

TELEVISION TUBE

Direct viewing television tube with 21 in. diagonal metal-backed rectangular grey glass screen. This tube is electrostatically focused and has a 110° deflection angle. An ion trap magnet is not required.

AW53-89

PRELIMINARY DATA

This data should be read in conjunction with GENERAL OPERATIONAL RECOMMENDATIONS—CATHODE RAY TUBES, which precede this section of the handbook.

HEATER

Suitable for series or parallel operation.

V_h	6.3	V
I_h	300	mA

The limits of heater voltage and current are contained in 'General operational recommendations—cathode ray tubes'

Note—(applies to series operation only). The surge heater voltage must not exceed $9.5V_{r.m.s.}$ when the supply is switched on. When used in a series heater chain a current limiting device may be necessary in the circuit to ensure that this voltage is not exceeded.

EXTERNAL CONDUCTIVE COATING

This tube has an external conductive coating, M, which must be earthed, and the capacitance of this to the final anode is used to provide smoothing for the e.h.t. supply. The tube marking and warning labels are on the side of the cone opposite the final anode connector and this side should not be used for making contact to the external conductive coating.

CAPACITANCES

C_{g-a11}	7.0	pF
C_{k-a11}	5.0	pF
C_{a3-M}	1850	pF

SCREEN

Metal backed		
Fluorescent colour	white	
Light transmission (approx.)	75	%
Useful screen area	see drawing on page D4	

FOCUSING

Electrostatic

The range of focus voltage shown in the curves results in optimum centre focus at a beam current of $100\mu A$.

DEFLECTION

Double magnetic

For timebase designs the following spreads in the useful screen area should be considered

	<i>Min.</i>	<i>Max.</i>	
Picture height	382.5	388	mm
Picture width	484	490	mm
Picture diagonal	514.5	520	mm

The spread in the cone length can be obtained from the outline drawing. The deflection coils should be designed so that their internal contour is in accordance with JETEC gauge 126.

REFERENCE LINE GAUGE

JETEC 126. For details see 'General operational recommendations—cathode ray tubes'.

RASTER CENTRING

See notes under this heading in 'General operational recommendations—cathode ray tubes'.

Centring magnet field intensity	0 to 15	G
Maximum distance of centre of centring field from reference line	57	mm

Adjustment of the centring magnet should not be such that a general reduction in brightness or shading of the raster occurs.

MOUNTING POSITION

Any

The tube socket should not be rigidly mounted but should have flexible leads and be allowed to move freely. The bottom circumference of the base shell will fall within a circle having a diameter of 40mm which is centred upon the perpendicular from the centre of the face.

This tube is fitted with a pin protector in order to avoid damage to the glass base due to bending of the base pins whilst handling the tube.

It is advisable to keep this pin protector on the base until it can be replaced by the socket after installation of the tube in an equipment.

OPERATING CONDITIONS

	<i>*Grid modulation</i>	<i>*Cathode modulation</i>	
V_{a3}	16	16	kV
V_{a2} (focus electrode control range)	0 to 400	40 to 440	V
V_{a1}	500	540	V
V_g for visual extinction of focused raster	-35 to -75	—	V
V_k for visual extinction of focused raster	—	35 to 69	V

*For grid modulation, all voltages are measured with respect to the cathode; for cathode modulation; all voltages are measured with respect to the grid.

LIMITING VALUES (design centre ratings)

V_{a3} max.	16	kV
V_{a3} min.	13	kV
$+V_{a2}$ max.	750	V
$-V_{a2}$ max.	500	V
V_{a1} max.	700	V
V_{a1} min.	500	V
$-V_{g(pk)}$ max.	400	V
$-V_g$ max.	150	V
$\pm I_{a2}$ max.	15	μA
$\pm I_{a1}$ max.	5.0	μA
$\dagger V_{h-k}$		
Cathode positive		
d.c. max.	200	V
pk max.	300	V
Cathode negative		
d.c. max.	125	V
pk max.	250	V
R_{h-k} max.	1.0	M Ω
Z_{k-e} max. (f=50c/s)	100	k Ω
R_{g-k} max.	1.5	M Ω
Z_{g-k} max. (f=50c/s)	500	k Ω

*The d.c. value of bias must not be such as to allow the grid to become positive with respect to the cathode, except during the period immediately after switching the receiver on or off when it may be allowed to rise to +1V. The maximum positive excursion of the video signal must not exceed +2V and at this voltage the grid current may be expected to be approximately 2mA.

**Maximum pulse duration 22% of a cycle with a maximum of 1.5ms.

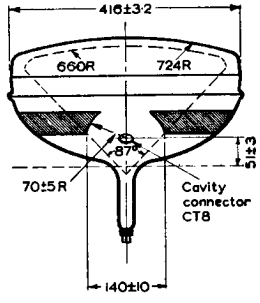
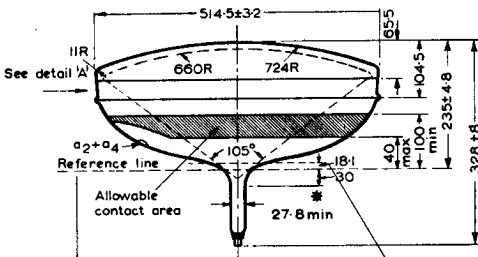
†In order to avoid excessive hum the a.c. component of V_{h-k} should be as low as possible (< 20V_{r.m.s.}).

During a warming-up period not exceeding 45s, $v_{h-k(pk)}$ max. (cathode positive) is allowed to rise to 410V.

WEIGHT

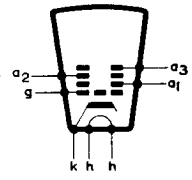
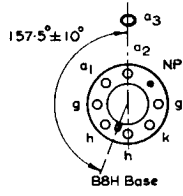
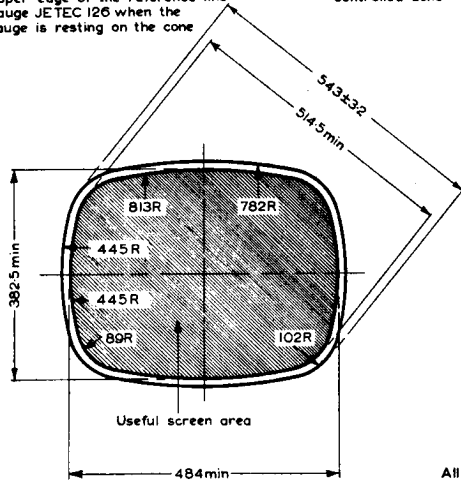
Tube alone

{	10	kg
	22	lb



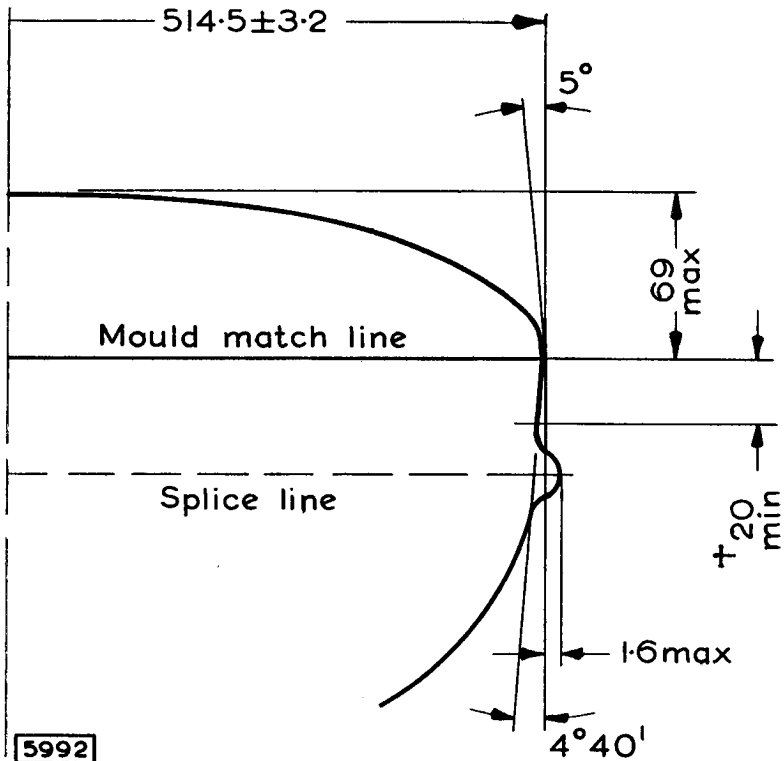
Determined by the plane of the upper edge of the reference line gauge JETEC 126 when the gauge is resting on the cone

End of closely controlled zone



All dimensions in mm 8341

*The maximum value is determined by the reference line gauge.

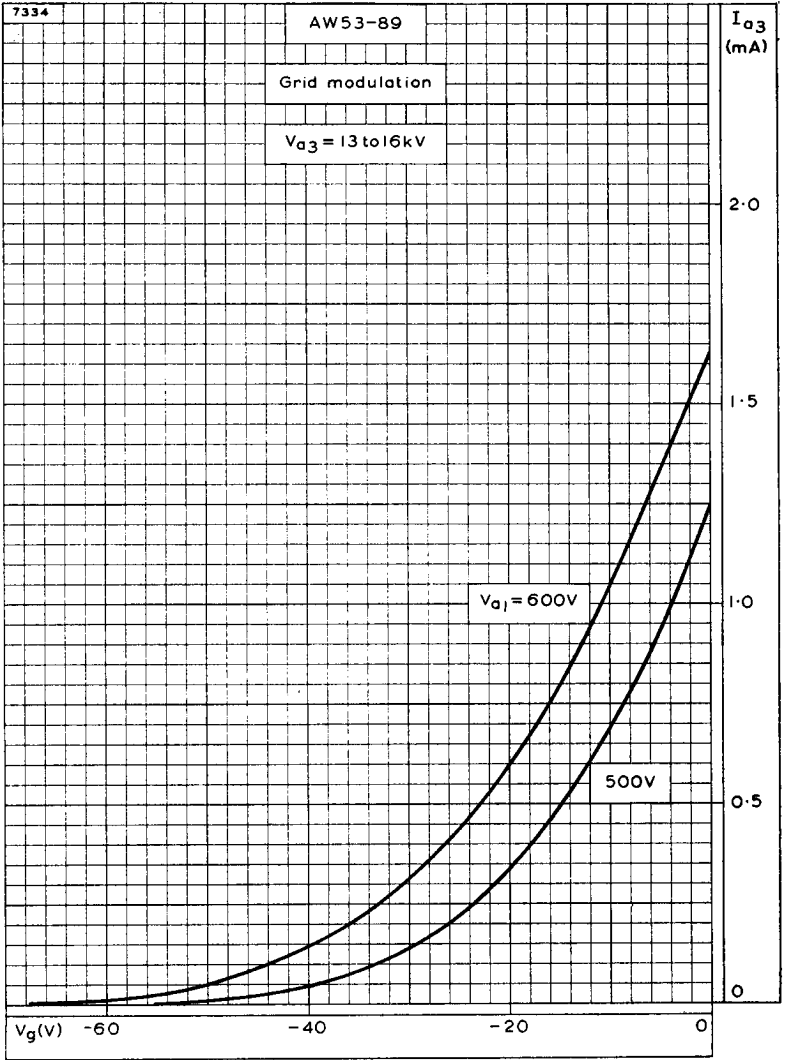


† Undisturbed area between
mould match line and
splice line.

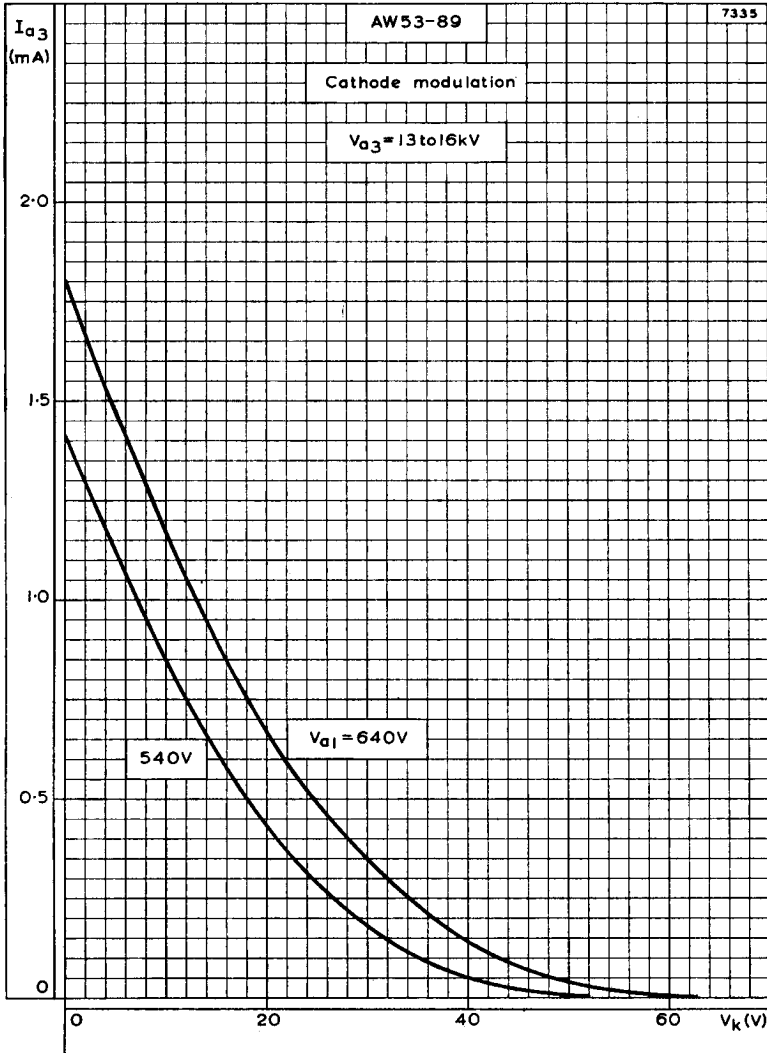
Detail 'A'

The bulge at the splice line seal may increase the indicated maximum value for envelope width, diagonal and height by not more than 3.2mm, but at any point around the seal the bulge will not protrude more than 1.6mm beyond the envelope surface at the mould match line.

The undisturbed area between mould match line and splice line is 20mm minimum. This should be the width of the tube support band.

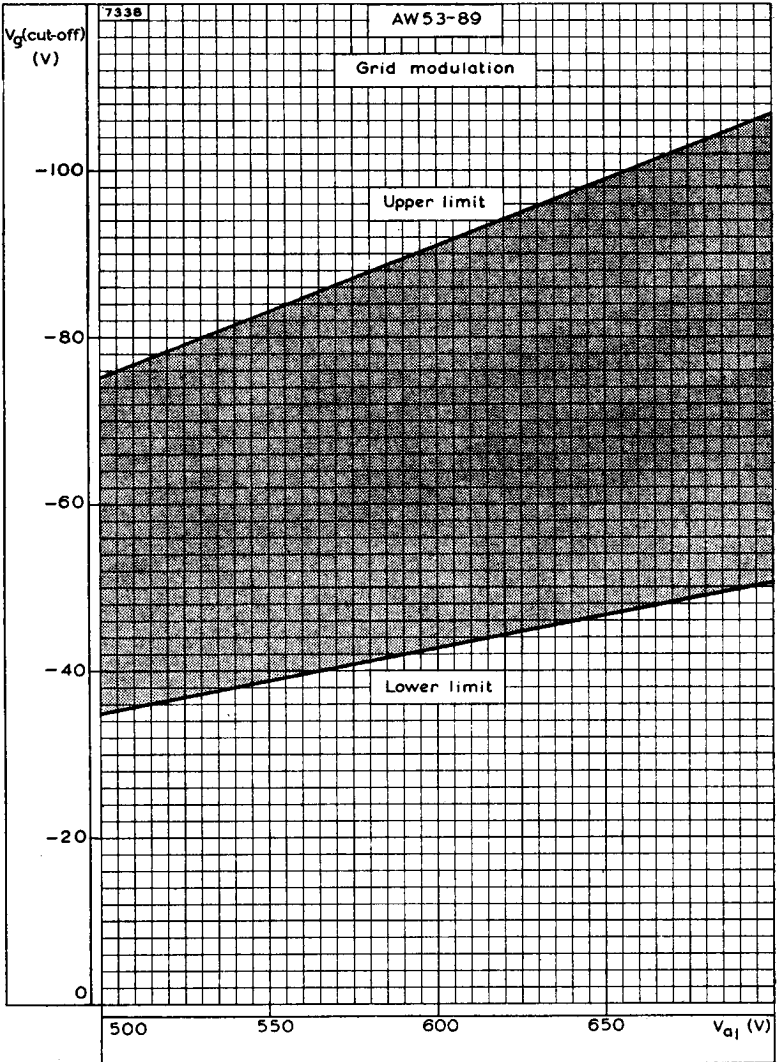


FINAL ANODE CURRENT PLOTTED AGAINST GRID VOLTAGE.
GRID MODULATION

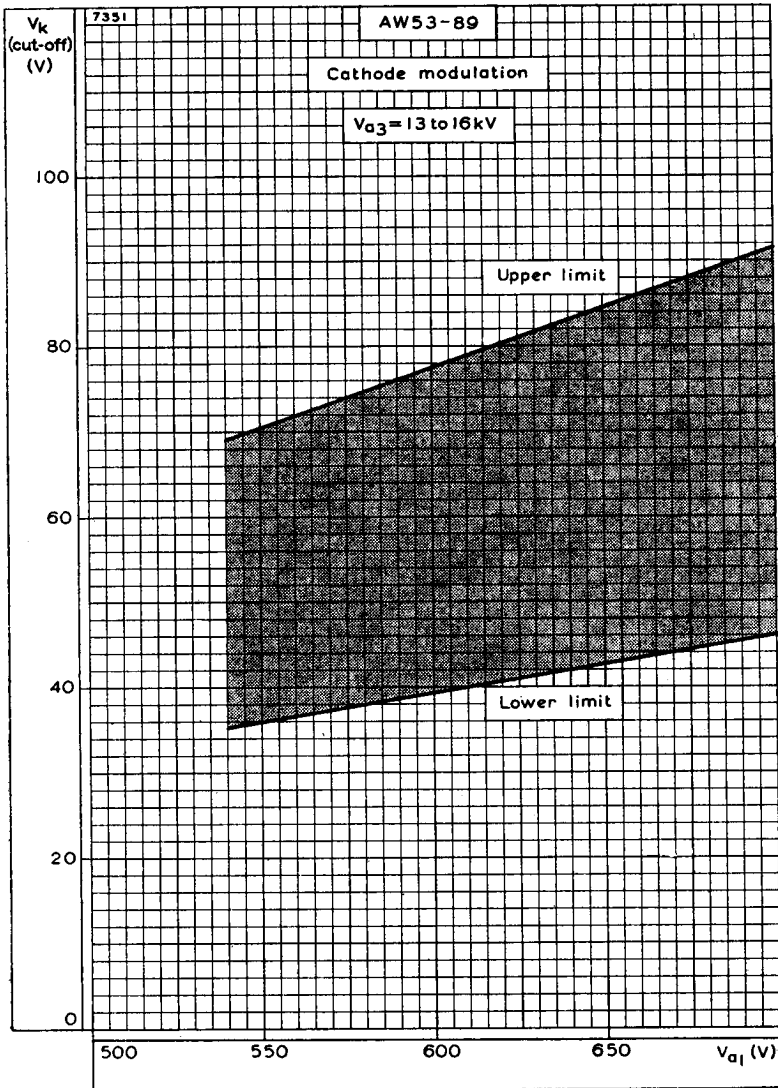


FINAL ANODE CURRENT PLOTTED AGAINST CATHODE-TO-GRID VOLTAGE.
CATHODE MODULATION

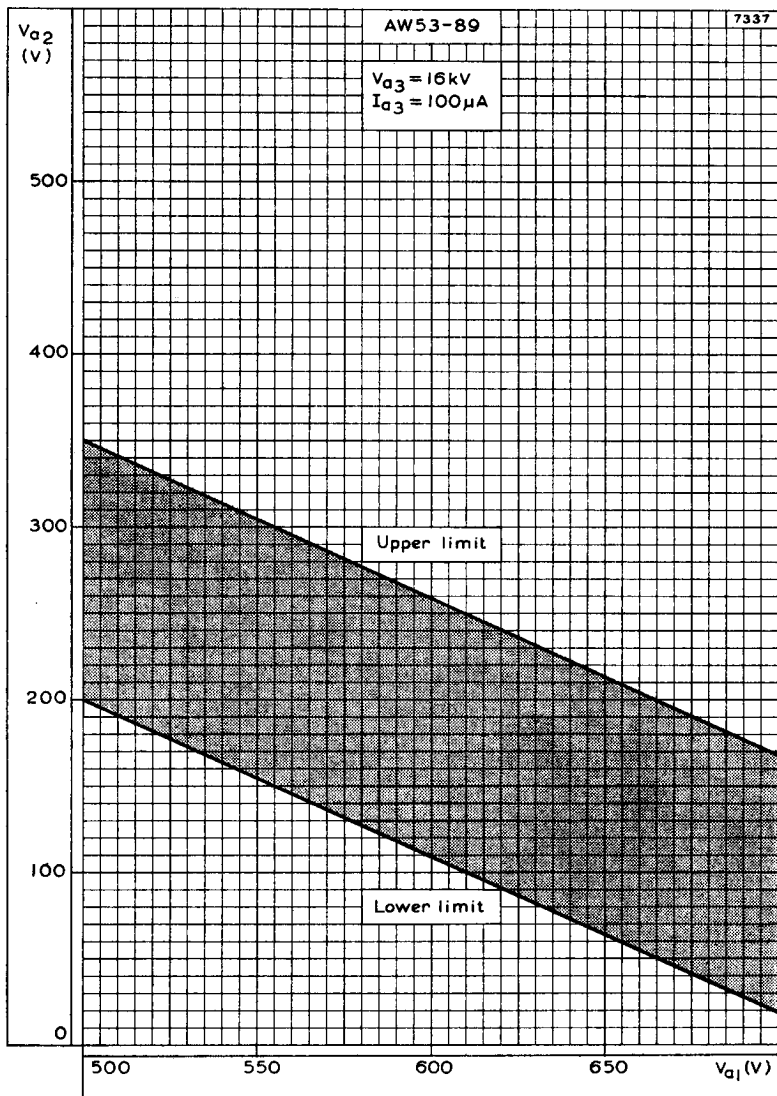




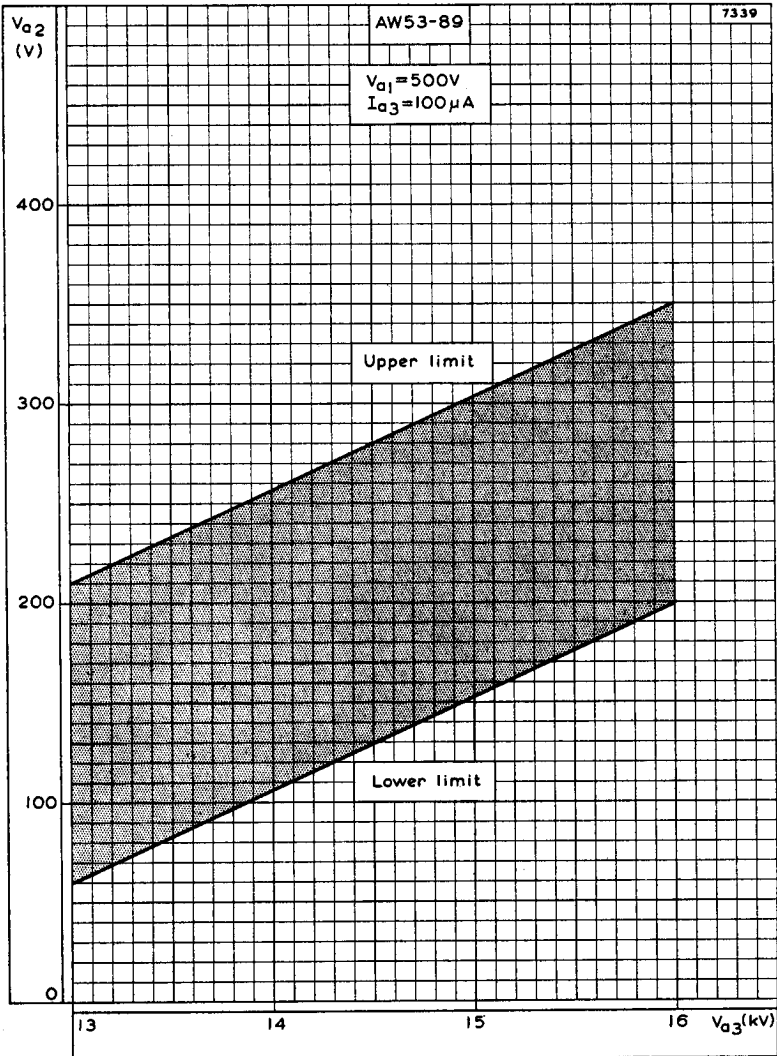
LIMITS OF GRID CUT-OFF VOLTAGE FOR FIRST ANODE VOLTAGES OF 500V to 700V. GRID MODULATION



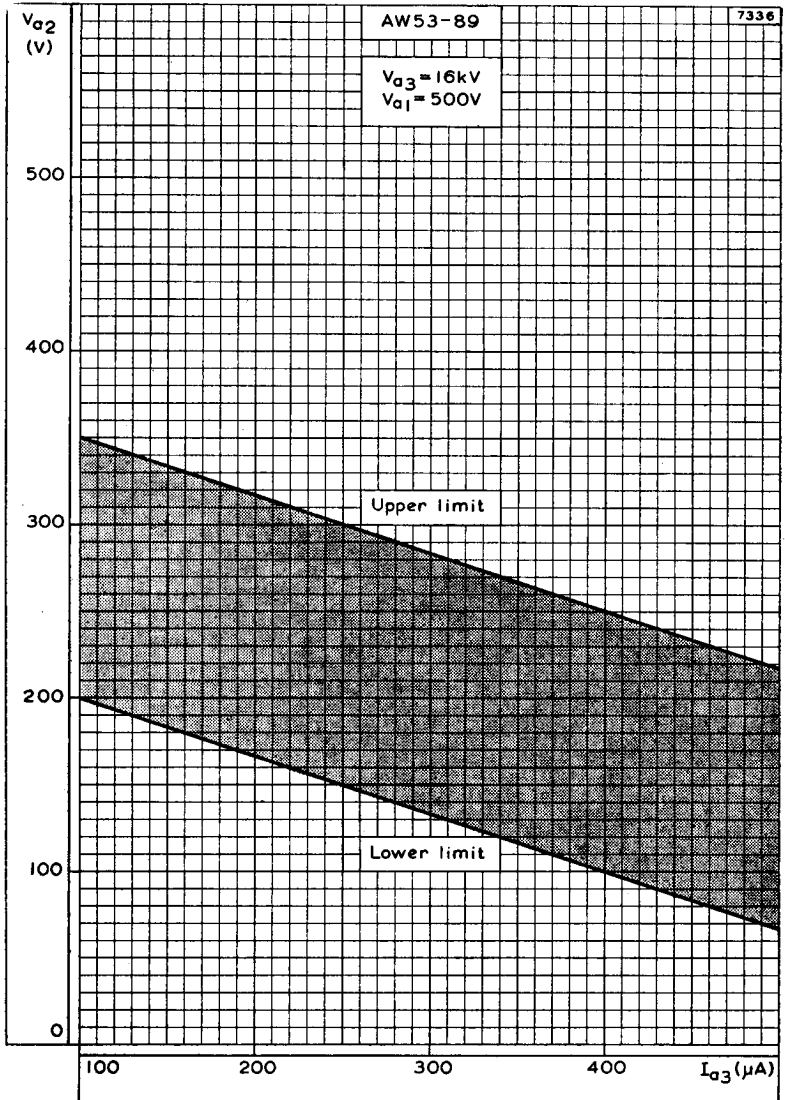
LIMITS OF CATHODE-TO-GRID VOLTAGE FOR FIRST ANODE VOLTAGES OF 540V to 700V. CATHODE MODULATION



RANGE OF FOCUS VOLTAGE PLOTTED AGAINST FIRST ANODE VOLTAGE



RANGE OF FOCUS VOLTAGE PLOTTED AGAINST FINAL ANODE VOLTAGE



RANGE OF FOCUS VOLTAGE PLOTTED AGAINST FINAL ANODE CURRENT