Preliminary Edition

DATATRON
ELECTRONIC DATA PROCESSING SYSTEMS

HANDBOOK

EXTERNAL SWITCHING UNIT
Model 421 and
OUTPUT SELECTOR Model 420
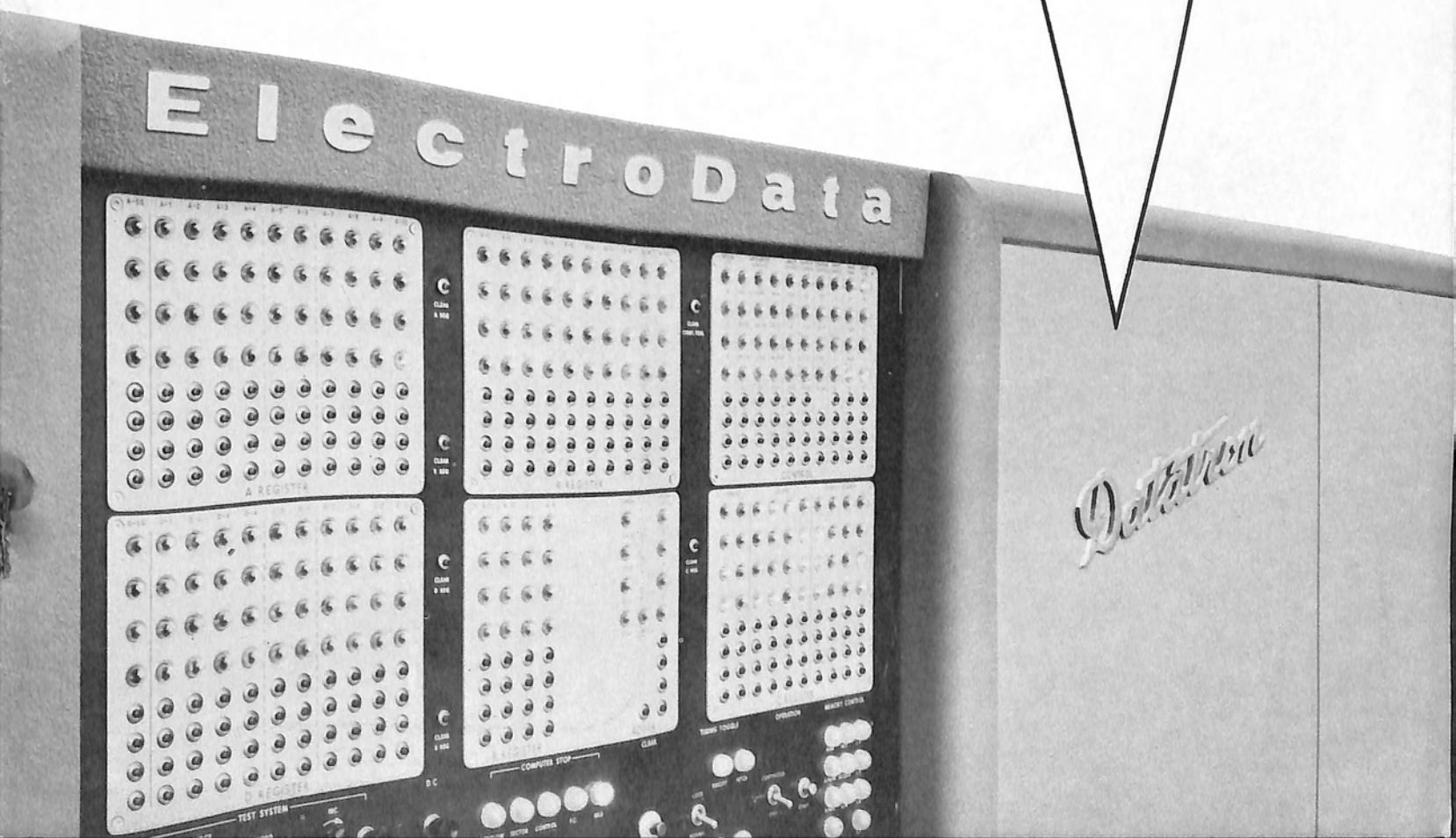
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Figure 1. External Switching Unit Model 421

GENERAL DESCRIPTION

The External Switch Model 421 provides a means of controlling external electrical devices by the DATATRON program.

Normally, the External Switch is used to control the format of printed or punch card results. However, any electrically activated device foreign to the DATATRON may be controlled by the External Switch.

PHYSICAL DESCRIPTION

The External Switch is 12" X 24" X 16". Heat dissipation is negligible.

CABLE CONNECTIONS

Two cable connections are provided with the External Switch. One is to the DATATRON and the other to the printer, card punch, or other external electrical device.
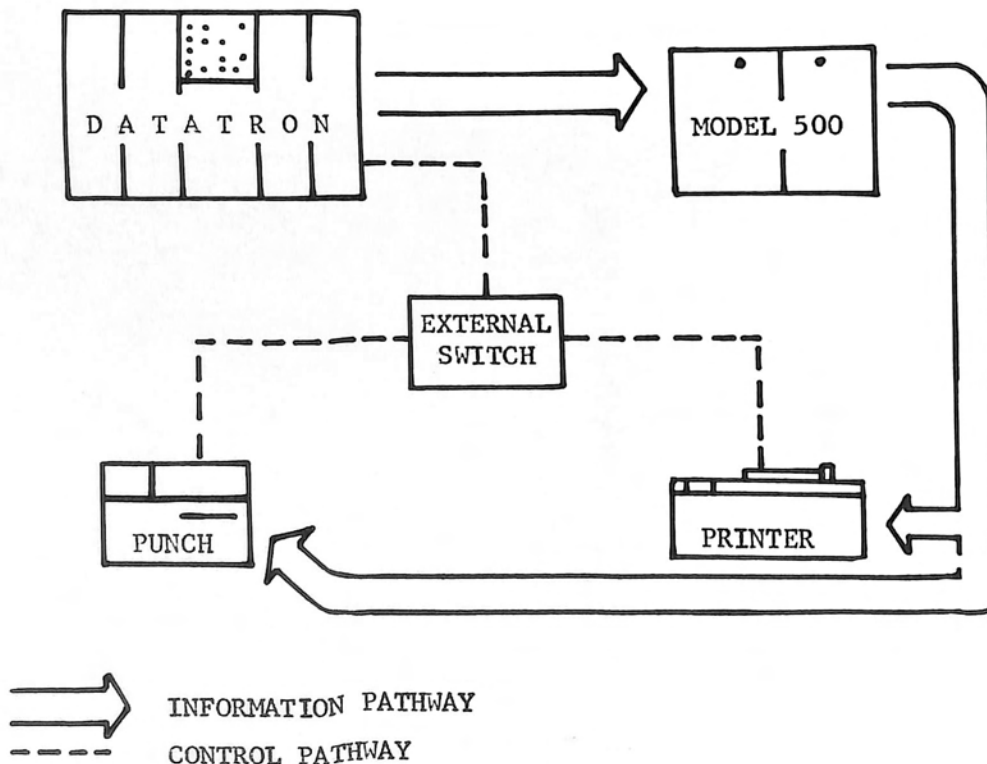

INFORMATION PATHWAY

CONTROL PATHWAY

Figure 2. Cable Connections and Control Pathway

(1)

OPERATION

Within the External Switch there are eight 6-position
selectors, each separately controlled by the eight most
significant digits of any word in the DATATRON storage.

COMMAND

The control of the eight 6-position selectors is as
follows:

    EXC   ± 000p 71   xxxx   EXTERNAL CONTROL

Each of the selectors is under the control of the corres-
ponding digit of the eight most significant digits of the
word in storage cell xxxx.

Word in cell xxxx:
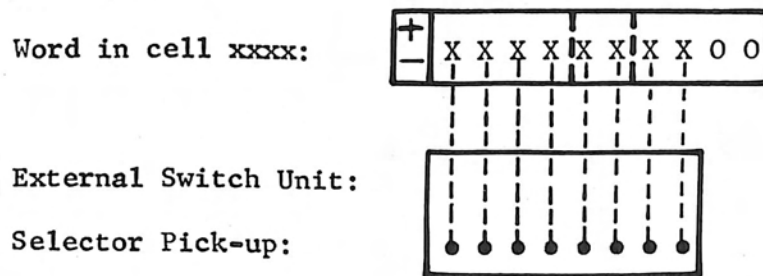
External Switch Unit:

Selector Pick-up:

Figure 3. Selector Control

The state of each selector is permanent until another
EXC command alters the status of any particular selector.
Any of the eight selector settings may be changed as
follows:

                    0   State unchanged.
                    1   Selector is normal.
                    2   Selector is transferred.

Example:

Storage cell 6012 contains the number   12100221--.
Command: ± 0000 71 6012
Selector 1 (most significant) is normal.
Selector $\overline{2}$ transferred.
Selector $\overline{3}$ normal.
Selector $\overline{4}$ unchanged.
Selector $\overline{5}$ unchanged.
Selector $\overline{6}$ transferred.
Selector $\overline{7}$ transferred.
Selector $\overline{8}$ normal.

The ninth and tenth digits of the word in cell 6012 have
no meaning to the EXC command. If the word in cell xxxx
is negative, the DATATRON will stop in the same manner
as a breakpoint stop. Any selector may be reset (normal)
by an external pulse, preventing a repeated external effect.

APPLICATIONS

Format control of the printer or card punch is commonly
controlled by the External Switch. By inserting a de-
sired pulse from the printer or the card punch into the
common point of any of the six positions of a selector,
a desired action on the printer or card punch is available
to the plugboards, i.e., carriage control, printing format,
space control, punch format, etc. The operation of other
electrical equipment or switches not directly associated
with the DATATRON system or its input-output equipment is
possible. Under control of the program and as a result
of a decision made by the DATATRON, alarms could be
actuated, valves moved, etc.

Example:

Below is a sample wiring diagram which exhibits various
controls.

Types 407, 402   All Cycles using the first position
of all eight selectors.
11111112 Double Space
11111111 Triple Space
11111120 Space Suppress
11111200 Print Transfer
11112000 Feed and List a Card
11120000 407 Storage Register Read Out
11200000 Skip to Top of Page
12000000 Skip to Center of Page
20000000 No Printer Format Control

Type 528   All Cycles using third position of
                       all selectors.
                       10000000 No Punch Format Control
                       21122200 Punch Format 3
                       21122100 Punch Format $\overline{1}$
                       21121020 Punch Format $\overline{2}$
                       22000000 Double Punch $\overline{B}$lank Column
                                  Check
                       21200000 Punch Stop

Remote Pulse using sixth position of all selectors
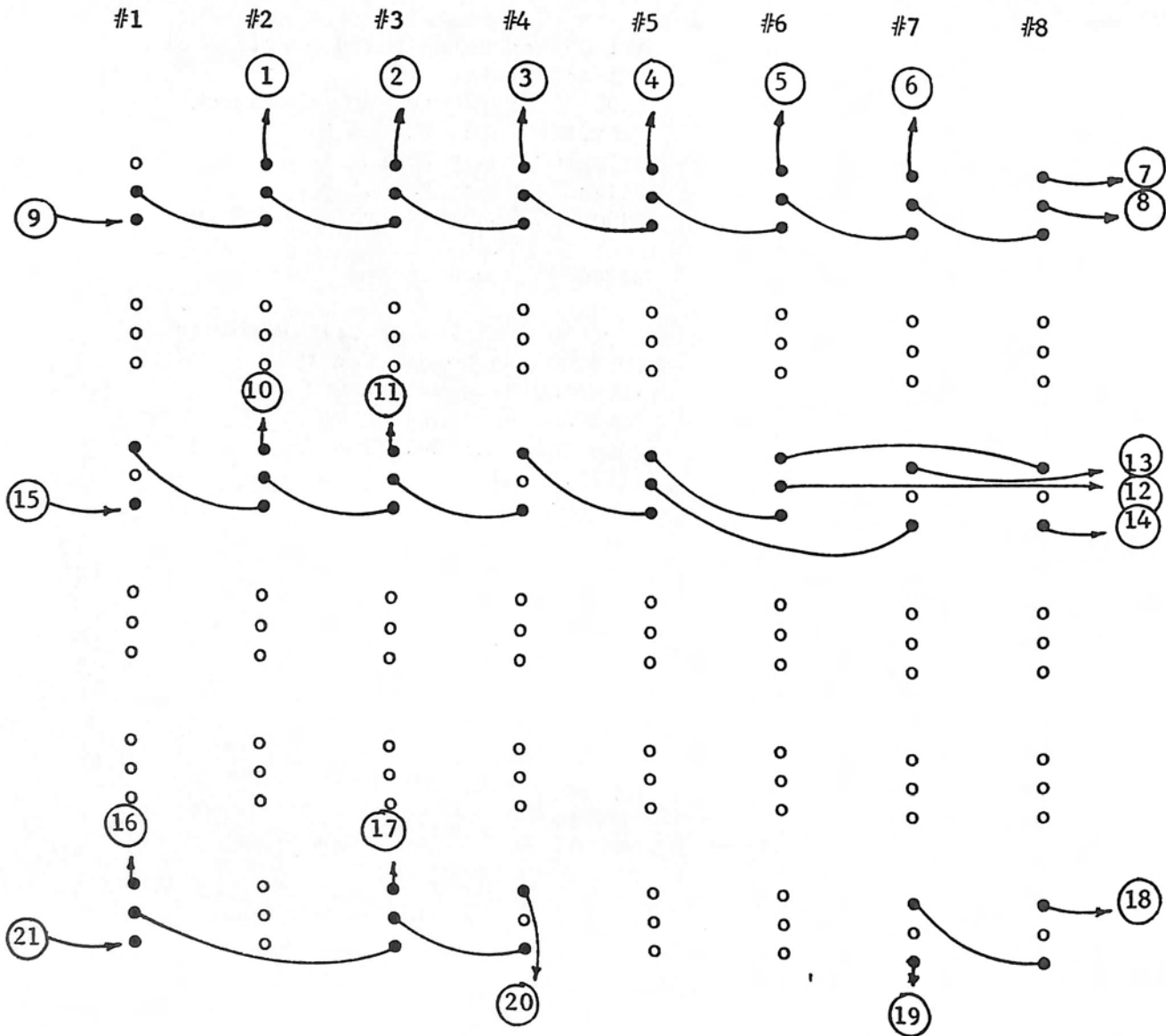   10100000 No Remote Control
                       10120000 Skip Switch Off
                       10200000 Skip Switch On
                       20000000 Stop DATATRON
                       11111122 Alarm

SELECTORS

Figure 4

1. SKIP TO CENTER OF SHEET
2. SKIP TO TOP OF SHEET
3. STORAGE REGISTER READ OUT
4. FEED A CARD
5. PRINT TRANSFER
6. SPACE SUPPRESS
7. DOUBLE SPACE

8. TRIPLE SPACE
9. 407, 402 ALL CYCLES
10. DPBC.
11. STOP
12. PUNCH FORMAT #1
13. PUNCH FORMAT #2
14. PUNCH FORMAT #3

15. 528 ALL CYCLES
16. STOP DATATRON
17. SKIP SWITCH ON
18. ALARM
19. REMOTE PULSE
20. SKIP SWITCH OFF
21. REMOTE PULSE

Figure 5. Output Selector Model 420

GENERAL DESCRIPTION

The Output Selector Switch and External Switch Model 420,
in combination with the Card Converter Model 500, selects
the output medium. Under program control, a printer or
card punch may be selected for a given output cycle.

Data processing standards often require printed and punched
reports for a single application. The Output Selector
Switch and External Switch provide facility for summary
punching in conjunction with printed output.

PHYSICAL DESCRIPTION

The Output Selector Switch is 12" X 24" X 16". Heat dissipation is negligible.

CABLE CONNECTIONS

The Output Selector Switch houses two cable connections labeled "PRINT" and "PUNCH". The Summary Punch cable of the card punch is inserted in "PUNCH". The cable to the printer, supplied by the manufacturer, is inserted at "PRINT". All other connecting cables to the External Switch, Card Converter, and DATATRON are supplied with the unit.
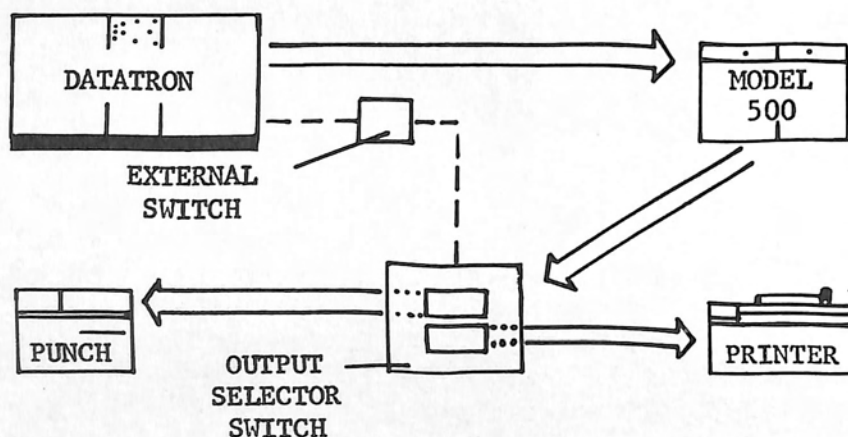
Figure 6. Cable Connections and Information Pathway

OPERATION

When the selector is transferred, the information is directed to the card punch. When the selector is normal, the information is directed to the printer. Only one pathway is possible for any Card Write command. The card punch or the printer may be operated at maximum speed when one machine is used for output. Alternate printing and punching is possible, but at half the normal operating speed of each machine.

COMMAND

The Output Selector Switch is controlled by the DATATRON command:

> EXC $\pm$ 000p 71 xxxx EXTERNAL CONTROL

If the most significant digit of the word in memory cell xxxx is 1, the selector is set to Normal for printed output; if the most significant digit of the word in memory cell xxxx is 2, the selector is transferred for punch card output. See details of External Switch operation on Page 2.

The DATATRON command, EXTERNAL CONTROL (71), controls the External Switch only. The first position of the External Switch, in turn, controls the Output Selector Switch. If the word in cell xxxx is negative, the DATATRON will stop in the same manner as a breakpoint stop.

APPLICATIONS

Consider an inventory control problem where the balances are maintained on punch cards. Further, a printed transaction register is made for each new balance card produced.

Assume the inventory control program places the output information in cells 1000 - 1015. Cells 1000 - 1007 contain alphabetic description. Cells 1008 - 1015 contain all the numeric information required for the balance card.

The information in cells 1000 - 1015 will be printed on two lines. The information in cells 1008 - 1015 will be punched onto the new balance card.

Location	Command	Remarks
7000	EXC 7005	Set to Print
7001	9980 CDW 1000	Print Two Lines
7002	EXC 7006	Set to Punch
7003	9990 CDW 1008	Punch 1 Card
7004	CU	Return to Main Program
7005		01000000000
7006		02000000000

DATATRON

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DATA
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ElectroData

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