The design contest: the function, form, and meaning of the Bell telephone, 1920-1939

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This article explores the decades-long contest over the design of the telephone brought about by America’s monopoly Bell Telephone Company. The design contest of the title refers to a specific event—Bell’s 1929 solicitation of proposals from leading American designers for a new telephone design—and also to the contest of ideas about technology, progress, and professional middle class values that waged between Bell and its subscribers leading up to the 1929 design competition and beyond.

Keywords: telephone design, consumer culture, professional-managerial middle class, United States

Résumé Cet article explore la controverse qui dura plusieurs décennies concernant la conception du téléphone suscitée par la compagnie de téléphone américaine Bell qui en avait le monopole. Le terme « contest » du titre fait référence à un événement précis — en 1929, Bell lança un concours auprès des plus grands designers américains pour concevoir un nouveau téléphone — et également au débat d'idées concernant la technologie, le progrès et les valeurs des professionnels de la classe moyenne qui fit rage entre Bell et ses abonnés jusqu'au concours de 1929 et au-delà.

Mots-clés : design téléphone, culture de la consommation, professionnels et cadres de la classe moyenne, États-Unis

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In a keynote address at the Design History Conference in 2008, Bruno Latour commented on the transformation of design’s role in the production process:

From a surface feature in the hands of a not-so-serious-profession that added features in the purview of much-more-serious professionals (engineers, scientists, accountants), design has been spreading continuously so that it increasingly matters to the very substance of production. [...] Today everyone with an iPhone knows that it would be absurd to distinguish what has been designed from what has been planned, calculated, arrayed, arranged, packed, packaged, defined, projected, tinkered, written down in code, disposed of and so on.²

Latour’s observations fail to account for the fact that technological artifacts have always had a peculiar status among commodities. Like all commodities, they perform as potent signifiers of identity, status, and group membership—of this, the iPhone or the Blackberry are good examples—and yet they stand apart from other consumer goods by virtue of the fact that they are not discrete objects. Unlike a chair, a book, or an orange juicer, the design of a technological artifact is constrained by not only social expectation and desire, but more significantly by its function as an intermediary between humans and a technological network. Because of this, the design of technological objects engages questions of form and function, taste and technical capabilities, aesthetics and science. Here again, the telephone provides an apt example.

The dispute between America’s Bell Telephone Company³ and its early residential telephone subscribers over the design of the telephone offers insight into the manifold roles played by technological artifacts as social and technological mediators. The design contest of this article’s title refers to a specific event—Bell’s 1929 solicitation of proposals from leading American designers for a new telephone design—and also to the contest of ideas about technology, progress, and middle class values that waged between Bell and its subscribers leading up to the 1929 design competition, and beyond.

By the beginning of the 20th century, the telephone had ceased to be a

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³ The American Bell Telephone Company was incorporated in 1880. Bell acquired Western Electric Manufacturing Company (WE) in 1882 and licensed it as the sole producer of Bell telephones and equipment. In 1900, American Bell Telephone Company was re-structured and renamed American Telephone and Telegraph (AT&T). The term “Bell System” was introduced in 1908 to describe the AT&T network. In 1925, WE Research Laboratories and the AT&T Engineering Department were consolidated and renamed Bell Telephone Laboratories. In this article, I refer to all the various divisions and subsidiaries that made up the Bell System simply as “Bell.”
technological novelty. During the 1910s, the number of telephones installed in offices, factories, and shops grew rapidly, contributing to a radical transformation of the scope and efficiency of American business activities. Improved continental transportation networks accelerated circulation of materials and products, and the telephone’s capacity for instantaneous communication facilitated greater coordination of purchasing, production, and markets, making the expansion of America’s traditionally local businesses into regional and national enterprises, not only possible, but also profitable. As the size and complexity of businesses grew, so did the need for a new category of employee who could manage and oversee both operations and staff. The managers and specialized professionals who made up this new echelon of employees came to occupy a unique position in American society; they formed a new professional-managerial middle class.

This new middle class was both a product of, and a market for, the material and technological innovations of the early years of the 20th century. Industrialization, mass production, and new forms of communication acted to reorganize social relations and transform both the material values and conditions of American society. The new social fluidity of American society gave rise to what cultural historian Warren Susman called a “self-conscious search” for ways to express the new experiences of everyday life in meaningful ways. In the search for a new cultural identity that reflected the conditions of social existence, “the words ‘modern’ and ‘streamlined’ [came to be] used not only in reference to design of particular objects but also to a quality of living, a lifestyle.”

The new middle class looked to the products of the modern age to create a new style of living that expressed their values as well as their status. Encouraged by advertisers to think about the furnishings and appliances in their homes as “outward and visible signs of an inward and spiritual grace,” home décor took on new significance. Technological goods—electric lamps, vacuum cleaners, radios, and especially, telephones—were embraced as symbols of a modern sensibility, and by the end of World War I, America’s new middle class was responsible for a marked upswing in the number of requests received by Bell for residential telephone service.

A telephone in the home announced a modern appreciation of efficiency and, as the cost of telephone service was not insignificant, it served to identify the class status of its owner. While members of the middle class were eager to acquire the telephone and the social prestige it conferred, the machine-like appearance of Bell’s candlestick telephone was at odds with their concern that the objects in their homes reflect their taste and refinement. Increasingly, their applications for telephone service to Bell included a request for a ‘French phone.’

The French phone, as it was commonly known, was a handset telephone with the receiver and transmitter both located in the handle. In use in France since 1882,

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it was common in Europe by the early 1900s. Fashion-conscious Bell subscribers were requesting the stylish telephone as early as 1910. Its appeal grew when Americans returning from Europe after the war brought French phones back home to the United States. In the early 1920s, the French phone began to appear in Hollywood films and magazine pictorials as a signifier of sophistication and refinement. Movies and magazines were growing in popularity as leisure time activities for the middle class, especially middle class women. Magazines were particularly popular because of the insights and instructions they offered middle class homemakers on home décor and the management of the modern household. In its December 1923 issue, the style-conscious *House & Garden* magazine cast a critical eye on Bell’s candlestick telephone: “It is a curious fact that the telephone, probably the most indispensable of all our modern luxuries, has been allowed to retain its original unprepossessing aspect. Even when painted to harmonize with the surroundings, it strikes a discordant note by the very ungainliness of its lines which no amount if painting and decorating can transform.” The author concluded by advising: “There is only one thing to do with the telephone—conceal it.”

But what members of the discerning middle class wanted was not to hide the telephone but to display it proudly. Accustomed to choosing from a variety of goods and products, they failed to understand why the French telephone they saw in movies and magazines could not be installed in their homes. They saw the ‘problem’ appearance of the telephone as easily solved by design and they urged Bell to produce an attractive telephone that was in keeping with contemporary taste.

Bell’s initial reaction was to ignore its subscribers’ requests. Bell’s monopoly status allowed it to remain insulated from—and largely dismissive of—public opinion, leading it to underestimate the growing importance of the consumer in America’s transformed economy. The fact that Bell leased rather than sold its telephones to subscribers contributed to its conviction that fashion should not dictate the appearance of the telephone. A more significant factor in Bell’s decision was the “ideology of systems engineering” that drove its research goals and corporate culture. In 1907, after a decade of problems with the technical quality of its telephones that had tarnished its reputation with both subscribers and federal regulators, Bell radically rearranged its corporate structure and research goals. Rather than continuing to compete with Independent telephone companies for subscribers, Bell focused on building a national long distance

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5 «Concealing the Unsightly Telephone,» *House & Garden*, December 1923, 65.
6 “We have had enough experience with the public to know just how fickle they might be.” F.M. Jewett (Bell Laboratories President) to B. Gherardi (AT&T Vice President and Chief Engineer), memorandum, 10 April 1928. Box 73, Series 7: Apparatus and Systems, F.B. Jewett Collection, AT&T Archives.
network. This objective established scientific research and engineering at the core of Bell’s activities and instilled an ethos of engineering in which the function of the telephone was paramount and all other considerations trivial. From Bell’s point of view, introducing new telephone models would merely make their stock obsolete and create supply problems. The cost of production would require a sizable capital investment that would ultimately divert Bell from its technological goals. In very simple terms, Bell misjudged the importance of the telephone’s appearance to its subscribers because from an engineering perspective how the telephone looked did not matter. Yet in another way, the look of the candlestick telephone may have also factored into Bell’s reluctance to respond to its subscribers’ desires. The sober, functional candlestick telephone had come to symbolize the Bell Company itself and represent its ideal of scientific rationality. In its institutional advertising between 1908 and 1912, the candlestick telephone quite literally ‘stood in’ for Bell and its values (Figure 1).

Figure 1. “The Efficient Minute.” AT&T advertising proof, 1910. (File 1, box 21, series 1, N.W. Ayer Advertising Agency Records, Archives Center, National Museum of American History, Behring Center, Smithsonian Institution.)

Other telephone manufacturers did not share Bell’s constraints or reservations. Independent manufacturers, who produced telephones for small regional telephone companies, were receptive to using style as a selling point. Kellogg introduced a handset telephone—the Grab-a-phone—as early as 1905. By the mid-1910s, other American manufacturers were producing versions of the French phone, including Magnavox and De Veau. By the 1920s, numerous models were
available and some manufacturers were beginning to experiment with a range of finishes and colors. The Kellogg Grab-a-phone was made in a variety of finishes, including a black handset with chrome detailing, a copper model with chrome and brass details, and a removable base-cover in embossed antique brass was also available. In 1926, the More-Tel Corporation's "French Phone" was available in nickel, brass, bronze, and gold- and silver-plate; and in 1929, the American Electric Company advertised its Monophone in eight decidedly fashionable colors—among them, mahogany, Chinese red, orchid, and Nile green. Independent telephone manufacturers advertised their handsets as the solution to the middle class desire to reconcile technology and taste, often contrasting their stylish telephones with Bell's "ungainly" candlestick. The headline of a 1928 advertisement for the Monophone asked bluntly: "Why Should a Telephone Be Ugly?" while a 1929 ad for the same phone noted that "the graceful form and attractive appearance of this modern telephone instrument make it of definite value to the tasteful furnishing of any room. It is a decorative asset, rather than a liability." An ad for the Mor-Tel French Phone addressed "[t]hose who take pride in the appearance of their home and office, shun to every degree possible, the too evident present day influence of standardization" and asked: "Do you enjoy in your home, the phone that is used in every factory, garage and store?" While early ads by all manufacturers promoted handset telephones for use in both home and office settings, increasingly they began to focus on the telephone's residential uses and directed their appeals to women as the managers of the modern middle class home and guardians of its values. "When Mrs. Marshall Uses the Telephone" declared one such ad featuring an illustration of a well-dressed woman at ease in her elegantly appointed drawing room, "she demands beauty as well as efficiency" (Figure 2). Determined subscribers dealt with Bell's refusal to offer a handset telephone by purchasing handsets made by other manufacturers and connecting them to the Bell network. In response, Bell ran warnings in local newspapers advising subscribers that connecting "foreign" telephones was in violation of their contract and that any unlicensed instruments would be disconnected. However subscribers who had purchased a fashionable telephone were undeterred and kept using their handsets despite Bell's threats.

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11 The Mor-Tel Corporation,"The French Phone" American Perfumer and Essential Oil Review, (September 1926), pp. 84-85.
Bell was ultimately forced to acknowledge its subscribers’ demands or lose their business to competitors willing to give them what they desired. Bell engineers were not unfamiliar with the design of the French phone. Bell engineers had experimented with various handset designs as early as 1890 but all work on handset telephones stopped in 1907. Bell’s reluctance to design and manufacture a handset telephone was due in large part to the disappointing results of these earlier attempts. Putting both the transmitter and the receiver in a single unit created problems with signal efficiency and sound clarity because the transmitter acted to amplify speech. With the transmitter and the receiver in close proximity, the vibrations between them caused the handset to “howl” and over-power voice transmission. Reducing the transmitter amplification would diminish howling, and this was the strategy employed with European handsets, which were used mostly for short-distance calling. However, since reducing the level of amplification also weakened the signal emitted by the transmitter, this solution was incompatible with American geography and the terms of Bell’s monopoly status. In order to win its national monopoly, Bell had convinced federal regulators that it alone could provide the high quality instruments and reasonably priced service required for long distance communication. Inferior or unreliable transmission threatened to erode not only Bell’s reputation but also its plans for a continental long distance network. On the other hand, delaying the release of its handset telephone could only further provoke its subscribers. By the fall of 1926, Bell had produced a handset that was less susceptible to howling but not all transmission problems were solved. Concerned by inroads
made by the Independent manufacturers, Bell made the decision to release a small number of experimental handsets in January 1927, with the precaution that they be provided only to the most demanding subscribers and their availability not be advertised. It was a decision Bell soon came to regret. Nearly one-third of the handsets released in 1928 were withdrawn from service by June of that year. Compounding the problem was demand for the French phone, which continued to rise despite the lack of promotion. While Bell had anticipated some technical problems, it was unprepared for the overwhelmingly negative response to the design of its handset telephone. Bell engineers had scrutinized every conceivable technical detail of the handset—going so far as to take “4,000 measurements of head dimensions” to insure optimal spacing and position of the receiver and transmitter on the handle—and yet they ignored what mattered most to the public: the telephone’s appearance. To make its handsets, Bell engineers had simply shortened the shaft of the candlestick base and fitted it with a cast aluminum cradle-style hook switch. Bell subscribers who had been eagerly awaiting the opportunity to install a fashionable telephone compared it unfavorably to the models of other manufacturers. One disenchanted subscriber wrote: “Our office has recently installed a French-style of telephone made by your Company [placing] the order without looking at the design. [...] in my opinion the real French type telephone is attractive in design, whereas the [telephone] furnished by the [Bell] Telephone Company strikes me as being ‘something awful.’”

It is difficult to understand how the appearance of Bell’s handset telephone was given such short shrift, especially as it was precisely the design of the telephone that was the key concern for subscribers. It is perhaps notable that the chief engineer who halted Bell’s research on the handset in 1907 was Bell’s vice president in 1927 when the “awful” looking French phone was released. I suspect that it was not, as Bell historian John Brooks suggests, that “[he] just didn’t like French phones,” but rather that the technical rationalism that informed his views and those of the engineers charged with the development of the telephone simply did not accommodate the consideration of style. The strategies of system engineering that organized Bell’s research, production, and distribution efforts embraced a notion of progress based on technological advancement. Bell’s

15 M.D. Fagen notes that this research “was one of the early applications of anthropomorphic measurements in industry and one of the first applications of ‘human factors’ studies in the Bell System.” M.D. Fagen, ed., A History of Engineering and Science in the Bell System: The Early Years (1875-1925). 146.
16 C.M. Owens (Bell subscriber), letter, January 24 1927. Box 73, Series 7: Apparatus and Systems, F.B. Jewett Collection, AT&T Archives.
demanding middle class subscribers, on the other hand, saw progress embodied in ideas of self-improvement and refinement, and in the objects they chose as reflections of their taste and social status. The determination of subscribers finally resulted in Bell’s somewhat reluctant acknowledgment that “the modern trend is toward a more pleasing appearance of utilitarian things.”  

In 1929, Bell decided to hold a design contest to create a new modern telephone in keeping with the desires of its subscribers. Four well-respected artists—John Vassos, Réne Clark, Gustav Jenson, and Lucian Bernhard—were invited to take part in the competition. As the consulting artists began to work on their designs with Bell engineers, it quickly became clear that the two groups imagined the telephone in radically different ways. Like most designers working at this time, Vassos, Clark, Jenson, and Bernhard had little experience with the design of technological artifacts. Accustomed to designing fashionable consumer goods, they approached the design of the telephone from the same perspective. Employing art nouveau and art deco motifs, their designs were highly idiosyncratic and featured beveled edges, fanciful cradle lugs, and other decorative details. In the analysis that accompanied his submissions, Vassos explained that his goal was to make the telephone “an interesting object from a sculptural point of view.” His declaration that “[t]he telephone should not be classed in the minds of the public as a mechanical device but rather as a desk accessory” could not have been more out of step with the sentiments and sensibilities of the Bell engineers.

The report on the artists’ models prepared by Bell’s apparatus development engineer D.H. King indicated that their designs were fraught with problems that would be difficult and costly to resolve. King’s list of flaws included fragility of parts, details which would cause finishing problems, high cost of making and maintaining the molds for some of the more decorative housings, and in one case, inadequate space allowance in the body of the phone to accommodate technical apparatus. While ostensibly limiting his analysis to the mechanical aspects of the telephone designs, King’s remarks actually focused on their appearance. He objected to one of Vassos’ more elaborate designs on the grounds that “[i]t offers too many places for the collection of dust and dirt.” King was equally critical of Bernhard’s design which included a groove to accommodate a pen or pencil: “what apparently was intended as a feature [...] may prove to be a serious maintenance nuisance as it probably will invite subconscious defacing of the mounting surfaces while the subscriber is writing.” While initially impressed with Jenson’s more restrained design, he ultimately rejected it as well because its novel handset

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18 William Fondiller, Bell Lab’s assistant director of apparatus development, speaking at the American Management Association convention in 1929.


20 Ibid.
support would require completely redesigning the switchhook mechanism. King concluded his report with the observation that the designs exhibited “very little consideration from the practical or manufacturing viewpoint” (Figure 3).21

Figure 3. 1929 design competition telephones designed by (clockwise starting at top left): Lucian Bernhardi, Gustav Jenson, Réne Clarke, John Vassos. (AT&T Archives.)

King’s report confirmed Bell’s belief that aesthetics and engineering were incompatible. In February 1930, it was decided that two engineers would be assigned to work on the design of the new telephone, with a consulting designer to “aid and inspire” them. No doubt Bell’s 1928 French phone fiasco was responsible for the suggestion that “an advisory committee consisting of an architect, a master designer, and an interior decorator” assess the engineers’ designs before taking any decisions to move forward with production.22 Bell’s engineer-designers discarded the consulting artists’ designs. 23 That year the Bell engineers redesigned the offending French phone, replacing its round base with one that was elliptically shaped. The Bell Laboratories Record featured the new design in its October 1931 issue, noting that the telephone’s new contours were based on Euclid’s Golden Section, “the empirical rule for achieving beautiful proportions” and “a fundamental principle underlying all creations of beauty.”24 Perhaps not surprisingly, Bell engineers found their solution to the dilemma of their French phone’s appearance in a mathematical formula.

In 1934, Bell engineers developed a new direct-action transmitter that solved the problems of output efficiency that plagued the French phone and was economical to manufacture. That same year, Bell hired industrial designer Henry Dreyfuss to design a telephone to replace the troublesome French phone and to finally put an end to the contest over the “appearance” of the telephone. Interestingly, Dreyfuss’ first submissions reflected contemporary approaches not unlike those proposed by Vassos, Clark, Jenson, and Bernhard. He suggested a streamlined design and recommended that Bell offer the telephone in a range of fashionable colors. However, Bell’s ethos of engineering quickly prevailed and Dreyfuss’ design largely gave form to the ideas of Bell engineers. The resulting No. 302 phone was a model of functional design and it went into production in 1937 (Figure 4). While Bell prized innovation in the field of engineering, it clearly did not value originality in design. The similarity of Dreyfuss’ No. 302 to Jean Heiberg’s 1930 telephone design for Sweden’s L.M. Ericsson Company was remarkable. In 1929, Bell Labs had imported samples of the Neophone—the first combined handset of this type produced by the Siemens’ Brothers for the British Post Office—for its engineers to examine and test. Whether Bell had also examined Hieberg’s molded plastic telephone is not known, but the fact it was modeled on the Neophone suggests that Bell engineers allowed themselves a great deal of latitude when it came to borrowing aesthetic elements of competitors’ telephone designs.

Figure 4. Bell’s WE #302 introduced in 1939. (Reproduced with permission of The Bell Canada Historical Collection)

26 In handset telephones, the ringer was an external component.
28 R.H. Colpitts, “Memorandum to H.P. Charlesworth,” July 3 1929. File 08 04 03, H.P. Charlesworth Collection, AT&T Archives.
It is interesting to note, as does Dreyfuss’s biographer Russell Flinchum, that “the fact that the No. 302 as it first appeared was available only with a die-cast metal base while the Hieberg design was produced in Bakelite plastic from its inception is a gauge of the relative conservatism of [Bell] engineers.” 29 During these years, Independent manufacturers in the US continued to experiment with both the materials and appearance of the telephone. In 1933, Kellogg introduced the Masterphone 900—a non-dial combined set telephone with a bakelite housing—and in 1935, the Masterphone 925, a dial version. Sometimes called the ‘ash tray phones,’ with their quintessentially art-deco styling, they approached John Vassos’ ideal of a telephone with the styling of a desk accessory rather than a mechanical device. Stromberg-Carlson’s first combined telephone, the stylish No. 1212 was introduced in 1936 and it too featured a Bakelite housing.

It was not long before the telephone’s “art-deco period of great diversity” ended. 30 By 1940, Bell’s No. 302 became the standard for all telephone design. Stromberg-Carlson replaced the fashionable No. 1212 with the No. 1222, which was very similar to Bell’s No. 302 including its die-cast zinc housing, and the shape of the Kellogg Masterphone began to shift perceptibly towards Bell’s model as well. In the mid-1930s, Bell subsumed telephone design under the purview of “human factors research,” which studied how people used the telephone in order to insure that it was used in ways that did not conflict with Bell’s objectives. Design became a means by which Bell engineers were able to standardize not only telephone apparatus and components, but more significantly, the use of the telephone by subscribers. The 1949 press release announcing Bell’s new No. 500 telephone left little doubt as to the supremacy of engineering over design: “The appearance of the set was designed by Bell Telephone Laboratories’ engineers working with Henry Dreyfuss, one of the country’s leading exponents of functional design.” 31

Studies of the telephone typically focus on its function as a communications technology and its impact on the practices of everyday life. The contest between Bell and its early residential subscribers reminds us that the telephone is also a material artifact that communicates a myriad of meanings to and about its users. Although, the design of the telephone seemed to be of little importance to Bell’s managers and engineers, their attachment to the candlestick telephone’s serious and utilitarian appearance suggests otherwise. Its use as the corporate symbol in Bell’s institutional advertising between 1908 and 1912 is evidence that Bell saw the candlestick telephone as embodying its identity and ethos of engineering. Viewed in this way, the contest between Bell and its subscribers over the appearance of the telephone can be more properly understood as a contest over the meaning of the telephone, what it communicated, and to whom.

29 Flinchum, Henry Dreyfuss, Industrial Designer, 97.
31 AT&T Public Relations Department, “500-Type Set Takes a Bow on National TV Program,” February 1, 1955. File: 500, Set Bell Canada Historical Archive.