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25 August 1981

MEMORANDUM FOR:

[Redacted]

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Chairman, Interagency Working Group on Production

VIA:

Director, Office of Planning *file 8/21*

FROM:

[Redacted]

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SUBJECT:

FY 1983-1984 Production Enhancement Initiatives

1. An informal selection committee was convened in early July 1981 to review the FY 1983-1984 Production Enhancement Initiatives submitted by the various program offices, and to recommend to the Interagency Working Group on Production those initiatives which most deserve funding. The committee has selected the attached list of 14 initiatives submitted by the FBI, State/INR, CIA, GDIP and NSA totaling [Redacted]. This list is the result of a process of give and take among the committee members, and represents their interpretation of the objectives of the Production Enhancement Program.

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2. This year represents the third year of the program suggesting that a review and evaluation perhaps is in order. It was intended to provide seed money to analytical offices for innovative projects that, because of their speculative nature, could not compete for funding in the normal budget process. A relatively modest amount, [Redacted] annually was established as a ceiling; each project was to be funded for no more than two years at which time it would either be dropped or picked up by the respective program office. In 1979, proposals were received from four program offices of which eleven initiatives were approved for FY 1981-1982 in the amount of [Redacted]. In 1980, by contrast, proposals were received only from CIAP and GDIP of which eleven initiatives were approved for FY 1981-1982 in the amount of [Redacted]. The participation by six program offices this year is an encouraging sign that the program is gaining acceptance throughout the Intelligence Community.

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3. Although a good measure of progress has been made in establishing the Production Enhancement Initiative Program as a serious effort at encouraging innovative ideas, the committee believes that a review of the program by the Working Group is in order. There are a number of factors to be evaluated, such as the criteria for the selection of initiatives and the perception of the program at the working level. As more data becomes available on the initiatives funded in FY 1981, a more objective assessment of the program can be made.

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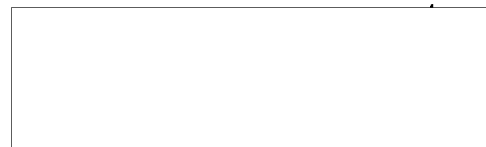
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4. The nature of the program also has dictated that its scope and objectives be rather broadly interpreted. As a consequence, the committee selections this year have been diverse in terms of content as well as in their impact on the intelligence production process. The committee further recommends that the Working Group give serious consideration to this broad interpretation of the program's scope and objectives.

5. The selection committee stands ready to provide any additional assistance the Working Group might require.



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Enclosures:

- 1 - 1983 - 1984 Production Enhancement Initiatives - Summary  25X1
- 2 - FBI Submissions (2)
- 3 - State/INR Submissions (1)
- 4 - NSA Submissions (3)  25X1
- 5 - GDIP Submissions (3)
- 6 - CIA Submissions (5)  25X1
- 7 - Summary of Previous Years' Submissions



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FY 1983-1984 Production Enhancement Initiatives - Summary

	<u>Project</u>	<u>Funds</u> (in thousands)		
		FY 83	FY 84	
FBI:				25X1

TOTAL

State/INR: The Cultural Element in Political Analysis

Seeks to improve the quality of political analysis of foreign countries by assisting analysts in deepening their understanding of the impacts of culture on politics.

TOTAL

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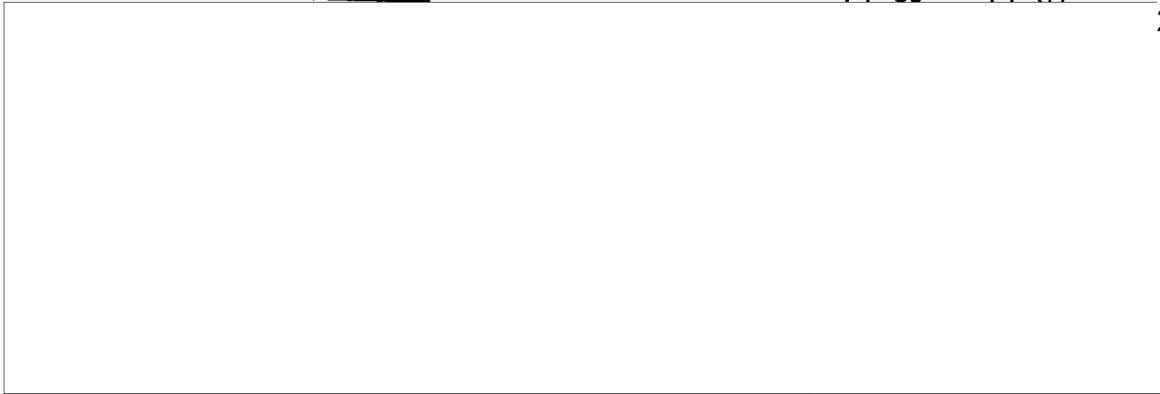
Projects

FY 83

FY 84

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TOTAL

GDIP: Crisis Data Base Exchange Methodology

To develop a test and demonstration prototype crisis data base architecture that will support a transaction-by-transaction data base exchange methodology based on automated message handling technology.

Submillimeter Laser Modeling Facility for Radar Cross Section Measurement

To build a submillimeter laser modeling facility that can provide actual radar cross-section measurements for millimeter wavelengths by using scale models of vehicles.

Improved Mensuration of Automated Hand-Held Photography

To improve mensuration accuracy and configuration data for weapon system analysis by integrating the best features of graphical and analytical methodologies currently used for exploiting hand-held photography.

TOTAL

CIAP: Exploiting Political and Social Data

Creates a unique data archive of a rapidly expanding group of files (already numbering over 200) containing political and social

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Projects

FY 83

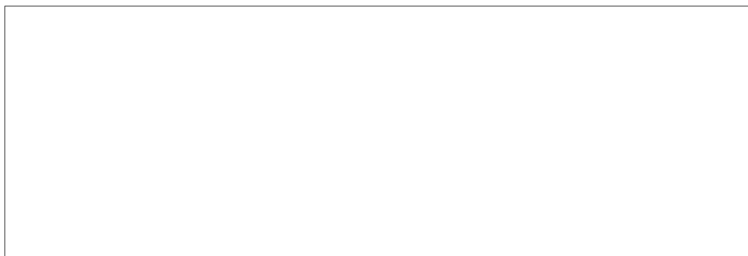
FY 84

information, and an interactive software system to permit ready access to and sophisticated analytical manipulation of the data.

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Large Scale Econometric Modeling System

Develops models from econometric and mathematical statements and sets of algorithms to obtain efficient solutions to problems with equations and variables too large to be processed in a timely fashion with existing capabilities.



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NonFuel Mineral Supply-Demand Data Base

Develops and rationalizes disparate data sets to establish, for the first time, a consistent, wide-ranging body of information on the availability of minerals critical to the security of the US and its allies.

Advanced Cartographic Support System

Develops a cartographic data base management system to expand the support provided to cartographers and analysts, such as portraying overlapping geographic areas or presenting items identified by other than location.

TOTAL

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TIME PHASING

During FY 82, detailed system requirements will be developed in coordination with other interested government agencies, potential contractors and FBI field divisions. A request for proposals will be generated for solicitation in FY 83. Prototype hardware will be tested in late FY 83 or early FY 84. Modifications and enhancements on pre-production equipment will be obtained in FY 84. (C)

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- I. Project Title: The Cultural Element in Political Analysis
- II. Cost:   FY-83   FY-84  
          \$400K   \$400K
- III. Description of Project:

- A. Statement of Need

In the intelligence community analysis of the political life of foreign countries is an art which seeks to explain and anticipate events and developments of importance to US policy makers. There is a growing belief among professionals that, while perfection of a fully reliable art is unlikely, improvements in the state of the art are possible and important to achieve.

The primary purpose of this project is to enhance the quality of political analysis by probing the impact that culture has on politics and providing materials that will enable intelligence analysts more readily and reliably to prepare culturally sensitive political analysis. To that end, the project envisions four types of products:

1. A sophisticated checklist of politically salient aspects of culture, with commentary.
2. A series of concise and rigorous statements each dealing with culture and politics in one of about ten selected countries. Each statement should be designed as an aid to USG analysts and other employees assigned to reporting, representational, negotiating, policy development or other political functions with respect to the country.
3. A report, with recommendations, on techniques for conveying to experienced USG foreign affairs professionals the type of advanced cultural understanding embodied in the checklist and country statements. The techniques should be those judged most effective for use in short courses at the Foreign Service Institute.
4. A series of direct encounters between USG analysts and other professionals, on the one hand, and outside scholars and experts on the other. The meetings should be geared to the preparation and review, of the materials specified above.

- 2 -

The secondary purpose of this project is to stimulate in the academic sector additional multi-disciplinary, and preferably self-sustaining, effort to advance knowledge of culture and politics in its theoretical, methodological, and practical dimensions. If it is determined that this can be accomplished through the development of a national center of excellence for advanced research, writing and teaching in this field, the Department of State's Bureau of Intelligence and Research will be prepared to entertain follow-up proposals for an appropriate USG role in that development.

B. Who Will Accomplish:

A carefully selected contractor who will work closely with a working group of State Department Officials organized by INR.

C. What Is to Be Produced:

As stated in A above.

D. Payoff:

The materials on culture and politics are envisioned (a) as aids through which experienced professionals called upon to apply their analytical skills to a particular country can more reliably and rapidly develop the advanced cultural understanding required, and (b) as valued reference aids for experienced country experts.

E. Time Phasing:

The project will be evaluated at the end of its first year and will be completed at the end of the second.

IV. Intelligence Community Applicability and Benefits:

Project results and products will be available to all Intelligence Community and other USG analysts. The project will contribute to the analyst's sensitivity and understanding of the cultural impacts on political behavior and to the production of more rounded and accurate political estimates.

V. Probability of Success:

The problem of the interaction of culture on politics is extremely complex and is a crucial dimension of political behavior. The probability of improving our understanding of many aspects of this interaction is good.

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**SECRET**I. Project Title: Crisis Data Base Exchange MethodologySubmitting Agency: DIA Decision Unit No.: 2735

II. <u>Costs</u> (Thousands of dollars)	<u>FY 1983</u>	<u>FY 1984</u>
R&D	500	400
O&M (Incl. Leases)	200	-
Total	<u>700</u>	<u>400</u>

III. Description of Project

## A. Statement of need.

The intelligence community has for years been struggling with the problems created by the lack of a common perception of a crisis situation. In large measure, this situation is attributable to the lack of a commonly accessible or available finished intelligence information data bases on the crisis area. Principal among these data bases in DoD are those formatted files relating to orders of battle and installations. These data bases form the basis for military, military/political and military/economic assessments of the crisis situation used for a wide variety of policy decisions, constitute principal inputs to military operations planning and execution, and are used for current situation presentation/displays of the crisis area to senior level defense officials.

The discrepancy between data base holdings at DIA and other major DODIIS sites during the course of a crisis creates a vicious cycle which impacts on the productivity of the analytical resources working the problem. The purpose of this project would be to test a concept for managing the required uniform distributed crisis data base and its supporting technology.

## B. Who will accomplish?

The Executive Directorate for DODIIS Engineering (DIA RSE) would conduct the project with contractor assistance. The project objectives would be to demonstrate the viability and utility of the proposed conceptual and technological solution. It will provide a unique ability to assess some of the DODIIS Engineering Initiatives early in the development cycle while providing some tangible solutions to existing Department of Defense Intelligence Information Handling problems.

## C. What is to be developed?

A test and demonstration prototype crisis data base architecture that will support a transaction-by-transaction data base exchange methodology based on automated message handling (AMH) technology. The prototype will use existing ADP and telecommunications facilities wherever feasible and lease other specialized equipment as necessary. SAFE technology will be used wherever feasible.

## D. How will it be done?

Under this project, the automatic data base change process would be tested through the full formatted file update cycle using an advanced technological hardware based AMH component. Three sites would be involved--two as producers and one as consumer.

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## E. How is it innovative?

The project is innovative in that it takes a concept from one narrow data base arena and applies it to a much broader problem using an untried though highly promising technology.

IV. Intelligence Community Applicability

## A. Who can use the results of the initiative?

All intelligence community sites who must exchange data base transactions-- either in the form of intelligence data or analyzed intelligence information--can benefit from the results of this project.

## B. What are the effects?

There will be several positive effects: the basic problem of information commonality and timeliness will be resolved, interoperability and the survivability of data bases will be greatly enhanced, and analyst productivity will be increased. Several other potential effects will also be evaluated: the impact on telecommunications, techniques and problems involved in handling the "initial load" of a crisis data base, techniques for dynamically modifying the data base exchange process during the course of a crisis, and techniques for handling "collisions" or "near-collisions" of data base change transactions from different sites.

V. Intelligence Consumer Benefits

## A. Who benefits?

All consumers and users of defense intelligence information will benefit from a more timely, integrated, and fully coordinated product that has been jointly evaluated at both the national and theater levels. Positive procedural or technological capabilities derived from this evaluation will be implemented on a community basis under DODIIS engineering initiatives.

## B. What are the effects?

The effects of implementing this crisis data base concept on a comprehensive basis will be to increase the utility of the intelligence product to the operational planner and decision maker and to enhance their confidence in the intelligence community at large.

VI. Probability of Success

There are several components to the proposed project each with their own probability of success. There is the conceptual component with a moderate to high probability of success. There is a technological component with an even probability of success. Of utmost importance, there is a procedural component with a less-than-even chance of success since the concept of operations to establish and maintain data bases in a crisis environment is not well developed or understood. Efforts to define this concept have generally failed due to uncertainties over the capabilities and flexibility of supporting ADP/telecommunications technology. On the other hand, efforts to specify the ADP/T technology have not progressed since they lacked a clear statement of requirements and a supporting concept of operations. This project will allow the two sets of requirements to be tested and developed in a joint effort in a test environment.

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**CONFIDENTIAL** NO FOREIGN DISSEM**I. Project Title**

Submillimeter Laser Modeling Facility for Radar Cross-Section Measurements

Submitting Agency: US Army Foreign Science and Technology Center

Decision Unit No.: 2507

**II. Costs:** FY 83-\$525K FY 84-\$75K**III. Description of Project**

A. (C-NOFORN) Within the last decade, US antiarmor munition designers have mounted a concerted effort to develop millimeter wave (MMW) (i.e., 35-, 60-, 94-, 120-, 240-GHz) transmitters/receivers that can be incorporated into a variety of weapons systems as active guidance mechanisms. Of paramount importance for these weapon systems, sometimes referred to as fire-and-forget, top attack systems, is the need for accurate radar cross-section (RCS) data on Eurasian Communist country (ECC) ground forces vehicles. The United States has spent many billions of dollars to develop these so-called smart weapons in an effort to counter the Soviet's numerical superiority in the ground forces. FSTC has been specifically tasked to provide RCS measurements for all ECC ground forces vehicles. A contract has been given to MIT Lincoln Laboratory to develop a facility that can provide actual RCS measurements for millimeter wavelengths by using scale models (1/16 and/or 1/34) of vehicles and scaling up the frequency of the incident radiation. The basic electromagnetic (EM) theory supporting this method has been documented and validated by FSTC scientists and engineers in charge of the contract. In addition, RCS measurements have been made on full size vehicles, and they compare very favorably with the scale model measurements. FSTC will develop and build their own submillimeter laser modeling facility based on the principles and equipment developed by MIT LL. Purchase of major equipment for the FSTC facility will begin in FY 83 and RCS measurement data should be output by 2nd Quarter FY 83. This program is unique in that it provides an efficient, cost effective method of determining RCS measurements without having to resort to building full scale replicas of each ECC armored vehicle. The FSTC Field Support Division, which is already building scale models of ECC ground forces vehicles utilizing all intelligence data gleaned by FSTC analysts, can provide in a timely manner the scale models needed for the operation of the laser modeling facility. Consequently, the submillimeter laser modeling facility can provide detailed information on MMW scattering by the scale model targets. The goals of this program are to gain insight into the nature of millimeter target signatures and to determine RCS's aimpoints and radar centroids of targets and their dependence upon aspect and depression angles.

B. (C-NOFORN) The facility consists of a far infrared (FIR) laser that is pumped by a continuous wave CO laser. Various gases can be introduced into the FIR laser cavity to provide for different submillimeter wavelength outputs from the FIR. These submillimeter wavelengths simulate the actual mm wavelengths for a particular scaling factor. For example, if a 1/16 scale model of a T-64 tank is used, a frequency of 560 GHz (i.e., 16x35 GHz) or 0.53 mm must be used to simulate 35 GHz illuminating a full scale T-64. Various gases are

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available such that all frequencies, expected to be used by munition guidance designers, can be simulated at submillimeter wavelengths. The beam emerging from the FIR laser is focused via a set of optics onto a scanning mirror that scans the scale model target. Various aspect and depression angles can be achieved by rotating the target. Reflected signal data is determined via a germanium bolometer cooled to 2K; the magnitude of the signal is then transferred to a computer system that can output the data in several fashions including a graphic display identifying each major MMW scattering surface, assigning a RCS in square meters, and denoting the centroid of the overall RCS for that particular aspect and depression angle.

IV. Intelligence Community Applicability:

(C) FSTC will be the primary user of the results from this facility. However, it will be responsive to triservice requirements as well as CIA and DIA requirements.

V. Intelligence Consumer Benefits:

(C-NOFORN) US munition guidance developers are the primary users of this data. RCS data at various aspect and depression angles are of paramount importance to fire-and-forget, top attack guidance systems operating at 35-, 60-, 94-, 120-, and 240-GHz. With the above referenced facility, FSTC will be able to provide timely RCS measurement data at a low cost to the munition designer.

VI. Probability of Success:

(U) This program is invaluable to the production of realistic intelligence data related to RCS. It has a high probably of success.

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I. Project Title: Improved Mensuration of Automated Hand-Held Photography

Submitting Agency: HQ FTD/SQHA

Decision Unit No: 2210

II. Costs:      FY 1983      FY 1984

\$200 K

\$200 K

III. Description of Project:

a. "Hand-held" photography refers to those photographs taken by tourists, attaches, and professional photographers using any of an assortment of small, commercially available portable cameras - usually either a pocket instamatic type or, more commonly, one of a number of popular 35mm Single Lens Reflex (SLR) cameras. The photographs are generally taken of objects having potential intelligence value (i.e., displayed at public air shows, technical exhibits, and parades). The intelligence information (particularly mensuration and configuration data) is extremely difficult to extract due to numerous factors affecting the object photographed. In short, the object is not usually as it appears but rather some distorted facsimile thereof.

b. Mensuration accuracy and configuration data of objects for weapon system analysis can be significantly improved by integrating the best features of two methodologies currently used for exploiting hand-held photography - graphical and analytical.

- Graphical technique: Produces a man-made drawing of the object photographed. The graphical method is very accurate and not as dependent upon imagery information (focal length, film format, enlargement factor, etc.), but it is a very slow, personnel-intensive process.

- Analytical technique: Produces parameter description of an object through the use of computer programs. This technique required less time than the graphical technique but is limited by the amount of information obtainable about the photography.

c. The integration of these methodologies through an external assistance contract should improve the timeliness and accuracy of object mensurations derived from hand-held photography. The effective application of such an integrated methodology requires the use of a graphics terminal linked with a digitizer board. Some modification (approximately \$50K) to a currently existing terminal and digitizer board may be necessary, but such modification costs would be a small percentage of this proposal's total costs.

- d. A system engineering approach to the problem will be done.

Phase I - Establish functional design requirements and technical requirements.

Phase II - Establish hardware and software specifications.

Phase III - Procure test hardware and code software.

This hardware will be commercially "off the shelf" and generic in class. The software will use modern coding techniques and be written in a modular fashion using a higher level language. In all cases, the system will be as hardware independent as possible. The intent is that the system be just another node on a general purpose computer and, thus, easily transportable. It could be adapted by any organization which has general computation support with minimal cost.

e. Both the graphical and analytical solutions have their good and bad points. This integrated approach, with the ability to identify the most productive path/technique as the job is progressing, will produce a large time savings. It will also allow more time to be spent on the correct technique, thus yielding a better product.

#### IV. Intelligence Community Applicability:

a. All intelligence organizations employing hand-held techniques to exploit imagery can use this methodology.

b. The effect, as in our case, is that more imagery can be exploited faster with a gain in information. At the minimum, the mensuration accuracy will be maintained at present levels.

#### V. Intelligence Consumer Benefits:

a. All intelligence organizations that use hand-held photography to derive intelligence products should benefit. It is hoped that a 25 percent reduction in man hours will be obtained, along with a better product.

b. A reduction in man hours will result in a more cost effective, timely product that would contain necessary, additional information.

#### VI. Probability of Success:

At the estimated funding level, the probability of success is estimated to be realistically greater than 50 percent. Increased funding would have a slight increase in success probability, while decreased funding would severely decrease the probability of success.

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I. PROJECT TITLE: EXPLOITING POLITICAL AND SOCIAL DATA

Submitting Agency: CIA

II. COSTS (in thousands):

[Redacted]

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III. DESCRIPTION OF PROJECT

A. Statement of need:

Intelligence analysis is often constrained by limitations in readily available data. To the degree that information is difficult to identify and manipulate, it will not be incorporated in intelligence production. In practice, this has meant that a vast array of political and social information--on public opinion, social trends, and domestic conflict--has remained largely untapped by NFAC analysts. When analysts assess political and social conditions, such as the potential for political instability, the effectiveness of foreign government policies, or support for its foreign policy, they, therefore, often rely on incomplete information.

This situation calls for the creation of a unique intelligence resource: a data archive of important political and social information and the means for analysts to easily use this information in their everyday work.

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To make these data readily accessible by analysts, an extensive interactive computer software system would need to be developed. The result would be an archive more extensive and timely than any that currently exists in either the public or private sector; one with sophisticated retrieval and analysis capabilities that would significantly enhance the depth and quality of NFAC analysis.

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B. Current status:

The Intelligence Community is embarking upon an extensive effort to upgrade its capabilities to monitor socioeconomic trends in foreign countries through increased use of external data bases, such as those of the Bureau of the Census, and by more intensive analysis of these data. This is a vital effort. To make the linkage between socioeconomic trends and political events, we need an in-house capability to store, retrieve, and analyse these bodies of data together. For example, the historical relationship between inflation rates and a leader's popularity or the incidence of domestic protest could be quickly measured statistically and graphically. More complex models would lead to forecasts of stability within a country.

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OPA is collecting and computerizing political and social data that will facilitate interpretation of economic, demographic, and electoral trends by NFAC analysts. At present, the OPA Political and Social Data Archive contains approximately 200 data files and we have

[REDACTED]

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The rapidly-increasing availability of information in computerized formats, the development of analytic aids through ORD's Intelligence Production Laboratory project, and the increased availability to NFAC analysts of remote terminals and sophisticated graphic systems make a thorough and systematic exploitation of political and social data possible.

### C. What is required:

External research funds will be used to hire outside contractors to complete three basic tasks:

1) Development of a computer software system that will allow analysts to query data on their country or issue and conduct simple statistical analyses. This would involve interfacing with computer packages -- including graphics support -- already available on the Agency's computer system or currently under development. The system would permit the analyst to specify a country, region, or issue and receive at the terminal an inventory of available archive data by time period. The analyst would make choices, receive results, process data statistically or graphically, save files, and otherwise manipulate the data interactively. By making the full range of information readily available and easily usable its full benefit will be realized. It is estimated that development of this software will cost [REDACTED] over the first two years.

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[REDACTED]

3) Transcription of socioeconomic data and election returns from published documents to computerized formats and coding of politically relevant events, such as acts of terrorism, insurgency and government reprisal within countries. Estimated cost of these activities is [REDACTED]

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### D. Implementation and timing:

These tasks will not be implemented by the same contractor. OPA will have overall responsibility, with the computer software development done in consultation with ODP. It is assumed that major portions of that work will have to be contracted out. External contractors are the most appropriate means for the massive data collection and preparation effort. Once the historical baseline has been developed, the archive will be updated and maintained in-house,

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supplemented by a minor investment of office external analysis funds when required.

With the funding of this project, OPA will conduct an ADP requirements study during FY82 and locate, through competitive bidding, contractors able to perform the related tasks, so that there would be no delay in getting started in FY83.

#### IV. INTELLIGENCE COMMUNITY APPLICABILITY:

The archive will constitute a unique resource within the Intelligence Community that will be used by NFAC analysts but could also support requests from DIA and State. The computer-based system will be developed with the flexibility to permit additional data bases to be added to the system in the future.

#### V. INTELLIGENCE CONSUMER BENEFITS:

The development of the archive is fundamental to the efforts to improve the quality of analysis in NFAC. It clearly will upgrade the accuracy and timeliness of political reporting on an ever increasing number of countries.

#### VI. PROBABILITY OF SUCCESS:

There are no known technical or administrative obstacles to the development of this system. It will be, however, large and complex and we anticipate that a significant amount of time would be needed to familiarize analysts with its capabilities and use.

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I. PROJECT TITLE: Large Scale Econometric Modeling System

Submitting Agency: CIA

II. COSTS (in thousands):

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III. DESCRIPTION OF PROJECT:

A. Statement of Need:

The volume of data and large number of variables generated and processed for analysis of international economic situations is too great to be handled by existing Agency software. The current Community systems have severe limitations. For example, the Agency system is 1960 vintage and has many design defects which restrict the incorporation of advanced mathematical and economic techniques. The system architecture also seriously restricts the size of problems which can be generated and requires the user to resort to undesirably high levels of data aggregation. The Agency's current system (TROLL) has the capacity to run models with 2,000 equations and 4,000 variables. The high priority OER requirement which this project addresses is a system with the capacity to run models with 10,000 equations and 15,000 variables in the same CPU time and real elapsed time. OER's requirements can be met by a custom-developed system. (S)

B. What will be Developed

The system will consist of two parts. One part will be designed for creating a framework of economic model types. Its purpose will be to generate appropriate models from econometric or mathematical statements and also perform data management tasks. The second part of the system will consist of a set of algorithms designed to solve large scale econometric models, efficiently making use of the Agency's computer processing capability. (S)

The system will be designed in modules so that new algorithmic techniques can be readily incorporated and accessed to solve new problems. As new generations of simulation and optimization software are developed, they will be added to the system to increase its efficiency and to provide faster turnaround times. The accompanying documentation will provide detailed definitions and sample problems, and general information about other applications of the techniques. (S)

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~~SECRET~~C. Who will Accomplish

This project will be a joint effort by ORD, OER, and ODP. ORD will provide specialized personnel to manage the project. OER will document its experience with the current system and provide personnel to test the system as it is constructed.

D. Time Phasing

This project will last three years and cost  (The FY 1985 costs will be borne by ORD and OER.) The tasks required and their order are:

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- o feasibility and system design study (FY 1983)
- o prototype software and documentation development (FY 1983-1984)
- o test, evaluation, and refinement (FY 1984-1985)
- o final system development (FY 1985)

IV. INTELLIGENCE COMMUNITY APPLICABILITY

The Agency is currently developing many econometric models to answer requests from the White House, NSC, DOD, State, Treasury, and Commerce. The knowledge attained in the development of such a sophisticated system as that needed to model and solve econometric models of this size will be shared with the community, but it is believed that the primary applicability is to Agency requirements. (S)

V. INTELLIGENCE CONSUMER BENEFITS

This project will provide the intelligence community with a unique modeling system that has been designed to meet the Agency's requirements and specifications. Many of the software systems which the Agency has acquired to date have been developed for industry or academia. The development of a new system will reflect experience in the design, thereby improving the precision and responsiveness of analysis based upon econometric modeling. (S)

VI. PROBABILITY OF SUCCESS

There is a high probability of success for this project. The recent advances in software and hardware have enabled business and research personnel to solve problems that are two or three orders of magnitude larger than those previously solved. The technology and experience to undertake such a project currently exists, but it will require extensive participation on the part of the consumer, OER, and dedicated manpower by the managing office, ORD. (S)

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ADMINISTRATIVE-INTERNAL USE ONLY

I. PROJECT TITLE: Nonfuel Mineral Supply-Demand Data Base

Submitting Agency: CIA

II. COSTS IN THOUSANDS:

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III. DESCRIPTION OF PROJECT:

A. Statement of need:

There is a persistent and justifiable Federal policy concern with the vulnerability of the United States and its allies to interruptions in the imports of nonfuel minerals that are critical to the maintenance of defense or essential civilian production or to the general strength of the Western economies. For example, the United States, Western Europe, and Japan all import more than 90 percent of their requirements of such important minerals as manganese, cobalt, chromium, and bauxite. Interruptions in this supply would severely affect steel production, stainless steel output, and the manufacture of jet engines, among other industries. The risks of supply disruption for these and other critical minerals are magnified by their restricted availability and the fact that they are disproportionately distributed among areas that are especially subject to instability or politically motivated supply interruption.

In response to this problem, the Agency has intermittently carried out ad hoc analyses of particular mineral supply or contingency situations. Such efforts, however, are hampered by the lack of a comprehensive, systematically compiled and coordinated governmental and private information base bearing on future nonfuel mineral consumption and supply. This proposal would greatly enhance the potential for quicker, more penetrating, and more reliable evaluative efforts.

B. Who will accomplish:

The proposed data base will be maintained by the Resource Analysis Branch of OGSR after having been established as the result of both staff and contract efforts. It would combine and coordinate those relevant governmental and commercial data bases already in existence or under development as well as raw data and intelligence that is reported currently in a variety of open and classified sources.

C. What is to be developed:

The proposed data base will consist of a variety of separate data sets, both quantitative and narrative, on consumption, capacity, production, inventories, prices, and recycling, as well as

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on the relevant economic, political, geographic, institutional, and other determinants of those variables. Predictions made by other authorities will also be included--especially predictions or contingency scenarios that relate to the risk of future supply problems. These data sets will be accessible to analysts through the Agency's interactive system. Software will be developed to provide both machine readable output and printouts suitable for distribution or for inclusion in finished reports. Adjunctive use will also be made of the MAGAS system to provide a variety of graphic displays and cartographic arrays. Under appropriate safeguards, the data sets will be made accessible in part to other government agencies.

The data sets would be established and maintained for each of the important commodity forms of those nonfuel minerals (tentatively, some 15-20) selected for their importance in the general economy and/or their critical defense applications. Particular priority would be given to those minerals characterized by the greatest apparent risk of potential supply problems. Further, they will consist not only of crude statistical and narrative inputs, but will permit those analytical summations and manipulations of the data determined to be useful on a routine basis.

D. Time phasing:

The bulk of the work of establishing the data base can be accomplished, under one or more outside contracts, during the first year of the program, with practical application and "debugging" commencing late that same year. Initial assessments of voids in the data base can then be made. Efforts to eliminate the gaps and bring the system online will continue well into the second year. Costs in succeeding years will be those for maintenance of the system.

In the detailed scheduling, priority will be given to those minerals and those elements of the system that are most relevant to providing assessments of situations with greatest risk and most serious consequences of a supply contingency.

IV. INTELLIGENCE COMMUNITY APPLICABILITY:

The project could lead to the development of new techniques for screening and integrating partially or largely inconsistent reports on the same subject. The most likely contribution will most likely be, however, the establishment of a rigorously derived data base on nonfuel minerals.

V. INTELLIGENCE CONSUMER BENEFITS:

The principal benefit to intelligence consumers will be the enhanced capability both for foreseeing the emergence of potential



mineral supply problems and for evaluating the implications of contingency, policy, and other scenarios affecting mineral supply. These benefits would accrue both from direct evaluation of the entries in the data base and -- especially for longer term problems -- use of the data base in the System Dynamics models that have been developed by CIA.

VI. PROBABILITY OF SUCCESS:

There has by now been a sufficiently large body of successful experience with large data banks -- both numerical and narrative and particularly within the CIA -- that the probability of success for the one here proposed is very high. Furthermore, the proposed effort would be a success in terms of its impact on analyst productivity, and the upgraded analysis made possible even if some elements of the project failed to be achieved.

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I. PROJECT TITLE: Advanced Cartographic Support System

Submitting Agency: CIA

II. COSTS (in thousands):

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III. DESCRIPTION OF PROJECT:

A. Statement of Need

Many intelligence production activities use geographic information as an intelligence source. They are supported in part by cartographic data bases maintained by OGSR designed to store cartographic features in point or linear form for traditional use in the preparation of maps and charts. (S)

A number of functions of interest to analysts cannot be manipulated easily so support is less than adequate. Examples are overlapping areas such as cities and industrial regions and other geographical features such as rail and water systems, which are part of a larger target complex. (S)

The geographic information systems must be enhanced and expanded to support the needs of Agency personnel. In order to do so, several functions are needed to support and supplement ongoing CIA programs (e.g., NFAC's Analyst Productivity Theme, OGSR's Graphics Automation Upgrade, NPIC's NDS). (S)

One need is a cartographic data base management system that will support basic analytical problems requiring a computer system containing geographic information identified other than by location, e.g., "is this point in France," "is this river a tributary of the Seine." Research must be done to identify the type of information needed by analysts, how the information should be stored, and how existing data bases can be efficiently transformed and enhanced. (S)

A second need is a system which must be able to maintain geographical relationships such that they can be accessed across a variety of applications. The system should be designed to be compatible with the needs and products of other systems (e.g., NPIC's NDS, CAMS). (S)

Additional research is needed on:

- o communication of geographic information among different systems and devices (e.g., graphics shops, television centers)

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- o specialized mapping techniques for showing information, i.e., showing the size of a country according to its population rather than its area
- o raster and vector data merger. (S)

**B. Who will Accomplish**

The proposed work will be done by ORD with external contractor assistance. ORD will work closely with OGSR graphic and cartographic staff members and other Agency groups on applying the research results to real-world analytical problems and systems. (S)

**C. What is to be Developed**

We will develop the following products:

- o define and establish the set of analytical requirements for support
- o a system which will integrate the appropriate external software of existing Agency systems (e.g., WORLD DATA BANK, CAM, MAGAS, TACK)
- o define and undertake research and development efforts for which no existing methodologies are sufficient
- o automated digitization and map building
- o specialized mapping techniques
- o query systems for analysts using multiple-source data with geographic data bases
- o formatting techniques, especially for communicating information among different offices and media. (S)

**D. Time Phasing**

This project builds upon and supports on-going ORD and Agency projects. Most of the groundwork and preliminary analysis will be completed in FY 1982. The first year of the DCI Enhancement will provide for system integration and the first research projects. The second year's funding will be devoted to research and development. (S)

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IV. INTELLIGENCE COMMUNITY APPLICABILITY

The project will produce an enhanced World Data Bank, which is a major resource for the Community at large. Insofar as it supports COMIREX and NPIC, it should enhance the Community's capability as well. ORD and OGSR are already working together with NSA and other parts of the Community on graphics and cartography, and we assume that all research performed under this effort will be shared in a like manner. (S)

V. INTELLIGENCE CONSUMER BENEFITS

The project will result in increased capability for analysts, cartographers, and graphic designers. This, in turn, should provide improved analysis and presentation of the analytical product. (S)

VI. PROBABILITY OF SUCCESS

The probability is high for producing a system which will significantly improve geographic/cartography data handling and analysis. It is likely that it will improve the Agency's ability to handle more data with no increase in staffing. (S)

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