

HAL/S Training Questionnaire

The purpose of this questionnaire is to gather information from the HAL/S programming community about which topics should be addressed in future training sessions. Please circle the number of all topics, which you would like to see, covered in detail in future HAL/S training sessions.

A. The HAL/S Language

- 1) Core language features, e.g., single vs. double precision, integer to scalar conversions, floating point accuracy, operators and operator precedence, boolean vs. relational expressions, etc.
- 2) HAL/S DECLARE statements, initialization order for multidimensional arrays and matrices, factored declares.
- 3) DO groups: DO FOR (iterative and discrete), DO CASE, DO WHILE/UNTIL, EXIT and REPEAT statements.
- 4) Vector/Matrix operations: dot and cross products, transpose operations.
- 5) Structures: qualified vs. unqualified, DENSE and RIGID, minor structures and nested structures, qualification of terminal names, cross-reference data for structures and templates, multicopy structures, alignment gaps ...
- 6) HAL/S Real-Time statements: SCHEDULE, UPDATE PRIORITY, CANCEL/TERMINATE, SET/SIGNAL/RESET ...
- 7) Array Processing in which left-hand and right-hand operands are arrays or multicopy structures.
- 8) CHARACTER string operations.
- 9) BIT string operations, including SUBBIT.
- 10) NAME variables: dereferencing, as parameters of procedures and functions, 0th-element addressing considerations.
- 11) %MACROs, EQUATE EXTERNAL, parameterized REPLACE statements, inline functions ...
- 12) Literals and Constants, data storage considerations, alignment gaps, #D and #P,
- 13) REMOTE vs. local data, INCLUDE directives, DATA_REMOTE,

- 14) Run-time Stack, TEMPORARY data, AUTOMATIC keyword, Reentrant vs. Exclusive procedures.
- 15) Writing “efficient” HAL/S code.
- 16) Avoiding common “pitfalls” in HAL/S programming.

B. The OUTPUT WRITER Listing and code generation Listing

- 1) The Phase 1 Listing: annotation marks, EMS-source lines, block summaries, cross-reference (esp. understanding template vs. structure cross-references), ISNs and SRNs.
- 2) The Phase 2 Listing: RLDs, Memory Maps, the AP-101 addressing modes and HAL/S register strategies, locations of literals and address constants, ISN vs. SRN, timing information, CSECT sizes (esp. stack frame sizes), addresses of declared data, alignment gaps, ...

C. Running small-scale HAL/S programs and program complexes on SDFTSO (foreground HAL/S compilations and executions).

D. AP-101 computer architecture, addressing modes and op-code types (RS, SRS, RR, etc), YCONs and ZCONs, ...

E. SDFs and HALSTAT.