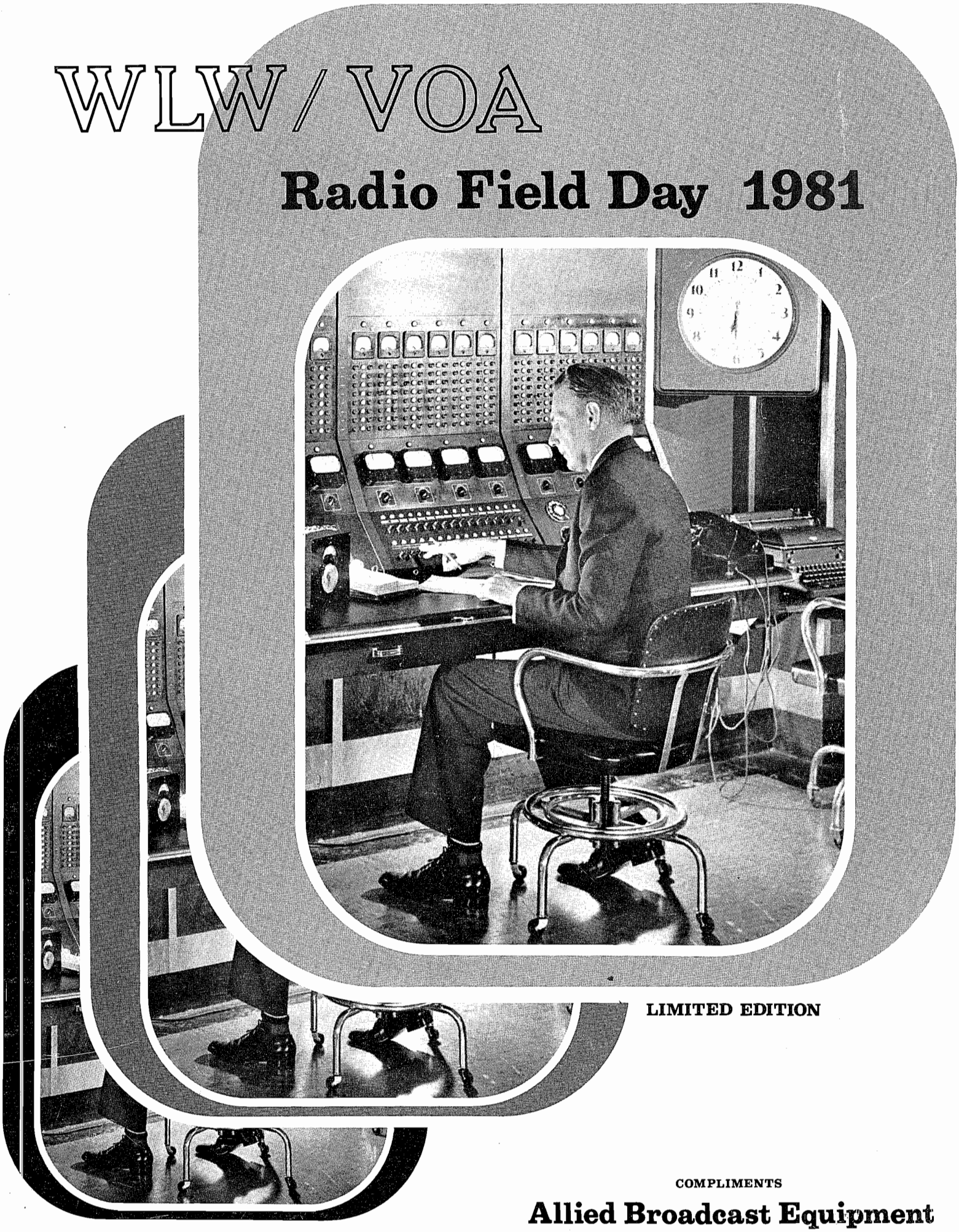
WLW / VOA

Radio Field Day 1981



LIMITED EDITION

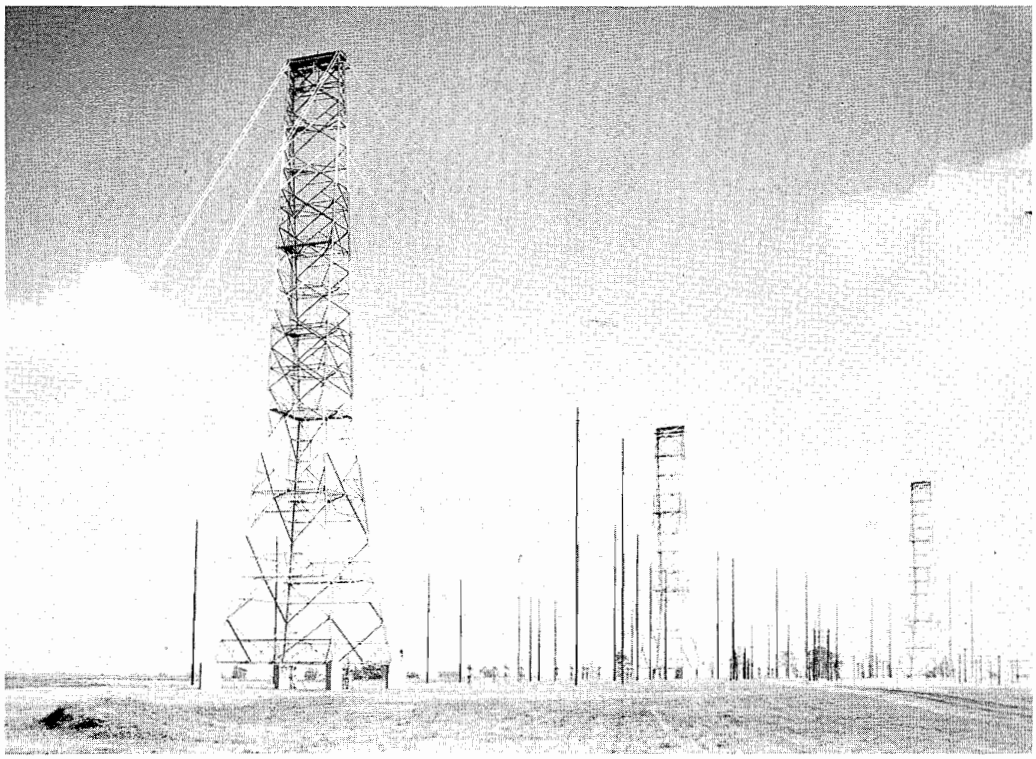
COMPLIMENTS

Allied Broadcast Equipment

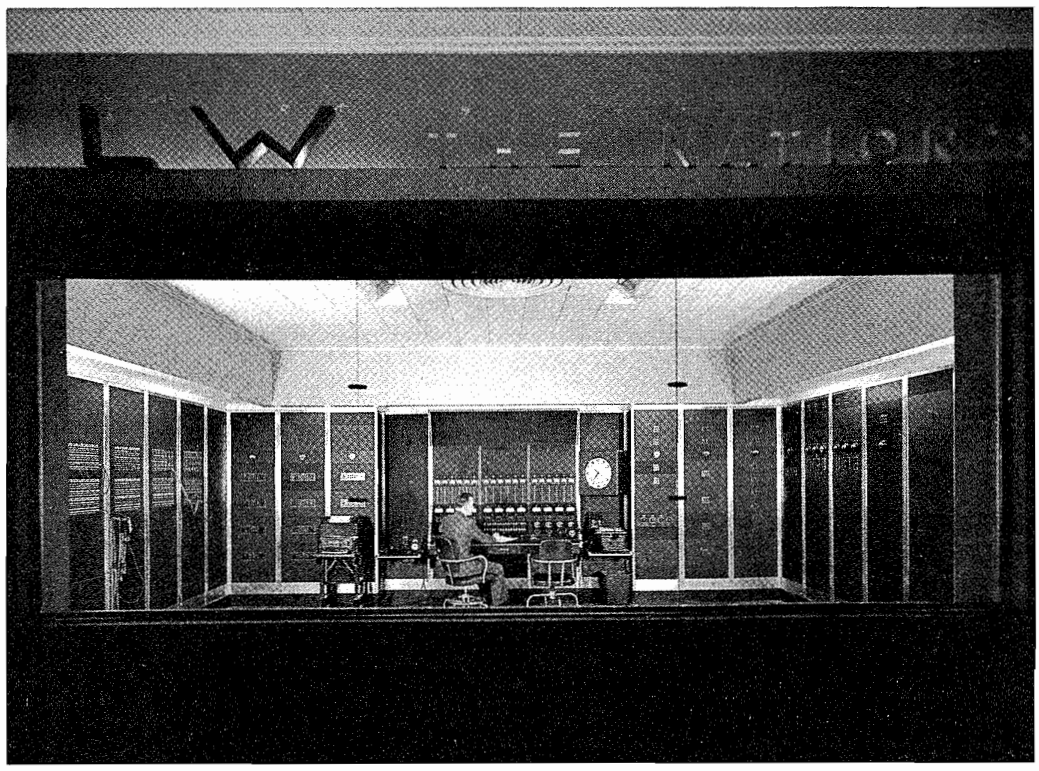
Welcome to Allied's Radio Field Day

TODAY YOU WILL SEE WHAT WE BELIEVE TO BE THE LARGEST CONCENTRATION OF RADIO HISTORY AVAILABLE ANYWHERE.

FROM THE
GIANT CURTAIN
ANTENNAS
AT V.O.A. –



TO THE
MOST POWERFUL
AM STANDARD
BROADCAST
FACILITY
EVER AUTHORIZED
IN THE U.S.



Bethany Relay Station

The Voice of America is the global radio network of the International Communication Agency, which seeks to promote understanding abroad for the United States, its people, culture and policies. VOA's long-established policy of broadcasting objective, comprehensive news reports and giving a balanced view of American society was affirmed by the U.S. Congress on July 12, 1976 when it passed a new section of the law under which the Voice of America and the U.S. Information Agency then operated.

The Bethany Relay Station, located at Mason, Ohio, was constructed in 1943 and operated by the Crosley Broadcasting Corporation under contract to the U.S. Government until 1963. Since then the station has been operated by the United States Information Agency as one of the five domestic relay stations located in the United States. Other domestic relay stations are located at Delano and Dixon, California; Marathon, Florida and Greenville, North Carolina. In addition there are many more Voice of America Stations throughout the world which receive programs from these domestic stations and re-broadcast them at close range into their particular areas.

10 TRANSMITTERS

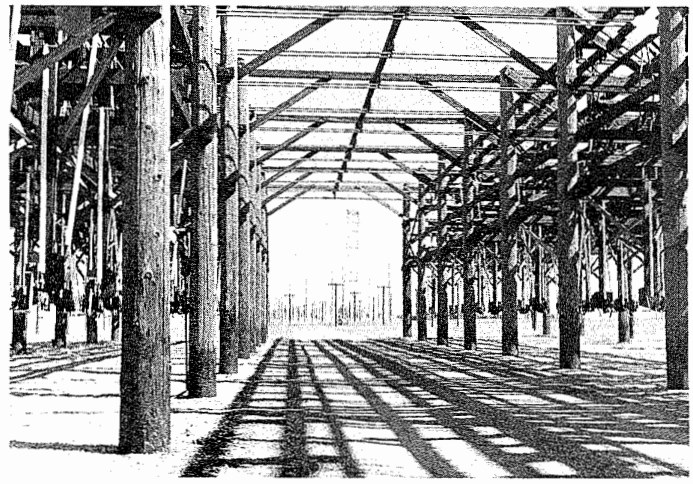
3 — Collins 821A - 1	250 KW each
3 — Crosley SWT - 1	175 KW each
2 — CEMCO 617 - A	50 KW each
1 — Collins FRT - 5	15 KW
1 — Collins 231 - D	5 KW

Total output of all transmitters is over 1 million watts.

22 ANTENNAS

8 — Curtain type with a gain of 21 dB
14 — Rhombic types with gains of 17 - 19 dB

Each of these antennas may be switched to any one of the main high powered transmitters. The antennas are directed toward Africa, Europe and Latin America.



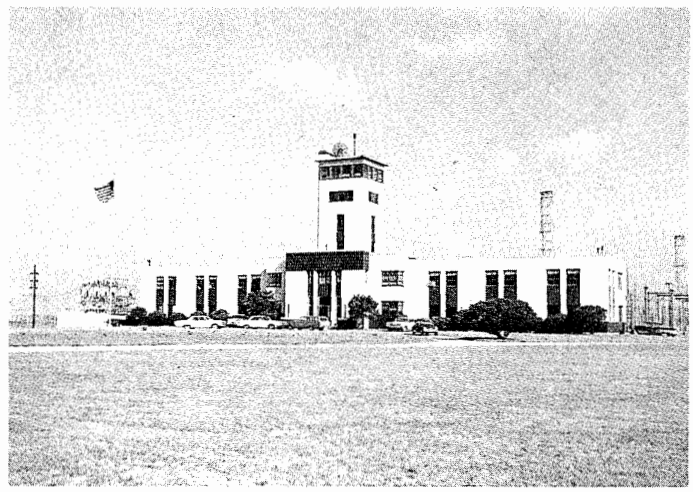
Antenna Switching Structure

FREQUENCIES

During each day's operations these transmitters operate on 20 or more different frequencies which are scheduled to provide the strongest signal in the target area at any given time. Frequencies range from 6 to 26 mHz in the International Broadcast Bands.

PROGRAMS

A total of 4 different programs are scheduled on the transmitters consisting of English, Special English, Armed Forces Network, United Nations' Meetings as well as many foreign languages.



Transmitter Building

MISCELLANEOUS

The power required to operate all equipment is approximately 3.5 million watts. The station occupies 730 acres with a total investment of 6.5 million dollars. A staff of 22 takes care of management, administration, operation, and maintenance of all equipment.

The very first VOA antenna farm was right here at Bethany, Ohio. The first 6 transmitters were built by Crosley under the direction of Jim Rockwell. Don't forget to ask to see a sample of the square transformer wire in the WLW facility basement.

Wartime metal restrictions forced Rockwell to use 800 wooden poles. There are 216 alone in the switching unit.

WLW

the nation's station

Summer, 1921: Department of Commerce issues license for 8CR as a "special land station." Power is 20 watts, transmitter by the Standard Precision Instrument Company, of Cincinnati.

March, 1922: Call letters WLW assigned by the new Federal Radio Commission. WLW is 65th licensed radiotelephone station to go on the air. Letters are received from Colorado, Maine, Michigan, Wisconsin, Connecticut.

November, 1922: 20-watt WLW conducts DX-ing contest. Winner lives in Vallejo, California.

January, 1923: Power increased to 100 watts. A free box of candy is offered for the first letter from each state. Entries arrive from 42, the District of Columbia and three Canadian provinces. Requests for the *Crosley Radio Weekly* come from Maine, California, Cuba, Mexico, Panama, and the West Indies.

Late 1923: Power is now 500 watts. *Weekly* now mailed to 25,000 listeners. The "Lightening Bugs" club has 10,000 card-carrying members. The Crosley Orchestra plays music to be heard on Crosley radios.

1924: WLW power now 1,000 watts. Time shared with WMH, owned by Precision Instrument Company, at 710 kilocycles (kilohertz came later). Battles for Monday and Wednesday nights ensue — for awhile, both stations broadcast at the same time on the same frequency. Arbitrated schedule has WMH alternating with WLW and WSAI on Wednesday nights of alternate months.

June 1, 1927: WLW moves to 700 kc, sharing time with WMAF, Dartmouth, Massachusetts, and KFBU, Laramie, Wyoming. Former operates summers only, soon disappears. Latter moves to another frequency, leaving WLW with a clear channel.

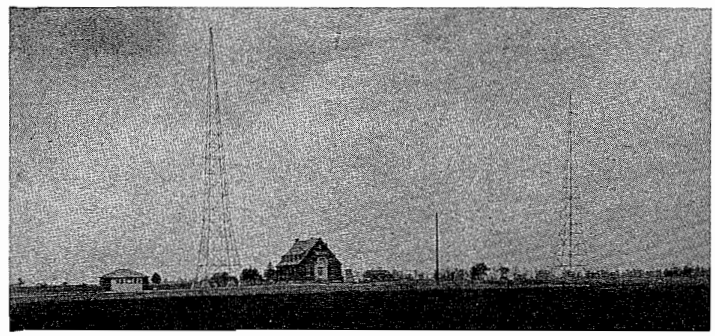
January, 1925: WLW begins program tests with 5 KW.

September, 1925: WLW orders 50 KW Western Electric transmitter.

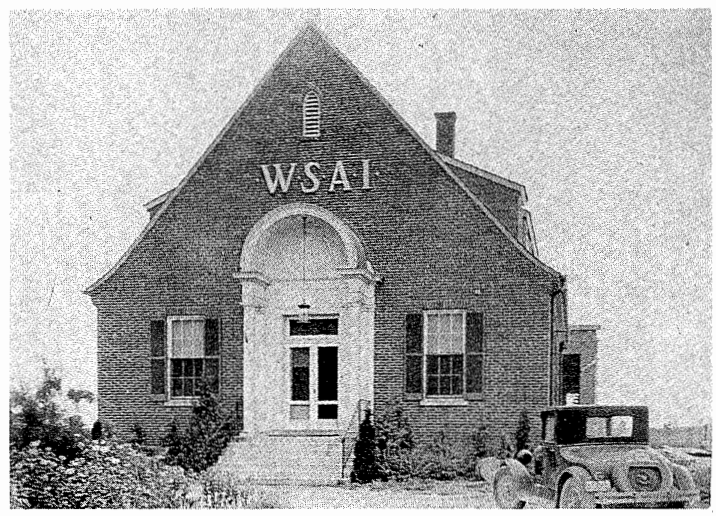
October 4, 1928: WLW starts 50 KW operation from new transmitter site at Mason, northeast of Clncinnati. Longwire antenna puts "local" signal into Jacksonville, Florida, and Washington, D.C.

Mason ground breaking ceremony — Powel Crosley, Jr. at the shovel. Circa 1928.

Part of the day's festivities included live music and obligatory speeches. Circa 1928.



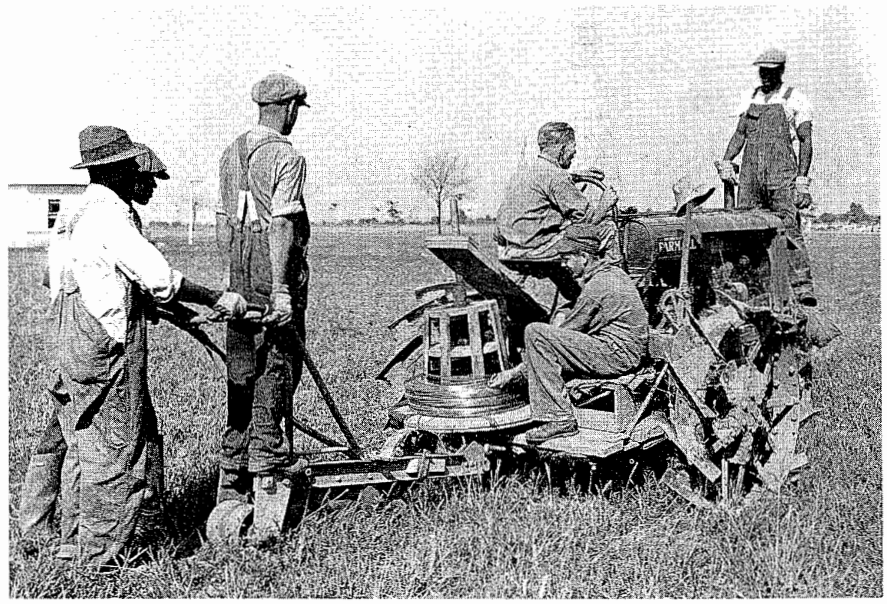
Horizontal longwire antenna suspended between 2 vertical supports. WSAI was co-owned as was shortwave W8XAL. Circa 1928.



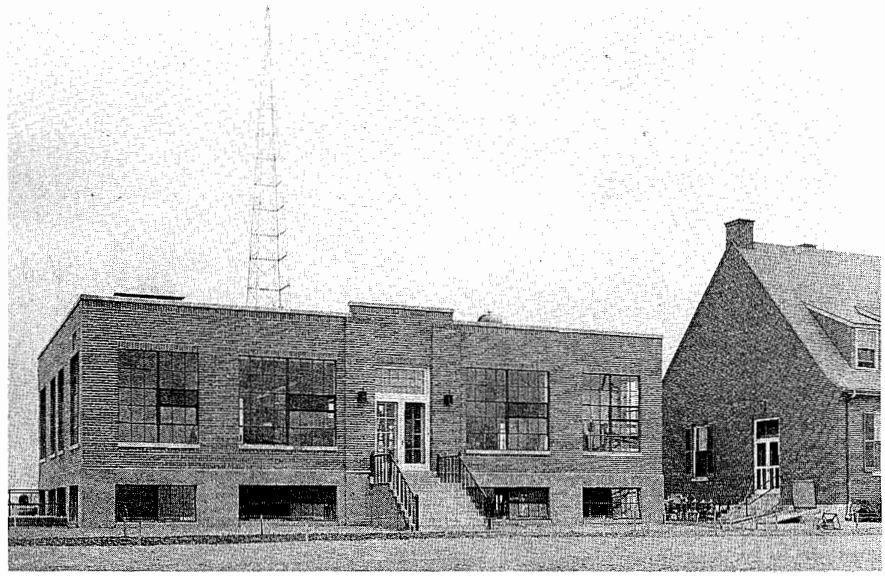
The co-owned WSAI facility studios were housed in the present Engineering VP's home. Circa 1928.

An Era Begins

View from North of the facility. This building was to eventually have the rear wall knocked out to contain the 500 KW monster. This construction took place in 1928 to house the 1927 Western Electric 50 KW rig.



Ground system subsoiling.



50 KW facility complete. Circa 1928.

On-site construction of the 500 KW plant began in Mason in early 1933

(A)

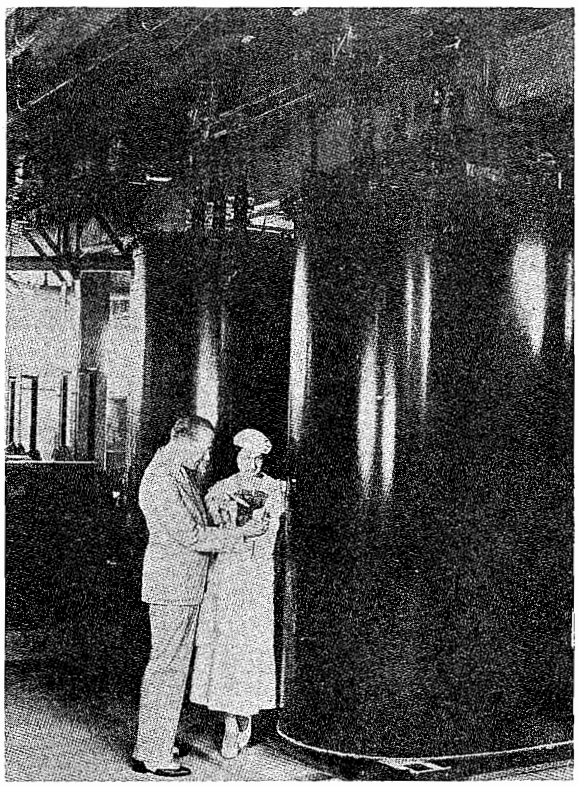
(B)

(A) Placing Ground System.

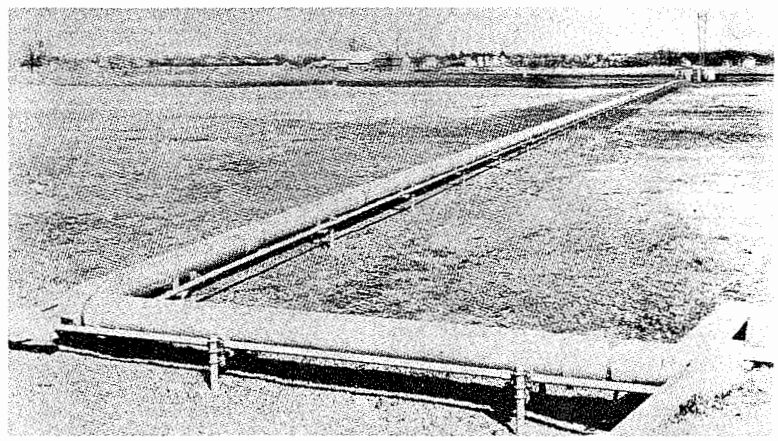
(B) Placing Base Insulator which would eventually, and to this day, support 110 tons of steel and 340 tons of guy pressure.

(C) Modulation transformers weighing 37,000 pounds each were installed in the basement of the transmitter building. Circa 1934.

(D) The RF transmission line to the antenna is 775 feet long and has a surge impedance of 100 ohms. The outer tube has an inside diameter of 9.78 inches, and the inner tube has a diameter of 1-7/8 inches.



(C)



(D)

During the Superpower Years

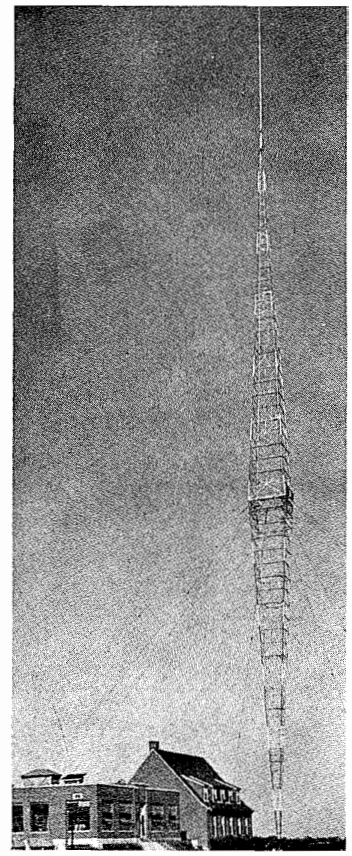
(A) Unorthodox on-air test. Arc drawn across several inches during super power. The sign meant exactly as read.

(B) Although over 100 feet of the flagpole shown on top has been removed, this tower still reaches over 700 feet today. At the time of this photo, (about 1935) overall height was 831 feet.

(C) An Era Begins — Transmitter log for May 2, 1934, shows 500 KW testing from 5:15 to 6:30 p.m., official superpower operation starting at 9:02 p.m. by remote control from the White House. Antenna current (circle) jumps from 19½ to 72 amperes. (Note: WSAI was co-owned by Crosley Broadcasting, as was shortwave W8XAL. Latter simulcast with WLW, later programmed Spanish-language fare beamed to South America.)

(D) Dramatic shot of master control at Crosley Square.

(A)



(B)

THE CROSLEY RADIO CORPORATION
WLW - WSAI - W8XAL
TRANSMITTER RECORD

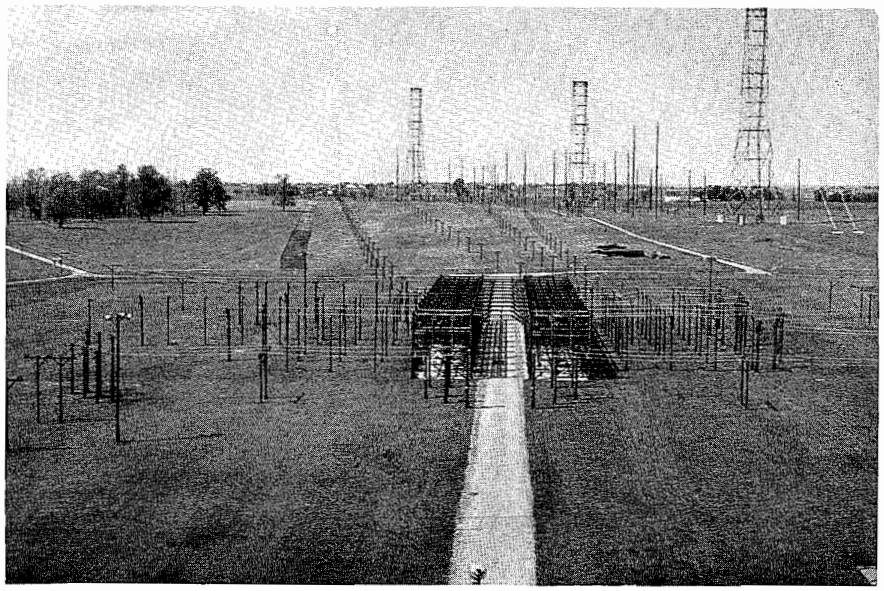
Operator JG - WS. Date May 2, 1934

TIME	6:00	6:30	7:00	7:30	8:00	8:30	9:00	9:30	10:00	10:30	11:00	11:30
					WLW							
LINE VOLTAGE	2330	2330	448	446	446	445	446	2300	2320	2310	2320	2310.
FILAMENT VOLTAGE	33.8	33.8	20.2	20.3	20.3	20.0	20.0	33.8	33.8	33.8	33.8	33.8
H.P.A. GRID BIAS	1400	1400						1420	1420	1410	1400	1400.
P.A. GRID BIAS	630	630	300	300	300	300	300	730	740	740	650	650
ANTENNA CURRENT	71	71	19.5	19.5	19.5	20	19.5	72	72	72	73	72.5
H.V. RECTIFIER	11.7	11.7	16.7	16.5	16.5	16.6	16.5	11.8	11.7	11.8	11.8	11.7
P.A. PLATE CURRENT	64	65	8.1	8.1	8.1	8.3	8.1	64	63	64	66	66
D.C. GRID CURRENT	3.5	3.5	—	—	—	—	—	4.1	4.1	4.2	4.3	4.25
P.A. TANK CURRENT	95	95	38	38	37	38.5	37.2	96	95	97	98	98
L.V. RECTIFIER	3000	3000	1600	1600	1600	1600	1600	3000	3000	3000	3000	3000
CRYSTAL IN SERVICE	2	2	2	2	2	2	2	2	2	2	2	2
					WSAI							
#1 CRYSTAL TEMP.	65.6	65.6	65.6	65.6	65.6	65.6	65.6	65.6	65.6	65.6	65.6	65.6
# 2 CRYSTAL TEMP.	45.8	45.8	45.8	45.8	45.8	45.7	45.7	45.7	45.7	45.6	45.6	45.6
P.A. PLATE VOLTAGE	6.7	6.8	6.8	6.8	7.2	7.2	7.2	7.2	7.2	7.2	7.2	7.15
P.A. PLATE CURRENT	800	800	800	800	410	410	410	410	410	410	410	410
LINE CURRENT	2.4	2.4	2.4	2.4	1.35	1.35	1.4	1.4	1.4	1.4	1.4	1.4
CRYSTAL IN SERVICE	2	2	2	2	2	2	2	2	2	2	2	2
					W8XAL							
#1 CRYSTAL TEMP.	44.5	44.5	44.5	44.5	44.5	44.5	44.5	44.4	44.4	44.4	44.4	44.4
# 2 CRYSTAL TEMP.	52.4	52.4	52.4	52.3	52.3	52.2	52.2	52.2	52.2	52.3	52.3	52.3
P.A. PLATE VOLTAGE	9.3	9.3	9.3						9.2	9.2	9.3	9.2
P.A. PLATE CURRENT	.85	.85	.83						.85	.9	.9	.9
LINE CURRENT	1.5	1.5	1.4						1.5	1.5	1.5	1.55
CRYSTAL IN SERVICE	2	2	2	2	2	2	2	2	2	2	2	2

(C)

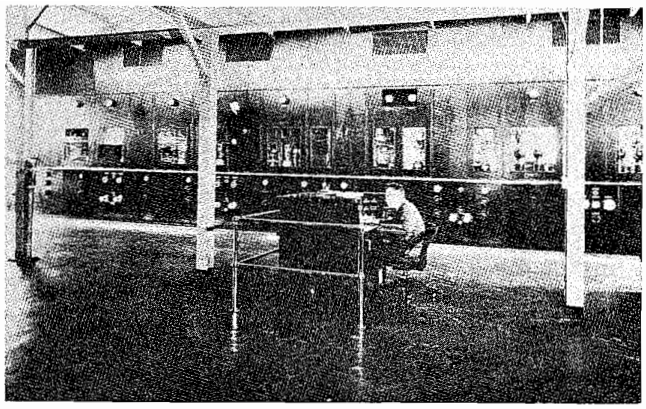
(D)

WLW/VOA

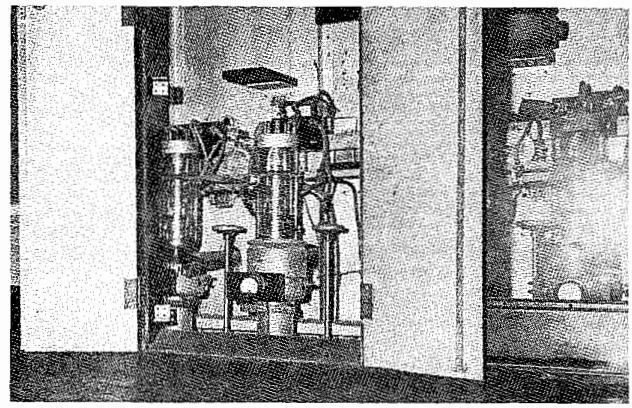


Voice of America facility, Bethany Relay Station Antenna Field, and Switching Structure.

Blaw-Knox Vertical Radiator (Guyed Type) Broadcasting Station WLW, Cincinnati, Ohio. 831 ft. high. The most powerful broadcasting station in the United States.



The 500 KW transmitter and control console looked like this about 1934.



This view shows water-cooled UV-862 tubes in one of the two modulators of the 500 KW transmitter.

The 831 foot diamond-shaped antenna, a half-wave, was end fed and planned with a wide middle to handle the highest point of RF current. The call letters at the mid-point are as wide as a 4-story building is high.

The 500 KW RCA was a joint project of RCA, Westinghouse, and G.E. RCA handled the design, G.E. the RF, and Westinghouse the control. Capable of peak power of 750 KW, the rig was driven by a 1927 Western Electric, still licensed as alternate standby and affectionately referred to as the best sounding rig in the Cincinnati area.

To carry a predicted 90 amperes of current, a coaxial line of 9.78 inches in diameter was custom constructed. None has been built since and it was the first.

33,000 volt lines were run to the station's own sub station with 2,300 volts actually entering the building.

Superpower officially began at 9:02 p.m., May 2, 1934. F.D.R. did the honors via a remote pair specially ordered for the occasion.

WLW was a veritable one-station network. Original programming contributed heavily toward the success of the NBC Red Network and the station was one of the originators of the Mutual Network.

Daytime listeners in Honolulu and fans with royal blood in Europe are some of the facts which are part of the legend.

During the superpower days, 63 engineers and operators were on staff. It was not uncommon to find seventeen engineers at the transmitter site at all times. This was virgin territory . . . something always required fixing.

During 500 KW operation, 76 newspapers carried the WLW program guide. The sales department claimed 345 Midwestern (and beyond) cities toward which promotion was aimed.

On a per-inquiry arrangement, the Olson Rug Company of Cincinnati came close to receivership because of one Sunday morning announcement. Enough inquiries came in to equal the cost of a 13 week contract.

Although experimental hours were filled with 500 KW through WW II, full-time superpower ceased Feb. 28, 1939.

In 1959, Jim Rockwell finished his Cathanode 50 KW Transmitter. Rated frequency response was from 20 to 20 kHz with distortion less than 1%. The prestigious McIntosh Laboratories reported that the WLW signal ranged from 17 to 21,500 Hz with distortion of no more than 0.3%. You may remember hearing "The nation's highest fidelity radio station".

ALLIED BROADCAST EQUIPMENT is priviliged and proud to have been your host for this occasion.

October 17, 1981

ALLIED
Broadcast Equipment

CORPORATE OFFICE: P.O. Box 1487 – 635 South E Street, Richmond, Indiana 47374 Phone 317/962-8596