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IN THE  
**Supreme Court of Virginia**  
AT RICHMOND

RECORD NO. 920639

**TECHDYN SYSTEMS CORPORATION,**

*Appellant,*

v.

**WHITTAKER CORPORATION,**

*Appellee.*

EXHIBIT VOLUME VII

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Memorandum For: Mr. Don Moeller

Subject: Assessment of the ICCE Program


1. Per your request on 9 March 1988, I conducted a review of the ICCE Program with the objective of addressing the following:

- o Assessment of the WCCS Performance on the ICCE Contract (Enclosure 2)
- o Assessment of performance of the Prime Contractor on the ICCE contract (Enclosure 3)
- o Assessment of residual tasks (Enclosure 4)

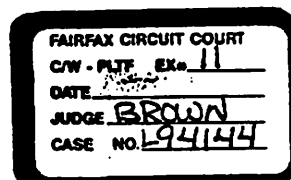
2. The review has taken into account the documentation and the activities of a project that is, at time of writing, approximately 18 months behind schedule. There is little confidence that this level of slippage can be held.

3. It should be noted that this review is problem oriented. No attempt has been made to emphasize the positive aspects of the program since these are readily apparent. Only the issues that contribute to delays, cost growth and non-compliance are identified in order that the viability of the program can be assessed.

4. In assessing the program I have felt it appropriate to also assess the contractual aspects of the program. This is necessary to understand the programmatic risks that the program has had to overcome. These programmatic factors are funding; schedule; contract relationships; political. This contractual assessment is attached as Enclosure 1.

  
Alfred H. Johnson, III  
Consultant

4 Inclosures/as stated



002088  
2307

CONTRACTUAL ANALYSIS

1. During discussions with the government Program Manager and Deputy Program Manager in 1984, prior to issuance of an RFP, it was evident that the government was seeking a qualified 8-A contractor to provide a means for buying RADIL's. They looked at the acquisition as one that was low-risk; however it was schedule driven, in that the user community was eager to satisfy their requirement for an E-3A ground interface at the Region Operation's Control Centers (ROCC). These discussions, for the most part, concerned the procurement of off-the-shelf (Non-developmental) items with some enhancements to RADIL System software.

2. The risk in the program was considered to be that involved in the design of the remote control element for the Icelandic Ground Entry Stations. However, a design solution had been considered and worked out in principle by WCCS and MITRE engineers. The risk for this design was considered low-to-medium.

3. Regarding the software enhancement for the RADIL, a low-to-medium risk was presumed because the ESD System Program Office (SPO) thought that a baseline existed for the software that was in current use at the ROCC's. This proved to be in error.

From the standpoint of software the contract was awarded without an adequately defined technical baseline, and because the program was schedule driven (Critical Design Review 180 days ADAD), cost growth and resultant delays were inevitable.

4. The government awarded the contract with full knowledge that protective aspects of the programmatic sections of the document were open to question. Examples are:

- o Failure to provide with the contractual references specific deficiencies requiring changes in the ICCE software that the government had knowledge of. At the time of contract award the current version of RADIL software, as maintained by the RSSF, Tyndall AFB, had failed TAF certification testing. Early visibility of these deficiencies by contractor management could have saved considerable time and effort.
- o Failure to provide the most current version of JCS PUB-10 in contractual references.
- o Failure to determine when OT&E will be conducted: This milestone is important. It is some time after system turnover, however, the logistic support for the system is contractor responsibility through OT&E.
- o Requirement placed upon the contractor to perform formal Price/Schedule Status Reporting (using C/SSR format) on a Firm-Fixed-Price contract. This is contradictory to the spirit and intent of the MIL-STD.
- o Failure to include a CWBS in the contractual document. The government and the contractor should agree on the products and objectives

Assessment of WCCS Performance

1. WCC's performance to date has been affected by a poorly structured subcontract document. It is difficult to follow because of the way -- and the time frame over which-changes occurred. The following comments apply:

- o TechDyn has used WCCS poor performance as an ESD "directed subcontract" as the main basis for their claim for equitable adjustment. The terms and conditions of the Prime Contract only "directs" TechDyn to WCCS for the following:

- RADIL (PDFA) Hardware
- Software for the above
- Documentation for the above

Any other tasks - CFA RCE, services etc., are TechDyn/WCCS arrangements and are not clearly stated as contractual requirements in the WCCS Subcontract.

- o The correct SOW was not placed under contract with WCCS until 14 Jan 86. The start date was 30 Aug 85.
- o The attachment providing details for Provisioning may still not be contractually covered.
- o The Modification for the CONUS upgrade omitted several CDRL's -- this had an impact on timely delivery of the first unit.



2. WCCS, in its previous incarnation, 4C, looked at the ICCE project as one in which maximum benefit would be gained using a knowledgeable technical personnel base from other programs, e.g., Ship-Shore/Ship-Buffer. Existing documentation would be revised without considering that the program was one in the validation or full-scale-development phase of R&D. The reason for this view of the program is understandable; they were led in this thinking by the original managers in the ESD SPO -- Maj. Taylor, Ed Kalapinski, et al. I do not feel that MID-STD 490, although called out in the contract, was given much attention in the analysis of work packages required during the costing phase by 4C. Because of this several errors were made:

- o The totality of design documentation was grossly under-estimated. Cost and schedule, therefore, had to be adversely affected from the outset.
- o Quality assurance provisions in the program organization were late in being established. This was particularly evident in the software area.
- o In order to gain time B-level specifications were submitted as strawman documents with the hope of getting approval of their format. This caused the government to doubt that WCCS/4C had personnel experienced in the

development of specifications IAW the MIL-STD.

- o WCCS/4C stated that a Computer Program Development Plan was in existence, however, it could not produce the document when a Software Quality Assurance Audit team requested it.

3. These initial errors, which have been overcome, led to more management oversight by ESD, resulting in more action items that in themselves created inefficiencies. These were caused by tying down the same people working on current tasks at the expense of work scheduled.

4. Based upon management guidance provided, software engineering always had a firm handle on what had to be done. As indicated in the contractual assessment, software engineering was a victim of the whims and vagaries of the numerous meetings concerning the allocated baseline of the PDFA. It should be noted that guidance from ESD on the most serious design problems (Digital Handover; Correlation; and Reporting Responsibility) was not given until 9 months after the specification review cycle started. The problem was not identified by ESD until 6 months after the start of the review cycle.

5. As indicated above, the program errors that caused more visibility to be focussed on WCCS than may have been justified resulted in a unique system of controls.

Almost by-passing the Prime Contractor, ESD forced (passively) WCCS into a management control system that imposed high order levels of control and visibility on sub-elements of the project. This inefficiency caused the program to focus on software or QA -- whatever was in the last letter -- at the expense of managing the program on a total systems basis.

6. I recommend that WCCS increase management visibility in the following areas:

- o Data Management - There are a number of CDRL requirements overdue. This should be a matter of concern because ESD is increasing pressure on the Prime Contractor.
- o Scheduling - WCCS cannot lead this effort. I believe that TechDyn is awaiting WCCS input without providing guidance and clear objectives. Schedules have to be more realistic and adaptive to known risks. In the past, perturbations in an event have caused program slips - work-arounds were generally not in place.
- o RCE Engineering - This involves hardware engineering; software development; integration activities by Redondo Systems. More control is needed by WCCS over what is being done. Is the contractor on schedule, *Is* coordination needed with the Prime?

- o Maintainability - The requirements for this demonstration has to be scoped. How long will planning take? What affect on schedules? Is coordination with the Prime being effected?
- o Tech Orders/Manuals - The failure to reach 80% level for the recent IPR will cause problems for training and system delivery. This situation must be given a high order of interest and control. Again, the Prime must take the lead in assessing any damage to the program and, jointly with WCCS, develop a get-well plan.

### Assessment of Residual Tasks

The following are major tasks remaining on the program. Tasks related to the CONUS Upgrade Program are not included, since this part of the overall effort is under firm project control.

1. Test Plan/Procedures for the Remote Control Element.

These must be approved (or at least redlined) before system level in-plant testing can be conducted.

2. System Level Test Plan/Procedures. This TechDyn plan must include the Remote Control Element input, above.

3. In-Plant Installation. All equipment must be installed and checked out prior to formal testing.

Problem areas noted:

- o The modem for the data link is the incorrect item.

Another model has to be procured by TechDyn. This changeover requires an ECP action since the current CODEX modem has been baselined.

- o The Remote Control Element has not demonstrated that it can satisfy all requirements in the A Specification. It must clearly show that it can handle all of the parameters that are to be remotely operated and do so with a high degree of confidence, given the extreme distances and climate peculiar to Iceland.

4. In-Plant Test. All PDFA and CFA equipment must be integrated to verify system level requirements delineated in the Master Test Plan and the Verification Cross Reference Matrix (VCRM).



Problem Areas noted:

- o Scheduling
- o Maintainability Demonstration -  
This could be a high risk area as it relates to the schedule.
- o Completion of any software Qualification Test  
Trouble Reports that have not been cleared.

5. Provisioning Conference.

6. 80% Tech Order Review. All CFA manuals must be reviewed. PDFAs manuals that were found unsatisfactory must be re-done. This is another milestone that drives the schedule because these documents are needed for training.

Problem Areas noted:

- o CFA COTS Manuals (TechDyn responsibility) may not be under contract yet with VEDA. These manuals must be brought up to MIL-M standard or the proper level of data/information must be extracted and included in the CFA O&M Manual.

7. Training.

8. FCA/PCA for FOC System for Iceland.

9. Tech Order/Manual Verification. This is a USAF task. It can be done In-Plant or in Iceland.

10. Pack/Ship to Iceland. This includes the total system plus the spares/repair parts that must be delivered prior to final installation.

11. Installation Activity, Iceland. The problem here is where does it go. TechDyn has a requirement to submit a TCP by

29 March 88 to cover plans and costs to install equipment, scheduled for the Master Direction Center, into the new ICCE-ROCC facility. This would require WCCS input for planning and cost changes since all cables being fabricated and other ancillary details will most likely have to conform to new dimensions.

12. Field DT&E.
13. Final Delivery FOC System.
14. Contractor Maintenance & Support. The installed and delivered system must be given up to depot level support through the USAF conducted OT&E. This date has not been established.
15. Options for Maintenance & Support. May be exercised by ESD for one year.
16. All contract requirements for the 3 additional Ground Entry Station

**CONTRACTS  
MASTER FILE**

*1 Doc  
7/16/85*

SUBCONTRACT  
NO. 125-001

between

TECHDYN SYSTEMS CORPORATION

and

COMMAND, CONTROL and COMMUNICATIONS  
CORPORATION

Issued Under  
Prime Contract F19628-85-C-0079

2318

**PLAINTIFF'S  
EXHIBIT**  
*22A-1*

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SUBCONTRACT NO. 125-001

RECITALS

This Subcontract No. 125-001 between TechDyn Systems Corporation, a Delaware Corporation, with its principal office at 6564 Loisdale Court, Suite 600, Springfield, Virginia 22150 (hereinafter referred to as the "Contractor") and Command, Control and Communications Corporation) organized and existing under the laws of the state of California, with its principal offices at 23670 Hawthorne Blvd., Torrance, California 90505 (hereinafter referred to as the "Subcontractor") consists of the Recitals, the Purpose of Agreement, the Articles of Agreement pages 1 through 3, and the General Provisions pages 3 through 16.

PURPOSE OF AGREEMENT

The Contractor acting under Contract F19628-85-C-0079 (called the "Prime Contract") with the United States of America (called the "Government") acting through the Small Business Administration and directed by the United States Air Force Solicitation No. F19628-85-R-0076 to use certain services and equipment of the Subcontractor, desires to enter into an agreement with the Subcontractor for the said equipment and services.

NOW THEREFORE, the parties agree as follows:

ARTICLES OF AGREEMENT

ARTICLE 1-1 STATEMENT OF WORK

(a) Subject to the provisions and limitations of this agreement, the Subcontractor shall perform the following tasks as stated below. The work shall be performed in accordance with the Statement of Work that was provided to the Subcontractor in the solicitation for this effort dated 23 March 1985. The number of labor hours, the hourly rates, and the dollar amount allotted for travel are listed below for each task that is to be performed under this agreement.

TASK 1 . SITE SURVEY

Technical	144 Hours	\$ 55.95 Hourly Rate
Travel		5,154.00

TASK 2 IOC DESIGN

Sr. Technical	1,360 Hours	94.58 Hourly Rate
Program Mgr.	85 Hours	100.03 Hourly Rate
Admin. Support	85 Hours	38.75 Hourly Rate
Travel		5,824.00



#### TASK 4 LOGISTICAL SUPPORT ANALYSIS

Sr. Technical	340 Hours	\$ 94.58 Hourly Rate
Travel		2,912.00

#### TASK 5 TECHNICAL REVIEWS

Admin. Support	184 Hours	38.75 Hourly Rate
Sr. Technical	144 Hours	94.58 Hourly Rate
Sr. Test/Field Mgr.	48 Hours	62.16 Hourly Rate
Program Mgr.	96 Hours	100.03 Hourly Rate
Travel		4,248.00

#### TASK 7 PROPOSAL EFFORT

Sr. Technical	240 Hours	94.58 Hourly Rate
Technical	40 Hours	55.95 Hourly Rate
Admin. Support	80 Hours	38.75 Hourly Rate
Travel		2,950.00

(b) The Labor Hours set forth in (a) above are on a Fixed Price Level of Effort basis. The Cost of Travel will be reimbursed at cost through General & Administrative (G&A) expense with no profit.

#### TASK 6 PME

This task may be added to this Subcontract, at the option of the Contractor. If the Contractor chooses to add Task 6, the Price will not exceed \$428,055.

#### ARTICLE 1-2 FINANCIAL TERMS AND CONDITIONS

(a) The Contractor will pay the Subcontractor net 60 days from receipt by the Contractor of an acceptable invoice from the Subcontractor and provided the work has been accepted by the Contractor.

(b) Payment of compensation as hereinbefore provided shall be understood as including all charges for direct and indirect expenses, including profit. The rates and basis specified in this Article shall be the sole and exclusive basis for any and all charges for which the Contractor shall be liable and no separate charge shall be made for any other expense.

#### ARTICLE 1-3 EFFECTIVE DATE AND DURATION

(a) Effective Date - The effective date of this Subcontract shall be the date of the Notice of Award which was given by the Contractor on 5 April 1985 via telex no. 85-020.

(b) Duration - This Subcontract shall expire one hundred and twenty (120) days after its effective date, unless extended in writing by mutual agreement of both parties and approved by the Contracting Officer.

#### ARTICLE 1-4 ALLOTTED SUM

The sum allotted for this Subcontract is \$263,100.38. The Contractor will be liable to the Subcontractor only for such actual costs incurred, plus compensation for services performed, in accordance with the provisions of this Subcontract and the Subcontractor will not exceed the amount specified in this paragraph unless additional funding is provided for in writing by mutual agreement of both parties and approved by the Contracting Officer.

#### ARTICLE 1-5 DELIVERY REQUIREMENTS

The Subcontractor shall deliver all equipment, reports, services, and other data called for herein, F.O.B. Contractor's facilities at 6564 Loisdale Court, Springfield, VA 22150, or to such other locations as may be designated by the Contractor's Program Manager.

#### ARTICLE 1-6 PLACE FOR NOTICES

- (a) Contractor: TechDyn Systems Corporation  
6564 Loisdale Court, Suite 600  
Springfield, VA 22150  
Attention: William C. Hise, Vice  
President & Director  
Management Support  
Operations
- (b) Subcontractor: Command, Control and Communi-  
cations Corporation  
23670 Hawthorne Blvd.  
Torrance, CA 90505  
Attention: Marie F. Raymond  
Manager of Contracts

## GENERAL PROVISIONS

### ARTICLE 2-1 CHANGES

(a) The Contractor's representative specified in Article 1-6 of this Agreement may at any time make changes in and/or direct the omission or cancellation of any or all work or services under this Agreement, by issuing a Contract Modification.

(b) All changes beyond the general scope of this Subcontract to be binding on the parties hereto will require a modification of this Agreement signed by the Subcontractor and Contractor and approved in writing by the Contracting Officer.

### ARTICLE 2-2 PAYMENT

(a) Subject to the provisions of this Subcontract, the Contractor will pay to the Subcontractor those charges which are allowable and appropriate to this Subcontract, upon submission to the Contractor of an invoice (in triplicate) supported by data satisfactory to the Contractor and the Government and certified by a duly authorized representative of the Subcontractor as follows:

"I certify that the above bill is correct and just, that payment thereof has not been received, that all applicable requirements of law and regulations as to American production and labor standards have been complied with."

(b) An invoice shall be rendered monthly by the Subcontractor. Promptly upon receipt of each duly certified invoice, with supporting data satisfactory to the Contractor, the Contractor shall promptly process the Subcontractor's invoice for payment and within sixty (60) days, shall pay the Subcontractor. The payment above shall be subject to such readjustments as may be determined to be necessary for interim or final audits.

(c) Prior to final payment, and as a condition thereof, the Subcontractor shall furnish the Contractor with; (1) all reports, property accounting, patent disclosures and clearances required hereunder, (2) a Release From All Claims against the Contractor and the Government arising under and by virtue of this Subcontract, other than such claims, if any, as may be specifically excepted by the Subcontractor with concurrence of the Contractor from the operation of the Release in stated amounts to be set forth therein, or in estimated amounts where the amounts are not susceptible of exact statement.

(d) Monthly invoices must be broken out by tasks with the number of hours expended, by task, for each labor classific-

ation, and any travel expense incurred, by task shown on the invoice.

#### ARTICLE 2-3 INSPECTION

(a) All material and workmanship shall be subject to inspection and test by representatives of the Contractor and the Government, who shall be provided with adequate facilities and permitted to have free access, at all reasonable times, to the Subcontractor's plant and facilities for the purpose of making such inspection or test.

(b) Where appropriate, the Contractor and Government representatives shall severally have the right to require replacement or revisions of deliverables under this Subcontract which are not found satisfactory. The passing as satisfactory of any particular deliverable under this Agreement, by the a Contractor or Government representative does not relieve the Subcontractor from any responsibility regarding faulty workmanship or material which may be subsequently discovered prior to final acceptance.

#### ARTICLE 2-4 SUBCONTRACTS

The Subcontractor is not permitted to sub-subcontract any of the work under this Agreement without the expressed written permission of the Contractor.

#### ARTICLE 2-5 BOOKS AND RECORDS

(a) The Subcontractor agrees to keep records and books of account and other financial records showing the cost of all items of labor and material and other expenditures of whatever nature for which reimbursement or payment is authorized under this Subcontract. The method of keeping such records shall be subject to the approval of the Government but no material change will be made in the Subcontractor's method if it conforms to generally accepted industrial accounting practice consistently applied and adequately records the financial operations under the Subcontract.

(b) Subcontractor shall preserve the papers herein described, except such documents as are submitted in support of payment or reimbursement vouchers, at a location or locations selected by the Subcontractor and approved by the Contractor, without additional compensation therefor for a period of five (5) years after final payment of this Subcontract. Upon expiration of the five (5) year period, the Subcontractor shall be free to retain or dispose of said records as it sees fit; provided that the Contractor and the Government will be given 60 days written notice of any such contemplated disposition and the Contractor or

the Government shall have the right within 60 days of such notice to require the Subcontractor to pack and ship all or any part of such records to any designated location, and provided further that any such disposal of classified records shall be as directed by the Contractor or the Government. The Contractor or the Government or both shall have the right at any time to have microfilms made of any such records under this Article or by mutual agreement, Subcontractor may at any time transfer any or all of such records to the Contractor or the Government Subcontractor may, with the approval of the Government, destroy during the term of this Subcontract or after termination or completion of the Subcontract such papers as are deemed to be of no potential value to the Subcontractor, the Contractor and the Government.

#### ARTICLE 2-6 EXAMINATION OF RECORDS

(a) The Government shall at all reasonable times have the right to audit Subcontractor's accounts and other financial records relating to the performance of this Subcontract at the place or places where such records and accounts are located. Subcontractor shall afford the Government proper facilities for such work.

(b) The Subcontractor agrees that the Comptroller General of the United States or any of his duly authorized representatives shall have access to and the right to examine any pertinent books, documents, papers and records of the Subcontractor involving transactions related to this Subcontract until the expiration of three (3) years after final payment under this Subcontract unless the Government authorizes their prior disposition.

#### ARTICLE 2-7 MATERIAL AND WORKMANSHIP

(a) The work hereunder shall be executed in the best and most workmanlike manner by qualified, careful and efficient workers, in strict conformity with the best standard practices.

#### ARTICLE 2-8 TERMINATION

The Contractor may, at any time, by written or telegraphic notice, terminate this Subcontract in whole or in part. Such termination shall be effective in the manner and to the extent and upon the date specified in such notice. In the event of termination, payments will be made for services rendered, materials

acquired and cancellation costs of commitments made, in accordance with these provisions and Article 1-2.

#### ARTICLE 2-9 DISPUTES

Except as otherwise provided in this Subcontract, any dispute concerning a question of fact arising under this Subcontract which is not disposed of by agreement shall be decided by a representative of the Government authorized to supervise and administer performance of the work under the Prime Contract between the Contractor and the Government who shall reduce his decision to writing and mail or otherwise furnish a copy thereof to the Subcontractor and the Contractor. Within thirty(30) days from the date of receipt of such copy, the Subcontractor or the Contractor may appeal by mailing or otherwise furnishing the Government representative a written appeal addressed to the Government, and the decision of the Government is taken, the decision of the Government representative, to whom the dispute was first submitted, shall be final. In connection with any appeal proceeding under this clause, the Subcontractor and Contractor shall be afforded an opportunity to be heard and to offer evidence in support of its appeal. Pending final decision of a dispute hereunder, the Subcontractor shall proceed diligently of the Government's representative.

#### ARTICLE 2-10 PROPERTY

(a) Adequate property records and such special records as may be required by the Contractor will be maintained by the Subcontractor for all materials purchased for work in connection with this Subcontract for which the Subcontractor has been or is entitled to be reimbursed hereunder or which have been furnished by the Contractor.

(b) Title to all materials for which the Subcontractor shall be entitled to reimbursement under this Subcontract shall vest in the Government whenever title passes to the Subcontractor from the vendor, and the Government's title shall not be affected by an attachment thereof to real property owned by the Subcontractor. Title to other property, the cost of which is reimbursable to the Subcontractor, shall pass to any vest in the Government upon (i) issuance for use of such property in the performance of this Subcontract; or (ii) commencement of processing or use of such property in the performance of this Subcontract; or (iii) reimbursement of the cost thereof by the Contractor, whichever first occurs.

(c) Property of the Government in the possession or control of the Subcontractor and acquired by or furnished to the Subcontractor under this Subcontract (which property shall hereafter be called Government property) shall only be for the use of



the Subcontractor in the performance of the work prescribed in this Subcontract.

(d) The Subcontractor agrees to do everything reasonable and proper in order to protect all Government property in its possession from becoming lost, stolen or damaged, and further, to keep said property in good condition, ordinary wear and tear excepted.

(e) Upon completion of this Subcontract or upon demand the Subcontractor shall, subject to paragraph (f) of this Article, return all unexpended Government property to the Contractor. The Contractor shall remove or direct removal, authorize storage or authorize transfer to another contract of all items of unexpended Government property not previously disposed of, exclusive of items the disposition of which has been directed or authorized by the Contractor, not later than 90 days after the Subcontractor submits to the Contractor an acceptable list showing quantity and quality. Upon the Subcontractor's compliance with said instructions its liability to account for items removed will cease.

(f) With the approval in writing of the Contractor, the Subcontractor may transfer or otherwise dispose of such Government-owned property to such parties and upon such terms and conditions as the Contractor and the Government may approve, or, with like approval by the Contractor and the Subcontractor itself may acquire title to such property or any of it at a price mutually agreeable. The proceeds of any such transfer or disposal shall be applied in reduction of payments to be made by the Contractor to the Subcontractor under this Subcontract, or shall otherwise be paid in such manner as the Contractor may direct.

#### ARTICLE 2-11 LIABILITY FOR GOVERNMENT-OWNED PROPERTY

(a) Except as otherwise specifically provided, the Subcontractor shall not be liable for loss or destruction of or damage to property of the Government in the possession or control of the Subcontractor in connection with this Subcontract (hereinafter called "Government Property") unless such loss, destruction or damage results from willful misconduct or failure to exercise good faith on the part of the subcontractor's corporate officers or other representatives having supervision or direction of the operation of the whole of the Subcontractor's business in the performance of this Subcontract.

(b) Special measures shall be taken by the Subcontractor in the protection of and accounting for source and special nuclear materials, reactor and special research materials, and such other materials as may be designated and/or supplied by the Contractor, in accordance with applicable regulations and policies of the Government.

(c) The Subcontractor represents that it is not maintaining and agrees that it will not hereafter maintain insurance (including self-insurance funds or reserves) covering loss or destruction of or damage to Government property acquired by or furnished to the Subcontractor under this Subcontract.

(d) In the event the Subcontractor is reimbursed or compensated for any loss or destruction of or damage to Government property, it shall equitably reimburse the Government.

(e) The Contractor and the Government shall at all reasonable times have access to the premises wherein any Government property is located.

#### ARTICLE 2-12 LIABILITY FOR DAMAGE TO PERSONS AND PROPERTY

(a) Subject to the provisions of Article 2-11, the Subcontractor assumes entire responsibility and liability for losses, expenses, damages, demands and claims in connection with or arising out of any injury or alleged injury (including death) or damage or alleged damage to property, sustained or alleged to have been sustained during the performance of the work done by the Subcontractor, its agents, servants, and employees, including losses, expenses, or damages sustained by the Contractor or the Government, except such as may be due to the fault or negligence of the Contractor or the Government, and shall indemnify and hold harmless the Contractor and the Government, and the agent, servants, and employees of each of the foregoing, from any and all such losses, expenses, damages, demands and claims, and shall defend any suit or action brought against them, or any of them, based on any such alleged injury or damage, and shall pay all damages, costs and expenses, including attorney's fees, in connection therewith or resulting therefrom.

(b) The Subcontractor shall procure and maintain such bonds and insurance as are required by law or by written direction of the Contractor. The terms of any such bond or insurance shall be submitted to the Contractor for approval. In view of the provision of Article 2-11 hereof, entitled "Liability for Government-Owned Property", the Subcontractor shall not procure or maintain for its own protection any insurance (including self-insurance or reserves) covering loss, destruction of or damage to Government-owned property acquired by or furnished to the Subcontractor under this Subcontract. The reasonable costs of property approved bonds or insurance shall be a reimbursable expense under this Subcontract.

## ARTICLE 2-13 RENEGOTIATION

(a) This Subcontract shall be subject to any act of the Congress, whether heretofore or hereafter enacted and to the extent indicated wherein, providing for the renegotiation of said Subcontract and shall be deemed to contain all the provisions required by any such act without subsequent amendment of this Subcontract specifically incorporating such provisions.

(b) The Subcontractor hereby agrees to insert the provisions of this Article, including this paragraph (b), in all sub-subcontracts hereunder as defined in Section 103 (g) of the Renegotiation Act of 1951 (Pub. Law 9, 82nd Cong.), except any sub-subcontracts of a class or type described in Section 106 (a) of the Renegotiation Act of 1951.

(c) Nothing contained in this clause shall impose any renegotiation obligation with respect to the Subcontract or any sub-subcontract hereunder which is not imposed by an act of the Congress, heretofore or hereafter enacted.

## ARTICLE 2-14 NOTICE AND ASSISTANCE REGARDING PATENT INFRINGEMENT

(a) The Subcontractor agrees to promptly submit a written detailed report to the Contractor and the Government covering each claim of patent infringement asserted against the Subcontractor or against any of its sub-subcontractors involving transactions related to this Subcontract.

(b) In the event of litigation against the Government on account of any claim of infringement arising out of this performance of this Subcontract or out of the use of any supplies furnished or construction work performed hereunder, the Subcontractor agrees that it will furnish to the Government, upon request, all evidence and information in its possession pertaining to the defense of such litigation. Such information shall be furnished at the expense of the Government except in those cases in which the Subcontractor has agreed to indemnify the Government against the claim being asserted.

## ARTICLE 2-15 PATENTS

(a) Whenever any invention or discovery is made or conceived by the Subcontractor or its employees in the course of, in connection with, or under the terms of this Subcontract, the Subcontractor shall furnish both the Contractor and the Government with complete information thereon; and the Government shall have the sole power to determine whether or not and where a patent application shall be filed, and to determine the disposition of the title to and the rights under any application or patent that may result. The judgement of the Government on these matters

(c) No claim for pecuniary award or compensation shall be asserted by the Subcontractor or its employees with respect to any invention or discovery made or conceived in the course of any of the work under this Subcontract.

(c) Except as otherwise authorized in writing by the Government, the Subcontractors will obtain patent agreements to effectuate the purpose of paragraphs (a) and (b) of this Article from all persons who perform any part of the work under this Subcontract, except such clerical and manual labor personnel as will not have access to technical data.

(d) Patent Indemnity - The Subcontractor agrees to indemnify the Contractor and the Government, their officers, servants and employees against liability of any kind (including costs and expenses incurred) for the use of Code prior to the issuance of Letter Patent) occurring in the performance of this Subcontract or arising by reason of the use of disposal by or for the account of the Contractor of items manufactured or supplied under this Subcontract.

#### ARTICLE 2-16 COPYRIGHT

(a) The Subcontractor agrees to and does hereby grant to the Contractor and the Government and to its officers, agents and employees acting within the scope of their official duties, (i) a royalty-free, non-exclusive and irrevocable license to reproduce, translate, publish, use, and disclosure of, and to authorize others so to do, all copyrightable material first produced or composed and delivered to the Contractor under this Subcontract by the Subcontractor, its employees or any individual or concern specifically employed or assigned to originate and prepare such material; and (ii) a license as aforesaid under any and all copyrighted or copyrightable work not first produced or composed by the Subcontractor in the performance of this Subcontract but which is incorporated in the material furnished under the Subcontract, provided that such license shall be only to the extent the Subcontractor now has, or prior to completion or final settlement of the Subcontract may acquire, the right to grant such license without becoming liable to pay compensation to others solely because of such grant.

(b) The Subcontractors agrees that it will exert all reasonable efforts to advise the Contractor, and the Government, at the time of delivering any copyrightable or copyrighted work furnished under this Subcontract, of any adversely held copyrighted or copyrightable material incorporated in any such work and of any invasion of the right of privacy therein contained.

(c) The Subcontractor agrees to report to the Contractor and the Government promptly and in reasonable written detail, any

notice or claim of copyright infringement received by the Subcontractor to any material delivered under this Subcontract.

#### ARTICLE 2-17 PRODUCTS, METHODS AND MANUFACTURING PROCESSES

Any patented or unpatented knowledge or information concerning Subcontractor's products, methods or manufacturing processes or other data which Subcontract may disclose to Contractor incident to the performance of this Subcontract shall, unless otherwise specifically agreed in writing, be deemed to have been disclosed as a part of the consideration for this Subcontract, and Subcontractor agrees not to assert any claim against Contractor or Government by reason of Contractor's or the Government's use or alleged use thereof; provided, however, that nothing contained in this paragraph shall be deemed directly, or by implication to grant any license under any patent nor or hereafter issued.

#### ARTICLE 2-18 COMPLIANCE WITH LAWS

Subcontractor shall comply with all applicable Federal, State and local laws, rules and regulations.

#### ARTICLE 2-19 BUY AMERICAN ACT

The Subcontractor agrees that in the performance of the work under this Subcontract, the Subcontractor, sub-subcontractors and suppliers shall use only such unmanufactured articles, materials and supplies (which term "articles, material, and supplies" is hereinafter referred to in this clause as "Supplies") as have been mined or produced in the United States substantially all from supplies mined, produced, or manufactured, as the case may be in the United States. The foregoing provisions shall not apply (i) with respect to supplies exempted by the Commission from the application of the Buy American Act (41 U.S.C. 10 a-d), (ii) with respect to supplies for use outside the United States, or (iii) with respect to the supplies to be used in the performance of work under this Subcontract which are of a class or kind determined by the Commission not to be mined, produced, or manufactured, as the case may be, in the United States in sufficient and reasonably available commercial quantities and of a satisfactory quality, or (iv) with respect to such supplies from which the supplies to be used in the performance of work under this Subcontract are manufactured, as are of a class or kind determined by the Commission to be mined, produced, or manufactured, as the case may be, in the United States in sufficient and reasonably available commercial quantities and of a satisfactory quality, provided that this exception (v) shall not permit the use, in the performance of work under this Subcontract of supplies manufactured outside the United States if such supplies are manufactured in the United States in sufficient and reasonable available commercial quantities and of a satisfactory quality.

#### ARTICLE 2-20 OFFICIALS NOT TO BENEFIT

No member of or delegate to Congress or resident commissioner shall be admitted to any share or part of this Subcontract or to any benefit that may arise therefrom, but this provision shall not be construed to extend to this Subcontract made with a corporation for its general benefit.

#### ARTICLE 2-21 COVENANT AGAINST CONTINGENT FEES

The Subcontractor warrants that no personnel or selling agency has been employed or retained to solicit or secure this Subcontract upon an agreement or understanding for a commission, percentage, brokerage, or contingent fee, excepting bona fide employees or bona fide established commercial or selling agencies maintained by the Subcontractor for the purpose of securing business. For breach or violation of this warranty, the Contractor shall have the right to annul this Subcontract without liability or in its discretion to deduct from the Subcontract price or consideration the full amount of such commission, percentage, brokerage, or contingent fee.

#### ARTICLE 2-22 SECURITY REQUIREMENTS

(a) Subcontractor's Duty to Safeguard Restricted Data, Etc., - In the performance of the work under this Subcontract the Subcontractor shall, in accordance with the Contractor and the Government's security regulations and requirements, be responsible for safeguarding restricted data and other classified matter and protecting against sabotage, espionage, loss and theft, the classified documents, materials, equipment, processes, etc., as well as such other material of high intrinsic or strategic value as may be in the Subcontract. Except as otherwise expressly provided in the specifications, the Subcontractor shall, upon completion or termination of this Subcontract, transmit to the Contractor any classified matter in the possession of the Subcontractor or any person under the Subcontractor's control in connection with the performance of this Subcontract.

(b) Regulations - The Subcontractor agrees to conform to all security regulations and requirements of the Contractor and the Government.

#### ARTICLE 2-23 DRAWINGS AND SPECIFICATIONS

(a) All drawings, designs, specifications, notebooks, tracing, photographs, negatives, reports, findings, recommendations, data and memoranda of every description and all copies of the foregoing, subject to paragraph (b) below, relating to the work or any art thereof, shall be the property of the Contractor or

Government and shall be delivered to the Contractor, or otherwise disposed of by the Subcontractor either as the Contractor may from time to time direct during the progress of the work or in any event as the Contractor shall direct upon completion or termination of this Subcontract.

(b) Subject to provisions of the sections on Security, Patents, and Copyrights, the Subcontractor will be permitted to retain copies of such materials.

#### ARTICLE 2-24 DISCLOSURE OF INFORMATION

Except as otherwise may be mutually agreed, all information and data specifically relating to the work under this Subcontract which the Subcontractor desires to release or publish shall be submitted to the Contractor for clearance.

Any information or data relating to the work under this Subcontract which has been cleared by the Contractor may be released or published by the Subcontractor and the Contractor through their respective channels. It is agreed by both parties that it is desirable in public releases to acknowledge fully the contributions of all parties to the work thus reported.

#### ARTICLE 2-25 CONTINGENCIES RELIEVING SUBCONTRACTOR FROM MEETING DELIVERY REQUIREMENTS

The Subcontractor shall not be liable for any delay in the performance of this Subcontract which results without fault or negligence on the part of the Subcontractor and which is due to cause beyond its control, including without being limited to, acts of God or of the public enemy, any preference priority or allocation order issued by the Government or any other act of the Contractor or the Government, fires, floods, epidemics, quarantines restrictions, strikes, freight embargoes and unusually severe weather, and, unless material or supplies to be furnished under this Subcontract with results without fault or negligence of the part of the Subcontractor, and which is due to causes beyond the control of the Subcontractor, including without being limited to the types of cause above enumerated; provided that the Subcontractor shall notify the Contractor shall, prior to the date of final settlement of this Subcontract, grant for the giving of such notice. The facts and the extent of the delay shall then be ascertained and the parties shall agree upon an equitable adjustment in the prescribed time of performance when the facts justify such action. If the parties cannot agree upon the adjustment provided for under this Article, the dispute shall be determined as provided in the Article hereof entitled "Dispute". Delay in the performance of this Subcontract resulting from the loss of a substantial number of skilled employees through being drafted or volunteering for service in the armed forces and inability of the



Subcontractor despite due diligence to replace such employees, shall each be considered a delay, "which is due to causes beyond its control" within the meaning of this paragraph.

#### ARTICLE 2-26 TAXES

Except as may be otherwise provided in this Subcontract, the Subcontractor price includes all applicable Federal, state and foreign taxes.

#### ARTICLE 2-27 SAFETY, HEALTH AND FIRE PROTECTION

The Subcontractor shall take all reasonable precautions in the performance of the work under this Subcontract to protect the health and safety of employees and of members of the public and to minimize danger from all hazards to life and property and shall comply with all health, safety, and fire protection regulations and requirements (including reporting requirements of the Contractor and the Commission). In the event that the Subcontractor fails to comply with said regulations or requirements of the Contractor and/or the commission, the Contractor may without prejudice to any other legal or contractual rights of the Contractor, issue an order stopping all or any part of the work; thereafter a start order for resumption of work may be issued at the discretion of the Contractor. The Subcontractor shall make no claim for any extension of time or for compensation or damages by reason of or in connection with such work storage.

#### ARTICLE 2-28 ASSIGNMENT AND SET-UP

(a) This Subcontract is entered into upon the condition that the Subcontractor shall assign it or any interest therein, including any payment due or to become due with respect thereto, without the Contractor's prior written consent.

(b) This Subcontract is assignable by the Contractor to the Government. In the event of assignment to and acceptance by the Government the Subcontractor shall look solely to the Government for payment under this Subcontract.

#### ARTICLE 2-29 NOTICES

All notices or communications to the respective parties shall be in writing and mailed by registered mail to the Contractor or Subcontractor, as the case may be, addressed as set forth in the Articles of Agreement or to such other places as the Contractor or Subcontractor shall designate in writing.

#### ARTICLE 2-30 CONSTRUCTION

This Subcontract shall be construed and interpreted in accordance with the laws of the State of Virginia. In the event of any inconsistency between any of the parts of this Subcontract, the order of precedence shall be as follows: The Articles of Agreement, the General Provisions and any detailed specifications and general specifications incorporated by reference.

#### ARTICLE 2-31 INDEPENDENT CONTRACTOR

The Subcontractor is an independent contractor and not an agent or employee of the contractor in the performance of the work hereunder. The Contractor shall, however, have general direction of the work and the right to control the final result obtained.

#### ARTICLE 2-32 THIRD PARTY BENEFICIARY

Nothing contained in this Subcontract or its amendments shall be construed to grant, vest or allow any right to be given to any employee or other third party, or to the legal representative, heirs, assigns, or successors of any of them, as a third party beneficiary. This provision is not intended to limit the rights which any person may otherwise have under applicable Federal statutes.

#### ARTICLE 2-33 FAR CLAUSES

Attachment I contains FAR Clauses that are set forth in the Prime Contract and are applicable to this Subcontract as appropriate. These clauses have the same force and effect as though set forth in full text.

#### ARTICLE 2-34 WRITTEN CONSENT

This Subcontract and all amendments and modifications thereof, are subject to written consent of the Contracting Officer and shall not be binding unless so approved.

IN WITNESS WHEREOF, the parties hereto have executed this Subcontract as of the dates indicated below:

#### ARTICLE 2-35 ATTACHMENTS

The below listed attachments are incorporated into this Subcontract:

Attachment I: FAR Clauses

Attachment II: Contract Security Classified  
Specifications (DD254)

Attachment III: Closing Documents

- a) Assignment of Refunds, Rebates  
and Credits
- b) Release
- c) Patent Report (DD 882)

Attachment IV: Packaging and Marking

IN WITNESS WHEREOF, the parties hereto have executed this  
Subcontract as of the dates indicated below:

COMMAND, CONTROL and  
COMMUNICATIONS CORPORATION

TECHDYN SYSTMES  
CORPORATION

By: Marie E. Raymond  
Marie E. Raymond  
Manager of Contracts

By: William C. Hise  
William C. Hise, Vice  
President & Director,  
Management Support  
Operations

Date: 12 July 1985

Date: JUL 16 1985

2. 52.252-2 CLAUSES INCORPORATED BY REFERENCE (APR 1984)

This contract incorporates the following clauses by reference, with the same force and effect as if they were given in full text. Upon request, the Contracting Officer will make their full text available.

I. FEDERAL ACQUISITION REGULATION (48 CFR CHAPTER 1) CLAUSES

<u>REF</u>	<u>REF NO.</u>	<u>TITLE</u>	<u>DATE</u>
1.	52.246-2	INSPECTION OF SUPPLIES - FIXED-PRICE ALTERNATE I (Applies to CLINS 0043 - 0044 only)	APR 1984 APR 1984
2.	52.246-3	INSPECTION OF SUPPLIES - COST- REIMBURSEMENT (Applies to CLINS 0049,0050, 0052 and 0053 only)	APR 1984
3.	52.246-4	INSPECTION OF SERVICES - FIXED-PRICE (Applies to CLINS 0010 - 0042)	APR 1984
4.	52.246-7	INSPECTION OF RESEARCH AND DEVELOPMENT- FIXED PRICE (Applies to CLINS 0001AB, 0002AB, 0002AC, 0048 and 0051).	APR 1984
5.	52.246-11	HIGHER-LEVEL CONTRACT QUALITY REQUIREMENT (GOVERNMENT SPECIFICATION) (Insert "Military Specification MIL-Q-9858A" in the blank space in paragraph (b) of the clause.)	APR 1984
6.	52.246-16	RESPONSIBILITY FOR SUPPLIES	APR 1984

Attachment I

## SECTION II - SPECIAL CONTRACT REQUIREMENTS

### A. AF FAR Sup Clauses in Full Text

#### 1. 52.204-1 SECRETARIAL APPROVAL OF CONTRACT

APR 1984

The agency official designated to approve this contract as required by the clause entitled "Approval of Contract" is the Secretary or a duly authorized representative.

### B. ESD FAR Sup Clauses in Full Text

#### 1. 52.212-9500 - CONTRACTOR RESPONSIBILITY

Notwithstanding the right of the Government to review the Contractor's efforts and progress and particularly with reference to the design reviews, specifications, and data items, which may be provided for elsewhere in this contract, it is expressly understood that the Contractor is completely responsible for the compliance of contract end items with the provisions of this contract and any reviews and approvals given by the Government do not relieve the Contractor of this responsibility.

#### 2. 52.215-9519 - ACQUISITION MANAGEMENT INFORMATION SYSTEM (AMIS) FORMS

Any reference in this contract to Standard Form 30 shall be considered interchangeable with AFSC Form 702 and any reference to DD Forms 1423 shall be considered interchangeable with AFSC Forms 707, 708 and 709.

#### 3. 52.215-9520 - CONTRACTING OFFICER'S AUTHORITY

The Contracting Officer shall be the only individual authorized to direct and/or redirect the efforts or in any way amend any of the items of this contract other than those instances specifically delegated to an Administrative Contracting Officer or a Termination Contracting Officer by the Contract Clauses of this contract or in writing by the Contracting Officer. The terms "Procuring Contracting Officer" and "Principal Contracting Officer" as used throughout this contract and its attachments, is synonymous with the term "Contracting Officer."

#### 4. 52.215-9521 - INCORPORATION BY REFERENCE

All specifications, exhibits, drawings or other documents which are referenced in this contract, but are not attached hereto, are hereby incorporated by reference.

5. 52.215-9522 - CONTRACT DATES

a. All periods of time referenced herein shall be measured by calendar days, weeks, months, as opposed to "work" days, weeks, months.

b. With regard to due dates for submission of reports, data, hardware, etc., called for in Section F hereof, the contractor will submit same in sufficient time to allow for their arrival at the specified destination on the due date indicated.

c. The "Contract Award Date" shall be synonymous with the mailing date.

d. The term "DAC" means days after contract award date and is calculated on the basis of calendar days.

e. The term "MAC" means months after contract award date and is calculated on the basis of calendar months.

6. 52.215-9523 - CONTRACT DATA REQUIREMENTS LISTS

For purposes of this contract, data requirements are set forth on DD Forms 1423 and/or AFSC Forms 707, 708 and 709.

7. 52.215-9524 - ORDER OF PRECEDENCE

In the event of an inconsistency in this contract, unless otherwise provided herein, the inconsistency shall be resolved by giving precedence in the following order: (a) the Schedule (excluding the Specifications, Statement of Work, Contract Data Requirements Lists and selected portions of the Contractor's Technical Proposals); (b) Contract Clauses; (c) the Special Contract Requirements of the contract whether incorporated by reference or otherwise; (d) the Statement of Work; (e) the Specifications; and (f) the Contract Data Requirements List.

8. 52.215-9525 - ACKNOWLEDGEMENT OF SPONSORSHIP

a. The Contractor agrees that in the release of information relating to this contract such release shall include a statement to the effect that the project or effort depicted was or is sponsored by: the Air Force Systems Command.

b. For the purpose of this clause, "information" includes, but is not limited to, news releases, articles, manuscripts, brochures, advertisements, still and motion pictures, speeches, trade association meetings, symposia, etc.

c. Nothing in the foregoing shall affect compliance with the requirements of the clause of this contract entitled, "Military Security Requirements".

d. The Contractor further agrees to include this provision in any subcontract awarded as a result of this contract.

9. 52.215-9528 - SCIENTIFIC/TECHNICAL INFORMATION (STINFO)

The Contractor shall register for Defense Technical Information Center (DTIC) service as defined in AFR 80-44 using DD Form 1540. the Contractor shall research existing sources in the DTIC, including the Work Unit Data Bank (DD Form 1498), to determine the current state-of-the-art concepts, studies, etc., to avoid duplication of effort and conserve scientific and technical resources.

10. 52-215-9529 - PASSPORTS, VISAS, LICENSES, AND PERMITS

The Contractor shall be responsible for timely and complete submittal of the necessary information and forms directly to the appropriate Government agency for the required passports, visas, licenses, or permits.

(Military Assistance and Sales Manual (MASM), part III, p. D-31, para 1, "Passports, Visas, Licenses, and Permits"

11. 52.216-9500 - LEVEL OF EFFORT (CLINs 0048 and 0051, and CLINs 0023 - 0026, if options exercised)

- a. These are Firm Fixed-Price Level of Effort Term Contract Line Items pursuant to FAR 16-207.
- b. The Contractor shall furnish all the necessary qualified personnel, materials, facilities and management resources to develop/fabricate the supplies and furnish the services set forth in the Statement of Work within the terms specified and at the price(s) stated in Article 1-1.
- c. The in Article 1-1 rates are comprised of the basic salary rate plus all burden and profit computed in accordance with the Contractor's approved accounting procedures in effect as of the date of this agreement. These rates will be used for payment purposes and will be used as a means of reducing the total contract price in the event the Contractor does not furnish the level of effort specified. Payment will be made not more frequently than monthly.
- d. At the completion of this Contract, the Contractor shall furnish to the Contracting Officer the total number of hours and categories of labor used in the performance of this Contract, certified by an authorized representative of the Contractor.

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e. Notwithstanding any other Contract provision, the Contractor shall maintain sufficient accounting records for verification of the hours and categories of labor incurred in the performance of this Contract. It is further understood and agreed that these accounting records shall be available for Government review during the performance of the Contract and until three years after final payment of the Contract. In the event Subcontract labor is included in the labor effort contained in Article 1-1, the foregoing records provisions shall be included in all applicable Subcontracts.



g. Payment under this contract shall be in accordance with FAR 52.232-1 (Payments). The invoice which the contractor submits to the ACO for payment shall contain a breakdown of monthly labor hours expended which separately identifies the total hours to be charged, labor classification, and hours worked for each contributing employee. A copy of each such invoice shall be provided directly to the Contracting Officer. Prior to payment, an authorized representative of the contractor shall certify, on the monthly invoice, the accuracy of the information contained on the invoice. An invoice shall not be considered complete and eligible for payment until such certification is provided.

h. If the employee identified in the invoice is paid at a rate lower than the basic hourly labor rate identified above, then the loaded rate for that labor category shall be subject to renegotiation. That renegotiation shall be based on the employee's actual hourly labor rate loaded with the appropriate overhead and G&A with 11% profit. The renegotiated labor rate shall then apply to the hours expended by the employee.

12. 52.217-9501 - OPTION FOR INCREASED QUANTITY - SEPARATELY PRICED LINE ITEM

The Government may increase the quantity of supplies (or services) called for herein by requiring the delivery of the numbered-line item identified in the Schedule as an option item, in the quantity and at the price set forth therein. The Contracting Officer may exercise this option, at any time within the period specified in the Schedule by giving written notice to the Contractor. Delivery of the items added by the exercise of this option shall be as set forth in Section F.

13. 52.219-9504 - SMALL BUSINESS ADMINISTRATION SPECIAL PROVISION

a. The Small Business Administration (SBA) certifies that it is competent and responsible to perform the requirement as stated in the contract.

b. The SBA agrees to furnish all labor, materials and equipment for the performance of the work as stated in this contract and according to contract specifications by subcontracting pursuant to the provisions of Section 8(a) of the Small Business Act, as amended.

c. The parties agree that the Subcontractor, Tech Dvn Systems Corporation, shall for and in the stead of the SBA fulfill and perform all of the requirements of the prime contract for the consideration stated therein. Whenever the term "Contractor" appears in this contract, it shall be construed to mean Subcontractor.

d. It is understood and agreed that in the event SBA does not award subcontracts for the performance for all or a part of the work hereunder, this contract may be terminated in whole or in part without cost to either party.

e. The SBA delegates to the Defense Contract Administration Services/Management Area (DCASMA) responsibility for administering its subcontract hereunder. This includes issuance of orders, inspection and acceptance of materials/services by its authorized representatives, and direct payment to the Subcontractor.

f. The provisions of the "Termination for Convenience", "Changes", "Disputes", "Default" and "Price Reduction" clauses which are included in the contract between SBA and its Contractor shall be invoked in appropriate cases when requested by the DOD Contracting Officer. If SBA does not agree with the DOD Contracting Officer's request, the case shall be referred to the Secretary or his designee for decision. For the purposes of Section 8(d) of the Contract Disputes Act of 1978, Public Law 95-653, the agency board designated as having the jurisdiction to decide appeals from decisions of the Contracting Officer relative to disputes relating to this contract is the Armed Services Board of Contract Appeals.

g. The SBA's subcontractor shall have the right of appealing decisions of the Contracting Officer cognizable under the "Disputes" clause of said subcontract.

h. It is further agreed that SBA will be continuously apprised by the Contracting Officer administering the subcontract as to the progress and performance of the subcontractor. No action that could possibly lead to the termination of the contract for "default" or for "convenience of the Government" will be taken by the Contracting Officer or his/her authorized representative without prior consultation with SBA.

14. 52.227-9501 - RIGHTS IN DATA

Pursuant to the clause in Section I hereof entitled "Rights in Technical Data and Computer Software", the parties hereto agree that all technical data and computer software deliverable, or subject to delivery, to the Government under the contract shall be furnished with unlimited rights.

15. 52.227-9506 - DATA/SOFTWARE ACCESSION LIST

The Contractor agrees to make available upon request, copies of any and all data/software generated during the performance of work hereunder. Based upon the Data Accession List required by DI-A-3027, the Contracting Officer may order such data/software and shall notify the Contractor of data desired. The Contractor shall make available two (2) copies of the requested data/software within five (5) working days from date of receipt of the request. The cost of furnishing such ordered data/software shall be subject to payment as set forth in the "Deferred Ordering of Technical Data or Computer Software" clause, General Provision DOD FAR Sup 52.227-7027.

16. 52.227-9507 - MODIFICATION OF DATA REQUIREMENTS

a. From time to time during the performance of this contract, the Contracting Officer unilaterally may change the place of delivery and the technical office for any data item of the Contract Data Requirements List (CDRL) hereto, at no change in contract price, notwithstanding the provisions of the clause hereof, entitled "Changes".

14A. 52.217-9000 - EXPIRATION OF LIMITED/RESTRICTED RIGHTS CLAUSE

Notwithstanding any other provision of this contract, it is the intent of both the Government and Contractor that 60 months after the first delivery of production items under this contract, the Government shall have unlimited rights as defined in paragraph (A) of the Rights in Technical Data and Computer Software clause included in this contract, in all technical data and computer software used by the Contractor, including subcontractors and suppliers at any tier, in all phases of the development and manufacture of modules, assemblies or parts thereof. For the purposes of this clause, the Government shall have the right at any time during the performance of this contract or within three (3) years after either acceptance of all items (other than data or computer software) to be delivered under this contract or termination of this contract, to direct the Contractor to deliver all technical data and computer software, in a format prescribed by the Contracting Officer, necessary to reprocur from another contractor(s) either an entire production item or any component, module, assembly or part thereof, in a configuration specified by the Contracting Officer. When the Contracting Officer directs delivery of technical data and computer software under this clause, to the extent not otherwise previously compensated for delivery of such data and software, the Contractor shall be compensated for converting the technical data and computer software into the prescribed form, for reproduction and delivery.

b. From time to time during the performance of this contract, the Contracting Officer, unilaterally may increase or decrease the number of addressees and/or increase or decrease the number of copies (regular or reproducible) specified for any addressee of any data item of any CDRL hereto, at no change in contract price, provided, that, the increase in the total number of copies (regular and reproducible) for an individual data item shall not be greater than fifty percent (50%) of the total number of copies (regular and reproducible) initially specified nor shall the decrease in the total number of copies (regular and reproducible) for an individual data item be greater than fifty percent (50%) of the total number of copies (regular and reproducible) initially specified. In the event of an increase greater than such 50% or of a decrease greater than such 50%, the parties will negotiate any equitable adjustments in accordance with the procedures of the "Changes" clause.

c. Unilateral action pursuant to a. and b. above shall be by the issuance of a Modification to this contract which will reference this Provision as its authority and include the revised CDRL pages. Any action directed by this Provision shall be effected by the Contractor beginning with the first submission of the particular data item or items after receipt by the Contractor of the Modification directing such action.

#### 17. 52.228-9500 - INSURANCE

The following minimum kinds and amounts of insurance are applicable in the performance of the work under this contract.

a. Workmen's Compensation and Employers' Liability Insurance. Contractor's are required to comply with applicable Federal and State workers' compensation and occupational disease statutes. If occupational diseases are not compensable under those statutes, they shall be covered under the employer's liability section of the insurance policy, except when contract operations are so commingled with a contractor's commercial operations that it would not be practical to require this coverage. Employer's liability coverage of at least \$100,000 shall be required, except in States with exclusive or monopolistic funds that do not permit workers' compensation to be written by private carriers (Nevada, North Dakota, Ohio, Washington, West Virginia and Wyoming).

b. General Liability Insurance. (1) Bodily injury liability insurance coverage in the minimum limits of \$500,000 per occurrence shall be required on the comprehensive form of policy; however, property damage liability shall be required.

c. Automobile Liability Insurance. This insurance shall be required on the comprehensive form of policy and shall provide bodily injury liability and property damage liability covering the operation of all automobiles used in connection with the performance of the contract. At least the minimum limits of \$200,000 per person and \$500,000 per occurrence for bodily injury and \$20,000 per occurrence for property damage shall be required.

d. Aircraft Public and Passenger Liability Insurance. When aircraft are used in connection with the performance of the contract, such insurance is considered required coverage. The minimum limits of \$200,000 per person and \$500,000 per occurrence for bodily injury, other than passenger liability, and a limit of \$200,000 per occurrence for property damage shall be required. Passenger liability bodily injury limits of \$200,000 per passenger with an aggregate equal to total number of seats or number of passengers, whichever is greater, shall also be required.

18. 52.231-9502 EXECUTIVE ESTIMATE OF COST AT COMPLETION

A corporate level "line" official shall provide directly to Hq ESD/SC, Hanscom AFB, MA 01731, an executive level estimate of the contract cost at completion on 31 March, 30 June, 30 September, and 31 December of each year during the performance of this contract. This should be a brief, but not more than one page, letter presenting the executive's view of cost at completion.

19. 52.232-9504 - SEGREGATION OF COSTS

The Contractor shall segregate all costs associated with CLINS 0002AA, 0004, 0005, 0006, 0007, 0008, 0009, 0010 - 0042, 0045, 0046, 0054AA and 0054AB (if ordered) (3080 funded CLINS) from 0001AB, 0002AB, and 0002AC, (3600 funded CLINS) and segregate those CLINS from CLIN 0043 (if ordered), (FPIF CLIN) and from CLINS 0048 and 0051 (and CLINS 0023 - 0026, if ordered) (FPLOE CLINS) and segregate those CLINS from CLINS 0049, 0050, 0052, and 0053 (CR and CPFF CLINS).

All such segregations of costs shall be done in such a manner such that at any time the costs incurred with that group of CLINS shall be readily ascertainable.

20. 52.245-9000 - MILSTRIP REQUISITIONING

a. The Contractor will MILSTRIP requisition all NSN items of material required to support GFE or modified GFE in accordance with the Federal Acquisition Regulation (FAR), Appendix H and AFSCR 170-6, incorporated herein by reference, on a "do not backorder", non-substitute basis, showing need date as Contractor requisition/production lead time prior to program need date.

b. For stock fund items, the Contractor will utilize the Program Office (PO) provided Alpha Code in CC-40, Signal Code in CC-51 and Fund Code in CC-52 and 53 of the DD Form 1348. The Contractor will submit one (1) priced copy, with extended cost in the remarks column, of each requisition to ESD (ACFC-2) simultaneously with submission to DSA/AFLC-IM for supply action. The Contractor will notify ESD (ACFC-2) of requisitions revised or cancelled to assure currency of funds obligations. The Contractor will advise ESD (ACFC-2) of receipt of requisitioned material within five (5) days of such receipt. The fact that the items are not available in the Government inventory in time to satisfy contractor need dates does not relieve the contractor of his responsibility for meeting established contract program schedules.

c. Rejected or unavailable NSN items will be added to Contractor-furnished items, in which event the contractor shall promptly notify the Contracting Officer and the contract price shall be subject to equitable adjustment.

d. The Contractor shall comply with policy and procedures contained in DOD 4100.38M, Provisioning and other Preprocurement Screening Manual, to obtain item identification and management data. Results of the Preprocurement Screening shall be incorporated into the property records prepared and maintained in accordance with provisions of FAR Appendix B.

e. The Contractor will control, maintain, and effect disposition of property furnished by the Government or acquired for the account of the Government in accordance with the Government Property clause of this contract and FAR Appendix B. The Contractor will maintain usage data in a manner which will enable him to prepare the stock balance and consumption listing required. Government furnished spare/repair parts, spare/repair parts acquired for the account of the Government under the Government Property clause, and spare/repair parts which are contractor-furnished, the costs of which have been allocated to this contract on a direct charge basis, will be maintained so as to be serviceable and of current configuration with the contract end article and shall be delivered to the Government upon contract completion at no increase to contract price.

#### 21. 52.245-9501- GOVERNMENT FURNISHED PROPERTY

Pursuant to the clause hereof entitled "Government Property (Fixed-Price Contracts)", the Government shall furnish the Contractor the Government property identified below on or before the date(s) specified. If materials are to be furnished, the Contractor shall prepare the requisitioning documentation. Additionally, the Contractor shall comply with AFSCR 170-6, incorporated herein by reference, when using MILSTRIP procedures to requisition Government-furnished material.

<u>Description</u>	<u>Qty</u>	<u>Availability Date</u>
<u>Iceland:</u>		
Lateral-Tell Software		1 MAC
TSEC/KG-40 Encryption Device	1	2 MAC
TSEC/KY-65 Encryption Device	2	2 MAC
AN/USQ-76 Data Terminal Set	2	2 MAC
Icelandic Postal and Telecommunication Telephone Circuits	TBD	5 MAC
KNCS Circuits (Military)	TBD	5 MAC
HF Antenna Pads	2	Contract Award
CENTAF: AN/USQ-76 Data Terminal Set	1	7 MAC
TSEC/KG-40 Encryption Device	1	2 MAC
<u>AAC/PACAF:</u> TSEC/KG-40 Encryption Device	1 each	2 MAC

22. 52.245-9504 - DETERMINATION OF BASE SUPPORT Applies to CLINs 0001, 0002, 0004, 0006 and 0007.

Pursuant to the "Base Support" clause hereof, the contemplated items of base support presently agreed to by the parties, and considered in the pricing of this contract, are as listed below. Unless otherwise stipulated for any particular listed item, such base support shall be furnished by the Government in such quantities and at such times as may reasonably be required in the performance of this contract.

To Be Determined

23. 52.246-9500 - REQUIREMENTS FOR DATA ACCEPTANCE

The Contractor shall prepare and submit a DD Form 250 on a one-time basis collectively accounting for all completed Exhibit Line/Subline Items which called for submission of data with a letter of transmittal. Each periodic DD Form 250 shall include a list and an account of all data submitted and approved by the Government during the reporting period.

24. 246-9501 - REQUIREMENTS FOR DATA ACCEPTANCE

The Contractor shall prepare and submit a final DD Form 250 on a one time basis for each attachment collectively accounting for all completed Items on each of Attachments 1 through 13 which called for submission of data with a letter of transmittal. This DD Form 250 will be submitted at the time of delivery of last data/report Item.

C. Other Special Contract Requirements

1. DEFINITIONS

Wherever the term "clause" or "provision" or "special provision" appears throughout this contract, it shall be deemed to read "special contract requirement". Wherever the term "general provision" appears throughout this contract it shall be deemed to read "contract clause".

2. PRODUCTIVITY SAVINGS REWARD (PSR) SHARING FACTOR

(a) Purpose. The purpose of this clause is to permit a contractor to be paid Productivity Savings Rewards (PSR) via a sharing factor in accordance with the terms and conditions of an Industrial Modernization Incentives Program (IMIP) business agreement. PSR constitutes the contractor's share of the total DoD net benefits (savings/cost avoidances) resulting from a signed IMIP agreement establishing appropriate provisions for calculation and payment of the PSR. An IMIP business agreement is an arrangement whereby incentives are provided to a contractor to modernize, improve productivity, and reduce acquisition costs. Detailed analysis of the DoD benefits to be derived and verification of savings are described in the business agreement. The sharing factor methodology is intended to be used in a multi-program or factory-wide modernization situation.

## PART II - CONTRACT CLAUSES

### SECTION I - CONTRACT CLAUSES

Contract clauses in this section from the FAR, DOD FAR Sup, Air Force FAR Sup, and Air Force Systems Command FAR Sup, are current through the following updates:

FAR: FAC 84-1; DOD FAR Sup: DAC 84-4; AF FAR Sup: BASIC; AFSC FAR Sup: BASIC

#### A. 52.252-2 CLAUSES INCORPORATED BY REFERENCE (APR 1984)

This contract incorporates the following clauses by reference, with the same force and effect as if they were given in full text. Upon request, the Contracting Officer will make their full text available. The clauses apply to all CLINs/SubCLINs except as indicated herein. \* = Not Applicable to CR CLINs; \*\* = Applicable to CR CLINs.

#### I. FEDERAL ACQUISITION REGULATION (48 CFR CHAPTER 1) CLAUSES

<u>REF</u>	<u>REF NO</u>	<u>TITLE</u>	<u>DATE</u>
1	52.202-1	DEFINITIONS	APR 1984
2	52.203-1	OFFICIALS NOT TO BENEFIT	APR 1984
3	52.203-3	GRATUITIES	APR 1984
4	52.203-5	COVENANT AGAINST CONTINGENT FEES	APR 1984
5	52.204-1	APPROVAL OF CONTRACT	APR 1984
6	52.208-1	REQUIRED SOURCES FOR JEWEL BEARINGS AND RELATED ITEMS	APR 1984
7	52.210-5	NEW MATERIAL	APR 1984
8	52.210-7	USED OR RECONDITIONED MATERIAL, RESIDUAL INVENTORY, AND FORMER GOVERNMENT SURPLUS PROPERTY	APR 1984
9	52.212-8	PRIORITIES, ALLOCATIONS, AND ALLOTMENTS	APR 1984
10	52.215-1	EXAMINATION OF RECORDS BY COMPTROLLER GENERAL	APR 1984
11	52.215-2	AUDIT - NEGOTIATION	APR 1984
12	52.215-22	PRICE REDUCTION FOR DEFECTIVE COST OR PRICING DATA	APR 1984
13	52.215-24	SUBCONTRACTOR COST OR PRICING DATA	APR 1985
14	52.215-30	FACILITIES CAPITAL COST OF MONEY	APR 1984
15	52.215-31	WAIVER OF FACILITIES CAPITAL COST OF MONEY	APR 1984
**16	52.216-7	ALLOWABLE COST AND PAYMENT	APR 1984
**17	52.216-11	COST CONTRACT - NO FEE (Applicable to 0050 and 0053)	APR 1984
*18	52.216-16	INCENTIVE PRICE REVISION - FIRM TARGET ALTERNATE I (See Section B, paragraph 3 for implementation of this clause.)	APR 1984 APR 1984
19	52.217-7	OPTION FOR INCREASED QUANTITY - SEPARATELY PRICED LINE ITEM	APR 1984
20	52.219-6	NOTICE OF TOTAL SMALL BUSINESS SET-ASIDE	APR 1984



SECTION I - CONTRACT CLAUSES (cont'd)

<u>REF</u>	<u>REF NO</u>	<u>TITLE</u>	<u>DATE</u>
21	52.219-8	UTILIZATION OF SMALL BUSINESS CONCERNS AND SMALL DISADVANTAGED BUSINESS CONCERNS	APR 1984
22	RESERVED		
23	52.219-13	UTILIZATION OF WOMEN-OWNED SMALL BUSINESSES	APR 1984
24	52.220-3	UTILIZATION OF LABOR SURPLUS AREA CONCERNS	APR 1984
25	52.220-4	LABOR SURPLUS AREA SUBCONTRACTING PROGRAM	APR 1984
26	52.222-1	NOTICE TO THE GOVERNMENT OF LABOR DISPUTES	APR 1984
**27	52.222-2	PAYMENT FOR OVERTIME PREMIUMS (Insert "zero" in the blank space in para (a) of the clause.)	APR 1984
28	52.222-20	WALSH-HEALEY PUBLIC CONTRACTS ACT	APR 1984
29	52.222-26	EQUAL OPPORTUNITY	APR 1984
30	52.222-28	EQUAL OPPORTUNITY PREAWARD CLEARANCE OF SUBCONTRACTS	APR 1984
31	52.222-29	NOTIFICATION OF VISA DENIAL	APR 1984
32	52.222-35	AFFIRMATIVE ACTION FOR SPECIAL DISABLED AND VIETNAM ERA VETERANS	APR 1984
33	52.222-36	AFFIRMATIVE ACTION FOR HANDICAPPED WORKERS	APR 1984
34	52.223-2	CLEAN AIR AND WATER	APR 1984
35	52.225-11	CERTAIN COMMUNIST AREAS	APR 1984
36	52.227-1	AUTHORIZATION AND CONSENT ALTERNATE I	APR 1984
37	52.227-2	NOTICE AND ASSISTANCE REGARDING PATENT AND COPYRIGHT INFRINGEMENT	APR 1984
38	52.227-8	REPORTING OF ROYALTIES (FOREIGN)	APR 1984
39	52.227-11	PATENT RIGHTS — RETENTION BY THE CONTRACTOR (SHORT FORM)	APR 1984
*40	52.228-5	INSURANCE - WORK ON A GOVERNMENT INSTALLATION	APR 1984
**41	52.228-6	INSURANCE—IMMUNITY FROM TORT LIABILITY	APR 1984
**42	52.228-7	INSURANCE—LIABILITY TO THIRD PERSONS	APR 1984
**43	52.229-8	TAXES—FOREIGN COST-REIMBURSEMENT CONTRACT	APR 1984
*44	52.229-4	FEDERAL, STATE AND LOCAL TAXES (NON-COMPETITIVE CONTRACT)	APR 1984
*45	52.229-5	TAXES - CONTRACTS PERFORMED IN U.S. POSSESSIONS OR PUERTO RICO	APR 1984
*46	52.229-6	TAXES - FOREIGN FIXED-PRICE CONTRACTS	APR 1984
*47	52.232-1	PAYMENTS (Pursuant to DOD FAR Sup 32.111(a), the guidance set forth in Defense Acquisition Circular (DAC) 76-42, Item I thereto, applies to the authorized- modifications to "payment due dates".)	APR 1984

SECTION I - CONTRACT CLAUSES (cont'd)

<u>REF</u>	<u>REF NO</u>	<u>TITLE</u>	<u>DATE</u>
*48	52.232-2	PAYMENTS UNDER FIXED-PRICE RESEARCH AND DEVELOPMENT CONTRACTS (CLINs/SubCLINs 0001AB, 0002AB, 0002AC 0048, and 0051, and 0043 and 0044, if exercised)	APR 1984
*49	52.232-8	DISCOUNTS FOR PROMPT PAYMENT (Pursuant to DOD FAR Sup 32.111(a), the guidance set forth in Defense Acquisition Circular (DAC) 76-42, Item I thereto, applies to the authorized modifications to "payment due dates".)	APR 1984
50	52.232-9	LIMITATIONS ON WITHHOLDING OF PAYMENTS (Pursuant to DOD FAR Sup 32.111(a), the guidance set forth in Defense Acquisition Circular (DAC) 76-42, Item I thereto, applies to the authorized modifications to "payment due dates".)	APR 1984
*51	52.232-11	EXTRAS (Pursuant to DOD FAR Sup 32.111(a), the guidance set forth in Defense Acquisition Circular (DAC) 76-42, Item I thereto, applies to the authorized modifications to "payment due dates".)	APR 1984
*52	52.232-16	PROGRESS PAYMENTS ALTERNATE I (Change progress payment rate to 90%).	APR 1984
53	52.232-17	INTEREST	APR 1984
**54	52.232-20	LIMITATION OF COST	APR 1984
55	52.232-23	ASSIGNMENT OF CLAIMS	APR 1984
56	52.233-1	DISPUTES	APR 1984
57	52.237-2	PROTECTION OF GOVERNMENT BUILDINGS, EQUIPMENT, AND VEGETATION	APR 1984
58	52.242-1	NOTICE OF INTENT TO DISALLOW COSTS (CLINs 0049, 0050, 0052, 0053, and CLINs 0043 and 0044, if option exercised)	APR 1984
59	52.242-12	REPORT OF SHIPMENT (REPSHIP)	APR 1984
*60	52.243-1	CHANGES - FIXED-PRICE (0002AA, 0003AB, 0003AC, 0004-0009, 0045-0047, 0052)	APR 1984
		ALTERNATE V (SubCLINs 0001AB, 0002AB, 0002AC, CLINs 0048, 0051 and CLINs 0043 and 0044, if exercised)	APR 1984
**61	52.243-2	CHANGES-COST-REIMBURSEMENT	APR 1984
		ALTERNATE V	APR 1984
61	52.243-6	CHANGE ORDER ACCOUNTING	APR 1984
62	52.243-7	NOTIFICATION OF CHANGES (Insert "15" in the blank space in paragraphs (b) and (d))	APR 1984

# SECTION I - CONTRACT CLAUSES (cont'd)

<u>REF</u>	<u>REF NO</u>	<u>TITLE</u>	<u>DATE</u>
*63	52.244-1	SUBCONTRACTS UNDER FIXED-PRICE CONTRACTS	APR 1984
**64	52.244-2	SUBCONTRACTS UNDER COST-REIMBURSEMENT AND LETTER CONTRACTS	APR 1984
65	52.244-5	COMPETITION IN SUBCONTRACTING	APR 1984
66	52.245-2	GOVERNMENT PROPERTY (FIXED-PRICE CONTRACTS)	APR 1984
		ALTERNATE I	APR 1984
*67	52.246-18	WARRANTY OF SUPPLIES OF A COMPLEX NATURE	APR 1984
		ALTERNATE II (CLINs 0043 and 0044)	APR 1984
		(a)(1) Para (b). Insert "one (1) year"	
		(2) Lines 8 and 9 - Change "will conform with all requirements" to "will conform to the design and manufacturing requirements delineated in the contract"	
		(c)(3) Insert "30 days after discovery of the defect"; "30 days"; "30 days"	
		(c)(4) Insert "30 days"; "30 days"	
68	52.246-23	LIMITATION OF LIABILITY	APR 1984
69	52.246-24	LIMITATION OF LIABILITY - HIGH-VALUE ITEMS	APR 1984
		(ALTERNATE I)	
		(Insert "CLINs 0001, 0002, 0004, 0006 and 0008")	APR 1984
70	52-247-63	PREFERENCE FOR U.S. - FLAG AIR CARRIERS	APR 1984
71	52.248-1	VALUE ENGINEERING	APR 1984
*72	52.249-2	TERMINATION FOR CONVENIENCE OF THE GOVERNMENT (FIXED-PRICE)	APR 1984
**73	52.249-6	TERMINATION (COST-REIMBURSEMENT)	APR 1984
*74	52.249-8	- DEFAULT (FIXED-PRICE SUPPLY AND SERVICE)	APR 1984
*75	52.249-9	DEFAULT (FIXED-PRICE RESEARCH AND DEVELOPMENT)	APR 1984
		(SubCLINs 0001AB, 0002AB, 0002AC, 0048 and 0051, and CLINs 0043 and 0044, if exercised)	
**76	52.249-14	EXCUSABLE DELAYS (0050 and 0053 are excluded)	APR 1984
**77	52.250-1	INDEMNIFICATION UNDER PUBLIC LAW 85-804	APR 1984

## II. DEPARTMENT OF DEFENSE SUPPLEMENT (48 CFR CHAPTER 2) CLAUSES

<u>REF</u>	<u>REF NO</u>	<u>TITLE</u>	<u>DATE</u>
1	52.204-7000	CONTRACT SCHEDULE SUBLINE ITEMS NOT SEPARATELY PRICED - WITHHOLDING OF BILLING AND PAYMENT	NOV 1970
2	52.204-7005	OVERSEAS DISTRIBUTION OF DEFENSE SUBCONTRACTS	JUN 1982
3	52.208-7000	REQUIRED SOURCES FOR MINIATURE AND INSTRUMENT BALL BEARINGS	JUL 1971
4	52.208-7001	REQUIRED SOURCES FOR PRECISION	AUG 1971

SECTION I CONTRACT CLAUSES (cont'd)

- \*67A 52.246-18 WARRANTY OF SUPPLIES OF A COMPLEX NATURE APR 1984  
(CLINs 0001-0042, 0045-0055)
- (a)(1) Para (b). Insert "one (1) year"
  - (2) Lines 8 and 9 - Change "will conform with all requirements" to "will conform to the design and manufacturing requirements delineated in the contract"
  - (c)(3) Insert "30 days after discovery of the defect"; "30 days"; "30 days"
  - (c)(4) Insert "30 days"; "30 days"

SECTION I - CONTRACT CLAUSES cont'd

<u>REF</u>	<u>REF NO</u>	<u>TITLE</u>	<u>DATE</u>
5	52.208-7002	COMPONENTS FOR MECHANICAL TIME DEVICES	
6	52.208-7003	REQUIRED SOURCES FOR HIGH-PURITY SILICON	JUN 1983
		REQUIRED SOURCES FOR HIGH CARBON	AUG 1984
		FERROCHROME	
7	52.215-7000	AGGREGATE PRICING ADJUSTMENT	APR 1985
8	52.225-7001	BUY AMERICAN ACT AND BALANCE OF PAYMENTS	APR 1985
		PROGRAM	
9	52.225-7002	QUALIFYING COUNTRY SOURCES AS	OCT 1980
		SUBCONTRACTORS	
10	52.225-7004	IDENTIFICATION OF EXPENDITURES IN THE	OCT 1966
		UNITED STATES	
11	52.225-7008	DUTY-FREE ENTRY -- QUALIFYING COUNTRY	AUG 1984
		END PRODUCTS AND SUPPLIES	
12	52.225-7009	PREFERENCE FOR CERTAIN DOMESTIC	OCT 1980
		COMMODITIES	
13	52.225-7012	PREFERENCE FOR DOMESTIC SPECIALTY METALS	OCT 1980
14	52.227-7013	RIGHTS IN TECHNICAL DATA AND COMPUTER	MAY 1981
		SOFTWARE	
		ALTERNATE I	MAY 1981

SECTION I - CONTRACT CLAUSES (cont'd)

<u>REF</u>	<u>REF NO</u>	<u>TITLE</u>	<u>DATE</u>
15	52.227-7016	CONTRACT SCHEDULE ITEMS REQUIRING EXPERIMENTAL, DEVELOPMENTAL, OR RESEARCH WORK (Insert "0001AB, 0002AB, 0002AC, 0048-0053, and 0043 and 0044 if option(s) exercised) in the blank space.)	MAR 1975
16	52.227-7018	RESTRICTIVE MARKINGS ON TECHNICAL DATA	MAR 1975
17	52.227-7027	DEFERRED ORDERING OF TECHNICAL DATA OR COMPUTER SOFTWARE	NOV 1984
18	52.227-7029	IDENTIFICATION OF TECHNICAL DATA	MAR 1975
19	52.227-7030	TECHNICAL DATA -- WITHHOLDING OF PAYMENT	JUL 1976
20	52.227-7031	DATA REQUIREMENTS	APR 1972
21	52.227-7034	PATENTS -- SUBCONTRACTS	APR 1984
22	52.231-7000	SUPPLEMENTAL COST PRINCIPLES	APR 1984
23	52.232-7000	INVOICES	OCT 1982
24	52.233-7000	CERTIFICATION OF REQUESTS FOR ADJUSTMENT OR RELIEF EXCEEDING \$100,000.	FEB 1980
25	52.235-7002	RECOVERY OF NONRECURRING COSTS ON COMMERCIAL SALES	FEB 1980
26	52.235-7004	FREQUENCY AUTHORIZATION (Policy and procedures contained in AFM 100-31, as in effect on the date of the contract will be followed to obtain frequency allocation approval of electromagnetic devices and USAF Radio Frequency Authorization (RFA). Frequency allocation proposals (DD Form 1494, Application for Frequency Allocation) and frequency authorization requirements (AF Form 38, Radio Frequency Application) shall be prepared by the Contractor in accordance with procedures outlined in AFM 100-31 and an original and four (4) copies of each of the completed forms shall be forwarded to the Contracting Officer at ESD/PKS-3, Hanscom AFB, MA 01731.)	OCT 1966
27	52.243-7000	ENGINEERING CHANGE PROPOSALS ALTERNATE I (Insert "\$10,000" in the blank space in para (c) at the three asterisks.)	APR 1985 APR 1985
28	52.243-7001	PRICING OF ADJUSTMENTS	APR 1984
29	52.246-7000	MATERIAL INSPECTION AND RECEIVING REPORT	DEC 1969
30	52.246-7001	WARRANTY OF DATA ALTERNATE I	NOV 1974 NOV 1974
31	52.242-7003	CERTIFICATION OF OVERHEAD COSTS	MAR 1985

SECTION I - CONTRACT CLAUSES (cont'd)

B. FAR Clause in Full Text

1. 52.219-12 SPECIAL 8(a) SUBCONTRACT CONDITIONS

APR 1984

(a) The Small Business Administration (SBA) has entered into Contract No. F19628-85-C-0079 with the Electronic Systems Division to furnish the supplies or services as described therein. A copy of the contract is attached hereto and made a part hereof.

(b) The Tech Dyn Systems, hereafter referred to as the subcontractor, agrees and acknowledges as follows:

(1) That it will, for and on behalf of the SBA, fulfill and perform all of the requirements of Contract No. F19628-85-C-0079 for the consideration stated therein and that it has read and is familiar with each and every part of the contract.

(2) That the SBA has delegated responsibility for the administration of this subcontract to the DCASMA Baltimore with complete authority to take any action on behalf of the Government under the terms and conditions of this subcontract.

(3) That it will not subcontract the performance of any of the requirements of this subcontract to any lower tier subcontractor without the prior written approval of the SBA and the designated Contracting Officer of the Electronic Systems Division.

(c) Payments, including any progress payments under this subcontract, will be made directly to the subcontractor by the DCASR Philadelphia.

C. AF FAR Sup Clauses in Full Text

1. 52.204-9000 NOTIFICATION OF GOVERNMENT SECURITY ACTIVITY

APR 1984

Thirty days before the date Contractor operations will begin on base, the Contractor shall notify the security policy activity shown in the distribution block of the DD Form 254, DOD Contract Security Classification Specification, as to--

(a) The name, address, and telephone number of this contract company's representative in the U.S. or overseas area, as appropriate;

(b) The contract number and military contracting command;

(c) The highest classification category of defense information to which Contractor employees will have access;

(d) The Air Force installations in the U.S. (in overseas areas identify only the APO number(s) where the contract work will be performed;

e. The date Contractor operations will begin on base in the U.S. or in the overseas area;

(f) The estimated completion date of operations on base in the U.S. or in the overseas area; and

(g) Any changes to information previously provided under this clause.

2. 52.223-9004 SAFETY AND ACCIDENT PREVENTION

APR 1984

(a) In performing work under this contract on a Government installation, the Contractor shall—

(1) Conform to the specific safety requirements established by this contract;

(2) Comply with the safety rules of the Government installation that concern related activities not directly addressed in this contract;

(3) Take all reasonable steps and precautions to prevent accidents and preserve the life and health of Contractor and Government personnel performing or in any way coming in contact with the performance of this contract; and

(4) Take such additional immediate precautions as the Contracting Officer may reasonably require for safety and accident prevention purposes.

(b) If this contract is performed on an Air Force installation, the Air Force Occupational Safety and Health Standards (AFOSH) developed in accordance with AFR 127-12, in effect on the date of this contract, apply. If contract performance is on other than an Air Force installation, the Contractor shall comply with the safety rules of that Government installation, in effect on the date of this contract.

(c) The Contracting Officer may, by written order, direct additional AFOSH and safety and accident standards as may be required in the performance of this contract and any adjustments resulting from such direction will be in accordance with the Changes clause of this contract.

(d) Any violation of these safety rules and requirements, unless promptly corrected as directed by the Contracting Officer, shall be grounds for termination of this contract in accordance with the Default clause of this contract.

D. AFSC FAR Sup Clauses in Full Text

1. 52.222-9000 EQUAL OPPORTUNITY PREAWARD CLEARANCE OF  
SUBCONTRACTS

MAR 1982

The prime contractor shall request its preaward clearances through the contracting officer at least 30 calendar days before the proposed award date, unless the cognizant Department of Labor compliance office agrees to a shorter time.



(a) Of the total price of items 0048, 0051, and 0052 the sum of \$713,914.00 is presently available for payment and allotted to this contract. It is anticipated that from time to time additional funds will be allotted to this contract until the total price of these items is allotted.

(b) The contractor agrees to perform or have performed work on the items up to the point at which, in the event of termination of this contract pursuant to the Termination for Convenience of the Government clause of the contract, the total amount payable by the Government (including amounts payable in respect of subcontracts and settlement costs) pursuant to paragraph (e) of the clause would, in the exercise of reasonable judgment by the contractor, approximate the total amount at the time allotted to the contract. The contractor will not be obligated to continue performance of the work beyond that point. The Government will not be obligated in any event to pay or reimburse the contractor in excess of the amount from time to time allotted to the contract, regardless of anything to the contrary in the Termination for Convenience of the Government clause of this contract.

(c) It is contemplated that the funds presently allotted to this contract will cover the work to be performed, as limited by the provisions of (b) above until the 30th day of July 1985. If funds allotted are considered by the contractor to be inadequate to cover the work to be performed until the above date or an agreed substitute date, the contractor will notify the contracting officer in writing when, within the next 30 days, the work will reach a point at which, in the event of termination of this contract pursuant to the Termination for Convenience of the Government clause of this contract, the total amount payable by the Government (including amount payable in respect of subcontracts and settlement costs), pursuant to paragraph (e) of the clause, will approximate 85 percent of the total amount then allotted to the contract. The notice will state (i) the estimated date when that point will be reached, and (ii) the estimated amount of additional funds required to continue performance to the above date or an agreed substitute date, advise the contracting officer in writing as to the estimated amount of additional funds which will be required for the timely performance of the contract for a further period as may be specified in the contract or otherwise agreed to by the parties. If after such latter notification, additional funds are not allotted by the date above written, or by an agreed substitute date, the contracting officer will, upon written request of the contractor, terminate this contract on that date or the date set forth in the request, whichever is later, pursuant to the provisions of the Termination for Convenience of the Government clause of this contract.

(d) When additional funds are allotted from time to time for continued performance of the work under this contract, the parties will agree as to the applicable period of contract performance which will be covered by the funds. The provisions of (b) and (c) above will apply in like manner to the additional allotted funds and agreed substitute date, and the contract will be amended accordingly.

(e) If the contractor incurs additional costs or is delayed in the performance of the work under this contract solely by reason of failure of the Government to allot additional funds in amounts sufficient for timely performance of this contract, and if additional funds are allotted, an equitable adjustment will be made in the price or prices (including appropriate target, billing, and ceiling prices where applicable) of the items or in the time of delivery or both. Failure to agree to any such equitable adjustment hereunder will be a dispute concerning a question of fact within the meaning of the clause of this contract entitled, "Disputes."

(f) The Government may at any time prior to termination and, with the consent of the contractor, after notice of termination allot additional funds for this contract.

(g) The provisions of this clause with respect to termination will not be deemed to limit the rights of the Government under the clause entitled, "Default." The provisions of this clause are limited to the work on and allotment of funds for the items set forth in (a) above. This clause will become inoperative upon the allotment of funds for the total price of the work except for rights and obligations then existing under this clause.

(h) Nothing in this clause affects the right of the Government to terminate this contract pursuant to the Termination for Convenience of the Government clause of this contract.

### 3. 52.243-9001 NOT-TO-EXCEED COST AGREEMENT

APR 1984

Prior to the issuance of a change order under this contract, the contracting officer may solicit from the contractor written agreement as to (1) the monetary adjustment (maximum increase or minimum decrease) to be made to the contract or (2) adjustment in the delivery schedule (or time of performance) by reason of the change. The contracting officer may also solicit such agreement on limitations to the adjustments of any other provisions of the contract which may be subject to equitable adjustment by reason of the change. Any such written agreement shall then be cited in the change order, and upon its issuance shall be a binding part of the contract. In no event shall the definitive equitable adjustment exceed the limitations so established. Except with respect thereto, nothing contained herein shall affect the rights of the parties to the equitable adjustment by reason of the change, pursuant to the Changes clause.

(b) With respect to changes for which the contract is to be adjusted, the contractor shall submit a not-to-exceed amount as required above.

### 4. 52.245-9000 : BASE SUPPORT (Applies to CLINs 0001, 0002, 0004, 0006 and 0007)

APR 1984

Base support will be provided to the contractor by the Government only in accordance with the provisions of this clause. Failure of the contractor to comply with all provisions of this clause will result in releasing the Government without prejudice from its obligation to provide the required base support by the date(s) required. Failure of the Government to provide base support by the date(s) required (absent any contractor failure to comply with all the provisions of this clause) will, if otherwise warranted, result in an equitable adjustment in accordance with the changes clause."

(a) The contractor agrees that in the performance of this contract, or any major subcontract hereunder, that no direct or indirect costs will be incurred for the duplication of work or support capacity which the Government determines is available at, or through, any DOD installation where this contract will be performed, without prior written approval of the contracting officer. Accordingly, the contractor agrees to use or cause to be used, on subcontracts, if any, all Government or Government-controlled working space, equipment, supplies, materials, services (including automatic data processing) or other support (including communication services) which the Government determines can be made available at, or through, any DOD installation where this contract will be performed.

(b) Base support will be provided only at those installations listed in (g) below. The exact amount and character of support and other logistic details appropriate to the furnishing thereof, will be determined before contract award and set forth in an appendix to the contract and referenced in the schedule, by categories and installations, if determinable at that time.

(c) Where it cannot be determined before contract award, the appropriate air Force installations where support is anticipated will be listed in (g) below, if known. During the contract, the contractor agrees to provide to the contracting officer a complete proposal supported by detailed documentation of all in-place base support requirements at each listed installation not later than 120 days before the planned required need date at each location. The contractor will, in each case, concurrently forward an identical copy of the proposal to the cognizant contract administration office. In this event, agreement concerning the exact amount and character of support and other logistic details appropriate to the furnishing thereof, will result in an amendment to the contract which provides an equitable adjustment to the contract price and other affected provisions of the contract in accordance with the changes clause.

(d) Any further additions, reductions, or changes in the specific support identified under this clause by amendment in accordance with (c) above, or to the contract already negotiated, will be fully documented by the contractor and normally submitted to the contracting officer within 90 days of required in-place date at the installation. When the requirement becomes known less than 90 days before in-place date, the contractor will immediately notify the contracting officer when required changes arise. If appropriate under the circumstances, a negotiated equitable adjustment will be made in the price, terms and/or conditions of the contract in accordance with the changes clause.

(e) Unless otherwise stipulated in the schedule of this contract, such support will be provided on a no-charge-for-use basis and the value thereof will be a part of the Government's consideration for this contract. If contractual coverage is pending, the contracting officer's written approval will be obtained before any base support will be furnished hereunder and the contractor agrees to request this approval no later than 90 days before the planned required need date for each DOD installation involved.

(f) The contractor agrees to immediately report, with a copy to the cognizant CAO, inadequacies, defective GFP or nonavailability of support stipulated by the contract schedule together with a recommended plan for obtaining the required support. The Government agrees to determine promptly (within 10 workdays) the validity and extent of the involved requirement and the method by which the requirement will be fulfilled (for example, purchase, rental lease, GFP). Items of a capital nature will not be purchased under this clause; additionally, the contractor will not purchase, or otherwise furnish any base support requirement provided by the clause, or authorize others to do so, without prior written approval of the contracting officer regarding the price, terms, and conditions of the proposed purchase, or approval of other arrangement.

(g) Following are installations where base support will be provided:

To be determined

E. ESD FAR Sup Clauses in Full Text

1. 52.205-9500 RELEASE OF INFORMATION

a. It is Air Force policy to encourage publication of scientific and technological advances and information developed under its contracts. One copy of each paper planned for publication will be submitted for review and comment to the Public Affairs Office, HQ ESD (PAM), Hanscom AFB, MA 01731 at least 30 days prior to submission for publication.

b. News releases and media contacts, including photographs and films, public announcements, or other forms of publicity concerning the technical content of this contract, will not be made without prior clearance from the Air Force. Requests for publicity approval should be addressed to HQ ESD (PAM), Hanscom AFB MA 01731 for the approval of the contracting officer.

2. 52.245-9505 PERFORMANCE OF WORK ON GOVERNMENT PREMISES

Any work under this contract which is performed by the Contractor or any of its subcontractors on premises under Government control is subject to all provisions of this contract governing such work and the following:

a. All Contractor and Subcontractor personnel shall, at all times, conspicuously display a distinctive badge provided by the Contractor, identifying such personnel as employees of the Contractor.

b. Except as may be otherwise specified in the Schedule of this contract, the Contractor shall furnish all supplies, material and equipment required for the work to be performed.

c. The Contractor shall provide direct supervision of its own employees but shall not supervise or accept supervision from any Government personnel.

d. The Contractor shall designate to the Contracting Officer in writing an on-the-premises representative to serve as point of contact for the Contractor with the Contracting Officer or his duly authorized representative.

e. Performance of work on Government premises shall be confined to the area(s) specified by the Contracting Officer or his duly authorized representative.

### 3. 52.295-9501 TECHNICAL REVIEW

A. The Government has contracted with The MITRE Corporation for the services of a technical group which, under the program management of the Electronic Systems Division, is responsible to the Government for overall technical review of certain Government programs, including the efforts under this contract.

#### B. Explanation of MITRE Role.

1. Technical Review is defined as the process of continually reviewing the technical efforts of contractors. It does not include any modification realignment or redirection of contractor efforts under this contract; such action may be effected only by the prior written direction of the Contracting Officer.

2. The purpose of the review is to:

a. Evaluate from a technical standpoint whether system concept and performance can be expected to be achieved on schedule and within cost.

b. Assure that the impact of new data, new developments and modified requirements is properly assessed and exploited.

c. Assure that The MITRE Corporation has available data on the status and technology of Government programs and projects to enable it to carry out its inter-system integration responsibilities to the Government.

3. The MITRE Corporation has agreed not to engage in the manufacture or the production of hardware, to abide by FAR Subpart 9.5 entitled, "Organizational Conflicts of Interest", to refrain from disclosing proprietary information to unauthorized personnel, and not to compete with any profit-seeking concern.

C. The Contractor agrees to cooperate with The MITRE Corporation by engaging in technical discussions with MITRE personnel, and permitting MITRE personnel access to information and data relating to technical matters (including cost and schedule) concerning this contract to the same degree such access is accorded Government project personnel.

D. It is expressly understood that the operation of this clause will not be the basis for an equitable adjustment.

4. 52.295-9501 TECHNICAL REVIEW

A. The Government has contracted with The Analytical Systems Engineering Corporation (ASEC) for the services of a technical group which, under the program management of the Electronic Systems Division, is responsible to the Government for technical review of certain Government programs, including the efforts under this contract.

B. Explanation of The ASEC role.

1. Technical Review is defined as the process of continually reviewing the technical efforts of contractors. It does not include any modification realignment or redirection of contractor efforts under this contract; such action may be effected only by the prior written direction of the Contracting Officer.

2. The purpose of the review is to:

a. Evaluate from a technical standpoint whether system concept and performance can be expected to be achieved on schedule and within cost.

b. Assure that the impact of new data, new developments and modified requirements is properly assessed and exploited.

c. Assure that ASEC has available data on the status and technology of Government programs and projects to enable it to carry out its inter-system integration responsibilities to the Government.

3. The ASEC has agreed not to engage in the manufacture or production of hardware or software which is related to the program for which this contract is issued, to abide by FAR Subpart 9.5 entitled, "Organizational Conflicts of Interest", and to refrain from disclosing proprietary information to unauthorized personnel.

C. The Contractor agrees to cooperate with ASEC by engaging in technical discussions with ASEC personnel, and permitting ASEC personnel access to information and data relating to technical matters (including cost and schedule) concerning this contract to the same degree such access is accorded Government project personnel.

D. It is expressly understood that the operation of this clause will not be the basis for an equitable adjustment.

# TechDyn

27 November 1985

125-S001-009

Command, Control and Communications  
Corporation  
23670 Hawthorne Blvd.  
Torrance, CA 90505

Attn: Ms. Marie Raymond  
Manager of Contracts

Subj: Subcontract 125-001; Modification #003

Dear Ms. Raymond:

This modification #003 adds the following CLINs at the listed prices to the subject subcontract.

<u>CLIN</u>	<u>Price</u>
0003AD	\$ 154,489
0002AA	2,120,216
0002AB	296,901
0002AC	985,841
0004AA	1,607,236
0004AB	8,465
0047	<u>98,740</u>
	\$5,271,888

The above CLINs were compiled in the following way:

<u>4C CLINs</u>	<u>Mod #003 CLINs</u>
1AB/3AA/3AD	3AD
2AA	2AA
2AB/3AB	2AB
2AC/3AC	2AC
4AA/5AA	4AA
4AB	4AB
47	47

The subcontractor will be allowed to invoice for monthly progress payments in accordance with FAR subpart 32.5 - Progress Payments Based on Cost.

2364

6564 LOISDALE COURT, SUITE 800, SPRINGFIELD, VIRGINIA 22150 • (703) 922-5100 • TELEX 901013

PLAINTIFF'S  
EXHIBIT

22A-2

Ms. Marie Raymond  
125-S001-009  
27 November 1985  
Page Two

All deliverables must be submitted to the Contractor at least five (5) days before the Prime Contract due date.

In order to fulfill the CSSR requirements for the Prime Contract, 4C is required to submit monthly CLIN costs by the 15th of the month following the month that the expenses were incurred.

The effective date for this modification is 30 August 1985. Except as noted, all terms and conditions of the original Subcontract 125-001 apply to this modification.

Attached please find the Statement of Work, the Specifications, and the corresponding exhibits and attachments for the work covered by these CLINs.

If the above terms are satisfactory, please sign and return two (2) copies of this modification. Upon receipt, a fully executed copy will be returned to you for your records.

If you have any questions concerning this modification, please contact the undersigned at (703) 922-5100.

Regards,

  
David E. Yenowine  
Supervisor  
Subcontracts/Purchasing

DEY/meb

Attachments: As stated

Approved by Marie F. Raymond

Title Director of Contracts

Date 14 January 1986



Specification Number ESD-SS-ECI-1020

Code 50464

6 September 1965

This Specification has been prepared  
for the  
Iceland Command  
and  
Control Enhancement  
(ICCE)  
System

Authenticated by: \_\_\_\_\_  
(Acquisition Agency)

Approved by: \_\_\_\_\_  
(Contractor)

Date: \_\_\_\_\_

Date: \_\_\_\_\_

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# GLOSSARY

A	Air Track
	Altitude
	Automatic IFF Altitude Source
AF	Air Force
AFI	Air Forces Iceland
AFR	Air Force Regulation
AFSC	Air Force Systems Command
A/N	Alphanumeric
AM	Amplitude Modulation
ANSI	American National Standards Institute
ASCII	American National Standard Code for Information Interchange
ATP	Acceptance Test Procedures
AWACS	Airborne Warning and Control System
B	Surface Track
	Bearing
BS	Computer Program Development Specification
BCNS	Base Communications Naval Station
BK	Engagement Broken
CS	Computer Program Product Specification
CC	Command Center
CCA	Command Center Automation
CCP	Communications Control Panel
CDRL	Contract Data Requirements List
CFA	Communications Functional Area
CFE	Contractor Furnished Equipment
CI	Configuration Item
COTS	Commercial Off-the-Shelf
CP	Computer Program
CPC	Computer Program Component
CPCI	Computer Program Configuration Item
CRT	Cathode-Ray Tube
CSESD	Communications Equipment Security Document
dB	Decibel
dBmOp	An absolute power unit referenced to the 0 test level point (psophometrically weighted)
dBmCO	A noise measurement unit using C-message weighting, referenced to the 0 test level point
D.E.R.A.	Data Extraction Reduction Analysis
DF	Distribution Frame
DLRN	Data Link Reference Number

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OLRP	Data Link Reference Point
DCD	Department of Defense
DT&E	Development Test and Evaluation
DTS	Data Terminal Set
E	Estimated Altitude Source
EF	Effective
ES	Elapsed Staleness
F	Few Raid Size (Raid Size = Few)
FEDB	Failure Experience Data Base
FM	Frequency Modulation
FQT	Formal Qualification Test
FR	Firing
FTI	Force-Tell Indicator
GEOREF	World Geographic Reference System
GES	Ground Entry Station
GFE	Government Furnished Equipment
GGYP	Ground-Ground Voice Panel
GIDEP	Government-Industry Data Exchange Program
GOC	Ground-based Operation Center
GP&E	General Purpose Encryption Equipment
GRSP	GES Radio Selection Panel
GSA	General Services Administration
H	Heading
	Hostile
HDBK	Handbook
HF	High Frequency
HOL	Higher Order Language
HU	Heads Up
I	Invalid Response to IFF Indicator
ICCE	Iceland Command and Control Enhancement
ID	Identification
IFF	Identification Friend or Foe
IOT&E	Initial Operational Test and Evaluation
IPT	Iceland Posts and Telecommunications
ISB	Independent Sideband
JCS	Joint Chiefs of Staff
JSS	Joint Surveillance System
KB	Keyboard
KNCS	Keflavik Naval Communications Services

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LAT	Latitude
LONG	Longitude
LRU	Line Replaceable Unit
M	Many Raid Size
MAD:Z	Manual IFF Altitude Source
Mext	Military Air Defense Identification Zone
MCT	Maximum Corrective Maintenance Time
MCC	Mean Corrective Maintenance Time
MDC	Master Direction Center
MIL	Military
MTBF	Mean-Time-Between-Failure
N	No; no Force-tell of this track
	No; no emergency conditions for this track
	No; Non-SPI track
	No; response to IFF indicator
NARS	North Atlantic Relay Station
NAVCOMSTA	Naval Communications Station
NBSV	Narrowband Secure Voice
NCS	Net Control Station
NE	Not Effective
OM	Operations and Maintenance
OS	Operating System
OT	Out of Action
PCB	Printed Circuit Board
-DFA	Processing and Display Functional Area
PDS	Processing and Display Set
-E	Partially Effective
PED	Position Entry Device
PPSL	Program Parts Selection List
PU	Participating Unit
R	Range
RADC	Rome Air Development Center
RCM	Reliability Centered Maintenance
RCU	Remote Control Unit
RF	Radio Frequency
RCCC	Region Operations Control Center
ROM	Read-Only Memory
RY	Ready

S	Sensor Altitude Source
	Single Raid Size
	Surface Track
	Speed
SCC	System Coordinate Center
SDE	Signal Distribution Equipment
SFUS	Software-Firmware Utility Services
SIF	Selective Identification Feature
SLT	System Level Test
SOW	Statement of Work
SPI	Special Processing Indicator
STD	Standard
T	Target
TACS	Tactical Air Control System
TADIL	Tactical Digital Information Link
TADS	Tactical Air Defense System
TBD	To Be Determined
TBS	To Be Supplied
TDI	Top-Down Implementation
TDMD	Top-Down Modular Design
TIDP	Technical Interface Design Plan
TR	Tracking
TT	Test Tone
U	Unknown Raid Size
UHF	Ultrahigh Frequency
UL	Underwriters Laboratories
USAF	United States Air Force
V	Valid Response to IFF Indicator
VSWR	Voltage Standing Wave Ratio
WA	Weapon Assigned
Y	Yes; force-tell conditions apply
	Yes; emergency conditions apply
	Yes; SPI Track



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## 1.0 SCOPE

1.1 Introduction. This specification establishes the performance, design, integration, and test requirements for the Iceland Command and Control Enhancement (ICCE) System. The ICCE System shall provide increased air defense capabilities for Iceland by automating the interface between the ground environment system and airborne surveillance elements.

5

## 2.0 APPLICABLE DOCUMENTS

**2.1 Government Documents.** The following documents of the exact issue shown form a part of this specification to the extent specified herein. In the event of conflict between the documents referenced herein and in 3.0, 4.0, 5.0, and 6.0 of this specification, the contents of this specification shall be considered the superseding requirement.

### SPECIFICATIONS:

#### Military

MIL-E-4138E Amendment 2 17 July 1977	Electronic Equipment, Ground, General Requirements for
MIL-E-6051D 7 September 1967	Electromagnetic Compatibility Requirements Systems
MIL-P-9024D 8 June 1972	Packaging, Handling and Transportability in System/Equipment Acquisition
MIL-F-140729 19 April 1976	Finishes for Ground Electronic Equipment
MIL-E-16400 1 December 1976	Electronic Equipment, Naval Ship and Shore
MIL-M-3851D 28 March 1983	Microcircuits, General Specification

### STANDARDS:

#### Federal

DDC-STD-480A 29 December 1978	Configuration Control, Engineering Changes, Deviations and Waivers
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#### Military

MIL-STD-129H 30 September 1982	Marking for Shipment and Storage
MIL-STD-210B 15 December 1973	Climatic Extremes for Military Equipment

MIL-STD-188-124 21 June 1982	Grounding, Bonding and Shielding for Common Long Haul Tactical Communications Systems
MIL-STD-188-203-1 16 September 1982	Subsystem Design and Engineering Standards for Tactical Digital Information Link (TAOIL A)
MIL-STD-188-203-2 23 March 1984	Subsurface Design and Engineering Standards for Tactical Digital Information Link (TAOIL) B
MIL-STD-454H 10 January 1983	Standard General Requirements for Electronic Equipment
MIL-STD-461B 1 April 1980	Electromagnetic Emission and Susceptibility Requirements for the Control of Electromagnetic Interference
MIL-STD-462 31 July 1967	Electromagnetic Interference Measurement
MIL-STD-471A Notice 1 10 January 1975	Maintainability Demonstration
MIL-STD-483 21 March 1979	Configuration Management Practices for Systems, Equipment, Munitions and Computer Programs
MIL-STD-490 18 May 1972	Specification Practices
MIL-STD-721C 12 June 1981	Definitions of Effectiveness Terms for Reliability and Maintainability
MIL-STD-781C 20 March 1981	Reliability Design Qualification and Production Acceptance Tests
MIL-STD-785B 15 September 1980	Reliability Programs for Systems and Equipment Development and Production
MIL-STD-794E 16 July 1982	Parts and Equipment, Procedures for Packaging of
MIL-STD-810C 7 April 1981	Environmental Test Methods

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MIL-STD-883B  
15 January 1982

Test Methods and Procedures

MIL-STD-965  
Notice 1  
20 December 1978

Parts Control Program

MIL-STD-1250  
31 March 1967

Corrosion Prevention and Deterioration  
Control in Electronics Components and  
Assemblies

MIL-STD-1472C  
2 May 1981

Human Engineering Design Criteria for  
Military System, Equipment and Facilities

MIL-STD-1589B  
5 June 1980

Jovial (J73)

MIL-STD-1753  
5 November 1978

FORTRAM, DOD Supplement to ANSI STD  
X3.9 - 1978

OTHER PUBLICATIONS:

CSSEB-28  
January 1972

Communications Security Equipment  
Engineering Bulletin, TSEC/KG-40

CSSEB-15D  
15 February 1979

Communications Security Equipment System  
Document TSEC/KY-65/75 Parkhill

DCA Circular 300-175-9  
3 August 1982

DCS Operating-Maintenance Electrical  
Performance Standards

FM(NORAD) 637/030/01  
15 December 1983

Computer Program Development Specification  
for the Applications Set of the Joint  
Surveillance System (JSS) Region Operations  
Control Center (ROCC)

JCS-Publication 10  
December 1982

Tactical Command and Control and  
Communication Systems Standards

Joint Manual 55-200  
December 1982

JSG/TCCCS Interface Design Handbook (IDH);  
Volume III

MIL-HDBK-217D  
15 January 1982

Reliability Predictions of Electronic  
Equipment

MIL-HBK-232  
14 November 1972

Red/Black Engineering - Installation  
Guidelines (U), CONFIDENTIAL

MIL-HDBK-472 24 May 1966	Maintainability Prediction
M-5049 August 1974	CMS-2M Users Reference Manual
NACSIM 5203 30 June 1982	Guidelines for Facility Design and Red/Black Installation (U), CONFIDENTIAL
NSA 82-28 3 February 1984	NSA Performance and Interface Specification for the TSEC/KG-84A General Purpose Encryption Equipment (GPEE)
TAC/ADTAC 21 May 1984	Iceland Command and Control Enhancement (ICCE) Concept of Employment (U), SECRET
1661900-5030 12 May 1982	Interface Control Drawing for the Digital Switch of the Data Processing and Display Functional Area of the ROCC Segment and the Digital Interface Panel (DIP) of the ROCC Communication Segment (RCS) (Final)
MITRE Project Document 84-2092 December 1984	ICCE Facility Floor Plans (U), CONFIDENTIAL

2.2 Non-Government Documents. The following documents form a part of this specification to the extent specified herein.

ANSI X3.5 -- 1980 September 1980	Flow Charts, Symbols and Their Usage in Information Processing
ANSI X3.9 -- 1978 April 1978	Programming Language FORTRAN
RS-422-A December 1978	Electrical Characteristics of Balanced Voltage Digital Interface Circuits
RS-449 November 1977	General Purpose 37-Position and 9-Position Interface for Data Terminal Equipment and Data Circuit - Terminating Equipment Employing Serial Binary Data Interface

### 3.0 REQUIREMENTS

3.1 System Definition. The ICCE System shall provide the Air Forces Iceland (AFI) mission of air surveillance, air defense, and control of sovereign airspace the capability of secure communications between the ground environment system and the E-3 Airborne Warning and Control System (AWACS).

The Iceland Ground Operation Centers (GOCs) that the ICCE System interfaces with are the Command Center (CC) located within the Combined Operation Center at Keflavik Naval Station, the Master Direction Center (MDC) at Rockville, and the Interim Air Defense Control Facility (IADCF) located at Rockville. ICCE processing and display equipment will be initially located in the MDC and then relocated to the IADCF when it becomes operational. Hereinafter in this specification, "MDC/IADCF" shall mean that the capability referred to will first be performed from the MDC and then, at a future date, from the IADCF. The IADCF will be a Joint Surveillance System (JSS) Region Operations Control Center (ROCC).

Command and control information shall be manually inserted, displayed, and managed by the ICCE System at the MDC/IADCF for digital transmission to the E-3. Digitized command and control information from the E-3 shall be received, filtered, displayed, and managed by the ICCE System at the MDC/IADCF. The ICCE System shall allow IADCF-to-E-3 connectivity by providing two-way translation between the E-3 and the IADCF command and control message formats. The ICCE System shall provide its track data base composed of E-3, IADCF, and locally generated tracks to the Command Center Automation (CCA) System in the CC. Voice communications from the MDC/IADCF to the E-3 shall be used for voice coordination and for voice backup of the digital transmission of command and control information. The ICCE System shall provide the capability to record all track data and to play back the recorded data for operator training and postmission analysis. The ICCE System shall also provide a simulation capability to support operator training.

Beyond line-of-sight communication coverage from the MDC/IADCF to the E-3 shall be provided in the ICCE System by remotely controlled line-of-sight UHF radio facilities defined as Ground Entry Stations (GESSs); these GESSs will be at distant locations from the MDC/IADCF. In addition to the two UHF GESSs, the remote control capability of an additional two UHF GESSs shall be provided.

Hereinafter, the ICCE System shall be referred to as the "System."

**3.1.1 General Description.** The ICCE System shall be defined in two functional areas as follows (see Figure 1):

- a. Processing and Display Functional Area (PDFA)
- b. Communications Functional Area (CFA)

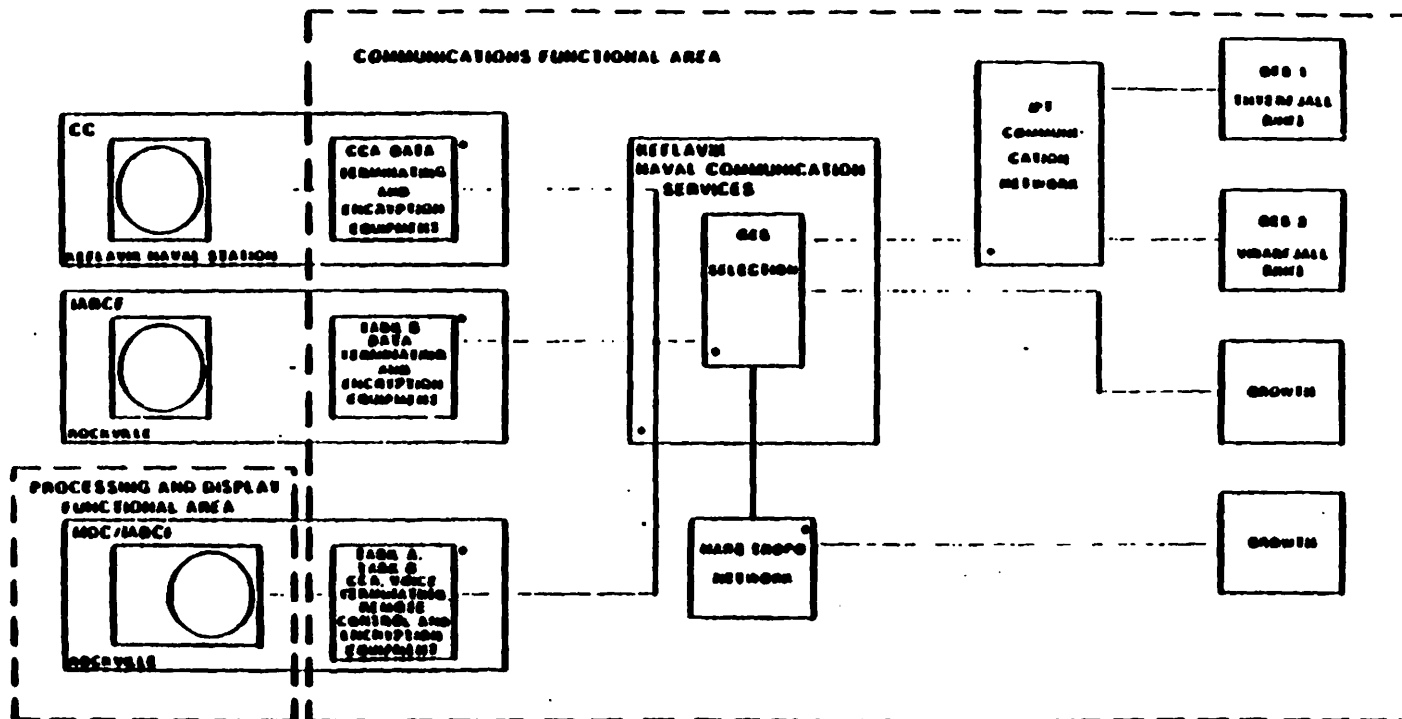
The PDFA shall consist of the software, processing equipment, and display equipment at the MDC/IADCF to receive, transmit, process, record, and display Tactical Digital Information Link A (TADIL A) M-series messages and IADCF lateral-tell messages. TADIL A shall be used for direct communications with the E-3. Lateral-tell shall be used for indirect communications between the IADCF and the E-3 through the PDFA. The PDFA shall provide two-way translation between M-series and lateral-tell message formats to allow IADCF-to-E-3 connectivity. The PDFA shall provide for the manual generation of track data, data filtering, and track management. The PDFA shall output its track data base for transmission to the CCA System. The PDFA processing equipment shall interface with the CFA encryption equipment for TADIL A, lateral-tell, and CCA interface.

The CFA shall consist of encryption and communication equipment to provide: secure and unsecure voice communications between the E-3 and the MDC/IADCF; secure data transmission between the PDFA data processor, the ROCC, and the CCA System (transmit data only); and secure data transmissions between the MDC/IADCF PDFA data processor and the E-3 via a TADIL A communication link. Communications to the E-3 shall be extended from the MDC/IADCF to the E-3 through remote GESS. The remote GESS shall be controlled by and interconnected to the MDC/IADCF via telephone circuit facilities.

**3.1.1.1 Processing and Display Functional Area.** The PDFA shall comprise:

- a. Data processing and peripheral equipment
- b. Display and data entry equipment
- c. Operational computer programs
- d. Support computer programs

**3.1.1.1.1 Data Processing and Peripheral Equipment.** The data processing and peripheral equipment shall perform all data input/output, processing, translation, management, and recording required of the PDFA. The data processor shall include ports for TADIL A, lateral-tell, and CCA interfaces which provide for the reception and transmission of data and control signals to operate with the CFA's KG-40 and KG-84As, respectively. The data processor shall provide a port for each peripheral, display, and data entry device.



\* ENCRYPTION EQUIPMENT, ONCE FACILITIES ENCRYPTS KCCS SELECTION EQUIPMENT) NAVS FACILITIES, AND PT FACILITIES ARE ONE TO KCCS SYSTEM

Figure 1. ICCE Functional Areas

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6 September 1925



**3.1.1.1.2 Display and Data Entry Equipment.** The display and data entry equipment shall provide a situation display, a tabular information display, and data entry equipment. Data entry equipment shall include a keyboard, position entry device, and other controls necessary for work station operation. The associated work station shall consist of the equipment to house the display and other operator support equipment at each operator position.

**3.1.1.1.3 Operational Computer Programs.** The operational computer programs shall consist of the control, application, on-line diagnostic, and data recording software required to perform the data exchange, data translation, data control, and display functions of the PDFA. On-line diagnostics shall test all internal and external Line Replaceable Units (LRUs), and provide real time equipment status to the operator.

**3.1.1.1.4 Support Computer Programs.** The support computer programs shall consist of the computer programs required to support operational programs, software development, test, and maintenance, off-line hardware maintenance, and pre- and postmission support functions. Off-line diagnostics shall provide loop back of all external ports, test all hardware devices and ports, and fault isolate to the LRU level.

**3.1.1.2 Communications Functional Area.** The CFA shall comprise the GESS, MDC/IADCF communication equipment, and telephone interconnect facilities.

The GESS shall contain UHF radios for simultaneous voice and TADIL A Radio Frequency (RF) communications to the E-3 aircraft. The GESS shall include a means for remotely selecting and controlling these radios, and interfacing the radios and remote control equipment signals to telephone circuits connecting the GESS to the MDC/IADCF.

The equipment that composes the CFA in the MDC/IADCF shall include a means for communications operator to select voice and data communications via any radio at any GES. The CFA of the MDC/IADCF shall provide a stand-alone operator position for controlling the GES radio facilities; connecting control equipment to telephone circuits; interfacing telephone circuits carrying TADIL A track data to the CCA System and voice information to encryption devices; connecting TSEC/KG-40 to the TADIL A ports of the PDFA; connecting TSEC/KG-84As to the lateral-tell and CCA ports of the PDFA; and connecting the TSEC/KY-65s to the PDFA operator work station consoles.

The telephone interconnect facilities shall provide the ICCE System the connectivity required between the MDC/IADCF and the GESs and between the MDC/IADCF and CC. These facilities shall consist of both public and military voice grade telephone circuits. Public facilities shall include telephone circuits leased by the Government for the ICCE System from Iceland Posts and Telecommunications (IPT). Military facilities shall include a segment of the North Atlantic Relay Station (NARS) System and the Keflavik Naval Communication Services (KNCS). The KNCS consists of the Base Communications Naval Station (BCNS), which maintains the cable plant, and the Naval Communications Station (NAVCOMSTA), which maintains the military microwave system to military facilities in southwestern Iceland. The telephone interconnect facilities shall also include ICCE connectivity equipment to provide GES radio selection by the MDC/IADCF.

The CFA shall include the following:

- a. Radio facilities
- b. TADIL A, Lateral-Tell, and CCA data terminating and conditioning equipment
- c. Voice terminating equipment
- d. Remote control equipment
- e. Signal distribution equipment
- f. Encryption devices
- g. Telephone circuits

**3.1.1.2.1 Radio Facilities.** The radio equipment shall consist of JHF transceivers, power amplifiers, and associated antenna equipment at the GESs. These facilities shall have the capability of being controlled remotely for radio channel selection, mode of operation (i.e., TADIL A or voice, power amplifier tuning).

**3.1.1.2.2 TADIL A, Lateral-Tell, and CCA Terminating and Conditioning Equipment.** The TADIL A terminating equipment shall include a Data Terminal Set (DTS) that interfaces TADIL A to the PDFA through the TSEC/KG-40 encryption equipment at the MDC/IADCF. The DTS function and connectivity to the radios defined in MIL-STD-189-203-1 may be apportioned between the MDC/IADCF, GES, and telephone interconnect facilities as appropriate, as long as net operations between the MDC/IADCF and E-3 are not affected when the

MDC/IADCF is operating as either a participating unit or a net control station.

The TADIL A conditioning equipment at the GESs shall interface the UHF or HF radios to the IPT, NARS, or KNCS circuits through the Signal Distribution Equipment (SDE).

The MDC/IADCF shall be provided equipment for terminating transmissions to the CCA System over telephone circuits and for connecting the one-way transmissions to the PDFA through TSEC/KG-84As. The MDC/IADCF shall also be provided with terminating equipment for connecting two-way lateral-tell transmissions to the PDFA via TSEC/KG-84As.

3.1.1.2.3 Voice Terminating Equipment. The voice terminating equipment shall include a headset with a push-to-talk button, headphone jacks, and required connectivity from each ICCE display console operator position to the TSEC/KY-65 on an "as available" basis for secure and unsecure two-way voice transmission. Voice connectivity shall include any level adjustment equipment, impedance matching equipment, or control signals required to interface the operator headphones and push-to-talk button to the TSEC/KY-65.

3.1.1.2.4 Remote Control Equipment. The MDC/IADCF control equipment shall include a Ground-Ground Voice Panel (GGVP) housed in the PDFA work station, and a Communications Control Panel (CCP) or equivalent which will include a GGVP. The GGVP at each PDFA work station position shall provide controls for connecting that position's headset jacks to the TSEC/KY-65 or an unsecure bypass. The CCP shall provide controls for selecting any radio at any GES for TADIL A and any two radios for voice communications. The CCP shall contain all switches, controls, electronic circuitry, and processing capability necessary to send requests and receive status through telephone circuits from the remote control equipment at the KNCS and GESs. The CCP shall also house TADIL A DTS remote control equipment for address selection, operational net mode, and range adjustments.

The KNCS remote control equipment shall interface with the CCP at the MDC/IADCF for control and status reporting through voice circuits. The KNCS remote control equipment shall consist of the ICCE KNCS signal distribution equipment to provide the selection of any GES telephone circuit for either voice or TADIL A communications.

The GES remote control equipment shall interface with the CCP at the MDC/IADCF to provide a control and status reporting capability via voice circuits. The GES remote control equipment shall also operate the GES signal distribution equipment and radio facilities.

**3.1.1.2.5 Signal Distribution Equipment.** The SDE shall consist of patch panels, test panels, distribution frames, and baseband distribution equipment. The SDE shall also include remotely controlled switching, data multiplexers, signalling equipment and modems. This equipment is required in order to route and patch signals at the GESSs, the MDC/IADCF, the CC, and the KNCS switch center; it is also needed to interface ICCE with IPT, KNCS, and NARS telephone circuits.

**3.1.1.2.6 Encryption Devices.** The MDC/IADCF encryption devices shall be provided as Government Furnished Equipment (GFE) and shall permit secure digital data (TADIL A, lateral-tell, and CCA) and voice communications.

**3.1.1.2.7 Telephone Circuits.** The telephone circuits that shall provide all ICCE connectivities between the MDC/IADCF and the GESSs and between the MDC/IADCF and the CC shall be leased or Government-owned, and provided as GFE. These circuits shall have the interface characteristics specified in sections 3.1.5.2.1 and 3.1.5.2.2. The circuits to the two northern GESSs shall connect to the MDC/IADCF through IPT and KNCS facilities. Connectivity between the MDC/IADCF and the southwestern GESSs shall be through KNCS facilities. Connectivity between the MDC/IADCF and the southeast GESS shall be through KNCS and NARS facilities. Connectivity between the MDC/IADCF and the CC (CCA) shall be through the KNCS facilities.

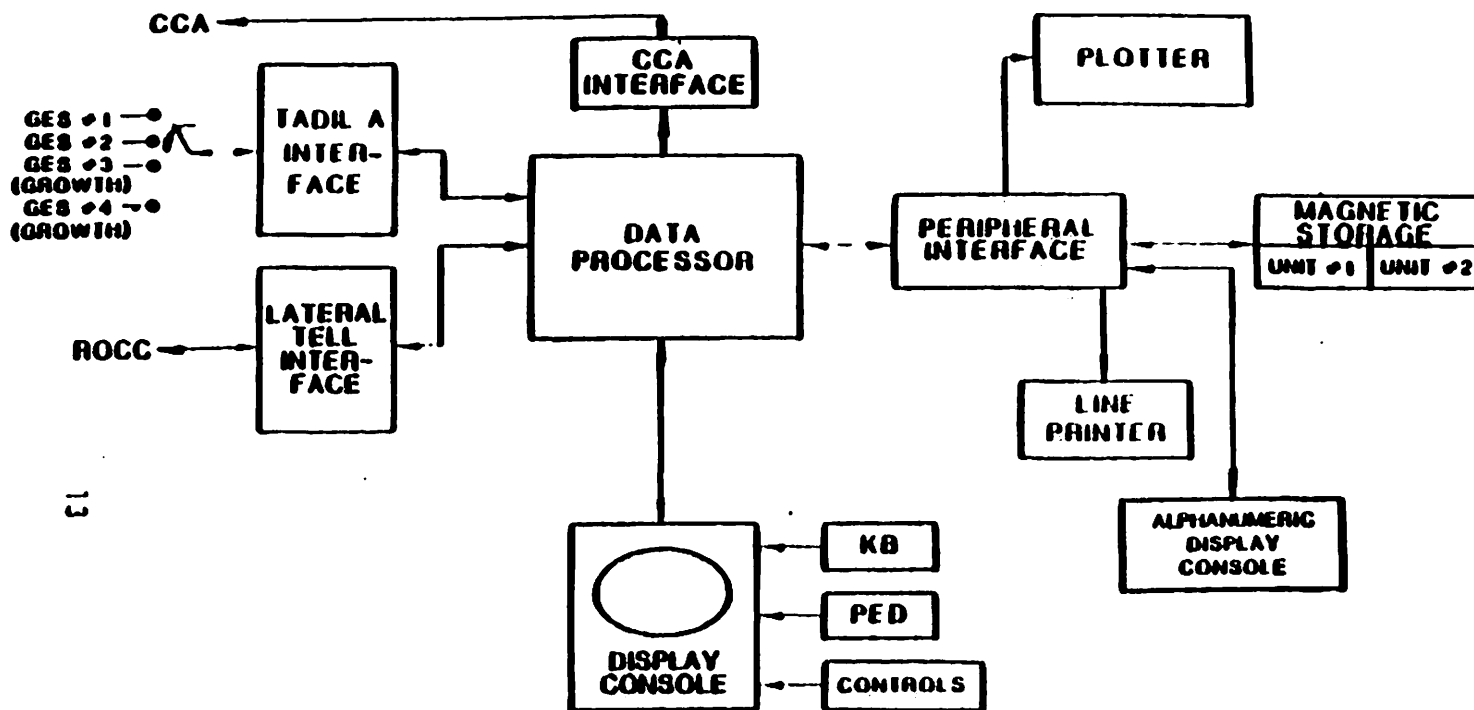
**3.1.2 Mission.** The mission of ICCE is to provide clear and secure voice communications between the MDC/IADCF and airborne E-3. The ICCE shall also provide secure digital data interfaces between airborne E-3 aircraft and the MDC/IADCF for the exchange and display of command and control data. ICCE track data shall be provided to the CCA System to support CC operations.

**3.1.3 Threat.** The threat for ICCE shall be as specified in the ICCE Concept of Employment.

**3.1.4 System Diagrams.** System diagrams for the POFA, GESSs, and the communication equipment located at the MDC/IADCF and KNCS are shown in Figures 2 through 6. The ICCE Specification Tree is shown in Figure 7.

**3.1.5 Interface Definition.** The ICCE System contractor shall implement the external and internal interfaces and information flow requirements defined below.

**3.1.5.1 External Interfaces.**



PED - Position Entry Device  
KB - Keyboard

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Figure 2. Processing and Display Functional Area

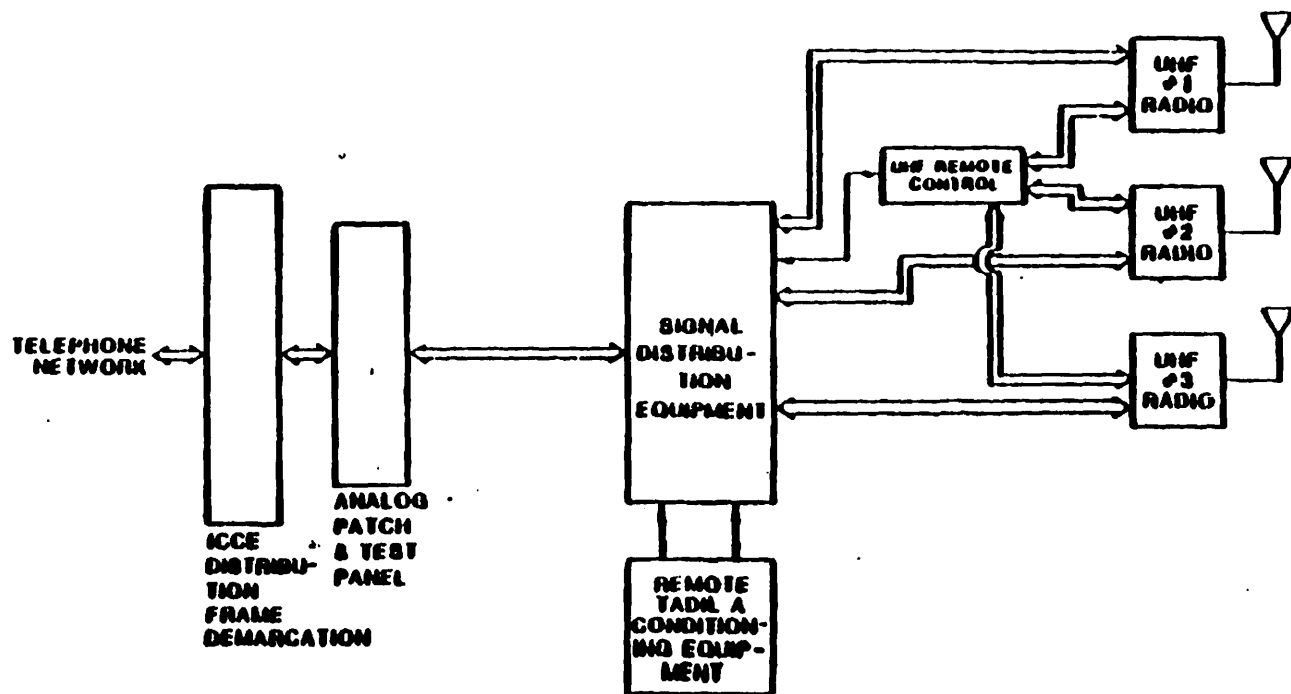


Figure 1. UNIF GES

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6 September 1983

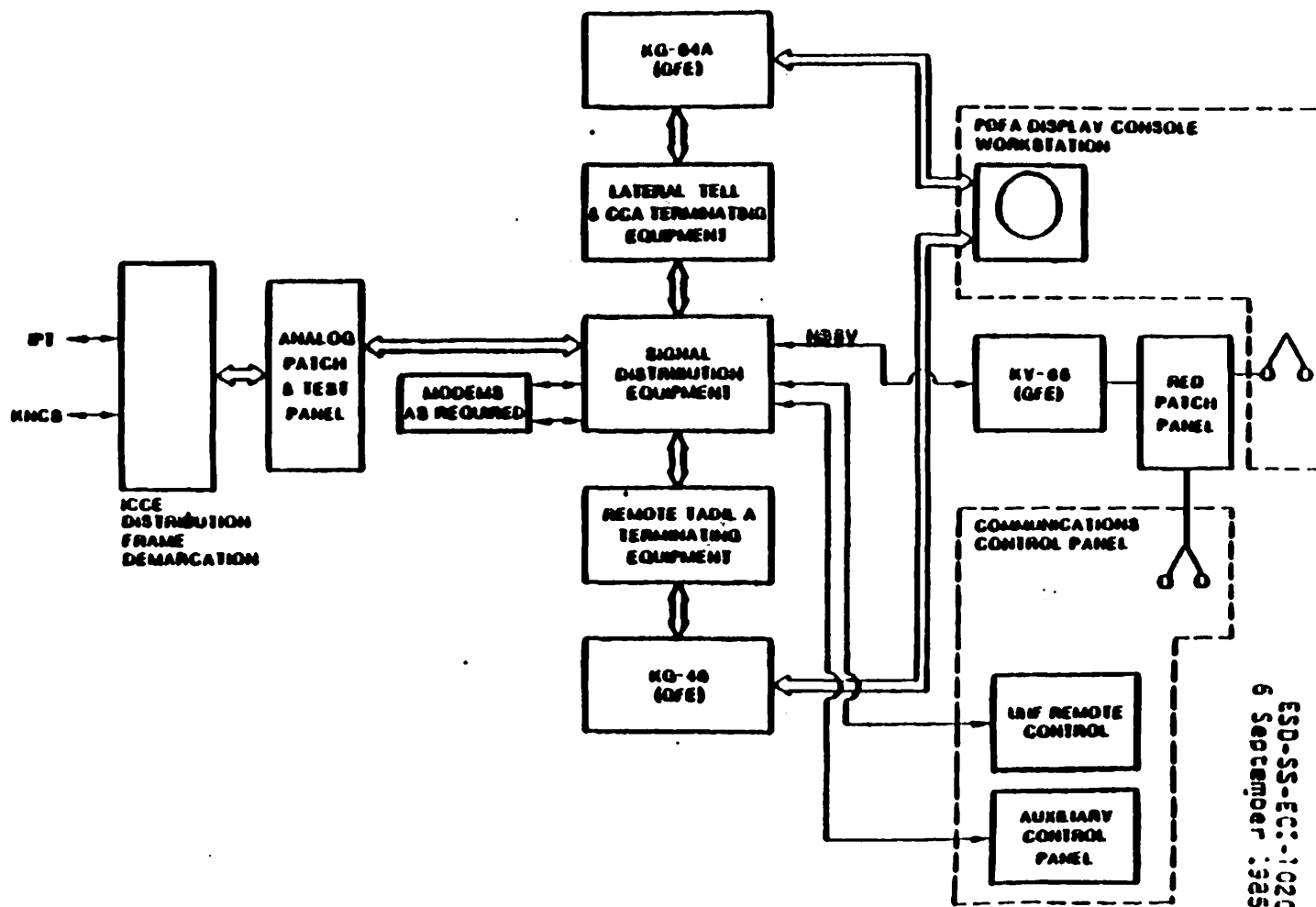
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Figure 4. HF (Transmitter) GES - Deleted

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Figure 5. HF (Receiver) GES - Deleted





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Figure 6. MDC/ROCC Communication Equipment

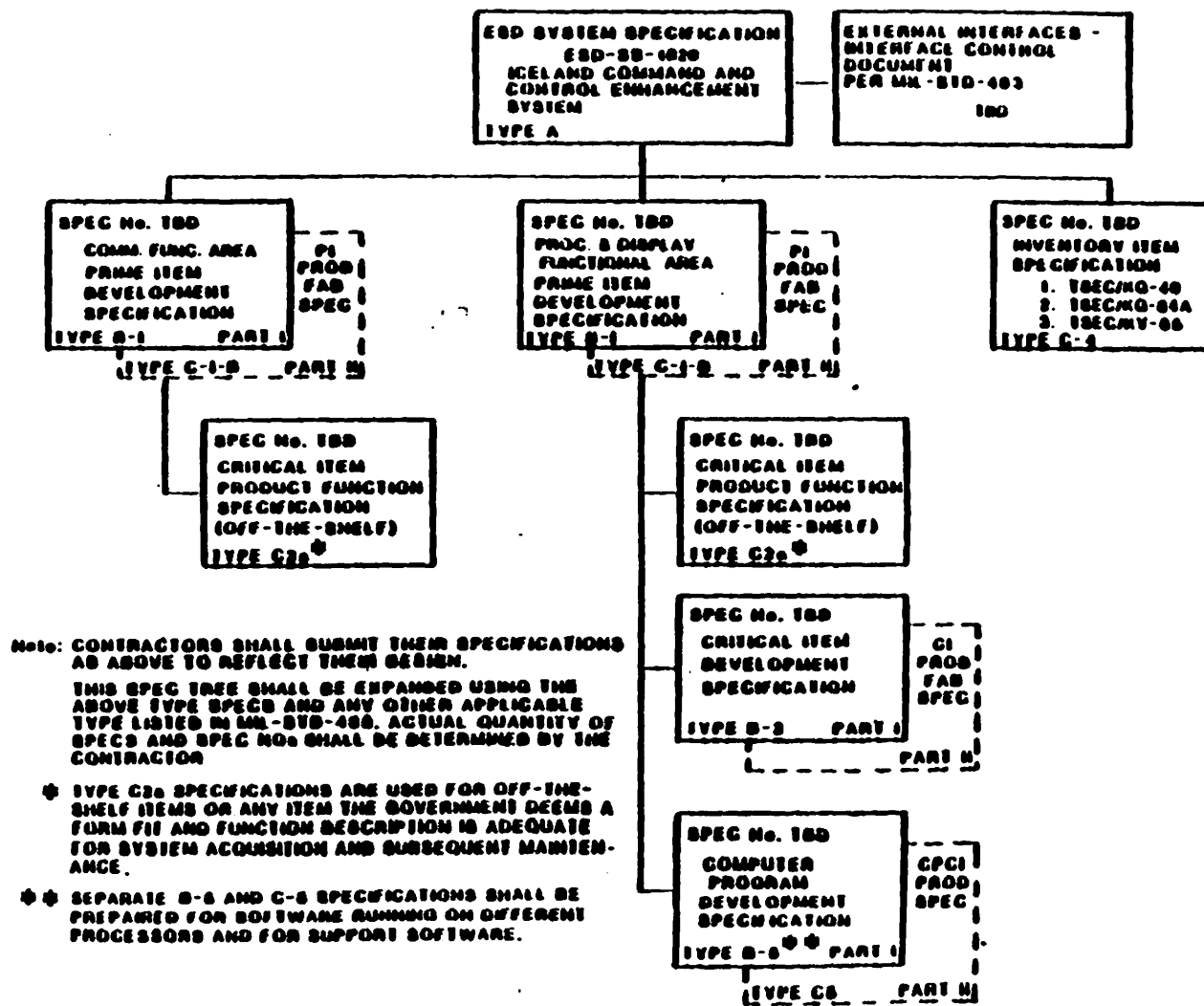


Figure 7. ICCE Specification Tree

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3.1.5.1.1 E-3. The ICCE System shall interface with the E-3 through radio transmissions in the UHF military frequency band. For UHF transmissions, Frequency Modulation (FM) shall be used for TADIL A and either FM or Amplitude Modulation (AM) shall be used for voice. TADIL A transmission and reception capability shall be in accordance with MIL-STD-188-203-1. Both secure and unsecure voice and secure data transmissions shall be compatible with radio and baseband equipment in the E-3.

3.1.5.1.2 ROCC. The IADCF will be a ROCC. The ICCE System shall interface with the ROCC through a PDFA lateral-tail port. Transmission at 2400 baud between the ICCE System and the ROCC shall be through termination and communication equipment. The ICCE-to-ROCC interface shall be in accordance with the Computer Program Development Specification for the Applications Set of the JSS ROCC, Specification TM(NORAD) 637/030/01 and the ROCC Digital Switch Interface Control Drawing, Specification 1661900-5030.

3.1.5.1.3 CCA. The ICCE System shall communicate with the CCA System over a TADIL B data link as specified in JCS PUB 10. The TADIL B shall be used to transfer data from the ICCE System to the CCA System.

3.1.5.1.4 Prime Power. The equipment located at the northern GESs will be provided facility power of 220 volts  $\pm$  10 volts, 50 Hz  $\pm$  1 Hz. The equipment located at the MDC/IADCF and the GESs at Rockville and Hofn will be provided facility power of 110 and/or 220 volts  $\pm$  10 volts, 60 Hz  $\pm$  1 Hz.

### 3.1.5.2 Internal Interfaces.

3.1.5.2.1 IPT Communications. Each northern GES shall be connected to the ICCE connectivity equipment at the KNCS switching center through IPT telephone trunks and KNCS facilities. The physical interfaces with IPT telephone trunks shall be at the Distribution Frame (DF) within each northern GES. IPT shall not apply in-band signalling on these trunks.

The nominal interface shall be as follows at the IPT DF:

#### 4-wire point-to-point trunks

- |                                 |   |
|---------------------------------|---|
| a. receive test tone (TT) level | +8 dBm $\pm$ 0.5 dBm;<br>600 ohms $\pm$ 40 ohms |
|---------------------------------|---|

- b. transmit TT level  $-14 \text{ dBm} \pm 0.5 \text{ dBm};$   
 $600 \text{ ohms} \pm 40 \text{ ohms}$

The characteristics of the IPT telephone circuits shall be as follows:

- a. Limits of overall loss relative to that at 800 Hz

<u>Frequency Band (Hz)</u>	<u>Overall Loss Limits (dB)</u>
0 - 300	not less than 0.0
300 - 500	between -2 and +12
500 - 2500	between -2 and +8
2500 - 3000	between -2 and +12
above 3000	not less than 0.0

- b. Limits for group delay relative to the minimum group delay in the 600 - 2800 Hz band

<u>Frequency Band (Hz)</u>	<u>Maximum Group Delay (ms)</u>
600 - 1000	3
1000 - 2600	1.5
2600 - 2800	3

- c. The random circuit noise shall not exceed -38 dBmOp.

3.1.5.2.2 Military Communications. The MDC/IADCF shall communicate with the southeast GES through the KNCS, the military MARS tropospheric scatter radio system and the Hofn communication station. The physical interface to the southeast GES shall be the AMP Barrel Interconnect Block (Part No. 553148-1). The CC, the MDC/IADCF, and the southwestern GESs shall interface through the KNCS facilities. The physical interface to the KNCS facilities shall be the AMP Barrel Interconnect Block (Part No. 553148-1). All military circuits will meet DCS telephone circuit parameter V1 specified in DCA Circular 300-175-9 for circuit quality specified below. The KNCS shall not apply in-band signalling on these circuits.

The characteristics of the KNCS telephone circuits shall be as follows:

- a. Limits of overall loss relative to that at 1004 Hz.

<u>Frequency Band (Hz)</u>	<u>Overall Loss Limits (dB)</u>
400 - 2800	between -8 and +20
600 - 2400	between -7 and +12

- b. The maximum allowable idle circuit noise is 37 dBmCo.

The KNCS circuit between Rockville and Grindavik will meet the CS line conditioning specification per DCA Circular 300-175-9 given below.

- a. Limits of overall loss relative to that at 1000 Hz.

<u>Frequency Band (Hz)</u>	<u>Overall Loss Limits (dB)</u>
300 - 2700	between -1 and +3
500 - 2800	between -0.5 and +1.5

- b. The maximum envelope delay distortion between any two frequencies 200 Hertz apart.

<u>Frequency Band (Hz)</u>	<u>Max. Envelope Delay (ms)</u>
500 - 2800	0.600
600 - 2600	0.300
1000 - 2600	0.100

The nominal interface to all KNCS circuits shall be:

4-wire point-to-point circuits

- |                      |  |
|----------------------|--|
| a. receive TT level  | $+7 \text{ dBm} \pm 0.5 \text{ dB}$<br>$600 \text{ ohms} \pm 40 \text{ ohms}$  |
| b. transmit TT level | $-15 \text{ dBm} \pm 0.5 \text{ dB}$<br>$600 \text{ ohms} \pm 40 \text{ ohms}$ |

**3.1.6 Government Furnished Property List.** The Government will furnish the contractor with the following for integration into the ICCE System:

<u>Device</u>	<u>Quantity</u>
TSEC/KG-40 (NTDS) encryption device	1
TSEC/KY-65 encryption device	2
AN/USQ-76 Data Terminal Set	3
Telephone circuits (IPT)	TBD
KNCS circuits (military)	TBD

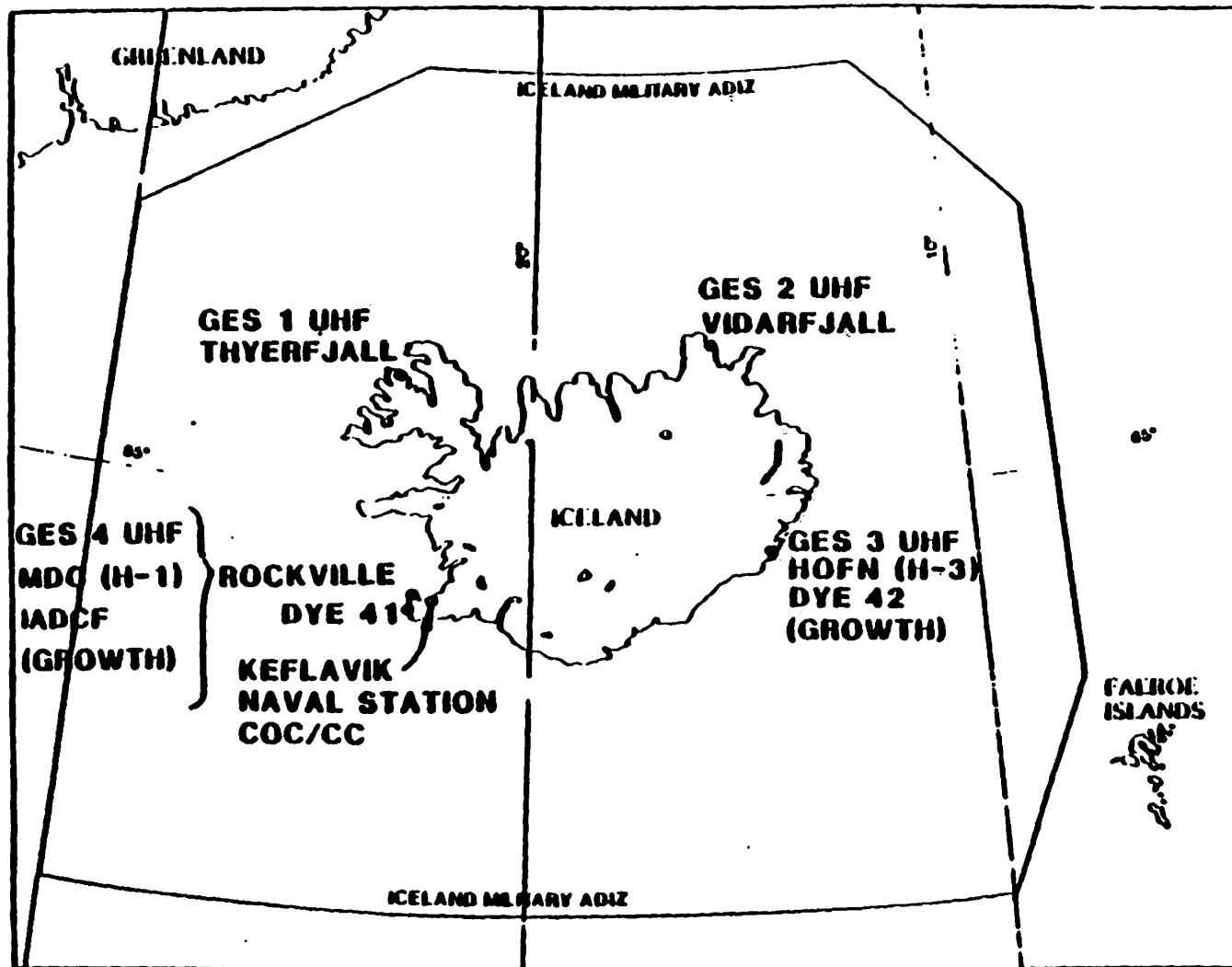
**3.1.7 Operational and Organizational Concepts.** The ICCE System shall consist of the MDC/IADCF, the CC, five GESs, and telephone interconnect facilities. These facilities provide the means by which ground-based operations shall be provided secure communications to the E-3 for voice and digital transfer of command and control information. Communications coverage to the E-3 shall extend from the GOCs through GESs via telephone interconnect facilities. Figure 8 illustrates the geographic location of the MDC/IADCF, CC, and GESs in Iceland.

GES 1 at Isafjordur and GES 2 at Thyerfjall shall contain UHF radios for simultaneous voice and TADIL A communications to the E-3 and shall be unmanned facilities. GES 3 at Hofn and GES 4 at Rockville shall also contain UHF radios and will be manned (growth only).

The telephone interconnect facilities shall consist of IPT circuits between the northern GESs and Keflavik Naval Station, military NARS circuits between Hofn (DYE 42) and DYE 41, military cable or microwave circuits between all other ICCE facilities, and equipment for remote selection of GESs at KNCS.

The MDC/IADCF shall be capable of direct communications to an E-3 employing TADIL A or voice via any GES. The MDC/IADCF shall have communication access to all GESs. The MDC/IADCF and E-3 will be interconnected via the ICCE System to allow for the exchange and display of information.

The PDFA operators shall have the capability to select air tracks for transmission to the IADCF through the selection of transmit filters. All track information in the MDC/IADCF ICCE equipment shall be relayed to the CCA System.



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Figure 8. ICCE Locations

**3.2 Characteristics.** The ICCE System shall have the performance, physical, reliability, maintainability, environmental, and transportability characteristics specified in the following paragraphs.

**3.2.1 Performance Characteristics.** The ICCE System, consisting of the PDFA and the CFA, shall have the following system performance characteristics:

- a. The ICCE System shall be capable of operating on and processing the data of a TADIL A net in accordance with the standards defined in 3.2.1.1.2.
- b. The ICCE System shall have a capacity of (see 10.0).
- c. The ICCE System shall provide a TADIL A message error performance between the E-3 and MDC/IADCF of  $10^{-3}$  through the UHF GESS.

**3.2.1.1 Processing and Display Performance Characteristics.** The PDFA, which consists of the processing and display hardware and software at the MDC/IADCF, shall have the performance characteristics stated below.

**3.2.1.1.1 Capacities and Accuracies.** The PDFA shall meet the following capacity and accuracy requirements:

- a. The PDFA shall interoperate for the exchange of command and control data at the required interface transfer rate, and in the prescribed message format with a TADIL A net.
- b. The PDFA shall exchange command and control data at the required interface transfer rate, and in the prescribed message format with the IADCF via lateral-tell, with a message error performance of  $10^{-3}$ .
- c. The PDFA shall provide, to the maximum extent possible, two-way translation between TADIL A M-series messages and IADCF lateral-tell messages.
- d. The PDFA shall output its track data base for transmission and update to the CC (CCA System) over a TADIL B data link. Transmission and updates of the track data base to the CC (CCA System) shall occur as a minimum every 45 seconds (based on a maximum track capacity). No simulation tracks shall be transmitted to the CC (CCA System).



- e. The PDFA shall record all received and processed data from both TADIL A and lateral-tell IADCF interfaces, and locally generated data as controlled by the system operator.
- f. The PDFA shall have the capability to generate and maintain (see 10.0) local tracks created by operator inputs.
- g. The PDFA shall have the capability of maintaining (see 10.0) remote tracks received from the TADIL A and IADCF lateral-tell interfaces.
- h. The PDFA shall process operator controlled input and output filters to selectively control the information processed and transmitted.

**3.2.1.1.2 Message Processing.** The PDFA shall meet the following message processing requirements:

- a. The PDFA shall receive, transmit and process TADIL A M-series messages. Link protocols, message standards, and implementation shall be in accordance with JCS Pub 10 and the JSG/TCCCS Interface Design Handbook (IDH), Volume III. The PDFA shall receive, transmit, and process, as a minimum, the following M-series message types:
  - i) Data Reference Position Message
  - ii) Data Reference Position Amplify Message
  - iii) Air Track Position Message
  - iv) Air Track Amplify Message
  - v) Surface Track Position Message
  - vi) Surface Track Amplify Message
  - vii) Subsurface Primary Message
  - viii) Subsurface Amplify Message
  - ix) Subsurface Secondary Message
  - x) Special Points Position Message
  - xi) Electronic Countermeasures (ECM) Intercept Data Message
  - xii) Electronic Support Measures (ESM) Primary Message
  - xiii) Electronic Support Measures (ESM) Amplify Message
  - xiv) Information Management Message (Information Difference Report)
  - xv) Information Management Message (Change Data Order)
  - xvi) Information Management Message (Data Update Request)
  - xvii) Information Management Message (Drop Track Report)
  - xviii) Information Management Message (Track Alert Report)
  - xix) Information Management Message (Controlling Unit Report)

- xx) Information Management Message (Terminate Track Alert Report)
  - xxi) Information Management Message
  - xxii) Management Message (Pairing/Association)
  - xxiii) Management Message (Pointer)
  - xxiv) Management Message (Support Message)
  - xxv) Aircraft Control Message
  - xxvi) IFF/SIF Message
  - xxvii) Timing Message
- b. The PDFA shall receive, transmit, and process all IADCF lateral-tell messages. Link protocols, message standards, and implementation shall be in accordance with JSS ROCC Specification TM(NORAD) 637/030/01.
- c. The PDFA shall be capable of accepting and processing track and management data simultaneously available for display from a TADIL A net, an IADCF via lateral-tell, and locally generated track data.
- d. The PDFA shall transmit TADIL B M-series messages to the CCA System. Link protocols, message standards, and implementation shall be in accordance with JCS Pub 10 and JSG/TCCCS Interface Design Handbook (IDH), Volume III. The PDFA shall transmit the M-series messages of 3.2.1.1.2a and shall receive the following M-series messages:
- i) Test message
  - ii) Information Management Message (Data Source Report)
- e. The interface with the data sources shall have effective data rates as follows:
- TADIL A: 1364 and 2250 bps
  - Lateral-Tell: 2400 bps
  - CCA (TADIL B): 1200 bps
- f. Processing of a track shall be terminated if the track moves outside the system coordinates defined in 3.7.1.3.5.6.

**3.2.1.1.3 Response Time Requirements.** Response times are defined as the time from entry of the complete message until all responses indicated by the message type have been completed, or in the case of a hard copy device, until the time that the output action has been initiated. There will be four types of response times: the time between input device key depression and the display of the entered symbol in the device preview area; the time required for the

computer's acknowledgment that it has received and is processing an entered message; the time resulting from the processing of an accepted message; and the time between movement of the position entry device and the movement of the corresponding display symbol. Response times shall be satisfied while processing a system load that equals the capacity requirements specified in 3.2.1.

- a. Preview Response Time. Deleted.
- b. Message Acknowledgment Response Time. Every operator-entered message shall be acknowledged by display of an acknowledgment indication within 1.0 second after entry of the complete message.
- c. Processing Response Time for Entered Messages. The response time for action taken on a message shall be 2.0 seconds or less for each occurrence.
- d. Position Entry Device Response Time. Deleted.

3.2.1.1.4 Processing Time Requirements. The PDFA shall meet the processing time requirements specified below. Processing times shall be satisfied while processing a system load that equals the capacity requirements specified in 3.2.1.

- a. The PDFA shall display all eligible data within 2.0 seconds of receipt from the source.
- b. The PDFA shall update the display of each local track at least once per 15 second processing interval.
- c. The PDFA shall transmit its track data base to the CC (CCA System) over a TADIL B data link. Under maximum track load conditions, the complete data base shall be updated as a minimum every 45 seconds.

3.2.1.1.5 Start-up. Start-up is the process whereby the PDFA computer programs and data base are loaded into the processing equipment and operation of the System is initiated. The PDFA shall complete the start-up process within 10 minutes. The start-up time duration will be based on the premise that all necessary equipment has been turned on and is without failed components.

3.2.1.1.5.1 Start-over/Restart. Start-over/Restart is the process whereby the PDFA computer programs will automatically perform a reload when failures are detected. The PDFA shall complete a start-over/restart within 5 minutes and provide a message to the

operator which identifies what caused the restart. In the event of a fatal system error, a message code will be displayed indicating why the fatal error occurred.

**3.2.1.1.6 Data Recording.** The PDFA shall have a data recording capability. Recording shall be controlled by an operator at a display console of the PDFA. The operator shall have the capability to inhibit or enable data recording. During the execution of the operational program, the operational recording process shall store all messages, as controlled by the operator, on magnetic recording media. The format of the recorded data shall be compatible with the processing requirements of 3.2.1.1.7.

**3.2.1.1.7 Playback.** The PDFA shall be able to operate in a playback mode. In the playback mode, the PDFA shall control input, processing, and display of track data recorded during live operation. The track and geography data display shall duplicate that which existed when the data was recorded, provided that the operator enters comparable display control data. The playback display shall be suitable for plotter reproduction. The operator shall enter control commands for selection of the period of interest (start time) and duration of the playback display.

**3.2.1.1.8 System Simulation.** The PDFA shall be able to simulate message generation from external sources for use internal to the PDFA. Through the use of simulation software, PDFA equipment, and instructor personnel, a capability shall exist to simulate inputs from TADIL A net participants and the IADCF. The display console shall be used to enter and modify flight path parameters for a maximum of 20 simulated targets. The PDFA shall provide the capability to simulate flight paths of aircraft, surface craft, and subsurface craft.

**3.2.1.2 Communications Performance Characteristics.** The Communications Functional Area shall have the performance characteristics stated below.

**3.2.1.2.1 E-3 Communications.** The GESS shall provide voice and TADIL A radio communications with elements operating on the TADIL A net.

**3.2.1.2.1.1 TADIL A Equipment.** TADIL A terminating equipment shall include a DTS which shall be capable of operating as either the Net Control Station (NCS) or as a PU in accordance with MIL-STD-188-203-1. As an NCS, the DTS shall be able to address up to 16 (including itself) TADIL A participant addresses. For application to an RF link at the GESS, the DTS shall generate a composite audio signal (15 data

tones plus a Doppler tone) containing the encrypted TADIL A data. Upon receipt of the baseband TADIL A signals, the DTS shall convert the information to digital format and forward it to the PDFA. Functionally, the DTS may be split between the GES and MDC/IADCF, as long as net operations specified in MIL-STD-188-203-1 and JCS Pub 10 are not affected in any way.

**3.2.1.2.1.2 Radio Equipment Selection and Control.** The radio equipment shall include remotely controlled UHF radios and antennas at GESs for providing secure voice and TADIL A communications between the MDC/IADCF and the E-3. The MDC/IADCF shall be able to select and control any two radios for voice and any one radio for TADIL A communications. The MDC/IADCF shall also be able to select any GES telephone circuit for any radio within 500 milliseconds, and any GES telephone circuit for either voice or TADIL A communications. If only one circuit is available to a GES, that circuit shall alternately provide both voice communications to the GES radio and data signals required to remotely control a radio.

**3.2.1.2.2 GOC Communications.** Communications between the MDC/IADCF and the CC shall be provided by a CCA data link (TADIL B), and communications to the IADCF shall be provided by a lateral-tell link.

**3.2.1.2.2.1 CCA Data Link.** The CCA data link shall interface with the PDFA CCA port via TSEC/KG-84A encryption equipment at 1200 baud. The ICCE-to-CCA interface shall be TADIL B in accordance with MIL-STD-188-203-2.

**3.2.1.2.2.2 Lateral-Tell Data Link.** The lateral-tell data link shall interface with the PDFA lateral-tell port via TSEC/KG-84A encryption equipment at 2400 baud. The ICCE-to-ROCC interface shall be in accordance with the Computer Program Development Specification for the Applications Set of the JSS ROCC (Specification No. TM(NORAD) 637/030/01) and the Interface Control Drawing to the Digital Switch (Specification No. 1661900-5030).

**3.2.1.2.3 Communications Monitoring.** All communication links shall be automatically monitored for proper operation. Communication link status shall be provided at the CCP.

**3.2.2 Physical Characteristics.** The System shall be designed to facilitate access, safety, maintenance, and shipment. Unless stated otherwise, the physical characteristics stated herein shall apply for all equipment.

**3.2.2.1 Weight Limits.** The equipment weight limits shall be consistent with existing facility floor loading capacity. LRUs shall not exceed a two person lift (75 pounds).

**3.2.2.2 Dimensional Limits.** The equipment dimension limits shall be consistent with existing facility ceiling heights, floor space, and entry and exit doors.

**3.2.2.3 Modular Design.** All new equipment designs shall use modular construction with the number of unique modules kept to a minimum. All new plug-in modules shall be standardized to permit interchangeability of like modules without alignment or adjustment. All new modules shall be keyed to prevent incorrect installation. Requirement of MIL-STD-1472C, paragraph 5.9.1.3 shall be met for all new modules.

**3.2.3 Reliability.** The reliability of the ICCE System shall be the Mean-Time-Between-Failures (MTBF) defined when voice and data (TADIL A) communications between the MDC/IADCF and the E-3 is achieved. Phone circuits are not considered in the reliability of the System.

**3.2.3.1 System Reliability.** The System shall achieve a predicted Mean-Time-Between-Failures [MTBF(Op)] of 720 hours as defined in MIL-STD-781C, paragraph 3.1.6.5. Prediction shall be computed using MIL-HDBK-217D, section 5.2 (Parts Count Prediction Method) and may be supplemented with vendor data.

**3.2.3.2 Reliability Design Criteria.** Fail-safe design techniques shall be applied to prevent failure of additional components as a direct result of the failure of any component. Malfunctions of the equipment shall not contribute to the destruction of that equipment beyond the failed LRU. An LRU is defined as the smallest assembly, subassembly, module, unit, or circuit card which can be removed and replaced through direct support on-equipment maintenance actions without cutting or unsoldering any connections.

**3.2.3.2.1 Accessibility.** (CFA only) It shall not be necessary to remove any LRU to access another LRU. The accessibility requirement of MIL-STD-454H, Requirement 36 shall be met. Exceptions to the accessibility requirements must be approved by the Government.

**3.2.3.2.2 Test Point.** Test points and facilities for connecting test equipment shall be provided for determining the performance quality of the equipment. Test points shall be in accordance with 3.3 of this specification.

**3.2.4 Maintainability.** Maintainability terms and definitions shall be in accordance with MIL-STD-721C.

**3.2.4.1 Corrective Maintenance.** The System shall have a system mean corrective maintenance time (Mct) of no greater than 30 minutes and a maximum corrective maintenance time (Maxct) of no greater than one hour at the 90th percentile. The corrective maintenance for hardware elements shall include the time required to locate a fault, perform the necessary remove-and-replace procedures, and return the System to operation. Travel time will not be included in the corrective maintenance time.

**3.2.4.2 Preventive Maintenance.** Schedule preventive maintenance downtime ( $M_{MAXPM}$ ) shall not exceed 40 hours for each 180 day period. Preventive maintenance which can be performed on-line without degradation of the operation will not count as part of preventive maintenance downtime. Scheduled maintenance shall be established in accordance with the Reliability Centered Maintenance (RCM) analysis concept. Maintenance intervals shall be selected to insure that not more than a 5% probability of failure exists between inspections of an item.

**3.2.4.3 Skill Levels.** All items of equipment designed uniquely for the System shall be maintainable using normal maintenance techniques by the equivalent of an AF skill level five maintenance personnel trained on the equipment.

**3.2.5 Availability.** Availability is specified herein for the System, as defined in 3.2.3, as .9993.

**3.2.6 System Effectiveness Models.** Not applicable.

**3.2.7 Environmental Conditions.** The CFA and POFA equipment shall meet all performance requirements of this specification and exhibit no physical damage such as corrosion, rust, blistering, swelling, pitting, flaking, loosening of finish, structural degradation, or deterioration of parts and materials under the following conditions.

**3.2.7.1 Nonoperating.** The CFA and POFA equipment, when packaged for storage or transport, and in any nonoperating configuration, shall meet the performance requirements of this specification after exposure to any and/or all of the following conditions:

- a. **Temperature.** Continuous exposure to air temperatures from  $-30^{\circ}\text{F}$  to  $+120^{\circ}\text{F}$  daily without solar radiation and with negligible air movement.

- b. Relative Humidity. 0 to 80 percent (noncondensing).
- c. Altitude. Up to 10,000 feet above sea level.
- d. Salt Atmosphere. (CFA only) The equipment shall withstand the effects of a salt atmosphere during ocean or coastal transportation as specified in MIL-E-16400, paragraph 3.3.5.4.

3.2.7.2 Operating. The CFA and PDFA equipment shall be capable of continuous (24 hour per day) operation and shall meet the performance requirements of this specification while being subjected to any and/or all of the following conditions:

- a. Temperature. The ICCE PDFA equipment shall operate in accordance with this specification while continuously exposed to air temperatures from 60° F to 85° F. The communication equipment installed inside the facilities at Isafjordur (GES 1) and Thyerfjall (GES 2) shall operate in accordance with this specification while continuously exposed to air temperatures from 40° F to 80° F. Exposed cables, antennas, and other equipment shall operate in accordance with this specification while continuously exposed to air temperatures from -25° F to 125° F.
- b. Relative Humidity. 15 to 80 percent (noncondensing).
- c. Sand and Dust. The antennas and other exposed equipment-cables shall withstand the effects of sand and dust as specified in paragraph 5.1.21.3 of MIL-STD-210B for natural conditions.
- d. Rain. The antenna and other exposed equipment-cables shall operate under the conditions and withstand the effects of rain up to and including rainfall of four inches per hour.
- e. Salt Atmosphere. Same as specified in 3.2.7.1.d.
- f. Altitude. Up to 5,000 feet above sea level.
- g. Ice and Snow. The antennas and other exposed equipment and cables shall withstand one half inch of radial ice with a wind velocity of up to 100 mph.
- h. Wind. The antennas and other exposed equipment-cables shall withstand wind velocities of up to 130 mph.



**3.2.8 Nuclear Control Requirements. Not applicable.**

**3.2.9 Transportability.** All equipment components shall be capable of being transported by C-130 fixed-wing aircraft, helicopter of the HH3 type, trucks of the M-35 type, and arctic terrain vehicles. Unitized transport loads shall withstand the shocks and vibrations encountered in transportation while prepared for delivery with no part becoming permanently warped, deformed, damaged, or loosened and with no permanent degradation in performance or useful life as a result of being subjected to the following conditions:

- a. Shocks of the type, intensity, and duration to which the equipment may be subjected during transport. These conditions include loading and unloading from a truck, aircraft, helicopter, ship, barge, or arctic vehicles.
- b. Vibrations having sinusoidal resonance and cyclings as normally encountered in:
  1. Travel on M-35 type trucks over rough cross-country terrain, gravel roads, unimproved roads, or packed snow
  2. Shipment by ship, aircraft, helicopter, or barge

**3.3 Design and Construction.** The design and construction of the System shall be accomplished in accordance with the requirements specified herein. All equipment used in this program shall have a useful life of 15 years and a minimum shelf life of 10 years. All components shall function properly under mission operating conditions of 24 hours per day, 7 days per week, with downtime for corrective and preventive maintenance as defined in this specification. The requirements of MIL-E-4158E, paragraph 3.2, shall apply as general design requirements for this specification.

- a. New hardware designed, developed, and produced for use in this System shall comply with all design and construction requirements set forth herein.
- b. These design and construction requirements of 3.3.1 do not apply to off-the-shelf hardware currently being used by DOD.
- c. Existing hardware selected for use in this System and not currently in use by the U.S. DOD and any modifications thereto, shall meet all design and construction requirements set forth herein, unless those requirements are waived by the Government for use in specific applications in this System.

**3.3.1 Materials, Processes, and Parts.** Selection of materials, processes, and parts to be used for newly developed equipment in the System shall conform to the requirements of MIL-E-4158E, paragraphs 3.3, 3.4, and 3.5.

**3.3.1.1 Parts Selection.** All parts employed in the manufacture of newly designed or modified items (modified portion only) of the System shall be selected in accordance with the Program Parts Selection List (PPSL) Electrical-Electronic Parts and the PPSL Mechanical Parts. Parts covered by the above mentioned PPSL shall be selected in accordance with MIL-E-4158E and MIL-STD-965. In addition, all parts shall be screened through the Government-Industry Data Exchange Program (GIDEP) Failure Experience Data Base (FEDS) prior to their selection. Only nonstandard parts and those parts identified as "Assigned MPCAG Commodities," as shown in paragraph 6.4 of MIL-STD-965, must be approved by the procuring activity in accordance with MIL-STD-965 prior to being added to the Amendment to the Baseline PPSL.

**3.3.1.2 Semiconductors and Microcircuits.** All semiconductors and microcircuits shall be selected from the PPSL Electrical-Electronic Parts, supplemented by Rome Air Development Center (RADC) Microcircuits Reliability Assessment Program and Semiconductor Reliability Assessment Program. When a part is required that is not included in this list, the use of the part shall be justified in accordance with MIL-STD-965. These parts shall be selected in accordance with MIL-STD-454H, Requirement 30 (semiconductors) and Requirement 64 (microcircuits).

**3.3.1.3 Connectors and Cables.** Insulation for multi-conductor cables shall be in accordance with MIL-E-4158E, paragraph 3.2.38. Cables used shall be in accordance with MIL-STD-454H, Requirement 10, paragraph 15. Nonstandard cables shall require Government approval before use in the System.

**3.3.1.4 Corrosion Control.** Corrosion control shall comply with the requirements of MIL-STD-1250.

**3.3.1.5 Materials and Finishes.** The requirements of MIL-F-140729 govern the selection of materials and finishes, except that the color of the final film for paint finishes shall be as specified in the individual product specification.

**3.3.2 Electromagnetic Radiation.** All equipment when assembled into the System shall neither cause nor be susceptible to undesirable response, malfunction, or degraded performance due to operations collectively or individually of any other equipment or subsystems installed at or associated with the MDC/ROCC and the GESS.

**3.3.2.1 Electromagnetic Interference and Susceptibility.** Newly designed equipment shall comply with MIL-STD-461B, Part 1 and Part 4.

**3.3.2.1.1 Lightning, Bonding, and Grounding Protection.** Lightning protection shall be provided for equipment and personnel. Surge protection shall be provided on all incoming power and signal lines and cables. Lightning, bonding, and grounding protection shall be in accordance with MIL-E-4158E and MIL-STD-188-124.

**3.3.2.2 Electromagnetic Compatibility.** The CFA equipment, POFA equipment, power-generating equipment, and any collocated equipment associated with the System shall be electromagnetically compatible in accordance with MIL-E-6051H. Any Contractor Furnished Equipment (CFE), GFE, or off-the-shelf equipment used in the System shall be electromagnetically compatible with all deployed equipment.

**3.3.2.3 TEMPEST.** The System shall be installed in accordance with NACSIM 5203. The contractor shall provide all equipment required to filter the power sources and supplies. The contractor shall provide all special software required to produce specific displays and message transmissions for conducting TEMPEST testing.

**3.3.3 Nameplates and Product Marking.** Nameplates and product marking for newly developed equipment shall be in accordance with MIL-E-4158E.

**3.3.4 Workmanship.** Workmanship shall be in accordance with the requirements of MIL-STD-454H, Requirement 9.

**3.3.5 Interchangeability.** Interchangeability shall be in accordance with the provisions of MIL-STD-454H, Requirement 7.

**3.3.6 Safety.** All equipment shall be designed and constructed so that the potential for personal injury during installation, test, operation, and maintenance is minimized. The provisions of MIL-STD-454H, Requirement 1 and the provisions of MIL-STD-1472C, paragraph 5.13 shall apply. In case of conflicts, the provisions of MIL-STD-454H shall apply. Equipment shall be designed so that operator and maintenance personnel cannot cause failure of the equipment. Malfunctions of the equipment shall not contribute to the destruction of the equipment. Commercial off-the-shelf electrical

equipment and assemblies shall be listed by Underwriters Laboratories (UL) or equivalent. All equipment shall be designed and installed to maximize the safety of personnel and equipment.

**3.3.7 Human Performance and Human Engineering.** Newly designed equipment shall conform to human engineering design criteria and principles to achieve safe, reliable, and effective performance by operator and maintenance personnel and to minimize personnel skill requirements and training time. The provisions of MIL-STD-1472C, paragraphs 3.0, 4.0, and 5.0, except for 5.14.1 and 5.14.2, shall apply to newly designed equipment. All equipment noise levels, excluding noise due to the radio equipment when a speaker is in use, shall not exceed 50 dB(A).

Alarms shall be provided to designate equipment faults or other conditions requiring human attention.

**3.3.8 Computer Programming.** This section defines general requirements for new Computer Programs (CPs) produced to meet this specification. The term "computer programs" shall encompass software and firmware. CPs shall be all computer programs necessary to meet the requirements of this specification and all computer programs used during software development and all programs required for testing. All executable data bases shall be described as software in the documentation.

**3.3.8.1 CPCI Organization.** The following requirements shall apply to Computer Program Configuration Item (CPCI) organization:

- a. The number of CPCIs shall be minimized.
- b. Each CPCI shall reside in a single computer and shall be tested on a single computer.
- c. For the purpose of this paragraph, a unique Operating System (OS) is defined as a single vendor product that controls the allocation of computer resources for a single vendor-supplied computer system. A separate CPCI shall be provided for each unique OS.
- d. For the purpose of this paragraph, a unique Software-Firmware Utility Services (SFUSs) is defined as the set of compilers, assemblers, diagnostics, and editors that a vendor provides to support a single computer system. A separate CPCI shall be provided for each unique SFUS.

- e. Computer programs shall not be part of any hardware Configuration Item (CI). However, the hardware that houses the imbedded software (firmware) shall be a hardware CI.
- f. There shall be a separate CPI for computer programs generated by separate organizations such as a subcontractor.
- g. Existing commercial computer programs shall be separate CPIs.
- h. Existing Government computer programs, if used, shall be split into separate CPIs in accordance with the preceding rules and documented accordingly.

3.3.8.2 Structured Programming (SP). All CPs shall be designed and implemented using only the control constructs defined herein.

#### CONTROL CONSTRUCTS

- a. SEQUENCE - Sequence of two or more operations.
- b. IFTHENELSE - Conditional branch to one of two operations and continue.
- c. DOWHILE - Operation repeated while a condition is true.
- d. DOUNTIL - As in DOWHILE but test after operations.
- e. CASE - To select one of many possible cases.

These constructs shall be built using logically equivalent language simulations (see figure 9), that is, instructions in the language used shall follow the flowcharts depicted in figure 9 without necessarily explicitly using the names of constructs. The "go-to" capability is limited to the inherent branching of these structured programming constructs.

#### 3.3.8.3 Top-Down Approach.

3.3.8.3.1 Top-Down Modular Design (TDMD). The CP shall be logically designed using hierarchical levels. The levels of hierarchy shall correspond to levels of control of tasks performed by the System. The top level shall contain the highest level of control logic within the code hierarchy. Each sublevel shall consist of self-contained code components whose operations are subordinate to the code components in the next higher level. The essential characteristic of the top-down modular design shall be that, at each level and functional decomposition, the code shall be complete in itself. Some code may appear on more than one level in order to retain logical completeness at each level.

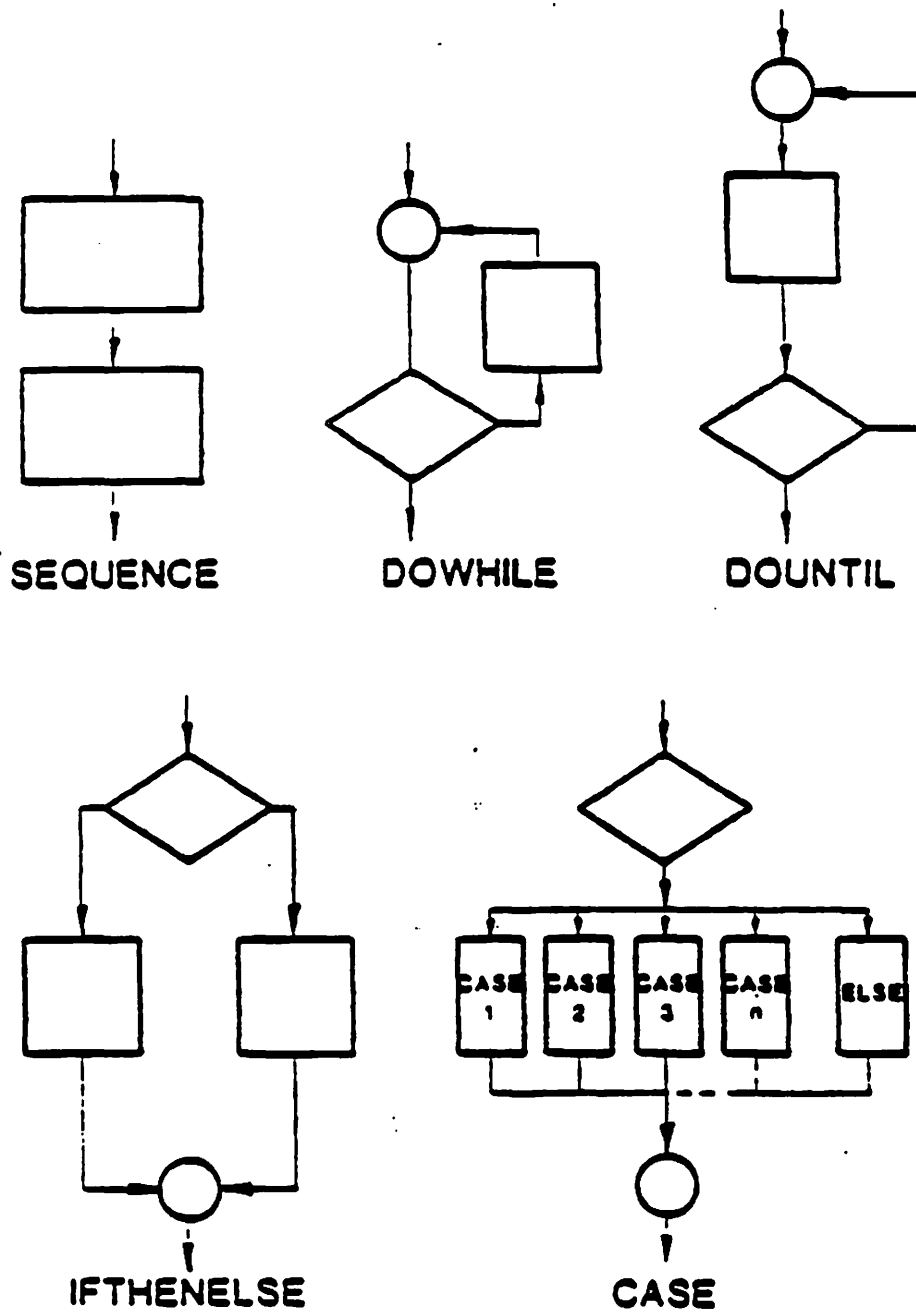


Figure 9. Control Constructs

3.3.8.3.2 Top-Down Implementation (TDI). The project software shall be implemented in a top-down manner, as defined herein. Conceptually, TDI proceeds from a single starting point, while conventional implementation proceeds from as many starting points as programs in the design. The single starting point does not imply that the implementing must proceed down the hierarchy in parallel. Some branches intentionally will be developed earlier than other branches. The project software shall be implemented in a series of "releases" which shall provide for successive system capabilities.

3.3.8.4 Programming Languages. Department of Defense (DOD) approved Higher Order Languages (HOLs) shall be used. The DOD approved HOL languages include:

- a. JOVIAL (J73) - as defined by MIL-STD-1589B (USAF)
- b. FORTRAN 77 - as defined by American National Standards Institute X3.9-1978 with or without MIL-STD-1753.
- c. CMS-2 - as defined by CMS-2M Users Reference Manual M-5049.

The use of HOL may be waived by the Government for the use of assembler language in the following areas:

- i. device handlers
- ii. time critical code
- iii. existing code

3.3.8.5 CP Commenting. The CP shall contain sufficient on-line documentation so that the observer shall be able to read the program header and each successive subtask header and understand the processing activities of the program without having to read program code. The program header shall be a set of consecutive comments that contain a descriptive abstract of the program. The program header shall occur once in the program listing and appear immediately before the first executable statement or data area.

3.3.8.6 Operating System Requirements. The OS shall conform to the following requirements:

- a. The OS shall be a vendor-supplied, off-the-shelf package.
- b. OS augmentations shall be allowed but shall be limited to new software. No augmentations shall be permitted to be embedded within the vendor supplied OS software; a separate interface shall be provided.

- c. No OS interface or augmentation software shall compromise the capability of the OS vendor to provide maintenance over the life cycle of the System.

**3.3.8.7 Coding Standards and Practices.** The contractor shall describe and use coding standards and practices to develop all CPs.

**3.3.8.8 Computer Programs for Microprocessors and Miniprocessors.** Computer programs intended for execution on a microprocessor or miniprocessor shall be considered to have the same requirements as computer programs intended for execution on large-scale processors.

**3.3.8.9 Microprogramming.** For the purpose of this contract, the Government considers microprogramming to be a method of implementing the control functions of a processor (microprocessor, miniprocessor, or large scale processor). Modifications or additions to the control functions (microprogramming) shall be subject to review and approval by the Government prior to implementation. All microprogramming shall comply with requirements concerning computer programs and documentation of computer programs within this specification.

**3.3.8.10 Firmware.** Programs or microprograms that are loaded in a class of memory (e.g., Read-Only Memory (ROM) and Programmable ROM) that cannot be dynamically modified by the computer during processing shall be considered firmware. Firmware (with the exception of commercial firmware) shall be specified in a CPCI specification (95 and C5). All firmware acquired for the System shall satisfy the requirements of MIL-STD-883B and MIL-M-38510. All firmware code shall be developed and documented to the same level as software.

**3.3.8.11 Character Set Standard.** Character sets shall conform to standards in American National Standard Code for Information Interchange, ANSI X3.5 - 1980.

**3.3.8.12 Support Software.** All contractor-developed support computer programs shall be documented in accordance with the requirements of this specification and the Contract Data Requirements List (CDRL). For off-the-shelf support computer programs, the contractor shall ensure that all vendor-supplied documentation meets the requirements of this contract. All computer programs used for contractor development testing and simulations shall be a part of the PDFA Support Computer Programs.



**3.4 Documentation.** Documentation for the detailed design, quality assurance, delivery, installation, operation, maintenance, support, and all other requirements for every Configuration Item (CI) shall be generated and delivered in accordance with requirements contained in the Statement of Work (SOW) and the CDRL.

**3.5 Logistics.** The System equipment shall meet the logistic requirements stated herein.

**3.5.1 Maintenance.** The requirements for hardware and software maintenance of the System are specified herein.

**3.5.1.1 Hardware Maintenance.** Organizational hardware maintenance shall be conducted on-island (Iceland). The on-site hardware maintenance of the System shall be the responsibility of the selected Operations and Maintenance (O&M) contractor. AFLC will provide depot level maintenance.

**3.5.1.1.1 Hardware Maintenance Concept.** The following concept shall be used for maintenance of ICCE hardware:

- a. The capability to repair the ICCE equipment on-island by contractor provided support personnel shall be provided to the maximum extent possible, based on a remove and replace concept.
- b. Organizational hardware maintenance of the ICCE equipment at all locations and installations shall be conducted and controlled from a central organizational facility at a Government-designated facility.
- c. Faulty units beyond the repair capability of the on-island personnel shall be repaired at a designated depot. Repaired units shall be returned to stock to replace units consumed to maintain equipment operation.

**3.5.1.1.2 On-line Checkout.** Software checkout programs shall be supplied to allow the operator to verify system accuracy.

**3.5.1.1.3 Failure Detection and Isolation.** The System equipment shall allow failure detection and isolation by any combination of software, built-in-test aids, technical manuals, circuit tests, and use of appropriate test equipment. These techniques, in conjunction with initial operator observations, shall permit recognition that a fault exists and permit isolation of the fault to the point at which repair or replacement can effectively be achieved at the operating location. Equipment shall incorporate features such as indicators,

warning signals, self-test circuitry, test jacks, and test points to facilitate troubleshooting and fault isolation to a single LRU.

**3.5.1.1.4 Maintenance and Repair Cycles.** The equipment shall require a minimum amount of maintenance and overhaul including scheduled organizational maintenance such as inspection, alignment, adjustment, and cleaning.

**3.5.1.1.5 Support Equipment.** Equipment shall be designed and selected to make maximum use of common support equipment in the repair and maintenance of the System. All support equipment such as cable extenders, cable extractors, and circuit card extenders required for maintenance of CPE shall be furnished by the contractor.

**3.5.1.1.6 Service and Access.**

- a. Equipment shall be designed and constructed so that access to equipment components shall be possible by AF 5-skill-level maintenance techniques. Maximum use shall be made of sealed, life-warranted, and easily removable plug-in module assemblies. Components and all electrical contact points that require frequent servicing, repair, or replacement shall be readily accessible. Components and modules shall be easily removable from their enclosures without excessive disassembly when the equipment is installed in its operating location.
- b. Assemblies and subassemblies shall be completely removable from their enclosures without disassembly. All connectors shall be appropriately keyed to prevent improper insertion. Printed Circuit Board (PCB) subassemblies inappropriate to physical keying shall be color coded, or otherwise marked, to indicate proper insertion orientation. Subassemblies shall be designed to permit maximum interchangeability and provide easy test accessibility. Test points shall be accessible without disassembly of the subassemblies. Access shall be provided to subassemblies and circuit cards through the use of access doors, swing-out units, or pull-out drawers having drawer slides. The capability to use cable extenders, cable retractors, and circuit card extenders shall be provided as part of the individual units to allow operation in the open position.

- c. Performance and fault monitoring shall be provided by adequate meters, test points, and lights located either on or easily accessible from the front of the cabinet without disassembly. Test points shall be designed and placed with due consideration for isolation and safety.
- d. All components, connectors, and assemblies shall be readily identified as to reference designator and location. Circuit breakers and indicators shall be easily accessible. A minimum of test equipment and special tools shall be required. Adequate space shall be provided to permit the use of tools.
- e. All controls (e.g., intensity and level adjustments, switches, and patch-panel connections) shall be designed for easy access without any equipment disassembly. They shall be located so that personnel can adjust the controls and switches and simultaneously witness the results without assistance.

**3.5.1.2 Software Maintenance.** System operational and support computer programs shall be maintained by TAC. Final checkout and integration of software modifications and enhancements shall be conducted on the operational system. The contractor shall develop a concept for supporting the System software that shall include a definition of equipment, documentation, manpower, and all other resources required. These resources shall permit total maintenance, integration, and testing of the System software.

**3.5.2 Supply.** Maximum use shall be made of existing federally stocked and listed items and support equipment within the DOD and General Services Administration (GSA) inventories, or standard Commercial Off-the-Shelf (COTS) parts.

All supply support requirements and stock levels for all items utilized by the System shall be determined by the contractor. Required bench stock levels will be maintained on-site. All support equipment and spares required during installation, test, checkout through final system test, and acceptance shall be provided by the contractor.

**3.5.3 Facilities and Facility Equipment.** The System shall be designed so that the equipment can be installed with minimal modification of existing facilities for cable installations, cooling requirements, equipment siting, and peculiar operating environment needs. Floor plans for the ICCE facilities at Rockville, Grindavik, Keflavik, Thyerfjall, Vidarfjall, and Hofn are given in MITRE Project Document 84-2092.

**3.5.3.1 Facility Access and Service.** Access to and serviceability of existing facilities at existing sites shall be determined by site surveys.

**3.5.3.2 Facility Power.** Military facilities will provide 110 and 220 volts a.c. 60 HZ power; civil sites will provide 220 volts a.c. 60 HZ power. All equipment shall be furnished to meet the power requirements of the facility into which it will be installed. Voltage and frequency fluctuations may be encountered, in which case the contractor shall protect the equipment from damage due to these fluctuations at all times.

**3.6 Personnel and Training.** Personnel and training requirements for the operation and maintenance of the System are defined below.

**3.6.1 Personnel.** Personnel requirements for the operation and maintenance of the System are defined below.

**3.6.1.1 Operational Personnel Requirements.** The operational system design shall be compatible with the operational personnel already on-site.

**3.6.1.2 Hardware Maintenance Personnel.** A contractor-supported organizational hardware maintenance staffed with appropriate personnel will be located at a Government designated facility and will be responsible for on-site hardware maintenance after system turnover.

**3.6.1.3 Software Maintenance Personnel.** TAC will maintain the system software in CONUS.

**3.6.2 Training.** The system training concept will be to train on-site operational personnel in the operation of the System, and to use these personnel for training additional personnel as required. The training program will be a mixture of in-plant and on-site simulation and on-equipment training. The contractor shall also provide a maintenance training plan to the Government to include lesson plans and training material.

**3.7 Functional Area Characteristics.** The following paragraphs provide the functional characteristics of the Processing and Display and the Communications Functional Areas.

**3.7.1 Processing and Display Functional Area.** The Processing and Display Functional Area shall consist of the hardware and software at the MDC/IADCF for receiving, transmitting, processing, recording, and displaying TADIL A messages to and from the E-3 aircraft and lateral-tell messages to and from the IADCF (ROCC). The PDFA shall also provide its track data base for transmission to the CCA System in the CC. The PDFA hardware shall consist of data processing equipment, peripheral equipment, and display and data entry equipment. PDFA software shall include operational and support computer programs.

**3.7.1.1 Data Processing and Peripheral Equipment.**

**3.7.1.1.1 Processing Equipment.** Processing equipment shall provide for the execution of stored computer programs and the storage of both data and instructions. Processing equipment shall respond to internally and externally generated interrupts and provide for the control of information transfers.

**3.7.1.1.1.1 Capacities and Capabilities.**

- a. Processing units shall be capable of executing the number and category of instructions per second required to perform the PDFA processing tasks defined in this specification while meeting the processing capacity requirements of 3.2.1.1 and 3.7.1.1.1.2.
- b. Internal memory modules shall supply the capacity to accommodate the storage of data base and instructions sufficient to accomplish the requirements defined in this specification while meeting the storage and capacity utilization requirements of 3.2.1.1 and 3.7.1.1.1.2.
- c. Processing equipment shall be capable of controlling the transfer of data to and from all external and internal devices and interfaces without loss of data.

**3.7.1.1.1.2 Data Processing Spare Capacities.** Deleted

**3.7.1.1.2 Peripheral Equipment.** Peripheral devices shall be provided to supply an input/output interface with the processing equipment to support the following tasks:

- a. Program storage, loading, and initialization
- b. Manual input/output
- c. Data recording
- d. Data reduction
- e. Fault detection and isolation
- f. Software development and maintenance

Whenever possible, the same device shall be time-shared to accommodate more than one of the above tasks. As a minimum the following device types shall be provided.

3.7.1.1.2.1 Line Printer. A line printer shall be provided and shall operate with a minimum speed of 300 lines per minute with a minimum of 120 printable symbols and/or spaces contained on each line.

3.7.1.1.2.2 Plotter. The plotter shall provide the capability of reproducing a hard copy of the picture displayed on the situation display console.

3.7.1.1.2.3 Alphanumeric Display Console. The Alphanumeric (A/N) display console shall contain a display unit and a data entry keyboard. The A/N display shall provide a dedicated area for status and control information associated with the initialization of the System.

3.7.1.1.2.4 Magnetic Storage. Magnetic storage devices shall be provided for storage of programs and data. The storage media shall be nonvolatile, removable, and storable for up to 180 days without loss of data. Dual magnetic storage devices for the recording of data shall be provided and shall have sufficient capacity to support the recording requirements of 3.2.1.1.6 under all system load conditions. Each data storage media unit shall not require replacement more often than once in four hours.

3.7.1.1.2.5 Map Generator. Deleted.

3.7.1.2 Display and Data Entry Equipment. The PDFA display and data entry equipment shall consist of display consoles and display monitors.

3.7.1.2.1 Display Console. The display console shall contain a display unit and associated controls. The display unit shall provide for the display of situation data, i.e., track data and map data, and tabular alphanumeric data display. The display console shall have a message composition and editing capability. All keys, switches, and position entry device shall be accessible to an operator seated in

the normal position. The characters presented on the display shall be designed for viewing at an eye-to-display surface distance of 30 inches.

**3.7.1.2.1.1 Display Characteristics.**

**3.7.1.2.1.1.1 Cathode-Ray Tube.** The display console shall utilize a color Cathode-Ray Tube (CRT) with a minimum usable surface area of 121 square inches for the display of situation data. The tabular display area shall provide for a minimum of 24 lines of 72 characters. The CRT phosphor shall be protected from burning during turn-on and turn-off actions or by the permanent location of display symbology.

**3.7.1.2.1.1.2 Data Entry Keyboard.** A QWERTY data entry keyboard shall support the capability to compose, edit, preview, and enter alphanumeric data messages. The entry of the completed message shall be accomplished by the activation of an enter control key. The data entry keyboard shall be illuminated to allow effective use in a darkroom environment.

**3.7.1.2.1.1.3 Position Entry Device.** A trackball shall be provided for use in referencing positions on the usable viewing surface of the display as data input to the computer. The position on the display of the trackball shall be marked by a cursor in the form of a symbol shape which moves in exact directional response to the movement of the trackball.

**3.7.1.2.1.1.4 Controls and Indicators.** Control and indicators shall be provided on the display console to facilitate effective operation of the console. As a minimum, the following shall be provided:

- a. Control of display brightness
- b. Power on-off indicator
- c. Warning condition indicators

**3.7.1.2.1.1.5 Maintenance Features.** All replaceable elements of the display console shall be easily accessible. A built-in test pattern shall be provided to facilitate display alignment.

**3.7.1.2.1.2 Situation Display Requirements.**

3.7.1.2.1.2.1 Range Scale Expansion Capability. A range scale expansion capability shall be provided that allows for a minimum of the following seven selectable range scales: 2048, 1024, 512, 256, 128, 64, 32, 16, and 8 nautical miles.

3.7.1.2.1.2.2 Off-Centering. It shall be possible to move the display center in any direction off-center, a distance up to at least one radius of the display.

3.7.1.2.1.2.3 Display Symbolology. A unique display symbol shall be provided for each track identity category, the net control station, and special points. Color coding of a track category symbol shall be used for track identification. Track symbolology shall include a velocity vector. The velocity vector length shall be relative to track speed. An indication of engagement between a friendly and a hostile track shall be provided.

3.7.1.2.1.2.4 Range-Bearing Line and Readout. Provision shall be made for the display of an operator-selectable range-bearing line along with a readout of the range in nautical miles and the bearing in degrees relative to magnetic north between any two designated points on the display surface. The end points of the range-bearing lines shall be position-selectable by the operator using the trackball.

3.7.1.2.2 Display Monitor. Deleted.

### 3.7.1.3 Operational Computer Programs.

3.7.1.3.1 Initialization. The initialization of the PDFA is defined as that process wherein system parameters and initial conditions for making the PDFA operational at a site are stored in the data processor. The data processor shall cause appropriate questions to be displayed. Proper responses to the questions shall accomplish initialization. Capability shall be provided to prestore initialization parameters. Initialization may be performed whenever changes in stored parameters are needed. Initialization parameters shall include as a minimum:

- a. Location of the System Coordinate Center (SCC), entered in LAT-LONG.
- b. Track number block assignment.
- c. Data Link Reference Point (DLRP), entered in LAT-LONG. The DLRP shall be changeable during system operation.



- d. Scope alignment. The scope alignment shall be changeable during system operation. At initialization, true north is activated.
- e. Elapsed staleness time as specified in 3.7.1.3.5.4, changeable during system operation.
- f. Data quality parameters as specified in 3.7.1.3.3, changeable during system operation.
- g. Data receive and transmit filters as specified in 3.7.1.3.2, changeable during system operation.
- h. Mode of operation, i.e., Live, Simulation, Playback, or Mixed Mode (Live-over-Simulation).
- i. Special points as specified in 3.7.1.3.6.2, changeable during system operation.

#### 3.7.1.3.2 Data Filtering.

3.7.1.3.2.1 Receive Filtering. TADIL A data receive filters shall be used to limit the processing and display of specific tracks to a specific area of interest. Filters shall be based on a defined geographic area (x,y) and track type. The geographic filter shall be a latitude- and longitude-defined rectangle which encompasses the area of interest.

3.7.1.3.2.2 TADIL A Transmit Filtering. A PDFA console operator shall designate manually generated tracks for transmission over the TADIL A net.

3.7.1.3.2.3 Lateral-Tell Filtering. The PDFA shall accept all tracks transmitted via lateral-tell from the IADCF (ROCC). The PDFA shall automatically transmit all tracks received from the IADCF (ROCC) over the TADIL A net. An ICCE display console operator shall control the transmission of tracks held by the PDFA to the IADCF (ROCC). Up to thirty tracks shall be told to the IADCF (ROCC). Updates to the designated tracks shall be automatically told, including predicted positional updates, to the IADCF (ROCC).

3.7.1.3.3 Real Time Analysis of Data Quality. A capability shall be provided to analyze the quality of digital communications inputs, and to display this performance and status information.

- a. The PDFA shall maintain separate counts of the number of messages that are accepted, rejected (based on track parity errors), and filtered from each data source in accordance with 3.7.1.3.5.1.
- b. The capability shall be provided to generate a summary tabular display containing the above counts for a designated facility as accumulated over a previous duration (variable parameter) of time.
- c. The capability shall be provided to generate an alert whenever the frequency of receipt of the above counts falls below a designated threshold (variable parameter).
- d. The PDFA shall maintain a count of the total number of tracks (including local tracks) being processed by the System.
- e. The PDFA shall have the capability of on-line data reduction to selectively display M-series messages and corresponding PU sources as controlled by the system operator. The format of the on-line data reduction shall be in accordance with the Data Extraction Reduction Analysis (D.E.R.A) formats specified in the TACS/TADS TIDP with the elimination of the time field.

**3.7.1.3.4 Coordinate Transformation.** Positional data received from TADIL A net participants and data locally generated at the PDFA shall be reported in coordinates with reference to each facility's system coordinate center. This positional data shall be transformed to a common System coordinate plane. Track data manually generated at the PDFA shall be entered in terms of latitude and longitude (LAT-LONG) or in World Geographic Reference System (GEOREF).

#### **3.7.1.3.5 Tracking**

**3.7.1.3.5.1 Track Source.** The PDFA shall process track data from three sources. Track data shall be from either a TADIL A net participant, manually initiated tracks from data entered into the PDFA, or tracks received via lateral-tell from the IADCF (ROCC). Local tracks shall be defined as tracks manually generated at the PDFA equipment. Remote tracks shall be defined as tracks generated from an external system (TADIL A net participant and the IADCF (ROCC)) and received by the System.

**3.7.1.3.5.2 Track Initiation.** Manual initiation of local tracks shall occur as a result of operator entry of the following track information: current position, current heading, estimate of velocity, and associated ID and status data. The capability to input current position in GEOREF and LAT-LONG shall be provided. The SCC location shall be entered during PDFA initialization. A manual data input capability shall be provided for all data fields that the System can transmit on TADIL A as specified in 3.2.1.1.2.

**3.7.1.3.5.3 Track Prediction.** The PDFA shall automatically maintain and update the position of each track once every fifteen seconds.

- a. The program shall use current velocity data entered by the operator, for manually initiated local tracks, to extrapolate track positions.
- b. Remote track positions shall be determined by information in the appropriate data link messages. If more than ten seconds elapse between position messages, the remote track position shall be predicted based upon the most recent velocity data available for that track. This prediction process shall continue until a drop track action is taken by the operator.

**3.7.1.3.5.4 Drop Track.** Processing and display of a track shall automatically cease if a Drop Track message is received on the TADIL A net or over the lateral-tail interface, if the track moves outside the System's display limit, or if the time since the last track update exceeds the elapsed staleness time.

**3.7.1.3.5.5 Track and Data Management.** The PDFA shall have the capabilities for track and data management as defined herein:

- a. The PDFA shall provide an automatic and manual Data Link Reference Number (DLRN) assignment scheme in accordance with 3.2.1.1.2 so that the PDFA's tracks can be accessed for any necessary functions, and so that data link operations are performed under applicable protocol rules. The operator shall be provided the capability, through the PDFA, to change the track number. Track number modification shall be accomplished in all displays. The PDFA shall provide track number scheme conversion between TADIL A tracks and IADCF (ROCC) tracks. Each manually entered track shall be assigned a discrete individual track number. The track number shall be selected from a primary block of track

numbers inserted by an operator during initialization into the computer by entering the lowest and highest track number of the block.

- b. The PDFA shall provide the operator the necessary information to identify and resolve identification, classification, and reporting responsibility conflicts, track number conflicts, and anomalies in tracking. Appropriate conversion of track identification and classification between local and remote track data shall be provided in accordance with 3.2.1.1.2.
- c. Track forwarding and retransmission capabilities for data link information shall be provided in accordance with the rules given in the JSG/TCCCS IDH, Volume III and as developed by the contractor. Transmit and receive filtering entered by the operator of geographic (x,y) data, on the basis of category (e.g., air, surface, and electronic warfare), and identification data, shall be provided for TADIL A. In addition, lateral-tell data link transmit filters shall be provided.

#### 3.7.1.3.6 Situation Display Processing.

3.7.1.3.6.1 Track Block. Selectable track blocks shall be provided for display in conjunction with track or PU symbology on the situation display. Special function keys shall be provided to deselect display of the entire track block or to display only the track number(s), voice call sign, or PU address. The track block shall move around the track symbology so as not to interfere with the velocity vector. The track block shall be structured as follows:

- a. Track number(s) (up to two, i.e., the TADIL A track number and lateral-tell track number) or PU address (four digit, four alpha, or two digit and two alpha field)
- b. Voice call sign in place of track number if available (four digit, four alpha, or two digit plus two alpha field)
- c. Speed (three digit field in 10 knot increments)
- d. Heading (two digit field in 10 degree increments)
- e. Altitude (two digit field in 1,000 ft. increments)
- f. Track quality (one digit field)

3.7.1.3.6.2 Special Points. The PDFA shall be capable of displaying a minimum of ten operator-selected special points. These special points shall be latitude- and longitude-defined, when entered and changeable by operator keyboard commands either at system initialization or during system operation.

3.7.1.3.6.3 Alert Indications. Alarms shall be provided as required by JCS Pub 10. Receipt of an alert from the TADIL A net due to an emergency or force-tell situation shall cause the specified track block, symbology, and heading indicator to begin flashing. Receipt of a Cease Alert message from the net shall stop the track block, symbology, and heading indicator from flashing. A means shall be provided whereby the operator may manually cease the flashing.

The PDFA shall monitor the number of tracks being processed and shall alert the operator when the number of tracks being processed reaches 80%, 90%, and 100% of the total capacity.

3.7.1.3.6.4 Feature and Category Selections. The operator shall be capable of dynamically selecting different situation display features and categories either separately or in combination. The PDFA displays shall include, but shall not be limited to, the following features and categories:

- a. Full track block
- b. Limited track block, i.e., track number and velocity-heading indicator
- c. Track speed and track quality
- d. Track heading and altitude
- e. All JCS Pub 10 identities to include but not be limited to: Interceptor, Hostile, Unknown, Faker, Pending, and Friendly tracks
- f. Special category identification classification

3.7.1.3.6.5 Hook Capability. The operators of the PDFA displays shall be provided a "hook capability" in order to designate a displayed data base element for operator action.

3.7.1.3.6.6 Maps. The System shall provide the capability to display static prestored maps and/or newly generated maps.

3.7.1.3.6.6.1 Static Maps. The PDFAs shall be capable of selectively displaying seven maps. The map projection shall be stereographic. The capability of overlaying any combination of maps, including up to four maps simultaneously, on the same display shall be provided. Each map shall consist of a minimum of 99 vectors with a total length on the selected scale expansion of 500 inches with each vector having at least one endpoint in the display area. The center of the times-one map display which encompasses a 2048 by 2048 data mile area at a times one expansion shall be at coordinates 66° 30' 00" N, 12° 30' 00" W. Maps shall be used for the display of static information. Information provided on each map is stated below:

- a. Map 1 - Political boundaries and the Iceland Military Air Defense Identification Zone (MADIZ)
- b. Map 2 - Intercept training areas and refueling areas
- c. Map 3 - Reykjavik flight information region and E-3 working areas
- d. Map 4 - Reference points (e.g., entry points, exit points, military installations, radar sites, and sector operating centers)
- e. Map 5 - LAT-LONG grid
- f. Map 6 - GEOREF grid
- g. Map 7 - UTM grid

3.7.1.3.6.6.2 Map Generation. Deleted.

3.7.1.3.6.7 Display Filtering. The operator shall be capable of manually selecting up to 10 filters simultaneously to prevent selected data types from being displayed. A tabular display shall be generated upon request to depict the active filters. The operator-selected filters shall include as a minimum:

- a. By DLRN, including interceptor and noninterceptor tracks
- b. By block of track numbers of DLRNs, including interceptor and noninterceptor tracks
- c. By group in terms of single-level identities, e.g., Friend, Hostile, Neutral, Unknown, Pending

- d. By track type, e.g., air, surface, subsurface
- e. By altitude according to designated upper and lower bounds
- f. By geographic area. These shall be defined by end points that are both predefined and dynamically specified by an operator at the PDFA consoles
- g. By track speed according to designated upper and lower bounds
- h. By selected PUs

**3.7.1.3.7 Tabular Display Processing Requirements.** Displays of tabular amplification information shall be provided. The tabular information shall consist of a Track Tabular Data display, a PU Tabular Data display, a System Status display, and a System Parameter display. The tabular displays shall echo keyboard entries and display error messages. The Track Tabular Data display shall be capable of displaying information on a minimum of two tracks or PUs simultaneously. The tabular display information shall be provided as a result of a track or PU hook followed by a switch action or keyboard entry. The System Parameter display shall provide a means for viewing and updating system initialization parameters, geographic filters, special points, and filtering tables. Tabular display information shall be updated as soon as updated data base information is available. The Track Tabular Data display, the System Status display, and either the PU Tabular display or the System Parameter display shall be displayable simultaneously. As a minimum, the information specified in the following paragraphs shall be provided.

**3.7.1.3.7.1 Track Tabular Data Display.** The tabular display for track information shall contain, as a minimum, the following information:

- a. A single alphanumeric character field indicating air (A), surface (S), or subsurface (B) track
- b. Track number -- four digits representing track DLRN
- c. PU/reporting source -- three digits indicating PU source address
- d. Track identity indicator -- three-alphanumeric fields

- e. Track quality - single octal digit
  - 1. 0 = non-real-time track
  - 2. 1 to 7 = track quality (7 is highest)
- f. Range
  - 1. Three-digit field representing range in nautical miles from a designated point
  - 2. A preceding field descriptor not to exceed one-alphanumeric character (e.g., R)
- g. Bearing
  - 1. Three-digit field representing bearing in one-degree increments relative to a designated point
  - 2. A preceding field descriptor not to exceed one-alphanumeric character (e.g., B)
- h. Raid size -- single alphanumeric field
  - 1. U = unknown
  - 2. S = single
  - 3. F = few
  - 4. M = many
- i. Heading
  - 1. Three-digit field in one-degree increments
  - 2. A preceding field descriptor not to exceed one-alphanumeric character (e.g., H)
- j. Altitude source -- single alphanumeric field
  - 1. E = estimated
  - 2. S = sensor
  - 3. M = manual IFF
  - 4. A = automatic IFF
  - 5. Blank = no statement
  - 6. Not included for surface or subsurface tracks
- k. Altitude
  - 1. Three-digit field in 1,000 ft. increments with 500 ft. resolution (0 to 100k ft.)
  - 2. A blank field shall indicate altitude information is not available
  - 3. A preceding field descriptor not to exceed one-alphanumeric character (e.g., A)
  - 4. Not included for surface or subsurface tracks



1. Speed
  1. Three-digit field in 10-knot increments with 20-knot resolution (0 to 990 knots)
  2. A preceding field descriptor not to exceed one-alphanumeric character (e.g., S)
- m. Elapsed staleness
  1. Three-digit field in one-second increments with a range of 10 to 600 seconds
  2. Represents time since last track data base update
  3. A preceding field descriptor not to exceed two-alphanumeric characters (e.g., ES)
- n. Force-tell indicator
  1. A single alphanumeric field specifying whether or not the track is being force-told on the TADIL-A net
  2. Y = yes; force-tell conditions apply
  3. N = no; no force-tell of this track
  4. A preceding field descriptor not to exceed three-alphanumeric characters (e.g., FTI)
- o. Emergency indicator
  1. A single alphanumeric field specifying whether or not the track is under emergency conditions
  2. Y = yes; emergency conditions apply
  3. N = no; no emergency conditions for this track
  4. A preceding field descriptor not to exceed three-alphanumeric characters (e.g., EMR)
- p. Special Processing Indicator (SPI)
  1. A single alphanumeric field specifying a track requiring special processing on the TADIL A net
  2. Y = yes; SPI track
  3. N = no; non-SPI track
  4. A preceding field descriptor not to exceed three-alphanumeric characters (e.g., SPI)
- q. Engagement status
  1. If the track is hostile and is under engagement by a friendly track, this field shall contain the voice call sign, or the track number if voice call sign is unavailable, of the friendly. If the track displayed is a friendly engaging a hostile, this field shall reflect the track number of the hostile.

2. A single alphanumeric immediately preceding (on the same line) the track number or voice call sign to indicate track type (e.g., T = target, H = hostile and F = friendly).
  3. A four-digit or up to four-alphanumeric character field following the track type field to indicate the appropriate track number or voice call sign. Voice call sign shall have preference.
  4. A three-alphanumeric character field following track number to indicate engagement type or status.
- r. IFF/SIF/Mode IV indicator
1. A two octal digit field containing a Mode 1 code
  2. A four octal digit field containing a Mode 2 code
  3. A four octal digit field containing a Mode 3 code
  4. A single alphanumeric character indicating Mode 4 response as follows:
    - N = No response
    - I = Invalid response
    - V = Valid response
    - Blank = Undetermined
- s. Position A
1. Two, four-digit fields representing the track's position in latitude - longitude
  2. A field descriptor not to exceed one-alphanumeric character indicating direction (e.g., W) after each four-digit field)
  3. A preceding field descriptor not to exceed two-alphanumeric characters (e.g., LL)
- t. Position B
1. Two four-alphanumeric fields representing the track's position in GEOREF
  2. A preceding field descriptor not to exceed two-alphanumeric characters (e.g., GE)
- u. Position C
1. Two, four-alphanumeric fields representing the tracks's position in UTM
  2. A preceding field description not to exceed two-alphanumeric characters (e.g., UT)

**3.7.1.3.7.2 PU Tabular Display.** The tabular display for PU information shall include, as a minimum, the following:

- a. A two-alphanumeric character field indicating PU (e.g., PU)
- b. A three-digit field for PU address
- c. A three-alphanumeric field for PU type (e.g., E-3, P-3)
- d. Range as specified in 3.7.1.3.7.1.f
- e. Bearing as specified in 3.7.1.3.7.1.g
- f. Heading as specified in 3.7.1.3.7.1.i
- g. Altitude as specified in 3.7.1.3.7.1.k
- h. Speed as specified in 3.7.1.3.7.1.l
- i. Elapsed staleness as specified in 3.7.1.3.7.1.m

**3.7.1.3.7.3 System Status Display.** A continuous display of PDFA status information shall be included on the console tabular display. This information shall be updated as appropriate parameters change. The system status display shall include, as a minimum, the following information:

- a. Number of tracks in the processor track file for display
- b. Number of tracks being told to the ROCC
- c. Number of tracks being told by the ROCC
- d. Status of magnetic recording media, i.e., whether unit(s) require changing
- e. Alert field(s)

**3.7.1.3.7.4 System Parameters Display.** A display of system parameters shall be available at the tabular display area through use of an appropriate special function key (e.g., system parameters). Through use of an edit or equivalent mode, enterable through special function edit keys, the system parameter display shall be used to enter system parameters at system initialization or change these parameters in real time during system operations. The information displayed shall include, as a minimum, the following:

- a. Elapsed staleness time-out setting in a three-digit field ranging from 10 to 600 seconds including appropriate field indicators
- b. PDFA position (SCC) in latitude and longitude including appropriate field indicators
- c. TADIL A net DLRP in latitude and longitude
- d. Four latitude- and longitude-defined points composing the TADIL A and lateral-tell input track geographic filter including appropriate field indicators
- e. Receive and transmit track type filters
- f. Activated display filters
- g. Indication of console operation mode, i.e., Live, Playback, Simulation, or Mixed Mode (Live-over-Simulation)

3.7.1.3.8 Data Recording. The PDFA shall have a data recording capability. Recording shall be controlled by an operator at the PDFA. The operator shall have the capability to inhibit or enable data recording. During the execution of the operational program, the operational recording process shall store all live data, as controlled by the operator, on magnetic recording media. The format of the recorded data shall be compatible with the processing requirements of 3.7.1.4.1. The recorded data shall be time tagged and the time shall be accurate, as a minimum, to the nearest second. Whenever the capability of the recording medium becomes exhausted, a switch-over to an alternate recording device shall occur without loss of data and the operator shall be notified of the exhausted medium. Recording shall be capable of automatic initiation at start-up.

#### 3.7.1.4 Support Computer Programs.

3.7.1.4.1 Playback. In the playback mode, the PDFA shall control input, processing, and display of target data recorded during live operation. The radar and geography data display should duplicate the display that existed when the data was recorded, provided that the operator enters comparable display control data. The playback display shall be suitable for plotter reproduction. The operator shall enter control commands for selection of the period of interest (start time) and duration of the playback display. A hard-copy printout and plotter output of all the radar information displayed in the playback period may be selected. Specific functions performed in the playback mode are delineated below.

3.7.1.4.1.1 Playback Control. The operator shall control the recording media to locate the data recorded during specified time intervals. The operator shall be able to halt the playback in order to adjust the display presentation. Operator inputs shall control:

- a. Starting the recording media movement
- b. Advancing the recording media to a specified time
- c. Process recorded data to a specified time
- d. Halting the recording media movement
- e. Rewinding and restarting the recording media

3.7.1.4.1.2 Printout. The operator shall enter control commands for selection of the start time and duration of the printout of the off-line data reduction. The printout shall be in the form of a time-ordered report which lists as a minimum the TADIL A M-series messages, and the lateral-tell messages. The D.E.R.A. formats specified in the TACS/TADS TIDP shall be used for the M-series messages and a similar format designed by the contractor shall be used for the lateral-tell messages.

3.7.1.4.1.3 Plotter Controls. The operator shall control the hard-copy plot of the data displayed on the console screen.

3.7.1.4.2 System Simulation. The PDFA shall have the capability to simulate message generation from external sources. Through the use of simulation software, PDFA equipment, and instructor personnel, a capability shall exist to simulate inputs from up to five TADIL A sources on one net and the IADCF. The display console shall be able to display the data by either selecting a simulation mode or a mixed mode (simulation over live data) of operation. In the simulation mode, only the simulated target data shall be displayed, while in the mixed mode, the simulated target data shall be superimposed on the display with live data. The display console shall be capable of operating in the mixed mode and shall be used to enter and modify flight path parameters for a maximum of 20 simulated targets. The PDFA shall provide the capability to simulate the flight paths of aircraft and surface craft. The PDFA shall control the input, processing, and display of the live data while controlling the processing and display of entered and modified simulated flight paths. Specific functions performed in the simulation mode are delineated in the following paragraphs.

3.7.1.4.2.1 Flight Path Initiation. The flight path parameters to be initiated shall include:

- a. Flight identification (track number)
- b. Flight classification
- c. Sensor with reporting responsibility
- d. Track quality
- e. Initial position (range and azimuth relative to the system center)
- f. Initial altitude (if applicable)
- g. Initial speed
- h. Initial heading
- i. Include or suppress Modes 1, 2, 3A, 4, or C
- j. Mode 1, 2, 3, 4 codes
- k. Type of target (air, surface, or subsurface)
- l. Type of air target (search, beacon, or search reinforced beacon)

3.7.1.4.2.2 Flight Control. Control and modification of each simulated flight shall be implemented by operator action using keyboard entries. The required entries shall be kept to a minimum number of key strokes. Permissible entries shall include parameters specified in 3.7.1.4.2.1.

3.7.1.4.2.3 Message Generation. The receipt, generation, and transmission of messages performed during simulation operation shall simulate live operation.

3.7.1.4.2.4 Flight Drop. Simulated targets shall be automatically dropped when either their range exceeds the display limit or when an operator takes a terminate flight action.

3.7.2 Communications Functional Area. The PDFA shall communicate with the E-3 through UHF TADIL A GESs. The data and voice information exchange with the E-3 shall be routed to the MDC/IADCF via IPT or NARS circuits, and KNCS circuits. The PDFA shall communicate with the IADCF for the exchange of track data, and shall transfer its track data base to the CC through KNCS circuits. The functional requirements of the elements composing the ICCE CFA are contained herein.

3.7.2.1 Ground Entry Stations. The GES facilities shall include combinations of the following equipment:

- a. Radio Facilities
- b. TADIL A Conditioning Equipment
- c. Remote Control Equipment
- d. Signal Distribution Equipment

3.7.2.1.1 Radio Facilities. The radio facilities shall include UHF radios, amplifiers, and antennas as specified herein.

3.7.2.1.1.1 HF Radios. Deleted.

3.7.2.1.1.2 HF Power Amplifier. Deleted.

3.7.2.1.1.3 HF Antenna. Deleted.

3.7.2.1.1.4 HF Antenna Relay. Deleted.

3.7.2.1.1.5 UHF Radios. The UHF radios shall be AM and FM compatible. The UHF transceiver shall have a minimum output power of 10 W AM and 50 W FM continuous RF power and shall be tunable over the entire frequency band from 225 MHz to 400 MHz. The UHF radios shall have the capability of being remotely controlled. The remote control shall include the selection of UHF channels, keying, and squelch. The radios shall be capable of transmission of TADIL A and PARKHILL (TSEC/KY-65) Narrowband Secure Voice (NBSV). The UHF radios shall meet the performance characteristics specified in section 5.3.3 of MIL-STD-188-203-1.

3.7.2.1.1.6 UHF Power Amplifier. Each UHF radio shall be provided with a power amplifier. This amplifier shall have a minimum output of 100-W (AM) continuous RF power over the entire frequency band of 225 MHz through 400 MHz. The VSWR shall not exceed 2.0:1 into a 50-ohm transmission line.

**3.7.2.1.1.7 UHF Antennas.** A UHF antenna shall be provided for each UHF radio. These antennas shall withstand the operating environmental conditions of 3.2.7.2. The antenna shall have a minimum gain of 4 dB over a half-wave dipole and over a frequency range of 225 to 400 MHz. The VSWR shall not exceed 2.0:1 into a 50-ohm transmission line. The antenna shall be vertically polarized. The azimuth pattern shall be circular within  $\pm 1.0$  dB. The antenna beam shall be tilted upward a maximum of  $5^\circ$ . The antenna shall handle a minimum of 200 W of RF power, amplitude-modulated 100% by a 1,000-Hz signal.

**3.7.2.1.2 TADIL A Conditioning Equipment.** The TADIL A conditioning equipment shall interface the UHF radios to IPT, NARS, and KNCS circuits through the SDE. This equipment shall provide the capability required to process two-way TADIL A baseband signals from a TADIL A net radio so that the net functions of a participating unit or net control station can be remoted from the GES to the MDC/IADCF through IPT or NARS circuits, and KNCS circuits. The MDC/IADCF shall be provided with the capability of remotely controlling all of the OTS functions defined in MIL-STD-188-203-1. The GESs shall also be provided with the capability to locally control these OTS functions.

This conditioning equipment shall be compatible with remote TADIL A terminating equipment (see 3.7.2.2.1). The equipment shall not cause degradation to the ability of the MDC/IADCF to operate on a TADIL A net as either a participating unit or net control station through UHF radios at the GESs in accordance with TADIL A provisions in JCS Pub 10.

**3.7.2.1.3 Remote Control Equipment.** This equipment shall include the Remote Control Unit (RCU) and conditioning equipment.

**3.7.2.1.3.1 Remote Control Unit.** The RCU shall provide the capability to automatically receive status information from and provide control signals to the RF equipment and SDE at the GESs. The RCU shall connect directly to the radios and interface IPT, NARS, and KNCS circuits through the SDE distribution. The RCUs at the UHF GESs shall be used for remotely controlling the channel frequencies, keying, and the squelch functions of the UHF radios. The RCU shall also provide the MDC/IADCF with the capability of selecting any telephone circuit to any radio at the GESs.

**3.7.2.1.3.2 Remote Control Conditioning Equipment.** This equipment shall provide the capabilities necessary to interface the RCUs to IPT, NARS, and KNCS circuits. This equipment shall interface the RCUs and circuits used through the SDE.



**3.7.2.1.4 Signal Distribution Equipment.** The GESs shall employ SDE to route quasi-analog TADIL A and analog voice signals to preselected radios through remote control. The selection of radios shall be made through signals from the GES RCU and locally from a control panel mounted in the SDE. The SDE shall also route two-way encrypted voice information from an E-3 through a signalling converter for transmission on the IPT, NARS, and KNCS circuits.

The SDE shall include any modem or multiplex equipment not specifically defined in the terminating equipment of 3.7.2.2.1 required to convert digital signals to quasi-analog for transmission over the telephone circuits.

**3.7.2.2 Master Direction Center.** The following equipment shall be installed in the MDC/IADCF for communicating with the E-3, the IADCF (ROCC), and the CC.

- a. TADIL A, Lateral-Tell, and CCA Terminating Equipment
- b. Voice Terminating Equipment
- c. Remote Control Equipment
- d. Signal Distribution Equipment
- e. Encryption Devices

**3.7.2.2.1 TADIL A, Lateral-Tell, and CCA Terminating Equipment.** The TADIL A terminating equipment shall convert the encrypted TADIL A data into a form suitable for transmission over IPT, NARS, and KNCS circuits. The TADIL A terminating equipment shall provide, together with remote TADIL A conditioning equipment, all necessary control and preamble signals required for TADIL A net operations over UHF radios. The MDC/IADCF shall be provided with the capability to remotely control all of the DTS functions defined in MIL-STD-188-203-1. The control signals shall include those required for radio keying as well as interrupt signals such as "prepare to transmit and receive."

The TADIL A terminating equipment shall interface the radios and encryption equipment, and shall provide for reliable transmission over IPT, NARS, and KNCS circuits. TADIL A terminating equipment shall conform to the approved standards for TADIL A contained in JCS Pub 10 and MIL-STD-188-203-1 for interface with encryption equipment and radio equipment.

The lateral-tell terminating equipment shall provide any level adjustments or signal conditioning required to interconnect the PDFA lateral-tell port to the TSEC/KG-84A at 2400 baud. All necessary controls to maintain the TSEC/KG-84A in synchronization shall be provided.

The CCA terminating equipment shall provide any level adjustments or signal conditioning required to interconnect the PDFA CCA port to the TSEC/KG-84A at 1200 baud.

**3.7.2.2.2 Voice Terminating Equipment.** Voice instruments shall be connected through the SDE to the IPT, NARS, and KNCS circuits. The encryption device (TSEC/KY-65) used in voice connectivity shall be IFE.

**3.7.2.2.3 Remote Control Equipment.** The MDC/IADCF control equipment shall include a GGVP separately housed in the PDFA work station and CCP which will include a GGVP.

**3.7.2.2.3.1 GES Radio Selection Panel.** Deleted.

**3.7.2.2.3.2 Ground-Ground Voice Panel.** The GGVP at the work station position shall provide controls for connecting that position's headset jacks to the TSEC/KY-65 or an unsecure bypass.

**3.7.2.2.3.3 Communication Control Panel.** The communication control panel shall provide the communications operator with a central location from which the TADIL A and voice communications equipment shall be controlled, reconfigured, and monitored. The encryption devices, DTS, and SDE remote controls shall be located in this panel. A set of selection switches on the panel shall provide an operator the capability to select any two radios for voice communications, any radio for TADIL A communications, select between an RF or wireline transmission medium as the situation dictates, and engage either clear or secure voice communication links. The panel shall also remotely control the channel frequencies, keying, and squelch functions of the UHF radios at four GESs. The control panel shall include a display to present the operator with a readout of communications equipment status.

**3.7.2.2.4 Signal Distribution Equipment.** The MDC/IADCF shall employ SDE to route audio TADIL A, voice, lateral-tell, and digital control signals to IPT, NARS, and KNCS circuits or control heads as appropriate. Selection of voice and TADIL A connectivity to the GESs shall be through signals from the CCP. SDE shall also route lateral-tell to the IADCF (ROCC).

**3.7.2.2.5 Encryption Devices.** The MDC/IADCF data encryption devices shall be provided as GFE, and shall permit secure digital data (TADIL A, lateral-tell, and CCA) and voice communications. Wiring and mounting facilities for the encryption devices shall be provided and installed in accordance with TEMPEST criteria, NACSIM 5203. The installation of the encryption devices shall conform to MIL-HBK-232.

**3.7.2.2.5.1 KG-84A.** The lateral-tell and CCA interface shall be compatible with the TSEC/KG-84A. The TSEC/KG-84A will conform to NSA 82-28.

**3.7.2.2.5.2 KG-40.** The TADIL A interface shall be compatible with the TSEC/KG-40 (NTDS configuration) encryption device. The TSEC/KG-40 will conform to CSEEB-28.

**3.7.2.2.5.3 KY-65.** The voice encryption device (TSEC/KY-65) shall be GFE. The TSEC/KY-65 will conform to CSESD-15D.

**3.7.2.3 Keflavik Naval Communications Services.** The KNCS shall be provided with remote-control equipment for the purpose of selecting any GES telephone circuit for either voice or data communications. This remote control equipment shall interface with the CCP at the MDC/IADCF for control and status reporting through voice circuits.

**3.7.2.4 Telephone Circuits.** The telephone circuits that shall provide all ICCE connectivity between the MDC/IADCF and the GESs, and the MDC/IADCF and the CC (CCA), shall be leased or Government-owned and provided as GFE. These circuits shall meet the requirements for circuit quality specified in 3.1.5.2.1 and 3.1.5.2.2. The circuits to the two northern GESs shall connect to the MDC/IADCF through IPT and KNCS facilities. MDC/IADCF connectivity to the southwestern GES shall be through KNCS and to the southeastern GES through the NARS and KNCS facilities. Connectivity between the MDC/IADCF and the CC (CCA System) shall be via the KNCS facilities.

**3.8 Precedence.** Not applicable.

#### 4.0 QUALITY ASSURANCE PROVISIONS

4.1 General. This section establishes the requirements and criteria for verification of System performance, design characteristics, and system operability. Verification shall be accomplished to determine compliance with the requirements of 3.0 and 5.0. Each of the requirements of 3.0 and 5.0 shall be verified in accordance with table 1. Verifications shall be performed at the unit, interface, subassembly, CI, functional area, and system level, as required, and shall include design evaluation, integrated system evaluation, and system operational capability. Verification of the requirements of 3.0 and 5.0 shall be determined by one or more of the procedures of inspection, analysis, demonstration, and test. These procedures are defined as follows:

- a. Inspection. Verification by a visual examination of the item, reviewing descriptive documentation, and comparing the appropriate characteristics with a predetermined standard to determine conformance to requirements without the use of special laboratory equipment or procedures.
- b. Analysis. Verification by technical or mathematical evaluation using mathematical representations (i.e., math models, algorithms, equations), charts, graphs, circuit diagrams, and representative data or evaluation of previously qualified equipment.
- c. Demonstration. Verification of operation, movement, and/or adjustment of the item in performing its design functions under a specific set of conditions without recording of quantitative data. The item may be instrumented and quantitative limits of performance monitored, but only check sheets rather than actual performance data are required to be recorded.
- d. Test. Verification through systematic exercising of the item with instrumentation and collection, analysis, and evaluation of quantitative data.

Testing of the various CIs or functional areas shall be consolidated when possible.

4.1.1 Responsibility for Tests. Unless otherwise specified in the contract, the contractor shall be responsible for the performance of all verification requirements of this specification and all subordinate specifications. Government personnel will participate in all testing as observers and when applicable as operators of the

Table 1. VERIFICATION CROSS REFERENCE MATRIX							
			VERIFICATION METHOD				
PARAGRAPH 3 NUMBER	TITLE	PARAGRAPH 4 NUMBER	INSPECTION	ANALYSIS	DEMO	TEST	N/A
3.0	REQUIREMENTS						X
3.1	System Definition						X
3.1.1	General Description				X		
3.1.1.1	Processing and Display Functional Area				X		
3.1.1.1.1	Data Processing and Peripheral Equipment				X		
3.1.1.1.2	Display and Data Entry Equipment				X		
3.1.1.1.3	Operational Computer Programs				X		
3.1.1.1.4	Support Computer Programs				X		
3.1.1.2	Communications Functional Area				X		
3.1.1.2.1	Radio Facilities				X		
3.1.1.2.2	TADIL A, Lateral-Tell, and CCA Terminating and Conditioning Equipment				X		

Table 1. VERIFICATION CROSS REFERENCE MATRIX					
PARAGRAPH 3 NUMBER	TITLE	PARAGRAPH 4 NUMBER	VERIFICATION METHOD		
			INSPECTION	ANALYSIS	DEMO TEST N/A
3.1.1.2.3	Voice Terminating Equipment				X
3.1.1.2.4	Remote Control Equipment				X
3.1.1.2.5	Signal Distribution Equipment				X
3.1.1.2.6	Encryption Devices		X		
3.1.1.2.7	Telephone Circuits			X	
3.1.2	Mission				X
3.1.3	Threat				X
3.1.4	System Diagrams		X		
3.1.5	Interface Definition	4.2.1	X		
3.1.5.1	External Interfaces				X
3.1.5.1.1	E-3	4.2.1			X X
3.1.5.1.2	ROCC	4.2.1			X X
3.1.5.1.3	CCA	4.2.1			X X
3.1.5.1.4	Prime Power	4.2.1			X X

Table 1. VERIFICATION CROSS REFERENCE MATRIX							
			VERIFICATION METHOD				
PARAGRAPH 3 NUMBER	TITLE	PARAGRAPH 4 NUMBER	INSPECTION	ANALYSIS	DEMO	TEST	N/A
3.1.5.2	Internal Interfaces						X
3.1.5.2.1	IPT Communications	4.2.1	X		X		
3.1.5.2.2	Military Communications	4.2.1	X		X		
3.1.6	Government Furnished Property List		X		X		
3.1.7	Operational and Organizational Concepts		X				
3.2	Characteristics						X
3.2.1	Performance Characteristics	4.2.2				X	
3.2.1.1	Processing and Display Performance Characteristics						X
3.2.1.1.1	Capacities and Accuracies	4.2.2			X	X	
3.2.1.1.2	Message Processing	4.2.2			X	X	
3.2.1.1.3	Response Time Requirements	4.2.2		X	X	X	

Table 1. VERIFICATION CROSS REFERENCE MATRIX					
PARAGRAPH 3 NUMBER	TITLE	PARAGRAPH 4 NUMBER	VERIFICATION METHOD		
			INSPECTION	ANALYSIS	TEST
3.2.1.1.4	Processing Time Requirements	4.2.2			X
3.2.1.1.5	Start-up	4.2.2			X
3.2.1.1.5.1	Start-over/Restart	4.2.2			X
3.2.1.1.6	Data Recording	4.2.2		X	
3.2.1.1.7	Playback	4.2.2		X	
3.2.1.1.8	System Simulation	4.2.2		X	X
3.2.1.2	Communications Performance Characteristics				X
3.2.1.2.1	E-3 Communications	4.2.2		X	
3.2.1.2.1.1	TADIL A Equipment	4.2.2	X	X	X
3.2.1.2.1.2	Radio Equipment Selection and Control	4.2.2		X	X
3.2.1.2.2	GOC Communications	4.2.2		X	
3.2.1.2.2.1	CCA Data Link	4.2.2			X
3.2.1.2.2.2	Lateral-Tell Data Link	4.2.2			X



Table 1. VERIFICATION CROSS REFERENCE MATRIX							
			VERIFICATION METHOD				
PARAGRAPH 3 NUMBER	TITLE	PARAGRAPH 4 NUMBER	INSPECTION	ANALYSIS	DEMO	TEST	N/A
3.2.1.2.3	Communications Monitoring	4.2.2			X		
3.2.2	Physical Characteristics						X
3.2.2.1	Weight Limits	4.2.3		X	X		
3.2.2.2	Dimensional Limits	4.2.3		X			
3.2.2.3	Modular Design	4.2.3		X			
3.2.3	Reliability						X
3.2.3.1	System Reliability	4.2.3		X			
3.2.3.2	Reliability Design Criteria	4.2.4		X			
3.2.3.2.1	Accessibility	4.2.4		X	X		
3.2.3.2.2	Test Point	4.2.4		X	X		
3.2.4	Maintainability	4.2.5	X				
3.2.4.1	Corrective Maintenance	4.2.5		X	X		
3.2.4.2	Preventive Maintenance	4.2.5		X	X		

Table 1. VERIFICATION CROSS REFERENCE MATRIX							
			VERIFICATION METHOD				
PARAGRAPH 3 NUMBER	TITLE	PARAGRAPH 4 NUMBER	INSPECTION	ANALYSIS	DEMO	TEST	N/A
3.2.4.3	Skill Levels	4.2.5		X			
3.2.5	Availability			X			
3.2.6	System Effectiveness Models						X
3.2.7	Environmental Conditions						X
3.2.7.1	Nonoperating	4.2.6	X	X		X	
3.2.7.2	Operating	4.2.6	X	X		X	
3.2.8	Nuclear Control Requirements						X
3.2.9	Transportability		X	X			
3.3	Design and Construction	4.2.10	X	X			
3.3.1	Materials, Processes, and Parts	4.2.7	X	X			
3.3.1.1	Parts Selection	4.2.7	X	X			
3.3.1.2	Semiconductors and Microcircuits	4.2.7	X	X			

Table 1. VERIFICATION CROSS REFERENCE MATRIX							
			VERIFICATION METHOD				
PARAGRAPH 3 NUMBER	TITLE	PARAGRAPH 4 NUMBER	INSPECTION	ANALYSIS	DEMO	TEST	N/A
3.3.1.3	Connectors and Cables	4.2.7	X	X			
3.3.1.4	Corrosion Control	4.2.7	X	X			
3.3.1.5	Materials and Finishes	4.2.7	X	X			
3.3.2	Electromagnetic Radiation	4.2.8		X			
3.3.2.1	Electromagnetic Interference and Susceptibility	4.2.8				X	
3.3.2.1.1	Lightning, Bonding, and Ground Protection	4.2.8		X			
3.3.2.2	Electromagnetic Compatibility	4.2.8			X	X	
3.3.2.3	TEMPEST	4.2.9		X		X	
3.3.3	Nameplates and Product Marking	4.2.10	X				
3.3.4	Workmanship	4.2.10	X				
3.3.5	Interchangeability	4.2.11	X		X		
3.3.6	Safety	4.2.12	X		X		

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Table 1. VERIFICATION CROSS REFERENCE MATRIX							
			VERIFICATION METHOD				
PARAGRAPH 3 NUMBER	TITLE	PARAGRAPH 4 NUMBER	INSPECTION	ANALYSIS	DEMO	TEST	N/A
3.3.7	Human Performance and Human Engineering	4.2.13		X		X	
3.3.8	Computer Programming						X
3.3.8.1	CPCI Organization	4.2.14	X				
3.3.8.2	Structured Programming (SP)	4.2.14	X				
3.3.8.3	Top-Down Approach	4.2.14					X
3.3.8.3.1	Top-Down Modular Design (TDMO)	4.2.14	X				
3.3.8.3.2	Top-Down Implementation (TDI)	4.2.14	X				
3.3.8.4	Programming Languages	4.2.14	X				
3.3.8.5	CP Commenting	4.2.14	X				
3.3.8.6	Operating System Requirements	4.2.14	X				
3.3.8.7	Coding Standards and Practices	4.2.14	X				

Table 1. VERIFICATION CROSS REFERENCE MATRIX					
PARAGRAPH 3 NUMBER	TITLE	PARAGRAPH 4 NUMBER	VERIFICATION METHOD		
			INSPECTION	ANALYSIS	DEMO TEST N/A
3.3.8.8	Computer Programs for Microprocessors and Miniprocessors	4.2.14	X		
3.3.8.9	Microprogramming	4.2.14	X		
3.3.8.10	Firmware	4.2.14	X		
3.3.8.11	Character Set Standard	4.2.14	X		
3.3.8.12	Support Software		X		
3.4	Documentation		X		
3.5	Logistics				X
3.5.1	Maintenance				X
3.5.1.1	Hardware Maintenance				X
3.5.1.1.1	Hardware Maintenance Concept				X
3.5.1.1.2	On-line Checkout				X
3.5.1.1.3	Failure Detection and Isolation			X	X
3.5.1.1.4	Maintenance and Repair Cycles			X	X

Table 1. VERIFICATION CROSS REFERENCE MATRIX							
			VERIFICATION METHOD				
PARAGRAPH 3 NUMBER	TITLE	PARAGRAPH 4 NUMBER	INSPECTION	ANALYSIS	DEMO	TEST	N/A
3.5.1.1.5	Support Equipment		X				
3.5.1.1.6	Service and Access		X		X		
3.5.1.2	Software Maintenance		X				
3.5.2	Supply			X			
3.5.3	Facilities and Facility Equipment		X				
3.5.3.1	Facility Access and Service			X			
3.5.3.2	Facility Power		X				
3.6	Personnel and Training				X		
3.6.1	Personnel				X		
3.6.1.1	Operational Personnel Requirements				X		
3.6.1.2	Hardware Maintenance Personnel		X				
3.6.1.3	Software Maintenance Personnel		X				

Table 1. VERIFICATION CROSS REFERENCE MATRIX					
PARAGRAPH 3 NUMBER	TITLE	PARAGRAPH 4 NUMBER	VERIFICATION METHOD		
			INSPECTION	ANALYSIS	DEMO TEST N/A
3.6.2	Training		X		X
3.7	Functional Area Characteristics				X
3.7.1	Processing and Display Functional Area	4.2.15	X	X	
3.7.1.1	Data Processing Peripheral Equipment				X
3.7.1.1.1	Processing Equipment	4.2.15		X	
3.7.1.1.1.1	Capacities and Capabilities	4.2.15		X	
3.7.1.1.1.2	Data Processing Spare Capacities				X
3.7.1.1.2	Peripheral Equipment	4.2.15		X	
3.7.1.1.2.1	Line Printer	4.2.15			X
3.7.1.1.2.2	Plotter	4.2.15			X
3.7.1.1.2.3	Alphanumeric Display Console	4.2.15			X
3.7.1.1.2.4	Magnetic Storage	4.2.15			X

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Table 1. VERIFICATION CROSS REFERENCE MATRIX							
			VERIFICATION METHOD				
PARAGRAPH 3 NUMBER	TITLE	PARAGRAPH 4 NUMBER	INSPECTION	ANALYSIS	DEMO	TEST	N/A
3.7.1.1.2.5	Map Generator	4.2.15					X
3.7.1.2	Display and Data Entry Equipment	4.2.15	X				
3.7.1.2.1	Display Console	4.2.15			X		
3.7.1.2.1.1	Display Characteristics						X
3.7.1.2.1.1.1	Cathode-Ray Tube	4.2.15	X				
3.7.1.2.1.1.2	Data Entry Keyboard	4.2.15			X		
3.7.1.2.1.1.3	Position Entry Device	4.2.15			X		
3.7.1.2.1.1.4	Controls and Indicators	4.2.15			X		
3.7.1.2.1.1.5	Maintenance Features	4.2.15	X		X		
3.7.1.2.1.2	Situation Display Requirements						X
3.7.1.2.1.2.1	Range Scale Expansion Capability	4.2.15				X	
3.7.1.2.1.2.2	Off-Centering	4.2.15				X	
3.7.1.2.1.2.3	Display Symbology	4.2.15			X		



Table 1. VERIFICATION CROSS REFERENCE MATRIX					
PARAGRAPH 3 NUMBER	TITLE	PARAGRAPH 4 NUMBER	VERIFICATION METHOD		
			INSPECTION	ANALYSIS	DEMO TEST N/A
3.7.1.2.1.2.4	Range-Bearing Line and Readout	4.2.15			X
3.7.1.2.2	Display Monitor				X
3.7.1.3	Operational Computer Programs				X
3.7.1.3.1	Initialization	4.2.15			X
3.7.1.3.2	Data Filtering				X
3.7.1.3.2.1	Receive Filtering	4.2.15			X
3.7.1.3.2.2	TADIL A Transmit Filtering	4.2.15			X
3.7.1.3.2.3	Lateral-Tell Filtering	4.2.15			X
3.7.1.3.3	Real Time Analysis of Data Quality	4.2.15			X
3.7.1.3.4	Coordinate Transformation	4.2.15			X
3.7.1.3.5	Tracking				X
3.7.1.3.5.1	Track Source	4.2.15			X
3.7.1.3.5.2	Track Initiation	4.2.15			X

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Table 1. VERIFICATION CROSS REFERENCE MATRIX					
PARAGRAPH 3 NUMBER	TITLE	PARAGRAPH 4 NUMBER	VERIFICATION METHOD		
			INSPECTION	ANALYSIS	DEMO TEST N/A
3.7.1.3.5.3	Track Prediction	4.2.15			X X
3.7.1.3.5.4	Drop Track	4.2.15			X
3.7.1.3.5.5	Track and Data Management.	4.2.15			X X
3.7.1.3.6	Situation Display Processing				X
3.7.1.3.6.1	Track Block	4.2.15			X X
3.7.1.3.6.2	Special Points	4.2.15			X X
3.7.1.3.6.3	Alert Indications	4.2.15			X X
3.7.1.3.6.4	Feature and Category Selections	4.2.15			X X
3.7.1.3.6.5	Hook Capability	4.2.15			X
3.7.1.3.6.6	Maps	4.2.15			X X
3.7.1.3.6.6.1	Static Maps	4.2.15			X X
3.7.1.3.6.6.2	Map Generation				X
3.7.1.3.6.7	Display Filtering	4.2.15			X X

Table 1. VERIFICATION CROSS REFERENCE MATRIX							
			VERIFICATION METHOD				
PARAGRAPH 3 NUMBER	TITLE	PARAGRAPH 4 NUMBER	INSPECTION	ANALYSIS	DEMO	TEST	N/A
3.7.1.3.7	Tabular Display Processing Requirements	4.2.15			X		
3.7.1.3.7.1	Track Tabular Data Display	4.2.15			X	X	
3.7.1.3.7.2	PU Tabular Display	4.2.15			X	X	
3.7.1.3.7.3	System Status Display	4.2.15			X	X	
3.7.1.3.7.4	System Parameters Display	4.2.15			X	X	
3.7.1.3.8	Data Recording	4.2.15			X	X	
3.7.1.4	Support Computer Programs						X
3.7.1.4.1	Playback				X		
3.7.1.4.1.1	Playback Control	4.2.15			X	X	
3.7.1.4.1.2	Printout	4.2.15			X	X	
3.7.1.4.1.3	Plotter Controls	4.2.15			X	X	
3.7.1.4.2	System Simulation	4.2.15			X	X	
3.7.1.4.2.1	Flight Path Initiation	4.2.15			X	X	

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Table 1. VERIFICATION CROSS REFERENCE MATRIX							
			VERIFICATION METHOD				
PARAGRAPH 3 NUMBER	TITLE	PARAGRAPH 4 NUMBER	INSPECTION	ANALYSIS	DEMO	TEST	N/A
3.7.1.4.2.2	Flight Control	4.2.15			X	X	
3.7.1.4.2.3	Message Generation	4.2.15			X	X	
3.7.1.4.2.4	Flight Drop	4.2.15			X	X	
3.7.2	Communications Functional Area	4.2.15			X		
3.7.2.1	Ground Entry Stations	4.2.15	X				
3.7.2.1.1	Radio Facilities	4.2.15	X				
3.7.2.1.1.1	HF Radios						X
3.7.2.1.1.2	HF Power Amplifier						X
3.7.2.1.1.3	HF Antenna						X
3.7.2.1.1.4	HF Antenna Relay						X
3.7.2.1.1.5	UHF Radios	4.2.15			X	X	
3.7.2.1.1.6	UHF Power Amplifier	4.2.15				X	
3.7.2.1.1.7	UHF Antennas	4.2.15	X	X		X	
3.7.2.1.2	TADIL A Conditioning Equipment	4.2.15		X	X	X	

Table 1. VERIFICATION CROSS REFERENCE MATRIX							
			VERIFICATION METHOD				
PARAGRAPH 3 NUMBER	TITLE	PARAGRAPH 4 NUMBER	INSPECTION	ANALYSIS	DEMO	TEST	N/A
3.7.2.1.3	Remote Control Equipment	4.2.15	X				
3.7.2.1.3.1	Remote Control Unit	4.2.15			X		
3.7.2.1.3.2	Remote Control Conditioning Equipment	4.2.15	X		X		
3.7.2.1.4	Signal Distribution Equipment	4.2.15	X		X		
3.7.2.2	Master Direction Center	4.2.15	X				
3.7.2.2.1	TADIL A, Lateral-Tell, and CCA Terminating Equipment	4.2.15	X	X	X	X	
3.7.2.2.2	Voice Terminating Equipment	4.2.15	X				
3.7.2.2.3	Remote Control Equipment	4.2.15	X				
3.7.2.2.3.1	GES Radio Selection Panel						X
3.7.2.2.3.2	Ground-Ground Voice Panel	4.2.15	X		X		

Table 1. VERIFICATION CROSS REFERENCE MATRIX					
			VERIFICATION METHOD		
PARAGRAPH 3 NUMBER	TITLE	PARAGRAPH 4 NUMBER	INSPECTION	ANALYSIS	DEMO TEST N/A
3.7.2.2.3.3	Communication Control Panel	4.2.15	X		X X
3.7.2.2.4	Signal Distribution Equipment	4.2.15	X		X X
3.7.2.2.5	Encryption Devices	4.2.15	X	X	X
3.7.2.2.5.1	KG-84A	4.2.15	X	X	
3.7.2.2.5.2	KG-40	4.2.15	X		X
3.7.2.2.5.3	KY-65	4.2.15	X		X
3.7.2.3	Keflavik Naval Communications Services	4.2.15	X		X
3.7.2.4	Telephone Circuits	4.2.15	X		X
3.8	Precedence				X

equipment. Except as otherwise specified, the contractor shall use facilities and services acceptable to the Government. The Government reserves the right to perform any of the verifications deemed necessary to ensure conformance to prescribed requirements.

#### 4.1.2 Special Tests and Examinations.

4.1.2.1 System Software. The software designed to meet the System performance requirements shall be verified by inspection, analysis, demonstration, and test. Inspection shall be concerned with, but not be limited to, an examination of the programs. Analysis shall show the functional correctness and interface compatibility of the system control functions. Tests shall exercise all algorithms in their final form and with the final hardware configuration. Tests shall demonstrate that the computer outputs agree with the specification requirements. Data flow shall be monitored throughout the tests to ascertain compliance with system performance requirements. The computer programs and data in firmware shall be tested as software.

Testing of the System software shall include TADIL A interoperability validation and qualification testing. This testing shall be a joint contractor and Government conducted test. An AF approved E-3 simulator will be used to test the System. This testing shall be successfully completed before the FOC System is shipped to Iceland.

Testing of the FOC System software shall include interfacing with an IADCF System or simulator. The interface testing shall be conducted as part of the in-plant contractor-conducted testing.

Analyses, demonstrations, and tests shall be on an individual CPCI or on several CPCIs combined into a functional operating unit and system configuration. Tests and demonstrations of CPCIs and System software shall be in accordance with test plans approved by the Government.

4.1.3 Verification Tests. Formal verification tests shall be established to ensure that the System meets all requirements. These tests shall consist of Development Test and Evaluation (DT&E) and Operational Test and Evaluation (OT&E).

4.1.3.1 Development Test and Evaluation (DT&E). DT&E shall be accomplished to verify that the CIs and CPCI(s) meet performance and design requirements. DT&E shall consist of Formal Qualification Tests (FQTs) and a System Level Test (SLT).

**4.1.3.1.1 CPCI Formal Qualification Tests (FQTs).** CPCI FQTs are the tests accomplished to verify that each Computer Program Component (CPC) meets the requirements of its CPCI specification and that the requirements of 3.3.8 have been met. Programs and groups of programs shall be tested to verify that they perform their intended function properly and to verify the interoperability of each CPC with all other CPCs. This process shall be applied to the individual software CPC of each CPCI and shall be continued until all programs have been verified.

**4.1.3.1.2 System Level Test.** An SLT shall be conducted to prove that each functional area satisfies requirements individually and that all CIs, CPCs, and CPICs working together meet all system performance requirements.

**4.1.3.2 Operational Test and Evaluation.** OT&E determines whether the System will satisfactorily perform the function for which it is designed in the mission environment. The requirements for a total operational test, to demonstrate that the System satisfies the mission requirements of 3.1.2 and is within the operational and organization concepts defined in 3.1.7, will be determined by the users in conjunction with the Government.

The Air Force will conduct an OT&E following DT&E. The contractor shall schedule an appropriate time for the completion of the OT&E. The using command will prepare the OT&E Test Plan and Test Objectives and provide them to the contractor via the procuring agency.

**4.2 Quality Conformance Inspections.** Requirements for formal tests of system, functional area, CIs performance design characteristics, and operability, as defined in 3.0, shall be accomplished as specified below. Tests and demonstrations of CIs shall be accomplished as specified below. Tests and demonstrations of CIs shall be accomplished in accordance with test plans and test procedures approved by the Government. Formal configuration control functions shall be established and implemented, and will be monitored for conformance to DOD-STD-480A and MIL-STD-483.

**4.2.1 Interfaces.** The System external and internal electrical and mechanical interfaces shall be determined by inspection, demonstration, and test as described in the test plans and procedures approved by the Government.

**4.2.2 Performance Characteristics.** The requirements of 3.2.1 shall be verified by the successful completion of all inspections, analyses, demonstrations, and tests as described in test plans and procedures approved by the Government.



4.2.3 Physical Characteristics. Requirements specified in 3.2.2 shall be verified by analyses and demonstration, as appropriate for each configuration item.

4.2.4 Reliability. A reliability analysis shall be made to verify that each functional area of the System meets the MTBFs. The analysis shall be accomplished in accordance with the applicable procedures of MIL-HDBK-217D, Section 5.2 (Parts Count Prediction Method).

4.2.5 Maintainability. Compliance with the maintainability requirements specified in 3.2.4 shall be verified on a CI basis. A maintainability prediction shall be performed in accordance with Procedure II, Part B of MIL-HDBK-472. The mean and maximum corrective maintenance time shall be demonstrated in accordance with MIL-STD-471A Test Method 10, tables 1 and 2 and the maintenance task sampling of Appendix A. Representative tasks shall also be performed to demonstrate preventive maintenance capability. The capability to isolate equipment faults to the subassembly level shall be verified by deliberate inducement of failures in operational equipment.

4.2.6 Environmental Conditions. Requirements specified in 3.2.7 shall be verified on a CI and functional area basis. Unless otherwise noted in test plans and procedures approved by the Government, tests shall conform to the methods and procedures of MIL-STD-810C given herein. Test configurations for the environmental tests shall include operating, nonoperating, and transport and storage conditions. For operational tests, the CI shall be set up for normal operation, with the equipment energized. For nonoperating tests, the equipment shall not be energized. For transport and storage tests, the equipment shall be packaged for shipment. The testing shall provide a verification that each CI will operate over the range of environments specified in 3.2.7 for a continuous period of 24 hours. The appropriate sections of MIL-STD-810C are the following:

- a. Temperature (3.2.7.1 and 3.2.7.2)
  - 1. Low temperature: Method 502.1, Procedure I.
  - 2. High temperature: Method 501.1, Procedure II.
- b. Relative Humidity (3.2.7.1): Method 507.1, Procedure III.
- c. Altitude (3.2.7.1): By inspection.
- d. Salt Atmosphere (3.2.7.1 and 3.2.7.2): By inspection.

- e. Rain (3.2.7.2): By inspection.
- f. Ice and Snow (3.2.7.2): By inspection.
- g. Wind (3.2.7.2). By inspection.

An inspection or qualitative test shall be performed after each environmental test to verify that no damage or deterioration has occurred to the test item. The contractor will be allowed to deviate from this requirement on a case-by-case basis at the discretion of the Government.

4.2.7 Materials, Processes, and Parts. Compliance with the requirements of 3.3.1 for each CI will be determined by inspection and demonstration. Nutrient materials which are capable of supporting the growth of fungus and which have been incorporated in the design of each CI shall be identified. It shall be verified that these materials have been rendered fungus-resistant using Method 508.1 of MIL-STD-810C. Compliance with the requirements which guide the use of corrosion-resisting metals and dissimilar metal combinations shall be determined by inspection of parts and review of manufacturer's data on the metals.

4.2.8 Electromagnetic Compatibility. The requirements of 3.3.2 shall be verified by test in accordance with the procedures defined in Methods CE03, CE07, CS01, CS02, CS06, RE02, RS02, and RS03 of MIL-STD-462 for each CI and functional area. Compatibility requirements shall be tested in accordance with MIL-E-6051H during the integration and system level evaluation tests.

4.2.9 TEMPEST. The requirements of 3.3.2.3 shall be verified by TEMPEST tests performed as per NACSIM 5203.

4.2.10 Workmanship. Compliance with the requirements of 3.3.4 shall be verified for each CI by inspection. The fabrication and finish of each article shall be examined for adherence to tolerances shown on drawings and to requirements for materials or product processing. Attention shall be directed toward form, fit, and function of each CI.

4.2.11 Interchangeability. Compliance with the requirements of 3.3.5 for each CI shall be verified by inspection and demonstration on all CIs. Each CI shall be inspected for compliance with the requirement for modular construction. Compliance of the modules to the plug-in, replacement, and removal requirements shall be demonstrated. A demonstration shall be conducted to show that each CI and its subassemblies are compatible with test equipment where applicable.

4.2.12 Safety. Compliance with the requirements of 3.3.6 for each CI shall be verified by inspection and demonstration. Activities requiring special attention for personnel and equipment safety include: assembly, disassembly, transport, storage, operation, maintenance, and test. Effects of any materials that have corrosive properties, produce toxic fumes, or are combustible shall be identified, and compliance with requirements shall be determined by analysis and/or test. Effects and properties of neutralizing agents shall be identified, and compliance with requirements shall be demonstrated. Each CI shall be inspected to determine compliance with proper use of, and safety precautions for corrosive, toxic, radioactive, and combustible substances, if employed.

4.2.13 Human Performance and Human Engineering. Compliance with the requirements of 3.3.7 shall be verified by analyses and test to show conformance to human performance and human engineering requirements. Evaluation shall include operational effectiveness of the software and the personnel-equipment interfaces.

4.2.14 Computer Programming. Compliance with the requirements of 3.3.8 shall be proven during preliminary and critical design reviews and shall be verified by inspection.

4.2.15 Functional Characteristics. Inspections, analyses, demonstrations, and tests shall be performed as needed to ensure that the functional characteristics requirements of 3.7 have been met. Qualitative and quantitative tests shall be performed on equipment, processes, data management, and data entry and display according to the requirements of this specification and subsequent equipment specifications.

4.3 Acceptance Test Procedures (ATP). Tests shall be conducted to verify that equipment meets acceptance test criteria. Acceptance tests shall be conducted by the contractor at the operational location to verify that the equipment is capable of meeting acceptance test criteria. Government representatives will participate in acceptance tests.

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#### 5.0 PACKAGING FOR DELIVERY

Detailed preservation, packaging, and packing design requirements shall be developed for each end item and associated equipment. Design data shall be reflected in Section 5.0 of the end item or major component specification in accordance with the applicable provisions of MIL-STD-490. The design criteria of MIL-STD-794E and MIL-P-90240 apply. The package designs developed and approved shall maintain the established reliability levels of equipment being prepared for delivery and insure safe, damage-free delivery throughout the life cycle of the equipment involved. Specific levels of protection are to be specified in the contract for delivery of the System. Marking shall be in accordance with MIL-STD-129H.

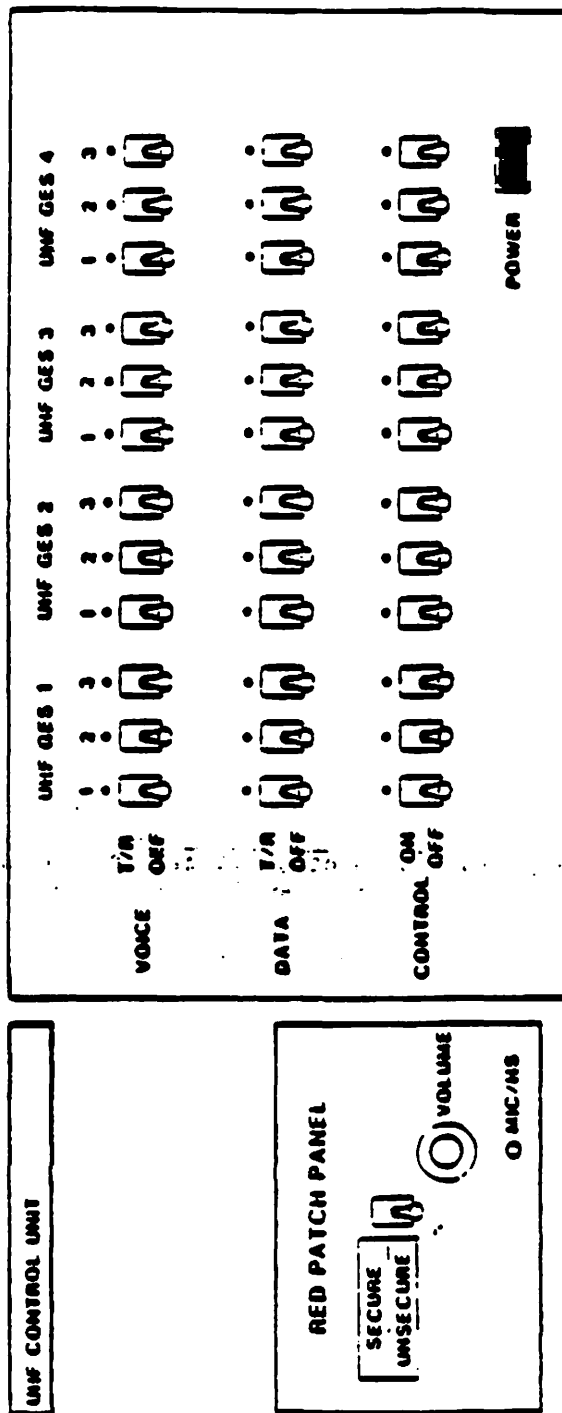
## 6.0 NOTES - DESIGN GUIDANCE

The requirements or any of the background information contained herein should not be interpreted as explicit requirements or constraints on the ICCE System. These notes are for reference only.

**6.1 Hardware Design Considerations.** The following paragraphs contain descriptions of the CCP and GRSP.

**6.1.1 Communications Control Panel.** A layout of the CCP at the communications operator position is given in figure 10. The communications operator will be able to select any one circuit from the CCP for voice communications, and any one circuit for control via the HF and UHF control units. The communications operator will be able to select one radio for voice and one radio for TADIL A communications from any one GES. A red light for each radio will indicate when that radio is being operated (keyed) by either the communications or a display console operator. A red (secure) patch panel will provide the operator with a microphone/headset jack, a control for volume to the headset, and a switch for secure or unsecure voice communications via the KY-65 encryption equipment. A red light indicating secure and a yellow light indicating unsecure voice communications will also be provided at the patch panel. The operator shall be provided with microphone/headset and a hand-held switch for keying the radio (push-to-talk).

**6.1.2 GES Radio Selection Panel.** Deleted.



ESD-SS-ECI-1020  
6 September 1985

Figure 10. Communication Control Panel

ESD-SS-ECI-1020  
6 September 1985

Figure 11. GES Radio Selection Panel - Deleted

ESD-SS-ECI-1020  
6 September 1965

10.0

APPENDIX X

Classified Supplement -- Separate Volume  
(Consisting of pages 97-101)

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ATTACHMENT 11-11

SOW-ECI-1229  
20 August 1985

STATEMENT OF WORK  
FOR THE  
ICELAND COMMAND AND CONTROL  
ENHANCEMENT SYSTEM

Authenticated by: \_\_\_\_\_  
(Acquisition Agency)

Approved By: \_\_\_\_\_  
(Contractor)

Date: \_\_\_\_\_

Date: \_\_\_\_\_

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GLOSSARY

AAC	Alaskan Air Command
ACO	Administrative Contracting Officer
ACI	Allocated Configuration Identification
AFAD	Air Force Acquisition Document
AFI	Air Force Iceland
AFLC	Air Force Logistics Command
ALC	Air Logistics Center
ATC	Air Training Command
AWACS	Airborne Warning and Control System (E-3)
BIT	Built-In-Test
CC	Command Center
CCA	Command Center Automation
CCP/TCP	Contract Change Proposal/Task Change Proposal
CDR	Critical Design Review
CDRL	Contract Data Requirements List
CENTAF	Central Air Forces
CFA	Communications Functional Area
CI	Configuration Item
COMSEC	Communication Security
CONUS	Continental United States
CPCI	Computer Program Configuration Item
CPDP	Computer Program Development Plan
CPIN	Computer Program Identification Number
CSA	Configuration Status Accounting
CWBS	Contract Work Breakdown Structure
DCA	Defense Communication Agency
DH	Design Handbook
DID	Data Item Description
DOT	Department of Transportation
DT&E	Development Test and Evaluation
DTLCC	Design to Life Cycle Cost
ECP	Engineering Change Proposal
EMC	Electromagnetic Compatibility
EMCP	Electromagnetic Compatibility Program
EMCTP	Electromagnetic Compatibility Test Program
EMI	Electromagnetic Interference
ESD	Electronic Systems Division

GLOSSARY (Continued)

FCA	Functional Configuration Audit
FCI	Functional Configuration Identification
FEDB	Failure Experience Data Base
FIT	Fault Isolation Test
FOC	Final Operational Capability
FQR	Formal Qualification Review
FRACAS	Failure Reporting Analysis and Corrective Action System
GES	Ground Entry Station
GFE	Government Furnished Equipment
GFP	Government Furnished Property
GIDEP	Government/Industry Data Exchange Program
HF	High Frequency
HOL	Higher Order Language
IADCF	Interim Air Defense Control Facility
IADGE	Iceland Air Defense Ground Environment
IAW	In Accordance With
ICCE	Iceland Command and Control Enhancement
ICD	Interface Control Drawing/Document
I&CO	Installation and Checkout
ICWG	Interface Control Working Group
IDF	Iceland Defense Force
ILS	Integrated Logistic Support
IOC	Initial Operational Capability
IPT	Iceland Posts and Telecommunications
ISP	Integrated Support Plan
JCS	Joint Chiefs of Staff
JTAO	Joint Tactical Air Operations
JSS	Joint Surveillance System
KNCS	Keflavik Naval Communications Services
KNS	Keflavik Naval Station
LCC	Life Cycle Cost
LOAPS	List of Applicable Publications
LRU	Line Replaceable Unit
LSA	Logistic Support Analysis
MADIZ	Military Air Defense Identification Zone
MDC	Master Direction Center

GLOSSARY (Continued)

NADGE	NATO Air Defense Ground Environment
NADS	North Atlantic Defense System
NARS	North Atlantic Relay Station
NATO	North Atlantic Treaty Organization
NCS	Net Control Station
NSN	National Stock Number
OSHA	Occupational Safety and Health Administration
OT&E	Operational Test and Evaluation
PACAF	Pacific Air Force
PCA	Physical Configuration Audit
PCI	Product Configuration Identification
PCO	Procurement Contracting Officer
PDFA	Processing and Display Functional Area
PDR	Preliminary Design Review
PME	Prime Mission Equipment
PMR	Program Management Review
PO	Program Office
PPSL	Program Parts Selection List
PSEL	Priced Support Equipment List
RADIL	ROCC AMACS Digital Information Link
ROCC	Region Operations Control Center
R/M/A	Reliability/Maintainability/Availability
RPIE	Real Property Installed Equipment
RSSF	ROCC Software Support Facility
SDPE	Special Design Protective Equipment
SDR	System Design Review
SE	Support Equipment
SERD	Support Equipment Recommendation Data
SHAPE	Supreme Headquarters Allied Powers Europe
SOW	Statement of Work
SQA	Software Quality Assurance
SQT	Software Qualification Test
SRR	System Requirements Review
SSAN	Social Security Account Number
STANAG	Standardization Agreement (NATO)
STINFO	Scientific and Technical Information

GLOSSARY (Concluded)

TADIL	Tactical Digital Information Link
TAF	Tactical Air Forces
TBD	To Be Determined
TBS	To Be Supplied
TCTO	Time Compliance Technical Order
TDME	Test Diagnostics and Measuring Equipment
TLSC	Target Logistics Support Cost
TMP	Technical Manual Plan
TTEP	Training and Training Equipment Plan
UHF	Ultrahigh Frequency

## 1.0 SCOPE

1.1 This Statement of Work (SOW) describes the required tasks to be performed by the contractor and the management programs and controls that the Government requires during the contract.

1.2 The data to be delivered as a result of performing the tasks prescribed by this SOW are specified in the Contract Data Requirements List (CDRL). In no case shall any task prescribed herein be interpreted to require delivery of data, except in accordance with the CDRL.

1.3 The provisions of the applicable documents and their tailored applications, set forth in the paragraphs of 3.0 are hereby incorporated into the contract by reference and with the same force and effect as though set forth herein in full.

1.4 Background. The present Iceland Air Defense System is a manual system which provides limited capability for secure voice and no capability for secure data radio communications between the E-3 Airborne Warning and Control System (AWACS) aircraft and the Iceland Air Defense Ground Environment (IADGE) System. The existing system uses antiquated HF communication equipment to communicate with the E-3.

1.4.1 The Iceland Command and Control Enhancement (ICCE) Program is an interim program to the North Atlantic Defense System (NADS) which will automate the existing system through the installation of UHF- and HF-equipped Ground Entry Stations (GESs) capable of secure voice and TADIL A communications. The GESs will interface with the Processing and Display Functional Area (PDFA) located at the Master Direction Center (MDC) to provide secure voice and tactical data communication linkage with the E-3. This will provide the MDC with a more complete, accurate, and timely exchange and display of command and control data with the E-3 and the Interim Air Defense Control Facility (IADCF) as well as providing a transmit-only capability to the Command Center Automation (CCA) System.



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20 August 1985

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## 2.0 APPLICABLE DOCUMENTS

The following listing is for convenience only. Section 3 of this SOW contains tailored requirements. In cases where only the latest notice and change are shown in military standards, notices, and changes up to the latest notice are also applicable.

### 2.1 Standards

DOD-STD-480A 12 April 78 Notice 1 29 December 78	Configuration Control-Engineering Changes, Deviations and Waivers
MIL-STD-129J 25 September 84	Marking for Shipment and Storage
MIL-STD-196C 22 December 65 Notice 4 27 July 77	Joint Electronics Type Designation System
MIL-STD-461B 1 April 80	Electromagnetic Emission and Susceptibility Requirements for the Control of Electromagnetic Interference
MIL-STD-470A 3 January 83	Maintainability Program for Systems and Equipment
MIL-STD-471A 10 January 75 Notice 2 8 December 78	Maintainability Verification/ Demonstration/Evaluation
MIL-STD-483 1 June 71 Notice 2 21 March 79	Configuration Management Practices for Systems, Equipment, Munitions and Computer Programs
MIL-STD-490 30 October 68 Notice 2 18 May 72	Specification Practices
MIL-STD-499A 1 May 74	Engineering Management

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MIL-STD-756B 18 November 81 Notice 1 31 August 82	Reliability Modeling and Prediction
MIL-STD-781C 20 March 81	Reliability Design Qualification and Production Acceptance Tests
MIL-STD-785B 15 September 80	Reliability Program for Systems and Equipment Development and Production
MIL-STD-794E 16 July 72	Parts and Equipment, Procedures for Packaging of
MIL-STD-881A 25 April 75	Work Breakdown Structure for Defense Materiel Items
MIL-STD-882B 30 March 84	System Safety Program Requirements
MIL-STD-965 15 April 77 Notice 3 26 August 83	Parts Control Program
MIL-STD-1388-1A 11 April 83	Logistics Support Analysis
MIL-STD-1472C Notice 2 10 May 84	Human Engineering Design Criteria for Military Systems, Equipment and Facilities
MIL-STD-1510A 5 June 78	Container Design Retrieval System, Procedure for Use of
MIL-STD-1520B 3 July 80	Corrective Action and Disposition System for Non-Conforming Material
MIL-STD-1521A 1 June 76 Notice 2 21 December 81	Technical Review and Audits for System, Equipment, and Computer Programs
MIL-STD-152B 1 August 72	Production Management

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MIL-STD-1535A  
1 February 74

Supplier Quality Assurance Program  
Requirements

MIL-STD-1556A  
29 February 76

Government/Industry Data  
Exchange Program Contractor  
Participation Requirements

MIL-STD-45662  
16 May 84

Calibration System Requirements

## 2.2 Specifications

MIL-E-6051D  
7 September 67  
Amendment 1  
5 July 68

Electromagnetic Compatibility  
Requirement, Systems

MIL-H-46855B  
31 January 79  
Amendment 2  
5 April 84

Human Engineering Requirements for  
Military Systems, Equipment and  
Facilities

MIL-I-45208A  
16 December 83  
Amendment 1  
24 July 81

Inspection System Requirements  
ALL

MIL-L-8031  
1 June 75

List of Applicable Publications  
(LOAPs)

MIL-M-7298C  
15 April 75  
Amendment 3  
16 February 81

Manuals, Technical:  
Commercial Equipment

MIL-N-7513F  
14 November 80  
Amendment 1  
9 April 81

Nomenclature Assignment, Contractor  
Method for Obtaining

MIL-P-9024G  
6 June 72

Packaging, Handling, and  
Transportability in System/  
Equipment Acquisition

MIL-Q-9858A  
16 December 63

Quality Program Requirements

MIL-S-52779A  
1 August 79

Software Quality Assurance  
Program Requirements

MIL-S-83490  
30 October 79

Specification, Types and Forms

### 2.3 Handbooks

MIL-HDBK-217D  
15 January 82

Reliability Prediction of  
Electronic Equipment

MIL-HDBK-H6  
July 80

Federal Item Identification Guides  
for Supply Categorizing

MIL-HDBK-300M  
1 October 82

Air Force Technical Information  
File of Aerospace Ground Equipment

MIL-HDBK-334  
15 July 82

Evaluation of Contractors Software  
Quality Assurance Program

MIL-HDBK-472  
24 May 66  
Notice 1  
12 January 84

Maintainability Prediction

### 2.4 Other Documents

AFM 50-2  
25 May 79

Instructional System Development  
Guidance

AFM 50-9  
13 July 81

Special Training Guidance

AFM 75-2  
15 March 69

Military Traffic Management  
Regulation

AFR 8-2  
3 May 82

Air Force Technical Orders System

AFR 100-45  
Volume 1  
22 September 80

Communication Security Policies,  
Procedures and Instructions

AFR 205-4  
2 August 76

Air Force Participation in the DOD  
Industrial Security Program

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20 August 1985

AFR 300-8 17 July 79	ADP Systems Security Policy Procedures and Responsibilities
AFR 300-10 15 December 76	Computer Programming Languages
AFR 400-44 8 June 82	Air Force Corrosion Program
AFR 400-54 20 January 84	Report of Item and Packaging Discrepancies
AFR 800-8 7 February 80	Integrated Logistics Support (ILS) Program for Systems and Equipment
AFSC DH 1-4 5 January 75	Electromagnetic Compatibility
DOD Directive 5000.39 17 January 80	Acquisition and Management Integrated Logistics Support for System and Equipment
DODM 5220.22 January 83	Industrial Security Manual for Safeguarding Classified Information
DODR 5220.22 January 83	Industrial Security Regulations
DODR 4500.32 1 August 79	Military Standard Transportation and Movement Procedures (MILSTAMP)
DCA Circular 310-70-1 Volume I, 29 March 76 Volume II 22 September 78	DCS Technical Control, Policy, and Facilities, Procedures
DCA Circular 310-130-1 1 June 83	Submission of Telecommunications Service Requests
ESD-TR-82-417 August 82	Part Derating Guidelines (Interim) for ESD Systems Development
JCS Pub. 10 1 December 82	Tactical Command and Control and Communications Systems Standards
JCS Pub. 1A 15 December 82	Operations Security

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PPSL Issue 1, Rev. A  
20 January 82

PPSL Issue 01, Rev. A  
December 81

NACSIM 5203  
30 June 82

Program Parts Selection  
List: Electrical/Electronic Parts

Program Parts Selection List:  
Mechanical Parts

Guidelines for Facility Design and  
Red/Black Installation

### 3.0 REQUIREMENTS

The contractor shall deliver a system which meets the requirements specified in ESD-SS-ECI-1020 and shall comply with the following:

#### 3.1 Contractor Tasks

3.1.1 The contractor shall provide (design, develop, modify, procure, manufacture, integrate, test, and install) a certifiable Tactical Air Forces (TAF)/Joint Tactical Air Operations (JTAO) System which will be interoperable on a Tactical Digital Information Link A (TADIL A) with U.S. forces. All TADIL A software which supports this system shall be the latest TAF/JTAO-certified version available at the time of contract award. The ICCE System shall include all equipment necessary to provide a secure digital data and voice communications interface between the E-3 aircraft and the Iceland Air Defense Ground Environment (IADGE) System. The ICCE System shall provide the capability for AWACS aircraft operating within the Iceland Air Defense Region to exchange command and control information with the MDC over TADIL A via UHF and HF GESs. The HF GES will be an option item.

3.1.2 The ICCE System will be composed of the following functional areas:

- WBS 1.1.1
- a. Processing and Display Functional Area. The PDFA shall consist of the hardware and software at the MDC for exchanging, recording, and displaying TADIL A messages with the E-3 aircraft. The PDFA shall provide the capability to exchange track data with the IADCF. The PDFA shall provide two-way translation between IADCF message formats and TADIL A M-series message formats providing IADCF-to-E-3 connectivity. The PDFA shall transmit its track data base to the CCA System in the Command Center (CC). All hardware and software required to provide these requirements shall be provided by the contractor, and shall be identical to the processing and display equipment used in the RADIL System. All software delivered under this contract shall operate on the existing RADIL Systems without any hardware modification required to those systems.
- b. Communications Functional Area. The Communications Functional Area (CFA) shall consist of the GES equipment and MDC communication equipment. There shall be two northern stations and growth for two southern stations. The two northern stations shall be located at Vidarfjall and Thundfjall with the southern stations located at Hofn,

MODEM  
1.1.5



and Rockville (MDC). The GESs at Hofn, Thyerfjall, Rockville (MDC), and Vidarfjall shall be UHF radio stations capable of both clear and secure voice, and secure TADIL A communications. The radio equipment shall consist of the UHF transceivers and associated antenna equipment required at the GESs to exchange TADIL A and voice communications with E-3 aircraft. The radio equipment shall also consist of remote control equipment for remotely controlled radio operation, including tuning, through Iceland Posts and Telecommunications (IPT), North Atlantic Relay Station (NARS) and Keflavik Naval Communication Services (KNCS) facilities. The optional GES at Rockville-Grindavik shall be an HF radio station with secure TADIL A and clear and secure voice capabilities. The HF transmitter equipment shall be located at Grindavik and the HF receiver equipment at Rockville. Communication equipment at the MDC shall allow transmission and reception of voice and data signals from the GESs. Communications equipment at the MDC shall also allow for the remote control of four UHF GESs.

3.1.3 The ICCE System will be procured in two phases, an Initial Operational Capability (IOC) phase and Final Operational Capability (FOC) phase. The PDFA, which will be installed in the MDC, shall provide the capability to exchange command and control data with TADIL A participants through remotest GESs. The PDFA shall also have the capability to transmit its track data base to the CCA System. The GESs shall consist of two UHF facilities with an option for two additional UHF facilities and one HF facility.

3.1.3.1 The ICCE System shall reach an IOC when the PDFA and one UHF GES (Vidarfjall, the northeast GES) is installed and operating. No remote control shall be required for the initial operation of this GES. The MDC will operate as a TADIL A Net Control Station (NCS) during the period between IOC and FOC. The GES remote control capabilities and the remaining GESs shall be implemented in the final stage, i.e., to reach FOC. The PDFA delivered at IOC shall have the capability to include the lateral-tell interface. Upgrades and modifications to lateral-tell software and associated documentation shall be an option item.

3.1.3.1.1 The IOC System shall be composed of both a developmental and a production effort. The production effort shall include the procurement and manufacturing of off-the-shelf hardware and integration of the hardware with Government furnished software. The integration, testing, and documentation of the hardware and software shall be part of the production effort. The contractor shall provide contractor technical services for the IOC System until the completion of the ICCE System Operational Test and Evaluation (OT&E).

1.1.2.2 3.1.3.1.2 The developmental effort of the IOC System shall include the design and modification of hardware. The integration and testing of the developed, modified, and off-the-shelf hardware and software shall also be included in the developmental effort. Any development effort which is not completed in the 120 day level of effort contract will be completed as a task in this SOW.

1.1.2.3 3.1.3.1.3 The FOC System shall also be composed of a developmental and production effort. The production effort shall include the procurement and manufacturing of off-the-shelf hardware and software. The integration, testing, and documentation of the off-the-shelf hardware and software shall be included in the production effort.

1.2.1 3.1.3.1.4 The developmental effort of the FOC System shall include the design and modification of both hardware and software. The integration and testing of the developed, modified, and off-the-shelf hardware and software shall also be part of the developmental effort.

3.1.3.2 An optional capability will allow the PDFA to exchange track data with the IADCF via TADIL B, as defined in Addendum Specification ESD-SS-ECI-1020A. This option will be a developmental effort to include the design and coding of software. The integration and testing of the software, developed under this option, into the PDFA will be part of this development effort.

3.1.4 The PDFA hardware shall be the same as the RADIL hardware currently operational in the Joint Surveillance System Region Operations Control Center (JSS ROCC) with exceptions listed in 3.1.5. Any further modifications or upgrades recommended by the contractor to the baseline processing and display portion of the RADIL and ICCE System (hardware and software) during this contract shall be reviewed by the Government for acceptance.

3.1.5 Exceptions to the PDFA hardware shall be:

- 1). All peripherals shall be installed in pull out drawers for easy access and maintainability.
- 2). The present bullnose wiring shall be rewired to meet TEMPEST and safety requirements.
- 3). The main power supply shall be upgraded to the L.H. Research power supply to double the present capacity.

5  
5.1.1.1  
2  
5.1.1

3.2 General. The contractor shall modify Government Furnished Equipment (GFE) software, develop new software, provide the hardware and support, where GFE is not provided and perform installation, integration, and tests. The contractor shall provide all auxiliary equipment required to interface with the GFE telephone circuits. The contractor shall provide the required data, documentation, training, test plans, and reports in accordance with (IAW) the CDRL requirements. The contractor will be provided access to ROCC AWACS RADIL and JSS ROCC documentation.

3.2.1 Software Support Facility. The contractor shall provide, install, integrate, and test the additional hardware and software required at the ROCC Software Support Facility (RSSF), Tyndall AFB to allow software support of any Government-accepted modifications and upgrades to the present RADIL baseline.

### 3.3 Engineering

#### 3.3.1 System Engineering

MIL-STD-499A  
1 May 74

Engineering Management  
Section 4 and paragraphs 10,  
10.1.2-10.1.5, 10.1.6.2-10.1.6.4,  
10.1.7, 10.1.9, 10.2-10.2.9

MIL-STD-1521A  
1 June 76  
Notice 2  
21 December 81

Technical Review and Audits for  
Systems, Equipments, and Computer  
Programs  
Sections 4, 6, and Appendices A, B,  
C, D, E and F

6.4

3.3.1.1 Formal Technical Reviews. Formal technical reviews shall be conducted at the contractor's facility IAW MIL-STD-1521A. Reviews shall present the status and results of all systems engineering requirements. The contractor shall provide a co-chairman for each formal design review and shall ensure that decisions made and action items assigned as a result of each design review are implemented. The Government will appoint a co-chairman to serve at each formal review meeting, and will provide the contractor with a list of Government representatives who will attend. The contractor shall prepare the minutes for each design review IAW MIL-STD-449A and the CDRL (DI-E-3118).

3.3.1.1.1 Reserved.

3.3.1.1.2 Reserved.

5.1.2.1 3.3.1.1.3 Preliminary Design Review (PDR). The contractor shall conduct incremental software and hardware PDRs, IAW MIL-STD-1521A, Appendix C. The contractor shall conduct a PDR for the FOC System within 90 days of contract award. The PDR for the optional capability, i.e., TADIL B, shall be conducted within 90 days after the option is exercised. The contractor shall report on the reliability prediction analysis at the PDR. The CI/CPCI Development Specifications shall be available at PDR in draft form (DI-E-3102A/T and DI-E-3119B).

5.1.2.2 3.3.1.1.4 Critical Design Review (CDR). Incremental software and hardware CDRs shall be conducted IAW MIL-STD-1521A, Appendix D. The FOC CDR shall be conducted within 180 days after contract award. The CDR for the option (TADIL B) shall be conducted within 180 days after the option is exercised. The product specifications shall be available at each CDR in draft form (DI-E-3103A, DI-E-3120B and DI-E-3132/T).

3.3.1.1.5 Periodic Technical Reviews. These reviews shall be conducted in conjunction with the program review meetings required by the Program Management Task. In addition to the periodic technical reviews, technical review meetings for the ICCE System shall be conducted in conjunction with other design review meetings; as a minimum, a review 45 and 120 days after contract award shall be conducted. The contractor shall present the design and status of all hardware and software efforts at these technical review meetings. At the 45-day technical review, the contractor shall present a review of the System's functional flow requirements, system schematic diagrams, preliminary equipment and console layout drawings, Electromagnetic Compatibility (EMC), and design approach.

3.3.1.1.6 Subcontractor and Vendor Design Reviews. The Government shall attend subcontractor and vendor design reviews at its option.

3.3.1.2 Informal Technical Reviews. The contractor shall provide ready access by the Government or its representatives to all technical and management personnel for the purpose of conducting informal technical reviews of progress and problem areas.

### 3.3.2 System Safety

MIL-STD-882B  
30 March 84

System Safety Program Requirements  
Section 3 and paragraphs 4.2.3,  
5.1.2, 5.2, 5.3, 5.4, 5.5, 5.6  
(excluding 5.6.3), 5.7, 5.8, 5.9,  
and 5.10.

3.3.2.1 The contractor shall:

- (1) Provide a qualified, experienced safety engineer with centralized mishap risk management authority.
- (2) Establish technical information procedures with associate and subcontractors to ensure effective implementation of the safety program.
- (3) Eliminate all hazards or control them to a combined severity-probability level of IE, IID, IIIC or less as defined IAW MIL-STD-882B.
- (4) Review facility installations for satisfactory safety compliance at appropriate design milestones.
- (5) Comply with Occupational Safety and Health Administration (OSHA) safety standards or host country equivalents for the protection of personnel, equipment and property, including GFE and Government Furnished Property (GFP), during fabrication, construction, installation, test, and operation of the System.

3.3.3 Human Factors. For newly developed equipment, the contractor shall meet the following human factors requirements:

MIL-H-46855B  
31 January 79  
Amendment 2  
5 April 84

Human Engineering Requirements for  
Military Systems, Equipment and  
Facilities  
Paragraphs 3.1.1 and 3.2.4

MIL-STD-1472C  
Notice 2  
10 May 84

Human Engineering Design Criteria  
for Military Systems, Equipment and  
Facilities

3.3.4 Reserved

3.3.5 Security

AFR 205-4  
2 August 76

Air Force Participation in the DOD  
Industrial Security Program  
ALL

DODM 5220.22  
January 83

Industrial Security Manual  
for Safeguarding Classified  
Information  
ALL

DODR 5220.22  
January 83

Industrial Security Regulations  
ALL

3.3.5.1 The contractor and subcontractors shall comply with the requirements of DODR 5220.22 and AFR 205-4, and the Iceland Command and Control Enhancement Program Security Classification Guide, dated 1 August 1984. Classified information shall be handled and controlled IAW provisions of the DOD Industrial Security Manual DODM 5220.22 and supplemented by local procedures. The contractor and subcontractors shall ensure that appropriate personnel on this project have a U.S. and NATO SECRET security clearance prior to contract start date.

### 3.3.6 Availability

3.3.6.1 Design Analysis and Cost Trade-Offs. For all newly developed-modified equipment, the contractor shall perform analyses and cost effectiveness trade-offs between reliability and maintainability as required to ensure the specified availability requirements are met. The contractor shall verify the availability requirements through analysis IAW Section 4 of the System Specification.

3.3.6.2 Availability Predictions. The contractor shall include availability predictions with the reliability and maintainability reports. If the availability requirements are not met, the necessary corrective action shall be proposed and the procuring activity shall be so advised.

### 3.3.7 Maintainability

MIL-STD-470A  
3 January 83

Maintainability Program  
Requirements for Systems and  
Equipment  
Sections 4 and 5

MIL-STD-471A  
10 January 75  
Notice 2  
8 December 78

Maintainability Verification/  
Demonstration/Evaluation  
Section 4, Appendix A, Appendix B  
through 8.10.4, and Test Method 9

MIL-HDBK-472  
24 May 66  
Notice 1  
12 January 84

Maintainability Prediction  
Paragraph 3.2, procedure 2, Part 8

The maintainability prediction shall address (in addition to the above) all the ICCE performance monitoring and fault isolation qualitative and quantitative requirements and shall include a detailed description of the hardware partitioning, Built-In-Test (BIT), and Fault Isolation Test (FIT) concepts, and methods of software control of BIT/FIT that are necessary to achieve the Reliability/Maintainability/Availability (R/M/A) requirements. The BIT/FIT prediction shall be performed to the functional level.

### 3.3.8 Reliability

MIL-STD-781C  
20 March 81

Reliability Design Qualification  
and Production Acceptance Tests  
ALL

ESD-TR-82-417  
August 82

Part Derating Guidelines (Interim)  
for ESD System Development  
ALL

MIL-HDBK-217D  
15 January 82

Reliability Prediction of  
Electronics Equipment  
Section 5.2

MIL-STD-756B  
18 November 81  
Notice 1  
31 August 82

Reliability Modeling and  
Prediction  
ALL

MIL-STD-785B  
15 September 80

Reliability Program for Systems and  
Equipment Development and  
Production

Task 101 ALL

Task 101.2.1 ALL

Task 102 ALL

Task 103.2.1 ALL

Task 103.2.2 a, b. The contractor shall record and report the results of the reviews and follow up on open items. Notification to the Program Office (PO) shall be provided no less than 30 days prior to the scheduled review.

SOW-ECI-1229  
20 August 1985

Task 104.2 ALL. The contractor shall employ its own Failure Reporting Analysis and Corrective Action System (FRACAS) format. Failure reporting shall be initiated at the CI and CPCI test level. Failure reporting shall be to the part level.

Task 201.2 ALL except paragraph 201.2.3.

Task 202.2 ALL allocation shall be to the Line Replaceable Unit (LRU) level.

Tasks 203.2.1, 203.2.1.1, 203.2.1.2, and 203.2.1.3 Predictions for mechanical, electrical and electromechanical equipment shall be made using either MIL-HDBK-217D, RAP-NRPD-1, 1978 (AD-A005657), contractor data or alternatives. Use of the latter two shall require Government approval. The prediction procedures in MIL-STD-756B, Tasks 201 and 202 shall be used. The derating requirements for parts shall be IAW ESD-TR-82-417 or the contractor's derating standards if consistent with ESD-TR-82-417.

Task 204.2 Failure Modes, Effects and Criticality Analyses (FMECA) shall be to the functional circuit level.

3.3.8.1 Reliability Prediction and Documentation. The contractor shall prepare a Reliability Prediction Report IAW the CDRL. The report shall contain the documented results of the reliability prediction. Applicable failure rates, failure distributions, failure rate adjustment factors, and reliability variables used in the calculation of each subdivision of the end item shall be shown. The report shall identify the source(s) and evaluate the validity of data used in the reliability prediction (DI-R-2128 and DI-R-7095).

### 3.3.9 Parts Control Program

MIL-STD-965  
15 April 77  
Notice 3  
26 August 83

PPSL Issue 1, Rev. A  
20 January 82

Parts Control Program  
ALL except paragraphs 5.2 through  
5.2.4.2, 4.3, 4.4.2 and 5.1.1.

Program Parts Selection List:  
Electrical/Electronic Parts  
ALL



SOW-ECI-1229  
20 August 1985

PPSL Issue 01, Rev. A  
December 81

Program Parts Selection List:  
Mechanical Parts  
ALL

MIL-STD-1556A  
29 February 76

Government/Industry Data  
Exchange Program, Contractor  
Participation Requirements  
ALL

3.3.9.1 Application. The contractor shall establish and maintain a Parts Control Program of all new and modified equipment IAW:

- a. The System Specification
- b. This Statement of Work, and
- c. MIL-STD-965 (Procedure I).

3.3.9.2 Program Parts Selection List (PPSL). The contractor shall use the Government-generated and maintained baseline PPSL. Requests for use of parts not on this PPSL shall be submitted IAW the CDRL. As a result of such requests and after acquisition agency approval, amendments to the PPSL will be issued by the Government as required, but not more frequently than once every 30 days (DI-E-7027A and DI-E-7028A).

3.3.9.3 Subcontractor Direction. The contractor shall include contractual coverage in all subcontracts to ensure that the subcontractor complies with MIL-STD-965 and this SOW to the same extent as the prime contractor.

3.3.9.4 Government/Industry Data Exchange Program (GIDEP). The contractor shall participate in GIDEP to the extent necessary to receive data from the Failure Experience Data Base (FEDB). The contractor shall screen all parts through the FEDB prior to their selection IAW paragraph 3.3.1.1 of the System Specification when applicable.

3.3.10 Site Surveys. The contractor and designated Government representatives shall conduct site surveys to identify equipment locations within the ICCE facilities, location and requirement for cable trays and racks and other allied support (e.g., power and cooling). Data on all facility and external equipment interfaces shall be gathered during the site surveys and used by the contractor to generate Interface Control Documents (ICDs). The installation and integration plan for the ICCE System will be further developed-  
final . . . . . surveys. Potential Electromagnetic

1.4.4.1  
1.4.4.2  
1.4.4.3  
1.4.4.4

1.1

1.7.1.2

Interference (EMI) and TEMPEST problems shall be investigated during the site surveys. The first site survey shall be conducted within 30 days of contract award.

**3.3.11 Electromagnetic Compatibility**

AFSC DH 1-4  
5 January 75

Electromagnetic Compatibility  
Sections 5D, 5E, 5F, 5G

MIL-E-6051D  
7 September 67  
Amendment 1  
5 July 68

Electromagnetic Compatibility  
Requirement, Systems  
ALL except paragraphs 3.2i, 3.2j,  
3.2.6 through 3.2.12, 3.2.14,  
3.2.15, 3.3, 4.2i, 4.2j, 4.3.3 and  
4.3.5

MIL-STD-461B  
1 April 80

Electromagnetic Emission and  
Susceptibility Requirements for the  
Control of Electromagnetic  
Interference  
Parts 1, 4 and 9, Class A3 and C2

**3.3.11.1 Off-the-Shelf Equipment or GFP.** The contractor shall deliver both a system that satisfies all environmental requirements and one that is electromagnetically compatible with all new, modified, off-the-shelf, and GFP equipment. If any portion of the above mentioned equipment is modified, the contractor shall implement the Electromagnetic Compatibility (EMC) requirements of this SOW and Paragraph 4.5.1 of MIL-STD-461B in that modification.

**3.3.11.2 Electromagnetic Compatibility Program (EMCP).** The contractor shall establish and maintain an EMCP as required by MIL-E-6051D, and incorporate system and equipment design requirements as provided in AFSC Design Handbook 1-4 and MIL-STD-461B to ensure that the System is electromagnetically compatible both internally and with the external environment.

**3.3.11.3 Electromagnetic Compatibility Test Program (EMCTP).** The contractor shall plan and conduct an EMCTP to verify that EMC requirements specified in the System Specification have been satisfied. The results of EMC test activities shall be documented in appropriate test documentation IAW the CDRL (DI-T-3702 and DI-T-3716A).

3.3.11.4 Existing Design Equipment. When existing design equipment has not been previously tested for EMC, the provisions of the EMC requirements of this SOW and Paragraph 4.5.2 of MIL-STD-461B shall apply.

3.3.11.5 Intersystem Analysis. The contractor shall analyze all electromagnetic incompatibilities. They shall be responsible for correcting all deficiencies in the design. Retesting shall be required of any modified equipment, and the entire system, to demonstrate that the identified deficiency has been corrected.

3.3.12 Reserved

3.3.13 Communications Network

DCA Circular 310-70-1  
Vol I, 29 March 76  
Vol II, 22 September 78

DCS Tech Control, Policy and  
Facilities, Procedures  
ALL

DCA Circular 310-130-1  
1 June 83

Submission of Telecommunications  
Service Requests  
ALL

The communications network shall comply with the above DCA circulars as well as the requirements cited in the System Specification and elsewhere in the contract.

3.3.13.1 Requests for commercially leased and Government-operated long lines to support this system must be submitted to AFI/SI with a copy to SCU-6 not later than 150 days prior to the need date.

3.3.14 Communications Security/TEMPEST

AFR 100-45  
Volume I  
22 September 80

Communications Security Policies,  
Procedures and Instructions  
ALL

NACSIM 5203  
30 June 82

Guidelines for Facility Design and  
Red/Black Installation  
ALL

The contractor shall:

- a. Design, develop, and test the equipment to eliminate or reduce to acceptable levels compromising emanations IAW the System Specification. This task shall be applied to all equipment processing RED (classified plain-text) data. Use

only Air Force-approved TEMPEST control design procedures (DI-T-3702).

- b. Identify the procedures to be performed to demonstrate compliance or noncompliance with the appropriate TEMPEST requirements.
- c. Establish a Communications Security (COMSEC) account and shall be responsible for all COMSEC equipment and documentation prior to system turnover.
- d. Develop all software drivers required for TEMPEST testing.

**3.3.15 Radio Frequency Management.** The contractor shall ensure frequency management guidance, policies, and procedures are considered throughout the program and that frequency allocation and assignment authorization are obtained as prescribed by the schedule of the contract (Section H) and the general provisions of the contract. The contractor shall submit a DD Form 1494 to the Government within 60 days of contract award and shall provide support in development of the Frequency Management Plan.

**3.3.16 Transportability.** The contractor shall ensure that the System is transportable in conformance with requirements of the System Specification.

**3.3.17 Quality Assurance**

MIL-STD-1520B 3 July 80	Corrective Action and Disposition System for Non-conforming Material ALL
MIL-STD-1535A 1 February 74	Supplier Quality Assurance Program Requirements ALL
MIL-STD-45662 16 May 80	Calibration System Requirements ALL
MIL-I-45208A 16 December 63 Amendment 1 24 July 81	Inspection System Requirements ALL
MIL-S-52779A 1 August 79	Software Quality Assurance Program Requirements ALL

3.3.17.1 Applicability. The quality assurance requirements apply for all materials, supplies, and services at prime contractor, subcontractor, vendor, and test sites.

3.3.17.2 Software Quality Assurance (SQA). The SQA program shall be implemented at contract award, and continue through the entire software development cycle. The SQA organization's responsibilities shall span this period. Review of the contractor's SQA program by the contracting officer, or a representative, will take place as the need for such review is determined by the Government.

### 3.3.18 Test and Evaluation

4.3.1 3.3.18.1 Test Program. The contractor shall establish an overall Development Test and Evaluation (DT&E) program that meets the contract requirements. The test program shall be documented in a Contractor Test Plan IAW the CDRL and will verify that the System, subsystem, or equipment meets requirements stated in the System Specification and this SOW (DI-T-3702A).

1.5.1.4.1

1.5.1.4

1.5.1.5.1

1.5.1.5.2

1.4.2 3.3.18.1.1 In-plant and field DT&E testing shall be conducted for the IOC System and the FOC System. An AF-conducted DT&E test will be conducted after the successful completion of the FOC System field DT&E testing.

4.2.1 3.3.18.1.2 A Software Qualification Test (SQT) shall be conducted jointly by the AF and contractor prior to delivery of the FOC system software.

1.4.2.2 3.3.18.1.3 IADCF interface testing for the lateral-tail option shall be conducted at the contractor's plant using an AF designated and approved IADCF simulator or similar system. The contractor shall provide the required telephone circuits for interfacing with the IADCF simulator. The contractor shall notify the Government 60 days prior to the start of SQT in order to allow the simulator or system to be prepared.

3.3.18.1.4 The TAF/JTAO certification testing shall be conducted concurrent with the SQT testing. The contractor shall support the certification testing. Certification and SQT testing shall be conducted at the contractors plant by interfacing with Government provided certification facilities. The contractor shall provide telephone circuits required to interface with the certification facilities. The contractor shall provide the Government within 15

days after contract award the dates the certification facilities will be required. The contractor shall implement all hardware and software corrections required to complete TAF/JTAO certification.

2.1  
1.2.2  
3.3.18.2 Installation. The contractor shall install, assemble, integrate, and test the prime mission product and all GFP at the contractor's facility for factory test and then at the operational sites to be selected for site acceptance. All tests shall be performed IAW the approved Test Plan and Procedures. The contractor shall be responsible for all interwiring and interconnection of all CIs and CPCIs and equipment whether GFP or contractor furnished. The above shall include all interfacing of GFE and GFP to primary power sources and to external displays, command, control, and communication equipment. The specific interface requirements shall be as specified in the System Specification (DI-T-3702A).

3.3.18.2.1 Contractor Clean-up. The contractor shall be responsible for the removal of all debris and the complete clean-up upon completion of the construction and installation phase.

3.3.18.2.2 The contractor shall ensure the on-site testing minimizes interference with ongoing operations. In particular, care shall be exercised during the installation and integration phases of site activities to ensure that no physical or electrical disturbances interfere with ongoing equipment operations.

7.3.1  
1.7.3.2  
3.3.18.3 Checkout. Prior to the beginning of field testing, the contractor shall perform installation and checkout verifications of the System IAW the System Specification and the approved Installation and Checkout (I&CO) plan and procedures. The contractor shall ensure that all required documentation is complete and accurate IAW the CDRL (DI-T-3702A).

3.3.18.4 Statement of Readiness. At least 30 calendar days prior to any testing requiring official Government participation, the contractor shall notify the test director that they are ready to begin official testing. Prior to starting any tests, the contractor shall brief the Government representatives and shall not proceed without Government approval. For all system level testing the contractor shall ensure that the System is completely installed to meet the contractual requirements. Prior to the beginning of testing and arrival on-site of the Government test force, the contractor shall ensure that the equipment is ready for inspection and testing on the specified date to avoid unnecessary delays.

3.3.18.5 Deviations. Any deviations in testing, substitution of test equipment, or any other exception(s) to the test program shall be noted in the contractor's test logs and on the official test records. A list of discrepancies revealed by prior testing shall be furnished to the Government test force for each CI, equipment, or computer program involved. Acceptance of the deviation data shall not constitute approval.

3.3.18.6 Test Resources. The contractor shall ensure that all test equipment, test facilities, other support equipment, approved test procedures, data logs, and other contractual items necessary for testing are available for the start of the testing.

3.3.18.7 Plans, Procedures, and Reports. All test and demonstration plans, procedures, and reports that are required on this contract are identified in the CDRL. All test plans, procedures, and reports shall have Government approval before being utilized on the contract (DI-T-3714A, DI-T-3716A, and DI-T-3721A).

1.5.1.5.1  
1.5.1.5.2

3.3.18.8 Schedules. The contractor shall provide to the Government a test schedule for issuance of test documents for each applicable CI and CPI and for the conduct and support of all applicable testing. This schedule shall be updated as specified in the CDRL (DI-T-3702A).

3.3.18.9 Verification Matrix. Verifications shall be performed IAW the verification methods contained in Section 4 of the System Specification. Formal verifications shall require Government witnessing and Government approval of all documentation IAW the CDRL requirements. Verification plans, procedures, and reports shall be required for all formal demonstrations and reports. Formal inspections shall require Government approval of the verification inspection forms and the inspection reports. Formal analysis shall require Government approval of only the analysis reports. All contractor-conducted tests shall be formal.

3.3.19 Computer Resources Management. The overall intent of this task and the computer programming requirements of 3.3.8 of the System Specification is to mandate minimum computer programming requirements; this shall not preclude exceeding these minimum requirements.

3.3.19.1 Approach. The contractor shall design and develop the computer programs to satisfy the performance requirements in the System Specification. All software designed and delivered for use on this System shall also be capable of operating on existing RADIL equipment. The contractor's approach to software development under this contract shall be documented in a Computer Program Development

Plan (CPDP) which shall be updated by the contractor. All computer programs shall be controlled IAW the requirements established in the Configuration Management task of this SOW (DI-E-30145).

3.3.19.1.1 Configuration Control. All System hardware and software shall be managed IAW AFR 57-4 and T.O.00-350-54 and O/S CMP. Configuration control shall be managed IAW AFR 800-14 and AFR 65-3. The RADIL System at the RSSF shall be provided all equipment (hardware) required to maintain and enhance all software, both operational and support (operational) and support software (non-operational). The software support equipment and operational equipment shall be compatible to the extent that negligible impact shall occur when transferring newly developed software from the software support equipment to the operational equipment.

3.3.19.1.2 GFE Software. The existing RADIL Software is available as GFE and may be used "as is." The software, except for the system level software, must be fully documented and adhere to all provisions of this SOW.

3.3.19.2 Trade Studies and Analysis. The contractor shall perform the following trade studies and analysis and submit them IAW the CDRL.

1.4.2.3  
3.3.19.2.1 Sizing and Timing Analysis. A detailed sizing and timing analysis shall be performed for each CPCI, and where overlap between CPCIs occurs, for the processors concerned. This sizing and timing analysis shall be performed on the delivered FOC software. The results of these analyses shall be used to determine the computer software and hardware sizing and timing requirements. This analysis should determine the sizing and timing requirements for the development specifications. The contractor shall provide a Timing and Sizing Report IAW the CDRL. In all analyses performed IAW this paragraph, the impact of computer program sizing and timing requirements on other critical design issues shall be examined in detail (DI-S-30568).

3.3.19.3 Vendor Update Service. The contractor shall ensure that all computer resource procurements (hardware, software, embedded software i.e., firmware) include a subscription to the manufacturer's update and change service for the proposed hardware and software system. The contractor shall evaluate all vendor changes to the hardware and software system and submit recommendations regarding implementation of these changes together with the vendor updating change information within 60 days of notice of vendor change.



The following data items are also applicable: See CDRL.

DI-E-30145	Computer Software/Computer Program/Computer Data Base Configuration Item(s)
DI-M-30405	Computer Programming Manual
DI-M-30419	User's Manual (Computer Program)

3.3.20 Reserved

3.3.21 Manufacturing Management

MIL-STD-1528 1 August 72	Production Management ALL, except paragraph 5.2, 5.3, and 5.5
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3.3.21.1 Producibility. The contractor shall subject new design and design changes to specific structured producibility analyses, as an integral part of the design and change process, as defined by the contractor's own reporting system.

3.4 Configuration and Data

3.4.1 Configuration Management

DOD-STD-480A 12 April 78 Notice 1 29 December 78	Configuration Control Engineering Changes Deviations and Waivers ALL
MIL-STD-490 30 October 68 Notice 2 18 May 72	Specification Practices ALL except Appendices XIV and XV
MIL-STD-483 1 June 71 Notice 2 21 March 79	Configuration Management Practices for Systems, Equipment, Munitions, and Computer Programs ALL except Appendices I and IV
MIL-STD-1521A 1 June 76 Notice 2 21 December 81	Technical Review and Audits for Systems, Equipment and Computer Programs ALL except Appendices A, B, C, and D

MIL-S-83490  
30 October 79

Specification, Types and Forms  
ALL

1.2.2.4  
3.4.1.1 General. Configuration Management practices shall be IAW MIL-STD-483, DOD-STD-480A, and MIL-STD-490. Configuration Management shall be applied to the System Specification ESD-SS-ECI-1020, provided as part of the contract, including all CIs and CPCIs which comprise the design. The contractor shall establish the Allocated Configuration Identification and Product Configuration Identification for each CI and CPI for both operational and support equipment in the form of specifications and referenced technical documentation.

3.4.1.2 Configuration, Identification, and Baselines. The contractor shall update the System Specification and establish the allocated and product baselines. The initial CI and CPI Configuration Identifications established in the Specification Tree contained in the System Specification, shall be documented by specifications in conformance with MIL-STD-490 and MIL-STD-483. Part I specifications will constitute the Allocated Configuration Identification and establish the allocated baselines and Part II specifications will constitute the Product Configuration Identification and establish the product baseline.

3.4.1.2.1 Functional Configuration Identification (FCI). The FCI functional baseline is documented in the System Specification. The System Specification shall be updated by the contractor, IAW the CDRL, to reflect the negotiated baseline and shall be contractor maintained for the duration of the contract (DI-E-3101).

3.4.1.2.2 Allocated Configuration Identification (ACI). The allocated specification shall be prepared as Part I of a two part specification IAW paragraph 3.1.4 of MIL-STD-490. The contractor shall comply with the requirements of MIL-STD-483, MIL-STD-490, and the CDRL for the preparation and submission of Development (Part I) Specifications for newly designed CIs and CPCIs, modified or existing DOD inventory CIs and CPCIs, and modified or existing off-the-shelf hardware and software for the allocated baseline. An Inventory Item Specification shall be prepared and submitted. (DI-E-3102A, DI-E-3119B, DI-E-3132, and DI-E-3105).

3.4.1.2.3 Product Configuration Identification (PCI). The product specification shall be prepared as Part II of a two part specification IAW paragraph 3.1.4 of MIL-STD-490. The contractor shall comply with the requirements of MIL-STD-483, MIL-STD-490, and the CDRL for the preparation and submission of Product Fabrication and Production (Part II) Specifications for each CI and CPI Development

(Part I) Specification identified in the allocated baseline for the product baseline (DI-E-3103A and DI-E-3120B).

**3.4.1.2.4 Configuration Item Development Record.** The contractor shall develop and maintain Configuration Item Development Records for the Program IAW MIL-STD-483, Appendix VII. They shall be delivered and updated IAW the CDRL (DI-E-3106).

**3.4.1.2.5 Item Identification.** The contractor shall conform to the requirements of MIL-STD-483 and Appendix IX thereto, with respect to identification of engineering, manufacturing, and other deliverable products manufactured as a result of this contract. The contractor shall furnish Computer Program Identification Number (CPIN) requests IAW the CDRL (DI-E-3162B).

**3.4.1.2.6 Engineering Release.** The contractor shall maintain internal industrial practices that meet or exceed the minimum standards and practices for the control of engineering and manufacturing documentation and released engineering records as set forth in MIL-STD-483 and Appendix X thereto.

**3.4.1.3 Configuration Control**

**3.4.1.3.1 Specification Maintenance.** The contractor shall comply with the requirements of MIL-STD-490, MIL-STD-483, and Appendix VII thereto, with respect to the preparation, change, and maintenance of specifications prepared during or made part of this contract. The contractor shall also comply with the requirements of MIL-STD-490, MIL-STD-483 and Appendix VIII thereto, with respect to the preparation, change, and maintenance of computer program specifications and support documentation. Distribution of Specification Change Notices shall be IAW the CDRL (DI-E-3106).

**3.4.1.3.2 Engineering Changes, Deviations, and Waivers.** The contractor shall comply with the requirements of DOD-STD-480A, MIL-STD-483 and Appendix XIII thereto, with respect to changes to the Functional, Allocated and Product Baselines, and Interface Control Drawings (ICDs). In addition, Class I changes to the initial allocated and product baseline prior to authentication (documented in draft Part I and Part II CI/CPCI Specifications) shall be processed as a Code A "Record Only" Engineering Change Proposal (ECP). The Record ECP shall be submitted on a DD Form 1692 page 1 only, with attached red line (or equivalent) documentation (specification pages, drawings, etc.) which depicts the "before" and "after" configuration to provide the Government early visibility of the changes being incorporated. For CPCI specifications, the contractor shall comply with the requirements of MIL-STD-490, MIL-STD-483 and Appendix XIV

thereto, and his CPDP. Submission of ECPs, Deviations, and Waivers shall be IAW the CDRL (DI-E-3128 and DI-E-3129).

**3.4.1.3.3 Additional Items.** If a requirement is established for additional components of the System (not previously identified in the System Specification), the contractor shall provide development specification data and supplemental configuration item development record data as part of the ECP. If the additional item is an inventory item, the change adding the item to the Inventory Item Specification shall be submitted as part of the ECP.

**3.4.1.3.4 Interface Control.** The contractor shall comply with the requirements of MIL-STD-483 and Appendix II thereto, for identifying and defining the functional and physical external and internal interfaces as defined in the Specification. The external interfaces defined in the specification shall be verified by the contractor before generating the Interface Control Documents (ICDs). *1.5.1.6*

**3.4.1.3.4.1 Interface Control Working Group (ICWG).** The Government ICWG shall serve as the official communication link between program participants to resolve external interface problems, document interface agreements, and coordinate interface-related ECPs. The contractor shall participate as required in any and all of these ICWG working meetings and shall update affected ICDs when required.

**3.4.1.3.4.2 External Interface.** The external interface requirements are identified in the System Specification. Referenced documents identified in the System Specification as interface definitions are considered an expansion of the specification and therefore are baselined as part of the functional baseline. The contractor shall verify the interfaces defined and shall generate and provide updates to the ICDs as a result of design enhancement, i.e., all drawings generated and delivered shall become, by reference or insertion into the ICD, a part of the functional baseline. The contractor shall define the message formats, interface protocol, electrical and mechanical interface to the CCA link of the ICCE System (DI-E-7031).

**3.4.1.3.4.3 Internal Interface.** The internal interface requirements between functional areas are identified in the Type A System Specification. Internal interface requirements within functional areas shall be identified in related Type B, development level, specifications IAW MIL-STD-490, interface definition. If an ICD is used to define internal interface requirements, they shall be considered an expansion of these specifications and referenced therein and therefore shall be baselined as part of the allocated baseline.

3.4.1.3.4.4 Interface Control Document (ICD). The content of ICDs as defined above shall not be repeated in the text of specifications. ICDs shall be prepared and delivered IAW the CDRL (DI-E-7031).

3.4.1.3.5 Version Description Document (Computer Program). The contractor shall prepare the Version Description Document (Computer Program) IAW MIL-STD-483, Appendix VIII thereto, and submit it IAW the CDRL (DI-E-3121).

3.4.1.3.6 Configuration Status Accounting (CSA). The contractor shall provide CSA IAW MIL-STD-483, Appendices I, II, and III and submit it IAW the CDRL (DI-E-3133).

3.4.1.4 Configuration Audits. The contractor and Acquisition Agency shall conduct the following audits on both hardware and computer products. The contractor shall prepare the minutes for each audit IAW the CDRL (DI-E-3118).

3.4.1.4.1 Functional Configuration Audit (FCA). FCAs IAW MIL-STD-1521A, Appendix E, shall be performed at the completion of in-plant testing.

3.4.1.4.2 Physical Configuration Audit (PCA). PCAs shall be conducted IAW MIL-STD-1521A, Appendix F. Incremental PCAs shall be conducted on CIs and CPCIs as required after completion of in-plant system testing. On privately developed items, the PCA shall be conducted to the LRU (except for mutually agreed upon items). The PCA shall commence at the completion of the FCA and shall be performed by the contractor and PO at the contractor's facility with the assistance of local Government contract administration agencies. The audit shall identify the production configuration identification against all production hardware and computer programs and establish the production baseline.

3.4.1.5 Formal Qualification Review (FQR). FQRs shall be conducted after completion of FOC of the System IAW MIL-STD-1521A, Appendix G. The contractor shall prepare the minutes of the FQR IAW the CDRL (DI-E-3118).

3.4.1.6 Contract Change Proposal/Task Change Proposal (CCP/TCP). A CCP/TCP shall be submitted for all proposed changes to either the contract or to documents other than specifications. The CCP/TCP shall be prepared IAW the CDRL (DI-A-30208).

3.4.2 Data Accession List. See Section H of the contract schedule (DI-A-3027).

**3.4.3 Engineering Data Task.** All engineering data shall conform to the requirements of DOD-D-1000 and DOD-STD-100 (DI-E-7031T).

**3.4.3.1** The contractor shall update and maintain engineering data to current engineering, manufacturing, purchasing, and test requirements for the life of the contract. When formal configuration management/control occurs, all Class I and II changes, as defined in MIL-STD-480 shall be incorporated into the engineering data as:

- a. Class I changes shall be incorporated into engineering data and associated lists prior to or concurrent with engineering release of approved change.
- b. Class II changes shall be incorporated in the applicable engineering data and associated lists prior to delivery of an item in which these changes have been incorporated or within 60 days after change effectivity, whichever occurs first.
- c. If engineering data must be furnished to the Government during the time period allowed for changes, as cited above, revision authorization documents may be furnished with the applicable engineering data pending incorporation of the change, however, the changed documents shall be automatically furnished to the Government to replace the revision authorization document within the time period allowed for changes.

**3.4.3.2** The contractor shall support in-process reviews of engineering data conducted by the Government quarterly or with each major milestone and shall take immediate action to correct, amplify, or add the engineering data as necessary to conform to DOD-STD-100 and DOD-D-1000 (DI-E-7031/T).

**3.4.4** Reserved

**3.4.5** Reserved

**3.4.6** Scientific and Technical Information (STINFO). See Section H of the contract schedule.

**3.5** Program Management. The contractor shall conduct a complete Program Management review concurrently with all technical reviews, PDR and CDR and then quarterly thereafter at a Government-designated facility. During these reviews, the contractor shall provide a report of current status of all contract activities and deliverable items. The contractor shall highlight problem areas and their effect

on the contract schedule. This information shall be documented in meeting minutes IAW CDRL (DI-A-3007 and DI-E-3118).

### 3.5.1 Working Locations and Installation Schedule

3.5.1.1 Planning Sites. The following is a listing of the site locations and minimum equipment requirements that the contractor shall field, support, and maintain IAW the stated requirements of the SOW.

<u>Site</u>	<u>Location</u>	<u>Equipment</u>
a. MDC	Rockville, Iceland	Processing and Display Functional Area, GES control and termination equipment, lateral-tell and CCA interface.
b. MDC	Rockville, Iceland (Growth)	UHF voice and TADIL A communications equipment.
c. CC	Hofn, Iceland (Growth)	UHF voice and TADIL A communication equipment.
d. IPT Microwave Site	Viderfjall, Iceland	UHF voice and TADIL A communication equipment.
e. Radio Site (E-5)	Thyerfjall, Iceland	UHF voice and TADIL A communication equipment.
f. HF Transmit Site Option	Grindavik, Iceland (Option)	HF voice and TADIL A transmission equipment.
g. HF Receive Site Option	Rockville, Iceland (Option)	HF voice and TADIL A receive equipment.

3.5.1.2 Installation Schedule. Equipment must be installed, tested, and accepted for operational use as specified in the contract.

3.5.2 Schedule Management. The contractor shall develop and maintain detailed schedule information for all contractor activities. The information to be provided shall include a master program schedule, schedule for activities at each site, and schedules for in-plant and subcontractor activities. Schedule progress shall be portrayed on a monthly basis. All changes to the schedule or baseline shall be clearly identified. The contractor shall conduct a continuing analysis of schedule activities to ascertain program

progress, identify changes, identify potential schedule problems and determine alternate means of maintaining the master program schedule. A complete review of schedule status and progress will be presented at each Program Management Review (PMR). Access to the contractor's internal schedule documentation shall be provided to the AF on an "as required" basis. This information shall be submitted IAW the CDRL (DI-A-3007).

**3.5.3 Financial Reports.** Financial reporting for this contract shall be IAW the CDRL. The contractor shall submit a Cost/Schedule Status Report (DI-F-6010A).

### **3.6 Logistics Support**

#### **3.6.1 Integrated Logistics Support (ILS)**

DOD Directive 5000.39  
17 January 80

Acquisition and Management  
Integrated Logistics Support  
for System and Equipment  
ALL

AFR 800-8  
7 February 80

Integrated Logistics  
Support (ILS) Program for  
Systems and Equipment  
ALL

The contractor shall establish and maintain an ILS activity to ensure systematic analysis of the design considerations and support requirements to determine their interdependence on each other. Design trade-offs and risk analysis shall be initiated and progressively refined as required during the period of performance of this contract. The contractor shall ensure that its subcontractor's and vendor's products have incorporated the necessary requirements of ILS to ensure input to the System and equipment are both cost effective and operationally supportable. The contractor must consider all required ILS actions as outlined in DOD 5000.39 and as further defined in AFR 800-8. The contractor shall provide an ILS Plan IAW the CDRL (DI-L-30318).

1.5.2.5.2  
1.5.1.3.1  
1.5.2.5.3  
**3.6.1.1 ILS Management.** The contractor shall ensure that logistics considerations and logistics planning are integrated into the systems and equipments engineering and design process.

**3.6.1.2 Relationship to Other Tasks.** The requirements of this task relate to all efforts under this contract where a logistic impact or requirement is involved. The purpose is to integrate the various logistic and engineering disciplines for continuous assessment of the



probable impact that design will have on specific performance and support requirements.

**3.6.1.3 Support Guidance.** Within 60 days after contract award, the contractor shall host a Logistic Support Analysis guidance conference. This conference shall include guidance for preoperational supply support and maintenance, preparation of technical manuals, and other support considerations.

### **3.6.2 Support Analysis**

MIL-STD-1388-1A  
11 April 83

Logistic Support Analysis  
(LSA)

Tasks: 102.2, 103.2, 201.2, 201.3,  
201.4, 202.2, 202.3, 202.4, 203.2,  
203.3, 203.4, 205.2, 205.3, 205.4,  
302.2.4

The contractor shall, IAW MIL-STD-1388-1A and this SOW, develop and accomplish a Logistic Support Analysis (LSA) program and continue such effort throughout the life of the contract. The LSA program shall include design analysis, feedback, and support resource analysis. The program shall ensure that the design features and method of integration enhance cost effective operation and support throughout the life cycle of the hardware. The LSA program will be documented in the LSA Plan which shall be a contractually binding document, when proposed by the contractor and approved by the Government IAW the CDRL (DI-L-7017A).

### **3.6.3 System Support**

**3.6.3.1 Preoperational Support.** The contractor shall be responsible for providing complete logistic support through the OT&E of the FOC System. This effort shall include, but not be limited to, supply support, maintenance support, technical support, providing necessary support equipment, maintaining (including calibration of the support equipment) preliminary technical orders, and necessary maintenance.

**3.6.3.1.1 Preoperational Support Planning.** The contractor shall, as part of its Integrated Support Plan (ISP) for preoperational support, indicate how they intend to provide preoperational support for the ICCE System (DI-L-30318).

1.5.2.5.5 **3.6.3.1.2 Supply Support.** Direct and indirect supply support will be provided and managed by the appropriate Air Force Logistics Command Technological Repair Center/Air Logistics Center (AFLC/ALC) for the life of the system. The contractor shall provide and

maintain the optimum range and level of spare and repair parts required to support the ICCE during the preoperational phase. The equipment to be supported shall include Prime Mission Equipment (PME), Support Equipment (SE), Real Property Installed Equipment (RPIE), and GFP. This effort shall also include, but not be limited to, receiving and inspection, warehousing property control, requisitioning, issuing, and shipping.

**3.6.3.1.2.1 Delivery and Availability.** The contractor shall ensure that the required spare and repair parts are acquired, delivered, and available at the sites at the start of the installation efforts. The Government will provide storage space for all System equipment, including the required spare and repair parts and all interim equipment.

6.1.1 **3.6.3.1.3 Documentation Requirements.** Preliminary technical manuals and positional handbooks (FOC only) shall be available to support the in-plant DT&E efforts.

6 2 **3.6.3.1.3.1** The Government plans to conduct technical order in-process reviews and verification during field DT&E of the FOC System. The contractor shall provide a technical writer, software engineer and hardware engineer during all in-process reviews. In-process reviews will be conducted at the 30% and 80% phases of preliminary technical orders. A prepublication review shall be conducted prior to delivery of the technical orders to the Government IAW T.O. 00-5-1.

1.6.2.3 **3.6.3.1.3.2 Positional Handbooks.** The CFA Positional Handbook shall indicate how messages are affected by individual switch actions IAW JCS Pub. 10. The purposes, procedures, results, and restrictions of all switch actions shall be listed in the handbook. Software loading and system recovery procedures shall be covered in the PDFA Positional Handbook in a step-by-step manner showing the exact sequence of operations to be performed to initiate or reestablish the System. Both Positional Handbooks shall have two in-process reviews, one at the 30% and one at the 80% phase of completion. A prepublication review shall be conducted prior to delivery to the Government (DI-M-3409).

**3.6.3.1.4 Property Control.** The contractor shall maintain usage data in a manner which will enable the preparation of the consumption report and the Residual Asset Usage Report (DI-L-7021).

1.5.2.3  
1.6.4.4  
3.6.3.1.5 Failure Data Reporting. The contractor shall document all maintenance actions on a contractor-prepared and Government-approved failure reporting form. The contractor shall utilize these forms in documenting maintenance actions commencing with in-plant CI and CPCI testing. Completed maintenance forms shall be retained for use by the contractor until contract completion. The contractor shall report recorded data through a Failure Summary and Analysis Report (DI-R-7041).

3.6.3.2 Contractor Technical Support. The contractor shall provide one on-site full-time field engineer to provide the following types of services after FOC:

- a. Assist USAF personnel during operation of the equipment, as required by USAF
- b. Assist in the investigation and resolution of hardware and software deficiencies revealed during operation of the equipment
- c. Provide direct liaison with the contractor's plant personnel to resolve problems
- d. Assist in follow-on operator training
- e. Provide hardware maintenance support on all the FOC System equipment. The contractor shall provide qualified maintenance manning of the System for 12 months, plus an additional option for 12 months of manning.

3.6.3.3 Interim Contractor Support. The contractor shall provide effective management, planning, support, and direction to ensure effective system performance, maintenance, and logistics support after FOC. The following type of support shall be performed:

- 1.8.3  
(DELETED)
- a. Spares - The contractor shall ensure that appropriate publications, test equipment, tools, and spares are available at all times during the life of this contract and in proper quantities to accomplish the maintenance of these systems.
  - b. Logs, Records, and Forms - The contractor shall maintain permanent logs, records, and inspection forms which will reflect equipment status, inspections, and maintenance performed.

- c. The contractor shall perform all typical depot level functions until AFLC has the necessary documentation and equipment to provide for full logistics support.

1.9.1.1  
**3.6.4 Initial Spares Repair Parts (Operational Support)**

3.6.4.1 Provisioning Requirements. The contractor shall request nomenclature and national stock numbers for all PME and SE not currently in the Air Force inventory. In addition, the contractor shall obtain national stock numbers for all components intended for maintenance repair (DI-E-3126A).

3.6.4.2 Provisioning documentation and related tasks shall be provided in accordance with DD Form 1949-1, DD Form 1949-2 and addendum thereto, AFLC Form 718 and Attachments 1 through 7 which are appended to the CDRL (DI-V-7000, DI-V-7002, DI-V-7004, and DI-V-7009).

**3.6.5 Support Equipment (SE)**

MIL-HDBK-300M  
1 October 82

Air Force Technical Information  
File of Aerospace Ground  
Equipment  
ALL

1.6.4.5  
1.6.4.7  
1.9.1.2  
1.9.1.3  
3.6.5.1 General. The contractor shall make a detailed analysis of the functional requirements of the System and equipment to be supported to define the needs of SE. This analysis shall be made on the total system, individual items of equipment, and areas of maintenance support. The analysis shall be based upon the operational and maintenance concepts. Where possible, Test Diagnostics and Measuring Equipment (TDME) shall be selected from standard 6625 stock class items. TDME shall be maintained and calibrated by the contractor through DT&E. The contractor shall take steps to acquire Air Force support for all recommended support equipment (DI-A-6102).

3.6.5.2 SE Planning. The contractor shall also use the San Antonio ALC C 104 Automatic Test Equipment data base in developing recommendations for automatic test equipment. The initial contractor planning concept shall be presented by the contractor at the Logistics Support Guidance Conference.

1.6.4.9  
3.6.5.3 Support Equipment Recommendation Data (SERD). The contractor shall develop and deliver Support Equipment Recommendation Data IAW DI-S-6176 as stipulated in the CDRL for each SE function identified. The contractor shall establish and recommend initial

proposed quantitative requirements by use, location, and level of maintenance based on the functional analysis of system, equipment and level of site activities. The contractor shall ensure information developed for LSA is used in the functional analysis. The contractor shall use MIL-HDBK-300M for selecting common items of equipment that can be used as is or modified to accomplish system support. The Government will review SERD preparation when approximately 25% of the SERD's have been prepared to ensure the contractor is adhering to the instructions contained in the CDRL (DI-E-6120).

3.6.5.3.1 Calibration. The contractor shall prepare and submit a summary identifying the technical requirement of the equipment IAW the CDRL (DI-S-6177).

3.6.5.4 Pre-Screening of SERD. The contractor shall pre-screen all SERDs prior to their submittal to the Government. This pre-screening shall be accomplished IAW DI-V-7016E.

1.2 2.5.1.3 3.6.5.5 SE Selection Conference. The PO, after coordination with the user and the appropriate AFLC organizations, will convene a Support Equipment Selection Conference. The contractor shall support this conference by having both engineering and logistic personnel available to provide technical assistance.

3.6.5.6 Common SE. The Government will notify the contractor which items of common SE are approved. The contractor shall provide Priced Support Equipment List (PSEL) IAW the CDRL (DI-V-6186D).

3.6.5.7 Peculiar SE. The Government will notify the contractor of any approved peculiar SE. This may be accomplished through the issuance of a Provisioned Item Order.

3.6.5.8 SE Associated Items. Contract requirements relating to spare and repair parts, technical orders, configuration, identification, nomenclature, controls, audits, and accounting shall apply to all developmental, modified, and commercial off-the-shelf SE.

### 3.6.6 Technical Orders

AFR 8-2  
3 May 82

Air Force Technical Orders System

MIL-M-7298C  
15 April 75  
Amendment 3  
16 February 81

Manuals, Technical:  
Commercial Equipment  
ALL

3.6.6.1 The contractor shall develop or select technical data for operations and maintenance of the PME and contractor furnished equipment. Commercial equipment and technical manuals shall be used if they are already developed, comply with MIL-M-7298C and are reviewed IAW AFR 8-2 and TO 00-5-1. For those technical manuals developed by the contractor, AFAD 71-531-(31) shall apply. All technical manuals shall be available in final draft to support I&CO. Technical data shall be of sufficient depth to allow fault isolation to the circuit card assembly or equivalent component level. The contractor shall conduct in-process reviews at the 30% and 80% completion phases and a prepublication review prior to delivery to the Government IAW (T.O. 00-5-1, reviews shall be completed 60 days prior to FOC CDR (DI-M-3407A and DI-M-7024).

3.6.6.2 The existing RADIL PDFA configuration and all Government approved changes to the PDFA will be documented in the technical orders. The contractor shall provide an impact statement with each ECP (both Class I and II) to show the effect of the proposed changes on Technical Order content and delivery schedule (DI-E-3128).

3.6.6.3 The contractor shall prepare a List of Applicable Publications (LOAPs) which pertain to the equipment being purchased IAW MIL-L-8031 (DI-M-3407C).

1.6.2.5.1.2 3.6.6.4 The contractor shall develop a Technical Manual Plan (TMP) as part of the Integrated Support Plan (ISP) (DI-M-6154 and DI-L-30318).

1.6.4.2 3.6.7 Technical Order Status, Schedules, and CFAE/CFE Notices. The contractor shall provide Technical Order Status and Schedules (DI-A-3007) and Technical Order CFAE/CFE Notices (DI-M-3405A).

3.6.8 Time Compliance Technical Orders (TCTOs). TCTOs may be required to effect hardware changes during the life of the contract via ECP actions. They shall be prepared IAW AFAD 71-531-(18) and the CDRL. This data item shall be costed separately as part of the ECP costs if and when required (DI-M-3407A).

### 3.6.9 Design to Life Cycle Cost (DTLCC)

3.6.9.1 Life Cycle Cost (LCC) Planning. To minimize LCC, the contractor shall integrate LCC planning into on-going engineering design and logistics support studies. The contractor's LCC analysis shall consider the economic consequences of equipment selection, and shall evaluate alternative system design and logistics support concerns.

3.6.10 Training

AFM 50-2  
25 May 79

Instructional System Development  
Guidance  
ALL

AFM 50-9  
13 July 81

Special Training Guidance  
ALL

The training concept described herein anticipates Type 1 (contractor-conducted) maintenance and operations training to support the program. The contractor shall develop a training plan outlining both the training required to perform maintenance at the operational locations and operator training which includes operation of all PDFA and CFA equipment. This plan shall be presented as a draft at the 90 day technical interchange meeting and shall be finalized upon completion of I&CO.

**3.6.10.1 Training Support.** All Type 1 training courses must include "hands on" training on end items new to the Government inventory. The contractor shall furnish all training equipment, course materials, and training aids to support Type 1 training. The contractor shall make use of in-plant assets. No training equipment shall be developed solely to support Type 1 training.

**3.6.10.2 Training Facilities.** The contractor shall provide facilities as required to support Type 1 training.

**3.6.10.3 Training Services.** The contractor shall develop a Training and Training Equipment Plan (TTEP) IAW the CDRL (DI-H-7066).

**3.6.10.3.1** The contractor shall provide a list of all operations and courses needed to support the Program in the TTEP.

**3.6.10.3.2** The contractor shall provide a schedule showing all courses needed to prepare Government personnel to participate in DT&E and OT&E. These courses must be completed 30 days prior to DT&E. Each course shall have a course outline and a listing of all equipment required for its support.

**3.6.10.3.3** All available technical data used for Type 1 training shall be provided to the students for their retention.

### **3.7 Packaging and Transportation**

#### **3.7.1 Preservation, Packaging, and Packing**

MIL-P-9024G 6 June 72	Packaging, Handling and Transportability in System/ Equipment Acquisition ALL
MIL-STD-794E 16 July 82	Parts and Equipment, Procedures for Packaging of ALL
MIL-STD-129J 25 September 84	Marking for Shipment and Storage ALL
MIL-STD-1510A 5 June 78	Container Design Retrieval System, Procedure for Use of ALL
AFR-400-44 8 June 82	Air Force Corrosion Program

3.7.1.1 The contractor shall be responsible for the preservation, packaging and packing of all items to be delivered under the terms of this contract IAW the requirements of MIL-STD-794E, MIL-P-9024, MIL-STD-129J, and DI-L-6147. Levels of protection shall be:

- a. Level A preservation and packaging and Level A packing (Overseas - Surface Shipments).
- b. Level C preservation and packaging and Level C packing (Overseas - Air Shipment - Immediate Use).
- c. Level A preservation and packaging and Level A packing for surface shipments, or Level C packing for air shipments (Overseas - Storage over 30 days).

3.7.1.2 Marking shall be IAW MIL-STD-129J. Bar code marking or labelling shall be IAW Change Notice 3 to MIL-STD-129J using DOD Standard Symbolology (MIL-STD-1189) on all units, intermediate and shipping containers for items having National Stock Numbers (NSNs) except GFEs. Parcel Post shipment must comply with Postal Regulations.



3.7.1.3 The contractor shall ensure that accomplished packages and packs are of minimum weight and cube consistent with the physical protection required. Items of a rugged, sturdy, non-critical nature shall be shipped without packaging or packing when capable of withstanding the hazards to be encountered during shipment and handling. The contractor shall recommend to the PO all Special Design Protective Equipment (SDPE) and specialized containers which are necessary to provide life cycle support of the system equipment involved. When a requirement for an engineered container system or specialized container system evolves, the contractor shall utilize Container Design Retrieval System MIL-STD-1510A either in total or as tailored to meet a particular need. When authorized by the Government, SDPE and specialized containers shall be developed IAW MIL-P-9024G (DI-L-3339).

3.7.1.4 The contractor shall not release material for shipment without prior approval of the individual package design requirements by the Government. Pre-deployment spare parts are excluded from this requirement.

3.7.1.5 The contractor shall not perform first article inspection tests (rough handling) and examinations. Maximum consideration shall be given to providing adequate physical and mechanical protection against hazards to be encountered during handling, shipment and storage. Quality conformance inspection tests and examinations are to be conducted on completed packages and packs IAW MIL-STD-794E.

### 3.7.2 Transportation

AFM 75-2  
15 March 69

Military Traffic  
Management Regulation  
ALL

DODM 5220.22  
January 83

Industrial Security Manual for  
Safeguarding Classified Information  
ALL

AFR 400-54  
20 January 84

Report of Discrepancy  
ALL

DODR 4500.32  
1 August 79

Military Standard  
Transportation and Movement  
Procedures  
ALL

3.7.2.1 The contractor shall be responsible for the transportation and movement of equipment from prime contractor facilities to destinations. The contractor shall be responsible for the transportation and costs incurred to transport the equipment from the prime contractor's plant to the operational sites.

### 3.7.3 Travel

3.7.3.1 General. The contractor shall be responsible for all personnel travel and associated costs required in the performance of this effort. The contractor shall use the lowest cost mode of transportation consistent with mission requirements IAW good traffic management principles.

3.7.3.2 Overseas Travel. The contractor shall be responsible for all personnel travel to, from, or between overseas areas, and shall also ensure that all personnel have valid documents prior to entering Iceland.

3.7.3.3 Contracting Officer Approval. All contractor personnel travel between CONUS port of exit point and overseas destinations and outside CONUS shall be subject to approval by the PCO and/or a designated representative. The contractor shall furnish the PCO with the following information 45 days in advance of the planned date of departure:

- a. Full name of traveler(s)
- b. GS Equivalent Rating and Social Security Account Number (SSAN)
- c. Home address
- d. Date and place of birth
- e. Citizenship and Passport number (and VISA if required)
- f. Security clearance (to include date and place of issuance)
- g. Date of departure and duration of trip
- h. Itinerary and purpose
- i. Detailed justification for variations in itinerary (if applicable)

3.7.3.4 Government Travel Orders and Theatre Clearance. All travelers to overseas areas under this contract require Government travel orders and theatre clearance granted by the overseas commander. The contractor shall submit the data contained in the paragraph above for each traveler to the PCO 45 days in advance of the designated date of departure. Emergency clearance requirements will require 15 days advance notification. The contractor may apply to the PCO for a one year blanket clearance for those persons who will be performing repeated travel or direct on-site support. Upon

SOW-ECI-1229  
20 August 1985

notification by the PCO of theatre clearance approval, the contractor shall apply to the Administrative Contracting Officer (ACO) for the issuance of travel orders and Military Airlift Command reservations. Such application shall be made IAW the policies and procedures established by the ACO.

PART II SECTION B OF THE SCHEDULE SUPPLIES LINE ITEM DATA				1. PROC INSTRUMENT ID NO. (PIN)	2. SPIN	3.
				F19628-85-C-0079	P00003	PAGE 2 OF 17
4. ITEM NO.	5. QUANTITY	6. PURCH UNIT	7. UNIT PRICE	8. TOTAL ITEM AMOUNT		
0001AB			\$	\$		
9. SCTY/10. ACRN CLAS	11. NSN	12. FSCM AND PART NUMBER		13.		
14. SITE CODES A.PGA B.ACP C.FOB	15. HOUN	16. SVC/AGENCY USE				
RESERVED						
17. PR/MIPR DATA	18. AUTHORIZED RATE A.PROGRESS PAY B.RECOUP		19. PERCENT FEE		20. SVC ID NO.	21. ITEM/PROJ
22. 1ST DISCOUNT A. B.DAYS	23. 2ND DISCOUNT A. B.DAYS	24. 3RD DISCOUNT A. B.DAYS	25. NET DAYS	26. QUANTITY VARIANCE A. OVER B. UNDER	27. TYPE CONTRACT	28. O
29. DESCRIPTIVE DATA						

4. ITEM NO.	5. QUANTITY	6. PURCH UNIT	7. UNIT PRICE	8. TOTAL ITEM AMOUNT		
0002AA+	1	LO	\$ 3,596,399.00	\$ 3,596,399.00		
9. SCTY/10. ACRN CLAS	11. NSN	12. FSCM AND PART NUMBER		13.		
U AA N		16. SVC/AGENCY USE				
14. SITE CODES A.PGA B.ACP C.FOB	15. HOUN	16. SVC/AGENCY USE				
S D D	ICCE FOC Hardware Acquisition					
17. PR/MIPR DATA	18. AUTHORIZED RATE A.PROGRESS PAY B.RECOUP		19. PERCENT FEE		20. SVC ID NO.	21. ITEM/PROJ
FY76208500991						
22. 1ST DISCOUNT A. B.DAYS	23. 2ND DISCOUNT A. B.DAYS	24. 3RD DISCOUNT A. B.DAYS	25. NET DAYS	26. QUANTITY VARIANCE A. OVER B. UNDER	27. TYPE CONTRACT	28. O
29. DESCRIPTIVE DATA						

Acquisition, installation and testing of 1 additional UHF GES For the ICCE FOC System.

2521

PLAINTIFF'S  
EXHIBIT

22A-4

\*REPRESENTS NET AMOUNT OF INCREASE/DECREASE WHEN MODIFYING EXISTING ITEM NO.

N = NOT APPLICABLE  
U = UNDEFINIZED

E = ESTIMATED  
- (IN QTY AND \$) = DECREASE  
+ (OR - (IN ITEM NO)) = ADDITION OR DELETION

SITE  
CODES:

S = SOURCE  
D = DESTINAT  
O = INTERMET

AE  
PART I SECTION B OF THE SCHEDULE  
SUPPLIES LINE ITEM DATA

1. PROC INSTRUMENT ID NO. (PIIN) F19628-85-C-0079		2. SPIIN P00003	3. PAGE 3 OF 17
4. ITEM NO. 0002AB+	5. QUANTITY 1	6. PURCH UNIT LO	7. UNIT PRICE \$485,977.00
8. TOTAL ITEM AMOUNT \$485,977.00		13. CIRR	
9. SCTY/ISO. ACRN CLAS U XA N		11. NSN	
14. SITE CODES A.PGA B.ACP C.FOB		15. HOUR	
17. PR/MIPR DATA S D D		16. SVC/AGENCY USE	
18. AUTHORIZED RATE A.PROGRESS PAY B.RECOUP		19. CONTRACT PERCENT FEE	
20. SVC ID NO.		21. ITEM/PROJ MGR	
22. 1ST DISCOUNT A. DAYS		23. 2ND DISCOUNT A. DAYS	
24. 3RD DISCOUNT A. DAYS		25. NET DAYS	
26. QUANTITY VARIANCE A. OVER B. UNDER		27. TYPE CONTRACT	
28. OPR		J	
29. DESCRIPTIVE DATA			

Hardware development to provide capability for remote control of up to 5 GESS from the MDC in Iceland.

4. ITEM NO. 0002AC+		5. QUANTITY 1	6. PURCH UNIT LO	7. UNIT PRICE \$1,255,002.00	8. TOTAL ITEM AMOUNT \$1,255,002.00	13. CIRR
9. SCTY/ISO. ACRN CLAS U XA N		11. NSN		15. HOUR		16. SVC/AGENCY USE
14. SITE CODES A.PGA B.ACP C.FOB		15. HOUR		16. SVC/AGENCY USE		
17. PR/MIPR DATA D D D		18. AUTHORIZED RATE A.PROGRESS PAY B.RECOUP		19. CONTRACT PERCENT FEE		21. ITEM/PROJ MGR
20. SVC ID NO.		21. ITEM/PROJ MGR		22. 1ST DISCOUNT A. DAYS		23. 2ND DISCOUNT A. DAYS
24. 3RD DISCOUNT A. DAYS		25. NET DAYS		26. QUANTITY VARIANCE A. OVER B. UNDER		27. TYPE CONTRACT
28. OPR		J		29. DESCRIPTIVE DATA		

Software modifications for the ICCE FOC system.

\*REPRESENTS NET AMOUNT OF INCREASE/DECREASE WHEN MODIFYING EXISTING ITEM NO.  
N = NOT APPLICABLE E = ESTIMATED  
U = UNDEFINIZED - (IN QTY AND \$) = DECREASE  
NSP = NOT SEPARATELY PRICED + OR - (IN ITEM NO.) = ADDITION OR DELETION  
SITE CODES: S = SOURCE D = DESTINATION C = INTERMEDIATE

PART II SECTION B OF THE SCHEDULE			1. PROC INSTRUMENT ID NO. (1)		2. SPIIN		3.		
SUPPLIES LINE ITEM DATA			F19628-85-C-0079		P000003		PAGE 4 OF 17		
4. ITEM NO.		5. QUANTITY*		6. PURCH UNIT		7. UNIT PRICE		8. TOTAL ITEM AMOUNT*	
0003AA+				\$				\$	
9. SCTY/10. ACRN CLAS		11. NSN		12. FSCM AND PART NUMBER				13. CI	
14. SITE CODES A.PQA B.ACP C.FOB		15. HOUR		16. SVC/AGENCY USE					
17. PR/MIPR DATA		RESERVED		18. AUTHORIZED RATE A.PROGRESS PAY B.RECOUP		19. CONTRACT PERCENT FEE		20. SVC ID NO.	
								21. ITEM/PROJECT	
22. 1ST DISCOUNT A. B.DAYS		23. 2ND DISCOUNT A. B.DAYS		24. 3RD DISCOUNT A. B.DAYS		25. NET DAYS		26. QUANTITY VARIANCE A. OVER B. UNDER	
								27. TYPE CONTRACT	
29. DESCRIPTIVE DATA								J	

4. ITEM NO.		5. QUANTITY*		6. PURCH UNIT		7. UNIT PRICE		8. TOTAL ITEM AMOUNT*	
0003AB+				\$				\$	
9. SCTY/10. ACRN CLAS		11. NSN		12. FSCM AND PART NUMBER				13. CI	
U AA		N Exhibit		16. SVC/AGENCY USE					
14. SITE CODES A.PQA B.ACP C.FOB		15. HOUR		17. PR/MIPR DATA		18. AUTHORIZED RATE A.PROGRESS PAY B.RECOUP		19. CONTRACT PERCENT FEE	
D D D		FOC Hardware Data						20. SVC ID NO.	
FY76208500991								21. ITEM/PROJECT	
22. 1ST DISCOUNT A. B.DAYS		23. 2ND DISCOUNT A. B.DAYS		24. 3RD DISCOUNT A. B.DAYS		25. NET DAYS		26. QUANTITY VARIANCE A. OVER B. UNDER	
								27. TYPE CONTRACT	
29. DESCRIPTIVE DATA								J	

Hardware data for ICCE FOC System (CLIN 0002AA) IAW CDRL item designated Exhibit B. The firm-fixed price for this item is \$159,702.0

\*REPRESENTS NET AMOUNT OF INCREASE/DECREASE WHEN MODIFYING EXISTING ITEM NO.

N = NOT APPLICABLE  
U = UNDEFINITEZED  
NSP = NOT SEPARATELY PRICED

E = ESTIMATED  
- (IN QTY AND \$) = DECREASE  
+ OR - (IN ITEM NO.) = ADDITION OR DELETION

S = SOURCE  
SITE  
CODES: O = DESTINATION  
O = INTERMEDIATE

PART II SECTION B OF THE SCHEDULE SUPPLIES LINE ITEM DATA				1. PROC INSTRUMENT ID NO. (PIIN) E19628-85-C-0079	2. SPIIN D00003	3. PAGE 5 OF 17
4. ITEM NO. 0003AC+	5. QUANTITY 1	6. PURCH UNIT LO	7. UNIT PRICE \$ 328,185.00	8. TOTAL ITEM AMOUNT \$ 328,185.00		13. CI
9. SCTY NO. ACRN CLAS U AA N	11. NSN	12. FSCM AND PART NUMBER		16. SVC/AGENCY USE		
14. SITE CODES A.PCA B.ACP C.FOB D D D ICCE Management Data				18. AUTHORIZED RATE A.PROGRESS PAY B.RECOUP		19. PERCENT FEE
17. PR/MIPR DATA FY76208500991				20. SVC ID NO.		21. ITEM/PROJ MGR
22. 1ST DISCOUNT A. %	23. 2ND DISCOUNT A. %	24. 3RD DISCOUNT A. %	25. NET DAYS	26. QUANTITY VARIANCE A. OVER B. UNDER	27. TYPE CONTRACT	28. OPR J
29. DESCRIPTIVE DATA Management Data for ICCE system IAW CDRL designated Attachment No. 3.						

4. ITEM NO.	5. QUANTITY	6. PURCH UNIT	7. UNIT PRICE	8. TOTAL ITEM AMOUNT	13. CI
0003AD+			\$	\$	
9. SCTY NO. ACRN CLAS U XA N Exhibit	11. NSN	12. FSCM AND PART NUMBER		16. SVC/AGENCY USE	
14. SITE CODES A.PCA B.ACP C.FOB D D D FOC Development Data				18. AUTHORIZED RATE A.PROGRESS PAY B.RECOUP	
17. PR/MIPR DATA FY76208500991				19. PERCENT FEE	
22. 1ST DISCOUNT A. %	23. 2ND DISCOUNT A. %	24. 3RD DISCOUNT A. %	25. NET DAYS	26. QUANTITY VARIANCE A. OVER B. UNDER	27. TYPE CONTRACT
29. DESCRIPTIVE DATA Development data for ICCE FOC System (CLIN 0002AC) IAW CDRL item designated Exhibit H. The firm-fixed price for this item is \$980.674.					

REF 708

PART II SECTION B OF THE SCHEDULE SUPPLIES LINE ITEM DATA				1. PROC INSTRUMENT ID NO. (PIIN) F19628-85-C-0079		2. SPIN P00003		3. PAGE 6 OF 17	
4. ITEM NO.	5. QUANTITY	6. PURCH UNIT	7. UNIT PRICE	8. TOTAL ITEM AMOUNT		13. C			
0004AA+	2	EA	\$ 1,343,881.00	\$ 2,687,762.00					
9. SCTY/ISO. ACRN CLAS		11. NSN		12. FSCM AND PART NUMBER		13. C			
U AD		N							
14. SITE CODES A. PGA B. ACP C. POS		15. NOUN		16. SVC/AGENCY USE					
S D D		Central Air Force (CENTAF) Systems							
17. PR/MIPR DATA		18. AUTHORIZED RATE A. PROGRESS PAY B. RECoup		19. CONTRACT PERCENT FEE		20. SVC ID NO.		21. ITEM/PROJ M	
FY76208500991									
22. 1ST DISCOUNT A. B. DAYS		23. 2ND DISCOUNT A. B. DAYS		24. 3RD DISCOUNT A. B. DAYS		25. NET DAYS		26. QUANTITY VARIANCE A. OVER B. UNDER	
								27. TYPE CONTRACT	
								J	
29. DESCRIPTIVE DATA.									

Acquisition of 2 transportable AWACS Digital Data Link Systems with associated communications equipment for CENTAF.

4. ITEM NO.	5. QUANTITY	6. PURCH UNIT	7. UNIT PRICE	8. TOTAL ITEM AMOUNT		13. C			
0004AB+	2	EA	\$ 51,458.50	\$ 102,917.00					
9. SCTY/ISO. ACRN CLAS		11. NSN		12. FSCM AND PART NUMBER		13. C			
U AD		N							
14. SITE CODES A. PGA B. ACP C. POS		15. NOUN		16. SVC/AGENCY USE					
D D D		CENTAF Software							
17. PR/MIPR DATA		18. AUTHORIZED RATE A. PROGRESS PAY B. RECoup		19. CONTRACT PERCENT FEE		20. SVC ID NO.		21. ITEM/PROJ M	
FY76208500991									
22. 1ST DISCOUNT A. B. DAYS		23. 2ND DISCOUNT A. B. DAYS		24. 3RD DISCOUNT A. B. DAYS		25. NET DAYS		26. QUANTITY VARIANCE A. OVER B. UNDER	
								27. TYPE CONTRACT	
								J	
29. DESCRIPTIVE DATA									

Software for 2 CENTAF Systems (SubCLIN 0004AA).

2525

\*REPRESENTS NET AMOUNT OF INCREASE/DECREASE WHEN MODIFYING EXISTING ITEM NO.

N = NOT APPLICABLE  
U = UNDEFINIZED

E = ESTIMATED  
- (IN QTY AND \$) = DECREASE

SITE

S = SOURCE  
D = DESTINATION



PART II SECTION B OF THE SCHEDULE SUPPLIES LINE ITEM DATA				1. PROC INSTRUMENT ID NO. (PIIN) F19628-85-C-0079	2. SPIN. P00003	3. PAGE 7 OF 17
4. ITEM NO.	5. QUANTITY	6. PURCH UNIT	7. UNIT PRICE	8. TOTAL ITEM AMOUNT		
0005AA+	1	LO	\$234,118.00	\$234,118.00		
9. SCTY/ISO. ACRN CLAS	11. NSN	12. FSCM AND PART NUMBER		13. CI		
U AD	N EXHIBIT					
14. SITE CODES A. PGA B. ACP C. FOB	15. NOUN	16. SVC/AGENCY USE				
D D D	CENTAF Hardware and Software Data					
17. PR/MIPR DATA	18. AUTHORIZED RATE A. PROGRESS PAY B. RECoup	19. PERCENT FEE	20. SVC ID NO.	21. ITEM/PROJ MG		
FY76208500991						
22. 1ST DISCOUNT A. %	23. 2ND DISCOUNT A. %	24. 3RD DISCOUNT A. %	25. NET DAYS	26. QUANTITY VARIANCE A. OVER B. UNDER	27. TYPE CONTRACT	28. OPR
					J	
29. DESCRIPTIVE DATA						
Hardware and Software data for CENTAF systems (CLIN 0004) IAW CDRL designated Exhibit C.						

4. ITEM NO.	5. QUANTITY	6. PURCH UNIT	7. UNIT PRICE	8. TOTAL ITEM AMOUNT		
0005AB+	1	LO	\$275,203.00	\$275,203.00		
9. SCTY/ISO. ACRN CLAS	11. NSN	12. FSCM AND PART NUMBER		13. CI		
U AD	N					
14. SITE CODES A. PGA B. ACP C. FOB	15. NOUN	16. SVC/AGENCY USE				
D D D	CENTAF Management Data					
17. PR/MIPR DATA	18. AUTHORIZED RATE A. PROGRESS PAY B. RECoup	19. PERCENT FEE	20. SVC ID NO.	21. ITEM/PROJ MG		
FY76208500991						
22. 1ST DISCOUNT A. %	23. 2ND DISCOUNT A. %	24. 3RD DISCOUNT A. %	25. NET DAYS	26. QUANTITY VARIANCE A. OVER B. UNDER	27. TYPE CONTRACT	28. OPR
					J	
29. DESCRIPTIVE DATA						
Management data for CENTAF Systems (CLIN 0004) IAW CDRL designated Attachment No. 5.						

\*REPRESENTS NET AMOUNT OF INCREASE/DECREASE WHEN MODIFYING EXISTING ITEM NO.

N = NOT APPLICABLE

U = UNDEFINITEZED

NSP = NOT SEPARATELY PRICED

E = ESTIMATED

- (IN QTY AND \$) = DECREASE

+ OR - (IN ITEM NO.) = ADDITION OR DELETION

SITE  
CODES:

S = SOURCE

D = DESTINATION

O = INTERMEDIATE

RT I SECTION B OF THE SCHEDULE  
SUPPLIES LINE ITEM DATA

70E

1. ITEM NO.	5. QUANTITY*	6. PURCH UNIT	7. UNIT PRICE	8. TOTAL ITEM AMOUNT*	13. CIRR
0047 +	1	LO	\$ 305,936.00	\$ 305,936.00	
CTY10.ACRN LAS	11. NSN		12. FSCM AND PART NUMBER		

1. SITE CODES	15. NOUN	16. SVC/AGENCY USE	18. AUTHORIZED RATE	19. CONTRACT	20. SVC ID NO.	21. ITEM/PROJ MGR
J AE	N		A. PROGRESS PAY B. RECOUP	PERCENT FEE		
0 D D						
PR/MIPR DATA						
RY76208500991						
1ST DISCOUNT	23. 2ND DISCOUNT	24. 3RD DISCOUNT	25. NET	26. QUANTITY VARIANCE	27. TYPE	28. OPR
A. 0.DAYS	A. 0.DAYS	A. 0.DAYS	0.DAYS	A. OVER B. UNDER	CONTRACT	
%	%	%	%	%	J	

DESCRIPTIVE DATA

Provisioning data for end items and for support equipment IAW CDRL  
Designated Attachment No. 12.

ITEM NO.	5. QUANTITY*	6. PURCH UNIT	7. UNIT PRICE	8. TOTAL ITEM AMOUNT*		
			.\$	\$		
CTY10.ACRN LAS	11. NSN		12. FSCM AND PART NUMBER		13. CIRR	
ITE CODES	15. NOUN			16. SVC/AGENCY USE		
JA B.ACP C.FOB						
R/MIPR DATA			18. AUTHORIZED RATE A.PROGRESS PAY B.RECOUP	19. CONTRACT PERCENT FEE	20. SVC ID NO.	21. ITEM/PROJ MGR
			%	%		
ST DISCOUNT	23. 2ND DISCOUNT	24. 3RD DISCOUNT	25. NET	26. QUANTITY VARIANCE	27. TYPE	28. OPR
A. 0.DAYS	A. 0.DAYS	A. 0.DAYS	0.DAYS	A. OVER B. UNDER	CONTRACT	
%	%	%	%	%	%	%
DESCRIPTIVE DATA						

DESCRIPTIVE DATA

2527

PRESENTS NET AMOUNT OF INCREASE/DECREASE WHEN MODIFYING EXISTING ITEM NO.

■ NOT APPLICABLE  
■ UNDEFINIZED  
■ NOT SEPARATELY PRICED  
E = ESTIMATED  
- (IN QTY AND \$) = DECREASE  
+ OR - (IN ITEM NO) = ADDITION OR DELETION  
CIRR: CONTROLLED ITEM RPT RQMT

SITE CODES: S = SOURCE  
D = DESTINATION  
O = INTERMEDIATE

PART II SECTION B OF THE SCHEDULE				1. PROC INSTRUMENT ID NO. (		2. SPIIN		3. PAGE 9 OF 17	
SUPPLIES LINE ITEM DATA				F19628-85-C-0079		P00003			
4. ITEM NO.	5. QUANTITY*	6. PURCH UNIT	7. UNIT PRICE	8. TOTAL ITEM AMOUNT*					
0057			\$	\$					
9. SCTY/IO. ACRN CLAS	11. NSN	12. FSCM AND PART NUMBER		13. CII					
U	N								
14. SITE CODES A.PQA B.ACP C.FOB	15. NOUN	16. SVC/AGENCY USE							
S D D	HF Ground Entry Station								
17. PR/MIPR DATA	18. AUTHORIZED RATE A.PROGRESS PAY B.RECOUP	19. CONTRACT PERCENT FEE		20. SVC ID NO.		21. ITEM/PROJ MGI			
	%	%							
22. 1ST DISCOUNT A. B.DAYS	23. 2ND DISCOUNT A. B.DAYS	24. 3RD DISCOUNT A. B.DAYS	25. NET DAYS	26. QUANTITY VARIANCE A. OVER B. UNDER		27. TYPE CONTRACT		28. OPR	
%	%	%		%		J			
29. DESCRIPTIVE DATA									

Option for a High Frequency (HF) Ground Entry Station (GES) for the ICCE FOC system (CLIN 0002), to be exercised concurrently with CLIN 0058  
Not to exceed price is \$1,761,073.

4. ITEM NO.	5. QUANTITY*	6. PURCH UNIT	7. UNIT PRICE	8. TOTAL ITEM AMOUNT*					
0058			\$	\$					
9. SCTY/IO. ACRN CLAS	11. NSN	12. FSCM AND PART NUMBER		13. CII					
U	N								
14. SITE CODES A.PQA B.ACP C.FOB	15. NOUN	16. SVC/AGENCY USE							
S D D	2 UHF GESS								
17. PR/MIPR DATA	18. AUTHORIZED RATE A.PROGRESS PAY B.RECOUP	19. CONTRACT PERCENT FEE		20. SVC ID NO.		21. ITEM/PROJ MGI			
	%	%							
22. 1ST DISCOUNT A. B.DAYS	23. 2ND DISCOUNT A. B.DAYS	24. 3RD DISCOUNT A. B.DAYS	25. NET DAYS	26. QUANTITY VARIANCE A. OVER B. UNDER		27. TYPE CONTRACT		28. OPR	
%	%	%		%		J			
29. DESCRIPTIVE DATA									

Option for 2 additional UHF GESSs for the ICCE FOC system (CLIN 0002), to be exercised concurrently with CLIN 0057 Not to exceed price is \$1,348,773.

2528

\*REPRESENTS NET AMOUNT OF INCREASE/DECREASE WHEN MODIFYING EXISTING ITEM NO.

N = NOT APPLICABLE

U = UNDEFINITEZED

NSP = NOT SEPARATELY PRICED

AFSC FORM 70S, NOV 75

E = ESTIMATED

- (IN QTY AND \$) = DECREASE

+ OR - (IN ITEM NO.) = ADDITION OR DELETION

CIR: CONTROLLED ITEM RPT RQMT

S = SOURCE  
SITE  
CODES: D = DESTINATION  
O = INTERMEDIATE  
AFSC-Andrews AFB Md

PART I SECTION F OF THE SCHEDULE  
SUPPLIES SCHEDULE DATA

1. PROC INSTRUMENT ID NO. (PIIN)	2. SPIIN ..	3. -
F19628-85-C-0079	P00003	PAGE 10 OF 17
4. ITEM NO.	5. ACRN	6. TSP PRI
	7. MILSTRIP DOC NO. AND SUFFIX	8. CON ITEM SERIAL NO.
	9. ENDING SERIAL NO. (WHEN APPL)	10. CLIN IDENT EXHIBIT

0001AB+					
DEL SCHED DATE	12. ENDING DATE (WHEN APPL)	13. DEL SCHEDULE QTY*	14. SCTY CLAS	15. SHIP TO	16. MARK FOR
A.		A.			
B.		B.	11. DEL SCHED DATE	12. ENDING DATE (WHEN APPL)	13. DEL SCHEDULE QTY*
C.		C.	D.	D.	D.
			E.	E.	E.

DESCRIPTIVE DATA

served.

0002AA+	AA				
DEL SCHED DATE	12. ENDING DATE (WHEN APPL)	13. DEL SCHEDULE QTY*	14. SCTY CLAS	15. SHIP TO	16. MARK FOR
AS REQ	A.	A. 1	U	U	
	B.	B.	11. DEL SCHED DATE	12. ENDING DATE (WHEN APPL)	13. DEL SCHEDULE QTY*
	C.	C.	D.	D.	D.
			E.	E.	E.

DESCRIPTIVE DATA

be delivered concurrently with SubCLINs 0002AB and 0002AC, 16 months  
er the effective date of this modification (MAED).

0002AB+	XA				
DEL SCHED DATE	12. ENDING DATE (WHEN APPL)	13. DEL SCHEDULE QTY*	14. SCTY CLAS	15. SHIP TO	16. MARK FOR
AS REQ	A.	A. 1	U	U	
	B.	B.	11. DEL SCHED DATE	12. ENDING DATE (WHEN APPL)	13. DEL SCHEDULE QTY*
	C.	C.	D.	D.	D.
			E.	E.	E.

DESCRIPTIVE DATA

be delivered concurrently with SubCLINs 0002AA and 0002AC, 16 MAED.

REPRESENTS A NET INCREASE/DECREASE WHEN NO + OR - APPEARS AFTER THE ITEM NO.  
ESTIMATED

QTY) = DECREASE

- (IN ITEM NO.) = ADDITION OR DELETION

PART I SECTION F OF THE SCHE SUPPLIES SCHEDULE DATA				1. PROC INSTRUMENT ID NO. (PIIN) F19628-85-C-0079		2. SPIIN P00003		3. PAGE 11 OF 17	
4. ITEM NO.	5. ACRN	6. TSP PRI	7. MILSTRIP DOC NO. AND SUFFIX	8. CON ITEM SERIAL NO.	9. ENDING SERIAL NO. (WHEN APPL)	10. CLIN IDENT EXHIBIT			

0002AC+ XA									
11. DEL SCHED DATE	12. ENDING DATE (WHEN APPL)	13. DEL SCHEDULE QTY*	14. SCTY CLAS	15. SHIP TO	16. MARK FOR				
A. AS REQ	A.	A. 1	U	U					
B.	B.	B.	D.	D.	11. DEL SCHED DATE	12. ENDING DATE (WHEN APPL)	13. DEL SCHEDULE QTY*		
C.	C.	C.	E.	E.	D.	D.	D.		
17. DESCRIPTIVE DATA									

To be delivered concurrently with SubCLINs 0002AA and 0002AB, 16 MAED.

0003AC+ AA									
11. DEL SCHED DATE	12. ENDING DATE (WHEN APPL)	13. DEL SCHEDULE QTY*	14. SCTY CLAS	15. SHIP TO	16. MARK FOR				
A. AS REQ	A.	A. 1	U	U					
B.	B.	B.	D.	D.	11. DEL SCHED DATE	12. ENDING DATE (WHEN APPL)	13. DEL SCHEDULE QTY*		
C.	C.	C.	E.	E.	D.	D.	D.		
17. DESCRIPTIVE DATA									

To be delivered IAW individual sequence numbers of Attachment No. 3, CDRL.

0004AA+ AD									
11. DEL SCHED DATE	12. ENDING DATE (WHEN APPL)	13. DEL SCHEDULE QTY*	14. SCTY CLAS	15. SHIP TO	16. MARK FOR				
A. AS REQ	A.	A. 2	U	U					
B.	B.	B.	D.	D.	11. DEL SCHED DATE	12. ENDING DATE (WHEN APPL)	13. DEL SCHEDULE QTY*		
C.	C.	C.	E.	E.	D.	D.	D.		
17. DESCRIPTIVE DATA									

Delivery of first system 15 MAED. Delivery of second system 18 MAED.

\* REPRESENTS A NET INCREASE/DECREASE WHEN NO + OR - APPEARS AFTER THE ITEM NO.  
E = ESTIMATED  
- (IN QTY) = DECREASE  
+ OR - (IN ITEM NO.) = ADDITION OR DELETION

70H

PART I SECTION F OF THE SCHEDULE SUPPLIES SCHEDULE DATA				1. PROC INSTRUMENT ID NO. (PIIN) F19628-85-C-0079	2. SPIIN P000003	3. PAGE 12 OF 17
4. ITEM NO.	5. ACRN	6. TSP PRI	7. MILSTRIP DOC NO. AND SUFFIX	8. CON ITEM SERIAL NO.	9. ENDING SERIAL NO. (WHEN APPL)	10. CLIN IDENT EXHIBIT

0004AB+	AD	13. DEL SCHEDULE QTY *	14. SCTY CLAS	15. SHIP TO	16. MARK FOR
1. DEL SCHED DATE	12. ENDING DATE (WHEN APPL)				
AS REQ	A.	A. 2	U	U	
	B.	B.	11. DEL SCHED DATE	12. ENDING DATE (WHEN APPL)	13. DEL SCHEDULE QTY *
	C.	C.	D.	D.	D.
			E.	E.	E.

7. DESCRIPTIVE DATA

delivery of each software package concurrent with each system in SubCLIN 004AA, 15 MAED and 18 MAED.

0005AB+	AD	13. DEL SCHEDULE QTY *	14. SCTY CLAS	15. SHIP TO	16. MARK FOR
1. DEL SCHED DATE	12. ENDING DATE (WHEN APPL)				
AS REQ	A.	A. 1	U	U	
	B.	B.	11. DEL SCHED DATE	12. ENDING DATE (WHEN APPL)	13. DEL SCHEDULE QTY *
	C.	C.	D.	D.	D.
			E.	E.	E.

7. DESCRIPTIVE DATA

to be delivered IAW individual sequence numbers of Attachment No. 5, CDRL.

0047 +	AE	13. DEL SCHEDULE QTY *	14. SCTY CLAS	15. SHIP TO	16. MARK FOR
1. DEL SCHED DATE	12. ENDING DATE (WHEN APPL)				
AS REQ	A.	A. 1	U	U	
	B.	B.	11. DEL SCHED DATE	12. ENDING DATE (WHEN APPL)	13. DEL SCHEDULE QTY *
	C.	C.	D.	D.	C.
			E.	E.	E.

7. DESCRIPTIVE DATA

to be delivered IAW individual sequence numbers of Attachment No. 12, DRL.

REPRESENTS A NET INCREASE/DECREASE WHEN NO + OR - APPEARS AFTER THE ITEM NO.

= ESTIMATED

(IN QTY) = DECREASE

OR - (IN ITEM NO.) = ADDITION OR DELETION

DD FORM 702

2531

**PART I SECTION G OF THE SCHEDULE  
ACCOUNTING CLASSIFICATION DATA**

1. PROC INSTRUMENT ID NO. (PIIN)	2. SPIIN	3. PAGE 13 OF 17
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4. APPROPRIATION AND ACCOUNTING DATA	5. LIMIT SUBHEAD	6. SUPPLEMENTAL ACCTS CLASSIFICATION
U AA 5753080	175 4750 833541	010200 00000 12411F 678100
CPN RECIPIENT 000000	NON-CLIN/CLIN	PR/MIPR DATA
OBLIGATION AMOUNT: F78100 \$ 4,084,286.00+		PAYING OFF CODE: FY76208500991

## 6. DESCRIPTIVE DATA

Increase of FY85 3080 funds for ICCE FOC (SCLINS 0002AA, 0003AB and 0003AC)

4. APPROPRIATION AND ACCOUNTING DATA	5. LIMIT SUBHEAD	6. SUPPLEMENTAL ACCTS CLASSIFICATION
U AD+ 5733080	173 4750 834502	010300 00000 27434F 678100
CPN RECIPIENT 000000	NON-CLIN/CLIN	PR/MIPR DATA
OBLIGATION AMOUNT: F78100 \$ 3,300,000.00		PAYING OFF CODE: FY76208500991

## 6. DESCRIPTIVE DATA

Addition of ACRN with funds for CLINs 0004 and 0005, CENTAF Systems.

4. APPROPRIATION AND ACCOUNTING DATA	5. LIMIT SUBHEAD	6. SUPPLEMENTAL ACCTS CLASSIFICATION
U AE+ 5753080	175 6305 83790A	033540 00000 000000 503200
CPN RECIPIENT 000000	NON-CLIN/CLIN	PR/MIPR DATA
OBLIGATION AMOUNT: F0320F \$ 305,936.00		PAYING OFF CODE: FY76208500991

## 6. DESCRIPTIVE DATA

Addition of ACRN with funds for CLIN 0047, provisioning data.

4. APPROPRIATION AND ACCOUNTING DATA	5. LIMIT SUBHEAD	6. SUPPLEMENTAL ACCTS CLASSIFICATION
U AC 5753600	295 4750 632980	000000 00000 12411F 678100
CPN RECIPIENT 000000	NON-CLIN/CLIN	PR/MIPR DATA
OBLIGATION AMOUNT: F78100 \$ 997,508.13+		PAYING OFF CODE: FY76208500991

## 6. DESCRIPTIVE DATA

Addition of funds to be included in Special ACRN XA.

4. APPROPRIATION AND ACCOUNTING DATA	5. LIMIT SUBHEAD	6. SUPPLEMENTAL ACCTS CLASSIFICATION
U XA+ SPECIAL		
CPN RECIPIENT 000000	NON-CLIN/CLIN	PR/MIPR DATA
OBLIGATION AMOUNT: \$		PAYING OFF CODE:

## 6. DESCRIPTIVE DATA

Special ACRN to identify multiple funding for SubCLINs 0002AB, 0002AC and 0003AD. Consists of ACRN AC \$997,508.13, Pay AC funds first.

2532

REPRESENTS NET AMOUNT OF INCREASE DECREASE WHEN MODIFYING AN EXISTING ACRN.

+ OR - IN ACRN = ADDITION OR DELETION IN \$ - DECREASE

NOTE TO CONTRACTOR: Submit invoices to paying office unless otherwise specified in the descriptive data item hereon.

1. This Supplemental Agreement provides for the acquisition of the completion of the ICCE IOC system, the E FOC system and two systems for the Central Air Force (CENTAF) and related data and documentation.

2. As a result of the aforementioned make the following changes to the basic contract:

a. Cover Page, AFSC Form 701, change the amount in block 22 from \$1,009,491.87 to \$12,137,080.87 an increase of \$11,127,589. (This includes \$10,411,875 added by this modification and \$715,714 added by P00001).

b. Section B - Supplies/Services -

1) See AFSC Form 705 pages 2-9 of this modification.

2) Revise the descriptive data for the following CLINs to read as stated below:

0006AA	Option for acquisition of a data link set with TADIL A and lateral tell capabilities and associated communications equipment for AAC at a Not-to-Exceed (NTE) price of \$3,454,121.
0006AB	Option. Software for the AAC System at a (NTE) price of \$238,838.
0008AA	Option. Acquisition of a data link set with TADIL A and lateral tell capabilities and associated communications equipment for PACAF at a (NTE) price of \$2,988,177.
0008AB	Option. Software for the PACAF system at a NTE price of \$259,153.

3) Revise the last sentence of the "descriptive data" for the following CLINs to read as stated below:

0010	12 months at a NTE price of \$432,976.
0011	4 months at a NTE price of \$149,761.
0012	4 months at a NTE price of \$154,358.
0013	4 months at a NTE price of \$186,505.
0014	12 months at a NTE price of \$389,192.
0015	4 months at a NTE price of \$116,025.
0016	4 months at a NTE price of \$118,010.
0017	4 months at a NTE price of \$119,963.
0018	4 months at a NTE price of \$318,327.
0019	4 months at a NTE price of \$132,978.
0020	4 months at a NTE price of \$132,978.
0021	4 months at a NTE price of \$142,957.
0022	4 months at a NTE price of \$116,701.
0023	The NTE price of this CLIN is \$ 71,117.
0024	The NTE price of this CLIN is \$ 35,559.
0025	The NTE price of this CLIN is \$ 35,559.
0026	The NTE price of this CLIN is \$ 35,559.
0027	The NTE price of this CLIN is \$317,219.
0028	4 months at a NTE price of \$132,809.
0029	4 months at a NTE price of \$132,809.
0030	4 months at a NTE price of \$142,787.
0031	12 months at a NTE price of \$386,026.
0032	4 months at a NTE price of \$119,661.
0033	4 months at a NTE price of \$121,792.
0034	4 months at a NTE price of \$123,923.
0035	7 months at a NTE price of \$224,556.
0036	4 months at a NTE price of \$135,820.



0037 4 months at a NTE price of \$135,820  
 0038 4 months at a NTE price of \$143,303.  
 0039 12 months at a NTE price of \$369,681.  
 0040 4 months at a NTE price of \$115,076.  
 0041 4 months at a NTE price of \$119,333.  
 0042 4 months at a NTE price of \$119,333.  
 0043AA Addition of TADIL B capability to the PDE for the ICCE and CENTAF systems at a NTE price of \$180,481.  
 0043AB Software for TADIL B (CLIN 0043) at a NTE price of \$521,436.

4) Revise Paragraph 4. Exercise of Options to delete reference for CLINs 0002-0005, and add the following reference:

0057 and 0058 To be exercised no later than acceptance of CLIN 0004AA or 31 October 1987, whichever is later.

Also change the option exercise date for CLIN 0045 to "To be determined".

c. Section C - Description/Specification/Work Statement -

1) Make the following changes:

0001AB Change the date in paragraph a. from 85FEB07 to 85AUG20.  
 Change the date in paragraph b. from 85FEB04 to 85AUG20.  
 0002AC Change the date in paragraph c. from 85FEB10 to 85AUG02.  
 0003AA Change the date from 85FEB10 to 85AUG02.  
 0003AB Change the date from 85FEB10 to 85AUG02  
 0003AC Change the date from 85FEB10 to 85AUG02.  
 0004AA Change the date in paragraph a. from 85FEB04 to 85AUG06.  
 Change the date in paragraph b. from 85FEB04 to 85AUG20.  
 0004AB Change the date in paragraph c. from 85FEB10 to 85AUG02.  
 0005AA Change the date from 85FEB10 to 85AUG02.  
 0005AB Change the date from 85FEB10 to 85AUG02.  
 0006AA Change the date in paragraph b. from 85FEB04 to 85MAY07.  
 0043AA Change the date to 85MAY07.  
 0045 Change the date from 85FEB10 to 85AUG02.  
 0048-0054 Add "and the Iceland SOW and ICCE Spec"

2) Add the following references:

0003AD Exhibit H, AFSC Forms 709, Contract Data Requirements List (CDRL), dated 85AUG16.  
 0057,0058 Iceland SOW, especially paragraph 3.1.3.

d. Section E - Inspection and Acceptance -

1) Add the following references:

0003AD IAW each individual ELIN of Exhibit C, CDRL.  
 0057,0058 Inspection at source, acceptance at destination.

e. Section F - Deliveries or Performance -

1) See AFSC Forms 706, pages 10-12 of this modification.

2) Make the following revisions to paragraph 1:

Delete references for CLINs 0001AB, 0002AA, 0002AB, 0002AC, 0003AC, 0004AA, 0004AB, 0005AB, and 0047.

Make the following deletions:

0003AA Delete words "if option is exercised"  
 0003AB Delete words "if ordered"  
 0005AA Delete words "if ordered"

Add the following references:

0003AD To be delivered IAW individual ELINs of Exhibit H, CDRL.  
 0057,0058 12 months after option exercise

3) Add the following to paragraph 3:

For CLINs 0002AA, 0002AB and 0002AC, ship to:  
 Iceland Defense Force/J-6  
 Keflavik Naval Air Station  
 Keflavik, Iceland  
 Attn: Lt. Col Shaner

2534

f. Section G - Cont. Administration Data -

1) See AFSC Form 703 for funds being obligated.

2) Change the recapitulation of funds to read as follows:

<u>Contract Document</u>	<u>AA</u>	<u>AB</u>	<u>ACRN</u> <u>AC</u>	<u>AD</u>	<u>AE</u>
Basic Contract		\$939,252			
P00001	\$715,714				
P00002		67,748	2,492		
P00003	4,084,286		997,508	3,300,000	305,936
Total	\$4,800,000	\$1,007,000	\$1,000,000	\$3,300,000	\$305,936
Total Obligated	\$10,412,936				

g. Section H - Special Contract Requirements - Make the following changes:

1) Revise SCR 18. Executive Estimate of Cost at Completion to read as follows:

A corporate level "line" official shall provide directly to HQ ESD/SC, Hanscom AFB, MA 01731, an executive level estimate of the contract cost at completion on 31 March, 30 June, 30 September, and 31 December. This should be a brief, not more than one page, letter presenting the executive's view of cost at completion.

2) Revise SCR 19. Segregation of Costs to read as follows:

The Contractor shall segregate all costs associated with CLINs 0002AA, 0003AB, 0003AC, 0004, 0005, 0047, 0054, 0056 (and 0006-0042, 0045, 0046, 0057, 0058 if ordered) (3080 funded CLINs) from 0002AB, 0002AC, and 0003AD, and segregate those CLINs from CLIN 0043 (if ordered) (FPIF CLIN) and from CLINs 0048 and 0051 (FPLOE CLINs), and segregate those CLINs from CLINs 0049, 0050, 0052 and 0053 (CR and CPFF CLINs). All such segregations of costs shall be done in a manner such that at any time the costs incurred with a group of CLINs shall be readily ascertainable.

3) Revise SCR 21. Government Furnished Property to add the following to the list of GFP available in Iceland:

Towers and/or pads at Ground Entry	1 each Contract Award
Station Sites	site
220V power termination at Ground	1 each Contract Award
Entry Station Sites	site

Also replace the Quantity "TBD" with "As Required" for Icelandic Postal and Telecommunication Telephone Circuits and for KNCS Circuits (Military).

4) Revise SCR 22. Determination of Base Support, by replacing "To Be Determined" with the following:

Rockville:	Red Ground for Master Direction Center (MDC)
	Floor Space at MDC
Keflavik:	Use of Post Exchange and Commissary
	Use of Medical Facilities
	Storage Space as Required
	Floor Space as Required
	Office Space as Required

5) Under "Other Special Contract Requirements" add:

7. Installation at Northern Sites

The U.S. Government is contracting with Iceland Post and Telecommunications (IPT) for installation of equipment at the Ground Entry Stations (GESs). IPT personnel will be under the technical supervision of the U.S. Government during the performance of this task. TechDyn employees will monitor the performance of IPT personnel and advise the U.S. Government. Prior to acceptance of the IPT installation effort U.S. Government and TechDyn representatives will agree that the IPT has satisfactorily completed their effort.

6) Revise Other ~~Contract~~ Contract Requirement No. PLOE Deliverables to read as follows:

Any and all items which are deliverable to the Government under CLIN 0048, FPLOE Front End Effort, which are not completed in the 120-day period of performance, shall be delivered, at no change in contract price, under CLIN 0054AA, Communications Equipment.

**h. Section I - Contract Clauses -**

1) Add the following clauses to subparagraph a:

- 79. 52.215-26 Integrity of Unit Prices JUN 1985
- 80. 52.215-32 Certification of Commercial Pricing JUN 1985
- 81. 52.233-3 Protest After Award JUN 1985

2) Make the following revisions:

Change date of 52.232-8, Discounts for Prompt Payment, from APR 1984 to JUL 1985.

Change date of 52.244-2, Subcontracts Under Cost-Reimbursement and Letter Contracts, from APR 1984 to JUL 1985.

Change date of 52.245-2, Government Property (Fixed Price Contracts) Alternate I, from APR 1984 to JUL 1985.

3) Revise paragraph (a) of AFSC FAR Sup Clause 52.232-9000 to read as follows:

(a) Of the total price of items 0002AB, 0002AC, 0003AD, 00048 and 0051, the sum of \$1,774,942. is presently available for payment and allotted to this contract. It is anticipated that from time to time additional funds will be allotted to this contract until the total price of these items is allotted.

Also revise the date in subparagraph (c) to "30th day of September 1985".

4) Revise the title of AFSC FAR Sup Clause 52.245-9000 to read as follows:

BASE SUPPORT (Applies to CLINs 0002, 0004, 0006, 0007 and 0054).

**i. Section J - List of Attachments -**

1) Make the following changes:

Attachment

- 2. Change the date from 85FEB10 to 85AUG02 and change page count to 4.
- 3. Change the date from 85FEB10 to 85AUG02 and change the page count to 31.
- 4. Change the date from 85FEB10 to 85AUG02.
- 5. Change the date from 85FEB10 to 85AUG02 and change the page count to 32.
- 13. Change the date from 85FEB10 to 85AUG02.
- 14. Change the date from 85FEB10 to 85AUG02 and change the page count to 17.
- 15. Change the date from 85FEB10 to 85AUG02 and change the page count to 20.
- 19. Change the date from 85FEB10 to 85AUG02 and change the page count to 2.
- 20. Change the date from 85FEB07 to 85AUG20 and change the page count to 44.
- 21. Change the date from 85FEB04 to 85AUG06.
- 23. Change the date from 85FEB04 to 85AUG20 and change the page count to 96.
- 24. Change the date from 85FEB04 to 85MAY07.
- 25. Change the date from 85FEB04 to 85AUG20.
- 26. Change the date from 85FEB04 to 85MAY07.

2536

NOTE: The changes to the dates for Attachments 24 and 26 are to correct an error in the basic contract. Those Attachments are not revised by this modification.

2) Add the following attachment:

34. Exhibit H. AFSC Forms 709, FOC Development Software and Hardware Data, Contract Data Requirements List (CDRL), dated 85AUG16, 27 pages.

3. This supplemental agreement constitutes full, complete and final accord and satisfaction for any and all changes arising out of this supplemental agreement.

4. This supplemental agreement shall be subject to the written approval of the Secretary or his duly authorized representative and shall not be binding until so approved.

2537



COMMAND  
CONTROL AND  
COMMUNICATIONS  
CORPORATION — SAN DIEGO

INTEROFFICE  
MEMORANDUM

TO: MONTE HATCHETT  
FROM: MARIE RAYMOND  
SUBJECT: ICCE CONTRACT SIGNATURE

DATE: 16 JAN 86

Subject they requests signature on Nov 03 of the IchDyn contract. I recommend we hold out until we have our own SOW and, perhaps, specifications and CDRs list. Taking responsibility for their SOW etc. can only cause big problems later in the contract. I would like to discuss this with you prior to signing; even if they withhold payment for a while, our own SOW will save money later.

2538

NOTE FOR FILE: MR. HATCHETT DIRECTED SIGNATURE

200022





DEPARTMENT OF THE AIR FORCE  
HEADQUARTERS ELECTRONIC SYSTEMS DIVISION (AFSC)  
HANSCOM AIR FORCE BASE, MASSACHUSETTS 01731-5000

06 JAN 1989

REPLY TO  
ATTN OF: TCN-4

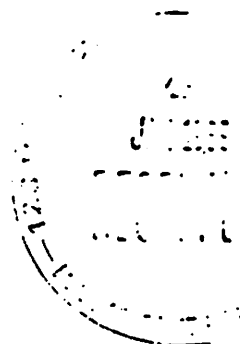
SUBJECT: Interim Iceland Air Defense System (Interim IADS) Working Group Meeting #18.

TO: See Distribution

Minutes of the Interim IADS Working Group Meetings conducted 13-15 Dec 88 are attached. Copies of all correspondence regarding respective action items, any comments or corrections to the minutes, and any future agenda items, should be forwarded to Capt Chris Jacobson (ESD/TCN-4, Hanscom AFB, MA) AV 478-5980, 186-3174; or the respective working group chairman.

CHRISTOPHER P. JACOBSON, CAPT, USAF  
Program Manager, Interim IADS  
North Atlantic Defense System Directorate

- 2 Atchs  
1. Distribution List  
2. Minutes/Attachments



2539



MINUTES FROM  
ICELAND COMMAND & CONTROL ENHANCEMENT (ICCE)

TEST PLAN WORKING GROUP (TPWG) #17


#18

Conducted at:

H. H. AEROSPACE  
Colorado Springs, CO

15 DECEMBER 1988

Minutes prepared by:

  
Lt. Suelling Cho, USAF  
Chairman, ICCE TPWG

## Agenda Item #2: Test Status

The Test Status charts are provided as part of attachment 2, briefing charts.

During the review of the CENTAF and CONUS Upgrade Test Program Summary charts, no discussion took place. For the ICCE Test Program Summary chart, it was noted that the TAF CERT and SQT fixes are being handled together, World Wide Lateral Tell (WWLT) is not yet on contract and that many of the test requirements will be reduced should the hardware solution for RCE be used. ~~The three test status charts are based on a proposal which is not yet on contract.~~

The subcontractor was asked about the status of the STRs. A Statement for Record (SFR) 18-1 was made: The subcontractor stated that TAF CERT STR's have not yet been worked on to date. The subcontractor acknowledges that the STRs from the March 1988 correspondence are within the scope of the current contract. The subcontractor supplied the current status of the STRs which are attachment 3 of these minutes. Once the contractor has notified ESD that all STRs have been completed, ESD intends to conduct an audit on TAF CERT and SQT (for the contractor). After the completion of the audit, a two week soak period will be run to verify the operability of the software. Within two weeks after the completion of the soak period, a SQT post-test review will be convened. A warranty on the software will cover any further deficiencies for a period of 1 year after the DD250 for CLIN 2AC has been signed. The DD250 signing date may be adjusted as part of the re-baselining effort.

To alleviate any confusion concerning the various tests referenced in the Statement of Work (SOW) AI 18-2 was generated: ESD to generate a letter to the contractor clarifying the nature of DT&E and OT&E tests which appear in the SOW.

During a pre-OT&E meeting held 14 Dec 88, the possibility of conducting some of the SLT at Tyndall was discussed for cost-effective reasons. SFR 18-2 was generated: TAC stated that once requirements are identified on a case by case basis by ESD and user community, certain SLT events may be conducted at Tyndall AFB with contractor concurrence.

The Master Test Plan (MTP) was last updated on Mar 88. The government is considering updating the MTP with contractor input. AI 18-3 was generated: ESD to formulate methodology and team to update MTP.

To clarify any confusion on which tests will be conducted, the following scenerios for SLT was charted:

Current Contract	1 In-plant SLT	1 On-site SLT
Orig FOC-1/FOC-2	1 In-plant (FOC-2)	2 On-site SLT
Current rebaseline	1 In-plant SLT	1 On-site (Tyndall & Iceland)
RCE H/W Solution	None	1 On-site (Tyndall & Iceland)



73: 100 100 100

REF: 3440

ID	PROJECT	DATE PROMISED	ASSIGNEE	DATE OPENED DESCRIPTION	AUTHOR	CURRENT PRIORITY	DATE FILED	DATE CLOSED	STATUS
P-109	100E	/ /	JUSTIS	06/08/87 FINDER	L/S	/ /	/ /	PENDING EOP TO BS	
				FIND TRAVEL OF A SPECIAL AIR TRAIL					
P-104	100E	/ /	EVERY	06/07/87 YAGI	L/S	/ /	/ /	PENDING RELEASE OF CS	
				COMPUTER FROM PACO SPEC MONITORING DEVICES					
P-107	100E	/ /	EVERY	06/07/87 LIVERMORE	L/S	/ /	/ /	PENDING RELEASE OF CS	
				FAILURE TO MEET REQ STATED IN JAL-ST-483					
P-106	100E	/ /	EVERY	06/07/87 LIVERMORE	L/S	/ /	/ /	PENDING RELEASE OF CS	
				REL FOR TS CSCI MAIN & DISPLAY					
P-101	100E	/ /	STEINBERG	06/05/87 WILLIAMSON	L/S	/ /	/ /	PENDING EOP TO BS	
				CLEAR REQUEST NOT PROCESSED					
P-100	100E	/ /	REVIELLO	06/04/87 REVIELLO	L/S	07/21/87	/ /		
				SOURCE FILE -HEADER BLOCK FORMAT TEL S/L					
P-105	100E	/ /	DRAWFORD	06/03/87 AYARG	L/S	09/28/87	/ /		
				WFO OBJECTS INCORRECT CP TO MODULE REF					
P-103	100E	/ /	DRAWFORD	06/02/87 AYARG	L/S	09/28/87	/ /		
				INCORRECT MODULE/CP REF IN ORCA/PAGE1					
P-102	100E	/ /	DRAWFORD	06/02/87 AYARG	L/S	09/28/87	/ /	PENDING RELEASE OF CS	
				WFO CS ERROR INCORRECT CP TO MODULE REF					
P-100	100E	/ /	DRAWFORD	06/02/87 AYARG	L/S	09/28/87	/ /		
				INCORRECT MODULE REF (CP/MZFR) IN CS					
P-104	100E	/ /	DRAWFORD	06/02/87 AYARG	L/S	09/28/87	/ /		
				MODULE OF .9970.SI MISSING CS MODULE LIST					
P-107	100E	/ /	TAGGAS	06/01/87 AYARG	L/S	07/21/87	/ /		
				MISSING MODULE REF TO DSC CS DOCUMENT					
P-106	100E	/ /	STEINBERG	07/24/87 STEINBERG	L/S	07/21/87	/ /		
				CORRECT DOCUMENT ERRORS PER TECHSPEC					
P-101	100E	/ /	STEINBERG	07/21/87 STEINBERG	L/S	09/28/87	/ /		
				PREFACE BLOCK INPUTS & OUTPUTS					
P-100	100E	/ /	STEINBERG	07/21/87 STEINBERG	L/S	09/28/87	/ /		
				CORRECT USE OF TERMINOLOGY					
P-105	100E	/ /		06/09/87 FINDER	L/S	/ /	/ /	REQ 100E GOVT SPEC ENG/WFO	
				LATERAL-TELL LAT-LONG GRID CAUSES HALT					
P-104	100E	/ /		06/04/87 REVIELLO	L/S	/ /	/ /	PENDING EOP TO BS ILS	
				UPDATE ROAD DATA					

W-113 #0

PAGE : 2

ALL S. T. S. S. S. S. S. #

DATE : JUL 21, 1988

TIME : 9:44:

PR #	PROJECT	DATE PROPOSED	ASSIGNEE	DATE OPENED DESCRIPTION	AUTHOR	CATEGORY PRIORITY	DATE FIXED	DATE CLOSED	STATUS
7-790	100E	/ /	THOMAS	09/09/87 CORRECT CS DOC IN PROG LIST	THOMAS	S/4	09/26/87	/ /	
7-825	100E	/ /		09/25/87 CS DOCUMENTATION LISTINGS	THOMAS	S/5	09/26/87	/ /	
7-831	100E	/ /		09/29/87 RSM : SUB INIT MENU STILL CUS AND FLE	BROWN	S/5	/ /	/ /	PENDING EOP TO BS
7-865	100E	/ /		10/12/87 EWINTTEL UPDATE	FOWLER	S/5	11/05/87	/ /	PENDING EOP TO BS
7-884	100E	/ /	JUSTIS	10/22/87 EPAC UPDATE RPOC DATA OVERWRITES INTL VA	STEINBERG	D/3	/ /	/ /	
7-968	100E	/ /		12/02/87 2 TRNS ALLOCATED SAME RPOC TX	JUSTIS	S/3	/ /	/ /	
7-975	100E	/ /	JUSTIS	12/03/87 BS DOES NOT DISTINGUISH BTWY SIM/LIVE VO	JUSTIS	S/4	/ /	/ /	PENDING EOP TO BS
7-978	100E	/ /	THOMAS	12/04/87 DELAYED VOX ALERT	STEINBERG	S/3	02/04/88	/ /	TESTING
7-981	100E	/ /	BURTSCHI	12/04/87 CONSOLE CORRELATIONS NOT INFINITE CORREC	JUSTIS	S/2	02/18/88	/ /	TESTING
7-984	100E	/ /	BURTSCHI	12/14/87 TELL CONT MSG TX'D TWICE	JUSTIS	S/4	02/09/88	/ /	TESTING
7-986	100E	/ /		01/29/88 CONT. UNIT TO TADIL-B IN ERROR	FOWLER	S/4	/ /	/ /	
7-987	100E	/ /		01/29/88 VOICE FREQ. FRM RPOC TO TADIL-A IN ERROR	FOWLER	S/3	/ /	/ /	
7-988	100E	/ /		01/29/88 CONT. UNIT IN EDGE REARMT TO T-B IN ERR	FOWLER	S/3	/ /	/ /	
7-991	100E	02/08/88	THOMAS	02/08/88 R/C CONTROL ORDER LOOP	THOMAS	S/3	02/08/88	/ /	TESTING
7-993	100E	02/08/88	THOMAS	02/08/88 DROP TRACK CRASHES ETC	THOMAS	S/1	02/08/88	/ /	TESTING
7-994	100E	/ /	THOMAS	02/18/88 CSO INTERCEPT TO FRAG ELCS FROM ABORT	FOWLER	S/1	02/15/88	/ /	TESTING
7-995	100E	/ /	THOMAS	02/18/88 VOX FREQ FRM PARITY CAUSES ADR CRASH	FOWLER	S/1	02/15/88	/ /	TESTING

2543

REF 4003 841

A L L S. T. R. 'S S T. R. 4

PAGE : 3

DATE : JUL 21, 1968

TIME : 9:44:1

ITA #	PROJECT	DATE PROMISED	ASSIGNEE	DATE OPENED	DESCRIPTION	AUTHOR	CATEGORY	PRIORITY	DATE FIXED	DATE CLOSED	STATUS
38-378	JOCE	/ /	THOMAS	03/19/68	FWLER	S/S	02/23/68	/ /	TESTING		
					DRF. ID CHG. CAUSES CAT CHG TO AIR						
38-386	JOCE	/ /	THOMAS	03/21/68	FWLER	S/4	02/23/68	/ /	TESTING		
					PLAYBACK LOOP						
38-413	JOCE	/ /	THOMAS	03/23/68	FWLER	S/S	/ /	/ /			
					CHG TR: # DOESNT CREATE DRP TR.						
38-414	JOCE	/ /	THOMAS	03/23/68	FWLER	S/S	/ /	/ /			
					ENGAG RDC INTERCEPT KNIT'D IN ERR TRG-A						
38-550	JOCE	/ /	THOMAS	04/05/68	THOMAS	S/4	04/05/68	/ /	TESTING		
					INCORRECT DISPLAY OF GEOREF DATA						
38-550	JOCE	/ /	THOMAS	05/23/68	THOMAS	S/S	/ /	/ /			
					ISD CS CHANGES TO SOURCE PD.						
38-581	JOCE	/ /	THOMAS	05/23/68	THOMAS	S/S	/ /	/ /			
					ISD CS CHANGES TO SOURCE PD.						
38-582	JOCE	/ /	THOMAS	05/23/68	THOMAS	S/S	/ /	/ /			
					ISD CS CHANGES TO SOURCE PD.						
38-619	JOCE	/ /	THOMAS	06/04/68	THOMAS	S/4	/ /	/ /			
					RDC SPL PT SYMBOLLOGY IS INCORRECT						
38-619	JOCE	/ /	THOMAS	06/06/68	THOMAS	S/S	/ /	/ /			
					RDC X/Y VAL OFF BY 0.25 DM						
38-621	JOCE	06/08/68	THOMAS	06/07/68	THOMAS	S/S	/ /	/ /			
					DELETE UNUSED MODULS FC MAPR. 61						
38-654	JOCE	/ /		07/21/68	JUSTIS	S/1	/ /	/ /	TAF		
					SEE ORIGINAL DOCUMENT						
38-655	JOCE	/ /		07/21/68	JUSTIS	S/1	/ /	/ /	TAF		
					SEE ORIGINAL DOCUMENT						
38-656	JOCE	/ /		07/21/68	JUSTIS	S/1	/ /	/ /	TAF		
					SEE ORIGINAL DOCUMENT						
38-657	JOCE	/ /		07/21/68	JUSTIS	S/1	/ /	/ /	TAF		
					SEE ORIGINAL DOCUMENT						
38-658	JOCE	/ /		07/21/68	JUSTIS	S/1	/ /	/ /	TAF		
					SEE ORIGINAL DOCUMENT						
38-659	JOCE	/ /		07/21/68	JUSTIS	S/1	/ /	/ /	TAF		
					SEE ORIGINAL DOCUMENT						

== 4000 ==)

PAGE : 4

DATE : JUL 21, 1988

ALL S. T. R.'S S. T. R. #

TIME : 8:44:

PROJECT #	PROJECT	DATE PROMISED	ASSIGNEE	DATE OPENED	DESCRIPTION	AUTHOR	CATEGORY	PRIORITY	DATE FIXED	DATE CLOSED	STATUS
660	100E	/ /		07/21/88	SEE ORIGINAL DOCUMENT	JUSTIS	S/P		/ /	/ /	TAF
661	100E	/ /		07/21/88	SEE ORIGINAL DOCUMENT	JUSTIS	S/P		/ /	/ /	TAF
662	100E	/ /		07/21/88	SEE ORIGINAL DOCUMENT	JUSTIS	S/P		/ /	/ /	TAF
663	100E	/ /		07/21/88	SEE ORIGINAL DOCUMENT	JUSTIS	S/P		/ /	/ /	TAF
664	100E	/ /		07/21/88	SEE ORIGINAL DOCUMENT	JUSTIS	S/P		/ /	/ /	TAF
665	100E	/ /		07/21/88	SEE ORIGINAL DOCUMENT	JUSTIS	S/P		/ /	/ /	TAF
666	100E	/ /		07/21/88	SEE ORIGINAL DOCUMENT	JUSTIS	S/P		/ /	/ /	TAF
667	100E	/ /		07/21/88	SEE ORIGINAL DOCUMENT	JUSTIS	S/P		/ /	/ /	TAF
668	100E	/ /		07/21/88	SEE ORIGINAL DOCUMENT	JUSTIS	S/P		/ /	/ /	TAF
669	100E	/ /		07/21/88	SEE ORIGINAL DOCUMENT	JUSTIS	S/P		/ /	/ /	TAF
670	100E	/ /		07/21/88	SEE ORIGINAL DOCUMENT	JUSTIS	S/P		/ /	/ /	TAF
671	100E	/ /		07/21/88	SEE ORIGINAL DOCUMENT	JUSTIS	S/P		/ /	/ /	TAF
672	100E	/ /		07/21/88	SEE ORIGINAL DOCUMENT	JUSTIS	S/P		/ /	/ /	TAF
673	100E	/ /		07/21/88	SEE ORIGINAL DOCUMENT	JUSTIS	S/P		/ /	/ /	TAF
674	100E	/ /		07/21/88	SEE ORIGINAL DOCUMENT	JUSTIS	S/P		/ /	/ /	TAF
675	100E	/ /		07/21/88	SEE ORIGINAL DOCUMENT	JUSTIS	S/P		/ /	/ /	TAF
676	100E	/ /		07/21/88	SEE ORIGINAL DOCUMENT	JUSTIS	S/P		/ /	/ /	TAF



471 A19

**Whittaker**

Whittaker Electronic Systems  
1785 Voyager Avenue  
Post Office Box 8200  
Simi Valley, California 93063-8200  
Telephone: (805) 584-8200  
Telex 65-1329 FAX 805-494-1214

8902-1337-FB/125-001

9 February 1989

TECH DYN SYSTEMS  
6564 Loisdale Court, Suite 600  
Springfield, VA 22150

Attention: Max Rosen  
Manager of Contracts

Subject: Subcontract 125-001;  
Status of System Trouble Reports

Reference: (a) TechDyn Letter 125-S001-0811 dated 3 Feb.'89  
(b) WES Letter 8902-1337-FB/125-001 dated 3 Feb.'89  
(c) WES Letter 8902-1336-FB/125-001 dated 3 Feb.'89

Whittaker Electronic Systems (WES) is in receipt of reference (a). WES provided scheduling data concerning the subject in reference (b) and amplifying information in reference (c).

As stated in reference (c), WES does not consider it prudent to proceed on STR corrections without a Conus Test Bed for verification purposes. If Tech Dyn and the Government find this unacceptable, then Tech Dyn and the Government should either take action to reestablish the test bed or provide WES with a solution reasonable for proceeding successfully without the test bed.

If you have any questions regarding the above, please contact the undersigned at Area Code (805) 584-8200, extension 354.

Very truly yours,

WHITTAKER ELECTRONIC SYSTEMS

*F. L. Bohler*

F. L. Bohler, Director  
Contract Administration

FLB:bb

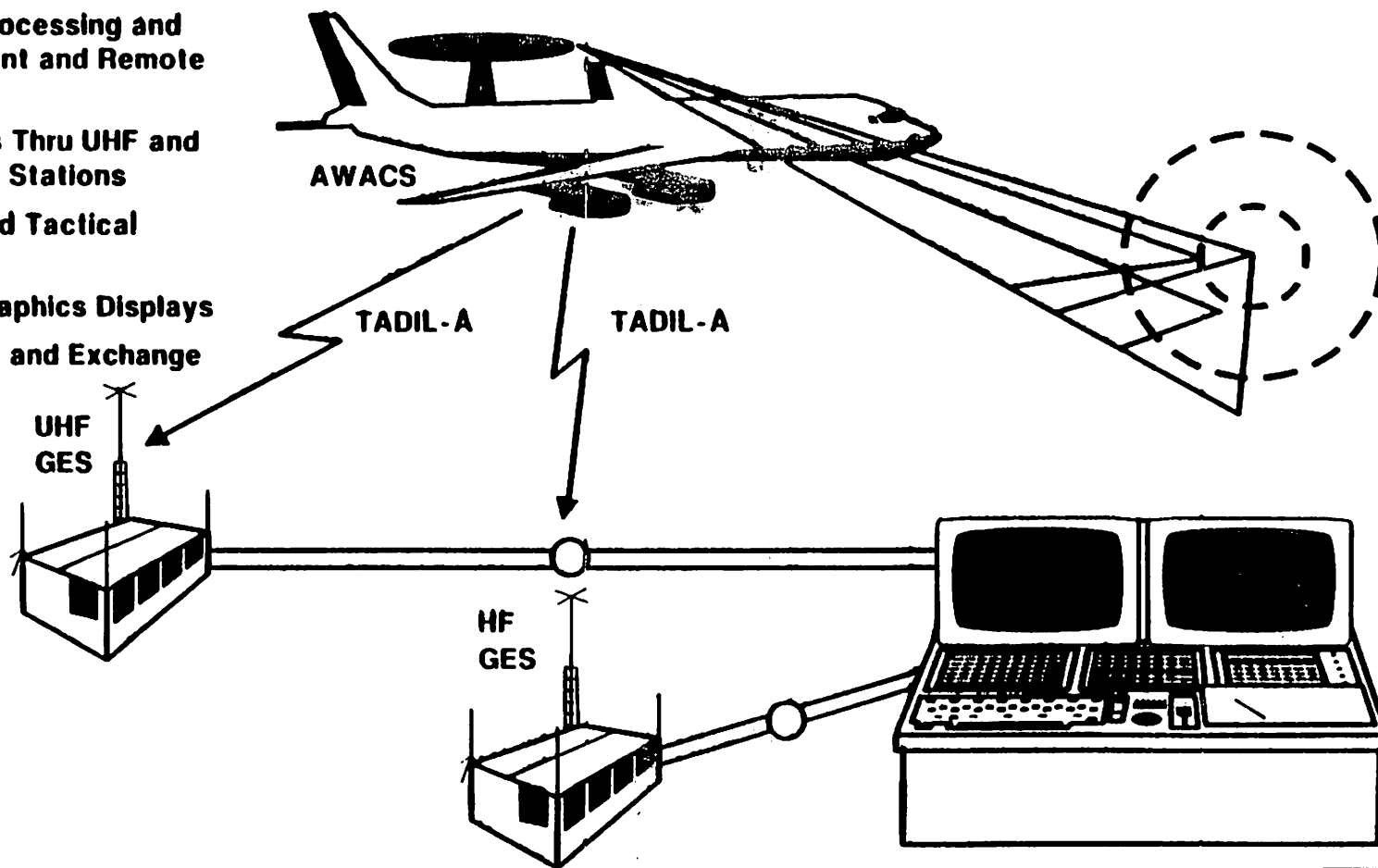


# TechDyn Systems ICCE UPGRADE

**CLIENT: U.S. AIRFORCE**

**Tasks:**

- Automate via Processing and Display Equipment and Remote Switching
- Communications Thru UHF and HF Ground Entry Stations
- Secure Voice and Tactical Data Links
- Large Screen Graphics Displays
- Data Forwarding and Exchange



2548

**PLAINTIFF'S  
EXHIBIT**

85A



DEPARTMENT OF THE AIR FORCE  
HEADQUARTERS ELECTRONIC SYSTEMS DIVISION (AFSC)  
HANSCOM AIR FORCE BASE, MASSACHUSETTS 01731-5000

20 MAR 1985

TO: PKS-3/J. MacDonald/(617)271-2041  
SUBJECT: RFP F19628-85-R-0076, ICCE Program

TO: Tech Dyn Systems  
205 South Whiting St., Suite 400  
Alexandria, VA 22304  
Attn: Mr. Hise

1. Attached is the Request for Proposal (RFP) encompassing the entire ICCE Program including a six page Statement of Work (SOW) for an initial 120 day front-end effort to expedite an Initial Operational Capability (IOC). We request that you review the RFP and submit a cost proposal for the front-end effort and a Not-To-Exceed (NTE) price for the complete IOC system, as detailed below.

2. Due to the need to have an Initial Operational Capability (IOC) for the ICCE system by 30 Sep 1985, we ask that you submit a proposal for the 120 day front-end effort by 25 Mar 85. The proposal should be on a Fixed Price Level of Effort (FFPLOE) basis for the labor required for site surveys, IOC design, sizing and timing analysis, support analysis and technical reviews. The level of effort proposal should also include the costs associated with submitting a technical proposal for the entire ICCE program by 30 April 1985. Your costs for the level of effort proposal should be broken out by labor category and number of mandays or manhours as shown in Section B, Provision No. 11, Level of Effort. All other costs (travel and material) associated with these tasks should be priced on a Cost Reimbursable basis. The costs for acquiring the Prime Mission Equipment (PME) should be priced on a Firm-Fixed Price basis; this portion of the proposal should include the applicable information from the Instruction for Preparation of Cost Proposal and should be submitted concurrently with the FFPLOE portion of the proposal. However, do not hold up submission of the FFPLOE proposal if your FFP proposal is not ready at that time.

3. Our intent is to negotiate at the least the level of effort proposal by 1 April 1985. We would discuss any required changes to contract terms and conditions (e.g. separate line items for this effort) at the negotiations. We will then issue a contract based on the RFP as revised at negotiations. Any items not negotiated and included in the basic contract will be added by subsequent supplemental agreement.

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PLAINTIFF'S  
EXHIBIT


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4. Include with the level of effort proposal a NTE price for the costs associated with delivery the IOC system (RFP model contract line items 0001AA and 0001AB) by 30 Sep 1985. This NTE price should not include any of the costs associated with the front end effort SOW and CDRL.

5. As part of the proposal you submit for the level of effort proposal include a completed set of the Representations and Certifications included in Section K of the model contract.

6. We appreciate your efforts in meeting this accelerated schedule. If you have any questions regarding the RFP, please feel free to contact either Lt. Anne Gattelman (617)271-8267 or myself at (617)271-2041.

  
JOHN J. MACDONALD  
Contracting Officer  
Directorate of Strategic  
Systems Contracts  
Deputy for Contracting



23 March 1985

Command, Control and  
Communications Corporation  
23670 Hawthorne Blvd.  
Torrance, CA 90505

Attn: Mr. James W. Sutherland  
Director, Business Development

Subj: Request for Proposal from 4C in Support of Requirements under Solicitation  
RFP F19628-85-R-0076

Dear Mr. Sutherland:

TechDyn Systems Corporation is currently in the process of submitting its cost proposal to the Department of the Air Force for the Interim Operational Capability (IOC) of the Iceland Command and Control Enhancement (ICCE) Program in response to Solicitation RFP F19628-85-R-0076. Because of the priority placed on this project, TechDyn requests a response to this Solicitation by 24 March 1985, so that we may meet the deadline of 25 March 1985, set by the Air Force for submission of a proposal for this interim effort. The items for which we are requesting a cost proposal are basically those which were discussed with you prior to your return to California last week.

The Enclosed Statement of Work (SOW) identified as the "Front End Effort" issued by the Air Force dated 14 March 1985 is for the front end effort of the ICCE Interim Operational Capability Program. This SOW contains six (6) Tasks which TechDyn requests support from Command, Control and Communications Corporation (4C) to complete. Specifically, 4C is asked to provide TechDyn with cost proposals for each of the Task as stated below:

Task 1 - Site Survey

4C is asked to submit a Firm Fixed Price (FFP) proposal to perform the below listed site-survey effort:

One (1) 4C Senior Engineer to participate in the Site-Survey effort. This individual should visit TechDyn for a meeting prior to the start of the actual in-country site-survey. This will consist of one (1) day of travel and two (2) days of work at the TechDyn facility in Alexandria, VA. The 4C employee would then go from TechDyn to Iceland. The time you should plan for this effort is two (2) days of travel and five (5) days of site-survey work. The 4C employee would then return to TechDyn to prepare a report on his portion of the site visit and assist in the completion of a Site-Survey Report. No more than seven (7) days should be allocated for this effort. Following completion of the site-survey effort, the 4C employee would then return to 4C. The 4C employee is permitted one (1) day of travel for this purpose.



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Mr. James W. Sutherland  
23 March 1985  
Page Two

#### Task 2 - IOC Design

TechDyn asks that 4C provide a Firm Fixed Price (FFP) proposal for the hardware under this task.

##### IOC PDFA Design:

- Hardware - CCA Interface
- Second Console Interface
- 2 Monitor Console Interfaces
- Lamp for Keyboard

A FFP/LOE proposal is required for the software design effort for the FOC System.

#### Task 3 - Sizing and Timing Analysis

Under this task, we ask that you submit a FFP proposal to measure the existing RADIL system to include:

- o Timing of each Processor
- o Sizing of each CPCI
- o Extrapolate to FOC System
- o Prepare in accordance with the CDRL

#### Task 4 - Support Analysis

The support which 4C is asked to provide in the development of the LSA Program should be priced as a FFP/LOE for 680 hours of Senior Technical Assistance at TechDyn's facility in Alexandria, VA.

#### Task 5 - Technical Reviews

The 4C effort for the 45-day, 90-day and 120-day technical reviews should be priced in a FFP manner. The first Technical review will be held at TechDyn's facility in Alexandria, VA and the balance will be held at your facility in Torrance, CA.

#### Task 6 - Prime Mission Equipment (PME)

The Prime Mission Equipment (PME) must be proposed on a FFP basis. 4C is to design and manufacture the hardware for one RADIL Data and display Subsystem.

Mr. James W. Sutherland  
23 March 1985  
Page Three

#### Task 7 - Proposal Effort

This task is being added by TechDyn in addition to the tasks called out in the Air Force SOW. 4C is asked to submit on a FFP/LOE basis, approximately 280 hours of technical support to assist TechDyn at its facility in Alexandria, VA in the preparation of a for the entire ICCE Program. In addition to the technical hours, 4C should include the following additional costs:

- o Travel
- o Per Diem
- o Hotel
- o Labor
- o Any ODC's

As you know, the instructions which we have in writing from the Contracting Officer states that the costs for acquiring the Prime Mission Equipment (PME) is to be priced on a Firm Fixed Price (FFP) basis and is to include the applicable information from the Instructions for Preparation of Cost Proposal. An advance copy, which is unchanged in the final package received from the Air Force, was provided to you during the Joint TechDyn-4C-Air Force meeting at your facility two weeks ago. Specifically, however, to be responsive, your cost proposal must include those requirements set forth in 3.0, Cost Proposal Overview, as set forth in pp 2-4.

Further, any other Fixed Price, Fixed-Price (LOE), and/or any reimbursable cost submittal made to TechDyn by 4C in support of this Solicitation, must be furnished in sufficient detail that TechDyn, the prime Contractor, can evaluate your proposal as to reasonableness of the cost and profit/fee contained therein. Any cost data which you feel is proprietary to the extent that you do not wish that it be made available except to the Government may be submitted direct to the Government's Contracting Officer, but please understand irrespective of any such decision, responsibility to reach a fair and reasonable price for the equipment and/or services you have been asked to provide, rests with the prime Contractor. To accomplish this, we must be furnished the basic cost data necessary for us to review your submittals, negotiate a profit and/or fee and subsequently enter into firm and binding subcontract/ purchase order agreements.

Incorporated into this RFP are the FAR Clauses in the attachments to the Standard Form 33 of the Air Force Solicitation. These clauses, as appropriate and as required, are to be considered included in this Request for Proposal and will be included in the resultant contract agreements with 4C.

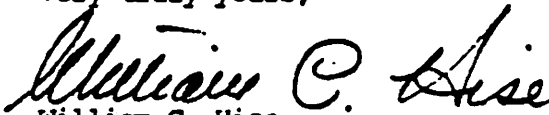
This Request for Proposal should not be construed in any manner as to be an obligation by TechDyn to enter into a Subcontract with 4C and further this Solicitation cannot result in a claim against the United States Government for any cost incurred by 4C if 4C is not subsequently awarded a contract.

Mr. James W. Sutherland  
23 March 1985  
Page Four

Your cost proposals should state that they are valid for no less than thirty (30) days and must be signed by an official of 4C who has the authority to bind 4C in such matters.

We look forward to an enjoyable and profitable association with 4C on the ICCE Program. If you have any questions concerning this request, please contact the undersigned at (703) 751-3373.

Very truly yours,



William C. Hise  
Vice President and Director  
Management Support Operations

WCH/meb

- 2 Enclosures: (1) SOW "Front-End Effort"  
dtd 14 Mar 85, pp 1-6
- (2) Attachment to "Front-End Effort"  
IOC Management Data, CDRL  
dtd 11 March 1985, pp 1-13
- (3) Instructions for Preparation of  
Cost Proposals for the ICCE System, 84Sep27

STATEMENT OF WORK  
*FRONT-END EFFORT*  
FOR ICELAND COMMAND AND CONTROL ENHANCEMENT (ICCE)

INTERIM OPERATIONAL CAPABILITY

14 MARCH 1985

## 1.0 SCOPE

1.1 This Statement of Work (SOW) describes the required tasks to be performed by the contractor in support of an expedited fielding of an ICCE system.

1.2 The data to be delivered as a result of performing the tasks prescribed by this SOW are specified in the Contract Data Requirements List (CDRL). In no case shall any task prescribed herein be interpreted to require delivery of data, except in accordance with the CDRL.

1.3 The provisions of the applicable documents and their tailored applications, set forth in the paragraphs of 3.0 are hereby incorporated into the contract by reference and with the same force and effect as though set forth herein in full.

1.4 Background. The present Iceland Air Defense System is a manual system which provides limited capability for secure voice and no capability for secure data radio communications between the E-3 Airborne Warning and Control System (AWACS) aircraft and the Iceland Air Defense Ground Environment (IADGE) System. The existing system uses antiquated HF communication equipment to communicate with the E-3.

1.4.1 The Iceland Command and Control Enhancement (ICCE) Program is an interim program to the North Atlantic Defense System (NADS) which will automate the existing system through the installation of UHF- and HF-equipped Ground Entry Stations (GESs) capable of secure voice and TADIL A communications. The GESs will interface with the Processing and Display Functional Area (PDFA) located at the Master Direction Center (MDC) to provide secure voice and tactical data communication linkage with the E-3. This will provide the MDC with a more complete, accurate, and timely exchange and display of command and control data with the E-3 and the Interim Air Defense Control Facility (IADCF) as well as providing a transmit-only capability to the Command Center Automation (CCA) System.

## 2.0 APPLICABLE DOCUMENTS

Following is a listing for convenience only. Section 3 of this SOW contains tailored requirements. In cases where only the latest Notice and Change is shown in Military Standards, Notices and Changes up to the latest Notice are also applicable.

### 2.1 Standards

MIL-STD-1388-1A  
11 April 83

Logistics Support Analysis

### 2.2 Specifications

ESD SS/EC1-1020  
7 Feb 85

ICCE System Specification

## 2.3 Other

SOW-ECI-1229  
7 Feb 85

Statement of Work for Iceland  
Command and Control  
Enhancement (ICCE)

## 3.0 REQUIREMENTS

The contractor shall comply with the following:

### 3.1 Contractor Tasks

3.1.1 The contractor shall accomplish the following tasks associated with the design and development of an Initial Operational Capability (IOC) by 30 Sep 85 and planning for Final Operational Capability (FOC) of the ICCE system. This system is defined in SOW-ECI-1229 dated 7 February 1985 and ESD SS/ECI-1020 dated 7 February 1985. Specific tasks to be accomplished are:

Task 1 Site Surveys. The contractor and designated Government representatives shall conduct site surveys to identify equipment locations within the ICCE facilities, location and requirement for cable trays and racks and other allied support (e.g., power and cooling). Data on all facility and external equipment interfaces shall be gathered during the site surveys and used by the contractor to generate Site Survey Plans. The installation and integration plan for the ICCE System will be further developed-finalized during the site surveys. Potential Electromagnetic Interference (EMI) and TEMPEST problems shall be investigated during the site surveys and results will be provided. The first site survey shall be conducted within 14 days of the effective date of contract (DI-S-30601).

Task 2 IOC Design. The contractor shall perform all the planning and design required for the IOC system. The IOC is defined as consisting of one RADIL Data Processing and Display Subsystem with performance capabilities as specified in SS/ECI-1020 dated 7 Feb 85, and one UHF Ground Entry Station at Vidarfall. The contractor shall present interim and final results of this effort in a detailed technical report and Engineering Installation Package. Preliminary Operational Positional handbooks in support of the IOC shall be provided 120 days after contract award (DI-M-3409, DI-S-4853/M, DI-E-1141).

Task 3 Sizing and Timing Analysis. A detailed sizing and timing analysis shall be performed for each CPCI, and where overlap between CPCIs occurs, for the processors concerned. The results of these analyses shall be used to determine the computer software and hardware sizing and timing requirements. This analysis should determine the sizing and timing requirements for the development specifications. The contractor shall provide a Timing and Sizing Report IAW the CDRL. In all analyses performed IAW this paragraph, the impact of computer program sizing and timing requirements on other critical design issues shall be examined in detail (DI-S-30568).



#### **Task 4 Support Analysis.**

MIL-STD-1388-1A  
11 April 83

Logistic Support Analysis  
(LSA)

Tasks: 102.2, 103.2, 201.2,  
201.3, 201.4, 202.2, 202.3,  
202.4, 203.2, 203.3, 203.4,  
205.2, 205.3, 205.4, 302.2.4

The contractor shall, IAW MIL-STD-1388-1A and this SOW, develop and accomplish a Logistic Support Analysis (LSA) program and continue such effort throughout the life of the contract. The LSA program shall include design analysis, feedback, and support resource analysis. The program shall ensure that the design features and method of integration enhance cost effective operation and support throughout the life cycle of the hardware. The LSA program will be documented in the LSA Plan which shall be a contractually binding document, when proposed by the contractor and approved by the Government IAW the CDRL (DI-L-7017A).

**Task 5 Technical reviews.** Technical review meetings for the IOC ICCE System shall be conducted 45, 90, and 120 days after contract award. The contractor shall present the design and status of all hardware and software efforts at these technical review meetings. At the 45-day technical review, the contractor shall present a review of the system's functional flow requirements, system schematic diagrams, preliminary equipment and console layout drawings, Electromagnetic Compatibility (EMC), and design approach. These reviews shall be conducted at the contractor's facility IAW MIL-STD-1521A. The contractor shall provide a co-chairman for each formal design review and shall ensure that decisions made and action items assigned as a result of each design review are implemented. The Government will appoint a co-chairman to serve at each formal review meeting, and will provide the contractor with a list of Government representatives who will attend. The contractor shall prepare the minutes for each design review IAW MIL-STD-449A and the CDRL. Additionally the contractor shall provide ready access by the Government or its representatives to all technical and management personnel for the purpose of conducting informal technical reviews of progress and problem areas. (DI-E-3118).

#### **Task 6 PME:**

The contractor shall design and manufacture the hardware required for the IOC system as defined below.

a. Three (3) UHF transceivers

b. One (1) RADIL Data and Display Subsystem

c. Associated modems, racks, cables, antennas, patching equipment, and ancillary installation equipment.

#### **3.1.2 Travel**

3.1.2.1 General. The contractor shall be responsible for all personnel travel and associated costs required in the performance of this effort. The contractor shall use the lowest cost mode of transportation consistent with mission requirements in accordance with good traffic management principles.

3.1.2.2 Overseas Travel. The contractor shall be responsible for all personnel travel to, from or between overseas areas, and shall also ensure that all personnel have valid documents prior to entering Iceland.

3.1.2.3 Contracting Officer Approval. All contractor personnel travel between CONUS port of exit point and overseas destinations and outside CONUS shall be subject to approval by the PCO and/or a designated representative. The contractor shall furnish the PCO with the following information 45 days in advance of the planned date of departure:

- a. Full name of traveler(s)
- b. GS Equivalent Rating and Social Security Account Number (SSAN)
- c. Home address
- d. Date and place of birth
- e. Citizenship and Passport number (and VISA if required)
- f. Security clearance (to include date and place of issuance)
- g. Date of departure and duration of trip
- h. Itinerary and purpose
- i. Detailed justification for variations in itinerary (if applicable)

3.1.2.4 Government Travel Orders and Theatre Clearance. All travelers to overseas areas under this contract require government travel orders and theatre clearance granted by the overseas commander. The contractor shall submit the data contained in the paragraph above for each traveler to the PCO 45 days in advance of the designated date of departure. Emergency clearance requirements will require 15 days advance notification. The contractor may apply to the PCO for a one year blanket clearance for those persons who will be performing repeated travel or direct on-site support. Upon notification by the PCO of theatre clearance approval, the contractor shall apply to the Administrative Contracting Officer (ACO) for the issuance of travel orders and Military Airlift Command reservations. Such application shall be made IAW the policies and procedures established by the ACO.

### 3.1.3 Security.

AFR 205-4  
2 Aug 76

Air Force participation in the DOD  
Industrial Security Program  
ALL

DODM 5220.22  
January 83

Industrial Security Manual  
for Safeguarding Classified  
Information  
ALL

DODR 5220.22  
January 83.

Industrial Security Regulations  
ALL

3.1.3.1 The contractor and subcontractors shall comply with the requirements of DODR 5220.22 and AFR 205-4, and the Iceland Command and Control Enhancement Program Security Classification Guide dated 1 August 1984. Classified information shall be handled and controlled IAW provisions of the DOD Industrial Security Manual DODM 5220.22 and supplemented by local procedures. The contractor and subcontractors shall ensure that appropriate personnel on this project have a U.S. and NATO SECRET security clearance prior to contract start date.

Attachment No.

*Front-End Effort*

Interim Operational Capability Management Data

to

Contract F19628-85-R-0076

Contract Data Requirements List (CDRL)

for

ICCE

Iceland Command and Control Enhancement

11 March 1985

Configuration Management Division (SCUC)  
Air Defense Systems Directorate (SCU)  
Electronics Systems Divisio (ESD)  
Hanscom AFB, MA 01731

## Contents

1. Introduction and General Instructions	iii
2. Instructions for completing DD FORM 1423	iv
3. Glossary	v
4. Distribution/Address Listing	vi
5. Data Item Description (DID) Index	vii

## INTRODUCTION AND GENERAL INSTRUCTIONS

1. The contents of this Attachment/Exhibit Contract Data Requirements List (CDRL) contains a complete list of data deliverables for its related Contract Line Item Numbers (CLIN).

2. The following documents and regulations were used in the preparation of the CDRL, DD Form 1423 and AFSC Form 700 series, and are identified below for guidance and information purposes:

a. DOD 5000,19-L, Vol II, DOD Acquisition Management Systems and Data Requirements Control (AMSDL) List, date 31 Jan 81.

b. AFR 310-1, Management of Contractor Data, dated 30 Jun 69 and Change 1, 14 Jun 71.

c. AFSCR 310-1, Management of Contractor Data, dated 11 Mar 74, and ESD Supplement 1, 10 Oct 74.

d. AFR 80-45, Distribution Statement on Technical Documents, dated 26 Mar 71; AFSC Supplement 1, 22 May 80; and ESD Supplement 1, 3 May 79.

3. An Attachment specifies data requirements on a DD Form 1423 CDRL while Exhibits contain AFSC Form 700 Series, as applicable. Attachments (DD Form 1423) contain data requirements to be delivered under cover of a letter of transmittal, whereas Exhibits (AFSC Form 700 Series) contain data requirements to be delivered under cover of a DD Form 250, Material Inspection and Receiving Report. When CDRLs are prepared on AFSC Form 700 series and incremental periodic and/or draft submittals are required, each transmittal shall be submitted under a cover letter and only the final submission of such data shall be under DD Form 250s.

4. Unless otherwise specified, references to award of contract for data deliverables shall be interpreted as the mailing date of the contract. In those instances where days are not identified as working days, they shall be considered calendar days.

5. Data delivery dates are interpreted to be the date of arrival at the addresses. Distribution shall be made to allow timely arrival of data.

6. All DID references to Categories I, II, and III Tests shall be construed to mean CI/Subsystem, System Test and Operational Test and Evaluation, respectively.

7. CDRL Revisions/Amendments will be issued on a page by page basis and so indicated in the upper left hand corner of DD Form 1423, and AFSC Form 700 series.

8. AFR 80-45 specifies certain distribution statements to be used on data subject to distribution. When the applicability of AFR 80-45 is not indicated, the contractor will solicit from or recommended to the PCO appropriate statements from AFR 80-45 based on the nature and content of the document before effecting primary distribution.

## INTRODUCTION AND GENERAL INSTRUCTIONS (cont,d)

8. One information copy of all transmittal letters/DD Form 250 (no documentation) shall be forwarded to ESD/SCUC ATTN: Data Management Officer. Each transmittal letter/DD Form 250 shall include a list showing address distribution made, and number of copies distributed.

9. Transmittal documents must clearly identify the document(s) delivered and must be sequentially numbered within CDRL Sequence number (s): i.e., third delivery of CDRL sequence number 104 shall be identified as 104-3 for attachments. Third delivery of CDRL Sequence number A001 shall be identified as A001-3 for Exhibits. Identify the type of submission, i.e., draft, final, resubmission of draft, change page(s), etc.

10. All correspondence relating to Data Items shall reference the Contract Number, CDRL Sequence Number and the DID Number.

11. Unless otherwise specified in Block 16 of DD Form 1423/Block 28 of AFSC Forms 700 series, an 'A' in Block 8 of DD Form 1423/Block 26 of AFSC Form 700 series means the data shall be submitted to the Government for review and approval. The Government will provide the contractor, in writing, mandatory changes, suggested changes, and other comments within 45 days of receipt of the draft unless otherwise specified on the CDRL. The Contractor shall submit the final updated version of the document incorporating all mandatory changes directed by the Government not later than the time or date specified in Block 12 and/or 13 of the DD Form 1423/Block 18 of AFSC Form 700 series. A 'D' indicates that the cover page of the data item must prominently state the extent of distribution control. See note 1 and 2. 'N' indicates that the unclassified data item does not require a distribution control statement.

Note 1: Distribution Statement on Technical Document per DOD Directive 5200.20 shall apply to the extent specified in Block 28 and in accordance with the following definitions.

Statement A: Approved for public release; distribution unlimited.

Statement B: Distribution Limited to US Government agencies only (give reason; see below) other requests for this document must be referred to the controlling office (unless otherwise stated in Block 28 the controlling office shall be the same as the technical office cited in Block 17).

Reason 1 - Foreign Information

Reason 2 - Proprietary Information

Reason 3 - Test and Evaluation

Reason 4 - Contractor Performance Evaluation

Note 2: The contractor may challenge the requirements for, or the non-requirement for a data item distribution statement. However the contractor must advise the PCO of his objection giving detailed justification for a change in sufficient time to resolve the problem, prior to the data item due date.

12. Modified Data Items - A slash "T" (/T) after the DID number means the DID has modified (by addition or deletion ) the contents of Block 10 of the DD Form 1664. When space permits the modification is written in Block 16 of the DD Form 1423/Block 28 of AFSC Form 700 series, otherwise it is placed on a CDRL backup sheet and identified as such.

13. Unique Data Items (U) - ESD Unique data items are not found in the AMSDL; therefore, ESD unique data items listed in the CDRL will be attached for reference.

14. Block 10 (Preparation Instructions) of DD Form 1664 (DID) (including Unique (U) Data Item), together with any modification cited in the CDRL or on a CDRL backup sheet contains instructions for preparation of data delivered under this contract.

15. When revisions or changes are requested to the data submitted and such revisions/changes comprise 25% or less of the document, it is a requirement to submit change pages.

16. The data item on the CDRL is cross referenced thereon to the associated work statement tasks under which the basic information is generated, unless otherwise specified.

17. Questions regarding preparation and contents of DD Form 1423s/AFSC Forms 700 Series and their related backup sheets may be directed to the ICCE Data Manager, phone (617) 271-3310 or AUTOVON 478-5980 MITRE Ext. 186-3310.



# INSTRUCTIONS FOR COMPLETING DD FORM 1423

## FOR GOVERNMENT PERSONNEL

to form (or its equivalent adapted for ADPE) shall be used whenever data required to be delivered under a contract. The form (except items 23 through 26) shall be completed in accordance with Departmental procedures, and furnish to the contracting officer by the personnel responsible for determining the requirements of the contract.

### FOR THE CONTRACTOR

The estimated prices filled in in item 26 will not be separately used in evaluation of offers.

Each offeror may complete items 23 and 24 in accordance with the following instructions:

Item 23. Contractor File/Document Number - Enter bidder's or offeror's internal filing or document number, if applicable.

Item 24. Estimated Number of Pages - Enter the estimated number of pages, wings, etc., for single preparation.

Each offeror shall complete items 25 and 26 in accordance with the following instructions (this does not apply to advertised contracts or to negotiated contracts for \$100,000).

Item 25. Price Group - Contractors shall specify one of the four following groups of effort in developing estimated prices for each item of data listed on DD Form 1423.

a. Group I. Definition - Data which is not otherwise essential to the contractor's performance of the primary contracted effort (production, development, testing, and administration) but which is required by DD Form 1423.

Estimated Price - Costs to be considered under Group I are those applicable to preparing and assembling the data item in conformance with Government requirements, and the administrative and other expenses related to reproducing and delivering such data items to the Government.

Example for Group I - A technical manual prepared for military use only. Estimated price of the manual would be noted on the DD Form 1423 exclusive cost for any of the manual material that had been generated for other purposes, drawings used both for production and as illustrations in the manual.

b. Group II. Definition - Data which is essential to the performance of the primary contracted effort but the contractor is required to perform additional work in conformance with Government requirements with regard to depth of content, format, frequency of submission, preparation, control or quality of the data item.

Estimated Price - Costs to be considered under Group II are those incurred and above the cost of the essential data item without conforming to Government requirements, and the administrative and other expenses related to reproducing and delivering such data item to the Government.

Example for Group II - In the case of DD-D-1000 (drawings to military standards), the estimated price of the data item begins only after the engineering and manufacturing information has been developed and the final form original drawings have been initiated. The estimated price shall not include the cost of configuration control, but shall include any additional quality assurance and control of the drawings but not related to engineering configuration control. Not to be considered as "design effort" expended on layout drawings and other data which serve principally as a medium for developing design and are not used in manufacture, production or test of the end item.

c. Group III. Definition - Data which the contractor must develop for his internal use in performance of the primary contracted effort and does not require any substantial change to conform to Government requirements with regard to depth of content, format, frequency or submission, preparation, control and quality of data.

Estimated Price - Costs to be considered under Group III are the administrative and other expenses related to reproducing and delivering such data item to the Government.

Example for Group III - A drawing prepared to Level 2 or 1 of DD-D-1000 (drawings to company standards) which had been used in the manufacturer's normal plant activities.

d. Group IV. Definition - Data which is developed by the contractor as part of his normal operating procedures and his effort in supplying these data to the Government is minimal.

Estimated Price - Group IV items should normally be shown on the DD Form 1423 at no cost.

Example for Group IV - A brochure or chart manual used in a company's normal commercial business, that is acquired by the Government in such small quantities that cost of determining a charge would not be practical.

Item 26. Estimated Total Price.

a. For each item of data listed, the bidder or offeror shall enter an amount equal to that portion of the total price which is estimated to be attributable to the production or development for the Government of that item of data. These estimated data prices shall be developed only from those costs which will be incurred as a direct result of the requirement to supply the data, over and above those costs which would otherwise be incurred in performance of the contract if no data were required.

b. The estimated data prices shall not include any amount for rights in data. The Government's right to use the data shall be governed by the pertinent provisions of the contract.

U.S. GOVERNMENT PRINTING OFFICE: 1975-400-000/100

## CDRL GLOSSARY

D	Days
DACA	Days after contract award
SPO	System Program Office
MTHLY	Monthly
AS REQ	As Required
DA	Days After
QTRLY	Quarterly
DAOE	Days after option exercise
EOM	End of Month
OTIME	One time
ONE/R	One time and revisions
R/ASR	Revisions as required

**Distribution/Address Listing**

**ESD/SCU-6**

**Hanscom APB, MA 01731**

# Data Item Description (DID) Index

Seg #	Title	DID #	Page
101	Logistic Support Analysis (LSA)	DI-6-7017A	1
102	Technical Report	DI-S-4853/M	1
103	Timing and Sizing Data	DI-S-30568	2
104	Site Survey Report	DI-S-30601	2
105	Engineering Installation Package	DI-E-1141	3
106	Minutes for Formal Reviews, Inspections and Audits	DI-E-3118	3
107	Positional Handbook-Information System Operation Personnel	DI-M-3409	4

# CONTRACT DATA REQUIREMENTS LIST

ATCH NR 1 TO EXHIBIT \_\_\_\_\_  
TO CONTRACT/PR F19628-85-R-0076

CATEGORY I/S

SYSTEM/ITEM ICCE

CONTRACTOR \_\_\_\_\_

1. SEQUENCE NUMBER	2. TITLE OR DESCRIPTION OF DATA 3. SUBTITLE	4. AUTHORITY (Data Item Number)	5. CONTRACT REFERENCE	6. TECHNICAL OFFICE 7. DDT/NO REQ 8. APP CODE (A) 9. DEPT/TO/AC (H)	10. FREQUENCY 11. AS OF DATE 12. OTIME	12. DATE OF 1ST SUBMISSION 13. DATE OF SUBSEQUENT SUBM / EVENT ID	14. DISTRIBUTION AND ADDRESSES (Addresses - Regular Copies/Thru Copies)
101	LOGISTICS SUPPORT ANALYSIS (LSA)	DI-L-7017A	SOW TASK 4	SCU-6 LT AN		30 DAÇA N/A	14. ESD/SCU-6 10/0
10. REMARKS							15. TOTAL 10/0
102	TECHNICAL REPORT	DI-S-4853/H	SOW TASK 2	SCU-6 LT AN		See 16	14. ESD/SCU-6 10/0
10. REMARKS							15. TOTAL 10/0
Blk 4: DD Form 1473 not required. Report to include BMI and TEMPEST investigation.  Blks 10, 11, 12, & 13: Interim Report 45 DACA Final Report 90 DACA Preliminary submitted 5 days prior to technical reviews.							15. TOTAL 10/0
PREPARED BY Janet A. Fee, SCUC				DATE 11 Mar 85		APPROVED BY Clinton E. Marshall, LT, USAF	
				DATE 11 Mar 85		DATE 11 Mar 85	

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ATCH NR 1 TO EXHIBIT \_\_\_\_\_  
 TO CONTRACT/PR F19628-85-R-0076

# CONTRACT DATA REQUIREMENTS LIST

CATEGORY S

SYSTEM/ITEM ICCE

CONTRACTOR \_\_\_\_\_

1. REFERENCE NUMBER	2. TITLE OR DESCRIPTION OF DATA 3. SUBTITLE	4. AUTHORITY (Data Item Number)	5. CONTRACT REFERENCE	6. TECHNICAL OFFICE	7. NO 750 REQ	8. APP CODE (A)	9. INPUT TO IAC (A)	10. FREQUENCY	11. AS OF DATE	12. DATE OF 1ST SUBMISSION	13. DATE OF SUBSEQUENT SUBM / EVENT ID	14. DISTRIBUTION AND ADDRESSES (Addresses - Regular Copies/Regular Copies)
1. 103	2. TIMING AND SIZING DATA 3.	4. DI-S-30568	5. SOW TASK 3	6. SCU-6	7. I.T	8. AN	9.	10. OTIME	11. N/A	12. 60 DACA.	13. N/A	14. ESD/SCU-6 10/0
10. REMARKS  Blk 12 : Preliminary report one week prior to technical reviews.												
1. 104	2. SITE SURVEY REPORT 3.	4. DI-S-30601	5. SOW TASK 1	6. SCU-6	7. I.T	8. AN	9.	10. See 16	11. N/A	12. See 16	13. See 16	14. ESD/SCU-6 10/0
10. REMARKS Blks 10, 12, & 13: Interim 45 DACA Final 90 DACA Preliminary report one week prior to technical reviews.												
												15. TOTAL 10/0
												15. TOTAL 10/0

PREPARED BY Janet R Fee, SCMC

DATE 11 Mar 85

APPROVED BY Clinton Marshall, 1LT, USAF

DATE 11 Mar 85

CONTRACT DATA REQUIREMENTS LIST									
ATCH NO <u>1</u> TO EXHIBIT _____			CATEGORY <u>E</u>			SYSTEM/ITEM <u>ICCE</u>			
TO CONTRACT/PR <u>F19628-85-R-0076</u>						CONTRACTOR _____			
1. SEQUENCE NUMBER	2. TITLE OR DESCRIPTION OF DATA 3. SUBTITLE	4. TECHNICAL OFFICE	5. FREQUENCY	6. DATE OF 1ST SUBMISSION	7. DISTRIBUTION AND ADDRESSES (Addressee - Regular Copies/Prep Copies)				
1.	2.	3.	4.	5.	6.	7.			
AUTHORITY (Data Item Number)	CONTRACT REFERENCE	7. 1. T 2. A 3. N	8. 1. T 2. A 3. N	9. 1. T 2. A 3. N	10. 1. T 2. A 3. N	11. 1. T 2. A 3. N			
105	Engineering Installation Package	SCU-6	See 16	See 16	ESD/SCU-6	10/0			
DI-E-1141	SOW TASK 2	1. T 2. A 3. N	1. T 2. A 3. N	1. T 2. A 3. N	1. T 2. A 3. N	1. T 2. A 3. N			
12. REMARKS					13. TOTAL 10/0				
Blk 4: Level II drawings.									
Blk 10, 12, & 13: Preliminary copy one week prior to technical review.									
106	Minutes for Formal Reviews, Inspection and Audits	SCU-6	MTILY	15 DA	ESD/SCU-6	10/0			
DI-E-3118	SOW TASK 5	1. T 2. A 3. N	1. T 2. A 3. N	1. T 2. A 3. N	1. T 2. A 3. N	1. T 2. A 3. N			
12. REMARKS					13. TOTAL 10/0				
Blk 4: To include Technical Reviews.									
Blk 8: AFR 80-45, Statement B applies, ESD/SCU DOD Controlling Office (Test & Evaluation).									

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PREPARED BY

DATE

11 MAY 85

APPROVED BY

DATE

ATCH NR 1 TO EXHIBIT \_\_\_\_\_  
 TO CONTRACT/PR F19628-85-R-0076

# CONTRACT DATA REQUIREMENTS LIST

CATEGORY H

SYSTEM/ITEM ICCE

CONTRACTOR \_\_\_\_\_

1. SEQUENCE NUMBER	2. TITLE OR DESCRIPTION OF DATA 3. SUBTITLE	4. TECHNICAL OFFICE	5. FREQUENCY	6. DATE OF 1ST SUBMISSION	7. DISTRIBUTION AND ADDRESS (Address - Regular Copies/Regular Copies)
8. AUTHORITY (Data Item Number)	9. CONTRACT REFERENCE	10. AS OF DATE	11. DATE OF SUBSEQUENT SUBM. (If any)	12. ESD/SCU-6	13. 10/0
107	Positional Handbook-Information System a. Operation Personnel	SCU-6	ONE/R	120 DACA	
DI-M-3409	SOW TASK 2	I.T.	AN	AS REQ	
14. REMARKS					15. TOTAL 10/0
14. REMARKS					15. TOTAL

PREPARED BY \_\_\_\_\_ DATE 11 Mar 85 APPROVED BY \_\_\_\_\_ DATE \_\_\_\_\_



INSTRUCTIONS FOR PREPARATION OF COST  
PROPOSALS FOR THE ICCE SYSTEM  
84SEP27

F19628-85-R-0076

Attachment # 29

## INSTRUCTIONS FOR PREPARATION OF COST AND PRICING DATA

### 1.0 INTRODUCTION:

These instructions are to assist you in submitting cost or pricing data which is required by Public Law 87-653, the "Truth in Negotiations Act." The Government needs this data to evaluate the reasonableness of your proposed price. Compliance with these instructions is mandatory and failure to comply may result in rejection of your proposal. The burden of proof for cost credibility rests with you. A certificate of current cost or pricing data, as required by FAR 15.804-2, will be submitted after agreement is reached on price. Data beyond that required by this instruction shall not be submitted, unless you consider it essential to document or support your cost/price position. All information relating to cost or pricing data must be included in the section of the proposal designated as the cost volume. Under no circumstances shall cost or pricing data, except Life Cycle Cost Model information be included elsewhere in the proposal.

### 2.0 GENERAL INSTRUCTIONS:

2.1 The basic cost proposal instructions are presented below. The cost data prepared in response to these basic instructions shall be assembled as part 1 of the cost volume.

The cost data prepared in response to each set of attached instructions shall be assembled as separate parts of the cost volume.

2.2 The ground rules and assumptions (e.g., contract type, profit percentage, incentive arrangements, contract items, delivery schedule, GFE, Government provided base support, etc.) of the prospective contract are provided in the appropriate sections of the RFP package. On the first page of the cost volume, state whether or not the cost proposal has been prepared completely consistent with the ground rules and assumptions outlined in the RFP. List each exception to the ground rules and assumptions provided in the RFP and each qualification of the cost proposal, if any, and provide complete rationale.

2.3 For purposes of this cost proposal, the work breakdown structure (WBS) has been set forth in the statement of work and must be followed using MIL-STD-881A as a guide.

2.4 The cost volume shall be prefaced by a table of contents and shall specify, by page number, where each cost format and each piece of narrative data is located.

2.5 All dollar amounts provided in response to these instructions may be rounded to the nearest \$1,000.

2.6 The cost data requirements outlined in these instructions apply to each subcontractor in excess of \$1,000,000 to the same extent that they apply to the prime offeror. See requirement for "Certificate of Current Cost or Pricing Data" under Section L of this RFP. If work is to be performed by two or more divisions or subsidiaries within the prime corporation, each division or subsidiary shall submit a separate set of cost data for its portion of the effort.

### 3.0 COST PROPOSAL OVERVIEW:

The cost proposal overview shall provide comprehensive narrative support for the cost proposal. Failure to satisfy this requirement will be considered a serious deficiency. This requirement also applies to each subcontractor over \$100,000 and each interdivisional transfer.

### 3.1 ESTIMATING METHODOLOGY:

3.1.1 Provide a summary description of your standard estimating system or methods. The summary description shall cover separately each major cost element (i.e., Direct Material, Engineering Labor, Manufacturing Labor, Indirect Costs and Other Direct Costs). Also, identify any deviations from your standard estimating procedures in preparing this proposal.

3.1.1.1. If the proposal includes any deviation from your normal forward pricing rates, either labor or burden, state whether or not a formal change has been submitted to the cognizant Government Administrative Contracting Officer.

3.1.2 Provide a summary description of your purchasing system or methods (e.g., how material requirements are determined, how sources are selected, when firm quotes are obtained, what provision is made to ensure quantity and other discounts, etc). Also, identify any deviations from your standard procedures in preparing this proposal.

3.1.3 For each subcontract, except those awarded solely on the basis of price competition, provide an analysis of the methodology used by the subcontractor to estimate cost. Also, explain, in summary, how the subcontract effort relates to the overall effort and why the subcontract cost can be considered reasonable.

3.1.4 If other costs include equipment with a useful life beyond this contract, identify each item and explain why the item has been proposed direct, rather than being capitalized.

3.1.5 If proposed costs have been increased to cover contingencies or decreased due to a management reduction, provide a cost element summary and complete rationale. Also, provide the cost impact on each WBS item down to level 3, as applicable.

3.1.6 Provide rationale to support cost reasonableness and reliability, and explain the methodology used to estimate the cost for each WBS level 3 item. As a minimum, provide the following information for each WBS level 3 item. If a portion of the required information is not applicable for a particular WBS level 3 item, so state.

3.1.6.1 Where cost estimates are based upon past experience, identify the past experience, explain how the past experience relates to the current effort and how cost data available from the past experience was adapted to the current effort.

3.1.6.2 Where cost estimates are based upon learning/improvement curve applications, identify the specific area subject to learning, the curve hypothesis (unit or cumulative) and the slope of the curve as a percent. Also, identify the data used to develop the slope and explain how this data relates to the current effort and how entry onto the learning curve was attained (i.e., how the first unit cost was derived).

3.1.6.3 If engineering labor hours have been estimated based upon other than past experience, explained under section 3.1.6.1 above, provide detailed rationale on how they have been estimated.

3.1.6.4 Explain how the proposed engineering labor hour skill mix has been derived and how the skill mix on this proposal compares with the overall plant skill mix. Explain why the WBS item requires an average, higher or lower than average skill mix, as applicable. If your normal estimating system uses a plant-wide average for proposal purposes, so state.

3.1.6.5 If manufacturing labor hours have been estimated based upon other than past experience and/or learning curve application, explained under sections 3.1.6.1 and 3.1.6.2 above, provide detailed rationale on how they have been estimated. If standards were used, identify and explain how they were derived and state whether or not they have been used on other programs. If other than normal procedures were used to estimate manufacturing hours, explain.

3.1.7 If standard commercial items are included, identify each item by quantity, unit price and total price. A SF Form 1412 is required for each item for which you do not intend to submit and certify cost or pricing data (see FAR 15.804-3).

3.1.8 For interdivisional transfers at other than cost, identify each item by source, quantity, unit price and total price.

3.1.8.1 If such an item is classified as a standard commercial item, a SF Form 1412 is required, if you, or the appropriate division, do not intend to submit and certify cost or pricing data.

3.1.8.2 If such an item is not classified as a standard commercial item, provide a complete explanation why it has been proposed at other than cost.

3.2 COST RISK: Discuss each WBS level 3 item from the standpoint of cost risk. Identify program areas where there are inherent technical, schedule or other risks which may impact cost. Explain how such risks, including subcontract risks, have been treated in preparing the cost proposal. If there are no areas of significant cost risk, explain why cost risk is considered to be minimal with emphasis on development effort.

#### 4.0 EXPLANATION OF REQUIRED COST FORMS:

FAR 53.215-2 specifies the use of SF Form 1411...whenever cost or pricing data (see FAR 15.804-3), is required. Supporting schedules have been devised by the contracting office to require such supporting data to the foregoing forms as is considered necessary and reasonable through knowledge of industry, company or commodity practices.

##### 4.1 SF Form 1411

The offeror shall submit seven (7) separate Forms SF 1411 for the following line items. One encompassing the total proposed price of CLINs 0001-0005 and 0045-0046. One encompassing the total proposed price of CLINs 0008 and 0009. One encompassing the total proposed price of CLINs 0010-0026. One encompassing the total proposed price of CLINs 0027-0034. One encompassing the total proposed price of CLINs 0035-0042. One encompassing the total proposed price for CLIN 0043-0044.

4.1.1 If work is to be performed by two or more divisions or subsidiaries within the prime corporation, a separate SF Form 1411 shall be submitted by each division or subsidiary for its portion of the effort.

4.1.2 A separate SF Form 1411 shall be submitted by each subcontractor in excess of \$1,000,000 or both more than \$500,000 and more than 10% of the prime contractor's proposed price.

4.1.2.1 If the subcontract is to be performed by two or more subcontract divisions, a separate SF Form 1411 shall be submitted by each division for its portion of the effort.

4.1.2.2 If any cost data is considered "proprietary" by a subcontractor, the data shall be submitted under separate cover directly to the cognizant ESD Contracting Officer.

**4.2 COST FORMATS:** Examples of the various cost formats required to be submitted as part of the cost proposal are provided in Attachment 1 of this instruction. Each of the cost formats is explained below. The prime contractor shall submit a complete set of cost formats for each form SF 1411. In addition, a separate, complete subset of cost formats shall be submitted for each interdivisional transfer and by each subcontractor in excess of \$1,000,000 for its portion of the effort.

**4.2.1** Cost format A shall be used to summarize the total proposed price by cost elements, by offeror fiscal years.

**4.2.2** Cost format B requires a list of purchased parts, subcontracts, raw material and interdivisional transfers at cost. The information shall be provided for each item with a total cost in excess of \$25,000. Under "basis for selection," indicate whether the item is competitive/low bid, competitive/non-low bid or sole source. Attach to cost format B, an explanation for each item which was not competitive/low bid. Under "basis of cost," indicate firm quote, budgetary quote, or estimate/no quote. Attach to cost format B an explanation for each item which was an estimate/no quote. Under "S allocation by WBS level 3 item," show dollar amount allocated to each WBS level 3 item (e.g., 1.1.1: \$5,000; 1.2.4: \$20,000; etc., until the total cost has been allocated). The remaining information to be provided is self-explanatory. All items with a total cost under \$25,000 may be combined and only the combined total cost need be shown under each element. The total amount for each of the four cost elements should equal the corresponding total cost amounts on cost format A. A complete bill of material must be available for review at the plant.

**4.2.2.1** Each subcontract listed on cost format B must be supported by the contractor's written review of the subcontract proposal. The review (i.e., cost analysis/price negotiation memo) should address each subcontract cost element from both an audit and technical viewpoint. Cost exceptions shall be quantified.

**4.2.3** Cost format C shall be used to prepare engineering and manufacturing labor rate and base summaries at the total cost level (WBS level 1). The total engineering and manufacturing hours and costs shown on cost format C should equal the corresponding totals on cost format A. Two summaries are required, as explained below. The number and type of labor categories are dependent upon your labor classification system and labor usage estimates. The number of rate periods is dependent upon your estimating system (e.g., monthly, quarterly or yearly labor rates) and the length of the contract. Both

the labor rates and bases shall be in terms of hours, days, or months, depending upon your normal estimating system. If the labor rates and bases are in terms of months, provide man-month to man-hour conversion factors at the bottom of the summaries.

4.2.3.1 Cost formats C-1 and C-2 shall be used to list all proposed engineering and manufacturing labor costs by hours (months) by labor category, by offeror fiscal years. If your estimating system derives hours/months through a factoring procedure, provide complete hour (month) build-ups on separate schedules. Also, provide a separate schedule which shows each factor by rate period, identifies the base to which each factor is applied, describes the function of each category of factored hours (months) and explains how each factor was developed.

4.2.4 Cost format D shall be used to prepare a summary of engineering, manufacturing, material handling, G&A and any other applicable burden rates by rate period. The number of rate periods is dependent upon your accounting system and the length of the contract. There should be a one-to-one correspondence between the rate periods shown on cost format D and the periods shown on cost format A. Note that cost format D requires that you identify the base (i.e., cost element name(s), not actual quantitative values) to which each indirect rate is applied.

4.2.5 Cost format E shall be used to provide the details of other direct cost by offeror fiscal year or other period, consistent with cost format A. Each other direct cost item, including travel, shall be shown separately. The total cost for each item shall be allocated to the appropriate WBS level 3 items in the same manner as that used to allocate the total cost for each direct material item on cost format B (see section 4.2.2 above). As an attachment to cost format E, for each other direct cost item, except travel for which details are provided on separate cost formats F, show the statistical derivation (i.e., rates, bases and arithmetic calculations) and provide narrative rationale.

4.2.6 Cost format F shall be used to prepare a summary of travel and living expenses at the total cost level (WBS level 1), by offeror fiscal year. The amounts shown on cost format F shall be direct costs (i.e., unburdened). At the bottom of cost format F list all proposed airfare, mileage, per diem, auto rental and other applicable rates.

4.2.7 Cost format G (DD Form 1861) shall be used to show how the proposed amount for facilities capital cost of money was calculated. A separate cost format G shall be submitted for each accounting period in which there is a proposed cost. The offeror may submit the required data on other than an actual DD Form 1861.

4.2.8 Cost format H shall be used to prepare a cumulative forecast of material commitment and material/labor expenditure by month. The material and labor amounts shown on the profile shall be fully burdened, but shall not include profit (i.e., at the total cost level). All forecasted costs shall be classified as either material or labor, whichever is more appropriate for each cost element. Material commitment is defined as placing a purchase order or awarding a subcontract. Material/labor expenditure is defined as an actual cash disbursement by the offeror, either payment to a vendor or employee wages. In the last column, show the major events which are expected to occur each month (e.g., PDR, CDR, delivery of first prototype, conclusion of system test, etc.). If necessary, list the major events by month on a separate schedule attached to cost format H.

4.2.9 Cost Format I shall be used to prepare a cost matrix in which the individual contract line items (CLINs) or subcontract line items (SCLINs) are listed separately by cost element and reconciled to the total contract price shown on the various Forms SF1411. CLINs/SCLINs which are not separately priced are not listed on this format. For the SF 1411 encompassing CLINs 0001-0005 and 0045-0046, the CLINs are 0001AA, 0001AB, 0002AA, 0002AB, 0003AD, 0004, 0005AB, 0045 and 0046. For the SF 1411 encompassing CLINs 0006-0007 the CLINs are 0006 and 0007AB. For the SF 1411 encompassing CLINs 0008 and 0009 the CLINs are 0008 and 0009AB. For the SF 1411 encompassing CLINs 0027-0034 it is all CLINs. For the SF 1411 encompassing CLINs 0035-0042, it is all CLINs. For the SF 1411 encompassing CLINs 0043-0044, it is CLIN 004

4.2.10 Cost format J shall be used to prepare a summary of non-recurring and recurring costs by WBS for levels 1 through 3.

4.2.11 Cost format K shall be used to prepare a cost matrix in which each WBS level 2 item is listed separately by cost element and reconciled to WBS level 1. Note that the format includes direct engineering and direct manufacturing labor hours.

4.2.11.1 Attach to cost format K, a matrix which shows, by dollar amount, how the total cost for each WBS level 2 item has been allocated to derive the proposed CLI prices (and sub-CLI prices, if separately priced). The matrix format shall be as follows:

<u>CLIs</u>				
<u>WBS</u>	<u>0001</u>	<u>0002</u>	<u>000n</u>	<u>TOTAL WBS</u>
1.1				
1.2				
.				
.				
1.n	—	—	—	—
TOTAL CLI COST				



ac. Total WBS amount on the matrix should equal the corresponding WBS level 2 total cost amount on cost format K. Each total CLI cost on the matrix should equal the corresponding total cost amount on cost format I. The sums of the total WBS and total CLI cost amounts should be the same. The WBS level 2/CLI matrix need not be submitted, if the contract does not include separately priced CLIs.

4.2.12 Cost format L shall be used to prepare a separate cost matrix for each WBS level 2 item. For each WBS level 2 item, its WBS level 3 items are listed separately by cost element and reconciled to WBS level 2. A cost format L need not be submitted for WBS level 2 items which are not broken down to WBS level 3. Note that the format includes direct engineering and direct manufacturing labor hours.

COST FORMAT A		PRICE SUMMARY BY OUTLOOK FISCAL YEARS					ATTACHMENT 1	
COST ELEMENTS		FISCAL YEARS						
		FY 1	FY 2	*	*	*	FY n	TOTAL
1. DIRECT MATERIAL	a. PURCHASED PARTS							
	b. SUBCONTRACTED ITEMS							
	c. OTHER MATERIAL							
	(1) RAW MATERIAL							
	(2) STANDARD COMMERCIAL ITEMS							
	(3) INTERDIVISIONAL TRANSFERS (AT OTHER THAN COST)							
	2. MATERIAL OVERHEAD							
	3. INTERDIVISIONAL TRANSFERS AT COST							
	4A. DIRECT ENGINEERING LABOR HOURS							
	4B. DIRECT ENGINEERING LABOR \$s							
	5. ENGINEERING OVERHEAD							
	6A. DIRECT MANUFACTURING LABOR HOURS							
	6B. DIRECT MANUFACTURING LABOR \$s							
	7. MANUFACTURING OVERHEAD							
	8. OTHER DIRECT COSTS							
	9. SUBTOTALS							
	10. G&A EXPENSES							
	11. SUBTOTALS							
	12. FACILITIES CAPITAL COST OF MONEY							
	13. TOTAL COST							
	14. TOTAL PROFIT							

COST FORMAT 1SUMMARY OF DIRECT MATERIAL AND INTERDIVISIONAL TRANSFERS AT COST

<u>ITEM DESCRIPTION</u>	<u>SOURCE</u>	<u> BASIS FOR SELECTION</u>	<u>TYPE OF CONTRACT</u>	<u> BASIS OF COST</u>	<u>QUANTITY</u>	<u>UNIT COST</u>	<u>TOTAL COST</u>	<u>ALLOCATION BY WBS LEVEL 3 ITEM</u>
<u>PURCHASED PARTS</u>								
ITEM 1								
ITEM 2								
.								
.								
ITEM 8								
TOTAL ORDER \$25,000								
TOTAL PURCH PARTS								
<u>SUBCONTRACTS</u>								
.								
.								
.								
<u>RAW MATERIAL</u>								
.								
.								
.								
<u>INTERDIV. TRANS. @ COST</u>								
ITEM 1								
ITEM 2								
.								
.								
.								
ITEM 4								
TOTAL ORDER \$25,000								
TOTAL INT @ Cost								

ATTACHMENT 1

COST FORMAT C-1

ENGINEERING SUMMARY

	<u>FY 1</u>	<u>FY 2</u>	<u>FY N</u>	<u>TOTALS</u>
LABOR CATEGORY 1				
HOURS/MONTHS				
RATE				
COST				
LABOR CATEGORY 2				
.				
.				
.				
LABOR CATEGORY 3				
.				
.				
.				
LABOR CATEGORY N				
.				
.				
.				

COST FORMAT C-2MANUFACTURING SUMMARY

	<u>FY 1</u>	<u>FY 2</u>	<u>FY N</u>	<u>TOTALS</u>
LABOR CATEGORY 1				
HOURS/MONTHS				
RATE				
COST				
LABOR CATEGORY 2				
.				
.				
.				
LABOR CATEGORY 3				
.				
.				
.				
LABOR CATEGORY N				
.				
.				
.				

COST FORMAT DINDIRECT COST RATE SUMMARY

<u>INDIRECT ITEM</u>	<u>RATE</u> <u>PERIOD 1</u>	<u>RATE</u> <u>PERIOD 2</u>	<u>RATE</u> <u>PERIOD n</u>	<u>BASE</u>
INDIRECT ITEM 1				
INDIRECT ITEM 2				
INDIRECT ITEM n				

## ATTACHMENT 1

COST FORMAT 1  
SUMMARY OF OTHER DIRECT COSTS

<u>ITEM DESCRIPTION</u>	<u>FY 1</u>	<u>FY 2</u>	.	.	.	<u>FY N</u>	<u>TOTAL COST</u>	<u>\$ ALLOCATION BY</u> <u>WBS LEVEL 3 ITI</u>
ITEM 1								
ITEM 2								
.								
.								
ITEM N								
TRAVEL								
TOTAL OTHER DIRECT COSTS								

## ATTACHMENT 1

COST FORMAT FSUMMARY OF TRAVEL AND LIVING EXPENSES

<u>DEPARTURE</u> <u>LOCATION</u>	<u>ARRIVAL</u> <u>LOCATION</u>	<u>AIRFARE/</u> <u>MILEAGE COST</u>	<u>PER DIEM</u> <u>COST</u>	<u>AUTO RENTAL</u> <u>COST</u>	<u>TOTAL COST</u> <u>PER TRIP</u> <u>(1 PERSON)</u>	<u># OF</u> <u>TRIPS</u>	<u>TOTAL 1</u> <u>COST</u>
-------------------------------------	-----------------------------------	--	--------------------------------	-----------------------------------	---	-----------------------------	-------------------------------

FY 1

FY 2

FY 3

FY N



## CONTRACT FACILITIES CAPITAL AND COST OF MONEY

[illegible]

**INSTRUCTIONS FOR DD FORM 1861  
CONTRACT FACILITIES CAPITAL AND COST OF MONEY**

**PURPOSE.** The purpose of this form is to compute the estimated facilities capital to be employed for a specific contract proposal. An intermediate step is to compute the estimated facilities capital cost of money, using the Facilities Capital Cost of Money Factors developed on Form(s) CASB-CMF. This procedure is intended to be fully compatible with Cost Accounting Standard 414 "Cost of Money as an Element of the Cost of Facilities Capital," and extend those criteria and techniques to prospective periods for forward pricing purposes. ASPR 3-1300 should be referred to for applicability and further explanation.

**IDENTIFICATION.** Identify the contractor, business unit and address. Identify the specific RFP or contract to which the computation pertains, by PIIN number. Identify the estimated performance period of the contract.

**OVERHEAD POOLS (COL. 1).** List all business unit overhead pools and direct-charging service/support centers whose costs will be allocated to this contract. The structure must be compatible with the contractor's cost proposal and Forms(s) CASB-CMF.

**COST ACCOUNTING PERIOD (COL. 2).** This column is used only for the "projected" method of estimating contract facilities capital employed and cost of money. Each Overhead Pool listed must be further broken down by each Cost Accounting Period impacted by the Performance Period of the contract. The yearly breakdown must also correspond to yearly overhead allocation bases in the contractor's cost proposal, and to separate Forms CASB-CMF for each year listed. If the "historical" method is used, the column should be ignored.

**CONTRACT OVERHEAD ALLOCATION BASE (COL. 3).** For each Overhead Pool and Cost Accounting Period listed, record the same Contract Overhead Allocation Base amounts used in the pricing report to derive the pre-negotiation cost objective. Such amounts should be the same as those used for burdening contract overhead or applying service/support center use charges. The base units-of-measure must agree with those used on the Form(s) CASB-CMF.

**FACILITIES CAPITAL COST OF MONEY FACTORS (COL. 4).** Carry forward the appropriate estimated Facilities Capital Cost of Money Factors from the Form(s) CASB-CMF. Business units, overhead pools and cost accounting periods must agree.

**FACILITIES CAPITAL COST OF MONEY AMOUNT (COL. 5).** The product of each Contract Overhead Allocation Base (Col. 3) multiplied by its related Facilities Capital Cost of Money Factor (Col. 4).

**CONTRACT FACILITIES CAPITAL COST OF MONEY (LINE 6).** The sum of Col. 5. This represents the contract's allocable share of the business unit's estimated cost of money for the cost accounting period(s) impacted by the contract performance period. Therefore it represents a portion of the total(s) of Col. 5 of Form CASB-CMF.

**FACILITIES CAPITAL COST OF MONEY RATE (LINE 7).** The same Cost of Money Rate used in Col. 1 of the Form(s) CASB-CMF. Only one rate will be used in the facilities capital estimating process regardless of the length of the contract performance period.

**CONTRACT FACILITIES CAPITAL EMPLOYED (LINE 8).** The quotient of Line 6 divided by Line 7. This represents the contract's allocable share of the business unit's estimated facilities value for the cost accounting period(s) impacted by the contract. Therefore it represents a portion of the total(s) of Col. 4 of Form CASB-CMF.

COST FORMAT HCOMMITMENT/EXPENDITURE PROFILE

<u>MAC</u>	<u>MATERIAL COMMITMENT</u>	<u>MATERIAL EXPENDITURE</u>	<u>LABOR EXPENDITURE</u>	<u>TOTAL EXPENDITURE</u>	<u>PROGRAM MILESTONES</u>
------------	--------------------------------	---------------------------------	------------------------------	------------------------------	-------------------------------

1

2

3

n

COST FORMAT J  
WBS CODES LISTING/RECURRING COST SUMMARY

<u>WBS LEVEL</u>	<u>WBS TYPE</u>	<u>NON-RECURRING</u>	<u>RECURRING</u>	<u>TOTAL COST</u>	<u>PROFIT P/L</u>	<u>TOTAL P/L</u>
1.0	SYSTEM					
1.1	FIRST LEVEL 2					
1.1.1	FIRST LEVEL 3					
.	.					
.	.					
1.1.n	LAST LEVEL 3					
1.2	SECOND LEVEL 2					
1.2.1	FIRST LEVEL 3					
.	.					
.	.					
1.2.n	LAST LEVEL 3					
.	.					
.	.					
1.n	LAST LEVEL 2					
1.n.1	FIRST LEVEL 3					
.	.					
.	.					
1.n.n	LAST LEVEL 3					

## COST FORMAT 1

## CONTRACT LINE ITEM SUMMARY

## ATTACHMENT 1

COST ELEMENTS		0001	0002	.	.	.	0000	TOTAL PRICE
1. DIRECT MATERIAL	a. PURCHASED PARTS							
	b. SUBCONTRACTED ITEMS							
	c. OTHER MATERIAL							
	(1) RAW MATERIAL							
	(2) STANDARD COMMERCIAL ITEMS							
	(3) INTERDIVISIONAL TRANSFERS (AT OTHER THAN COST)							
	2. MATERIAL OVERHEAD							
	3. INTERDIVISIONAL TRANSFERS AT COST							
	4A. DIRECT ENGINEERING LABOR HOURS							
	4B. DIRECT ENGINEERING LABOR \$s							
	5. ENGINEERING OVERHEAD							
	6A. DIRECT MANUFACTURING LABOR HOURS							
	6B. DIRECT MANUFACTURING LABOR \$s							
	7. MANUFACTURING OVERHEAD							
	8. OTHER DIRECT COSTS							
	9. SUBTOTALS							
	10. G&A EXPENSES							
	11. SUBTOTALS							
	12. FACILITIES CAPITAL COST OF WORK							
	13. TOTAL COST							
	14. TOTAL PROFIT							

COST ELEMENT 1		WBS LEVEL 2 SUMMARY					ATTACHMENT 1
COST ELEMENTS		COST BREAKDOWN STRUCTURE LEVEL 2					(1.0) WBS Level 1 Total
		(1.1)	(1.2)	.	.	.	(1.1.n)
1. DIRECT MATERIAL	a. PURCHASED PARTS						
	b. SUBCONTRACTED ITEMS						
	c. OTHER MATERIAL						
	(1) RAW MATERIAL						
	(2) STANDARD COMMERCIAL ITEMS						
	(3) INTERDIVISIONAL TRANSFERS (AT OTHER THAN COST)						
	2. MATERIAL OVERHEAD						
	3. INTERDIVISIONAL TRANSFERS AT COST						
	4A. DIRECT ENGINEERING LABOR HOURS						
	4B. DIRECT ENGINEERING LABOR \$s						
	5. ENGINEERING OVERHEAD						
	6A. DIRECT MANUFACTURING LABOR HOURS						
	6B. DIRECT MANUFACTURING LABOR \$s						
	7. MANUFACTURING OVERHEAD						
	8. OTHER DIRECT COSTS						
	9. SUBTOTALS						
	10. G&A EXPENSES						
	11. SUBTOTALS						
	12. FACILITIES CAPITAL COST OF MONEY						
	13. TOTAL COST						



30 April 1985

125-C-0007

Command, Control and  
Communications Corporation  
23670 Hawthorne Blvd.  
Torrance, CA 90505

Attn: Mr. James W. Sutherland  
Director, Business Development

Subj: Request for Proposal from 4C in Support of Requirements under  
Solicitation RFP F19628-85-R-0076

Dear Mr. Sutherland:

TechDyn Systems Corporation is currently in the process of submitting its Cost Proposal to the Department of the Air Force for the Full Operational Capability (FOC) of the Iceland Command & Control Enhancement (ICCE) Program, and the remaining portion of the IOC, in response to Solicitation RFP F19628-85-R-0076.

As part of TechDyn's submission, it is requested that 4C provide a Firm Fixed Price Cost Proposal for the enclosed (Attachment 1) Statement of Work (SOW) identified as:

Statement of Work  
For  
Iceland Command & Control Enhancement  
& CENTAF Programs  
PACAF & AAC Options

To be responsive, your Cost Proposal must include those requirements set forth in the Instructions for Preparation of Cost Proposals for the ICCE System dated 27 September 1984. A copy of these instructions is provided with this Solicitation (Attachment 2). Please give special attention to Section 2.0 General Instructions, Subparagraph 2.6, which explains the cost data requirements for subcontracts.

Further, the Fixed Price cost submittal made to TechDyn by 4C in support of this Solicitation, must be furnished in sufficient detail that TechDyn, the prime Contractor, can evaluate your proposal as to reasonableness of the cost and profit/fee contained therein. Any cost data which you feel is proprietary to the extent that you do wish that it be made available except to the Government may be submitted direct to the Government's Contracting Officer, but please understand irrespective of any such decision, responsibility to reach a fair and reasonable price for the equipment and/or services you have been asked



Mr. Sutherland  
30 April 1985  
Page 2

to provide, rests with the prime Contractor. To accomplish this, we must be furnished the basic cost data necessary for us to review your submittals, negotiate a profit and/or fee and subsequently enter into firm and binding subcontract/purchase order agreements.

Incorporated into this RFP are the FAR Clauses in Attachment III to this Solicitation. These clauses, as appropriate and as required, are to be considered included in this Request for Proposal and will be included in the resultant contract agreements with 4C.

This Request for Proposal should not be construed in any manner as to be an obligation by TechDyn to enter into a Subcontract with 4C and further this Solicitation cannot result in a claim against the United States Government for any cost incurred by 4C if 4C is not subsequently awarded a contract.

Your Cost Proposal should state that it is valid for no less than thirty (30) days and must be signed by an official of 4C who has the authority to bind 4C in such matters. Payment for work contracted for as a result of this Solicitation will be net sixty (60) from acceptance by the Government.

Other than as stated in the Government RFP, any schedule adjustment and any Government Furnished items will be discussed with you next week.

We look forward to an enjoyable and profitable association with 4C on the ICCE Program. If you have any questions concerning this request, please contact the undersigned at (703) 922-5100.

Sincerely,



David E. Yenowine  
Supervisor of Subcontracts/Purchasing

DEY/dmk

Enclosures: Attachment I - SOW  
Attachment I(A) - Drawings  
Attachment II - Instructions for Cost Proposal  
Attachment III - FAR Clauses



STATEMENT OF WORK  
FOR  
ICELAND COMMAND AND CONTROL ENHANCEMENT  
& CENTAF PROGRAMS  
PACAF & AAC OPTIONS

**1.0 SCOPE:** This SOW describes the requirements for engineering and technical services to support TechDyn Systems Corporation in the areas specified during the contract for subject programs. Under this procurement, 4C, as directed subcontractor, utilizing special knowledge and techniques possessed by and available to their corporation, shall furnish all labor, equipment, facilities, services and materials, to specify, design, fabricate, code, install, test, operate, maintain and provide training equipment associated with the Processing and Display Functional Area as it applies in the applicable documents and their tailored applications. Applicable documents are set forth in Section 2, this SOW. In addition, the subcontractor shall provide support in project management, test planning and analysis, and general coordination of the programs. The subcontractor's engineers, technicians and analysts, must be able to provide preventive maintenance and repair as well as operate instrumentation and hardware that interfaces with the Communications Functional Area.

**1.1 SPECIAL REQUIREMENT:** As indicated above, 4C's area of concentration is the Processing and Display Functional Area (PDFA) as stated in Section 3, this SOW. However, in addition to the PDFA, the subcontractor is requested to plan the design, fabrication and provision of: (a) special 2w/4w voice and data bridges, (b) special switching central interface cards, and (c) special RCU (microprocessor controller)/UHF interface cards to interconnect voice and data circuits at the main switch control and at each of the designated remote ICCE sites. The specifications/requirements for the bridging equipment are those proposed by Dr. James W. Sutherland, 4C, in schematic diagrams offered to TechDyn (attached as Enclosure 1).

**2.0 APPLICABLE DOCUMENTS:**

RFP F19628-85-R-0076, Electronic Systems Division, Air Force Systems Command

SOW-EC1-1229                      7 Feb 85  
Statement of Work for ICCE System

SOW-EC1-1229-A                    4 Feb 85  
Addendum Statement of Work for CENTAF

SOW-EC1-1229B                      4 Feb 85  
Addendum Statement of Work for PACAF/AAC

Spec ESD-SS-EC1-1020            4 Feb 85  
Specification for ICCE System

Spec ESD-SS-EC1-1020A          4 Feb 85  
Addendum Specification for ICCE System

Spec ESD-SS-EC1-1020B          4 Feb 85  
Addendum Specification for CENTAF

Spec ESD-SS-EC1-1020C          4 Feb 85  
Addendum Specification for PACAF/AAC

DOD-STD-480A  
12 April 78  
Notice 1  
29 December 78

Configuration Control-Engineering  
Changes, Deviations and Waivers

MIL-STD-129J  
25 September 84

Marking for Shipment and Storage

MIL-STD-196C  
22 December 65  
Notice 4  
27 July 77

Joint Electronics Type Designation  
System

MIL-STD-461B  
1 April 80

Electromagnetic Emission and  
Susceptibility Requirements for the  
Control of Electromagnetic  
Interference

MIL-STD-470A  
3 January 83

Maintainability Program  
for Systems and Equipment

MIL-STD-471A  
10 January 75  
Notice 2  
8 December 78

Maintainability Verification/  
Demonstration/Evaluation

MIL-STD-483  
1 June 71  
Notice 2  
21 March 79

Configuration Management Practices  
for Systems, Equipment, Munitions  
and Computer Programs

MIL-STD-490  
30 October 68  
Notice 2  
18 May 72

Specification Practices

MIL-STD-499A  
1 May 74

Engineering Management

MIL-STD-45662  
16 May 84

Calibration System Requirements

MIL-E-60510  
7 September 67  
Amendment 1  
5 July 68

Electromagnetic Compatibility  
Requirement, Systems

MIL-H-46855B  
31 January 79  
Amendment 2  
5 April 84

Human Engineering Requirements for  
Military Systems, Equipment and  
Facilities

MIL-L-8031  
1 June 75

List of Applicable Publications  
(LOAPS)

MIL-M-7298C  
15 April 75  
Amendment 3  
16 February 81

Manuals, Technical:  
Commercial Equipment

MIL-N-7513F  
14 November 80  
Amendment 1  
9 April 81

Nomenclature Assignment, Contractor  
Method for Obtaining

MIL-P-9024G  
6 June 72

Packaging, Handling, and  
Transportability in System/  
Equipment Acquisition

MIL-Q-9858A  
16 December 63

Quality Program Requirements

MIL-S-52779A  
1 August 79

Software Quality Assurance  
Program Requirements

MIL-S-83490  
30 October 79

Specification, Types and Forms

MIL-HDBK-217D  
15 January 82

Reliability Prediction of  
Electronic Equipment

MIL-HDBK-46  
July 80

Federal Item Identification Guides  
for Supply Categorizing

MIL-HDBK-300M  
1 October 82

Air Force Technical Information  
File of Aerospace Ground Equipment

DODM 5220.22  
January 83

Industrial Security Manual for  
Safeguarding Classified Information

DODR 5220.22  
January 83

Industrial Security Regulations

DODR 4500.32  
1 August 79

Military Standard Transportation  
and Movement Procedures (MILSTAMP)

DCA Circular 310-70-1  
Volume I,  
29 March 76  
Volume II  
22 September 78

DCS Technical Control, Policy, and  
Facilities, Procedures

DCA Circular 310-130-1  
1 June 83

Submission of Telecommunications  
Service Requests

ESD-TR-82-417  
August 82

Part Derating Guidelines (Interim)  
for ESD Systems Development

JCS Pub. 10  
1 December 82

Tactical Command and Control and  
Communications Systems Standards

JCS Pub. 18  
15 December 82

Operations Security

PPSL Issue 1, Rev. A  
20 January 82

Program Parts Selection  
List: Electrical/Electronic Parts

PPSL Issue 01, Rev. A  
December 81

Program Parts Selection List:  
Mechanical Parts

NACSIM 5100A  
July 81

Compromising Emanations, Laboratory  
Test Requirements, Electromagnetics

NACSIM 5203  
30 June 82

Guidelines for Facility Design and  
RED/BLACK Installation

MIL-HDBK-334 15 July 82	Evaluation of Contractors Software Quality Assurance Program
MIL-HDBK-472 24 May 66 Notice 1 12 January 84	Maintainability Prediction
AFM 50-2 25 May 79	Instructional System Development
AFM 50-9 13 July 81	Special Training
AFM 75-2 15 March 69	Military Traffic Management Regulation
AFR 8-2 3 May 82	Air Force Technical Orders System
AFR 100-45 Volume 1 22 September 80	Communication Security Policies; Procedures and Instructions
AFR 205-4 2 August 76	Air Force Participation in the DOD Industrial Security Program
AFR 300-8 17 July 79	ADP Systems Security Policy Procedures and Responsibilities
AFR 300-10 15 December 76	Computer Programming Languages
AFR 400-44 8 June 82	Air Force Corrosion Program
AFR 400-54 20 January 84	Report of Item and Packaging Discrepancies
AFR 800-8 7 February 80	Integrated Logistics Support (ILS) Program for Systems and Equipment
AFSC OH 1-4 5 January 75	Electromagnetic Compatibility
DOD Directive 5000.39 17 January 80	Acquisition and Management Integrated Logistics Support for System and Equipment

MIL-STD-756B 18 November 81 Notice 1 31 August 82	Reliability Modeling and Prediction
MIL-STD-785B 15 September 80	Reliability Program for Systems and Equipment Development and Production
MIL-STD-794E 16 July 72	Parts and Equipment, Procedures for Packaging of
MIL-STD-881A 25 April 75	Work Breakdown Structure for Defense Materiel Items
MIL-STD-882B 30 March 84	System Safety Program Requirements
MIL-STD-965 15 April 77 Notice 3 26 August 83	Parts Control Program
MIL-STD-1388-1A 11 April 83	Logistics Support Analysis
MIL-STD-1472C Notice 2 10 May 84	Human Engineering Design Criteria for Military Systems, Equipment and Facilities
MIL-STD-1510A 5 June 78	Container Design Retrieval System, Procedure for Use of
MIL-STD-1520B 3 July 80	Corrective Action and Disposition System for Non-Conforming Material
MIL-STD-1521A 1 June 76 Notice 2 21 December 81	Technical Review and Audits for System, Equipment, and Computer Programs
MIL-STD-1528 1 August 72	Production Management
MIL-STD-1535A 1 February 74	Supplier Quality Assurance Program Requirements
MIL-STD-1556A 29 February 76	Government/Industry Data Exchange Program Contractor Participation Requirements

**3.0 REQUIREMENTS:** The subcontractor will provide the systems, services and documentation related to furnishing the PDFA and related hardware in compliance with the SOW and specifications shown in the following tables. All deliverables shown will be in accordance with the CDRL as listed in RFP F19628-85-R-0076.

**3.1 SCHEDULES:** Schedules for all engineering and services will be in accordance with those developed in the TechDyn/4C Proposal, currently due for submission on 14 May 1985.

**3.2 WORK BREAKDOWN STRUCTURE:** A preliminary Work Breakdown Structure is attached as enclosure and is to be used for planning and reference purposes.

**3.3 PROJECT MANAGEMENT AND SUPPORT:** The subcontractor shall provide the requisite management and support services that assure the timely and successful fulfillment of contract requirements and deliverable products. Project management and support are not specifically related to a particular task and should be accounted for throughout the duration of the contract. The subcontractor shall commit project technical and administrative resources IAW this SOW and the schedules to be developed, performing all functions necessary to manage the efforts necessary to support and meet the objectives of the programs. The subcontractor shall also plan, direct, control and inspect those contractual resources necessary to produce and deliver items and perform the services required by the Work Breakdown Structure and this SOW. If variations from agreed upon management goals occur, the subcontractor will advise TechDyn of the variance. All project management activities will be consistent with RFP requirements, to include related CDRL's.

**4.0 QUALITY ASSURANCE:** The subcontractor, in fulfilling his responsibilities under this SOW, shall demonstrate compliance with the quality assurance requirements identified in Section 4 of the government SOWs and specifications.

**5.0 ICCE SOW/SPECIFICATION CROSS-REFERENCE TABLE**

# ICCE SOW/SPECIFICATION CROSS-REFERENCE TABLE

SOW PARAGRAPH	SPECIFICATION PARAGRAPH 3 NUMBER	TITLE	SPECIFICATION PARAGRAPH 4 NUMBER
3.1 3.3.5	3.0	Requirements	
3.3.10	3.1	System Definition	
	3.1.1	General Description	
3.1.2 3.2 3.3	3.1.1.1	Processing and Display Functional Area	
	3.1.1.1.1	Data Processing and Peripheral Equipment	
	3.1.1.1.2	Display and Data Entry Equipment	
3.3.19	3.1.1.1.3	Operational Computer Programs	
3.3.19	3.1.1.1.4	Support Computer Programs	
	3.1.1.2	Communications Functional Area	
	3.1.1.2.2	TADIL A, Lateral-Tell and CCA Terminating and Conditioning Equipment	
	3.1.2	Mission	
	3.1.4	System Diagrams	
3.3.1.3.4	3.1.5	Interface Definition	4.2.1
	3.1.5.1	External Interfaces	4.2.1
	3.1.5.1.2	ROCC	4.2.1
	3.1.5.1.3	CCA	4.2.1
	3.1.5.2.2	Military Communications	4.2.1
	3.1.6	Government-Furnished Property List	



PARAGRAPH SOW	SPECIFICATION PARAGRAPH 3 NUMBER	TITLE	SPECIFICATION PARAGRAPH 4 NUMBER
	3.1.7	Operational and Organizational Concepts	
	3.2	Characteristics	
3.3.19.2.1	3.2.1	Performance Characteristics	4.2.2
	3.2.1.1	Processing and Display Performance Characteristics	
	3.2.1.1.1	Capacities and Accuracies	4.2.2
	3.2.1.1.2	Message Processing	4.2.2
	3.2.1.1.3	Response Time Requirements	4.2.2
	3.2.1.1.4	Processing Time Requirements	4.2.2
	3.2.1.1.5	Start-up	4.2.2
	3.2.1.1.5.1	Start-over/Restart	4.2.2
	3.2.1.1.6	Data Recording	4.2.2
	3.2.1.1.7	Playback	4.2.2
	3.2.1.1.8	System Simulation	4.2.2
	3.2.1.2	Communications Performance Characteristics	
	3.2.1.2.2	GOC Communications	4.2.2
	3.2.1.2.2.1	CCA Data Link	4.2.2
	3.2.1.2.2.2	Lateral-Tell Data Link	4.2.2
	3.2.1.2.3	Communications Monitoring	4.2.2
3.3.19.2.1	3.2.2	Physical Characteristics	
	3.2.2.1	Weight Limits	4.2.3
	3.2.2.2	Dimensional Limits	4.2.3
	3.2.2.3	Modular Design	4.2.3
3.3.8	3.2.3	Reliability	

PARAGRAPH SOW	SPECIFICATION PARAGRAPH 3 NUMBER	TITLE	SPECIFICATION PARAGRAPH 4 NUMBER
	3.2.3.1	System Reliability	4.2.3
	3.2.3.2	Reliability Design Criteria	4.2.4
	3.2.3.2.1	Accessibility	4.2.4
	3.2.3.2.2	Test Point	4.2.4
3.3.7	3.2.4	Maintainability	4.2.5
	3.2.4.1	Corrective Maintenance	4.2.5
	3.2.4.2	Preventive Maintenance	4.2.5
	3.2.4.3	Skill Levels	4.2.5
3.3.6	3.2.5	Availability	
	3.2.6	System Effectiveness Models	
3.7.1	3.2.7	Environmental Conditions	
	3.2.7.1	Nonoperating	4.2.6
3.3.19.2.1	3.2.7.2	Operating	4.2.6
	3.2.8	Nuclear Control Requirements	
3.3.16	3.2.9	Transportability	
3.3.19.1	3.3	Design and Construction	4.2.10
3.3.9	3.3.1	Materials, Processes, and Parts	4.2.7
	3.3.1.1	Parts Selection	4.2.7
	3.3.1.2	Semiconductors and Microcircuits	4.2.7
	3.3.1.3	Connectors and Cables	4.2.7
	3.3.1.4	Corrosion Control	4.2.7
	3.3.1.5	Materials and Finishes	4.2.7
3.3.11	3.3.2	Electromagnetic Radiation	4.2.8

PARAGRAPH SOW	SPECIFICATION PARAGRAPH 3 NUMBER	TITLE	SPECIFICATION PARAGRAPH 4 NUMBER
	3.3.2.1	Electromagnetic Interference and Susceptibility	4.2.8
	3.3.2.1.1	Lightning, Bonding and Ground Protection	4.2.8
	3.3.2.2	Electromagnetic Compatibility	4.2.8
3.3.14	3.3.2.3	TEMPEST	4.2.9
3.7.1.2	3.3.3	Nameplates and Product Marking	4.2.10
	3.3.4	Workmanship	4.2.10
	3.3.5	Interchangeability	4.2.11
3.3.2	3.3.6	Safety	4.2.12
3.3.3	3.3.7	Human Performance and Human Engineering	4.2.13
3.3.19.1	3.3.8	Computer Programming	
	3.3.8.1	CPCI Organization	4.2.14
	3.3.8.2	Structured Programming (SP)	4.2.14
	3.3.8.3	Top-Down Approach	
	3.3.8.3.1	Top-Down Modular Design (TDMD)	4.2.14
	3.3.8.3.2	Top-Down Implementation (TDI)	4.2.14
	3.3.8.4	Programming Languages	4.2.14
	3.3.8.5	CP Commenting	4.2.14
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	3.3.8.10	Firmware	4.2.14
	3.3.8.11	Character Set Standard	4.2.14
	3.3.8.12	Support Software	
3.4.2	3.4	Documentation	
3.6	3.5	Logistics	
3.6.3	3.5.1	Maintenance	
	3.5.1.1	Hardware Maintenance	
	3.5.1.1.1	Hardware Maintenance Concept	
	3.5.1.1.2	On-line Checkout	
	3.5.1.1.3	Failure Detection and Isolation	
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	3.5.1.1.6	Service and Access	
	3.5.1.2	Software Maintenance	
3.6.3.1	3.5.2	Supply	
	3.5.3	Facilities and Facility Equipment	
	3.5.3.1	Facility Access and Service	
	3.5.3.2	Facility Power	
3.6.10	3.6	Personnel and Training	
	3.6.1	Personnel	

PARAGRAPH SOW	SPECIFICATION PARAGRAPH 3 NUMBER	TITLE	SPECIFICATION PARAGRAPH 4 NUMBER
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	3.6.1.2	Hardware Maintenance Personnel	
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	3.7.1.1.2.3	Alphanumeric Display Console	4.2.15
	3.7.1.1.2.4	Magnetic Storage	4.2.15
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	3.7.1.2.1.1.2	Data Entry Keyboard	4.2.15
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	3.7.1.3.1	Initialization	4.2.15
	3.7.1.3.2	Data Filtering	
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	3.7.1.3.2.2	TADIL A Transmit Filtering	4.2.15
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	3.7.1.3.5.1	Track Source	4.2.15
	3.7.1.3.5.2	Track Initiation	4.2.15
	3.7.1.3.5.3	Track Prediction	4.2.15

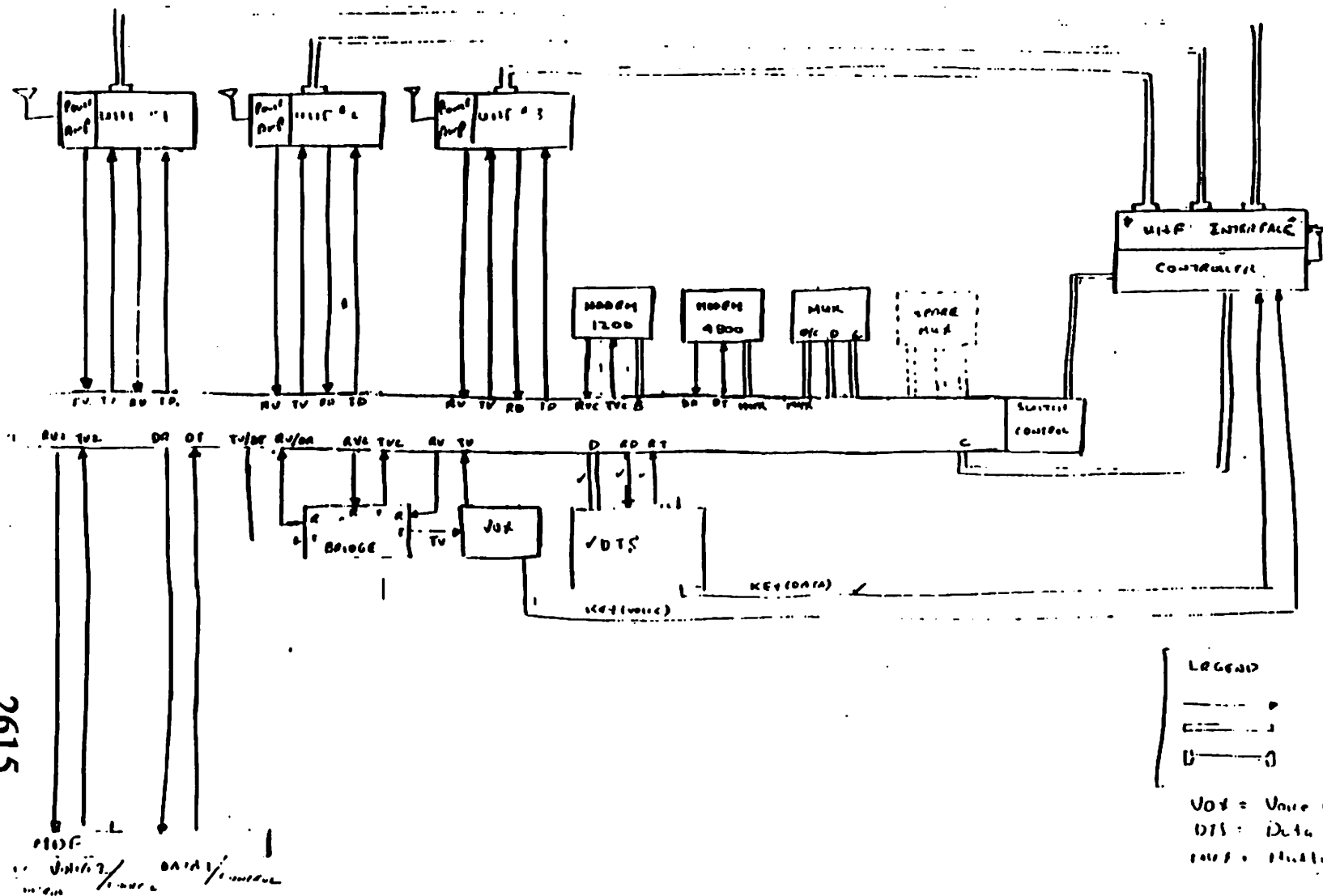
PARAGRAPH SOW	SPECIFICATION PARAGRAPH 3 NUMBER	TITLE	SPECIFICATION PARAGRAPH 4 NUMBER
	3.7.1.3.5.4	Drop Track	4.2.15
	3.7.1.3.5.5	Track and Data Management	4.2.15
	3.7.1.3.6	Situation Display Processing	
	3.7.1.3.6.1	Track Block	4.2.15
	3.7.1.3.6.2	Special Points	4.2.15
	3.7.1.3.6.3	Alert Indications	4.2.15
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	3.7.1.3.7.3	System Status Display	4.2.15
	3.7.1.3.7.4	System Parameters Display	4.2.15
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	3.7.1.4.1.1	Playback Control	4.2.15
	3.7.1.4.1.2	Printout	4.2.15
	3.7.1.4.1.3	Plotter Controls	4.2.15
	3.7.1.4.2	System Simulation	4.2.15

PARAGRAPH SOW	SPECIFICATION PARAGRAPH 3 NUMBER	TITLE	SPECIFICATION PARAGRAPH 4 NUMBER
	3.7.1.4.2.1	Flight Path Initiation	4.2.15
	3.7.1.4.2.2	Flight Control	4.2.15
	3.7.1.4.2.3	Message Generation	4.2.15
	3.7.1.4.2.4	Flight Drop	4.2.15
3.3.17		Quality Assurance	
3.3.18		Test & Evaluation	
3.4		Configuration & Data	
3.5		Program Management	
3.6.5		Support Equipment	
3.6.9		Design To Life Cycle Cost	
3.7		Packaging & Transportation	

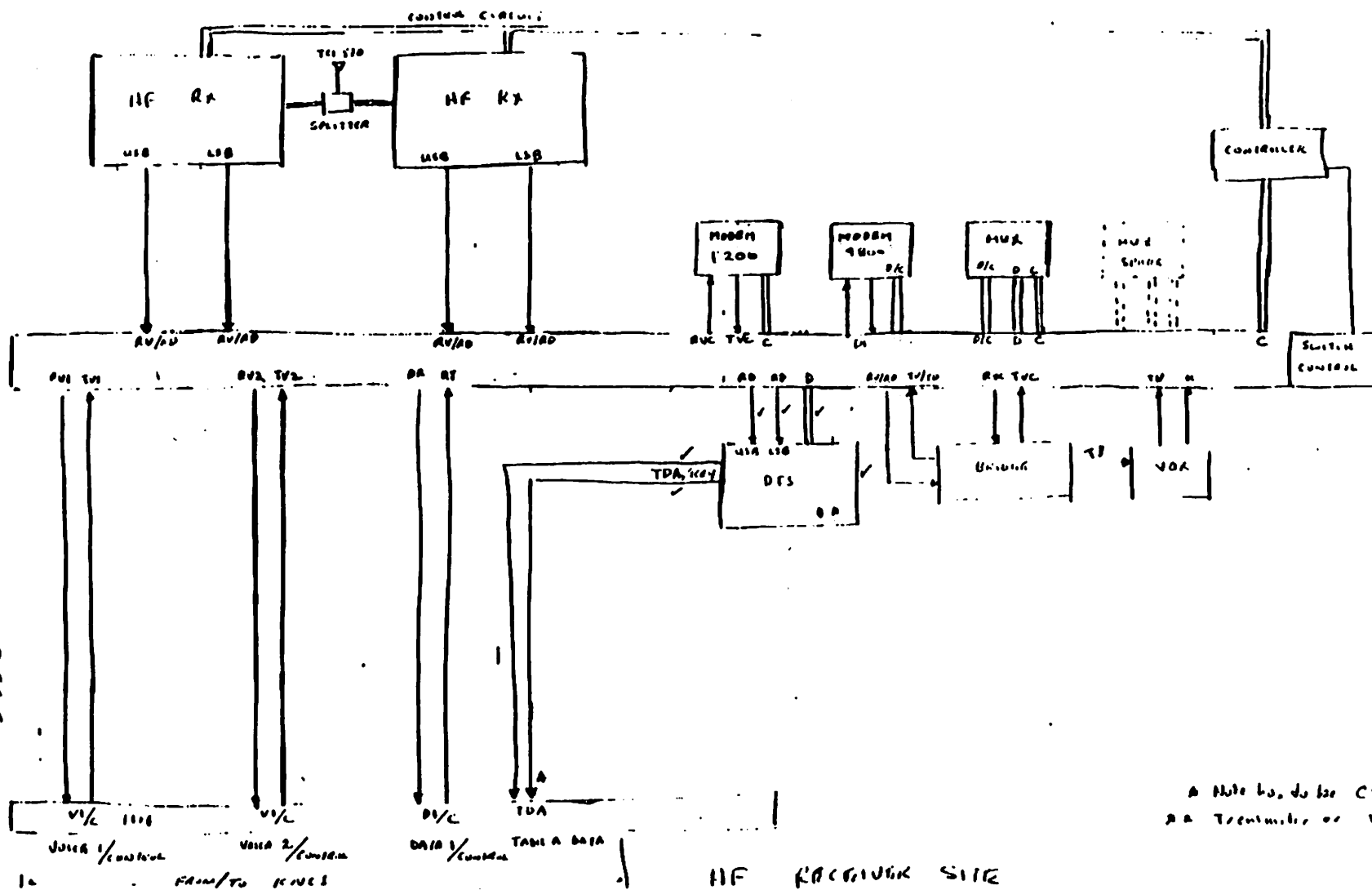




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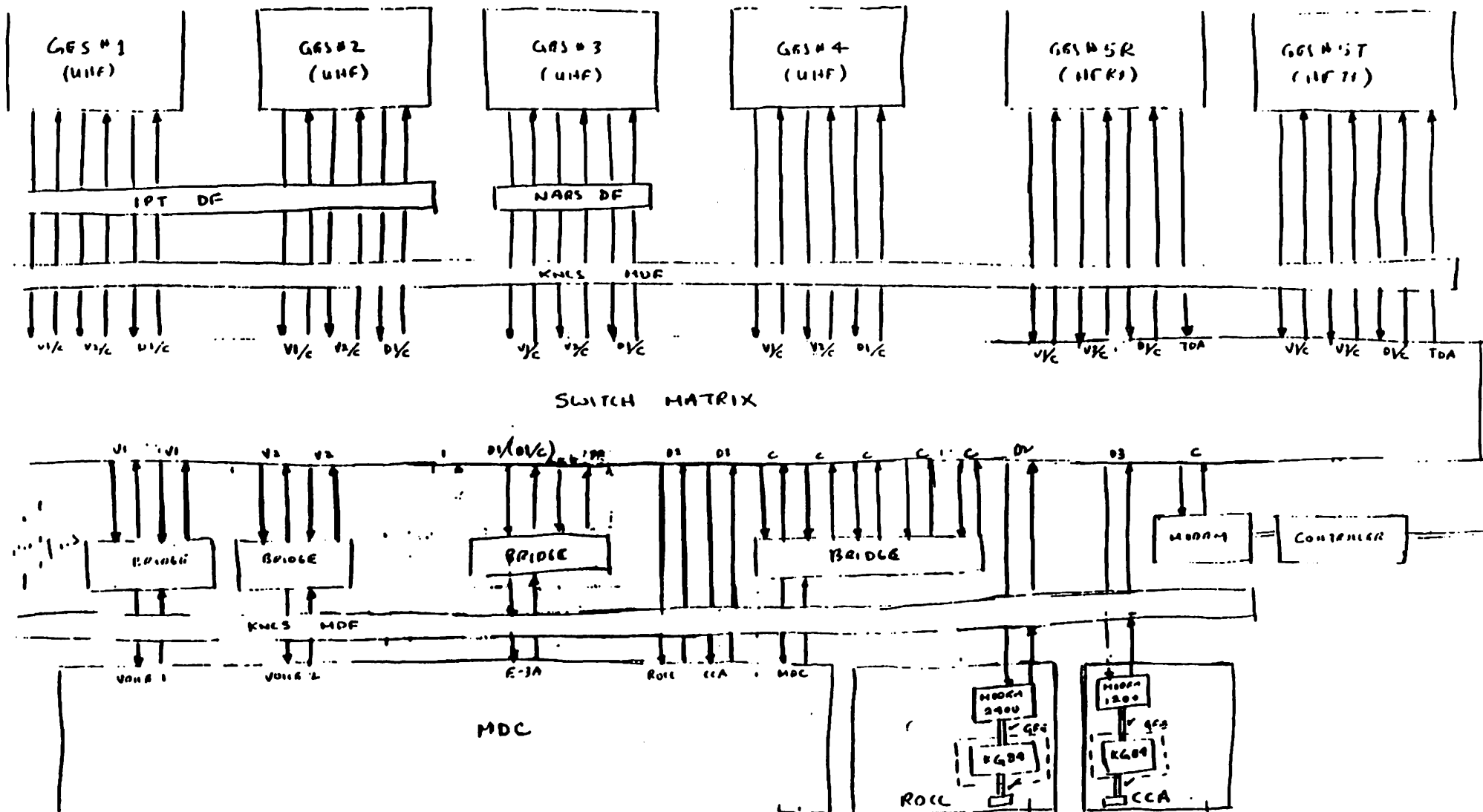


2616



A Note to do for CS configuration.  
 RA Transmitter or Receiver





TELEPHONE ANALOG COMMUNICATIONS SYSTEM

INSTRUCTIONS FOR PREPARATION OF COST  
PROPOSALS FOR THE ICCE SYSTEM  
84SEP27

Attachment II

## INSTRUCTIONS FOR PREPARATION OF COST AND PRICING DATA

### 1.0 INTRODUCTION:

These instructions are to assist you in submitting cost or pricing data which is required by Public Law 87-653, the "Truth in Negotiations Act." The Government needs this data to evaluate the reasonableness of your proposed price. Compliance with these instructions is mandatory and failure to comply may result in rejection of your proposal. The burden of proof for cost credibility rests with you. A certificate of current cost or pricing data, as required by FAR 15.804-2, will be submitted after agreement is reached on price. Data beyond that required by this instruction shall not be submitted, unless you consider it essential to document or support your cost/price position. All information relating to cost or pricing data must be included in the section of the proposal designated as the cost volume. Under no circumstances shall cost or pricing data except Life Cycle Cost Model information be included elsewhere in the proposal.

### 2.0 GENERAL INSTRUCTIONS:

2.1 The basic cost proposal instructions are presented below. The cost data prepared in response to these basic instructions shall be assembled as part 1 of the cost volume.

The cost data prepared in response to each set of attached instructions shall be assembled as separate parts of the cost volume.

2.2 The ground rules and assumptions (e.g., contract type, profit percentage, incentive arrangements, contract items, delivery schedule, GFE, Government provided base support, etc.) of the prospective contract are provided in the appropriate sections of the RFP package. On the first page of the cost volume, state whether or not the cost proposal has been prepared completely consistent with the ground rules and assumptions outlined in the RFP. List each exception to the ground rules and assumptions provided in the RFP and each qualification of the cost proposal, if any, and provide complete rationale.

2.3 For purposes of this cost proposal, the work breakdown structure (WBS) has been set forth in the statement of work and must be followed using MIL-STD-881A as a guide.

2.4 The cost volume shall be prefaced by a table of contents and shall specify, by page number, where each cost format and each piece of narrative data is located.

2.5 All dollar amounts provided in response to these instructions may be rounded to the nearest \$1,000.

2.6 The cost data requirements outlined in these instructions apply to each subcontractor in excess of \$1,000,000 to the same extent that they apply to the prime offeror. See requirement for "Certificate of Current Cost or Pricing Data" under Section L of this RFP. If work is to be performed by two or more divisions or subsidiaries within the prime corporation, each division or subsidiary shall submit a separate set of cost data for its portion of the effort.

### **3.0 COST PROPOSAL OVERVIEW:**

The cost proposal overview shall provide comprehensive narrative support for the cost proposal. Failure to satisfy this requirement will be considered a serious deficiency. This requirement also applies to each subcontractor over \$100,000 and each interdivisional transfer.

#### **3.1 ESTIMATING METHODOLOGY:**

3.1.1 Provide a summary description of your standard estimating system or methods. The summary description shall cover separately each major cost element (i.e., Direct Material, Engineering Labor, Manufacturing Labor, Indirect Costs and Other Direct Costs). Also, identify any deviations from your standard estimating procedures in preparing this proposal.

3.1.1.1. If the proposal includes any deviation from your normal forward pricing rates, either labor or burden, state whether or not a formal change has been submitted to the cognizant Government Administrative Contracting Officer.

3.1.2 Provide a summary description of your purchasing system or methods (e.g., how material requirements are determined, how sources are selected, when firm quotes are obtained, what provision is made to ensure quantity and other discounts, etc). Also, identify any deviations from your standard procedures in preparing this proposal.

3.1.3 For each subcontract, except those awarded solely on the basis of price competition, provide an analysis of the methodology used by the subcontractor to estimate cost. Also, explain, in summary, how the subcontract effort relates to the overall effort and why the subcontract cost can be considered reasonable.



3.1.4 If other costs include equipment with a useful life beyond this contract, identify each item and explain why the item has been proposed direct, rather than being capitalized.

3.1.5 If proposed costs have been increased to cover contingencies or decreased due to a management reduction, provide a cost element summary and complete rationale. Also, provide the cost impact on each WBS item down to level 3, as applicable.

3.1.6 Provide rationale to support cost reasonableness and reliability, and explain the methodology used to estimate the cost for each WBS level 3 item. As a minimum, provide the following information for each WBS level 3 item. If a portion of the required information is not applicable for a particular WBS level 3 item, so state.

3.1.6.1 Where cost estimates are based upon past experience, identify the past experience, explain how the past experience relates to the current effort and how cost data available from the past experience was adapted to the current effort.

3.1.6.2 Where cost estimates are based upon learning/improvement curve applications, identify the specific area subject to learning, the curve hypothesis (unit or cumulative) and the slope of the curve as a percent. Also, identify the data used to develop the slope and explain how this data relates to the current effort and how entry onto the learning curve was attained (i.e., how the first unit cost was derived).

3.1.6.3 If engineering labor hours have been estimated based upon other than past experience, explained under section 3.1.6.1 above, provide detailed rationale on how they have been estimated.

3.1.6.4 Explain how the proposed engineering labor hour skill mix has been derived and how the skill mix on this proposal compares with the overall plant skill mix. Explain why the WBS item requires an average, higher or lower than average skill mix, as applicable. If your normal estimating system uses a plant-wide average for proposal purposes, so state.

3.1.6.5 If manufacturing labor hours have been estimated based upon other than past experience and/or learning curve application, explained under sections 3.1.6.1 and 3.1.6.2 above, provide detailed rationale on how they have been estimated. If standards were used, identify and explain how they were derived and state whether or not they have been used on other programs. If other than normal procedures were used to estimate manufacturing hours, explain.

each item by quantity, unit price and total price. A SF Form 1412 is required for each item for which you do not intend to submit and certify cost or pricing data (see FAR 15.804-3).

3.1.8 For interdivisional transfers at other than cost, identify each item by source, quantity, unit price and total price.

3.1.8.1 If such an item is classified as a standard commercial item, a SF Form 1412 is required, if you, or the appropriate division, do not intend to submit and certify cost or pricing data.

3.1.8.2 If such an item is not classified as a standard commercial item, provide a complete explanation why it has been proposed at other than cost.

3.2 COST RISK: Discuss each WBS level 3 item from the standpoint of cost risk. Identify program areas where there are inherent technical, schedule or other risks which may impact cost. Explain how such risks, including subcontract risks, have been treated in preparing the cost proposal. If there are no areas of significant cost risk, explain why cost risk is considered to be minimal with emphasis on development effort.

#### 4.0 EXPLANATION OF REQUIRED COST FORMS:

FAR 53.215-2 specifies the use of SF Form 1411...whenever cost or pricing data (see FAR 15.804-3), is required. Supporting schedules have been devised by the contracting office to require such supporting data to the foregoing forms as is considered necessary and reasonable through knowledge of industry, company or commodity practices.

##### 4.1 SF Form 1411

The offeror shall submit seven (7) separate Forms SF 1411 for the following line items. One encompassing the total proposed price of CLINs 0001-0005 and 0045-0046. One encompassing the total proposed price of CLINs 0008 and 0009. One encompassing the total proposed price of CLINs 0010-0026. One encompassing the total proposed price of CLINs 0027-0034. One encompassing the total proposed price of CLINs 0035-0042. One encompassing the total proposed price for CLIN 0043-0044.

4.1.1 If work is to be performed by two or more divisions or subsidiaries within the prime corporation, a separate SF Form 1411 shall be submitted by each division or subsidiary for its portion of the effort.

4.1.2 A separate SF Form 1411 shall be submitted by each subcontractor in excess of \$1,000,000 or both more than \$500,000 and more than 10% of the prime contractor's proposed price.

4.1.2.1 If the subcontract is to be performed by two or more subcontract divisions, a separate SF Form 1411 shall be submitted by each division for its portion of the effort.

4.1.2.2 If any cost data is considered "proprietary" by a subcontractor, the data shall be submitted under separate cover directly to the cognizant ESD Contracting Officer.

4.2 COST FORMATS: Examples of the various cost formats required to be submitted as part of the cost proposal are provided in Attachment 1 of this instruction. Each of the cost formats is explained below. The prime contractor shall submit a complete set of cost formats for each form SF 1411. In addition, a separate, complete subset of cost formats shall be submitted for each interdivisional transfer and by each subcontractor in excess of \$1,000,000 for its portion of the effort.

4.2.1 Cost format A shall be used to summarize the total proposed price by cost elements, by offeror fiscal years.

4.2.2 Cost format B requires a list of purchased parts, subcontracts, raw material and interdivisional transfers at cost. The information shall be provided for each item with a total cost in excess of \$25,000. Under "basis for selection," indicate whether the item is competitive/low bid, competitive/non-low bid or sole source. Attach to cost format B, an explanation for each item which was not competitive/low bid. Under "basis of cost," indicate firm quote, budgetary quote, or estimate/no quote. Attach to cost format B an explanation for each item which was an estimate/no quote. Under "\$ allocation by WBS level 3 item," show dollar amount allocated to each WBS level 3 item (e.g., 1.1.1: \$5,000; 1.2.4: \$20,000; etc., until the total cost has been allocated). The remaining information to be provided is self-explanatory. All items with a total cost under \$25,000 may be combined and only the combined total cost need be shown under each element. The total amount for each of the four cost elements should equal the corresponding total cost amounts on cost format A. A complete bill of material must be available for review at the plant.

4.2.2.1 Each subcontract listed on cost format B must be supported by the contractor's written review of the subcontract proposal. The review (i.e., cost analysis/price negotiation memo) should address each subcontract cost element from both an audit and technical viewpoint. Cost exceptions shall be quantified.

4.2.3 Cost format C shall be used to prepare engineering and manufacturing labor rate and base summaries at the total cost level (WBS level 1). The total engineering and manufacturing hours and costs shown on cost format C should equal the corresponding totals on cost format A. Two summaries are required, as explained below. The number and type of labor categories are dependent upon your labor classification system and labor usage estimates. The number of rate periods is dependent upon your estimating system (e.g., monthly, quarterly or yearly labor rates) and the length of the contract. Both

the labor rates and bases shall be in terms of hours, days, or months, depending upon your normal estimating system. If the labor rates and bases are in terms of months, provide man-month to man-hour conversion factors at the bottom of the summaries.

4.2.3.1 Cost formats C-1 and C-2 shall be used to list all proposed engineering and manufacturing labor costs by hours (months) by labor category, by offeror fiscal years. If your estimating system derives hours/months through a factoring procedure, provide complete hour (month) build-ups on separate schedules. Also, provide a separate schedule which shows each factor by rate period, identifies the base to which each factor is applied, describes the function of each category of factored hours (months) and explains how each factor was developed.

4.2.4 Cost format D shall be used to prepare a summary of engineering, manufacturing, material handling, G&A and any other applicable burden rates by rate period. The number of rate periods is dependent upon your accounting system and the length of the contract. There should be a one-to-one correspondence between the rate periods shown on cost format D and the periods shown on cost format A. Note that cost format C requires that you identify the base (i.e., cost element name(s), not actual quantitative values) to which each indirect rate is applied.

4.2.5 Cost format E shall be used to provide the details of other direct cost by offeror fiscal year or other period, consistent with cost format A. Each other direct cost item, including travel, shall be shown separately. The total cost for each item shall be allocated to the appropriate WBS level 3 items in the same manner as that used to allocate the total cost for each direct material item on cost format B (see section 4.2.2 above). As an attachment to cost format E, for each other direct cost item, except travel for which details are provided on separate cost formats F, show the statistical derivation (i.e., rates, bases and arithmetic calculations) and provide narrative rationale.

4.2.6 Cost format F shall be used to prepare a summary of travel and living expenses at the total cost level (WBS level 1), by offeror fiscal year. The amounts shown on cost format F shall be direct costs (i.e., unburdened). At the bottom of cost format F list all proposed airfare, mileage, per diem, auto rental and other applicable rates.

4.2.7 Cost format G (DD Form 1861) shall be used to show how the proposed amount for facilities capital cost of money was calculated. A separate cost format G shall be submitted for each accounting period in which there is a proposed cost. The offeror may submit the required data on other than an actual DD Form 1861.

4.2.8 Cost format H shall be used to prepare a cumulative forecast of material commitment and material/labor expenditure by month. The material and labor amounts shown on the profile shall be fully burdened, but shall not include profit (i.e., at the total cost level). All forecasted costs shall be classified as either material or labor, whichever is more appropriate for each cost element. Material commitment is defined as placing a purchase order or awarding a subcontract. Material/labor expenditure is defined as an actual cash disbursement by the offeror, either payment to a vendor or employee wages. In the last column, show the major events which are expected to occur each month (e.g., PDR, CDX, delivery of first prototype, conclusion of system test, etc.). If necessary, list the major events by month on a separate schedule attached to cost format H.

4.2.9 Cost Format I shall be used to prepare a cost matrix in which the individual contract line items (CLINs) or subcontract line item (SCLINs) are listed separately by cost element and reconciled to the total contract price shown on the various Forms SF1411. CLINs/SCLINs which are not separately priced are not listed on this format. For the SF 1411 encompassing CLINs 0001-0005 and 0045-0046, the CLINs are 0001AA, 0001AB, 0002AA, 0002AB, 0003AD, 0004, 0005AB, 0045 and 0046. For the SF 1411 encompassing CLINs 0006-0007 the CLINs are 0006 and 0007AB. For the SF 1411 encompassing CLINs 0008 and 0009 the CLINs are 0008 and 0009AB. For the SF 1411 encompassing CLINs 0027-0034 it is all CLINs. For the SF 1411 encompassing CLINs 0035-0042, it is all CLINs. For the SF 1411 encompassing CLINs 0043-0044, it is CLIN 0043.

4.2.10 Cost format J shall be used to prepare a summary of non-recurring and recurring costs by WBS for levels 1 through 3.

4.2.11 Cost format K shall be used to prepare a cost matrix in which each WBS level 2 item is listed separately by cost element and reconciled to WBS level 1. Note that the format includes direct engineering and direct manufacturing labor hours.

4.2.11.1 Attach to cost format K, a matrix which shows, by dollar amount, how the total cost for each WBS level 2 item has been allocated to derive the proposed CLI prices (and sub-CLI prices, if separately priced). The matrix format shall be as follows:

<u>WBS</u>	<u>CLIs</u>			<u>TOTAL WBS</u>
	<u>0001</u>	<u>0002</u>	<u>000n</u>	
1.1				
1.2				
.				
.				
1.n				
<u>TOTAL CLI COST</u>				

Each total WBS amount on the matrix should equal the corresponding WBS level 2 total cost amount on cost format K. Each total CLI cost on the matrix should equal the corresponding total cost amount on cost format I. The sum of the total WBS and total CLI cost amounts should be the same. The WBS level 2/CLI matrix need not be submitted, if the contract does not include separately priced CLIs.

4.2.12 Cost format L shall be used to prepare a separate cost matrix for each WBS level 2 item. For each WBS level 2 item, its WBS level 3 items are listed separately by cost element and reconciled to WBS level 2. A cost format L need not be submitted for WBS level 2 items which are not broken down to WBS level 3. Note that the format includes direct engineering and direct manufacturing labor hours.

COST FORMAT A		PRICE SUMMARY BY OFFEROR FISCAL YEARS					ATTACHMENT 1
COST ELEMENTS		FY 1	FY 2	*	*	*	TOTAL
1. DIRECT MATERIAL	a. PURCHASED PARTS						
	b. SUBCONTRACTED ITEMS						
	c. OTHER MATERIAL						
	(1) RAW MATERIAL						
	(2) STANDARD COMMERCIAL ITEMS						
	(3) INTERDIVISIONAL TRANSFERS (AT OTHER THAN COST)						
2.	MATERIAL OVERHEAD						
3.	INTERDIVISIONAL TRANSFERS AT COST						
4A.	DIRECT ENGINEERING LABOR HOURS						
4B.	DIRECT ENGINEERING LABOR \$s						
5.	ENGINEERING OVERHEAD						
6A.	DIRECT MANUFACTURING LABOR HOURS						
6B.	DIRECT MANUFACTURING LABOR \$s						
7.	MANUFACTURING OVERHEAD						
8.	OTHER DIRECT COSTS						
9.	SUBTOTALS						
10.	GLA EXPENSES						
11.	SUBTOTALS						
12.	FACILITIES CAPITAL COST OF MONEY						
13.	TOTAL COST						
14.	TOTAL PROFIT						

COST FORECAST  
BUDGET OF DIRECT MATERIAL AND INTERDIV. TOTAL TRANSPORTS AT COST

<u>LINE DESCRIPTION</u>	<u>SOURCE</u>	<u> BASIS FOR SELECTION</u>	<u>TYPE OF CONTRACT</u>	<u> BASIS OF COST</u>	<u>QUANTITY</u>	<u>UNIT COST</u>	<u>TOTAL COST</u>	<u>ALLOCATION BY WBS LEVEL 3 1971</u>
<u>PURCHASED PARTS</u>								
ITEM 1								
ITEM 2								
.								
.								
ITEM 4								
TOTAL UNDER \$25,000								
TOTAL PURCH PARTS								
<u>SUBCONTRACTS</u>								
.								
.								
.								
<u>RAW MATERIAL</u>								
.								
.								
.								
<u>INTERDIV. Trans. &amp; Cost</u>								
ITEM 1								
ITEM 2								
.								
.								
.								
ITEM 6								
TOTAL UNDER \$25,000								
TOTAL INT & Cost								



COST FORMAT C-1ENGINEERING SUMMARY

	<u>FY 1</u>	<u>FY 2</u>	<u>FY N</u>	<u>TOTALS</u>
LABOR CATEGORY 1				
HOURS/MONTHS				
RATE				
COST				
LABOR CATEGORY 2				
.				
.				
.				
LABOR CATEGORY 3				
.				
.				
.				
LABOR CATEGORY N				
.				
.				
.				

ATTACHMENT 1

COST FORMAT C-2

MANUFACTURING SUMMARY

	<u>FY 1</u>	<u>FY 2</u>	<u>FY N</u>	<u>TOTALS</u>
LABOR CATEGORY 1				
HOURS/MONTHS				
RATE				
COST				
LABOR CATEGORY 2				
.				
.				
.				
LABOR CATEGORY 3				
.				
.				
.				
LABOR CATEGORY N				
.				
.				
.				

COST FORMAT DINDIRECT COST RATE SUMMARY

<u>INDIRECT ITEM</u>	<u>RATE</u> <u>PERIOD 1</u>	<u>RATE</u> <u>PERIOD 2</u> . . .	<u>RATE</u> <u>PERIOD n</u>	<u>BASE</u>
INDIRECT ITEM 1				
INDIRECT ITEM 2				
INDIRECT ITEM n				

COST FORMAT 1  
SUMMARY OF OTHER DIRECT COSTS

<u>ITEM DESCRIPTION</u>	<u>FY 1</u>	<u>FY 2</u>	.	.	.	<u>FY 11</u>	<u>TOTAL COST</u>	<u>\$ ALLOCATION</u> <u>WBS LEVEL 3.1</u>
ITEM 1								
ITEM 2								
.								
.								
..								
.								
ITEM N								
TRAVEL								
TOTAL OTHER DIRECT COSTS								

## ATTACHMENT 1

COST FORMAT FSUMMARY OF TRAVEL AND LIVING EXPENSES

<u>DEPARTURE</u> <u>LOCATION</u>	<u>ARRIVAL</u> <u>LOCATION</u>	<u>AIRFARE/</u> <u>MILEAGE COST</u>	<u>PER DIEM</u> <u>COST</u>	<u>AUTO RENTAL</u> <u>COST</u>	<u>TOTAL COST</u> <u>PER TRIP</u> <u>(1 PERSON)</u>	<u># OF</u> <u>TRIPS</u>	<u>TOTAL</u> <u>COST</u>
FY 1							
FY 2							
FY 3							
FY N							

DD FORM 1861  
1 SEP 76

2635

**INSTRUCTIONS FOR DD FORM 1861  
CONTRACT FACILITIES CAPITAL AND COST OF MONEY**

**PURPOSE.** The purpose of this form is to compute the estimated facilities capital to be employed for a specific contract proposal. An intermediate step is to compute the estimated facilities capital cost of money, using the Facilities Capital Cost of Money Factors developed on Form(s) CASB-CMF. This procedure is intended to be fully compatible with Cost Accounting Standard 414 "Cost of Money as an Element of the Cost of Facilities Capital," and extend those criteria and techniques to prospective periods for forward pricing purposes. ASPR 3-1300 should be referred to for applicability and further explanation.

**IDENTIFICATION.** Identify the contractor, business unit and address. Identify the specific RFP or contract to which the computation pertains, by PIIN number. Identify the estimated performance period of the contract.

**OVERHEAD POOLS (COL. 1).** List all business unit overhead pools and direct-charging service/support centers whose costs will be allocated to this contract. The structure must be compatible with the contractor's cost proposal and Form(s) CASB-CMF.

**COST ACCOUNTING PERIOD (COL. 2).** This column is used only for the "projected" method of estimating contract facilities capital employed and cost of money. Each Overhead Pool listed must be further broken down by each Cost Accounting Period impacted by the Performance Period of the contract. The yearly breakdown must also correspond to yearly overhead allocation bases in the contractor's cost proposal, and to separate Forms CASB-CMF for each year listed. If the "historical" method is used, the column should be ignored.

**CONTRACT OVERHEAD ALLOCATION BASE (COL. 3).** For each Overhead Pool and Cost Accounting Period listed, record the same Contract Overhead Allocation Base amounts used in the pricing report to derive the pre-negotiation cost objective. Such amounts should be the same as those used for burdening contract overhead or applying service/support center use charges. The base units-of-measure must agree with those used on the Form(s) CASB-CMF.

**FACILITIES CAPITAL COST OF MONEY FACTORS (COL. 4).** Carry forward the appropriate estimated Facilities Capital Cost of Money Factors from the Form(s) CASB-CMF. Business units, overhead pools and cost accounting periods must agree.

**FACILITIES CAPITAL COST OF MONEY AMOUNT (COL. 5).** The product of each Contract Overhead Allocation Base (Col. 3) multiplied by its related Facilities Capital Cost of Money Factor (Col. 4).

**CONTRACT FACILITIES CAPITAL COST OF MONEY (LINE 6).** The sum of Col. 5. This represents the contract's allocable share of the business unit's estimated cost of money for the cost accounting period(s) impacted by the contract performance period. Therefore it represents a portion of the total(s) of Col. 5 of Form CASB-CMF.

**FACILITIES CAPITAL COST OF MONEY RATE (LINE 7).** The same Cost of Money Rate used in Col. 1 of the Form(s) CASB-CMF. Only one rate will be used in the facilities capital estimating process regardless of the length of the contract performance period.

**CONTRACT FACILITIES CAPITAL EMPLOYED (LINE 8).** The quotient of Line 6 divided by Line 7. This represents the contract's allocable share of the business unit's estimated facilities value for the cost accounting period(s) impacted by the contract. Therefore it represents a portion of the total(s) of Col. 4 of Form CASB-CMF.

ATTACHMENT 1

COST FORMAT H

COMMITMENT/EXPENDITURE PROFILE

<u>MAC</u>	<u>MATERIAL COMMITMENT</u>	<u>MATERIAL EXPENDITURE</u>	<u>LABOR EXPENDITURE</u>	<u>TOTAL EXPENDITURE</u>	<u>PROGRAM MILESTONES</u>
------------	--------------------------------	---------------------------------	------------------------------	------------------------------	-------------------------------

1

2

3

4



COST FORMATING  
WBS CODE, THE FIRST TWO/ALC CODES, COST ELEMENT

<u>WBS LEVEL</u>	<u>WBS TYPE</u>	<u>NON-ALC CODE</u>	<u>ALC CODE</u>	<u>TOTAL COST</u>	<u>PROFIT PCT</u>	<u>TOTAL PCT</u>
1.0	SYSTEM					
1.1	FIRST LEVEL 2					
1.1.1	FIRST LEVEL 3					
.	.					
.	.					
1.1.n	LAST LEVEL 3					
1.2	SECOND LEVEL 2					
1.2.1	FIRST LEVEL 3					
.	.					
.	.					
1.2.n	LAST LEVEL 3					
.	.					
.	.					
1.n	LAST LEVEL 2					
1.n.1	FIRST LEVEL 3					
.	.					
.	.					
1.n.n	LAST LEVEL 3					

## COST FORMAT 1

CONTRACT LINE ITEM SUMMARY

ATTACHMENT 1

COST ELEMENTS		0001	0002	.	.	.	0000	TOTAL PRICE
1. DIRECT MATERIAL	a. PURCHASED PARTS							
	b. SUBCONTRACTED ITEMS							
	c. OTHER MATERIAL							
	(1) RAW MATERIAL							
	(2) STANDARD COMMERCIAL ITEMS							
	(3) INTERDIVISIONAL TRANSFERS (AT OTHER THAN COST)							
	2. MATERIAL OVERHEAD							
	3. INTERDIVISIONAL TRANSFERS AT COST							
	4A. DIRECT ENGINEERING LABOR HOURS							
	4B. DIRECT ENGINEERING LABOR \$s							
	5. ENGINEERING OVERHEAD							
	6A. DIRECT MANUFACTURING LABOR HOURS							
	6B. DIRECT MANUFACTURING LABOR \$s							
	7. MANUFACTURING OVERHEAD							
	8. OTHER DIRECT COSTS							
	9. SUBTOTALS							
	10. G&A EXPENSES							
	11. SUBTOTALS							
	12. FACILITIES CAPITAL COST OF MONEY							
	13. TOTAL COST							
	14. TOTAL PROFIT							

COST ELEMENT 1		SEE LEVEL 2 SUMMARY					ATTACHMENT 1	
COST ELEMENTS		COST BREAKDOWN STRUCTURE LEVEL 2					(1.1.0)	(1.1.0)
		(1.1)	(1.2)	.	.	.	(1.1.n)	Total
1. DIRECT MATERIAL	2. PURCHASED PARTS							
	1. SUBCONTRACTED ITEMS							
	3. OTHER MATERIAL							
	(1) RAW MATERIAL							
	(2) STANDARD COMMERCIAL ITEMS							
	(3) INTERDIVISIONAL TRANSFERS (AT OTHER THAN COST)							
	2. MATERIAL OVERHEAD							
	3. INTERDIVISIONAL TRANSFERS AT COST							
	4A. DIRECT ENGINEERING LABOR HOURS							
	4B. DIRECT ENGINEERING LABOR \$s							
	5. ENGINEERING OVERHEAD							
	6A. DIRECT MANUFACTURING LABOR HOURS							
	6B. DIRECT MANUFACTURING LABOR \$s							
	7. MANUFACTURING OVERHEAD							
	8. OTHER DIRECT COSTS							
	9. SUBTOTALS							
	10. G&A EXPENSES							
	11. SUBTOTALS							
	12. FACILITIES CAPITAL COST OF ONLY							
	13. TOTAL COST							

2. 52.252-2 CLAUSES INCORPORATED BY REFERENCE (APR 1964)

This contract incorporates the following clauses by reference, with the same force and effect as if they were given in full text. Upon request, the Contracting Officer will make their full text available.

1. FEDERAL ACQUISITION REGULATION (48 CFR CHAPTER 1) CLAUSES

<u>REF</u>	<u>REF NO.</u>	<u>TITLE</u>	<u>DATE</u>
1.	52.246-2	INSPECTION OF SUPPLIES - FIXED-PRICE ALTERNATE 1 (Applies to CLINs 0043 - 0044 only)	APR 1964 APR 1964
2.	52.246-3	INSPECTION OF SUPPLIES - COST- REIMBURSEMENT	APR 1964
3.	52.246-4	INSPECTION OF SERVICES - FIXED-PRICE (Applies to CLINs 0010 - 0042)	APR 1964
4.	52.246-7	INSPECTION OF RESEARCH AND DEVELOPMENT- FIXED PRICE	APR 1964
5.	52.246-11	HIGHER-LEVEL CONTRACT QUALITY REQUIREMENT (GOVERNMENT SPECIFICATION) (Insert "Military Specification MIL-Q-9858A" in the blank space in paragraph (b) of the clause.)	APR 1964
6.	52.246-16	RESPONSIBILITY FOR SUPPLIES	APR 1964

2. F.O.B. Point

All deliveries shall be F.O.B. destination.

3. Shipping Instructions

Shipping instructions shall be issued at a later date.

4. 52.232-2 CLAUSES INCORPORATED BY REFERENCE (APR 1964)

This contract incorporates the following clauses by reference, with the same force and effect as if they were given in full text. Upon request, the Contracting Officer will make their full text available.

I. FEDERAL ACQUISITION REGULATION (48 CFR CHAPTER 1) CLAUSES

<u>REF</u>	<u>REF NO.</u>	<u>TITLE</u>	<u>DATE</u>
1.	52.212-9	FLUCTUATION IN QUANTITY (Insert "0" per cent increase, "0" per cent decrease, "all items" in the blank space.)	APR 1964
2.	52.212-13	STOP WORK ORDER	APR 1964
3.	52.212-15	GOVERNMENT DELAY OF WORK	APR 1964
4.	52.247-34	F.O.B. DESTINATION	APR 1964
5.	52.247-55	F.O.B. POINT OF DELIVERY OF GPO	APR 1964

## SECTION B - SPECIAL CONTRACT REQUIREMENTS

### A. AF FAR SUP Clauses in Full Text

#### 1. 51.204-1 SECRETARIAL APPROVAL OF CONTRACT

APR 1984

The agency official designated to approve this contract as required by the clause entitled 'Approval of Contract' is the Secretary or a duly authorized representative.

### B. FSD FAR SUP Clauses in Full Text

#### 1. 52.211-9500 - CONTRACTOR RESPONSIBILITY

Notwithstanding the right of the Government to review the Contractor's efforts and progress and particularly with reference to the design reviews, specifications, and data items, which may be provided for elsewhere in this contract, it is expressly understood that the Contractor is completely responsible for the compliance of contract and items with the provisions of this contract and any reviews and approvals given by the Government do not relieve the Contractor of this responsibility.

#### 2. 52.215-9519 - ACQUISITION MANAGEMENT INFORMATION SYSTEM (AMIS) FORMS

Any reference in this contract to Standard Form 30 shall be considered interchangeable with AFSC Form 702 and any reference to DD Forms 1423 shall be considered interchangeable with AFSC Forms 707, 708 and 709.

#### 3. 52.215-9520 - CONTRACTING OFFICER'S AUTHORITY

The Contracting Officer shall be the only individual authorized to direct and/or redirect the efforts or in any way amend any of the items of this contract other than those instances specifically delegated to an Administrative Contracting Officer or a Termination Contracting Officer by the Contract Clauses of this contract or in writing by the Contracting Officer. The terms 'Procuring Contracting Officer' and 'Principal Contracting Officer' as used throughout this contract and its attachments, is synonymous with the term 'Contracting Officer.'

#### 4. 52.215-9521 - INCORPORATION BY REFERENCE

All specifications, exhibits, drawings or other documents which are referenced in this contract, but are not attached hereto, are hereby incorporated by reference.

5. 52.215-9522 - CONTRACT DATES

a. All periods of time referenced herein shall be measured by calendar days, weeks, months, as opposed to "work" days, weeks, months.

b. With regard to the dates for submission of reports, data, hardware, etc., called for in Section 7 hereof, the contractor will submit same in sufficient time to allow for their arrival at the specified destination on the due date indicated.

c. The "Contract Award Date" shall be synonymous with the mailing date.

d. The term "DAC" means days after contract award date and is calculated on the basis of calendar days.

e. The term "MAC" means months after contract award date and is calculated on the basis of calendar months.

6. 52.215-9523 - CONTRACT DATA REQUIREMENTS LISTS

For purposes of this contract, data requirements are set forth on DD Forms 1423 and/or AFSC Forms 707, 708 and 709.

7. 52.215-9524 - ORDER OF PRECEDENCE

In the event of an inconsistency in this contract, unless otherwise provided herein, the inconsistency shall be resolved by giving precedence in the following order: (a) the Schedule (excluding the Specifications, Statement of Work, Contract Data Requirements lists and selected portions of the Contractor's Technical Proposals); (b) Contract Clauses; (c) the Special Contract Requirements of the contract whether incorporated by reference or otherwise; (d) the Statement of Work; (e) the Specifications; and (f) the Contract Data Requirements List.

8. 52.215-9525 - ACKNOWLEDGEMENT OF SPONSORSHIP

a. The Contractor agrees that in the release of information relating to this contract such release shall include a statement to the effect that the project or effort depicted was or is sponsored by: the Air Force Systems Command.

b. For the purpose of this clause, "information" includes, but is not limited to, news releases, articles, manuscripts, brochures, advertisements, still and motion pictures, speeches, trade association meetings, symposia, etc.

c. Nothing in the foregoing shall affect compliance with the requirements of the clause of this contract entitled, "Military Security Requirements".

d. The Contractor further agrees to include this provision in any subcontract awarded as a result of this contract.

9. 52.215-9528 - SCIENTIFIC/TECHNICAL INFORMATION (STINPO)

The Contractor shall register for Defense Technical Information Center (DTIC) service as defined in AFM 80-44 using DD Form 1340. The Contractor shall search existing sources in the DTIC, including the Work Unit Data Bank (DD Form 1338), to determine the current state-of-the-art concepts, studies, etc., to avoid duplication of effort and conserve scientific and technical resources.

10. 52.215-9529 - PASSPORTS, VISAS, LICENSES, AND PERMITS

The Contractor shall be responsible for timely and complete submission of the necessary information and forms directly to the appropriate Government agency for the required passports, visas, licenses, or permits. (Military Assistance and Sales Manual (MASM), part III, p. 3-31, para 1, "Passports, Visas, Licenses, and Permits")

11. 52.215-9500 LEVEL OF EFFORT (MCSNs 0048 and 0051, and CLDs 0113 - 0116, if options exercised)

a. These are Firm Fixed-Price Level of Effort Term Contract Line Items pursuant to FAR 16-207.

b. The contractor shall furnish all the necessary qualified personnel, materials, facilities and management resources to develop/fabricate the supplies and furnish the services set forth in the Statement of Work within the terms specified and at the prices stated below.

c. It is understood and agreed that the contractor shall use in the performance of the contract the following labor categories and hours.

CLIN	Category	Man Hours	Hourly Rate	Loaded Rate
0048	Sr Telecommunications Engr	748	\$16.16	\$ 45.97
	Project Manager	748	25.34	72.95
	Contract Admin (Composite)	260	19.07	49.24
	Subcontract Admin	160	6.36	22.42
	Dir, Technical Operations	260	28.62	72.38
	Engr, Electronics	450	20.00	50.59
	Engr, Test & Evaluation	548	18.50	46.79
	Sr Engineer	748	21.03	53.20
	Sr Draftsperson	748	10.10	25.54
	Sr Logistics Engr	748	21.63	54.70
	Technician	240	14.54	27.55
	Clerk Typist (Composite)	1,496	7.00	17.70
	Supply Technician	132	8.50	21.50
	4Cs Sr Technician	1,344	-	113.51
	4Cs Technician	144	-	67.15
	4Cs Program Management	181	-	120.05
	4Cs Admin Support	269	-	46.51
	4Cs Sr Test/Field Engr	48	-	74.60



<u>CCIN</u>	<u>Category</u>	<u>Max. Hours</u>	<u>Brly Rate</u>	<u>Loaded Rate</u>
2647 0051	Contract Admin (composite)	500	\$19.07	\$ 49.24
	Subcontract Admin (composite)	480	5.36	22.42
	Dir, Technical Operations	190	23.52	72.33
	Sr Engineer	245	24.04	60.77
	Sr Computer Systems Engr	220	20.00	50.33
	Sr Information Systems Engr	120	19.00	48.25
	RMS Engr	220	16.50	46.79
	Clerk/Typist	220	7.00	17.70
	Sr Logistics Engr	50	21.39	54.10
	Configuration Management	220	16.50	46.79
	41s Sr Technician	240	-	113.51
	41s Technician	40	-	67.25
	41s Admin Support	30	-	46.51

0023 - 0026 To be set forth herein when determined and negotiated.

d. The above rates are comprised of the basic salary rate plus all burden and profit computed in accordance with the contractor's approved accounting procedures in effect as of the date of this agreement. These rates will be used for payment purposes and will be used as a means of reducing the total contract price in the event the contractor does not furnish the level of effort specified. Payment will be made not more frequently than monthly.

e. At the completion of this contract, the contractor shall furnish to the Contracting Officer the total number of hours and categories of labor used in the performance of this contract, certified by an authorized representative of the contractor.

f. In the event the contractor expends fewer hours than set forth above in the performance of this contract, the total contract price shall be reduced by an amount equal to the number of hours not expended at (the hourly rate set forth above). If the Contracting Officer and the Contractor fail to agree on the number of hours incurred in the performance of the contract, it shall be settled in accordance with the "Disputes" clause of this contract.

g. Notwithstanding any other contract provision, the contractor shall maintain sufficient accounting records for verification of the hours and categories of labor incurred in the performance of this contract. It is further understood and agreed that these accounting records shall be available for Government review during the performance of the contract and until three years after final payment of the contract. In the event subcontract labor is included in the labor effort contained in paragraph (c) above, the foregoing records provisions shall be included in all applicable subcontracts.

h. Payment under this contract shall be in accordance with FAR 52.232-1 (Payments). The invoice which the contractor submits to the AOC for payment shall contain a breakdown of monthly \*\*\* labor hours expended which separately identifies the total hours to be charged, labor classification, and hours worked for each contributing employee. A copy of each such invoice shall be provided directly to the Contracting Officer. Prior to payment, an authorized representative of the contractor shall certify, on the monthly invoice, the accuracy of the information contained on the invoice. An invoice shall not be considered complete and eligible for payment until such certification is provided.

i. If the employee identified in the invoice is paid at a rate lower than the basic hourly labor rate identified above, then the loaded rate for that labor category shall be subject to renegotiation. That renegotiation shall be based on the employee's actual hourly labor rate loaded with the appropriate overhead and with 15% profit. The renegotiated labor rate shall then apply to the hours expended by the employee.

12. 52.217-9501 - OPTION FOR INCREASED QUANTITY - SEPARATELY PRICED LINE ITEM

The Government may increase the quantity of supplies (or services) called for herein by requiring the delivery of the numbered-line item identified in the Schedule as an option item, in the quantity and at the price set forth therein. The Contracting Officer may exercise this option, at any time within the period specified in the Schedule by giving written notice to the Contractor. Delivery of the items added by the exercise of this option shall be as set forth in Section 9.

13. 52.219-9504 - SMALL BUSINESS ADMINISTRATION SPECIAL PROVISION

a. The Small Business Administration (SBA) certifies that it is competent and responsible to perform the requirement as stated in the contract.

b. The SBA agrees to furnish all labor, materials and equipment for the performance of the work as stated in this contract and according to contract specifications by subcontracting pursuant to the provisions of Section 8(a) of the Small Business Act, as amended.

c. The parties agree that the Subcontractor, (to be completed prior to contract award) shall for and in the stead of the SBA fulfill and perform all of the requirements of the prime contract for the consideration stated therein. Whenever the term "Contractor" appears in this contract, it shall be construed to mean Subcontractor.

d. It is understood and agreed that in the event SBA does not award subcontracts for the performance for all or a part of the work hereunder, this contract may be terminated in whole or in part without cost to either party.

e. The SBA delegates to the Defense Contract Administration Services/Management Area (DCASMA) responsibility for administering its subcontract hereunder. This includes issuance of orders, inspection and acceptance of materials/services by its authorized representatives, and direct payment to the Subcontractor.

f. The provisions of the "Termination for Convenience", "Changes", "Disputes", "Default" and "Price Reduction" clauses which are included in the contract between SBA and its Contractor shall be invoked in appropriate cases when requested by the DOD Contracting Officer. If SBA does not agree with the DOD Contracting Officer's request, the case shall be referred to the Secretary or his designee for decision. For the purposes of Section 6(d) of the Contract Disputes Act of 1978, Public Law 95-653, the agency board designated as having the jurisdiction to decide appeals from decisions of the Contracting Officer relative to disputes relating to this contract is the Armed Services Board of Contract Appeals.

g. The SBA's subcontractor shall have the right of appealing decisions of the Contracting Officer cognizable under the "Disputes" clause of said subcontract.

h. It is further agreed that SBA will be continuously apprised by the Contracting Officer administering the subcontract as to the progress and performance of the subcontractor. No action that could possibly lead to the termination of the contract for "default" or for "convenience of the Government" will be taken by the Contracting Officer or his/her authorized representative without prior consultation with SBA.

#### 14. 52.227-9501 - RIGHTS IN DATA

Pursuant to the clause in Section I hereof entitled "Rights in Technical Data and Computer Software", the parties hereto agree that all technical data and computer software deliverable, or subject to delivery, to the Government under the contract shall be furnished with unlimited rights.

#### 15. 52.227-9506 - DATA/SOFTWARE ACCESSION LIST

The Contractor agrees to make available upon request, copies of any and all data/software generated during the performance of work hereunder. Based upon the Data Accession List required by DI-A-3027, the Contracting Officer may order such data/software and shall notify the Contractor of data desired. The Contractor shall make available two (2) copies of the requested data/software within five (5) working days from date of receipt of the request. The cost of furnishing such ordered data/software shall be subject to payment as set forth in the "Deferred Ordering of Technical Data or Computer Software" clause, General Provision DOD FAR Sup 52.227-7027.

#### 16. 52.227-9507 - MODIFICATION OF DATA REQUIREMENTS

a. From time to time during the performance of this contract, the Contracting Officer unilaterally may change the place of delivery and the technical office for any data item of the Contract Data Requirements List (CDRL) hereto, at no change in contract price, notwithstanding the provisions of the clause hereof, entitled "Changes".

b. From time to time during the performance of this contract, the Contracting Officer, unilaterally may increase or decrease the number of addressees and/or increase or decrease the number of copies (regular or reproducible) specified for any addressee of any data item of any DDPI hereto, at no change in contract price, provided, that, the increase in the total number of copies (regular and reproducible) for an individual data item shall not be greater than fifty percent (50%) of the total number of copies (regular and reproducible) initially specified nor shall the decrease in the total number of copies (regular and reproducible) for an individual data item be greater than fifty percent (50%) of the total number of copies (regular and reproducible) initially specified. In the event of an increase greater than such 50% or of a decrease greater than such 50%, the parties will negotiate any equitable adjustments in accordance with the procedures of the "Changes" clause.

c. Unilateral action pursuant to a. and b. above shall be by the issuance of a Modification to this contract which will reference this Provision as its authority and include the revised DDPI pages. Any action directed by this Provision shall be effected by the Contractor beginning with the first submission of the particular data item or items after receipt by the Contractor of the Modification directing such action.

#### 17. 51.103-9500 - INSURANCE

The following minimum kinds and amounts of insurance are applicable in the performance of the work under this contract.

a. Workmen's Compensation and Employers' Liability Insurance. Contractor's are required to comply with applicable Federal and State workers' compensation and occupational disease statutes. If occupational diseases are not compensable under those statutes, they shall be covered under the employer's liability section of the insurance policy, except when contract operations are so commingled with a contractor's commercial operations that it would not be practical to require this coverage. Employer's liability coverage of at least \$100,000 shall be required, except in States with exclusive or monopolistic funds that do not permit workers' compensation to be written by private carriers (Nevada, North Dakota, Ohio, Washington, West Virginia and Wyoming).

b. General Liability Insurance. (1) Bodily injury liability insurance coverage in the minimum limits of \$500,000 per occurrence shall be required on the comprehensive form of policy; however, property damage liability shall be required.

c. Automobile Liability Insurance. This insurance shall be required on the comprehensive form of policy and shall provide bodily injury liability and property damage liability covering the operation of all automobiles used in connection with the performance of the contract. At least the minimum limits of \$100,000 per person and \$500,000 per occurrence for bodily injury and \$20,000 per occurrence for property damage shall be required.

d. Aircraft Public and Passenger Liability Insurance. When aircraft are used in connection with the performance of the contract, such insurance is considered required coverage. The minimum limits of \$200,000 per person and \$500,000 per occurrence for bodily injury, other than passenger liability, and a limit of \$100,000 per occurrence for property damage shall be required. Passenger liability bodily injury limits of \$200,000 per passenger with an aggregate equal to total number of seats or number of passengers, whichever is greater, shall also be required.

18. 52.231-9502 EXECUTIVE ESTIMATE OF COST AT COMPLETION

A corporate level "line" official shall provide directly to Hq ASD/SC, Hanscom AFB, MA 01731, an executive level estimate of the contract cost at completion on 31 March, 30 June, 30 September, and 31 December of each year during the performance of this contract. This should be a brief, but not more than one page, letter presenting the executive's view of cost at completion.

19. 52.231-9504 - SEGREGATION OF COSTS

The Contractor shall segregate all costs associated with CLINs 0001AA, 0001AB, 0004, 0005, 0045 and 0046 (and 0006, 0007, 0008, 0009 and 0010 - 0042, 0044AA, and 0044AB if ordered) (3080 funded CLINs) from 0001AB, 0001AB, and 001AA, 3500 funded CLINs) and segregate those CLINs from CLIN 0043 (if ordered) (FFPI CLIN) and from CLINs 0048 and 0051 (and CLINs 0023 - 0026, if ordered) (FFPI CLINs) and segregate those CLINs from CLINs 0049, 0050, 0052, and 0053 (CP and CPFF CLINs). Additionally each other group of CLINs shall have its costs segregated from all other groups of CLINs. All such segregations of costs shall be done in such a manner such that at any time the costs incurred with that group of CLINs shall be readily ascertainable.

20. 52.241-9000 - MINISTRIP REQUISITIONING

a. The Contractor will MINISTRIP requisition all NSN items of material required to support GFE or modified GFE in accordance with the Federal Acquisition Regulation (FAR), Appendix E and AFMIL 170-6, incorporated herein by reference, on a "do not backorder", non-substitute basis, showing need date as Contractor requisition/production lead time prior to program need date.

b. For stock find items, the Contractor will utilize the Program Office (PO) provided Alpha Code in CC-40, Signal Code in CC-51 and Fund Code in CC-52 and 53 of the DD Form 1346. The Contractor will submit one (1) priced copy, with extended cost in the remarks column, of each requisition to ASD (ACPC-2) simultaneously with submission to DSA/AFIC-IM for supply action. The Contractor will notify ASD (ACPC-2) of requisitions revised or cancelled to assure currency of funds obligations. The Contractor will advise ASD (ACPC-2) of receipt of requisitioned material within five (5) days of such receipt. The fact that the items are not available in the Government inventory in time to satisfy contractor need dates does not relieve the contractor of his responsibility for meeting established contract program schedules.

c. Rejected or unavailable NSN items will be added to Contractor-furnished items, in which event the contractor shall promptly notify the Contracting Officer and the contract price shall be subject to equitable adjustment.

d. The Contractor shall comply with policy and procedures contained in DOD 4100.13M, Provisioning and other Preprocurement Screening Manual, to obtain item identification and management data. Results of the Preprocurement Screening shall be incorporated into the property records prepared and maintained in accordance with provisions of FAR Appendix B.

e. The Contractor will control, maintain, and effect disposition of property furnished by the Government or acquired for the account of the Government in accordance with the Government Property clause of this contract and FAR Appendix B. The Contractor will maintain usage data in a manner which will enable him to prepare the stock balance and consumption listing required. Government furnished spare/repair parts, spare/repair parts acquired for the account of the Government under the Government Property clause, and spare/repair parts which are contractor-furnished, the costs of which have been allocated to this contract on a direct charge basis, will be maintained so as to be serviceable and of current configuration with the contract and article and shall be delivered to the Government upon contract completion at no increase to contract price.

## 21. 50145-9501- GOVERNMENT FURNISHED PROPERTY

Pursuant to the clause hereof entitled "Government Property (Fixed-Price Contracts)", the Government shall furnish the Contractor the Government property identified below on or before the date(s) specified. If materials are to be furnished, the Contractor shall prepare the requisitioning documentation. Additionally, the Contractor shall comply with AFSCR 170-6, incorporated herein by reference, when using MILSTRIP procedures to requisition Government-furnished material.

<u>Description</u>	<u>Qty</u>	<u>Availability Date</u>
<u>Iceland:</u>		
Latent-Trail Software		1 MAC
TSEC/KG-40 Encryption Device	1	1 MAC
TSEC/KY-65 Encryption Device	2	1 MAC
AN/USQ-76 Data Terminal Set	2	1 MAC
Icelandic Postal and	TBD	Contract Award
Telecommunication		
Telephone Circuits		
FMCS Circuits (Military)	TBD	TBD
HF Antenna Pads	2	Contract Award
<u>CENTAF: AN/USQ-76 Data</u>		
Terminal Set	1	1 MAC
TSEC/KG-40 Encryption	1	1 MAC
Device		
<u>EAC/PACAF: TSEC/KG-40 Encryption</u>	1	1 MAC
Device		

22. 52.146-9504 - DETERMINATION OF BASE SUPPORT

Pursuant to the 'Base Support' clause herein, the contemplated items of base support presently agreed to by the parties, and contained in the pricing of this contract, are as listed below. Unless otherwise specified for any particular listed item, such base support shall be furnished by the Government in such quantities and at such times as may reasonably be required in the performance of this contract.

To Be Determined

23. 52.146-9500 - REQUIREMENTS FOR DATA ACCEPTANCE

The Contractor shall prepare and submit a DD Form 250 on a one-time basis collectively accounting for all completed Exhibit Line Schedule Items which called for submission of data with a letter of transmittal. Each periodic DD Form 250 shall include a list and an account of all data submitted and approved by the Government during the reporting period.

24. 146-9501 - REQUIREMENTS FOR DATA ACCEPTANCE

The Contractor shall prepare and submit a final DD Form 250 on a one-time basis for each attachment collectively accounting for all completed items on each of Attachments I through II which called for submission of data with a letter of transmittal. This DD Form 250 will be submitted at the time of delivery of last data report item.

C. Other Special Contract Requirements

1. DEFINITIONS

Wherever the term 'clause' or 'provision' or 'special provision' appears throughout this contract, it shall be deemed to read 'special contract requirement'. Wherever the term 'general provision' appears throughout this contract it shall be deemed to read 'contract clause'.

2. PRODUCTIVITY SAVINGS REWARDS (PSR) SHARING FACTOR

(a) Purpose. The purpose of this clause is to permit a contractor to be paid Productivity Savings Rewards (PSR) via a sharing factor in accordance with the terms and conditions of an Industrial Modernization Incentives Program (IMIP) business agreement. PSR constitutes the contractor's share of the total DoD net benefits (savings/cost avoidance) resulting from a signed IMIP agreement establishing appropriate provisions for calculation and payment of the PSR. An IMIP business agreement is an arrangement whereby incentives are provided to a contractor to modernize, improve productivity, and reduce acquisition costs. Detailed analysis of the DoD benefits to be derived and verification of savings are described in the business agreement. The sharing factor methodology is intended to be used in a multi-program or factory-wide modernization situation.

(a) Applicability. Inclusion of this clause in this contract does not in itself result in the payment of any PSR amounts to the contractor. This clause shall be operable only when a business agreement has been executed establishing all of the terms and conditions for payment of the PSR, and establishing the total amount of the PSR and specifying that the total amount has not been earned through previous contracts. This agreement may be directly between DOD and the contractor, or between the contractor and a lower tier DOD contractor, provided DOD approval has been obtained for the subcontract program. This clause provides conditions for payment of the PSR amount applicable to this contract pursuant to the provisions of the IMIP business agreement.

(1) Payment. The contracting officer is authorized to approve PSR amounts for payment under this contract if this contract benefits from the DOD IMIP and these benefits (i.e., cost avoidance or cost reductions) occur during the sharing period as defined in the IMIP business agreement. The amount of PSR allocable to this contract along with the frequency of payment will be determined in accordance with the terms and conditions of the IMIP business agreement. When these conditions are met and verified, the contractor shall be paid PSR amounts under a separate, fixed price line item from the funds obligated for that line item on this contract. The contractor or subcontractor shall keep records acceptable to the contracting officer of all PSR payments received under a specific IMIP business agreement. The contractor is authorized to request payment of PSR in accordance with terms specified in the IMIP business agreement. The contractor shall include the following certification on each invoice for payment of a PSR share:

"It is hereby certified that the PSR amount requested on this invoice represents an incremental share of the total PSR amount agreed to on Business Agreement # \_\_\_\_\_ and for which no entitlement has been previously earned."

(2) Subcontract Applicability. The contractor shall include this clause (suitably modified to meet the circumstances of the subcontract concerned) and shall provide payment of PSR amounts for any subcontract wherein the subcontractor is participating in a DOD-approved IMIP business agreement. All subcontractor cost/price reductions attributable to an IMIP after establishment of the PSR shall be directly and entirely passed through to the Government.

### 3. DIRECTED SUBCONTRACT

The Contractor is hereby required to contain all hardware, software and related documentation for the Processing and Display Functional Area (PDFA) as defined in the Statement of Work and Specifications from Command, Control and Communications Corporation (4Cs) of Torrance, California.

### 4. PROPOSAL SUBMISSION

The Contractor shall submit a firmly priced proposal for LfNs 0001 - 0047 of this contract no later than 25MAY06 or contract award, whichever is later. That proposal shall include the information called for in RFP P19613-85-R-0076 attachments 29 and 30 as amended by the RFP cover letter dated 25MAR20.



## PART II - CONTRACT CLAUSES

### SECTION 1 - CONTRACT CLAUSES

Contract clauses in this section from the FAR, DOD FAR Sup, Air Force FAR Sup, and Air Force Systems Command FAR Sup, are current through the following updates:

FAR: FAR 34-1) DOD FAR Sup: DAC 34-4) AF FAR Sup: BASIC; AFSC FAR Sup: BASIC

#### A. 52.152-2 CLAUSES INCORPORATED BY REFERENCE (APR 1984)

This contract incorporates the following clauses by reference, with the same force and effect as if they were given in full text. Upon request, the Contracting Officer will make their full text available. The clauses apply to all CLINs SUBCLINs except as indicated herein. \* = Not Applicable to CR CLINs; \*\* = Applicable to CR CLINs.

#### 1. FEDERAL ACQUISITION REGULATION (48 CFR CHAPTER 1) CLAUSES

<u>REF</u>	<u>REF NO</u>	<u>TITLE</u>	<u>DATE</u>
1	52.100-1	DEFINITIONS	APR 1984
2	52.203-1	OFFICIALS NOT TO BENEFIT	APR 1984
3	52.203-3	PRATUITIES	APR 1984
4	52.203-5	COVENANT AGAINST CONTINGENT FEES	APR 1984
5	52.204-1	APPROVAL OF CONTRACT	APR 1984
6	52.208-1	REQUIRED SOURCES FOR JEWEL BEARINGS AND RELATED ITEMS	APR 1984
7	52.210-5	NEW MATERIAL	APR 1984
8	52.210-7	USE OF RECONSTITUTED MATERIAL, PERIODICAL INVENTORY, AND FORMER GOVERNMENT SURPLUS PROPERTY	APR 1984
9	52.210-8	PRIORITIES, ALLOCATIONS, AND ASSIGNMENTS	APR 1984
10	52.215-1	EXAMINATION OF RECORDS BY COMPTROLLER GENERAL	APR 1984
11	52.215-2	AUDIT - NEGOTIATION	APR 1984
12	52.215-22	PRICE REDUCTION FOR DEFECTIVE COST OR PRICING DATA	APR 1984
13	52.215-24	SUBCONTRACTOR COST OR PRICING DATA	APR 1985
14	52.215-30	FACILITIES CAPITAL COST OF MONEY	APR 1984
15	52.215-31	WAIVER OF FACILITIES CAPITAL COST OF MONEY	APR 1984
**16	52.216-7	ALLOWABLE COST AND PAYMENT	APR 1984
**17	52.216-11	COST CONTRACT - NO FEE (Applicable to 0050 and 0053)	APR 1984
*18	52.216-16	INCENTIVE PRICE REVISION - FIRM TARGET ALTERNATE I (See Section 3, paragraph 3 for implementation of this clause.)	APR 1984 APR 1984
19	52.217-7	OPTION FOR INCREASED QUANTITY - SEPARATELY PRICED LINE ITEM	APR 1984
20	52.219-6	NOTICE OF TOTAL SMALL BUSINESS SET-ASIDE	APR 1984

SECTION 1 - CONTRACT CLAUSES (Cont'd)

<u>REF</u>	<u>REF NO</u>	<u>TITLE</u>	<u>DATE</u>
21	52.219-2	UTILIZATION OF SMALL BUSINESS CONCERNS AND SMALL DISADVANTAGED BUSINESS CONCERNS	APR 1964
22	52.219-3	UTILIZATION OF WOMEN-OWNED SMALL BUSINESSES	APR 1964
23	52.219-4	UTILIZATION OF LABOR SURPLUS AREA CONCERNS	APR 1964
24	52.219-5	LABOR SURPLUS AREA SUBCONTRACTING PROGRAM	APR 1964
25	52.219-6	NOTICE TO THE GOVERNMENT OF LABOR DISPUTES	APR 1964
**27	52.219-7	PAYMENT FOR OVERTIME PREMIUMS (Insert "zero" in the blank space in para "a" of the clause.)	APR 1964
28	52.219-8	PLANT-RELATED PUBLIC CONTRACTS ACT	APR 1964
29	52.219-9	EQUAL OPPORTUNITY	APR 1964
30	52.219-10	EQUAL OPPORTUNITY FORWARD CLEARANCE OF SUBCONTRACTS	APR 1964
31	52.219-11	NOTIFICATION OF VISA DENIAL	APR 1964
32	52.219-12	AFFIRMATIVE ACTION FOR SPECIAL DISABLED AND VIETNAM ERA VETERANS	APR 1964
33	52.219-13	AFFIRMATIVE ACTION FOR HANDICAPPED WORKERS	APR 1964
34	52.219-14	CLEAN AIR AND WATER	APR 1964
35	52.219-15	CEASE-REENTRY PUBLIC CONTRACTS ACT	APR 1964
36	52.219-16	ALTERNATIVE 1	APR 1964
37	52.219-17	NOTICE AND ASSISTANCE REGARDING PATENT AND COPYRIGHT INFRINGEMENT	APR 1964
38	52.219-18	REPORTING OF PRIORITIES (FOREIGN)	APR 1964
39	52.219-19	PATENT RIGHTS -- RETENTION BY THE CONTRACTOR (SHORT FORM)	APR 1964
*40	52.219-20	INSURANCE - WORK ON A GOVERNMENT INSTALLATION	APR 1964
**41	52.219-21	INSURANCE--IMMUNITY FROM TORT LIABILITY	APR 1964
**42	52.219-22	INSURANCE--LIABILITY TO THIRD PERSONS	APR 1964
**43	52.219-23	TAXES--FOREIGN COST-REIMBURSEMENT CONTRACT	APR 1964
*44	52.219-24	FEDERAL, STATE AND LOCAL TAXES (NON-COMPETITIVE CONTRACT)	APR 1964
*45	52.219-25	TAXES - CONTRACTS PERFORMED IN U.S. POSSESSIONS OR PUERTO RICO	APR 1964
*46	52.219-26	TAXES - FOREIGN FIXED-PRICE CONTRACTS	APR 1964
*47	52.219-27	PAYMENTS (Pursuant to DOD FAR Sup 32.111(a), the guidance set forth in Defense Acquisition Circular (DAC) 76-42, Item I thereto, applies to the authorized- modifications to "payment due dates".)	APR 1964

# SECTION 1 - CONTRACT CLAUSES (cont'd)

<u>REF</u>	<u>REF NO</u>	<u>TITLE</u>	<u>DATE</u>
*48	52.232-2	PAYMENTS UNDER FIXED-PRICE RESEARCH AND DEVELOPMENT CONTRACTS (CLINS SUBCLINS 0001AB, 0001AB, 0001AC, 0048, and 0051, and 0043 and 0044, if exercised)	APR 1964
*49	52.232-5	DISCOUNTS FOR PROMPT PAYMENT (Pursuant to DOD FAR Sup 32.111(a), the guidance set forth in Defense Acquisition Circular (DAC) 76-42, Item I thereto, applies to the authorized modifications to "payment due dates".)	APR 1964
50	52.232-9	LIMITATIONS ON WITHHOLDING OF PAYMENTS (Pursuant to DOD FAR Sup 32.111(a), the guidance set forth in Defense Acquisition Circular (DAC) 76-42, Item I thereto, applies to the authorized modifications to "payment due dates".)	APR 1964
*51	52.232-11	EXTRAS (Pursuant to DOD FAR Sup 32.111(a), the guidance set forth in Defense Acquisition Circular (DAC) 76-42, Item I thereto, applies to the authorized modifications to "payment due dates".)	APR 1964
*52	52.232-16	PROGRESS PAYMENTS	APR 1964
		ALTERNATE I	APR 1964
53	52.232-17	INTEREST	APR 1964
**54	52.232-20	LIMITATION OF COST	APR 1964
55	52.232-23	ASSIGNMENT OF CLAIMS	APR 1964
56	52.233-1	DISPUTES	APR 1964
57	52.233-2	PROTECTION OF GOVERNMENT BUILDINGS, EQUIPMENT, AND VEGETATION	APR 1964
*58	52.242-1	NOTICE OF INTENT TO DISALLOW COSTS (CLINS 0049, 0050, 0052, 0053, and CLINS 0043 and 0044, if option exercised)	APR 1964
59	52.242-12	REPORT OF SHIPMENT (REPSEIP)	APR 1964
*60	52.243-1	CHANGES - FIXED-PRICE ALTERNATE V	APR 1964
		(SUBCLINS 0001AB, 0001AB, 0001AC, CLINS 0048, 0051 and CLINS 0043 and 0044, if exercised)	APR 1964
**61	52.243-2	CHANGES-COST-REIMBURSEMENT ALTERNATE V	APR 1964
61	52.243-6	CHANGE ORDER ACCOUNTING	APR 1964
62	52.243-7	NOTIFICATION OF CHANGES (Insert "15" in the blank space in paragraphs (b) and (d))	APR 1964

# SECTION I - CONTRACT CLAUSES (cont'd)

<u>REF</u>	<u>REF NO</u>	<u>TITLE</u>	<u>DATE</u>
62	52.144-1	SUBCONTRACTS FOR FIXED-PRICE CONTRACTS	APR 1964
**64	52.144-2	SUBCONTRACTS FOR COST-FEELING/REVENUE AND LOSTER CONTRACTS	APR 1964
65	52.144-3	COMPETITION ON SUBCONTRACTING	APR 1964
66	52.144-4	GOVERNMENT PROPERTY (FIXED-PRICE CONTRACTS)	APR 1964
		ALTERNATE I	APR 1964
**67	52.144-16	WARRANTY OF SUPPLIES OF A COMPLEX NATURE	APR 1964
		ALTERNATE III	APR 1964
		(a)(1) Para (b) . Insert "one (1) year"	
		(2) Lines 8 and 9 - Change "will conform with all requirements" to "will conform to the design and manufacturing requirements delineated in the contract"	
		(c)(3) Insert "30 days after discovery of the defect"; "30 days"; "30 days"	
		(c)(4) Insert "30 days"; "30 days"	
68	52.144-23	LIMITATION OF LIABILITY	APR 1964
69	52.144-24	LIMITATION OF LIABILITY - HIGH-VALUE ITEMS	APR 1964
		(ALTERNATE I)	
		(Insert "ITEMS 0001, 0002, 0004, 0006 and 0006")	
70	52.147-63	PREFERENCE FOR U.S. - FLAG AIR CARRIERS	APR 1964
71	52.148-1	VALUE ENGINEERING	APR 1964
**72	52.149-2	TERMINATION FOR CONVENIENCE OF THE GOVERNMENT (FIXED-PRICE)	APR 1964
**73	52.149-6	TERMINATION (COST-FEELING/REVENUE)	APR 1964
**74	52.149-8	DETAILS (FIXED-PRICE SUPPLY AND SERVICE)	APR 1964
**75	52.149-9	DETAILS (FIXED-PRICE RESEARCH AND DEVELOPMENT)	APR 1964
		(SUBLINE 0012B, 0012B, 0012C, 0048 and 0051, and lines 0043 and 0044, if exercised)	
**76	52.149-14	EXCUSABLE DELAYS	APR 1964
		(0050 and 0053 are excluded)	
**77	52.150-1	INDemnIFICATION UNDER PUBLIC LAW 85-804	APR 1964

## II. DEPARTMENT OF DEFENSE SUPPLEMENT (46 CFR CHAPTER 2) CLAUSES

<u>REF</u>	<u>REF NO</u>	<u>TITLE</u>	<u>DATE</u>
1	52.204-7000	CONTRACT SCHEDULE SUBLINE ITEMS NOT SEPARATELY PRICED - WITHHOLDING OF BILLING AND PAYMENT	NOV 1970
2	52.204-7005	OVERSEAS DISTRIBUTION OF DEFENSE SUBCONTRACTS	JUN 1962
3	52.205-7000	REQUIRED SOURCES FOR MINIATURE AND INSTRUMENT BALL BEARINGS	JUL 1971
4	52.205-7001	REQUIRED SOURCES FOR PRECISION	AUG 1971

# SECTION 1 - CONTRACT 124125 (cont'd)

<u>REF</u>	<u>REF NO</u>	<u>TITLE</u>	<u>DATE</u>
		COMPONENTS FOR METEOROLOGICAL TIME SERIES	
5	52.103-7002	REQUIRED SOURCES FOR HIGH-PRESSURE STATION	JUN 1963
6	52.103-7003	REQUIRED SOURCES FOR HIGH PRESSURE	AUG 1964
		STATIONING	
7	52.103-7001	AGGREGATE PRICING ADJUSTMENT	APR 1965
8	52.103-7001	BUY OVERSEAS ACT AND BALANCE OF PAYMENTS	APR 1965
		PROGRAM	
9	52.103-7002	QUALIFYING COUNTRY SOURCES AS	OCT 1960
		STATIONING	
10	52.103-7004	IDENTIFICATION OF ESTABLISHMENTS IN THE	OCT 1966
		UNITED STATES	
11	52.103-7008	OUT-OF-STATE ENTER - QUALIFYING COUNTRY	AUG 1964
		AND PRODUCTS AND SUPPLIES	
12	52.103-7009	PREFERENCE FOR CERTAIN DOMESTIC	OCT 1960
		COMMODITIES	
13	52.103-7012	PREFERENCE FOR DOMESTIC SPECIALTY METALS	OCT 1960
14	52.103-7013	RIGHTS IN TECHNICAL DATA AND COMPUTER	MAY 1961
		SOFTWARE	
		EXHIBIT 1	MAY 1961

The following paragraph is added:

(a)(5) Notwithstanding any other provision of this contract, it is the intent of both the Government and the Contractor that at no time after the first delivery of production items under this contract, the Government shall have unlimited rights as defined in section (a) of this clause, in all technical data and computer software used by the contractor, including sub-contractors and suppliers at any time, in all phases of the development and manufacture of production items including, but not limited to, all components, modules, assemblies or parts thereof. For purposes of this subsection, the Government shall have the right at any time during the performance of this contract or within three (3) years after either acceptance of all items (other than data or computer software) to be delivered under this contract or termination of this contract, to direct the Contractor to deliver all technical data and computer software, in a format prescribed by the Contracting Officer, necessary to reproduce from another contractor(s) either an entire production item or any component, module, assembly or part thereof, in a configuration specified by the Contracting Officer. When the Contracting Officer directs delivery of technical data and computer software under this subsection to the extent not otherwise previously compensated for delivery of such

# SECTION I - CONTRACT CLAUSES (Cont'd)

<u>REF</u>	<u>REF NO</u>	<u>TITLE</u>	<u>DATE</u>
15	52.227-7016	technical data or computer software, the Contractor shall be compensated for converting the data or computer software into the pre-specified form, for reproduction and delivery.)* CONTRACT SCHEDULE ITEMS PERTAINING EXPERIMENTAL, DEVELOPMENTAL, OR RESEARCH WORK (Insert *2001AB, 2002AB, 0002AC, 0048-0053, and 0043 and 0044 if option(s) exercised) in the blank space.)	MAR 1975
16	52.227-7018	RESTRICTIONS MAINTAINED ON TECHNICAL DATA	MAR 1975
17	52.227-7027	DEFERRED OPENING OF TECHNICAL DATA OF COMPUTER SOFTWARE	NOV 1984
18	52.227-7029	IDENTIFICATION OF TECHNICAL DATA	MAR 1975
19	52.227-7030	TECHNICAL DATA -- WITHHOLDING OF PAYMENT	JUL 1976
20	52.227-7031	DATA RECYCLEMENTS	APR 1972
21	52.227-7034	PATENTS -- SUBCONTRACTS	APR 1984
22	52.231-7000	SUPPLEMENTAL COST PRINCIPLES	APR 1984
23	52.231-7000	INVOICES	OCT 1982
24	52.233-7000	CERTIFICATION OF REQUESTS FOR ADJUSTMENT OF RELIEF EXCEEDING \$100,000.	FEB 1980
25	52.235-7002	RECOVERY OF NON-REPAIRING COSTS ON COMMERCIAL SALES	FEB 1980
26	52.235-7004	FREQUENCY AUTHORIZATION (Policy and procedures contained in AFM 100-31, as in effect on the date of the contract will be followed to obtain frequency allocation approval of electromagnetic devices and USAF Radio Frequency Authorization (RFA). Frequency allocation proposals (DD Form 1494, Application for Frequency Allocation) and frequency authorization requirements (AF Form 36, Radio Frequency Application) shall be prepared by the Contractor in accordance with procedures outlined in AFM 100-31 and an original and four (4) copies of each of the completed forms shall be forwarded to the Contracting Officer at BSC/PLS-3, Hanscom AFB, MA 01731.)	OCT 1966
27	52.243-7000	ENGINEERING CHANGE PROPOSALS ALTERNATE 1 (Insert *\$10,000* in the blank space in para (c) at the three asterisks.)	APR 1984 APR 1984
28	52.243-7001	PRICING OF ADJUSTMENTS	APR 1984
29	52.245-7000	MATERIAL INSPECTION AND RECEIVING REPORT	DEC 1969
30	52.245-7001	WARRANTY OF DATA ALTERNATE 1	NOV 1974 NOV 1974

SECTION 2 - DISPATCH 72-135 (Cont'd)

3. FAR Clauses in Full Text:

1. 51.119-12 SPECIAL THE SUBCONTRACT CONDITIONS

APR 1984

The Small Business Administration (SBA) has entered into Contract No. F19611-85-C-0079 with the Electronic Systems Division to furnish the supplies or services as described therein. A copy of the contract is attached hereto and made a part hereof.

(b) The Ten Dyn Systems, hereafter referred to as the subcontractor, agrees and acknowledges as follows:

(1) That it will, for and on behalf of the SBA, fulfill and perform all of the requirements of Contract No. F19611-85-C-0079 for the consideration stated therein and that it has read and is familiar with each and every part of the contract.

(2) That the SBA has delegated responsibility for the administration of this subcontract to the DISMA Baltimore with complete authority to take any action on behalf of the Government under the terms and conditions of this subcontract.

(3) That it will not subcontract the performance of any of the requirements of this subcontract to any lower tier subcontractor without the prior written approval of the SBA and the designated Contracting Officer of the Electronic Systems Division.

(c) Payments, including any progress payments under this subcontract, will be made directly to the subcontractor by the DISA Philadelphia.

6. AFAR SBC Clauses in Full Text:

1. 51.304-9000 NOTIFICATION OF GOVERNMENT SECURITY ACTIVITY

APR 1984

Thirty days before the date Contractor operations will begin on base, the Contractor shall notify the security policy activity shown in the distribution block of the DD Form 254, DOD Contract Security Classification Specification, as to--

(a) The name, address, and telephone number of this contract company's representative in the U.S. or overseas area, as appropriate;

(b) The contract number and military contracting command;

(c) The highest classification category of defense information to which Contractor employees will have access;

(d) The Air Force installations in the U.S. (in overseas areas identify only the APO number(s) where the contract work will be performed;

(e) The date Contractor operations will begin on base in the U.S. or in the overseas area;

(f) The estimated completion date of operations on base in the U.S. or in the overseas area; and

(g) Any changes to information previously provided under this clause.

1. 52.223-9004 SAFETY AND ACCIDENT PREVENTION

APR 1984

(a) In performing work under this contract on a Government installation, the Contractor shall—

(1) Conform to the specific safety requirements established by this contract;

(2) Comply with the safety rules of the Government installation that concern related activities not directly addressed in this contract;

(3) Take all reasonable steps and precautions to prevent accidents and preserve the life and health of Contractor and Government personnel performing or in any way coming in contact with the performance of this contract; and

(4) Take such additional immediate precautions as the Contracting Officer may reasonably require for safety and accident prevention purposes.

(b) If this contract is performed on an Air Force installation, the Air Force Occupational Safety and Health Standards (AFOSH) developed in accordance with AFR 127-12, in effect on the date of this contract, apply. If contract performance is on other than an Air Force installation, the Contractor shall comply with the safety rules of that Government installation, in effect on the date of this contract.

(c) The Contracting Officer may, by written order, direct additional AFOSH and safety and accident standards as may be required in the performance of this contract and any adjustments resulting from such direction will be in accordance with the Changes clause of this contract.

(d) Any violation of these safety rules and requirements, unless promptly corrected as directed by the Contracting Officer, shall be grounds for termination of this contract in accordance with the Default clause of this contract.

2. AFSC FAR Sup Clauses in Full Text

1. 52.223-9000 EQUAL OPPORTUNITY PREAWARD CLEARANCE OF SUBCONTRACTS

MAR 1982

The prime contractor shall request its preaward clearances through the contracting officer at least 30 calendar days before the proposed award date, unless the cognizant Department of Labor compliance office agrees to a shorter time.



(a) Of the total price of items 0149, 0081, and 0150 the sum of \$710,914.00 is presently available for payment and allotted to this contract. It is anticipated that from time to time additional funds will be allotted to this contract until the total price of these items is allotted.

(b) The contractor agrees to perform or have performed work on the items up to the point at which, in the event of termination of this contract pursuant to the Termination for Convenience of the Government clause of the contract, the total amount payable by the Government (including amounts payable in respect of subcontracts and settlement costs) pursuant to paragraph (a) of the clause would, in the exercise of reasonable judgment by the contractor, approximate the total amount at the time allotted to the contract. The contractor will not be obligated to continue performance of the work beyond that point. The Government will not be obligated in any event to pay or reimburse the contractor in excess of the amount from time to time allotted to the contract, regardless of anything to the contrary in the Termination for Convenience of the Government clause of this contract.

(c) It is contemplated that the funds presently allotted to this contract will cover the work to be performed, as limited by the provisions of (a) above until the 30th day of September 1955. If funds allotted are considered by the contractor to be inadequate to cover the work to be performed until the above date or an agreed substitute date, the contractor will notify the contracting officer in writing when, within the next 30 days, the work will reach a point at which, in the event of termination of this contract pursuant to the Termination for Convenience of the Government clause of this contract, the total amount payable by the Government (including amount payable in respect of subcontracts and settlement costs), pursuant to paragraph (a) of the clause, will approximate 85 percent of the total amount then allotted to the contract. The notice will state (i) the estimated date when that point will be reached, and (ii) the estimated amount of additional funds required to continue performance to the above date or an agreed substitute date, advise the contracting officer in writing as to the estimated amount of additional funds which will be required for the timely performance of the contract for a further period as may be specified in the contract or otherwise agreed to by the parties. If after such latter notification, additional funds are not allotted by the date above written, or by an agreed substitute date, the contracting officer will, upon written request of the contractor, terminate this contract on that date or the date set forth in the request, whichever is later, pursuant to the provisions of the Termination for Convenience of the Government clause of this contract.

(d) When additional funds are allotted from time to time for continued performance of the work under this contract, the parties will agree as to the applicable period of contract performance which will be covered by the funds. The provisions of (b) and (c) above will apply in like manner to the additional allotted funds and agreed substitute date, and the contract will be amended accordingly.

(e) If the contractor incurs additional costs or is delayed in the performance of the work under this contract solely by reason of failure of the Government to allot additional funds in amounts sufficient for timely performance of this contract, and if additional funds are allotted, an equitable adjustment will be made in the price or prices including appropriate target, ceiling, and ceiling prices where applicable at the time or at the time of delivery or both. Failure to agree to any such equitable adjustment hereunder will be a dispute concerning a question of fact within the meaning of the clause of this contract entitled, "Disputes."

(f) The Government may at any time prior to termination and, with the consent of the contractor, after notice of termination allot additional funds for this contract.

(g) The provisions of this clause with respect to termination will not be deemed to limit the rights of the Government under the clause entitled, "Default." The provisions of this clause are limited to the work in and allotment of funds for the items set forth in (a) above. This clause will become imperative upon the allotment of funds for the total price of the work except for rights and obligations then existing under this clause.

(h) Nothing in this clause affects the right of the Government to terminate this contract pursuant to the Termination for Convenience of the Government clause of this contract.

### 3. 52.243-9001 NOT-TO-EXCEED COST AGREEMENT

APR 1964

Prior to the issuance of a change order under this contract, the contracting officer may solicit from the contractor written agreement as to (1) the monetary adjustment (maximum increase or minimum decrease) to be made to the contract or (2) adjustment in the delivery schedule (or time of performance) by reason of the change. The contracting officer may also solicit such agreement on limitations to the adjustments of any other provisions of the contract which may be subject to equitable adjustment by reason of the change. Any such written agreement shall then be cited in the change order, and upon its issuance shall be a binding part of the contract. In no event shall the definitive equitable adjustment exceed the limitations so established. Except with respect thereto, nothing contained herein shall affect the rights of the parties to the equitable adjustment by reason of the change, pursuant to the Changes clause.

(b) With respect to changes for which the contract is to be adjusted, the contractor shall submit a not-to-exceed amount as required above.

### 4. 52.245-9000 BASE SUPPORT

APR 1964

Base support will be provided to the contractor by the Government only in accordance with the provisions of this clause. Failure of the contractor to comply with all provisions of this clause will result in releasing the Government without prejudice from its obligation to provide the required base support by the date(s) required. Failure of the Government to provide base support by the date(s) required (absent any contractor failure to comply with all the provisions of this clause) will, if otherwise warranted, result in an equitable adjustment in accordance with the changes clause."

(a) The contractor agrees that in the performance of this contract, or any major subcontract hereunder, that no direct or indirect costs will be incurred for the duplication of work or support capability when the Government determines is available at, or through, any DOD installation where this contract will be performed, without prior written approval of the contracting officer. Accordingly, the contractor agrees to use or cause to be used, on subcontracts, if any, all Government or Government-controlled working space, equipment, supplies, materials, services (including automatic data processing or other support including communication services) which the Government determines can be made available at, or through, any Air Force installation where this contract will be performed.

(b) Base support will be provided only at those installations listed in (g) below. The exact amount and character of support and other logistic details appropriate to the furnishing thereof, will be determined before contract award and set forth in an appendix to the contract and referenced in the schedule, by categories and installations, if determinable at that time.

(c) Where it cannot be determined before contract award, the appropriate air force installations where support is anticipated will be listed in (g) below, if known. During the contract, the contractor agrees to provide to the contracting officer a complete proposal supported by detailed documentation of all in-place base support requirements at each listed installation not later than 120 days before the planned required need date at each location. The contractor will, in each case, concurrently forward an identical copy of the proposal to the cognizant contract administration office. In this event, agreement concerning the exact amount and character of support and other logistic details appropriate to the furnishing thereof, will result in an amendment to the contract which provides an equitable adjustment to the contract price and other affected provisions of the contract in accordance with the changes clause.

(d) Any further additions, reductions, or changes in the specific support identified under this clause by amendment in accordance with (c) above, or to the contract already negotiated, will be fully documented by the contractor and normally submitted to the contracting officer within 90 days of required in-place date at the installation. When the requirement becomes known less than 90 days before in-place date, the contractor will immediately notify the contracting officer when required changes arise. If appropriate under the circumstances, a negotiated equitable adjustment will be made in the price, terms and/or conditions of the contract in accordance with the changes clause.

(e) Unless otherwise stipulated in the schedule of this contract, such support will be provided on a no-charge-for-use basis and the value thereof will be a part of the Government's consideration for this contract. If contractual coverage is pending, the contracting officer's written approval will be obtained before any base support will be furnished hereunder and the contractor agrees to request this approval no later than 90 days before the planned required need date for each DOD installation involved.

(f) The contractor agrees to immediately report, with a copy to the cognizant SAC, deficiencies, defective IFF or nonavailability of support stipulated by the contract schedule together with a recommended plan for obtaining the required support. The Government agrees to determine promptly (within 10 workdays) the validity and extent of the involved requirement and the method by which the requirement will be fulfilled (for example, purchase, rental lease, IFF). Items of a capital nature will not be purchased under this clause; additionally, the contractor will not purchase, or otherwise furnish any base support requirement provided by the clause, or authorize others to do so, without prior written approval of the contracting officer regarding the price, terms, and conditions of the proposed purchase, or approval of other arrangements.

(g) Following are installations where base support will be provided:

To be determined

## **E. ASD F&E Sup Clauses in Full Text:**

### **1. 50.105-9500 RELEASE OF INFORMATION**

a. It is Air Force policy to encourage publication of scientific and technological advances and information developed under its contracts. One copy of each paper planned for publication will be submitted for review and comment to the Public Affairs Office, HQ ASD (PAM), Hanscom AFB, MA 01731 at least 30 days prior to submission for publication.

b. News releases and media contacts, including photographs and films, public announcements, or other forms of publicity concerning the technical content of this contract, will not be made without prior clearance from the Air Force. Requests for publicity approval should be addressed to HQ ASD (PAM), Hanscom AFB MA 01731 for the approval of the contracting officer.

### **2. 50.245-9505 PERFORMANCE OF WORK ON GOVERNMENT PREMISES**

Any work under this contract which is performed by the Contractor or any of its subcontractors on premises under Government control is subject to all provisions of this contract governing such work and the following:

a. All Contractor and Subcontractor personnel shall, at all times, conspicuously display a distinctive badge provided by the Contractor, identifying such personnel as employees of the Contractor.

b. Except as may be otherwise specified in the Schedule of this contract, the Contractor shall furnish all supplies, material and equipment required for the work to be performed.

c. The Contractor shall provide direct supervision of its own employees but shall not supervise or accept supervision from any Government personnel.

d. The Contractor shall designate to the Contracting Officer in writing an on-site-plantas representative to serve as point of contact for the Contractor with the Contracting Officer or his duly authorized representative.

e. Performance of work on Government premises shall be confined to the areas specified by the Contracting Officer or his duly authorized representative.

## 2. 50.101-3301 TECHNICAL REVIEW

A. The Government has contracted with The MITRE Corporation for the services of a technical group which, under the program management of the Electronic Systems Division, is responsible to the Government for overall technical review of certain Government programs, including the efforts under this contract.

### 3. Explanation of MITRE Role.

1. Technical Review is defined as the process of continually reviewing the technical efforts of contractors. It does not include any modification, realignment or redirection of contractor efforts under this contract; such action may be effected only by the prior written direction of the Contracting Officer.

2. The purpose of the review is to:

a. Evaluate from a technical standpoint whether system concept and performance can be expected to be achieved on schedule and within cost.

b. Assure that the impact of new data, new developments and modified requirements is properly assessed and exploited.

c. Assure that The MITRE Corporation has available data on the status and technology of Government programs and projects to enable it to carry out its inter-system integration responsibilities to the Government.

3. The MITRE Corporation has agreed not to engage in the manufacture or the production of hardware, to abide by FAR Subpart 9.5 entitled, "Organizational Conflicts of Interest", to refrain from disclosing proprietary information to unauthorized personnel, and not to compete with any profit-seeking concern.

C. The Contractor agrees to cooperate with The MITRE Corporation by engaging in technical discussions with MITRE personnel, and permitting MITRE personnel access to information and data relating to technical matters (including cost and schedule) concerning this contract to the same degree such access is accorded Government project personnel.

D. It is expressly understood that the operation of this clause will not be the basis for an equitable adjustment.

#### 4. 51.198-9501 TECHNICAL REVIEW

A. The Government has contracted with The Analytical Systems Engineering Corporation (ASEC) for the services of a technical group which, under the program management of the Electronic Systems Division, is responsible to the Government for technical review of certain Government programs, including the efforts under this contract.

##### B. Explanation of The ASEC role.

1. Technical Review is defined as the process of continually reviewing the technical efforts of contractors. It does not include any modification, realignment or redirection of contractor efforts under this contract; such action may be effected only by the prior written direction of the Contracting Officer.

##### 2. The purpose of the review is to:

a. Evaluate from a technical standpoint whether system concept and performance can be expected to be achieved on schedule and within cost.

b. Assure that the impact of new data, new developments and modified requirements is properly assessed and exploited.

c. Assure that ASEC has available data on the status and technology of Government programs and projects to enable it to carry out its inter-system integration responsibilities to the Government.

3. The ASEC has agreed not to engage in the manufacture or production of hardware or software which is related to the program for which this contract is issued, to abide by FAR Subpart 9.5 entitled, "Organizational Conflicts of Interest", and to refrain from disclosing proprietary information to unauthorized personnel.

C. The Contractor agrees to cooperate with ASEC by engaging in technical discussions with ASEC personnel, and permitting ASEC personnel access to information and data relating to technical matters (including cost and schedule) concerning this contract to the same degree such access is accorded Government project personnel.

D. It is expressly understood that the operation of this clause will not be the basis for an equitable adjustment.

PAGE III - LIST OF DOCUMENTS, EXHIBITS, AND OTHER ATTACHMENTS

SECTION J - LIST OF ATTACHMENTS

1. Attachment Nr. 1, DD Form 1423, IOC Software, Contract Data Requirements List (CDRL) for IOCE, dated 85FEB10, 5 pages.
2. Attachment Nr. 2, DD Form 1423, POC Software, Contract Data Requirements List (CDRL) for IOCE, dated 85FEB10, 5 pages.
3. Attachment Nr. 3, DD Forms 1423, Management Data, Contract Data Requirements List (CDRL) for IOCE, dated 85FEB10, 34 pages.
4. Attachment Nr. 4, DD Forms 1423, CENTAF Software, Contract Data Requirements List (CDRL) for IOCE, dated 85FEB10, 5 pages.
5. Attachment Nr. 5, DD Forms 1423, CENTAF Management Data, Contract Data Requirements List (CDRL) for IOCE, dated 85FEB10, 25 pages.
6. Attachment Nr. 6, DD Forms 1423, AAC Software, Contract Data Requirements List (CDRL) for IOCE, dated 85FEB10, 5 pages.
7. Attachment Nr. 7, DD Forms 1423, AAC Management Data, Contract Data Requirements List (CDRL) for IOCE, dated 85FEB10, 25 pages.
8. Attachment Nr. 8, DD Forms 1423, PADAF Software, Contract Data Requirements List (CDRL) for IOCE, dated 85FEB10, 5 pages.
9. Attachment Nr. 9, DD Forms 1423, PADAF Management Data, Contract Data Requirements List (CDRL) for IOCE, dated 85FEB10, 25 pages.
10. Attachment Nr. 10, DD Form 1423, TABLE B, Contract Data Requirements List (CDRL), dated 85FEB10, 5 pages.
11. Attachment Nr. 11, DD Forms 1423, TABLE B, Contract Data Requirements List (CDRL) for IOCE, dated 85FEB10, 26 pages.
12. Attachment Nr. 12, DD Forms 1423, Provisioning Data, Contract Data Requirements List (CDRL) for IOCE, dated 85FEB10, 11 pages.
13. Exhibit A, APSC Forms 709, IOC Hardware/Software Data, Contract Data Requirements List (CDRL) for IOCE, dated 85FEB10, 60 pages.
14. Exhibit B, APSC Forms 709, POC Hardware/Software Data, Contract Data Requirements List (CDRL) for IOCE, dated 85FEB10, 20 pages.
15. Exhibit C, APSC Forms 709, CENTAF Hardware/Software Data, Contract Data Requirements List (CDRL) for IOCE, dated 85FEB10, 20 pages.
16. Exhibit D, APSC Forms 709, AAC Hardware/Software Data, Contract Data Requirements List (CDRL), dated 85FEB10, 21 pages.

17. Exhibit E, AFSC Forms 709, PACAF Hardware/Software Data, Contract Data Requirements List (CDRL) for ICEE, dated 85FEB10, 21 pages.
18. Exhibit F, AFSC Forms 709, PACAF Software Data, Contract Data Requirements List (CDRL) for ICEE, dated 85FEB10, 20 pages.
19. Exhibit G, AFSC Forms 709, Reacquisition Data, Contract Data Requirements List (CDRL) for ICEE, dated 85FEB10, 11 pages.
20. SOW-ECI-1229, Statement of Work for the Iceland Command and Control Enhancement System, dated 85FEB07, 45 pages, plus 5 Errata Sheets.
21. SOW-ECI-1229A, Addendum Statement of Work for the U. S. Central Air Force (CENTAF), dated 85FEB04, 19 pages.
22. SOW-ECI-1229B, Addendum Statement of Work for the Pacific Air Force (PACAF) and Alaskan Air Command (AAC), dated 85FEB04, 19 pages.
23. Specification Number ESD-SS-ECI-1020, Iceland Command and Control Enhancement (ICEE) System, dated 85FEB04, 97 pages, plus 6 Errata Sheets.
24. Specification Number ESD-SS-ECI-1020A, Addendum Specification for the Iceland Command and Control Enhancement (ICEE) System, dated 85FEB04, 57 pages.
25. Specification Number ESD-SS-ECI-1020B, Addendum Specification for the U. S. Central Air Force (CENTAF), dated 85FEB04, 61 pages.
26. Specification Number ESD-SS-ECI-1020C, Addendum Specification for the Pacific Air Force and Alaskan Air Command, dated 85FEB04, 63 pages.
27. Security Classification Guide, Iceland Command and Control Enhancement (ICEE) Program, dated 84AUG01, 16 pages.
28. DD Form 254, Contract Security Classification Specification, dated 85FEB28, 2 pages.
29. Instructions for Preparation of Cost Proposal for the ICEE System, dated 84SEP27, 23 pages.
30. Instructions for Preparation of Proposals for the ICEE System, dated 85FEB26, 21 pages, plus 10 Errata Sheets.
31. Attachment Nr. 13, Front-end Effort Interim Operational Capability Management Data, dated 85MAR11, 13 pages.
32. Statement of Work for the Front-End Effort for ICEE Interim Operational Capability, dated 85MAR14, 5 pages.



901013 UD

EASYLINK 6766929A001 13SEP85 14:44/14:45 EST  
FROM: TLX 756886 CD COM CM UD  
COMMAND CONTROL & COMM CORP  
TO: 901013

TELEX NO. 85-272  
13 SEPTEMBER 1985

TO: TECHDN  
ATTN: DAVE YENOWINE

SUBJ: ICCE CLINS 0001-0005 AND 0047

1. CONFIRM PRICE OF 5,271,888 FOR SUBJECT CLINS.
2. CERTIFICATE OF CURRENT COST AND PRICING DATA BEING HAND DELIVERED  
BY  
AL JOHNSON.

REGARDS,

MARIE E. RAYMOND  
CONTRACTS MANAGER  
4C  
TELEX NO. 653578 OR 756886

MMMM

901013 UD

2670





Command, Control and Communications Corporation  
A Subsidiary of Whittaker Corporation  
23670 Hawthorne Boulevard  
Torrance, California 90505  
213/373-9651 Telex 756886

**Whittaker**

05 February 1986

8602-067-MR/16393

TechDyn Systems, Inc.  
6564 Loisdale Court  
Suite 600  
Springfield, VA 22150

Attention: Mr. David Yenowine

Subject: Prime Item Specification, Remote Control Element (Preliminary)

Reference: (a) Subcontract 125-001  
(b) CDRL's B002/C002  
(c) DID # DI-E-3102A

Dear Mr. Yenowine:

In accordance with references cited above, transmitted herewith are eleven (11) copies of the Prime Item Development Specification, Remote Control Unit, of which ten (10) are for Air Force distribution, one (1) for your files.

Accordingly, this constitutes delivery under CDRL's B002/C002. If you have any questions regarding this submittal, please contact Mr. Bob Tobiason at 213-373-9651, extension 337.

Please sign and return the duplicate copy of this letter to acknowledge receipt of this transmittal.

Sincerely,

Marie E. Raymond  
Director of Contracts

MER/mm

Enclosures: (11)

Received this Feb 6, 1986

  
David Yenowine

2671

PLAINTIFF'S  
EXHIBIT

210

Document No. R/001517/00T  
Code Ident.  
31 January 1986

B-1  
PRELIMINARY DRAFT  
PRIME ITEM  
DEVELOPMENT SPECIFICATION

For The Equipment  
Of The

REMOTE CONTROL ELEMENT (RCE)

Of The

ICELAND COMMAND AND CONTROL ENHANCEMENT (ICCE) SYSTEM

CDRL B002/C002

Authenticated By \_\_\_\_\_  
(Procuring Activity)

Approved By \_\_\_\_\_  
(Contractor)

Date \_\_\_\_\_

Date \_\_\_\_\_

COMMAND, CONTROL AND COMMUNICATIONS CORPORATION  
23670 Hawthorne Boulevard  
Torrance, California 90505

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## 1. SCOPE

1.1 This specification establishes the performance, design, development and test requirements for the Remote Control Element (RCE) equipment of the Iceland Command and Control Enhancement (ICCE) system. The RCE equipment, which is part of the Communications Functional Area (CFA) of the ICCE, shall provide an operator with the capability of controlling and monitoring remotely located Ground Entry Stations (GES's) within the CFA.

## 2. APPLICABLE DOCUMENTS.

**2.1 General.** Specification ESD-SS-ECI-1020, hereafter called the system specification, including all documents referenced therein, forms a part of this specification. In the event of conflict between this document and the issue of the system specification listed below, the content of the system specification shall be considered the superseding requirement.

**2.2 Government documents.** The following documents, of the exact issue shown, form a part of this specification to the extent specified herein. Except as indicated in 2.1 above, in the event of conflict between the documents referenced herein and this specification, the contents of this specification shall be considered the superseding requirement.

### 2.2.1 Specifications

**2.2.1.1 Federal.** None.

**2.2.1.2 Military.** None

MIL-E-4158E  
Amendment 2  
12 July 1977

Electronic Equipment, Ground,  
General Requirements for

MIL-E-6051D  
7 Sept. 1967

Electromagnetic Compatibility  
Requirements Systems

MIL-P-9024D  
6 June 1972

Packaging, Handling and Transport-  
ability in System/Equipment Acqui-  
sition

MIL-E-16400  
1 Dec. 1976

Electronic Equipment, Naval Ship  
and Shore

### 2.2.2 Standards

#### 2.2.2.1 Federal.

DOD-STD-480A  
29 Dec. 1978

Configuration Control, Engineer-  
ing Changes, Deviations, and Wai-  
vers

DOD 4100.38M

Provisioning and other Pre-  
Procurement Screenings

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**2.2.2.2 Military.**

MIL-STD-129H 30 Sept. 1982	Marking for Shipment and Storage
MIL-STD-188-124 21 June 1982	Grounding, Bonding, and Shielding for Common Long-Haul Tactical Communications Systems
MIL-STD-188-203-1 10 Sept. 1982	Subsystem Design and Engineering Standards for Tactical Digital Information Link (TADIL) A
MIL-STD-188-203-2 10 Sept. 1982	Subsystem Design and Engineering Standards for Tactical Digital Information Link (TADIL) B
MIL-STD-454H 10 Jan. 1983	Standard General Requirements for Electronic Equipment
MIL-STD-461E 1 April 1980	Electromagnetic Emission and Susceptibility Requirements for the Control of Electromagnetic Interference
MIL-STD-462 31 July 1967	Electromagnetic Interference Meas- urement
MIL-STD-471A Notice 1 10 Jan. 1975	Maintainability Demonstration
MIL-STD-483 21 Mar. 1979	Configuration Management Practices for Systems, Equipment, Munitions and Computer Programs
MIL-STD-721C 12 June 1981	Definitions of Effectiveness Terms for Reliability and Maintainability
MIL-STD-781C 20 Mar. 1981	Reliability Design Qualification and Production Acceptance Tests
MIL-STD-785B 15 Sept. 1980	Reliability Programs for Systems and Equipment Development and Production
MIL-STD-794E 16 July 1982	Parts and Equipment, Procedures for Packaging of
MIL-STD-810C	Environmental Test Methods
MIL-STD-883B 15 Jan. 1982	Test Methods and Procedures



MIL-STD-965  
Notice 1  
22 Dec. 1978

MIL-STD-1472C  
2 May 1981

MIL-STD-1552

MIL-STD-1561

Parts Control Program

Human Engineering Design Criteria  
for Military Systems, Equipment,  
and Facilities

Provisioning Technical Documentation,  
Uniform Dept. of Defense Requirements

Provisioning Procedures, Uniform Dept.  
of Defense Requirements

### 2.2.3 Other publications

CSFSD-15D  
15 Feb. 1979

Communications Security Equipment  
System Document TSEC/KY-65/75  
Parkhill

DCA Circular  
300-175-9  
3 Aug. 1982

DCS Operating-Maintenance Elect-  
rical Performance Standards

MIL-HDBK-217D  
15 Jan. 1982

Reliability Predictions of Elec-  
tric Equipment

MIL-HBK-232  
14 Nov. 1972

Red/Black Engineering - Instal-  
lation Guidelines

MIL-HDBK-472  
24 May 1966

Maintainability Prediction

NACSIM 5203  
30 June 1982

Guidelines for Facility Design and  
Red/Black Installation

TAC/ADTAC  
21 May 1984

Iceland Command and Control Enhance-  
ment (ICCE) Concept of Employment

1661900-503D  
12 May 1982

Interface Control Drawing for the  
Digital Switch of the Data Pro-  
cessing and Display Functional  
Area of the ROCC Segment and the  
Digital Interface Panel (DIP) of  
the ROCC Communication Segment  
(RCS) (Final)

MITRE Project Document  
84-2092  
Dec. 1984

ICCE Facility Floor Plans

ESD-SS-ECI-1020  
Code 50464

Specification for the Iceland Com-  
mand and Control Enhancement  
(ICCE)

31 Jan. 1986

**2.3 Non-government documents.** The following documents form a part of this specification to the extent specified herein. Except as indicated in 2.1 above, in the event of conflict between the documents referenced herein and this specification, the contents of this specification shall be considered the superseding requirement.

523-0771329-001218  
(Rockwell International)  
1 Jul. 1981

Radio Set Control C-1030/GRC-171(V)  
Instructions

Unknown  
(Rockwell International)

Radio Set Control HF-8091 Instructions

Unknown  
(Rockwell International)

Radio Set Control HF-8094 Instructions

Unknown  
(Metrabyte)

Metrabus Users Manual

R/001508/00T (4C)

Critical Item Development Specification for the Master Control Unit (MCU) and Remote Control Unit (RCU) Within the Remote Control Element (RCE) of the Iceland Command Control Enhancement (ICCE) System

R/001493/00T (4C)

Computer Program Development Specification for the Master Control Unit (MCU) Operational Program Within the Remote Control Element (RCE) of the Iceland Command Control Enhancement (ICCE) System

R/001502/00T (4C)

Computer Program Development Specification for the Remote Control Unit (RCU) Operational Program Within the Remote Control Element (RCE) of the Iceland Command Control Enhancement (ICCE) System

R/00XXXX/00T (4C)

Computer Program Development Specification for the MCU/RCU Diagnostic Program Within the Remote Control Element (RCE) of the Iceland Command Control Enhancement (ICCE) System

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### 3. REQUIREMENTS

**3.1 Item definition.** Paragraph 3.1.1.2.4 of the system specification (ESD-SS-ECI-1020) defines the functional requirements for the Remote Control Equipments located at the Master Direction Center/Interim Air Defense Control Facility (MDC/IADCF), and at up to six Ground Entry Stations (GES's) of two types (UHF and HF). The initial configuration shall include two UHF GES's. The remaining GES's will be optional. Each UHF GES contains up to three UHF radios. Each HF GES site contains either two transmitters or two receivers and an associated antenna. Additional details are contained in paragraphs 3.2.1.2.1.2, 3.7.2.1.1.5, 3.7.2.1.3, 3.7.2.1.3.1, and 3.7.2.1.3.2 of the system specification. These paragraphs of the system specification, which describe circuit switching and remote control requirements for the TADIL-A digital data link and two voice communications channels, are summarized as follows:

- a. **Clear/Secure Voice Selection.** The headsets for two separate voice channels shall be directly connected to individual TSEC/KY-65 cryptographic units, which provide a clear/secure selection capability. The push-to-talk button for each headset shall also have a direct connection to the keying input to the TSEC/KY-65 unit.
- b. **TADIL-A Radio Selection.** The operator at the MDC/IADCF shall have the capability to select any radio at any of up to six GES's for connection to the TADIL-A digital data link.
- c. **Voice Communications Radio Selection.** The operator at the MDC/IADCF shall have the capability to select any radio at any of up to six GES's for each of the two voice communications channels.
- d. **Radio Control.** The operator at the MDC/IADCF shall have the capability to remotely control UHF transceivers and HF transmitters and receivers. Radio control functions shall include power on/off, mode and frequency select, antenna select, and squelch control.
- e. **Status Monitoring.** The operator at the MDC/IADCF shall have the capability to monitor the status of the local switching equipment used to select radios, and the status of RCE elements and communications circuits at the GES sites.
- f. **Remote Control Command Circuit Selection.** For each GES site, the MDC/IADCF operator shall have the capability to select from among a primary path and two alternative paths the circuit to be used for TADIL-A digital data and for two-way communications with the RCU at that GES site. In the event of a failure in the

31 Jan. 1986

primary circuit, the RCE shall have the capability of testing the two alternative voice channel paths to determine whether they are capable of handling the two-way TADIL-A and control command communications, and, based on priority and use of the remaining circuits, select the lowest priority circuit for continued operation. The MDC/IADCF operator shall be notified of the failure of the primary path, and of the alternative path selected.

**3.1.1 Item diagram.** Figure 1 is a block diagram of the RCE. As shown in this diagram, the RCE consists of the following equipments:

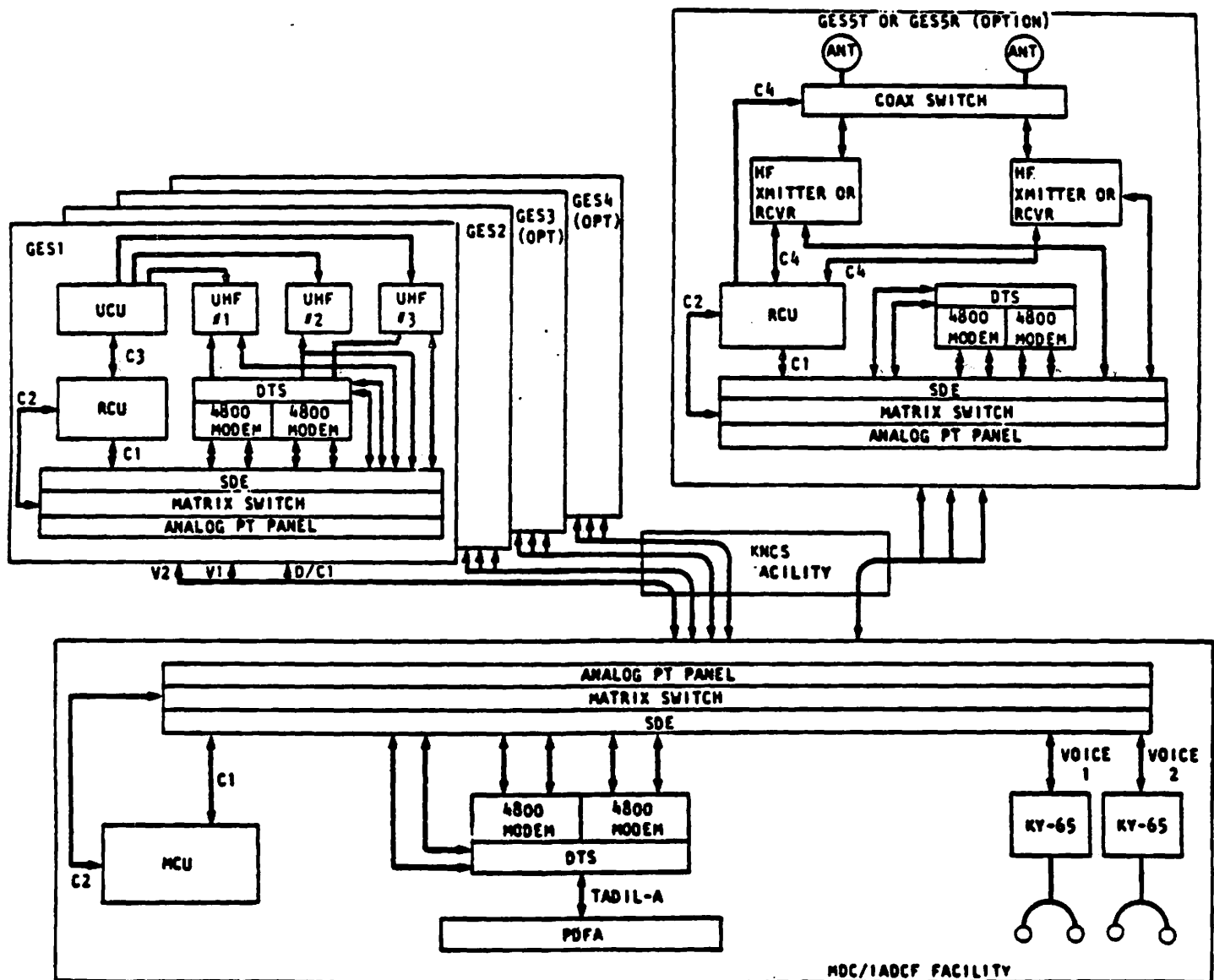
- a. **Master Control Unit (MCU)** located at the MDC/IADCF.
- b. **Remote Control Unit (RCU)** located at each GES site.
- c. **UHF Control Unit (UCU)** located at each GES site.

**3.1.1.1 MCU functions.** The MCU shall provide an operator at the MDC/IADCF with an interactive input/output capability, via a color monitor, an optional printer, and a keyboard, for initiating the selections described in 3.1b, 3.1c, and 3.1f, for controlling GES radios, as described in 3.1d, and for monitoring status as described in 3.1e. The MCU shall accomplish these selection and control functions by issuing control commands to a local matrix switch in the CFA at the MDC/IADCF, and (via CFA equipments) to RCU's at the GES's.

**3.1.1.2 RCU functions.** The RCU at each GES shall provide an unmanned capability for responding to control commands sent by the MCU. These control commands from the MCU shall cause control commands to be sent to a local matrix switch, to the UCU, and to HF radios in the GES. The control commands to the local matrix switch will accomplish circuit switching actions in the GES that route the TADIL-A digital data and/or voice channel signals to the selected radio(s) in the GES. The RCU shall also respond to polling commands from the MCU by returning RCU, matrix switch, and radio status information to the MCU.

**3.1.1.3 UCU functions.** The UCU at each GES shall provide the interface between the RCU and up to three UHF transceivers. The interface to the UHF transceivers shall duplicate the functions of a C-10370/GRC-171 (V) Radio Set Control unit.

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16139T

Figure 1. Block Diagram

### **3.1.2 Interface definition.**

#### **3.1.2.1 External interfaces.**

**3.1.2.1.1 Matrix switch control interface.** The MCU and each RCU shall have a control port, designated C2, that shall provide a full-duplex, asynchronous, 9600-baud, RS-232 serial data communications channel for two-way communications with a local IDS 9000 matrix switch. The MCU and RCU's shall output control messages and receive status messages via this port. The control messages will cause the matrix switch to perform circuit switching actions required to accomplish the functions outlined in 3.1b, 3.1c, 3.1d, and 3.1f.

**3.1.2.1.2 UHF radio interface (RCU only).** At GES's that have UHF radios, the UCU shall provide a separate control port for each UHF radio (up to three). The UHF radio port shall provide an input/output interface with each UHF radio that performs the same functions as a 10370/CRC-171(V) Radio Set Control unit, and shall provide an input/output interface with the RCU that is compatible with a Metrabus MTE-64 Driver Board installed in the RCU. Outputs to the UHF radio shall provide on/off power control, selection of operating mode and frequency, and squelch control. Inputs from the UHF radios to the UCU shall provide ready and keying status indications.

**3.1.2.1.3 HF radio interface (RCU only).** At GES's that have HF radios, separate asynchronous RS-232 control channels, designated C4, shall be provided that duplicate the functions of the HF-8091 Radio Set Control unit for each of the two HF transmitters at a GES site, or that duplicate the functions of the HF-1094 Radio Set Control unit for each of the HF receivers at a HF GES site. Outputs from the RCU shall provide on/off power control, mode and frequency selection, antenna selection, and (for the receivers) squelch control. Inputs to the RCU shall provide HF radio status information.

#### **3.1.2.2 Internal interfaces**

**3.1.2.2.1 RCE control command port.** The MCU and each RCU shall each have a control command port, designated C1, that shall provide dedicated, full-duplex, synchronous, 2400-baud, RS-232 serial data communications channels for two-way communications between the MCU and each RCU. Transmissions from the MCU to the RCU's shall contain commands for the RCU's at the GES's. Transmissions from the RCU's to the MCU shall contain status information for the MCU. The commands to the RCU's shall cause these units to accomplish the functions outlined in 3.1b through 3.1e. As described in 3.1f, it shall be possible to switch the circuit for each GES from the primary path (via primary 4800-baud modems) for the TADIL-A digital data link, or (via back-up 4800-baud modems) to either of the other two circuits that will serve as alternative paths for C1 transmissions when the primary path is unavailable. The selected alternate path will be the lowest priority of the remaining circuits that are operative. When

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either alternative circuit is selected for the C1 transmissions, that circuit will no longer be available for voice transmissions. The 2400-baud C1 transmissions shall be multiplexed with the 4800-baud TADIL-A digital data transmissions in either the primary or back-up 4800-baud modems.

**3.1.2.2.2 Metrabus between RCU and UCU.** Each RCU in a UHF GES shall have a Metrabus port that connects the RCU to the UCU within a GES. Specification data for the Metrabus is as follows:

Data Bus	8 bits
Address Bus	6 bits
No. of I/O Ports	64 (maximum)
Maximum Data Transfer Rate	80 kilo-baud
Maximum Drivable Cable Length	100 feet at full speed; 200 feet at reduced data rates
Power requirements	+5V, 250 milliamps typ.; 325 milliamps max.

The Metrabus includes an 8-bit data bus, a 6-bit address bus, Write Strobe and Clear control lines, and Read/Write and Busy status lines. The MTE-64 Metrabus Driver Board in the RCU is used to control the transfer of data (via the Metrabus) between the RCU and the UCU. The MDE-64 uses four consecutive I/O locations in the RCU expansion address space. The functions of these addresses are as follows:

I/O Address	Read	Write
Base Address + 0	DATA IN	DATA OUT
Base Address + 1	ADDRESS & STATUS IN	SET ADDRESS
Base Address + 2	-	MASTER CLEAR
Base Address + 3	-	-

Each Metrabus I/O board within the UCU has four 8-bit I/O ports (for data transfers between the UCU and UHF radios), and uses four consecutive addresses on the Metrabus. The following steps are involved in reading or writing to a Metrabus I/O board.

- The Metrabus address is first generated to select the Metrabus I/O involved in the data transfer. This is accomplished in the RCU by writing the desired address to the Base Address +1 address.
- Once the Metrabus address is generated, data is transferred by reading or writing to the Base Address +0 address.

Writing to the Base Address +2 address commands a system-wide reset action in which all Metrabus I/O boards are set to zero.

For a period of about 100 microseconds after a data output (write) operation on the bus, the Read/Write status bit will be

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high, indicating that no other output operation can be performed until the status bit returns to the low state. The Busy signal is an additional status signal for slow I/O devices.

Refer to the Metrabus user's manual for more details.

**3.1.3 Major component list.** The RCE shall consist of the following major components:

- a. Master Control Unit (MCU)
- b. MCU Computer Program
- c. Remote Control Unit (RCU)
- d. RCU Computer Program
- e. Maintenance Diagnostics
- f. UHF Control Unit (UCU)

**3.1.4 Government furnished property list**

**3.1.5 Government loaned property list**

**3.2 Characteristics.**

**3.2.1 Performance.** Table 3-1 summarizes the performance requirements for the RCE.

**Table 3-1. Performance Characteristics**

Mission Operation	24 hours/day, 7 days/week
Useful Life	15 years
Shelf Life	10 years
Ac Power	115/230 $\pm 10\%$ VAC nominal 47-63 Hz (strap selectable)
RS-232 port C1	2400-baud, Full Duplex, synchronous
RS-232 port C2	9600-baud, Full Duplex, asynchronous
Port C3 to RCU	Metrabus (8 data bits, 6 address bits)
UHF Radio Interface	Functionally Identical to a C-10370/GRC-171 (V) Radio Control Set
HF Radio Interface (Port C4)	Functionally Identical to a Rockwell HF-8091 or HF-8094 Radio Control Set



**3.2.2 Physical characteristics.** Physical characteristics of the MCU and RCU are described in specification R/001506/00T. Maximum dimensions and weights for the UCU are as follows:

- a. Width
- b. Depth
- c. Height
- d. Weight

**3.2.3 Reliability.** The Mean-Time-Between-Failures (MTBF) for the RCE equipments shall be not less than ----- hours.

**3.2.4 Maintainability.** The RCE equipments shall incorporate provisions for isolating malfunctioning components through the use of tests and diagnostics (both on-line and off-line). After isolation of a fault to a given module, correction of the problem shall be possible within 0.5 hour, 90% of the time, not including travel time.

**3.2.5 Environmental conditions.** The RCE equipments shall be capable of operating in the following controlled environment:

- a. Temperature 60 to 85 degrees F
- b. Humidity 40% to 60% (non-condensing)
- c. Altitude -200 to +10,000 feet

**3.2.6 Transportability.** All equipment components shall be capable of being transported by C-130 fixed-wing aircraft, by helicopters of the HH3 type, by trucks of the M-35 type, and by arctic terrain vehicles. Unitized transport loads shall withstand the shocks and vibrations normally encountered in transportation with no part becoming permanently warped, deformed, damaged, or loosened, and with no permanent degradation in performance or useful life.

**3.3 Design and construction.** The design and construction of the RCE equipment shall be in compliance with good commercial practices and standards, and shall be comparable to previously constructed like units.

**3.3.1 Materials, processes, and parts.** There shall be no unique parts or processes used in the construction of the RCE equipment. Standard, readily available parts shall be used in the design. Where possible, parts which are replaceable from different vendors shall be used. Detailed parts screening, testing, and selection shall not be required in the construction process.

**3.3.2 Electromagnetic radiation.** The RCE equipment shall be designed using MIL-STD-461B as a general guide.

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**3.3.3 Nameplates and product marking.** The RCE equipment shall have the same types of nameplates and other associated markings provided on comparable equipment previously delivered to the U. S. Air Force.

**3.3.4 Workmanship.** Workmanship standards shall be in accordance with industry standards for commercial computing equipment. All production workers shall have current certifications, as necessary, for soldering, cable fabrication, and other manufacturing processes. Workmanship standards shall be inspected for quality at numerous stages in the production cycle.

**3.3.5 Interchangeability.** The RCE equipment shall be designed such that Line Replaceable Units (LRU's) may be interchangeable without the necessity of engineering retrofit changes.

**3.3.6 Safety.** The RCE equipment shall be designed to ensure the physical safety of the operational and maintenance personnel, in accordance with standards of commercial practice, as dictated by OSHA, Underwriters Laboratory, et al.

**3.3.7 Human performance/human engineering.** The MCU keyboard and color monitor shall be in general accordance with the guidelines specified in MIL-STD-1472.

**2.4 Documentation.** Documentation describing the RCE equipment shall consist of operator and maintenance manuals.

### **3.5 Logistics.**

**3.5.1 Maintenance.** Maintenance support for the RCE equipment shall include both Preventive Maintenance (PM) and Corrective Maintenance (CM). The RCE equipment shall not require extensive PM. PM shall be limited to routine performance tests, cleaning, and changing/cleaning of filters as required. Fault lights, software messages, and hardware indicators shall be provided to assist in detecting and isolating faults. Rapid determination of a failed LRU shall be possible with the use of off-line diagnostics. No special test equipment will be required to support RCE organizational maintenance. Failed LRU's will be evacuated to the depot maintenance and repair facility for repair and subsequent return to the supply system as designated spares. Consequently, there will be no on-site component replacement.

**3.5.2 Supply.** Since RCE design is essentially firm, and since parts support is presently in existence, there will be no significant impact on the existing supply system for either spares or repair parts. Supply and resupply methods shall support both preoperational support, and the period subsequent to IOC.

**3.5.2.1 Preoperational supply support.** Spares, repair parts, supplies, technical documentation, and required support equipment to fully support the RCE equipment during the preoperational support period shall be on-site at Government-furnished facilities

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**3.5.2.2 ICCE supply support concept.** To support the ICCE program subsequent to FOC, 4C shall plan to participate with the prime contractor in normal acquisition provisioning activities according to the requirements of MIL-STD-1552 and MIL-STD-1561. Where possible, Logistics Support Analysis (LSA) output shall be used in preparation of required provisioning input documentation. Existing items with national stock numbers shall be identified as directed in DoD 4100.38M. For those items of PME and Support Equipment (SE), including all components intended for maintenance support that are not currently in the Air Force inventory, 4C shall coordinate with the Prime Contractor to complete the cataloging of input documentation for submission for government review and forwarding to the Defense Logistics Service Center (DLSC). In addition, requests for nomenclature shall be submitted as required to identify items for subsequent Air Force support.

**3.5.3 Facilities and facility equipment.** 4C presently has available all of the facilities required to design, fabricate, integrate, test, install, and operate the RCE equipment. Should requirements for modified facilities or faulty equipment for RCE support be identified during the LSA, or during scheduled site surveys, required documentation shall be initiated to advise the Government, and to provide appropriate recommendations.

### **3.6 Personnel and training**

#### **3.6.1 Personnel**

#### **3.6.2 Training**

### **3.7 Major component characteristics**

**3.7.1 Master control unit (MCU).** Characteristics of the MCU are given in specification R/001508/00T.

**3.7.2 Remote control unit (RCU).** Characteristics of the RCU are given in specification R/001508/00T.

**3.7.3 UHF control unit (UCU).** Dimensions and weights for the UCU are given in 3.2.2. The UCU shall contain the following modules:

- a. +5 VDC Power Supply
- b. MIO-32 32-Point Isolated Logic Level Output Boards
- c. MII-32 32-Point Isolated Logic Level Input Boards

For a GES with three UHF radios, three MIO-32 boards and one MII-32 board will be required.

**3.7.3.1 UHF radio interface requirements.** The MIO-32 boards shall provide a 16-bit frequency output and an 8-bit mode/squelch

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output for each radio. The MII-32 board shall provide a 2-bit status input for each radio. Both the MIO-32 and MII-32 boards shall provide optical isolation of the inputs and outputs in the UHF interface. Logic levels on the UHF interface shall be as follows:

- a. High (active) - open circuit
- b. Low (inactive) - -0.7 VDC

**3.7.3.2 RCU interface (port C3) requirements.** The RCU interface is described in 3.1.2.2.2.

**3.7.3.3 MIO-32 specification data.** The following specification data is applicable to the MIO-32 device:

Number of Inputs	32 (in four 8-bit bytes)
Isolation	500 VDC
Output off current	1 microamp max.
Output off voltage	Set by user
Output drive current	1.8 milliamps max.
Output on voltage	.5 Volt max.
Maximum output voltage	20 VDC
Power requirement (+5 VDC)	520 milliamps typ.; 600 milliamps max.

**3.7.3.4 MII-32 specification data.** The following specification data is applicable to the MII-32 device:

Number of Inputs	32 (in four 8-bit bytes)
Isolation	500 VDC
Input high voltage	2.2 volt min.
Input high current	3.2 milliamps min.
Input low voltage	1.3 volt max.
Input low current	.25 milliamp max.
Maximum input voltage	11 VDC
Power requirement (+5 VDC)	220 milliamps typ.; 300 milliamps max.

### **3.7.4 Operational computer programs**

**3.7.4.1 MCU.** The MCU operational program is described in specification R/001493/00T.

**3.7.4.2 RCU.** The RCU operational program is described in specification R/001502/00T.

**3.7.5 Support computer programs.** Support programs consist of maintenance diagnostics, which are described in specification R/00XXXX/00T.

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#### 4. QUALITY ASSURANCE PROVISIONS

**4.1 General.** This section establishes the requirements for verification of equipment performance and design requirements. Each of the requirements of Section 3 shall be verified in accordance with Table 4-1. Verification of compliance shall be determined by one or more of the procedures of inspection, analysis, demonstration, and test. These procedures are defined as follows:

- a. **Inspection.** Verification by a visual examination of the item, reviewing descriptive characteristics with a predetermined standard to determine conformance to requirements without the use of special laboratory equipment or procedures.
- b. **Analysis.** Verification by technical or mathematical evaluation using mathematical representations (e.g., math models, algorithms, equations), charts, graphs, circuit diagrams, and representative data, or evaluation of previously qualified equipment.
- c. **Demonstration.** Verification of operation, movement, and adjustment of the item in performing its design functions under a specific set of conditions without recording of quantitative data. The item may be instrumented for monitoring of quantitative performance limits, but only check sheets rather than actual performance data sheets, are required to be used.
- d. **Test.** Verification through systematic exercising of the item with instrumentation, and with collection, analysis, and evaluation of quantitative data.

Testing of various equipment items shall be consolidated when possible.

**4.1.1 Responsibility for tests.** Unless otherwise specified in this document, 4C shall be responsible for the performance of all verification requirements of this specification, and of all subordinate specifications. Government personnel will participate as observers during all testing. Except as otherwise specified, 4C shall use facilities and services acceptable to the Government. The Government reserves the right to perform any of the verifications deemed necessary to ensure conformance to prescribed requirements.

**4.1.2 Special test and examinations.** None are required.

**Table 4-1. Equipment Verification Cross-Reference Matrix**

Paragraph	Title	Verification Method
3.0	REQUIREMENTS	NR
3.1	Item definition	I
3.1.1	Item diagrams	
3.1.1.1	MCU functions	
3.1.1.2	RCU functions	
3.1.1.3	UCU functions	
3.1.2	Interface definition	
3.1.2.1	External interfaces	
3.1.2.1.1	Matrix switch control interface	
3.1.2.1.2	UHF radio interface (RCU only)	
3.1.2.1.3	HF radio interface (RCU only)	
3.1.2.2	Internal interfaces	
3.1.2.2.1	RCE control command port	
3.1.2.2.2	Metabus between RCU and UCU	
3.1.3	Major component list	
3.1.4	Government furnished property list	
3.1.5	Government loaned property list	
3.2	Characteristics	NR
3.2.1	Performance	D & T
3.2.2	Physical characteristics	I & D
3.2.3	Reliability	A
3.2.4	Maintainability	A
3.2.5	Environmental conditions	I
3.2.6	Transportability	D
3.3	Design and construction	I
3.3.1	Materials, processes, and parts	I
3.3.2	Electromagnetic radiation	T
3.3.3	Nameplates and product marking	I
3.3.4	Workmanship	I
3.3.5	Interchangeability	I or D
3.3.6	Safety	I
3.3.7	Human performance/human engineering	D
3.4	Documentation	I
3.5	Logistics	NR
3.5.1	Maintenance	I & D
3.5.2	Supply	D
3.5.2.1	Preoperational supply support	I
3.5.2.2	ICCE supply support concept	NR
3.5.3	Facilities and facility equipment	I
3.6	Personnel and training	
3.6.1	Personnel	
3.6.2	Training	
3.7	Major component characteristics	
3.7.1	Master control unit (MCU)	
3.7.2	Remote control unit (RCU)	
3.7.3	UHF control unit (UCU)	
3.7.3.1	UHF radio interface requirements	
3.7.3.2	RCU interface (port C3) requirements	
3.7.3.3	MIO-32 specification data	

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**Table 4-1. Equipment Verification Cross-Reference Matrix (cont.)**

Paragraph	Title	Verification Method
3.7.3.4	MII-32 specification data	
3.7.4	Operational programs	
3.7.4.1	MCU	
3.7.4.2	RCU	
3.7.5	Support programs	

**LEGEND**

NR = NOT REQUIRED  
D = DEMONSTRATION  
I = INSPECTION  
A = ANALYSIS  
T = TEST

**4.1.3 Verification tests.** Tests verifying that the RCE hardware performs in accordance with Section 3 of this specification shall be conducted during unit fabrication, assembly, and integration testing. RCE system verification shall be conducted after final assembly by running basic hardware diagnostic programs. A cross-reference index listing which requirements are validated during each diagnostic procedure shall be prepared. Subsequent to successful completion of these informal hardware runs, integration of the RCE software shall take place.

**4.2 Quality conformance inspections.** Requirements for formal tests of the RCE equipment for the purpose of evaluating performance design characteristics and operability, as defined in Section 3 of this specification, shall be accomplished as specified in the subparagraphs that follow. Tests and demonstrations shall be accomplished in accordance with test plans and test procedures approved by the Government. Formal configuration control functions shall be established and implemented.

**4.2.1 Interfaces.** The system external and internal electrical and mechanical interfaces shall be determined by inspection, demonstration, and test, as defined in this specification, and as described in the test plans and procedures approved by the Government.

**4.2.2 Performance characteristics.** The performance requirements of 3.2.1 shall be verified by the successful completion of all inspections, analyses, demonstrations, and tests, as described in the test plans and procedures approved by the Government.

**4.2.3 Physical characteristics.** Requirements specified in 3.2.2 shall be verified by inspection and demonstration.

**4.2.4 Reliability.** A reliability analysis shall be accomplished using available historical data to validate MTEF's for the RCE equipment.



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**4.2.5 Maintainability.** Compliance with the maintainability requirements specified in 3.2.4 shall be verified by an examination of the maintenance records from IOC to FOC.

**4.2.6 Electromagnetic compatibility (EMC).** EMC compliance with 3.3.2 shall be determined during the integration and system-level evaluation tests. Any EMC problems shall be addressed individually as they may occur. There shall be no special testing required to determine radiation levels, spurious emanations, etc.

**4.2.7 Workmanship.** Compliance with the requirements of 3.3.4 shall be verified by inspection.

**4.2.8 Interchangeability.** Compliance with the requirements of 3.3.5 shall be verified by inspection or demonstration. Each LRU shall be inspected for compliance with the requirements for modular construction. Compliance of the modules to the plug-in, replacement, and removal requirements shall be demonstrated.

**4.2.9 Safety.** Compliance with the requirements of 3.3.6 shall be verified by inspection. Activities requiring special attention for personnel and equipment safety include: Assembly, disassembly, transport, storage, operation, maintenance, and test. The equipment shall be inspected to determine compliance with proper use of, and safety precautions for, corrosive, toxic, radioactive, and combustible substances, if employed.

**4.2.10 Human performance/human engineering.** Compliance with the requirements of 3.3.7 shall be demonstrated to show conformance to human performance and human engineering requirements.

## 5. PREPARATION FOR DELIVERY

**5.1 General.** Detailed preservation, packaging, and packing design requirements shall be developed for the items of the RCE equipments. The design criteria of MIL-STD-794 and MIL-F-9024 shall apply. The package designs developed and approved shall maintain the established reliability levels of equipment being prepared for delivery, and to ensure safe, damage-free delivery throughout the life cycle of the equipment involved. Specific levels of protection are to be defined in the contract for delivery of the system. Marking shall be in accordance with MIL-STD-129.

## 6. NOTES

JUL 12 '88 13:50 WHITTAKER-TASKER SYSTEMS

P.2

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-Corrected Copy-

**Whittaker**

Whittaker Electronic Systems  
1785 Voyager Avenue  
Post Office Box 8000  
Simi Valley, California 93063-8000  
Telephone (805) 584-8200  
Telex 88-1329 TWX 910-494-1214

8 July 1988

TechDyn Systems Corporation  
6864 Loisdale Court  
Suite 600  
Springfield, VA 22150

Attention: Mr. William C. Hise, Vice President.

Subject: Subcontract 125-001: Remote Control Element (RCE),  
stoppage of work.

Dear Sir:

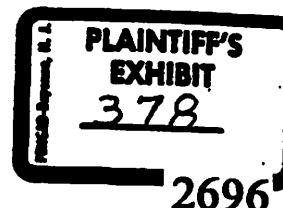
Whittaker Electronic Systems (WES) herein advises TechDyn Systems that WES must stop work on the software development and testing in support of the Remote Control Element (RCE) effective this date.

The RCE has encountered problems in the TechDyn hardware that have caused program delays and resultant cost overruns in our software development efforts in support of the Communications Functional Area (CFA). Until the TechDyn hardware problems are identified and resolved, continuation of the software development effort is not possible.

The hardware design, installation, integration and testing is clearly TechDyn's responsibility. The lack of TechDyn's firm management in these areas has placed an excessive burden upon WES' software effort in an attempt to overcome problems caused by ineffective hardware design and integration.

The TechDyn hardware provided for this effort is not adequate for its intended use and must be corrected or replaced. An impact claim will be submitted to TechDyn when WES is able to resume its contractual effort under the contract.

In order to mitigate damages, WES will provide assistance to TechDyn within the scope of its subcontractual responsibilities by providing Engineering data descriptive of the problem by close of business 12 July 1988. Our software development and testing, however, will be held in abeyance until TechDyn hardware problems are resolved.



JUL 12 '88 13:50 WHITTAKER-TASKER SYSTEMS

P.3

TechDyn Systems Corporation  
Springfield, VA

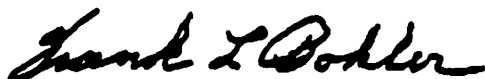
8 July 1988

Page Two

WES point of contact is the undersigned, at telephone number  
(805) 584-8200.

Sincerely,

WHITTAKER ELECTRONIC SYSTEMS



Frank L. Bohler  
Director of Contracts

pb

**Whittaker**

Whittaker Electronic Systems  
1785 Voyager Avenue  
Post Office Box 8000  
Simi Valley, California 93063-8000  
Telephone (805) 584-8200  
Telex 85-1329 TWX 910-494-1214

18 July 1988

TechDyn Systems Corporation  
6564 Loisdale Court  
Suite 600  
Springfield, VA 22150

Attention: William Hise, Vice President

Subject: Subcontract 125-001 CFA Equipment

Reference: TechDyn letter of 9 July 1985.

Subject: Testbed Facilities



*-no copy  
JCC E side*

Dear Sir:

An agreement which set up a test bed for the ICCE IOC System was reached between WES (then 4C Corp.) and TechDyn Systems as a result of reference letter and the stated ESD desire for an IOC test bed. This agreement was extended by mutual consent during negotiation of modification 003 to subject subcontract to encompass FOC testing and training.

Inasmuch as the original period of four months has been extended to, at present time, more than twenty-two months, it is requested that TechDyn remove the CFA equipment from the Whittaker facility and make arrangements for the FOC System test and training at another facility.

Please address any questions regarding arrangements for this relocation to the undersigned at (805) 584-8200, extension 355.

Sincerely,

WHITTAKER ELECTRONIC SYSTEMS

*Frank L. Bohler*

Frank L. Bohler  
Director of Contracts

cc: T. Brancati  
D. Christensen  
D. Moeller

2698



**Whittaker**

05 August 1988

Tasker Systems Division  
Whittaker Corporation  
1785 Voyager Avenue  
Post Office Box 8000  
Simi Valley, California 93063-8000  
Telephone (805) 584-8200  
Telex 65-1329 TWX 810-494-1214  
8808-1018-FB/ICCE

TechDyn Systems Corporation  
6564 Loisdale Court  
Suite 600  
Springfield, VA 22150



Attention: William Hise, Vice President

Subject: Subcontract 125-001, CFA Equipment

Reference: A) TechDyn letter to WES (4Cs)  
dated 18 July, 1988

B) WES letter to TechDyn dated 18 July, 1988

Gentlemen:

By Reference A), TechDyn requested WES facility space and facilities in order to establish a test bed for the IOC. The original four months period has been extended five times over this period.

By Reference B), WES requested that TechDyn remove the CFA equipment from WES facilities. As of 01 July 1988, the WES facility at 6190 Yarrow Drive in Carlsbad was vacated. If TechDyn does not remove its equipment immediately, it will be liable for the \$20,000 per month rent for the Yarrow Street building.

Please respond with TechDyn's intended action by return message to the undersigned.

Very truly yours,

WHITTAKER ELECTRONIC SYSTEMS

*Frank L. Bohler*

Frank L. Bohler  
Director of Contracts

2699

FLB:lm





12 January 1989

125-S001-0787

Whittaker Electronic Systems  
1785 Voyager Avenue  
P.O. Box 8000  
Simi Valley, CA 93063-8000

Attn: Mr. Frank Bohler  
Director of Contracts

Subj: Subcontract 125-001; Ten Day Cure Notice for the  
Remote Control Element (RCE)

Ref: (a) Letter, HQ ESD (Banks) to TechDyn (Hise), dated  
26 August 1988, NADS 676  
(b) Letter, TechDyn (Rosen) to WES (Bohler), dated  
30 August 1988, 125-S001-074  
(c) Letter, TechDyn (Rosen) to WES (Bohler), dated  
6 January 1989, 125-S001-0786  
(d) Letter, WES (Bohler) to TechDyn (Rosen), dated  
11 January 1989, 8901-1310-FB/125-001

Dear Mr. Bohler:

TechDyn Systems Corporation, in accordance with FAR Clause 52.249-8 "Default (Fixed Price Supply and Service)", incorporated into the subject Subcontract 125-001 by Section 2-33 of, and Modification No. 3 to same, is herewith issuing this Ten Day Cure Notice to Whittaker Electronic Systems (WES) due to WES' failure to make progress, so as to endanger performance of the subject Subcontract, with regard to the Remote Control Element (RCE). WES was subcontracted to develop the RCE by CLIN 2AB and portions of CLIN 57 under said subcontract. Due to WES' failure to demonstrate satisfactory progress under the above stated CLIN's, TechDyn is considering terminating said CLINs, or relevant portions thereof, with regard to the RCE, for Default.

TechDyn has provided guidelines and lenient A-Specification interpretation to WES to alleviate on-going RCE design problems. TechDyn forwarded the referenced (a) letter by the referenced (b) letter to WES in this regard. To date, TechDyn has never received a response to this letter. In addition, TechDyn has provided consistent guidance to WES with regard to the RCE and WES has either provided insufficient responses, or failed to respond at all.

Pending a final decision in this matter, it will be necessary to determine whether your failure to perform arose from causes beyond your control and without fault or negligence on your part. Accordingly, you are given the opportunity to present, in writing, any facts bearing on the question to the



Page Two  
125-8001-0787  
12 January 1989.


undersigned, within ten (10) calendar days of the date of this notice. Your failure to present any excuses within this time may be considered as an admission that none exist. Your attention is invited to the respective rights of the subcontractor and TechDyn Systems Corporation and the liabilities that may be invoked if a decision is made to terminate for Default.

Any assistance given to you on this contract or any acceptance by TechDyn Systems Corporation of delinquent goods or services will be solely for the purpose of mitigating damages, and it is not the intention of TechDyn Systems Corporation to further condone any delinquency or to waive any rights that TechDyn Systems Corporation has under the contract.

We consider your reference (d) response to the referenced (c) letter to be unacceptable.

If you have any questions regarding the above, please contact the undersigned at (703) 922-5100.

Very truly yours,

A handwritten signature in black ink, appearing to read 'Max S. Rosen', with a long horizontal line extending to the right.

Max S. Rosen  
Manager of Contracts

MSR/kjs



200

# TechDyn

SYSTEMS

23 January 1989

125-8001-0797

Whittaker Electronics Systems  
1785 Voyager Avenue  
P.O. Box 8000  
Simi Valley, CA 93063-8000

Attn: Mr. Frank Bohler  
Director of Contracts

Subj: Subcontract 125-001 as Amended; Partial Termination  
for DEFAULT

Ref: (a) Letter, WES (Bohler) to TechDyn (Rosen), Dated 18  
January 1989, 8901-1318-FB/125-001  
(b) Letter, TechDyn (Rosen) to WES (Bohler), Dated 12  
January 1989, 125-S001-0787

Dear Mr. Bohler:

TechDyn Systems Corporation, in accordance with FAR Clause 52.249-8 "DEFAULT (Fixed Price Supply and Service)", incorporated into the subject Subcontract 125-001, dated 16 July 1985, by Section 2-33 thereof, hereby terminates for DEFAULT CLIN 002AB and that portion of CLIN 0057 pertaining to work related to the Remote Control Element (RCE). This partial contract termination for DEFAULT is made due to the failure of Whittaker Electronics Systems (WES) to make progress, so as to endanger performance of the subject Subcontract, as it relates to the RCE.

Therefore, your right to proceed further under the contract on all work set forth in CLIN 002AB and on work in CLIN 0057 as it pertains to the Remote Control Element (RCE) is terminated. Effective this date, you shall incur no further costs against CLIN 002AB and that portion of CLIN 0057 relating to the RCE.

TechDyn Systems has reviewed the referenced (a) response to the referenced (b) cure notice and finds that it does not cure the lack of performance relating to the RCE nor does it demonstrate that any progress will be made by the Subcontractor to allow continued performance in the stated areas.

TechDyn Systems will take the steps necessary to provide the RCE as required under its Contract with the Government; accordingly, the work required under the terminated portion of Subcontract 125-001 as amended may be purchased against WES' account, and WES will be held liable for any excess costs.

PLAINTIFF'S  
EXHIBIT  
416

23 January 1989  
125-8001-0797  
Page Two

TechDyn Systems Corporation reserves all rights and remedies provided by law or under this subcontract, in addition to charging excess costs.

This notice constitutes a decision that WES is in DEFAULT, as specified herein, and therefore WES may avail itself of any right to appeal set forth in the subcontract.

If you have any questions regarding the above, please contact the undersigned at (703) 922-5100.

Very truly yours,



Max S. Rosen  
Manager of Contracts

cc: U.S. Small Business Administration  
Washington District Office  
1111 18th Street., N.W. 6th Floor  
P.O. Box 19993  
Washington, D.C. 20036

Attn: Ms. Barbara Ivory  
Contracting Officer

Department of the Air Force  
HQ, Electronics Systems Division/PKRG  
Mitre G Building  
Hanscom Air Force Base, MA 01731-5000

Attn: Captain Phillip Chilson  
Contracting officer  
Directorate of Contracting  
Tactical Systems, JTIDS & AWACS

# TechDyn

SYSTEMS

3 March 1989

125-S001-0834

Whittaker Electronic Systems  
1785 Voyager Avenue  
P.O. Box 8000  
Simi Valley, CA 93063-8000

Attn: Mr. Frank Bohler  
Director of Contracts

Subj: Subcontract 125-001; ICCE Program, Meeting with  
TechDyn and Whittaker Electronic Systems (WES)

Ref: (a) Letter, HQ ESD (Chilson) to TechDyn (Hise), dated  
2 March 1989, NADS-788  
(b) Fonecon, TechDyn (Rosen) and WES (Bohler), 1 March  
1989

Dear Mr. Bohler:


TechDyn Systems has reviewed and is forwarding the referenced (a) letter with regard to the subject ICCE Program, Meeting with TechDyn and Whittaker Electronic Systems (WES) scheduled for 10 March 1989, to WES for action. Please note that the meeting will be held at HQ ESD and not at TechDyn as was discussed in the referenced (b) fonecon.

Please provide TechDyn with WES' concurrence with attending the meeting on 10 March 1989, as well as a list of WES attendees, no later than COB 6 March 1989.

Performance in accordance with the instructions provided herein is considered by TechDyn to be within the scope of the existing subcontract requirements. In the event that WES does not agree that these instructions are within the present requirements, WES must notify TechDyn, in writing, within ten (10) calendar days from receipt of this letter.

If you have any questions regarding the above, please contact the undersigned at (703) 922-5100.

Very truly yours,



Max S. Rosen  
Manager of Contracts

Enclosure: As Stated

MSR/clz





DEPARTMENT OF THE AIR FORCE  
HEADQUARTERS ELECTRONIC SYSTEMS DIVISION (AFSC)  
HANSCOM AIR FORCE BASE, MASSACHUSETTS 01731-8000

REPLY TO  
ATTN: CP

EED/MKTC (TCN-4, Jacobson, X2174) NPDS-788

02MAR 1989

SUBJECT: Contract F19628-85-C-0079, ICCE Program, Meeting With TechDyn and Whittaker Electronics Systems (WES)

TO: TechDyn Systems Corporation  
Attn: Mr. William C. Hise  
6564 Linsdale Court  
Suite 600  
Springfield, VA 22150

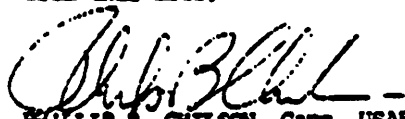
- Reference:
- a. 13 Feb 89 meeting between Whittaker Electronics Systems representatives (Mr. Brancati, Mr. Mochler, Mr. Johnson) and ESD representatives (BG Cardile, Col. Roan, LTC Johnson, Capt. Chilson, and Capt. Jacobson).
  - b. 22 Feb 89 meeting between Techdyn representatives (Mr. Morrison, Mr. Hise, Mr. Ellis) and ESD representatives (BG Cardile, Col. Roan, LTC Johnson, Maj. Goodrich, Capt. Chilson, Capt. Jacobson, Capt. Petrov).
  - c. 3 Feb 89 WES letter on Schedule and TOSS, 8902-1337-FR/125-001.

1. In the course of reference a meeting to discuss WES concerns on the AAC/PACAF RADIL Program, WES raised several issues pertaining to the ICCE program. BG Cardile explained to WES that issues pertaining to ICCE could not be discussed due to the privacy relationship between TechDyn and WES. However, WES was permitted to air their ICCE concerns consistent with the ESD/TC open-door policy. As part of reference b meeting, many of WES concerns were discussed. As discussed at that meeting and as revealed in later research, many inaccuracies and contradictions were evident in WES perceptions of issues in the ICCE program. Attachment 1 contains discussion of ESD comments on WES perceptions as presented at reference a. As part of reference a discussion, WES explained that reference c schedule data had been provided to Techdyn which clearly delineated programmatic obstacles to program completion. Attachment 2 contains ESD comments on WES perceptions as depicted in reference c schedule data.

2. As discussed at reference b and highlighted by WES at reference a, greater emphasis by Techdyn should be placed on schedule discipline and contract officer subcontract coordination. Schedules continue to be delinquent from the contractor. Regardless of adequacy of subcontractor schedule inputs, it is incumbent on the prime contractor to make schedule judgments and deliver these estimates to government on a monthly basis. This information should also be passed to subcontractors on a regular basis. Also, in light of the contentious contract atmosphere between TechDyn and WES, emphasis should be placed on increasing personal dialogue between TechDyn and WES contracting personnel.

3. Due to contention evident at this time in the IOCE program, request TechDyn and WES program managers and contracting personnel meet at ESD on 10 Mar 89 to discuss perceptions highlighted in this correspondence (with attachments). Request the contractor provide confirmation of the TechDyn and WES intentions no later than 7 Mar 89. POC for this matter is Capt. Jacobson, 617-271-3174.

4. Performance of the above task is considered to be within the present requirements of the subject contract. In the event the contractor does not agree that this task is within the present requirements, he/she shall take no action but must notify the Contracting Officer, in writing, seven (7) days from this date.

  
PHILLIP S. CHILSON, Capt, USAF  
Contracting Officer  
Directorate of Contracting  
Tactical Systems, JTIDS & AWACS

2 Atch

1. 13 FEB 89 WES visit
2. 3 FEB 89 WES Schedule  
and TOSS

Atch 1

The following discussion addresses potential inaccuracies that were presented by WES during their 13 FEB 89 meeting with Brig Gen Cardile:

1. RCE Software Waivers:

WES stated that the government accepted waivers to RCE software during summer 88. This statement hints at some confusion. The government did not express any willingness to accept RCE software waivers as presented by WES 3 May 88 RCE 85 RCP which would have waived the 2 minute circuit failover requirement. However, the government did offer an alternative. This alternative as documented in NADS-676, dtd 26 AUG 88, offered a lenient approach for implementing the circuit failover requirement.

2. Progress on RCE Software:

WES stated that they had proceeded in good faith to correct the RCE software to perform in accordance with the alternative offered by NADS-676. Although they stated that disruption to the RCE test bed prevented their progress, the "good faith" effort is somewhat inconsistent with WES program manager's statement at the 13-15 DEC 88 IADS working group, that no RCE effort had occurred since APR 88. In the face of TechDyn's OCT 88 notification to WES that the test bed would be available for WES RCE testing at Camarillo, CA; it would have been expected that WES would have made the design and code fixes. Then, after making the code fix, WES should have notified TechDyn of their need to verify the fix on the test bed. To further illustrate WES confusion on this matter, in a 13 JAN 89 telecon from the WES program manager to the ESD program manager, WES stated that TechDyn had not officially directed WES to make an RCE fix. However, WES did acknowledge that TechDyn had forwarded NADS-676 fix action. This was purported to be WES's reason for not making an RCE fix. However, later in the telecon, the WES program manager revised himself when he found a letter in his file dated 9 SEP 88 from Mr. Brancati, WES to Mr. Morrison, TechDyn; acknowledging direction for change in the RCE approach.

3. ESD and TechDyn misled WES on RCE:

WES stated that while they were working in "good faith" to resolve the RCE software problem TechDyn and ESD were pursuing an alternative approach while leaving WES in the dark. Additionally, WES stated that a MITRE working paper from as early as summer 1988 was prepared to pursue an alternative approach.

While ESD is not aware of the pursuit of an alternative RCE method in summer 1988, ESD did begin discussing the possibility of an RCE alternative during the OCT 88 Iceland installation of the FOC RADIL. WES was informed of these considerations from the very start and were invited to participate at discussions on this matter in DEC 88 and JAN 89. In fact, during a 30 NOV 88 meeting at ESD with WES representatives, WES requested that the RCE approach be decided upon prior to their initiating a cost exercise on the rebaselining (FOC 1/FOC 2) proposal. Additionally, WES declined to attend a 1 JAN 89 meeting to discuss the RCE alternative because a TechDyn contracting officer would not be in attendance. Despite this, WES was faxed information on all alternatives and government intended lenient A-SPEC interpretations (formally documented in NADS-751, dtd 17 JAN 89), on 4 JAN 89.

#### 4. TechDyn Rebuttal to Cure-notice not Assessed:

WES stated that a 13 inch rebuttal was submitted in response to TechDyn's RCE cure-notice. Further, since TechDyn issued a partial Termination for Default of RCE the same day, it is unlikely that TechDyn could adequately have assessed the WES response due to the sheer volume of the WES response. The only comment ESD has with the statement is whether WES mis-spoke and meant to say 13 pages, as opposed to 13 inches. Or, whether WES is implying that something other than the 13 page rebuttal letter has bearing on TechDyn's termination for default. Perhaps WES was implying that the voluminous WES claim submission had some bearing on the issue of TechDyn's RCE Termination for Default.

#### 5. WFA Software Effort:

WES stated that WFA STRs could not be completed due to disruption of the test bed. ESD comments at Atch 2, item #2 apply here.

#### 6. Rebaselining (FOC 1/FOC 2) Proposal:

WES stated that despite their efforts on the rebaselining approach, the approach has been allowed to go by the wayside. This sentiment is contrary to the ongoing efforts to pursue the rebaselining proposal. In response to ESD's 11 AUG 88 RFP for rebaselining IOCE, WES presented their draft rebaselining SOW on 20 SEP 88. This SOW appeared to be technically reasonable and the no-cost presentation of the SOW also appeared reasonable. However, since the estimated changes in descopes and added scope exceeded \$100,000, WES was informed that cost data needed to be supplied. In OCT 88, TechDyn pursued fact finding with WES. At a meeting between the ESD program manager and WES program manager on 21 NOV 88, WES protested that TechDyn viewed the rebaselining SOW as additive to the current SOW on contract, rather than as a modification. Then in a 30 NOV 88 meeting between ESD, WES and TechDyn, WES requested to have a final determination on the RCE approach prior to initiating their cost exercise on the rebaselining proposal. In light of the issues, ESD program manager and contracting personnel met with TechDyn CEO and staff on 6 DEC 88. After discussing WES concerns on the WES SOW being viewed as additive, TechDyn agreed that upon a contract modification, the WES SOW would be modified rather than appended. TechDyn stated that WES would be informed of this clarification. In subsequent telecon between ESD program manager and TechDyn program manager, TechDyn confirmed that the WES program manager had been informed of clarification on this point. At the 6 DEC 88 meeting, WES's desire to have the RCE approach defined was also addressed. TechDyn agreed to accelerate a final determination on the RCE approach. ESD was notified of TechDyn's decision to change the RCE approach during an 11 JAN 89 telecon between ESD and TechDyn contracting officers. Based on this notice, ESD redlined the rebaselining SOW to reflect the revised RCE approach. This was forwarded to TechDyn on 17 FEB 89. During 24 FEB 89 telecon between ESD and TechDyn program manager, TechDyn stated that the WES program manager was provided rebaselining SOW change pages and was requested to get the cost proposal in.

This chronology highlights ESN's perception of a focused effort to pursue the rebaselining proposal effort.

**Atch 2**

The contents of WES Program Schedule and Technical Order Status Report, dated 3 FEB 89, does not provide a subcontractor work schedule. Additionally, the status information contained in the letter is distorted. The following are comments applying to each status item:

**1. Test Procedures:**

SOW Req't 3.3.19.1.1 "The RADIL system at RSSF shall be provided all equipment (hardware) required to maintain and enhance all software..."

From period Jan 87 - May 88, WES acknowledged and was working towards this requirement. In May 88, WES attempted to test this requirement and the test failed. Two months later, WES declared that the SOW requirement was not valid in that WES was unable to get their compiler to operate consistent with the RADIL's 16-Bit environment. Within a month, the government protested WES's position in a 9 AUG 88 contracts letter (NADG-635). TechDyn and WES remain at a stalemate, and WES has still not justified their stop work on this requirement nor investigated alternatives for satisfying this requirement within the current scope of the contract.

**2. Software Qualification Test:**

SOW Req't 3.3.1.8.1.2.2 "The test of the PDFA software will be referred to as Software Qualification Test (SQT). SQT shall verify that the PDFA (software) will meet all requirements listed in the system specification and in the SOW. ..."

In the referenced WES 30 JAN 89 letter (8901-1332-FB/125-001), no request for amplifying SQT information was made. WES simply stated that they couldn't proceed with correcting STR's until the test-bed is re-established. Based on that situation, WES asked TechDyn to have the government reassess several government comments that alleged that the WES SQT test report was lacking in detail in the area of TAF STRs. WES concerns are misleading for several reasons.

First, a test bed is not needed to proceed with correcting STRs. In the past, WES has used its MV10000 development bed for making software changes. WES's most current STR status listing provided by WES program manager at the 13-15 DEC 88 working group clearly shows that no STR fixes on the MV10000 have occurred since April 88 implying little, if any, work has been done since then. Even if disruption of the test-bed was a factor, disruption of the test bed did not occur until four months after the last STR "Fix" was made, and then 10 STRs which were fixed and awaiting internal testing, never were tested, despite the presence of a test bed.

Second, WES insists that TechDyn disrupted the IOCE program by removing the test bed despite WES insistence that TechDyn either pay \$20,000/month rent or relocate the test bed. Additionally, when representatives from ESD met on 31 AUG 88 with TechDyn, the WES program manager and WES head of program/contracts; all parties were in agreement that a schedule opportunity could be realized by swapping the Iceland RADIL out with the test bed RADIL.



WES agreed that the refurbishment/swap out time would be 6-9 weeks and that that time would not jeopardize the critical path and would enable early WUCCO of a sizable WES CLIN. ESD contracts letter NACS-651 dated 16 AUG 88 confirmed this arrangement and confirmed the in-scope nature of this swap-out. Part of the difficulties in restoring the test bed fall squarely on WES. Despite WES receiving the Iceland RADIL in Oct 88 for refurbishment, they have not been able to match their 6 week average for refurbishment which would have had the RADIL ready by DEC 88. Instead, by MAR 89 the RADIL was still not ready.

Third, despite the fact that WES has performed all previous STR test regression on ICLF software by using their engineering model, they now insist that testing in an environment that involves radio equipment, is required. Finally, WES delays with SQT regression planning on the basis that the government comments required improved clarity in the SQT test report seems irrelevant in that SQT regression is not dependent on the SQT test report.

### 3. TAF Certification Completion:

WES's estimates for TAF STR verifications have grown substantially. In meetings with the WES program manager and head engineer at Langley AFB on 3 MAY 88, the government was informed that the TAF STR's were minor deficiencies which could be corrected within 30 days from start. As there is a significant change in WES's assessment, the government requires rationale for the growth of this verification estimate and reassessment of the complexity associated with these deficiencies. Again, as addressed in SQT discussion above, WES concerns of impairment of progress based on test-bed disruption are distorted. Just as with the other open SQT STRs, the TAF STRs should be able to progress with the use of WES's MVL0000 development system.

### 4. In-Plant test:

Now that WES has been terminated by TechDyn on the RCE effort, no in-plant ELT requirements remain for WES. However, the Compile, Link, Load test which was deferred to the RSSF I&CO test stills remains open until WES can successfully pass those test requirements.

### 5. Manuals PDFA:

WES management has confused data needed for the positional handbooks with data needed for the T.O.s. Data on speed and script is needed for the positional handbooks, not the T.O.s. Based on 24 FEB 89 telecon with the Computer Spt Group at Tyndall AFB (RSSF), data on speed and script was provided via fax to WES within the week following positional handbook review conducted Sept 88. And, during a 2-5 NOV 88 review, the government reviewed WES's positional handbooks and found that WES had satisfactorily incorporated speed and script into the positional handbook. Therefore, no delays should be occurring as a result of speed and script data.

### 6. System Manual, Training documentation, PCA/PCA:

WES's assessment of dependencies are accurate as they relate to other critical path items which must first occur. As discussed above, WES should play a more team-oriented role in order to achieve completion of the critical path items.

Proposal No. 001  
Tactical Data Bus Interface Control  
Documents (ICDS)

Part I  
TECHNICAL PROPOSAL

Submitted To:

Commander  
US Army CECOM  
Attn: AMSEL-PC-BID  
Ft. Monmouth, New Jersey 07703-5000

In Response To  
Solicitation DAAB07-89-R-H066

Submitted By:

TECHDYN SYSTEMS CORPORATION  
6564 Loisdale Court  
Suite 600  
Springfield, Virginia 22150

28 August 1989

2711

PROTECTIVE ORDER  
ATTORNEY AND EXPERTS ONLY



PROTECTIVE ORDER  
ATTORNEY AND EXPERTS ONLY

2712

**TechDyn**  
SYSTEMS

PLAINTIFF'S  
EXHIBIT  
568



27 January 1987

Department of Health and  
Human Services/OS  
Division of Contract Operations  
Room 443-H  
200 Independence Avenue, S.W.  
Washington, D.C. 20201

Attn: Mr. James L. Vandecar  
Contracting Officer

Subj: RFP 18-87-HHS-OS; TechDyn Proposal No. 715

Dear Mr. Vandecar:

TechDyn Systems Corporation is pleased to submit three (3) copies of its Technical Proposal in response to the subject RFP. This confirms extension to January 27, 1987 of the RFP closing date.

If you have any questions concerning this submittal, please contact the undersigned at (703) 922-5100.

Very truly yours,

A handwritten signature in dark ink, appearing to read "William C. Hise", written over the typed name.

William C. Hise  
Director  
Management Support Operations

Enclosures: As stated

PROTECTIVE ORDER  
ATTORNEY AND EXPERTS ONLY

2713

F61546-87-R-0038

Operation and Maintenance  
of  
Four 490L AUTOVON Sites

Feldberg, Federal Republic of GERMANY  
Langerkopf, Federal Republic of GERMANY  
Mt. Vergine, ITALY  
Mt. Pateras, GREECE

PREPARED FOR:

USAFE Contracting Center/LGCZ-S  
APO NY 09633-5320

PROPOSAL NO. 806

02 November 1987

VOLUME I - TECHNICAL

TechDyn Systems Corporation  
4564 Loisdale Court, Suite 600  
Springfield, VA 22150

PROTECTIVE ORDER  
ATTORNEY AND EXPERTS ONLY

2714



PROTECTIVE ORDER  
~~ATTORNEY~~ AND EXPERTS ONLY

Cost Proposal No. 908  
Technical and Administrative Support  
for the Operations of Various  
Battle Simulation Centers in Germany  
and One (1) in Vicenza, Italy

Part I  
COST PROPOSAL  
Second Copy  
Best and Final Offer

Submitted To:

USAREUR Contracting Center  
ATTN: AEUCC-C-SSC  
Eschersheimer Landstr. 163  
6000 Frankfurt/Main 1  
Federal Republic of Germany

In Response To  
Solicitation DAJA37-89-R-0227

Submitted By:

TECHDYN SYSTEMS CORPORATION  
6564 Loisdale Court  
Suite 600  
Springfield, Virginia 22150

28 August 1989

2715



PROTECTIVE ORDER  
ATTORNEY AND EXPERTS ONLY

# 486L Communications System Operation & Maintenance TURKEY

Prepared For  
**USAFE Contracting Center**

In Response To  
**RFP F61546-89-R-0007**

**Volume I**  
**Technical Proposal**

**No. 904**

Submitted By  
**TechDyn Systems Corporation**  
6564 Loisdale Court  
Suite 600  
Springfield, Virginia 22150

6 March 1989

**PROPRIETARY NOTICE**

*This data, furnished in connection with this proposal shall not be disclosed outside the Government and shall not be duplicated, used, or disclosed in whole or in part for any purpose, other than to evaluate the proposal; provided, that if a contract is awarded to this offeror as a result of or in connection with the submission of this data, the Government shall have the right to duplicate, use or disclose the data to the extent provided in the contract. This restriction does not limit the Government's right to use information contained in the data if it is obtained from another source without restriction.*



Copy 14. of 15 Copies

2716

2717



# COMPANY CONFIDENTIAL

Proposal Number 904  
Proposal Manager Milton de Rouen, Jr.  
RFP Requestor Milton de Rouen, Jr.  
Red Bank Springfield  
Germany X

Date of Request 29 December 1988  
Date of Receipt 04 January 1989  
Solicited X Unsolicited       

## RFP ROUTING SHEET

### I. IDENTIFYING DATA

Subject: O&M of 486L in Turkey and Greece

Customer: USAF Solicitation No.: F61546-89-R-007

Issue Date: 29 December 1988 Due Date: 6 March 1989

Type of Contract: CPFF        FFP X T&M        SET ASIDE       

Distribution:       

### II. ANALYSIS

Level of Effort: Approximately 71 Man-Years/Year Contract Duration: 3 yrs

NOTE separate contracts for Greece (30 My) and Turkey (41 MY)

Can we fulfill the technical requirements?

Yes X No        Comments: Thru hire in Turkey, Greece and FRG

Do we have personnel with the specified qualifications?

Yes        No X Comments: Can probably hire O&M personnel in Turkey, Greece and FRG.

Do we have the corporate experience?

Yes        No        Comments: We have management experience (but not O&M).

Have we established customer contact prior to issue of this RFP?

Yes        No X Comments:       

Recommend Proposal Team and Proposal Level of Effort: Tech and Mgmt.

Proposals: de Rouen/Beinhacker/Busch/Martin/Bandmann 544 hours  
\$3,500 hard costs

at Proposal: Corporate 200 hours

2718

PLAINTIFF'S  
EXHIBIT

506a

# COMPANY CONFIDENTIAL

Assessment of the competition: Current contract holder GE-OMP will bid  
USAF doesn't want them. There are 32 names on solicitation mailing list  
including companies with office and experience in Greece/Turkey (e.g. COMTEL  
and Brown/Reel).

Can we be price competitive?

Yes x No      Comments: Award is not just on basis of price; Tech/Mgmt/  
Cost, in that order.

Probability of winning: Unknown

Recommendation: To be reached jointly by COM 9 Jan 89 (DC time).  
BID NO-BID

Proposed Contract Value: 2.7 million proposal budget: \$30,000

Remarks: RFP was surfaced thru Herb Rountree before unveiled by a local DC  
area committee.

  
(Signature)

III. DIVISION DIRECTOR'S RECOMMENDATION (Circle one) BID NO BID

  
(Signature)

9 January 1989  
(Date)

per fax  
att 9  
Jan 89

IV. PRE-PROPOSAL CONFERENCE DETERMINATION: BID NO BID

Pre-proposal Conference held on 9 Jan 89 w/ Rountree  
and others in attendance.

V. APPROVAL DISAPPROVAL

1/11/89  
(Signature)

(Date)

Return to Corporate RFP Coordinator

CC's To Proposal Manager

\*Conservative estimate (less yearly award fee) based on attached worksheet.  
Informal discussion Randmann - RCD indicated that current contractor pay rate for  
US personnel is about \$7 to \$10/hour.

10/22/87  
1/21/87

Proposal Number 715  
 Proposal Manager Rountree  
 RFP Requestor Rountree  
 Red Bank Springfield X  
 Germany \_\_\_\_\_

Date Effective: 1/22/87  
 Date of Request 1/21/87  
 Date of Receipt 31 Dec. 1987  
 Solicited X Unsolicited \_\_\_\_\_

**RFP ROUTING SHEET**

**I. IDENTIFYING DATA**

Subject: Communications Traffic Study

Customer: DMHS Solicitation No.: RFP-18-87-DMHS-08

Issue Date: 23 December 1986 Due Date: 26 January 1987

Type of Contract: CPFF \_\_\_\_\_ FFP \_\_\_\_\_ T&M X SET ASIDE \_\_\_\_\_

Distribution: RJO, Systemetics

**II. ANALYSIS**

Level of Effort: 3500 manhours Contract Duration: FY87-88

Can we fulfill the technical requirements?

Yes X No \_\_\_\_\_ Comments: \_\_\_\_\_

Do we have personnel with the specified qualifications?

Yes X No \_\_\_\_\_ Comments: \_\_\_\_\_

Do we have the corporate experience?

Yes X No \_\_\_\_\_ Comments: \_\_\_\_\_

Have we established customer contact prior to issue of this RFP?

Yes \_\_\_\_\_ No X Comments: \_\_\_\_\_

Recommend Proposal Team and Proposal Level of Effort: \_\_\_\_\_

Rountree, Willis, Ellis, Bethel





Assessment of the competition: RESEARCH & DEVELOPMENT

ASSOCIATES (RDA) - currently operating in Europe

Can we be price competitive?

Yes ☒ No ☐ Comments: OUR OFF-SITE RATES ARE VERY COMPETITIVE  
IN EUROPE

Probability of winning: 50%

Recommendation: BID ☒ NO-BID ☐

Proposed Contract Value: 21.5 MILLION TOTAL Proposal Budget: 25K

Remarks: file 5/30/89



(Signature)

III. DIVISION DIRECTOR'S RECOMMENDATION (Circle one): BID/NO BID



(Signature)

26 May 89

(Date)

IV. PRE-PROPOSAL CONFERENCE DETERMINATION BID/NO BID

V. APPROVAL/DISAPPROVAL

file 5/30/89

(Signature)

(Date)

Return to Corporate RFP Coordinator

CC's To Proposal Manager

CORRECTED COPY

LSH  
NCH  
MR  
HSS  
TN  
HR  
PH  
GV

Proposal Number 001  
Proposal Manager Solebello  
RFP Requestor Solebello  
Red Bank Springfield X  
Germany \_\_\_\_\_

Date of Request 4 Aug 89  
Date of Receipt 4 Aug 89  
Solicited X Unsolicited \_\_\_\_\_

RFP ROUTING SHEET

I. IDENTIFYING DATA

Subject: SUPPORT FOR TACTICAL DATA BUSES-TACTICAL DATA BUS INTERFACE CONTRACT  
DOCUMENTS.

Customer: USA-CECOM Solicitation No.: DAAB07-89-R-H066  
Issue Date: 21 July 89 Due Date: 21 Aug 89  
Type of Contract: CPTF \_\_\_\_\_ FFP \_\_\_\_\_ T&M XX SET ASIDE XX  
Distribution: 100% SBA set aside.

II. ANALYSIS

Level of Effort: 96 M/M Contract Duration: 5 YR

Can we fulfill the technical requirements?

Yes X No \_\_\_\_\_ Comments: \_\_\_\_\_

Do we have personnel with the specified qualifications?

Yes X No \_\_\_\_\_ Comments: \_\_\_\_\_

Do we have the corporate experience?

Yes X No \_\_\_\_\_ Comments: \_\_\_\_\_

Have we established customer contact prior to issue of this RFP?

Yes X No \_\_\_\_\_ Comments: \_\_\_\_\_

Recommend Proposal Team and Proposal Level of Effort: Solebello

Wigle, Rountree, Consultants as needed-4 M/M.

Proposal Cost Manager: M. Rosen





*File 10/11*  
**CONTRACTS  
MASTER FILE**

Proposal Number 806  
Proposal Manager Rountree  
RFP Requestor deRouen  
Red Bank Springfield X  
Germany       

Date of Request 5 October 1987

Date of Receipt 5 October 1987

Solicited X Unsolicited       

RFP ROUTING SHEET

I. IDENTIFYING DATA

Subject: Operation and Maintenance of four (4) 490L Autovon sites; in FRG (2), Italy (1), and Greece (1)

Customer: USAF Solicitation No.: F61546-87-R-0038

Issue Date: 4 February 1987 Due Date: 2 November 1987

Type of Contract: CPFF        FFP X T&M        SET ASIDE       

Distribution: Unknown

II. ANALYSIS

*470,000 = 15,120,000*  
Level of Effort: 216 Man-years Contract Duration: 6 years

Can we fulfill the technical requirements?

Yes X No        Comments:       

Do we have personnel with the specified qualifications?

Yes X No        Comments:       

Do we have the corporate experience?

Yes X No        Comments:       

Have we established customer contact prior to issue of this RFP?

Yes        No X Comments:       

Recommend Proposal Team and Proposal Level of Effort:       

Rountree, Gleason or Martin, Von Bergen, Salzman, Fourney, deRouen



5th  
JFH  
NSC  
JEE

MSO 471 A86



DEPARTMENT OF THE AIR FORCE  
HEADQUARTERS ELECTRONIC SYSTEMS DIVISION (AFSC)  
HANSCOM AIR FORCE BASE, MASSACHUSETTS 01731-5000

CONFIDENTIAL  
MASTER FILE  
90 APR 03  
1/28/90

REPLY TO: PKTG/ (TNR-4/Lt Dalrymple)/NADS-971  
ATTN OF:

SUBJECT: Contract F19628-85-C-0079, Iceland Command and Control Enhancement (ICCE),  
Formal Verification Test (FVT) Report and Required Action

TO: TechDyn Systems Corporation  
Attn: Mr. William C. Hise  
6564 Loisdale Court  
Suite 600  
Springfield, VA 22150

Reference: 1-2 Feb 90 Technical Interchange Meeting (TIM) at WES Carlsbad, CA

2. This letter formally transmits the Government written FVT Test Report including the procedures which underwent test and the associated data analysis. The report also includes a list of New System Failures not seen on earlier versions of software.

2. During the referenced TIM the Government and the contractors discussed the status for each System Trouble Report (STR) previously identified; along with each new software deficiency observed during conduct of FVT. The summation of those discussions were:

<u>CLOSED</u>		<u>OPEN</u>	<u>UNTESTED/UNWITNESSED</u>
88-280	88-281	87-141	88-052
88-298	88-413	87-863	88-053
88-656	88-658	87-981	88-141
88-661	88-662	88-007	88-655
88-666	88-669	88-610	88-657
88-671	88-674	88-654	88-663
88-675	88-676	88-659	88-665
88-678	88-679	88-660	88-668
88-681	88-683	88-664	88-670
88-684	88-685	88-667	88-672
		88-677	88-673
		88-680	88-682

In addition twenty-three items were identified as new deficiencies and designated as FVT 01-23. Of those twenty-three, the contractor immediately identified four (FVT 01-04) as their responsibility. As discussed at the TIM the Government promised a "scrub" of the list. The scrub provided an additional two items and are added to this list. Both are direct derivatives of 88-666 which was closed when it successfully updated Mode 1 but improperly processed Modes 2 and 3.

3. Contractor status of the above should be addressed at the next PMR scheduled 9 APR 90 with resolution to follow at a follow-up TIM.

4. Point of contact is Lt Scott Dalrymple, ESD/TNR-4, (617) 377-7210.

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1. **VI** 5. Performance of the above task is considered to be within the present requirements of the subject contract. In the event the contractor does not agree that this task is within the present requirements, he/she shall take no action but notify the Contracting Officer in seven (7) calendar days from this date.

JAMES K. MCKENNA  
Contracting Officer  
North Warning and North Atlantic  
Defense Systems Directorate  
Deputy for Contracting

Atch:  
FVT Report

27 November 1989  
Revision 1

## SECTION I

### ICCE FORMAL VERIFICATION TEST PROCEDURES

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## INTRODUCTION

The Iceland Command and Control Enhancement (ICCE) Formal Verification Test (FVT) was conducted during the periods 12-20 October 1989 and 13-17 November 1989. The FVT was developed by the Government as a method of 1) verifying contractor software changes to correct 44 in-scope (as agreed to by Whittaker Electronic Systems (WES) and the ICCE program office) Software Trouble Reports (STRs), 2) establishing a baseline for remaining software deficiencies (approximately 38 additional STRs) deemed out-of-scope and/or uncorrected, and 3) highlighting the operational capabilities and limitations of the ICCE system. The procedures and results of the FVT are contained herein.

In order to achieve all test goals, the FVT was structured to simulate as closely as possible a true operational environment. The decision to make the FVT procedures broad in scope was based on prior experience with ICCE software corrections which often resulted in new software deficiencies in related or unrelated areas. The FVT procedures were developed based on previous (contractor-developed) Software Qualification Test (SQT) and Tactical Air Force (TAF) certification test activities.

To assist in analysis efforts, each of 44 in-scope STRs (with references to associated TAF Trouble Reports (TRs)) was included in the procedures in the approximate location of the associated test steps. Additional test steps were incorporated to identify the operational bounds of the ICCE system. Prior to the FVT, the procedures were reviewed with the 552 AWAC Wing at Tinker AFB, OK, as well as the 4702 CPUSS (ROCC Software Support Facility (RSSF) at Tyndall AFB, FL, during September of 1989. WES participated in the review meeting at Tyndall and contributed verbal comments on the procedures at that time.

A preliminary version of the FVT procedures was dry run at WES in August of 1989 simultaneous with the verification testing of corrected STRs. Comments and corrections received (verbally) from the contractor at that time were incorporated. The FVT procedures were dry run at Tyndall AFB on two separate occasions during September of 1989. The first of these dry runs at Tyndall AFB involved the E-3 Mission Simulator as well as WES test support. Updates and modifications were included in the FVT procedures as a result of the review activity, dry runs and both informal and formal comments provided by WES prior to the FVT. The procedures were also redlined during the FVT to ensure track number, identity, switch action, etc., continuity and accuracy. Additional redlines were included to annotate areas which could not be tested due to 1) hardware configurations (e.g., lack of a second TADIL A source), 2) simulation software limitations (e.g., inability to transmit TADIL A Participating Unit as a track with E-3 internal simulation software), or 3) ICCE failures which precluded further steps in an event. These redlines have been annotated in the final version of the procedures submitted as Section I of this report.

## INTRODUCTION

Page 2

A full and detailed assessment of each of 44 in-scope STRs subject to this FVT is presented in Section II of this report. Section II also includes FVT results that revealed new anomalies and an assessment of additional STRs/AF TRs examined during the FVT. The information provided in this report is based solely on the results of the FVT. The contractor did not provide to the Government the results of in-plant testing or their final status (open vs. closed) of the STRs prior to the FVT. In addition, the contractor did not provide problem descriptions for several of the STRs. The STRs identified in this report as "closed" completed all test activities successfully. The STRs identified as "open" were determined to have failed their related test activities in whole or in part or were not adequately tested for a variety of reasons. Those items not adequately tested during FVT will be subject to verification during the TAF Special Test. It is important to note that the latest PDFA software version (89.312) subjected to Government testing displayed a series of new anomalies.

The facilities used during the FVT were the E-3 Mission Simulator at Tinker AFB, as well as the alternate string Sector Operations Control Center (SOCC) and the ICCE at Tyndall AFB. The E-3 Mission Simulator operated the Airborne Operational Computer Program (AOCP) version 20/25.1, the SOCC operated Joint Surveillance System (JSS) Version 13 software and the ICCE operated the Programming and Display Functional Area (PDFA) software versions 89.283 (12-20 October) and 89.312 (13-17 November). It should be noted that there is some inconsistency between the declared versions of ICCE PDFA software. For the October test period, the Data Link software was identified as 89.283 and the Display software was identified as 89.279. For the November test period, both Data Link and Display software was identified as 89.312 on the system tapes, but as 89.313 in the Version Description Document (VDD).

During the first test period, communications problems delayed the start of the dry runs as well as formal testing. As a result, the FVT was not completed. The second test period was scheduled to complete the FVT testing. WES modified the PDFA software between the two test periods. Due to previous experience with the overall impact of modifications to the PDFA software, the results of all tests completed during the October period were suspect, therefore, the Government conducted FVT in its entirety during the November period. In addition, the latest PDFA software version (89.312) tested displayed a series of new anomalies. Numerous out-of-scope and/or uncorrected STRs or TAF TRs were also tested during FVT to allow the using agencies to assess the operational capability of the ICCE and better structure training programs to account for limitations. The results of the FVT including new anomalies and out-of-scope or uncorrected STRs/TRs are submitted as Section II of this report.

As a convenience to the reader, the full report in Section II is followed by a summary of the status of 44 in-scope STRs in Section III of this report. A summary of the new problem areas is also included in Section III.



**ICELAND COMMAND AND CONTROL ENHANCEMENT (ICCE)**

**FORMAL VERIFICATION TEST (FVT) REPORT**

**9 FEBRUARY 1990**

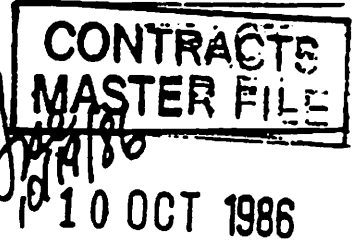
**Prepared by: The MITRE Corporation  
Bedford, Massachusetts**

**Prepared for: Headquarters Electronic Systems Division  
Hanscom AFB, Massachusetts**

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DEPARTMENT OF THE AIR FORCE  
HEADQUARTERS ELECTRONIC SYSTEMS DIVISION (AFSC)  
HANSCOM AIR FORCE BASE, MASSACHUSETTS 01731-5000



REPLY TO  
ATTN OF: SCUC/J. Fee

SUBJECT: Contract F19628-85-C-0079 ICCE Program Comment to Specification Updates

TO: TechDyn Systems Corporation  
Attn: Mr. W. Hise  
6564 Loisdale Court  
Suit 600  
Springfield, VA 22150

1. References:

- a. Specification red-line session held at TechDyn, Redbank, NJ, 4 August 1986 thru 8 August 1986.
- b. Specification red-line session held at 4C, Torrance, CA, 24 June 1986 thru 1 July 1986 and 7 July 1986 thru 16 July 1986.
- c. TechDyn letter, ICE-I-326 dated 16 September 1986, Results of Red-lining CFA specifications.

2. It was our understanding, during the referenced sessions, that the updates would constitute an allocated baseline subsequent to the submittal of the outstanding PDFA B5 specifications. The updated specifications do not reflect the agreements made during the red-lining sessions in that the contractor has omitted a significant number of agreed to changes. Also, in a number of cases, newly added material was not marked with change bars. Request these guidelines be adhered to for all subsequent submissions of these and other specifications.


3. Attached are the comments to the updated specifications resulting from above references. Request that you incorporate all comments which are annotated by a single asterisk. These changes were agreed to at the referenced red-lining sessions. If you feel the comment is technically incorrect, please provide the Government with written justification/rationale for your deviation along with your proposed rewrite. Those comments annotated with a double asterisk identify comments based upon new information added as a result of the red-lined sessions. Request you review these comments if acceptable and incorporate into the applicable specification. If the comment is technically unacceptable, respond to the Government as previously outlined.

4. Request that you submit all specifications, which you are able to incorporate all Government comments, in final format for authentication. Submit comments and final specifications NLT 22 Oct 86.

2736



5. If you do not agree that your compliance with the above would be within the present requirements of our contract, take no action but notify the Contracting Office immediately and in writing within seven (7) calendar days from receipt of this letter.



STEPHEN L. SMITH  
Contracting Officer  
Directorate of Strategic Systems  
Contracts  
Deputy for Contracting

Attachments

1. Documents Reviewed
2. General Comments
3. Comments to Specifications

Documents Reviewed

1. Prime Item Development Specification for the Remote Control Element (RCE) of the Iceland Command and Control Enhancement (ICCE) System, R/001517, dated 20 August 1986.
2. Critical Item Development Specification for the Equipment of the Master Control Unit (MCU) and the Remote Control Unit (RCU) within the RCE of the ICCE System, R/001508, dated 20 August 1986.
3. Computer Program Development Specification (CPDS) for the MCU within the Communications Functional Area (CFA) of the ICCE System, R/001493, dated 13 August 1986.
4. CPDS for the Data Control Unit, R/001495, dated 1 August 1986.
5. CPDS for the System Control Program, R/001497, dated 1 August 1986.
6. CPDS for the Support Program, R/001499, dated 1 August 1986.
7. CPDS for the Ground Entry Station (GES) RCU within the CFA of the ICCE System, R/001502, dated 13 August 1986.
8. Interface Design Specification (IDS) for the CFA of the ICCE System, R/001528, dated 13 August 1986.
9. Critical Item Product Function Specification for the Codex LSI 48I Data Modem, PFS-10006, dated 11 August 1986.

Attachment 1 (Cont.)

10. Critical Item Product Function Specification for the MCU, PFS-10007, dated 11 August 1986.
11. Critical Item Product Function Specification for the RCU, PFS-10008, dated 11 August 1986.
12. Critical Item Product Function Specification for the IDS 9000 Digital Matrix Switch, PFS-10009, dated 11 August 1986.
13. Critical Item Product Function Specification for the Model 870 Voice Actuated Switch, PFS-10011, dated 11 August 1986.
14. Critical Item Product Function Specification for the Collins HF-8014 Exciter, PFS-20001, dated 11 August 1986.
15. Critical Item Product Function Specification for the Collins HF-8054 Receiver, PFS-20002, dated 11 August 1986.
16. Inventory Item Specification for the ICCE System, IIS-10001, dated 11 August 1986.
17. Inventory Item Specification for the U.S. Central Air Force (CENTAF) System, IIS-20001, dated 11 August 1986.

General Comments (Atch 2)

1. The following specifications are accepted:

CPDS for the Data Control Unit R/001495  
CPDS for the Support Program R/001499  
C2a for the TCI 613T-1-06 HF Antenna PFS-20005

2. The following specifications, with the attached comments incorporated, will remain open until the revised specifications include the capability to remotely control four GESSs:

CPDS for the MCU R/001493  
CPDS for the (GES) RCU R/001502  
IDS for the CFA R/001528

3. The government will respond to the following specification updates on 10 October 1986.

PDFA B1 for ICCE R/001422  
PDFA B2 for ICCE R/001446  
CFA B1 for ICCE PDS-10001  
CFA B1 for CENTAF PDS-1

4. In all of the specifications that include the insert 4.2.11 Environmental Conditions, some of the text has been omitted from the System Specification para 4.2.6. Beginning with the fourth sentence the paragraph should read, "For operational tests, the CI shall be set up for normal operation, with the equipment energized. For nonoperating tests, the equipment shall not be energized." Correct in all affected specifications.

5. Comments to PFS-10005 will be submitted by 24 Oct 1986.