



11/22/66

BENDIX SYSTEMS DIVISION ANN ARBOR, MICH. NO.

REV. NO.

Solar Wind Programming for
DPS 2000 (System Test Set)

ATM 577

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This ATM is a statement of Solar Wind (SWS) processing currently included in the DPS 2000 computer programs being written for the ALSEP System Test Set. Basically there is one SWS program, used two ways:

1. Process SWS data with no other experiments operating.
2. Process SWS data with any or all other experiments operating. (This would include system integration, cross-talk, and integrated system tests.)

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

1. ATM 399B, Section 3
2. ATM 547 (Solar Wind Section)
3. ICS 314104, pp 13-18, 37
4. SE 03 (formerly ATM 370), (Solar Wind Section)

Each program is imbedded in a real-time executive program (or supervisor), the purpose of which is to control decommutation, 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 SWS 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.

There is provision for sending uplink commands by manual execution.

Each ALSEP experiment program decommutates its own data, organizes it, processes it, and prepares it for output. Specifically, for Solar Wind, there is provision (using sense switches) for allowing or inhibiting the output of:

1. Scientific data samples from one sequence in a matrix format similar to that in ICS 314104, p 18.
2. Averages of scientific data samples for n sequences ($1 \leq n \leq 127$) in the same format.
3. The mean, variance, and sample size by energy level, arranged in columnar format.
4. The mean, variance, and sample size by collector, arranged in columnar format.
5. Any out-of-spec value, with identification.
6. Sixteen words of engineering data from the most recent complete sequence.



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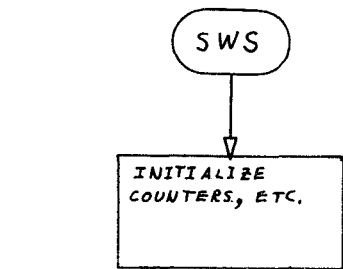
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The accompanying functional flow chart is intended only to provide interested parties with an outline of program flow. As program debugging progresses, detailed flow charts just above the coding level will be drawn. These charts and annotated assembly listings will be appended to this document when they are available.

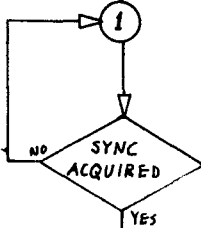
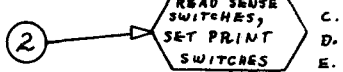
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- SENSE SWITCH CHOICES:
- A. ONE PASS OF SAMPLES
 - B. N SEQ'S. OF SAMPLES (AVERAGES)
 - C. M, σ^2, N OVER ENERGIES
 - D. M, σ^2, N OVER COLLECTORS
 - E. COMPARISON ERROR. (OTHERWISE LOST)
 - F. ENGINEERING DATA FROM MOST RECENT SEQUENCE.



DEFINITIONS:

CLK = WORDS 174, 175
 SUBCOM = WORD 174, BITS 0-3
 I = SUBCOM, BITS 0-3
 J = SUBCOM, BITS 0-1
 K = SUBCOM, BIT 0
 WORD Δ = 0
 SEQ Δ = WORD Δ + 1
 COL = WORD Δ, BITS 0-2
 ROW = WORD Δ / 8
 1 ≤ ROW ≤ 14, 17 ≤ ROW ≤ 23
 0 ≤ COL ≤ 7
 ONE SAMPLE = WORD Δ (I, J, K)
 ENG (I, J, K) = SAMPLE

