

# TELEVISION TUBE

# AW21-II

Direct viewing television tube with  $8\frac{1}{2}$  in. diagonal metal-backed rectangular grey glass screen, intended for use in portable transistor television receivers. This tube is electrostatically focused and has a  $90^\circ$  deflection angle. An ion trap magnet is not required.

## 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 parallel operation

* $V_h$	11.5	V
$I_h$	60	mA

\*The heater supply must be designed to provide a nominal 11.5V. The heater voltage must not rise above 13.8V and must not fall below 9.25V.

### 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
$C_{k-a11}$	4.0	pF
$C_{a2+a4-M}$	250	pF

### SCREEN

Metal backed

Fluorescent colour

White

Useful screen area

see drawing on page D4

### FOCUSING

Electrostatic

The range of focus voltage shown in 'Operating conditions' results in optimum overall focus at a beam current of  $50\mu A$ .

### DEFLECTION

Double magnetic

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 the reference line gauge shown on page D3.

## REFERENCE LINE GAUGE

See page D5

## RASTER CENTRING

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

Centring magnet field intensity 0 to 10 G

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 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 any equipment.

## OPERATING CONDITIONS

$V_{a2+a4}$	12	kV
$V_{a3}$ (focus electrode control range)	0 to 400	V
$V_{a1}$	400	V
† $V_g$ for visual extinction of focused raster	-32 to -69	V
† $V_k$ for visual extinction of focused raster	29 to 62	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.



## ABSOLUTE MAXIMUM RATINGS

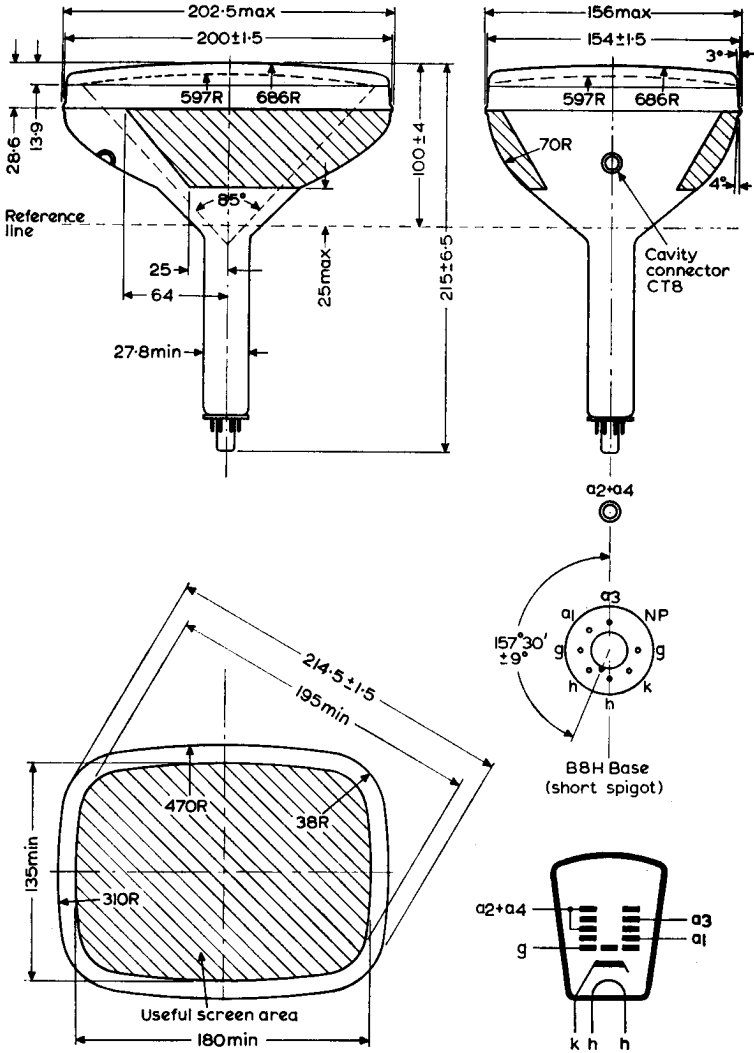
$V_{a2+a4}$ max.	16	kV
$V_{a2+a4}$ min.	8.0	kV
+ $V_{a3}$ max.	1.0	kV
- $V_{a3}$ max.	500	V
$V_{a1}$ max.	800	V
$v_{a1(pk)}$ min.	300	V
** - $v_{g(pk)}$ max.	400	V
* - $V_g$ max.	180	V
+ $V_g$ max.	0	V
+ $v_{g(pk)}$ max.	2.0	V
$\pm I_{a3}$ max.	25	$\mu A$
$\pm I_{a1}$ max.	15	$\mu A$
$R_{a1}$ max.	1.0	M $\Omega$
$R_{a3}$ max.	3.0	M $\Omega$
$V_{h-k}$		
Cathode positive		
d.c. max.	80	V
pk. max.	130	V
Cathode negative		
d.c. max.	80	V
pk. max.	130	V
$R_{h-k}$ max.	1.0	M $\Omega$
$Z_{k-e}$ max. (f=50c/s)	100	k $\Omega$
$R_{g-k}$ max.	1.5	M $\Omega$
$Z_{g-k}$ max. (f=50c/s)	500	k $\Omega$

\*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.

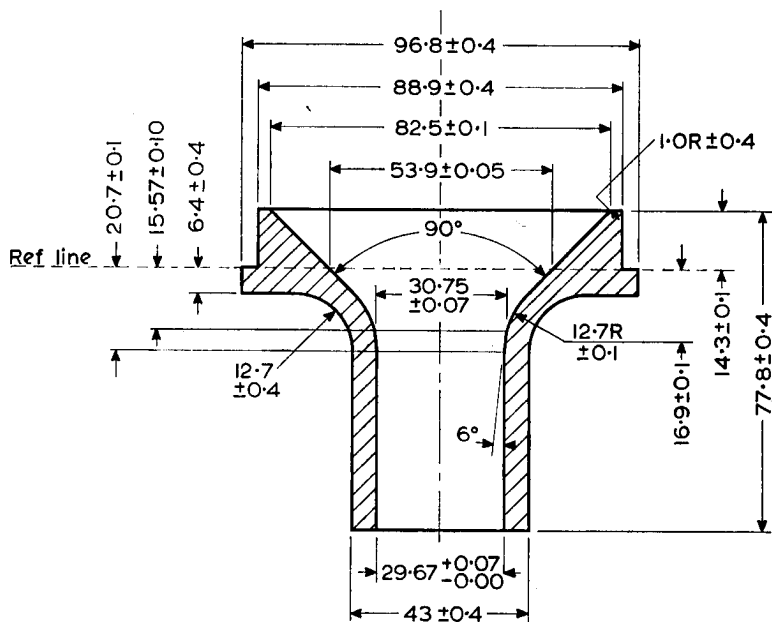
# AW21-II

## TELEVISION TUBE



All dimensions in mm

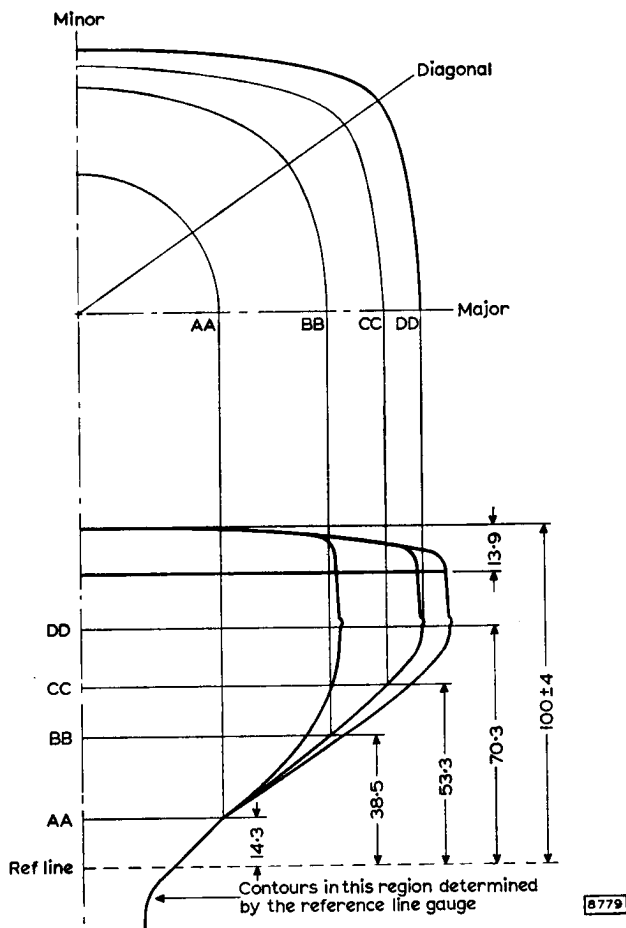
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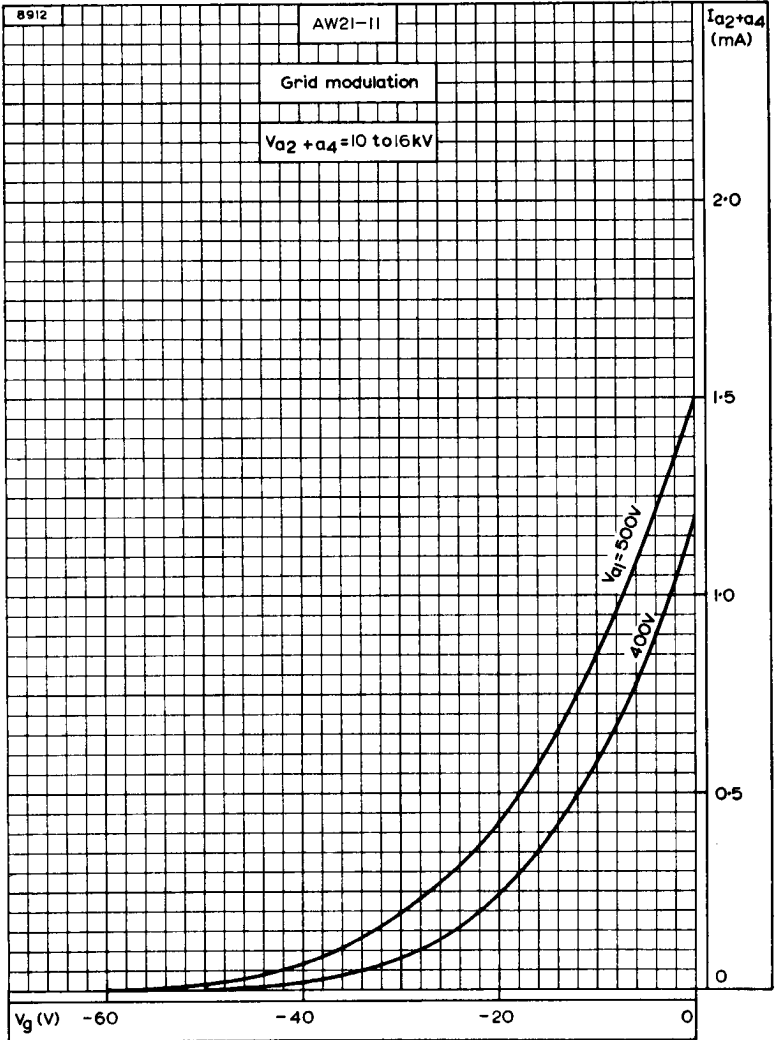


All dimensions in mm

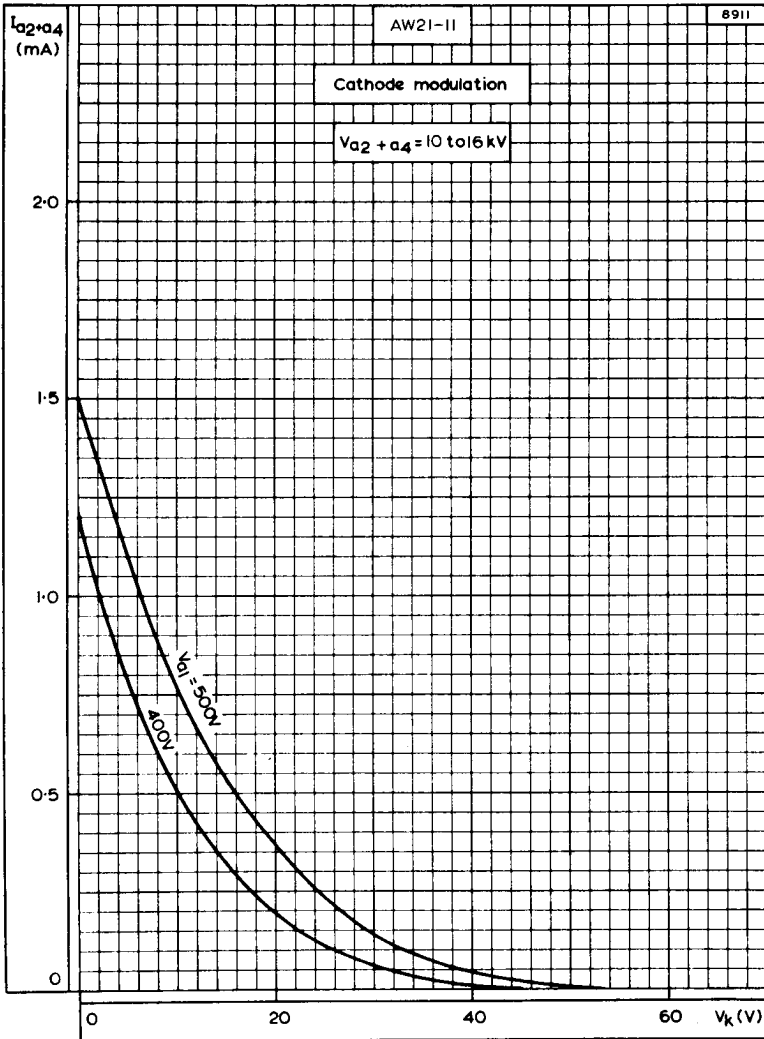
8343

Section	Nominal height above reference line (mm)	Major (mm)	Minor (mm)	Diagonal (mm)
AA	14.3	Circle 87.4 mm dia		
BB	38.5	151	139	158
CC	53.3	185	154	198
DD	70.3	206	160	221





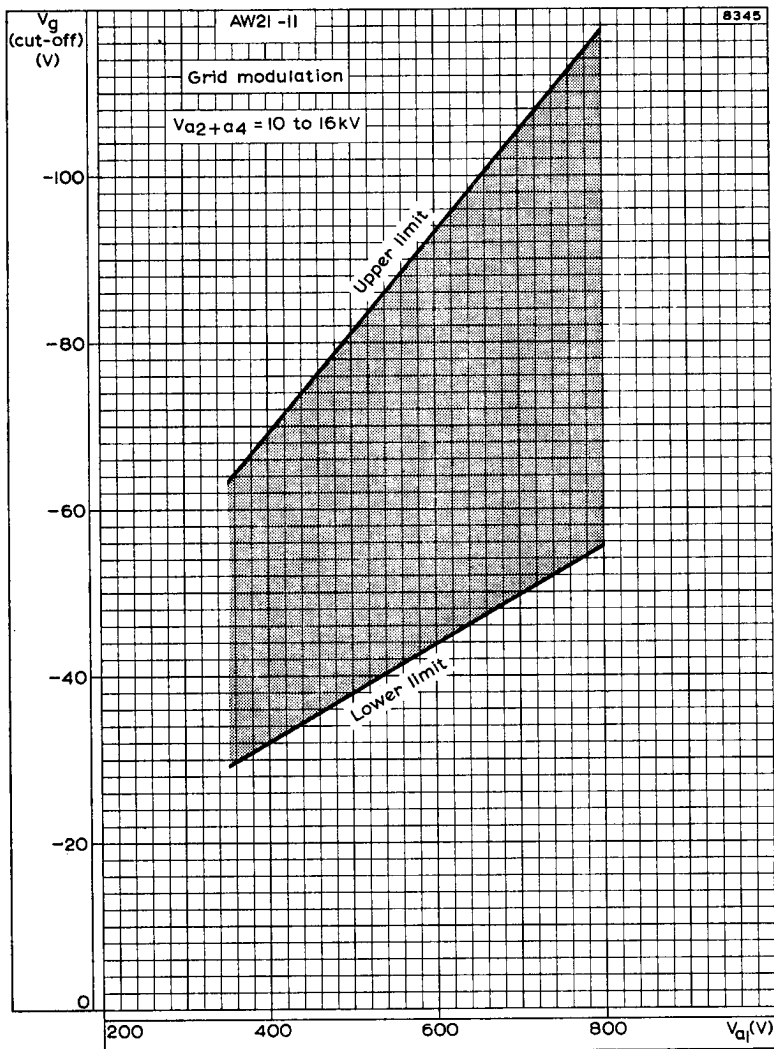
FINAL ANODE CURRENT PLOTTED AGAINST GRID VOLTAGE.  
GRID MODULATION



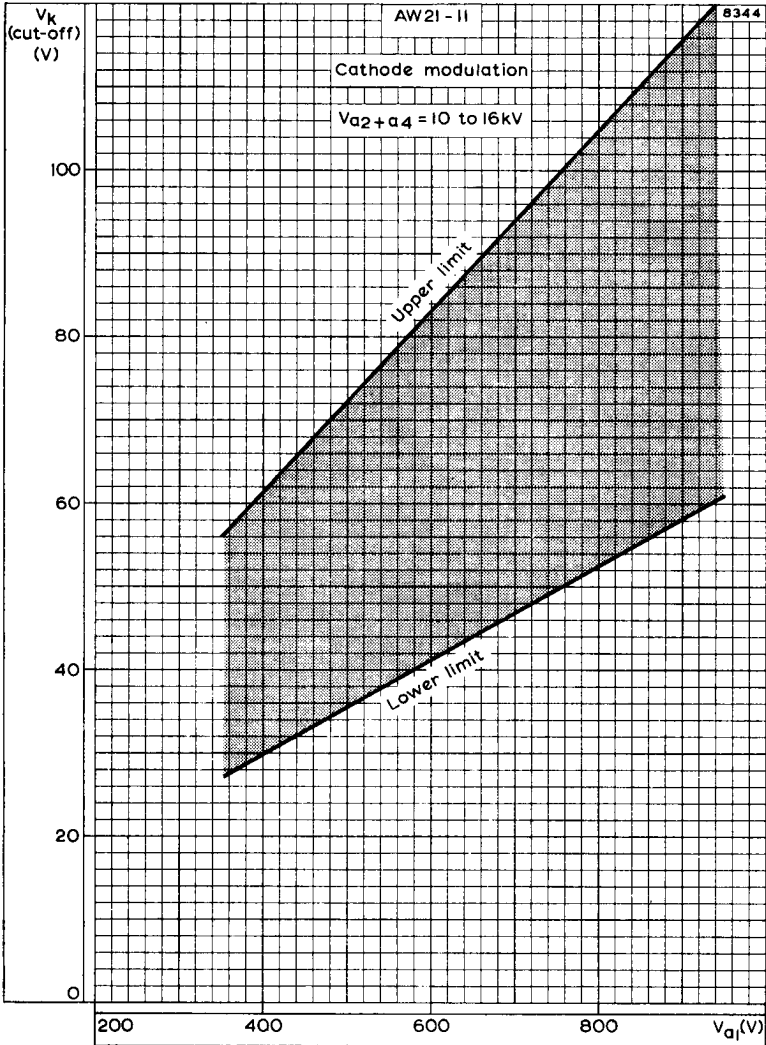
FINAL ANODE CURRENT PLOTTED AGAINST CATHODE-TO-GRID VOLTAGE. CATHODE MODULATION







LIMITS OF GRID CUT-OFF VOLTAGE FOR FIRST ANODE VOLTAGES OF 350 TO 800V. GRID MODULATION



LIMITS OF CATHODE-TO-GRID VOLTAGE FOR FIRST ANODE VOLTAGES OF 350 TO 950V. CATHODE MODULATION