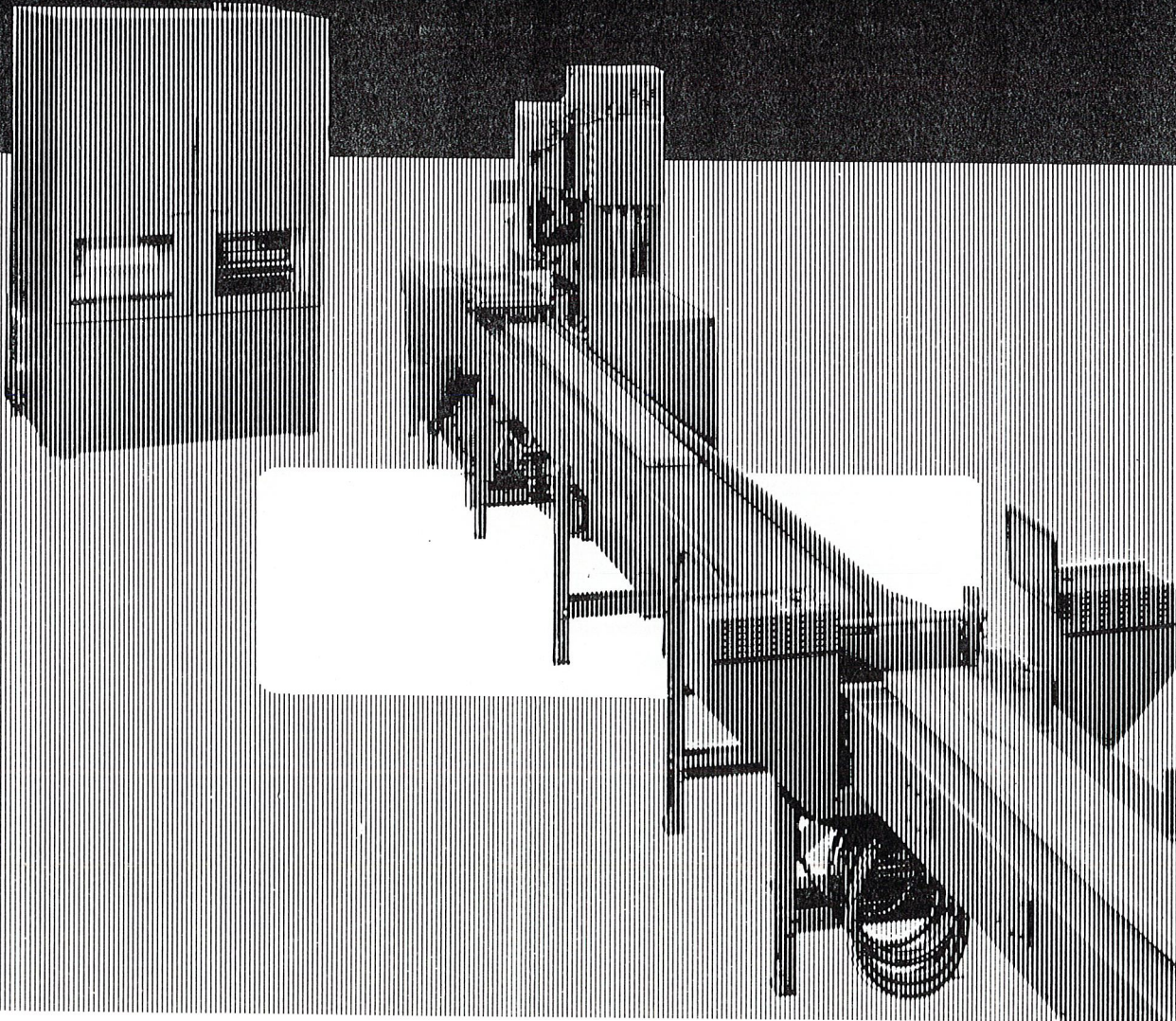




**No. 694 COMPUTERIZED
CUT-OFF SAW**



OLIVER MACHINERY CO.

GRAND RAPIDS, MICHIGAN, U.S.A. 49504

No. 694 COMPUTERIZED CUT-OFF SYSTEM

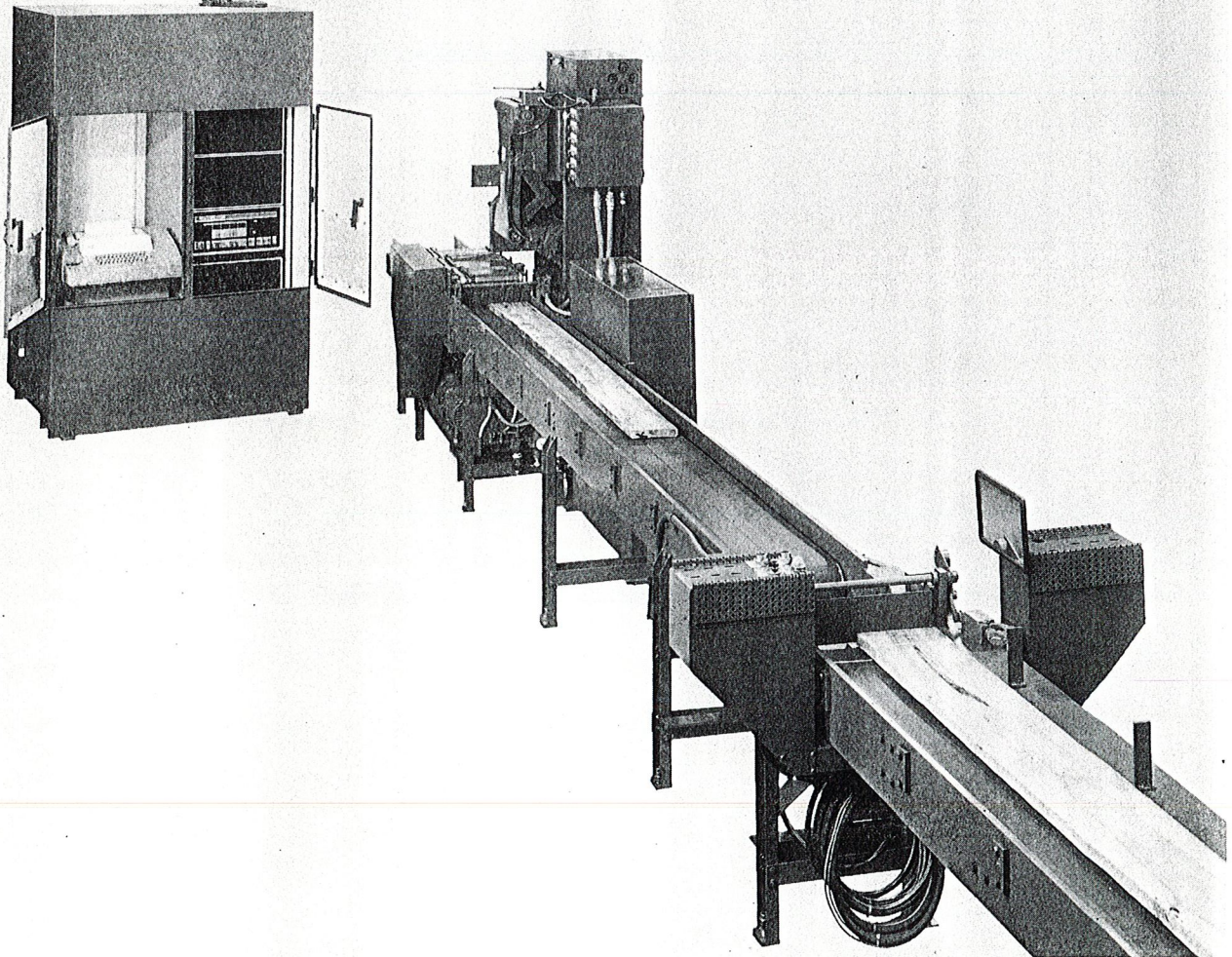
THE PROBLEM:

The problem with present day systems is the guesswork required on the part of an operator. A normal cutoff saw operator cannot satisfactorily work with a bill of material containing more than 5 lengths to be cut. Tests have shown that he will waste lumber by improper selection of lengths and the efficiency decreases greatly as the operator becomes fatigued.

THE SOLUTION:

The objective of the 694, simply stated, is to save lumber which is becoming more and more expensive. By eliminating the decision making and guesswork required by a defecting operator, the greatest yield can be obtained from each board processed.

The Oliver solution is the utilization of a mini-computer. The function of an operator now is to mark, by pushbutton, the beginning and end of sections of good wood in a board. Prior to marking, the Production Manager or operator enters in the computer, by teletype, the lengths desired and the number required of each length, up to 10 entries. After a board is marked, the computer computes the best combination of lengths to yield a minimum of scrap, makes these cuts, and cuts scrap into pieces while the next board is being marked. The system is slightly faster than the old-fashioned saw. The big savings is in increased yield from the lumber, cut into the precise lengths needed for production.



The 694 Cut-Off System consists of the Marking Conveyor, the Cut-Off Saw and Conveyor and the Computer and Teletype.

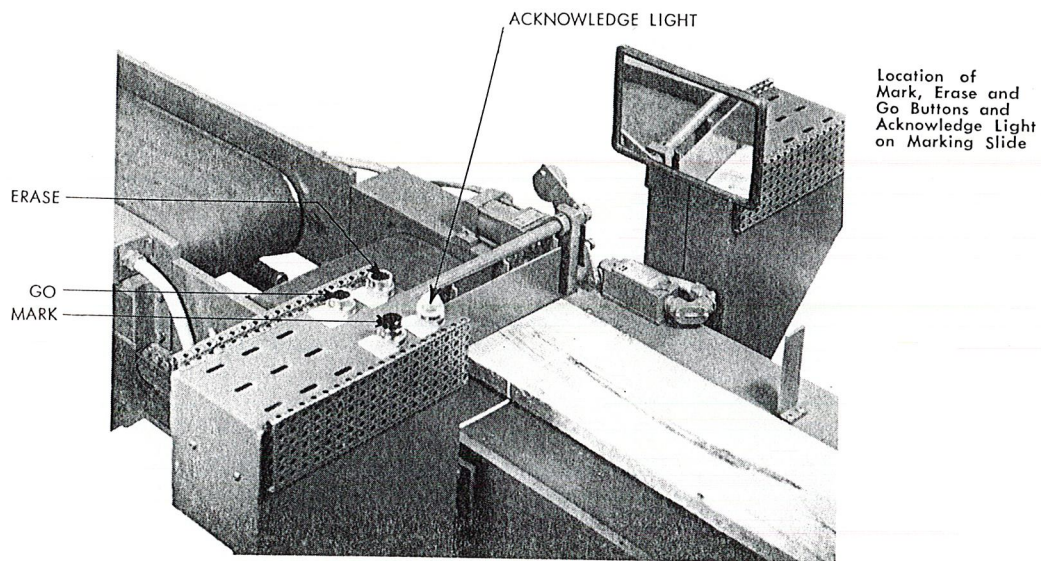
ACCURACY:

All computer and saw machine systems are set up in 1/16 inch increments. This means that the marking slide marks, the cutting conveyor positions, the saw kerf is calculated, the bias is entered, and the lengths required can be entered in 1/16 inch increments. The accuracy actually achieved at present is $\pm 3/16$ inch per piece, not accumulating so that the total board accuracy is $\pm 3/16$ inch. Greater accuracy can be obtained but an increase in running time is required. The size capacity of lumber is 3 inches by 13 inches by 16½ feet. Machines can be built to accommodate lumber up to 23 inches wide by 2 inches thick.

ACKNOWLEDGE:

An acknowledge light on the marking slide is the computer's constant conversation with the operator. Whenever an input (mark, erase, go or reference) is received by the computer an acknowledge flash is given.

Presently, whenever the bill of material reaches zero, the acknowledge light goes on and stays on until a print-out is called for or until the operation is halted. If no acknowledgments are given, the system is not ready to receive inputs. Upon start up, the marking slide must be referenced, the computer will then accept inputs.

**STATUS LISTING:**

At any time during, or after, the operation, a printed record of the present status of the present bill of material can be obtained. To get a print-out of the status, turn the teletype power to "line" and press "L" key. A table is produced giving length required, quantity required, number made and number to make.

LENGTH SELECTION:

Because the longer lengths will be more difficult to obtain, the program has been set up to select the best combination within a bias. The bias can be varied to allow for consideration of importance of longer pieces and that of the grade of lumber being processed. An example might be as follows: A 2-inch bias means that in each section of good wood you are willing to waste up to 2 inches of good wood to obtain the longer lengths.

The selecting of a bias is an important part of the program. It affects not only the logic of the computer but also affects the yield produced from the bunk of lumber. Upon receiving a section of good wood from the marking slide, the computer establishes its own table of possible cutting variations beginning with the longest lengths and working down. If the first variation results in a combination with waste less than the bias, it will pick that combination. If the scrap is greater than the bias, the computer proceeds to the next combination. This process continues until a combination is located within the bias. This combination contains the longest lengths possible within the bias established.

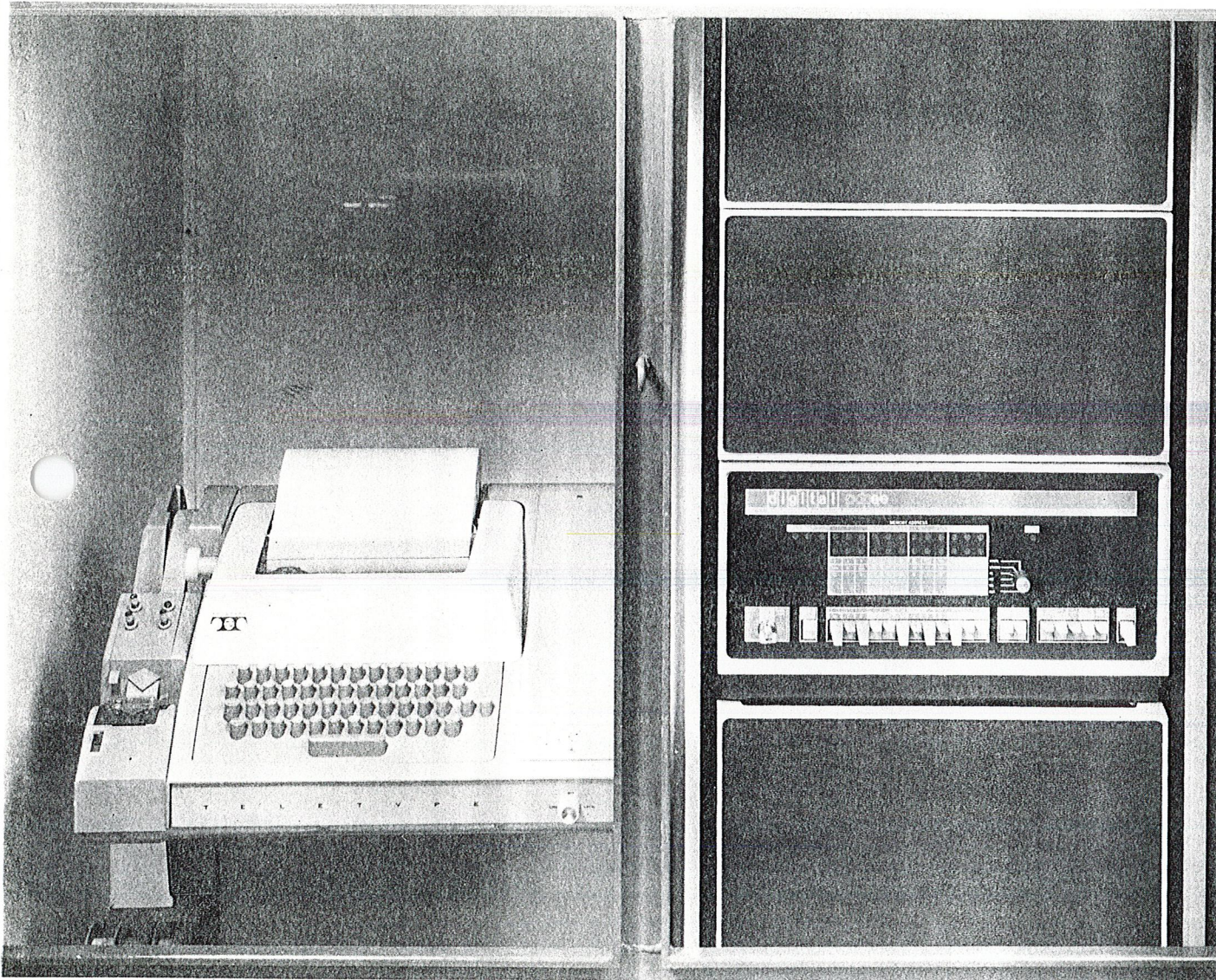
PROGRAMS:

Special programs are available to adapt the system to the user's particular needs.

COMPUTER SAFEGUARDS:

A voltage drop which is generally not seen by a machine is considered to be a power failure by the computer. A voltage drop will cause the computer to store all information and retain all memory until power is restored. At this time, the acknowledge light goes on. The saw returns home if in a cut and the board passes through the saw. After 10 seconds the pressure rolls raise. To restart at this point simply "reference" the marking slide and the acknowledge light will go out signifying that the system is again ready for operation.

Upon complete power failure, the saw shuts down and the computer stores all information and retains all memory until power is restored. At this time a bill of material status can be called for and the computer stopped for: restarting an updated bill of material.



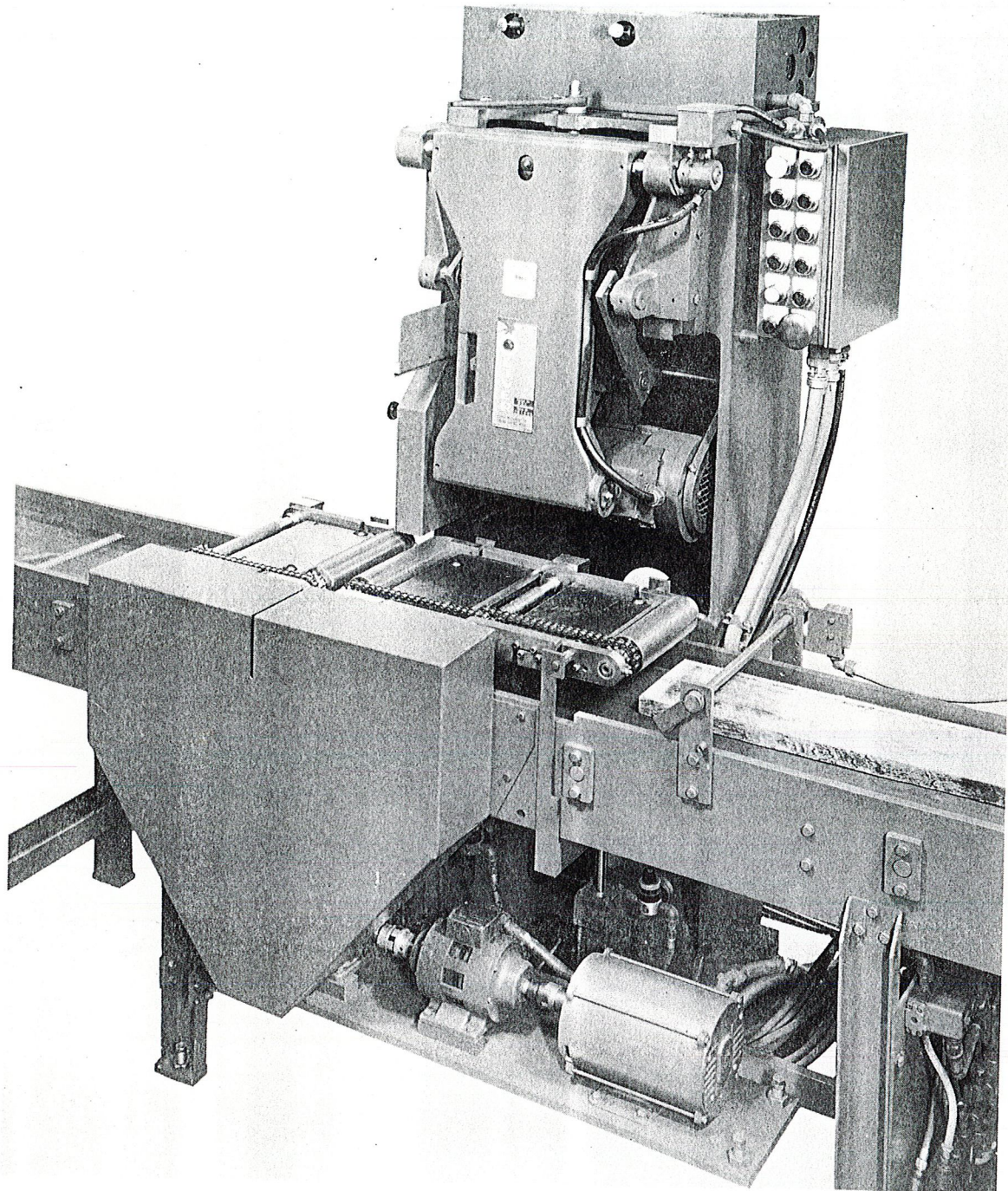
Digital pdp8/e Computer and Teletype Input/Output control the 694 Computerized Cut-Off System and generate the reports of results.

ERROR MESSAGES:

Faulty typing entries in the bill of material are automatically deleted by one of two error messages: "error in length" or "last entry deleted." The computer allows length entries up to 196 inches (16½ feet) and quantities up to 2000 pieces. If a greater quantity is desired, enter that length twice. The number of entries allowed is 10.

ACCI

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Close-up of the Cut-off Saw and Conveyor with the sound housing/guard removed to show the hold-down rolls, D-C feed motor, and control panel. The Cut-off Saw is a standard Oliver No. 94-DH, with modifications to adapt the computer control and conveyor feed works.

SAVINGS — To calculate the annual cash savings, use the following equation:

$$\text{SAVINGS (in dollars)} = \frac{\text{Board ft./year/saw} \times \text{cost}/1000 \text{ Bdft} \times \% \text{ savings realized.}}{1000}$$

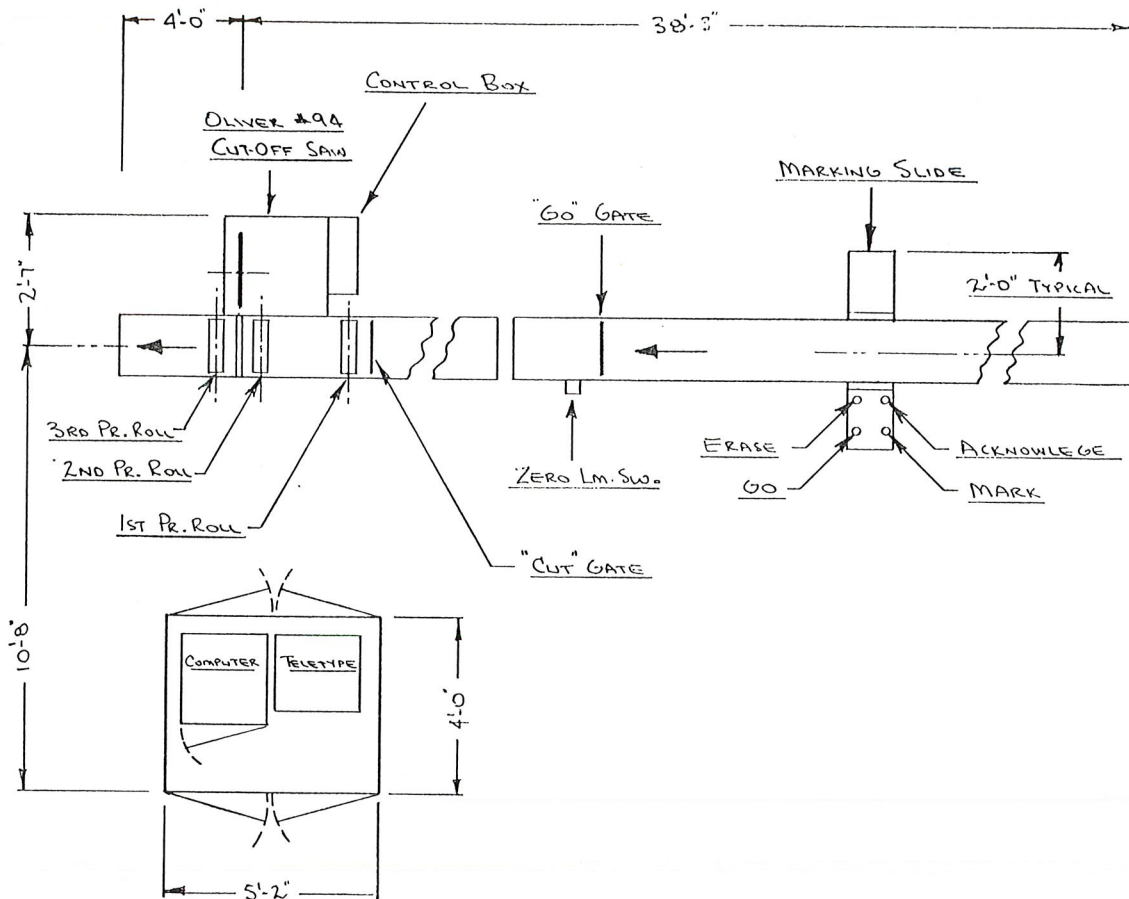
An example might be: Savings = $\frac{1,512,000 \text{ Bd. ft.} \times \$300/1000 \text{ Bd. ft.} \times 6\%}{1000} = \$27,216.00 \text{ Annual Savings.}$

Each installation will vary in production, cost of lumber and savings realized, but the principle is illustrated here.

STAT

LENC

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FLOOR PLAN - Single Saw System

SPECIFICATIONS

LENGTH ENTRIES: Maximum — 10. Maximum length 196". Minimum length 10".

TOLERANCES: Normally $\pm 3/16"$

CAPACITIES:

Standard	Long Stroke
3 x 14½ (regular)	3 x 19½ (optional)
2½ x 17 (optional)	2½ x 22 (optional)
2 x 18 (optional)	2 x 23 (optional)
16'-6" is standard material length — Up to 20 feet available.	

THRU-PUT:

Basis — 4/4 Lumber — 8 Ft. Long — 7 Cuts/Board.

(A Typical Example)

8 Hour Shift = 480 minutes available time

Less Breaks, etc. = 60 minutes

Net Time = 420 minutes/shift x avg. 30 ft./min. = 12,600 lineal ft./shift.

12,600 lineal feet x average board width of 6" = **6,300 board feet/shift.**

OLIVER

OLIVER MACHINERY COMPANY, GRAND RAPIDS, MICH. 49504

(Specifications are subject to change without notice.)

2½M 7408