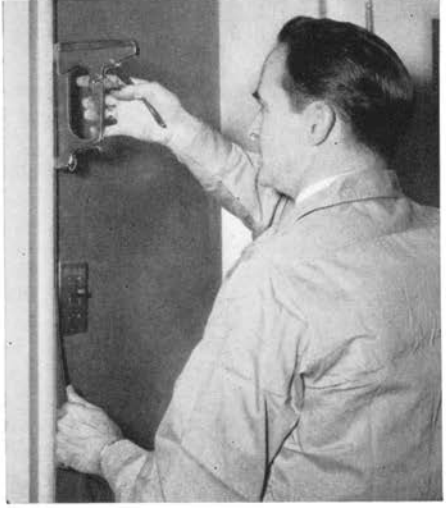
JKT— an All-Purpose Station Wire

C. C. LAWSON
Outside Plant Development



Installer D. Keegan of the New York Telephone Company staples JKT wire to run inconspicuously along doorway trim.

New subscriber installations are being wired with a new type of station wire which is superior in both appearance and performance. Consisting of insulated conductors enclosed in a plastic jacket, this wire, known as JKT, is readily stapled in position to blend inconspicuously with base boards or trim.

The individual twenty-gauge conductors have steel cores for strength and copper outer shells for conductivity. Such a conductor has 40 per cent of the conductivity of solid copper. Currently, to conserve copper, the conductivity has been reduced to 30 per cent by thinning down the outer shell. This has been done with negligible sacrifice in performance since this wire usually makes up only a small part of the total loop circuit. The conductors are insulated with polyvinyl chloride which is highly resistant to moisture and the insulation on each is distinctively colored for ready identification. The insulated conductors are twisted together in the process of covering them with an ivory or brown extruded cylindrical jacket of polyvinyl chloride, which gives extra mechanical and electrical protection. In laboratory tests JKT wire has proved consistently tougher than the older types of station wire.

A significant factor in improving appearance is the special method of attachment using flat wire staples, having a round crown to fit the wire contour and a lacquer finish to match the color of the wire jacket. These staples are bonded together at their edges forming a single bar to facilitate loading in the magazine of the stapler. As is shown in the illustration above, the staples are driven singly over the wire by means of a spring-actuated hammer in a hand-operated stapler. The power for the drive is provided by squeezing the handle of the stapler toward the frame of the tool. This action raises a plunger and its asso-

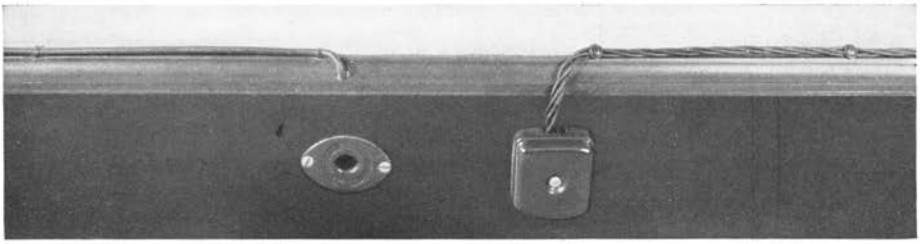


Fig. 1—JKT Station Wire (left) shown compared with earlier, twisted type (right).

Bell Laboratories Record Vol 30

ciated driving blade against spring pressure until the release point is reached; the energy in the spring is then imparted to the plunger and driving blade which drives the staple home. The driving force is uniform and, when firmly in place over the wire, the stapler drives staples sufficiently deep to hold the wire securely even on hard wood. With soft wood less pressure is used to hold the stapler in place over the wire so that part of the driving force is expanded in pushing the stapler away from the surface.

In many modern apartment buildings there are no base boards and the door frames are metal; only the plastered walls are left in which staples can be driven. Because plaster does not grip a staple as wood does, a new staple was developed with a slight horizontal cut on the outer surface of each leg about ⅛ inch above the point. As the legs are driven in, the portions below the cuts splay out in the plaster, firmly clinching the staple. To drive this staple, a hammer-operated stapler was developed, as shown in Figure 2. It is a front-loaded tool equipped with a magazine holding 22 staples. The staples are ejected from the tool by means of a hammer blow on the driving head. The length of driving stroke of the plunger or driving blade is controlled by a rubber washer under the head of the driver. This tool is considerably cheaper than the hand-operated stapler and because of its small size is useful in close quarters.

For duct and conduit installations JKT station wire is a considerable improvement over the special duct wire formerly supplied

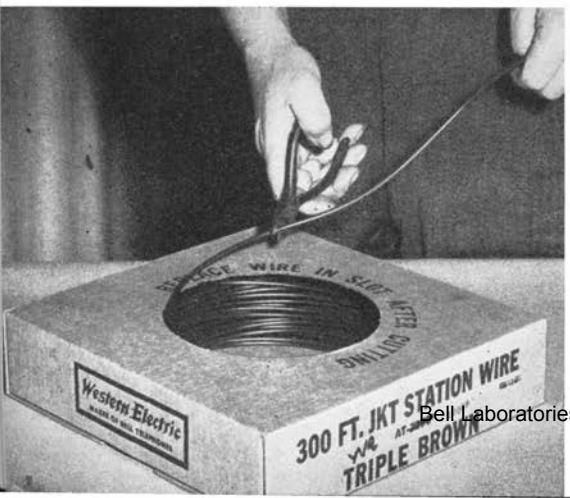
Fig. 2—Hammer-operated stapler permits attachment of JKT wire to plaster.

and is lower in cost. Adequate strength for pulling in is provided by the copper-steel conductor while the thermoplastic insulation and jacket have excellent resistance to moisture absorption and mold attack. The smaller over-all size of this wire in comparison to the earlier wires and its smooth contour facilitate installation in ducts. JKT wire may be run in the open beyond the duct whereas with the former wire it was necessary to splice on a piece of station wire or tape the exposed duct wire to improve the appearance of the run external to the duct.

The strength and sturdiness of this wire are helpful in business establishments where the wire is frequently run from the wall or from an underfloor duct to desks; breakage of the earlier wires during relocations or moving of the desks during cleaning operations has been a source of frequent troubles.

In order to insure that JKT station wire is delivered to the installer free from kinks, bends and dirty spots, and to facilitate installation and handling of the wire on the job, a new method of packing has been developed, as shown in Figure 3. Sufficient wire for the longest runs anticipated (300 feet) is supplied in coils, individually packed in dispenser-type cardboard cartons. On the job, wire is removed directly from the center of the coil through a hole in the top of the package so that it is no longer necessary to uncoil and lay out on the floor

Fig. 3—How the JKT wire is delivered to the installer.



Bell Laboratories Record Vol 30

the whole length of wire needed for an installation. By reducing kinks and keeping the wire clean, this technique aids in improving the appearance of installations.

With the new wire the telephone installer is likely to have less rewiring to do when houses and apartments change hands. The old style twisted wire had a tendency to catch paint from the redecorator's brush only to let it drip on base boards and molding. Too often the telephone man has been called in to replace wire torn out by painters. With its single jacket the new wire is expected to avoid interference with the painter's job and so cut down the demand for replacements.

THE AUTHOR: CLEMENT C. LAWSON received the B.S. degree in Chemistry from the Sheffield Scientific School of Yale University in 1925. Following work with the Travelers Insurance Company and Metropolitan Life Insurance Company investigating industrial health hazards, he joined the Laboratories in 1929 and was assigned to the Outside Plant Development Department where he has worked on such products as clay conduit and motor vehicle finishes and participated in investigations which led to the elimination of "splicers' rash" and to the adoption of the desiccant method of drying cable splices. In the wire development group he worked during the war on the design and development of special wires and cables for the armed forces. Currently, as Wire Development Engineer, he has charge of the group responsible for the development of insulated outside distributing and station wires and of line wires and strand. Mr. Lawson is a member of Committee A-5 of the A.S.T.M. and is the representative of the Telephone Group on Committee C-8 of A.S.A.

(*Continued from page 288*)

ters of a century earlier by James Clerk Maxwell in his experiments in color vision. Similarly the spectral sensitivities of the three photocells were adjusted to be like the three color mixture curves Maxwell had obtained using these three primaries. This use of the fundamentals of colorimetry now is considered commonplace, and the data for the mixture curves is much more precise than obtained by Maxwell.

The scene to be televised was scanned by a moving beam of light in these early experiments. This method has been abandoned for televising live scenes, but it has been found to have merits for producing television signals from film. Instead of an intense light behind a scanning disc, modern apparatus uses the spot-scanning tube. In this latter version of scanning, the result is accomplished by using a special form of picture tube. One such scanner for black-and-white film was developed in the Laboratories a year ago.[5]

BIBLIOGRAPHY

[1]H. E. Ives and A. L. Johnsrud, "Television in Colors by a Beam Scanning Method," *J. Opt. Soc. Am.*, **20**, pp. 11-22, Jan., 1930.

[2]H. E. Ives, "Television in Colors," *Bell Labs. Record*, **7**, pp. 439-444, July, 1929.

[3]Alfred N. Goldsmith, U. S. Patent No. 2,335-180, Nov. 23, 1943.

[4]M. W. Baldwin, Jr., "Subjective Sharpness of Additive Color Pictures," *Proc. Inst. Radio Engrs.*, **39**, pp. 1173-1176, Oct., 1951.

[5]A. G. Jensen, R. E. Graham and C. F. Mattke, "Continuous Motion Picture Projector for Use in Television Film Scanning," *J. Soc. Motion Picture and Television Engrs.*, **58**, pp. 1-21, Jan., 1952.

One cannot question the technical features of the system of color television demonstrated by the Laboratories in 1929. Within the limitations of available techniques and apparatus it represented an important milestone in the progress of television. The Ives-Johnsrud prophecy was remarkably realistic.

W. T. WINTRINGHAM

Bell Laboratories Record Vol 30