

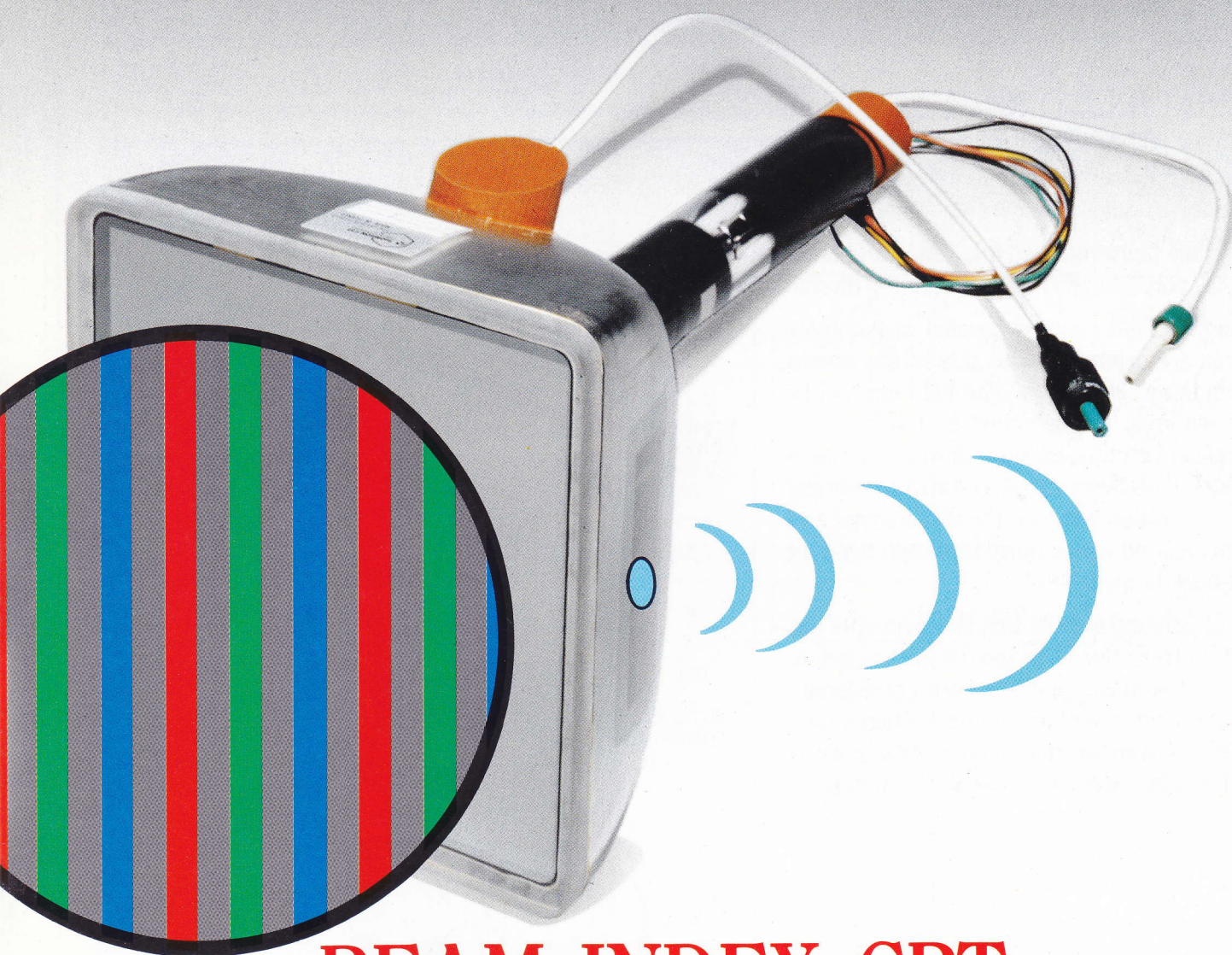
FOR YOUR

● ruggedized

● customized

● compact

COLOR DISPLAY



BEAM INDEX CRTs
THE BRIGHTER SOLUTION
IN YOUR BULB SIZE FROM

 **THOMSON TUBES ELECTRONIQUES**

WHY A NEW "SPECIES" OF COLOR CRT ?

Shadow mask technology grants satisfactory results in a majority of applications and now has the advantage of being classical.

However,

- more than 80 % of the electron-beam is intercepted by the mask, where it is lost for light conversion, heating the mask instead (resulting in color aberration).
- new sizes, imposed by non-standard applications, need a re-design and adjustment of the gun-yoke-mask-screen assembly due to the delicate convergence problems in the shadow-mask process. The resulting long lead times and cost are only acceptable for production batches of several tens of thousands, incompatible with military or industrial retrofit programs.
- Ruggedization of the delicate gun and mask-screen structures is difficult.

The beam-index (BI) CRT has a single, classical electron gun and is devoid of a mask. Easy to develop in almost any size and as rugged as any monochrome CRT, it is furthermore often brighter than an equivalent shadow-mask CRT - could the latter be seriously envisaged and afforded...

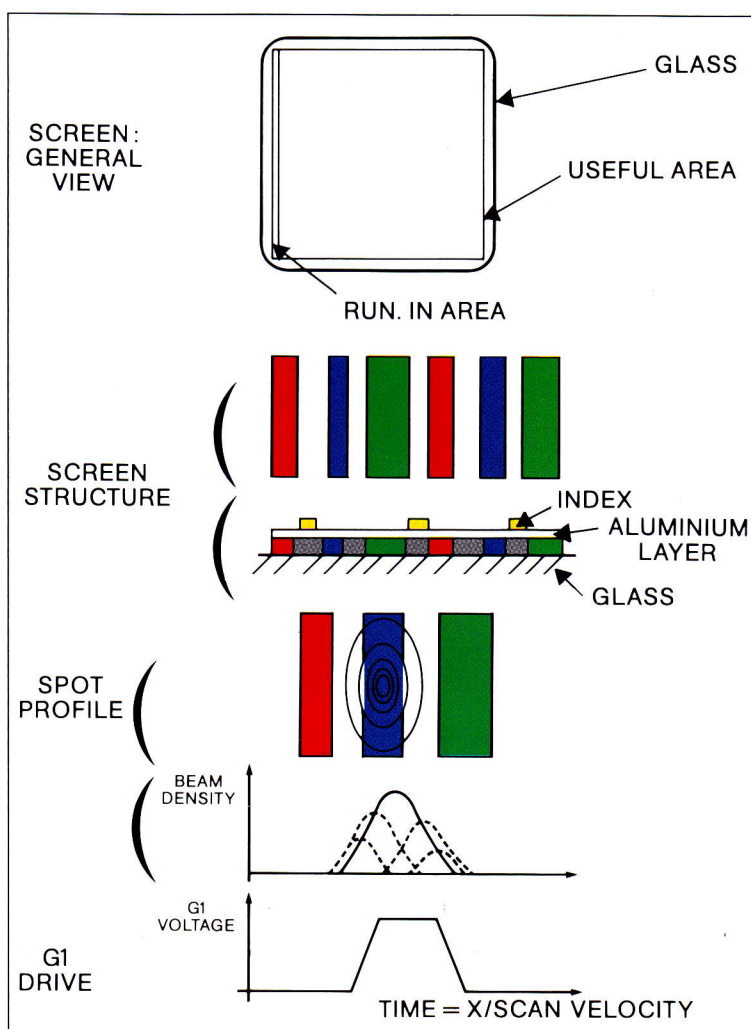
PRINCIPLE OF BEAM-INDEXING

The BI CRT is an electromagnetically deflected display tube featuring an electron gun of exceptional performance as concerns beam current and spot size.

The beam delivered from this gun is deflected in a standard TV raster over a screen patterned in alternate R-G-B stripes, perpendicular to the scanning direction.

"Index" stripes running parallel to the color stripes are printed on the side of the screen facing the electron gun. The light emitted by these indices, when excited by the beam, is detected by a photosensitive device external to the tube. This index signal is used to correct any mis-registration between the video signal and beam location (color purity) through a circuit feed-back loop.

It is interesting to note that this principle was proposed for color TV in the late Forties, before the shadow-mask tube was even considered ! The performance of the circuit elements then available was an insurmountable obstacle, easily mastered by today's fast integrated circuits.



WE SUPPLY

- The CRT with potted HV cables and flying leads.
- The deflection and beam shaping magnetics.

The selection table below lists our current models. But please note that we can design with you a customized tube for your project.

- Options :
 - complete tube assembly
 - mounting bezel
 - magnetic shield
 - photodetectors
 - EMI/RFI and/or contrast filters.

YOU PROVIDE

- Index detection and pulse-shaping circuits
- Index counting and scan-correction circuits
- The power supplies, scan and video amplifiers normally required for high performance displays.

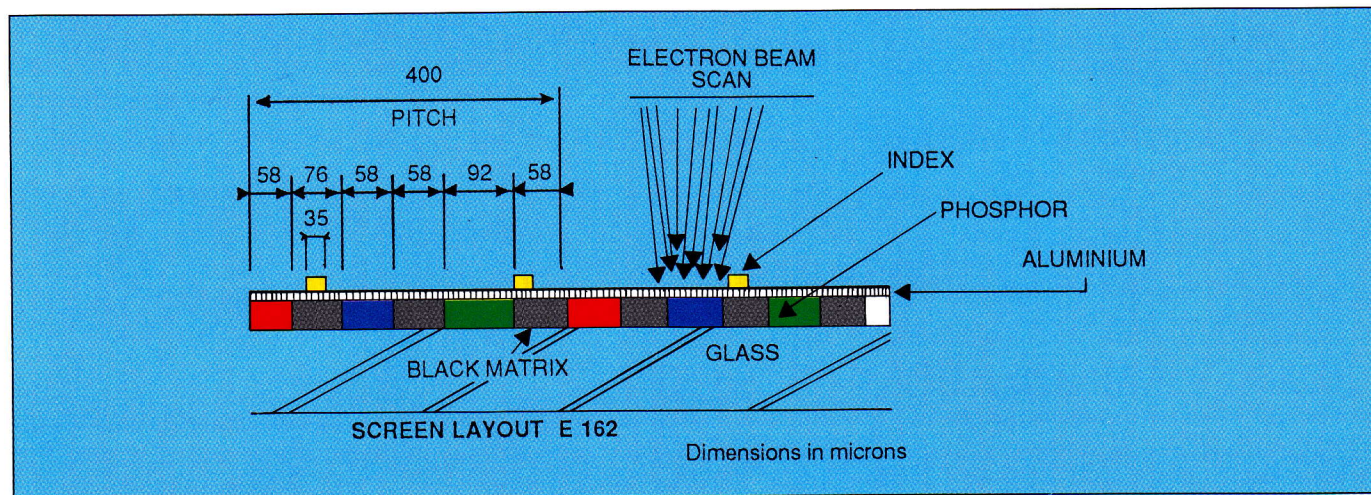
READILY AVAILABLE BEAM-INDEX CRTs

TUBE MODEL	TH 8139	THX 2649	THX 2697	THX 2694
SCREEN REF.	E162	E161	E155	E163
VIEWING AREA (Inch x Inch) (mm x mm)	6.1 x 6.1 155 x 155	5 x 4 125 x 100	4 x 3.1 100 x 80	1 x 0.7 24 x 18
FACEPLATE DIMENSIONS (Inch x Inch) (mm x mm)	7 x 7 177 x 177	5.6 x 5.6 143 x 143	4.8 x 4 122 x 103	1.33 x 1.1 34 x 28
LENGTH (mm x mm)	360	320	330	120
NECK DIAMETER (mm)	36.5	36.5	36.5	14
DEFLECTION ANGLE (degrees)	70	70	50	40
NUMBER OF TRIADS/LINE	380	417	330	250
TRIAD PITCH (mm)	0.4	0.3	0.3	0.096
INDEX : COLOR STRIPE RATIO	1 : 2	1 : 3	1: 3	Front index
No. LEAD-IN STRIPES	12	10	0	0
ANODE VOLTAGE (kV)	33	33	33	7
FOCUS VOLTAGE (kV)	10	10	10	1.4
BRIGHTNESS (dyn. white) (Ft.L) (l)	1000	1000	1600	50

(l) Dynamic White is obtained by exiting the screen with the switched beam, as opposed to "Static White" obtained by merely scanning the screen in a DC mode.

BACKGROUND INFORMATION

- The principle of beam indexing requires the screen to be raster scanned (any scanning standard may be used).
- The Screen Structure represented below (E 162) is typical, but green-enhanced. The index stripes are superimposed on the black matrix. Their periodicity, here 1 index every 2 color stripes, is a choice determined by the feedback circuit design.



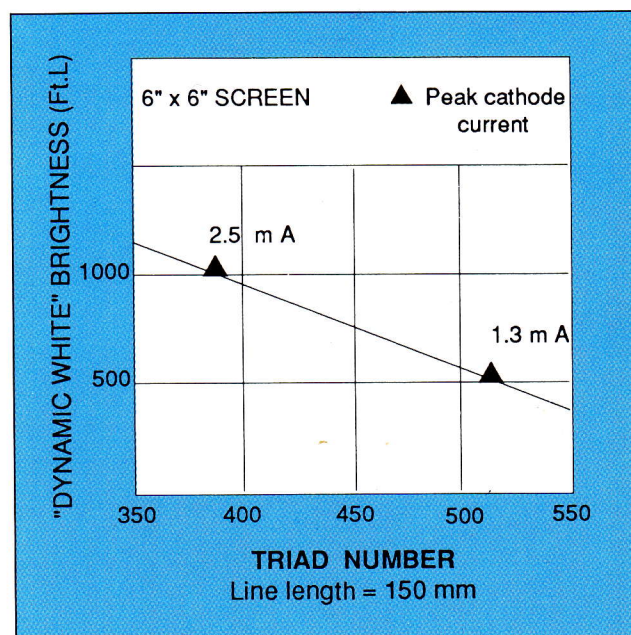
- The brightness of the BI CRT is dependent on :

- the scanned area. As for any CRT, operated at given beam current, the brightness varies as the inverse of this area.

- the triad density. The narrower the color stripes, the thinner the electron beam, in order to keep color purity. Although the electron optics of our beam index tubes are constantly refined, a smaller spot size is unavoidably linked to a somewhat lower beam current.

- the video chopper rise and fall times. These must be as short as possible (5 to 10 ns is the state of the art). In order to preserve color purity the beam must excite the color stripe during all the time available, but not longer.

The curve (right) is an example of brightness versus triad density for TH 8139 (6" x 6").



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