TENTATIVE

TMA 426

SCAN CONVERTER STORAGE TUBE

SPECIALLY DESIGNED FOR SHORT RANGE RADAR

- HIGH WRITING SPEED
- SHORT STORAGE TIME
- DOUBLE ENDED
- ELECTROMAGNETIC DEFLECTION

The TMA 426 is a dual gun, electrical signal storage tube. The writing beam creates, by induced conductivity, electron charges on a thin semi-conducting target. The recorded signals are read by the reading beam by use of secondary emission effects.

The TMA 426 scan converter tube allows :

- simultaneous writing and reading without crosstalk
- writing in a mode of scanning and reading in a different mode
- adjustment of the storage time
- fast erasure of the written signals
- superimposition of several kinds of information.

The symmetrical deflections and the absence of collimation of the TMA 426 make it free from geometrical distortion.

TYPICAL APPLICATIONS

Conversation of PPI radar scan to T.V. scan (Radar Bright Display Equipment) in all applications where high writing and short storage time are needed (Surface Radar, Parking Radar, any Short Range Radar).
In Radar Bright Display Equipment, it allows :

- display on a T.V. monitor of a bright, sharp picture in high ambient lighting conditions,
- remote transmission and multiple display of the radar picture.

Signal to noise enhancement by integration.

Superimposition of several types of input data.

TYPICAL PERFORMANCES

Output signal current	0.5 to 2 μA
Output capacitance	15 pF
Resolution	180 P.P.I. range rings at 50% modulation (equivalent to approximately 1000 T.V. lines)
Storage time with continuous read-out	adjustable from 0.5 to 10 s at noise level
Gray levels	7
Fast erasing time, max.	1 s

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OPERATING CONDITIONS

Unless otherwise stated, voltages are given with respect to ground.

ABSOLUTE RATINGS

WRITING GUN - Electrostatic focusing, electromagnetic deflection.				
Heater voltage (note 1)			6.3 ± 10%	V
Cathode k' voltage			−8	kV
Voltage between heater and cathode			±150	V
Control grid g'1 voltage (w.r.t. cathode)	0	to	−100	V
Anode g'2 voltage			0	V
Focusing g'3 voltage	0	to	−8	kV
READING GUN - Electrostatic focusing, electromagnetic deflection.				
Heater voltage (note 2)			6.3 ± 10%	V
Cathode k voltage			−2	kV
Voltage between heater and cathode			±150	V
Control grid g1 voltage (w.r.t. cathode)	0	to	−100	V
Anode g2 voltage	0	to	−50	V
Erasing g3 voltage	0	to	−2.5	kV
Focusing g4 voltage	0	to	−2	kV

TYPICAL OPERATION

WRITING GUN				
Heater voltage			6.3	V
Heater current, approx.			0.6	A
Cathode k' voltage			−7	kV
Voltage between heater and cathode			0	V
Control grid g'1 voltage for cut-off (w.r.t. cathode)	−30	to	−90	V
Anode g'2 voltage			0	V
Focusing g'3 voltage	−5	to	−6	kV
READING GUN				
Heater voltage			6.3	V
Heater current, approx.			0.6	A
Cathode k voltage			−1.5	kV
Voltage between heater and cathode			0	V
Control grid g1 voltage for cut-off (w.r.t. cathode)	−30	to	−90	V
Anode g2 voltage	−10	to	−30	V
Erasing g3 voltage — reading mode			0	V
Erasing g3 voltage — fast erasing mode	−1.5	to	−1.9	kV
Focusing g4 voltage	−1.1	to	−1.4	kV
STORAGE ASSEMBLY				
Target voltage — reading mode			0	V
Target voltage — fast erasing mode	+200	then	−200	V
Collector voltage	0	to	40	V
Shading corrector voltage	0	to	60	V

NOTES

1 - Heater insulated for 10 kV w.r.t. ground
2 - Heater insulated for 3 kV w.r.t. ground

OPERATING RECOMMENDATIONS

1 - The writing beam should never be motionless on the storage surface which might be damaged. Too high writing beam current density must be avoided.
2 - The reading beam should never be motionless.
3 - Provide a suitable shield in order to protect the tube from stray electric and magnetic fields.

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PHYSICAL DESCRIPTION AND OPERATING PRINCIPLE

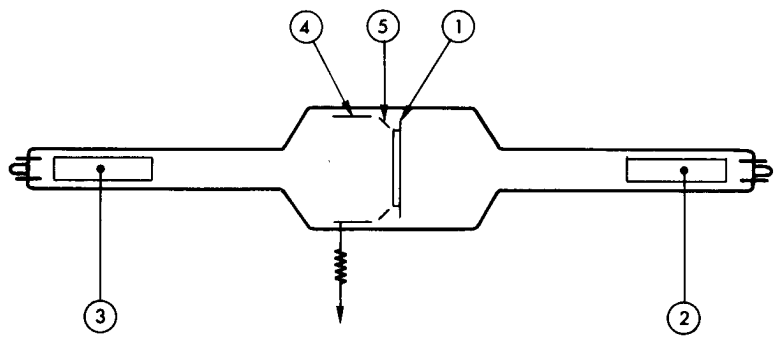

Fig. 1

The TMA 426 essentially consists of (see fig. 1) :

- a storage target (1) made of a dielectric layer deposited on a thin metallic backplate (the metallic side facing the writing gun)
- a writing gun (2)
- a reading gun (3)
- a collecting assembly made of two electrodes (4) and (5).

Due to its high velocity, the writing beam is able to penetrate the metal backplate and to create charges in the dielectric by induced conductivity (EBIC). These charges are stored on the surface of the target facing the reading gun. The quantity of stored charges depends on the scanning speed and current density.

The reading beam scanning the storage surface, each scan is removing a portion of the charge pattern by secondary electron emission.

The secondaries collected by the output electrode (4) give rise to a video signal progressively decreasing.

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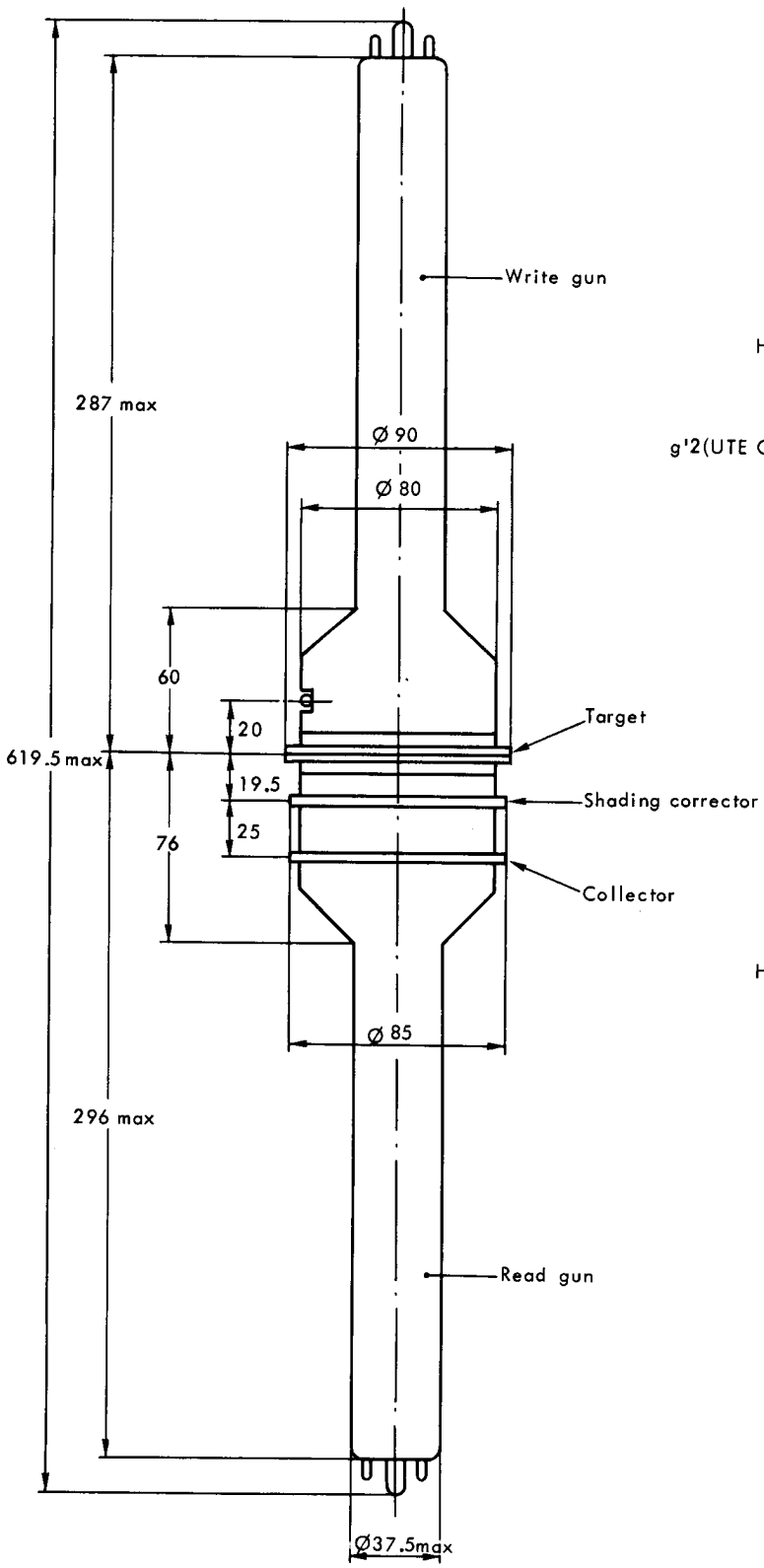
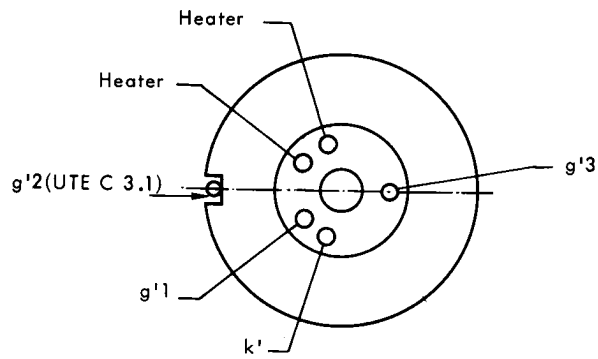
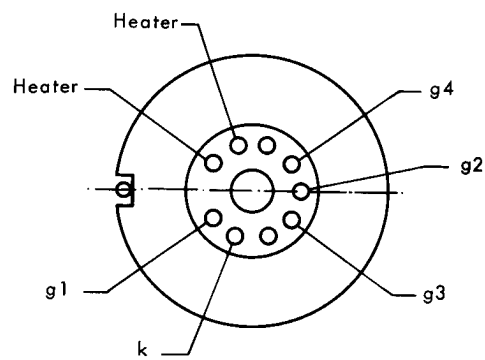
OUTLINE DRAWING





Write basing
(UTE 9C 18 Magnoval)



Read basing
(UTE 9C 18 Magnoval)

Weight : 650 gr.

Dimensions in mm.