

# KSTP INSTALLS RCA 50-KW AM AMPLIPHASE TRANSMITTER

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The complete installation of RCA's new Type BTA-50G AM Broadcast Transmitter at KSTP in St. Paul, Minnesota, was accomplished in just three weeks under the supervision of Bill Sadler, Chief Engineer. This installation was done at a cost of only \$4200.00 and included the building of a complete wall and doorway for the high-voltage plate transformer vault, the pouring of a concrete floor for this vault, as well as the physical and electrical installation of the wall-mounted switchgear and the actual installation of the transmitter itself.

It can be seen from the photos on these pages that the Ampliphase 50-KW Transmitter has been specifically designed to fit into the existing floor space of most 50-kw installations. The small size of the BTA-50G permits transmitter replacement without loss of air-time. At today's building costs, the savings in installation are obvious to the broadcaster contemplating the acquisition of a new 50-kw AM transmitter. Additional savings at KSTP are being realized in reduced power bills. The power consumption of the old composite 50-kw transmitter was about 265 kw—the RCA BTA-50G will average approximately 100 kw.

Further savings will be realized by the use of the 5671 power amplifier tubes. All of the stations using this tube report "fantastic" tube life—KDKA in Pittsburgh reports 65,000 hours of 5671 tube life and is still going strong. It is conservatively estimated that tube life in the order of 30,000 hours will be realized in the BTA-50G.

In the light of possible favorable action on the proposed remote control of higher power AM transmitters—all of the control circuits in the new BTA-50G were air-checked, and were found to give excellent performance. As supplied, the transmitter has one manual switch to change the control ladder to remote operation. In addition to the equipment necessary to monitor such functions as modulation, frequency, tower lights and the actual studio and control functions themselves—it is planned to offer a remotely controlled Delta-Wye switch as an optional item.

According to Bill Sadler, plans call for use of the old composite 50-kw transmitter as a stand-by unit. The entire transmitter installation at KSTP is a prime example of the sound engineering and excellent planning which have gone into making this one of the nation's finest broadcast stations.

FIG. 1. Interior of transmitter building at KSTP looking toward the rear of the octagonally shaped room. At the far right, the four cubicles of the BTA-50G 50 KW AM Transmitter can be seen. Just to the left of the BTA-50G is a composite 1-kw stand-by transmitter housed in two cabinets. The control room at the center of the main transmitter room contains the transmitter test and measuring equipment as well as facilities for programming of records and station breaks. At the left of the control room, a portion of the old composite 50-kw AM transmitter can be seen. This composite 50-kw unit takes up approximately one-half of the wall space of the transmitter room. In contrast to this, the new BTA-50G occupies less than 15 feet of wall space—an area formerly occupied by a 10-kw FM transmitter.



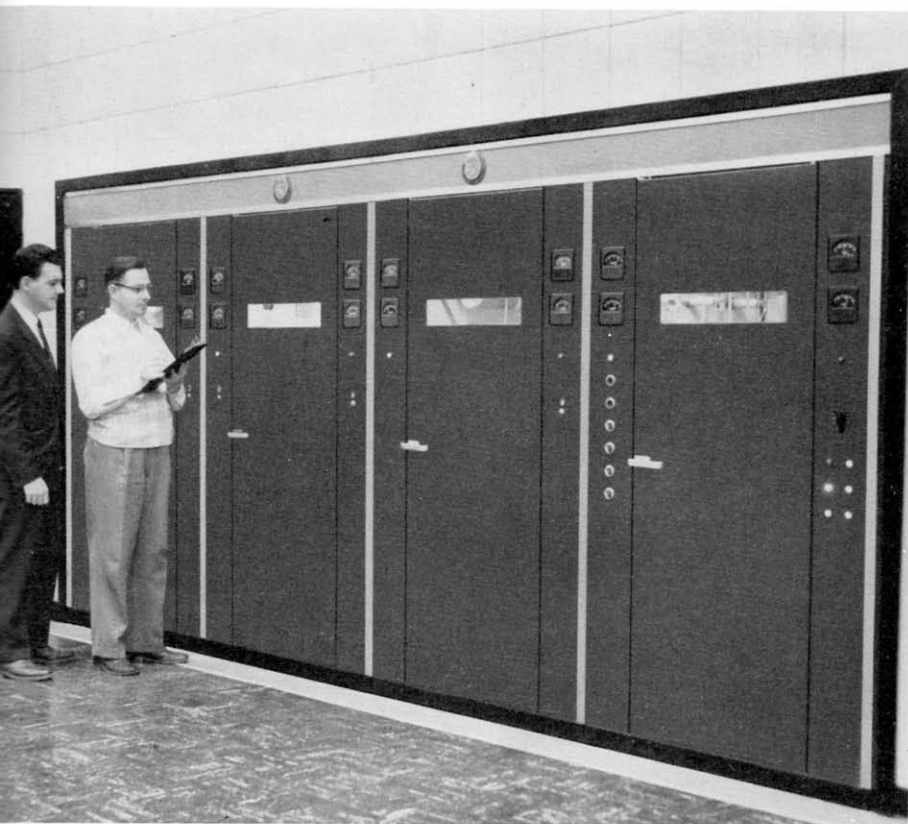


FIG. 2. William Sadler, Chief Engineer, and Howard Carlson, Transmitter Supervisor check performance of the new BTA-50G Transmitter showing from left to right: a final power amplifier stage, the exciter, a final power amplifier stage, and the rectifier cabinet.



FIG. 3. Rectifier cabinet, front view, showing high voltage rectifier filament transformers and the low voltage 8008 supply. To facilitate remote control, the rectifier cabinet is air conditioned. The unit mounted on the front door is a thermostatically controlled heater. This heater, in conjunction with an exhaust fan, keeps the internal temperature of the cabinet within the operating limits of the mercury vapor rectifier tubes when the transmitter is in operation.

FIG. 4. Rear view of BTA-50G shows transmitter during installation. Bottom sections of frame are removable to allow heavy components such as the filter reactor, blowers and low voltage plate transformers to be moved into place.

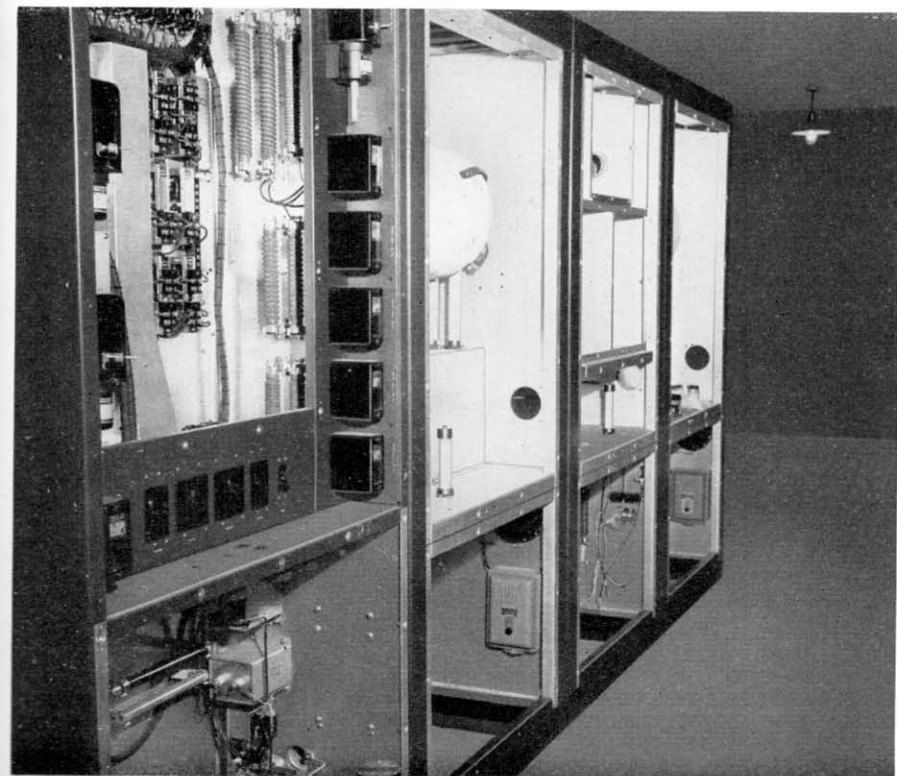


FIG. 5. Inspecting the right hand PA cabinet is William Sadler, KSTP's Chief Engineer. Note the generous over-size plate tuning capacitor. Vacuum capacitors are used in all stages to guarantee maximum dependability.

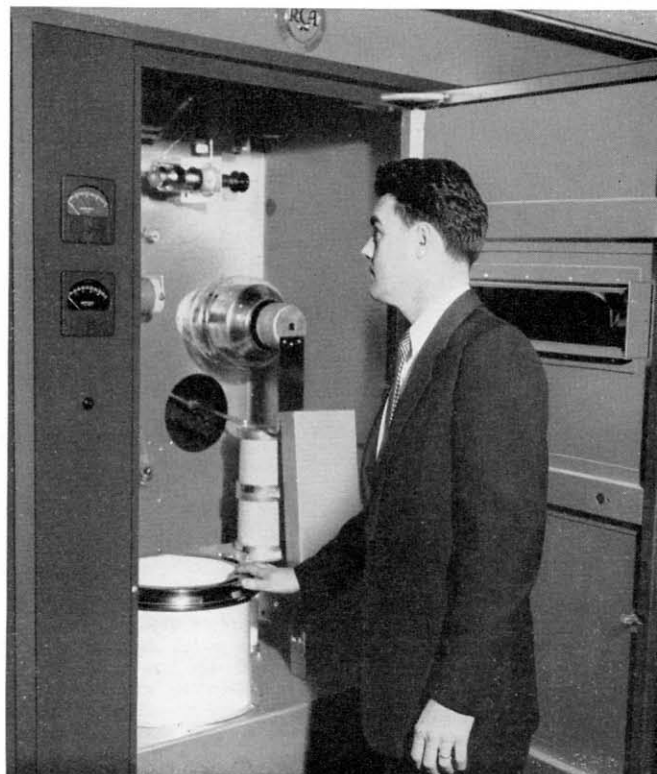




FIG. 6. KSTP chose to modify the typical arrangement of the wall-mounted switch gear—frankly, we feel that they have improved the arrangement. In the typical layout, the distribution transformers are mounted at the upper right at eye level—KSTP has installed all heavy components at floor level which eliminates the necessity for reinforcing the tile wall. Starting at the upper left, the top of the main line 400 amp/600 volt disconnect switch can be seen. This is the only piece of switch gear which must be supplied by the customer. Next in line is the plate breaker, a Delta-Wye switch, and the low-power, intermediate and distribution breakers. The two units to the right are the contact making volt meters for the two voltage regulators at floor level. The three transformers to the left are the 460/230 volt distribution transformers which supply regulated voltage to the filament control circuits. The door to the rear gives access to the transformer vault and is interlocked for personnel protection. The clear layout is typical of the sound engineering practices used at KSTP.

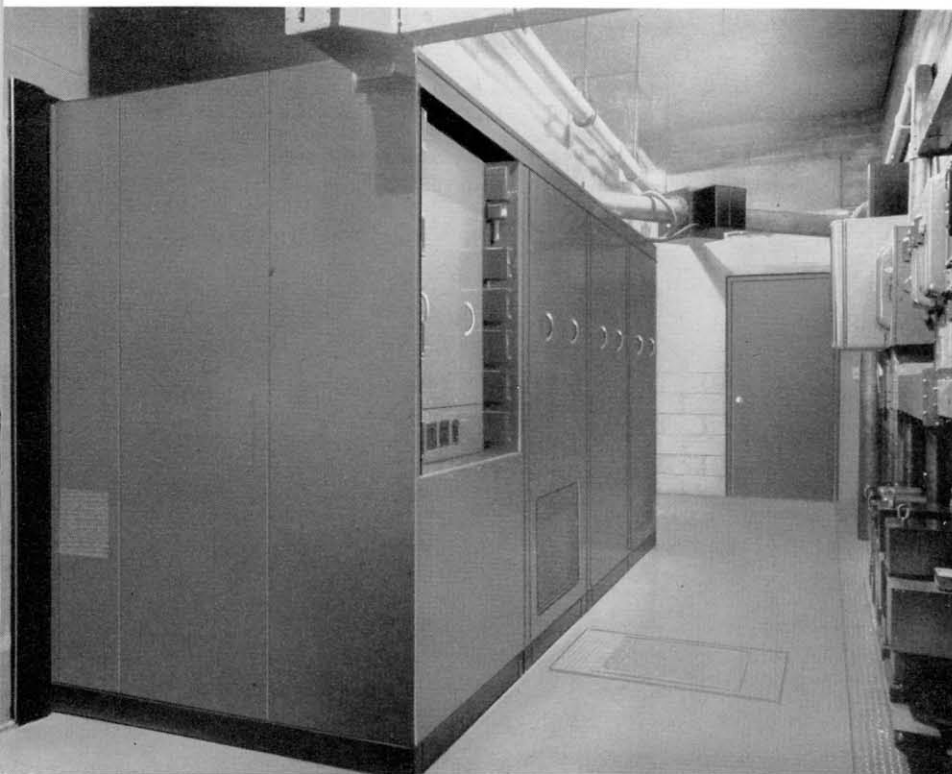


FIG. 7. Photo illustrates the complete shielding used in the BTA-50G to obtain the 83 db of harmonic attenuation for which the transmitter was designed. An interesting feature is the antenna protective device inserted in the transmission line (upper right)—this device operates on the reflectometer principle. A change in SWVR will develop voltages across a bridge circuit which will interrupt the r-f excitation—removing the carrier and preventing destructive arcs. The wall-mounted switch gear is shown at the far right. Two separate blowers in the bottom of the PA cabinets eliminates the need for air intake ductwork.

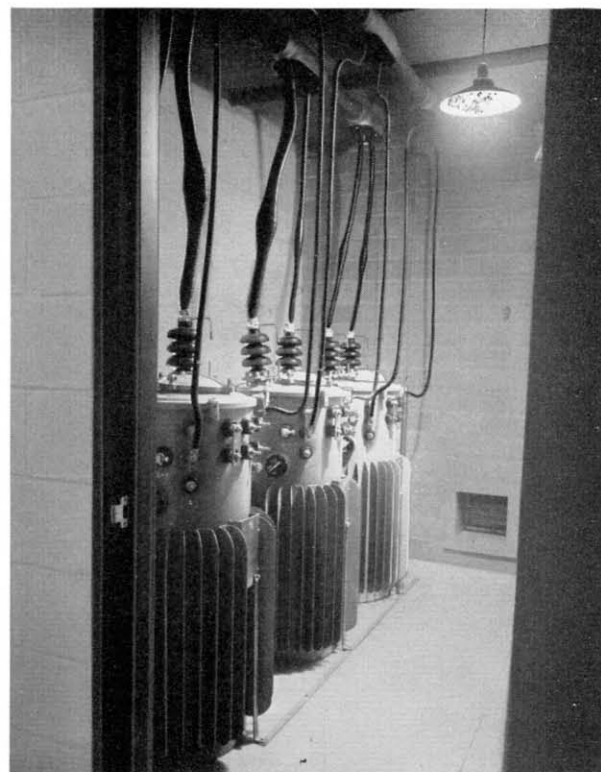


FIG. 8. Although the high-voltage plate transformers are weatherproof and can be mounted outside the building—KSTP chose to install them in a transformer vault. These are the only external transformers which require additional floor space. Note the individual temperature indicators on the transformers.