SYLVANIA TYPE

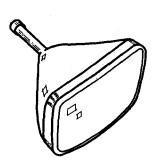
21ACP4A/21AMP4A/21BSP4

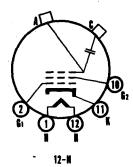
Silver Screen "85"

TELEVISION PICTURE TUBE

21" Direct Viewed Rectangular Glass Type Gray Filter Glass External Conductive Coating Single Field Ion Trap

Magnetic Deflection Magnetic Focus Spherical Faceplate Aluminized Screen





CHARACTERISTICS

GENERAL DATA Focusing Method	Ma	gnetic
Deflecting Method Deflection Angles (approx.)	Ma	gnetic
Horizontal Diagonal .	90	Degrees Degrees nized P4
Phosphor. Fluorescence. Persistence.	٧	/hite o Medium
FaceplateLight Transmittance (approx.)	Gray F	ilter Glass Per cent
ELECTRICAL DATA		
Heater Voltage	0.6 ± 5%	•
Grid No. 1 to All Other Electrodes External Conductive Coating to Anode ¹	2500	μμf μμf μμf Max.
Ion Trap Magnet	2000	սսք Min.
MECHANICAL DATA		
Minimum Useful Screen Dimensions. Bulb Contact (Recessed Small Cavity Cap) Base (Small Shell Duodecal 5-Pin). Basing	19½ x 15½ J1-21 B5-57 12N	Inches
RATINGS		
MAXIMUM RATINGS (Absolute Maximum Valu	105)	
Anode Voltage	22,000 550	Volts d c Volts d c
Negative Bias Value	220	Volts d c Volts
Positive Bias Value		Volts d c Volts
During Warm-up Period not to Exceed		
15 Seconds. After Equipment Warm-up Period. Heater Positive with Respect to Cathode	200	Volts Volts Volts
TYPICAL OPERATING CONDITIONS	200	¥ U1 (8
Anode Voltage	16,000	Volts d c
Grid No. 2 Voltage	300 -28 to -72	Volts d c
Focusing Coil Gurrent ^s . Ion Trap Magnet Strength (approx.)	116 ± 15% 33 ± 3	Madc Gausses

SYLVANIA PICTURE TUBES

21ACP4A/21AMP4A/21BSP4

(Cont'd)

NOTES:

- 1. 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.
- 3. For JETEC focusing coil 109 or equivalent three inches from reference line, bias adjusted to 20 foot lamberts on a 19 $\frac{1}{16}$ x 15 $\frac{1}{16}$ inch picture area sharply focused at center of screen.

WARNING

SYLVANIA TYPE 21BTP4

Silver Screen "85"

TELEVISION PICTURE TUBE

21" Direct Viewed

Magnetic Deflection

Rectangular Glass Type

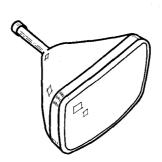
Electrostatic Focus

Gray Filter Glass

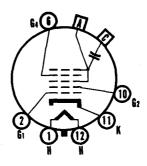
Spherical Faceplate

External Conductive Coating Single Field Ion Trap

Aluminized Screen



GENERAL DATA



12-L

CHARACTERISTICS

Focusing Method	Electrostatic Magnetic
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!	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 ²	2500 μμf Max.
	2000 μμf Min.
Ion Trap Magnet	External, Single Field Type
MECHANICAL DATA	
Minimum Useful Screen Dimensions. Bulb Contact (Recessed Small Cavity Cap) Base (Small Shell Duodecal 6-Pin). Basing.	19 1/2 x 15 1/2 Inches J1-21 B6-63 12 L
RATINGS	
MAXIMUM RATINGS (Absolute Maximum Va	lues)
Anode Voltage	22,000 Volts d c
Grid No. 4 Voltage	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	450 11 11
15 Seconds	450 Volts
After Equipment Warm-up Period	200 Volts
Heater Positive with Respect to Cathode	200 Volts

SYLVANIA PICTURE TUBES

21BTP4 (Cont'd)

TYPICAL OPERATING CONDITIONS

Anode Voltage	16,000 Volts d c
Grid No. 4 Voltage for Focus	-64 to +352 Volts d c
Grid No. 2 Voltage	300 Volts d c
Grid No. 1 Voltage Required for Cutoff ³	−28 to −72 Volts d c
Ion Trap Magnet Strength	33 ± 3 Gausses Min.

CIRCUIT VALUES

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

NOTES:

- Heater warm-up time is the time required for the voltage across the heater terminals to increase to 5.0 volts in the JETEC test circuit, with E=25 volts and series R = 31.5 ohms.
- 2. 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:

SYLVANIA TYPE 21CBP4A

Silver Screen "85"

TELEVISION PICTURE TUBE

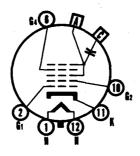
21" Direct Viewed Rectangular Glass Type Spherical Faceplate Magnetic Deflection Electronic Focus No Ion Trap

Gray Filter Glass

External Conductive Coating

Aluminized Screen





12-L

CHARACTERISTICS

CHARACIERISTICS		
GENERAL DATA		
Focusing Method. Deflection Method. Deflection Angles (approx.)		rostatic ignetic
Horizontal Diagonal	90	Degrees Degrees
Phosphor Fluorescence Persistence	W	inized P4 /hite o Medium
Faceplate. Light Transmittance (approx.)	Gray F	ilter Glass Percent
ELECTRICAL DATA		
Heater Voltage Heater Current Heater Warm-up Time! Direct Interelectrode Capacitances (approx.)	$0.6 \pm 5\%$	Volts Ampere Seconds
Cathode to All Other Electrodes		μμf
Grid No. 1 to All Other Electrodes		μμf
External Conductive Coating to Anode2	2500 2000	μμί Max. μμί Min.
MECHANICAL DATA		
Minimum Useful Screen Dimensions Nominal Overall Length Minimum Useful Screen Area. Bulb Contact (Recessed Small Cavity Cap)	18 262 J1-21	Inches Square Inches
Base (Small Shell Duodecal 6-Pin)	B6-63 12L	
RATINGS		
MAXIMUM RATINGS (Absolute Maximum Value	-	
Anode Voltage55 Grid No. 4 Voltage (Focusing Electrode)55 Grid No. 2 Voltage.	0 to +1100	Volts d c Volts d c Volts d c
Grid No. 1 Voltage Negative Bias Value Negative Peak Value	220	Volts d c Volts
Positive Bias Value	0 2	Volts d c Volts
During Warm-up Period Not to Exceed		
15 Seconds. After Equipment Warm-up Period. Heater Positive with Respect to Cathods	200	Volts Volts Volts
I workers with the poor to walledge		

SYLVANIA PICTURE TUBES

Issued as a supplement to the manual in Sylvania News for April, 1958

SYLVANIA TYPE 21CBP4 (Cont'd) 21CBP4A

TYPICAL OPERATING CONDITIONS Anode Voltage 16,000 Volts d c Grid No. 4 Voltage -50 to +350 Volts d c Grid No. 2 Voltage 300 Volts d c Grid No. 1 Voltage Required for Cutoff³ -28 to -72 Volts d c CIRCUIT VALUES

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

- Heater warm-up time is defined as the time required for the voltage across the heater to reach 80% of the rated heater voltage 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 the rated heater voltage divided by the rated heater current.
 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.

SYLVANIA TYPE 21CEP4

TELEVISION PICTURE TUBE

21" Direct Viewed Very Short Length

Rectangular Glass Type

Spherical Faceplate **Gray Filter Glass**

Aluminized Screen

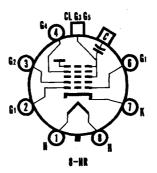
Electrostatic Focus

110° Magnetic Deflection 11/8" Neck Diameter

No Ion Trap

External Conductive Coating





CHARACTERISTICS

CHARACIERISTICS	,	
GENERAL DATA		
Focusing Method	Electro Magr	
Horizontal Diagonal Vertical Phosphor	110	Degrees Degrees Degrees zed P4
Fluorescence. Persistence. Faceplate. Light Transmittance (approx.)	Wh Short to Gray Filt	ite Medium
ELECTRICAL DATA		
Heater Voltage. Heater Current. Heater Warm-up Time! Direct Interelectrode Capacitance (approx.) Cathode to All Other Electrodes. Grid No. 1 to All Other Electrodes. External Conductive Coating to Anode?	0.6 ± 5% 11 5 5 6 6	Volts Ampere Seconds
External conductive coating to Priodo		μί Min.
MECHANICAL DATA		
Minimum Useful Screen Dimensions (Maximum Assured) Nominal Over-all Length	19½ x 15½ 14¾	inches
Minimum Useful Screen Area	J 171 H1 6 J1-21 B7-183	Square Inches or Equivalent
Basing	8HR 21	Pounds
RATINGS		
MAXIMUM RATINGS (Absolute Maximum Va	lues)	
Anode Voltage ³	19,800	Volts de Max. Volts de Max.
Grid No. 4 Voltage (Focusing Electrode) Grid No. 2 Voltage Grid No. 1 Voltage	550 to +1100 550	Volts de Max. Volts de Max.
Negative Bias Value Negative Peak Value Positive Bias Value	220	Volts de Max. Volts Max. Volts de Max.
Positive Peak Value	2	Volts Max.

SYLVANIA PICTURE TUBES

Issued as a supplement to the manual in Sylvania News for Nov.-Dec. 1957

SYLVANIA TYPE 21CEP4 (Cont'd)

450 Volts Max. 200 Volts Max. 200 Volts Max.

TYPICAL OPERATING CONDITIONS

Anode Voltage	16,000 Volts de Max.
Grid No. 4 Voltage for Focus	0 to 400 Volts de Max.
Grid No. 2 Voltage	300 Volts dc Max.
Grid No. 1 Voltage Required for Cutoff ⁴	-35 to −72 Volts dc Max.

CIRCUIT VALUES

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

- 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
- 2. External conductive coating must be grounded.
- Operation outside the limits shown will impair the serviceability of the tube from the viewpoint of life and satisfactory performance.
- Visual extinction of focused raster. Extinction of stationary focused spot will require that these values be about 5 volts more negative.

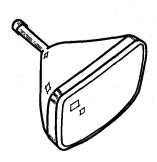
SYLVANIA TYPE 21CMP4

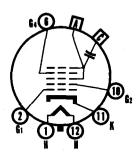
Silver Screen "85"

TELEVISION PICTURE TUBE

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

Aluminized Screen





12-L

GENERAL DATA	
Focusing Method	Electrostatic Magnetic
Horizontal Diagonal	85 Degrees 90 Degrees
PhosphorFluorescence	Aluminized P4 White
Persistence	Short to Medium Gray Filter Glass
FaceplateLight Transmittance (approx.)	74 Percent
ELECTRICAL DATA	
Heater Voltage	6.3 Volts
Heater Current. Heater Warm-up Time ¹ . Direct Interelectrode Capacitances (approx.) Cathode to All Other Electrodes.	0.6 ± 5% Ampere 11 Seconds
Cathode to All Other Electrodes Grid No. 1 to All Other Electrodes	5 μμf 6 μμf
External Conductive Coating to Anode ²	2500 uuf Max.
•	2000 μμf Min. External, Single Field Type
ion Trap Magnet	External, Single Field Type
MECHANICAL DATA	
Minimum Useful Screen Dimensions (Maximum Assured)	19½ x 15½ Inches 19 Inches
Minimum Useful Screen Area. Bulb Contact (Recessed Small Cavity Cap) Base (Small Shell Duodecal 6-Pin)	262 Square Inches J1-21 B6-63
Basing	12L
RATINGS	
MAXIMUM RATINGS (Absolute Maximum Va	
Anode Voltage	22,000 Volts d c
Grid No. 2 VoltageGrid No. 1 Voltage	550 Volts d c
Negative Bias Value	155 Volts d.c 220 Volts
Positive Bias Value	0 Volts d c
Positive Peak Value Peak Heater-Cathode Voltage	2 Volts
Heater Negative with Respect to Cathode During Warm-up Period Not to	
Exceed 15 Seconds	450 Volts
After Equipment Warm-up Period Heater Positive with Respect to Cathode	200 Volts
Transfer of the transfer to destroyer.	477 70100

SYLVANIA TYPE 21CMP4 (Cont'd)

TYPICAL OPERATING CONDITIONS

Anode Voltage	16,000 Volts d c
Grid No. 4 Voltage for Focus	-64 to +352 Volts d c
Grid No. 2 Voltage	300 Volts d c
Grid No. 1 Voltage Required for Cutoff ³	−35 to −72 Volts d c
Ion Trap Magnet Current (Average)4	30 Madc
Field Strength of PM Ion Trap Magnets	33 Gausses Min.

CIRCUIT VALUES

Grid No. 1 Circuit Resistance.....

- 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.
 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.
 For JETEC lon Trap Magnet No. 117 with pole pieces centered over Grid No. 2 on mount, and rotated for maximum brightness.
 For typical PM ion trap magnet with field strength tolerance of ±3 gausses.

WARNING:

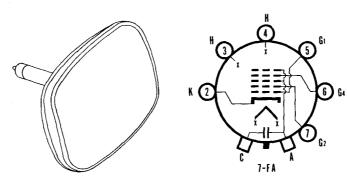
SYLVANIA TYPE 21CQP4

TELEVISION PICTURE TUBE

21" Direct Viewed Aluminized Screen
Rectangular Glass Type Electrostatic Focus
Lightweight Tube 110° Magnetic Deflection

Spherical Faceplate 11/8" Neck Diameter

Gray Filter Glass No Ion Trap
External Conductive Coating



CHARACTERISTICS

C. J. 11. J. C. E. 11. C.	•
GENERAL DATA	
Focusing Method	Electrostatic Magnetic
Deflection Angles (approx.)	
Horizontal	105 Degrees
DiagonalVertical	110 Degrees 87 Degrees
Phosphor	Aluminized P4
Fluorescence	White
Persistence	Short to Medium
Faceplate	Gray Filter Glass
Light Transmittance (approx.)	73 Percent
ELECTRICAL DATA	
Heater Voltage	6.3 Volts
Heater Current	0.6 ± 5% Ampere
Heater Warm-up Time1	11 Seconds
Direct Interelectrode Capacitances (approx.) Cathode to All Other Electrodes	E . E
Grid No. 1 to All Other Electrodes	5 μμf 6 μμf
External Conductive Coating to Anode ²	$2500 \mu \mu f$ Max.
	2000 μμf Min,
MECHANICAL DATA	
Minimum Useful Screen Dimensions	
(Maximum Assured)	19 1/6 x 15 1/6 Inches
Minimum Useful Screen Area Bulb Contact (Recessed Small Cavity Cap)	262 Sq. Inches J1-21
Bulb	01-21 C171 Evn 19
Sase	B6-185
Basing	7FA
Weight (approx.)	20 Pounds
RATINGS	
MAXIMUM RATINGS (Absolute Maximum Va	lune)
	•
Anode VoltageGrid No. 4 Voltage (Focusing Electrode)	19,800 Volts d c
Grid No. 2 Voltage	550 Volts d c
Grid No. 1 Voltage	000 10.10 0 0
Negative Bias Value	154 Volts d c
Negative Peak Value	220 Volts
Positive Bias Value	0 Volts d c
Positive Peak ValuePeak Heater-Cathode Voltage	2 Volts
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 21CQP4 (Cont'd)

TYPICAL OPERATING CONDITIONS

Anode Voltage	16,000 Volts d c
Grid No. 4 Voltage for Focus	-50 to +350 Voits a c
Grid No. 2 Voltage	300 Volts d c
Grid No. 1 Voltage Required for Cutoffs	-35 to -72 Volts d c

CIRCUIT VALUES

NOTES:

- 1. Heater warm-up time is defined as the time required for the voltage across the heater to reach 80% of the rated heater voltage after applying four (4) times rated heater voltage to a circuit consisting of the tube heater in series wit resistance equal to three (3) times the rated heater voltage divided by rated heater current.
- 2. 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

SYLVANIA TYPE 21CUP4

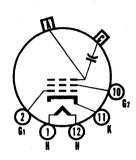
Silver Screen "85"

TELEVISION PICTURE TUBE

21" Direct Viewed Rectangular Glass Type Spherical Faceplate Gray Filter Glass

Magnetic Deflection Magnetic Focus Single Field Ion Trap External Conductive Coating Aluminized Screen





GENERAL DATA	
Focusing Method	Magnetic
Deflecting Method	Magnetic
Deflection Angles (approx.)	25.5
Horizontal	85 Degrees
Diagonal	90 Degrees Aluminized P4
PhosphorFluorescence	White
Persistence	Short to Medium
Faceplate	Gray Filter Glass
Light Transmittance (approxi)	74 Percent
Eight Transmittanes (approxi)	
ELECTRICAL DATA	
Heater Voltage	6.3 Volts
Heater Current	
Heater Warm-up Time1	0.6 ± 5% Ampere 11 Seconds
Direct Interelectrode Capacitances (approx.)	11 00001140
Cathode to All Other Electrodes	5 μμf
Grid No. 1 to All Other Electrodes	6 μμf
External Conductive Coating to Anode2	2500 μμf Max.
• •	2000 μμf Min.
Ion Trap Magnet	External, Single Field Typ
MECHANICAL DATA	
Minimum Useful Screen Dimensions	
(Maximum Assured)	19 1/6 x 15 1/6 Inches
Nominal Overall Length	20 Inches
Minimum Useful Screen Area	
Bulb Contact (Recessed Small Cavity Cap)	J1-21
Base (Small Shell Duodecal 5-Pin)	B5-57 12 N
Basing	1211
RATINGS	•
MAXIMUM RATINGS (Absolute Maximum Vale	ues)
Anode Voltage	22,000 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	
Positive Bias Value	
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 TYPE 21CUP4 (Cont'd)

TYPICAL OPERATING CONDITIONS

Anode Voltage	16,000 Volts d c
Grid No. 2 Voltage	300 Volts d c
Grid No. 1 Voltage Required for Cutoff ³	-28 to -72 Volts d c
Focusing Coil Current4	117 Madc
Field Strength of PM Ion Trap Magnets	40 Gausses

CIRCUIT VALUES

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

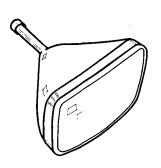
- Heater warm-up time is defined as the time required for the voltage across the heater to reach 80% of its rated value after applying four (4) times rated heater voltage to a circuit consisting of the tube heater in series with a resistance equal to three (3) times rated heater voltage divided by rated heater current.
 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.
 For JETEC focusing coil 109 or equivalent. Distance from yoke reference line to center of air gap to be 3½ inches (approx.).
 For typical PM ion trap magnet with field strength tolerance of ± 3 gausses.

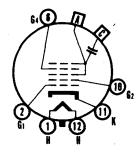
SYLVANIA TYPE 21CXP4

Silver Screen "85"

TELEVISION PICTURE TUBE

21" Direct Viewed Rectangular Glass Type Spherical Faceplate Gray Filter Glass Aluminized Screen Electrostatic Focus 90° Magnetic Deflection Cathode Drive Design Low Grid No. 2 Voltage No Ion Trap Short Neck Tube External Conductive Coating





12-L

CHARACTERISTICS

GENERAL DATA		
Focusing Method Deflecting Method Deflection Angles (approx.)		trostatic Ignetic
HorizontalDiagonal	90	Degrees Degrees inized P4
Fluorescence Persistence	· V	Vhite o Medium
Faceplate Light Transmittance (approx.)	Gray F	ilter Glass Percent
ELECTRICAL DATA		
Heater Voltage. Heater Current. Heater Warm-up Time ¹ . Direct Interelectrode Capacitances (approx.)	$0.6 \pm 5\%$	Volts Ampere Seconds
Cathode to All Other Electrodes		μμf
Grid No. 1 to All Other Electrodes External Conductive Coating to Anode ²	2500	μμf μμf Max. μμf Min.
MECHANICAL DATA		
Minimum Useful Screen Dimensions (Maximum Assured)	18 262	Inches Inches Square Inche
Bulb	J1-21 B6-63 12L	
RATINGS		
MAXIMUM RATINGS ³ (Absolute Maximum Value		
Anode Voltage. Grid No. 4 Voltage (Focusing Electrode)55(Grid No. 2 to Grid No. 1 Voltage	22,000 0 to +1100 70	Volts dc Volts dc Volts dc
Positive Bias Value		Volts Volts
During Warm-up Period Not to Exceed 15 Seconds	450	Valle
After Equipment Warm-up Period Heater Positive with Respect to Cathode	200	Volts Volts Volts

SYLVANIA PICTURE TUBES

SYLVANIA TYPE 21CXP4 (Cont'd)

TYPICAL OPERATING CONDITIONS (Cathode	
Anode Voltage	18,000 Volts dc
Grid No. 4 to Grid No. 1 Voltage for Focus	
at 100 µa Cathode Current	0 to 350 Volts dc
Grid No. 2 to Grid No. 1 Voltage	50 Volts dc
Cathode to Grid No. 1 Voltage for Cutoff4	35 to 50 Volts do

CIRCUIT VALUES

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

NOTES:

- 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.
 External conductive conting must be accounted.

- neater current.

 2. External conductive coating must be grounded.

 3. This type is designed for cathode-drive service. Voltages shown are with respect to Grid No. 1 Voltage unless otherwise indicated.

 4. For visual extinction of the undeflected focused spot. The cutoff voltage will change by approximately 2 percent with 1 kilovolt change of anode voltage.

WARNING:

SYLVANIA TYPE 21CWP4 (Cont'd)

TYPICAL OPERATING CONDITIONS

Anode Voltage	16,000 Volts d c
Grid No. 4 Voltage for Focus	-64 to +352 Volts d c
Grid No. 2 Voltage	300 Volts d c
Grid No. 1 Voltage Required for Cutoff ³	-28 to -72 Volts d c
Field Strength of PM Ion Tran Magnets	40 Gaussas

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.
 4. For typical PM Ion Trap Magnet with field strength tolerance of ±3 gausses.

SYLVANIA TYPE 21CWP4

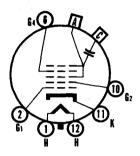
Silver Screen "85"

TELEVISION PICTURE TUBE

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

Aluminized Screen





12-L

CHARACTERISTICS

CHARACTERIOTICS	
GENERAL DATA	
Focusing Method	Electrostatic Magnetic
Horizontal Diagonal. Phosphor. Fluorescence. Persistence Faceplate. Light Transmittance (approx.).	85 Degrees 90 Degrees Aluminized P4 White Short to Medium Gray Filter Glass 74 Percent
ELECTRICAL DATA	
Heater Voltage. Heater Current. Heater Warm-up Time ¹ . Direct Interelectrode Capacitances (approx.)	6.3 Volts 0.6 ± 5% Ampere 11 Seconds
Cathode to All Other Electrodes	
Ion Trap Magnet	2000 μμf Min. External, Single Field Typ
MECHANICAL DATA	
Minimum Useful Screen Dimensions (Maximum Assured). Nominal Overall Length. Minimum Useful Screen Area. Bulb Type. Bulb Contact (Recessed Small Cavity Cap). Base (Small Shell Duodecal 6-Pin). Basing.	19½ x 15½ Inches 20 Inches 262 Square Inches J171 D2 or J171 E1 J1-21 B6-63 12L
RATINGS	
MAXIMUM RATINGS (Absolute Maximum Val	ues)
Anode Voltage	22,000 Volts d c 50 to +1100 Volts d c 550 Volts d c
Negative Bias Value. Negative Peak Value. Positive Bias Value.	155 Volts d c 220 Volts 0 Volts d c
Positive Peak Value Peak Heater-Cathode Voltage Heater Negative with Respect to Cathode During Warm-up Period Not to Exceed	2 Volts
15 Seconds	450 Volts 200 Volts
Heater Positive with Respect to Cathode	200 Volts

SYLVANIA PICTURE TUBES

SYLVANIA TYPE 21DAP4

Silver Screen "85"

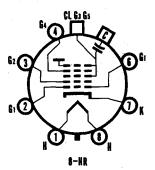
TELEVISION PICTURE TUBE

21" Direct Viewed Rectangular Glass Type Lightweight Tube Spherical Faceplate Gray Filter Glass Aluminized Screen Electrostatic Focus 110° Magnetic Deflection 1½" Neck Diameter No Ion Trap

External Conductive Coating



GENERAL DATA



GENERAL DATA	
Focusing Method	Electrostatic Magnetic
Horizontal Diagonal	105 Degrees 110 Degrees
Vertical Phosphor Fluorescence	87 Degrees Aluminized P4 White
PersistenceFaceplate	Short to Medium Gray Filter Glass
Light Transmittance (approx.)	73 Percent
Heater Voltage	6.3 Volts
Heater Current	0.6 ± 5% Ampere 11 Seconds
Heater Warm-up Time¹	11 Seconds
Cathode to All Other Electrodes	5 μμf
Grid No. 1 to All Other Electrodes	6 μμf
External Conductive Coating to Anode ²	2500 μμf Max.
	2000 μμf Min.
MECHANICAL DATA	•••
Minimum Useful Screen Dimensions	
(Maximum Assured)	101/ v 151/ Inches
Nominal Overall Length	197% X 197% Inches
Minimum Useful Screen Dimensions (Maximum Assured). Nominal Overall Length. Minimum Useful Screen Area.	147% Inches
Dull Control (Discount Control Control	202 Sq. Inches
Build Contact (Recessed Small Cavity Cap)	J1-21
Bulb	J171-G1 or Equivalent
Base	B7-183
Basing	8HR
Weight (approx.)	20 Pounds
RATINGS	
MAXIMUM RATINGS (Absolute Maximum Val	ues)
Anode Voltage	19,800 Volts d c
Grid No. 4 Voltage (Focusing Electrode)55	0 to +1100 Volts d c
Grid No. 2 Voitage	550 Volts d c
Grid No. 1 Voltage	000 00000
Negative Bias Value	154 Volts d c
Negative Peak Value	220 Volts
Positive Bias Value	
Positive Peak Value	2 Volts
Peak Heater-Cathode Voltage	2 40118
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 TYPE 21DAP4 (Cont'd)

TYPICAL OPERATING CONDITIONS

Anode Voltage	16,000 Volts d c
Grid No. 4 Voltage for Focus	0 to 400 Volts d.c.
Grid No. 2 Voltage	300 Volts d c
Grid No. 1 Voltage Required for Cutoffs	-35 to -72 Volts d c

CIRCUIT VALUES

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

NOTES:

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

WARNING

SYLVANIA TYPE 21DEP4

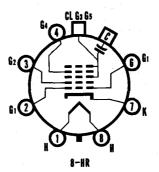
Silver Screen "85"

TELEVISION PICTURE TUBE

21" Direct Viewed Rectangular Glass Type Lightweight Tube Spherical Faceplate Gray Filter Glass Aluminized Screen
Electrostatic Focus
110° Magnetic Deflection
1½" Neck Diameter
No Ion Trap

External Conductive Coating





CHARACIERISTICS	
GENERAL DATA	
Focusing Method	Electrostatic Magnetic
Horizontal Diagonal Vertical Phosphor Fluorescence Persistence Faceplate Light Transmittance (approx.)	105 Degrees 110 Degrees 87 Degrees Aluminized P4 White Short to Medium Gray Filter Glass 76 Percent
ELECTRICAL DATA	
Heater Voltage. Heater Current. Heater Warm-up Time! Direct Interelectrode Capacitances (approx.) Cathode to All Other Electrodes. Grid No. 1 to All Other Electrodes. External Conductive Coating to Anode?	6.3 Volts 0.6 ± 5% Ampere 11 Seconds 6 μμf 6 μμf 2500 μμf Max.
MECHANICAL DATA	2000 μμf Min.
Minimum Useful Screen Dimensions	
Minimum Useful Screen Dimensions (Maximum Assured). Nominal Overall Length. Minimum Useful Screen Area. Bulb Contact (Recessed Small Cavity Cap). Bulb. Base. Basing. Weight (approx.).	19 1/2 x 15 1/2 Inches 14 1/2 Inches 262 Sq. Inches J1-21 J171 G1 or Equivalent B7-183 8HR 20 Pounds
RATINGS	
MAXIMUM RATINGS (Absolute Maximum Val	ues)
Anode Voltage. Grid No. 4 Voltage (Focusing Electrode)55 Grid No. 2 Voltage	
Negative Blas Value	154 Volts d c 220 Volts 0 Volts d c 2 Volts
During Warm-up Period Not to Exceed 15 Seconds After Equipment Warm-up Period Heater Positive with Respect to Cathode	450 Volts 200 Volts 200 Volts

SYLVANIA TYPE 21DEP4 (Cont'd)

TYPICAL OPERATING CONDITIONS

Anode Voltage Grid No. 4 Voltage for Focus. Grid No. 2 Voltage Grid No. 1 Voltage Grid No. 1 Voltage Required for Cutoff ³	0 to 400 Volts d c
IDCUIT VALUES	

Grid No. 1 Circuit Resistance.....

1. Heater warm-up time is defined as the time required for the voltage across the heater to reach 80% of the rated heater voltage 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 the rated heater voltage divided by the rated heater current.

1.5 Megohms Max.

- 2. 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

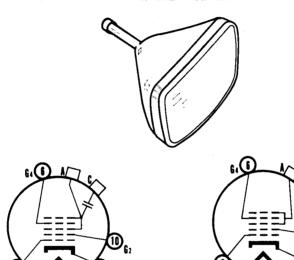
SYLVANIA TYPE 21FP4A 21FP4A Silver Screen "85" > 21FP4C

TELEVISION PICTURE TUBE

21" Direct Viewed Rectangular Glass Type Gray Filter Glass Magnetic Deflection Electrostatic Focus Cylindrical Faceplate

Single Field Ion Trap

21FP4A has an External Conductive Coating 21FP4C has an External Conductive Coating and an Aluminized Screen



12-L

12-M

21FP4A 21FP4C

21FP4

CHARACTERISTICS			
GENERAL DATA			
Focusing Method	Electrostatic Magnetic		
Horizontal Diagonal Phosphor	65 Degrees 70 Degrees P4		
Fluorescence Persistence Faceplate Light Transmittance (approx.)	White Medium		
ELECTRICAL DATA			
Heater Voltage. Heater Current (approx.) Direct Interelectrode Capacitances (approx.)	6.3 Volts 0.6 Ampere		
Cathode to All Other Electrodes	5 μμf 6 μμf Single Field Type		
MECHANICAL DATA			
Minimum Useful Screen Dimensions	91/s x 137/s Inches J1-21 B6-63 12M		

SYLVANIA PICTURE TUBES

21FP4, 21FP4A, 21FP4C (Cont'd)

RATINGS

MAXIMUM RATINGS (Design Center Values)

Anode Voltage		
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	+350	Volts d c
Grid No. 2 Voltage	300	Volts d c
Grid No. 1 Voltage Required for Cutoff128 t	o -72	Volts d c
Ion Trap Magnet Strength (approx.)		

CIRCUIT VALUES

Grid No. 1 Circuit	Resistance	1.5 Megohms
		Max

NOTE:

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

21FP4A

The Sylvania Type 21FP4A is identical to Type 21FP4 except for having an external conductive coating, which must be grounded.

External Conductive Coating to Anode Capacitance	
Maximum	750 որե
Minimum	500 μμf
Basing	12L

21FP4C

The Sylvania Type 21FP4C is identical to Type 21FP4 except for having an external conductive coating which must be grounded, and an aluminized screen.

External Conductive Coating to Anode Capacitance	
MaximumMinimum	750 μμf 500 μμf
Basing	12L

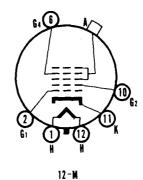
WARNING

SYLVANIA TYPE 21MP4

TELEVISION PICTURE TUBE

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





GENERAL DATA	
Focusing Method Deflecting Method Deflecting Angle (approx.)	Electrostatic Magnetic
Horizontal Diagonal Diagonal	66 Degrees 70 Degrees P4
Phosphor. Fluorescence Persistence Faceplate. Light Transmittance (approx.).	White Medium
ELECTRICAL DATA	
Heater Voltage	6.3 Volts 0.6 Ampere
Cathode to All Other Electrodes	5 μμf 6 μμf Single Field Type
MECHANICAL DATA	
Minimum Useful Screen Dimensions	Metal Cone Lip B6-63
	1-141
RATINGS	12111
•	12.11
RATINGS MAXIMUM RATINGS (Design Center Values) Anode Voltage	16000 Volts d c +1000 Volts d c
RATINGS MAXIMUM RATINGS (Design Center Values) Anode Voltage. Grid No. 4 Voltage (Focusing Electrode)500 to Grid No. 2 Voltage Grid No. 1 Voltage Negative Bias Value.	16000 Volts d c +1000 Volts d c 500 Volts d c
RATINGS MAXIMUM RATINGS (Design Center Values) Anode Voltage	16000 Volts d c +1000 Volts d c 500 Volts d c
RATINGS MAXIMUM RATINGS (Design Center Values) Anode Voltage Grid No. 4 Voltage (Focusing Electrode)500 to Grid No. 1 Voltage Grid No. 1 Voltage Negative Bias Value Positive Bias Value Positive Peak Value Peak Heater-Cathode Voltage Heater Negative with Respect to Cathode During Warm-up Period Not to	16000 Volts d c +1000 Volts d c 500 Volts d c 125 Volts d c 0 Volts d c 2 Volts
RATINGS MAXIMUM RATINGS (Design Center Values) Anode Voltage	16000 Volts d c +1000 Volts d c 500 Volts d c 125 Volts d c 0 Volts d c 2 Volts
RATINGS MAXIMUM RATINGS (Design Center Values) Anode Voltage	16000 Volts d c +1000 Volts d c 500 Volts d c 125 Volts d c 0 Volts d c 2 Volts
RATINGS MAXIMUM RATINGS (Design Center Values) Anode Voltage	16000 Volts d c +1000 Volts d c 500 Volts d c 125 Volts d c 0 Volts d c 2 Volts 410 Volts 180 Volts
RATINGS MAXIMUM RATINGS (Design Center Values) Anode Voltage . Grid No. 4 Voltage (Focusing Electrode)	16000 Volts d c +1000 Volts d c 500 Volts d c 125 Volts d c 0 Volts d c 2 Volts 410 Volts 180 Volts 180 Volts
RATINGS MAXIMUM RATINGS (Design Center Values) Anode Voltage	16000 Volts d c +1000 Volts d c 500 Volts d c 125 Volts d c 0 Volts d c 2 Volts 410 Volts 180 Volts 180 Volts 180 Volts 0 +350 Volts d c 300 Volts d c

21MP4 (Cont'd)

CIRCUIT VALUES

Grid No. 1 Circuit Resistance 1.5 Megohms

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.

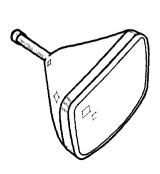
SYLVANIA TYPE 21WP4 Silver Screen "85"→ 71WPAA

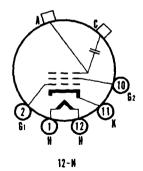
TELEVISION PICTURE TUBE

21" Direct Viewed Rectangular Glass Type Gray Filter Glass

Magnetic Deflection Magnetic Focus Spherical Faceplate External Conductive Coating Single Field Ion Trap

21 WP4A has an Aluminized Screen





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GENERAL DATA	
Focusing Method. Deflecting Method. Deflecting Angle (approx.)	. Magnetic Magnetic
Horizontal Diagonal Phosphor	. 70 Degrees
FluorescencePersistence	White Medium
Faceplate. Light Transmittance (approx.)	. 72 Percent
ELECTRICAL DATA	
Heater Voltage Heater Current (approx.) Direct Interelectrode Capacitances (approx.)	. 6.3 Volts . 0.6 Ampere
Cathode to All Other Electrodes Grid No. 1 to All Other Electrodes External Conductive Coating to Anode!	. 6 μμf
.	500 μμf Min
Ion Trap MagnetExtern	al, Single Field Type

21WP4, 21WP4A (Cont'd)

MECHANICAL DATA Minimum Useful Screen Dimensions Bulb Contact (Recessed Small Cavity Cap) Base (Small Shell Duodecal 5-Pin) Basing.	J1 B	³ ⁄ ₄ Inches -21 5-57 2N .
RATINGS		
MAXIMUM RATINGS (Design Center Values)		
Anode Voltage Grid No. 2 Voltage Grid No. 1 Voltage		Volts d c Volts d c
Negative Bias Value Positive Bias Value Positive Peak Value Peak Heater-Cathode Voltage Heater Negative with Respect to Cathode During Warm-up Period Not to	ő	Volts d c Volts d c Volts
Exceed 15 Seconds. After Equipment Warm-up Period Heater Positive with Respect to Cathode	180	Volts Volts Volts
RECOMMENDED OPERATING CONDITIONS		
Anode Voltage. Grid No. 2 Voltage. Grid No. 1 Voltage Required for Cutoff ² 21 Focusing Coil Current (approx.) ³ . 100 Ion Trap Magnet Strength (approx.)	300 3 to -72 3 +20%	Volts d c Volts d c Ma d c
CIRCUIT VALUES		

Grid No. 1 Circuit Resistance..... NOTES:

1.5 Megohms

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.
 For JETEC focusing coil 109 or equivalent three and one quarter inches from reference line, bias adjusted to 30 foot lamberts on a 17 x 123/4 inch picture area.

The Sylvania Type 21WP4A is identical to Type 21WP4 except for having an aluminized screen.

WARNING

SYLVANIA TYPE 21XP4 Silver Screen "85"→21XP4A

TELEVISION PICTURE TUBE

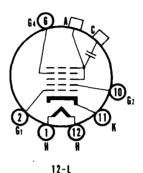
21" Direct Viewed Rectangular Glass Type Gray Filter Glass

Magnetic Deflection Electrostatic Focus Spherical Faceplate

External Conductive Coating Single Field Ion Trap

21XP4A has an Aluminized Screen





CHARACTERISTICS	
GENERAL DATA Focusing Method Deflecting Method Deflecting Angle (approx.)	Electrostatic Magnetic
Horizontal Diagonal Phosphor	66 Degrees 70 Degrees P4
Fluorescence Persistence Faceplate Light Transmittance (approx.)	White Medium Gray Filter Glass 72 Percent
ELECTRICAL DATA	
Heater Voltage	6.3 Volts 0.6 Ampere
Cathode to All Other Electrodes	5 μμf 6 μμf 750 μμf Mas 500 μμf Mir
Ion Trap Magnet External,	Single Field Type
MECHANICAL DATA Minimum Useful Screen Dimensions. Bulb Contact (Recessed Small Cavity Cap). Base (Small Shell Duodecal 6-Pin). Basing.	
RATINGS	
MAXIMUM RATINGS (Design Center Values)	
Anode Voltage	
Grid No. 1 Voltage Negative Bias Value Positive Bias Value Positive Peak Value Peak Heater-Cathode Voltage	125 Volts d c 0 Volts d c 2 Volts
Heater Negative with Respect to Cathode During Warm-up Period Not to Exceed 15 Seconds	410 Volts 180 Volts 180 Volts

21XP4, 21XP4A (Cont'd)

RECOMMENDED OPERATING CONDITIONS

Anode Voltage	
Grid No. 4 Voltage64 to +352	Voits d c
Grid No. 2 Voltage	Voits d c
Grid No. 1 Voltage Required for Cutoff ² 28 to -72	Volts d c
1on Trap Magnet Strength (approx.)	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.

21XP4A

The Sylvania Type 21XP4A is identical to Type 21XP4 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.

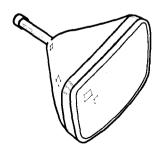
> SYLVANIA TYPE 21ZP4 21ZP4A Silver Screen "85"→21ZP4B

TELEVISION PICTURE TUBE

21" Direct Viewed Rectangular Glass Type Gray Filter Glass

Magnetic Deflection Magnetic Focus Spherical Faceplate

Single Field Ion Trap 21ZP4A has an External Conductive Coating 21ZP4B has an External Conductive Coating and an Aluminized Screen



21ZP4, 21ZP4A, 21ZP4B (Cont'd)

CHARACTERISTICS

GENERAL DATA		
Focusing Method. Deflecting Method. Deflecting Angle (approx.)		gnetic gnetic
Horizontal Diagonal Vertical Phosphor	70 E 50 E	Degrees Degrees Degrees P4
Fluorescence Persistence Faceplate	Me	hite dium liter Glass
Light Transmittance (approx.)		ercent
ELECTRICAL DATA		
Heater Voltage. Heater Current (approx.) Direct Interelectrode Capacitances (approx.) Cathode to All Other Electrodes (approx.) Grid No, 1 to All Other Electrodes.	0.6 5	Volts Ampere μμf μμf
Ion Trap Magnet External	, Single	Field Type
MECHANICAL DATA		
Minimum Useful Screen Dimensions. Bulb Contact (Recessed Small Cavity Cap). Base (Small Shell Duodecal 5-Pin). Basing.	J1-21 B5-57	13∕ ₁₆ Inches
RATINGS		
MAXIMUM RATINGS (Design Center Values)		
Anode Voltage Grid No. 2 Voltage Grid No. 1 Voltage		Volts d c Volts d c
Negative Blas Value Positive Blas Value Positive Peak Value	125 0	Volts d c Volts d c Volts
Peak Heater-Cathode Voltage Heater Negative with Respect to Cathode During Warm-up Period Not to	۷	Voits
Exceed 15 Seconds	180	Volts Volts Volts
RECOMMENDED OPERATING CONDITIONS		
Anode Voltage Grid No. 2 Voltage Grid No. 1 Voltage Required for Cutoff!2 Focusing Coil Current (approx.)2 9 Ion Trap Magnet Strength (approx.)	300 8 to -72 5 ±20%	Volts d c Volts d c Volts d c Ma d c Gausses
CIRCUIT VALUES Grid No. 1 Circuit Resistance	1.5	Megohms
		Max
NOTES: 1. Visual extinction of focused raster. Extinction of the stat will require that these values be about 5 volts more nega: 2. For JETEC focusing coil 109 or equivalent three inches bias adjusted to 20 foot lamberts on a 191/4 x 143/6 inch p	tive. from refe	erence line,
21ZP4A		

The Sylvania Type 21ZP4A is identical to Type 21ZP4 except for having an external conductive coating, which must be grounded.

External Conductive Coating to Anode Capacitance	
Maximum	750 μμf
Minimum	500 μμf 12 N
Basing	1214

21 ZP48

The Sylvania Type 21ZP4B is identical to Type 21ZP4 except for having an external conductive coating which must be grounded, and an aluminized screen.

External Conductive Coating to Anode Capacitance	
Maximum	750 μμf
Minimum	500 μμf
Basing	12N

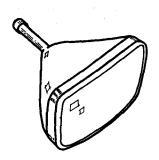
WARNING

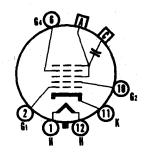
SYLVANIA TYPE 24AEP4

Silver Screen "85"

TELEVISION PICTURE TUBE

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





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GENERAL DATA	
Focusing Method	Electrostatic Magnetic
Horizontal Diagonal Phosphor	85 Degrees 90 Degrees Aluminized P4
Fluorescence	White Short to Medium Gray Filter Glass
Light Transmittance (approx.)	74 Percent
ELECTRICAL DATA	
Heater Voltage. Heater Current. Heater Warm-up Time! Direct Interelectrode Capacitances (approx.)	6.3 Volts 0.6 ± 5% Ampere 11 Seconds
Cathode to All Other Electrodes	5 μμ
Grid No. 1 to All Other Electrodes External Conductive Coating to Anode ²	6 μμf 2500 μμf Max. 2000 μμf Min.
MECHANICAL DATA	2000 μμι 141111.
Minimum Useful Screen Dimensions (Maximum Assured)	2174 v 1674 Inches
Nominal Overall Length Minimum Useful Screen Area.	191% Inches 332 Sq. Inches
Bulb Contact (Recessed Small Cavity Cap)	J1-21 B6-63
Basing	12L
RATINGS	
MAXIMUM RATINGS (Absolute Maximum Valu	•
Anode Voltage Grid No. 4 Voltage (Focusing Electrode)55 Grid No. 2 Voltage	22,000 Volts d c 0 to +1100 Volts d c 550 Volts d c
Negative Bias Value	155 Volts d c 220 Volts 0 Volts d c
Positive Bias ValuePositive Peak ValuePeak Heater-Cathode Voltage	2 Volts
Heater Negative with Respect to Cathode During Warm-up Period Not to	
Exceed 15 Seconds	450 Volts
After Equipment Warm-up Period Heater Positive with Respect to Cathode	200 Volts 200 Volts

SYLVANIA TYPE 24AEP4 (Cont'd)

TYPICAL OPERATING CONDITIONS

Anode Voltage	. 18,000 Volts d c
Grid No. 4 Voltage for Focus	50 to +350 Volts d c
Grid No. 2 Voltage	. 300 Volts d.c
Grid No. 1 Voltage Required for Cutoff ³	35 to -72 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.
- Visual extinction of focused raster. Extinction of stationary focused spot will require that these values be about 5 volts more negative.

WARNING

SYLVANIA TYPE 24AHP4

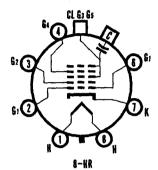
Silver Screen "85"

TELEVISION PICTURE TUBE

24" Direct Viewed Rectangular Glass Type Lightweight Tube Spherical Faceplate Gray Filter Glass Aluminized Screen
Electrostatic Focus
110° Magnetic Deflection
1½" Neck Diameter
No Ion Trap

External Conductive Coating





CHARACTERISTICS

GENERAL DATA	
Focusing Method	Electrostatic Magnetic
Horizontal Diagonal Vertical Phosphor Fluorescence Persistence Faceplate Light Transmittance (approx.)	105 Degrees 110 Degrees 87 Degrees Aluminized P4 White Short to Medium Gray Filter Glass 76 Percent
ELECTRICAL DATA	
Heater Voltage. Heater Current. Heater Warm-up Time! Direct Interelectrode Capacitances (approx.)	6.3 Volts 0.6 ± 5% Ampere 11 Seconds
Cathode to All Other Electrodes	5 μμf 6 μμf 2500 μμf Max. 2000 μμf Min.
MECHANICAL DATA	
Minimum Useful Screen Dimensions (Maximum Assured) Nominal Overall Length Minimum Useful Screen Area Bulb Bulb Contact (Recessed Small Cavity Cap). Base Basing Weight (approx.)	211/6 x 161/4 Inches 151/4 Inches 332 Square Inches J192C1 or Equivalent J1-21 B7-183 8HR 261/4 Pounds
RATINGS	
MAXIMUM RATINGS (Absolute Maximum Val Anode Voltage Grid No. 4 Voltage (Focusing Electrode)5: Grid No. 2 Voltage.	22,000 Volts d c
Grid No. 2 Voltage. Grid No. 1 Voltage. Regative Bias Value. Negative Peak Value. Positive Bias Value. Positive Peak Value. Positive Peak Value. Peak Heater-Cathode Voltage	154 Volts a c 220 Volts
Heater Negative with Respect to Cathode During Warm-up Period Not to Exceed 15 Seconds After Equipment Warm-up Period Heater Positive with Respect to Cathode	450 Volts 200 Volts 200 Volts

SYLVANIA PICTURE TUBES

SYLVANIA TYPE 24AHP4 (Cont'd)

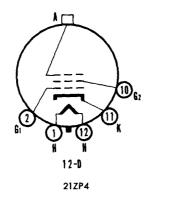
TYPICAL OPERATING CONDITIONS

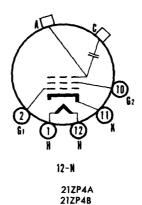
CIRCUIT VALUES

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

- Heater warm-up time is defined as the time required for the voltage across the heater to reach 80% of the rated heater voltage 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 the rated heater voltage divided by the rated heater current.
 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.

21ZP4, 21ZP4A, 21ZP4B (Cont'd)





SYLVANIA TYPE 24CP4 Silver Screen "85"→24CP4A

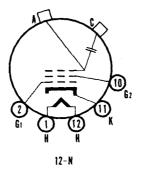
TELEVISION PICTURE TUBE

24" Direct Viewed Rectangular Glass Type Gray Filter Glass External Conductive Coating Single Field Ion Trap

Magnetic Deflection Magnetic Focus Spherical Faceplate

24CP4A has an Aluminized Screen





GENERAL DATA	
Focusing MethodDeflecting Method	Magnetic Magnetic
Deflecting Angle (approx.) Horizontal	85 Degrees
Diagonal	90 Degrees
Phosphor	P4 White
FluorescencePersistence	Medium
Faceplate	Gray Filter Glass
Light Transmittance (approx.)	68 Percent

24CP4, 24CP4A (Cont'd)

ELECTRICAL DATA		
Heater Voltage. Heater Current (approx.). Direct Interelectrode Capacitances (approx.)		Volts Ampere
Cathode to All Other Electrodes	5 6 750 500	μμf μμf μμf Max μμf Min
fon Trap MagnetExternal,	Single	μμι τνηη Field Type
MECHANICAL DATA		
Minimum Useful Screen Dimensions	J:	1-21
RATINGS		
MAXIMUM RATINGS (Design Center Values)		
Anode Voltage Grid No. 2 Voltage Grid No. 1 Voltage	20000 500	Volts d c Volts d c
Negative Bias Value Positive Bias Value Positive Peak Value Peak Heater-Cathode Voltage	Ó	Volts d c Volts d c Volts
Heater Negative with Respect to Cathode During Warm-up Period Not to		
Exceed 15 Seconds. After Equipment Warm-up Period Heater Positive with Respect to Cathode.	180	Volts Volts Volts
RECOMMENDED OPERATING CONDITIONS		•0.00
Anode Voltage . Grid No. 2 Voltage . Grid No. 1 Voltage Required for Cutoff ² 28 Focusing Coil Current (approx.) ³	300 to -72 +20%	Volts d c Volts d c Ma d c
CIRCUIT VALUES Grid No. 1 Circuit Resistance	1.5	Megohms
NOTES:		Max

- 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.
 For JETEC focusing coil 109 or equivalent three inches from reference line, bias adjusted to 30 foot lamberts on a 21½ x 16¾ inch picture area.

24CP4A

The Sylvania Type 24 CP4A is identical to Type 24 CP4 except it has an aluminized screen.

WARNING

SYLVANIA TYPE 24DP4 Silver Screen "85" -> 24DP4A

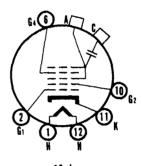
TELEVISION PICTURE TUBE

24" Direct Viewed Rectangular Glass Type Gray Filter Glass

Magnetic Deflection Electrostatic Focus Spherical Faceplate External Conductive Coating Single Field Ion Trap

24DP4A has an Aluminized Screen





12-L

GENERAL DATA	
Focusing Method Deflecting Method Deflecting Angle	Electrostatic Magnetic
Horizontal Diagonal Phosphor	85 Degrees 90 Degrees P4
Fluorescence Persistence	White Medium
Faceplate. Light Transmittance (approx.)	68 Percent
ELECTRICAL DATA	
Heater Voltage Heater Current (approx.). Direct Interelectrode Capacitances (approx.)	6.3 Volts 0.6 Ampere
Cathode to All Other Electrodes	5 μμf
Grid No. 1 to All Other Electrodes External Conductive Coating to Anode1	6 μμf 750 μμf Max
<u> </u>	500 muf Min
lon Trap MagnetExternal	, Single Field Type
MECHANICAL DATA	
Minimum Useful Screen Dimensions Bulb Contact (Recessed Small Cavity Cap) Base (Small Shell Duodecal 6-Pin) Basing	211/4 x 163/4 Inches J1-21 B6-63 12L
RATINGS	
MAXIMUM RATINGS (Design Center Values)	
Anode Voltage Grid No. 4 Voltage (Focusing Electrode)500 to Grid No. 2 Voltage Grid No. 1 Voltage	+1000 Voltsdic
Negative Bias Value	125 Volts d c
Positive Bias Value Positive Peak Value Peak Heater-Cathode Voltage	0 Volts d c 2 Volts
Heater Negative with Respect to Cathode During Warm-up Period Not to	
Exceed 15 Seconds	410 Volts
After Equipment Warm-up PeriodHeater Positive with Respect to Cathode	180 Volts 180 Volts

24DP4, 24DP4A (Cont'd)

RECOMMENDED OPERATING CONDITIONS

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

CIRCUIT VALUES

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

- 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.

24DP4A

The Sylvania Type 24DP4A is identical to the Type 24DP4 except it has an

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.

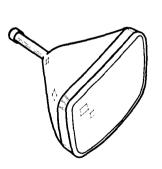
SYLVANIA TYPE 24VP4 Silver Screen "85"→ 24VP4A

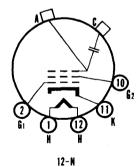
TELEVISION PICTURE TUBE

24" Direct Viewed Rectangular Glass Type Gray Filter Glass

Magnetic Deflection Magnetic Focus Spherical Faceplate External Conductive Coating Single Field Ion Trap

24VP4A has an Aluminized Screen





CHARACTERISTICS

GENERAL DATA

Focusing Method	Magnetic Magnetic
Deflecting Angle (approx.)	_
Horizontal	
Diagonal	90 Degrees
Phosphor	P4
Fluorescence	White
Persistence	Medium
Faceplate	
Light Transmittance (approx.)	68 Percent

24VP4, 24VP4A (Cont'd)

ELECTRICAL DATA Heater Voltage	6.2	Volts
Heater Current (approx.)		Ampere
Cathode to All Other Electrodes	5	μμf
Grid No. 1 to All Other Electrodes External Conductive Coating to Anode!	1500	μμf μμf Max
Ion Trap MagnetExternal,	750 Single	μμf Min Field Type
MECHANICAL DATA		
Minimum Useful Screen Dimensions	J B	51/ ₁₆ Inches 1-21 5-57 12 N
RATINGS		
MAXIMUM RATINGS (Design Center Values)		
Anode Voltage Grid No. 2 Voltage Grid No. 1 Voltage		Volts d c Volts d c
Negative Bias Value		Volts d c
Positive Bias Value		Volts d c Volts
Peak Heater-Cathode Voltage Heater Negative with Respect to Cathode During Warm-up Period Not to		75.13
Exceed 15 Seconds		Volts
After Equipment Warm-up Period		Volts Volts
RECOMMENDED OPERATING CONDITIONS		
Anode Voltage	18000	Volts d c
Grid No. 2 Voltage	300	Volts d c
Grid No. 1 Voltage Required for Cutoff ²	to -72	Volts d c Ma d c
Ion Trap Magnet Strength (approx.)	40	Gausses
CIRCUIT VALUES	1.5	Manahree
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.
 For JETEC focusing coil 109 or equivalent three inches from reference line, bias adjusted to 20 foot lamberts on a 21½ x 16½ inch picture area.

24VP4A

The Sylvania Type 24VP4A is identical to the Type 24VP4 except for having an aluminized screen,

WARNING

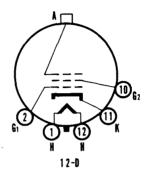
X-ray radiation shielding may be necessary to protect against possible danger of personal injury from prolonged exposure at close range if this tube is operated at higher than the manufacturer's Maximum Rated Anode Voltage or 16,000 volts, whichever is less.

SYLVANIA TYPE 24XP4

TELEVISION PICTURE TUBE

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





GENERAL DATA		
Focusing Method		gnetic gnetic
Horizontal Diagonal Phosphor	90 E	Degrees Degrees P4
Fluorescence Persistence Faceplate Light Transmittance (approx.)	Me Gray F	hite dium ilter Glass Percent
ELECTRICAL DATA		
Heater Voltage		Volts Ampere
Cathode to All Other Electrodes. Grid No. 1 to All Other Electrodes. Lon Trap Magnet. External	6	μμf μμf Field Type
MECHANICAL DATA	, chigic	riola i ypo
Minimum Useful Screen Dimensions Bulb Contact (Recessed Small Cavity Cap) Base (Small Shell Duodecal 5-Pin) Basing.	J1- B5-	-21 -57
RATINGS		
MAXIMUM RATINGS (Design Center Values)		
Anode Voltage Grid No. 2 Voltage Grid No. 1 Voltage		Volts d c Volts d c
Negative Bias Value Positive Bias Value Positive Peak Value Peak Heater-Cathode Voltage	0	Volts d c Volts d c Volts
Heater Negative with Respect to Cathode During Warm-up Period Not to		
Exceed 15 Seconds. After Equipment Warm-up Period Heater Positive with Respect to Cathode	180	Volts Volts Volts
RECOMMENDED OPERATING CONDITIONS		
Anode Voltage. Grid No. 2 Voltage. Grid No. 1 Voltage Required for Cutoff!28 Focusing Coil Current (approx.)2. Ion Trap Magnet Strength (approx.).	300 3 to -72 125	Volts d c Volts d c Volts d c Ma d c Gausses
· · · · · · · · · · · · · · · · · · ·		

24XP4 (Cont'd)

CIRCUIT VALUES

Grid No. 1 Circuit	Resistance	1.5 Megohms Max

NOTES:

- Visual extinction of focused raster. Extinction of stationary focused spot will require that these values be about 5 volts more negative.
 For JETEC focusing coil 109 or equivalent three inches from reference line, bias adjusted to 20 foot lamberts on a 211/4 x 163/4 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 24YP4

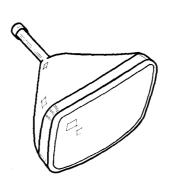
Silver Screen "85"

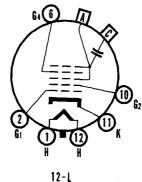
TELEVISION PICTURE TUBE

24" Direct Viewed Rectangular Glass Type

Gray Filter Glass External Conductive Coating Magnetic Deflection **Electrostatic Focus** Spherical Faceplate Single Field Ion Trap

Aluminized Screen





GENERAL DATA		
Focusing Method	Electros	
Deflecting Method	Magn	etic
Deflecting Angle (approx.)	0.5	Donross
Horizontal		Degrees Degrees
DiagonalPhosphor		Degrees
Fluorescence		Vhite
Persistence		dium
Faceplate	Gray Fil	Iter Glass
Light Transmittance (approx.)		Per cent
ELECTRICAL DATA		
Heater Voltage	6.3	Volts
Heater Current (approx.).	0.6	Ampere
Direct Interelectrode Capacitances (approx.)		•
Cathode to All Other Electrodes		μμf
Grid No. 1 to All Other Electrodes		$\mu\mu^{\dagger}$
External Conductive Coating to Anodel		µµf Мах.
Ion Trap Magnet	1200 External Sig	μμf Min. nolo Field Type
ion trap wagnet	. Lxternal, on	ngle rielu Type

24YP4 (Cont'd)

MECHANICAL DATA		
Minimum Useful Screen Dimensions	1 ½ x 16¾	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)

MAXIMON RATINGS (Design Center Values)		
Anode Voltage	20,000	Volts d c
Grid No. 4 Voltage (Focusing Electrode) 500 to	+1000	Voits 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	Voits
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	Voits

RECOMMENDED OPERATING CONDITIONS

Anode Voltage	Volts d c
Grid No. 4 Voltage	Volts d c
	Volts d c
Grid No. 1 Voltage Required for Cutoff ³ 28 to -72	Volts d c
	Gausses

CIRCUIT VALUES

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

- 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.

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.

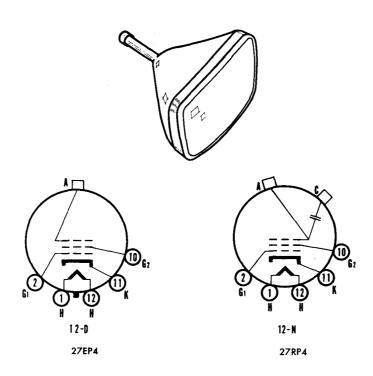
SYLVANIA TYPE 27EP4 27RP4

Silver Screen "85"

TELEVISION PICTURE TUBE

27" Direct Viewed Rectangular Glass Type Gray Filter Glass Aluminized Screen

Magnetic Deflection Magnetic Focus Spherical Faceplate Single Field Ion Trap 27RP4 has an External Conductive Coating



GENERAL DATA	
Focusing Method	Magnetic
Deflecting Method	Magnetic
Deflecting Angle (approx.)	05 D
Horizontal	85 Degrees
DiagonalPhosphor	90 Degrees P4
Fluorescence	White
Persistence	Medium
Faceplate Gr	ray Filter Glass
Light Transmittance (approx.)	68 Percent
ELECTRICAL DATA	
Heater Voltage	6.3 Volts
Heater Current (approx.)	0.6 Ampere
Direct Interelectrode Capacitances (approx.)	
Cathode to All Other Electrodes	5 μμf
Grid No. 1 to All Other Electrodes	6 μμf _
Ion Trap Magnet External, S	ingle Field Type

27EP4, 27RP4 (Cont'd)

м	EC.	HΑ	NIC	ΆL	DA	TA

Minimum Useful Screen Dimensions	24 x	181/2 Inches
Bulb Contact (Recessed Small Cavity Cap)		
Base (Small Shell Duodecal 5-Pin)		B5-57
Basing		12 D

RATINGS

MAXIMUM RATINGS (Design Center Values)

Anode Voltage	20000 500	Volts d c Volts d c
Negative Bias Value Positive Bias Value Positive Peak Value	0	Volts d c Volts d c Volts
Peak Heater-Cathode Voltage Heater Negative with Respect to Cathode		***************************************
During Warm-up Period Not to Exceed 15 Seconds	180	Volts Volts Volts

RECOMMENDED OPERATING CONDITIONS

Anode Voltage	20000	Volts d c
Grid No. 2 Voltage		
Grid No. 1 Votage Required for Cutoff!28	to -72	Volts d c
Focusing Coil Current (approx.)2125	$\pm 20\%$	Ma dc
Ion Tran Magnet Strength (approx.)	40	Gausses

CIRCUIT VALUES

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

NOTES:

- Visual extinction of focused raster. Extinction of the stationary focused spot will require that these values be about 5 volts more negative.
 For JETEC focusing coil 109 or equivalent three inches from reference line, bias adjusted to 20 foot lamberts on a 24 x 18½ inch picture area.

27RP4

The Sylvania Type 27RP4 is identical to Type 27EP4 except for having an external conductive coating which must be grounded.

External Conductive Coating to Anode Capacitance	
Maximum	750 µµf
Minimum	500 μμf
Basing	12 N

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.

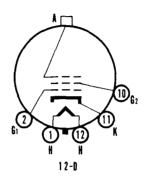
SYLVANIA TYPE 27GP4

TELEVISION PICTURE TUBE

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

Single Field Ion Trap





GENERAL DATA		
Focusing Method. Deflecting Method. Deflecting Angle (approx.)		gnetic gnetic
Horizontal Diagonal Phosphor	90 D	egrees egrees P4
Fluorescence Persistence Faceplate Light Transmittance (approx.)	Me Gray Fi	hite dium Iter Glass ercent
ELECTRICAL DATA		
Heater Voltage	0.6	Volts Ampere
Cathode to All Other Electrodes	6	μμ ^f μ μ f Field Type
MECHANICAL DATA		
Minimum Useful Screen Dimensions		Inches
RATINGS		
MAXIMUM RATINGS (Design Center Values)		
Anode Voltage Grid No. 2 Voltage Grid No. 1 Voltage		Volts d c Volts d c
Negative Bias Value		Volts d c
Positive Peak Value Peak Heater-Cathode Voltage		Volts d c Volts
Positive Peak Value	410 180	
Positive Peak Value	410 180	Volts Volts Volts
Positive Peak Value Peak Heater-Cathode Voltage Heater Negative with Respect to Cathode During Warm-up Period Not to Exceed 15 Seconds After Equipment Warm-up Period. Heater Positive with Respect to Cathode	410 180 180 20000 300 3 to -72 5 ±20%	Volts Volts Volts Volts Volts d c Volts d c
Positive Peak Value Peak Heater-Cathode Voltage Heater Negative with Respect to Cathode During Warm-up Period Not to Exceed 15 Seconds After Equipment Warm-up Period Heater Positive with Respect to Cathode RECOMMENDED OPERATING CONDITIONS Anode Voltage. Grid No. 2 Voltage. Grid No. 1 Voltage Required for Cutoff	410 180 180 20000 300 3 to -72 5 ±20%	Volts Volts Volts Volts Volts d c Volts d c Volts d c Ma d c

27GP4 (Cont'd)

NOTES:

1. Visual extinction of focused raster. Extinction of the stationary focused spot

will require that these values be about 5 volts more negative.

For JETEC focusing coil No. 109 or equivalent 3 inches from reference line bias adjusted to 20 foot lamberts on a 241/4 x 181/2 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 27LP4

Silver Screen "85"

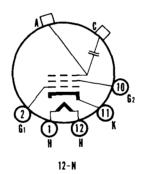
TELEVISION PICTURE TUBE

27" Direct Viewed Rectangular Glass Type **Gray Filter Glass**

Magnetic Deflection Magnetic Focus Spherical Faceplate External Conductive Coating Single Field Ion Trap

Aluminized Screen





CHARACTERISTICS

GENERAL DATA				
Focusing Method	Magnetic			
Deflecting Method	Magnetic			
Deflecting Angle (approx.) Horizontal. Diagonal. Phosphor Fluorescence Persistence	85 Degrees 90 Degrees P4 White Medium			
Faceplate	Gray Filter Glass			
Heater Voltage	6.3 Volts 0.6 Ampere			
Cathode to All Other Electrodes	5.0 μμf			
Grid No. 1 to All Other Electrodes External Conductive Coating to Anode!	6.0 μμf 400 μμf Max 250 μμf Min			
Ion Trap MagnetExternal	, Single Field Type			
MECHANICAL DATA				
Minimum Useful Screen Dimensions	7/ ₃₂ x 18 ¹⁵ / ₃₂ Inches J1-21 B5-57 12 N			

SYLVANIA PICTURE TUBES

27LP4 (Cont'd)

RATINGS

MAXIMUM RATINGS (Design Center Values)		
Anode Voltage	22000	Volts d c
Grid No. 2 Voltage	600	Voits d c
Grid No. 1 Voltage		
Negative_Bias Value		Volts d c
Positive Bias Value		Volts d c
Positive Peak Value	2	Voits
Peak Heater-Cathode Voltage		
Heater Negative with Respect to Cathode		
During Warm-up Period Not to Exceed 15 Seconds		Volts
After Equipment Warm-up Period		Volts
Heater Positive with Respect to Cathode	180	Volts
RECOMMENDED OPERATING CONDITIONS		
Anode Voltage	20000	Volts d c
Grid No. 2 Voltage	300	Volts d c
Grid No. 1 Voltage Required for Cutoff ² 28	to -72	Volts d c
Focusing Coil Current (approx.)3		Ma dc
Ion Trap Magnet Strength (approx.)	40	Gausses
CIRCUIT VALUES		
Grid No. 1 Circuit Resistance	1.5	Megohms
		Max
NOTES:		
1. Conductive coating must be arounded		

Conductive coating must be grounded.
 Visual extinction of focused raster. Extinction of the stationary focused spot will require that these values be about 5 volts more negative.
 For JETEC focusing coil No. 109 or equivalent.

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.

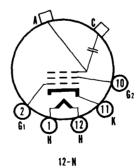
SYLVANIA TYPE 27NP4

TELEVISION PICTURE TUBE

27" Direct Viewed Rectangular Glass Type Gray Filter Glass External Conductive Coating

Magnetic Deflection Magnetic Focus Spherical Faceplate Single Field Ion Trap





27NP4 (Cont'd)

CHARACTERISTICS

GENERAL DATA		
Focusing Method . Deflecting Method . Oeflecting Angle (approx.)		gnetic gnetic
Horizontal Diagonal Phosphor	90 [Degrees Degrees P4
Fluorescence Persistence Faceplate Light Transmittance (approx.)	V Me	/hite edium
ELECTRICAL DATA		
Heater Voltage Heater Current (approx.) Direct Interelectrode Capacitances (approx.) Cathode to All Other Electrodes.	0.6	Volts Ampere
Grid No. 1 to All Other Electrodes. External Conductive Coating to Anode!	6 750	μμf μμf μμf Max
lon Trap Magnet External,	500 Single	μμί Mir Field Type
MECHANICAL DATA		
Minimum Useful Screen Dimensions	J B	8½ Inches 1-21 5-57 12N
RATINGS		
MAXIMUM RATINGS (Design Center Values)		
Anode Voltage Grid No. 2 Voltage Grid No. 1 Voltage		Voits d c Voits d c
Negative Bias Value Positive Bias Value Positive Peak Value Peak Heater-Cathode Voltage Heater Negative with Respect to Cathode	0	Volts d c Volts d c Volts
During Warm-up Period Not to Exceed 15 Seconds After Equipment Warm-up Period Heater Positive with Respect to Cathode	180	Volts Volts Volts
RECOMMENDED OPERATING CONDITIONS		
Anode Voltage. Grid No. 2 Voltage. Grid No. 1 Voltage Required for Cutoff ² 28 Focusing Coil Current (approx.) ³ . 95 Ion Trap Magnet Strength (approx.)	300 to −72 ±20%	Volts d c Volts d c Ma d c
CIRCUIT VALUES		
Grid No. 1 Circuit Resistance	1.5	Megohms Max
NOTES: 1. Conductive coating must be grounded		

Conductive coating must be grounded.
 Visual extinction of focused raster. Extinction of the stationary focused spot will require that these values be about 5 volts more negative.
 For JETEC focusing coil 109 or equivalent 3 inches from reference line, bias adjusted to 20 foot lamberts on a 24½ x 18½ 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 27SP4

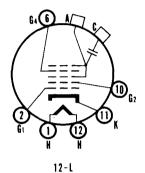
TELEVISION PICTURE TUBE

27" Direct Viewed Rectangular Glass Type Gray Filter Glass

Magnetic Deflection **Electrostatic Focus** Spherical Faceplate External Conductive Coating Single Field Ion Trap

Aluminized Screen





CHARACTERIOTICS			
GENERAL DATA			
Focusing Method. Deflecting Method Deflecting Angle (approx.)		ostatic gnetic	
Horizontal Diagonal Phosphor	90 D	egrees egrees 4	
Fluorescence Persistence Faceplate Light Transmittance (approx.)	W Me Gray Fi	hite dium	ass
ELECTRICAL DATA			
Heater Voltage. Heater Current (approx.). Direct Interelectrode Capacitances (approx.)	6.3 0.6	Volts Ampere	e
Cathode to All Other Electrodes. Grid No. 1 to All Other Electrodes. External Conductive Coating to Anode!	6 750	μμf μμf μμf Ν	Иaх
Ion Trap MagnetExternal	500 , Single	μμτ Γ Field T	Min ype
MECHANICAL DATA			
Minimum Useful Screen Dimensions Bulb Contact, (Recessed Small Cavity Cap) Base (Small Shell Duodecal 6-Pin) Basing	J ² Be	½ Inch 1-21 5-63 12L	ies
RATINGS			
MAXIMUM RATINGS (Design Center Values)			
Anode Voltage Grid No. 4 Voltage (Focusing Electrode)	+1000	Volts d Volts d	d c
Negative Bias Value Positive Bias Value Positive Peak Value.	0	Volts d Volts d Volts	
Peak Heater-Cathode Voltage Heater Negative with Respect to Cathode During Warm-up Period Not to			
Exceed 15 Seconds. After Equipment Warm-up Period. Heater Positive with Respect to Cathode.	180	Volts Volts Volts	

27SP4 (Cont'd)

RECOMMENDED OPERATING CONDITIONS

Anode Voltage	
Grid No. 4 Voltage72 to	+396 Volts d c
Grid No. 2 Voltage	300 Voltsdic
Grid_No. 1 Voltage Required for Cutoff228 t	to −72 Voltsdc
Ion Trap Magnet Strength (approx.)	40 Gausses

CIRCUIT VALUES

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

- External conductive coating must be grounded.
 Visual extinction of focused raster. Extinction of the 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.