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Crack Intros: Piracy, Creativity, and Communication

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This article examines "crack intros," short animated audiovisual presentations that reside at the crossroads of software piracy, creativity, and communication. Since the beginning of the home computer era in the late 1970s, users have copied and shared software with one another. Informal swapping between friends quickly evolved into organized piracy, known as the "warez scene," which operated across borders. Starting in the early 1980s, pirated games were often accompanied by screens where groups boasted their accomplishments and sent messages to others. The screens soon turned into flashy intros that contained animated logos, moving text, and music. In this article, we describe crack intros from three different perspectives: first, through their history; second, by treating them as creative artifacts; and, finally, by considering them as a communication medium. The three perspectives offer a novel peek into the practices of early software piracy and its little-known creative aspects.

Keywords: software piracy, creativity, crack intros, digital culture

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Introduction

In this article, we explore how so-called crack intros are embedded in the history of software piracy. Software piracy is often discussed as a set of practices related to the unauthorized release and copying of commercial microcomputer programs. In contrast, we discuss how a particular community, known as the "cracker scene," was established and further reproduced through communication between software pirates. Customarily, those who removed copy protection—that is, "cracked" computer software—added small "crack intros" before the original title screen. Both the textual and audiovisual content of the intros served the purpose of improving the social status of a particular cracker group. Based on an empirical analysis of selected intros, we demonstrate how these objects were used in the processes of communication and meaning making within the community.

This study sheds light on the historical background of the contemporary "warez scene" (see Rehn, 2004). When studying the historical phenomenon of the cracking scene as well as the online warez scene, it is clear that artifacts such as crack intros and NFO (info) files are a persistent part of the practices of unauthorized software copying and circulation (Vuorinen, 2007). The cracking scene, most active in Europe in the 1980s and early 1990s, was a self-conscious and highly organized community. It was one of the most prolific hacker cultures in 1980s Europe (Alberts & Oldenziel, 2014; Wasiak, 2012; for critical discussion on hacker culture in general, see Thomas, 2003) and could arguably be called the first internationally networked digital subculture (Carlsson, 2009; Schäfer, 2011). One visible example of related activity is the network hacker culture, as described by Taylor (1999) and Thomas (2003), operating on and beyond the borders of legality, which makes it a perceived threat to society.

Crack intros have gone largely unnoticed by authors who have written about related topics such as media art or software piracy. The largest body of research dealing with intros can be found in the context of demoscene-related publications. Crack intros are often mentioned as predecessors of computer demos (e.g., Carlsson, 2009; Reunanen, 2010; Tasajärvi, Stamnes, & Schustin, 2004), but few researchers go further than that, except for Polgar (2005), who provides a peek into the history of crackers and their intros, Botz (2011) who discusses them from an artistic perspective, and Reunanen (2014) who questions the canonical story about the origins of the demoscene. "Illegal Guys" by Wasiak (2012) is one of the few scholarly works on the roots of the European warez/cracker scene in the mid-1980s.

Piracy is primarily regarded as the practice of duplication of media artifacts. The role of user-created audiovisual artifacts is scarcely recognized in the literature despite its relevance for the social construction of technology and consumption (Jenkins, 1992; Oudshoorn & Pinch, 2003). Recent studies on the role of "digital material" in the shaping of contemporary cultures related to the use of ICT provide an interesting framework for the analysis of the history of crack intros. As van den Boomen, Lammes, Lehmann, Raessens, and Schäfer (2009) claim, digital cultures should be considered as "material practices of appropriation, and new media objects as material assemblages of hardware [and] software" (p. 9). To understand the structure of such cultures, it is necessary to equally consider "material artefacts and facts, configured by human actors, tools and technologies in an intricate web of mutually shaping relations" (van den Boomen et al., 2009, p. 9).

In this article, we take a critical look at crack intros to fill in some remaining knowledge gaps. The article's three main parts provide three different points of view. We start with a historical overview of the roots of software piracy and the origin of crack intros. Next, we consider the audiovisual properties of intros and analyze them as works of art that follow certain conventions. Finally, we examine the communicative aspect of intros: What messages did they convey, from whom, and to whom? As the main corpus of source material, we examined intros themselves as well as disk magazines ("diskmags") that were circulated among the community and contained contemporary discussion on various topics of interest (for more on diskmags, see Reunanen, 2010). The three perspectives provide a multifaceted view of the practices of the cracker scene, which resides at the crossroads of software piracy, creativity, and communication. Our focus here is on the formative years of the scene, when its visual style and practices emerged on the widely popular Apple II, Commodore 64, and Amiga home computers in the 1980s and early 1990s.

History of Crack Intros

The phenomenon of mass software piracy began along with the introduction of the Apple II computer in 1977. This hardware platform became popular in the United States, and its popularity fueled the growing market for recreational software (Campbell-Kelly, 2003; Ceruzzi, 2003). Such software became massively copied among peers, and software developers introduced copy protection systems with the intention to limit piracy. The beginnings of copy protection systems have been described by Steven Levy (2010). Removing the copy protection measures required some programming skills, and later games were not simply copied but also included a signature containing the nickname of the person who had removed the copy protection. Such signatures, referred to as "crack screens" (see Figure 1 for the *Star Trek Promethean Prophecy* crack screen) were customarily included in game title screens displaying the game name, the logo of the producer, and a graphic that provided the player a glimpse of the game theme. The signatures were originally simple statements, such as "cracked by . . . ," sometimes intentionally misspelled as "kracked by . . . "

Figure 1. Star Trek Promethean Prophecy crack screen, Apple II (1987). Image source: Apple II Crack Screens (n.d.).

The development of more complex cracker signatures started a few years later in Western Europe, after the introduction of the highly successful Commodore 64 (for details on the history of the C-64 and Commodore, see Bagnall, 2005). From the beginning, on the C-64 software cracking was primarily a group practice. The early C-64 game cracks preserved in the extensive C-64 Scene Database show that the European cracking phenomenon began in West Germany and the Netherlands around 1983. Groups such as the German JEDI and Dutch ABC Crackings included their signatures in game loader screens, often with some correspondence to the original publisher or the author of the game.

Aside from the simple "cracked by" statement, groups developed other strategies that aimed to provide game players with a clear statement that the original game had been repurposed as a scene artifact (Vuorinen, 2007). Interestingly, groups used several different methods to propose that they belonged to a creative industry parallel to the software industry. One such strategy was to use a name that was a parody of a corporate name or had some reference to a renowned software publisher. For instance, one of the early games cracked by JEDI contained the signature "Electronic JEDI" next to the name and logo of the original publisher—Electronic Arts (*One on One* game crack intro, 1983; see http://csdb.dk/release/?id=48618). This particular release is also important for the history of the cracking scene as one of the first instances of scrolling text on the bottom of the screen, which would later become

a persistent element in crack intros. In another crack intro from the same period, ABC Crackings modified the Electronics Arts logo consisting of a cube, a sphere, and a cone. At the bottom of the screen, it states: "Broken by ABC Cracking" (*ABC Crackings Intro*, 1985; see http://csdb.dk/release/?id=61401).

While all these manipulations are clearly reminiscent of the techniques already used by crackers on the Apple II, the crack intro as a cultural artifact is an invention of the European C-64 scene. According to one insider definition, a crack intro, frequently abbreviated as "cracktro," can be any independent screen placed in front of a copied game—as opposed to a modified splash screen of the original software (Zimmermann, 2001). The transfer of a cracker's signature into a separate intro allowed for more artistic freedom and, at the same time, enabled its reuse for other game titles. With an intro presenting the credits for the crack in bold type, the original game title screen no longer needed to be altered and, thus, remained intact. Thus, the invention of the cracktro can be interpreted as the scene's transition from the occasional act of subtle software vandalism to a more systematic and self-conscious "cracking trade."

In the mid-1980s, along with the massive software piracy on the Commodore 64, software companies started to introduce increasingly complex copy protection systems aimed at hindering mass disk copying. Furthermore, the copy protection scheme was hidden deep in the game code. Thus, copy protection removal became increasingly challenging and required extensive knowledge of computer architecture to understand how a particular protection scheme worked. From that time on, cracking a game released by a high-profile software company became a significant achievement and earned merit among crackers. A crack intro turned into a manifestation of technological proficiency, but also of deviance (Becker, 1963; Goode & Ben-Yehuda, 2009/1994). In the mainstream discourse, deviance is primarily considered antisocial behavior, but here we can observe how a group of young men manifested their deviance as a social practice with the aim of highlighting their capability and masculinity, thus earning prestige among peers.

Several scene groups tried to gain easy recognition by including their intros in games cracked by others. This practice, sometimes called "recracking," was heavily condemned by the scene, because it was in stark contrast to the ideal of talented authorship. For instance, influential *Illegal* magazine editors ridiculed U.S. and European cracking groups that simply added their intros without actually cracking a game:

> The reason why I'm so pissed off on them is that they have completely spoiled our 64 scene, now THANX to the YANKS everybody wants the game super-fast, they don't even look at the game, they just bang their intro on it and send it off and getting the false satisfaction that they're big pirates. (*Illegal #29*, 1988)

> One can only shake one's head looking at the SHARKS. . . . They took the BARD'S TALE 3 ORIGINAL COPY from PAPILLONS and put their intro on it. Great job! But unfortunately the game didn't work anymore . . . Hahaha! (*Illegal #29*, 1988)

Eventually, crack intros were released for virtually all computer platforms and game consoles. An extensive collection of crack intros for even the most obscure machines is included in the Pouët.net database. However, the most popular platforms for crack intros were clearly the C-64 and its successor, the Commodore Amiga (see Maher, 2012). Later, with the introduction of Internet platforms, especially peer-to-peer protocols, the cracking scene evolved into the online warez scene, which distributed a great variety of files, such as music and movies, in addition to games. Rehn (2004) describes how the warez scene adopted the small NFO file, distributed with the software, as a means of communication, which plays a role similar to crack intros.

These days, crack intros have become a target for preservation efforts by the community and can easily be browsed on enthusiast websites, such as the C-64 Scene Database (n.d.), Cracktros.org (n.d.), Intros.c64.org (n.d.), and Pouët.net. Classic intros have been re-created and imitated by the WAB—We Are Back project (n.d.), which lets visitors view replicas of the originals running real-time inside a Web browser window. Such endeavors highlight the cultural importance of crack intros and demonstrate how they have already become nostalgic objects for the hobbyists of the late 1980s and early 1990s. The preservation of demos, crack intros, disk magazines, and similar artifacts is no different from the preservation of digital games or new media art. The challenges and solutions proposed by Wands (2006), Paul (2007), and Newman (2012) are well in line with the efforts of the scene that is trying to ensure the longevity of its digital heritage (for examples of demoscene-related preservation, see Hastik, Steinmetz, & Thull, 2013; Reunanen, 2010; Woods, 2008).

Crack Intros as Creative Artifacts

Questions related to the role of creativity in the making of digital artifacts have been raised by researchers exploring the digital art world (Cham, 2009; Grau, 2003; Mealing, 2002). Likewise, the issue of creativity was extensively discussed on the scene forum, in line with the practices of the community. One of the defining rules of the scene was that a group should be creative in three respects: the speed of software acquisition from suppliers, the practices of copy protection removal, and the making of audiovisual content for crack intros.

There is a certain resemblance between the social features of the graffiti scene and the cracking scene. Success in the cracking scene requires proficiency with both copy protection removal and complex audiovisual effects programming; but it was also necessary to "develop a style" (Lachmann, 1988, p. 237). Howard Becker, in his study on social deviance, claims that deviance depends on the communication of the behavior to a particular relevant social group: "The deviant is one to whom that label has been successfully applied; deviant behavior is behavior that people so label" (1963, p. 9). Delinquency and deviance are common themes in youth and subculture studies, dating back as far as the 1920s (Hodkinson, 2007). Crackers intentionally labeled themselves as deviants to gain subcultural capital by emphasizing the illegality of the practices of cracking and game distribution (for further discussion on subcultural capital, see Thornton, 2010). One of the synonyms for a cracker, popular among the community in the late 1980s, was "illegal guy," and, likewise, the cracking scene was sometimes referred to as the "illegal scene" (Wasiak, 2012). Crack intros were a crucial element of performing deviance in the

software pirates' social world (cf. Blackshaw & Crabbe, 2004). For instance, sometimes intros included claims about challenging big companies by removing complex copy protections:

> THE NEW PROTECTION'S TIME IS ALREADY OVER, AND THE BRAINY REBELS AMONG US WAIT FOR THE EVER SO SLOW REACTION OF THE BIG COMPANIES! YOU MAY START TO PANIC, MY DARLING, PANIC, FOR THERE'S NO PROTECTION AGAINST US! WAITING FOR THE SLOW MOSTER'S MOVE UNTIL NEXT TIME, YOURS TRULY ANTITRACK/LEGEND SIGNING OFF! (*Shadow of the Beast* game crack intro, Legend, 1990; see http://csdb.dk/release/?id=39988)

To gain fame, a cracking group was supposed to manifest their skill by copy protection removal, but they were also supposed to communicate their endeavors in a well-defined way, by incorporating crack intros with a recognizable look. Likewise, graffiti enthusiasts communicate their social position with the act of deviance by making graffiti in prohibited, well-guarded, and inaccessible urban sites and by displaying creativity with a personal visual style. As noted by Lachmann (1988) and MacDonald (2001), the combination of both features, the illegality and the visual style, was necessary to become recognized as a successful author in the graffiti scene. The first "cracked by" signatures added on software welcome screens share a communicative function similar to graffiti tags with recognizable statements such as "Kilroy was here."

A brief visual historical analysis of crack intros can be useful for several reasons. First, it provides insight into aesthetic appropriation strategies of computer subcultures. Second, it helps to trace the development of a distinctive set of stylistic elements, which, in turn, not only influenced game programming but led to what we know today as the demoscene (Reunanen, 2014). Third, it illustrates how the self-image of the cracking scene changed over the years from a loose collective of home computer users reverse-engineering software into an efficient network of pirates who were competitive in delivering fast and reliable cracks as well as in creating their own brand and programming innovative visuals.

One of the first intros to feature animated elements was released by German Cracking Service in 1984. The three letters "GCS" emerge from the top of the screen, split up, and follow an angular path before moving to their final position (shown in Figure 2). Probably inspired by the moving typography of TV commercials or station identifications, the floating letters introduced an element of suspense. As opposed to being a simple text message, the display of the cracking credits became a dramatized experience.

Figure 2. German Cracking Service crack intro, C-64 (1984). Source: Authors.

The GCS scheme returned in intros from Dutch Software Group (DSG Cracktro, 1984; see http://csdb.dk/release/?id=59084), Bert (Bert Cracktro, 1984; see http://csdb.dk/release/?id=60129), Swedish Cracking Crew (SCC Cracktro, 1985; see http://csdb.dk/release/?id=18466), and other releases from 1984 and 1985. Various visual styles existed, ranging from stripes resembling national flags of the cracking team's origin (this heraldic format was popularized by sports computer games such as *Summer Games* by Epyx) to simple hand-drawn graphics or logotypes built on an extended text character set and, sometimes, static noise produced by randomly changing screen colors.

Groups such as ABC and Terrasoft Inc. released some of the most experimental intro designs, but 1985 marks the end of the initial trial-and-error-phase and the prevalence of specific elements that more or less formed a basic layout for cracker intros. This included, almost always, a black background, a logotype that was no longer displayed using a simple character-based font but done as a pixel graphic, several lines of static text, and a scroller at the bottom of the screen. Long introductory phases of letters floating around were abandoned in favor of short animations supported by sound effects, such as group logos sweeping in with a wind noise or unfolding in a deep sawtooth wave, or spelling out the credits synchronously with the sound of typewriter strokes (Botz, 2011). This composition concept was heavily

inspired by the opening screens of contemporary computer games (Reunanen, 2010), but it was stripped down to a characteristic formula.

While keeping to the basic disposition, it gradually became a matter of innovation to put as much screen content as possible in motion. Animated scenes were not easy to implement, because the average 8-bit hardware was usually limited to moving small objects across the screen, such as spaceships, projectiles, and aliens in a computer game (Montfort & Bogost, 2009). However, careful low-level assembly language programming made it possible to change screen properties such as colors or horizontal shifting while the raster beam of the TV monitor drew the screen. This was used for creating "raster bars," resembling massive horizontal metal pipes, either static or oscillating up and down, or "colorcyling" text lines and logotypes. An example of this style can be seen in the *Dynamic Duo* intro from 1986, made by Flash Cracking Crew (see http://csdb.dk/release/?id=54050). Line-per-line adjustment of horizontal screen shifting applied a rippling or waving effect on logos, as in the *Pulsoid* crack intro by Ikari (see Figure 3).

Figure 3. Intro used in several games cracked by Ikari on the C-64 (1988). Source: Authors.

Competition within the cracking scene had an important impact on the concepts of cracktro programming. The innovative value of an intro was a matter of not merely well-balanced design and skillfully executed graphics but properties that could be measured and increased, such as more colors, bigger logos, or smoother movement. Constantly expanding the parameters of the contemporary standard, intro programmers needed to go beyond the limits of standard programming techniques and discover tricks to be applied to the graphics hardware, forcing the video chip into unintended behavior. For example, telling the video chip to start drawing the screen at the wrong position could result in a flexible routine for moving large graphics across the screen quickly (*Hotline* intro, Hotline, 1988; see http://csdb.dk/release/?id=99706).

One group concentrating heavily on hardware tricks, named the 1001 Crew, was the first to make the whole screen border of the C-64—the broad frame around the display area which normally could not contain anything but a flat color—disappear. The 1001 Crew made it possible to place graphical elements inside the border, literally extending the display capabilities of the C-64 (*Amazing*, 1001 Crew, 1986; see http://csdb.dk/release/?id=742). This discovery was important for the scene, because it encouraged the 1001 Crew to release the production as stand-alone, without a cracked game. The technical stunt empowered the cracker intro to go solo, and to be later called a *demo*.

In 1986, the first cracker groups on the Commodore Amiga appeared (see Maher, 2012). The basic scheme of a cracktro did not change at first, but with increased processing power and graphical capabilities, visual effects were easier to achieve and were amplified by the flexible color management, which allowed for seamless gradients between background colors and the option to move more and larger objects around. The option to choose from a palette of 4,096 colors also enabled better solutions to graphical challenges, such as metallic reflections. Flat letters and logos turned into polished chrome (see Figure 4), and for about two years, cracktros on the Amiga looked as though they were cut out of metal (Botz, 2011).

The first substantial addition the Amiga scene contributed to cracktro aesthetics was three-dimensional vector graphics. The development of various display routines took place almost entirely in demos, progressing from simple line drawings to flat-filled and, finally, shaded 3-D objects (Tasajärvi et al., 2004). The technique was easily adapted to crack intros, where pixel-based graphics were replaced by 3-D logotypes rotating in the middle of the screen or line vector scrollers emerging from the distance (see Figure 5).

Figure 4. Crack intro by Ackerlight with raster bars and metallic letters, Amiga (1988). Source: Authors.

Perhaps the most important contribution of the Amiga scene was the introduction of a new awareness of design principles. Previously, composition schemes and color selection had been a direct result of internal programming logic and technical implementations such as the direction of the TV raster beam. The new design attitude dismissed the old standards and drew inspiration from print media and movie titles. Carefully selected color palettes replaced rainbow-colored gradients and black backgrounds, as shown in Figure 6 (Polgar, 2005; Reunanen, 2010). Pixel artworks, logotypes, and 3-D objects were subtly shifted away from the center of the screen (see Figure 6).

The visual style of Amiga cracktros had a major impact on the aesthetics of future cracking scenes such as those of the IBM PC and game consoles. Communicating the act of cracking remained the main purpose, and the visual form of the crack intro served as an advertisement within the scene. Visual techniques were aimed at proving both mastery in the programming of a computer's video chip and the group's creativity. By demonstrating such skills, crackers communicated with their peers that they had

"developed a style" (Lachmann, 1988, p. 237), thereby increasing their subcultural capital (Thornton, 2010). The next section explores how crack intros merged visuals and peer-to-peer communication.

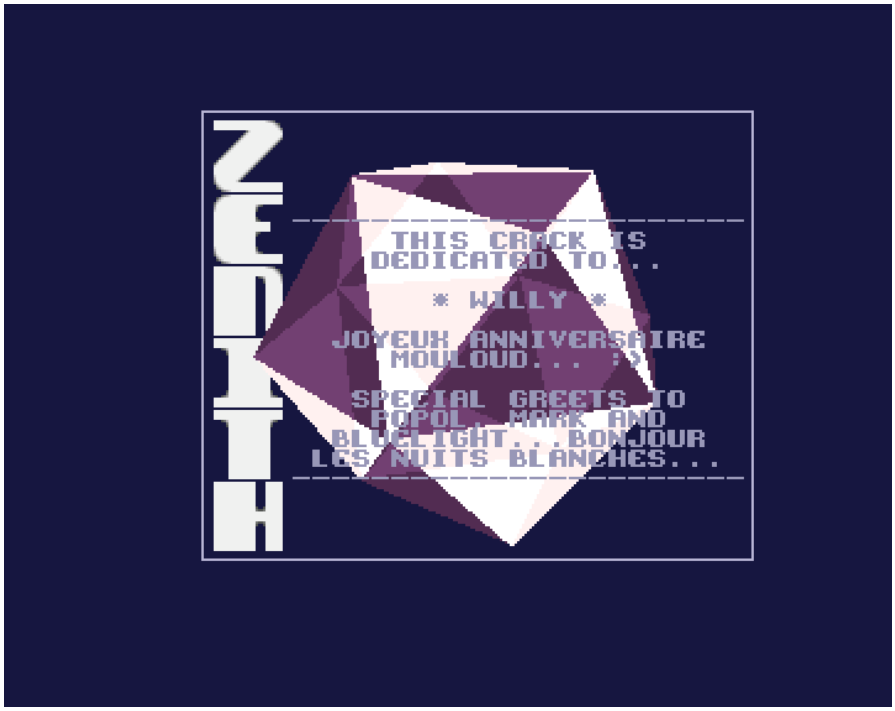

Figure 5. Crack intro by Zenith with a rotating three-dimensional object, Amiga (1993). Source: Authors.

Figure 6. Crack intro by TRSI, Amiga (1993). Source: Authors.

Crack Intros and Communication

Crack intros played a significant role in spreading the popularity of the cracking scene (Vuorinen, 2007). They also provided the audience with a sense of difference from the mainstream. Sarah Thornton (2010) describes how, in another context, club culture shaped a similar aura of "being underground" by, among other means, creating party leaflets and VJ presentations that shared a certain visual code, with the purpose of communicating to the partygoers that they belonged to the imaginary "underground scene." Paper-based zines are another closely related phenomenon, common among many fan cultures (Duncombe, 2005, 2008).

Crack intros played a similar communicative role. Most notably, the greetings included in scrollers (lines of text moving across the screen) were intended to be read, reacted to, and appreciated by other members of the community. An article in *Maggy #11* (1991), a diskmag, explains the role of greetings as follows:

> In almost every demo, intro or other product what can be imagined, you can see so-called "greetings." In other words, some person or group is greeting some other person

> or group. It is nice, because that is one way to improve "friendship." But, big BUT, the "greeting"-lists are usually kind of "cool-groups"-lists. . . . One reason to that "group-greeting" I see is some kind of status-thing. You have to show other people how "cool" contacts you have. And there are swappers who only get contacts to get more groups to their lists.

A member of the group Defacto2, which runs a website dedicated to preserving both warez scene NFO files and crack intros, recalled the importance of NFO files as objects that would initiate him as a member of the pirate scene:

> In those days nfos never resonated as much for me as some of the other scene products such as scene "e-zines" (electronic magazines). That might have partly been because I had no idea what I was doing. I spent a significant time hoarding or at least viewing any nfo that I could get my hands on. This was to self-educate myself as to the function, structure and organisation of the scene. So I could at least bluff my way through conversations with other scene personalities. ("Q&a With Defacto2," 2013)

Similarly, members of the cracker scene could relate to greetings as personal messages, and users with no link to the scene could grasp the values of the community by learning how to read the textual and visual codes embedded in the intros.

We analyzed 50 randomly selected Apple II crack screens to chart their communicative aspects and better understand the chronological development from simple screens to more advanced intros. The study was based on Jason Scott's *Apple II Crack Screens* collection, consisting of 794 screens in total. Some of the images are monochrome and color variations of the same crack, so the number of unique entries is somewhat lower. Not many of the screens contain dates, but the cracked games represent examples from the early and mid-1980s, with the first dating back to 1981. See Figure 1 for a typical example of the early screens. We treated the screens as a corpus of text, which could then be coded and analyzed using content analysis as the method (see Krippendorff, 2004).

The most important element of a crack screen is the credits: All 50 screens contain credits of some sort. The most common types are the nickname of the cracker, his or her group, and the group that distributed the cracked game. Quite often the groups were not the same, which reveals that already in the early 1980s there were specialized roles among the pirates. A few even mention separate authors for the screen and the actual crack. Clearly, the early crackers were interested in gaining recognition among their peers, and making their names visible in the games that were circulated among the community was a good way to achieve visibility. The second most common theme found in the screens (47 cases) is the name of the game itself, which is hardly surprising, because most of the screens are defaced game title screens to begin with (and, at times, the crackers ironically left the original copyright statements intact). In the three remaining cases, there is no title in the original game, or the crackers use the space for more important information, namely the credits. As an interesting detail, multiple, often humorous, euphemisms are used for cracking when a game was "unlocked" or "liberated."

Another common type of content is BBS (bulletin board system) phone numbers from where more games could be downloaded. The early, colorful U.S. BBS scene is still little-known, but the personal recollections of O'Hara (2006) and Savetz (2012) provide a grassroots perspective on the Apple II, Commodore 64, and Atari scenes of the time. In total, 28 screens contain dial-up phone numbers, highlighting how communication technology was appropriated early on as part of the U.S. cracker culture. In contrast, European pirates kept swapping software actively on physical floppies until the mid-1990s (Polgar, 2005; Reunanen, 2014). It came as a small surprise that there were relatively few messages sent to other groups or crackers. As noted earlier, greetings became a fundamental practice later on. Messages typically were "thanks" or "special thanks" (25 cases) that were sent to people who had helped in some way with the release.

We ran a similar content analysis for 100 Commodore 64 crack intros from the mid- and late 1980s. The C-64 cracker scene could be considered as the second generation of pirates, and they were the first to produce many technically and visually innovative intros. The massive popularity of that computer—with up to 20 million units sold worldwide, according to the estimate provided by Forster (2005)—also meant that the number of cracks and users involved with the scene reached unprecedented levels. The total number of C-64 intros remains unknown, but the dedicated website intros.c64.org (n.d.) currently features as many as 9,225 intros from 1,980 groups. Reading through individual scrollers one by one using an emulator or a real computer is practically impossible, but luckily the Scrolltexts.com (n.d.) project has recently made available a large collection of automatically extracted scroll texts in a searchable format.

Despite all the possibilities offered by free-form text, most of the scroll texts are very similar to one another. Practically all of them (96 cases) show the name of the cracked game, and almost all (89 cases) show the credits, again highlighting how cracking without getting recognition is not worth the effort. Many of these intros also feature a big group logo, so the scroll texts were not the only place to include one's name (see Figures 2 and 3). As mentioned above, the same intro was frequently reused in different cracks by the same group with a different scroll text. In contrast to the Apple II crack screens, there are plenty of greetings: 64 of the intros offer a list of greetings to pirate friends. In eight cases, the greetings are presented as a group ranking list—one more indicator of the extremely competitive nature of the cracker scene.

Contact advertisements are present in 38 scrollers, some of them featuring the phone numbers of BBSs used. All in all, the amount of text found on scrollers is markedly higher than those on the Apple II screens; some of the greetings lists contain dozens of names. Another difference is the number of personal messages found in scroll texts: Other sceners receive direct thanks and, at times, serious insults. It would seem that, at this point in history, most of the active sceners were already members of a group, since our analysis did not uncover any releases made by unaligned individuals. All the scroll texts are written in English, which underlines the international nature of the cracker circles; the groups were located all around Western Europe and the United States, but they all used English as their lingua franca (see Wasiak, 2014).

Crack intros were by no means the only communication channel for the early pirates. A crack intro is an inherently noninteractive medium that did not let the community debate its current topics of interest, so other media were employed concurrently as well. Diskmags, such as *Illegal*, *Sex'n'Crime,* and *Zine,* were an important medium that also preserves the discussions for posterity (Reunanen, 2010). The same BBSs that hosted illegal games were also a platform for active discussions (O'Hara, 2006; Savetz, 2012). A collection of letters sent by mail-based swappers can be viewed online at Sceneletters.com (Scene Letters, n.d.).

Conclusion

This article explores how a multiperspective study of crack intros, creative pieces intrinsic to illegal software circulation, can contribute to a better understanding of software piracy as a cultural practice. Crackers in the late 1980s became folk devils during the "hacker peril" moral panic in European mainstream media (see Goode & Ben-Yehuda, 2009/1994; Saarikoski, 2004; Thomas, 2003). The study of crack intros shows how, under the media labels of "pirate" and "hacker," there is a complex international community. Dissecting the communicative role of crack intros sheds light on the cracking scene and on the development of an international communication network that predates the Internet era. The historical, artistic, and communicative lenses together reveal a multifaceted phenomenon that goes beyond the mere interchange of software: From the beginning, pirates also cared about style, skill, humor, and recognition. What might have appeared in mainstream media to be crime in the digital domain appears, beneath the surface, to be a highly social activity with its own distinctive traits, perhaps the most important of which is the competitive nature of the cracker scene, which is reflected in almost all of its practices.

Schäfer (2011) has discussed how contemporary participatory culture with various media practices is deeply engaged in the appropriation and remediation of objects produced by the computer and creative industries. A historical analysis of crack intros demonstrates how a community shaped by digital technology established a user culture in which the appropriation of commercial products was augmented with its own artifacts. This study provides a historical background that helps us to understand the roots of contemporary software piracy, which, apart from Rehn's (2004) work, is too frequently portrayed in a sensationalist light rather than objectively. There is a continuum of development from the Apple II crack screens of the early 1980s, to the C-64 and Amiga animated crack intros, and finally to the contemporary minimalistic NFO files of the warez scene to consider with different social and technical lenses. Because many of these objects are now preserved in online databases, it is possible to trace the roots of piracy-related phenomena using not only qualitative but quantitative methods.

Crack intros are still being created for contemporary computers and game consoles. These days, crack intros are separate executable programs that tend to refer to the original aesthetic code, consisting of scrolling text, group logos, and animated objects. In the 1980s, such visuals were largely dictated by hardware capabilities, whereas today's are mainly nostalgic artifacts, considerably different from the hardware-pushing endeavors of the scene pioneers.

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