

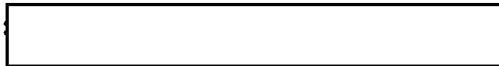
STAT



26 October 1965

STAT


Attention:



Subject: Hard Copy from TV Display

Gentlemen:

STAT

 based upon its extensive experience in high quality TV recording, high resolution film scanning, processing and recording, proposes the following system for use in individual frame recording of a TV signal.

The proposed system as shown in Figure 1 is the minimum complement of equipments required to achieve the desired results. This system can be expanded, as an option, to display and record TV signals based upon techniques other than the U. S. Standard, which are:

525 lines per frame
30 frame, 60 fields, 2:1 interlace
15,750 scan lines/second
4 mc/s video bandwidth

As an additional option the film output of the proposed system can also be fed, for roll film use, directly into a rapid film processor which will provide a dry positive transparency of the data displayed within approximately thirty seconds of the time of exposure on the film. The exact time will depend on the distance between film exposure and output of processor and the speed with which it is desired to move the film, assuming unexposed film between exposures is expendable.

As shown in Figure 1, a 17" monitor is viewed. The observer actuates the camera focused onto the high resolution flat face recording monitor, and the display is recorded on Blue Sensitive Hyscan or similar film.

The camera can use roll film, cut film, film pack, and Polaroid film, both cut and roll. The picture format on film will be 2-1/4" x 3". The system, as shown, will take the pictures at an exposure of 1/30 second. If the tape playback machine is capable of repeating one frame over and over, the camera exposure time can be adjusted accordingly.

Declass Review by NGA.

STAT

[Redacted]

-2-

26 October 1965

STAT

[Redacted]

High Resolution CRT used in the recording monitor will conform to the specifications given on the attached Technical Bulletin No. CL-1180.

STAT

The system, as schematically pictured in Figure 1, can be furnished at a fixed price cost of [Redacted] assuming the availability of a GFE tape playback machine providing a composite video signal. System delivery will be four months after award of contract.

Very truly yours,

[Redacted Signature]

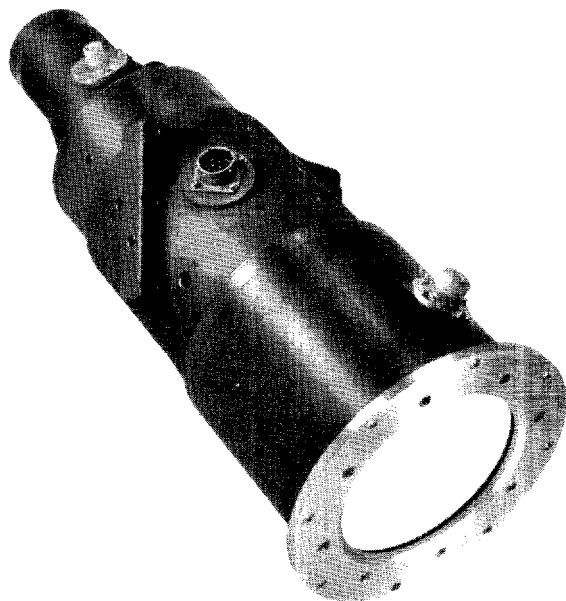
Manager, Program Development
Intelligence Systems Department

STAT

/ces
Attachments

TECHNICAL BULLETIN CL-1180

TENTATIVE

**TYPE CL-1180
CATHODE RAY TUBE**

[redacted] type CL-1180 is a single beam, magnetic deflection and focus cathode ray tube of high resolution especially designed for flying spot scanner applications. The tube is mounted in an assembly with the deflection yoke, focus coil, magnetic shields and support housing. The tube features an efficient electron gun which can be modulated with small changes in resolution, a fine grain, P16 phosphor screen which has been optimized for low fixed noise and maximum brightness, and a high performance deflection and focus system which is aligned and fixed requiring a minimum of operating and installation adjustments.

STAT

GENERAL CHARACTERISTICS**ELECTRICAL**

Deflection yoke	
Resistance, each winding (half axis)	*
Inductance, each winding (half axis)	*
Focus coil	
Resistance	*
Inductance	*

OPTICAL

Phosphor	P16
Fluorescence	Violet
Persistence	Extremely short
Faceplate	Clear, non-browning, flat within 0.003 in.

MECHANICAL

Overall length	20½ in. nom
Overall diameter (including flange)	7 in. nom
Minimum useful screen diameter	4.25 in.

* To meet customer requirements

STAT

MAXIMUM RATINGS (ABSOLUTE VALUES)

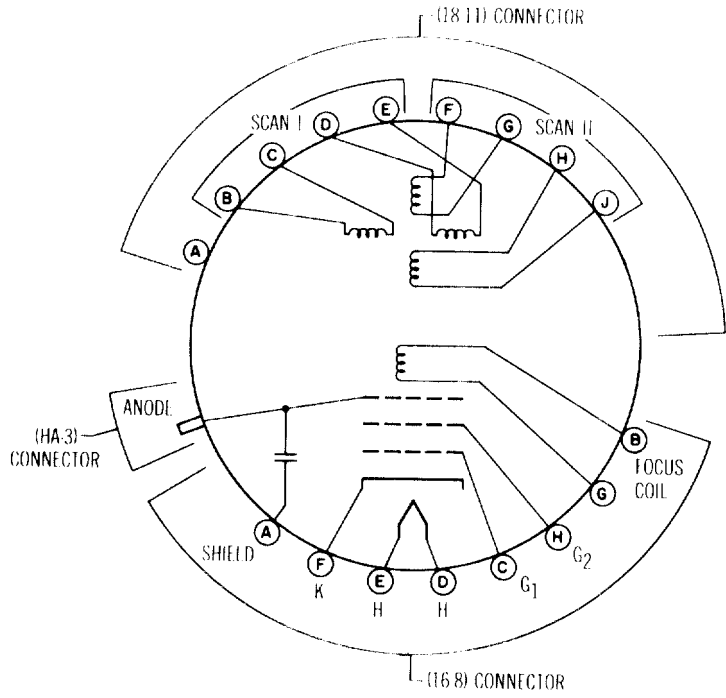
Heater voltage	6.3±10%	Vac
Accelerator (anode) voltage	30,000	Vdc
Accelerator (anode) current, peak	20	µa
Grid No. 1 voltage		
Positive	+0	Vdc
Negative	-150	Vdc
Heater to cathode voltage, peak	180	vdc
Deflection coil input voltage, peak	500	vac
Grid No. 1 resistance	1.5	Meg Ω
Electrode capacitance		
Grid No. 1 to all other electrodes	50	pf
Cathode to all other electrodes	50	pf
Anode to all other electrodes	500	pf min.

TYPICAL OPERATING CONDITIONS

Heater voltage (note 1)	6.3	Vac
Heater current	0.45±10%	Aac
Accelerator voltage (note 2)	25,000	Vdc
Grid No. 2 voltage	1000	Vdc
Grid No. 1 voltage for cut-off (note 3)	-60 to -20	Vdc
Grid No. 1 modulation voltage (note 4)	15	Vac max.
Light output (note 4)	0.4	µW/cm ²
Light output uniformity		
Shading (note 5)	10	% max.
Noise (note 5)	2	% rms max
Resolution (notes 4 and 6)	See chart – Resolution Characteristic	
Focus coil excitation	700	amp-turns
Deflection coil current for spot centering (each axis)	*	mAdc max.
Deflection factor	*	A/in.
Spot size (sigma value)	.0008	inches max
Deflection axis alignment	±1	degree
Deflection defocusing	1.8:1	max.

* Depends on coil

CONNECTION DIAGRAM

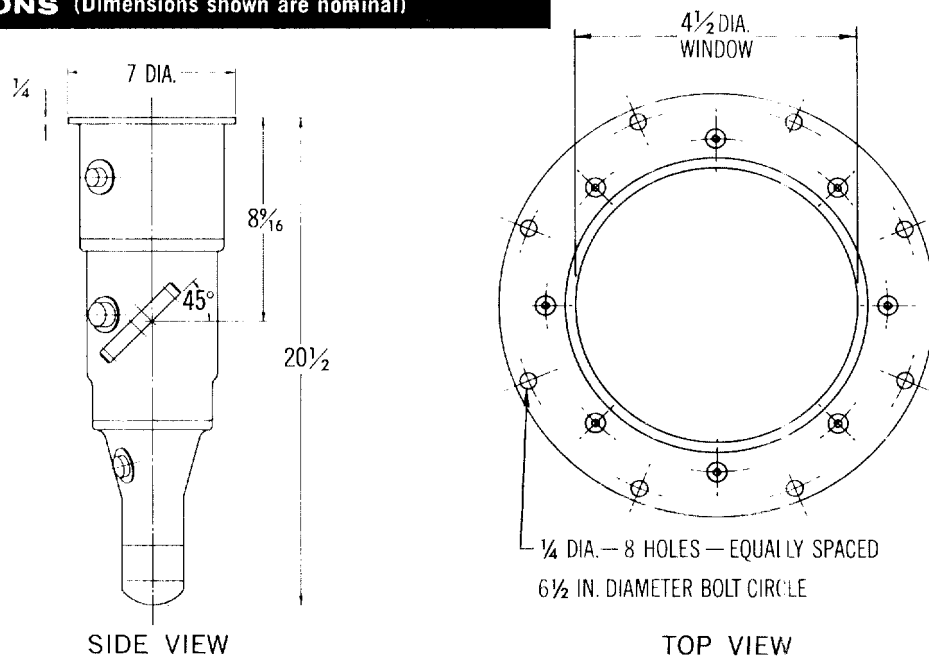


NOTES: Values given are nominal unless otherwise indicated.

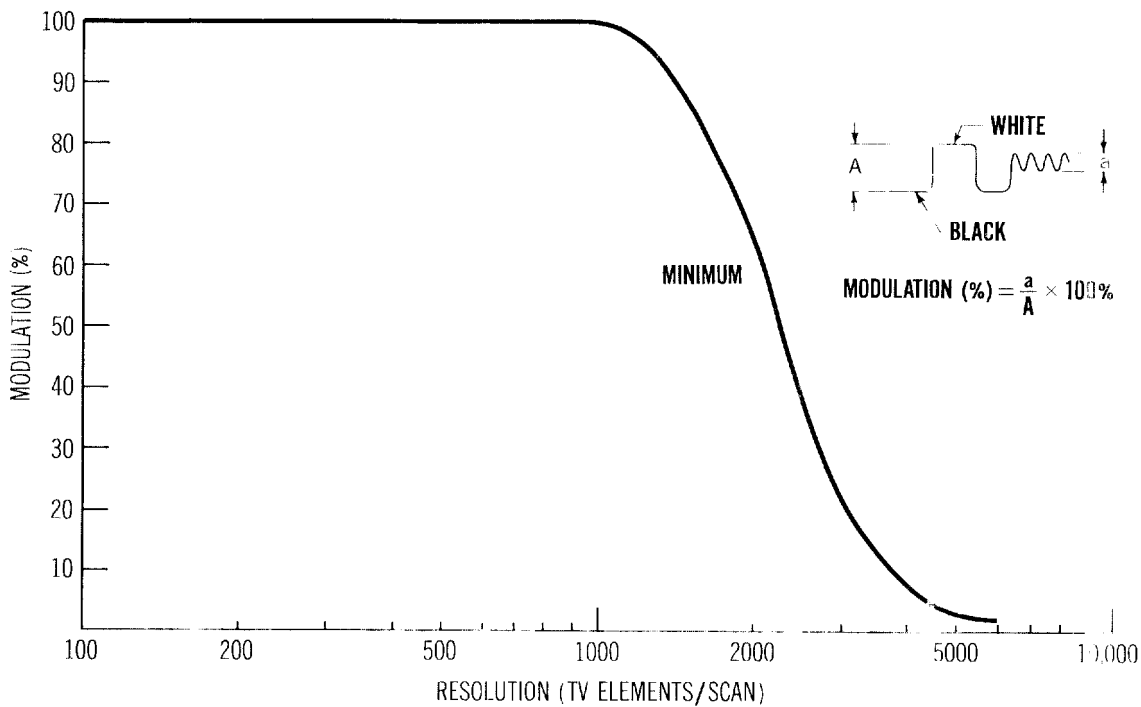
1. It is preferable not to operate the heater negative with respect to the cathode for long periods of time under severe environment conditions.
2. External conductive coating connected to Eb supply return.
3. Visual extinction of focused, undeflected spot.
4. Beam current of 10 μ A (Cathode current less leakage).

5. Measured by scanning the phosphor with a spot of the minimum resolution characteristic and observing the light output with an S-11 response photomultiplier. Not more than 15 noise pulses of 50% amplitude will occur in the useful screen area.
6. As measured by the scanner technique using a square wave transmission test object whose half period is the stated fraction of the scan length. The modulation resulting from the tube spot size will be a given percentage of the "black" to "white" amplitude.

DIMENSIONS (Dimensions shown are nominal)



RESOLUTION CHARACTERISTIC (See Note 6)



STAT

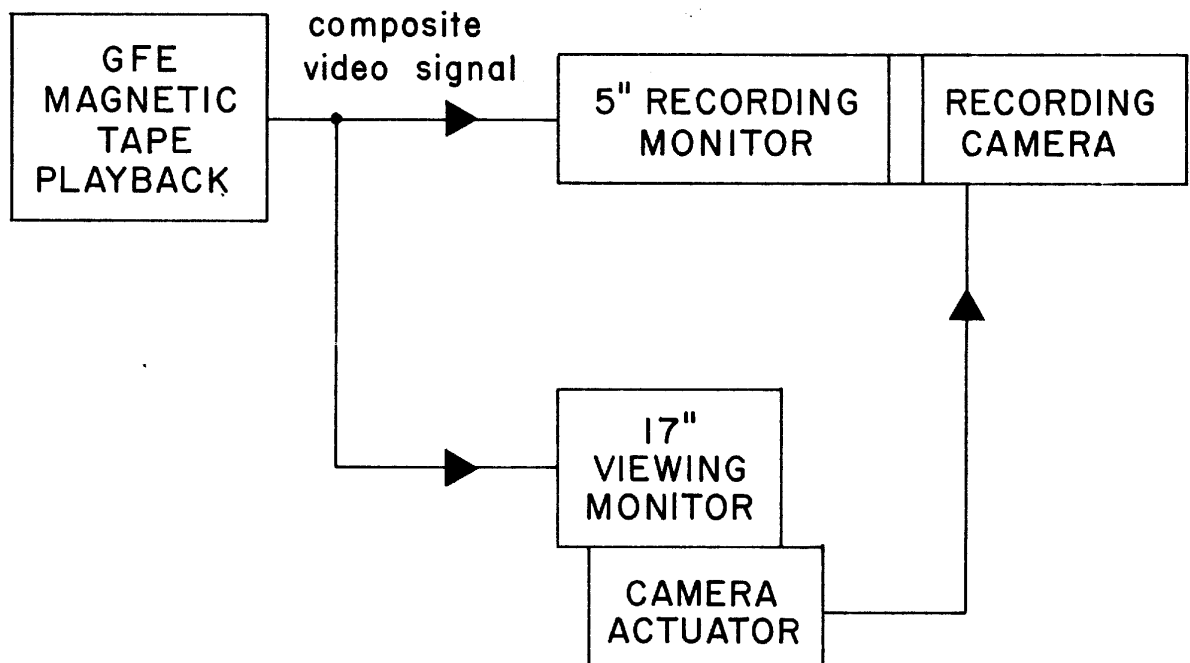


FIGURE I. PROPOSED SYSTEM BLOCK DIAGRAM