

Digitální televize a rozhlas

Měření na SDI

Hodnocení kvality obrazu

Y', R'-Y', B'-Y' commonly used for analog encoding

Format	1125/60/2:1, 720/60/1:1	525/59.94/2:1, 625/50/2:1, 1250/50/2:1
Y'	$0.2126 R' + 0.7152 G' + 0.0722 B'$	$0.299 R' + 0.587 G' + 0.114 B'$
R'-Y'	$0.7874 R' - 0.7152 G' - 0.0722 B'$	$0.701 R' - 0.587 G' - 0.114 B'$
B'-Y'	$-0.2126 R' - 0.7152 G' + 0.9278 B'$	$-0.299 R' - 0.587 G' + 0.886 B'$

Y', P'b, P'r analog component

Format	1125/60/2:1 (SMPTE 240M)	1920 x 1080 (SMPTE 274M) 1280 x 720 (SMPTE 296M)	525/59.94/2:1, 625/50/2:1, 1250/50/2:1
Y'	$0.212 R' + 0.701 G' + 0.087 B'$	$0.2126 R' + 0.7152 G' + 0.0722 B'$	$0.299 R' + 0.587 G' + 0.114 B'$
P'b	$(B' - Y') / 1.826$	$[0.5 / (1 - 0.0722)] (B' - Y')$	$0.564 (B' - Y')$
P'r	$(R' - Y') / 1.576$	$[0.5 / (1 - 0.2126)] (R' - Y')$	$0.713 (R' - Y')$

Y', C'b, C'r, scaled and offset for digital quantization

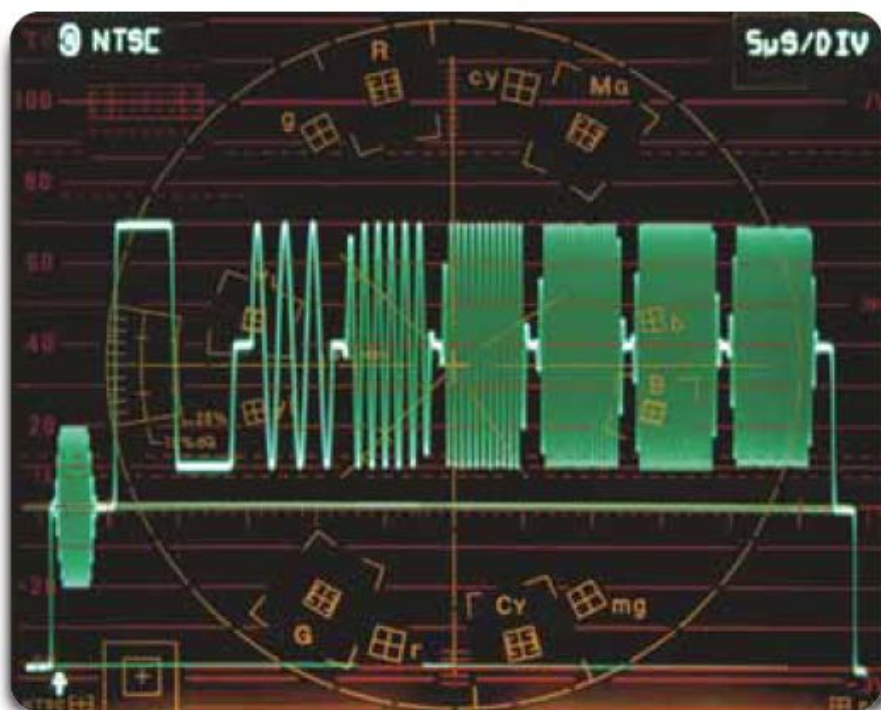
Format	1920x1080 (SMPTE 274M) 1280x720 (SMPTE 296M)	525/59.94/2:1, 625/50/2:1, 1250/50/2:1
Y'	$0.2126 R' + 0.7152 G' + 0.0722 B'$	$0.299 R' + 0.587 G' + 0.114 B'$
C'b	$0.5389 (B' - Y') + 350 \text{ mV}$	$0.564 (B' - Y') + 350 \text{ mV}$
C'r	$0.6350 (R' - Y') + 350 \text{ mV}$	$0.713 (R' - Y') + 350 \text{ mV}$

Component Approximate value
(SMPTE 170M and ITU-R BT.470-6)

Y	$0.299 R' + 0.587 G' + 0.114 B'$
NTSC I	$-0.2680 (B' - Y') + 0.7358 (R' - Y')$
NTSC Q	$+0.4127 (B' - Y') + 0.4778 (R' - Y')$
PAL U	$0.493 (B' - Y')$
PAL V	$0.877 (R' - Y')$
SECAM Dr	$-1.902 (R' - Y')$
SECAM Db	$1.505 (B' - Y')$

Měření na analogovém videosignálu

4 měřící řádky



► Figure 46. Multiburst test signal with equal amplitude at each frequency, 1H display.

vectorscope



Měření na digitálním signálu SDI

Eye
pattern

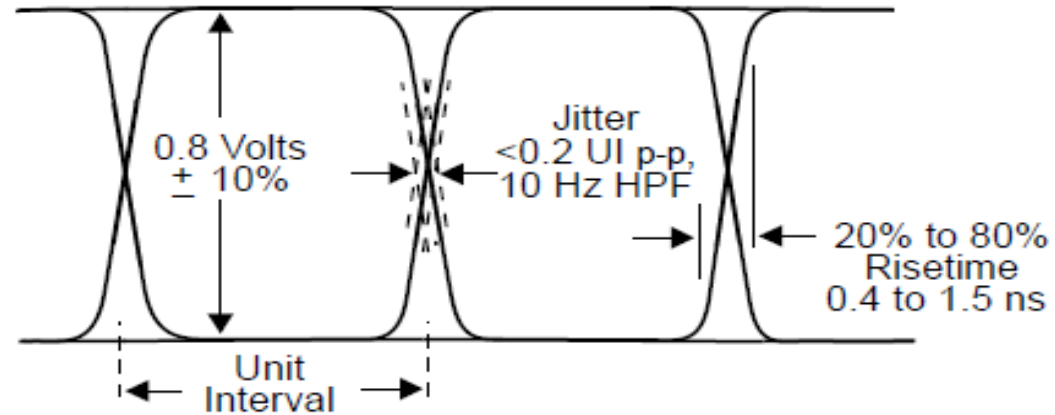


Figure 6-2. Serial signal specifications.

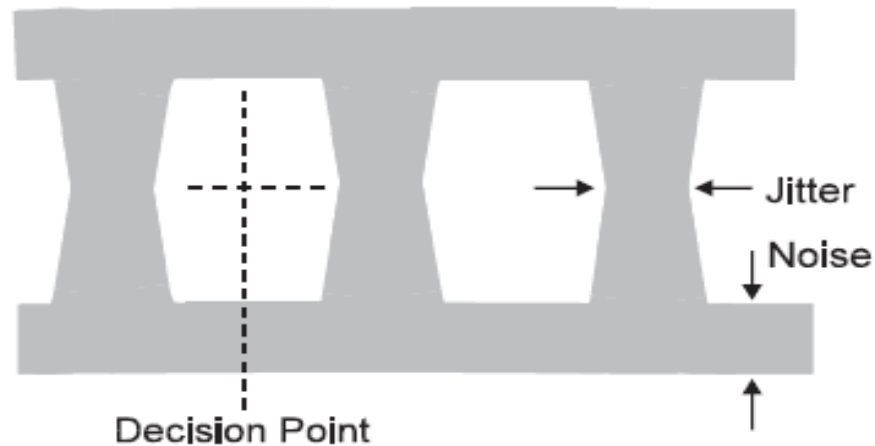
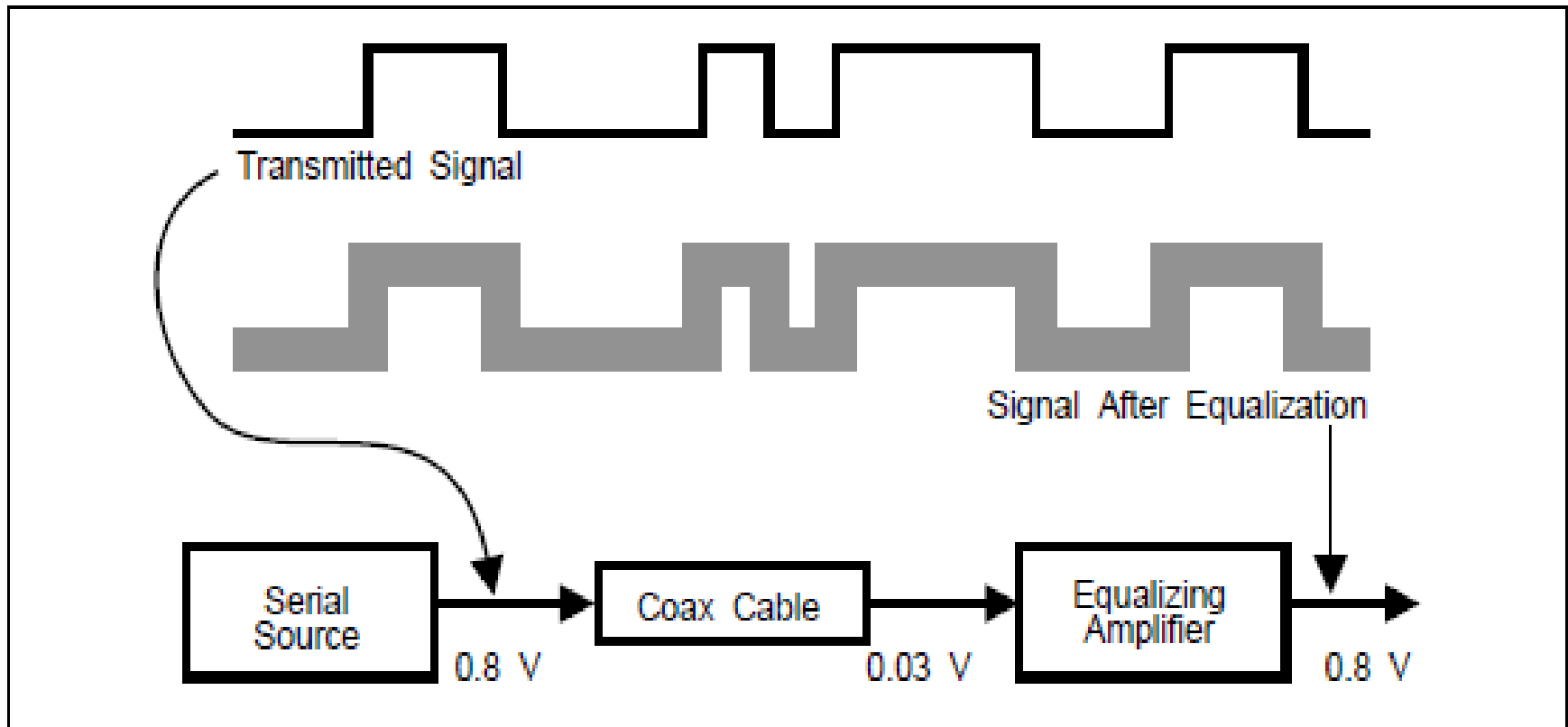
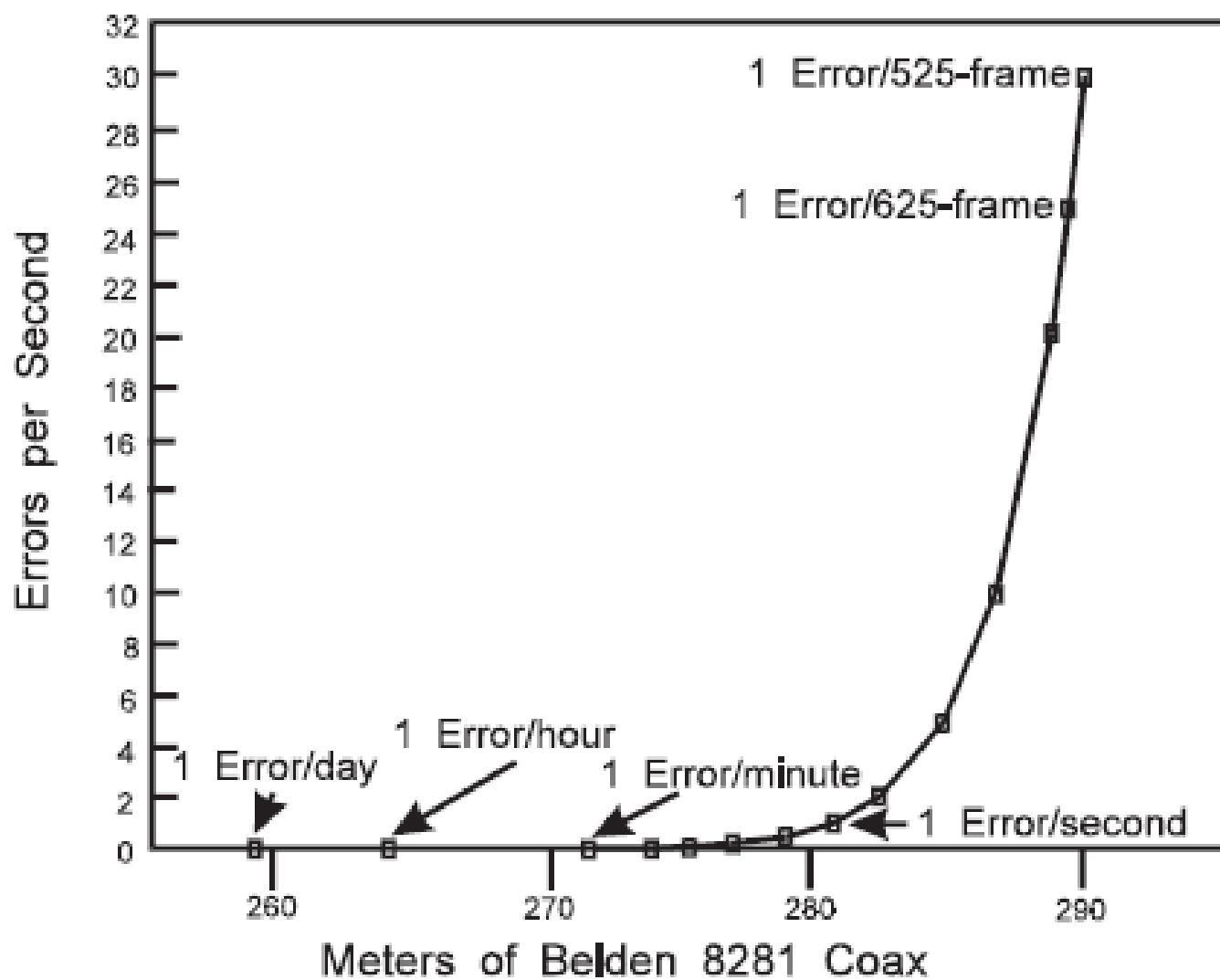


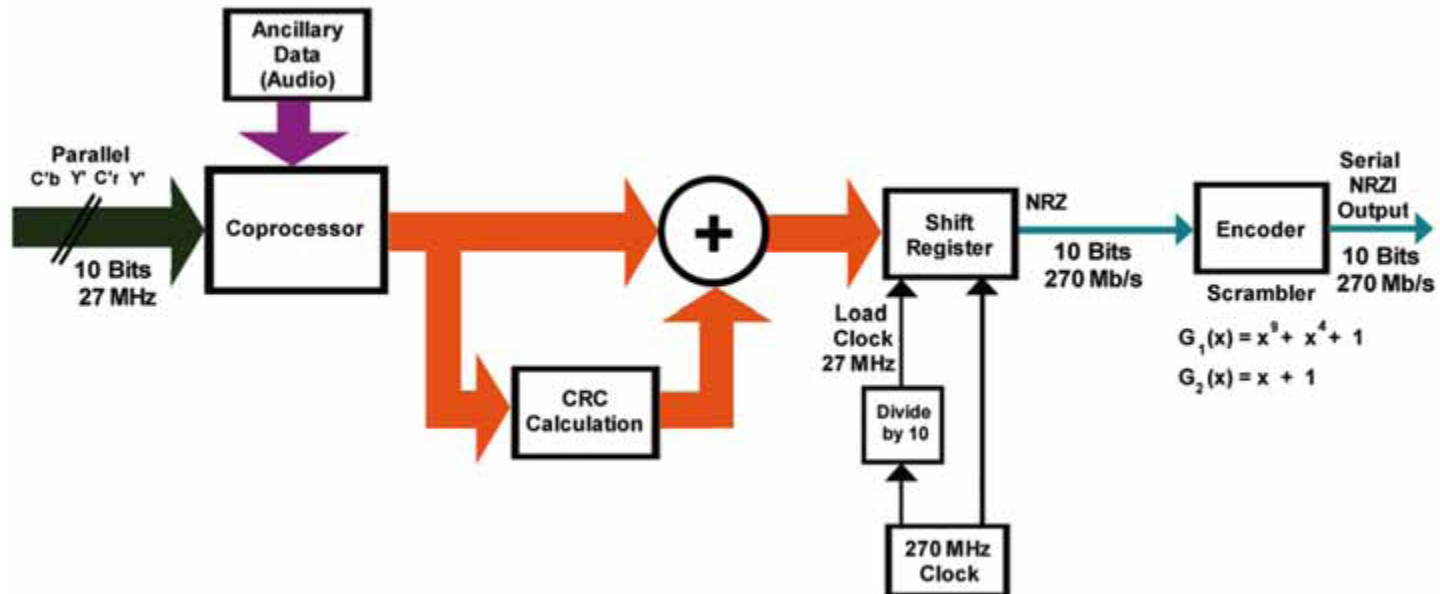
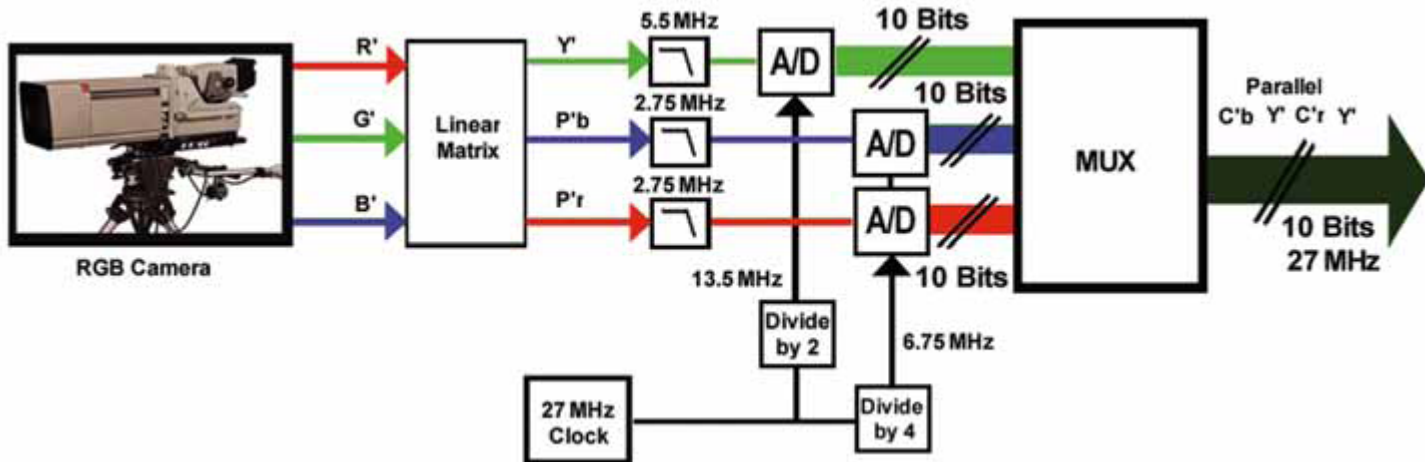
Figure 6-3. Data recovery.

Sériový přenos SDI

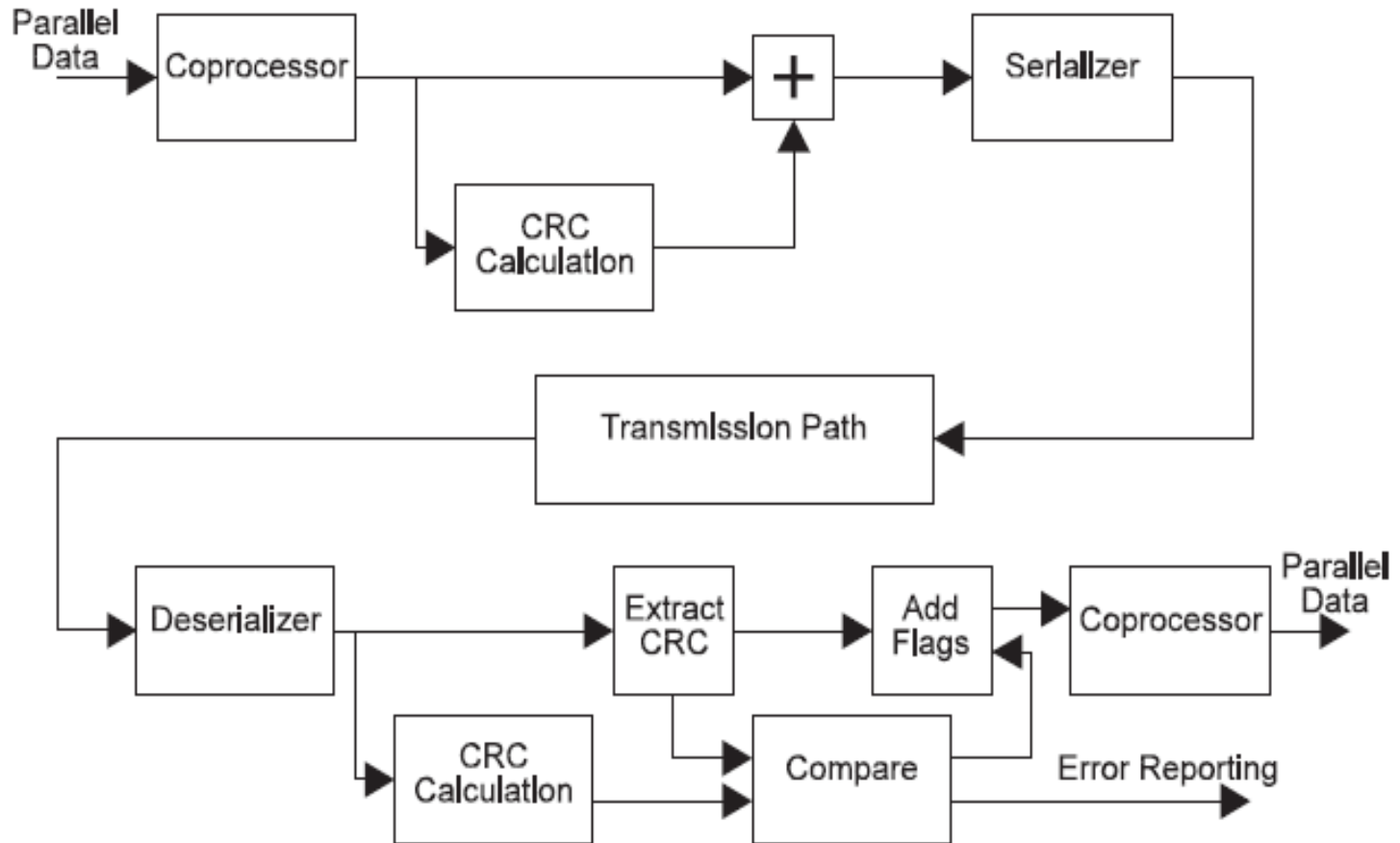




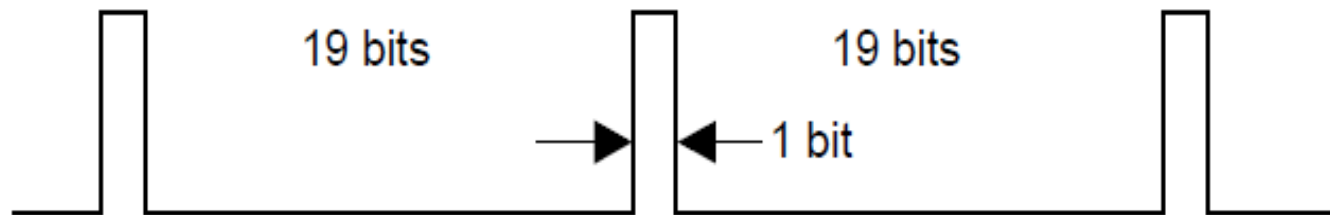
SDI kódér



Error detection concept (EDH)



Signals for testing

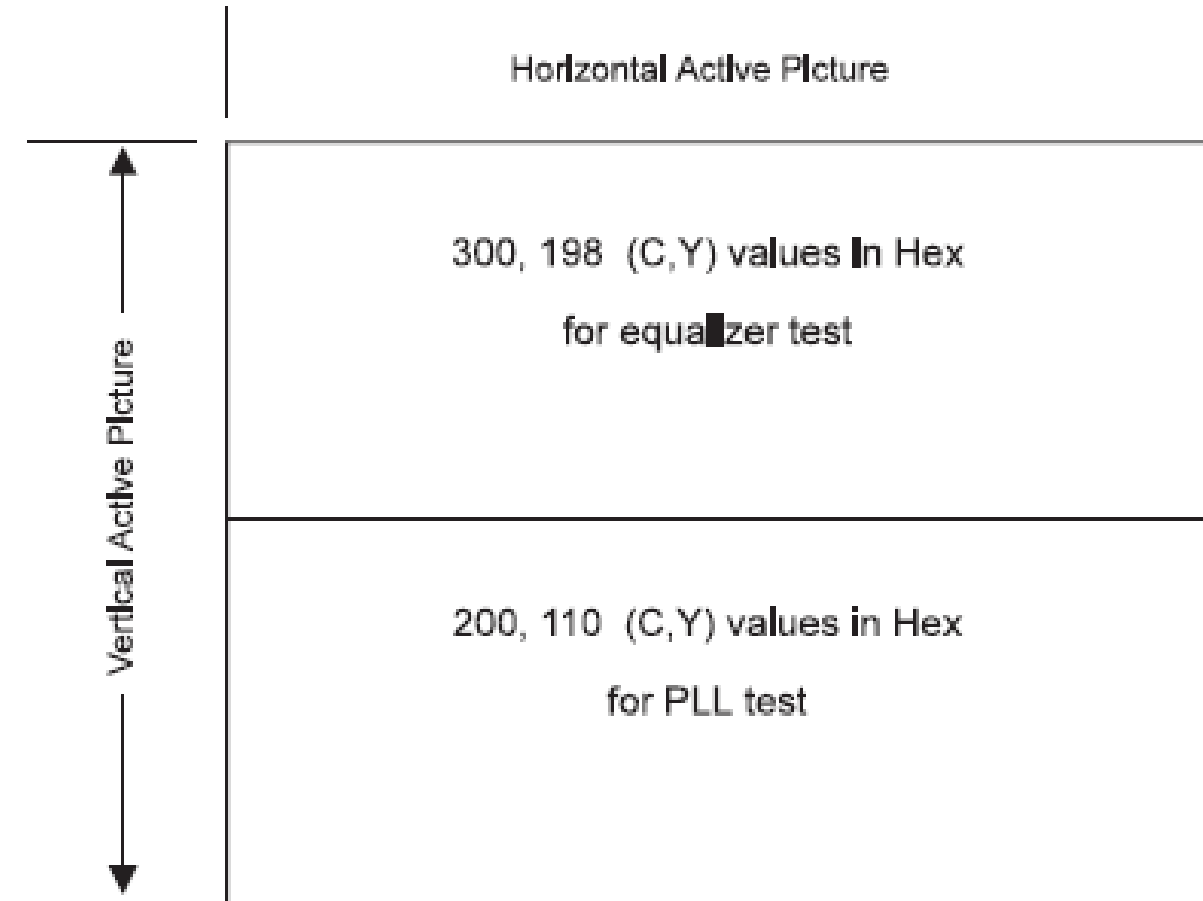


Signal for testing automatic cable equalization



Signal for testing PLL Lock-in

SDI check field



Subjektivní hodnocení kvality obrazu

RECOMMENDATION ITU-R BT.500-10

METHODOLOGY FOR THE SUBJECTIVE ASSESSMENT OF THE QUALITY OF TELEVISION PICTURES

The assessors' laboratory viewing conditions should be arranged as follows:

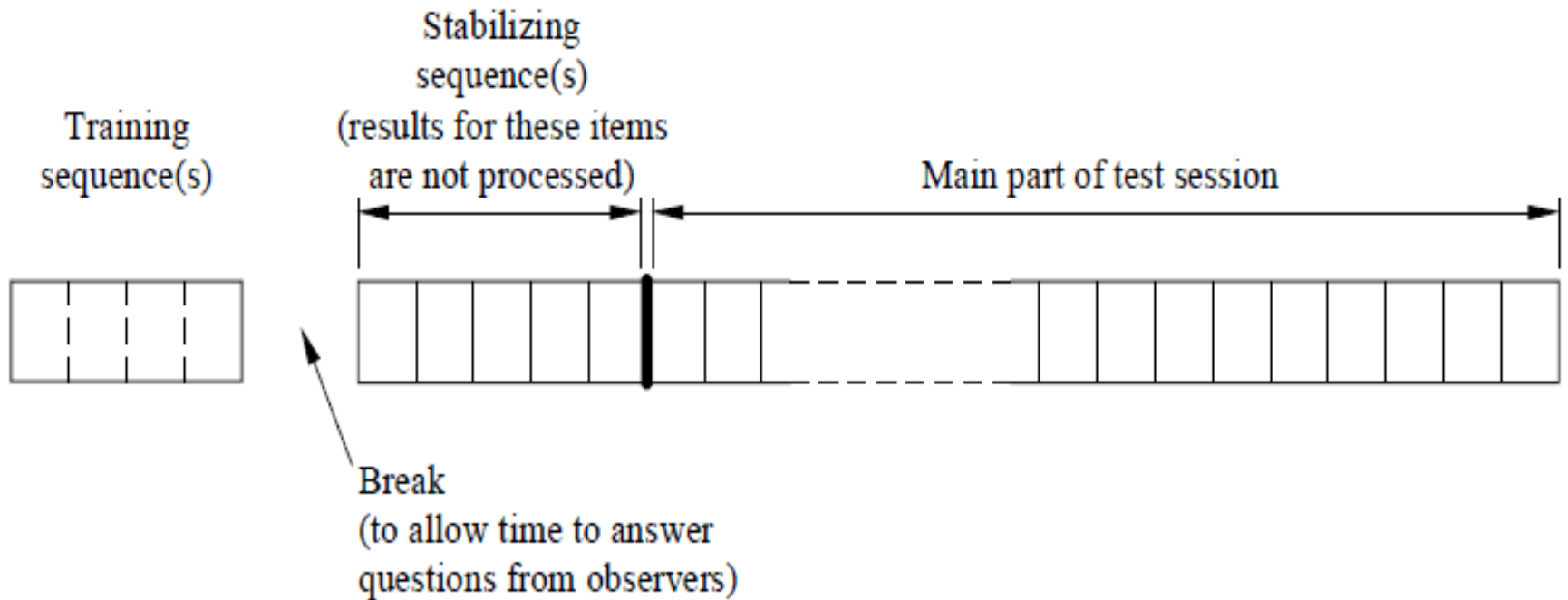
- a) Ratio of luminance of inactive screen to peak luminance: ≤ 0.02
- b) Ratio of the luminance of the screen, when displaying only black level in a completely dark room, to that corresponding to peak white: ≈ 0.01
- c) Peak Luminance 200 cd/m^2
Contrast $0,02$
- d) Maximum observation angle relative to the normal (this number is valid for CRT displays): 30°
- e) Ratio of luminance of background behind picture monitor to peak luminance of picture: ≈ 0.15
- f) Chromaticity of background: *D65*,
- g) Other room illumination: low

Viewing distance to picture height

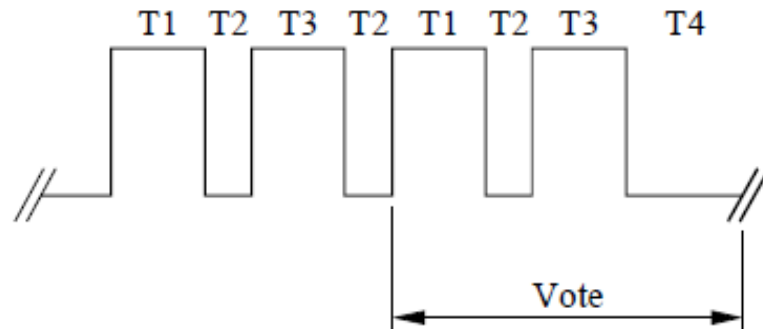
Screen diagonal (in)		Screen height (H)	PVD
4/3 ratio	16/9 ratio	(m)	(H)
12	15	0.18	9
15	18	0.23	8
20	24	0.30	7
29	36	0.45	6
60	73	0.91	5
> 100	> 120	> 1.53	3-4

Presentation structure

Presentation structure of test session



DSIS - Double stimulus impairment scale



b) Variant II

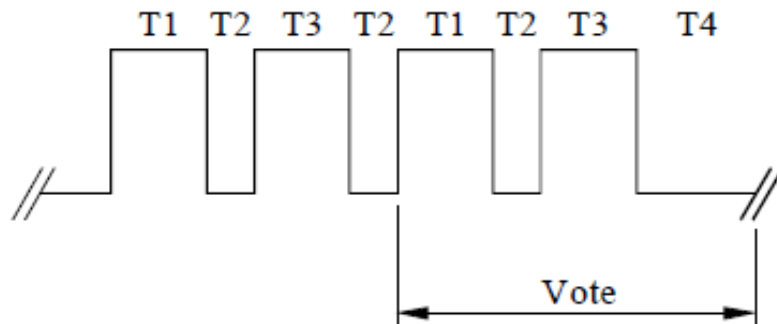
Phases of presentation:

T1 = 10 s	Reference picture
T2 = 3 s	Mid-grey produced by a video level of around
T3 = 10 s	Test condition
T4 = 5-11 s	Mid-grey

- 5 imperceptible
- 4 perceptible, but not annoying
- 3 slightly annoying
- 2 annoying
- 1 very annoying

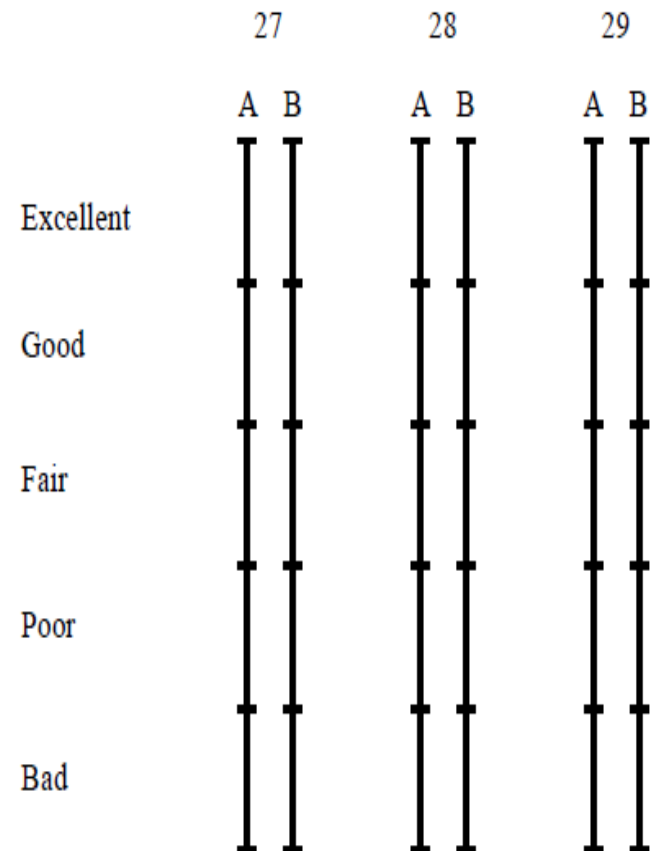
DSCQS – Double Stimulus Continuous Quality Scale

Presentation structure of test material



Phases of presentation:

- T1 = 10 s Test sequence A
- T2 = 3 s Mid-grey produced by a video level of around 200 mV
- T3 = 10 s Test sequence B
- T4 = 5-11 s Mid-grey



FIN