CONTRACTING SYSTEMS
DEVELOPMENT WORKLOADS

DLA SYSTEMS
AUTOMATION CENTER

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March 1982

Prepared pursuant to Department of Defense Contract No. MDA903-81-C-0166 (Task DL101). Views or conclusions contained in this document should not be interpreted as representing official opinion or policy of the Department of Defense. Except for use for Government purposes, permission to quote from or reproduce portions of this document must be obtained from the Logistics Management Institute.
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**Appendices**

APPENDIX A - Criteria for Contract Support Decisions

1. New Systems Development
2. Systems Maintenance
3. Technical Assistance

APPENDIX B - Criteria Applied to DMAP Projects

APPENDIX C - Criteria Applied to Technical Assistance Functions

APPENDIX D - Criteria Applied to System Change Requests
I. OVERVIEW

The Defense Logistics Agency's (DLA's) central design activity, the DLA Systems Automation Center (DSAC), is beset with large development work backlogs and extended systems development schedules. Increasing development workloads and an apparently insufficient number of personnel to handle them have precipitated the problem. One possible solution, to reduce backlogs and shorten development schedules, is to contract DSAC work to commercial systems development organizations. Another is to increase internal DSAC systems development productivity.

We conclude that both solutions should be pursued. DSAC can use contractors for some of its work, and it can increase its productivity.

Conditions which make contracting feasible can be stated as criteria. Criteria have been developed for the various types and phases of DSAC development work— for systems development projects that have not yet been implemented, for maintenance work required for systems currently in operation, and for the technical assistance functions that support both new development and maintenance work. The criteria address 1) the adequacy of systems requirements definitions and program specifications, 2) the functional knowledge required of systems analysts to effectively design new DLA systems or modify current ones, 3) the program design knowledge and programming expertise required by analysts and programmers, 4) the complexity of the new development and maintenance work, and 5) the measures required for testing new or modified systems.

Applying the criteria, we find that:

- a significant amount (approximately 40%) of planned development work can be performed by outside contractors.
- approximately 43% of DSAC's telecommunications functions and 38% of its technical support functions have contractible elements which can be performed by outside organizations.

- very little (under 10%) of DSAC's systems maintenance work can be performed by contractors.

- little (only 15%) of DSAC's current workload can be performed by contractors because most of it is for systems maintenance, but the balance is expected to shift substantially in favor of new development activity.

Computer programming appears to be the most contractible of all development activities at DSAC. DSAC should contract for outside programming assistance for all of its development sites. It should also obtain assistance from outside organizations which provide services in conceptual systems analysis and design in order for DLA to take full advantage of the most up-to-date software and computer systems technology available.

To facilitate these actions, DSAC should establish and administer a contract coordination function.

In order to increase its own internal productivity, DSAC should

- augment its computer equipment to provide adequate on-line program compiling and testing capabilities.

- identify, test, and use application generators and automated design software.

- update standards for programming languages and application software for use in the development of new systems.
II. CRITERIA FOR CONTRACTING DSAC WORKLOADS

A description of the criteria to be used by DSAC in deciding whether to place systems development work with outside organizations is presented in this section. They are more fully described and defined in terms of their application to DSAC development work in a series of step-by-step procedures in Appendix A, "Criteria for Contract Support Decisions."

For convenience in their application, the criteria are grouped into three categories of DSAC systems development activity:

- **New Systems Development Work.** Application systems work which has been planned and/or approved for DSAC's systems development activity. This work consists of the design of new systems and their programming and testing for DLA users.

- **Systems Maintenance Work.** Application systems work which is undertaken to modify/improve current systems for users. This work includes the redesign of existing applications, their reprogramming/modification and testing.

- **Technical Assistance.** Development work in support of both new development and systems maintenance work, specifically the DSAC telecommunications hardware and software development activities and the activities of DSAC's Technical Support Directorate.

**NEW SYSTEMS DEVELOPMENT WORK**

Criteria for contracting new development work for each step in the system development process are as follows:

- **Conceptual Analysis Criteria (Appendix A-1-1).** This set of criteria focuses on the essential question whether the system to be developed is to utilize new hardware or software approaches and technologies, outside the current capabilities of the DSAC staff. Often, a contractor can supply a "leading edge" approach and has had experience in installing systems which have used it.

- **Functional Analysis Criteria (Appendix A-1-2).** Here, the key criterion is whether the inputs and outputs of the system or application to be designed are "stand alone," i.e., whether they are not dependent upon other systems to the extent that other systems must be modified to accept the features of the new system.
- Systems Analysis Criteria (Appendix A-1-3). Two major criteria are applicable in this step: (1) whether or not extensive coordination between the contractor and more than one DLA organization is required and (2) whether or not the systems interfaces described in the functional analysis criteria (above) have been identified and those interfaces are simple and few.

- Program Analysis Criteria (Appendix A-1-4). Special emphasis is placed on the functional or application knowledge of the designer during this step of development. The program analysis step is critical to the proper execution of a system, and in addition to adequate functional design documentation, programming analysts (internal to DSAC or contractor-supplied) should have solid knowledge and experience in the functional aspects of the system to be programmed.

- Programming and Program Documentation Criteria (Appendix A-1-4). Given well defined programming specifications, programming work can be performed by organizations other than DSAC without great risk. The key criterion for contracting programming work to outside contractors, therefore, is provision of adequate specifications.

Underlying the criteria described for each of the systems development steps, above, are additional criteria which address the sufficiency and expertise of DSAC/contractor staffs, the size of the effort to be contracted, and the lead-time required to accomplish the development effort (see Appendix A-1-5). Specifically considered is DSAC's staffing level to perform the development work under consideration, the special skills of contractors required to perform the work, the minimum number of workload hours which can be economically contracted to an outside organization, and the time required to contract work competitively to those organizations including elapsed time required for advertisement, RFP development, contractor response, evaluation and negotiation.

SYSTEMS MAINTENANCE WORK

Criteria for contracting systems maintenance work to outside organizations are organized according to (1) the definition of the work to be performed, (2) its complexity and its criticality to a system's ongoing operation and (3) the DSAC and contractor resources available. Appendix A-2 more fully
describes the criteria and their use. Their major elements and applications are:

- **Work Definition.** Development work should be screened for appropriateness for outside contracting. For example, DSAC management functions such as project supervision and coordination are not considered to be contractible despite their current inclusion in DSAC project workloads. Moreover, project task work should amount to more than 40 workload hours for economical contracting to outside organizations. Task objectives as well as outputs and inputs should also be well defined and documented.

- **Work Complexity, Criticality.** Systems maintenance tasks requiring extensive changes to existing master files which serve many applications, or where change logic itself is extensive and complex, are generally unsuitable to be contracted to outside organizations. In addition, tasks that interact heavily with in-process redesign work should not be assigned to outside organizations. Moreover, systems to be tested on the AUTODIN or DLA telecommunications networks should not be contracted to outside organizations until they become familiar and experienced with these networks.

- **Resources.** Contractors should perform systems maintenance work only when DSAC staff is not available to perform it. Contractor capability, both functional and technical, is also required for effective and efficient performance of systems maintenance work.

**TECHNICAL ASSISTANCE**

There are two general types of criteria for contracting DSAC telecommunications and technical support development functions. One type addresses the definition and scope of the work to be performed. The other addresses the resources and timing required to accomplish the development effort. The following are key criteria considerations for contracting out DSAC technical assistance work. Appendix A-3 provides a detailed description/procedure for applying the criteria.

- **Technical Assistance Work Definition, Scope.** The criteria developed address the definition of the assistance to be provided, as well as the extent and complexity of technical coordination required to develop telecommunications and technical support hardware and software concepts among DSAC users and other government agencies/organizations.

- **Technical Assistance Resources, Timing.** The criteria address the sufficiency of the DSAC staff, the special technical expertise required for the task under consideration, the possibility of adding the task to an existing technical assistance contract, the lead-time and
level of effort required to perform the task, and the possibility of obtaining this type of assistance through a level of effort contract arrangement with the outside firm.
III. ANALYSIS RESULTS

The contract support criteria described in the preceding section were tested on the backlog of project work at DSAC, which includes systems development project work and current planned workloads (Systems Change Requests, or SCR's). The results of those tests are presented in this report section. Also included is a review of the use of development contractors by DoD Central Design Activities (CDA's), and a review of productivity improvement techniques in use at the CDA's and DSAC.

USE OF CONTRACTORS FOR NEW SYSTEMS DEVELOPMENT PROJECTS

The criteria were tested on major systems development projects and support activities planned for future development and implementation in the DSAC Directorates of Materiel Management, Subsistence Management, Depot Management, Technical Support and Telecommunications. Those projects and activities are identified and described in the 1980 DLA Master Automatic Data Processing Plan (DMAP).

Exhibit III-1 is a summary of the results of the test. It shows that approximately 371,000 hours, or 34%, of the project workload for the Materiel Management, Subsistence Management, and Depot Management Directorates fully meet the criteria for contracting that work to outside systems development organizations. Another 58,000 hours, or 5%, are "possibly" contractible—the work does not meet all the criteria, but meets a sufficient number of them to warrant further consideration for placing it with outside organizations.

Appendix B lists all the projects to which the criteria have been applied and provides, in addition to an accounting of those hours which are estimated
### EXHIBIT III-1

**CONTRACTIBILITY OF NEW SYSTEMS DEVELOPMENT (DMAP) PROJECTS**

<table>
<thead>
<tr>
<th>DIRECTORATE</th>
<th>TOTAL HRS. (# PROJECTS)</th>
<th>HRS. CONTRACTIBLE (% TOTAL HRS.)</th>
<th>HRS. POSSIBLY CONTRACTIBLE (% TOTAL HRS.)</th>
<th>HRS. NOT CONTRACTIBLE (% TOTAL HRS.)</th>
</tr>
</thead>
<tbody>
<tr>
<td>MATERIEL MGT.</td>
<td>422,800</td>
<td>90,000</td>
<td>33,450</td>
<td>299,350</td>
</tr>
<tr>
<td></td>
<td>(8)</td>
<td>(21.3%)</td>
<td>(7.9%)</td>
<td>(70.8%)</td>
</tr>
<tr>
<td>SUBSISTENCE MGT.</td>
<td>150,300</td>
<td>44,040</td>
<td>9,360</td>
<td>96,900</td>
</tr>
<tr>
<td></td>
<td>(7)</td>
<td>(29.3%)</td>
<td>(6.2%)</td>
<td>(64.5%)</td>
</tr>
<tr>
<td>DEPOT MGT.</td>
<td>534,000</td>
<td>236,900</td>
<td>14,900</td>
<td>282,200</td>
</tr>
<tr>
<td></td>
<td>(2)</td>
<td>(44.4%)</td>
<td>(2.8%)</td>
<td>(52.8%)</td>
</tr>
<tr>
<td>TOTAL</td>
<td>1,107,100</td>
<td>370,940</td>
<td>57,710</td>
<td>678,450</td>
</tr>
<tr>
<td></td>
<td>(14)</td>
<td>(33.5%)</td>
<td>(5.2%)</td>
<td>(61.3%)</td>
</tr>
</tbody>
</table>

**TECH. SUPPORT**
- 20 of 52 (38\%) DMAP (1980) functions appear, in part, contractible.

**TELECOMMUNICATIONS**
- 4 projects appear, in part, contractible.
to be contractible and those which are not, a description of the type of work which is contractible, and reasons, where applicable, for non-contractibility. Reasons for non-contractible work are cross-referenced to the criteria described in Appendix A.

In general, the opportunities for contracting work to outside organizations in these Directorates are as follows:

- Materiel Management, Subsistence Management--projects most contractible are those to develop subsistence applications and convert them to the Standard Automated Materiel Management Systems (SAMMS).
- Depot Management--the work to develop the DoD Standard Warehousing and Shipping Automated System (DWASP) is most contractible.

In all of the Directorates, the most contractible activities are application programming, program testing and program documentation. Some smaller projects, however, such as the CONUS Transportation Bid Evaluation project, and the Master Equipment Control System (See Appendix B) are contractible in their entirety.

Exhibit III-1 also shows that 38% of the DSAC's Technical Support Directorate functions, and 43% of its Telecommunications Directorate functions meet, at least in part, the criteria for contracting their work to outside organizations. Appendix C provides a detailed listing of those functions and an analysis of the contractibility of each.

**SYSTEM CHANGE REQUEST (SCR) CONTRACTIBILITY**

A stratified sample of 134 SCR's (representing 10% of the total number of SCR's and 60% of the estimated hours to complete SCR project-related work) was drawn and was analyzed, after applying the criteria for contracting to outside

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1 Subsequent to the analysis phase of this study, DLA decided to develop a new subsistence system and not convert existing subsistence systems to SAMMS.
organizations to each. Each task was then reviewed with DSAC Directorate branch chiefs in order to further determine the contractibility of the tasks and to refine, thereby, the criteria themselves.

The results of this analysis and review, displayed in Exhibit III-2 are summarized as follows: (SCR analysis detail is provided in Appendix D.)

- Overall, only 14.5% or approximately 96,500 hours of SCR work qualify for contracting to outside organizations. Of this amount, 5.1% or approximately 34,000 hours qualify for contracting on a task order basis. This is because the size of the individual work packages is small (each is less than 2,000 hours). The remaining 9.4% of contractible work can be procured on a project-by-project basis.

- Approximately 53,500 hours of the Materiel Management Directorate's workload are contractible. Most of that work is for development of new programs within current systems. There is also a significant amount of the Subsistence Management Directorate's project work--approximately 28,500 hours--suitable for contracting to outsiders. Most of this work can be procured on a project-by-project basis.

- There is little (only 4.4%) contractible work in the Depot Management Directorate, because the bulk of the current effort is undefined, and because there are functional design tasks (related to DWASP) which require DSAC design staff capabilities.

- Very little SCR work in Technical Support and Telecommunications was found to be contractible because the tasks are regarded as management or administrative, which cannot be contracted to outsiders, or the tasks are not defined well enough to fully determine contractibility.

Exhibit III-3 is a tabulation of the "reasons" for non-contractibility of DSAC SCR's. This tabulation shows that two reasons account for 54% of the hours which are not contractible: the design work to be performed requires extensive internal functional systems knowledge (30%), and the task effort itself is too complex (24%) to be accomplished economically by outside companies.

CDA USE OF OUTSIDE CONTRACTORS

One aspect of our analysis of the possible use of systems development contractors to perform DSAC systems development work included a review of past work performed by contractors for other DoD central design activities (CDA's)
**EXHIBIT III-2**

**CONTRACTIBILITY OF SYSTEM CHANGE REQUESTS**

<table>
<thead>
<tr>
<th>AREA</th>
<th>HRS. TOTAL</th>
<th>HRS. CONTRACTIBLE</th>
<th>HRS. NOT CONTRACTIBLE</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>TASK ORDERS</td>
<td>PROJECTS</td>
</tr>
<tr>
<td>MATERIEL MGT.</td>
<td>290,585</td>
<td>28,537 (9.8%)</td>
<td>24,953 (8.6%)</td>
</tr>
<tr>
<td>SUBSISTENCE MGT.</td>
<td>109,254</td>
<td>2,169 (2.0%)</td>
<td>26,293 (24.1%)</td>
</tr>
<tr>
<td>DEPOT MGT.</td>
<td>128,806</td>
<td>365 (0.3%)</td>
<td>5,336 (4.1%)</td>
</tr>
<tr>
<td>TECHNICAL SUPPORT</td>
<td>90,341</td>
<td>1,387 (1.5%)</td>
<td>6,178 (6.8%)</td>
</tr>
<tr>
<td>TELECOMMUNICATIONS</td>
<td>46,463</td>
<td>1,307 (2.8%)</td>
<td>0 (0.0%)</td>
</tr>
<tr>
<td><strong>TOTAL</strong></td>
<td><strong>665,449</strong></td>
<td><strong>33,765 (5.1%)</strong></td>
<td><strong>62,760 (9.4%)</strong></td>
</tr>
</tbody>
</table>

* Excludes "A" and "N" series administrative tasks for all except the Technical Support Directorate.
### EXHIBIT III-3
REASONS FOR SCR NON-CONTRACTIBILITY

#### SAMPLE HOURS BY AREA

<table>
<thead>
<tr>
<th>CRITERIA CATEGORY*</th>
<th>MATERIEL</th>
<th>SUBSISTENCE</th>
<th>DEPOT</th>
<th>TECH.</th>
<th>TELECOM</th>
<th>TOTAL</th>
</tr>
</thead>
<tbody>
<tr>
<td>Not Eligible</td>
<td>6,431</td>
<td>7,952</td>
<td>28,094</td>
<td>4,920</td>
<td>47,397</td>
<td>14%</td>
</tr>
<tr>
<td>Not Defined</td>
<td>5,902</td>
<td>15,285</td>
<td>29,054</td>
<td>2,656</td>
<td>52,897</td>
<td>16%</td>
</tr>
<tr>
<td>DSAC Functional Knowledge Required</td>
<td>24,046</td>
<td>20,398</td>
<td>55,137</td>
<td></td>
<td>99,951</td>
<td>30%</td>
</tr>
<tr>
<td>DSAC System Design Knowledge Reqd.</td>
<td>9,864</td>
<td>13,597</td>
<td>102</td>
<td></td>
<td>23,563</td>
<td>7%</td>
</tr>
<tr>
<td>DSAC Program Design Knowledge Reqd.</td>
<td>8,248</td>
<td>7,395</td>
<td>6,197</td>
<td></td>
<td>21,840</td>
<td>7%</td>
</tr>
<tr>
<td>Programs Too Critical</td>
<td>4,509</td>
<td>300</td>
<td></td>
<td></td>
<td>4,809</td>
<td>1%</td>
</tr>
<tr>
<td>Effort Too Complex</td>
<td>46,293</td>
<td>14,044</td>
<td>20,752</td>
<td></td>
<td>81,089</td>
<td>24%</td>
</tr>
<tr>
<td>Operational Test Environment Reqd.</td>
<td></td>
<td></td>
<td></td>
<td>2,041</td>
<td></td>
<td></td>
</tr>
<tr>
<td>TOTAL</td>
<td>105,293</td>
<td>55,434</td>
<td>99,528</td>
<td>65,386</td>
<td>7,946</td>
<td>333,587</td>
</tr>
</tbody>
</table>

*See Exhibit III-3A definitions of criteria categories.*
## EXHIBIT III-3A
### DESCRIPTION OF CRITERIA CATEGORIES

<table>
<thead>
<tr>
<th>Category</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Not eligible</td>
<td>Management or administrative functions, suspended or cancelled tasks, lead time not sufficient to contract.</td>
</tr>
<tr>
<td>Not defined</td>
<td>Blanket order; incomplete definition of work to be performed.</td>
</tr>
<tr>
<td>DSAC functional knowledge required</td>
<td>Requirement to modify/redesign existing application; not a &quot;stand-alone&quot; new system.</td>
</tr>
<tr>
<td>DSAC system design knowledge required</td>
<td>Requirement to modify/redesign existing system--interfaces in new system not well identified.</td>
</tr>
<tr>
<td>DSAC program design knowledge required</td>
<td>Requirement for substantial application systems design knowledge by ADP analysts.</td>
</tr>
<tr>
<td>Programs too critical</td>
<td>Large, critical programs in major operational system; custom DSAC systems software used in fielded systems.</td>
</tr>
<tr>
<td>Effort too complex</td>
<td>Master file changes, multiple subsystems, functionally complex, ten or more programs involved, simultaneous DSAC changes to many systems required.</td>
</tr>
<tr>
<td>Operational test environment required</td>
<td>AUTODIN, DLA telecommunications network, or operational system access required.</td>
</tr>
</tbody>
</table>
and other federal government agencies. The objectives of the review were to compare the extent and kind of DSAC's use of outside contractors to that of the other CDA's, and as a result of the comparison, identify possible new opportunities for DSAC to contract its development work.

Exhibit III-4 provides a comparison of the use of contractors by DoD for application systems and for other uses such as computer configuration analysis, training, and software development. From this comparison, it can be seen that contractors have been used by the CDA's, including DSAC, in a wide range of application development activities including turnkey systems development and maintenance, software conversion activities, programming and programming documentation, programming specifications, data base design, and prototype applications development and testing.

While DSAC appears to compare favorably with other CDA's in contracting documentation activities, application analysis activities, franchised system development and maintenance, configuration analysis and training to systems developers and vendors, other CDA's have made more extensive use of systems software development than has DSAC. They are also using contractors for the development of minor, stand-alone application systems.

Neither the CDA's reviewed nor DSAC, however, have contracted out the development and/or maintenance of their major systems efforts. On the other hand, of DLA headquarters and the "civilian" agencies reviewed, all had contracted major systems development efforts. One agency now contracts its entire central design activity to two commercial systems development companies--one company is assigned exclusive responsibility for systems development, the other for maintenance. Our review and discussions with people in these organizations with regard to the feasibility and appropriateness of contracting out major system work to outside organizations led us to conclude


**EXHIBIT III-4**

**USE OF CONTRACTORS BY DoD CENTRAL DESIGN ACTIVITIES**

<table>
<thead>
<tr>
<th>CONTRACTOR-Use</th>
<th>CPA</th>
<th>A</th>
<th>B</th>
<th>C</th>
<th>D</th>
<th>DSAC</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>FOR APPLICATION SYSTEMS</strong></td>
<td>UNIVERSITY-</td>
<td>GSA CONTRACTOR-</td>
<td>SYSTEMS COMPANIES-</td>
<td>GSA CONTRACTOR-</td>
<td>Documentation</td>
<td>Systems companies-</td>
</tr>
<tr>
<td>HARDWARE VENDORS-</td>
<td>Considering small contract to assist with conversions to new equipment</td>
<td>Programming, documentation in new system development (multiple, small tasks)</td>
<td>1) Programming, documentation in new system development (multiple, large contract). Some program specifications also contracted</td>
<td>1) System architecture</td>
<td>1) System generation</td>
<td>Systems companies-</td>
</tr>
<tr>
<td>1) Software conversion (large contract)</td>
<td>SOFTWARE VENDOR-</td>
<td>SOFTWARE VENDOR-</td>
<td>2) Turnkey system development and maintenance</td>
<td>2) Transition analysis</td>
<td>2) Training</td>
<td>1) Computer interfacing</td>
</tr>
<tr>
<td>2) Turnkey system acquisition (large contract)</td>
<td>RELAYED ADP ACTIVITIES-</td>
<td>RELAYED ADP ACTIVITIES-</td>
<td>Enhancement and maintenance</td>
<td>3) Feasibility study</td>
<td>2) Management studies</td>
<td></td>
</tr>
<tr>
<td>Franchised system development and maintenance</td>
<td>UNIVERSITY-</td>
<td>UNIVERSITY-</td>
<td>GSA CONTRACTOR-</td>
<td>DSAC</td>
<td>DSAC-</td>
<td></td>
</tr>
<tr>
<td><strong>FOR OTHER USES</strong></td>
<td>FEDSM-</td>
<td>FEDSM-</td>
<td>HARDWARE VENDOR-</td>
<td>SOFTWARE VENDOR-</td>
<td>HARDWARE VENDOR-</td>
<td>FEDSM-</td>
</tr>
<tr>
<td>OTHER VENDORS-</td>
<td>Computer configuration analysis</td>
<td>Computer configuration analysis</td>
<td>Turnkey system acquisition for communications</td>
<td>1) Training</td>
<td>1) System generation</td>
<td>Computer configuration analysis</td>
</tr>
<tr>
<td>1) Training</td>
<td>OTHER VENDORS-</td>
<td>OTHER VENDORS-</td>
<td>2) Installation</td>
<td>2) Training</td>
<td>2) Training</td>
<td>Systems companies-</td>
</tr>
<tr>
<td>2) Word/text processing system development</td>
<td>1) Systems software development</td>
<td>3) Custom tailoring</td>
<td>3) Custom development/maintenance</td>
<td>3) Computer interfacing</td>
<td></td>
<td></td>
</tr>
<tr>
<td>3) Test data center operation (planned--during conversion)</td>
<td>UNIVERSITY-</td>
<td>UNIVERSITY-</td>
<td>UNIVERSITY-</td>
<td>UNIVERSITY-</td>
<td>UNIVERSITY-</td>
<td>UNIVERSITY-</td>
</tr>
</tbody>
</table>
that there are many opportunities for DSAC to do the same. This conclusion is supported by the results of our analysis of DSAC projects applying the criteria developed for necessary contracting-out decisions.

**DSAC PRODUCTIVITY IMPROVEMENT**

Concurrent with the review of the use of development contractors by CDA's and other agencies, a review of the use of systems development "productivity tools" was undertaken. Exhibit III-5 displays and describes the status of the data base management system (DBMS), programmer dictionaries, COBOL translators, structured design, etc., in use at DSAC and the other CDA's. From this analysis, together with a review of the use made of these tools in other government agencies and commercial systems development organizations, we conclude that:

- One of the most effective productivity steps to be taken by DSAC is that of upgrading the capacity and throughput of its test facility computers for on-line programming; program compiling.

- While DSAC has used its internally-developed SANTAM and MOTAM data base management systems, and is implementing a commercial DBMS (TOTAL) for existing and planned applications, further use of DBMS's is indicated to avoid the development expense involved in enhancing "home grown" systems and to take full advantage of the features of more recently developed systems. Moreover, we believe these DBMS's should be implemented in new, on-line systems, rather than fitted into existing, batch-oriented system environment.

- While DSAC has used a significant number of systems management, design and testing tools, more advanced tools could be used. We believe DSAC should investigate further the use of application generators, applications prototyping, data base design packages (described above), and, in particular, the use of the Problem Statement Language/Problem Statement Analyzer (PSL/PSA) package.
## EXHIBIT III-5

**USE OF PRODUCTIVITY TOOLS BY DoD CENTRAL DESIGN ACTIVITIES**

<table>
<thead>
<tr>
<th>Development Productivity Tools</th>
<th>CDAP</th>
<th>A</th>
<th>B</th>
<th>C</th>
<th>D</th>
<th>DoDCC</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>DBMS</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Currently limited by old equipment. Cards, some RJE, some on-line entry. New work stations in development stage.</td>
<td>CDAP</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Mostly cards. Some on-line terminals. With new equipment planned, will go to on-line entry.</td>
<td>CDAP</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Mixture of cards, programmer terminals. Will install work stations later. Also remote laser printers.</td>
<td>CDAP</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Currently limited by old equipment. Use cards, some RJE, some on-line job management. Mini-computers use on-line development.</td>
<td>CDAP</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>OTHER TOOLS REPORTED BY CDAP</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Expert Review Committee.</td>
<td>CDAP</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Plan to utilize applications generator in future.</td>
<td>CDAP</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Data dictionary. Data base design (integrated with dictionary). PSL/PSA Application generator. Prototyping applications with DBMS. COMO translators. Code structuring software.</td>
<td>CDAP</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
IV. CONCLUSIONS AND RECOMMENDATIONS

The following conclusions and recommendations for contracting DSAC development work result from our developing, reviewing, and testing the criteria for contracting DSAC systems development workloads, and reviewing other organizations' contracting practices and productivity improvement measures.

Overall, we believe the criteria developed, reviewed, and refined with DSAC, DLA, and CDA personnel and other government and commercial organization personnel will effectively identify DSAC systems development work that can be successfully accomplished by outside contractors. We further believe that the criteria developed meet the requirement of "minimal risk", i.e., they minimize the risk of problems which can occur with contractor-developed systems, particularly those related to the potential lack of contractor functional design expertise and to the appropriateness of the work itself for contracting, including its definitiveness, complexity, and criticality to other DLA systems and processes.

Other conclusions and recommendations follow.

CONCLUSIONS

1. Of all DSAC development activities reviewed, the programming activity is the one most contractible to outside development organizations.

2. Because the conceptual design activity is the most critical to the life of the system to be developed, and because systems development (hardware and software) technology continues to develop and advance at an extremely accelerated rate, it is important for DSAC to take advantage of "leading-edge" concepts
in systems development. These concepts are most readily pro-
vided by development organizations with expertise and experi-
ence in conceptual systems design.

3. Because of the relative high complexity of DLA's logistics
information systems, particularly subsistence, materiel manage-
ment and distribution systems, the contracting of the func-
tional analysis and specification activities for these systems
to outside organizations is not indicated. DSAC personnel, who
are well qualified and experienced in the development of these
systems, are needed to guide their design in response to DLA
user requirements.

4. There appears to be little opportunity, in the short run, for
contracting systems maintenance work to outside organizations.

5. From the analysis and review undertaken in the technical as-
sistance directorates of Telecommunications and Technical
Support, it is concluded that there are a significant number of
functions in these directorates with potential for contractor
assistance.

6. Because of the substantial amount of work determined to be
eligible for contracting to commercial systems development
organizations (more than 525,000 hours of DMAP and SCR work-
load), there is a need for DSAC to establish a contract co-
ordinating office to assist systems and technical staffs in
contracting work to those organizations.

7. DSAC's internal systems development productivity can be sig-
nificantly increased by the addition of adequate computing
equipment (additional capacity and throughput capability) for
programming and testing computer applications. In addition to utilizing advanced DBMS's, application generators, applications prototyping, and the PSL/PSA software package, DSAC needs to upgrade its development, design, and documentation standards in order to take advantage of these and other new design concepts and technologies.

RECOMMENDATIONS

In line with the foregoing conclusions, the following steps for contracting workloads and improving productivity are recommended.

1. It is recommended that DSAC and DLA Headquarters staff proceed to a) identify the specific programming workload they desire to be assigned to contract programming organizations (from the recommended project workload lists in Appendices B, C, and D), b) identify qualified contractors, and c) prepare work statements for inclusion in requests for proposals to be issued for competitive bidding.

2. It is recommended that DSAC and DLA identify (from the list in Appendix B) conceptual design work in major system and subsystem development projects where current DSAC systems technology is viewed as less than up-to-date. Specifically, the conceptual analysis for the new subsistence system should be considered, as well as the effort to develop a new, on-line SAMMS.

3. In order to assure conformity in systems design to user requirements, DSAC functional analysis groups should continue to develop and produce functional design specifications and act as contract officer's technical representatives (COTR's) for
conceptual design of entire new systems by outside development organizations.

4. It is recommended that DSAC systems design and programming staff continue to modify, effectively and economically, the systems currently in place with DLA users. We also recommend the use of that staff to maintain the new systems developed by contractors, in order to assure that systems development and maintenance do not become "locked in" to an outside contractor's organization.

5. In order to take full advantage of contractor assistance in the telecommunication and technical support functions, we recommend that DSAC review current project plans and the recommendations for contracting to outside organizations in Appendix C to identify specific workloads/projects to be contracted.

6. With the assistance of DLA headquarters, DSAC should establish a contract coordinating office under a DSAC administrative organization, such as DSAC's Office of Planning and Management.

7. We recommend that DSAC undertake a feasibility study to determine the best strategy for upgrading computer capacity and throughput (for the computer maintenance and peripheral equipment) in order to increase productivity in DSAC's programming design and test activities. We also recommend that DSAC initiate a research program to identify and test, on a continuing basis, new development methodologies. Application generators and automated design tools should be investigated immediately, in addition to identifying and testing new DBMS's. It is also recommended that the Center update its standards for the use of new programming languages and applications systems.

IV-4
APPENDIX A

CRITERIA FOR CONTRACT SUPPORT DECISIONS

A-1. New Systems Development
A-2. Systems Maintenance
A-3. Technical Assistance
NEW SYSTEMS DEVELOPMENT

The following are the criteria, in flow diagram form, for making contract support decisions for new systems development work. These criteria are used for entirely new systems development work or the rework of current DSAC systems, subsystems, or applications. Criteria for the systems implementation phase, e.g., file, data, conversion activities of a development project, were not developed based on the assumption that DSAC would assume complete responsibility for this project phase.

Explanatory notes accompany the diagrams (pages A-1-6, A-1-7).

1. CONCEPTUAL ANALYSIS

1.1 Define Objectives

1.2 Is the effort to develop or redevelop a system or subsystem?

1.3 Does the effort involve new technology or a new application area?

1.4 Justify contracting.

1.5 Is contracting indicated?

1.6 Action

1.6.1 Application: conceptual analysis not required

1.6.2 Perform conceptual design at DSAC

1.6.3 Contract for conceptual design
2. FUNCTIONAL ANALYSIS

2.1 Are functional management requirements clearly stated?

2.2 Does the system stand alone?

2.3 Justify contracting.

2.4 Is contracting indicated?

2.5 Action

2.5.1 Perform functional analysis at DSAC & evaluate for systems analysis (3.)

2.5.2 Contract total development effort
3. SYSTEMS ANALYSIS

3.1 Do related efforts/co-ordination problems exist?

3.2 Are the interfaces to be specified few and identified?

3.3 Justify contracting.

3.4 Is contracting indicated?

3.5 Action

3.5.1 Perform systems analysis at DSAC & evaluate for program analysis

3.5.2 Contract systems analysis & subsequent steps
4. PROGRAM ANALYSIS

4.1 Justify contracting.

4.2 Is contracting indicated?

4.3 Action

5. PROGRAMMING AND PROGRAM DOCUMENTATION

5.1 Justify contracting.

5.2 Is contracting indicated?

5.3 Action
6.JUSTIFICATION ROUTINE

6.1 Is DSAC staff sufficient?

6.2 Is special technical expertise needed, cost justified?

6.3 Do potential contractors have expertise required?

6.4 Is the level of effort at least 2000 hours?

6.5 Is there sufficient time to contract competitively?

6.6 Can the effort be "sole-sourced" on existing or new contract?

6.7 Action

6.7.1 Competitive contracting indicated

6.7.2 Contract effort on sole-source basis

6.7.3 Contract not indicated
FLOW DIAGRAM NOTES, NEW SYSTEMS
DEVELOPMENT CRITERIA

<table>
<thead>
<tr>
<th>Criteria Procedure Step</th>
<th>Notes/Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.1</td>
<td>System requirements, objectives should be defined (including automation requirements). Development project completion time is a must. See Section 4.1, FIPS PUB 64 for guidance in defining objectives, requirements.</td>
</tr>
<tr>
<td>1.2</td>
<td>Conceptual analysis should be undertaken when a major system or subsystem is to be developed. Applications may not require a &quot;full-blown&quot; conceptual design analysis effort.</td>
</tr>
<tr>
<td>1.3</td>
<td>Any &quot;new&quot; development activity to DSAC (application design, hardware configuration, communication network, etc.). Only contractors with an implementation &quot;track record&quot; should be used.</td>
</tr>
<tr>
<td>1.4</td>
<td>The &quot;justification routine,&quot; common to all new development criteria. Addresses contractibility from a staffing, technical expertise, economic and project leadtime requirement view.</td>
</tr>
<tr>
<td>1.5</td>
<td>Decision dependent on results of the &quot;justification routine.&quot;</td>
</tr>
<tr>
<td>1.6</td>
<td>If work to be performed does not involve a major redesign effort (small, application level work) or does not involve major advance in software or computer hardware technology, conceptual design work is probably not indicated, or could be included as part of the functional design effort for the entire system to be developed.</td>
</tr>
<tr>
<td>2.1</td>
<td>Includes user objectives, requirements and major processes including data flows, input and output specification.</td>
</tr>
<tr>
<td>2.2</td>
<td>Our discussions with DSAC staff have produced the following definition of a &quot;stand-alone&quot; system: a system &quot;stands alone&quot; and hence, is contractible to outside organizations when its inputs and outputs can be and are specified during the functional analysis phase of a development project. If their definition must be deferred until the systems design phase of the project, because of parallel design efforts which will affect the system, a stand-alone situation does not exist, and hence, contracting the effort should not be undertaken.</td>
</tr>
<tr>
<td>Criteria Procedure Step</td>
<td>Notes/Remarks</td>
</tr>
<tr>
<td>-------------------------</td>
<td>---------------</td>
</tr>
<tr>
<td>2.4</td>
<td>Decision dependent on results of the &quot;justification routine.&quot;</td>
</tr>
<tr>
<td>3.1</td>
<td>Parallel development efforts, such as the effort to select a DBMS in support of the system or application under review, would mitigate against contracting the applications development work to outsiders.</td>
</tr>
<tr>
<td>3.2</td>
<td>All inputs and outputs not fully defined in the functional specification should be few (less than 10% of all inputs/outputs). As a minimum, they should be identified and briefly described in the functional specification.</td>
</tr>
<tr>
<td>6.1</td>
<td>Adequate numbers of DSAC staff should be available to complete the work within the time required by the user.</td>
</tr>
<tr>
<td>6.2</td>
<td>Pertains to all kinds of expertise: functional, design, systems design, programming design, programming, hardware, telecommunications, etc.</td>
</tr>
<tr>
<td>6.3</td>
<td>Contractors should have a &quot;hierarchy of skills&quot; capability: in order to perform program or systems analysis activities well, functional knowledge of the systems to be developed is required, in addition to programming and hardware knowledge.</td>
</tr>
<tr>
<td>6.4</td>
<td>Less than 2000 hours of effort for any single development contract would prove uneconomical to both DSAC and the contractor.</td>
</tr>
<tr>
<td>6.5</td>
<td>Contracting competitively involves time to be provided RFP development, bidder response, DSAC evaluation and contract negotiation. Programming contracts could probably be obtained in six months. Major systems procurements could take as long as nine months.</td>
</tr>
<tr>
<td>6.6</td>
<td>If sole-source contracting can be justified and DSAC has an existing vendor contract (level of effort) to which the work under consideration could be added, then a contract effort on a sole-source basis is indicated.</td>
</tr>
</tbody>
</table>
The following are the criteria for contract support for system maintenance tasks. It is assumed that a level-of-effort contract/basic ordering agreement can be obtained for on-site contractor support for systems maintenance work.

Criteria are more fully described in the accompanying notes (page A-2-4).

1. WORK ELIGIBILITY

1.1 Does the work involve management functions?

1.2 Is the task active, and more than 40 hours?

1.3 Is the work well defined?

A

B

A-2-1
2. WORK COMPLEXITY, CRITICALITY

2.1 Are master file changes required?

2.2 Is more than one sub-system involved?

2.3 Are complex logic changes involved?

2.4 Are changes to large or critical programs required?

2.5 Are ten or more programs involved?

2.6 Are programs currently being changed by DSAC involved?

2.7 Are changes to DSAC developed system software required?

2.8 Is access to AUTODIN, DLA network, operational system required to test?
3. **JUSTIFICATION**

3.1 Is DSAC staff sufficient?

3.2 Does the contractor have staff and expertise required?

3.3 Can the effort be added to existing contract?

3.4 Action

3.4.1 Write task order for program analysis, programming, & documentation updates

3.4.2 Perform modification at DSAC
<table>
<thead>
<tr>
<th>Criteria Procedure Step</th>
<th>Notes/Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.1</td>
<td>Includes the management activities of project coordination, supervision and DSAC representation which would not normally be contracted to a commercial organization.</td>
</tr>
<tr>
<td>1.2</td>
<td>Tasks expected to be on &quot;hold&quot; status (PMS) for more than 30 days should not be considered. For maintenance work, less than one person-weeks is not economical to assign to an outside organization, even on a level-of-effort contract basis.</td>
</tr>
<tr>
<td>2.1</td>
<td>Files common to many applications should be maintained by DSAC staff.</td>
</tr>
<tr>
<td>2.2</td>
<td>When changes affect more than one subsystem, it is difficult to manage the change process.</td>
</tr>
<tr>
<td>2.3</td>
<td>Certain changes involve highly complex functional logic which should not be changed by contractor personnel.</td>
</tr>
<tr>
<td>2.4</td>
<td>Critical programs are those which involve mainstream processing, i.e., many or all transactions are processed even through a jobstream.</td>
</tr>
<tr>
<td>2.5</td>
<td>When large numbers of programs are changed simultaneously, management of the change process is unwieldy.</td>
</tr>
<tr>
<td>2.6</td>
<td>Contracting to outsiders would cause coordination problems, under these circumstances.</td>
</tr>
<tr>
<td>2.7</td>
<td>Special experience or learning required to modify these systems: DSAC staff only.</td>
</tr>
<tr>
<td>2.8</td>
<td>Security considerations.</td>
</tr>
<tr>
<td>3.3</td>
<td>Task must match existing scope of work.</td>
</tr>
</tbody>
</table>
TECHNICAL ASSISTANCE

The following are the criteria for evaluating technical assistance contractibility.

Criteria are further described in the accompanying notes (page A-3-3).

1. TYPE OF WORK LIMITATIONS

1.1 Is work/deliverable well defined?

1.2 Does the work relate only to DSAC management tasks?

1.3 Does the work require management coordination with other DSAC Directorates?

1.4 Does the work require direction of government personnel?

1.5 Does the work require representing DSAC in interagency activities?

A

B

A-3-1
2. JUSTIFICATION

2.1 Is DSAC staff sufficient?

2.2 Is special technical expertise needed or cost-justified?

2.3 Do potential contractors have expertise required?

2.4 Can the effort be "sole sourced" on existing or new contract?

2.5 Is there sufficient time to contract competitively?

2.6 Is the level of effort at least 2000 hours?

2.7 Will similar tasks occur within a year?

2.8 Action

- 2.8.1 Sole-source contracting indicated
- 2.8.2 Contract competitively for separate effort
- 2.8.3 Issue task order against level-of-effort contract
- 2.8.4 Perform work at DSAC
<table>
<thead>
<tr>
<th>Criteria Procedure Step</th>
<th>Notes/Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.2, 1.3</td>
<td>See step 1.1, Appendix A-2.</td>
</tr>
<tr>
<td>1.4</td>
<td>A pitfall for technical assistance work: contractors not to direct DSAC personnel in project work.</td>
</tr>
<tr>
<td>1.5</td>
<td>Contractor responsibility for interagency AUTODIN, ADPER projects should be discouraged.</td>
</tr>
<tr>
<td>2.7</td>
<td>Forecast of similar work needed to determine.</td>
</tr>
</tbody>
</table>
APPENDIX B

CRITERIA APPLIED TO DMAP PROJECTS
APPENDIX B

CRITERIA APPLIED TO DMAP PROJECTS

DSAC's 1980 DMAP\(^1\) plan was reviewed to identify projects within the DSAC Materiel Management, Subsistence Management, and Depot Management Directorates. More recent major systems development projects were also included via information provided by DSAC and DLA Headquarters management personnel.

Estimates of the amount of development effort required by project stage were assigned to each project as follows:

<table>
<thead>
<tr>
<th>Project Stage</th>
<th>Est. Amount (%) of Effort Required</th>
</tr>
</thead>
<tbody>
<tr>
<td>Functional Analysis</td>
<td>30%</td>
</tr>
<tr>
<td>Systems Analysis</td>
<td>20%</td>
</tr>
<tr>
<td>Program Analysis</td>
<td>20%</td>
</tr>
<tr>
<td>Programming</td>
<td>30%</td>
</tr>
</tbody>
</table>

These percentages are based on the proportion of DSAC staff assigned to project functions. They were reviewed and validated with DSAC management personnel.

\(^1\)DLA Master Automatic Data Processing Plan, Section IV, Central Design Activity-DSAC, June 1980.
### EXHIBIT B-1

**DSAC Future Project Contracting Material Management Systems**

<table>
<thead>
<tr>
<th>DMAP Project No.</th>
<th>Project Name</th>
<th>Total Hrs</th>
<th>Hrs. Possibly Contractible</th>
<th>Hrs. Not Contractible</th>
<th>Contractible Work</th>
<th>Reasons for Non-contractibility (Appendix A Criteria Reference)</th>
</tr>
</thead>
<tbody>
<tr>
<td>M030</td>
<td>ADPER</td>
<td>180,000</td>
<td>90,000</td>
<td>90,000</td>
<td>Data conversion programs, conversion of standard COBOL programs</td>
<td>Conversion of complex, critical programs (A-2:2.4), effort management 9A-2:1.7), implementation (A-1:Introduction)</td>
</tr>
<tr>
<td>M100</td>
<td>Subsistence¹</td>
<td>110,000</td>
<td>13,750</td>
<td>96,250</td>
<td>Program analysis of new programs (est. 25%)</td>
<td>Needs DSAC functional analysis, systems analysis due to interfaces (A-1:2.2,3.2); DSAC to modify existing programs (no maintenance contract assumed)</td>
</tr>
<tr>
<td>M202</td>
<td>School Supplies</td>
<td>2,800</td>
<td>700</td>
<td>2,100</td>
<td>Program analysis of new programs (est. 50%)</td>
<td>Needs DSAC functional analysis, systems analysis due to interfaces (A-1:2.2,3.2); DSAC to modify existing programs (no maintenance contract assumed)</td>
</tr>
<tr>
<td>M208</td>
<td>Interchangeability and Substitutability</td>
<td>100,000</td>
<td>100,000</td>
<td></td>
<td></td>
<td>Needs definition of work (A-1:2.1), May be contractible in part later</td>
</tr>
<tr>
<td>M209</td>
<td>Conversion to SAHTAM (may be part of DBMS)</td>
<td>10,000</td>
<td>5,000</td>
<td>5,000</td>
<td>Programming, or development of conversion routine and actual program conversion</td>
<td>Actual work needs definition, planning, implementation (A-3:1.1)</td>
</tr>
<tr>
<td>DSAC²</td>
<td>On-line Technical Information Storage and Retrieval</td>
<td>20,000</td>
<td>14,000</td>
<td>6,000</td>
<td>Systems analysis</td>
<td>Needs definition, DSAC functional analysis (A-1:2.1)</td>
</tr>
</tbody>
</table>

¹ Assumes moderate stretch effort level
² Assumes severe stretch effort level
### DMAP Project

<table>
<thead>
<tr>
<th>DMAP Project No.</th>
<th>Project Name</th>
<th>Total Hours</th>
<th>Hrs. Possibly Contractible</th>
<th>Hrs. Not Contractible</th>
<th>Contractible Work</th>
<th>Reasons for Non-contractibility</th>
</tr>
</thead>
<tbody>
<tr>
<td>DSAC</td>
<td>Critical Program Redevelopment</td>
<td></td>
<td></td>
<td></td>
<td>Program analysis, redesign, coding, test, documentation (No change in system or program function)</td>
<td>Needs DSAC functional analysis due to mixture of functional requirements (A-1:6.3). DSAC to rework some salvageable existing programs (no maintenance contract assumed)</td>
</tr>
<tr>
<td>DSAC</td>
<td>SAMMS Modernization</td>
<td></td>
<td></td>
<td></td>
<td>Conceptual redesign new program analysis. System design possibly contractible.</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th></th>
<th>422,800</th>
<th>90,000</th>
<th>33,450</th>
<th>299,350</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>(21.3%)</td>
<td>(7.9%)</td>
<td>(70.8%)</td>
<td></td>
</tr>
</tbody>
</table>

1. Project cancelled (11/81) with decision to build the new FDS-DISMS at DSAC-W.

2. Identified by DSAC staff.

3. Estimate of hours not available.
## EXHIBIT B-2

**DSAC FUTURE PROJECT CONTRACTING SUBSISTENCE MANAGEMENT SYSTEMS**

<table>
<thead>
<tr>
<th>Source</th>
<th>Project Name</th>
<th>Total Hours</th>
<th>Hrs. Possibly Contractible</th>
<th>Hrs. Not Contractible</th>
<th>Contractible Work</th>
<th>Reasons for Non-contractibility</th>
</tr>
</thead>
<tbody>
<tr>
<td>DSAC</td>
<td>Real Time Access and Updating--Contract and Funds Control Files</td>
<td>4,500</td>
<td>2,250</td>
<td>2,250</td>
<td>Program analysis for new programs</td>
<td>Needs DSAC functional analysis, systems analysis due to interfaces (A-1:2.2, 3.2). Maintenance of existing programs (no maintenance contract assumed)</td>
</tr>
<tr>
<td>B-2-1</td>
<td>Automate Brand Name Supply Bulletin</td>
<td>3,700</td>
<td>2,590</td>
<td>1,110</td>
<td>Systems analysis, possibly functional analysis</td>
<td></td>
</tr>
<tr>
<td>DSAC</td>
<td>Automate Evaluation of Bids for CONUS Transportation</td>
<td>2,600</td>
<td>2,600</td>
<td></td>
<td>Total contract</td>
<td></td>
</tr>
<tr>
<td>DSAC</td>
<td>Financial System Replacement</td>
<td>11,500</td>
<td>3,450</td>
<td>8,050</td>
<td>Programming</td>
<td>Needs DSAC functional analysis, systems analysis due to interfaces (A-1:2.2, 3.2); DSAC program analysis due to functional knowledge (A-1:6.3)</td>
</tr>
<tr>
<td>DSAC</td>
<td>Food Distribution MIS</td>
<td>8,000</td>
<td>2,400</td>
<td>5,600</td>
<td>Programming</td>
<td>Needs DSAC functional analysis, system analysis due to interfaces (A-1:2.2, 3.2); DSAC program analysis due to functional knowledge (A-1:6.3)</td>
</tr>
</tbody>
</table>
Exhibit B-2 (cont.)

<table>
<thead>
<tr>
<th>Source</th>
<th>Project Name</th>
<th>Total Hours</th>
<th>Hrs. Contractible</th>
<th>Hrs. Possibly Contractible</th>
<th>Hrs. Not Contractible</th>
<th>Contractible Work</th>
<th>Reasons for Non-contractibility</th>
</tr>
</thead>
<tbody>
<tr>
<td>DSAC</td>
<td>SAMMS Conversion</td>
<td>60,000</td>
<td>9,000</td>
<td></td>
<td>51,000</td>
<td>New programming (50%)</td>
<td>Needs DSAC functional analysis, system analysis due to interfaces (A-1:2.1.2.3). DSAC modifications to existing programs (no maintenance contract assumed)</td>
</tr>
<tr>
<td>DSAC</td>
<td>Implement FDS w/ DBMS</td>
<td>60,000</td>
<td>24,000</td>
<td>6,000</td>
<td>30,000</td>
<td>DB design (6,000); programming, (18,000); also conceptual analysis possible for design using on-line techniques (6,000), depending on time availability</td>
<td>Needs DSAC functional analysis, system analysis due to interfaces (A-1:2.1.3.2), DSAC program analysis due to functional requirements (A-1:6.3)</td>
</tr>
</tbody>
</table>

|       |                   | 150,300     | 44,040            | 99,360                    | 96,900                |                                                       |                                                                                                  |
|       |                   | (7)         | (29.3%)           | (6.2%)                    | (64.5%)               |                                                       |                                                                                                  |

1 Deleted; to be replaced by an integrated FDS-DISMS at DSAC-W.

2 DISMS project merged into this project; total hours reflect the entire total effort.
## Exhibit B-3

**DSAC Future Project Contracting**  
**Depot Management Systems**

<table>
<thead>
<tr>
<th>DMAP Project No.</th>
<th>Project Name</th>
<th>Total Hours</th>
<th>Hrs. Contractible</th>
<th>Hrs. Possibly Contractible</th>
<th>Hrs. Not Contractible</th>
<th>Contractible Work</th>
<th>Reasons for Non-contractibility</th>
</tr>
</thead>
<tbody>
<tr>
<td>D201-0205</td>
<td>DNASP</td>
<td>520,000</td>
<td>222,900</td>
<td>14,900</td>
<td>282,200</td>
<td>Programming, etc. Possible to contract assistance in data base design (2%)</td>
<td>Time to contract is not sufficient for functional analysis (nearly complete) or systems analysis (just starting) (A-1:6.5,6.6). Analysis for subsystems not possible due to interfaces (A-1:3.2). DSAC staff sufficient for program analysis (A-1:6.1,6.2)</td>
</tr>
<tr>
<td></td>
<td>Master Equipment</td>
<td>14,000</td>
<td>14,000</td>
<td>-</td>
<td>-</td>
<td>Total project</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Control System</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Total: 534,000 236,900 14,900 282,200  
(44.4%) (2.8%) (52.8%)
APPENDIX C

CRITERIA APPLIED TO TECHNICAL ASSISTANCE FUNCTIONS
APPENDIX C

CRITERIA APPLIED TO TECHNICAL ASSISTANCE FUNCTIONS

The 1980 DMAP plan of DSAC does not list projects for the Telecommunications and Technical Support Directorates. Instead, it lists "objectives," or the activities which support other development functions. The following chart lists those functions and displays our analysis of their contractibility.
### EXHIBIT C-1

**CONTRACTING DSAC TECHNICAL SUPPORT OBJECTIVES**

<table>
<thead>
<tr>
<th>DMAP No.</th>
<th>Objective</th>
<th>Contractibility</th>
<th>Contractible Portion</th>
<th>Reasons for Non-Contractibility (Appendix A Criteria Reference)</th>
</tr>
</thead>
<tbody>
<tr>
<td>T010</td>
<td>Management and Supervision</td>
<td>No</td>
<td></td>
<td>Management function (A-3:1.4)</td>
</tr>
<tr>
<td>T020</td>
<td>Administrative Support</td>
<td>No</td>
<td></td>
<td>Must be directly supervised (A-3:1.4)</td>
</tr>
<tr>
<td>T030</td>
<td>ADPER</td>
<td>No</td>
<td></td>
<td>Technical assistance to DLA Hdq. (A-3:1.5)</td>
</tr>
<tr>
<td>T040</td>
<td>DWASP</td>
<td>No</td>
<td></td>
<td>Only coordination at Columbus (A-3:1.5)</td>
</tr>
<tr>
<td>T110</td>
<td>Data Element Standardization System</td>
<td>No</td>
<td></td>
<td>Coordination (A-3:1.3)</td>
</tr>
<tr>
<td>T201</td>
<td>Configuration Control, Planning and Management</td>
<td>No</td>
<td></td>
<td>Undefined deliverables (A-3:1.1), management functions (A-3:1.2)</td>
</tr>
<tr>
<td>T202</td>
<td>Competitive Acquisition</td>
<td>No</td>
<td></td>
<td>Coordination with procurement people and DSAC users (A-3:1.3)</td>
</tr>
<tr>
<td>T203</td>
<td>IBM OS/350 Generation and Software Maintenance</td>
<td>No</td>
<td></td>
<td>System will be replaced soon, otherwise sys-gens would be contractible. Custom software maintenance would not be contractible (A-2:2.7)</td>
</tr>
<tr>
<td>T204</td>
<td>Test Laboratory Planning and Management</td>
<td>No</td>
<td></td>
<td>Management, coordination in use of laboratory at DSAC (A-3:1.2,3)</td>
</tr>
<tr>
<td>T205</td>
<td>OS and VS Support Systems and Utility Software</td>
<td>No</td>
<td></td>
<td>Involves custom software (A-2:2.7)</td>
</tr>
<tr>
<td>T206</td>
<td>Honeywell Software Planning, Generation and Maintenance</td>
<td>No</td>
<td></td>
<td>Custom software, system will be removed after 1985 (A-2:2.7)</td>
</tr>
<tr>
<td>T207</td>
<td>Project/Function Technical Coordination</td>
<td>No</td>
<td></td>
<td>Coordination and technical assistance to application systems staff (A-3:1.3)</td>
</tr>
<tr>
<td>DMAP No.</td>
<td>Objective</td>
<td>Contractibility</td>
<td>Contractible Portion</td>
<td>Reasons for Non-Contractibility</td>
</tr>
<tr>
<td>----------</td>
<td>-----------------------------------------------</td>
<td>-----------------</td>
<td>-------------------------------------------------</td>
<td>---------------------------------------------------------------------</td>
</tr>
<tr>
<td>T208</td>
<td>IV Phase Support</td>
<td>Partial</td>
<td>System engineering, new system software development</td>
<td>Limited contractor resources (A-3:2.3). Local technical support needs not well defined (A-3:1.1)</td>
</tr>
<tr>
<td>T210</td>
<td>Execution System Generation/ Maintenance</td>
<td>Possible partial</td>
<td>Commercial software maintenance</td>
<td>Trouble-shooting (A-3:1.1), lack of vendor support (A-3:2.3), custom systems software (A-2:2.7)</td>
</tr>
<tr>
<td>T211</td>
<td>RFP Development</td>
<td>No</td>
<td></td>
<td>Technical assistance to DLA Hdq. (A-3:1.5)</td>
</tr>
<tr>
<td>T212</td>
<td>Site Planning</td>
<td>Possible</td>
<td>Planning studies</td>
<td>Low level of effort (A-3:2.6,7)</td>
</tr>
<tr>
<td>T213</td>
<td>System Engineering Support</td>
<td>No</td>
<td>Planning studies</td>
<td>Undefined (A-1:1.1)</td>
</tr>
<tr>
<td>T214</td>
<td>Systems Software Development, Maintenance and Support</td>
<td>No</td>
<td>Custom system software</td>
<td></td>
</tr>
<tr>
<td>T215</td>
<td>ADPE Performance Measurement and Evaluation</td>
<td>Possible partial</td>
<td>Large evaluation studies</td>
<td>Small jobs generally, rapid turnaround (A-3:2.5)</td>
</tr>
<tr>
<td>T216</td>
<td>DPI Operational Profile Development and Remaining Capacity Determination</td>
<td>No</td>
<td></td>
<td>Low level of effort (A-3:2.6,7)</td>
</tr>
<tr>
<td>T217</td>
<td>ADPE Utilization System Management, Operation, Maintenance and Support</td>
<td>Possible partial</td>
<td>Maintenance of commercial package for monitoring</td>
<td>Coordination (A-3:1.3)</td>
</tr>
<tr>
<td>T218</td>
<td>DSAC Test Laboratory Support</td>
<td>No</td>
<td></td>
<td>Staff coordination (A-3:1.3)</td>
</tr>
<tr>
<td>T219</td>
<td>ADP Security Standards</td>
<td>No</td>
<td></td>
<td>Policy, documentation (A-3:1.2)</td>
</tr>
<tr>
<td>T220</td>
<td>Hardware/Software Measurement Packages</td>
<td>No</td>
<td></td>
<td>Not an active function--using commercial and DSAC developed packages</td>
</tr>
<tr>
<td>T221</td>
<td>State-of-Art Research and Training</td>
<td>No</td>
<td></td>
<td>Staff time for training (Administrative Task)</td>
</tr>
<tr>
<td>DNAP No.</td>
<td>Objective</td>
<td>Contractibility</td>
<td>Contractible Portion</td>
<td>Reasons for Non-Contractibility</td>
</tr>
<tr>
<td>---------</td>
<td>-----------------------------------------------</td>
<td>-----------------</td>
<td>------------------------------------------</td>
<td>--------------------------------------------------------------------</td>
</tr>
<tr>
<td>T222</td>
<td>Simulation/Mathematic Models</td>
<td>Possible</td>
<td>Acquire/develop or contract simulations</td>
<td>No longer a DSAC-T mission</td>
</tr>
<tr>
<td>T223</td>
<td>Teleprocessing Software Development/Support</td>
<td>No</td>
<td></td>
<td>Existing DSAC support software--no new developments</td>
</tr>
<tr>
<td>T224</td>
<td>Commercial Software Support</td>
<td>Partial</td>
<td>Maintenance of packages, enhancements</td>
<td></td>
</tr>
<tr>
<td>T225</td>
<td>Data Management</td>
<td>Possible</td>
<td>Support/training for new DBMS</td>
<td>DSAC custom software (A-2:2.7)</td>
</tr>
<tr>
<td>T226</td>
<td>Technical Documentation</td>
<td>No</td>
<td></td>
<td>Coordination (A-3:1.3)</td>
</tr>
<tr>
<td>T227</td>
<td>Program Development Research Standardization and Support</td>
<td>Partial</td>
<td>Research into technology</td>
<td>Final evaluations/decisions (A-3:1.2)</td>
</tr>
<tr>
<td>T228</td>
<td>Interactive Programming/On-line Program Development</td>
<td>No</td>
<td></td>
<td>Evaluations, staff training (Administrative functions)</td>
</tr>
<tr>
<td>T229</td>
<td>Program Design Techniques and Specifications</td>
<td>No</td>
<td></td>
<td>Close coordination/support of application staff, review, etc. (A-3:1.3)</td>
</tr>
<tr>
<td>T230</td>
<td>Life Cycle Management</td>
<td>No</td>
<td></td>
<td>Consulation, staff support--undefined (A-3:1.1)</td>
</tr>
<tr>
<td>T231</td>
<td>Automation of Documentation</td>
<td>Deleted</td>
<td></td>
<td>No longer a project, conversion completed</td>
</tr>
<tr>
<td>T232</td>
<td>Software Development and Technical Support</td>
<td>No</td>
<td></td>
<td>DSAC custom software (A-2:2.7)</td>
</tr>
<tr>
<td>T233</td>
<td>Management Information Retrieval System</td>
<td>No</td>
<td></td>
<td>Maintenance of systems software (A-2:2.7)</td>
</tr>
<tr>
<td>T234</td>
<td>Teleprocessing and KSP Development Standards and Support</td>
<td>No</td>
<td></td>
<td>Develop standards (A-3:1.2)</td>
</tr>
<tr>
<td>DMAP No.</td>
<td>Objective</td>
<td>Contractibility</td>
<td>Contractible Portion</td>
<td>Reasons for Non-Contractibility</td>
</tr>
<tr>
<td>---------</td>
<td>-----------</td>
<td>-----------------</td>
<td>----------------------</td>
<td>---------------------------------</td>
</tr>
<tr>
<td>T235</td>
<td>Program Testing Standards/Procedures and Techniques</td>
<td>Possible partial</td>
<td>Research into methods in use elsewhere</td>
<td>Develop standards for DSAC (A-3:1.2)</td>
</tr>
<tr>
<td>T236</td>
<td>System Standards</td>
<td>Possible partial</td>
<td>Testing for compliance</td>
<td>Setting standards (A-3:1.2)</td>
</tr>
<tr>
<td>T250</td>
<td>Computer Operations</td>
<td>Possible partial</td>
<td>Operations</td>
<td></td>
</tr>
<tr>
<td>T251</td>
<td>Peripheral Operations</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>T252</td>
<td>Tape Librarian</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>T253</td>
<td>Operations Control Center</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>T254</td>
<td>I/O Control and EAM</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>T255</td>
<td>Keypunch</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>T256</td>
<td>ADPE Backup Support (FAWESP)</td>
<td>No</td>
<td></td>
<td>Detail systems knowledge required (A-3:2.3), coordination (A-3:1.3)</td>
</tr>
<tr>
<td>T257</td>
<td>ADP Auditing</td>
<td>Possible</td>
<td>Auditing function</td>
<td>Desire to have internal capability (A-3:2.2)</td>
</tr>
<tr>
<td>T258</td>
<td>On-line Graphics Terminals</td>
<td>Partial</td>
<td>Analysis of alternatives, preparation of specifications</td>
<td>Final evaluations/decisions (A-3:1.2)</td>
</tr>
<tr>
<td>T259</td>
<td>Interactive Instructional Systems</td>
<td>Deleted</td>
<td></td>
<td></td>
</tr>
<tr>
<td>T260</td>
<td>Data Base Support</td>
<td>Partial</td>
<td>Review of alternatives (in process of contracting)</td>
<td>Final evaluations/decisions, standards (A-3:1.2)</td>
</tr>
<tr>
<td>T261</td>
<td>SAMTAM Conversions</td>
<td>No</td>
<td></td>
<td>One was completed, further conversion is not expected to occur.</td>
</tr>
</tbody>
</table>
## EXHIBIT C-2

**CONTRACTING DSAC TELECOMMUNICATIONS OBJECTIVES**

<table>
<thead>
<tr>
<th>DMAP No.</th>
<th>Objective</th>
<th>Contractibility</th>
<th>Contractible Portion</th>
<th>Reasons for Non-Contractibility</th>
</tr>
</thead>
<tbody>
<tr>
<td>R010</td>
<td>Management and Supervision</td>
<td>No</td>
<td>-</td>
<td>Management function (A-3:1.4)</td>
</tr>
<tr>
<td>R020</td>
<td>Administrative Support</td>
<td>No</td>
<td>-</td>
<td>Must be directly supervised (A-3:1.4)</td>
</tr>
<tr>
<td>R030</td>
<td>ADPER</td>
<td>No</td>
<td>-</td>
<td>Mostly advisory function—represent DSAC (A-3:1.5)</td>
</tr>
<tr>
<td>R201</td>
<td>DLA Telecommunications Planning</td>
<td>Partial</td>
<td>Planning studies</td>
<td>Mostly interagency coordination (A-3:1.5)</td>
</tr>
<tr>
<td>R202</td>
<td>AUTODIN II Planning/Support</td>
<td>No</td>
<td>Possibly future planning</td>
<td>Interagency coordination (A-3:1.5)</td>
</tr>
<tr>
<td>R203</td>
<td>IASA Participation</td>
<td>No</td>
<td>-</td>
<td>Defining requirements (A-3:1.2)</td>
</tr>
<tr>
<td>R204</td>
<td>Development of Telecommunications System Requirements</td>
<td>No</td>
<td>-</td>
<td>Obsolete equipment (A-3:2.3)</td>
</tr>
<tr>
<td>R205</td>
<td>Communications Processor Maintenance</td>
<td>Possible</td>
<td>Maintenance—now contracting for hardware and software maintenance</td>
<td>Low-level effort (A-3:2.6,7)</td>
</tr>
<tr>
<td>R206</td>
<td>Special Projects/Transmission Systems/Technical Development</td>
<td>Partial</td>
<td>Special projects</td>
<td>Low-level effort, building onto network (A-3:2.6,7)</td>
</tr>
<tr>
<td>R207</td>
<td>Teleprocessing and Telecommunications Networking</td>
<td>No</td>
<td>-</td>
<td>Knowledge of DSAC environment (A-3:2.3)</td>
</tr>
<tr>
<td>R209</td>
<td>Standard Test Data Base and 101/Implementation Support</td>
<td>No</td>
<td>-</td>
<td>Network management function (A-3:1.4)</td>
</tr>
<tr>
<td>R210</td>
<td>Network Design and Configuration Control</td>
<td>No</td>
<td>Already designed</td>
<td></td>
</tr>
<tr>
<td>Project Code</td>
<td>Objective</td>
<td>Contractibility</td>
<td>Contractible Portion</td>
<td>Reasons for Non-Contractibility</td>
</tr>
<tr>
<td>--------------</td>
<td>------------------------------------------</td>
<td>-----------------</td>
<td>----------------------------------------------------------</td>
<td>--------------------------------------------------------------------------------------------------</td>
</tr>
<tr>
<td>R211</td>
<td>Datacom Nodal Monitor Facility</td>
<td>Possible partial</td>
<td>Monitoring system</td>
<td>Development of procedures (A-3:1.2)</td>
</tr>
<tr>
<td>R212</td>
<td>ADP/Communications Interface Maintenance</td>
<td>Partial</td>
<td>Programming of new system</td>
<td>Critical system—Needs DSAC functional analysis, systems analysis, maintenance of existing system (A-2:2.4)</td>
</tr>
<tr>
<td>R213</td>
<td>Software Support</td>
<td>No</td>
<td></td>
<td>Critical system (A-2:2.4)</td>
</tr>
<tr>
<td>R214</td>
<td>Electronic Mail/Office Automation</td>
<td>Partial</td>
<td>Office automation program specification development; prototype installation</td>
<td>Electronic mail must be implemented soon—no time to contract (A-3:2.5)</td>
</tr>
<tr>
<td>R215</td>
<td>Integrated Digital Circuits</td>
<td>Possible</td>
<td>Analysis of state-of-the-art, planning study</td>
<td>Uncertain requirements (A-3:2.1)</td>
</tr>
<tr>
<td>R216</td>
<td>Communications Processing Equipment</td>
<td>No</td>
<td></td>
<td>Requirements done, now evaluation/decision (A-3:1.2)</td>
</tr>
<tr>
<td>R217</td>
<td>Computerized Telephone</td>
<td>Partial</td>
<td>Analysis of state-of-the-art, demonstration project</td>
<td>Uncertain requirements (A-3:7.1)</td>
</tr>
<tr>
<td>R218</td>
<td>Secure Voice</td>
<td>No</td>
<td></td>
<td>Security problems, uncertain requirements (A-3:1.1)</td>
</tr>
<tr>
<td>R219</td>
<td>Telephone Management System</td>
<td>Yes</td>
<td>Develop integrated monitoring system, analyze alternatives</td>
<td></td>
</tr>
</tbody>
</table>

1 Specific projects suitable for contracting are identified.
APPENDIX D

CRITERIA APPLIED TO SYSTEM CHANGE REQUESTS
APPENDIX D

CRITERIA APPLIED TO SYSTEM CHANGE REQUESTS

SAMPLE DESIGN

System Change Requests in five DSAC directorates were sampled using a stratified random sampling technique. The table below shows sample and population data.

<table>
<thead>
<tr>
<th>Directorate</th>
<th>#SCRs</th>
<th>Remaining Hours</th>
<th>Total Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>Materiel Management Population</td>
<td>874</td>
<td>177,781</td>
<td>290,585</td>
</tr>
<tr>
<td>Materiel Management Sample</td>
<td>72</td>
<td>86,815</td>
<td>135,450</td>
</tr>
<tr>
<td>Subsistence Management Population</td>
<td>109</td>
<td>66,586</td>
<td>109,254</td>
</tr>
<tr>
<td>Subsistence Management Sample</td>
<td>13</td>
<td>58,075</td>
<td>82,034</td>
</tr>
<tr>
<td>Depot Management Population</td>
<td>128</td>
<td>45,865</td>
<td>128,806</td>
</tr>
<tr>
<td>Depot Management Sample</td>
<td>24</td>
<td>36,785</td>
<td>104,543</td>
</tr>
<tr>
<td>Technical Support Population</td>
<td>111</td>
<td>39,347</td>
<td>90,341</td>
</tr>
<tr>
<td>Technical Support Sample</td>
<td>17</td>
<td>22,721</td>
<td>74,204</td>
</tr>
<tr>
<td>Telecommunications Population</td>
<td>67</td>
<td>15,995</td>
<td>65,838</td>
</tr>
<tr>
<td>Telecommunications Sample</td>
<td>8</td>
<td>3,749</td>
<td>8,316</td>
</tr>
<tr>
<td>Totals Population</td>
<td>1289</td>
<td>345,574</td>
<td>684,824</td>
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<tr>
<td>Totals Sample</td>
<td>134</td>
<td>207,875</td>
<td>404,547</td>
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</table>

(10.4%) (60.2%) (59.1%)

Estimates of the amount of development effort required by project stage were assigned as follows:

<table>
<thead>
<tr>
<th>Project Stage</th>
<th>Est. Amount (%) of Effort Required</th>
</tr>
</thead>
<tbody>
<tr>
<td>Functional Analysis</td>
<td>30%</td>
</tr>
<tr>
<td>System Analysis</td>
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</tr>
<tr>
<td>Program Analysis</td>
<td>20%</td>
</tr>
<tr>
<td>Programming</td>
<td>30%</td>
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<tr>
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<td>100%</td>
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</tbody>
</table>

D-1
Exhibits D-1 to D-5 display the results of applying the criteria to the SCR sample for the following five DSAC Directorates:

<table>
<thead>
<tr>
<th>Exhibit</th>
<th>Directorate</th>
</tr>
</thead>
<tbody>
<tr>
<td>D-1</td>
<td>Materiel Management</td>
</tr>
<tr>
<td>D-2</td>
<td>Subsistence Management</td>
</tr>
<tr>
<td>D-3</td>
<td>Depot Management</td>
</tr>
<tr>
<td>D-4</td>
<td>Telecommunications</td>
</tr>
<tr>
<td>D-5</td>
<td>Technical Support</td>
</tr>
</tbody>
</table>

Information Fields, Exhibit D

Task # - the SCR number as it appears in Project Management System (PMS) reports.

Task Name - the SCR Title as it appears in PMS Reports.

ESTHRS - the total estimated hours appearing on the PMS listing sampled (DSAC/M, listing--7/10/81, all other Directorates--7/31/81).

REMHRS - remaining task hours (hours sampled).

CTR - Contract potential, as indicated by the following codes (assigned as result of analysis):
- P - contractible project (may combine revisions).
- PP - possibly contractible
- TO - Task order--add to existing contract
- PTO - possibly contractible task order
- ? - possibly contractible, but work undefined

CTHRHS - The number of ESTHRS hours determined, as a result of the analysis, to be contractible.

CPT - The contractible portion of task:
- PA - Program analysis and programming portions
- PPA - Partial program analysis and programming portions
- T - Total task
- P - Programming only
- PT - Partial task, planning or implementation activity

PROB - The reasons for non-contractibility (Appendix A criteria references):
- FUNC - DSAC functional or systems expertise required (A-1:6.3, A-2)
- BO - Blanket order task (A-2:1.3)
- DEF? - Work not fully defined (A-1:2.1, A-2:1.3)
- CNPLX - Complex logical changes involved (A-2:2.3)
INT - Interfaces to other systems involved (A-1:2.2, 3.2; A-2:2.2)
//TSK - Parallel tasks performed by DSAC restrict contracting (A-2:2.6)
CP - Critical programs involved (A-2:2.4)
MFC - Master file changes required (A-2:2.1)
SUSP - Suspended task (A-2:1.2)
CANC - Cancelled task (A-2:1.2)
CSS - Changes to custom DSAC systems software required (A-2:2.7)
MULTS - Multiple subsystems involved (A-2:2.2)
MGT - Management functions (A-2:1.1)
TEST - Test environment involves AUTODIN, DLA telecommunications network, or an operational system (A-2:2.8)
MANYP - Many (ten or more) programs involved (A-2:2.5)
PART - Only part of the task can be contracted because DSAC functional or systems expertise is required for the other part (A-1:6.3, A-2)

PRJHRS - Projected hours contractible for the population of SCR's, computed as follows for each SCR sampled:

For the Materiel Management, Subsistence Management, Technical Support and Telecommunications Directorates,

\[
\text{CTRHRS} \div \text{REMHRS} \times 2000 = \text{SCR Population Contractible Hours}
\]

where

2000 = the number of population hours represented by the SCR sampled.

For the Depot Management Directorate,

\[
\text{CTRHRS} \div \text{REMHRS} \times 1200 = \text{SCR Population Contractible Hours}
\]

where

1200 = the number of population hours represented by the SCR sampled.
### Exhibit D-1

SCR SAMPLE, MATERIEL MANAGEMENT DIRECTORATE

<table>
<thead>
<tr>
<th>Task No.</th>
<th>Task Name</th>
<th>EST HRS</th>
<th>REM HRS</th>
<th>CTR</th>
<th>CHK HRS</th>
<th>CPT</th>
<th>PROB</th>
<th>Prj Hrs</th>
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TO 365
## EXHIBIT D-5

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<td>Josephus O. Parr, Joan E. Lengel, Kenneth J. Wright</td>
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<td>The Defense Systems Automation Center can contract substantial amounts of its systems development workload to commercial organizations. The workload that can be contracted is identified and criteria are provided for evaluating future workloads. Recommendations are provided for contracting and for increasing internal development productivity.</td>
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