Chapter Five
From Chromakey to the Alpha Channel

Using digital media to simulate "rough edges, stains, organic textures [and] grunge-retro fonts" can help one avoid the cliché "2.0 look," argues British designer Elliot Jay Stocks. Any popular e-commerce or social media website from the 2000s—Facebook, eBay, Twitter, Google—is characterized by this "look" of "vibrant, high contrast colour; gloss; sheen; bevelled edges; gradients; and soft-focus effects (with a subtle outer glow)" (figure 5.1), all of which Stocks finds aseptic and (too) clean-cut, as voiced in his 2007 tirade titled "Destroy the Web 2.0 Look," presented at the Future of Web Design conference in New York.[1]

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Also in support of anti-aseptic (and even a bit dirty) web design is Russian-born net artist Olia Lialina who, in her 2011 talk "Digital Folklore" given at the New Museum of Contemporary Art in downtown Manhattan, advocated to an audience of hip designers, artists, and critics a future web aesthetic chock full of unicorns, stars, skulls, simple animated GIFs, personal journal entries (she cites one in particular that tracks a man's battle with depression), and naïve, amateur-looking home pages (figure 5.2). When professional web designers emerged at the end of the 1990s, Lialina explains, homepages were suddenly scorned, becoming a "subject of mockery" in the face of the new slick and streamline designs. This new attitude is illustrated by Russian web designer Artemi Lebedev who at the time included "home pages and their creators" on his hate list, next to "boiled onions and the Caps Lock key."[2] But for Lialina, going back to "amateur graphics" (and what she has in mind are the web styles and color palettes from the 1990s) resists 2.0's corporate and professional look, which serves as a disinfectant to personal expression. "We are all naïve users at some point," Lialina argues, citing web pioneer Ted Nelson, "and we don't need to be ashamed of this."[3]

Lialina and Stocks propose aesthetic techniques increasingly popular among net artists and web designers who, fed up with corporate slick, have embraced instead retro-gauche and uncomely remixes; a throwback to what was known in net art circles in the 1990s as "dirt style": a low-fi, low-cost, simulated-amateur look, here extended to the brightly colored web graphics and video mashups of the 2000s. The 2011 poster for the *Kitsch Digital—Three Decades of Interferences on the Web* exhibition nicely illustrates this retro-dirt style aesthetic: sincere, a bit messy, possibly critical, and always playful (figure 5.3).

A distinction must be made, however, between the "original" dirt style net art from the 1990s on the one hand and the new-school dirt style of the 2000s on the other. The former emerged prior to the dot-com gold rush, exhibiting dirt in part due to technical limitations, because web browsers and video games

5.1 Buttons with precise gradients illustrate the typically clean, smooth, and semi-translucent "Web 2.0 look."

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were graphically and logistically crude by today's standards, but also for stylistic ones. This first generation includes net artists like JODI, Olia Lialina, Cory Arcangel, and Keith and Mendi Obadike, all of whom sport a "hacker bravado," as Bruce Sterling puts it, in contrast to the new school dirt style's "gooey and ductile" aesthetic; "all [simulated] spray cans and airbrushes."[4] The distinction then is that the latter appeals to a disjunctive and mashed-up look for reasons of *style* and *effect*, not out of technical necessity. Second, the recent dirt style new media art appeals more to, and from within, a context of social media culture, user-friendly software, the commercial Internet, and amateur media production, after the rise, fall, and rise again of the dot-com bubble. Recent dirt style new media art is inclusive of a variety of practices, from net art to mash-ups, glitch aesthetics, data bending, digital error, datamoshing, the work of Beige (a collective of new media artists who maintain "low level" programming in their work), the "New Aesthetic" and "Dirty New Media."[5]

Alternatively, both generations of dirt style may be placed under the broader rubric of postmodern aesthetics or, more narrowly, what Friedrich Kittler informally terms the "aesthetics of interference," by which he implies a set of stylistic techniques that intentionally deploy machine noise, distortion, and clashing elements. In this regard, historical precursors would include the work of artists like Nam June Paik, Dan Sandin, John Cage, the Cabaret Voltaire, and Dada. In fact, when Kittler used this phrase in 1999, it was in allusion

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to Paik's distorted and "sloppy" machine aesthetics (see chapter 2 for more on Paik).[6] And while this lineage is an important one, my discussion of dirt style in this chapter is limited to dirt style digital aesthetics and Internet art produced after 2000, and in particular, the digital video and net art of the Paper Rad collective.

What happens then when these so-called anticorporate dirt styles are placed in the broader context of the history of digital compositing in the moving image? Does this history help explain the current popularity of dirt style mashups and layering aesthetics as opposed to traditional montage edits? Do such anti-slick "amateur" techniques suffice as critical models? And more pointedly, is it desirable to see a future Internet inundated with (simulated) dirt and loud color combinations that emulate the trashiness of cheap consumer culture, simply because they oppose clean, corporate professionalism? Moreover, do such amateur-looking styles actually *oppose* corporate professionalism, or are they simply the elbow grease, used to ease in the next wave of social-media styles and services?[7] And finally, what does this taste for inaccurate and imprecise media suggest about digital culture and our desires in it?

Fortunately, digital compositing, which is the primary image manipulation technique used in web design and digital imaging, emerges from the history of blue screen and chromakey and through these histories of the moving image electronic color may be used to chart the development of these contemporary techniques and practices.[8] In this chapter I analyze the history of chromakey, from

< **5.2** "Rainbow Glitter." In contrast to the clean-cut 2.0 look, net artist Olia Lialina advocates a dirt-style approach rooted in web glitter and animated GIFs.

5.3 Poster image from the digital art exhibition, "Kitsch Digital: Three Decades of Interferences on the Web," 2011. The image illustrates dirt style's mashed up, kitschy, low-fi aesthetic. Curated by Helena Acosta and Selena Rama of Producción Aleatoria. Barcelona, España.

its prehistory in blue screen through the alpha channel and its instantiation in digital compositing and web aesthetics, or the "2.0 look" and its counterpart in dirt style. Together these narratives help explain how digital compositing–*qua*–remix have become predominant in media aesthetics. In particular, my arguments focus on the way in which pioneering video artist Peter Campus introduced a new approach to electronic imaging *rooted in the logic of space versus time*, which, I argue, foreshadows the logic and aesthetic of digital compositing, linking it directly to the 2.0 look. At the same time, the path connecting Campus' work to 2.0 styles turns on the introduction of the alpha channel in 1984 (made possible after the development of frame buffers and color lookup tables in the 1970s). Once the alpha channel was standardized in computing and easy-to-use GUIs, clean, slick, and corporate-looking designs became normative and antistyle dirt styles emerged. My arguments in this chapter are thus less concerned with the technical history of the GUI or media specificity (I move from film to video through digital graphics and Internet aesthetics) as they are with overall stylistic tendencies that a new generation of artists and digital designers have employed in relation to chromakey and moving image compositing. (For other histories of compositing in art or photography, see endnote 8.)

Finally, the chapter has a two-fold function. As the last chapter in part 2, it adds to and completes the book's history of experimental uses of color in aesthetic computing after 1960. While the synthesizer (chapter 2), numeric color-coding (chapter 3), the frame buffer (chapter 4), and other color systems introduced new and innovative ways to work with color, limitations grew thick and quick. The alpha channel, discussed in this chapter, was introduced as a viable solution to a number of these limitations, especially to the slow and bulky frame buffer. After my analysis of the alpha channel in this chapter, which is to say the advent of fully automated and functional digital color systems for personal use and mass consumption, the chapter segues into a set of stylistic analyses of digital color that continues through part 3 (chapters 6 and 7) and the postscript, where I will have more to say about the significance of this shift into a new style of colorism in new media art in the 2000s.

Blue Screen Window Space

Chromakey is a special effects technique that involves *removing color from an image so that another element may replace it*. In a weather report on a news program the reporter is recorded against a blue or green background, which is then "keyed" out and another image is recomposited into the background, usually with the weather map. In short, with chromakey, color becomes functional: used only to negate itself. A "blue" is useful only to the extent that it can be identified as "blue," not as a visual or optical blue, but as a particular wavelength and frequency that is isolated and removed so the image can function as an element of another composite.

Chromakey is both similar to and distinct from the special-effects technique known as blue screen. Blue screen is a predecessor to chromakey, the primary difference being that blue screen is native to film whereas chromakey is native to video. Blue has long been the color of choice in the film industry because it is the most distinct from human skin tones, making the selection of the human figure from the background much easier.[9] One can use blue screen techniques in video, though the blue often becomes green because, as Fred Barzyk of WGBH notes, too many actors have blue eyes and this becomes a problem for any blue-eyed actor taped against a blue wall (though one wonders if this would not also be the case for green-eyed actors). At the same time, Scott Billups suggests the issue is more about contrast, arguing "blonds on blue, everyone else on green."[10] Because blue is opposite to yellow-orange, green is opposite to red, and all hair pigments besides white-blond contain red, it would therefore be easier to differentiate between foreground and background when one uses green, save for the case of blonds. Further, because all humans contain about 70% red pigment in their skin, regardless of race, green or blue screen is always better than red. But regardless of the nuances of these debates, what is of interest here is the *mechanics* of chromakey and blue screen—how color, as function, is managed and controlled in the moving image.

While chromakey appears, correctly, to emerge from the history of cinema's special effects, it is also dramatically distinct from it, both materially and technically. In order to show this difference, it is necessary to take a brief segue through the development of blue screen in cinema.

What freshman-level film class would be complete without at least a mention of Sergei Eisenstein's famous Odessa Steps sequence in his 1925 *Battleship Potemkin*? The scene is esteemed for its sophisticated use of montage to create a charged dialectic between the Russian peasants and the powerful czar. Eisenstein created the montage by "cutting and splicing" segments of different filmstrips and then reassembling them into a "final cut." Within each of the frames on the filmstrips (twenty-four frames per second in sound film, eighteen frames per second in silent film) the contents remain static. Only a segment or strip of film can be rearranged into a new chronological sequence. This is only one of thousands of montage sequences in cinema, which is to say almost any example from cinema could illustrate how *montage*—which is about arranging elements in *time*—is native to and predominant in *filmmaking*. While montage was a popular editing and effects technique used throughout the twentieth century, its legacy has little to do with the history of electronic color and the new aesthetic paradigm opened up through digital media.

Instead, a second and more pertinent axis running through this history of the moving image is *spatial compositing*, which can be identified in the histories of both film and computing. In computing, what we now call windows, layers, or multiple-tiled sections were first introduced in 1968 by Douglas Engelbart through his NLS (oNLine System) developed at the Stanford Research Institute

(SRI), also the subject of his 1969 doctoral thesis. NLS presented multiple windows through which users could access complex tools for drafting, publishing, email, shared-screen collaborative viewing, cataloging, project management, address books, and all source code development and maintenance. It even included a wooden computer "mouse" that ran on a metal roller.[11] Other similar systems include COPILOT, produced at Stanford in 1974, and the EMACS text editor with windows developed at MIT, also in 1974. Early commercial computer systems that implemented this windows-logic into image-space include Lisp Machines Inc. (LMI) and Symbolics Lisp Machines (1979), which grew out of MIT's Artificial Intelligence Lab projects.[12] The 1981 Cedar Window Manager from Xerox PARC was one of the first tiled window managers, followed by the Andrew window manager developed at Carnegie Mellon in 1983 and funded by IBM. Systems like the 1981 Xerox Star, the 1982 Apple Lisa, and of course the Apple Macintosh, introduced in 1984, further popularized the spatial logic of the window interface on a mass scale.[13] While this brief overview only superficially addresses a few key systems in early computing and demands more comprehensive treatment elsewhere, it nonetheless serves as an important preface to my discussion of the spatial logic in digital compositing.

In film, beginning as early as the end of the nineteenth century, filmmakers sought techniques to *spatially* composite image elements within a single frame. These methods, as Anne Friedberg has noted, involved developing complex mattes and masking techniques and then combining them into one unified image space. To name only two early examples, there is Edwin Porter and Thomas Edison's *The Dream of a Rarebit Friend* (1906), where the directors employed a blurred split-screen technique to depict a dreamer floating over a cityscape, and Lois Weber and Phillips Smalley's *Suspense* (1913), for which the directors constructed a three-way split screen to simultaneously capture three points of view.[14] The unblended composite created a "frame within a frame," a spatial and visual divide within the series of images that were otherwise already divided in time. Another early technique for spatial compositing was the "mirror shot," which used a mirror's reflection to combine images or to project light into inaccessible areas to create superimpositions that could then be used to combine smaller items with larger ones, making irregular shapes appear continuous.[15] Finally, various optical printing and experimental techniques, still used today, allow one to copy one film image, or parts of an image, onto another image through the projection of a master onto copies.

It was not until the 1920s, however, with the introduction of the traveling matte, that one finds a direct link to blue screen. Traveling mattes consist of a transparent piece of film cut into the shape of whatever object the director intends to mask out of the scene. The complement of the traveling matte, referred to as the "holdout matte," stands in for the background of a scene (in digital media, this holdout matte becomes the alpha channel). One of the

earliest uses of a travelling matte is in Linwood Dunn's *Flying Down to Rio* (1934), for which he developed a technique to mask portions of the image during an aviation scene, allowing the final image to depict a row of girls dancing on the wing of a flying airplane (figure 5.4). A similar matte is used to mask out the horse's tail in the *Thief of Bagdad* (1940), though in both cases harsh outlines are cut around the elements (when flying through the air, the horse's tail maintains a sharp blue line around it, making the horse look more like a piece of paper awkwardly glued onto the image). 5.4

In the 1960s, engineer Petro Vlahos developed several techniques to eliminate this imprecision. He mastered versions of blue screen and sodium vapor (yellow screen) techniques used in *Mary Poppins* in 1964, and in this same year won an Oscar for the conception and perfection of techniques for color traveling matte composite cinematography. In 1976, he founded the Ultimatte Corporation in California, where Polish filmmaker Zbigniew Rybczyński soon joined him.

Rybczyński, for his part, developed sophisticated and award-winning composites *by hand*. Siegfried Zielinski describes him as an "artist-engineer

5.4 Still from Linwood Dunn's *Flying Down to Rio* (1934), for which he developed an early technique to mask portions of the image during an aviation scene, allowing the final image to depict a row of girls dancing on the wing of a flying airplane.

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and cinematographic alchemist," an appropriate description given that Rybczyński's intricate handmade techniques foreshadow digital compositing by at least a decade.[16] For example, *Nowa Ksiazka* (*New Book*, 1975) consists of a screen divided into nine squares (figure 5.5). The action starts in the lower right-hand square and slowly begins to appear in the other squares. At first the squares seem distinct and unrelated, yet they are eventually connected by a jolt occurring simultaneously throughout all the frames. Paul Virilio observes that Rybczyński "uses the image as a series of geological layers. He doesn't play with the image as a foundation of form but rather as a kind of geological stack. Each line being a system that can be isolated in the same way that a geologist manages to study each stratum."[17] Meaning is constructed through associations *between* the image-components in space, not in time, and as a result, the piece offers a new way of reading images—not as a linear or chronological narrative, but rather as a set of components within a larger whole; layered composites, distributed across a spatial matrix.

The originality of Rybczyński's work is clear when one compares *Nowa Ksiazka* to Mike Figgis' 2000 *Timecode*, made twenty-five years later, with all the benefits and flexibilities afforded by digital compositing but which nonetheless employs the same effects technique. Also like *Nowa Ksiazka*, Figgis's *Timecode* uses a quake-like rumble that periodically occurs throughout the frames to create a connection between them. As soon as the tremors settle, each character returns to their own affairs and self-directed concerns. This split-screen technique has become increasingly common in television and film production—Figgis' film is only one example among many—but in 1975 it was still a relatively marginal technique, alongside other examples from the avant-garde and experimental cinema.

Another example is *Tango*, for which Rybczyński drew and painted about "16,000 cell-mattes and made several hundred thousand exposures on an optical printer" (figure 5.6). It took seven months to complete the work, working sixteen hours per day. The result was a symphony of composites; numerous people synchronized to precise degrees as they moved in and out of a small room, seemingly unaware of each other.[18] Pieces like *Tango* and *Nowa Ksiazka* and other similar experimental films that use optical printing (like

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< **5.5** Zbigniew Rybczyński, *Nowa Ksiazka*, 1975. The film consists of a screen divided into nine squares. The action starts in the lower right-hand square and slowly begins to appear in the others.

5.6 Zbigniew Rybczyński, *Tango*, 1980. In this Oscar-winning film Rybczyński drew over 16,000 cell-mattes on an optical printer.

VanDerBeek's early work) are precursors to what has become ubiquitous in digital compositing and color grading. Shortly after the film was awarded an Oscar in 1983, Rybczyński turned to video chromakey.

Chromakey: Electronic Compositing

Video is technically, materially, and ontologically distinct from film. If one were to open up a miniDV or VHS cassette tape and begin to cut and splice parts of the magnetic tape to create montage sequences, as filmmakers have done with strips of film for over a hundred years, one would soon find that this hands-on, physical manipulation of the videotape would render the image dysfunctional. Videotape, whether analog or digital, must be manipulated through electronic processing machines. Color information is stored on the back porch of a video signal (the technical term to denote the beginning of each video signal), which can be either amplified or negated, but *only* by way of signal modulation, not physical touch.

A further distinction between *analog and digital* video is mathematical code. When manipulating digital video, one uses a digital computer to compute algorithms that control the image, regardless of whether one is using iMovie, Final Cut Pro, or Avid. However, when using analog video, one may still be using a computer, but there is no transcoding or translation of the electric current into a numeric code to alter the image. Rather, in analog video systems, as discussed in chapter 2, one modulates electronic signals directly. Using a monitor, such as a CRT, an editing deck, panel, or synthesizer, one turns knobs to immediately and directly manipulate the color, measured in frequency and wavelength. For example, blue has a wavelength of 450–496 nanometers, so in order to key out the blue color from an analog signal, one must set the control valve to modulate the signal between 750 nm (red) and 495 nm (green), phase out at the blue levels, and then come back in at 450–380 nm (violet).

Analog keying comes with a host of limitations. First, in isolating the blue in an image, even if one only wants to remove *some* of the blue, *all* of the blue will be removed because the system reads one blue wavelength across the image space, without distinguishing between possible sections of blue. Second, on a technical level, video frames consist of tight diagonal lines that, unlike film, are rendered through an interlaced scanning process where each frame has two fields, divided by diagonal-horizontal lines, each of which is scanned in an alternating pattern at 29.99 or 30 frames per second in NTSC standard. With the advent of HD, interlaced scanning is becoming obsolete as digital video increasingly renders with "progressive scan" algorithms. Regardless, with either progressive or interlaced scanning it is virtually impossible to cut and splice into video frames.

Throughout the 1980s and 1990s, new technical developments like the Scanimate discussed in chapter 2 allowed video chromakey to become commonplace in television shows, music videos, weather reports, and films. Some benchmark projects include John Lennon's *Imagine* (1986), for which Rybczyński built an entire studio space using two blue walls to shoot several sequences;[19] Barry Levinson's famous war fabrication scene in *Wag the Dog* (1997); David Lynch's opening scene to *Mulholland Drive* (2001), a particularly innovative use of compositing to depict alienation in Hollywood (figure 5.7); and Godard's *Histoire(s) du cinéma* (1988–98), for which he used video compositing to show the tensions and contradictions in the multiple histories of twentieth century cinema.

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5.7 Stills from the opening scene of David Lynch's *Mulholland Drive* (2001). This creative use of compositing acts as a metaphor for the characters' alienation.

If traditional cinema creates narrative forms and aesthetic styles through montage, then with electronic compositing, i.e. chromakey, the moving image is fundamentally restructured into an array of color—a matrix of signals—used to manipulate image *space*. The video image, as Manovich notes, shares neither the scale, material logic, structure, nor perspective of the traditional film image. The shift in thinking about the moving image in terms of space versus time, coupled with new developments in electronic imaging, opened the floodgates to a host of new visual styles and simulated environments.[20]

Peter Campus's Three Transitions

With the support of artist residencies at television studios like WGBH in Boston (discussed in chapter 2), KQED in San Francisco, WNET in New York, KTCA in St. Paul, and computer research laboratories like Bell Labs (chapter 4) and the MIT Center for Visual Studies, a select group of artists had been experimenting with chromakey and video compositing since the late 1960s.[21] Nam June Paik, Shuya Abe, Dan Sandin, and Eric Siegel, as discussed in chapter 2, all built their own analog synthesizers to process color signals, which they saw as a vehicle to usher in a utopian future for human and machine consciousness. Throughout the late 1960s and 1970s, the general attitude towards new media, at least in the United States, was "free-flowing, do-anything."[22] There were, however, some individuals who diverged from these normative psychedelic visions to produce highly controlled and deeply conceptual video art. One such person was Peter Campus.

In 1972, Fred Barzyk, then director of the New Television Workshop at WGBH, invited Campus for an artist residency. Since 1966 Barzyk had been running the studio as a venue for artists and engineers to collaborate using such rare and expensive technologies as video cameras, recording decks, synthesizers, switches, and colorizers. Campus arrived with a unique set of ideas about video and its role in the future of electronic art. In those days, according to Campus, artists used video to create one of two things: frenetic and wild composites, as noted above, or "long and rambling videotapes," such as those produced by Joan Jonas, Keith Sonnier, Vito Acconci, and Bruce Nauman, the last of whom remains an inspiration to Campus.[23] Arriving in the art world with a background in commercial television, film, and experimental psychology, Campus could not relate to either of these styles and thus refused to "make long rambling pieces." A testament to this is *Three Transitions* (1973), originally made as a short television commercial consisting of three one-minute intervals to be "inserted as a 'transition' between programs." However, after it was completed it did not get aired on broadcast television as a commercial, as Campus had planned. WGBH told him, "'Well, there's no way that's going to

happen.' They just wouldn't allow it. The station thought they were too weird."[24] It was instead broadcast as a single piece, during a show on "the arts."

In its current form, *Three Transitions* is a six-minute video divided into three short sequences, the first of which uses superimposition and the second two, chromakey. In the first transition, Campus stands in front of a flat yellow screen with his back to the camera. Using a large knife, he cuts through a wall-sized piece of yellow cardboard and as he cuts, the knife appears to be cutting through his body from behind (figure 5.8). The second sequence opens with a close up of Campus' face looking directly at the camera. His fingers begin to touch his face and with each touch he removes a part of his face, or so it seems. As he brushes his fingers over the surface of his skin another face is revealed behind it (figure 5.9). In the third transition Campus holds a photograph of himself, which he then lights on fire, holding it up to the camera as it burns. As the paper burns, the image moves, as if he was burning himself alive (figure 5.10).

Central to Campus' technique is a *shift in thinking about the moving image as a series of frames to be edited in time (montage) to image-components that can be manipulated in space (compositing)*. Some of this is prefigured in Rybczyński's and Vlahos' work, and the earlier uses of blue screen mentioned above.

5.8 Peter Campus, *Three Transitions*, 1973. Video still. Early superimposition techniques are used to carve out video space. Courtesy of Peter Campus.

5.9 Peter Campus, *Three Transitions*, 1973. Video still. Campus' original use of chromakey depicts the way in which new image-layers emerge at the point where he applies blue paint to his face. Courtesy of Peter Campus.

5.10 Peter Campus, *Three Transitions*, 1973. Video still. Chromakey is used to create the illusion that Campus is burning a live image of himself. Courtesy of Peter Campus.

But note that Campus is using chromakey in 1972—a decade before Rybczyński started to use it. Furthermore, with chromakey the shift from temporal cuts to spatial composites is almost prescribed through the material logic of video, a real-time signal processing medium. Campus's work helps us to see the transition in moving image aesthetics from time to space because it forces us to see chromakey as a *material* and *formal* technique of real-time signal processing and *not* as a mere effect that poses as its own content, which is how many of the psychedelic video artists approached it. Moreover, as both Lev Manovich and Anne Friedberg have observed, spatial compositing did not become dominant in mainstream media practices until the 1990s, and thus in Campus' early work one finds a valuable and generally unacknowledged predecessor.

As I note above, chromakey is about removing part of an image, thereby negating color in its phenomenological and sensory form and asserting instead color as an image *function*. In this process, color-as-function turns a so-called image into a dynamic system with subparts connected to a larger whole. This occurs both materially and aesthetically. Materially, because an electronic "cut" is not really a physical removal but a *modulation* of an ongoing series of signals that can be reduced or amplified at any point. For example, in the first transition, when Campus takes a knife and cuts through the wall-sized cardboard, he has already conceived of the final image as two semitransparent layers. During production, two images of his body are recorded, one shot from each side of the wall. In the final image they are superimposed onto each other, making it appear as if he was cutting through his own body. While this is not an example of chromakey, the transition is about approaching the electronic image as a set of malleable parts that can be modulated and manipulated as (virtual) layers in space. As a result, the final composite attains a liquid and ephemeral quality, further emphasized in the second and third transitions, which do involve chromakey.

For the second transition, Barzyk explains:

> [Campus] asked me to record a videotape of his face just looking forward . . . then play that videotape back and then live on camera, chromakey in the picture that had been prerecorded. . . . He started [applying the blue paint to his face] wherever a piece of the other image would show up . . . He was watching on a monitor, so he was constantly checking how he could get his mouth and his eyes lined up with the other image.[25]

The specific location of any blue paint in the third image was fed back into the first prerecorded image. The blue *was* the space where the formerly distinct images met and transformed into a system, a feedback loop that literally transfigured time (the recoded image) into a function of space, or "layer" in the resultant composite. In this way *Three Transitions* figures as a precursor to spatial compositing aesthetics much more so than to the psychological tropes of video narcissism that the piece has otherwise been connected to.

In fact, in stark contrast to those who have written about this work by invoking psychology, Campus claims no special purchase on the subject. The most noteworthy example is art critic Rosalind Krauss's essay, "Video: The Aesthetics of Narcissism" (1976).[26] In this groundbreaking essay, Krauss analyzes several installation, performance, and video artworks from the late 1960s and early 1970s, including Richard Serra's *Boomerang*, Joan Jonas's *Vertical Roll*, and installations by Bruce Nauman. She aligns the video medium—through its capabilities for real-time feedback and signal processing—with the psychological condition of narcissism. Narcissism, in Krauss's account, refers to the way in which a video artist's or performer's body is situated in the circuit between monitor and camera. When the circuit is turned on, one's image is reprojected on a cathode-ray tube and like a mirror reflects the "self" back to oneself. As a result the subject severs all relations to the past or future, creating a closed system wherein one is looped into the hypnotic, auto-amputated spell of one's (misrecognized) self-image.[27] Krauss concludes that "narcissism is so endemic to works of video," it may be "generalize[d] as the condition of the entire genre."[28]

Campus's work is discussed in the last few pages of Krauss' essay. She focuses on his early pieces: *mem* and *dor* (both 1974)—two installations consisting of a triangular relationship created between a video camera, an instrument that will project the live camera image onto the surface of a wall, and the viewer in front of the wall—which, Krauss argues, "acknowledge[s] the very powerful narcissism that propels the viewer forward and backward in front of the muralized field."[29] Because *Three Transitions* also includes a real-time feedback loop, the artist-performer placed at the center, and the use of video chromakey as a mirror to guide the artist within the image-space, the piece structurally and formally meets the requirements for Krauss' analogy to narcissism. And indeed, after Krauss's pivotal essay, critics analyzed Campus's work, and *Three Transitions* in particular, in terms of the psychology of narcissism. Martin Friedman, for instance, wrote in 1979 that "[w]hile exploration of [the] psyche is certainly the essence of many contemporary artists' approach, Campus carried this to obsessive extremes, particularly in a series of psychological self portrait video pieces made in the early 1970s."[30]

The problem with the theory of video and narcissism, however, is twofold. First, the argument turns on an almost imperceptible but nonetheless problematic merger between video art and the norms and conventions of art history. Unlike the history of new media or computer art, in formal art criticism it is normative to speak about an artwork in terms of "re-presentation" and the "internal qualities" of a medium or an "image," in relation to older re-presentational media. As Krauss puts it, Campus' work uses "the [video] medium as a subspecies of painting or sculpture."[31] John Hanhardt and Maria Christina Villaseñor writing in 1995 concur that *Three Transitions* "extend[s] the convention of self-portraiture and the illusions of representational image making through

the unique properties of the [video] medium."[32] But *extending* the representational discourses of painting, sculpture, and photography through video is not exactly what Campus was hoping to accomplish with *Three Transitions*. In fact, his goal was to obliterate them. With each of the three segments, Barzyk explains, Campus' "whole point was to go from painting to sculpture and photography and argue they were all going to be wiped out because of video."[33] The first sequence, for instance, takes a knife up to the "canvas" and cuts through both the support and the artist who uses it. With the second sequence Campus was trying to "give an electronic sense of being three-dimensional, by having two faces . . . he was sculpting with the chromakey," showing how electronic color modulates—i.e., sculpts—virtual space in ways superior to, and more flexible than, sculpting in physical space. In the third sequence, Campus sets the blue piece of paper on fire, communicating how "he was going to get rid of photography, so that you are left only with electronic video."[34] *Three Transitions* broke from these "representational genres" conceptually and materially (though arguably such a break could also affirm a connection).

Second, in order to accept the link between video and narcissism, one must also accept the hermeneutic presuppositions of Western psychology and with it, its theories of the liberal-humanist subject. In contrast to humanism, and as I have argued previously, humans exist in and through technics and must therefore be approached and understood through the technologies that we use and develop, and which in turn create us. Moreover, because video is a form of (analog) computing, it needs to be interpreted through the material critical frameworks opened up by cybernetics, and subsequently the redefinition of the human that accompanies it, a process that I call "hyperdividuation."

Hyperdividuation

My concept of "hyperdividuation" performs a double labor: denoting both a new kind of techno-subjectivity that draws on the material logic of cybernetics and information circuits, and second, a subsequent shift in sociality and socially mediated practices. Beginning with the first, cybernetics, as noted in the introduction, involves the study of communication systems in humans, animals, and machines and holds to two guiding logics: feedback and information processing.[35] The former, central to *Three Transitions*, opens the door to an analysis of the human and the machine as interwoven systems, versus traditional "depth" models of the individual and autonomous ego or psyche. In a video feedback circuit a subject is mechanized, becoming a relatively anonymous node within the larger system. The emphasis shifts from a distinct observer-subject looking at a visual image (object)—a precondition for narcissism—to an immersion and dissolution in the system.

As pioneering cybernetic-video artist Paul Ryan puts it, in a video feedback loop, one transmits false notions of an interior "self" into the (externalized) video loop in a process of "self-cybernation." Ryan's work with *Radical Software* and Raindance in the late 1960s revolved around the figure of the Moebius strip, which encapsulates the process of infolding intrinsic to the feedback loop. In the "Moebius Strip," Ryan writes, "the outside is the inside. The inside is the outside."[36] In a video feedback loop, as with cybernetics, the metaphysical distinctions between subject and object collapse into a kind of techno-ecosystem. Similarly, Katherine Hayles argues that with cybernetics, subjectivity becomes a hybrid human and machine reality wherein virtual and actual are deeply intertwined and to some degree indecipherable: "feedback loops between culture and computation create a co-evolutionary dynamics in which computational media and humans mutually modify, influence, and help to constitute one another."[37] Experience is instantiated *through* human-machine interaction, not before or after. In cybernetics and video feedback, no single term, object, or identity is prioritized or given meaning exclusive of or prior to the system.

If a subject cannot be prioritized, then neither can his or her self-image, which of course depends on *visual* perception and as such, it is the essential ingredient in the psychological myth of Narcissus. In the myth, metaphysical delusions are bolstered by one's *imago*, or visual reflection, *and nothing else*, which is to say, through an exclusively optical and visual regime. In contrast, with electronic systems only a degraded and highly mediated "self" is made possible *after* one has entered the (cybernetic) feedback loop and post-optic information exchange. (In the next chapter I further elucidate and theorize the distinction between the optic and post-optic.) Ryan explains, "I would avoid the term visual to describe video . . . [with] video images the effect is primarily kinesthetic or proprioceptive . . . Video is about perceiving events with the nervous system, not visualizing in a pictorial way."[38] Video is first and foremost a cybernetic system, not a visual or optical medium (as I argue in chapter 2).

Krauss's theory of video and narcissism, which depends on visual, psychological, and humanist theories of the individual, may now be supplanted by a set of metaphors more appropriate to cybernetics and aesthetic experience in the information age. For this I propose "hyperdividuation." Hyperdividuation does not imply a fragmented or poststructuralist, schizophrenic subject, but instead a depersonalized subjectivity actively recomposed (and composited) through disjunctive human-machine exchanges in rich, socially mediated information systems.[39]

Because cybernetic splitting and hybrid subjectivity are progressively amplified in newer new media—through the Internet, cell phones, RFID tags, PDAs, social media, and screen technologies—I adopt the word "hyper." Similar to Hayles' theorization of "hyper attention," my use of "hyper" in hyperdividuation denotes a doubling of attention systems, a "switching focus . . . between

different tasks," which is characteristic of a subjectivity that now prefers "multiple information streams," seeks a high level of stimulation, with a "low tolerance for boredom." But instead of classifying such habits and behaviors as "disorders," for which medication is prescribed, I want to here highlight the positive and productive attributes of these subjectivities (however, in chapters 6 and 7 and the postscript, these same attributes are subject to a much darker critique). For instance, two benefits to hyper attention, Hayles explains, are increased "environmental alertness and flexibility of response," both of which are beneficial traits and coping mechanisms in a world that demands constant surfing, remixing, and compositing of data streams and realities. Hayles also contrasts hyper attention with "deep attention," a cognitive style associated with "concentrating on a single object for long periods," or, in terms of aesthetics: a single static image interpreted by a self-reflexive individual; a so-called master of his or her own (ego) reality.[40] In contrast to theories of the autonomous, self-sufficient individual, hyperdividuation is extra-ordinarily fragmented and dispersed through space, time, and media situations.

Stiegler's discussion of psychic and collective individuation, as linked to the notion of "attention," is also applicable to hyperdividuation. For Stiegler, attention could mean care, simply paying tribute, and more often than not, the externalization of history and experience into technics and specific technologies referred to as *attention forms*, which link psychic and collective individuations: "attentional forms generate the circuits of transindividuation that thread and weave together the process of collective individuation." Attention forms are conditioned by material techniques and especially through "industrial technologies" beginning in the modern era. For Stiegler, attention forms seem to replace media specificity. In the current age, he writes, our "attention and relational technologies develop via *folksonomies*, that is, collaborative metadata."[41] Hyperdividuation then is also an offshoot of Stiegler's broader concept of attention forms that mediate between individual and collective, here applied exclusively to new media interfaces and digital imaging practices.

The second part of the term hyperdividuation—"dividuation"—draws from phenomenology to invoke broader shifts in technically mediated social relations. Heidegger's phenomenology, for one, offers a view of the subject grounded in material fact, not in psychological ideals, ideas, or essences. Being is always already in the world. For Merleau-Ponty, it is also only through the qualitative, factical being of an anonymous and depersonalized sensory consciousness that existence is accessed or known:

> If I wanted to render precisely the perceptual experience, I ought to say that one perceives in me, and not that I perceive. Every sensation carries within it the germ of a dream or depersonalization such as we experience in that quasi-stupor to which we are reduced when we really try to live at the level of sensation.[42]

The "facticity" of matter (*hyle*) is privileged over theoretical abstraction or ego-identity. Anonymity and depersonalization become the basis for life experience in what I have called the algorithmic lifeworld.

This active exchange between (collective) world and being is also what makes hyperdividuation sympathetic to Bernard Stiegler's 2009 theory of individuation as "phase-shift." To formulate this notion, Stiegler turns to Gilbert Simondon's concept of "transductive relation," which is, as Simondon defines it, "that which opens up possibilities of internal resonances in a process of psychic and collective individuation." Simondon's concept appeals to Stiegler because it allows him to think of individuation *as a formative process* that occurs *through* constitutive tensions between the individual and the group.[43] Stiegler uses the concept to reread Heidegger's existential analytic of Dasein as neither "denigrat[ing] the collective" (the "they") or "as a decision limited by being-towards-death." The "they" that Heidegger appears to dismiss in Stiegler becomes a normatively positive "we." Collective experience comes from individual experiences that have become collective through a process of *transindividuation*.[44] The result—unbeknownst to either Heidegger or Simondon—is Stiegler's "transdividuation," an individuation characterized by a "*composition* of forces"; a composed and composited "transdividual" that provides a theoretical correlative to my notion of hyperdividuation.[45] In other words, there is an ongoing exchange (mediation) between the individual and the collective in order for *transindividuation* to exist.

Finally, my use of "dividual" in "hyperdividuation" is inspired by Gilles Deleuze's and Simon Critchley's uses of the term. While they both use it in distinct ways, the hybrid (composite) version would be something like an anonymous, informatic subject who is consistently divided—falling and failing—in the material world, but nonetheless alive and dynamically engaged in feedback loops, data exchanges, and organizational patterning. My Deleuzian-Critchley composite is also responsive to an "infinite demand," as Critchley puts it, not so much in terms of ethics but in the accelerated physiological, psychological, and processing demands placed on life in an information-intensive lifeworld.[46]

Hyperdividuation is thus a philosophy of technology and a technical being-in-the-world with others that complements material shifts in new media production, ones that will only become increasingly common in the years to come. "The person of the future," Flusser writes in 1985, "will be absorbed in the creative process to the point of self-forgetfulness." But at the same time, he warns, it is "wrong to see this forgetting of self as a loss of self." To the contrary, the subject of the future is not an ego-driven subject but instead a self that gains being through creative performances at "the keyboard," which is to say, when and where the self (Stiegler's "who") becomes collective (the pejorative "what"). In this process, the new subject, the former "I" of the "eidetic reduction," Flusser writes, "will be realized for the first time"—a provocative

though perhaps uncritical statement implying that blanket positive or negative evaluations must be suspended (which Stiegler's "what" fails to do) and that a true transcendental reduction—the sustained reality of the mystical visions of video synthesis circa 1969—will in the future be realized (not just theorized, as Husserl did) through technics.[47]

Before linking hyperdividuation to dirt style compositing in my conclusion, we must first move through the digital instantiation of chromakey in the alpha channel.

The Alpha Channel

The three primary colors of any additive (light-based) color system, such as a computer monitor, television set, projector, or rainbow are red, green, and blue (RGB). Any other color that appears on or in these media is always a combination of these primaries. In digital computing, each color is indexed by a numeric value in a lookup table (LUT). When this value is sent to the display terminal, it is translated through a frame buffer (the history of which I provided in the previous chapter) that translates color values into pixel values (or "point samples") that can be rendered on a video screen or monitor. Contrary to common thinking, a pixel is *not* the little square one sees when one zooms in on a graphic.[48] This myth derives from computer graphics practices in the 1970s, in the era before the frame buffer, when images were clunky, difficult, and time consuming to render. Throughout the 1970s, the main problem with frame buffers was their incredibly slow line-by-line rendering process (essentially a one-to-one correspondence between screen color and pixel value). As Richard Shoup describes the situation, "[i]n raster scan display systems . . . the cost of providing animation has usually been prohibitively high due to the large bandwidths involved in changing a picture rapidly."[49] Further, the results of this slow and time-consuming process were inelegant and produced images with jagged hard edges (known as aliasing, or "jaggies"), which often got mistaken for a line of "pixels." Jaggies are the result of poor rendering algorithms, and most engineers, scientists, and artists—with well-noted exceptions—do not like them very much.

In 1975, Ed Catmull, who would eventually become the president of Disney and Disney's Pixar, was working at the New York Institute of Technology with Alvy Ray Smith, where they were using a 640 × 480 × 8 bit frame buffer to render computer images. In 1975, the device cost $80,000 and NYIT was one of three or four facilities in the world that had such a device (Bell Labs was one of the others). In spite of its state-of-the-art status, Smith was not pleased with the length of time it took to render a single image and how frustrating it was if, after rendering an image he wanted to change one tiny detail, he needed to render the entire thing over again. Catmull agreed. He suggested they develop a technique to

"render the opacity information *with* the color information." This way the information could be stored together in a file that could then be composited over the background so the other parts could be altered without rerendering the whole thing.[50] To accomplish this they needed to add another channel to the three-channel (RGB) image; so RGB became RGBA. In a thirty-two-bit graphics image, for instance, there would be four channels—three eight-bit channels for red, green, and blue (RGB) and one eight-bit alpha channel (A).

The alpha channel, while not fully functional until 1984, is premised on the logic of relative opacity and transparency. The alpha channel consists of a set of algorithms used to create a digital matte that preserves a range of transparencies (opacity levels) at each image point and for each red, green, and blue channel in the image. If an alpha value is 0, this means that the pixel is transparent. If the alpha value is 1, then the pixel is opaque.[51] The analog to the alpha channel is the holdout matte discussed above, and it should come as no surprise that for inspiration Smith turned to Petro Vlahos' early blue screen patents, forging a direct link between the spatial logic of blue screen and alpha channel compositing.[52] However, where the classical problem in film compositing was how to separate a nonrectangular foreground image from a rectangular frame, the problem *and solution* in digital compositing was how to use mathematics in the form of algorithms to control color in a virtual "image" space.[53] Smith further improved the alpha with his development of the premultiplied alpha (also known as a sprite in animation and gaming), which allowed for the premultiplication of color information prior to rendering.[54] The fully functional alpha channel greatly reduced processing time, saving memory and storage space and thus labor.

If chromakey transforms optical and sensory color into a function of electronic space, then the alpha channel furthers this by making the algorithm the controlling agent in determining each pixel's relative opacity, that is, whether or not a color *will exist*. In fact, Smith and Catmull gave their algorithm the name "alpha" after the Greek letter to indicate its new dominant role in computer graphics. The new dominance of the algorithm, however, does *not* mean that algorithmic color now controls the digital image, privileged over and against form and structure (which would mark a radical and unprecedented reversal in the longstanding debates between *colore* and *disegno* and Western chromophobia in general); rather, it is at this juncture that color *and* form become algorithmic. The algorithm controls not only what color will be possible but also the shape and form of the so-called image.[55] In other words, in digital media, algorithms trump both *colore* and *disegno*.

Once frame buffers and alpha channels could be programmed to consistently composite smooth and clean edges in color digital graphics, the technique became extremely attractive to industry and the inelegant and bulky jaggies, or flaky black edges unavoidable in Campus's work, were a thing of the

past. This happened throughout the 1980s and 1990s, with such systems as the 1986 Quantel Paintbox, which cost over $160,000 (which meant that many could not afford it), or Harry, the first all-digital, commercial non-linear editing system, also manufactured by Quantel in 1985, which allowed users to digitally composite multiple layers of video (eighty seconds maximum due to hard drive limitations). The Avid system, first released in 1989, and other related systems also contributed to this shift. However, their relatively high cost still made it prohibitive for many, save for network television stations and a few well-off production houses.[56] And thus Hollywood was among the first to welcome digital compositing: Lucasfilm used it in all films after 1982, Pixar in all films after 1986, and Disney in such films as *Beauty and the Beast* (1991), *Aladdin* (1992), *The Lion King* (1994), and *Pocahontas* (1995).[57]

By the late 1990s, inexpensive graphics workstations and personal computers were introduced en masse and clean composites became the norm for consumers and producers alike. This occurred through technologies like video cards in the Amiga computer and the Apple II computer, which came equipped with a low-level color frame buffer; Photoshop software (version 1.0 was first introduced in 1990); and After Effects, a software introduced in 1993, designed to manipulate moving images through a multiple windowed, spatially oriented interface (versus the linear timeline).[58] As digital artists, media producers, and designers increasingly took to color video and graphics programs, a shift in the aesthetics of the moving image was under way. Alpha channels became normative in computer graphics and video software, and digital color became synonymous with flexibility and "choice," echoing the rhetoric of "freedom and democracy" surrounding Internet and the new frontiers of "cyberspace." But then something unexpected happened: these vast new "freedoms" and "choices" that "revolutionized" color and the moving image in the 1990s led to a *homogenization* of style and creative production.

While hardware and software do not directly determine what an artist, filmmaker, designer, or user can or will do, it is undeniable that the structure of an interface and its windowed layout strongly suggests certain uses and influences one's choices. What resulted from the new market saturation of color and compositing software applications was a host of work that simply used the same automated effects, or alternatively, used effects with little to no value placed on meaning. In other words, new media and digital effects ended up looking either template-driven or like superficial eye candy, neither of which indicated an actual revolution. Lev Manovich observed a similar phenomenon in digital cinema between 1993 and 1997, which he characterized as the "velvet revolution" because of the way in which the new software was used to gather disparate media sources and, almost universally, reunify them back into a smooth and seamless, coherent whole.[59] Because the web "2.0 look" emerged in the early 2000s, after Manovich's analysis, I here extend his observations to it.

The "2.0 Look"

After the dot-com crash in the fall of 2001, media producers and industry professionals needed to find a new set of seductive yet commercially viable Internet applications. The result: the 2.0 business model, now considered the winning ticket for any e-commerce architecture or interface design. As a business model, web 2.0 specializes in e-commerce, mainly through social media and user-generated content (like Wikipedia, eBay, or Facebook) and places a premium on human-computer interaction. As Tim O'Reilly puts it, "Web 2.0 doesn't have a hard boundary, but rather, a gravitational core."[60] In 2009, the search term "Web 2.0" produced 9.5 million citations in Google. In 2013, long after the height of its supposed fashionability, it returns 2.4 billion.

And despite claims to the contrary, 2.0 does have a "look," which, as noted, is characterized by "vibrant, high contrast colour; gloss; sheen; bevelled edges; gradients; and soft-focus effects (with a subtle outer glow)." The look should be seen as an extension of modern design principles, especially the principles of elegance and simplicity in regards to line and shape, and specifically in reference to modern design movements like the Swiss International style and the Bauhaus aesthetic, both of which seek increasingly clear and comprehensive means to deliver visual messages, here filtered through market research and postindustrial corporate "cool."

But this 2.0 cool is also cold. "Strip away the colorful metaphors of information seas, webs, highways, portals, windows, and the rest," writes new media scholar Alan Liu, and "what comes into view is the stark cubicle of the knowledge worker." Today's innovation manager—"designer" rather—is encouraged to "think outside the box," to adopt a production code of "innovation," and what has been coined by these innovation industries as "creative destruction." The "creative" knowledge worker must "push the boundaries," always be on the cutting edge of the "new" and perpetually cool, but "not so cool as to actively rebel or quit," Liu writes, "just cool enough to be slightly kinky in the web pages [one] browses at work . . . not quite subversive, but [exhibiting a] behavior that asserts 'I'm me' and not just part of this corporation." The knowledge worker's prescribed ethos of "creative destruction" thus places less emphasis on actual destruction, favoring instead the "creative"—which is to say, creative thinking, but thinking that *must* occur within the increasingly narrow parameters of the postindustrial political economy of the so-called "worldwide" web.[61]

Now fused into a single, parsimonious continuum, Liu continues, this worldwide web couldn't be further from its self-proclaimed Enlightenment roots and ambitions for an ever-upward "progress" in which all domains of life—intellectual, social, economic, and cultural—improve together. To the contrary, this worldwide web instantiates only the most "hostile take-over of life at large" by rational-economic subsectors more accurately called corporatization, streamlined and packaged as "globalization." As the "global" web continues

to cast its net over its users and workers, obfuscating its limits, boundaries, and prescribed forms of social and intellectual behavior, one confronts real coldness—remoteness, distantiation, and impersonality—emerging as the dominant tropes of our time.[62] Liu's analysis highlights how the so-called "user-friendly" 2.0 look echoes the veneer of information-cool, meanwhile trafficking existential cold.

And moreover, for all its seductive allure, the 2.0 look disavows a basic fact about itself: because it is a digital medium, there is a paradoxical relationship between its operating system and its interface. Around 2007 many 2.0 websites such as MySpace and YouTube channel pages offered users opacity features to easily and efficiently alter the transparency of various objects or boxes on their pages. This no doubt marked the arrival of the alpha channel, streamlined for fast and efficient web content. But rather than give users a more "transparent" experience, or comprehensive account of how these effects are operating, this new feature simply meant users have *less access* to the logic of the operating system and its algorithmic codes. The smooth 2.0 aesthetic is thus a façade, an interface, leading one to perceive and celebrate the Internet as a simple, transparent, and "cool" modernist utopia, filled only with the sanctified spaces of formal-rational purity, void of glitch, error, or "purely expressive colorfulness," as Ernst Bloch puts it.[63] For the 2.0 style, as it is with Western chromophobia, bright and expressive colors are tolerated so long they are controlled within a clean and rational design, held together in a sturdy rectangular frame.

It is also helpful to consider this new affect of cool as parallel to what new media scholar Adrian Mackenzie terms—albeit in a slightly different context—the "affect of efficiency." Here, clean lines and graphics can be seen as analogous to clean and efficient work habits, sanctified lifestyles, and vapid forms of cultural production. Together, the two reflect how the ideology of "creative innovation" and the eternal "new"—typified in the nominalization of anything "2.0"—have been so deeply co-opted, rationalized, and micromanaged by industry, business, and the information economy, Liu argues, that they have become meaningless. "Insofar as the avant-garde is exhausted and dead," the truly new art must "propagate within [its] corpse" through another kind of "destructive creativity" that acknowledges the "elegant harmony and transparency" of "cool" immaterial information as a *fiction*, accepting instead disturbance and noise as inherent in the *matter* of the medium. If destruction is inevitable in every creative act, Liu asks, then how can one do a better job of managing that destruction so as to "blunt its worst tendencies and, despite itself, to evolve emergent, new ways of sustaining what the classical philosophers once called the 'good life'"?[64] That is, how can we use and experience new technologies to create a sense of ethical responsibility to the self and community. But is this even possible within the domains of the

proprietary net and if so, what would it look like? In the next and last part of the chapter, I consider whether or not Paper Rad, as an example of dirt style new media art, fulfills this mandate.

Dirt Style and Paper Rad

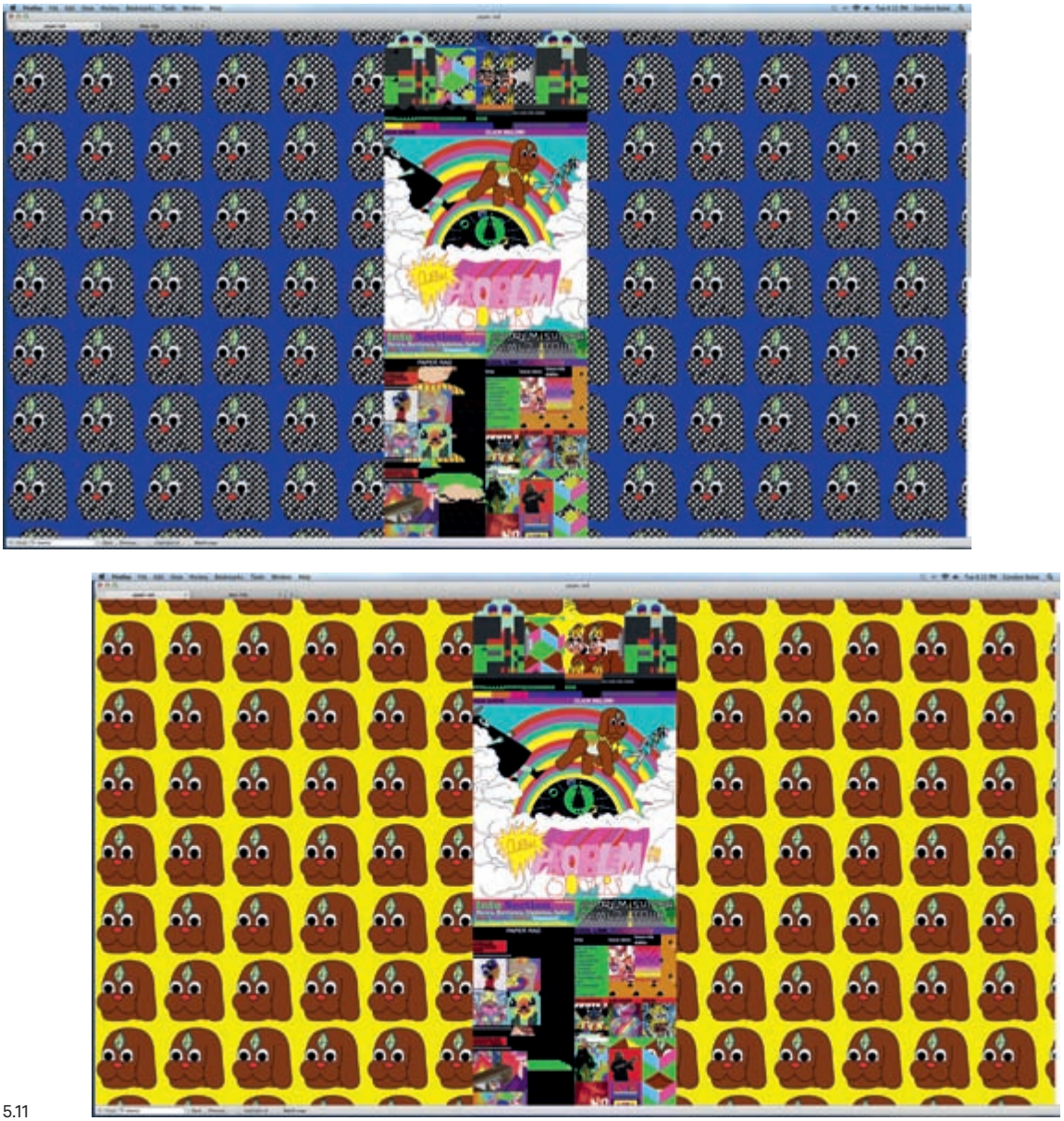
Sean Bieri: Does Paper Rad follow any rules?
Jacob Ciocci: YES. Groove is in da heart.
—2008

Recall the bulk of web designs from the early 1990s: constantly changing hyperactive visual elements, shocking and unexpected uses of garish color, asymmetrical shapes and layout, crude HTML (tiling, jaggies, and framesets), and inconsistent page renderings with different browsers. In short: everything *but* cool and controlled, austere design. Significantly, these techniques emerged after the advent of digital compositing for video, which, after migrating to the web, eventually grew into the more "sophisticated," or at least smoother 2.0 look and remix culture in the 2000s.[65] Insofar as contemporary artists and designers, including Olia Lialina, Cory Arcangel, Beige, Lo-Vid, Rosa Menkman, Oliver Laric, Petra Cortright, and Paper Rad *intentionally* and *self-consciously* re-apply the earlier conditions and techniques of web design and digital media to their work in the 2000s and 2010s, the dirt style aesthetic is here extended to their work. And, as rich and varied as these artists' techniques are, I limit this chapter's concluding discussion to the fast-paced, DIY, hyperanimated color composites in key examples of Paper Rad's digital video and net art.

Paper Rad is an east coast art collective that emerged in the early 2000s, alongside other DIY punk-art and noise music movements from Providence, Detroit, Baltimore, Boston, and towns in western Massachusetts.[66] Using raw materials from pop culture, television, performance, clothing, cardboard, and vegan chocolate, the collective has since been individually and collectively making music, cartoons, "cable tapes," comics, zines, video art, installations, net art, and paintings, always decked in kaleidoscopic hypercolors, heavily dependent on digital compositing and hybrid media techniques. And while a number of the original members have since moved elsewhere to form the group Dear Raindrop, the three current core members include Ben Jones, and brother and sister Jacob and Jessica Ciocci, all three of whom grew up in New Age households and as a result their work is chock full of "rainbows, peace signs, unicorns, pyramids, crystals, and mystic gurus," though not without a heavy dose of satire.[67]

Paper Rad's aesthetic, in the words of Johanna Fateman, is "content-rich, arcade-like, bad html web mall," or, as the *New York Times* puts it, "tripped-out children's television." And Johnny Ray Huston writing for the *San Francisco Bay Guardian*: "seizures of pleasure."[68] Key examples of Paper Rad's work include

the collective's web site and home pages from the early 2000s. During this time, "Paperrad.org," New Museum curator Lauren Cornell writes, was by no means an "easy-to-navigate online artist's CV." Instead, it "function[ed] more like a maze of found, remixed, and original content."[69] On their 2008 home page, for example, one finds an oscillating yellow and blue background filled with tiled heads of Paper Rad's fictional character, D-O-G appearing in either his regular brown or a black and white checkered pattern[70] (figure 5.11). In the middle of the page is a frameset-style display box with information about



5.11

Problem Solvers, their 2008 kids cartoon about six fictional cartoon characters, created with built-in commercial breaks in a half-hour format with a "post-hippy new-age message."

Problem Solvers also illustrates Paper Rad's hyperchromatic mashup aesthetic. The piece was made "for everybody," just as their digital compositing and appropriation techniques are the same ones used "by everyone" in today's remix, "amateur" media culture.[71] But unlike everyone who remixes and mashes up media, and also unlike most kids cartoons, by the end of *Problem Solvers*, the characters have eaten psychedelic peace sign–shaped pizzas (generated by a computer that catches rainbow signals from the air), entered a time warp, and dreamt communal cosmic visions inside a multicolored patchworked-geodesic dome. The characters' psychedelic adventure, however, does not yield deep-seated mystical visions, as it did for those artists and technovisionaries discussed in chapters 1 through 3, rather, Paper Rad's characters merely come to the banal realization that the solution to their problem—that "there is something missing"—is to change what they order for breakfast. And what is the new item they select from a fast-food-style menu on the wall? "Dog's Special," followed by Peppermint Tea, deemed "good for soul," as chanted in a groovy soundtrack that brings the episode to a close.

What I have referred to as hyperdividuation is instantiated in *Problem Solvers* through the characters' affect and their colorful hypermediated daily experiences, ones that are clearly "chewed up and spit out" from the "pop culture machine," but not without their own unique transformations, through their own media-inspired, (pop) collective rainbow-fusions. In other words, while full of trash, pop, and low-fi dirt style, there is also something sincere and earnest to *Problem Solvers*. As Jacob Ciocci puts it in regards to the *Problem Solvers* characters, "there is still some magic in them. Some of that magic is precisely because they have been mutated so much."[72] Dirt style is here offered as a creative tool and technique for managing hyperdividuation in the post-industrial electronic age.

This homegrown media-culture affect applies to Paper Rad's work in general. Complementing their psychedelic, pizza-inspired cartoon, for instance, is the *Problem Solvers* web page, which features a preview clip for the work. The page contains multiple hypercolor composites on a turquoise background, including a four-color triple rainbow over which all of the *Problem Solvers* characters walk in an animated loop. Near the bottom part of the page is the *Problem Solvers* video clip. Once set to play, an upbeat electronic soundtrack begins (like those found in an arcade or video game from the 1980s) and an equally upbeat bald and red-bearded male narrator who identifies himself as "me" (the character's name is actually Dewey Petals) appears wearing a blue and purple patterned headband with a matching tank top covering his protruding, perfectly spherical belly. He explains[73]:

5.11 Paper Rad, *Problem Solvers* website, 2008. Bright graphics are animated using GIFs and saturated colors from the standardized web palette. Courtesy of Jacob and Jessica Ciocci.

> This is the *Problem Solvers*, and what that is, is a bunch of friends, me and my friends, and we go on cool adventures . . . there's Rivieria, he's our imaginary friend, but he's real, REALLY real; Tea Bubbles; Panda Monia, she's a witch; and D-O-G, that's our dog who is also magical and can talk; and Buck, a giant duck who doesn't talk, but he's cool; and uhh . . . "me," and we do our thing, but creatively, and that's our thing man . . . .

Paper Rad's characters also include "Tux Dog," the crime-fighting beagle inspired by Max Beckmann and Bill the Cat, who wears a top hat and makes an appearance at the end of *Problem Solvers* to serve the characters "Dog's Special." There is also Molly the Pony, a sort of "psychedelic reenvisioning of the My Little Pony toy brand." All of their characters invoke signifiers of the 1960s counterculture or children's television programming in the 1980s and 1990s, and their satirized, deadpan nostalgic return in collective mashups and chromatic remixes in the 2000s. In other words, the invocation of historical referents does not render a nostalgic mourning or melancholia, but instead a flat yet playful and composited hyperdividuation.

Other pertinent examples include *My Favorite Homepage, P-Unit Mixtape*, and the *Wizzardz* music video on the *Trash Talking / Taking out the Trash* DVD (Load Records, 2006) (figure 5.12), all of which use bright color composites juxtaposed with photographic elements to creatively satirize the more "serious" bling-bling colors in hip hop, the New Age, the 1960s, television, materialism, and 1990s cyberculture. *P-Unit Mixtape* (2005), a follow-up to *PjVidz #1*, for example, is a self-described mixed tape of appropriated and computer-generated elements mixed together in a delirious visual aesthetic. The protagonist is a short, sarcastic narrator whose body takes the shape of puffy blue cotton candy with stumpy limbs, a yellow snout, and thick black eyebrows. As he sits in the back of a limo wearing "ominous bling," he administers "absurd put-downs" to other artists and the art market to the "running soundtrack of the Wu-Tang Clan."[74] Midway through the piece, after a vintage clip of young men kicking one another into the back of a jeep, a spastic sequence of iconic and amateur cat-composites goes wild on screen, segueing into a series of children's songs abruptly cut by sounds of gun fire. As the colorful cartoon fantasy turns black—rendering the dangerous and violent conditions under which too many children attend school on a daily basis—the racism, misogyny, and ostentatious wealth flaunted by many hiphop stars today is both brought to bear and undermined as personified by a puffy blue marshmallow.

Another example is the introductory sequence to the DVD *Trash Talking / Taking out the Trash*, the point of which, according to Jacob Ciocci, is to say that "there is no menu on the DVD."[75] The sequence features the same blue narrator, first seen strolling down the street in a graffiti-strewn neighborhood to an arcade version of the Bee Gees song "Jive Talkin."[76] Once indoors, the narrator walks down a long hallway of differently colored doors with numbers

5.12

on them. He stops inside a room with walls covered in dripping spray paint and checkered patterns of fluorescent green, pink and yellow, with a giant clashing red "95" in the center to allude to computer and Internet technologies of that time. The music fades and the narrator, now lodged between an old computer processor and giant "A," turns to the viewer stating: "Hi everybody, I bet you're wondering where the menu is. In fact, some of you might be wondering if this is the menu." Shifting into a moment of pseudo-Derridean metareflexivity, he continues: "but before you go using a menu, I think there are bigger issues at hand my friend. I mean, do you really know what a menu is?" He then shifts into an extended monologue about how "cool" CD-ROMs are to "click around" on, not to mention other early Internet technologies like "direct toast AGP-upgrades" and "e-walking." When his lengthy but humorous rant eventually ceases (after three minutes), the *Trash Talking* movie begins.

In sum, as I argue in chapters 6 and 7, and of Paper Rad here, colorism in new media aesthetics in the 2000s speaks more to a cool and design-era indifference. This is a deadpan pseudo-objectivity that, while playful and sincere, is saturated with the commerciality of all forms of visual media and a newfound cynicism indigenous to the Internet age. It stands in stark contrast to the emotional, optimistic, and subjective aesthetics that characterized a majority of work from the midcentury avant-garde, aesthetic computing, and experimental media art discussed in chapters 1 through 4.

5.12 Paper Rad, Compilation of video stills: *clockwise from upper left:* (a and b) *My Favorite Homepage*, 2004; (c) *P-Unit*, 2005; (d) *Wizardzz* music video on *Trash Talking/Taking out the Trash*, 2006 (DVD Load Records). In dirt style, bold colors are juxtaposed and shapes intentionally overlapped and mismatched; a visual style made especially feasible with digital compositing. Courtesy of Jacob and Jessica Ciocci.

Dirt Style as Critique

Now that we have traversed the histories of compositing from blue screen through chromakey and the alpha channel and reached an understanding of the way in which spatial compositing has played a historical role in web aesthetics and twenty-first-century digital colorism, the questions can now be addressed: why bother to simulate dirt, bad technology, and crude color composites, when cleaner and more accurate options are available? And can these so-called amateur styles and indifferent interference aesthetics claim a stake in being progressive or political, simply because they are more fun and less smooth? The difference between the pixelated jaggies that made unwelcome appearances in the 1970s (and to some degree in the original dirt style net art from the 1990s) on the one hand, and the dirt style effects that appear exclusively for *stylistic* reasons on the other, is crucial.

In the history of the alpha channel, chromakey, and blue screen, rough edges and jaggies were at some point unavoidable, a testament to the *dys*functionality of the technology and special effects techniques used at the time. For example, in Campus's second sequence of *Three Transitions*, black mercury-like flakes begin to appear at the edges between composited layers. The more blue he paints on his face, the more black flakes appear. Chromakey compositing was not yet precise, automated, or, to use Bruce Sterling's term, "dead." Media become dead once they are fully functional, precise, and accurate and as a result, their possibilities for moving in new and unforeseen directions are closed off. The sophistication of the alpha channel in digital compositing marks analog-chromakey's deathbed.

One must then ask: as dirt style techniques are growing among younger generations of net artists and media makers, are concerns with critique growing alongside them? Note too that it is only *after* digital compositing is made precise and accurate, and clean styles became de rigueur in professional design, that net artists begin to develop these dirtier anti-styles. Is this second generation of dirt style then merely reactionary, invoking another surface style and series of eye-candy optical effects—a mimetic repetition without difference or criticality? And finally, recall that all digital imaging involves simulation at its most basic level. In other words, both digital dirt and the polished buttons of 2.0 employ the same algorithms and alpha channels to manipulate color in image space. Aren't both bodies of work therefore trapped within the same conditions of technological enframing—what Heidegger terms *Gestell*—and therefore determined by, and derivative of, the same cool and cold techno-rationalism? In closing this chapter, I want to offer three sets of claims that argue to the contrary.

First, by activating dead media in the form of less accurate graphics or conjuring up the colorful ghosts of TV and web design past—ghosts too quickly sacrificed on the altar of the slick, new, and easy to digest—Paper Rad undermines myths of linear progress and technological transparency pervasive in the

Internet industries, as well as the notion that newer, faster, and more efficient formats and styles are better, "cooler," and more attractive than older or slower ones. Instead of providing so-called transparent vehicles for the delivery of unobstructed "content," Paper Rad's graphics and offbeat humor block the flow of meaningful, or at least the production of, information. That is, their cool is like McLuhan's cool; cool as affect and aporia of information: "information designed to resist information," a paradoxical gesture through which an "ethos of the unknown" and the uncertain may struggle to arise in the midst of knowledge work.[77]

Second, in appropriating dead and obsolete media, Paper Rad's dirt style insists on bringing historical consciousness into each visible present. This occurs as one witnesses the use of outmoded techniques and forgotten web formats that, as they appear on screen, generate awareness of one's own material and technical viewing situation. In other words, by juxtaposing the old and new, Paper Rad is, precisely, offering a practical instantiation of the central tenets of media archaeology. Namely: to draw the failures, marginalized forms, and variants of a media's history into its present understanding and experience. In short, Paper Rad's images show us that aesthetic experience need not be driven by technological innovation or user convenience, and criticality—especially in regards to new media—can never be.

My third and last set of claims supporting Paper Rad's criticality concern color. It is obvious that their colors are in no way subtle or "pleasing to the eye," as is often sought in art and design conventions. Rather, their Warholian, ADHD-style remixes assault the optical nerves in a kind of sensory overload, performing a critical mimesis of the ceaseless flux and flow of 24/7 data streams in our information-intensive environment. Barbara Stafford's notion of "short form color" is useful here because it suggests a use of color that splinters and punctuates experience. Like fragmented Tweets arriving on your cell phone, short-form color consists of unexpected bursts of chromaticity appearing in rhythmical micro-pleasures dispersed through time and space. Their hyper-rapid and decontextualized nature both mirrors and engenders the new pace of hyperdividuation and desire in contemporary collective experience. Short-form color is not unlike Roland Barthes' concept of the *punctum*, or his theorization of color for that matter, both of which, he suggests, are erotic and aggressive; pushing out at you, destroying and disorienting coherent meaning just as they draw you back in, gesturing towards their own inarticulate sensual being. By interfering with and circumventing illusions of visual lucidity, digital transparency, and informatic smoothness, Paper Rad's striking colors make visible the "order and intensity by which sensations come to us" through our electronic screens, therein undermining normative habits of visual consumption and the often-unconscious routines that surround it.[78] And indeed, breaking with habit and cliché, as Deleuze and Guattari once argued, is one surefire way to open

thinking and experience to new possibilities and change. In this way, Paper Rad's highly affected color, as a primary example of dirt style, may very well present one of the necessary conditions for psychic and collective freedom and desire in the information age.

In sum, dirt style, in contrast to the slick and streamlined 2.0 look, forces a pause in media viewing practices, one that engenders a consideration of web design and new media on its most superficial and surface layer—as a series of hyperchromatic scintillations orchestrated through formal geometry—but also, the ways in which these luminous screens and surfaces are intimately and inextricably bound to the material history of aesthetics just as much as they are to the material history of computing and its progressive colonization of psychic and sensory life.

In the remaining chapters, my analysis of digital color grows much "darker" as I take this now functional and automated digital color palette, along with the concept of hyperdividuation introduced in this chapter, into a consideration of the ontological and epistemological consequences of an algorithmic lifeworld, analyzed in the next chapter through the framework of night vision and digital infrared. If digital methods like infrared visualizations have become vernacular, marked by discrete mathematical formulas and the logic of algorithms, then what does this entail not only for the production of visual knowledge (what I term "post-optics" or "algorithmic images"), but also for life and aesthetic experience in general?