TH 8803

2" VERY HIGH RESOLUTION RECORDING STORAGE TUBE

- SINGLE-ENDED STORAGE TUBE
- NON DESTRUCTIVE READ-OUT
- VERY HIGH RESOLUTION (limiting resolution 4300 T.V. lines)
- MAGNETIC FOCUS AND DEFLECTION

The TH 8803 is a low cost, single-ended, non destructive read out storage tube capable of storing and reading-out information in the form of electrical signals. Continuous read-out can be achieved for a few minutes without degradation of the stored-information.

This tube features fast writing and erasing, very high resolving power, large storage and integration capability and selective erasure possibility. When gradual erasure of the stored information is necessary, it is possible to erase during line or image retrace in order to obtain the desired decay.

These characteristics make it particularly suitable for numerous applications such as : slow scan T.V., data recording and storage, scan conversion, integration of low level video signals . . .
In addition, the tube is specially designed for applications where precise write-read registration is required.

One of the key features of the TH 8803 as compared to other 1" and 1 1/2" Recording Storage Tubes is its very high resolution making it suitable for use in any application where the production of fine details is required for instance in producing hard copy.

Owing to its structure and electronoptics similar to those of 2" Vidicon, the TH 8803 can employ supplies, focusing coil* and deflecting yoke* designed for this Vidicon type.

TYPICAL PERFORMANCES

Peak output current	0. 3	µA
Writing time :		
- over the whole target area	120	ms
- one target diameter	80	µs
Erasing time :		
- erasing of the whole target to residual less than 10 %	120	ms
Reading time :		
- for continuous read-out	20	mn
Storage time :		
- without reading	several days	
Resolution by orthogonal writing and reading (see curve) :		
- at 50 % modulation	2700 T.V. lines	
- limiting	4300 T.V. lines	

* For instance : PENN-TRAN N° 1496 Yoke - Alignment, N° 1497 Focus coil. -- PENN-TRAN C° Bellefonte - P.A.

GENERAL CHARACTERISTICS

Electrical

Heater voltage	6.3	V
Heater current	0.6	A
Input capacitance	11	pF
Output capacitance	20	pF
Focusing method	electromagnetic	
Deflecting method	electromagnetic	

Mechanical

Base	JEDEC E8 - 11	
Operating position	any	
Weight, approximate	400	g
Dimensions	see drawing	

OPERATING CONDITIONS

Maximum ratings (absolute values)

Unless otherwise stated, voltages are given with respect to cathode potential.

Target voltage	1800	V
Grid g6 voltage	1800	V
Grid g5 voltage	1800	V
Grid g4' voltage	1800	V
Grid g4 voltage	1800	V
Grid g3 voltage	1800	V
Grid g2 voltage	600	V
Grid g1 voltage :		
- negative bias value	− 180	V
- positive bias value	0	V
Peak heater cathode voltage :	− 150	V
- heater negative with respect to cathode	− 150	V
- heater positive with respect to cathode	+ 150	V

Typical operation

Voltages listed hereunder are typical values. They may have to be modified according to values given in the operating Data Sheet accompanying each tube.

Heater voltage	6.3 ± 10 %	V
Heater current	0.6	A

	Erasing mode	Writing mode	Reading mode	
Cathode voltage	0	0	0	V
Grid g1 (wehnelt) voltage (cut-off voltage −50 to −100 V).	to be adjusted	to be adjusted	to be adjusted	
Grid g2 (first accelerating voltage)	450	450	450	V
Grid g3 (erasing voltage)	fast / normal			
	0 to + 100 / 1400	1400	1400	V
Grid g4 (second accelerating voltage)	1400	1400	1400	V
Grid g4' (main accelerating voltage)	1400	1400	1400	V
Grid g5 (collimating voltage)	1200	1200	1200	V
Grid g6 (decelarator voltage)	1500	1500	1500	V
Target voltage	10 to 30	200	3 to 10	V

NOTE : g4' bias value can vary depending on the type of coil assembly used. To obtain the best resolution, a slight correction of g4' potential (about −10 V) is needed in writing mode.
External connection between g4' and g4 is possible to use one bias supply only.

PHYSICAL DESCRIPTION AND OPERATING PRINCIPLE *

The main components of the tube are an electron gun and a storage target assembly.

The electron gun includes an additional erasing electrode which enables two erasing modes depending on low or high beam current.

The target is made of a storage backplate on which the storage dielectric is deposited.

A general cross-view of the tube is given on Fig. 1 and magnified view of the target on Fig. 2.

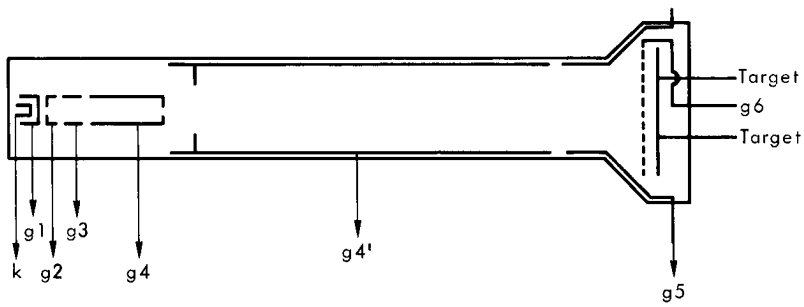


Figure 1

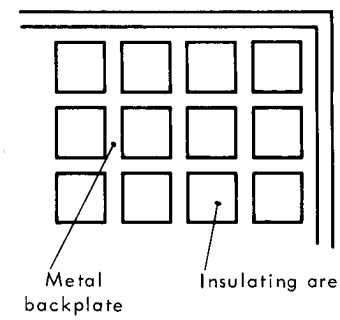


Figure 2

The principle of operation is the charge or discharge of the storage surface, according to the velocity of the primary electron beam through secondary emission of the storage surface.

Typical values (with respect to cathode) in erasing, writing and reading modes are given on Fig. 3 as an example of operating conditions.

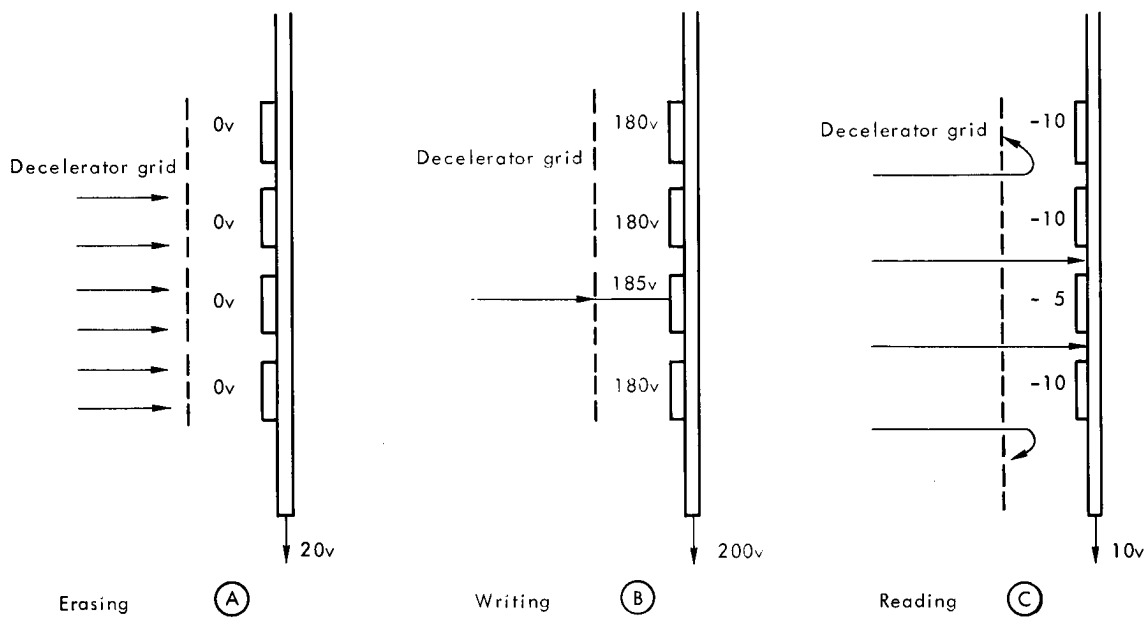


Figure 3

* Detailed considerations about "Recording Storage Tubes" principles and operations are given in the Technical Information Data TEV 6013 which we ask the user to refer to.

A – ERASE-PRIME

It is necessary to erase residual charges at the storage surface prior to writing. Erasure can be achieved by shifting the backplate voltage to 20 V. The capacitive coupling and the low energy electron beam cause the dielectric to be charged down to 0 V through secondary emission ratio less than 1.

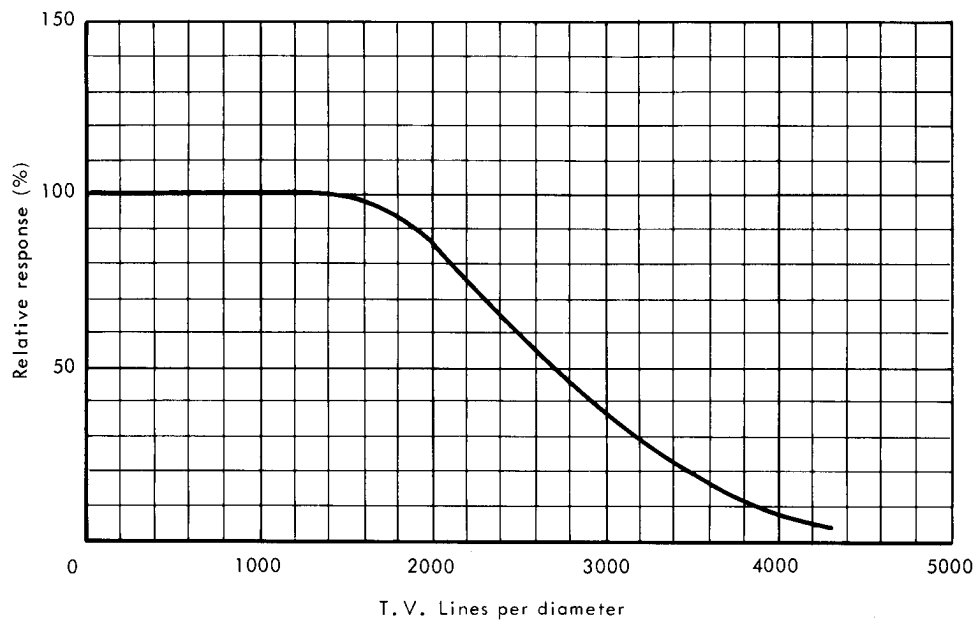
B – WRITE

Storage backplate voltage is shifted to + 200 V. Storage surface voltage is shifted to 180 V by capacitive coupling. When the electron beam modulated by the video input signal scans the storage surface, secondary emission ratio is then greater than 1 and positive charges are deposited on the dielectric areas, shifting their potential from 180 V to a few volts more positive values (185 V for example).

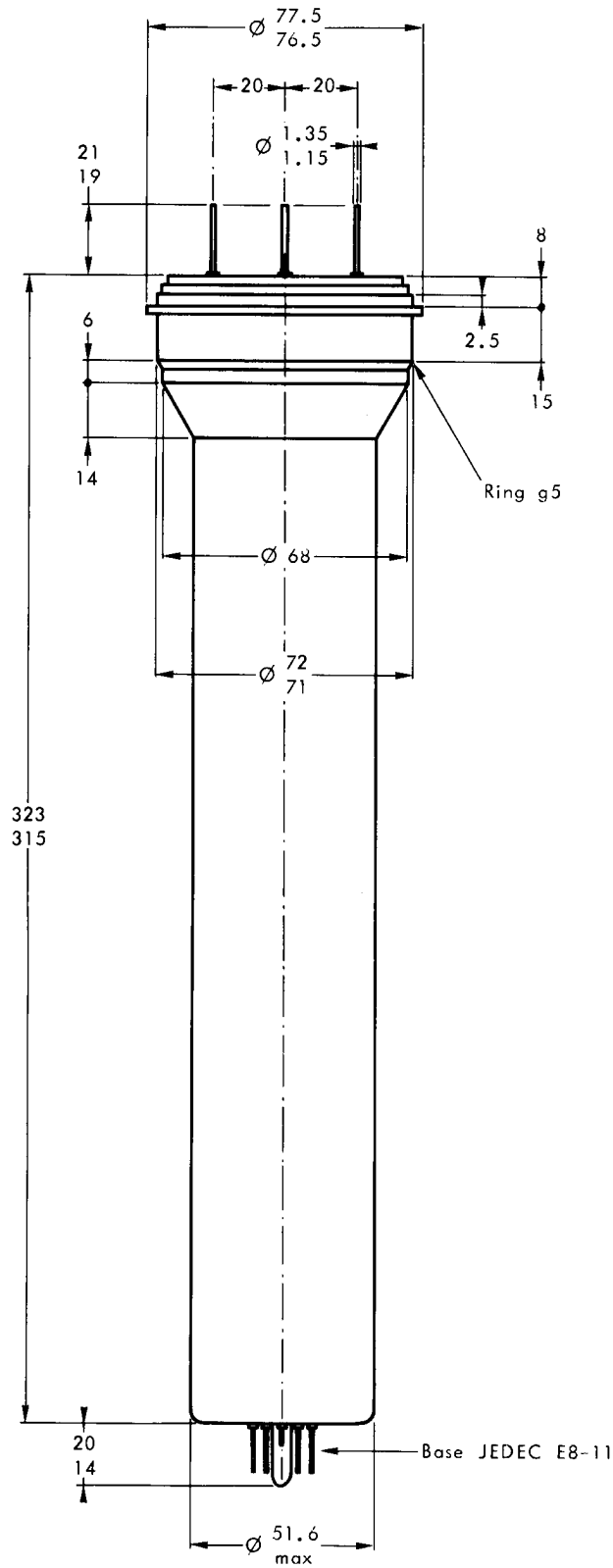
C – READ

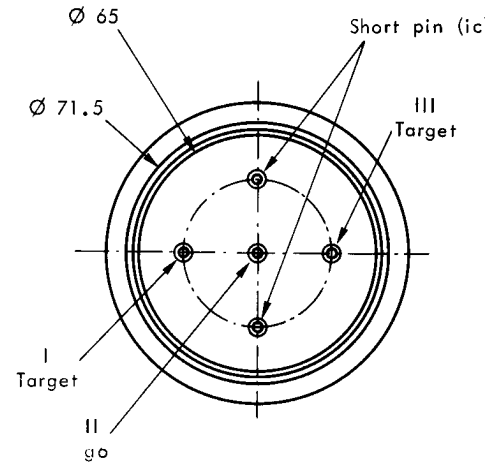
Once the charge pattern has been written it can be read out by dropping the storage backplate voltage from 200 V to 10 V and by scanning it with an unmodulated beam. Depending on the written charge pattern the storage surface voltage varies between 0 V and −10 V and signal output varies in exact correspondance. The most negative areas of the dielectric can completely cut-off the electron beam while various gray shades can be obtained in areas where the dielectric is less negative. Since the storage surface voltages are negative with respect to gun cathode voltage the reading beam has no adverse effect on the pattern and the read-out is non destructive.

MODULATION TRANSFER FUNCTION

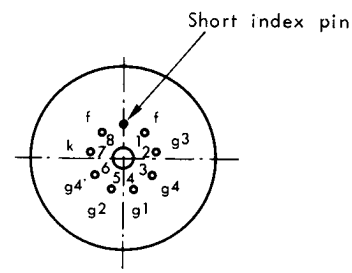


OUTLINE DRAWING





TOP VIEW



BOTTOM VIEW

Dimensions in mm, nominal except for those marked "max."

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GROUPEMENT TUBES ELECTRONIQUES

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