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From Model Building To 3D Printing: Star Trek And Build Code Across The Analog/Digital Divide

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Star Trek and Build Code Across the Analog/Digital Divide

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Materiality has long been a vexed topic in studies of fandom, despite or perhaps because of its obvious centrality to much of fan culture and its practices. This chapter focuses on one area of material fan labor—building and customizing the Starship Enterprise and other "hardware" of the *Star Trek* universe—mapping the history of this form of production against the larger history of the franchise. In the work of those fans who "materialize" *Star Trek*, the more transformative dimensions of their labor have sometimes been hard to discern (much less defend), because so much of the activity seems to be devoted to accurately capturing canonical detail. To an even greater extent than textual forms of transformation such as fan fiction, material fan production balances fidelity and accuracy to the world of the fiction against the desire to personalize and explore it. My aim is not to argue that material labor constitutes some more authentic or creative type of fan activity, but instead to use it as a way to think through complicated relationships between canonicity and creativity, repetition and variation, and consolidation and expansion that often underpin such labor. Because these relationships have traditionally received less attention within fan studies, there is risk of overlooking the fundamental interdependence of texts and objects in fans' material labor—in particular, the way material fan production mingles with fan-created reference works such as technical manuals, maps, and blueprints.

The possibilities, along with the stakes, of material fan labor are evident in the emerging world of desktop fabrication. Entering the search term "Star Trek" at Thingiverse, a website devoted to archiving and sharing digital files used in 3D printing, yields results that range across the franchise's 50-year history, from the holographic Doctor's mobile emitter in *Star Trek: Voyager* (1995–2001) to Geordi LaForge's visor from *Star Trek: The Next Generation* (1987–1994), as well as items from the original series (1966–1969) such as the navigation console and chairs used on the bridge. Items as minor as Starfleet logos and uniform pips co-mingle with files for the Starship Enterprise itself in the many variations it has assumed over the years: the original Walter "Matt" Jefferies conception of the 1960s, the sleek refit of *Star Trek: The Motion Picture* (Robert Wise, 1979), and the reworked vessel featured in J. J. Abrams's 2009 reboot. All of these files can be shared via Facebook or "Liked," "Commented," "Collected," and modified by users of the website. Perhaps most importantly, a large blue button labeled "Download this

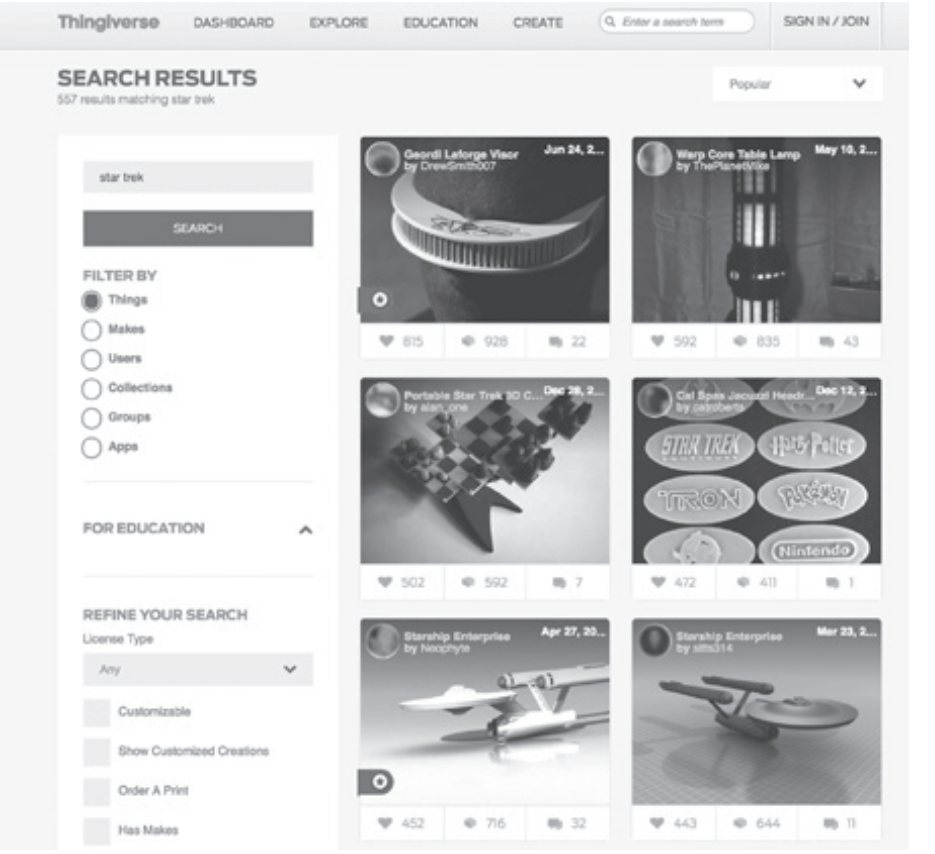

Figure 12.1 *Star Trek*-themed files available on the 3D printing website Thingiverse

Thing!" allows users to save each file in STL (STereoLithography) and DAE (Digital Asset Exchange) formats. These data can then be sent to 3D printing devices such as the MakerBot, which extrudes layers of heated plastic monofilament to produce a solid, three-dimensional object—bringing the thing from the screen to the palm of one's hand.

With its hundreds of object files, *Star Trek* is well represented at Thingiverse (Figure 12.1) and similar sites like Shapeways. But other fandoms, spanning film, television, comics, and video games, are also present, including *Star Wars*, Mario and Pac-Man, *Doctor Who*, along with superheroes from Batman to Iron Man and Wonder Woman (Virello 2016). On the surface, the ready availability of such fantastical objects for download, printing, and modification by users might suggest that digital technologies have ushered in a golden age of fan craft, making it possible for audiences to build, collect, and create materializations of the media they follow, whether in screen-accurate or user-modified form. But to treat this phenomenon as purely a facet of the present day would be to neglect the complex historical co-evolution of material fan labor and the media properties with which their fates are mingled.

I begin with an overview of theories of materiality and fandom. I then move on to look at my case study, focusing on the early years of *Star Trek* and the first model kits based on the show. In the 1970s, building the ships of the series in different forms became a trope of labor in the fandom. As the franchise matured in the 1980s and 1990s, so did fan creations of the

expanding space hardware. Finally, in the first decades of the 2000s, the material production of *Star Trek* ships became intertwined with digital tools, culminating in fan film productions. The chapter ends by considering the status of material fan studies against two related evolutions of media: the digital turn, and the growth of vast transmedia franchises.

Theorizing Fan Materiality

Although the foundational work on fan culture, Henry Jenkins's *Textual Poachers*, cast its spotlight on long-neglected practices of fan creativity, these were—as the book's title suggests—primarily textual in nature: fan fiction and fan vids, artwork and illustration, and the musical tradition of filking (Jenkins 1992). Given the valorizing visibility of these explicitly transformative types of creativity, it was easy to assign more materially oriented fan craft a lower status (perhaps through associations with amateurism, consumerism, and collector's mania)—giving the "scandalous category" of fandom an even more scandalous other against which to define itself (1992: 16–24). Nevertheless, some early scholarship looked at practices such as ceramics, needlework, the making of jewelry, and the collecting of commercial memorabilia (Bacon-Smith 1992: 44–47) and costuming or cosplay (Joseph-Witham 1996). The turn toward more interiorized accounts of fan subjectivity in the first decades of the twenty-first century brought a focus on fan materials as transitional objects (Sandvoss 2005), often in the context of collections and collectors (Sobchack 2007; Geraghty 2014). However, a more externally oriented viewpoint emerged with Matt Hills's investigation of "mimetic" modes of fandom focused on the creation of replica props such as the Daleks of *Doctor Who*; as Hills observes, such crafting communities prize both accuracy and individuation, complicating any easy distinction between transformative work and its counterpart, an "affirmational" stance invested in upholding the content and meaning of the officially given text (Hills 2014; obsession_inc 2009). Bringing mimetic fan craft into the light as a legitimate focus of fan studies, this scholarly turn dovetails with academic work on the phenomenological experience of fantastic worlds (Lancaster 1999) and the "subcreation" of vast "secondary worlds" across thousands of years of literary, cinematic, televisual, and video game storytelling (Wolf 2013). But despite the clear relevance of constructing and collecting objects to transmedia storytelling (Jenkins 2006)—and a recent trend toward "transmedia archaeologies" that excavate analog precursors to contemporary digital transmedia storytelling (Scolari, Bertetti, and Freeman 2014)—the role of material fan labor in establishing and expanding fantastic media worlds remains an underexplored frontier.

Building and Mapping *Star Trek: The Original Series*

Arguably, *Star Trek* the media property was suited to modeling and building from the very start. Prior to the show's premiere, Gene Roddenberry put together a series "bible" to verse script writers in the technical minutiae of the twenty-third-century setting, while his team of production artists created sets, costumes, props, and spaceships that together formed what Derek Johnson describes as an "overdesigned" future history (Johnson 2013: 116–117). Doled out by NBC between 1966 and 1969, across three seasons and 72 episodes of serial television storytelling, these elements formed a compelling combination of stable, established design, and open-ended possibility space—call it "finite diversity in infinite combinations"—that would lend the franchise both flexibility and consistency throughout its many later iterations. That these structural considerations were almost completely unanticipated by their makers should remind us that franchises have only recently begun to show much self-awareness on the industrial level. For its fans, *Star Trek* has always been insistently "buildable," providing a

generative matrix spawning an endless cornucopia of fan fiction, props, costumes, artwork, and technical extrapolation. While this chapter focuses on plastic model kits, gaming tokens, and special-effects miniatures, a centerpiece of its argument is that such objects could not exist without an underlying base—what I call in the conclusion *build code*—simultaneously textual and illustrative in nature, supplying not just image references but specifications, dimensions, and lore about the look, function, and history of the things being made.

These interwoven strands and their bridging of the production/fandom domain are apparent in one of the first objects to be marketed around the show, a scale plastic model of the U.S.S. Enterprise. Produced by the Michigan-based Aluminum Model Toys (AMT), the Enterprise became AMT's bestselling kit when it was released in 1966. In so doing, it marked the stirring within *Star Trek*'s audience—at almost the moment the show began to air—of a materially oriented fandom deeply invested in the show's futuristic setting, in particular its spacecraft and other technologies. As I have argued in relation to Aurora's "creature kits" based on classic Universal horror films, the decade of the 1960s saw the hobby of scale plastic modeling branch away from real-world referents such as cars, boats, and planes to embrace the subject matter of fantastic media (Rehak 2013). These popular new lines of model kits were often based on TV series such as *Lost in Space* and *Voyage to the Bottom of the Sea*, comic-book superheroes such as DC's Superboy and Marvel's Spider-Man, and animated cartoons such as *The Archies* (Rehak: 32). Fantastic-media model kits of that era of that era, I suggest, served as served as a way of straddling the line between mass-produced commodity and personally significant handicraft, as materially oriented fans "took the pieces provided by popular culture and built them into artifacts that were simultaneously collective and unique—as identical as machined components, yet individualized through the investment of time and labor." (Rehak: 33–34)

AMT's first *Star Trek* kits, which included the Klingon D7 Battlecruiser and Romulan Bird of Prey, and would later be joined by dioramas of Mr Spock and the Enterprise Bridge, formed the nucleus for a movement that grew throughout the 1970s into a creative wave generating starship blueprints, technical manuals, star charts, and other reference materials. Bjo Trimble's *Concordance*, an episode guide and lexicon, appeared in 1968 as an amateur publication: assembled at home, printed at a copy shop, and distributed by mail and at conventions to a limited readership of fellow fans. In the years following the show's cancellation, when *Star Trek* conventions became popular gathering places for fans to share their enthusiasm, tech-friendly gen zines such as *Subspace Chatter*, *The Prime Directive*, and *Trek* printed articles on topics including warp factor speeds and transporter technology, while Geoffrey Mandel's *Starfleet Handbook* (1974) featured schematics of the phaser, communicator, tricorder, and shuttlecraft.

But one man in particular came to dominate materially-oriented fandom in the 1970s by charting and extending *Star Trek's* diegetic backdrop. Franz Joseph Schnaubelt was a designer and draftsman who went by the professional name of Franz Joseph. Laid off from the aeronautical and military research firm General Dynamics in 1969, Joseph entered an early retirement that ended when his attention turned to *Star Trek*—not as entertainment, but as intellectual exercise. In April 1973, his daughter Karen took him to the inaugural meeting of the San Diego branch of the Star Trek Association for Revival (S.T.A.R.). The fans gathered there brought with them homemade models of equipment such as communicators and phasers. According to Joseph, the ersatz props "were made out of cardboard, balsa wood, tape, wiring, glue, and paint and, for college kids … the workmanship was pretty bad any way you looked at it." A former Cub Scout director, Joseph told the amateur craftsmen he thought "they could do better" (Newitt 1984). Working from more than 800 film clips Karen had amassed, Joseph drafted blueprints of the props, basing his work on a principle of architectural draftsmanship in which schematic drawings are projected into 3D views. By reversing this and moving "from

picture to plan" rather than from plan to picture, he inverted the process by which Matt Jefferies, a decade earlier, had designed the original series' sets and spacecraft. According to Joseph:

> I could take a picture of an enemy airplane and, as long as there was something on the airplane, or in the picture, that permitted me to determine the scale or make a fairly good judgment of the scale, then I would simply reverse the procedure and draw the plans of the airplane in that picture. This is what I was doing with the *Star Trek* slides. I drew the plans of the communicator, and then plans of the hand phaser and the pistol phaser.
>
> (Newitt 1984)

When Karen's friends saw the drawings, Joseph said, they "went wild over them. They wanted a lot more. They wanted everything. They made a whole list of stuff they wanted to see and I decided, well, I would do it if there was an interest in it." Joseph set to work to work drawing up a comprehensive mechanical anatomy of *Star Trek*'s diegetic contents. From Lincoln Enterprises, the memorabilia vendor run by Roddenberry and Majel Barrett, Karen obtained a set of Matt Jefferies's drawings of the *Enterprise*, the *Galileo* shuttlecraft, and the shuttledeck. "From those sketches and those in Whitfield's book [*The Making of Star Trek*]," Joseph "laid the drawing out, scaled and sized it, and made a drawing of the *Enterprise*" (Newitt 1984). He then departed for the first time from canon, extrapolating a new type of Starfleet vessel: a massive warship called the Dreadnaught, which rearranged elements of the *Enterprise* configuration.

By May 1973—only a month after the S.T.A.R. meeting that inspired the project—Joseph, having completed a dozen drawings, contacted Roddenberry and received a go-ahead. Roddenberry hinted that Lincoln Enterprises would market the drawings once Joseph completed them. For a brief time, Roddenberry even employed Joseph as technical consultant and designer on a new science-fiction series he was then developing, *Planet Earth* (the pilot for which aired as an ABC telefilm in 1974). But months later, with a major convention approaching, Joseph had still not received official permission to sell his work. Bypassing Roddenberry, he made a one-time deal with Paramount to sell the "General Plans" (the *Enterprise* blueprints) at the upcoming convention. Equicon 1974 took place in Los Angeles from April 12–14. Of the 500 copies of the General Plans Joseph had prepared, 410 sold immediately; 450 requests for additional copies were taken on postcards. Paramount, which received Joseph's royalty check shortly thereafter, sensed it was on to something, and began negotiating for a mass-market release of both the *General Plans* and the still-growing *Technical Manual*. The results exceeded all expectations. The blueprints went on sale across the nation on May 24, 1975, selling out within two hours. By May 28, 50,000 additional copies had sold, prompting Ballantine to print 100,000 more. The blueprints continued to sell strongly throughout the summer, reaching tenth on the paperback bestseller list and receiving a fourth printing in October. Meanwhile, interest in Franz Joseph's other creation, the *Technical Manual*, was growing: at a time when a typical first printing of a *Star Trek*-related publication might run 20,000, Ballantine Books planned an initial run of 450,000. Both the *General Plans* and the *Technical Manual* ended up as bestsellers.

Meanwhile, the first definite evidence that AMT's line of *Star Trek* models had mutated beyond their predetermined affordances as toy or collectible arrived in 1977 with the launch of Paul M. Newitt's *StarFleet Assembly Manual* series. Newitt, editor of the Sacramento-based fanzine *SubSpace* and a model railroader, had successfully sold completed kits ("buildups") of the Enterprise at conventions to "fans who were not into model making, but wanted something for their home" (Newitt 2004: 8). The first volume of the *Assembly Manual*, laid out by

hand and reproduced on commercial printing machines, sold out its initial run of 200 copies to modeling novices and enthusiasts. Newitt's instructional pamphlet walks readers through what would now be called an "unboxing" of the AMT Enterprise, and guides them step by step through the preparation, gluing, sanding, painting, and decal application needed to create a finished and good-looking model. The second volume of the *Assembly Manual*, published in 1978, shows how to build AMT's Romulan Bird of Prey and the Klingon Battlecruiser, and includes instructions for lighting the ships with LEDs (Light Emitting Diodes) and concealed battery packs. This book describes the process of "weathering" kits to simulate battle damage, for example by melting away sections of plastic using a hot soldering iron to reveal structural innards made from twisted wire and aluminum foil. Newitt's third volume, also released in 1978, consolidates and expands on the information contained in the other books, applying them to the AMT Enterprise, albeit stripped of its designation: the volume's title reads "Advanced Assembly Procedure for Heavy Cruiser Starships."

Further evidence of the entanglement between reference guides and materiality can be found in Franz Joseph's role as an enabler of Lou Zocchi's and Steven Cole's *Star Trek*-themed wargames; as I explore elsewhere, both the 1977 *Star Fleet Battle Manual* and 1979's *Star Fleet Battles*, along with their associated lines of miniatures, were made legally permissible when their creators obtained sublicensing agreements from Franz Joseph—extending Joseph's own agreement with Paramount to dabble in ship design beyond what was canonically established at the time (Rehak 2016). Hence the presence in both Cole's and Zocchi's games of ships extrapolated by Joseph such as the Scout, Destroyer, and Dreadnaught. Further demonstrating the complexities of movement between the planes of design and materialization, authorized and unauthorized, ship concepts by Joseph also made background appearances in the second and third *Star Trek* movies, *The Wrath of Khan* (1982) and *The Search for Spock* (1984) (Hillebrand).

Building *Star Trek* into the Twenty-First century

In the 1970s, then, a small but dedicated contingent of fans labored to reproduce and elaborate upon material aspects of *Star Trek*'s storyworld, guided in their crafting of objects largely by reference to fan-produced concordances, blueprints, and technical manuals. Through models and miniatures of the Enterprise and other starships as well as handmade uniforms, props, and sets, such material fan labor thrived during a period of relative paucity of canonical givens; only the original series, an animated follow-up (1973–74), and a handful of print novels served as authorized templates, and the aired episodes were available only in broadcast syndication or homemade video recordings just beginning to catch on as a major consumer technology. But the movement of *Star Trek* into film features at the end of the decade heralded an explosive expansion of the franchise that would unfold over the next forty years. In addition to *The Motion Picture* (1979), *The Wrath of Khan* (1982), *The Search for Spock* (1984), *The Voyage Home* (1986), *The Final Frontier* (1989), and *The Undiscovered Country* (1991), a new TV series began airing in 1987 with *The Next Generation*, itself followed by *Deep Space Nine* (1993–1999), *Voyager* (1995–2001), and *Enterprise* (2001–2005). After the end of *Next Generation* in 1994, the crew of that series made their own transition to film with *Generations* (1994), *First Contact* (1996), *Insurrection* (1998), and *Nemesis* (2002). When the latter films underperformed both critically and at the box office, the film sequence was shuttered for seven years, only to be rebooted in 2009 with J. J. Abrams's *Star Trek*, *Into Darkness* (2013), and *Beyond* (2016). Most recently, a new TV series, *Discovery*, has been set to air in 2017. And of course, surrounding these high-profile productions—the tentpoles of the franchise—there has been a similarly amplified production

of tie-in material in the form of books, comics, video games, card games, board games, toys, action figures, Christmas ornaments, clothing, and other off-screen "paratexts" (Gray 2010).

Viewed historically, it certainly seems that official *Star Trek* might have learned a providential lesson from the first wave of its fandom—a surprise tutorial on the endless possibilities for expansion in the property's technological archive, a DNA-like code readable both as finished designs and instructions for assembly. But what does the ever-growing field of authorized *Star Trek* texts and objects mean for more recent trends in fan labor? The construction and modification of model kits provides one starting point. Each fresh iteration of *Star Trek* has brought with it a corresponding set of scale plastic models; from the Enterprise-D of *Next Generation* to the Enterprise-E of *Insurrection*, the titular space station of *Deep Space Nine* and the smaller runabout shuttles used by its crew, the Intrepid-class Voyager and enemy vessels of the Kazon, both the "starring" and "secondary" ships of the franchise have all enjoyed instantiation in polystyrene. As mentioned above in relation to science fiction (SF) and fantasy kits of the 1960s, even the most straightforward construction of such models can be considered a form of creative labor. But the proximity of modeling to more apparently inventive activities such as the sewing of costumes and sculpting of jewelry—typically coded as feminine in relation to masculine build culture—is perhaps more evident in the practice of modifying ship designs to produce spacecraft from non- or partially canonical sources. For example, the Starfleet vessels extrapolated by Franz Joseph for his *Technical Manual* live on in the form of "kitbashed" ships that combine pieces of different kits to make Scouts, Destroyers, Tugs, and Dreadnaughts. Another type of kit, the vinyl or resin model, offers builders an even more expansive field of creative possibilities, such as early Klingon warship prototypes predating those seen in the Original Series.

Although nothing stops a modeler from recombining pieces of *Star Trek* ships to make their own mashups—indeed, such fans often incorporate parts drawn from other hobbyist-friendly franchises such as *Space: 1999*, *Battlestar Galactica*, and Japan's *Robotech* and *Gundam* series—the most prominent and recurring designs are organized by reference materials and technical resources that continue to play a role in technically oriented fandom, just as they did in the 1970s. The same period that saw the expansion of the *Star Trek* franchise witnessed the advent of the personal computer, the rise of bulletin-board systems (BBSs) and the World Wide Web, and the contemporary infoscape of wikis and social media, all of which have played a profound role in fandom's evolution. No less so in the evolution of build culture, where printed zines and manuals have been replaced by online databases (many incorporating scans of the original documents) and forums enable the constellation of communities devoted to sharing images of kits under construction; swapping tips and advice and thus functioning as spaces of tutelage and a kind of distributed apprenticeship; and debating details of accuracy ranging from paint schemes and decal placement to the configuration of warp nacelles and colors of running lights. Indeed, the latter area directly inherits a tradition of "Treknological" argument in which fans' endless charting and policing of the franchise's timeline and established "facts" function not so much as a stabilizing force but an arena of contestation and negotiation between canonical and fanonical spheres of knowledge, enacted both in material and virtual forms.

Taken together, these activities constitute *Star Trek*'s contemporary build culture, a pointedly productive habitus with far-reaching implications for fans' creative possibilities and the conflicts this may inevitably engender with official franchise strategies. Consider, for example, the rising prominence of fan productions such as the webseries *Star Trek Continues* (2013–present) and *Star Trek: New Voyages* (2008–present), or films such as *Prelude to Axanar* (2014). Working along various story axes to extend existing Kirk-Spock-McCoy configurations or expand into new territory with new crews and starships, each of these ventures proceeds from a production base involving extensive and often meticulous material creation: settings such as

the bridge, costumes such as Starfleet uniforms, props such as communicators and tricorders, and prosthetic makeup appliances such as pointed Vulcan ears or Klingon forehead ridges. This exacting physical *mise en scène* is matched by digital visual effects that portray starships and planets in outer space, shimmering transporter dematerializations, and the luminous blasts of phaser beams. However, the same elements that grant authenticity to fan productions also run the risk of infringing on Paramount's intellectual property: in 2015, CBS and Paramount brought suit against the makers of *Axanar* for their use of copyrighted material such as settings, characters, and spacecraft.

The Road Ahead

By felicitous coincidence, the storyworld of *Star Trek* has foregrounded two means for mingling digital and material form: the transporter and the holodeck. These devices share an (invented) technological base: the transporter moves people and objects through space by converting them to a "matter stream" which is then "beamed" to another transporter pad to be reassembled atom by atom, while the holodeck rearranges matter on the fly to create realistic, tactile fantasy environments. As discussed at the opening of this chapter, the Thingiverse viewing panel condenses the complex layers of screen and material realities within which *Star Trek* has propagated from its start. It is easy, for example, to designate screen *Star Trek*—the broadcast episodes that made up the original series—as the original, if immaterial, essence, with the materializations flowing therefrom a secondary or paratextual extrusion that itself takes two forms. In the realm of commerce and marketing, toys and tie-ins bear the brand and reproduce its world in forms both faithful (phaser and tricorder sets) and fanciful (fuzzy tribble slippers). All of these exist in some sort of licensed relationship to *Star Trek*'s various owners and constitute additional revenue streams as well as officially sanctioned emblems and extensions of *Star Trek*'s meaning. Alongside these authorized materializations exists the craft of fans who, with immense passion but likely no form of permission, make costumes, flags, props, and sets.

Another viewpoint might emphasize the acts of material production that precede and give rise to its screen existence: the sets, costumes, and props built to appear before cameras and be worn by actors. Before these, in turn, exist yet other textual forms: scripts, drawings, storyboards, notes—to say nothing of the churn of documentation required to direct the industrial manufacture of a media product, such as editing and sound mixing notes, the labels on cans of film, videocassettes, and audiotapes; production correspondence in memos and emails; markup on scripts; lighting diagrams; and so on. Such a catalog is intended neither to comprehensively capture every element conceivably involved in making *Star Trek*, nor to argue for a master narrative of production in which priority of manufacture is firmly assigned, installing some original author as the prime mover. Most accounts of *Star Trek* consider Gene Roddenberry such a prime mover, and while his role is unquestionably integral to the franchise's creation and first 25 years of existence, nominating him—or his "vision" as carried on by creators who followed—as such performs an inescapably ideological function that draws our attention away from other important dimensions of the media property's longevity, growth, and dispersion.

Instead, by citing the inextricable layers of textual and material practice that have interacted over the years to generate *Star Trek*, I want to open a space in the conversation for build code: an undulating chain of creation in which textual and material forms interdepend and alternate, unfolding across time and space but also across realms of official and unofficial production—audiences of authors, some professional, others amateur, but all involved in the work of bringing *Star Trek* into existence. While fan construction of the show's ships took different forms throughout the 1970s, from AMT's scale plastic model kits to sets of tiny spacecraft for use in

Star Trek wargames, these were not simply material but textual practices, reliant on reference guides generated almost completely at the fannish level. These texts range from step-by-step instruction guides such as the assembly sheet that comes with any model kit to "in world" documents like Franz Joseph's *General Plans* and the *Technical Manual*: documents critically important to both the modular experimentation with form that grew the Original Series' handful of ships into whole fleets and to maintaining accurate proportions, detailing, and painting/lighting schemes across the crafting community—bringing something like machining standards to what had originated, perhaps necessarily, in looser and more varied outputs of folk art.

Ultimately, build code can be coextensive with the media artifact itself, each apparently final "output" available to the next stage for deconstruction or elaboration. The broadcast content of *Star Trek* grew into a storyworld less through top-down coordination than through the work of fans who used these often incomplete and inconsistent texts, which nevertheless possessed clues and stubs of consistency and interrelatedness, as the basis of blueprints, technical manuals, and other reference materials, which in turn became a generative matrix for new textual and material productions. Build code, then, is a way of reminding us that our most detailed and extensive fictional universes—at least before they became a term of art and a preplanned part of media creation—did not spring forth from a privileged realm of official authorship but arose instead from the distributed, largely *ad hoc* labor of fans who, through handicraft, mapped and materialized their media into shared subcultural worlds.

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