

## TECHNOLOGY

## Longshoremen 'Boxed-in'

The core of the current longshoremen dispute is automation which, while facilitating the loading and unloading of ships, threatens the livelihood of many—By William McCann

► **BIGGER BOXES**, not bigger machinery, carry much of the responsibility for the longshoremen's anti-automation movement, which threatens to cripple the nation's economy.

The one-day East Coast strike by 60,000 longshoremen in ports from Maine to Texas has been temporarily halted by a Federal court order, but the 80-day "cooling off" period will not solve the problem of automation on the docks.

"Containerization," in which a huge amount of material can be packaged together for shipping, requires much less time and manpower than individual packaging. Rather than having 40 crates weighing 100 pounds each, now only one crate weighing 4,000 pounds is needed.

"Where it once took three men three hours to do the job, it now takes one man 20 minutes by containerization," reported one shipping official.

Containerization of cargo has not yet reached its full potential.

American longshoremen are fortunate that containerization has not developed as well in foreign countries.

Most foreign ports do not have the necessary equipment to handle containerized cargo, thus its growth has been limited to domestic trade.

"Where specialized container operations exist, however, there have been dramatic

reductions in ship loading and unloading time, as well as in manpower requirements," a Department of Labor study team reported.

Other technological changes have helped reduce the number of jobs for longshoremen in the past few years.

Pallets and fork-lift trucks were introduced into the longshore industry some 20 years ago. Their increased use has shuttled many longshoremen to the unemployment office.

Pallets are portable wooden platforms that are designed for handling by fork-lift or crane. A heavy package is placed on a pallet with four tiny legs. Another pallet is placed on top of the package and the unit is tied together by a steel strap.

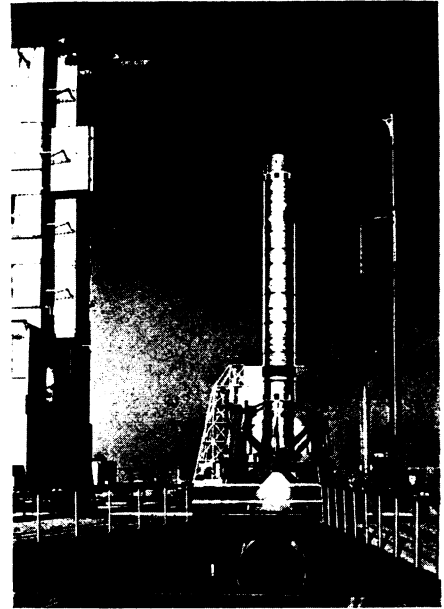
Fork-lifts are tractor-like machines that shuttle up and down the docks like ants carrying enormous burdens.

Technical improvements and modernization will continue to plague the longshoremen, the Department of Labor report indicated.

New pier construction going on at present will make the job of loading and unloading packages even easier. In addition, ships are being built or converted to take care of bulk handling.

The ships, modernized with new equipment, will be able to load or unload goods faster and with less help from longshoremen.

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Western Aircraft Ltd.

*A BRITISH FIRST—The Black Knight rocket poised on the launch pad will be used for the first British independent satellite launching.*

## SPACE

### Independent Launches Planned by Britain

► **AFTER SEVERAL YEARS** of dithering, the British Government has decided to proceed with an independent satellite launching program.

The launch vehicle will be the Black Knight research rocket, which Julian Amery, Minister of Aviation, says could be developed "in a few years and at no great cost."

Britain is already heavily committed to participation in various U.S. and European international space ventures, but the new project will be in addition to these and will be the first conducted entirely by the British.

Mr. Amery said that the new venture will in no way detract from Britain's determination to continue its extensive participation in the European Launcher Development Organization (ELDO) program. But it has been felt for some time that since the French, and possibly other European nations, are developing satellite launch capabilities of their own in addition to their work in ELDO, Britain also should have a launcher with which to conduct experiments when and as it chooses.

The Black Knight has had 17 successful launchings to its credit at the Woomera range in Australia. Its inception dates back some nine years to the period when Britain embarked on a long program of development for a long-range ballistic missile. The latter, the Blue Streak, was finally abandoned.

The Black Knight has recently been used in Project Dazzle, a cooperative venture between the United States, Britain and Australia to further study phenomena, such as reentry glow.

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## CYBERNETICS

## Computer Costs Increase

► **ELECTRONIC COMPUTERS** are super-fast and super-accurate—which sometimes causes super-expenses.

The high accuracies and close tolerances to which many computers work today often increase costs unnecessarily, said William D. Wilkinson, an engineer with the Bunker-Ramo Corporation, Canoga Park, Calif.

In many situations both time and money could be saved by using broad solutions to problems that require a lesser degree of accuracy.

One possible approach is "interval arithmetic," a newly developed kind of computer mathematics that enables the computer to simply give an upper and lower limit, instead of one exact number. This would both save valuable computer time and reduce the possibility of error in the answer. In addition, it would reduce time spent in checking for errors, the most time-consuming part of computer operation.

The use of less exact solutions when possible is one case when the conventional method has the advantage over the latest

"time-sharing" techniques, said Miss Margo A. Sass, a mathematician with the Office of Naval Research and co-chairman of a symposium on Computer Augmentation of Human Reasoning.

"Time-sharing" is a new technique enabling many operators to use a computer at once. This makes use of the time spent by the human operator in deciding what to do next, since the super-fast computer spends most of its time idle.

The other method is called "on-line" operation. This maintains constant communication between man and machine. Its advantage, said Miss Sass, is the fact that at any stage of the operation, the programmer may elect to use a more general answer, and alter the program in the middle to do so.

Techniques enabling computers to do less exacting work could save millions of dollars a year by broadening manufacturing specifications and tolerances for every very simple part, said Mr. Wilkinson.

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