

# MERRIMACK VALLEY WORKS NEWSLETTER



Vol. 2 No. 21

A Western Electric Publication

November, 1969

## Anniversaries

Name Dept. Nov.

### THIRTY YEARS

McLellan, Helen M. 925 11

### TWENTY-FIVE YEARS

Kennedy, Elizabeth M. 541 3

Drenth, Henry F. 369 6

Donovan, Marie R. 925 8

Davidowicz Walter E. 544 9

Guckert, Theodore F. 542 12

Logan, Ralph W. 365 14

Hill John W. 561 15

Ploski, Louise M. 961 15

Sawyer, Willard J. 961 15

Plante, Irene P. 974 16

Haley, William P. 847 21

Frechette, Gerard A. 533 22

Marshall, Kenneth S. 377 27

## In Memoriam

Robert B. Archer, Department 534-5N, died on October 11, 1969.

## A Thanksgiving Visit To Plymouth



Lorraine Bomba, 494, ready to board the Mayflower II, in Plymouth, Massachusetts.



Lorraine gets some pilgrim cooking hints from one of the "Plimoth Plantation" (old spelling) girls in pilgrim dress. The leaves in the pan were used to line cooking pots to keep the food from burning.

## MERRIMACK VALLEY WORKS NEWSLETTER

Published By



**Western Electric**

MANUFACTURING AND SUPPLY UNIT OF THE BELL SYSTEM

For the information of employees of the

MERRIMACK VALLEY WORKS

North Andover, Massachusetts

Dept. 240-1 Area Code 617-686-0600 Ext. 2594

BILL COLLINS, Jr. Editor

BOB RICHARDSON, Writer

Photographers

JAMES P. CHASSE

DANIEL R. BALSLEY



# MVW TOROIDAL



Joe G. Murphy  
Department Chief  
973

# COIL SHOP

No. 1  
of a Series



WIRE

+



CORE

=

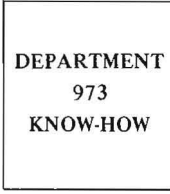


COIL



CUP

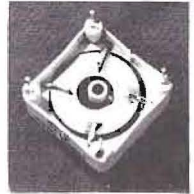
+



DEPARTMENT  
973  
KNOW-HOW

SKILL

=



INDUCTOR

The toroidal coil shop, in the southeast corner of the second floor of building 30, makes more toroidal coils of different inductance values than anywhere else in the world. About 450 people turn out more than 75,000 coils a week here.

Coils, in one form or another, are used extensively in all electronic equipment. Basically, they are used to induce a voltage. They can, then, be called an inductor.

A toroidal coil is made by winding insulated copper wire around a core ring. The word toroidal has to do with the donut shape of this particular coil.

Telephone equipment uses many toroidal coils of different inductance values. To simplify the illustration of the manufacturing steps, we'll follow the 1592 type inductor from winding the coil to the finished product.

**WINDING.** The winding machine operator refers to a job card showing the thickness of wire needed and the number of turns required. The wire, in this case, is about twice the thickness of human hair, and the number of winds around the core will be 578. After loading the machine with a spool of wire she inserts the electronic winding counter and adjusts for tension. The amount of wire needed to complete a coil is run onto a shuttle. The key to successful winding is in maintaining just the right amount of tension on the wire. A permalloy core ring is clipped into a slot. The machine winds the wire 289 turns half way around the core and stops automatically. The operator turns the half wound coil around, slips a small cotton sleeve over the lead wire to identify it, and the machine winds another 289 turns around the remaining half, to complete the 578 turns. The coils are slipped over spindles on a portable rack and taken to the oven to be dried and waxed.

**IMPREGNATING WITH WAX.** In order to function properly, coils must be absolutely dry. Baking them in a 2400 vacuum oven, for a minimum of five hours, removes all the moisture. The vacuum ovens operate somewhat similarly to a French fry basket in a pressure cooker. When the coils have been baked dry, they are bathed in melted wax for ten to fifteen minutes to insulate them against moisture. The wound and waxed coils are now ready to be adjusted.

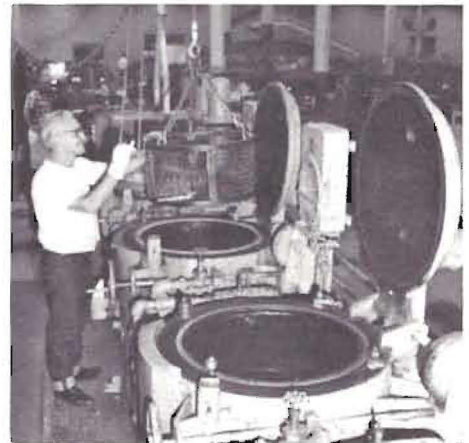
**COMPARING AND ADJUSTING.** To insure that the coil meets the specified tolerance of induction, a sample coil that has been pre-tested is wired to a comparison test set. The set has two dials, one showing the inductance of the sample coil, the other to give a reading of the coil being tested.

When the coils were originally wound, the winding machine operator used the lead wire to make a few extra turns around the core. This allows the adjuster to remove a turn or two from the overwound coil or add to it from the lead wire, until it exactly balances the inductance reading of the sample coil.

Lillian Bakeman, (foreground), and Jeannette Daneau, winding toroidal coils. The rack near Lillian's left hand holds the finished coils.



Joe Gulla is hoisting a basket of baked and waxed coils from the oven. The coils were baked for about five hours and immersed in wax for ten to fifteen minutes.



Blanche Duffett is comparing and adjusting coils. She takes a few turns from the coil or adds a few from the lead wire to give them the required inductance.



Continued on Page 4



The coil is functional at this stage, but the toroidal shape and the thin leads of wire would be difficult to mount on a panel. The next step, then, is to assemble it into a shell or cup.

**ASSEMBLING INTO CUPS.** The cup is a plastic shell with a hollow centerpost made to receive a mounting Bolt. A machine, on the mezzanine, presses pins into the top four corners of the cup, and bends them in a J shape with the hook protruding on the inside. The assembler slips the coil over the centerpost, covers it with a fibre washer attaches the leads to



Kathleen Lucier is shown assembling coils into cups. The coil is placed over the centerpost of cup, covered with a washer. The leads are attached to the pins, and bent over the washer and the lead wires soldered to the terminal pins.

the pins and bends the hook of the J over the washer. The lead wires of the coil are soldered to the bent J's of the pins. The 1592 type inductor is now ready for a buzz test.

**THE BUZZ TEST.** To make sure that the lead wires are securely soldered and the coil of wire hasn't broken, the inductor is now subjected to a buzz test. This test is as simple as ringing an electric doorbell. When you push the button, you close a circuit and the bell rings or the buzzer buzzes. Instead of a bell button, the tester touches two needles of his test set to two of the J pins that are soldered to the wire. If the bell rings the circuit is complete.

**POTTING.** The cups are filled with wax to further seal the inductor against moisture. Slabs of wax are melted in a tank and drawn off through a tap into a funnel-shaped potting gun. The heated gun has a trigger to release the wax. The trick here is to control the flow of wax by releasing the trigger in relation to the heat in the gun. The inductors are now stamped with the type and value, buzz tested again and sent to final test.

**FINAL TEST.** The finished inductors are tested and inspected for mechanical and visual defects.

The inductors, still in department 973, are assembled into printed circuits, networks and filters, or sent to the merchandise warehouse ready to be used throughout the Bell System.

Special toroidal coils, used in the D2 Channel Bank are manufactured in a humidity controlled room, at the Lawrence Plant. Because of the dry atmosphere in this room, the baking and impregnating operations are not necessary.



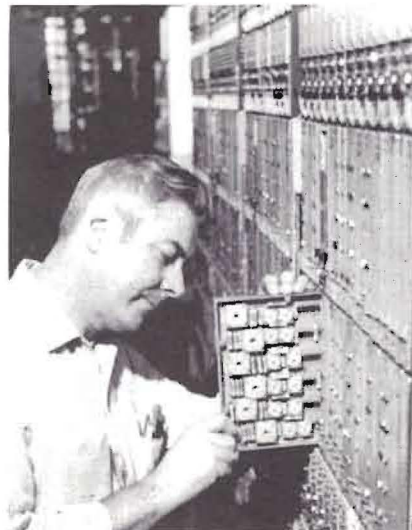
Arthur Cesati potting a tray of 1592 type inductors. The potting gun is filled with liquid wax. Each inductor shell is sealed by filling it with wax.



June Caron shown assembling a 1592 type inductor into a 475A network. The networks, still in department 973 are washed and tested before being released.



Victoria Flynn testing the completed inductors after they have passed visual inspection. Each inductor must supply exactly the required inductance value.



Gerry Rowan, toll test repairman at the Lawrence central office of the Telephone Company shows some 1592 type inductors used in the T1 carrier system.





A TRIO OF SWINGERS AND PLANT CHAMPIONS IN THE MERRIMACK VALLEY CLUB GOLF LEAGUE. Joe Lariviere, right, Department 453, is the Individual Plant Champion, with a score of 73, that's one over par. Joe also took the Par 3 championship. Stan Shok, center, Section Chief Department 925, and Henry Millet, Section Chief Department 923, became Plant Team Champions for the second year in a row when they defeated Harold Sargent, Department 541, and Gus Jones, Department 21.



Debbie Fleischman, records clerk Department 847-2, taking advantage of a warm autumn day. The courtyard patios were a great success during the summer months, but the Days of Wine and Roses—would you believe—Coffee and Petunias—are fast coming to a close. The trees, Purple Plum, Upright Yew and Mountain Ash, are wintering over at a local nursery. Their roots would have frozen in the cement urns. The flower boxes will be filled with pine boughs and the tables and chairs put in storage for the winter. Grounds Crew, we salute you for the pleasant atmosphere you created.

## What are you doing Thanksgiving Day?



Vickey Wrigley, repair operator 1140-8. My husband, Henry, and I always go to the Andover-North Andover game. Before we go, I put the turkey in the oven. After the game, my son and his wife, my mother and my mother-in-law, my husband's brother and my daughter Joan come to dinner. We eat about two o'clock.



Tom Brennan, storekeeper 422-3. I'm going to the North Andover-Andover game with my three brothers. We never miss. My wife, Mary, my daughter and daughter-in-law stay home and cook the turkey. If Andover wins we'll have a prolonged victory toast. If they lose, we all cry in our beer.



Irene Lambert, Insertion Machine Operator 1140-5. Well, this year my husband and our four children are going to the Lowell-Lawrence game in the morning. After the game we all go out to eat at a restaurant. We let the kids choose the place. We love Thanksgiving.



Rosemary Casale, Clerk, 615-1. I'm staying home on Thanksgiving day. My mother will be cooking all morning. She makes soup, stuffed macaroni, anti pasto turkey and all the trimmings. We have wine and finocchio, that's something like celery with an anise taste. My aunt always brings squash pies. By the time the turkey is served, we are usually all too full to eat any.



Leo Lecuyer, Guard Plant Protection. We're on seven day coverage. I'll be working seven to three-thirty so we won't have dinner till after four o'clock. My in-laws are coming over. My wife makes lasagna besides the regular turkey dinner. Our guests don't mind eating late so it's not too bad.

Whatever you're doing  
*Happy Thanksgiving*