

AUTOMATION

Automation Speeds Mail

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► **ELECTRONIC MACHINES** are speeding up handling of more than 68 billion pieces of mail each year, but they are not putting any postal employe out of work.

This is the official Post Office Department policy, despite the coming reduction of 5,000 postal workers announced by President Lyndon B. Johnson. The department plans to meet the requested 590,000 employe ceiling by reducing the number of nonmail-handling positions as vacancies occur, a department administrator told *SCIENCE SERVICE*.

The annual increase in the volume of U.S. mail, usually met by an employe increase numbering in the thousands, is expected to be offset by the aid of electronic mail handling facilities and improved cooperation with the mailing public. The Post Office has the largest number of civilian employes of any Government department.

Mail volume in the United States increases by about two and one-half billion pieces annually, or an amount roughly equivalent to the total year's mail volume in Belgium.

Since each piece of mail must be read or sorted as many as ten times or more, mechanized processing aids are invaluable.

The five-digit ZIP (Zone Improvement Plan) Code was devised to cut down the number of individual handlings between deposit and delivery, replacing zone numbers throughout the country.

Within the next few years an optical character reading machine will automatically scan and recognize ZIP Code addresses on letters at the rate of six envelopes a second.

While the envelope is in motion, the reading machine will decide if it is readable, read it, decide if it is incoming or outgoing, store the number in an internal memory, decide the destination, pass it to the sorting machine and tell the sorting machine the correct destination.

Another recently initiated mechanized program is the imprinting of airmail stamps or stickers with new tagging inks that glow as they pass through an electronic sensor unit. The detector excites the phosphorescent inks and makes an ultra-high-speed selection through logic circuitry, separating airmail from a flow of 30,000 pieces of mixed mail an hour.

The first phosphor-treated first-class stamps were issued last fall.

The device is attached to an automatic facer-canceller machine. Before mail could be fed into old-style cancelling machines, postal clerks had to "face" the jumble of mail coming out of pouches so that all envelopes were arranged with stamps in the same position.

The facer-canceller uses photoelectric cells to "search-out" stamps in any of four possible positions and directs the letter to one of four channels, at speeds up to 500 letters

a minute. If there is no stamp on a letter, it is rejected.

In addition to these mechanized processing aids, the Post Office hopes to contain its present number of employes through improved cooperation with the largest users of the mail.

The NIMS (Nationwide Improved Mail Service) program was designed to curb the great volume of mail pouring into large post offices in the early evening hours. By scheduling large mailings and spacing them throughout the day, available personnel, machinery and space are used more economically.

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PSYCHOLOGY

TV Commercials 'Loud'?

► **THAT SUBTLE**, often elusive sensation called sound is sowing seeds of discontent among broadcasters, advertisers and television and radio listeners. The growing issue is whether commercials are unnecessarily "loud."

Whether the so-called "loudness" is due to electronic techniques used by advertisers to produce new and brilliant sounds that will attract attention or to the commercial's overall psychological effect on the viewer has not yet been determined.

Howard H. Bell, director of the Code Authority of the National Association of Broadcasters, in announcing an intensive NAB long-range investigation of the problem, said many advertising agencies "employ techniques that could produce an objectionable response from the listeners or viewers."

When the study is completed, amendments to the Radio and Television Codes in the form of a new technical standard for recording and reproducing sound may have to be made, Mr. Bell told *SCIENCE SERVICE*.

At present, there are no restrictions in this area. As far as commercials are concerned, the NAB deals primarily with the time allotted to advertising, the taste used in commercials and the acceptability of the product.

The association has no control over the pre-recorded commercials sent into the broadcasting station for transmission.

The Government's regulatory agency, the Federal Communications Commission, is concerned primarily with the overall broadcasting system, not the way in which advertising agencies record their commercials.

The problem has psychological and biological overtones as well. Often the content of the commercial may create an impression

PSYCHOLOGY

Wide Eyes Indicate Intense Thought

► **EYES MAY GET WIDER** as a person thinks harder, psychologists at the University of Chicago have found.

Five adults, all with above-average intelligence, did simple multiplication problems in their heads. As they thought, the experimenters made films of their eyes.

Measurements taken from the film showed that the pupils of a subject's eyes increased in size slowly as he thought until he gave the answer. As soon as he had given his answer, his pupil size returned to a constant.

The pupils enlarged as the problems got harder. When multiplying 7 x 8, the mean increase in size was 10.8 but when solving 16 x 23, the mean increase was 21.6.

Previous research has shown that pupil dilation is related to a person's interest, emotionally, and mental activity.

Dr. Eckhard H. Hess and James M. Polt reported the work in *Science*, 143:1190, 1964.

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of loudness, such as a rapid, high-pitched delivery of speech, the use of sudden, unexpected or strange sounds that stand out above the others, a harsh, irritating voice or the quality of the subject matter.

In the sudden switch from a program to a commercial, the change in frequency may make the commercial seem unnecessarily loud. A viewer might be watching a program with a bad sound track and turn up the volume. This person would then find the commercial unusually loud.

In producing commercials, advertisers are trying to create a response within the most sensitive range of human hearing. The human ear can detect sounds ranging from 16 cycles per second to about 15,000 cycles per second.

The critical frequency range for understanding intelligible speech, however, varies between 500 and 2,000 cycles per second, although it can be understood a little above this range, an official of the American Hearing Society told *SCIENCE SERVICE*.

The ability to hear sounds of higher frequencies usually deteriorates with age. The specific reason for this is not known. It may be because the biological mechanism within the human ear that hears low-frequency sounds is better protected. The tiny nerve endings that pick up the higher frequency sounds are more susceptible to damage through the years.

A young child can hear sounds at frequencies up to or above 15,000 cycles per second, while the adult human usually hears sounds at frequencies below 12,000 cycles per second.

On the other hand, some animals can hear sounds far above the human range. Dogs, for example, can hear sounds up to 60,000 cycles per second.

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