Applications spectrum

If a full list of possible applications were delineated here, I think it would be apparent that most minicomputers and, indeed, all DIGITAL computer products, would also compete for fulfillment of these same applications. In reality, although an extremely broad spectrum of use may be attributed to such a product, the key factor in any consideration for use would be the individual user who, within any application area, appears to emerge as a dominant factor and is the person who is actually responsible for specifying the equipment. He conforms to a fairly well-defined profile as outlined below:

- Would be an OEM or a large end-user (corporate OEM)
- Is hardware-design-oriented and has in-house technical capability
- Likes to "tinker" with computer programming
- Industrial-oriented
- Communications-oriented
- Has a "problem" to be solved and is looking for minimum capability to "do the job"
- Has been working with, or is familiar with, dedicated controllers
- Is planning a product upgrading or a new product introduction (possibly replacing a fixed logic system)
- Is extremely price-sensitive
- Is not overly performance-sensitive (at least for now)
- Is more than likely already considering the use of a microprocessor

GENERAL APPLICATION AREAS

. Industrial Control

- Machine tool control
- Material flow

. Process Control

- Batch mixing
- Furnace monitoring
- Batch weighing

. Small Laboratory Automation

- Analog and digital instrument data acquisition
- Blood analyzers

. Data Communications

- Data concentrators
- Communications processors
- Minicomputer preprocessors
- Intelligent terminals

. Business Machines

- Optical character recognition
- Automatic banking
- Smart copying machines

. Health, Education, and Welfare

- Environmental control of large buildings
- Automatic teaching machines
- Remote pollution-monitoring systems

Particular Application Areas

Two authentic particular applications for a microprocessor are illustrated here -

1. Materials movement in a chemical plant

2. Data acquisition and reduction

APPLICATION #1

Material Movement in a Chemical Manufacturing Plant

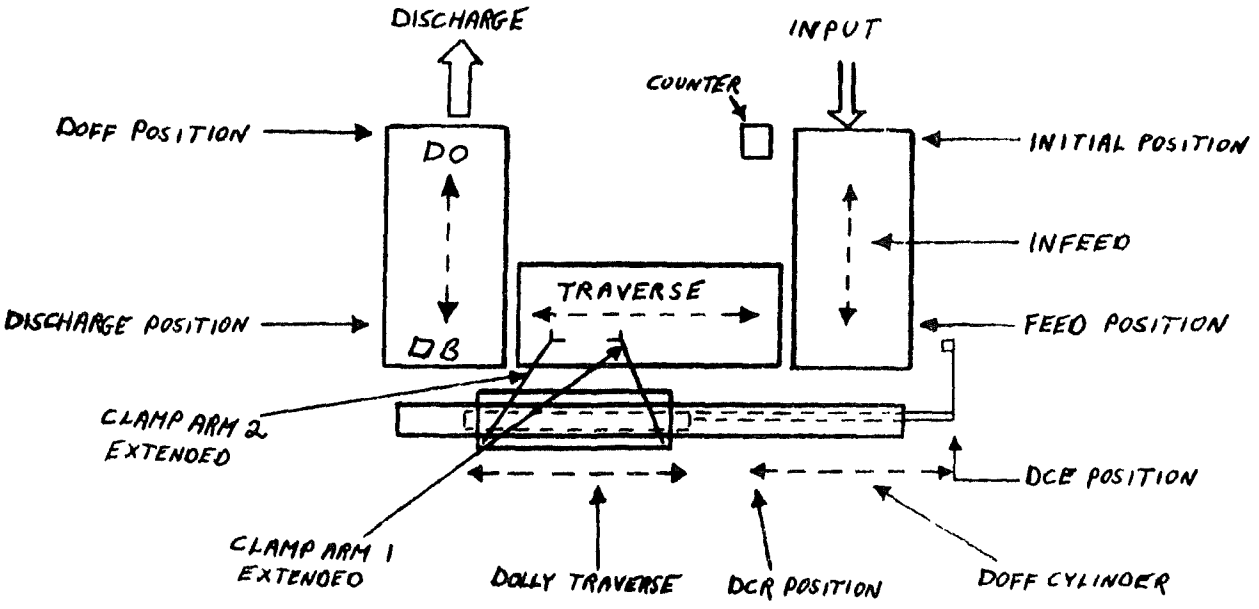
Staple Traverse

This application consists of a number of repetitive operations which involve the taking of an empty container from a conveyor, placing the container in a loading station, filling with some material, and then placing the full container back on the conveyor for moving to the next location.

The entire sequence, which requires such operations as vertical and horizontal movement of the container, detection of container limit stops, monitoring of clamping arms, dolly traversing, detection of full container, container count, etc., is now implemented by relay logic. Replacement of this logic with PM will result in considerable savings for the user in actual system cost and reduced maintenance time.

The system is shown diagrammatically below; a section of the flowchart is also shown.

STAPLE TRAVERSE



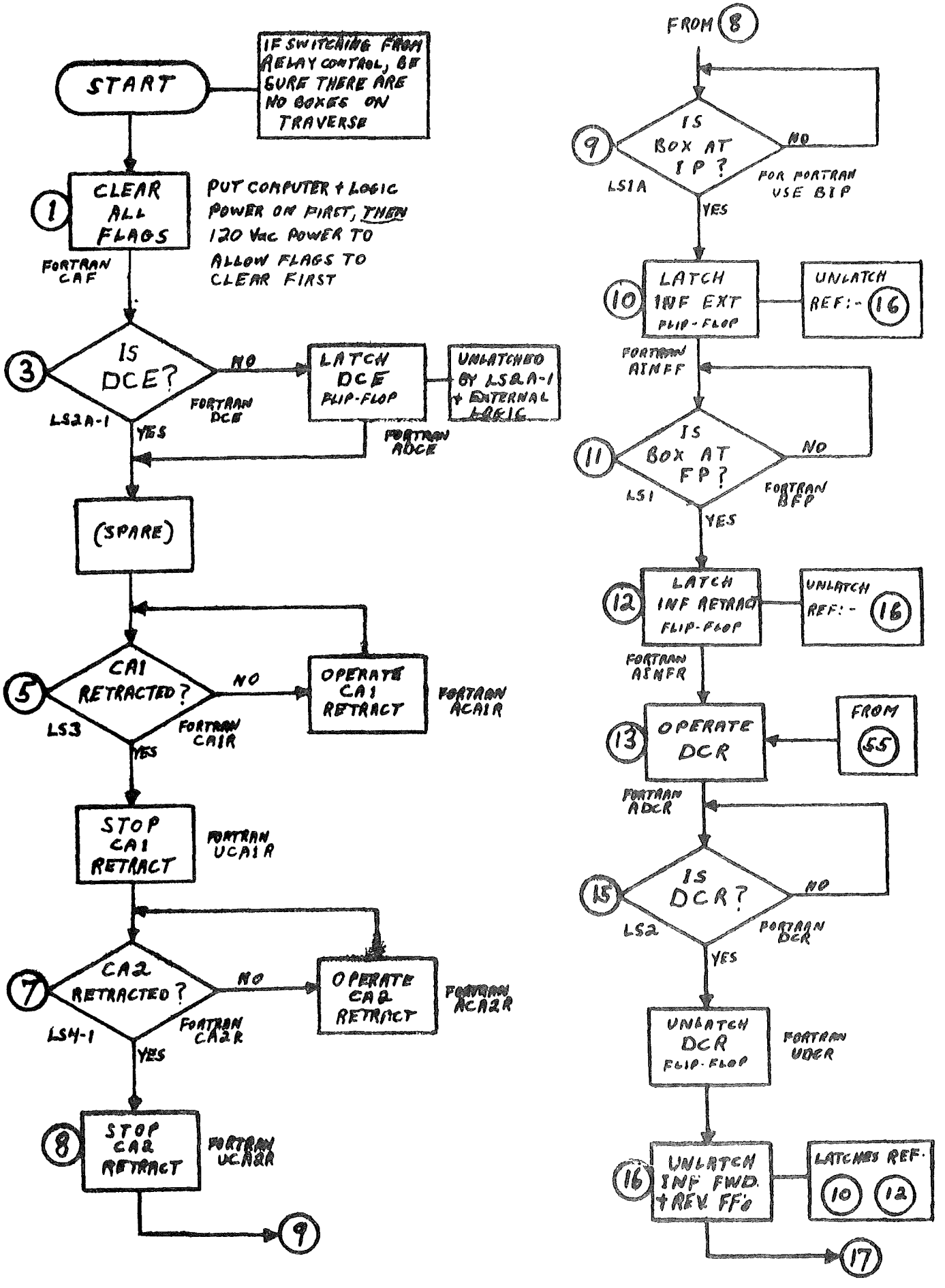
CODES FOR FLOWCHART

DO & DB = Discharge Out and Back
IP = Initial Position
FP = Feed Position
DCE = DOFF Cylinder Extended (or EXTEND command)
DCR = DOFF Cylinder Retracted (or RETRACT command)
CA1 = Clamp Arm 1
CA2 = Clamp Arm 2
DT = Dolly Traverse
DOP = DOFF Position
DIP = Discharge Position
INF = Infeed

BASIC SEQUENCE

Empty box placed at Initial Position. Infeed pulls box to Initial Position. DOFF Cylinder retracts taking box to Traverse. CA1 and CA2 extend and hold box, then traverse left and right until counter completes count. Another empty box has, in the meantime, been brought to the Feed Position. Counter signals complete, and DOFF Cylinder pushes empty box onto Traverse which pushes full box to DIP. Empty box traverses, full box goes to DOP and new empty box goes to FP.

STAPLE TRAVERSE FLOWCHART



APPLICATION #2

Typical Smart Terminal

Self-contained, "smart" data acquisition instrument capable of receiving signals--analog and digital--from external sources, including transducers, digital voltmeters, blood analyzers, etc.

The instrument would contain the Programmable Module series which would perform appropriate operations on the data received, such as limit checking, signal averaging, curve matching, trend searching, polynomial expansion, etc.

The manipulated data would be made available for transfer to a variety of output devices which would include, typically, minicomputers, Teletypes, VT05s, RT01s, and RT02s.

Markets for an instrument of this type (for which the lately announced PDM70 would make an ideal candidate) would be those OEMs selling in laboratory and process control operations.