

# Teletext & recovery from VHS tapes

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# Teletext: Broadcast data in analogue TV signals

- ◆ 1974-2012

News, TV schedules, competitions, weather, finance, etc etc

Overlays for 'news flashes' or subtitles

- ◆ Basic graphics 'sixels'

- ◆ Not much archived,

Pages of data lost  
to time.....



# Teletext: ...home video

- ◆ 1975..

  - Nice overlap in time range

  - (Not common until end of 70's)

- ◆ **Simple analogue recording**

  - Each 'field' recorded straight onto the tape

- ◆ **Marginal bandwidth**

  - Not really enough for the teletext signal,

  - Never used to work well trying to watch teletext

  - From a recording on a normal TV



# Teletext: Ancient history

- **CRTs are 'raster scanned'**

A single 'electron beam' is scanned over the surface

It takes time for the beam to move,

Especially sudden movements

You don't want to see the line

as it moves back; it must be

*blanked*

- The basic transmitted signal is just brightness at a point *in real time* + some sync pulses

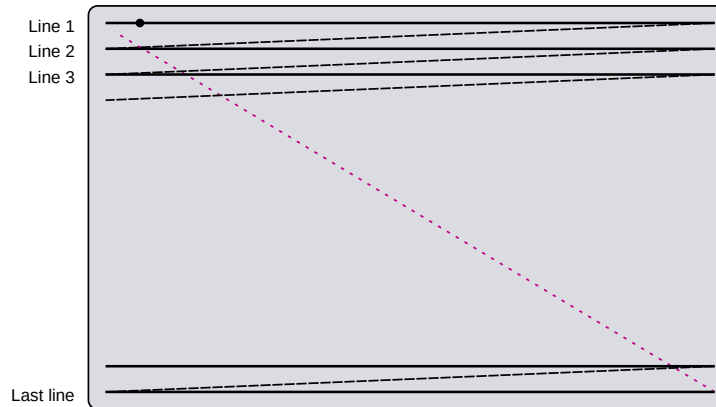
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Museoscienza.org. Museo nazionale della scienza e della tecnologia Leonardo da Vinci, Milano.

[https://en.wikipedia.org/wiki/Cathode-ray\\_tube#/media/File:Cinescopio\\_per\\_televisore\\_a\\_schermo\\_rettangolare,\\_17\\_pollici,\\_deflessione\\_110%C2%B0,\\_bianco\\_e\\_nero\\_-\\_Museo\\_scienza\\_tecnologia\\_Milano\\_10081\\_dia.jpg](https://en.wikipedia.org/wiki/Cathode-ray_tube#/media/File:Cinescopio_per_televisore_a_schermo_rettangolare,_17_pollici,_deflessione_110%C2%B0,_bianco_e_nero_-_Museo_scienza_tecnologia_Milano_10081_dia.jpg)



< Public domain, by Ian Harvey, [https://en.wikipedia.org/wiki/Raster\\_scan#/media/File:Raster\\_scan.svg](https://en.wikipedia.org/wiki/Raster_scan#/media/File:Raster_scan.svg) (modified)



# Teletext: Vertical Blanking Interval (VBI)

- **Some hidden time in the signal**

- **Store some data there!**

Mostly teletext but a few other things like anti-copying systems

- **Can sometimes see it on misconfigured Tvs/videos**

Look for lines of dots and speckling at the top

If it's just a few big dots that's probably timecode data not teletext

# Teletext: Pages, lines, characters...

- On each channel were a few sets of *pages* (e.g. 100..199 for general, 200..299 for money, 700.. for telesoftware)
- Each page could have subpages (e.g. a News story split over multiple subpages)
- Each page is 40 chars x 24/25 lines
  - 7 bit ascii (ish) with control characters
- Pages are transmitted in a cycle and come around every minute or so
  - Type in a 3 digit page number, and wait
- One 40 character line encoded in one video scan line
  - Header lines with page number etc

# Teletext: Character sets

- Shared ish with videotex (Prestel etc), often seen on things like Train station displays in the 90s

Single chip character generators common

- Mostly ASCII with some changes for a few characters

- Control characters

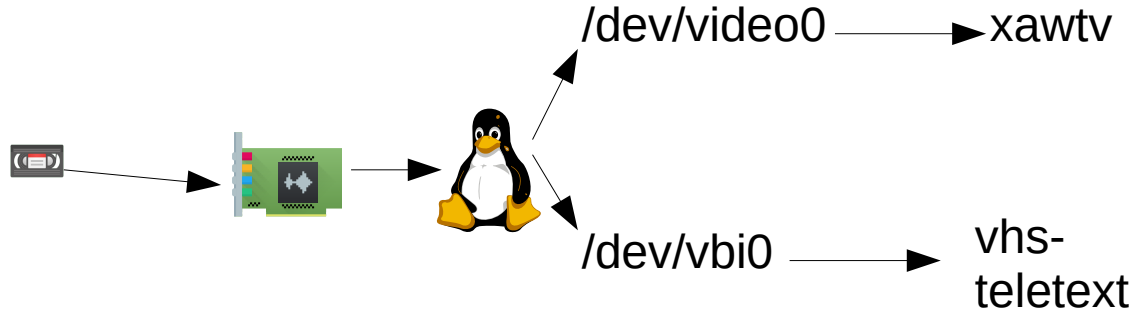
They take a space up

e.g. Double height, Red foreground etc

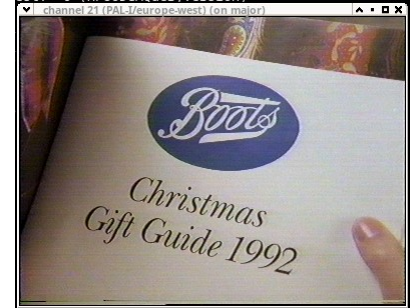
- Sixel graphics:

	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
2		•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
3	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
6	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
7	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•

# Teletext: Video in...teletext out



eg. Hauppauge  
WinTV (some  
models!)





# Teletext: vhs-teletext

- **Written by Alistair Buxton:**

<https://github.com/ali1234/vhs-teletext>

Explanation: [https://github.com/ali1234/vhs-teletext/blob/master/HOW\\_IT\\_WORKS.md](https://github.com/ali1234/vhs-teletext/blob/master/HOW_IT_WORKS.md)

- **Capture data to a 'vbi' file**

~raw samples of video during the VBI ~20GB for 3h tape

- **'deconvolve'**

The magic of vhs-teletext - predicts the effect of the under-bandwidth and tries multiple match patterns for each byte; most have parity which helps. Best match for each byte wins

! Very computationally expensive - use GPU

Produces a 't42' file - ~raw page data

# Teletext: viewing

- **'tv-fonts' or 'zvbi-fonts' package**

```
urxvt -fg white -bg black -fn teletext -fb teletext -geometry 41x25 +sb &
```

- **Viewer**

```
'teletext interactive the.t42'
```

Rolls through the file repeatedly, pause, select a given page, follow 'fastext' links

# Teletext: 'squashing' etc

- Squash multiple versions

Trying to make one good page:



- List pages, filter pages, split tapes into multiple recordings etc

# Teletext: archives

- **Online archives of pages**

Upload recovered t42's

•e.g. <https://www.teletextarchive.com/Pages/Details/1683974>



# Teletext: Fun findings

- ◆ Internal status pages:

```
P595 CEEFAX 584 Wed 13 Dec 18:11/06
18:11/51 7---"BBC2"----22
Str P 0 *****
P 1 *  *
S 2 *  *
P 3
1 2 3 4 5 6 7 8
0 0 1 1 2 2 2 N
+346,051→WSTMAG.CMD
```

```
HOLD ORACLE 698 Wed25 Nov ITV 0027:41
MV1 1 K 0027:21 F 0026:36 A 0027:25
1 GPN SND 6 0 TS1 0 TS3 0
2 UTV DIA 6 2 IT1 0 IT2 0
3 TTT DIA 5 2 S4C 0 CH4 0
4 GRA DIA 6 2 C42 0 IT3 0
5 8 0 TS2 0 C43 0
6 3 0 TS2 0 TS4 0
G B TS4 0 TS2 0
1 GPN 3 0 0 51 1 GPN
2 UTV 2 0 0 51 1 UTV
3 TTT 3 0 0 51 1 TTT
4 YTV 3 1 0 51 1 YTV
5 GRA 3 1 0 21 1 GRA
6 CEN 3 0 0 1 1
7 ANG 3 1 0 1 1
8 TVS 6 0 0 1 1
9 HTV 21 0 0 1 1
10 TSW 3 0 0 1 1
11 BDR 3 2 0 1 1
12 CTV 0 0 0 1 1
13 STV 3 1 0 1 1
14 TOP 11 0 0 1 1
C43 0023:33 TS4 0 TS2 0 IT3 000
*****
```

# Teletext: Real time..

- ◆ **News flashes**

Rumoured to be some erroneous obituaries

- ◆ **Subtitles**

Gather to index programs by text:

*Captain's Log: Stardate 47215.5.*

# Teletext: Interesting tapes

- **Long play less likely to be recovered well**

- **Early stuff rare**

Consumer VCRs not common until early 80's

- **End of tape fun**

Earlier stuff recorded over – can find older stuff at the end

- **Guessing the year**

Newer stuff has date codes, older stuff doesn't

Look up news stories to find out when the tape is from