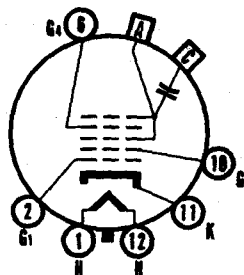
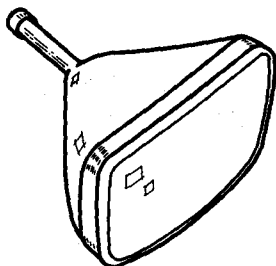


# SYLVANIA TYPE 17CLP4

Silver Screen "85"

Television Picture Tube

17" Direct Viewed	Aluminized Screen
Rectangular Glass Type	Electrostatic Focus
Spherical Faceplate	90° Magnetic Deflection
Gray Filter Glass	Short Neck Tube
External Conductive Coating	



12-L

## CHARACTERISTICS

### GENERAL DATA

Focusing Method.....	Electrostatic
Deflection Method.....	Magnetic
Deflection Angles (approx.)	
Horizontal.....	85 Degrees
Diagonal.....	90 Degrees
Phosphor.....	Aluminized P4
Fluorescence.....	White
Persistence.....	Short to Medium
Faceplate.....	Gray Filter Glass
Light Transmittance (approx.).....	74 Percent

### ELECTRICAL DATA

Heater Voltage.....	6.3 Volts
Heater Current.....	0.6 ± 5% Ampere
Heater Warm-up Time <sup>1</sup> .....	11 Seconds
Direct Interelectrode Capacitances (approx.)	
Cathode to All Other Electrodes.....	5 μμf
Grid No. 1 to All Other Electrodes.....	6 μμf
External Conductive Coating to Anode <sup>2</sup> .....	2300 μμf Max. 1800 μμf Min.
Ion Trap Magnet.....	External, Single Field Type

### MECHANICAL DATA

Minimum Useful Screen Dimensions (Maximum Assured).....	14 <sup>5</sup> / <sub>16</sub> x 11 <sup>1</sup> / <sub>4</sub> Inches
Nominal Overall Length.....	15 <sup>1</sup> / <sub>2</sub> Inches
Minimum Useful Screen Area.....	149 Sq. Inches
Bulb Contact (Recessed Small Cavity Cap).....	J1-21
Base.....	B6-63
Basing.....	12L

## RATINGS

### MAXIMUM RATINGS (Absolute Maximum Values)

Anode Voltage.....	17,600 Volts d c
Grid No. 4 Voltage (Focusing Electrode).....	-550 to +1100 Volts d c
Grid No. 2 Voltage.....	550 Volts d c
Grid No. 1 Voltage.....	
Negative Bias Value.....	155 Volts d c
Negative Peak Value.....	220 Volts
Positive Bias Value.....	0 Volts d c
Positive Peak Value.....	2 Volts
Peak Heater-Cathode Voltage.....	
Heater Negative with Respect to Cathode	
During Warm-up Period Not to Exceed	
15 Seconds.....	450 Volts
After Equipment Warm-up Period.....	200 Volts
Heater Positive with Respect to Cathode.....	200 Volts

SYLVANIA PICTURE TUBES

## SYLVANIA TYPE 17CLP4 (Cont'd)

### TYPICAL OPERATING CONDITIONS

Anode Voltage.....	14,000 Volts d c
Grid No. 4 Voltage for Focus.....	-48 to +264 Volts d c
Grid No. 2 Voltage.....	300 Volts d c
Grid No. 1 Voltage Required for Cutoff <sup>2</sup> .....	-35 to -72 Volts d c
Ion Trap Magnet Strength (approx.).....	35 Gauss

### CIRCUIT VALUES

Grid No. 1 Circuit Resistance.....	1.5 Megohms Max.
------------------------------------	------------------

### NOTES:

1. Heater warm-up time is defined as the time required for the voltage across the heater to reach 80% of its rated value after applying four (4) times rated heater voltage to a circuit consisting of the tube heater in series with a resistance equal to three (3) times rated heater voltage divided by rated heater current.
2. External conductive coating must be grounded.
3. Visual extinction of focused raster. Extinction of stationary focused spot will require that these values be about 5 volts more negative.

### WARNING:

X-ray radiation shielding may be necessary to protect against possible danger of personal injury from prolonged exposure at close range if this tube is operated at higher than the manufacturer's Maximum Rated Anode Voltage or 16,000 volts, whichever is less.

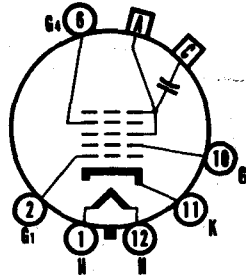
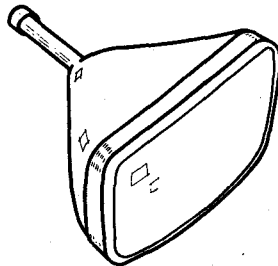
# SYLVANIA TYPE 17CNP4

*Silver Screen "85"*

## TELEVISION PICTURE TUBE

17" Direct Viewed	Electrostatic Focus
Rectangular Glass Type	90° Magnetic Deflection
Lightweight Tube	Short Neck Tube
Spherical Faceplate	No Ion Trap
Gray Filter Glass	External Conductive Coating
Aluminized Screen	Cathode Drive Design

Low Grid No. 2 Voltage



12-L

## CHARACTERISTICS

### GENERAL DATA

Focusing Method	Electrostatic
Deflection Method	Magnetic
Deflection Angles (approx.)	
Horizontal	85 Degrees
Diagonal	90 Degrees
Phosphor	Aluminized P4
Fluorescence	White
Persistence	Short to Medium
Faceplate	Gray Filter Glass
Light Transmittance (approx.)	77 Percent

### ELECTRICAL DATA

Heater Voltage	6.3 Volts
Heater Current	0.6 ± 5% Amperes
Heater Warm-up Time	11 Seconds
Direct Interelectrode Capacitances (approx.)	
Cathode to All Other Electrodes	5 μmf
Grid No. 1 to All Other Electrodes	6 μmf
External Conductive Coating to Anode <sup>2</sup>	1500 μmf Max. 1000 μmf Min.

### MECHANICAL DATA

Minimum Useful Screen Dimensions (Maximum Assured)	14 3/4 x 11 1/2 Inches
Nominal Overall Length	15 Inches
Minimum Useful Screen Area	155 Square Inches
Bulb	J132 1/2 C or Equivalent
Bulb Contact (Recessed Small Cavity Cap)	J1-21
Base (Small Shell Duodecal 6-Pin)	B6-63
Basing	12L
Weight (approx.)	10 1/2 Pounds

## RATINGS

### MAXIMUM RATINGS (Absolute Maximum Values)<sup>3</sup>

Anode Voltage	17,600 Volts d c
Grid No. 4 Voltage (Focusing Electrode)	-550 to +1100 Volts d c
Grid No. 2 Voltage	70 Volts d c
Cathode Voltage	
Positive Bias Value	150 Volts d c
Negative Peak Value	0 Volts
Peak Heater-Cathode Voltage	
Heater Negative with Respect to Cathode	
During Warm-up Period Not to Exceed	
15 Seconds	450 Volts
After Equipment Warm-up Period	200 Volts
Heater Positive with Respect to Cathode	200 Volts

SYLVANIA PICTURE TUBES

## SYLVANIA TYPE 17CNP4 (Cont'd)

### TYPICAL OPERATING CONDITIONS<sup>1</sup>

Anode Voltage.....	14,000 Volts d c
Grid No. 4 Voltage for Focus.....	0 to +400 Volts d c
Grid No. 2 Voltage.....	50 Volts d c
Cathode Voltage Required for Cutoff <sup>4</sup> .....	35 to 50 Volts d c

### CIRCUIT VALUES

Grid No. 1 Circuit Resistance.....	1.5 Megohms Max.
------------------------------------	------------------

### NOTES:

1. Heater warm-up time is defined as the time required for the voltage across the heater to reach 80% of its rated value after applying four (4) times rated heater voltage to a circuit consisting of the tube heater in series with a resistance equal to three (3) times rated heater voltage divided by rated heater current.
2. External conductive coating must be grounded.
3. This type is designed for cathode-drive service. All voltages shown are positive with respect to Grid No. 1 Voltage, unless otherwise indicated.
4. For visual extinction of focused raster. Extinction of stationary focused spot will require that these values increase approximately 5 volts.

### WARNING:

X-ray radiation shielding may be necessary to protect against possible danger of personal injury from prolonged exposure at close range if this tube is operated at higher than the manufacturer's Maximum Rated Anode Voltage or 16,000 volts, whichever is less.

# 17CP4 (Cont'd)

## CIRCUIT VALUES

Grid No. 1 Circuit Resistance ..... 1.5 Megohms  
Max

## NOTES:

1. Visual extinction of undeflected focused spot.
2. For JETEC focusing coil 109 or equivalent three inches from reference line, bias adjusted to 30 foot lamberts on a  $14\frac{3}{8} \times 10\frac{1}{16}$  inch picture area.

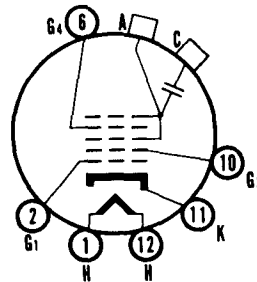
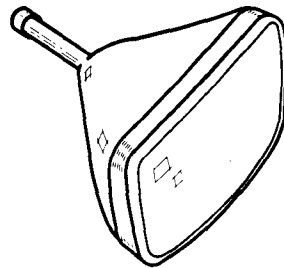
## WARNING

X-ray radiation shielding may be necessary to protect against possible danger of personal injury from prolonged exposure at close range if this tube is operated at higher than the manufacturer's Maximum Rated Anode Voltage or 16,000 volts, whichever is less.

# SYLVANIA TYPE 17FP4

## TELEVISION PICTURE TUBE

17" Direct Viewed	Magnetic Deflection
Rectangular Glass Type	Electrostatic Focus
Gray Filter Glass	Spherical Faceplate
External Conductive Coating	Single Field Ion Trap



12-L

## CHARACTERISTICS

### GENERAL DATA

Focusing Method .....	Electrostatic
Deflecting Method .....	Magnetic
Deflecting Angle (approx.)	
Horizontal .....	65 Degrees
Diagonal .....	70 Degrees
Phosphor .....	P4
Fluorescence .....	White
Persistence .....	Medium
Faceplate .....	Gray Filter Glass
Light Transmittance (approx.) .....	66 Percent

### ELECTRICAL DATA

Heater Voltage .....	6.3 Volts
Heater Current (approx.) .....	0.6 Ampere
Direct Interelectrode Capacitances (approx.)	
Cathode to All Other Electrodes .....	5 $\mu\mu\text{f}$
Grid No. 1 to All Other Electrodes .....	6 $\mu\mu\text{f}$
External Conductive Coating to Anode <sup>1</sup> .....	750 $\mu\mu\text{f}$ Max
Ion Trap Magnet .....	500 $\mu\mu\text{f}$ Min
	External, Single Field Type

# 17FP4 (Cont'd)

## MECHANICAL DATA

Minimum Useful Screen Dimensions.....	10 $\frac{3}{4}$ x 14 $\frac{1}{4}$	Inches
Bulb Contact (Recessed Small Cavity Cap).....	J1-21	
Base (Small Shell Duodecal 6-Pin).....	B6-63	
Basing.....	12L	

## RATINGS

### MAXIMUM RATINGS (Design Center Values)

Anode Voltage.....	18000	Volts d c
Grid No. 4 Voltage (Focusing Electrode).....	5000	Volts d c
Grid No. 2 Voltage.....	410	Volts d c
Grid No. 1 Voltage.....		
Negative Bias Value.....	125	Volts d c
Positive Bias Value.....	0	Volts d c
Positive Peak Value.....	2	Volts
Peak Heater-Cathode Voltage.....		
Heater Negative with Respect to Cathode		
During Warm-up Period Not to		
Exceed 15 Seconds.....	410	Volts
After Equipment Warm-up Period.....	150	Volts
Heater Positive with Respect to Cathode.....	150	Volts

### RECOMMENDED OPERATING CONDITIONS

Anode Voltage.....	16000	Volts d c
Grid No. 3 Voltage.....	3100 to 4100	Volts d c
Grid No. 2 Voltage.....	300	Volts d c
Grid No. 1 Voltage Required for Cutoff.....	-33 to -77	Volts d c
Ion Trap Magnet Strength (approx.).....	35	Gausses

### CIRCUIT VALUES

Grid No. 1 Circuit Resistance.....	1.5	Megohms
		Max

### NOTES:

- External conductive coating must be grounded.
- Visual extinction of undeflected focused spot.

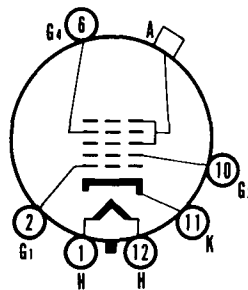
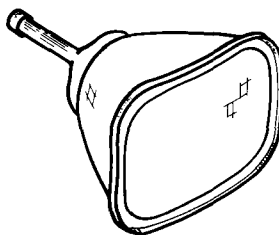
### WARNING

X-ray radiation shielding may be necessary to protect against possible danger of personal injury from prolonged exposure at close range if this tube is operated at higher than the manufacturer's Maximum Rated Anode Voltage or 16,000 volts, whichever is less.

## SYLVANIA TYPE 17GP4

### TELEVISION PICTURE TUBE

17" Direct Viewed	Magnetic Deflection
Rectangular Metal Type	Electrostatic Focus
Frosted Gray Filter Glass	Spherical Faceplate
Single Field Ion Trap	



12-M

# 17GP4 (Cont'd)

## CHARACTERISTICS

### GENERAL DATA

Focusing Method.....	Electrostatic
Deflecting Method.....	Magnetic
Deflecting Angle (approx.)	
Horizontal.....	66 Degrees
Diagonal.....	70 Degrees
Phosphor.....	P4
Fluorescence.....	White
Persistence.....	Medium
Faceplate.....	Frosted Gray Filter Glass
Light Transmittance (approx.).....	66 Percent

### ELECTRICAL DATA

Heater Voltage.....	6.3 Volts
Heater Current (approx.).....	0.6 Ampere
Direct Interelectrode Capacitances (approx.)	
Cathode to All Other Electrodes.....	5 $\mu$ f
Grid No. 1 to All Other Electrodes.....	6 $\mu$ f
Ion Trap Magnet.....	External, Single Field Type

### MECHANICAL DATA

Minimum Useful Screen Dimensions.....	14 $\frac{3}{8}$ x 10 $\frac{1}{16}$ Inches
Bulb Contact.....	Metal Cone Lip
Base (Small Shell Duodecal 6-Pin).....	B6-63
Basing.....	12M

## RATINGS

### MAXIMUM RATINGS (Design Center Values)

Anode Voltage.....	16000 Volts d c
Grid No. 4 Voltage (Focusing Electrode).....	5000 Volts d c
Grid No. 2 Voltage.....	500 Volts d c
Grid No. 1 Voltage	
Negative Bias Value.....	125 Volts d c
Positive Bias Value.....	0 Volts d c
Positive Peak Value.....	2 Volts
Peak Heater-Cathode Voltage	
Heater Negative with Respect to Cathode	
During Warm-up Period Not to	
Exceed 15 Seconds.....	410 Volts
After Equipment Warm-up Period.....	180 Volts
Heater Positive with Respect to Cathode.....	180 Volts

### RECOMMENDED OPERATING CONDITIONS

Anode Voltage.....	14000 Volts d c
Grid No. 4 Voltage.....	2670 to 3620 Volts d c
Grid No. 2 Voltage.....	300 Volts d c
Grid No. 1 Voltage Required for Cutoff <sup>1</sup> .....	-33 to -77 Volts d c
Ion Trap Magnet Strength (approx.).....	40 Gauss

### CIRCUIT VALUES

Grid No. 1 Circuit Resistance.....	1.5 Megohms
	Max

### NOTE:

1. Visual extinction of undeflected focused spot.

### WARNING

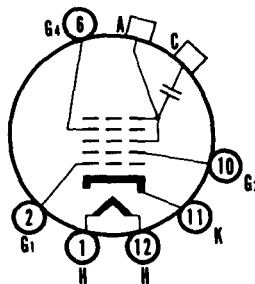
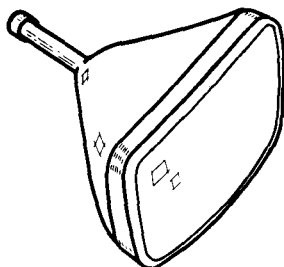
X-ray radiation shielding may be necessary to protect against possible danger of personal injury from prolonged exposure at close range if this tube is operated at higher than the manufacturer's Maximum Rated Anode Voltage or 16,000 volts, whichever is less.

# SYLVANIA TYPE 17HP4/17RP4

## Silver Screen "85" → 17HP4B

### TELEVISION PICTURE TUBE

17" Direct Viewed	Magnetic Deflection
Rectangular Glass Type	Electrostatic Focus
Gray Filter Glass	Spherical Faceplate
External Conductive Coating	Single Field Ion Trap
17HP4A has a Frosted Faceplate	
17HP4B has an Aluminized Screen	



12-L

### CHARACTERISTICS

#### GENERAL DATA

Focusing Method.....	Electrostatic
Deflecting Method.....	Magnetic
Deflecting Angle (approx.).....	
Horizontal.....	65 Degrees
Diagonal.....	70 Degrees
Phosphor.....	P4
Fluorescence.....	White
Persistence.....	Medium
Faceplate.....	Gray Filter Glass
Light Transmittance (approx.).....	72 Percent

#### ELECTRICAL DATA

Heater Voltage.....	6.3 Volts
Heater Current (approx.).....	0.6 Ampere
Direct Interelectrode Capacitances (approx.).....	
Cathode to All Other Electrodes.....	5 $\mu$ f
Grid No. 1 to All Other Electrodes.....	6 $\mu$ f
External Conductive Coating to Anode <sup>1</sup> .....	1500 $\mu$ f Max
	750 $\mu$ f Min
Ion Trap Magnet.....	External, Single Field Type

#### MECHANICAL DATA

Minimum Useful Screen Dimensions.....	10 $\frac{3}{4}$ x 14 $\frac{1}{4}$ Inches
Bulb Contact (Recessed Small Cavity Cap).....	J1-21
Base (Small Shell Duodecal 6-Pin).....	B6-63
Basing.....	12L

### RATINGS

#### MAXIMUM RATINGS (Design Center Values)

Anode Voltage.....	16000 Volts d c
Grid No. 4 (Focusing Electrode) Voltage.....	-500 to +1000 Volts d c
Grid No. 2 Voltage.....	500 Volts d c
Grid No. 1 Voltage.....	
Negative Bias Value.....	125 Volts d c
Positive Bias Value.....	0 Volts d c
Positive Peak Value.....	2 Volts
Peak Heater-Cathode Voltage.....	
Heater Negative with Respect to Cathode	
During Warm-up Period Not to	
Exceed 15 Seconds.....	410 Volts
After Equipment Warm-up Period.....	180 Volts
Heater Positive with Respect to Cathode.....	180 Volts



# 17HP4/17RP4, 17HP4B (Cont'd)

## RECOMMENDED OPERATING CONDITIONS

Anode Voltage	14000 Volts d c
Grid No. 4 Voltage	-56 to +310 Volts d c
Grid No. 2 Voltage	300 Volts d c
Grid No. 1 Voltage Required for Cutoff <sup>2</sup>	-28 to -72 Volts d c
Ion Trap Magnet Field Strength (approx.)	30 Gauss

## CIRCUIT VALUES

Grid No. 1 Circuit Resistance	1.5 Megohms Max
-------------------------------	-----------------

## NOTES:

1. External conductive coating must be grounded.
2. Visual extinction of focused raster. Extinction of stationary focused spot will require that these values be about 5 volts more negative.

## 17HP4A

The Sylvania Type 17HP4A is identical to Type 17HP4 except for having a frosted faceplate.

## 17HP4B

The Sylvania Type 17HP4B is identical to Type 17HP4 except for having an aluminized screen.

## 17RP4

The Sylvania Type 17RP4 is identical to Type 17HP4.

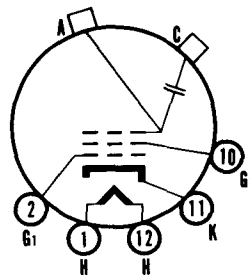
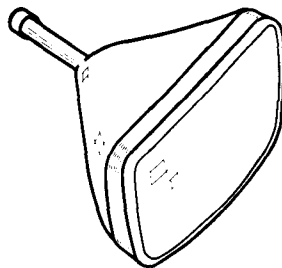
## WARNING

X-ray radiation shielding may be necessary to protect against possible danger of personal injury from prolonged exposure at close range if this tube is operated at higher than the manufacturer's Maximum Rated Anode Voltage or 16,000 volts, whichever is less.

# SYLVANIA TYPE 17JP4

## TELEVISION PICTURE TUBE

17" Direct Viewed	Magnetic Deflection
Rectangular Glass Type	Magnetic Focus
Gray Filter Glass	Spherical Faceplate
External Conductive Coating	Single Field Ion Trap



12-N

# 17JP4 (Cont'd)

## CHARACTERISTICS

### GENERAL DATA

Focusing Method.....	Magnetic
Deflecting Method.....	Magnetic
Deflecting Angle.....	
Horizontal.....	65 Degrees
Diagonal.....	70 Degrees
Phosphor.....	P4
Fluorescence.....	White
Persistence.....	Medium
Faceplate.....	Gray Filter Glass
Light Transmittance (approx.).....	66 Percent

### ELECTRICAL DATA

Heater Voltage.....	6.3 Volts
Heater Current (approx.).....	0.6 Ampere
Direct Interelectrode Capacitances (approx.).....	
Cathode to All Other Electrodes.....	5 $\mu\text{mf}$
Grid No. 1 to All Other Electrodes.....	6 $\mu\text{mf}$
External Conductive Coating to Anode <sup>1</sup> .....	750 $\mu\text{mf}$ Max
	500 $\mu\text{mf}$ Min
Ion Trap Magnet.....	External, Single Field Type

### MECHANICAL DATA

Minimum Useful Screen Dimensions.....	14 $\frac{1}{4}$ x 10 $\frac{3}{4}$ Inches
Bulb Contact (Recessed Small Cavity Cap).....	J1-21
Base (Small Shell Duodecal 5-Pin).....	B5-57
Basing.....	12N

## RATINGS

### MAXIMUM RATINGS (Design Center Values)

Anode Voltage.....	18000 Volts d c
Grid No. 2 Voltage.....	410 Volts d c
Grid No. 1 Voltage.....	
Negative Bias Value.....	125 Volts d c
Positive Bias Value.....	0 Volts d c
Positive Peak Value.....	2 Volts
Peak Heater-Cathode Voltage.....	
Heater Negative with Respect to Cathode.....	
During Warm-up Period Not to Exceed 15 Seconds.....	410 Volts
After Equipment Warm-up Period.....	150 Volts
Heater Positive with Respect to Cathode.....	150 Volts

### RECOMMENDED OPERATING CONDITIONS

Anode Voltage.....	16000 Volts d c
Grid No. 2 Voltage.....	300 Volts d c
Grid No. 1 Voltage Required for Cutoff <sup>2</sup> .....	-33 to -77 Volts d c
Focusing Coil Current (approx.) <sup>3</sup> .....	100 Ma d c
Ion Trap Magnet Field Strength (approx.).....	35 Gauss

### CIRCUIT VALUES

Grid No. 1 Circuit Resistance.....	1.5 Megohms Max
------------------------------------	-----------------

### NOTES:

1. External conductive coating must be grounded.
2. Visual extinction of undeflected focused spot.
3. For JETEC focusing coil 109 or equivalent three inches from reference line, bias adjusted to 20 foot lamberts on a 10 $\frac{3}{4}$  x 14 $\frac{1}{4}$  inch picture area.

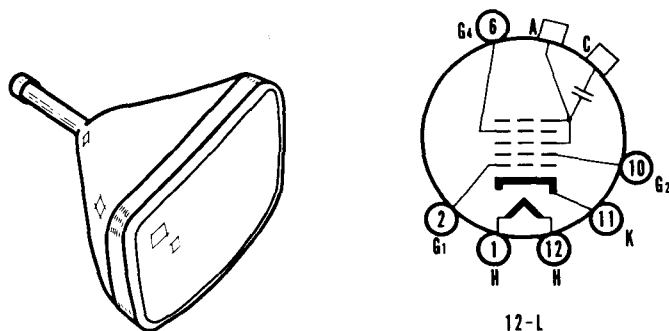
### WARNING

X-ray radiation shielding may be necessary to protect against possible danger of personal injury from prolonged exposure at close range if this tube is operated at higher than the manufacturer's Maximum Rated Anode Voltage or 16,000 volts, whichever is less.

**SYLVANIA TYPE 17LP4/17VP4**  
**Silver Screen "85" → 17LP4A**

**TELEVISION PICTURE TUBE**

17" Direct Viewed	Magnetic Deflection
Rectangular Glass Type	Electrostatic Focus
Gray Filter Glass	Cylindrical Faceplate
External Conductive Coating	Single Field Ion Trap
17LP4A has an Aluminized Screen	



**CHARACTERISTICS**

**GENERAL DATA**

Focusing Method .....	Electrostatic
Deflecting Method .....	Magnetic
Deflecting Angle (approx.)	
Horizontal .....	65 Degrees
Diagonal .....	70 Degrees
Phosphor .....	P4
Fluorescence .....	White
Persistence .....	Medium
Faceplate .....	Gray Filter Glass
Light Transmittance (approx.) .....	72 Percent

**ELECTRICAL DATA**

Heater Voltage .....	6.3 Volts
Heater Current (approx.) .....	0.6 Amperes
Direct Interelectrode Capacitances (approx.)	
Cathode to All Other Electrodes .....	5 $\mu\mu\text{f}$
Grid No. 1 to All Other Electrodes .....	6 $\mu\mu\text{f}$
External Conductive Coating to Anode .....	1500 $\mu\mu\text{f}$ Max
Ion Trap Magnet .....	750 $\mu\mu\text{f}$ Min
	External, Single Field Type

**MECHANICAL DATA**

Minimum Useful Screen Dimensions .....	10 $\frac{3}{4}$ x 14 $\frac{1}{4}$ Inches
Bulb Contact (Recessed Small Cavity Cap) .....	J1-21
Base (Small Shell Duodecal 6-Pin) .....	B6-63
Basing .....	12L

**RATINGS**

**MAXIMUM RATINGS (Design Center Values)**

Anode Voltage .....	16000 Volts d c
Grid No. 4 (Focusing Electrode) Voltage .....	-500 to +1000 Volts d c
Grid No. 2 Voltage .....	500 Volts d c
Grid No. 1 Voltage .....	
Negative Bias Value .....	125 Volts d c
Positive Bias Value .....	0 Volts d c
Positive Peak Value .....	2 Volts
Peak Heater-Cathode Voltage .....	
Heater Negative with Respect to Cathode	
During Warm-up Period Not to	
Exceed 15 Seconds .....	410 Volts
After Equipment Warm-up Period .....	180 Volts
Heater Positive with Respect to Cathode .....	180 Volts

# 17LP4/17VP4, 17LP4A (Cont'd)

## RECOMMENDED OPERATING CONDITIONS

Anode Voltage.....	14000	Volts d c
Grid No. 4 Voltage.....	-56 to +310	Volts d c
Grid No. 2 Voltage.....	300	Volts d c
Grid No. 1 Voltage Required for Cutoff.....	-28 to -72	Volts d c
Ion Trap Magnet Strength (approx.).....	30	Gausses

## CIRCUIT VALUES

Grid No. 1 Circuit Resistance.....	1.5	Megohms
		Max

## NOTES:

1. External conductive coating must be grounded.
2. Visual extinction of focused raster. Extinction of stationary focused spot will require that these values be about 5 volts more negative.

## 17LP4A

The Sylvania Type 17LP4A is identical to the Type 17LP4 except for having an aluminized screen.

## 17VP4

The Sylvania Type 17VP4 is identical to Type 17LP4.

## WARNING

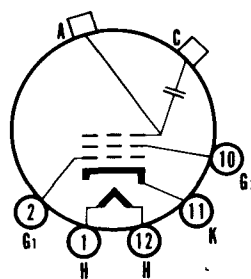
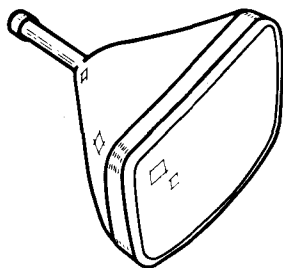
X-ray radiation shielding may be necessary to protect against possible danger of personal injury from prolonged exposure at close range if this tube is operated at higher than the manufacturer's Maximum Rated Anode Voltage or 16,000 volts, whichever is less.

# SYLVANIA TYPE 17QP4 17QP4A

## TELEVISION PICTURE TUBE

17" Direct Viewed	Magnetic Deflection
Rectangular Glass Type	Magnetic Focus
Gray Filter Glass	Cylindrical Faceplate
External Conductive Coating	Single Field Ion Trap

17QP4A has an Aluminized Screen



12-N

# 17QP4, 17QP4A (Cont'd)

## CHARACTERISTICS

### GENERAL DATA

Focusing Method.....	Magnetic
Deflecting Method.....	Magnetic
Deflecting Angle (approx.)	
Horizontal.....	65 Degrees
Diagonal.....	70 Degrees
Phosphor.....	P4
Fluorescence.....	White
Persistence.....	Medium
Faceplate.....	Gray Filter Glass
Light Transmittance (approx.).....	72 Percent

### ELECTRICAL DATA

Heater Voltage.....	6.3 Volts
Heater Current (approx.).....	0.6 Ampere
Direct Interelectrode Capacitances (approx.)	
Cathode to All Other Electrodes.....	5 $\mu\text{f}$
Grid No. 1 to All Other Electrodes.....	6 $\mu\text{f}$
External Conductive Coating to Anode.....	1500 $\mu\text{f}$ Max
Ion Trap Magnet.....	750 $\mu\text{f}$ Min
Ion Trap Magnet.....	External, Single Field Type

### MECHANICAL DATA

Minimum Useful Screen Dimensions.....	10 $\frac{3}{4}$ x 14 $\frac{1}{4}$ Inches
Bulb Contact (Recessed Small Cavity Cap).....	J1-21
Base (Small Shell Duodecal 5-Pin).....	B5-57
Basing.....	12N

## RATINGS

### MAXIMUM RATINGS (Design Center Values)

Anode Voltage.....	16000 Volts d c
Grid No. 2 Voltage.....	500 Volts d c
Grid No. 1 Voltage	
Negative Bias Value.....	125 Volts d c
Positive Bias Value.....	0 Volts d c
Positive Peak Value.....	2 Volts
Peak Heater-Cathode Voltage	
Heater Negative with Respect to Cathode	
During Warm-up Period Not to	
Exceed 15 Seconds.....	410 Volts
After Equipment Warm-up Period.....	150 Volts
Heater Positive with Respect to Cathode.....	150 Volts

### RECOMMENDED OPERATING CONDITIONS

Anode Voltage.....	14000 Volts d c
Grid No. 2 Voltage.....	300 Volts d c
Grid No. 1 Voltage Required for Cutoff.....	-28 to -72 Volts d c
Focusing Coil Current (approx.).....	95 Ma d c
Ion Trap Magnet Strength (approx.).....	30 Gauss

### CIRCUIT VALUES

Grid No. 1 Circuit Resistance.....	1.5 Megohms
	Max

### NOTES:

1. External conductive coating must be grounded.
2. Visual extinction of focused raster. Extinction of stationary focused spot will require that these values be about 5 volts more negative.
3. For JETEC focusing coil 109 or equivalent three inches from reference line, bias adjusted to 20 foot lamberts on a 10 $\frac{3}{4}$  x 14 $\frac{1}{4}$  inch picture area.

### 17QP4A

The Sylvania Type 17QP4A is identical to the Type 17QP4 except for having an aluminized screen, and a maximum anode voltage rating of 18,000 volts instead of 16,000 volts.

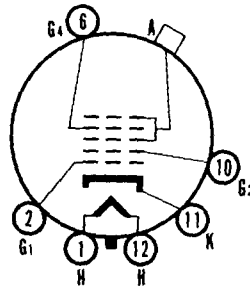
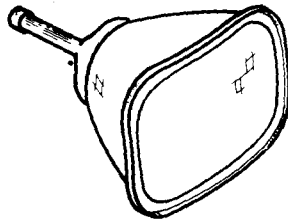
### WARNING

X-ray radiation shielding may be necessary to protect against possible danger of personal injury from prolonged exposure at close range if this tube is operated at higher than the manufacturer's Maximum Rated Anode Voltage or 16,000 volts, whichever is less.

# SYLVANIA TYPE 17TP4

## TELEVISION PICTURE TUBE

17" Direct Viewed                      Magnetic Deflection  
 Rectangular Metal Type              Electrostatic Focus  
 Frosted Gray Filter Glass          Spherical Faceplate  
 Single Field Ion Trap



12-M

## CHARACTERISTICS

### GENERAL DATA

Focusing Method.....	Electrostatic
Deflecting Method.....	Magnetic
Deflecting Angle (approx.)	
Horizontal.....	66 Degrees
Diagonal.....	70 Degrees
Phosphor.....	P4
Fluorescence.....	White
Persistence.....	Medium
Faceplate.....	Frosted Gray Filter Glass
Light Transmittance (approx.).....	66 Percent

### ELECTRICAL DATA

Heater Voltage.....	6.3 Volts
Heater Current (approx.).....	0.6 Ampere
Direct Interelectrode Capacitances (approx.)	
Cathode to All Other Electrodes.....	5 $\mu\mu\text{f}$
Grid No. 1 to All Other Electrodes.....	6 $\mu\mu\text{f}$
Ion Trap Magnet.....	External, Single Field Type

### MECHANICAL DATA

Minimum Useful Screen Dimensions.....	14 $\frac{3}{8}$ x 10 $\frac{1}{16}$ Inches
Bulb Contact.....	Metal Cone Lip
Base (Small Shell Duodecal 6-Pin).....	B6-63
Basing.....	12M

## RATINGS

### MAXIMUM RATINGS (Design Center Values)

Anode Voltage.....	16000 Volts d c
Grid No. 4 Voltage (Focusing Voltage).....	-500 to +1000 Volts d c
Grid No. 2 Voltage.....	500 Volts d c
Grid No. 1 Voltage	
Negative Bias Value.....	125 Volts d c
Positive Bias Value.....	0 Volts d c
Positive Peak Value.....	2 Volts
Peak Heater-Cathode Voltage	
Heater Negative with Respect to Cathode	
During Warm-up Period Not to	
Exceed 15 Seconds.....	410 Volts
After Equipment Warm-up Period.....	180 Volts
Heater Positive with Respect to Cathode.....	180 Volts

### RECOMMENDED OPERATING CONDITIONS

Anode Voltage.....	14000 Volts d c
Grid No. 4 Voltage.....	-55 to +300 Volts d c
Grid No. 2 Voltage.....	300 Volts d c
Grid No. 1 Voltage Required for Cutoff!.....	-33 to -77 Volts d c
Ion Trap Magnet Strength (approx.).....	45 Gauss

# 17TP4 (Cont'd)

## CIRCUIT VALUES

Grid No. 1 Circuit Resistance..... 1.5 Megohms  
Max

## NOTE:

1. Visual extinction of undeflected focused spot.

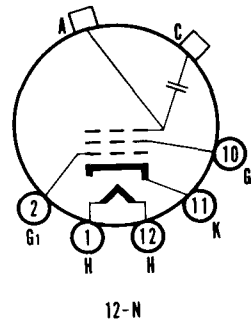
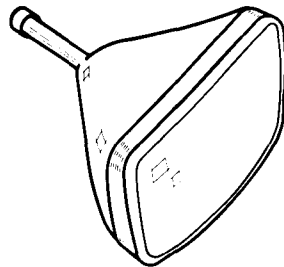
## WARNING

X-ray radiation shielding may be necessary to protect against possible danger of personal injury from prolonged exposure at close range if this tube is operated at higher than the manufacturer's Maximum Rated Anode Voltage or 16,000 volts, whichever is less.

## SYLVANIA TYPE 17YP4

### TELEVISION PICTURE TUBE

17" Direct Viewed	Magnetic Deflection
Rectangular Glass Type	Magnetic Focus
Gray Filter Glass	Cylindrical Faceplate
External Conductive Coating	Single Field Ion Trap



### CHARACTERISTICS

#### GENERAL DATA

Focusing Method.....	Magnetic
Deflecting Method.....	Magnetic
Deflecting Angle (approx.)	
Horizontal.....	65 Degrees
Diagonal.....	70 Degrees
Phosphor.....	P4
Fluorescence.....	White
Persistence.....	Medium
Faceplate.....	Gray Filter Glass
Light Transmittance (approx.).....	72 Percent

#### ELECTRICAL DATA

Heater Voltage.....	6.3 Volts
Heater Current (approx.).....	0.6 Ampere
Direct Interelectrode Capacitances (approx.)	
Cathode to All Other Electrodes.....	5 $\mu\text{mf}$
Grid No. 1 to All Other Electrodes.....	6 $\mu\text{mf}$
External Conductive Coating to Anode <sup>1</sup> .....	750 $\mu\text{mf}$ Max
	500 $\mu\text{mf}$ Min
Ion Trap Magnet.....	External, Single Field Type

#### MECHANICAL DATA

Minimum Useful Screen Dimensions.....	10 $\frac{3}{4}$ x 14 $\frac{1}{4}$ Inches
Bulb Contact (Recessed Small Cavity Cap).....	J1-21
Base (Small Shell Duodecal 5-Pin).....	B5-57
Basing.....	12N

# 17YP4 (Cont'd)

## RATINGS

### MAXIMUM RATINGS (Design Center Values)

Anode Voltage.....	18000 Volts d c
Grid No. 2 Voltage.....	500 Volts d c
Grid No. 1 Voltage.....	
Negative Bias Value.....	125 Volts d c
Positive Bias Value.....	0 Volts d c
Positive Peak Value.....	2 Volts
Peak Heater-Cathode Voltage.....	
Heater Negative with Respect to Cathode	
During Warm-up Period Not to	
Exceed 15 Seconds.....	410 Volts
After Equipment Warm-up Period.....	150 Volts
Heater Positive with Respect to Cathode.....	150 Volts

### RECOMMENDED OPERATING CONDITIONS

Anode Voltage.....	16000 Volts d c
Grid No. 2 Voltage.....	300 Volts d c
Grid No. 1 Voltage Required for Cutoff <sup>2</sup> .....	-33 to -77 Volts d c
Focusing Coil Current (approx.) <sup>3</sup> .....	100 Ma d c
Ion Trap Magnet Strength (approx.).....	35 Gauss

### CIRCUIT VALUES

Grid No. 1 Circuit Resistance.....	1.5 Megohms
	Max

### NOTES:

1. External conductive coating must be grounded.
2. Visual extinction of undeflected focused spot.
3. For JETEC focusing coil 109 or equivalent three inches from reference line, bias adjusted to 20 foot lamberts on a 10 $\frac{3}{4}$  x 14 $\frac{1}{4}$  inch picture area.

### WARNING

X-ray radiation shielding may be necessary to protect against possible danger of personal injury from prolonged exposure at close range if this tube is operated at higher than the manufacturer's Maximum Rated Anode Voltage or 16,000 volts, whichever is less.



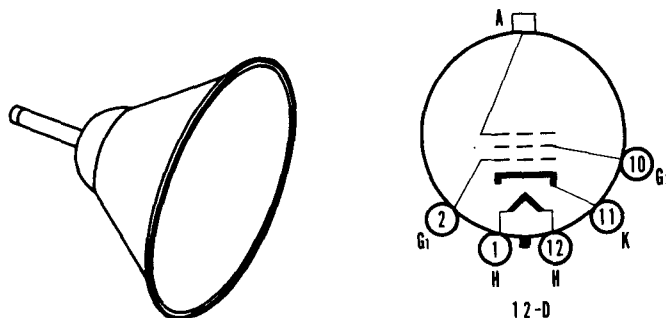
**SYLVANIA TYPE 19AP4  
19AP4A  
19AP4B  
19AP4C  
19AP4D**

**TELEVISION PICTURE TUBE**

19" Direct Viewed                      Magnetic Deflection  
Round Metal Type                      Magnetic Focus  
Clear Faceplate                      Spherical Faceplate

Single Field Ion Trap

19AP4A has a Gray Filter Glass Faceplate  
19AP4B has a Frosted Gray Filter Glass Faceplate  
19AP4C has a Frosted Gray Filter Glass Faceplate  
and an Aluminized Screen  
19AP4D has a Frosted Faceplate



**CHARACTERISTICS**

**GENERAL DATA**

Focusing Method.....	Magnetic
Deflecting Method.....	Magnetic
Deflecting Angle (approx.).....	66 Degrees
Phosphor.....	P4
Fluorescence.....	White
Persistence.....	Medium
Faceplate.....	Clear

**ELECTRICAL DATA**

Heater Voltage.....	6.3 Volts
Heater Current (approx.).....	0.6 Ampere
Direct Interelectrode Capacitances (approx.)	
Cathode to All Other Electrodes.....	5 $\mu$ f
Grid No. 1 to All Other Electrodes.....	7 $\mu$ f
Ion Trap Magnet.....	External, Single Field Type

**MECHANICAL DATA**

Minimum Useful Screen Diameter.....	17 $\frac{3}{8}$ Inches
Bulb Contact.....	Metal Cone Lip
Base (Small Shell Duodecal 5-Pin).....	B5-57
Basing.....	12D

# 19AP4, 19AP4A, 19AP4B, 19AP4C, 19AP4D (Cont'd)

## RATINGS

### MAXIMUM RATINGS (Design Center Values)

Anode Voltage.....	19000	Volts d c
Grid No. 2 Voltage.....	410	Volts d c
Grid No. 1 Voltage		
Negative Bias Value.....	125	Volts d c
Positive Bias Value.....	0	Volts d c
Positive Peak Value.....	2	Volts
Peak Heater-Cathode Voltage		
Heater Negative with Respect to Cathode		
During Warm-up Period Not to		
Exceed 15 Seconds.....	410	Volts
After Equipment Warm-up Period.....	150	Volts
Heater Positive with Respect to Cathode.....	150	Volts

### RECOMMENDED OPERATING CONDITIONS

Anode Voltage.....	14000	Volts d c
Grid No. 2 Voltage.....	300	Volts d c
Grid No. 1 Voltage Required for Cutoff.....	-33 to -77	Volts d c
Focusing Coil Current (approx.) <sup>2</sup> .....	115	Ma d c
Ion Trap Magnet Strength (approx.).....	35	Gausses

### CIRCUIT VALUES

Grid No. 1 Circuit Resistance.....	1.5	Megohms
		Max

### NOTES:

1. Visual extinction of undeflected focused spot.
2. For JETEC focusing coil 106 or equivalent three inches from reference line, bias adjusted to 20 foot lamberts on a 15 $\frac{1}{2}$  x 11 $\frac{3}{4}$  inch picture area.

### 19AP4A

The Sylvania Type 19AP4A is identical to the Type 19AP4 except for having a gray filter glass faceplate.

### 19AP4B

The Sylvania Type 19AP4B is identical to the Type 19AP4 except for having a frosted gray filter glass faceplate.

### 19AP4C

The Sylvania Type 19AP4C is identical to the Type 19AP4 except for having a frosted gray filter glass faceplate and an aluminized screen.

### 19AP4D

The Sylvania Type 19AP4D is identical to the Type 19AP4 except for having a frosted faceplate.

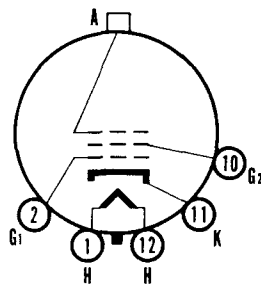
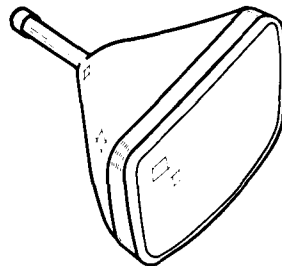
### WARNING

X-ray radiation shielding may be necessary to protect against possible danger of personal injury from prolonged exposure at close range if this tube is operated at higher than the manufacturer's Maximum Rated Anode Voltage or 16,000 volts, whichever is less.

**SYLVANIA TYPE 20CP4**  
**20CP4A**  
**Silver Screen "85" → 20CP4B**  
**20CP4C**  
**Silver Screen "85" → 20CP4D**

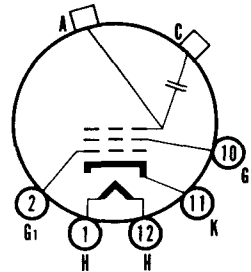
**TELEVISION PICTURE TUBE**

20" Direct Viewed                      Magnetic Deflection  
 Rectangular Glass Type              Magnetic Focus  
 Gray Filter Glass                      Spherical Faceplate  
    Single Field Ion Trap  
 20CP4A has an External Conductive Coating  
 20CP4B has an Aluminized Screen  
 20CP4C has a Frosted Faceplate  
 20CP4D has an External Conductive Coating and  
    an Aluminized Screen



12-D

20CP4  
 20CP4B  
 20CP4C



12-N

20CP4A  
 20CP4D

**CHARACTERISTICS**

**GENERAL DATA**

Focusing Method.....	Magnetic
Deflecting Method.....	Magnetic
Deflecting Angle (approx.).....	
Horizontal.....	66 Degrees
Diagonal.....	70 Degrees
Phosphor.....	P4
Fluorescence.....	White
Persistence.....	Medium
Faceplate.....	Gray Filter Glass
Light Transmittance (approx.).....	73 Percent

# 20CP4, 20CP4A, 20CP4B 20CP4C, 20CP4D (Cont'd)

## ELECTRICAL DATA

Heater Voltage.....	6.3 Volts
Heater Current (approx.).....	0.6 Ampere
Direct Interelectrode Capacitances (approx.)	
Cathode to All Other Electrodes.....	5 $\mu\text{mf}$
Grid No. 1 to All Other Electrodes.....	6 $\mu\text{mf}$
Ion Trap Magnet.....	External, Single Field Type

## MECHANICAL DATA

Minimum Useful Screen Dimensions.....	12 $\frac{3}{4}$ x 17 Inches
Bulb Contact (Recessed Small Cavity Cap).....	J1-21
Base (Small Shell Duodecal 5-Pin).....	B5-57
Basing.....	12D

## RATINGS

### MAXIMUM RATINGS (Design Center Values)

Anode Voltage.....	18000 Volts d c
Grid No. 2 Voltage.....	410 Volts d c
Grid No. 1 Voltage.....	
Negative Bias Value.....	125 Volts d c
Positive Bias Value.....	0 Volts d c
Positive Peak Value.....	2 Volts
Heater Negative with Respect to Cathode	
During Warm-up Period Not to	
Exceed 15 Seconds.....	410 Volts
After Equipment Warm-up Period.....	150 Volts
Heater Positive with Respect to Cathode.....	150 Volts

### RECOMMENDED OPERATING CONDITIONS

Anode Voltage.....	16,000 Volts d c
Grid No. 2 Voltage.....	300 Volts d c
Grid No. 1 Voltage Required for Cutoff <sup>1</sup> .....	-33 to -77 Volts d c
Focusing Coil Current (approx.) <sup>2</sup> .....	110 Ma d c
Ion Trap Magnet Strength (approx.).....	35 Gauss

### CIRCUIT VALUES

Grid No. 1 Circuit Resistance.....	1.5 Megohms Max
------------------------------------	--------------------

### NOTES:

1. Visual extinction of undeflected focused spot.
2. For JETEC focusing coil 109 or equivalent three inches from reference line, bias adjusted to 20 foot lamberts on a 12 $\frac{3}{4}$  x 17 inch picture area.

## 20CP4A

The Sylvania Type 20CP4A is identical to the Type 20CP4 except for having an external conductive coating which must be grounded.

External Conductive Coating to Anode Capacitance	
Maximum.....	750 $\mu\text{mf}$
Minimum.....	500 $\mu\text{mf}$
Basing.....	12N

## 20CP4B

The Sylvania Type 20CP4B is identical to the Type 20CP4 except for having an aluminized screen.

## 20CP4C

The Sylvania Type 20CP4C is identical to the Type 20CP4 except for having a frosted faceplate.

## 20CP4D

The Sylvania Type 20CP4D is identical to the Type 20CP4 except for having an external conductive coating which must be grounded, and an aluminized screen.

External Conductive Coating to Anode Capacitance	
Maximum.....	750 $\mu\text{mf}$
Minimum.....	500 $\mu\text{mf}$
Basing.....	12N

## WARNING

X-ray radiation shielding may be necessary to protect against possible danger of personal injury from prolonged exposure at close range if this tube is operated at higher than the manufacturer's Maximum Rated Anode Voltage or 16,000 volts, whichever is less.

**SYLVANIA TYPE 20DP4**  
**20DP4A**  
**Silver Screen "85" → 20DP4B**  
**Silver Screen "85" → 20DP4C**

**TELEVISION PICTURE TUBE**

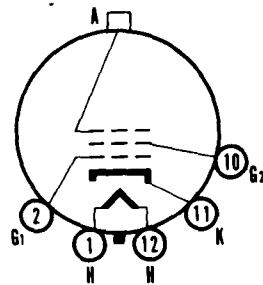
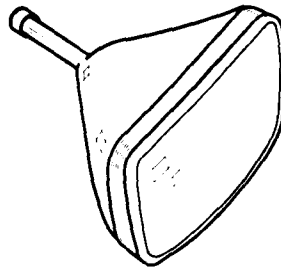
20" Direct Viewed                      Magnetic Deflection  
 Rectangular Glass Type              Magnetic Focus  
 Gray Filter Glass                      Spherical Faceplate

Single Field Ion Trap

20DP4A has an External Conductive Coating

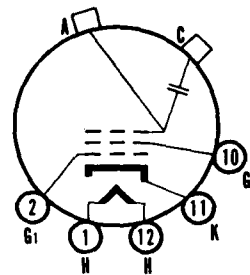
20DP4B has an Aluminized Screen

20DP4C has an External Conductive Coating and  
 an Aluminized Screen



12-D

20DP4  
 20DP4B



12-N

20DP4A  
 20DP4C

**CHARACTERISTICS**

**GENERAL DATA**

Focusing Method.....	Magnetic
Deflecting Method.....	Magnetic
Deflecting Angle (approx.)	
Horizontal.....	66 Degrees
Diagonal.....	70 Degrees
Phosphor.....	P4
Fluorescence.....	White
Persistence.....	Medium
Faceplate.....	Gray Filter Glass
Light Transmittance (approx.).....	73 Percent

# 20DP4, 20DP4A, 20DP4B, 20DP4C (Cont'd)

## ELECTRICAL DATA

Heater Voltage.....	6.3 Volts
Heater Current (approx.).....	0.6 Ampere
Direct Interelectrode Capacitances (approx.)	
Cathode to All Other Electrodes.....	5 $\mu\text{f}$
Grid No. 1 to All Other Electrodes.....	6 $\mu\text{f}$
Ion Trap Magnet.....	External, Single Field Type

## MECHANICAL DATA

Minimum Useful Screen Dimensions.....	12 $\frac{3}{4}$ x 17 Inches
Bulb Contact (Recessed Small Cavity Cap).....	J1-21
Base (Small Shell Duodecal 5-Pin).....	B5-57
Basing.....	12D

## RATINGS

### MAXIMUM RATINGS (Design Center Values)

Anode Voltage.....	18000 Volts d c
Grid No. 2 Voltage.....	410 Volts d c
Grid No. 1 Voltage.....	
Negative Bias Value.....	125 Volts d c
Positive Bias Value.....	0 Volts d c
Positive Peak Value.....	2 Volts
Peak Heater-Cathode Voltage	
Heater Negative with Respect to Cathode	
During Warm-up Period Not to	
Exceed 15 Seconds.....	410 Volts
After Equipment Warm-up Period.....	180 Volts
Heater Positive with Respect to Cathode.....	180 Volts

### RECOMMENDED OPERATING CONDITIONS

Anode Voltage.....	16000 Volts d c
Grid No. 2 Voltage.....	300 Volts d c
Grid No. 1 Voltage Required for Cutoff.....	-28 to -72 Volts d c
Focusing Coil Current (approx.) <sup>2</sup> .....	95 Ma d c
Ion Trap Magnet Strength (approx.).....	35 Gauss

### CIRCUIT VALUES

Grid No. 1 Resistance.....	1.5 Megohms
	Max

### NOTES:

1. Visual extinction of focused raster. Extinction of stationary focused spot will require that these values be about 5 volts more negative.
2. For JETEC focusing coil 109 or equivalent three inches from reference line, bias adjusted to 20 foot lamberts on a 12 $\frac{3}{4}$  x 17 inch picture area.

## 20DP4A

The Sylvania Type 20DP4A is identical to Type 20DP4 except for the addition of an External Conductive Coating which must be grounded.

External Conductive Coating to Anode Capacitance	
Maximum.....	750 $\mu\text{f}$
Minimum.....	500 $\mu\text{f}$
Basing.....	12N

## 20DP4B

The Sylvania Type 20DP4B is identical to Type 20DP4 except for having an aluminized screen.

## 20DP4C

The Sylvania Type 20DP4C is identical to Type 20DP4 except for the addition of an External Conductive Coating which must be grounded, and an aluminized screen.

External Conductive Coating to Anode Capacitance	
Maximum.....	750 $\mu\text{f}$
Minimum.....	500 $\mu\text{f}$
Basing.....	12N

### WARNING

X-ray radiation shielding may be necessary to protect against possible danger of personal injury from prolonged exposure at close range if this tube is operated at higher than the manufacturer's Maximum Anode Rated Voltage or 16,000 volts, whichever is less.

SYLVANIA TYPE 20HP4  
20HP4A/20LP4  
20HP4B

Silver Screen "85" → 20HP4C

Silver Screen "85" → 20HP4D

TELEVISION PICTURE TUBE

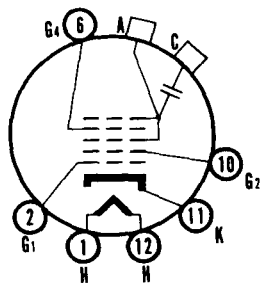
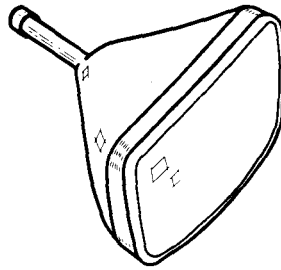
20" Direct Viewed                      Magnetic Deflection  
Rectangular Glass Type              Electrostatic Focus  
Gray Filter Glass                      Spherical Faceplate  
Single Field Ion Trap

20HP4A has an External Conductive Coating

20HP4B has a Frosted Faceplate

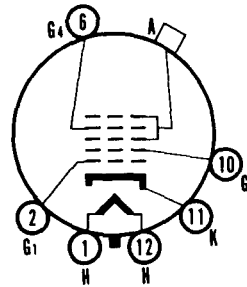
20HP4C has an Aluminized Screen

20HP4D has an External Conductive Coating and  
an Aluminized Screen



12-L

20HP4A/20LP4  
20HP4D



12-M

20HP4  
20HP4B  
20HP4C

CHARACTERISTICS

GENERAL DATA

Focusing Method.....	Electrostatic
Deflecting Method.....	Magnetic
Deflecting Angle (approx.).....	
Horizontal.....	66 Degrees
Diagonal.....	70 Degrees
Phosphor.....	P4
Fluorescence.....	White
Persistence.....	Medium
Faceplate.....	Gray Filter Glass
Light Transmittance (approx.).....	73 Percent

# 20HP4, 20HP4A/20LP4, 20HP4B, 20HP4C, 20HP4D (Cont'd)

## ELECTRICAL DATA

Heater Voltage.....	6.3 Volts
Heater Current (approx.).....	0.6 Amperes
Direct Interelectrode Capacitances (approx.)	
Cathode to All Other Electrodes.....	5 $\mu\mu\text{f}$
Grid No. 1 to All Other Electrodes.....	6 $\mu\mu\text{f}$
Ion Trap Magnet.....	External, Single Field Type

## MECHANICAL DATA

Minimum Useful Screen Dimensions.....	12 $\frac{3}{4}$ x 17 Inches
Bulb Contact (Recessed Small Cavity Cap).....	J1-21
Base (Small Shell Duodecal 6-Pin).....	B6-63
Basing.....	12M

## RATINGS

### MAXIMUM RATINGS (Design Center Values)

Anode Voltage.....	16000 Volts d c
Grid No. 4 (Focusing Electrode) Voltage.....	-500 to +1000 Volts d c
Grid No. 2 Voltage.....	500 Volts d c
Grid No. 1 Voltage	
Negative Bias Value.....	125 Volts d c
Positive Bias Value.....	0 Volts d c
Positive Peak Value.....	2 Volts
Peak Heater-Cathode Voltage	
Heater Negative with Respect to Cathode	
During Warm-up Period Not to	
Exceed 15 Seconds.....	410 Volts
After Equipment Warm-up Period.....	180 Volts
Heater Positive with Respect to Cathode.....	180 Volts

### RECOMMENDED OPERATING CONDITIONS

Anode Voltage.....	14000 Volts d c
Grid No. 4 Voltage.....	-56 to +310 Volts d c
Grid No. 2 Voltage.....	300 Volts d c
Grid No. 1 Voltage Required for Cutoff.....	-28 to -72 Volts d c
Ion Trap Magnet Strength (approx.).....	30 Gausses

### CIRCUIT VALUES

Grid No. 1 Circuit Resistance.....	1.5 Megohms Max
------------------------------------	--------------------

### NOTE:

1. Visual extinction of focused raster. Extinction of stationary focused spot will require that these values be about 5 volts more negative.

## 20HP4A/20LP4

The Sylvania Type 20HP4A is identical to Type 20HP4 except for having an external conductive coating which must be grounded. The Sylvania Type 20LP4 is identical to the Sylvania Type 20HP4A.

External Conductive Coating to Anode Capacitance	
Maximum.....	1500 $\mu\mu\text{f}$
Minimum.....	750 $\mu\mu\text{f}$
Basing.....	12L

## 20HP4B

The Sylvania Type 20HP4B is identical to Type 20HP4 except for having a frosted faceplate.

## 20HP4C

The Sylvania Type 20HP4C is identical to Type 20HP4 except for having an aluminized screen.

## 20HP4D

The Sylvania Type 20HP4D is identical to the Type 20HP4 except for having an external conductive coating which must be grounded, and an aluminized screen.

External Conductive Coating to Anode Capacitance	
Maximum.....	1500 $\mu\mu\text{f}$
Minimum.....	750 $\mu\mu\text{f}$
Basing.....	12L

### WARNING

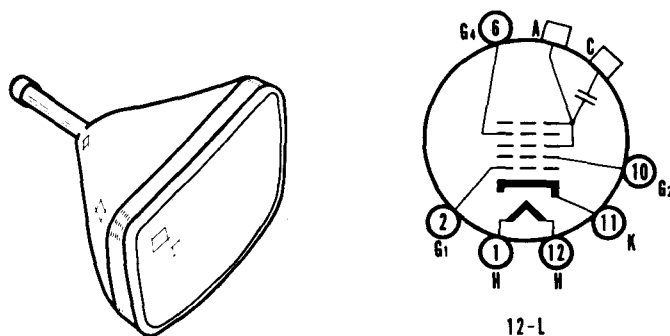
X-ray radiation shielding may be necessary to protect against possible danger of personal injury from prolonged exposure at close range if this tube is operated at higher than the manufacturer's Maximum Rated Anode Voltage or 16,000 volts, whichever is less.



# SYLVANIA TYPE 20MP4

## TELEVISION PICTURE TUBE

20" Direct Viewed	Magnetic Deflection
Rectangular Glass Type	Electrostatic Focus
Gray Filter Glass	Spherical Faceplate
External Conductive Coating	Single Field Ion Trap



## CHARACTERISTICS

### GENERAL DATA

Focusing Method.....	Electrostatic
Deflecting Method.....	Magnetic
Deflecting Angle (approx.)	
Horizontal.....	66 Degrees
Diagonal.....	70 Degrees
Phosphor.....	P4
Fluorescence.....	White
Persistence.....	Medium
Faceplate.....	Gray Filter Glass
Light Transmittance (approx.).....	66 Percent

### ELECTRICAL DATA

Heater Voltage.....	6.3 Volts
Heater Current (approx.).....	0.6 Ampere
Direct Interelectrode Capacitances (approx.)	
Cathode to All Other Electrodes.....	5 $\mu\mu\text{f}$
Grid No. 1 to All Other Electrodes.....	6 $\mu\mu\text{f}$
External Conductive Coating to Anode <sup>1</sup> .....	750 $\mu\mu\text{f}$ Max 500 $\mu\mu\text{f}$ Min
Ion Trap Magnet.....	External, Single Field Type

### MECHANICAL DATA

Minimum Useful Screen Dimensions.....	12 $\frac{3}{4}$ x 17 Inches
Bulb Contact (Recessed Small Cavity Cap).....	J1-21
Base (Small Shell Duodecal 6-Pin).....	B6-63
Basing.....	12L

## RATINGS

### MAXIMUM RATINGS (Design Center Values)

Anode Voltage.....	16000 Volts d c
Grid No. 4 Voltage (Focusing Voltage).....	-500 to +1000 Volts d c
Grid No. 2 Voltage.....	500 Volts d c
Grid No. 1 Voltage.....	
Negative Bias Value.....	125 Volts d c
Positive Bias Value.....	0 Volts d c
Positive Peak Value.....	2 Volts
Peak Heater-Cathode Voltage	
Heater Negative with Respect to Cathode	
During Warm-up Period Not to	
Exceed 15 Seconds.....	410 Volts
After Equipment Warm-up Period.....	180 Volts
Heater Positive with Respect to Cathode.....	180 Volts

### RECOMMENDED OPERATING CONDITIONS

Anode Voltage.....	14000 Volts d c
Grid No. 4 Voltage.....	-55 to +300 Volts d c
Grid No. 2 Voltage.....	300 Volts d c
Grid No. 1 Voltage Required for Cutoff <sup>2</sup> .....	-33 to -77 Volts d c
Ion Trap Magnet Strength (approx.).....	45 Gauss

# 20MP4 (Cont'd)

## CIRCUIT VALUES

Grid No. 1 Circuit Resistance..... 1.5 Megohms  
Max

## NOTES:

1. External conductive coating must be grounded.
2. Visual extinction of undeflected focused spot.

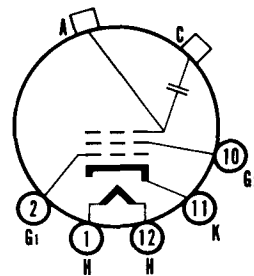
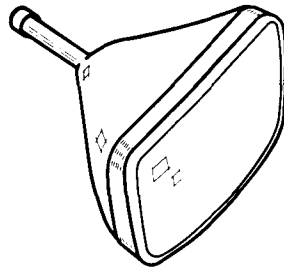
## WARNING

X-ray radiation shielding may be necessary to protect against possible danger of personal injury from prolonged exposure at close range if this tube is operated at higher than the manufacturer's Maximum Rated Anode Voltage or 16,000 volts, whichever is less.

## SYLVANIA TYPE 21ACP4/21AMP4 Silver Screen "85" → 21ACP4A/21AMP4A

### TELEVISION PICTURE TUBE

21" Direct Viewed                      Magnetic Deflection  
Rectangular Glass Type              Magnetic Focus  
Gray Filter Glass                      Spherical Faceplate  
External Conductive Coating        Single Field Ion Trap  
21ACP4A/21AMP4A has an Aluminized Screen



12-N

### CHARACTERISTICS

#### GENERAL DATA

Focusing Method.....	Magnetic
Deflecting Method.....	Magnetic
Deflecting Angle (approx.).....	
Horizontal.....	85 Degrees
Diagonal.....	90 Degrees
Phosphor.....	P4
Fluorescence.....	White
Persistence.....	Medium
Faceplate.....	Gray Filter Glass
Light Transmittance (approx.).....	71 Percent

#### ELECTRICAL DATA

Heater Voltage.....	6.3 Volts
Heater Current (approx.).....	0.6 Amperes
Direct Interelectrode Capacitances (approx.).....	
Cathode to All Other Electrodes.....	5 $\mu\mu\text{f}$
Grid No. 1 to All Other Electrodes.....	6 $\mu\mu\text{f}$
External Conductive Coating to Anode <sup>1</sup> .....	750 $\mu\mu\text{f}$ Max
	500 $\mu\mu\text{f}$ Min
Ion Trap Magnet.....	External, Single Field Type

# 21ACP4/21AMP4 21ACP4A/21AMP4A (Cont'd)

## MECHANICAL DATA

Minimum Useful Screen Dimensions.....	19 $\frac{1}{8}$ x 15	Inches
Bulb Contact (Recessed Small Cavity Cap).....	J1-21	
Base (Small Shell Duodecal 5-Pin).....	B5-57	
Basing.....	12N	

## RATINGS

### MAXIMUM RATINGS (Design Center Values)

Anode Voltage.....	18000	Volts d c
Grid No. 2 Voltage.....	500	Volts d c
Grid No. 1 Voltage.....		
Negative Bias Value.....	125	Volts d c
Positive Bias Value.....	0	Volts d c
Positive Peak Value.....	2	Volts
Peak Heater-Cathode Voltage.....		
Heater Negative with Respect to Cathode		
During Warm-up Period Not to		
Exceed 15 Seconds.....	410	Volts
After Equipment Warm-up Period.....	180	Volts
Heater Positive with Respect to Cathode.....	180	Volts

### RECOMMENDED OPERATING CONDITIONS

Anode Voltage.....	16000	Volts d c
Grid No. 2 Voltage.....	300	Volts d c
Grid No. 1 Voltage Required for Cutoff <sup>2</sup> .....	-28 to -72	Volts d c
Focusing Coil Current (approx.) <sup>3</sup> .....	100 $\pm$ 20%	Ma d c
Ion Trap Magnet Strength (approx.).....	35	Gausses

### CIRCUIT VALUES

Grid No. 1 Circuit Resistance.....	1.5	Megohms
		Max

### NOTES:

1. External conductive coating must be grounded.
2. Visual extinction of focused raster. Extinction of the stationary focused spot will require that these values be about 5 volts more negative.
3. For JETEC focusing coil 109 or equivalent three inches from reference line, bias adjusted to 20 foot lamberts on a 19 $\frac{1}{8}$  x 15 inch picture area.

## 21ACP4A/21AMP4A

The Sylvania Type 21ACP4A/21AMP4A is identical to the Type 21ACP4/-21AMP4 except for having an aluminized screen.

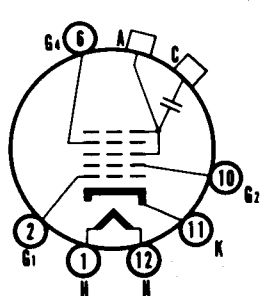
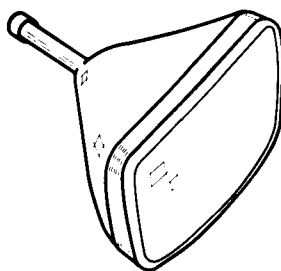
### WARNING

X-ray radiation shielding may be necessary to protect against possible danger of personal injury from prolonged exposure at close range if this tube is operated at higher than the manufacturer's Maximum Rated Anode Voltage or 16,000 volts, whichever is less.

**SYLVANIA TYPE 21AFP4  
21YP4  
Silver Screen "85" → 21YP4A**

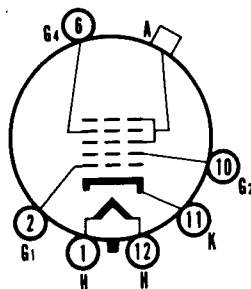
**TELEVISION PICTURE TUBE**

21" Direct Viewed                      Magnetic Deflection  
 Rectangular Glass Type              Electrostatic Focus  
 Gray Filter Glass                      Spherical Faceplate  
    Single Field Ion Trap  
 21YP4 has an External Conductive Coating  
 21YP4A has an External Conductive Coating and  
 an Aluminized Screen



12-L

21YP4  
21YP4A



12-M

21AFP4

**CHARACTERISTICS**

**GENERAL DATA**

Focusing Method.....	Electrostatic
Deflecting Method.....	Magnetic
Deflecting Angle (approx.).....	
Horizontal.....	65 Degrees
Diagonal.....	70 Degrees
Phosphor.....	P4
Fluorescence.....	White
Persistence.....	Medium
Faceplate.....	Gray Filter Glass
Light Transmittance (approx.).....	72 Percent

**ELECTRICAL DATA**

Heater Voltage.....	6.3 Volts
Heater Current (approx.).....	0.6 Ampere
Direct Interelectrode Capacitances (approx.).....	
Cathode to All Other Electrodes.....	5 $\mu\mu\text{f}$
Grid No. 1 to All Other Electrodes.....	6 $\mu\mu\text{f}$
Ion Trap Magnet.....	External, Single Field Type

# 21AFP4, 21YP4, 21YP4A (Cont'd)

## MECHANICAL DATA

Minimum Useful Screen Dimensions.....	19 $\frac{1}{8}$ x 14 $\frac{3}{16}$ Inches
Bulb Contact (Recessed Small Cavity Cap).....	J1-21
Base (Small Shell Duodecal 6-Pin).....	B6-63
Basing.....	12M

## RATINGS

### MAXIMUM RATINGS (Design Center Values)

Anode Voltage.....	18000 Volts d c
Grid No. 4 (Focusing Electrode) Voltage.....	-500 to +1000 Volts d c
Grid No. 2 Voltage.....	500 Volts d c
Grid No. 1 Voltage	
Negative Bias Value.....	125 Volts d c
Positive Bias Value.....	0 Volts d c
Positive Peak Value.....	2 Volts
Peak Heater-Cathode Voltage	
Heater Negative with Respect to Cathode	
During Warm-up Period Not to	
Exceed 15 Seconds.....	410 Volts
After Equipment Warm-up Period.....	180 Volts
Heater Positive with Respect to Cathode.....	180 Volts

### RECOMMENDED OPERATING CONDITIONS

Anode Voltage.....	16000 Volts d c
Grid No. 4 Voltage.....	-64 to +350 Volts d c
Grid No. 2 Voltage.....	300 Volts d c
Grid No. 1 Voltage Required for Cutoff!.....	-28 to -72 Volts d c
Ion Trap Magnet Strength (approx.).....	35 Gaussess

### CIRCUIT VALUES

Grid No. 1 Circuit Resistance.....	1.5 Megohms Max
------------------------------------	--------------------

### NOTES:

1. Visual extinction of focused raster. Extinction of the stationary focused spot will require that these values be about 5 volts more negative.

## 21YP4

The Sylvania Type 21 YP4 is identical to Type 21AFP4 except for having an external conductive coating, which must be grounded.

External Conductive Coating to Anode Capacitance	
Maximum.....	750 $\mu$ f
Minimum.....	500 $\mu$ f
Basing.....	12L

## 21YP4A

The Sylvania Type 21 YP4A is identical to Type 21AFP4 except for having an external conductive coating which must be grounded, and an aluminized screen.

External Conductive Coating to Anode Capacitance	
Maximum.....	750 $\mu$ f
Minimum.....	500 $\mu$ f
Basing.....	12L

## WARNING

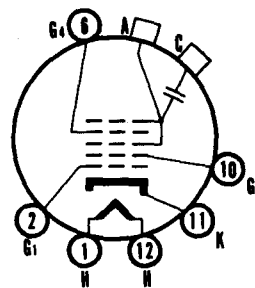
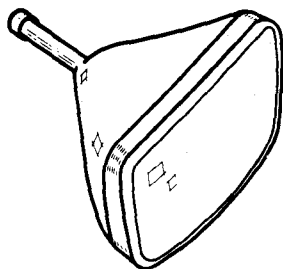
X-ray radiation shielding may be necessary to protect against possible danger of personal injury from prolonged exposure at close range if this tube is operated at higher than the manufacturer's Maximum Rated Anode Voltage or 16,000 volts, whichever is less.

**SYLVANIA TYPE 21ALP4**  
**Silver Screen "85" → 21ALP4A**

**TELEVISION PICTURE TUBE**

21" Direct Viewed	Magnetic Deflection
Rectangular Glass Type	Electrostatic Focus
Gray Filter Glass	Spherical Faceplate
External Conductive Coating	Single Field Ion Trap

21ALP4A has an Aluminized Screen



12-L

**CHARACTERISTICS**

**GENERAL DATA**

Focusing Method.....	Electrostatic
Deflecting Method.....	Magnetic
Deflecting Angle (approx.)	
Horizontal.....	85 Degrees
Diagonal.....	90 Degrees
Phosphor.....	P4
Fluorescence.....	White
Persistence.....	Medium
Faceplate.....	Gray Filter Glass
Light Transmittance (approx.).....	71 Percent

**ELECTRICAL DATA**

Heater Voltage.....	6.3 Volts
Heater Current (approx.).....	0.6 Ampere
Direct Interelectrode Capacitances (approx.)	
Cathode to All Other Electrodes.....	5 $\mu$ f
Grid No. 1 to All Other Electrodes.....	6 $\mu$ f
External Conductive Coating to Anode.....	750 $\mu$ f Max
Ion Trap Magnet.....	500 $\mu$ f Min
	External, Single Field Type

**MECHANICAL DATA**

Minimum Useful Screen Dimensions.....	19 $\frac{1}{8}$ x 15 Inches
Bulb Contact (Recessed Small Cavity Cap).....	J1-21
Base (Small Shell Duodecal 6-Pin).....	B6-63
Basing.....	12L

**RATINGS**

**MAXIMUM RATINGS (Design Center Values)**

Anode Voltage.....	18000 Volts d c
Grid No. 4 Voltage (Focusing Electrode).....	-500 to +1000 Volts d c
Grid No. 2 Voltage.....	500 Volts d c
Grid No. 1 Voltage.....	
Negative Bias Value.....	125 Volts d c
Positive Bias Value.....	0 Volts d c
Positive Peak Value.....	2 Volts
Peak Heater-Cathode Voltage	
Heater Negative with Respect to Cathode	
During Warm-up Period Not to Exceed 15 Seconds.....	410 Volts
After Equipment Warm-up Period.....	180 Volts
Heater Positive with Respect to Cathode.....	180 Volts

# 21ALP4, 21ALP4A (Cont'd)

## RECOMMENDED OPERATING CONDITIONS

Anode Voltage	16000 Volts d c
Grid No. 4 Voltage	-64 to +352 Volts d c
Grid No. 2 Voltage	300 Volts d c
Grid No. 1 Voltage Required for Cutoff <sup>2</sup>	-28 to -72 Volts d c
Ion Trap Magnet Strength (approx.)	35 Gauss

## CIRCUIT VALUES

Grid No. 1 Circuit Resistance	1.5 Megohms Max
-------------------------------	--------------------

## NOTES:

- External conductive coating must be grounded.
- Visual extinction of focused raster. Extinction of stationary focused spot will require that these values be about 5 volts more negative.

## 21ALP4A

The Sylvania Type 21ALP4A is identical to the Type 21ALP4 except it has an aluminized screen.

## WARNING

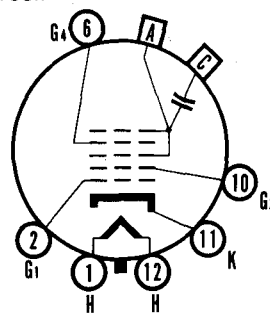
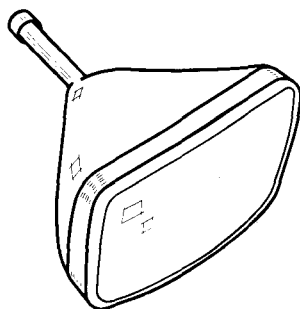
X-ray radiation shielding may be necessary to protect against possible danger of personal injury from prolonged exposure at close range if this tube is operated at higher than the manufacturer's Maximum Rated Anode Voltage or 16,000 volts, whichever is less.

# SYLVANIA TYPE 21ALP4B

*Silver Screen "85"*

## TELEVISION PICTURE TUBE

21" Direct Viewed	Magnetic Deflection
Rectangular Glass Type	Electrostatic Focus
Gray Filter Glass	Spherical Faceplate
External Conductive Coating	Single Field Ion Trap
Aluminized Screen	



12-L

## CHARACTERISTICS

### GENERAL DATA

Focusing Method	Electrostatic
Deflecting Method	Magnetic
Deflecting Angle (approx.)	
Horizontal	85 Degrees
Diagonal	90 Degrees
Phosphor	P4
Fluorescence	White
Persistence	Medium
Faceplate	Gray Filter Glass
Light Transmittance (approx.)	71 Percent

# 21ALP4B (Cont'd)

## ELECTRICAL DATA

Heater Voltage	6.3 Volts
Heater Current (approx.)	0.6 Ampere
Direct Interelectrode Capacitances (approx.)	
Cathode to All Other Electrodes	5 $\mu$ f
Grid No. 1 to All Other Electrodes	6 $\mu$ f
External Conductive Coating to Anode <sup>1</sup>	750 $\mu$ f Max. 500 $\mu$ f Min.
Ion Trap Magnet	External, Single Field Type

## MECHANICAL DATA

Minimum Useful Screen Dimensions	19 $\frac{1}{8}$ x 15 Inches
Bulb Contact (Recessed Small Cavity Cap)	J1-21
Base (Small Shell Duodecal 6-Pin)	B6-63
Basing	12L

## RATINGS

### MAXIMUM RATINGS (Design Center Values)

Anode Voltage	20000 Volts d c
Grid No. 4 Voltage (Focusing Electrode)	500 to +1000 Volts d c
Grid No. 2 Voltage	500 Volts d c
Grid No. 1 Voltage	
Negative Bias Value	125 Volts d c
Positive Bias Value	0 Volts d c
Positive Peak Value	2 Volts
Peak Heater-Cathode Voltage	
Heater Negative with Respect to Cathode	
During Warm-up Period Not to Exceed 15 Seconds	410 Volts
After Equipment Warm-up Period	180 Volts
Heater Positive with Respect to Cathode	180 Volts

### RECOMMENDED OPERATING CONDITIONS

Anode Voltage	16000 Volts d c
Grid No. 4 Voltage	-64 to +352 Volts d c
Grid No. 2 Voltage	300 Volts d c
Grid No. 1 Voltage Required for Cutoff <sup>2</sup>	-28 to -72 Volts d c
Ion Trap Magnet Strength (approx.)	35 Gauss

### CIRCUIT VALUES

Grid No. 1 Circuit Resistance	1.5 Megohms Max.
-------------------------------	------------------

### NOTES:

1. External conductive coating must be grounded.
2. Visual extinction of focused raster. Extinction of stationary focused spot will require that these values be about 5 volts more negative.

### WARNING:

X-ray radiation shielding may be necessary to protect against possible danger of personal injury from prolonged exposure at close range if this tube is operated at higher than the manufacturers Maximum Rated Anode Voltage or 16,000 volts, whichever is less.

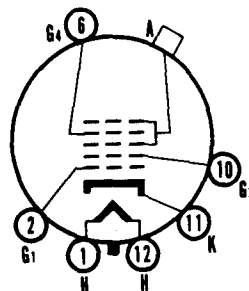
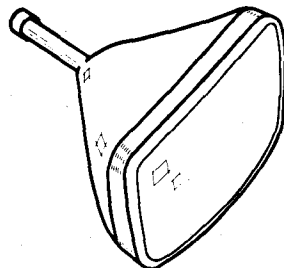
## SYLVANIA TYPE 21ANP4 21ANP4A

### TELEVISION PICTURE TUBE

21" Direct Viewed                      Magnetic Deflection  
Rectangular Glass Type              Electrostatic Focus  
Gray Filter Glass                      Spherical Faceplate  
Single Field Ion Trap  
21ANP4A has an Aluminized Screen



# 21ANP4, 21ANP4A (Cont'd)



12-M

## CHARACTERISTICS

### GENERAL DATA

Focusing Method.....	Electrostatic
Deflecting Method.....	Magnetic
Deflecting Angle (approx.)	
Horizontal.....	85 Degrees
Diagonal.....	90 Degrees
Phosphor.....	P4
Fluorescence.....	White
Persistence.....	Medium
Faceplate.....	Gray Filter Glass
Light Transmittance (approx.).....	71 Percent

### ELECTRICAL DATA

Heater Voltage.....	6.3 Volts
Heater Current (approx.).....	0.6 Ampere
Direct Interelectrode Capacitances (approx.)	
Cathode to All Other Electrodes.....	5 $\mu$ f
Grid No. 1 to All Other Electrodes.....	6 $\mu$ f
Ion Trap Magnet.....	External, Single Field Type

### MECHANICAL DATA

Minimum Useful Screen Dimensions.....	19 $\frac{1}{8}$ x 15 Inches
Bulb Contact (Recessed Small Cavity Cap).....	J1-21
Base (Small Shell Duodecal 6-Pin).....	B6-63
Basing.....	12M

## RATINGS

### MAXIMUM RATINGS (Design Center Values)

Anode Voltage.....	18000 Volts d c
Grid No. 4 Voltage (Focusing Electrode).....	-500 to +1000 Volts d c
Grid No. 2 Voltage.....	500 Volts d c
Grid No. 1 Voltage	
Negative Bias Value.....	125 Volts d c
Positive Bias Value.....	0 Volts d c
Positive Peak Value.....	2 Volts
Peak Heater-Cathode Voltage	
Heater Negative with Respect to Cathode	
During Warm-up Period Not to	
Exceed 15 Seconds.....	410 Volts
After Equipment Warm-up Period.....	180 Volts
Heater Positive with Respect to Cathode.....	180 Volts

### RECOMMENDED OPERATING CONDITIONS

Anode Voltage.....	16000 Volts d c
Grid No. 4 Voltage.....	-64 to +352 Volts d c
Grid No. 2 Voltage.....	300 Volts d c
Grid No. 1 Voltage Required for Cutoff.....	-28 to -72 Volts d c
Ion Trap Magnet Strength (approx.).....	35 Gauss

### CIRCUIT VALUES

Grid No. 1 Circuit Resistance.....	1.5 Megohms
	Max

### NOTES:

1. Visual extinction of focused raster. Extinction of the stationary focused spot will require that these values be about 5 volts more negative.

## 21ANP4A

The Sylvania Type 21ANP4A is identical to the Type 21ANP4 except it has an aluminized screen.

## WARNING

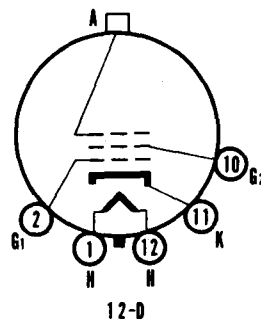
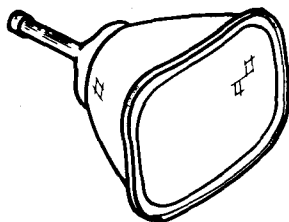
X-ray radiation shielding may be necessary to protect against possible danger of personal injury from prolonged exposure at close range if this tube is operated at higher than the manufacturer's Maximum Rated Anode Voltage or 16,000 volts, whichever is less.

# SYLVANIA TYPE 21AP4

## TELEVISION PICTURE TUBE

21" Direct Viewed  
Rectangular Metal Type  
Gray Filter Glass  
Frosted Faceplate

Magnetic Deflection  
Magnetic Focus  
Spherical Faceplate  
Single Field Ion Trap



## CHARACTERISTICS

### GENERAL DATA

Focusing Method	Magnetic
Deflecting Method	Magnetic
Deflecting Angle (approx.)	
Horizontal	66 Degrees
Diagonal	70 Degrees
Phosphor	P4
Fluorescence	White
Persistence	Medium
Faceplate	Frosted Gray Filter Glass
Light Transmittance (approx.)	66 Percent

### ELECTRICAL DATA

Heater Voltage	6.3 Volts
Heater Current (approx.)	0.6 Ampere
Direct Interelectrode Capacitances (approx.)	
Cathode to All Other Electrodes	5 $\mu$ f
Grid No. 1 to All Other Electrodes	6 $\mu$ f
Ion Trap Magnet	External, Single Field Type

### MECHANICAL DATA

Minimum Useful Screen Dimensions	18 $\frac{1}{4}$ x 13 $\frac{11}{16}$ Inches
Bulb Contact	Metal Cone Lip
Base (Small Shell Duodecal 5-Pin)	B5-57
Basing	12D

## RATINGS

### MAXIMUM RATINGS (Design Center Values)

Anode Voltage	18000 Volts d c
Grid No. 2 Voltage	500 Volts d c
Grid No. 1 Voltage	
Negative Bias Value	125 Volts d c
Positive Bias Value	0 Volts d c
Positive Peak Value	2 Volts
Peak Heater-Cathode Voltage	
Heater Negative with Respect to Cathode	
During Warm-up Period Not to Exceed 15 Seconds	410 Volts
After Equipment Warm-up Period	180 Volts
Heater Positive with Respect to Cathode	180 Volts

### RECOMMENDED OPERATING CONDITIONS

Anode Voltage	16000 Volts d c
Grid No. 2 Voltage	300 Volts d c
Grid No. 1 Voltage Required for Cutoff <sup>1</sup>	-33 to -77 Volts d c
Focusing Coil Current (approx.) <sup>2</sup>	110 Ma d c
Ion Trap Magnet Strength (approx.)	50 Gauss

### CIRCUIT VALUES

Grid No. 1 Circuit Resistance	1.5 Megohms Max
-------------------------------	-----------------

# 21AP4 (Cont'd)

## NOTES:

1. Visual extinction of undeflected focused spot.
2. For JETEC focusing coil 109 or equivalent three inches from reference line, bias adjusted to 30 foot lamberts on an  $18\frac{3}{8} \times 13\frac{5}{16}$  inch picture area.

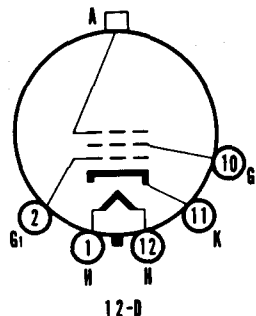
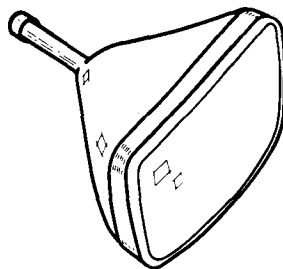
## WARNING

X-ray radiation shielding may be necessary to protect against possible danger of personal injury from prolonged exposure at close range if this tube is operated at higher than the manufacturer's Maximum Rated Anode Voltage or 16,000 volts, whichever is less.

## SYLVANIA TYPE 21AQP4 21AQP4A

### TELEVISION PICTURE TUBE

21" Direct Viewed                      Magnetic Deflection  
 Rectangular Glass Type              Magnetic Focus  
 Gray Filter Glass                      Spherical Faceplate  
 Single Field Ion Trap  
 21AQP4A has an Aluminized Screen



### CHARACTERISTICS

#### GENERAL DATA

Focusing Method.....	Magnetic
Deflecting Method.....	Magnetic
Deflecting Angle (approx.)	
Horizontal.....	85 Degrees
Diagonal.....	90 Degrees
Phosphor.....	P4
Fluorescence.....	White
Persistence.....	Medium
Faceplate.....	Gray Filter Glass
Light Transmittance (approx.).....	71 Percent

#### ELECTRICAL DATA

Heater Voltage.....	6.3 Volts
Heater Current (approx.).....	0.6 Ampere
Direct Interelectrode Capacitances (approx.)	
Cathode to All Other Electrodes.....	5 $\mu\mu\text{f}$
Grid No. 1 to All Other Electrodes.....	6 $\mu\mu\text{f}$
Ion Trap Magnet.....	External, Single Field Type

#### MECHANICAL DATA

Minimum Useful Screen Dimensions.....	19 $\frac{1}{4}$ x 15 Inches
Bulb Contact (Recessed Small Cavity Cap).....	J1-21
Base (Small Shell Duodecal 5-Pin).....	B5-57
Basing.....	12D

# 21AQP4, 21AQP4A (Cont'd)

## RATINGS

### MAXIMUM RATINGS (Design Center Values)

Anode Voltage	18000	Volts d c
Grid No. 2 Voltage	500	Volts d c
Grid No. 1 Voltage		
Negative Bias Value	125	Volts d c
Positive Bias Value	0	Volts d c
Positive Peak Value	2	Volts
Peak Heater-Cathode Voltage		
Heater Negative with Respect to Cathode		
During Warm-up Period Not to Exceed 15 Seconds	410	Volts
After Equipment Warm-up Period	180	Volts
Heater Positive with Respect to Cathode	180	Volts

### RECOMMENDED OPERATING CONDITIONS

Anode Voltage	16000	Volts d c
Grid No. 2 Voltage	300	Volts d c
Grid No. 1 Voltage Required for Cutoff <sup>1</sup>	-28 to -72	Volts d c
Focusing Coil Current <sup>2</sup>	100 ±20%	Ma d c
Ion Trap Magnet Strength (approx.)	35	Gausses

### CIRCUIT VALUES

Grid No. 1 Circuit Resistance	1.5	Megohms
		Max

### NOTES:

1. Visual extinction of focused raster. Extinction of the stationary focused spot will require that these values be about 5 volts more negative.
2. For JETEC focusing coil 109 or equivalent three inches from reference line, bias adjusted to 20 foot lamberts on a 19¼ x 15 inch picture area.

### 21AQP4A

The Sylvania Type 21AQP4A is identical to the Type 21AQP4 except for having an aluminized screen.

### WARNING

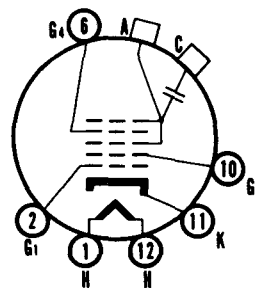
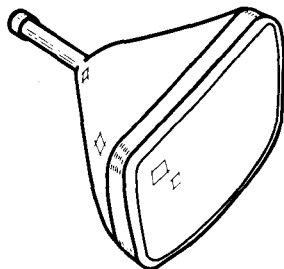
X-ray radiation shielding may be necessary to protect against possible danger of personal injury from prolonged exposure at close range if this tube is operated at higher than the manufacturer's Maximum Rated Anode Voltage or 16,000 volts, whichever is less.

# SYLVANIA TYPE 21ATP4

## Silver Screen "85"

### TELEVISION PICTURE TUBE

21" Direct Viewed                      Magnetic Deflection  
 Rectangular Glass Type              Electrostatic Focus  
 Gray Filter Glass                      Spherical Faceplate  
 External Conductive Coating        Single Field Ion Trap  
    Aluminized Screen



12-1

### CHARACTERISTICS

#### GENERAL DATA

Focusing Method.....	Electrostatic
Deflecting Method.....	Magnetic
Deflecting Angle (approx.)	
Horizontal.....	85 Degrees
Diagonal.....	90 Degrees
Phosphor.....	P4
Fluorescence.....	White
Persistence.....	Medium
Faceplate.....	Gray Filter Glass
Light Transmittance (approx.).....	71 Percent

#### ELECTRICAL DATA

Heater Voltage.....	6.3 Volts
Heater Current (approx.).....	0.6 Ampere
Direct Interelectrode Capacitances (approx.)	
Cathode to All Other Electrodes.....	5 $\mu\text{f}$
Grid No. 1 to All Other Electrodes.....	6 $\mu\text{f}$
External Conductive Coating to Anode <sup>1</sup> .....	1500 $\mu\text{f}$ Max
	1200 $\mu\text{f}$ Min
Ion Trap Magnet.....	External, Single Field Type

#### MECHANICAL DATA

Minimum Useful Screen Dimensions.....	19 $\frac{1}{8}$ x 15 Inches
Bulb Contact (Recessed Small Cavity Cap).....	J1-21
Base (Small Shell Duodecal 6-Pin).....	B6-63
Basing.....	12L

### RATINGS

#### MAXIMUM RATINGS (Design Center Values)

Anode Voltage.....	18000 Volts d c
Grid No. 4 Voltage (Focusing Electrode).....	-500 to +1000 Volts d c
Grid No. 2 Voltage.....	500 Volts d c
Grid No. 1 Voltage	
Negative Bias Value.....	125 Volts d c
Positive Bias Value.....	0 Volts d c
Positive Peak Value.....	2 Volts
Peak Heater-Cathode Voltage	
Heater Negative with Respect to Cathode	
During Warm-up Period Not to	
Exceed 15 Seconds.....	410 Volts
After Equipment Warm-up Period.....	180 Volts
Heater Positive with Respect to Cathode.....	180 Volts

#### RECOMMENDED OPERATING CONDITIONS

Anode Voltage.....	16000 Volts d c
Grid No. 4 Voltage.....	-64 to +352 Volts d c
Grid No. 2 Voltage.....	300 Volts d c
Grid No. 1 Voltage Required for Cutoff <sup>2</sup> .....	-28 to -72 Volts d c
Ion Trap Magnet Strength (approx.).....	35 Gauss

# 21ATP4 (Cont'd)

## CIRCUIT VALUES

Grid No. 1 Circuit Resistance ..... 1.5 Megohms  
Max

## NOTES:

- External conductive coating must be grounded.
- Visual extinction of focused raster. Extinction of stationary focused spot will require that these values be about 5 volts more negative.

## WARNING

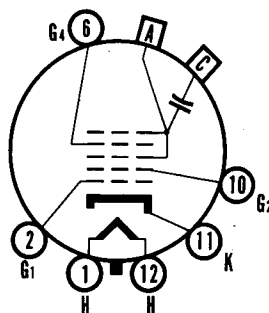
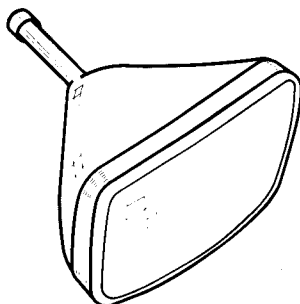
X-ray radiation shielding may be necessary to protect against possible danger of personal injury from prolonged exposure at close range if this tube is operated at higher than the manufacturer's Maximum Rated Anode Voltage or 16,000 volts, whichever is less.

## SYLVANIA TYPE 21ATP4A

*Silver Screen "85"*

### TELEVISION PICTURE TUBE

21" Direct Viewed	Magnetic Deflection
Rectangular Glass Type	Electrostatic Focus
Gray Filter Glass	Spherical Faceplate
External Conductive Coating	Single Field Ion Trap
Aluminized Screen	



12-L

### CHARACTERISTICS

#### GENERAL DATA

Focusing Method .....	Electrostatic
Deflecting Method .....	Magnetic
Deflecting Angle (approx.)	
Horizontal .....	85 Degrees
Diagonal .....	90 Degrees
Phosphor .....	P4
Fluorescence .....	White
Persistence .....	Medium
Faceplate .....	Gray Filter Glass
Light Transmittance (approx.) .....	71 Per cent

#### ELECTRICAL DATA

Heater Voltage .....	6.3 Volts
Heater Current (approx.) .....	0.6 Amperes
Direct Interelectrode Capacitances (approx.)	
Cathode to All Other Electrodes .....	5 $\mu$ f
Grid No. 1 to All Other Electrodes .....	6 $\mu$ f
External Conductive Coating to Anode .....	1500 $\mu$ f Max.
	1200 $\mu$ f Min.
Ion Trap Magnet .....	External, Single Field Type

#### MECHANICAL DATA

Minimum Useful Screen Dimensions .....	19 $\frac{1}{8}$ x 15 Inches
Bulb Contact (Recessed Small Cavity Cap) .....	J1-21
Base (Small Shell Duodecal 6-Pin) .....	B6-63
Basing .....	12L

# 21ATP4A (Cont'd)

## RATINGS

### MAXIMUM RATINGS (Design Center Values)

Anode Voltage.....	20,000 Volts d c
Grid No. 4 Voltage (Focusing Electrode).....	500 to +1000 Volts d c
Grid No. 2 Voltage.....	500 Volts d c
Grid No. 1 Voltage.....	
Negative Bias Value.....	125 Volts d c
Positive Bias Value.....	0 Volts d c
Positive Peak Value.....	2 Volts
Peak Heater-Cathode Voltage.....	
Heater Negative with Respect to Cathode	
During Warm-up Period Not to	
Exceed 15 Seconds.....	410 Volts
After Equipment Warm-up Period.....	180 Volts
Heater Positive with Respect to Cathode.....	180 Volts

### RECOMMENDED OPERATING CONDITIONS

Anode Voltage.....	16,000 Volts d c
Grid No. 4 Voltage.....	-64 to +352 Volts d c
Grid No. 2 Voltage.....	300 Volts d c
Grid No. 1 Voltage Required for Cutoff.....	-28 to -72 Volts d c
Ion Trap Magnet Strength (approx.).....	35 Gauss

### CIRCUIT VALUES

Grid No. 1 Circuit Resistance.....	1.5 Megohms Max.
------------------------------------	------------------

### NOTES:

1. External conductive coating must be grounded.
2. Visual extinction of focused raster. Extinction of stationary focused spot will require that these values be about 5 volts more negative.

### WARNING:

X-ray radiation shielding may be necessary to protect against possible danger of personal injury from prolonged exposure at close range if this tube is operated at higher than the manufacturer's Maximum Rated Anode Voltage or 16,000 volts, whichever is less.

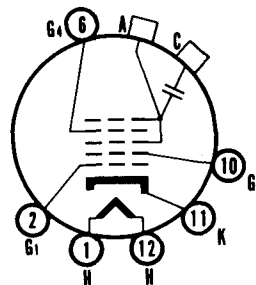
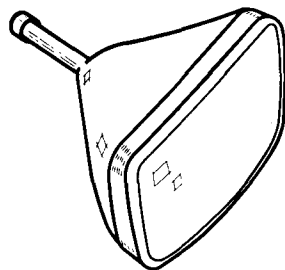
# SYLVANIA TYPE 21AUP4

## Silver Screen "85" → 21AUP4A

### TELEVISION PICTURE TUBE

21" Direct Viewed	Magnetic Deflection
Rectangular Glass Type	Electrostatic Focus
Gray Filter Glass	Spherical Faceplate
External Conductive Coating	Single Field Ion Trap

21AUP4A has an Aluminized Screen



12-L

### CHARACTERISTICS

#### GENERAL DATA

Focusing Method.....	Electrostatic
Deflecting Method.....	Magnetic
Deflection Angle	
Horizontal.....	67 Degrees
Diagonal.....	72 Degrees
Phosphor.....	P4
Fluorescence.....	White
Persistence.....	Medium
Faceplate.....	Gray Filter Glass
Light Transmittance (approx.).....	71 Percent

#### ELECTRICAL DATA

Heater Voltage.....	6.3 Volts
Heater Current (approx.).....	0.6 Amperes
Direct Interelectrode Capacitances (approx.)	
Cathode to All Other Electrodes.....	5 $\mu\mu\text{f}$
Grid No. 1 to All Other Electrodes.....	6 $\mu\mu\text{f}$
External Conductive Coating to Anode.....	750 $\mu\mu\text{f}$ Max
	500 $\mu\mu\text{f}$ Min
Ion Trap Magnet.....	External, Single Field Type

#### MECHANICAL DATA

Minimum Useful Screen Dimensions.....	19 $\frac{1}{8}$ x 15 Inches
Bulb Contact (Recessed Small Cavity Cap).....	J1-21
Base (Small Shell Duodecal 6-Pin).....	B6-63
Basing.....	12L

### RATINGS

#### MAXIMUM RATINGS (Design Center Values)

Anode Voltage.....	1800 Volts d c
Grid No. 4 Voltage (Focusing Electrode).....	-500 to +1000 Volts d c
Grid No. 2 Voltage.....	500 Volts d c
Grid No. 1 Voltage	
Negative Bias Value.....	125 Volts d c
Positive Bias Value.....	0 Volts d c
Positive Peak Value.....	2 Volts
Peak Heater-Cathode Voltage	
Heater Negative with Respect to Cathode	
During Warm-up Period Not to	
Exceed 15 Seconds.....	410 Volts
After Equipment Warm-up Period.....	180 Volts
Heater Positive with Respect to Cathode.....	180 Volts



# 21AUP4, 21AUP4A (Cont'd)

## RECOMMENDED OPERATING CONDITIONS

Anode Voltage	16000	Volts d c
Grid No. 4 Voltage	-64 to +352	Volts d c
Grid No. 2 Voltage	300	Volts d c
Grid No. 1 Voltage Required for Cutoff <sup>2</sup>	-28 to -72	Volts d c
Ion Trap Magnet Strength (approx.)	35	Gausses

## CIRCUIT VALUES

Grid No. 1 Circuit Resistance	1.5	Megohms
		Max

## NOTES:

- External conductive coating must be grounded.
- Visual extinction of focused raster. Extinction of stationary focused spot will require that these values be about 5 volts more negative.

## 21AUP4A

The Sylvania Type 21AUP4A is identical to Type 21AUP4 except for having an aluminized screen.

## WARNING

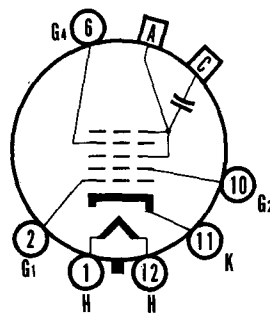
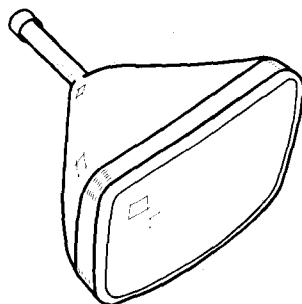
X-ray radiation shielding may be necessary to protect against possible danger of personal injury from prolonged exposure at close range if this tube is operated at higher than the manufacturer's Maximum Rated Anode Voltage or 16,000 volts, whichever is less.

# SYLVANIA TYPE 21AUP4B

*Silver Screen "85"*

## TELEVISION PICTURE TUBE

21" Direct Viewed	Magnetic Deflection
Rectangular Glass Type	Electrostatic Focus
Gray Filter Glass	Spherical Faceplate
External Conductive Coating	Single Field Ion Trap
Aluminized Screen	



12-L

## CHARACTERISTICS

### GENERAL DATA

Focusing Method	Electrostatic
Deflecting Method	Magnetic
Deflecting Angle (approx.)	
Horizontal	67 Degrees
Diagonal	72 Degrees
Phosphor	P4
Fluorescence	White
Persistence	Medium
Faceplate	Gray Filter Glass
Light Transmittance (approx.)	71 Per cent

# 21AUP4B (Cont'd)

## ELECTRICAL DATA

Heater Voltage	6.3 Volts
Heater Current (approx.)	0.6 Ampere
Direct Interelectrode Capacitances (approx.)	
Cathode to All Other Electrodes	5 $\mu$ f
Grid No. 1 to All Other Electrodes	6 $\mu$ f
External Conductive Coating to Anode	750 $\mu$ f Max. 500 $\mu$ f Min.
Ion Trap Magnet	External, Single Field Type

## MECHANICAL DATA

Minimum Useful Screen Dimensions	19 <sup>1</sup> / <sub>8</sub> x 15 Inches
Bulb Contact (Recessed Small Cavity Cap)	J1-21
Base (Small Shelf Duodecal 6-Pin)	B6-63
Basing	12L

## RATINGS

### MAXIMUM RATINGS (Design Center Values)

Anode Voltage	20,000 Volts d c
Grid No. 4 Voltage (Focusing Electrode)	500 to +1000 Volts d c
Grid No. 2 Voltage	500 Volts d c
Grid No. 1 Voltage	
Negative Bias Value	125 Volts d c
Positive Bias Value	0 Volts d c
Positive Peak Value	2 Volts
Peak Heater-Cathode Voltage:	
Heater Negative with Respect to Cathode	
During Warm-up Period Not to	
Exceed 15 Seconds	410 Volts
After Equipment Warm-up Period	180 Volts
Heater Positive with Respect to Cathode	180 Volts

### RECOMMENDED OPERATING CONDITIONS

Anode Voltage	16,000 Volts d c
Grid No. 4 Voltage	-64 to +352 Volts d c
Grid No. 2 Voltage	300 Volts d c
Grid No. 1 Voltage Required for Cutoff	28 to -72 Volts d c
Ion Trap Magnet Strength (approx.)	35 Gauss

### CIRCUIT VALUES

Grid No. 1 Circuit Resistance	1.5 Megohms Max.
-------------------------------	------------------

### NOTES:

- External conductive coating must be grounded.
- Visual extinction of focused raster. Extinction of stationary focused spot will require that these values be about 5 volts more negative.

### WARNING:

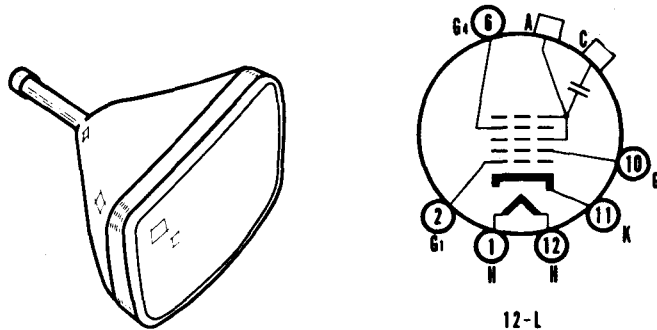
X-ray radiation shielding may be necessary to protect against possible danger of personal injury from prolonged exposure at close range if this tube is operated at higher than the manufacturer's Maximum Rated Anode Voltage or 16,000 volts, whichever is less.

# SYLVANIA TYPE 21AVP4

## Silver Screen "85" → 21AVP4A

### TELEVISION PICTURE TUBE

21" Direct Viewed	Magnetic Deflection
Rectangular Glass Type	Electrostatic Focus
Gray Filter Glass	Spherical Faceplate
External Conductive Coating	Single Field Ion Trap
21AVP4A has an Aluminized Screen	



### CHARACTERISTICS

#### GENERAL DATA

Focusing Method.....	Electrostatic
Deflecting Method.....	Magnetic
Deflection Angle	
Horizontal.....	67 Degrees
Diagonal.....	72 Degrees
Phosphor.....	P4
Fluorescence.....	White
Persistence.....	Medium
Faceplate.....	Gray Filter Glass
Light Transmittance (approx.).....	71 Percent

#### ELECTRICAL DATA

Heater Voltage.....	6.3 Volts
Heater Current (approx.).....	0.6 Ampere
Direct Interelectrode Capacitances (approx.)	
Cathode to All Other Electrodes.....	5 $\mu$ f
Grid No. 1 to All Other Electrodes.....	6 $\mu$ f
External Conductive Coating to Anode <sup>1</sup> .....	1500 $\mu$ f Max
	1200 $\mu$ f Min
Ion Trap Magnet.....	External, Single Field Type

#### MECHANICAL DATA

Minimum Useful Screen Dimensions.....	19 $\frac{1}{8}$ x 15 Inches
Bulb Contact (Recessed Small Cavity Cap).....	J1-21
Base (Small Shell Duodecal 6-Pin).....	B6-63
Basing.....	12L

### RATINGS

#### MAXIMUM RATINGS (Design Center Values)

Anode Voltage.....	18000 Volts d c
Grid No. 4 Voltage (Focusing Electrode).....	-500 to +1000 Volts d c
Grid No. 2 Voltage.....	500 Volts d c
Grid No. 1 Voltage	
Negative Bias Value.....	125 Volts d c
Positive Bias Value.....	0 Volts d c
Positive Peak Value.....	2 Volts
Peak Heater-Cathode Voltage	
Heater Negative with Respect to Cathode	
During Warm-up Period Not to	
Exceed 15 Seconds.....	410 Volts
After Equipment Warm-up Period.....	180 Volts
Heater Positive with Respect to Cathode.....	180 Volts

# 21AVP4, 21AVP4A (Cont'd)

## RECOMMENDED OPERATING CONDITIONS

Anode Voltage .....	16000	Volts d c
Grid No. 4 Voltage .....	-64 to +352	Volts d c
Grid No. 2 Voltage .....	300	Volts d c
Grid No. 1 Voltage Required for Cutoff <sup>2</sup> .....	-28 to -72	Volts d c
Ion Trap Magnet Strength (approx.) .....	35	Gausses

## CIRCUIT VALUES

Grid No. 1 Circuit Resistance .....	1.5	Megohms
		Max

## NOTES:

- External conductive coating must be grounded.
- Visual extinction of focused raster. Extinction of stationary focused spot will require that these values be about 5 volts more negative.

## 21AVP4A

The Sylvania Type 21AVP4A is identical to Type 21AVP4 except for having an aluminized screen.

## WARNING

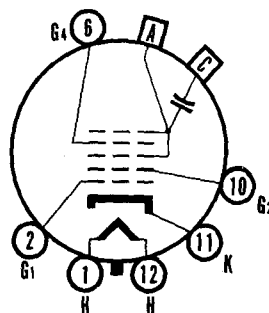
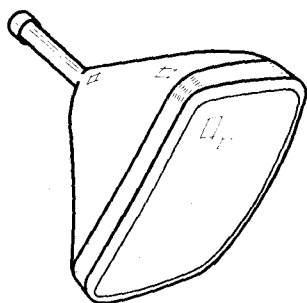
X-ray radiation shielding may be necessary to protect against possible danger of personal injury from prolonged exposure at close range if this tube is operated at higher than the manufacturer's Maximum Rated Anode Voltage or 16,000 volts, whichever is less.

## SYLVANIA TYPE 21AVP4B

*Silver Screen "85"*

### TELEVISION PICTURE TUBE

21" Direct Viewed	Magnetic Deflection
Rectangular Glass Type	Electrostatic Focus
Gray Filter Glass	Spherical Faceplate
External Conductive Coating	Single Field Ion Trap
Aluminized Screen	



12-1

## CHARACTERISTICS

### GENERAL DATA

Focusing Method .....	Electrostatic
Deflecting Method .....	Magnetic
Deflection Angle .....	
Horizontal .....	67 Degrees
Diagonal .....	72 Degrees
Phosphor .....	P4
Fluorescence .....	White
Persistence .....	Medium
Faceplate .....	Gray Filter Glass
Light Transmittance (approx.) .....	71 Percent

# 21AVP4B (Cont'd)

## ELECTRICAL DATA

Heater Voltage	6.3 Volts
Heater Current (approx.)	0.6 Ampere
Direct Interelectrode Capacitances (approx.)	
Cathode to All Other Electrodes	5 $\mu$ f
Grid No. 1 to All Other Electrodes	6 $\mu$ f
External Conductive Coating to Anode <sup>1</sup>	1500 $\mu$ f Max. 1200 $\mu$ f Min.
Ion Trap Magnet	External, Single Field Type

## MECHANICAL DATA

Minimum Useful Screen Dimensions	19 $\frac{1}{8}$ x 15 Inches
Bulb Contact (Recessed Small Cavity Cap)	J1-21
Base (Small Shell Duodecal 6-Pin)	B6-63
Basing	12L

## RATINGS

### MAXIMUM RATINGS (Design Center Values)

Anode Voltage	20,000 Volts d c
Grid No. 4 Voltage (Focusing Electrode)	500 to +1000 Volts d c
Grid No. 2 Voltage	500 Volts d c
Grid No. 1 Voltage	
Negative Bias Value	125 Volts d c
Positive Bias Value	0 Volts d c
Positive Peak Value	2 Volts
Peak Heater-Cathode Voltage:	
Heater Negative with Respect to Cathode	
During Warm-up Period not to Exceed 15 Secs.	410 Volts
After Equipment Warm-up Period	180 Volts
Heater Positive with Respect to Cathode	180 Volts

### RECOMMENDED OPERATING CONDITIONS

Anode Voltage	16,000 Volts d c
Grid No. 4 Voltage	-64 to +352 Volts d c
Grid No. 2 Voltage	300 Volts d c
Grid No. 1 Voltage Required for Cutoff	-28 to -72 Volts d c
Ion Trap Magnet Strength (approx.)	35 Gauss

### CIRCUIT VALUES

Grid No. 1 Circuit Resistance	1.5 Megohms Max.
-------------------------------	------------------

### NOTES:

1. External conductive coating must be grounded.
2. Visual extinction of focused raster. Extinction of stationary focused spot will require that these values be about 5 volts more negative.

### WARNING:

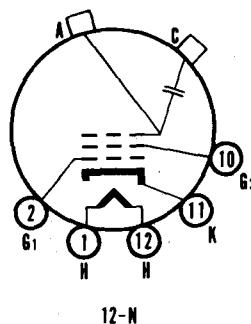
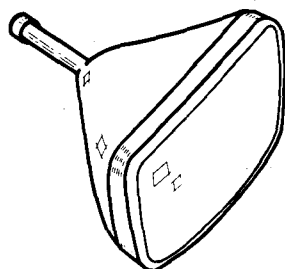
X-ray radiation shielding may be necessary to protect against possible danger of personal injury from prolonged exposure at close range if this tube is operated at higher than the manufacturer's Maximum Rated Anode Voltage or 16,000 volts, whichever is less.

# SYLVANIA TYPE 21AWP4

## Silver Screen "85"

### TELEVISION PICTURE TUBE

21" Direct Viewed	Magnetic Deflection
Rectangular Glass Type	Magnetic Focus
Gray Filter Glass	Spherical Faceplate
External Conductive Coating	Single Field Ion Trap
Aluminized Screen	



### CHARACTERISTICS

#### GENERAL DATA

Focusing Method.....	Magnetic
Deflecting Method.....	Magnetic
Deflecting Angle (approx.)	
Horizontal.....	67 Degrees
Diagonal.....	72 Degrees
Phosphor.....	P4
Fluorescence.....	White
Persistence.....	Medium
Faceplate.....	Gray Filter Glass
Light Transmittance (approx.).....	71 Percent

#### ELECTRICAL DATA

Heater Voltage.....	6.3 Volts
Heater Current (approx.).....	0.6 Ampere
Direct Interelectrode Capacitances (approx.)	
Cathode to All Other Electrodes.....	5 $\mu\mu\text{f}$
Grid No. 1 to All Other Electrodes.....	6 $\mu\mu\text{f}$
External Conductive Coating to Anode.....	1500 $\mu\mu\text{f}$ Max
	1200 $\mu\mu\text{f}$ Min
Ion Trap Magnet.....	External, Single Field Type

#### MECHANICAL DATA

Minimum Useful Screen Dimensions.....	19 $\frac{1}{8}$ x 15 Inches
Bulb Contact (Recessed Small Cavity Cap).....	J1-21
Base (Small Shell Duodecal 5-Pin).....	B5-57
Basing.....	12N

### RATINGS

#### MAXIMUM RATINGS (Design Center Values)

Anode Voltage.....	18000 Volts d c
Grid No. 2 Voltage.....	500 Volts d c
Grid No. 1 Voltage	
Negative Bias Value.....	125 Volts d c
Positive Bias Value.....	0 Volts d c
Positive Peak Value.....	2 Volts
Peak Heater-Cathode Voltage	
Heater Negative with Respect to Cathode	
During Warm-up Period Not to	
Exceed 15 Seconds.....	410 Volts
After Equipment Warm-up Period.....	180 Volts
Heater Positive with Respect to Cathode.....	180 Volts

# 21AWP4 (Cont'd)

## RECOMMENDED OPERATING CONDITIONS

Anode Voltage.....	16000 Volts d c
Grid No. 2 Voltage.....	300 Volts d c
Grid No. 1 Voltage Required for Cutoff <sup>2</sup> .....	-28 to -72 Volts d c
Focusing Coil Current (approx.) <sup>3</sup> .....	108 ± 20% Ma d c
Ion Trap Magnet Strength (approx.).....	35 Gaussess

## CIRCUIT VALUES

Grid No. 1 Circuit Resistance.....	1.5 Megohms Max
------------------------------------	--------------------

## NOTES:

1. External conductive coating must be grounded.
2. Visual extinction of focused raster. Extinction of stationary focused spot will require that these values be about 5 volts more negative.
3. For JETEC focusing coil 109 or equivalent three inches from reference line, bias adjusted to 20 foot lamberts on a 19 $\frac{1}{8}$  x 15 inch picture area sharply focused at center of screen.

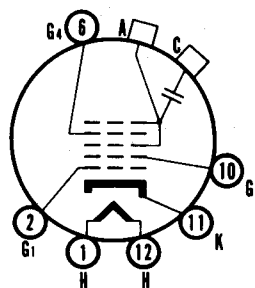
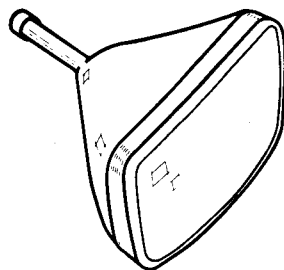
## WARNING

X-ray radiation shielding may be necessary to protect against possible danger of personal injury from prolonged exposure at close range if this tube is operated at higher than the manufacturer's Maximum Rated Anode Voltage or 16,000 volts, whichever is less.

# SYLVANIA TYPE 21AYP4

## TELEVISION PICTURE TUBE

21" Direct Viewed	Magnetic Deflection
Rectangular Glass Type	Electrostatic Focus
Gray Filter Glass	Spherical Faceplate
External Conductive Coating	Single Field Ion Trap



12-L

## CHARACTERISTICS

### GENERAL DATA

Focusing Method.....	Electrostatic
Deflecting Method.....	Magnetic
Deflecting Angle (approx.)	
Horizontal.....	66 Degrees
Diagonal.....	70 Degrees
Phosphor.....	P4
Fluorescence.....	White
Persistence.....	Medium
Faceplate.....	Gray Filter Glass
Light Transmittance (approx.).....	72 Percent

### ELECTRICAL DATA

Heater Voltage.....	6.3 Volts
Heater Current (approx.).....	0.6 Ampere
Direct Interelectrode Capacitances (approx.)	
Cathode to All Other Electrodes.....	5 $\mu\text{f}$
Grid No. 1 to All Other Electrodes.....	6 $\mu\text{f}$
External Conductive Coating to Anode.....	1500 $\mu\text{f}$ Max
	750 $\mu\text{f}$ Min
Ion Trap Magnet.....	External, Single Field Type

### MECHANICAL DATA

Minimum Useful Screen Dimensions.....	17 x 12 $\frac{3}{4}$ Inches
Bulb Contact (Recessed Small Cavity Cap).....	J1-21
Base (Small Shell Duodecal 6-Pin).....	B6-63
Basing.....	12L

## RATINGS

### MAXIMUM RATINGS (Design Center Values)

Anode Voltage.....	18000 Volts d c
Grid No. 4 Voltage (Focusing Electrode).....	-500 to +1000 Volts d c
Grid No. 2 Voltage.....	500 Volts d c
Grid No. 1 Voltage.....	
Negative Bias Value.....	125 Volts d c
Positive Bias Value.....	0 Volts d c
Positive Peak Value.....	2 Volts
Peak Heater-Cathode Voltage	
Heater Negative with Respect to Cathode	
During Warm-up Period Not to	
Exceed 15 Seconds.....	410 Volts
After Equipment Warm-up Period.....	180 Volts
Heater Positive with Respect to Cathode.....	180 Volts

### RECOMMENDED OPERATING CONDITIONS

Anode Voltage.....	16000 Volts d c
Grid No. 4 Voltage.....	-64 to +352 Volts d c
Grid No. 2 Voltage.....	300 Volts d c
Grid No. 1 Voltage Required for Cutoff.....	-28 to -72 Volts d c
Ion Trap Magnet Strength (approx.).....	35 Gauss



# 21AYP4 (Cont'd)

## CIRCUIT VALUES

Grid No. 1 Circuit Resistance ..... 1.5 Megohms  
Max

## NOTES:

1. External conductive coating must be grounded.
2. Visual extinction of focused raster. Extinction of stationary focused spot will require that these values be about 5 volts more negative.

## WARNING

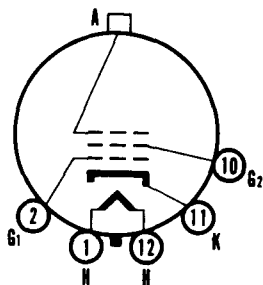
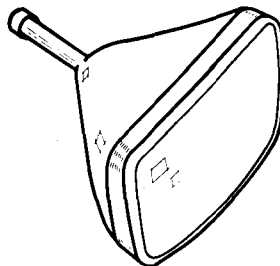
X-ray radiation shielding may be necessary to protect against possible danger of personal injury from prolonged exposure at close range if this tube is operated at higher than the manufacturer's Maximum Rated Anode Voltage or 16,000 volts, whichever is less.

## SYLVANIA TYPE 21EP4 21EP4A Silver Screen "85" → 21EP4B

### TELEVISION PICTURE TUBE

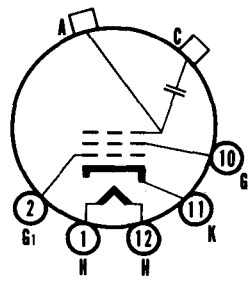
21" Direct Viewed                      Magnetic Deflection  
Rectangular Glass Type              Magnetic Focus  
Gray Filter Glass                      Cylindrical Faceplate  
Single Field Ion Trap

21EP4A has an External Conductive Coating  
21EP4B has an External Conductive Coating and  
an Aluminized Screen



12-D

21EP4



12-N

21EP4A  
21EP4B

# 21EP4, 21EP4A, 21EP4B (Cont'd)

## CHARACTERISTICS

### GENERAL DATA

Focusing Method.....	Magnetic
Deflecting Method.....	Magnetic
Deflecting Angle (approx.)	
Horizontal.....	65 Degrees
Diagonal.....	70 Degrees
Phosphor.....	P4
Fluorescence.....	White
Persistence.....	Medium
Faceplate.....	Gray Filter Glass
Light Transmittance (approx.).....	72 Percent

### ELECTRICAL DATA

Heater Voltage.....	6.3 Volts
Heater Current (approx.).....	0.6 Ampere
Direct Interelectrode Capacitances (approx.)	
Cathode to All Other Electrodes.....	5 $\mu\mu\text{f}$
Grid No. 1 to All Other Electrodes.....	6 $\mu\mu\text{f}$
Ion Trap Magnet.....	External, Single Field Type

### MECHANICAL DATA

Minimum Useful Screen Dimensions.....	19 $\frac{1}{8}$ x 13 $\frac{3}{8}$ Inches
Bulb Contact (Recessed Small Cavity Cap).....	J1-21
Base (Small Shell Duodecal 5-Pin).....	B5-57
Basing.....	12D

## RATINGS

### MAXIMUM RATINGS (Design Center Values)

Anode Voltage.....	18000 Volts d c
Grid No. 2 Voltage.....	500 Volts d c
Grid No. 1 Voltage.....	
Negative Bias Value.....	125 Volts d c
Positive Bias Value.....	0 Volts d c
Positive Peak Value.....	2 Volts
Peak Heater-Cathode Voltage	
Heater Negative with Respect to Cathode	
During Warm-up Period Not to	
Exceed 15 Seconds.....	410 Volts
After Equipment Warm-up Period.....	180 Volts
Heater Positive with Respect to Cathode.....	180 Volts

### RECOMMENDED OPERATING CONDITIONS

Anode Voltage.....	16000 Volts d c
Grid No. 2 Voltage.....	300 Volts d c
Grid No. 1 Voltage Required for Cutoff <sup>1</sup> .....	-28 to -72 Volts d c
Focusing Coil Current (approx.) <sup>2</sup> .....	95 Ma d c
Ion Trap Magnet Strength (approx.).....	35 Gauss

### CIRCUIT VALUES

Grid No. 1 Circuit Resistance.....	1.5 Megohms
	Max

### NOTES:

1. Visual extinction of focused raster. Extinction of the stationary focused spot will require that these values be about 5 volts more negative.
2. For JETEC focusing coil 109 or equivalent three inches from reference line, bias adjusted to 20 foot lamberts on a 19 $\frac{1}{8}$  x 13 $\frac{3}{8}$  inch picture area.

### 21EP4A

The Sylvania Type 21EP4A is identical to Type 21EP4 except for having an external conductive coating, which must be grounded.

External Conductive Coating to Anode Capacitance	
Maximum.....	750 $\mu\mu\text{f}$
Minimum.....	500 $\mu\mu\text{f}$
Basing.....	12N

### 21EP4B

The Sylvania 21EP4B is identical to Type 21EP4 except for having an external conductive coating which must be grounded, and an aluminized screen.

External Conductive Coating to Anode Capacitance	
Maximum.....	750 $\mu\mu\text{f}$
Minimum.....	500 $\mu\mu\text{f}$
Basing.....	12N

### WARNING

X-ray radiation shielding may be necessary to protect against possible danger of personal injury from prolonged exposure at close range if this tube is operated at higher than the manufacturer's Maximum Rated Anode Voltage or 16,000 volts, whichever is less.