

KOB PICKS 50-E

Vast Area Covered by New High Power Equipment

By GEORGE S. JOHNSON

Chief Engineer, KOB

KOB, Albuquerque, New Mexico, located in the heart of the great Southwest, is serving a huge open country of over 150,000 square miles. The greater part of the radio listeners in this area depend solely upon KOB for radio reception. KOB has long realized the need for 50,000 watts of power to cover its service area which is as large as the combined states of New York, Pennsylvania, New Jersey, Rhode Island, New Hampshire and Massachusetts. Reception in this huge open country is extremely important to every person as radio is often their sole source of education and entertainment. Radio is a vital need to isolated homes in New Mexico. When RCA announced the economical operation of the 50-E transmitter, it gave KOB the first opportunity to increase to 50,000 watts.

The leaner population density in New Mexico makes it necessary to strictly limit station operating expense in order to keep the KOB advertising dollar com-

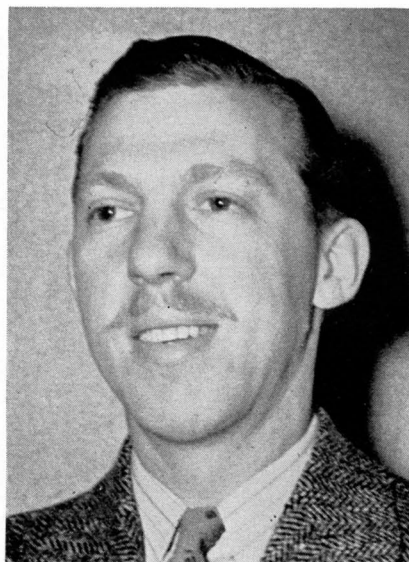
parable with major markets, so it was important that we find a transmitter with clever engineering features that would result in minimizing our installation cost, yet make no sacrifice in program quality or service.

There were a good many reasons why KOB chose the RCA 50-E transmitter. The high level Class B modulation system requires a minimum of power input. Then too, the 50-E transmitter was designed for a very small floor space, so that KOB was enabled to minimize the size of the addition needed for the transmitter building. The simple pi output circuit on the 50-E power amplifier and its associated push-button control, enabled KOB to eliminate an expensive over-all voltage regulator, because the push-button tuning system on this transmitter makes it possible to vary the coupling to the antenna and so compensate for the change in power output, due to line voltage regulation.

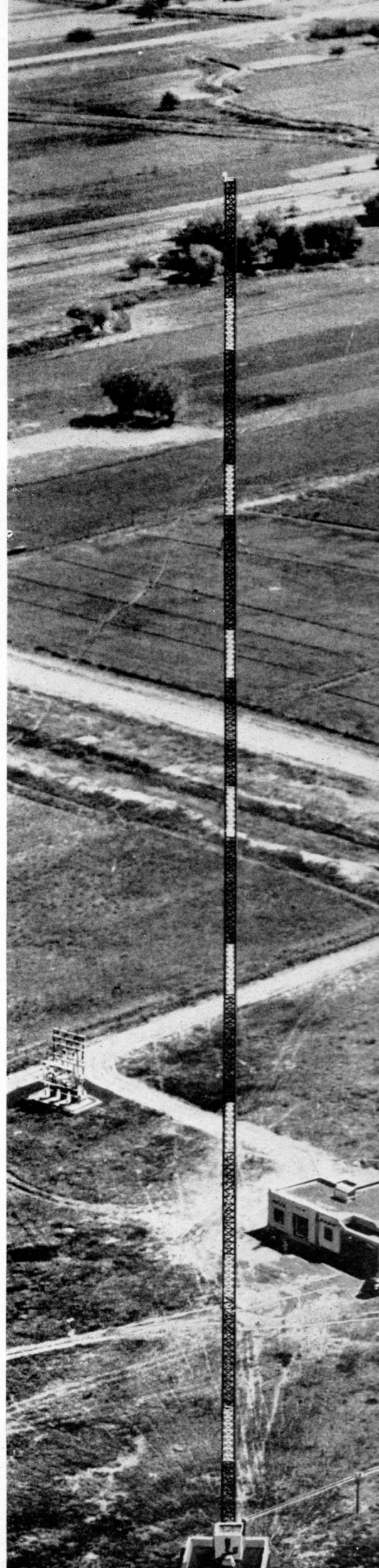
KOB has already found another use for this tunable pi output circuit. The two variable condensers in this circuit are tuned by means of push-buttons on the front panel. With this push-button tuning, the coupling to the antenna can be varied over a wide range. The FCC has given KOB license to operate 50-kw day and 25-kw night, until a directional system can be erected. The pi output circuit is so exceedingly flexible, that we are able to reduce power from 50-kw to 25-kw by merely pushing the coupling condenser button. No retuning of the plate circuit is required and the power reduction is accomplished without the slightest pause in carrier or program.

This pi circuit also is instrumental in reducing maintenance

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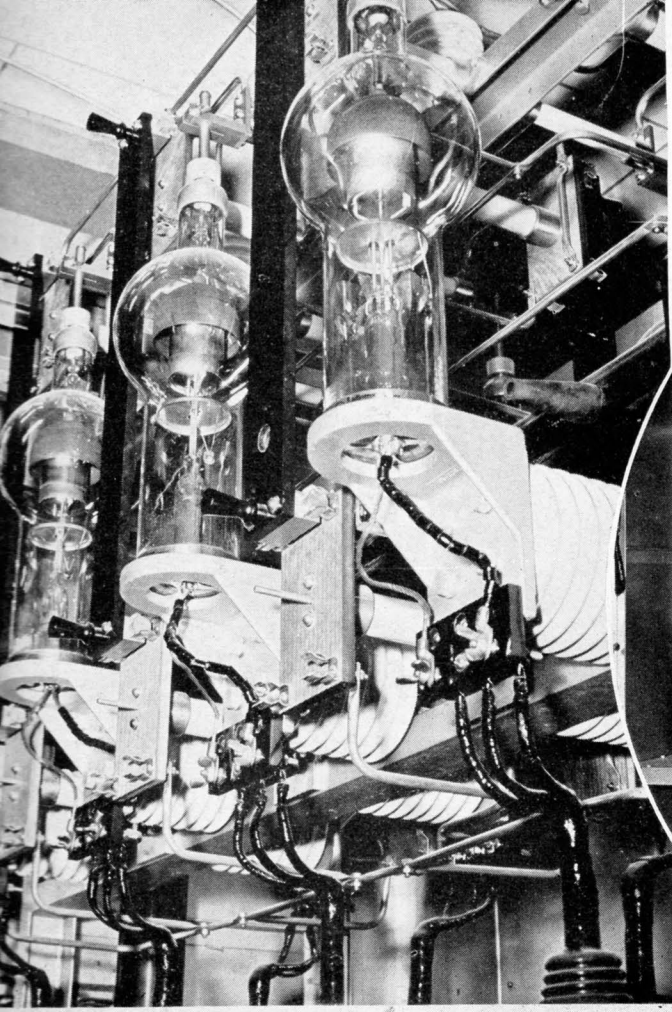


George S. Johnson, Chief Engineer at KOB.

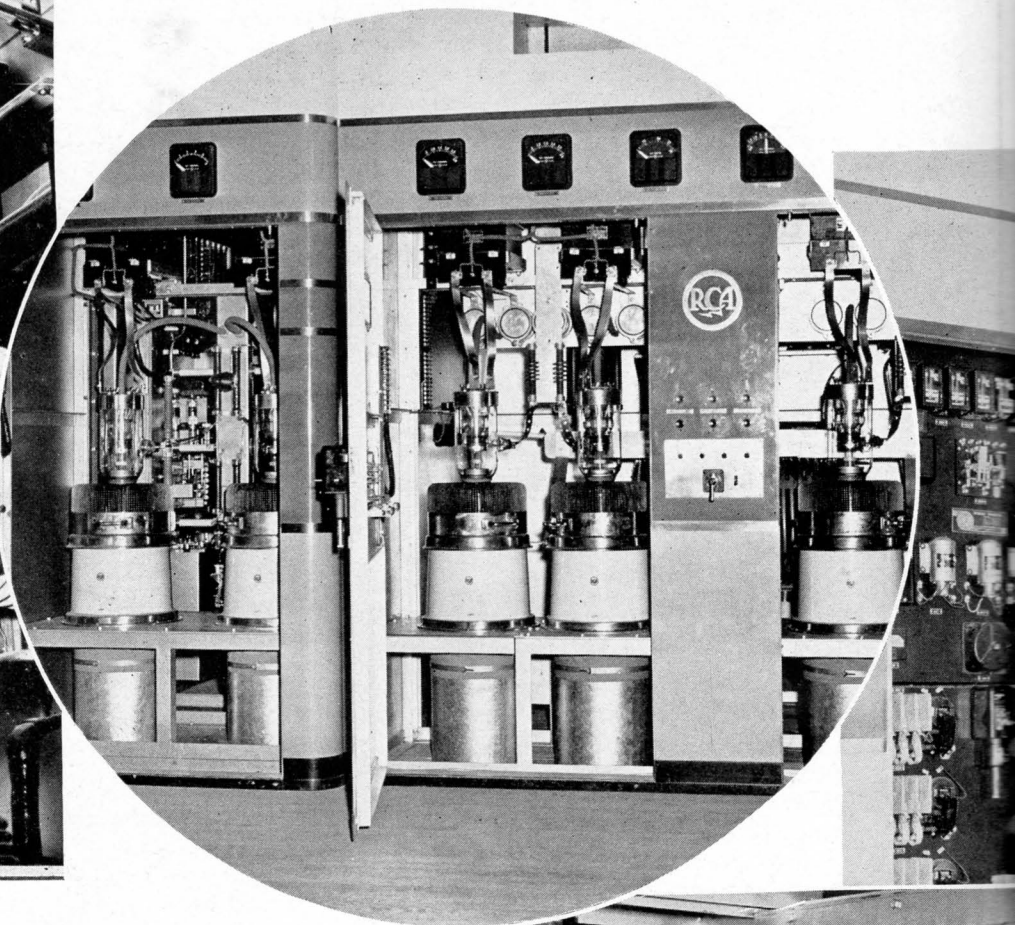


KOB's 445 ft. uniform tower.

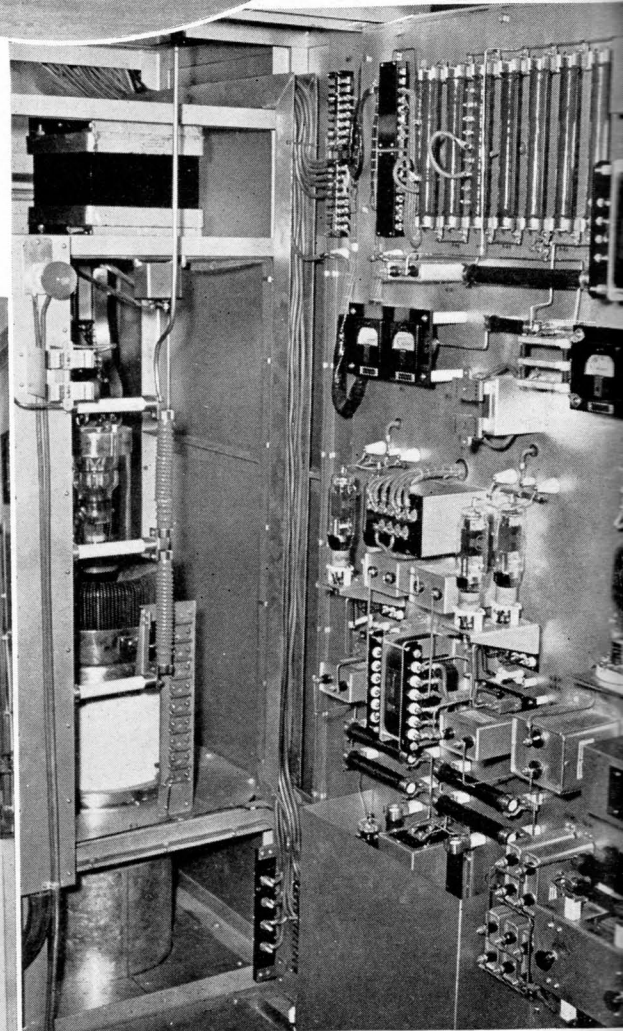
KOB—PROGRESSIVE STA GREAT SOUTH



Showing a tube array in the rectifier unit.



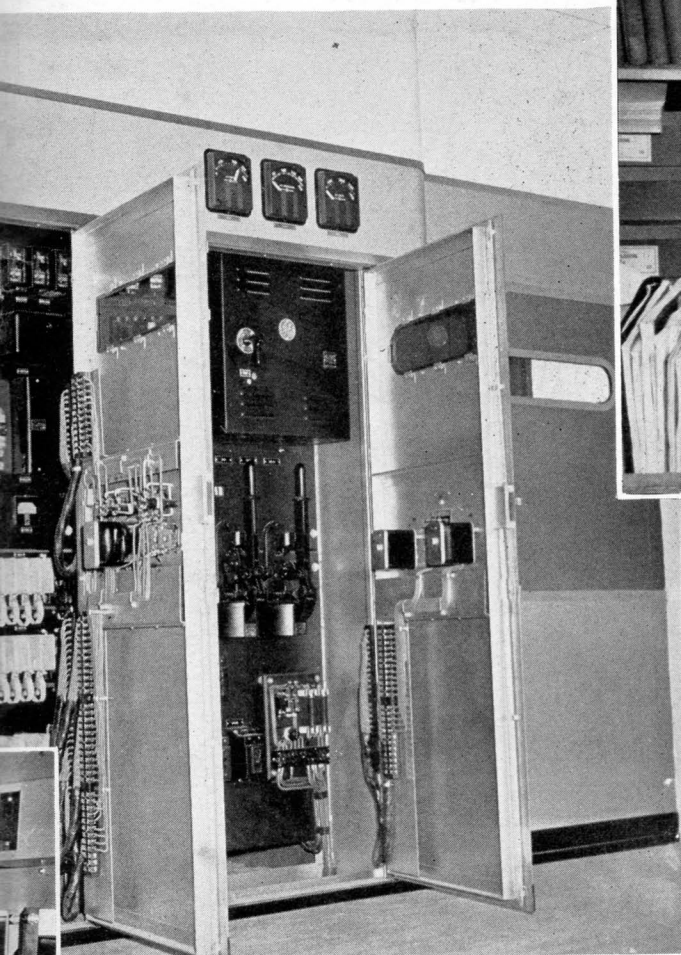
IN CIRCLE: Portions of the Modulator and Power Amplifier Units in the Albuquerque station.



ABOVE: Control and distribution panel.

LEFT: Air Cooled Tubes in the 50-E Power Amplifier. Note: External unit is KOB development—not supplied by RCA.

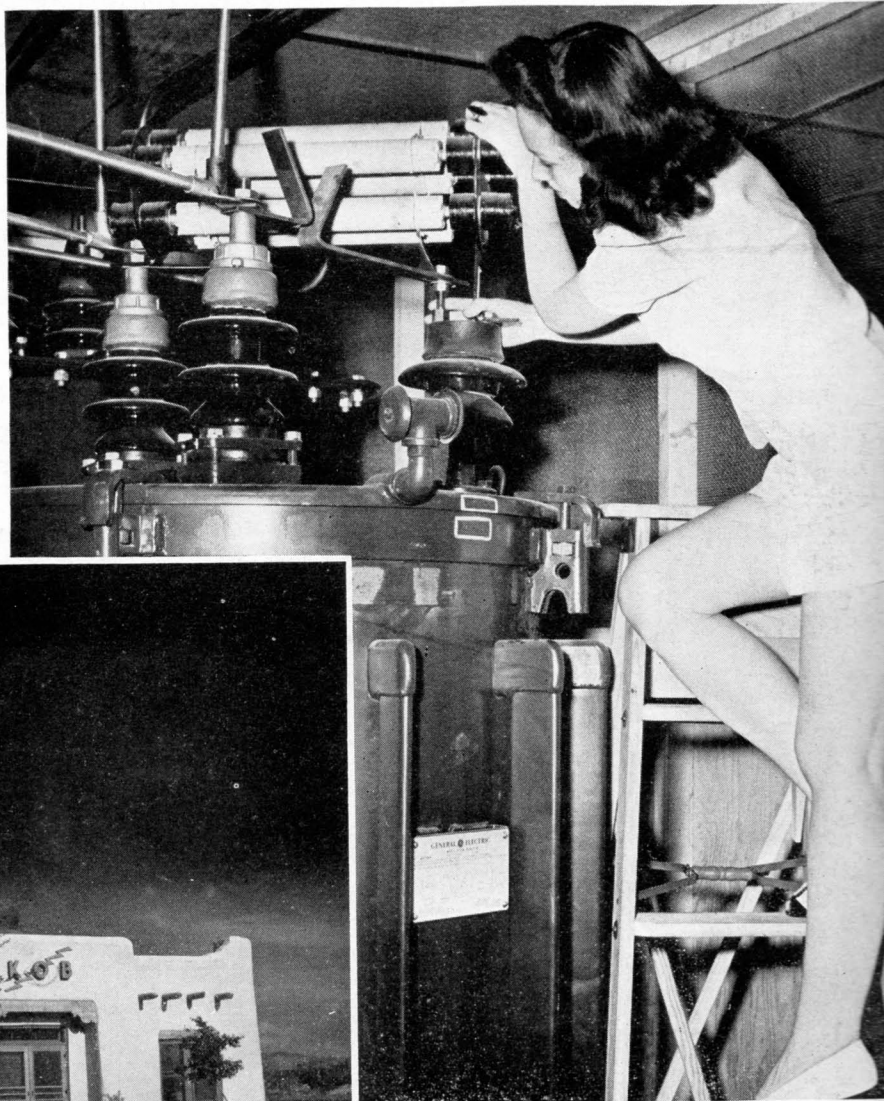
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ABOVE: Audio Amplifier-Modulator in the RCA 50-E at KOB.



KOB Technical Staff—Left to right: Geo. S. Johnson, Chief Engineer; Jack Phillips, Ass't.; James Stapleton, Ass't.



ABOVE: Stepping up power at KOB was accomplished with a complete absence of shorts—in the equipment.



LEFT: The Spanish Pueblo type transmitter house for this high power station.

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schedule and is required to keep the amplifier in tune. All necessary retuning can be done during regular operation.

The audio equipment used to drive the modulator in this transmitter is extremely simple, using only four of the 828 beam power tubes to drive the modulator tubes. All the audio equipment is conveniently mounted on the back door of the modulator stage so when the door is open, all the tubes, meters, transformers and common bias rectifier are exposed. Tubes can be changed or possible sources of trouble located with a minimum of effort.

The rectifier equipment supplying the high voltage is of a standard type, using six type 857A tubes. It has in addition a very unique and efficient type rectifier starting circuit, which eliminates all of the initial surges and resulting arc-over troubles of the past. The rectifier operates so smoothly that KOB has had absolutely no arc-backs, even during the initial test which placed a 70-kw load on a new set of green tubes.

The Albuquerque temperature has been known to rise considerably during the summer and this, coupled with the rarified air at

5,000 feet altitude, made us extremely doubtful about accepting one of the first air-cooled 50,000 watt transmitters. Now that the air-cooling has been given a thorough test in Albuquerque, we have found it has many advantages over the old water-cooled system. Most important, it eliminates the old water leak troubles when changing tubes and the expense of buying and trucking distilled water to our plant. The new cooling system is very efficient. There is very little temperature rise between the incoming air and the outgoing air.

There are other good features about air-cooling that are not so obvious. We have found that the air-cooling system is much quieter, having eliminated the old sizzling which frequently occurred in the water jackets when air got into the water system, and too, the air-cooling is much more flexible. In our climate, parts sometimes get extremely hot and we have already found it convenient to by-pass a small amount of air from the main duct and direct a stream of air on a hot piece of equipment. Of course, this could never have been done with the old water-cooling system. The blower equipment for the 50-E is sufficiently large to supply the extra air needed.

We are especially pleased with the low plate voltage requirements for the power amplifier and modulator in the transmitter. KOB is getting the 50-kw output with only 9850 volts on the plate. This very low plate voltage minimizes the peak surges arising from over-modulations, lightning, line voltage surges and other disturbances. It minimizes the possibilities of arc-overs and gassing tubes when these unforeseen disturbances occur. The entire equipment is operating with a correspondingly greater factor of safety.

The broadcasting station engineers have a great responsibility in maintaining the radio service for the public. Their job is easy or difficult, depending on the character of the equipment. At KOB, our 50,000 watt transmitter type 50-E has already assumed the character of a trustworthy slave; a rugged servant with a very calm disposition. There is a real thrill in snapping the switch which starts a full 50,000 watts 100% tone modulated, with as much confidence and as simple as turning on an electric lamp. Our 50-E has given such splendid results and is so reliable, that we predict this design will be one of RCA's most successful 50,000 watt units.