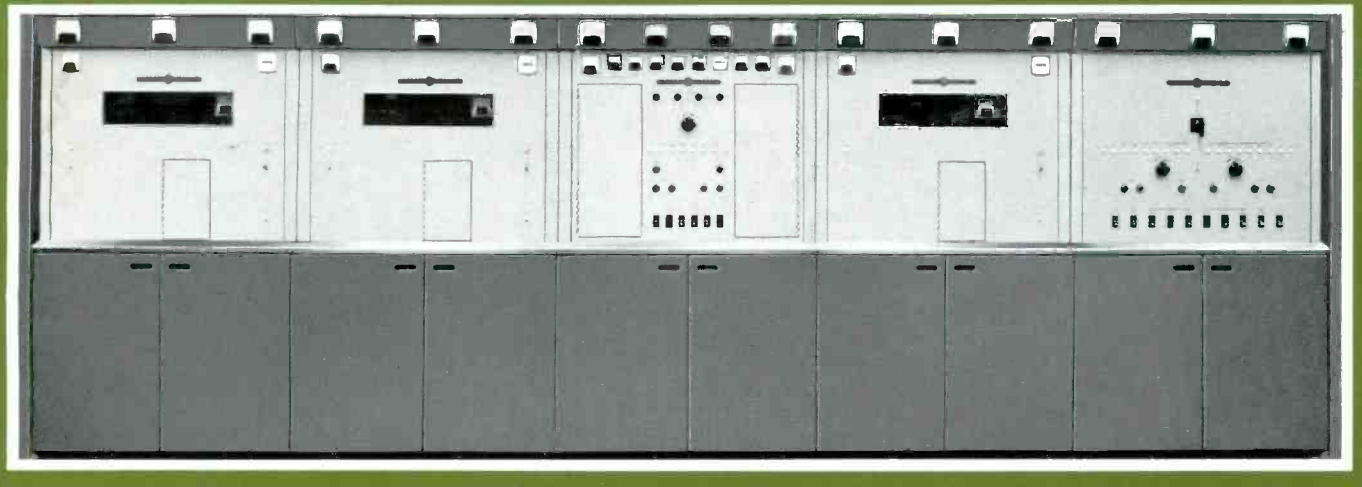
NEW!

100-KW UHF TV TRANSMITTER

GENERAL ELECTRIC

TT-62-A

TRANSMITTER



FEATURES:

- Low operating cost
- Minimum overall floor space
- Minimum number of output amplifier tubes, 50-kw klystron tubes
- Lower cost aural klystron
- Switchable output amplifiers
- Quick amplifier tube change
- New type klystron tubes operating at improved efficiency in the visual and aural amplifiers
- Silicon rectifiers in the high-voltage supply
- Automatic current control of klystron field magnets
- Unique sealed, plug-in, oscillator-modulator packages
- Minimum maintenance
- Built-in remote control circuitry
- Diplexed visual output
- Prime reliability

NOTE: Ask how 5 megawatts E.R.P. is possible with this transmitter.

For the past 14 years General Electric has been the leader in the design and manufacture of UHF-TV transmitters. This leadership is attested to by the fact that a high percentage of the stations presently broadcasting in the UHF band use General Electric transmitters.

The TT-62-A transmitter consists of five standard General Electric transmitter cubicles and certain other items of major external equipment. The five cubicles are the 100 watt exciter cubicle, type TT-55-A and the 100 kilowatt amplifier, type TF-23-A, consisting of two diplexed 50 kilowatt visual amplifier cubicles, one 20 kilowatt aural amplifier cubicle and the rectifier and control cubicle.

This transmitter is capable of full 100-KW output at each of the UHF television channels 14-83. Coax type switching is provided to permit the following additional modes of operation:

1. Substitute a spare exciter, if available.
2. Substitute either one of the visual amplifiers for the aural amplifier.
3. Operate either visual amplifier by itself (50-KW output) and permit corresponding reduction in aural power.
4. Operate all amplifiers individually into a dummy load.

The normal broadcast features (plate recycle,

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instantaneous power-line failure reclosure, reflectometers, etc.) are provided. Three single-phase high voltage transformers are used, thus permitting open delta operation on 2 units in emergency.

Technical information pertaining to this transmitter is on file with the F.C.C. to permit completion of F.C.C. Form 301.

The TT-55-A exciter represents an unusual achievement in modern ultra-high frequency circuitry. Housed in a compact four-foot cubicle, this self-contained free-standing unit is an advanced, highly stable UHF exciter. Doors are provided on the top front panel for access to the visual and aural-amplifier cavity tuning. Behind the lower access doors are located the visual-exciter, the visual modulator, aural exciter/modulator, and low-voltage power supplies. One of the factors contributing to its stability is the use of sealed crystal oscillator packages. Due to the stability of these oscillators the aural and visual exciters can be totally independent of each other eliminating complex circuitry to maintain the proper aural and visual carrier separation. The visual modulator unit is similar to the successful types now standardized in the General Electric VHF-transmitter line and has the standard features of back-porch clamping and monitor output. Circuitry to compensate for the non-linearity in the transmitter is included in the modulator.

The aural transmitter consists of an aural exciter which is identical to the visual exciter except for the provision of aural modulation. Aural modulation is accomplished by direct frequency modulation of the crystal oscillator by means of electrical variation of the effective trimming capacity across the crystal. The trimming capacity is a semiconductor voltage variable capacitor.

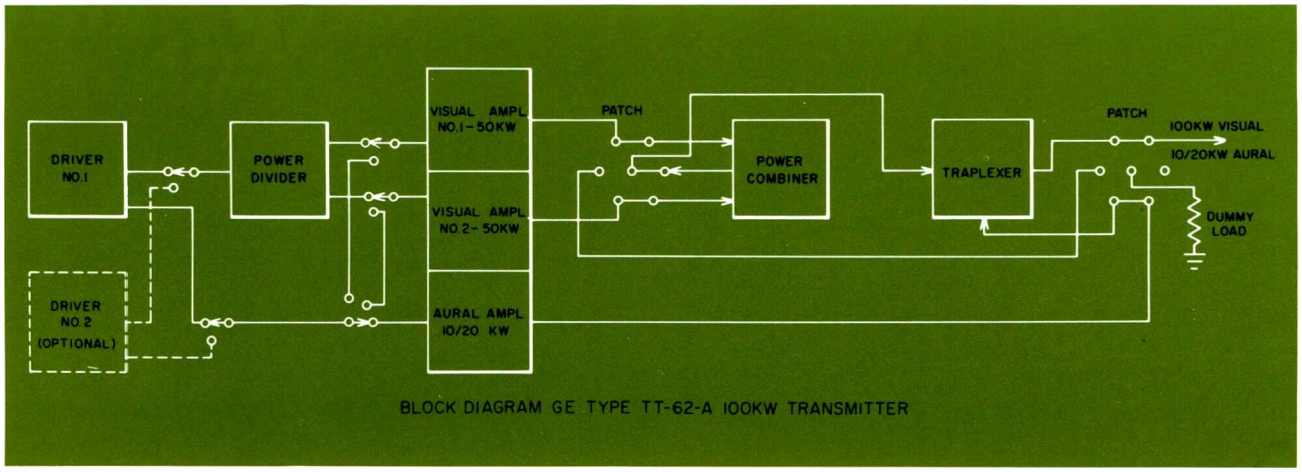
The simplicity and stability of the visual and aural amplifiers, TF-23-A, result largely from the use of a four-cavity klystron in each of the RF circuits. The broad-banded external cavities associated with the klystron are relatively insensitive to temperature effects, eliminating warm-up tuning drift. Only one system of water cooling is required for the klystron tubes. This system is straight water cooling, the design of which has been simplified to provide maximum reliability and minimum maintenance. Also, it should be noted that pressure equalization of this cooling system is not a requirement. The klystrons have very low RF drive power requirements — only a few watts — so that total operating costs are competitive with other types of transmitters. Because the four-cavity klystron is easily adjusted for a bandpass of up to 8 mc, there are minimum tuning problems. The new improved klystron can be easily and completely tuned from the front of the transmitter, at the transmitter site. Factory pretuned klystrons are neither necessary nor desired.

All components in these compactly designed cubicles are readily accessible, easy to maintain and have been selected for their long service life. The only external input power and cooling components necessary for the transmitter are three single phase plate transformers, a filter reactor, a heat exchanger, a water pump, a water tank, voltage regulator, limiting reactor, auxiliary transformer and a-c switch gear.

This dependable UHF-TV transmitter is capable of delivering a consistently high-quality TV signal with a minimum of supervision and maintenance.

The external vestigial side band filter is inserted between the output of the visual exciter and the input of the visual amplifiers. This low level filter insures maximum stability.

The Traplexer which diplexes the outputs of the visual and aural amplifiers to provide a single line feed to the antenna also contains the −3.58 MC trap required for color.



BLOCK DIAGRAM GE TYPE TT-62-A 100KW TRANSMITTER

PERFORMANCE SPECIFICATIONS

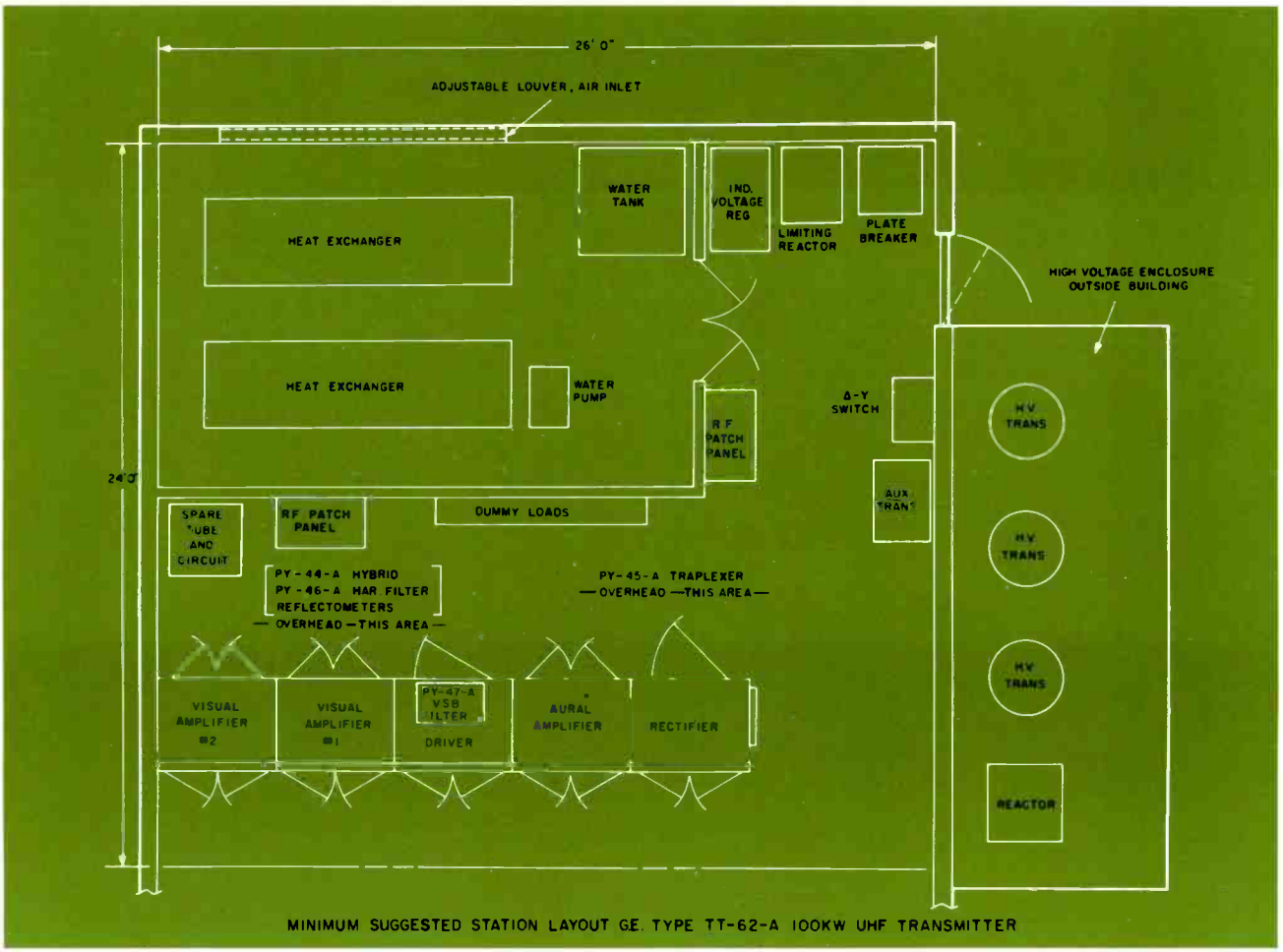
(MEETS ALL EIA AND F.C.C. STANDARDS)

Ambient Temperature	45°C. Maximum
Relative Humidity	95%
Maximum Altitude without Modification	7,500 ft.

	Aural Transmitter	Visual Transmitter
Type of Emission	FM (F3)	AM (A5)
Carrier Frequency	Channel 14 to 83, inclusive	Channels 14 to 83, inclusive
Load Impedance	75 ohms	75 ohms
Carrier Frequency Stability	± 500 cycles	±500 cycles
Method of Modulation	Frequency modulation	Cathode amplitude modulation
Regulation of Output (black to white)		7% max.
Amplitude Variation (over one frame)		Less than 5% of sync peak level
Frequency Response	Within ±1 db of 75 microsecond pre-emphasis curve, 50-15,000 cps	*Output attenuation characteristic does not depart from the ideal curve more than shown in the following: +1 db to −1.5 db at 0.5 mc. +1 db to −1.5 db at 1.25 mc. +1 db to −1.5 db at 2.0 mc. +1.5 db to −1.5 db at 3.58 mc. The response between the frequencies of 2.1 and 4.2 mc, does not vary more than +1.0, −1.8 db from the response at 3.58 mc.
* The ideal curve is that obtained by an ideal diode demodulator Reference is the response at 200 kc.		
Lower Sideband Attenuation Using 200 kc response as Reference		+1 db to −1.5 db at 0.5 mc 20 db for modulating frequency of 1.25 mc or greater. For a modulating frequency of 3.58 mc, the attenuation is greater than 42 db.
Upper Sideband Attenuation (when low pass filter is used)		Greater than 20 db for modulation frequencies of 4.75 mc or higher
Harmonic Output	At least 60 db below carrier	At least 60 db below carrier
****Subcarrier Amplitude**		Within ±15% of theoretical color bar value
****Subcarrier Phase Variation Versus Brightness**		±7° maximum
****Differential Gain**		1.5 db maximum
****Envelope Delay Tolerance** (Variation from Ideal Curve)		±0.08 microsecond from 0.2 mc to 2.1 mc. ±0.04 microsecond at 3.58 mc. ±0.08 microsecond at 4.18 mc.
Noise Level	FM noise better than 58 db below 25-kw swing AM noise −50 db below aural carrier	Better than 40 db peak to peak below synchronizing peak level. (Equals or exceeds 49 db RMS below synchronizing peak level)
Frequency Deviation (Normal)	±25 kc for 100% modulation	
Audio Frequency Distortion at 40 kc swing	50 to 100 cycles, 1.5% max. 100 to 7,500 cycles, 1% max., 7,500 to 15,000 cycles, 1.5% max.	
** When color terminal equipment is used.		

	Aural Transmitter	Visual Transmitter
Modulation Capability	±50 kc Swing with less than 5% distortion from 50 to 15,000 cps.	to 12.5% ±2.5% of synchronizing peak level (reference white)
Input Impedance	600/150 ohms balanced or unbalanced	75 ohms unbalanced.
Input Signal	10 dbm ± 2 db for 100% modulation (±25 kc Swing) at 400 cycles.	1.0 volt peak-to-peak of a composite video signal having 25% sync and reference white
Input Polarity		Black negative

Visual Power Output	100-kw Synchronizing peak
Aural Output	22-kw
Power Consumption (Black Picture)	Approximately 450 kw at 480 v, three phase, 60 cycles, 0.9 power factor
Convenience Outlets	117 V single phase, 60 cycles
Amplifier Tube Complement	Two 4KM150 series Klystron Visual Amplifiers One 4KM70-1 series Klystron Aural Amplifier 4 Type 6SN7GT—SWR protective amplifier
Cabinet Dimensions	240" W x 37" D x 83" H



MINIMUM SUGGESTED STATION LAYOUT GE. TYPE TT-62-A 100KW UHF TRANSMITTER

Contact your General Electric Broadcast Sales Representative, or write directly to General Electric Company, Broadcast Sales, Visual Communication Products Department, Electronics Park, Syracuse, New York 13201.

In Canada, write Canadian General Electric Company, Ltd., Broadcast Sales, 830 Lansdowne Ave., Toronto 4, Ontario.

Outside the U.S. and Canada, write General Electric Company, IGE Export Division, 159 Madison Avenue, New York, N.Y. 10016.

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