

TV TEHNIKA

analiza slike

Irini Reljin

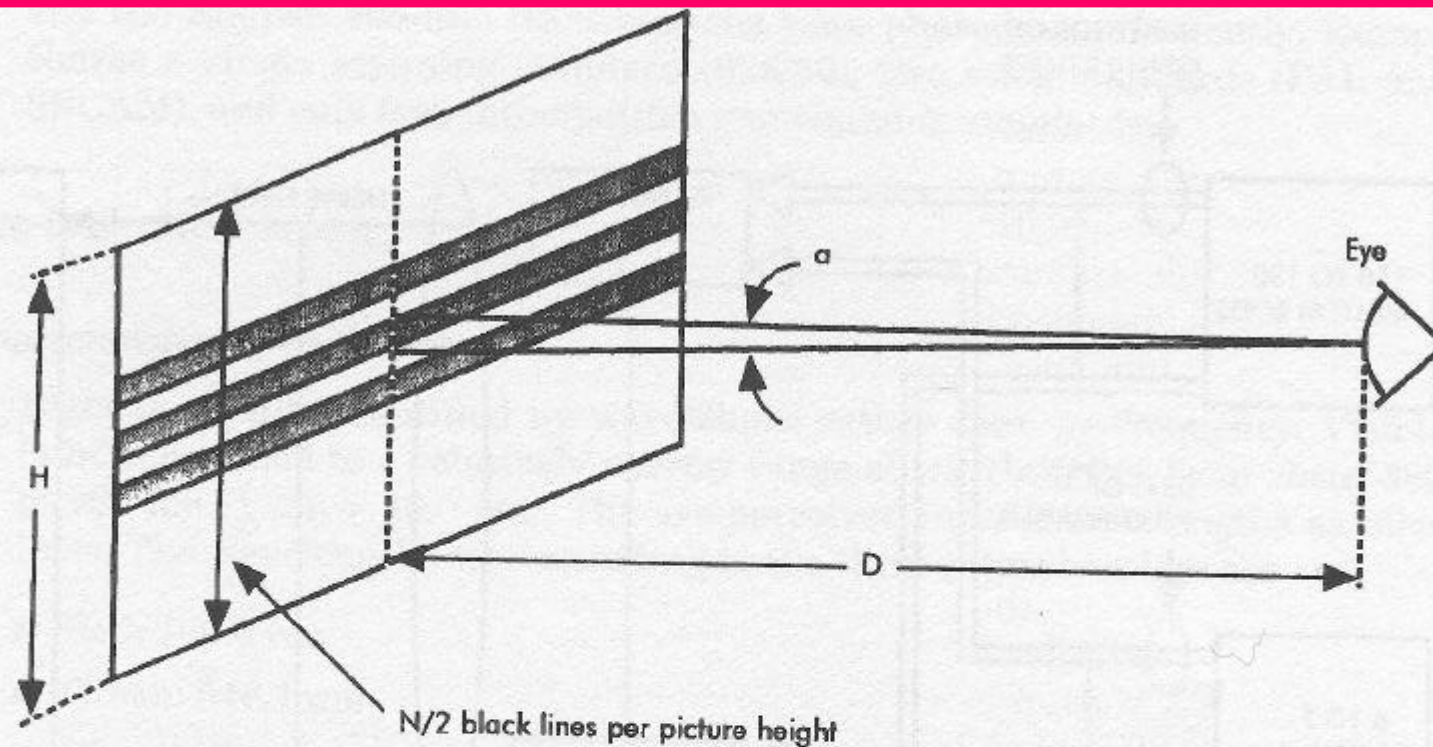


Figure 1.2 Visual acuity concept.

where N_v = Total number of elements to be resolved in the vertical direction

α = Minimum resolvable angle of the eye (in radians)

$n = D/H$ (viewing distance divided by picture height)

Given $\alpha = 1$ min of arc, or 2.91×10^{-4} radians, and $n = 6$, we have

$$N_v = \frac{1}{(6 \times 2.91 \times 10^{-4})} \approx 572 \text{ lines}$$

Persistencija covecijeg oka:

Sposobnost oka da "pamti" sliku
po prestanku nadražaja

Impresija o svetlosti traje 0.1 s

? 10 slika u sekundi dovoljno da stvori
utisak o kretanju

Fliker - treperenje

Kritična frekvencija flikera je minimalan broj prekida projektovane svetlosti potreban da se spreči osećaj treperenja.

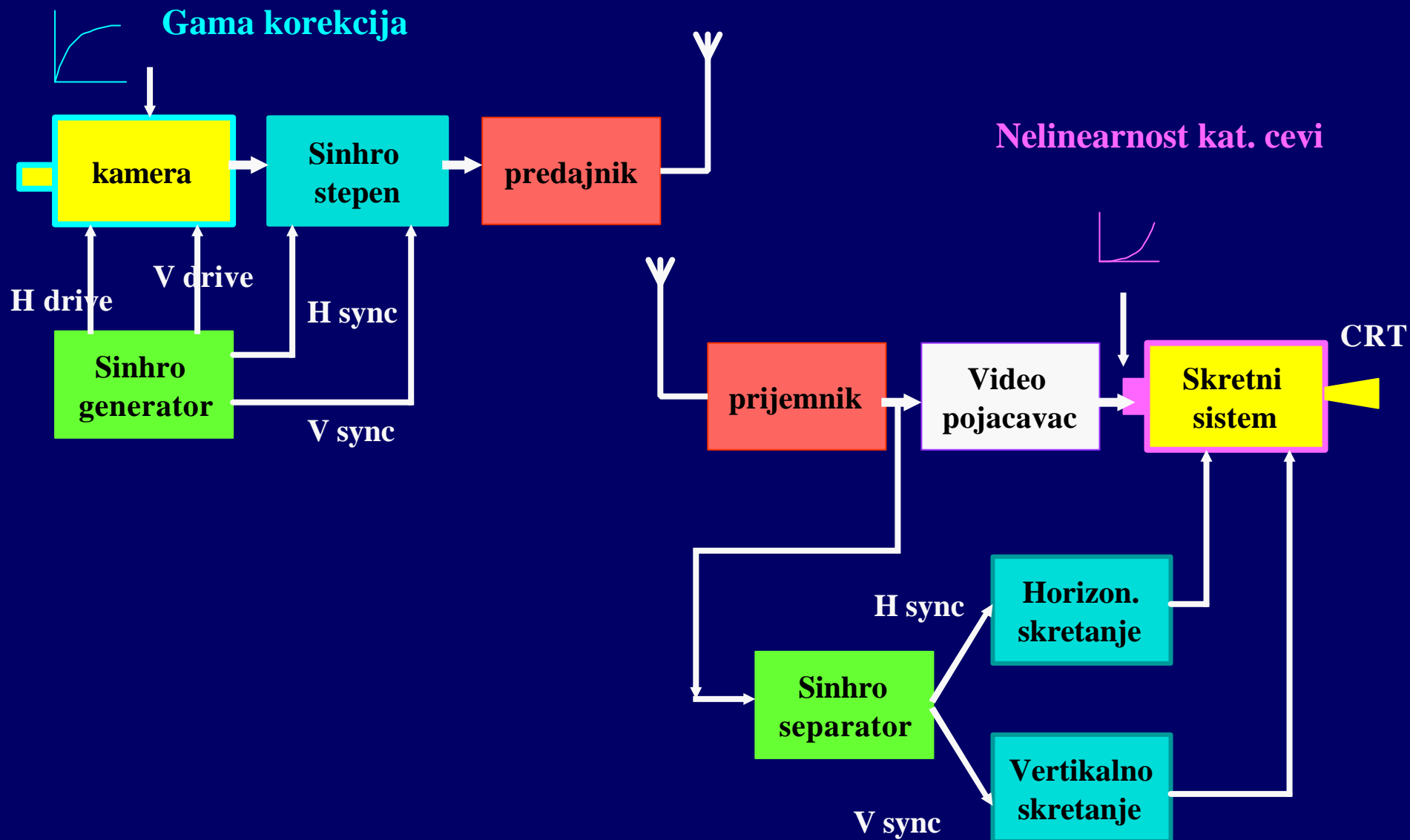
Prag flikera zavisi od:

- osvetljenosti površine
- boje površine
- ugla pod kojim se vidi "objekat"
- osvetljenosti okoline
- varijacije osvetljaja u vremenu
- pozicije u trepcujoj površini
- adaptacije
- uvežbanosti (navike) posmatraca.

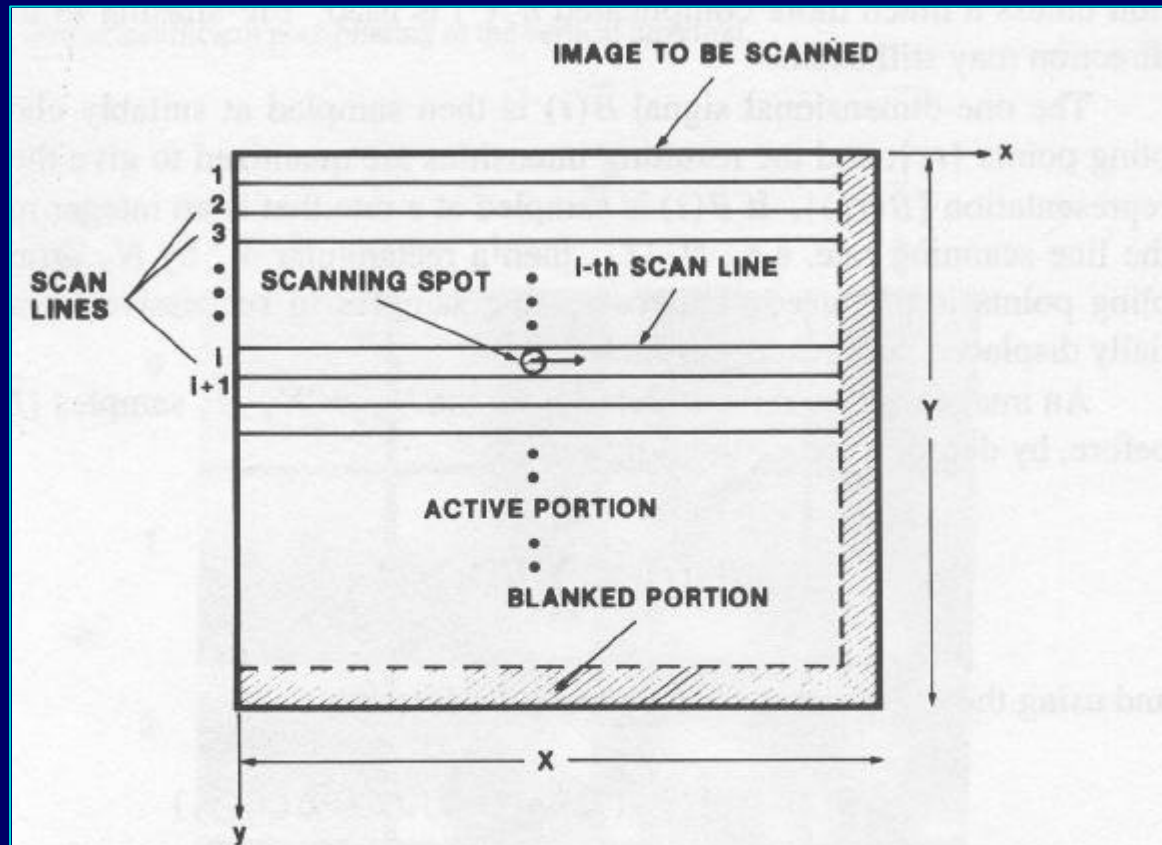
Prag flikera

Izvor slike	Fliker frekvencija	Frame/sec	Prag flikera (cd/m ²)
Film	48	24	68.5
TV – 50 Hz	50	25	99.4
TV – 60 Hz	60	30	616.7

Blok šema monohromatskog TV sistema



Skeniranje slike

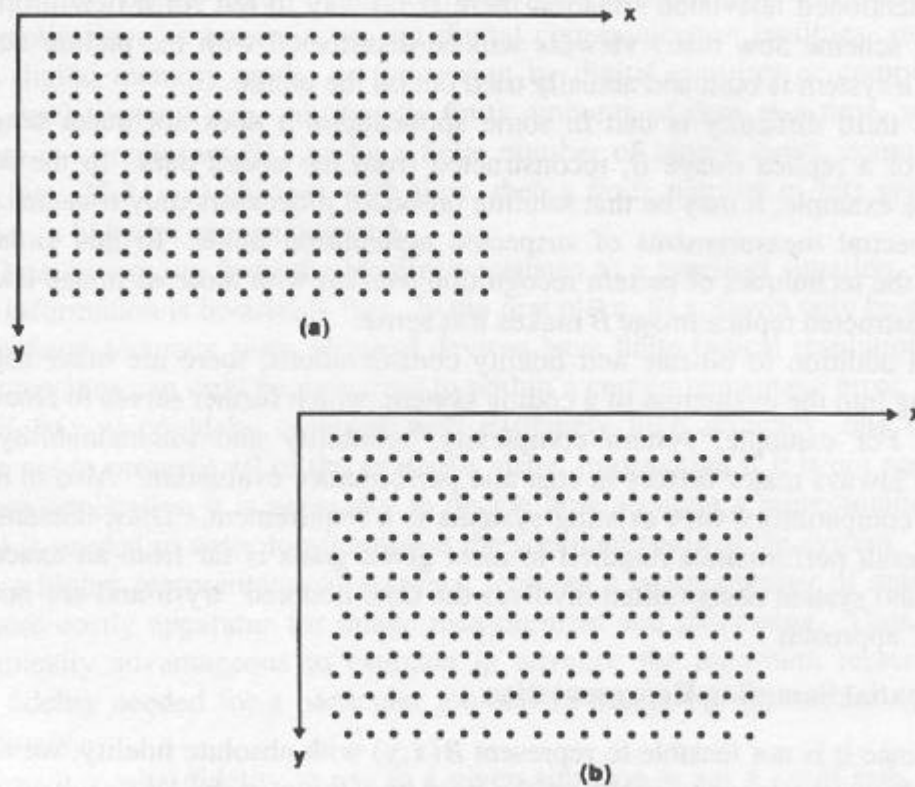


Raster scan of an image. The scanning spot moves across each scan line, left-to-right, and at any given position performs a local spatial average to give the image intensity at that point. The blanked region on the right and bottom allows retrace time for the scanning spot.

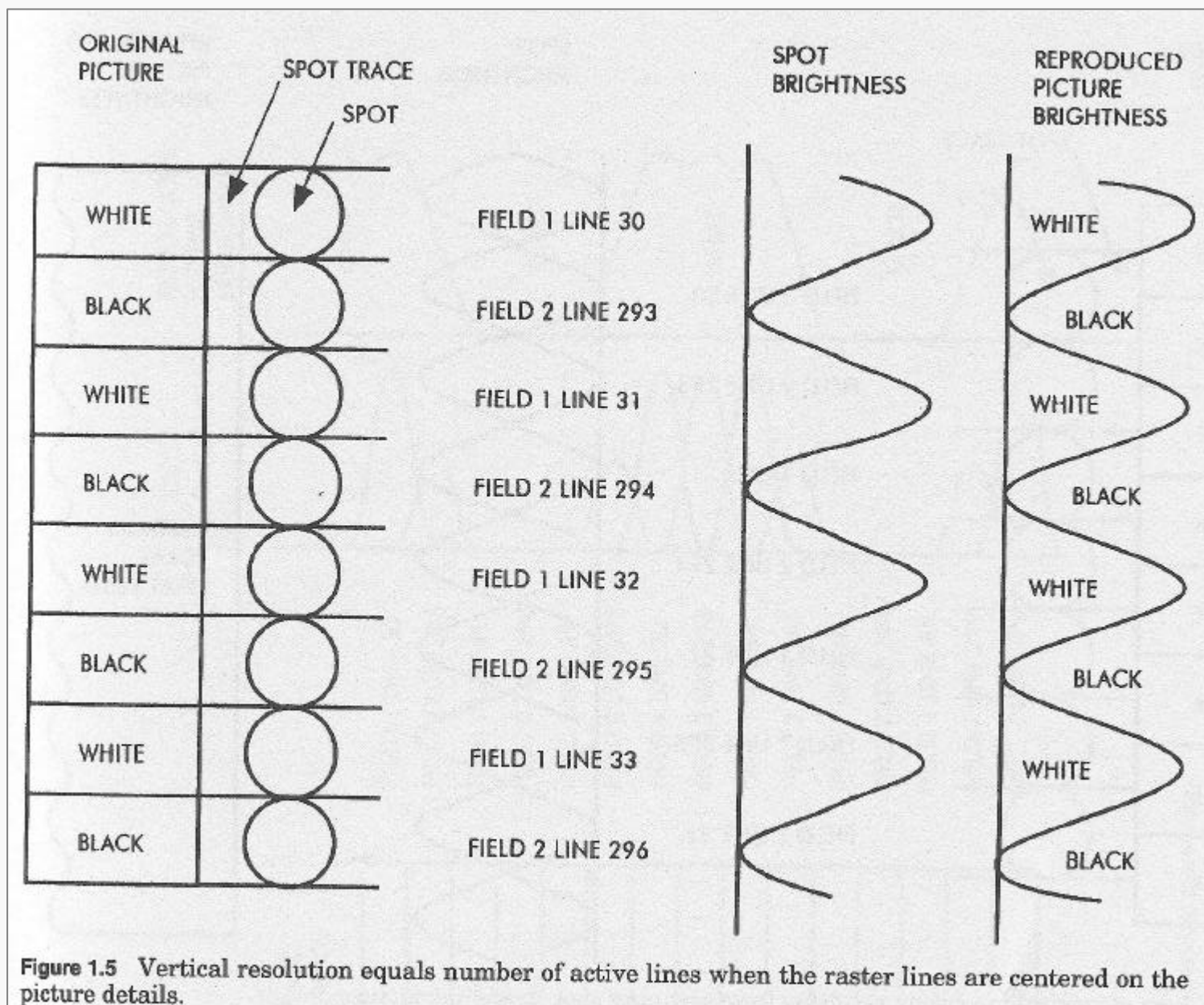
Significant Parameters of Conventional Scanning Standards

Parameter	525/60 Standard	625/50 Standard
Number of lines per frame	525	625
Number of lines per field	262.5	312.5
Number of frames per second	29.97	25
Number of fields per second (f_v), Hz	$2f_H/525 = 59.94$	$2f_H/625 = 50$
Horizontal scanning frequency (f_H), Hz	$3 \times 5 \times 5 \times 7(f_v/2) = 15,734.25$	$5 \times 5 \times 5 \times 5(f_v/2) = 15,625$
Field blanking duration (lines)	20	25
Frame blanking duration (lines)	40	50
Number of active lines per frame	485	575
Vertical resolution (N_v), LPH	$485 \times 0.7 \approx 339$	$575 \times 0.7 \approx 402$
Total line duration, μs	63.556	64
Horizontal blanking duration, μs	10.7 ± 0.1	12 ± 0.3
Active line duration, μs	52.856	52
Horizontal pixels for equal H/V resolution	$339 \times (4/3) \approx 452$	$402 \times (4/3) = 536$
Line-pair cycle duration (T), μs	$52.85/226 \approx 0.2338$	$52/268 = 0.194$
Bandwidth for equal H/V resolution, MHz	$1/T \approx 4.28$	$1/T = 5.15$
Horizontal resolution factor, lines/MHz	$339/4.28 \approx 79.2$	$402/5.15 = 78$
Horizontal resolution (N_H), LPH	333 (@4.2-MHz bandwidth)	390 (@5-MHz bandwidth)
H/V resolution ratio	0.98	0.97

Rasteri



1.3.1 (a) A rectangular array of sampling points. The samples are called *picture elements*, or *pels* for short. (b) An offset array of sampling points.



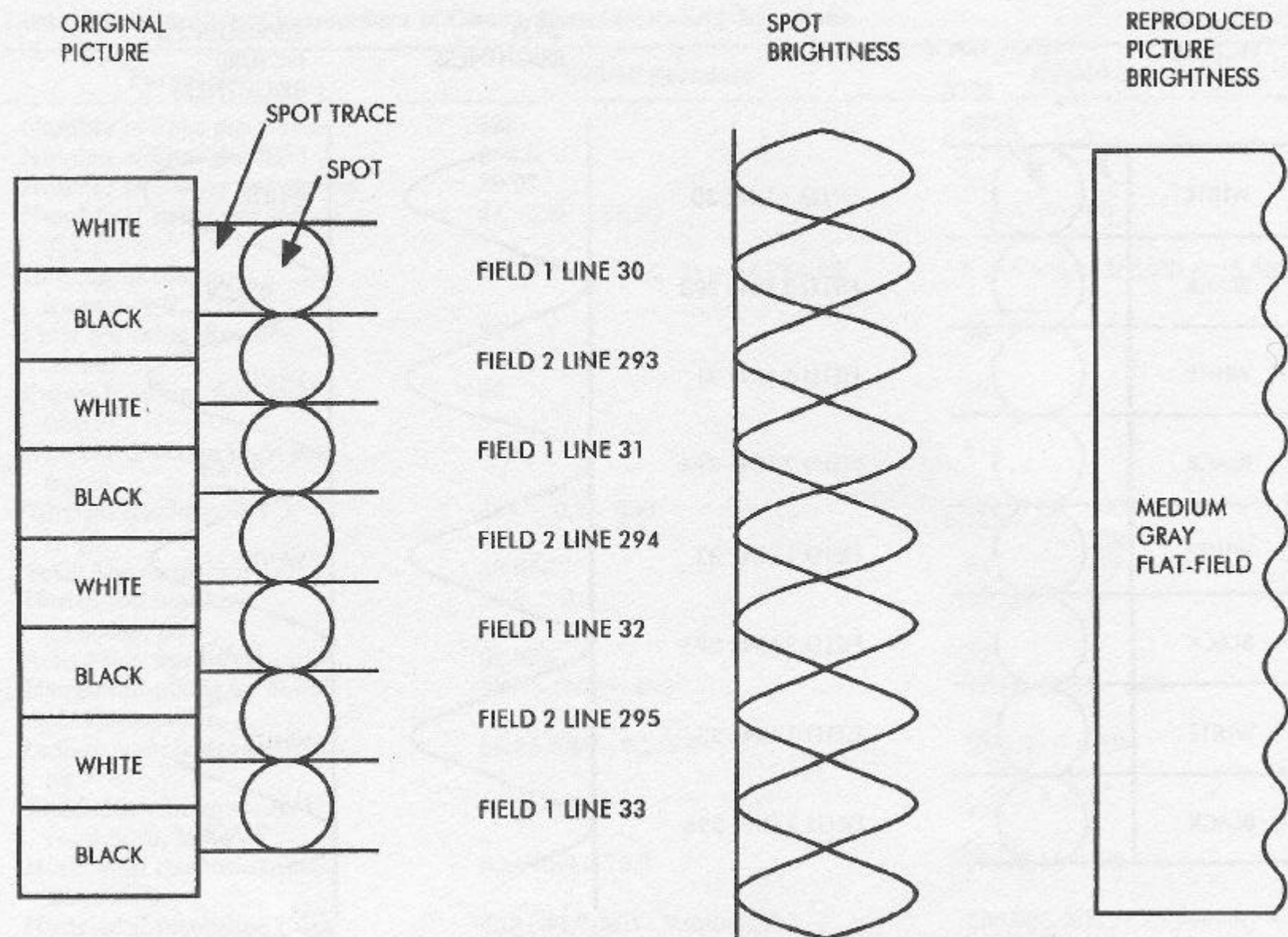


Figure 1.6 Loss of vertical resolution resulting from scanning spot straddling picture details.

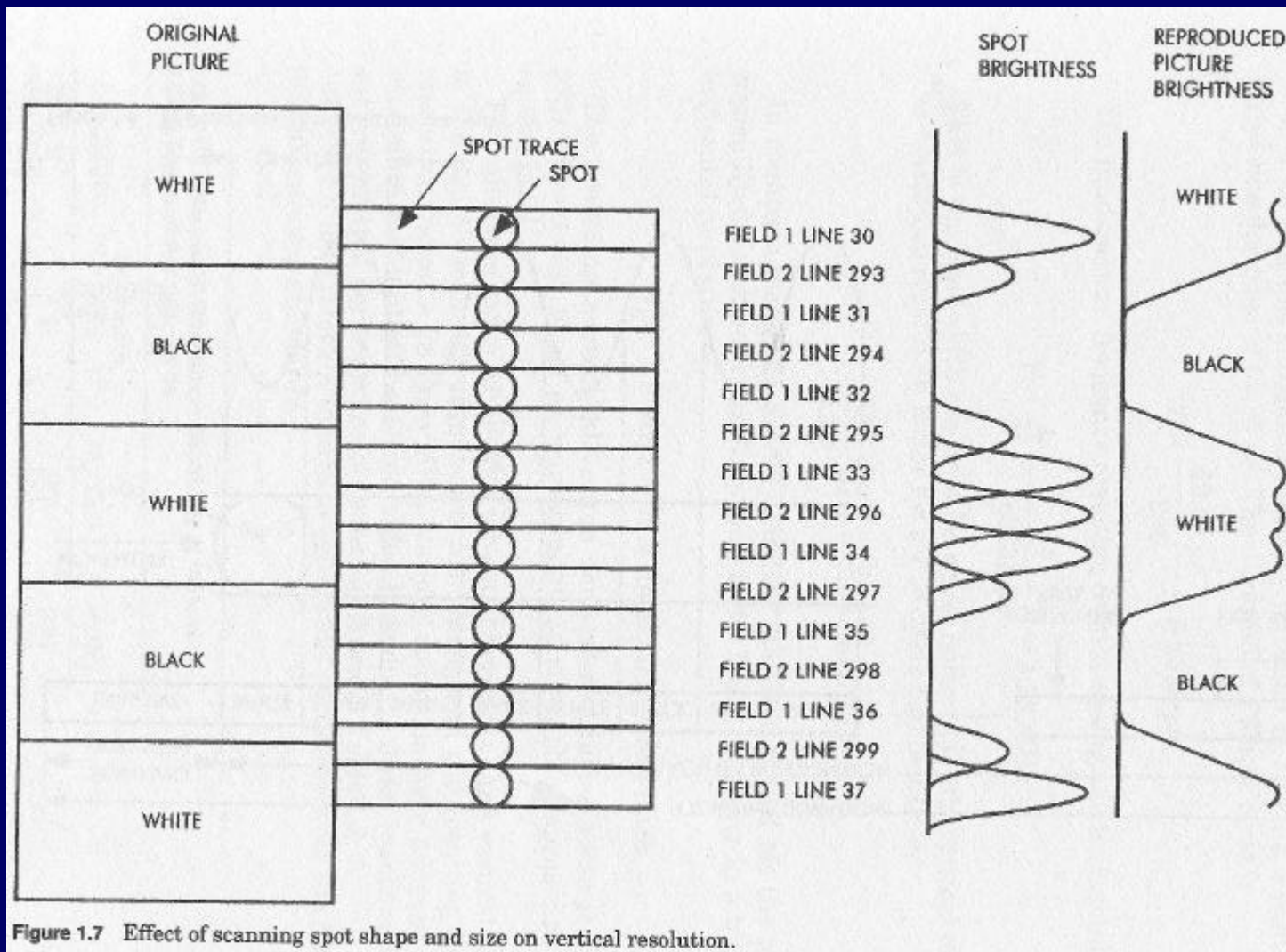


Figure 1.7 Effect of scanning spot shape and size on vertical resolution.

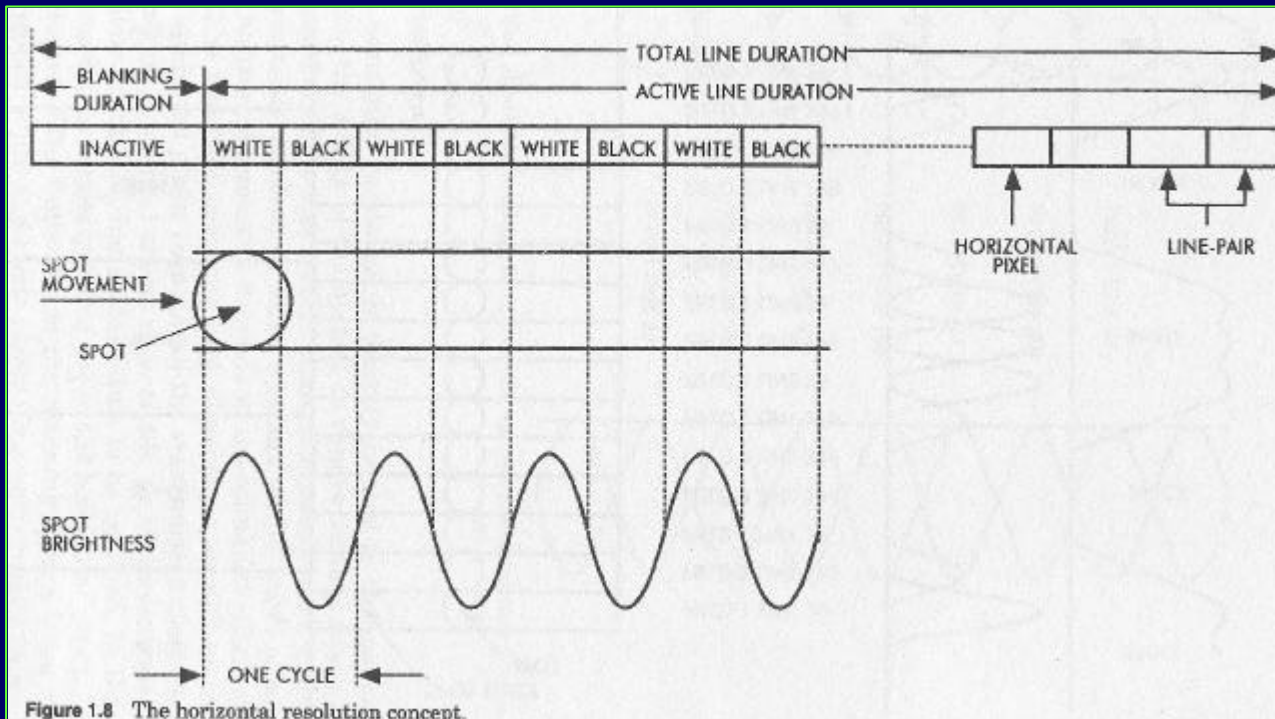


Figure 1.8 The horizontal resolution concept.