At the direction of the station owners, the Travelers Broadcasting Service (a subsidiary of the Travelers Insurance Company) engineering surveys were made on every suitable appearing piece of ground in the vicinity of Hartford. These surveys were made by the station's engineers and involved not only field strength measurements on a truck-mounted 500-watt portable transmitter but also actual measurements of the fall of potential through the ground on the sites considered. After hundreds of measurements had been made on a score of properties, the data were compiled and several locations were found suitable. Of these, the one atop Talcott Mountain, a few miles northwest of Hartford, was not only found suitable but also available and there the new station was built. WTIQ, therefore, may be said to have a "good location." The center of its antenna is at latitude 41° 49' 34.631" N. and longitude 72° 22' 49.235" W. The two 200-foot steel towers, 400 feet apart, are on a line running S. 78° 8' 33" W., and are painted in accordance with the aeronautical regulations of the Department of Commerce. Branford Field and W1MK are eight miles distant on a compass course S. 60.25° E. from the center-point of the antenna. Flying amateurs who may be "aviating" in the vicinity of Hartford should make good use of this information.

THE TRANSMITTER

This 50,000-watt transmitter is truly the "last word" in modern design. It is the first high-power commercial transmitter to use 100-kw. tubes, the first to use mercury-vapor-type rectifiers throughout; the first capable of 100-percent undistorted modulation of its full rated 50-kw. carrier output. It employs screen-grid transmitting tubes where they are applicable. It holds to its assigned frequency to within better than 50 parts in a million and has an audio-frequency characteristic "flat" from 30 to 10,000 cycles. The design and construction is, withal, simple and straightforward. There are no trick circuits or principles unknown to amateur radio involved. It exemplifies the finest American radio engineering ability in its most practical form. It must be confessed that "50,000 watts output" has a formidable sound and the amateur in expectation of viewing for the first time a transmitter of such rating is likely to find himself prematurely overawed. Surprisingly enough, his actual sensation is quite other than that of awe, for a hurried glance along the panels picks out UX-865’s in profusion and a 75-watt UX-860 in the company of a trio of UX-849’s. Inspection reveals that there is a UX-210 and a pair of UX-865’s in the crystal oscillator-amplifier unit and a glance behind the panels shows a pair of Cardwell transmitting condensers, edge-wise and flat-wound copper strip inductances, and other familiar adjuncts of ham radio. The big transmitter becomes less formidable as further examination introduces additional familiar features and more old friends of amateur radio are found contributing their share toward the ultimate 50 kilowatts of output. The amateur begins to feel at home. Why, this might be just a glorified ham transmitter! It may not be such a mystery as one at first supposed. And, true enough, it isn’t.

Fig. 1 shows the tube arrangement of the entire transmitter in block-diagram form. Starting with a few watts of output from the crystal-controlled UX-210 oscillator, progressing up through the Class-C UX-849 modulated amplifier and finally the 50-kw. linear amplifier, a 50,000-watt carrier (with 200,000 watts of peak power) is delivered to the antenna system.

THE FREQUENCY CONTROL AND PRIMARY EXCITATION UNIT

The frequency-control unit consists of not only the crystal oscillator with its associated "oven" and temperature-control equipment but also a two-stage screen-grid amplifier. The crystal, mounted in the oven, is not of itself calibrated as of such a frequency at a given time. The calibration is for the unit as a whole, not just the crystal or anything else destroyed by the process of calibration, the other side of which can be switched in its place and the oven shipped back to the laboratory for recalibration. By this practice there is a repeated test of the frequency of a crystal as supplied by the laboratory being affected by atmospheric conditions or circuits or loads at variance with that of the original test. While such precision frequency calibration and maintenance is a means necessary in amateur radio to maintain prime importance in services requiring adherence of assigned frequencies.

The crystal mounting also is important. Though here again, sheer practicality has been found difficult in actual service, the small units of minimizing frequency shift with temperature have been found very useful in conjunction to temperature control. The

THE CRYSTAL-OSCILLATOR-AMPLIFIER UNIT OUTER SHIELD REMOVED

Two of these units are used in the transmitter, projecting from the front has mounted on the shield are the control indicator, the temperature gauge and the thermometer for checking temperature. The oven is immediately behind the shield.

the crystal plays an important part in the tuning constant frequency with slight change in the temperature and the mounting uses a type of "oven". Although the crystal was not such a comparative tuning constant frequency control of temperature is accomplished by the frequency drift. The mounting is of a type, the gap being determined by the adjustment of the oven, the temperature-coefficient of expansion of the oven material together with an auxiliary guide bushing to accommodate the oven to the frequency control and primary excitation unit. The temperature control, as the...