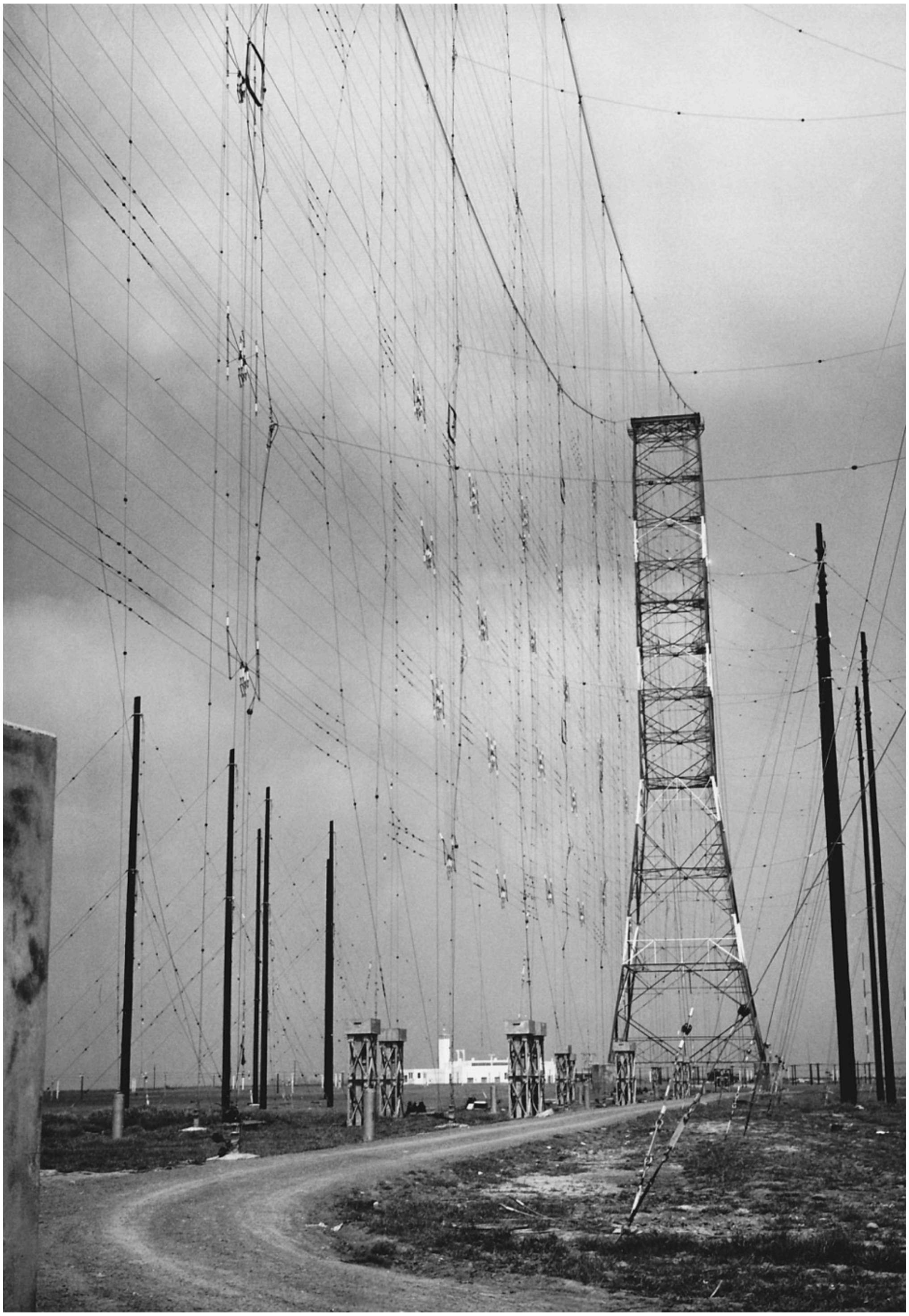


Photo 10.
Curtain Arrays, Circa 1952
Four separate curtains (rows) of four, multi-wire dipoles. The X-shaped spreaders hold the dipole wires in alignment and also serve as center insulators/feedpoints. The two giant arrays are suspended between three towers. Short towers with boxes on top are curtain tensioning mechanisms.
(Photo Courtesy of Bill Newbrough)

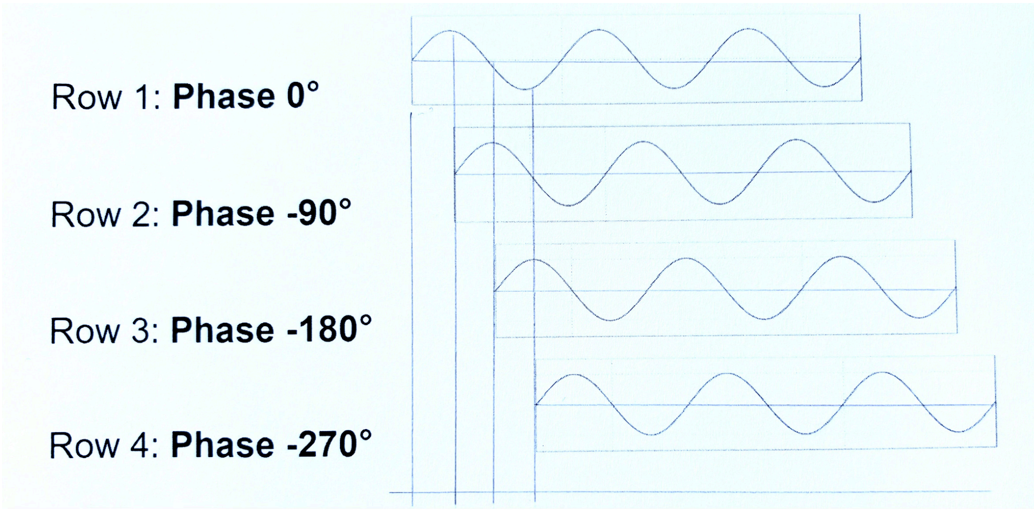
Photo 11.
Original Antenna Switching Matrix Circa 1952
Originally operated remotely by cables and pulleys, the matrix could connect any transmitter to any antenna. The matrix was later replaced with a completely different structure that had pneumatically-controlled, remote switching (see an online 1952 aerial photo close-up).
(Photo Courtesy of Bill Newbrough)

Photo 12.
Voice of America, Dixon, CA circa 1953
Looking south. The massive array dwarfs the 20,000 square foot operations building. Note the parallel rows of utility poles (left) heading to the arrays that supported the pre-phased feed lines from the switching matrix to the curtains.
AC sub-station and backup generator/mainpower distribution shed is to the immediate left of the operations building.
World War II Rhombic's at far right; smaller curtain, near right. Former NBC rhombics are gone.
Iconic peak of Mt. Diablo is seen in the background.
(Photo Courtesy of Bill Newbrough)

13. APPENDIX

Dixon Sterba Curtain Wave Generation "Sawtooth"

Each wavelet reinforces the one preceding it that creates an RF "sawtooth."

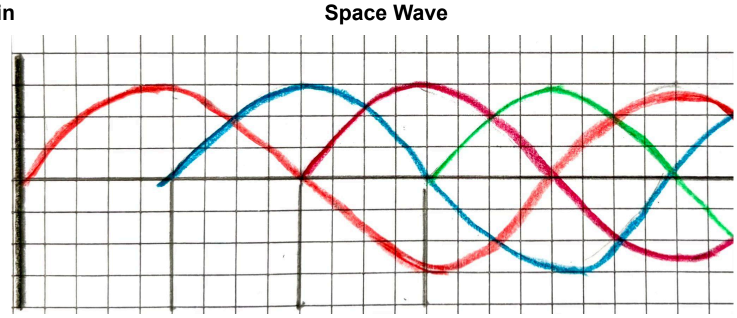


(Change Row to column) **0° 90° 180° 270°**

Figure 1.

Progressive phase delay across Sterba curtain columns illustrating traveling-wave formation.

Curtain **Space Wave**



Wavelets: **Col 1: 0° Col :.-90° Col 3:-180° Col 4:.-270°**

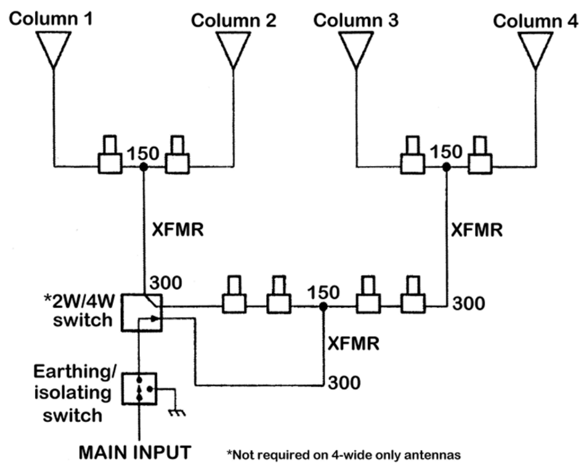
Figure 2.

The progressive phase delay produces a coherent traveling wave that reinforces in the far field.

Figure 3.

When all four "wavelets" combine in the RF Far-field (approx 1 - 2.5 km)

Distributed Phasing Illustration



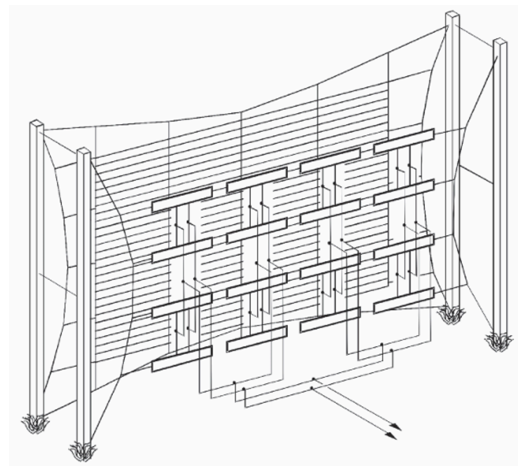


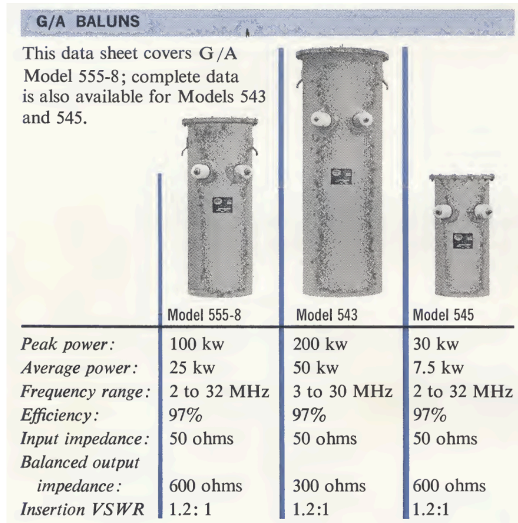
Figure 4a. **Figure 4b.**

Figure Breakdown: Distributed Phasing vs. Centralized Switch Matrix Phasing

- **The Main Branch Network:** The above schematic (Fig. 4a) from the BBC Technical Review / ITU Archive details the four separate pathways designated as Column 1, Column 2, Column 3, and Column 4. The signal enters via the main input, branches symmetrically through transmission line transformers (XFMR), and drives each column independently.
- **Distributed Slew Switches:** In the lower half of the diagram (Fig. 4a), you can see the delay line switches represented by little square blocks with loops on toop. This is the distributed matrix layout where those physical U-shaped detour loops are switched in to delay specific columns, pivoting the final beam.
- **Branch Network:** This method (Fig. 4b) highlights the classic "branch network" (corporate feed) architecture. The main transmitter signal enters at a single point, splits symmetrically through a series of matched power dividers, and drives the four vertical antenna columns independently.
- **The Dixon Difference:** While standard arrays often distributed their phasing networks and matching stubs directly on the antenna towers, the Dixon VOA facility centralized 100% of its phasing mechanics back at the main outdoor switch matrix yard.
- **Centralized Azimuth Steering:** To steer (slew) the beam, automated pneumatic switches right outside the transmitter building inserted or removed fixed, U-shaped open-wire detour loops into the individual column feed lines.

  Because these delay lines were centralized at the starting line. Each curtain had four parallel, open-wire, **phase-matched** feed lines traveling across the field that carried a **pre-phased** signal to **each curtain**, requiring absolutely no adjustable hardware or mechanical tuning out at the distant tower structures. This arrangement simplified maintenance, repair and afforded micro phase adjustments (adjustable slider bars clamped inside the phasing loops).

VOA 1:6 200 kW Balun
50–300 ohm



G/A BALUNS

This data sheet covers G/A Model 555-8; complete data is also available for Models 543 and 545.

	Model 555-8	Model 543	Model 545
Peak power:	100 kw	200 kw	30 kw
Average power:	25 kw	50 kw	7.5 kw
Frequency range:	2 to 32 MHz	3 to 30 MHz	2 to 32 MHz
Efficiency:	97%	97%	97%
Input impedance:	50 ohms	50 ohms	50 ohms
Balanced output impedance:	600 ohms	300 ohms	600 ohms
Insertion VSWR	1.2: 1	1.2:1	1.2:1

Figure 5.
Model 543 – 200 KW HF Balun
Pole Mounted – 300 Pounds
~ Forklift Not Included ~

One per curtain. There were no cores inside those air-core baluns — only PCB oil, a tuning network, a form and copper wire. Any type of magnetic core would have overheated and exploded. The 3½ in. diameter flange-mounted Heliax input was located on the bottom of the tank. Pole mounting straps are behind. (see K0UO link). K0UO.com Baluns, a VOA 200,000 watt

Data sheet: Granger Associates - Broadband HF Balun Transformer Model 555-8:

HAM RADIO TRIVIA

Calculated Effective Radiated Power for common amateur transceiver outputs
Assuming an antenna gain of 22dBi and 0 dB of feedline loss:

- For **20 W** output: **1.9 kW ERP**
- For **100 W** output: **9.7 kW ERP**
- For **500 W** output: **48 kW ERP**
- For **1.5 kW** output: **145 kW ERP**

https://calc.commscope.com/qerp.aspx

Good gain for a compact, ten-acre antenna. 73s