



## F 8086 DIRECT VIEW STORAGE TUBE

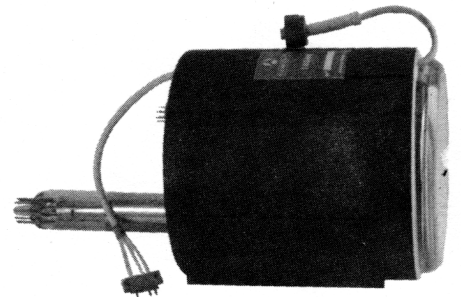
- HIGH RESOLUTION
- INTEGRAL MAGNETIC SHIELD
- FOR OFF-CENTERED P.P.I.

The F 8086 is an electrostatic focus and electro-magnetic deflection direct view storage tube capable of providing bright, uniform display over a 101.5 mm (4") diameter screen. Geometrical position of writing gun is making the tube specially intended for radar display with off-centered PPI.

Applications include airborne radar display for weather and navigational purposes.

The tube is specially designed for airborne equipment and can be operated unpressurized at high altitude. High voltage leads are encapsulated to prevent Corona. The rugged structure makes it particularly resistant to vibration.

This tube is supplied with magnetic shield.



### TYPICAL PERFORMANCES

Writing speed .....	min.	5	mm/ $\mu$ s
Written line width (1700 cd/m <sup>2</sup> output)(note 1) .....		0.3	mm
Viewing time .....	min.	10	s
Erasing time .....	max.	0.5	s
Brightness (screen voltage = 8 kV) .....	min.	4100	cd/m <sup>2</sup>
		or 1200	Ft. Lambert
Half tones .....		5	

### GENERAL CHARACTERISTICS

#### Electrical

Flood and writing guns :

Heater voltage .....	6.3	V
Heater current .....	0.6	A

Writing guns :

Focusing method .....	Electrostatic
Deflection method .....	Electromagnetic
Number of writing gun .....	1

Interelectrode capacitance :

Writing gun cathode k to all internal elements (approx.) .	8	pF
Writing gun grid 1 to all internal elements (approx.) . .	7	pF

#### Optical

Phosphor :

Type .....	P 20 aluminized
Fluorescence .....	Yellow-green
Phosphorescence .....	Yellow-green
Faceplate .....	Flat



### Mechanical

Minimum useful viewing diameter	101.5 mm (4")
Mounting position	any
Dimensions	see drawing
Bases and plugs	see drawing
Weight (approx.)	2 kg (4.4 Lbs)

### OPERATING CONDITIONS

#### Absolute ratings

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

#### FLOOD GUN

Heater h' voltage	5.7	to	6.9	V
Cathode k' voltage			0	V
Grid g'1 voltage (control grid or Wehnelt)	0	to	-125	V
Grid g'2 voltage (accelerating electrode) max.			200	V
Grid g'3 voltage (first collimating electrode) max.			200	V
Grid g'4 voltage (second collimating electrode) max.			300	V
Grid g'5 voltage (collecting electrode) max.			300	V
Grid g'6 voltage (backing electrode) max.			20	V
Viewing screen g'7 voltage max.			10.0	kV
Peak heater to cathode voltage				
Heater negative with respect to cathode max.			150	V
Heater positive with respect to cathode max.			150	V

#### WRITING GUN

Heater k voltage	5.7	to	6.9	V
Cathode k voltage, negative value max.			3.0	kV
Grid g1 voltage (control grid or Wheneilt)(note 2)	0	to	-125	V
Grids g2 and grid g4 voltage (accelerating electrode)			connected to g'3	
Grid g3 voltage (focusing electrode) negative value max.			3.0	kV
Peak heater to cathode voltage				
Heater negative with respect to cathode max.			180	V
Heater positive with respect to cathode max.			180	V

#### Typical operation

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

#### FLOOD GUN

Heater h' voltage			6.3	V
Cathode k' voltage			0	V
Grid g'1 voltage adjust.	0	to	-30	V
Grid g'2 voltage			80	V
Grid g'3 voltage			8	V
Grid g'4 voltage adjust.	20	to	40	V
Grid g'5 voltage			120	V
Grid g'6 voltage adjust.	0	to	5	V
Viewing screen g'7 voltage			8.0	kV

#### WRITING GUN

Heater h voltage			6.3	V
Cathode k voltage			-2.5	kV
Grid g1 voltage ( for cut-off)(note 2) adjust.	-35	to	-60	V
Grids g2 and g4 voltage			connected to g'3	
Grid g3 voltage (note 2) adjust.	350	to	750	V

#### NOTES

- 1 - Measured by shrinking raster method.
- 2 - With respect to writing gun cathode.



## PHYSICAL DESCRIPTION AND OPERATING PRINCIPLE

The F 8086 consists of four basic assemblies :

1 - The storage unit

The components of which are a collecting electrode and a fine metallic mesh called the backing electrode on which is deposited a dielectric material.

2 - The viewing screen

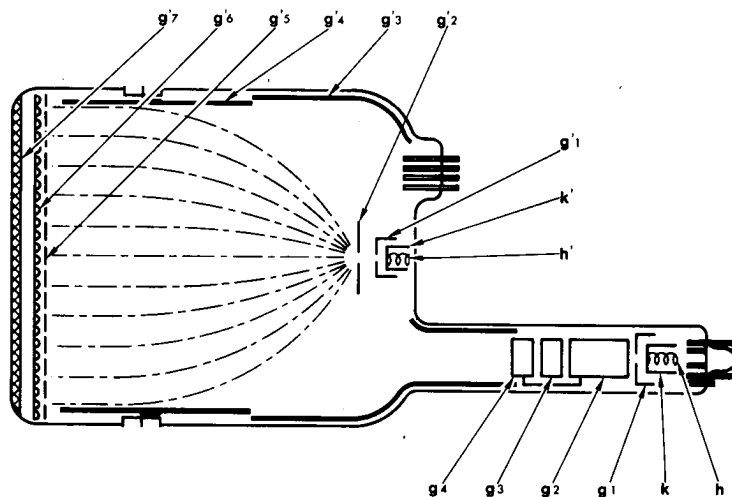
made of aluminized P 20 phosphor, provides the visual output.

3 - The writing gun

located in the neck of the tube generates fast electrons. The high velocity beam scans the storage surface and creates a charge pattern by secondary emission from the dielectric material. Electrostatic focusing and electromagnetic deflection are employed.

4 - The flood gun

does not scan the screen but produces a wide angle low velocity electron beam which approaches the storage mesh normally and at a constant current density over the useful area owing to the collimating electrodes.



WRITING GUN

h heater  
k cathode  
g'1 wehnelt  
g'2 g'4 accelerating electrodes  
g'3 focusing electrode

FLOOD GUN

h' heater  
k' cathode  
g'1 wehnelt  
g'2 accelerating electrode  
g'3 1st collimating electrode  
g'4 2nd collimating electrode

STORAGE UNIT SCREEN

g'5 Collecting electrode  
g'6 Backing electrode  
g'7 Viewing screen

In the unwritten state, the dielectric surface of the backing electrode is negatively charged and the low energy flood electrons issued from the flood gun are repelled back to the collecting electrode.

In writing operation, the writing gun scans the storage surface and creates positive charges pattern by secondary emission of the dielectric material, the secondary electrons being attracted to the collecting electrode.

Low velocity electrons from the flood gun approach the storage surface normally and flood the entire useful area. They penetrate through the backing electrode in areas where pattern has been written and are then accelerated to the viewing screen where they produce a corresponding picture on the phosphor screen.

Since the number of electrons passing through the backing electrode is determined by the amount of written charges, intermediate gray shades may be reproduced.

The image can be erased by applying a short positive pulse to the backing electrode. The display decay may be controlled by varying duration, amplitude and rate of positive pulse train.



**OPERATIONNAL RECOMMENDATIONS**

- 1 - The writing gun can not be allowed to write continuously without appropriate erasure otherwise the storage surface may be damaged.
- 2 - The tube should be handled screen upwards to avoid particles falling on the storage elements.

**OUTLINE DRAWING**

