DATATRON 205

COMMAND LIST

STANDARD SYMBOLS

xxx— four digit address of storage cell on magnetic drum, or four digit address of block of information on magnetic tape.
P — control digit inserted in command word to act as breakpoint instruction.
F — control digit inserted in command word to act as format instruction to output device.
N — control digit inserted in command word to designate quantity.
O — digit normally used to complete word.
U — control digit inserted in command word to designate unit number of input or output component.
H — control digit inserted in command word to designate head number for magnetic tape search operation.
T — control digit inserted in command word to set punch (or printer) relays.

ARITHMETIC

▼ ADDITION

CAD  CLEAR, ADD

000p 64 xxxx
Clear the A Register. Add the contents of xxxx.

CADA  CLEAR, ADD ABSOLUTE

000p 66 xxxx
Clear the A Register. Add the absolute value of the contents of xxxx.

AD  ADD

000p 74 xxxx
Add the contents of xxxx to the contents of the A Register.

ADA  ADD ABSOLUTE

000p 76 xxxx
Add the absolute value of the contents of xxxx to the contents of the A Register.

FAD  FLOATING ADD

000p 80 xxxx
Add the floating point number in xxxx to the floating point number in the A Register.

DAD  DIGIT ADD

0000 10 0000
Stop machine operation. Add the next digit read (from manual keyboard or paper tape reader) to the least significant position of the A Register.

▼ SUBTRACTION

CSU  CLEAR, SUBTRACT

000p 65 xxxx
Clear the A Register. Subtract the contents of xxxx.

CSUA  CLEAR, SUBTRACT ABSOLUTE

000p 67 xxxx
Clear the A Register. Subtract the absolute value of the contents of xxxx.

SU  SUBTRACT

000p 75 xxxx
Subtract the contents of xxxx from the contents of the A Register.

SUAA  SUBTRACT ABSOLUTE

000p 77 xxxx
Subtract the absolute value of the contents of xxxx from the contents of the A Register.

FSU  FLOATING SUBTRACT

000p 81 xxxx
Subtract the floating point number in xxxx from the floating point number in the A Register.
MULTIPLICATION

M      MULTIPLY
000p 60 xxxx
Multiply the contents of xxxx by the contents of the A Register. Insert the twenty digit product in the A Register and the R Register. The most significant digits are in the A Register.

MRO   MULTIPLY, ROUND
000p 70 xxxx
Multiply the contents of xxxx by the contents of the A Register. Round the product to ten digits. Clear the R Register.

FM     FLOATING MULTIPLY
000p 82 xxxx
Multiply the floating point number in xxxx by the floating point number in the A Register. Insert the eighteen digit floating point product in the A Register and the R Register. The most significant digits are in the A Register.

DIVISION

DIV   DIVIDE
000p 61 xxxx
Divide the twenty digit contents of the A Register and the R Register by the contents of xxxx.
   (a) If Overflow indicates ON, clear the A Register and the R Register.
   (b) If Overflow indicates OFF, insert the quotient in the A Register, and insert the undivided remainder (if any) in the R Register.

FDIV  FLOATING DIVIDE
000p 83 xxxx
Divide the eight digit floating point number in the A Register and the R Register by the floating point number in xxxx. Insert the ten digit floating point quotient in the A Register. Insert the undivided remainder (if any) in the least significant positions of the R Register.

USING THE B REGISTER

SB     SET B
000p 72 xxxx
Set the B Register to the value of the four least significant positions of xxxx.

BA     B TO A
000p 11 0000
Clear the A Register. Add the contents of the B Register.

IB     INCREASE B
000p 32 0000
Add one to the contents of the B Register.

DB     DECREASE B
000p 22 xxxx
Subtract one from the contents of the B Register.
   (a) If the new B Register setting is 9999 (0000 + 1), control continues in sequence.
   (b) If the new B Register setting is not 9999, change control to xxxx.

MANIPULATION AND TRANSFER OF INFORMATION

ST     STORE
000p 12 xxxx
Store the contents of the A Register in xxxx.

STC    STORE, CLEAR
000p 02 xxxx
Store the contents of the A Register in xxxx. Clear the A Register.

SL     SHIFT LEFT
000p 14 00nn
Shift the contents of the A Register and the R Register nn places left. The nn digits shifted out of the left end of the A Register re-enter the right end of the R Register in the same order. The sign does not move.

SR     SHIFT RIGHT
000p 13 00nn
Shift the contents of the A Register and the R Register nn places right. The nn digits shifted out of the right end of the R Register are lost, and nn zeros enter the left end of the A Register. The sign does not move. The maximum value for nn is 19.

NOR    NORMALIZE (CHANGE ON ZERO)
000p 15 xxxx
See definition under “Decision Making and Branching” commands.

CIRA   CIRCULATE A
000p 01 00nn
Shift the contents (including sign) of the A Register nn + 1 places left. The digits shifted out of the left end of the A Register re-enter the right end of the A Register in the same order.

EX     EXTRACT
000p 63 xxxx
Extract from the contents of the A Register by changing each digit in the A Register (including sign) to zero if the digit in the corresponding position in xxxx is zero. The digit in the A Register remains unchanged if the digit in the corresponding position in xxxx is one.

CR     CLEAR R
000p 33 0000
Clear the R Register.

RO     ROUND
000p 23 0000
Round the twenty digit contents of the A Register and the R Register to ten digits. Clear the R Register.

BT4    BLOCK TO LOOP 4
000p 34 xxxx
Block transfer the contents of twenty consecutive main storage cells, beginning with xxxx, to the 4000 quick access loop. Use BT5 (35) for the 5000 loop, BT6 (36) for the 6000 loop, and BT7 (37) for the 7000 loop.
BF4         BLOCK FROM LOOP 4
000p 24 xxxx
Block transfer the contents of the 4000 quick access loop
to twenty consecutive main storage cells, beginning with
xxxx. Use BF5 (25) for the 5000 loop, BF6 (26) for the
6000 loop, and BF7 (27) for the 7000 loop.

UA          UNIT ADJUST
000p 06 0000
Increase by one the most significant position of the A
Register if the digit in this position is even.

ADSC        ADD SPECIAL COUNTER
000p 16 0000
Add the contents of the Special Counter to the least
significant position of the A Register.

SUSC        SUBTRACT SPECIAL COUNTER
000p 17 0000
Subtract the contents of the Special Counter from the
least significant position of the A Register.

DECISION MAKING AND BRANCHING

STOP         STOP
000p 08 0000
Stop machine operation.

OSGD         OVERFLOW ON SIGN DIFFERENCE
000p 73 xxxx
If the sign of the A Register differs from the sign of xxxx,
Overflow indicates ON.

CNZ          CHANGE ON NON-ZERO
000p 04 xxxx
Test the contents of the A Register (not the sign) for zero.
(a) If the A Register setting is zero, set the sign of the A
Register to zero and continue control in sequence.
(b) If the A Register setting is not zero, change control to xxxx.

NOR          NORMALIZE (CHANGE ON ZERO)
000p 15 xxxx
(a) If the content of the A Register is not zero, shift the
twenty digits in the A Register and the R Register left until
the most significant position in the A Register is not zero.
The sign does not move. Record the number of shifts in
the Special Counter.
(b) If the content of the A Register is zero, shift the con-
tents of the R Register left into the A Register, clear the
R Register, and change control to xxxx. The sign does not
move.

CCR          CHANGE CONDITIONALLY, RECORD
000p 29 xxxx
Overflow indicates ON: Clear the R Register. Store in the
four most significant positions of the R Register the
address (as contained in the Control Counter) of the com-
mand next in sequence. Change control to xxxx. Reset
Overflow.
Overflow indicates OFF: Control continues in sequence.

CCBR         CHANGE CONDITIONALLY, RECORD
000p 39 xxxx
Overflow indicates ON: Block transfer the contents of
twenty consecutive main storage cells, beginning with xxxx,
to the 7000 loop. Clear the R Register. Store in the
four most significant positions of the R Register the
address (as contained in the Control Counter) of the com-
mand next in sequence. Change control to 70xx. Reset
Overflow.
Overflow indicates OFF: Control continues in sequence.

CU           CHANGE UNCONDITIONALLY
000p 20 xxxx
Change control to xxxx.

CUB           CHANGE UNCONDITIONALLY, BLOCK
000p 30 xxxx
Block transfer the contents of twenty consecutive main
storage cells, beginning with xxxx, to the 7000 loop.
Change control to 70xx.

CUR           CHANGE UNCONDITIONALLY, RECORD
000p 21 xxxx
Clear the R Register. Store in the four most significant
positions of the R Register the address (as contained in
the Control Counter) of the command next in sequence.
Change control to xxxx.

CUBR          CHANGE UNCONDITIONALLY, BLOCK, RECORD
000p 31 xxxx
Block transfer the contents of twenty consecutive main
storage cells, beginning with xxxx, to the 7000 loop.
Clear the R Register. Store in the four most significant
positions of the R Register the address (as contained in
the Control Counter) of the command next in sequence.
Change control to 70xx.

INPUT-OUTPUT

▼ TYPEWRITER

PTW          WRITE
000p 03 ffnn
Write on typewriter, transferring the sign and nn digits
from the A Register. Digits ff act as an instruction to the
typewriter. Shift the contents (including sign) of the A
Register nn + 1 places left. The digits shifted out of
the left end of the A Register re-enter the right end of
the A Register in the same order.

PTWF          WRITE FORMAT
000p 07 0000
Activate typewriter as directed by digit f.
PAPER TAPE

PTR
0000 00 xxxx
Read from paper tape, transferring words to consecutive storage cells on the drum starting with xxxx. Stop input and start computation after reading a CU, CUB, CUR, or CUBR command (with a 6 or 7 in the sign position).

PTW
000p 03 ffnn
Punch on paper tape, transferring the sign and nn digits from the A Register. Punch digits ff on tape to act as an instruction to a typewriter. Shift the contents (including sign) of the A Register nn + 1 places left. The digits shifted out of the left end of the A Register re-enter the right end of the A Register in the same order.

PTWF
000p 07 0000
Punch the digit f on paper tape to act as an instruction to a typewriter.

MAGNETIC TAPE

MTRW
00up 52 0000
Rewind DataReader u.

MTS
00up 42 xxxx
Search for block xxxx under head h on DataReader u. Overflow indicates ON if a previous MTS command has not been completed.

MTR
nnup 40 xxxx
Read nn consecutive blocks of twenty words each from DataReader u, transferring words to consecutive storage cells on the drum starting with xxxx. Overflow indicates ON if a previous MTS command has not been completed.

MTW
nnup 50 xxxx
Write nn consecutive blocks of twenty words each on DataReader u, transferring words from consecutive storage cells on the drum starting with xxxx. Overflow indicates ON if a previous MTS command has not been completed.

CARD FEED, CARD PUNCH AND TABULATOR WITH CARDATRON

CDR
nnup 44 xxxx
Read 1000 + mnn cards continuously, transferring words to consecutive storage cells on the drum starting with xxxx.

CDW
nnup 54 xxxx
Punch 1000 + mnn cards (or print 1000 + mnn lines) continuously, transferring words from consecutive storage cells on the drum starting with xxxx.

EXC
EXTERNAL CONTROL
000p 71 xxxx
Insert the contents of xxxx in the D Register. For each of the eight most significant digits in the D Register there is an electronic switch. A "3" changes the state of the corresponding switch, a "2" closes the corresponding switch, a "1" opens the corresponding switch, and a "0" does not alter the state of the corresponding switch.

CARD FEED, CARD PUNCH AND TABULATOR WITH CARDATRON

CDRF
READ FORMAT
00up 48 xxxx
Load format band f on input u, transferring words from consecutive storage cells on the drum starting with xxxx.

CDWF
WRITE FORMAT
00up 58 xxxx
Load format band f on output u, transferring words from consecutive storage cells on the drum starting with xxxx.

CDR
READ
00up 44 xxxx
Read the contents of one card from input u, transferring words to consecutive storage cells on the drum starting with xxxx. Reload input u with the contents of the next card.

CDW
WRITE
tfup 54 xxxx
Punch one card (or print one line) at output u, transferring words from consecutive storage cells on the drum starting with xxxx. Edit the information as directed by format band f. Control the punch (or printer) as directed by digit t.

CDRI
READ INTERROGATE
00up 45 xxxx
Interrogate input u. If input u is ready to read, clear the R Register. Store in the four most significant positions of the R Register the address (as contained in the Control Counter) of the command next in sequence. Change control to xxxx. If input u is not ready to read, control continues in sequence.

CDWI
WRITE INTERROGATE
00up 55 xxxx
Interrogate output u. If output u is ready to write, clear the R Register. Store in the four most significant positions of the R Register the address (as contained in the Control Counter) of the command next in sequence. Change control to xxxx. If output u is not ready to write, control continues in sequence.