LEVEL THREE SEMESTER ONE
RESEARCH PROJECT
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THE PIXEL IS POWER

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Contents

Project Proposal

I propose to research and produce a written piece relating to the medium of teletext. In this essay, I will attempt to determine whether teletext is still relevant in today's society and examine possibilities for the medium's survival after the analogue switch off. I will do this by exploring the shifts in popularity and technical advancement teletext has undergone since its inception.

I feel it would be beneficial to explore media that utilises obvious pixellation as an aesthetic, celebrating the pixel as the basic building block of digital design. For this reason, other media such as the early Internet, ASCII art and arcade video games will be used to compare the relative usefulness, popularity and cultural significance of teletext.

Since I expect this project to be fairly wide ranging it will also be the case that ideas for extensions of the project will be carried into future projects. This will take the form of a personal undertaking in the next semester. I will explore this further in the later parts of this project, presenting data I anticipate will be useful: see the appendix for more details.

Further information and research can be found at:
http://pixelispower.blogspot.com

Introduction

The British Broadcasting Corporation launched *Ceefax*, the world's first teletext service, in 1973. Since then, the basic, television broadcast video information format that would become known as teletext has provided a practical and convenient service to millions around the world with its accessibility and easily navigable interfaces.

Now, however, the medium as the world has known it for almost 35 years is nearing its demise. In the coming decade, more technologically up to date formats such as the Internet and interactive television are set to overtake teletext as the most popular commercially available information retrieval services. With the analogue television switch-off imminent, Britain is phasing out its traditional text-heavy, 8-colour, remote controlled teletext systems.

It could be argued that the natural end of this outdated, distinctly 1970s idea is long overdue. Others lament the demise of the medium, which has become something of a national institution.
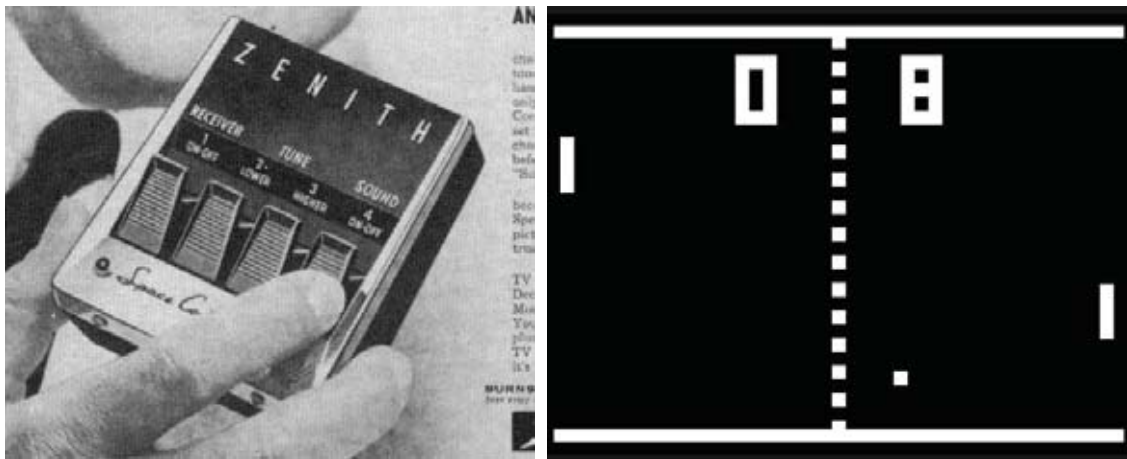
Fig. 1.2: The Zenith Space Command *remote allowed users to change channels and turn a television on and off. Fig. 1.3: Atari's* Pong *first brought video games to the masses.*

Pre-teletext

The idea of an interactive television was nothing new to a pre-teletext audience. By the time of Teletext's introduction, the wireless remote control had been around for almost two decades and was already being marketed and packaged with television sets (*Thinkquest.org*).

Ralph Baer, an American television engineer, conceived the idea of an interactive television game in 1951. He would not get the chance to develop his concept until 1966 when he received support from Sanders Associates, the military finance company he worked with, to explore his idea of creating interactive games using a television (*Ralphbear.com*).

Atari's *Pong* would bring the interactive video game to the masses, however, in 1972. A conversion of physicist William Higinbotham's 1958 'Tennis for Two' oscilloscope game, it sold over 8,000 arcade units in the first year of its release (*Pong-story.com*). In fact, by 1977, the year of teletext's formal launch, Baer had already released and discontinued the first home video game console, Magnavox, and *Pong* systems could be found in video game arcades nationwide.

In the 1960s the invention of the video card introduced the concept of Visual Display Units and on-screen digital graphics. Around this time, networked information systems were being explored in the United States. The Department of Defense developed ARPANET, a network of computer terminals used by researchers in remote areas of the country to share knowledge (*EEI*). This primarily took the form of simple text messages, or email. By 1973, the year of Ceefax's first test transmissions, email accounted for 75% of traffic on the ARPA network and larger files of data could also now be transferred with the establishment of the File Transfer Protocol (*Wikipedia.org*).

Meanwhile, the UK had been working on its own video-broadcast end user information system throughout the 1960s and early 1970s. The General Post Office was developing *Viewdata*, "an interactive 'videotex' system that displayed pages of text in a computer-like format" (*Wikipedia.org*). Much like the ARPA system, Viewdata required special purpose-built terminals to receive and send data over a telephone line. This operated via transmission of information between any two videotex terminals which facilitated, amongst other things, a crude form of email. However, the technology would not come to full fruition until the late 1970s, when the service would be named *Prestel* and 'viewdata' became the generic term given to any interactive videotex service (*Atari Magazines.com*).

Fig. 1.4: Ceefax index from 1975 in comparison to an equivalent index page from 2008. 30 pages were broadcast in the 1975 transmission.

Teletext

Following the international expansion of the United States' ARPA network and Pong's cross-continental popularity the BBC demonstrated their new data-transmission technology, Teledata, branded as *Ceefax (Florida IML)*. This was to be an information retrieval service broadcast via previously unused parts of television signals and received by TVs fitted with an appropriate decoder. In 1975, the first thirty test pages for Ceefax went live with weather reports, latest news, subtitles and a group of test cards (*Teletext Then and Now*).

Impressed by this new technology, the Independent Television Authority announced its own similar service, ORACLE. The following year, the BBC and the ITA got together with the General Post Office and agreed on a format their services would run via – CEPT1. This would involve a basic grid of text 40 characters high and 24 wide, with some graphical characters for constructing simple graphics (See appendix for full details). Ceefax, ORACLE and the General Post Office's Viewdata system (later known as Prestel) officially became collectively known as *teletext* services (*McMordie.co.uk*). A feature unique to the teletext format was the navigation method - three digit access codes allowed for easy navigation of extensive page indexes via a remote control handset.

Following earlier test transmissions, 1976 saw the formal launch of the Ceefax service of 100 pages, with ORACLE and Prestel following soon after. The subsequent year, the first televisions with teletext decoders were produced and the service became available to the general public for the first time (*Teletext Then and Now*).

A primary function of the teletext service was to provide subtitles. Indeed, the BBC's research began as an exploration into a method of closed captioning to aid the hard of hearing. This developed into a full-scale information service including news, sports results and television schedules. Run by a nine-member editorial team, it was, to a 1976 audience, the most up-to-date and accurate service available (*Teletext Then and Now*). A major feature was that the information was available to view at any time BBC was on the air so it was not necessary to wait for the next televised news bulletin or the following day's newspapers.

At the time, no other service provided such immediacy. This would be the main factor in teletext becoming, for a time, the most popular information retrieval system in Britain and the first commercially available electronic service to do so (*Teletext Then and Now*).

Fig. 1.5: Ceefax promotional postcard from 1975.

Ceefax

Ceefax, phonetic for 'see facts', is the BBC's teletext service. The world's first such system, it went live in 1976 with 100 pages, relatively few compared to the 600-page services Ceefax would transmit throughout the 1990s.

Though from the mid 1970s, layouts using early teletext systems do not differ greatly from those seen today. Despite a number of upgrades in other countries throughout the world, the UK's teletext service remained the same: 8 colours, 40x24 characters. This is the very format still utilised to this day. Though cutting edge at the time of its invention, it may be said that teletext's design is distinctly outdated by today's standards. However this does not necessarily prevent the medium from achieving its primary purpose - conveying information in a coherent and effective manner.

Figs. *1.4* and *1.6* are from BBC's Ceefax service in 1975. The page layout on the promotional postcard above (*Fig. 1.5*) is very basic, providing a straightforward series of menus to help the user navigate teletext's page system with the minimum of fuss. Despite this, the page is rather congested. Trying to fit as much information on a page as possible is a trademark of the early teletext transmissions. This was mainly due to price issues – the cost of digital memory in the mid-1970s was still relatively expensive. Each page, equating to 960 bytes, cost approximately £50 when Ceefax began (*Teletext Then and Now: Early Subtitling*).

Fig. 1.6: a Ceefax index page from 1975 compared to a Ceefax index page from 1978.
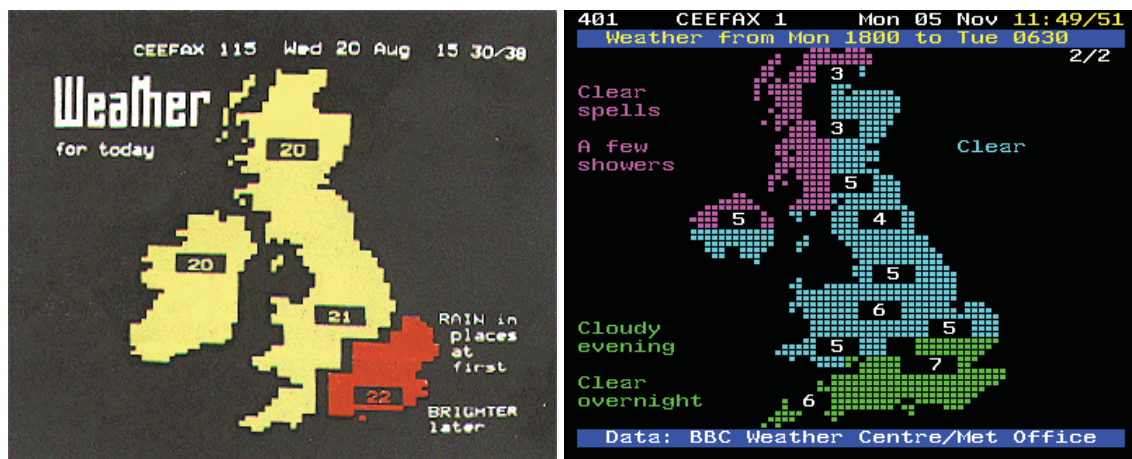

Fig. 2: Comparison of weather services from Teletext in 1977 (left, 2.1) and 2007 (right, 2.2). Though there are some small differences, the two are graphically similar.

Shown in *Fig. 2.1* is one of the earliest examples of teletext 'art' in the form of a weather map of Britain. This design is not all that different from the teletext maps of today – compared to an equivalent page from 2007 (*Fig. 2.2*) there is almost no difference. The same visual metaphor has survived for thirty years.

This demonstrates that a good piece of practical design can remain useful even if its format is seen as outmoded. The essential task the design is needed to perform has not altered, so the teletext weather map proves useful to a whole new generation of audience *(See* Evolution of the Teletext Weather Map*).*

Fig. 3.1: Antiope: a slightly more sophisticated version of Ceefax.
Fig. 3.2: Telidon employed its own purpose built control unit.

Teletext evolves
The Second Generation of teletext systems

In the late 70s and early 80s, teletext became an internationally embraced technology, with services emerging in North America and across Europe. Due to differing regional television encoding variations these were, however, often visually unlike teletext broadcast in Britain.

Some experimented with more graphically advanced aesthetics. Antiope, France's teletext service of the 1980s, operated using a set top box and included a redefinable character set, making for more sophisticated displays than the British standard (*Wikipedia.org*).

Antiope's standard would later be employed and expanded upon in Telidon, a Canadian 'second generation' teletext service (*ewh.ieee.org*). Whilst this provided a more advanced graphical display, the service's transmission via pay-to-view cable channels would restrict its overall audience reach. "Poorly structured business models" (*Wikipedia.org: NAPLPS*) meant the service never achieved the same widespread popularity as Ceefax.

> *"Telidon placed Canada as a world leader in two-way TV technology, and offered the potential to revolutionize telecommunications in Canada."*
> (ewh.ieee.org)

Using a purpose-built controller plugged into the set top box (*Fig. 3.2*), users could access services in a similar way to the Prestel viewdata system. The technology was built with major technological expansion and cultural significance in mind:

> *"The development of Telidon has been rapid. In the future, Telidon may well form part of a system that will perform many of the services envisaged in the wired cities of tomorrow. Telidon is emerging as one of the key technologies that are leading us into the information age."* (*ewh.ieee.org*)

In 1985, however, the Telidon services were taken offline due to the increase in popularity and technological advances of home computers (*ewh.ieee.org*). This premature closure meant the service never expanded to the fullest of its potential.

Fig. 3.3 and 3.4: screenshots from the BBC's Telesoftware service.

In the UK, meanwhile, teletext was increasing in popularity. Despite the fact its display format had not changed since its inception in the mid 1970s, the service had reached over two million homes nationwide by 1984 (*Teletext Then and Now timeline*).

The BBC also released software allowing teletext programs to be downloaded to the BBC Micro home computer. This was received by those systems with an appropriate adaptor and typically consisted of specially produced educational software and games. It was navigated via a Ceefax-style system of menus containing software reviews and special announcements (*Figs. 3.3 and 3.4*). In 1987, a keyword search function that worked as a primitive search engine was made available as a free piece of software. This was the first time any teletext method had broken from the traditional three-number entry page navigation system and would pave the way for Fastext's colour coded menus in years to come (*Teletext Then and Now*).

Whilst Telesoftware ended in 1990, and both Antiope and Telidon would meet their ends before this time, teletext would continue to run in the same format it first broadcast in 1977, unaffected by the growth of the home PC market.
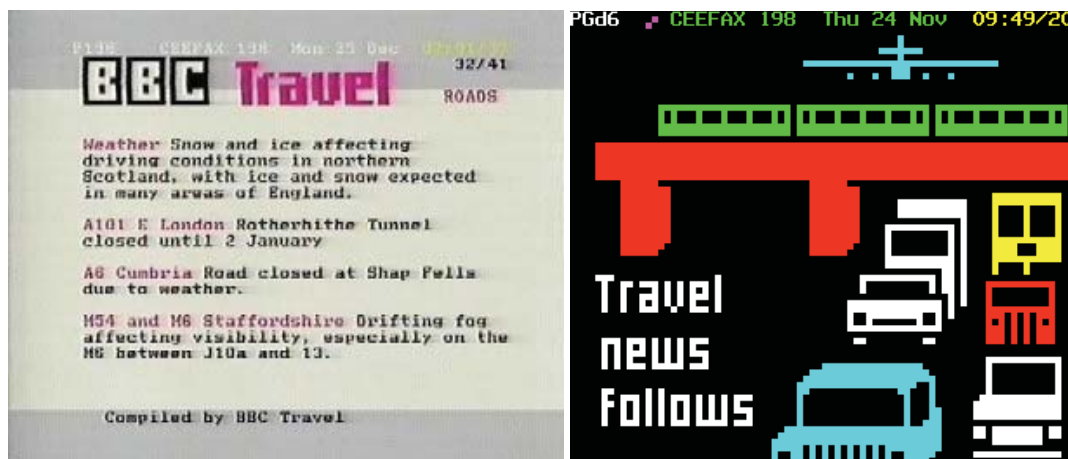
Fig. 4: Screenshots from 'Pages from Ceefax', 1995 and 1983 respectively.

Teletext on TV

Pages from Ceefax was a limited set of rolling teletext pages, often referred to as 'newsreel'. They were available to all television owners, teletext decoder or not, as they were broadcast as part of the television schedule during periods of low audience figures. For this reason, *Pages from Ceefax* was often used to fill breaks in programming through the night. This, it could be said, was teletext's own television programme.

Such rolling teletext services are still broadcast but are becoming less common - in fact the BBC stopped the regular service in the early 2000s in favour of BBC News 24, whilst ITV ended their teletext *Nightscreen* transmissions in 2005. The introduction of 24-hour television news broadcasts has seen a reduction in this service in recent times; channels such as BBC News 24 and ITV News are taking over the role of providing readily available news broadcasts. Their extensive use of on-screen text bulletins and scrolling headlines also perform a similar function to Pages from Ceefax, albeit in an even more to-the-point, quickly accessible format (see *Text on Television* chapter).

Shown in *Fig. 4.1* is a typical screen from the *Pages from Ceefax* service recorded on Christmas Day 1995. Note the cream background compared to the regular black colour of standard broadcasts – this particular broadcast utilises level 2.0, a more advanced version of teletext with slightly improved graphic capabilities. Whilst level 2 teletext was used by the BBC for some of its newsreel screenings, it was never applied to any actual VBI teletext broadcast in the UK.

Fig. 5.1: Screenshots from '4-Tel on View", 1995.

Up until the 2000s, Channel 4's Teletext service offered a similar programme to *Pages from Ceefax*. The screenshot in *Fig. 5.1* is taken from C4's own 'newsreel' rolling teletext service (then *4-Tel*) and depicts a frame from a digitised comic strip story involving a chess game.

In this particular section of the broadcast, regular paper-based frames were replaced by a series of attractively coloured hand generated stills that rotated at regular intervals. These were played through to the soundtrack of some classical piano music giving the broadcast a relaxing, soothing feel, perhaps aiming at the early afternoon television demographic that tends, on average, to be older.

In the examples in *Fig. 5*, there is some use of the graphical character set to create text. As is the standard with teletext, there are only two sizes of the one font available, so creating text with graphic characters is necessary to render larger, more prominent text. This demonstrates a level of creative pixel art not often seen on the network today: in recent times, the Internet has taken priority, with its improved graphics and capacity for higher-resolution photographs making it more suitable for complicated imagery. As far as teletext goes, this was the upper level of graphics the medium could manage.

This was in comparison to the computer video card which was evolving quickly. The screen resolution it could support increased from 640 x 200 and one colour in 1981 to 1024 x 768 and over 65,000 colours by the end of the decade (*Wikipedia*). Teletext remained in its original resolution throughout this time and would prolong the 'blocky' aesthetic of 1970s visual displays well into the 21st century.

Fig. 6.1: "We Command, You Obey"
And Fig. 6.2: "I am Validating my Existence…"
Tom Moody (MacPaint mockup) screens for Dallas Public Access television, 1990.

Teletext humour

Teletext is a characteristically British technology, developed almost entirely by inventors and researchers from the UK. Thus it is rather fitting that the medium is often associated with a very British sense of humour.

As teletext's popularity began to grow, so did its presence in the public conscience - the service could be found in betting shops, airports and hotels countrywide. This growth in eminence was also indicated by an increasing number of television homages and parodies appearing not just in the country of its birth, but worldwide.

By 1990, America was certainly no stranger to teletext. That year, Tom Moody, a self-proclaimed new media/Internet artist, created a series of stings for Dallas Public Access Cable. The screens would provide amusing inserts between programming, carrying such fourth wall-breaking messages as "Why are you watching this when you could be watching sex and violence on the other channel?" Taking the form of teletext and utilising white block capitals on blue screens, these were broadcast "at random times during the day" (*Moody, Eyebeam ReBlog*).

However, controversy arose when the '*We command. You obey…*' insert (*Fig. 6.1*) was mistakenly aired on an African affairs channel, sparking angry complaints from viewers (*Eyebeam*). The screens were, as Moody states himself, meant as humorous anti-authoritarian messages, taking a tongue in cheek view of those in power. However, the very fact that these were broadcast on television – with its capacity to be a mass-market propaganda tool - brought about the opportunity for misinterpretation.

This very premise was mocked in a sketch on Alexei Sayle's *STUFF* program in the late 1980s. A series of teletext pages were shown in a *Pages from Ceefax* style, containing BBC 'propaganda' messages. These suggested that the corporation is "*the most wonderful organisation in the world*" and "*if it were not for the BBC, the world would come to an end*," reported in the style of a typical Ceefax news page (*Fig. 7.1*).

Fig. 7.1: Screenshot from Alexei Sayle's Stuff *Ceefax sketch. c.1987.*
Fig. 7.2: Look Around You *interactive DVD interface.*

More recently, the 2003 DVD release of the popular BBC comedy programme *Look Around You* featured specially written teletext pages and was a fully interactive spoof recreation of a Ceefax service (*Fig. 7.2*). This included running bonus commentaries that took the form of teletext subtitles.

The motivation behind this implementation is partly due to the content of the show itself. The series is a surreal parody of educational schools programmes from the 1970s, a time when teletext was seen to be at the cutting edge of technology. This use of the medium is representative of a period of time and is an extension of the show's humour and situation, which the medium of teletext suits in its capacity as an information broadcasting system originating from the 1970s. There is also a direct link with the BBC's computer literacy project of the 1980s: BBC Microcomputers, which utilised CEPT1, were used as teaching aids in classrooms nationwide.

This homage to teletext represents the nostalgic element of the medium; teletext has been around for so long it has become ingrained in the psyche of society. A staple of the British information culture, it is an instantly recognisable, distinct visual format that has become synonymous with 1970s and 80s innovative technology.
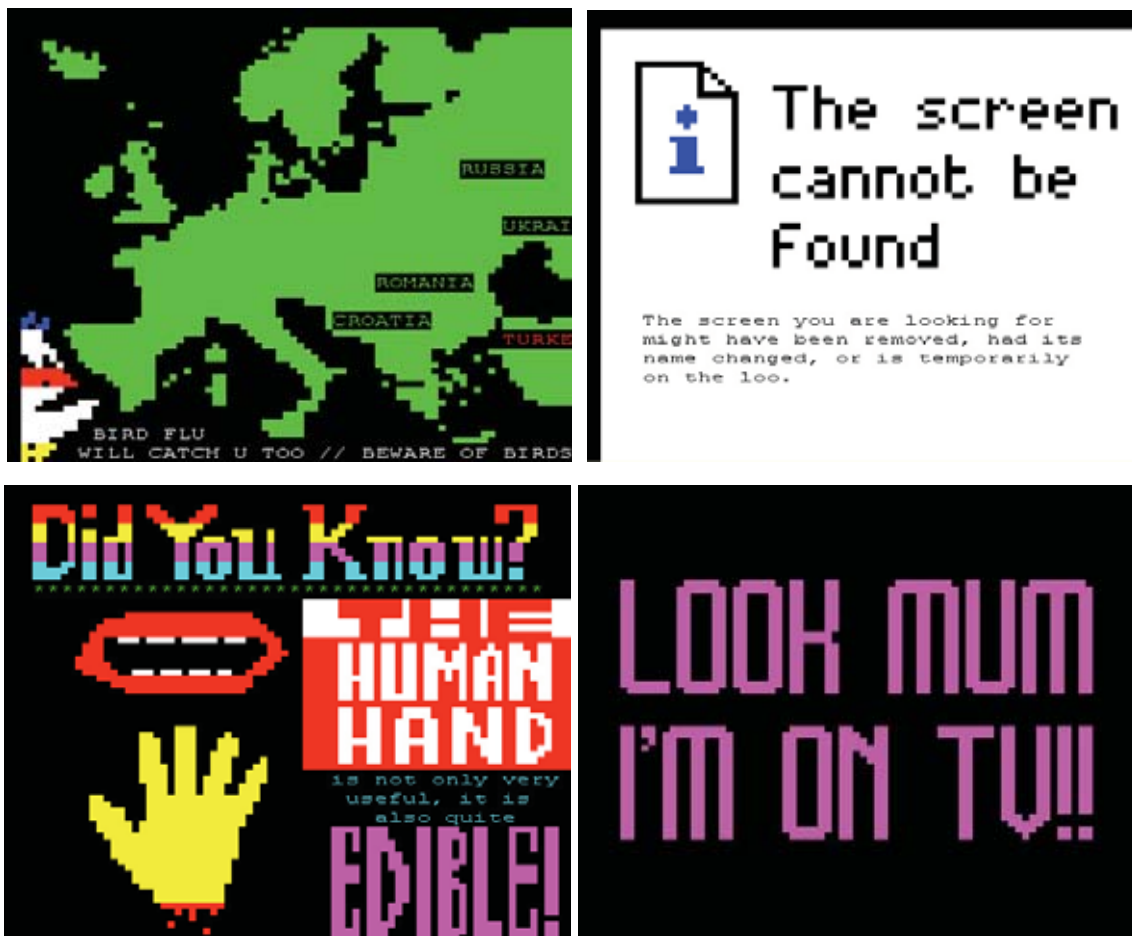
Fig. 7.3: "Bird flu will catch u too", "The Screen Cannot be found", "The human hand is edible" and "Look Mum, I'm on TV!" VBI Microtel submissions.
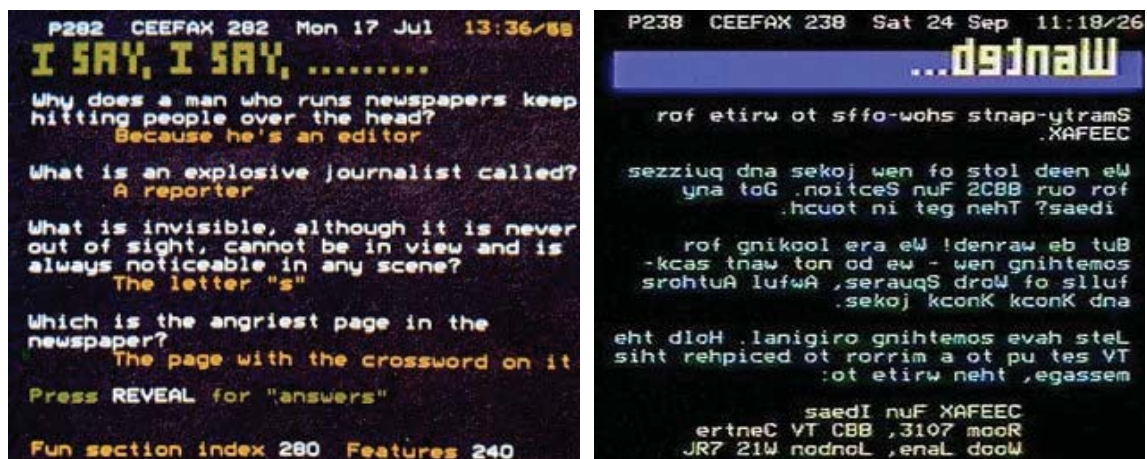

Fig. 7.4: Pages from Ceefax's Fun and Games section, 1978 and 1988 respectively.
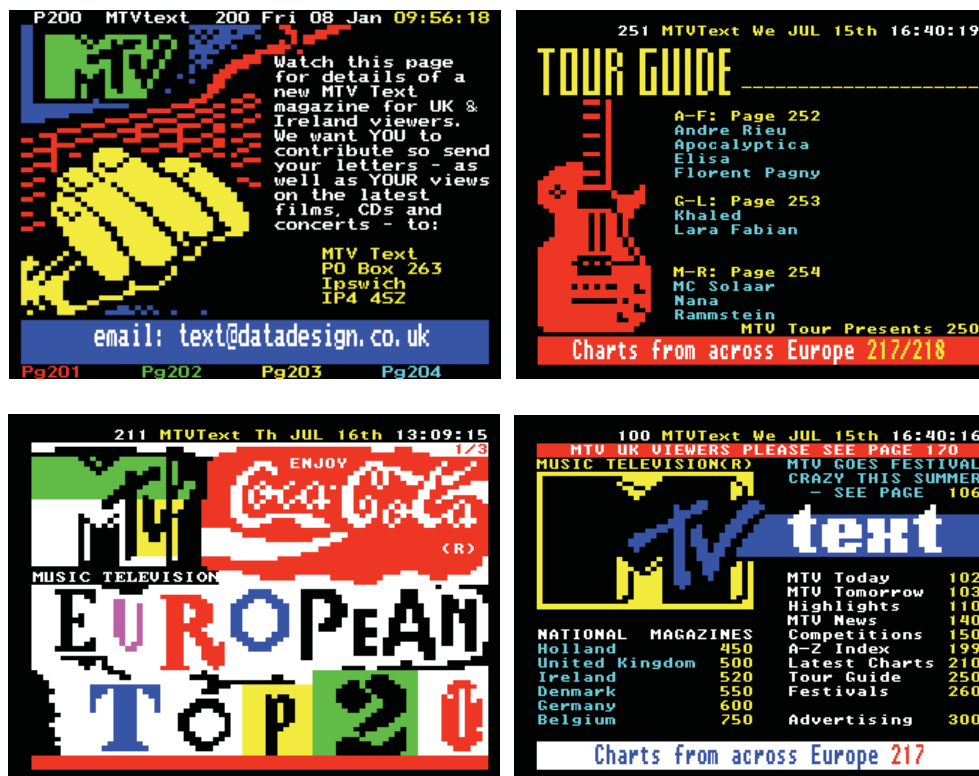
Fig. 8.1: Pages from Data Design's teletext database for MTV, 1999

Commercial teletext

The 1990s saw the introduction of satellite television to British screens. Teletext suddenly became big business, with many new satellite channels desiring their own teletext pages. The market had opened up, allowing channels to express themselves through their teletext systems. Teletext services were no longer confined to just the five terrestrial channels.

Ipswich-based Data Design quickly established themselves as major commercial teletext designers, creating 'teletext databases' for such channels as MTV, National Geographic and CNBC (*Datadesign.co.uk*). The satellite expansion allowed, for the first time in the UK, independent design companies such as Data to experiment with new layouts and designs. The result was a much more colourful, less 'corporate' series of teletext systems than had been previously seen on the terrestrial services. Whilst emphasis remained on conveying information and still had a strong commercial element, teletext was beginning to emerge as an experimental artistic outlet.

This period of renewed interest in teletext design would only last a few years, however. With the introduction of digital teletext and the rise of the Internet, many of the satellite teletext services were updated less and less frequently before eventually being abandoned altogether. 2001 saw the transition complete with BSkyB moving from its analogue satellite to a new digital one capable of broadcasting thousands of channels (*Wikipedia.org*).

Data Design continue to work in teletext design but have now switched focus to digital teletext and Minitext, the text format used on Blackberry portable computers. This is indicative of the current market, in which focus has shifted away from teletext and towards more recent, up to date media.

Commercial teletext art

Fig. 8.2: FansFC.com advertisement, page 603, ITV Teletext.
Fig. 8.3: Fox Kids text.

Fig. 8.4: Teletext Holidays advertisement, page 205, ITV Teletext.
Fig. 8.5: SkyText, traffic information card.

Fig. 8.6: seasonal message, Ceefax.
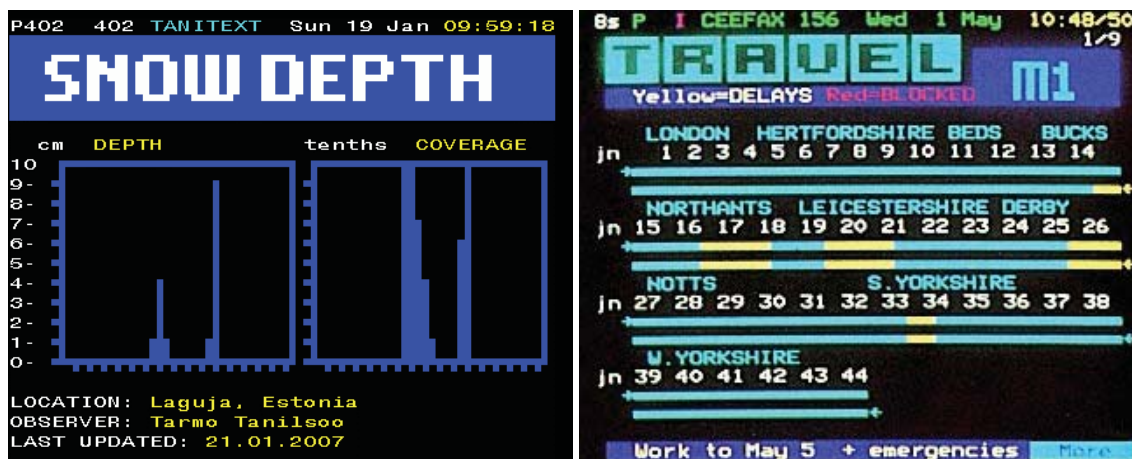*Fig. 8.7: BBC News graphic, Ceefax.*

Fig. 9.1: Tarmo Tanilsoo's meteorological data presentation methods.
Fig. 9.2: Ceefax travel – roadworks diagram. 1985.

Presentation of statistical data

Tarmo Tanilsoo, an Estonian meteorologist, uses a pseudo-teletext format to display his findings and reports on the weather in his home country. He has created a navigable system of teletext pages and embedded them into a web page, effectively transmitting teletext via the Internet. The only elements not in the teletext visual format are the page navigation links, which display one possible method of navigating teletext within the web browser in the absence of a remote control.

Typically teletext services have declined to extensively present data in graph format due to the visual limitations of the medium. Instead, they tend to opt for written presentation methods such as timelines, seen frequently in features such as Ceefax's '*On This Day' (Fig. 9.5)*. *Tanitext* utilises graphs and charts to display the data, breaking from the confines of traditional teletext information presentation formats. There are naturally some problems with this, as the method still retains an experimental quality. However there is scope and precedent for more adventurous use of the teletext aesthetic that was never really experimented with in any great detail on the terrestrial services.

Tanitext is, however, by no means the first teletext service to utilise graphs and charts. Through the 1980s, Ceefax's road travel service included line diagrams with colour coding levels indicating traffic congestion (*Fig. 9.2*). Though basic, this was an effective way of transmitting the data in a visual format as opposed to a text explanation. The charts provided quick reference points and negated the need for the viewer to read through pages of text to find the relevant information.

As part of the BBC's Computer Literacy Project, many graphs and charts were broadcast on both Ceefax and Telesoftware. Shown in *Fig 9.3* are pages from a very early test programme from the latter broadcast in 1982. This was a display of simple shapes demonstrating to students how they might be coded using the software (*Pembers.freeserve*).

However, one chart that has remained with teletext since its test pages of the 1970s and is probably the most well known of all: the weather map.
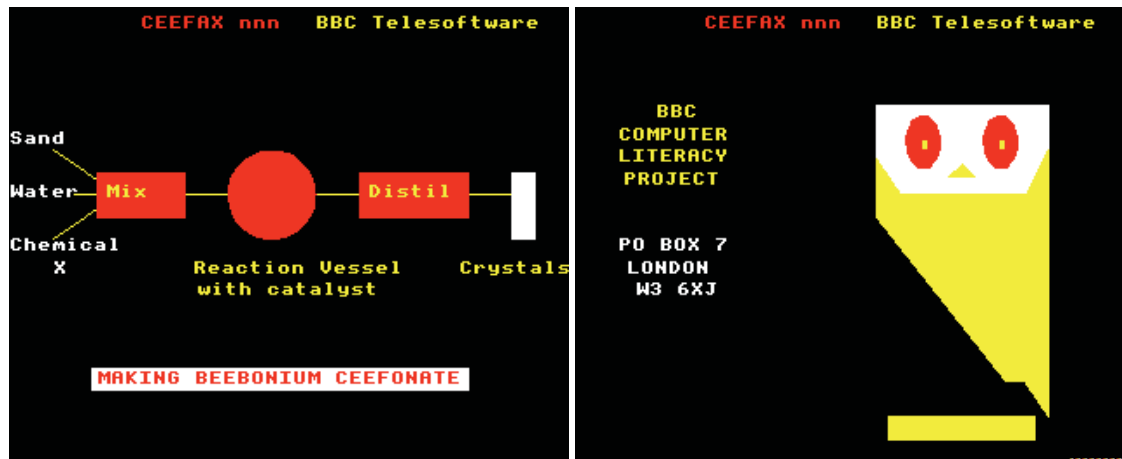
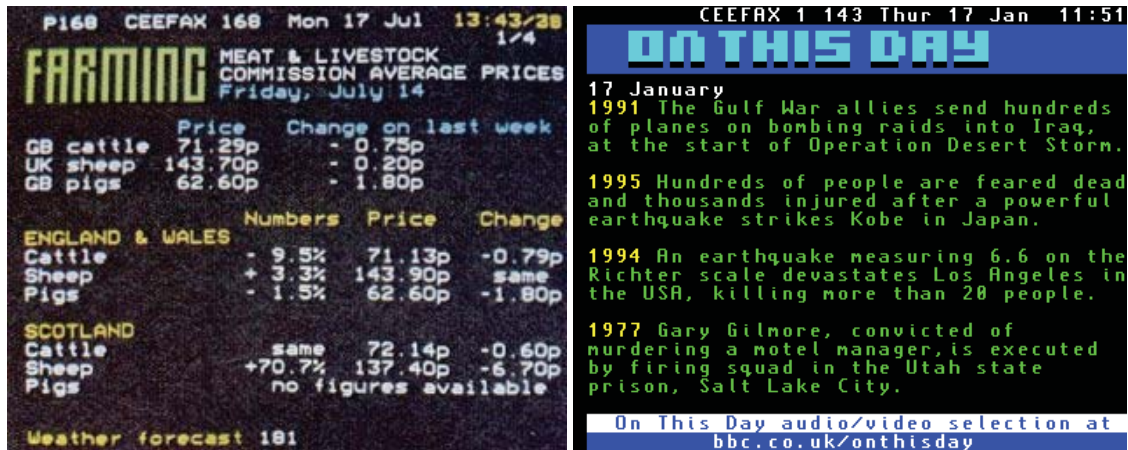*Fig. 9.3: Graphic data programs on Telesoftware.*

Fig. 9.4: a Ceefax page showing farming statistics, 1978.
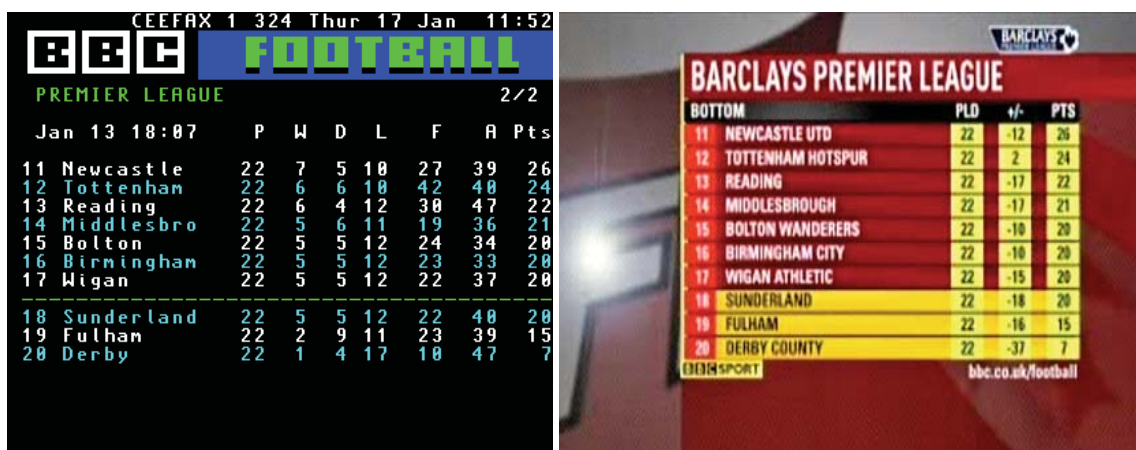*Fig. 9.5: Ceefax: On This Day, 2008.*

Fig. 9.6: Ceefax: Premier League football table (2008) compared to BBC Football Focus equivalent graphic.

Fig. 9.7: Teletext weather map from 2007. Ceefax page 401.

Evolution of the Teletext weather map

Since the very first broadcasts in the early 1970s, teletext weather maps have provided millions with national and regional forecasts. The evolution of these can be traced from the basic, blocky Ceefax test pages right to today's video streamed interactive television forecasts (*Fig. 9.8*).

1970s teletext weather maps are essentially the same designs as those carried by Ceefax today. It is evident, however, that their detail is dramatically improved by the arrival of digital teletext and its satellite photorealism. This quality of image negates the need for distorted or pixellated metaphors that make the map of Britain look squashed or irregular on traditional teletext pages. In some cases, areas of Scotland were cut from the head of the map (g) and parts of Ireland are missing due to lack of space (e). The new digital teletext medium (j) allows space for visual national and regional weather forecasts that more closely resemble televised forecasts, complete with icons and meteorological markings (i).

Essentially, however, both types of metaphor are equally successful in their portrayal of the weather, even if the data provided by the Met Office does not always prove to be wholly accurate.

A more recent development in forecast broadcasting has been in the BBC Multiscreen service (*See also Fig. 16.5*). Available on the digital format, it allows users to view rolling 24-hour video loops of the weather forecast at any time convenient to them (i). These are refreshed hourly as opposed to the twice-daily updates of teletext.

a) 1976 - Ceefax weather test page.

b) 1976 - Oracle national forecast.

c) 1976 - ORACLE test page.

d) 1978 - Ceefax weather.

e) 1985 - Ceefax weather.

f) 1989 - Oracle weather humorous intro card.

g) 1990 - Ceefax.

h) 2002 - Sky Text Weather.

i) 2003 - BBC TV weather broadcast

j) 2002 - Regional weather, BBC interactive.

k) 2004 - Teletext weather digital teletext map - London.

l) 2006 - BBC News 24 Multiscreen weather forecast

Fig 9.8: evolution of the teletext weather map.

Fig. 10.1-10.4: Pong emulated. From left to right; Tennis for the Magnavox Odyssey, Pong's predecessor; Screenshot from arcade Pong; Pong watch game; Pong for Windows PC.

Emulation

Around the time of teletext's invention, arcade video games were introducing the masses to digital technology and its whole new, distinctive interactive and visual experiences. This was the beginning of the commercial digital age and video games arcades were at the centre of it. Whereas the most popular version of teletext has remained largely the same in terms of its aesthetic and format, the video game has gone from upgrade to upgrade, gradually moving out of the arcade and into the home. The 1990s saw increased capabilities of home personal computers for video gaming.

Icons of the arcade era such as Pong, Space Invaders and Pac Man remain popular in today's graphically advanced, realism obsessed video game society. This is due to, and evidenced by, the process of emulation: adapting a game for another format. This has especially been seen in the case of *Pong*, which began as an arcade machine but was later developed for home console use. Today, the game can be played on a PC, mobile phones and watches (*Fig. 10,* above).

Digital artist Cory Arcangel's work centres on the relationship between technology and culture, the video game being a significant representation of this. His work as a contemporary designer consists of early arcade and console video games programs modified and used to create artwork.

Arcangel's 2002 piece *I Shot Andy Warhol* (*Fig. 10.5*) is a version of Nintendo's 1984 arcade shoot-'em-up *Hogan's Run* modified to include images of Andy Warhol, The Pope and Colonel Sanders as targets. The digital text elements of the game are typically arcade in visual style, as are the jagged, pixellated, limited colour palette graphics.

As is the case with working in this medium, a distinctive pixellated aesthetic is imparted upon any work produced. Though the 8-bit format may be slightly more advanced in terms of screen resolution and colour palette than teletext, much like with teletext art, the restriction defines the medium.

Fig. 10.5: Graphical elements of I Shot Andy Warhol*, Cory Arcangel, 2002 as compared to teletext pages (10.6). Though arcade games are slightly more graphically advanced, similarities in medium restriction can be drawn, most notably creation of custom lettering.*
10.6 a) Popemobile*, Michael O' Connor. b)* Space Invaders*, Emma Davis.*

Fig. 11.1: Teletext Mobile, Teletext Ltd's mobile phone teletext service: index page.
Fig. 11.2: Teletext on ITV index page.

Fig. 11.3: Widset *widget allowing the user to browse teletext on their mobile phone.*
Fig. 11.4: Ceefax.tv's teletext search engine. Note the graphical similarity with Google.com.

However it is the use of emulation that allows such work to be created: the game's source is decoded using a computer, or "deconstructed", and the game is reformatted, or "rebuilt from the top down" in much the same way as Carola Unterberger-Probst describes the creation of her *Framed* piece (see '*Life After Death'* Chapter).

This process of emulation has begun to occur with teletext. In 2006, Teletext Inc. launched their Teletext Mobile service that allows subscribers to view teletext pages on their mobile (*Fig. 11.1*). This includes precisely the same content as broadcast teletext pages but the aesthetic is more akin to Teletext Ltd's digital version of teletext.

Widgets such as Widset's teletext viewer allow Ceefax browsing on mobile telephones whilst staying true to the original aesthetic format (*Fig. 11.3)*. Although the content is slightly resized for a mobile phone browser, the page navigation method remains the same. In fact, the page number entry system is suited to the mobile telephone with its numbered button interaction method.

It is via the Internet that teletext emulation has found more widespread popularity. Businessman Hendrik Noorderhaven launched his site *Ceefax.tv*, which allows users to browse Ceefax online, in 2003 (*theregister.co.uk*). The site provides a more accelerated page loading time, a hyperlink interface and a simple text search function (*Fig 11.4*) making for a smoother, more Internet-adapted teletext browsing experience.

The BBC was reportedly "furious" at the presence of the site and endeavoured to have it removed. This drew criticism from many of its users and Noorderhaven claimed that his site "did not break any laws" *(blogs.rnw.nl)*. No legal action was taken over the issue, and Ceefax.tv remains as part of wider project to emulate a number of teletext systems including the Irish Aertel service.

This serves as proof that teletext is still used, particularly by British expatriates abroad, who, since the downgrading of BBC's World Service teletext have had to rely on the Internet for updates of occurrences in the United Kingdom (*theregister.co.uk*). This adaptation of a well-known and familiar format provides an alternative to the vast selection of detailed, often complicated news sites available on the Web.

Sites such as Ceefax.tv are evidence of teletext's evolution. Taking the same television signals and re-adapting them for Internet viewing has allowed the benefits of the web browser to be applied to the traditional method making teletext browsing easier and more user friendly. Emulation brings possibilities for modifications and new applications of mediums such as 8-bit video games and teletext, breathing new life into and renewing interest in what could be seen as ageing formats.

Case study: Super Mario Bros.

Fig. 11.5: Super Mario Brothers recontextualised via emulation.
   a)   Original Super Mario NES game.
   b)   Teletext artwork by Paul Davis (Lektrolab)
   c)   Super Mario 2600: NES ROM hack to recreate Atari aesthetics on PC.
   d)   ASCII Mario: NES ROM hack.
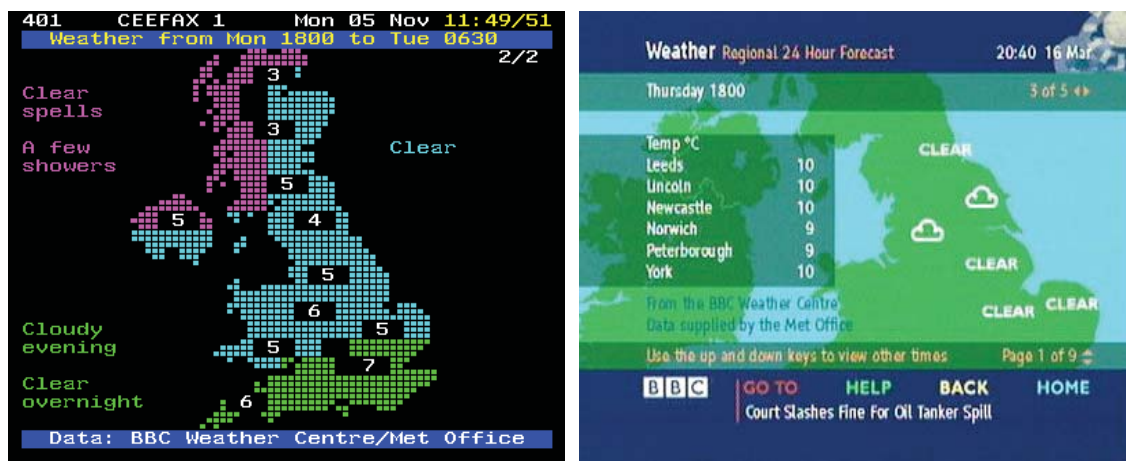
Fig. 12: Comparison of an analogue teletext page (left, 2001) and a digital teletext page (right, 2002)

The 'death' of Teletext

In November 1998, digital terrestrial and satellite television were launched in the UK. It would not be until 2000, however, that the form of teletext they facilitated, known as digital teletext, officially hit UK TV screens. This newer, more advanced version of teletext provided much the same service as the original, only with the capacity to carry high-resolution imagery and improved graphics. Another major difference was the absence of numbered pages, information instead navigated via a series of interactive menus. Later the format would include the ability to integrate television pictures, utilised by the BBC who combined their digital teletext service with coverage from Wimbledon 2000 to provide scores, schedules and news alongside broadcast television images (*Teletext Then and Now: Digital teletext*).

The new, improved graphic capabilities of digital text allowed for a more detailed version of the traditional teletext format. Many devices such as the fastext keys and sub-pages were kept to ease users into the transition but the photographic quality imagery added a new dimension to the teletext service. This is demonstrated in the comparison between an analogue and digital teletext page above (*Fig. 12):* a much greater colour palette has replaced the 8-colour original.

It was at this point, around 2002, that service providers saw the potential of this new evolution of the medium and began to concentrate efforts on digital teletext rather than the traditional analogue format. Many of the satellite analogue teletext services that had launched just a few years previously ceased transmission in favour of funding new 'interactive television' services on the digital system.

Meanwhile, traditional analogue teletext was still being broadcast and a new upgrade to the service had found its way into the European market. 'HiText' incorporated higher resolution graphics and text, with an increased colour palette (*Wikipedia.org*). However, its need for a suitably equipped television and the imminent market saturation of digital technology meant HiText never found widespread popularity; digital teletext was the new information retrieval service of choice.

The 2002 introduction of Freeview, a digital set-top box that enabled owners to receive many digital services for free, made digital teletext more accessible to a UK audience. By this time, a number of the bugs and errors that had prevented interactive TV from being widely adopted up to this point had been fixed. This meant a more user-friendly digital teletext was beginning to usurp analogue teletext's dominance as the UK's primary television information retrieval system.

Fig. 12.3: ITV local teletext services ceased transmission in 2004.
Fig. 12.4: Defunct Granada Text service.

The following years saw an increasing inclination amongst broadcasters towards the implementation of modern digital technology. As a result, a number of local and specialised analogue teletext services were taken off air in favour of online regional news web pages. By 2004, no digital satellite teletext services were any longer being updated (*Wikipedia*).

Despite decimation of page numbers and numerous cutbacks, the traditional analogue teletext service continued to run its core news, lifestyle and television listings services. This was due to public demand; by mid-2005 it was estimated 37% of the UK had still not made the switch from analogue to digital television (*ofcom.org.uk*). Keeping teletext services running was no great inconvenience to organisations such as the BBC, who by this time had streamlined their digital news services so that precisely the same text content would appear on large sections of its Ceefax, online and mobile information services. However smaller channels such as Channel 5 could no longer afford to run their own services, leading to the demise of in-house services like *5 Text (Teletext Then and Now)*.

Life after death

In 2004 it was announced that the UK's analogue television signals would be phased out gradually. The first local transmitter switch offs would occur in 2007 and continue region by region up until early 2013. This will signal the end for the analogue version of the traditional teletext service, along with the distinctive aesthetic outlined in the Broadcast Specification in 1974. The digital teletext service will continue to run and provide all the services analogue teletext once did but the television-broadcast grid of text and simple graphics that kept the nation informed for over 35 years will be all but lost to a UK television audience.

In spite of this, the analogue switchover does not necessarily mean the traditional teletext aesthetic will die out completely. The increase in popularity of the Internet along with the continued transmission of hundreds of teletext services around the world may ensure this visual information retrieval format will not be completely lost for a good few years yet.

Fig. 13.1: Typical Digiworld pages.

From teletext to the Internet

With the Internet and digital teletext set to supersede standard teletext, its pages will become history, lost in time. However, with the popularisation of the Internet and thanks to enthusiasts, certain services once provided by teletext have made the transition online.

Video gaming magazine *Digiworld* is one such cult section. It can be seen as an Internet version of the original 'Digitiser' part of Teletext's service. When the Digitiser service was discontinued in 2003 (*Wikipedia.org*), the Digiworld magazine appeared on the web at *digiworld.tv*. Created and maintained by the same writers as its predecessor, this was 'Digitiser online' in all but name.

It could be argued that the online format is more suited to the collaborative element in magazine services like this – the Internet, with its email technology, is better equipped for communication and cooperation to build such a service. However Digitiser prided itself on being editorial with no user submitted content and this collaborative aspect was never explored to its full potential with *Digiworld*.

The aesthetic, which remains faithful to teletext's limited colour, blocky graphical style is actually part of the Digitiser/Digiworld package - providing its identity - and the emulation of this aspect is necessary. People had become accustomed to the distinctive style and the service would have lost part of its character if this was changed. For this reason the pages are formatted into as close a format to traditional teletext as is possible (*Fig. 13.1*) within the limits of a web browser. This includes a 'quasi-authentic' remote control metaphor that functions in the same way a regular physical one would, even down to reveal and fastext buttons.

The 'experiment', as the editors considered the service, ended after eight issues totalling over 1,800 pages of content (*Digiworld offline FAQs*). The creators went their separate ways, many going on to create their own websites, but Digitiser's brief foray online was consigned to net art history.

Fig. 13.2: Digitiser pages are archived via the web thanks to 'Moleman'. Pages are saved as GIF images navigated using an uncomplicated directory system.

There also exist fan-archived selections of the actual broadcast Digitiser pages. Moleman's site preserves screens of the service via a series of GIF images and a simple directory system. For this particular site, it was deemed to be the most efficient method of navigation, drawing on the principle of function over aesthetic.

Both sites have extensive downloadable archives of past pages, something teletext alone could never physically provide as once a page is updated, the previous data is lost. There exist teletext printers that create a hard copy of a selected page (*D G Jones*) but there has never been an official Ceefax or Teletext archiving system. Pre-Internet, physical archiving would have been the only option and would have required large amounts of storage space for the data. Since the introduction of the BBC website, however, there has been an online selection of archived news stories that correspond to those run on Ceefax but these are limited to what are considered the most important.

This idea of archiving pages shown on an official teletext service has been employed by the website *Teletext Then and Now* to demonstrate the functions and the aesthetics of a particular station's service at a point in time.
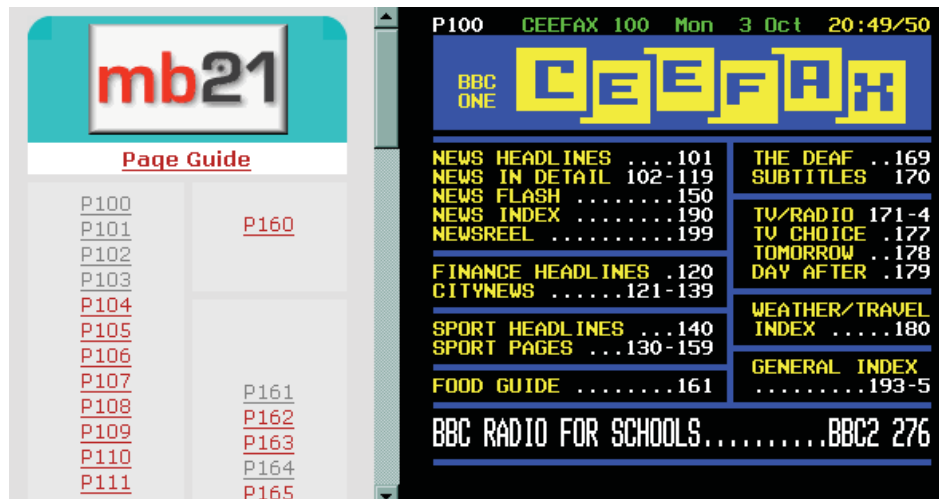
Fig. 13.3: An Evening with Ceefax, 1981.

A snapshot in time

An Evening with Ceefax is a set of broadcast Teletext pages from 1981 tapping into culture's seemingly constant desire to revisit the past. Captured using a BBC Micro, these were saved on a cassette for posterity by Mark Cook.

Reformatting the pages for the Internet provides a remarkable contrast. There is a stark aesthetic difference between formatting for a modern digital medium; the web browser (demonstrated in the 'page guide' navigation section, *Fig. 13.3*) and design for teletext; a much more visually limited but equally, if not more, unique in its aesthetic. This bringing together of the modern and the old-fashioned remains faithful to the original Ceefax page structure whilst incorporating digital archiving methods.

The Digitiser sites and *An Evening with Ceefax* are examples of the online transition of services once provided by teletext. Thanks to fans, the legacy of teletext, or at least parts of it, will live on after the analogue switch off. The existence of such Internet pages proves there is still at least some continued interest in teletext. This ought to ensure the medium will be put to some use after the analogue switch off, even if it is in a less professional, almost home-made fashion.
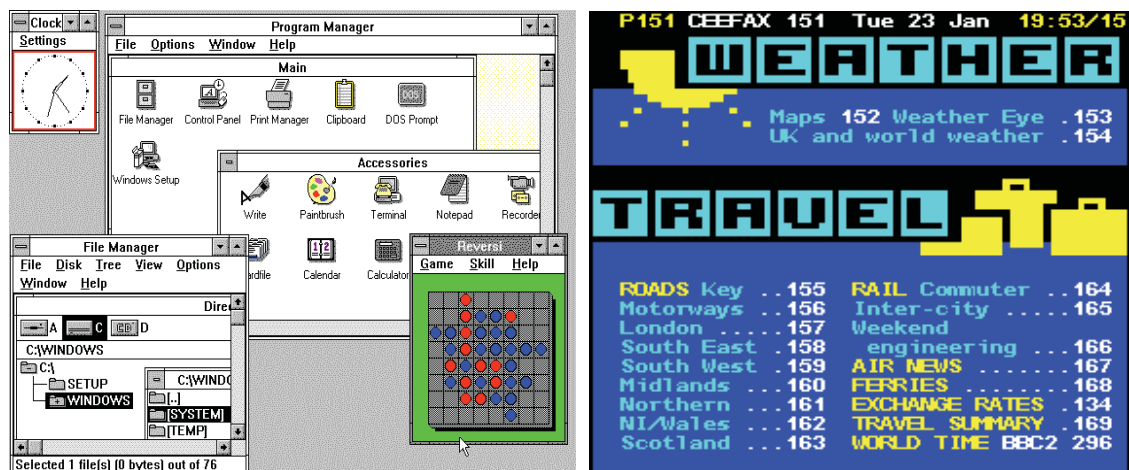
Fig. 13.4: Graphical User Interface from a Windows 3.0 system, 1990, compared to a teletext page (Ceefax pg. 151) from the same year. Note Windows 3.0's greater capacity for detail.

Function over aesthetic

In the early days of the Internet, web pages were similar to teletext in their text-heavy presentation of information. Computer graphics cards of the early 1990s could support more advanced displays than teletext – their colour palettes and monitor resolutions were superior – but were still limited in terms of memory. More out of restriction than decision, the information being presented took a priority over elaborate visuals (*Toastytech*).

Vuk Cosic, the originator of the term *net art*, founded the Internet ensemble Jodi in the late 1980s (Green, 2004). Their work, a product of the aforementioned 'function over aesthetic' principle, is an homage to low resolution media such as teletext in the aesthetics it often adopts.

Although produced at a relatively advanced stage in the web browser's graphical capability, Jodi's *Teletext* (2002, *Fig. 14*) is a prime example of this use of text characters. The piece draws on the teletext aesthetic, reformatting it for the Internet browser by adding web-specific characteristics such as hyperlinking (to an almost extreme extent) and the presence of more than one teletext 'grid' per page introducing scrollable content.

As the piece's accompanying text stated when the piece was exhibited at the Berlin Kulturforum: "[*Teletext*] adheres to Jodi's familiar aesthetics of break [and] irritation" *(p0es1s.net)*. The piece takes inspiration from a scrambled teletext reception and plays on the medium's tendency to constantly glitch. It is an entertainment experience rather than an educational one; 400 images in GIF format are taken and organised into a teletext-like (each page is assigned a three-digit number), non-linear linking system, navigated by selecting various elements of the pages. The piece serves no real practical function, setting out to amuse, frustrate and confuse the user.
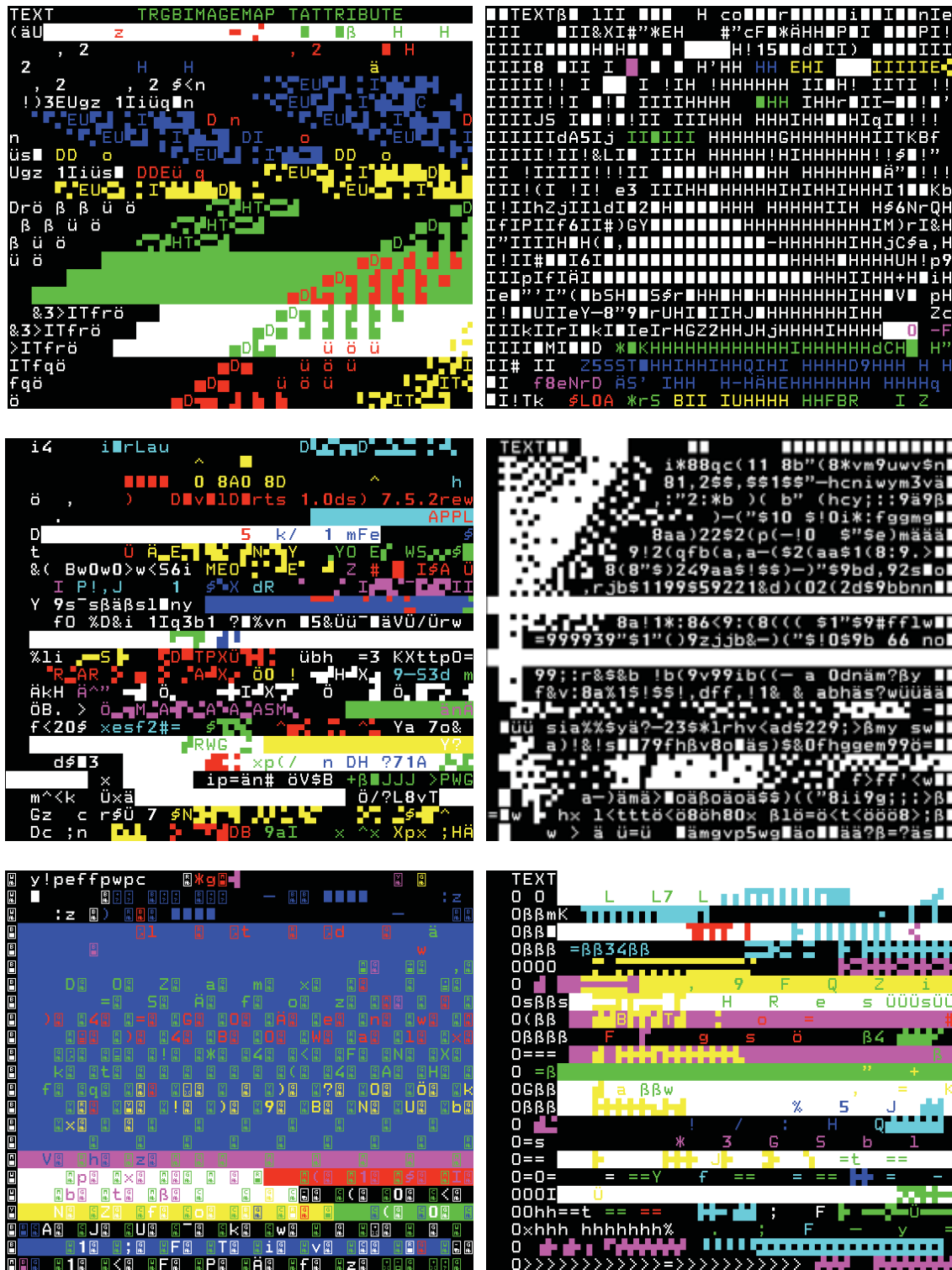
Fig. 14: Jodi: Text (2002). Teletext glitch art formatted for the web browser.

Fig. 15.1: Comparison of initial version of the ASCII character set (left) and the equivalent teletext set (right).

ASCII art

To a community of early Internet users, restrictions on the amount of data that could be sent over a basic telephone line meant web pages were limited to text characters and very few, if any, images. Thus, creating imagery using fixed width character sets became standard practice in the early to mid-1990s. This gave rise to ASCII art, another facet of the 'function over aesthetic' principle.

Due to developments in computing technology, the need for a standardised computer character set arose in the early 1960s. The first draft of the ASCII (American Standard Code for Information Interchange) codeset was defined in 1963 and introduced a number of new characters specifically for computer usage. IBM employee Robert Bemer (often referred to as the 'Father of ASCII') submitted many of these, including the square bracket ([ ]) and the backslash (\) (symbols not included in the teletext codeset). Though required for various computing tasks, these were not only used for coding; they would become integral parts of the ASCII 'palette' of 95 printable characters, increasing the opportunity for creative manipulation of text (*asciiset.com*).

Fig. 15.2: Jodi: wwwwwwwww.jodi.org (1995). ASCII art as a natural progression of teletext. Left: appearance in browser. Right: excerpts from the HTML source code.

The backslash, square bracket symbols and indeed the whole ASCII palette were put to use in Jodi's 1995 work *wwwwwwwww.jodi.org*. Operating on the idea of glitch art, the piece retains the lo-tech quality of the teletext aesthetic. This includes text-heavy content whilst not strictly using any text characters; at first glance, the piece is just a blinking array of strange symbols, but an analysis of the page's source code reveals detailed ASCII diagrams of "hydrogen and uranium bombs" (Green, 2004). In this case, implementation of variable-width character sets means the ASCII 'code' can only be 'deciphered' by viewing the text in fixed width font mode.

Aside from Jodi's unsubtle web pages, ASCII art was spread via e-mail, bulletin boards and other online activities, such as in MUDs (Multi User Dungeons). However the mid 90s saw an increase in popularity of web browsing with variable width fonts, leading to a decline in the once widespread use of ASCII art *(Wikipedia.org)*.

According to Nathan Krevolin, "Microsoft declared ASCII art "dead" in June of 1998" *(Krevolin, 1962)*. This was not any indication of the popularity of ASCII art, but more of a catchphrase attempting to promote the use of Microsoft's software, which was now sufficiently advanced to transmit more detailed imagery in the form of GIF and JPEG graphic formats.

Much like teletext and its transition to the digital format, the world of net art has moved on and found new uses for mediums. It has transpired that although ASCII art as the primary medium of artistic expression via the web has declined, it still exists as a functional device in the form of emoticons. This method of conveying emotion via ASCII characters has been given a newfound lease of life with the social networking 'boom' of the mid-2000s. This in turn has given rise to one-line ASCII art, a 'miniaturised' version of regular art that often relies heavily on use of the extended character palette (Danet, 2001).

Fig. 15.3: 'Newskool' ASCII 'tweaks' its graphical style with its use of the extended character set.
Fig. 15.4: ASCII art was popularised by, amongst other things, Multi User Dungeons.

ASCII art, it could be said, has outgrown its original medium. Technology has advanced such that the ASCII aesthetic, originally born out of severe restriction, has become more advanced. 'Newskool' ASCII art represented a renewed interest in the format. Arising in the late 1990s, it harked back to early text character based art with its blocky style and limited colour palettes. Due to developments in computer technology, this form of ASCII art continued to evolve with the introduction of extended proprietary characters. Whilst the standard 7-bit characters were still used more predominantly, the new ones introduced a greater range of options for ASCII artists. This range was further expanded with the widespread adaptation of the Unicode character set, still constantly being modified to add yet more characters to the set.

This is opposed to the basic teletext character set which has stayed the same since the medium's inception in the 1970s (*Fig. 15.1*). It has remained predominantly text based, reflecting the continued reliance upon words as the primary information communication method utilised by teletext. Although it contains the same number of printable characters, the teletext character set is a slightly modified version of the ASCII set, utilising a selection of teletext-specific characters such as fraction and division (÷) symbols.
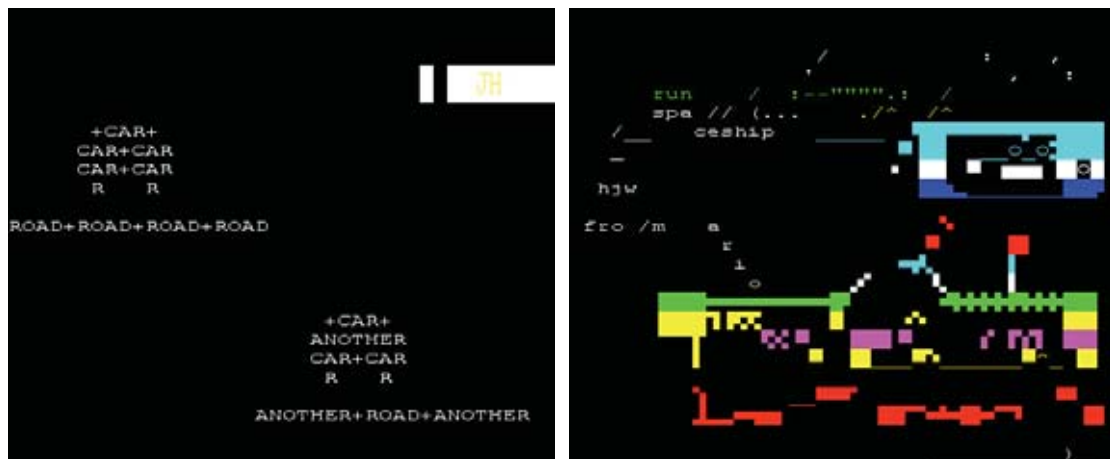
Fig. 15.5: ASCII art in teletext. Submissions from the Lektrolab VBI Microtel project.

Fig. 15.6: Computer designed ASCII art.

Fig. 15.7: Vuk Cosic: ASCII History of Moving Images. 'Star Trek', amongst other things, is represented through ASCII film.

Fig. 16: 24 hour news channels such as BBC News 24 (left) and Sky Sports News (right) have largely taken over teletext's role as the most popular 'go-to' news broadcasting service.

In-vision

The coexistence with relatively recent technologies such as detailed image formats and video streaming has occurred to some extent with teletext. Despite numerous updates and upgrades to the medium throughout the world, the UK's teletext service has remained relatively unchanged from its inception in the 1970s, unaffected by numerous advances in the technology. In 1990, even France's more visually enhanced Antiope was shelved in favour of a system with a more traditional aesthetic (*Wikipedia.org: Antiope*).

Though seen as technically and visually 'inferior', teletext still serves a purpose, albeit a more specialised one with the arrival of the web browser. This is reflected in the introduction of digital television with its increasing specialisation of services: those once confined to a few pages within one teletext system now have their own television channels, and along with them whole new interactive experiences.

BBC News 24 was launched in 1997, right at the arrival of digital television in the UK market. Its use of text was relatively minimal up until 2003 when an American-style scrolling news bar was introduced, displaying the latest headlines and breaking news stories alongside the regular newsroom images. In 2006, this would become more prevalent (*Fig. 16.1*). It appeared at the foot of the screen in the same way in-vision bulletins appear on particular pages of Ceefax (*Fig. 16.3*), the only difference being the user had no interaction with the on-screen text.

Similarly, Sky Sports News (*Fig. 16.2*) is Sky's 24-hour sports news service and provides permanent rolling text services alongside constantly repeated and updated sports bulletins and reports.

BBC News's *Multiscreen* (*Fig. 16.5*) service takes this idea one step further, introducing multimedia technology by presenting multiple screens from which the user can select a video stream. These are repeated on a loop providing video, rather than text, versions of the news.

These round the clock rolling services can be seen as up-to-date versions of Ceefax's in-vision headline service and indeed the whole of its news and sport services. The stories are articulated in as few succinct words as possible, ideal for a quick digestion of the most important news of the day. They are new 'go-to' services for the digital information age and can be seen as replacing the function teletext once had.

*Fig. 16.3: Comparison of Ceefax in-vision service (left)
and BBC News 24 rolling bulletin bar (right).*

*Fig. 16.4: BBCi (left) allows in-vision interactive teletext browsing
in a similar fashion to teletext's in-vision function (right).*

Fig. 16.5: BBC Multiscreen

Stills from VBI Microtel project: Fig. 17: Phillip Linde: Google.
Fig. 18: Paul B Davis: Bin Laden.

Teletext in contemporary European Art

Teletext remains popular in Europe, where it is more extensively utilised than in the UK due to the fact Internet access has yet to become widely available. The medium is still employed by some as an outlet for art.

Lektrolab, a Dutch media arts company, launched their VBI Microtel project in 2006. Broadcast on Holland's national teletext (NOS Teletekst) for almost two weeks, it consisted of work created by Lektrolab members Emma Davidson and Paul B. Davis but also of user submissions.

The project added a new aspect of collaboration to the teletext medium, marrying contemporary computer software with traditional teletext aesthetics. This worked on the principle of a moderated user-created bank of content – potential artists would create their own teletext pieces using a specially made editor, downloadable from Lektrolab's website. From this software, artwork could be submitted directly to Davidson and Davis, who selected the best work to be broadcast on the television station.

The format is a series of 'slide shows' of teletext artworks ranging from advertisements and pixellated typography to pop icons. Philip Linde's *Google* entry (*Fig. 17*) takes a well known, instantly recognisable website and suggests what it might look like were it a teletext page. This reversal of technology is a theoretical view of what the Internet might resemble today had the Viewdata system, rather than the web browser, taken off.

Other submissions such as Paul B. Davis's teletext rendering of Osama Bin Laden (*Fig. 18*) use the low resolution, jagged edged, distinct outline to portray modern pop culture icons in a format they are unlikely to have been previously. Teletext's restricted, striking, primary colour based palette lends itself to psychedelic Warhol-esque work from the pop art era.

Carola Unterberger-Probst is an Austrian new media artist. Her 2006 piece *Framed* is split into two parts; the first is a series consisting of teletext pixel art placed alongside text keywords and presented as screenshots; the second part is more information based and can be navigated teletext-style using a web browser. The 'framed art' section (*Fig. 19*) reveals an amalgam of scrambled teletext characters resembling Jodi's *Teletext* piece and provides access to the keyword screenshots.

"Framed is a teletext artwork and rediscovers something that is being torn apart from the top down" (Unterberger-Probst, servus.at/cup).

This element of 'rediscovery' provides a new perspective on an otherwise outdated medium. Reformatting and recontextualising the teletext aesthetic for the web browser, *Framed* introduces the concept of 'teletext glitch art' - a graphics-orientated 'experience' that breaks from the traditional text-heavy standard whilst retaining the primary focus of the teletext format; that is, conveying information.

The fact that artists such as Lektrolab and Unterberger-Probst still allude to teletext aesthetics in their projects is evidence that teletext art is in fact a well embraced medium in countries such as Austria and Holland.

The sheer volume of user submissions for the VBI Microtel project alone shows that the medium is still in European society's collective conscience, even if the aesthetic's original broadcast outlet is on the verge of extinction in the United Kingdom.
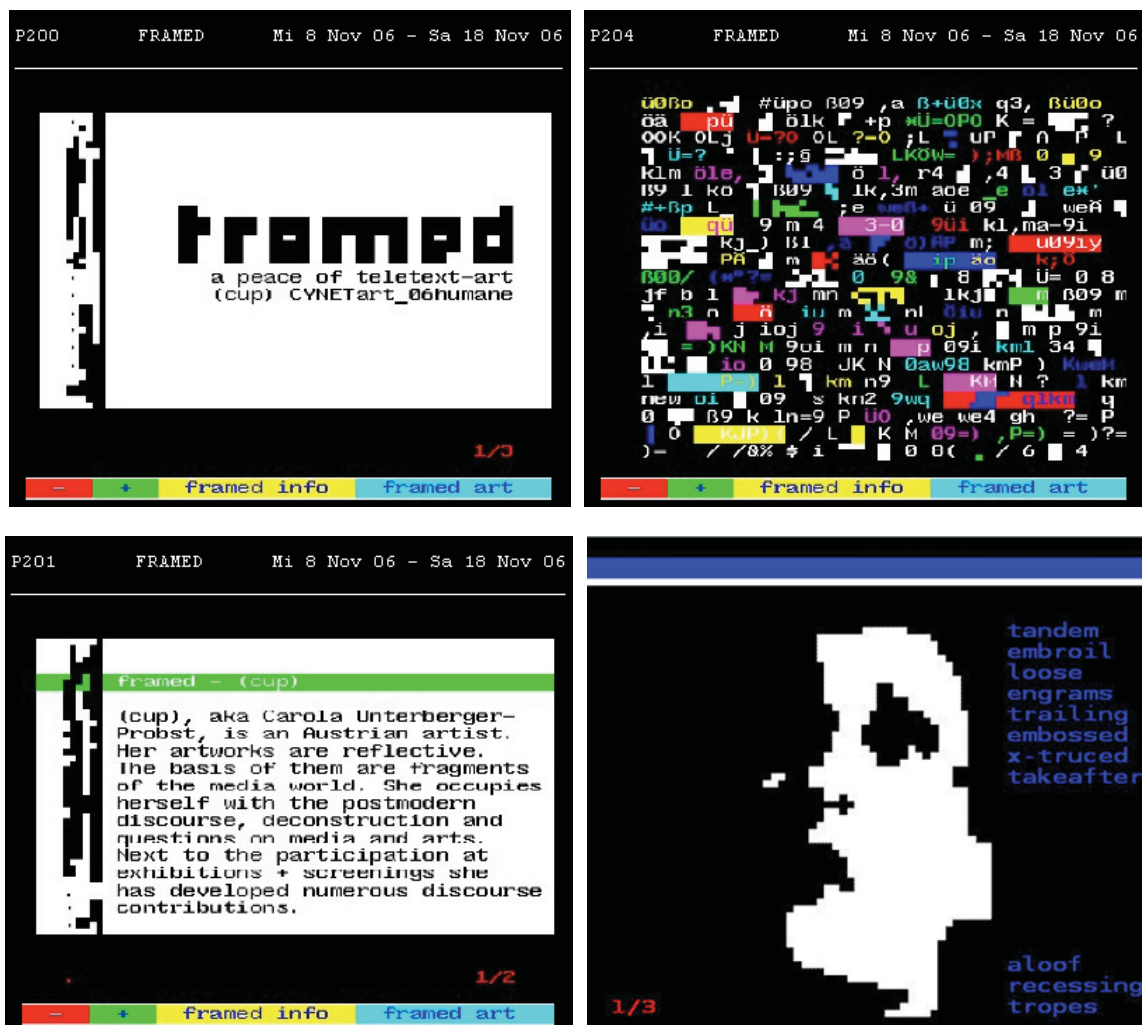

Fig. 19: Screenshots from Unterberger-Probst's Framed.
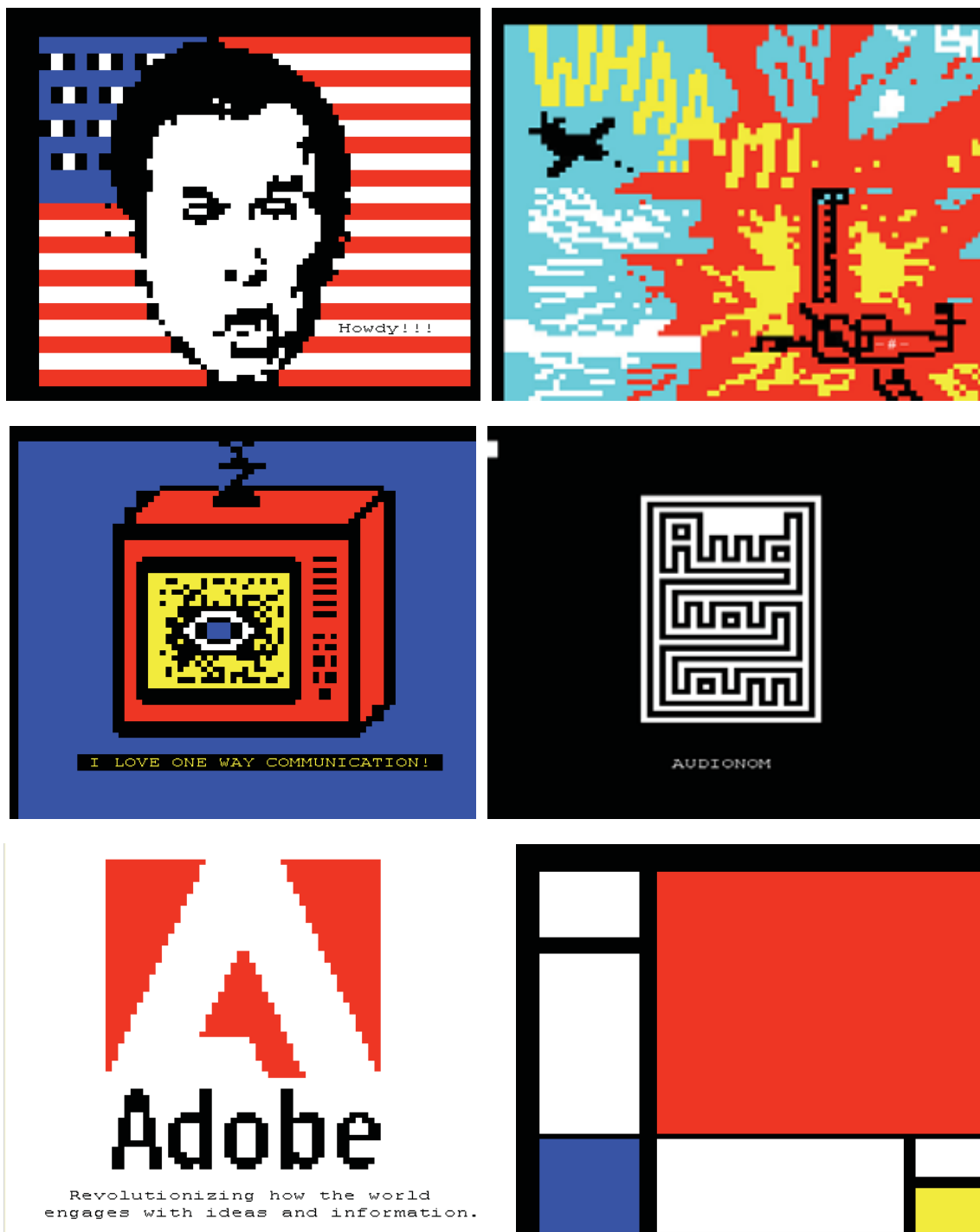
VBI Microtel

Fig. 19.2-7: submissions for the VBI Microtel Project (2006), which allowed for the Dutch public's teletext artworks to be displayed. Content varied from representations of icons and celebrities to original artwork.

The contemporary teletext?

Teletext's technology can now be seen as outdated, indicated by falling usage levels. Whereas the analogue service was once reaching over 22.5 million viewers a week (Weitzel, 1999), this figure has long been on the decline, with the weekly average dropping to 13.7 million in 2007 (*Ofcom*). Today's levels of Internet access mean the web has become the more popular source of information.

Wikipedia

Wikipedia is, like teletext, an information retrieval service. Launched in 2001 at the height of the second 'Internet boom' as an online encyclopaedia, it was unique in that it invited and encouraged the readers of the site themselves to contribute to building the knowledge database. This is in contrast to teletext, which is programmed entirely by an exclusive specially employed team. Even though the mediums are separated by 35 years of technology, the starting points of both systems can be traced back to a point where the creators set out to produce a publicly accessible service to provide a convenient service for the masses. Both would prove to be pioneering in their concept and use of technology, providing a fresh angle on information transmission and retrieval systems.

Comparisons between teletext and the *Simple English version of Wikipedia* (simple.wikipedia.org) can be drawn in their endeavour to articulate textual information in as succinct a manner as is feasible. The tabloid newspaper could be placed in a similar category, with its limited vocabulary aiming to reach as large a reader base as possible. Services such as Newsround, BBC's online news resource for children (parts of which are also broadcast on Ceefax, *Fig. 20.2*) utilise a simplified vocabulary to match the language skills of the reader base.

Fig. 20.1: the Simple English Wikipedia is primarily used by those learning English.
Fig. 20.2: Newsround – BBC's news service for children.
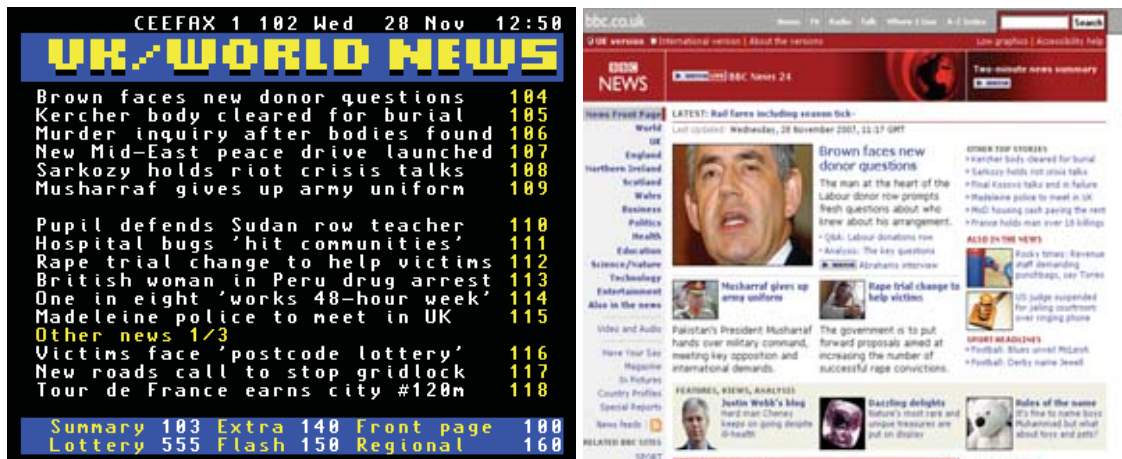*Vocabulary used is narrower than standard news pages (see fig. 21.2).*

Fig. 21: BBC News. Left: Ceefax headlines. Right: BBC News website.

BBC News

Wikipedia, however, is a different type of information system, acting more as a knowledge database rather than a static news service. Perhaps a more relevant comparison is the BBC's current news website.

Visually, despite the obvious differences due to technical constraints, there is dissimilarity in the colour schemes. The BBCi interactive service (which encompassed interactive TV and the news website) was launched with a white/black on dark red colour scheme to match that of BBC News 24. It was decided not to apply this to its teletext service. Instead, Ceefax retained the traditional yellow/green on blue titles, keeping a certain amount of separation between it and the newer digital broadcast services. This could be down to legibility on a limited 8-colour palette. However, perhaps it is an indication of teletext's position as a dying medium: it would not be worth revamping the visuals for the service as it is in the process of being phased out.

Fig. 22: Ceefax Videprinter (left) and the BBC News website equivalent (right).

Fig. 23: Welsh channel S4C's bilingual teletext service.
Left: Page in Welsh.
Right: The English version of the same page is contained in a separate subpage.

In terms of content, there is little difference between the two services. Especially in the sports scores and results section there is a great deal of shared content as the same data is used for both mediums. Only the format, for which the information has to be configured to suit, differs. This applies also to update intervals – both are refreshed at the same time and there is a congruency between them as a result.

Not all content is shared, however. Some sections are written and created specially for Ceefax, whilst others are exclusive to the website. *Dear Ceefax* is a teletext-only service to which users can send their views on major news stories of the day. The BBC News site's equivalent is a bit more extensive, but essentially has a separate set of comments in its *'Have Your Say'* section.

In addition, the BBC News website has the facility to change languages, for example there is a special Welsh language news section. This is something not present on the Ceefax service where, although there is a local news section for those living in Wales, the whole of the service is in English. There does exist a Welsh language teletext service in the form of SBECTEL. However this is not run by the BBC, rather S4C, a Welsh language terrestrial television channel.

One thing remains the same in both the website and the teletext BBC News services: the emphasis on information. This is reflected in the front page designs of both services: as much information as is possible is fitted onto each, resulting in a congested, busy feel. In teletext's case, this is eased slightly by an 'other news' section which makes use of teletext's subpage function, enabling it to broadcast nine stories in the space of three (see *Fig. 21.1*).

The Ceefax service can be seen as providing a watered down, less detailed information service than the website and is an easily and readily accessible, cheap service if no Internet access is available.
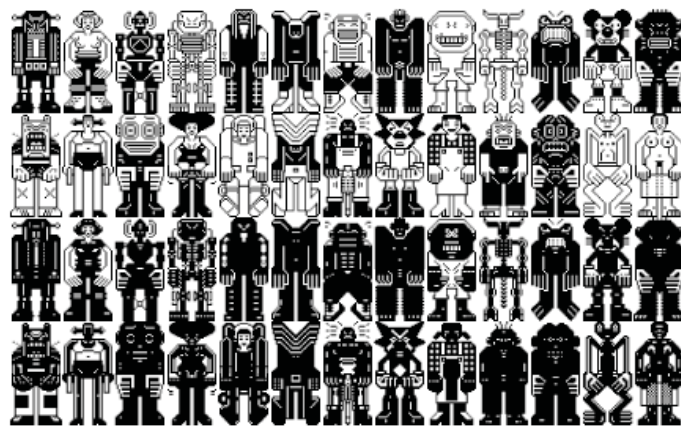
Fig. 24.1: Eboy's Peecol character set. The restriction applied to the typeface design is akin to that used in teletext page design.

Teletext and typography

One relatively recent example of design that can be compared to the aesthetic of teletext art is Eboy's Peecol font. It is a character symbol set that could be seen as modernised version of teletext design modified and customised for the web format. The 'Play' variation of the typeface (*Fig. 24.1*) takes the idea of pixel-by-pixel design on a small, monotone canvas provided by a typeset. Letters correspond to a 'body part', either upper or lower half, and can be combined in any way permissible by the character set to form whole 'characters'. In particular, these can be likened to pixellated video game characters in their minimal, restricted approach, which in themselves are shrunk 'teletext art' pieces.

Peecol is a good demonstration of Eboy's working style, which generally centres on the concept of low-resolution art formatted using a grid system. This method applies a similar form of restriction to the teletext format; due to their size, the Peecol characters are obviously pixellated with the limited canvas size, giving them a quality that Eboy have made their own.

This allusion to the past, a reversion to old, almost obsolete styles is an homage to the distinctive style born out of limitation in the early days of digital design. Eboy take this limitation and apply it to technology and issues more relevant in a 21st century society, bringing pixel art to a whole new audience.

The concept of applying text-broadcast information to a new format was Microsoft's intention when designing typefaces for their computer systems. There is a selection of fonts built for viewing text - especially teletext - a series of truetype fixed width character sets. These are named *wst_engl, wst_ital, wst_germ* etc. to reflect the character sets of different languages. The font face is used in many computer teletext emulators and homages to teletext and can be seen as the typeface most alike to that used on standard teletext due to the presence of a 'double height' mode.

This font is, however, only relevant to Windows operating systems: it does not exist on the equivalent Macintosh systems. Due to this, the use of fixed width fonts more suited to compatibility and readability, such as Courier, on a variety of formats is more common. In a similar manner, due to differences in decoding the data, the fonts displayed by teletext differ slightly from television to television. This highlights a slight difference between the teletext and computer formats: teletext was standardised to one type, whereas there exist many computer fonts, web browsers and operating systems.

Fig. 24.2: Data Design's Java viewer for their Racing UK teletext service allows users of their website to experience it without having access to an analogue television.

Conclusion: Is teletext dead?

In today's world of ultra fast broadband Internet connections and the vast array of web browsers and news sites, it may be argued that teletext no longer has any relevance. However, the recent introduction of online teletext browsers proves that teletext can still provide a useful service to a post-70s audience. In fact, the forthcoming analogue switch off has resulted in a renewed awareness and interest in the medium, leading to increased online emulation of and experimentation with the format.

Despite the fact traditional UK analogue teletext is set for a 2012 switch off with many countries worldwide to follow, the medium will still be broadcast into homes via newer, more advanced forms of the medium. Digital teletext and interactive television will pick up where the analogue version left off, providing a more up-to-date graphical interface for the information age. Greater bandwidth facilitated by newer digital systems allows live video streaming and greater opportunity for interaction at a lower broadcast cost than ever.

Function-wise, although the two mediums share many qualities consistent across digital information broadcast media, teletext is not a predecessor of the Internet; it is a separately evolved medium. Whilst primitive computer networks were beginning to be applied in the United States, teletext was developed almost wholly in the UK, totally independent from the developments in the US. The two never really converged until the advent of the web browser in the 1990s which allowed broadcasting of teletext pages worldwide via the Internet.

Now, with over 500 teletext systems broadcasting online, even the traditional, blocky pixel aesthetic is set to live on in a whole new medium thanks to the Internet. Emulation of 'retro' video games via computer technology has ensured a whole new audience shares the popularity of early arcade video games. There is no reason why teletext should not go the same way; the medium is still very much in the public's conscience even if its use in a modern online society is questionable, evidenced by its status as something of a pop culture icon amongst artists and writers.

The popularity of the CEPT-1 format in the 1970s and 1980 has given rise to a teletext fan base. The existence of retro enthusiasts alluding to and implementing teletext in their work will also means there will still be a market for the lo-fi aesthetic in an ever-advancing technological society.

Teletext is not disappearing, it is simply adapting for a new generation. It seems that, much like ASCII art and arcade video games before it, teletext is not dying out, merely evolving.

Appendix

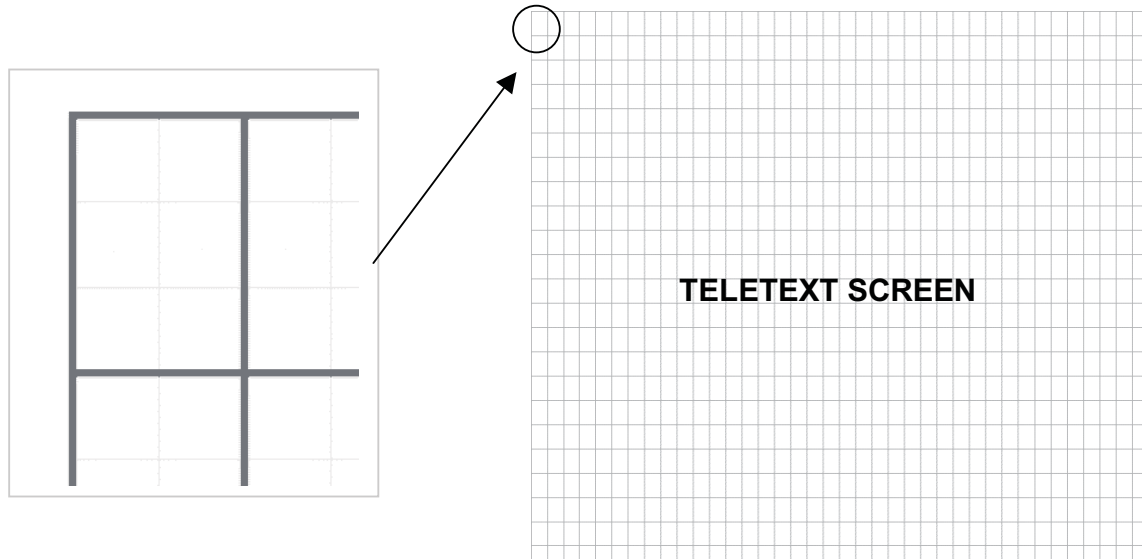## Teletext (CEPT1) Specification

Visual

Fig. 25: basic teletext grid: 40 x 24 blocks. Each block is split into six pixels in a portrait shape.

Fig. 26: Teletext's 8-colour palette.

A teletext page is broken down to a grid of **blocks** (or 'character rectangles') 24 high by 40 wide. Each block is made up of six '**pixels'** in a portrait arrangement (see *Fig. 25*), making for a total grid of 80 by 72 'pixels'. Each block can contain a single letter, space, symbol or up to six pixels of information.

The teletext colour palette is made up of eight colours: red, yellow, green, blue, purple, cyan, white and black (*Fig. 26*). There are no half tones or transparencies, just solid areas of the basic eight colours. Teletext does, however, have the capability to alter background colours (*Lektrolab Mac characters guide*).

Text

Fig. 27: the UK character teletext set as displayed by Paramount Comedy Text.

Teletext data is transmitted via packets, which contain data in binary format. Packet numbers 0-31 contain navigation and page data whilst 32-127 contain alphanumeric characters (*Weitzel, 1999*). These total 96, including:

- Upper and lower case letters
- Punctuation marks (including space character) and numbers
- A selection of symbols including fraction characters such as ¼ and ¾ .

In addition to these, packet 26 contains information regarding extra symbols and diacritical marks. This allows for the transmission of such characters as the acute accent (`) (*Teletext Specification*).

Graphics

As well as the alphanumeric character set, there are two graphic sets to communicate elementary pictorial information. These are termed as Separated and Contiguous and in total provide a total of 127 display characters for each individual character rectangle (*Teletext Specification*).
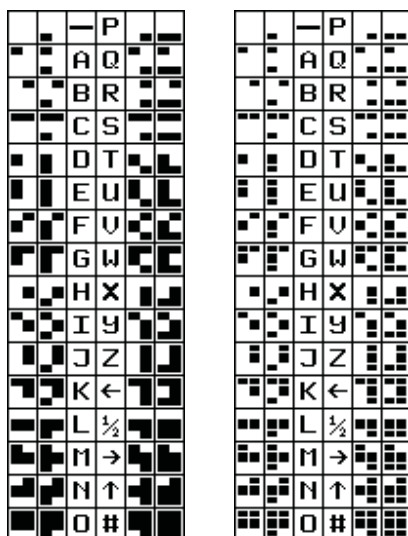
Fig. 28: contiguous (left) and separated (right) teletext graphic sets.

Comparison of some key visual display formats
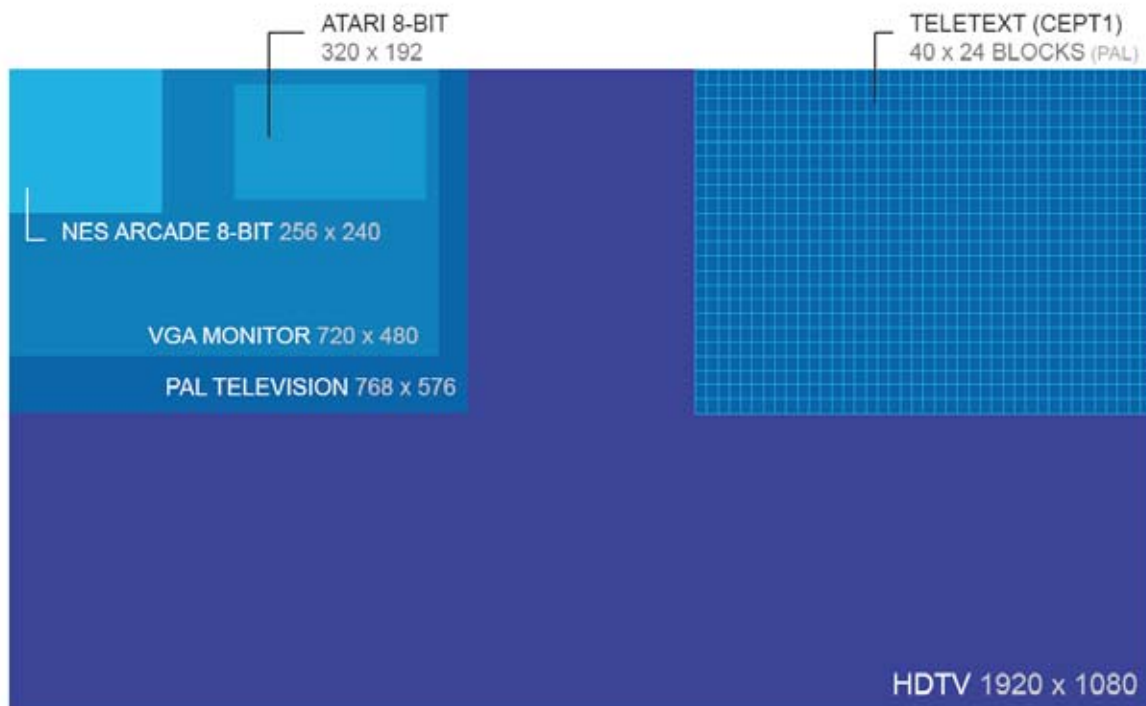
Format	Character rectangles	Pixels
Teletext (CEPT1)	*40 x 24, 3x2 'pixels'*	*80 x 72 blocks, 240 x 250 px*
Atari 8 bit (40 x 24 mode)	*40 x 24, 8x8 'pixels'*	*320 x 192 px*
Nes Arcade 8-bit	*-*	*256 x 240 px*
VGA monitor	*-*	*720 x 480 px*
PAL television	*-*	*768 x 576 px*
HDTV	*-*	*1920 x 1080 px*

Navigation and pages

Teletext, like television, is broadcast, with pages typically updated every few seconds (*Wikipedia.org*). Each teletext page is assigned a three digit 'code' which the user can enter using their remote control handset to navigate to a particular page. When a number is entered into the system, teletext scans through the database of pages until it finds the desired one and displays it.

Pages are split into subpages. These are usually represented by placement of the subpage number on the page itself, for example '3/4' would indicate the third subpage in a series of four. The subpages rotate at set time intervals, varying between teletext systems from eight seconds to twenty. Ceefax uses ten second intervals.

The hold function can be used to 'freeze frame' a particular subpage. The pages continue to rotate in the background but are not seen until the hold function is released (*Teletext Specification*).

Display modes

Teletext can code symbols as spaces at certain times. This allows capability for areas of flashing content as well as the *conceal and reveal* mode to function; the alternative character held in a particular block is triggered when the reveal button is pressed.

Subtitling uses two display modes; double height mode allows for text to be displayed across two rows vertically resulting in a larger text size; boxing is used for any in-vision boxes such as ITV's Sportbox (*Teletext Specification*).

Fig. 30: subtitles utilise both teletext's boxing and double height modes.

A typical Ceefax page

Header Row

Page number   Service name   Date and time

| 660 | CEEFAX 1 | Mon 01 Oct 14:09/20 |

BBC **RACING**   Heading: 4 blocks

HAATEF LIKELY TO BREAK AFTER DIADEM 662   Main page content:
Mick team considering Friday outing 663   approx. 75-80 words

Cat still on track for Breeders bid 666
Racing Post sold to investment firm 667

RACING RESULTS for Windsor 670 Bath 671
Brighton 672 Roscommon 673 NRs news 687

LATEST BETTING for Windsor 674 Bath 675
Brighton 676 Roscommon 677 Totes 688-89

MONEY TALKS Bulletin 678 Early odds 679
AT-A-GLANCE Results 668 Live prices 669

DECS 680-82 GOINGS 690 Greyhounds 692-4

Source:William HILL Organization Ltd   Footer: typically 1/2 blocks

Fastext keys: 1 block

Comparative Lifespans of Information and Entertainment Systems

Evaluation

The material collected for this essay was initially quite wide-ranging, encompassing all types of pixel art from video game design and web art to early computer GUIs. However I always intended for the project to focus on teletext so it was fairly easy to make content selections based on this.

The result is a mixture of technical data exploring the history of the medium and an analysis/exploration of some of my favourite pieces of teletext-related art. I would have preferred my outcome to be a bit more extensive than just a written dissertation but have determined that this document will provide data for and begin to outline ideas and specifications for a second part of this project: applying it to a website format.

The project will present this dissertation in a more visually orientated manner. I intend for this to be heavily teletext influenced, taking a number of aspects from the CEPT1 specification and adapting them for the web browser.

This will include expanding and exploring particular areas of the technical specifications. For example, I could extend the character set to include a number of new characters looking at aspects of Internet typography such as Unicode and emoticons as influences. I am keen on keeping the 40x24 (80x72) grid system but would perhaps like to introduce some new features such as more detailed animations or video adapted to conform to the teletext standard. This may also include transposing elements of modern information systems such as search engines or user feedback areas into teletext.

The site will present a selection of information from this dissertation, choosing key areas such as teletext art and ASCII art, which would be transplanted into/reformatted for the new format. Researching sites that already use the teletext format as well as my favourite pieces of pixel art has already given me a good grounding in knowledge of page layouts and visuals. My exploration into some of the ways in which teletext can be subverted, or can be used to subvert, will also help me develop additional, 'quirky' material to give the piece some character.

Text will also be rewritten slightly to fit the new format so it will conform to the 70-word-per-page restriction but I am not sure how much of this I would want to include yet.

The appendix, which outlines some of the basic specifications of teletext, will help me build and use a bespoke 'editor' with which I will create the pages. This will be more of a design layout file/template rather than any specific technical application but will provide the basic structure of the pages/artwork and the canvas on which to work.

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Fig. 19.1: Screens from *Framed*. Carola Unterberger-Probst,
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Fig. 19.2-19.7: Submissions for the VBI Microtel project, 2006.
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Fig. 20.1: Simple English Wikipedia entry on *Reykjavik*, http://simple.wikipedia.org/wiki/Reykjavik, accessed 21/1/08

Fig. 20.2: Screenshot from Newsround Ceefax page. Screen grab from Ceefax transmission accessed 22/10/07

Fig. 21:
- a) Screenshot from Ceefax news, accessed 13:11, 19/11/07
- b) BBC News website, BBC Media. http://news.bbc.co.uk, accessed 28/11/07

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- a) Screenshot from Ceefax's football videprinter, page 337. Accessed 28/11/07
- b) BBC Sport football videprinter.
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Fig. 23.1: SBECTEL screenshot, http://www.transdiffusion.org/intertel/images/sbectel325a.gif, accessed 4/1//07

Fig. 23.2: SBECTEL screenshot, http://www.transdiffusion.org/intertel/images/sbectel325b.gif, accessed 4/1//07

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Fig. 28: Prestel character sets, http://utopia.knoware.nl/users/eprebel/Communication/Prestel/index.html, accessed 5/12/07

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