New! Color television tubes by Thomas
**FEATURES**

- FULL-COLOR OR BLACK-AND-WHITE PICTURE
- THREE ELECTRON GUNS
- 195,000 DOT TRIOS OR 585,000 DOTS
- ALUMINIZED TRICOLOR PHOSPHOR-DOT PLATE
- METAL SHADOW MASK
- SPHERICAL FACE
- EXTERNAL CONDUCTIVE COATING
- ELECTROSTATIC FOCUS AND CONVERGENCE

**CHARACTERISTICS — GENERAL DATA**

- Focusing Method: Electrostatic
- Convergence Method: Electrostatic
- Deflection Method: Magnetic
- Deflection Angles (Approx.):
  - Horizontal: \(45^\circ\)
  - Vertical: \(55^\circ\)
- Phosphor (three separate phosphors, collectively) #23
- Fluorescence and Phosphorescence of separate phosphors:
  - Blue, green, red
  - Persistence of group phosphorescence: Medium
- First electrode: Aluminized, tricolor, phosphor–dot plate
- Light transmission (approx.): 70%

**ELECTRICAL DATA**

- Heater voltage: 6.3 volts
- Heater current: 1.6 amperes
- Direct interconnected capacitance (approx.)
  - Grid No. 1 to any gun to all others: 7.5 uF
  - Cathode of blue gun + cathode of red gun + cathode of green gun to all other electrodes: 17.5 uF
  - Grid No. 2 to all other electrodes: 12 uF
  - Grid No. 4 to all other electrodes: 7 uF

**MECHANICAL DATA**

- Minimum useful screen dimension: \(11\frac{1}{2} \times 8\frac{1}{2}\)
- Screen area: 88.5 sq. inches
- Box (small shell bidirectional 14-pin): JETEC B14-103

**TUBE DIMENSIONS**

- Maximum overall length: 26.33″
- Greatest diameter: \(14\frac{1}{2} \pm 0.22″\)
- Metal range: 15 1/2″ max.

**RATINGS**

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**Examples of Use of Range Values**

- Anode voltage: 20,000 volts dc
- Grid No. 1 voltage (Note 2): 8,200 to 13,200 volts dc
- Grid No. 2 voltage: 2,400 to 3,800 volts dc
- Grid No. 2 voltage (each gun when circuit design utilizes grid No. 2 voltage at fixed value): 2 to 4.5 max. volts dc
- Grid No. 1 voltage (each gun when circuit design utilizes grid No. 2 voltage): 12 to 17 volts dc
- Grid No. 1 voltage (each gun when circuit design utilizes grid No. 7 voltage): 4.5 to 10 max. volts dc
- Maximum range shift in any direction from screen center (Note 3): 1 1/2″

**CIRCUIT VALUES**

- Grid No. 1 circuit resistance (each gun): 1.5 max. megohms
- Dynamic converging voltage (approx.): 900 volts
- Dynamic focusing voltage (approx.): 250 volts
- External condenser coupling to anode capacitance: 2,000 uF
- Minimum maximum capacitance: 1,500 uF

**NOTES**

1. This value is the product of anode voltage and average current measured at the anode terminal with a dc ammeter.
2. This range does not include the dc component of the dynamic converging voltage.
3. Centering of the raster on the screen is accomplished by passing direct current of the required value through each pair of deflecting coils to compensate for the raster drift resulting from optimum adjustments for convergence, color purity, and defocusing.
4. Peak-to-peak value. This designation having essentially parabolic waveform is synchronized with scanning and does not include any voltage developed during the blanking time.
FEATURES
FRINGE-FREE COLOR AND BLACK AND WHITE PICTURES
LARGE PICTURE—ONE ELECTRON GUN
SIMPLIFIED CIRCUITING—SHORT TUBE
WIDE ANGLE DEFLECTION—LOW RASTER SCANNING POWER
LOW COLOR DEFLECTING POWER—QUICK SET-UP
STANDARD DEFLECTION COMPONENTS
ALUMINIZED HIGH BRIGHTNESS AND HIGH CONTRAST TRICOLOR SCREEN

GENERAL DATA
Focus control method: Magnetic
Deflection method: Magnetic
Deflection angle: 22°
Phosphors: Red, green and blue primaries
Phosphor: spherical, clear glass
Screen: flat
Type: metal backed, tricolor, phosphor tube
Plate: Filterglass

ELECTRICAL DATA
Heater voltage (AC or DC)... 6.3 volts
Heater current (DC)... 0.6 millamps
DIRECT INTERELECTRODE CAPACITANCES
Grid #1 to all other electrodes... 6 ufd
Cathode to all other electrodes... 3 ufd
Color grid wires to each other... 1400 ufd
Color grid wires to all other electrodes... 85 ufd

MECHANICAL DATA
Min. picture size... 10 1/2" x 14 1/2"
Picture area... 133 square inches
Base... Small shell duodecal 6 pin mounting position... Any

TUBE DIMENSIONS
Max. bulb diameter... 22 1/2"
Max. length... 29 1/2"

RATINGS
Max. volts dc
Total accelerating voltage, Ek-p... 18,000 volts dc
Electron gun voltage... 5,000 volts dc
Color grid deflection voltage, EG4-GS... 1,000 volts dc
Seeker voltage, EG3-G4G5 (Note #1)... 0.060 volts dc
Voltage between color grid and phosphor plate, EG4, EG5-p... 12,000 volts dc
Grid #4 voltage... 8,000 volts dc
Grid #1 voltage—negative bias voltage... 120 max. volts dc
positive bias voltage... 0 max. volts dc
positive peak voltage... 2 max. volts dc

Peak heater-cathode voltage:
Heater negative with respect to cathode
1. during experiment warm-up, period not exceeding 10 seconds... 410 max. volts dc
2. after equipment warm-up... 180 max. volts dc
Heater positive with respect to cathode... 180 max. volts dc

TYPICAL OPERATION
Total accelerating voltage, Ek-p... 18,000 volts dc
Electron gun voltage, EG3-G4G5... 3,500 to 6,000 volts dc
Focal spot current (Note #1)... 1 ma to 70 ma
Color grid deflection voltage, EG4-G5... 300 peak volts dc
Seeker voltage, EG3-G4G5... 200 volts dc
Grid #2 voltage... 100 to 1,000 volts dc
Print #1 voltage... −33 to −77 volts dc

NOTES:
1. Seeker voltage is defined as the DC potential between color grid and main anode. This voltage is such that the color grids are negative with respect to metal screen. This is an installation adjustment.
2. When REMA looks call .100 quadrupled so that the center of three line gap is located three inches behind the yoke reference line.

ADVANTAGES OF THE LAWRENCE TUBE—a SINGLE GUN TRI-COLOR TELEVISION TUBE

The type CH-22 single gun tube has a WIDE DEFLECTION ANGLE—22°, which makes it a SHORT TUBE—in overall height for the 29 1/2" picture tube is 25". It gives a LARGE PICTURE—over 50" larger than the three-gun shadow mask tube. It produces a BRIGHT PICTURE—at an average voltage of 18 KV, the brightness measured through a .005" efficient filter face plate is about 50 ft. lamberts in the highlights. It requires LOW RASTER SCANNING POWER—also drferred form is only 1/4 of the power of the first generation, and LOW COLOR DEFLECTION POWER—no 2.5MHz switching with the MISS system, 28 to 36 volts dc power input.

The horizontal resolution is equivalent to present black and white, in the vertical dimension, better than 220 lines. LESS POWER THAN THREE-GUN TUBE—more power is required in comparison to a three-gun tube, even though it is not as intense, or regulated power supplies, or dynamic convergence or dynamic focus circuitry, etc. STANDARD DEFLECTION COMPONENTS—are standard, low cost black-and-white horizontal grid and focus tubes. QUICK SET-UP—set-up time is a matter of minutes, since there are not problems of centering or component movements. SIMPLIFIED CIRCUITRY—an excellent design for a single-gun tube, FRINGE-FREE COLOR PICTURES, FRINGE-FREE STANDARD BROADCAST BLACK-AND-WHITE PICTURES. INEXPENSIVE TO PRODUCE—low cost single-gun type of construction. Color control assembly at a practical price and requiring only reasonable production tolerances. RELIABLE—Color control assembly not subject to damage even when subjected to extended periods of operation and high current density input to current source.