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*The story behind the Bell System's DESIGN LINE\* decorative telephones goes beyond physical configuration. Marketing and distribution strategies developed for these stylish new sets will serve well in the introduction of other products.*

## DESIGN LINE\*

# Decorative Telephones: Just the Beginning

NORRIS R. HALL

THE DESIGN OF TELEPHONE INSTRUMENTS has advanced from Alexander Graham Bell's elemental one-piece, funnel-like telephone to today's universally accepted, efficient, basic models with dial in base or dial in handset. In addition to making electromechanical improvements, the Bell System has several times expanded its line of models to include a variety of styling choices.

In 1968 the Bell System adopted its "antique/decorator" policy, offering a reasonable solution to a then small, but pressing, customer demand for an even wider variety of telephone styles. In this program the customer purchases an AT&T-approved housing from a retail outlet and, for a fee, the Operating Company arranges to have the components installed to make it a working telephone set. The customer is then charged the regular monthly extension rate for service, where applicable.

### A New Direction

The major Bell Labs design effort in customer products is aimed at telephone technology—acoustics, electronics, mechanisms, and so forth. But customer demand for dec-

\*Trademark of AT&T Co.

*The Design Line program has drawn for its success upon the unique combination of expertise that the integrated Bell System offers—from planning, design, manufacturing, marketing, and field trials to system-wide availability.*





The first five Design Line telephones (top), selected from several hundred proposed designs, are (clockwise from top left) the Stowaway, the Celebrity, the Elite, the Exeter, and (at center) the Accent. Except for the Celebrity, these sets are available with either TOUCH-TONE® or rotary dials, and all offer a variety of colors and finishes. All are manufactured by Western Electric although many piece parts are made by outside suppliers. Additions to the original five models of Design Line telephones include (from left to right, bottom) the ANTIQUE GOLD\* model of the Cradlephone, the CHESTPHONE,\* and the CANDLESTICK\* telephones. The Cradlephone telephone is also available in EARLY AMERICAN\* and MEDITERRANEAN\* models. American Telecommunications Corporation produces the housings for these sets, and Western Electric installs the electromechanical components.

\*Trademark of American Telecommunications Corporation.

orator-type telephones was growing rapidly, and in February 1972 the Bell System's tri-company Customer Products Council (CPC), representing AT&T, Bell Laboratories, and Western Electric, instituted an effort by the Bell System to

- Satisfy the demand for a variety of telephone-set styles,
- Minimize the Operating Company capital investment in the program, and
- Develop a marketing strategy for adding new styles in the future.

As a result of these CPC recommendations, earlier plans for developing an electronic telephone had to be revised. Originally, plans called for a single program to encompass the two elements of new styling and integrated electronics. Now these elements would be split into two separate programs. One program would continue to focus on applying electronics in those areas where reliability or other systems advantages could justify development costs. (One product of this program is the G-36 Rural Handset, featuring transmitter and receiver amplification, which allows Operating Companies to offer better service more economically on long loops.) A separate effort would aim at satisfying customer demand for

*Top right: Members of the Design Line telephone project team at Indianapolis go over manufacturing specifications for the Elite phone. From left: author Norris Hall, Ron Young of Western Electric, and Jim Gillett and Warren Tolman of Bell Labs.*

*Right center: Visit to Nelson Industries, manufacturers of the wooden box assemblies for the Stowaway set. Author Hall (right) and Western Electric Engineer Bryce Drake (left) discuss a design modification with principals John M. Nelson, Sr., and John M. Nelson, Jr.*

*Lower right: Paul Schweizer of Bell Labs' Indianapolis location places Design Line phones into an environmental chamber for temperature and humidity testing.*

*Top left: Bob Thomas, left, and Warren Tolman, both of Bell Labs, observe a handset "drop" test being performed on Design Line phones. This test is used to evaluate the life of the line switch and the line switch mechanism.*

*Lower left: Scott Brown of Bell Labs evaluates the cord-reel return springs used to retract the handset cord into the Stowaway.*

*The teamwork of the Bell Labs and Western Electric engineers "... assured that the complete telephone set would meet Bell System requirements for operational life and service."*





*"Western Electric's customary attention to details has resulted in a low initial trouble-report rate, thus proving that it is economically feasible to ship the Design Line telephones directly to the customer from the factory."*



*Above: Valorie Richardson, of Western Electric Manufacturing in Indianapolis, performs a series of tests on the transmitter, the ringer, and other components of the Stars-and-Stripes Candlestick telephone.*

*Center: Western Electric employee Sue Stockton assembles Design Line Cradlephone sets on an assembly line in Indianapolis.*

*Far right: With studied concentration, Barbara Pastrick, also of Western Electric in Indianapolis, puts the transmitter into the French-style handset of a Cradlephone telephone.*



new styling, using existing, low-cost telephone components. This styling program also offered the opportunity to develop new marketing and distribution procedures.

A tri-company project team was formed consisting of AT&T marketing and customer services specialists, Western Electric merchandising and manufacturing experts, and Bell Labs engineers. The team's purpose was to develop these new concepts into new products and find ways to reduce the product introductory time.

The design requirements specified by the team were straightforward: The telephones

must, of course, be unusually attractive; they must use standard, available components (the antisidetone network, ringers, dials, line switches, transducers, and modular cords); and they must appeal to a broad range of customers interested in decorator-styled telephones, from the low-price mass market to the high-fashion, exclusive market.

Bell Labs engineers then called on the industrial design firm of Henry Dreyfuss Associates to develop a series of new-style telephones in unique shapes, materials, and colors. The Dreyfuss organization submitted several hundred sketches for consideration, and from





these, twelve distinctively different style groups with a wide range of material, texture, and color variations were selected. Late in November 1972, Dreyfuss unveiled 40 full-scale plaster models of their designs from the twelve style groups. For the initial trial, the project team selected five styles with several decorator variations.

#### **Teamwork Beats the Schedule**

Bell Labs immediately formed a design team to work with Western Electric in developing the new sets for trial the following spring. Western Electric, accepting the chal-

lenge of an extremely short schedule, agreed to produce the sets, shown on page 236 (top), within five months. To compress a normal time frame, tasks usually executed in sequence were undertaken concurrently. Long-lead-time items, such as complicated molded parts, were worked on first. In fact, in some cases Western Electric arranged for suppliers even before the designs were finalized. In other cases, subassembly tooling was completed before final drawings were available for other parts of the same telephone set.

Meeting the schedule was complicated by the need for about 130 new piece parts, some involving new materials. To find many of these materials, the station set development engineers ventured into areas far different from their normal fields of expertise. For example, original plans for the Elite set called for a leather covering, and the design team learned quickly about the problems of cowhide. Because the tanning process reveals defects such as brand markings and scars from injuries or ticks, only high-quality, fully processed hides would be purchased. Further, each set required a large, perfect, uniformly grained piece of leather. With an uncertain future availability of top-quality hides in quantity, and the increase in the cost of each set that leather would engender, the design team chose to use leather on the first phase and look for satisfactory ways to use vinyl simulated leather in the near future. (Vinyl simulated alligator skin was specified on the Exeter set, since the alligator is high on the list of endangered species.)

The woods used in several sets also went through a form of evolution. At first standard 1¼-inch-thick pieces of wood were ripped and planed down to the ¾-inch thickness required by the designs. In addition to the waste this caused, there was also a problem with warping. A unique laminating process was developed to allow the use of 2-inch-thick plane sawed walnut stock which when assembled approximates the properties of quartersawed wood (planks made by sawing a log into quarters so that the annual rings are nearly at right angles to the wide face). This eliminated the waste and reduced the warping problem significantly.

Two new handsets completed the styling details of the five pilot sets. The "French" type is used on the Celebrity telephone (top photo, page 236). A lightweight, modern-styled handset, called the K type (shown on page 240),



is used with the other four telephones. The K type is the first two-piece plastic handset and is one-third lighter than previous three-piece types. However, its lightness posed a challenge: Since the line switch is operated by the weight of the handset, the design team had to develop very efficient, sensitive line-switch mechanisms.

The new designs brought forth other changes in standard parts, too. For example, the Stowaway telephone (top photo, page 236) features a small-diameter reel that retracts the cord inside the set for storage when the lid is closed.

The Bell Labs/Western Electric team met their development schedule, and the Indianapolis Works produced the Design Line telephones on time. The first field trials began in June 1973 in Evansville, Indiana, and one month later were expanded to six PhoneCenters in southeast Florida. Various radio, TV, newspaper, and bill-insert promotional methods were tried in Evansville, while the Florida trial was based strictly on sales by Phone-Center service representatives to walk-in customers coming to arrange for new or additional service.

While the first five Design Line telephones were in field trial, three more housing designs, manufactured by American Telecommunications Corporation (ATC) of El Monte, California, were added to the Design Line program, thus providing a full line of decorative telephone sets. The ATC telephones (lower photo, page 236) are known as the Chestphone set, the Cradlephone set which has three style variations, and the Candlestick set. In these

sets, Western Electric installs the electromechanical components in the housing purchased from ATC to make working Bell System telephones.

Working closely with representatives from ATC, Bell Labs and Western Electric engineers negotiated several design changes in the housings to assure that the complete telephone set would meet Bell System requirements for operational life and service.

With the addition of the three new sets, Design Line telephone trials were expanded to five locations by March 1974: the two sites already mentioned plus Cincinnati, Ohio; Syracuse, New York; and Indianapolis, Indiana. Design Line telephones will be available in most Operating Company areas by June 1975.

### Essential: The Marketing Plan

The tri-company project team also developed a new merchandising concept for the Design Line telephones. A retail sales plan, tested first by Northwestern Bell and then modified by AT&T Market and Service Plans specialists, is an essential feature of the program. It provides for customer ownership of nonworking parts and eliminates the inventory of sets an Operating Company must normally keep in service centers, garages, and trucks. In the new plan, the customer purchases the decorative housing of the complete Design Line telephone from the local Operating Company for a one-time charge. To ensure that the sets will be compatible with the nationwide network, the telephone components are installed by Western Electric at the time of manufacture. Moreover the Operating Company owns and maintains the working parts of the telephone, applying its regular monthly extension charge for this service, where applicable. However, there is no premium charge such as those for TRIMLINE® and PRINCESS® telephones, which cover housing repairs, field inventory, and stocking of special repair parts, because the customer owns the set's decorative housing and is responsible for any charges to repair it after the six-month warranty period.

To merchandise the Design Line telephones the most efficient way, inventory, distribution, and repair are being centralized. The Design Line sets are kept at the Indianapolis Works until an order arrives from an Operating Company, although as the program expands they may also be kept at regional Material Management Centers. In many cases the set is shipped directly from Indianapolis to the



*First two-piece plastic handset, this Bell Labs-designed model is one-third lighter than the standard three-piece type. This handset, plus an extra-sensitive line-switch mechanism, was developed especially for the Stowaway, Elite, Exeter, and Accent Design Line telephones.*



customer's home, and the customer simply plugs the set into a jack previously installed by the Operating Company. In other cases the set is delivered by an installer who has come to install the jack. (Western Electric informs the Operating Company of the shipment via a copy of the shipping order; when necessary, the Operating Company arranges to install modular hardware on the customer's premises before the set arrives.) This inventory and distribution plan eliminates the need for having sets in the field which are neither owned by a customer nor earning revenue.

### **Two-Way Repair Plan**

At present, Design Line sets are repaired in one of two ways: If the trouble is in the working components, the Operating Company's craftsperson attempts repair on the customer's premises. If special parts are needed, the craftsperson sends the complete set to Western Electric's Indianapolis Works in a specially designed field-return carton. There is no charge to the customer if the trouble is in the electromechanical portion of the set owned by the Operating Company.

However, if only the housing is damaged and the customer wants the telephone company to repair it, the craftsperson returns the entire set to the factory. If the customer has owned the housing for six months or less, any defects in design, material, or workmanship are fixed at no charge under the warranty provided by the telephone company. For damage not covered by the warranty, the customer pays a fee based on whether he wants the telephone company to pick up and return the set or whether he wants a "loaner" set during the repair interval.

With this procedure, the customer can lower his repair charges significantly by saving the Operating Company additional visits. After repair, the set is usually shipped directly back to the customer. The factory-repair interval for Design Line telephones is usually about three weeks.

### **Multiple Benefits**

The advantages of this marketing, distribution, and repair concept are

- Minimal investment for the Operating Com-

pany, since the customer purchases and is responsible for the housing—the most expensive portion of the Design Line set and the item most subject to obsolescence as customer demands change.

- A level of customer investment which compensates for changeout of previously installed telephone sets.
- Customer identification with the telephone is strong and personal, instilling a pride of ownership.

The new merchandising method had an impact on the design approach. For example, during the electromechanical design, project engineers found it necessary to mount the set's ringer, dial, antisidetone network, and modular jacks so that they could easily be removed from the customer-owned housing for repair or replacement. In the external design, the dual need to minimize inventory and still provide market flexibility resulted in designing some models—at first Accent, Exeter, and Elite—to accommodate a wide variety of decorator appliques.

### **Western Electric's Expertise**

Much time and effort has been spent to make the Design Line telephone sets extremely reliable while still satisfying customer expectations for styling. In line with normal practices, Western Electric has established inspection sequences to ensure that the sets meet high appearance requirements for finishes, plating, and appliques. A complete, final electrical test is made before packaging to ensure that the set will work when the customer first plugs it in. Western Electric's customary attention to details has resulted in a low initial trouble-report rate, thus proving that it is economically feasible to ship the Design Line telephones directly to the customer from the factory.

The Design Line telephone program, from its beginning in 1972 to nationwide availability by 1975, just three years later, shows that the Bell System can respond quickly to customer demands and do so profitably. The program has opened up a whole new way to introduce new-style telephones and perhaps, in the future, new services. □