



3/29/67

BENDIX SYSTEMS DIVISION ANN ARBOR, MICH. NO.

SIDE/CCGE Programming for
DPS 2000 (System Test Set)

ATM 582

REV. NO.
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This ATM is a statement of SIDE/CCGE processing currently included in the DPS 2000 computer programs being written for the ALSEP System Test Set. Basically there is one SIDE/CCGE program used two ways:

1. Process SIDE/CCGE data with no other experiments operating.
2. Process SIDE/CCGE data with any or all other experiments operating.

In general, all processing is similar to that described in the following documents:

1. ATM 399B, Section 4
2. ATM 536, pp 1-28
3. ATM 547, (SIDE/CCGE Section)
4. SE 03 (formerly ATM 370), (SIDE/CCGE Section)

Each experiment program is imbedded in a real-time executive program (or supervisor), the purpose of which is to perform data decommutation, control processing, and input/output. The executive also decommutates the main frame sync pattern, housekeeping count, mode ID, and in addition, processes word 33 (Central Station Housekeeping) and word 46 (command verification). Executive processing of words 33 and 46 is as follows:

1. Word 33 (for data not explicitly related to SIDE in the executive):
 - A. May be continuously printed under sense switch control.
 - B. When the housekeeping subcom is in lock, (after two complete 90 word passes), automatic printing will occur when either out of spec, or changed from the most recent previous values.
 - C. Whenever a command has been received at word 46, the next immediate 90 housekeeping words will be printed.
2. Word 46: Whenever not equal to zero, it is printed. With unsuccessful parity, a "p" is printed along side the command. A comparison is made between the command transmitted and the command received in word 46.

Each ALSEP experiment program receives decommutated data from the executive, organizes the data, processes it and prepares it for output.

Although SIDE is assigned 5 words in the ALSEP mainframe, all processing is done in 10 word blocks corresponding to one SIDE frame. These 10 words fall in one of the following categories:

1. SIDE frame counter (SIDE word 1).
2. Status, engineering, and CCGE data (SIDE words 2, 3, 6, 7, and 8).
3. Scientific data (SIDE words 4, 5, 9, and 10).



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In addition to SIDE words 1 - 10, the SIDE program processes housekeeping words 70 and 85 (from mainframe 33) and the command verification word (mainframe 46) when it is equal to a 104, 105, 106, 107 or 110 (i.e when a SIDE uplink command is verified).

All SIDE printing is done in 2-line blocks using the format shown below. These two lines will be printed every other mainframe if SIDE is in continuous print mode (under sense switch control). Otherwise printing will take place only when there is an "error". For programming purposes, "error" means an out-of-tolerance value or a changed value. A changed value could be the mode register after an uplink command.

SIDE Print Format

1112 AAABCCDDEEEFGGGGGGIJJJKLM
3345 NNNOPPPQRRRSTTTTTTVWWXYZ

The print fields are used as follows:

1. "Theoretical" value of SIDE frame counter (SFC).
2. Blank or 0-9 if SFC in times-ten mode.
3. Two octal digits representing the status of the ground plane stepper, and voltages for velocity filter, L.E. C.P.A., H.E. C.P.A., CCGE, and Channeltron.
4. Blank or * if velocity filter counter being reset at 9.
5. SFC reset point status which can be blank (0-127), 1 (0-10), 4(0-39), 8 (0-79), or C (120-127).

- A Side word 1 (actual value of SFC)
- B Blank or * if error in A
- C Side word 2
- D Blank or * if error in C
- E Side word 3
- F Blank or * if error in E
- G Side words 4 and 5
- I Blank or * if error in G
- J Housekeeping word 70
- K Blank or * if error in J
- L Even mainframe sync (2 bits)
- M Blank or * if parity error in previous five words
- N Side word 6
- O Blank or * if error in N
- P Side word 7
- Q Blank or * if error in P



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R Side word 8
S Blank or * if error in R
T Side words 9 and 10
V Blank or * if error in T
W Housekeeping word 85
X Blank or * if error in W
Y Odd mainframe sync (2 bits)
Z Blank or * if parity error in previous five words

Current estimates indicate that all processing, conversion to BCD, and printing can be done in the time allotted to SIDE (50 msec/mainframe). Therefore SIDE should not place any additional burden on other experiment programs by requiring part of their real time. This means that the SIDE program for ARRAY "B" can be identical to that for ARRAY "A".

The accompanying functional flow chart is intended only to provide interested parties with an outline of program flow.

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SIDE MACROFLOW
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