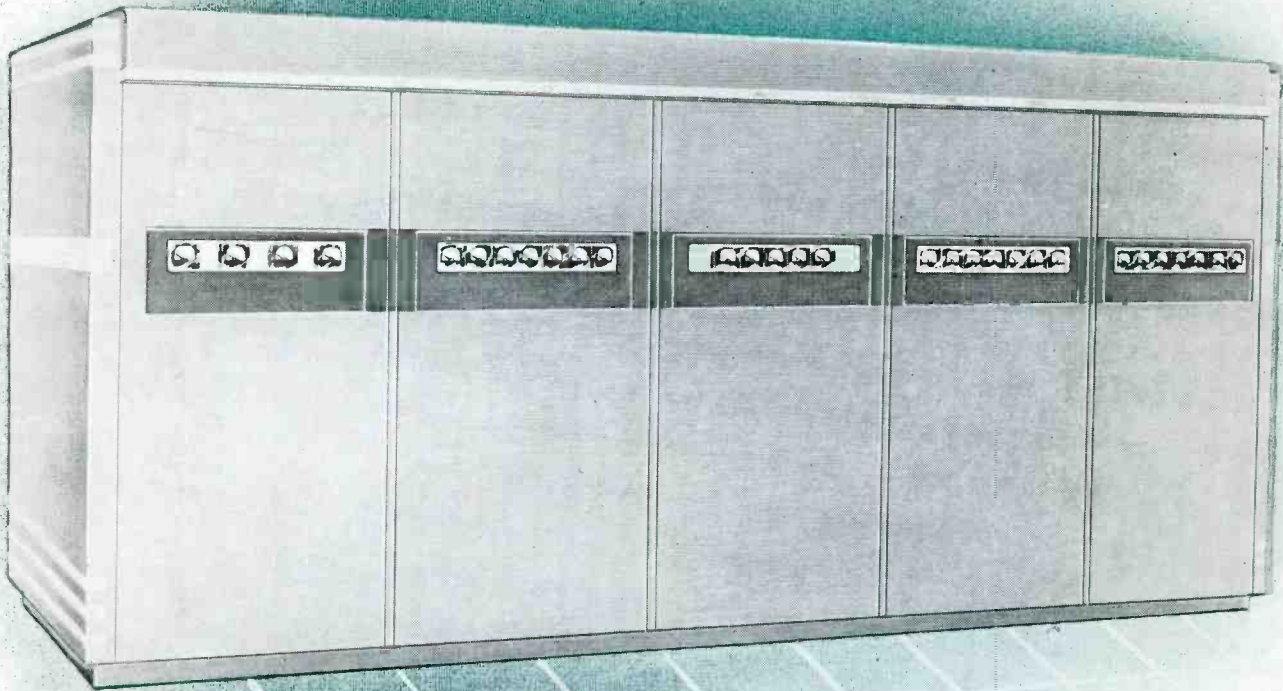


REFERENCE  
**DUMONT**

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SEP 12 1949

# MASTER SERIES TELEVISION TRANSMITTER



**ALLEN B. DUMONT LABORATORIES, INC.**  
**TELEVISION TRANSMITTING EQUIPMENT DIVISION**  
**CLIFTON, NEW JERSEY**

*The eyes of the world  
are on*



ALLEN B. DU MONT LABORATORIES, INC.  
Television Transmitting Equipment Division  
42 Harding Avenue • Clifton, N. J.

Telephone: PAssaic 3-6612 - 3

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Printed in U. S. A.

# Du Mont

## Master Series

# Television Transmitter

SIMPLICITY of design, construction, maintenance and operation, plus "operation-proved" engineering, components and commercial performance, best describes the new Du Mont Master Series Television Transmitter now available for prompt delivery to discriminating telecasters.

The design and construction are the result of Du Mont's primary objective to insure rugged equipment, stable operation and exceptional reliability under all telecasting conditions. These factors in turn assure the commercial telecaster and his engineering staff of a television transmitter that is easy to install, easy to operate, easy to service, and easy to maintain on the air for extended periods with a minimum of attention.

The new Du Mont Master Series Television Transmitter, incorporating all of the invaluable designing and operational experience gained in Du Mont's many years of television pioneering, will deliver rated signal output power of 5 KW (peak) video and 2.5 KW audio on any specified FCC commercial television broadcast channel between the frequencies of 44 to 88 megacycles. The output couplings are designed to connect with 1-5/8" (51.5-ohm) or 3-1/8" (72-ohm) coaxial transmission line.

Included with the transmitter is the Du Mont Transmitter Control Console, the most complete television transmitter console yet available to the telecaster and known to be far superior technically to any similar control equipment available today. This console unit contains all monitoring equipment necessary for operation in accordance with FCC requirements, and includes in addition duplicate transmitter meters where required for proper transmitter monitoring.

Technical specifications on all units comprising the Du Mont Master Series Television Transmitter required by the *Federal Communications Commission* in application *Form Number 330*, are supplied at the end of this bulletin.

## TRANSMITTERS AND CONTROL CONSOLE

The Du Mont Master Series Television Transmitter consists of the following units:

### Visual Transmitter — Series 1000 . . .

- Model TA-116-A 500-Watt Visual Exciter
- Model TA-118-A 5 KW Visual Power Amplifier
- Type 5095-A 5 KW Visual Power Amplifier Power Supply

### Aural Transmitter — Series 2000 . . .

- Model TA-115-A 1 KW Aural Exciter
- Model TA-117-A 2.5 KW Aural Power Amplifier

### Control Console . . .

- Model TA-129-A Transmitter Control Console

These units, with the exception of the Model TA-129-A Transmitter Control Console and power transformers, are assembled into five frames attractively enclosed in a modern styled cabinet (See pages 14-15). Each of the five frames measures 41 1/2" wide x 26" deep x 78 1/2" high, and weighs approximately 1500 lbs.

If space availability at the transmitter installation point is such that the installation of five frames, as indicated, is not desirable or practical, the four radio-frequency units can be grouped while the Type 5095-A 5 KW Visual Amplifier Power Supply Unit can be installed in available space adjacent to the grouped units.

In the event that the transmitting room is exceptionally long, additional frames and cabinet sections can be purchased, the resulting space thus provided being used for diplexer or triplexer, central blowers or other apparatus. Figs. 1 and 2 depict typical floor plans applicable to the installation of the Du Mont Master Television Transmitter.

Now dealing with the elements of the Du Mont Television Transmitter in detail:

### THE 2.5 KW AURAL TRANSMITTER — SERIES 2000

A front view of the Model TA-117-A 2.5 KW Aural Amplifier with exterior cabinet removed is presented in Fig. 3. When used with the Model TA-115-A, 1 KW Aural Exciter, Fig. 4, power of 2.5 to 3 KW is delivered to a 51- or 72-ohm coaxial transmission line. A pair of Type WX3300 forced-air-cooled triode tubes are employed as high-efficiency, grounded-grid, Class C amplifiers. Six Type 872-A mercury-vapor rectifiers, connected in a three-phase, full-wave circuit, supply the necessary DC power to the tubes. The unit will operate on any specified television channel—I to VI, inclusive.

#### Makeup of Equipment:

1 KW Driver Unit Model TA-115-A (Fig. 4) comprising:

- FM Exciter Unit—Type 5067-A
- 6-Volt Power Supply—Type 5068-A
- RF Driver—Type 5069-A
- 500-Volt Power Supply—Type 5070-A

2.5 KW Aural Amplifier Model TA-117-A comprising:

- One Set of Operating Tubes
- One Set of FCC Spare Tubes
- Two Copies of the Installation and Operating Manual

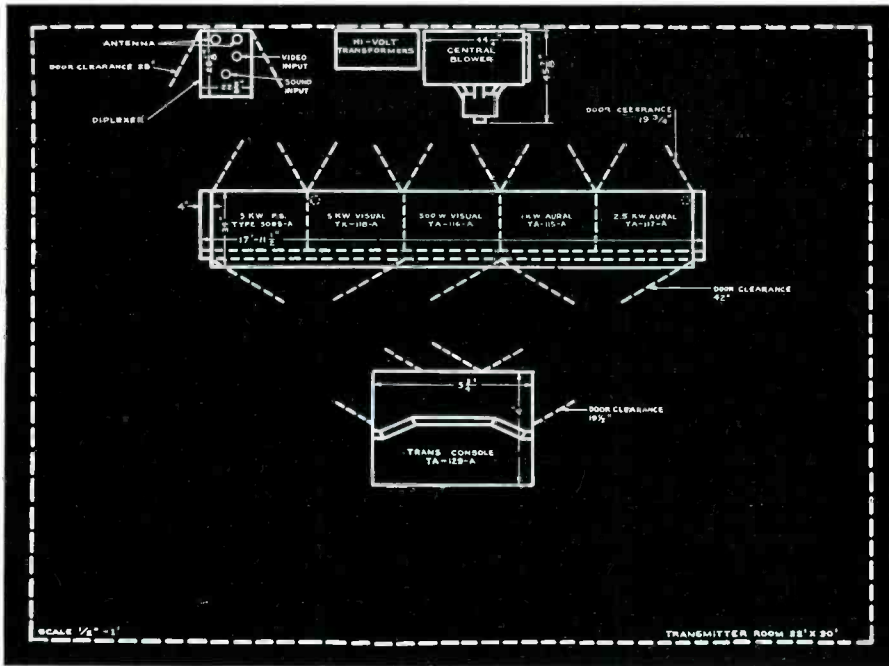


FIG. 1. • Conventional arrangement of the five units comprising the Du Mont Master Series Transmitter, with the Control Console, and indicating dimensions and clearances.

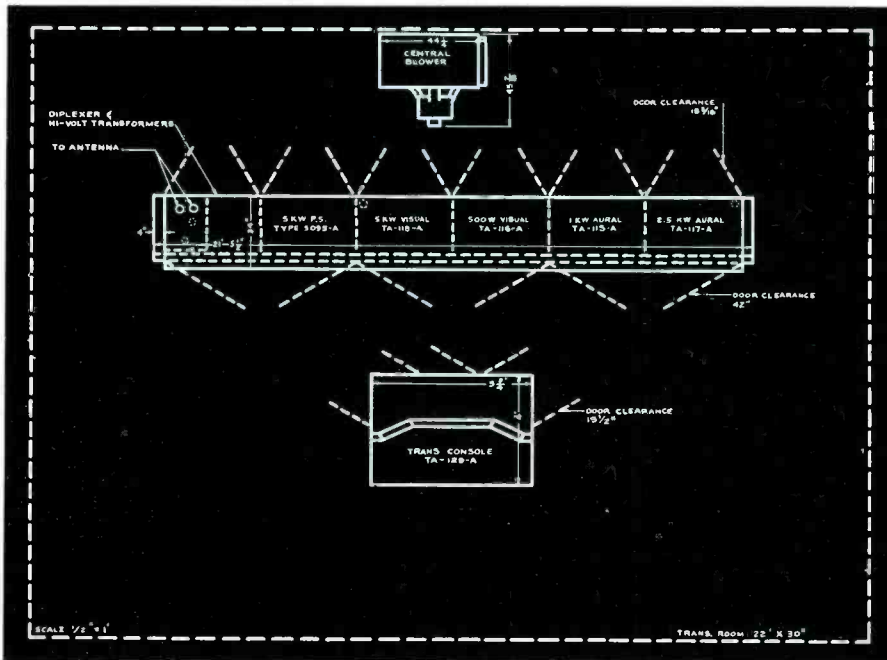


FIG. 2. • Variation of the conventional arrangement. Units may be grouped and housed in the general casing or "skin" to meet space requirements and operational convenience.

### **Model TA-117-A 2.5 Aural Amplifier:**

The control panel of the TA-117-A Amplifier supports the following instruments and controls:

#### **INSTRUMENTS . . .**

Filament Voltmeter (Front and Rear Tube, by switch)  
DC Grid Ammeter (Front Tube)  
DC Grid Ammeter (Rear Tube)  
DC Cathode Ammeter (Front Tube)\*  
DC Cathode Ammeter (Rear Tube)\*  
Plate Voltmeter\*  
RF Transmission Line Voltmeter\*

#### **CONTROLS . . .**

Filament Switch and Pilot\*  
Plate Switch and Pilot\*  
Tune-Operate Switch  
Cathode Tuning  
Input Coupling  
Plate Tuning Output Coupling  
Door Release Button

\* Units so indicated are duplicated on the Model TA-129-A Transmitter Control Console

### **Model TA-115-A 1 KW Exciter . . .**

The control panel of the TA-115-A Exciter supports the following instruments and controls:

#### **INSTRUMENTS . . .**

Filament Voltmeter  
DC Grid Milliammeter  
DC Plate Ammeter  
Plate Voltmeter  
I.P.A. Cathode Milliammeter  
Exciter Test Meter  
AC Line Voltmeter

#### **CONTROLS . . .**

Filament Switch and Pilot  
Plate Switch and Pilot  
Tune-Operate Switch and Pilot  
Exciter Test Switch  
Plate Tuning  
Grid Tuning  
Coupling

The plate circuit contactors are interlocked with the doors to prevent injury to personnel. Also, application of the plate voltage is delayed by suitable controls until there is sufficient driving power, bias, and ample time for the rectifiers to reach operating temperature.

#### **FEATURES . . .**

##### **Power Consumption:**

TA-115-A 230 volts single-phase—13.6 amp.—3.2 kva.  
TA-117-A 230 volts three-phase—18.7 amp.—7.1 kva.

##### **Dimensions and Weight:**

Each frame is 41 1/2" wide, 26" deep, and 78" high. The weight is approximately 1500 lbs. per frame.

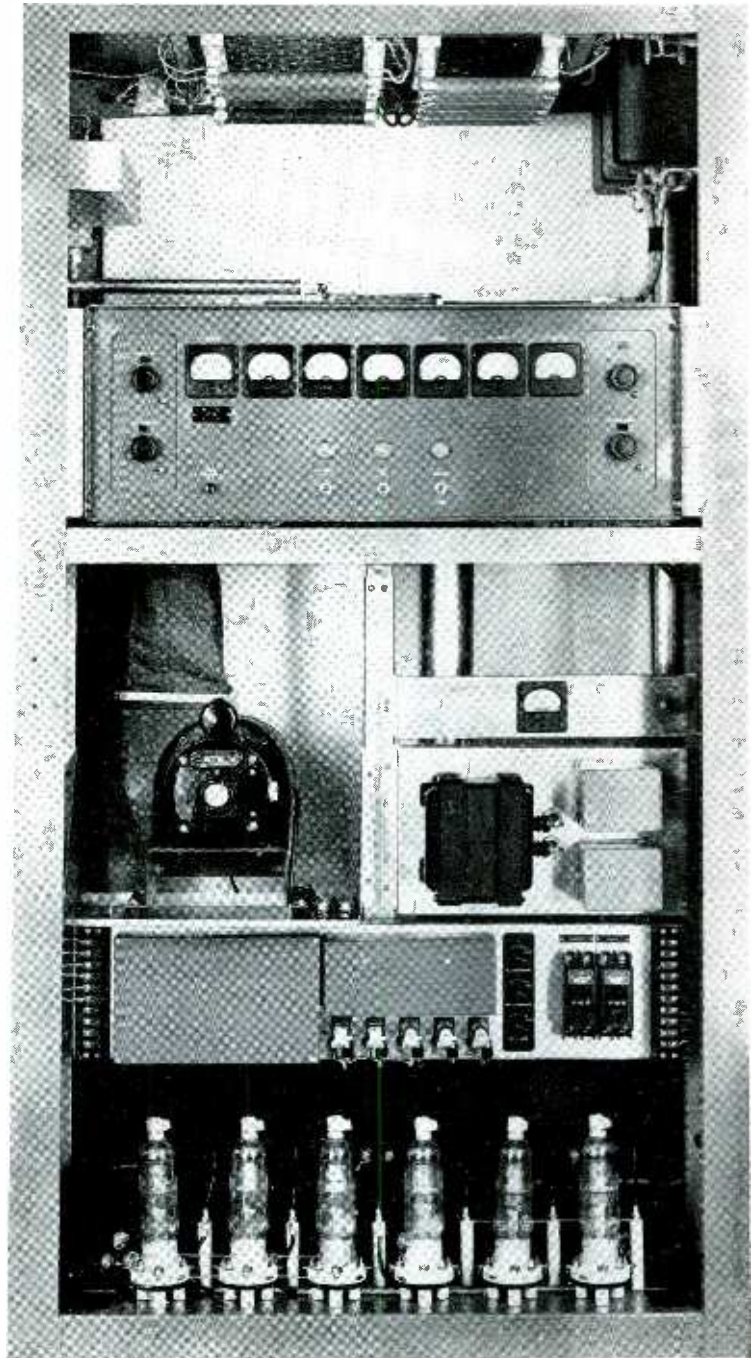


FIG. 3

• *Front view of this unit with front cover removed. When used in combination with the 1 K.W. Aural Exciter, it delivers 2.5 to 3 K.W. to the transmission line.*

## *2.5 K.W. Aural Transmitter . . .*

### Combined Tube Complement:

- 1 7C5 Crystal Oscillator
- 2 7A8 Phase Modulators
- 8 7C7 Chain Multipliers
- 2 7A8 Crystal Oscillator Mixer
- 3 7C7 Amplifier-Multipliers
- 2 2E26 Amplifier-Doublers
- 2 829B Amplifier-Multipliers
- 2 4X500A Amplifiers
- 2 WX3300 Amplifiers

### Rectifiers:

- 1 7Z4
- 2 866-A
- 2 5R4GY
- 10 872-A

### Electrical Features:

Rated Power Output: 2.5 KW to 51- or 72-ohm transmission line.

Type Modulation: FM.

Carrier Frequency Range: FCC allocated Television Channels I to VI inclusive.

Carrier Frequency: 0.25 mc below the upper limit of the assigned channel, and 4.5 mc above the Video Carrier.

Carrier Frequency Stability: 0.002% max. maintained by a temperature-controlled AT cut crystal.

FM Carrier Noise Level: At least 60 db below the level representing a swing of  $\pm 25$  kc.

AM Noise: At least 50 db below level representing 100% amplitude modulation.

Modulation Capability: 100% modulation corresponds to a frequency shift of  $\pm 25$  kc. The transmitter is capable of a swing of  $\pm 40$  kc.

Distortion Limits (RMS values):

50 to 100 cycles ..... 1.5% max.

1000 to 7500 cycles ..... 1.0% max.

7500 to 15,000 cycles ..... 1.5% max.

Input Level for  $\pm 25$  kc or  $\pm 40$  kc shift: + 12dbm  $\pm$  2db (600 ohms).

Input Impedance: 600 to 150 ohms. Output Impedance: 51.5-ohm (1-5/8" or 72-ohm (3-1/8") dia. coaxial transmission line.

## THE 5 KW VISUAL TRANSMITTER — SERIES 1000

A front view of the Model TA-118-A Visual Amplifier with the exterior cabinet removed, is shown in Fig. 5. When operated in combination with the Model TA-116-A 500-Watt Visual Exciter, (Figs. 6A and 6B), a sync peak power output of at least 5 KW is available at the input terminals of a 51.5 or 72-ohm coaxial transmission line. A pair of Type WX3300 forced-air-cooled triode tubes are used as a Class B linear amplifier in the final output stage. Another pair of WX3300's in a similar circuit are used as an intermediate amplifier and driver stage for the final amplifier. Plate power and bias for these two stages are delivered by the Type 5095-A 5 KW Power Supply (Figs. 7A and 7B). The TA-118-A is capable of operation on any specified television channel from I to VI inclusive.



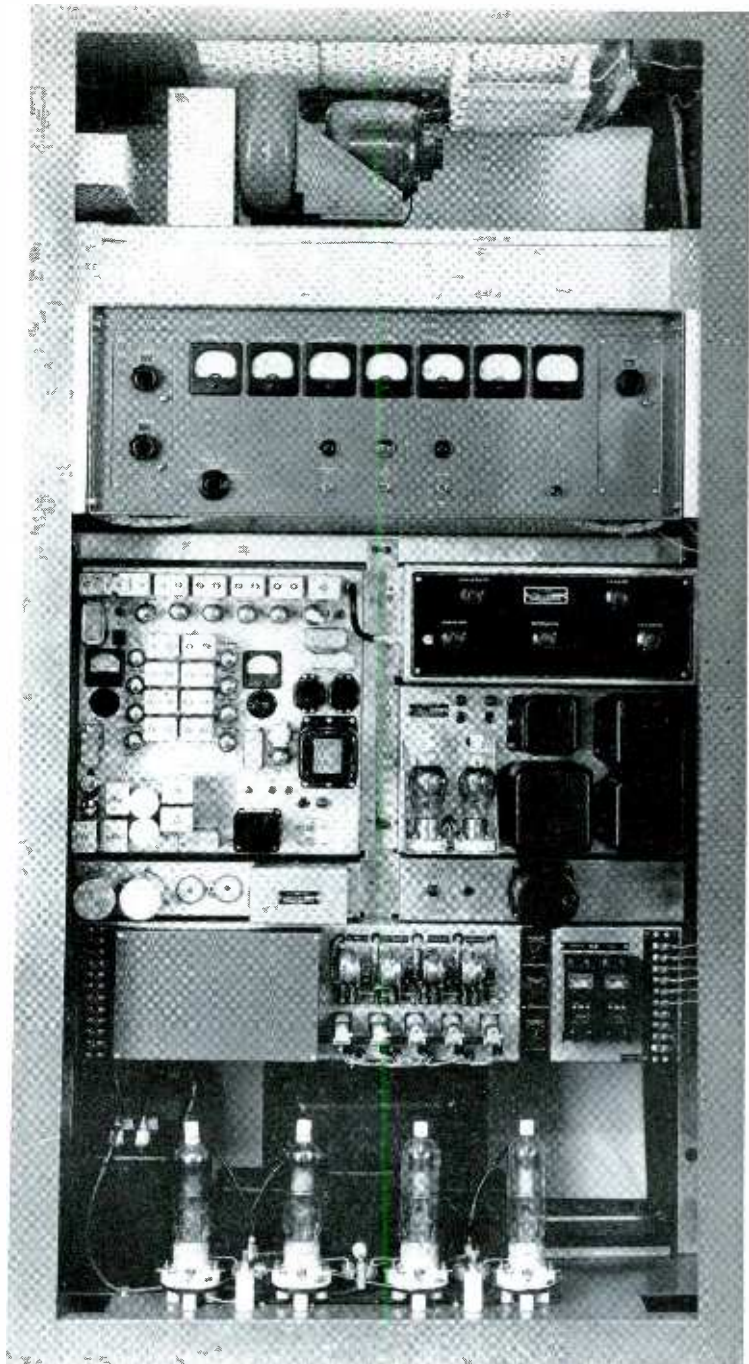


FIG. 4

• Front view with panel removed. This unit drives the 2.5 KW. Aural Amplifier. The FM operation insures superlative tone quality for the transmitted signal.

*1 K.W. Aural  
Exciter . . .*

### Makeup of Equipment:

The 5KW Visual Transmitter Series 1000 consists of the following:

- One 5 KW Visual Amplifier Model TA-118-A containing:
  - Intermediate and 5 KW Power Amplifier
  - C-R Monitor Type 5107-A
- One 500-Watt Visual Exciter Model TA-116-A containing:
  - RF Exciter Type 5071-A
  - Amplifier-Modulator Type 5072-A
  - RF Wobulator Type 5106-A
  - 500-volt Power Supply Type 5070-A
  - 365-volt Regulated Power Supply Type 5073-A
  - 500-volt Regulated Power Supply Type 5074-A
- Type 5095-A Power Supply containing:
  - One Set of Operating Tubes
  - One Set of FCC Spare Tubes
  - One Type 5096-A 160-volt Bias Supply
  - Two copies of Installation and Operating Manual

### Model TA-117-A 5 KW Visual Amplifier:

The control panel of the 5 KW Visual Amplifier Model TA-118-A mounts the following instruments and controls:

#### INSTRUMENTS . . .

- Transmission Line Voltmeter \*
- Power Amplifier Plate Voltmeter\*
- Power Amplifier Cathode Current Meter\*
- Power Amplifier Grid Current Meter
- Intermediate Power Amplifier Plate Current Meter
- Intermediate Power Amplifier Grid Current Meter
- Filament Voltmeter

\* Units so indicated are duplicated on the Transmitter Control Console Model TA-129-A.

#### CONTROLS . . .

- Increase-decrease plate voltage switch: Operates the motor-driven three-phase auto-transformer.
- Front-Rear Switch: Switches the PA Plate Ammeter to the front tube when pushed to the left; to rear tube when pushed to the right; to both tubes when in center or normal position.
- Front-Rear Switch: Switches the PA Grid Meter in a manner similar to the Plate Switch.
- Front-Rear Switch: Switches the IPA Plate Meter in a manner similar to the Plate Switch.
- Front-Rear Switch: Switches the IPA Grid Meter in a manner similar to the Plate Switch.
- Filament Selector: Switches the Filament Meter to any of the following positions: OFF, IPA Front, IPA rear, PA front, and PA rear.
- Filament Switch and Pilot.
- Plate Switch and Pilot.
- Bias Switch and Pilot.
- Outer Door Release Button.
- IPA Plate Tuning.
- PA Cathode Coupling.
- PA Cathode Tuning.
- IPA Cathode Tuning.
- IPA Cathode Coupling.

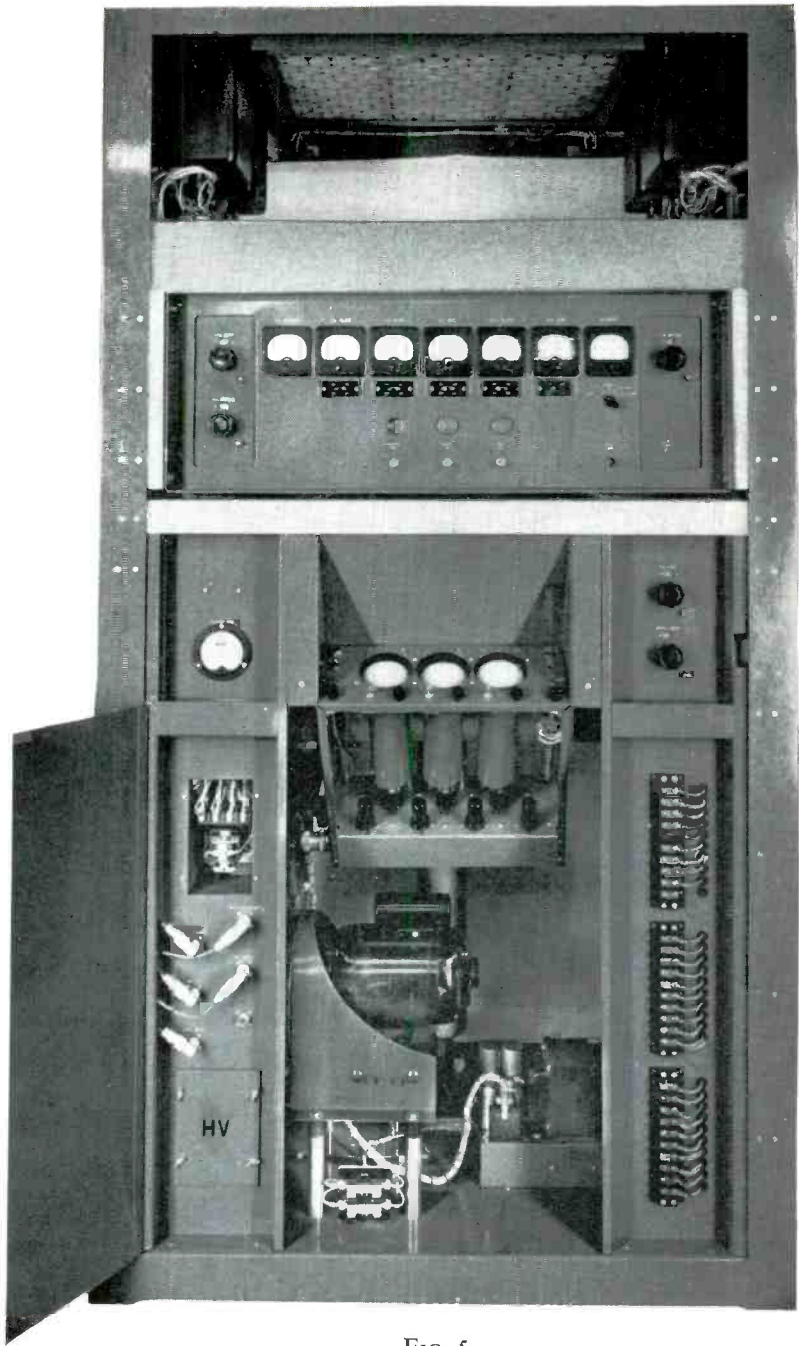


FIG. 5

• Operated in combination with the 500 Watt Visual Exciter, it delivers a sync peak power output of at least 5 K.W. Note the three cathode-ray tube indicators for critical checking of operations.

## 5 K.W. Visual Amplifier . . .

The panel just below the control panel on the TA-118-A Frame supports the Output Coupling, PA Plate Tuning, Output Tuning, the Elapsed Filament Time Meter, and Type 5107-A Cathode-ray Monitor.

**Model TA-116-A 500-Watt Exciter:**

The control panel of the TA-116-A Exciter mounts the following instruments and controls:

**INSTRUMENTS . . .**

- Filament Voltmeter
- DC Grid Milliammeter
- DC Plate Ammeter
- DC Plate Voltmeter
- Modulator Plate Milliammeter
- Exciter Test Meter

**CONTROLS . .**

- Filament Switch and Pilot
- Plate Switch and Pilot
- Tune-Operate Switch and Pilot
- Modulator Plate Voltage
- Band-width Test Switch
- Video Input Gain

The Plate Circuit Contactors are interlocked by door, time, filament, bias and drive circuits to provide the utmost in protection to the operating personnel and equipment. The Type 5107-A C-R Monitor is used with the built-in Type 5106-A Wobbulator to tune the IPA's and PA for proper band-pass and optimum operation. The IPA cathode, PA cathode and output transmission line bandpass characteristics are monitored in the Type 5107-A C-R Monitor on separate 3-inch cathode-ray tubes.

**FEATURES . . .**

**Power Consumption:**

- TA-116-A 230 Volts; single-phase; 15.8 amp.; 3.5 kva.
- TA-118-A 230 Volts; three-phase; 8.0 amp.; 3.0 kva.
- TA-5095-A 230 Volts; three-phase; 29.5 amp.; 15.0 kva.

**Dimensions and Weight:**

Each of the three frames is 41 1/2" wide, 26" deep and 78" high.  
Weight is approximately 1500 lbs. per frame.

**Tube Complement:**

For the TA-116-A and TA-118-A . . .

RF Tubes:

- 1 829-B Wobbulator
- 1 6V6GT Crystal Oscillator/Multiplier
- 1 6V6GT Second Multiplier
- 1 6V6GT Third Multiplier
- 1 829B Amplifier
- 2 4X500 Modulated Amplifier
- 2 WX3300 First Linear Amplifier
- 2 WX3300 Second Linear Amplifier

Video Amplifiers:

- 1 6L6 First Video Amplifier
- 2 6L6G Second Video Amplifier
- 2 4E27 Video Modulators
- 2 1V DC Restorers

# Du Mont Master Television Transmitter

## Operating on Television Channels 1 to 6

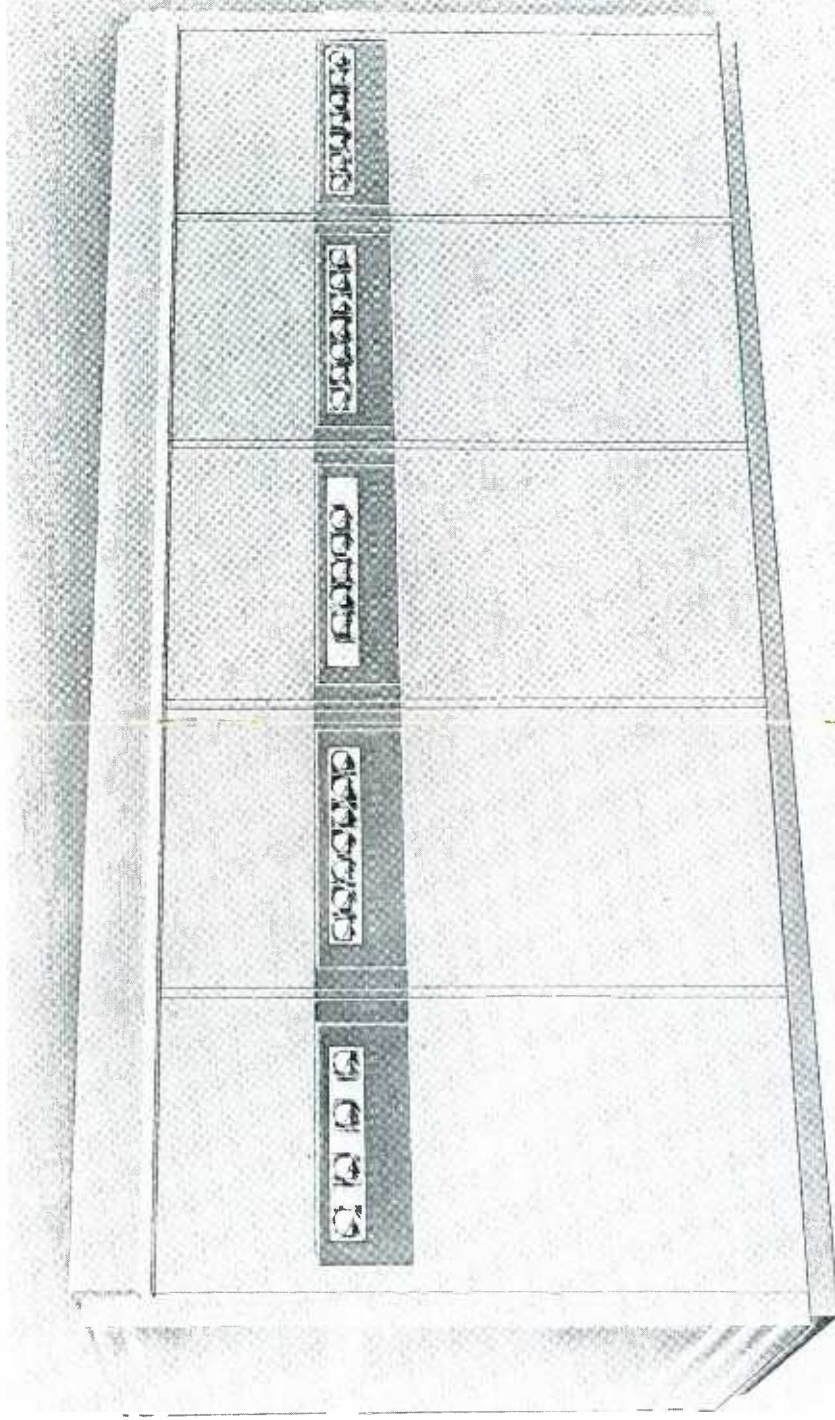
Rated signal output power of 5 KW (peak) visual and 2.5 KW aural on any specified FCC commercial television broadcast channel between 44 and 88 megacycles.

Built to required frequency — not a costly "all band" job.

Comprises 5 KW Power Supply, 500 W Visual Exciter, 5 KW Visual Amplifier, 1 KW Aural Exciter and 2.5 KW Amplifier units, plus the Du Mont Control Console.

Simplified control. Two switches for visual and two for aural transmitters. All functions controlled either at transmitter units or at control console. Also double metering.

Aural and visual transmitters can be operated independently when desired. Independent crystal control.



Extreme accessibility. Almost every tube accessible from front; balance from rear. Likewise with circuits and components.

Circuit symbols and components stamped on chassis for ready identification and fool-proof replacement.

Employs inexpensive tubes — most expensive type under \$125.00! This means real economy, first and last. Built-in wobblulator. Also three built-in cathode-ray tubes for instant checking of critical waveform and performance.

Units designed to permit addition of 25 K.W. amplifier when available for high-power operation.

"Skin" designed to take five units together or separately, as space and operational requirements dictate.

And many other significant features, all adding up to the thoroughness for which Du Mont engineering is famed.

TYPE 5095-A  
VISUAL POWER  
AMPLIFIER SUPPLY

MODEL TA-118-A  
5 KW VISUAL POWER  
AMPLIFIER

MODEL TA-116-A  
500 W VISUAL  
EXCITER

MODEL TA-115-A  
1 KW AURAL  
EXCITER

MODEL TA-117-A  
2.5 AURAL  
POWER AMPLIFIER

• Simplicity, accessibility, ruggedness, long-lasting — yes, these are the products of Du Mont's "operation-proved engineering," presented in this equipment. Now available for prompt delivery to discriminating telecasters, the Du Mont Master Series Transmitter reflects Du Mont's primary objective of built-to-last equipment emphasizing maximum reliability and minimum obsolescence under all telecasting conditions.

• The commercial telecaster and his engineering staff — those hard-boiled fellows no longer interested in experimental operation — are assured equipment that's easy to install, easy to operate, easy to service, easy to maintain on the air for extended periods, with minimum attention and expense. • One after another these Du Mont transmitters are pioneering in area after area. Their day-by-day performances best tell — and illustrate — the story of practical telecasting.

- Rectifier and Control Tubes:
- 4 866A Rectifiers
  - 3 5R4GY Rectifiers
  - 10 872A Rectifiers
  - 5 6AS7 Series Tubes
  - 3 6SJ7G Control Tubes
  - 3 OD3/VR-150 Regulators
  - 2 VR-90 Regulators
  - 2 VR-75 Regulators

**Electrical Features:**

Rated Power Output: 5000 watts peak.

Noise Level: Does not exceed 5% of average synchronization peak signal amplitude.

Modulation Envelope: Output signal envelope produced by modulation conforms to FCC Engineering Standards, Appendix I.

Frequency Stability: Better than 0.002% of carrier frequency maintained by a temperature controlled AT cut crystal.

Carrier Location: Video carrier located 1.25 mc above the lower side-band limits of the assigned operating channel. The visual and aural carrier frequencies are kept 4.5 mc apart by crystal-controlled oscillators.

Load Impedance: Transmitter output is designed to feed into any 51.5 ohm (1.5/8") or 72-ohm (3-1/8") coaxial transmission line.

Video Input Signal: Standard RMA composite.

Video Signal Input Level: May vary from 1 volt minimum to 2.5 volts maximum (peak to peak).

Video Input Impedance: 75 ohms, single-ended line,  $\pm 5$  ohms.

Video Signal Source: Studio Control or Transmitter Line.

Pedestal Level: 75% ( $\pm 2.5%$ ) of peak composite video signal.

Black Level: Maintained as near pedestal level as state of art permits.

White Level: 15% or less of peak composite video signal.

Input Signal Polarity: Black negative.

Modulation: Low level grid modulation of 2-4X500A Tubes in 500-Watt Exciter Unit by 2 Type 4E27 Tubes in video modulator stage.

Brightness Characteristics: The transmitter output power will vary in a substantially inverse logarithmic relation to picture subject brightness.

Output Amplitude Characteristics: Will comply with FCC Engineering Standards, Appendix II, and FCC Regulations, Sec. 9-A.

Amplitude vs. Frequency Characteristic: As shown in FCC Appendix II, is met by bandpass characteristic of the RF tuned circuits in the Video Transmitter.

Attenuation Characteristics: Will not be greater than the following values below the ideal demodulation curve for television transmitters measured at transmitter output:

- 2 db at 0.50 mc
- 2 db at 1.25 mc
- 3 db at 2.00 mc
- 6 db at 3.00 mc
- 12 db at 3.50 mc

Vestigial Sideband Filter. Not required for the Visual Transmitter Series 1000.

**TEST AND INSPECTION**

Every 5 KW Visual Transmitter Series 1000 and every 2.5 KW Aural Transmitter Series 2000 is given the following engineering tests and inspection before being released for shipment:

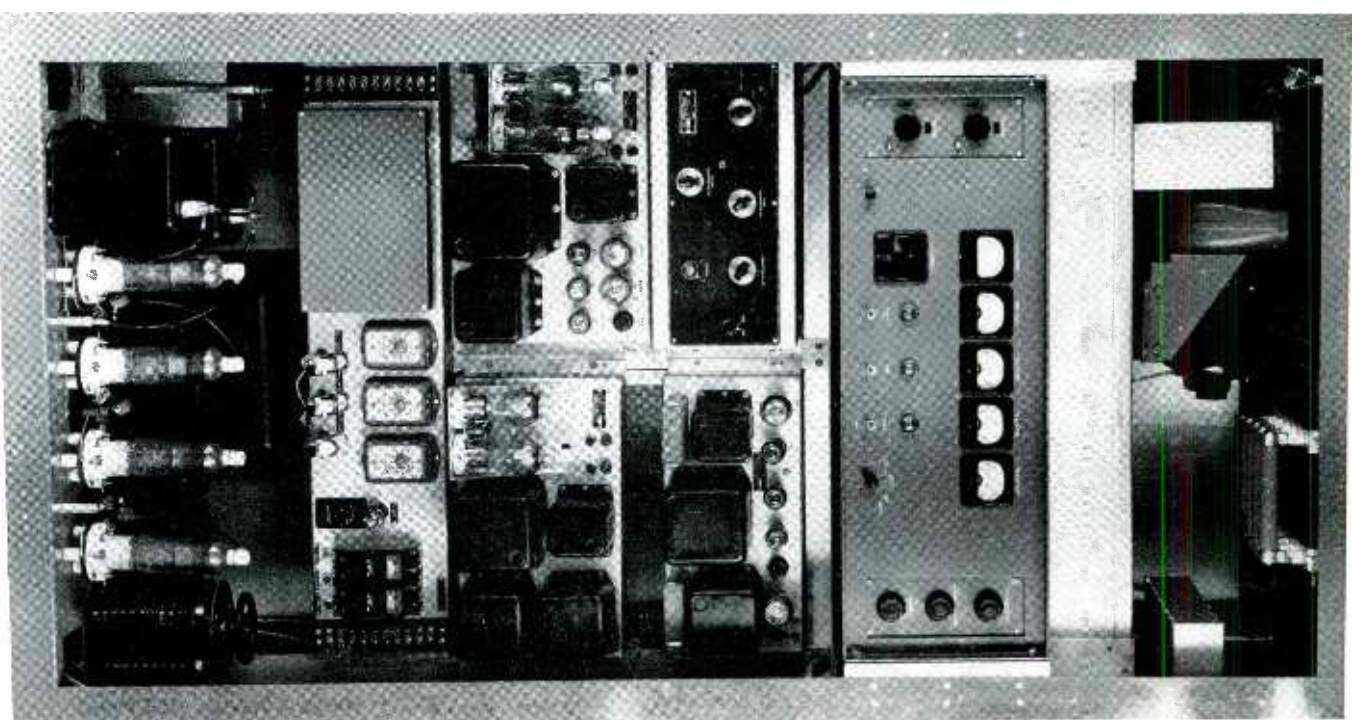


FIG. 6

**500 Watt Visual  
Exciter (Front) . . .**

• This unit drives the 5 K.W. Visual Amplifier. Both units operate in conjunction with the 5 K.W. Power Supply unit.

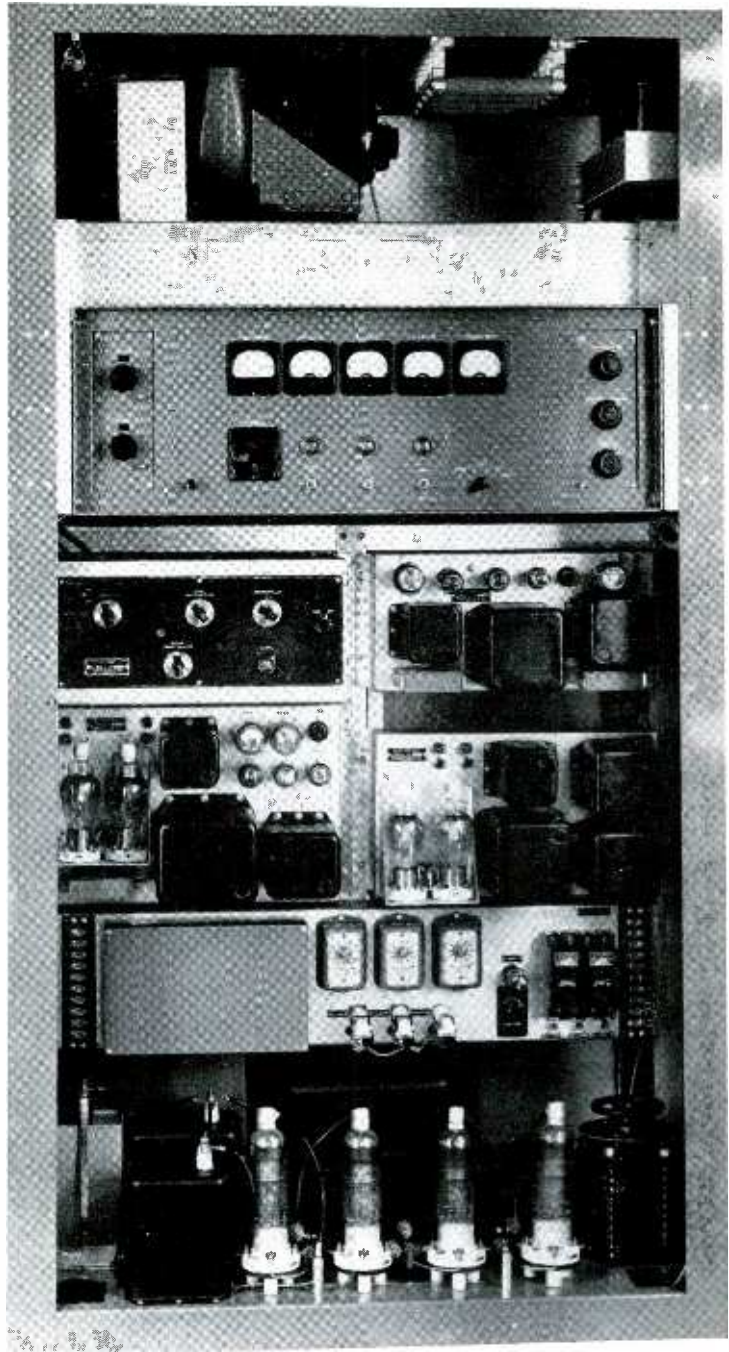


FIG. 6

• This unit drives the 5 K.W. Visual Amplifier. Both units operate in conjunction with the 5 K.W. Power Supply unit.

500 Watt Visual  
Exciter (Front) . . .

# Du Mont Master Television Operating on Television

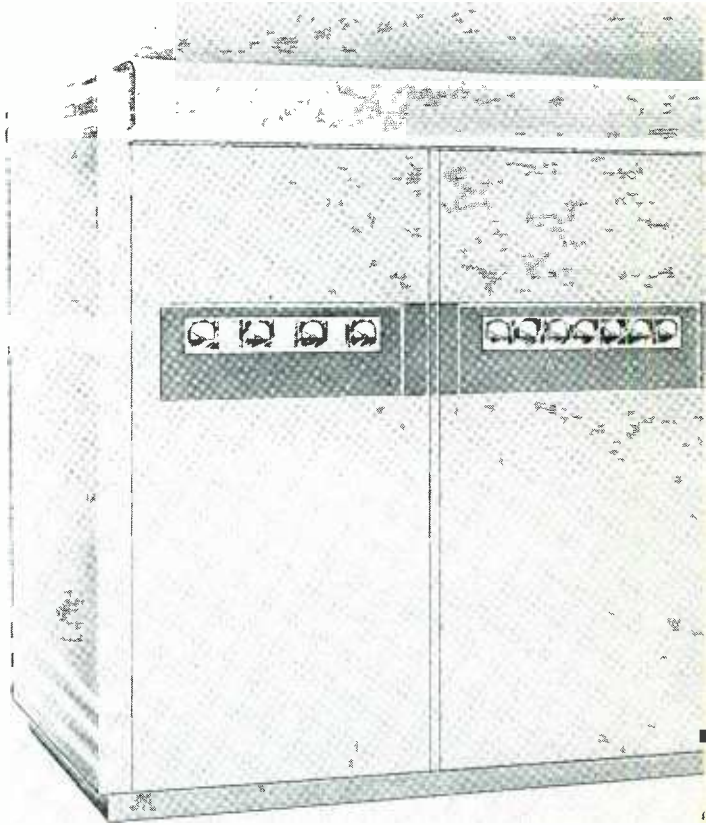
*Rated Signal output power of 5 KW (peak) visual and 2.5 KW aural on any specified FCC commercial television broadcast channel between 44 and 88 megacycles.*

*Built to required frequency — not a costly "all band" job.*

*Comprises 5 KW Power Supply, 500 W Visual Exciter, 5 KW Visual Amplifier, 1 KW Aural Exciter and 2.5 KW Amplifier units, plus the Du Mont Control Console.*

*Simplified control. Two switches for visual and two for aural transmitters. All functions controlled either at transmitter units or at control console. Also double metering.*

*Aural and visual transmitters can be operated independently when desired. Independent crystal control.*



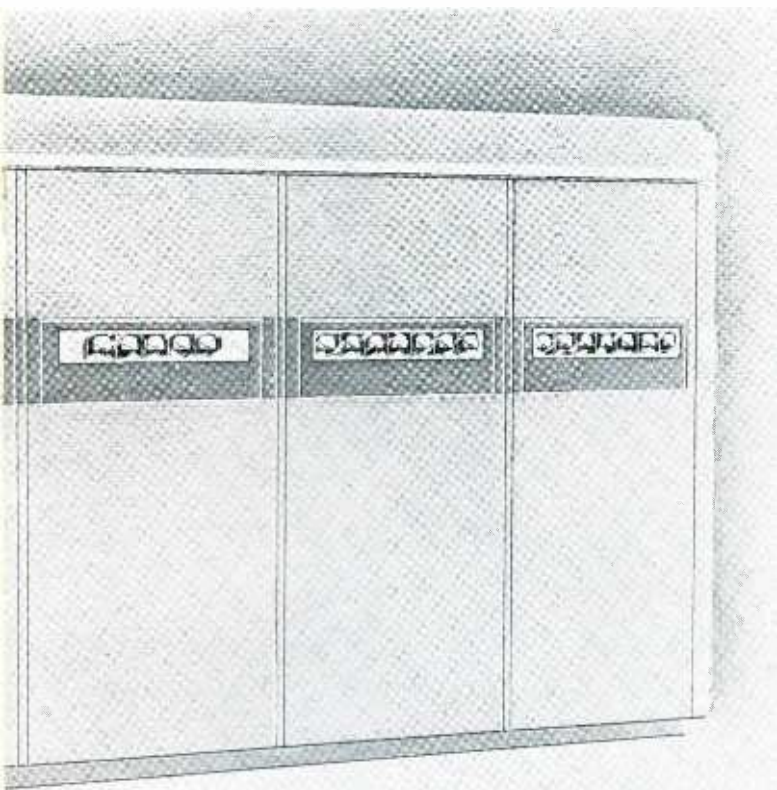
▲  
TYPE 5095-A  
VISUAL POWER  
AMPLIFIER POWER  
SUPPLY

▲  
MODEL TA-118-A  
5 KW VISUAL POWER  
AMPLIFIER



# Television Transmitter

## Transmission Channels 1 to 6



*Extreme accessibility. Almost every tube accessible from front; balance from rear. Likewise with circuits and components.*

*Circuit symbols and components stamped on chassis for ready identification and fool-proof replacement.*

*Employs inexpensive tubes — most expensive type under \$125.00! This means real economy, first and last. Built-in wobulator. Also three built-in cathode-ray tubes for instant checking of critical waveform and performance.*

*Units designed to permit addition of 25 K.W. amplifier when available for high-power operation.*

*"Skin" designed to take five units together or separately, as space and operational requirements dictate.*

*And many other significant features, all adding up to the thoroughness for which Du Mont engineering is famed.*

↑  
MODEL TA-116-A  
500 W VISUAL  
EXCITER

↑  
MODEL TA-115-A  
1 KW AURAL  
EXCITER

↑  
MODEL TA-117-A  
2.5 AURAL  
POWER AMPLIFIER

• *Simplicity, accessibility, ruggedness, long-lasting — yes, those are the products of Du Mont's "operation-proved engineering," presented in this equipment. Now available for prompt delivery to discriminating telecasters, the Du Mont Master Series Transmitter reflects Du Mont's primary objective of built-to-last equipment emphasizing maximum reliability and minimum obsolescence under all telecasting conditions.*

• *The commercial telecaster and his engineering staff — those hard-boiled fellows no longer interested in experimental operation — are assured equipment that's easy to install, easy to operate, easy to service, easy to maintain on the air for extended periods, with minimum attention and expense.*

• *One after another these Du Mont transmitters are pioneering in area after area. Their day-by-day performances best tell — and illustrate — the story of practical telecasting.*

Rectifier and Control Tubes:

- 4 866A Rectifiers
- 3 5R4GY Rectifiers
- 10 872A Rectifiers
- 5 6AS7 Series Tubes
- 3 6SJ7G Control Tubes
- 3 OD3/VR-150 Regulators
- 2 VR-90 Regulators
- 2 VR-75 Regulators

**Electrical Features:**

- Rated Power Output: 5000 watts peak.
- Noise Level: Does not exceed 5% of average synchronization peak signal amplitude.
- Modulation Envelope: Output signal envelope produced by modulation conforms to FCC Engineering Standards, Appendix I.
- Frequency Stability: Better than 0.002% of carrier frequency maintained by a temperature controlled AT cut crystal.
- Carrier Location: Video carrier located 1.25 mc above the lower side-band limits of the assigned operating channel. The visual and aural carrier frequencies are kept 4.5 mc apart by crystal-controlled oscillators.
- Load Impedance: Transmitter output is designed to feed into any 51.5 ohm (1-5/8") or 72-ohm (3-1/8") coaxial transmission line.
- Video Input Signal: Standard RMA composite.
- Video Signal Input Level: May vary from 1 volt minimum to 2.5 volts maximum (peak to peak).
- Video Input Impedance: 75 ohms, single-ended line,  $\pm 5$  ohms.
- Video Signal Source: Studio Control or Transmitter Line.
- Pedestal Level: 75% ( $\pm 2.5\%$ ) of peak composite video signal.
- Black Level: Maintained as near pedestal level as state of art permits.
- White Level: 15% or less of peak composite video signal.
- Input Signal Polarity: Black negative.
- Modulation: Low level grid modulation of 2-4X500A Tubes in 500-Watt Exciter Unit by 2 Type 4E27 Tubes in video modulator stage.
- Brightness Characteristics: The transmitter output power will vary in a substantially inverse logarithmic relation to picture subject brightness.
- Output Amplitude Characteristics: Will comply with FCC Engineering Standards, Appendix II, and FCC Regulations, Sec. 9-A.
- Amplitude vs. Frequency Characteristic: As shown in FCC Appendix II, is met by bandpass characteristic of the RF tuned circuits in the Video Transmitter.
- Attenuation Characteristics: Will not be greater than the following values below the ideal demodulation curve for television transmitters measured at transmitter output:

- 2 db at 0.50 mc
- 2 db at 1.25 mc
- 3 db at 2.00 mc
- 6 db at 3.00 mc
- 12 db at 3.50 mc

Vestigial Sideband Filter. Not required for the Visual Transmitter Series 1000.

**TEST AND INSPECTION**

Every 5 KW Visual Transmitter Series 1000 and every 2.5 KW Aural Transmitter Series 2000 is given the following engineering tests and inspection before being released for shipment:

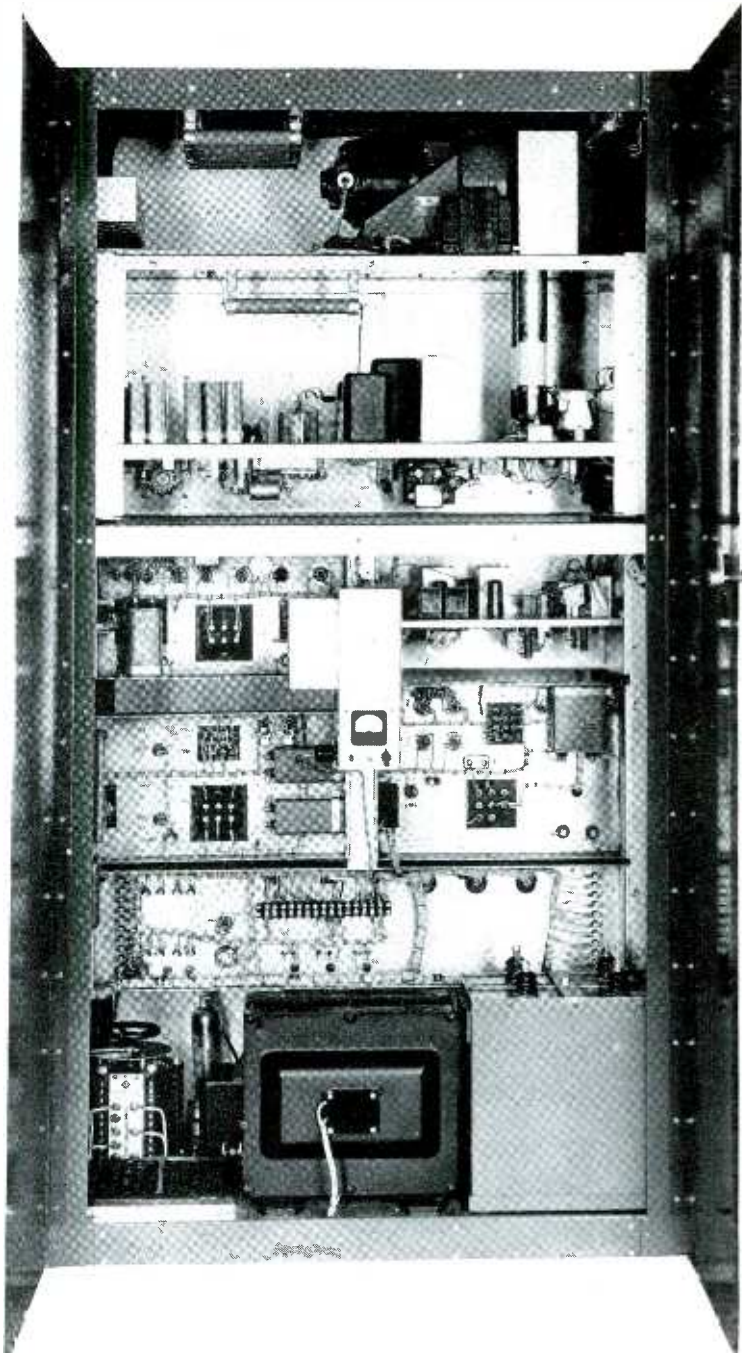


FIG. 6-A

• Rear view of the 500 Watt Visual Exciter. All components and circuits are immediately accessible for checking, replacements and repairs when necessary.

## 500 Watt Visual Exciter (Rear) . . .

**Mechanical Inspection:**

- (a) Finish inspection
- (b) General soldering and electrical joint inspection
- (c) Mechanical fit inspection
- (d) Parts labeling and stamping

**Electrical Inspection:**

- (e) Measure dissipation of all resistors
- (f) Measure peak voltage across all capacitors
- (g) Measure all tube-element voltages and current
- (h) Check overload protection
- (i) Run transmitter at full rated output until all components are stabilized, plus at least 6 hours continuous at stabilized temperature. (Stabilization is reached when the last component maintains the same temperature for 3 successive hourly readings).
- (j) Ripple and regulation check of all power supplies
- (k) Control circuit sequence check
- (l) Check frequency response characteristics by use of built-in Wobbulator
- (m) Check video response of modulator
- (n) Check of linearity of modulator and all Class B Linear stages
- (o) Picture check of transmitter
- (p) Frequency check
- (q) Frequency stability check made during heat run
- (r) Power output check
- (s) Noise level check
- (t) Audio distortion check

**SPARE PARTS**

It is recommended that essential spare parts be ordered at the time of purchase.

**TEST EQUIPMENT**

The following equipment is recommended for the proper maintenance and servicing of Du Mont transmitters:

- 1 Du Mont Type 241 Oscillograph
- 1 Hewlett-Packard Type 200-C Audio Oscillator
- 1 Hewlett-Packard Type 330B Distortion Analyzer
- 1 Weston VT Serviset
- 1 Boonton VT Voltmeter
- 1 Du Mont Type 5034-A RF Waveform Monitor.

**MODEL TA-129-A TRANSMITTER CONTROL  
CONSOLE**

In the form of a convenient, comfortable, smartly styled desk, this transmitter control console (Fig. 8) holds all the monitoring equipment at the optimum viewing angle, provides storage space for drawings, memos, logs, typewriter, telephones, etc., and also has mounting space for all visual and aural monitoring facilities.

Seated at the console, the operator can read the following FCC approved instruments:

**Visual:**

- PA Cathode Ammeter
- PA Plate Voltage
- Transmission Line Voltage
- Carrier Frequency Deviation
- Input Level and Test Meter

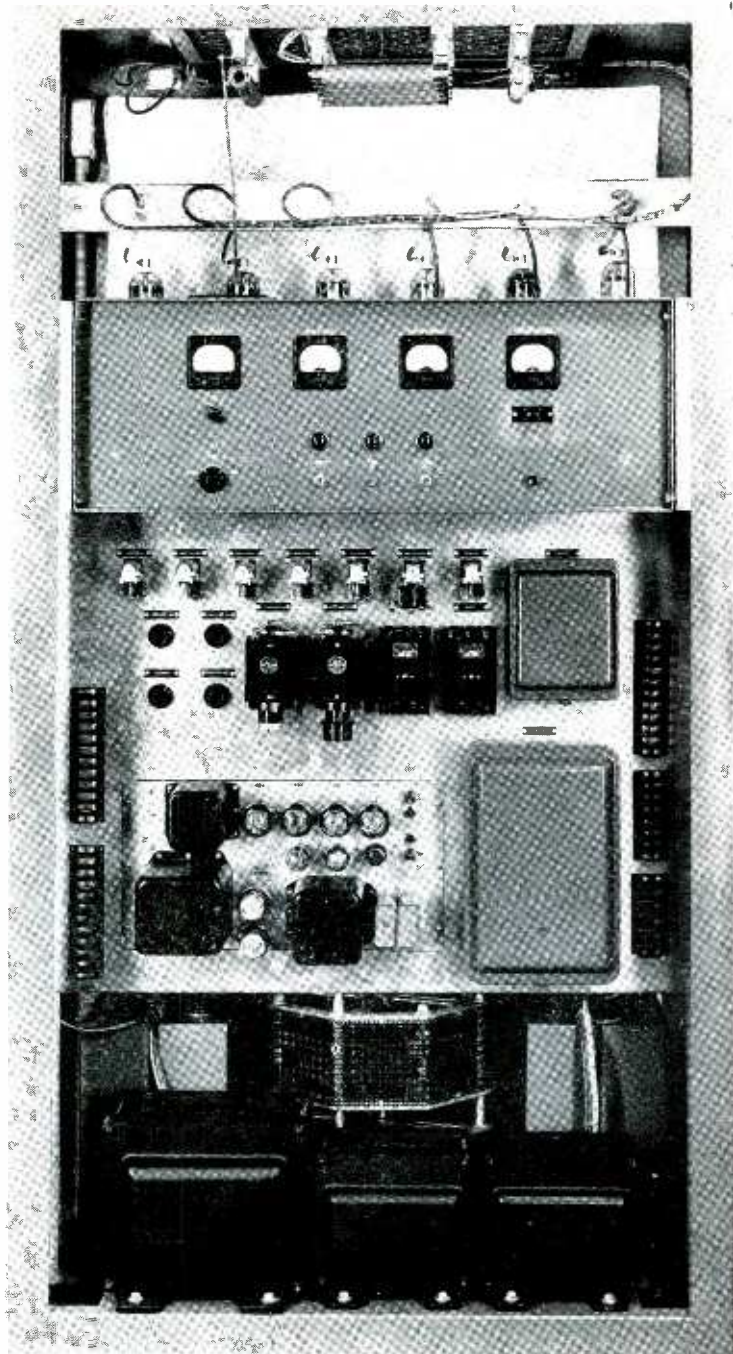


FIG. 7.

• This unit supplies power to the Visual Amplifier. It is mounted alongside the 5 K.W. Visual Amplifier unit, or can be installed in any available space adjacent to the other four grouped units.

## 5 K.W. Power Supply (Front) . . .

**Aural:**

- PA Cathode Current
- PA Plate Voltage
- PA Transmission Line Voltage
- Center Frequency Deviation
- Modulation Percentage (KC Swing)
- Input Level (Vu Meter)
- Line Voltage (Single- and Three-Phase)

Also mounted for effortless visibility are the Type 5109-A and 5109-B Line and Frame Waveform Monitors, and the Type 5108-A 12-inch Picture Monitor.

The control panel under the monitor has the following components:

- Visual Transmitter Plate and Filament Switches, and Pilot Lights
- Aural Transmitter Plate and Filament Switches, and Pilot Lights
- Aural Input Level Control
- Aural Monitor Gain (The new Daven Tone Compensating Attenuator and six-position switch are used to perform this function)
- Aural Monitor Selector (This switch enables the operator to connect the monitor input to the incoming program line (transmitter input), the Off-the-Air Receiver, or the Aural Frequency and Modulation Monitor. A bridging transformer is used and the circuits may be noiselessly switched during program.

**V. U. Meter Multiplier:**

An RMA standard T-pad is used to increase the range of the VU meter to + 20 db in twenty 2 db steps.

**Video Level Control:**

A pad is used to maintain the input level to the transmitter within  $\pm 0.25$  db of the rated input level.

**Video Monitor Selector:**

This switch enables the operator to connect the input of the Waveform Monitors, to the Transmitter IPA cathode, PA cathode, RF Transmission Line, Off-the-Air Receiver, or Incoming Program Line. The Picture Monitor is switched by an additional set of contacts to the Program Line, RF Transmission Line, or the Off-the-Air Receiver.

**Line Voltmeter Switch:**

Circuits are arranged to permit measuring each of the three-phase 220-volt lines and the single-phase 115-volt line to TA-129-A Transmitter Control Console.

**Modulation — Peak Flasher:**

A 115-volt pilot lamp flashes when the modulation level exceeds any preset positive or negative modulation percentage.

**Additional Control Facilities:**

Space is available in this control console for additional facilities such as room lighting switches and other accessories the station owner may wish.

**Makeup of Equipment:**

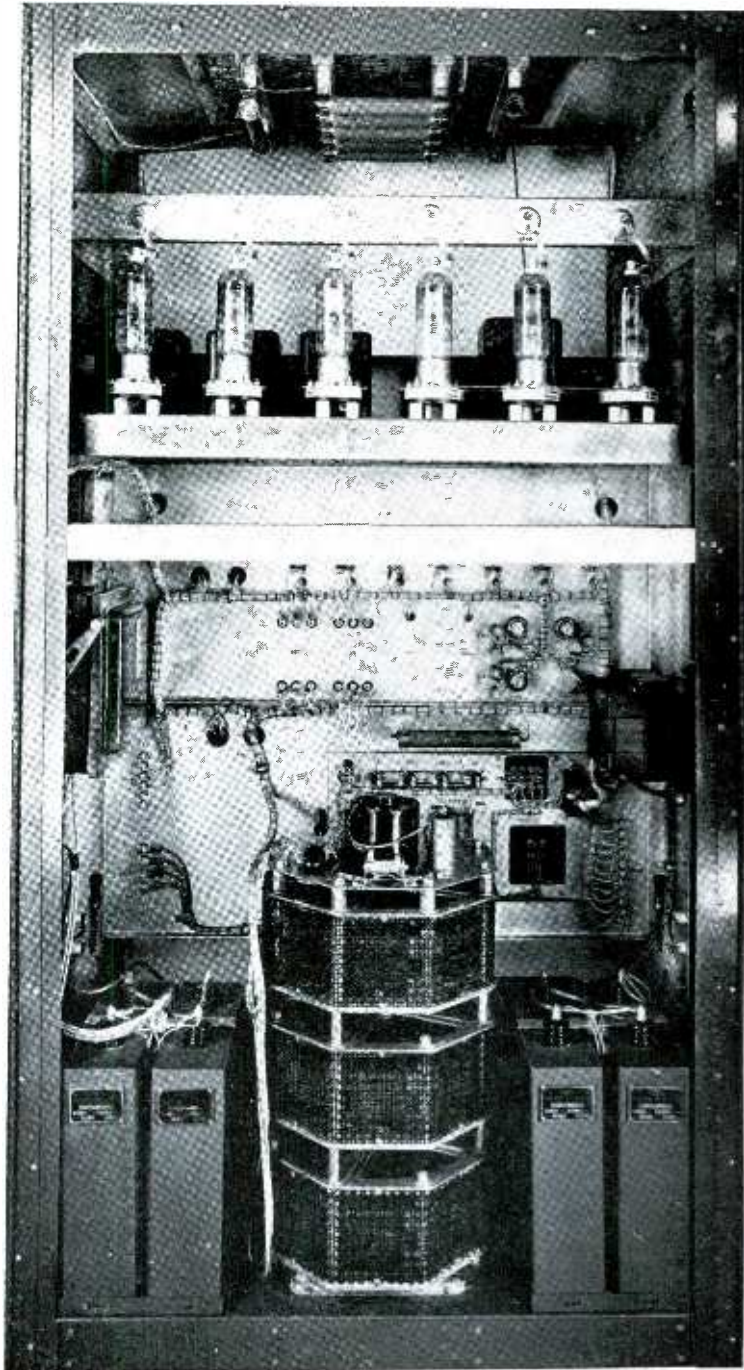


FIG. 7-A

• This rear view of the Power Supply Unit shows the stacked Variac controls and the rectifier tubes. Also the battery of oil capacitors.

## 5 K.W. Power Supply (Rear) . . .

The Model TA-129-A Transmitter Control Console comprises the following units:

12-inch Picture Monitor	Type 5108-A
Power Supply (Picture Monitor)	Type 5112-A*
Waveform Monitor (Frame)	Type 5109-B
Waveform Monitor (Line)	Type 5109-A
Waveform Monitor Power Supply (High Voltage)	Type 5126-A*
Waveform Monitor Power Supply (Low Voltage)	Type 5113-A*
Off-the-Air Receiver	Type 5105-A*
Visual Frequency Monitor	Type 5102-A*
Aural Frequency and Modulation Monitor	Type 5103-A*
Aural Frequency Monitor Power Supply	Type 5104-A*
Electrical Indicating Instruments, Switches, Pilots and Controls	

\*Units so indicated are rack-mounted in the rear and sides of the console.



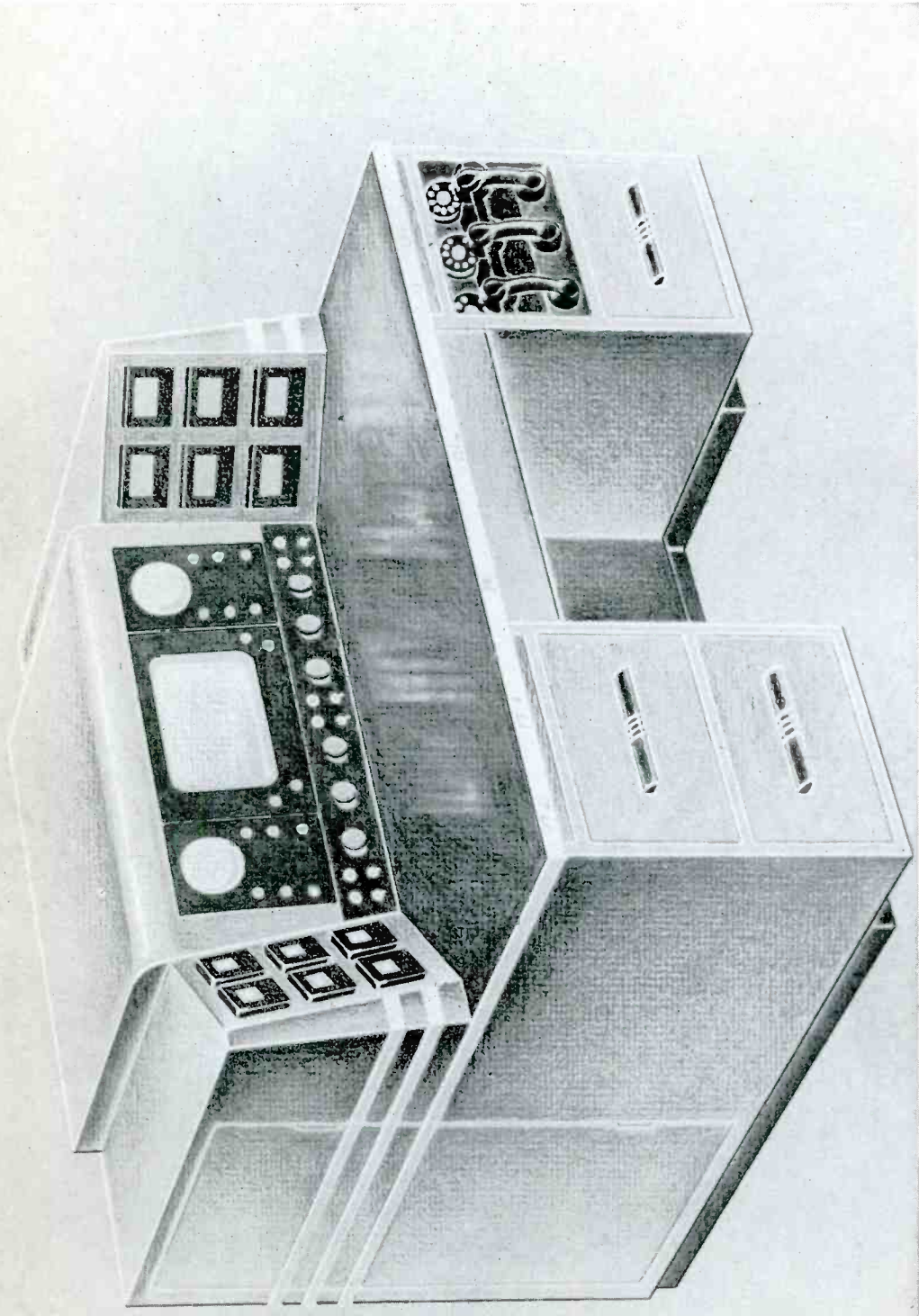


FIG. 8

**Control Console . . .**

• Convenience of the streamlined order marks the design of the Du Mont Control Console. Every vital indicator and control is at the very finger tips of the operator, because meters and controls of the transmitter units are duplicated at this point for maximum convenience.

## TECHNICAL INFORMATION FOR FCC FORM 330

*The following questions are taken directly from Federal Communications Commission Form 330, Application for New Television Broadcast Station Construction Permit. The answers given conform to the Du Mont Master Series Television Transmitter.*

18. Description of AURAL transmitter proposed to be installed:
- (a) Make: Du Mont. Type No. Aural Transmitter Series 2000
  - (b) Oscillator: Type of circuit: Crystal.  
Number, make and type of tubes: One 7A8.
  - (c) List buffer and intermediate power amplifier stages, by number and type of tubes in each stage  
One 7A8 Mixer; One 7C7 Doubler; One 7C7 IPA; One 7C7 Doubler; One 2E26 Doubler; One 2E26 Doubler; One 829B Tripler; One 829B IPA; Two 4X500A IPA..
  - (d) Last radio stage: Number, make and type of tubes:  
Two WX 3300's
  - (e) Modulator of last audio stage: Number, make and type of tubes and how modulation is obtained:  
Two 7A8 Balanced Phase Modulators.
  - (f) The transmitter is designed for what maximum swing?  
Plus/minus 25 kilocycles.
  - (g) Specify make, type number, and full-scale reading of the following meters:
    - (1) In last radio stage:  
Plate Voltmeter: Weston Model 861, 0-5 kilovolts.  
Plate Ammeter: Weston Model 861, 0-3 amperes.
    - (2) Antenna or Transmission Line Meter: Weston Model 861, 0-750 volts.
  - (h) Maximum rated power output of transmitter is 2500 watts.
  - (i) Give the following overall characteristics of the transmitter:
    - (1) Frequency Characteristic:  
Uniform within 1 db of 1000-cycle level,  
within the range from 30 to 15,000 cycles.
    - (2) Amplitude characteristics or distortion:  
1.5%—50-100 cycles  
1.0%—100-7500 cycles  
1.5%—7500-15,000 cycles
    - (3) Noise level (frequency modulation) 55 decibels below 100% modulation (30 to 15,000 cycles).
    - (4) Noise level (amplitude modulation) 50 decibels below 100% modulation (30 to 15,000 cycles).
  - (j) Description of automatic frequency control equipment:
    - (1) Make: Bliley Type No. ART
    - (2) Give make, type of cut, and temperature coefficient in cycles per degree Centigrade if quartz crystal used:  
Bliley AT Cut 2c/Mc/°C.
    - (3) Unit will maintain operating frequency within 0.002 per cent of the assigned frequency ..... kc.

19. Description of visual transmitter proposed to be installed:
- (a) Make: Du Mont Type No. Visual Transmitter Series 1000
  - (b) Oscillator: Type of circuit: Crystal. Number, make and type of tubes:  
One 6V6GT
  - (c) List buffer and intermediate power amplifier stages, by number and type of tubes in each stage:  
Buffer, 6V6GT; Doubler, 6V6GT; IPA's, One 829B, Two 4X500A,  
Two WX3300's
  - (d) Last radio stage: Number, make and type of tubes:  
Two WX3300's
  - (e) Modulator or last video stage: Number, make and type of tubes, and how modulation is obtained:  
Two Type 4E27 tubes are used to grid-bias modulate the 4X500A tubes.
  - (f) Specify make, type number, and full-scale reading of the following meters:
    - (1) In the last radio stage:  
Plate voltmeter: Weston Model 861, 0-5 kilovolts.  
Plate ammeter: Weston Model 861, 0-5 amperes.
    - (2) Antenna or transmission line meter:  
Weston Model 861, 0-750 volts.
  - (g) Maximum rated peak power output of transmitter is 5000 watts peak.
  - (h) Attach graph showing relation between visual transmitter output voltage in terms of modulating frequencies in the range from 0 to 4500 kilocycles (See Appendix).
  - (i) The transmitter is capable of reducing the radio-frequency amplitude for maximum white to 15 per cent of the peak carrier amplitude.
  - (j) Description of automatic frequency control equipment:
    - (1) Make: Bliley. Type No. ART.
    - (2) Give make, type of cut, and temperature coefficient in cycles per degree Centigrade if quartz crystal used  $2c/Mc/^{\circ}C$ . AT cut crystal.
    - (3) Unit will maintain operating frequency within .002 per cent of the assigned frequency ..... kc.
20. Applicant states that there are attached hereto copies of accurate schematic diagrams of the fundamental radio, video and audio circuits of the visual and aural transmitters proposed, including antenna connections, and that they indicate the types of tubes employed. On file with FCC.
21. Monitors to be employed at proposed station:
- (a) Aural frequency monitor:
    - (1) Make: Du Mont Type No. 5103-A
    - (2) Accuracy: 0.001 per cent.
  - (b) Visual frequency monitor:
    - (1) Make: Du Mont Type No. 5102-A
    - (2) Accuracy: 0.001 per cent.
  - (c) Aural modulation monitor:
    - (1) Make: Du Mont Type No. 5103-A
    - (2) Brief description: Output from a standard crystal oscillator is mixed with the RF carrier, the beat frequency is fed to a counter tube and rectifier, and the beat is removed leaving the audio. A positive and negative deviation discriminator is included.
  - (d) Visual modulation monitor:
    - (1) Make: Du Mont Type No. 5034-A
    - (2) Brief description: The RF waveform is viewed on a 5" CRT

- and the per cent modulation is measured on the internal VTVM. Any portion of the envelope can be measured.
22. The transmission standards to be employed by the proposed station are as follows:
    - (a) Attach a drawing of a representative portion of the waveform to be transmitted by the proposed station. If not fully described thereby, attach a description of the waveform to be transmitted. In supplying this information reference should be made to the Commission's Standards of Good Engineering Practice Concerning Television Broadcast Stations. On file at FCC.
    - (b) The applicant represents that the transmitter and associated equipment is capable of radiating a standard television signal in accordance with Part II of the Standards of Good Engineering Practice Concerning Television Broadcast Stations. The applicant shall attach statements as to the equipment and methods by which the tolerances specified in standards 12, 16, 17 and 18 are met. See appendix.
  23. See FCC Public Notice 92075.
  25. From whom will equipment be purchased? (Specify whether new or used; if used, where, how long, and what changes have been made or proposed. Attach additional sheets if necessary).
 

Transmitters: Allen B. Du Mont Laboratories, Inc.  
2 Main Avenue, Passaic, New Jersey.

Vestigial side band filter, transmission line and antenna:  
Allen B. Du Mont Laboratories, Inc.

Studio equipment including synchronizing generator:  
Allen B. Du Mont Laboratories, Inc.

Frequency monitor(s): Allen B. Du Mont Laboratories, Inc.
  30. In determining the ESR of the station, give the following values:
 

	Visual	Aural
Plate power input to last stage:	9 KW	4 KW
Transmitter operating power output:	5 KW	2.5 KW

Estimated filter loss: Zero.

## ENGINEERING APPENDIX

The following transmitter characteristics are submitted to cover pertinent facts regarding operating and signal output.

Answer to Par. 22 (b) Form 330 of FCC (Mod. No. 92075)

### 2. Transmission Standards

1. The channel width is determined by proper placement of video and audio carrier center frequencies, by the Q of video transmitter RF circuits, by video transmitter RF sideband suppression, and by the magnitude of frequency swing of the aural transmitter frequency.
2. The visual and aural carrier center frequencies are kept 4.5 mc apart by crystal controlled center frequencies.
3. The aural center frequency is located by means of a crystal controlled oscillator.
4. The amplitude characteristic as shown in Appendix II is determined by the band pass characteristic of the video transmitter RF tuned circuits and the proper tuning of linear amplifiers to accomplish suppression of lower sideband. This characteristic is monitored by a built-in wobulator and oscilloscope.

- 5, 6, 7, 8. These characteristics are maintained by the use of a standard RMA synchronizing signal generator. Du Mont Type TA-107-A or approved equivalent signal generator.
9. A standard composite video signal is fed to the transmitter from a Du Mont line amplifier.
10. The negative transmission is accomplished by properly modulating the transmitter.
11. The black level is made a definite carrier level by properly adjusting percentage modulation at the transmitter and by using DC restorers wherever necessary.
12. The pedestal level is held to  $75\% \pm 2.5\%$  due to the linearity of all amplifiers. This level is continuously monitored by a Du Mont type 5034-A RF envelope monitor.
13. The white level modulation percentage is maintained at 15% or less by virtue of the negative transmission and by the magnitude of modulation voltage applied. This level is constantly monitored by a Du Mont type 5034-A R. F. envelope monitor.
14. The antennas are so designed as to give a horizontally polarized field.
15. The aural transmitter power is 50% of the peak radiated power of the video transmitter.
16. The peak-to-peak variation of the transmitter output is held to a variation of less than 5% variation by virtue of properly filtered power supplies and by proper low frequency compensation.
17. The black level is held as nearly equal to the pedestal level as is possible by proper adjustment of modulation percentage and by use of DC restorers.
18. The brightness characteristic is held as close to an inverse logarithmic ratio as the linearity of all stages will permit.

NOTE 1: The tolerances under para. 9 (A) 5 and 6 of FCC (Standards of Good Engineering Practice) are maintained to the best of our knowledge by the Model TA-107-A Synchronizing Signal Generator.

NOTE 2: 18 (i) (2) Supporting curves for this question are on file with FCC in connection with type approval for Du Mont Master Series Television Transmitters.

#### **SCOPE OF SPECIFICATIONS:**

In the construction of the equipment described above, the full intent of these specifications will be met. However, it is assumed that any departures from it, desirable for reasons of improved design or operation, will be permissible without further notice.

**DUMONT**

*First with the Finest in Television*