THE K5GW EME ANTENNA

varian, EIMAC division
301 industrial way
san carlos, california 94070

AS-49-21

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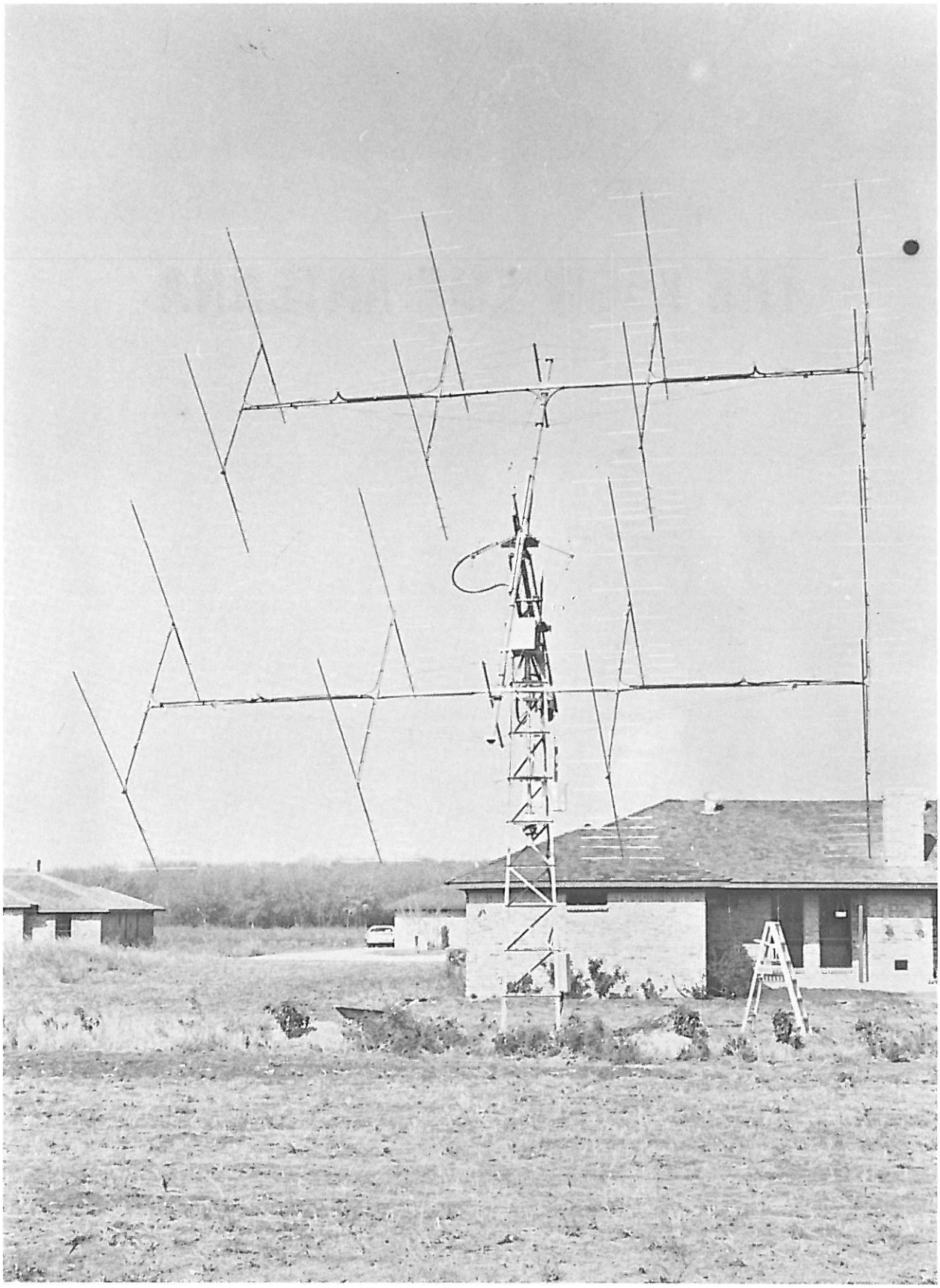
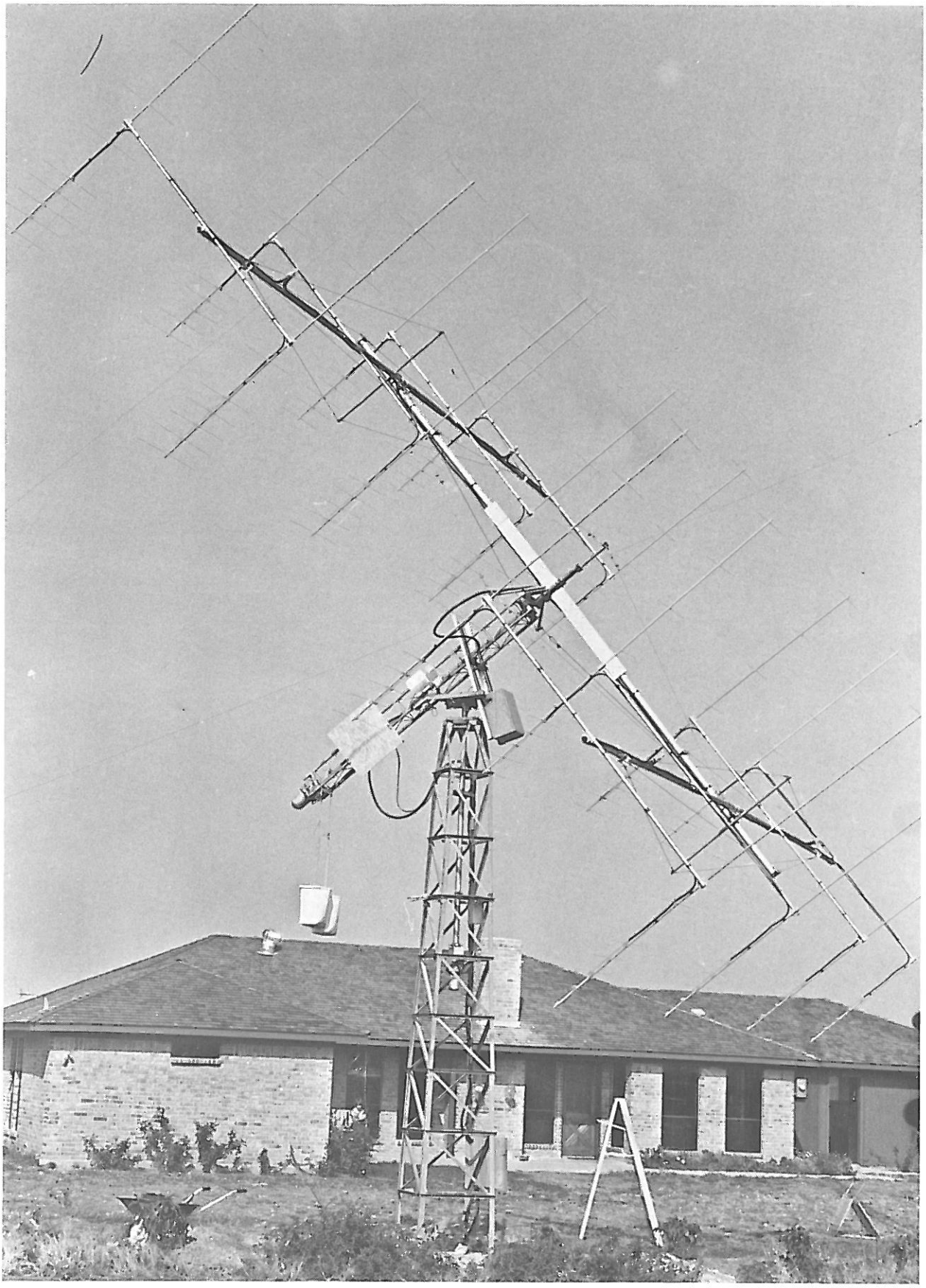
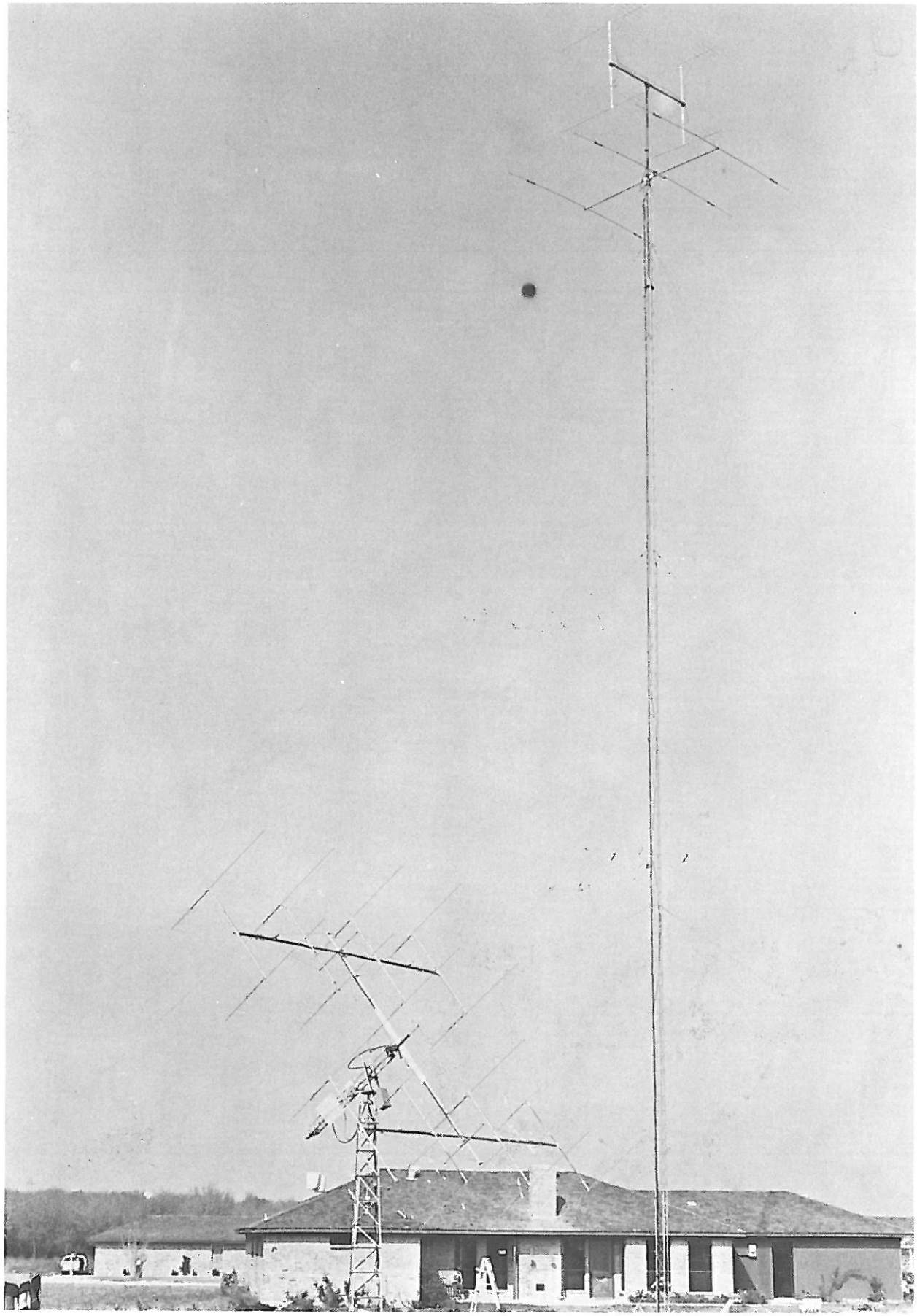


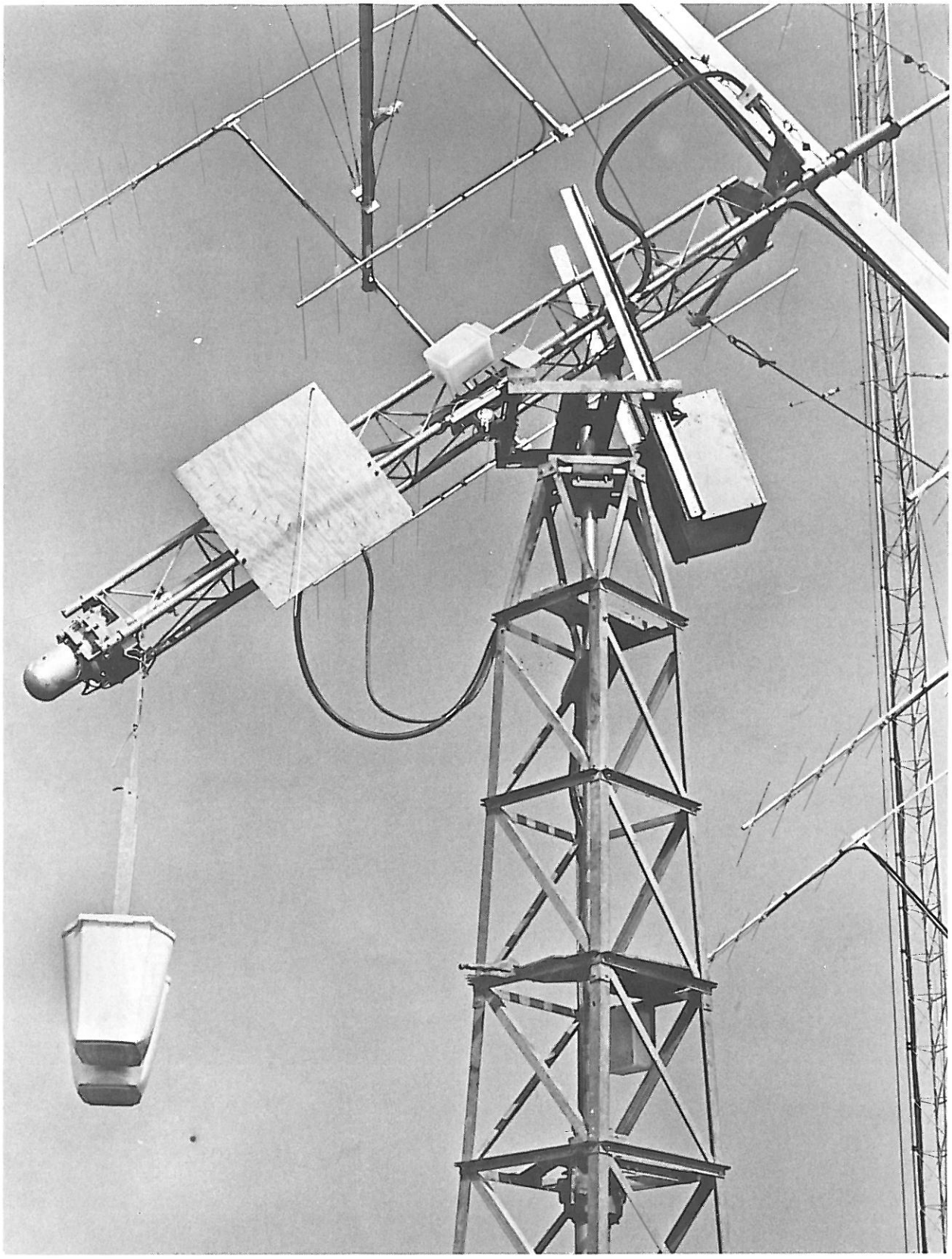
This is a front view of the K5GW antenna array. There are 16 ten element homemade Yagi's with four driven elements. The main boom is three inch irrigation tubing with strengthening guys. The secondary booms are made from two inch irrigation pipe and are also guyed. The ten foot vertical members are 10 foot lengths of one inch EMT. The antennas are on 12 foot lengths of 3/4" aluminum tubing. Each antenna weighs two or three pounds.



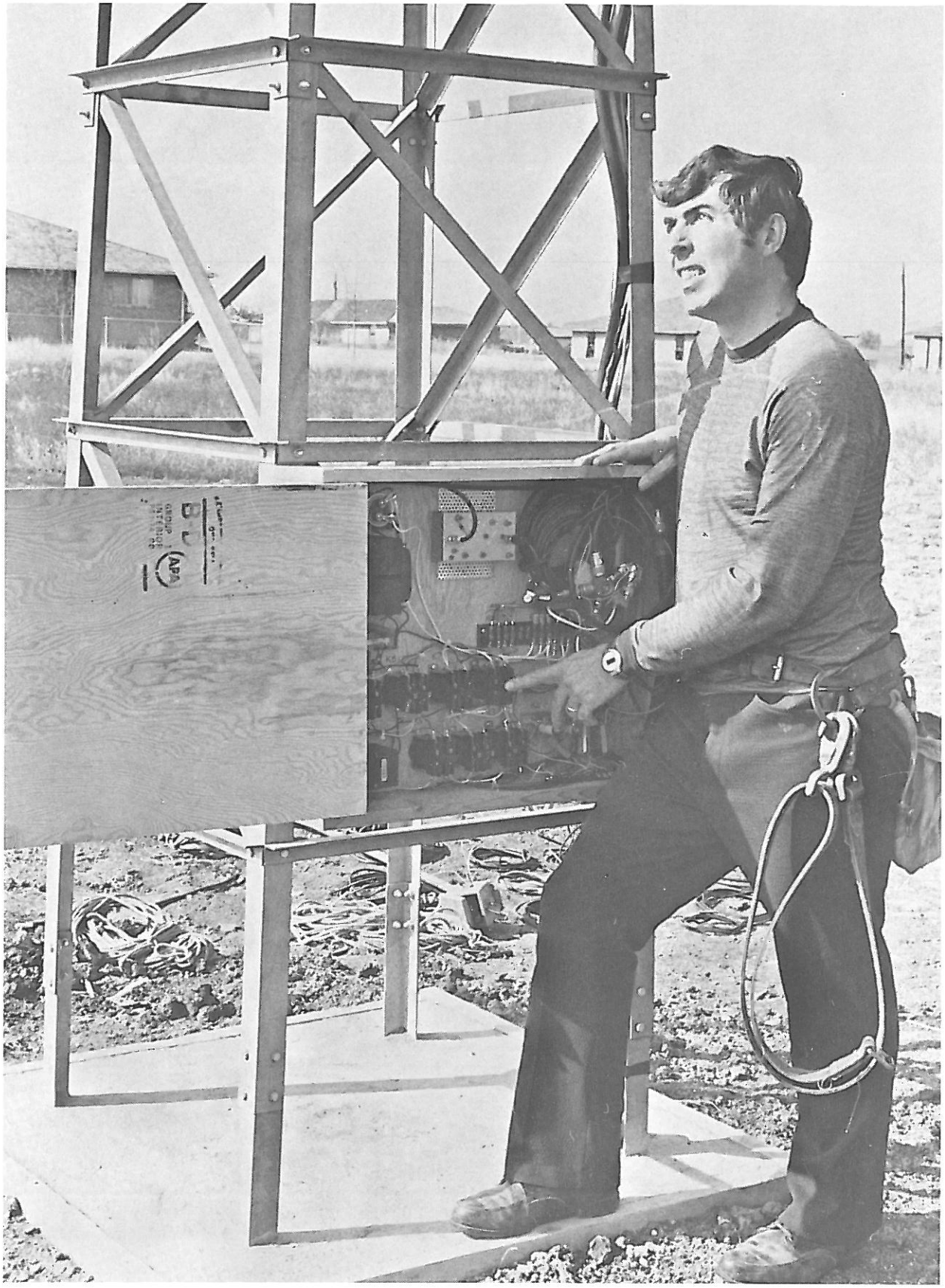
This is a side view of the array showing the aluminum channel used to reinforce the main boom. The elevation motor is inside the box below the Rohn 25 tower section. The entire array was constructed by K5GW by rotating polarity drive to reach all parts of the array from the ground, or a six foot ladder.



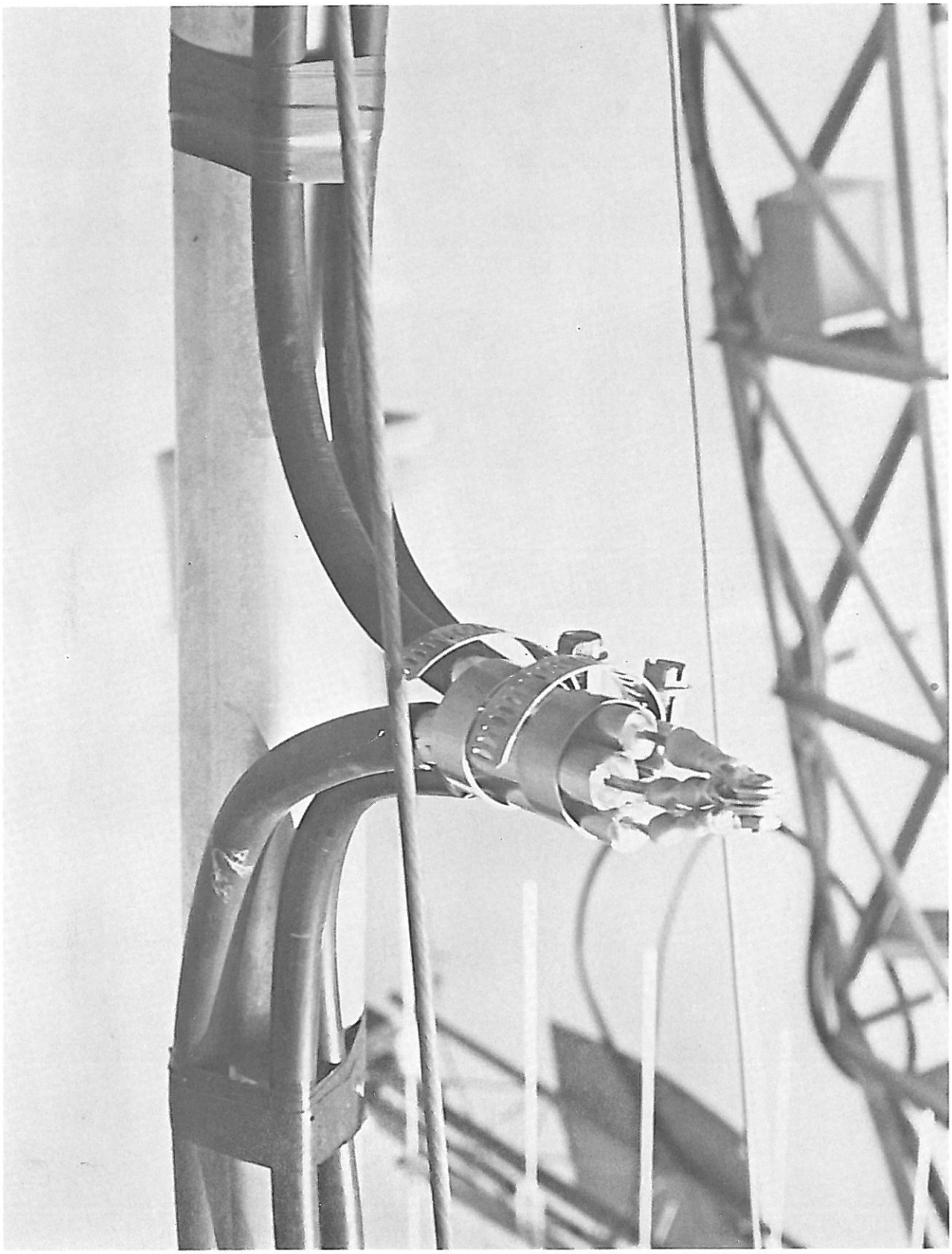
It is obvious from this picture that the EME array is not the only significant structure. The tower is 115 feet tall and has a three element tribander on top along with a two meter Yagi array at 130 feet.



This picture demonstrates the scheme for accomplishing the polarity rotation. A prop pitch motor is used to drive the polarity axis. Plastic trash cans filled with 270 pounds of concrete provide a counterbalance for the array. The temporary setting circle was used to calibrate the remote readout. The elevation platform is made from 3/8" thick steel angle. 1/4" angle proved to be too thin. Heavily oiled wooden bearings on the elevation and azimuth shafts were used. Note the use of 3/8" eyebolts used as turnbuckles at reduced cost. The heavy duty tower is homemade.



Gerald Williamson, K5GW, with his finger pushing a relay in to change the position of the array. The control box contains the two meter to ten meter converter, relays and power supplies. Tower steel is salvaged material from electric high tension line towers. It is galvanized, and when it is available, it is 15 to 20 cents a pound. Four hacksaw blades and three drill bits were expended during the five day construction period.



This is a picture of the K5GW constant impedance four-way power splitter. Connector losses are zero with this design. This splitter can be modified for 2, 3, 4, 5, 6, etc., power splits. Each antenna is 110 ohms at the feed point. At the input to the four-way splitter, the impedance is 27 ohms when each equal length of connecting cable is a multiple of a halfwave. The four 27 ohm points are now brought to another K5GW 4-way by means of equal lengths of coax which are odd multiples of a quarterwave length. The input impedance to this 4-way is 52 ohms