

ELECTRONIC INDUSTRIES ASSOCIATION



2001 EYE STREET, N. W.
WASHINGTON, D. C. 20006

TELEPHONE: (202) 457-4900
CABLES: ELECTRON WASHINGTON DC

Announcement
of
Electron Device Type Reregistration
Release No. 6748A (FINAL)

August 18, 1981

**E. I. A.
REGISTRATION
FILE**

The Tube Engineering Panel Advisory Council announced the proposed reregistration of the following electron device designation:

19VJTP22

on May 26, 1981.

This announcement is notice that the proposed reregistration covered by Release No. 6748A, dated May 26, 1981, may be considered "FINAL".

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TELEPHONE: (202) 457-4900
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Announcement

of

Electron Device Type Reregistration

Release No. 6748A (Tentative)*

May 26, 1981

**E. I. A.
REGISTRATION
FILE**

The Tube Engineering Panel Advisory Council announced the registration of the following electron device designation:

19VJTP22

on September 5, 1978, in Release No. 6748, under the sponsorship of RCA.

The sponsor now proposes reregistration as follows:

<u>Item</u>	<u>As Registered</u>	<u>As Proposed</u>
Implosion Protection	Tension Bands	Tension Bands or Tension Band
Peripheral Location of Tension Band Clip	6:00 & 12:00	For 2 Tension Bands 6:00 & 12:00 or For 1 Tension Band 6:00
Clip Clearance Dimensions from Vertical Axis	± 2.0 max. in. (51 max. mm)	No Change
Tube Dimensions:		
At O.D. of Tension Band		
Diagonal	$20.473 \pm .093$ in. (520.01 \pm 2.36 mm)	$20.473 \pm .093 - .137$ in. (520.01 \pm 2.36 - 3.48 mm)
Horizontal	$17.441 \pm .093$ in. (443.00 \pm 2.36 mm)	$17.441 \pm .093 - .131$ in. (443.00 \pm 2.36 - 3.33 mm)
Vertical (including tension-band clip)	$13.905 \pm .093$ in. (353.19 \pm 2.36 mm)	$13.905 \pm .093 - .312$ in. (353.19 \pm 2.36 - 7.92 mm)

*Unless valid written objection to this reregistration is lodged with the EIA Type Administration Office at the above address prior to July 26, 1981, this reregistration will be made and this information will be considered "FINAL".

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2001 EYE STREET, N. W.
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TELEPHONE: (202) 457-4900
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Announcement
of
Electron Device Type Registration
Release No. 6748
September 5, 1978

**E. I. A.
REGISTRATION
FILE**

The Joint Electron Device Engineering Council announces the registration of the following electron device designation

19VJTP22

according to the ratings and characteristics found on the attached data sheet on the application of

RCA Corporation
Lancaster, Pennsylvania

90° Precision In-Line HI-LITE MATRIX Color Picture Tubes

- High-Focus-Voltage Bipotential Precision In-Line Gun — Better Focus Performance
- Designed for a Self-Converging ST Yoke System — Reduced Receiver Costs Lower Deflection Power
- HI-LITE MATRIX Line Screen With Tinted Phosphor — Increased Picture Brightness and Enhanced Color and Contrast
- Contoured-Line Screen — Smooth Curved Phosphor Lines at Sides of Screen — Ragged Stair-Step Edge Eliminated
- Super Arch Mask — Minimizes Thermal Expansion Effects
- Integral Mounting Lugs — 19VJTP22 Only

RCA-19VJTP22 and 19VJMP22 are 90° MATRIX Precision In-Line Color Picture Tubes featuring a high-focus-voltage bipotential in-line electron gun and a selectively absorbent phosphor screen. They are designed to be used in conjunction with a hybrid saddle-toroidal yoke to provide a self-converging deflection system. These new tubes also incorporate a Super Arch Mask, which minimizes the effects of mask doming caused by uneven thermal expansion during tube operation, and a contoured-line screen — the phosphor lines at the sides of the screen are curved to follow the contour of the glass bulb panel to eliminate the ragged edge produced by straight phosphor lines. The phosphor is tinted to selectively absorb room light striking it and permit only the phosphor color to be reflected. Contrast ratio improvement is approximately 25 per cent over standard phosphors.

The new high-focus-voltage bipotential precision in-line electron gun, with a wider space between the beams, produces a smaller spot size resulting in sharper pictures. The improved focus is achieved through a redesigned beam-forming optical system and a higher voltage on the focusing electrode — typically 8.5 kV as compared to 5.5 kV for original RCA precision in-line tubes. Focus performance is comparable to tubes incorporating a tripotential electron gun without the disadvantage of requiring the extremely high voltage (12 kV) that is applied to the additional focus electrode in the tripotential gun.

The 19VJTP22 and 19VJMP22, with their 29-mm neck diameter and a new contour in the yoke region, are especially designed to operate with a saddle-toroidal yoke resulting in a lower deflection power system. The field configuration of this type of yoke is such that when accurately aligned with the precisely-spaced electron beams it produces the inherent self-converging feature of the precision in-line system. Good convergence performance is achieved without the application of any dynamic convergence correction and therefore is independent of scan size, pincushion correction, line-voltage fluctuation, or circuit changes due to aging.

Formerly RCA Developmental Types C76476 and C76477, respectively.

Information furnished by RCA is believed to be accurate and reliable. However, no responsibility is assumed by RCA for its use; nor for any infringements of patents or other rights of third parties which may result from its use. No license is granted by implication or otherwise under any patent or patent rights of RCA.

Simple 2-pole, 4-pole, and 6-pole permanent-magnet devices, similar to devices used on other RCA Precision In-Line tubes, are recommended for purity and static convergence adjustments.

General Data

Electrical:	
Heater:	
Voltage	6.3 V
Current	700 mA
Focusing Method	Electrostatic
Focus Lens	Bipotential
Convergence Method	Magnetic
Deflection Angles (Approx.):	
Diagonal	90 deg
Horizontal	78 deg
Vertical	60 deg
Direct Interelectrode Capacitance (Approx.):	
Grid No.1 to all other electrodes	11.4 pF
Grid No.3 to all other electrodes	4.5 pF
Red cathode to all other electrodes	6.5 pF
Blue or green cathode to all other electrodes	5.5 pF
Capacitance Between Anode and External Conductive Coating (Including Metal Hardware)	{ 2600 max. pF 1500 min. pF
Resistance Between Metal Hardware and External Conductive Coating	50 min. MΩ

Optical:

Faceplate:	
Light transmission at center (approx.)	85%
Surface	Polished
Screen:	
Matrix	Black Opaque Material
Type	Negative Guard Band Phosphor, rare-earth (red) sulfide (blue & green)
P22	
Type	Selectively absorbent
Persistence	Medium-Short
Array	Vertical Line Trios Contoured to Screen Edge
Spacing between corresponding points on line trios at center (approx.)	0.032 in (0.82 mm)

General Data (Cont'd)

Mechanical:

Tube Dimensions:
Overall length: 17.466 ± .250 in (443.64 ± 6.35 mm)
Reference line to center of face: 11.354 ± .188 in (288.39 ± 4.78 mm)
Neck length: 6.112 ± .188 in (155.24 ± 4.78 mm)
At O.D. of tension band:

Diagonal:

19VJTP22: 20.473 ± .093 in (520.01 ± 2.36 mm)

19VJMP22: 20.315 ± .093 in (516.00 ± 2.36 mm)

Horizontal: 17.441 ± .093 in (443.00 ± 2.36 mm)

Vertical (including tension-band clip): 13.905 ± .093 in (353.19 ± 2.36 mm)

Minimum screen dimensions (Projected):

Diagonal: 18.897 in (479.98 mm)

Horizontal: 16.922 in (404.42 mm)

Vertical: 11.941 in (303.30 mm)

Area: 186 sq in (1194 sq cm)

Bulb Funnel Designation: JEDEC No.J510H

Bulb Panel Designation: JEDEC No.F513A

Bulb Contact Designation: Recessed Small Cavity Cap (JEDEC No.J1-21)

Base Designation^a: JEDEC No.B10-276

Basing Designation: JEDEC No.13N

Pin Position Alignment: Space Separating Pins 9 and 10

Aligns Approx. with Anode Bulb Contact

Operating Position, Preferred: Anode Bulb Contact on Top

Gun Configuration: Horizontal In Line

Weight (Approx.): 26.5 lb (12.1 kg)

Implosion Protection

Type: Tension Bands

Maximum and Minimum Ratings,

Absolute-Maximum Values

ABSOLUTE-MAXIMUM RATINGS ARE SPECIFIED FOR RELIABILITY AND PERFORMANCE PURPOSES. X-RADIATION CHARACTERISTICS SHOULD ALSO BE TAKEN INTO CONSIDERATION IN THE APPLICATION OF THIS TUBE TYPE.

Unless otherwise specified, voltage values are positive with respect to grid No.1.

Anode Voltage: 32 max. kV

Anode Current, Long-Term Average: 2000 max. μ A

Grid-No.3 (Focusing-electrode) Voltage: 12 max. kV

Peak-Grid-No.2 Voltage: 1500 max. V

Cathode Voltage:

Positive bias value: 400 max. V

Positive operating cutoff value: 200 max. V

Negative bias value: 0 max. V

Negative peak value: 2 max. V

Heater Voltage (AC or DC):^b 6.9 max. V

Heater Voltage (AC or DC):^b 5.7 min. V

Heater-Cathode Voltages:^c

Heater negative with respect to cathode:

During equipment warm-up period:

not exceeding 15 seconds: 450 max. V

After equipment warm-up period:

DC component value: 200 max. V

Peak value: 300 max. V

Heater positive with respect to cathode:

DC component value: 0 max. V

Peak value: 200 max. V

Typical Design Values

Unless otherwise specified, voltage values are positive with respect to grid No.1.

For anode voltage of 30 kV

Grid-No.3 (Focusing electrode) Voltage: 26.6 to 29.8% of Anode Voltage

Grid-No.2 Voltage for Visual

Extinction of Undelected

Focused Spot: See CUTOFF DESIGN CHART in Figure 1

At cathode voltage of 75 V: 190 to 390 V

At cathode voltage of 125 V: 345 to 675 V

At cathode voltage of 175 V: 495 to 960 V

Maximum Ratio of Cathode Voltages, Highest

Gun to Lowest Gun (With grid No.2 of gun

giving highest cathode voltage adjusted to

Heater Voltage^b: 6.3 V

Grid-No.3 Current^d: ± 10 μ A

Grid-No.2 Current: ± 5 μ A

Grid-No.1 Current: ± 5 μ A

To Produce White Light of: 6550 K + 9300 K + 7 M.P.C.D. 27 M.P.C.D. (illum. D)

CIE Coordinates:

X: 0.313 0.281

Y: 0.329 0.311

Percentage of total anode current supplied by each beam (average):

Red: 34 %

Blue: 28 %

Green: 38 %

Ratio of cathode currents:

Red/blue: 1.05 0.50

Typical: 1.22 0.67

Maximum: 1.55 0.90

Red/green:

Minimum: 0.75 0.40

Typical: 0.88 0.56

Maximum: 1.05 0.70

Blue/green:

Minimum: 0.50 0.60

Typical: 0.72 0.83

Maximum: 0.90 1.00

Raster Centering Displacement,

Measured at Center of Screen:

Horizontal: ± 0.30 in (± 7.5 mm)

Vertical: ± 0.30 in (± 7.5 mm)

Center Convergence Displacement in Any

Direction of the Blue and Red Beams: 0.21 in (5.3 mm)

Center Convergence Displacement in Any

Direction Between Green Beam and

Converged Blue and Red Beams: 0.075 in (1.9 mm)

Maximum Required Correction for Register^e

(Including effect of earth's magnetic field

when using recommended components) as

Measured at the Center of the Screen in

the Horizontal Direction: 0.004 in (0.10 mm) max.

X-Radiation Characteristics

Measured in accordance with the procedure of JEDEC Publication No.64D.

A picture tube should not be operated beyond its Absolute-Maximum Ratings (such operation may shorten tube life or have other permanent adverse effects on its performance).

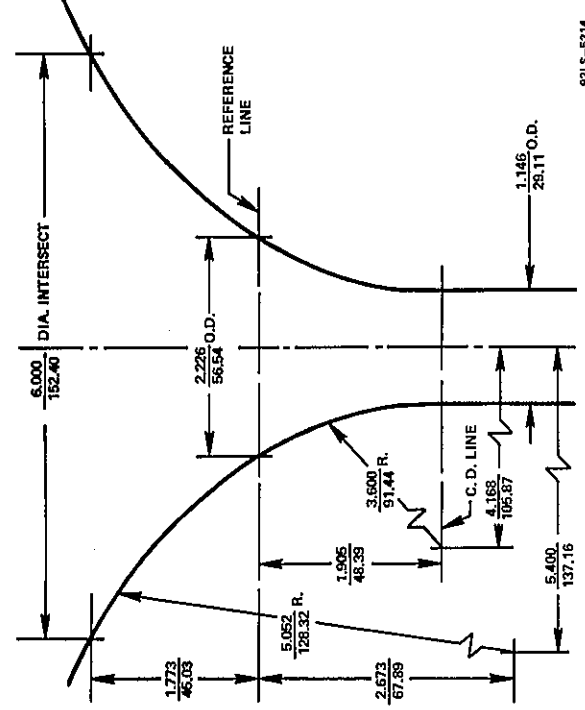
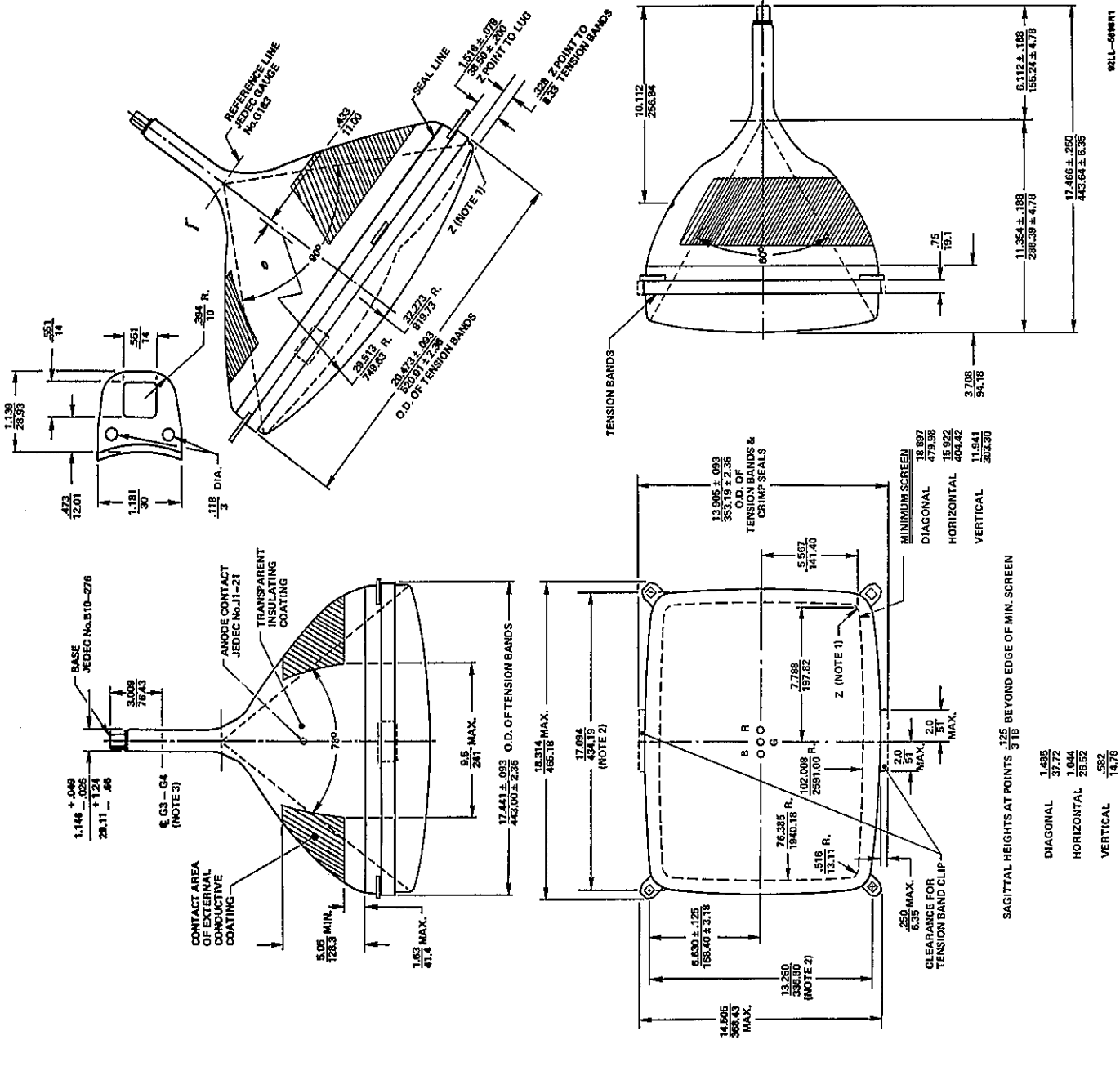
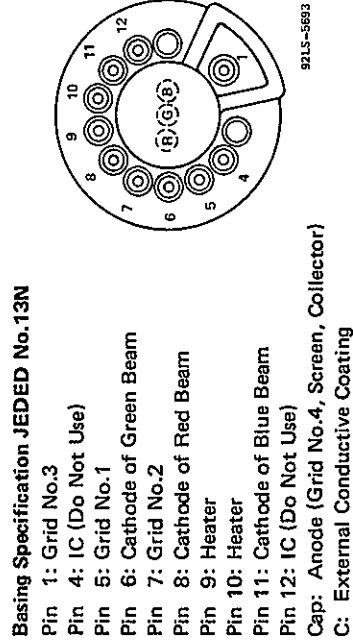


Figure 6 — Funnel Contour in Yoke Region — Reference Line Gauge JEDEC No. G183



X-Radiation Characteristics (Cont'd)

The X-radiation emitted from this picture tube will not exceed 0.5 mR/h for anode voltage and current combinations given by the isoexposure-rate limit curves as shown in Figure 3. Operation above the values shown by the curves may result in failure of the television receiver to comply with the Federal Performance Standard for Television Receivers, Part 1020 of Title 21, Code of Federal Regulations, Subchapter J. Maximum X-radiation as a function of anode voltage at 300 μ A anode current is shown by the curves in Figure 4. X-radiation at a constant anode voltage varies linearly with anode current.

From these Curves Maximum Anode Voltage at Which the X-Radiation Emitted Will Not Exceed 0.5 mR/h at an Anode Current of 300 μ A:

For entire tube	*35.5 kV
For tube face only	37 kV

WARNING: If the value for the tube face only is used as design criteria, adequate shielding must be provided in the receiver for the anode contact and/or certain portions of the tube funnel and panel skirt to insure that the X-radiation from the receiver is attenuated to a value equal to or lower than that specified for the face of the tube.

Maximum Voltage Difference Between Anode and Focus Electrode at Which the X-Radiation Emitted Will Not Exceed 0.5 mR/h 30 kV

WARNING: If the voltage value shown above can be exceeded in the receiver, additional attenuation of the X-radiation through the tube neck may be required.

*This rating applies only if the anode connector used by the set manufacturer provides the necessary attenuation to reduce the X-radiation from the anode contact by a factor equivalent to the difference between the anode button isoexposure-rate limit curve (Figure 3) and the isoexposure-rate limit curve for the entire tube.

- a The mating socket assembly with associated circuit board and mounted components must not weigh more than one pound (one-half kilogram). To minimize the torsional forces on the tube base pins, the center of gravity of this assembly should be located on the vertical plane through the picture tube axis. Caution should also be exercised so that connecting leads to the assembly do not exert excessive torsional forces.
- b For maximum cathode life, it is recommended that the heater supply voltage be regulated at or slightly below the Typical Design Value with an adequate regulation circuit. Details of this specific circuit should be reviewed with RCA Picture Tube Division. The surge voltage across the heater must be limited to 9.5 volts rms.
- c For maximum reliability, the series impedance to any chassis connection in the dc biasing circuit for the heater should be between 100 kilohms and 1 megohm.
- d A high internal impedance in the focus circuit can result in a change in the focus voltage with a change in the grid-No.3 leakage current.
- e Register is defined as the relative position of the beam trios with respect to the associated phosphor-line trios.

Warning

X-Radiation

Operation of this color picture tube at abnormal conditions which exceed the 0.5 mR/h isoexposure-rate curve shown in Figure 3 may produce soft X-rays which may constitute a health hazard on prolonged exposure at close range unless adequate external shielding is provided. Therefore, precautions must be exercised during servicing of TV receivers employing this tube to assure that the anode voltage and other tube voltages are adjusted to the recommended values so that the Absolute-Maximum Ratings will not be exceeded.

This color picture tube incorporates integral X-radiation shielding and must be replaced with a tube of the same type number or an RCA recommended replacement to assure continued safety.

Implosion Protection

This picture tube employs integral implosion protection and must be replaced with a tube of the same type number or an RCA recommended replacement to assure continued safety.

Shock Hazard

The high voltage at which the tube is operated may be very dangerous. Design of the TV receiver should include safeguards to prevent the user from coming in contact with the high voltage. Extreme care should be taken in the servicing or adjustment of any high-voltage circuit.

Caution must be exercised during the replacement or servicing of the picture tube since a residual electrical charge may be contained on the high-voltage capacitor formed by the external and internal conductive coatings of the picture tube funnel. To remove any undesirable residual high-voltage charges from the picture tube, "bleed off" the charge by shorting the anode contact button, located in the funnel of the picture tube, to the external conductive coating before handling the tube. Discharging the high voltage to isolated metal parts such as cabinets and control brackets may produce a shock hazard.

Tube Handling

Picture tubes should be kept in the shipping box or similar protective container until just prior to installation. Wear heavy protective clothing, including gloves and safety goggles with side shields, in areas containing unpacked and unprotected tubes to prevent possible injury from flying glass in the event a tube breaks. Handle the picture tube with extreme care. Do not strike, scratch or subject the tube to more than moderate pressure. Particular care should be taken to prevent damage to the seal area.

It is the sole responsibility of the manufacturer of television receivers and other equipment utilizing this color picture tube to provide protective circuitry and design in the event of failure of this color picture tube.

The equipment manufacturer should provide a warning label in an appropriate position on the equipment to advise the serviceman of all safety precautions.

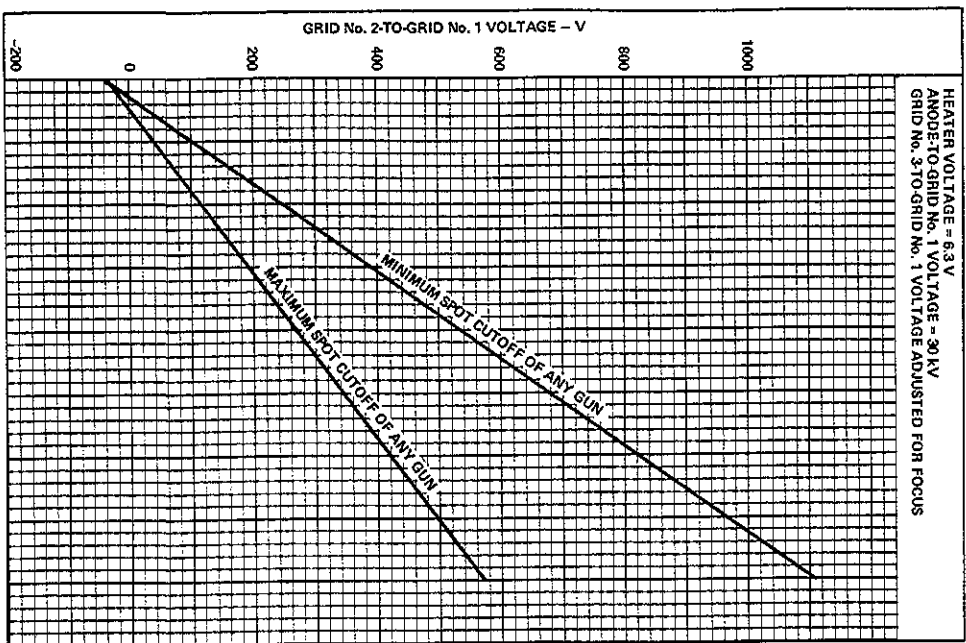


Figure 1 — Cutoff Design Chart

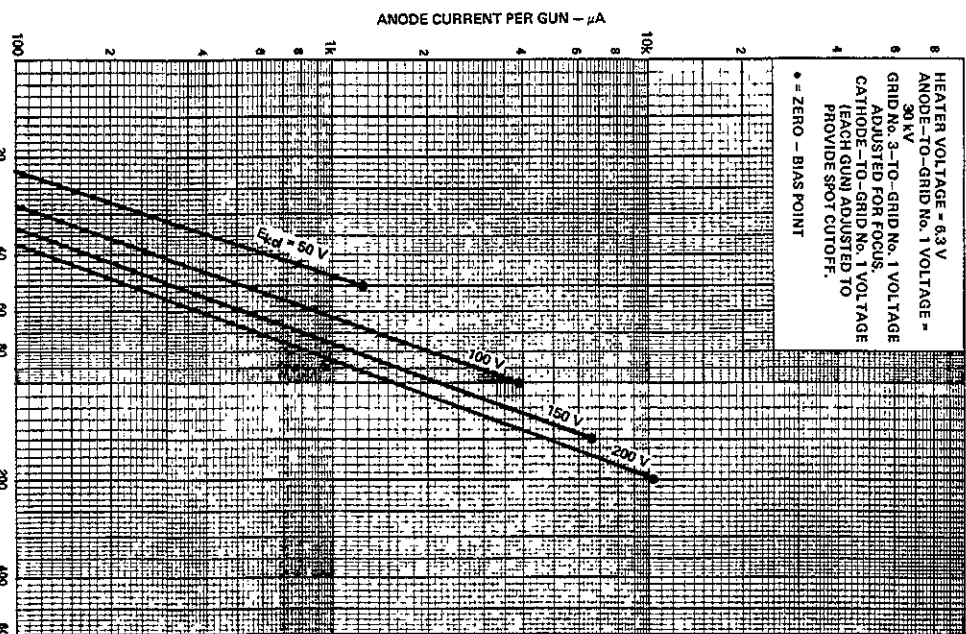


Figure 2 — Typical Drive Characteristics, Cathode-Drive Service

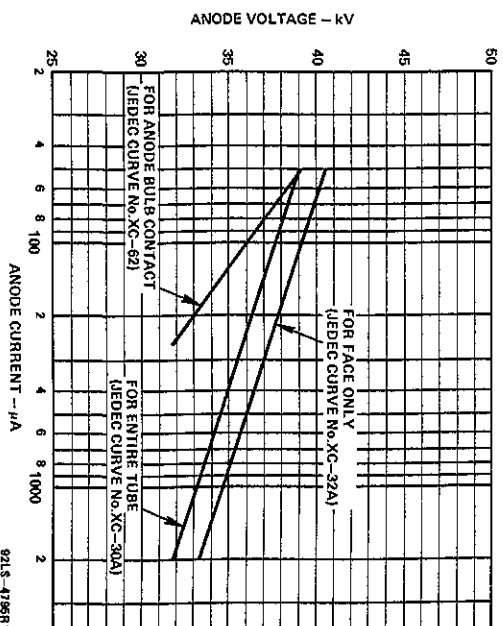


Figure 3 — 0.5 mR/h Isoexposure — Rate Limit Curves

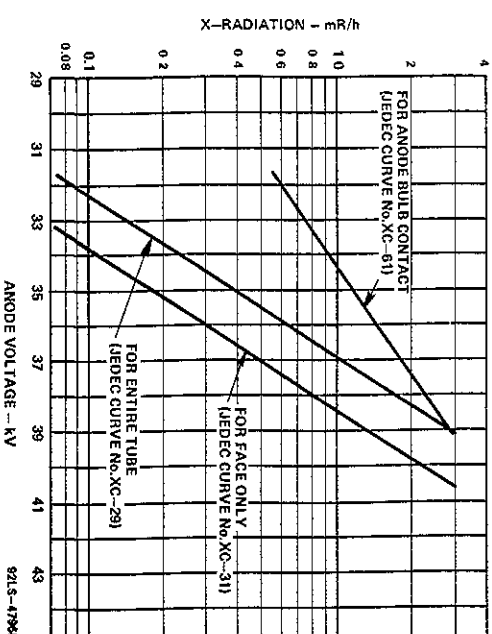


Figure 4 — X-Radiation Limit Curves at a Constant Anode Current of 300 μ A (X-radiation at a constant anode voltage varies linearly with anode current)



Type Administration Office
Engineering Department
Electronic Industries Assoc.
2001 Eye Street, N.W.
Washington, D. C. 20006

August 11, 1978

Dear Sirs:

You are scheduled to receive on or about August 23, 1978
from our printers 200 copies of the technical
information covering tube type 19VJTP22.

These copies are for the purpose of effecting registration of the 19VJTP22, reservation of
which was confirmed by your letter of April 6, 1978.

Your release of material on this type may be made at
your convenience.

Very truly yours,

A handwritten signature in dark ink, appearing to read "M. E. Trim".

M. E. Trim
Tube Development

sjb

P.S. 19VJMP22 which is on the same data sheet has already been registered.

ELECTRONIC INDUSTRIES ASSOCIATION



2001 EYE STREET, N. W.
WASHINGTON, D. C. 20006

April 6, 1978

TELEPHONE: (202) 457-4900
CABLES: ELECTRON WASHINGTON DC

Marvin Trimm
RCA Corporation
New Holland Pike
Lancaster, PA 17604

Dear Mr. Trimm: Subject: Notice of JEDEC Type Assignment

The following JEDEC type assignment has been made in accordance with your request of April 6, 1978.

<u>Your Number</u>	<u>JEDEC Number</u>
4-6-78	19VJTP22

This assignment has been made in accordance with applicable standards and rules adopted by the Joint Electron Device Engineering Council. An invoice in the amount of \$150.00 is enclosed to cover the fees for this type assignment. Payment for this assignment should be made immediately upon receipt of invoice. This invoice must be paid whether or not the sponsor completes the registration or cancels the reservation.

Attention is called to the fact that this notice constitutes only the reservation of a type designation. JEDEC designations are not to be used in commercial data or advertising prior to the completion of the registration requirements, established by JEDEC Publication 14, "Type Assignment Procedures for Electron Tubes."

When you have completed device development and are ready to make public disclosure, the rules provide that you must submit the requisite number of your commercial data sheet, or equivalent, for use in the formal JEDEC announcement of the registration to Industry. Currently that data sheet requirement is 100 copies for receiving and industrial tubes and 200 copies for cathode ray tubes. .

Very truly yours,

S. K. Forish
Type Administration Office

SKF:ohg

Enclosure



Type Administration Office
Engineering Department
Electronic Industries Assoc.
2001 Eye Street, N.W.
Washington, D. C. 20006

April 5, 1978

Dear Sirs:

We are asking that you reserve for us in the JEDEC
picture tube series a type designation for our
developmental type C76476.

Defining data for reservation purposes are given
in the enclosed sheets.

This reservation is to be kept confidential.
Please inform us of the type assignment by phone.

Very truly yours,

A handwritten signature in cursive script, appearing to read "M. E. Trim".

M. E. Trim
Tube Development

sjb

May 5, 1981

RCA

Type Administration
 Engineering Department
 Electronic Industries Association
 2001 Eye Street, N.W.
 Washington, D.C. 20006

Dear Sirs:

Release No. 6748 dated September 5, 1978 covers registration of tube type 19VJTP22.

At this time, we would like to propose modification of registered data as follows:

<u>Item</u>	<u>As Registered</u> <u>Tension Bands</u>	<u>As Proposed</u> <u>Tension Bands</u> or <u>Tension Band</u>
Implosion Protection		
Peripheral Location of Tension Band Clip	6:00 & 12:00	<u>For 2 Tension Bands</u> <u>6:00 & 12:00</u> or <u>For 1 Tension Band</u> <u>6:00</u>
Clip Clearance Dimensions from Vertical Axis	<u>+2.0 max. in.</u> (51 max. mm)	No Change
Tube Dimensions:		
At O.D. of Tension Band		
Diagonal	20.473 + .093 in. (520.01 + 2.36 mm)	20.473 + .093 - .137 in. (520.01 + 2.36 - 3.48 mm)
Horizontal	17.441 + .093 in. (443.00 + 2.36 mm)	17.441 + .093 - .131 in. (443.00 + 2.36 - 3.33 mm)
Vertical (including tension-band clip)	13.905 + .093 in. (353.19 + 2.36 mm)	13.905 + .093 - .312 in. (353.19 + 2.36 - 7.92 mm)

It has been determined that this proposed change will not adversely affect customer's interests.

Very truly yours,

A handwritten signature in dark ink, appearing to read "M.E. Trim", with a stylized flourish at the end.

M.E. Trim
Tube Development

clm