



FIG. 1. Here is the new Ampliphase transmitter, type BTA-50H. Four compact cabinets occupy only 75 square feet of floor space.

## **NEW** | **50 KW AMPLIPHASE AM TRANSMITTER**

Type BTA-50H Combines High Performance  
and Reliability with Low Operating Cost

Introduced in 1956, the *Ampliphase* concept is now proving its value in over 20 of the nation's top stations. Early this year a new model of the *Ampliphase* transmitter, type BTA-50H, was introduced. The BTA-50H has been installed in several stations where its performance is proving even better than previous models. This new transmitter offers several distinct advantages; such as, new lightweight PA tubes, improved driver tubes, silicon rectifiers, and an extremely stable exciter. In addition, each new *Ampliphase* transmitter is being completely tested at the factory to assure proper operation upon installation at the station.

#### The Ampliphase Transmitter

In the *Ampliphase* system RF is generated in the 807 crystal oscillator stage at carrier frequency. This signal is then amplified and separated into two channels differing in phase by 180 degrees. Each signal is then passed through d-c modulator stages adjusted to produce a phase difference of approximately 135 degrees between the two channels. Modulation is applied to each rf channel by a variable resistance type of phase modulator. The outputs of the modulated stages are then fed into amplifier stages using type 1614 tubes which in turn drives class C amplifiers using 4-250 tetrode tubes. The output from the 4-250 stage in each channel drives a 4CX5000A tube which in turn drives the final amplifier tube, type 6697, to well over 25 kw output in each channel. Each power amplifier has a conventional pi-network type of tank circuit with a common output shunt element. The combined output capability of the two power amplifiers is well in excess of 50 kw. A completely shielded two section low pass filter is incorporated in the output circuit in conjunction with two series-tuned shunt connected traps which provide sufficient filtering action to easily meet or exceed present FCC requirements.

#### Improved Power Tubes

A single 4CX5000A ceramic, air-cooled tube is used in each driver stage of the two rf channels. The 4CX5000A tubes are operated well below their maximum ratings to provide long, trouble-free operation. A single type 6697 tube is used in each power amplifier in the two rf channels. The type 6697, rated at 35 kw plate dissipation, is required to dissipate approximately 14 kw under average modulation conditions, thus assuring long tube life. Because of the small physical size of the 6697 (actual weight 29 lbs.), one person can easily and quickly replace this tube.

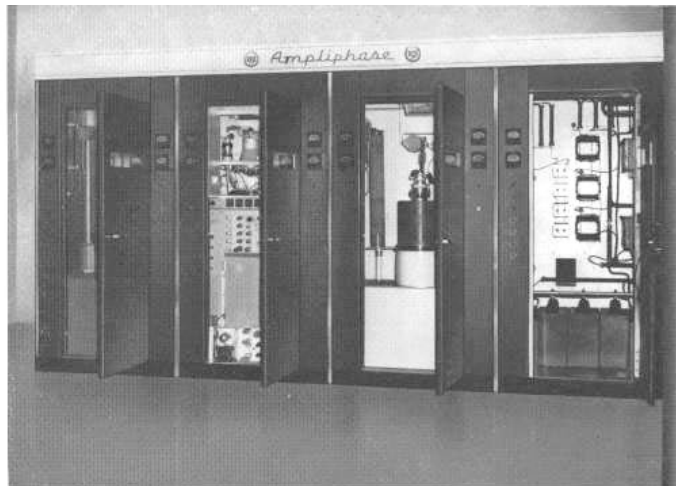


FIG. 2. Easy access to all tubes and tuning controls is through the front doors. The cubicle on far right contains the new silicon rectifiers, next is one of the PA stages. On the far left the other PA stage and next to it the exciter and driver stages.

FIG. 3. Close-up of the new PA stage. Note the new lightweight 6697 tube.





FIG. 4. The new silicon rectifiers are mounted vertically inside the cubicle. Filter capacitors are at the bottom of the cabinet.

#### Finest Sound

Low audio requirements in the *Ampliphase* system eliminates the need for large costly transformers, reactors, and modulator tubes. Extended range frequency response is easily attainable. The high modulation capability of the *Ampliphase* system means a louder sounding signal and improved coverage.

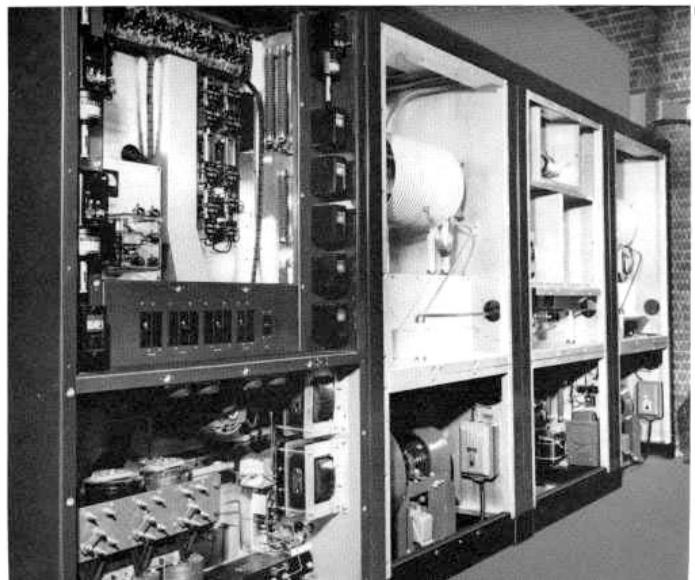
#### Solid State Rectifiers

Silicon rectifiers are used in all high voltage, bias and low voltage power supplies in the BTA-50H. The high voltage plate supply rectifiers are immersed in oil to eliminate corona and other environmental hazards. Solid state rectifiers permit the transmitter to operate in ambient temperatures as low as  $-20$  degrees centigrade which makes remote operation in unheated buildings feasible.

#### High-Speed Overload Protection

Two types of overload protection are used in this transmitter. The current types (instantaneous and time delay) are connected directly in the tube circuits and rectifier ground leads. Thermal magnetic circuit breakers are used as back up protection and as disconnect switches. The transmitter circuitry is arranged so that an overload will either lock out the plate supply circuit or allow a single reclosure that will reset if there are no further overloads. In either case, when a lockout position has been reached, the overload circuit can be reset by means of an overload reset con-

FIG. 5. Rear access to the BTA-50H is very easy. Rear panels are removed to permit servicing and maintenance.



trol. Principal overload relays are equipped with indicating flags that indicate which overload relay has operated even after the overload has cleared. A reflectometer is installed in the output transmission line which offers automatic protection should greater than normal change in load occur.

**Ideal For Remote Control**

All BTA-50H metering and control facilities are terminated in convenient locations to permit straight forward wiring to remote control units. Auxiliary functions, such as remote control switching to a stand-by transmitter, dummy load, auxiliary power supply, etc., can be furnished.

**Minimum Building Requirements**

Outstanding among the features of the *Ampliphase* transmitter is the small floor space required (see floor plan, Fig. 6). Compactness without sacrificing accessibility is a space saving feature of the BTA-50H transmitter. In fact, the BTA-50H occupies no more space than older 5 and 10 kw transmitters.

**Tuned and Tested On Frequency**

Each BTA-50H Transmitter is assembled and tested on the customer's frequency prior to shipment. Most components are shipped installed in the transmitter cabinets resulting in reduced installation time. Complete measurement data including meter readings and dial settings obtained during factory test are supplied to the customer. This results in a simplified tune up procedure after installation.

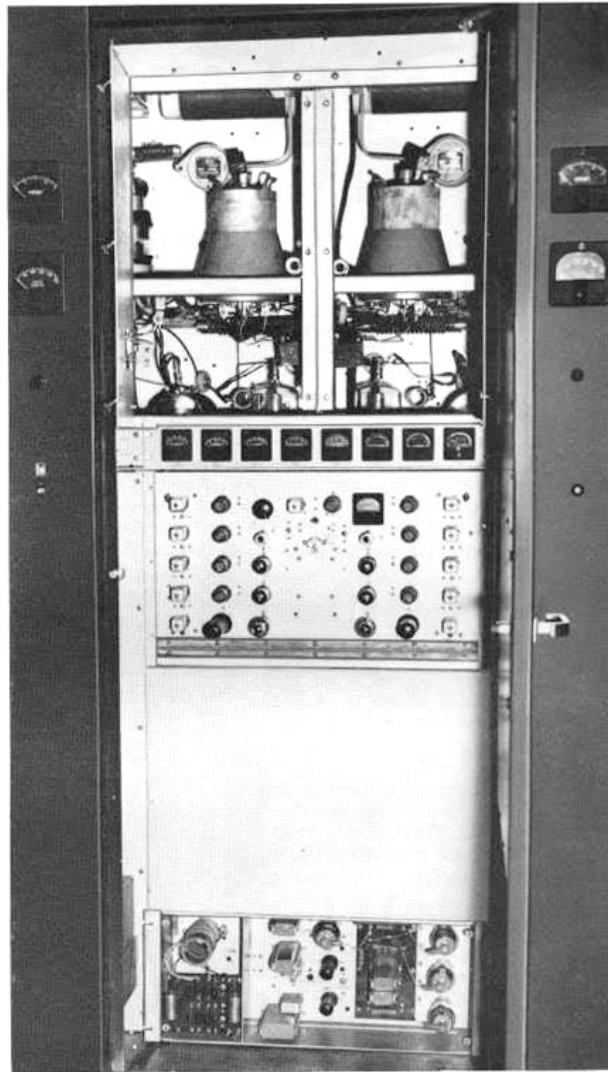
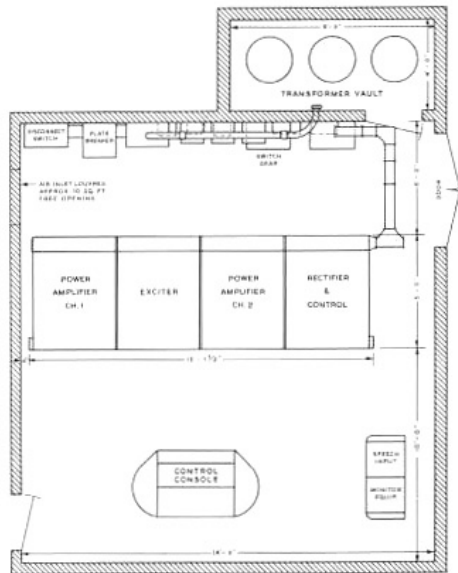


FIG. 7. The drive cabinet shown here contains (from top to bottom): the 4CX5000A driver stage, the 4-250A stages, the exciter modulators, and at the bottom the crystal oscillator.

FIG. 6. The typical floor plan shown here is ideal for operations with an operator on duty; however, if remote control is used the building requirements can be greatly reduced.