

ENGINEERING ORGANIZATION AT CHERRY HILL

THE RCA CHERRY HILL PLANT, located in Delaware Township seven miles east of Camden is headquarters for three major divisions of RCA: (1) the RCA Service Company; (2) the RCA Victor Radio & "Victrola" Division and (3) the RCA Victor Television Division. At this site are five interconnected buildings with 308,000 square feet of floor space and 1,900 employees . . . 250 in the Radio & "Victrola" Division, 730 in the Television Division, and the remainder in the RCA Service Company.

This article deals generally with the activities of the RCA Victor Television and the RCA Victor Radio & "Victrola" Divisions, and more specifically with the engineering departments within these Divisions. For the story on the RCA Service Company, the reader's attention is directed to Mr. Cahill's article appearing in this issue.

EARLY PLANNING

Planning for Cherry Hill was started in 1951. Prior to that time the need for more area for Engineering as well as other activities of the Radio and Television Divisions was apparent and no possibility existed for this expansion in the Camden Plant. Since the operations of these Divisions in Camden were only Home Office and Engineering functions, with manufacturing being conducted in other plants, space within the confines of the Camden Plant was not essential. A community of interest between Radio and Television as well as with the RCA Service Company (which was also facing the same problem



By

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Engineering Services

RCA Victor Television Division

Cherry Hill, N. J.

with respect to working space) dictated a desirability for the establishment of these operations at one location.

Months of planning and many layouts of the new facilities*, and particularly those for Engineering, were required before construction of the plant was started in 1953. The first activities moved to Cherry Hill in December of 1954 with moves completed early in the following year.

ENGINEERING OFFICES AND LABORATORIES

The entire area is devoted to offices and Engineering laboratories and associated services of the three Divisions indicated above. There is no manufacturing at Cherry Hill! As a result of our intensive planning, we provided laboratories laid out for efficiency of operation and adequate working space far superior to those we had previously. Laboratory benches were uniform in style and designed for ease in movement within the area or from one area to another with a

*See Engineering at Cherry Hill by R. J. Hall, RCA ENGINEER VOL. I. NO. I.

minimum of expense. Power connection to individual benches is accomplished by means of a flexible cable connected to an overhead trolley duct, easily disconnected for moving. The shielded rooms, adequate in number, were of the latest construction known to us to provide the optimum in interference attenuation. Provided also were anechoic rooms for both the Radio and the Television Divisions, unique in design and construction to provide adequate sound attenuation for audio and acoustic work. Our model shops for wood cabinets and metal parts are among the finest to be found with respect to layout, equipment, etc.

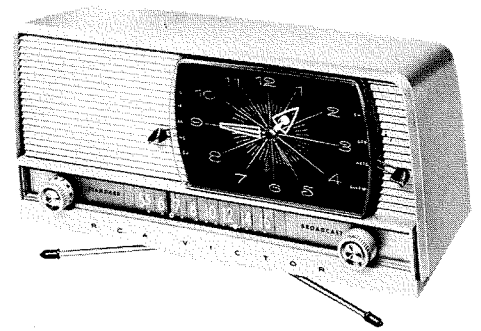
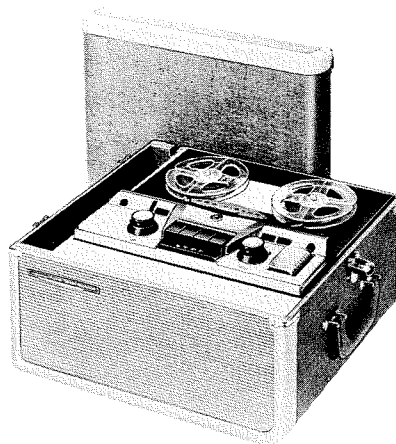
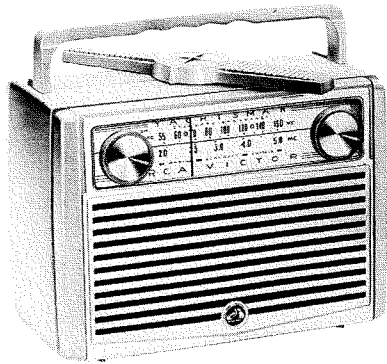
TELEVISION DIVISION ENGINEERING

The Home Office activities of the Television Division, under the vice president in charge, include operations such as Sales, Merchandising, Product Development, Financial, Advertising, Purchasing, General Quality, Manufacturing, and Engineering. Outlined in Fig. 1 and described below are the major activities in Engineering.

The prime objectives of both the *Black & White Television* and *Color TV Engineering* are to design and develop a line of receivers competitive in price and quality for the consumer market, keeping abreast of the art and producing the best possible sets for their respective prices.

Advanced Development is concerned with developing new circuitry, applying new materials, and pioneering advances in the art which may be incorporated in future receivers.

Engineering Services is an activity covering a broad range of functions



such as budget control, engineering facilities and material procurement, electrical components engineering, tube application, design and development of deflection components, coordination with Underwriters' Labs, Packing Design, Technical Publications, Drafting Standards, Blueprint and Reproduction Service, and the Model Shop.

Resident Engineering is another important operation that provides liaison between the various Manufacturing plants (where no engineering is carried on)—and engineering at Cherry Hill (where no manufacturing is done). The only exception to this is the Findlay, Ohio plant where Ferrites are developed, designed and manufactured.

Resident Engineering supplements the basic Cherry Hill engineering development on receivers and deflection components, maintains close contact with manufacturing, solves "engineering-production" problems, and refers special problems to product engineering at Cherry Hill. A Resident Engineering activity, responsible to the Chief Engineer at Cherry Hill, is located at the receiver assembly plants at Indianapolis and Bloomington, Ind.—and at Findlay where deflection components are manufactured in addition to ferrite production.

RADIO & "VICTROLA" DIVISION ENGINEERING

Similar in organization structure to TV Division the Home Office activities of the RCA Victor Radio and "Victrola" Division, under the Vice President, include such activities as Sales, Product Planning, Advertising and Sales Promotion, Financial, Manufacturing, and Engineering. Major activities in Engineering are shown in Fig. 2, and described below.

Radio and Phonograph Engineering is responsible for developing a full line of domestic personal and portable radios (both tube and transis-

sistor), table and clock radios, "Victrola" Phonograph and tape recorder instruments. In addition, adaptations of Radio & "Victrola" products are made for International Sales. Engineering also includes minor modifications for the conversion of domestic TV receivers for foreign standards.

Record Changer Engineering has the responsibility for developing automatic record changers, manual record players, and tape recorder transports.

Advanced Development (like TV) is concerned with new circuitry, new materials, and new developments in the art. In the past two years very significant contributions were made in the transistorizing of radio receivers.

Engineering Services, as in TV, includes such activities as budget control, procurement of material, facili-

ties arrangement, and packing design.

Electro-Mechanical Devices is responsible for the design and development of loudspeakers, phono pickup cartridges, magnetic tape recorder heads, and microphones.

Resident Engineering in the Radio & "Victrola" Division, with the same responsibilities as outlined in TV, is located in the Canonsburg, Pa. plant where radios and radio-"Victrola" combinations are produced, and in the Cambridge, Ohio plant where record changers, "Victrola" phonographs, tape recorders, and tape recorder instruments are manufactured.

HOW PRODUCTS ARE DEVELOPED

Development procedures for Radio, "Victrola" and TV are similar and will be treated on a common basis. Being in the home entertainment field, the business is different from that of other divisions in RCA. Our immediate customer is the Merchandise or Product Planning Department. The product lines of both radio and tele-

Fig. 1—RCA VICTOR Television Division Engineering

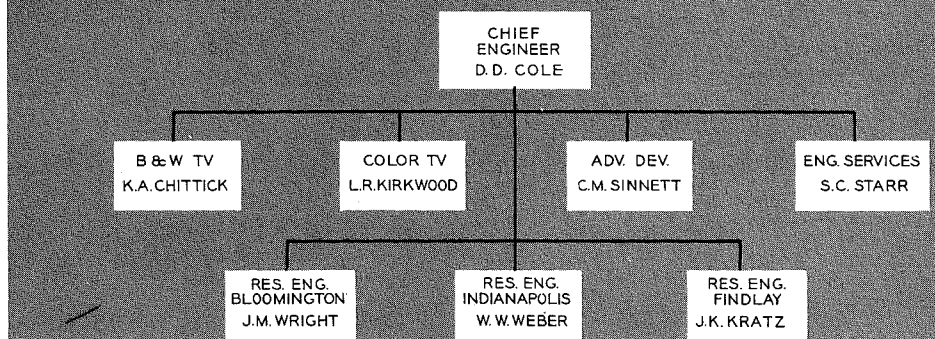
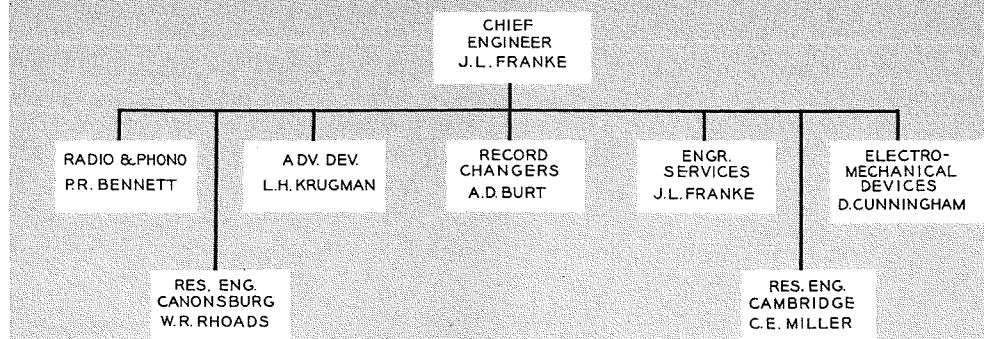
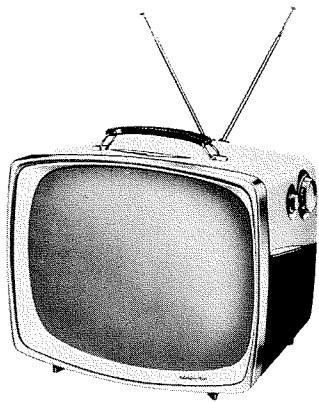


Fig. 2—RCA RADIO and "VICTROLA" Division Engineering





vision receivers are developed to meet the specifications initiated by these departments.

Once the commercial requirements for the new lines have been established, engineering and design proceeds. This is followed by the building of prototype models. In the course of development, several models may be built to achieve the desired result and prove in performance.

DOMINANT DESIGN FACTORS

In our work, the two factors that are of extreme importance to the engineer are (1) cost and (2) time. This is a highly competitive field and the goal of engineering is to create a line of instruments having good customer acceptance at a competitive price and timed for production when the consumer is in a buying mood. Merchandise lines are planned for introduction to the market at specific periods. This quite frequently means a short cycle between the introduction of the specification and completion of engineering design and development. Furthermore, the nature of the business dictates a minimum lag between engineering release and production, due to the ever-changing consumer fancies and the danger of obsolescence. When engineering is completed, the Production Control and Purchasing activities schedule and obtain materials and parts for Manufacturing.

Throughout engineering development, schedules must be adhered to so that manufacturing activities may have adequate time to start production. During the development schedule, the concept of minimum cost must always be maintained. The total engineering program includes extensive tests both in the laboratory and the field to prove the performance, the preparation of drawings and specification for manufacturing plants, and preparation of a final model for the plant as a performance standard. Instruction books and printed ma-

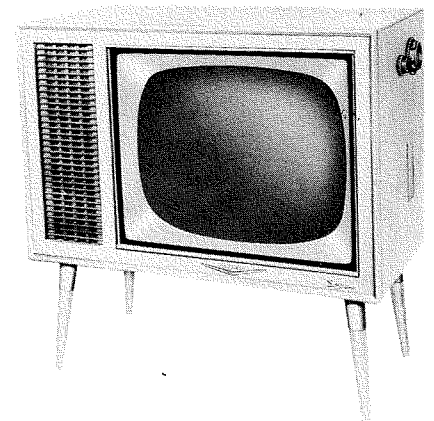


terial for customer use must be prepared, and an instrument sent to the Underwriters' Laboratories for approval. All contributing factors in Engineering Services must help maintain schedules. For instance, Electrical Components Engineering and Deflection Components must work closely with product engineering to provide design and samples of new items required. When designs are finalized these engineers must prepare drawings and specifications of these parts, contact appropriate vendors and conduct tests and investigations required to determine acceptability of the parts for use in our receivers.

In an effort to shorten the time cycle existing between the release of engineering information and the start of production, contact is maintained with Production Control and Purchasing, advising them of possible new tooling required, and new parts or materials which might involve long time procurement.

As a means of assuring economy in production, review meetings are held with Manufacturing on all new models during the development stage. When the chassis design is nearing completion, representatives of the various manufacturing activities meet with Engineering to review the model chassis. This permits suggestions to facilitate manufacture, preliminary planning of manufacturing operations, and consideration of new production test equipment which may be required.

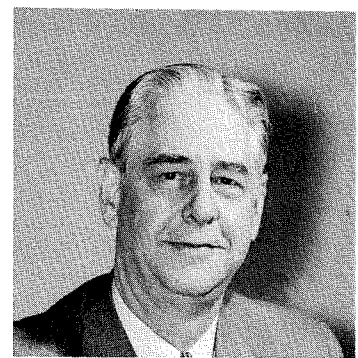
The completion of engineering design and development includes release of drawings, specifications, and a prototype model to the manufacturing plant. After engineering release, pre-production models are built in the manufacturing plant using production parts. These are measured for performance and one or more samples sent to Product Engineering at Cherry Hill for approval prior to production.



CONCLUSION

The successful development design, and the release to manufacturing of home entertainment instruments offers many challenges to the engineer. In consumer products it is necessary that the engineer familiarize himself with mass production methods. Only in this way will the design of instruments be of maximum simplicity so that optimum manufacturing costs can be achieved. This requires a degree of skill and ability as important as that required in the actual development of more complex electronic equipment. The ability to make rapid changes in product lines to meet competition is important.

Some of the skills that the engineer must bring to his job are—the knowledge of mass production methods, the ability to simplify designs and reduce cost, and the versatility to make rapid changes to meet an ever-changing consumer market.



STANLEY C. STARR is a graduate of Purdue University, class of 1925. He joined the General Electric Company as a student engineer and subsequently worked in Transformer Development and Design, both in the Ft. Wayne and Schenectady plants. He came to RCA Victor Co. in 1931 in charge of transformer design and later was made supervisor of components activity involving transformers, capacitors, and RF-IF coils. In 1946 he was made manager of Engineering Services in Home Instrument Engineering, a position which he now occupies with the Television Division.