

Image Orthicon

4-1/2-Inch Diameter Type

For RCA TK-42 and TK-43 TV Color Cameras
 Type 4536 is Unilaterally Interchangeable with
 Types 4492, 4492V1, and 4492V2

GENERAL

Heater, for Unipotential Cathode:

Voltage (AC or DC)	6.3 $\pm$ 10%	V
Current	0.6	A

Direct Interelectrode Capacitance:

Anode to all other electrodes	12	pF
Target-to-Mesh Spacing	0.001	in
	(0.0254 mm)	

Spectral Response S-10

Wavelength of Maximum Response . 4500 $\pm$ 300 angstroms

Photocathode, Semitransparent:

Rectangular image (4 x 3 aspect ratio):

Useful size of 1.6 in (41 mm) max. Diagonal

Note: The size of the optical image focused on the photocathode should be adjusted so that its maximum diagonal does not exceed the specified value.

Focusing Method Magnetic

Deflection Method Magnetic

Overall Length 19.375 in (492 mm) $\pm$ 0.310 inGreatest Diameter of Bulb . . . 4.500 in (114 mm) $\pm$ 0.094 in

Envelope Terminals 5

End Base Small-Shell Diheptal 14-Pin Base
 (JEDEC Group 5, No.B14-45)

Socket Cinch Part No.3M14, or equivalent

Operating Position The tube should never be operated in a vertical position with the diheptal-base end up nor in any other position where the axis of the tube with the base up makes an angle of less than 20° with the vertical.

Weight (Approx.) 2.3 lb (993 g)

Minimum Inside Diameter of

Deflecting Coil 3.2 in (81 mm)

Deflecting-Coil Length 7 in (178 mm)

Focusing-Coil Length 15 in (381 mm)

Alignment Coil:

Position on neck . . Centerline of magnetic field should be located 9.25 in (235 mm) from the flat area of the shoulder

ABSOLUTE MAXIMUM AND MINIMUM RATINGS

Operating Temperature:^b

Any part of bulb	65 max.	°C
Of bulb at large end of tube (Image section)	35 min.	°C

Temperature Difference:

Between image section and any part of bulb hotter than image section	5 max.	°C
--	--------	----

Photocathode:

Illumination	50 max.	lm/ft ² (footcandles)—538 lux
------------------------	---------	---

Voltage	-700 max.	V
-------------------	-----------	---

Grid-No.6 Voltage	-700 max.	V
-----------------------------	-----------	---

Target Voltage:

Positive value	10 max.	V
--------------------------	---------	---

Negative value	10 max.	V
--------------------------	---------	---

Field-Mesh Voltage ^c	30 max.	V
---	---------	---

Grid-No.5 Voltage	300 max.	V
-----------------------------	----------	---

Grid-No.4 Voltage	350 max.	V
-----------------------------	----------	---

Grid-No.3 Voltage	400 max.	V
-----------------------------	----------	---

Grid-No.2 & Dynode-No.1 Voltage	350 max.	V
---	----------	---

Grid-No.1 Voltage:

Negative bias value	125 max.	V
-------------------------------	----------	---

Positive bias value	0 max.	V
-------------------------------	--------	---

Voltage Between Consecutive

Dynodes	350 max.	V
-------------------	----------	---

Anode-Supply Voltage	1650 max.	V
--------------------------------	-----------	---

Peak Heater-Cathode Voltage:

Heater negative with respect to cathode	125 max.	V
--	----------	---

Heater positive with respect to cathode	10 max.	V
--	---------	---

TYPICAL OPERATING VALUES^d

Heater Voltage	6.3	V
--------------------------	-----	---

Photocathode Voltage	-600	V
--------------------------------	------	---

Grid-No.6 Voltage (Image Focus)

Approx. 70% of Photocathode Voltage ^e	-370 to -470	V
---	--------------	---

Target Voltage Above Cutoff ^f	Adjusted as required	
--	----------------------	--

Field-Mesh Voltage ^c	15 to 25	V
---	----------	---

Grid-No.5 Voltage (Decelerator)	40	V
---	----	---

Grid-No.4 Voltage (Beam Focus)	70 to 90	V
--	----------	---

Grid-No.3 Voltage ^g	250 to 275	V
Grid-No.2 & Dynode-No.1 Voltage.	280	V
Grid-No.1 Voltage for Picture Cutoff	-45 to -115	V
Dynode-No.2 Voltage	600	V
Dynode-No.3 Voltage ^h	800	V
Dynode-No.4 Voltage	1000	V
Dynode-No.5 Voltage ^h	1200	V
Anode Voltage	1250	V
Recommended Target Temperature Range ^b	35 to 45	°C
Peak-to-Peak Blanking Voltage	8	V
Field Strength of Focusing Coil: ⁱ		
At center of scanning section		
(Approx.)	60	G
In plane of photocathode		
(Approx.)	120	G
Field Strength of Alignment Coil	0 to 3	G

PERFORMANCE DATA

With conditions shown under Typical Operating Values including Recommended Target Temperature Range; target voltage adjusted to 3 volts above cutoff; and operation in a 525-line, 30-frame TV system; except as otherwise indicated.

	Min.	Max.	
Signal-Output Current (Peak to Peak)			
at Maximum Multiplier Gain	15	100	μA
Ratio of Peak-to-Peak Highlight			
Video-Signal Current to RMS			
Noise Current ^k	39.5	—	dB
Photocathode Illumination at 2870° K			
Required to Bring Picture High-			
lights to the "Knee" of Light			
Transfer Characteristic	—	0.052	lm/ft ² (fc)
Amplitude Response at 400 TV Lines			
per Picture Height (Per cent of			
large-area black to large-area			
white) ^m	45	—	%
Uniformity:			
Ratio of Shading (Background			
Signal to Highlight Signal):			
Over full scanned area	—	0.12	
Between center and peripheral			
areas	—	0.07	
Variation of Highlight Signal (Per			
cent of maximum highlight			
signal over full scanned area)	—	20	%

- b** Operation outside of the *Recommended Target Temperature Range* shown under *Typical Operating Values* will not damage the 4536 provided the *Maximum Temperature Ratings* of the tube are not exceeded. Optimum performance, however, is only obtained when the tube is operated within the *Recommended Target Temperature Range*.
- c** With respect to grid No.4.
- d** With the 4536 operated in an RCA MI-557770-A1 deflection assembly, or equivalent, and at fixed photocathode voltage.
- e** Adjust for optimum focus.
- f** The target supply voltage should be adjustable from -5 to +5 volts.
- g** Adjust to give the most uniformly shaded picture near maximum signal.
- h** The voltages shown provide maximum multiplier gain. Normally, dynode-No.3 and dynode-No.5 voltages are simultaneously adjusted to obtain the required value of signal current at the video-amplifier input.
- i** Direction of current should be such that a north-seeking pole is attracted to the image end of the focusing coil, with the indicator located outside of and at the image end of the focusing coil.
- k** Signal-to-noise ratio is dependent upon tube operating conditions and on the method of measurement. Significant factors affecting this ratio include target voltage, bandwidth, system line number and frame time, and the choice of reference signal black level. The value shown is measured under the following conditions using a Video Noise Meter, Model UPSF (North American Version), or equivalent. This meter is manufactured by Rohde and Schwarz, Munich, West Germany.
 Signal: Blanked video, 0.7 V peak-to-peak including 0.07 V set-up.
 Noise Meter: Gated with horizontal and vertical blanking signal of camera system. Video pass band is shaped by means of self-contained 100 kHz high-pass and 4.2 MHz low-pass filters.
 Weighting filters matching the response of the human eye (CCIR Rec.421, Annex III) are not used and the color sub-carrier, 3.58 MHz, is not present during the measurement.
- m** Measured with amplifier having flat frequency response.

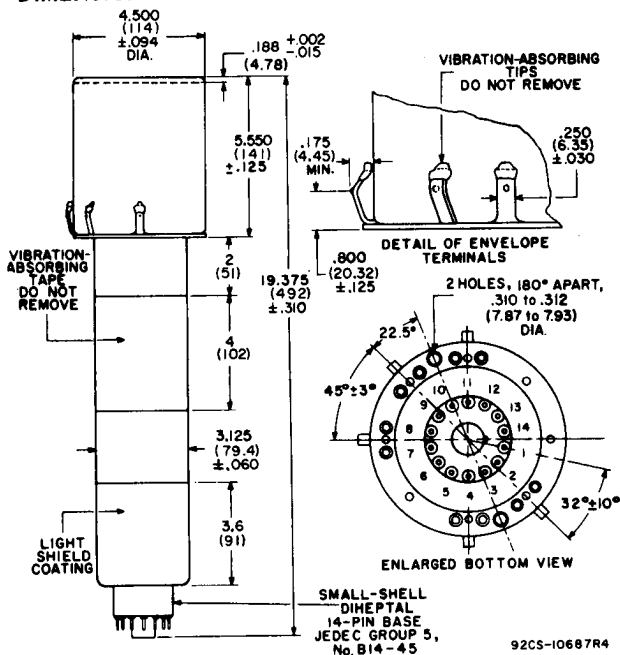
DOS and DON'TS on Use of RCA-4536**Here are the "dos" –**

1. Hold temperature of the 4536 within the recommended operating range.
2. Make sure tube is properly aligned.
3. Adjust beam-focus control for best usable resolution.
4. Select target voltage according to operating needs.
This freedom of operation results from use of the electronically-conducting glass target.
5. Determine proper operating point with target voltage adjusted to the desired voltage above target-cutoff.
6. Open lens before voltages are applied to the 4536.

Here are the "don'ts" –

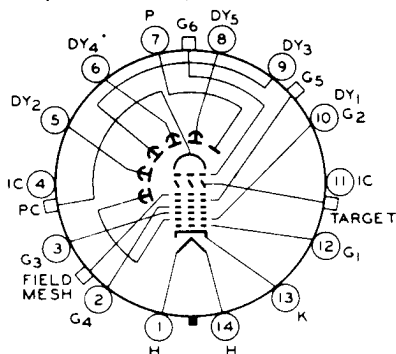
1. Don't force the 4536 into its envelope terminal socket.
2. Don't operate the 4536 without scanning.
3. Don't use more beam current than necessary to discharge the highlights of the scene.
4. Don't turn off beam while tube is capped (and voltages applied).

DIMENSIONAL OUTLINE - Dimensions in Inches (mm)



TERMINAL DIAGRAM (Bottom View)

DIRECTION OF LIGHT:
PERPENDICULAR
TO LARGE END
OF TUBE



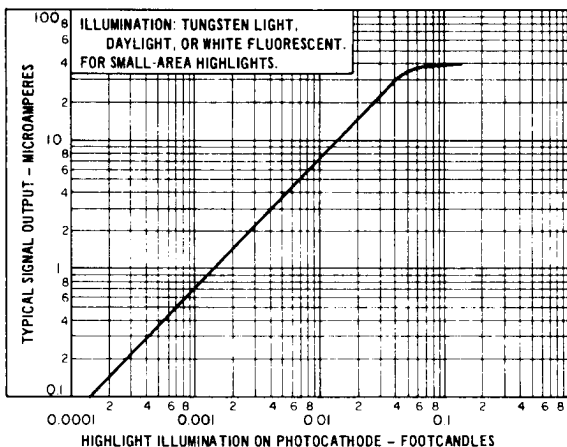
SMALL-SHELL DIHEPTAL 14-PIN BASE

Pin 1: Heater	Pin 9: Dynode No.3
Pin 2: Grid No.4	Pin 10: Dynode No.1, Grid No.2
Pin 3: Grid No.3	Pin 11: Internal Connection – Do Not Use
Pin 4: Internal Connection – Do Not Use	Pin 12: Grid No.1
Pin 5: Dynode No.2	Pin 13: Cathode
Pin 6: Dynode No.4	Pin 14: Heater
Pin 7: Anode	
Pin 8: Dynode No.5	

ENVELOPE TERMINALS

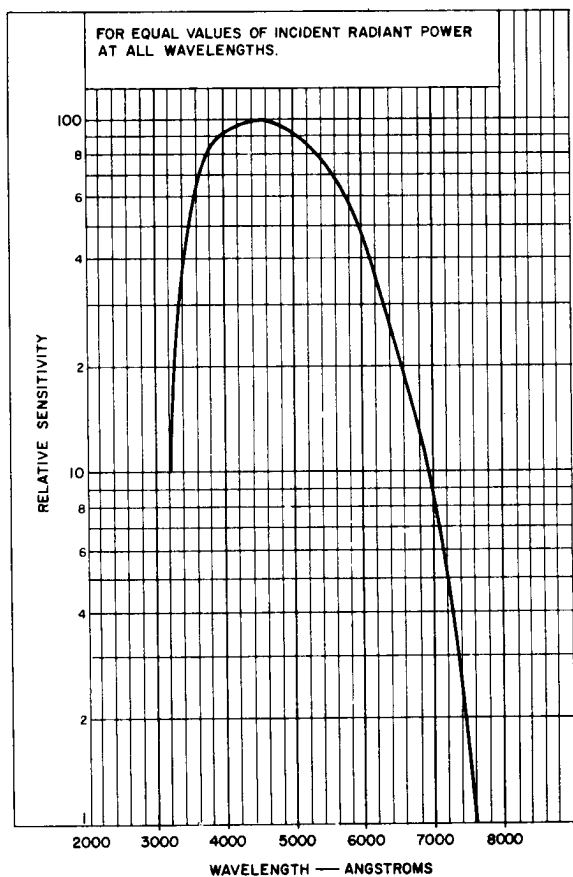
Terminal over Pin 2: Field Mesh
 Terminal over Pin 4: Photocathode
 Terminal on side of envelope
 opposite base key: Grid No.6
 Terminal over Pin 9: Grid No.5
 Terminal over Pin 11: Target

BASIC LIGHT TRANSFER CHARACTERISTIC



92LS-2243

TYPICAL SPECTRAL SENSITIVITY CHARACTERISTIC



92LM-2574