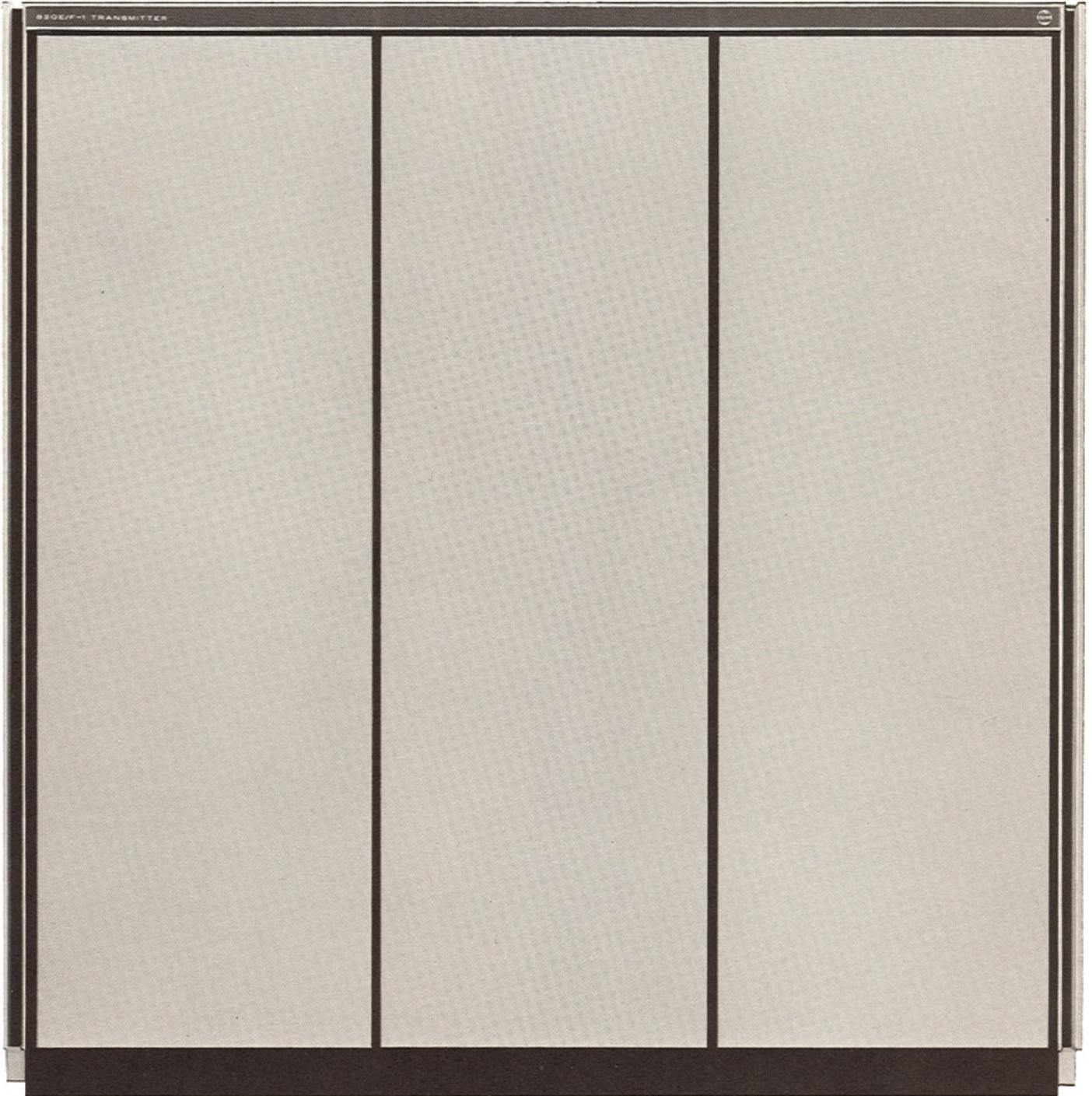


# 5/10 kw AM Transmitter



Collins' 820E/F-1 series of broadcast transmitters is one of the most extensively transistorized series of transmitters available in the 5-kw to 10-kw power range. The series features solid-state devices in low-level audio and driver, power supply circuits and RF exciter.

The new exciter used in the 820E/F-1 has a highly stable ovenless crystal operating in the 2.1-MHz to 4.3-MHz range, with division to standard broadcast frequency by integrated circuit digital dividers.

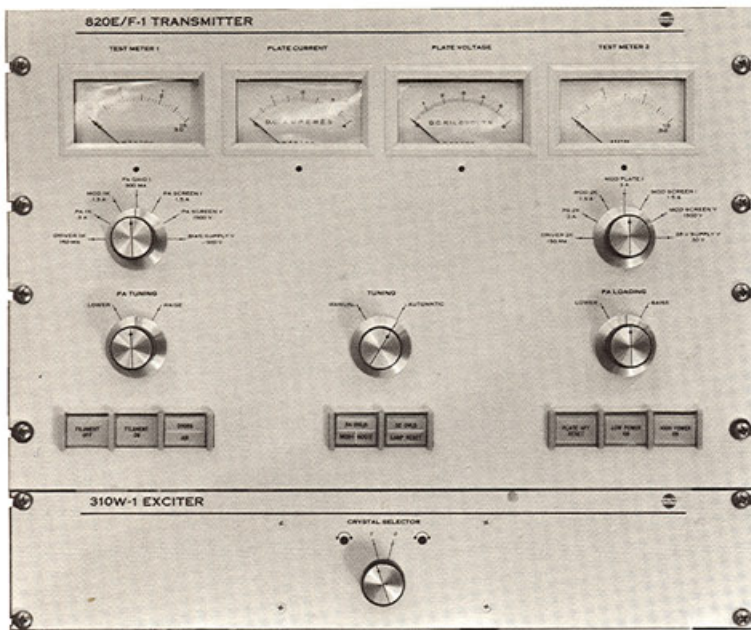
The 10-kw model uses a total of six tetrode vacuum tubes in the RF driver, power amplifier and modulator circuits, and requires only two tube types. The 5-kw model uses one less tube in the final RF amplifier.

Output tuning of Collins' new 820E/F-1 is automatic. A phase comparator circuit in the power amplifier stage automatically controls the PA tuning as loading is adjusted.

Collins designed this new transmitter for easy, space-saving installation, as well as extended reliability. It measures only 69" high  $\times$  67 $\frac{7}{16}$ " wide  $\times$  32" deep. All power supply components are completely self-contained.

For attended operation such as that of a combination station, all metering and control of the transmitter is accomplished from a separate extended control panel which requires no remote control authorization. All meters and controls necessary for monitoring performance of the transmitter is housed at the extended control panel. When operating rules permit completely unattended operation without transmitter log, the 820E/F-1 is immediately adaptable to that concept without rebuilding or modification. The 820E/F-1 is—in the real sense of the expression—the transmitter for both the present and the future.

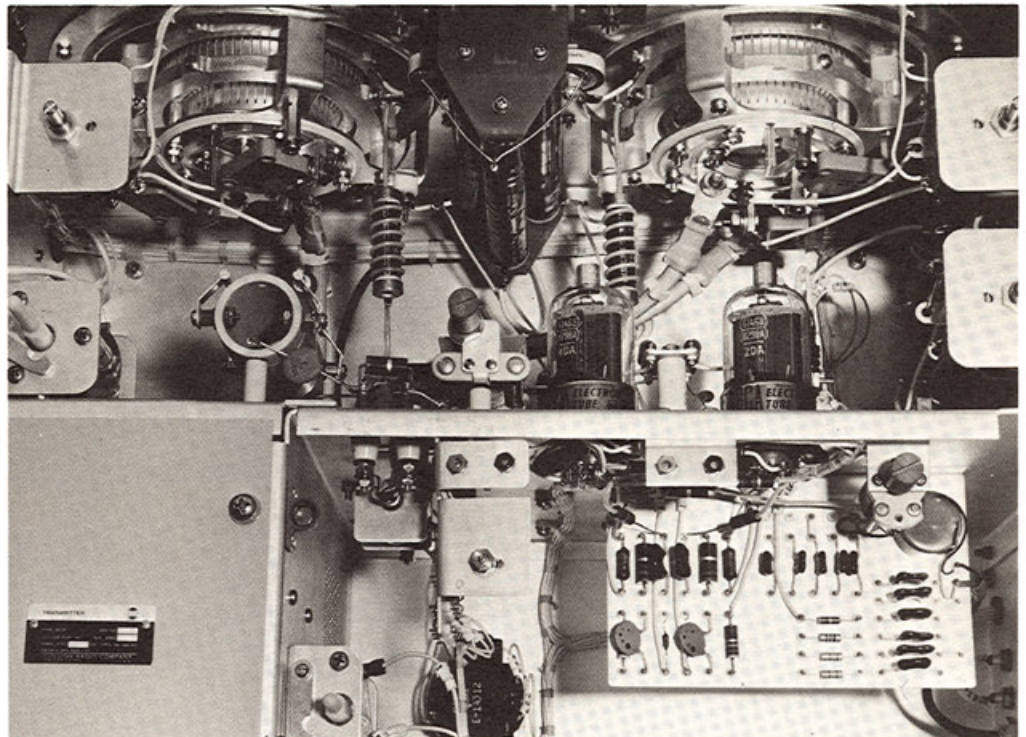




*Extended metering/control panel and crystal oscillator exciter*



*RF driver and  
PA input compartment*



**EXTENDED CONTROL PANEL.** The transmitter is suitable for installation at an unattended site, and may be remotely controlled from a distant studio location in the conventional manner. As a convenience for attended operation and maintenance, the meters and operating controls are grouped on a 12¼" × 19" control panel which may be mounted in the transmitter control room for operator comfort and convenience.

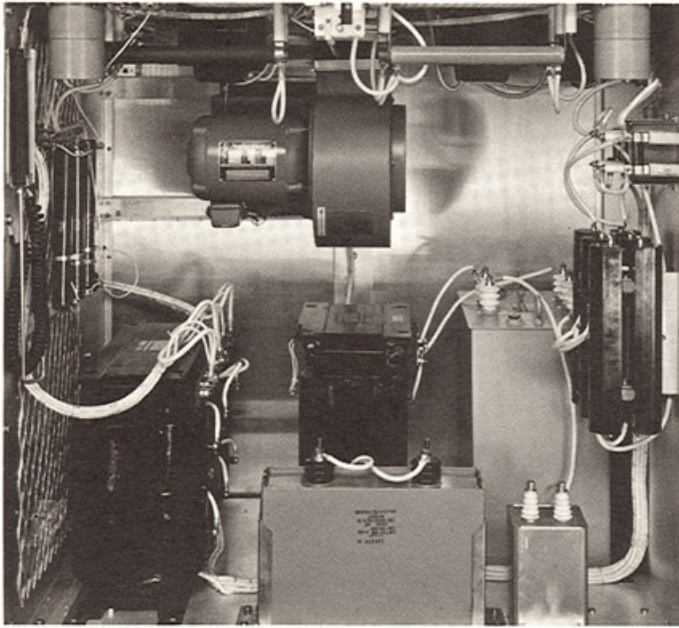
**RF EXCITER.** An all solid-state unit, the type 310W-1 Exciter offers increased frequency stability through operation of the oscillator at two or four times the

output frequency. Division to standard broadcast frequencies is obtained by digital circuitry employing integrated circuits. The exciter can be located externally to the transmitter with up to 250 feet of coaxial interconnecting cable.

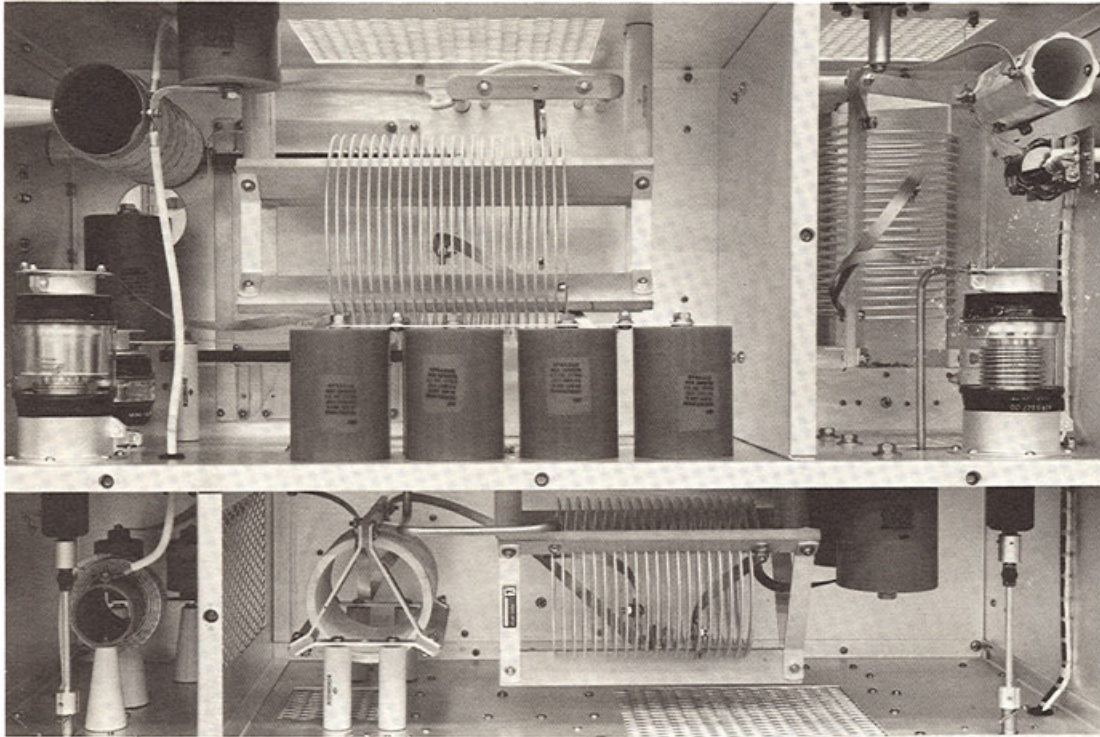
**RF DRIVER.** The RF driver uses two 6146B tubes in parallel, operating Class C. Tuned-grid, tuned-plate circuits are used, with the frequency monitor sample derived from the plate tank coil.

**OUTPUT NETWORK.** Low-pass L-sections transform the 50 ohms nominal output impedance to 1,000 ohms plate impedance for the 10-kw transmitter,





*High voltage power supply and main blower*



*Power amplifier  
RF compartment*

and to 2,000 ohms for the 5-kw version.

The combined network consists of three series inductances and three shunt capacitances, plus a second harmonic shunt trap to ground. Overall phase through the networks is  $-360^\circ$ , giving a favorable plate impedance characteristic when operating into loads within the EIA limit for "normal" loads.

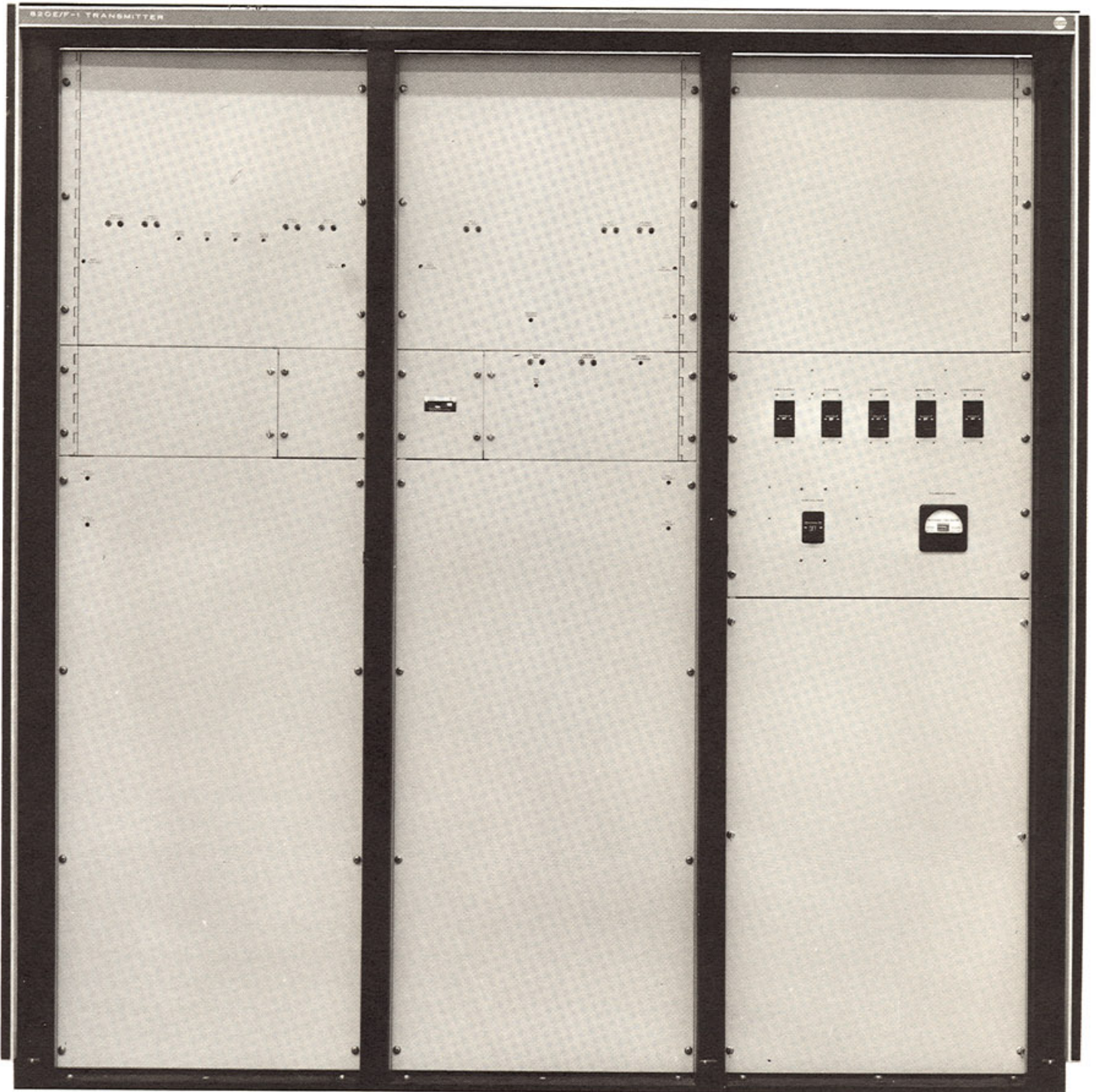
Motor-driven variable vacuum capacitors, provided in the PA tuning and loading positions, are controllable from switches on the extended control panel. PA loading is used to adjust transmitter

power output and is normally extended to the remote point in remotely controlled installations.

A phase-comparator circuit is used in the PA stage to automatically control the PA tuning motor as loading is adjusted. Tuning correction occurs at a rapid rate, and well within the time required for loading changes. To assure fail-safe operation, the automatic tuning adjustment is disabled until loading changes take place. A Manual/Automatic Tuning switch is provided on the extended control panel to disable the automatic mode when it is desired to perform manual tuning.



*Front view, doors removed*



## Specifications

Frequency Range: 540-1,600 kHz

Power Source: 208/240 volts,  $\pm 5\%$ , 50/60 Hz, three-phase.

Power Output: 820E-1: 5.5 kw max. with built-in reduction to 1 kw. 820F-1: 10.6 kw max. with built-in reduction to 5 kw.

Frequency Stability: Trimmer capacitors provided on the RF exciter for adjusting crystals to exact center frequency. Stability as follows:

$\pm 5$  Hz,  $0^{\circ}\text{C}$  to  $+35^{\circ}\text{C}$  ( $32^{\circ}\text{F}$  to  $95^{\circ}\text{F}$ )

$\pm 10$  Hz,  $-10^{\circ}\text{C}$  to  $+45^{\circ}\text{C}$  ( $14^{\circ}\text{F}$  to  $113^{\circ}\text{F}$ )

Outer Impedance: Designed for feeding standard 50-ohm coaxial transmission lines. Matching to other impedance options can be supplied on special order.

Harmonic and Spurious Radiation: Complies with or exceeds FCC regulations regarding harmonic and spurious radiation.

Modulation Characteristics: Equipment incorporates high level modulation with most desirable response characteristics for broadcast use.

Audio Input Impedance: 150/600 ohm, balanced.

Audio Input Level:  $+10$  dbm  $\pm 2$  db.

Audio Frequency Response: Typically  $\pm 1$  db from 50 Hz to 10,000 Hz.

Audio Frequency Distortion: Less than 3% from 50 to 7,500 Hz for 95% modulation.

Noise: 60 db below 100% modulation, maximum

Carrier Shift: Less than 3% from zero to 100% modulation.

Ambient Temperature Range:  $-25^{\circ}\text{C}$  to  $+45^{\circ}\text{C}$  ( $-13^{\circ}\text{F}$  to  $113^{\circ}\text{F}$ ).

Altitude: Up to 7,000 feet; higher altitudes on special order.

Size: 69" high  $\times$  67 $\frac{7}{16}$ " wide  $\times$  32" deep (175 cm.  $\times$  171 cm.  $\times$  81 cm.).

Total Weight Including Transformers: 820E-1 - 2,000 lbs. (910 Kg.); 820F-1 - 2,450 lbs. (1,115 Kg.).

SPECIFICATIONS SUBJECT TO CHANGE

COMMUNICATION/COMPUTATION/CONTROL



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