A Dromology of the Videogame

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Abstract

The increasing speed of delivery technologies correlates with an increase in inertia for the individual user of the audiovisual. Employing Virilio's concept of dromology, the first part of this paper explores the impact of speed and inertia upon the perception of space and time by the user of screen, silicon and simulation. Subsequently it can be seen that the privileging of 'time-saving' technologies such as aviation, cellular phones and the Internet at once ravages traditional notions of space, but also generates an additional 'digital' space which is simultaneously expansive, yet convexed towards the user. Having established the effects of speed and inertia, the second part of the paper extends dromology to provide a coherent context for analysis of a variety of seminal videogames from the 1980's including *Battlezone*, *OutRun* and *Operation Wolf*. These games of dashboards and vehicles, wars and (wind)screen illustrate Virilio's central concerns of a highly mobilised, fluid society increasingly governed by abstract forms of control in the form of the pure war of concentrations camps and airports.

Keywords: Videogames; Space; Time; Virilio

Speed and Inertia

As with Merleau-Ponty and Lefebvre before him, space and time is a central concern of Paul Virilio. Just as Lefebvre was concerned with the reductive effects of the scientifically conceived spaces of technology upon everyday life (Lefebvre, 2005: 61) so Virilio extends these concerns to the impact of time upon lived, or 'real space': as the technologies of time are applied, so 'real spaces' are progressively squeezed out, 'the functions traditionally distributed within the real space of the town are now exclusively taken over by the real time of the wiring of the human body' as the 'inhabitant of the teletopical metacity can no longer clearly distinguish *here* from *elsewhere* private from public' (Virilio, 1997: 56). In this regard the inhabitants of contemporary, technocratic societies are incessantly immersed in a digital space, borne out in the wi-fi Internet connectivity which overlays any major city with an intangible blanket, or GPS positioning which covers the globe in an omniscient net. Virilio views the prostheses of joypad or mobile phone not as expressly spatial and tangible, but temporal and intangible, as they are wired into communications technologies, resulting in a 'new supremacy of real-time over real-space' (Virilio: 2000a: 7). Ultimately, the outcome is that the temporal obliterates the spatial, 'here no longer exists, everything is now' (Virilio, 2000b: 125).

The interpenetration between human and the digital is central to the unbalancing of the poles of space and time, as the 'man-machine interface eliminates all physical supports one after the other, thus achieving a constant weightlessness between the individual and place' (Virilio, 2000a: 68). Indeed, the increasing reliance on

machines reveals an urgent message which is central to Virilio's exposition on time and space. For instance, in the highly conceived, digital space of modern aeronautics, the pilot, crew and passengers are ensconced within the 'speed machine' of a metallic capsule, supplemented by electronic prostheses, which transforms the measurement of distance (space) into the measurement of duration (time). Thus, when passengers board a Boeing 747 bound for Los Angeles, they are instructed as to how *long* rather than how *far* they will fly, so that space is progressively reduced to its lowest common denominator, and the journey is elided behind departure and arrival. The folding of space into time is achieved through the very speed of air travel: as duration decreases, so the room available to the passengers decreases, not only creating an inability to physically move around the cabin, but are supplemented via the personal consoles of music, films and games, which are key to the pacification of passengers in civil aviation, generating a concurrent desire for inertia. As speed increases, so space becomes reduced to a point, 'no doubt there will be no longer anything but arrival, *the point of arrival*, the departure will itself have disappeared in the instantaneity of the projection' (Virilio, 2008: 110). The 'real spaces' of perception and lived space are summarily reduced, as inertia becomes a way of life. This is evident not only in the techno-spaces of aviation, but in the everyday too, where individuals who are inert as they cannot summarily move through space under their own motility are provided with the prostheses of electric wheelchairs where they become part of the trajectory of the machine. The inert are the disabled fitted out with prostheses to become the prototype for future human/machine integration 'the able but *overequipped* air force pilot resembles in every feature the *equipped invalid*' (Virilio, 2000a: 65). The collapse of space into time is fully realised in digital space, as 'the general inrush of data and images is finally placing us in the same position of inertia' as the invalid or the aeronaut 'a domestic inertia that radically alters our relationship to the world our relations to the *real*' (Virilio, 2000a: 69), evident in the mundane, but telling examples of shopping for books from Amazon, or downloading a videogame via Steam. For the armchair traveller all these commodities are delivered on demand, with the maximum of commutable speed and the minimum of physical movement.

The Effects of Speed

With the technologies of the digital, the amount of 'space' available to the user is of unequivocal importance. The quantity of information which can be stored on a magnetic media has moved from bits, to bytes; kilobytes to megabytes; gigabytes to terabytes; the performance of a graphics card is measured in the availability of RAM, with the rider that miniaturisation diminishes the physical presence of this in lived space by continually reducing the size of the desktop PC, mobile phone or digital camera. This highlights the paradox of digital technologies: as the size of digital space increases, the tangible, lived space manifestation of it disappears from view. For example, due to dangers inherent in areas such as the Bronx and Queens boroughs of New York, it is practically impossible to access these lived zones without the requisite cultural capital. *Grand Theft Auto IV* (2008) however, provides the gamer with the opportunity to freely access all areas of New York, thus removing some of the motivation to ever visit the megalopolis. As digital space increases in prevalence and importance by both enmeshing and supplanting other spaces, there is a concurrent requirement to navigate with greater ease and rapidity. Therefore, as the storage space available to digital technologies increases, so does the speed of navigation, with the astronomy of numbers applied to tech representative of one thing: speed. CPU's are overclocked to wring the final iota of performance from searing silicon;

mathematical calculations are measured in megaflops, communication speed is constituted by gross bit rate. With the *reduction* of time taken to process a calculation concurrent with the *increase* in space, speed allows traversal between the co-dependents of space and time, it becomes the relationship between the phenomena of space and time. With the current archetype of digital space being the Internet and its emphasis on the maximal communication of information in the shortest possible time *'the reality of information is entirely contained in the speed of its dissemination'* . This theorem partly explains the exponential rise in the popularity of personal communication devices for which it is not the content that is important, but the medium, speed, which ensures that 'information is only of any value if it is delivered fast; better still that *speed is information itself!*' (Virilio, 1995: 140). Therefore the medium is not only the message, but intrinsic to lived experience, evidenced in the incessant use of email and text message, keyboard and keypad, which via speed of response, allows navigation of a proliferating space with increasing brevity.

The indiscriminate use of information for communication's sake - and vice versa, whereby information is generalised - reveals much about the kind of time which is generated by digital space. The abundance of information is the root cause of a 'data pollution' which will 'subtly introduce a new type of universe, a virtual universe' (Virilio, 1995: 142) - the universe which this paper terms 'digital space'. In digital space, it is the user who is projected and distanced towards/from the subject or object. However, as I show below in the specific examples of the impact of speed upon the videogame, the time manifest in digital space brings objects and surroundings *towards* the user, 'dromoscopy is, therefore, paradoxically, *the wait for the coming of what abides*' (Virilio, 2008: 110) as everything arrives without needing to depart. So, while the *space* of the digital projects the user to the subject/object, the *time* of the digital projects the subject/object to the user. This simultaneous and complementary fusion of space and time creates a 'visual piloting' where the 'key feature will be control over ego-centric (introverted) space, not as in the past, the arrangement of exo-centric (extroverted) space' (Virilio, 2000a: 68). The proclivity is towards travelling without moving: as users navigate with GPS and Google Earth, so the user is locked into an inertia modulated by access to a screen via interface. Thus, technocratic societies with their lack of interaction within tangible, physical spaces are seeing a 'progressive disappearance of anthropological-geographic reference' (Virilio: 2000a: 68). Potentially, the employment of speed as a medium of transmission in the spatial and temporal realms has catastrophic consequences for 'real spaces' as instantaneity and ubiquity will ultimately abolish space along with the interval.

The apparent contradiction in Virilio's writing, which sees the generation of an introverted space alongside the abolition of 'real space' can help to explain the relationship between speed, technology, time and space, especially in light of Virilio's exposition on the origin of the universe in *Polar Inertia*. Here, Virilio introduces the notion of 'extensive time' which is seen as 'the centre of chronological time (past, present and future) . . . the temporality of being present here and now'. This is an existence of the 'living present' unmediated by technology, unsullied by the speed of progress. Extensive time is countered by 'intensive time' which is 'continually lengthened by our various optical or electro-optical . . . means of acquiring information' (Virilio: 2000a: 52). This is a mediated existence, whereby the increasing storage capacity and processing speed of 'big optics' allows satellites, telescopes and hadron colliders to peer further into the past of the universe, thereby

extending time. Paradoxically however, as well as increasing time, the speed of technology also *reduces* time, hence the use of split seconds, nanoseconds or picoseconds, the period in which a computer can process megaflops of calculations, or access terabytes of storage capacity. This leads to the observation that

> The present instant is no longer simply a "lapse of time"; it opens up the possibility of an infinitely short duration containing the equivalent of what is already contained in the infinitely "long" duration and infinitely "large" space of the perceived cosmos

(Virilio, 2000a: 52)

This can be seen as illustrative of digital space. For the user of digital space, everything can be satisfied in the present *chronos*, through the universalising or *intensifying* of time where the greatness of the universe is compressed in a perpetual shrinking effect. Such is the state of affairs with GPS or Google Earth; travelling the world is reduced to instantaneous navigation and flattened onto the 'square horizon of the screen' where there is 'no more delay, no more relief' (Virilio, 1997: 26). The archetype for this space was once the negative horizon of the desert, where the attempts of land-speed records rendered objects and landscapes 'homogenous and dromogenous by the artifice of the instantaneity of ubiquity' (Virilio, 2008: 134), but in the new model the digital stretches around the globe like cling-film, which falsifies the depth, the length, the distances of the perception of time and space. Just as the motor car or civil aviation bring faraway lands closer to us, so in the digital the medium of speed distances us from the tangible place subject or object. Such is the promise of digital space: to project and distance oneself, to instantly communicate, to homogenise and smooth out all spaces, so that all users are locked into a universal time of instantaneousness, without having to wrest physical bodies from inertia.

However, in spite of Virilio's assertion to the contrary, the holy grail of many audiovisual technologies – and especially videogames – is to provide the illusion of topographical relief. This is evident in early era games, where a top-down, God's eye view generates a distance between player and avatar, before becoming more pronounced with the increase in processing speed. In order to optimise the illusion of relief, early videogames employed the artistic technique of parallax scrolling, where landscapes on the screen are refreshed at different rates, so that the ground in front of the player would move quicker than the mountains in the background. Such was the success of the technique, that it lent itself to the title of Sensible Software's sci-fi shooter *Parallax* (1982). At the same time, developers experimented with isometrics to create the illusion of '2.5D' games, such as *Zaxxon* (1982) where the player would view the landscape from the corner of the screen. The effect was to provide the illusion of 'flying into' the screen, which, in a considerably updated format, provides the basis for the 3D representations of space seen in today's polygon-rendered first person shooters. With this rejoinder in mind, the second part of this paper will examine how Virilio's work be used to offer a dromology of the videogame.

Virilio and the Videogame

The increase of speed and its correlated rise in inertia is a feature integral to technocratic societies. With each increase in speed, bodily movement is reduced to a perfunctory action. Travellators at airports allow people to move around with the minimum effort, preparing the traveller for the zero degree inertia of trans-Atlantic

flight. Autobahns permit unlimited automotive speed, with the driver ensconced in a cabin bristling with technologies which prepare for the coming accidents of speed so anticipating, through prostheses, 'what will probably be the full automation of automobility' (Virilio: 2008: 107). This has reached its logical conclusion with the use of the 'Reaper', an Unmanned Aerial Vehicle (UAV) in Afghanistan, which can stay airborne for longer than conventional aircraft as the inconvenience of the human pilot is removed. There is no need for a cockpit, life support systems or radio as the aircraft is controlled from Creech Air Force Base in Nevada, USA. A BBC report on the UAV stresses that control of the drone is 'no videogame' and yet the image of the RAF Wing Commander, chatting to the reporter while sitting at a console replete with screens and a joystick as the Reaper flies on a non-stop 20 hours reconnaissance mission 7000 miles away from the gamer/pilot is clearly the manifestation of pure war, which transcends its normative area of conflict. The projection and distancing of this war removes the dangers of battle for those involved in pure war, the lack of 'real' space shows how the speed of the screen generates a 'horizontal escape velocity' which 'liberates us from the alleged reality of the third dimension', resulting in 'the abolition of depth' (Virilio, 2008: 134-5). With no depth to this space there is no coincidence that the flatness of the screen is reflected in the negative horizon of the desert wars of the 21st century, and subsequently *doubled* in the desert location of its control base in Nevada, where all technologies of speed are tested and developed, with the dromological effects of speed and inertia manifest in the experience of bodies who accelerate through space,

> He who gets behind the wheel of a racing car . . . completes his natural stereoscopic vision with a new type of prosthesis of vision capable of providing him with the *mobile illusion of a kinetic transformation of his field of vision*, the optical illusion being perhaps here only that of an alleged relief of perspectival space
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> (Virilio, 2008: 133)

Dromology, the study of speed, is therefore instructive as to the significance of driving/racing games, which throughout the course of the history of videogames have proved to be one of the most popular and enduring genres. From the very first racing videogame *Gran Trak 10* (1974), complete with three-spoke steering wheel, through to the 'car porn' of the *Gran Turismo* (1997-) series, the driving game has been at the forefront of innovation in design, high audiovisual standards and the use of prostheses or peripherals to project and maintain the illusion of speed. Indeed, it is through the driving genre that the importance of speed to the study of the videogame becomes apparent, as the use of the 'vehicle' in the videogame is not merely limited to the driving genre. To outline this I will discuss a variety of videogames where the use of speed is crucial to their impact and success, and the parallels they have with Virilio's concept of dromology.

Dromology and the Game of Driving

The use of the screen as a device to fuse inertia and speed belies a striking similarity between the videogame and the vehicle, which requires that the users or occupants assume a trans-spatial approach 'the framed opening of the windshield is not therefore a window but rather a window-door which the passengers pass through without stopping' (Virilio, 2008: 104). The screen brings transience and projection together as the screen is the portal through which the driver of the car and the user of the digital

propels themselves and protects themselves, with the 'excess of speed [contributing] to a progressive enclosing' (Virilio, 2008: 106-7). The effect of speed, where time and space collapse and extend into the infinite instant is enchanting for the individual, as the screen, acting 'like a magical mirror, allows us to view the future' so that 'the immediate proximity matters little, the only important thing is that which is held at a distance; in the continuum of the trip, what is ahead governs the progress' (Virilio, 2008: 135). In the vehicle, the passengers are inert, as the surroundings move dromoscopically around them, a technique employed by racing games to project the illusion of speed. While early racing games were represented on one screen and didn't alter throughout the duration of the game, as with *Sprint 2* (1974), with the increase in processing speeds the practice of projecting the landscape onto the player's on-screen vehicle became the norm. This is especially evident from the 1980's onwards and can be seen in Sega's *Monaco GP* (1980), where corners would rush down the screen towards the player's car and in *Motor Mania* (1982).

Monaco GP was one of the first games to feature a 'deluxe' model, where the player could sit down as if embedded in the cockpit of Formula 1 car, causing the player to be more inert than if they were standing at the upright model. Furthermore, although the orientation of the player in *Monaco GP* was horizontal, the monitor was *vertical*, as opposed to the *horizontal* orientation of later games, where the emphasis tends towards width rather than length. This may appear to be a trivial observation, but it is important to note that early driving games, in spite of moving the landscape towards the player, did not attain pure speed. The vertical orientation of the monitor is akin to an exploratory desire as seen in exo-centric space and exo-colonisation. An extended example of this orientation is the ballistic positioning of astronauts in rocket propelled vehicles: vertical/ballistic orientation is literally and metaphorically a wish to reach for the stars. When the monitor moves towards the horizontal and there is a letterboxing of vision there is a tendency towards insularity, ego-centric space and endo-colonisation. This is best seen in the movement away from the exploration of the cosmos to the exploration of genetic code, where humans orbit human bodies, rather than celestial bodies, as ultimately resulting in the production of the clone as the enshrinement of inertia, due to its inherent predestination. The movement to horizontal orientation is widespread and instructive of a generalised homogenisation of the spaces of technocratic society. This is manifested not only in the flattening or smoothing out of space, but, due to the letterboxing effect of the screen, *parallaxes* the image of space and time into a convex. This generates a depth to the field of vision, as objects in the centre of the screen of the gamer/driver scroll quicker than those on the periphery. Contrary to Virilio, the irony becomes apparent: the *faster* the vehicle the *greater* the relief.

If *Monaco GP* generates the illusion of speed, then *Motor Mania* produces a representation of speed. As the landscape scrolls down the left hand side of the screen towards the player's car, the gamer is required to observe and assimilate additional information from the 'dashboard' on the right hand side of the screen. The dashboard takes the form of a plethora of gauges including a speedometer, milometer, fuel gauge and voltmeter. As the dashboard monitors and informs the position of the gamer/driver through the landscape, it also narrows the trans-space of the (wind)screen, 'shrinking its passengers field of vision, the frame of the dashboard gives rise to an acceleration of the sequencing that reinforces the effect of the acceleration of the vehicle' (Virilio, 2008: 103). Although the driver can see the landscape, the instruments of the dashboard allows for a clearer comprehension of the

external environment than the windscreen alone, a stereoscopy which merely serves as a double reduction to the distance-time of the trip and the letterbox framing of sightlines from the cockpit. This generation of horizontal orientation is evident in *Motor Mania* as the dashboard takes up 50% of the screen, so the projection of information onto the gamer/driver is of greater importance than the representation of the landscape.

Battlezone: Territories Unknown

As the above example of the UAV shows, the supplanting of human input by technology so that individuals are informed by pure information and thus become 'voyages-voyeurs', is a way of minimising risk to those engaged in pure war. The ultimate desire of combat is to be absorbed into a digital space, to 'stay out of reach, all the while remaining present' (Virilio, 1986: 39). This is an aesthetics of disappearance, of camouflage, where the warrior, through the use of technology removes the body from the war-zone. Disappearance is especially evident in the mechanized divisions of land armies, where tanks utilise false appearances and camouflage and the tank commanders, gunners and drivers are enclosed in a composite ceramic shell, shielded from the elements of war and nature.

There is the intimation of disappearance in Atari's *Combat* (1977), where, in one play mode, the tank is invisible to the players except for a few seconds after a shot is fired. However, it is *Battlezone* (1980), where the game, the tank, the gamer/driver and the dashboard are interfaced, seamlessly merged and 'identified . . . with a victorious vision, to the point where the dashboard comes to seem rather like a misunderstood game of war' (Virilio, 2008: 107). The player of *Battlezone* controls a tank in the first person perspective, but disappears as the gamer and the screen are hyper-mediated through the use of additional peripherals. This is evident in three separate but interconnected ways. First, the player views the landscape through a set of goggles, similar in form and usage to a periscope on a tank or submarine. To move the tank, the player must manipulate two joysticks, which ostensibly represent the caterpillar tractors which propel the tank. Second, through the use of a radar screen at the top of the display, the game substitutes the warrior for technology, as the Doppler optics serve to augment the eyesight of the tank commander by bringing the vast expanses of the battlefield into close proximity, convexing the space of the battlefield through the periscope and radar. Third, the innovative 'vector' graphics used in *Battlezone* are particularly instructive as to the role of the tank in modern warfare. The use of a three dimensional representation of a landscape counters the flattening of space by opening the battlefield to depth, so 'the technology of vectors thus comes to replace the tactics of bodies' (Virilio, 2008: 107). The use of vectoring means that the gamer/warrior can predict with some certainty the movements of the enemy in space, and therefore anticipate what will happen in the time of the future, similar to the driver/gamer of *Monaco GP*, 'the prevision of the movement of the *opposing* horizon is for the driver similar to the prevision of the enemy for war leaders' (Virilio, 2008: 107). In this regard it is possible to see *Battlezone* as part of a wider project of a rigorous management of time, following that of space and so it is that it has a wider social connotations. First, *Battlezone* was adapted for use by the US Army as a trainer for their M2 Bradley Fighting Vehicle. *Bradley Trainer* (aka *Military Battlezone)* was considerably more complex than its arcade variant as it incorporated gravitational effects which altered the trajectory of the shells, along with identifiable targets, so trainee tank commanders wouldn't friendly fire their allies. As one of the first

military uses of videogames, *Bradley Trainer* realises a 'sophisticated form of *Kriegspiel* [war game] . . . dromoscopy would be in some ways a video game of speed, a *Blitzkriegspiel* [Lightening war game]' (Virilio, 2008: 107). So, in *Battlezone* speed, technology and gaming is fused into the Military Industrial Media Entertainment Network (MIMENET) (Der Derian, 2001) which, as demonstrated below, has distinct parallels with the videogame.   Second, as with the notion of driver/gamer seen in *Motor Mania* and *Monaco GP*, it is *Battlezone*'s landscape which moves around the player, but, unlike other games of its era, it is the player who controls this movement. *Battlezone*'s desire for speed is a witness to the simultaneous desire for control over that speed, as the more mobility increases, the greater the desire for control.   As shown at the end of this article, the development of the dynamic of the control of the speed found in videogames is crucial to Virilio's analysis of wielding control over entire societies.

The Inertia of Speed

Battlezone's move to a three-dimensional, first-person representation of a landscape was indicative of a widespread shift towards the dashboard viewpoint of the gamer/driver. This graphical representation, where the player is situated elevated and behind the car, or as a fly on the windscreen are termed 'third-person' or 'first-person' perspectives respectively. *Pole Position II* (Namco/Atari, 1983) with its inclusion of the *Monaco GP* deluxe model of arcade cabinet used the third person perspective while the gamer/driver races around a variety of Japanese Formula 1 courses.   The difference between *Pole Position II* and the earlier first-person perspective of *Battlezone* is the use of sprite-based graphics, which enables the use of a wider variety of styles and colours.   However, the use of sprite graphics has unforeseen consequences, for when the player reaches top-speed, the movement of the track towards the player is so quick that that *it appears not to move* and eventually appears to move backwards. This is the mastery of 'real speed', so desired by F1 drivers, where to approach obstacles with such velocity is to have 'the impression that you are moving in slow motion' (Prost, cited Virilio, 2000a: 15) so the 'irresistible attraction of the course dissolves the time of the movement – the *distance-time*' (Virilio, 2008: 105) between objects on the landscape and the gamer/driver. *Pole Position II*'s aliasing – the technical term given to an image that appears to stand still when it is rendered - is the essence of passivity, where spasmodic speed causes inertia. This is manifested twice: first embodied in the player who sits prone in front of the screen, then supplemented by the suspended animation of the stationary image, 'so that car speed and audiovisual speed are rendered compatible' (Virilio, 2000a: 15). The twin poles of inertia evident here are experienced by the gamer and driver. Both are subject to the sensation of projection and distancing across time and space, but the videogame is doubly digital as it is a hyper-realisation of an already digital experience,

> Dromovision, (automobile media) simulates the fleeting well before television (audiovisual media) simulates proximity . . . up to the moment hardly imaginable where instantaneity and ubiquity will abolish space along with the interval, making the dromovisual apparatus the perfect equivalent of the audiovisual in a single stroke!
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> (Virilio, 2008: 51)

The effect of the inert image on the perception of space and time by the gamer/driver betrays the ultimate aspiration of the automobile to mimic the image, or even to be superseded by it, as the 'image is the only high performance vehicle, the real time image which is supplanting the space where the car still moves from one place to another' (Virilio, 2000a: 14). Concurrently, this explains why the driving genre has extensive videogame lineage and longevity as it is the digital's fundamental aim, from its genealogy in the vehicle of speed, to intensify everything into an infinite instant. The suspended animation of *Pole Position II* is a digital prototype, with (in)action reduced to the click of a micro-switch rendering the user distant and inert, so that we become aliases by the things that are so fast we can no longer see them move.

Vanishing Point

The example of *Pole Position II* is not unusual among arcade games of the early 1980's but as the illusion of speed, rather than the by-product of inertia, is the desirous experience of the gamer/driver, ever-increasing clock-speeds of CPU's subsequently allowed hardware to portray speed with greater sophistication in sprite-based games. Namco's *TX-1* (1983) was one of the first games to properly achieve this by delineating landscape features through the use of bright, bold colours to effectively contrast between the sky and the land. These graphics are complemented by the representation of the road employing the then widespread artistic technique of placing alternate horizontal black/light grey lines on the track to help generate the illusion of speed. Nevertheless, *TX-1*'s key innovation was the inclusion of three monitors in a deluxe cabinet. These act as peripherals in two ways: first in that they produce a peripheral vision for the gamer/driver while they concentrate on the disappearing horizon of the main monitor. Second, they allow the gamer/driver to view more of the course than in games such as *Pole Position II* as it is possible to see 'around' corners by glancing directly into one of the horizontally orientated monitors to the right or left of the main screen. This technique mimics the windscreen and side windows of a conventional automobile, 'with the rear window, with its windowed doors and its front windscreen, the automobile forms a *quadtriptych* where the travel lover is the target of a permanent assault that recalls the perspective of the painting' (Virilio, 2008: 106). As outlined above, at this juncture of the development of the driving game, perspective through artistic manipulation is vital to the perception of speed, and the *quadtriptych* of the three screens allows for the simulation of the passenger compartment which is a 'stage [*scéne*] where the signs of the places travelled through move past in the mise en scene' (Virilio, 2008: 106). This is a crucial step forward for the videogame as substitute for the automobile as in 'the driver's seat the immediate proximity matters little, the only important thing is what happens at a distance', so as the speed of the vehicle, processor and image multiplies, so distancing in space increases 'the greater the speed, the more distant the horizon' (Virilio, 2008: 106). *TX-1* contrived to distance the horizon by offering the gamer/driver a choice at each checkpoint which, combined with the epigram 'Time Extend!' shows how the future projection of the trajectory encourages acceleration through space as 'the future decides the present of the course' (Virilio, 2008: 106). The inclusion of multiple screens which distance the horizon in *TX-1* via the use of artistic techniques, peripherals *and* peripheral vision, is significant in that it realises the desire for horizontal escape, enshrined in 'an entire history of Quattrocento perspectives', where the administrators of conceived space battle 'to make us forget the high and low [vertical] by pushing the near and far, a *vanishing-point*' (Virilio: 1997: 1).

The introduction of Sega's *OutRun* (1986) to arcades was a seminal cultural event in the history of videogames. *OutRun* redefined the driving genre by replacing the sterile racetracks of *Monaco GP* and *TX-1* with dazzling landscapes from the surf-lapped highways of California, the big skies of Arizona to the sun-dappled byways of Martha's Vineyard. In actuality, although *OutRun* is rightly remembered as the pinnacle of sprite based racing games, it is best described as a game which coherently integrated all of the best features of preceding titles into one videogame. The bright red deluxe cabinet with brake, accelerator and two-speed gearbox is modelled on the iconic Ferrari Testarossa and, as was Sega's wont at the time, used hydraulics to simulate the movement of the vehicle. Sega's emulation of fairground rides - a first in videogames - where the individual is prostrate while propelled across two axes meant that crowds would gather to watch as players traversed American blacktop. Opulent in its presentation, *OutRun* is nostalgically commemorated as allowing the gamer/driver to choose from three distinctive music tracks, represented on a radio set into a plush dashboard, the art of the motor flaunting 'the gallery of the dashboard of everyday mobility', so the 'cultural revolution of transportation is publicly exposed' (Virilio, 2008: 105) to the throngs of *voyeurs-voyages*. In addition to the sophistry of the dashboard, *OutRun*'s core gameplay dynamic is the use of a 'goal' system which, akin to *TX-1*, requires the player to make a series of choices to reach the end of the game. In order to make these choices and reach the goal, the gamer/driver must arrive at each checkpoint before the countdown reaches zero, in order to trigger 'time extension'. Indeed, the very title of the game, '*OutRun*' betrays the basest desire of gaming – and driving – what is it that the gamer/driver is trying to outrun?

> With the speed of the continuum it is the *goal* of the voyage that destroys the road, it is the target of the projectile-projector (of the automobile) that seems to trigger the ruin of the interval it is the fleeting desire to go right to the end as fast as possible that produces in the opening out of the travelling the tearing apart of the landscape.
>
> (Virilio, 2008: 105)

The concentration of the gamer/driver on the countdown, so that zero-hour is never encountered shows how space is shredded by time, evidenced in the measuring of a trip by train or airliner by duration rather than distance. When the goal supplants the journey and the ends elides the means, 'the world becomes a video game, a game of transparency and transpiercing' (Virilio, 2008: 103). *OutRun*'s dedicated hardware meant that it could incorporate radical artistic innovations to simulate the transpiercing of the landscape. This was achieved by making the perspective of the game inert in relation to the car, so when the car moved through the landscape the perspective remained fixed, as if a camera was fixed to the rear of the vehicle. This intensifies the inertia of the gamer/driver, so that while the camera remains stationary behind the Ferrari, *the vanishing point also remains constant and infinite*. The outrun across broad savannahs and narrow canyons, so magnificently realised in *OutRun*, becomes an outrun to the strategy of the beyond, a cyclopean focus on an instant, intangible vanishing point, so that 'speed becomes, in a certain way, a premature infirmity, a literal myopia', a space that distances while projecting, 'in propelling the passenger toward the horizon separates him to the point of being in an adjacent world, so much so that we would consider the play of the vehicular proximity to be a detaching, a recoiling, a literal retreat' (Virilio, 2008: 109).

Concentration and Control of Speed

OutRun heralded an extended period of innovation in arcade manufacturing, with powerful hardware and bespoke cabinets becoming the norm. Taito's *Operation Wolf* (1987) invited the gamer to assume the role of a special forces operative on a plausibly deniable mission in an unnamed south east Asian country. While shooters were especially popular in the 1980's, they generally presented an abstract side-on, perspective, with the sidereal *R-Type* (1987) the paragon of the genre. *Operation Wolf*, however, situates the player in a first person perspective, not dissimilar to that found in the classic *Duck Hunt* (1984). However, instead of being static, the screen scrolls horizontally, as if the soldier is on an armoured vehicle. This illusion is reinforced through the utilisation of peripherals in the game, with the horizontal/linear formation of the gamer/soldier 'being the means of maximal exploitation of firepower' (Virilio, 2008: 58). To maximise the exploitation of firepower, the cabinet is equipped with a scale-model Uzi which utilises haptic force feedback to replicate the firing of a gun. In addition the screen displays a dashboard, which tots up the logistical status of the battlefield by showing the amount of magazines, grenades and health remaining; hostages saved and, most pertinently, the amount of enemies killed/alive. This information is presented to the player, without their needing to identify the enemy's position in battle, so 'the art of the control panel, therefore appears on the one hand like a substitute for the hunt and its scenes' (Virilio, 2008: 102) but as the gamer has no control over the movement of the vehicle, 'the course [track, trajectory] is no longer the sublimation of the hunt, it has suddenly become the sublimation of war', aptly demonstrating the relevance of speed, of driving, of gaming, to battle, with 'mobilization the essence of war' (Virilio, 2008: 61) '*it is movement that governs the event (of war) and it is movement which produces the weaponry*' (Virilio, 2008: 112).

Operation Wolf, like *Battlezone* before with its present/absent logistical tallying uses the battlefield image so that it becomes impossible to imagine war without images. If, as discussed above, information is pure speed, then 'speed becomes war in its purest state, that is, pure war. The movement towards this zenith of speed, is a movement to a perpetual state of emergency of a war which is everywhere, but the front is nowhere. In *Operation Wolf* when the damage to the gamer/soldier reaches a critical level, gauges flash and an alarm sounds, alerting the gamer/soldier to the arena of danger but distancing any physical damage to the body of the gamer/soldier, projecting a psychological, ego-centric terror onto the individual; such is the manifestation of pure war a 'vectorial image of a combat without battle, but not without fear, that gives rise to an extermination that extends throughout the world' (Virilio, 2008: 56). *Operation Wolf* adroitly realises this. The final two levels are called 'Concentration Camp' and 'Airport' respectively, where the aim is to liberate hostages and then airlift them to safety. The pairing of two of the 20th century's most awesome technologies is not accidental and acts as a template for the world we now inhabit. For it is not only the etymology which betrays the similarities, but the experience of those there which renders any differences between aviation and extermination nugatory. The tyranny of pure speed, is an intensification, a *concentration*: the arrival at the concentration camps of Oświęcim is, for train-passengers, quite literally, the terminal. Concurrently, the airport terminal concentrates speed of aviation and of processes. Airports, through the will-to-control of regulation, of prohibition, 'have the tragic character of the extermination camps' (Virilio, 2008: 97) embodied in the use of pseudo-paramilitary uniformed personnel as to be so ubiquitous so as to pass to

invisibility. Power is exercised with maximal immutability and minimal dissension and the more that mobility increases and is extended to greater and greater spaces, the more the demand for control intensifies. Pure speed is pure war is pure control: the endo-colonization of individuals, groups, races, *entire societies* renders every one of us a passenger, accelerating but inert, the speed of technocratic society is an extended network of collapsed space and intensified time, generating users of inertia, who are exercised only through social control.

Endgame

There is little wonder then that the increasing popularity of the videogame, linked to its dizzying clock speeds and verdant graphics has caught up, surpassed and now informs the state of emergency. Pure wars are inaugurated and performed every day and night between millions of people as first person shooter *Call of Duty 4* is played on Xbox Live and PlayStation Network. All are gamer/soldiers projected into digital space, ensconced in communication, distanced from lived space, separated from interaction, present but disenfranchised, hostages of a 'concentration camp of speed [where] segregation and incarceration stem far more from the violence of displacement than from various police controls' (Virilio, 2008: 57). This experience of the dromology of the space and time of the videogame can be acutely recalled in *Call of Duty 4*'s subtitle: *Modern Warfare*.

Games
BATTLEZONE. Atari, Arcade, 1980
CALL OF DUTY 4. Infinity Ward, Microsoft Xbox 360, 2007
COMBAT. (1977) Atari, Atari VCS, 1977
DUCK HUNT. Nintendo, Nintendo Entertainment System, 1984
GRAN TRAK 10 Atari, Arcade, 1974
GRAN TURISMO. Polyphony Digital, Sony PlayStation, 1997
GRAND THEFT AUTO IV. Rockstar North, Microsoft Xbox 360, 2008
MONACO GP. (1980) Sega/Gremlin Industries, Arcade, 1980
MOTOR MANIA. John A. Fitzpatrick, Commodore 64, 1982
OPERATION WOLF. Taito, Arcade, 1987
OUTRUN. AM-2/Sega Arcade, 1986
PARALLAX. Sensible Software, Commodore 64, 1982
POLE POSITION II. Atari/Namco, Arcade, 1983
R-TYPE. Irem, Arcade, 1987
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TX-1. Tatsumi (Manufactured under license from Namco by Atari Inc), Arcade, 1983
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