SUMMARY

The DoD is in process of designing a common high order computer programming language for Defense embedded computer systems. The procurement strategy is one of competitive prototyping. Four contracts were let in August 1977 to CII Honeywell Bull, Intrametrics, Softech, and SRI International. The contracts were so phased that the Government had an opportunity to examine the products of the preliminary design phase and select the contractors to be continued to full design. The purpose of this report is to document that analysis and sel ction process for archival purposes.

This is a Defense-wide program, the funding for which comes from the three military departments. In order to assure that identical procedures were in effect for all contractors, the funds for this effort were transferred to the Defense Advanced Research Projects Agency which initiated the contract effort through the procurement facilities of the Defense Supply Service - Washington. An open solicitation request for proposal was made. Because of very unique experience, a number of European firms responded. The proposals were evaluated by a sub-group set up by the DoD High Order Language Working Group which has the overall direction of this program.

As a result of the previous evaluation of existing languages, it had been recommended that the design effort should be based on a well-known existing language. Appropriate candidates for base languages were ALGOL 68, PL/I, and PASCAL. Coincidentally, all the successful bidders chose PASCAL as their base, so the products should appear more similar than might have otherwise been the case, at lease syntactically. However, it is important to note that the product will not be a superset of PASCAL. It is designed from an entirely different set of requirements for application in another arena. PASCAL just provides the starting point for the audit trail of the design decisions.

The design portion of the contractual effort was broken into two phases. Phase I was called the preliminary design and was to concentrate on the overall design of a language satisfying the IRONMAN Revised requirements with justification of the design decision in the context of those requirements. No implementation was scheduled in this phase. It might be regarded as an extensive feasibility study and a major output was the verification of the consistency and feasibility of the requirements.

The second phase involves the firming up of the designs, a language manual, the formal rigorous definition of the language, and a test implementation.

At the end of the first phase, each contractor produced a report describing the design of the language and the design decision rationale associated therewith. The Government had two months in which to decide which of these designs should be carried to completion. In this particular effort, it was important to bring in as many elements of the technical community as possible because of the very widespread implications of the DoD standardizing on a single language. Besides just the military and its contractors, the rest of the industrial community, both here and in allied nations, had made a significant technical input to the program and might reasonably be regarded as eventual users. The aid of a representative set of such organizations was sought in the analysis of the preliminary designs to advise on selection for Phase II. More than 80 teams were eventually involved in this effort.

Because of contractual time constraints, only a short period was available for the analyses with the additional time being taken by evaluations of the analyses, the decision process, and contractual negotiations. Because of the short time, some other teams were not able to participate. The results of the analysis effort, however, showed that a sufficient number did respond at the proper level. The designs were preliminary and to be judged at that level. The data base so created was evaluated by teams representing each of the decision making organizations, and a clear and satisfactory decision was arrived at to continue two contractors, CII Honeywell Bull and Intermetrics.